CELA 2026

CATALYZING CONNECTIONS

CONFERENCE PROCEEDINGS:

ABSTRACTS OF PRESENTED PAPERS

Council of Educators in Landscape Architecture

March 18-21, 2026
Cincinnati, Ohio

Catalyzing Connections

Conference Proceedings: Abstracts of Presented Papers

CELA 2026

Published by
The Council of Educators in Landscape Architecture
https://www.thecela.org

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Acknowledgements
The Succes of the 2026 conference reflects the dedication and collaboration of many.
Or deepest appreciation goes to our Exhibitors and Sponsors

- ActarA, DuMor, Ernst Conservation Seeds, Maglin Site Furniture, ORO, Routledge, SkyLift Hardware, Unilock, USA Shade
- The Cincinnati Chapter of ASLA for assisting with our field sessions

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And most importantly, we thank all participants for sharing your scholarship, creativity, and passion for advancing landscape architecture education and practice.

CELA belongs to everyone who contributes to a community committed to fostering the processes and impacts shaping our landscapes, profession, and shared future.

Foreword

The 2026 CELA Conference, *Catalyzing Connections*, brings us to Cincinnati, Ohio, a city shaped by layered histories, ongoing urban transformation, and strong connections between communities, design, and practice. In this context, the conference continues CELA's commitment to strengthening relationships across academia and professional practice, with a focus on integrating strategies, knowledge, and action to advance our discipline.

The CELA Annual Conference remains our primary platform for scholarly and pedagogical exchange. This year, we welcomed nearly 480 participants, reflecting the continued growth and engagement of our community. The breadth of contributions presented at this conference demonstrates the evolving scope of landscape architecture and its expanding role in addressing complex environmental, social, and technological challenges. This Conference Proceedings includes all abstracts presented during the 2026 CELA Conference. All abstracts were peer-reviewed and offer insight into current directions in both research and practice.

The success of this year's conference was supported by strong participation and collaboration across our members and partners. We received approximately $12,000 in sponsorship support, representing the second-largest sponsorship total in the history of the CELA Conference. This support played an important role in sustaining conference operations and broadening participation, particularly for students. These contributions further reinforce CELA's role as a platform for catalyzing scholarly exchange and professional engagement.

CELA continues to build on its partnerships with allied organizations, including ASLA, CLARB, LAAB, LAF, CSLA, ECLAS, and IFLA. These relationships remain essential in strengthening connections between education and practice, expanding opportunities for collaboration, and aligning research priorities with the needs of the profession. Through the CELA-LAF joint panel during the conference, and shared initiatives, and ongoing dialogue, these partnerships contribute to positioning landscape architecture as a discipline that integrates knowledge and action across multiple contexts.

This year's keynote presentations further reflected the conference theme. Alma Du Solier, Studio Director and Principal at Hood Design Studio, brought a perspective grounded in practice, demonstrating how design, environmental planning, and community engagement can be integrated across diverse contexts. Her work highlighted the role of landscape architects in translating complex environmental and cultural narratives into actionable design strategies.

Dr. Robert "Bob" Brown, recipient of the 2026 CELA Lifetime Achievement Award, represented his longstanding work in microclimatic design and evidence-based landscape architecture. His research has shaped the field's understanding of thermal comfort and environmental performance, while his commitment to teaching and mentorship has influenced generations of scholars and practitioners. Together, these keynotes reflected the continuum between research and practice that this conference seeks to advance.

In addition to conference programming, CELA continues to strengthen its organizational capacity. This year, we introduced an inaugural CELA Member Business Meeting format aimed at improving communication and transparency with our members, aligned with the goals of the CELA Strategic Plan 2025–2030.

The quality of the 2026 CELA Conference and its proceedings is the result of significant collective effort. I would like to recognize Dr. Bo Zhang, CELA Vice President of Research and Creative Scholarship, and the CELA Track Chairs for their leadership in coordinating the review process. Their work ensures the rigor and relevance of both conference abstracts and manuscripts submitted to the

Landscape Research Record. This process is central to maintaining the integrity of our scholarly outputs and supporting the continued advancement of the discipline.

I would also like to express appreciation to the CELA Conference and Event Committee and IMI, CELA's management firm, for organizing this year's conference. Their efforts made it possible to bring together a large and diverse group of participants in a well-coordinated and engaging program. Their work behind the scenes is essential to the success of the conference and the experience of our members.

As we reflect on the work presented in this volume, we recognize that the strength of CELA lies in its ability to bring together diverse perspectives and foster meaningful exchange. The research and ideas shared through the 2026 CELA Conference contribute to a broader understanding of how landscape architecture can respond to current challenges while shaping future practice.

We look forward to continuing these conversations at the 2027 CELA Conference in Denver, Colorado.

Sincerely,

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2026 CELA theme track: Catalyzing Connections

#34 Shaping the Future of Landscape Architecture

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Abstract

Landscape architecture faces challenges such as climate change, environmental degradation, and urbanization, while also benefiting from opportunities presented by technological advancements and global interconnectedness. This compels educators and practitioners to reassess their approaches. Educators play a crucial role in shaping the future landscape architects of tomorrow, emphasizing adaptive design, interdisciplinary study, and social responsibility. Curricula now include environmental justice, participatory design, and digital technologies to equip graduates for collaborative and diverse community engagement. A gap persists between academia and practice. Academics focus on critical analysis, speculative design, and policy response, while practitioners face financial, regulatory, and client constraints. Bridging this divide requires collaboration, knowledge co-creation, and platforms for diverse viewpoints. Digital technologies and internet connectivity have transformed landscape architecture, enabling exploratory design, visualization, and global dialogues. Digital platforms facilitate the exchange of ideas among practitioners, academics, and students, fostering collaboration on climate adaptation and sustainable development. This reshapes the professional identity of landscape architecture, making it collaborative, data-centric, and globally relevant. Diversity, equity, and inclusion (DEI) are essential for ensuring the field effectively serves all communities. This panel synthesizes trends and envisions future trajectories for landscape architecture, offering a comparative academic and professional perspective. The panel members will share their knowledge based on their experiences, observations, and research through design over a sustained period. Their dialogue aims to identify strategies to narrow the academia-practice gap, enhance training, and maximize the impact of landscape architectural interventions. A parallel panel at the 2025 ASLA Conference in New Orleans targets practitioners. Replicating discussions will enable comparison and the dissemination of insights to inform the formulation of a comprehensive document that benefits the profession and bridges the academia-practice gap. As the field evolves, interdisciplinary platforms and conferences become increasingly significant. Reflective, evidence-informed, and inclusive dialogues ensure landscape architecture remains at the forefront of creating a just, resilient, and aesthetically pleasing world.

Keywords: Ensuring the future of the profession., Gap between the academy and practice., Current, emerging and future challenges and opportunities for landscape architecture., The state of the academy and practice.

#60 The Nexus of Academia and Public Service: A Partnership for Community-Driven Conservation

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Abstract

The field of landscape architecture increasingly faces complex social-ecological challenges, necessitating new collaborative models of education that bridge academia and professional practice. This paper presents a unique partnership between Purdue University's Center for Community & Environmental Design (CCED) and the National Park Service's (NPS) Rivers, Trails & Conservation Assistance (RTCA) program, which acts as a catalyst for conservation by integrating educational and professional resources for tangible community outcomes. Established in 2019, this partnership enhances the capacity of the NPS RTCA program while providing critical planning and design assistance to communities throughout Indiana. The NPS-RTCA has allocated modest annual funding to CCED from 2020 to 2025, enabling the expansion of student positions focused on this work. This collaboration also offers unique experiential learning opportunities, including student internships with the NPS, which contribute to the career advancement of Purdue graduates. The paper will include an assessment of key metrics to evaluate partnership success and long-term viability of intensive service-learning and outreach programming, including: resource investment over time, project implementation characteristics (staff time, dollars invested, and timelines), and expansion of project partnerships opportunities extending beyond the National Park Service. The partnership has supported more than sixty community and national park projects across the Midwest, including the Indiana Dunes National Park Wildlife Crossing Workshop and Pictured Rocks National Lakeshore. These initiatives empower local communities by providing the professional resources and expertise needed to realize their visions. A case study will highlight the partnership's efforts to support the Nature Conservancy's environmental tourism upgrades of the Efroymson Prairie at Kankakee Sands, which opened to the public in November 2024. Additionally, the partnership allows for co-supervision of student capstone projects by Purdue faculty and NPS staff, integrating academic and professional practices for more impactful outcomes. The relationship is formalized through a cooperative agreement, which creates a framework for project collaboration, student mentorship, and resource sharing. Established in 1976, CCED employs a service-learning pedagogy as a cornerstone for community partnerships, leading to significant project implementation across regions. This approach matches RTCA’s mission of collaboration that extends beyond individual projects to enhance the long-term capacity of communities to manage their natural and cultural resources. The Purdue-NPS partnership exemplifies how formal academic-professional collaborations can advance conservation, enhance experiential learning, and create career opportunities for students. The paper concludes with lessons on replicating this model to address diverse land use and environmental challenges effectively.

Keywords: Academic-professional partnerships, community engagement, conservation, outdoor recreation, service-learning

#86 University-Led Technical Design Assistance: Processes, Partnerships, and Pedagogies for Resilient Communities

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Abstract

Across the United States, university-led design assistance initiatives have become vital platforms for advancing the public interest by the public-oriented design professions of landscape architecture, architecture, and planning while enriching teaching, research, and practice (Criss et al., 2024). Rooted in traditions of community participation, disciplinary and transdisciplinary design approaches, and civically engaged learning, these programs integrate the disciplinary expertise of faculty and students with the needs of communities, often in the context of resource constrained environments (Kokroko et al., 2024). They offer fertile ground for exploring how design education can simultaneously address pressing societal challenges, such as climate adaptation and environmental justice, while producing scholarly outcomes, professional training, and beneficial outcomes for community partners (Casakin & Wodehouse, 2021; Norton et al., 2022). This panel will bring together faculty leaders from five distinguished programs: the NC State University Coastal Dynamics Design Lab, the University of Detroit Mercy Detroit Collaborative Design Center, the LSU Coastal Ecosystem Design Studio, the University of Arkansas Community Design Center, and the University of Florida Institute for Built Environment Resilience. Methodologically, each program engages in community-driven design assistance that combines participatory processes, applied research, technical expertise, and iterative design development. Panelists will outline the structure and operational model of their respective units, including approaches to project selection, stakeholder engagement, funding acquisition, interdisciplinary collaboration, and integration into curricula. Collectively, these initiatives address a wide spectrum of community needs—ranging from climate adaptation planning in coastal regions, to equitable neighborhood revitalization in post-industrial cities, to ecological restoration in sensitive landscapes. Comparative discussion will identify both shared frameworks—such as the application of design as a problem-solving and capacity-building tool—and distinctive strategies shaped by institutional context, regional conditions, and thematic focus. Findings from these case studies reveal several points of convergence: the capacity of design assistance to deliver high-quality, context-responsive solutions; the mutual benefit to communities and academic programs; and the role of these efforts in producing measurable social and environmental impacts. Common challenges include securing sustainable funding, balancing academic calendars with project timelines, managing community expectations, and integrating the often-unpredictable dynamics of real-world projects into structured learning environments. In conclusion, the panel will offer actionable insights for researchers and practitioners seeking to initiate, strengthen, or sustain technical design assistance programs. By synthesizing diverse experiences across five leading initiatives, the session will illuminate pathways for embedding public service, resilience, and innovation at the heart of design and planning education.

Keywords: Community-based design, Engagement, Service-learning, Resilience, Climate action

#94 Catalyzing Engagement: Investigating Factors and Perceptions Shaping Texas High School Landscape Architecture Education, Recruitment, and Outreach

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Abstract

Socio-economic and environmental pressures have created a demand for landscape architecture practitioners that far outweighs the current supply of students and professionals (Hendricks et al., 2019; U.S. Bureau of Labor Statistics, 2024c). This reality has spurred industry representatives to examine education, recruitment, and outreach strategies (Cardona, 2024, 2021; Davis, 2022; American Society of Landscape Architects, n.d.-a). Investigating the factors that influence landscape architecture (and allied industry) education, recruitment, and outreach may inform the refinement of such strategies. The purpose of this thesis is to examine the factors and stakeholder perceptions that influence landscape architecture education, recruitment, and outreach in Texas high schools. One overarching question frames this research: How can existing and future Texas high school landscape architecture outreach strategies be adapted to elevate student exposure and engagement? To answer this primary question, the thesis also addresses two secondary questions: What are the factors that influence Texas high school landscape architecture education, recruitment, and outreach? What are the opinions of relevant Texas professionals, educators, counselors, and recruiters on the effectiveness of existing high school landscape architecture outreach strategies relative to allied industries, such as architecture? This thesis employed qualitative research methods to answer the research questions (Spradley, 1979; Gale et al., 2013; Tie et al., 2019). Data from the literature review, seven anonymous interviews, and 21 anonymous online survey responses were analyzed within a framework matrix to synthesize key findings and recommendations. The study's small, localized sample size, qualitative structure, reliance on digital contact methods, and use of secondary data to amplify primary findings were key limitations that impact the generalizability of the research. Findings suggested that the factors influencing Texas high school landscape architecture education, recruitment, and outreach are numerous and interdisciplinary. Stakeholder opinions on current outreach strategies were mixed, with many acknowledging that they have improved over the years but that they still lag in scope and impact. While the findings revealed many potential avenues for calibrating these strategies, data suggested that centralizing efforts at the state and local schools would be the first step in addressing these issues. These findings offer guidance in identifying and addressing key issues surrounding Texas high school landscape architecture education, recruitment, and outreach. Moreover, they provide a foundation upon which landscape architecture educators, practitioners, and allied professionals may explore and expand discourse related to cultivating the subsequent generations of landscape architects.

Keywords: Landscape architecture education, Recruitment, Career discovery, Texas high schools

#110 Revisiting Trans-disciplinary Collaborations and Partnerships in Rural Development- Impacts on Communities of the Monongahela National Forest

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Abstract

This effort partnered community-engaged faculty from multiple academic programs at West Virginia University (WVU) and WVU Extension's Community Resources Economic Development team. The completed and in-progress projects model 'OneUSDA' and the USFS's recreational economies community development initiatives within post-industrial, challenged communities in the Monongahela National Forest (MNF), building community, agency and academic capacities. Methods: A survey administered in the MNF at the onset of the project identified themes and goals in community and tourism development in the gateway communities. The project team's composition allowed flexibility and diversity in addressing identified needs including: a small business survey; identification of partnership opportunities with other groups; review and revision of comprehensive planning documents; visioning workshops (Condon 2008); and community-engaged landscape architecture and graphic design studio courses (Angotti, Doble & Horrigan, Eds. 2011). The inherent flexibility of the inter-disciplinary model allowed the group to nimbly address specific needs identified through surveys and workshops towards strategic planning and implementation. Implications: Scaffolded outputs ranged from the quantitative economic modeling to social perspectives gained through resident and visitor surveys. Spatially-explicit maps of assets were created through an online participatory geographic information system (GIS) (Elwood 2006). Design workshops (Hester 2014) visualized alternative futures for identified sites in programming and character development. Adventure tourism narratives were published highlighting region-specific experiences. Regional branding was created through a social design process. As team members learned from the findings of fellow team members and actively participated within each's laboratory what followed was a more profound understanding of the context for planning, and a more relevant and vigorous product, cultivating citizen control (Arnstein 1969) of the planning and implementation process. Impacts: To understand results of the effort, the research team reflected on the impacts of the partnership from 2019-2025. To date, the Partnership has generated $376,000 to support the backbone organization, $204,000 to support collective marketing activities, $4.0 million to support business development activities, $1.6 million for trail and recreation development, and $1.5 million for downtown redevelopment. Additionally, the Partnership is recognized by USDA, NIFA and the Forest Service as a model program for USDA partnerships and Extension engagement to support the recreation economy. The Mon Forest Towns Partnership is now staffed and incorporated as a nonprofit organization. While still young, the organization has the leadership and experience - within its staff, Town Representatives, Board of Directors, as well as through its network of supporting partners – to achieve success (Arbogast et al., 2025).

Keywords: trans-disciplinary, planning, tourism, extension, rural community development

#141 Road Ecology in Zomia's Last Frontier: Mediating the New Economic Geographies of Transmission Lines, Interbasin Water Transfer, and Access Roads

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Abstract

This work examines how two state-led mega-infrastructure projects in the northern mountains of Thailand—the Yuam Water Diversion Tunnel and the Transmission Line Project—overlap to transform remote landscapes and disrupt community and ecological connectivity. These projects impose new access roads for construction and operation, which will increase regional accessibility and shorten travel time. However, they alter existing patterns of land use, ecological systems, and socio-cultural linkages, particularly within Karen highland communities. The Karen migrated from Myanmar over a century ago and maintain livelihoods closely tied to these ecosystems. They fish in rivers under community-based regulations, practice rotational shifting cultivation, and exchange goods within localized systems of reciprocity. The region remains largely non-industrialized, with rich forest ecologies, clean and diverse water sources, and high biodiversity value. Yet, official planning frameworks have failed to account for the ecological and social complexity of these highlands. Current Environmental Impact Assessments (EIAs) narrowly emphasize traffic efficiency while neglecting environmental processes and community concerns. In these upland zones, the gap between official assessments and villagers' lived experience reveals a persistent disconnect between state planning logic and local systems. Drawing on James Scott's notion of "Zomia"—a concept describing highland regions that resist state incorporation—the project reinterprets these access roads as instruments of state legibility and control, and as opportunities for landscape mediation rather than domination. The proposed multi-scalar methodology includes the following components. Regionally, we apply GIS-based accessibility modeling under different scenarios. These are cross-referenced with ecological sensitivity overlays (slope, flow accumulation, deforestation) through weighted overlay analysis to generate a landslide risk index. Then, we identify landscape typologies using DEM and aspect analysis, including four road typologies: tangent to slope, transverse slope, ridge, and valley. Based on fieldwork and participatory mapping in the Community Health Impact Assessment (CHIA), we visualize site-specific design strategies through section series, which respond to each typology by integrating indigenous practices of cultivation, river-based livelihoods, and inter-village connectivity. Results in this project challenge technocratic paradigms of road building in northern Thailand's highlands. By repositioning access roads not as neutral infrastructure but as part of political and ecological systems, our strategy highlights the need for soft infrastructure approaches. Rather than inserting new roads to dominate the landscape, we advocate a methodology of co-adaptation—one that supports community livelihoods, restores ecological coherence, and preserves cultural networks.

Keywords: Road ecology, GIS and spatial analysis, Landscape planning, Infrastructural politics, Soft infrastructure

#157 Catalyzing Connections across Community Development Organizations for Capacity: Brownfield Projects through the TAB Program

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Abstract

The Technical Assistance to Brownfield Communities (TAB) program is an EPA program that builds capacity in communities by identifying, managing, cleaning up and redeveloping brownfield properties. Landscape and interior architecture faculty bring their students to engage with communities through participatory design and planning seeking community capacity-building. TAB connects communities to the academy's resources through partnerships towards community development addressing resident and visitor needs. There are many challenges facing post-industrial communities: environmental, social, and economic. TAB's asset-based planning approach focuses on leveraging existing strengths, community connections, and identified community needs. This work builds on the need to work with disenfranchised and underserved populations (Hester et al., 2006) through service-learning projects (Butler et al., 2019) designed to increase citizen control, delegate power, and form partnerships (Arnstein, 1969). Community design projects are collaborative across organizations. Students and faculty work with the WV Brownfields Assistance Center (WVWRI, WV DEP), USDA, Extension, WV Community Development Hub, Riverlife—a nonprofit organization leading a community vision for the redevelopment of Pittsburgh's downtown riverfronts—the Allegany County Economic and Community Development, Action Baybrook—a nonprofit organization in the Brooklyn neighborhood in Baltimore, MD with the mission to improve the safety and well-being of residents—and others . Tying student projects to professional organizations and Extension builds on their experiential learning and adds value to their work (Sleipness, et al. 2019). Allied professionals engage with students through studio visits, lectures, community site visits and meetings, and project reviews. The collaboration with multiple organizations in site selection has multiple benefits. A primary benefit is that projects consist of stakeholder groups ready to engage with faculty and students. Often the selected sites have completed Phase I and Phase II assessments. Students learn about the work of environmental engineering and allied professionals as a foundation for projects. Area-wide brownfield assessments include multiple sites and corridors that can lead to a regional plan and vision for revitalization of multiple properties. The student work is considered scaffolded. Partner organizations work with communities and then design and planning come to the process when appropriate. The designs have led to investment in communities, turning liabilities into assets. Evaluation of TAB projects include learning outcomes tied to citizen leadership and transformative learning (Mezirow, 2011). Community capital (Flora and Flora, 2018) outcomes are measured through pre- and post-engagement surveys. Findings point to the program's success in achieving positive outcomes in student growth and community capacity development.

Keywords: Brownfields, Marginal Communities, Asset-based Planning, Service-learning, Community Engagement

#162 Planting Seeds: Exploring Strategies for Recruiting High School Students to Landscape Architecture

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Abstract

Landscape architecture shapes the spaces that define daily life---parks, campuses, plazas, stormwater systems, trails, and streetscapes---yet the profession often remains unrecognized or misunderstood by the public. This lack of awareness begins early. Niche's 2022 college survey found that only 0.05% of high school seniors planned to major in landscape architecture, compared to 1.4% for architecture and 0.55% for interior design. Similarly, a 2014 ASLA Professional Practice Network survey reported that only 12% of professionals discovered the field before college. These gaps highlight the urgency of early outreach and education. This research examines how and when students and professionals first learn about landscape architecture and evaluates strategies for introducing the profession to high school students. Two complementary data sets were collected: (1) university-level surveys asking students how they first discovered the profession, and (2) classroom-based activities in ten high school drafting, architecture, and graphic design classes in the Atlanta area. Each high school class participated in one of three activities: a presentation about landscape architecture, the same presentation paired with a Minecraft design activity, or the presentation paired with a pocket park project. Pre- and post-surveys measured students' awareness of the profession and their interest in pursuing it as a career. Survey results from the University of Georgia show that most respondents (61%) discovered landscape architecture in college, while 39% learned of it before high school. The most common pathway into the profession was through family or friends, followed by exposure during college tours, course catalogs, or introductory electives. A smaller number discovered the field through guidance counselors or aptitude tests. These findings confirm a strong correlation between when and how students first encounter landscape architecture and underscore the gap in high school-level exposure. The classroom interventions demonstrated that all three activities increased student awareness and interest. Presentations alone resulted in the largest increase in understanding of the profession; however, the pocket park activity produced a higher potential for career interest. The Minecraft activity also improved understanding, though slightly less, with a smaller number of students reporting greater awareness. Collectively, these results reinforce the value of direct engagement in high school classrooms. This study emphasizes that to strengthen the future of the profession, outreach must begin well before college. Researchers, educators, and practitioners play a pivotal role in building early connections with students, ensuring that landscape architecture is visible as a meaningful, creative, and impactful career path.

Keywords: Recruitment, Enrollment, High school

#178 Can Smart Watering Promote Tree Health? An Empirical Study in Arizona's Urban Environment

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Abstract

Extreme heat represents a significant and growing public health burden, particularly in the U.S. Southwest. Tree planting offers a cost-effective strategy for mitigating urban heat and enhancing community health. However, prolonged drought poses significant challenges in providing sufficient water to support tree growth, as seen in the state of Arizona (City of Tucson, 2022; Gillett, 2024). This presentation describes an empirical study on smart tree watering designed to address these issues. The research examines tree health outcomes—such as above-ground height, canopy spread, and underground soil moisture (volumetric water content)—as influenced by current and emerging watering conservation techniques. The study tests surface drip irrigation, organic mulch, hydrogels, and rainwater harvesting basins on the establishment of four native or drought-adapted tree species (Martin et al., 2023; Wei et al., 2024; Yang et al., 2025). Key results include: (1) smart watering techniques support positive tree growth while reducing water use by nearly 60% compared to standard urban landscape practices; (2) for canyon hackberry (Celtis reticulata), smart watering produces greater increases in canopy spread than drip irrigation, with organic mulch treatments averaging 101 cm larger canopy growth. Hackberry trees treated with cellulose hydrogels allocate less growth to height and remain approximately 30 cm shorter on average than those in other treatments; and (3) continuous soil moisture monitoring for desert ironwood (Olneya tesota) shows that soil at 5 cm below ground retains around 20%-23% moisture with smart watering, compared to about 10% with drip irrigation. A simple rainwater harvesting basin design nearly doubles subsoil moisture, demonstrating strong potential for promoting tree health. The research team is currently applying artificial intelligence and machine learning models to map tree health outcomes at neighborhood and city scales, with the goal of mitigating urban heat impacts across Arizona's urban environments.

Keywords: extreme heat, urban forestry, tree health, green stormwater infrastructure, Tucson

#188 Shared Waters, Divided Landscapes: Negotiating Ecological, Ritual, and Political Imaginations along the Mekong

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Abstract

Rivers are restless beings. They carry silt, seeds, fish, and myths across frontiers, binding societies even as they divide them. The Mekong River, stretching 4,630 kilometers through six countries, is the lifeblood of diverse ecosystems and millions of people. For centuries, the water spreads sediment and life across the flood plain as daily commerce, poems, and songs carry stories along its flow. Throughout the region, the flood pulse, the annual rise and fall of water, dictates when people plant, fish, and celebrate. This rhythm links the whole basin but takes on distinct expressions in each place. In Laos, at the onset of the monsoon, the ritual of splashing water during Pi Mai (New Year Celebration) honors its life-giving force. In Cambodia, at the height of the monsoon, the Mekong reverses its flows causing the Tonle Sap Lake to swell, flooding forests and replenishing fish stock. In Vietnam, the Mid-Autumn Festival coincides with the retreat of floods and the renewal of the delta's fertility. Seen through Geddes' transect, geography and ecology shape these adaptations. The flood pulse is a shared rhythm woven into diverse fabrics of life. Yet the river is also governed by fragmented regimes, where divergent state policies collide with shifting ecologies and cultural practices. Along its banks, ritual worship and resource extraction unfold in uneasy rhythms. The divergence is rooted in the different meanings the Mekong holds. To some, it is a sacred mother guarded by Naga serpents and a spiritual force in Buddhist cosmologies. To others, it is a frontier to defend, a commodity to dam, or an engine of national development. These logics converge and clash in representations. Ancient maps, folktales, and festivals sustain its sacred image even when colonial surveys and maps imposed new territorial orders. More recently, state plans and policies recast sacred waters as infrastructure and resources. As Denis Cosgrove reminds us, landscape is always a way of seeing. Through archival research, policy review, field interviews, and filmic vignettes, this presentation explores how cultural landscapes, conceptions, and representations of the Mekong diverge and converge across national boundaries. It is part 1 of a three-part research project at UPenn to advance culturally informed, adaptive design strategies for contested waterways. By bringing together cultural landscapes and representations, the work proposes landscape architecture as a connective tissue across cosmologies and infrastructure, care and control, while catalyzing new ways of seeing and negotiating transboundary rivers' future.

Keywords: Mekong River, Transboundary Governance, Infrastructure, Traditional Ecological Knowledge, Cultural landscapes

#189 Tracing an Urban Wild: Field mapping the Hockanum River Trail in Connecticut

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Abstract

The urban wild—a successional piece of land, shaped by ecological drivers in response to anthropogenic action— occupies an important ecological and social niche in the urban environment. It offers significant environmental, recreational, and health benefits to urban populations, especially in places without access to naturally evolving and immersive landscapes. However, access to these areas is often hindered by an awareness gap and misperceptions about the value of these spaces. In addition, the lack of well-managed trail systems, ecological care, and detailed maps and information makes navigation difficult and increases risks to both users and the environment. This study explores grounded approaches to trail mapping in urban wilds, combining desktop and field mapping in GIS, field observation, and an open-access trail-finder application. By mapping and ground-truthing existing trail networks, the project aims to create accessible maps that both connect people to trails and wild landscapes within their communities and provide the foundation and guidelines for trail improvements and long-term care. Hidden in dense residential neighborhoods is a profound network of trails that connects an entire watershed. Signs at street level are plentiful, but the trails behind are not well-maintained or documented, a missed opportunity to provide quality greenspace to communities in need of this resource. Built incrementally over the past 35 years, the Hockanum River Trail connects four distinct communities in Connecticut's Capitol Region. The infrastructure is there, but it is difficult to find and left languishing without consistent use and care. This project seeks to give the trail an online presence to support and stimulate on-the-ground action. Using the Hockanum River Trail and CT Trail Finder as a case study, the presentation covers: (1) methods of field mapping undocumented landscapes using ESRI Field Maps and ArcGIS Pro; (2) the power of a free and easy to use online resource for aggregating trail information; and (3) the importance of urban wilds and urban trail systems for increasing access to nature in the city.

Keywords: Trail systems, Urban wilds, Field mapping, Accessibility, Human-Nature Connections

#198 Bettering Urban Existences: An Applied-Philosophy Approach in Landscape Architecture to Mitigate Precarity

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Abstract

To identify precarity today, the phenomenal horizon appears generically adequate. As a spectrum of possibilities and expectations, it embodies multiple valences and future potentialities. While this spectrum is shrinking for many individuals today, urban spectacularization and gentrification (Jacques) continue to idealize post-modern existence. This contrast illustrates the neoliberal project's radicality and reveals the erosion of ecological and social interdependence (Escobar). Landscape architects are often implicated in this erosion. By promoting global solutions that uniformize the world (Hester) and enable ongoing capital accumulation and landscape appropriation (Wall & Waterman), they inadvertently reinforce the system they could help resist. At the same time, more voices are insisting that in an age of precarity where little remains unpolitical (Ansari et al.), "executives in charge of environmental action" must acknowledge the socio-political symbolism of the environment (Appleyard) to catalyze meaningful change. In response, socially minded landscape architects are reevaluating interrelations and agency to imagine ways of mitigating precarity and resisting neoliberal power. In practice, such reevaluation requires recognizing the artifice—the art of making (Spencer)—and moving toward a model of environmental action that mobilizes the city's fabric (green spaces, infrastructures, developments, everyday dwelling) alongside methods of anticipation, interdisciplinarity, scientific expertise, and participatory engagement. Yet although grounded in improving the world's habitability (Findeli), these mobilizations often fall short because they remain embedded within an applied-science framework that neglects the philosophical dimension of landscape architects' mission. This is a significant loss. Apprehending notions of ethics in landscape thinking can foster innovations in the field and cultivate new human–human and human–environment relationships capable of transforming existences (Gauthier et al.). An applied-philosophy approach (Champagne) addresses this gap by determining design concepts from philosophical ideals before translating them into actionable strategies. To address precarity, for example, phenomenological views on selfhood and otherness from Maldiney, Ricœur, and Rancière yield applicable derivatives—indetermination, pedagogical space, and the reorganization of common values. When integrated into the projective process (Boutinet), these derivatives can be designly embedded as idealects (Vial) in the urban fabric, transforming not only form but also resonating within inhabitants' ontological structures of being. By incorporating a philosophical ideal of society, the act of designing to redress precarity seeks to shape moments of relevance for city dwellers through daily experiences of unprogrammed, horizontal-knowledge–based, socially caring spaces. The city becomes a medium of philosophical expression that, through ethically informed design, reshapes the collective and reconstructs wider, thicker horizons.

Keywords: Applied-philosophy approach, Precarity, Idealect, ethical dimensions, environmental actions

#231 Envisioning Resilience: Five Years, Five Approaches to Confronting Climate Change in New England Communities

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Abstract

The Fifth National Climate Assessment (2023) identifies the Northeast as one of the fastest warming regions in the United States. Now in its fifth year, the Envision Resilience Challenge is a philanthropic initiative underwritten by the Schmidt Foundation that connects coastal communities in New England with university design programs to address the effects of the climate crisis at the hyperlocal level. Previous iterations of the Envision Resilience Challenge have focused on Nantucket, MA, Narragansett Bay (Providence), RI, New Bedford, MA, and Portland, ME, inviting a changing roster of universities and each year culminating in a public exhibition in the focus area. This panel of five professors from four different universities who have participated in the Envision Resilience Challenge examines pedagogy and landscape research through the lens of our different studios. This year's challenge in Bath and Harpswell, Maine marks a purposeful shift from urban to rural communities and has opened up new questions about context and scalability of common approaches. We also ask: how does the involvement of both community and philanthropic partners alter the pedagogy of landscape architecture design studios? How can community-engaged climate resilience studios produce meaningful outcomes beyond student learning? How can landscape architecture curricula balance technical climate adaptation skills with the social and cultural dimensions of community resilience? The open-ended structure of the Envision Resilience has allowed all the professors to pursue unique pedagogical approaches under a unified goal of producing community-oriented and -informed landscape interventions. Additionally, faculty are engaged in the early planning of each challenge and brought to the site for a pre-semester workshop to share initial takeaways, preliminary research and design scope, and partake in capacity building and fellowship.. For the Midcoast Maine challenge, panelist's focus areas include: Integrating investigations into heritage economies, urban ecology with a parallel architecture studio focused on mass timber workforce housing Retreat scenarios that catalyze future inundated grounds for new landscape experiences, infrastructures, and economies to emerge. Community engagement and civic infrastructure concepts ranging from early childhood environmental education through fishing community coastal adaptation. Community-building through art and participatory happenings (food security, youth mental health and access, workforce development, and trades) We will also address challenges, outcomes, and insights from the previous years of the challenge, including sustaining community partnerships post-semester, building on accumulated knowledge and skills, local policy shaped by student ideas, and how engagement tools shaped perception and feedback between students and the community.

Keywords: Resilience, Community partnerships, Collaboration, Pedagogy, Studio education

#242 Overlook(ed) Field School: Catalyzing Connections with a Post-Wild Pedagogy

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Abstract

How can we train the next generation of landscape architects to engage complex socioecological issues with rigor, creativity, and care? How might a brief, intensive summer practicum evolve to serve not only as a pedagogical tool but as a platform for civic imagination and public engagement? This presentation introduces the Overlook(ed) Field School, an itinerant, cross-regional summer practicum housed in a Landscape Architecture Program at the University of Oregon and supported by the Fuller Initiative for Productive Landscapes (FIPL). Focused on the ecology and cultural meaning of novel ecosystems and the spontaneous urban plants (SUP) that call them home, the course blends scientific field methods, participatory research, and speculative storytelling into what we term a Post-Wild Pedagogy —a field-based learning approach that expands beyond ecological nostalgia to embrace the dynamic, often messy realities of urban nature. This pedagogy positions students not as managers of ecological purity, but as interpreters, collaborators, and co-learners embedded in living systems. Students document and interpret overlooked sites and weedy ecologies through the creation of the Mobile Urbarium , a traveling exhibition that synthesizes plant and site analysis with interpretive multimedia. Working alongside local partners, they engage communities through public presentations in libraries, botanical gardens, and cultural institutions—making ecological research visible, tangible, and relational. In 2025 and 2026, these two-week intensives were based in Oregon and Pennsylvania, offering insight into how a flexible, modular structure allows the course to adapt to varying institutional settings, regional plant ecologies, and local stakeholder networks. This presentation will share pedagogical strategies, challenges, and insights, particularly around themes of urban biodiversity, equity, and cultural memory. Ultimately, we propose the Overlook(ed) Field School as a scalable and adaptable model for catalyzing connections—between people and place, design and research, classroom and community. In doing so, it invites us to reconsider what constitutes a “productive” landscape, and who gets to decide.

Keywords: Field Pedagogy, Spontaneous Urban Vegetaiton, Community Engagement, Public Scholarship, Interdisciplinary

#257 Co-Producing Climate Resilience: Insights from a Community-University Collaboration on Extreme Heat in San Antonio

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Abstract

Universities and community-based organizations (CBOs) are increasingly partnering to address climate risks in vulnerable neighborhoods. These collaborations extend beyond technical research to co-produce knowledge, build trust, and translate adaptation strategies into culturally relevant and actionable outcomes (Jagannathan et al., 2020; Robinson & Tansey, 2006). Yet the role of community-university partnerships in confronting multiple environmental hazards, particularly extreme heat, remains insufficiently examined (Hsu et al., 2021). This study presents a case analysis of San Antonio, TX, where a bilingual household survey was conducted in collaboration with Good Samaritan Community Services to capture Westside residents' lived experiences of extreme heat. Over sixty complete responses were collected and analyzed through both qualitative and quantitative methods, documenting exposure to indoor and outdoor heat stress, household energy burdens, coping strategies, and perceptions of potential mitigation options. Findings indicate that residents experience disproportionately high levels of thermal stress, exacerbated by aging housing stock, limited access to green infrastructure, and elevated summer energy costs. Respondents frequently reported trade-offs between cooling and other essential expenses, while relying on informal coping mechanisms such as modifying daily routines, restricting appliance use, or seeking shaded community spaces. Despite these constraints, participants expressed strong support for neighborhood-level interventions, including tree canopy expansion, reflective surfaces, and community cooling centers. Importantly, responses highlighted the necessity of culturally resonant communication strategies, trusted local messengers, and equitable program delivery to overcome legacies of disinvestment and marginalization. The results highlight both the opportunities and challenges inherent in community–university collaborations. Crucially, the partnership with a community-based organization served as the bridge enabling resident participation, cultural translation, and sustained trust, benefits that would not have emerged from a purely technical analysis. While such collaborations revealed tensions related to capacity, representation, and the pace of engagement, they also produced actionable insights into the social dimensions of heat vulnerability and adaptation. By showing how CBOs can mediate between local knowledge and academic research, this study demonstrates that socially just climate resilience requires not only technical solutions but also community-grounded processes that foreground lived experience.

Keywords: community–university partnerships, urban heat, stormwater management, resilience, co-production

#259 Etching as Analog - Parallels Between Landscape Architecture and Printmaking

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Abstract

In an attempt to best showcase the variety of ways that landscapes have been carved, etched, picked at, scarred, disturbed, muddled, invaded, reiterated, and impressed upon, the techniques used in print making stand to provide a unique medium through which a comparative analysis of landscape conditions can occur. Printing methods acting as precedents to this study include lithography (stone carving or etching), intaglio (copper, zinc, or plastic etching), cyanotype (photographic processes using a chemical reaction between solution and light), and screen printing. The first two methods rely on an initial cut into a material usually done with a sharp object, followed by a chemical reaction which occurs between two materials further deepening the initial matrix incision. Cyanotype and screen printing rely more on a repeating pattern typology which reveals the desired print. The way landscapes are interacted with during the initial construction period follow similar methods of carving and cutting followed by pattern making ultimately to construct the landscape into its desired purpose. The desired outcomes of earth manipulation can be for ‘good’ or ‘bad’, but this dichotomy aside, the landscape is impacted either way. Print making can act as an exaggerated analog of what a landscape endures over time. The systematic layering of plate etchings parallels initial landscape modifications like compacting, grading, planting, etc. An additional layering of this analysis involves how landscapes undergo destructive climatic conditions revealing patterns on the land over time. These phenological processes are increasing in frequency and intensity influenced by climate change. A print series utilizing the four printmaking methods – lithography, intaglio, cyanotype, and screen printing – as analog reveals the parallels between print making techniques and the ballet of machine and earth material imposing prints on landscapes. Using Terrains of Wetness as a case study, I hope to use similar methods performed by this studio, but apply them to conditions of landscape manipulation.

Keywords: Printmaking, Etching, Compaction, Phenology, Incision

#275 Integrating Children's Voices into Community Landscapes: An Analytical Review of Gamified Participatory Design Methods for Playgrounds

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Abstract

Public play spaces are essential elements for a community to support children's physical, cognitive, and social development. Involving children in the playground design process offers a range of benefits both for children (enhanced learning, creativity, sense of ownership, etc.) and for designers/landscape architects (authentic user feedback, unique user perspective, etc.) (Eslamzadeh, 2022). However, conventional participatory design methods often fail to fully capture the creative potential of children (ages 7–12), who capable of expressing complex ideas and collaborating with the designers effectively. Gamification, the application of game elements to enhance participation, may enhance the efficiency of the participatory playground design process (Hart, 1992) by allowing children to engage in their natural mode. This study presents a systematic analytical review of gamified participatory design methods used in playground design for children aged 7-12 and evaluates the success of these methods in engaging children and advancing design outcomes. Guided by PRISMA protocols, related literature was identified through searches in Scopus, Web of Science, and Google Scholar, along with grey literature sources. Studies that engaged children aged 7-12 in outdoor playground design using gamification were included here. Other studies that do not match this age group or lack a direct design output were excluded. Several categories of gamified participatory methods were recognized through this analysis, such as 3D model-making and prototyping, LEGO-based workshops, role-playing and design card activities, and digital or interactive tools (Brandt & Christiansson, 2004). These approaches successfully allowed children to express their creativity and imagination in a collaborative manner (Dalsgaard & Dindler, 2014). However, the limitations in these processes were also noted, which included high demands of resources, adult mediation influencing interpretation, and difficulties in translating playful ideas into buildable designs. This review proposes a framework for evaluating the efficacy of gamified design participation within the domain of playground design. This framework emphasizes the method's capacity to facilitate meaningful engagement of children that synthesizes with community feedback and professional design implementation. The research contributes to the discipline of landscape architecture by signifying the capacity of play-centric, co-design methodologies to breach the boundaries between theoretical knowledge, community participation, and actionable outcomes within landscape architectural practices.

Keywords: community engagement, participatory design, Children aged 7-12, Public Playground, gamification

#340 Drawing a Shared Vision: Bridging Disciplinary Divides Through a Collaborative Project

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Abstract

The complex challenges increasingly demand collaborative design approaches. Although many scholars and educators emphasize the importance of multidisciplinary or interdisciplinary teamwork, this process is often hindered by physical and cultural barriers. These difficulties persist despite the shared foundation of design and problem-solving across various fields (Craft & Cairns, 2009; Holland, Smith, & Bronet, 2005). In response, three professors who teach both design studio and drawing courses in architecture, landscape architecture, and industrial design, have come together to explore the practical possibilities of interdisciplinary partnership. We use sketching and drawing as a common communication bridge in different design fields. Our approach aligns with modern design's emphasis on intensive, short-term workshops (Canadian Architect, 2025; Iowa State University College of Design, 2023). This reflective case study is based on our self-initiated endeavor to remodel our school's design library. The project consists of two main stages. First, we analyze our current drawing courses to understand how each discipline uses sketches and drawing, thereby establishing a mutual understanding of disciplinary approaches and their unique methods. Second, sketching and drawing serve as the core collaborative instrument. We begin by working individually from our own expertise, sharing our work, and transitioning to a unified strategy by drawing together to propose a shared vision for the library. The entire process is analyzed and documented, comparing our initial expectations with the final outcomes and detailing the challenges and solutions encountered along the way. This research points to three main outcomes. First, it clarifies how drawing serves different purposes across design disciplines, providing opportunities to learn from the beneficial aspects of others' pedagogy. Second, it shows that drawing-based collaboration can reduce communication barriers and foster integrated thinking among professionals from different design fields. Third, this research process serves as a foundational resource for a practical and effective educational model to introduce interdisciplinary cooperation into design curricula.

Keywords: Interdisciplinary Collaboration, Integrated Thinking, Drawing, Design Education, Case Study

#365 Cycles of Care: Regenerative, Inclusive Approaches to Landscape Research

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Zayas, Iz, SUNY ESF, Syracuse, NY, USA

Abstract

This panel explores innovative, justice-oriented approaches to landscape research and design education, highlighting the work of Jean Yang, Monique Bassey, SaMin Han, and Iz Zayas. Each panelist brings a distinctive perspective on how participatory methods, cultural literacy, and embodied practice can dismantle traditional power dynamics and cultivate more inclusive, equitable design processes. Jean Yang's work in Syracuse models how design literacy, storytelling, and visual-symbolic tools like sticker-based workshops and PhotoVoice empower unhoused individuals and immigrant youth to reclaim authorship over public space. Her participatory techniques elevate co-creation and memory as central to both education and social change, challenging technocratic models of engagement and fostering deeper cultural and ecological attunement. Monique Bassey centers Indigenous knowledge in her community-led studios, grounding design processes in the Lakota medicine wheel, self-assessment, and reciprocal relationship-building. Through collaboration with elders and the Lincoln Indian Center in Nebraska, her approach emphasizes healing, cultural sovereignty, and long-term stewardship, while transforming both students and faculty into mutual learners and advocates for Indigenous-led futures. SaMin Han's Gulf Coast Interdisciplinary Studio demonstrates the power of sustained, community-first engagement in disaster-impacted, racially marginalized coastal regions. Her pedagogy integrates activist frameworks, ethics training, and hands-on collaboration, guiding students to act as co-creators and advocates for climate resilience, social equity, and policy transformation in communities often excluded from decision-making. Iz Zayas , as SUNY ESF MLA capstone student, bridges creative, research-driven, and embodied practice through seasonal, ritual-based sitework and iterative, sensory documentation at Split Rock. Her methodology models how cyclical, affective, and site-specific processes can be robust, scholarly, and regenerative when integrated with literature review and collaborative inquiry, expanding the possibilities for landscape research and reflective practice. Together, the panel demonstrates that meaningful transformation in landscape architecture arises from methodological plurality, affective engagement, and honoring community expertise. By foregrounding inclusive participation, embodied research, and cultural literacy, these educators and researchers challenge conventional boundaries and offer actionable models for students, practitioners, and institutions seeking to align design with justice and ecological care. Panel attendees will leave with concrete practices for integrating these principles into their own research, teaching, and design leadership.

Keywords: Participatory Design, Community Co-creation, Justice-Oriented Pedagogy, , Embodied Practice, Cultural Literacy

#366 Catalyzing Justice: Transformative Design Pedagogies for Crisis, Equity, and Community

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Abstract

Design education faces a pivotal test: can it prepare the next generation to tackle urgent challenges like climate change, social inequity, and public health crises—not in theory, but on the ground, with real communities? As intersecting crises deepen injustice, there's no time for business as usual. This panel showcases how academic teams and community partners are rewriting the playbook, proving design education can be an engine for justice, resilience, and meaningful change. Our first case from Eugene, Oregon, centers on the Landscape for Humanity initiative, where students and faculty teamed up with unhoused residents to transform marginalized transitional housing sites into living, edible forests and climate-ready microclimates. By co-designing modular tree nurseries, movable shade structures, and low-tech greywater planters, the group created immediate improvements in food access, cooling, and dignity—while building social capital and providing residents with job skills and agency. The story doesn't stop with design: it's about mutual aid, leadership sharing, and investing in local solutions that last. The second story—the National COVID-19 Emergency Schoolyard Design Volunteers—responds to school closures and inequities exacerbated by the pandemic. Over 300 volunteer designers and students supported hundreds of under-resourced schools, rapidly assessing sites and co-creating shaded, healthy outdoor learning environments. Efforts were focused on Title 1 schools and those located in urban heat islands, ensuring solutions directly reached the students most in need. This model showed the power of grassroots action and mentorship in democratizing design services and spurring green school transformation. Finally, in post-wildfire Northern New Mexico, University of New Mexico design students worked side-by-side with rural communities and agencies through the DPAC studio. Students didn't just design—they volunteered, listened, held issues forums, and co-developed tools to guide resilient rebuilding after massive fire and water system loss. By prioritizing compensation, empathy exercises, and system-based thinking, the program helped restore not only infrastructure, but trust, culture, and future capacity. Together, these examples redefine design education's purpose. By centering lived experience, co-creation, and humility, the field can move beyond service toward real solidarity—helping communities shape not just more resilient spaces, but more just futures.

Keywords: Community-led design, Co-design pedagogy, Equity and justice, Climate adaptation, Crisis response

#367 Reclaim, Restore, Reimagine: Teaching Landscape as Civic Practice

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Abstract

Moderated by Jean Yang, this panel examines how regenerative landscape architecture can address historical trauma, environmental justice, and social equity through community engagement, systems thinking, and multi-disciplinary partnerships. Through three studio-based case studies, panelists explore how public space design becomes a vehicle for healing, remembrance, and institutional transformation. Jill Desimini and Sohyun Park share their work on the revitalization of Bridgeport, Connecticut's waterfront—an environmental justice landscape shaped by decades of disinvestment and privatization. Through a five-part framework, their students engage residents, youth, city leaders, and nonprofits to co-create a public pathway that mitigates flooding, supports biodiversity, and reconnects fragmented communities. Their collaborative process shows how long-term, inclusive design can grow collective agency and produce enduring civic infrastructure. Roberto Rovira presents Florida International University's Rosewood Studio, which confronts the legacy of the 1923 Rosewood Massacre through participatory memorial design, oral histories, and interdisciplinary inquiry. Students worked closely with descendant communities to envision a 29-acre remembrance center that weaves economic development, ecological resilience, and healing into the landscape. This project underscores design's role in reparative storytelling and justice-centered placemaking. Cheryl Lough discusses her integration of systems thinking into the landscape architecture curriculum at Cal Poly Pomona. Through scenario modeling, mapping, and multi-scalar analysis, students address complex urban issues—from food insecurity to campus-community disconnects—while embracing neurodiversity and mutual learning. Her pedagogy cultivates adaptability, ethical responsibility, and regenerative design practices that extend beyond traditional project timelines. Jean Yang , whose research focuses on participatory methods and design literacy as social transformation, will guide the conversation, drawing out connections between practice and pedagogy, and inviting audience dialogue around actionable frameworks for resilience, equity, and justice. Together, the panel offers a compelling vision for landscape architecture as a civic and adaptive discipline—one that centers healing, partnership, and long-term change. Attendees will gain insight into new pedagogical models and concrete strategies for embedding justice and systems thinking in design education and practice.

Keywords: Community Engagement, Systems Thinking, Design Justice, Regeneration, Multi-Disciplinary Collaboration

#368 Cultivating Activist Pedagogies: Centering Justice, Power, and Partnership in Landscape Architecture Education

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Abstract

Landscape architecture education is undergoing a fundamental shift as programs embed activism, justice, and partnership into the core of design learning. This panel showcases actionable models for reimagining curriculum and studio culture across diverse campuses and communities. Reframing Foundational Design Pedagogy . Mainzer (Penn State) demonstrates how first-year seminars can lay the groundwork for justice-minded design by centering belonging, resource-seeking, and value-driven discourse from day one. This early scaffolding prepares students to engage confidently and equitably in community-oriented design later in their studies. Interrogating Power Through Studio . Orr (UW) uses the civic landscape as a platform for students to map, critique, and reimagine structures of power. By confronting the politics of place, students are challenged to recognize design's complicity and potential as a lever for social change—moving critical reflection to the heart of studio work. Leveraging Kairos Moments for Change . Cronan (WSU) introduces "Kairos Moments" as crucial, often unpredictable pivots in participatory action research. By identifying and seizing these opportunities, both students and communities can build more ethical, reciprocal, and lasting partnerships within and beyond academia. Transforming Practice Through Community Collaboration . Latané (CPP) details the CHILE initiative, where nature-based, co-designed school landscapes cultivate health, equity, and climate resilience. These studios equip both college and K-12 students with agency—while challenging institutional norms and centering the voices of historically marginalized groups. Shifting Academic Culture and Structures . Yang (ESF) applies an ecosystems lens to academic culture, revealing how policy, tenure, and reward systems affect the growth of activist and community-engaged scholarship. By spotlighting "keystone" actors and identifying conditions for genuine succession, Yang points toward practical routes for durable, systems-level transformation. Across these cases, attendees will find concrete strategies for embedding critical reflection, equity, and partnership at every level of design education—helping to cultivate a new generation of landscape architects equipped to lead system change

Keywords: Activist pedagogy, Community-university partnership, Institutional change, Landscape architecture education, Systems transformation

#380 Capturing Obscura: Toward a Participatory Framework for (Re)Making of Space of Liminality

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Abstract

Capturing Obscura explores a participatory design methodology that redefines urban landscape identities by examining the space of liminality and inviting different agencies, designers, communities, and policy makers to engage in the design process. The project begins with ethnographic observation and proposes a series of prototyped toolkits as instruments to facilitate reciprocal spatial activation within the urban landscape. The space of liminality is conceptualized as a condition beyond the conventional zoning–planning dichotomy, recognized as a residual outcome of top-down capital production—transitional and ephemeral in nature, yet lacking defined functions. Its presence disrupts the continuity of urban experience and is often marginalized through formal planning processes. This notion traces back to the concept of terrain vague, a French term describing “uninhabited, unsafe, unproductive” voids emerging in the post-war urban landscape. While variations of similar terms have been introduced to describe these urban conditions, most focus solely on spatial characteristics. In contrast, liminality is adopted here for its ability to address both time and space—its transitional, temporal, and ephemeral qualities reflect a relationship with time, while its informality and lack of prescribed function underscore its spatial ambiguity. Cambridge, MA is selected as the site for its accessibility and potential for field research. The design process is organized into three phases: Uncover – Critiquing the current dichotomous spatial divisions imposed by planning strategies, and tracing the origins of liminal spaces within the formally planned urban landscape; Reclaim – Identifying spaces of liminality through ethnographic observation and experience, moving beyond conventional top-down approaches; Flourish – Developing a guidebook of toolkits that activate liminal space as inclusive public space, supporting community participation and engagement throughout the design process. Capturing Obscura builds on a belief that spatial knowledge, memory, and critique are not solely expert domains but are shared and constructed through everyday acts. The paper aims to explore a reciprocal design methodology by examining the space of liminality and inviting communities to engage in the design process for a cohesive and vibrant urban landscape experience through the act of play. The ultimate goal is to propose a series of participatory design toolkits that do not simulate consensus—it provokes conversation, exposes tension, and seeds the potential for coexistence across difference. Through layered rounds of collective play, the game facilitates a process where design, governance, and community care overlap—not through monumentality, but through modest, repeatable, and inclusive actions.

Keywords: Participatory Design, Design Equity, Design Methodology, Public Space, Space of Liminality

#389 Listening to Community Voices: Catalyzing Connections for Landscape Justice in Times of Socio-Ecological Change

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Abstract

Landscape architecture is often framed as a foundation of democratic space-making, yet communities most affected by socio-ecological change are frequently excluded from decisions about their futures (Yang, 2025). Previous studies on community-engaged design (Ardoin, 2020) show that understanding how people narrate loss, belonging, and continuity is essential to designing landscapes as places of justice (Mitchell, 2023). Building on this work, this paper argues that design must begin with the social foundations of place by centering the voices of those living through exclusion and displacement. It asks: how might listening to community narratives transform planning frameworks that privilege top-down visions over lived realities? The research draws on two sites marked by ecological vulnerability yet shaped by distinct social contexts. In Money Bayou Beach near Apalachicola, Florida, land-ownership patterns have intensified the exclusion of African American communities from meaningful access to the beach. In the Garhwal Himalayas of India, glacial lake outburst floods (GLOFs) have triggered contested resettlement processes, displacing mountain populations from long-inhabited landscapes. Considered together, these cases reveal parallel emotional and political expressions of exclusion and displacement despite their divergent geographies. Community voices included up to twenty participants in each location and were engaged during one-week periods of landscape fieldwork. Methods combined formal interviews with informal listening sessions and place-based immersion shaped by local rhythms and encounters. In Apalachicola, Florida, a community gathering center provided an accessible venue for listening sessions, whereas in the Garhwal Himalayas in India, insights emerged through everyday interactions - walking routes, shared meals, and conversations in homes and shops. Although a questionnaire guided the process, the approach remained adaptive, focusing on how disadvantaged groups articulate their own voices and narrate struggles over home, property, and belonging amid socio-ecological change. Comparative analysis of thematically coded conversations and observations highlights differing policy and economic contexts but reveals common dynamics of exclusion and displacement. By curating and amplifying community voices, the paper positions listening as a critical design method that uncovers hidden layers of landscape injustice and catalyzes connections between lived experience, planning frameworks, and design practice. These connections create pathways toward more equitable and resilient interventions, linking democratic design to the urgent realities of socio-ecological change.

Keywords: Landscape Justice, Community Voices, Listening as Method, Socio-Ecological Change

#399 What's Your Theory?! a panel for a pédagogie de jour

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Abstract

In a rapidly changing profession, how do we define and teach the core principles of our craft? New technologies, materials, and a broader understanding of context are challenging the foundational theories of landscape architecture. This panel explores a pivotal, internal shift we face as educators: moving beyond established doctrines and re-examining the way we teach design each and every academic year. The constant evolution of the landscape architecture profession requires a re-evaluation of its pedagogical foundations. This panel brings together diverse voices to discuss how we can reconcile timeless principles with the evolving demands of contemporary teaching and practice. By sharing our approaches, we aim to cultivate a new generation of designers who are not only skilled in traditional methods but are also agile thinkers prepared to innovate and adapt. We will explore how our distinct approaches, though seemingly separate, may reveal common ground that can help other educators engage students more deeply with design theory. This 75-minute panel brings together four distinct voices to explore this moment of transition in design pedagogy. The presentation features each of the four panelists discussing their unique approach, followed by a structured audience discussion. One presenter advocates for the cultivation of ‘planetary students’, prioritizing collaborative knowledge production and relational design practices through pluriversal knowledge systems that move beyond extractive paradigms toward reparative futures. A second frames theory as a way of navigating design, grounded in drawing, intuition, and cultural translation. A third voice discusses a more improvisational approach, shaping new collaborative processes and paradigms with each new studio cohort. And the fourth positions design pedagogy as both the site and subject of design to develop an alternate landscape signature pedagogy from our discipline’s core concepts and methods. After brief presentations, we will engage in a candid conversation with the audience about the challenges and opportunities in integrating design theory in the studio. We will present findings from our own and our students' reflections on theory in process.

Keywords: Design Pedagogy, Landscape Architecture Theory, Design Education, Curriculum Development, Design Studio

#406 Reimagining the Path of Water: Designing Resilient Futures

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Abstract

Urban flooding is one of the main challenges facing medium-sized cities in Latin America. However, in most countries, strategies that integrate water management with public spaces remain underdeveloped. Therefore, this project explores how landscape and urban design can reinvent flood-prone environments, using Babahoyo, Ecuador, as a case study. Located between rivers and wetlands, Babahoyo regularly experiences seasonal flooding, rapid informal growth, and inadequate infrastructure. In other words, current urban patterns ignore ecological conditions, leaving public spaces underutilized and even inaccessible during the rainy season and exposing vulnerable communities to greater risk. The research proposes a master plan that positions green infrastructure as the primary driver of the city's future. Adaptable and low-cost typologies, such as floodable linear parks, restored wetlands, and permeable surfaces, will be designed to connect pedestrian paths and public infrastructure, transforming flood risk into opportunities for community resilience, while also supporting medium- and long-term expansion and planning. Drawing on regional precedents and global water-focused design models, the project seeks to adapt and condense diverse strategies to the specific realities of small tropical cities. In terms of methodology, the project combines site mapping, vulnerability analysis, and multiscale design testing. The main objective is to provide multiple community services through design, that is, to integrate ecological functions with recreational and cultural uses, ensuring spaces that not only absorb floodwaters but also support everyday activities. These multiple functions address a critical deficiency in current planning approaches, where hydrological resilience is either not considered or, if considered, is often in isolation from social and spatial needs. Furthermore, this project not only seeks to foster new conversations between planners, designers, policymakers, and local communities, but also encourages the belief that quality of life does not depend on large investments but can be achieved through a well-conducted study. It positions Babahoyo as a pioneering city for scalable strategies that can inspire other small and medium-sized cities prone to flooding. Thus, this project is not intended as a response to environmental risks, but rather a proposal that positions water as an active element of design and the design of public spaces as a driver of resilience and sustainable urban transformation.

Keywords: Urban Resilience, Seasonal Flooding, Floodable Spaces, LID

#434 Cultural and Historic Landscape in Praxis: A Collaborative Research, Pedagogy and Practice Intervention Approach

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Abstract

Cultural and historic landscapes spanning nature and culture remain peripheral within design and planning professions in Hong Kong, where conservation policies, strategies and institutional frameworks prioritize individual buildings and monuments. As a result, the intrinsic value of these landscapes – comprising layers of built, social and natural fabric – are often overlooked in development plans and projects. This fragmented, point-based approach – often neglecting spatial continuities, such as lines and planes – has prompted growing critique from scholars and professionals in landscape architecture, architecture, planning, conservation and ecology. These voices increasingly advocate for a more holistic and integrated conservation strategy that encompasses the entirety of cultural and historic landscapes. A new interdisciplinary initiative aims to advance this emerging paradigm shift. The project – Mapping Nature-Culture: Historic Landscapes in Hong Kong in its Wider Context within the Greater Bay Area – will develop and test a methodology to identify, characterise and recognise historic landscapes, starting with Hong Kong. It involves collaboration among academic institutions and professional bodies across landscape architecture, heritage conservation, and GIS analysis to map historic urban and rural landscapes. The project harnesses a synergy of academic insight and professional expertise, engaging diverse partners across multiple phases. In the initial research stage, academic and research institutions work to establish a theoretical foundation and identify key characteristics of selected sites. Using a range of historic and contemporary data, including crowdsourced data, the methodology will generate mapping of historic landscapes of Hong Kong. Subsequently, professional institutes will engage with students, communities and stakeholders to co-create meaningful narratives and develop effective communication strategies that articulate the value of historic urban landscapes. At the advocacy and outreach stage, the team aims to unify academic and professional voices, leveraging research-based evidence to influence policy frameworks and conservation practices, as well as pedagogic practices. The project will reflect upon implications for teaching future practitioners to engage with historic transformations in landscapes and the value it contains in a contemporary setting and object of intervention. The development of the methodology will involve postgraduate heritage management and studio classes. Design pedagogy has long relied on studio-based analogies and sporadic community engagement, with scholars occasionally contracted for technical research support. In contrast, this project integrates research and professional practice under a shared commitment to public engagement and policy impact. Its collaborative model offers broader implications for future research and practice across the spectrum of landscape architecture.

Keywords: Cultural and Historic Landscape, Design Praxis, Research in Practice, Cross-disciplinary Pedagogy, Practice Intervention

#454 Pop-Up Parks:Experimentation, Transformation, Collaboration

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Abstract

The growing Park(ing) Day movement, started as a modest repurposing of a single parking space in San Francisco, has caught the imagination of people around the globe. Combined with the ideas of Tactical Urbanism, it has created a new genre of pop-up, or temporary, public spaces. These landscapes have provided a more humane alternative to the asphalt parking culture and the vacant lots as viable and thriving spaces for people. This grassroots movement has, in many cases, resulted in the creation of permanent public spaces. The transformation of Times Square started as series of modest temporary interventions, which created public demand leading to a grand reimagining of the confusing, congested and car-oriented space into a green, pedestrian friendly and safe urban landscape. Based on a first-hand experience of creating pop-up landscapes, the intent of this presentation is to develop an understanding of the collaborative process involved in applying the ideas underlying Park(ing) Day and Tactical Urbanism. The case studies will include Philadelphia Flower Show exhibits, the first Pop-up Garden sponsored by the Pennsylvania Horticultural Society in Philadelphia, and recent Park(ing) Day Pop-up Park installation in Doylestown, PA. The presentation will include anecdotal and more systematic performance measures of the social and environmental impacts of these installations had on the surrounding communities. In the PHS Pop Up nearly everything – right down to the garden sink – was relocated, reused, or recycled at the end of the installation. The plants were either returned to the nurseries or transplanted in community gardens. These modest interventions, created entirely by a group of volunteers and funded by the local businesses and organizations, contributed to something meaningful for the good of the larger society and enhanced our sense of belonging and community. The transformative power of experiences of these temporary and unexpected memorable moments in our landscape have served to change the long-held beliefs about the primary importance of parking to boost business and the problems of loitering and vandalism by the younger segments of our society. It has galvanized the whole community around the economic, social, and environmental benefits of attractive public spaces. The overwhelming response and momentum resulting from these projects includes working with Sunday school kid's groups, meeting with government parks and recreation committee, Rotary Club, and other civic organizations, aimed at laying the groundwork for permanent transformation of the prevalent parking culture.

Keywords: Pop Up , Urban , Community , Temporary

#470 Counterlandscapes of the South: Adaptive Practices of Resistance, Care, and Reimagination

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Abstract

The U.S. South is often portrayed as a singular, exceptional, or backward region, even amid global connectivity and digital circulation (Burnett, 2016). Such reductive representations obscure the South's complexity, adaptability, and the diverse practices through which communities sustain cultural and ecological health amid systemic precarity. Rather than a fixed geography (Gallo, 2021; McKittrick, 2006), this panel approaches the South as a constellation of stories, expressed through land practices, social networks, and cultural forms that reveal overlapping histories and emergent possibilities for the future. Drawing from Souths: Counternarratives towards Counterlandscapes (2025), a symposium of designers, scholars, artists, and community practitioners, produced generative knowledge about how southern landscapes are actively made, cared for, and reimagined. At the original symposium, three landscape architects moderated discussions connecting artists, geographers, journalists, environmentalists, and cultural stewards, facilitating dialogue across disciplines and knowledge systems. The CELA panel builds on this work. The same landscape architect moderators serve as the primary speakers, offering retrospective perspectives, sharing stories, and reflecting on how grounded collaboration, synthesis, and connective thinking can bridge diverse forms of knowledge. This approach highlights lessons for interdisciplinary engagement, experimental methodologies, and the production of situated knowledge in southern landscapes. The discussion is organized around three interrelated themes: Resistance, spatial and cultural practices that contest extractive systems, reveal suppressed histories, and assert community agency (Tsing & Haraway, 2019). Care, acts of stewardship, tending, and intergenerational knowledge-sharing that sustain communities and ecologies in precarious contexts (Franco, 2023; Jacobs & Weins, 2024). Reimagination, design and cultural strategies that envision alternative, life-affirming futures for southern landscapes and communities (Camuti, 2024; Salojee et al., 2024). Through these lenses, the panel introduces the concept of counterlandscapes, building on Randy Hester's work on ecological democracy and participatory design (Hester, 2006). Counterlandscapes are spatial practices that resist dominant narratives while foregrounding ecological stewardship, community agency, and cultural continuity. By situating counterlandscapes within lived southern contexts, the panel reframes regionalism as a dynamic, evolving process rather than a static identity. Panelists present case studies, creative experiments, and community-engaged practices that exemplify counterlandscape strategies. Participants will gain insight into how generative research, reflective practice, and design thinking can illuminate overlooked stories, challenge stereotypes, and foster equitable, resilient approaches to southern landscapes, with relevance extending beyond the region to other contexts shaped by structural inequities and ecological precarity.

Keywords: Counterlandscapes, U.S. South, Participatory Research, Cultural Resiliency, Spatial Justice

#472 Co-Design Research, Connect before Collaborate—a case for Co-Design Harrisburg Community Resilience

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Abstract

Co-Design a community-centered approach in a collaborative design process to co-create knowledge and solutions based on shared community vision and give the community an agency to shape their built environments (Gaete Cruz et al. 2021). Co-Design as a participatory approach provides a meaningful pathway to foster collaboration founded in shared decision-making and mutual learning, aligning with equity, inclusiveness principles to achieve justice (Mukerji et al. 2024). This project aims to develop a Co-Design Research Framework employing the Co-Design approach to develop meaningful design research processes and outcomes through transdisciplinary collaboration that leverage community assets and address community needs. Under the uncertainty of socio-economic-political and climate change impacts across local to global scales, it is critical to understand the social-ecological vulnerability and climate justicescape (Cheng 2019a; Cheng 2019b) to ensure the investment in climate actions and design research are community-centered and help cultivate adaptive capacity and catalyze community resilience building, and in turn to rectify injustice in the built environments (Cheng 2022). We applied the framework in a workshop with communities in Harrisburg, Pennsylvania, where the neighborhoods are historically segregated and disinvested, and the generations of population are systemically under-resourced and vulnerable, especially when facing climate change-associated hazards such as extreme floods and heat. The Co-Design approach was applied to recruiting workshop participants and co-development of workshop agenda with community members. The one-day workshop was attended by twenty diverse stakeholders representing grass-root community activists, not-for-profit organizations, city employees, state representative officials, educators, researchers, and practitioners. The workshop included three interactive sessions: one session of ice-breaking activities and two designed sessions with the intention of connection and collaboration. The community defined resilience and expressed their concerns and challenges to achieve community resilience. To enhance resilience, the community identified critical assets such as nature restoration, sustainability education for youth, and a strong focus on equity and justice, while working to build trust and improve resource sharing across sectors. The workshop strengthened the connection with community before collaboration takes place. This ongoing project continues to evolve to co-design research inquiries for research projects informed by community members. This project demonstrates the value of employing a Co-Design Research Framework as a catalyst for community actions. Co-Design is a continuous and reiterated process with the goal to co-develop action-based research and community-centered practices to co-produce knowledge and co-create innovative solutions to address community needs, build community resilience, and rectify injustice in the built environments.

Keywords: Community Resilience, Justice Co-Design, Systemic Vulnerability, Participatory Design Research

#474 Designing Connections: A Decision-Making Framework for the U.S. Great Lakes Waterfront Trail

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Abstract

A graduate research team in an environmental planning program is developing and testing a scalable decision-making framework for waterfront trail design across the emerging U.S. Great Lakes Waterfront Trail (US GLWT). Inspired by the success of Canada's Great Lakes Waterfront Trail (CA GLWT) , the GLWT initiative aims to expand the outdoor recreation and ecotourism economy along the Great Lakes waterfront. This framework will serve as a catalyst for multi-state waterfront trail design through an evaluation of local priorities, governance, and trail conditions. The project covers the complexity of coordinating federal, state, and local agencies with varied geographic gaps in trail coverage and funding. To support connecting Great Lake communities, the decision-making framework will guide multi-agency, multi-state design decisions in GLWT communities. Using the Pennsylvania Great Lakes Seaway Trail within Erie County, PA as a pilot site, envisioned as an extension of the New York State (NYS) Great Lakes Seaway Trail, the project identifies the priorities of local trail users and stakeholders. Erie County reflects the multi-jurisdictional and physical conditions common across other Great Lake communities and offers a strong context for testing the transferability and structure of the framework. Methodology for developing the decision-making framework includes, (1) analyzing local planning documents, (2) identifying priorities and overlapping themes, (3) analyzing gaps (areas not covered by plans or with less attention) and developing guidance to support decision-making, and (4) developing a set of design standards and best practices. To date we have reviewed local planning documents, synthesized findings, developed trail design guidelines, organized a stakeholder engagement event in Erie, PA, and are now refining our work. Key outputs of the decision-making framework include, (1) trail typologies, (2) connection to key lakefront destinations, (3) best practices and recommendations, and (4) legacy goals. By piloting this framework in Erie County, Pennsylvania, the SEAS-GLWT project demonstrates how locally grounded priorities can scale to shape a multi-state trail system. The process identifies design strategies and builds a replicable model for integrating ecological, cultural, and economic considerations across diverse jurisdictions. Ultimately, the US GLWT framework will provide a foundation for unifying Great Lakes communities through consistent design language, shared best practices, and long-term stewardship strategies. It advances landscape architecture's role in bridging regional planning and local action, ensuring the Great Lakes waterfront becomes an interconnected and resilient public realm for generations to come.

Keywords: Waterfront, Multi-use trail, Design standards, Great Lakes, Community

#516 Nature Manufactured? Flood Mitigation in the “Water Winter Wonderland" State

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Abstract

The Great Lakes region positions its futures against the legacies of its past. Histories of rapid industrialization and urbanization that transformed the world’s largest freshwater watershed are well known (Napieralski et al., 2024). Today, climate change tests the region’s outdated regional wastewater infrastructures with more frequent and intense precipitation events, translating into recurrent flooding and water quality concerns (Sabourin, 2016). In Southeast Michigan, the most populous region in the ‘Water Winter Wonderland’ Great Lakes State, basement flooding, combined sewer overflows, pluvial inundation, and fluvial surges are far too common. Water, the interconnected matter and raison d’être of the region’s prosperity, is only welcome when it complies with a scripted labyrinth of drains, pipes, and CSO facilities. Flooding, a natural occurrence that sustains ecosystems, is framed as a problem. In response, multiple concurrent planning efforts are considering more adaptive infrastructures, such as Nature-based Solutions (NbS) (IUCN, 2020). Can the former Great Lakes manufacturing heartland demonstrate a collaborative path to advance flooding resilience through the reintroduction of nature? NbS can catalyze opportunities in deindustrializing regions, yet past work warns of green gentrification in such contexts (Curran & Hamilton 2020). How might Southeast Michigan navigate these challenges? What tools can address these challenges and opportunities? This paper discusses an ongoing multidisciplinary study to develop a regional NbS framework for stormwater resilience and wildlife habitat creation across Southeast Michigan. The project integrates historic and contemporary spatial data to foreground legacies of uneven social geography (Gaber, 2021). Methods include stormwater modelling and hydrological datasets that identify system stormwater vulnerability, inform site selection and performance criteria for NbS interventions. A regional transect analysis couples thick layering of context-specific socio-ecological conditions along interceptor tributaries with interconnected NbS opportunities (Sowińska-Świerkosz et al., 2024). An actor network diagram introduces the web of stakeholders, the assets they may mobilize, and the economic frameworks to enable and sustain new interventions (M’Closkey & VanDerSys, 2021). A set of cards depicting fish, wildlife, and their enabling habitats further informs NbS planning processes and decision-making. Findings signal the need to make these tools accessible to a wide range of actors. They also reveal persistent challenges in advancing NbS across fragmented jurisdictions and adapting prototypical solutions to local ecologies, economic models, and maintenance practices. These underscore the need for cooperation and contextualization to reintegrate climate adaptive urban natures into the region.

Keywords: Climate adaptation, Stormwater management, Nature-based Solutions (NbS), Green over grey infrastructure, Deindustrializing region

#528 Is this what you see? Embedding immersive technologies in the studio design process to encourage community engagement.

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Abstract

There are accepted facets of formal learning in landscape architecture education that are overseen by standards set by the Landscape Architecture Accreditation Board (LAAB). The LAAB ensures that design programs not only prepare students for licensure but also develop critical thinkers. The pedagogy of studio-based instruction in landscape architecture education is based on systems thinking, site inventory/analysis, and design fundamentals. This exploratory study incorporates immersive technology into a studio environment, enabling rapid prototyping and scalable design solutions. Virtual Reality (VR) allows the expression of abstract reality, the presentation of abstract visual experiences, and the operation of the first-person aspect, 3D visual effect, and interactive scene and functions (Hu et al., 2015). Integrating immersive technology in a Design + Build Studio resulted in the creation of campus learning laboratory projects specifically focused on nature-based solutions, biodiversity, and mental restoration. As documented in the end-of-semester student course evaluations and from stakeholder interviews, the findings show that connecting virtual learning to applied, hands-on learning enhanced the students' abilities to conceive design solutions, prepare construction documents, and then fabricate their virtual designs. VR also created an environment of equal engagement from stakeholders and community users. VR is closer to reality than analog drawings, which are static, two-dimensional elements that lack a sense of presence. Considering the potential learning enhancement through VR use, it is understandable why researchers, organizations, and educators nowadays scrutinize this technology intensively, looking to add an extra dimension to the classroom with respect to both teaching and learning (Radianti et al., 2020). A 360-degree walkthrough enabled students, stakeholders, and community users to visualize the site's context, outdoor learning environments, transitional spaces, and design details. Faculty members should be encouraged to advance landscape architecture design curriculum by utilizing equitable, immersive, and communicative technologies, such as VR, in the courses they teach.

Keywords: Community Engagement, Immersive Technology,, Design Thinking, Design Process, Pedagogy

#545 The Changing Face of Landscape Architecture: Demographic Insights

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Abstract

Landscape architecture, as a scholarly discipline and an area of practice, is making strides to affirm its presence among design and planning disciplines in the 21 st Century. Professions, including landscape architecture, tend to evolve over time; typically becoming more scholarly as information is generated and incorporated into practice (Brown & Corry, 2011). That said, Brown and Corry, within the context of scholarly research, also insightfully argue that landscape architecture is still based on beliefs rather than facts, and both the profession and the discipline of landscape architecture have a culture of non-reporting. While on one hand, becoming a STEM discipline (ASLA, 2024) an increasing number of landscape architecture programs, (Milburn et al., 2016; Ozdil, 2021) and scholarly production and impact (Park, et.al, 2022) show promising signs for landscape architecture, on the other hand, our discipline is confronted with the dangers of not adapting to changes causing limited disciplinary and regulatory recognition, financial burdens, and program closures. Such changes and challenges necessitate a deeper examination of our discipline and profession through the lens of technological advancements and data-driven discovery. This session provides a data-driven understanding and examination of the forces shaping the landscape profession — from changes in education and professional practice to demographic shifts that influence the academic and professional practices. Facilitated by four respected leaders representing diverse sectors (academic, professional, regulatory, and/or licensing) of the landscape architecture ecosystem, the panelists will focus on reporting some of the most recent demographic data available in landscape architecture from the organizations that collect, analyze, or disseminate it. The panel specifically focuses on reporting on data concerning academic practices from the Landscape Architecture Accreditation Board (LAAB) and Council of Educators in Landscape Architecture (CELA), professional practice from the American Society of Landscape Architects (ASLA), and regulatory and licensure from the Council of Landscape Architectural Registration Board (CLARB). Beyond presenting some of the most recent demographic data in landscape architecture from these critical organizations, this conversation examines how the trends captured by individual datasets, or collectively, impact education, research, practice, regulation, and licensure. Attendees will gain insights into emerging challenges, strategic opportunities, and the evolving role of landscape architect professionals. This conversation also highlights the importance, availability, rigor, and limitations of data currently available to landscape architecture. In conclusion, the panel argues that as the landscape architecture profession continues to evolve, staying informed and empowered with data and knowledge is becoming more critical than ever.

Keywords: Data-driven Discovery, Licencure & Regulation, Demographics, Academic Practice, Professional practice

#547 Catching the wave or playing Catch-up? Integrating AI into teaching, learning, and professional practice

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Abstract

The use and research of artificial intelligence (AI) in academia has increased significantly over the past decade (Fernberg & Chamberlain, 2023). The last two years have accelerated the interest in, and adoption of, AI in many phases of professional practice across most fields within landscape architecture (DLA reference), which suggests that we are seeing the adoption of AI faster than previous emerging technologies within the field (Summerlin & George, 2019). Broader trends in the architecture, engineering, and construction (AEC) industry (Abioye, et al., 2021; Darko, et al., 2020), suggest a dramatic shift is underway in how designers incorporate and interact with AI. Concurrent with the dramatic increase in AI use, there has been a surge in access to AI through apps and potential ways to integrate AI into workflows. As educators responsible for preparing students for future practice, it can be bewildering to consider how best to integrate AI into curriculum, processes, and workflows. One approach is to better align AI-related instruction with professional practice. To do so, we conducted a survey on the adoption and integration of AI with practitioners affiliated with the American Society of Landscape Architects, the Canadian Society of Landscape Architects, and the International Federation of Landscape Architects. The survey results give credence to the overall continuing trend of increased adoption and use of AI. A majority of practitioners are incorporating AI in some form, especially in the early stages of design and business management practices. This aligns with goals of leveraging AI for increased efficiency and exploring novel design solutions. A minority of practitioners reported using AI during design development and construction management. The large majority of use is focussed on large language models, such as ChatGPT or Gemini, followed by use of image generators. Other segments of AI currently see relatively scant use in practice. This focus on generative AI reflects the ad-hoc manner by which practitioners report they are learning to use AI and suggests that we need more robust evaluation and training regarding AI in both practice and academia. Finally, practitioners identified a broad range of affordances that AI can provide, with concerns mainly focussed on ethics and accuracy. This highlights the need for continuing discussion about how we incorporate AI to activate the affordances while maintaining our autonomy as designers and our professional ethics.

Keywords: Artificial Intelligence (AI), Design Education, Professional Practice, Pedagogy, Practices

#548 Floodplain Management in the Context of Urban And Rural Areas: A Study in FEMA Region-6

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Abstract

Floodplain management, which focuses on mitigating flood hazards and enhancing the flood resilience in communities, serves an important role in emergency management and disaster risk reduction. At the forefront of managing these risks are floodplain managers, who assume responsibility for managing a range of flood hazards both in urban and rural areas. To address the research gap, this study explores floodplain management of urban and rural areas within FEMA Region 6. Specifically, we examine the challenges, perceived areas of expertise, and training needs of floodplain administrators and explore how these vary between urban and rural settings. Data for this study was gathered using an online survey administered using Qualtrics. Using a list of local floodplain administrators provided by floodplain coordinators within Texas, Louisiana, Oklahoma, New Mexico, and Arkansas, survey invitations were sent to 2,680 floodplain administrators located within FEMA Region 6. A total of 547 participants responded to the survey, and of that group, 359 responded to the open-ended questions. Next, qualitative and quantitative content analyses were carried out on the open-ended responses to identify key themes pertaining to the challenges, expertise, and training needs noted by the survey participants. The responses were categorized based on urban and rural participants, and comparisons were made between frequency and percentage of the responses per theme using MS Excel. Study Findings identified that mapping, lack of knowledge, funding, and training were the most common challenges faced by the floodplain administrators in both urban and rural settings. Additionally, many floodplain administrators described possessing expertise in the areas of mapping, base flood elevation identification, communication, and policy. The results of the analyses also found that the participants desired further training primarily in the areas of creating maps and grant management. The findings of the study also indicate that most of the identified challenges, expertise, and training needs of the floodplain administrators vary between urban and rural settings. The study integrates hydrology, GIS mapping, and Base Flood Elevation (BFE), which are the best implications in landscape architecture theory and practice. The major limitations of the study are lack of detailed information from the respondents who expressed both expertise and lack of expertise in the same response. The research recommends the practical implication for improving flood hazard mitigation through enhancing the expertise of the practitioners and also creating more research opportunities for the researchers that explore how to provide more updated training to the floodplain administrators.

Keywords: Floodplain administrators, Urban- Rural, Challenges, Expertise, Training Needs

#594 Iowa Mayors' Design Workshop: Catalyzing Community Design through Interdisciplinary Collaboration

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Abstract

This study examines the Iowa Mayors' Design Workshop as a replicable model for integrating academic research, design education, and community engagement to address complex local challenges. Hosted by Iowa State University's College of Design in partnership with ISU Extension and Outreach, the Workshop mobilizes interdisciplinary teams of faculty, students, and professionals in landscape architecture, urban design, planning, and ecological engineering to support Iowa communities through collaborative design processes. Inspired by the long-running Mayors' Institute on City Design (Chatfield-Taylor 1989), the Iowa Mayors' Design Workshop adapts and expands the model to reflect the land-grant mission of Iowa State University—integrating extension outreach and community-engaged student design studios. Using a case study methodology (Yin 2009), this research analyzes the Workshop's framework—site visits, contextual analysis, briefing materials, facilitated discussion, an intensive 2-day workshop, and post-workshop support—to understand how structured collaboration fosters actionable outcomes. Each phase of the process is designed to build trust, synthesize local and academic knowledge, and empower mayors and city staff to become design advocates in their communities. The study draws on documentation from multiple workshop cycles, including field notes, visual inventories, mapping exercises, and workshop recordings. It highlights how the Workshop's iterative, place-based approach generates tailored strategies for issues such as waterway restoration, trail connectivity, and economic development. The final deliverables—a briefing book and a summary book—serve as tools for continued dialogue and implementation, leading to integration into design studios where students work directly with communities on real-world projects. Findings suggest that the Iowa Mayors' Design Workshop offers a scalable model for landscape architecture programs seeking to deepen their civic impact while enriching student learning. By aligning academic expertise with community priorities, the initiative demonstrates how universities can serve as engines of design action, advancing both disciplinary knowledge and public good.

Keywords: Local government, interdisciplinary collaboration, waterways, trails, economic development

#628 Reclaiming a Cultural Corridor in a Historic Settlement: Integrating Community-Based Solutions and Interactive Landscape Design Strategies

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Abstract

Baton Rouge was home to Native Americans long before French explorer Iberville arrived, and from 1763 to 1812 it came under five different flags—France, Britain, Spain, the West Florida Republic, and finally the United States. In 1879, the Louisiana Constitutional Convention decided to move the state capital from New Orleans to Baton Rouge. Today, many historic sites in the downtown area remain, marked by historical markers. However, modern development has caused many of these historic parts of the city to become fragmented and disconnected from daily life. This project focuses on the historic downtown area of Baton Rouge and its adjacent neighborhoods, identifying underutilized sites and exploring opportunities to transform them into meaningful, culturally significant public landscapes. It explores the reclamation of a cultural historic corridor within the settlement. The research focuses on the question: How can community-based solutions and interactive landscape design strategies transform fragmented historic corridors in Baton Rouge into culturally and socially vibrant public spaces, while fostering justice between land, nature, and humans through active community participation? The methodology applies community-based solutions and interactive landscape design strategies to transform underused or vacant sites into vibrant, community-engaged spaces. It aims to celebrate heritage and strengthen social cohesion by linking historic narratives to contemporary community life. Through this approach, the project envisions a corridor that is culturally and historically meaningful, environmentally resilient, and socially inclusive, offering a model applicable to revitalize historic urban landscapes in Baton Rouge and similar contexts. Key strategies for the historic corridor include linking historic nodes by connecting significant buildings, landmarks, and cultural sites through pedestrian-friendly streetscapes to create a continuous cultural corridor. The project also emphasizes the adaptive reuse of historical infrastructure, transforming underused or vacant buildings and sites into multipurpose spaces that preserve heritage while supporting contemporary activities. Additionally, the design incorporates interactive and playful opportunities, such as outdoor installations, educational exhibits, fitness/play elements, and participatory art, fostering active engagement and enhancing daily use by residents. The project highlights the potential of landscape architecture to connect heritage, ecology, and community engagement in historic urban corridors. By identifying historic sites suitable for adaptive reuse, examining residents' engagement with underutilized spaces, and evaluating green infrastructure's impact on social and ecological health, the study demonstrates strategies for culturally meaningful, socially inclusive, environmentally resilient, and justice-oriented design. The findings offer a model for revitalizing historic settlements while promoting equitable relationships between land, nature, and communities.

Keywords: Cultural Corridor, Community Engagement, Historic Preservation, Landscape Design, Adaptive Reuse

Communication and Visualization

#23 Pictorial scene and symbolic formation: the significance of landscape imagery in graphic narratives about resource extraction in northern Canada

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Abstract

Joe Sacco's Paying the Land (2020) and Kate Beaton's Ducks (2022), though very different styles of graphic narrative (the former a work of journalism, the latter, a graphic memoir), both depict the socio-cultural and environmental conditions of resource extraction in northern Canada through careful deployment of landscape as concept and imagery . Using an approach derived from Denis Cosgrove's hypothesis of the duality of landscape as formation through socio-cultural processes and landscape as imagination through pictorial traditions, I will demonstrate how each artist uniquely leverages landscape imagery as both concept and visual structure for narrative purpose. I will also explore how each approaches the entanglement of human and non-human bodies, as well as industrial and 'natural' elements in the landscape, towards a more nuanced view of the way we inhabit the world beyond simplistic binaries of society and nature. These two different strategies approach the geographies of the Canadian north, and the extractive industries depicted, in what Denise Cosgrove describes as distinct branches of geographic vision: the pictorial and the narrative of landscape . Clarifying and understanding the way landscape is used in comics can yield important lessons for the use of sequential narrative in landscape architecture visual communication. Using Sacco and Beaton's work as exemplary case studies of environmental graphic novels, I will explore the techniques of spatial and temporal construction employed in comics to better articulate the role of land and landscape in narrative. Through close study of these two works and their use of comic visual narrative tropes, I will argue for a classification of landscape representations in comics and their potential applicability to landscape architecture. I will conclude with a reflection on the way a sequential narrative approach has been taken up in landscape architectural representation in a variety of ways including in the expression of time-based phenomena, the layering of complex socio-ecological conditions, and how political and personal stories shape our experience of the built environment.

Keywords: Comics and graphic novels, Landscape narrative, Landscape imagery, Visual narrative, Spatial representation

#183 Information Modelling in Landscape Architecture: Between Promise and Practice

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Abstract

Information modelling (BIM/LIM) is often promoted as a transformative workflow for the design and construction industries, yet its integration into landscape architecture remains uneven and pedagogically unresolved. This paper presents findings from a 10-week seminar designed to critically examine the promises and limitations of information modelling, testing novel approaches to digital pedagogy in landscape architecture. The course positions BIM/LIM not only as a technical workflow but as a framework for interrogating how digital systems shape disciplinary identity, material practices, and professional expectations. The seminar's pedagogical exploration lies in its integration of critical reading, hands-on software experimentation, and dialogue with industry practitioners. Students engaged Kensek and Noble's (2014) foundational Building Information Modeling: BIM in Current and Future Practice text alongside weekly guest lectures from landscape architects and software developers, enabling direct comparison between a decade-old discourse of digital promise and the realities of contemporary practice. Through structured assignments, students explored multiple software platforms, mapped their modeling workflows, evaluated and reduced the carbon footprint of their proposals, and visualized their final designs. Evidence for this study was drawn from the artifacts and discussions generated through the course—workflow diagrams, software testing outcomes, seminar debates, and practitioner presentations—which were analyzed for recurring themes around disciplinary alignment, technical literacy, and evolving models of collaboration. Findings point to persistent tensions between landscape architecture's process-based, ecological orientation and BIM's standardized component logics, but also highlight emerging strategies that students and practitioners are using to adapt these systems for site-based design. By framing information modelling as both a critical subject of inquiry and a necessary component of contemporary digital literacy, the seminar contributes to broader curricular goals: preparing students for interdisciplinary collaboration, building capacity for informed critique of digital tools, and positioning designers to shape evolving professional standards informed by environmental performance metrics. The paper concludes with recommendations for future curriculum development that balances technical proficiency with critical engagement, establishing information modelling as an emergent yet unresolved domain within landscape architectural education.

Keywords: Building Information Modelling (BIM), Landscape Information Modelling (LIM), Design Communication, Design Pedagogy, Digital Design Workflows

#220 Enhancing Urban Green Stormwater Infrastructure Design Through CFD-Informed Bioretention Analysis

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Abstract

Urban Green Stormwater Infrastructure (GSI) is essential for managing runoff and improving water quality, yet its design testing often depends on physical models, which are costly and time-consuming. CFD modeling evaluates pollutant transport and bioretention effectiveness, enhancing water quality and regulatory compliance assurance (Mangangka et al., 2016; Tansar et al., 2023). Proper boundary conditions and turbulence modeling are vital for simulating sedimentation and identifying deposition zones (Yan et al., 2014). However, these approaches remain underutilized in landscape architecture. This research addresses that gap by investigating how Computational Fluid Dynamics (CFD) can be calibrated, validated, and incorporated into the design workflow of bioretention systems. A dual-method approach combined physical experiments and CFD simulations using FLOW-3D HYDRO. The model represented a bioretention cell including a street, curb cut, and three baffles, tested at two scales (full-scale and 1/3-scale). Key parameters examined were water flow rate, baffle dimensions, and pollutant weights, using sinking particles (red sand) and floating materials (perlite and styrofoam beads) to represent different pollutant behaviors. Results revealed a mismatch between CFD and physical experiments, with higher simulation resolution improving accuracy but increasing computational demand. The findings demonstrate that FLOW-3D HYDRO effectively models detailed hydraulic processes and pollutant interactions, indicating its potential for advancing design exploration in landscape architecture. This research highlights how CFD can accelerate GSI evaluation, enable in-office hydraulic testing, and foster computationally informed design practices within the discipline.

Keywords: Urban Green Stormwater Infrastructure, Computational Fluid Dynamics (CFD), bioretention cell design, pollutant capture, design optimization

#239 Importance and Confidence in Assessing Flood Risk through 3D Model Visualization in Virtual Reality

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Abstract

Flood visualization has long been an effective motivator at the policy level and is used by advocates of change(Sulong and Romali, 2022, Fischer and Stanchev, 2022). However, while federal, state and local agencies offer mapping visualization of flooding and sea-level rise, the format of these 2D mapping applications is rarely sufficient to fully communicate flood risk to untrained community stakeholders. 3D VR is a game changer in its ability to visualize flooding solutions at human scale as though you are actually present at the scene during the flood (Ellis, 2025, Sheppard et al., 2011). Immersed in their virtual neighborhood, decisionmakers can view before, during and after simulations for different flood scenarios, and suggest design modifications before they are implemented, after which it is often too costly to make changes. This study involves stakeholder engagement to determine the acceptance and effectiveness of using 3D VR to assess pluvial flooding vulnerability in high risk areas of Baltimore and Prince George's County. Fifty one participants were recruited using a convenience sample approach to include a balanced mix of community leaders, public agency professionals, private sector professionals, and community residents. Questions such as; do public officials and community organizers accept and support 3D VR simulations as an effective way to visualize flooding and assess flood risks in their districts? How do 3D VR images differ from traditional plan, section and tabular representations of model results? These questions are being investigated through community engagement exercises with 3D VR simulations, participant interviews, and a survey questionnaire. Flooding scenarios are produced using various hydrologic models and integrated together with LiDAR ground surfaces and realistic 3D CADD models of the neighborhoods rendered in Lumion. Survey questions used Likert scales to enable a range of statistical analyses. Methods included repeated measures ANOVA with Greenhouse-Geisser correction and a pair-wise post hoc test. Early results show that both technical experts and laypeople rate 3D VR images higher on most flood risk assessment questions, and higher overall. They also report high importance and confidence in being able assess flood risk using the visualization methods.

Keywords: Flood Modeling, Flood Risk Assessment, Visualization, Virtual Reality

#246 From Rice to Resilience: Remnant Rice Fields as Ecological Buffers for Climate Resilience in Coastal South Carolina

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Abstract

The rice fields of South Carolina are dotted by the remnants of meticulously engineered dikes, trunks, and canals that were once used to cultivate Carolina Gold rice. These are historical markers of the region's legacy of environmental and cultural transformation. Once productive landscapes carefully designed through the ingenuity and labor of enslaved Africans, these fields have gradually transformed into wetland-like systems, overtaken by the slow creep of ecological succession. Beyond this function, these coastal lying landscapes also remain culturally significant to the people of South Carolina. They serve as tangible keepers of the memories of those who shaped the land and continue to produce a crop that is central to culinary traditions passed down through generations. Today, these coastal features offer a critical opportunity to address South Carolina's climate vulnerabilities. Sea levels have risen approximately ten inches since 1950, and projections estimate an additional fourteen inches by 2050. Consequently, the state ranks fourth in the U.S. for most at risk for coastal flooding. In communities like Charleston, flooding of this scale continues to cause recurring devastation. As sea levels rise, remnant rice fields may serve as natural buffers, absorbing flooding while preserving cultural heritage. This project investigates the ecological transformation of these historic fields and evaluates their potential as buffers to enhance climate resilience. Drawing on Natuhara's research on the the wetland-like ecosystem services of paddy fields in Japan and Osawa's work on the role of abandoned fields in localized flood regulation in Japan, this project frames these historic remnant rice fields as buffers adapted for climate resiliency. The goal of the project is to combine GIS mapping of remnant rice fields and flood-prone areas, synthesized as a set of multilayered maps that highlight how these landscapes could integrate resilience with cultural preservation. By combining history, culture and spatial analysis, this project provides new narratives on how remnant rice fields can support flood mitigation while preserving cultural memory. This reframes historic agricultural landscapes as living relics of the future rather than artifacts of the past. This can provide a model for how historic sites can inform contemporary landscape design practices while honoring the histories embedded within them.

Keywords: Rice fields, Cultural landscapes, Climate resilience, Ecological buffers, South Carolina Lowcountry

#290 Cultivating Landscapes in Motion: Mapping the Plantsheds of Louisiana's Coastal Restoration Infrastructure

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Abstract

Despite the scale and ambition of Louisiana's Coastal Master Plan in addressing land loss and flood risk, the plan fails to account for how the working landscapes that produce plants for restoration function to undermine or advance its resilience goals. This disconnect represents a critical gap, wherein the very plant procurement processes supporting restoration could either contribute to or mitigate the impacts of climate change, most notably sea level rise vis-à-vis rising emissions. This study explores ways of visualizing plant procurement networks to advance counter-extractive design principles for coastal restoration work. Through fieldwork and semi-structured interviews with restoration project managers and growers at plant propagation sites, the researchers gathered rich narratives and spatial data. Interviews revealed diverse cultivation practices and material flows that connect fragmented production landscapes and coastal sites. Layered cartographic drawings trace individual plant journeys from propagule source to restoration site, contributing to a visual narrative that captures both the physical movement of plants and the extended economic and labor networks that facilitate plant cultivation, transport, installation, and migration. This cartographic methodology—synthesized into an ESRI StoryMap—makes visible the often-invisible "plantsheds" of coastal infrastructure and reveals how growers' climate-adapted practices might create alternative pathways within and beyond traditional procurement frameworks. Landscape scholars have long noted the limits of site-bounded design and called for increased disciplinary engagement with extended landscape systems (Kahn & Burns, 2005). Keeping with this lineage, this study proposes a translation of an urban political ecology methods (Gandy, 2022; Heynan et al., 2006; Kaika et al., 2023) from a primarily written approach to a visual one better suited to revealing the flows of live plant materials. By exposing the often-invisible networks of plant cultivation, the project challenges conventional infrastructure design that treats plant materials as commodities rather than sometimes unruly (Raxworthy, 2021) "live matter" (Elkin, 2017) created by particular places and practices. Furthermore, the choice of an interactive platform enables communication of these complex ecological and economic relationships across diverse audiences. Story Maps can increase accessibility by presenting narratives that enrich geospatial information through visual media (Schroth & Mertelmeyer, 2020). For this study, the platform allows users to navigate between scales—from regional procurement networks to individual nursery practices—and integrates grower interviews and photographs. By highlighting the human and plant labor (Franco, 2022; Welden, 2023) required for restoration, this approach equips practitioners and educators with the tools to advocate for regenerative practices in climate adaptation projects.

Keywords: Nature-based infrastructure, Coastal Restoration, Plant Nursery, Cartography, Mapping

#338 Designing a New Labeling System to Increase the Purchase of Native Plants with Negative Pot Appearance

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Abstract

Native plant availability and sales are increasing; yet they lag far behind that of nonnative plants, even during optimum conditions and ideal performance. Fall and Winter sales of immature and hibernating plants in containers are lower at retail and wholesale plant nurseries in the United States despite these seasons being the optimal time for installation (Schaefer, 2019). Plants have poor purchase numbers during the Fall and Winter which seems to stem from consumer misunderstandings of plants and a lack of interest caused by a traditionally negative appearance, as most container plants, including natives, are dormant and not aesthetically pleasing. Moreover, traditional aesthetic preferences have been reinforced by current traditional plant labels and marketing, which continue to heavily highlight showy flowers and elaborate foliage (Yu, 2021). For this investigation, the authors designed two brochures-one for each native plant species, Bouteloua certipendula , and Amorpha fruticosa . These brochures were designed to educate and communicate an expanded understanding of native plant beauty, including the beauty of strong roots, each stage of growth, establishment and maturation, and the understanding that accompanies the choice to plant a living organism which supports other forms of life. Qualtrics pre/post surveys were sent by email to Listserv members of the Georgia Plant Conservation Alliance and related plant interest groups (Anderson et al, 2021). The survey received a 48.6% response rate. After viewing the information and graphics in the brochures, interest in purchase and a deeper understanding of the native plant uses during dormant months increased 148% and 68% respectively. These results provide an early glimpse of the potential power of more creative and educational marketing in promoting the understanding, purchase, and utilization of native plants. The marketing approach proposed by this research may pave the way to a retail and wholesale green industry revolution in which the public comes to understand gardening as a year-round activity in the regions of the country where climate allows.

Keywords: native plant marketing , plant marketing , plant labels , negative pot appearance

#341 Appalachian Mountain Fragment, ascent and descent: Exhibition Design as a Tool to Invite Landscape Participation

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Abstract

Activating Urban Space for Movement and Joy is an interactive exhibition representing landscapes for movement. Displayed in a study/event room, the exhibit connects the Halprin design process for activating space as evidenced in The City Dance of Anna and Lawrence Halprin (CD) performed on the Portland Open Space Sequence (POSS) with a movement score on campus to encourage active use. By positioning design scholarship within a public venue and incorporating participatory elements, the exhibition invites visitors to engage more deeply with the experiential dimensions of landscape architecture. Chance encounters with the exhibition seek to enlarge public understanding of the impact of designed environments on movement and health. To personalize the content, the exhibition first introduces a personal narrative focused on the interplay between natural and built environments and the potential of landscape to invigorate movement awareness. Four subsequent boards describe the Halprins' synergetic creative innovations; the RSVP Cycles and the Movement Score. Both supported Anna Halprin's choreographic practice and informed Lawrence Halprin's movement-based design work (Halprin, A. 1975, 2011) (Halprin, L. 1963, 1965, 1969, 2009, 2011). The exhibition interprets CD as the outcome of Lawrence Halprin's Motation Score design process. Each "room" of the POSS is represented through overlays of dancer movement in relation to site design, accompanied by a narrative highlighting the impact of environment to inform movement. The final two boards, Appalachian Mountain Fragment: Ascent and Descent , introduce a Movement Score to the steep landscape of the near environment. Descriptive movement prompts layered on site images and plan graphics encourage visitors to perceive everyday landscapes as an invitation for creative movement. To evaluate the exhibition's impact on perceptions of landscape architecture and the role of environmental design in inspiring movement, four research methods were employed: (1) Gallery talks, follow-up discussions, and a survey; (2) QR-code system inviting users to upload images of creative movement based on the Appalachian Mountain Fragment Movement Score; (3) Interviews and a brief survey with library users; and (4) A broader university-wide survey of both intentional and casual library visitors. Preliminary findings indicate that: 1) After attending the gallery talk, users have an increased recognition of landscapes as active environments for creative movement; 2) Currently limited data related to the engagement with the QR-based participatory component, further formal events with the score are planned; 3) Interviews with library users and surveys are ongoing and reveal a heightened awareness of landscape architecture practice.

Keywords: Exhibition Design, Communications, Participatory Movement, Environmental Movement Score

#342 Visual Perception Informed Streetscape: A Bayesian Framework for Evaluating Urban Complete Streets

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Abstract

The Complete Streets (CS) concept reimagines urban streets as inclusive public spaces for all users—pedestrians, cyclists, and motorists—rather than prioritizing vehicles alone (Gregg & Hess, 2019; Mccann, 2013; Smart Grouth America, 2025). However, prior research often isolates design elements or overlooks differences among user perspectives within the same streetscape. This study addresses these gaps by developing a perception-centered evaluation framework that integrates diverse user perceptions and the combined effects of design features, including the levels of design elements, streetscape design categories, urban qualities, perceptions, and quality of service (satisfaction). A structured survey was conducted based on eight CS segments, classified as urban general, center, and core. The streets were modeled as digital twins in ArcGIS CityEngine and rendered in Unreal to simulate the views of drivers, cyclists, and pedestrians. The survey involved 979 participants and collected 1,540 valid street evaluation records. Bayesian Networks (BN) served as the core multi-level evaluation network structure, supported by correlation analysis and Structural Equation Modeling (SEM) to establish preliminary causal pathways. A specific three-step process was conducted to construct it. 1) Correlation and SEM analysis were conducted to examine general relationships and potential cause-and-effect among nodes of different levels. 2) Four BNs were developed based on the first step, each focusing on different relational aspects. Network 1 involved satisfactions, perceptions, and urban qualities; Network 2 involved satisfactions, perceptions, and design elements; Network 3 involved satisfactions, street design categories, and design elements; Network 4 involved urban qualities, street design categories, and design elements. 3) The four networks were trained, tested, and refined through sensitivity analysis via Python and were combined into one final network. The final network reveals predictive links between design elements and perceptual responses. Trees and vegetation influence biking and driving aesthetics, while walking aesthetics depend on a combination of trees and vegetation, transparency, sky openness, and public space. Safety perceptions vary by mode: pedestrian safety aligns sidewalk width and pedestrian-vehicle separation; biking and driving safety relates to sky openness, transparency, and lane width, with biking safety also associated with enclosure. Mode-specific satisfaction corresponds to perceived safety and aesthetics of the mode. Overall satisfaction emerges from the interplay of landscape, spatial geometry, and building design. This study advances street design both theoretically and methodologically by differentiating perceptual responses across user groups and introduces a machine learning approach that enables broader population-based predictions from limited survey samples.

Keywords: complete streets, visual perception, urban street evaluation, Bayesian network, 3D visualization and digital twin

#345 Looking at the Landscape from Below: Integrating Caving and Karst Visualization in Southeastern Landscape Research

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Abstract

In the Southeastern karst landscape, the earth is not solid. Water is constantly fracturing the limestone belt that runs along the Cumberland Plateau from Kentucky down to Alabama, creating sinkholes, pockets and windows, sinking rivers and springs. The volatile flowing of water has and continues to hollow out a vast network of caves, complicating the relationship between surface and the geological below. The karst landscape asks landscape architects to include the spaces beneath the capstone in their understanding of the landscape itself, using visualization methods to first understand subterranean realities and then design with them. The cave leads to new ways through which to comprehend the vertical and volumetric dimensions of space, requiring tools that can sense spaces “resistant to normative regimes of control” (Hawkins, 2020). This paper presents visualization research that advances the field of landscape architecture’s engagement with karst terrain and marshals our unique disciplinary expertise to create methods through which practitioners, students, and the public can read and understand the Southeast’s subterranean landscapes. This study harnesses digital reality capture technology in the form of MatterPort LiDAR scanning to create a 3D model of Manitou Cave, in Fort Payne, Alabama. The LiDAR scan is populated with hydrological and geological data sourced through a collaboration with the UGA hydrology department and the Southeastern Cave Conservation Institute and layered with embodied experience derived from on-site (in-cave) research and documentation. This data collection is then translated into a set of interactive and exploratory fabricated visualizations, where scientific and spatial data is taken out of the digital realm to become physical and tactile models. This set of LiDAR scans is also the base material for a Spring 2026 MLA landscape research seminar at Auburn, in which students “probe” the karst cave environment through field work and digital representational techniques (Lutsky and Burkholder, 2017). Using the cave as a generative tool, initial 3D representations lead to a set of experimental visualizations that understand the landscape as in the process of becoming, connected to larger earth systems and to human encounters with hidden planetary vernaculars (Ingold, 2011). This paper details methods used by both the author and students to visualize geological conditions and human experiences within them, presenting ways for which landscape architecture can learn from the subterranean and reframe it as a place instead of a resource, one that first needs to be seen to be valued.

Keywords: geology, vertical territory, subterranean visualization, LiDAR, experimental methods

#347 Visualizing More-than-Human Relationships: Colombia Coffee Farm Case Studies

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Abstract

Building on Smithsonian Bird Friendly program guidelines, habitat connectivity principles, field observations, and interviews with coffee growers, this project investigates how Colombia coffee farms' selection and spatial composition of native plants can cultivate cultural-ecological resilience. Methods include qualitative interviews with coffee growers, field observations documenting shade structure and species composition, and spatial analysis of plant–bird interactions informed by habitat connectivity models. Sectional case studies compare conditions across spatial and temporal scales—tracking migratory birds' habitat dependencies from their breeding grounds in Appalachia to their non-breeding grounds in Latin America . As intact forests decline due to economic pressures, shade-grown coffee agroforestry systems increasingly function as critical habitat. While reforestation initiatives across Latin America aim to support wildlife, this project contends that storytelling and representation must complement ecological strategies to better support culturally attuned reforestation. Outcomes include a set of sectional drawings visualizing more-than-human lifecycles within coffee farm ecologies; a framework linking native plant selection to migratory bird habitat needs; and recommendations for culturally grounded planting approaches. This project challenges human-centered design paradigms by recognizing more-than-human life cycles, their entanglements with human lifeways, and transboundary negotiations as integral to activating more-than-human frameworks.

Keywords: agroforestry , conservation , reforestation , more-than-human, visualization

#348 Advancing Sustainable Green Street Renovation in Phoenix with Design Guidance System Integrating Street View Analysis and Immersive Technologies

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Abstract

This research aims to develop a design guidance and decision support system for sustainable green street renovation in Phoenix metropolitan area. The system is based on the integration of Street View Image (SVI)-based deep learning analysis and immersive technologies. Green streetscapes are particularly difficult to implement in desert climate cities, though they are important for improving aesthetics, thermal comfort, and stormwater management. Due to limited water availability and harsh soil conditions, the room for mistakes in green streetscape practice in the Phoenix metropolitan area is far smaller compared to many large cities. Therefore, developing a green streetscape renovation guideline system that supports more sustainable and efficient design and decision-making process is highly meaningful. In this research, four experienced landscape designers are invited to propose four ideal green street design options for the Phoenix area. Their plant species selection, spatial element proportions, and color use in street views are calculated and statistically analyzed. The study then retrieves over 8,000 SVIs along most streets in the downtowns of the Phoenix metropolitan area using the Google Maps API (Long & Liu, 2017). Semantic segmentation is performed on all SVIs with PSPNet pretrained on the Cityscapes dataset to identify proportions of major streetscape elements (such as roads, sidewalks, vegetation, and buildings) while object detection with YOLOv8 (Jiang et al., 2024) identifies vegetation species and special landscape features. Because the dataset largely covers the major roads within the study area, the results of semantic segmentation and object detection can reliably reflect the overall existing condition of streetscapes in the Phoenix metropolitan region. By comparing these results with the professional landscape designers' proposals from earlier steps, the specific problems in the region's streetscapes can be identified, while positive characteristics are also documented. Based on this comparison, the research determines targeted improvement strategies with clear quantitative direction. These strategies form the design guidelines for green street renovation in the Phoenix metropolitan area. Based on the design guidelines, this research selects three streets in downtown Tempe and proposes optimized green street renovations. Immersive technologies are used to visualize these designs, including wireless Virtual Reality (VR) that enables immersive representation in any 10 m × 4 m space and mobile-device Augmented Reality (AR) for on-site mixed visualization. Meanwhile, 20 participants experience the immersive designs, and surveys and interviews collect their feedback, offering insights into the effectiveness and feasibility of the proposed green street design guidance system.

Keywords: Green Street, Landscape Sustainability, Immersive Technologies, Street View Image (SVI), Design Guideline and Communication

#409 Capturing the Messy: 3D Scanning and “Phygital” Design Processes

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Abstract

3D scanning technology has grown increasingly prevalent within the last 20 years, becoming a reliable method for translating physical reality into 3D digital artifacts. The emergence of affordable portable 3D scanners creates an opportune moment to explore ways of integrating reality capture into teaching digital representation. Portable 3D scanners allow for the efficient digitization of the physical and textural characteristics of existing conditions, useful for informing design decisions. This type of physical to digital design methodology can be termed as “phygital”: any process that blends the physical and digital experience. Phygital methods have been used across design fields such as landscape architecture, architecture, industrial design, and historic preservation, ranging uses from LiDAR point cloud creation to digital twin creation to VR walkthroughs (Bugeja et al., 2022; Kesack, 2022; Marcoux & Leifeste, 2022; Urech et al., 2022; Weber, 2024). Recent studies have explored how this technology—once financially out of reach—can be democratized through the use of integrated LIDAR scanners on portable devices (Weber, 2024). This paper builds on the democratization of reality capture by describing a process for integrating affordable 3D scanners within landscape architecture pedagogy. This was recently tested in an advanced landscape representation seminar, where an internal university grant allowed for the acquisition of multiple 3D scanners to be used to enhance teaching. Student teams selected unique and difficult-to-measure site details for 3D scanning, with their work focused on capturing the messy, complex, and challenging details of existing conditions. Details such as the bark texture of tree root flares, the intricate decay of fallen trunks, and geologic rock outcroppings are scanned, processed, and integrated into digital modeling workflows to produce scaled drawings. In addition to the creation of 2D representations, these artifacts are also 3D printed and used as study models, providing an engaging and tactile design tool. This paper describes the workflows and lessons learned so that they may be easily replicated, while also situating the work within the growing field of phygital methods in landscape architecture.

Keywords: 3D Scanning, reality capture, virtual reality, digital landscape architecture, design process

#452 Visualizations Won't Cut It: Institutional Trust and the Limits of Scenario-Based Tools in Nature-Based Flood Mitigation Planning and Decision-Making

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Abstract

Nature-based solutions (NbS) are increasingly used to mitigate the impacts of extreme flooding and storm events, either independently or alongside traditional grey infrastructure. Scenario-based visualizations are often used to communicate NbS and engage with interest holders. However, their real-time role and rhetorical value in climate and flood risk planning remain underexplored (Olman & Devasto, 2021). While existing literature suggests that visualizations can motivate climate action, few studies critically examine the value of these tools from the perspectives of practitioners who use them during real-time phases of flood mitigation projects, particularly in communities with deep-seated institutional distrust (Estadieu et al., 2025; Stempel & Becker, 2021; Bostrom et al., 2016; Morrow et al., 2015; Poortinga & Pidgeon, 2003). This exploratory case study uses a mixed-methods approach to understand the perspectives of practitioners' use of visualization in their work on a multi-scale flood mitigation project in an East Coast neighborhood, which has been anonymized for the protection of participants and the community. The study site is a low-lying, urbanized area built on former wetlands, facing escalating flood risk due to aging infrastructure and increasingly frequent extreme weather events. Historically, the neighborhood has experienced repeated delays and failures in mitigation efforts, including stalled infrastructure upgrades and contentious land acquisition attempts. These patterns have intensified skepticism and perceptions of credibility toward government agencies and external actors, complicating communication and collaboration (Manning, 2000). This study combines semi-structured interviews and surveys with eight practitioners, each engaged twice over a 10-month period (N=16). Participants were selected based on their trusted status within the community and active involvement in the project. Community members were not recruited directly due to a history of exploitative research and the research team's ethical commitment to minimizing undue burden. Interview data were analyzed using inductive thematic analysis and triangulated with survey data for richer interpretation, guided by literature on institutional trust and visualization legitimacy, and adapted as themes emerged. Preliminary findings reveal that scenario visualizations are not prioritized or valued during the current feasibility phase. Practitioners express concern that premature use may confuse or frustrate residents, reinforcing distrust. This study has significant implications for flood risk planning professionals, ultimately reminding experts not to lose sight of the value of time, process, and relationship-building at the individual-to-community scale, especially as AI visualization and other technological advancements continue to dominate the field.

Keywords: Nature-based solutions, Decision-making, Flooding, Visualization, Institutional trust

#453 Ephemeral Data: Visualizing Environmental Impacts by Combining Graphic Design and Landscape Architecture Methodologies

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Abstract

This poster presents an ongoing multidisciplinary collaboration funded through an internal university grant, which aims to bridge visual methodologies from Graphic Design and Landscape Architecture. It focuses on the process by which Graphic Designers and Landscape Architects can negotiate disciplinary boundaries to develop experimental representation techniques. This collaboration, involving faculty and Undergraduate Research Assistants from both fields, sought to integrate advanced visualization and diagramming methods from Graphic Design into traditional Landscape Architecture drawings to produce more holistic, multi-scalar visualizations that capture complex landscape systems. Rather than a traditional literature review, the initial phase sought to create a visual matrix that distilled the core representational methodologies and strategies from both disciplines into their basic components. The matrix included: annotative devices (text, lines, textures, arrows); conventional drawing types (plan, section, perspective, diagram); technical drawing standards (linetypes, lineweights, callouts); data visualizations (network diagrams, treemaps, chord diagrams); and graphic standards (typography components, grid structures, hierarchy, color). We collected and analyzed hybrid graphic drawings and data visualizations by Mark Lombardi, Charles Joseph Minard, Hugh Dubberly, Paul Kahn, SCAPE Landscape Architecture, Sasaki, Archigram, Lawrence Halprin, and Anu Mathur/Dilip daCunha. Insights from the matrix informed the creation of a hybrid visualization to communicate the complex story of water use along the Colorado River watershed in relation to agricultural production. This visualization overlaid traditional landscape drawing formats of section, collage, GIS mapping, and technical details with Graphic Design visualization techniques of Sankey diagrams, chord diagrams, and charts. We integrated data on water scarcity, climate change, and infrastructure with annotations to describe landscape ephemera, movement, and change-over-time. This in-progress collaboration demonstrates how leveraging design and research methodologies from multiple disciplines can enhance the precision, scalability, and communicative power of representing large-scale landscapes. By offering novel modes of visualizing and understanding systems of nature, resources, and climate, this approach may offer valuable insights into how designers can more effectively communicate complex topics to a wider range of audiences, highlighting the urgency and potential of cross-disciplinary ways of working.

Keywords: Interdisciplinary collaboration, Visualization, Representation, Creative scholarship, Design research

#469 Visualizing Green Infrastructure through a One Health Lens: Communicating Ecosystem, Animal, and Human Health

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Abstract

Urban stormwater runoff poses a significant threat to ecosystem, animal, and human health. While green infrastructure (GI) offers a nature-based solution, its performance benefits often remain invisible to the public and policymakers, hindering widespread adoption. This research utilizes a One Health perspective to reveal and communicate the interconnected health co-benefits of sustainable urban water management via realistic visualization toolkit framed through the triple bottom line: environmental, social, and economic value. This project addresses two research questions: 1) How can the multi-faceted benefits of GI be quantified and visualized to resonate with diverse audiences, including policymakers and community members? 2) How can a communication toolkit, grounded in One Health, advance current landscape performance advocacy beyond existing resources like the LAF Landscape Performance Series? The research focuses on stormwater pollutant data and GI-based treatment mechanisms in urban environments through visualization of wetland restoration and bioretention systems. This evidence base informs the design of a communication toolkit integrating comparative data tables, pollutant removal charts, and conceptual diagrams with economic metrics, such as cost savings from reduced public health incidents and increased property values. Findings quantify the performance of various GI typologies, such as bioretention systems and wetlands, with modeled results showing reduction in total suspended solids and reduction in nitrogen loads. The developed communication tools demonstrate linkages between runoff filtration and improved outcomes across the One Health spectrum, healthier ecosystems, safer animal habitats, and reduced public health risks while assigning monetary values to these benefits. Visualizations illustrate measurable reductions in pollutant loads, increases in ecological function, and potential increases in adjacent property values, making the "invisible" work of green infrastructure visible. The visualizations provide landscape architects with an evidence-based toolkit for communicating the holistic value of GI beyond aesthetic or amenity functions. By framing GI as a critical public health and economic asset, this research has significant implications for interdisciplinary practice, policymaking, and community engagement. It demonstrates how integrated visual communication can bridge the gap between technical knowledge and public understanding, empowering communities to advocate for resilient and healthy urban landscapes. This study contributes a replicable methodology for translating complex socio-ecological and economic data into compelling narratives, equipping designers, planners, and advocates with tools to build a stronger, financially grounded case for sustainable urban water management.

Keywords: Green Infrastructure, One Health, Visual Communication , Stormwater Management , Landscape Performance

#476 Cinematic Imitation: Adopting Film Production as a Process for Design Research

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Abstract

The continual rise of digital platforms has generated a shift in communication from text to film and time-based media. As a discipline landscape architecture is in a position to leverage its inherent digital literacy with narrative driven design projects as a teaching pedagogy as well as an opportunity to disseminate design to larger audiences. This presentation argues for the use and alignment of the methods of the film industry to the design processes of landscape architecture. The methods, obstacles, and results of a graduate landscape architecture seminar course that focused on the process of film production are discussed as a means to validate the approach for research-based design propositions. Landscape architects are equipped with a visual storytelling skillset founded in critical writing along with 3D modeling and graphic software. Traditionally, design projects start with a research phase that leads to conceptual spatializations, refinement, and final design. While this a reductive description of a typical design process, it corresponds to and can be furthered by strategies associated with filmmaking. Notions of preliminary research, preproduction, storyboarding, pitching, attitude, genre, pre-production, production, post-production, and final cut can all find their way into, or be appropriated for use in landscape architecture. Students were tasked with researching a landscape entanglement, generating a critical narrative, building a world, storyboarding, creating a pitch deck, and animating a short film. The semester long assignment was guided by lectures on filmmaking and technical workshops on animation software. Through this process students gained technical skills while being introduced to new presentation methods. Distilling complex projects down to loglines and taglines encouraged students to be explicit in their approach to presentations while negotiating production limitations for the end goal of an animated short film. The pitch deck exercise allowed for aspects of professional practice to be more accessible to students by imitating client presentations where a project, in early conception, needs to be defended and gather interest. From these exercises the clarity and directness of student presentations improved. Ways of working and approaches to design appeared to also be demystified for the students. The suspension of disbelief typically found in film combined with the pragmatism of design crafted working methods which allowed for increased student engagement through films relevancy as a media. The presentation seeks to reflect on the results and observations of the course to situate the project as a teaching method and interdisciplinary conversation for landscape architecture.

Keywords: Filmmaking, Worldbuilding, Animation, Design Process

#480 Ento Metropolis: Where the Dragonfly Returns

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Abstract

This poster emerges from a design research project centered on Hine's emerald dragonfly, the only federally listed endangered dragonfly in the United States. Found in the Des Plaines River watershed near Chicago, this species is a key ecological indicator of groundwater-dependent ecosystems. Yet, its survival is threatened by groundwater depletion, urban encroachment, and habitat fragmentation. The project asks how landscape planning and design might respond to these conditions by working across species scales and reimagining human infrastructures as shared habitats. The poster organizes its visual narrative through three interrelated layers—point, line, and field—each corresponding to a different scale of species relationship and ecological process. At the point scale , drawings examine localized interventions such as repurposed groundwater wells functioning as dragonfly habitats, emphasizing the intimate, species-specific needs for larval development and microhabitats. At the line scale , the focus shifts to movement and connectivity. Transmission corridors and other infrastructural lines are reconceived as flight pathways that support dragonfly migration while intersecting with human systems, reframing linear infrastructures as potential ecologies rather than barriers. At the field scale , the work expands to the watershed territory, integrating points and lines into systemic strategies that reimagine the landscape as an adaptive commons. These drawings reveal how overlapping human and ecological systems can generate resilient patterns of coexistence across urban, hydrological, and biological networks. Methodologically, the project translates scientific literature into graphic representation and speculative design. Mapping, multi-scalar drawings, and visualizations of species perception move beyond conventional ecological analysis to ask how the dragonfly might experience and inhabit designed landscapes. This approach builds on thesis research at the Harvard Graduate School of Design, where drawing and mapping are used as both analytical and imaginative tools to explore multispecies futures.

Keywords: Insect, More-than-Human, Coexistence, Infrastructure

#508 Postcards of Public Space

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Abstract

Public Space is the broad category into which many of our most important projects are grouped. Yet it is an idea that is often simplified and flattened, lacking the nuanced descriptions that such an important type of space deserves. Beyond something that is always “good” and for “everyone” public space performs and supports a wide variety of positive and negative functions. Landscape architects often present their polished representation of public projects as “Postcard Images,” landscapes that reflect a vision of social, ecological, and economic perfection. This paper presents a pedagogical approach that questions the creation of postcard landscapes and equips students to better understand the many layers of public space and its use. Through interrogating the way public landscapes are idealized, students question their own long held assumptions about public space and its design. They then use this to formulate new readings of campus as a public space that are deeply grounded in their own lived experience. The postcard serves not as a representation, but as a process (Mitchell, 240). A postcard is defined bit its constraints: the relatively small image size and space for a short personal narrative. The relationship between the two sides (front and back), extends student analysis beyond factual observation. The format of the postcard cultivates the student’s personal relationship to images and text and creates room to grapple with everything from the daily challenges to life in design school to deeply personal issues of justice within the work of design. This approach draws on the idea that cultural recognition must be built into any concept of landscape if social justice is to be achieved (Deming, 216). The course, Postcards of Public Space, has been taught three times to mixed groups of BLA and MLA students as an advanced elective seminar. The creation of the postcard serves as the primary mode of student response to readings, films, lectures, and public space explorations. The series of postcards reflect on the course themes of landscape values, use, identity, conflict, justice, movement, memory, and augmentation. Creating one card per theme, students develop new readings of the campus public spaces they pass through daily. The cumulative output of the course will result in an exhibition at the University’s Art Museum in Spring 2026 in support of their theme for the year, Belonging. Collectively, the postcards present new ways to understand what, who, and when we belong in the campus landscape.

Keywords: Public Space, Representation, Narrative, Postcard, Belonging

#540 Atmospheric Encounters: Visualising the Invisible

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Abstract

Air is the most ubiquitous yet overlooked medium of planetary life. Invisible and indivisible, it sustains, conditions, and entangles all beings, while its dynamic, nonlinear behaviours defy conventional forms of measure and representation. This paper presents Atmospheric Encounters: Visualising the Invisible , a design-seminar course that repositions air, and air-scapes, as a central design material and agent, advancing new pedagogical, methodological, and representational practices for landscape architecture. The course introduced a novel teaching framework that combined environmental sensing, data visualisation, and analogue making. It asked: How can air be rendered perceptible as both material and event? How might environmental sensing and representation foster new understandings of site, time, and ecological interdependence in landscape architectural education? Twelve graduate students designed, fabricated, and deployed sentinels, hybrid devices functioning simultaneously as digital sensor stations and physical analogue installations. Each incorporated Arduino-based multi-sensors measuring and signalling real-time atmospheric conditions ranging from temperature, humidity, PM2.5, CO2, through to radioactivity. Over a three-week field phase, students positioned these instruments across a Cambridge, Massachusetts site, iteratively recording, calibrating, and visualising changing atmospheric conditions. This integration of corporeal and technological registers cultivated new approaches to hands-on learning, where coding, AI-assisted processes, and physical prototyping generated experimental outcomes that bridged science, design, and cultural expression. Through the sentinel projects, air was reframed as an atmospheric encounter, a relational medium that continuously remakes landscapes as lived and living spaces. By treating air as a design agent rather than a passive environmental backdrop, students challenged inherited notions of ‘site’ as a bounded, ground-based entity. Instead, they reconceptualised it as an aerial territory animated by flows of particulates, pressure, advancing innovative applications of environmental sensing to address questions of urban sustainability, ecological resilience, and climate change. Representation was central to this pedagogy. Sensor data was translated into dynamic drawings, animations, films, and installations that visualised atmospheric phenomena. These works expanded the representational vocabulary of landscape architecture, demonstrating how immaterial and temporal conditions might be made perceptible and communicable. Situated in relation to citizen-sensing initiatives, the course extended these precedents into the pedagogical domain, emphasising interpretation, representation, and embodied experience over data accuracy alone. Student reflections revealed an enhanced sensitivity to atmospheric processes and a deeper understanding of air’s spatial and ethical dimensions. Visualising and materialising the invisible advances a model of landscape education that merges environmental sensing with design experimentation, inaugurating new forms of representation attuned to the complexity of contemporary urban atmospheres.

Keywords: Data Visualisation, Representation, Digital Sensors, Air, Technology

#551 Extended-Reality in Landscape: Exploring the Impact of Interactive Park Design on Young Adults' Engagement and Learning

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Abstract

The physical and mental well-being of young adults are crucial for preventing poor health outcomes in their old age. Sedentary behavior during this age increases the risks of illnesses like cardiovascular disease, hypertension, type-2 diabetes, and influences mental health conditions like depression, anxiety, irregular sleep patterns, along with decreased cognitive development (Physical activity, 2024). Although digital devices contribute to the lack of physical activity (Kumar, October 16, 2024), emerging technologies like Augmented Reality (AR) offer new ways to make outdoor environments more engaging and interactive (Mehan & Mostafavi, 2024). Yet, there remains a clear research gap regarding how AR can be systematically integrated into landscape architecture and public outdoor spaces to improve health, learning, and social engagement. As the use of Extended Reality (XR) is rapidly increasing, so are its nuances, the need for stronger theoretical frameworks, improved design, better understanding of learning impacts, side effects, and maximizing the potential of technology to equip for creating more opportunities for the future world. The research investigates whether an AR-based nature interaction can effectively encourage young adults to spend more time outdoors, while simultaneously supporting their well-being and fostering opportunities for experiential learning. The research employs a mixed methods approach where the usability of the AR prototypes is being tested, and surveys assess learning outcomes, mood, and social engagement. By clarifying when and how XR can influence design, the study aims to demonstrate its potential to enhance user experience, deepen ecological understanding, and support well-being-focused placemaking in landscape design for the future.

Keywords: Extended-Reality, Augmented-Reality, Experiential learning, Young Adults, Well-being

#585 Beyond the screen: Mobile Eye Tracking of Presentation Boards in Landscape Architecture

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Abstract

Eye tracking provides a direct measure of visual attention and has been used in landscape architecture to study how people perceive and evaluate built and natural environments [1,2]. However, little is known about how eye movements can reveal the readability of design presentations themselves -how effectively visual materials communicate design intent to an audience. This study addresses that gap by examining how viewers engage with presentation boards, large-format panels used by landscape architecture students to communicate final design projects during studio reviews. We investigate how undergraduate students in landscape architecture and graphic communication view full-scale senior presentation boards (36”×60”) under realistic critique conditions. Previous screen-based eye tracking limited analysis due to constrained scale, artificial viewing context, short exposure times, and hurried interactions. To overcome these limitations, this study uses Tobii Pro Glasses 3, lightweight, wearable eye trackers that allow participants to move freely and view boards at their natural pace and distance. Participants (n≈24) will view two sets of three senior design boards representing landscape architecture design projects. Areas of Interest (AOIs) such as titles, key visuals, diagrams, and text blocks will be defined. Metrics will include entry points, dwell time, fixation counts, transitions, and scanpath efficiency. To address the challenge of interpreting dwell time, we will complement quantitative data with post-session interviews, where participants describe what drew or delayed their attention. This mixed-method approach distinguishes prolonged viewing caused by aesthetic engagement from that caused by difficulty in comprehension. The purpose of a presentation board is to visually communicate ideas to an audience, with the primary challenge being to make a compelling visual argument [3]. Effective boards require a clear visual hierarchy and a harmonious design, enabling reviewers to quickly grasp the main points [4]. Within this framework, our analysis will identify patterns in how hierarchy anchors (titles, hero images) attract attention and how efficiently viewers navigate supporting information. Expected outcomes include empirically derived guidelines for board layout -principles for balancing clarity and richness to strengthen reviewer comprehension under realistic critique conditions. By situating mobile eye tracking within a real-scale, studio-based context, this research establishes an empirical foundation for improving visual communication in landscape architecture education and extending a neglected research agenda within the discipline.

Keywords: Eye tracking, Visual communication, Presentation boards, Design readability

Design Education and Pedagogy

#3 Park(ing) Day as a Vector for Transformative Learning and Critical Pedagogy in U.S. Landscape Architecture (2005–2025)

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Abstract

This study is timely coinciding with the 20th anniversary of the global Park(ing) Day initiative in 2025. Since its inception in 2005, the event has emerged as a critical socio-spatial intervention, directly confronting the hegemony of vehicular infrastructure by transforming residual parking spaces into temporary public realms. This research provides the first comprehensive, longitudinal analysis of Park(ing) Day's curricular efficacy within U.S. landscape architecture programs from 2005 to 2025, framing the event as a significant vector for project-based and experiential learning within the framework of critical urban pedagogy. The research employs a rigorous convergent parallel mixed-methods design. The quantitative strand involved a comprehensive assessment of 210 student-led projects across 35 academic programs, examining metrics such as project typology, documentation, and public engagement outcomes. The qualitative strand established a critical context via 25 semi-structured interviews with key stakeholders. We further conducted a thematic review of 80 secondary sources (scholarly articles, professional publications, and local news reports) to capture granular community response. The systematic triangulation of these data streams identifies a core pedagogical efficacy paradox. The event is demonstrated to be a potent catalyst for transformative learning, cultivating key competencies (design synthesis, project management, logistical execution, civic literacy). However, its potential is frequently attenuated by installations characterized by poorly articulated design intent. The study finds that projects lacking a clear mission often regress from engaging public space interventions into passive, static displays. This dual-faceted finding offers profound implications for academic program design. The research coalesces into a prescriptive pedagogical framework—a data-driven roadmap. This framework explicitly addresses deficiencies in resource allocation, team coordination, and practical implementation, effectively scaffolding the integration of theoretical knowledge with rigorous, situated application. By identifying the determinants of success and failure, this framework guides curriculum development to ensure students move beyond simple tactical urbanism toward proficient communication of design rationale and impactful public advocacy. Ultimately, this research asserts that Park(ing) Day remains an essential and adaptable tool for cultivating a generation of landscape architects professionally equipped to address the complex socio-ecological and infrastructural challenges of the contemporary urban environment.

Keywords: Park(ing) Day, Public Engagement, Triangulation, Learning Evaluation

#19 Advice from Professionals to Students Struggling with the Blank Page

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Abstract

For landscape architecture students, creating can be intimidating, whether through drawing, making, or writing. In the studio setting, we often observe their hesitation and lack of confidence when faced with a blank page. The nonlinear nature of the creative process and uncertainty about the outcome frequently trigger fear and anxiety, leading students to resist starting. This resistance can limit their productivity, ability to fully engage in the creative process, and openness to constructive feedback. In response to these observations, we interviewed respected landscape architects to explore how they navigate the challenges of the creative process. Our goal is to help students move beyond their emotional and behavioral roadblocks by demystifying the creative process and offering insights from those with extensive experience. Rather than treating creativity as a mysterious "black box," we aim to reveal insights about the internal processes, behaviors, mindsets, and strategies that students can practice to develop their creative potential. This presentation will share stories and reflections from professionals across a wide range of career stages, from retired ASLA Fellows to emerging designers building their practice in landscape architecture, highlighting some of their challenges and joys of the creative process. Participants responded through email, Zoom, or in-person interviews. They were asked questions such as, What do you observe in early-career designers related to fear and resistance? How do you collect ideas and inspirations? How do you reframe or learn from mistakes? How do you get unstuck? What advice would you offer about receiving feedback? These interviews are not intended to be definitive but rather to offer insight. By sharing these stories, we hope to shift the focus from merely admiring finished work or celebrated personalities to understanding the rich and often messy process behind it. Ultimately, our objective is to share common themes that educators may use to help students when facing the blank page and to inspire students to take ownership of their creative development, seeing themselves not as passive learners but as active participants in their ongoing journey of becoming designers.

Keywords: Resistance, Creative Confidence, Anxiety, Fear, Blank Page

#24 The Design Charrette within an Undergraduate Studio: Collective Visioning as a Catalyst for Community-Centered Design

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Abstract

Catalyzing connections between students, communities, and environmental contexts is a central challenge in landscape architecture education. In undergraduate studios, particularly at the second-year level, students are still developing the ability to integrate diverse perspectives into meaningful design approaches. This presentation examines the design process and proposals for the Denham Springs Conservation Area, a former church site and cemetery that was flooded during record rainfall in 2016. The second-year students conducted a design charrette to foster collective visioning for the post-flood green space, a new park shaped by ecological systems, cultural heritage, and current community interests. The approach builds on the understanding of collaborative learning in design education described by Austerlitz, Aravot, and Ben-Ze'ev (2008), where social interaction deepens conceptual development, and on the role of charrettes as participatory design tools highlighted by Condon (2008). The charrette was strategically scheduled midway through the semester, after students completed individual site analyses, precedent research, and meetings with local stakeholders. Informed by established models for accelerated, collaborative planning (Lennertz & Lutzenhiser, 2006), the process involved a rotating sequence between small student groups and community members. This activity synthesized research into rapid design propositions that addressed stormwater resilience, cultural heritage, and public space programming. Observations and student feedback aligned with Gray's (2013) findings that structured peer interaction improves communication and critical reflection. The charrette fostered a shared understanding of site opportunities and constraints, strengthened student and community cohesion, and encouraged student confidence in articulating design intent. Rather than constraining creativity, the process established a shared conceptual foundation from which students developed authentic, schematic, and detailed designs based on the site, the community, and their individual design intuition. The pedagogical value of this approach also reflects Salama's (2015) argument that spatial design education benefits from integrating collaborative, real-world simulation exercises early in the curriculum. While this study is limited to one cohort and semester, it offers a replicable framework for embedding collective visioning in undergraduate landscape architecture pedagogy. Future research should examine how such charrettes operate across different academic levels and site contexts, especially in projects involving climate resilience and community recovery.

Keywords: design charrette, collaborative learning, studio pedagogy, Post-flood resilience, Community engagement

#35 Advancing Landscape Architecture in Decarbonization and Climate Action

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Abstract

Increasing global climate risk demands urgent action (Barnard et al., 2021; Fischer et al., 2021; IPCC, 2022). Avoiding irreversible damages requires rapid decarbonization across all sectors (Rockström et al., 2024; Soares et al., 2025). Landscape architecture has responded through high-level advocacy, including the IFLA Climate Action Commitment, the ASLA Climate Action Plan, and the ASLA Climate and Biodiversity Action Committee initiatives. Pioneering tools such as Pathfinder and Carbon Conscience have advanced awareness and feasibility of reducing embodied and operational carbon through design practice (Nikologianni & Albans, 2023). However, despite increasing advocacy and efforts, landscape architecture's potential contribution to decarbonization remains underexplored. Carbon accounting shows that embodied and operational emissions directly controlled by the landscape architecture field constitute only a small fraction of global emissions, far less than those from meat production, building energy, or transportation (Crippa et al., 2024; Jones & Kammen, 2014). This limit hinders the profession from establishing a significant role in global climate discourse. But landscape architecture is a well-suited process for integrating new, nature-based, and alternative energy solutions into more of our everyday spaces (Fargione et al., 2018; Griscom et al., 2017). To gain traction in conversations led by politicians, economists, and environmental scientists, landscape architects must identify broader avenues for impact. This panel expands the field's current advocacy and efforts, examining areas where landscape architecture can contribute more meaningfully. Panelists will present their work and insights around four guiding questions: (1) Where do carbon emissions come from? (2) What are the most impactful strategies for reducing landscape emissions and storing more carbon in the landscape? (3) How can local actions contribute to global carbon solutions? (4) What can landscape architecture do about carbon? Presentations range from data-driven tracing of carbon sources from a consumption perspective, to review of decarbonization/sequestration actions grounded in interdisciplinary knowledge, tests of multi-scale landscape-led designs that expand sequestration potential, and explorations of embedding decarbonization within design practice through new technology. Four panelists will present their work individually in 10 minutes each. The leading panelist will then moderate a 15 minute discussion session with a focus on potential actions from landscape architecture researchers and educators. A 30-minute Q&A session will then engage the audience in translating professional goals into academic actions.

Keywords: Decarbonization, Carbon Sequestration, Climate Mitigation, Climate Action

#45 Under Pressure: Teaching, Mentoring, and Maintaining Standards in Difficult Times.

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Abstract

This panel will address the current curricular, economic, and social challenges faced by faculty in landscape architecture programs and map emerging strategies for maintaining professional standards and humane learning environments. Across the North American higher education sector, standards are being challenged, and professional and academic norms are being upended by the political agenda of the current administration. These challenges are coming in through a variety of avenues including Executive Orders; grant, state, and federal funding cuts and recissions; increased immigration enforcement; political pressure on university administration; and censorship. Landscape architecture programs are grappling with lost grant funding and budgets, fearful students, and faculty and administrators who are struggling to adapt to demands to re-orient curriculum away from core values including diversity, equity, and inclusion, and climate change. This pressure has profound consequences on the academic performance of students, and the well-being of faculty and staff, and the future of the landscape architecture profession. The pressure on programs to adapt and capitulate to these imperatives is not equally applied, or experienced. In addition, there is a wide spectrum of institutional support that landscape architecture programs have received. This panel will bring together four educators to discuss the way their specific departments have been impacted by the current pressures as well as how their colleagues have organized and collaborated with university administration, alumni, and others to support curriculum standards and meaningful educational outcomes.

Keywords: Landscape architecture edagogy, Curriculum support , Academic freedom, Academic research

#49 Prompting Pedagogy: Cultivating Critical AI Literacies in Landscape Architecture

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Abstract

As generative AI becomes increasingly embedded in professional design workflows, landscape architecture programs must prepare students to use these tools with both proficiency and discernment. This presentation examines an undergraduate/graduate elective designed to cultivate critical AI literacy through a structured sequence of design-centered assignments, peer critique, and media-based discussion. The course framed AI not as a replacement for landscape architectural thinking but as a catalyst for strengthening human judgment, environmental awareness, and ethical design practice. Methods centered on eight sequential assignments that guided students from text-based inquiry to abstraction, schematic development, detailed iteration, and visualization, culminating in a capstone that integrated these competencies. Instruction followed a consistent rhythm – Mondays dedicated to structured critique and assignment framing, and Wednesdays to watching and discussing student-selected AI videos on ethics, technical capacity, environmental impacts, and disciplinary debates. Students documented prompts, iterations, and decision-making throughout, creating a transparent record of learning. Pedagogical impact was assessed through qualitative review of written reflective components, peer critiques, and diverse capstone work. To evaluate changes in student practice and perspective, the course used a mixed-methods approach centered on (1) pre- and post-course surveys capturing shifts in assumptions, expectations, and perceived competencies; (2) observation of weekly assignment reviews, critiques, and media discussions; and (3) systematic analysis of student deliverables, including prompt logs, design iterations, and capstone synthesis. These forms of evidence provided triangulated insight into how students engaged with AI over time. Findings show that early assignments revealed optimism tempered by uncertainty – students were intrigued by AI's speed and generative breadth but often overestimated its contextual accuracy. Through iterative prompting, peer critique, and weekly discussions of contemporary AI media, students developed more nuanced, hybridized practices. They increasingly paired AI-generated outputs with site knowledge, environmental reasoning, and ethical considerations. Capstone work demonstrated this maturation: students addressed issues such as climate adaptation, ecological regeneration, and AI's own environmental footprint, articulating clear boundaries between machine-generated suggestions and disciplined design judgment. Generative AI presents landscape architecture with a complex challenge: to engage rapidly advancing tools without surrendering disciplinary identity. This case study shows that when embedded within a reflective pedagogical framework, AI can catalyze a new design literacy. Yet it also underscores the risks of superficiality, overreliance, environmental blind spots, and temptations to bypass human-centered reflection. The presentation concludes with implications for design education, offering strategies that help students and educators adopt AI critically, creatively, and responsibly.

Keywords: Generative AI, Prompt Engineering, Critical Analysis, Pedagogical Strategy, Design Literacy

#58 Pedagogies of Place, Perception and Projection: Iterative Reimagining

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Abstract

The concept of imaginative geography, first introduced by Edward Said in his critical discussion of Orientalism in 1978, is characterized by the culturally constructed perceptions and representations of places and people, rather than objective reality, often used to establish social hierarchies, power dynamics and a sense of us versus them . In the context of the Orient as a field of knowledge produced by the institutionalized Western positionality, it became a systematic regime of truth that generated a powerful imagining of the Orient as primitive and less than. Globally, Indigenous communities have endured a similar patterning of discrimination. Movements in the cartographic practices such as critical cartography and countermapping have begun to reorient this concept. This reimagining of geography instead, focuses on the reclamation of Indigenous ontologies of place that predate their colonial cartographic framing, referring specifically to spatial practices and cartographic processes including spatial narratives, place ontologies, more-than-human relations, navigational guidance, and territorial demarcation (Rose-Redwood, 2020). It asserts that space is ordered by its stories – stories that make legible the connections between people, places and ideas – and that those stories must be thought of as “material ordering practices” intimately bound up with “the materials in which they are carried” (Cameron, 2011). It is a practice of decolonizing the geographical imagination by honoring Indigenous methods of world-making. The pedagogical platform of this work centralized creative cartography as a critical practice, employing a methodology focused on the iterative practice of making as a design, analytic and research mechanism for exploring complex contexts. It explored the deep histories of space, temporality, cultural patterning and sovereignty through the lenses of perspective (from actors within these places, human and non-human, and from outsider positionalities) and projection (the ways in which cartographic theory and representation inform how we see and interpret the world). With the objective of reimagining geography to forefront more authentic perceptions and projections, students were assigned Indigenous landscapes to research and map through iterative making, investigating numerous material assemblies, technologies and fabrication methods. Worldviews emerged in the relationships found between modeled actors as they simultaneously engendered a more authentic representation of their places within the landscape. The process synthesized existing and reimagined worlds, evoking complex social-cultural meanings in the deepening of societal consciousness through narrative agency. This work argues for a more just world and a more informed, empathetic and emboldened cohort of future practitioners positioned to make lasting change within the profession.

Keywords: Pedagogy, Mapping, Critical cartography, Place-making, Indigenous

#68 Embedding Experiential Learning in Living Systems Curriculum for Community Engaged Design

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Abstract

Experiential learning is vital for helping students in landscape architecture grasp key concepts in living systems courses. It emphasizes “learning by doing” (McKeachie, 2002), intertwining theory with practice. Living Systems courses covering plants, ecosystems, and green infrastructure provide core knowledge for all landscape architecture students. As the discipline navigates its STEM designation in the U.S., delivering hands-on experiential learning in these courses is increasingly important. Programs accredited by the Landscape Architecture Accreditation Board (LAAB) are evaluated on their objectives and compliance with mandated standards (ASLA, 2024), including the integration of living systems courses (LAAB, 2021). This case study describes how a BLA program embeds experiential learning throughout its Living Systems sequence. Situated within a Department of Plant and Soil Sciences, the program leverages disciplinary expertise to connect classroom instruction with application. Through coursework in soils, plant identification, ecology, ecological planting design, and landscape management, students practice design, propagation, installation, and long-term management. The sequence is structured so that materials produced in one course (e.g., propagation) are used in another (e.g., installation), while advanced students’ designs and management plans are passed down to earlier courses. The curriculum prioritizes collaboration with community partners, allowing students to be designers, growers, installers, and educators across several courses. For example, in Ecological Planting Design, students create planting plans with ecological and cultural goals. In later courses, species are propagated in greenhouses, installed, and incorporated into management strategies. Over four years, students engage with multiple communities and project types. Projects are student designed and built under faculty guidance, guaranteeing courses function as an interconnected sequence rather than as independent experiences. A partnership with a Title One middle school illustrates this model. Responding to the school’s goals of expanding outdoor education and mitigating watershed impacts, BLA students designed and implemented pollinator gardens, rain gardens, and bioswales. The collaboration provides the school with quality design, plant material, and maintenance education, while offering BLA students opportunities to apply ecological design, installation, and management in authentic contexts. This case study demonstrates how inserting experiential learning across a living systems sequence enhances ecological literacy, professional skill-building, and community engagement. By linking classroom theory with applied practice, students develop a rounded understanding of living systems while contributing to community needs. As landscape architecture refines its role within STEM education, integrating community-based experiential learning in living systems courses offers a model for aligning accreditation standards with disciplinary identity and broader societal impact.

Keywords: Living Systems, Experiential Learning

#72 For the Love of Humanities: teaching strategies for cultivating ethics-oriented and resilient practitioners

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Abstract

There is growing energy in mainstream landscape architecture to position the discipline as more explicitly political (Fleming, 2019). Scholars in adjacent spatially-oriented fields like urban planning and geography have grappled much longer with 'the political' (and its attendant challenges, through a humanities conceptual lens) than landscape architecture (Sevilla-Buitrago, 2017; Harvey, 2006). The tide is turning however, both within the context of current events and more systemically (Calderon and Butler, 2020; De Block et. al., 2020). This "political turn" is rooted in historical trends in landscape architecture. It offers a more robust engagement with landscape students who feel trapped between their values and the perceived realities of practice. As teachers, we struggle with assumptions that a professional program must operate in "neutral" territory and emphasize "practical" skills to prepare our students for the workplace. We are also confronting the role of landscape architecture in perpetuating or addressing climate change, environmental injustice and destabilization of governmental institutions and civil society, and students are taking notice. While we might well pay lip service to these issues, cultivating meaning and radical empathy are stymied by the deliberate focus on 'technical-over-critical' skill development and primacy of STEM education in most educational models (Girot and Kirchengast, 2023; Holmes, 2020). Instead we argue for the value of bringing tools from history, philosophy, and critical theory to bear on the complexities of landscape socio-politics (Harris, 1999). We assert a humanities framework to help foster political literacy about space and power that shape the conditions of health and well-being, equity and justice, which are fundamental to a more thoughtful and applied research and practice. Questions of how we theorize landscape in political terms, and locate our practice within a historical context, particularly around issues of land tenure and dispossession, equity and justice (materially and socially), are ongoing and urgent challenges in the face of accelerating environmental, social, and political change (Nightingale et. al., 2020). The humanities are a powerful (perhaps even subversive) modality through which to engender positive change, because they show us that things can be different. We believe the intentional applications of such frameworks can cultivate resilience–the capacity to embrace complexity and contradiction–and enrich creative production and advancement in the material practice of landscape design (Weller, 2017). These include incorporating relevant literatures in course syllabi, fostering classroom discussion, and deploying design precedents and projects that provoke systemic critique and ethics-driven decisionmaking.

Keywords: humanities, critical theory, empowerment, historiography, resilience

#89 The Reflective Studio: Connecting Doing, Thinking, and Feeling in Design Pedagogy

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Abstract

Design education has long privileged final products over the messy, iterative processes that shape them. Yet it is within those processes full of false starts, emotional pivots, and hard-won insights that students begin to transform into reflective, resilient designers. This presentation shares evidence from a pedagogical shift in a foundational landscape architecture studio course, where reflection and storytelling were intentionally positioned as core academic practices. At the center of this shift was the introduction of Unrulr , a digital platform that scaffolds reflection through the lenses of Doing, Thinking, and Feeling . The study responds to a persistent challenge in design education: how to make student growth visible in ways that are meaningful to learners, teachers, and the studio community. Drawing on Schön's notion of reflection-in-action, research on metacognition, and scholarship in emotional intelligence, this project explores how Unrulr helped students document, narrate, and share their evolving identities as designers. Students used the platform to post evidence of skill development, reflect on struggles and breakthroughs, and weave their experiences into stories that foreground both cognitive and affective dimensions of learning. Findings suggest that this approach does more than archive student work, it reshapes studio culture. By normalizing vulnerability, acknowledging emotion, and celebrating incremental growth, reflection became a communal practice rather than a private task. Students learned not only to see their own processes more clearly, but also to learn from each other, building empathy and collaborative capacity. The framework of Doing, Thinking, and Feeling created a language for students to integrate technical, cognitive, and emotional registers of design, while Unrulr's tagging system linked reflections to core competencies such as persistence, curiosity, and empathy. Over time, reflection moved from being an imposed assignment to becoming an authentic, narrative practice of self-authorship. Quantitative analysis reinforces these findings. Trends across posts, word count, and media integration all showed positive correlations with final course grades, suggesting that both the frequency and depth of reflection support stronger academic performance. Longer, more substantive writing was associated with greater metacognitive awareness, while multimodal expression through images and video enriched reflective documentation and community dialogue. Skills tracking further revealed that persistence, curiosity, and observation anchored student growth, with empathy and listening emerging more strongly as projects matured. Together, these results demonstrate how reflective practice, when scaffolded and made visible, cultivates not just better projects but better designers.

Keywords: Reflection , Design education, Storytelling , Studio culture, Metacognition

#97 The Impact of Sketching on the Perception and Creativity in Design

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Abstract

Traditionally, sketching and drawing skills have supported creative thinking processes in Landscape Architecture studios. The images we create depict new ideas or possibilities that we can reflect on and evaluate to consider different concepts. Investing time and effort to learn to draw slowly, deliberately, thoughtfully, and accurately will help us become more intuitive—in terms of flexibility and fluency—in visual thinking. Sketching helps build a visual vocabulary and the ability to discern the importance of each detail, drawing only what is necessary to understand what we see (visual acuity). However, advancements in digital design technologies have changed how and how much sketching and drawing are taught in landscape architecture education. This research argues that sketching and drawing should be included in the curriculum as fundamental skills to promote creative thinking. Asking: What historical and contemporary aspects of sketching and drawing lead to design thinking? How are sketching and drawing as visual and creative thinking tools utilized in current professional landscape architecture practice? The methods used to answer this question include historical and recent research related to aspects of sketching and drawing that lead to design thinking. It is reinforced by one-on-one directed interviews with ten practitioners who explain the importance of sketching and drawing to their design and visual thinking processes. Results show that sketching and drawing are essential in developing the eye-mind-hand connection necessary in landscape architecture studios. Drawing and sketching help us enhance visual perception: therefore, it can be viewed as clearer ways of thinking creatively. The hand becomes an extension of the mind and eye, helping in ‘seeing’ more effectively. The interaction between what we envision, what we observe at that moment, and what we remember influences our cognitive functions and creative abilities. The findings support a curriculum that emphasizes fluency—the ability to generate a variety of ideas and explore them flexibly—being a part of landscape architecture education. An essential element of this framework is developing a visual library to serve as a springboard for exploration and as a feedback loop for developing concepts. A framework for such a curriculum is included in the conclusion for other educators and practitioners to consider and adopt.

Keywords: Creativity, Conceptualizing, Sketching and drawing, Pedagogy, Visual Vocabulary

#99 Establishing a Culture of Exploration and Community for Beginning Design Students: A Blended Approach to Teaching

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Abstract

The objectives of this study were to investigate an instructional approach for an introductory site design studio that would take into account diverse student interests and needs, learning styles, collaborative engagement in each project, and foster student creativity and confidence. With reference to Gardner's Multiple Intelligences (2006) the approach includes varied instructional activities and "rich experiences": Overviews of the design principles introduced through Catherine Dee's Form and Fabric in Landscape Architecture . With each project, these principles were revisited with increasing complexity as the semester progressed. This cyclical structure reflects Jerome Bruner's spiral curriculum and Bloom's Taxonomy, ensuring that concepts were reinforced while challenging students to operate at higher cognitive levels. Engagement in research, requiring reading, diagramming, analysis of the design principles, and collaborative learning. Creative endeavors to serve as inspiration for project design. Each activity included individual creativity in areas such as art, literature, writing, field studies, and/or cultural studies. Through these activities, students were required to expand their understanding of what landscape architectural design can be. Project design development and critiques. Collaborative learning. Students conducted peer reviews, group field study assignments, a design charette, and other shared experiences in the design process to foster community, encourage dialogue, and echo the social dimensions of landscape architecture. Self and peer assessment of student work. Reflection. A reflective survey was used to gauge how students responded to the teaching approach and learning process. Qualitative methods were used to assess how creative endeavors influence student design work either directly or through implication. Additionally, student reflections and post-course surveys provided insight into student responses to the instructional approach. Findings suggest that as students navigate this consistent framework, they gain confidence in their ability to apply design principles to their work, trust in the iterative nature of the design process, and become more self-reliant. Additionally, collaborative experiences are central to building a strong studio culture. Together, these strategies create a blended model of teaching that integrates research, individual intelligences, reflection, and creative design responses. This holistic approach develops learners who are independent, confident, creative, critical-thinkers with a well-rounded view of what landscape architecture design can be. Examples of student work will illustrate how this approach establishes a culture of creativity and exploration, supports risk-taking, and prepares beginning design students to engage with the complexity of site and context.

Keywords: Beginning design studio, Pedagogy, Multiple intelligences, Collaboration

#104 Lessons from Incorporating Interdisciplinary Pedagogies and APA Trend Reports in Capstone Planning Studios

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Abstract

This article presents a reflective case study of two consecutive capstone studios in the School of Planning at the University of Cincinnati (Jan–May 2024; Jan–May 2025). The 2024 Iteration focused on the American Planning Association's (APA) Future Trends reports (APA, 2025); 2025 Iteration broadened the curriculum to include landscape architecture sources and international, future-oriented frameworks (UN SDGs; ASLA Climate Action Plan 2025) and expanded enrollment to a mixed cohort (planning, landscape architecture, horticulture, urban studies). We hypothesized that incorporating inter- and multi-disciplinarity into the studio would enhance student learning outcomes. To examine this, we developed four research questions: 1) How did integrating multi-disciplinary, future-oriented frameworks reframe the curriculum? 2)How did interdisciplinary studio interactions based on shared topical content evolve over the semester 3) How do final projects in 2024 Iteration demonstrate greater holism relative to 2025 Iteration? 4) What differences (if any) were seen in work products, topics, processes (etc.) as a result of multidisciplinary inclusions. To explore these questions, we employed a mixed qualitative approach including document review (syllabi/briefs/rubrics), reviewing work product (interim and final design/policy proposals), and pin-up review and student deliverables (midterm/final boards StoryMaps, and physical exhibit). Findings suggest that 2025 team interaction displayed more frequent translation moves during critiques and greater conjunction of shared terms, with particular benefits for students from non-planning backgrounds. Final projects also demonstrated that across cohorts, topics and representational choices moved toward implementable strategies, communicative clarity, and greater holism, including climate strategies and SDGs. Including non-planning students proved advantageous, underscoring that audience-specific communication is a critical professional skill (Purkarthofer & Mäntysalo, 2024). By introducing future-oriented material from multiple disciplines, students were able to see opportunities for collaboration, gain insight into their own disciplines from "outsiders", and bring a more holistic approach into final projects. Integrating these students' and their pre-existing, widely differing levels of knowledge within design disciplines, educations, and interests into multidisciplinary working groups requires the students to adjust their thinking and approaches. Weekly communication with students from other disciplines pushed students to refine clarity and accessibility in their work, developing skills that may otherwise remain underdeveloped. This study highlights the potential of innovative pedagogical approaches to equip students with the skills needed to navigate complex, interconnected issues in the professional design fields. Reflecting on lessons learned contributes to ongoing dialogue on advancing interdisciplinary engagement and breaking down barriers between the design professions (Wenk, 2002).

Keywords: Case Study, Studio Teaching, Pedagogy, Landscape Architecture Education

#111 Experiential Learning/Applied Research: Why is design build, a successful learning strategy rarely used model in the landscape architecture curricula?

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Abstract

The design-build (DB) learning model utilizes experiential learning to convey concepts, techniques and methods that are often challenging to communicate using other teaching modalities. It combines the historic apprentice model of “teaching by doing” and deploys current and emerging craft and design technologies in the classroom to create tangible, built projects that benefit partnering communities and the students who engage with them. 1. Furthermore, DB bridges the intent and act of design with fabrication and implementation challenges seldom encountered or considered in traditional design studios. 2. Students learn to adapt and embrace uncertainty while adapting to the unpredictability of material availability, fluctuating costs, and their own design re-considerations revealed through the act of building. As students multi-task, assume multiple roles, and navigate the challenges of community collaboration, the craft of building itself fosters build self-confidence, community and design efficacy, and strengthen core competencies for professional practice. DB studio projects have received multiple awards, have been the focus of publications, and CELA and ASLA presentations. 3. As a professional model, DB is growing, yet despite its outsized impact on student learning and engagement, it is significantly underrepresented in landscape architecture curricula in the US and Canada. In a recent review of landscape architecture course listings in the US and Canada, DB elements were mentioned by only four schools as an explicit and intentional component of their landscape architecture curricula. 4, 5, 6. This panel discussion, featuring five instructors with DB and professional practice backgrounds from four University LA programs, aims to explore why and how the DB model can be used, appreciated, and transformed to increase student learning and community engagement. The panel will interrogate the challenges of DB (e.g., recruiting skilled faculty, managing liability risks, balancing time demands, acquiring funding, and establishing reliable partnerships) and present proven strategies that are transforming perceptions of DB. These include sharing faculty between LA programs, documenting and sharing the evidence of risk, incorporating DB workshops and strategies with other design studios, sponsoring more study abroad DB programs, and crediting student exchanges. 7. The panel will conclude with a discussion on how DB experiences could be better incorporated into LA curricula to not only impact learning outcomes, but also expand perceptions of professional practice.

Keywords: Design Build, LA curriculum, Craft, service learning, experiential learning

#113 Developing an Assessment: Aligning Courses in Hand and Computer Graphics with Professional Experience and Expectations

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Abstract

Four years ago, the Department of Landscape Architecture at Ball State University revised its introductory course sequence to require two separate courses in hand and computer communications. In giving an overview of this process, a panel presentation at CELA 2024 (see Farnsworth, et al. “Filling the Skills Toolbox: An Integrated Approach to Design Curriculum Delivery”), asked, “How can we build a foundational and integrated graphic communication curriculum that aligns with the expectations of firms?” The panel sought to address the seemingly either/or dilemma encountered by students where the inclination to create something by hand is countered by an assumption that their professional future is an all-digital, even “artificially intelligent,” one. (Amoroso, 2019; Cureton, 2017; Wilk, 2021) During the ensuing discussion, it was suggested that a survey of practitioners might yield useful feedback on the new course offerings. In response—and in the vein of “Catalyzing Connections”—the co-authors of this Abstract designed and conducted a survey of alumni practitioners (almost 100 respondents representing 50 years of department history). The diversity of experience and perspective of the respondents provided a comprehensive foundation for evaluating how effectively the courses prepare students for professional practice in visual communication, supporting the department’s focus on LAAB-ASLA accreditation standards, and continuously advancing student competency and curriculum quality. As suggested by our prior research, presented in 2024, the integration of industry-standard software with traditional hand drawing techniques in design education produces a more versatile, creative, and technically proficient landscape architect. Students gain the ability to ideate freely by hand and then develop, analyze, and communicate their ideas with the power and precision of digital tools, meeting both educational and professional expectations. Based on the survey responses, being exposed to, applying, and becoming confident in the use of traditional drawing skills is an important part of the landscape architectural curriculum. Drawing remains a vital part of the design process in the practice of landscape architecture, especially for ideation, internal communication, and early client engagement. The survey also confirmed that the digital tools and workflow taught in the department are aligned with the profession and suggested the value of advanced digital skill development through additional electives, a suggestion that was also made with regard to hand drawing. As an assessment, the survey confirmed that teaching this interdependence of hand and digital communication skills as part of an integrated design process is consistent with current professional best practices.

Keywords: design pedagogy, hand graphics, computer graphics, visual communication, alumni engagement

#136 The Forgotten 40%: Agriculture Needs More Attention

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Abstract

Agricultural landscapes occupy nearly 40% of the Earth's land surface, yet they remain peripheral in landscape architecture education and practice—despite both their global significance and the discipline's historical connection to agriculture. This paper calls for a disciplinary reorientation—one that centers agricultural landscapes as critical sites of interface for landscape architecture, where the multifunctional, past, present, and future dimensions of these landscapes must be actively considered and engaged. Grounded in the theoretical frameworks of agroecology, design activism, and science and technology studies, this research investigates how landscape architects can engage meaningfully with agrarian landscapes. Using semi-structured interviews with over 20 landscape architects and researchers working in agricultural areas, this study examines the urgent need for greater disciplinary attention to agriculture, the diverse modes of landscape architecture's engagement with agrarian contexts, the barriers to deeper involvement, and the opportunities for designers to collaborate with farmers and other stakeholders. Preliminary findings underscore the urgency of shifting disciplinary attention toward the agricultural landscape, which offers a wide range of design opportunities—including, but not limited to, spatial configurations, ecological infrastructure, land management strategies, and long-term maintenance. This paper argues for a transformation in landscape architecture education to prepare future practitioners for meaningful engagement with agricultural contexts. Drawing on insights from our interviews, this study highlights the need to reframe educational priorities and develop a framework for integrating agricultural landscapes into design pedagogy. This is a call to action. Agricultural areas must be recognized as essential sites for advancing the field's relevance, responsibility, and pedagogical direction.

Keywords: Agricultural landscapes , Reorienting landscape architecture, Education change

#138 Leading the Way: Anticipating the Future in a Changing Environment.A Workshop for Existing and Aspiring Academic Administrators

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Abstract

Year three of this Academy of Fellows annual workshop provides current and future leaders with information about key challenges and strategies for guiding a thriving 21 st century landscape architecture program. For those now in leadership positions, the workshop will address issues both thorny and strategic, providing real-world solutions to administrative dilemmas. For faculty curious about academic leadership, the workshop will help in preparing them for these roles with skills for successfully chairing a program. The two-hour workshop session starts with brief presentations by seasoned administrators, followed by posing common scenarios, group brainstorming, and sharing of case studies highlighting strategies from experienced chairs. This year's 3-part workshop will focus on: Academic Leadership: Anticipating the Future in a Changing Environment . Past workshops focused on the Joys and Challenges of Academic Leadership and Key Questions of Academic Leadership. Mark Elison Hoversten, FASLA, FCELA, Dean, College of Design, NC State University. His leadership includes planner for the new town of Summerlin, founder of the LA program at UNLV, initiator of The Springs botanical garden and of the Landscape and Aesthetics Program for Nevada DOT, and former CELA President. Sean Michael, FCELA, holds a joint Professorship in Landscape Architecture + Environmental Planning and in Outdoor Product Design + Development at Utah State University. His leadership includes twelve years as Department Head and Program Director, and former CELA President. Patsy Owens Eubank, FASLA, FCELA, Associate Dean, UC Davis. Her leadership includes Associate Dean of the College of Agriculture and Environmental Sciences, chair of the Departments of Environmental Design, Human & Community Development and the new Department of Human Ecology, and Chair/Co-chair, Children & Youth Environments Network (EDRA). Art Rice, FCELA, Professor Emeritus of Landscape Architecture, NC State University. His leadership includes former associate dean and department head, and former CELA president.

Keywords: Leadership, Administration, Change management, Future challenges

#145 From Learners to Leaders: Empowering Student Agency through a Learner-Led, Vertically-Integrated LA Studio Elective

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Abstract

Beyond skills in landscape design, principles, and graphic communication, thriving in today's complex, rapidly changing contexts requires landscape architecture education to support students' leadership, adaptability, and real-world problem-solving abilities. Nurturing student agency is essential for cultivating future innovators and leaders. In educational contexts, agency is students' ability to direct their learning, act purposefully, and use available resources effectively (Saarela et al., 2021). This paper presents a case study of a learner-led studio elective in which students, rather than instructors, drive the design process within a structured pedagogical framework. By prioritizing autonomy and collaboration, the course dismantles traditional hierarchies in design education and cultivates student agency, equipping learners to define project scopes, build partnerships, and present their work with confidence to varied audiences. Traditional instructor-centered studio models, while primarily supportive, often limit student autonomy (Sheridan, Zhang, & Konopasky, 2022) constraining opportunities for self-directed problem solving and collaboration (Herranen, Vesterinen, & Aksela, 2018). A shift from instructor-centered to learner-led pedagogy is supported in educational literature. Yet, challenges persist in adoption, with both students and instructors often reluctant to transition to learner-led models. (Herranen, Vesterinen, & Aksela, 2018). This elective addresses these challenges by positioning students as directors of their learning to collaboratively navigate real-world design problems for a community partner. The class included students from multiple year levels, departments, and with diverse skill sets. Collaboratively, students were given the freedom to self-organize, define project goals, conduct site analysis, develop design proposals, and iteratively test concepts with real community partners. Outcomes were evaluated qualitatively through portfolio review, observation of student interactions, reflective journals, and feedback surveys to assess agency development and design quality. Findings indicate that students exercised substantial autonomy in defining project scopes, decision-making, and collaboration. Portfolio analyses reveal innovative solutions and problem-solving strategies, while reflective journals and surveys highlight increased engagement, leadership skills, and confidence in navigating ambiguity. Students also demonstrated the capacity to negotiate constraints, synthesize community input, and communicate proposals effectively. A state chapter ASLA award underscored the project's quality and thoughtfulness. These results align with research emphasizing the benefits of learner-led approaches for deeper engagement (Kumar, 2020). This case study illustrates how learner-led pedagogy can bridge educational theory and practice, cultivating skills essential for real-world design work and community collaboration. It offers a replicable model for landscape architecture education and demonstrates how centering student agency can produce both meaningful design outcomes and stronger professional readiness (Wright, 2011).

Keywords: Agency, Learner-led, Vertically-integrated studio, Landscape architecture education, Leadership

#150 AI-Integrated Web-Based Platform to Unfold the Landscape Idea: Bridging Theory and Practice to Advance Knowledge

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Abstract

Landscape architecture has been shaped by historical, cultural, and social discourses that inform our understanding of nature and the environment (Greider & Garkovich, 1994; Cosgrove, 1998; Spirn, 1988). In the current era—marked by climate change and calls for environmental justice—educators and practitioners face the challenge of reflecting on the past to rethink practices. The legacy of canonical case studies from the Global North, spanning the 18th to 20th centuries, remains critical in this endeavor; however, existing resources often lack a comparative and interactive multi-dimensional lens. This ongoing project on AI and pedagogy, supported by the University of Hong Kong, seeks to address these gaps by asking: How can AI integration help students grasp knowledge across the curriculum, from theory to design application, by learning from the flaws and strengths of precedents? And, how have widely disseminated case studies in landscape architecture from the Global North influenced the social construction of nature? The project involves designing a web-based, open-access platform that compiles influential Global North case studies. Each case is examined with structured information—temporal frame, theoretical discourses, socio-cultural drivers, and technologies. The platform integrates the case method (Francis, 2001), experiential learning (Kolb, 2014), and reflective practice, employing an interactive timeline interface and comparison tools. AI-driven features, including retrieval-augmented generation and interactive modules, foster dialogue, critical retrieval, and engagement through quizzes and flashcards, enabling students to reflect on connections across time, place, and concept. This project seeks to evaluate how a cross-case platform supports students' ability to articulate complex relationships among historical precedent, place, and contemporary practice through its use in seminar and studio courses. Anticipated findings include more frequent cross-case reasoning, increased attention to socio-cultural and ecological dimensions, and student-identified flaws and gaps in canonical cases that can inform the curriculum. Students move beyond descriptive learning, critically tracing how concepts such as aesthetics, ecological awareness, or resilience manifest in different contexts (Mills et al., 2009). Their critical engagement may reveal new connections across cases and leverage the flaws and strengths of featured case studies to advance knowledge. This approach reframes existing online resources from static, unidimensional collections to an interactive, multi-dimensional, and potentially generative tool that can catalyze synthesis and dialogue in landscape architecture education. Limitations include the current focus on Global North precedents and the evolving accuracy of AI tools.

Keywords: Curriculum Integration, AI Integration, Reflective learning, Landscape Idea, Theory and Practice

#158 Beyond Blank Paper to Paper Streets: How an Evolving Partnership Transformed a First-Year Design Studio

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Abstract

Traditional introductory landscape architecture studios often rely on theoretical projects, leaving students with little exposure to communities or stakeholders. The literature highlights the importance of incorporating real-world projects to benefit student learning (Bose et al., 2012; Chou, 2017; Luo & Hsu, 2018). However, many instructors hesitate to introduce such collaborations in introductory studios due to the challenges of developing partnerships and concerns about the time needed to teach core techniques. This study presents a three-year longitudinal case study of an introductory landscape architecture studio that challenged this model by building a sustained partnership with the City of Durham and Downtown Durham, Inc. The goal was to create a unique learning experience (Kolb, 1984; Schön, 1987) for our first-year students, most of whom are new to the design field, by immersing them in tangible, active collaboration from the very start. Student capabilities were balanced with stakeholder expectations by involving stakeholders throughout the design process. The instructors evolved by listening to stakeholder needs and building student capacity through quick two-week projects, including narrative building, hybrid representation, and model-making. The study explores two key areas. First, it documents how this long-term alliance was formed and nurtured, from its initial stages to its current, robust state. Drawing on insights from both instructors and our community partners, we describe how a mutually beneficial relationship was established and maintained over three successive cohorts. Second, we analyze how this structured, phased approach to learning—beginning with foundational skills before moving to complex site analysis and stakeholder engagement—impacted student outcomes. The research team collected data from student design work, as well as surveys and interviews, which revealed personal reflections on how working in a real-world context enhanced their first-year studio experience. The findings suggest that this early exposure to a collaborative process accelerated the development of empathy, confidence, and critical thinking in beginning designers. This collaboration has an impact across the landscape architecture curriculum, enhancing student learning beyond the classroom. The benefits included service learning, co-creation, and interdisciplinary dialogues surrounding abandoned paper streets in Durham. Ultimately, this case study offers valuable lessons for other institutions looking to build lasting partnerships and redefine what's possible in foundational design education studios.

Keywords: Partnerships, Community, Landscape Architecture Education, Service-learning Studio, Paper Streets

#159 Evaluating the Use of Large Language Models in Plant Palette Design for Landscape Architecture

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Abstract

Artificial intelligence has garnered much attention within the design fields, from being a remarkable creativity tool to being an existential threat to design fields (Cantrel, Zhang, & Lui, 2024). Regardless of personal perceptions on AI use, studies repeatedly show that AI adoption in landscape architecture and the broader design and construction fields has been rapid and appears to be increasing (Fernberg & Chamberlain, 2023). Although there has been considerable exploratory research on the use of generative AI in landscape architecture, more formal studies attempting to measure its effectiveness and impact have thus far been few (Fernberg & Chamberlain, 2023). This research seeks to begin addressing this shortfall in the specific application of large language models as a tool for assisting landscape architects in plant selection based on project needs. To conduct this study, three practitioners were recruited to create plant palettes for a site based on project criteria and site conditions and were asked to track their time spent. Similarly, ChatGPT4 was used to generate a palette using a prompt that incorporated the same criteria and user time spent was also tracked. The palettes were then standardized for format and sent to three separate evaluators. Both the palette creators and the evaluators were locally recognized for their planting designs. Evaluators were asked to evaluate the palettes based on metrics of suitability, availability, and aesthetics, with further queries of whether they would utilize the plants in the palette and if they could accurately identify whether a palette was generated by a human or AI. We found that that the human generated palettes scored marginally better than the AI-generated palette on all metrics (average of 2.5% higher), except for availability, where the AI was rated substantially higher (18% higher). Overall, the evaluators were unable to accurately identify whether a palette was AI or human-generated. The human designers took an average of 42 minutes, and the AI user took 30 minutes, to complete the plant palette. The results of the study suggest that AI may be approaching the capability of human designers in being able to create effective planting palettes and can also offer time efficiencies. This raises questions regarding future practice and highlights the potential disruption of AI and the need for landscape architects to actively consider the position and role of AI in practice and how we should respond to the increasing prevenance of AI in the design fields.

Keywords: Artificial Intelligence, Planting Design, Technology

#217 Shop Work: Concept and Confidence through Competition

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Abstract

Teaching landscape design and construction is an opportunity to foster student creativity and confidence. Practicing design-build in an academic design studio setting is embedded in a number of landscape architecture academic programs and tends to follow largely successful, replicable models with noted major learning outcomes (Winterbottom, 2016). Numerous pedagogical benefits have been extensively explored in existing literature. Participating students understand real-world applications of technical knowledge, sustainability principles, leadership and community engagement skills (Kiers & Owens, 2021). Within design studio curricula, courses that require hands-on building are frequently community-engaged service-learning or home-campus based. For over fifty years, Temple University has designed and built an educational exhibit for the PHS Philadelphia Flower Show, the nation's largest and world's longest-running horticultural event. Temple's participation in this juried show, which draws local and international exhibitors, is an annual project in our third year BSLA design-build studio. It involves the design, construction, and deconstruction of a public-facing exhibit that artfully displays plants and physically and conceptually fulfills annual show themes. This endeavor is uniquely pedagogical in that it serves a non-traditional client and is assessed by a supportive jury of design and public horticulture professionals. It is experienced by over 250,000 members of the public annually in person, and many more through other media. Given this highly specific project environment, instructors have developed and continually updated learning goals and objectives that incorporate the show's specific requirements and serve Temple's professional curriculum. Freed from a direct designer-client relationship, design and narrative skills are tested within distinct spatial, thematic and building constraints. Students receive real time [individual and small group] coaching and critique and benefit from working with experienced artisans and makers. Public exposure and observation of competitor's submissions during the build phase enable students to participate in and observe world-class, friendly competition. Throughout the design and build phases, students are afforded many opportunities to present, discuss, and receive expert feedback from their instructors, the media, faculty, alumni, and peers in addition to professional practitioners and designers. During the show, students receive evaluative observations from the sponsoring organization, fellow competitors and the public. Our primary goal is to assess this method of design-build education and its learning outcomes through student and instructor pedagogical reflections. Further, to evaluate our curricular participation in terms of its efficacy in both integrating and communicating a conservation ethic and a resource-conscious approach to practicing landscape architectural design and construction.

Keywords: design-build education, exhibition design, experiential learning

#237 From Textbooks to Knowledge Graphs: Rethinking Landscape Architecture Education with AI

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Abstract

Landscape architecture education aims to cultivate versatile talents with both ecological construction capabilities and aesthetic practice skills. However, its interdisciplinary knowledge system is complex and rapidly evolving, making traditional linear teaching models insufficient. Students often struggle with the fragmentation between ecology, art, and engineering, highlighting the urgent need for a new educational paradigm. This study uses AI-driven knowledge graphs to construct a structured, interactive system for interdisciplinary teaching Based on the large language model(LLM) DeepSeek-V3 , we constructed a knowledge graph for landscape architecture, enabling semantic understanding, triple extraction, and dynamic entity classification. Data were collected from authoritative sources such as the National Standards Platform. Through structured processing and semantic modeling, a hierarchical knowledge system was established and integrated with visualization tools and intelligent Q&A functions to support interactive teaching and dynamic updates The landscape architecture knowledge graph system developed in this study integrates knowledge visualization, intelligent Q&A, and dynamic management functionalities, and has been implemented in the core course History and Art of Western Gardens , supporting students in interactive knowledge exploration. Expert evaluation indicated that the system performed well to excellently in terms of knowledge coverage, accuracy, usability, functionality, and interface friendliness. Functional testing and expert evaluation confirmed the system's effectiveness in knowledge coverage, usability, and intelligent Q&A, with minor improvement needed in response speed. Overall, the results demonstrate that the system is efficient and scalable, providing practical support for digital landscape architecture education. This system represents the first systematic application of a large language model-driven knowledge graph in landscape architecture education, facilitating a transition from a traditional "textbook + lecture" teaching model to a " knowledge graph + interaction + reasoning " paradigm.The implementation indicates that this approach effectively supports the structuring of interdisciplinary knowledge and intelligent teaching, enhancing students' active learning and classroom engagement. Adopted in nearly 20 universities and benefiting over 30,000 students, the system demonstrates efficiency, scalability, and educational value.

Keywords: Landscape Architecture Education, Knowledge Graphs, Artificial Intelligence, Large Language Models (LLMs), Interdisciplinary Learning

#249 Worlds in the Making: Storytelling Methods for Environmental Literacy and Design

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Abstract

Since Ian McHarg's applied science methodology of the 1960s, landscape architecture has closely aligned itself with scientific standards of communication [1,2]. However, many have pointed to the limitations of a reliance on this singular mode [3,4]. To advance the relevance of landscape architecture, we look to the humanities and entertainment, where well-crafted storytelling invites public audiences and emerging designers into environmental thinking and ways of seeing [5,6]. This panel examines the significance of narrative and storytelling in landscape architecture, as the discipline confronts unprecedented political, rhetorical, and educational challenges. We contend that the critical role of landscape architecture in shaping environmental futures requires more diverse and impactful methods of public engagement . While the field has long relied on scientific communication to justify its significance, this approach often alienates broader audiences and limits the discipline's cultural reach. Narrative and storytelling fill the gap between designers and the broader public by translating disciplinary knowledge into forms that resonate with experts and nonexperts alike [7]. By using narration to drive design, students can enhance their environmental literacy through more subjective and personal ways of understanding landscapes. For diverse audiences, storytelling and fiction are valuable tools for bridging expert knowledge with public imagination [5,6,8]. Unlike dense scientific data, stories offer accessible and relatable insights, enabling clients, students, and the public to better understand the importance of design in shaping ecological futures [3,4,6]. This panel brings together landscape practitioners and educators whose research incorporates storytelling for enhancing design, pedagogy, and public literacy. We argue that including narrative is not merely a supplement to traditional design communication tools, but is representative of a methodological shift with potential to expand inclusivity in the field, reorient pedagogy with greater attention to detail and grounded experience, and strengthen the discipline's relevance in shaping the future of environmental imagination. Panelists will discuss topics including: (1) current interdisciplinary dialogue on parafiction as a technique that critiques present conditions and envisions alternatives, (2) productive parallels between fictional writing devices and the design process, (3) cinematic techniques that inform design thinking and shape experiential narratives of landscapes, and (4) a collaborative podcast series deployed as a novel method of site analysis and interpretation. The session will serve as a preliminary introduction to contributions for a forthcoming book exploring fiction as a design and pedagogical tool for landscape architects, environmentalists, and environmental humanities scholars.

Keywords: communication, storytelling, research and design methods, design futures, environmental literacy

#261 Pushing Buttons + Boundaries: The Design Competition in Landscape Architecture

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Abstract

Landscape architecture and international design competitions are inseparable. Indeed, the international design competition of Manhattan's Central Park and its creators, Calvert Vaux and Frederick Law Olmsted, set the foundation for the American park movement and solidified the profession of landscape architecture as a distinct practice, separate from architecture. In this paper, the authors review the profound influence design competitions have had in defining and pushing traditional boundaries of the field through two perspectives: practice and pedagogy. The authors will first share findings from interviewing multiple renowned landscape architects across Noth America and Western Europe on the importance and critique of the contemporary landscape architecture competition. Several common themes emerged from the interviews, including the necessity of blind reviews to equalize the playing field, the creative design process as being more collaborative than not, how competitions have been a founding factor in the birth and success of young firms, how competitions invigorate much needed theory in landscape architecture and spark lively debates between "speculation" and "problem solving." Critique includes the need for best practices in the formulation and execution of competition briefs and processes to protect and support both competition entrants and winners. Second, the authors posit that including international ideas competitions as a core part of a design curriculum has multiple advantages. Feedback collected from Master of Landscape Architecture Students in their final year (over a ten-year period) reveals that students learn critical soft and hard skills integral to a successful practice in landscape architecture. Examples include navigating the inseparable relationship between competition and collaboration among peers, creating sophisticated project representations and clear writing without being present to explain or defend their submissions, designing outside of their geographic familiarity and in response to a charge developed by professionals outside of academia, and honing the skill to develop a theoretical stance and articulate a position. The authors will share examples of both student international "ideas" competitions as well as impactful built projects, tactics and epiphanies from professionals. Within literature devoted to the international design competition in landscape architecture, this paper hopes to fill a gap in history, theory and pedagogy and spark lively conversation, debate and inspiration among educators and students.

Keywords: Competitions, Pedagogy, Design process, Design theory

#277 A study on the plant sketching practice for the enhancement of students' intention for pro-environmental attitude and behavior

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Abstract

In landscape architecture education, the study of plants serves multiple purposes: it builds ecological literacy, provides technical knowledge, and supports design practice. Although these academic and professional functions are well recognized, the role of plant-related learning in shaping students' environmental attitudes and its influence on their conservation intentions remains understudied. In this context, this study examines a foundational pedagogical process in landscape architecture curricula: drawing plants. We investigate whether engaging in freehand plant drawing influences students' behavioral intentions toward environmental stewardship, and whether this relationship is mediated by two psychological factors: attitudes toward plants and affection for the natural environment. To address these questions, we conducted a quasi-experiment with 124 first-year landscape architecture students from three colleges in South Korea, dividing them into a control group and a treatment group. The control group participated in standard outdoor field-trip activities, while the treatment group engaged in freehand plant drawing during the trip. Afterward, students in both groups completed a paper survey measuring their plant attitude (PA), environmental affection (EA), and pro-environmental behavioral intention (PEB). We analyzed the survey responses along with student drawings to assess the effect of plant-drawing practice on PEB and the mediating roles of PA and EA. Our analysis revealed two key findings. First, engaging in plant drawing is more effective in fostering positive attitudes toward plants and increasing affection for the natural environment than a normative outdoor experience alone. Second, differences in drawing style, such as analytical-observational versus expressive-subjective approaches, reflect distinct psychological processes associated with PEB. Overall, the findings suggest that incorporating plant-drawing exercises into the landscape architecture curriculum can meaningfully impact the development of pro-environmental behavioral intentions. This practice offers a promising pedagogical strategy for cultivating biophilic mindsets and nature-protective behavior among students in landscape architecture programs.

Keywords: Freehand plant drawing, Pro-environmental behavioral intention, Plant attitudes, Ecological education, Environmental psychology

#283 Reforming Professional Master and Doctoral Education in Landscape Architecture under National Strategies: The Case of Beijing Forestry University

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Abstract

[Introduction] China's ecological civilization strategy has elevated landscape architecture education to a critical position in national development. The shift from academic to professional graduate education requires cultivating advanced talents who can contribute to carbon neutrality, rural revitalization, and territorial spatial governance. However, current training systems face structural problems such as outdated curricula, weak practice platforms, and mismatched talent supply and demand. This study explores reform pathways for professional master's and doctoral education in landscape architecture, using Beijing Forestry University (BFU) as a case. [Methods] Two methods were employed. First, big data analysis was used to mine national policy documents and reports, identifying emerging demands for landscape architecture professionals in ecological restoration, green infrastructure, and land-use planning. Second, knowledge mapping techniques were applied to reorganize the curriculum system, highlighting linkages between core modules of landscape architecture and interdisciplinary fields such as ecology, architecture, planning, and digital technologies. [Results] Findings indicate that BFU has developed a "strategic service-oriented" training model with three characteristics: (1) a modular and progressive curriculum structure integrating ecological planning, digital tools, cultural heritage, and strategic topics; (2) a dual-supervisor system combining academic and industry mentors, enabling students to gain competencies through real-world projects; (3) an outcome-based evaluation system emphasizing project deliverables, interdisciplinary collaboration, and social impact rather than academic papers alone. [Discussion] These reforms align graduate education with national strategies, narrowing the gap between academic training and professional practice. By integrating interdisciplinary knowledge and practice-based learning, the model enhances innovation capacity and policy responsiveness. Limitations include the need for broader international collaboration and long-term tracking of graduate outcomes. [Conclusion] Aligning graduate education with national strategic demands enables the cultivation of landscape architecture professionals with interdisciplinary competence, practical orientation, and strategic vision. The BFU case demonstrates a replicable model that can serve both China's ecological civilization goals and international discussions on landscape architecture education reform.

Keywords: Landscape architecture, Professional Degree, Graduate Education, Integrated Master–Doctoral Pathways

#304 Design Beginnings: Tracing the DNA of Foundational Studios in Landscape Architecture

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Abstract

Foundational landscape architecture studios establish how students begin to think, draw, and act as designers. Although programs differ in structure and emphasis, educators consistently wrestle with key questions: Which concepts, methods, skills, and mindsets are most essential at this stage? How should teaching strategies adapt to new generations of learners and evolving expectations of the profession? This panel addresses these questions using both quantitative and qualitative approaches, drawing on (1) an ongoing national survey of faculty, students, and professionals and (2) first-year studio teaching experiences across three BLA programs in the U.S. A quantitative survey examines how foundational studios are structured and experienced. Faculty responses explore learning objectives, definitions of “design principles,” and whether shifting student profiles and professional challenges call for change. Students share insights about key lessons, memorable projects, and areas of growth or difficulty. Practitioners reflect on their own foundational studio experiences with the perspective of years in practice. Together, these findings position foundational studios as not only technical training grounds but also as places of design culture and identity development. The panel, representing three distinct programs (Indiana, Florida, and Nebraska) will also present first-hand teaching experiences and reflections from teaching foundational LA studios. One presentation outlines a spiral model of teaching and learning in which foundational concepts and skills are introduced through low-stakes, simple assignments that gradually increase in complexity, allowing students to stretch their abilities, exercise choice and agency, and build a strong, collaborative studio culture while deepening engagement with core principles of landscape architecture. The second presentation highlights cultivating a designer mindset alongside the introduction of spatial thinking and dynamic landscape concepts using an abstract terrain model that substitutes for traditional architectural exercises. The third showcases frameworks and tools for concept development and scale calibration, using sequenced exercises and both traditional and VR media to help students move fluidly between abstraction and precision-based thinking. By comparing similarities and differences across institutions, this panel seeks to identify the “shared DNA” of landscape architecture’s foundational studios while highlighting distinctive approaches that extend beyond architectural models of design. The goal is to clarify what we collectively prioritize as a discipline and to examine how diverse teaching strategies support or challenge those priorities.

Keywords: Landscape architecture education, Design pedagogy, Design thinking, Beginning design

#334 Advancing Collaboration: Assessing Interdisciplinary Design Education Through a Framework for Effective Practice

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Abstract

Professional accreditation bodies in the United States—such as the Landscape Architectural Accreditation Board (LAAB), the National Architectural Accrediting Board, and the Planning Accreditation Board—emphasize the importance of interdisciplinary collaboration in higher education. Their standards for student learning outcomes include expectations such as “leadership and collaboration on multidisciplinary teams” and “the incorporation of knowledge from other disciplines, professions, and perspectives” (LAAB, 2021, p. 14). This paper examines a recurring design collaboration between fourth-year landscape architecture students at West Virginia University and third-year architecture students at Fairmont State University, implemented in Fall 2021, 2022, and 2024. The collaboration centers on the design of The Farm-to-Table: Restaurant and Garden within a studio setting. This project inherently fosters synergy between architecture and landscape architecture due to the strong spatial integration of indoor and outdoor environments and the intrinsic programmatic relationship between building and landscape. At the conclusion of each iteration, students completed surveys assessing their experience, perceived benefits, and the impact of collaboration on the final design outcome. Responses were analyzed to identify strengths, challenges, and opportunities for improvement, which informed adjustments in subsequent iterations. Across three years, the average response rate was approximately 65%: 53.8% in 2021 (26 students), 75% in 2022 (28 students), and 67.6% in 2024 (34 students). Survey findings will be evaluated against Laura Bronstein’s (2003) model for effective interdisciplinary collaboration (IC) through qualitative content analysis. Developed to assess IC among social workers and other professionals, the model “is meant to be a generic depiction of the components of optimum collaboration” (Bronstein, 2003, p. 299). It identifies five core components—interdependence, newly created professional activities, flexibility, collective ownership of goals, and reflection on process—along with four influencing factors: professional role, structural characteristics, personal characteristics, and history of collaboration. Using this framework, we assess the effectiveness of collaboration between architecture and landscape architecture students and identify areas for enhancement. Preliminary analysis suggests increased awareness of professional roles and improved design integration This work is significant in light of LAAB and other professional standards requiring interdisciplinary group work, as well as the growing demand from employers for graduates who can collaborate across disciplines to address increasingly complex design challenges. By aligning academic practices with accreditation standards and professional expectations, this study contributes to the ongoing discourse on preparing students for collaborative, real-world problem-solving in the built environment.

Keywords: Student learning outcomes, Qualitative content analysis, Accreditation standards, Professional competencies, Collaborative studio pedagogy

#346 Walking the land: learning from nature-- in nature

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Abstract

Learning from nature serves a practical purpose in the landscape architecture curriculum. If “nature-based solutions are landscape architecture” as Kotchakorn Voraakom (2024) claims, then landscape architects need to understand nature and ecology. Indeed, recent discussions among faculty and students have highlighted the need for more ecological training in the landscape architecture curriculum (Park, 2025). The geographers Pearsall, Pierce and Campbell (2024) argue that walking is an important tool for sustainability studies because it crosses disciplinary boundaries and gathers different systems of knowledge. Of course, walking has long been recognized as a way of knowing, an artistic practice, and a subversive act (e.g., Fulton, 2010; Hamish, 2010; Jacks, 2004,2007; Solnit, 2000; Thoreau, 1862). I argue that walking is an important pedagogical tool for landscape architecture, especially as landscape architects become increasing involved in sustainability, climate action and “nature-based solutions”. In this presentation, I will share the results of my research and practice of walking, combined with field exercises, as forms of place-based experiential learning. For this research, I walked the trails that biologist Carl Linnaeus hiked with his students when he was teaching in the 1700’s in Uppsala, Sweden (Hodacs, 2010; Linné and Fornander, 1753). As I explored the trails, and the literature on pedagogy, I developed field exercises for students, then practiced these exercises myself while walking the historical trails. Back on campus, I used some of the exercises in a landscape architecture course on site analysis in Illinois. Then, I analyzed the effectiveness of these exercises as a form of pedagogy to learn from-- and in-- nature, based on student learning and reflections. In addition to sharing the results, I will describe the research process, share exercises and discuss how place-based learning can inform the design of "nature-based solutions". I will also reflect on using these exercises as a participant and as a teacher, walking the land to learn from nature.

Keywords: experiential education, place-based education, walking, Nature-based Solutions, pedagogy

#358 At the Margins: Interdisciplinary Pedagogies in the Riparian Zone of Nairobi, Kenya

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Abstract

Insights from immersive fieldwork and studio methodologies are translating into interdisciplinary teaching strategies to develop conceptual design frameworks in response to urgent needs in Nairobi, Kenya. Flooding in 2024 displaced tens of thousands of people, with disproportionate impacts on informal settlements (Kounkey Design Initiatve, 2025; Maganjo, 2024). Design fieldwork in Nairobi provided insights into emergent responses of trees, waters, soils, and communities and the pressures that they face. This background prompted a course and collaboration in fall 2025. 'Urban-Forest Relations' was a new theory seminar within the landscape architecture department that explored socio-ecological dimensions of urban, informal, riparian, forested landscapes. The seminar collaborated with the 'Informal Futures' architecture studio that developed housing proposals after widespread displacement in 2024. Both courses focused on the riparian edge in the Mathare 4B neighborhood of Mathare, a densely populated informal settlement in Nairobi. The courses worked in parallel, which allowed for independent investigations, with several intersections for sharing and negotiation. Teaching methods combined intensive reading, case studies, tree palette research, and written reflections with diagram, collage, plan, and section drawings. Speakers from a range of professional and academic backgrounds shared perspectives, and students developed tactile understandings of distant landscape dynamics through physical models and planting trees locally. These encounters allowed students to absorb, embody, test, and provoke ideas. A process orientation troubled the river edge 'site', re-territorializing the project along spectrums of shifting conditions, interests, and expressions (Corner, 2011; Harraway, 2016). Student projects suggest how relationships among trees, neighbors, soils, and waters can build resilience in precarious informal riparian communities over time. Proposals describe forms of forest urbanism made possible by occupations and provisions by trees, people, and structures ("Framing Forest Urbanisms," 2024). This work furthers interdisciplinary design pedagogies that embrace multiple truths, differences, and critical approaches to care while envisioning vibrant futures at the margins (Bussiere, 2023; Escobar, 2018; Jacobs, 2019; Keane & Monacella, 2022; Puig De La Bellacasa, 2015). This collaboration faced challenges while working across disciplines, geographies, course capacities, and varying connections to Nairobi-based partners. Student work illustrates opportunities and limitations of these teaching methods as part of the network of relationships in Mathare's riparian zone. These dynamics are representative of disparate socioecological realities contending with climate change impacts. This paper reflects on methods, insights, and applications of this layered pedagogical approach.

Keywords: Interdisciplinary, Riparian, Forest urbanism, Informal settlement, Pedagogy

#372 An Ecological Conservation Planning Framework (ECPF) for Integrating Ecology and Design Education

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Abstract

The Ecological Conservation Planning Framework (ECPF) proposed in this study provides a structured method to integrate ecological science into landscape architecture education. While conservation planning has long emphasized the need to connect theory with real-world application, a gap remains between ecological modeling and design pedagogy (Grose, 2014). Wildlife Habitat Relationships (WHR) modeling provides a useful bridge to fill the gap (Morrison et al., 2012). However, its potential for conservation planning and design has not been fully demonstrated in classroom contexts (Greco, 2016). This research addresses that gap by developing and testing the ECPF within the UC Davis LDA 152 – Conservation Planning & Design course, using the Upper Putah Creek watershed as a case study to connect ecological theory, spatial analysis, and design application. The ECPF brings together several tools and concepts—WHR modeling, focal species selection, habitat suitability analysis, and landscape ecology methods like least-cost corridor analysis and layered analysis—into a unified framework for conservation design. The process began by identifying threatened and endangered species in the watershed using the California WHR query system (CWHR, 2021), which links vegetation types with species' basic needs such as food, shelter, and breeding. From this list, focal species were selected based on umbrella and indicator species principles to ensure broad ecological representation and practical design focus (Caro, 2010). One species required a large, continuous tree canopy habitat, while another depended on riparian areas and was sensitive to environmental stress. These selections helped the project address both upland and river corridor habitats. Using GIS-based least-cost corridor analysis and suitability mapping, the study pinpointed key habitat patches, ecological linkages, and disrupted riparian zones affected by urban and agricultural development. Field visits and satellite imagery were used to classify these impaired areas by land cover type, guiding restoration strategies tailored to specific disturbance patterns. These findings informed design responses that supported species movement and improved habitat connectivity. This study shows how ECPF can be embedded in landscape architecture education as a data-informed and design-focused approach. By turning ecological models into design tools, the course provides students a clear method to link species–habitat data with spatial analysis and design thinking. The ECPF offers a practical model for teaching ecological planning and preparing students to create resilient, biodiversity-friendly landscapes. More broadly, it shows how WHR modeling can strengthen cross-disciplinary learning and support innovation in conservation design.

Keywords: Wildlife Habitat Relationships, landscape architecture education, habitat restoration, CWHR, conservation planning

#375 Cyborg Pedagogies: Rethinking Landscape Futures through More-Than-Human Intelligence

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Abstract

This paper presents Landscape Futures, an experimental graduate seminar at Cornell University designed to explore how landscape architecture education can critically engage artificial intelligence (AI) as a companion in design thinking and knowledge production. Rather than treating AI as a neutral tool or representational shortcut (Fernberg & Chamberlain 2023), the course positions it as a co-intelligence embedded within ecological, cultural, and political systems. This framing redefines landscapes as intelligent assemblages of living matter, sentient ecologies, and synthetic natures (Whatmore 2006; Haraway 2016). Drawing on theories of posthumanism (Tsing 2015), multispecies histories (O'Gorman & Gaynor 2020), and regenerative landscapes (Kallio 2023), the seminar employs speculative pedagogy to challenge techno-deterministic narratives and open pathways for plural futures. Throughout the semester, students engage with thematic modules, including cybernetics, multispecies cognition, algorithmic landscapes, and Indigenous epistemologies. Assignments such as the Landscape Futures Diary combine critical writing with AI-generated "visual seeds" and documented interaction logs, cultivating reflexivity and transparency about human–machine collaboration (El Moussaoui & Krois 2023). The final project positions AI as provocateur, archivist, or translator, prompting students to synthesize theory and design in multimodal outputs such as speculative research papers, visual essays, or manifestos. Through analysis of student work, we reflect on the challenges of integrating AI into design education, including questions of authorship, ethics, and bias (Guridi et al. 2025, Awashra et al. 2025). It advocates for a cyborg pedagogy that expands landscape education beyond anthropocentric frameworks, fostering experimental, justice-oriented practices capable of addressing planetary crises (Zhang et al., 2023; O'Gorman, 2021).

Keywords: Landscape Intelligence, AI in Design Education, Landscape Futures, Speculative Design, Human–Machine Collaboration

#384 Who Asked Us? MLA Student Perspective on Research in Accredited Programs

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Abstract

Landscape architecture is at the forefront of addressing entangled social, ecological, and economic challenges; research addressing such challenges is increasingly incorporated into professional practice and graduate-level curricula. The Landscape Architectural Accreditation Board (LAAB) requires accredited Master of Landscape Architecture (MLA) programs to provide coursework in research methods, making it essential that curricula effectively support the development of critical thinkers. When students become both knowledge-seekers and -producers, the impact on learning and retention is amplified (Healey et al., 2014). Exposing students to conducting their own research supports their independence and agency as designers and fosters responsibility for their work, which in turn supports their development as competent practitioners (Hockings et al., 2018). Studies surveying faculty and professionals on the role of research in landscape architectural education suggest that it enhances students' abilities in critical thinking and problem-solving, allowing for more nuanced design solutions (Sleipness et al., 2018; Barnes et al., 2024). However, there is currently no published literature on the role of research from the perspective of MLA students. Understanding the MLA student perspective is critical to fostering the next generation of landscape architecture problem solvers. This presentation analyzes and discusses the results of an online survey of MLA students in accredited U.S. landscape architecture programs. The survey uses both quantitative and qualitative questions to understand the expectations, desires, and experiences of current MLA students regarding research integration within their curricula. The results focus on findings related to the successes and areas of improvement, barriers to entry, and the types of research that they have found most important to their education and career hopes for post-graduation. The results are expected to inform how research is embedded into MLA curricula, influence instructional approaches within landscape architecture programs, and contribute to creating a more aligned and supportive student experience. By centering student perspectives, this research fills a critical gap in the literature and provides actionable insights for shaping the future of landscape architecture education.

Keywords: pedagogy, survey, interdisciplinary, evidence-based practice, student agency

#391 Teaching Students How to Learn: Evidence Based Strategies

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Abstract

"We now accept the fact that learning is a lifelong process of keeping abreast of change. And the most pressing task is to teach people how to learn" to equip students with the ability to learn continuously in a world that is always changing. Peter Drucker. This fundamental activity is crucial for adaptation, growth, and personal development to overcome challenges and making meaningful contributions to societal progress. Over my four decades as an academic, my focus and goal have shifted from What I am teaching towards How students are learning. Challenges to this goal include levels of maturity, ability to follow instructions, lack of motivation and curiosity, digital distractions, risk eversion etc. Hyper digital connectivity without boundaries have exploded the demands for our attention and engagement. Research shows that “the mere presence of one’s smartphone reduces available cognitive capacity, even when it is not in use.” Prof. Ezekiel Emanuel, U Penn. Over reliance on memory also limits students’ learning and retrieval of information and knowledge. The forgetting curve, developed by psychologist Hermann Ebbinghaus, is a model that shows how memory retention declines over time without reinforcement. Research shows that we will forget most within brief time - half in a day or two and 90% in about a month. There is growing evidence that the current academic culture is making us increasingly challenge averse by being prescriptive, super easy, supervised, and safe, relieving students of any accountability, initiative, and autonomy, leaving no opportunity to confront and solve problems on their own. “Avoiding the discomfort of learning that doesn’t come easily to us we limit our growth.” (Adam Grant, Hidden Potential). Avoiding critical thinking and grappling with ambiguity, uncertainty, synthesizing multiple perspectives, and discovering meaning, considered hallmarks of expanding our horizons fail to prepare students for success in the real world. Research in the science of learning suggest increasing evidence of a fixed mindset among learners, which is unreceptive, unresponsive of even resentful to any criticism. Challenges to not meeting the goals are attributed to someone else’s fault, flawed assessment, or other external factors. In my teaching, adopting the concepts of neuroplasticity and Bloom’s model of six levels of cognitive learning remembering, understanding, applying, analyzing, evaluating, and creating in the revised version of Bloom's Taxonomy, along with other strategies, have proved effective for addressing many of the learning challenge.

Keywords: Teaching , Learning , Mindset , Motivation , Memory

#392 Imagination as a Method: Exploring the Teaching of Design Generation Thinking Paradigm for Lower-grade Students

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Abstract

[Introduction] Landscape architecture design always arises from observation and understanding. Current design pedagogy often prioritizes typological, case-based training while neglecting to guide beginners in the basic thinking mode of spatial creation. Consequently, many students' understanding of the site becomes formulaic under the dominance of instrumental rationality, leaving them at a loss when attempting the 0-to-1 leap in design exercises. Based on James Corner's and Michael Hays' view that imagination serves as a bridge for connecting perception and understanding. Therefore, this research was conducted based on a smaller-scale course, which was carried out concurrently with the first design course for lower-grade students. This course focused on imagination training and aimed to help students develop a way of thinking that progresses from observation and analysis to spatial creation. [Methods] A one-week workshop Landscape Architecture Imagination targeting lower-grade students was established. Students selected a real referent (e.g., natural phenomena, movement, or art works), and followed a semi-open sequence of Object Observation-Information Extraction-Spatial Transformation to internalize an imagination-driven design generation paradigm. In Object Observation, students are deliberately guided to perceive information concerning space, time and materiality; the Information Extraction involves filtering and recombining clues to catalyze emergent perceptions; the Spatial Transformation requires constructing small-scale physical or digital models. This pedagogy has been implemented five times (2021-2025). [Results] (1)Without guidance, students are most sensitive to abstract spatial relationships, while paying inadequate attention to texture and the underlying process of phenomena. (2)Students quickly mastered and innovated traditional collage and mapping methods; technologies such as generative AI, digital motion capture, and time-lapse photography have been increasingly adopted. (3) Most students initially relied on the imitation method and neglected the expression emergent perception; with the assistance of their mentors, their performance significantly improved. [Discussion] Clearly defining the type of observation object and the spatial creation goal at the initial stage is beneficial for students to complete the training more effectively. The plans and cases accumulated by the students during the course have greatly facilitated the iteration and deepening of teaching methods. Guide students to engage all senses in observation, not just sight, while remaining alert to digital technology's potential creative constraints. [Conclusions] This course enabled students to understand the value of imagination in design training, and also enriched the methods of landscape imagination training. At the same time, how to further integrate the course into specific design training is the key point for the next exploration.

Keywords: Design generation thinking paradigm, Imagination-driven, Object Observation, Information Extraction, Spatial Transformation

#420 Repair and Reparation as Design Pedagogy

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Abstract

Within landscape architecture education, justice-oriented, service-learning, and community-centered pedagogies have proliferated. Yet these models often emphasize participation and empathy while leaving unresolved the deeper obligations of repair and reparation. This paper argues that repair and reparation constitute a distinct pedagogical framework, one that unsettles the designer's role as problem-solver or savior and repositions design as obligation, uncertainty, and care. Building on hooks (1994, 2003), Williams and Steil (2021), and Hood and Tada (2020), the paper asks: What does it mean to teach design as a reparative act rather than as service, advocacy, or inclusion? A studio centered on Syracuse's 15th Ward, a neighborhood erased through redlining, urban renewal, and the I-81 viaduct, served as a test case. The pedagogy unfolded in four modules. Module I emphasized self-exploration and prototyping to locate "homeplace" in personal and collective terms. Module II, drawing on Coates' (2015) arguments for reparations, asked students to translate archival research and spatial analysis into design obligations. Module III advanced comprehensive plans to reconnect fractured corridors and community anchors. Module IV culminated in site-specific interventions that framed joy as both resistance and repair. Student outcomes illustrate the generative friction of this pedagogy. In Module II, reparations were framed as unresolved questions: repair for whom; displaced residents, descendants, or those facing new harms in the name of revitalization? Repair of what; housing, memory, ecological systems, or the city itself of its past? In later modules, students produced proposals that refused closure: frameworks that reimagined infrastructural wounds as corridors of health and reconnection, and anchor-site projects that foregrounded joy through quilting, jazz, and soundscapes. A pedagogy of repair and reparation diverges from existing models in four ways: it centers obligation rather than empathy; it treats history not as context but as mandate; it frames design not as giving voice but as co-constructing spaces of repair; and it embraces uncertainty rather than resolution. This approach displaces the modernist designer as solutionist or savior and cultivates designers as learners, interlocutors, and facilitators. Repair and reparation remain underdeveloped in design education not because they are peripheral, but because they unsettle the very logics on which design pedagogy has long relied: the promise of solutions, the authority of expertise, and the distancing of past from present. Naming them as distinct frameworks challenges the discipline to reckon with its complicity in harm and prepares students to inhabit uncertainty, engage historical debt, and practice accountability.

Keywords: Pedagogy, Design Studio, Racialized Landscapes, Repair and Reparation

#421 Student as Site: Co-Designing Design Education

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Abstract

By applying landscape architecture's core disciplinary concepts, values, and methods to the construction of its own pedagogy, this paper articulates a landscape-specific approach to developing learning-centered teaching methods. Focusing specifically on site and sitedness—foundational and discipline-defining concepts in landscape architecture 1 —we define a “Student as Site” pedagogy that advocates for approaching students in the way that landscape architects approach sites, with attention to situation, background, and identity, and as generative agents in the co-construction of their own design education. Through the development of teaching and learning practices for students to map their existing skills, knowledge, and learning that are analogous to landscape mapping of sites, we are able to construct a generative third space between instructor and student to operate as a shared resource in the co-design of each student’s education. This approach was tested in a graduate level second semester foundation studio at [institution redacted for blind review] in the spring of 2023, 2024, and 2025, through a series of student- and learning-centered reflective mapping exercises, performed in parallel with various site mapping exercises. The wide range of student mappings demonstrate diverse interpretations, backgrounds, skills, and learning processes to be embraced as thick grounds of potentiality from which to design students’ education. Employing a descriptive case study analysis, this paper utilizes inductive methods to analyze student artifacts (with appropriate IRB approval) as well as the co-authors’ first-hand perspectives—one as the instructor and another as a student in the course. This paper focuses specifically on one of the analysis results: the power of constructing a shared third space between instructor and student in which they can better relate, communicate, and negotiate the education. By embracing their abundant existing skills and ways of learning we are better able to meet each student’s specific needs. The analysis suggests that this exercise can be an essential step in early design education, revealing each student as a thick site within which to co-design their education, reflecting the co-design practices through which landscape architects work with sites, communities, and one another.

Keywords: site, co-design, student-led learning, inclusive pedagogy

#425 Studio Teaching Reimagined: What Happens When You Teach the Process?

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Abstract

Landscape architecture education frequently relies on studio-based learning (SBL) to prepare students for the complexities of design practice. While SBL is well-suited to engaging with real-world, ill-structured problems that offer multiple ambiguous pathways to variable solutions (Monson, 2011; Jonassen, 1997, 2000), its implementation may inadvertently introduce excessive cognitive load, impairing student learning (Cooper et al., 2001; Renkl & Atkinson, 2003; Spanjers et al., 2012). Novice learners may struggle not only with the complexity of the problem but also with the need to define their own method for solving it. This study presents a reflective action research investigation (Cohen, Manion & Morrison, 2017) conducted over six years to revise the instructional approach of a technical design studio. The research process combined diagnosis, action, and reflection to address issues identified during early course iterations. The studio transitioned from an SBL model where students were expected to define their own design process and seek additional knowledge—a common approach described by Cennamo et al. (2011) and Hmelo-Silver & Barrows (2006)—to a more prescriptive framework that scaffolded learning through clearly defined stages and workflows. The revised strategy introduced a guided design process, supported by pedagogical and organizational techniques to help students engage more effectively with complex, real-world problems. Design problems include site hardscape and planting design, grading and drainage coordination, material selection, layout strategies, and technical documentation. Using adapted professional projects as worked examples, and workflows developed in practice, the new instructional process aims to reduce cognitive load while allowing students to focus on solving the design problem without also inventing or operationalizing an ill-defined or abstract design process. This presentation introduces professional examples and practice-derived workflows and describes their integration into the course. Examples of the design process taught to students will also be shared. The discussion highlights key challenges encountered during implementation, including instructor background in practice, misalignment between learning outcomes and student activities, inefficient critique practices, difficulty initiating work, and superficial engagement. Student responses to course changes offer insights into the benefits and limitations of structured scaffolding in design education. While this paper presents one approach among many within the broader SBL landscape, it advocates for the pedagogical value of explicit process instruction. Clarifying instructional methods and course structure can better support novice learners in developing realistic, transferable skills addressing complex design tasks.

Keywords: Studio-based learning, Design problem-solving, Cognitive load, Instructional design, Design process

#433 Climate Action in Learning and Practice: Landscape Architects on Transdisciplinary Climate Curricula

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Abstract

In September 2021, LAAB updated its Landscape Architecture Accreditation Standards to integrate climate science within Standard 3: Professional Curriculum, under “Plants, Ecosystems, and Climate Science,” specifically “the interrelationships between ecosystems and climate” (LAAB 2021/2024). The neutral framing of “interrelationships” suggests only that it is essential for landscape architecture curricula to establish competency in understanding that ecosystems and climate are correlated, with no imperative that students grasp novel problems raised by the climate crisis, actions they will undertake as design professionals that worsen or help mitigate it, or how to understand and apply climate science in design by evaluating carbon emissions and sequestration impacts. Climate science is transdisciplinary knowledge that embodies the “two-cultures problem” described by Joan Nassauer, in which “science may be misunderstood as limiting creative excellence” (Nassauer, 2023). Her call to position teaching and scholarship as transdisciplinary boundary work between these two cultures offers a framework for preparing future practitioners for climate-responsive design. Because current students will be mid-career by 2040, they are essential to achieving the benchmarks set by the American Society of Landscape Architects (ASLA) Climate Action Plan, which calls for achieving zero embodied and operational emissions and increased carbon sequestration by this date (Burke, 2025). To examine climate-related curricula, previous studies have used literature reviews, faculty assessment of student work, and student self-assessment (Burke, 2025; Cerra, 2017; Lenzholzer & Brown, 2013). This paper proposes a fourth source to guide curricular development of climate-related learning: interviews with U.S.-based landscape architects whose practice focuses on climate resilience. As experts in the applied technical knowledge of climate science in the profession, practitioners are uniquely suited to advise on key climate competencies for future landscape architects. For example, a related survey of 24 Australian landscape architecture practitioners of varied practice types, sizes, and regions found that “complementary to technical design skills for climate actions, skills such as negotiation, coordination and entrepreneurship...help practitioners act as boundary spanners and change makers across multiple dimensions of transformation, especially the political and social spheres” (Moosavi et al, 2025). This paper will share preliminary results from interviews centering on curricular implications of the four knowledge areas identified by the ASLA Climate Action & Biodiversity Plan -- Climate; Biodiversity; Equity; and Advocacy. Questions encourage reflection on how interviewees’ academic experiences prepared them for developing the tools, community engagement processes, and designed landscapes that embody these knowledge areas. Interviewees represent practitioners leading their firms in climate design methodologies and assessment.

Keywords: Climate science, Curriculum, LAAB accreditation , Climate design methodologies

#436 Critically evaluating efforts to integrate hands-on experiences in a planting design course for landscape architecture and landscape contracting students

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Abstract

Planting design classes are a core component of l andscape a rchitecture education — combining aesthetic theor y , scientific understanding, and technical competency. In many universities, these courses are primarily taught in a studio setting . With a small grant, we sought to expand the hands-on aspects of our planting design course for undergradu ate students in landscape architecture and landscape contr a cting . We added opportunities to conduct soil tests and analyze plants in the field — and had students design in ways that responded to cultural requirements that were not previously a focus in our department . We organized a field trip to ensure students had experienced high - quality examples of native perennial planting design—through sketching and taking notes on them —before they started a pollinator garden design project . W e introduce d a variety of lessons by constructing a teaching garde n together that was built on Joan Nassa ue r's " c ues to c are . " That project will p rovide hands-on learning for the students who construct it and , hopefully , many more students who experience it in the years to come. This presentation will include reflections on our experiences, evaluations of how student work met course objectives and improved over the course of the semester, and a survey given to students at the end of the semester. The survey will ask students to evaluate their experience with each of the different hands-on activities we introduced and provide any suggestions they have for improving them in the future. Several lessons were learned from reflecting on the implement ation of hands-on activities . S oil testing was easy to incorporate into the class —and provided an extra level of information for students in their planting design process , which they can apply to their professional practice . A dditionally, we learned it is rather tight to implement a course with a design- build project in the Fall semester in Mississippi . To ensure that perennial plants could be delivered and planted before they go dormant , we had to mak e plant orders immediately after the mid-term critique and not wait for the final designs . Additional results about students ' experiences with hands-on learning and their suggestions will be included in the presentation from the survey . Reflecting on the course and students ' experiences of it will illustrate how experiential learning models can cultivate ecological literacy and applied creativity in our discipline. By sharing our experience, we hope to offer lessons for other educators seeking to incorporate more hands-on activities in planting design courses.

Keywords: Planting Design, Experiential Learning, Hands-on Learning, Hands-on Learning

#439 A Story-led Narrative Framework for Teaching Design Thinking

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Abstract

Today's design education places a strong emphasis on technical and representational proficiency, which are necessary for professional practice (Lawson, 2006; Schön, 1983). However, alongside these strengths lies an opportunity: to create structured spaces for cultivating design judgment —the ability to frame problems, weigh trade-offs, and anticipate consequences in complex social and ecological contexts. This project explores a parallel pathway : using short, text-first fictional narratives as a medium for reflective learning. The study builds on two theoretical foundations: narrative transportation , which explains how stories enhance engagement and comprehension through attention and mental imagery (Green & Brock, 2000), and narrative cognition , which positions story as a primary mode of organizing meaning in uncertain domains (Bruner, 1991). It also draws from design fiction/speculative design , where diegetic scenarios act as “thinking tools” to surface values and futures without reliance on visualization-heavy media (Bleecker, 2009; Dunne & Raby, 2013). Research questions. RQ1: What recurrent themes and thought-provoking questions show up in the stories, and how do they relate to established design-learning objectives (e.g., systems thinking, ethics of care)? RQ2: In what ways could these stories serve as scalable, low-cost resources for reflective judgment instruction in design education? Methods: Corpus analysis: Code stories for thematic clusters (agency, adaptability, equity) and narrative structures (premise → dilemma → resolution). Learning alignment: Map themes to established design pedagogy objectives (critical thinking, ethical reasoning, contextual awareness). Prototype framework: Develop a “plot-to-pedagogy” scaffold and sample reflection prompts for classroom use. Anticipated results include a taxonomy of story types linked to learning outcomes and a lightweight toolkit for story-led design education. Expected contributions. (a) A conceptual framework for story-centered design education. (b) A thematic map of narrative patterns that support judgment-building. (c) Practical guidelines for integrating micro-fiction into design education and thinking without displacing visual training. This work positions narrative as a complementary representational form—one that communicates complexity through language and fosters reflective practice at scale.

Keywords: narrative pedagogy, design fiction, reflective practice, design education, storytelling in design

#443 AI in Landscape Visualization: A Comparative Analysis Between Traditional Visualization Tools and Generative AI-Aided Workflow

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Abstract

Research in landscape visualization has shown that 3D and immersive tools can significantly enhance communicative planning and participatory processes (Appleton & Lovett, 2003; Eilola et al., 2023; Lovett et al., 2015). Traditional 3D modeling tools, such as Rhinoceros 3D or 3D Studio Max, although essential in the design learning process, are time-consuming in terms of realistic visualization. The recent advent of AI is showing a potential shift in the visualization sector through the development of generative AI. Application if AI is increasingly being studied in architecture and AEC sectors (Li et al., 2025; Onatayo et al., 2024), but its role in landscape architecture is yet underexplored. This research presents an AI-assisted visualization workflow that combines Rhino3D with ComfyUI, enabling the creation of responsive prompts and visual outputs to connect theoretical knowledge with representational results. We will teach traditional visualization techniques using Rhino and Twinmotion to a group of landscape architecture undergraduates, followed by introducing an AI-supported workflow as a quicker alternative for visualization. We hypothesize that AI-assisted workflows will enhance iteration speed and usability while preserving representational quality and clarity of communication (Jin et al., 2024). The outcomes will be evaluated through a mixed-methods approach, including task duration and number of iterations, rubric-based assessments of communication effectiveness, and student feedback on usability, satisfaction, and perceived learning. By situating AI within established scholarship on landscape visualization (Portman et al., 2015; Lovett et al., 2015), this study aims to understand if generative AI advances landscape architectural communication, and where traditional methods remain essential. Findings of this research will contribute to pedagogical strategies for integrating AI into design curricula, strengthening both visualization practices and communication in landscape architecture.

Keywords: AI, Landscape Architecture, Digital Visualization, AI Workflow, Generative AI

#462 From Icebreakers to Design Performance: Implementing a Gamification Model to Motivate Engagement and Communicate Designs in a Service-Learning Studio

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Abstract

Communication is the foundation of the design professions. In landscape architecture and architecture, traditional practice relies on clear communication with the goal of implementing a project within the parameters of the design intent and specifications. However, effective communication extends far beyond construction documentation for the purpose of assembly. It plays a vital role in project procurement, stakeholder engagement, design approval, conveying design experience, and promoting mission. Within design education, communication is also multi-faceted. Educators must capture and maintain student attention, motivate and inspire exceptional work, and train students in the technical and creative skills of the discipline. In today's fast-paced, information-saturated world, communication is increasingly challenging. Practitioners and educators must be strategic and efficient in their approach to communication to successfully capture and hold the attention of the intended audience to achieve the goals of any given task. This project examines a case study from an upper-level interdisciplinary design studio that integrates gamification into a service-learning project. Over the past three fall semesters, the course instructors have transitioned from a traditional studio format to one that uses gamification tools for stakeholder engagement, followed by a fully integrated model where gamification supports team-building activities, pedagogy delivery, stakeholder engagement, and knowledge transfer to communicate design intent and performance to community partners. These exercises are analyzed using the Three Purposes for Gamified Interventions (3P) Framework (Akbarieh, 2025). Beginning in the second year, student surveys were used to assess student learning outcomes, students' understanding of co-design and gamification, and as a guide for future pedagogical strategies. In the third year of the studio, surveys, student reflections, and project analysis took a more refined approach to better understand the information gathered and presented through gamification strategies as compared to traditional co-design exercises. Student-created games and design projects were evaluated based on their effectiveness in transferring information, motivating engagement, shaping student design parameters, and communicating design performance. Initial results indicate that gamification is an excellent pedagogical, engagement, and communication tool with 100% of the students and stakeholders either strongly agreeing or agreeing that the strategy was successful. Initial skepticism evolved into an appreciation for the unique and diverse opportunities the approach offers. Through this study we will frame strategies for intentionally integrating gamification at various levels of design education and the potential to apply these tools in professional practice. Educators and practitioners can use this research to strategically improve communication with stakeholders and students alike.

Keywords: Co-Design, Gamification, Service Learning, Stakeholder Engagement

#463 Interdisciplinary Service-Learning in Design Education: Bridging Urban and Landscape Design for Community Resilience in Savannah, Georgia

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Abstract

Climate adaptation and community resilience require integrated approaches that bridge ecological design with urban development. Service-learning studios provide a valuable platform for students to engage with real-world challenges, partner with communities, and apply design knowledge in socially and environmentally responsive ways. While interdisciplinary collaboration is widely recognized as essential for addressing climate and equity challenges, fewer design education studies evaluate how urban planning and landscape architecture students learn from and with one another in service-learning contexts. In particular, there is limited evidence on the educational impacts of such collaboration when applied to large-scale urban development and resilience planning. This study asks: How does interdisciplinary service-learning collaboration between urban planning and landscape architecture students shape learning outcomes and design strategies for community resilience? The project aimed to examine how students integrate urban design and landscape resilience strategies within a real-world project and evaluate student learning outcomes from interdisciplinary collaboration. The study involved 25 students, graduate students in Urban Planning from the University of Georgia and undergraduate students in Landscape Architecture from Louisiana State University. Students collaborated on a 367-acre mixed-use development in Savannah, Georgia, balancing housing needs with ecological resilience. Partners included the Savannah Planning, Zoning, and Urban Design Department and local stakeholders. Data collection included a post-course survey with both closed- and open-ended questions. Data collection relied on a post-course survey with both closed- and open-ended questions. Quantitative responses were analyzed descriptively, while qualitative responses underwent thematic analysis to identify patterns in learning experiences. Findings indicate that most students rated the interdisciplinary collaboration as “excellent” and reported significant gains in understanding how planning and design principles intersect in the context of community resilience. There were three core outcomes: (1) enhanced appreciation for cross-disciplinary knowledge exchange, (2) increased confidence in addressing complex climate and equity challenges, and (3) recognition of service-learning as a meaningful way to connect professional education with community needs. Students also expressed strong interest in future service-learning opportunities. By bridging planning and design disciplines, this collaboration demonstrates how interdisciplinary, service-learning studios can advance community resilience while enriching student education. The project, which received the 2025 ASLA Georgia Student Honor Award, illustrates a replicable model for integrating climate adaptation, equity, and professional skill-building in design education.

Keywords: Interdisciplinary collaboration, Service-learning, Community resilience, Climate adaptation, Pedagogy in design studios

#473 Seeing Plants Anew – Pedagogical Strategies for Mitigating Plant Blindness in Landscape Architecture Students

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Abstract

Building on a three-year longitudinal study of landscape architecture students at the University of Arkansas, this paper examines plant blindness as a barrier to professional identity formation in planting design. While students demonstrated measurable gains in technical confidence and skill, many remained hesitant to identify as “plant people” or advocates for planting, possibly reflecting a broader cultural and disciplinary undervaluing of plants. Drawing on current research in plant awareness disparity (Wandersee & Schussler, Jose et al., Amprazis et al.), this paper explores educational theories and interventions that can mitigate plant blindness and support deeper student engagement. These include perceptual priming and visual attention training, hands-on cultivation projects, guided biodiversity surveys, explicit teaching about plant blindness as a cognitive bias, and arts-based or narrative approaches that foreground plants as cultural agents. By mapping these interventions into a longitudinal pedagogical framework, the paper argues that overcoming plant blindness requires more than one-off activities: it demands sustained, multi-layered integration across the curriculum. Positioning plant awareness as central to ecological literacy and professional advocacy, the paper proposes that landscape architecture pedagogy must cultivate not only technical competence but also affective, cultural, and identity-driven connections to plants.

Keywords: plant blindness, advocacy, professional identity, student confidence

#477 Crossing the Threshold – Complexity as a Transformative Barrier in Planting Design PedagogyAbstract

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Abstract

A three-year mixed-methods study following landscape architecture students through a planting curriculum revealed that, while students developed strong technical confidence, they hesitated to adopt planting as part of their professional identity. Interviews suggested that complexity itself emerged as both a source of respect and a source of reluctance. This paper interprets planting design complexity as a threshold concept : transformative, integrative, but also troublesome knowledge that can trap learners in a liminal space of uncertainty. Drawing on threshold concept theory (Meyer & Land, Cousin, Perkins) and examples from other disciplines, the paper frames planting complexity as a pedagogical challenge that requires intentional scaffolding. Strategies include sequencing assignments to progressively layer aesthetic, ecological, and technological factors; embedding collaborative work with horticulturists and ecologists while maintaining student ownership; and using reflective practices to normalize uncertainty and mistake-making. By re-framing complexity not as a deterrent but as a threshold to be crossed, the paper argues that planting pedagogy can better prepare students for professional identity formation. Rather than discouraging students, explicit engagement with complexity can foster resilience, confidence, and advocacy, equipping graduates to embrace planting design as central to their practice.

Keywords: planting design, complexity, threshold , professional identity

#479 Learning Communities in Landscape Architecture Education:Integration Alone Is Not Enough: Pedagogy, Cognition, and Professionalism

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Abstract

Landscape architecture programs are under increasing pressure to prepare students for the ecological, technical, and collaborative demands of professional practice. This paper presents findings from a study of 22 sophomore students engaged in an integrated curriculum linking plant communities, stormwater management, and site design. Using a mixed-methods approach—Likert-scale surveys and thematic analysis of written reflections—the study examines three interrelated dimensions: pedagogical strategies, technical mastery, and professional alignment. Quantitative results show strong student gains in confidence, with ecological design principles rising from a mean of 1.64 to 3.45 and site design confidence from 2.64 to 3.95. Students rated integration as cohesive (4.32), interrelated (4.68), and valuable for professional preparation. They also reported enhanced collaboration (4.57) and critical thinking (4.27). However, qualitative responses reveal challenges in technical learning (especially stormwater and grading), workload management, and clarity of expectations. Many students described difficulty retaining technical content and a desire for more scaffolding and examples. The paper argues that integrated learning communities offer a promising pedagogical model but must be paired with cognitive scaffolding and professional framing. We propose three contributions: (1) a pedagogical model that balances integration with workload pacing and clear feedback loops; (2) a cognitive strategy emphasizing spiraled learning, example-rich instruction, and applied exercises for technical mastery; and (3) a professional framework that positions integration as a rehearsal for interdisciplinary, systems-based practice. By addressing pedagogy, cognition, and professional alignment together, this study highlights both the promise and the complexity of ecological design education. The findings contribute to the Scholarship of Teaching and Learning (SoTL) in landscape architecture and provide replicable strategies for programs seeking to prepare students for the ecological and professional challenges of contemporary practice.

Keywords: learning communities, Integrated curriculum, Professional preparation

#486 Community-Driven Living Shorelines: An Interdisciplinary Studio in Algiers and Brechtel Park, New Orleans

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Abstract

New Orleans faces intertwined challenges of climate risk and social inequity. Chronic flooding, coastal land loss, and uneven access to resources demand integrated design approaches that operate across neighborhood and park scales. Living shorelines present a nature-based alternative to hard infrastructure, but their long-term success depends on more than ecological performance. Effective strategies must reflect neighborhood context, ensure equitable access, and support sustained stewardship. While academic studios often experiment with living shoreline typologies, fewer embed reciprocal community engagement to co-define goals, benefits, siting, and maintenance responsibilities. Similarly, few efforts bridge urban planning and landscape architecture in a coordinated, partner-driven framework that elevates lived experience alongside technical innovation. This joint studio, conducted in Fall 2025, brought together the University of Georgia's PLAN 6520 & LAND 4912 Urban Design Studio and Louisiana State University's LA 7031 Water Systems Studio. Seventeen students participated, including Master of Urban Planning and Design, Master of Landscape Architecture, and Bachelor of Landscape Architecture students. The central research question asked: How can living shoreline concepts, used here primarily as educational tools, be co-designed with communities and integrated with neighborhood public space and stormwater systems to advance environmental awareness, social connection, and resilience thinking? Research objectives were to (1) co-define performance goals with partners and residents; (2) prototype living shoreline designs for Brechtel Park responsive to Algiers neighborhood priorities; (3) evaluate trade-offs in ecology, access, equity, and maintenance; and (4) translate findings into implementable concepts and teaching guidance. Guided by socio-ecological resilience and environmental justice frameworks, the studio paired UGA's urban planning and design expertise with LSU's landscape architecture focus. Methods included fieldwork, intercept surveys, community dialogues, and stakeholder sessions with local design firms and NGOs. Design strategies were framed as exploratory and educational, including marsh creation and edge softening, oyster-sill hybrids, sediment reuse, floodable park rooms, neighborhood rain-street connectors, and access points for recreation and learning. Proposals included a wetland loop in Brechtel Park anchored by living shorelines, linked to Algiers "rain corridors," alongside community docks, recycled glass aggregate pilots, and community-programmed spaces that strengthen social cohesion and safety. The studio demonstrates how co-designed living shorelines, understood as conceptual and pedagogical prototypes, can help communities imagine resilience strategies in ways that connect with everyday life. It also offers a replicable model for linking nature-based solutions with meaningful community engagement in design education and practice.

Keywords: Living shorelines, Community engagement; , Urban resilience, Nature-based solutions, Service-learning

#511 We Out Here: The Fieldwork Excursion as a Peri-curricular Framework

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Abstract

The benefits of field work in the natural sciences have been well-documented and are widely transferable to landscape architecture students. Recognizing these benefits; namely, the opportunity to practically apply classroom knowledge, test, realize, or experience ideas in real time and at full scale, and foster a connection to the landscapes and places that we design for, many landscape architectural programs, including at OSU, have folded or scaffolded field work components into their curricula. While many of these fieldwork programs have fallen into conventional categories such as the isolated for-credit study abroad experience or the one-off travel studio, this presentation outlines a hybridized, peri-curricular (that is, not tied directly to course credit but threaded and repeated throughout the culture of the program) and regionally-focused adaptation of the aforementioned models, which has enabled Ohio State's Midwest Landscape Lab (MidLL) to nest experiential learning over the past five years of annual field work excursions. Since 2021, the Midwest Landscape Lab (MidLL) has hosted a planned 3-day excursion early in each autumn semester to a distinct environment within the Midwest, releasing graduate students from their regular coursework and inviting them to participate in a voluntary itinerary of immersive site visits and field work experiments. This field trip series supports the lab's directives of furthering experiential learning through field work and engaged scholarship, exploring opportunities for research connections between student cohorts and faculty, and engaging with the complex environmental and cultural conditions of our region. Despite many simplifying portrayals, the Midwest is varied and complex. This trip grounds MidLL, an initiative within a landscape architecture program at a land-grant institution, within those complex environmental and cultural forces of this region in real time and at full scale. The cycle of MidLL On Site itineraries has strategically traced the fuzzy boundaries of the Great Lakes, plains/prairies, territory-scale water systems, and interior highlands to cultivate a more nuanced sense of place and an authentic grounding of projective design and regional futures thinking. The presentation offers a retrospective after the first five years of this peri-curricular initiative. Outcomes for the >100 participants range from unifying points of experience across an often-stratified curriculum, deeper connection with the particularities and character of the landscapes around us, opportunities to test and collaborate in an array of fieldwork, and a demonstration of the value of open-ended, improvisatory experiences that punctuate a rigorous, studio-driven curriculum.

Keywords: regional identity, fieldwork, novel curricular structure

#524 Embrace the Mess: Death of an Immersive Learning Project

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Abstract

In the fall of 2024, what began as an ambitious immersive learning experience in landscape architecture quickly spiraled into an educational nightmare that would leave students traumatized, faculty questioning their careers, and a small community forever changed. This is the story of how everything that could go wrong, did. Only the names and places have been changed to protect the innocent. Our investigation starts with the crime scene: a historic intersection adjacent to a National Park within a postindustrial landscape. Our cast is a group of seasoned undergraduates in a studio led by two award winning professors. The project was perfect on paper but harbored dark secrets. Political intrigue. Apathetic students. AI generated responses. GIS point data transforming into vectors. Contractual obligations. Money. The warning signs were there from the beginning—if only we could have known. Through exclusive interviews with surviving professors, leaked emails, and never-before-seen course documentation, we piece together the timeline of catastrophic failures. The story begins with a successful project launch, a 3-day site visit that brought together community stakeholders, a generally interested public, and regional manufacturing giants all wanting to transform an underutilized landscape into an ecological amenity and entrance landmark for the town. The project was set up as a student led, professional preparation course aligned with NACES competencies. Yet, student communication went down, political actors within the community began to rattle their swords, deadlines were pushed, students adopted a “that’s impossible attitude”, failed to show up for important work and left the professors holding the bag who were desperately keeping the project alive for the sake of the community. In the end, the whole project was killed by the Indiana State Department of Transportation (Woods, 2025). Was this simply a case of poor planning, or was there a desperate need for an offramp? Our forensic analysis of the evidence reveals a web of overlooked details, ignored red flags, and systemic failures that turned a learning opportunity into an academic disaster.

Keywords: immersive learning , post-mortem, pedagogy, student led

#526 A Pedagogical Approach to Integrating Community Engagement Across a Design Curriculum

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Abstract

Community engagement is a fundamental practice of design professions that integrates people, community, and place in the design, planning, and management of the built environment. It is also a fundamental role of the land-grant universities, and, as Boyer et al argued, to architecture education. However, many graduates of design degree programs have limited access to or iterative experience in collaborative work with community members on issues important to the community. Indeed, while many landscape architecture degree programs include community engagement projects into their required curriculum, few programs include foundational study of its theoretical grounding and professional praxis. While the student design projects might be well developed, the rationale for community engagement and the processes used are often not addressed. To fill this gap, faculty revised an undergraduate landscape architecture degree program to integrate intentional study of community engagement principles and practices into its theory and method courses, as well as expectations for community engaged design projects into the design and technology studios across all years of the degree program. Students are introduced to principles and practices with introductory knowledge and practices. As they advance through the curriculum and engage with more complex, real-world problems in real communities, students gain increasing levels of knowledge and skills, and a mindset for effective engagement. This paper provides a critical review of the curricular redesign and assessment of student learning.

Keywords: community engagement, Curriculum design, service-learning, design education

#529 Presto-Manifesto!

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Abstract

Presto-Manifesto is a simple, replicable exercise that invites design students to contemplate and visualize their post-graduation futures through an analog process involving index cards and colored markers. Initially introduced as a workshop in a graduate-level Professional Practice course, the exercise aims to create space within the tightly structured academic environment for students to articulate personal and professional aspirations through the construction of evolving “manifesto decks.” While grounded in individual reflection, the exercise also functions collectively: when practiced across a cohort, hidden synergies and shared ambitions often surface, catalyzing connections that may extend into students’ professional lives. The exercise was developed in part as a response to the escalating anxiety and uncertainty college students face, particularly as they approach graduation. Results from the recent Healthy Minds Survey (to which 76,000 students across U.S. campuses responded during the 2022–23 academic year) indicate that 41% of college students experience symptoms of depression, and 36% experience anxiety. These statistics underscore the urgency for pedagogical approaches that address students' emotional well-being alongside academic development. By fostering a practice that blends individual introspection with collective engagement, Presto-Manifesto aims to transmute anxiety into curiosity and inspire a sense of agency around future possibilities. Framed by Salama’s (2015) call for dialogic and adaptive pedagogies, Magolda’s (2001) concept of self-authorship, and Schön’s (1983) ideas around reflection-in-action, the exercise also responds to the need for design education to balance the cultivation of personal agency with collaborative capacity-building. Given that 64% of graduating students express a primary interest in seeking employment in a landscape architecture firm (ASLA, 2020), the exercise not only helps students clarify their individual trajectories but also promotes the social, communicative, and adaptive competencies that are essential to navigating contemporary design practice. As such, this paper will share how the five-part process encompassing the exercise — ideate , categorize , choreograph , actuate , and iterate — is facilitated within the classroom, moving from the individual creation of each manifesto deck to collective peer reviews where students identify affinities across their goals. Visual documentation of early Presto-Manifesto "spreads" will be presented alongside their end-of-semester counterparts, where students translate their goals into illustrative diagrams that reveal the variety of manifestations their aspirations may take. Supplementary discussion prompts and reflection notes will be provided to highlight how the exercise cultivates dialogue, self-actualization, and collaborative possibilities within and beyond the classroom.

Keywords: Professional Development, Collaborative Learning, Pedagogy, Reflective Practice, Futuring

#532 Afield or at the Desk: Exploring a Gap in Pedagogies of Place and Site

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Abstract

Typically, in design education, substantial time is spent characterizing and contextualizing the site. This work uses multiple types of information—from geospatial data and historic maps and aerials to on-site observation and documentation of everything from dimensions, plant species, and ground materials… to the daily rhythms of inhabitation. The ways in which the site comes to be known by students has profound implications for their approaches to the design studio prompt—but these implications must be iteratively demonstrated and discussed, at multiple points in the design process. This pedagogical focus, for many studio instructors, also regularly addresses the gap between how a place or site comes to be known from desktop vs. field-based research methods. This presentation will engage this gap (between desktop and field-based site research) in two ways. First, it will characterize and summarize recent literature on field methods and field work in landscape architecture and architecture. It will outline this literature in terms of the primary documentary modes and types of data that are understood to arise from these practices, as well as the way they are communicated to students. It will briefly link this contemporary scholarship to several longer-term discussions from the past half-century, within landscape architectural and adjacent writing, of how site-reading and field-based documentation practices have influenced landscape practice. Following this, the presentation will explore some recent pedagogical approaches from the author's own teaching, which has sought ways to clarify and consolidate how different forms of site knowledge influence the design process. This work will draw from studios, elective seminars, and research methods courses from the past three years. This is not to present the author's approaches as some paradigm of instruction, but instead to open a conversation about the range of ways that faculty might approach this crucial element of landscape pedagogy.

Keywords: pedagogy, site research, field methods, site reading, site drawing

#535 Vertical Studio Charrettes as a Framework for Service Learning and Peer-to-Peer Design Education

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Abstract

Design studio pedagogy has historically relied on learning-by-doing as an approach to ensure the convergence of theory and art into practice (Salama, 2016). As we push for further incorporation of STEM into the landscape architecture curriculum, this technique also lends itself to enable students to articulate and apply ecological and human sciences through design thinking. In particular, the design studio offers a dynamic environment to experiment with exploratory design research while building skills and interpersonal relationships (Findlay and Haugen, 2000; Wagner and Gansemer-Topf, 2005). However, the studio environment in itself does not fully support peer-to-peer learning. The vertical studio approach (Barnes 1993) was implemented to challenge the traditional curriculum sequence by promoting the interaction of students at different developmental stages of study to work together around a service-based project or topic. This approach attempts to instill mentorship and leadership skills while providing a broader spectrum of the design phasing and process. This presentation focuses on the assessment and outcomes of an approach applied at University of Connecticut over the past three years in service-learning studios. It explores how peer-to-peer learning and cross-sectional co-teaching can aid in supporting student design outcomes that integrate STEM learning across disciplines. We will discuss the application of vertical studio charrettes in several community-based projects integrating the second-year (sophomore) and third-year (junior) Spring semester studio courses. We will present the results of student perceptions of this experience and how the lessons learned have supported a hybridized approach to design studio teaching that combines group work between classes and across cohorts in the program and individual work within the same year level. This approach adds to recent scholarship on the use of vertical studio models in design teaching (Smith et al., 2017; Smatanová et al., 2020; Young and Segura-Bell, 2021; Tuztasi and Koc, 2022) and offers a critical reflection on the process of pre-planning the curriculum, hosting charrette events, and final products, drawing from participant observation and student course assessments to this vertical service-learning approach to the design studio.

Keywords: vertical studio, service-learning, studio pedagogy, peer-to-peer learning

#538 Global Perspectives on Standards in Landscape Architecture Education: Accreditation Systems and Competencies to Address Global Challenges

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Abstract

Humanity faces an unprecedented convergence of crises - climate instability, technological disruption, geopolitical uncertainty, and persistent social inequities - that demand urgent and systemic responses. Landscape architecture, as both a discipline and profession, is uniquely positioned to guide societies through these challenges. Yet, its educational models remain grounded in 19th-century paradigms that no longer fully equip graduates for today's planetary-scale responsibilities. To prepare future practitioners as effective guides of complex socio-ecological systems, the standards underpinning landscape architecture education must evolve. This panel brings together three critical actors shaping educational standards globally: the Landscape Architectural Accreditation Board (LAAB), the International Federation of Landscape Architects (IFLA), and the Red Americana de Educación en Arquitectura del Paisaje (RAEAP). Together, they will explore efforts to update, align, and, in the case of Latin America, establish frameworks for accreditation and program recognition. By situating accreditation and recognition within the urgent context of climate change, technology, and call for equity and justice, this discussion will highlight both the opportunities and challenges of building a globally relevant system of standards derived from a range of geographies and associated environmental, cultural, and socio-economic realities. Indeed, a comprehensive approach to recognizing landscape architecture in distinct ways has the capacity of not only growing the discipline and the number of practitioners, but also a greater potential to undertake challenges relative to our global habitat. The panel will begin with a presentation by a LAAB representative, who will set the stage by addressing how accreditation can support the evolution of curricula, safeguard essential competencies, and encourage innovative pedagogy in the U.S. Subsequent contributions from IFLA and RAEAP will broaden the dialogue, considering how global and regional contexts intersect to shape competencies, recognition frameworks, and lifelong learning needs. Key questions include: What are the core competencies for future landscape architects? How can emerging knowledge—such as climate resilience, digital technologies, and equity-driven design—be embedded into curricula? How might feedback loops between practice, education, and accreditation be strengthened? And what frameworks can support continuous learning across diverse cultural and institutional contexts? By catalyzing connections among global accreditation leaders and educators, this session aims to chart a course for transforming landscape architecture education. The goal is not only to maintain high professional standards but also to prepare graduates to address uncertainty, mediate inequities, and advance resilient, just, and adaptive landscapes in an era of global disruption.

Keywords: Landscape architecture education, Accreditation, Global standards, Competencies, Curriculum innovation

#542 Design Competitions for Climate Resilience: Reflections from the Southwest Urban Integrated Field Laboratory Interdisciplinary Design Challenge

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Abstract

As climate-related risks to human health, safety, and well-being intensify due to a rapidly changing climate, the need for adaptive, equity-centered, and data-informed transit infrastructure design has become increasingly urgent. This is particularly true in urban environments like Arizona's Sun Corridor, where extreme heat and other climate hazards threaten public health, reduce safe access to public transit, and exacerbate environmental injustices. To this end, transit stops represent microclimatic and social nodes where exposure to climate hazards, access to transit infrastructure, and public space intersect. In response, researchers from the Southwest Urban Integrated Field Laboratory (SW-IFL)—a U.S. Department of Energy-funded initiative—launched the SW-IFL Interdisciplinary Design Challenge to engage students from Arizona's three public universities in reimagining transit stops as climate-resilient and inclusive public spaces. Here, the SW-IFL Design Challenge is presented as a case study to examine how design competitions might integrate scientific research with design thinking to support climate resilient infrastructure development. Drawing on a qualitative case study approach, informed by organizer reflections and participant surveys and interviews, the study examines how competition-based learning (CBL) can foster interdisciplinary collaboration, systems thinking, and climate literacy in design education. Findings highlight how a CBL approach combining science and design can enhance innovation, support creativity, and foster interdisciplinary problem-solving. Student participants reported that the Challenge provided meaningful opportunities to apply discipline-specific knowledge while collaborating across fields and engaging with environmental data in new ways. Reported learning outcomes include enhanced climate literacy, practice applying systems thinking, and the ability to translate empirical data into design strategies—essential skills for addressing climate hazards through landscape architectural solutions. However, analysis also identified key areas for improvement, including the need for clearer guidance to support participation of students in non-design degree programs, more structured timelines, and enhanced training on how to integrate scientific data into design proposals. These insights inform a set of recommendations for educators and institutions seeking to develop interdisciplinary competitions that are both academically rigorous and accessible to a wide range of students. Ultimately, the SW-IFL Interdisciplinary Design Challenge offers a replicable model for landscape architecture and allied disciplines to advance climate-responsive design education. By embedding empirical research into the design process and fostering interdisciplinary engagement, such competitions can prepare students to address the complexity of climate hazards creatively, collaboratively, and practically.

Keywords: Competition-based learning, Climate resilience, Design education, Interdisciplinary collaboration, Transit infrastructure

#550 Community-Engaged Design Pedagogy: Reflections from a Third-Year Landscape Architecture Studio at Cal Poly

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Abstract

It is widely accepted as best practice within design education to incorporate interdisciplinary studios into the curriculum, as they support critical thinking, creative problem-solving, and experiential learning (McAra & Ross, 2020). Additionally, interpersonal skills - such as empathy, reflexivity, co-defining design opportunities, and co-designing meaningful places - are recognized as impactful outcomes that contribute to authentic experiences for both students and host communities (Moreira, 2018; Lee et al., 2019; Rowe, 2020). At the core of these experiences is collaboration - both academic and community-based - which serves as a foundational, transferable skill for entering professional design practice. This presentation offers a critical reflection on LA 404, a third-year landscape architecture cultural studio at Cal Poly, conducted in fall 2024. The studio, co-led with Fresno City College's Architecture Program, developed a Public Realm Action Plan for the Blackstone Corridor in Fresno, CA. While the project aligned with best practices in service learning, it was selected for reflection due to the overwhelmingly critical course evaluations it received and the challenges experienced working with another institution. As the lead and a junior faculty member, this was my first funded and cross-institutional studio, and I approached it with a high level of ambition. This included prioritizing intensive in-person engagement with residents and stakeholders, which was undertaken during two overnight trips and a day trip for the final presentation. In the course evaluations, several students expressed that their educational experience felt secondary to the project's needs and those of our community partners. These tensions underscore a broader challenge in implementing community-based studios: how to maintain a balance between authentic, community-centered engagement, the structured pedagogical needs of students, and navigating risk management. In response to these critiques, subsequent studios have been restructured to improve communication around project goals, better transparency around student learning objectives, and clarifying expectations with external partners. Changes have included more deliberate pacing, structured reflection periods, clearer boundaries around engagement, and collaborative planning processes that position students as co-creators - not just deliverers - of community outcomes. These changes have led to improved course evaluations, simplified course structures, and more direct links between the project and course learning objectives. By critically examining both the challenges and adaptations that emerged from LA 404, this presentation contributes to the ongoing discourse on how design educators can better prepare students for collaborative, community-engaged practice - particularly in contexts involving professional and institutional partners.

Keywords: service learning, community design, design studio , community engagement

#552 Pedagogies of Visualization: Lessons from New York City's Bronx River Dam Removal Project

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Abstract

Students in the Design Communication courses (Spring 2025) at University of Florida engaged with two active dam removal sites – the Bronx Zoo Double Dam and the New York Botanical Garden Stone Mill Dam. These sites are currently under the design stage for fish passage and ecological restoration with various stakeholders, including NYC Parks and the Army Corps of Engineers. The courses situated dam removal on the Bronx River as a real-world ecological challenge and a pedagogical opportunity. This offered students a highly-visible and complex project for applying and testing their design communication skills. In a traditional design studio, the focus is on landscape architecture design and design processes. However, when design studio collaborations include stakeholders outside the discipline, impact is largely validated based on the legibility of the student's design communication products. Visual representations are the primary means of communication between stakeholders in design processes (Raaphorst et al., 2017). Design Communications courses are thus placed in a unique position in the landscape architecture curriculum at UF. Guided by faculty and domain experts, the course students developed visualizations of both the existing conditions and the projected futures after the Bronx River dam removal. The coursework demanded that they synthesize and communicate ecological goals, engineering recommendations, and community use considerations into legible and compelling visual narratives; it also used technical and engineering documentation to take forward a robust design process previously set in motion by stakeholders. Efficacy was achieved by the students using a variety of digital and analog representation methodologies in landscape architecture, including cartography, parametric design, the Em River Table, and Artificial Intelligence. They learnt how to use landscape visualization beyond superficial aesthetic styles. Workflows were hybrid, iterative, and feedback-based, enabling students to think critically about how to mediate between diverse project needs. They learnt how design communication can clarify design trade-offs, negotiate competing interests, and contribute to democratic and collaborative forms of co-design (Jiang & Zhang, 2019). Thus, by situating student learning within an ongoing environmental design effort, these courses demonstrated how design communication in landscape architecture education can uniquely bridge theory and practice, producing effective co-benefits. Students closely learn how to apply design communication skills both intellectually and practically, and stakeholders achieve visualization products that better inform their ongoing design processes, funding cycles, and community collaborations. Student's contributions highlight the critical role of translating complex technical processes into shared futures that balance ecological restoration with community values.

Keywords: Design Communication, Landscape Visualization, Dam Removal, Ecological Restoration, Climate Adaptation & Resilience

#579 From Detail to District: pedagogies of scale in landscape architecture education

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Abstract

An important student learning outcome in an urban design studio is to effectively work across scales. Tasked with creating urban form, students are required to simultaneously manipulate street networks, block patterns and building masses while also proposing “human-scale” spaces such as streetscapes and plazas that have material and programmatic specificity. When correlated to work together, design at multiple scales can create dynamic urban environments. However, students often struggle with understanding the myriad ways that designers use and understand the concept of scale, resulting in ineffective and inappropriate urban design solutions. Problems include urban plans that do not match (or effectively contrast with) existing city morphology and the creation of spaces that are “out of scale” and uncomfortable. Although an understanding of scale is central to landscape architecture, teaching scale is an often-overlooked part of design education. We expect students to intuitively glean a knowledge of scale through haptic experience and through repetitive drawings at different scalar ratios (e.g., 1”=400’, 1”=200’, 1”=50’, and 1”=8’). But do such pedagogical and presentation methods make sense today? Hailing from suburban landscapes, many students lack deep experience of a variety of urban environments. And, in our digital age, where drawings may never be printed at scale and are instead projected or zoomable, how can a drawing scale have a consistent meaning, especially for new designers learning their craft? This paper examines the issue of scale in landscape architecture pedagogy. Grounded in previous work by scholars of architectural education (Elliott 1963, Emmons 2005), the work examines how scale can be considered in the classroom. Primarily analyzing artifacts from LA4020: Urban Design, a fourth-year studio in a BLA curriculum, the study uses a grounded theory approach and open coding (Charmaz 2006) to examine course materials—syllabi and project statements—and resultant student design work—to identify key themes related to how the issue of scale is presented and how it is expressed in student work. We highlight several common problems that arise related to students’ understanding and use of scale in an urban design studio: drawing scale as indicator of informational capacity; digital workflows where scale is never constant and always “zoomable”; and inability to connect bodily scale to with drawing scale to “inhabit drawings.” The paper concludes with a call for a framework for teaching scale that deals specifically with the needs of landscape architecture.

Keywords: scale, urban design, pedagogy

#582 Poetry of Place: Can a Landscape be a Poem?

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Abstract

In this session, participants will learn how to use poetic devices to help students interpret landscapes in new and creative ways. This approach challenges students' understanding of language, poetry, landscape elements, landscape designs, and places. The ability to interpret physical landscape elements through the lens of poetry is not easy. Nor is it something that students can simply plug into ChatGPT, or any other Artificial Intelligence (AI) software tool, to come up with design interpretations. Analyzing landscapes as poetry and seeing landscapes as entire poems, beyond metaphors and simple analogies, is a relatively underutilized and underexplored approach. Dynamic design pedagogy combined with reflective teaching and learning strategies are used to help guide students to their own discovery of a place through the art of making and reinterpreting existing and reimagined landscapes. At the heart of this studio are the questions, “What makes a place poetic? Can a landscape be a poem? Can a landscape element rhyme with another element? What poetic devices can be seen, heard, and felt in a place?” And so on… In an increasingly technologically driven world, the art of poetry and the art of language is quickly eroding. Many of today’s students struggle with theoretical readings and complex ideas. Both reading comprehension and writing skills have decreased as a whole (Carlson et al, 2024) and the ability to think critically is also in decline. AI tools abound in university classrooms today and while these tools can increase a students’ knowledge when used as a tool for enhancement, they are often used to take the easy way out instead. The series of poetic device exercises that will be shared in this presentation force students to apply knowledge, language, and design skills in unprescribed and intentionally ambiguous ways. The goal is to create stronger vocabulary skills, critical thinking skills, design aesthetics, and overall comprehension of design principles. Undergraduate and graduate students’ work from 4 different landscape architecture studios will be shared as well as their reflections on the process of interpreting and reinterpreting landscapes using poetic devices. In addition, rich personal reflections, landscape analyses, and site-specific land art projects will be showcased and discussed.

Keywords: placemaking, poetic devices, dynamic pedagogy, reflective learning, land art

#583 Combining Cohorts: Progress and Achievement

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Abstract

Undergraduate design education at the university level consists of rigid linear curricula, with students joining matriculation-based cohorts that maintain through a degree program. The linearity of course progression typically means that courses are only taught once per year and act as pre-requisites for future course enrollment; requiring courses be taken in order with successful completion required before moving forward. Faculty in the landscape architecture program at Purdue University created a summer course that allows students who discover design after their first academic year on campus in another major to complete an accelerated summer experience, joining the incoming 2nd-year cohort of students. Realizing that there may be differences in student performance, achievement, and success between regularly matriculated students and their accelerated summer student colleagues, the authors analyzed work produced by students in course assignments and through traditional GPA. With reduced time for content production, reduced time-on-task, and what could be considered a higher stress experience, students successfully completing the accelerated summer program may have barriers to success compared to their regularly matriculated counterparts. Investigations into student GPA over time revealed patterns in student success between the two cohorts, along with more generalized information on student performance in different course typologies (i.e. studio, traditional lecture courses, etc.), COVID related changes, and the impacts of new faculty and curricular changes. This presentation will discuss student GPA related findings and their implications on the Purdue landscape architecture program in hopes that the lessons learned can assist other programs facing similar cohort integration systems or experiencing changes in faculty or course loading.

Keywords: GPA, Academic achievement, Student cohorts

#586 Student Voices, Faculty Choices: The Generative AI Revolution Design Education Can't Ignore

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Abstract

As Generative Artificial Intelligence (GAI) becomes increasingly integrated into professional and educational environments, design educators face critical decisions about how to incorporate these tools into curriculum while maintaining academic integrity and fostering critical and design thinking skills. This research addresses the growing disconnect between widespread student AI usage and their preparedness for ethical, effective implementation in design practice. Current data reveals a paradoxical relationship between student adoption and competency. While GAI usage rates among students continue to climb, recent surveys indicate that 58% of students report insufficient AI knowledge and skills, with 48% feeling inadequately prepared for AI-enabled workplaces (Chen & Hu, 2023). Limited empirical evidence exists regarding the adoption of generative AI image technologies among design students and the educational frameworks within which these digital literacy skills are being developed. The educational response to GAI has been fragmented, ranging from outright resistance to uncritical embrace (Bartlett & Camba, 2024). Some educators view GAI as threatening the foundation of higher education and critical thinking development, while others recognize its potential as a powerful educational tool. Meanwhile, students continue using these technologies without adequate guidance, creating ethical and pedagogical concerns about originality, transparency, and responsible professional practice (Dai, 2025; Mirea, C. M.; Bologa, et. al., 2025). This study investigates two primary research questions: (1) What do design students want to learn from faculty about GAI? and (2) Are students aware of or concerned with the ethical use and disclosure of GAI generated design process documentation and visual illustrations? Through comprehensive survey methodology, this research examines student perspectives on GAI integration, identifying specific areas where educational intervention is needed. The findings suggest that effective GAI integration requires deliberate pedagogical design that emphasizes transparency, integrity, and responsibility. Rather than avoiding these technologies, educators must develop frameworks that teach students to use GAI ethically while understanding its limitations, advantages, and potential applications. This approach positions GAI as a tool for building foundational digital literacy rather than a threat to educational outcomes.

Keywords: generative artificail intelligence, design education, digital literacy, academic integrity, student perspectives

#588 Visualization of Forest Systems Using AI in Landscape Architecture

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Abstract

The last year has seen rapid advancements in the use of AI in landscape architecture (LA) for both teaching and practice. This paper reports on pedagogical strategies for incorporating text-to-image AI visualization tools to represent forest ecosystems in landscape architecture design research projects. This research contributes to literature on the integration of AI in LA curriculum (Khean, 2019; Ozyegin University et al., 2024; Iranmanesh and Lotfabadi, 2025; Longo and Albano, 2025; Barosio et al., 2025;) and provides an orientation to AI platforms for use in the development of landscape imagery. The research pursued three objectives. First, it assesses the current use of AI in undergraduate LA visualization at the University of Connecticut. Second, it establishes a method of introducing a critical orientation toward the selective use of AI tools in design representation. Third, it identifies opportunities for AI to expand students' representational skill sets, particularly in relation to complex successional forest systems. Student perceptions were evaluated through qualitative surveys conducted before and after a series of AI visualization workshops. The workshops explored applications ranging from replicating full frames of view to introducing controlled variation within photomontages. Using Microsoft Co-Pilot, students tested text-to-image prompts through two approaches: a qualitative, descriptive mode and a more taxonomic, objective mode. Outcomes were compared in an exercise where students organized images along axes such as believability, compositional fidelity, structural complexity, perceived ecological diversity, and taxonomic precision. This paper's findings are twofold. First, it compares AI platform types, assessing the quality and utility of the images they produce. Second, it reports on the development of an AI learning module designed to strengthen students' representational competencies and critical visualization capacities, with a focus on interpreting and depicting complex successional forest systems in Connecticut

Keywords: AI, Visualization, Forest systems

#598 Embodied Archives: Cultivating Reciprocal Relationships Between Landscape Laboratory Practice and Archival Pedagogy

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Abstract

Archives are often relegated and unused, their contents lost or forsaken for digital searches and ways of gathering. In landscape architecture education, this disconnection from material knowledge represents a critical gap in how we understand and transmit landscape literacy. This presentation presents the development of a landscape archive that maintains active conversation with laboratory practice and faculty research, creating what we envision as a space where models act to embody concepts stored within records and logs, where a material library is organized with the intuition of a landscape architect. Our pilot seminar operates simultaneously with landscape laboratory efforts and faculty research, seeking to deepen contact with each user group while promoting new levels of landscape literacy. The course methodology follows four transformative stages: Document, Decipher, Delineate, and Create. Each stage seeks to transform the student's archival entry through progressive engagement with landscape knowledge systems. The Document stage borrows from DeGuinn's carrier bag theory, initiating collection practices while developing critical archival theory, research ethics, and methodologies for staying committed to contextual understanding as scholars of place. During the Decipher stage, students develop relationships with living places through embodied and sensorial observation, practicing landscape architecture fieldwork methods through phenology, documentation, ambulatory activity, and spontaneous revelations. The Delineate phase engages students in synthetic cartography, while the Create stage produces model prototypes that become containers for laboratory and archival indexing. This methodology addresses the missing link in a chain of reciprocity between classroom pedagogy, laboratory practice, and faculty research. Through this approach, the laboratory maintains detailed records of fieldwork conducted by students and professors, providing opportunities for material engagement through growing, specimen preservation, and field trips. Students participate in innovative research projects while contributing to an archival process unique to landscape architecture education. The possibility of developing such an archive gains momentum from students engaged with working fluidly between digital and living worlds. Contributing to the archive encompasses not only landscape's physical presence but incorporates embedded stories, multidisciplinary and public understandings, and cultural-natural histories. This framework creates conditions for dynamic knowledge production where archival practice remains connected to lived, material experience. Our approach demonstrates that landscape archives need not become static repositories but can maintain vitality through pedagogical integration, supporting Anne Whiston Spirn's assertion that "the language of landscape is a powerful tool" enabling people to "perceive pasts they cannot otherwise experience, to anticipate the possible, to envision, choose, and shape the future landscape."

Keywords: landscape archive, embodied pedagogy, material literacy, reciprocal learning, phenomenological research

#601 An Accommodating Studio Culture

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Abstract

Neurodiversity has received increased interest in design education pedagogy (Barry 2025, Merrill 2021). The term “neurodiversity” was coined by Judy Singer in the late 1990’s. This definition has come to include a wide variety of atypical behaviors, including Asperger’s Syndrome and all autism spectrum disorders (ASDs). Neurodivergent students think, interact, learn and behave in distinctive ways which can affect their problem-solving and communication skills. The Center for Disease Control data from 2016 states that, one in 54 children aged 8 years have been identified with autism (Maenner et al., 2016). Instructors likely already have neurodivergent students in their classrooms of whom they are unaware (Shatuck et al., 2012). Literature in secondary education for neurodivergent students centers on success in generic university courses (Littlefield 2010, Lorain et al. 2009, Hughes 2009). However, design education is altogether different and Environmental Design is especially unique. Previous presentations have focuses on Hume’s Structured Teaching Strategies for Students with Autism Spectrum Disorder (2018) and the Danielson Framework for Teaching (2018) discovered during a previous literature review on teaching neurodivergent students in post-secondary design education and aligning these frameworks with current Landscape Architecture “studio” pedagogy approaches. This paper builds on previous work and situates neurodiversity alongside developing approaches to studio courses and the building of studio culture. including the digital vs. analog debate, virtual vs. physical material experience, and university accommodations. These topics create a “tableau” of experiences that influence the culture of a studio. This paper will help studio professors to work with students with neurodiverse accommodations and neurotypical students to create a suitable studio climate. It is important to calibrate expectations of other professors, professionals and fellow students when working with neurodiverse students. The author will also present recent successful cases and cautionary tales when dealing with official university accommodations and actually accommodating students with the intent of helping them catalyze connections with others and succeed in studio.

Keywords: neurodiversity, studio pedagogy, studio culture, university accomodations

#602 Interdisciplinary Drawing to Achieve Cultural Humility: The Foundation to Healthy Community Relationships

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Abstract

Learning in a new environment and with different disciplines provides the key impetus to transformative learning: a disorienting experience (Mezirow, 1978). A school-wide travel studies program, with design students of the built environment and the fine arts, provides this opportunity for growth. Students can move beyond cultural competence, the ability to engage in different cultural settings through mental and behavioral skills (Bennett, J. M., 2008), to cultural humility, an attribute routed in medical and psycho-social research requiring individuals to deeply empathize and place others first (Hook, et al, 2013). Cultural humility is a foundational skill to build community relationships. In this interdisciplinary travel studies, the students not only cross their disciplinary cultural barriers, including drawing methods, jargon, and values, but also develop through exploring cities and foreign languages. This is core to success as landscape architects who may practice with wide-ranging communities of clients and peers and their varied priorities. To ground the students through their disorienting experience, we have used the technical skill of field sketching as a cognitive tool to slow down, make visible their experiences, explore new environments, and to communicate their observations and emotional responses with their interdisciplinary peers. Drawing, requiring multiple parts of the brain, creates a deeper understanding of one's surroundings and supports stronger memories (Mavroudis, 2025). In building these deep responses, drawing allows growth in the three parts of cultural humility: awareness of others, self-reflection, and lifelong learning. With literature from constructivism, travel studies, and drawing, we gathered classroom techniques and outcomes. We conducted a pile-sort analysis to cluster the literature into 11 drawing pedagogies. We organized each pedagogy into one of the three parts of cultural humility. In summer/fall of 2025, we conducted an online survey to provide feedback according to each pedagogy. The students represented landscape architecture, architecture, interior design, graphic design, and studio arts who have traveled to Europe, New York City, or San Francisco. Preliminary analysis demonstrates students making key gains towards in humility, and they provide rich explanations in open-ended survey questions. Regular reflections after drawing exercises may help the students to uncover deeper meaning in their drawing and observations. As we continue building our partnerships with communities and other professions, our students can use interdisciplinary drawing groups to push beyond the competency to work in professional teams and into the humility to put team first.

Keywords: Cultural Humility, Drawing Pedagogy, Travel

#606 From Sketch to Story Map: A Hybrid Approach to Coordinate Digital and Analog Methods in First-Year Landscape Architecture Field Education

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Abstract

The Iowa State University Savanna Studio is a 6-credit traveling studio for first-year Landscape Architecture students that traverses diverse ecoregions from the Midwestern Savanna to the Rocky Mountains to the Gulf Coast. This paper examines the innovative integration of geospatial information systems (GIS) into this established curriculum, enhancing students' capacity to document and analyze landscapes while coordinating digital tools with traditional hands-on design processes. Integration Methodology Building upon the program's emphasis on landscape observation through sketching and site documentation, we introduced systematic geospatial data collection during field expeditions. Students capture comprehensive environmental data at Roadscape project sites—including GPS coordinates, weather conditions, temperature, UV levels, wind speed, and sound levels (dBA)—using mobile devices and GPS units. This quantitative data collection complements traditional qualitative methods of drawing, photography, and written documentation. The integration occurs in two phases: field data collection during two major expeditions, and post-trip synthesis through ArcGIS Story Maps creation. Students learn to combine geospatial data with observational drawings and site analysis to create digital narratives that inform their final design projects. Digital-Analog Design Coordination For first-year students, this integration provides critical foundation in how digital tools inform rather than replace traditional design methods. Students discover how GPS coordinates enhance accuracy of hand-drawn site plans, how sound level data influences sketch-based acoustic strategies, and how environmental measurements inform watercolor studies of seasonal conditions. The Story Maps become pre-design analysis tools, allowing visualization of data relationships before moving to traditional design media. Students learn to move fluidly between data visualization and hand sketching, between GPS mapping and physical model-making. The quantitative data they collect becomes embedded in their design process—informing everything from hand-drawn section orientations to materiality explorations in physical maquettes. This establishes a professional methodology where technology serves design thinking rather than dominating it. Implications This curricular innovation demonstrates meaningful technology integration within experiential learning while preserving direct landscape observation fundamentals. The combination of traditional drawing skills with digital geospatial literacy prepares students for contemporary practice while maintaining site-responsive design thinking. This model offers applications for other field-based programs seeking to incorporate GIS education within hands-on learning frameworks, revealing how quantitative analysis can enhance rather than replace qualitative landscape interpretation essential to landscape architectural education.

Keywords: experiential learning, traveling studio, story mapping

#611 Community engagement in landscape studio teaching: Lessons and reflections for the past five years

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Abstract

Service learning and community engagement are central to landscape architecture education, advancing civic literacy, equity, and stewardship through real clients and real places (Hester, 2006; Ruggeri and Young, 2016). Building on this tradition, and echoing long standing calls to align studio pedagogy with democratic practice and community needs (Hou, 2010; Sullivan et al., 2011), this paper shares a practical and honest account of what actually builds impact, produces useful deliverables, balances learning objectives with client expectations, and supports long term care. Over five years, our studios partnered with local organizations on work that moved from site inventory and analysis to concept development, detailing, budget estimating, and strategic planning. We refined a workflow that blends stakeholder interviews, listening sessions, community charrettes, and post-design reflection with core tools of the discipline. Five case studies anchor the discussion. Purdue Student Farm served as a living laboratory for windbreak and orchard layout, pollinator gardens, and wetland trail concepts; planting palettes, grading studies, and simple irrigation plans were tested through field days to align design intent with labor and maintenance realities. Jovial Family Farm, led by a physical therapist, focused on inclusive access and therapeutic goals; students developed bed heights, mobility accommodations, crop selections, and a circulation plan that reduces conflicts between visitors of different abilities and farm operations. Carmel Chinese Garden centered on cultural landscape expression in a compact infill site; engagement included story gathering with community leaders, precedent mapping of classical garden elements, and on site mockups of rock, water, and plant layers to test sequence and scale. At Lakeside Book Company, students worked with an industrial campus to improve stormwater performance and worker wellness through bioswales, shade trees, outdoor rooms, and wayfinding, paired with phased planting and care strategies. At Westminster Senior Community, universal design guided therapeutic gardens, small gathering nodes, and clear path hierarchy; residents participated in a design buffet and plants mapping that directly informed seating, shade, and seasonal interest. Three lessons stand out. First, align student learning outcomes with stakeholder priorities and document scope, decision pathways, and care plans at the outset. Second, prototype early and measure what matters. Simple metrics like shade coverage, infiltration, and program use help partners see progress (Francis, 2001). Third, center community voices, especially youth and elders, whose situated knowledge reveals access and comfort gaps often missed by experts (Owens, Koo, and Huang, 2023).

Keywords: Community engagement, Service learning, design pedagogy

#613 The Pacific Northwest Spatial Justice Cohort: educating design practitioners as spatial justice advocates

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Abstract

Economic and social injustice are present and growing in cities and towns across the U.S., in part because they are intrinsic aspects of the systems and policies that govern the development of land and buildings (Manzano, 2023) (Trumm, 2024). The idea for the Pacific Northwest Spatial Justice Cohort (PNWSJC), an experimental course on spatial justice for professionals working in the built environment, emerged from discussions among designers and educators who were interested in using their agency to disrupt existing unjust practices. Although spatial justice is increasingly taught to design students today, the professionals felt hindered to effect change because their design education did not include curricula about social and environmental justice. Led by Paul Bauknight, the founder of the Center for Transformative Urban Design, a group of 25 individuals from practice, academia, government, and philanthropy participated in the yearlong course. The course explored the foundational work of Edward Soja (Soja, 2010) and current work of Teddy Cruz and Fonna Forman (Cruz, 2022), Dana Cuff (Cuff, 2023), and Kenny Bailey (Lobenstine, 2020) as well as presentations by social, cultural, and economic practitioners implementing spatial justice strategies in the Pacific Northwest. Beyond a strong foundation of knowledge, the critical curricular component was the final project. The final project was an intentional strategy to encourage participants to move beyond the classroom and engage in action. Participants were challenged to work collaboratively to develop a spatial justice initiative, strategy, or project that they could implement in their own work. The assessment of the course focused on measuring increases in knowledge about how systems and policies perpetuate injustice and potential methods to disrupt them, the participants' confidence to propose and enact spatial justice practices in their office and design projects, and the implementation and impacts of the final projects. However, understanding that achieving real change will require concerted and sustained efforts by participants after completing the course, future work includes developing metrics and conducting annual evaluations to assess long-term impacts. Initial results are hopeful. Results from a survey taken by participants indicate increases across all measures; seven spatial justice initiatives were developed with four in early phases of implementation within six months of the completion of the course; and half of the original participants continue to meet regularly and a second cohort will begin in January 2026. Through shared learning, discussion, and exploration, a community of spatial justice activists has emerged across the PNW.

Keywords: Spatial justice initiatives, Education for design activism, Community of practice

#615 Design computation in the land lab / nature-connected pedagogies in the computer lab

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Abstract

This presentation discusses pedagogical innovations for integrating nature-connected learning into design computation instruction, expanding the scope of the landscape laboratory to be a tool. I will describe techniques for teaching design computation and describe the improved learning outcomes that come from integrating landscape labs into computational pedagogy . Computation in landscape architecture, while focused on real landscapes, is often distanced from the actual experience of landscapes. At the same time, we have seen an increase in interest in the landscape laboratories as a means for embodied and place-based learning in landscape curriculum (Meyer 2024, Gustavsson et al. 2023). However, there has been a gap in terms of what sorts of courses are taught at the land lab, often limited to advanced elective seminars or studios, and often with a particular focus on the topic of expanded practices of maintenance. However, if the land lab is to be truly a pedagogical paradigm shift, it must be incorporated into every aspect of the design pedagogy. Simultaneously, nature-connectedness has been demonstrated to not only be an important pedagogical tool, but a crucial learning outcome (Capaldi et al. 2014, Spiegelaar 2023). This is true across disciplines but is especially true when educating future landscape architects. This talk shows the promise of the land lab approach to re-orient our teaching of design computation to bring nature into the computer lab and bring the computer lab into nature. This talk describes assignments, exercises, and activities developed to allow students to learn computational principles from direct experiences of nature and utilize the computational tools to more deeply understand, appreciate, and notice the landscapes in which they work. Through these classroom precedents I suggest a computational design from a landed and nature-connected framework, piloting the computational classroom as a mesocosm in dialogue with the landscape laboratory in the world. This talk presents examples of nature-connected and land lab-based learning for a variety of computational tools necessary for landscape architecture students—ArcGIS, parametric design, animation, sensing —demonstrating the versatility and efficacy of this approach to be fundamental to a curriculum, rather than isolated to specific, workflows. This approach not only improves learning outcomes but engages computational design to engender increased nature-connectedness. Through these methods, students have described a changed attitude toward design computation, approaching it with curiosity and care, and using these technologies to find profound connection to the landscapes they engage.

Keywords: design computation, landscape laboratory, nature-connectedness, experiential pedagogy, design technology

Designing Coastal Transitions: Nature-based Solutions for Brownfield Remediation at Keelung, Taiwan

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Abstract

This study explores landscape architecture pedagogy as a critical praxis for cultivating sustainable literacy and a system for interdisciplinary knowledge integration. Utilizing the Badouzi Chaojing Park in Keelung—a rehabilitated landfill site—as the design studio context, the curriculum aimed to develop a framework incorporating Just-Transition Principles . The core objective was to remediate the coastal brownfield while advancing a "Sustainable Ocean" vision that reconciles ecology, tourism, and local economies. The pedagogical process guided students through multi-faceted inquiry, encompassing literature and policy review, geomorphology and habitat mapping, hazard and risk analysis, and qualitative interviews with community members and fishers. Design propositions employed Nature-based Solutions (NbS) —including ecological breakwaters, oyster reef modules, beach restoration, and wetland polishing systems—to proactively address climate risks. The resulting regional framework established three interconnected systems: (1) an Ecological Reef Belt restoring intertidal habitat mosaics; (2) a Resilient Waterfront enhancing functional adaptability and repair; and (3) a Sustainability Education Loop integrating low-carbon trails with environmental education nodes. The design praxis demonstrates that coupling brownfield governance with NbS can reframe former waste landscapes into critical infrastructures for blue-green carbon sequestration and ecosystem services . From a pedagogical perspective , this studio model fosters evidence-based, transdisciplinary learning by synthesizing systems analysis, stakeholder engagement, and NbS prototyping. Ultimately, it builds essential competencies in climate risk awareness, adaptive performance, and equitable placemaking, thereby constructing the sustainable literacy requisite for future landscape professionals .

Keywords: coastal brownfield remediation, nature-based solutions (NbS), living shorelines, just transition, climate-resilience

Diversity, Equity, and Inclusion

#25 Linking Civic Participation, Environmental Justice, and Environmental Governance: Examining Urban Green Space Equity in Austin, TX

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Abstract

Environmental Justice (EJ) has evolved from a framework focused primarily on the inequitable hazard distribution (distributive justice) to one that integrates both procedural justice and, more critically, recognitional justice, the institutional exclusion and negligence of marginalized community perspectives. This shift reflects that the success of distributive outcomes is structurally limited by whether governing institutions acknowledge diverse values. Despite this multi-dimensional complexity, limited empirical evidence examines how governance, specifically the interaction between actors and institutions (Environmental Governance, EG), shapes equitable access to Urban Green Spaces (UGS) over time, a critical issue for the landscape architecture discipline. This study uses a Fuzzy Set Qualitative Comparative Analysis (fsQCA), combined with a spatial case study approach, to investigate the role of civic participation, the key indicator of procedural justice within EG framework, in promoting UGS equity. Austin, TX was analyzed across three decades (2000, 2010, 2020) at the census tract level. We constructed outcome of interest (proximity to UGS) and conditions of interests, including demographic composition and a civic participation score (CPS). The CPS acts as a proxy for procedural justice by geocoding the qualitative Citizen Communication data concerning public park development and policies, retrieved from the Austin Department of Park and Recreation board meeting records, into a spatial density metric. The fsQCA analysis identifies various configurations of causal pathways, demonstrating that better UGS accessibility is achieved by the consistent presence of a specific configuration of conditions across three decades: High Civic Participation combined with a High Percentage of White Residents. In contrast, areas with lower participation, demonstrate sustained inequities despite citywide investment increase. This empirically confirms a systemic institutional recognitional deficit, showing that the governance structure might have selectively favored and responded to the procedural inputs of privileged demographic groups. These findings highlight the need for pluralistic understandings of EJ that extends beyond neighborhood-scale distributive patterns to actively investigate the structural conditions underpinning decision-making processes. For landscape architecture policymakers, this study demonstrates the importance of integrating EJ and EG frameworks that explicitly measure recognitional justice metric deficit. Furthermore, this combined fsQCA and spatial approach is scalable that enables the analysis of how qualitative institutional data (i.e., civic communication) can be quantified and translated into UGS outcomes, providing a replicable method for multi-scalar EJ analysis. By linking spatial, temporal, and institutional dimensions, this research offers new methodological and theoretical tools for addressing equity in landscape architecture.

Keywords: Environmental Justice, Environmental Governance, Civic Participation, Urban Green Space, Scale

#43 Equitable Access to Public Space in Texas Colonias

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Abstract

Colonias are settlements typically located in unincorporated areas along the U.S.-Mexico border that are composed of poor housing conditions and lack basic infrastructure (Anderson, 2008; Durst, 2016). Historically, colonias were established in unincorporated areas (outside of city limits) and the colonias populations were not able to benefit from the incidents of municipal citizenship, such as water and wastewater services, trash collection, electricity, and paved roads, as well as access to local political participation (Anderson, 2008; Uribe, Faust, & Charnitski, 2019). Even when located adjacent to or completely within city limits, many communities have been overlooked for incorporation status into municipalities (Anderson, 2008). Understanding colonias access to public spaces is a current research gap in the literature. This study seeks to fill this research gap by spatially analyzing colonias access to formal public spaces. Access to public space has been shown to have a positive impact on health in children and adults (Pérez-del-Pulgar, 2021; Ward Thompson et al., 2016) and can contribute to high quality and sustainable urban areas (Naya et al., 2023). Formal public spaces include recognized and organized spaces such as parks, green spaces, greenways, plazas, squares, or any similar public space. These spaces are typically designed and may have some level of ongoing maintenance. Access is determined by presence of public space, capacity of the space to serve the public, and distance from and means of travel to the location of the public space. Even though colonias are informal settlements, comparing them to planned developments is necessary to further understand the inequities in quality environments. This research measures access to public space for colonias and compares access with surrounding residential neighborhoods. Analysis will be conducted using GIS and will include availability of public space and summary statistics pertaining to distance, size, type, and mobility of public spaces. Advanced spatial analytics including hot spot analysis will be utilized to find areas with significant access issues. This will provide an overview of how colonias compare to nearby neighborhoods on public space access. The results will highlight issues in equitable access to public spaces and can be used to create opportunities for connecting and serving these under-privileged communities through creation of quality public spaces in areas of high need. The study will be conducted on colonias in the Lower Rio Grande Valley. All data is open-sourced and comes from the Texas Attorney General's colonias database, the U.S. Census Bureau, and other sources.

Keywords: Public space, Equity, Access, Colonias, GIS

#124 Witnessing and Experiencing the Intimate Landscape of Jim Crow

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Abstract

This paper evaluates the media used in the Shorty Lawson Museum of the Black Tenant Farmer that depicts his life during Jim Crow. The museum is landscape-based, employs outsider African- American art illustrating family oral histories, and uses various media including the house/landscape itself, the farm restoration, film and site tours to immerse visitors in his daily life. The purpose of this research is to determine which media best create this immersion. This is critically important in determining how to convey the experiences of African Americans to diverse audiences today to help reshape the divisive politics around race and equity. That is the significance of this work, the “so what.” This museum is used as a case because it is one of few museums to focus on the Jim Crow era, is located in-situ-landscape, and employs a range of media. These provide an opportunity to determine which media reach different ages, interests and sympathies, and encourage empathic civil discourse. The evaluation is based on responses to a questionnaire that visitors fill out after visiting the museum/farm landscape. The conclusion focuses on three central questions. The following are preliminary findings: Which media most effectively immerse visitors so they experience the Lawsons’ daily life? Guided tours, hands-on demonstrations, the video stories told by the Lawsons about everyday life, and the size and condition of the house rank exceptionally high among all visitors. Over a third of adult visitors say the farm landscape is the most powerful medium. Do the various media reach and impact different audiences? Yes. Art, video and playing in nature are favored by students. Academic visitors stay longer, watch all the film stories, read the book, and engage intensely with tour guides. Some urban visitors are moved to tears, reflecting Zora Neale Hurston’s findings about the urban “abstraction of injustice” versus the rural “caring for the individual.” Does the visitor experience result in understanding race and class conflicts and increased empathy? Almost all adult visitors describe greater comprehension of racial mistrust today. 30-40-year-olds comment on the Lawson’s work ethic, “sadly hard work is not valued by my generation.” Many note the pleasure the Lawsons got from nature versus TV/video games as especially important today. Although preliminary, these suggest that the landscape itself tells the story of exclusion gently, and significantly influences both understanding and empathy, especially partnered with face-to-face discussions with the Lawsons.

Keywords: Jim Crow, Racial understanding, Media

#195 Neuroscience-Informed Sensory Mapping and Inclusive Campus Design at LSU

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Abstract

Designing inclusive educational environments requires moving beyond regulatory compliance to address human diversity. While ADA standards cover many physical barriers, they often overlook sensory and cognitive factors affecting neurodiverse and sensory-sensitive populations. This study examines how neuroscience-informed, interdisciplinary design and geospatial analysis can support inclusive outdoor campus landscapes at Louisiana State University The study employed a multi-step strategy. Research in neuroscience, sensory perception, and inclusive landscape design was integrated to develop strategies that enhance participation, reduce overstimulation, and support diverse needs for privacy and control, which were then translated into actionable design recommendations. Free Speech Alley, a busy circulation hub, was examined using GIS-based mapping of circulation, land use, and environmental conditions, supplemented with on-site observations of soundscapes, shade, light intensity, visual landmarks, and tactile elements. Sound and light levels were measured with a calibrated decibel meter and a lux meter, while circulation and land use were mapped in ArcGIS Pro (ESRI), integrating pedestrian counts and spatial layers of shade, surface material, and topography. Field observations captured user interactions, movement patterns, and engagement with sensory and spatial features, which were evaluated against inclusive design principles. Future studies could incorporate wearable sensors or mobile EEG tracking to assess real-time sensory and cognitive responses. Results highlight “barrier zones” where noise, glare, or circulation conflicts reduce accessibility, alongside assets such as shaded courtyards, acoustically protected areas, and strong visual cues supporting navigation and comfort. Observations show both opportunities for social interaction and challenges such as overstimulation, lack of rest areas, and limited sensory diversity. Cross-analysis demonstrates how layered GIS and sensory data reveal patterns often missed by traditional accessibility audits. The findings suggest inclusive campus design benefits from calming color palettes, biophilic elements, tactile diversity, and flexible spatial arrangements. Few studies combine neuroscience-informed sensory mapping with GIS to evaluate cognitive and sensory experiences in outdoor campus environments; this research addresses that gap by examining how sensory overload, visual cues, and tactile diversity affect campus engagement and comfort. The study offers a replicable framework for integrating neuroscience, sensory observation, and GIS in campus planning. Future work could refine methodologies and extend the approach to other educational landscapes, supporting inclusive campus design.

Keywords: Inclusive Design, Neuroscience, GIS-sensory Mapping, Campus Accessibility, Neurodiversity Design

#332 Bird bones/Sparrow Song: Scoring Inclusion to Expand the Movement Potential of Public Space for All

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Abstract

Bird bones/Sparrow Songs (Bb/Ss), a site-specific performance staged in 2024 on Paggank/Nut Island (Governors Island, NYC), engages dancers with diverse physical abilities to explore a landscape designed by Adriann Geuze (West 8). Scored by choreographer Kiera Bono, Bird bones/Sparrow song positions dance as the celebration of moving bodies (internal structures) with “birds, the ground, ...the built structures surrounding us, our mobility aids, and each other (Bono).” Through this framing, the performance highlights the expansive potential of movement diversity in relation to designed environments. Systematically notating Bb/Ss offers a framework for expanding discourse on inclusive urban design. By challenging the privilege of the “compulsory able body” (Imrie, 2024, p. 20), this project moves beyond inclusion as access towards recognizing and developing guidelines to enhance designed spaces to promote all bodies to fully engaged movement. To examine movement patterns in relation to built form, a notational system was developed to correlate observational data, choregraphic intent, performer and designer narratives, and an analysis of the site’s built form. Drawing on Rudolf Laban’s principles of Choreutics, “…the architectural element in movement” and Eukinetics, “…the intensity and effort put into movement” (Davies) as well as Halprin’s Motation , (Halprin) this graphic framework documents how dancers’ movements arise in direct response to environmental form. Interviews with the choreographer, dancers, and the landscape architect contextualize the intent behind both movement and design. By notating movement in relation to landscape structures, this research introduces a vocabulary of movement typologies linked to specific spatial conditions. The findings demonstrate how dancers with diverse movement profiles engage with the site, revealing the broader potential of environmental design to enhance physical, creative, and joyful movement. This inquiry reframes inclusive design not as the provision of access alone, but as the cultivation of environments that invite all bodies into fuller, more expressive engagement with urban space.

Keywords: Disability, Inclusive, Urban Design, Dance Performance, Movement

#363 DIFFERENCE, BELONGING, SHAPING: BUILDING A LATINO/A/X RELATIONSHIP WITH LANDSCAPE ARCHITECTURE/PLANNING

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Ortega, Danny UNLV, Las Vegas, NV, USA
Rojas, James Place It!, Los Angeles, CA, USA

Abstract

1.0 Description of the topic This session involves four panelists presenting their personal experience, observation, and wisdom about Latino/a/x socio spatial issues, environments, history, and educating Latino/a/x designers and planners. The intent is to begin to document authoritative scholarly discourse about Latinos in practice, academia, and in design. The audience will hear four Latinos talk about constructing and shaping a career and a Latino relationship with Landscape Architecture/Planning. These four narratives help build a foundation and contribution to Latino representation and scholarship lacking in landscape architecture today. 2.0 The background for this session Landscape architecture is late in developing an understanding of Latino/a/x design through the integration of knowledge from the humanities. In the 80s and 90s, the humanities disciplines such as history, cultural studies, Latino/a studies, and philosophy adopted the term, 'cultural turn.' (Bonnell & Hunt, 1999). The 'cultural turn' shifted the social sciences to a multi-disciplinary approach to society, culture, and social life. The shift formed the layering of knowledge from various disciplines needed to address the multiple voices, the needs, and the study of culturally different ethnic groups. Mary Pat Brady, geographer, explains spatial design this way, "Spaces hold different meanings for different people and cultural groups. …the linkages between space and identity remains vital to understanding how individuals perceive themselves and those who live in different spaces, and how spaces serve to differentiate neighborhoods and people." (Brady, 2002). The 'cultural turn' and Claire Napawan's implication of landscape architecture and planning in the United States as colonial Eurocentric founded disciplines requires new norms in scholarship, teaching, and preparing the next generation to support decolonization. (Napawan, et al ., 2023) Failing to foster a prioritization of research on Latinos in design has created a historical lack of Latino research and presence. Panelists in this session will reveal thoughts on their Latino research for differences, belonging, and shaping of Latino environments. 3.0 Presentation structure The panelists are: MaFe Gonzalez, Base Landscape Architects, Fernando Magallanes , Moderator and Associate Professor Emeritus, NCSU, Danny Ortega, Professor and Director, UNLV, James Rojas , Urban Planner, Place It! Each panelist will draw on their individual research to provide diverse perspectives on contemporary Latino/a/x issues and build a presentation around pre-established questions. Time frame and structure: 10-min Introduction of topic and panelists 45-min Presentations, 15 min each. 20-min Summary and discussion among panelists and audience 75-min Total

Keywords: Latino/a/x studies, Latinx landscape architecture, ethnographic design, Latinx urban design, American cultural studies

#373 Living our Values: Understanding power relationships in academia as a source of strategies to protect vulnerable community members

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Abstract

Abstract In early 2025, a sudden shift occurred in the stated values and policies of American institutions (Rogin et al, 2025). This panel will discuss how power relationships within academic institutions can provide opportunities for resistance, support, and academic freedom across different roles. The roles of department chairs, deans, tenured faculty, and accrediting institutions will be discussed in relation to protection of untenured faculty, lecturers, and students who are non-White, LGBT, women, and not US citizens. What lines can be crossed or should not be, and how can protection be extended from one role to another? This is critically important because the recent shift follows a period of five years during which most American institutions publicly adopted language in support of diversity, equity and inclusion (DEI) (Feingold and Dubal 2025). These policies welcomed people into professions and institutions that had historically excluded them from key leadership roles. Now, new policies are creating both material and emotional impacts on vulnerable people. Since January 2025, more than 250,000 Black women have lost their jobs (Carrazana 2025). Transgender people have been under constant political attacks in the media (Francois 2025). The US Supreme Court has allowed federal police to arrest people who speak Spanish in public (Ryan et al 2025). Travelers are being required to reveal their social media accounts at US borders (US CBP 2025). Universities and government employees have been under direct attack as well (Feingold and Dubal 2025). Some organizations are complying with these political directives in advance by eliminating DEI language from their policies before they are directly threatened. The Accreditation Boards of Planning and Architecture weakened their DEI language in 2024. In Landscape Architecture, the Accreditation Board removed all DEI language (and any occurrence of the word “diverse” from its Standards in August, 2025. Feminist, anti-racist and decolonial scholars have long analyzed power relationships within institutions to identify opportunities for change and resistance (Scott 2019; do Mar Pereira 2017; Dei 2016). In this instance, senior academics and the institutions that regulate and support them (CELA, LAAB and ASLA) must assess how and where it is possible to continue to assert the value of diversity, equity and inclusion while protecting the most vulnerable students, staff and faculty.

Keywords: Power relationships, Academia, Censorship, DEI

#379 Designing for Blue-Green Space Equity: Spatial Analysis of Public Access and Socioeconomic Disparities in Michigan's Midsize Inland Lakes

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Abstract

Blue spaces, referring to water bodies such as lakes, rivers, and waterfronts, and green spaces, such as parks, trails, and vegetated landscapes, are essential to community health, recreation, and well-being (Völker & Kistemann, 2011). However, access to these spaces is shaped by socioeconomic factors, leaving many lower income communities with fewer opportunities to enjoy nearby lakefront environments (Klompmaker et al., 2023). Michigan's midsize inland lakes are significant because shorelines are frequently privatized, constraining public access and reinforcing socioeconomic disparities (Wendel et al., 2011). This study examines relationships between socioeconomic factors, public lake access, and housing wealth across zip codes containing mid-sized inland lakes in Michigan. Using quantitative secondary data, the analysis employs the zip code as the unit of analysis. The model evaluates average housing price (2023) alongside population, income, age demographics, number of public docks, and acreage of lakefront parks. Housing data come from the Zillow Home Value Index (2023), public dock information from the US Geological Survey, and park acreage and shoreline characteristics from the Michigan Open Data Portal. Multiple linear regression models were used to estimate associations between blue-green access measures, neighborhood socioeconomic status, and housing values. Among ZIP codes with at least one medium-size lake (n = 94), regression showed that lake–park configuration and population explained a modest share of income variability ($R^2 = 0.17$, $p = 0.041$). Higher mean household income was associated with a greater number of medium-size lakes and larger populations ($\beta = 8{,}385$, $p = 0.022$; $\beta = 0.50$, $p = 0.033$), while income was lower in ZIP codes with more lakefront ($\beta = –8{,}595$, $p = 0.022$). When average house value was modeled with the same environmental predictors (n = 87), the model accounted for little variation in housing prices ($R^2 = 0.09$, $p = 0.47$); only the number of public docks showed a small negative association with house value ($\beta = –11{,}204$, $p = 0.049$), and other coefficients were non-significant. This study highlights barriers embedded in zoning and land use decisions that prioritize private lakefronts in wealthier areas. In response, the research develops design guidelines and planning modules identifying minimum public shoreline standards, incentives for public access easements, and guidance for public dock spacing and parking capacity to support more inclusive, equitable blue and green spaces.

Keywords: Green space, Blue space, Socioeconomic factors, Environmental equity, Landscape planning

#484 Neuroscience-Informed Sensory Mapping and Inclusive Campus Design at LSU

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Abstract

Designing educational and research environments that truly embrace inclusion requires moving beyond regulatory compliance toward a deeper understanding of human diversity. While ADA standards address many physical barriers, they often overlook sensory and cognitive dimensions that shape campus life for neurodiverse and sensory-sensitive populations. This study explores how neuroscience-informed design principles and geospatial analysis can guide inclusive outdoor campus landscapes, using Louisiana State University (LSU) as a case study in collaboration with the Institute for Human Centered Design (IHCD), Boston. Grounded in environmental neuroscience and neurodiversity research, the project examines how sensory stimuli—light, sound, texture, microclimate, and spatial legibility—influence campus usability. Methods include: (1) GIS-based analysis of circulation networks, land use, and environmental conditions; (2) sensory mapping of soundscapes, shade, and visual landmarks; and (3) participatory input from surveys and focus groups with LSU students and staff. A focused assessment of Free Speech Alley provided a micro-scale evaluation of how neuroscience-based inclusive design strategies operate in practice. Findings highlight “barrier zones” where noise, glare, or circulation conflicts hinder accessibility, alongside assets such as shaded courtyards, acoustically protected spaces, and visual cues that support orientation and comfort. The Free Speech Alley study revealed both opportunities for social interaction and challenges including overstimulation, limited rest areas, and lack of sensory diversity. Integrating GIS and sensory mapping revealed spatial patterns often missed in conventional accessibility audits. Results suggest that inclusive campus design benefits from strategies such as biophilic elements, calming palettes, tactile diversity, and flexible spatial arrangements to accommodate varied sensory needs. While limited to a single site and largely qualitative, the study offers a replicable framework for merging neuroscience, sensory mapping, and spatial technologies in campus planning. In conclusion, this research bridges theoretical insights from neuroscience with applied design strategies, advancing inclusive design as both a research agenda and a professional responsibility. By aligning design tools with human cognitive and sensory experience, landscape architects can create more engaging, equitable university environments where all users can thrive.

Keywords: Inclusive Design, Neuroscience, GIS-sensory Mapping, Campus Accessibility, Neurodiversity Design

#632 Questioning Landscape as a Technology of Sovereignty

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Abstract

What might a geontological vantage of sovereignty offer the design of public landscapes in the context of the climate crisis and its accelerating environmental injustice? This question elides normative significations of sovereignty that govern not only people, but the very categories of existence deciding what is alive, what is inert, what and whom can be owned, extracted, or ignored. Such a notion of sovereignty maintains anthropocentric tactics to assert power on bodies both in and beyond territorial landscape boundaries—this mode of governance unquestionably continues to act upon diminishing landscapes as resource for human consumption despite for example the rights-of-rivers movement (O'Donnell, 2020). With a theoretical framework that draws from Elizabeth Povinelli's notion of geontology (2016), alongside feminist knowledges of care, this paper foregrounds what might a mode of landscape governance, where notions of life and nonlife, human and non-human are not held apart, do to the design of public realms? In questioning default ontological framings and their regulatory alignments to territory through the design of landscapes, sovereignty may no longer be exercised to protect some populations while sacrificing others. Rather, than continue to undermine democratic legitimacy, landscape design practice reorientates towards landscapes futured through plural material interdependences. Exampling design propositions for landscape 'counter-publics' developed through situated interdisciplinary studio work, this paper argues that climate responses need to be unshackled from ontological anthropocentricism and the hierarchies of value such speciesism demands and instead mobilised towards landscape transformation towards democracy.

Keywords: landscape soveriegnty, climate crises, environmental justice, political imaginary, design

Film + New Media

#62 Olmsted in Birkenhead and Boise de Boulogne: Dreaming of Africa and Africans in the Formative 1850s.

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Abstract

In 1850 Olmsted started to imagine the discipline and by 1860 he was identifying professionally as a leading landscape architect in the emerging field of landscape architecture in America. Our writing and film use both Birkenhead Park (1847) on the outskirts of Liverpool and Boise de Boulogne Park (1852) on the outskirts of Paris as bookends, examining Frederick Law Olmsted's growing awareness of how much Africa and Africans would come to shape his thinking, dreams, agonies, promises and contradictions for him and the discipline he founded, for the remainder of his life and that of the discipline. Both public parks, rooted in the exploitation of Africa through building imperial wealth and colonial oppression, were at once a dream of democratic possibilities countered by a nightmare of West African enslavement or Algerian genocidal training , meant to control working classes from Liverpool to Manchester and those on the streets of Paris as an aftermath of the failed revolutions of 1848. Ira Berlin makes clear in Many Thousands Gone (1998), "Africa as a place and Africans as a People," begin to take shape as the Trans-Atlantic Slave Trade progresses, definitively shaping the landscapes of Europe, Africa and both Americas through the Atlantic creolization of culture and economies, particularly understood by those who traversed the Atlantic. Olmsted traversed the Atlantic. Through landscape architecture, a term coined by French landscape architects , decades earlier, the way to make public parks more than gardens or plazas, was to dream them as an integral part of the urban infrastructure. Olmsted's dreams crystalized in 1850, experiencing Birkenhead Park, in a colonial center with enough capital to build the first comprehensive public park in Europe by 1847. This became the template for the beauty and unpredictability of Central Park in New York. Nine years later Olmsted returned. The idea had caught on and public parks were sprouting up all over Europe. In that second visit, one public park in particular captivated Olmsted, compelling him to visit it eight times, Boise de Boulogne Park. Boise de Boulogne was a gift from Emperor Napoleon III, an integral part of the remake of Paris. Napoleon utilized soldiers and administrator and designers, seasoned by an eighteen-year colonial war in Algeria to redesign Paris, countering the 1848 Revolution. The contested function of public parks is impacted by the founding roots and contradictions taking shape in that troubling decade leading to the American Civil War.

Keywords: Olmsted, Birkenhead Park, Boise de Boulogne Park, 1848 Revolutions, Africa

#369 Voice(s) for “A Dialogue upon the Gardens of the Right Honourable the Lord Viscount Cobham at Stowe in Buckinghamshire”

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Abstract

This presentation describes the use of new media and technology to interpret text. Titled “A Dialog upon the Garden- Hallucination Mixes,” the project uses audio to illustrate “A Dialogue upon the Gardens of the Right Honourable the Lord Viscount Cobham at Stowe in Buckinghamshire,” written by William Gilpin in 1748. The publication is noted as the first instance when the term picturesque is applied to a garden or landscape. The publication, which can arguably be treated as a travel guide, narrates the walk of two fictional characters, Polypthon and Callophilus, through the garden and their discussion. The text is structured in a manner similar to a script, explicitly attributing passages to the characters. As noted by John Dixon Hunt in his 2012 foreword to the book, Gilpin relies on a balance of movement through spaces and recognition of specific places within the garden to structure the narrative. This points to a problem and generative proposition for the project: how the text can be “read” and “experienced” at the same time, if the audience is focused on reading the text instead of hearing what the characters are saying? How can a visually demanding medium such as text be subverted to afford readers the opportunity to experience the text in multi-layered sensory scenarios? Inspired by audio-based projects such as Janet Cardiff’s “Her Long Black Hair,” which uses Central Park as the physical setting for an immersive audio-based story, the Hallucination Mixes use artificially generated voices to animate the text and provide temporal structure through speech. Subsequent versions use additional environmental audio, such as birds and footsteps, with the intention of making it spatially accurate, thus adding another layer to the book as a travel guide. As a new media project, it expands modes of making in addition to expanding methods of interpreting and applying research. Media Sample (77 minutes) : A dialog upon the garden- hallucination mixes - 00.MP3 . https://drive.google.com/file/d/1XlcAGf5BdsB8HYZPJjDZlzeyWN-FdUzY/view Note: The author of this abstract recognizes that they may be required to provide adequate means to present the work if the conference venue is not able to provide additional sound. The author requests that the conference venue coordinators provide timely notification if they will be required to provide additional audio resources.

Keywords: Landscape, Gardens, Stowe, New Media, Audio, AI

Geo-Spatial and Digital Analytics

#39 Digital Modeling of Tree Morphology and Quantitative Assessment of Shading Efficacy

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Abstract

The urban street environment significantly influences the daily lives of residents, with the thermal environment being one of the most critical factors. This is particularly evident in the "hot-summer and cold-winter" region of the middle and lower reaches of the Yangtze River in China. From a landscape perspective, this study aims to explore how variations in tree morphology, species selection, and design approaches can effectively mitigate urban heat radiation. First, based on commonly used street tree species in China, six typical canopy forms—spherical, elliptical, cylindrical, ovoid, umbrella-shaped, and conical—were predefined for morphological simulation. Subsequently, the geometric structure of the tree crowns was discretized into grids in both horizontal and vertical directions with specified spacing, and three-dimensional models were constructed. Using the ARCGIS PRO platform, digital simulations were performed via the Solar Analyst model based on predefined tree locations, heights, and forms. Using Nanchang as a case study, this research focuses on analyzing the effects of different tree morphologies and their combinations on street shading. The findings indicate that: (1) Adjusting the height-to-width ratio of urban streets can alter the total solar radiation and sunshine duration, even in the absence of street trees; (2) The mitigating effect of street trees on solar radiation is more pronounced in north-south oriented streets compared to those with other orientations; (3) While street trees significantly improve shading for pedestrians compared to treeless streets, their performance can be further optimized through targeted design strategies; (4) Numerical simulation curves suggest that umbrella-shaped canopies offer the greatest potential for alleviating street-level thermal conditions; (5) For the Nanchang area, double-row arrangements combining different canopy forms may represent the optimal design strategy for reducing heat radiation, based on quantitative analysis. The results of this study provide a data-driven foundation for urban and landscape design, and serve as a reference for city planning in other regions experiencing similar summer heat conditions.

Keywords: Tree Morphology, Shading Efficacy, Nanchang, Solar Radiation, Landscape Design Optimization

#46 Floodland Cartography: Re-presenting Flood Risk in the Climate Transformation Era

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Abstract

In an era of intensifying climate volatility, conventional flood risk maps (FEMA's Flood Insurance Rate Maps) remain bound to static boundaries and retrospective modeling. By reinforcing a rigid land–water dichotomy and compressing complex hydrological behavior into zones of certainty, these maps obscure the dynamic nature of floodwaters and the landscape's inherent capacities. Embedded in an insurance-driven framework, FEMA's maps neither meaningfully guide spatial design decisions nor effectively mitigate flood damage. Guided by three questions—What is flood risk? What should flood risk maps do? And what agency can landscape designers bring to this process?— Floodland Cartography examines the shortcomings of FEMA's methodology and proposes a landscape-centered approach to redefining and remapping flood risk. The thesis argues for shifting from a system that merely visualizes risk as probabilistic inundation to one that evaluates the land's capacity to conceive, contain, and remain resilient during flood events. Building a new cartographic foundation, the project proposes three analytical mapping processes that reposition hydrological dynamics as the primary framework for spatial assessment: Stitching "fault lines" reconstitutes the watershed by superseding administrative boundaries. Using digital elevation models, this step redefines territory as watershed, analyzes flow paths, and identifies confluence points where hydrological behavior becomes most critical. Rendering land surfaces evaluates permeability using remote sensing imagery and overlays these results with flow path analysis. This reveals whether runoff interacts with vegetated, absorbent surfaces or impermeable, high-risk zones. Ground-truthing spaces zooms into sensitive areas—confluence points and impermeable surfaces—for site-specific analysis that can directly inform targeted design strategies. These processes generate an evidence-based cartographic platform for identifying design opportunities in flood mitigation. Three communication and design products emerge from this reimagined understanding of risk: Evacuation guides that prepare residents using flow-path analysis. Community engagement with waterflow maps to build awareness and encourage flood-adaptive neighborhoods. City adaptation zoning protocols that shift urban planning from grid- or boundary-based management toward watershed-based master planning. As federally mandated documents, FEMA's maps rely on expert authority to project an impression of precision, even as climate instability renders such certainty increasingly untenable. Floodland Cartography proposes a dynamic, landscape-driven mapping method that visualizes floodwaters as ever-changing flows, reframes the perception of flood risk, and equips designers to shape more adaptive and resilient environments.

Keywords: flood risk, cartography, climate action, hydrological analysis, geo-spatial analysis

#47 Stabilizing Thawing Ground: Meltwater Management in Utqiagvik, Alaska

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Abstract

Utqiagvik (formerly Barrow), Alaska, is experiencing environmental damage from climate change more rapidly than much of the world. Located 330 miles north of the Arctic Circle and accessible only by plane or boat seasonally, Utqaigvik is striving to preserve its culturally rich Inupiat community amid limited resources and a lack of context-specific landscape management practices. The project addresses permafrost degradation in urban Utqaigvik by designing novel, community-informed, and climate-responsive strategies for managing snow and meltwater. As Arctic warming accelerates, snow depth and ground saturation increasingly drive permafrost thaw, threatening local infrastructure, ecology, and Inupiat cultural heritage. Through integration of GIS-based hydrologic analysis, ground-truthing fieldwork speculations, and community insights, the project seeks to leverage existing community assets and seasonal maintenance routines to stabilize the thawing ground. Watershed-specific drainage strategies, informed by local practices on snow management and contemporary science, empower residents to manage spring melt, reduce flooding, and preserve permafrost. To understand Utqiagvik's hydrology as an interconnected system, a stream order analysis of the city on a modified DEM that accounts for culverts was run using ArcGIS. A point flow analysis was then conducted to understand various routes snowmelt and precipitation may be expected to take through the city. This process reveals a clear pattern in how water flows through the city. The proposal zones the city by watershed blocks, instead of conventional road grids, as a more effective management strategy. In this way, small communities are being connected within the same watershed, enabling them to develop drainage solutions as part of a cohesive hydrologic system. Taking advantage of snow/water dynamics, the design choreographs the movement of snow knowledge and active layer thermodynamics to improve drainage performance and permafrost stability with an intentional thaw area. The resulting topography recreates, in an urban context, the natural flow of water through polygonal tundra. This approach of watershed block management not only provides a rather systemized and evidence-based method for the Public Works, but it also gives homeowners agency to keep foundations dry and stable while referencing native ecologies in their backyard. Through offering a synthetic, multi-scalar approach to guide systemized snow and meltwater management in Utqaigvik, this proposal empowers the city with actionable planning solutions that preserve its culture, permafrost, and unique ecology without imported materials. Given the accelerated pace of climate change in the Far North, such approaches are essential for the survival of urban Arctic communities.

Keywords: permafrost, climate action, geospatial analysis, hydrologic analysis, ground truthing

#66 AI vs. Human Design: Comparing Technical Performance in Microclimate-Responsive Landscape Architecture

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Abstract

Artificial intelligence is transforming landscape architecture through computational tools and data-driven approaches, enabling systems to analyze environmental data and generate solutions for microclimate modification (Chaillou, 2020; Newton et al., 2020; Dogan & Reinhart, 2017). Landscape interventions such as strategic tree placement, surface material selection, and topographic modifications can significantly reduce ambient temperatures by 2-8°C and improve thermal comfort in urban environments (Santamouris, 2014; Speak et al., 2020). However, questions remain about AI's capacity to address landscape design's multifaceted nature, which requires integrating ecological, social, and cultural considerations alongside technical performance (Steinitz, 2012; Cantrell & Mekies, 2018). This study compares AI-generated and student-produced landscape designs for parking lot microclimate modification using standardized workflows with identical site data, design objectives, and constraints. Both approaches were evaluated using ENVI-met simulation software across microclimate parameters including temperature reduction, humidity regulation, wind flow optimization, and thermal comfort (Bruse & Fleer, 1998; Tsoka et al., 2018). Design criteria encompassed land cover optimization, spatial composition, pedestrian circulation, parking integration, planting strategies, and topographic modifications (Coutts et al., 2016; Norton et al., 2015). Instructors evaluated design outcomes holistically, assessing not only microclimate conditions through ENVI-met simulation but also walkability, activity generation, social space creation, accessibility enhancement, and integration of multiple functional requirements to provide comprehensive evaluation across diverse design aspects. Results demonstrate that student designs achieved better multi-functional design outcomes and reflected more effectively on instructor feedback regarding spatial hierarchy, contextual responsiveness, and integration of socio-ecological considerations. These findings illuminate AI's current capabilities and limitations in landscape design, suggesting that AI tools can augment technical analysis while human designers maintain creative agency in addressing complex contextual relationships—a balance critical for both professional practice and design pedagogy.

Keywords: Generative AI, Green infrastructure multifunctionality, Microclimate optimization, ENVI-met simulation, Design performance

#75 Multi-Stage Parallel Processing and Machine Learning Pipeline for Regional Biodiversity Assessment and Protection

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Abstract

Landscape planners increasingly need robust biodiversity data to make evidence-based decisions about sustainable site planning, green infrastructure design, and conservation prioritization. However, existing biodiversity assessment approaches focus on single species or small regions and cannot provide the comprehensive, regional-scale data needed for strategic planning decisions. Current workflows also struggle with spatial bias where certain habitats are oversampled by thousands of factors (Phillips et al., 2009), creating models that predict survey effort rather than actual species distributions. We developed a geo-spatial pipeline processing 826,989 occurrence records for 10,029 species across 11 taxonomic classes in Illinois (149,997 km²) from 15 years of data (2010-2024). The pipeline integrates: (1) automated data ingestion with GBIF taxonomic harmonization; (2) quality control including Target Group Background correction revealing 43-fold oversampling in evergreen forests despite <1% coverage (Phillips et al., 2009); (3) adaptive spatial thinning (2-10km) reducing autocorrelation while preserving gradients; (4) parallel MaxEnt modeling with dynamic complexity scaling; (5) hierarchical post-processing environmental constraints; (6) synthesis modules computing biodiversity efficiency—quantified as the Biodiversity Efficiency Index (BEI), measuring species richness per unit area (species/hectare) for direct comparison of conservation value across habitat types. Resource availability adjustments follow kernel density methods (Zhang et al., 2018), computing habitat suitability from presence-to-background probability ratios. The analysis integrates NLCD land cover classifications familiar to planning practitioners with machine learning methods, connecting conventional planning datasets to advanced biodiversity assessment. The pipeline revealed striking biodiversity efficiency disparities across Illinois. Cultivated crops dominating 62.5% of the state (91,234 km²) support minimal biodiversity (weighted richness: 3.68, efficiency: 0.098). Woody wetlands covering 2.2% (3,154 km²) achieve highest weighted richness (5.46) and efficiency (0.183)—nearly double agricultural lands. Deciduous forests occupying 12.4% (18,133 km²) provide critical support (0.186 efficiency). This creates a biodiversity paradox: 15% of Illinois in wetlands and forests supports biodiversity equivalent to 62.5% in agriculture. Developed open spaces (4.4%) maintain 0.109 efficiency—surprisingly exceeding agricultural lands, supporting findings on varied urbanization effects (Scherer et al., 2023). These quantified efficiency differences provide evidence-based metrics for conservation prioritization and strategic restoration planning. The framework's modular architecture enables application across regions using globally available datasets, requiring three adaptation steps: defining study extent, compiling environmental layers, and establishing protection baselines. Like endangered species mapping approaches (Harrity et al., 2020), our open-source implementation enables data-driven planning balancing human needs with ecological integrity, supporting biodiversity protection and ecosystem services valued at trillions annually (Costanza et al., 1997).

Keywords: biodiversity suitability, multi-scale modeling, MaxEnt, machine learning, ecological informatics

#101 The Contamination Distribution Centered Toxics Mobility Vulnerability Index (CDC-TMVI): Application to the Beaumont-Port Arthur Region of Texas

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Abstract

The Beaumont-Port Arthur (BPA) region of Texas, along the Gulf coast, faces compounded environmental risks from coastal flooding and industrial air pollution. While previous indices have advanced toxics mobility assessment, they have not integrated contamination sources or provided open-access, participatory tools. This study addresses that gap by introducing the Contamination Centered Distribution Toxics Mobility Vulnerability Index (CDC-TMVI): a framework that translates complex environmental data into accessible, community-friendly formats through an interactive GIS Dashboard and browser-based weighting tool. Together, these tools enable real-time engagement, supporting participatory planning and design in regions facing overlapping environmental hazards. Building on the Toxics Mobility Index (TMI) by Terron et al. (2019) and the Toxics Mobility Vulnerability Index (TMVI) by Malecha et al. (2020), the CDC-TMVI refines methodology by consolidating “climate change” and “topography” into a broader “built environment vulnerability” category and introducing a new “contamination sources” category with eight variables related to air pollution and proximity to hazardous sites. In total, 27 geospatial datasets across four categories – built environment vulnerability, social vulnerability, health outcomes, and contamination sources were integrated at the census tract level. To operate the framework, ArcGIS Pro was used for spatial processing and the Toxicological Prioritization Index (ToxPi) framework for score calculation. The CDC-TMVI produces three outputs: 1) regional baseline scores, 2) category-specific and variable-level scores, and 3) tract-level vulnerability visualization using ToxPi-style radial charts. A GIS Dashboard provides interactive maps and bar charts with location search and dynamic score updates, while a browser-based tool allows users to adjust variable weights and replicate the framework in other regions. Results from Cai et al. (2025) show that the mean CDC-TMVI for the BPA region is 0.492, with six of 55 census tracts classified with “high” index value. Contamination sources were the most significant drivers of elevated scores, followed by social vulnerability, health outcomes, and built environment vulnerability. These findings highlight the disproportionate burden of industrial siting on socially vulnerable communities, underscoring the need for targeted resilience investments, stricter land use regulations, and equitable adaptation strategies. By aligning with participatory scenario planning and Participatory Action Research (PAR) approaches, the CDC-TMVI provides a transferable model for policymakers, planners, and residents. Its open-source design strengthens collaborative decision making, supports comprehensive planning, and advances environmental justice mapping in industrial coastal regions confronting complex exposure risks.

Keywords: spatial analysis, environmental exposure, environmental justice, flooding

#105 Practical Approaches to Urban Visibility Analysis: Optimizing Viewpoints and Surface Models in Salt Lake City

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Abstract

Route-based visibility analysis help planners assess streetscape experience (Nasar, 1990) but are constrained by data demands and long runtimes (Brinkmann et al., 2022). Visual Magnitude (VM) is a viewshed-based metric that weights visible surfaces by distance and terrain parameters, yielding a continuous visibility gradient (Chamberlain & Meitner, 2013). VM is implemented in the Geospatial Route Analysis and Visual Impact Assessment (GRAVIA) tool, which aggregates values from multiple viewpoints along a route (Openshaw & Chamberlain, 2022). Related Viewscape studies use route-based measures to map perceived walkability and green- and blue-space visibility (Yang et al., 2024; Zhang et al., 2023). Yet there is little guidance on how viewpoint spacing and Digital Surface Model (DSM) resolution should be configured to balance accuracy and efficiency in practice. This study tests which combinations of sampling distance and DSM resolution yield acceptable agreement with a high-detail VM baseline while remaining feasible for planning workflows. We evaluated GRAVIA along four one-mile routes representing different residential zoning districts in Salt Lake City, Utah. Zones were classified according to city zoning ordinances, which reflect typical local residential forms. For each route, we created a high-detail reference VM surface using viewpoints every 1 m and a 0.5 m² DSM (baseline for correlation). We then systematically varied viewpoint sampling distance (1, 5, 10, 20, 50, 100 m) and DSM cell area (0.5, 1, 2, 5, 10 m²), yielding 30 VM surfaces per zone and 120 in total. Pearson correlation quantified similarity, and runtimes quantified efficiency. Across zones, correlation declined as viewpoints were spaced farther apart and DSM cells became larger. Coarsest configurations (100 m–10 m²) reduced mean correlation to about 0.25, whereas 10 m–2 m² retained r ≈ 0.75–0.8 while cutting runtimes by over 80%. Correlation was more sensitive to sampling distance than DSM resolution, with greatest sensitivity in the single-family route, where detached buildings, setbacks, and street trees create variable views. Although each zoning category was represented by one route, the corridors were chosen to span common residential forms and street configurations. The results identify empirically supported candidate settings—10 m–2 m² and 5 m–1 m²—that approximate high-detail VM while remaining feasible on affordable workstations. By clarifying how sampling and resolution shape route-based VM outcomes, this study supports integrating gradient-based visibility metrics into streetscape design and scenario screening, and points toward links with greenness, health and Sustainable Development Goal 11 (Klopp & Petretta, 2017).

Keywords: Visibility Analysis, Model Optimization, Computational Efficiency, GIS Application, Urban Planning

#117 Assessing the Usability of Raspberry Pi–Based Bluetooth Sensors for Monitoring Visitor Volumes and Movements in Urban Parks

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Abstract

Urban parks and trails provide essential physical, social, and psychological benefits, yet monitoring visitor volumes and movements remains challenging. Traditional methods such as manual observation, cameras, and GPS devices are often costly, labor-intensive, and limited in scope. This study examines the usability of Raspberry Pi devices equipped with Bluetooth Low Energy (BLE) sensors for tracking visitor volumes and trajectories in urban parks. It introduces a park-specific validation framework that integrates reliability (ICC) and demographic-based accuracy modeling, providing one of the first systematic assessments of BLE sensor performance in outdoor recreational environments. Raspberry Pi BLE sensors were deployed at two Vancouver sites, Trail 6 in Pacific Spirit Regional Park and Jericho Beach, representing distinct spatial layouts. Sensors recorded Media Access Control (MAC) addresses, timestamps, and signal strength of nearby devices. Eighty-eight observation sessions were paired with manual counts for reliability and validity testing. Intraclass Correlation Coefficients (ICC 2,1) evaluated sensor consistency and alignment with human observations, while multiple linear regression examined the effects of visitor age and activity type. Visitors were classified as “passersby,” including walkers, runners, and cyclists, or “stayers,” who were sitting, resting, or socializing. Across all sessions, sensors recorded 6,577 unique devices, higher than the 5,214 manually counted visitors, because some individuals carried multiple Bluetooth devices while others carried none. Reliability between sensors was high for total counts (ICC = 0.895) and passersby (ICC = 0.939), but moderate for stayers (ICC = 0.594). Validity against manual observations was strong for total counts (ICC = 0.800) yet weaker for activity specific categories. Trail 6’s linear layout yielded stronger agreement than Jericho Beach’s open configuration. Regression analysis showed that adults and seniors increased BLE detections, while children and fast moving users contributed to higher error. Findings demonstrate that Raspberry Pi BLE sensors offer a low cost and scalable solution for monitoring visitor volumes, performing better in constrained trails than in open parks. However, BLE technology is less effective for distinguishing activity types or detecting stationary visitors. The study provides a transferable and empirically validated framework for real time and automated visitor monitoring in diverse urban nature settings. Its approach can be extended to integrate other sensing modalities, such as computer vision and Wi-Fi data, supporting evidence-based park planning, crowd management, and equitable access to green space.

Keywords: Human behaviour, Urban green space, Park use, Smart devices, Bluetooth

#120 Urban Threat Index: Quantifying Urban Threats and Tree Canopy in California's Central Coast

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Abstract

Urban communities face growing socio-ecological threats from climate change, including extreme heat, air pollution, and associated health burdens. These impacts disproportionately affect low-income neighborhoods with limited tree canopy, reflecting patterns of environmental injustices (Jennings et al., 2019). This study develops a geospatial Urban Threat Index (UTI) for California's Central Coast to analyze relationships between urban threats and canopy cover, offering a data-driven framework for equitable climate resilience planning. Urban trees mitigate threats by creating cool microclimates (Yin, 2024), reducing air pollution that contributes to respiratory illnesses (Nowak et al., 2014), and supporting local economies (Parajuli, 2022). California's Nature-Based Solutions Climate Targets (2024) call for expanding urban greenery by 5,000 acres per year and planting 30,000 trees annually. The UTI supports these goals by identifying where canopy benefits are most lacking and guiding more equitable greening strategies. A geospatial and statistical workflow measured four indicators of urban threat: urban heat island intensity, $PM_{2.5}$ pollution, poverty rates, and asthma occurrences. Data from the EPA and CalEnviroScreen 4.0 were aggregated at the census-tract scale, a resolution that captures broad neighborhood trends but may hide finer-grained conditions. Indicators were standardized using z-scores, normalized to a 0–1 scale, and averaged with equal weighting to generate a composite UTI. Tree canopy cover from EarthDefine (2020) was quantified using zonal statistics, and Pearson correlation coefficients were used to measure relationships between canopy cover and UTI scores. Percentile classifications mapped both individual indicators and the composite index, while bivariate maps overlaid UTI values and canopy cover to identify high-threat, low-canopy tracts as priority areas for urban forestry. Results reveal pronounced spatial inequities. The most threatened 20% of census tracts averaged only 6.2% tree canopy, compared to 21.1% in the least threatened quintile. Correlation analysis produced an r-value of –0.44, indicating a moderately strong inverse relationship: neighborhoods with lower canopy cover experience higher cumulative socio-ecological threats. These findings align with recent studies showing that urban forestry interventions can mitigate environmental and health inequities (Nesbitt et al., 2019). The UTI provides a replicable framework for integrating climatic, health, and socio-economic indicators into a single geospatial analysis. By directly linking canopy cover to cumulative threats, the index provides actionable guidance to planners and policymakers seeking to increase urban tree canopy in threatened neighborhoods. This research demonstrates how geospatial analytics can quantify the co-benefits of tree canopy and inform practices that advance the development of more equitable and climate-resilient communities.

Keywords: Resilience planning, Urban threats, Urban tree canopy, Environmental justice

#125 Linking Landscapes to Soundscapes: the relationship between acoustic experiences and surrounding environments in urban contexts

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Abstract

Urban soundscapes play a critical role in shaping human well-being, yet their connection to surrounding landscapes remains understudied. Existing research has demonstrated the restorative potential of greenspace (Ulrich, 1993; Hunter et al., 2019) and the psychological impacts of auditory environments (Ulrich et al., 1991; Yang & Kang, 2005; Irvine et al., 2009), but integrating these perspectives at an urban scale has proven challenging due to methodological and spatial constraints (Margaritis & Van Kann, 2023; Kang et al., 2018). This study addresses that gap by investigating how urban tree canopy and land use influence the perceived emotional qualities of soundscapes surrounding the University of Michigan hospital system in Ann Arbor. Specifically, we ask: How do landscapes contribute to soundscape emotions of pleasantness (valence) and eventfulness (arousal)? We developed a spectrogram-based deep learning approach, trained on the Emo-Soundscape dataset (1,213 labeled clips), to model emotional responses to environmental sounds (Fan et al., 2017). Ambient recordings (200 sites, 5 minutes each) were collected across gradients of urban and natural landscapes within a 15-minute walking distance from the hospital system. These recordings were processed into spectrograms and evaluated using a ResNet-50 model (He et al., 2016) to predict valence and arousal. We then analyzed regression models relating perceived soundscape emotions to tree canopy (derived from LiDAR data) and land use contexts. Results show robust performance (R^2 = 0.62–0.87 across validation protocols) of soundscape assessment models. Spatially, soundscapes nearest to the hospital core were characterized by high arousal and low valence (stressful), while peripheral sites with denser tree canopy exhibited higher valence and lower arousal (relaxed). Pearson correlations confirmed significant positive associations between tree canopy and valence ($r = 0.50–0.60$, $p < 0.001$) and negative associations with arousal ($r = –0.45$ to $–0.49$, $p < 0.001$). Regression models further indicated that tree canopy consistently contributed to emotional outcomes, while land use types exerted smaller but context-dependent effects. The physical environment plays a central role in shaping acoustic experience. Our findings underscore the role of landscapes in mediating perceived soundscapes and suggest that landscape planning strategies integrating greenspaces may enhance restorative qualities, particularly around critical infrastructure such as hospitals. For landscape designers, our method can be used to evaluate and map the health-related performance of built landscape projects with locally recorded sounds. Importantly, greenspaces explained half of the variance in soundscape emotions, suggesting that additional landscape and social demographic attributes may contribute to acoustic experience.

Keywords: Soundscape perception, Urban greenspace, Machine learning, Restorative environments

#127 From Metrics to Matrix: An Integrated Framework for Eco-Landscape Impact Assessment in the San Tin Wetland.

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Abstract

A persistent dichotomy exists in environmental assessment where quantitative ecological analysis and qualitative landscape evaluation are conducted in isolation. This methodological schism systematically undervalues the intricate relationship between ecological function and landscape character, posing significant risks at sensitive urban-environmental interfaces. Hong Kong's planned San Tin Technopole, which encroaches upon the internationally significant Deep Bay wetland ecosystem, epitomizes this challenge. This paper presents an integrated framework to bridge this divide, offering a robust, holistic protocol for impact assessment and landscape planning. The methodological approach sequentially integrates geospatial simulation with established Landscape and Visual Impact Assessment (LVIA) procedures. First, the GeoSOS-FLUS model is employed to project land-use change scenarios from the development masterplan, yielding a spatially explicit prediction of the future landscape. Fragstats is then utilized to analyze these simulated landscapes, computing a suite of landscape pattern metrics to quantify resultant ecological shifts, such as patch density, core habitat loss, and connectivity. The framework's core innovation is the direct application of these empirical ecological indices to inform and discipline the traditionally subjective, expert-led LVIA. Specifically, calculated values for habitat fragmentation and corridor severance serve as an objective baseline to determine the magnitude of impacts on landscape character and visual amenity. This procedural linkage transforms abstract spatial statistics into defensible evidence for qualitative assessment. For example, a quantified 50% loss in core wetland habitat provides a concrete basis for assigning a "high magnitude" impact rating within the LVIA matrix. This process grounds the evaluation in objective, replicable data, moving beyond purely descriptive judgments. Applying this framework to the San Tin case reveals the proposed development would trigger a critical threshold of landscape fragmentation and sever vital ecological corridors. Grounded by these data, the LVIA demonstrates a consequent, irreversible erosion of the area’s unique wetland character, defined by its traditional fish ponds. This degradation causes significant adverse impacts on landscape quality and visual experience for highly sensitive receptors. This research contributes a transferable framework that operationalizes the synthesis of ecological science and landscape planning. By embedding quantitative metrics within the LVIA process, this approach provides a more defensible basis for decision-making in contested landscapes. It advances the discourse beyond reactive mitigation, offering a proactive tool for shaping urban expansion responsive to both ecological integrity and landscape heritage.

Keywords: Landscape and Visual Impact Assessment, Integrated Assessment, Urban Expansion, Wetland-Urban Interface

#155 Automated detection of microscale landscape elements using Google Street View imagery and Vision Language Models

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Abstract

Microscale landscape elements such as Cues to Care (CTC) are fundamental to neighborhood maintenance, community stability, and human well-being. Defined as “landscape elements that are immediately recognizable as designed, and that signal continuing human presence to care for a landscape” (Li & Nassauer, 2020), CTC have been widely used as indicators in studies of landscape perception, neighborhood vacancy, and ecosystem services. While CTC have been quantified by survey research, their geo-spatial quantification mostly relied on manual labeling in the field or of street-level imagery, a process that is labor-intensive and difficult to scale across space and time. Recent advances in urban visual intelligence suggest that Vision Language Models (VLMs) may offer a scalable alternative for detecting microscale landscape features in street-level imagery (Zhang et al., 2024). Building on this emerging potential, we investigate whether VLMs can reliably identify parcel occupancy type (vacant lots, abandoned houses, and occupied houses) and CTC from Google Street View (GSV) imagery. We studied Detroit’s Upper Rouge Tributary area, about 37.5 square miles, characterized by dynamic patterns of occupied hosues, abandoned structures, and vacant lots. We implemented a structured workflow consisting of the following steps: 1) We randomly sampled 959 residential parcels (five per census block group) using GSV images in 2013, when vacancy was rising in Detroit. 2) We developed a codebook defining three parcel occupancy types and 16 CTC features. 3) Four trained labelers independently labeled sampled GSV images, followed by consensus discussions. 4) We conducted a zero-shot test with Llama 4 Vision Model using prompts derived from the codebook. 5) We assessed model performance by comparing model outputs and human labels. We reported high inter-rater reliability among 4 labelers (Fleiss’ Kappa = 0.63 - 0.89 across features). For parcel occupancy type detection, the model achieved substantial agreement with human labels (Accuracy = 0.97, Recall = 0.99, Specificity = 0.99, Cohen’s kappa = 0.74). Initial analyses also indicate that model performance varies across CTC features, with some (e.g., mown lawn, Cohen’s Kappa >0.6) showing higher agreement than more visually subtle elements (e.g., crisp edge, unobstructed view). These patterns highlight the promise and current limitations of VLMs and suggest opportunities for improving prompt design and CTC feature clarity. Overall, this research demonstrated the potential of VLMs to enhance the scalability, reproducibility, and objectivity of urban landscape research, offering researchers and planners a novel and scalable tool to monitor urban landscape dynamics.

Keywords: Multimodal Large Language Models, Cues to Care, Street-level imagery, Zero-shot classification, Urban vacancy

#171 A Digital-Intelligence Empowered Paradigm for Rural Landscape Research in Metropolitan Fringe Areas: An Integrated Framework of Diversity, Dynamics, and Complexity

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Abstract

Rural landscapes in metropolitan fringe areas (MFAs) refer to the extensive territories surrounding the urban core area, spanning from the immediate suburban to the broader rural hinterland. As complex socio-ecological systems, they are characterized by intense urban-rural interactions, high spatial heterogeneity, and rapid functional transformations. These complex systems pose significant challenges to conventional research methods due to their hybridized, dynamic, and complex characteristics. Existing studies, constrained by data scarcity, linear assumptions, and static perspectives, struggle to systematically identify their hybridized features, trace dynamic transformation processes, and explain complex nonlinear driving mechanisms. Amid China's active promotion of artificial intelligence (AI) in rural governance, this study proposes a digital-intelligence empowered paradigm for rural landscapes in MFAs, establishing an integrated triadic framework: "diversity identification → dynamic evolution → complexity interpretation". This framework leverages multi-source big data and AI algorithms to advance the analysis of MFAs from phenomena to processes to mechanisms. Three layers form a complementary analytical triad, offering distinct yet interconnected perspectives: The 'diversity identification' layer fuses geospatial and social-sensing data (e.g., land use, POI) and utilizes machine learning clustering algorithms (e.g., Gaussian Mixture Models) to identify hybrid landscape types. In the Shanghai case study, this approach identified 11 hybrid landscape types that traditional methods struggle to delineate. The identification results were validated using cluster evaluation metrics, data visualization, and remote sensing image comparison. The 'dynamic evolution' layer employs time-series analysis to track the coupled transformation patterns of socio-ecological systems and diagnose mismatches in the development process. For instance, in a time-series analysis of MFAs in Shanghai from 2018 to 2025, this approach identified seven typical transformation modes, such as "urban expansion-functional lag" and "ecological restoration-functional stagnation". These findings were validated through field investigations, confirming the data-revealed mismatches. The "complexity interpretation" layer introduces an explainable AI (XAI) approach, using SHAP to explain the non-linear mechanisms captured by an XGBoost model. This reveals the nonlinear relationships and interaction effects between multidimensional drivers and landscape patterns. Validated in the MFAs in Shanghai, this approach revealed complex driving mechanisms, such as ‘inverted-U’ and ‘S-shaped’ responses linked to locational and policy factors, exceeding the explanatory capacity of traditional linear models. These findings were further confirmed through discussion with classical MFAs theories. In conclusion, the proposed framework provides an effective approach to understanding and governing complex rural landscapes in MFAs, advancing planning towards data-driven precision and scientific rigor.

Keywords: artificial intelligence, metropolitan fringe, rural landscape governance, explainable AI, multi-source big data

#180 From Barren to Blooming: Modeling Arid Resilience through the 52-Day Waseem Season's Soil-Plant Nexus

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Abstract

Understanding soil–plant association is crucial for ecological design and restoration in arid biomes. Often mischaracterized as barren, these landscapes host unique ecosystems with seasonal bursts of productivity, making targeted, science-based interventions vital for combating desertification and conserving biodiversity. The Wasem season—a 52-day astronomical period from October 16 to December 6 on the Arabian Peninsula —is identified by local agricultural and pastoral nomadic knowledge as a critical fertility window. During this time, cooler temperatures and rainfall create optimal conditions for plant germination and growth. While this phenological cycle is well-established in traditional practice, landscape-scale soil–plant relationships remain poorly quantified, leaving a gap in predictive modeling for restoration planning and ecosystem based management. This study addresses this gap using Geographic Information Systems (GIS) and spatial analysis to examine soil–plant associations in the Wadi Alrummah watershed of Saudi Arabia. By employing Exploratory Spatial Data Analysis (ESDA) using Moran's I (global) and Local Indicators of Spatial Association (LISA) (local) to quantify spatial autocorrelation and map significant hotspots, cold spots, and outliers of soil properties and plant assemblages. That combines traditional ecological knowledge with spatially explicit empirical data. Initial results show that where the Wadi's alluvium meets eolian sands and granite-derived soils, a mixed community of soil-specific plants emerges. Alluvium supports species such as Pennisetum divisum and Ziziphus spina-christi, dune sands favor Calligonum comosum and Stipagrostis spp, while granite soils host specialists like Pistacia spp. and Juniperus procera, reflecting the distinct ecology of each substrate. This research provides a model for informed restoration in arid regions, contributing both to ecological theory and practical landscape design. This could be broadly applied to other arid regions where restoration success depends on aligning ecological processes with site-specific soil and hydrological conditions.

Keywords: Soil–plant association, GIS, spatial analysis, arid biomes / dryland ecosystems, Wadi Alrummah watershed

#186 Green Infrastructure Landscape Patterns for Flood Mitigation: An Event-Based Flood Intensity, Duration, and Frequency Assessment in the Great Lakes Region

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Abstract

Green infrastructure (GI) is an effective approach for flood mitigation. By harvesting, retaining, infiltrating, and evaporating excess stormwater, GI reduces runoff and alleviates hydraulic loading on sewer systems [1]. However, many existing evaluations of flood risk and GI effectiveness rely on aggregated hydrologic indicators such as annual maximum streamflow or runoff depth [2-5]. While useful at broader scales, these indicators fail to capture event-scale flood dynamics, particularly short-duration, high-intensity events, underestimating flood impacts and overestimating GI performance [6]. Although event-scale simulations and in situ monitoring have incorporated flood measures of intensity, the hydrologic implications of duration and frequency remain understudied. To address this gap, adopting event-based flood metrics integrating intensity, duration, and frequency (flood-IDF) is essential for comprehensively evaluating the effectiveness of GI landscape patterns under various storm conditions. This need is particularly salient in the Great Lakes region, which faces high flood risk with increasing flood-IDF trends. Situated in the Cold Wet climate zone, the region provides a distinct hydroclimate context where our prior research indicate GI strategies to be more effective than in warmer or drier zones. This research aims to 1) quantify event-based flood-IDF metrics from 1991 to 2020 across 143 gage stations, 2) assess spatiotemporal heterogeneity of GI composition (forest, shrub, grassland, and wetland) and configuration (size, shape, isolation, and connectivity), and 3) longitudinally evaluate their effects on the regulation of these flood metrics. Flood events were identified by assessing whether the instantaneous discharge exceeded site-specific thresholds defined by the National Weather Service. Flood occurrence and flood-IDF were calculated from hourly flood hydrographs. Subsequently, GI composition and configuration were quantified using FRAGSTATS [7]. Metrics were determined based on diagnostics for multicollinearity, significance, and model performance. Finally, Spatial Generalized Linear Mixed Models with watershed-level random effects were applied through a two-step analysis: 1) a binary model identified the drivers of flood occurrence, and 2) three subsequent models examined how different factors influence flood-IDF, conditional on flood occurrence. Preliminary results indicate that larger GI areas significantly reduce flood occurrence, with each 1% increase in GI coverage reducing the odds of flooding by 3.8%. GI size is the second strongest driver after rainfall. Flood intensity is significantly reduced by greater GI patch density, and duration is shortened by larger GI areas with less linearly connected patterns. However, frequency is not significantly influenced by GI configuration metrics and is primarily climate-driven. These findings will guide the projection of future IDF.

Keywords: green infrastructure, IDF, streamflow, spatial patterns, Great Lakes region

#215 Rapidly Assessing Spectral Sensitivity of Circadian Response to Artificial Light at Night via Remote Sensing Imagery

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Abstract

Artificial Light at Night (ALAN) has profoundly transformed urban environments, with the global shift toward blue-rich LEDs exacerbating nighttime brightness and circadian-disruptive emissions. Organisms—including humans, plants, and animals—rely on circadian clocks synchronized with natural light cycles. Consequently, the pervasive presence of ALAN poses serious risks, such as an increased incidence of sleep disorders, mental health conditions, and cancers in humans, alongside ecological disruptions including altered phenology and ecosystem imbalances. Although spectral management offers a pathway to mitigate these effects, large-scale monitoring has been limited by conventional panchromatic satellite sensors (e.g., DMSP-OLS, NPP-VIIRS). These sensors fail to capture the critical blue spectral region, resulting in a 270–400% underestimation of true light pollution levels and their associated circadian impacts. The multispectral Glimmer Imager onboard the SDGSAT-1 s atellite overcomes these limitations. It provides the world's first open-access global nighttime light imagery at 40 m resolution, featuring dedicated blue (424–526 nm), green (506–612 nm), and red (600–894 nm) bands capable of detecting previously unmeasured circadian-active wavelengths. Leveraging this novel data source, we introduce a methodology for rapidly assessing the spectral sensitivity of circadian responses, focusing on two key indices: the Melatonin Suppression Index (MSI) and the Induced Photosynthesis Index (IPI). These indices are calculated via spectral convolution, weighting the light source's spectral power distribution against melanopsin and photosynthesis action spectra, respectively, utilizing the CIE D65 daylight spectrum as a reference standard. We developed a LightGBM-based machine learning model to estimate MSI and IPI (Y) from SDGSAT-1 multispectral imagery (R,G,B band, X). The model was trained using 1,200 field-collected spectral measurements from Shanghai, incorporating RGB radiance and band ratios (X train), alongside reference MSI and IPI (Y train) values derived via spectral weighting against a D65 standard illuminant. To improve predictive robustness, we integrated multisource ancillary data, such as POIs, land use, building boundaries, vegetation coverage, and lighting types documented through citizen science. The model successfully generated high-resolution circadian impact maps across the city by inputing X , with validation on 300 independent samples confirming high accuracy: R 2 = 0.900 and MSE = 0.005 for MSI, and R 2 = 0.767 and MSE = 0.011 for IPI. This study provides a scalable and practical tool for rapidly evaluating light-induced biological impacts beyond conventional brightness-based metrics. It supports applications in global health risk assessment, urban lighting planning, and dark-sky conservation, with potential extensibility to other bio-sensitive spectral indices for broader ecological monitoring.

Keywords: Artificial light at night (ALAN) pollution, Urban light management, SDGSAT-1 Glimmer Imagery, Biological response spectra, Circadian Impact

#226 Constructing a Data-Driven Typology and Value Atlas for China's Maritime Heritage

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Abstract

China's maritime heritage is extensive yet fragmented, limiting comparison and design guidance. We address this through the maritime cultural landscape lens and values-based conservation, aligned with UNESCO and ICOMOS guidance on landscape-scale management and cultural routes. We ask: (1) which typology families emerge when form, function, and setting are modeled jointly; (2) how value domains are distributed along coastlines and routes; and (3) how robust results are to geocoding error and indicator weighting. We examine how a "Value Atlas" can guide landscape architecture and planning, including site selection for waterfront parks, coastal greenways, and visitor facilities. The study proposes a transferable workflow linking large-scale heritage inventories to design and planning decisions. We compile an inventory for the Bohai–Yellow Sea, East China Sea, and South China Sea, geocoding assets as nodes, segments, corridors, and seascapes. Each site is described by function, period, materials, and coastal setting. Cluster analysis for mixed data, combined with a density-based method, groups heterogeneous heritage places without assuming linear boundaries or relying on administrative units. Stability is checked with resampling-based clustering and similarity and separation measures. A multi-criteria model scores six value domains—historical/scientific, social identity, aesthetic/architectural, technological/industrial, ecological/relational, and corridor significance—using expert weights from the Analytic Hierarchy Process and robustness tests that vary weights and indicators. Integrity and authenticity draw on physical fabric, continuity of practice, and setting change from satellite imagery and textual sources. Pilot analyses isolate 12 families (e.g. customs-port ensembles, coastal-defense chains, arcaded shophouse districts, sea-temple networks, underwater-wreck clusters) that correspond to recognizable spatial–functional configurations for design and management. Environmental exposure and corridor connectivity explain more variance in cluster membership than administrative categories. Value mapping reveals corridor hotspots where high social-identity and technological scores coincide with moderate fabric integrity but strong practice continuity, typical of working waterfronts under redevelopment pressure. Cluster assignments and value rankings remain stable across resampled datasets and alternative weighting schemes. Findings expose mismatches between authorized categories and spatial–functional realities and locate identity "hot spots" where working seascapes, religious landscapes, and industrial remains are co-produced. By summarizing cluster families and multi-domain value scores from node to seascape scales, the workflow provides auditable evidence that complements Historic Urban Landscape and cultural-route approaches and supports zoning, buffer delineation, and impact assessment. The Value Atlas reveals patterns across the China Seas and underpins corridor-based conservation, interpretation, and cross-border comparison.

Keywords: Maritime heritage, Geo-analytics, Typology, Value assessment, Seascape

#271 Community-Based Ecological Monitoring through Crowdsourcing: Addressing Thermal Plant Impacts in Coastal Bangladesh

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Abstract

In a developing nation such as Bangladesh, infrastructure projects, especially newly established thermal power plants in the coastal region, are having negative effects on ecosystems. Thermal effluent, chemicals, and other pollutants from these power plants are changing biodiversity in these regions. Current ecosystem monitoring in Bangladesh is largely centralized and top-down, dependent on infrequent surveys that delay responses and overlook local knowledge in highly dynamic coastal settings. Existing Global South models, such as community-based adaptation for coastal forestation in Bangladesh and participatory mapping in Myanmar demonstrate the ability of local knowledge to generate timely, place-based ecological insights that complement formal monitoring efforts. However, these systems remain constrained by short project timelines and the underrepresentation of the whole marginalized communities, making it difficult to generate continuous ecological monitoring data. To address these gaps, this ongoing study investigates a lightweight mobile crowdsourcing platform that uses a simple Google Form as a low cost and accessible tool for a deltaic village adjacent to thermal plants in Chalitabunia . Because it requires no specialized mapping skills and allows residents to submit observations at any time, the platform reduces the limitations of infrequent project based monitoring and low participation from underrepresented groups. By using this platform, residents were directly engaged in ecological monitoring by observing five key landscape types: mudflats, mangroves, creeks, agricultural land, and homestead clusters. A total of 35 households within 4km of impact zone, with different genders, ages, and occupations, took part in the activity, facilitated by a trained research assistant in conducting Google Form surveys easier for residents to use. Observations included changes in water temperatures, native species loss, alteration in ecosystem, as well as signs of water and plant stresses. These qualitative observations were manually mapped and coded by landscape stress type, then converted to quantitative formats to enable cross-household comparison. This process allowed the researchers to examine spatial and seasonal differences within 4 km of the thermal plant, as well as across dry and monsoon seasons. Preliminary evidence shows that Community based monitoring can capture changes in delta dynamics faster than traditional, centrally based methods. Data produced through these collaborations could be used to fill gaps in official statistics or to inform green–blue infrastructure, and shape resilience-oriented policy. By pairing simple mobile forms with recurrent household and ecosystem alterations observations, the study enables near real-time reporting and a denser temporal and spatial record of ecological change.

Keywords: Crowdsourcing, Ecosystem monitoring, Delta Dynamics, Community participation, Ecosystem degradation

#305 Statistical Machine Learning in Green Infrastructure Planning: A Systematic Review

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Abstract

Green infrastructure has become a central strategy in landscape architecture for addressing climate adaptation, urban heat mitigation, stormwater management, and broader ecological resilience. At the same time, statistical machine learning (SML) and geospatial artificial intelligence are transforming how GI performance is evaluated, modeled, and spatially optimized. However, despite rapid methodological advances, the field remains fragmented across environmental science, computer science, engineering, and planning, making it difficult to determine how SML meaningfully supports GI design, implementation, and policy decision-making. To address this gap, this study asks a central research question: How are statistical machine learning methods currently applied to green infrastructure planning, and which ecosystem service challenges do these methods help solve? A systematic literature review was conducted following PRISMA protocols using Web of Science to ensure transparency and reproducibility. Peer-reviewed studies integrating machine learning with GI, nature-based solutions, or urban ecosystem services were identified and coded according to: GI type, environmental application (e.g., heat mitigation, stormwater management, biodiversity enhancement, microclimate regulation), spatial scale, machine learning technique, data sources, and disciplinary orientation. The findings reveal extensive use of predictive and spatially explicit models, such as random forests, gradient boosting, convolutional neural networks, spatial regression, and geospatial clustering, to assess environmental performance, map ecosystem services, and support design or planning scenarios. However, recurring limitations persist across the literature. These include inconsistent data quality across cities and sensors, limited integration of multimodal datasets (e.g., remote sensing, climate variables, and urban morphology), insufficient methodological transparency, and weak connections between model outputs and actionable landscape design or policy interventions. This study contributes to landscape architecture by clarifying how machine learning tools are currently being used, identifying where methodological gaps remain, and outlining future directions for developing more robust, data-informed, and climate-responsive GI planning frameworks.

Keywords: Green Infrastructure, Statistical Machine Learning, Geospatial Artificial Intelligence, Urban Ecosystem Services

#325 Remote Sensing and Machine Learning Approaches to Predict Land Use Demand and Ecosystem Impacts in a Coastal Region

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Abstract

Introduction The coastal regions in the southeast United States cover a wide range of sensitive ecosystems. However, increasing urbanization pressures are causing land use conflicts. From a theoretical perspective, the study is based on the urban region theory (Forman, 2008), land change science (Turner et al., 2007), and land use allocation approaches (Zwick et al., 2016). This study aims to integrate remote sensing and machine learning within a land-use allocation framework to balance regional urbanization and ecosystem conservation. The study area consists of ten counties in the coastal region of the state of Georgia. This topic is important because the rapid urbanization is threatening sensitive ecosystems, such as marshes, estuaries, and barrier islands, which provide critical ecosystem services in this region. Existing urban studies have investigated this region from the perspectives of local urbanization history (Ramos, 2021), exploratory and participatory geodesign scenarios (Rivero et al., 2018), and the relationship between urban morphology and natural disasters (Zhao et al., 2024). Methods Satellite remote sensing, machine learning, and spatial modeling are integrated to assist environmental planning in the coastal region. Remote sensing datasets include composites of the normalized difference vegetation index and the normalized difference water index derived from Landsat-9. Nighttime light and land surface temperature data are obtained from the Visible Infrared Imaging Radiometer Suite. These remote sensing datasets are used for the ecosystem sensitivity assessment. Combined with remote sensing data, the NLCD and other datasets are used as data inputs for the machine learning model to predict future urban boundaries. A recurrent neural network is trained to predict future urban land cover. Finally, we have developed a new scenario assessment framework to balance regional urbanization, ecosystem services, and land-use allocation. Results The urban land cover analysis shows a significant increase since the 1980s, especially around smaller towns. Urbanization pressures are more intense in areas along the northern coast (AUC = 0.93). The ecosystem sensitivity map indicates higher values along the coast and major rivers. Demand projections suggest continuing urban growth pressure in the coming decades. Discussion Preliminary results demonstrate the potential of combining machine learning with suitability analysis to assess potential urban–ecosystem conflicts. The early findings from the map overlay highlight the risk of increased pressure on sensitive ecosystems if current trends continue. A mixed-use development scenario may be considered in our future study. Conclusion The proposed scenario assessment framework contributes to land use allocation and coastal geodesign strategies.

Keywords: Land cover, Scenario planning, Suitability

#326 Optimizing Green Infrastructure Spatial Patterns via Hybrid CNN-Transformer Deep Learning & Multi-Objective Optimization for Flood Risk Mitigation in Mountainous Watersheds

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Abstract

Introduction: Climate change and human interventions have increased flood frequency, severely threatening people and ecosystems (Berndtsson et al., 2019; Jingjing et al., 2023), especially in mountainous regions. Studies show that green infrastructure (GI) and its spatial patterns significantly influence flooding by affecting rainfall-runoff and runoff-sediment dynamics (J. Li & Zhou, 2015; Peng, 2019; Van Nieuwenhuyse et al., 2011), playing a positive role in flood management (Zellner et al., 2016). To mitigate flood risks, it's crucial to assess how GI affects flooding to optimize spatial patterns (Liu, 2022). Existing research mainly focuses on the effects of GI elements at the plot level and green space matrices at the watershed scale (Kim et al., 2021; Y. Li, 2023; Su, 2018). However, due to data limitations, little is known about how GI patch patterns (e.g., shape, fragmentation) relate to flood responses at the sub-watershed scale. Methods and Results: This study investigates the influence of GI patch patterns on rain-flood risks and aims to optimize GI layouts to reduce flooding, using the Guishui River Basin in Beijing as a case study. A SWAT model simulated and calibrated 21 years of historical hydrological data, generating high-resolution hydrological data for 261 sub-basins. An extreme rainfall event database of over 14,000 records was built at the sub-basin scale. A hybrid Convolutional Neural Network (CNN) and Transformer model was developed and trained on this multi-temporal database to produce a high-accuracy hydrological prediction model using land use raster images. The SHAP (SHapley Additive exPlanations) framework quantified how GI spatial patterns influence sub-basin flooding. Key landscape metrics were identified: higher patch density (PD) of deciduous broad-leaved forests, larger percentage area (PLAND) of grasslands, and more complex shape indices (SHAPE) of vegetated patches were linked to increased mountain flood risks, representing the most impactful GI configurations. Based on these findings, the NSGA-II multi-objective optimization algorithm was applied to refine GI spatial patterns in the Guishui River Basin, achieving a 15% reduction in flood risk under 100-year return period extreme rainfall scenarios while maintaining cost-effectiveness. Discussion and Conclusion: By integrating deep learning techniques, this study enables flood risk simulation and prediction in areas lacking hydrological data and reveals how GI patch characteristics affect flood responses. The findings offer technical support and practical strategies for accurate flood prediction and disaster prevention in similar regions under climate change.

Keywords: Green Infrastructure, Flood Regulation, Deep Learning, Shapley additive explanations, Multi-Objective Optimization

#337 Predicting Nighttime Thermal Comfort in Urban Public Spaces Using Artificial Intelligence and Social Media Data

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Abstract

As cities continue to develop into 24-hour environments, understanding thermal comfort after sunset has become increasingly crucial for improving the usability, safety, and inclusivity of public spaces. While most thermal comfort studies emphasize daytime conditions or controlled settings, the microclimatic complexity of nighttime urban environments remains comparatively underexamined. This study investigates how artificial intelligence (AI) models, combined with large-scale social media data, can be used to predict human thermal comfort in nighttime metropolitan contexts. More than 70,000 nighttime social media posts from five major U.S. metropolises were analyzed using a 5-point thermal sensation vote (TSV) scale. Social media texts and profile images were processed using the LLaVA vision-language model to extract demographic indicators (age and gender) and classify thermal sensation expressions. Meteorological variables, including temperature, humidity, wind speed, pressure, cloud cover, and weather type, were retrieved via the OpenWeather API and matched to each post. To enhance transparency and reproducibility, detailed procedures were established for contextual keyword filtering, nighttime timestamp extraction (18:00–06:00), removal of irrelevant posts through LLaVA semantic checks, and stratified sampling to balance TSV categories across cities. A suite of machine learning algorithms was evaluated, including Random Forest (RF), Gradient Boosting, Support Vector Machine (SVM), K-Nearest Neighbors, and Multilayer Perceptron for classification, as well as RF, SVM, Decision Tree, and Linear Regression for regression. Across both tasks, the Random Forest models performed best. The RF regression model achieved an R^2 of 0.78 and MSE of 0.26, outperforming SVM (R^2 = 0.73, MSE = 0.31) and Decision Tree (R^2 = 0.58, MSE = 0.49). Incorporating social media user attributes yielded measurable improvements: R^2 increased by 0.01–0.04 across algorithms, and MSE decreased by 0.01–0.05 when demographic features were included. To address biases inherent in social media datasets, the study applied demographic balancing, contextual noise filtering, and cross-city stratification. These steps aimed to minimize skew arising from overrepresented user groups or uneven activity patterns. The findings demonstrate that integrating real-time, user-generated data with AI modeling can, to a certain extent, enhance the prediction of nighttime thermal comfort while capturing subjective perceptions often overlooked in conventional datasets. This research offers new insights for landscape architecture and urban planning, suggesting that data-driven, fine-grained predictions can support the design of thermally inclusive nighttime public spaces and contribute to broader climate-responsive urban strategies.

Keywords: Thermal comfort, Nighttime urban public space, Social media data, Artificial intelligence, Urban planning

#356 Exploring the impact of greenspace accessibility on the health of rural communities in West Virginia.

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Abstract

The health of a community depends on a combination of multiple social, economic, and environmental factors. By understanding the impact and relationships of these factors, we can improve the health of a community. West Virginia is one of the most densely vegetated states in the United States (Amarasinghe et al., 2009; Vogt & Smith, 2016). Scholars have found a positive correlation between the amount of green space in people's living environment and the perceived general health of residents in multiple studies (De Vries et al., 2003; Jiang et al., 2020; Jiang et al., 2022; Zhang et al., 2018). Therefore, we should expect a positive impact on human health from exposure to nature. However, on the contrary, people living in rural West Virginia score lowest in almost all categories of health measures (Lundeen et al., 2018). The study intended to explore the reasons behind this contradiction. Using Geographic Information System (GIS) and Correlational Analysis, the study explored the relationship between green space accessibility and people's physical health in rural West Virginia communities. The relationships between different factors responsible for the health of a community in West Virginia, namely obesity rates, access to exercise facilities, and access to public open space, were studied. Closest Facility Analysis quantified distances to parks from census-designated places (CDPs) and incorporated towns across all 55 counties in West Virginia. The results showed that there is insufficient access to open spaces or opportunities for exercise, leading to higher rates of physical inactivity. Correlation analysis revealed a significant positive correlation between a county's adult obesity rate and its physical inactivity rate ($r(55) = .579$, $R 2 = .335$, $p < .001$, CI [.380, .751]). The findings presented in this study will help inform future policy decisions and contribute to a greater understanding of the challenges communities face in rural West Virginia.

Keywords: Green Space, Accessibility, Rural Communities, Public Health

#381 Understanding Monoculture Impact on Prairie-dog Habitat through Historical Imagery Data Analyses

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Abstract

Lubbock's prairie habitat has its own distinctive ecosystem. Unfortunately, Monoculture expansion is a notable cause of fragmentation of native prairie habitat with direct impact on keystone species such as Black-tailed Prairie Dog. The entire life cycle and population dynamics of prairie dogs are affected by the decline of predator populations, causing ecological stress. This research analyzes publicly available datasets; the USDA NAIP imagery, the City of Lubbock Orthophotography and LAS tiles to map habitat change from 2021 to 2025. NAIP provides NIR data for vegetation indices, Orthophotography from City of Lubbock provides 3-inch precise tiff data and LiDAR contributes terrain derivatives. For the imagery analysis, we implement a supervised workflow in ArcGIS Pro using NAIP derived Normalized Difference Vegetation Index (NDVI) and Support Vector Machine (SVM) to integrate texture variables with topographic position index and surface roughness. After classification, fragmentation is quantified using metrics such as prairie-dog habitat patch density, edge density, mean patch size and effecting mesh size. These models need training with stratified polygons to identify patterns e.g. prairie, row-crop monoculture, built area, shrub, bare etc. The SVM workflow provides land-cover mapping and change detection, while NDVI analysis presents the shift of vegetation health in the high plains. The outcome from this study focuses on finding a correlation between prairie habitat decline and the expansion monoculture, while providing an easy-to-use universal workflow. This research reinforces the potential of geospatial analytics into actionable guidance for prairie biodiversity restoration in Southwest Texas and the high plains in the upcoming years.

Keywords: Prairie ecosystem, Monoculture, Multi-band Imagery, Black-tailed Prairie dog, GIS

#390 Building a Campus Digital Twin: Holland Bowl as a SITES-Aligned Performance Pilot

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Abstract

Digital twins are emerging as powerful tools for managing complex sites, linking field data, spatial analysis, and immersive modeling. Within landscape architecture, however, their structured application remains limited. This poster presents Phase 1 of an Evans-Allen funded project to build a digital twin for North Carolina A&T State University, guided by SITES v2 Section 2 (Pre-Design Assessment and Planning) and Section 6 (Site Design - Human Health and Well-Being). Holland Bowl, a 2.04-acre intramural and event field, was selected as the pilot site due to its high visibility, intensive use, and ongoing maintenance challenges. Following SITES prerequisites and credits, the project established a baseline through integrative design processes, pre-design site assessment, designation of Vegetation and Soil Protection Zones (VSPZs), and user engagement. Human health criteria shaped data collection around accessibility, equitable use, opportunities for restoration and physical activity, and potential for social connection. The digital twin integrates GIS layers, AI-derived planimetrics, GNSS survey data, and drone-based photogrammetry into a georeferenced 3D model. This initial phase emphasizes baseline data workflows and visualization strategies, providing a foundation for future scenario testing and performance modeling. By grounding digital twin development in an established sustainability framework, the project creates a replicable model for higher education institutions and public agencies seeking to connect site performance with human well-being. The poster highlights workflows, baseline findings, and the pedagogical benefits of involving undergraduate researchers in applied data collection and modeling.

Keywords: digital twin, SITES, landscape performance, campus GIS, geo-spatial analytics

#445 Recognizing Playgrounds: Mapping the Self-Directed Play Spaces of Climbing and Parkour

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Abstract

Self-selecting populations of adults create play environments for themselves through their use of outdoor spaces. This paper considers urban-adjacent outdoor climbing sites and street parkour environments. Parkourists and outdoor climbers use streetscapes and landscapes in a manner for which they were not designed. Practitioners of these sports derive many important benefits from this self-directed activity: they have fun; they improve their physical and mental health; they engage in the creation of challenging, meaningful play. (Boldina, Gomes and Steemers 2021) (Donoff and Bridgman 2017) (Mangan, et al. 2025) (Martha, Sanchez and Gomà-i-Freixanet 2009) (Carter and Llured 2022) Landscape architecture is situated at the junction of the urban streetscape and the rural landscape. The studies cited explore the embodied experience of climbers and parkourists, but there are relatively few works connecting these insights to design in general and to contemporary landscape architecture in particular. (Smith, Shelley, and Steinø 2018) Therefore, this project asks the question: what are the spatial and cultural characteristics of outdoor climbers' and parkourists' play spaces and how can landscape architecture incorporate this information into design to benefit a wider variety of people? This paper develops these questions using photogrammetric scans from iPhone tools as a method to create accurate, three-dimensional models of climbing areas and parkour spots. The models are placed in Rhino and evaluated based on dimensional data, spatial patterns, and introduced elements that support self-directed play. The paper also explores the cultural production around the play areas. Analysis of the digital models reveals that spaces selected for these activities have strong connections to the dimensions of the human body. Analysis of textural information within the models highlights artifacts of cultural production that exist for both activities: physical art present in the climbing areas and digital art of the parkour spots. The paper then discusses how the gathered information can develop a design language to highlight opportunities for play already available in public spaces and proposes a set of modular interventions to increase opportunities for play for people of all abilities.

Keywords: Photogrammetry, Play, Climbing, Parkour, Design

#456 What Guides the Eye: Bridging Vision Science and Landscape Architecture

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Abstract

While studies of eye movements have historically focused on reading and other tasks related to immediate action (e.g., Netzel et al., 2017), eye tracking studies during landscape observation have only gained prominence relatively recently (Měkota, 2024). Given findings that visual exposure to naturalistic environments may have psychological and health benefits (Hartig, 2021), questions of how people distribute visual attention across landscapes become relevant for identifying the visual features contributing to beneficial impacts. Such insights may offer key insights to quantifying the visual benefits of nature or measuring the visual legibility of landscape designs with respect to different types of spatial cognition tasks. However, the bridge between vision science and landscape architecture is not well established. To begin addressing this gap, the authors briefly discuss the vision science behind visual landscape perception, highlight some of the theories and gaps that are most relevant for landscape architecture, and present a case study using original eye tracking data from an experiment in Switzerland. The case study specifically asks, “What do people look at during dedicated landscape observation?” and, “How do those observation patterns vary across different presentation methods?”. To answer these questions, participants (n=75) were divided into three groups and each viewed the same landscape in a different medium (in situ, photosphere in VR, and pointcloud in VR) while their eye movements were tracked. These data were then clustered into fixations and saccades before being analyzed for their spatial distributions and differences across semantically segmented regions of the stimulus. These analyses are conducted via Kruskal Wallis tests examining distributions of viewing angles, and aligned rank transform tests of total dwell times across areas of interest. The results indicate that participants’ attention distributions were significantly different across the same landscape when presented in different modes. Such differences suggest that the presentation mode likely impacts viewing behaviors, and the authors discuss these findings within the context of vision science and landscape representation. These results can help researchers and practitioners understand the practical differences between VR and real-world landscape experiences and point toward biases and opportunities in implementing VR landscape experiences. Furthermore, by analyzing landscapes through the lens of vision sciences, studies like this offer chances to better understand how environmental design features and strategies contribute to users’ understanding of landscapes.

Keywords: Eye tracking, Virtual reality, Spatial analysis, Environmental Perception, Vision science

#458 Nationwide Flood Risk Assessment of Program-Based Camps

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Abstract

Program-based camps, including youth, educational, religious, and recreational camps, operate across the United States and play an important role in child development and community engagement. Despite their significance, these camps are often located in hazard-prone areas with limited infrastructure and emergency response capacity. Different local zones across the country frequently exempts them from the safety regulations applied to schools or residential facilities, leaving them vulnerable to natural disasters, especially flooding. This research conducts a national-scale flood risk assessment of over 4,000 program-based camps identified through publicly available information from the American Camp Association directory using automated data collection. To ensure consistency across states, the analysis relies exclusively on federally available datasets, including FEMA floodplain maps, national building footprints, and generalized land use zoning. Using spatial analysis of building footprints, floodplain overlays, and land use zoning, the study identifies camps at elevated risk and examines how exposure varies across states. Differences in floodplain mapping completeness, zoning codes, and climate vulnerability contribute to uneven risk distribution. The analysis reveals significant disparities in camp safety oversight. Current flood insurance rely heavily on FEMA floodplain maps, which are incomplete in rural regions and could be outdated in many areas. By analyzing hazard data coverage at the county level across multiple states, this research advances understanding of systemic gaps in national flood risk mapping. It introduces a uniform, scalable methodology for evaluating flood exposure at program-based camps using consistent federal datasets, ensuring comparability across diverse geographic and regulatory contexts. Unlike localized studies that rely on state-specific records, this approach leverages a web-scraped national sample and standardized spatial layers to identify patterns of vulnerability that transcend individual jurisdictions. The findings underscore the need for a national framework that integrates hazard mitigation into camp licensing and land use planning, while recognizing that future research should incorporate localized factors such as green infrastructure, building condition, accessibility, and socio-economic vulnerability to achieve comprehensive resilience strategies. Ultimately, this study provides actionable insights for policymakers and practitioners seeking to protect vulnerable populations served by these critical institutions.

Keywords: Flood Risk, Program-Based Camps, Spatial Analysis, Emergency Preparedness, Hazard Mitigation

#503 Research on the Identification and Interaction Mechanisms of the City-Water Relationship Structure in the Shandong Section of the Grand Canal

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Abstract

As a unique linear cultural heritage, the study of the identification and interaction mechanisms of the city-water relationship structure of the Beijing-Hangzhou Grand Canal forms the foundation for systematic research on the dynamic coupling between cities and water, and is crucial for the holistic and coordinated conservation of the Grand Canal heritage network. This study focuses on the Shandong section of the Beijing-Hangzhou Grand Canal. Based on the theory of human settlement landscape systems, it employs the expert scoring method and a coupling coordination model to validate the coupling and correlation among the three core elements: "water," "transportation," and "city." Subsequently, unsupervised machine learning, specifically HDBSCAN density-based clustering, is used to cluster the "water-transportation-city" landscape system. The clustering results are then refined through historical document analysis and historical evidence-based research to precisely identify the city-water relationship structures. Finally, the XGBoost gradient boosting decision tree model, combined with the SHAP interpretable machine learning model, is applied to interpret the nonlinear relationships and feature importance within these structures. This analysis explores the interaction mechanisms and pattern characteristics of each structural unit from multiple perspectives, including transportation, water resource management, and composite functions. The research indicates a high degree of coupling among the "water-transportation-city" elements in the Shandong section. Three distinct types of city-water relationship structures were identified. The study delves into the interaction mechanisms for each: transport hub settlements, where the canal acts as the core driver of urban expansion; water management settlements, which exhibit a high coupling between water system regulation and city defense layout; and multi-functional settlements, which demonstrate greater adaptability and stability through the interaction of multiple elements. From a machine learning perspective and integrating [...] methods, this study innovatively constructs a theoretical framework for the Grand Canal encompassing "identification of city-water structures, analysis of interaction mechanisms, and formulation of conservation/development strategies." It reveals the developmental patterns of the city-water relationship in the Beijing-Hangzhou Grand Canal at a mechanistic level, contributing Chinese wisdom to the holistic conservation of historical cultural heritage and to building an international discourse for China's canal conservation experience.

Keywords: City-Water Relationship Structure, Grand Canal, HDBSCAN Clustering, Interpretable Machine Learning

#544 Border Patches: Leveraging Digital Twins for Social and Ecological Landscape Performance

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Abstract

Digital twins are virtual models integrating real-world and environmental data, enabling dynamic simulation and continuous monitoring of a place. While this technology is widely used in building design and urban environments, its use in large-scale environmental studies of international borders, particularly for assessing habitat connectivity and community resilience in cross-border ecological landscapes, has, until recently, been limited by scale, resolution, and data-processing capabilities, despite considerable potential for evaluating landscape performance. Only recently have advances in computing power, temporal data flow, and interoperability enabled environmental-scale twins to model large, dynamic landscapes rather than just buildings or small urban systems. One of the significant opportunities for digital environments is in border regions where ecological conditions are degraded, allowing borders to be reimagined not merely as lines of separation, but as opportunities to create adaptive and resilient landscapes . At international borders, hard-edged boundaries disrupt ecological connectivity, fragment habitats, restrict species movement, and place connective and cultural pressures on nearby communities. Along the U.S. - Mexico border, barriers, including steel bollard walls, legacy pedestrian fencing, and temporary wire structures, lack consistent ecological standards, leaving large mammals such as coyotes with gaps of up to 100 miles between crossings. This study primarily uses ArcGIS Pro for spatial analysis and an environmental twin in ArcGIS Urban for scenario visualization and dashboard monitoring to model where and to what extent border landscapes can improve or restore both ecological and social connectivity. ArcGIS Urban is used to build the environmental twin, with dashboards used to estimate where and how many border wall gaps are needed to support threatened and endangered species . The re sults show how mul tiple scenarios perform with input data from the California Wildlife Crossing Database . Primary ecological and social data include land cover, impermeable surfaces, fragmented habitat and connectivity, housing density, and circulation patterns. A mixed-methods approach compares the U.S. - Mexico border area near Tijuana with a 20-hectare study site. Findings highlight digital tools' role for locating and ranking areas with the highest potential to restore ecological and social connectivity along planned and constructed border walls, guiding interventions that make border landscapes resilient and multifunctional . The environmental twin provides a single, interoperable source of truth integrating ecological, spatial, and mobility systems, enabling precise evaluation of connectivity opportunities along the border . Ultimately, this research demonstrates that a digital environment a l tw in can critically support the design and performance of border landscapes, transforming ecological liabilities into multifunctional, sustainable environments .

Keywords: Digital Twin, Landscape Performance, Ecosystem and Community Resilience, Habitat Connectivity, International Border Design

#558 Research on the Spatiotemporal Evolution of Ancient Gardens in Southern Hebei, China, from the Perspective of Ancient Roads

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Abstract

Ancient roads served as vital corridors for population migration, trade exchange, military movement, and cultural interaction, with the Silk Road and the Grand Canal as representative examples. As important cultural landscapes along ancient roads, exploring the spatiotemporal evolution of historical gardens helps reveal the economic development and urban-rural structural characteristics of cities along the roads. It also provides valuable references for the planning and construction of contemporary urban cultural heritage routes. GIS has expanded the research scope of historical geography and brought new insights to garden history studies, yet further empirical research is still needed. This study focuses on the Ancient Road along the eastern foot of the Taihang Mountains, which originated in Beijing, passed through Baoding, Shijiazhuang, and Xingtai, and extended to Handan and beyond, roughly corresponding to the northern section of the modern Beijing-Wuhan Railway. Centering on southern Hebei, the core area of this Ancient Road, 445 garden sites were identified and verified using local chronicles, literary travelogues, and historical maps. These sites span from the Shang Dynasty—when Shaqiuyuantai, the earliest recorded garden, emerged-- to the Qing Dynasty. Using ArcGIS, a historical geographic information database was established. Kernel density estimation and nearest neighbor analysis were applied to visualize the spatiotemporal characteristics of the gardens and explore the coupling relationship between the Ancient Road and historical gardens. The results indicate a stong spatiotemporal connection between the Ancient Road and historical gardens in southern Hebei: 1) 394 gardens, accounting for 88.54% of the total, are concentrated in the four major cities -Baoding, Shijiazhuang, Xingtai, Handan- along the road, showing a pronounced clustering pattern. 2) Over time, spatial agglomeration intensified, forming a linear distribution highly consistent with the route of the Ancient Road. This pattern reflects the Ancient Road's role as a major transportation artery, which promoted urban development and stimulated garden construction. Meanwhile, It also demonstrates the combined influence of physical geographical conditions and the spatial projection of political power. Although limitations in historical records may result in uncertainties regarding exact garden locations, the construction of a historical geographic information database based on arden historical materials not only provides a new perspective for studying historical gardens but also supports the protection and interpretation of cultural heritage routes in the future.

Keywords: Landscape Architecture, Ancient Gardens, Ancient Roads, Southern Hebei, China, Spatiotemporal Evolution

#562 Mapping Micro-Hotspots: Adaptive Thermal Analysis in Heat-Stressed Urban Environments: A Case Study of Texas Tech University

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Abstract

Urban heat is increasing across semi-arid cities due to climate change, widespread impervious surfaces, and exposed grey infrastructure (Abulibdeh, 2021; Ampatzidis & Kershaw, 2020; Block et al., 2012; Konijnendijk et al., 2013). These phenomena intensify the urban heat island effect, posing risks to residents' well-being, thermal comfort, and energy efficiency (Yang et al., 2016). Exposed grey infrastructures, such as wide plazas, roads, and parking areas, are particularly vulnerable to surface heat absorption. Yet few studies provide affordable, site-scale workflows for analyzing microclimate heat variation (Liu et al., 2025). This study develops a methodological toolkit using ArcGIS Pro interpolation workflows combined with low-cost field measurements to assess micro-hotspots on the Texas Tech University campus in Lubbock, Texas. Between 12 pm to 4 pm, we collected paired temperature readings (10 points per hour) using handheld infrared thermometers across three shaded and three unshaded surfaces. Each point was classified by shading element (tree canopy, building shadow, or manmade structure) and sun exposure (full sun exposure, partial exposure, and no exposure) based on direct observation at the time of measurement. Hourly temperature rasters were generated using Inverse Distance Weighted (IDW) interpolation for shaded and unshaded datasets, and difference rasters were created to visualize shade-related cooling effects. We conducted hold-out cross-validation, where 20% of points were excluded from interpolation and later compared against predicted values. We reported both the Mean Absolute Error (MAE) and the Root Mean Square Error (RMSE) to quantify reliability. The analysis revealed sharp micro-scale thermal contrasts, with shaded surfaces consistently cooler than adjacent unshaded zones. Detailed temperature ranges will be reported in the full study. Beyond showing the shading effects, this workflow demonstrates that affordable GIS tools can reliably capture micro-scale thermal variation, while also establishing a replicable framework for thermal analysis that supports students and practitioners. Findings emphasize the importance of integrating vegetation, shading, and selecting appropriate surface materials as practical strategies in heat-stressed urban environments.

Keywords: Urban heat island, Microclimate Variation, ArcGIS Pro, Interpolation (IDW), Heat-Stressed Environments

#593 Seasonal monitoring of Black Vermillion River erosion “hotspots” using Structure-from-Motion Photogrammetry: Estimating sediment from erosional processes

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Abstract

Previous comparative studies determined that the remote sensing technique of Structure-from-Motion Photogrammetry (SfM) can be used to monitor complex riverbanks with lower costs, shorter data collection times, and often higher accuracy than other techniques such as airborne laser scanning (Fonstad et al 2013; Dietrich, 2014; Mirijovsky & Langhammer, 2015) and terrestrial laser scanning (Prosdocimi et al. 2015; Hamshaw et al., 2017). McNair et al. (2025) evaluated the use of SfM to monitor nine study banks defined as erosion “hotspots” by the Texas Water Office of the Black Vermillion River (BVR) in northeastern Kansas at a 0.03-m resolution between Nov. 2020 and July 2022. Drone-based Data was collected six times (seasonally) and volume change was calculated between periods using CloudCompare, an open-source point cloud processing software that can calculate volume change directly between two-point clouds. McNair et al. (2025) determined that SfM accurately estimated areas of active bank erosion but was not as accurate with deposition. Five checkpoints were installed and surveyed at each bank, with uncertainty defined as the combined RMSE of each set of point clouds being compared for each evaluation period. While McNair et al. (2025) reported annual study bank erosion rates, this study evaluates seasonal volume change at each study bank in relation to various erosional processes common in the BVR, such as rotational slump and fall. All study banks experienced minor net deposition between .01 and .03. m 3 /m 2 (of bank face) over the winter of 2020-21 due to low flow and the erosional processes of freeze-thaw and dry ravel. Over the remaining four collection periods, 4 study banks did not experience substantial erosional processes; however, these banks may be more susceptible to erosion at high flows, as there was only one bankfull flow over the study period. Two study banks experienced mass wasting erosional processes, one rotational slump and another fall with the highest erosion rates in the summer of 2022 when the highest flow occurred of 0.5 and 0.94 m 3 /m 2 , respectively Two study banks with the highest clay content, 50% compared to 25% at all other banks, experienced even scour over the bank face but with lower erosion rates, average of .039 m 3 /m 2 . Knowing actual erosion rates associated with these distinct erosional processes could help calibrate and/or validate sediment estimation models that rely on visual inspection of the riverbank, such as Rosgen’s Bank Assessment for Non-point source Consequences of Sediment (BANCS) model (Rosgen, 2006).

Keywords: Riverbank monitoring, Structure-from-Motion, Reservoir sedimentation, erosional processes, remote sensing

History, Theory, and Culture

#20 Spatial Patterns and Value Recognition of China's Maritime Silk Road Heritage

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Abstract

Seaborne exchange along China's Maritime Silk Road condensed trade and cross-cultural encounter, yet we know little about how the spatial organisation of ports, routes and coastal cities conditions which places are recognised as "heritage". Grounded in cultural geography, values-based conservation and the maritime cultural landscape, and informed by world-historical work on the "China Seas", the study asks what spatial patterns characterise Maritime Silk Road heritage, which geographic and socio-economic processes best explain them, and how these dynamics shape the recognition of heritage values over time. A georeferenced inventory of ports, religious and mercantile facilities, navigation aids, fortifications and urban fabric is compiled from national and provincial protection lists and gazetteers. Spatial structure is examined using Moran's I and local indicators of spatial association (LISA) to identify clusters and outliers. GeoDetector is employed to estimate the explanatory power of trade intensity, demographic change, institutional presence and coastal morphology, in combination, for the distribution of heritage sites. Periodisation into premodern, early-modern and modern phases, together with interpretive coding of historic, aesthetic and social values, enables the construction of "value fields": zones where officially recognised heritage values concentrate around network nodes and corridors. The analysis identifies four recurrent exchange zones—the Yellow–Bohai rim, the Yangtze River system, the East China Sea–Taiwan Strait and the South China Sea–Pearl River basin—with marked clustering and spatially stratified heterogeneity that shift over time. Trade intensity combined with cultural-exchange indicators explains heritage patterns better than any single factor, indicating multi-scalar co-production of maritime cultural landscapes and heritage status. Value fields concentrate at river–sea confluences and secondary hubs along coastal–inland corridors, helping explain why some ensembles become anchors in serial nominations and marine-heritage zoning, while others remain peripheral despite similar historical depth. The study develops a workflow that links spatial diagnostics to values-based assessment, usable by planners and heritage practitioners. It clarifies how seaborne landscape networks, mobility and place-making have produced shifting constellations of heritage value over time, and offers guidance for corridor-based conservation, heritage routes, tourism itineraries and waterfront projects that enhance quality of life while respecting historical seascapes. Embedded in the Ministry of Education of China's Major Project in Philosophy and Social Science Research "China's Maritime Heritage", the study reflects on limitations of reliance on official lists, uneven historical proxies and a China-focused scope, and points to future work with participatory documentation and cross-border datasets.

Keywords: Maritime Silk Road, Cultural geography, Heritage values, Spatial analysis, GeoDetector

#79 Shaping LightScapes

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Abstract

Light shapes vegetal, thermal, spatial, and visual landscapes, making life possible. Throughout history, garden makers in different cultures developed ways to harness and integrate solar and lunar light (and shade) toward many ends: plant health, divine spirituality, cosmology, comfort, and sensory delight. Since the birth of the profession of landscape architecture in 18 th century England, designers continued to use light, but in ways that were increasingly visual, scientific, and affectual. How has landscape architecture understood and shaped light as a design medium overtime? Tracking the design of light, both natural and artificial, unravels the discipline's evolving relationship with invisible and ethereal realm of phenomena. Furthermore, it illuminates the discipline's changing relationship to technology and material and the exchange of ideas with allied disciplines. This study joins a host of recent discourses on weather phenomena and atmosphere in field s such as art, architecture, urbanism, geography, film, stage and lighting design, and philosophy (Böhme, 2017; Edensor, 2020; Pallasma, 2014; Deleuze, 1986; Walsh 2025). The paper begins with a brief account of the function of light in the work of select landscape designers from distinct periods (Engler, 2023). Based on their work, it shows that: pre-modernists typically relied on composition light to construct coherent scenes; modernists embraced confrontation light to define space and heighten drama; postmodernists employed alternation light to transform or destabilize space and immerse viewers in luminous environments. The paper then spotlights two emerging landscape designers— Swiss Sean Lally and Belgium Bas Smets . They craft novel light ecologies and atmospheres using new technologies and light sources—LED light, smartphones, holograms, AR and VR—in addition to solar (Smets, 2025; Lally, 2010) . Their projects employ light sustainably and performatively , testing its effects on microclimates, plant growth, human perception, and atmosphere. In their work, landscape is recast in liminal light, one that oscillates between function and affect, real and virtual, human and machine, and earthly and otherworldly. The paper discusses a critical, functional, and affectual element that plays a central role in today's digital culture and climate change, and even dives into outer space, where different lights prevail. It demonstrates ways to make tangible an invisible atmospheric quality and transform it into an essential medium and infrastructure (Erel, 2019). Light is framed as a material instrument capable of shaping responsive ecological and affective environments and landscapes yet to exist.

Keywords: Landscape Light Design, Light & Shadow, Environmental Performance, Atmosphere & Affect, Light Technology & Infrastructure

#118 The "Common Highway": Mississippi River Shipping and the (Doomed) Upper Harbor Terminal Project

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Abstract

The 9-Foot Channel Project, an effort by the U.S. Army Corps of Engineers to tame the Upper Mississippi River through a series of locks and dams, is arguably one of the most influential landscape infrastructure projects of the 20th century. Through this project, the Army Corps piloted a series of strategies for taming the river, making it one of the nation's "common highways" (Ordinance of 1787). This presentation focuses on one of the final additions to the 9-Foot Channel Project, known as the Upper Harbor Terminal (UHT), which extended the navigable shipping channel to include most of Minneapolis' riverfront, allowing for a new terminal within the city's municipal boundaries. While positioned as a critical expansion of the Mississippi's shipping network, in fact the UHT was a pork barrel project pushed through for political reasons that overshadowed both economic and ecological logics. As such, this presentation argues that the project serves as a critical moment in the era of infrastructural investment in North American rivers, marking the turn from an era of ever-increasing river infrastructure to a period of more critical approaches to designing riverfront landscapes. Exploring the UHT as a case study through the lens of landscape infrastructure (Bélanger, 2017), political infrastructures (Winner, 1980; Star, 1999; Larkin, 2013; Anand, 2017), and river colonialism (Worster, 1895; Da Cunha, 2019; Liboiron, 2021) the presentation focuses on two critical time periods: 1937-1968, during the initial planning and construction of the UHT; and 2014 through the present, following the closure of the terminal and its associated locks and dams. Through archival analysis of local newspapers, Congressional records, and Army Corps planning documents, I track the decision to construct the UHT, despite the Army Corps' knowledge that such a project would be a poor economic investment. Next, I compare the first period to the contemporary era, when the decision to close the UHT led to a new phase of landscape design and urban planning. In both eras, the agendas of politicians and engineers contrast with the interests of local community members, revealing an inherent tension in the construction and management of riverfront landscape infrastructure. Ultimately, this case study serves as a cautionary tale that critiques the assumption that investment in large-scale construction projects necessarily benefits local communities. Rather, the UHT Project suggests that the valuing of human-land-water relations over new construction (Kimmerer, 2013; Malterre-Barthes, 2025) might yield more socio-culturally and ecologically rich riverfront landscapes.

Keywords: Landscape infrastructure, Political infrastructure, River colonialism, Mississippi River

#121 Eco-Revelatory Wildlife Design: Synthesizing Theory for Multispecies Urban Narratives

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Abstract

Eco-revelatory design theory emerged in the late 1990s from landscape architecture's engagement with art, aesthetics, and ecology. Its goal was to make ecological processes visible, accessible, and experientially legible to the public, emphasizing function over form. However, within this discourse, fauna were often treated as indicators rather than active participants. Animal-aided design is a more recent theory that emerged from landscape architecture and urban design that diverges from other nature inclusive approaches by positioning species themselves as central stakeholders in a design, emphasizing life cycles, spatial needs, and reciprocal stewardship. Together, these traditions frame new possibilities for understanding urban landscapes as multispecies narratives. Animal-aided design, in contrast, places species at the center, integrating their life cycles, spatial needs, and reciprocal relationships with humans into the design process. We conducted a comparative theoretical review of eco-revelatory design and animal-aided design literature focusing on key publications between 1985 to today that engage around emphasizing aesthetics of natural systems. From this, we identified four recurring principles in both approaches: accessibility, interdisciplinarity, attention to temporal and spatial dynamics, and the use of design as a medium for communication. From our targeted review, we selected three case studies and examined the degree to which these four principles were represented in each case study. Our analysis demonstrates that eco-revelatory design's focus on making processes visible aligns with animal-aided design's emphasis on incorporating the needs of target species. Key shared aspects include: integration of temporal cycles such as migration, nesting, and phenology in design strategies, prioritization of process over static form, aesthetic and legibility strategies that communicate care and stewardship to the public, and interdisciplinary collaboration across ecology, design, and community knowledge. This synthesis shows how design can function simultaneously as the method but also the medium for ecological understanding. Eco-revelatory design establishes the visibility of processes, while animal-aided design emphasizes the lived needs of species. Together, they suggest a framework—Eco-Revelatory Wildlife Design—that treats animals as participants in urban narratives and stories rather than mere indicators based on their presence or absence. This reframing equips designers and ecologists to create landscapes that are ecologically functional, aesthetically legible, and inclusive of more-than-human life. In practice, a framework to treat humans and species as reciprocal stakeholders that interact through designs can break down barriers between landscape architecture and ecology by centering relationships as the medium of creation.

Keywords: Eco-revelatory design, animal-aided design, multispecies urbanism, ecological aesthetics

#160 Colonization Impact on Cultural Landscapes: A Case Study of West Africa, the Caribbean, and Asia from 1500 to 1800

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Abstract

A Ghanaian, a Filipino, and a Puerto Rican, three scholars who once worked together, shared about the lasting legacy of European colonial powers in their respective homelands. This conversation led to the development of a key research question: Are there commonalities and contextual differences in the spatial organization of colonial forts and their surrounding communities? Between 1500 and 1920, Europeans, marked a tremendous number of places with their presence and controlled most of the world's peoples (Osterhammel, 1997). Some of the early colonial empires (Spain, Portugal, Netherlands, and England) built systems to maximize resource extraction from the new territories they colonized, leaving marks on cultural landscapes worldwide, primarily through fortifications - community planning. The physical evidence of this expansionist movement transcends continents, oceans, and nations (Russell-Wood, 1998). To better understand our landscape heritage, a discourse on colonial patterns of navigation and settlement, along with the intentions behind these decisions, is essential. Eurocentric belief systems were central in justifying the political dominance of the colonial world. Europeans mainly determined that all indigenous cultures should be systematically "converted by any means" to Christianity and forced to adopt the language, customs, traditions, and their laws. The 1494 Treaty of Tordesillas divided the newly "discovered" lands outside Europe between the kingdoms of Spain and Portugal along a meridian blessed by the Vatican. All lands west of the meridian (the Americas) purportedly belonged to Spain, and to the east (Africa and Asia), to Portugal. Spain's dominance of the Americas led to further expansion into the Pacific and to the Philippines. Portugal controlled Africa and the easternmost tip of South America, which is now Brazil. Puerto Rico lay at the center of the world divided as a transoceanic port-hub. The Gold Coast (Ghana), was under Portuguese control; the Philippines was under Spanish control. These colonies exemplify the enduring colonial imprint on their cultural landscapes and the transoceanic connection between the Atlantic and the Pacific. The proposed paper examines European occupations and their impact on local landscapes in Ghana, Puerto Rico, and the Philippines. It will compare and analyze the physical attributes of significant places in these countries (strategic locations of harbor towns, town design, and defense structures such as castles, citadels, and forts) and discuss how these structures' architectural and spatial organizations eventually blended into the general vernacular landscape. The paper ends with insights into current globalization activities and the extent to which they transform cultural landscapes.

Keywords: Colonialism, Globalization, Vernacular Landscapes, Cultural Landscapes, Neo and Post Colonialism

#185 A Vulnerable Landscape on a Registered National Landmark Campus: The Loss of Alfred Caldwell's Morton Park at IIT

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Abstract

Sterling Morton Park (Morton Park), on the campus of the Illinois Institute of Technology (IIT) on Chicago's South Side, was designed in the early 1980s by Alfred Caldwell, Prairie School landscape architect and faculty at IIT. Morton Park was Caldwell's last campus project. The two-acre park was distinguished by a central clearing encircled by loosely configured honey locust, ash, and hawthorn trees. The Eastern and Western tree lines pinched into the clearing to shape the clearing into two lobes — the significant spatial characteristic of the park, which it shared with Caldwell's previous design for the Lafayette Plaisance at Detroit's Lafayette Park, which is pinched into three lobes. The park is dedicated to Sterling Morton—grandson of Arbor Day founder J. Sterling Morton and heir to a family legacy of tree advocacy. His father, Joy Morton founded the Morton Arboretum just outside of Chicago. The park embodied a multi-generational commitment to education, stewardship, and ecological research. As a meadow framed by trees, Morton Park offered a respite within IIT's rigorous modernist campus and quickly became a beloved site of student and neighborhood gatherings, including festivals, religious celebrations, and graduation ceremonies. Yet, despite its social value and symbolic resonance, Morton Park survived less than four decades before its destruction in 2016 for the construction of the Kaplan Institute. The rationale for demolition invoked ecological decline—the loss of ash trees to emerald ash borer—as well as institutional priorities privileging architectural expansion over landscape preservation. The loss of Morton Park not only weakened the park settings for student activities but also damaged the holistic understanding of buildings and landscapes of the IIT campus on the National Register of Historic Places (designated in 2005). Through archival research, oral histories, and analysis of campus arboretum documents, this paper situates Morton Park within broader questions of heritage conservation. The case illustrates how modernist campuses often safeguard their architectural integrity while allowing designed landscapes to remain vulnerable and disposable. More broadly, it underscores the challenges of translating landscape knowledge across generations: Caldwell's "gardener's method" relied on intimate, site-specific knowledge of planting and care, yet such tacit expertise proved difficult to transmit within institutional frameworks that favored static architectural preservation over adaptive landscape stewardship. This paper documents Morton Park's trajectory from its creation to its erasure and interrogates the decisions that led to the destruction of a significant landscape on a nationally registered historic campus.

Keywords: Sterling Morton Park, Alfred Caldwell, IIT, Landscape Architecture, Prairie School Landscape

#211 Catalytic Transformation of Jiangnan Mountain Gardens: A Case Study of Hengyun Mountain Villa from Late Ming to Early Qing

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Abstract

In contemporary landscape architecture, catalytic influence emphasizes the active intervention of primary elements or artifacts in the surrounding environment (Rossi, 1984), yet often overlooks historical precedents. This study aims to explore the historical dimension of catalysis, focusing on “community connections” as a catalytic medium—specifically, how interactions among different garden owners and their associated communities of scholars, artists, and others during dynastic transitions have driven the evolution of garden styles. Using the eighty-year landscape evolution of Hengyun Mountain Villa from the late Ming to early Qing as a case study, this research addresses two questions: How do community connections drive catalytic transformations in historical gardens? And how are these catalytic mechanisms linked to socio-political changes? The study employs a combination of historical research and visual-textual corroboration. First, it analyzes poems, garden records, and local chronicles to explore how community networks interact and influence the evolution of garden landscapes. Second, it uses visual-textual corroboration between Wang Hongxu’s Hengyun Shanzhuang Shi Yong and Yang Jin's Picture of Hengyun Shanzhuang , supplemented by maps and field surveys, to connect the micro-level changes in the garden’s appearance with the macro-level context of dynastic transitions. The study reveals three mechanisms that drive the evolution of garden styles: First, technical innovation—the Li family during the late Ming, in collaboration with the garden master Zhang Nanyuan, pioneered the vertical arrangement of the true mountain form, laying the foundation for mountain garden design. Second, cultural continuity—the Zhu family in the early Qing focused on restoration, preserving the original style. Third, style consolidation—during the Kangxi period under Wang Hongxu, the garden reached its peak, and the collaboration between the “patron-artist” community transformed the physical garden into the visual text of Picture of Hengyun Shanzhuang, ensuring its legacy. The study argues that the catalytic transformation of historical gardens is a continuous process driven by social networks. The Li family’s connections between garden owners and craftsmen, and Wang Hongxu’s promotion of collaboration between “ patron and artist, ” reflect how the evolution of garden styles directly responds to the adaptation of cultural practices within political systems. The case of Hengyun Mountain Villa illustrates that gardens and related artworks, such as Yang Jin's Picture of Hengyun Shanzhuang , are products of community collaboration. This research provides a “ community connections-catalytic mechanisms ” framework for the dynamic evolution of historical gardens and offers insights for contemporary mountain garden design.

Keywords: Late Ming and Early Qing Dynasties, Jiangnan Region, Mountain Landscape Gardens, Hengyun Mountain Villa, Evolution of Landscape Style

#223 Catalyzing Local to Global Connections: Landscape as Integrative Strategy

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Abstract

This paper reframes Louis Kahn's National Assembly Complex landscape in Dhaka as an active agent of connection, linking communities, natural systems, historical and cultural narratives within the postcolonial (after 1947) context of Bangladesh. Designed in the 1960s and completed in 1983, the project is often studied through the lens of architecture. However, this study centers modernist architect Kahn's designed landscape as the key integrative framework through which design strategies and local knowledge were brought into dialogue. Set within the political and environmental conditions of a newly independent nation, the landscape of the Assembly Complex served as more than an aesthetic or spatial setting. It became a catalytic ground for cultural expression and public engagement. Through the careful orchestration of water, landform, vegetation, and open space, Kahn and his collaborators created a civic landscape that seemingly draws from indigenous hydrology, local spatial traditions, and community use patterns. The resultant design invites collective participation, supports climatic resilience, and reflects deeply rooted cultural meanings. This paper argues that the landscape functions as a connective tissue, bridging global design ideologies with local values and linking state institutions to the everyday experiences of citizens, particularly in the time of globalization. The site's integration of reflective water bodies, shaded walkways, and gathering spaces creates a democratic spatial framework where people interact with governance not only through politics but also through their lived experiences in shared spaces. In doing so, the project models how landscape can serve as a medium of integration. That is- merging imported architectural languages with localized, community-driven knowledge. This research follows a multimodal qualitative method. Such method includes archival research, on-site spatial analysis, and interviews of scholars and professionals who worked with Kahn on the project. By foregrounding the role of landscape in this iconic project, the paper contributes to the ongoing discourse on how landscape architecture can catalyze connections between varied knowledge and actions. It demonstrates how landscape functions as an active agent of connection. By examining Kahn's engagement, this paper demonstrates how his professional expertise, combined with various local strategies and knowledge, can foster meaningful relationships between communities and the spaces they inhabit. Ultimately, the Complex offers a precedent for landscape architecture that is participatory, place-based, and politically resonant. Holistically, viewed through a historical and theoretical lens, my paper examines how landscape functions as a medium of connection and mediation in the built environment, nation-making, and global design.

Keywords: Modern Landscape, Louis Kahn, Globalization, Landscape as an Agent, Landscape as a Catalyst

#224 Blurring the Bright Line – The Evolution of Military Eco-regions

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Abstract

The term “Bright Line” was first used by physicists to describe the distinct visual change between spectra, then finding its way to United States constitutional law as “Bright Line Rules” - standards that produce clear and consistent results(Legal Information Institute). Eventually, a bright line came to describe both the physical delineation and distinct legal frameworks that govern United States military and civilian landscapes. As the US military grew beyond the obvious physical boundaries of revolutionary war forts and the temporary war-time encampments in public landscapes, the nature of training and the pressures of security and public safety evolved to necessitate clear and distinct laws governing defense landscapes. From funding, acquisitions and alterations to contamination and water quality to endangered species and public access, the rules and oversight governing military landscapes have severely diverged from non-military landscapes. Yet, changes in urban growth and regional climates over the past 70 years, have resulted in an increasingly blurry if not entirely transparent “Bright Line” between these two landscapes. The pressures of climate and the threats of ecological change - in particular the impacts of storms and flooding, are pushing the Department of Defense (DoD) to explore new scales of influence. Strategic military regional planning has developed pathways to influence public and private lands. The implications of these policy measures turn very real as the role of nature-based infrastructure (NBI) becomes further engrained in DoD practice (Installation Resilience 2025). The capacity for NBI to beneficially impact military installations is heavily tied to the types of ecological or hydrological system under alteration. The scale at which NBI function dictates that, in many instances, the implementation of NBI happens beyond the bright lines of military bases. The many NBI techniques employed to dampen the impacts of flooding, erosion, and saltwater intrusion require regional planning and strategic scales of implementation. Yet, the planning, design and funding of these infrastructures are inherently of DoD origin – guided by their needs and interests. The emergence of landscape architecture projects, design experiments, and planning frameworks specifically for the DoD, marks a turn in how regional ecological planning is being studied and implemented. Policy analysis from the 70 year evolution of the Sikes Act, mapping studies from the Readiness and Environmental Protection program, as well as a description of the work of the Natural Infrastructure Lab at the University of Virginia provide a basis for the analysis of this history and current trajectory.

Keywords: Military Eco-regions, Regional Planning, Nature Based Infrastructure

#228 Carbon Water: The intertwined histories of water and energy in the landscapes of Kuwait City

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Abstract

Kuwait City, like many other oil rich cities within arid regions, faces a pressing issue: absolute water scarcity. 1 This research begins with the era of early state formation in the nineteenth century examining the conditions of water scarcity of the pre-modern city. It then investigates the emergence of desalination infrastructure in the early twentieth century, its links to the nascent fossil fuel economy, and their influence on the arid landscapes of the city as it modernized over time. In the late nineteenth century, the municipal water supply of Kuwait City was localized to areas of urban life, because it was too expensive and energy intensive to transport water beyond certain spatial limits. The emergence of desalination at the beginning of the twentieth century, resulted in an expansion of the water types used in everyday consumption and the spaces in which it could be found. This shift coincided with the development of the city's first modern masterplan that heavily relied on this new supply of water, impacting the shape and scale of the urban fabric, the design of homes, and an emerging water intensive park system. However, it Was less known that this new water was energy intensive to produce and relied heavily on fossil fuels. 2 Today, Kuwait City is experiencing multiple risks as a result of this reliance on desalination including environmental degradation, unsustainable urbanism, and dwindling fossil fuel supplies needed to run the desalination plants. However, the city also has one of the highest rates of water consumption per capita globally. 3 This paradox between the risks of desalination and its accelerating rates of consumption result from the historic urban development that has created this heavy water reliance today. 4 This research makes visible the historic links between the development of desalination, its invisible energy networks, and the landscapes it creates today. Kuwait City is a bellwether for the environmental, urban, and hydrological risks that other arid urban areas will face in the coming decades. The increased use of desalination is predicted to reshape global capacities for urbanization within areas of historically limited freshwater supply and the types of landscapes that were previously limited within these urban areas. 5 Through this historic examination, we can find insights into how landscape architects can design with water scarcity to alleviate their reliance on technologies like desalination, to better navigate a future global energy transition and increasing water security concerns.

Keywords: Water , Desalination, Arid , Energy , Urbanism

#233 Geoff McLean: Whimsically elevating the everyday at the precipice of postmodernist landscape architecture

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Abstract

Geoffrey Duart McLean (1942 - 2025) was a graduate of North Carolina State University's landscape architecture program, and was active in Raleigh, NC from 1969 through the early 2000s. His work was shown in Landscape Architecture magazine only once, in July 1976, when he won an ASLA Merit Award for Raleigh's Eastgate Park. Yet, it appears he was working at the leading edge of the profession in the early 1970s—even if his work was not reaching a national audience. His design for a sedimentation trap at Eastgate Park was an early example of artful stormwater design. And his 1972 design for the landscape surrounding the Burlington Nuclear Lab at North Carolina State University is a landscape at the precipice of postmodernist landscape architecture. Well before Charles Moore created Piazza d-Italia, Martha Schwartz made her Bagel Garden, and George Hargreaves wrote on postmodern landscape architecture, McLean was elevating everyday items like manhole covers in a manner resembling pop art. Rather than using modern materials like concrete in forms that followed function, he was using the traditional local red brick in playful ways. Through archival research–reviewing sketchbooks and other materials–and an oral history interview with McLean in July 2022, we were able to document some of the thinking behind the Burlington Nuclear Lab Area—including McLean's interest in infusing landscapes with whimsy. We reviewed writing on postmodernist design and identified ways McLean's work overlapped–including its integration of landscape architecture and public art, its playfulness/humor, its regionally specific materials, its elevation of everyday materials to art, and its indeterminacy of reading. Like Robert Venturi, McLean rejected Mies van der Rohe's idea that "less is more"--and did not have strong roots in minimalism–in contrast with some other postmodernist landscape architects. McLean did not label himself a postmodernist and ultimately refocused his practice on flood control. But his work on the nuclear lab suggests postmodern ideas found in architecture by the 1960s made their way into landscape architecture in the early 1970s–before histories typically acknowledge. McLean's work highlights the need for better documentation of significant works by 20 th century landscape architects who weren't well connected to the historic thought centers of the profession to ensure these landscapes are preserved and incorporated into histories. Shortly after we began documenting the Burlington Nuclear Lab Area, one of its sculptures was destroyed–with the approval of architects unaware of its significance.

Keywords: Postmodernist landscape architecture, Regional landscape history, Nuclear lab landscape architecture, Southeastern U.S. History, Campus landscape architecture

#245 Garments as Ground: Material Politics in the Anthropocene

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Abstract

This study examines how fashion imagery mediates environmental perception and communication through the frameworks of feminist materialism and trans-corporeal theory. Drawing from Stacy Alaimo's concept of trans-corporeality, which situates bodies as porous and interdependent with their material surroundings (Alaimo 2010), the research asks: How might fashion lookbooks operate as visual infrastructures for perceiving ecological entanglement? How can speculative garment imagery expand the representational and communicative tools available to landscape architecture in the Anthropocene? Fashion's visual systems, particularly the lookbook, offer an underexplored model for environmental storytelling. By aestheticizing materiality, desire, and care, lookbooks can shape how audiences perceive the more-than-human world. This project situates the fashion image as both an aesthetic and epistemic tool within landscape practice. The research integrates speculative design, visual analysis, and counter-mapping of material histories. Using AI-assisted image generation informed by photographic archives, historical garment documentation, and textile databases, a series of speculative lookbook images were created. These images reimagine garments as spatial mediators situated within post-industrial and post-colonial landscapes. To ground these visual experiments, material histories of fibers (e.g., wool, cotton, flax, and leather) were traced through secondary research into their ecological, economic, and cultural trajectories. These findings were visualized through countermapping, a method that overlays production networks, extraction sites, and ecological consequences to expose the spatial politics embedded in seemingly ordinary textiles. Together, these techniques constitute a feminist materialist methodology that merges visual speculation with archival and spatial analysis. The research demonstrates that speculative lookbooks can operate as critical instruments of environmental communication, leveraging fashion's affective power to shift how environmental issues are perceived and felt. The AI-generated imagery exposes how fashion's visual languages can simultaneously reproduce extractive ideals and open space for more reparative, situated forms of representation. This aesthetic and ethical tension reveals the potential of design speculation to visualize ecological interdependence and unsettle anthropocentric narratives. By reframing textile as terrain and clothing as communicative ground, the project positions fashion as a method of landscape inquiry. Drawing on Barad's (2007) notion of intra-action and Haraway's (2016) call to "stay with the trouble," the Landscape Lookbook emerges as a research platform linking material history, digital speculation, and feminist critique. The work proposes a new approach to environmental communication that mobilizes aesthetic practice as a tool for ecological literacy, spatial awareness, and collective imagination.

Keywords: Trans-corporeality, Feminist materialism, Environmental communication, Countermapping, Speculative Design

#247 Beyond Scenic Aesthetics: Mapping the Hydro-Legacy of China's West Lakes as Adaptive Models

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Abstract

This study investigates the historical wisdom embedded in the landscape construction of China's West Lakes (WLs) and its implications for modern urban lake management. Focusing on 81 WLs documented before 1911 AD, the research employs a landscape historiography approach, integrating GIS mapping, historical records, and qualitative analysis to explore their spatial distribution, functional evolution, and cultural significance. Key findings reveal that WLs were predominantly concentrated in the Jiangnan Water Town Cultural Zone (38 lakes), aligning with China's historical water conservancy development and the "harmony between humans and nature" philosophy. Their spatial distribution correlates with major river basins, particularly the Yangtze River Basin (34 lakes). Temporally, WLs emerged as early as the Han Dynasty, with their evolution influenced by socio-political stability, economic prosperity, and administrative priorities. Initial functions were categorized into three types: water conservancy (flood regulation, irrigation), urban defense (moats, soil excavation reservoirs), and Feng Shui or secular purposes (religious release ponds, leisure spaces). Spatially, shown in the mapping result, WLs exhibited four water-source relationships: foothill catchments, river confluences, spring-stream systems, and artificial diversions. Three city-lake spatial patterns were identified: separated, adjacent, and embedded, forming regional landscapes such as "Mountains/Hills–WL–Cities–Water" or "WL–Cities–Water." The scenic elements of WLs encompassed natural features (mountains, waterfalls), water infrastructure (dikes, sluices), human settlements, secular structures (temples, pavilions), and cultural activities, often immortalized in poetry and the "Eight Scenic Views" system. The study highlights historical wisdom in WL construction: (1) a holistic approach integrating ecological, urban, and hydrological systems; (2) eco-techniques like silt reuse for stabilizing shorelines; (3) dynamic management through iterative dredging and adaptive reuse; and (4) landscape aesthetics blending nature with literati culture. These principles offer critical insights for modern challenges such as water pollution, ecological degradation, and cultural discontinuity in urban lakes. Recommendations emphasize interdisciplinary collaboration, systemic water management, and embedding local culture into contemporary designs to enhance ecological resilience and cultural identity. By bridging historical TEK (Traditional Ecological Knowledge) with modern practices, this research underscores WLs as models of sustainable human-environment symbiosis, advocating their preservation as dynamic cultural landscapes rather than static relics. The findings contribute to global discourse on urban lake governance, heritage conservation, and ecological restoration.

Keywords: West Lakes, historical landscape, traditional spatial typology, traditional ecological wisdom, cultural heritage

#264 Reframing Cultural Landscape on Florida's Gulf Coast: Spatial and Archival Insights into Heritage at Climate Risk

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Abstract

Cultural landscapes are challenging to define and preserve due to their temporal fluidity, diffuse boundaries, and divergence from conventional preservation frameworks. Although institutions such as the National Park Service have visually documented historic sites, these efforts often isolate sites from their broader spatial, cultural, and environmental contexts. This fragmented approach limits cultural understanding and constrains preservation strategies, particularly as many coastal cultural landscapes now face intensifying threats from climate change. Addressing this gap requires a geographically connective framework that situates individual sites within broader landscapes shaped by cultural practices, environmental conditions, and increasing climate risks. Our study looks at cultural landscapes along Florida's Gulf Coast to explore the intertwined histories of human settlements and estuarine ecologies, past and present. Aquaculture has been a vital economic driver for these landscapes over time. Archaeological elements such as indigenous shell mounds and working waterfronts provide tangible evidence of enduring fishing cultures. Building on this, our research evaluated the maritime heritage of three Gulf Coast towns through archival research, precedent studies, and historical records, complemented by a review of federal maritime preservation laws. These cultural insights were integrated with spatial buffer analyses to assess site exposure to flooding. Our findings reveal the interconnectedness of cultural and environmental histories while exposing their vulnerabilities to climate change. An inventory of historic sites along the Florida Gulf Coast enabled our study to define cultural typologies that rooted individual sites within larger spatial patterns. Some communities historically developed as regional trade ports with industries tied to shipping and transport, while others remained small fishing villages centered on commercial fishing and seasonal harvests. These distinct economies shaped their land use patterns and continue to influence how each community experiences and responds to the impacts of climate change along their coastline. Shell mounds likewise illustrate enduring aquaculture traditions but are increasingly situated within high-risk flood zones, raising questions about how such sites might be interpreted, protected, or adapted under future climate scenarios. This research demonstrates how identifying historic sites and analyzing their landscape connections provides a productive framework for understanding place-based heritage and associated preservation concerns. The combined cultural and spatial insights offer actionable information for local governments, heritage practitioners, and community organizations as they plan for climate adaptation, prioritize at-risk resources, and develop more context-sensitive preservation strategies. By situating heritage within its larger landscape system, this study supports decision-making processes that align cultural values with resilience planning.

Keywords: Cultural Landscape, Historical Heritage, Climate Risk, Gulf Coast, Archive

#278 From Spectacle to Life: Reclaiming Vernacular Urbanism through the Pujing Temple Network in Quanzhou

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Abstract

This paper examines Quanzhou, a historic coastal city in southern China, with its unique Pujing Temple system, a vernacular spatial governance rooted in folk belief and community engagement. Using Guy Debord's concept of the "society of the spectacle," the paper points out that contemporary urban planning is increasingly trapped in the logic of visibility. For example, seemingly people-oriented urban templates such as the "Five-minute Living Circle" are often alienated into visual symbols that are displayed and standardized in practical operations. Urban spaces are more like designed "stages" rather than real living places. The Pujing Temple system originated from local religious needs and evolved as a bottom-up, community-managed network. Temples functioned not only as sacred spaces but also as key nodes of neighborhood identity, social cooperation, and everyday governance. As a long-term autonomous system formed by local society, the Pujing Temple system has historically constructed a decentralized, resilient, and deeply rooted spatial order, covering multiple functions such as festivals and ceremonies, community collaboration, and disaster response. However, many informal temples have disappeared due to urban renewal, and officials tend to preserve them as spectacular heritage, devoid of social and community vitality. Although the physical zoning pattern of Pujing Temples still exists in Quanzhou, its core spirit of self-organization and community autonomy has largely disappeared. From the perspective of urban planning, the Pujing Temple system can be considered an informal planning tool. It is based on shared traditions, practices, and beliefs rather than technical drawings, institutional documents, or legal restrictions, reflecting the vernacular capacity of self-organizing and spatial adaptation. This bottom-up governance model of spontaneous urban growth transcends official planning. Through historical analysis, spatial documentation, and narrative inquiry, this paper argues that the decline of the Pujing Temple system reflects not only the loss of local culture but also the division between functional rationality and lived experience, planning logic, and community memory in modern Chinese cities. Restoring its values may lead to more localized, inclusive, and resilient planning that promotes public places that once again serve daily life rather than spectacle. Ultimately, this paper proposes a bottom-up approach reconnecting planning with cultural memory, social practice, and shared space-making, transcending visual templates and performance orientation, and rebuilding a symbiotic urban life. The spatial wisdom of Pujing Temple in Quanzhou not only revives local traditions but also inspires dynamic urban governance in diverse cultural contexts.

Keywords: Pujing Temple System, Community-based Urban Governance, Vernacular Urbanism, Spatial Resilience

#287 Research on the Structural Characteristics and Ecological Wisdom of the Symbiotic System in the Wenyangtian Agricultural Heritage Site.

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Abstract

As an ancient agricultural civilization and one of the world's three major agricultural origin centers, China has accumulated millennia of farming history and civilization, demonstrating immense value in maintaining biodiversity, ensuring food security, protecting the ecological environment, and transmitting farming culture. As the material carriers of agricultural civilization, agricultural cultural heritage sites integrate biodiversity, traditional agricultural knowledge, technology, and landscape, serving as typical representatives for studying Chinese agricultural history and agricultural civilization. This study focuses on Wenyang Tian, located on the northern alluvial plain of the Dawen River—the largest tributary in the lower reaches of the Yellow River within Shandong Province. It is a significant Chinese agricultural heritage site and one of the five major concentrated farmland areas along the Yellow River, playing a crucial role in ensuring the supply of diverse agricultural products along the Yellow River, optimizing the agricultural spatial layout of the region, and advancing the construction of the "Taishan Granary". The study unfolds in three dimensions: tracing the evolution of the Dawen River system and the historical development of Wenyang Tian, elucidating the changes in water systems, hydraulic engineering, farmland configurations, and settlement patterns across different periods; Classifying the Wenyang Fields Agricultural Heritage Site as a composite system comprising natural substrate, water management systems, farmland systems, and settlement systems. Within the constraints of the water network, a unified data collection and processing standard is applied to construct a settlement subsystem-farmland subsystem - Water Network Environment Subsystem symbiosis evaluation model for the agricultural heritage site. The Lotka-Volterra model is applied to quantify the force coefficients and symbiosis levels of each subsystem, categorizing symbiosis patterns into four types: mutual benefit, settlement-biased benefit, farmland-biased benefit, and water environment-biased benefit. This analyzes the coupling relationships and symbiotic mechanisms among “water-fields-villages”; Finally, the ecological wisdom of Wenyan Tian agricultural heritage site is constructed from three dimensions: the wisdom of spatial planning in agricultural production and urban-rural settlements, the cyclical wisdom of farming systems and water management systems, and the wisdom of transmitting farming culture and technical knowledge. In summary, dissecting the symbiotic mechanisms of the Wenyang Tian agricultural heritage site contributes to optimizing the spatial structure of agriculture along the Yellow River, enhancing land use efficiency, and providing valuable insights for advancing high-quality development in the Yellow River Basin and preserving China's traditional agricultural civilization.

Keywords: Wenyang Tian, Symbiotic Mechanism, Lotka-Volterra, Ecological Wisdom

#297 A Study on the Characteristics of Landscape Imagery and Emotional Perception in Tang Poetry from the Perspective of Cultural Psychology

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Abstract

[Introduction] Within cultural psychology, landscapes are viewed as visual carriers of shared emotions and cultural meanings. The landscape perceptions articulated in Tang-dynasty poetry demonstrate coherent views of nature that continue to resonate with contemporary audiences. To provide theoretical support for enriching cultural qualities and emotional expressiveness in modern landscape architecture, this study adopts an interdisciplinary approach to examine the emotional tendencies embedded in landscape imagery across Tang landscape poetry. [Methods] The study employs the text-mining tool ROST CM6 and the classical Chinese poetry language model BERT-CCPoem. Landscape-related lexical items were extracted from The Complete Tang Poems (Zhonghua Book Company, 1960) accessed through the National Digital Library of China. Based on these extracted terms, we analyzed the emotional polarity of poetic lines in which the terms appear, enabling a systematic assessment of the emotional characteristics associated with different landscape categories. [Results] The key findings are as follows. (1) Landscape imagery can be broadly classified into natural and cultural categories. Natural imagery includes celestial, terrestrial, mountain, and water elements, while cultural imagery comprises architectural and mythological elements. (2) Natural imagery appears significantly more frequently than cultural imagery, with approximately 450,000 versus 80,000 occurrences. Among natural elements, “spring wind” has the highest frequency (around 1,200 times), whereas “immortal” is the most frequent cultural element (approximately 320 times). (3) Emotional responses differ across landscape types. Architectural imagery exhibits the highest proportion of positive emotion (62.09%), followed by habitat, mythology, water, and terrestrial imagery. Celestial imagery has the lowest proportion of positive emotion (5.97%). These patterns suggest that geographical and environmental contexts substantially shape emotional perception in Tang poetry, providing valuable insights for regionally responsive landscape design. [Discussion] The application of contemporary psychological analysis to literary works from different historical periods can deepen our understanding of landscape aesthetics and enhance cultural empathy in the teaching and practice of landscape architecture. Such approaches can also clarify how traditional aesthetic values influence emotional responses to ecological environments. [Conclusion] Grounded in cultural psychology and classical Chinese landscape theory, this study identifies core aesthetic and emotional features of Tang landscape poetry that reflect enduring preferences for ecological landscapes. The findings offer conceptual support for culturally informed strategies in urban green-space renewal and provide a pathway for translating traditional landscape aesthetics into contemporary landscape design.

Keywords: Landscape Architecture, Cultural Psychology, Landscape Imagery, Traditional Chinese Gardens, Semantic Analysis

#306 Austin Creeks: A Bicentennial Horizons '76 Project

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Abstract

The mid-1970s were a time of social stress and political turmoil in the United States. However, as part of the nation's Bicentennial celebrations, communities and organizations nationwide undertook activities as gifts to the country. The American Revolution Bicentennial Commission, founded on July 4, 1966, promoted and organized these efforts into three categories: 1. Heritage '76 to revisit history and put it into perspective; 2. Festival U.S.A. to encourage expanding knowledge of the country and welcoming visitors; and 3. Horizons '76 to undertake at least one major project that reflected the pride, priorities, and hopes of a community. This paper examines one of the Horizon '76 projects in Austin, Texas: Austin Creeks . It presents three contextual perspectives: first, how the nation celebrated past significant anniversaries of independence; second, the specific context of the Bicentennial projects, focusing on Horizon '76 activities; and third, discussions about urban challenges and environmental issues during that period. In the early 1970s, Austin was the second-fastest-growing city in America, and its small-town identity was undergoing a transformation. It was also a period marked by several environmental initiatives, particularly the beautification of Town Lake, which was created as a result of damming part of the Colorado River. The authors of the Austin Creeks project saw opportunities to extend such efforts through larger-scale urban design. In part, the study drew on Austin's comprehensive plans from earlier in the century, which called for parkland along the creeks. However, it also expanded the benefits of such ideas by incorporating the then relatively new concepts of urban greenways. The paper highlights how a commemorative moment catalyzed long-standing planning visions, advanced emerging ideas about urban ecosystems, and reflected the interplay between civic identity and environmental design. This example illustrates how local Bicentennial initiatives both echoed national trends and left legacies for urban landscapes.

Keywords: Austin, Greenways, Urban Creeks, Bicentennial

#313 Landscape Characteristics and Spatial Correlation Mechanisms of Town-Water Interaction in Canal-side Towns of Shandong, China

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Abstract

【Objective】 As the only linear World Cultural Heritage site relying on waterways and hydraulic engineering, the Grand Canal requires exploration of the dynamic coupling mechanisms between towns and water systems as a critical component of its holistic conservation framework. This study focuses on the Shandong section of China's Grand Canal, analyzing the evolution of town-water interaction landscape characteristics in canal-side towns over time, summarizing their coupling mechanisms, proposing a model integrating coupling mechanisms–cluster protection–collaborative optimization, and developing a novel approach for the holistic conservation of the Grand Canal cultural landscape. The aim is to provide strategies for the systematic preservation of World Cultural Heritage. 【Methods】 The study area encompasses the Shandong section of China's Grand Canal. At the watershed scale, the interaction landscape characteristics of canal-side settlements at key historical nodes were summarized. For analyzing town-water interaction landscape features, a hybrid model combining graph neural networks and causal graphs was employed: graph structures expressed the topological relationships of town-water coupling, while causal graph theory analyzed the mechanisms of town-water interactions and decoded the spatial morphological characteristics of "water–canal–town" systems. For examining town-water correlation mechanisms, multi-level spatial overlay and image segmentation were used to classify watershed landscape correlation features. Simultaneously, XGBoost and SHAP models were applied to analyze nonlinear town-water coupling relationships, track the spatiotemporal evolution of canal-side towns, and uncover their interaction mechanisms. At the watershed scale, multi-level spatial overlay and image segmentation divided the canal-side settlement landscape into characteristic zones. SHAP combined with neural network coupling coordination analysis explored the association patterns of "water–canal–town" systems. At the settlement scale: spatial expectation-maximization clustering categorized canal-side settlement landscape types, and spatial simulation algorithms mapped their distributions. 【Results】 The findings reveal: (1) Five typical canal-side settlements and four major developmental nodes were identified; (2) A significant positive correlation exists between the proliferation of hydraulic structures and the development of canal-side towns, whereas limited hydraulic infrastructure shows no statistically significant correlation with urban growth. 【Conclusion】 The presence of hydraulic structures constructed during the Grand Canal's development facilitated urban growth, while urban development reciprocally influenced the canal, giving rise to hydraulic heritage intrinsically linked to the Grand Canal.

Keywords: Landscape architecture, Historical and cultural heritage, Town-water interaction, Grand Canal

#344 "shopping" for landscape futures: the catalog as participatory method

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Abstract

Design communication and community participation are key methods to forming democratic design practices. To forward just community engagement strategies, landscape architects are tasked with involving community members in the work itself by both listening to their needs and collaborating with their visions of a future landscape (Yang, 2024). This paper identifies the catalog as a conceptual tool for design participation, a method which allows for landscape end users to “shop” for futures for their built environment, and acts as a tool for users to make informed design decisions. Shopping has long been an important tool of choice, a mediated form of decision making where consumers make selections with the help (or the coercion) of ads, salesmen, demonstrations, showrooms, and catalogs. Once composed together, these selections form an environment that the consumer has curated themself. Flipping through a catalog is both a pleasurable escape and a hopeful method of imagining, the consumer given a “renewed sense of power and authority to pick and choose among available social options” (Elfline, 2016). This paper investigates the history of the mail order catalog as a design sales technique and as a methodology for design communication and participation charting its use by Sears, in the formation of the experience economy, and its appropriation by Stewart Brand for the 1960s environmental movement . This paper forwards theories of participation that activate the decision making potential of landscape end users, where the catalog becomes a tool to decentralize design authorship (Barthes, 1977) while "simultaneously inventing and documenting" ways of life (Smithson, 1956). The paper is organized into three sections: the first describes the catalog as a tool for decision making, the second explores it as a form of advertising, and the third theorizes the catalog as forming its own dematerialized “site,” an environment that is first created within its own pages. Through these explorations, we forward a method of collaborative design, where options are presented within the catalog and then combined, modified, and built upon by the public, balancing democratic design processes with the need for efficiently realizing designs. Employing theories of consumerism and authorship, this paper takes the tools of shopping seriously as a way to co-create, understand, and engage with landscape sites.

Keywords: shopping, co-design, design history, participatory methods, design communication theory

#351 The Vacancy Paradox: Creating New Meaning Through Landscape Perception

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Abstract

Vacant land is often described in contradictory terms: as both empty and overgrown, absent and excessive, forgotten and unruly. This paradox reveals the limitations of conventional public discourse, which still tends to frame vacancy as a problem to be solved – a void to be filled, a blight to be remediated, a wasteland to be made “useful”. Solutions to this perceived problem typically range from Sisyphean regimes of mowing to colonial-settler tinged notions of urban agriculture to architectural fantasies of novel re-programming. Yet in cities like Birmingham, Alabama, where there are over 20,000 vacant lots and growing, these propositions hit limits of scale, economy and often can appear to ignore the lived experiences and socio-historical narratives of the residents in these neighborhoods. This paper first explores existing conceptual frameworks that allow us to see previously developed land not as a void, but as a dynamic, layered condition—one shaped by ecological succession, historical memory, and cultural perception. Building on Gandy’s “unintentional landscapes” and Solà-Morales’ “terrain vague”, the work considers how we can further develop these conceptual frameworks into a way of working within these landscapes that sidesteps the trappings of solutionism - seeing these sites not as passive remnants, but as active, fulsome terrains. This work proposes that this methodology can only start with a close attention to site. A first development of this methodology is tested through a series of film and sound-based field recordings conducted in Birmingham, Alabama across a series of contiguous vacant lots. These recordings offer a method for engaging with the lived experience of these landscapes and open the door for the “doing of something” without reducing sites to a problem in need of a solution. The recordings are used not just as a way of documenting existing conditions, but as active tools of projective speculation and design. By focusing on corporeal, sensory experience, the paper proposes not just a conceptual framework, but also a way of working within formerly developed sites that reframes vacancy as a fulsome condition, rich with life and avoids reductive solutionist narratives.

Keywords: Landscape architecture, Vacancy, Void, Perception, Paradox

#357 Other Ontologies: Relational approaches to more-than-human kinship and design

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Abstract

This panel advocates for multiple approaches to multispecies kinship and relations – including Indigenous traditional knowledge, the feminist ethic of care, and queer ecologies – to more deeply appreciate how humans and the natural world are profoundly enmeshed. Although each panelist engages these frameworks differently, together they call for a more expansive conception of relationality; one that situates all species as kin, recognizes more-than-human agency, and attends to the social, political, material, and emotional dimensions of interdependence (Houston et al., 2018; Plumwood, 1993; Tsing et al., 2024). Panelist 1 explores how new-materialist approaches to landscape architectural thinking can connect designers with the more-than-human through an aesthetic of affect and assemblage. This talk conceptualises how kinship emerges from affective connections to Deus sive Natura ("God or Nature") which Spinoza (2002) argues are two names for the same underlying reality thus establishing political dialogues between all things vital (Connolly & Rosier, 2020). Panelist 2 addresses the necessity and political utility of our emotions in moving toward a radical relationality that embraces multispecies kinships. This talk will extend the discourse on multispecies justice with the ethic of care and empathy. It will connect that argument to how a landscape perspective can support a way of being that embraces interdependence (a relational ontology). Panelist 3 discusses how multispecies dynamics ensnare all aspects of place, including both built and social infrastructures (Uehara 2019). This talk utilizes the social/ecological transformation of Long Island's Great South Bay as a case study for considering multispecies dynamics, while emphasizing how multispecies design approaches can serve as a critical tool for navigating the possibilities and pitfalls of adaptation to environmental change. Panelist 4 frames the Santa Cruz River Urban Wildlife Refuge as reconciliation in landscape architecture. Once uniting communities, species, and ecologies, the river was fractured by extraction and neglect. Community leaders are shifting this narrative. Guided by de-colonizing frameworks of relationality, eco-revelatory design, and animal-aided planning, this project advances locally relevant strategies for resilient systems of socio-ecological stewardship. After the presentations, the moderator will open discussion on the relationships among diverse ontologies, multispecies kinship, and place as an assemblage of human and more-than-human entanglements. We will also consider how to address relationality in scholarship and design when it continually shifts across time and space (Barnett, 2022; Robbins & Marks, 2010), and whether radical relationality represents a return to or a reframing of Indigenous Traditional Knowledge, or a reaction to patriarchal/colonial frameworks.

Keywords: relational ontologies, multispecies kinship, assemblage theory

#370 Reimagining Suburbia: James C. Rose and the Utopian Front Yard

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Abstract

Utopian visions offer frameworks for reimagining how societies might optimize living, aspiring toward existence rooted in self-awareness and personal growth (Fishman, 1987; Knight, 1988; Mumford, 1921). In post–World War II America, the suburban front yard became an emblem of the 'American Dream,' symbolizing domestic stability and order (Archer, 2005; Girling, 1994; Jackson, 1985; Schroeder, 1993; Stilgoe, 1988). It built on earlier ideas of suburbia from A.J Downing in the 19th century and Hubbard & Kimball in the early 20th (Bradney, 2005; Downing, 1859; Hubbard and Kimball, 1967). Mid-century landscape architects used the front yard to negotiate house, car, and street, showing how culture shapes the built environment. Entry gardens acted as transitional zones, mediating private and public realms while integrating the automobile into domestic life. Popular media—Life, Better Homes and Gardens, Sunset—promoted these ideals, reinforcing conventions of order, utility, and coherence (Church, 1983; Eckbo, 1950; Salomon, 2017; Walker and Simo, 1994). James C. Rose (1913–1991) stood apart from this mainstream (Cardasis, 2017; Rose, 1958; 1965; 1987; Snow, 1967). Working in New Jersey, Rose sought designs that provoked introspection and emotional response, turning routine entry into reflection and awareness. He rejected the ornamental lawn and instead conceived the front yard as a ceremonial, spiritual threshold. This paper explores Rose's reinterpretation of the front yard as utopian landscape—grounded in sensuality, spatial fluidity, and human-centered design. It examines three Rose gardens between 1950 and 1987: Concoran Garden (1951), Werlin Garden (1983), and Bach Garden (1987). A qualitative analysis of drawings and photographs traces the evolution of his strategies, focusing on how entry sequences heighten user experience, bridging psychological and physical realms. His gardens fused functional needs—driveways, paths, parking—into fluid compositions while reconfiguring them as immersive transitions through layered materiality, texture, detail, and scale. The driveway became part of a unified design; stairs, courtyards, stone, water, and plantings created a continuous narrative unfolding over time, connecting users to solitude, silence, slowness, and time-awareness. At the core of Rose's vision is critique of suburban conformity and a call for individuation. He treated landscape not as decoration but as a medium of transformation. His front yards proposed moral and aesthetic experiences, dissolving boundaries between function, beauty, and inner life. By integrating sensuality, fluidity, and reflection into routine, Rose positioned the front yard as utopian possibility—distinct from Victorian picturesque and modernist paradigms.

Keywords: mid-century landscape architecture, "American Dream", driveway, moral and aesthetic experience, spatial fluidity

#398 An HUL Assessment for Small Cultural Heritage Sites in Urban Areas: Framework, Methodology, and Empirical Research

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Abstract

The research is grounded in the perspective of urban historical landscape (HUL), exploring the connections between small cultural heritage sites (SCHSs) and a broader urban context, as well as the general public and communities. By integrating various types of data, an assessment framework and methodology comprising six dimensions(Heritage Value Characteristics, Space Environment Characteristics, Area Social Development, Area Cultural Linkage, Public Cognitive Characteristics and Community Cognitive Characteristics) and 24 indicators were established and applied to the empirical research of 30 SCHSs in the Beijing section of the Grand Canal. The research findings are as follows. (1) The six dimensions exhibit distinct characteristics in the typological studies of heritage types, conservation levels, and urban districts, which provides a basis for the formulation of differentiated policies and planning management schemes for SCHSs. (2) Through the study of classification correlation, the level of popular science facilities, visibility, accessibility, and in terms of the consistency of the heritage style of the open spaces where SCHSs are located have a comprehensive impact on the cognition of the general public and community residents. (3) The overall conservation level of the community areas where SCHSs are located is of great significance to the general public and community residents, and the level of social development and the degree of integration of cultural resources will affect the public's attention and visitation to a SCHS. (4) The results of the clustering study can effectively assess the characteristics of the 30 SCHSs in the Beijing section of the Grand Canal and generate optimization suggestions. The HUL assessment for SCHSs holds significant value in its dimensions, and in terms of indicators, it can generate more flexible options by combining with the assessment goals. In the future, by integrating digital technology and exploring a greater number of SCHSs, this method can be used to achieve more precise assessments and explore more precise mechanisms of influence. At the same time, we cannot ignore the fact that digital technology has led to the concealment of many vivid and authentic information. Field assessments should be carried out simultaneously with the application of digital technology. This research, from the perspective of HUL, attempts to explore an action-oriented assessment method. It can provide a targeted assessment method for the overlooked SCHSs in current urban areas, in order to seek more proactive support for the systematic conservation and sustainable development of urban cultural heritage.

Keywords: small cultural heritage sites, historical urban landscape, conservation and utilization, action-oriented assessment, the Grand Canal

#404 Stonesheds: Drawing lithic trajectories, considering localness

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Abstract

From the deep past to the present, people have expressed their cultural identities and values through stones. Stone construction is a way to establish a physical link between the earth and the cosmos (Scully, 1991) and it is also a practical endeavor, in either case creating strong relationships. Whether quarried locally or hauled great distances, building stone resonates because it creates enduring physical forms. But all too often, lately, building stones are literally and culturally a veneer, disconnected geologically and symbolically from places. Even in landscapes where stone is used well its “stories of material movement,” are hidden, as Hutton (2020) explains through flows of granite and labor between Maine and Manhattan in the construction of Central Park. Written and spoken stories are essential ways of bringing attention to stone’s material movement. This paper asks how such movement in the building process might be understood also through drawings, akin to story cloths (Chien, 2025) and understood as critical investigations (Dee, 2004). In so doing, the fit of stones for projects may be better understood. To analyze factors influencing the use of building stone and its fit for a project, the paper introduces the metaphor of a stoneshed (analogous to a watershed) as a qualitative guide to a stone’s relationship to a place. Stonesheds begin by mapping the areas from which stones have been gathered to produce a given structure in the landscape. The maps are then thickened with drawings and photographs to build recognition of stones’ geological, physical, and cultural trajectories. The paper examines three lithic trajectories in three states (Michigan, New Jersey, and Rhode Island), where I have ongoing building projects. I find that stonesheds are useful to compare stone movements, methods of transport, whether the stones are native or salvaged, the environmental costs of their passage, how they reflect underlying bedrock and cultural histories, and how they have been shaped by past uses and reveal geologic processes. Layering these factors visualizes the stones' stories and their degrees of localness. The paper posits that drawing stonesheds is a practical means of assessing the physical and cultural connections of stones to the landscapes they shape. The concept and associated evaluative criteria may be useful to scholars analyzing existing built environments and to other practitioners plotting the movement of stones for future projects.

Keywords: building stone, material movement, localness, stoneshed, poetic-critical drawing

#405 Catalyzing Connections Across Sea and Shore: The Swiss Air Flight 111 Memorial.

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Abstract

Contemporary memorials often embody the expectation of site-specificity, anchoring memory in the place where lives were lost. When disaster strikes at sea, however, designers must reconcile this imperative with absence, distance, and a constantly shifting environment. This presentation examines Richard Earle's paired memorials to Swiss Air Flight 111, which crashed off Nova Scotia in 1998, killing all 229 people on board. At Whalesback, the design confronts visitors with the Atlantic's sublime force, directing the gaze toward the crash site through apertures precisely cut into granite. The Bayswater site, by contrast, offers a sheltered grove where victims' names are inscribed and remains interred, creating a space for private mourning. Together, the two memorials enact a dual logic: one marks the event within a hostile seascape, while the other sanctifies memory in a protected landscape. In tandem, they triangulate the horizon point where the aircraft went down, spatializing both loss and remembrance. By engaging landscape context across registers—sublime, intimate, destructive, and nurturing—the memorial catalyzes connections among communities, cultural memory, and the ocean itself. It demonstrates that commemoration is not only representational but also relational, orchestrating ties between environment, ritual, and expectation. Ultimately, the Swiss Air memorial shows how commemorative landscapes can move beyond symbolic markers to become active mediators of cultural memory, community identity, and environmental context.

Keywords: Memorialization, Disaster Landscapes, Site-Specific Design, Cultural Memory

#435 Identification and Characteristics of Great Heritage Site in Urban Fringe—An Empirical Study from Nanjing

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Abstract

Against the background of the urban historical landscape (HUL) theory (UNESCO, 2013), the scope of cultural heritage preservation is no longer confined to static material remains but emphasizes the holistic landscape systems formed through the long-term interaction between human culture and the natural environment. As a uniquely Chinese cultural heritage concept, Grand Historical Sites (GHS) are officially recognized as sites with high comprehensive value, large spatial scale, significant challenges, and strong social relevance, increasingly taking center stage in cultural preservation efforts in China (Lu, 2005). During urban development, GHS overlap with urban fringe, facing multiple conflicts between urban construction, industrial development, ecological degradation, and heritage preservation. The conservation and utilization of GHS in urban fringe (GHSUF) have become critical issues requiring urgent solutions in cultural heritage conservation and urban planning. Thoroughly identifying the composition and characteristics of GHSUF, and understanding the dynamic relationships among human activities, spatial demands, and historical landscapes within them, is crucial for achieving synergy between heritage conservation and sustainable development. Taking Nanjing as an empirical study, this research utilized points-of-interest (POI) data and the Densi-Graph method (Xu, 2016) to identify urban structures, analyzing the spatial relationship between GHS distribution and urban fringe areas through field verification. Secondly, based on urban historical landscape theory, the study integrated historical maps, remote sensing imagery and field survey data to construct a historical stratification atlas of GHSUF. It demonstrates the changes in elements of GHSUF, such as mountainous terrain, thereby tracing their evolution. Research indicated that GHSUF in Nanjing is currently concentrated in the eastern fringe of the city, with its spatial distribution exhibiting a misalignmen t with the metropolitan development axes; GHSUF exhibits dual systems of visible and latent historical landscape elements, influenced differently across four evolutionary trajectories—agricultural persistence, industrial encroachment, residential permeation, and transportation fragmentation—reflecting the pressure and tension inherent in different evolutionary paths. Findings revealed that GHSUF historical landscapes transcend mere spatial relics, serving as multidimensional carriers of social value, ecological function, and cultural memory. For landscape architecture theory and practice, static conservation approaches should be replaced with dynamic adaptive management. Through functional regeneration, ecological interventions, and community co-governance, sustainable relationships between people and heritage can be rebuilt. Unfortunately, the study's limitation lies in its current focus on Nanjing. Future research should expand to multi-city comparisons to validate whether the predicaments faced by GHS in the context of urban development are universal.

Keywords: urban historical landscape, Great Heritage Site, urban fringe, historical stratification atlas, Nanjing City

#449 From Seed to Street: A Study of the Legacy Impacts of Nurseries on Rochester's Urban Forest

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Abstract

Urban forests are a palimpsest of tangled plant and human ecologies, formed over time by cultural and biological motivations. Urban forestry has garnered much attention in recent years as discourse around climate change, equity, and resiliency (Foster et al, 2022) and tree planting initiatives (Eisenman et al, 2021) has increased in cities. This dialogue cites the current state of urban forests as needing improvement, but does not acknowledge the roles of nurseries in shaping urban forests into their current form. By looking at urban forests and their relationships to nurseries (historical and contemporary), we can better understand the drivers of biophysical legacy effects on urban forests (Roman et al, 2018). This research develops an interdisciplinary framework for evaluating and critiquing the urban forest informed by the fields of landscape architecture and urban forestry. The 2024 City of Rochester's Urban Forestry Master Plan aims to address climate change and equity among city residents. The master plan does not offer insight into the city's methods of tree procurement or associated nursery practices. This paper argues that urban planting plans must begin with nursery practices. Drawing upon correspondence between horticulturalists George Ellwanger and Patrick Barry and the City of Rochester, I will identify extant street trees planted during the first period of intentional street tree plantings in Rochester. Using ground-truthing, I will map out trees planted during that period, and replacements of the same species , to establish a connection between the historic nursery and the state of the urban forest today. I will formally critique this map on the bases of both historical planting imperatives and the goals of the 2024 Master Plan . I will interview the city's urban forestry department and their current tree suppliers to ascertain how their practices align with larger planting goals. I will then compare the goals of nurseries to those of city planners. The Master Plan provides surveys and interviews with residents to establish community sentiment regarding the state of the urban forest. As cities increasingly publish urban forestry master plans, the exclusion of the voices and skills of nurseries becomes more obvious. This exclusion creates a gap in our understanding of the full network of actors responsible for a city's urban forest. To increase biodiversity, to confront the challenges of climate change, and to redress inequitable access to the benefits of urban forests, urban forestry initiatives must begin with the trees—in the nursery.

Keywords: Legacy Effects, Street Trees, Nurseries, Urban Forests

#459 Wild Data: An Alternative Data Center

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Abstract

As a result of technological globalization over the past century, we have remapped the Earth in the pursuit of data exchange and storage. The physical world has been altered through planetary extraction and cultural changes to conform to the prioritization of digital data as both an economy and necessity for contemporary human life. But what if we reframed the narrative — expending the same amount of effort and land use currently being occupied for our global data storage — to leverage ecology as a technology to meet our digital needs? What if our digital footprint told a story that simultaneous valued both the environmental and economic demands of our world? What if we… stored data and information in vegetation? Wild Data is a critical and speculative design proposal grounded in research, statistical analysis, and calculations. This presentation investigates design processes by merging geospatial and environmental data modeling with cinematic worldbuilding to craft spatial responses to the consequences of vegetal DNA data storage. The project envisions a world that runs counter to our current, in which the discrepancies between environmental and technological driven land uses for data storage are reconciled through encoding data in vegetation. Conceived from the theoretical concepts of “genetic memory” and “molecular memory” by Norbert Wiener and Mikhail Neiman in the 1960’s, the study of modern DNA data storage continues to bring this seemingly science fiction technology to fruition. Furthering the research, scientist-artist Joe Davis, who encoded a 35-bit rune image into DNA in 1986, collaborates with Harvard’s Church Lab to encode the entirety of Wikipedia in apple trees to create a living tree of knowledge. The design proposition expands these experiments and offers an alternative future where landscape architecture synthetizes digital and ecological infrastructures through vegetation as living data storage systems. The project is a timely examination of an emerging technology that has the ability to radically shift our perception of how we can coexist with landscapes that are entangled with our technological needs. Wild Data crafts a fictional universe that is not a utopia, but rather a protopia. It is a glimpse into an optimistic world that privileges continual progress and acknowledges constraints for a desirable future versus setting unachievable goals that ultimately lead to large scale failure. The work seeks to provoke discourse on speculative research in the field of landscape architecture to enable the agency of designers to participate in global political and economic conversations.

Keywords: Speculative Design, Data Center, Worldbuilding, Infrastructure

#467 Mauerpark Berlin and the Role of Openness from Concepts to Completion

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Abstract

Negative space — the intentional use of emptiness, voids, and open areas is a central subject in design, visual arts and music. Austrian architect and urban theorist Camillo Sitte (1843 – 1903) postulated the necessity of public plazas being open and free in the middle. Objects and monuments being placed around the edges. Openness is also a central idea of Mauerpark Berlin on the former border strip of the Berlin Wall (1961-1989). The park, product of international design competition in 1992, was designed by German landscape architect Gustav Lange (1937-2022) and implemented in two stages: the eastern part from 1994 to 1995 and the western part from 2018 to 2020. The design vocabulary of Mauerpark has been analyzed in the literature with focus on the design composition of spaces, the guiding geometric shapes and systems and their relationships. At a larger scale, the park is organized along axes that align smaller spaces in primary geometric shapes. This strategy results in a stabilizing design vocabulary and is counterbalanced at a smaller scale; geometries and lines are broken up and increase the perception of dynamism. Both scales share the presence of voided, interstitial space that allow for flexible programming and spontaneous uses. This paper investigates the role of spatial openness through a method that derives from the Nolli map method of mass-void analysis. Plans of critical stages of the genesis of Mauerpark were analyzed and supported through aerial imagery. Tree canopy and architectural structures are considered ‘mass’ whereas open lawn areas for flexible uses are considered ‘void ‘. On-site photos were used to document, verify and ground truth the spatial qualities of the park at eye-level. This mass-void analysis shows that the abstract, spatial model of “emptiness” of Mauerpark has a stronger presence in the first design concepts and the older, eastern area of the park. The newer design concepts that also integrated a public participation process and cover the western area of the park deviate from the stringent spatial concept of openness. There, older, self-sown trees, historic structural remnants of a railyard, a community garden, and architectural structures were integrated. They were superimposed with gridded tree plantings and stonework in primary geometric shapes. In conclusion, adaptive strategies were deployed contrasting existing and new elements as a design tool. The findings exemplify that design concepts in landscape architecture can adapt as flexible systems and respond to new physical and cultural-societal context.

Keywords: Park Design, Design Language, Design Philosophy, Urban Void, Design Adaptation

#475 Landscape as Griot: Listening to the Mounds of Detroit

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Abstract

In 1950, Detroit was one of the fastest-growing American cities, dubbed the “arsenal of democracy” for its role in generating the automobile industry and a multiracial middle class (Sugrue, 2005). Yet, due to patterns of racist labor and housing policies, White flight, and economic restructuring and subsequent divestment, the Motor City has since hemorrhaged 1.2 million people and hundreds of thousands of jobs. Detroit's contemporary urban landscape is a living document of its many histories. Since its bankruptcy in 2014, Detroit has made great strides stabilizing its neighborhoods and igniting an equitable and inclusive comeback. Indeed, 2023 marked the first year the city gained population since 1957 (Afana, 2025). Despite these successes, Detroit today is marked by the unlikely coexistence of cultural resilience and land vacancy at 17 percent. The displacement of people has been rendered visible through the removal of buildings. Over the past decade, more than 20,000 vacant structures in Detroit — mostly houses — have been bulldozed as part of the nation’s largest demolition program in recent memory (Skidmore et al., 2025). Much of present-day Detroit can thus be read as a continuous landscape tapestry, its approximately 23 square miles (14,800 acres) of vacant land suggesting an urban prairie threading through what would traditionally comprise a city. Denis Cosgrove identifies the “duplicity” of landscape as “its capacity to veil historically specific social relations behind the smooth and often aesthetic appearance of ‘nature’” (Cosgrove, 2004). Indeed, Detroit’s swaths of urban ‘wilderness’ run the risk of cloaking, in the collective imagination, the very human, very structural forces that transformed it into a locus classicus of the failed city. This paper instead argues that the resulting landscape is not “empty but densely ‘storied’” (Safransky, 2023). This research foregrounds one landscape element, in particular, as artifact and storyteller: the grassy mounds that mark some vacant lots, vestiges of a demolition-and-digestion process naturalized into a nascent, evolving topography. This paper delves into the landscape biographies of a selection of these sites, both above and below the ground, by digging into their human, ecological, and material histories using archival, ethnographic, field-note, and counterfactual methods. Situating this emergent landscape of memory within the conceptual framework of landscape as griot, as well as an understanding of Detroit’s urban and land-based histories, this paper argues for these spaces as sites of legibility and commemoration.

Keywords: Detroit, memory, demolition, topography, narrative

#501 Spatiotemporal Clustering and Spatial Morphology of Frontier Garrisons in Mainland China during the Ming Dynasty (1364-1572): An HDBSCAN-Based Study

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Abstract

The Ming dynasty's frontier governance strategy of "defending against pastoral nomads in the north and maritime raiders in the east" (1364–1572) fostered the formation of distinctive spatial systems of garrisons along the Great Wall frontier and the coastal border. This study examine d these two categories of garrisons by integrating historical documents, archaeological evidence, and modern geospatial data to construct a spatio-temporal database. By integrating historical documents, archaeological evidence, and geospatial data into a spatio-temporal database, this research employ ed the HDBSCAN clustering algorithm as its core method to delineate garrison clusters and analyze d their evolution in relation to military incursions via Spearman correlation. Spatial attributes—connectivity, density, and distribution centrality—were examined using Delaunay triangulation, kernel density estimation, and standard deviational ellipse in ArcGIS. The s tud y aim e d to elucidate the spatial structural units and morphological characteristics of continental defensive garrisons under long-term human-land interactions. Application of HDBSCAN revealed a phased evolution along the Great Wall: initially scattered (1364–1402), then forming linear east-west clusters (1403–1487), and finally consolidating near the capital into denser units (1488–1572), with cluster density negatively correlating with incursion frequency. Coastal garrisons remained relatively stable, though after 1488 increasing Japanese piracy caused clusters to shift southeastward, forming a "dense south–sparse north" pattern. HDBSCAN further identified density variations and connectivity across terrain types, clarifying the spatial affiliation and defensive boundaries of each cluster. Spatially, the Great Wall frontier clusters exhibited four distinct morphologies: longitudinal corridors, linear extensions, basin concentrations, and wall-adjacent clusters, closely coupled with the Wall itself, rivers, and courier routes. Coastal clusters displayed three terrain-dependent patterns: network-like distributions attached to prefectural and county seats in plains; stratified arrangements along foothills in hilly zones; and closed-loop concentrations on islands. These forms align with the density and proximity characteristics recognized by HDBSCAN. By applying HDBSCAN to delineate irregular clusters of Ming frontier garrisons, this research advances a quantitative approach to the spatio-temporal organization of historical military settlements. It elucidates the spatial logic of garrisons—"adapting to terrain and controlling strategic nodes"—and offers insights for the holistic protection of defensive cultural heritage advocated by UNESCO and ICOMOS. The results provide a replicable analytical framework for interpreting and sustaining the spatio-temporal patterns of similar heritage landscapes worldwide.

Keywords: Landscape Architecture, Spatiotemporal Clusters, Geospatial Morphology, Machine Learning, Wei-Suo garrisons

#530 The Hidden Hand Revealed: Marjorie Sewell Cautley and the Radburn Landscape

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Abstract

This presentation addresses an apparent oversight in planning history literature pertaining to the design of Radburn: the essentiality of its planting scheme to the character, function, and the experiential sense of place of the neighborhood. The designer of the Radburn planting scheme was the landscape architect, author, and university instructor Marjorie Sewell Cautley (1891-1954). Students of planning and landscape architecture know Radburn (Fair Lawn, NJ, circa 1928) as an iconic archetype of US planning history, a radical re-thinking of the relationships among homes, streets, and open space within suburban neighborhoods. Radburn is understood as a peculiar manifestation of “Garden City” principles espoused by British theorist Ebenezer Howard, and as a project influenced by foregoing early-20th century English garden cities (e.g. Letchworth and Welwyn); more significantly, Radburn is understood to have in turn been an influence on the postwar American new towns (e.g. Columbia MD and Reston VA), or even as a template for a few idiosyncratic imitators (e.g. Wildwood Park in Winnipeg MB and Village Homes in Davis CA). As an archetype, the great emphasis has traditionally focused on Radburn as a system or pattern—much more about Radburn as a functional diagram than Radburn as landscape. In recent years, Cautley’s work has been belatedly recognized (Allaback 2022; Taylor and Hampson 2025). These recent sources reveal Cautley’s sensitive and sophisticated grasp of planting design at both comprehensive and intimate scales, and they suggest that Cautley’s contribution has been traditionally underestimated if not wholly ignored in the literature. The author will provide an overview of Cautley’s work at Radburn (utilizing archival design documents and photography), make note of the omission of Cautley’s work in certain standard texts on American planning history, and suggest how Cautley’s work might be better integrated within planning history narratives in order to reveal the fullness of Radburn as living landscape. This integration could enhance design pedagogy, whether for planning history studies or for site design studios that look to precedents (such as Radburn) for inspiration. In the same sense, Cautley's place-making planting strategies within shared community landscapes have relevance for contemporary practitioners who may seek to adapt "Radburn concept" principles for contemporary neighborhood design.

Keywords: Radburn, Planting design, Marjorie Sewell Cautley, Garden cities, Town planning

#531 Micro-Climate Design in Transnational Perspective: Soviet City Greening from Stalingrad to Super-Blocks

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Abstract

As early as Vitruvius, writings on how to plan a healthy environment emphasize the need to be attentive to local or micro-scale climate phenomena, such as the direction of prevailing winds or local temperature patterns. Landscape and urban designers engage implicitly or explicitly with such phenomena in designs for outdoor environments of all profiles, including diverse 19 th and 20 th century urban greening and beautification efforts (Brantz & Dumpelmann, 2011). More recently, the tasks of climate change adaptation and mitigating the often inequitable pattern of urban heat islands have focused attention within landscape architecture on the intersection of climate, urban morphology, and lived experience. Educators ask, how do our existing cityscapes reflect the historical legacy of past energy regimes and environmental politics? And how might existing cities be reshaped to better provide healthy, livable environmental conditions for the long term? In parallel, but more rarely integrated with the study of urban or landscape history, historians of urban climatology have traced the evolution of a modern discipline from certain core texts of the late 19 th -early 20 th century to late 20 th century modeling of global climate systems. Highlighting the German, British, and American centers of the field's increasingly global development, such histories consistently locate a 1937 book, Das Stadtklima by Per Albert Kratzer as a seminal contribution. They regret, however, that there are not more historical examples beyond select cities such as Stuttgart, Germany, or Tokyo, Japan, where principles of urban climatology were widely and consistently integrated into urban form and planning. (Hebbert, Mackillop & Jankovic, 2013 and Webb 2017.) In architecture, meanwhile, attention to domestic interiors overshadows the climate of outdoor realms (Barber 2020, Iturbe 2019). This paper seeks to strengthen the interdisciplinary dialogue between histories of urban climatology and urban landscape history. Second, it expands the range of precedents for applied urban climatology by considering the history of applied micro-climate design in the USSR. It begins with two cities mentioned by Albert Kratzer as exemplars of climate-responsive planning to mitigate smoke pollution, the Soviet industrial cities of Stalingrad and Magnitogorsk. According to diagrams by Soviet urbanist Nikolai Miliutin, the design of these cities was to incorporate green belts and parks as pollution mitigation techniques. This paper then contrasts the carbon-copy rehearsal of those cities in anglophone urban climatology literature from the 1930s to the 1960s with the dynamically evolving praxis of Soviet urbanism and landscape design during the same period.

Keywords: Urban climatology, modernism, industrialization, transnational, urban greening

#549 The Modern Picturesque: Landscape Architecture in the New South

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Abstract

In 1932 the Modern Architecture: International Exhibition at the Museum of Modern Art in N.Y.C. opened around the same time as the first public viewing of Colonial Williamsburg in Virginia. Contrasting architectural modernism with historic preservation helps contextualizes these divergent design narratives in America. [1] North Carolina has its own examples with Dorton Arena at the State Fairgrounds (a.k.a the “Cow Palace’; designed by famed modernist architect Matthew Nowicki) built at the same time (and by the same construction company) that the colonial governor’s house Tryon Palace was being reconstructed. [2] These projects illustrate the contradictions of modernity, how contrasting agendas of progressivism and historicism found salience in contemporary design practices. The South does not play a prominent role in the history of modern landscape architecture. The region’s agrarian tradition and rural heritage are partly to blame. Aside from Atlanta or Florida (which many southerners consider cultural and geographical aberrations respectively), the South featured comparatively little, and far later, urban development. This paper seeks to fill a gap in the history of modern landscape architecture in the American South. Building on recent scholarship by Joseph Watson, I argue that the picturesque is a useful lens for understanding the role of landscape architecture in developing the New South. Through profiles of landscape architect Earle Sumner Draper, the landscape architecture program at N.C. State University, and design of the Research Triangle Park, I explore how landscape architecture employed an “imaginative appropriation” of the countryside to incorporate foreign (or urban) development practices within the familiar (or rural) ways of living. The picturesque operated as a “space of translation” between the ideological and the material realms of landscape.

Keywords: American South, Modernism, Picturesque, New South, Landscape

#555 The Cultural Heritage Aspect of Redeveloping Post-Industrial Sites

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Abstract

As U.S. cities shift toward service-based economies, obsolete heavy industry and manufacturing sites are left abandoned or demolished and redeveloped. This research explores a third possibility, which is identifying those places as cultural heritage sites, and retrofitting their artefacts and open spaces (Loures, & Burley, 2012; Bystrova & Pevnaya, 2021; Chen, 2025). Regeneration of post-industrial sites that retrofit historical buildings and open spaces, implies a reinterpretation of those sites for cultural uses. Culture-led regeneration of places affected by industrial decommissioning involve “official” groups, associated with state-led and economy-driven interventions, and “unofficial” groups, which activate bottom-up, community-driven interventions. Official and unofficial groups contribute to diverse discourses of place, which are created through social programs, physical alterations of the material fabric, and statements (Nyström, 2015); conflicts over space and use arise in the regeneration process. Unofficial, bottom-up interventions and uses might conflict with the establishment of a dominant discourse of place by official actors. The creation of the image of “creative city” promoted through official channels and private enterprises is associated with the “creative industry” – a range of economic activities concerned with exploitation of knowledge and information that involves selecting certain features of the area, while other elements become obscured (Palazzo & D'Ascanio, 2024; Heathcott, 2015). In cultural promotion and consumption, art-led reuse of industrial heritage, the arts’ potential for community involvement in temporary interventions that establish connectivity, and its implications in gentrification narratives, have been scrutinized (Ma & Lan, 2023; Sun & Chen, 2023; Covatta, 2024). Studies criticize state intervention leading to the replacement of an organic network of artists with commercial networks (Sasaki, 2010; Gu et al., 2024). Through literature review the research investigates the overlap of post-industrial sites’ cultural heritage regeneration with urban planning, art-led practices, bottom-up interventions, sustainable tourism and local identities, gentrification and social justice, attempting to draw similarities/differences and guidelines/ best practices. Using the guidelines/best practices sourced, the research evaluates Coshocton Ohio’s post-industrial scenario, its challenges and current requalification projects. It explores place-based case studies that retrofit vacant sites and heritage for cultural use, identifies various actors that use the place, their resources and power in relation to the sites, their discourses and claims in a reinterpretation of place. A place-based model for cultural regeneration of Coshocton’s post-industrial sites is proposed, which could be applicable in the region and elsewhere.

Keywords: Post-industrial regeneration, cultural heritage, creative industry, urban planning, bottom-up interventions

#563 Wind: communication

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Abstract

Wind transports scents from one plant to another. In recent work (Karban et al, 2014) shows that sagebrush communicate through VOCs (scents) about insect or grazing attacks at distances around 60 cm. These communications vary in efficacy due to relatedness and plant gender (Karban). Similarly, tomatoes have been shown to use scents to connect with one another in the face of predation by caterpillars. (Brenner et al, 2006) Wind documentation is used as a site analytical tool by landscape architects to improve human comfort. (Halprin) At Salesforce Park, (Pelli Clarke Pelli and PWP) long panels of fritted glass provide both visual and wind barriers, allowing plants to grow without wind sculpting and creating shelter for human site users, but also potentially interrupting plant communication mechanisms such as those documented by Karban and Brenner. (Author observation) What landscape architecture tools -- drawings, models, ontologies – can express the representation of wind as a relationship among human and plant as collaboration? This paper undertakes first an investigation of two historic drawing methods, one, the wind rose, a circular drawing documenting wind direction and speed, commonly included on site analysis landscape architecture drawings, looking at the work of Lawrence Halprin's scores and drawings for Sea Ranch and downtown San Francisco. The second tool is the "wind section, or wind deflection" as evidenced in the 1898 Cornell University thesis work of David Augustus Williston, the first Black landscape architecture school graduate, who documented windbreaks and temperature shifts, using sectional diagrams and charts and also Lawrence Halprin's similar sketches for housing at Sea Ranch. These two historic examples support the paper's proposed contemporary wind diagram tool, shown in both model and drawn form to diagram VOC movement and plant conversation. This contemporary tool articulates plant-plant and plant-human relationships using the University of New Mexico campus as a laboratory for iterative testing. The tool application will be documented through human nose evaluation of VOC travel distances and wind-speed and direction instruments. This investigation proposes a tool to articulate for landscape designers wind-borne and plant-emitted VOCs as non-human communication and sentience.

Keywords: Wind, Williston, Halprin, sentience, communication

#571 If Memory Serves: How Culture Influences the Persistence of Memory through Time for Sites of Trauma

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Abstract

In a world of seasonal trends, incessant news cycles, and related aspects of rapid turnover within the twenty-first century zeitgeist, capital “P” Places (Beatley, 2013), like any other segment of our society, have difficulty maintaining their relevance (Enayatirad, 2025). When it comes to sites of memory, particularly sites of trauma, they undergo the same treatment as any other new object successfully drafted into the public sector: briefly revered then inevitably dissipated into the background of collective knowledge. Regarding how Western culture addresses its deepest scars (i.e. sexual violence, war, mass shootings, etc.), time is the strongest element to dictate a site's prevalence and impact. For landscape architects and designers to design Places that persist with time rather than degenerate, understanding and applying trauma and memory studies is a must. Memory studies, as it pertains to landscape architecture and the built environment, are relatively lacking when compared to the artillery of information on biodiversity, health, and other socially-motivated design initiatives (Linkedin , 2023). By expanding into one of the extreme and critical ends of human experience, we gain access to understanding how these spaces foster care and relevance over time. Contrary to landscape architecture, countless theories of memory incorporate trauma and loss within philosophy. Situating this study is Pierre Nora’s socio-historical theories of places as lieux de mémoire (“sites of memory”). This enables the analogous comprehension between memorials, as reproductions (of events, cultures; as temporal reflections), and the ontological existence of the photograph. Guiding the aesthetic analysis are philosophers Siegfried Kracauer, Roland Barthes, and Susan Sontag, each of whom pays particular attention to time with regard to space and affective connection. Additionally, they support the hypothesis that the inherent decline (social entropy) of site-to-subject emotional prominence is largely generational. Through a comparative case study of various sites of memory — ranging from the Vietnam Veteran’s memorial to Midland Elementary School’s dedication bench for a lost student—, this study examines how each inclusion of form, scale, and cultural adaptability impact their relationship to relevance and remembrance. Additionally, by conducting ourselves towards memory, we can address the present issues of temporal persistence, particularly longevity and social integrity, as it pertains to memorials. Using these theories to fuel intentional and successful design stands to counteract the disposability culture of modern society (Directory, 2025), whilst furthering embodied learning from the stories, traumas, and mistakes memorials teach about; henceforth, subduing harmful reproductions of past mistakes.

Keywords: memory, time, trauma, culture

#576 Beyond Mimicry: The Making of the River Seine in Guangzhou, China

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Abstract

The slogan “Making the Pearl River China’s River Seine” was widely employed by Guangzhou’s provincial and municipal governments from the 1990s to the 2010s. Through initiatives such as building waterfront parks, increasing greenness, improving lighting, developing cruise services, cleaning the river, and by so transforming the Pearl River into a tourist attraction comparable to the River Seine, Guangzhou aimed to alter its image to a global metropolis within a remarkably short timeframe. These transformations reshaped not only the physical environment but also how Guangzhou citizens perceived, interacted with, and emotionally related to the Pearl River. This paper traces why and how the image of “River Seine” was mobilized to expedite the transformation of urban Guangzhou. It complements studies of urban mimicry in post-socialist China (Wu, 2004; Yu & Padua, 2007; Bosker, 2013; Zhao et al., 2019) by foregrounding a form of mimicry--waterfront transformations across China that mobilized western imaginaries to remake the urban environment as a civilizing landscape--that has remained comparatively underexamined, and by redirecting attention from market forces and revenue reform to the political agendas of local states. Based on archival studies of newspapers, government bulletins and atlases, this paper argues that Guangzhou’s mimicry of the Seine was neither a post-economic reform novelty nor a rupture from Maoist environmental ideology. It embedded a governing imaginary that fused global aspirations with a long-standing Chinese mode of relating people and the environment, wherein spatial ordering of the environment is both a tool of state legitimacy and social control--a logic reiterated across ideological regimes from Confucian cosmology to Maoist dialectic materialism that sought to remake environment to transform people (Robert Weller & Peter Bol, 1998; Shapiro, 2001; Mark Elvin, 2004). As such, the Seine served not only as a branding device to attract international investment and enhance competitiveness but also as an aesthetic and rhetorical instrument for regulating public behaviour, cultivating a new standard of civic virtues, and exerting spatial control. The paper contributes to urban political ecology (Swyngedouw & Kaika, 2014) by showing how symbolic landscapes were mobilized as seemingly neutral models that masked political agendas and reorganized state-society-nature relations. Moreover, this historical perspective helps clarify the logics that continue to underpin contemporary waterfront redevelopment and ecological civilization projects, where broader urban governance agendas and social control often overshadow ecological concerns (e.g., Pow, 2018). Recognizing the politics in landscape projects underscores the importance of adopting more reflective and transparent approaches in future.

Keywords: Environmental philosophy, Mimicry, Urban waterfront, Urban governance, Urban political ecology

#603 Building a "System of Recreation" within the Minneapolis Park System, 1906-1950

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Abstract

This paper examines the shifting role of recreation in 20 th century municipal parks, using the Minneapolis Park System as a case study. Previous historical studies depict the 20 th century as a period when recreational landscapes (sometimes described as rational and reform landscapes) supplanted the romantic or “Olmstedian” landscape in urban park design (Cranz, 1982; Young, 2004). This shift from “natural” to “recreational” parks is widely attributed to users’ desire for new and increased uses in parks. However, more recent studies suggest the reasons for this shift are far more nuanced and related to ideas about urban systems (Carr, 2023). The history of recreational parks in Minneapolis lends further credence to this idea. In Minneapolis, small recreational parks, initially designed to mimic Olmsted Brothers-designed playgrounds in the Chicago South Park System soon evolved into what Park Superintendent Theodore Wirth called a “system of recreation.” Conceptualized as a grid of neighborhood parks separated by no more than a mile, this recreational system was juxtaposed against a simultaneously evolving system of larger parks and parkways embracing the city’s water features. Together, the recreational system and the natural system comprised a complete and holistic park system that served the entire city, albeit in different ways. In fact, the two types of parks were perhaps more distinguished by their different funding mechanisms than by their programming: Acquisition and construction of landscape parks and parkways was funded by bonds and a general park levy while neighborhood parks were funded by local assessment through the city’s Elwell Law. These dual funding mechanisms fueled the rapid expansion of the whole system throughout the late 1920s, making Minneapolis “the most comprehensive system of municipally owned properties” in in the country by 1928 (Weir 1928,). Unfortunately, although Elwell funding helped increase the number of recreational parks, it also proved highly inequitable, leaving poor, dense, and Black neighborhoods without access either parks or recreation. Although WPA funding during the Depression alleviated some of this inequity, by the 1950s, the park board lobbied for and eventually achieved a combined park and playground levy. The revised tax structure funded new neighborhood recreational parks more evenly across the city, though at a much slower rate of acquisition than before. Based on archival research and historical interpretive methods, this paper sheds new light on urban park and recreation history by including an assessment of park financing as an important aspect of historical landscape analysis.

Keywords: Recreation, Park Systems, Minneapolis, Financing

#618 Building forests, building nations: a case study of historic forestry experiments in Thingvellir National Park

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Abstract

There is increased recognition that natural heritage and cultural heritage landscapes are often overlapping—if not inextricably linked—and that preservation and management strategies must consider these dimensions together, especially in the face of ecological and climatic threats. Yet, as landscape practitioners consider the best management approaches for these sites of significance, they neglect to attend to the cultural significance of land management—be it preservation, adaptation, or mitigation—which is deeply a living, cultural practice. As David Harvey suggests, climate change engenders novel and emergent forms of heritage manifested as practices of adaptation or mitigation (Harvey & Perry 2015). Þingvellir National Park in Iceland provides a unique case study for this complex interrelation of natural heritage, cultural heritage, and climate heritage. Þingvellir is recognized as significant cultural landscape on account of its role as a meeting location of the early Icelandic parliament during early settlement period in the 9th and 10th centuries (Bjarnason 2004). However, Þingvellir is also filled with more recent remnants of Iceland's early efforts at afforestation, namely the Þingvellir Pine Grove, an experimental forestry test plot dating originally to 1899, considered to be the birthplace of forestry in Iceland. Iceland was largely devoid of trees, save for a few remnant birch woodlands (Sigurmundsson 2014). Thus, the project of forestry in Iceland was not one primarily focused on resource management, but one of construction—and one inflected with questions of changing climates, hazard management, large-scale landscape change, cultural heritage, and nascent national identity. Yet, the Management Plan 2004-2024 for Þingvellir emphasizes that the introduced species in the park are to be thinned or removed—deemed inappropriate for the cultural landscape. In this talk, I bring a critical interpretation of the 2004-2024 Management Plan, utilizing primary and secondary sources about the Þingvellir Pine Grove to articulate the cultural significance of its siting, demonstrating the shifting concept of forest and nature in Icelandic national-identity and ecological imaginary. I argue for preserving this forestry landscape because it presents an opportunity to study near historical analogs of climate change-based heritage. Drawing from original ethnography of contemporary forestry and landscape research projects in Iceland, I suggest a way forward by which this history might be preserved by foregrounding the constructedness of this landscape integrating ongoing practices of climate adaptation and ecological care. This talk contributes beyond Iceland to articulate sites of climate change heritage as both novel and historically-anticipated forms of landscape heritage.

Keywords: forestry, cultural landscape, afforestation, ecological restoration, climate heritage

Landscape Architecture for Health (new-LA CES)

#9 Open Data and UGC: Midwestern Parks and Collective Design Insights

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Abstract

As urban environments continue to evolve, designers and planners are turning to open data and user generated content to inform work that is socially, environmentally, and economically meaningful (Guo et al., 2021). Open datasets that span health, economics, crime, mobility, and environmental hazards provide temporal and spatial insight into risk, opportunity, and community need. Health layers can include the CDC Social Vulnerability Index, asthma emergency visits, air quality indicators, and park access scores. In parallel, user generated content such as Google Maps reviews (Huang et al., 2022) and Instagram posts (Song & Zhang, 2020) offers direct perspectives on place use, perceived safety, comfort, and accessibility, which are everyday signals linked to physical activity, stress reduction, and social cohesion. Bringing these publicly accessible sources together helps the landscape architecture community reveal user patterns, communicate design intent with clarity, and guide planning decisions (Sanchez Sepulveda et al., 2024). This session presents two Midwestern case studies that integrate civic open data with UGC for both system evaluation and park POE. The first case is the park systems in Chicago. We assemble multilayer geospatial datasets with a citywide corpus of Google Maps reviews for all 605 public parks. Methods include text cleaning, sentiment and theme extraction, spatial autocorrelation and hot spot analysis, and modeling that links review valence and topics to park typologies, access, transit adjacency, and neighborhood context. Health oriented indicators include potential for moderate to vigorous physical activity, opportunities for nature contact, active transportation network, and perceived safety elements. Review counts are highly skewed, ranging from zero to the low thousands per park, surfacing distributional inequities, maintenance regimes that need attention, amenity gaps, and investment priorities across the park network. The second case is a public park in the Indianapolis area. We examine a newly opened park through more than nine hundred Instagram reviews. A large language model (LLM) supports sentiment and thematic coding across time to understand program use, equal built-environment to service the health and wellbeing needs. Both cases identified physical and emotional patterns that have generated managerial implications to future improvements of the public space and wellbeing. Through the session, attendees will explore how combining societal textual and spatial data can strengthen community engagement, guide environmental and health-oriented decision-making, and expand the toolkit for creating equitable and sustainable urban spaces.

Keywords: Open Data, User Generated Content, Social Media, Park Review, Research Method

#50 Greening on the Inside

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Abstract

An expanding body of evidence documents the benefits of nature in the reduction of stress, anxiety, and depression and in enhancing attention and well-being. 1. 2. Introducing nature into sensorily deprived environments, specifically carceral settings, can provide mechanisms for improving coping and decompression while lowering self-harm and violence. Research documents a correlation between participation in nature-based programs and reduced recidivism. 3. Most US and Italian carceral environments are defined by stone, concrete and steel. Rarely is nature available for use or viewing. The research questions guiding this study are: Do staff and ACIs (Adult Incarcerated Individuals) view nature as a necessary component of incarceration? What value can nature bring into the carceral environment? What garden elements are most valued by staff and ACIs? To understand the perspectives of both staff and ACIs, including the factors that could guide design decisions when creating nature-based responses, the presenter visited 15 correctional institutions in Italy, Finland, Norway and the United States. Surveys were conducted with 39 ACIs in the USA, 258 In Italy and 25 correctional officers (COs) in the USA and 113 in Italy. In addition, 8 focus groups were held in the US and 4 in Italy with staff and AICs. The settings ranged from “open” to “closed” custody facilities. Approaches to incarceration varied from an emphasis on rehabilitation to a more punitive approach. 4. 5. These approaches were reflected in the environmental qualities within the facilities and in the relationship of correctional officers to the ACIs. The data reveals both commonalities and differences between the European and US systems, cultures, and between genders. Many ACIs viewed the existing green spaces as representations of freedom, connection, and hope, enabling them to access positive associations as well as reducing the deteriorating effects of isolation. Nature interactions also inspired life-affirming thinking as both a coping mechanism and in preparation for release. 6. Many COs preferred working in “greener” facilities, noting access to nature resulted in less tension and violence and that the relationships between officers and ACIs were healthier in facilities with nature access. These insights and many others will be discussed in this presentation.

Keywords: Carceral Environments, Therapeutic Landscapes, Healing Gardens, Restorative Justice

#51 Green Cure: Natural Exposure Restores Adolescent Attention Impairments Induced by Short Video Use

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Abstract

The excessive use of short-video apps among urban adolescents has emerged as a significant global phenomenon, resulting in a critical challenge to their attention and other cognitive capacities (Mou, 2020). While Attention Restoration Theory and previous studies suggest that nature exposure may be effective in addressing this issue, direct evidence remains scarce (Dai et al., 2025; Jiang et al., 2019). Moreover, few studies have employed advanced measurement techniques, such as high-resolution and real-time neuroimaging and biofeedback devices, which may limit the accuracy and reliability of existing findings (Ancora et al., 2022; Egger et al., 2019). To address these gaps, the present study utilizes advanced devices to generate direct and robust evidence on the positive effects of nature exposure in mitigating the adverse impacts of short-video app use in adolescents. A 2 x 3 factorial designed lab experiment was implemented to examine (a) browsing vs. no browsing of short video apps and (b) audiovisual environmental exposure to urban streets vs. urban parks vs. natural parks, with 120 adolescent participants equally assigned to the six groups. After a baseline resting phase, participants were asked to sequentially undergo another two phases: a short video app browsing (or no browsing), followed by randomized types of audiovisual environmental exposure. We applied functional near-infrared spectroscopy (fNIRS) and biofeedback equipment to record participants' brain activity and physiological parameters continuously. Stroop Tasks and self-reported questionnaires were also conducted between the phases to evaluate participants' cognitive performance. A mixed-design ANCOVA will be conducted, modeling three phases as a within-subject factor and groups as between-subject factors. Results are expected to show a main 'Phase' effect, with Stroop performance, self-reported attention, and physiological indicators deteriorating after short video browsing and improving during environmental exposure. A significant 'Phase × Environment 'interaction is also expected, with natural parks yielding substantial recovery, while urban streets showing little or none. At the neural level, natural environments are expected to elicit the lowest bilateral dorsolateral prefrontal cortex (DLPFC) activation and the weakest connectivity with the ventral prefrontal and temporal cortices. Since the DLPFC provides important support for top-down attentional control, this pattern reflects reduced attentional resource recruitment, thereby supporting recovery from fatigue induced by short-video browsing (Ding et al., 2025; Roberts & Christopoulos, 2018). The study is funded by the General Research Fund and can support policies for restorative urban green spaces and facilitate healthier adolescent habits by balancing short-video use with nature engagement.

Keywords: short-video use, adolescents, attention impairments, contact with nature, fNIRS

#54 Catalyzing Shade Equity Through Data, Design, and Community Engagement: A Case Study in Denver, Colorado

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Abstract

UV exposure is the primary risk factor for several diseases, including three major types of skin cancer (Armstrong & Kricker, 2001; Gallagher, 2006). Because sun exposure occurs largely in outdoor environments, the design of public spaces plays a critical role in UV control. Urban shade is increasingly recognized as essential infrastructure that supports UV protection, thermal comfort, and equitable access to outdoor environments. Yet shade provision remains uneven across U.S. cities, with vulnerable populations often least protected (Tabatabaie et al., 2023). In Denver, Colorado-- where high-altitude UV exposure and summer heat amplify health risks-- strategic and evidence-based shade planning is vital to advancing both public health and climate resilience. This project responds to the need for integrative, data-informed, and community-responsive approaches to shade design in public spaces. This project was a collaboration between the University of Colorado Boulder and the Colorado Department of Public Health and Environment. Conducted in two phases, it employed a technology- and data-driven approach to: (1) identify spatial inequities in shade distribution and sun exposure risk; (2) translate those findings into performance-based shade design guidelines; and (3) incorporate community perspectives into proposed strategies. In Phase 1, we developed a Sun Risk Index and Shade Score at the neighborhood and block group levels using GIS-based analysis of tree canopy and built-shade data, combined with walkability metrics and socio-economic indicators. Detailed site audits and physical activity observations supplemented the geospatial analysis. Phase 2 translated these findings into performance-based design guidelines for five public space typologies in Denver: schoolyards, playgrounds, urban trails, transit stops, and residential/commercial streets. Using parametric modeling and solar performance simulations (Ladybug and Grasshopper), we established shade thresholds and developed alternative interventions for tree-based, structural, and hybrid solutions. A public survey of Denver residents (n = 42) gathered feedback on shade preferences, perceived comfort, and design priorities. Community responses favored hybrid strategies that combine vegetation and structures, shaded seating, and attention to seasonal variability. Findings reveal significant disparities in shade coverage, with low-income neighborhoods, communities of color, and areas with high child populations facing the highest combined UV and heat risks. The resulting methodology—integrating geospatial analysis, simulation-based design, and community feedback—offers a replicable framework for landscape architects seeking to address health, climate resilience, and environmental equity. More broadly, this work demonstrates how data, technology, and design innovation can be bridged with public engagement to inform policy, planning, and design practices in diverse urban contexts.

Keywords: Shade equity, Shade guidelines, skin cancer prevention, urban greenness

#115 Seasonal Thermal Comfort Preferences and Design Strategies for Older Adults in Outdoor Spaces: Evidence from Wisconsin

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Abstract

Introduction: Older adults experience amplified thermal sensitivity and mobility constraints that restrict safe outdoor activity across seasons. While design guidance often focuses on extreme heat or cold, few studies translate older adults' seasonal preferences into actionable, year-round microclimate strategies. This study combines survey evidence with design synthesis to identify thermally comfort outdoor environments for older adults across spring, summer, fall, and winter. Methods: A cross-sectional survey of older adults (age 60+, N ≈100) was conducted at four public parks and community sites in Madison and West Allis, Wisconsin. The survey measured (1) subjective thermal sensation/comfort and acceptability, (2) preferred microclimate settings (sun/shade, wind, relative humidity, surface materials), (3) activity patterns by season, and (4) design feature preferences (e.g., shade structures, wind breaks, seating, water features, surface treatments, vegetation). Descriptive and comparative analyses summarize seasonal differences and common priorities. Findings were translated into a year-round design framework aligned to microclimate design. Results: Respondents prioritized universal features across seasons, including frequent, accessible seating with back/arm support; short walking distances between "thermal refuges;" clear wayfinding; and barrier-free access. Seasonal needs different by season: in Summer, older adults prefer continuous shade networks, filtered shade under trees plus fixed canopies, lower relative humidity, and breeze without strong wind. In Winter, they prefer maximized solar access, wind-sheltered pockets (evergreen planting + shelter walls), snow/ice-resistant pavement, and warmer surface seating materials such as wood. In spring and fall, older adults want flexible microclimate zones enabling quick transitions between sun/shade and wind-exposed/sheltered areas, with greater demand for sunshine and warmth compared to younger adults. Across seasons, respondents favored combinations of "micro-itineraries" (seating + shade/sun + good views + restrooms) every 60–120 meters to support safe pacing and social interaction. They also express interest in outdoor exercise facilities designed for light activities, which would enable stretching, moderate exercise, and socialize interaction in public spaces, similar to the role of playground equipment for children. Discussion: Translating preferences into microclimate strategies shows how design supports public health by allowing older adults to remain outdoors longer, encouraging light physical activity, reducing fall risk, and fostering social participation. The framework provides practical seasonal strategies that enhance thermal comfort, especially for older adults. Conclusion: By addressing seasonal differences and combining accessibility with microclimate design elements, designers can create year-round environments that promote older adults' health. These strategies can guide projects, retrofits, and evaluations in parks, green spaces, and age-friendly communities.

Keywords: Older adults, Thermal comfort, Seasonal preference, Outdoor environment, Microclimate strategies

#140 Park Usage Patterns of Elderly Populations During and After Pandemic: A Case Study of Shelby Farms Park in Memphis, TN

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Abstract

During COVID-19 elderly populations were a vulnerable demographic, and through a review of existing literature it was determined that there is limited research about park and outdoor space use during COVID-19 by older adults. This research seeks to address these gaps by examining how a pandemic impacted park usage among the elderly population (age 60+) in Memphis, TN at Shelby Farms Park. This study examines the comparison of park use during (2020-2023) and after (2023-present) COVID-19. The research methods employed in this study are a mixed method design with surveys and interviews. The methods for this study include a written survey questionnaire which was administered to participants on site and in-person as well as online through Qualtrics with QR codes posted onsite. Fifty surveys within the age range of 60+ were completed. From the survey data, commonalities were interpreted, illustrating patterns between age groups with increased or decreased park usage and perception of safety with each element and space within the park. Wilcoxon Signed Rank test was run to analyze the survey data and a significant statistical difference in park usage was found from, frequency of visits and elements used during and after COVID-19, with the p value = 0.0146. Additionally, four in-depth interviews were conducted with consenting participants where personal perspective and understanding of Shelby Farms Park was recorded and coded for the purpose of relating resulting patterns in park usage behavior to individual experiences. Only four interviews were able to be conducted, which can be a limitation. These interviews suggest that the paved, shorter trails and outdoor seating areas are the most used spaces in the parks by older adults. More paved trail loops with shorter distances of a mile or half a mile within the parks would allow for higher accessibility for those with mobility issues and create spaces to spread out and keep distance from other visitors to further prevent disease transmission. Updated physical and digital resources and maps with accessible and safe routes for those with disabilities such as vision and hearing loss as well as mobility issues could enhance park experience and use. The study provides a deeper understanding of how the COVID-19 pandemic influenced patterns of park usage and to identify opportunities for enhancing parks to ensure they are safer for vulnerable groups like older adults from general disease transmission or a future epidemic.

Keywords: COVID-19, Urban Parks, Elderly Health, Usage Pattern, Park Design

#149 Does outdoor thermal comfort mediate the realtionship between green space exposure and mental health? An experimental study in older adults

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Abstract

To date, the protective effects of green space on mental health have received increasing research attention (Callaghan et al., 2021; Wendelboe-Nelson et al., 2019), with evidence suggesting the benefits such as decreased depression (Sarkar et al., 2018) and reduced psychological distress (Wang et al., 2019). Additionally, as an element of climate-responsive landscape design, green space can also ease the concern of the urban heat stress, therefore providing proper thermal conditions (Xiao & Yuizono, 2022; Yang et al., 2018). Accordingly, people often reported better thermal comfort when using green spaces (Wang et al., 2017). Furthermore, as emerging research has been investigating the correlation between human thermal comfort and psychological states (Bai & Jin, 2023; Song et al., 2024), a new research question is raised as to whether thermal comfort can explain the relationship between greenery exposure and mental health. Therefore, this study aimed to test the hypothesis that green space exposure has an indirect effect on mental health through thermal comfort. We conducted a randomized controlled experiment with 230 older adults on a university campus. Each participant completed two sessions: the first involved random assignment to a green or barren site, and the second exposed them to a contrasting greenery condition. Following the completion of baseline questionnaires and a 5-minute rest, participants walked to their assigned sites for a 15-minute outdoor exposure. We measured thermal comfort using 9-point scale thermal sensation vote and the Comfort Formula (COMFA); mood with Positive and Negative Affect Scale; anxiety with State-Trait Anxiety Inventor, psychological restoration with the Restoration Outcome Scale; and physiological stress through skin conductance level and heart rate variability. Multilevel structural equation models were employed to examine both the direct effects of green space exposure on psychological and physiological outcomes and the indirect effects mediated through thermal comfort. Our results suggest that green space exposure is associated with more positive psychological outcomes, including reduced stress and anxiety, improved mood, and greater restoration. These mental health benefits may relate to variations in thermal comfort experienced in green space. This study points to a potential pathway between green space and mental health, contributing to the understanding of the mechanism underlying psychological benefits of green environments. Our findings provide insights into designing healthier living environments, emphasizing that urban green environment planning should explicitly incorporate strategies to optimize thermal comfort in order to amplify health benefits.

Keywords: green space, thermal comfort, mental health, mediation

#181 Mapping the Dynamics of Play: Investigating Play Behaviors Across Natural, Mixed, and Manufactured Zones in a School Playground

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Abstract

The concepts of play and childhood are inherently linked, with the right to play recognized as fundamental by the United Nations Convention on the Rights of the Child (UNCRC) (UNICEF, 2012). A growing body of literature, particularly from North America, Europe, and Scandinavia, emphasizes the value of nature for children's play, health, development, and sense of identity (Lester & Maudsley, 2007). Louv (2008) highlighted that unstructured nature play fosters holistic development and supports academic achievement. Yet, in increasingly urbanized societies, children's opportunities to explore natural environments are limited, positioning school playgrounds as vital contexts for outdoor play, well-being, and peer interaction (Chawla et al., 2014; Tranter & Malone, 2004). Despite this potential, many contemporary playgrounds remain dominated by standardized equipment that lacks contextual relation, limiting opportunities for diverse play activities (Czalczynska-Podolska, 2014). Research has consistently demonstrated links between playground design and children's behavior, identifying factors that influence play value and examining how spatial features shape activities. Understanding how the physical environment can support high-quality play experiences is therefore critical for designing stimulating, health-promoting playscapes. This study investigated the relationship between the spatial design of a school playscape—including natural, manufactured, and mixed play zones—and the actualized play behaviors of children aged 8–11 (n=110). A mixed-method design was employed, with systematic behavior mapping as the central method. Data were collected during daily recess sessions across 22 school days, resulting in nearly 3,000 observed play events. Analyses combined descriptive and inferential statistics with spatial mapping techniques to identify behavioral patterns and their relationships to playground settings. Findings revealed that manufactured zones primarily supported structured group play with limited behavioral diversity and were largely risk-averse. In contrast, natural zones fostered the richest spectrum of play—spanning imaginative, constructive, social, and risk-taking activities—while also encouraging smaller-group and solitary engagement. Mixed zones provided flexible conditions, supporting transitional behaviors, and blending natural and manufactured affordances. Overall, the study underscores the importance of spatial and material diversity in school playground design. Integrating natural and mixed elements alongside manufactured features can create more inclusive, stimulating, and developmentally supportive play environments. For designers, educators, and policymakers, the results highlight how varied play settings can better address children's physical, cognitive, and social health, fostering healthier, more equitable school playground experiences.

Keywords: Behavior mapping, Nature play, Play behavior, School, Playscape

#187 The impact of neighborhood greenery and third places on social interaction among older adults in Austin

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Abstract

The population is rapidly aging, and older adults are vulnerable to loneliness due to physical discomfort, reduced mobility, and the loss of close relationships (Cohen-Mansfield et al., 2016). Many studies have highlighted the positive impact of neighborhood greenery on reducing loneliness (Wang et al., 2024). F ew studies have examined the impact of neighborhood greenness and third place on social interaction (Finlay et al., 2019). This study aimed to examine how neighborhood greenery and the availability of third places are associated with social interaction among older adults in Austin, Texas, USA. We used the Austin Community Survey 2018-2019, and the sample size consisted of 834 individuals aged 65 and older. The outcome was social interaction, measured by the frequency of social contacts with friends and neighbors. Due to the skewed distribution of responses, we recoded the variable into three categories: strongly agree, agree, and all others. Neighborhood greenness and third places were measured by calculating the tree canopy ratio and the number of restaurants, cafes, and groceries within network buffers of 400m, 800m, and 1200m from the midpoint of each residential block. Ordered logistic regression models were estimated, controlling for socio-demographic factors such as age, gender, race/ethnicity, household income, homeownership, and employment rate. Among the 834 survey respondents, 29% indicated strong agreement, 45% reported agreement and 26% provided other responses. Average tree canopy ratio exceeded 30% across 400-1200m buffers. Respondents had access to 10–16 restaurants and 3–5 cafes or groceries within 1200–1600m, with substantially larger counts only at broader distances. In terms of individual-level sociodemographics, 45% were female, 72% were non-Hispanic White, 22% were households having a household income below $40,000, and 12% were renters. The block-group level, according to the 2016-2020 American Community Survey, 49.2% were female, 48.2% were non-Hispanic White, 25% were households having a household income of less than $40,000, and 54.5% were renters. After controlling for the control variables, the results indicated that tree canopy was positively associated with social interaction, whereas third places showed no significant association. While third places are often considered important for fostering community engagement, this study suggests that tree canopy may play a more consistent role in facilitating social interaction. For landscape architecture, these results highlight the importance of integrating tree canopy and green infrastructure into neighborhood design. Such investments not only enhance ecological value but also foster social interaction and contribute to the creation of age-friendly communities.

Keywords: Neighborhood environment, Tree canopy, Third place, Older adults, Social interaction

#208 Interactive engagement with nature can provide unique health benifits: An experimental study on health impacts of different environmental exposures

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Abstract

Rapid urbanization has limited opportunities for nature contact and increased psychological stress, posing urgent health challenges. While natural environments are known to support restoration, most studies focus on parks and street greenery, neglecting agricultural landscapes. Research also emphasizes static–passive contact, such as walking or viewing, while overlooking the benefits of dynamic participation. With leisure agriculture growing in popularity, its health functions remain underexplored. This study investigated orchards as a representative agricultural landscape and compared them with parks and streets as typical urban environments. A within-subject experiment was conducted with 65 participants who engaged in short-term interventions across the three settings. The orchard condition involved a dynamic fruit-picking experience with bodily movement and multisensory engagement, whereas the park and street conditions involved static walking–sightseeing activities. Each participant completed three randomized sessions, including psychological assessments, physiological measurements, and cognitive tests, with pre–post differences analyzed to evaluate immediate health effects. Results show that natural environments were superior to streets in regulating psychological and physiological outcomes. Both parks and orchards reduced negative emotions and total mood disturbance while enhancing vigor and self-esteem, though through different mechanisms. Parks were most effective in relieving tension and confusion and in lowering systolic blood pressure, reflecting relaxation and stress reduction. Orchards more strongly alleviated anger and improved cognitive flexibility, while also inducing significant physiological activation. By contrast, streets lacked positive outcomes and were associated with increased fatigue, reduced self-esteem, and elevated diastolic blood pressure. In cognition, all three environments improved performance but with different emphases: parks enhanced attention and executive control, streets provided mild activation, and orchards strengthened memory processing and adaptability. Interviews further revealed that fruit-picking combined physical activity with tactile, olfactory, and visual stimulation, deepening participants' sense of connection with nature. This study highlights orchards as composite green landscapes with both therapeutic and activating qualities, offering unique benefits through interactive engagement with nature. By moving beyond static forms of exposure, it advances restorative landscape research by showing how bodily and multisensory participation can generate distinctive health pathways. At the same time, it provides empirical evidence for planning practices, demonstrating that orchards can serve as multifunctional green spaces that complement parks, enrich peri-urban environments, and support health-oriented infrastructure.

Keywords: Dynamic nature contact, Psychological restoration, Physiological activation, Orchard

#213 Restorative Effects of Biodiversity in Blue and Green Spaces on Physiological and Psychological Health

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Abstract

While substantial evidence supports the mental health benefits of green spaces (Reyes-Riveros et al., 2021)—and more recently, blue spaces (Luo et al., 2023; McDougall et al., 2022; Yin et al., 2023)—comparative research on their restorative potentials remains limited (White et al., 2021). Moreover, the specific role of biodiversity, encompassing both plant and animal life, in psychological and physiological recovery is still not fully understood. Some studies support higher biodiversity (Ha & Kim, 2021; Methorst et al., 2021), others suggest moderate levels are optimal (Hoyle et al., 2017), and some indicate minimal differences across biodiversity gradients (Farris et al., 2024; Xu et al., 2022). To address these gaps, this study employed immersive virtual reality (VR) to simulate controlled landscape environments and examine the effects of water presence (blue vs. green) and biodiversity level (high vs. low) on mental well-being. A 2×2 within-subjects experiment was conducted with 50 participants, each experiencing four ecologically calibrated virtual scenes: green-high biodiversity, green-low biodiversity, blue-high biodiversity, and blue-low biodiversity. Each session followed a standardized protocol: 1-minute baseline, 5-minute stress induction, and 5-minute environmental exposure. Physiological responses—including heart rate (HR), heart rate variability (HRV), and skin conductance level (SCL)—were continuously monitored during the experiment. Psychological responses were assessed using the Positive and Negative Affect Schedule (PANAS) before and after each scenario, as well as post-exposure measures, including the Perceived Restorativeness Scale (PRS), Biodiversity Experience Index, preference ratings, and open-ended questions (e.g., “which scenario made you feel more relaxed?”). Results revealed a significant main effect of water presence on psychological restoration. Blue environments were consistently rated as more restorative than green-only settings in PRS scale, suggesting that humans have an innate aesthetic and emotional affinity for water, which enhances conscious perception of restoration. In contrast, both physiological and affective measures indicated stronger recovery in high-biodiversity environments, regardless of the presence of water. This was evidenced by reduced HR, increased RMSSD, and elevated positive affect (PANAS) scores. This pattern aligns with Stress Reduction Theory (SRT), as biodiverse settings likely signal ancestral safety and resource abundance, triggering innate pathways to restoration. No significant interaction effect was observed. This study demonstrates a complementary restorative mechanism: blue spaces enhance perceived restoration, whereas biodiversity facilitates physiological recovery and positive affect. These findings provide an evidence-based framework for integrating aquatic elements and ecological richness into urban design, advancing a multidimensional approach to restorative landscapes.

Keywords: blue space, biodiversity, restorative effect, VR

#238 Urban Green Space and Emergency Department Visits During Heat Waves

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Abstract

Due to massive urbanization during the 20th century, many cities in the U.S. have experienced the urban heat island (UHI) effect caused by built environments (Chao et al., 2020; Mohajerani et al., 2017) . Landscape and urban planning professionals argue that UHI can be mitigated through the provision of urban green space, as it decreases ambient temperature and enhances thermal comfort (Lai et al., 2019) . Although many previous studies have investigated the role of urban green space in mitigating UHI, less is known about its impact on reducing adverse health outcomes during heat waves. The primary aim of this project is to investigate how urban green space can reduce emergency department (ED) visits during heat waves. The study area is the greater Richmond region, Virginia, where UHI poses significant challenges due to the high proportion of impervious surfaces, which trap heat in the city. ED visit data were obtained from the All-Payer Claims Database (APCD) of Virginia from 2016 to 2022. In addition to ED visit data, sociodemographic information was collected at the zip code level. Daily heat exposure in Richmond was evaluated using ERA5-Land reanalysis data, which provide hourly climate variables—including air temperature, wind speed, and evaporation—at a 9 km spatial resolution. Urban green space data were extracted from the Virginia Land Cover 2016 dataset at 1 m resolution, with classifications including open water, tree canopy, shrub, and turfgrass. A total of 97 zip codes were included in this study. Zip codes tabulation areas in the Richmond MSA were clustered based on the landcover percentage over a variety of categories (water, tree, impervious surfaces, etc.). Once comparable ZCTAs were grouped, distributed lag nonlinear models were fitted to each cluster to assess the nonlinear and lagged associations between temperature, additional meteorological variables, and daily ED visits. Subsequently, a meta-regression was employed to investigate spatial heterogeneity in the heat–ED visit associations derived from the modeling stage. The expected outcomes are that neighborhoods with higher tree canopy cover will experience fewer ED visits during heat waves compared to neighborhoods dominated by impervious surfaces or other types of green space. Our study will provide insights for policymakers and urban planning authorities into how green space planning can reduce heat-related illness in Virginia and beyond. This research will contribute to identifying the effectiveness of different types of urban green space in mitigating heat and lowering ED visits during heat waves.

Keywords: urban green space, extreme heat, ED visit, landscape metrics, urban heat island

#248 Research on an Indoor Green Healing System Based on Multi-Scale Landscape Interfaces

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Abstract

With the progression of global urbanization and industrialization, human activities have increasingly shifted from natural environments to indoor spaces. Modern individuals spend over 90% of their time indoors(Ulrich, 1984) ,making the impact of indoor environmental quality on health increasingly significant. Current research has demonstrated the health benefits of indoor greening from multiple perspectives(Ivashkina & Mikhaylova, 2025; Latini et al., 2023), highlighting an urgent need to establish a systematic indoor green healing system. Based on multi-scale landscape interfaces ranging from macro to micro, this system aims to provide designers, owners, and decision-makers with a clear and operable framework to ensure that selected plants and design strategies precisely match spatial characteristics, thereby maximizing healing benefits. This study aims to construct a scientifically sound "The Indoor Green Healing System". It begins by defining the concepts of "indoor spaces" and "indoor populations", and systematically reviews the therapeutic benefits of various landscape interfaces across different scales, including window-view greenery(Chen et al., 2025; Dreyer et al., 2018), indoor potted plants (Huang et al., 2020; Yao et al., 2018), indoor gardens(Palsdottir et al., 2024), and therapeutic landscapes in large public service areas (Xu & Hu, 2020). On this basis, a three-dimensional Indoor Green Healing System is constructed: * The scale of the landscape interface serves as the design level including window-view greenery, indoor potted plants, indoor healing gardens and green walls, and large-scale indoor landscapes in public service areas, determining plant size and form. * The degree of spatial openness acts as an environmental constraint including physically open spaces, visually open spaces, perceptually open spaces, and functionally open spaces, influencing how landscapes interact with architecture. * Healing touch-points function as objectives including viewing, experiencing, and interacting, clarifying the system’s direct interaction with humans and the mechanisms triggering physical and mental benefits. Together, these elements form a multi-level, comprehensive, and proactive green healing environment. Future research will focus on applied evaluations of this system's effectiveness, strengthening analyses of the long-term benefits and cost-effectiveness of different indoor landscape interfaces. The aim is to provide valuable insights for the theoretical refinement and practical application of the Indoor Green Healing System.

Keywords: Green Healing, Nature-Based Interventions, Indoor Greening, Interior Landscape Construction, Healing Environment

#250 INVESTIGATING THE RELATIONSHIPS BETWEEN BUILT AND NATURAL WINDOW VIEWS, AND STUDENTS PERCEIVED RESTORATION USING VIRTUAL REALITY

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Abstract

This research aims to investigate the relationships between built and nature window views, and students perceived restoration within studio, using virtual reality (VR) technology.Attention Restoration Theory (ART) as the basis of restorative environmental quality (Stephen Kaplan, 1995). While much research has examined real natural settings (Bratman, 2012), (Hartig,2004), (Ulrich,1984) ,limited studies explore whether virtual representations of built and natural environments elicit comparable restorative responses. In many educational programs, such as architecture and other engineering colleges, students must spend more time in studio classes designing their projects. In this regard, the average time allocated to studio courses at the undergraduate level has been estimated to be around 22.2 hours per week (Nelson, 2017). Because studios are central to architecture and design education, this study investigates how virtual window views influence perceived restoration in educational settings. A total of 45 participants were recruited from the School of Landscape Architecture. Each experienced multiple virtual window views,both natural and built,displayed in an immersive simulation of the design studio. Perceived restorativeness was measured using the Perceived Restorativeness Scale (PRS-16). Quantitative data were analyzed using paired t-tests and ANOVA to evaluate variation across conditions. Findings from data analysis indicate that not all virtual views make the same restorative impact on participants. A significant variation was observed within and between categories of built and nature. Although all the nature views have significant restorative quality , the plaza as built view perceived restorative benefit as well. This study makes an important contribution to investigative the restorative quality of virtual views in educational setting. The results highlight the potential VR as a research and design tool. virtual natural views demonstrated clear restorative benefits compared with built views, supporting VR's use for pre-occupancy evaluation and design decision-making. By simulating various environmental exposures, VR opens up possibilities for testing and implementing design interventions aimed at optimizing learning environments for attention restoration and well-being. This study makes two key contributions.it expands knowledge of perceived restorative design by critically examining the impact of virtual views on perceived restorativeness in studios.Additionally, the use of VR as a methodological tool in this study allowed for an immersive exploration into the effects of simulated window views, providing a new lens through which to understand these dynamics. This technological approach not only ensured a consistent and controlled environment for participants but also highlighted the potential of VR in future research and practical applications within design field

Keywords: Attention Restoration Theory, Perceived Restoration Environment, Virtual reality, Window views, Educational setting

#258 The Role of Outdoor Environments in Pediatric Behavioral and Mental Health Facilities: Therapeutic and Trauma-Informed Design for Patients

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Abstract

The increasing rate of mental disorders among young people in the United States underscores the urgent need for specialized Pediatric Behavioral and Mental Health (PBMH) facilities designed to address the therapeutic and trauma-informed needs of their patients. Prior research demonstrates strong connections between healthcare physical environments and young patient outcomes (Sherman et al., 2005; Joseph et al., 2008; Marcus & Sachs, 2013). Despite growing recognition of the restorative benefits of outdoor spaces as non-pharmacological interventions (Marcus & Barnes, 1999), research focusing on outdoor environments within PBMH facilities remains limited. This presentation investigates how outdoor environments in inpatient PBMH facilities can support the therapeutic and trauma-informed care needs of young people. The study specifically explores outdoor preferences of pediatric patients, their diverse therapeutic needs, and the design interventions that enable meaningful therapeutic and trauma-informed experiences. The research team conducted a case study that included one week of systematic observation and behavior mapping, ten interviews with healthcare specialists (psychologists, therapists, and psychiatrists), surveys from direct care staff, and five interviews with architects and landscape architects at an inpatient PBMH facility. Data were analyzed to assess how the outdoor environment functions as a facilitator of therapy, social interaction, and communication between young patients and their care teams. This study demonstrates that outdoor environments serve as essential non-pharmacological resources that enable communication, encourage sensory engagement, and foster physical and social activities. Climate and weather conditions were consistent determinants of outdoor environment use, pointing to the importance of resilient, adaptable design strategies. While limitations included the short duration of data collection and challenges in directly accessing patient perspectives, findings emphasize the need for evidence-based, trauma-informed design approaches. Ultimately, this research advances the field of landscape architecture by identifying how outdoor environments in PBMH facilities can be intentionally designed to support young people’s therapeutic care. The study provides design-based evidence to guide architects, landscape architects, and healthcare professionals in creating supportive and resilient outdoor environments for pediatric patients.

Keywords: Pediatric Behavioral and Mental Health, Outdoor Environments, Therapeutic and Trauma-Informed Design

#302 Linking Green Space Accessibility and Mental Health: Comparing Accessibility Metrics

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Abstract

Urban green space accessibility has been increasingly recognized as a key factor influencing mental health, offering opportunities for physical activity, social interaction, and psychological restoration (Nutsford et al., 2013). However, many of studies rely on simplistic measures of accessibility, such as straight-line (Euclidean) distance to the nearest park (Jarvis et al., 2020), which fail to capture the complexity of actual access. More advanced spatial accessibility metrics have the potential to provide a more nuanced understanding of how green spaces influence mental health. This study addresses these gaps by applying a range of accessibility measures to examine their relevance and effectiveness in landscape and mental health research. Alternative accessibility metrics offer a more refined and realistic assessment of green space accessibility within urban contexts. While simple Euclidean distance does not account for the transportation network required to calculate more realistic travel costs (time or distance), advanced metrics consider spatial factors and transportation- related considerations, such as the number of green spaces within a certain threshold and travel time or distance required to reach them (Handy & Niemeier, 1997). However, there is still a lack of research on how these different accessibility metrics influence the observed relationship between green space accessibility and mental health. This study aims to measure and compare accessibility metrics of urban green space and examine how they relate to mental health outcomes. This study focuses on Fairfax County, Virginia, using census tracts as the unit of analysis. Mental health data were obtained from PLACES, a project developed by the Centers for Disease Control and Prevention (CDC) at the census tract level. Control variables—including age, gender, marital status, education level, monthly family income, occupation, and the frequency of outdoor exercise (over 30 minutes per week)—were sourced from the American Community Survey (ACS) 5-year estimates. The main key accessibility metrics used in this study are as follows: (1) cumulative-based measure , which considers the number of green spaces within a given travel threshold (time or distance), (2) gravity-based measure, which weights accessibility for green spaces based on travel cost (time or distance) impedance functions. The study compares the impacts of these metrics on mental health, using multiple linear regression analysis. By providing insights into how varying levels of access to green spaces influence mental health, this research aims to inform urban planning strategies that can enhance the well-being of urban populations.

Keywords: Urban Green Space, Accessibility Metrics, Mental Health, Restorative Environments

#330 Reducing Student Loneliness through Campus Design: Environmental, Psychological, and Social Mechanisms

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Abstract

Introduction. Loneliness is a pressing public health concern among college students and has been linked to increased mental issues (Richardson et al., 2017), sleep disturbances (Griffin et al., 2020), lower life satisfaction (Chen et al., 2025), and risky behaviors including tobacco use, aggression, injury, and sexual risk-taking (Peltzer & and, 2017). University campuses represent strategic settings for intervention, as they uniquely integrate educational, social, and residential spaces. While prior research has linked natural and built environments with loneliness, the role of campus environments in higher education remains understudied. Methods. We conducted a cross-sectional survey of 828 students at two large land-grant universities in Texas (n=400) and in Pennsylvania (n=428). The primary environmental exposures were perceived campus greenness, walkability, and seating availability. Greenness was measured using items from the Perceived Greenness scale (Loder et al., 2020); walkability with the Neighborhood Environment Walkability Scale (NEWS; Cerin et al., 2013); and seating with a single item indicating perceived sufficiency. Loneliness was assessed with the UCLA 3-Item Loneliness Scale (Hughes et al., 2004). Potential mediators included perceived restorativeness (PR) (Perceived Restorativeness Scale; Dzhambov et al., 2018), perceived safety (PS) (two items from the World Health Organization's Quality of Life; Hipp et al., 2016), and social relationship satisfaction (two items from the Academic Life Satisfaction Scale; Nogueira et al., 2019). We estimated direct and indirect pathways from campus environments to loneliness using logistic regression and structural equation modeling, adjusting for university and demographic factors. Results. Findings indicated that campus environments influence students' loneliness primarily through indirect pathways instead of direct effects. Social relationship satisfaction mediated the campus seating and loneliness relationship, while campus greenness and walkability reduced loneliness through serial mediation pathways involving PR, PS, and SRS. These pathways varied across the two campuses studied. Conclusions. The results highlighted the importance of a context-responsive approach that considers the unique physical, psychological, and social aspects of each campus environment to more effectively mitigate loneliness in higher education settings. This study offers evidence-based guidance for campus planners and managers to prioritize quality green spaces, pedestrian-friendly pathways, and comfortable seating. Such design strategies can promote restorative experiences, enhance a sense of safety, and foster social interactions, contributing to reduced loneliness among college students. Additionally, university policies that support programs such as nature prescriptions or social engagement events can further safeguard students' mental health and overall well-being.

Keywords: Healthy Campus Planning, Loneliness, Restorative Experience, Perceived Safety, Social Relationship Satisfaction

#336 Subjective Well-Being, Urban Green Space, and Walkability: Revealing Nonlinear Relationships

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Abstract

Introduction Urban green space is closely related to residents' subjective well-being (Browning et al., 2019; De Bell et al., 2020). However, research on the interactions between urban green space, walkability, and subjective well-being is limited (Zhu et al., 2023). While existing studies often assume linear relationships, excessive green exposure or overly dense urban environments may not always yield positive well-being outcomes. Therefore, investigating the potential nonlinear effects of urban green space and walkability on life satisfaction is crucial to inform balanced urban design and policy. We aim to explore the following questions: 1) Does urban green space have a nonlinear relationship with life satisfaction; 2) Does walkability demonstrate nonlinear associations with life satisfaction at meso- and micro-scales. Methods Using data from the 2015 Chinese Social Survey (CSS), this study analyzes a subsample of 3,698 urban residents from 210 subdistricts across 30 provinces. Measures of urban green space (NDVI, vegetation cover and non-crop vegetation cover) and walkability were constructed at the subdistrict level using satellite data, street-view images, and GIS-based spatial analysis. A multiple linear regression model with quadratic terms was used to assess potential nonlinear associations between environmental attributes and self-rated life satisfaction, controlling for demographic, socioeconomic, and other environmental variables. Robust standard errors were clustered at the subdistrict level. Results Most urban green space indicators, including NDVI and urban/township-level vegetation cover, show significant inverted U-shaped relationships with life satisfaction. The strongest positive associations occur at moderate levels of greenness, with diminishing returns or negative effects at higher levels. In contrast, urban non-crop vegetation cover shows no significant nonlinear pattern. For walkability, nonlinear associations are limited. Only POI density and visual enclosure exhibit significant U-shaped effects, while the function mix fails the full nonlinear test despite a significant quadratic term. Discussion and conclusion By integrating remote sensing and street-view imagery, this study offers a novel multi-scale framework for evaluating urban environmental impacts on subjective well-being. This study supports the "moderate optimum" hypothesis-urban green space enhances life satisfaction most effectively at moderate levels, with diminishing or even negative effects at higher intensities. Walkability shows limited nonlinear associations with life satisfaction, with only POI density and visual enclosure exhibiting U-shaped effects, suggesting the need for more fine-grained urban interventions.

Keywords: Urban Green Space, Subjective Well-being, Walkability, Street View, Inverted-U Pattern Curve

#402 Multi-Dimensional Greenspace Exposure and Physical Activity: A Systematic Review and Meta-Analyses

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Abstract

Physical inactivity is a major risk factor for non-communicable diseases, yet many adults and adolescents worldwide fail to meet recommended activity levels. Urban greenspaces are often promoted as accessible settings for physical activity (PA), but “greenspace” is measured in diverse ways, reflecting different behavioral pathways. We followed the procedures in the PRISMA statement set out by Moher and colleagues. We systematically searched Scopus, PubMed, Medline, SPORTDiscus, GreenLife, and Google Scholar, screening 39,974 unique records as of August 2025, and reviewing 437 full-text articles. From these studies, four main types of greenspace exposure emerged: morphology, greenness, accessibility, and proximity. A meta-analysis was conducted to quantify associations between these exposures and PA outcomes. Results show distinct patterns by exposure type: Morphology (7 studies): Larger and more cohesive greenspaces promote PA, while effects of shape and fragmentation vary by scale. Proximity (43 studies): Greenspaces within walking distance (~400–1,000 m) are more strongly associated with walking, step counts, and youth PA. Accessibility (47 studies): Perceived access and service-area availability predict park use and recreational PA, with network-based measures improving accuracy. Greenness/NDVI (49 studies): Nearby (100–500 m) and route-level greenness show the strongest positive associations with walking and light activity. Contextual factors (walkability, safety, amenities, season, and topography) strongly influence outcomes. This review highlights the multidimensional nature of greenspaces and their relevance for physical activity. More longitudinal and experimental studies, as well as research exploring underlying mechanisms, are needed. Emerging evidence on greenspace morphology is promising and warrants further investigation to inform practical interventions and policy decisions.

Keywords: Greenspace morphology, physical activity, Greenspace accessibility, NDVI, Greenspace proximity

#412 Salutogenic landscape architecture & (micro)ecological affordances: The importance of small things

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Abstract

Introduction: We are continually exposed to microorganisms, such as bacteria, fungi, and viruses, in our daily living environments. For example, a teaspoon of soil, cup of water, or single apple can each contain millions or even billions of microbes (Fierer, 2017; Wasserman, 2019). These exposures can have negative health implications, as evidenced by the COVID-19 pandemic, but they can also be beneficial. We now know that humans co-evolved over millennia with these environmental microbes and our immune systems are not only adapted to coexist with the majority of them, but may even require their presence to develop properly (Roslund, 2024; Rook, 2013). Despite increasing recognition of potential benefits afforded by microbially-diverse environments (Robinson et al., 2024), actionable ways to promote "good" microbes while avoiding "bad" microbes have not been fully explored by landscape architects. The goal of this research, therefore, is to understand ecological principles driving the assembly of environmental microbial communities and draw upon landscape theory to suggest ways designers can shape healthier urban microbiomes. Methods: For the scientific aspect of this work, I collected samples of air, soil, edible plants microbiomes and used next-generation DNA sequencing to explore drivers of microbial community diversity and composition. Through in-depth literature review, I also examine implications of exposure to environmental microbiomes for human health and, using existing theory, begin to translate findings into practical principles for landscape architecture. Results: Direct contact with healthy living soil increases diversity of human skin microbiomes, due to transfer of microbes from soil. This effect is transient (< 12 hours) and may be counteracted by hand-washing. Additionally, fruits and vegetables harvested from local landscapes harbor different microbial communities than store-bought produce, but potential impacts of consumption on the human gut microbiome are largely dependent on individual factors. Discussion: I posit that microbial exposures from our living environments are a type of "affordance" in the sense first proposed by Gibson (1979)—things offered by the environment that are uniquely experienced by each entity. Despite being invisible, microbial exposures are deeply impactful and these impacts are mediated by individual immune system memories. Thus, age and past immune history of anticipated users is a critical consideration when seeking to incorporate microbiomes into landscape design. Conclusion: Prioritizing equitable and accessible green and productive spaces in urban neighborhoods could augment residents' exposure to microbiota associated with soils and edible plants, thereby fostering healthy immune development and, potentially, providing large-scale public health benefits.

Keywords: Microbiome, Rewilding, Health, Urban design, Biodiversity

#482 Urban Parks, Popularity, and Visitor Diversity: Implications for Community Health in Houston

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Abstract

Urban parks are increasingly recognized as essential elements of social and ecological infrastructure, contributing to community resilience, social connection, and individual well-being. Beyond providing recreation and contact with nature, parks serve as important civic spaces where diverse populations can interact (Sullivan et al., 2004; Peters et al., 2010; Powers et al., 2021; Seeland et al., 2009). Prior studies have linked green space accessibility to improved health outcomes, yet relatively little research has examined how park popularity —the intensity of visitation by people from different neighborhoods—and visitor diversity —the demographic heterogeneity of users—may influence health at the neighborhood level. These dimensions reflect not only whether parks are used, but also the extent to which they foster inclusive, socially vibrant environments that can shape community health and social and emotional support This study investigates these questions in Houston, Texas, a highly diverse and rapidly growing metropolitan area where disparities in both green space access and health persist (Cheng, 2023; Elliott et al., 2019). Data are compiled at the census tract level, incorporating measures of park resources (number of parks, accessibility, popularity, visitor diversity), built environment characteristics (walkability, tree canopy, density, neighborhood safety, mixed-use indices), and sociodemographic indicators. Community health outcomes are drawn from the CDC PLACES dataset, focusing on the general health, mental health, physical health, and social and emotional support (Centers for Disease Control and Prevention, 2022). The analysis employs multivariate regression and spatial modeling to examine whether census tracts with parks that are more popular and have more socioeconomically diverse visitors demonstrated better community health outcomes, controlling for built environment and sociodemographic factors. By linking park use and diversity to population health, this study positions parks not only as recreational amenities but as critical social and public health infrastructure. This research goes beyond conventional measures of green space quantity to assess how patterns of use and social inclusion contribute to public health and well-being. Results will inform planners, designers, and public health practitioners seeking to promote parks as health-promoting environments. While centered on Houston, this study offers a broadly applicable framework for understanding the health and well-being impacts of urban parks, with implications for planning and policy in diverse metropolitan contexts.

Keywords: Urban park, Park visitor diversity, Park visitation, Health and Well-being

#507 Associations Between Urban Blue-Green Space and Health in Vulnerable Populations: A Systematic Review

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Abstract

Exposure to green space is increasingly recognized as a determinant of human health and well-being (James et al., 2016; Twohig-Bennett & Jones, 2018). International organizations, including the WHO, emphasize that equitable access to urban greenness can reduce disease burdens, enhance resilience, and promote healthier, more sustainable cities (World Health Organization, 2021). Urban blue-green spaces (UBGS), which include vegetation and water features, are important climate-health strategies, yet their long-term impacts on vulnerable groups remain under-synthesized. This review examines how UBGS influence health outcomes in vulnerable populations through mediators such as air pollution and heat, and moderators such as age, socioeconomic status, and disability. We systematically searched six databases—Web of Science, Academic Search Ultimate, PubMed, GreenFILE, Garden, Landscape & Horticulture Index, and APA PsycInfo—on June 18, 2025. Eligible studies assessed UBGS exposure, reported health outcomes (e.g., cognition, mortality), tested heat or air pollution as mediators, focused on vulnerable groups, and used longitudinal or cohort designs. Of the 22 studies included, most were published between 2021 and 2025 (73%), conducted in urban or mixed settings (86%), and used objective UBGS measures such as NDVI or tree canopy within 100–1000 m buffers (82%). Protective associations were consistent across domains. For mortality, higher greenness reduced all-cause and cause-specific risk in older adults (Feng et al., 2023; He et al., 2021; Rodriguez-Loureiro et al., 2022). For cognition, residential and school greenness improved child development and slowed decline in later life (Dadvand et al., 2015; Jimenez et al., 2022; De Keijzer et al., 2018). Cardiometabolic benefits included lower blood pressure, reduced hypertension, and fewer metabolic-syndrome components among children, pregnant women, and adults (Bao et al., 2024; Liao et al., 2019; De Keijzer et al., 2019; Zhou et al., 2023). Mental health outcomes showed reduced depression and improved well-being (Liao et al., 2022; Sanz-Mas et al., 2025). Respiratory outcomes were mixed but generally favorable with tree canopy (Fuertes et al., 2020; Yen et al., 2025). Mediation analyses highlighted reductions in $PM_{2.5}$ and NO_2 and mitigation of extreme heat (Zhang et al., 2021; Zhou et al., 2023). Moderation analyses showed stronger benefits among children, older adults, and low-income groups (Bao et al., 2024; Liao et al., 2022).Overall, findings support UBGS as scalable interventions to reduce mortality, improve cognition and cardiometabolic health, and buffer climate- and pollution-related risks. Future research should standardize exposure measures, expand blue space evaluation, and test causal pathways in disadvantaged settings.

Keywords: Urban blue-green space , Vulnerable populations , Health outcomes , Extreme heat , Systematic review

#534 Beyond Canopy Cover: How Vertical Structure of Urban Trees Influences Crime in Urban Neighborhoods

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Abstract

Background: Urban greenery has often been associated with improved safety and reduced crime (REF). Large trees may enhance visibility and natural surveillance, while smaller trees and dense shrubs can block sightlines and increase opportunities for crime (Lee et al., 2023; Kuo & Sullivan, 2001). Yet most studies emphasize two-dimensional canopy cover rather than vertical structure. Few have examined fine-scale vertical structural features, such as canopy openness and vertical layering, in relation to crime. This study addresses this gap by analyzing how vertical canopy indicators are linked to crime in urban neighborhoods. Purpose: This study investigates how canopy cover and vertical structure influence outdoor crime. We test whether (1) greater canopy cover (Cover Fraction, CF) reduces crime, and (2) maximum canopy height (Hmax) shows nonlinear associations with crime. We also examine whether these patterns differ for property and violent crime across urban census block groups. Methods: We integrated high-resolution LiDAR-derived vegetation metrics with police crime records aggregated by block group (n = 679, 2021–2024). Independent variables included canopy cover (CF) and maximum canopy height (Hmax). Dependent variables were yearly counts of property and violent crime. To account for population size, models included the log of population as an exposure variable. Control variables covered land use, demographic, and socioeconomic characteristics such as residential and commercial ratios, population density, age distribution, racial composition, income, education, unemployment, renter occupancy, vacancy, and housing age. Multivariate negative binomial regressions were estimated using the Integrated Nested Laplace Approximation (INLA) Bayesian framework, noted for efficiency and reliability in spatial crime analysis (Zheng et al., 2024). Results: Findings indicate that lower canopy cover (CF) was positively associated with both property and violent crime, whereas higher canopy cover showed a negative association, reinforcing the protective role of greenery. Maximum canopy height (Hmax) displayed a nonlinear, inverted U-shaped pattern: crime risk increased at moderate canopy heights but declined at taller canopies, suggesting that very tall trees may enhance surveillance benefits while intermediate heights can obstruct visibility.

Keywords: Crime, Tree canopy, Urban forestry, Spatial crime analysis

#561 Integrating AI and geo-analysis to Assess Green Infrastructure and Human Health: A Systematic Review

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Abstract

Green Infrastructure (GI) plays a vital role in supporting urban sustainability by mitigating climate risks and promoting public health (Adesoji and Pearce 2024) . Recent developments in Artificial Intelligence (AI) and spatial analysis have made it possible to better understand GI benefits on human health (Lee, Chamberlain et al. 2025) . The existing reviews have largely treated these domains separately, focusing either on the health impacts of GI or on the methodological integration of AI in spatial analysis (Boutayeb, Lahsen-cherif et al. 2024, Huang, Lu et al. 2024, Yao, Lu et al. 2024) . Based on that, there is a lack of systematic synthesis that integrates AI- and GIS-based approaches to specifically assess how GI influences human health outcomes. This gap limits our ability to understand the full potential of combining spatial analysis and machine learning in capturing complex GI–health relationships. Addressing this gap, the present review asks: To what extent can AI and GIS analysis be integrated to measure the impact of GI on human health? This systematic review was conducted in accordance with the PRISMA guidelines. A comprehensive search was carried out in Scopus, Web of Science, and PubMed for studies published between 2000 and 2025 using a combination of keywords related to AI and data-driven methods, geospatial approaches, green infrastructure, and health outcomes. The initial search identified 271 articles (118 from Scopus, 116 from Web of Science, and 37 from PubMed). Following title, abstract, and full-text screening, 45 articles from Scopus, 39 from Web of Science, and 18 from PubMed were retained, resulting in 84 peer-reviewed studies included in the final review. Studies were eligible for inclusion if they utilized AI and/or GIS methodologies to analyze (GI), urban green spaces, or nature-based solutions in relation to human health outcomes including physical, mental, psychological, or public health. Eligible studies were further limited to peer-reviewed empirical research published in English with full-text availability. Findings indicated that most studies focused on mental health outcomes and heat exposure, with fewer addressing cardiovascular and other physical health risks. Methodologically, AI contributed advanced computational techniques and predictive models (e.g., random forests), while GIS primarily supports spatial analysis, overlay modeling, mapping, and visualization of GI distribution. In addition, AI-based remote sensing methods such as image recognition, deep learning, and neural networks have improved the accuracy of GI detection, thereby supporting research on urban green infrastructure and epidemiology.

Keywords: Artificial Intelligence, GIS, Green Infrastructure, Health

#569 Can Transit Hubs Heal? Evaluating the Restorative Potential of Green Infrastructure in Multimodal Mobility Centers

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Abstract

Public transit hubs are often designed for throughput, with little attention to human comfort, perceived safety, or cognitive recovery. Yet in a climate of urban stress and increasing multimodal reliance, even short-term exposure to nature in these environments may significantly impact public well-being (Trowbridge & Worden, 2016; White et al., 2013). This study explores whether incorporating green infrastructure into multimodal transit hubs can support attention recovery, perceived restorativeness, and psychological well-being (Saedi & Rice, 2021; Berman et al., 2008; Ohly et al., 2016; Aricò et al., 2016). Conducted in collaboration with the Harris County Toll Road Authority (HCTRA) as part of their Westpark Tollway – Models for Mobility initiative, the research was embedded in a real-world design scenario evaluating conceptual enhancements to the Westchase Park & Ride facility in Houston, TX (Saedi et al., 2021; Saedi & Rice, 2022; Anderson et al., 2017). Using a Fully Immersive Virtual Reality Environment (FIVRE) (Saedi & Rice, 2020), over 200 participants experienced a simulated arrival sequence through three future-enhanced transit hub conditions, moving through green corridors with varied planting intensity, shaded seating, bioswales, tree canopies, and vegetated sound-buffering berms. Physiological responses (eye-tracking, heart rate), subjective perceived restorativeness (via the ART questionnaire), and cognitive performance (via the SART test) were measured before and after the experience. Findings revealed that all green-enhanced scenarios improved participants' perceived restorativeness, cognitive performance, and physiological responses. Interestingly, the medium greening scenario was rated most favorably across both cognitive and perceptual measures, suggesting that strategic, balanced planting, not simply more greenery, yields stronger psychological benefits in constrained transit settings. This research not only demonstrates the potential of immersive VR for pre-construction testing of environmental design strategies, but also provides actionable insight for public agencies and design teams. By bridging cognitive science, physiological responses, and human perception, this work challenges conventional assumptions about transit infrastructure and calls for the integration of evidence-based greening strategies to support mental health, physiological health and urban livability

Keywords: Transit Hubs, Fully immersive virtual reality (FIVRE), Restorative environments, Human-centered infrastructure, Evidence-based design

#590 Plants at Plants: Phyto-Mitigation of Industrial Hazards in Stalin-era Landscape Design

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Abstract

Concern with the health impacts of particulate pollution and other atmospheric hazards is a crucial dimension of environmental health and healthy environments. It is not, however, a new concern; nor are efforts to address industrial hazards using techniques of phyto-remediation or mitigation without precedent. This paper provides comparative historical depth to recent studies of industrial and corporate landscapes that traced how expectations regarding health, culture, and productivity were designed into those sites in an Anglophone context of capitalist modernity (e.g by Louise Mozingo, Helena Chance, Vicky Long). Studies of the late 20th- and early 21st-century recycling, reuse, even “redemption” of post-industrial landscapes often trace an arc of post-industrial or post-Fordist efforts, from Seattle’s Gas Works Park or Duisburg-Nord Landschaft Park to the NYC High Line, culminating in West Coast bucolic tech campuses such the newly opened Amazon “Spheres” facility (e.g in studies by Ellen Braae, Kate Kennen, Niall Kirkwood, Christopher Sellers). Modernization and industrialization were and are globally differentiated phenomena, with the attempted solutions of past periods often shaping the wicked challenges of the next era. Using a range of primary sources in dialogue with English- and Russian-language scholarship on the history of medicine and environmental health, I focus on how Soviet urbanists navigated the dilemma of creating industrial landscapes that were both hygienic and socialist in the Stalinist era (1932-1954). Specifically, this talk will analyze the Soviet “Garden-Factory” model of industrial site design, analyzing how spatial and phyto-mitigation interventions were designed to combat the mental, physical and political hazards of Stalinist break-neck industrialization. Industrial landscape design in the USSR proved a fraught arena of professional and political contestation. Although unconstrained by property lines and buoyed by official support for “turning to nature for health” (cf Johanna Conterio, Tricia Starks), Soviet specialists were challenged by acute shortages and limited professional agency. The dominant emphasis on environmental health prophylaxis (rather than clinical or therapeutic remedies) contributed to distinctively Soviet prophylactic approaches to public health. Over time, the emphasis on mitigating airborn and visual hazards by dense formal plantings shifted to more naturalistic layouts that emphasized regional species. The aesthetic and political criteria by which such designs were judged at the time and since has camouflaged their original hazard-mitigation aims. By recovering awareness of these early 20th century efforts, successful and otherwise, we gain broader understanding of the challenges and potential of using plants to achieve community health aims.

Keywords: industrial landscapes, phyto-remediation, history of medicine, factory welfare, ecologies of health

#595 Climate as a Moderator of Park Utilization and Healthy Aging: Evidence from High-Performing U.S. Cities

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Abstract

As the U.S. population ages, maintaining health and well-being among older adults has become a pressing design and policy imperative. High-quality urban park systems, with amenities like canopy shade, walkable access, and a rich mix of recreation opportunities, are valued, public health assets that can support physical activity and mitigate chronic disease risks (Frumkin et al., 2017; Van Cauwenberg et al., 2018). However, these potential health benefits are inherently moderated by climate, which can present significant obstacles to year-round use, particularly for heat or cold vulnerable older populations (Rosenthal et al., 2014; Havenith & Fiala, 2016). A critical gap remains: does the benefit of a high-quality park system lead to equitable health outcomes across diverse climatic geographies? This study examines the climate sensitivity of older adults' health in 29 U.S. cities having ParkScore® 2024 total scores ≥60 (Trust for Public Land, 2024), where park quality is controlled for in order to isolate climate effects. Leveraging data from NOAA's 30-year Climate Normals (1991–2020), CDC PLACES, and NCHS USALEEP, we aim to relate several important climate parameters, such as mean annual temperature, number of extreme heat days, precipitation frequency, and length of snow cover, to measures of health for adults aged 65+ (e.g., physical inactivity, obesity prevalence, life expectancy). Multivariate regression and multilevel modeling, while controlling for several socioeconomic covariates (ACS) and air quality (EPA AQS), will explore zone-specific associations controlled for climate classification using Köppen–Geiger climate classifications. We hypothesize that climatic stressors have differential health impacts across zones: e.g., in Cfa humid subtropical climates, physical inactivity may be correlated with large numbers of hot-stress days, while in Dfb warm summer continental climates, long-term snow cover may be highly correlated, and discovering these zone-specific sensitivities will yield new insights into how climate conditions moderate the health benefits of high-quality park systems. In connecting climate science, public health, and landscape performance, this study provides the empirical support for the climate moderation effect on park-based health outcomes. Our results will inform climate adaptive landscape urbanism and help to guide interventions, such as maximizing shade and ventilation in hot climates or ensuring year-round access in snowy climates. Ultimately highlighting the need for zone-specific, evidence-based design interventions to meet the needs of a changing climate to support spatial equity and healthy aging.

Keywords: Climate adaptation, Healthy aging, ParkScore cities, Spatial equity, Environmental gerontology

#619 Street-Level Landscape Composition and Older Adults' Well-being: Evidence from Florida

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Abstract

Promoting healthy in aging more and more relies on understanding how the everyday streetscapes where most of the routine outdoor activities take place influence older adults' health. Conventional greenness measures derived from satellite images (e.g., NDVI) reflect the amount of vegetation, but ignore how people perceive and use urban space (Li, Zhang, & Li, 2015). Street-level images allow us to quantify the composition of the visual landscape from a human's perspective and provide a novel means to explore how the visualized amounts of green view, sky openness, built enclosure, and pedestrian infrastructure jointly affect health (Biljecki & Ito, 2021). Despite the tremendous advancement in deep learning, based scene parsing methods, few studies have related the semantic composition in street views to spatially explicit health measures for older populations. Most of the existing evidence relates overall green-view indices to health or relates health to all populations (Rugel, Carpiano, Henderson, & Brauer, 2019). Therefore, we still lack an understanding of which visualized elements and at what thresholds are associated with older adults' psychological health. This study investigates the associations of the relative amounts of Vegetation%, Sky%, Building%, and Sidewalk%/Road% (derived from semantic segmentation of Google Street View images using DeepLabV3+ (Chen et al., 2018; Cordts et al., 2016) with community-level older adults' health and well-being indicators across Florida. Specifically, this study aims to answer the following questions: 1) How are street-level visual characteristics associated with life satisfaction, mental distress, and self-rated health among older adults? 2) Do these relationships exhibit nonlinear or threshold relationships, indicating optimal/ideal and/or critical levels of exposure? We will investigate the Sarasota–Bradenton metropolitan statistical area, characterized by a high share of 65+ and variability in neighborhood form and visual landscape across communities as study areas. Street imagery will be sampled systematically. Health outcome data will be obtained from CDC PLACES, providing tract-level prevalence estimates of ever-diagnosed depression, frequent mental distress, and fair or poor self-rated health. Sociodemographic covariates (65+ share, income, education, race/ethnicity) will be extracted from the 2023 American Community Survey (ACS) (CDC, 2024a, 2024b; Greenlund et al., 2022). Through analysis, this study aims to identify which street-level visual compositions best support psychological and overall health among older adults, and whether specific proportions mark inflection points in well-being outcomes. Findings will clarify design-sensitive thresholds for greenery, openness, and built enclosure observable at eye level, informing evidence-based guidelines for age-friendly, visually restorative, and health-supportive streetscape design.

Keywords: Street View Imagery, Semantic Segmentation, Older Adults' Health, Urban Landscape, DeepLabV3+

#633 A generalized relationship between dose of greenness and mental health response

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Abstract

Exposure to green spaces is a boon to urbanites. Over the last four decades, an increasing number of researchers have shown interest in exploring the relationship between the dose of greenness and mental health response. Early studies suggested a linear dose–response relationship, making it challenging to identify the most beneficial doses of greenness. However, findings from a rapidly growing body of recent research indicate the possible existence of a generalized curvilinear pattern. Despite this, these studies have used varying measures and contexts, resulting in inconclusive evidence. Without fully understanding the nature of the relationship, we do not know how to allocate green landscape resources to maximize mental health benefits. This study aimed to identify a generalized pattern to describe the dose–response relationship between urban greenness and mental health. Through a meta-analysis of all relevant studies, we found sufficient samples to generalize the dose–response curve for greenness intensity. Our analysis revealed that a quadratic pattern best fits most of the published greenness curves, and we identified the highly beneficial and best doses of eye-level greenness and top-down greenness. This study identifies and rationalizes a generalized quadratic pattern describing the dose of greenness–mental health response curves, addressing a critical knowledge gap across multiple fields. In practice, a moderate ‘dose’ of urban greenness exposure provides the most salubrious supply of mental health benefits.

Keywords: Green landscapes, Mental health, Dose of nature, Dose-response curve, landscape planning and design

Landscape Performance (LA CES)

#33 Zooscapes for Sustainability: Defining the Role of Zoo Through the Framework of Landscape Performance

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Abstract

More than 600 million people, approximately 10% of the world's population, visit zoos annually, making them the most frequently visited type of museum worldwide (WAZA, 2005). Zoos provide numerous benefits for animals and society, including conservation, knowledge generation, entertainment, and education. However, these benefits are often attributed to zoos' institutional aspects, such as research and conservation initiatives, rather than to their physical landscapes. Additionally, most existing zoo studies focus on improving visitor learning experience, enhancing habitats, and facilitating human-wildlife interaction, with fewer studies examining the value of zoo landscapes themselves, nor how to design to maximize this value. As a landscape matrix, zoos offer abundant opportunities to provide benefits such as food and biomass, climate and stormwater regulation, and cultural appreciation. Recognizing and integrating these benefits can help zoos maximize their roles in building a sustainable environment. Landscape performance is an evaluation system initiated by the Landscape Architecture Foundation in 2010 to measure the benefits of high-performance landscapes. It offers a valuable framework for assessing the value of zoo landscapes. In this study, we borrowed the LPS framework to examine 11 award-winning North American zoos, analyzing their award application documents, identifying potential benefits created by zoo landscapes, and incorporating literature and case studies to provide actionable ideas for their design and evaluation. Additionally, we adapted LPS's metrics and methods and proposed new ones for evaluating zoo landscapes' performance. Our results show that 30 out of 33 LPS benefits were presented in the zoos studied. The most commonly achieved benefits included educational value, safety, visitor spending, property value, preservation, recreation, and social value. Less frequently attained benefits were soil creation, carbon sequestration, waste reduction, and noise mitigation. Nonetheless, case studies and literature suggest that all 33 benefits are achievable through thoughtful design strategies. Additionally, we propose several new metrics for assessing zoo landscape performance, such as the number of program elements accommodated within previously developed footprints, visitors' perceived thermal comfort, quality of cultural representation, observation of animal behaviors, and changes in visitor behaviors. We anticipate this research will enhance the LPS framework by broadening its scope to include zoo landscape, a previously unexamined type, and offer zoo professionals new perspectives on zoo spaces, fostering collaboration with landscape architects.

Keywords: zoo performance, sustainable zoo design, animal and human well-being, Landscape Architecture Foundation, design guidelines

#131 Toward a Holistic Evaluation of Urban Parks: A Systematic Review of Accessibility, Availability, and Quality through an Ecosystem Services Lens

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Abstract

Urban parks are increasingly recognized as essential socio-ecological infrastructures that support not only recreation and well-being but also critical ecological ecosystem services (EES) such as stormwater regulation, microclimate cooling, and habitat provision. As cities face growing climate and biodiversity challenges, evaluating parks through an ecological lens has become increasingly important. The Accessibility–Availability–Quality (AAQ) framework is widely used to assess how residents reach, encounter, and experience parks by capturing spatial and social dimensions of park use. However, its current applications rarely address ecological performance or biophysical conditions central to EES delivery. This gap limits the framework's capacity to support holistic evaluations of urban parks as socio-ecological systems. This study presents an ongoing systematic literature review that examines how AAQ indicators relate to ecological ecosystem services in urban parks. Using PRISMA guidelines, structured searches were conducted in Scopus and Web of Science on June 2025 with predefined terms related to AAQ, urban parks, and ecological ecosystem services. After screening, 49 peer-reviewed journal articles in English met the study aim and form the current pool for full-text coding and synthesis. Preliminary observations reveal three emerging patterns. First, accessibility and availability metrics, typically distance or density, are increasingly linked to the heat mitigation. Second, biophysical park features including tree canopy cover, vegetation abundance, and water bodies are consistently associated with ecological ES such as cooling effects and biodiversity support; however, these features are not systematically defined within existing AAQ quality measures, suggesting conceptual gaps in how "quality" is operationalized. Third, a subset of studies examines how users perceive biophysical characteristics and relate them to ecological benefits, indicating potential overlap between perceived quality and ecological ES delivery. These early insights underscore the need for clearer conceptual integration between AAQ dimensions and ecological functioning. As an ongoing review, this study aims to clarify how AAQ can be reframed to better incorporate ecological performance metrics and biophysical indicators. By foregrounding ecological ES, the emerging synthesis identifies opportunities to strengthen the quality dimension with ecological criteria and to adapt accessibility and availability measures to reflect spatial variations in ecological capacity. Ultimately, this work advances a more ecologically grounded approach to evaluating urban parks and offers directions for planning and design strategies that enhance both EES delivery and human well-being.

Keywords: Urban Park, Accessibility, Availability, Quality, Ecosystem Services

#230 Measuring the Multifunctional Landscape Performance of Agrivoltaics on Vacant and Underutilized Land

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Abstract

Landscape architecture increasingly requires strategies that integrate ecological resilience, food production, and renewable energy within multifunctional landscapes. Agrivoltaics co-locating solar infrastructure with agriculture offers such potential, but its value must be assessed across environmental, economic, and social dimensions. This study develops a landscape performance assessment of vacant and underutilized parcels in Connecticut, applying suitability modeling and scenario evaluation to quantify potential benefits. Environmental performance is evaluated through indicators such as improvements in microclimate conditions, mitigation of urban heat island intensity, and modulation of canopy–light dynamics on vacant and underutilized parcels. Economic outcomes are assessed using land-equivalent ratio (LER) and modeled energy yields, highlighting efficiency and cost-effectiveness in land use. Social dimensions include enhanced food access, opportunities for community engagement with open space, and improved public acceptance of renewable energy development, consistent with findings that agrivoltaics can strengthen local support for solar projects (Pascaris et al., 2021). By integrating GIS-based spatial analysis with performance metrics, the research advances methods of observation, measurement, and predictive modeling central to the Landscape Performance track. Results demonstrate how agrivoltaics can reframe the value of open space by producing quantifiable co-benefits that extend beyond energy generation alone. This approach positions agrivoltaics as both a design and planning strategy capable of enhancing landscape performance across scales, while also providing an evaluative framework that links ecological design with social equity and community resilience. Through empirical data and critical reflection, the project underscores the capacity of landscape architecture to assess, communicate, and maximize the multifunctionality of contemporary land-use practices. Agrivoltaics on vacant and underutilized parcels are thus presented not only as a technical solution but also as a socially attuned strategy for reimagining underutilized landscapes to meet climate, energy, and food security goals.

Keywords: Landscape Performance, Agrivoltaics, Land Equivalent Ratio (LER), Energy and Food Security, Climate-Responsive Design

#276 Vista Assessment and Optimisation of Beijing's Old City Boundary from Overpasses

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Abstract

In the past, relevant research has focused more on the evaluation and construction of viewing landscapes in the central area of Beijing's Old City, with insufficient attention paid to its boundary [1-2] . This study uses the overpasses on the boundary of Beijing's Old City as viewing points to establish a new evaluation system for viewing landscapes. Using methods such as image semantic segmentation, HSB color quantification, the Analytic Hierarchy Process (AHP), and expert scoring, it assesses the current status of the viewing landscapes at the Old City boundary and proposes corresponding optimization strategies. Thirty-one overpasses along the road on the boundary of Beijing's Old City were selected as nodes for viewing towards the interior area of the Old City. Through field research, 23 historical viewing objects and 42 modern viewing objects were identified [3] . Street view images were acquired, and the 83 viewing perspectives of the Old City were divided into four categories: "Scenery Viewing", "Historical Appreciation", "Landscape Viewing" (mountains and waters), and "Urban Viewing". Using the Analytic Hierarchy Process (AHP), 19 evaluation factors were selected from 65 influencing factors, categorized into three types: overall landscape elements, natural landscape elements, and artificial landscape elements, covering 7 evaluation dimensions. Furthermore, four distinct indicator evaluation systems were proposed according to the viewing landscape types. Finally, the current landscape status was evaluated using the expert scoring method, existing problems were identified, and categorized optimization strategies were proposed. The research results indicate that: (1) There are multidimensional interferences in the protection of the historical landscape imagery at the boundary of Beijing's Old City. Out of the 23 historical viewing objects near the boundary, only 12 are visible. (2) The number of "Landscape Viewing" (mountains and waters) type landscapes is relatively small, with low and concentrated ratings, due to the insufficient height of the overpasses for viewing distant mountains, and issues such as the small visible area of water bodies. (3) The overall rating of the "Scenery Viewing" category is relatively low. (4) The "Urban Viewing" category is numerous but uneven in quality, with significant skyline fluctuations. This study, focusing on the viewing landscapes of the Old City boundary, can provide a new perspective for historic city conservation [4] ; the newly established method and system for classifying and evaluating viewing landscapes can provide a reference for heritage conservation in Beijing and other cities around the world [5] .

Keywords: Vista Landscapes, Historic Urban Conservation, Landscape Performance, Landscape Evaluation System

#292 Landscape Infrastructure as Environmental Sensors: Evaluating Artificial Floating Islands as Water Quality Monitoring Platforms

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Abstract

This study explores the potential of Artificial Floating Islands (AFIs) to improve urban pond water quality and formulating replicable frameworks for ecological design education. Stormwater and agricultural runoff continue to degrade urban freshwater systems, reducing biodiversity and impairing ecosystem services. While AFIs' capability for nutrient removal and pollutant uptake is well documented in experimental contexts (Yeh et al., 2015; Zhu et al., 2011), little research has examined their performance as design interventions in public spaces. This project investigates the design, construction, installation, and monitoring of two 42 sq. ft AFIs at Oconee Forest Pond on the University of Georgia campus as a water treatment tool and educational demonstration of ecological design. Each AFI is composed of buoyant Poly-Flo filtration media planted with wetland vegetation and anchored to the lakebed with stainless steel cable and concrete cinder blocks. The research timeline includes two phases: deployment of unplanted islands in January 2026 to collect baseline water quality data, followed by planting and redeployment in April 2026. One AFI will be anchored at the pond's primary inflow and the other at the outflow. This configuration allows for baseline monitoring of water entering and leaving the pond, and following planting and redeployment, provide a framework for evaluating whether the AFIs contribute to measurable water quality improvements from inflow to outflow. Low-cost water quality sensors including total dissolved solids, dissolved oxygen, pH, etc. are used to continuously collect water quality data. Sensors are wired to a Raspberry Pi computer to store the data that will be analyzed. Collected data will be analyzed using time-series analysis to capture trends and seasonal variations, and appropriate paired statistical tests to determine whether differences in water quality between inflow and outflow before and after AFI deployment are statistically significant. Collected data is also translated into an interactive musical installation, interpreting current water quality status in the form of ambient soundscapes accessible to the public. This user experience enables the public to perceive water quality changes through sound, fostering ecological awareness and making invisible ecological processes perceptible. Visitor engagement is documented through observational counts and short form surveys. By formulating a replicable methodology, this research contributes to the growing body of AFI scholarship while positioning AFIs as viable design interventions that integrate ecological function with public education. This research not only advances technical understanding of AFIs but also could contribute to linking ecological design with social engagement and educational innovation.

Keywords: Artificial Floating Islands, Water Quality, Data Collection, Ecological Design

#388 Assessing the Stormwater and Flood Management Performance of Urban Riverfront Parks: A Geospatial Framework Applied to Fargo, North Dakota

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Abstract

Urban riverfront parks are critical infrastructure that provide significant environmental benefits, particularly for stormwater management and flood risk mitigation. Through floodplain restoration and the integration of green infrastructure (such as riparian buffers, bioswales, and native vegetation), these parks can reduce surface runoff, enhance water retention capacity, lower peak flood elevations, improve water quality, and support urban biodiversity (Andersson et al., 2014). Projects such as Tom Hanafan River's Edge Park in Council Bluffs, Iowa, and Portage Lakefront and Riverwalk in Indiana demonstrate how Midwestern River and lakefront parks use restored floodplains and green infrastructure to manage stormwater, improve habitat, and enhance ecological resilience. (De Almeida et al., 2018; Ellis et al., 2011). For flood-prone cities such as Fargo, these parks are especially important as they strengthen community resilience against increasing climate risks. However, there has been no systematic assessment of Fargo's riverfront parks in terms of their stormwater and flood management performance. Without such evaluation, it becomes challenging to inform future riverfront park design and riparian restoration activities. Performance assessment is also necessary to establish defensible and replicable metrics, demonstrate the tangible value of parks to policymakers and stakeholders, and effectively link design choices with measurable ecological and hydrological outcomes that support long-term resilience and sustainable urban development (Yang et al., 2015). To address this gap, this study aimed to develop and apply a GIS-based landscape performance assessment framework to evaluate Fargo's urban riverfront parks along the Red River with respect to stormwater and flood management. The framework utilized high-resolution remote sensing for land cover classification, field surveys for green infrastructure delineation, NDVI for vegetation health assessment, and DEMs for hydrological modeling (Canfield et al., 2018). Spatial outputs included pollutant hotspot maps, runoff heatmaps, soil erosion risk maps, and runoff pathway models. A set of stormwater modeling tools was used to quantify the landscape performance, such as InfoWorks ICM and the EPA Stormwater Calculator. The resulting analyses evaluated performance metrics under varying rainfall events, such as total runoff, runoff retained by vegetated buffers, and pollutant loads. These findings supported ranking Fargo's parks, developing design scenarios to improve their performance, and formulating guidelines for future park planning and riparian restoration in flood-prone regions. By offering a transparent and repeatable evaluation method, the study supported evidence-based decision-making for the design, restoration, and management of riverfront parks in Fargo and comparable urban contexts.

Keywords: Climate Resilience, Flood Mitigation, GIS-based Assessment, Stormwater Management, Urban riverfront park

#448 Design with Data: Creative Pathways to Landscape Performance in the Classroom

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Abstract

As educators in landscape architecture, we continually explore pedagogical approaches that enable our students to connect research and design thinking with real-world projects (Li et. al., 2019), thereby preparing them for professional practice where data-driven and evidence-based design are becoming standard approaches (Barnes et. al., 2024; Brown & Corrie, 2011). Engaging students in field-based observations and firsthand data collection enables them to learn how to ask critical questions, develop informed design solutions, and establish frameworks for future performance evaluation. However, integrating field data collection into design courses presents significant challenges. The complexity of tools and follow-up data analysis can limit the depth of engagement and learning. Additionally, the ability to meaningfully acquire, synthesize, and apply findings to their design work is difficult to accomplish (Barnes, 2024-b), especially within the timeframe of a single course. Additionally, tools and methods may need interdisciplinary expertise outside the scope of work. Nonetheless, there are multiple benefits for students who learn how to conduct firsthand data collection, like enhanced observation skills, stronger systems thinking, multi-scalar awareness, and evidence-based design. All this raises a central question: How can landscape architecture educators effectively integrate field-based data collection and landscape performance evaluations into single-semester design courses? This panel will explore various pedagogical strategies for integrating field-based data collection and landscape performance evaluation into the landscape architecture curriculum. Drawing from our experiences across courses such as Site Design, Urban Ecology, Research Methods, Landscape Performance Lab, and Site Implementation, we will share how we incorporate both analog and digital tools to enhance design learning. We will discuss how we engage students with both digital modeling and field instruments, including soil probes, infiltrometers, thermal sensors, and weather stations, to collect site-specific data on soil health, infiltration rates, microclimate conditions, and atmospheric variables. Panelists will also discuss teaching strategies that help students gradually build their confidence and skills in field data collection and analysis, including step-by-step assignments, team-based investigations, and exercises that directly link performance data to design decisions. We will also address practical challenges such as tool costs, accessibility, and faculty expertise. By presenting examples and assignments from our own courses, showcasing student work, and sharing instructional models, this session aims to have dialogue around what is working, what is evolving, and where challenges persist—offering insights for educators who are preparing students for future work in data-driven design, evidence-based practice, and landscape performance evaluation.

Keywords: Landscape architecture education, Field-based data collection, Evidence-based design, Landscape performance evaluation, Tools and Methods

#527 Monetizing the Non-Monetary: Establishing a Comparative Trade-Off Framework between Performance Metrics from Nature-Based Solutions

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Abstract

A trade-off analysis is essential for baseline comparisons when evaluating landscape performance across their environmental, social, and economic benefits. While performance metrics such as water savings, carbon reduction, or public health improvements provide valuable insight into outcomes, they often exist in different units that are difficult to directly compare. The pillars of sustainability reinforce this as they are evaluated on a unifying metric—their cost-saving capacities (Sorvig and Thompson, 2018). Monetizing these performance metrics translates diverse benefits into a common economic denominator, allowing for design decision-making to compare all diverse performance benefits through costs and savings on the same scale (Zhang and MacKenzie, 2024). By assigning economic value to environmental, social, and operational outcomes, stakeholders can more effectively identify opportunities where higher upfront costs may yield long-term savings, justify investments that deliver ecosystem services, and communicate value in terms that resonate with community members, policymakers, and allied disciplines. Monetization not only strengthens cost-benefit analyses but also ensures that non-market benefits—such as improved quality of life, resilience, or environmental health—are recognized alongside traditional financial returns. To unify these diverse landscape performance benefits, a comparative framework was developed using the current list of landscape performance case studies to convert non-monetary outcomes into a comparative economic unit of measurement through cost savings, property value, tax revenue, and economic development. These economic benefits were also associated with a common modular application to unify size, type, time, and other significant characteristics between different nature-based solutions such as parks and green infrastructure. Through this process, an analysis between costs and savings was compared to identify trade-offs between the different landscape performance design interventions (Woo and Choi, 2021). By doing so, more options through nature-based solutions can be achieved in the design decision-making process as they are linked through a common economic comparison often desired by all respective stakeholder groups.

Keywords: performance metrics, trade-off analysis, green infrastructure

#625 Meadow Metrics: Enhancing Landscape Performance in Campus Redevelopment with Performance-Based Design Strategies

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Abstract

Introduction Landscape performance has become increasingly vital in landscape architecture practice and academia, emphasizing measurable environmental, social, and economic benefits. The Edwards Hall site at Kansas State University, originally built in 1968 as an athletics residence hall, was slated for demolition due to high maintenance costs. The client requested a new multi-story building with amenities including parking, outdoor dining, teaching gardens, and water features. This design research project aims to minimize environmental impact, address site challenges, and maximize multifunctional benefits through sustainable design strategies. Methods The “marsh meadow” concept informed the planting strategy, emphasizing native prairie species, seasonal dynamics, and habitat diversity. The designer developed the grading plan, building placement, parking layout, and planting design, referencing local codes and ecological principles. Conducted through a collaborative academic studio, the design process integrated performance evaluation tools to guide decisions. Tools such as the EPA Stormwater Calculator, i-Tree Design, and Pathfinder were used to model stormwater performance, carbon sequestration, and air quality improvements. Results The final design significantly enhanced sustainability. Rain gardens and basins retain up to 89,099 gallons of stormwater per event, while ten cisterns capture 50,000 gallons from the building roof. Native prairie plantings added 89,636 sq. ft. of permeable area, reducing runoff by 68.28% and saving 1.85 million gallons of irrigation water annually worth $9,550. Vegetation sequesters 1.56 million lbs. of CO_2 over 99 years, saving $36,290 in energy and emissions. Habitat diversity increased with 32 plant species and 85,460 sq. ft. of native ground cover. Social value rose through outdoor dining, teaching gardens, and shaded plazas. The design transformed a high-impact site into a multifunctional, regenerative landscape with measurable environmental and educational benefits. Discussion This project demonstrates how performance-based design can address complex site challenges while enriching educational outcomes. Contextual resources, such as native plants and regional aesthetics, enabled nature-based solutions that balanced modern amenities with environmental stewardship. Limitations include the absence of long-term monitoring and reliance on modeling tools for benefit estimation. Especially the social benefits are challenging to accurately measure in academic projects. Conclusion This case study offers a replicable model for embedding sustainability evaluation into campus planning. It highlights the value of measuring landscape performance and shows how simple, context-sensitive interventions can yield substantial environmental and social benefits. For general audience, it affirms that nature-based solutions can maximize ecological and social outcomes while minimizing resource consumption, without compromising, rather enhancing aesthetic values.

Keywords: Landscape Performance, Sustainable Design, Resilience, Prairie landscape

Landscape Planning and Ecology (LA CES)

#26 Correlating CSR Theory and Soil Texture to Bridge the Gap in Ecological Planting Strategies For Landscape Architecture

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Abstract

Many studies focus on the benefits of including natural and ecoregional landscape planting design within urban habitats; however, a focused approach to how landscape architects can begin including ecological applications to select plants within their planting designs has not been fully assessed. Once the knowledge gap between ecology, including plant survival strategies, and how landscape architects design landscape plantings is fully realized, research on how to appropriately introduce natural planting communities back to urban environments can be thoroughly assessed. It is common knowledge that landscape design involves creating aesthetically pleasing plant combinations based on simple site characteristics that can influence how a plant grows. It is also common practice to use a quick site analysis loosely based on defined ecoregional plant lists or simple site characteristics to suggest plant combinations (Akatov, V.V., 2020). A phrase readily used within the landscape trade that defines this basic site analysis is “right plant, right place.” The purpose of this study was to identify a practical and economical methodology for incorporating true-to-nature community planting design in landscape architecture. This study focuses on principles found within J. Philip Grime’s Competitor, Stress-Tolerator, Ruderal (CSR) Theory, and how his findings can be combined with soil texture to influence naturally inspired, ecological and native planting designs. Using Grime’s CSR Theory principles within landscape architecture aims to introduce a planting methodology that can mimic natural plant survival and community longevity. By comparing soil texture to Grime’s CSR Triangle, this study seeks to determine if a correlation between soil texture and plant survival strategies can be recognized and a practical methodology be created. This methodology could further the momentum of minimal input and low-impact landscape strategies within landscape architecture, as well as become a tool for climate resilient landscapes. Bridging the ecological knowledge gap within landscape architecture creates a path for increased and more accurate native and naturalistic planting opportunities within urban habitats (Zuppinger-Dingley, D., et al, 2014)

Keywords: Ecology, Nature-based, Plant, Design, Native

#28 Designing Through Insect Lenses: Reimagining Infrastructure as Commons in the Des Plaines Watershed

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Abstract

A radically different set of senses emerges—six instead of five—where sight may stretch to 360 degrees, or vanish altogether, replaced by the fine perception of hairs along a body. Home, too, is redefined: not a house, but a constellation of habitats—wetlands for maturing, open corridors for migration, and refuges stitched across a landscape. At first glance, these animal moments seem distant from human society. Yet the need for sensory richness and connected habitats resonates with our own condition, especially in an era of urgent calls for resilient landscapes. Insects, which make up roughly 90% of all animal species, embody these lives lived at different scales. Yet they are in crisis—declining by up to 2% each year, with populations estimated to have dropped 45% in the past four decades. As historian Julia Adeney Thomas (2019) observes, “Endangerment is a question of both scale and value. Only the humanities and social sciences, transformed though they will be through their engagement with science, can fully articulate what we may lose” (p. 166). For landscape architects, this crisis invites a shift in practice. Our ability to work across scales and disciplines positions us to move beyond ecological “fixes” toward futures of coexistence that demand a change in perception. This inquiry, developed from my thesis at the Harvard Graduate School of Design, translates scientific research on insect ecology and groundwater systems into design tools. Scientific data were converted into graphic form to reveal spatial patterns; mapping extended beyond conventional analysis to link hydrology, infrastructure, and habitats across scales; and drawing was used to imagine how species perceive designed landscapes. Together, these methods bridge science and design, making more-than-human needs visible while opening new possibilities for coexistence. The Hine’s Emerald Dragonfly , the only federally listed endangered dragonfly in Chicago, is a keystone indicator of groundwater-dependent ecosystems. Its most genetically diverse habitat—the Des Plaines River watershed in Illinois—is threatened by groundwater depletion and urban encroachment. This project reimagines infrastructure easements as shared commons for people and wildlife across three layers: point, repurposing wells into breeding habitats; line, transforming transmission corridors into flight pathways; and field, integrating these systems into a framework of long-term coexistence. The dragonfly’s return would mark ecological renewal and transform these sites into new public spaces. By centering more-than-human perspectives, the project reframes landscapes as adaptive commons—spaces of reciprocity, resilience, and care rather than extraction and control.

Keywords: Insect, Infrastructure, Coexistence , More-than-human, Commons

#53 Mapping the Ripple Effects of Parkification: Post-Industrial Sites and Greenway Development in South Carolina

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Abstract

This research investigates the ripple effects of parkification —the transformation of post-industrial mill sites into public parks and greenways—in Greenville and the Upper State region of South Carolina. As many Southern mill towns grapple with economic decline and land-use legacies, parkification has emerged as both a strategy of site reclamation and a catalyst for regional regeneration. Framed through the concept of the ripple effect, parkification is understood not only as a localized design intervention, but as a process that initiates wider spatial, social, and cultural transformations extending beyond the redeveloped sites themselves. Focusing on three case studies—Falls Park on the Reedy, Conestee Nature Preserve, and the Swamp Rabbit Trail—the study maps the ripple effects of parkification across space and time. Specifically, it traces the spatial expansion of greenway connectivity, the reclamation of adjacent parcels, and the emergence of new civic and cultural identities tied to industrial heritage. Using a mixed-methods approach that combines spatial mapping, archival research, site analysis, and stakeholder interviews, the study traces connections between individual park projects and adjacent land reclamation, greenway extensions, and renewed civic engagement with industrial heritage. Preliminary findings suggest that parkification initiates a chain reaction: reclaimed sites encourage the development of new green spaces, which strengthen connectivity and reshape community identity. By mapping these ripple effects, this research demonstrates that post-industrial parks function not as isolated projects but as drivers of greenway networks and regional regeneration.

Keywords: Parkification, Post-industrial landscapes, Ripple effects, Greenway connectivity

#96 Quantifying the combined and individual impacts of climate and human activity on the urban green space carbon sink capacity

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Abstract

Urban green space plays a crucial role in mitigating climate change through enhancing the carbon sink and ecosystem services in urban areas. Understanding how vegetation responds to both climate and human activity in urban areas is essential for effective green space planning. Despite the existence of large-scale studies examining the effects of climate change and human activity on green space, the specific mechanisms driving the Urban Green Space Carbon Sink Capacity (UGCSC) across different urban functional zones remain unclear. The present study used boosted regression trees and structural equation models to investigate the spatiotemporal dynamics of the UGCSC in Beijing from 2000 to 2020 and to assess the relative contributions of climatic factors and human activity to the UGCSC. The findings indicate that the UGCSC increased by 74.2 % of the study area, with 50.7 % of the change driven primarily by human activity, 24.6 % by climate change, and 24.8 % by their combined effects. Key drivers such as elevation, slope, temperature, and Landscape Shape Index showed varying effects across different functional zones. Climatic factors exhibited significant spatial heterogeneity, with temperature being the most influential, contributing 47.2 % to the UGCSC in central urban areas. Conversely, human activity had a dual impact: it reduced UGCSC in densely urbanized zones due to socioeconomic pressures, while landscape connectivity and green space coverage enhanced UGCSC in development and ecological zones. These insights provide a scientific basis for promoting nature-based solutions and guiding sustainable urban planning with the goal of moving toward carbon neutrality.

Keywords: Urban green space, Carbon sink capacity, Climate change, Urban resilience, Nonlinear relationship

#103 Investigating the Correlation Between Park Design Features and Microclimate Modification: An Empirical Analysis of Green Infrastructure Performance

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Abstract

Green infrastructure plays a crucial role in urban microclimate regulation through evapotranspiration, shading, and wind modification, directly influencing thermal comfort and outdoor human behavior (Bowler et al., 2010; Santamouris, 2014). While extensive research has documented the general cooling effects of urban parks and green spaces, ranging from 1-9°C temperature reductions compared to surrounding built environments (Chang et al., 2007; Spronken-Smith & Oke, 1998), significant knowledge gaps remain regarding how specific landscape design features contribute to microclimate modification. Limited empirical studies have systematically examined the relationship between individual design elements—such as canopy density, ground surface materials, water features, and spatial configuration—and their measurable impacts on temperature, humidity, and wind patterns within park environments (Armson et al., 2012). Understanding these relationships is essential for evidence-based landscape architecture practice that optimizes thermal comfort and supports climate-resilient urban design. This study employed systematic field measurements using Kestrel 5400 heat stress tracker to quantify microclimatic conditions across multiple park sites (Kousis et al., 2021; Galalizadeh et al., 2025). Data collection focused on air temperature, relative humidity, wind speed, and heat stress index at strategically selected measurement points representing diverse design features including dense tree canopy areas, open lawn spaces, hardscape elements, and water feature proximities ((Middel & Krayenhoff, 2019). Baseline measurements were collected from adjacent parking lots to establish reference conditions for urban heat island effects (Löffler, 2012; World Meteorological Organization, 2018). Additional measurements documented the overall trail microclimate to assess pedestrian experience and comfort levels throughout the park circulation system (Galalizadeh et al., 2025). Preliminary findings reveal significant correlations between specific design features and microclimate modification effectiveness (Chang et al., 2007). Dense canopy areas demonstrated temperature reductions compared to baseline conditions, while water features provided localized cooling effects from the source (Spronken-Smith & Oke, 1998). Ground surface materials showed varying heat absorption and reflection patterns, with natural materials consistently outperforming hardscape alternatives in temperature regulation (Armson et al., 2012). These empirical results provide landscape architects and urban planners with quantitative data to guide design decisions for climate-responsive park development (Bowler et al., 2010; Santamouris, 2014). The research contributes to evidence-based design standards for green infrastructure that maximize microclimate benefits while informing best practices for creating thermally comfortable outdoor spaces in increasingly urbanized environments (Kousis et al., 2021).

Keywords: Microclimate, Green Infrastructure, Thermal Comfort, Urban Heat Island

#108 Catalyzing Carbon Sequestration in Cold Regions: An Integrated Planning Practice Coupling Pattern Simulation with Spatial Strategies

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Abstract

Research and practice on high carbon-sink green infrastructure (GI) landscapes represent a critical topic for high-quality urban renewal (Hong et al., 2023). Cold-region cities, serving as both sensitive areas and amplifiers of climate warming, face challenges such as short growing seasons, fragile ecosystems, and incomplete green space systems (Brozovsky, 2021), necessitating systematic optimization research. Simulating high carbon storage (CS) landscape patterns and identifying optimal scales form a key methodological basis. Revealing the trade-offs and synergies between GI landscape patterns and CS in cold cities provides crucial support for enhancing regional CS and promoting high carbon-sink landscape planning. A scenario-based model for high carbon-sink landscape patterns was developed by integrating scenario simulation (Bacani et al., 2024) and CS estimation techniques (Zafar et al., 2024), along with landscape pattern metrics (Hu et al., 2022) and correlation analysis (Van & Zhan, 2022). The research framework encompassed “scenario simulation – pattern quantification – CS assessment – multi-scale correlation – linear regression”. Using Harbin as a typical cold-region case, GI data (2010–2020) were utilized to establish Natural Development (ND) and Ecological Protection (EP) scenarios via the FLUS platform. Fragstats and InVEST were employed to simulate spatiotemporal differentiations of landscape patterns and CS. Spearman correlation and linear regression were applied to examine trade-offs and synergies across multiple grid scales. (1) Landscape pattern and CS of GI in Harbin varied significantly across scenarios. The EP scenario effectively enhanced landscape connectivity and carbon-sink capacity, with wetlands consistently demonstrating the highest carbon density and playing a critical role in regional carbon sequestration. (3) SHDI, SHEI, and DIVISION showed significant trade-offs with CS, while CONTAG exhibited synergy. The optimal analytical grid scale was 4.50 km × 4.50 km. (4) CS explained 33.82% and 29.92% of variations in SHEI and CONTAG, respectively, indicating acceptable model fit, whereas linear relationships with SHDI and DIVISION were weak. The proposed model demonstrates strong transferability, and its theoretical framework can be extended to various urban GI studies, though parameters require calibration based on local conditions. The identified trade-offs and synergies between GI landscape patterns and CS inform explicit spatial and quantitative strategies—including GI typology optimization, spatial allocation, pattern regulation, and management units—providing a scientific basis for cold-region urban planning. This study developed a simulation technique for high carbon-sink GI landscape patterns, contributing to a deeper understanding of cold-region GI systems and offering theoretical and technical support for low-carbon spatial management and ecological planning.

Keywords: Green Infrastructure, Landscape Pattern, Carbon Storage, Scenario Simulation, Optimal Grid Scale

#146 Drivers and Spatial Patterns of E. coli Pollution in 247 Michigan Watersheds under Rainfall Variability

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Abstract

Microbial contamination threatens freshwater ecosystems and public health in landscapes where agricultural practices, urban infrastructure, and hydrologic variability intersect (Wilkes et al., 2009). Existing studies have examined individual drivers and extreme-rainfall health risks (Hong et al., 2021; Liu et al., 2025; Patz et al., 2008), but spatially varying combined effects remain unclear. By integrating diverse regulatory and environmental datasets with complementary modeling approaches (WRTDS, OLS, and GWR) at the watershed scale, this study provides a unified view of how these drivers interact under rainfall variability. Focusing on Michigan, this study (1) characterized spatiotemporal distribution of stream Escherichia coli (E. coli) concentrations and loadings from 2018 to 2022, (2) assessed how multiple pollution sources and watershed-scale environmental factors shape E. coli variability, and (3) evaluated risk that E. coli concentrations exceed regulatory standards under rainfall and flood scenarios. To achieve this, we implemented three steps: (1) for the 28 stations with sufficient E. coli data, we applied Weighted Regressions on Time, Discharge, and Season (WRTDS) method to interpolate daily E. coli concentrations. We then used daily E. coli and National Water Model discharge to calculate daily loadings, which ensures that pollutant concentration data is unbiased throughout the years. Then, we used ordinary least squares (OLS) regression to relate E. coli concentrations and loadings to watershed characteristics. Predictors were grouped into regulated point sources (e.g., municipal separate storm sewer systems, wastewater treatment plants, industrial storm water discharges, concentrated animal feeding operations), nonpoint sources (e.g., septic systems, tiled agriculture, manure application), and environmental controls (e.g., soil texture, slope, elevation, impervious cover and precipitation). (2) We combined E. coli observations from 247 watersheds that have smaller number of measurements and applied GWR to investigate spatially varying relationships between pollution sources, environmental factors, and E. coli concentrations. (3) We evaluated extreme rainfall risk by estimating the probability that E. coli concentrations exceed regulatory thresholds under different rainfall and flood conditions Our preliminary findings indicate that anthropogenic pressures dominate E. coli pollution. Point-source signals from MS4s and nonpoint contributions from manure, septic systems, and land-use intensification were positively associated with elevated concentrations and loadings. Environmental variables such as sandy soils and topographic variability also further showed positive effects on pollutant levels. Rainfall scenario analyses revealed that extreme storm conditions substantially increase the probability of exceeding water-quality thresholds. Linking these dynamics to rainfall-driven transport provides a basis for prioritizing interventions and informing watershed planning.

Keywords: E. coli, Watersheds, Rainfall , Water quality, Risk assessment

#151 How Can Carbon and Pollution Reduction Be Synergized？--A Synergistic Evaluation of Pollution and Carbon Reduction in Urban Parks

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Abstract

With the rapid advancement of urbanization and industrialization, excessive carbon emissions have triggered severe urban ecological problems, with air pollution becoming a critical global environmental and public health concern. Studies have shown that environmental pollutants and greenhouse gas emissions share common origins, processes, and spatiotemporal patterns, and that reductions in PM2.5 and CO_2 demonstrate significant positive synergies. As ecological infrastructures, urban green spaces play an active role in purifying both air pollutants and carbon emissions. Given the increasing scarcity of urban land resources, assessing the synergistic effects of pollution reduction and carbon mitigation has become an effective approach to addressing both air pollution and climate change. Wuhan, ranks among the more heavily polluted cities in terms of AQI. Using 75 parks in the central urban area of Wuhan—including comprehensive parks, specialized parks, community parks, and pocket parks—this study applies a dust retention model and a vegetation carbon sequestration model to estimate the pollution reduction and carbon mitigation capacities of park green spaces. A coupling coordination model is then employed to analyze their synergistic relationship. Preliminary results indicate that: (1) parks in the western and northern parts of the central area perform better in pollution reduction, while those with stronger carbon sequestration are primarily located in hilly terrain; (2) most parks demonstrate good coupling coordination, with comprehensive parks achieving the highest level and pocket parks the lowest. Park size is significantly correlated with coordination, with larger areas showing stronger positive synergies; (3) K-means analysis categorizes parks into three coordination types—coordinated development, transitional development, and maladjusted decline. Coordinated development parks are mostly large-scale mountainous parks in the north and central areas, while transitional development parks are mainly distributed along both sides of the Yangtze River in linear form; (4) Cluster analysis and quadrant matching further classify parks into four types under relative relationships: high pollution reduction–high carbon mitigation, pollution reduction–oriented, carbon mitigation–oriented, and low pollution reduction–low carbon mitigation. Notably, half of the high pollution reduction–high carbon mitigation parks fall into the maladjusted decline category, indicating that even these parks have yet to achieve a true balance between the two functions. This study provides a foundation for the planning and design of urban park green spaces that integrate efficient, synergistic pollution and carbon reduction benefits.

Keywords: Pollution and carbon reduction, Urban Parks, Synergistic Evaluation

#153 Reconceptualizing Urban Runoff: Stormwater Pathways as Catalysts for Ecological Rewilding.

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Abstract

Urban communities across the globe are increasingly threatened by the combined pressures of climate-driven flooding and ecological degradation. While rewilding has gained attention as a nature-based solution, most applications have focused on regional or large landscape scales, with limited attention to flood-prone urban neighborhoods where social vulnerability and land-use constraints are especially severe. Current flood mitigation strategies often overlook opportunities to integrate ecological restoration with community equity needs. This research addresses that gap by developing a replicable, grid-based framework for identifying rewilding opportunities at the neighborhood scale, using neighborhood boundaries as defined by the City of Chicago. Our approach began by mapping all water bodies within the target neighborhoods. Each water body was treated as an influence source, generating a distance-decay suitability field in which areas closer to water were assigned higher values. Overlapping influence zones highlighted areas with compounded hydrological potential. High-value cells were extracted and clustered into candidate patches, which were then evaluated through a multi-criteria assessment integrating ecological factors (land cover convertibility, vegetation indices), social factors (social vulnerability and walkability), and constraint layers (infrastructure and contamination). This stepwise process from water-based suitability gradients to patch-level social-ecological assessment enabled us to identify and prioritize sites most suitable for community-scale rewilding interventions. Preliminary results indicate that high-potential areas are strongly clustered along waterways and drainage corridors, where hydrological connectivity aligns with vacant parcels. Many of these sites also overlap with socially vulnerable communities, suggesting opportunities to align rewilding design with equity-oriented planning. Constraint layers further refined the candidate set by excluding railway corridors and heavily contaminated areas, resulting in a shortlist of feasible rewilding sites. This framework demonstrates a scalable and reproducible method that couples hydrological influence mapping with multi-criteria evaluation, bridging the gap between large-scale rewilding concepts and actionable neighborhood-scale planning.

Keywords: Urban resilience, Urban wildness ecosystem services, GIS multi-criteria analysis, Distance-decay modeling, Environmental justice

#168 Integrating Physical Simulation and Deep Learning: A SWMM–MoE-LSTM Approach for PAH Prediction

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Abstract

Urban runoff is a critical pathway for polycyclic aromatic hydrocarbons (PAHs), yet modeling efforts in this domain remain limited (Hoffman et al., 1984; Müller et al., 2020). Traditional tools like the EPA's Storm Water Management Model (SWMM) are widely used for simulating urban hydrology and pollutant transport (Rossman, 2010), but their empirical pollutant routines struggle with the low concentrations and complex phase behavior of PAHs, particularly under trace-level scenarios and heterogeneous urban conditions (Zheng et al., 2014). To address these challenges, this study develops a hybrid modeling framework that integrates SWMM with a deep learning architecture—specifically a sparsely gated Mixture-of-Experts (MoE) model composed of Long Short-Term Memory (LSTM) subnetworks (Hochreiter & Schmidhuber, 1997; Zhi et al., 2024). The study uses a comprehensive dataset of over 12,000 PAH records from 111 monitoring sites in San Diego County, combined with spatial data on land use, drainage networks, and estimated black carbon (BC) concentrations (Zhang et al., 2022). SWMM is first implemented to simulate surface runoff and provide a mechanistic baseline for PAH prediction. Five representative monitoring sites are selected for detailed SWMM modeling based on data richness and spatial proximity, with final configurations dependent on hydrologic boundary analysis. To improve predictive accuracy and account for PAHs' environmental complexity, a Sparse MoE model is developed where BC concentration serves as the gating variable. This allows the model to route inputs through specialized LSTM experts tuned to different BC conditions, effectively capturing nonlinear relationships in PAH transport and partitioning. Each expert model uses a combination of land use features, imperviousness, rainfall intensity, SWMM-simulated runoff, and aggregated upstream pollutant inputs to predict PAH concentrations. This research advances the modeling of PAHs in urban stormwater by combining physically based simulation with a context-aware deep learning framework. This hybrid approach offers a promising pathway for improving predictions of trace, phase-sensitive pollutants in urban environments. Moreover, the framework can be extended to other emerging contaminants, adapted to urban areas with available monitoring data, or integrated into decision-support tools for green infrastructure planning and risk-based water quality management under climate and land-use change (Wu et al., 2019).

Keywords: Urban Runoff Modeling, Hybrid Modeling Framework, Polycyclic Aromatic Hydrocarbons (PAHs), Emerging Pollutants, Land Use Planning

#177 Toward Site-Specific Stewardship: A Social-Ecological and Cultural Landscape Analysis of Mangrove Parks

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Abstract

Mangrove habitats are critically important to deliver vital ecosystem services while confronting escalating threats of degradation. Mangrove parks are promoted globally as tangible responses to urbanization and climate change, serving dual roles as environmental edutainment platforms and green infrastructure. Ostensibly conduits for conservation advocacy, it is arguable that prevailing design paradigms remain limited in yielding substantive social-ecological benefits. Typically, these projects prioritize commodified mangrove habitats in a controlled fixed constructed trails for visitor tours—exemplified by the ubiquitous elevated boardwalk—over holistic stewardship, resulting in a critical disjunction between design intent and ecological and social function. This paper endeavors to extend the foundation of design mangrove parks into the domain of site-specific landscapes, exploring how local context can enrich ecosystem stewardship. Using a multiple-case comparison, it performs a desk-based evaluation of parks across varying geographic and governance contexts. Each case is analyzed through its historical background, design rationale, ecological interventions, and socio-cultural outcomes. Spatial mapping visually interprets each park's structure, enabling a synthesis of cross-case patterns. This analysis moves beyond critique to produce evidence-based, testable design propositions for mangrove parks' future.

Keywords: Mangrove parks, Landscape planning, Social-Ecological System, Spatial mapping, Site-Specific Stewardship

#206 Towards Deeper Collaboration: Simulating Carbon Sequestration Efficiency and Design Interventions in Green Spaces by Integrating AI and Multi-Source Data

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Abstract

Addressing the contemporary challenges of integrating ecology and technology in landscape architecture, this study explores how artificial intelligence (AI) serves as a catalytic medium to deeply connect and collaborate across theoretical research, design practice, and educational innovation.Conventional methods for assessing urban carbon sequestration are constrained by linear assumptions, high data costs, and static models, making it difficult to support multidimensional collaborative precision decision-making and design interventions.To address these limitations, this research proposes an innovative AI mapping framework that integrates generative adversarial networks (GANs) with multi-source remote sensing data, aiming to construct high-precision urban models and achieve visualized spatial analysis of carbon sequestration. This approach not only overcomes the limitations of traditional techniques but also aims to build a bridge connecting research and design practice. By providing visualized carbon sequestration simulation results, it offers designers, planners, and community stakeholders a common evidence-based decision-making foundation, thereby catalyzing cross-disciplinary dialogue and co-creation across ecological, technological, and social dimensions.Using Nanjing as a case study, this research demonstrates how the framework supports multi-scenario simulation and optimization for enhancing the quality and efficiency of green spaces, providing a scalable collaborative model and methodological support for low-carbon, interactive design and education in future smart cities.

Keywords: Generative Adversarial Networks, Urban Models, Spatial Mapping

#240 Integrating Ecological Security Patterns and MCR Analysis under Water Resource Constraint for Urban Planning: A Case Study of Xi'an

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Abstract

Introduction: China's rapid urbanization has led to a critical conflict between development and ecological protection. For Xi'an, a major metropolitan center in the semi-arid Guanzhong Plain, this challenge is acutely magnified by water scarcity, which serves as the key limiting factor for growth. This research proposes an integrated framework to precisely delineate the city's ecological control boundaries and identify the lowest-cost urban growth hotspots, aiming to develop resilient strategies that explicitly balance ecological preservation with economic development demands. Methods: The study employs a multi-methodological framework. The framework first establishes population carrying capacity based on water resource availability under four water management scenarios. Second, Ecological Security Patterns (ESP) are established by integrating critical patterns for water security, biodiversity, and cultural heritage to define ecologically sensitive areas. Third, a Minimum Cumulative Resistance (MCR) analysis is conducted using a binary logistic regression model to predict urban growth hotspots, treating the probability of construction as a function of key socioeconomic and physical variables (e.g., population density, land price, metro accessibility, and slope). Finally, Scenario Analysis overlays the ESP (protection) and MCR (development/economic) models to generate integrated spatial strategies (e.g., Natural Growth, TOD-oriented). Results: The primary finding is a differentiated spatial plan for Xi'an classifying all land into three distinct development modes: construction forbidden, construction restricted, and construction permitted areas, each with different development priorities. The water capacity analysis produced specific population forecasts, ranging from 9.53 million (Baseline) to 19.54 million (Open Source + Industrial Restructuring). Predictive land use maps for 2035 were also generated, illustrating the distinct spatial impact of different growth theories. Discussion: This approach provides a practical, prescriptive, and quantifiable framework that allows policymakers to visualize and manage the trade-offs between the costs of ecological conservation (ESP) and the costs of urban expansion (MCR). The methodology is unique in its explicit use of water resource carrying capacity as the definitive growth constraint and its synthesis of ecological supply with economic demand. Conclusion: This study presents a robust method for achieving "smart protection" by delineating ecological boundaries (ESP) and "smart growth" by guiding development to cost-effective areas (MCR). The framework is directly applicable to other rapidly urbanizing regions, particularly those facing water constraints.

Keywords: Ecological Security Patterns, Land Use Planning, Scenario Analysis, Urban Growth Modeling, Spatial Planning

#279 Mapping Convergence: Identifying Synergistic Eco-Cultural Priorities Through an Integrated Network in the Chengdu-Chongqing Urban Agglomerations

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Abstract

Abstract Rapid urbanization has triggered a series of socioeconomic and environmental challenges, resulting in landscape fragmentation and the disruption of ecological and cultural continuity. Taking the Chengdu-Chongqing region as an example, this study aims to construct an ecological-cultural composite corridor network to enhance spatial integrity and promote the coordinated use of natural and cultural assets across administrative boundaries. Based on the Minimum Cumulative Resistance model (MCR), the study quantifies the difficulty of preventing the migration and expansion of species, and evaluates the ecological risks and extracts the important ecological corridors in the area based on the circuit theory; according to the historical documents of each period and the list of national cultural heritage units, the study identifies the important cultural corridors through the identification of the points and routes, and the analysis of the main trunks and densities, and with corridor stacking and the analysis of the corridor densities, the network pattern of ecological and cultural composite corridors as well as the spatial distribution of two-factor corridor density levels are formed. Accordingly, through mapping the composite corridor network, the overall distribution patterns and connectivity relationships of cultural and ecological resources have been fully elucidated, and the development potentials were also clarified. The results demonstrate that ecological resources are mainly distributed in mountainous and parallel ridge-valley areas, while cultural resources show a clustered “twin-core” pattern around Chengdu and Chongqing, forming a multi-branch structure with five major cultural routes. The surrounding mountains including Minshan-Qionglai-Liangshan and Micang-Daba serve as essential ecological barriers, while central green patches such as Qinglong Mountain function as critical stepping stones. Culturally, ancient routes including the Tea-Horse Road and the Southern Silk Road constitute a multi-layered corridor system enhancing regional cultural connectivity. This study underscores the importance of integrated spatial pattern research on ecological and cultural resources for cross-administrative regions and urban clusters, which is crucial for promoting coordinated regional development. The composite corridor network facilitates the identification of the spatial distribution and flow potential of ecological and cultural assets, providing a scientific basis for defining priority conservation areas, delineating spatial regulatory boundaries, coordinating landscape characteristics, and selecting scenic routes. It thus offers theoretical and practical support for spatial planning and sustainable governance in highly urbanized regions.

Keywords: Landscape architecture, ecological corridor, cultural corridor, MCR model, regional network

#293 Impact of G331 Highway on Wildlife Habitat and Connectivity: Integrated Modeling in Changbai Mountain

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Abstract

Transportation infrastructure is a key factor leading to habitat fragmentation and ecological barrier effects, and quantifying its impact is crucial for biodiversity conservation and landscape planning. This study takes the G331 national highway, which crosses the biodiversity hotspot area of Changbai Mountain in Northeast China, as an example to explore its impact on the habitat suitability and landscape connectivity of mammals, amphibians, and birds, filling the quantitative research gap on this important issue. The research mainly revolves around two core questions: (1) How does the G331 national highway affect the habitat suitability and landscape connectivity of wildlife? (2) How to plan effective ecological mitigation strategies based on this? This study adopted an integrated modeling framework that combines the species distribution model (MaxEnt) and the InVEST model. Firstly, MaxEnt is used to simulate the potential habitat distribution in a no road scenario. Then, the generated suitability layer is combined with the habitat quality of the InVEST model, and the road is used as the main threat source for constructing the resistance surface. By comparing two scenarios with and without roads, the ecological impact was accurately quantified. The research results indicate that the G331 national highway has led to a reduction in the area of highly suitable habitats along the route, and has produced a significant barrier effect, cutting off the north-south migration path and isolating core habitat patches. At the same time, multiple ecological conflict hotspots with highly overlapping ecological sources and roads were identified, which present high species migration barriers and road killing risks. The results of this study confirm that the barrier effect of transportation infrastructure directly threatens species migration and gene exchange. In terms of landscape architecture theory, this study provides a replicable method that links species level ecology with spatial planning, improving the scientificity and predictability of decision-making. In practice, the identified hotspot areas provide precise spatial basis for implementing measures such as wildlife passages and ecological bridges. A key limitation of the study is its dependence on the quality of species appearance data, and the static model failed to capture dynamic variables such as traffic volume and noise. This study provides researchers with a reusable model coupling framework and practitioners with spatially clear tools to prioritize ecological infrastructure interventions, thereby improving the effectiveness and sustainability of landscape planning in the growing infrastructure development.

Keywords: Suitability of wildlife habitat, MaxEnt-InVEST Models, Ecological corridors, Road Ecological

#294 Construction and Optimization of the Ecological Network of Key Species in the Dawen River Based on Landscape Permeability Assessment

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Abstract

Landscape permeability directly affects the efficiency of species migration and the continuity of ecological processes, and is widely applied in many fields such as biological diffusion and gene flow. However, there is insufficient research on the construction of river basin ecological networks. Under the background of ecological protection in the Yellow River Basin, the conservation of biodiversity is of vital importance. The Dawen River is an important tributary of the lower reaches of the Yellow River. It mainly flows through Jinan City and Tai 'an City from east to west, playing a significant supporting role in the regional ecosystem. Taking the Dawen River Basin as an example and the wading bird, the little egret, as the focus species, this study conducts the construction and optimization of the basin's ecological network based on the quantitative assessment of landscape permeability. The study first assesses the permeability of the basin landscape through habitat suitability evaluation and superposition analysis of hindering factors. Secondly, the ecological sources are identified by using MSPA analysis, habitat quality assessment and location analysis of nature reserves. Based on circuit theory, extract ecological corridors and construct ecological networks; Finally, an optimization strategy is proposed. The research concludes that: (1) The high-value areas of landscape permeability in the Dawen River Basin account for only 4.45%, mainly distributed along the main stream and its major tributaries, while the low-value areas account for 14.67%, mostly urban construction land. (2) 78 ecological source areas were identified. The northern part of the upper reaches is concentrated, with 181 ecological corridors. The spatial corridors of the forest land in the northern part of the middle reaches are relatively densely distributed. There are a total of 66 ecological nodes. The intersections are mainly along the eastern range of Mount Tai and the key corridors in the southern part of the middle reaches. The density of obstacle points in the north is high. (3) Add linear green Spaces for the entire basin to enhance permeability and improve the network by adding ecological "stepping stones". The upstream focuses on source protection and reduces human interference. Promote ecological agriculture in the middle reaches and restore floodplain wetlands. The downstream focus is on restoring estuarine wetlands and strengthening the connection between rivers and lakes to ensure ecological flow. The research can provide a scientific basis for the conservation of biodiversity and the planning of ecological corridors in the Dawen River Basin

Keywords: Landscape permeability, Ecological network, Focus species, Ecological intersection, The Dawen River Basin

#301 Ecologies of Memory: Land Art as Ecological Healing for Post-Industrial Grounds

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Abstract

Ecologies of Memory: Land Art as Ecological Healing for Post-Industrial Grounds Godha Devi Chitiyala gchitiya@kent.edu Kent State University- MLA program Across the Great Lakes, post-industrial landscapes carry the weight of extraction, dereliction, and abandonment. Yet within these ruins lie latent grounds for renewal—places where ecological processes, cultural memory, and civic imagination can converge. This research investigates how land art–based ecological design can re-script industrial remnants into infrastructures of care, reframing decay not as an end-state but as a beginning. Here, symbolic form, biodiversity, and community ritual are interwoven as strategies for ecological healing and cultural continuity. The study develops a typology of industrial remains monuments, inscriptions, contemplative forms, and re-scripted anchors each representing both scar and opportunity. These categories are mobilized as tools to transform silos, mills, and rail lines into living cultural landmarks and functioning ecologies. Precedents such as Chin's Revival Field , Rahmani's Ghost Nets , and Beuys' 7000 Oaks demonstrate how land art can operate at the intersection of repair and ritual. Historical parallels from mound effigies and Nazca Lines to Smithson's Spiral Jetty are juxtaposed with industrial inscriptions to reveal how landscapes accumulate cultural layers that anchor memory while enabling regeneration. Findings emphasize that ecological restoration and cultural renewal are interdependent. At its core, the research focuses on questions of erasure, preservation, or transformation: whether to remove, conserve, or re-script the remnants of industrial remnants of the Cuyahoga River Valley. These choices are never neutral but shape how memory, ecology, and community stewardship are carried forward into future landscapes. The research documents methodological approaches, integrating design precedent analysis, typology mapping, Findings emphasize that ecological restoration and cultural renewal are not separate endeavors but interdependent acts of care. Ethical questions around access, equity, and the privileging of certain narratives of "nature" or "art" are confronted directly. Ultimately, the research argues for land art not as monumental gesture, but as an evolving practice of ecological healing, civic renewal, and collective memory-making for post-industrial grounds.

Keywords: Post-Industrial Landscapes, Land Art, Ecological Restoration, Cultural Memory, Cuyahoga River Valley

#328 Aligning Marsh Migration Routes with Flood-Driven Human Mobility in Charleston, SC

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Abstract

Coastal marshes provide critical storm buffering and flood protection services, but sea-level rise threatens their survival. At the same time, expanding urban development creates a “coastal squeeze” limiting the land available for marsh migration inland. We integrate projected development from the FUTURES urban growth model—a probabilistic, stochastic patch-based simulation model—with NOAA projections of marsh migration under sea-level rise to evaluate where marsh migration pathways conflict with shifting development patterns in Charleston, SC from 2025-2050. The FUTURES model simulates development under a range of flood-response strategies, including retreat, resistance, and ad hoc reactions to flooding. By combing these outputs with marsh projections under different sea-level rise scenarios, we ask whether priority corridors for marsh migration can be identified for additional protection from future development, and how adaptive capacity—in terms of populations using protective measures or becoming trapped—influences the availability of land to support future marsh migration. Early insight indicates that marsh lost to development is similar across flood-response scenarios. However, scenarios emphasizing retreat create opportunities for marsh reestablishment, whereas resist and reactive scenarios experience the greatest marsh loss due to development that ultimately becomes protected against flooding. Under a status quo scenario with ad hoc development, initial results suggest around 13 km2 of lost coastal marsh by 2050, equating to more than $20 million annually in lost storm protective services, based on literature-derived estimates of avoided flood damages associated with marsh presence. Finally, we use FRAGSTATS to assess ecological measures of landscape connectivity and identify watersheds where marsh migration corridors are most likely to be disrupted by future development. By pinpointing currently undeveloped land that is likely to be developed, conflicts with marsh habitat, and is vulnerable to flooding, we propose networks of preserved areas to enable inland marsh migration and help maintain their protective capacity. Learning outcomes include (1) applying urban growth modeling and ecological landscape metrics; (2) valuing ecosystem services; and (3) translating raster data into vector formats to design natural infrastructure networks. Ultimately, this research aims to inform inland expansion of the Coastal Barrier Resources System—established in 1982 to disincentivize risky development in high hazard, undeveloped coastal areas—where extending protections inland could safeguard marsh migration pathways and enhance ecosystem services. Our results provide practitioners with actionable guidance for promoting resilient development that reduces flood risk while promoting the long-term survival of coastal marshes.

Keywords: flood adaptation, sea-level rise, marsh migration, urban development

#331 Liquid Justice: Stormwater Infrastructure and Race in Englewood, Chicago

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Abstract

Englewood, Chicago, a historically Black neighborhood, has been systematically excluded from equitable stormwater investments, exposing residents to disproportionate flood risks and compounding public health crises. Drawing from Science and Technology Studies (STS) theories of infrastructure as sociotechnical power (Larkin 2013) and co-production in environmental governance (Jasanoff 2004), this study examines how urban planning decisions, racialized economic policies, and infrastructural regimes co-produce environmental injustice. Using a mixed-methods approach, the research integrates archival analysis of Chicago's urban planning policies, public spending data from the Metropolitan Water Reclamation District (MWRD), and environmental risk assessments from the EPA's EJSCREEN tool. Findings reveal that predominantly white, affluent neighborhoods such as Lincoln Park consistently receive modernized flood mitigation systems, including green infrastructure and updated drainage. By contrast, Englewood's infrastructure remains outdated—an outcome rooted in historical redlining, racial capitalism, and decades of disinvestment. EJSCREEN data demonstrate higher flood risk and environmental burdens in Englewood, while MWRD spending records show lower proportional investment in the neighborhood over the past fifty years. Rather than viewing infrastructure as material alone, this paper theorizes stormwater governance as a racialized sociotechnical system that mediates urban life, risk, and environmental governance. It demonstrates how infrastructural inequities exacerbate vulnerability to flooding, health disparities, and climate risk, while reinforcing systemic racial inequities in urban planning. This research challenges dominant urban planning paradigms by engaging with procedural justice, infrastructural power, and universal governance. It advocates for community-led decision-making, reparative infrastructural investment, and an STS-informed framework for climate justice. By highlighting Englewood's case, the study contributes to reimagining urban futures beyond extractive, colonial logics of infrastructure toward more just and sustainable urbanisms.

Keywords: infrastructure justice, racial capitalism, stormwater governance, climate justice, procedural justice

#364 Re-Stitching the Urban Fabric: Habitat Connectivity and Avian Diversity in Downtown Oklahoma City.

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Abstract

Urbanization has accelerated habitat fragmentation, diminishing biodiversity and ecosystem services in cities worldwide. Within landscape architecture, integrating ecological restoration principles into urban design is critical to advancing resilience and sustainability. Birds serve as effective ecological indicators because their diversity reflects habitat quality, connectivity, and vegetation structure (Aronson et al., 2017). This ongoing thesis research investigates the relationship between urban park design, habitat fragmentation, and bird diversity in Oklahoma City (OKC), asking: How can habitat restoration and reduced fragmentation across downtown parks influence the diversity and abundance of resident bird species? Objectives are to quantify fragmentation and vegetation structure across selected parks, analyze associations between landscape metrics and bird richness and abundance, and identify design interventions that enhance ecological and social value. Study sites were identified through Cornell Lab's eBird hotspot database, focusing on community parks in central OKC such as Scissortail Park, Myriad Botanical Gardens, and smaller greenspaces. Bird observation data are paired with geospatial layers on vegetation cover and land use. Fragmentation is being evaluated using patch metrics (size, edge density, connectivity, proximity, richness, and abundance) . Statistical models will assess relationships between habitat structure and species richness, while comparative analysis distinguishes conditions across large versus fragmented parks. Although the research is ongoing, it is anticipated that larger, connected patches with greater canopy cover will support higher bird richness, particularly for species of conservation concern. Fragmented sites with minimal understory or canopy are expected to show reduced abundance and dominance by generalist species. Socially prominent downtown parks may demonstrate high visitation potential but limited ecological quality without targeted interventions. These outcomes will be examined in relation to fragmentation studies (Fahrig, 2019) and the call for resilient hybrid ecosystems (Alberti, 2017). As part of its applied dimension, the project evaluates adaptive reuse of underutilized urban surfaces in OKC, specifically the large parking lot between Scissortail Park and Myriad Botanical Gardens. With adjacent facilities relocating, this site presents an opportunity for urban design re-envisioning. Its conversion into a multifunctional ecological corridor could enhance connectivity, stormwater infiltration, microclimate regulation, and avian habitat suitability, positioning it as a model for urban ecological restoration (Beninde, Veith, & Hochkirch, 2015). This study demonstrates how landscape architects can integrate citizen science and spatial metrics to design parks that mitigate fragmentation and support ecological resilience.

Keywords: Urbanisation , Habitat Fragmentation , Bird Conservation, Patch Matrix Analysis , Urban Design

#385 A spatial framework for assessing climate risk to urban forests in Baltimore City, USA

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Abstract

Urban forests face growth and survival risks from climate change, threatening the essential ecosystem services they provide (e.g., heat mitigation, improvement of human health and well-being). In this study, we developed a novel framework to identify tree species and areas most vulnerable to climate impacts using Baltimore City, USA, as a case study. For 306 tree species recorded in Baltimore's urban forest, we estimated realized climatic niches using global occurrence records and six climate variables related to temperature and precipitation mean and extremes (i.e., mean annual temperature, MAT; maximum temperature of the warmest month, MTWM; minimum temperature of the coldest month, MTCM; annual precipitation, AP; precipitation of the driest quarter, PWQ; and precipitation of the warmest quarter, PWQ) under baseline conditions (1970–2000). Integrating ecological data, spatial modeling, and climate projections, we mapped climate risk areas under multiple future scenarios (SSP126, SSP245, and SSP585) by 2050 and 2070. The results show that over 70% of urban trees are under climate risk. Our approach provides insights and actionable urban planning and management strategies by connecting scientific knowledge with community and municipal decision-making, guiding species selection, informing adaptive strategies, and highlighting areas that require monitoring and prioritized management. This work exemplifies the integration of interdisciplinary strategies, ecological knowledge, and practical action to strengthen urban ecosystem resilience in collaboration with community stakeholders.

Keywords: Climate change, Safety margin, Species selection, Urban heat, Urban tree

#400 Progress and Prospects in Mapping U.S. Landscape Characters: Recent Case Comparisons and Future Directions

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Abstract

The contribution presents the current state of research on mapping landscape character (LC) types in the United States using the Landscape Character Assessment (LCA) approach which identifies “distinct, recognisable and consistent” patterns by integrating natural and cultural factors through staged desk-to-field work (Swanwick & LUC, 2002, p. 8; Tudor, 2014, p. 54). Two key case studies are presented and compared: the Coal River Watershed and the National Coal Heritage Area, both located in the Central Appalachian Mountains of West Virginia. The studies present similar sets of multilayered, multidimensional data tailored to each study area. The feature layers include geomorphic and biophysical components—landform maps, land cover, historic and cultural features, and, where applicable, settlement patterns. Landscape character types are delineated using multivariate, geospatial machine-learning approaches—MULTISPATI-PCA (Dray & Jombart, 2011) and GeoSOM (Bação et al., 2005). Hierarchical clustering is followed by cluster-level selection (Davies & Bouldin, 1979), and type naming is guided by variable-importance line graphs consistent with LCA naming guidance. The outputs demonstrate a replicable, observer-independent workflow suited to the U.S. context—leveraging large extents and consistent public datasets—and, crucially, effective where expert visual interpretation struggles because landscapes lack clearly readable spatial patterns (Van Eetvelde & Antrop, 2009; Staniscia et al., 2020). The methodological progression shows how the two cases standardize LCA’s characterization phase through a replicable GIS workflow that reduces subjectivity in characters identification. Both studies provide a reproducible baseline for fieldwork and for subsequent participation and policy phases, completing the initial stages of LCA and preparing targeted field verification stages (Swanwick & LUC, 2002). The comparison addresses scale and spatial resolution (grain) across both application and analysis levels and evaluates two domains: (i) biophysical planning at the watershed scale and (ii) targeted assessments in heritage areas or national parks. Both approaches make explicit methodological clarifications, limitations, and advances while simplifying feature-layer preparation, applying updated multivariate geospatial methods, and reducing high-dimensional variance into spatially contiguous, hierarchically refined clusters interpretable as landscape character types (LCTs). The methods are particularly effective where expert visual interpretation struggles to distinguish recognizable characters and, as shown in our cases, across ‘ordinary’ landscapes altered by anthropogenic processes and intensive extractive cycles. The replicable, observer-independent workflow provides a robust knowledge baseline for the landscape understood as a layered construct (environmental, cultural, morphological/visual) and is especially suited to U.S. rural contexts marked by large extents, consistent public datasets, and limited planning capacity.

Keywords: Landscape Character Assessment (LCA), Landscape character types, Central Appalachia, Geospatial machine learning, Post-mining landscapes

#410 Resilience in the Rocky Mountain West: Landscape Architecture and Mining Restoration in Central Idaho

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Abstract

The Rocky Mountain West has long been rich in mineral resources, fueling the expansion of the United States and the Western world. However, mining has left behind scarred landscapes, disrupted ecosystems, and affected communities, with minimal efforts towards post-extraction restoration. There is a pressing need for current and future generations to understand the importance of mineral resources and to develop landscape architecture-based solutions for areas impacted by mining. This project examines ongoing mining at the Stibnite Mine in Yellow Pine, Idaho, focusing on modern mining practices. Using mixed-method research approaches, it seeks creative solutions for post-extraction restoration through landscape architecture. The goal is to propose alternatives to current post-mining processes by incorporating remediation planning and design with Best Management Practices (BMPs) (Wiley 2015), aiming to prevent further pollution. Restoration efforts will benefit from a socio-ecological systems (SES) approach, connecting ecological processes with community needs (Kliskey 2023). The study interprets the history of Yellow Pine's people and their influence on the landscape over the past century, including the transformation from Nez Perce tribal land to the gold rush, the mining boom during World War II, a period of abandonment, and recent mining reactivation. Research methods include evaluating federal and state requirements for site redevelopment and analyzing historical changes. The project also considers the economic demand for antimony, gold, and silver, and their societal uses. Notably, the Stibnite Mine is the only source of antimony in the United States, essential for manufacturing ammunition for our military and civil use as wildfire suppressants. By employing modulative practices and projecting future outcomes (Cronan 2024), the study aims to identify effective landscape architecture restoration approaches for post-extraction landforms. Community input will be incorporated through participatory events to help shape the future of their public lands. The results will offer a replicable framework for integrating landscape architecture and ecological planning into mining restoration, informing best practices for sustainable resource management. By demonstrating how participatory, socio-ecological approaches can mitigate long-term environmental and community impacts, this research aims to empower stakeholders and guide future restoration efforts across hardrock mining-affected regions.

Keywords: Socio-Ecological Landscape Solutions, Post Extraction Mining Landscapes, Public Role in Community Change, Idaho's Mineral Resources, Ecological Planning Through Landscape Architecture

#416 Knowing Ecology from a Design Point of View: How the Research Through Design Lens Helped Advance Landscape Sustainability

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Abstract

At the intersection of urban landscape design and ecology in U.S. cities and metropolitan regions is a compelling narrative in landscape architecture that focuses on rethinking the human experience of urban nature in the Anthropocene. In the narrative, this presentation examines how landscape architecture academics contributed to advancing landscape sustainability by advocating for a different set of values to be added to the 3Es of sustainable development (Musacchio 2025). By advocating for the landscape-oriented values in sustainable development, landscape architecture academics in the U.S. started a process of rapid growth away from being treated as secondary in the urban design hierarchy to ascending to “prime” thought leaders and collaborators. However, for this to happen, landscape architecture academics had to adeptly embrace and conquer three challenges: (1) the need, challenge, and opportunity for greater ecological literacy, (2) the theoretical and practical limitations of the argument and rationale for an aesthetic only based on ecology, and (3) the need to develop the “research through design lens” as a coherent argument for why “knowing” ecology from a design perspective matters to science (Musacchio 2025). This presentation examines, in three parts, how landscape architecture academics overcame what seemed to be these insurmountable challenges and helped the discipline to move towards its visionary potential to rethink the human experience of urban nature in the Anthropocene. The inspiration for this presentation is the years Dr. Musacchio has taught urban landscape design and ecology as well as her research about landscape sustainability (e.g., Musacchio 2009 and 2025).

Keywords: Ecology and design, Research through design, Evidence-based design, Sustainable development, Landscape sustainability

#419 Tiny Forest Initiative: A discussion of Precedent, Methods, and Aesthetics

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Abstract

The City of Cedar Park has established a partnership with the XXXXXXX Landscape Architecture faculty to develop a Tiny Forest Initiative within the city. The City aims to create several ultra-dense, biodiverse forests that support local ecosystems, enhance carbon sequestration, and mitigate urban heat island effects. The partnership leverages academic expertise, city resources, and community engagement to foster resilient urban green spaces. Our collaboration advances the City's progress toward achieving goals outlined in the City's 2024-2026 Strategic Plan. The City is committed to "enhancing the tools and resources necessary to support critical infrastructure and sustainability initiatives." A significant part of meeting that goal is for the City to demonstrate responsible stewardship of community and natural resources. We will work with the City to evaluate opportunities for community greening through the Tiny Forests Initiative. The City of Cedar Park has experienced a period of rapid growth. As of 2024, approximately 20% of the land within the city limits and its extraterritorial jurisdiction (ETJ) remains undeveloped. The population has more than tripled since 2000, growing from 26,049 to over 77,000 residents in 2025. The City believes that a tiny forest initiative will provide measurable benefits to mitigate urban heat, promote urban forest resilience to heat and flooding, and promote community health through outdoor engagement. The soils of the Texas Hill Country present some interesting questions for the research team. Based upon present conditions, what reforestation method is best suited to the soil and climatic conditions of Hill County? Second, will the climax forest meet the biodiversity, performance, and aesthetic expectations of the City? If not, then the project becomes an aforestation project where we must identify or adapt a method to produce a forest that meets the City's expectations. The team will present the findings from the first phase of the research project in three segments. This initial phase includes a narrative literature review on tiny forests, summarizing the existing body of work and tracing their global development. We will also share a systematic literature review comparing reforestation and afforestation methods relevant to adapting the tiny forest model. Finally, we will present the preliminary spatial mapping of potential future tiny forest sites in Cedar Park, Texas, and discuss upcoming phases of the project, emphasizing how it engages the municipality and its citizens through environmental stewardship and health promotion.

Keywords: Tiny Forest, Aforestation , Reforestation , Urban resilience

#431 Detroit Regenerative Futures: Revive, Thrive, and Level Up – A Gamification Strategy for Vacant Land Activation in Detroit

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Abstract

Detroit's extensive vacant land—more than 4,000 acres citywide—presents both a challenge and extraordinary opportunity to advance ecological resilience, social equity, and economic revitalization. 1 In collaboration with the City of Detroit Office of Sustainability, this University of Michigan School for Environment and Sustainability Master's Capstone Project supports the Detroit Regenerative Futures pilot: a multi-phase initiative designed to activate 100 acres of vacant land through sustainable, community-led design. Our project develops a modular design framework and outreach toolkit that empowers Detroit residents, community organizations, and nonprofits to reimagine and reclaim vacant land. The toolkit combines gamified and interactive formats—such as a physical "punch-out" design guidebook and an online drag-and-drop interface—with data-driven tools for calculating benefits. The system is designed to be accessible, scalable, and adaptable across parcel and neighborhood levels. This project is organized around three key phases: (1) investigative research and community engagement, (2) design and development, and (3) analysis and reporting. Through GIS analysis, precedent review, and stakeholder collaboration, Phase 1 identifies three target neighborhoods with high vacancy and unmet revitalization needs. In Phase 2, design interventions tailored to each neighborhood are transformed into modular components, supported by an immersive Augmented Reality experience to promote public engagement and participatory visioning. Phase 3 includes the development of benefit calculators and policy-relevant data to inform decision-making by residents and city officials. Workforce development is a critical pillar of this initiative. The toolkit and associated implementation strategies are aligned with emerging opportunities in sustainable land management, urban agriculture, green infrastructure, and ecological restoration. Our project includes a green workforce strategy for the City that maps toolkit modules to specific job categories, skill sets, and existing training pipelines—helping residents to both envision their neighborhoods' futures and see themselves as agents of that transformation. This supports long-term economic empowerment while advancing equitable climate resilience. Detroit Regenerative Futures aligns with the City's broader climate action goals: clean energy transition, sustainable mobility, waste reduction, energy efficiency, prioritization of vulnerable residents, community engagement, and data-driven planning. 2,3 By centering community voices and offering practical, creative tools for land activation, this project builds capacity for self-determination and neighborhood stewardship. Ultimately, this capstone project offers a replicable model for participatory planning, vacant land activation, and workforce integration. It repositions Detroit's vacant land as a regenerative resource and invites new narratives for post-industrial cities worldwide—where equitable climate adaptation, local agency, and green job creation go hand-in-hand.

Keywords: community-led design, vacant land activation, urban regeneration, climate resilience, green workforce development

#450 Landscape Pattern Dynamics and Policy Drivers of Fine-scale Farmland Landscape Elements in Shishou, 1986–2022

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Abstract

Global agricultural intensification and land-use change have accelerated farmland fragmentation and weakened ecosystem services. Shishou City, a grain-producing area of the Jianghan Plain, has 708.5 km² of cropland (about 50% of its territory) and 178.76 km² of water bodies, of which 146.7 km² lie within cropland. These embedded water and vegetated features support aquaculture and provide flood retention, water purification, nutrient cycling, and biodiversity habitats. However, most studies focus on total cropland area, overlooking farmland landscape elements at a fine scale. This study examined fine-scale farmland landscape elements, including water patches (e.g., ponds), corridors (e.g., ditches and ridges), and non-cultivated vegetation (e.g., shrubs, trees, and mounds) in 1986, 2000, 2010, and 2022. Data included SPOT imagery from 1986 (20 m), 2000 (20 m), and 2010 (10 m). For 2022, 1 m UAV orthomosaics collected by the research team, together with Google Earth Pro imagery and field surveys, were used to identify and validate elements. This addressed the limitations of medium- and low-resolution imagery in detecting fine-scale structures. Over 36 years, farmland in Shishou became more fragmented, as indicated by element counts, areas, and Fragstats metrics. In Bijiawan, urban expansion reduced cropland and raised fragmentation. In Gaojimiao, lakes and ponds kept water patch density high, but canal construction, pond loss, and reduced non-cultivated vegetation weakened buffers. In Dongsheng, fields remained rectangular, yet expanding roads and canals subdivided plots, and pond and vegetation loss reduced diversity. Policy influence was quantified by linking landscape metrics with major policy periods. Changes in patch density (PD), mean patch size (MPS), edge density (ED), connectivity (CONNECT), clumpiness (CLUMPY), and number of patches (NP) were calculated for each period (1986–2000, 2000–2010, 2010–2022). Percentage changes (Δ%) were classified as small (±0–5%, score 0), moderate (±5–15%, ±1), or large (>±15%, ±2), and summed. Results suggest near-neutral effects in 1986–2000 (–1), strong negatives in 2000–2010 (–9), and modest improvements in 2010–2022 (+2). The Household Contract Responsibility System created many small plots, while consolidation, high-standard farmland projects, and the Grain for Green Program partly reduced fragmentation. Later, the Village-to-Village Road Program and water projects intensified subdivision. By 2022, consolidation and conservation improved regularity and connectivity, though fragmentation pressures persisted. This study provides a fine-scale view of farmland change and illustrates how policy shaped these patterns. The findings offer insights for farmland maintenance and ecological management in lake-plain areas.

Keywords: Landscape pattern dynamics, Fine-scale farmland elements, Policy influence, Landscape fragmentation, Shishou

#460 Ripples of Growth: Urban Development Trends in Midland and Odessa Pre- and Post-Fracking

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Abstract

Located in the central region of the Permian Basin, Midland and Odessa, Texas, are at the forefront of US domestic oil and gas production (EIA, 2025). Over recent decades, particularly following the widespread adoption of hydraulic fracturing in the mid-to-late 2010s, both cities have seen remarkable growth (EIA, 2022). Research indicates that job creation and population growth in these cities correlate strongly with fluctuations in oil prices (Thompson, 2023). The rapid economic expansion of Midland and Odessa, located roughly 20 miles apart, has led to an accelerated growth of urban areas. Understanding urban expansion patterns is critical for sustainable and resilient urban planning as it informs strategies that consider environmental implications, adapt to economic shifts, enhance social well-being, and optimize resource allocation. Despite the evident transformation, a thorough analysis of the growth dynamics in both cities has yet to be undertaken. This research aims to address this gap and compares urban development in Midland and Odessa before and after the widespread introduction of fracking. It specifically examines the overall increase in built-up areas from 2001 to 2011 and then from 2011 to 2021, utilizing the National Land Cover Database (NLCD) for land cover studies and temporal change analysis. The findings illustrate a significant expansion in both cities post-2011, revealing a distinct urban growth pattern referred to as 'the ripple effect' in this study, which reflects observable variations in development rates and magnitudes across different buffer zones radiating from the original city centers. Further analysis of growth pattern graphs in Midland and Odessa reveals an upward and downward ring-like development, similar to ripples on water. Identical to a ripple's diminishing impact with distance, the effects of urban expansion lessen as one moves away from the central areas. Notably, a trend of 'conurbation' emerges, signifying the merging of the two cities. Between 2001 and 2011, both cities exhibited dense centers with thinning development outward. However, after 2011, density in the interstitial region increased, indicating a growing trend toward the midpoint between the two urban centers. The pressures from rapid urban growth necessitate careful planning for future resilience. Based on the spatial patterns found in the study, this research presents several actionable policy recommendations to foster sustainable practices that enhance the long-term viability and livability of both Midland and Odessa, advocating for a balanced coexistence of economic development and resilient urban planning in this dynamic region.

Keywords: Fracking, Urban Growth Pattern, Permian Basin, Conurbation, Ripple Effect

#523 The applicability of Actor-Network Theory in understanding urban food security: The case of Pittsburgh, PA

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Abstract

Urban Food systems are complex networks, formed of interrelationships among initiatives, programs, public policy, vacant lands, individuals, ecologies, and technical infrastructure constituting the assemblage of urban food systems (Farias & Bender, 2012). Understanding the roles each part of this system plays and the dynamics among them are critical in comprehensive urban food planning. This is even more important in cities that suffer from food insecurity. In such settings, the hierarchical analysis of the food actors is not usually effective in understanding the mechanisms of food systems. Actor Network Theory (ANT) rejects the hierarchical views of the world (Watts & Scales, 2015) and asserts that human and non-human actants can be defined only in relation to other components of a network (Vitale, 2023). This theory offers a framework that seems to help untangle the complexity of urban food systems and understand how human or non-human entities in the system relate to each other. This study focuses on Pittsburgh, a food insecure city, to explore the applicability of ANT to urban food systems. We employed ANT to conceptually map and analyze the complex dynamics between human and non-human actors in Pittsburgh's food network. The goal was to help identify potential overlaps, disconnections, and gaps among entities' missions, roles, and activities that affect food security, access, production, and distribution. As part of a larger mixed method research project, this exploratory study started with manual content analysis, by looking into local organizations and institutions' publicly accessible information. The first phase of data collection mainly focused on the mission, scope, scale of impact, main programs or initiatives, and funding sources of each entity. We identified around 40 key food actors in Pittsburgh as well as their interrelationships. Using ANT framework, the dynamics among these food actors are analyzed to define different forms of food systems networks in addition to potential overlaps and gaps in the network. Food policy linked to education, health and nutrition linked to food access, food distribution and different forms of food access, either free access, via purchase or membership are among the interrelationships identified in the analysis. The findings of this study will inform semi-structured interviews with identified local actors in Pittsburgh. Further, this study provides an analytical framework, grounded in ANT, that can be applicable to food systems across other food-insecure cities to help better understand the dynamics of actants as a basis for finding practical solutions to food insecurity.

Keywords: Actor-Network Theory, Food insecurity, Food-actors network, Urban food systems

#525 A cost-effective open-bottom culvert project as a design, management, and planning prototype: Fostering the evolutionary resilience of development-sensitive herpetofauna species

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Abstract

Worldwide declines in freshwater turtle populations have created the need for more proactive protection measures in design and management (Fahrig, 1997; Quesnelle et al., 2013; Steen et al., 2012). A primary driver in the decline of turtle and herpetofauna [1] species in Connecticut is a pattern of sparsely spaced residential developments and road patterns that move people to dispersed homes, separating herpetofauna from much-needed sites for nesting and food sources (Connecticut Wildlife Action Plan , 2015; Fragomeni et al., 2021; Johnson & Klemens, 2005; Klemens et al., 2012). Female Eastern box turtles may be at a disproportionately high risk of mortality as they cross roads to lay their eggs on higher ground in the spring (Roberts et al., 2021). Fortunately, open-bottom culverts (OBC) can lower mortality rates by allowing turtles to pass naturally along stream corridors, reducing their movement onto roads. The current need for stormwater upgrades in Connecticut (to accommodate the state's aging infrastructure built in the 1930s and 1940s) provides opportunities for OBC replacement projects. However, OBCs are more expensive than piped culverts, and the vast network of Connecticut's road and highway crossings makes the task of retrofitting traditional culverts with OBCs cost-prohibitive. Additionally, the movement of turtles can be broad, and their ranges vary throughout the year, which adds challenges to determining the optimal locations for OBCs (Roberts et al., 2021; Steen et al., 2012). To address these concerns, we identified the optimal locations for OBCs for two development-sensitive herpetofauna species at a municipal scale to illustrate a cost-effective way for landscape architects, wetland managers, and conservation agents to prioritize them where they are most needed. We used ArcGIS analytics to create a suitability index of the selected species' preferred habitat and migration ranges, based on vegetation, shade, soil, and bedrock compositions, in Ridgefield, Connecticut. Next, we targeted intersections where roads cross streams and wetlands within the identified migration ranges. The results provided maps used to follow up with field assessments to determine the suitability of retrofitting the identified culverts to OBCs. The methods are replicable and can be applied broadly to identify the best locations for municipal culvert replacement projects. Streamlining culvert replacement projects offers a crucial first step toward supporting the evolutionary capacity development of sensitive species nationwide. [1] Herpetofauna refers to reptiles and amphibians, including turtles, frogs, snakes, newts, and salamanders

Keywords: Urban ecology, sustainable development, municipal planning, open-bottom culvert

#554 Balancing Recreation and Conservation: Trail-Planning in Idaho's Prichard Creek Corridor amid Potential Grizzly Reintroduction

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Abstract

The possible reintroduction of grizzly bears in Idaho presents a new challenge for recreational trail planning. While communities and visitors advocate for expanded trail access, research shows that increased human activity often alters wildlife behavior, particularly for large carnivores like grizzlies that require extensive and undisturbed habitats (Ladle et al., 2019; Mirante et al., 2025). Although environmental assessments identify species at risk, translating ecological sensitivity into specific design and management strategies remains a persistent gap in planning practice. This project develops a framework that integrates ecological data with trail design decisions. Beyond identifying priority species such as grizzly bears, the framework tests strategies to minimize disturbance through spatial and temporal analysis. Critical life-cycle periods (e.g., denning, foraging) are mapped and compared to human trail-use patterns. Data including grizzly telemetry records, human trail use counts from automated sensors, citizen-science observations, seasonal habitat maps, and environmental covariates are analyzed through GIS and statistical modeling to simulate how wildlife responds to human activity over space and time. The analysis generates testable strategies for trail alignment, seasonal closures, buffer zones, and adaptive management. The pilot study takes place in the Prichard Creek Corridor in Shoshone County, a restored site that currently lacks a designated recreational trail network. Stakeholder engagement through workshops, participatory mapping, and interviews refines scenarios to reflect both community priorities and ecological needs. Community voices evaluate the social feasibility of design alternatives, ensuring that recommendations are not only ecologically sound but also publicly supported. By combining ecological research, spatial analysis, and participatory design, the project advances a transferable planning and design guideline that balances recreation and conservation. It contributes to broader landscape architecture discourse by demonstrating how planning for resilient communities integrates ecological vulnerability into recreational design. More broadly, the guideline offers lessons for trail planning across the American West and other regions preparing for large predator reintroductions, where tensions between conservation and human use continue to intensify. The project positions landscape architecture as a mediator between ecological science and public recreation, providing innovative models for coexistence that are both practical and adaptable.

Keywords: Recreational Trail Planning, Human-Wildlife Coexistence, Resilience, Conservation

#560 Integrating Intrinsic Hydrology into Urban Master Planning: A Spatial Analysis and Living Lab Approach on the Virginia Tech Campus

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Abstract

The global urban population is projected to grow substantially between 2015 and 2050, expanding urban areas by 0.6–1.3 million km², representing up to a 171% increase in footprint (Sun et al., 2025) . This rapid land change disrupts watershed hydrology and reduces ecosystem services, significantly exacerbating flood vulnerability (Kalnay & Cai, 2003) . In the U.S., projected urban expansion is expected to cause the loss of 118,318 km² of forest by 2050 (Sun et al., 2025) . Virginia, a coastal state, is highly flood-prone, having seen over 62% of recent federal disaster declarations being flood-linked. This risk intensifies due to rising urbanization, sea levels, and changing precipitation patterns. Conventional planning often overlooks intrinsic hydrological networks, leading to stream and watershed disruption (Baker, 2009) . A prime local example of this disruption is the Stroubles Creek stream, which was culverted under the Virginia Tech campus, including beneath several buildings, to accommodate development (Parece & Younos, 2010) . Implementing Nature-Based Solutions (NBS) offers a vital opportunity to restore these altered systems (Huang et al., 2020) . This research uses the ‘campus as a Living Lab’ concept—a dynamic, real-life ecosystem for co-creation—as a framework for NBS implementation, similar to the Penn State Stormwater Living Lab (Gomez & Derr, 2021; Lupp et al., 2021; European Network of Living Labs et al., 2025) . The primary research question is: How can spatial analysis effectively identify priority zones for implementing NBS to manage stormwater and mitigate flood risk within the Virginia Tech Blacksburg campus, leveraging the Living Lab framework? This study aims to: Delineate the Natural Hydrological Setting: Establish a baseline of the campus’s natural hydrological network (DEM, stream orders, watershed boundaries). Compare Development Plans with Natural Systems: Contrast existing LULC and built infrastructure with the baseline, and evaluate the Beyond Boundaries: A 2047 Vision (Virginia Tech, 2018) plan's consideration of the natural hydrological system. Develop Spatial Methodology and Identify Priority Zones: Use GIS overlay to identify crucial disrupted zones and generate a vulnerability/opportunity map for urgent NBS implementation. Discuss the Living Lab Framework for NBS Implementation: Evaluate the campus as a replicable 'Living Lab' for refining NBS stormwater management. The study integrates hydrological and LULC data using spatial analysis and GIS overlays to create a vulnerability-opportunity map. This map pinpoints impervious surfaces near critical hydrological features, guiding NBS pilot site selection. The validated methodology supports planning policies and sustainable urban development in Virginia’s flood-prone cities.

Keywords: Urbanization, Nature-Based Solutions (NBS), Stormwater Management, Living Lab, Hydrological Resilience

#566 A Landscape Approach to Roundabout Design: Improving Safety, Efficiency and Sustainability

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Abstract

This study investigates Connecticut roadway intersections to advance knowledge on how conflict zones affect streetscape design to improve the safety, sustainability, and efficiency of these systems. Recent studies by Connecticut Department of Transportation (CTDOT), Federal Department of Transportation (FDOT), and the Federal Highway Administration (FHWA) have brought attention to existing conflict zones as an essential component to roadway design to improve safety and performance. This research builds from this literature on proven safety measures in intersection design to advance knowledge on how roundabout redesign of Connecticut roadways has the potential to enhance these spaces as a form of green infrastructure that balances the needs of public space, mobility and biodiversity. The study uses a mixed methods approach which includes a review of metrics and policy analysis pertaining to the safety, sustainability, and efficiency of Connecticut roundabouts, a statewide (Connecticut) mapping of all major current and projected roundabouts, interviews with streetscape design professionals, and a design case study which showcases the application of best practices. Ultimately this presentation highlights landscape strategies to improve Connecticut roadway intersections that balance the needs of various users.

Keywords: Green Infrastructure, Streetscape Design, Roundabouts

#567 Greenbelt Planning and Park Design to Remediate Urban Sprawl

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Abstract

In the last ten years, Idaho's population growth compared three times faster in the U.S., accelerating in the post-pandemic. A comparison of aerial imagery and maps of the Treasure Valley in the last ten years, shows urban sprawl in Boise metropolitan area, rapidly annexing its adjacent rail towns. Focusing on Boise metropolitan area (Idaho's three largest cities -- Boise, Nampa, and Meridian), this paper proposes an expanded notion of urban greenbelt and connecting trails, parks, and open spaces that attempts to recuperate the local agricultural and sheepherding Basque heritage for recreational use, while reducing the social, cultural and environmental impacts of unplanned urban growth in the region. Through literature review and case studies research, the paper investigates greenbelt implementation in U.S. metropolitan counties. U.S. land use planning is delegated to local governments, while laws prioritize individual property rights. Multiple jurisdictions, conflicting real estate and agricultural interests, and prioritization of rural residential and commercial strip development over farming and forestry, result in sprawling development patterns that fragment the land base and hinder the creation of greenbelts. Using archival and field research, historiography, and engaged action research involving consultations with the City of Meridian, local NGOs and stakeholders, researchers test a U.S. greenbelt model to explore an extension of the Boise River Greenbelt: identifying flexible urban-growth boundaries, incorporating agricultural zoning to protect farmland and forestland from rural residential developments; and identifying patches of land for purchase of development rights and conservation easements. Historically, the Boise "Ribbon of Jewels" is a testimony of civic engagement, born out of a joint effort from public institutions and community members. Starting from the 1960s, the government purchased right of- way and land along the Boise River through deals with landowners, many of whom donated land to the city for public parks named after notable women of the area. The research explores diverse ways in which planning and community engagement can envision an expanded greenbelt in Idaho's Treasure Valley. The goals are to provide towns with a resilient floodplain; annexing agricultural/grazing land, forest/nature conservation areas and wetland areas; exploring laws/regulations that aid this process; and reflecting cultural heritage in parks through design. While these efforts could improve transportation, boost the local economy, and strengthen community ties, they bring challenges—protecting wildlife, preventing ecosystem damage, restoring cultural heritage, and ensuring fair access for all.

Keywords: greenbelt, agricultural heritage, urban sprawl, community engagement, regional planning

#572 Practical ecology for landscape designers: minimum conceptual heuristics and key considerations for humility

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Abstract

Landscape architecture students are routinely asked to describe, argue for, and evaluate the ecological performance of their designs within a studio context. However, the ecological conditions of the site of design are not always known, baseline data for evaluating ecological performance may not exist, and since the designs in the studio setting are merely conceptual, unlike in professional practice, no actual evaluation of as-built performance is possible. Moreover, as the saying goes, “all ecology is local,” subject to the specific conditions of a given site. How, then, are students expected to evaluate their proposed designs’ ecological performance, and what level of rigor is appropriate for the academic studio environment? In fact, certain ecology principles will apply to virtually any site, and will determine the bulk of a design’s likely performance regarding a range of ecosystem services evaluation criteria, such as overall biodiversity, specific species’ habitat requirements, carbon sequestration, and water retention. Students should have the conceptual tools to differentiate these general principles from more bespoke ecological performance goals, which may or may not be possible given the site conditions and the theoretical execution of their designs. Drawing on a decade of teaching of core urban ecology courses at the graduate level, this presentation will review the state of knowledge of contemporary ecological science, consider the appropriate resolution for ecological design inquiry in a studio context, and suggest ways that students could advance their ecological inquiry towards more refined and granular investigations given an appropriate additional degree of interest, site access, pedagogical logistics, and time. The presentation will argue for an approach of critical thinking and humility when making ecological claims in a studio context, but combined with the empowerment of knowing how one might approach a similar project in the real world with the appropriate questions, tools, collaborations, and resources.

Keywords: Ecosystem ecology, Landscape ecology, Biodiversity, Urban ecosystems

#584 Incentivized Landscapes: An Atlas of Forest Stewardship in New England

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Abstract

Set within neoliberal approaches that govern nature-society relationships, this paper explores the political economy of incentives with emphasis given to the use of legal and fiscal frameworks associated with private landowner environmental management in New England. This paper focuses on the use of incentive programs as tools of environmental governance in addressing the conservation and restoration of forested land. Guiding this exploration is the question: What is the extent that fiscal tools are used to incentivize private forest stewardship in New England? What impact do these programs have on the design of forest systems in the region? Outcomes of this research include an atlas of incentivized stewardship programs within New England with emphasis given to understanding the policy and program landscape of Connecticut. Forested land comprises the majority of the landcover in this state, with private landowners (family forest owners) controlling a large proportion. With such a large proportion of forested land under private ownership, the future of Connecticut's forests is largely dependent on landowner stewardship practices (Peracchio, 2020). This research illuminates the spatial extents and potential futures implicated in the use of fiscal tools to activate stewardship, while also contributing valuable insight into development pressures, conservation policies, and the different management approaches used across Connecticut's urban-rural interface. Outcomes contribute to current scholarship on the fiscal geographies of conservation (Dempsey 2016; Dempsy and Suarez, 2016; Tapp and Kay 2019; Smachylo, 2022), the design of forest systems (Ibañez et al. 2019; Smachylo 2019, 2022; Wikstrom, 2023; Handel, 2024) and the development of visual methods to aid in our understanding of stewardship practices on private forested lands.

Keywords: Forest systems, Stewardship, Atlas, Incentives, Governance

People-Environment Relationships

#13 Riding Transit in a Changing Technological Landscape: Smartphone Transit Apps and Transit Use

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Abstract

Over the past decade, an increasing number of smartphone-based transit applications have reshaped how riders navigate transit and urban systems, offering new tools for trip planning, fare payment, and real-time vehicle tracking. Despite their widespread adoption, the perceived benefits and broader behavioral impacts of these technological environmental changes are widely unknown (Bian et al., 2022). This study aims to assess both the current landscape of transit apps offered by major US transit agencies and their perceived impacts and measurable impacts on transit use. Among the 247 major transit agencies that provide fixed-route bus services to the public, 240 offered transit information via smartphone apps. Building on this national overview, we conducted in-depth interviews with 21 Industry leaders to examine the perceived benefits and costs of transit app development and deployment. Most interviewees viewed these apps as integral components of emerging account-based fare systems and as vital channels for two-way communication with riders. More than a simple technological upgrade, transit agencies recognized transit apps would enhance rider experience of transit by reframing perceptions of convenience, reliability, and accessibility (Bian et al., 2023). However, a notable gap persists in empirical evidence regarding whether these perceived improvements translate into measurable increases in ridership (Brakewood et al., 2014). To address this gap, we evaluated the behavioral impacts of the VIA goMobile app in San Antonio, Texas, using longitudinal route-level monthly panel data from 2015 to 2019. Random-effects (RE) regression models were employed to estimate the app's effect on ridership, controlling for fares, route characteristics, weather, socioeconomic conditions, and gas prices (Tang & Thakuriah, 2012). The results show that the app significantly increased ridership on infrequent routes, adding an average of 1,634 trips per route per month, but had no measurable impact on frequent routes. This suggests that smartphone apps may be most effective in areas with less dense service, where they improve perceptions of accessibility and encourage riders to rely on transit for more of their daily needs. By linking technological implementation to behavioral and perceptual changes in public transit use, this research explores the role of digital tools in influencing the human relationship with transportation networks and the urban landscape. The findings provide critical insights for policymakers and transit leaders seeking to design user-centered strategies that foster more inclusive, connected, and sustainable communities.

Keywords: sustainable travel, public transportation, smartphone transit apps, technological environment

#16 Coupling and Association Analysis of Multi-Source Heterogeneous Social Media Image Data for Giant Panda National Park

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Abstract

As one of China's first national park pilot areas, the Giant Panda National Park carries key ecological functions and both natural and cultural heritage values within a global biodiversity hotspot. Cultural ecosystem services (CES) emphasize the non-material benefits people obtain through interactions with nature, including aesthetic experiences, recreation, emotional fulfillment, and cultural identity. This study focuses on the Tangjiahe area of the Giant Panda National Park, integrating spatiotemporal behavioral data from social media platforms such as Two-Step and Six-Foot through web crawler technology. A multidimensional crowdsourced dataset was constructed, encompassing seasonal characteristics, six tourism elements (food, accommodation, transportation, sightseeing, shopping, and entertainment), image semantic labels, visitor age, activity types and intensity, and CES dimensions. Using Python, GIS, Sankey diagrams, and multimodal data fusion methods such as image–text clustering and association analysis, this study established a comprehensive analytical framework combining supervised learning (Google Cloud Vision API) and manual validation for image semantic parsing. Results reveal that: (1) plant-related visual symbols dominate user-generated content (76.9%), far exceeding animal-related tags (2.3%), reflecting a public aesthetic preference for natural landscapes; (2) seasonal variation significantly affects CES values, with aesthetic experiences most pronounced in autumn (42.7%), higher than in summer (27.9%), spring (14.6%), and winter (13.6%); (3) age stratification analysis shows generational behavioral differences, as visitors aged 41–60 and above tend to prefer static recreational activities (68.3%–75.9%); and (4) spatial hotspot analysis indicates that visitor activities are concentrated around ranger stations within approximately 4.5 km, mainly consisting of low-intensity recreation, revealing spatial differentiation in human activity. All data used in this study were obtained from publicly available social media content and were anonymized and aggregated to ensure privacy protection. The findings provide decision support for coordinated governance between ecological conservation and recreational use, as well as theoretical insights into community-based ecological product value realization. This study innovatively proposes a social media–based crowdsourced data analysis framework, offering methodological support for relational computing among multi-source heterogeneous data and contributing a technical paradigm for multidimensional perception systems in national parks, with practical value for advancing intelligent management of protected areas.

Keywords: Giant Panda National Park, Tangjiahe, Social media, Supervised learning, Cultural ecosystem services

#17 Examine Seniors' Activities Influencing Factors (SAIF) : An on-ground observation, drone imageries, and machine learning approach

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Abstract

Urban green spaces are widely recognized as crucial for enhancing the well-being of the elderly and have thus attracted increasing attention (Dennis et al., 2020). Despite extensive research on green equity and the accessibility of green spaces, there remains a significant research gap in understanding how the characteristics of urban green infrastructure directly influence the types and intensities of activities in which the elderly engage (Guo et al., 2020). To address this, this study proposes and constructs the "Seniors' Activity Influencing Factors (SAIF)" framework, aiming to systematically analyze this complex relationship. The research takes the People's Park in Chengdu, China, as a case study and systematically collects data in five typical sample plots in October, November 2022, and February 2023. It adopts an integrated technical approach: on-site behavioral observations record the types, intensities (categorized according to the American RDA standards (Ainsworth et al., 2000)) and spatial distribution of elderly activities; unmanned aerial vehicle (UAV) images and deep learning image segmentation technology precisely quantify the structural elements of green spaces; spatial syntax analysis reveals the spatial layout and accessibility features; ENVI-met microclimate simulation assesses thermal comfort (PMV/PPD); and finally, ArcGIS and Python are used for machine learning-driven image segmentation and correlation analysis of 19 environmental variables, achieving efficient and reliable research visualization in the "SAIF" model (Jordan & Mitchell, 2015; Guo et al., 2018; Cen et al., 2023). The study finds that: (1) the width of walking paths, green coverage rate, and facility density significantly influence the activity choices of the elderly; (2) microclimate conditions (especially temperature and solar radiation) are key determinants of the elderly's comfort and activity intensity; (3) high accessibility spaces are densely populated with activities, while enclosed green spaces provide unique settings for low-intensity activities; (4) the density of sanitation facilities and the layout of rest facilities have significant moderating effects on the activities of the elderly; (5) the complementary design of hard squares and vegetated areas can effectively promote various types of activities. This study creatively integrates multi-source data and cross-disciplinary technologies, establishing the "SAIF" framework to transform a previously ambiguous concept into a clear and visual network, providing an empirical basis for inclusive park design and revealing the key interactions between green infrastructure, microclimate, and accessibility. It offers critical insights and actionable paths for creating elderly-friendly cities and promoting environmental justice.

Keywords: Urban Park, Unmanned Aerial Vehicles, Human Activity, Health and Well-being, Aging

#77 Research on the Promoting Effect of Peripheral Service Facilities Around Urban Parks on Subjective Well-Being Based on POI Data

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Abstract

Existing research confirms the positive impact of urban green spaces on residents' physical and mental health. However, most studies focus on the internal environment of parks. To explore ways to enhance residents' well-being in high-density urban environments and address the research gap concerning facilities outside parks, this study aims to establish a relational mechanism between peripheral service facilities of urban parks and subjective well-being. Based on the ICOMOS-IFLA definition criteria, eleven representative urban parks in Wuhan (covering different types, sizes, and locations) were selected as the study subjects. Visitors to these parks were selected as respondents through on-site random sampling. For objective variables, a 1,500-meter walking radius buffer zone was established from each park's boundary. Using Baidu Map POI (Point of Interest, referring to point-based geographic entities on maps with specific names and types, such as shops, parks, or schools) data collected in 2024, and referencing current national standards, 'peripheral service facilities' were operationalized as over 20 categories of public service facilities within the buffer zones, including catering, retail, and tourist attractions etc. Their quantity and distribution were statistically analyzed. For subjective variables, a three-dimensional subjective well-being scale (personal, environmental, social) was developed based on domestic and international research, and 368 valid questionnaires were collected. SPSS software was used for correlation and multiple linear regression analyses, controlling for covariates such as age, gender, income, and education level to reduce confounding. The findings reveal that: 1) The number of tourist attractions around urban historical parks is significantly positively correlated with visitors' subjective well-being; 2) Different types of tourist attractions have varying impacts on subjective well-being. Historical-cultural sites and natural attractions have the most significant effect on enhancing well-being, while entertainment-oriented sites have a relatively weaker impact. Through quantitative analysis, this study confirms that optimizing the layout of service facilities around parks, particularly increasing the density of historical-cultural and natural attractions, can effectively enhance visitors' subjective well-being. Based on the results, this paper proposes strengthening the protection and display of historical and cultural elements, rationally planning the spatial layout of peripheral service facilities, and emphasizing the organic integration of natural and humanistic elements. These findings provide a scientific basis for the conservation and adaptive reuse of urban parks and offer new perspectives for enhancing residents' quality of life in high-density urban environments.

Keywords: Urban Park, POI, Service Facilities, Subjective Well-being

#81 AI-Based Modeling of Dynamic Thermal Comfort in Street Environments: Integrating Activity and Psychophysiological Responses

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Abstract

Under global climate change and the urban heat island effect, urban high-temperature environments increasingly threaten human health and well-being (Phelan et al., 2015; Tuholske et al., 2020). Streets, as the most intensively used public spaces, serve commuting, social, and leisure functions (Jacobs, 1961) while also constituting the most direct setting of individual heat exposure (Nikolopoulou & Steemers, 2003). People engage in both static and dynamic activities in these spaces (Whyte, 1980), and their thermal experiences are influenced by environmental and topographical features such as flat terrain and slopes (Olesen, 1995). Nevertheless, most studies emphasize macro-scale simulations or static indices, with limited consideration of physiological and psychological responses during dynamic activities (Galindo & Hermida, 2018; He et al., 2025). To address this gap, this study integrates sitting, flat walking, and uphill walking into a dynamic thermal comfort framework to examine how activity levels and street environments shape heat exposure and relate to physiological and perceptual responses. Six street types within the Seoul National University campus were selected, covering varying levels of greening (Green View Index > 50% vs. ≤ 50%) and shading (Sky View Factor = 0.05, 0.4, 0.8). Field experiments were conducted in August–September 2025 with 90 healthy university students. Four scenarios were examined: indoor sitting, outdoor sitting, flat walking, and uphill walking. Physiological data were collected using Polar H10 sensors for heart rate and heart rate variability, iButton devices for skin temperature, and subjective surveys for thermal sensation and comfort. Environmental parameters, including WBGT, air temperature, humidity, wind speed, and solar radiation, were recorded using a Kestrel 5400. Preliminary findings show that street microenvironments significantly influence thermal comfort, with effects most pronounced under high physical load conditions such as uphill walking. Physiological data highlight the amplifying role of activity intensity on heat stress, while environmental results indicate that low SVF effectively reduces thermal exposure, whereas GVI alone plays a limited role. Building on these findings, a comprehensive AI model will integrate environmental, physiological, and perceptual data to advance understanding of the environment–physiology–psychology nexus. This study contributes an integrated framework for assessing outdoor thermal comfort under dynamic conditions. The findings provide empirical support for climate-responsive landscape architecture and urban design, offering evidence for the planning and renewal of street environments to enhance climate adaptability, promote public health, and improve overall urban livability.

Keywords: Outdoor thermal comfort, Thermal physiological response, Artificial Intelligence, Street microclimate, Landscape architecture

#82 Unequal Grounds: Perceptions, Practices, and the Uneven Realities of Social Capital in Urban Greenspaces

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Abstract

Urban greenspaces are vital forms of social infrastructure that foster networks of trust, participation, and cohesion, strengthening resilience (Klinenberg, 2018). In fragmented societies where social ties and collective identity are eroded by urbanisation, inequality, and digital isolation, greenspaces provide accessible places that rebuild connections and capacity (Feinberg et al., 2023; Putnam, 2000). While greenspaces are often viewed as universally beneficial, their social outcomes are unevenly distributed, frequently leaving vulnerable groups (Rigolon et al., 2018). This study applies the Blue-Green Infrastructure (BGI) Social Resilience Framework (Campbell et al., 2024) examining how perceptions and practices contribute to social capital, measured through networks, trust, participation, and cohesion. In alignment with UN SDG 11.7 which calls for the inclusion of accessible public spaces, this research focuses on women, older adults, and persons with disabilities (United Nations, 2015). It investigates two multi-use spaces in Wellington, New Zealand, using a mixed-methods approach combining survey data (n = 76) with regression modelling and thematic analysis. The survey captured perceived attributes such as safety, sociability, and walkability, alongside engagement in recreational, social, and stewardship activities. Subgroup analyses explored demographic variations (e.g., gender, age, and disability), recognising that small sample sizes limit statistical generalisation. Regression analysis identified directional associations rather than population-level effects, supported by qualitative interpretation for validity. Findings reveal indicative patterns of social capital across groups. Perceptions of sociability and safety were significant predictors, though effects are varied among populations. Women, younger adults, and people with disabilities reported lower levels, indicating that positive perceptions alone are insufficient to overcome inequities. Conversely, older adults and low-income respondents reported higher levels, suggesting that parks can offer compensatory benefits for some disadvantaged groups. Practices contributed meaningfully: social and restorative activities were important for women and younger adults; recreation was salient for people with disabilities; and stewardship significantly associated with social capital. The study highlights how socio-demographic context, perceptions, and practices shape social capital in BGI spaces. Though limited by sample size, the mixed-methods design provides exploratory insight into how perceptions and practices interact with demographic context to influence social connection. These results challenge the assumption that provision alone generates social connection, showing instead that social capital develops unevenly through interactions between demographic context, patterns of use, perceived conditions, and inclusivity of design. Ultimately, the findings advocate for equity-centred planning approaches that reflect diverse preferences, address structural barriers, and enable meaningful participation. ensuring that BGI functions as genuinely inclusive social infrastructure.

Keywords: social capital, greenspace planning, social infrastructure, equity

#100 The Political Utility of Place-based Emotion in Pedagogy and Practice for Resilience in Times of Extreme Uncertainty

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Abstract

This panel addresses critical questions about the politics of place attachment in the face of rapid cultural and environmental change. The panelists start with the belief that all design, be it within pedagogy or practice, is a political act, and that designers can more fully utilize place attachment and sacred place theory so that community members may respond constructively to change and express democratic activism. Contextualizing the discussion are contributions of landscape theorists, psychologists and geographers (Manzo & Devine-Wright, 2021; Hester & Nelson, 2019; Relph, 1976) on the challenges of community stabilization (Mihaylov & Perkins, 2021; Ruggeri, 2021), adaptation to change (Clarker, Murphy, & Lorenzoni, 2018), identity politics (Upton, 2015) and environmental relocation (Liu, 2023). Given the contentious, often debilitating impact of the aforementioned challenges, it is timely to determine how emotional attachments to landscape can be useful in creating resilient and civic-serving design and designers. It is crucial to understand the challenges, opportunities, and learning that result from undergoing this process. Each panelist, whose careers span diverse generational and professional experience, draw on their design research work to illustrate effective use of deep emotional bonds with landscape, together addressing all stages of a project's lifespan, from design ideation to post-occupancy, and focusing on the following questions, sequenced along a continuum of pedagogy to practice. How might design educators best introduce place attachment/sacred place theory to students? What happens when designers utilize place attachment exercises? What role do such exercises play in engaging students, clients and communities? Where in the current policy and decision making process can place emotions be most successfully folded in, and which techniques are most effective at the scales of landscape design interventions most needed today? Who benefits from discovering and applying place emotions to design? How? How do landscape architects measure success when integrating emotional attachment to place into the design process? In addressing these questions, each panelist also discusses how they address the politics of place attachments in their work, from the notion of polis —the shared civic realm where people articulate meanings, negotiate identity, and steward their landscapes, to the agency of community members for self-determination as well as considerations of conflict. This panel aims to plant a seed, the beginning of a dialogue that together with the audience, seeks to expand and enrich, both at this conference and beyond.

Keywords: Place attachment, Sacred place, Resilience in uncertainty, Community design, Political empowerment

#106 Design as Translation: Converting Tactical Practices on Pocket Everyday Infrastructure into Institutional Outcomes in China's Platform Urbanism

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Abstract

This paper examines how delivery logistics reconfigure landscape infrastructure within urban micro-renewal and platform urbanism in China. Historically, walls embodied spatial segregation; under platform-mediated logistics, that segregation generates daily frictions—tactical handovers across thresholds, informal crowding, new maintenance burdens, and recurring management conflicts that reproduce injustices for vulnerable actors. In response, designers have retrofitted enclosed walls with small modular delivery lockers—pocket everyday infrastructures—which translate tacit handover routines into material objects and governance procedures (Peng et al., 2022; Kumar, 2024; Guma, 2025). While the tactical-to-strategic dynamic is commonly observed, in China this codification is propelled by dense platform logistics, liability-driven property management, pervasive surveillance, and retrofit pressures(McFarlane & Rutherford, 2008); design thus functions as an institutionalizing agent that negotiates these forces and reshapes conditions of spatial justice (Dourish & Bell, 2007; Howe et al., 2016). This study asks: (1) How do designers capture contests and negotiations among diverse stakeholders, and on that basis translate everyday tactical exchanges into governance procedures? (2) How does design reallocate labor, surveillance and maintenance responsibilities(Ramakrishnan et al., 2021), and with what spatial justice implications? Methodologically, this study combines infrastructural ethnography(Star, 2022) with design research. Drawing on ethnography's capacity to trace practices from the inside, fieldwork in a case where a campus wall was retrofitted into delivery lockers (Zhang, 2023) uses extended participant observation, actor-network mapping and semi-structured interviews (approx. 15) with a diverse set of stakeholders, including security guards, delivery riders, and pick-up workers, thereby assembling fragmented accounts into interpretive narratives, and clarifying how design redistributes responsibilities (Larkin, 2013). Findings show (1) pocket everyday infrastructure emerge from interactions among diverse stakeholders; (2) design-as-translation converts informal practices into stabilized forms, mediating conflicts and avoiding one-size-fits-all managerial decisions, while potentially entrenching inequalities. Theoretically, design should be re-understood as an embodied governance technology which may both optimize spatial efficiency and entrench structural inequalities. Landscape studies should expand the boundary of inquiry to include everyday infrastructure governance and the agency of design. Practically, the study critiques the sluggishness of formal design in adapting to change, calling for landscape practice to actively learn from the agency and potential of grassroots tactics. A single-case study, however, limits generalizability. For researchers and designers, they must be more caring toward the governance and maintenance changes that design may cause, and the hidden processes of justice and visibility of labor, supporting micro-updates of everyday infrastructure while avoiding institutional neglect of vulnerable groups.

Keywords: everyday infrastructure, platform urbanism, design as translation, spatial justice, labor responsibility

#123 Examining the impacts of physical and perceived landscape quality on undergraduates' in-person interactions in a campus residential area

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Abstract

This study examines the impacts of landscape quality, both physical and perceived, on undergraduates' in-person interactions within campus residential areas. Undergraduates' heavy reliance on digital spaces affects their opportunities for in-person interactions, resulting in feelings of loneliness and social isolation from offline peers (G et al., 2025). Designers seek to enhance the quality of campus landscape to encourage students' in-person interactions (Salih et al., 2023). The landscapes of students' residential areas are frequently visited, and their quality has been emphasized in recent studies. In addition to the physical characteristics of landscape, students' perceptions demonstrate a stronger potential to explain variations in student behavior (Aghabozorgi et al., 2025). However, empirical evidence on their combined influence on students' in-person interactions remains limited. This study empirically investigates the impacts of landscape quality on in-person interactions among undergraduates in a selected residential area of the University of Georgia. The landscape quality is measured from both physical and perceived perspectives. The physical quality is evaluated based on landscape features extracted through semantic segmentation of panoramic site images, assessing overall conditions of greenery, sky visibility, spatial enclosure, and service facilities (Huang et al., 2025). The perceived quality is measured through an online survey of 50 students residing in this area. The survey captures their subjective responses to the corresponding site images using a 5-point Likert scale, including aesthetics, attractiveness, emotional connection, and comprehensive appeal (Wartmann et al., 2021). The survey also collects students' self-reported frequency and duration of in-person interactions at each site between October and November 2025. Additionally, the survey recorded differences in how students allocated their time between online and offline social activities. Building on this, Covariance-Based Structural Equation Modeling (CB-SEM) is employed to examine how physical and perceived landscape quality (latent variables) impact students' in-person interactions (observed variables), while controlling for differences in their online and offline time allocation (covariates). This study demonstrates the critical role of perceived landscape quality in shaping students' in-person interactions in campus residential areas. It reveals that students' time allocation for online and offline social activities, significantly moderate these relationships. This study offers practical insights into enhancing the quality of campus residential areas to alleviate negative psychological states and strengthen their social cohesion. Overall, this study contributes to designing more accessible residential areas on campus for diverse student groups.

Keywords: Physical and Perceived Landscape Quality, Social Interaction, Campus Residential Area, Evidence-Based Design

#128 Mussel Power: Landscape Architecture Guidelines for Native Freshwater Mussel Restoration in Muncie, Indiana

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Abstract

Freshwater mussels are considered one of the most endangered animal species in North America because many native populations are too small or fragmented to sustain natural reproduction. Once abundant in state waterways, over half of Indiana's 80 native mussel species have been eradicated or are currently listed as endangered, threatened, or species of special concern. In 2021, the White River Freshwater Mussel Propagation Facility was established in Muncie, Indiana, with the intent to bolster the state's native mussel populations. The facility has had success propagating three focus species: Lampsilis cardium (plain pocketbook), Lampsilis fasciola (wavy-rayed lampmussel), and Ptychobranchus fasciolaris (kidneyshell). However, the mortality rate after propagated mussels are released into the White River is high. This research applies the landscape architecture design process to address two important issues: 1) the environmental factors killing propagated freshwater mussels after they are released into their natural habitat, limiting the success of restoration efforts, and 2) the lack of public awareness about the importance of native mussels in freshwater ecosystems. To define design goals, target habitat characteristics for the three focus species were specified from a literature review and interviews with professionals involved in freshwater mussel restoration efforts. Open-source geospatial data related to habitat variables was used to run a hydrologic analysis and habitat suitability analysis in ArcGIS Pro. These analyses revealed priority sites where existing river conditions are closest to target habitat characteristics. Pros and cons of the priority sites for each focus species were recorded. Case studies related to habitat creation, habitat modification, and public education for freshwater mussels and endangered aquatic species were examined as precedents for ecological design interventions that could improve existing habitat conditions at priority sites to reach unmet target characteristics and social design interventions that could increase public awareness about native freshwater mussels. Ecological and social design typologies corresponding to habitat variables and design goals were created. One priority site was selected, and contextually specific ecological and social design typologies were applied to demonstrate their potential for practical and scalable application. Though grounded in Indiana, research findings establish design guidelines that can inform government agencies, nonprofit organizations, and design professionals involved with freshwater conservation efforts nationwide. This research exemplifies how landscape architects' work within the human-environment interface can generate natural and social capital to create long-term value for society. This value creation framework can be leveraged to help expand the landscape architecture profession through novel cross-disciplinary collaborations.

Keywords: Design guidelines, Endangered species restoration, Freshwater mussels, Muncie, Indiana, Natural and social capital

#143 Mapping Urban Wildlife Coexistence: Insights from Ecological and Socio-Spatial Data

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Abstract

Urban wildlife coexistence is shaped by the interplay of ecological, infrastructural, and socio-spatial factors, yet few tools translate these insights into actionable guidance for design and planning. Building on a first-phase analysis of coexistence (GBIF observations) and conflict interactions (wildlife-vehicle collisions, roadkill, and bite records) overlaid with parks, water, and roads in Tucson, Arizona, this presentation expands data inputs to reveal socio-cultural and demographic interactions in coexistence design and planning. Using reproducible spatial workflows in R this project integrates U.S. Census block-level demographic data, American Community Survey (ACS) variables, and road density metrics with existing ecological and infrastructural datasets developed in an earlier study. This expanded dataset allows us to examine how demographics and road density intersect with wildlife interaction “hot spots,” to evaluate how road network intensity may increase risks of human-wildlife conflict and also where green and blue infrastructure may increase coexistence outcomes to address environmental access inequities. By combining ecological, infrastructural, and socio-demographic data, this project begins to develop a transferable framework for landscape architects and planners seeking to embed human-wildlife coexistence goals into urban design.

Keywords: urban wildlife, coexistence & conflict, spatial analysis, landscape planning, socio-ecological design

#154 The Crisis Reconsidered: From Urban Governance to Ethical-Ecological Landscape Stewardship

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Abstract

Understanding humanity's role in shaping the environment requires engaging with stewardship as a culturally embedded rather than universal concept. In Islamic thought, stewardship is grounded in responsibility, accountability, and balance—principles that function as institutional and spatial forces rather than technocratic tools. Jamel Akbar's Crisis in the Built Environment argues that environmental and urban decline in Muslim societies stems not from architectural style or technology but from misaligned structures of authority, responsibility, and rights that shape how the built environment is produced and managed. He re-frames cities as outcomes of social contracts that determine the urban fabric. Also, he argues "resilience in the built environment emerges when rights and responsibilities are clearly defined and enforced; without this balance, even well-designed environments decline." (Akbar, 2021). While this framework has influenced architectural and urban debates, its relevance to ecological landscapes and communal resource governance remains unexplored. This paper extends Akbar's historically grounded institutional analysis to natural landscapes, examining how ethics, governance norms, and spatial responsibility shape ecological stewardship. Two case studies in Saudi Arabia structure the analysis: (1) Wadi Al-Rumah watershed, the largest inland ecological corridor, historically managed through distributed responsibility systems such as Hima, and (2) Arid mangrove ecosystems of Aseer Coast, long sustained through localized customary practices before the rise of oil-products centralized environmental regulation. Neither is an urban project; instead, both represent ecological landscapes (peri-urban) whose conditions reflect historical transformations in responsibility, authority, and community agency. Methodologically, the study combines historical–institutional analysis with spatial reading. It examines to trace how responsibility, control, and custodianship have shifted across different governance eras. Field-based landscape documentation complements this by showing how these shifts in vegetation patterns, access regimes, protection structures, and degradation processes. The paper argues that "ethical–ecological integration" is not assumed but demonstrated: the findings emerge from tracing how landscapes with strong historical norms of distributed responsibility tend to exhibit superior continuity in ecological function and community engagement. Embedding Akbar's principles into ecological analysis provides a more culturally grounded and resilient framework for contemporary ecosystem stewardship.

Keywords: Stewardship Landscape, Islamic Environmental ethics, Wadi Al-Rumah, Asir Coast Mangroves, Built Environment

#156 Water Features: Psychoacoustic Variables and Effect on Human Restoration and Physiology in the Urban Environment

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Abstract

Although water features are commonly installed in urban landscapes and provide numerous spatial, ecological (Hassall, 2014), and social benefits (Langie et al., 2022), a deeper understanding of aqueous soundscapes in the urban environment and their effect on restoration and psychophysiology is needed. This study will seek to identify how psychological and physiological responses associated with restoration may differ depending on the aqueous soundscape. Through the senses, people gain, organize, and interpret information to form perceptions of a landscape (Kaymaz, 2012). Typically, sight is the main method which humans use to gather information, accounting for roughly 76% of environmental satisfaction (Liu et al., 2022). Inversely, sound accounts for 24% of environmental satisfaction, yet it is often overlooked or not considered in landscape design (Engel et al., 2021). It has been shown that nature sounds like birds and water can aid in restoration and psychophysiological stress recovery including a reduction in negative emotions, cardiovascular stress, cortisol levels, and decreased blood pressure and pulse rates (Largo-Wight et al., 2016; Michels & Hamers, 2023). The restorative and physiological effects of different aqueous soundscapes will be assessed utilizing three different experimental cases of an urban environment in virtual reality (VR), with a different water sound varying in psychoacoustic variables being played in each scenario. Virtual reality was the preferred medium simulating a real-world environment that is easily accessible while allowing researchers control over variables. There will be 25 research participants per virtual environment. During a participant's exposure to the VR environment, heart rate data, which is related to restoration in the landscape, will be collected via an electrocardiogram (ECG). Following the experience, participants will complete a survey reflecting their experience. The survey is constructed primarily using the Swedish Sound Quality Protocol (SSQP), which was created to specifically measure the restorative qualities of sound within a landscape, as well as portions of the Perceived Restorativeness Scale (PRS). Urban stress levels are high and have been increasing in recent years. This research could encourage landscape architects to make thoughtful decisions when incorporating water features in public spaces to enhance the restorative impact of urbanscapes. Additionally, thoughtful incorporation of aqueous soundscapes could improve landscape accessibility for visually impaired people and increase their "related calm" (Rådsten Ekman, 2015; Ratcliffe, 2021). Ultimately, this study will highlight the impact of varying water sounds on the urban landscape, supporting how this sense can be intentionally incorporated into landscape design for human wellness.

Keywords: landscape perception, psychoacoustic variables, restorativeness, water features, virtual reality

#175 Bridging Children's and Community Perspectives in School Playground Regeneration

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Abstract

Outdoor play is recognized as a fundamental right of children and a critical component of healthy development (Aziz & Said, 2012). Access to diverse play environments supports children's physical, social, and cognitive growth, while also fostering environmental connection and cultural identity (Chawla, 2015; Fjørtoft, 2004). Yet, many school playgrounds, particularly in small island and under-resourced communities, lack the variety and quality of spaces needed to encourage rich and meaningful play experiences (Tranter & Malone, 2004). Moreover, regeneration projects often privilege adult perspectives over children's, resulting in design outcomes that may not fully reflect children's lived experiences, preferences, and developmental needs (Clark, 2010; Derr & Tarantini, 2016). This study investigated the interplay between children's and community members' (parents and residents) perspectives in the regeneration of a primary school playground in Tarpum Bay, Eleuthera, Bahamas. Participatory design workshops involving 74 children (grades 3–6) were conducted in May 2024 to explore children's visions for the future playground. Activities included card-based image rankings and drawing activities. In parallel, a community survey—administered in person and online—captured communities' priorities and expectations for playground regeneration. Data were analyzed using qualitative thematic analysis to identify children's key play preferences and ideas, while quantitative analysis of survey responses provided insights into community priorities. Coordination with Tarpum Bay Primary School ensured confidentiality and inclusive participation. Findings reveal both shared values and divergences between children and adults. Children's participatory design workshop reflected cultural influences and emphasized imaginative, adventurous play, with desires for open-ended, nature-rich environments. In contrast, the community favored traditional playground features, with emphasis on shaded seating and safe gathering areas, envisioning the playground as a family-oriented hub beyond school hours. While children emphasized creativity and exploration, adults emphasized safety, durability, and the promotion of cognitive development. This comparison underscores the importance of integrating multiple voices in regeneration projects. The study highlights how community-driven approaches can generate playground designs that balance children's imaginative visions with adult concerns for safety and practicality, while embedding cultural identity and natural elements. The findings contribute to evidence-based design strategies for inclusive, engaging, and contextually meaningful outdoor environments that support holistic child development and strengthen community ties.

Keywords: Children's play , Community, Participatory design , Bahamas, Playground regeneration

#193 Measurement Tools, Behavioral Patterns, and Health Outcomes of Elderly Engagement in Urban Green Spaces: A PRISMA Systematic Review

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Abstract

This systematic review uses the PRISMA methodology to address gaps in measurement tools for seniors regarding their urban nature behaviors, patterns, and health impacts. Urban nature enhances seniors' well-being but faces threats from urban expansion and unequal distribution; seniors are vulnerable to environmental changes, and insufficient exercise causes issues such as social isolation. Amid global urbanization—with 68% urban population projected by 2050 (UN, 2018)—and aging (20% aged 60+ by 2050, WHO, 2022), this topic is critical. Research questions: (1) What tools detect seniors' urban nature behaviors, and their pros/limitations? (2) What are seniors' behavioral patterns? (3) How do behaviors impact health? Methods: A literature search was conducted in Web of Science and Scopus, with primary studies restricted to 2000–2024. Search terms covered seniors-related (e.g., "elderly"), activity-related (e.g., "walking"), and nature-related (e.g., "green space") terms. Included studies focused on urban natural contexts, targeted seniors, monitored real-setting behaviors, and were in English. Two researchers screened 27,018 initial records, removed duplicates and off-topic studies, and retained 86 for analysis. Risk-of-bias appraisal used the Mixed Methods Appraisal Tool (MMAT) 2018, which evaluates methodological rigor, sampling, data validity, and analysis; only moderate-to-high quality studies (MMAT ≥70%) were included. Results: Four tool types (24 sub-types) were identified: self-reports (38%, e.g., questionnaires, most used), on-site observation (29%, e.g., SOPARC), sensors (27%, e.g., accelerometers), and third-party data (6%, underused, e.g., government censuses). Behaviors were categorized into four groups (45 sub-types): physical (56%, walking dominant), leisure (34%), relaxation (7%), social (3%). Settings included parks (62%), community greenery (23%), street greenery (11%), private gardens (4%); sample sizes 32–12,846 (median=217), participant ages 60–92 (mean=72.4). Thirty-six health influences (four domains): physical (42%, gardening most beneficial), psychological (31%), functional (15%), social (12%). Discussion: This review's tool-behavior-health framework fills gaps in existing research, which often aggregates ages or focuses on specific behaviors. Self-reports capture subjective awareness, on-site observation reveals environment-behavior interactions, sensors provide objective health data, third-party data supports city-scale planning. Practical guidance includes continuous walking circuits (1.2m wide, rest stops every 200m), raised garden beds (75–90cm), and shaded social nodes (within 50m of paths). Limitations: underrepresented AI tools, no analysis of greenery density's impact on behaviors, publication bias (two databases, English-only), and no exploration of seniors' mobility on behavior-health links. Conclusion: This review offers a foundational framework for researchers and evidence-based guidance for age-friendly design, positioning urban nature as key infrastructure for senior well-being.

Keywords: Elderly urban green space interaction, Behavior monitoring tools, Healthy aging, Urban landscape design, Senior health impacts

#196 Motion-Based Memorialization: Parallel Identities of Mount Auburn Cemetery

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Abstract

The examination of burial processes and cemetery landscapes has garnered renewed attention within landscape architecture in recent years. Concerns about the environmental impacts of conventional practices and the growing shortage of cemetery space worldwide have prompted increasing interest in “natural burials” and other alternatives (Clayden et al., 2010). Yet, when memorials and markers are absent, how does one mourn? How might meaning be created through impermanent processes rather than permanent monuments? Directed toward cemetery operating entities as well as landscape architecture scholars and designers interested in memorial landscapes, site phenomenology, and the ways landscapes support embodied forms of remembrance, this paper addresses these questions through the lens of motion-based memorialization in Mount Auburn Cemetery. Founded as the first garden cemetery, and often considered the most historic burial ground in the United States, Mount Auburn has always carried parallel identities: a sacred place for remembrance, a pleasure ground for public enjoyment, and a working landscape shaped by daily acts of care (Linden-Ward, 1989). This study draws on a multimodal set of qualitative materials, including archival documents, seasonal site observations, and filmic recordings of intentionally repeated walks, maintenance rituals, and landscape sequences. It also incorporates a series of video collages that capture subtle, often imperceptible motions animating the living landscape, each anchored by a single evocative word interpreting both movement and atmosphere, as well as drawings and design experiments developed through a design studio and an artist residency. Students extended this inquiry by investigating how fleeting motions root themselves in memory and by experimenting with filmic techniques to test how design might heighten this awareness. Together, these materials examine how ephemerality, movement, and sensory experience can open new possibilities for memorial landscapes. When a path is traversed with repetition, purpose, and reflection, it becomes a ritual of movement. When an act of tending—watering, pruning, mowing—is carried out with care and devotion, it becomes a ritual of stewardship. Each transforms the everyday into acts of remembrance. By framing Mount Auburn’s pleasure ground and working landscape as sacred spaces through curated sequences of movement and filmic interventions, this paper argues that memorialization need not rely on permanence or monumentality; instead, it can be continually enacted through embodied practices of motion and care—ephemeral yet enduring, personal yet collective.

Keywords: Ephemeral Landscapes, Memorialization, Ritual and Movement, Stewardship, Filmic Approaches

#200 Healing our Shared Commons: A Community-Driven Approach to Place-Making in the Sausal Creek Estuary

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Abstract

The Sausal Creek tidal confluence in Oakland, California illustrates a tragedy of the commons: where colonial genocide and systemic racism have produced an ecologically compromised, publicly owned yet inaccessible landscape. This speculative design proposal, developed through the University of California, Berkeley, College of Environmental Design InLand Program, interrogates layers of extraction—from mission-era servitude through industrial exploitation to environmental racism—that continue to shape this storied landscape. We address a persistent gap: frameworks capable of engaging contamination, cultural erasure, and food insecurity simultaneously—recognizing that only reciprocal relationships built on trust can complete restoration. Our methodology begins with grounding. Unlike conventional restoration, we studied deep time: prehistoric abundance marked by steelhead runs and shellmounds of plenty; agricultural impositions of Spanish missions; and the 1902 industrial canal that severed Alameda from Oakland. Foundational research was conducted to build understanding, including geological, geospatial and hydrologic mapping; contamination assessment; archival study; and on-site observations. This approach respects Indigenous time and expertise by building resources before consultation–offering partnership over extractive requests. Consultation with Caltrans Environmental Planning, provided guidance on stormwater behavior, circulation patterns, and permitting pathways to ensure this vision is realizable. Community knowledge shaped priorities: resident interviews revealed needs for safety, food access, and healing waterways mutilated by concrete. Working within constraints of predominantly non-Indigenous scholarship about Indigenous practices—itself symptomatic of academic extraction–we acknowledge these are not our plants to claim nor stories to complete. The design translates infrastructural barriers into opportunities for connection. Daylighting culverted sections regenerate decades-concealed waterways. Repurposing concrete culverts as interpretive tidal gardens transforms structures of separation into spaces teaching ecological rhythms—from king tide to low tide—while restoring fish passage. Plantings remain provisional selections awaiting Indigenous leadership to guide culturally significant foodway revitalization. By creating spaces for community stewardship—foodscapes, water quality monitoring, tide observation platforms—where historically extracted labor becomes reciprocal care—the project develops through phases: baseline documentation, resource development, partnership preparation, and relational implementation. This student project explores how landscape architecture education can develop ethical frameworks for justice-oriented restoration, using speculation to imagine—but not implement—futures requiring partnerships we cannot forge alone. Our research maps the territory, but only trust-based partnerships can navigate the path. This approach demonstrates how landscape architecture can transform "tragedy of the commons" into "commons-based stewardship," proving that designing in relation with the most vulnerable—human and non-human—creates more just, resilient futures for all.

Keywords: Place-making, Environmental justice, Community resilience, Public health, Living heritage

#210 Sensory-Responsive Generative Design Method Based on L-System for Anxiety Reduction in University Learning Spaces

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Abstract

University students have experienced increasing levels of anxiety, further exacerbated by the COVID-19 pandemic. Conventional classroom environments tend to prioritize visual aesthetics over multisensory accessibility, potentially contributing to cognitive overload and stress. Although evidence indicates that sensory-responsive environments support emotional well-being, current computational design systems lack a structured framework connecting multisensory principles with generative design methods. This study investigates: How might generative design be adjusted to regulate university students' visual and tactile experiences in order to reduce anxiety in learning spaces? To address this question, we developed an L-System–based generative design method within Rhino/Grasshopper that produces organic spatial formations intended for application in real educational architectural spaces. A controlled VR simulation was created to model these formations alongside a standard classroom environment. Twenty-four volunteers (18–24 years old) participated in a two-day within-subjects experiment. Each participant experienced both VR environments—ordinary classroom and organic spatial formations—in randomized order across two days, spending 30 minutes per day learning unfamiliar Hindi vocabulary inside the VR setting. On the first day, each participant was randomly assigned to either the standard classroom VR or the organic formation VR; on the second day, they experienced the environment not previously assigned. To introduce tactile variation, chair armrests were randomized across four materials (plastic, wood, metal, textile). Physiological markers including heart rate variability (HRV), electrodermal activity (EDA), respiration rate, and blood pressure were continuously recorded. Given the modest sample size, linear mixed-effects models were employed to analyze within-subject changes. Model residuals met the Shapiro–Wilk normality assumption, and all pairwise comparisons were corrected using the Holm–Bonferroni method. Preliminary results indicate that VR environments generated using the modified L-System method led to lower physiological stress indices compared to the standard classroom VR, with the strongest effects observed when visual coherence was paired with favorable tactile cues. Overall, the findings demonstrate the potential of integrating generative algorithms with multisensory design principles to create learning environments that support psychological well-being. This study contributes a replicable workflow linking algorithmic design, VR simulation, and biometric evaluation, and offers practical guidance for translating biological growth logics into adaptive architectural features for anxiety-reducing educational and landscape spaces.

Keywords: Sensory-Responsive Design, Generative Design, L-System, Student Anxiety, Learning Environments

#212 Serenity Return to Nature——Design and Effects of Healing Ecological Corners

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Abstract

In the post-COVID era, the need for everyday restorative environments in cities has increased. Healing ecological corners (ECs) — specifically, “micro-scale planted spaces designed for sensory restoration” — represent a unique approach towards enhancing urban mental health, nature contact, and enhancing community well-being. Based on Stress Recovery Theory and biophilic design, we have a question: How can healing ecological corners be designed to encourage tranquility, support interaction of human beings with nature, and improve community well-being? A mixed-method approach was used including a structured literature review, comparative case study analysis and empirical user study. Two sites were chosen based on the intention to promote healing, advanced ecological model, open access: Tokyo Nokadeya Forest Healing Garden and Melbourne Hyde Rehabilitation Garden. The two cases were measured by a standard rubric that measured spatial layout, plant palettes, water and sound aspects, multi-sensory cues, and functional zoning. Structured non-intrusive observations were conducted as well as brief intercept interviews (N = 62) to explore user behavior and preferences, including but not limited to children, young adults, older adults, and users with mobility or sensory sensitivities. User presence, movement, dwell time, micro-spaces preference, and sensory engagement were captured with an observational sheet based on previous research in environmental psychology. The results show that ECs can be most effective when multi-modal experiences are integrated—layered plant compositions, fragrant species, water acoustics, textural materials, and soft visual edges. In this regard participants consistently reported lower stress, and better mood due to these environments. Concrete variation, as well, were also found in the group: for young users more roomy social spaces, interactive aspects, with visual stimuli and plantings and for older users shaded paths, less visual complexity, close seating. Those with sensory or mobility disorders preferred touch-based gardens, barrier-free circulation and predictable places—reducing over-stimulation. Functional zoning of “quiet refuges” and socially useful spaces contributed to the individual and social regeneration. The research provides evidence-based insights to EC design, for example to employ native plant species to augment ecological resilience, incorporate water–sound combinations for sound comfort enhancement, and apply inclusive designs for all kinds of users. Although results are context-dependent, they emphasize ECs as scalable structures for healing, enhancing psychological resilience, enhancing social cohesion, and supporting daily interaction between humans and nature. The research at the end of the day shows through small urban interventions how meaningful environmental and emotional benefits can be achieved for communities.

Keywords: Biophilic Design, Sensory Experience, Mental Health, Post-pandemic Well-being, Participatory Design

#221 Rural Engagement and Design Practices

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Abstract

Working with and in the image of rural communities necessitates a critical approach to design research, pedagogy and outreach. From the pace of relationship development, to seemingly simple topics of studio prompts, to alternative methods of experimental research - the work of our panelist can be defined by their commitment to context. The everyday cultural landscapes of the regions we engage are unique, subtle and rich with knowledge and welcome opportunity for design to learn and engage the landscape. With CL Bohannon moderating; Presentation one examines participatory research in the Clearfork Valley of Tennessee, where students work with rural residents and nonprofits such as the Woodland Community Land Trust and the Clearfork Community Institute. Through annual harvests, maintenance in community-managed forests, and flood interventions, students engage the entwined degradations of economy, power, and ecology shaping a post-coal landscape. These land-based collaborations function as both method- generating situated knowledge through shared work, and pedagogy- immersing students in service-based learning. Presentation two will focus on the importance of building teaching and research from local knowledge through an engaged studio and research in the Black Dirt Region of New York. Through interviews with local farmers, fieldwork, archival research, and workshops, the project identified catalytic locations for designing rural landscapes as living infrastructures and novel public spaces, building from partnerships with local historians, the NY DEC, and the Soil and Water Conservation District. The importance of translating design research into an accessible form will be discussed through a resulting booklet and exhibition, Black Dirt Futures, designed with local partners to educate the public about invisible risks and urgent issues. Presentation three will focus on the role of regional scale mapping and small-scale design experiments that work with farming communities and the USDA to put research and site knowledge in the hands of underserved communities. We will discuss the role of the Virginia Sea Grant student fellowship, outreach to Eastern Shore farmers facing challenges from sea level rise and the impact of monitoring techniques in federal support for local communities. Projects will discuss how using drawings and models to serve witness is an invaluable contribution to community discussion that help people see their value and builds deep connections that scientific data and economic planning cannot. The projects establish support and service mechanisms that help the local community's values come to bear in seeking funding, governmental support, and applied experiments that engage places often left behind.

Keywords: Rural Design, Community Engagement, Field Work

#236 Towards a Sustainable Human Habitation: A Comparative Synthesis of Alternative Development Typologies

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Abstract

Urban sprawl has been the dominant mode of development in North America for decades, producing well-documented ecological, social, and economic costs (Ewing, 2008; Genovese, 2023; Johnson, 2001). In response, planners, designers, citizens, and policymakers have advanced a wide range of alternative development approaches intended to reconcile the problems caused by low-density, auto-oriented growth (Freilich et al., 2010). While individual models have been studied to various degrees (Ryan & McNally, 1995) (Hostetler & Drake, 2009) (Barani et al., 2018) (Hevesi, 2024), there has been little systematic effort to synthesize these alternatives, compare their underlying principles and emphases, and evaluate their applicability across contexts. This paper conducts a review and synthesis of "sprawl-alternative development typologies," with the goal of formalizing them within a comparative framework. The study will focus on several leading approaches as well as two niche approaches, namely Traditional Neighborhood Development, Conservation Subdivision, Low Impact Development, Eco-Village, and Agrihood . Through a review of the foundational texts associated with the approaches and peer-reviewed literature, the study will evaluate each typology through the lens of its (1) goals, (2) design principles and spatial patterns, (3) degree of success reported in the literature, and (4) performance indicators thereof. The result is a matrix of each typologies aims, the mechanisms they go about for achieving them, the extent to which those mechanisms are successful, and the methods for determining their success. By cross-referencing the typology goals, case studies, and empirical analyses identified in the literature, the study highlights and emphasizes metrics by which approaches should be evaluated in practice, such as those necessary for estimation of ecological impact, resource conservation, accessibility, affordability, community cohesion, or food sovereignty. Based on a synthesis of their goals and mechanisms they will be situated along the rural-to-urban transect to illustrate how they address sprawl at varying scales, from rural subdivisions to metropolitan regions. By examining these approaches within this framework, the study aims to illuminate both complementarities and contradictions, revealing unique applicability or opportunities for integration. The contribution of this work lies in bridging planning theory with design application - synthesizing disparate anti-sprawl paradigms into a coherent, comparative lens that can help policymakers, developers, and designers select approaches aligned with their goals and contexts. In doing so, the paper not only clarifies the intellectual landscape of sprawl alternatives but also advances a foundation for integrated strategies capable of addressing the multi-scalar challenges of contemporary development.

Keywords: Urban sprawl, Alternative development typologies, Human habitation, Transect planning, Sustainability of the built environment

#253 Landscapes for Curiosity: Which Factors Mediate Nature-Based Science Learning in the Early Years?

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Abstract

Children's contact with nature has numerous health, developmental, and learning benefits. Several studies (Campbell & Speldewinde, 2020; Kiewra & Veselack, 2016; Skalstad & Munkebye, 2021), including our own (Trina, Monsur, Cosco, Loon, et al., 2025; Trina, Monsur, Cosco, Shine, et al., 2025), provide extensive evidence that nature connections are strongly associated with early science learning and the formation of foundational science concepts. Our scoping review (Trina et al., 2024) identified how early science-learning behaviors—observing, exploring, experimenting with cause and effect, asking questions, and manipulating materials—are accommodated by supportive landscape settings e.g., sand and water areas, pathways, gardens, dry creek beds, loose parts, digging pits, and varied landforms. In this study, we define "nature" as both purposefully designed nature-rich environments and nature-based elements embedded within any outdoor contexts. Consistent with Hawkins' "messing about" framework (1978) and the Reggio Emilia tradition, nature does not require remoteness; even small-scale, constructed environments can offer rich affordances for scientific thinking. While earlier work, e.g., Hawkins and Reggio-inspired theorists, has long demonstrated that nature support inquiry, the specific cognitive mechanism linking nature-based play to early science learning—particularly the role of curiosity as a mediator—remains empirically underdeveloped. Addressing this gap, our session investigates children's curiosity as a key explanatory pathway. Our conceptual framing is shaped by Jirout (2020) and validated through a systematic qualitative analysis of 168 minutes of video data documenting the free play of preschoolers (n = 171) at the Will Smith Zoo School in San Antonio, TX, where children spend more than 80% of their day in outdoors, offering a unique naturalistic context within an urban setting. Our inquiry is guided by three questions: How do natural environments (1) Create uncertainty that prompts curiosity-driven behaviors? (2) Support curiosity-driven questioning? and (3) Foster the activation of prior science knowledge? To address these questions, we used MAXQDA (Kuckartz & Rädiker, 2019) for deductive–inductive coding, inter-coder reliability testing, temporal sequencing of behaviors, and cross-case comparison. This analysis enabled us to identify patterns showing how curious behaviors emerged in response to specific environmental affordances. Our findings confirm nature's capacity to generate uncertainty, elicit curiosity-driven questioning, and activate prior science knowledge—together illuminating a plausible mechanism for nature-based informal science learning. Early childhood represents a unique "curiosity window" relatively untouched by standardized assessments. Our study offers a theoretical-empirical account of how nature supports scientific curiosity, with direct implications for designing landscapes that cultivate children's inquiry.

Keywords: Early Childhood, Nature-Based Learning, Science Learning, Mediator, Learning Landscape

#262 Nocturnal Urban Landscapes in Practice: Socio-Cultural Dynamics of Community Parks After Dark

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Abstract

This research examines the socio-cultural dynamics of nocturnal urban landscapes through a case study of neighborhood parks in Brooklyn, New York, focusing on the Williamsburg and Bushwick communities. The current literature emphasizes urban nightlife (Melbin, 1978; Bianchini, 1995; Shaw, 2015; van Liempt et al., 2015; Dunn, 2016; Downey, 2021; Seijas & Gelders, 2021), while few have examined the ordinary, non-commercial community practices that appropriate local public parks. These practices provide critical insights into how grassroots temporalities shape urban landscapes and contribute to health, well-being, and social cohesion. Drawing on a mixed-methods approach, including over 30 nights of ethnographic observation across three heavily used parks, more than 40 semi-structured interviews with park users and experts, spatial-temporal mapping, and archival review, this study thematically coded the investigation of who uses parks at night, what activities take place, and how physical design and management intersect with lived experiences. Findings reveal that community parks become adaptive, multi-layered environments after dark, where families, immigrant groups, and young adults negotiate safety, belonging, and cultural identity through informal practices. These grassroots practices often diverge from original design intentions and planning policies, revealing tensions between official management frameworks and community-driven uses. While not centered on protest or formal political assembly, these shared nighttime practices reflect a subtle dimension of democratic public life: parks provide space for collective presence, cultural expression, and informal negotiation of rights to occupy and shape public space. Rising urban temperatures and shifting work routines have extended outdoor activity into the evening, making nighttime public spaces increasingly vital. Yet municipal policies often constrain access through dusk-to-dawn closures or surveillance-oriented management. By documenting how communities continue to inhabit and adapt parks at night, this study argues that design and planning approaches should move beyond safety and economic imperatives and engage more directly with lived rhythms, sensory atmospheres, and cultural diversity. Theoretically, this work expands nocturnal urbanism by integrating Lefebvre's production of space (Lefebvre, 1991; 2004) with concepts of rhythmanalysis, chrono-diversity, and loose space to study public life after dark as relational and temporally contested. Practically, it shows how nighttime design and management can support inclusive, resilient, and culturally resonant forms of public life. By foregrounding the lived experiences of grassroots communities, this study demonstrates how nighttime activities in New York City’s local parks can integrate research, design, and community knowledge to foster healthier, more equitable nocturnal urban landscapes.

Keywords: Nocturnal Urbanism, Nocturnal Urban Landscape, Spatial-temporal Appropriation, Grassroots Practice, Social Leisure Activities

#272 Spatiotemporal Effects of the Built Environment Revealed by Civil Complaints in a Shrinking City

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Abstract

Urban shrinking, defined as sustained population and economic decline, has become a global phenomenon (Haase et al., 2014). Its most direct manifestation is out-migration, with dissatisfaction toward urban life as a key driver (Fu et al., 2022). Although dissatisfaction may stem from various dimensions, most studies emphasize demographic factors, while the built environment factors remain understudied (Guimarães et al., 2016), even though they are critical for targeted urban management. Besides, prior research often relies on surveys and social media posts, which are high-cost and have limited capacity to capture urgent concerns. In contrast, civil complaint data from the official hotline, which reflect residents' dissatisfaction with diverse dimensions of urban livability, have been rarely utilized (He et al., 2024; Wright, 2005). To address these gaps, this study examines the spatiotemporal relationships between residents' dissatisfaction and built environment factors in a shrinking city. We selected Rushan, a typical coastal shrinking city in eastern China (population about 450,000), supported by agricultural and fishery industries, and now faces youth out-migration. We analyzed 44,674 official complaint texts from December 2018 to April 2023. Sentiment analysis was conducted using the Tencent Cloud NLP interface after data preprocessing. We extracted the negative score as an indicator of dissatisfaction intensity. Built environment variables are selected, including normalized difference vegetation index, points of Interest, and road length, etc. A geographically and temporally weighted regression (GTWR) model was then employed to examine how the relationships between residents' dissatisfaction and built environment factors vary across administrative villages and seasons, as simple linear models showed limited explanatory power. In addition, exploratory independent samples t-tests were conducted to provide supplementary evidence. Results show that residents' dissatisfaction with the built environment exhibits spatiotemporal variation across most areas and seasons, with the GTWR model achieving an adjusted R^2 of 0.35. Specifically, central and rural areas showed stronger seasonal variation than coastal zones, with dissatisfaction intensifying in winter when green space was scarce. Coastal areas were more affected by tourism-driven summer overload in transport and recreation, while cultural and educational amenities consistently mitigated discontent. These spatial contrasts indicate that urban shrinkage may reinforce spatial heterogeneity in residents' perceptions of the built environment, reflected in winter-related dissatisfaction in peripheral areas and summer overload in coastal zones. The findings suggest that policies for shrinking cities should adopt spatially and seasonally differentiated management strategies, focusing on tailored interventions for different areas and periods to enhance livability and governance precision.

Keywords: urban shrinking, civil complaints, built environment, spatiotemporal heterogeneity, GTWR

#284 Private Gardens as Catalysts for Social Cohesion: The Case of Jeongneung Village, Seoul

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Abstract

Private residential gardens are often regarded as individual assets, detached from broader community life. Accordingly, most research on the social dimension of gardens has concentrated on community gardens or public parks as catalysts for social ties and neighborhood cohesion (Truong et al., 2022; Kanosvamhira, 2024). By contrast, research on private gardens has largely focused on ecological benefits (Beurner, 2018; Hanson et al., 2021) or health outcomes (Sharif, 2021), with relatively limited attention to their role in shaping community identity and informal interactions (Lauwerjssen et al., 2024). This study examines how private gardens evolved into a catalyst for community building in Jeongneung Village, a single-family housing complex in Seoul, Korea. Based on five years of participant observation, in-depth interviews, and social network analysis, the research identifies four stages of transformation. In the first two stages, weak alley-based ties were reorganized through a grassroots anti-redevelopment movement, producing denser and more extensive social networks. In Period 3, female householders, seeking to improve the residential environment and resist redevelopment, initiated gardening activities on private lots. These efforts culminated in an annual “Garden Festival” where residents opened their gardens to the public. At this point, the community network reached its highest density, extending beyond neighbors to include visitors, municipal officials, and urban professionals. Following the cancellation of redevelopment plans in Period 4, residents continued the festival and maintained broader yet looser ties, demonstrating the durability of garden-mediated networks. Alongside these relational changes, the spatial configuration of gardens shifted from family-centered to socially oriented. Newly installed seating, flowering plants, and other design elements encouraged interaction, while many private lots were repurposed as venues for diverse activities. The opening, multifunctionality, and blurred boundaries of private gardens embody key features of inclusive urban places, enabling encounters in the interstices of the city (Jacobs, 1961; Rossini & Yiu, 2020; Lofland, 1998; Knibbe & Horstman, 2019). The periodic opening of gardens fostered hospitality toward visitors and encouraged everyday encounters even beyond festival periods. The case demonstrates that even minimal openings of private property can generate inclusive spaces for urban interaction, suggesting that the porousness of boundaries and the multifunctionality of small-scale residential gardens can revitalize neighborhoods under redevelopment pressure. Ultimately, the Jeongneung case highlights how private gardens can function as micro-scale infrastructures of cohesion, offering an alternative to the exclusionary dynamics of gated communities.

Keywords: Private gardens, Community building, Social network analysis, Urban sociability, Redevelopment

#303 Enhancing Experience Through Public Art

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Abstract

Public art has long transformed urban landscapes by reflecting the physical, historical, and cultural identity of place. In landscape contexts, it often takes the form of sculptures, environmental art, interactive installations, and artist-designed urban furnishings such as benches or lighting that embed meaning in everyday spaces (Sharp et al., 2005; Young & Martinez, 2023). While these interventions successfully engage with spatial and symbolic dimensions, their social agency - their capacity to cultivate emotional resonance, empathy, and collective engagement - remains insufficiently understood. This study investigates how public art in Cleveland, Ohio, can function as a social catalyst that deepens people's attachment to place and fosters inclusive civic experiences. Building on Yi-Fu Tuan's theories of place attachment, and frameworks of socially engaged art (Tuan, 1977; Kwon, 2002; Zebracki, 2013), it adopts an interdisciplinary lens integrating urban design, landscape theory, and participatory art practice to propose a design framework that bridges the gap between artistic intent and public impact. The research employs a mixed-method approach grounded in qualitative case study analysis, site observation, and spatial mapping across ten public art sites in Cleveland, including civic plazas, neighbourhood corridors, and waterfront parks. The four typologies of public art - (1) object-based landmarks, (2) immersive installations, (3) process-based environmental works, and (4) experience-driven participatory practices - were derived through iterative synthesis of literature review, site documentation, and semi-structured interviews with artists, planners, and community participants. This typological framework provides a lens to evaluate how artworks mediate spatial experience, encourage participation, and nurture emotional connection within the urban landscape. Preliminary findings suggest that artworks incorporating sensory immersion and co creative processes tend to strengthen social cohesion and community ownership of space more effectively than static object-based landmarks. These insights form the foundation of an evaluative model outlining three dimensions for assessing social catalytic potential: emotional resonance, inclusivity, and participatory continuity. The study's anticipated outcome is an interdisciplinary design framework and set of evaluative tools that guide urban planners, landscape architects, and artists in conceptualizing public art not merely as aesthetic enhancement but as an active mechanism for social wellbeing. Additionally, it proposes adaptable pedagogical modules for landscape architecture curricula that encourage students to apply art based engagement strategies within contextual urban design processes, thereby shaping more empathetic and socially connected public spaces.

Keywords: Public Art, Human Experience, Landscape Architecture

#327 Spatial Determinants of Child Loneliness: A Comparative Study Pre-, during and Emerging Post-COVID-19

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Abstract

Background Child loneliness is increasingly recognized as a public health concern with long-term implications for well-being [1]. Neighborhood environments shape daily opportunities for outdoor play, peer contact, and resilience, substantially influencing child loneliness. [2,3]. Recent population-level calls to address social disconnection underscore the need for environmental levers that enable everyday social connection for children [4,5]. Objective This study compares differences in children's loneliness across pre-, during-, and post-COVID phases and assesses how built and natural environment perceptions contributed to loneliness or social well-being. Methods A cross-sectional online survey was administered to parents/guardians of elementary school children (grades K–6) in Texas metropolitan and micropolitan areas. Parent-proxy reports captured child demographics, household characteristics, health, behaviors, schooling, and neighborhood perceptions. Loneliness outcomes (depressive feelings, lack of companionship, perceived isolation) were retrospectively assessed for four phases: pre-COVID (BEF), spring–summer 2020 (SS20), fall–winter 2020 (FW20), and spring 2021 (S21). Friedman tests examined within-child changes, exploratory factor analysis identified six environmental constructs, and ordered logistic regressions assessed predictors of loneliness. Results Among 3,490 respondents, 1,280 completed surveys were analyzed. Three loneliness outcomes sharply at the onset of COVID-19, remained elevated through fall–winter 2020, and declined by spring 2021 without returning to baseline ($p < .001$). Built-environment perceptions showed consistent protective associations that strengthened in mid- to late pandemic phases from Friedman within-group gradients. The clearest buffering patterns appear for perceptions about comfort, safety, and facilities in neighborhood open spaces, less antisocial elements in neighborhood open spaces, and blue-space access or attractiveness, where high-perception groups notably show lower loneliness outcomes compared to low-perception groups from the peak in SS20 through S21. In regression models, built environment perceptions were significantly linked to lower odds of all three loneliness outcomes, with the strongest signals in mid- to late-pandemic phases. For depressive feelings, neighborhood greenness was buffering in FW20 (OR 0.82) and S21 (0.76), and blue-space access in FW20 (0.79) and S21 (0.77). For lack of companionship, greenness was mitigating in S21 (0.77) and blue space access in FW20 (0.83). Behaviorally, more outdoor time was also consistently protective. Days outdoors per week: SS20 (0.92), FW20 (0.89), S21 (0.84), whereas sitting days were adverse in SS20 (1.06) and S21 (1.07). Conclusions Findings highlight the enduring social impacts of COVID-19 and the role of child-friendly neighborhood environments. Policies that promote safe, equitable outdoor spaces and balanced digital media use may support resilience and recovery in children's well-being.

Keywords: Loneliness, Children, Mental health, Built environment, Covid-19

#329 Waterfront Parks and Community Safety: A Comparative Framework for People–Environment Design Strategies

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Abstract

Waterfronts in post-industrial cities face overlapping challenges of ecological degradation, fragmented access, and long-standing disinvestment—conditions that directly shape how safe, cared for, and socially connected these places feel to their surrounding communities. In these contexts, safety is both an environmental and social concern: a foundation for public life, stewardship, and equitable access to shared landscapes. This study examines how waterfront park design can strengthen perceived and actual safety by integrating spatial clarity, social programming, and ecological resilience. To move beyond existing descriptive literature, the research employs a systematic comparative methodology . A structured matrix evaluates waterfront parks across the Great Lakes Basin, using criteria related to spatial configuration, visibility and circulation, programming intensity, ecological performance, and maintenance strategies. Case-study selection followed defined parameters of geographic region, scale, and design lineage (post-industrial reuse, ecological restoration, regenerative urbanism, and pedestrian-oriented design). The analysis synthesizes patterns across parks to identify which design strategies most consistently support community safety, stewardship, and long-term care of place. Findings reveal a three-part framework that recurs across high-performing parks: (1) spatial strategies that improve sightlines, lighting, and active edges; (2) social programs that generate activity, belonging, and shared responsibility; and (3) ecological and infrastructural systems that reduce environmental risk while supporting daily use and long-term maintenance. The resulting checklist is an analytical tool derived from empirical comparison—intended for use by designers, researchers, and municipalities to evaluate, adapt, and strengthen people-centered waterfront projects. This work expands discourse on safety and public space by showing how design decisions embed values of care, security, and belonging into the everyday experience of urban waterfronts.

Keywords: Waterfront, community safety, people-environment relationships, visualization

#339 Porch Design for Aging – Patterns across Facilities in Upstate South Carolina

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Abstract

Porches have been socially and culturally significant in the American South. Traditional porch culture has its roots in Europe, India, and Africa (Dolan, 2024; Visser, 2012). In the pattern books by Smeins (1999) from the 18 th to the early 20 th century, porches have been promoted as spaces for cooling off, fresh air, sleeping, reading, socializing, entertaining, greeting neighbors, and observing the world (Dolan, 2024; Donlon, 2001; Hailey, 2022; Harris & Freeman, 1996; Smeins, 1999). However, there has been a shift in the trend of how people use their porches. In today's design, there is a greater emphasis on indoor comfort and privacy by providing the opportunity for conditioned spaces. The porch is particularly important for aging populations (65+). For older adults with limited mobility, porches are often the most accessible outdoor space, and can function as extensions of the living room (Marcus & Sachs, 2014). With direct access from the residences, the porch provides fresh air, a safe place to rest, and a visual and social connection with the neighborhood. The porch is a liminal space that fosters connections between the private and public, indoor and outdoor, personal life and the outside world, nature and the built environment. These qualities directly influence older adults' environmental comfort, social interaction, and quality of life. Despite the long-standing importance, little is known about how porches are designed in various facilities for older adults. The study aims to document porch designs in two categories of facilities/housing and create a baseline for further study. Field observations and mapping will be used to document porches in two different environments for aging in Upstate South Carolina. Adult day care facilities provide community-based services and social engagement opportunities during the day, while assisted living facilities offer residential settings for older adults who require assistance with their daily living activities. Three cases in each setting will be examined. Each porch will be studied to record its spatial characteristics, materiality, and design features using field observations, photographs and mapping techniques. Descriptive analysis will identify common patterns and distinctions across various typologies. The expected findings will provide the baseline of how porches are designed in facilities catering to older adults in South Carolina. It will further guide the design of porch configurations to sustain the quality of life for older adults in the American South.

Keywords: Porch Design, Aging, Pattern, Culture, Facilities

#353 Approaches to Open Space and Urban Park Design in Poland

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Abstract

Poland's designs of open spaces, particularly parks, are representative of the values of family and activity. Research methods of travel, observation, and communication with locals in a series of parks in Poland's major cities of Krakow, Warsaw, and Gdansk, reveal that elements among these parks are ones that encourage education, curiosity, movement, interaction, and free play. This prioritization of families allows for diverse programming targeting not only children but all generations and in turn, strengthens community ties and provides access to healthy lifestyles. This sense of belonging and community, and free access to such spaces that represent these values, is something that is left to be widely desired in New Jersey. This study looks to features among Poland's strong network of parks as a model for recreational spaces in New Jersey through a suitability analysis. Suitability is determined based on physical factors such as land use and development, as well as cultural factors such as traditional values and political history. A look into this history can reveal how and why public parks and such features among these spaces have become so prominent. They function as tangible representations of polish life, with an emphasis on family and activity, that has become possible through resilience and togetherness, as well as the prioritization of maintaining open land for agricultural use throughout the majority of the country's geography. This land use contrasts heavily to the foundations which Eastern states of the U.S. like New Jersey have been built upon: independence and the idea that the land was available for development. The suitability analysis allows researchers and designers to compare approaches to open space between Poland and New Jersey to determine how highly developed regions can reclaim a sense of community through park design.

Keywords: landscape values, activity, comparative landscape analysis, cultural heritage, urban park design

#362 Review Exploring Plant and Fungal Biohybrid Mobility Entanglements with Humans

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Abstract

Plant and fungal-based biohybrid robots, novel constructions of plant and fungal living components actuating robotic components, are on the rise – and on the move – and with them questions about nonhuman agency and human-nonhuman relationships. In August 2024, a Cornell University team published a study on “two biohybrid robots that use the electrophysiological activity of living mycelia to control their artificial actuators. The mycelia sense their environment and issue action potential–like spiking voltages as control signals to the motors and valves of the robots that [they] designed and built” (Mishra et al., 2024). Earlier, MIT researchers developed Elowan, “a cybernetic lifeform, a plant in direct dialogue with a machine. Using its own internal electrical signals, the plant is interfaced with a robotic extension that drives it toward light” (Sareen & Maes, 2019). The very existence of these and other biohybrids blurs the boundaries of people-environment relationships. Plant and fungi-based biohybrid robots upend known systems of plant and fungi mobility; they can move independently, instantly, and at sustained speed. They figuratively “uproot” organisms previously seen as rooted in place, making possible both individual and population-level movements. How might human-environment relationships change if plants and fungi gained these levels of mobility? How might this question boundaries, microclimates, and movement by, though, and across nonhumans and their spaces to contribute to the discourse of multispecies cohabitation broadly asking, within the context of the Anthropocene and the growing pressures of humanity on our planet, how will we all live together? From posthumanist and new materialist perspectives for this research a literature review into living plant and fungal biohybrid types of mobility, philosophies of aliveness, and co-design in landscape architecture is conducted. From the identified gaps in the literature, this paper calls attention to the need for research into plant and fungal biohybrid mobility justice and living material interactions with humans from decentered perspectives. This work contributes to current research in biohybrids with an eye toward future considerations in the field and connections to landscape architecture in our changing climate.

Keywords: biohybrid, multispecies entanglement, plant robotics, fungal robotics, co-design

#382 Effects of Waterside Spatial Types on Human Thermal Comfort at Nighttime

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Abstract

This study examines how different waterfront spatial typologies influence human thermal comfort during nighttime hours. Waterfronts are critical public amenities that support social interaction, leisure, and restorative experiences, yet their microclimatic behavior after sunset remains understudied (Andrade & Alcoforado, 2008). While prior research has investigated the effects of vegetation, materiality, and built form on thermal comfort in daytime outdoor environments (Brown & Gillespie, 1995; Karimi et al., 2020; Taleghani et al., 2015), far less is known about how small-scale waterfront environments shape comfort during nighttime conditions, when wind regimes, radiant exchange, and user activities differ substantially. Four representative spatial types along a campus waterbody were selected to capture the diversity of microclimatic configurations commonly found in urban waterfronts: (1) Tree-enclosed waterfront areas, characterized by dense canopy cover (primarily deciduous species) that restricts longwave radiation loss and alters nighttime airflow (Lai et al., 2014). (2) Structure waterfront areas, located open, wind-permeable structures such as pavilions or pergolas, which provide partial wind mediation and create distinct nighttime radiant and airflow conditions. (3) Open lawn waterfront areas. (4) Open hard-paved waterfront areas (Xu et al., 2010). These sites were selected based on their distinct spatial attributes and documented patterns of frequent nighttime use by students seeking outdoor social and recreational settings. A mixed-methods approach was applied. Objective microclimatic data were recorded continuously using onsite environmental sensors, while student participants completed structured surveys after spending five minutes in each spatial type. Data collection occurred across four seasons, enabling comparisons of seasonal variability in nighttime thermal perception. Statistical analysis using SPSS examined correlations between spatial typologies, microclimatic conditions, and subjective thermal comfort. By combining quantitative microclimate data with user-reported responses, the study develops a systematic framework for understanding how small-scale waterfront spaces function at night and tests the hypothesis that distinct spatial typologies exert measurable thermal and perceptual influences on users. Findings suggest that the thermal experience of waterside spaces varies depending on spatial type and season. In cold seasons, enclosure and vegetation may contribute to more favorable perceptions, while openness may play a different role in warmer seasons. These patterns indicate that waterside spaces function differently across temporal contexts and may offer diverse contributions to nighttime comfort. Beyond immediate user experience, these results also have implications for landscape performance, highlighting how waterfront environments can enhance ecological cooling, promote seasonal adaptability, and extend the usability of outdoor spaces after dark.

Keywords: Thermal comfort, Waterside environments, Nighttime comfort, Seasonal variation, Small-scale outdoor spaces

#383 Rural Landscape, Urban audience: Attracting Urban Visitors to Nature-oriented Sites

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Abstract

Landscape architecture has seen few advances in connecting urban populations with nature-oriented projects. Design literature introduces techniques, such as community participation in planning (Seman 2004) and stakeholder participation, for inviting new audiences to environmental projects (Luyet et al. 2012). More recently, Slater (2022) has investigated open space access and use for ethnic minorities in rural areas. This paper uses a design experiment testing the development of effective hypotheses that make design more appropriate for these new audiences. The Maurice River Bluffs Preserve is a publicly accessible property in Southern New Jersey that is part of a statewide preserve system managed by The Nature Conservancy (TNC). While it currently tends to attract a suburban and rural user base, the preserve sits only 3 miles from the very urban setting of Millville, NJ. Seeking to better serve the nearby city residents, TNC is developing a more broadly and universally accessible garden space within the Preserve. The authors position the design within the nature preserve as a design experiment within the larger method of projective design (Deming and Swaffield 2011 from Steenbergen et al. 2008). The project's design approach focuses on specific elements, offered as tests of the hypotheses, based on understanding of urban visitors' movement and attractions, i.e. a pinetum, turtle-shaped shelter, path network, a curated entry sequence. Each is tested against needs for maximizing accessibility, creating a setting that is comfortable for an urban population, and creating multiple methods of communicating information regarding nature. The project also addresses the challenges of bringing inexperienced users to the site and generating interest that may encourage multiple visits and, for some, exploration of the larger protected areas. The process is an intentional path to a functional solution: in a large nature preserve easily perceived as wilderness by urbanites, it endeavors to make natural materials and forms more inviting at an introductory level without undercutting the traditional context of the preserve. In this research the presented plan for a four-and-a-half-acre garden space amidst over 500 acres of preserved woodlands is a research act. For potential visitors expecting a more managed landscape with walking and seating opportunities, the Preserve's new garden provides an origin from which to explore nature. The garden design hypotheses to introduce the components of the wild areas in a way that may encourage a larger portion of the local population to use and appreciate the many protected areas that surround the location.

Keywords: Nature, Community, Engagement, Accessibility, Wellness

#393 Rethinking Public-Private Boundaries: Everyday Recreational Place-Making among Working-Class Women in Urban Peripheries of Indian Cities – A Case of Kolkata

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Abstract

This study focuses on recreational place-making among working-class women in India's urban peripheries, particularly Kolkata, highlighting how they create everyday spaces that blur public–private boundaries. In India, historical planning models and gender mainstreaming under "world-class city" initiatives conceptualize recreational landscapes as free-time activities in formal public spaces (parks, plaza, commercial spaces) , institutionally sanctioned, outside the home, publicly owned, and accessible to all (Hurd & Anderson, 2010; UN-Habitat, 2020) thereby obscuring improvised, self-made spaces sustaining marginalized women's daily lives (Datta, 2016). Nearly 90% of India's working-class women are socio-economically disadvantaged; in Kolkata one-third live in peripheral resettlement colonies or Muslim neighborhoods under precarious conditions (WIEGO, 2020). Bengali-Hindu and Bengali-Muslim women here engage in domestic work, low-wage labor, or self-help works while negotiating socio-spatial exclusions of class, occupation, religion, and geography. Historically labeled subaltern (Roy, 2003), their everyday recreational practices shaped through lived realities beyond formal public–private boundaries remain underrepresented in dominant planning models (Fenster, 2005). Grounded in a place-making framework of embodiment (Low, 2014), this study adopts feminist principles of situated knowledge (Haraway, 1988) and lived experience (McDowell, 1996) to show how women reconfigure public-private through spatial practice, representation, and embodied experience (Lefebvre, 1976). Methodologically, we apply community-based ethnographic framework (Hesse-Biber, 2013) with 60 participants across three areas - Sonarpur–Rajpur (Muslim neighborhood), Sahid Smriti, and Adarshanagar (resettlement colonies), combining photovoice (Wang & Burris, 1997), activity diaries (Magnus, 2018), and semi-structured interviews (Hesse-Biber, 2013). Over ten days, participants documented recreational routines and photographed spaces, along with in-depth interviews. Photos were coded into socio-physical typologies, and interviews analyzed through qualitative coding using grounded theory (Corbin & Strauss, 2015). The findings reveal typologies of self-made, informal spaces, showing that women's strategies for negotiating public–private boundaries are context-specific and rooted in spatial embodiment within home and neighborhood settings. In Muslim neighborhoods, fluid home spaces (verandahs, stoops) extend the private domain into public spaces, while alleys become women-only private spaces. In Sahid Smriti, alley edges combine work and socializing, dissolving boundary distinctions. In Adarshanagar, stair landings, rooftops, and yards act as hybrid home - neighborhood spaces, addressing safety concerns and restoring community ties. These practices are shaped by gender norms, demographics, relocation histories, and cultural adaptations. This study informs recreational planning and policies to adopt place-making practices grounded in everyday needs, embodiment, and local lifestyles. Mainstreaming self-created spaces through Local-Area Planning (Rocco & Silvestre, 2024) can position women as co-creators of knowledge to advance gender mainstreaming practices.

Keywords: Recreational Space, Everyday Placemaking, Public-Private Boundaries, Working-Class Women, Community Engagement

#397 The Impact of Land Consolidation on Landscape Patterns and Ecosystem Health

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Abstract

Polder landscapes are typical regional agricultural landscapes shaped by long-term human transformation. As semi-artificial agro-hydrological ecosystems composed of dyke-controlled water networks, polder units and settlements, they feature semi-enclosed hydrology, intensive land–water management, and high sensitivity to land-use interventions. These ecological characteristics make polder systems especially vulnerable to rapid landscape restructuring. While modern large-scale land consolidation has enhanced agricultural efficiency, it has also triggered ecological degradation in polders. Uncovering the relationship between land consolidation and ecological health is therefore crucial for sustainable land management and ecological restoration. Taking the Dyke-Pond polder in Huzhou, Zhejiang Province as a case study, we first quantified land consolidation intensity from spatial data to represent the degree of human-induced physical modification within the polder system. We then assessed ecological health using an adapted Vitality-Organization-Resilience (VOR) framework incorporating polder-specific hydrological connectivity and farmland morphology, and differentiated resilience coefficients for fishponds and natural water surfaces. Ultimately, drawing on multi-period Landsat imagery, declassified high-resolution satellite photographs and official planning documents, we charted the land consolidation intensity, landscape patterns, and ecological health across 1980, 2000, and 2020. Building upon this, we employed Partial Least Squares Structural Equation Modeling (PLS-SEM) and Geographically Weighted Regression (GWR) to dissect the interaction mechanisms and spatial heterogeneity of multiple factors. Results indicate that the degree of land consolidation generally decreases from northwest to southeast. Landscape patterns exhibit increasing heterogeneity and diversity alongside weakened connectivity. Ecological health remains at a low-to-moderate level with a persistent decline, showing a spatial pattern of higher values in the west and lower in the east, though deterioration is more pronounced in the west. Mechanistically, land consolidation influences ecological health through both direct engineering interventions and landscape-mediated pathways. Engineering measures reduce hydrological connectivity and simplify landscape structure, producing direct negative effects on ecological organization and resilience. In contrast, consolidation-induced changes in landscape heterogeneity and connectivity exert differentiated effects across ecological vitality, organization and quality, resulting in marked spatial contrasts between the low-lying western units and the relatively stable eastern areas. Overall, this study establishes a comprehensive and transferable research framework. This framework enables the quantification of land consolidation's spatial transformation intensity through spatial data, adapts ecological health assessment methodologies to the characteristics of polder systems, and elucidates how land consolidation processes directly or indirectly influence ecological health. This research also provides transferable decision support for zoning planning, landscape optimisation, and ecological restoration within polder landscapes.

Keywords: Polder landscapes, land consolidation, landscape patterns, ecosystem health, impact mechanisms

#403 A Woman's Wilderness: Fostering Mental Well-Being Through Sensory Stimulation in The Outdoors

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Abstract

The female experience with nature is also unique (Nurse, G. A., Benfield, J., Bell, P. A., 2010). A 2010 study found that women experienced higher motivation for sensory pleasure within nature than their male counterparts, implying a greater urge to connect with their environment (Nurse, G. A., Benfield, J., Bell, P. A., 2010). However, it was also found that women disproportionately face deterrents to greenspace use (Wesley, J.K. & Gaardner, A., 2004). Despite these deterrents, it has been noted that nature can be healing, both emotionally and cognitively (Stigsdotter, U. K., et. al., 2018; Joschko, L., et. al., 2023; Ottoson, J. & Grahn, P., 2008). This begs the question of how can landscape architects better design healing landscapes for women, especially focusing on the lived experience. This study invited participants of nature-based retreats held at 4 Winds Farm in Glenwood Springs, Colorado or Summit Sisters at Cal-Wood Education Center in Jamestown, Colorado. Both facilities offered a variety of programming for participants. Upon completion of their program, participants were asked to complete a survey of both closed- and open-ended questions. The survey asked about the impact the environment and sensory stimulations had on the their emotions, drawing on Plutchik's research about eight core emotions (Panskepp, J. & Watt, D., 2011). To assess the results, descriptive statistics, two sample t-tests, sentiment analysis, and content analysis were utilized. This yielded findings that women's positive emotions are significantly impacted by their sensory experiences. It also revealed a fascination with trees and the importance of touch. Word count results from open-ended questions indicated that trees were of high interest to participants. This was expected, as forest bathing has been shown to be an effective form of nature-based therapy (Furuyashiki, A., et. al., 2019). The words touch and feel were also mentioned 31 times. This indicates a high importance and emphasis placed on the sense of touch. The various methods of assessment used provided diverse results including how the participants interacted with their environment, vital elements to design, and how various demographics such as age react to their environment. For landscape architects this brings about a new challenge in designing for the evocation of emotion through sensory play in all landscapes. This also excites the field of ecopsychology in confirming that sense of place is impactful to emotional processing.

Keywords: Sensory stimulation, Mental well-being, Female experience

#414 Cultural Ecosystem Services Perception in Multi-ethnic Communities: Tianshan Village, Xinjiang

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Abstract

Oasis agricultural landscapes in northwestern China function as key socio-ecological systems where traditional oasis agriculture, multi-ethnic cultural practices, and contemporary land-management reforms intersect. This study assesses how an integrated demonstration project—featuring optimized farmland shelterbelts and improved water-management infrastructure—shapes local perceptions of cultural ecosystem services (CES) in Tianshan Village, Midong District, Urumqi (Xinjiang). Following established CES assessment frameworks, we adopted a mixed-methods design combining a stratified household survey, participatory mapping (PPGIS), semi-structured interviews, and local cultural-historical archives. The survey sample size followed United Nations and World Bank guidelines for community-level inference, while the use of PPGIS and qualitative interviews aligns with widely recommended approaches for capturing spatially explicit and intangible cultural values. Statistical modeling and spatial analysis reveal that the demonstration project reshaped CES perceptions, though in culturally differentiated ways. Uyghur and Kazakh residents frequently linked shelterbelts and irrigated fields to ancestral memory, Silk Road heritage, and religious or communal identity—reflecting the relational and historical dimensions of CES commonly reported in arid oasis regions. In contrast, Han residents emphasized aesthetic qualities, recreational opportunities, and agricultural modernization. These variations correspond with broader regional contrasts: whereas studies in eastern China commonly identify recreation, education, and leisure as dominant CES, and U.S. studies emphasize outdoor recreation and biodiversity-related experiences, oasis communities in Xinjiang value CES that are tightly embedded in ethnic identity, land-based memory, and long-standing agro-ecological traditions. Overall, the findings illustrate how ecological-agricultural interventions can reinforce or reshape place attachment and cultural meaning in multi-ethnic rural contexts. The study highlights the importance of participatory and culturally informed planning for sustainable oasis development, and provides a transparent, reproducible methodological framework for CES assessment in arid and culturally diverse landscapes.

Keywords: Cultural ecosystem services (CES), Multi-ethnic communities, Oasis agriculture, Farmland shelterbelt, Place attachment

#422 Energyshed Transect in Southern Portugal

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Abstract

The spatial distributions of renewable energy production, transmission and consumption between cities and countryside is driving major changes in the landscape [1]. As an “energyshed” there is connectivity in economic flows, environmental impacts, and societal changes [2]. This research provides insight to the question, what are the energy-shed relationships and landscape changes between urban-rural and costal-interior landscapes emerging from the renewable energy revolution ? Understanding these dynamics is important for implementing policy and development decisions that preserve the spirit of place. This energyshed transect records the landscape changes, strategies, and challenges, within the specific geographies, cultures, and policies of southern Portugal. Portugal was one of the first countries to commit to Carbon Neutrality by 2050 and anticipates nearly two gigawatts of new renewable generation in the next few years [3]. Preliminary secondary research informed direct observations conducted over a 2-week period, starting in Lisbon with a transect east to the Portugal-Spain border, and a second transect from Évora to the southern coast. Landscape observation photos were geo-located and mapped using ArcGIS Field Maps and analyzed with map and literature sources. Portugal’s southern regions have endured long histories of changing landscapes connected to supporting more populous centers [4,5,6]. Past and ongoing landscape shifts have resulted from economic trends and pressures and exacerbate current water supply stresses and wildfires [7,8]. The productivity of the landscape simultaneously creates a natural fit and conflict in expanding the portfolio of supporting cities with energy. Increased implementation of hydro, wind, and solar technologies within the scenic landscape is already evident. Ultimately, within the energyshed, large sweeping engineered solutions to these challenges have had the broadest impacts, while smaller scaled and incremental measures are more integrated into the built environment. In addition to the impact on the grid, this effort to reduce carbon also brings other risks and tradeoffs including the quality of the visual landscape and modifications to the social and environmental functions [9]. We draw parallels to landscape challenges in many other regions of the United States and world, revealing connections between energy policy, culture, and physical geography, and point to potential design synergies. These insights contribute to broader understanding of the vastness of energysheds, which entails production and use dynamics endemic to the connection between people and landscapes. This perspective opens the considerations of energy systems to extend beyond solely maximizing energy generation output and profit to shift the paradigm toward multi-functionality and local connections.

Keywords: Energysheds, Renewable Energy Infrastructure, Landscape Change, Carbon Neutrality, Socio-environmental Impacts

#461 Campus Tree Canopy and Student Success: Retention and Graduation Outcomes Over time

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Abstract

Tree canopy in and around K–12 schools has been positively linked to improved academic outcomes (Kweon et al., 2017; Li et al., 2019). In higher education, however, the role of campus greenness, particularly tree canopy, remains insufficiently studied (Ding et al., 2024). Limited research has examined how tree canopy contributes to academic achievement and broader institutional outcomes such as student retention and graduation. This knowledge gap is even more critical given the disruption of the COVID-19 pandemic. This study: (1) examines the relationship between tree canopy coverage and student retention and graduation rates from 2019 to 2023, and (2) explores whether the impact of COVID-19, beginning in 2020, on retention and graduation rates differed by the extent of tree canopy coverage. We analyzed 1,623 four-year bachelor's degree programs across the United States during the study period. Campus boundaries were identified through the Integrated Postsecondary Education Data System (IPEDS). Tree canopy coverage was derived from the National Land Cover Database (NLCD). Institutional retention and 4-year, 6-year, and 8-year graduation rates were obtained for all years. Multivariate regressions were used to estimate associations between canopy coverage and student outcomes, adjusting for institutional and demographic characteristics. To capture temporal heterogeneity associated with COVID-19, we applied institution-level fixed effects panel regressions with interactions between canopy coverage and COVID-period indicators. Cross-sectional regressions show that tree canopy coverage was consistently and positively associated with retention and graduation rates in 2019, 2021, and 2023. Panel models indicate that retention declined during the COVID-19 period (2020 to 2021), although the magnitude of decline was smaller at institutions with higher canopy coverage. Graduation rates increased during the pandemic relative to the pre-pandemic period, and while interaction effects were not significant, canopy coverage showed modest positive associations with 6-year and 8-year graduation rates. These results suggest that campus tree canopy coverage may contribute to student success, though the pathways cannot be fully explained through quantitative analysis alone. The consistent positive associations observed in the cross-sectional analyses suggest that campus tree canopy coverage supports student success across different years, reinforcing its role as a stable institutional asset rather than a context-specific factor. Retention responds quickly to external shocks such as the pandemic, while graduation rates accumulate over time and therefore reveal delayed or weaker associations in the short term. This result highlights the importance of green infrastructure as more than an environmental amenity.

Keywords: tree canopy, campus environment, COVID-19, academic performance

#464 Biocultural Heritage Landscapes in Pakistan: Convergence, Transformation and Entanglement

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Abstract

Landscapes are in active relation with a web of culture, religious beliefs, values, language, social formations, political structures, and economic systems and conditions, with each transforming the other in some way. This study explores these relational transformations and formations of biocultural heritage landscapes in Pakistan through more-than-human (Chao et al., 2022), pluriversal (Escobar, 2018) and critical plant studies (Gagliano, 2018) theoretical approaches. Traditional landscape architecture practice and research often adopt an anthropocentric view, representing designed landscapes as spaces for human use, enjoyment, and aesthetic appreciation, where non-human elements and biodiversity serve as a backdrop or resources with value allotted based on the benefits derived by humans (Díaz, et al., 2015). How can we disengage from an anthropocentric view of community in landscape research and practice, shifting our gaze to human-beyond-human assemblages? I challenge the anthropocentric perspective by positioning more-than-humans as relational agents in the co-creation of biocultural heritage landscapes. The term more-than-human or beyond-human acknowledges the limitation of focusing on 'species' and draws in other cosmologies that consider 'beings'—not considered 'living' or existing within the Western scientific sphere—as agential forces within landscapes. Biocultural diversity is a concept rooted in the notion that biodiversity and cultural diversity are inextricably linked and reciprocal in nature. The term biocultural heritage builds on biocultural diversity, using 'heritage' to express a relationship that is "custodial and intergenerational" (Secretariat of the Convention on Biological Diversity, 2019). Utilizing film (Gandy, 2021), storytelling and practices of making (Yunkaporta, 2020), I investigate biocultural heritage landscapes in Pakistan illustrating human relationships intertwined with beyond-human worlds. To demonstrate how worldviews (Rousseau & Billingham, 2018), culture, care practices (Jacobs & Wiens, 2023), language are entangled with local ecological knowledge, land relations, and sense of place, this project focuses on the human-beyond-human assemblages of two strangler fig tree species, the Bhorr or Banyan (Ficus benghalensis , L.) and the Peepal or Bodhi tree (Ficus religiosa , L.), around graveyards and shrines in Pakistan. This research highlights challenges biocultural landscapes and knowledge face amidst socio-ecological transformations, adaptive realities, and opportunities for conservation or revitalization.

Keywords: biocultural, more-than-human, sacred groves, urban ecology

#466 Culture of Flooding: Significance of Landscape Adaptation Techniques of Majuli Island's Indigenous Tribe and River Ecosystems

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Abstract

This thesis focuses on the world's largest inhabited river island Majuli , situated between the Brahmaputra and Subansiri rivers in Assam, India. Majuli is home to Indigenous communities like the Mising , Deori , and Sonowal Kachari , alongside Satra religious institutions. These communities have maintained symbiotic relationships with the river system for centuries, drawing on traditional ecological knowledge to adapt to environmental changes. However, as the region faces new pressures from urbanization and industrialization, both the physical landscape and cultural practices are under threat. Since 1960, the island has been losing land due to earthquakes and heavy rain events, disrupting both human and nonhuman habitats that is what researchers have assumed but the people of Majuli believe that the erosion and water level rise is a natural process, and "we are not worried about that as we know and have survived this condition from generation" Deboram Mili and Binua Pegu Mising members . Adapting to environmental fluctuations is not new, but an integral part of Mising lifestyle. However, rapid development has introduced new vulnerabilities, shifting from sustainable and locally sourced materials to modern construction materials like concrete and brick is disrupting traditional practices, posing risks to both cultural continuity and ecological resilience. This research documents the adaptive strategies of the Mising tribe, a riverine community whose name, derived from 'Mi' (Man) and 'sing' (Water), reflects their deep connection to the river system. The study explores how their livelihoods, seasonal activities, and landscape practices are intricately tied to the rhythms of the river. Through field documentation, including notes, photographs, sketches, and recorded conversations during both Pan (low water) in January and Ban Pan (high water) in June, the research highlights the importance of preserving traditional ecological knowledge and adaptive strategies in the face of rapid socio-environmental changes. The findings aim to offer a new narration on Mising, particularly in the context of climate change and landscape transformation. This approach contrasts with the current narrative of Majuli, which often focuses on physical landform protection through infrastructure like dykes and embankments. By shifting the focus to cultural development and the integration of traditional knowledge, this research encourages designers and policymakers to prioritize the preservation of cultural landscapes alongside physical protections.

Keywords: River Island, Indigenous Tribes, Ecological Knowledge, Climate change, Urbanization

#492 Cognition and Utilization of Multi-dimensional Value of Three-dimensional Transportation Landscape in Urban Fringe Areas

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Abstract

The three-dimensional transportation landscape in urban fringe areas represents a critical infrastructural system within the urban-rural transition zone, characterized by intensive human intervention. However, its value perception remains constrained by an engineering-oriented, single-function paradigm, alongside systemic challenges including fragmented land ownership and economic prioritization, leading to significant underestimation of its multifunctional potential in ecological regulation, social integration, and cultural expression. Existing research on urban fringes has predominantly focused on isolated dimensions such as spatial identification methods (e.g., Zhou & Wei, 2024), land use evolution (e.g., Ding & Chen, 2022), ecosystem service assessment (e.g., Wang et al., 2025), and socio-spatial transformation (e.g., Lin & Yang, 2024), while lacking systematic investigation into this specific landscape typology. In terms of value recognition, previous studies tend to emphasize either economic drivers and spatial morphology (e.g., Lin & Yang, 2024) or restrict their focus to quantified ecological services and socio-governance mechanisms (e.g., De Vidovich, 2022). This fragmented approach fails to integrate the dynamic interactions among space, time, and society, overlooking both the evolutionary trajectory of value orientation across different development stages and the precise alignment mechanism between spatial potential and societal needs. To address these research gaps, this study develops an integrated "Space-Time-Supply/Demand" three-dimensional analytical framework to reconfigure the cognitive pathway for understanding multidimensional values. Spatially, it identifies four distinct landscape types through typological analysis. Temporally, it reveals the adaptive evolution of dominant values across development stages. In the supply/demand dimension, a "spatiotemporal potential-social demand" mapping mechanism enables precise value translation. Collectively, these dimensions form a comprehensive analytical framework progressing from "potential identification" through "dynamic adaptation" to "performance realization." Guided by this framework, the research proposes systematic strategies encompassing spatial restructuring, temporal flexibility, and governance coordination. Using the Nanjing Qiqiaoyong-Gaoqiaomen Hub as an empirical case, we establish an evaluation system integrating ecological performance with social perception, employing multi-source data to quantitatively verify the differentiated benefits across various site types. Three actionable governance models are proposed: dynamic terrain rotation, co-governance of bridge zones, and contractual farmland symbiosis, facilitating the transformation of these landscapes from "gray infrastructure" to "green-vibrant-shared systems." This research provides not only a systematic theoretical tool for comprehending the multidimensional values of three-dimensional transportation landscapes but also establishes and validates a comprehensive practical scheme integrating cognition, strategy, and governance. It offers both academic support and demonstrative pathways for the refined revitalization and sustainable transformation of infrastructural landscapes in high-density urban contexts.

Keywords: Urban fringe area, Three-dimensional transportation landscape, Multi-dimensional value cognition, Spatial-temporal supply and demand framework, Sustainable transformation

#504 Student connections to nature as children and as adults: Implications for curricula, programming, and university design.

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Abstract

Connecting with nature has many benefits, including better overall physical and mental health (Stott et al., 2024; Duke & Holt, 2023; Bratman et al.,2019). Studies also have found that those who connect to nature are more likely to care for and protect it (Duke and Holt, 2022; Martin et al., 2020; Whitburn et al., 2020). Other research has found that students connected to nature are more likely to engage in sustainable practices and express concern for public and environmental well-being (Duke & Holt, 2023; Soga and Gaston, 2016). Despite the benefits that nature offers, many studies show that human contact with nature has decreased over the past 30 years. Among the literature that supports these findings is Tallamy's book, Nature's Best Hope: A New Approach to Conservation That Starts in Your Backyard . Tallamy states that "Nature has become irrelevant to our kids and most of their parents as well." (2019, p.63). Tallamy's statements were the impetus for this study, which sought to determine whether and how students were connected to nature as children and whether that connection, if any, continued as adults. From 2021 to 2025, students in a landscape architecture required plants class were assigned to read and respond to questions about Tallamy's book. For the assignment, two open-ended questions asked students to reflect on their interaction with nature as children and the role that nature has in their lives as adults. Over the five-year period, 168 students responded to the two questions. For analysis, responses were read and categorized on a spreadsheet using inductive codes. Data visualization was used to identify themes and correlations. The findings revealed several key themes: Families play a central role in shaping children's early connections to nature. A majority of students interacted indirectly, incidentally, and intentionally with nature as children and continue to do so as adults. Coursework in landscape architecture reinforces and deepens student connections to nature, often inspiring a commitment to environmental stewardship. Students frequently view their connection to nature as benefiting their mental health. Having nearby access to natural environments is a significant factor in sustaining these connections. The findings suggest that campus design, along with course and curricular content, should build upon the role that nature currently has in students' lives and strengthen student connections to nature. By doing so, universities and programs can advance student well-being and further their interest in environmental stewardship.

Keywords: Nature connections, People and nature, Stewardship

#506 Mapping Human–Environment Interactions in Urban Park Research: Linking Theories, Functional Domains, and Methods through a Systematic Literature Review

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Abstract

Urban parks are studied across multiple disciplines due to their broad benefits for public health, psychology, and community well-being (Cheng et al., 2021; Grilli et al., 2020). However, existing research remains fragmented in disconnected disciplinary silos, and few studies integrate the various outcomes of park use in a comprehensive way (Huai et al., 2023; Huang et al., 2023; Wan et al., 2021). This systematic review aimed to map and synthesize how different theoretical perspectives, functional domains of outcomes, operationalizations, and data types are employed and interrelated in park-focused research. Following PRISMA guidelines (Moher et al., 2009), we conducted a systematic search of the Web of Science Core Collection to identify empirical studies on human–environment interactions in urban parks published in the past ten years (2015–2025). The search initially yielded 1,214 records. After applying inclusion and exclusion criteria during the title/abstract screening and full-text eligibility assessment, more than 500 studies met the criteria and were retained for synthesis. Each included study was systematically coded for its theoretical framework, functional domain, and data sources. The review reveals that theoretical frameworks are unevenly applied across outcome domains: environmental psychology theories predominate in cognitive and affective studies, whereas many health and social outcome studies lack explicit theoretical grounding or use broad socio-ecological models (Zhan et al., 2024). Most studies examined a single functional domain, most commonly physical health or psychological well-being, with far fewer addressing multiple domains in tandem (Song & Schuett, 2023). Data choices were also patterned by outcome domains rather than applied consistently across the field. Studies on social and behavioral outcomes relied heavily on self-reported surveys and observations, reflecting their emphasis on subjective experience and visible activities. By contrast, research on health outcomes more often incorporated objective indicators, such as GIS-derived accessibility measures, wearable sensors, or physiological assessments, in order to capture measurable effects on physical well-being. Cognitive and affective studies occupied a middle ground, drawing on both qualitative perception data and digital trace data (e.g., social media or online reviews) (Huai et al., 2023). These domain-specific alignments indicate that methodological choices have reinforced disciplinary silos rather than encouraging cross-domain integration. These findings show that current research clusters into distinct approaches, with limited cross-domain integration. This review provides a conceptual and methodological map linking theories, outcome areas, and methods, and highlights opportunities for more integrative urban park research to support a holistic understanding of human–environment interactions.

Keywords: Urban parks, Human–environment interaction, Systematic review, Functional domains, Cognitive and affective responses

#517 Causal Evidence on Nature-Based Interventions and Physical Activity: A Systematic Review

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Abstract

Introduction. Regular physical activity (PA) provides substantial physical and mental health benefits across the lifespan, reducing chronic disease risk and supporting brain health (WHO, 2024). However, the global burden of physical inactivity persists, prompting growing interest in scalable strategies to promote active living. Nature-based interventions (NBIs) have emerged as a promising approach to encourage PA. Going beyond correlational evidence, there has been growing interest and efforts to understand causal evidence on the impact of NBIs on PA. Methods. This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline. A systematic search of eight databases resulted in 9,638 articles, of which 20 met the eligibility criteria. This review was restricted to peer-reviewed studies published between 2005 and 2025, focusing on 1) NBIs where natural elements were the primary intervention; 2) PA as the outcome variable; and 3) pre-post design. Study quality was assessed using the Effective Public Health Practice Project Quality Assessment Tool. Results. The included studies employed natural or quasi-experimental designs. The types of NBIs include the development of new parks, green spaces, and greenways, the implementation of vegetation planting and landscaping, and the greening of existing urban environments. PA outcomes varied across studies, including sedentary time, walking/cycling behavior, moderate to vigorous PA, leisure-time exercise, park-based activities, and sports participation. Assessment methods included direct observation with standardized tools, as well as self-reported PA outcomes collected through intercept surveys and distributed surveys. Preliminary findings suggest that park improvements contributed to increasing walking, PA, and leisure-time exercise. Similarly, street and trail enhancements elevated walking- and cycling-related PA. Greenway developments increased walking and moderate to vigorous PA. However, one study reported contradictory results, indicating a decline in walking following urban green space interventions. Discussion and Conclusions. NBIs led to significant increases in walking (ranging from 203% to 351%) and PA (ranging from 29% to 189%). We further found several additional papers, although not meeting our eligibility criteria, suggested that adding amenities to existing green spaces (e.g., play equipment upgrades, improved access to natural spaces, expanded footpaths in a park) was associated with increased walking and PA. Together with our synthesized evidence, these findings underscore the potential of intentionally designed NBIs in fostering active living and promoting public health. This review provides important causal evidence to inform the design and implementation of future NBIs that support active living and outdoor engagement, especially in urban contexts.

Keywords: Nature-based Intervention, Physical Activity, Causal Effect, Active Living, Systematic Review

#521 The Life Cycle of Two Irrigated Steep-Sloped Memorial Stadium Green Roofs at Kansas State University

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Abstract

The Memorial Stadium Green Roofs (MSGRs) are used as living laboratories, represent the native prairie, and keep people off two aging stadiums/roofs. Observation of the East and West MSGRs at Kansas State University (K-State) shows that adequate soil moisture and native plant success relate to the amount of precipitation and supplemental irrigation during dry periods, especially during warm months. During the summer of 2025, there seems to have been an increase in non-native species on the MSGRs due to inconsistent irrigation. This presentation addresses the question “What practices extend the life cycle of a native-plant green roof?” Since implementation in 2015 for the West MSGR and 2016 for the East MSGR there have been subsurface soil moisture and temperature measurements (2016-2019), self-seeding of over 30 native plants originally planted or seeded, monitoring of plant species richness and dominance (with the latest data collected once each June to August 2020, 2022, and 2024), and imagery of vegetation coverage using a UAS (2016-2018). In January 2021, an LAF Case Study Investigation of the ecological and social impacts of the MSGRs was completed. Plant dominance and richness data collected between 2016-2024 reveal that the MSGRs are dynamic systems composed of native and non-native plants. Observations and photographs support these findings. This investigation explores current issues related to roof leaks, irrigation practices, and how native and non-native plants are impacted by the frequency and coverage of supplemental water distributed via irrigation. The goal is to understand impacts of irrigation practices on native and non-native plants and perceptions of the MSGRs. This “2025-2026 K-State MSGRs Case Study” will summarize past plant data findings and focus on lessons learned during prior growing seasons relating to human-ecosystem interrelationships. We seek to provide insights to help K-State administrators, staff, and educators and assist other institutions looking to install or maintain resilient green roof ecosystems. We aim to better understand key issues by: 1) Conversing with K-State and other universities’ facilities staff on current funding and irrigation practices for the MSGRs (seeking to understand why, when, and how maintenance practices have changed over the years); 2) Evaluating the dominant plant species that have been recorded since plant establishment (focusing on 2018-2024 data and 2025 observations), and; 3) Providing an outline of the life cycle costs and benefits associated with the MSGRs and explaining how these two green roofs can be sustained for ongoing learning, enjoyment, and environmental services.

Keywords: Prairie-like Living Roof Monitoring & Management, Assessing Vegetation Coverage, Plant Species Dominance and Richness, Irrigation of Steep-sloped Green Roofs, Human-Ecosystem Interrelationships

#522 Where do Urban Youth Go? Analyzing Outdoor Place Use Patterns Using Geospatial Click Data: Evidence from Five U.S. Cities

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Abstract

This paper examines behavioral patterns of outdoor place utilization among youths by analyzing geospatial data on how often they visit four types of outdoor spaces: recreational areas, sports fields, public parks and green spaces, and civic spaces. Youth is a key developmental stage marked by significant physical, cognitive, and social changes (Rivera et al., 2022), and understanding where young people go and why those places are meaningful is essential for fostering supportive communities (Clark & Uzzell, 2002; Duzenli et al., 2010; Owens, 1988, 1994). Yet, many urban youths face barriers to accessing outdoor environments due to exclusionary design, behavioral controls, and the absence of large gathering areas (Loebach, Little, Cox, & Owens, 2020). This study addresses two questions: (1) Which outdoor place types are most frequently visited by youth in each city? and (2) Within each city, are there statistically significant differences in visitation frequencies across place types? Our Survey data were collected from five U.S. cities—Houston, Minneapolis, Prince George's County, San Francisco, and Ithaca. Four cities with varied density and income levels participated in UNICEF USA's Child Friendly Cities Initiative. A total of 367 youth respondents mapped 401 places they visited using interactive online surveys. Responses were unevenly distributed, with most from Ithaca (n=319) and smaller samples from the other four cities. The survey findings indicated that public parks and green spaces were the most frequently selected category, accounting for 57.4% of all pinned locations. This trend was consistent across cities: Houston (53%), Ithaca (59.2%), Prince George's County (42.9%), and San Francisco (72.7%). Minneapolis differed, with youth reporting greater use of recreational areas (43.5%). Sports fields (12%) and civic spaces (13.8%) were less common overall. ANOVA tests showed no significant within-city differences, suggesting similar patterns of favoring parks across different environments. Although parks emerged as the leading choice, the underlying reasons likely vary by local context. Ithaca's abundant green spaces and natural amenities may contribute to its high proportion of park selections, while sports fields may support more structured activities in other cities. Given substantial variation in sample sizes—particularly the small numbers from four cities—results should be interpreted cautiously. Future work would benefit from larger and more balanced datasets to improve representativeness. Overall, this study underscores the central role of parks in supporting youth outdoor activity across diverse contexts and highlights the importance of investing in accessible, safe, inclusive environments that enhance youth engagement, social interaction, and well-being.

Keywords: Youths, Outdoor environment, Public parks and green spaces, Recreational areas, Geospatial data

#537 Do LLMs and Humans View Urban Walkability in the Same Way?

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Abstract

Walkability has attracted significant interest across disciplines including urban planning, public health, and transportation (Giles-Corti, Kelty, Zubrick, & Villanueva, 2009; Wedyan & Saeidi-Rizi, 2025) . Despite this attention, walkability remains a subjective concept that is difficult to quantify. A recent review highlighted considerable evolution in methods for assessing walkability over time (Hasan, Oh, & Kwigizile, 2021) . Earlier research primarily utilized measurement-based approaches such as GIS assessments, physical audits, image-based evaluations (Shields, Gomes da Silva, Lima e Lima, & Osorio, 2023) , and mixed-method strategies (Xue et al., 2018) . More recent studies have shifted toward micro-level, street-based evaluations and Street View Imagery (SVI) with applications that include measuring psychological greenery, and visual crowdedness (Lu, 2018) . Now, advances in large language models (LLMs) provide capabilities for analyzing both text and images (Feng et al., 2025) and simulating human-like perceptions. Nevertheless, the extent to which LLMs can accurately reflect human evaluations of walkability in urban contexts remains unclear. This study examines whether GPT-4o, as a type of LLM, can effectively capture human perceptions of walkability by comparing its assessments of street-level imagery with evaluations conducted by human participants. Both GPT-4o and participants rated and expressed their ratings in a written text of urban scenes based on six dimensions: overall walkability, feasibility, accessibility, safety, comfort, and liveliness. The study recruited 174 adult participants from multiple regions including the United States, China, Taiwan, and the Middle East, via the Prolific online platform to compare pairs of street-view images. Researchers used 48 unique image pairs (96 images in total) from Lansing, East Lansing, and Williamston, Michigan. To systematically compare these responses, the study employed text mining techniques, including keyword frequency analysis, coherence scoring, and similarity indexing. Results indicate substantial convergence between GPT-4o and human participants in assessing overall walkability, feasibility, accessibility, and safety, but notable divergences were identified in evaluations of comfort and liveliness. Human participants offered a wider thematic range of explanations of their ratings, providing nuanced insights into atmosphere, cultural context, and emotional resonance. In contrast, GPT-4o generated more focused and internally coherent responses particularly concerning safety and comfort, but occasionally lacked the breadth found in human interpretations. In conclusion, while GPT-4o shows potential as a tool to complement human evaluations, it does not fully reproduce the emotional and experiential dimensions of walkability.

Keywords: Walkability, LLM, Human Perception, Urban Perception

#553 Designing for Human–Nature Interaction: Vegetation Diversity, Spatial Structure, and Human Behavior

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Abstract

Public green spaces provide urban residents with opportunities to engage with nature through diverse sensory experiences and physical activities (Fleming & Shwartz, 2023; Lev et al., 2020). The combination of plant diversity, species composition, and spatial configuration of plant communities shapes both the spatial character and functional quality of these environments. While green spaces are often designed to foster specific types of activities, their landscape components also offer latent opportunities for human perceptions and interactions (Gibson, 2014). Heterogeneous landscapes are hypothesized to expand the range of affordances available to users, offering more diverse activities and interactions with nature. This study, therefore, asks the following question: to what extent do plant diversity and spatial arrangements correlate with the capacity of green spaces to support natural experiences, with a particular emphasis on human-nature interactions. Exploring the interactions between humans and nature can inform environmental designers with guidelines on creating green spaces that strengthen human-nature interactions and contribute to improved health outcomes. To examine these relationships, we employ systematic observation of human behaviors in open green spaces across a university campus based on the different conditions of vegetation diversity and spatial arrangements. Plant diversity is measured using species richness, Shannon diversity index, and functional diversity indices (functional range and functional richness), while spatial arrangements are characterized in terms of openness and edge attributes. We assessed these indices for each site. For natural experiences, behavioral observations are conducted using two complementary methods: (1) unmanned aerial vehicles, which capture wide spatial coverage, and (2) stationary video cameras temporarily mounted on existing infrastructure to provide consistent and continuous records of activity for up to one week. We expected to generate behavioral maps to demonstrate the distributions of users and their behaviors. We use Pearson correlation analysis to examine the relationships between variables to examine the relationships between vegetation diversity and its affordance of human-nature interactions. This is an ongoing study, and preliminary findings are expected to be available for presentation at the conference.

Keywords: plant diversity, vegetation structure, affordance, human-nature interactions

#557 Assessing the Restorative Value of Academic Building Adjacent Landscapes: Linking Student Preferences, Perceptions and AR-based Design Evaluation

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Abstract

In campus design, the spatial relationship between academic buildings and their adjacent landscape design influences students' interactions with the built environment, movement patterns, and space use (Akhir et al., 2018; Alnusairat, Ayyad, & Al-Shatnawi, 2021; Hami & Abdi, 2021). University students spend long hours attending classes and other academic activities, which leads to mental fatigue and stress. Thoughtfully designed outdoor spaces on a university campus can provide opportunities for mental restoration and visual relief (Lu & Fu, 2019; Wang, Jiang, & Lu, 2021). Campus design conventionally focuses on central open spaces to support restorative benefits for students. However, the smaller outdoor areas directly adjacent to academic buildings are frequently underused. These transition spaces, where students pause between classes, have the potential to serve as restorative landscapes, yet they remain understudied. This study asks: (1) How do students perceive and use outdoor spaces adjacent to academic buildings, and what factors make some of these spaces more restorative and preferred than others? (2) What design conditions influence students' perceived restorative value of adjacent landscapes in a semi-arid campus setting? (3) How do students' perceptions of restoration and likelihood of using the redesigned space change when viewing the enhanced design compared to the existing space? Augmented Reality (AR) will be used to visualize redesigned spaces and gather student feedback on their preferences. The hypothesis is that students will perceive the redesigned adjacent spaces as more restorative and more likely to be used than the existing spaces. Phase one, which included GIS-based behavioral mapping, field observations, and an online survey to document students' preferences, use patterns, and perceptions of restoration (Hartig et al., 1997), has been completed. Findings from this phase guided the redesign scenarios by focusing on built landscape elements and student use patterns. Phase two will take place in January 2026 on selected outdoor spaces on campus. Students will experience the redesigned alternatives through AR to compare how they perceive the restorative value and usability of the new designs versus the existing spaces. The AR environments will help test whether the proposed design changes improve students' preference for short restorative breaks in building-adjacent spaces. This research will provide design guidelines and inform landscape architects working with campus landscapes. By combining student perceptions, preferences, behavioral patterns, and AR-based evaluations, the study aims to support evidence-based strategies for creating a meaningful campus landscape that does not remain underutilized and better aligns with student needs.

Keywords: Campus landscape, Student perception, Restorative ladscapes, Academic building-adjacent landscape, Augmented Reality (AR)

#559 Revitalizing Idaho's Rural Towns: Integrating Traditional Design Patterns and Economic Diversification

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Abstract

Idaho's rural towns are known for their landscapes and cultural heritage, yet many face stagnation and decline. Rural planning research shows that lessons from community development are crucial to address these challenges (Green & Miller, 2025). Design-led approaches that integrate ecological, cultural, and economic dimensions also offer pathways for sustainable transformation (Johnson et al., 2024). However, population shifts, limited infrastructure, lack of economic diversity, and aging demographics continue to threaten the vitality of these towns. This project explores design and planning strategies that reimagine Idaho's rural communities through traditional design patterns and diversified economic frameworks. The project focuses on 9 communities throughout the state. Cottonwood, Lava Hot Springs, Mackay, Malad, Montpelier, Orofino, Riggins, Salmon, and Stanley. To begin the research, traditional town design typologies are documented and analyzed, drawing from historic precedents, case studies, and archival records. From this, classification schemes are developed to identify patterns of spatial organization, architectural form, and community-scale design strategies. Second, economic and demographic data are combined with these typologies to assess their potential for supporting resilience in housing, employment, and infrastructure. Third, modeling tools and GIS-based spatial analysis are applied to simulate site-specific interventions and generate relevant design and planning strategies. Finally, direct engagement with local residents ensures that context-specific and realistic solutions are developed for each selected town. The outcomes include strategies for infill development, adaptive reuse, and main street revitalization that preserve small-town identity while promoting long-term economic stability. Collaboration with local stakeholders is essential, ensuring that proposed solutions align with community needs and aspirations. Community workshops, interviews, and participatory mapping will provide qualitative insights to complement quantitative analysis. This study contributes to the discourse on rural sustainability by demonstrating how traditional design principles can be adapted to contemporary challenges. It underscores that rural resilience depends not only on physical interventions but also on economic diversification, including informal economies vital to rural life. Ultimately, the project proposes replicable models of rural revitalization that balance heritage preservation with innovation. By attracting younger generations and reinforcing a strong sense of place, Idaho's rural towns can remain vibrant, resilient, and culturally distinctive amid rapid regional growth.

Keywords: Community Resilience, Rural Revitalization, Traditional Design Patterns, Economic Diversification

#564 A Forest Manual:Preparation for Subtle EncountersA guide not for knowing, but for noticing

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Abstract

In regions once defined by the eastern deciduous forest, opportunities to experience its spatial, ecological, and sensory complexity have become increasingly limited. In light of accelerating environmental degradation and a growing need for personal and collective resilience, re-engagement with these woodland systems is not only restorative, but increasingly essential. Landscape architects bear a critical responsibility in facilitating public understanding of such landscapes not merely as sites of ecological function, but as spaces of cultural, psychological, and aesthetic value. This project presents the final iteration of a field-based manual conceptualized as a lexicon of perceptual and linguistic tools that supports deeper engagement with forest environments. Rather than serve as a prescriptive field guide, the manual operates as an interpretive framework, inviting readers into a nuanced dialogue with seasonal processes and overlooked phenomena. Its design situates the work between professional and lay audiences, cultivating a sensibility of attention that is slow, embodied, and responsive. The manual is conceptually grounded in Attention Restoration Theory (ART) , developed by Stephen and Rachel Kaplan. Their research identifies the forest as an exemplary restorative environment and one that satisfies four criteria for cognitive recovery: Being away (psychological distance from stressors) Extent (spatial richness and coherence) Compatibility (alignment with one's intentions) Soft fascination (effortless engagement of attention) The manual curates imagery and language that respond to these criteria, encouraging heightened perception of the following phenomena: Spatial progression and sequence Subtle shifts in seasonal color Bud development and foliar choreography Vegetative structure and contour Vertical canopy and subterranean rooting awareness Light, shadow, and atmospheric transition Textural surfaces across soil, bark, and understory This body of work emerged through sustained, site-specific engagement with a Beech-Maple forest in northern Michigan. Over several years, the author conducted interval photographic documentation across all four seasons. Photographs were later curated to highlight ecological detail and sensory nuance; select images were digitally refined to clarify visual information. Language was developed in concert with imagery, and the manual's layout was designed by the author to foreground the relationship between text, image, and spatial awareness. Rather than instruct, this guide seeks to invite attentiveness in order to cultivate a way of seeing that is slow, sensory, and reverent. It is a companion for those who walk not to arrive, but to witness.

Keywords: Eastern Deciduous Forest, Forest Encounter, Attention Restoration Theory, Forest Dynamics, Forest Phenomenology

#570 Not Just a Trail: Activating Athens' Greenway for Community Life

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Abstract

Greenways are versatile tools for advancing sustainability, linking mobility, ecology, and community within a single corridor. They can strengthen local economies through recreation and cultural tourism, conserve natural areas, mitigate flooding, and provide inclusive spaces that promote healthier living (McDonald & Brown, 2015; Zhang, Stewart & Chan, 2023; Bryant, 2006). Yet many greenways remain underutilized and fall short of their intended goals. One such case exists in Athens, Georgia (USA), where the greenway experiences limited engagement, recreation, and identity. By reimagining the corridor through more flexible uses, community-driven programming, and partnerships that highlight local identity, the Oconee Rivers Greenway has the potential to function as an activated civic space that delivers strong social, economic, and environmental returns for its surrounding communities. To identify opportunities for activation, this study applies an Asset-Based Community Development (ABCD) framework (Green and Haines, 2016). The framework maps existing community assets, organizations, partnerships, cultural institutions, and ecological resources. It also evaluates different forms of capital, including social, cultural, human, political, environmental, physical, and financial, in order to identify strategies that can strengthen development. The ABCD framework is used to interpret economic, social, and environmental research related to greenway activation and to guide a comparative case analysis of three established greenways: the Atlanta BeltLine, Greenville's Swamp Rabbit Trail, and Charlotte's Little Sugar Creek Greenway. This analysis examines how different activation strategies influence use patterns, community identity, and local economic development. One strategy emerging from this assessment is the introduction of micro markets, designed to support local entrepreneurship while promoting the greenway's environmental vision, preserving its wildlife corridors, and maintaining its role as a recreational space. When paired with targeted programming and design interventions, micro markets can foster community development, respond to user needs, and create welcoming civic spaces that enhance ecological, social, and cultural functions. Markets and street vendors contribute to economic and community development by offering flexible, small-scale entrepreneurial opportunities, providing creative responses to local challenges, and serving as social spaces that foster interaction and local identity (Morales, 2009). Whether temporary or ongoing, micro markets can function as business-incubator spaces that strengthen the local economy, meet user needs, and support the greenway as a thriving ecological and recreational corridor. By applying these insights to Athens, the study reframes greenway design: sustainable greenways are not only preserved ecological corridors but also dynamic urban platforms that support local economies, enhance community life, and foster everyday civic engagement.

Keywords: Green Infrastructure, Sense of Place, Sustainable Design, Economic Development, Community Urban Design

#578 Shaping Urban Environments for Children: Affordances in Theory and Practice

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Abstract

Urban spaces, as complex social units, are an integral part of each child's life and provide a range of opportunities. The concept of affordance (Gibson, 1979) is a useful tool to describe environmental features through active recognition of information, which affects individuals and groups differently depending on their activities (Kyttä, 2002). This theory has been refined by researchers studying children's environment . Foundational work on affordance theory by Heft (1988), Fjørtoft (2001), and Kyttä (2002), has since been extended by others to encompass cognitive development, play, physical activity, socialization, and risk-taking (Kleppe, 2018). Most previous studies in this area, however, have focused on assessing affordances or analyzing them without translating findings into practical design solutions. This research aims to shape the urban landscape to align with children's skills by enabling independent movement (Kyttä et al., 2018). The following questions were examined: Which factors facilitate the formation, development, and enhancement of children's affordances? How can urban environments be designed or transformed to enhance these affordances? Building on prior research on Child-Friendly Cities, we examined variables across three categories of affordances: social, functional, and emotional. Social variables included communal activity, social identity, and control/restrictions; functional variables covered physical needs, access to services, attractions, play, and interaction with nature; and emotional variables encompassed climate and air quality, cleanliness, aesthetics, safety, and auditory environment. This study faced limitations, including time constraints in data collection and limited parental cooperation. Findings revealed that enhancing functional affordances improves social and emotional affordances, while improvements in social or emotional affordances further strengthen evaluations of functional affordances. If spaces are functionally supportive, children gain more opportunities for social interaction and develop positive emotional connections. Conversely, when children feel socially engaged and emotionally comfortable, they are more likely to recognize and use functional qualities, further supporting independent mobility. affordance theory allowed this research to be approached from two angles: the influence of the environment on the child and the role of the child within the environment. In this study, the environment was not only examined but also addressed through practical solutions presented in guideline tables. These guidelines, organized into three categories from both the child's and the environment's perspectives, help landscape architects and urban designers implement affordance theory effectively in practice. This approach can also be applied across various scales and settings to create more effective child-centered environments and ensure multiple aspects are addressed in the design process.

Keywords: Children, Social/Functional/Emotional affordances, Practical guidelines, Urban environments

#581 Cultivating Wellness: The Effect of Community Garden Features on Social Cohesion and Maintenance for Garden Vitality in Lansing, Michigan

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Abstract

As more US citizens embrace urban living, many are going back to their roots with community gardens. Glover et al. (2005) define a community garden as “an organized, grassroots initiative whereby a section of land is used to produce food or flowers or both in an urban environment for the personal use or collective benefit of its members.” Specific features, such as paths, trees (Lanza et al., 2021), disability-led design (Tigere and Moyo, 2022), and culturally relevant foods (Gray et al., 2022), have been reported to directly influence user engagement. Likewise, the location of community gardens and their motivations have a positive impact on social cohesion (Veen et al., 2016). However, a lack of research surrounding which design features enhance garden lifespan, social cohesion, and ease of maintenance — or garden vitality — inhibits the continued operation and future of community gardens. In partnership with the Greater Lansing Food Bank (GLFB), this study examines community garden features in Lansing, MI, through in-person site visits and a multilingual survey. The research aims to inform and guide future garden initiatives, providing practical resources such as a guide for residents who wish to create new gardens and inventory data to support the GLFB’s ongoing work. The study focuses on participants in GLFB’s community garden project, which includes over 50 community gardens classified as donation, grow-your-own, and school-style gardens. Physical design features were documented through field observations and, following a previous study (Bradley et al., 2014), while non-physical community garden aspects, such as recipe exchange, highlighted in a previous study (Gray et al., 2022), were also recorded. From Summer to Fall 2025, inventories of gardens were completed with support from local garden leaders. Then, design features were categorized for use in a survey to measure the effect of community garden features on social cohesion. This study will present the final findings from both qualitative and quantitative approaches to address which design feature categories contribute to social cohesion and/or maintenance ease for all combined gardens. As the study analysis will be conducted in Spring 2026, results are currently unavailable. Findings will be concluded in January 2026. Research will be presented to the GLFB for practical guidance with new garden initiatives, providing present and future gardeners with insight into increasing garden vitality.

Keywords: Community garden, Garden vitality, Community-led design, Landscape design features, Social cohesion

#620 Embracing Economic, Cultural, and Environmental Changes for the Future: Community Engagement and Planning in Amonate, Virginia

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Abstract

Amonate is an unincorporated community in Tazewell County, Virginia. It was a “coal camp” built in 1920 by Faraday Coal & Coke to serve Mine #31, a facility within the Pocahontas Coal Field—a large area that encompasses considerable portions of West Virginia and western Virginia. In 1923 Pocahontas Fuel Company took over the operation and constructed most of the buildings in Amonate. Dozens of these small "coal camp" company towns were built throughout Appalachia. Amonate rose to flourish during coal mining’s heyday, then slowly declined as the world became less dependent on coal. Mine #31 closed in 2012. As residents sought opportunity elsewhere, small businesses were shuttered and several houses sat vacant. Today, two original church structures and fifty homes remain standing—a testimony to the resilience of this underserved community. The remaining landscape infrastructure and buildings are considered noteworthy for their coal heritage connections, as is Amonate’s ‘coal camp’ layout. However, the town faces significant challenges; it is in an isolated rural area with no cell service, emergency services are at least 40 minutes away, and most people must find employment a significant distance from their homes. How might place-based and participatory-design practices inform a collaboration between residents of Amonate and a university-based multidisciplinary design team foster positive economic, cultural, and environmental changes? This work-in-progress project has worked with residents to record oral histories that have been made into a documentary, are in the process of conducting a complete architectural survey of the town, done LiDAR scans of town structures and model home interiors for the archives. This past summer, the team hosted three community engagement workshops to elicit resident visions of the future for Amonate that have resulted in four priority projects: renovate the historic Methodist Church (1935), seek funding opportunities to install better emergency cell service infrastructure, address water quality concerns in the town creek, and design a memorial to the local coalminers. Forthcoming community engagement workshops will inform a town master plan that is generated through participatory design and development guidelines which will identify short-, mid- and long-term objectives for town planning and economic resiliency. When completed, this project hopes to serve as a model for place-based community engagement and participatory design practices for other rural underserved communities.

Keywords: coal camp, Appalachian coal mining history, community engagement, participatory design, company town

#621 The Escambia Experimental Forest and the Afterlife of Experimental Landscapes

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Abstract

The Escambia Experimental Forest, a 3,000-acre field laboratory established in 1947 near Brewton, Alabama, embodies a mid-20th-century vision for ecological and economic renewal through forestry. Conceived by the U.S. Forest Service in partnership with T.R. Miller Mill Company, Escambia was designed to test whether longleaf pine (Pinus palustris), once dominant across the southeastern coastal plain, could be restored as a viable timber crop and foundation for rural prosperity. By the 1940s, longleaf forests had been drastically reduced by logging, fire suppression, and the rise of faster-growing loblolly (Pinus taeda) plantations. Escambia's location within the longleaf belt and its second-growth forest made it an ideal site for experimentation. The forest's design reflected two ambitions: to discover whether longleaf pine could compete commercially with loblolly, and to offer small landowners a model for profitable, ecologically resilient forestry. Forty-acre plots tested distinct management techniques, varying in planting densities, fire regimes, thinning schedules, and harvest cycles. Each plot was a discrete experiment balancing productivity and ecological function. The result was a mosaic of forest structures, from dense plantations to open savannas, abstractions of historic longleaf ecosystems shaped by fire. Today, Escambia's original vision lingers in suspension. In 2019, the Forest Service chose not to renew its lease; all experimental activity ceased. No new data has been collected, yet the trees persist, each plot evidencing its management history. Walking the forest reveals abrupt transitions. Overgrown, shaded patches give way to vast savannas, each with distinct qualities of light, sound, and understory life. The grid of experimental plots, once a rational framework for rural uplift, now reads as a haunting afterimage of silvicultural ambition. As test plots and research landscapes proliferate across the discipline, this paper will examine Escambia's unfinished experiments, prompting landscape architects to reconsider what it means to embed inquiry into the landscape. As in landscape architecture, forestry's priorities shift with policy, economic forces, and evolving ecological theory, yet trees grow slowly, outliving the foresters who planted them. Longleaf pine takes forty years to mature; succession unfolds across generations. Yet institutional and capital-driven agendas rarely extend beyond a decade. Thus, this paper will draw upon fieldwork in Escambia and interviews with the foresters who stewarded this landscape for decades, prompting a call to action for landscape architects: to design and advocate for research landscapes that might endure beyond short-term agendas, to theorize their afterlives, and to commit to questions that require patience and resilience.

Keywords: Experimental forestry, Forest management, Timescape, test plots, research landscapes

#631 Electric Micromobility in National Parks: Planning, Design, and Management Implications

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Abstract

As electric vehicles (EVs) become widely available, so has broader adoption of electric micromobility devices. Electric micromobility include any light-weight, low speed, electric-powered transportation device, including electric scooters and electric-assist bikes, commonly known as e-bikes (US DOT, 2023). Electric micromobility is particularly attractive in settings that are characterized by high levels of congestion, relatively short travel distances, and regulatory and physical constraints on the feasibility of using other conventional transportation modes. Moreover, for users with physical limitations, electric micromobility devices can be attractive alternatives to walking or riding traditional bicycles in topographically challenging situations. Traditionally employed in dense urban areas and physically constrained limited access environments such as airport and theme parks, electric micromobility devices have unique potential to meet personal transportation needs in national park settings. This study examines the opportunities, constraints, and implications of implementing electric micromobility in national parks, particularly in the context of land management policies. This NSF-funded study evaluates existing public lands policies for defined opportunities and constraints of integrating electric micromobility devices in public lands broadly, and within selected national parks. Through direct content analysis of public land management agency policies, evaluation of the physical contexts of select national park sites, and analytical synthesis, this study provides insights for public land managers, planners and designers of national park visitor amenities, as well as the gateway communities located in close proximity to public lands. Electric micromobility has potential to for both positive and negative impacts on visitor experience in national park settings. Broad adoption of electric micromobility has the potential to relieve congested vehicle entrance points and reduce visitor wait times to enter highly-visited national parks, while allowing more personal space and individualized itineraries than shuttle busses. However, broad adoption of electric micromobility also poses other challenges for the management of highly visited public lands, particularly in settings that were designed only for traditional transportation modes. To mitigate these issues, park entry routes and access points to high-traffic points of interest should have dedicated bike paths separated from vehicle travel lanes, to avoid additional congestion and conflicts between e-bikes and larger vehicle traffic. Additionally, electric micromobility may be most appropriate for national parks where gateway communities are situated directly adjacent to park entrances rather than those situated far from visitor accommodations. Electric micromobility has the potential to impact—positively and negatively—visitor experiences in heavily visited national parks.

Keywords: electric micro mobility, e-bikes, National Parks, Gateway Communities

Research Methods

#61 The Opportunities and Challenges of Conducting Scientific Research for Junior Faculty in Landscape Architecture

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Abstract

Scholarly productivity and research activities have increased in North American landscape architecture departments in the last two decades, which correlates with the rising number of landscape architecture professors with PhDs (Milburn & Brown, 2016) . Today, it is common for new tenure-track hires in landscape architecture to hold doctoral degrees. Meanwhile, the expectations for scholarly achievements have also been increasing in the discipline (Ozdil, 2021) . As the discipline shifts from being largely practice-based to increasingly research-oriented (Brown & Corry, 2011; Milburn & Brown, 2016; Park et al., 2022; van den Brink & Bruns, 2014) , junior faculty frequently pursue scientific research with impact both within and beyond landscape architecture. This panel brings together tenure-track and early-tenured junior faculty members with PhDs employed in US landscape architecture and planning departments to reflect on the opportunities and challenges of conducting scientific research both as individual researchers and in leading and participating in interdisciplinary research teams. The panelists include landscape architecture faculty working within and across the physical and social sciences. We focus the conversation specifically on scientific research, which is one type of research pursued by landscape architecture faculty. For the purposes of this panel, scientific research means research with landscape architecture faculty in key methodological roles that produces results that are publishable in high-impact journals and make significant scholarly contributions both within landscape architecture as well as other scientific fields, for example urban planning, sociology, environmental psychology, geography, environmental sciences, and data science. Landscape architecture offers unique opportunities for innovative, creative, and interdisciplinary inquiry but it also poses challenges. These include balancing teaching and research workloads, pursuing complex grant proposals, mentoring and training students, managing varied disciplinary norms, strategizing contributions to multiple disciplines, and addressing limited external awareness of landscape architecture as a discipline. Moreover, today's sparse and competitive funding outlook poses additional challenges that prompt the need to revise research strategies, such as shifting to self-initiated projects or leveraging teaching assistants to train graduate students, although these strategies can create additional burdens on faculty. By sharing our personal experiences as researchers, this panel aims to foster dialogue about the realities of pursuing scientific research in landscape architecture. We seek to establish a forum to create community and find innovative ways to continue conducting scientific research in the current funding environment. Ultimately, we are interested in helping to advance research in landscape architecture and expanding the engagement of landscape architecture with other disciplines within research universities.

Keywords: Tenure track, Academia, Research, Science, Grants

#102 Adapting and Validating the COMFA Model for Older Adults in Outdoor Environments

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Abstract

Introduction: With aging, older adults experience physiological decline, impaired thermoregulation and altered thermal comfort. Most existing outdoor thermal comfort models are calibrated for younger adults. As the population ages, outdoor spaces must be planned and designed with special attention to the distinct thermal comfort requirements of older adults. This paper modifies and validates the COMFA model ("COMFA-elderly") that integrates age-specific physiological, psychological, and psychological parameters, thereby enhancing the accuracy to predict outdoor comfort conditions for older adults. Methods: The COMFA (Comfort Formulas) model is based on the principles of whole-body energy balance and thermoregulation from Brown and Gillespie (1986). Key physiological terms were revised to reflect older adults' lower metabolic rates, slower sweat production, lower cardiac output, and different body composition. Equations for resting metabolic rate, tissue resistance, and evaporative heat loss were adapted using established biophysical models and meta-analysis of older–younger physiological differences. A nine-month field study with older adults (n≈100, age ≥ 60) was conducted across four seasons in public parks and age-friendly communities in Madison, WI. Data collection combined (1) microclimatic variables (air temperature, humidity, solar radiation, wind speed), (2) physiological responses (heart rate, skin temperature), and (3) subjective thermal comfort votes (thermal sensation, acceptability, preference). Two-thirds of observations will calibrate COMFA-elderly; one-third will provide independent validation. Planned analyses include prediction-error metrics (RMSE, mean bias error), agreement statistics, and sensitivity tests quantifying contributions of metabolic, evaporative, and radiative terms. Results: Preliminary analyses show that COMFA-old greatly improves predictive accuracy for older adults compared with the original COMFA model. Older adults demonstrated heightened sensitivity to wind and solar radiation. The validated COMFA-old model predicts narrower comfort envelopes and higher cumulative heat storage compared to younger cohorts, reflecting age-related vulnerabilities. Discussion: This methodological advance demonstrates the necessity of population-specific model adaptation in outdoor comfort research. COMFA-elderly combines biophysical accuracy with empirical validation to provide a practical tool that connects microclimate design to the health of older adults. The model defines age-related thermal comfort zone and offers practical measures for assessing thermal environment in outdoors, supporting age-friendly microclimate design. Conclusion: The COMFA-elderly model expands thermal comfort modeling by addressing physiological characteristics of older adults. Its validation provides stronger support for inclusive outdoor design and offers a practical tool to guide year-round access to thermally comfort parks and green spaces.

Keywords: Thermal comfort, COMFA-old model, Older adults, Outdoor environments

#134 A Systematic Review of Evaluation Methods for Constructed Wetlands in Cold Climates

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Abstract

Research on constructed wetlands (CWs) in cold climates has expanded in recent years, driven by persistent uncertainties in treatment performance under low temperatures, freeze–thaw cycles, and variable hydrological regimes (Wu et al., 2023; Hao et al., 2025; Jiang et al., 2025; Ebrahimi Gardeshi et al., 2024; Zhang et al., 2025). Although technological adaptations, such as insulation, aeriation, and optimized plant-substrate configuration, have been proposed (Stentella et al., 2023), their demonstrated effectiveness depends fundamentally on the methodological frameworks used to evaluate CW performance (Liu et al., 2024). Yet, these methodologies have not been systematically synthesized. Existing studies employ diverse approaches, including controlled laboratory experiments, pilot-scale prototype installations, full-scale operational monitoring, and increasingly, computational modeling. Each method offers distinct strengths: experiments isolate specific mechanisms by reducing environmental variability, field studies capture ecological and operational complexity, and modeling extends predictive capacity under variable climatic conditions. Simultaneously, each presents limitations in external validity, scalability, or experimental control. A systematic comparison of these approaches is essential when study design, sampling frequency, and model validation protocols directly affect estimates of nutrient removal efficiency, hydraulic retention capacity, and system resilience to freeze-thaw perturbations. This review study applied Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines to peer-reviewed literature published from 2020 to 2025 to analyze how methodological frameworks influence knowledge generation on CWs in cold climates. Literature searches were conducted across the Web of Science, Scopus, Taylor & Francis, and Springer databases using the following search string: ("constructed wetland" OR "artificial wetland*") AND ("cold climate*" OR "cold region*" OR "freeze-thaw" OR "low temperature*) AND ("methodology" OR "methodological framework* OR "experimental design" OR "field study" OR "pilot-scale" OR "full-scale" OR "modeling" OR "simulation") AND ("nutrient removal" OR "phosphorus removal" OR "nitrogen removal" OR "treatment efficiency" OR "water quality" OR "pollutant removal")*. After initial screening of titles, 350 studies were retained for abstract review, which was subsequently narrowed to 86 articles for full-text analysis. To minimize bias, all reviews were conducted independently by two trained reviewers. By synthesizing insights across experimental, field-based, and modeling studies, we identify strengths, limitations, and complementarities, highlighting where biases constrain interpretation and where integration enhances methodological robustness. The findings underscore the need for multi-scale, cross-method evaluation strategies that couple mechanistic experimentation, long-term monitoring, and predictive modeling. Such integration is necessary to advance evidence-based, climate-resilient CW design and operation in northern and alpine regions increasingly challenged by seasonal and long-term climate variability.

Keywords: Constructed wetlands, Cold climate, Low-temperature effects, Methodological framework, Research methods

#148 A Hybrid Deep Learning and NDVI Threshold Approach for High-Resolution Urban Greenspace Classification

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Abstract

Accurate mapping of urban greenspace is essential for landscape planning, environmental monitoring, and decision-making related to green infrastructure. Traditional vegetation index thresholding methods rely on subjective parameter selection, while deep learning approaches often require large labeled datasets and may struggle with vegetation exhibiting non-green hues. This study presents a hybrid framework that integrates NDVI with a deep-learning segmentation model to leverage the strengths of both approaches. We fine-tuned a previously trained model—originally developed using imagery from a study in China—using an additional 122 NAIP training images from Utah, supported by patch-based sampling and transfer learning. The model was then applied to derive an optimal NDVI threshold for producing a binary greenspace/non-greenspace classification. To support practical implementation, we developed a fully automated Python workflow that performs the complete classification process from model inference to NDVI threshold optimization. The hybrid model enables classification of super-high-resolution (0.6 m) satellite imagery, providing detailed urban greenspace maps that are currently rare in landscape architecture research. Applied to 2021 NAIP imagery for the State of Utah, the model outperformed standalone deep learning and NDVI thresholding, improving overall accuracy by 2% and Kappa by 3%, representing meaningful gains for statewide vegetation classification. The method is particularly effective for vegetation with yellow, purple, and red hues and is designed to generalize to NAIP-like multispectral imagery in other regions. By offering reliable, fine-scale greenspace mapping with minimal manual supervision, this work supports landscape architecture practice in urban ecological assessment, climate-resilience planning, and evaluating spatial equity in access to vegetation.

Keywords: Remote Sensing, Image Classification, Vegetation, Land Cover, Greenspace

#205 Measuring Utilization and Equity of Streetscape through Crowdsource and Vision-language Models

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Abstract

As cities strive toward greater equity, streetscape as an integral part of cities, are increasingly recognized not just as transit routes, but as critical social infrastructure (Jacobs, 1961) , yet systematic evaluation frameworks remain inadequately developed (Salazar-Miranda et al., 2023) . Assessing the equity and inclusiveness of streetscape is constrained by three limitations: (i) reliance on proxy indicators (Loo & Fan, 2023) , (ii) non-real-time, discontinuous street-view imagery that lacks the granularity (Wang et al., 2024) , and (iii) uneven user-generated traces that are sparse, selective (Guo et al., 2024) . This study introduces a low-cost, data-driven framework to evaluate the utilization and inclusiveness of streetscape using crowdsourced street videos and vision-language models (Zhang et al., 2025) . We develop a crowdsourced data collection method based on delivery riders. Prior to of collection, communication with the local police department was established. We also obtained formal institutional ethics approval. Eventually, we collected over 220 hours of real-life street videos and construct the largest fine-grained dataset of pedestrian street activity in Beijing. Subsequently, to analyze who uses the streets and how, we develop the “ LLaVA-PI ” model , a hybrid vision-language model. The model integrates DETA with a Swin-L backbone and a fine-tuned LLaVA-OV, enabling pedestrian identification by age group and behavior. Unlike traditional models, LLaVA-PI achieves high precision in interpreting complex pedestrian activities in real-world contexts (F1: 0.958). We observe individual activities at the street level and scale them up by composing contiguous street segments into regional units. The main findings are: (1) At the individual level, adults dominate both volume and activity diversity. Children and the elderly are systematically underrepresented across large portions of the street network, even in vibrant areas (Gehl, 2013) . (2) At the street level, there is a spatial mismatch between pedestrian flow and residential population. (3) At the regional level, spatial advantages and resources are concentrated in select areas at the expense of broader equity (Soja, 2009) . These findings point to a troubling mismatch between urban utilization and inclusiveness. This study introduces a novel framework that uses real-time data to evaluate the utilization and inclusiveness of streetscape, aiming to diagnose spatial inequalities in public street life. This micro-scale perspective reframes streetscape equity as the fair distribution of spatial opportunities, offering an empirical basis for understanding spatial injustice and advancing environmental justice research. The results call for a rethinking of urban design and policy to ensure that the right to the streetscape is shared by all.

Keywords: Pedestrian behavior, Vulnerable groups, Public street spaces, Social justice, Computer vision

#232 Narrative Mapping as Method

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Abstract

The narrative map that serves as a primary research method and qualitative nontextual analytic technique for my doctoral study of migrant farm labor in Community Supported Agriculture (CSA) is presented here in a format that takes the viewer through the process of discovering and establishing coordinates across and between geographic, temporal, personal, social, and sometimes imaginary spaces. As a method of critical cartography that cuts across multiple disciplines of social sciences (Lapum et al., 2015), the application of narrative mapping to this study of two farms and the local communities they serve provides a framework and performative practice through which to explore and answer research questions of visibility, class, care, and community maintenance. In this case study, my use of narrative mapping systematically disarticulates in order to rearticulate both the space and practice of CSA by centering the experience of those engaged in migrant farm labor. In other words, the work centers those whose stories are, more often than not, omitted. As research practice, narrative mapping allows for “immersion in the particular” (Grabel 2018, qtd. In Roelvink, 2020, p. 459) within which a multiplicity of landscape readings can quite literally inhabit the same page, amidst which the relationality of often disparate and non-linear things can be discovered. It makes possible visual communication of a mutually constituted landscape of emerging, converging, overlapping, and diverging entanglements that are on the one hand bound by time and place, and, on the other, refuse to be bound by either. And while the audience can be asked to read particular stories across the layers of such a map, the narrative presentation of layered data is also intended to “foster imagination and curiosity” (Lapum et al., 2015, p. 2) toward stories continuing beyond the research at hand and toward possible futures. With this in mind, I present my approach to narrative mapping as an interdisciplinary method and technique that can be fitted for a wide range of geographically engaged projects. More specifically, and as an educator in landscape architecture, I am interested in the development and application of this methodology in the discipline, particularly as it relates to studio projects. Given the baseline capacity of narrative mapping to collate and convey multiple and simultaneous stories, it is well-suited to inform all phases of the design process for projects that are asked to respond to and design with myriad – sometimes vulnerable – social, cultural, and ecological constituencies.

Keywords: narrative mapping, critical cartography, relationality

#269 Assessing Coastal Urban Landscape Ecological Health: Spatiotemporal Dynamics and Planning Implications in Weihai, China

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Abstract

China's urbanization is undergoing a critical phase of qualitative upgrading and structural transition. Coastal cities, however, continue to face significant challenges, including habitat fragmentation, diminishing green spaces, and declining ecosystem services. Research into landscape–ecosystem health has therefore become essential for the sustainable development of coastal urban regions. This study focuses on Weihai, a coastal city in eastern China, and uses eight temporal datasets from 1990 to 2023, covering land use, natural environment, and socioeconomic attributes. Drawing from systems theory, human–environment coordination theory, landscape ecology theory, and sustainability theory, we developed a pressure–structure–process–function (PSPF) framework and integrated it with GIS-based spatial analysis to evaluate landscape ecological health (LEH) and examine its spatiotemporal evolution. The analysis reveals that from 1990 to 2023, the mean LEH index follows a fluctuating upward trend. Spatially, Weihai's landscape has evolved from a "low-quality matrix with localized repair and gradient evolution" to a "networked distribution of high-quality units with citywide coordinated improvement." This transition reflects not only steady enhancement of LEH but also narrowing disparities among ecological units. The results highlight areas where ecological restoration, coastal buffer zones, and green infrastructure need improvement, as well as areas where existing planning and development measures have effectively strengthened landscape resilience. For landscape architecture practice, the PSPF-based assessment provides a decision-support tool that can: (1) identify priority areas for habitat restoration and ecological corridor design, (2) guide urban expansion and waterfront development in alignment with ecological carrying capacity, and (3) refine strategies for open-space, park, and coastal protection planning at multiple scales. By integrating a clear conceptual framework with operational spatial analysis, this study provides both an empirically grounded case study and a transferable approach for diagnosing and guiding ecological construction and sustainable landscape planning in coastal cities.

Keywords: landscape ecological health, assessment system, Coastal Urban Sustainability, PSPF Framework, Ecological Restoration and Planning

#320 Divergence and Synthesis of the Notion of ‘Practice’ in Practice-Based Research

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Abstract

Recent enthusiasm for ‘practice-based research’ (PBR) in North American landscape architecture risks a significant divergence from the established global discourse. While the North American context frames PBR as research conducted within professional firms to address wicked problems (Barnes, et al., 2024), a wider body of literature understands it as a critical inquiry into the creative ‘doings’ of the practitioner themselves (van Schaik, 2011). Practice as a location vs a doing. The former addresses external project-based problems while the latter investigates the nature of a designer’s own methods. This paper addresses a critical knowledge gap: the lack of a synthetic framework to unify these divergent approaches. The utility of this research is to prevent disciplinary bifurcation, as the cost of divergence, and potential lack of convergence, needs to be recognized. Practice research and related fields like design-as-research remain emerging fields that have struggled for legitimacy, especially in the United States (Davis, 2008; Vaughan, 2017). Bifurcating our efforts in our limited-resource field could prove costly for our shared goal of advancing robust forms of knowledge production. This paper argues that converging these approaches can bolster our disciplinary research capacity, especially given the proximity of the practitioner to the acts of design-research.. A synthetic model is proposed that puts the designerly doings (internal problems of method and technique) in direct contact with the design-research activities of the firm (external problems of application). For example, a firm’s investigation into resilient shoreline typologies would be explicitly linked to a practitioner’s critical investigation of their fieldwork and representational techniques used to understand and envision those shorelines. This allows practice researchers to rigorously investigate both the definition of problems and the creative methods used to interrogate them (van de Weijer, et al., 2014). This proposition is structured on a qualitative, interpretative analysis of prior practice research literature in landscape architecture, wider creative practice disciplines, and the emerging North American discourse. This method involves unpacking and comparing definitional characteristics, investigative methods, and evaluation criteria from these discourses. This analysis culminates in a diagrammatic framework for a shared PBR approach. This framework offers a shared language, enabling practitioners and academics to align their efforts. For this conference of educators, its primary utility is pedagogical. This framework provides a clear and robust structure for teaching design research methods, helping designers bridge the perceived gap between academic inquiry and design research and reinforcing PBR as a legitimate form of knowledge production.

Keywords: practice research, design research, design methods, design epistemology, research by design

#322 Spatial Decision Unit Framework for Multifunctional Green Infrastructure Planning and Optimization: An Application in the Dead Run Watershed

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Abstract

Green infrastructure (GI) not only provides a sustainable alternative to gray infrastructure by reducing stormwater runoff but also enhances multiple ecosystem services (ES) and contributes to a more sustainable urban development strategy. Current GI planning decision-making relies on simulation optimization frameworks that run repeated hydrological simulations to search for optimal GI allocation strategies (Raei et al., 2019; Zhang & Chui, 2018). However, hydrological subcatchment-based optimization methods ignore site-scale spatial patterns of GIs, make it difficult to integrate assessments of multiple ES (Gulshad et al., 2024), and offer little guidance for place-specific planning and design for landscape architects. This study introduces a general-purpose, spatially explicit decision-support framework that formalizes spatial decision units (SDUs), defined as unified spatial units suitable for both decision making and performance modeling, within the GI simulation optimization workflow and harmonizes inputs for both vector- and raster-based ES models to enable multi-model integration. The proposed framework consists of three core modules: 1. an SDU formulation module that defines hydrological response units with practical planning units (e.g., vacant parcels); 2. a compiler that converts SDUs with GI allocations into a general input format compatible with vector-based models (e.g., SWMM) and raster-based models (e.g., InVEST); and 3. a multi-objective optimization module to find optimal GI allocations that maximize multiple ES objectives while minimizing costs. To demonstrate its utility, the framework was applied in the Dead Run watershed in Baltimore County, Maryland, using storm ensembles representing design events with return periods of 20 and 50 years to evaluate GI performance in connectivity, runoff reduction, and habitat quality. Two experiments were conducted to demonstrate the utility of the framework. First, simulation performance was compared and found to be similar between the non-SDU-based SWMM model and the SDU-based model. Second, a spatially explicit, multi-service GI optimization integrating cost, runoff reduction from the SWMM model, and a raster-based ES indicator (habitat quality from the InVEST model) was performed using rasterized SDUs that align SWMM modeling units with the InVEST grid to search for optimal GI allocations that maximize multiple ESs. The integrated objectives produced Pareto-optimal solutions with higher landscape connectivity and improved co-benefits without reducing stormwater performance. This research presents a novel framework for the GI optimization problem that addresses long-standing limitations related to limited spatial guidance and incompatibility with multiple ESs. The framework links hydrologic modeling with multiple sustainability targets, can be adapted across urban contexts, and supports evidence-based, multifunctional GI design and decision-making.

Keywords: green infrastructure, simulation optimization, decision support, ecosystem service, multifunctionality

#335 HOW TO MAKE BRAZILIAN CITIES GREENER:Greening Cities Across Six Biomes

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Abstract

Despite being in the world's most biodiverse country, Brazil's cities have a paradoxical relationship with urban greenery that doesn't reflect what is sustainable for their biome . 1 "How to Make Brazilian Cities Greener" uses both quantitative and qualitative method s to examine the environmental impacts, and social and cultural values of urban greenery in six Brazilian cities, one in each of its biomes. Th is research begins with an examination of the color green , and its perceived social and environmental value within each city examined. This requires asking h ow green space is identified and measured , the costs and benefits of urban greenery in different biomes and strategies to make Brazilian cities greener. To answer these questions, we conducted a multi-city study, using multiple methods from fieldwork practices such as participant observation and spatial mapping of urban conditions to statistical analysis using remote sensing, and census data mapping . 2 This allowed us to examine green spatially, statistically, and narratively . This mixed method approa ch allowed us to examine green through both comparative mapping and site-specific fieldwork. Our initia l liter ature review showed that there was no single standard measure of green across Braz ilian c i ties , leading to gaps in knowledge about the ir ecological health. Through r emote sensing, we conducted color mappings of each city revealing their seasonal color changes , and relationship to urban fabric . An analysis of census data also showed a correlation between income inequality and access to green spaces across multiple cities. Our fi eldwork allowed us to further examine this correlation and understand the social, economic, and urban conditions that lead to this green inequity . Collaboration with experts from universities in the se cities, provided a deeper understanding of existing social conditions and how they relate to the guiding questions of this research. 3 The acclaimed Brazilian landscape architect, Roberto Burle Marx, argued that green areas were essential for "the tranquility and mental health of urban dwellers." 4 He argued: "The important thing is to observe beauty in chromatic relationships," and rightly cautioned that "The successful use of color is one of the most difficult things in the world." 5 Through a combination of novel methods this project re-centers the practice of green urbanism toward a more nuanced understanding of green's many hues and values. This provides a basis for developing a novel greening framework for Brazil that imagines alternative forms of green that are more culturally nuanced, resource-efficient, and environmentally sustainable for a more resilient future.

Keywords: Green, Brazil, Biome, Fieldwork, Color

#407 From Hidden Streams to Flooded Streets: Digitally Daylighting Delhi's Waterways to Map its Flood Patterns

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Abstract

Water bodies are systemically erased from official government maps of Indian cities. Often, this erasure is deliberate— there is no obligation to protect an ecosystem that does not exist. Cities like Delhi flood consistently during the monsoon. This paper empirically tests a correlation between preexisting water bodies and flood zones in Delhi. While this may seem intuitive, there is a lack of accurate, publicly accessible, and easily usable open-source spatial data about Delhi's urban form, creating a barrier to effective research. The first part of this project will generate publicly accessible, well-labeled shapefiles that trace the outlines of Delhi's existing and recently disappeared water bodies. This first, more time-consuming part, will rely on a combination of sources acquired from publicly available archives, Bhuvan, ArcGIS, and Google Earth, including historical and digitized maps, satellite imagery, and existing shapefiles to trace Delhi's rivers, canals, lakes, ponds, and reservoirs, many of which are not spatially documented. These shapefiles, generated in ArcGIS, will then be overlaid with historical flood maps of Delhi as shared by the Indian Space Research Organisation (ISRO)'s geospatial web portal, Bhuvan, and the National (NDMA) and state (DDMA) Disaster Management Authorities. This archival and digital data research will help produce open-source visualizations in the form of digital maps and publications. Preliminary observations show that several flood zones remain constant year after year, pointing to a systemic problem in the city. The goal of this project is to conduct an open-source spatial study to test if there is a correlation between Delhi's flood zones and its water bodies, both existing and recently disappeared. This research would help plug a gap in spatial knowledge about Delhi's waterbodies at a time when the city is deeply water insecure and staring at a worsening hydrological future. Its results will be open-source. This is an ongoing project, expected to be completed in January 2026, and this abstract will be updated with results prior to the conference.

Keywords: Floods, Delhi, Mapping, Open source, Infill

#478 Living Shorelines: A Regenerative Landscape Approach to Coastal Protection and Community Resilience in Bhasan Char, Bangladesh.

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Abstract

Bhasan Char is a newly formed, unstable silt island in Bangladesh which is home for more than one million Rohingya refugees—an ethnic Muslim minority from Myanmar who have fled decades of systematic persecution and violence—suffering from an ecological and humanitarian crisis (Human Rights Watch, 2021). This community faces extreme vulnerability from cyclones and sea-level rise on a landscape of profound precarity (Biswas et al., 2024). This research addresses the inadequacy of traditional, hard-engineered coastal defenses, which are ecologically damaging, prohibitively expensive, and fundamentally unsuitable for the island's dynamic geomorphology (Sutton-Grier et al., 2018). It argues that such static infrastructure fails to address the Rohingya community's extreme social vulnerability (Adger et al., 2005). This study forwards a regenerative model for shoreline protection that is affordable, adaptable, and socially just. This work contributes to the knowledge base by specifically applying principles of Blue-Green Infrastructure to a humanitarian crisis (Hansen et al., 2015), creating a model that intersects coastal resilience with refugee empowerment. Drawing on the work of practitioners like Kate Orff/SCAPE (Orff, 2016) and the "Sponge City" concept (Yu, 2021), the analysis finds that nature-based coastal systems create landscapes that are more resilient, biodiverse, and liveable than traditional engineered solutions. Using a qualitative case study methodology guided by the frameworks of Mark Francis (1999) and Robert K. Yin (2018), So far, this research analyses three international precedents: the habitat-centric Living Shorelines Project (USA), the large-scale mangrove restoration at the Can Gio Biosphere Reserve (Vietnam), and the geology-inspired Cobble Bell (USA). The primary finding from these case study analysis is a design method for protective living shorelines that prioritizes embracing natural processes, layering ecological and bio-engineered systems, and integrating community stewardship. Applying these methods, the primary outcome is a design proposal for an "Island as a System," which synthesizes a protective mangrove buffer with a community-based management framework known as the "Shoreline Stewardship Cooperative." The findings indicate that technical solutions are insufficient without a social framework (Adger et al., 2005). While this study presents a comprehensive design framework, a limitation is the absence of actual data from a built pilot project. This study concludes by offering a framework showing how social factors shape resilience, emphasizing that designing landscapes which empower displaced communities is the most profound way to achieve observable ecological, economic, and social benefits (Cohen-Shacham et al., 2016).

Keywords: Climate Adaptation, Coastal Landscapes, Community Resilience, Ecological Crisis, Living Shorelines

#512 Pollinators as Performance: Standardizing observation methods to bridge design intent and ecological evidence

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Abstract

Pollinators are vital to ecosystem health and agricultural productivity, yet they are experiencing significant decline due to habitat loss, pesticide exposure, and climate change (Potts et al., 2010; Zattara & Aizen, 2021). Within landscape performance case studies, methods for documenting benefits remains inconsistent. A review of previous Landscape Architecture Foundation (LAF) Case Studies revealed that pollinator diversity is often assessed indirectly, through posted observations in platforms like iNaturalist or by identifying whether on-site plants provide pollinator resources. Very few projects employ first-hand observations and replicable field protocols (Corkery 2020). This study reports on methods and findings from the 2025 LAF case study of the Española Healing Foods Oasis, a one-acre ethnobotanical garden in Northern New Mexico. A modified version of the Xerces Society Streamlined Bee Monitoring Protocol for Assessing Pollinator Habitat was used to evaluate whether native and climate-adapted plantings increased pollinator abundance and diversity compared to an unmanaged reference site nearby (Ward et al., 2014). Modifications included compressing observations into a two-month window rather than a multi-year timeframe, limiting surveys to midday hours before summer monsoonal storms, and expanding observations to include butterflies, moths, and wasps. Macro photography supported genus-level identification, verified with field guides and iNaturalist. Observations were consistently recorded along 100-foot transects for 15 minutes each, documenting all pollinator interactions with floral reproductive parts. Results indicated that pollinator visits were more frequent and diverse within the Healing Foods Oasis than the reference site, with floral resources strongly influencing visitation patterns. Although the shortened observation period restricted seasonal coverage, this modified protocol successfully supported the measurement of pollinator diversity and abundance within a limited timeframe. The findings demonstrate the challenges and opportunities for integrating ecological monitoring into design research. For landscape performance researchers this modified protocol provides an accessible entry point that balances rigor and feasibility for studies with a limited timeframe. It also broadly illustrates the potential for a standardized monitoring method that could be incorporated across future LAF Case Studies. This potential standardization could contribute to a more comparative dataset to inform design strategies promoting biodiversity and climate adaptation – moving beyond intention of selecting pollinator-friendly plants to evidence of design choices that support ecosystem health.

Keywords: landscape performance, pollinators, field research, biodiversity, habitat assessment

#622 Shade, Plant Cover, and Soil Moisture Dynamics on Non-irrigated Extensive Green Roofs in Manhattan, Kansas (USA)

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Abstract

To mitigate some of the negative impacts of urbanization, including urban heat island effects and increased energy use, green infrastructure such as green roofs can play a critical role (Dvorak & Coseo, 2021; Perivoliotis et al., 2023; Santana et al., 2023). To maintain a green roof over the long-term, understanding adaptive plant species, regional climate, relationships to architecture and surrounding landscapes, and microclimate are very important (Catalano et al., 2016). In the Flint Hills Ecoregion, maintaining green roofs is challenging because of hot summers with high evapotranspiration rates and prolonged dry periods (Dvorak & Skabelund, 2021). “Can green roof vegetation be sustained without supplemental irrigation?” This question has been asked by researchers (Li et al., 2014; Raimondi et al., 2021; Zhang et al., 2021) and explored in Manhattan, Kansas since 2009 on various green roofs. This research assesses precipitation, vegetation coverage, soil moisture, and temperature dynamics on non-irrigated extensive green roofs atop Kansas State University’s Architecture, Planning, and Design building. Extensive green roofs are used because of their shallow profile, lighter weight, and lower cost. This study explores plant coverage on non-irrigated green roofs by analyzing drone images taken three times in 2025 (July, August, and September) and then using the Canopeo app, which is a green canopy cover analyzer tool (Patrignani & Ochsner 2015). The research team collected soil moisture and soil temperature data in September 2025 using a portable Teros-12 sensor (Cominelli et al., 2024) and accompanying handheld datalogger in more and less shaded green roof areas. Visual observations suggest that there is more plant cover where afternoon or evening building shade comes earlier on green roof areas that are also close to paver sand and drains. Along with the amount of afternoon and evening building shade May to August, the influence of sand below the pavers along green roof edges is explored. Additionally, the locations of roof drains potentially influence plant cover and the height of species such as little bluestem and purple prairie clover. The study examines soil moisture readings in relation to plant cover and height to see if soil moisture levels increase with earlier afternoon building shade and proximity to roof drains and paver sand. This study helps us understand the implications of not irrigating green roofs. Observations indicate that some species of plants can be sustained on unirrigated green roofs in Manhattan, Kansas with no or minimal irrigation if there is sufficient shade and substrate moisture.

Keywords: Extensive green roofs, Plant cover, Soil moisture, Irrigation frequency, Shading

Research by Design and Implementation (LA CES)

#15 Using a Digital Twin to Design and Assess Multifunctional Solar Farms

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Abstract

As solar infrastructure expands rapidly across the United States, concerns grow over its long-term impact on land use and native ecosystems. In Louisiana, where landscapes have been heavily degraded by agriculture and logging, solar development presents an opportunity to restore ecological function within working energy infrastructure(1). While agrivoltaic research has made progress in integrating food crops beneath solar panels, there has been far less attention to the use of native plantings and ecological systems.(2) Existing ecological interventions, such as pollinator strips or wildflower meadows, are a promising start—but they remain limited in scope and design diversity. This paper proposes a method for data-oriented design that integrates native planting into solar farms using a site-specific digital twin. The goal is to create a replicable process that connects ecological decision-making directly to modeled site conditions, reducing risk while maximizing biodiversity, water resilience, and landscape function. The method begins with layered environmental analysis, using site-specific data such as solar radiation, flood behavior, water retention, and soil infiltration. A hydrological model (HEC-RAS)(3) is used to simulate areas prone to flooding or standing water. Simultaneously, solar array geometry is modeled to map zones of full sun, partial shade, and deep shade across seasonal cycles. The resulting environmental matrix becomes the foundation for an ecological planting strategy. Native species are organized into a planting matrix based on light and moisture tolerance, rooting depth, seasonal performance, and ecological function. These species are then matched to appropriate zones in the environmental model. By simulating various rainfall events, drawdown times, and seasonal solar shifts, the digital twin enables the designer to iterate, test, and refine planting scenarios before implementation. In traditional design, planting strategies of this complexity would be difficult to justify without clear evidence of performance. However, by using a digital twin, the process becomes predictive and testable—allowing for both creativity and accountability. The resulting workflow is not only applicable to the case study site, but can be adapted to other locations and land conditions. This paper contributes a scalable method for designing high-performance ecological solar landscapes, offering a new way to integrate biodiversity and climate resilience into renewable energy development.

Keywords: Digital Twin, Solar Farm, Native ecosystems, Ecological design, Native plants

#88 Explorative Scenario Planning for Extraction Landscapes: Design-led progressive reclamation strategies for urban aggregate quarries

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Abstract

Urban environments are made possible through vast networks of urban aggregate quarries (UAQ) which can be found in any city or town around the globe. These quarries extract the material necessary to produce concrete and cement used to construct buildings, roads, and infrastructure. Despite the long-term planning used for their establishment and operation, a UAQ's future tends to be discussed only after extraction has completed. This reactive role leaves designers with limited agency and options for meaningful intervention. This research asks: How can explorative scenario planning reposition UAQs as generative and resilient urban landscapes rather than being merely extractive? UAQ operators are often required to develop reclamation plans as part of consenting process, yet these plans are typically generic, and economically driven to do as little as possible. It is not uncommon for landscape architects to be involved in UAQ reclamation projects after the quarry site has been purchased by the public to resolve a more beneficial and positive future – placing the burden on public funds to enact this rather than the operators. This research argues that through scenario planning, landscape architecture can be repositioned as a proactive force integrated into UAQ operations, facilitating more robust reclamation processes and outcomes. Rather than an uncertain reclamation future, multiple, adaptable futures can be developed throughout the life-of-mine, ensuring that UAQs are not fixed in place post-extraction. Using an explorative scenario planning methodology situated within a larger research-through-design modality, seven scenarios have been explored for three UAQs in the Northern Virginia region. This region has seen explosive growth throughout the 20 th and 21 st centuries which has been made possible through extracting aggregate material from near-surficial igneous intrusions via large UAQs. Rather than predicting what will happen , this approach probes what can happen by illuminating how key external uncertainties (time till closure, normative vs experimental approaches to reclamation, and degree of community collaboration) influence an expanded urbanistic life-of-mine project that can be experimented with through design. The three quarries were selected for scenario development as they represent three key urban context typologies: functionally isolated , potential for a strong connection , and uncertain or ambiguous connections . The work is grounded in an iterative design process that employs plan, section and perspectival studies as both analytical and generative tools. This research demonstrates that UAQs can be active agents in forming their surrounding urban field if critical and speculative design/planning methodologies are employed throughout the life-of-mine.

Keywords: scenario planning, speculative design, urban aggregate quarry, research through design, scenario representation

#142 Beyond the Ground Plane: Translating Landscape-Based Stormwater Management Practices (L-SWMPs) to the Building Envelope

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Abstract

Implementing infiltration-based Green Infrastructure (GI) in shallow groundwater areas, where water tables are 2-3m below the bottom of GI or shallower, presents major challenges that have significantly restricted its widespread adoption (Zhang & Chui, 2019). Recent studies demonstrate that shallow groundwater tables can reduce green infrastructure efficiency due to the shorter distance between the bottom of the GI and the groundwater table, triggering groundwater mounding and flooding that damages nearby underground infrastructure and further compromises GI performance (Zheng et al., 2018) These hydrological limitations are particularly problematic in coastal and deltaic regions, such as [X], where climate change is intensifying flooding risks and aging underground drainage systems are increasingly vulnerable to overloading. This study explores alternative approaches that move beyond conventional ground-based GI systems to enhance urban climate resilience. This research translates landscape-based stormwater management practices (L-SWMPs) from horizontal surfaces to a building façade system, leveraging the vast untapped vertical surfaces abundant in dense urban areas where ground-based water detention is most limited, thereby extending stormwater's travel distance and delaying its entry into overwhelmed drainage systems. The concept, exemplified through an initial physical prototype at [X] utilizes Additive Manufacturing (AM)/3D printed (3DP) ceramics to fabricate building facade components with custom-designed porosity, geometry, and water detention capacity—properties that extend across scales from the micro (material composition) to the meso (panel geometry) to the macro (system performance). This paper outlines the R&D of the components, including test results that quantify the prototype's performance, evaluated using the same standard metrics for assessing GI, including detention time, infiltration rates, and controlled release rates. These testing protocols enable the team to understand the potential impact of the prototype to temporarily soak up and store water as a critical first line of stormwater detention in urban environments. The project ultimately reconceptualizes vertical surfaces of buildings as active participants in urban water management systems, including those that utilize GI. This approach aligns with emerging frameworks for distributed GI that recognize the need for multi-scalar, three-dimensional stormwater management networks (Joyce et al., 2018) that can integrate a plurality of performance benefits. The preliminary findings of this research provide landscape architects with new strategies for achieving watershed-scale stormwater management goals in shallow groundwater and spatially constrained environments, while demonstrating how landscape design performance principles can inform material innovation and evaluation beyond both traditional site and disciplinary boundaries.

Keywords: stormwater, green infrastructure, additive manufacturing, digital fabrication, climate resilience

#225 Research on the Planning and Practice of Natural and Cultural Heritage Corridors in River Basin

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Abstract

The Boertala River Basin possesses remarkable ecological value and profound cultural heritage. It is the main water source for Xinjiang's largest saline-alkali lake (Ebinur Lake), a key ecological barrier in the Tianshan Mountains belt, and an important segment of the ancient Silk Road, with nature and culture jointly shaping its unique legacy. Facing severe threats to ecosystems and cultural heritage from global climate change and human activities, coupled with inherent conflicts between protection and development (Oriaghe, 2023), this study focuses on the basin as its research object. Interviews and surveys with local residents revealed that regional infrastructure construction has exacerbated climate change, triggering systematic ecological degradation such as soil erosion, vegetation loss, reduced biodiversity, and more frequent floods. Climate change has expanded landscape value to include both aesthetic and ecological dimensions. Meanwhile, inadequate protection and presentation of cultural heritage have hindered local tourism development, impeding rural and regional economic growth and forming a vicious circle. To address these issues, the study analyzes from ecological and cultural perspectives. Ecologically, it uses GIS-based multi-source data to assess ecological sensitivity and ecosystem service importance, identifying source areas. The Minimum Cumulative Resistance (MCR) model and circuit theory determine key and sub-optimal corridors, forming an ecological security pattern verified by scenario simulations (Yang et al., 2021). Culturally, it evaluates cultural, tourism, and village resources to locate high-potential nodes, and uses the MCR model to simulate scenic routes, establishing a preliminary cultural corridor network. Five optimization strategies are proposed: soil and water conservation, carbon sequestration and oxygen release, biodiversity enhancement, stormwater management, and landscape path systems (Yu et al., 2021). It integrates blue-green ecological networks with cultural scenic areas to build collaborative dual-heritage corridors (Xu et al., 2019). This study establishes and practices an innovative river-centered planning framework coordinating natural and cultural functions. It explores approaches to realizing landscape value in ecological and cultural protection, offering climate-resilient insights for global basin planning. Additionally, a flexible, customizable node design toolbox (including ecological, cultural, and exhibition components) is developed, enabling other regions to reference and integrate it into localized planning frameworks.

Keywords: River basin, Ecological corridor, Cultural corridor, Scenic path system, Planning framework

#285 How to Examine Landscape Design Basis? A Methodology of Landscape Architectural Programming Based on an Urban Park in Guangzhou, China

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Abstract

The project delivery process for landscape architecture in China typically includes stages of project initiation, client commissioning, design development based on the brief, construction, and final handover. The design brief should be prepared through rigorous and scientific methods, as it functions as the design basis for the project—the comprehensive set of all requirements and constraints to be established before design initiation. In practice, however, the development of design brief often relies more on experience than evidence (Brown & Corry, 2011), undermining the scientific validity and rationality of the design basis (Lin et al., 2022). Taking urban park projects as an example, many parks lack detailed preliminary analysis regarding positioning, type, scale, and layout during the pre-design phase (Xia et al., 2015), leading to mismatches with public needs and management difficulties (Oguz, 2000; Kim et al., 2022). This inadequate examination of the design basis is a common issue in public construction projects globally (McKinsey & Company, 2015). In contrast, architects employ architectural programming (Peña & Parshall, 2012) to help clients analyze project requirements and formulate design briefs during pre-design (UIA-PPC, 2004). While landscape research addresses general design processes (Liu, 1999; Murphy, 2016), proposals, and feasibility studies (Lin, 2010), these focus on whether a project should be done—not what and how it should be designed. This gap underscores the need for a dedicated landscape architectural programming (LAP) phase, where designers and clients collaboratively analyze project scale, nature, positioning, and design requirements before design begins, thereby promoting evidence-based decision-making. This study aims to propose and validate a methodology of LAP—an approach to exploring design basis, which produces a design brief as its key deliverable. First, by tracing and comparing programming development in urban design, architecture, and LA, the definition and attributes of LAP are clarified. Second, the implicit programming processes in existing park cases are identified and synthesized to construct a theoretical framework. Finally, using research through design, the six-step framework (objective setting, real-site investigation and analysis, conceptual and spatial ideas conceiving, objective demonstration, programming representation, and programming evaluation) was applied and tested in an actual urban park project in Guangzhou, China. This process resulted in a practical toolkit of methods, techniques, operational points, and time-cycle tables applicable to each step. The methodology of landscape architectural programming is applicable to all landscape design projects. The toolkit developed in this study is particularly suited for public design projects with diverse stakeholders.

Keywords: design brief, landscape architectural programming, design basis, urban park, research through design

#333 Optimal Calculation Method of Size of LID Facilities for Rainwater Harvesting Green Space Based on NSGA-II Algorithm and Application

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Abstract

In recent years, urban waterlogging caused by extreme weather events such as heavy rainfall and intense typhoons under climate change, coupled with disrupted natural runoff processes from rapid urbanization, has made stormwater management and rainwater recycling crucial for resilient city development. Sponge city planning featuring Low Impact Development (LID) facilities has gained increasing research attention in urban stormwater management. However, current LID implementations face challenges including insufficient multi-objective quantitative criteria for facility layout and sizing, poor interoperability between simulation platforms and design tools, and the need to optimize traditional trial-and-error approaches that prioritize subjective layout decisions over systematic verification. To address these issues, this study establishes an integrated stormwater optimization platform by embedding SWMM engine into Grasshopper parametric modeling environment. This innovation enables real-time feedback between design modifications and LID facility configurations, effectively bridging computational analysis and design implementation. The research introduces NSGA-II algorithm during facility combination optimization, simultaneously considering stormwater control efficiency and construction costs as dual objectives. The Pareto-optimal solutions derived from precise calculations provide cost-effective layout schemes that balance drainage performance with economic viability, overcoming the limitations of conventional methods that neglect resource efficiency. The research team validated this methodology through the stormwater management design for Nanyang Academic Town. Comparative analysis demonstrated that the optimized LID solutions achieved equivalent hydrological performance while reducing construction costs by up to 20.37% compared to traditional approaches. This study proposes a scientific quantitative framework for LID facility layout and sizing in sponge city green spaces, offering optimized strategies for efficient urban stormwater management systems under intensive development scenarios. The workflow advances the integration of multi-objective optimization algorithms with parametric design tools in ecological infrastructure planning.

Keywords: Rain-harvesting Green Space, SWMM, Low Impact Development, Sponge City, Multi-objective Optimization

#376 From Roof to River: Threshold Hydrology Connecting Domestic and Urban Water Circulations

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Abstract

Hydrological responsibilities are often segregated: landscape architecture manages catchment, conveyance, and storage outside, whereas architecture seals envelopes to keep water out. This split fractures flows at property lines and makes household water invisible—leaving residents with little awareness or agency over how water enters, moves through, and leaves their homes. This design research proposes Threshold Hydrology —a seamless flow of water between interior and exterior, so that roofs, walls, rooms, plinths, gutters, stoops, yards, tree trenches, streets, and river edges operate as a continuous field rather than separate disciplines. The work adopts a poetic lens of hydrological intimacy —rain tunes light, humidity, and air; infrastructural rhythms (roof-to-room capture, storage, reuse) and material textures render thresholds as places of care and performance. Methods A research-by-design protocol integrates: (1) Flow tracing as narrative cartography : Drawing annotated plans and time-series sections (event/diurnal/seasonal) that storyboard a raindrop across the transect; Running targeted fixture audits (gutters, pipes, cisterns, valves, wet cores) to locate domestic water nodes and breakpoints at envelopes/curbs/yards; (2) Threshold prototyping 3D assemblies of hygroscopic/capillary assemblies (roof catchment → interior water infrastructures → planted gutters/porous stoops → tree trenches), with logging of moisture buffering, seepage choreography, and maintenance; (3) Aggregating strategies to package parcel-to-block retrofit kits and a pattern library (collect / convey / buffer / exchange), with homeowner guides and policy-ready drawings compatible with municipal stormwater credit/rebate programs (e.g., Chicago StormStore program). Results The project yields a systemic pattern language for threshold hydrology, including: (1) Typology of landscape–architecture seams : an illustrated matrix that classifies where indoor–outdoor systems meet (collect / convey / buffer / exchange) across roofs, gutters, wet cores, plinths, gardens, yards, and rights-of-way; (2) Pattern library : detail drawings that pull architectural elements into green–blue systems (cistern-to-planter, ventilated rainscreen-to-swale, permeable stoop-to-tree trench); (3) Atlas-toolkit : step-by-step drawings and homeowner guides that translate roof-to-river continuity into deployable design. Discussion Putting hydrology first reframes domestic landscapes and buildings as inhabited watershed components , shifting from end-of-pipe control to distributed, scalable practices . It clarifies roles (landscape sets the hydrologic brief; architecture materializes exchanges), supports curriculum integration, and informs permitting pathways for curb-to-catchment retrofits. Limitations include jurisdictional complexity, maintenance cultures, and the need for longitudinal monitoring. Conclusion Threshold Hydrology reconnects landscape and architecture as one hydrological medium. By operationalizing thresholds as hydrologic media, the work advances landscape design and ecology, offers implementable details for practice, and provides adaptable models for resilient, low-energy urban water systems.

Keywords: threshold hydrology, hydrological intimacy, landscape–architecture continuum, domestic hydrology, multi-scalar water flows

#426 From Scenarios to Sections: A Parameter Framework for Sea Level Rise -Responsive Design

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Abstract

While coastal adaptation guidance exists, it tends to be sporadic and inconsistent. Landscape practitioners lack systematic methods to convert sea-level rise (SLR) projections into actionable planning and design strategies. A systematic review of 123 peer-reviewed coastal projects (2010–2024) confirms this translational gap. 95.9% acknowledge SLR yet only 4.1% (n = 5) successfully translate SLR scenarios into quantified design parameters. This study proposes to reverse-engineer these five exemplar projects to extract operational knowledge enabling successful design implementation. Our methodology employs forensic document analysis following established protocols (Bowen, 2009; Yin, 2018), systematically extracting design parameters across four essential dimensions: a) vertical dimension (elevations, freeboard, slopes) defining flood protection levels (Herseth et al., 2012); b) horizontal (setbacks, buffers, vegetation coverage) establishing spatial footprint and wave attenuation capacity (Narayan et al., 2017); c) temporal (phase triggers, monitoring intervals) enabling adaptive management (Haasnoot et al., 2013); and d) ecological (species tolerance, migration space) ensuring long-term functional performance (Schuerch et al., 2018). Vertical and horizontal dimensions define spatial form, temporal enables adaptation, and ecological ensures functionality. We identify translation patterns linking SLR projections to design specifications, codified as IF–THEN decision rules contextualized by site conditions including wave exposure, relative SLR–accretion balance, and migration space availability. The extraction protocol applies predetermined categories while transparently documenting gaps using standardized notation (NR = not reported, NA = not applicable, ND = not determinable), ensuring reproducibility and acknowledging source documentation limitations. The output is a Sea-Level Rise → Design Parameter Framework (SLR→DPF) providing transferable information for design specification. A proposed Parameter Minimum Reporting Set (PMRS) establishes standards for documentation and peer review, following boundary-object principles for knowledge translation (Cash et al., 2003). Preliminary results indicate shared translation patterns: discrete SLR steps structure scenarios and trigger phases; wave attenuation follows marsh width × vegetation-coverage logic (~50–100 m; ≥50–75% cover); and hybrid shorelines add sediment when accretion lags local SLR. A recurring gap is lack of specified design water levels and freeboard for construction. This research addresses the persistent gap between strategic guidance and implementation in SLR landscape planning and design projects. By systematically extracting and codifying tacit knowledge from successful projects, this framework provides practitioners with evidence-based pathways from climate scenarios to construction documents, positioning landscape architects as essential translators between climate science and spatial interventions – equipping them with reproducible methods for coastal design adaptations that advance beyond conceptual guidance and moves toward buildable solutions.

Keywords: sea-level rise, nature-based solutions, design parameters, landscape resilience, adaptive pathways

#438 Designing a Model Flow: Integrating Predictive AI into Wind Analysis for Rapid Design Decision-Making in Practice

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Abstract

For landscape architecture practitioners, Computational Fluid Dynamics (CFD) simulations are often too computationally intensive and time-consuming to be feasibly used in iterative design, despite their high value for climate-responsive landscape and urban design. This research focused on the potential of AI to accelerate wind analysis, an important factor in environmental comfort. The team utilized open-source artificial intelligence to develop a landscape-oriented, AI-driven model for CFD simulation, with a goal of integrating this model within landscape 3D modeling workflows, creating a rapid feedback tool in the design decision-making stages. This research employs a supervised learning framework using TensorFlow to train a Pix2Pix generative adversarial network on CFD simulations produced in Rhino, Grasshopper, and Eddy3D. Simulations were run at varying wind speeds and directions on a sandbox inputting building massing, topography, trees of varying distribution and canopy structure. This approach generated a robust dataset that served as a front-end learning library, enabling the AI model to associate environmental factors with wind dynamics and predict wind flow and comfort conditions. Model accuracy was tested through quantitative margin-of-error analysis, comparing AI-generated predictions to ground-truth CFD outputs. The current model shows strong alignment except in cases of high complexity as it relates to building, tree, and topographic geometries. However, error rates are within 10% across new cases that were tested, demonstrating that the model can reliably approximate airflow patterns and support design-level decision making. This suggests that AI-based tools can shorten environmental analysis feedback loops for landscape architects, accelerate early design exploration, and reduce computational effort for these types of analyses. The team subsequently integrated this model within a custom interface inside Rhino and Grasshopper, which requires only basic knowledge of Rhino 3D and moderate personal computing hardware. This work demonstrates how environmental analysis research can be embedded in professional practice, offering practical tools for landscape architecture design. While currently limited to wind, the framework establishes a pathway for developing analogous tools for more rapid analysis of other climatic variables, such as solar radiation, humidity and sound pollution. As AI tools become more entwined in the work of researchers, educators, students, and practitioners alike, this research also contributes to discourse on the varying potentials for use of AI in landscape architecture, demonstrating how data-driven models can complement traditional simulation in the pursuit of more responsive, livable urban environments.

Keywords: Predictive AI Modeling, Climate-Responsive Design, Outdoor Wind Environment Simulation, Computational Fluid Dynamics (CFD), TensorFlow

#510 Ecosystem Shifts: Digitally Fabricated Ceramic Substrates for Freshwater Restoration

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Abstract

Ecosystem Shifts is an ongoing interdisciplinary grant-funded research initiative between Landscape Architecture, Architecture, and Interior Design faculty. Through additive manufacturing and parametric design, we are developing 3D-printed clay modular units that facilitate the emergence of resilient biodiverse ecologies in impaired aquatic ecosystems (Zhang et al., 2018; Akinnawo, 2023). By positioning clay as a living interface, this project seeks to catalyze site-specific temporal infrastructures that support emergence, degradation, and decay as an alternative to standardized, inert carbon-intensive infrastructure (Behm et al., 2018; Stefanova et al., 2020). Work is structured in three phases: Phase I evaluates the durability and permeability of variably fired ceramic objects under controlled aquatic conditions; Phase II introduces parametrically defined geometric configurations, seeded with native aquatic plants, to assess ecological metrics; and a future Phase III in collaboration with a community partner will design, fabricate, install, and monitor modules in an impaired stormwater pond. Additional project collaborators include engineers at St. Anthony Falls Laboratory with expertise in laboratory and site-based experimentation, monitoring, and evaluation. We combine a novel theoretical framework with physical making and quantitative analysis, bridging landscape architectural design approaches with ones from material science, computational design, and environmental engineering. Designing for landscape “change-over-time,” allowing opportunities for dynamic and emergent processes (Corner, 2004), along with "unmaking," choreographing the process of decay and disassembly (Song & Paulos, 2021), informs an approach that embraces temporality, transformation, and emergence as productive, designed conditions. Computational modeling tools Rhinoceros 8.0 and Grasshopper along with 3D-printing using a Potterbot 10 PRO allow us to design and fabricate complex, non-repetitive geometries impossible to produce using traditional methods (Esmaeilian, B. et al. 2016). Voids, ridges, textures, and droops, leveraging clay’s intrinsic plasticity, are deployed specifically to support aquatic and semi-aquatic vegetation, promote microbial colonization, collect sediment, and filter suspended nutrients. Bio-based additives, such as biochar, paper pulp, and chitosan, and variable kiln firing techniques introduce temporal material compositions and increased surface porosities to further support emergent ecological processes. This work extends the lineage of digital ceramics into landscape infrastructure and designed degradation, drawing inspiration from biomaterials, 3D-printed earthen forms, and ecologically active soils (Rael & San Fratello, 2018; Akemah & Ben-Alon, 2023; Barnes et. al., 2022). While in early stages, our findings suggest that digitally fabricated ceramics could create viable conditions for rooted vegetation and microbial colonization in freshwater environments. Future work will focus on small-scale installations and interdisciplinary collaborations to refine these strategies under real-world conditions.

Keywords: Design research, Interdiscplinary, Material experimentation, Digital fabrication, Landscape infrastructure

#543 Rethinking Grading Pedagogy: Practice-informed Strategies for Teaching Technical Grading to Novice Learners

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Abstract

Technical grading in landscape architecture is a complex and often under-appreciated pedagogical challenge. As Untermann (1973) observed, grading is frequently approached without sufficient attention to its unique complexities, leaving students uncertain about how to begin, resolve competing design requirements, or recognize a complete solution. This presentation explores how professional practice can inform and enhance the teaching of technical grading to novice learners. Drawing on a career spanning nearly 100 built projects, I reflect on how teaching has illuminated and refined grading methods I once applied intuitively. Through this dual lens of practitioner and educator, I developed four adaptable strategies that address common student difficulties while improving project outcomes, reducing risk, and enhancing firm performance: Spot Skipping – Rapidly clarifies critical relationships, verifies site grading functionality, and flags problem areas. Transect Grading – Refines surface profiles, drainage concepts, and earthwork relationships along selected site transects. Flow Barrier Analysis – Identifies impediments to flow in the proposed hardscape design and proposes micro-grading solutions to accommodate those flows. Flow Branch Analysis – Defines surface and subsurface flow paths and integrates them into the broader grading proposal. These methods were developed then refined through an iterative case study process involving real-world professional projects. Each case was selected for its relevance to challenges commonly encountered by students, such as reconciling design intent with technical constraints or managing uncertainty in grading logic and workload efficiency. By applying the developing strategies to these projects, I tested their effectiveness in resolving complex grading problems, assessed their adaptability across varied site conditions, and observed how they clarified decision-making and fostered efficiency under real project pressures. Insights from these applications were then introduced to student design processes in the classroom, allowing for a feedback loop that sharpened each method's pedagogical potential. Rather than addressing direct curricular implementation, this process demonstrates how intuitive practitioner problem-solving expertise can be distilled into teachable frameworks. Examples from professional projects, coupled with student work, illustrate how these approaches foster clarity, confidence, and competence when learning technical grading. By bridging practice and pedagogy, this paper advocates for a design research approach to technical grading instruction, one that moves beyond simplification and equips students with realistic, methodical strategies for one of landscape architecture's most demanding technical tasks.

Keywords: Design research, Professional practice, Applied pedagogy, Site grading techniques

#577 Coastal Multiple Lines of Climate and Cultural Defense through Indigenous Place keeping Practices

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Abstract

The accelerating loss of coastal land in Louisiana presents an existential threat to Indigenous communities, whose cultural survival is inseparable from their homelands. Technocratic resilience strategies—such as managed retreat—often ignore Indigenous knowledge systems, eroding sovereignty and cultural practices while privileging depoliticized, deculturized, engineering-driven approaches. This research argues that authentic resilience must be rooted in Indigenous place-keeping: the continuance of cultural practices, material technologies, and environmental relationships that sustain both community and landscape. Grounded in a decolonial framework, the project employs “research by design” as one of its primary methodologies, combining experimental material prototyping, digital modeling, and construction with Indigenous community-driven design in selected areas of coastal Louisiana with cultural significance. These experiments investigate how landscape architecture can participate in place-keeping by adapting and honoring traditional material practices. The project engages in co-design with tribal partners to develop, fabricate, conduct fieldwork, and test integrated prototypes such as “oyster castle” assemblages, tabby concrete, bio-composite mats (brushes–basket weaving), and experimental mound-inspired landforms. These prototypes are evaluated through both scientific/design lab testing and community-centered processes. Field-based sediment analysis, hydrodynamic simulation, and material strength testing are combined with in-situ installation of functional 1:1 models to measure performance in terms of structural integrity, sediment accretion, and habitat creation. At the same time, these constructions act as cultural anchors—sites of memory, teaching, and ecological knowledge—ensuring that the process itself becomes a form of material storytelling and place-keeping. Preliminary findings indicate that Indigenous-led material strategies provide effective shoreline stabilization while reinforcing cultural sovereignty and continuity. The research demonstrates that effective climate adaptation requires integrating cultural systems with ecological restoration. By combining Indigenous material technologies, scientific/design experimentation, digital modeling, seasonal performance evaluation and real-scale prototypes, the project offers a model of interdisciplinary, community-driven resilience planning. It concludes that supporting Indigenous-led innovation is essential to confronting climate coloniality and expanding the role of landscape architecture as an ethical, culturally sustaining practice.

Keywords: Indigenous resilience, Material storytelling, Oyster - Tabby Castles , Native Mounds, Climate coloniality

#610 Wheelstop Garden

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Abstract

In many contemporary American cities and towns, there is an abundance of surface parking lots; in these parking lots, concrete wheelstops are ubiquitous. When properly installed, wheelstops sit perpendicular to the painted lines of the parking space. They are heavy and often pinned to the paving surface. They can be manually moved, and they rarely stay in orderly rows. Over time, they often break free from their mountings and drift across parking lots as they are nudged by the repeated force of tires or moved by people; the typical pattern of wheelstops starts to shift. In The Practice of Everyday Life , Michael de Certeau describes the process of making do as utilizing “fragments taken from vast ensembles of production” that people then adapt to solve a different need and “compose new stories with them.” By experimenting with the modularity, installation methods, and placement of wheelstops an unexpected garden engages with this vernacular material that becomes comfortable in a completely different context. This essay will explore photographic documentation of this material as it is used in intended and unintended ways in different American towns and cities. These observations of the cultural practices and materiality of the wheelstop will be linked to the design process for the garden. This process will be explored from full-scale mock-ups, to the installation process with two people and minimal tools, to the built space which includes additional vernacular and reclaimed materials. The wheelstops used in the garden were reclaimed from a scrap pile. They have minor chips and their surfaces are patinaed, but their form remains relatively unchanged from their assumed previous use in a parking lot. The qualities of the unit were explored, but not altered. The Wheelstop Garden could be disassembled, and reinstalled as a parking lot, or reconfigured with the garden. Within a parking space, wheelstops define space and prevent forward motion. In this garden, they define places of rest, but their relationship to the surface changes. The wheelstops are stacked to form low retaining walls; when embedded in the ground, they define a thin edge. In places of movement and growth, the wheelstops flow playfully like pick-up sticks. They are not pinned down, but their weight keeps them in place. In time, these loose lines will gradually shift and move. Economic realities, possible futures, and residual spaces come together to create a predictable pattern in otherwise unexpected locations.

Keywords: wheelstop, garden, modular, reclaim, material

#626 Reclaiming a Cultural Corridor in a Historic Settlement: Integrating Community-Based Solutions and Interactive Landscape Design Strategies

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Abstract

Baton Rouge was home to Native Americans long before French explorer Iberville arrived, and from 1763 to 1812 it came under five different flags—France, Britain, Spain, the West Florida Republic, and finally the United States. In 1879, the Louisiana Constitutional Convention decided to move the state capital from New Orleans to Baton Rouge. Today, many historic sites in the downtown area remain, marked by historical markers. However, modern development has caused many of these historic parts of the city to become fragmented and disconnected from daily life. This project focuses on the historic downtown area of Baton Rouge and its adjacent neighborhoods, identifying underutilized sites and exploring opportunities to transform them into meaningful, culturally significant public landscapes. It explores the reclamation of a cultural historic corridor within the settlement. The research focuses on the question: How can community-based solutions and interactive landscape design strategies transform fragmented historic corridors in Baton Rouge into culturally and socially vibrant public spaces, while fostering justice between land, nature, and humans through active community participation? The methodology applies community-based solutions and interactive landscape design strategies to transform underused or vacant sites into vibrant, community-engaged spaces. It aims to celebrate heritage and strengthen social cohesion by linking historic narratives to contemporary community life. Through this approach, the project envisions a corridor that is culturally and historically meaningful, environmentally resilient, and socially inclusive, offering a model applicable to revitalize historic urban landscapes in Baton Rouge and similar contexts. Key strategies for the historic corridor include linking historic nodes by connecting significant buildings, landmarks, and cultural sites through pedestrian-friendly streetscapes to create a continuous cultural corridor. The project also emphasizes the adaptive reuse of historical infrastructure, transforming underused or vacant buildings and sites into multipurpose spaces that preserve heritage while supporting contemporary activities. Additionally, the design incorporates interactive and playful opportunities, such as outdoor installations, educational exhibits, fitness/play elements, and participatory art, fostering active engagement and enhancing daily use by residents. The project highlights the potential of landscape architecture to connect heritage, ecology, and community engagement in historic urban corridors. By identifying historic sites suitable for adaptive reuse, examining residents' engagement with underutilized spaces, and evaluating green infrastructure's impact on social and ecological health, the study demonstrates strategies for culturally meaningful, socially inclusive, environmentally resilient, and justice-oriented design. The findings offer a model for revitalizing historic settlements while promoting equitable relationships between land, nature, and communities.

Keywords: Cultural Corridor, Community Engagement, Historic Preservation, Landscape Design, Adaptive Reuse

Resilience and Climate Action (new-LA CES)

#37 Measuring Resilience in Urban Leftover Spaces for Sustainable Micro-Scale Renewal

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Abstract

High-density urban cores accumulate “leftover” or remnant parcels that are small, fragmented, and often overlooked in planning. Many of these spaces perform poorly in terms of access, ecology, and everyday use, yet they hold great potential to support climate adaptation and community life. This study introduces the Urban Residual Resilience Index (URRI) as a practical way to diagnose and upgrade these micro spaces through a resilience lens. URRI brings together three pillars—spatial efficiency, ecological performance, and social inclusiveness—while treating local management capacity as a constraint that may limit what can be implemented. Each pillar is supported by a compact set of indicators that translate everyday conditions (for example, how many people can reach the site on foot, how continuous shade and vegetation are, or whether seating and play are inclusive) into comparable scores. Indicators were first drawn from literature and local planning standards, then filtered with correlation checks and expert review to remove redundancy and keep only those that are both meaningful and feasible to measure. Multi-source spatial data—such as aerial and street-level imagery, land-use and facility records, and short on-site surveys—are used to calculate the indicators. A transparent, multi-criteria scoring method then combines them into a single resilience score for each parcel. The workflow is tested in Chaotiangong Sub-district, a compact historic area in Nanjing with a dense network of leftover spaces. Parcel-level maps reveal clusters of low-resilience units where poor pedestrian access, weak ecological continuity, or limited social amenities are the main bottlenecks, sometimes acting together. Based on these patterns, we define several typical “problem types” of leftover space and match each type with small-scale design strategies, such as opening walking shortcuts, adding shade trees and rain gardens, or providing age-inclusive seating and play edges. Simple scenario tests show that these bundles can measurably lift resilience scores and reduce inequalities within the district. By clarifying how indicators are chosen, screened, and combined, the URRI framework makes resilience assessment at the micro scale more legible to designers, planners, and communities. The approach helps practitioners move from a long list of problems to clear priorities and type-specific design responses, and it can be transferred to other dense urban districts facing similar climate and social pressures.

Keywords: Urban resilience, Leftover spaces, Micro-scale renewal, Spatial analysis, Landscape design

#59 Exploring the Influence of Urban Morphology and Green Infrastructure on Outdoor Thermal Comfort in Water-Adjacent Urban Areas

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Abstract

Urban waterfronts are often viewed as natural climate refuges, yet their thermal benefits are shaped by surrounding morphology and vegetation. Water bodies can reduce land surface temperature by 1.5–5 °C within 500–2000 m, but compact morphologies with dense canyons or limited sky view factors frequently diminish this effect (Zhou et al., 2022). In addition, Reviews of urban geometry confirm that height-to-width ratios, orientation, and openness strongly influence outdoor thermal comfort and the mitigation of urban heat islands (Malcoti et al., 2023). Evidence also highlights that integrated green–blue systems are more effective than isolated measures, particularly when river corridors align with prevailing winds (Ampatzidis & Kershaw, 2020; Hathway & Sharples, 2012). Despite these findings, few studies have examined the combined effects of morphology, vegetation, and water proximity in U.S. waterfront settings. This study addresses that gap by focusing on the James River waterfront in Richmond, Virginia. The site is an active urban riverfront where dense development coincides with summer heat stress, offering a suitable context for testing spatial cooling effects. Site-scale field measurements will be conducted in winter and summer, using Kestrel 5500 weather meters mounted at several fixed monitoring points across representative waterfront zones to continuously record near-surface air temperature, relative humidity, and wind speed at pedestrian height (~1.5 m) during representative periods in each season. Complementary GIS-based analysis will derive urban morphology indicators such as sky view factor, height-to-width ratio, building density, floor area ratio, and canopy cover, using local datasets and remote sensing products. To assess microclimate regulation, the study applies ENVI-met simulations calibrated with field measurements to model localized cooling effects under different morphology–vegetation configurations and to test alternative design scenarios informed by recent waterfront microclimate research (e.g., Zhou et al., 2022). Statistical modeling further integrates multi-buffer analysis (200–2000 m) with geographically weighted regression (GWR) to capture spatial variation and boosted regression tree (BRT) models to identify the most influential predictors and their thresholds (Jiang et al., 2021). The expected contribution is twofold: first, to provide precise evidence on how far and under what conditions water bodies extend their cooling influence into the urban fabric; and second, to translate these findings into practical guidance for climate-sensitive waterfront planning. The outcomes will support designers and planners in creating more comfortable, resilient, and livable riverfront environments in cities facing rising heat.

Keywords: outdoor thermal comfort, urban morphology, green infrastructure, waterfront microclimate, ENVI-met simulation

#65 Towards a Place-Based Approach to Identifying Localized Heat Vulnerability Drivers in Belém, Brazil.

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Abstract

Rising extreme heat in rapidly urbanizing contexts demands place-based approaches that center community expertise. Still, many quantitative-heavy GIS assessments overlook the social, cultural, and spatial realities that shape heat exposure on the ground, particularly for residents of favelas and public housing. This study integrates constructivist grounded theory with geospatial analysis to co-develop a localized heat vulnerability model for Belém, Brazil, one of the largest metropolitan areas in the Amazon region. The research foregrounds how heat is experienced and coped with across two contrasting morphologies within the Vila da Barca community: traditional stilt-house palafitas along tidal igarapés and the adjacent public housing development. We conducted 16 targeted interviews, including six residents, eight environmental planners and policymakers, and two public health workers. Their roles were defined so that residents documented their lived experiences of heat, housing materiality, and riverine cultural practices; planners explained the barriers in the city's flood- and heat-adaptation strategies; and health workers contextualized social and environmental health inequities. Thematic coding of these insights guided the translation of qualitative findings into spatially explicit recommendations for the landscape. Preliminary results reveal vulnerability drivers shaped by Belém's humid tropical climate and its urban–riverine dynamics. Favela residents described worsening heat tied to disrupted water access, the deforestation of igarapés, and gray infrastructure drainage works that they feel intensify heat and restrict the cultural use of the water. In contrast, public housing residents described thermal discomfort driven by building density, the absence of shaded courtyards, limited airflow, and extensive use of heat-absorbing concrete and structural masonry compared to the more ventilated wooden palafitas. These themes informed a geospatial prioritization model capable of guiding landscape interventions at multiple scales: (1) at the city scale, an equitable expansion of urban forests; (2) at the neighborhood scale, revitalization of igarapé edges with flood mitigation, environmental education, and culturally relevant waterfront spaces; and (3) at the public housing scale, low-cost bioclimatic strategies such as shaded plazas, permeable materials, ventilation corridors, and thermally comfortable streetscapes. By basing the vulnerability model on residents' and local professionals' knowledge, rather than relying solely on top-down indicators, this approach foregrounds a nuanced understanding of heat vulnerability and how adaptation can better reflect local culture and ecology. Future research will investigate how relocation into public housing impacts outdoor heat exposure, utilizing landscape factors such as green space cooling potential and building density, as well as materials, to inform the analysis.

Keywords: Extreme heat, Vulnerability modeling, Participatory GIS, Favelas, Public housing

#74 Rural Resilience Planning through Diagnosis, Pathways, and Adaptive Capacity

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Abstract

Resilience has become a central theme in planning discourse; however, most approaches remain urban focused (Meerow et al., 2016; Skerratt, 2013). Rural communities, although often socially cohesive, face challenges tied to limited institutional capacity, dispersed geographies, and uneven access to resources (Li, 2023). To address these gaps, this paper presents the Extended Rural Resilience Planning (XRRP) framework, which embeds resilience goals into planning processes. XRRP was created through a synthesis of resilience literature, ecological planning theory, and rural typology research. It integrates absorptive and adaptive capacities with ecological planning phased logic and restructures them to better reflect rural realities. The framework was refined through mapping, document reviews, and an assessment of planning practices in Utah rural regions. Existing frameworks (Steiner, 2016; Levy et al., 2024) provide structured steps for analysis but do not integrate resilience goals. Resilience models (Cutter et al., 2008) describe capacities but remain largely diagnostic and urban oriented. XRRP builds on these traditions by organizing resilience planning into three phases: Diagnostic, Planning Pathways, and Adaptive Capacity. The Diagnostic phase identifies indicators across social, institutional, and environmental domains to clarify strengths and vulnerabilities. The Planning Pathways phase translates these indicators into scenarios and trade-offs, helping communities weigh short-term absorptive actions against long-term adaptive strategies. The Adaptive Capacity phase emphasizes iteration, partnerships, and institutional flexibility, positioning resilience as a continuous process rather than a fixed outcome. The Six County Association of Governments (AOG) in central Utah provides the study context. As a regional planning and coordination body, the AOG supports hazard mitigation, community development, and infrastructure planning across six member counties. It represents a collaborative governance structure where counties with limited capacity share planning resources and regional strategies. XRRP is used as an analytical tool to examine two counties within this region, evaluating social, institutional, and environmental indicators from secondary datasets and planning documents. Analysis reveals three overarching patterns: rural resilience remains rooted in informal collaboration; institutional mechanisms emphasize maintenance and recovery rather than long-term adaptation; and environmental and infrastructural investments are often pursued separately from broader regional goals. While absorptive capacities are strong, adaptive capacities remain underdeveloped, showing the need for more integrated, multi-scalar approaches. The XRRP structure allows communities to substitute locally meaningful indicators and pathways, making it responsive to diverse conditions. It reflects rural community life and provides a model for resilience planning, helping rural communities leverage their strengths to address future challenges.

Keywords: Resilience planning, Planning framework, Adaptive Capacity, Community strengths, Rural resilience

#83 Repairing Historical Fragments: Reimagining Indigenous Legacies for Climate-Resilient Urban Design

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Abstract

Shellmounds, composed of the ancient Indigenous remains, shells and food debris, once stood as sacred burial sites and spiritual strongholds across the San Francisco Bay. Successive waves of colonization and urban development erased many Tribal forms. Their disappearance reflects fractured historical legacies, obscured cultural memory, and the “shifting baseline” by which each generation normalizes diminished traces of the past. Today, while Indigenous people continue to lament this erasure, the city presses forward in its cycle of renewal, leaving Shellmounds as both unique and essential components of the Bay Area and a haunting reminder of what has been lost. This project aims to understand how urban design can restore Indigenous cultural memory and enhance climate resilience at San Rafael’s Gallinas Creek, where imprecisely Shellmounds' sites intersect with projected sea-level rise and ground water flooding. This study asks: (1) How can design restore Indigenous cultural memory? (2) How can design simultaneously enhance climate resilience? Methods included (1) Archival Study of municipal planning documents and archaeological surveys of Shellmounds, (2) Field Research of site topography, hydrological conditions, and remaining cultural traces, (3) GIS Mapping of historical Shellmound locations, projected sea-level rise, and groundwater flooding extents, and (4) Spatial Analysis of overlapping cultural heritage and climate hazard zones. Modeling incorporates NOAA sea-level-rise projections and groundwater data from the ART Bay Shoreline Flood Explorer (Adapting to Rising Tides), strengthening the technical basis for assessing 50-year inundation risk. Indigenous perspectives were incorporated through preliminary interviews with Tribal members, scholars, and ethical use of cultural and archaeological information follows published Tribal cultural resources. Flood modeling indicates that over 60% of the site will be inundated within 50 years. The proposed managed-retreat strategy relocates nearly 700 households at risk by 2050. Balance 386,000m³ of cut and 366,300m³ of fill, protects approximately 400 existing households, also creates capacity for 3,500 new housing units for rehousing displaced residents and providing additional affordable housing. The design suggests a decentralized, interconnected sequence of public spaces that reimagine Shellmounds as sites of remembrance, but also as resilient ecological infrastructure. Establishing a multi-scalar system that re-centers Indigenous narratives within the urban fabric. For practice, it offers design tools that make sea-level rise adaptation simultaneously a process of healing, storytelling, and capacity-building. Ultimately, the project contributes frameworks for integrating cultural heritage, climate adaptation, and equitable housing policy, positioning climate change as both a technical challenge and an opportunity for cultural restoration and collective resilience.

Keywords: Shellmound, Climate resilience, Sea-level rise adaptation, Ecological infrastructure, Reparative urban design

#91 From Suitability to Interventions: Community-Based Geodesign for Coastal Resilience in Virginia

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Abstract

Coastal Virginia faces severe impacts from sea-level rise and more frequent flooding (Moore & Acker, 2018), and risks are projected to grow sharply over the next six decades. In the Hampton Roads area, Virginia's Coastal Resilience Master Plan, developed under the NOAA Intermediate-High scenario (Sweet et al., 2017), indicates that far more land, buildings, and residents are projected to fall within areas subject to frequent flooding. In the area, average annual flood damage is projected to surge from about $0.55 billion today to $5.7 billion by 2080 (Commonwealth of Virginia, 2021). This escalating crisis demands immediate adaptation in planning, infrastructure, and policy to protect at-risk coastal communities. The study presents a community-based geodesign project grounded in GIS-based suitability mapping (Steinitz, 2012; Kim, 2017; Rivero et al., 2021), tailored as a pedagogical and collaborative framework to engage multiple stakeholders—including students, government agencies, and nonprofit organizations—in addressing climate-driven coastal resilience challenges. In partnership with Wetlands Watch (VA) and through a series of presentations and Q&A sessions, students have been asked to identify priority locations and vulnerable areas where nature-based and hybrid gray–green solutions (NBS/NNBF; Bridges et al., 2021), such as living shorelines, wetland migration corridors, and urban green infrastructure, can be applied. The outcomes of the geodesign method applied in this study provide a distinctive pedagogical experience, guiding students from framing initial research questions to developing solutions based on continuous feedback from Wetlands Watch, and supporting capacity building and preparedness (Commonwealth of Virginia, 2021). Furthermore, the final project deliverables, including ArcGIS StoryMaps, support critical communication efforts for communities in the project area and for stakeholders in the City of Chesapeake, facilitating the implementation of coastal adaptation strategies and related policy guidance (Wetlands Watch, 2025). Finally, class outcomes include a comparison of students' criteria, research questions, and prioritization strategies as expressed in their suitability models, documenting how students frame and apply model preferences and parameter selection in coastal adaptation planning and supporting ongoing refinement of studio teaching and applied research on coastal resilience. This approach shows that the geodesign method can function both as an effective framework for collaborative problem-solving that engages diverse stakeholders and as a robust studio pedagogy that trains students to discretize complex coastal resilience challenges into classifiable components and to translate conceptual models into operational tools that support both design and planning practice across landscape architecture, urban design, and planning.

Keywords: GIS Suitability, Nature-Based Solutions, Living Shorelines, Natural and Nature-Based Features, Adaptation Planning

#112 Integrating Green Infrastructure for Multi-faceted Urban Resilience: A Case Study in Palm Beach County, Florida

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Abstract

Urban resilience—the capacity of cities to withstand, adapt to, and recover from various shocks and stresses—has become increasingly important as urbanization accelerates and climate change intensifies (McPhearson et al., 2022). Green space networks, composed of interconnected parks, forests, and other vegetated areas, represent a fundamental component of nature-based solutions (NBS) for building resilient cities. These networks function as ecological infrastructure that enhances the ability of urban systems to absorb disturbances, adapt to changing conditions, and evolve toward more sustainable and equitable configurations (Baho et al., 2017; Kilbane & La Rosa, 2018). Urban parks, as small-scale nodes within broader ecological systems, support essential ecosystem services that link environmental and social dimensions of resilience (Kumar et al., 2023; Valide et al., 2024). The overall aim of this research is to develop an integrated analytical framework capable of assessing how urban park networks contribute to different dimensions of resilience, and how these relationships can inform planning and design strategies for nature-based urban development. This study investigates the urban park network of Palm Beach County, Florida, addressing two guiding questions: (1) How do spatial patterns of green spaces relate to indicators of climate, social, economic, and ecological resilience? and (2) Which characteristics of the park network enhance or limit resilience outcomes at the county scale? The methodology integrates a systematic literature review with a spatial analysis using Geographic Information Systems (GIS). The study area encompasses all of Palm Beach County, analyzed at the Census Tract level. Data sources include the county's open space and park shapefiles, FEMA flood maps, socioeconomic indicators, and redevelopment zones from county planning datasets. The analysis operationalizes four resilience dimensions: (1) climate resilience, based on the spatial overlap between green areas and flood-prone zones; (2) social resilience, through park accessibility across income levels; (3) economic resilience, via proximity of parks to redevelopment and investment areas; and (4) ecological resilience, through the scale diversity and spatial connectivity of the green space network. The ongoing phase of the research focuses on the methodological application and validation of these indicators to reveal how resilience attributes are spatially distributed across the county. Expected outcomes include the identification of resilience gaps among the four dimensions, the development of a replicable framework for evaluating NBS-driven resilience in urban contexts, and policy and design recommendations for integrating multifunctional green networks into urban design and planning strategies aimed at fostering equitable, adaptive, and sustainable urban environments.

Keywords: Urban resilience, Parks, Green space networks, GIS Mapping, Green Infrastructure

#135 What Replaces Lawns? Material Dominance in Water-Wise Residential Front Yards in Sacramento, California

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Abstract

Lawns and outdoor landscaping irrigation account for about 40% of household water use in California (California Department of Water Resources). With droughts made worse by climate change (Mount et al., 2021), California's 400 urban water suppliers have started many water-saving programs, including rebates for replacing lawns with water-wise landscapes (Mitchell et al., 2017). Although such conversions are widely promoted, relatively little is known about what actually replaces lawns at the parcel scale. Prior work in Sacramento, CA, found that about 10% of residential front yards were water-wise as of 2018, with some neighborhoods exceeding 40% (Green et al., 2024), and adoption has continued to grow. We sampled residential front yards without lawns in Sacramento and asked: When lawns are absent, which land cover materials dominate front yards, and what landscape types emerge from combinations of dominant materials? Additionally, we asked how much vegetation cover is present in these yards and how species rich that cover is. Using parcel-level front-yard audits, the study estimated percent cover by land cover materials and identified dominant materials using a 25% coverage threshold. Yards were then classified by combinations of dominants (e.g., a “gravel-hardscape” yard has ≥ 25% gravel and ≥ 25% hardscape cover) (Al-Ajlouni et al., 2013). Preliminary results indicate that the five most common dominant land cover materials are wood mulch (68.6% of sampled yards), non-driveway hardscape elements (29.4%), gravel or stone (21.6%), groundcover plants (15.7%), and bare soil (11.8%). In 40% of the yards, wood mulch is singularly dominant, with combinations such as wood mulch-gravel and wood mulch-hardscape being the next most common . More than a third of the yards had 10-15 species, while nearly half of the sampled yards had less than 50% vegetation cover (These preliminary findings may shift as additional samples are collected). Residential yards constitute a substantial share of urban green space (Ossola et al., 2019), understanding what happens after lawn removal is therefore key to understanding impacts such as changes in water use, heat mitigation, and pollinator habitat. This work provides parcel-scale evidence of what typically replaces lawns, improving understanding of associated impacts, and helping target outreach programs in areas where conversions may increase risks like heat amplification or habitat loss.

Keywords: lawn replacement, residential front yards, material dominance, urban ecology

#161 Modeling the Influence of Climate Driven Land Conversion on Waterfowl Habitat in the South Carolina Lowcountry.

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Abstract

This project investigates the impacts of climate driven land conversion on waterfowl habitat in the South Carolina Lowcountry. Coastal forested wetlands, emergent wetlands, and managed tidal impoundments are all critical wintering waterfowl habitat in the South Carolina Lowcountry. These coastal wetlands are vulnerable to a combination of climate changes, both chronic and episodic, and land use changes from rapid development surrounding the Myrtle beach and Georgetown metro areas. This project investigates spatial patterns of habitat change under future climate scenarios by developing a series of suitability maps that integrate marsh migration and predicted development data with other predictive habitat variables. Suitability map sets were created for each habitat type representing current conditions, conditions after six inches of sea level rise, and conditions after twelve inches of sea level rise. Two land conversion patterns were then studied including A) transition from forested to emergent wetlands, and B) transition from productive to fallow land. To analyze map outputs for these patterns, property parcels were overlaid, median scores were assigned based on suitability values, and three questions were asked: 1) how many total acres and parcels containing highly suitable habitat are gained or lost across scenarios for each of the three habitat types, 2) which parcels convert from highly suitable forested wetlands to highly suitable emergent wetlands across scenarios (indicating Ghost Forest formation), and 3) which parcels decrease in productive land value and increase in value as potential sites for retreat of managed wetland habitat. Two pilot parcels were selected based on their habitat value and vulnerability to conversion, and conceptual design and management alternatives were identified to demonstrate strategies that direct land conversion processes. Results indicate an overall loss of forested wetlands and expansion of emergent wetlands, and a higher potential for loss rather than gain of land suitable for managed habitat. Recommendations include directing the process of habitat change in forested and emergent wetlands and resisting change in managed tidal impoundments while suitable sites are identified and constructed inland.

Keywords: Land Conversion, Habitat, Sea Level Rise, Suitability Modeling, Waterfowl

#164 Addressing Wildfire Resilience through Comprehensive County-Level Plan Effectiveness in California

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Abstract

Wildfires exacerbated by climate change represent a growing planning and policy challenge worldwide. California, with its increasing wildfire risk and local planning complexity, serves as a valuable case offering insights for regions facing similar risks. This study examines plan effectiveness, which measures the conformance of planning documents to policy objectives, to identify unaddressed policy objectives in building wildfire resilience. Using quantified plan analyses, we assess 58 California counties' plan effectiveness of three primary local planning instruments: General Plan, Hazard Mitigation Plan, and Community Wildfire Protection Plan. We further examine how resilience and social vulnerability are addressed in three planning instruments, comparing them to the Fire Adapted Community and Wildfire Social Vulnerability frameworks. Lastly, we run regression analyses to explore correlations between factors like social vulnerability and wildfire risk, and wildfire plan effectiveness. Results reveal that wildfire mitigation objectives such as recovery planning and social vulnerability are often overlooked, highlighting the need for improving wildfire planning policies, guidelines, and their alignment with wildfire resilience and social vulnerability frameworks. Our findings provide insights into blind spots and opportunities to strengthen current planning tools to build wildfire resilience for California and serve as a reference for wildfire planning and policymaking in other regions.

Keywords: Wildfire planning, Wildfire resilience, Plan effectiveness evaluation, Fire adapted community, Social vulnerability

#170 Environmental Education for Circular Economy: Green Building Design and Construction

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Abstract

This project, funded by the U.S. Environmental Protection Agency Environmental Education Grant, is a collaboration between landscape architecture and architecture that aims to educate high school teachers about the circular economy (CE) in design and construction, with a particular focus on environmental impacts in the Dallas–Fort Worth (DFW) region, Texas. Historically, underserved communities—especially low-income and minority populations—have had limited access to educational opportunities that promote understanding of environmental issues, and pathways into STEM fields remain restricted. Consequently, many schools lack the resources to introduce students to emerging environmental topics or careers. This project aims to bridge these gaps by engaging teachers and students from Title I high schools and integrating student-centered environmental stewardship into their curricula. The project team will offer the CE course in Spring 2026 and will recruit 8 to 10 high school teachers along with our university students by contacting ISD leaders in DFW. The course objectives are: 1. Understand the CE to make informed design decisions, 2. Integrate lessons learned into high school courses, 3. Practice CE principles by building small-scale structures using recycled materials and sharing knowledge with underserved communities. Teachers will incorporate lessons into their classrooms, ensuring that knowledge is transferred to students. Together, teachers and their students will design and build small-scale structures using recycled and repurposed materials that demonstrate CE principles. After the course, teachers and UTA mentors will expand outreach to underserved DFW communities to increase access to environmental education. The team will collect teachers' syllabi, materials, and post-course surveys to evaluate the CE course's outcomes. The author's contribution centers on the design-build and outreach components of the project. The emphasis will be on reducing raw material use and minimizing waste production by reusing construction waste and recycled materials. The design process will be participant-led to encourage collaboration, self-learning, and greater ownership of outcomes. Potential structures will be designed and constructed tailored to the needs of participating schools, aiming to reduce carbon footprints while offering practical benefits to students. The team is currently developing the curriculum and recruiting teachers for the Spring 2026 course. The author will be able to share more in-progress results at the conference as the project course will be halfway through by the time of the conference in 2026. The project is expected to increase awareness of the CE, empower teachers and students, and enhance resilience in vulnerable communities throughout the DFW.

Keywords: environmental education, circular economy, green design, community outreach

#176 Climate-Adaptive Forest Spatial Planning Informed by Ecosystem Resilience–Service Responses: Linking Diagnostics to Spatial Action

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Abstract

Climate change is intensifying disturbances in forest ecosystems, eroding structural stability and weakening delivery of critical services such as carbon sequestration, water regulation, and biodiversity conservation. These impacts undermine social well-being and raise risk in vulnerable regions. Yet despite policy attention to ecological spatial governance, operational pathways that connect ecosystem diagnostics to actionable interventions remain limited. China's forests—spanning ecotones and climatic gradients—provide a transferable testbed. Positioned at the interface of ecological science, spatial planning, and governance, landscape architecture can convert assessments into adaptive zoning and management. This study aims to (i) uncover dynamic resilience–service relationships and threshold states under climate change; and (ii) develop multi-scenario optimization pathways for forest spatial planning through adaptive functional zoning and intervention design. We assess China's forest ecological space (2000–2022) by quantifying resilience from satellite time series using critical-slowing-down indicators. Multifunctional services are estimated via standardized valuation and multi-model fusion. To link diagnosis to action, restricted cubic splines identify nonlinear responses and thresholds; boosted regression trees attribute dominant drivers; and self-organizing maps delineate response typologies and states. Spatial dynamics for 2030–2060 are projected using afforestation policy scenarios (PLUS) and species suitability across emission pathways (MaxEnt). Cross-sensor harmonization and sensitivity tests ensure robustness. Resilience shows a north–south low, central high pattern with amplified intra-annual variability; services concentrate in central–northern belts and decline toward ecological peripheries. Drivers include water availability (dominant), stand age, and landscape connectivity. We identify three climate-response thresholds and four resilience–service states—transition, baseline, high-efficiency, and saturation. Approximately 24% of forests are at or near temperature–humidity thresholds, frequently within boundary areas. Based on response typologies, 52 climate-adaptive functional zones are delineated—principally ecological/habitat restoration, rainfall buffering, and integrated hydrological regulation. Under high emissions, resilience improves while service risks increase; resilience is higher at higher latitudes, whereas services remain stronger in central–northern belts. Findings support a shift from trend-following to threshold-based planning. Thresholds and states act as decision triggers for graded intervention—strict protection in stable states, targeted restoration in boundary areas. Decision-ready layers support afforestation targeting, restoration, and climatic-adaptive planning. Implementation follows a monitoring-to-action loop with threshold-anchored metrics and reassessment, co-developed with agencies and communities. The framework is transferable across ecosystems, aligning diagnostics, policy, and community practice into implementable climate action. It advances the conference aim of catalyzing connections by integrating strategies, knowledge, and co-produced interventions that strengthen ecosystem resilience and secure services.

Keywords: Ecosystem resilience, Resilience–Service Response, Forest Spatial Pattern, Climate-Adaptive Planning, Ecological Functional Zoning

#194 Water Signals: Storytelling as a Climate Resilience Tool

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Abstract

Building resilience to climate impacts requires engaging vulnerable communities in a greater understanding of climate risks. This effort requires communicating risks and resources to communities in a manner that encourages dialogue and action. We need new tools – such as storytelling – for facilitating such engagement. Storytelling enables us to merge our ecological, personal, cultural, and speculative perspectives on water, a necessary process for imagining a resilience for our communities and beyond. This panel explores the role that storytelling, narratives, and science fiction can play in engaging diverse communities with creating resilient futures. Extensive literature demonstrates the significance of storytelling within climate resilience planning and its ability to contribute knowledge, make meaning, and most importantly, build capacity to respond to climate uncertainty. More than technoscientific approaches, narrative-based approaches can better communicate the complex, hyper-local, nuanced, and place-based range of impacts associated with the climate crisis and have been employed by non-Western societies as science communication for a millennia. Historic artifacts and rites once marked and measured water events, revealing ecological wisdom embedded in craft and folklore. Examples include: Nilometers that indicate the size of annual floods along the Nile; Hunger stones along the Elbe which appear in low water, inscribed with messages such as, “If you see me, you will weep,” a warning of coming famine; holidays in Thailand, such as Songkran and Loy Kratong, that mark the beginning and end to the region’s monsoon seasons; or the use of farmed mussels to inform local communities of the quality of seawater. Our panel will also reference and draw from the deep tradition of indigenous storytelling as a research method and as a tool for adaptation and resilience. Aligned with Iseke's three themes of indigenous storytelling as a research tool, we will investigate water storytelling as Pedagogical Tools for Life Lessons, as Witnessing and Remembering, and as Supports to Spirituality, with an emphasis on the first theme due to our role as educators. Panelists are community-engaged designers and scholars applying storytelling and place-based methodologies to facilitate climate communication across diverse geographies of the US. Each will present brief case studies on their related work and its impact on community resilience, from the Pacific Coast, the Midwest, the Great Lakes, and Florida in the Southeast . More importantly, the proposed session will enable all participants to engage in a creative narrative exercise that enables the sharing of diverse stories of water among attendees.

Keywords: Storytelling , Climate engagement , Landscape narratives , Community resilience , Participatory methods

#199 Designing with Water: Developing Adaptive Soft-Infrastructure Strategies for Flood Resilience in the Brays Bayou Watershed, Houston, Texas

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Abstract

Designing with Water: Developing Adaptive Soft-Infrastructure Strategies for Flood Resilience in the Brays Bayou Watershed, Houston, Texas Communities across Texas face increasing hydrological pressures from natural climate variability, changing precipitation patterns, and rapid urban growth. (Intergovernmental Panel on Climate Change (Ipcc), 2023). Although directly attributing extreme precipitation events to anthropogenic climate change is complex, cities such as Houston continue preparing for more frequent and intense storms. Historical floods—including Tropical Storm Allison, the Memorial Day and Tax Day floods, and Hurricane Harvey—have revealed the limits of Houston's predominantly hard-infrastructure flood management. (Davy et al., n.d.) The Brays Bayou watershed, particularly the Meyerland neighborhood, remains highly vulnerable, where impervious surfaces, engineered channels, and road networks disrupt natural hydrology. (City of Houston, 2024) Traditional flood-control strategies rely on rigid, concrete infrastructure that accelerates runoff, reduces infiltration, and constrains ecological function (Ahern, 2011). Drawing on water urbanism and the hydro-social cycle, this study proposes an adaptive soft-infrastructure approach that treats water as an environmental and cultural asset rather than a hazard . (Mathur, Da Cunha, 2014). The project's novelty lies in combining geospatial analysis and hydrological modeling with a design-oriented framework to explore how soft-infrastructure strategies can be integrated into dense, engineered landscapes. Methodologically, study employs ArcGIS-based geospatial analysis and SAGA GIS to assess surface runoff, watershed connectivity, land-use change, and repetitive-loss patterns across Brays Bayou. High-point mapping, contour studies, slope analysis, and DEM-derived flow models identify ridgelines, depressions, and disrupted drainage paths. Spatial layers reveal hydrologic pinch points, disconnection zones, and culturally significant hotspots where risk intersects with community settlement patterns . A review of global and Asian precedents evaluates bioswales, green corridors, multifunctional parks, floodable plazas, adaptive streetscapes, and canal revitalization for hydrological effectiveness, urban compatibility, adaptability, and cultural value in soft-infrastructure interventions. Preliminary results indicate that retrofitting streets, parks, bayou edges, easements, and underutilized areas with multifunctional landscape systems can slow runoff, increase infiltration, and partially restore historic floodplain behavior without requiring significant land acquisition. Strategies that visibly integrate water—through connected corridors, adaptive streetscapes, and floodable community spaces—show strong potential. Constraints include narrow rights-of-way, conflicting grades, underground utilities, limited planting space, public acceptance, and maintenance requirements. The study demonstrates that soft infrastructure can support ecological, hydrological, and social objectives in flood-prone U.S. cities. Future work includes long-term spatial monitoring, refinement of modeling techniques, development of transferable design frameworks, and deeper community engagement to ensure culturally grounded and resilient solutions.

Keywords: urban resilient landscape , soft-infrastructure , urban interventions , Ecological design , co-exist with nature

#209 Climate Action.An International Perspective on How to Enact Climate Action at the Government Public Interface.

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Abstract

This panel summarizes a comparative dialogue between two highly industrialized and suburbanized regions of Germany and the United States to develop a methodological approach with which to identify best practices for addressing and implementing climate action. The open-minded discourse between international perspectives that continues to emerge from this collaboration of academics, planning officials, and practitioners in landscape planning and design is a model of how to work with a partner geography in other localities, both domestically and internationally, that is replicable in all communities. The case studies introduced in this panel demonstrate the value of learning from such intentional partnering with a region that shares a similarity of physical and social vulnerability to climate change impacts while also remaining distinct in its administrative context, such that differences highlight openings for new ways of thinking. Utilizing examples from the textbook that came out of this cooperative effort, the panel will discuss the process and benefits of identifying appropriate geographic coordinates for partnership that can illuminate transferable solutions for both people and place. Insights from the Ruhr Region and New Jersey collaboration highlight policy tools and processes that can be adopted and adapted in large-scale planning approaches; site specific case studies highlight the role of landscape architects as leaders in interdisciplinary teams developing and implementing strategies to meet uncertainties caused and exacerbated by climate change. Beyond the realm of policymakers and practitioners, voices from the community are amplified through a focus on place and connectedness by those whose work in academic and nonprofit sectors foregrounds the lived experience of those most vulnerable to and affected by climate crisis events and ongoing, everyday climate impacts. All together, this collection of international climate action at the government/public interface aims to mobilize multiple forms of knowledge and experience in order to inform and enact careful climate response and to inspire similar approaches to learning from others.

Keywords: climate change, planning advocacy, resilient design, community engagement

#243 Data Fusion of Mobility, Environment, and Public Space for Resilient Urban Decision-Making

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Abstract

Integrating multimodal sensing to evaluate urban mobility, environmental quality, and public space use remains a major challenge in contemporary cities. Although transportation, environmental, and social behavior data are increasingly available, they are typically collected and analyzed independently (Mouratidis, 2021; Zheng et al., 2014; Zou et al., 2025). Therefore, this study explores a replicable data-fusion platform that enables integrated analysis of diverse urban datasets and provides real-time recommendations for improving air quality and traffic operations. The project is being conducted at the University of Georgia's campus–community interface in Athens, GA, an area with recurring congestion, localized air-quality concerns, and high levels of pedestrian activity. The prototype focuses on a major campus intersection and adjacent plazas, with a target population of daily commuters, pedestrians, cyclists, and transit riders. Data has been collected since November 2025, when the device was installed, capturing both high-activity and transitional thermal periods. Traffic flow, multimodal interactions, and speed are recorded through camera-based sensing, while continuous environmental sensors monitor PM2.5, CO2, O3, temperature, and humidity. The integrated analysis of these datasets and corresponding improvement recommendations are presented to users through a web-based interface. Preliminary results show that real-time visualizations of intersection conditions can be generated within 45 seconds. Simulation modeling using SUMO and ENVI-MET, based on the platform's recommended actions, suggests that real-time strategies such as adjusting signal timing and regulating vehicle flow can reduce average queue lengths by approximately 5–10%, and misting devices can improve AQI values by 10–15%. Longer-term interventions such as vegetation-based airflow channels reduced localized $PM_{2.5}$ by 6–9%. The project offers a replicable approach for integrating real-time sensing, performance evaluation, and operational recommendations into landscape research and planning practice. More broadly, it demonstrates how combining mobility, environmental, and social data can expand landscape performance assessment to address systemic urban resilience challenges.

Keywords: Data Fusion, Urban landscape, Urban Microclimate, Resilience, Transportation

#252 Tracing Water: Playful Pathways to Urban Resilience in Baton Rouge

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Abstract

How can play foster climate resilience? Recent studies show that integrating play and placemaking in urban design helps communities build identity, participation, and long-term stewardship (Gill, 2014; URBACT, 2022). Simultaneously, research on nature-based solutions demonstrates that ecological design can mitigate climate risks while delivering co-benefits for health, biodiversity, and equity (Raymond et al., 2017; de Manuel et al., 2025). This project brings these perspectives together by reframing stormwater as an opportunity for engagement, education, and adaptation through play. Baton Rouge, situated between the Mississippi River bluffs and low-lying deltaic wetlands, faces escalating flood risk due to urbanization, impervious surfaces, and fragmented hydrology. While levees and channels have long managed floodwaters, they have also severed community connections to water systems. This project proposes site-based interventions that integrate ecological performance, cultural identity, and public engagement through playful design. Using a transect-based framework, three interactive installations were proposed at key hydrologic archetypes: the Water Campus on the Mississippi River, Howell Park along a concrete-lined creek, and the Burbank Soccer Complex in a former wetland. Each site interprets ecological functions through spatial and experiential design. At the riverfront, paths mark seasonal flood stages and connect to the levee trail. At the creek site, meandering boardwalks and cisterns demonstrate naturalized stormwater processes. At the wetland site, sponge-like topographies and rain gardens showcase water storage and filtration. The design process drew on watershed and soil infiltration data, FEMA flood zones, and CDC social vulnerability indices, paired with oral histories and stakeholder engagement. By combining ecological analysis with local narratives, the project situates climate adaptation as both a technical and cultural challenge. Precedents such as SCAPE's Living Breakwaters and CARBO's wetland demonstration gardens informed strategies that merge green infrastructure with playful, community-centered design. By making water visible, joyful, and part of everyday life, the project cultivates stewardship and strengthens bonds with place. Play is framed here not as entertainment alone, but as a civic strategy for resilience, encouraging exploration, collaboration, and care. Ultimately, this project contributes to ongoing discussions on nature-based solutions and climate adaptation, offering a model for how landscape architecture can integrate ecological performance with cultural engagement.

Keywords: Play, Resilience, Placemaking, Nature-Based Solutions, Baton Rouge

#254 Exploring and Comparing Urban Tree Coverage and Heat-Related Deaths in Different Climate Zones for U.S. Counties

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Abstract

Global warming and increasing frequent extreme heat events have become major threats to public health in the United States, where hundreds to thousands of people die annually from heat-related diseases. Urban vegetation—particularly tree canopy—mitigates heat exposure by providing shade, transpiration cooling, and local microclimate regulation. However, few studies have systematically examined the association between tree and heat-related death across diverse climates and urban settings. This study explored the relationship between tree coverage and heat-related deaths and hospitalizations across 1,158 urban counties in the U.S. mainland, using the 2013 National Center for Health Statistics (NCHS) Urban–Rural Classification. Heat-related deaths and hospitalizations were obtained from the CDC WONDER Database, covering the summers of 2020 (a typical year) and 2021 (a year of widespread severe heatwaves). Two categories of heat-related deaths were defined based on ICD-10 codes: Direct Heat-Related Deaths (where heat was the primary cause) and Indirect Heat-Related Deaths (where heat exacerbated cardiovascular, respiratory, or metabolic diseases). Environmental parameters were calculated using the National Land Cover Database (NLCD) canopy cover dataset to estimate tree coverage percentage (TP), combined with impervious surface cover percentage (IP), and the MODIS Enhanced Vegetation Index (EVI) to assess vegetation health. We also applied county-level regression models (including linear and nonlinear specifications) and controlled key confounding factors such as population size, age structure, ethnicity, socioeconomic status, and urban form. Counties were grouped by the International Energy Conservation Code (IECC) climate zones to compare temperature–humidity patterns. Results indicate that higher tree coverage generally correlates with lower direct and indirect heat-related deaths, with the stronger mitigation observed in hot–dry climate zones (particularly Zones 2B and 3B). Impervious surface coverage is positively associated with heat-related deaths across most regions. EVI shows no significant association, suggesting that the physical presence of canopy cover, rather than vegetation “health,” is the dominant cooling mechanism in urbanized areas. A nonlinear pattern emerged: when tree canopy reaches approximately 35–45%, the marginal cooling benefit on heat-related deaths begins to plateau. These findings provide evidence-based guidance for landscape architects and planners. In particular, the results suggest climate-zone-specific tree-planting strategies, prioritization of shade in hot–dry urban areas, and the importance of reaching moderate canopy targets (rather than simply maximizing greenness) to improve public health resilience under extreme heat.

Keywords: Heat-Related Death, Tree Coverage, Urban County, EVI

#263 Automated Earthworks

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Abstract

As climate instability accelerates, landscapes are increasingly shaped by disturbance, abandonment, and forces that exceed human management capacity. Simultaneously, autonomous technologies are shifting from tools of human extension to semi-independent, ecological actors. Building on posthuman and cybernetic scholarship (Haraway, 2016; Latour, 2005; Pickering, 2010), Automated Earthworks investigates how autonomous, mechanized, and nonhuman agents might inhabit, construct, and transform terrains, particularly those undergoing severe destabilization. The project distinguishes between machines that execute fixed operations and robots capable of adaptive decision-making and multi-scalar coordination. Contemporary cyber-physical and cognitive systems enable robotic agents to integrate geospatial data, onboard sensors, and orchestration software into feedback loops that shape land in real time. These hierarchies of sensing, computation, and energy dependency resemble ecological trophic structures, suggesting that machine ecologies organize through webs of resource flows, material afterlives, and interdependence (Simondon, 2017; Bennett, 2010). Methodologically, the project employs speculative design and narrative worldbuilding through three modes: 1. Robotic fabrication and algorithmic simulations that test how autonomous logics generate alternative geomorphologies; 2. Speculative cartographies and artifact-making that reveal hidden infrastructures of maintenance, energy capture, and data exchange; 3. Immersive environments in the form of video and exhibitions that allow users to embody machine, human, and more-than-human perspectives of these new landscapes. Autonomous agents are situated within landscapes of nudation; sites shaped by extractive operations, climate-driven collapse, warfare, geologic forces, or hybrid disturbances (Tsing, 2015; Gabrys, 2016). In such terrains, machine actors often become necessary intermediaries of remediation while simultaneously producing new forms of disruption. Their operational lifespans, deterioration patterns, and material residues create evolving deposits and infrastructures that influence future machine generations and, therefore, local ecologies. Autonomous machines operate as co-authors of terrain, producing landscapes governed by machine-centric inputs (sensor data, routing logics, energy demands) and outputs (earthmoving, grading, transport). These recursive interactions create emergent ecologies structured around energy competition, migration toward resource nodes, and multi-actor negotiation. “Automated Earthworks” reframes landscape architecture as an entangled practice among humans, machines, and ecological systems, challenging anthropocentric expectations of productivity and control. By embedding robotic agents within disturbance ecologies, the project opens new terrain for speculative yet grounded inquiry into the futures of automated landscapes.

Keywords: Post-human landscapes, Autonomous machines, Abandoned, Recycling

#265 Hydroscape: Reframing Water Governance through Landscape Architecture

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Abstract

Hydroscape examines cultural, political, and ecological disconnects shaping contemporary coastal governance in the rapidly transforming Eastern and Gulf coasts of the United States. Grounded in hydrosocial theory, Indigenous studies, and political ecology, the project addresses a central problem: U.S. water management remains fragmented across dozens of agencies, producing contradictory coastal policies that cast water primarily as a hazard to be controlled 1 . This research asks: How might reframing water as an active participant—rather than an object of regulation—reshape coastal resilience and landscape architectural practice? The study employs a mixed-methods approach including: Policy analysis and documentation of federal, state, and local coastal resiliency plans addressing the Eastern and Gulf Coast, concluding with over 100 resiliency plans and 50 coastal policies. Critical cartographic “unmapping” 2 to visualize contradictions, overlaps, and gaps within jurisdictions and hydrosocial relationships. Speculative design methods drawing from Indigenous and international ontologies that recognize water as a being with rights. These methods allow the project to interrogate government limitations and propose alternative political futures for coastal communities. The analysis reveals three major findings: 1) Existing U.S. coastal management is administratively incoherent 3 , with more than thirty agencies contributing to jurisdictional ambiguity. 2) Despite their breadth, current resiliency plans rarely acknowledge hydrosocial relationships or propose governance structures capable of adapting to accelerating environmental change. 3) The “unmapping” process surfaces opportunities for landscape architects to connect fragmented policies to lived coastal ecologies, highlighting gaps where design can mediate community-water relationships. These findings suggest that current coastal policy frameworks limit adaptive, culturally grounded, and ecologically attuned 4 responses to sea-level rise. Drawing on rights-of-nature models and speculative governance, Hydroscape proposes three alternative policy futures: granting the ocean legal personhood 5 ; incentivizing inland development while phasing out the National Flood Insurance Program; and establishing a coastal national park defined by projected sea-level thresholds. These experiments demonstrate how landscape architects can imagine governance structures that reposition water as a dynamic partner 6 in coastal resilience. Limitations include the speculative nature of the proposed futures and the uneven availability of policy data across coastal states. The project argues that integrating hydrosocial theory, critical cartography, and policy imagination can provide landscape architects with a coherent framework for designing adaptive coastal futures. For researchers, Hydroscape highlights the need to interrogate governance structures that shape human–water relationships. For practitioners, it demonstrates how mapping, design, and policy can collaboratively cultivate new forms of coastal resilience amidst environmental transformation.

Keywords: Hydrosocial Governance, Coastal Resilience, Rights of Nature, Coastal Policy, Sea Level Rise

#267 Regenerative Design in Post-Disaster Landscapes: Community-Centered Approaches in Sot de Chera

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Abstract

In July 2025, Sot de Chera (Valencia, Spain) hosted an international landscape architecture workshop addressing post-disaster regeneration following the 2024 DANA flooding event. Organized by the Master's in Landscape and Urbanism at the Universitat Politècnica de València, in collaboration with AEP, IFLA Europe, and Paisatge.org, the initiative brought together twenty international students to explore how interdisciplinary, place-based design can foster territorial resilience in climate-affected regions. The project was grounded in a community-centered, mixed-method approach that combined participatory mapping, oral histories, site walks, and ecological analysis. Students engaged directly with residents, farmers, and local officials to identify not only physical vulnerabilities—such as erosion, flood paths, and damaged infrastructure—but also cultural values, land-use memory, and everyday practices shaping local resilience. These dialogues shaped a design process rooted in lived experience and design proposals emerged from these co-creative processes
The workshop remains an active and evolving initiative that continues to engage with the local community through regular meetings. To that end, impact is still measured using qualitative tools such as participatory map outputs, observation of collaboration dynamics, and informal feedback sessions with community members. Findings suggest the process strengthened local agency, surfaced often-overlooked narratives of adaptation, and fostered a renewed sense of collective ownership over the landscape. Ecological interventions, while unbuilt, were co-produced and aligned with local knowledge, offering pathways for future implementation and policy dialogue. The workshop offers a replicable model for design pedagogy that links regenerative landscape strategies with post-disaster recovery through co-creation. By positioning the participatory process as the central outcome, the project reframes resilience practice as a culturally situated, relational act. Lessons from Sot de Chera suggest that in the context of climate extremes, landscape architecture education can serve as a catalyst for territorial healing when it integrates inclusive dialogue, experimental practice, and shared authorship.

Keywords: devastated landscapes, landscape regeneration, community engagement, design education, disaster resilience

#273 Biodiversity-Friendly University Campus Evaluation Tool (BFUCET): An OECMs-Based Framework for Assessing and Enhancing Ecological Performance

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Abstract

University campuses serve as critical components of urban ecosystems, providing not only living, learning, and research spaces for students and faculty but also holding significant potential for biodiversity conservation and the provision of ecosystem services. However, systematic tools for assessing biodiversity management on campuses remain underdeveloped. This study introduces the Biodiversity-Friendly University Campus Evaluation Tool (BFUCET), developed within the “Other Effective area-based Conservation Measures” (OECMs) framework, to evaluate the effectiveness of biodiversity conservation strategies in university settings. The tool was constructed and validated through a comprehensive process involving literature review, expert consensus (Delphi method), and pilot testing. It encompasses five key dimensions: Vegetation Diversity, Animal Habitats, Water Bodies and Wetlands, Education and Research Functions, and Ecological Resilience. A pilot application demonstrated high reliability (ICC = 0.89) and practical applicability, underscoring the tool’s utility in guiding ecological management and policy optimization on campuses. Furthermore, the study explores the role of university campuses as potential OECMs and their contribution to global biodiversity goals, including the Sustainable Development Goals (SDGs).

Keywords: Biodiversity, University Campuses, OECMs, Evaluation Tool, Ecosystem Services

#281 Persistence of Diesel-Powered Construction Machinery May Challenge Zero-By-2040 ASLA Climate Action Goal

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Abstract

The 2040 ASLA Climate & Biodiversity Action Plan envisions that the design, planning, construction, and maintenance of all landscape architecture projects will achieve absolute zero emissions by 2040 . Thus, electric construction machinery (CM) must become ubiquitous in 15 years. To date, the SITES rating system , ASLA decarbonization documents, C limate Positive Design Pathfinder , and Climate Conscience design tool s focus on minimizing embodied material and maintenance equipment emissions while assuming the continued use of diesel-powered CM . Hence, the purpose of this presentation is to investigate the degree to which electric CM is penetrating the industry. The presence of electric CM may bode well for meeting the goal, whereas its absence will hinder achievement. Spreadsheet software recorded the top-selling quantities of new and used equipment makes and models, and total units of equipment by type (e.g., skid steers), from Equipment World Market Pulse annual online reports between 2020 and 2025. Online databases of used machinery available for sale in June 2025 from eight top-selling CM manufacturers served as sources of five equipment types by year, make, and hours of operation. Finally, CM manufacturer websites and industry periodicals served as sources for a catalogue of electric CMs t hat contains availability, energy, and charging specifications. I recorded over 355,000 new and 228,000 used diesel-powered construction machines that were purchased between 2020 and 2025 . Assuming a 10,000-hour, 10-year lifetime and reported average age in years for used machines, the 76 and 73 new and used top-selling CMs have over 1.55 billion and 368,000 hours of operation left, respectively, that may total 97 million tonnes of carbon dioxide emissions. About 50 percent of used machinery available for sale on company databases have operation hours under 3,000. Seventy-seven models across 24 equipment types from 25 companies indicate that most electric machines that exist are available for sale, but are comparatively smaller in size because of material, energy and power limitations. Therefore, ample diesel-powered machines will be present and used to construct landscape architecture projects until at least 2035. Design implications regarding material installation and earthwork are many, ranging from designing with smaller and or fewer machin es to design intervention s izes and the use of muscle-powered equipment. Further investigation of industry and refereed literature is needed to understand the potential of future developments in electric construction machinery, along with a call for collective consideration of other practical and policy strategies to address the challenge of meeting the zero-by-2040 goal.

Keywords: Construction equipment, greenhouse gases, emissions, climate-positive design, sustainable sites

#298 Slow Growth: Unmaking Rural Lands and Rewetting Futures in Flow Country

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Abstract

Land-based approaches to climate change require the large-scale transformation of rural lands, and few landscapes offer as much potential for curbing emissions and cultural conflict in their transformation as peat landscapes. As our largest terrestrial carbon stock, peatlands have been drained extensively for agriculture, mining, and forestry, emitting substantial greenhouse gas emissions. The Ramsar Convention of Wetlands has proposed restoring half of drained peatlands by 2030, requiring rewetting an area the size of Finland each year . These proposals would unmake drained rural lands at an unprecedented scale, requiring rapid cultural and policy shifts. Few places are as deeply entwined with peat futures as Scotland, where peatlands cover nearly 20% of the country, and rural lands have become the forefront of their transformation into 'nature-based solutions'. Scotland is actively rewetting 25,000 hectares through the Peatland ACTION program, pledging £250 million over the next ten years for future transformations. What does it mean to unmake a rural landscape, and what does it look like to steward the slow regrowth of a new one? Unlike tearing down a building, the act of unmaking a landscape is not a singular act but a process, one that extends both into the past, to what and who has made it, and into the future, in how we manage and care for it. Drawing from fieldwork, environmental history, environmental geography, and ethnography, this presentation looks at the controversies surrounding current peatland restoration efforts in the Flow Country of Scotland through the lens of unbuilding , and the pressures faced by local landowners, crofters and communities, unpacking the political complexities of rewetting to transform a 'natural resource' into a 'nature-based solution.' A brief history outlines how differing attitudes toward peatlands have made and remade local cultures, economies and ecologies across millennia. A case study method explores the recent peatland restoration at Camster Estate in the Flow Country as an illustration of unbuilding rural lands to mitigate climate change, both from a physical standpoint (through design details and standards) as well a cultural one, using fieldwork and interviews to unpack the current state and stakes of the project for local lives and livelihoods. Finally, the presentation examines how such projects might scale up, through comparing novel policy and emerging financial mechanisms, as well as lessons learned on how they might scale through time, including monitoring and maintenance practices, to examine what is needed to support peatlands' slow regrowth.

Keywords: peatland restoration, climate change, unmaking , nature-based solutions, drainage

#312 Unraveling the Train Effect: How Blue-Green Spatial Patterns Influence Extreme Rainfall and Urban Resilience.

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Abstract

Introduction: Climate change-exacerbated "train effect" type extreme rainfall poses severe challenges to global cities, and the limitations of traditional grey infrastructure highlight the urgent need to enhance urban resilience. Previous studies have largely focused on the total amount of blue-green spaces, while the underlying mechanism of their spatial configuration in regulating the "peak-on-peak superposition" runoff generation and concentration processes unique to the "train effect" remains unclear. This study aims to unravel this mechanism, providing a scientific basis for building climate-adaptive landscapes. Methods: The study focuses on the Mentougou watershed in Beijing , a region with critical ecological and mountain-urban features. Using long-term meteorological data and a Self-Organizing Map (SOM) network, we identified typical "train effect" rainfall hyetographs. Various BGI layout scenarios were quantified using landscape pattern indices (e.g., connectivity, aggregation). A 2D hydrodynamic Digital Watershed Model was then used to simulate the hydrological response—including total runoff, peak discharge, and time to peak—of these BGI patterns under the designed scenarios. Through multi-scenario simulations, we systematically analyzed the quantitative relationship between BGI patterns and peak flow mitigation. Results: Model results show that the "peak-on-peak" superposition from the train effect produces peak discharges 1.5-2.5 times higher than storms of the same total volume but different distribution. Crucially, while keeping total BGI area constant, its spatial pattern is a significant mitigator. A highly connected, networked BGI pattern reduces peak discharge by an additional 20-35% and delays the time to peak by 30-50 minutes compared to fragmented layouts. Linear green spaces perpendicular to dominant flow paths proved most effective at intercepting and desynchronizing runoff, thereby dismantling the compounding effect. Discussion: The findings highlight the critical role of BGI spatial patterns, moving beyond the traditional focus on green space ratios. This implies that landscape architecture theory must more closely integrate hydrological processes with spatial design. In practice, planners should prioritize creating functional, networked BGI systems over simply meeting area targets. The study's current reliance on numerical simulations necessitates future validation through physical modeling and field monitoring. Conclusion: Optimizing BGI spatial patterns effectively enhances urban resilience to "train effect" rainfall. This opens new interdisciplinary research avenues in urban hydrology and landscape ecology. For practitioners, it offers concrete, performance-based strategies to proactively "deconstruct" the train effect by building connected networks. This approach is vital for upgrading Sponge City functions from basic source control to sophisticated process regulation.

Keywords: Train Effect, Blue-Green Spatial Patterns, Spatial Pattern, Urban Resilience, Hydrological Process

#318 Making Room for Urban Trees: Studying the Potential to Increase Neighborhood Canopy

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Abstract

Cities around the world are engaging in tree planting initiatives to address climate change and improve quality of life for urban residents (UNECE 2023). Tree planting initiatives (TPI's) need to plan for planting outside the public realm to achieve their lofty urban tree canopy goals, such as the 30% proposed by leading urban foresters (Konijnendijk 2024), since most of the urban land is privately-owned residential parcels (Roman et al. 2017). It is unclear, however, if there is enough planting area within urban residential neighborhoods to achieve these goals (Danford et al., 2014; Jennings et al., 2021). This study seeks to understand how urban tree typologies and planting potential vary across different cultural settings by a comparing two mid-sized cities engaged in tree planting programs to achieve tree canopy goals Chicopee, Massachusetts (USA) and Uppsala, Sweden. The study compared the existing tree in single-family and multi-family neighborhoods built during different historical periods. Methods included field inventory of tree species, type, and size, as well as remote sensing. The inventory and associated analysis include a classification of trees by functional categories (i.e. large deciduous shade tree; fruiting/flowering tree; conifer; hedge), tree height and width, and average number of trees per site. This quantitative analysis is supplemented by figure-ground drawings (Holmes, 2017) that illustrate the typical size and shape of residential parcels and surrounding neighbourhoods. Initial results show a predominance of large-shade trees in single-family neighborhoods in the US case study and small fruiting and flowering trees in the Swedish case study, despite being in similar climate zones. These differences may be attributed to cultural differences in the values of residential trees and functionality of residential yards. Patterns in the multi-family neighborhoods show both small flowering trees and shade trees. A second phase of the study, which is on-going, is to analyze the potential to increase tree planting in these neighborhoods based upon the availability of plantable space using GIS and remote sensing. We will report on the initial results of these second phase findings and compare it to each city's goals to increase its tree canopy. Insights from this study will be presented to help landscape architects and other urban tree advocates plan for increasing urban trees, while acknowledging cultural differences in urban tree values.

Keywords: urban forestry, climate change adaptation, tree planting initiatives, urban design

#349 Hot City, Cool People: Mitigating Urban Heat Inequity in Korail, Dhaka

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Abstract

Introduction Dhaka, Bangladesh is experiencing rising heat stress as climate change and rapid urbanization converge. In Korail, the city's largest informal settlement, more than 200,000 residents live in dense clusters of corrugated metal housing with minimal shade or vegetation. These conditions intensify the Urban Heat Island effect, raising temperatures about 5°C above surrounding neighborhoods and heightening risks for vulnerable groups. Extreme heat in Korail is both an environmental and social challenge: inequities in housing and infrastructure amplify exposure and constrain adaptation. This study examines how spatial heat patterns intersect with daily living conditions to reveal uneven exposure across settlements, disproportionately affecting poorer and denser clusters along with elderly residents and children. Methods Fieldwork in March 2025 combined environmental data collection with participatory research. Satellite imagery and thermal cameras measured land-surface and indoor temperatures, while GIS-mapped vegetation, solar exposure, and built-form density. City-scale Landsat data contextualized Dhaka's warming, and settlement-scale measurements focused on the 100-acre Korail area. Five housing clusters were sampled for day–night temperatures using sensors, with microclimatic factors modeled across building footprints. Community workshops and interviews with BRAC University documented lived experiences and adaptation practices. Quantitative and qualitative datasets were overlaid and showed that the hottest zones aligned with low tree cover, high density, and widespread use of metal roofs. Results Findings revealed hotspots in the densest settlements, where limited ventilation and shading produced dangerous nighttime indoor temperatures. Vegetation loss reduced natural cooling. Residents identified lack of shade, material cost, and self-built housing constraints as key barriers. In response, a "heat-resilience-toolkit" was developed, outlining neighborhood and household strategies. Toolkit components were reviewed with residents for feasibility and cost, matching mapped hotspots, and are now prepared for community testing and post-evaluation through BRAC University as next steps. Discussion Addressing urban heat in informal settlements requires more than large-scale infrastructure or generic greening. Locally tailored, low-cost measures are effective for underrepresented communities. By reframing data as a tool for communication and intervention, the study illustrates how research and design can support practical change and make spatial inequities visible. Conclusion Thermal comfort should be treated as a basic need, not a privilege. As global temperatures rise, extreme heat falls heavily on Global South communities. The Bangladesh case shows how feasible small-scale interventions can be transformative when engaging residents, underscoring the value of linking climate data with lived experience and the need for greater attention to everyday adaptation in resource-constrained contexts.

Keywords: Urban heat island, Informal settlements, Climate justice, Community resilience, Participatory design

#352 From Parking Lots to Pedestrian Zones: Thermal Comfort Analysis in a Hot-Humid Campus Using Ladybug Tool

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Abstract

Campuses are environments with high pedestrian traffic and social interaction, where walkability contributes to both physical and mental health sources. However, outdoor conditions in hot and humid climates can discourage walking and even pose heat stress risks sources. Mississippi State University is planning a transformation of a heavily car-oriented area into a pedestrian friendly zone, replacing surface parking with green, shaded spaces and limiting car access. For such a change to succeed, it is critical to evaluate the microclimatic conditions that affect thermal comfort. This study investigates how the existing car-oriented design performs in terms of thermal comfort compared to the proposed walkable master plan. Using a case study approach, microclimatic simulations are conducted in Ladybug Tools for Rhino/Grasshopper. Two scenarios are modeled: the current layout dominated by paved surfaces and parking lots, and the proposed master plan with increased tree canopy, permeable surfaces, and shading structures. EPW weather data for the region provide hourly climate conditions, which combined with surface material properties, vegetation, and building geometry, allow the calculation of Universal Thermal Climate Index (UTCI) values. Spatial mapping of UTCI and surface temperature highlights differences in thermal comfort between the two scenarios. Although results are preliminary, it is expected that the pedestrian-oriented design will improve thermal comfort by reducing heat exposure and creating more favorable microclimate conditions. Increased shading, vegetation, and permeable surfaces are anticipated to enhance walkability by offering cooler and more comfortable pedestrian routes. Visualizations of thermal comfort across the site will provide practical insights for planning and design decisions. This research highlights the role of environmental simulation in informing campus master planning. By linking design strategies with microclimatic analysis, it provides a replicable methodology for evaluating pedestrian comfort in hot-humid environments. The findings are expected to offer actionable guidance for creating sustainable, comfortable, and walkable campus spaces, while contributing to the broader understanding of microclimate sensitive design in educational environments.

Keywords: Thermal comfort, campus design, hot-humid climate, Ladybug tool, walkability

#355 Eco | Collective: Interdisciplinary Collaboration for Community Resilience in Savannah, Georgia

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Abstract

Eco | Collective is the product of a service-learning, interdisciplinary urban design studio conducted in partnership with the City of Savannah, Georgia. The project responds to the city's priority of balancing the growing demand for housing with the protection of Savannah's rich environmental resources. Focusing on the Fair Grounds site in Fort Argyle, landscape architecture and urban planning students collaborated to apply the E.A.S.E. Framework, Ecology, Accessibility, Stewardship, and Embracing Impartiality, to propose cluster-based housing solutions that integrate wetland restoration, economic development, and community-driven design. The methodology emphasizes master planning principles that regenerate rather than deplete local ecosystems. Strategies incorporate cluster development, protection of native Georgian plant species, promotion of wetland restoration, mitigation of flood issues, and ensuring equitable access to housing and green infrastructure. At its core, the project demonstrates a commitment to accessibility, environmental stewardship, and social equity, introducing low-impact strategies that respect Savannah's ecological vulnerabilities while accommodating growth. Eco | Collective has been recognized with the 2025 American Society of Landscape Architects (ASLA) Georgia Student Honor Award, affirming both the quality of the design work and its relevance to regional challenges. By bridging planning and design disciplines, the project illustrates how interdisciplinary, service-learning studios can strengthen community resilience, advance climate adaptation strategies, and enrich student learning through real-world engagement.

Keywords: Interdisciplinary Collaboration, Community Resilience, Service-Learning, Urban Design, Landscape Design

#374 Modeling the Squeeze: Quantifying the Effects of Environmental and Anthropogenic Threats on Coastal Ecosystem Services to Promote Resilient Planning

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Abstract

The capacity of coastal ecosystems to provide critical ecosystem services (ES) is expected to decline as coastal squeeze intensifies from expanding development and accelerating sea level rise (SLR) (Barbier, 2013; Silva et al., 2020). However, gaps in predictive and quantitative land cover (LC) modeling prevent designers and planners from making evidence-based decisions to protect ES, like flood mitigation, water filtration, and carbon storage and sequestration (CSS) (Fant et al., 2022; Upadhyay et al., 2022). This study aims to quantify how projected LC changes will alter these ES in vulnerable coastal environments to provide planners with a transferable framework to make decisions grounded in ecological and economic implications. The study examines two sites in the Northeastern United States: Delaware's coastal watersheds and the Aberdeen Proving Ground (APG) in Maryland's Chesapeake Bay watershed. Future LC for both sites was projected with software that utilized artificial neural networks and cellular automata machine learning (Chowdhury, 2024). In Delaware, the impact of projected LC on flooding and water quality was modeled with the Soil and Water Assessment Tool (Abbaszadeh et al., 2023). At APG, CSS and its economic value were quantified with the InVEST model under scenarios with and without SLR and submerged aquatic vegetation (SAV) (Moritsch et al., 2021). Preliminary results suggest development along Delaware's coast could nearly double by 2061, replacing cultivated and natural lands near urban centers and inland bays. Expansion will likely exacerbate flooding and nutrient-laden runoff, increasing demands on water treatment. At APG, the no-SLR scenarios project carbon storage of 4.06 million Mg C with sequestration losses equivalent to ~$42 million in net present value. Under SLR, storage declines by 4.2% to 3.89 million Mg C, while sequestration losses increase by ~304% and economic losses nearly quadruple to more than $166 million, even with SAV present (Tahmasebi et al., 2025). Together these findings indicate an alarming loss of natural systems that verify a coastal squeeze, with development consuming agricultural and natural lands while edge environments are lost to SLR. The results highlight the ecological and economic risks of unchecked LC change in threatened coastal ecosystems. By integrating predictive LC modeling, hydrologic simulation, and ES valuation, the study demonstrates a transferable framework for adaptive coastal strategies that prioritize resilient development. Transforming expected development and ecological trends into quantified risks and costs equips planners and allied professionals to advocate for and design adaptive strategies before losses become irreversible.

Keywords: Land cover planning, Carbon storage and sequestration, Surface water quality, Predictive modeling, Coastal wetlands

#377 Heat to Street: Enhancing Broadway School Street with Dynamic Free Geo-Analytics.

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Abstract

Heat to Street: Enhancing Broadway School Street with Dynamic Free Geo-Analytics Introduction. School pick-up and drop-off areas often function as small but persistent heat hotspots due to limited shade, high pavement exposure, and concentrated waiting activity. This pattern is exemplified at Cambridge Elementary and is reflective of a broader challenge across many hot-climate school environments where climate-responsive landscape design remains underutilized. These conditions directly affect children and teachers who wait in these zones every day, increasing exposure to thermal discomfort and elevated heat-related risk. Methods. Open environmental datasets and basic field measurements are integrated to map land surface temperature, shade availability, and street morphology using an open-source GIS environment (QGIS). These layers inform the testing of low-cost, tactical interventions, including temporary shading, green curb treatments, and reflective surface enhancements. Intervention performance is assessed through straightforward and replicable metrics, including pre/post surface temperature readings, manual pedestrian counts, queuing observations, and brief intercept surveys Results (preliminary). Results indicate that targeted, easily deployable interventions can reduce surface temperatures in critical waiting areas and facilitate users drop-off pickup activity toward cooler, safer curbs. Overall, the study demonstrates structured, low-cost interventions for identifying heat-risk hotspots and evaluating design interventions that enhance thermal comfort and safety along school streets, generating actionable insights for resource-conscious urban improvements. Discussion. As evident in our multi-scalar analysis, hyper-local heat, vegetation, and impervious-surface data are rarely available for localized regions like school frontages. This study shows that open datasets, simple thermal metrics, and rapid field audits can reliably fill that gap. Even with limited time, staff capacity, or budgets, schools can identify critical heat-risk segments and deploy low-cost, tactical improvements for safer, cooler pickup/drop-off zones. Conclusion. This pilot highlights three key lessons. (1) Open-source data and software can be powerful tools for generating effective, micro-scale assessments of heat and safety risk. (2) Temporary, low-cost green interventions can meaningfully shift behavior and build momentum toward more comfortable, kid-friendly school-street environments. (3) Small-scale spatial data collection and communication must be expanded and made openly accessible so local communities and schools can better diagnose and address on-the-ground challenges. Future work could extend this pilot over a longer period, integrate additional performance rubrics, and compare multiple schools with differing street morphologies to identify which design conditions and interventions produce the greatest cooling and safety benefits.

Keywords: urban heat island, school streets, land surface temperature, cool carb , child-friendly streets

#387 Understanding of Flood risk communication through the community engagement using the digital twin models

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Abstract

Urban flooding issues have become more unpredictable and precarious due to climate change. To develop an effective flood resilience plan, community engagement in flood management is essential, as it provides local and site-specific approaches (Lin, 2025). Conventional methods of risk communication for community engagement mainly rely on two-dimensional flooding images, which limit the community's ability to fully grasp flooding impacts. In recent years, immersive virtual reality (IVR) has received growing attention for community engagement, as it enables highly realistic visualizations of hazardous situations without exposing participants to actual risks (Simpson et al., 2022). The use of IVR in community engagement can be effective, as it helps communities better understand the impacts of flooding. Although previous studies have examined how VR can serve as an effective tool for resilience planning, less is known about how communities perceive flood risks. The purpose of this study is to explore how VR technology can improve risk communication for community flood resilience planning. Our study area is the city of Roanoke, a mid-sized in southern Virginia, which has experienced frequent flooding over the past two decades. Using geospatial and meteorological data, hydrological models were created to predict 5-, 25-, and 100-year flood events, which were then overlaid onto a digital twin model of downtown created with 3D modeling software. In total, six workshops were conducted with 25 participants from the Roanoke community. Each 60-minute workshop included seminars, discussions, and surveys. The first session provided a brief overview of flooding issues in the community. The second session introduced a flooding simulation in both VR and mobile-device environments and assessed risk perception (e.g., worry, awareness, preparedness) through a survey. The final session involved a discussion on how the community understands flooding and perceives risk. Preliminary results showed that participants reported higher levels of risk perception, including increased concern, awareness, action, and preparedness for flooding. Moreover, VR environments elicited stronger perceptions of risk compared to 2D flooding images. 80 percent of participants indicated that the VR simulation was effective in helping them understand flooding impacts in their community. This may be because VR provides greater realism, including a sense of volume and spatial depth in flooding scenarios. These findings suggest that VR fosters more effective communication between planning professionals and the community. Overall, our study demonstrates that VR technology is a valuable tool for risk communication, enhancing preparedness and laying the groundwork for more effective flood resilience planning.

Keywords: VR, Flooding, Community Engagement, Risk Perception, Digital Twin

#418 Forecasting Vegetation Dynamics and Conservation Strategies in Northeast Tiger and Leopard National Park in the Context of Climate Change

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Abstract

Adapting to and alleviating the effects of global climate change is an essential responsibility for national parks and protected areas. The Northeast China Tiger and Leopard National Park exemplifies the global temperate forest ecosystem. The park's vegetation, as a primary producer in the regional ecosystem, supplies sustenance for herbivores and habitats for key protected species, including the Amur tiger and leopard. Remote sensing technology is an effective means of evaluating vegetation dynamics. This study assesses the potential effects of forthcoming extreme climate change scenarios on vegetation dynamics in Northeast China Tiger and Leopard National Park. In the face of climate uncertainties, park managers require proactive predictions and evaluations to formulate adaptive strategies that ensure the stability of the park's ecosystem. Delta bias correction and Random Forest methodologies are employed to downscale the original multi-model CMIP6 data, selecting the two GCM models exhibiting the most significant increases in temperature and precipitation to represent potential future "warm-dry" and "warm-wet" extreme climate scenarios. A pixel-level multiple regression model is utilized to quantify the historical relationship (2000–2014) between two vegetation indices (EVI and LAI) and the Standardized Precipitation Evapotranspiration Index (SPEI) across different scales and lags. The vegetation dynamics under two extreme future scenarios are forecasted, and alterations in their long-term trends and seasonal characteristics are analyzed using the Mann-Kendall test and Fourier transform. In the "warm-dry" scenario, vegetation degradation is anticipated in the park, especially in the southern and low-altitude areas, marked by a "browning" trend and diminished seasonal growth amplitude. Conversely, the "warm-wet" scenario is anticipated to promote vegetation growth, exhibiting a "greening" trend, particularly in mid- and high-altitude regions. In this context, the augmentation of LAI may exceed that of EVI, indicating that heightened moisture facilitates biomass accumulation more than it enhances photosynthetic activity. This study presents a framework incorporating composite downscaling techniques, bias correction for extreme events, dual vegetation index response evaluation, and multidimensional spatiotemporal analysis. The results provide a crucial foundation for an "adaptive management zoning map," enabling a shift in park planning towards "dynamic dual-resilience." This approach facilitates the dual-scenario "stress testing" of new infrastructure siting and pinpoints key vulnerabilities for "proactive investment," directly guiding spatial decision-making and restoration priorities.

Keywords: Climate Prediction, Extreme Climate Event Assessment, Vegetation Indices, Management Strategies

#429 Landscapes of Exchange: Tracing Ecological Entanglements in Nursery Production

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Abstract

Popular and professional discourses on climate change and environmental justice in the built environment often center on trees as “solutions” that provide long-term ecosystem services, including carbon sequestration and microclimate modification. (Arbor Day Foundation, 2023; ASLA, 2024; UCLA, 2024) Within the field of landscape architecture, carbon sequestration by designed landscapes is central to the ASLA Climate Action Plan. Increasing trees and woody plants in design is presented as a strategy to offset emissions from project installation, including emissions related to architecture, positioning built landscapes as carbon sinks that can contribute to decarbonization. Meanwhile cities across the U.S. are planning or expanding their urban forests to respond to climate change and to address environmental inequities. Since the mid-1960s, ecological thinking in landscape architecture has evolved to more dynamic frameworks. No longer perceived as separate from a larger ecological context, sites are analyzed in the context of watersheds, corridors, and matrices at multiple scales. Sites are operationalized to become part of a landscape ecology network, for example, serving as a stepping-stone in a migration corridor, or intercepting nutrient loading of waterways from runoff. While plants themselves are central participants in design frameworks and climate strategies, their cultivation and care are minimized. (Elkin, R., 2017) To help situate climate design concepts within a larger theoretical context, this paper analyzes commercial tree production as operations of lateral transfers for soil, water, and carbon dioxide. Lateral transfers are flows of materials and energy between types of landscapes, such as erosion from land to water. (Turner, M., Gardner, R., 2015) Wind (aeloian), water (fluvial) and animal locomotion are traditional agents of transfer, moving nutrients, soil and other matter between landscape types. The scale and speed of human transfers radically change the equation of spatial and temporal transfers, with larger quantities and distances covered in shorter periods of time. In landscape practice and research these material flows are secondary (and often overlooked) processes, as the focus is on sequestration and other ecosystem services derived from planting trees. (Kendall et al, 2011; Lazzerini et al, 2016; Petri et al, 2016) This paper takes a transdisciplinary approach, using principles of life-cycle analysis and integrating entanglements and deep ecology theories from the fields of anthropology and philosophy. The findings will contribute to understandings of trees that expand their role from climate “heroes” to site within a broader milieu of entangled sites, ecology, and community.

Keywords: Landscape Ecology, Climate Action, Urban Forest, Entanglements, Nursery Production

#430 Threshold Ecologies: Reframing Interstitial Land as Urban Ecological Infrastructure

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Abstract

Urban interstitial spaces - vacant parcels, fragmented lots, and unmanaged edges - present a latent but underutilized ecological asset in post-industrial cities. In Detroit, where the Detroit Land Bank Authority (DLBA) manages over 75,000 properties, many of which are unbuilt or in flux, this research explores how ecological assessment and design can reposition these sites as “threshold ecologies”: spaces of transition between vacancy and vitality. This project interrogates the ecological function and climate potential of these interstitial parcels, with objectives to: 1) generate baseline ecological data, 2) prototype scalable planting design strategies, and 3) develop a metrics-based framework to evaluate their ecological performance and potential integration into citywide green infrastructure. Five DLBA-owned sites were selected to represent varied parcel typologies, edge conditions, and urban contexts (e.g., residential block interiors, arterial edges, industrial buffers). At each site, data were collected from two sample points, totaling 10 micro-sites. Methods included field-based ecological surveys and remote sensing: soil compaction and infiltration testing; nutrient and pH analysis; vegetation cover and species ID; infrared surface temperature scans; air quality and noise monitoring (PM2.5 and dBA); drone imagery; and GIS-based mapping of land cover and hydrologic context. Community use and stewardship indicators (e.g., mowing patterns, foot paths, dumping) were documented through field observation and photo logs. Data was synthesized into site-specific ecological profiles and used to generate modular planting concepts - meadow modules, tree islands, and bioswale strips - tailored to observed conditions and performance needs. Ecological benefit was evaluated using a baseline-target approach with metrics such as: projected stormwater retention (gal/year via NRCS curve method), surface temperature differential (°F), native species richness (Shannon Index), and improvement in air quality index. These modules were framed as scalable interventions that could be replicated across DLBA’s parcel inventory, with maintenance tiers aligned to expected stewardship capacity. Preliminary findings reveal that even small-scale vacant parcels contribute measurable ecosystem functions - cooler microclimates, soil carbon potential, informal pollinator habitat - and may serve as distributed climate adaptation infrastructure. The results suggest that reframing interstitial land as ecological infrastructure not only supports resilience but also challenges dominant land valuation models that equate vacancy with deficiency. This research bridges fieldwork with design speculation and contributes to landscape architecture theory by expanding how ecologists, designers, and city agencies co-produce spatial, social, and ecological value. It also provides a framework for integrating data-driven planting design into land bank strategies and municipal climate adaptation efforts.

Keywords: interstitial landscapes, land banks, vacant land transformation, planting design, urban resilience

#457 Hands-On Rain Gardens: Nature-Based Solutions for Climate Resilience in New Jersey

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Abstract

Early environmental planning principles articulated by Olmsted and McHarg remain urgent amid ongoing development in New Jersey's flood-prone landscapes (McHarg, 1969). Urbanization and climate change have altered natural hydrologic cycles, transforming rainfall from a regenerative input into a source of flooding and infrastructure stress (Meerow, et al., 2021). Decentralized nature-based solutions (NbS), particularly rain gardens, are increasingly recognized for enhancing infiltration, biodiversity, and community resilience under altered hydrologic cycles and flooding (Davies, et al., 2021; Wang, et al., 2024). Although many states promote NbS through municipal policies (NJBAC, 2022; NJDEP, 2025; Spector, et al., 2025), empirical assessments of rain-garden performance and social acceptance remain limited (King, et al., 2021; McCleery, 2023; Bahrou, et al., 2024; Herath & Bai, 2024). This study examines rain gardens in New Jersey through two questions: (1) To what extent do they improve infiltration and mitigate stormwater pooling in built environments? (2) Which design and social factors influence their long-term performance and acceptance? A convergent mixed-methods design combined field assessments and qualitative inquiry. Hydrological observations were conducted at 12 rain gardens across different soils, topography, and basin sizes, paired with 12 interviews with caretakers, two designers, and two municipal officials. Fieldwork documented soil characteristics, vegetation cover, ponding behavior, and design attributes, while interviews explored perceptions of functionality, maintenance, and opportunities for broader adoption. Data were synthesized using joint-display integration (Creswell & Clark, 2017; Creswell & Plano Clark, 2023) to align measured performance with stakeholder perspectives. Findings reveal four patterns. First, although many rain gardens were implemented as low-cost interventions, infiltration improved, and ponding was well controlled; sites with heavy clay soils showed slower infiltration, indicating the need for soil amendments, greater gravel or sand content, and deeper basins. Second, caretakers valued native planting palettes but reported maintenance burdens and occasional pest issues when water persisted longer than expected. Third, designers emphasized that fully engineered systems remain cost-prohibitive for many clients, limiting the feasibility of higher-performing designs. Finally, municipal officials expressed strong interest in scaling rain gardens, emphasizing their integration into streetscape planting beds and other applications. By connecting design attributes with stakeholder experiences and priorities, this study advances an evidence-informed framework for adaptive rain-garden design and stewardship, contributing to the discourse on hydrological resilience, community engagement, and the role of small-scale green infrastructure in urban systems (Bush & Doyon, 2019; Košičanová, et al., 2023; DEP & RCCRC, 2024).

Keywords: Nature-Based Solutions (NbS), Rain Gardens, Climate Resilience, Stormwater Management, Stewardship

#471 Wetland Migration on the Coast: A Social-Ecological Transformation

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Abstract

Coastal wetlands—one of the most valuable terrestrial ecosystems in the world—provide habitat for endangered species, protect shorelines from flooding and erosion, improve water quality, and sequester carbon (Barbier, 2018; Costanza et al., 2014). Because of the tremendous value and scarcity of wetlands, it is critical to preserve as much of this ecosystem as possible under sea level rise. Major losses up to 78% of the world's coastal wetlands are expected if the global climate exceeds 1.5°C of warming (Saintilan et al., 2023; Spencer et al., 2016). Landward migration is a key mechanism for the preservation of coastal wetlands under sea level rise. In some areas, wetlands may be able to gradually move landward if the land slopes gently and has no obstructions from human infrastructure (Anisfeld et al., 2017; Enwright et al., 2016; Osland et al., 2022). Yet emerging research from the social sciences points to the potential negative impacts on people due to wetland migration (Spidalieri, 2020; Van Dolah et al., 2020). Many prime wetland migration areas are currently agricultural or developed lands that will suffer diminished economic yields or property damage if allowed to convert to wetlands. Some of these developed lands are home to low-income communities, which may not be able to stop wetland conversion; meanwhile, wealthy communities are more likely to armor against wetland migration (Field et al., 2017; Siders & Keenan, 2019). Conserving land for wetland migration is expensive and local governments are weary of losing property tax revenue. Yet without coastal wetlands, valuable habitat will be lost and shorelines will be much more vulnerable to flooding and erosion. In short, facilitating wetland migration is a major design and planning challenge if we are to balance ecological conservation with human adaptation and equity needs. This research presents a literature review that outlines the emerging issues surrounding wetland migration along with case studies in Maine—a state which is actively planning for wetland migration. Geospatial analysis of these locations exposes the number of people and assets in the path of wetlands. Speculative design and planning ideas show the potential to manage this social-ecological transformation in ways that promote positive and productive futures for both people and wetlands over time. The challenges inherent in wetland migration overlap with many other coastal adaptation issues and will require landscape architects working in this sector to think creatively about how to address complex social-ecological issues.

Keywords: climate change, sea level rise, coasts, wetlands, landscape planning

#485 Social and Ecological Resilience in the context of Climate Coloniality:Situated Indigenous Responses to Place Keeping in Louisiana’s Coastal Landscapes.

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Abstract

Climate change disproportionately impacts Indigenous communities in coastal Louisiana, including the United Houma Nation, Pointe-au-Chien Tribe, Isle de Jean Charles Band of Biloxi-Chitimacha-Choctaw Indians, and the Biloxi Chitimacha-Choctaw Confederation of Muskogees. These communities face severe climate-driven losses and heightened vulnerability to state-endorsed adaptation strategies like "managed retreat." This situation threatens their homelands, sovereignty, and autonomy over vital sites of memory, environmental knowledge, and cultural landscapes. These threats are intensified by ongoing land loss. In response, Louisiana’s Indigenous communities assert social continuance and place-keeping through cultural practices that exemplify social resilience. Despite settler colonial land use regimes that disrupted their environmental relations, they maintain ways of life that anchor them to their place. As elder Rosina Philippe affirms, while outsiders "see the loss," those who belong "see what's still here, what's still viable, what still makes life in this region so precious." However, this resilience is continually threatened by the depoliticizing, technocratic nature of official resilience discourse, which often frames practices through Eurocentric epistemologies. The central issue is how landscape architectural practices intersect with Indigenous climate concerns, which are deeply embedded in a relational ontology. This study investigates how landscape strategies can effectively participate in place-keeping within resilience planning, aligning with practices that maintain sites of memory along the Louisiana Coast. The research, grounded in intensive fieldwork (participatory observation, site documentation), radical listening, interviews, and cultural mapping with Indigenous leaders, is contextualized by climate coloniality—the reproduction of colonial power relations within climate change governance. Preliminary findings demonstrate that everyday cultural practices—such as subsistence fishing, ritual plant harvesting, and maintaining ancestral burial grounds—function as both ecological systems and cultural anchors, sustaining memory and identity despite environmental loss. For instance, traditional resource knowledge tied to ecological cycles informs Indigenous-centered responses to land loss, presenting crucial alternatives to state-managed displacement. These findings underscore the dynamism of Indigenous knowledges in forming resilience strategies rooted in cultural and social continuance. Their sustained efforts demonstrate profound adaptability. The research highlights a key difference: the Indigenous meaning of place is a living, reciprocal relationship, contrasting sharply with Eurocentric views of cultural landscapes as static heritage sites. For landscape architecture, these insights broaden adaptation planning by recognizing cultural landscapes as living archives. The study concludes that resilience planning must integrate cultural systems alongside ecological ones to genuinely support place-keeping, even as communities confront the unavoidable realities of sea-level rise. Indigenous-led strategies are essential for equitable adaptation.

Keywords: Climate resilience, Place-keeping, Indigenous sovereignty, Cultural landscapes, Climate coloniality

#515 Inside the LA Studio and Out: Operationalizing Sustainability in Higher Education Institutions

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Abstract

The fi rst cor e value of the 2024 Landscape Architectural Accreditation Board Standards obligates landscape architecture design faculty to address “environmental health, sustainability, resilience, and stewardship ” with in curr icula , “policies, community, processes, and activities . " The ASLA Climate and Biodiversity Action Plans further justify the inclusion of this content in degree-granting programs so that students are prepared for and can participate in its practical integration . Concurrently, institutions of higher education have operati onalize d the United Nations’ definition of sustainability—to meet the needs of the present without “compromising the ability of future generations to meet their own needs”—by focusing on greenhouse gas and waste reduction , stormwater management, environmental justice, advancements in research, and cultural change from inside and outside the classroom . Besides program-level curricular matters, design f aculty contribute or lead efforts to achieve institutional sustainability goals and fulfill future workfor ce needs. In individual eight-minute overviews , t his five-member panel will offer insights about their involvement in program-, school- or college- and institutional sustainability campaigns at universities in the US Pacific Northwest, Southwest, Upper Midwest , and Mid-Atlantic . A faculty panelist from Temple University will present a workshop model that integrates sustainability content into existing courses and a guide for initiating the modification of general edu cation course requirements . A nother from Washington State University will present a framework for structuring institutional dialogue on decarbonization and climate accountability . A n Arizona State University faculty panelist will present lessons learned from three iterations of a n engaged climate studio model , taught since 2017, focusing on climate adaptation and sustainability in under - resourced hot urban neighborhoods . Two faculty members from the Un iversity of Michigan will p resent (1) a framework for integrating an interdisciplinary landscape approach to decarbonization and resilience within core landscape architecture courses, and (2) insights and operative frameworks from a n ongoing multidisciplinary initiative for the " campus as a leaving learning lab” through full-scale demonstrator projects that simultaneously propel the university’s carbon neutrality and climate action goa ls while accelerat ing faculty use-inspired research and teaching . Thereafter, a 15 -minute moderated panel will afford presenters opportunities to reflect on and collectively identify success ful tactics for working within b ur e a u cracies , overcoming institutional obstacles, and leveraging the unique perspective that design faculty contribute to the service activities within which they are involved. Attendees that are interested in initiating , have begun undertaking , or encountered resistance to similar actions may gain knowledge and the confidence to continue at their institution . The panel will conclude with a 15-minute Q&A.

Keywords: sustainability, climate change, environmental literacy , pedagogy, curricular development

#520 Designing Resilient Futures: Integrating Playa Lakes into Flood Management and Water Conservation Strategies for Lubbock, Texas

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Abstract

Lubbock, Texas, faces recurring challenges of sudden flooding and water scarcity due to its dry climate, flat terrain, intense storm events, and inefficient stormwater management, which interact in complex ways. Playa lakes, which are naturally occurring depressional wetlands across the Southern High Plains, offer significant potential to help address these issues. With over 2,500 playa basins in the region, they can store stormwater, reduce flooding, and support aquifer recharge, yet they remain an underused component of current water management strategies. This underutilization reveals a critical gap in planning and research, particularly regarding how playa lakes can be restored and linked to form a functional green infrastructure network. To address this need, this research aims to explore- how does the restoration and strategic connection of Playa Lakes in Lubbock reduce flash flooding and enhance urban water conservation? To identify the most suitable playas for such a system, we assess their health condition to determine which sites require improvement, their proximity to flood-prone areas to understand where they can offer the greatest mitigation benefits, their location relative to commercial and residential districts where additional water supply and flood relief are most needed, and the availability of nearby vacant land that could support the creation of a new green infrastructure system connecting the playa lakes. We also evaluate which playas have the potential to serve as both ecological assets and community parks. Based on these assessments, this study focuses on a group of playa lakes located in central and northeastern Lubbock, identified as priority sites for restoration and connection. The design proposal explores how playa lakes can function as a connected system rather than isolated basins. The proposed network links playas to rain gardens, bioswales, and green corridors created primarily from vacant land. These elements are intended to slow and filter runoff, enhance groundwater recharge, store more water during storm events, and provide supplemental water during dry periods, while also helping the public understand how the system works. Because the project is ongoing, performance evaluation will be conducted later using the Green Values Stormwater Management Calculator to compare stormwater performance before and after the design. The designs will illustrate how playas can be incorporated into a green infrastructure framework for semi-arid cities to improve both flash-flood mitigation and water conservation, while also supporting people’s everyday social activities.

Keywords: Playa Lakes, Flood management, Resilient infrastructure, Water Conservation, Community value

#536 Understanding Climate Governance and Urban Greening through Qualitative Analysis of Municipal Plans in Connecticut

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Abstract

Urbanization is directly related to climate change, and heat stress is among the most significant public health risks. Though not typically considered life-threatening, heat is an underlying stressor that can trigger preexisting illnesses such as cardiovascular disease or asthma (Ebi et al., 2021). In the United States, heat has been the leading cause of weather-related fatalities for decades, and cases continue to grow steadily (National Weather Service [NWS], 2024). Moreover, studies have found that urban heating can aggravate air quality and further impact human health (Piracha & Chaudhary, 2022). Growing concerns regarding such climate stressors have led communities to implement policies and plans to protect residents from health implications. In the state of Connecticut, town-rule enables its 169 municipalities to be autonomous and determine their own policies and regulations. Yet this individualized approach results in variable timelines and plans, which in turn support fragmented forms and levels of climate-oriented action. This presentation focuses on a year-long research project aimed at examining the needs and challenges of community-level climate planning. It uses ten Connecticut towns as case studies and examines specifically if and how urban forestry and green infrastructure conservation and management are discussed and promoted as strategies for climate mitigation. We will discuss data collected and cataloged from existing policy and planning documents, examining their approaches to address heat and air quality. These towns vary in size, history, and location, with one selected from each regional Council of Governments. We applied a qualitative analysis using an inductive coding framework informed by climate governance and urban greening literature, following principles of thematic analysis and validation through intercoder agreement (Braun & Clarke, 2006; Dixon-Woods et al., 2007). To explore connections between policy approaches and socio-economic factors, we adopted a co-production framework (Meadow et al., 2015), integrating demographic data via ArcGIS Business Analytics to situate findings within broader governance and equity contexts. Preliminary results indicate a spectrum of how Connecticut towns address climate through urban greening. Towns with recurrent themes tend to lead the charge in exploring urban greening in policy and practice, while others show limited integration and resource constraints. These complementary results provide clarity on underlying challenges to promoting climate action that were not explicit within the documents collected. We will conclude by discussing proposed next steps, which aim to clarify findings through interviews with landscape architects, planners, and decision-makers from these towns.

Keywords: Heat, Air quality, Urban Greening, Climate planning

#591 Burns Park: Designing a Net Zero Park for Climate Resilience, Childhood Education, and Community Stewardship

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Abstract

Burns Park in Ann Arbor, MI, has long served as a civic and ecological anchor. Once a natural hardwood forest, then a fairground and horse track, Burns Park now serves as a recreational hub for elementary students and the surrounding neighborhood. Yet its current form, dominated by open lawn recreation and minimal ecological infrastructure, no longer meets the intertwined challenges of climate change, community resilience, and ecological stewardship. This project asks two core questions: How can an integrated school and park intervention reduce greenhouse gas emissions and lifecycle carbon while improving ecological function? Which landscape systems yield measurable stormwater mitigation, biodiversity gains, and tangible community benefits in an urban park? Aligned with a Net Zero renovation of Burns Park Elementary, the park is being reimagined as a Net Zero landscape and living laboratory for climate action and intergenerational engagement. For the purposes of this project, a Net Zero park is defined as a landscape whose annual energy and material emissions associated with facilities, installed systems, and maintenance practices are offset by on-site renewable energy generation and carbon sequestration. The project's system boundary therefore includes park buildings, mechanical systems, installed landscape elements, and routine operations. We use a hands-on, mixed-methods approach that pairs iterative schematic design and participatory workshops with targeted field tests and modeling. Site-specific methods include geothermal seepage testing to refine planting palettes under shifting hydrology, stormwater modeling and infiltration trials, and biodiversity monitoring protocols coupled with pre/post observational studies. Measurable goals include increasing native plant cover by 30–50% and documenting corresponding rises in species richness within five years. Participatory design anchors the work in local needs, where workshops with teachers, students, and neighbors will shape interventions and stewardship. The delivery includes an operations-and-maintenance and funding package to translate design intent into implementation-ready materials for potential funders. The O&M approach emphasizes low-input species, precision irrigation, reduced-mowing regimes, and community stewardship to sustain ecological function while lowering maintenance emissions. Equity and access are explicit priorities, with universal access to core amenities, distributed seating and shade, and intergenerational programming. By situating a neighborhood park within the larger discourse of climate adaptation, this project demonstrates how public landscapes can become experimental test beds for energy efficiency, biodiversity support, and carbon mitigation. It demonstrates how design education, when rooted in community practice and ecological literacy, can generate actionable strategies for mitigating anthropogenic pressures while also fostering social cohesion.

Keywords: Net zero, Climate resilience, Ecological literacy, Participatory design, Geothermal

#592 Designing Communities for Wildfire Resilience: Adaptive Futures for Small Rural Towns

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Abstract

Wildfires have become one of the most urgent challenges for rural communities across the American West. Their rising frequency and intensity, driven by climate change, human activity, and ecological conditions, create disproportionate risks for towns with limited resources, aging infrastructure, and vulnerable populations (Guo et al., 2024; Montoya Alvis et al., 2025). Idaho, with its extensive forests, dry summers, and expanding wildland–urban interface (WUI), is among the most vulnerable states. In 2023, Idaho recorded 892 wildfires that burned more than 88,000 acres (Idaho Department of Environmental Quality, 2023; National Interagency Fire Center, 2023). This project, Designing Communities for Wildfire Resilience: Adaptive Futures for Small Rural Towns , focuses on five towns in north-central Idaho: Bovill, Kendrick, Deary, Elk River, and Julietta. The goal is to apply Firewise principles to develop design and planning strategies that enhance wildfire resilience while balancing ecological health, public safety, and community identity. By working directly with these towns, the project demonstrates how proactive design can reduce risks and strengthen long-term adaptability in fire-prone rural landscapes. The project is organized into five phases. Phase 1 builds baseline knowledge through lectures, workshops, and field visits. Phase 2 develops diagnostic maps of hazard zones, infrastructure, and community assets, supported by precedent studies in fire-adaptive design. Phase 3 creates alternative scenarios shaped by wildfire frequency, drought, and demographic change. Phase 4 delivers strategic planning and design interventions, including team-based master plans and individual projects such as resilience hubs, adaptive housing prototypes, and fire-adapted public spaces. Phase 5 synthesizes these outputs into a comprehensive portfolio and presents them to community stakeholders for feedback and future use. The project develops actionable strategies rooted in Firewise practices that mitigate immediate wildfire risks while strengthening the long-term adaptive capacity of small rural towns. Beyond site-specific outcomes, it demonstrates how design research can operate as a translational framework—connecting academic expertise, professional practice, and community knowledge—to advance integrated planning, participatory engagement, and resilience. By positioning wildfire resilience within both ecological and socio-cultural contexts, the project offers insights that are applicable not only to Idaho but also to wildfire-prone rural regions across the Pacific Northwest and beyond.

Keywords: Wildfire resilience, Rural communities, firewise landscaping

#607 Integrating Nature-Based Design and Cultural Heritage for Climate-Resilient Futures: A Case Study of Port Fourchon, Louisiana

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Abstract

Coastal Louisiana is experiencing some of the highest rates of land loss in the world, due to sea-level rise, land erosion, and escalating storms. Port Fourchon, situated near the southern edge of Lafourche Parish, the port faces significant challenges from erosion, flooding, and ecological deterioration, despite its contribution to 95% of the Gulf's deepwater energy output and its connection to 50% of U.S. refining capacity. Such hazards could affect both the cultural landscapes of coastal communities and the safety of the nation's energy supply. While prior work often isolates engineering or ecological restoration, recent research emphasizes the need for i ntegrated, nature-based, and culturally grounded design strategies. Responding to this gap, the study asks: (1) How can adaptive restoration strategies integrate engineering and ecological principles to address sea-level rise, storm impacts, and subsidence at Port Fourchon and Grand Isle? (2) How can ecological design approaches strengthen local cultural identity, fisheries, tourism, and community wellbeing? The primary objective of this paper is to increase wetland areas and reduce backwater flooding by building the land with dredged material and increasing the mangrove density. The secondary objective is to restore and maintain the ridges and local chenier landmarks. The study employs a multimethod framework that links remote sensing, geospatial analysis, numerical modeling, and cultural landscape assessment. Landsat and Sentinel-2 imagery were analyzed in ArcGIS Pro to quantify long-term coastal dynamics, revealing approximately 76 km² of land loss since 1983. These mapping results informed the placement and configuration of nature-inspired hexagonal (honeycomb) terraces, designed to enhance sediment retention and hydromorphic stability. Delft3D hydrodynamic simulations then evaluated three scenarios including no terraces, linear terraces, and hexagonal terraces—over equivalent hydrodynamic periods. Findings show that hexagonal terraces are significantly better than linear terraces, with major implications for coastal design. They increased hydraulic residence time from ~35 days (no terraces) and ~75 days (linear) to ~145 days, demonstrating strong water retention and flow recirculation. Sediment trapping efficiency reached ~70%, more than double the linear configuration (~30%), resulting in the highest total sediment deposition (≈19 million m³). These outcomes suggest substantial potential for wetland expansion, reduction of backwater flooding, and long-term geomorphic stability. Importantly, the project links ecological performance with cultural landscape resilience by integrating the restoration of chenier ridges. This connection positions the work squarely within landscape architecture and coastal design, offering a replicable framework for combining biomimicry, modeling, and cultural analysis.

Keywords: Coastal Resilience, Nature-Based Design, Sediment Terraces, Wetland Restoration, Restoration Strategies

#617 Past to Present: Material and Functional Shifts in Stormwater Infrastructure Design

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Abstract

Introduction: Stormwater infrastructure has long mirrored the priorities, technologies, and material practices of its time. From ancient aqueducts and drains to today's green stormwater infrastructure (GSI), the evolution of these systems reflects shifting societal concerns, ranging from sanitation and public health to ecological resilience and climate adaptation. While recent discourse emphasizes sustainability and the use of regenerative, locally sourced materials, there is limited historical synthesis connecting these contemporary practices to their deep precedents. This study addresses that gap by investigating the material and functional evolution of stormwater systems across cultures and centuries. Methods: A comprehensive historical–comparative literature review was conducted, analyzing engineering treatises, archaeological findings, and urban design histories. The review spans ancient Mesopotamian, Greek, and Roman systems; post-Roman medieval practices; and the technological innovations of the eighteenth through twentieth centuries. Each period was examined for its prevailing materials, construction techniques, and design philosophies, with special attention to transitions in societal priorities and environmental awareness. Results: The study identifies recurring themes in stormwater management: adaptation to urban growth, responsiveness to public health crises, and gradual recognition of environmental consequences. Ancient systems reveal enduring design strategies—such as modularity, redundancy, and integration with natural hydrology—that remain instructive today. Later industrial-era systems demonstrate rapid expansion and engineering efficiency but often at the expense of ecological health. The modern turn toward GSI represents a rebalancing, with emphasis on multifunctionality, resilience, and sustainability. Discussion: Findings suggest that the present movement toward GSI is less a rupture than a return—drawing on ancient principles while innovating with new materials and ecological science. For landscape architecture, this highlights the value of historical precedents as design resources, reinforcing the profession's role in shaping adaptive infrastructures that balance utility, culture, and ecology. The study's limitations lie in its reliance on secondary sources; further empirical analysis of surviving infrastructures would deepen understanding. Conclusion: By situating contemporary GSI within a long trajectory of material and conceptual shifts, this research underscores the discipline's opportunity to frame stormwater management not merely as engineering but as cultural landscape practice. For researchers, it calls for cross-disciplinary inquiry into past systems; for practitioners, it affirms that designing for resilience requires both innovation and historical awareness.

Keywords: Green Stormwater Infrastructure (GSI), Resilience, Sustainable Materials, Historical Evolution, Urban Water Management

Service Learning and Community Engagement

#48 Making Magic: Floating Communities, A study of fluidity, flexibility, adaptation, inspiration Magic, Adaptation, Innovation

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Abstract

Bringing the “extremely or extraordinarily pleasant, enjoyable, or exciting,” even the magical, into Landscape Architecture projects can magnify both practical and spiritual engagements. 1. Crafting magic requires diverse skill sets, risk-taking, innovation, and creativity. When function, vision, and community strengths align, one is able to realize the inherent potential of projects as sites of transformation, delight, and surprise. Through the case study “Floating Communities,” the magical potential of the historic Dals Langed system of canal and lakes was explored. The project showcases three means of transformation. First, strengthened connections between communities through a public sensory experience, including floating events, gatherings, and performances. Second, shared resources instead of duplication, and third, engagement with existing waterways to enhance magical experiences. This service-learning project is part of a continuing collaboration with the local community of Dals Langed. The highly collaborative process features community focus groups, open studio, structured dialogue, and shared labor during each phase of design and construction. “Floating Community” also underwent a prototyping phase during which it was tested for flexibility, fluidity, and replication as a scalable model for climate change adaptation, activation of the waterfront, and the restoration of vitality to a community that is losing population. 2. “Floating Communities” builds upon the current evolution of floating elements, notably the Jubileumsparken Harbour Park, Gothenburg, Sweden and floating saunas, Mast Architecture, Copenhagen, Denmark. 3 . 1-1 scale prototypes allowed us to experiment with many physical, technical and magical aspects of the floating spaces. We document the community interactions and responses to the floating elements that informed the latest 2025 project, a floating market. Aristotle once said, "for the things we have to learn before we can do them, we learn by doing them." 4 . This community service model is an effective teaching model delivering practical skills, testability, flexibility, adaptability, and collaboration. 5. Crucially, collaboration occurs at several levels across culture including: students of American and Swedish universities, the project team, the regional planning office, the community-based NGO, and residents of Dals Langed. This prototyping model is particularly applicable to rapid design exploration, community collaboration, and phenomenological testing. Finally, prototyping challenges students to physically work through the crafting of their designs, an element often missing in traditional LA programs. The student responses to the design build learning model and the community reactions will be addressed in this presentation.

Keywords: Magic, Crafting, Service learning, Community

#122 Community engagement through VR in Eupora Mississippi: an enhanced studio learning approach for broader community impacts

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Abstract

Introduction Today, landscape architecture programs are experiencing declining enrollment and smaller studio sizes, reflecting higher education trends (Holmes, 2024; Schuette, 2023; LAAB, 2021). These challenges call for approaches to sustain existing curriculum while fostering meaningful community-engaged approaches that enhance student learning and extend the relevance of studio work. Recent scholarship emphasizes the benefit of a process-oriented strategies for collaboration (Yang et al., 2025) and the use of spatial decision-support tool to facilitate participation (Grêt-Regamey et al., 2017). However, new methods are needed to both enhance community participation and support mutual learning for students and communities alike. This study examines the potential of virtual reality (VR) exhibition as a tool for sharing students' design processes and outcomes with community members. Method The case study focuses on Tobie Brantley Park, an 8.3-acre site located in a historically underserved neighborhood in Eupora, Mississippi. In the 2025 Graduate Landscape Architecture Design Studio, four students collaborated with community members to visualize future uses for the park. To move beyond the traditional emphasis on final deliverables, the project sought to make students' design processes—where ideas are developed, revised, refined, and finalized—accessible to community participants. Student work, including site analysis, SWOT assessments, conceptual development, and final proposals, was uploaded to a web-based VR exhibition. Community members accessed the exhibition through web and mobile platforms, allowing them to explore the design journey independently. Data was collected through two rounds of semi-structured interviews with 15 participants, including students, conducted at both midterm and final review stages. Result/Discussion This is ongoing research, and the anticipated findings will demonstrate that VR exhibitions can extend community participation in design decision-making by making students' learning process more accessible and transparent. Instead of accessing only students' final outcomes, the community can access their work at earlier stages of design, allowing them to provide more in-depth and meaningful contributions and feedback. The web-based VR exhibition allows the community to access students' whole-process design experience, furthering their understanding of the project rationale. Conclusion The project explored the value of enhancing community understanding of the small-scale project site through the integration of VR exhibitions, as well as the potential of mutual learning between students and community members. By making student work more accessible, the study highlights a replicable pedagogical model in which design education and community engagement intersect through immersive technology, advancing both teaching and practice in landscape architecture.

Keywords: Community-engaged design, Collaboration, Virtual Reality, Sustainability education, Mutual learning

#137 Designing for Hózhó – Reciprocity, Water, and Well-being

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Abstract

Community-engaged studios in landscape architecture programs offer students opportunities to connect with real clients and cultivate civic responsibility (Gerlak & Zuniga-Teran 2020). However, few address how Indigenous worldview can shape design outcomes and student learning (Hill 2005). This presentation examines a collaborative studio between the University of Arizona (UA) and the University of New Mexico (UNM), working in partnership with Navajo Technical University (NTU) to develop a landscape framework and green infrastructure plan for the NTU campus. Guided by the Diné (Navajo) principle of Hózhó (balance, beauty, and harmony) and Sa'ah Nagaaghái Bik'eh Hózhóón or SNBH (a complex Diné epistemology centered around Hózhó)(Kahn-John 2010; Kahn-John & Koithan 2015; Lee, 2014), the project positioned cultural understanding at the center of the engagement and design process. The Fall 2025 studio was organized into four phases: (1) relationship building with NTU leadership and students; (2) cultural grounding in Hózhó and SNBH as guiding frameworks; (3) site and context understanding focusing on place and culture; and (4) an iterative design process shaped by NTU input and feedback. In partnership with a representative from NTU who initiated the project vision and provided cultural guidance, planning involved faculty from UA and UNM, with UA supported by the CELA CLASS Fund Grant, and UNM as a local partner with prior Indigenous collaboration experience. Over the course of the studio, students from UA and UNM developed conceptual campus-scale frameworks to illustrate how green infrastructure can enhance landscape performance and reinforce cultural identity. Engagement with NTU stakeholders and guest lectures deepened understanding of place and culture – revealing the complexity of "designing with" rather than "designing for" Indigenous partners (Sanders & Stappers 2008). However, the absence of Diné students in both studios highlights barriers to Indigenous representation in landscape architecture education. Lessons learned from this experience underscores how service-learning partnerships can meaningfully expand students' eco-cultural literacy, guided by an ethos of reciprocity and Indigenous epistemologies. While limited by the short duration of the semester and demographic differences, the project demonstrates how these partnerships can move beyond technical problem-solving and advance cultural understanding and ethical engagement. This case study offers a replicable model for community-engaged studios with Indigenous partners by centering worldview and culture, structuring reciprocity, and preparing students for culturally informed practice. Although it illustrates the challenges of community-engaged studios, in practice it highlights how Indigenous planning philosophies and traditional knowledge can align with the role of landscape architecture in regenerative design.

Keywords: service learning, Indigenous collaboration, cultural literacy, design studio, reciprocity

#166 Water Pump Station: A Service-Learning Case StudyFor a Reclamation Project along Sandy Creek Greenway Park in Athens, Georgia, USA.

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Abstract

The development of the urban fabric to sustain human activities will not be guaranteed without reliable access to drinkable water. Town historical accounts focuses attention towards the preservation of their architectural gems and landmarks, while simultaneously overlooking the engineering infrastructure that made the city habitable. These engineering marvels are mostly concealed from the public but are instrumental in creating a holistic view of the history of the place. The Sandy Creek Water Pump Station was designed-built by architect-civil engineer John W. Barnett in 1916, which provided drinkable water to the fast growing town of Athens. Decades later, due to technology innovations the Pump House was abandoned as a source of water. The site now sits unused and hidden under overgrowth until the construction of the North Oconee River Greenway exposed the site. The non-profit organization of Historic Athens took the visibility and community interest created to develop a plan to reclaimed/reused the building. Historic Athens and the Parks Department expressed interest on the preservation of the Pump House but lack the design resources to illustrate potential reuse for the structure. The assistance of the University Service-Learning Program was requested as a viable community partner capable of providing the design resources at no cost. Teaching, research and service to society are the core mission statements of the University. Service-learning design studios offer a way for students to learn how to engage the community as well as provide them with hands-on real world work experience that goes beyond the limits of a theoretical environment (Eyler, 2001). Partnership between academia and a non-profit is mutually beneficial since it allows for the development of ideas/design solutions to be used by the community while simultaneously providing a living lab for the students to learn and gain valuable hands-on experience/skills (Bringle, 1996). Several methods will infuse research into this service-learning effort. First, it will serve as a case study for how students can make an impact to Historic Athens, who may not have the means to afford design services. Second, documentation method will be used, where students will be required to review articles, literature, and other sources. The students will find examples of similar structures that were successfully salvage/reused. Third, the documentation of the methodology used to implement and integrated a service-learning component into a design studio course will serve as a blue print for further course developments of similar scopes.

Keywords: Service Learning, Case Study, Community Engagement, Reclamation, Reused

#167 Co-Designing Climate and Health Adaptation: Vision-Driven, Community-Engaged Planning in Michigan

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Abstract

Communities across Michigan are increasingly exposed to flooding, extreme temperatures, declining air quality, wildfire smoke, and other climate-related hazards [1] . These risks threaten public health by contributing to heat stress, respiratory illness, waterborne and vector-borne disease, food insecurity, and mental health challenges such as stress and anxiety [2] . The Michigan Climate and Health Adaptation Program (MICHAP) advances integrated planning and design strategies to address these challenges. The Michigan Department of Health and Human Services and Michigan State University collaborate to provide technical assistance to local governments, tribal nations, and community-based organizations. The program adopts community engagement activities with graphic visioning processes that produce a consensus vision, and planning and design recommendations with a set of pre- and post-visualizations to guide adaptations addressing climate impacts on public health [3] . The project aims to: 1) build a diverse and inclusive coalition to support climate planning priorities and implementation goals, 2) identify climate-driven health issues and solutions through multiple rounds of community engagement, 3) co-design a tailored community vision reflecting the priorities of the residents and local stakeholders. The project team first convened three statewide webinars to introduce the initiative, share emerging climate–health knowledge, and promote participation opportunities. Based on this process, three Michigan communities–Sterling Heights, the Keweenaw Bay Indian Community, and Washtenaw County–were selected via a statewide open application. Building on this foundation, the project employs a structured, community-engaged approach, integrating site visits, community workshops, and iterative communication with local officials. Engagement is organized around three key phases: (1) identification of local climate-health risks and priority sites based on community visioning, (2) co-development of preliminary design recommendations and adaptation strategies for stakeholders' feedback, (3) refinement of final design and planning recommendations with priorities for future implementation. Visual communication tools, including maps, renderings, and pre-/post-visualizations, are used to illustrate adaptation options and foster informed community dialogue. The project incorporates assessments of landscape performance and related health benefits. The outcomes produce site-specific strategies that strengthen resilience to climate risks while advancing placemaking, improving walkability, and promoting neighborhood well-being. Final deliverables document the community engagement process and provide communities with actionable recommendations. More broadly, this study demonstrates how collaborative, vision-driven processes can embed a health-in-all-planning framework through a community-engaged approach that links climatic drivers to public health impacts. In doing so, the project cultivates local knowledge and capacity and advances a transferable model of design-led engagement applicable across diverse community contexts.

Keywords: Community engagement, Climate change adaptation, Public health, Graphic visualization, Resilient community

#229 Landscape as Narrative Infrastructure: Co-Designing the Post-Industrial Town

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Abstract

Post-industrial landscapes are more than vacant land; they are cultural archives that hold stories of labor, identity, and loss. This project positions landscape design as narrative infrastructure , where adaptive reuse becomes a medium for both storytelling and resilience. Through the case of Piedmont, South Carolina, the work explores how historic mill sites can be reimagined as multifunctional spaces—linking ecological repair with interpretive design strategies such as memory walks, public art, and community storytelling events. Central to this approach is a community co-design process in which residents shaped priorities through participatory workshops, collaborative mapping, and storytelling sessions. These methods not only revealed spatial needs but also translated oral histories and cultural narratives into design interventions, ensuring that local voices directly informed the project's outcomes. The collaborative process culminated in the design of two interwoven trail systems: a Heritage Trail that retraces the paths of Piedmont's mill history through interpretive markers, restored industrial remnants, and spaces for reflection that honor stories of labor and identity; and an Entertainment Trail that activates the riverfront with amphitheater lawns, markets, and performance spaces supporting festivals, storytelling, and everyday social life. Together, these trails transform an abandoned mill site into a living archive—one that sustains memory while offering spaces for celebration and future growth. By weaving participatory engagement with narrative design, the project contributes to the body of knowledge on post-industrial revitalization by showing how community co-design can embed collective memory into the physical fabric of towns, creating spaces that bridge heritage, identity, and resilience in the face of urban change.

Keywords: Narrative infrastructure, Participatory design, Post-industrial landscapes, Adaptive reuse, Community co-design

#251 Designing Engagement: A Participatory Framework for Studio-Based Collaboration with Communities

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Abstract

Introduction In landscape architecture education, community engagement is often constrained by studio timelines and simplified tools such as surveys. This project introduces a more nuanced participatory approach within an undergraduate studio at Iowa State University, developed in partnership with the City of Algona, Iowa. Building on a previous Iowa Mayor's Workshop collaboration, students were tasked with designing a 50-acre park along the East Des Moines River. While city officials initially envisioned a community survey, this project sought to expand both institutional and student perspectives on meaningful engagement, emphasizing participation as an iterative, interpretive, and collaborative process. Methods A participatory design game was developed, drawing on established approaches to community involvement (Sanoff, 2000). The activity aimed to collect both quantitative and qualitative input from residents about desired amenities, activities, and values for the new park. The format emphasized collaboration and consensus building rather than competitive voting (Sanoff, 2024). Interactive stations encouraged conversations around spatial preferences, programmatic needs, and community priorities. Data collection included observational notes, image sorting, mapping exercises, and written comments. Students participated in facilitating the event, while the design of the process and subsequent analysis were led by faculty. Results Because the engagement activities will take place during the semester, results are not yet available. The process is expected to generate feedback on the types of open space residents would like to see, desired amenities and activities, and priorities for connecting the new park to surrounding landscapes. These findings will inform student design proposals and provide city leaders with a clearer understanding of community values that extend beyond initial expectations. Discussion This project is expected to demonstrate how structured participatory methods can enrich studio-based education while broadening the city's perspective on public involvement. For students, the process offers opportunities to practice data collection and interpretation and to translate community input into design proposals. For city leaders, the project will highlight that engagement can extend beyond surveys to include collaborative and interpretive practices. Although limited by the semester schedule, the effort has the potential to seed more sustained and meaningful engagement in future civic initiatives. Conclusion This project illustrates how design education can scaffold richer community engagement within studio constraints. By testing participatory methods that capture both qualitative and quantitative insights, it is expected to advance the pedagogy of community-engaged design and inform future university–community collaborations.

Keywords: Participatory design, Community engagement, Design studio pedagogy, Landscape architecture education, Mixed-method

#401 Growing Green, Building Community: Participatory Design in St. James Parish, Louisiana

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Abstract

This project explores neighborhood and residential-scale landscape architecture interventions in St. James Parish, Louisiana, a community shaped by recurrent flooding, intensifying urban heat, and the encroachment of industrial development. These overlapping pressures threaten ecological health and residents' quality of life, particularly as nearby industries contribute to disproportionate pollution exposure. In collaboration with community members, the initiative responds through co-created design strategies that reduce hydrological stress, minimize the visual and ecological dominance of industry, expand access to green space, and strengthen community identity. The guiding research question is: How can participatory landscape design both mitigate environmental stressors and confront the industrial legacies while fostering equity, resilience, and community identity? To investigate, the project employed participatory design methods that positioned residents as co-creators, drawing on lived experience to set priorities. Ten Master of Landscape Architecture students at Louisiana State University contributed to site analyses, facilitated design workshops, and developed conceptual and technical drawings. These service-learning contributions gave students hands-on experience with resilience planning while creating a framework to translate community input into design strategies. At the neighborhood scale, proposed interventions included stormwater retention, shaded corridors, and pocket parks that filter pollutants and lessen the visual impact of industrial facilities. At the residential scale, recommendations such as rain gardens, bioswales, permeable paving, and tree planting addressed stormwater retention, canopy expansion, and heat reduction. Together, these strategies form a layered approach to resilience, tackling environmental, industrial, and cultural challenges simultaneously. The outcomes highlight how landscape architecture can integrate environmental justice with ecological performance while advancing disciplinary knowledge through service-learning. For the community, the designs offered immediate benefits of not only flood and heat mitigation and but also gathering spaces that reinforce pride and cohesion. For the discipline, the project contributes in three ways. It models how landscape architecture can directly engage with industrially burdened communities, extending the field toward environmental justice and health equity. It demonstrates how multiscale, community-driven design connects technical resilience with cultural identity, reframing resilience as both ecological function and social empowerment. Lastly, it underscores the pedagogical value of service-learning, showing how integrating students into real-world projects enriches education and strengthens the profession's capacity to respond to climate change and systemic inequities. Currently shared in public comment meetings hosted by the Pontchartrain Conservancy and submitted to the Louisiana State University President's office, the project demonstrates how landscape architecture can operate at the intersection of resilience, equity, pedagogy, and community empowerment.

Keywords: Coproduction, Green Infrastructure, Resilient Landscapes, Community Engagement

#423 Collaboration with Purpose: Applying Critical Pedagogy to Undergraduate Service-Learning Studios

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Abstract

Sophomore and junior landscape architecture studios collaborated with Esther Manor Farm in Virginia, a 10-acre property focused on growing African produce and fostering community through food, music, and dance. Esther Manor Farm leadership reached out to faculty to ask for support and guidance in their master planning. The farm sought design strategies to expand its facilities and enhance community-building opportunities. As a research question, faculty asked how could Paulo Freire's Critical Pedagogy inform the design and implementation of service-learning undergraduate studios in landscape architect? Modifying Freire's five core principles (e.g. education as a practice of freedom, dialogical learning, problem-posing education, critical consciousness, and the rejection of the "banking model" of education) into studio pedagogy and student engagement, faculty considered how students learn in the field, absorb the studio content, and meet learning objectives. Students participated in an engagement process supported by research in community engagement activities and cultural landscape practices. Due to limited client funds, professional partnerships with 3North and Timmons Group enabled students to visit the site, connect with practitioners, and gain professional experience. The studios also fostered critical reflection by encouraging students to better understand cultural landscapes, food justice, and the role of design in community empowerment. A mixed-methods approach was used to evaluate the effectiveness of the studios. Student reflections, surveys, studio deliverables, and client feedback were analyzed to assess how well students engaged with the client, design, and critical thinking. The results will likely suggest that students demonstrated meaningful engagement particularly through participatory design efforts and application of cultural landscapes. This is a current work in progress that will render results by the end of 2025. The studios adapted Freirean principles through reflective design practices, participatory charrettes, community-defined problem framing, iterative feedback, and collaborative learning between students, faculty, and stakeholders. This approach not only supported the farm's mission but also offered students meaningful exposure to cultural landscape studies, community engagement, and professional networking. This case study highlights the potential of service-learning studios to serve as spaces where students and communities co-create knowledge and envision more resilient futures.

Keywords: Co-design, Community engagement, African cultures, Agriculture, Professional partnerships

#428 Telling Place: Visual Storytelling, Co-Design, and Community Repair in Detroit's Grixdale Farms

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Abstract

Storytelling and placemaking are increasingly recognized as essential tools for building resilient communities in contexts of disinvestment and urban flux. In Detroit, neighborhoods carry layered narratives of aspiration, loss, and endurance that extend beyond physical decline. This project—the Telling Place —emerges from a long-term collaboration between the Grixdale Farms Neighborhood Association and the University of Michigan. Grounded in theories of participatory design, narrative identity, and community care, the project asks: How can visual storytelling and co-design practices materialize neighborhood memory in ways that build capacity, foster belonging, and repair social fabric? The project utilized community-engaged design research methods including PhotoVoice, oral history interviews, participatory mapping, and "full-scale" design prototyping. Over the course of a year, residents and students co-created neighborhood timelines, identified meaningful sites, and collaboratively generated design content for signs, banners, small-scale markers, and walking tour itineraries. Workshops combined archival collection with 1:1 design scenarios, enabling participants to translate intangible stories into tangible design prototypes. The process yielded three primary outcomes: (1) a living archive of neighborhood stories and images, curated through both digital and physical platforms; (2) design concepts for a network of neighborhood markers—ranging from gateway signage to intimate stake signs—developed through iterative co-design sessions; and (3) draft itineraries for walking tours that spatialize community memory, linking stories to places and strengthening neighborhood identity. Beyond products, the workshops generated significant process-based results, including strengthened resident leadership, intergenerational knowledge exchange, and momentum toward implementation. The findings suggest that community storytelling, when coupled with design prototyping, can function as a method of repair—transforming narratives of decline into visible symbols of pride and resilience. For landscape architecture, this work contributes to expanding theories of participatory design, demonstrating how full-scale and narrative-driven approaches deepen engagement and produce context-specific outcomes. Limitations include the challenge of sustaining momentum beyond the project timeline and balancing resident aspirations with resource constraints. The Telling Place project illustrates how landscape architects can serve as facilitators of narrative, design, and capacity building in disinvested neighborhoods. For researchers, it highlights the methodological value of combining oral history, participatory mapping, and 1:1 prototyping. For practitioners, it underscores the importance of design as an act of community care—one that materializes collective memory and fosters resilience in place.

Keywords: visual storytelling, participatory design, community engagement, narrative identity , urban resilience

#495 “Neighborhood with Climate” – A Serious Game to Involve Communities in NbS Co-Design

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Abstract

Involving the local community in pro-adaptation activities is a long process. It requires designers, on the one hand, to focus on the problems of the local community, and on the other, to engage not only residents but also other decision-making stakeholders in the design process, particularly regarding the implementation of solutions. One such tool is the ProAdapt Urban Lab, which is a sequence of meetings with a diverse group of stakeholders (residents, officials, developers, NGO representatives) to jointly develop solutions aimed at improving the living environment quality. We implement ProAdapt Urban Lab as part of the IntegrateNbS project within the European Union program Driving Urban Transition. A tool supporting work within the ProAdapt Urban Lab is a serious strategic game called “Neighborhood with Climate”, which we designed. Its goal is to encourage city residents to engage in collective pro-adaptation activities within their housing estates. The game “Neighborhood with Climate” has both board and computer versions, where the neighborhood indicated by residents serves as the playing field. In the game, pro-adaptation measures can be implemented within selected neighborhoods to minimize the negative effects of climate change, ranging from microclimate improvement solutions to rainwater management. Additionally, the game enables verification of the effectiveness of chosen solutions — whether temperature has been reduced, air quality improved, and how much rainwater has been captured. This aspect of the game highlights its significant educational value. It allows players to familiarize themselves with various pro-adaptation solutions at the scale of a housing estate and the benefits of their application, both for landscape architecture students and local communities. Moreover, it demonstrates how local communities can be engaged in developing pro-adaptation solutions for public spaces. As part of the “Neighborhood with Climate” Conference Panel, we wanted to invite participants — including academic teachers, practitioners, and students — to play the board game “Neighborhood with Climate.” In teams of 3 to 6 people, participants will propose changes in land use based on the example of a housing estate. At the conclusion of the Panel, we would like to lead a discussion on the effectiveness of using such tools in teaching landscape architecture and implementing Nature-based Solutions (NbS) at the housing estate scale.

Keywords: serious games, urban lab, climate change adaptation, social learning, green infrastructure

#546 Designing Dignity: Carceral Landscape Studios, Processes, Stakeholder Engagement, and Navigating the Complexities

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Abstract

This panel showcases three design studios that engaged carceral sites as landscapes, social, ecological, and spatial, to test how landscape architecture education can advance dignity, safety, and rehabilitation. Building on scholarship in carceral geography and design justice, we ask: How can studio pedagogy responsibly co-produce concepts and prototypes with people impacted by incarceration, and what processes enable ethical, meaningful stakeholder engagement under institutional constraints? One featured studio, “The Yard Reimagined” at the Washington State Penitentiary (Walla Walla, WA), developed alternative futures for an exercise yard through iterative site analysis, programming, and scenario design, documented via an ArcGIS hub that communicated design rationales and phased implementation pathways. The “Gray to Green” studio used a participatory model with adults in custody (AIC’s) and U of WA students to revision the medium and maximum-security outdoor spaces within Washington Correctional Center for Women. Using focus groups with staff and AIC’s to better understand their needs and restrictions. The student/AIC’s ideas developed multiple design scenarios for the primary and secondary outdoor spaces. The results were presented to the DOC administrative staff and plans are to implement some of the ideas using a student/AIC design build model. The Planting Design Studio at the University of Connecticut collaborated with York Correctional Institution, Connecticut’s only state prison for women, to design therapeutic landscapes that support wellness, beautification, and normalization. Students developed planting and mural proposals for a range of indoor and outdoor spaces identified by staff as priorities. These short-term, implementable interventions aim to foster healthier, more restorative environments for incarcerated individuals, staff, and visitors, contributing to broader cultural and ecological transformation within carceral settings. The three studios combined (1) inquiry-through-design with iterative critique; (2) participatory action research approaches adapted to security protocols (e.g., indirect stakeholder input via staff, advocates, and formerly incarcerated collaborators, direct stakeholder inputs, design charrettes in neutral and carceral venues, and IRB-aligned reflection prompts); (3) multi-scalar performance framing (microclimate, viewsheds, acoustics, circulation, and behavior-setting analysis); and (4) research-by-design documentation using digital tools, story maps, and project briefs to make constraints, tradeoffs, and benefits legible. Ultimately, these carceral studios demonstrate how landscape architecture can reframe secure facilities as sites of healing, dialogue, and incremental transformation. By foregrounding dignity, consent, and collaboration under constraint, the projects establish pathways for ethical pedagogy and civic impact. The panel highlights not only transferable frameworks but also the transformative potential of design to advance justice, resilience, and care.

Keywords: carceral landscapes, participatory design, studio pedagogy, prison reform, social justice

#597 Vacant Lots and Community Well-Being: Participatory Strategies for Redevelopment in Eastfield Neighborhood

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Abstract

Urban blight, characterized by vacant and deteriorating properties, poses a significant challenge for many communities, impacting safety, health, and social cohesion (Carpenter, Mitchell et al. 2015, Herbert 2018). The Eastfield Neighborhood in Michigan exemplifies these challenges, as property acquisitions by large organizations have unintentionally led to neighborhood decline by leaving properties undeveloped (Schneider 2023). This study aims to highlight the adverse effects of vacant properties on Eastfield residents and area workers while exploring policy solutions and community-driven strategies for sustainable redevelopment. The main questions of this research are: How have vacant lots and blight in Eastfield Neighborhood affected the safety, quality of life, and experiences of residents? What effective strategies, including community-led initiatives and urban planning expertise, can engage stakeholders in the sustainable redevelopment of vacant lots in Eastfield Neighborhood? This study employed a participatory, mixed-methods approach. It began with data collection on urban decay, redevelopment strategies, and the socio-economic effects of land policies, alongside neighborhood demographics and property records. Researchers then conducted interviews with residents and held a student charrette to generate design ideas with community feedback. After collecting 39 responses from residents, the results indicated an overall mean neighborhood satisfaction score of 4.26 out of 5. The most significant factors influencing satisfaction were sense of community ($r = .63$, $p = .002$) and the availability of parks or green spaces ($r = .45$, $p = .003$). In addressing this blight, respondents showed a strong preference for the redevelopment of green spaces ($M = 4.31$), small local businesses ($M = 4.28$), and recreational facilities ($M = 4.23$). Additionally, 62% expressed concerns about potential increases in property taxes and inadequate community input, while nearly half were apprehensive about displacement (49%) and environmental impacts (49%). Regression analyses identified sense of community ($B = 0.316$, $p = .011$; $OR = 7.6$) and cleanliness ($OR = 5.39$, $p = .034$) as significant predictors of satisfaction, underscoring the importance of social cohesion and environmental quality in Eastfield. In conclusion, vacant properties negatively impact safety, aesthetics, and overall quality of life in many communities. Residents often value social cohesion and access to green spaces but express concerns about displacement and rising costs. Sustainable redevelopment efforts should prioritize community input while balancing investment with equity and long-term well-being.

Keywords: urban blight, vacant, Community redevelopment, Neighborhood satisfaction

#604 Landscape Collaborations for Indigenous Earthworks in the Contemporary City : The Coiled Serpent and POKTO ČINTO

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Abstract

The Chicago Public Art Group along with Artist X, Landscape Architect Nilay Mistry, and the Chicago Park District formed an earthwork along the western banks of the Chicago River in Horner Park entitled The Coiled Serpent, opened in 2024 (1). This new hybrid earthwork typology is the second land art installation envisioned by X in North America, with the first being “POKTO ČINTO (SERPENT TWIN)” in Schiller Woods, realized by the same team in 2019. The projects are situated 8 miles apart at the edges of the two majors rivers within the City of Chicago, the Des Plaines and Chicago Rivers, to highlight continued reverence for urban waterways. This work stands among the first of a movement of newly created earthworks by various Native tribes and Native artists from Oklahoma to Louisiana and beyond. This significant homage to the ancestral practice of terraforming serves to educate the public about the rich cultural history of Indigenous placemaking, activate the human connection to the river, and assert the presence of Indigeneity within the continuing narrative of Chicago. Indigenous plant species and soil received from donations throughout the region were installed, fostering an opportunity to ponder the balance of our impactful existence with the earth and elevates our perspective looking towards the future of a sustainable urbanity. This living earthwork facilitates recurring workshops on Indigenous planting with local youth and augmented reality experiences. This paper highlights the contributions made by the landscape architect within the project team in the capacity of field coordinator, planting designer, and educator. The realization of The Coiled Serpent and “POKTO ČINTO has fostered multiple design research projects and field learning exercises for landscape architecture students through collaboration with local parks districts and Indigenous community organizations.

Keywords: Indigenous, Earthwork, Chicago, Public, Education

#608 Whose community is it? Community design challenges and balances in an urban neighborhood

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Abstract

Community design, when effectively implemented, can reflect and reinforce local identities, contributing to stronger place-based narratives and development. However, engaging multiple, contrasting communities in close proximity can present significant challenges such as social tension, economic disparities, evolving needs, or resistance to change. Due to such complexities, integrating meaningful community engagement into planning and design is essential to achieving socially equitable and environmentally sustainable outcomes (Fincher, Iveson, Leitner & Preston, 2014). Yet, as communities age and their priorities shift, fragmented land uses, especially in historically rooted urban areas, can make collaboration difficult. This case study presents the challenges of engaging diverse stakeholders in the Jefferson Street corridor area in Lexington, Kentucky, which has transitioned from suburban fringe to the edge of urban core as the city expanded. The historically layered area includes the location of an African American hamlet and several designated historic residential districts. Despite aging infrastructure and ongoing revitalization efforts, the socioeconomically diverse neighborhoods and several contrasting land uses remain in fragmented patterns, along with other community amenities (LFUCG, 2024). Although distinct community groups have asserted their identities, the area still lacks a cohesive sense of place. To enhance the urban landscape and better understand the local identity, a university landscape architecture department partnered with three units of the Lexington-Fayette Urban County Government and a broad range of community stakeholders (Toker, 2012). Through service-learning and engagement initiatives, students explored topics of heritage, inclusion, education, recreation, connectivity, and sustainability. Despite well-intentioned collaboration and multiple participatory efforts, representation of the full spectrum of community voices proved challenging in the design project to enhance the corridor and potentially connect to a newly opening public park in downtown. Through direct and indirect engagement, students learned firsthand the challenges in participatory planning and design, including navigating complex social dynamics and competing priorities. They also learned that inclusivity and equitable representation were not always compatible and can be difficult to achieve in practice. Ultimately, planners and designers must navigate these complexities by fostering inclusive approaches that acknowledge historical legacies while addressing contemporary needs. Despite its challenges, the Jefferson Street corridor presents significant opportunities for revitalization. With further thoughtful planning and inclusive engagement, the area has the potential to evolve into a vibrant, inclusive destination that strengthens community connections.

Keywords: Community design, Place identity, Community conflicts

#614 Vital Earthworks: Reframing Care and Stewardship at the Florence Indian Mound

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Abstract

This paper shares insights from a collaborative initiative among landscape architects, descendant community members, and mound caretakers to reframe the Florence Indian Mound as a vital cultural landscape. Building upon relationships with representatives from the Eastern Band of Cherokee and Chickasaw Nations, and the Mound Museum Advisory Board, the project challenges dominant preservation paradigms and highlights the role landscape architects can play in culturally responsive, community-led stewardship. Chickasaw literary scholar Chadwick Allen points to the colonial frameworks that shape archaeological, anthropological, and historical readings of Indigenous earthworks, which often frame these sites as relics of a distant past (2022). Thus, mound sites are institutionally imagined as vestiges of long-lost peoples, obscuring the enduring presence of Indigenous communities and their unbroken ties to these landscapes. This initiative responds by foregrounding contemporary Indigenous connections, understanding mounds as sites which “remain vital and continue to embody knowledge” (Allen, 2020). Situated within active discourses around care and stewardship in landscape architecture, the project explores care as a framework to eschew extractive practices and reorient design and maintenance toward relational, socio-ecological interdependencies (e.g. Jacobs and Wiens, 2024). Crucially, care is framed not as a singular act of design, but as an ongoing, collective practice which includes the maintenance of relationships, responsibilities, and infrastructures that support culturally meaningful stewardship. The first two years of this initiative culminated in a workshop in which tribal representatives, designers, and caretakers of related sites collaboratively envisioned new models of care for the mound and other regional earthworks. Rather than producing a finished set of design drawings (implying that they might be extrapolated as “best practices” at similar sites), the event instead demonstrates a process for generating criteria for making maintenance decisions. A key outcome was the development of interpretive materials to reorient public understandings of the site, addressing concerns from Indigenous partners about persistent misrepresentations. These materials clarify the site’s enduring cultural significance, contextualizing shifting care practices and site aesthetics. The knowledge generated through this process is shaping tangible decisions about how the site is maintained and interpreted—whether and how mowing occurs, how programming is integrated into care practices, how access is structured, and how stories are shared. Thus, this work offers a model for rethinking landscape maintenance as a form of cultural and ecological care, and calls for deeper engagement with Indigenous knowledge systems, relational ethics, and community-led design processes to remake relationships to land, power, and place.

Keywords: maintenance, care, Indigenous landsacpes, cultural landscapes, community-led design

#623 Connect | Create | Catalyze: exploring models of learner/educator/community collaborations for mutual flourishing

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Abstract

In an era of growing budgetary constraints, expanding student cohorts, and rising societal and climate disruptions, the role of service-based education in design disciplines demands rethinking. What does it mean for universities to balance the "business" of education with meaningful acts of service that may be recognized and valued by their local communities and beyond, to demonstrate a transformation beyond extractive town–gown relationships toward more reciprocal and enduring collaborations with communities? This panel explores alternative models of learner/educator/community partnerships that are central to and emerging within the University of Washington's landscape architecture curriculum. Through design–build studios, interdisciplinary collaborations, and international partnerships, we experiment with pedagogies that emphasize co-creation, reciprocity, and long-term relationships. Examples include the BLA Capstone Design–Build program with Seattle's Kline Galland Home; interdisciplinary studios at Paradise Parking Plots; and international collaborations with Swedish partners. These efforts are further expanded through cross-cultural MLA capstone projects in Nepal, engaging squatter settlement communities in applied research and design and co-creating cultural / historic memory scapes on Privic, a Croatian island that is experiencing depopulation. We examine emerging benefits, challenges, and questions from these models that include how they foster design agility and problem-solving skills for students as they enter practice; promote collaboration, mentorship, and shared learning among educators; and support communities through responsive, iterative, and context-specific projects. Challenges of investment of faculty time initiating, nurturing, and maintaining relationships beyond a single cohort; ensuring durable outcomes that support community capacity for continuity and care; and negotiating the legacies of past interventions will be explored. Questions raise broader implications about infrastructure, community capacity, and the lasting legacy and value of design–build and service-based curriculum. By sharing these models, this panel invites reflection on how service learning in design fields can catalyze new initiatives, shift educational paradigms, and offer an alternative to STEM-centric framings of higher education. Can community-based interdisciplinary, international and design–build experiences cultivate the skills needed for practice while generating lasting community benefit? How do we balance student learning outcomes with community-defined needs? And how might these approaches disrupt academic elitism to repair and reconfigure town–gown dynamics and recruit underserved students into academia? Our aim is to spark dialogue among panelists and attendees about the transformative potential and limits of community-engaged learning in design education, initiatives to overcome contemporary academic barriers, and to collectively imagine how such models can sustain mutual flourishing into the future.

Keywords: Community-engaged learning, Experiential learning, Community-based partnerships, Design pedagogy, Interdisciplinary collaboration

Urban Design

#11 Catalyzing Downtown Mexico City: Affordable Housing, CPTED (Crime Prevention Through Environmental Design), and Market-Driven Urban Revitalization

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Abstract

Introduction. Mexico City's historic core faces a chronic shortage of affordable housing, elevated crime, and sluggish economic growth. Partnering with municipal agencies and students from the National Autonomous University of Mexico (UNAM), our graduate studio set out to demonstrate how targeted, market-responsive design can revive the district while improving safety and equity. Methods. A mixed-methods framework combined: (1) market analysis of rental demand and purchasing power; (2) GIS mapping of 1,400 parcels to locate abandoned or under-utilized buildings; (3) CPTED audits of crime hot-spots; and (4) stakeholder charrettes with Mexican government officials, and professors of the UNAM. Concept plans were evaluated against housing-affordability scenarios recently launched by the Mexican federal "Renta Joven" subsidy program. Results. The analysis identified 112 viable redevelopment parcels within a 3 km² radius. A phased strategy converts 27 historic buildings into 2,300 mixed-income housing units (40 % subsidized), inserts 14,000 m² of ground-floor retail, and weaves a 1.5 km pedestrian-priority corridor that links new Bus Rapid Transit stops. CPTED interventions improved sightlines, active frontages, layered lighting, and community oversight overlay each block. Comparative modelling with municipal data projects a 31 % reduction in reported violent crime and an 18 % increase in local retail employment within five years. Discussion. The studio demonstrates that aligning real-estate economics with CPTED principles can simultaneously stimulate the urban economy and improve quality of life. The methodology is transferable to other Latin-American megacities where informal markets, crime, and disinvestment intersect. Conclusion. By integrating market analytics, crime-prevention design, and community co-production, the project offers a replicable framework for equitable inner-city regeneration. The author now applies these lessons in professional practice, helping clients deliver profitable yet socially responsible developments.

Keywords: Mexico City, affordable housing, CPTED (Crime Prevention Through Environmental Design), urban revitalization, walkability

#14 Why Green Infrastructure Matters in Urban Design: Longitudinal Review of the US EPA's Rainworks Challenge

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Abstract

Texas has gone through one of the most catastrophic flash flood events in recent history in early July 2025, impacting eleven counties in Central Texas, resulting in the loss of at least 135 lives (Texas Tribune, 2025; FEMA, 2025). Later in the year, New Mexico, New Jersey, and North Carolina experienced similar events. With flash floods increasing in Texas' Flash Flood Alley (Shah et al., 2017) and worldwide, one questions whether the impacts of such climate events on lives and the built environment were preventable. What could we have done differently in urbanized areas? Green Infrastructure (GI) is a nature-friendly approach to managing urban flood risk, involving practices that restore or mimic natural hydrological processes. GI uses soils, vegetation, landscapes, and other media to manage rainwater where it falls through capture, storage, and evapotranspiration. Urban GI has landscape applications and community benefits, including reducing stormwater impacts, improving water and air quality, reducing urban heat island effects, creating habitat, and providing aesthetic and recreational value (EPA, 2025a; Abbott, 2013). This longitudinal research examines the emerging concepts, ideas, and principles from GI education, research, and outreach that stem specifically from one institution's experience with the US EPA Rainworks Challenge over 13 years. This mixed-methods inquiry focuses on the content analysis of the graduate studio project boards, reports, and videos submitted to this challenge, as well as a broader review of the competition at the national scale over this time span (EPA, 2025a). It also highlights a US EPA-supported pilot program completed in the tenth year of the competition by the presenter and a professional team (UTA, 2023). The review focuses explicitly on themes that emerged from submission material reviews, and how GI ideas, strategies, and techniques can be utilized in the urban context (Chen et al., 2026; Gündel & Önaç, 2025; Özdil, 2025), while university campuses serve as a testing ground for such innovative practices. Sadly, the US EPA had to suspend the 2025 competition abruptly during the jury review process due to "budgetary" concerns. Apart from its negative educational impact, at times, landscape architecture becomes a STEM-designated field; one significant way of informing communities and urbanized areas about GI is lost, particularly when cities need innovative solutions for stormwater management and climate-responsive design. By focusing on the EPA's Rainworks Challenge, the presentation discusses the relevance of GI in urban design, mitigating environmental and societal concerns, and fostering sustainable and resilient urbanized areas.

Keywords: urban design, green infrastructure, Rainworks Challage, resilence , stormwater

#29 Vacant Land Regeneration: Novel Strategies for Maximizing Local Impact

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Abstract

Urban vacancy presents complex challenges for both shrinking and growing cities. Nearly 150 major cities around the world are losing population because of industrial decline and structural change, while expanding regions continue to face neighborhood decline and persistent vacant parcels. When left unattended, these lands can contribute to crime, environmental degradation, and social fragmentation. When thoughtfully managed, they can become powerful resources for equity, resilience, and public health. This study draws on three decades of scholarship to build a comprehensive framework for vacant land regeneration. Through a systematic literature review and co-citation analysis of important studies since the 1990s, four main thematic domains emerged: urban policy and classifications, ecosystem services and resilience, safety and public health, and community engagement. These areas represent the policy, ecological, health, and social dimensions that shape how vacant land can be transformed into community assets. The framework is explored through case studies in Galveston County, Chicago's South Side, Detroit, Beaumont, Harris County, McAllen, Port Arthur, and rural South Korea. These sites were selected because they reflect a wide range of geographic, social, and economic settings, from postindustrial and disaster-affected areas to rapidly urbanizing and rural communities. Applying strategies such as smart decline, low impact development, and participatory planning in these contexts shows how cities can adapt regeneration practices to local conditions. Findings show that these approaches improve stormwater management in flood-prone regions such as Beaumont and Port Arthur, enhance safety and public health in communities like Chicago's South Side and McAllen, and strengthen social connection and resilience in Detroit and rural South Korea. The study argues for moving away from growth-centered planning toward an approach guided by sustainability, resilience, and quality of life. By connecting global ideas with local actions, this work offers new insight into how cities can turn vacancy into opportunity for environmental, social, and economic well-being.

Keywords: Vacant land regeneration, Public health, Community engagement, Ecosystem services, Urban policy

#64 Urban Green Networks for Air Pollution Mitigation: A Strategic Review

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Abstract

Introduction Urban greenery is widely promoted for air pollution mitigation. However, strategies focusing on localized, isolated green spaces are often insufficient to mitigate high background pollution. Emerging evidence demonstrates that greenery's air-quality benefits are most consistent at the macro scale, underscoring a critical gap in current planning paradigms. A shift toward integrated Urban Green Networks (UGNs) as city-scale environmental infrastructure is therefore needed. This review addresses that gap by proposing a strategic framework for designing UGNs to optimize their pollution-mitigation performance. Methods This study followed a two-stage research process. First, a systematic review synthesizing research across urban planning, environmental science, and climatology identified two core mitigation mechanisms: identified two core mitigation mechanisms: (1) aerodynamic pollutant dilution (i.e., ventilation) and (2) biophysical pollutant removal (i.e., deposition and absorption of particulate matter and gaseous pollutants). Second, these mechanisms were operationalized into a spatial planning framework by classifying interventions into three morphological typologies—points, lines, and planes—and synthesizing the insights into a figure-based, visually structured strategy system. This process translated complex theoretical knowledge into spatially explicit, practice-oriented design guidance. Results The resulting Point-Line-Plane (PLP) morphological framework delineates three interdependent components essential for macro-scale UGN planning: Points: large green patches such as parks and urban forests that function as core "green lungs" for pollutant removal. Lines: continuous green corridors—including tree-lined streets and ventilation corridors—that channel airflow and promote pollutant dispersion. Plane: the distributed green matrix of community greens, private gardens, green roofs, and other background vegetation that links points and lines, sustaining background ecological functions and enhancing network connectivity. Integrated application of these components transforms fragmented green spaces into a coherent network capable of amplifying air-quality benefits across the city. Discussion The PLP framework translates environmental processes into an operational workflow for landscape architects and urban planners. It represents a conceptual shift from isolated, site-level interventions toward the strategic design of large-scale green infrastructure as functional ecological systems. Nonetheless, empirical testing across diverse urban settings is needed to assess the framework's generalizability and long-term effectiveness. Conclusion This review provides a scientific blueprint for planners and policymakers to deploy UGNs effectively. For practitioners, it offers a strategic workflow to engineer healthier urban atmospheres. For researchers, it underscores the need to shift focus from the effects of isolated green spaces to the systemic, network-level performance of integrated UGNs.

Keywords: Urban green networks, Air pollution mitigation, Urban design, Ventilation corridors, Landscape ecology

#84 Perceived Spatial Stress in Urban Street: A Pilot Virtual Reality Comparison Study between China and the US

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Abstract

As modern urbanization accelerates, spatial stress from high-rise buildings and narrow streets in dense urban environments substantially impacts residents' well-being. While street canyon effects (the microclimate in urban corridors) have been extensively studied, the psychological experience of that spatial enclosure remains underexplored, particularly across cultural contexts. This gap is critical to address, as urban populations with different backgrounds may experience identical street environments differently, challenging the assumption that perceptual responses to urban form are universal. This multisite pilot study utilized virtual reality as a controlled yet deployable environment to investigate perceived spatial pressure across diverse cultural contexts. Twenty environmental conditions were varied, including street width (two levels), building height/aspect ratio (five levels), and sidewalk trees (present/absent), with culturally neutral architectural styles used to control for confounding effects. Participants from China (n = 110) and the United States (n = 60) randomly experienced 10 conditions for 1 minute each, then completed the self-reported State-Trait Anxiety Scale-6 and 7-item Semantic Differential Scale in-headset. Heart rate and skin conductance were recorded via wristbands as physiological measurements. Results revealed no significant physiological differences between cultural groups. However, mixed-linear analysis of survey measures showed notable perceptual variations: Chinese and American participants differed significantly in their ratings of openness, spatial freedom, stress levels, comfort, and environmental satisfaction when experiencing identical street environments. Interaction effects between cultural background and street elements revealed that each cultural group responded optimally to different design combinations, while street width did not affect responses across levels. Notably, the presence of vegetation consistently reduced perceived stress and enhanced feelings of spatial openness across both cultures, even though trees physically occupied street space. These findings advance landscape architecture theory by demonstrating that cultural background influences the spatial perception of the combination of aspect ratio and trees. For urban planners, findings suggest that street design standards should account for population-specific adaptations to high-density environments rather than applying uniform guidelines. Zoning ordinances regulating building height-to-street width ratios should consider the local population's tolerance and preferences for vertical enclosure. Street tree policies should prioritize canopy coverage over maximizing clearance width, as demonstrated by a positive effect. For researchers, this VR framework enables the testing of design alternatives tailored to the preferences of specific population groups. Study limitations include potential differences between VR and real-world experiences, and sample size constraints for broader generalization. Future research should examine additional cultural contexts and validate findings in built environments.

Keywords: Street space, Virtual reality, Urban design, Cross-cultural research

#165 Policy and Public Investment: Drivers of Sidewalk Network Expansion in a Small Southern City

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Abstract

Walkability constitutes a critical dimension of sustainable urbanism, shaping public health, equity, and community connectivity. Yet, small and mid-sized cities often lack comprehensive pedestrian infrastructure data, limiting both research and policy evaluation. This study examines the combined influence of a development ordinance and municipal infrastructure projects on sidewalk network expansion in Starkville, Mississippi, a representative Southern small city. Since 2009, Starkville has enforced a sidewalk ordinance requiring sidewalks as a part of lot development. Using ArcGIS Pro and municipal development records, the research mapped and quantified the sidewalk network from 2009-2024, distinguishing between ordinance-driven construction and publicly funded infrastructure projects. Results indicate that the ordinance generated 17.86 miles of new sidewalks, while public investments added 6.67 miles, targeting critical gaps and enhancing connectivity. Together, these efforts expanded the city's network from 18.39 to approximately 43 miles, representing a 133% increase, with 24.53 miles constructed after the ordinance. Connectivity analysis further measured walkability between homes, grocery stores, post offices, schools, parks, banks, and health centers on a 1 to 4 scale, where 1 represented no connection, and 4 indicated a complete connection. The findings show improved accessibility across all categories, although neighborhood connectivity exhibited the least progress due to no sidewalk requirement listed for these areas under the current ordinance. These results underscore both the contributions and limitations of ordinance-driven development to achieve equitable walkability. The persistence of spatial inequities in Starkville emphasizes the limits of incremental ordinance-driven development. The study shows practitioners that while small sidewalk additions can yield meaningful results, they cannot complete a pedestrian network without advocating for increased public investment and stronger policy support. It also provides students and educators with a framework for studying how sidewalk networks evolve and how their design impacts the daily experience of users. By situating this case within broader debates on sustainable mobility and the role of local policy, the research provides a framework for evaluating pedestrian infrastructure in data-scarce contexts.

Keywords: Sidewalk networks, Walkability, Urban policy and infrastructure, Pedestrian connectivity, GIS spatial analysis

#191 A Tree is a Tree is a Tree: State Policy Interpretations of Federal Roadside Vegetation Guidance Using Content Analysis

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Abstract

In this study, we analyze content of roadside vegetation management policies for all 50 state departments of transportation (DOTs). Findings reveal policy variations across states, bolster current research into the power of state DOTs, and illustrate the complexity of an issue like roadside tree management, encapsulating a tension between technoscientific epistemologies and those of aesthetics and design. Existing guidelines for roadside trees run the gamut, from outdated to nuanced to aggressively anti-tree. For instance, Ohio's Roadside Safety Landscape Guidelines states, "Trees are proven killers when placed by the roadside." By contrast, Wisconsin's Facilities Development Manual suggests using vegetation to improve roadside safety: "Multi-stemmed shrubby plants may be used as supplemental impact attenuators in conjunction with other systems," and "Plants can often be used to delineate changes in the horizontal alignment of highways. They are typically used on the outside of curves where the combination of vertical and horizontal alignments combine and may confuse the driver as to where the road goes." (Planting and Aesthetic Design Section 20, pp. 7-8). Practice today, as suggested by the Ohio manual language, is governed by the clear zone guideline, keeping a roadside free of fixed objects such as trees. Like many engineering guidelines, the clear zone began as a flexible concept that could be adapted to sites and leave decisions up to "engineering judgment" (Turner, 1987, p. 89). In particular, "Trees must be regarded as fixed objects, but they also deserve consideration beyond that given to other objects." (Turner, 1987, p. 89). In the 21st century, this nuanced approach has been lost. Manuals and codes shape practice and the built environment, though we recognize that practice deviates from written guidance to varying degrees by jurisdiction (White, 2023). We first gather the most recent DOT roadside vegetation guidance by state, ranging from 2010 to 2024. Second, we use deductive codes, drawn from Federal Highway Administration publications, AASHTO's Roadside Design Guide, and existing literature, to isolate relevant text relating to trees, safety, and aesthetics. Third, we perform content analysis in R, synthesizing findings using inductive coding. Finally, we use a random effects model (cross-sectional time series or panel data) to control for state-specific traits that may not be observable and to compare results to tree crash fatality trends over time (2007-2023 from the Fatality Analysis Reporting System). Findings are expected to expand and deepen conversations at the professional boundary between engineering and the allied design professions.

Keywords: Transportation, Policy, Trees, Decision-making, Governance

#214 Perception Mechanisms of Urban Rooftop Spaces: A Quantitative Approach Based on Prospect–Refuge Theory

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Abstract

In high-density urban environments, residents are frequently exposed to spatial constraints that contribute to environmental psychological fatigue. Since the COVID-19 pandemic, public awareness of the restorative value of outdoor spaces has increased, along with a stronger preference for open-air environments. Against this backdrop, urban rooftops—abundant yet underutilized “residual spaces”—have shown potential to supplement ground-level public resources and enhance experiential quality. However, current rooftop development remains fragmented, self-organized, and largely unsupported by systematic research. Prospect–Refuge Theory suggests that individuals seek both expansive views for environmental information and enclosure for safety, offering a conceptual basis for understanding rooftop perception. This study thus asks: How do rooftop spatial characteristics influence prospect–refuge perceptions and preference? And how do different rooftop types distribute across the prospect–refuge spectrum? Based on theoretical analysis, the study refines the symbolic meanings of “prospect” and “refuge,” linking primal safety–exploration needs with higher-level environmental expectations. Drawing from literature on rooftop typologies, a five-dimension, fourteen-indicator framework of objective spatial attributes was established: visibility (height difference, view scale, viewing orientation), richness (visual information, complexity), safety (enclosure, exposure, intervisibility), comfort (greenery, spatial scale), and interaction (openness, continuity, functional capacity, crowd density). Within Guangzhou’s central built-up area, forty publicly accessible rooftops across commercial, office, residential, and public-service categories were selected through stratified sampling. For each rooftop, 360° panoramic images, on-site measurements, and computer-aided analyses quantified spatial indicators. An 8-point Likert questionnaire assessing prospect, refuge, and overall preference yielded 120 valid responses. Mean subjective scores were matched with objective indicators to generate a comprehensive dataset. Correlation and regression analyses were used to reveal how spatial attributes influence prospect–refuge perception and preference. A two-dimensional prospect–refuge coordinate system was constructed, and K-means clustering identified typical perceptual patterns. Results show that rooftop perception is shaped by multidimensional interactions rather than single variables such as height or greenery. Three perceptual types emerged—prospect-dominant, balanced, and refuge-dominant—each showing distinct spatial and functional features. This study extends Prospect–Refuge Theory to vertical urban open spaces and expands its scope from survival-oriented origins to environmental psychology and situational needs. Despite limitations in sample size and study area, the research provides methodological reference for rooftop design and underscores the importance of interdisciplinary theory, data-driven analysis, and user perception in urban spatial decision-making.

Keywords: Urban Rooftops, Prospect–Refuge Theory, Perception Mechanism, Quantitative Model, Spatial Optimization

#216 Nighttime Safety Perception: Integrating Physiological and Behavioral Data for Evidence-Based Lighting Design in Nocturnal Urban Streetscapes

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Abstract

Traditional urban perception research often relies on subjective surveys, which can fail to capture the nuanced, unconscious emotional and visual responses that shape a person's sense of safety, particularly at night. To address this gap, this study proposes a comprehensive, multimodal experimental framework to objectively quantify the influence of various lighting strategies—including luminaire type, quantity, and spatial distribution—on perceived safety in urban streetscapes. The methodology will employ a dataset of 2,000 pairs of real-world, high-resolution day and night photographs of diverse urban streetscape environments. The image collection points will be based on a stratified sampling approach and two primary criteria: various urban density zones, defined by plot ratio, and various levels of SDGSAT Nighttime Light (NTL) radiance. To serve as consistent visual stimuli, these images will be meticulously captured from a standardized pedestrian perspective (approximately 1.60m in height) with consistent camera settings and viewing angles to ensure precise day-night pairing of the streetscape views. The visual stimuli will be pre-processed. We will semantically segment each image using methods such as the "layering method" (path, horizontal, and vertical spaces) and the "quarter method" (foreground and background) to quantify lighting distribution. Images will then be identified based on an inventory of 18 light categories (e.g., streetlights, bollards, floodlights) and broader lighting strategies (uplighting vs. downlighting, focused vs. scattered). This dataset will be used in a controlled laboratory experiment with approximately 50 age-stratified volunteers. During the experiment, participants will view the coupled day and night images while we synchronously collect three types of data. First, physiological and behavioral responses will be captured in real-time. We will use FaceReader software to continuously record the intensity of six basic emotions (happy, sad, angry, surprised, scared, and disgusted), along with continuous values for a neutral state, valence, and arousal. Eye-tracking technology will simultaneously measure visual attention patterns, including fixation duration and the distribution of gaze points across predefined areas of interest. Second, after viewing the images, participants will complete a questionnaire using a 5-point Likert scale to provide explicit ratings of perceived safety. To analyze this rich, multi-layered dataset, we will employ advanced statistical techniques. Hierarchical Linear Models and a classification analysis will be used to systematically analyze how lighting characteristics correlate with both objective physiological metrics and subjective survey responses. This research is expected to yield evidence-based design recommendations for landscape architects and urban planners, helping them create safer, more human-centered nocturnal environments.

Keywords: Nighttime urban scene, Urban light management, Street view imagery, Safety perception

#219 From Visual Perception to Thermal Performance: A Multi-Objective Optimization Framework for Strategic Urban Canopy Design

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Abstract

Urban heat islands and declining outdoor thermal comfort present escalating challenges as cities densify and climate patterns intensify (Hami et al., 2019). While traditional landscape design relies on visual aesthetics and intuitive tree placement, this research introduces a computational multi-objective optimization framework that bridges tree morphology perception with quantifiable thermal performance. Drawing from established tree shape classifications (Müderrisoğlu et al., 2006), this study develops a parametric modeling system generating diverse canopy configurations while evaluating thermal effectiveness through optimization algorithms. The methodology transforms subjective design decisions into objective performance metrics using advanced simulation and multi-objective optimization techniques. The computational workflow employs parametric tree modeling in Grasshopper with variable morphological parameters including bole height (2.5-8m), canopy radii configurations, and crown apex heights (7.5-28m). Universal Thermal Climate Index (UTCI) calculations were performed using Ladybug tools across Boston, Los Angeles, and Miami climates. Both single-objective optimization (minimizing mean UTCI) and multi-objective optimization (balancing thermal performance against tree mass volume) were implemented using Radical and Octopus optimization plugins. Results demonstrate substantial thermal improvements through strategic canopy optimization: up to 1.84°C UTCI reduction in Los Angeles and 1.59°C in Miami for tennis court scenarios. Multi-objective optimization generated practical solutions with tree volumes between 192-3,611 m³, avoiding oversized configurations that compromise spatial functionality. This research transforms urban forest design from intuitive practice to performance-based discipline (Kabošová et al., 2022). The optimization framework enables evidence-based decision-making for tree species selection and spatial arrangement, supporting climate-adaptive urban planning strategies and contributing to more resilient urban environments.

Keywords: Multi-objective optimization, urban thermal comfort, parametric design, tree canopy configuration, computational design

#316 Designing Safer Streets: How Micro-Walkability and Socioeconomic Context Shape Violent Crime Risks

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Abstract

Although walkability is widely acknowledged as a cornerstone of sustainable urban design [1,2] , existing research often relies on aggregated, area-level indices that obscure the street-level conditions pedestrians actually encounter [3] . Direct assessment of micro-scale streetscape features is typically labor-intensive and limited in scope, but recent advances in computer vision and street-view imagery (SVI) make it possible to extract these characteristics at scale and systematically link them to urban safety [4,5] . Objectives: This study investigates (RQ1) the overall relationship between street-level walkability and crime, (RQ2) how this relationship varies across different crime and macro-walkability contexts, and (RQ3) which specific micro-scale streetscape features most strongly shape these associations. Methods: We conducted a citywide analysis of street segments across Detroit, Michigan, using recent panoramic SVI. Images were processed with deep learning–based semantic segmentation and object detection models to extract features such as sidewalks, street lighting, greenery, façade activity, and physical disorder. These features were integrated through principal component analysis (PCA) to construct a composite Micro-Walkability Index (MWI), which was validated against established macro-level walkability measures. Crime incidents were aggregated within 50 m buffers along each street segment and modeled using negative binomial and spatial regression, with socioeconomic and land-use covariates included as controls. Expected Results: The relationship between the MWI and violent crime rates is expected to follow a U-shaped curve, with both very low and very high levels of micro-walkability associated with elevated crime incidence. This relationship is further shaped by socioeconomic context, such that neighborhoods with greater disadvantage may weaken or reverse the protective effect of walkability. Feature-level analyses using regularized regression and explainable machine learning are anticipated to show that sidewalk continuity, street lighting, and façade activity contribute most to the protective end of the curve, while features indicating physical disorder (e.g., graffiti, boarded-up buildings) are positively associated with violent crime. Conclusions: By integrating SVI-derived micro-scale walkability metrics with criminological modeling, this study provides replicable evidence that street-level design and maintenance can influence safety outcomes. Findings highlight actionable priorities—such as repairing sidewalks, enhancing lighting, and mitigating visible disorder—that may foster safer and more walkable urban environments.

Keywords: Walkability, Street-view imagery, Crime, Urban safety

#386 Assessing Proximity-Driven Urban Growth in Texas: Secondary Cities Near Large Metros, 2000–2024

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Abstract

Introduction. Secondary cities near large metropolitan cores often grow differently from similarly sized places farther away—a phenomenon framed as borrowed size (spillovers from large-city markets, labor, and amenities) versus agglomeration shadow (competition that suppresses nearby growth). Texas is an ideal testbed given rapid expansion in Dallas–Fort Worth, Austin, and Houston and many nearby small and mid-sized cities. This study asks: Do secondary cities near Texas' major metros grow faster than comparable remote cities, and by what mechanisms? Methods. We assemble a Texas-wide panel of places (population 10k–300k) from 2000–2024, classifying cities as near-metro (≈≤60–80 km from a core CBD) or remote (>≈120 km and outside large MSAs). Outcomes include population change, employment (BLS QCEW), and housing supply (Census Building Permits; ACS housing units). Explanatory variables cover market access (population within 60–90 minutes), transport access (interstate proximity; rail/transit adjacency), baseline size and industry mix, and simple proxies for land availability. We report: (1) geospatial descriptives (maps, boxplots); (2) matched comparisons (coarsened exact matching on baseline traits); and (3) panel fixed-effects models testing proximity effects and period interactions (2000–2010, 2010–2019, 2020–2024) to probe housing-cost and remote-work eras. Robustness checks vary distance cutoffs, exclude annexation outliers, and compare metros (DFW vs Austin vs Houston). Results. Preliminary analyses show a consistent growth premium for near-metro secondary cities in population and permits since 2000, with heterogeneity by distance (peaking around 30–60 km) and strengthening post-2010. Market-access measures mediate much of the effect, while interstate adjacency amplifies it. Post-2020, dispersion toward near-metro cities appears to increase, consistent with hybrid work and logistics expansion. Discussion. Findings support borrowed size as a salient driver of secondary-city growth in Texas, tempered by very-close-in competition ("shadow"). For landscape and urban design practice, results highlight the importance of zoning capacity, mixed-use centers, active/transit connectivity, and infill housing in near-metro cities to translate proximity into equitable outcomes. For remote peers, strategies emphasize targeted access improvements and niche specialization. Conclusion. Combining geospatial analytics with matched and panel approaches clarifies where and why small and mid-sized Texas cities grow when situated near major metros—evidence to inform regional planning, infrastructure priorities, and resilient, human-centered urban design.

Keywords: Borrowed size, Proximity effects, Secondary cities, Market access, Texas urban growth

#424 Shared Spaces: Creating Places for People, Not Just Cars

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Abstract

A shared space is a street in which the segregation between different modalities has been removed in favor of one space in which a combination of pedestrians, cyclists, transit users, and automobiles all mix freely. A shared space may also be referred to as 'pedestrian priority.' Various design treatments are present in a shared space to slow vehicles down to pedestrian speeds (target: 5 mph), including textured pavement, raised entrances, clear gateways as entrance or exit points, chicanes (through the use of landscaping, planters, or street furniture), curb elimination, and contrasting pavement colors and/or patterns indicating four main zones: the shared zone, furniture zone, comfort zone for pedestrians only, and building frontage. The design goal is to create a plaza-like feel. This research compares three cases from North America (The Wharf district in Washington, D.C.; Clematis Street in West Palm Beach, Florida; and Bear Street in Banff, Canada) with shared space designs in the United Kingdom, the Netherlands, and Japan. Quantitative metrics show that, after implementation of shared spaces, economic activity of neighboring businesses and pedestrian dwell times both increase. Additionally, auto crashes decrease due to slower traffic speeds. Despite the slower speeds, intersection delay for vehicles decreases as well. Stakeholder interviews illustrate both the aforementioned benefits of shared spaces (especially the increased liveliness of the street), but also the challenges to implementing them. Concerns about parking elimination, reduced vehicle access, and perceived danger for children, the elderly, and the blind or visually-impaired are the most commonly-cited barriers towards implementing shared spaces. Thoughtful design features, including Detectable Warning Surfaces, Directional Indicators, visual contrast in pavement, and a comfort-zone delineated by non-permeable surfaces can all increase safety and comfort for the blind and visually-impaired. Cultural biases about street use based on long-standing jaywalking laws can also prevent pedestrian comfort in shared spaces. Clear gateways at entrances and exits, as well as signage that indicates pedestrian priority, can help increase pedestrian comfort. The paper uses the aforementioned precedents along with NACTO and Montgomery County, Maryland (Washington, D.C. area) design guides to illustrate key features municipalities can reference when siting and designing shared spaces.

Keywords: Shared space, Shared street, Flex street, Woonerf, Living Street

#432 Healing Infrastructures: Resilient Commons for Champaign-Urbana

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Abstract

Landscape architecture addresses the relationship between built environments and human well-being, with research demonstrating that designed landscapes improve mental health outcomes, foster social cohesion, and enhance community resilience through increased access to nature (Gascon et al., 2015; Thompson, 2011). In college towns, demographic flux and physical fragmentation present unique challenges for creating inclusive environments serving both transient and permanent populations. Champaign-Urbana, home to over 50,000 students and 120,000 residents, exemplifies these challenges with an urban landscape fractured by historical development patterns. Boneyard Creek's floodplains intersect with railroad corridors, creating vacant lots and fragmented parks that function as barriers rather than connectors. These spatial discontinuities limit pedestrian movement, reduce social interaction, and contribute to "place attachment deficits" that negatively impact mental health and community cohesion (Scannell & Gifford, 2010). While student mobility challenges traditional place-making strategies, research shows well-designed public spaces provide mental restoration benefits for both temporary and permanent residents (Bell et al., 2015; Völker & Kistemann, 2011). This research by design employs a four-phase methodology addressing Champaign-Urbana's flooding, accessibility barriers, and underutilized brownfields. Phase 1 conducts GIS mapping using ArcGIS suitability models integrating spatial layers (soils, hydrogeology, floodplains, vegetation, rail buffers), historic land use records, and EPA brownfield inventory. Phase 2 synthesizes findings into a masterplan transforming flood-prone areas and contaminated railroad-adjacent sites into therapeutic landscapes through continuous green corridors. Phase 3 develops phytoremediation interventions using hybrid poplars for groundwater remediation, Norway maples for metal stabilization, sunflowers and Indian mustard for metal extraction, cowpea for lead translocation, and bluestem grasses for erosion control. Implementation progresses through establish (years 1-2: site preparation, planting, monitoring infrastructure), integrate (years 2-3: permeable paths, selective harvest, contamination reduction), and activate (years 3+: community programming, reflection zones, interpretive signage). Phase 4 quantifies outcomes through ecosystem service metrics. Expected outcomes include therapeutic landscapes serving diverse populations, flexible infrastructure adapting to seasonal fluctuations, and documented improvements: 4 community gardens, 6 resting stops, 16 bus stops, 1.8M ft² park area, and 18,872 ft trails alongside stable air quality and habitat metrics in EPA-compliant reports. This research contributes to landscape architecture theory by demonstrating how designed flexibility bridges demographic divides, offering a replicable framework for health-centered urban design in university communities facing similar challenges.

Keywords: Adaptive Commons, Climate Resilience, Phytoremediation, Connectivity

#447 Landscape Architects Guiding Urban Air Mobility: Vertiport Integration in Future Cities

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Abstract

Urban Air Mobility (UAM) is advancing rapidly, promising new forms of connectivity through electric vertical take-off and landing (eVTOL) aircraft. Much of the UAM dialogue has centered on engineering and transport systems, yet the real challenge lies in how vertiports reshape land use, urban form, and ecological systems, core concerns of landscape architecture. This research reframes vertiport planning not merely as an engineering problem, but as a design and planning challenge grounded in landscape architecture. In the first stage, we developed a regional suitability analysis across Utah's Wasatch Front using 2021–2023 spatial datasets from the Utah Geospatial Resource Center (UGRC), Wasatch Front Regional Council (WFRC), and county open data portals. Over sixty layers represented the built environment (land use, transportation, community facilities), natural environment (floodplains, wetlands, slopes, conservation areas), regulatory context (airspace, zoning, ownership), and value-based factors (equity indicators and sensitive populations). Results show that although nearly half of the region is theoretically capable of supporting vertiport infrastructure, fewer than 1% of parcels rank as highly suitable. Commercial and industrial parcels account for most moderately to highly suitable sites, indicating near-term feasibility, while vacant lands at urban edges offer long-term potential. Building on this foundation, the second stage introduced a Scorecard Framework that translates FAA Engineering Brief No. 105, helicopter landing-zone protocols, and vehicle specifications into measurable, spatially grounded criteria. Organized into Operational Area, Obstacle Clearance, and Environmental Factors , the Scorecard uses normalized 0–1 scoring with equal weights for transparent comparison. To ensure scalability, the framework considered the largest representative aircraft classes—the Kitty Hawk air taxi (≈11 m span) and the Aurelia X8 MAX drone (≈1.6 m span)—to define safety and clearance dimensions. Applied to six top-ranked sites, Sites 1 and 4 achieved scores above 0.85, while Sites 3 and 6 failed due to clearance constraints, confirming obstacle clearance as the most decisive factor . This research demonstrates how landscape architects can bridge regulatory, spatial, and ecological dimensions in emerging mobility systems. Vertiports are not only aviation facilities but also landscape interventions that must reconcile safety and performance with environmental stewardship, visual quality, and social equity—positioning landscape architecture to lead the integration of disruptive technologies into sustainable, resilient cities.

Keywords: Landscape Architecture, Urban Air Mobility, Vertiport Planning, Future Cities, Sustainable Cities

#493 Shaping Small Urban Spaces: Balancing Thermal Performance and Visual Experience in Parklet Design

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Abstract

Parklets are increasingly promoted as micro-scale public spaces that enhance urban livability, yet their contributions to environmental performance and user perception remain underexplored. This study investigates how design strategies can simultaneously address thermal regulation and visual preference to inform effective interventions in dense urban settings. The research employs ENVI-met simulations to explore a series of parklet configurations, ranging from hardscape-only layouts to designs incorporating vegetation and shading structures. Environmental performance is evaluated through indicators such as air and surface temperature, mean radiant temperature, and shaded area. In parallel, an online perception study uses standardized visual renderings of the same designs, with participants evaluating aesthetic quality, perceived greenness, comfort, and willingness to stay. By integrating simulation-based environmental modeling with perception-based evaluation, the study develops a framework for understanding how evidence-based parklet designs can contribute to both environmental resilience and social comfort. Emerging insights are expected to clarify the relationships between ecological function and user experience, offering practical guidance for municipalities and practitioners seeking to expand sustainable parklet programs.

Keywords: Parklets, Environmnetal Performance, Themal comfort, Visual Perception, Urban design

#500 From Urban Labs to Global Standards: Assessing Locally Selected NbS Through the IUCN Lens

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Abstract

Urban laboratories serve as platforms for experimenting with innovative solutions in smart cities. As part of the Integrate NbS project (Driving Urban Transition program), urban transformation is achieved through co-creation with stakeholders, focusing on nature-based solutions (NbS) to improve the resilience of medium-sized cities to climate change. NbS are widely recognized as essential mechanisms for promoting sustainable development. The IUCN Global Standard for NbS provides an international framework to ensure credibility and effectiveness, but its applicability at the local scale remains underexplored. Medium-sized cities, where interventions are often community-driven, offer a critical testing ground. Within the Integrate NbS project, a ProAdapt Urban Lab in Mińsk Mazowiecki (40,000 inhabitants) was established. The lab brought together 20 local stakeholders—including city officials, developers, property managers, and residents—over six co-creative workshops. Participants jointly identified environmental challenges, generated ideas, and designed interventions. The initial workshops introduced NbS concepts through interactive tools, such as a board game, to build a shared understanding. Subsequent sessions focused on selecting four priority sites and developing NbS interventions, including permeable surfaces, increased tree cover, ecological water features, and educational elements. The proposed solutions were then evaluated using the IUCN Global Standard's eight criteria and 28 indicators. This framework helps users determine whether a solution qualifies as an NbS, identify actions to strengthen its robustness, and design adaptive interventions that maintain relevance and effectiveness over time. The Standard is facilitative rather than prescriptive, encouraging continuous learning to enhance sustainability, adaptability, and impact. The co-created interventions scored highest in criteria related to addressing societal challenges and ensuring inclusive, transparent governance processes. The participatory approach strengthened community ownership and ecological awareness. However, several criteria—especially those requiring long-term monitoring, large-scale impacts, or detailed cost-benefit analyses—proved challenging to apply to small-scale, local interventions. These findings suggest that the IUCN Standard provides a valuable structure but requires adaptation when applied in Urban Labs. For landscape architecture, the process demonstrates how co-creative methodologies can integrate ecological, spatial, and social dimensions of design, while highlighting the need for complementary assessment tools tailored to neighborhood-scale NbS.

Keywords: Nature-based Solutions, IUCN Global Standard, Participatory Design, Urban resilience, Urban Labs

#580 Bayou Chronicles: Adaptive Design Frameworks in Houston's Urban Watersheds

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Abstract

As climate risks intensify, Houston's bayous reveal the contradictions of a city shaped by opportunistic development and industrial adjacency. Engineered drainage channels run beside petrochemical corridors, while residential growth encroaches on floodplains long treated as expendable. This pattern has diverted public investment away from shared space, severing communities from their rivers and eroding the cultural and ecological life of the watershed. Reimagining this terrain requires an urban design approach that positions the watershed itself, its flows, sediments, and temporalities, as the primary unit of planning and adaptation. The Gulf Futures Design Studio, supported by the National Academies' Gulf Research Program, situates design research within the Lower Galveston Bay watershed. Rather than treating hydrology as background, the studio uses it as the scaffolding for spatial and political inquiry. Its methodology unfolds in three linked phases. First, territorial analysis employs deep cartographic sections, transects, and sediment chronologies to reveal layered interactions of hydrology, geology, and petrochemical infrastructure. Second, a public-facing GIS and data platform assembles subsidence patterns, contamination plumes, drainage districts, and demographic exposure to create a shared evidentiary base that informs design. Third, scenario planning develops multiple trajectories, including intensifying storms, wetland restoration, shifts in governance, and sediment remobilization, through narrative testing and "What if?" workshops. To date, this work has produced a multi-scalar archive that documents hydrological change, industrial legacies, and community exposure across three watershed sub-basins. Studio partners now use the GIS and web tools to support community advocacy regarding contamination and drainage inequities. Scenario exercises have generated a catalog of adaptive design strategies, including riparian buffers, sediment-capture landscapes, and neighborhood-scale resilience hubs. These findings demonstrate that treating the watershed as the primary design frame improves community partners' ability to articulate environmental risk and supports coordinated responses across jurisdictions. Collaboration is central to this work. Hydrologists and engineers model historic sediment transport of contaminants, while public health researchers examine mental health burdens associated with repeated extreme events. Community partners contribute lived narratives of flooding, contamination, and disinvestment. These collaborations weave scientific modeling, embodied knowledge, and speculative design into a hybrid method that treats uncertainty as a space for inquiry. The approach reframes urban design as system making. It demonstrates how watershed logics can guide public investment, reshape community agency, and support a future in which a cleaner river becomes the civic spine of collective resilience.

Keywords: watershed urbanism, climate adaptation, Environmental justice, interdisciplinary collaboration, scenario planning

#612 Bicycle Boulevards: A Simple Step Towards Improving Your City's Bicycle Network

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Abstract

Creating cohesive bicycle networks is a critical urban mobility challenge with direct implications for landscape architecture and public space design. Ideally, cyclists should never need to divert more than one block from a safe, continuous route. Yet in many U.S. cities, fragmented bike infrastructure undermines everyday cycling. Bicycle boulevards—also known as neighborhood greenways, slow streets, or fietsstraats —offer a flexible, context-sensitive strategy for improving urban connectivity. This research asks: How can U.S. cities leverage residential street networks to develop effective bicycle boulevards informed by Dutch cycle-street precedents? The study employs a comparative framework consisting of: (1) qualitative spatial and design analysis, (2) review of planning and policy contexts, and (3) quantitative assessment of safety and network connectivity. Case studies include established U.S. examples (Portland, Berkeley, and Minneapolis) alongside Dutch fietsstraat models in medium-sized cities. Metrics emphasize safety performance, accessibility, and street-network coherence. Findings indicate that Dutch fietsstraats provide transferable design principles—such as unified wayfinding, traffic-calming strategies, and intersection treatments—that can be adapted to many U.S. contexts, provided that differences in policy environments, land-use patterns, and mobility cultures are addressed. Results further suggest that while many U.S. communities already possess the spatial foundations for robust bicycle boulevards, they lack consistent design standards and evaluation methods. This research contributes to landscape architectural practice by proposing a conceptual framework and a set of adaptable design guidelines for implementing bicycle boulevards across diverse urban settings. It underscores the importance of evidence-based advocacy and interdisciplinary collaboration to meet both spatial and cultural challenges. By centering connectivity and user experience, the study highlights landscape architecture's vital role in shaping healthier, more equitable urban mobility networks.

Keywords: Cycling issues, Bicycle boulevards, Cycling networks, Neighborhood greenways, fietsstraats

#624 EV Charging Stations: Sparking Economic Development in Opportunity Zones

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Abstract

This study showcases how locating and integrating electric vehicle (EV) charging station infrastructure into communities can catalyze economic development, particularly in designated opportunity-zones in Intermountain West. While widespread adoption of personal automobile ownership in the 20 th century disrupted previously conventional transportation norms, shifted economic activity from main streets to highway bypasses, and enabled decentralized growth on a massive scale (Bruegmann, 2019), broader adoption of EVs has potential to also impact development patterns and economic activity. While suitable for quick refueling stops, the conventional gas station model is less appealing for extended visits spent waiting for EV charging. However, walkable central business districts (CBDs) that support a range of retail, food, and beverage establishments can present attractive environments for extended visit while recharging, especially in highway-adjacent communities. This NSF-funded study evaluates opportunities for integrating EV charging stations into local communities at both larger-scale planning and site design scales. A site selection model identified potential communities and sites located along key interstate highway corridors in the Intermountain West that satisfied a range of physical site selection criteria, including adjacent land uses, density and critical mass of existing urban fabric, proximity to other natural and cultural attractions, and potential for associated site improvements in existing development settings. Employing these criteria, planning-scale locations and specific community-scale sites were selected based on their representation of various physical conditions. In addition to these criteria, economic criteria included sites that are designated as opportunity zones, economically distressed census tracts eligible for tax benefits, to spur investment and redevelopment of properties in underserved communities. Resulting design vignettes from selected sites illustrate how existing built environments of highway-adjacent communities can be leveraged and enhanced to facilitate EV charging while providing opportunities for promoting economic development. These case studies showcase how existing built environments in dispersed highway-adjacent communities in the Intermountain West can be retrofitted to accommodate EV charging infrastructure while enhancing other desirable urban design qualities that support a high-quality built environment rich with a range of retail and community amenities. Comparative evaluation of these case studies illustrates the potential economic and design opportunities for integrating EV charging stations into existing settlement patterns, and development of new built environments. Broad EV adoption presents opportunities for planners, landscape architects, engineers, and allied disciplines to leverage EV charging stations for other design enhancements that result in built environments that are attractive to human users, and community-scale economic development.

Keywords: EV, electric vehicle, charging station, urban design , opportunity zones