

# RESPONDING TO EMOTIONAL ASPECTS OF ENVIRONMENTAL LOSS: IMPLICATIONS FOR LANDSCAPE ARCHITECTURE THEORY AND PRACTICE

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## 1 ABSTRACT

*The physical consequences of biodiversity loss, environmental degradation, and climate change have been well documented, and more is being said about emotions connected to major environmental impacts. This paper explores the role of design theory and practice in addressing environmental losses and changes to places of personal and collective significance. I draw upon the early literature on associated emotions and affect, including work from the ecological humanities, psychology, and biology, and pull this together with the work of artists and curators to explore the implications for landscape architecture theory and practice. Designers generally focus on creating beautiful and pleasant places where one might connect with nature in a positive way. They do not often engage with emotions such as grief, anxiety, guilt, and despair. Yet, as illustrated by the important role played by memorials in most societies, designed spaces can serve as important points for publicly addressing traumatic histories and memories in collective forums. While landscape architects have done the important work of highlighting human intervention in the landscape and making ecological processes evident in designed terrains, I explore how design practice might also respond to the emotional aspects of environmental loss and climate change. Such sites can play a role in transforming public grief into political action, but to do so they must move beyond pastoral forms, lament and nostalgia.*

## 1.1 Keywords

Anthropocene, Climate Change, Design, Extinction, Memorial

## 2 INTRODUCTION

The physical consequences of biodiversity loss, environmental degradation, and climate change have been well documented, and more is being said about emotions connected to major environmental impacts. This article explores the role of design theory and practice in addressing environmental losses and changes to places of personal and collective significance. I draw upon the early literature on associated emotions and affect, including work from the ecological humanities, psychology, and biology, and pull this together with the work of artists and curators to explore the implications for landscape architecture design theory and practice. Seeing as significant environmental changes today invite, and indeed necessitate, an adequate design response, this article engages in a search for a design approach that might mark their scale and consequences through embodied experiences of mourning, celebration, and interconnectivity. The impact of the human on the environment and climate occurs today at a scale that is impossible to experience in a comprehensive way. Instead, we encounter these changes only as data or as flash events and phenomena that are difficult to apprehend in their entirety. Designed spaces can make abstract information apprehensible and available to the human body in a way that opens up access to understandings of the multiple temporal, historical, and spatial scales involved - from the neighborhood to the bio-region, from our lifetimes to intergenerational thinking. There can be a materiality to these scales.

Designers generally focus on creating beautiful and pleasant places where one might connect with nature in a positive way. They do not often engage with emotions such as grief, anxiety, guilt, and despair. Yet, as illustrated by the important role played by memorials in most societies, designed spaces can serve to address traumatic histories and memories in collective forums (Bakshi, 2017). Concerns about climate change have most certainly affected the design disciplines, leading to an important focus on sustainability, green infrastructure, and ecological restoration (Thayer, 1993; Spirn, 1985; Waldheim, 2006; Reed & Lister, 2014). While landscape architects have done the important work of highlighting human intervention in the landscape and making ecological processes evident in designed terrains, I will explore here how design practice might also respond to the emotional aspects of environmental loss and climate change, and how the work of landscape architectural designers and theorists might be translated to this concern (Ware 2008). Such sites, I argue, can play a role in transforming public grief into political resistance, but to do so they must move beyond pastoral forms, lament and nostalgia.

## 3 LANDSCAPE ARCHITECTURE, CULTURE, NATURE

For the most part, the discipline of landscape architecture has responded to environmental disruptions and losses through sustainable design strategies, such as green infrastructure, native plantings, stormwater management strategies, and ecological remediation of brownfield sites and urban environments. Such developments are extremely important, yet I would like to question why landscape architecture has not responded more directly to the cultural and emotional impacts of environmental losses. While responses have been both practical and theoretical (Meyer 2008; Treib 2009), I explore below how to connect relevant theory to the issues explored in this article. To do this I begin with an examination of select aspects of the profession's development since the eighteenth century. The organic lines and 'natural' vistas of the Picturesque garden were part and parcel of the partitioning trend of modernity, whereby a line was drawn between nature and culture. As Bruno Latour has pointed out, this put nature into the domain of science, where it remains off-limits to culture. Landscape architecture must navigate this terrain more than the other design disciplines, such as architecture and urban design, because its palette includes soil, plants, water, and environmental systems.

Landscape architects have done much to improve landscape function in relation to human impacts on the environment, and at times these interventions inform the designed landscape in ways that can be experienced spatially. A few early examples illustrating this approach are Hargreaves Associates' Guadalupe River Park, DIRT Studio's Vintondale Reclamation Park, and Peter Latz's Duisburg-Nord.<sup>1</sup> Unlike land art - which often operates on a purely visual register - and ecological restorations - which are mainly technical and scientific - these projects exhibit a synthesis of these two tendencies. Such projects must be situated among developments in the discipline since the 1980s, outlined by Elizabeth Meyer as attempts to "reconcile the values of earlier ecological design, the operations of landscape as art, the systems aesthetics of environmental art" (2000 p.202). In this way, landscape architects have interwoven design practices over this divide, drawing together nature (now located in science) and cultural expression.

Yet, as Meyer points out, the focus is typically on the ecological aspects of sustainability, and beauty rarely finds room in this discourse. I build here on Meyer's suggestion that we consider the role of aesthetic

environmental experiences in enabling a shift in the visitor from “an egocentric to a more bio-centric perspective.” (2008 p.6). Such landscapes can play a role in building public support for the environment, and Meyer cites Elaine Scarry’s argument that beauty can cause a “radical decentering.” (Quoted in Meyer, 2008 p.18). Richard Misrach, the American photographer known for documenting changes to the environment by petrochemical manufacturing and nuclear weapons, dispels critiques that accuse him of making “poetry of the Holocaust.” He believes that “beauty can be a very powerful conveyor of difficult ideas. It engages people when they might otherwise look away.” (Quoted in Lippard, 1997 p.180)

In addition to considering beauty, we must also examine the dominant understandings of the relationship between nature and culture, and I discuss here the framework provided by Third Nature as well as subsequent challenges to this paradigm. Third Nature was first described by Jacopo Bonfadio in 1541, when he remarked that at the villas at Lake Garda “...the industry of the local people has been such that nature incorporated with art is made an artificer and naturally equal with art, and from them both together is made a third nature...” This Third Nature was a radical restatement of the relationship between nature and culture. In a much more recent translation of this relationship, several decades ago landscape architects were influenced by land artists to develop different forms of expression, focusing more attention on site-specific phenomena and processes, leading to landscape designs that unfolded over time and at the scale of the body. Most influential of these artists was Robert Smithson, who proposed an alternate model for understanding our relationship with nature.

Smithson was one of the first to take his art outside of the gallery and to work with unconventional materials and sites, incorporating the wastes of construction with ecological thinking. He wrote in 1970: “To organize this mess of corrosion into patterns, grids, and subdivisions is an aesthetic process that has scarcely been touched. Art can become a resource that mediates between the ecologist and the industrialist.” Smithson has described his art as “...entropic situations that hold themselves together. It’s like the Spiral Jetty is physical enough to withstand all these climate changes, yet it’s intimately involved with those climate changes and natural disturbances” (1996 p.298). Several decades after this statement, we are much less likely to imagine any intervention that could actually “withstand” climate change (Skinner, 2010 p.14), yet the notion of intimate involvement is possible. And it is to this element of Smithson’s thinking, the development of a synthesis between industry and nature, that landscape architects might turn to at this moment of climate crisis. Smithson had proposed a different model of nature, one informed by entropic conditions, where the organization of the “mess” of decline or deterioration becomes an “aesthetic process.”

Where Third Nature involved man and nature creating something new together, Smithson proposed a mutually informed entropy - a coordinated dissolution. Could employing such a model of nature today provide a design language capable of expressing environmental losses as well as recognizing and celebrating interconnectivity? Susan Herrington has convincingly argued that “gardens can mean,” and that the duration of time spent experiencing a garden can make “available meaning through memory.” While people may read a book once or twice, “gardens...can be experienced for decades.” (2007 p.314.). How might this power of duration be employed to address a range of environmental losses including contamination, loss of biodiversity, and the impacts of climate change. What elements might compose these landscapes in this period of accelerating environmental change? Landscapes should be designed that consider the changes in the ecological sciences where focus on the fixed endpoint of ecological stability and equilibrium have shifted to understandings of resilience and complexity within dynamic systems. As Meyer argues, “These theories have enormous implications for landscape design, and yet twenty years after their general adoption in the sciences, many landscape architects and their clients operate on outdated, even romantic, conceptions of nature and its beauty.” (2008 p.16). Instead, addressing the questions posed in this article will involve working in tandem with these developments in the ecological sciences. Recent years have seen emerging discussions of what some term “fourth nature” landscapes.<sup>ii</sup> Describing ecosystem typologies resulting from invasive species or climate change, Hobbs et.al recognize that “the definitions of ‘natural,’ ‘historic,’ and ‘altered’ are rarely clear and are often determined in relation to cultural, national, religious, or personal experiences or values” (2009 p.601). Moving in the direction of a new understanding of nature, they raise questions about how to manage ecosystems where retention or restoration of the historical reference is no longer possible due to extremely altered conditions such as soil salinity or the dependence of species on certain non-native or even invasive plants. In these environments, they argue, the costs and benefits of restoration to a previous state must be weighed considering that “Such novel systems can be relatively stable and have high cultural value, particularly if they continue to provide

the same, or enhanced, delivery of ecosystem services, such as flood attenuation and habitat provision” (2009 p.603). This fourth nature is an “alternate stable state.”

To take it further and extend beyond discussions of conservation or restoration, we must question how designed landscapes might address the “uncanny” nature of the moment. This is described by Amitav Ghosh in relation to weather events today, which “despite their radically nonhuman nature, are nonetheless animated by cumulative human actions...They are the mysterious work of our own hands returning to haunt us in unthinkable shapes and forms.” Explaining why climate change has been left largely unaddressed in contemporary literature, Ghosh explains that it has proven resistant to the manner in which writers often frame nature. Climate events are “too powerful, too grotesque, too dangerous, and too accusatory to be written about in a lyrical, or elegiac, or romantic vein” (2016 p.43). Translating this argument to landscape architecture, the development of which has been so strongly influenced by the picturesque, the romantic, the lyrical, we can see the roots of why it has been so difficult for landscape architecture to develop forms and spatial experiences that respond to the climate crisis and address attendant emotional impacts.

More is revealed by looking closely at the history of the picturesque form. The Third Nature that found expression in the Renaissance garden - the obvious play of human expression in dialogue with nature - was later masked in the Picturesque garden, in tandem with the Romantic movement and the formation of the Romantic human subject vis-à-vis nature. Romantic painting and literature often represent pristine landscapes, blissful in their simplicity, and allude to the possible overall harmony between the worlds of man and nature. They feature representations of awesome experiences of solitude, adventure, despair, and discovery as the person leaves the moorings of the familiar world. In this tradition, nature became an expression of “a human subject emancipated from the traditional restrictions of religion and society,” allowing for an experience of the “unfathomable depth of the soul.” This human subject is steeped in an infinite longing for “a lost unity and harmony resonantly evoked as ‘nature’” (Schneider, 2007 p.92). The Romantic movement was an aesthetic reaction to the overwhelming onset of the tidal wave of modernity; with this came the birth of an abiding nostalgia for nature.<sup>iii</sup> Some landscape historians have argued that this period continues to influence the profession to this day, maintaining connections to this nostalgia (Hunt, 2000 p.136).

Nostalgia takes on new meanings and forms today as we witness growing losses of biodiversity and absences of nature as we have understood it. Considering our impacts on the earth, “emancipation” from the constrictions of human society is no longer possible. Yet, nostalgia still plays a role. The biodiversity that “matters” to early ecologists sets the desired state for ecosystems far back in historical time; in settler societies this is before the arrival of Europeans (Heise, 2016 p.29). And while there are currently shifts from fixed endpoint “restoration ecology” towards the recognition of the need to work with novel ecosystems, romanticized notions of certain species appear in a variety of mechanisms for protection such as biodiversity databases and laws (Heise, 2016). As Hobbs et.al state, “Perhaps...we might, in the future, regard historic and hybrid ecosystems in much the same way as we do human historical sites; large investments will be required to restore and maintain the historical character of such sites” (Hobbs et.al, 2009 p.603). How can a design practice that has been connected to this nostalgic impulse towards nature now respond as growing losses are shifting the very nature of this nostalgia? More importantly, what are the dangers of nostalgia that must be steered clear of? It is instructive to look at how this response has taken shape in other fields, and the rest of this article looks at means for enfolding explorations from other disciplines into spatial design approaches.

#### **4 IMPACTS: ENVIRONMENT, CLIMATE, SOCIETY**

Recent books including *The End of Nature*, *The End of the Wild*, *Storms of My Grandchildren*, and *The Sixth Extinction* describe the enormous scale of the losses we are facing today. Facts and predictions from such texts, often read as snippets in news articles, are overwhelming for many who may then turn away from the enormity of the crisis (Coyle and Van Susteren, 2012). It is not difficult to imagine how reading such statements can bring about despair and despondency:

Nothing—not national or international laws, global bioreserves, local sustainability schemes, nor even “wildlands” fantasies—can change the current course. The path for biological evolution is now set for the next million years. And in this sense “the extinction crisis”...is over, and we have lost.” (Meyer, S., 2006 pp.4-5).

Many scientists and intergovernmental panels are in agreement that the impacts of climate change will be severe, but such impacts are often couched in abstract terms that are difficult to understand. Most people struggle to understand what abbreviations like ppm (parts per million) mean or how they relate to phenomena witnessed in everyday life, such as inconsistent weather or slow changes to their surroundings. These are absorbed into the background and more subtle changes may not draw conscious attention from most. Physical scientists and intergovernmental panels catalogue these losses with databases such as the Red List and ARKive.org. Such assessments are likely to provoke despondency, a sense of helplessness, and inaction. We need other forums for communicating and responding to this information, and a growing body of work has begun to reflect upon associated emotional impacts, as I will describe in this article and urge designers to contribute to such narratives.

Environmental journalist Michael McCarthy outlines the emotions that encounters with the natural world have evoked for him in *The Moth Snowstorm*. Upon seeing his first wild elephant, he felt, “intermingled with wariness, something akin to passion.” As a boy, stumbling upon the great Dee Estuary in the north west of England, there was a “feeling of immensity facing you, of nature untouched on the grand scale.” In the calls of the thousands of birds he found there was a song “pulling everything together, this ethereal mournful fluting, all the beauty of the untouched estuary, and the great skies and the distant mountains...” Upon happening upon a bed of Snowdrop flowers in the woods, he felt the turning of the seasons and the coming of spring: “...here against the dead tones of the winter woodland floor was hope.” Following online the migration of cuckoos that had been tagged by scientists, he felt the excitement of their return to England: “They were coming back...I was watching spring coming from 4,000 miles away.” He also outlines the pain of the losses. At the dead estuary at Saemangeum in South Korea he felt “rage” at the creation of a senseless dead zone that had once teemed with wading birds. Such environmental loss is “astringent,” and it involves hurt. As McCarthy warns, “If loss of nature becomes a sort of essay subject, we miss its immediacy; we may lose sight of its sadness and its nastiness, its sharp and bitter taste, the great wounding it really is” (2016 p.65).

The phenomenal reality of environmental losses involves an impoverishment of our sensual experience of the world: of the colors, sounds, smells and behaviors of vanishing or absent plants and animals (Ryan, 2009). In *The Sixth Extinction: Biodiversity and its Survival*, alongside the ecological and economic arguments, scientists Richard Leakey and Roger Lewin also recognize the aesthetic motives for preserving biodiversity. This aesthetic category, while the least objectively definable, is important. This goes “beyond a merely abstract experience and, instead, taps deep into what it is to be human. An appreciation of, and psychological dependence on, biodiversity is part of the biologically built psyche of *Homo sapiens*, a product of a long evolutionary history.” A depletion of biodiversity has a deep impact on our fundamental composition (1995 p.127). Facing a potential future in which there is “nothing but us” (McKibben, 2006) the incredible scale becomes difficult to comprehend; the enormity of the numbers provoking for many an inability to engage with the facts. Those who pay attention are confronted with figures and projections of possible futures. Thus, emotion *is* present in the conveyance and reception of alarming data. Yet, “science has no mourning rituals,” (Visvanathan, 1996 p.311) which might assist in making sense of the losses and exploring why they matter.

Due to the focus on objective data, while scientific studies provide knowledge, they can strip away emotional significance. The process of categorization by which we make sense of the natural world conveys knowledge, and then “immediately begins to flatten the meaning” (McCarthy, 2016 p.136). Using numbers, figures, and statistics to describe climate change and environmental losses, this abstract and academic language is sterile; it misses something vital and important in terms of human experience. Instead, as Meyer argues, aesthetic experiences and “challenging forms of beauty can lead to attentiveness, empathy, love, respect, care, concern and action on the part of those who visit and experience designed landscapes.” (2008 p.21). Environmental and digital humanities scholar John C. Ryan proposes that “we need to engage the power of our senses and emotions, and contact the particular life cycles and seasonal patterns of plants...” to fully understand the extinction of a species (2009 p.53). The concept of species itself makes emotional connection and mourning difficult. A species is a “generalisation and an artifice of taxonomy” which has a functional value for science, but is insufficient as an “aesthetic, sensory or emotional medium” (2009 p.73).

An additional complication is carefully outlined by Ursula Heise in her book *Imagining Extinction: The Cultural Meaning of Species*: a “taxonomic bias” is present in science, whereby a fairly narrow set of species is used to represent biodiversity loss; this includes mostly large “charismatic” mammals, almost no

plants, and only a few reptiles and amphibians. Much of the science is shaped by “underlying cultural assumptions” (Heise, 2016 p.13). For example, a recent study on taxonomic and geographic biases in wildfowl species research illustrates a bias towards ‘high income’ countries, with a focus on a mere 15 species from 7 genera (Roberts et al., 2016). There are nostalgic impulses at work here that share commonalities with the nostalgia often marshaled to support nationalist narratives. For instance, in a number of extinction narratives, “biological crisis typically becomes proxy for cultural concerns: worries about the future of nature, on one hand, and on the other hand, hopes that a part of one’s national identity and culture might be preserved, revived, or changed...” (Heise, 2016 p.48) through species protection, or even through ‘rewilding’ or ‘de-extinction’ projects. Heise argues that biodiversity and extinction are “primarily cultural issues,” (2016 p.5). with an attendant set of emotional influences and concerns. An appeal to rational and logical thinking, to science, to clinical and abstract statistics is not enough. Narratives that make the numbers and losses understandable are required to visualize the enormity and scale of the changes underway. Sustainable development initiatives and complicated strategies for carbon taxes are not going to “stir the soul” or inspire emotional engagement. While such approaches are of vital importance, they remain intangible and abstract in that they do not allow for physical experience or engagement.

The 2012 report *The Psychological Effects of Global Warming on the United States* points out the major emotional impacts of climate change. For instance, in the aftermath of Hurricane Katrina, affected communities suffered from high rates of depression, post-traumatic stress disorder and domestic violence. Higher suicide and suicide attempt rates were documented as 14.7 and 78.6 times higher than the baseline rates for the area, respectively (2012 p.9). According to forensic psychiatrist Lise Van Susteren, “people suffer more from disasters that are ‘man made’ than they do from natural disasters. The pain caused by intentional or avoidable acts is much harder to get over than those caused by events perceived as accidental or uncontrollable” (2012 p.12). It is not just the victims of preventable disasters who suffer, it’s also the researchers studying these phenomena. Biologist Camille Parmesan outlines the especially difficult emotional toll climate change is having on those who study the issue. She describes an ocean reef she has studied since 2002: “It’s gotten to be so depressing that I’m not sure I’m going to go back to this particular site again, because I just know I’m going to see more and more of it dead, and bleached, and covered with brown algae” (2012 p.19). Kathy Selvage, founder of the Southern Appalachian Mountain Stewards, associates the loss of the mountains with grief. Her childhood memories are of mountainside streams and berry-picking in the woods, but mountain-top removal and surface mining changed this landscape drastically. “To have all that demolished, taken away, geographically eradicated? It is one of the most disturbing things. It was the death of the mountain” (Aldern, 2016).

Research indicates that increased anxiety will likely result from continuous and frequent media reports about climate change, including fear about what the future holds, guilt about personal living and consumption habits, as well as feelings of hopelessness, anger, and sorrow, or what has been termed *ecoanxiety* (Clayton et al., 2017 p.27). Robert Lifton, who originally coined the term “psychic numbing” to describe the impact of witnessing the disastrous effects of the bombing of Hiroshima, argues that this numbing now extends to a broad swath of humanity in relation to the forces of environmental destruction (1982). As Christian Parenti points out in *Tropic of Chaos: Climate Change and the New Geography of Violence*, the numbers of those affected by migration and violence connected to climate events will only continue to grow. Militaries across the globe are already preparing as migration on a massive scale is predicted, with Britain’s 2006 *Stern Review* estimating that climate change will set 200 to 250 million people on the move (2011 p.182). And for those who remain in place, Australian philosopher Glenn Albrecht has coined the term *solastalgia* to refer to emotions that arise in relation to places that have undergone drastic changes. In contrast with nostalgia, it is “the pain and yearning that stem not from the passing of better times, but from an altered environment” (2005). What happens when people remain in places that have changed drastically; when home environments associated with feelings of belonging and continuity are transformed?

In their writings on trauma, scholars such as Dori Laub and Jill Bennett have demonstrated the therapeutic importance of bearing witness (Bennett, 2005 p.31). This is necessary, not only so that others can know the truth of events experienced, but also because it enables those who were there to themselves make sense of and process the experience. Such approaches are grounded in the recognition that traumatic memories do not remain in the past, but rather are firmly situated in the present. As Cathy Caruth has emphasized, “Trauma is not locatable in the simple violent or original event in an individual’s past, but rather in the way that its very unassimilated nature – the way it was precisely not known in the first instance –

returns to haunt the survivor later on” (1996). Such understandings have been important for informing commemorative practices, memory work, and memorial design (Bakshi, 2017). A similar impulse can be brought to acknowledging the impacts of disruptions to the relationship between people and their home environments.

## 5 MARKINGS BY AUTHORS, ARTISTS, ARCHITECTS, AND CURATORS

Explored below are a number of projects created in recent years that address climate change and environmental losses - examining first the two-dimensionality and linearity of text, and moving towards spatial experiences. This accounting is directed towards drawing some conclusions about how design practice might develop along these lines, and then extend beyond elegy and mourning to create sites for reflection, commemoration, and experience of a variety of emotions in relation to changing environments. In particular, landscape architects could translate the narrative studies employed here to designs that take advantage of duration. Many of the projects discussed below are text- or object-based, and most involve deliberate engagement on the part of the visitor, who has made a choice to visit a particular site or gallery space. In contrast, landscape architects can create spaces, employing strategies from the examples listed below, that might bring these narratives into the everyday realm and enable unscripted encounters with landscapes that people will encounter over time. In this section I point to a few strategies from other fields that have the potential to be powerfully translated into landscape designs that engage a politics of place.

Michael McCarthy endeavors such a descriptive task for Saemangeum in South Korea, a former estuary, located on the East Asia / Australasia Flyway. “One of the wonders of the bird world,” it was destroyed by a giant sea wall that turned a landscape of rich mud and wading birds, into an annihilated ecosystem.

Saemangeum is gone. Extinguished. Rubbed out. The whole thing. It haunted me. I kept going back to Google Maps, spellbound by the satellite photo: so simple it seemed, the thin white line in the sea, stretching nearly from one point to another; such destructions it had done...

Yet no one seemed to be bothered about it.

It was over.

It was finished.

It was history.

It was only an estuary.

Who writes elegies for estuaries?

...I resolved I would do it myself, I would go and bear witness to it...(2016 p.78).

Many pages of *The Moth Snowstorm* are dedicated to this task, but McCarthy does not leave the reader at elegy; he also includes descriptions of wonder and awe, and turns to joy as a “defense strategy” in his narrative. He has found that this can be powerful: in speaking to people about their experiences with the natural world, he finds they become animated “once a memory is triggered. It’s as if it were locked away in a corner of their minds, and in recalling it and realizing that it has disappeared, they can recognize what an exceptional phenomenon it was...” (2016 p.102). Rather than stopping at calling out calamities, finding a way to connect with positive, even treasured, memories and emotions can be a more compelling strategy.

John C. Ryan refers to ‘botanical memorials’ in visual arts and literature as “elegies to landscapes lost” (2009 p.66). One such example is *Black Solander* by Gregory Pryor, a memorial to over 10,000 plants in Western Australia, including living as well as endangered and extinct species. In 2005 Pryor created a crypt within the gallery space by rendering these plants as shadowy images on black paper:

The visitor to the exhibition enters into the body of the immediacy, symbolised by the mausoleum within the gallery enclosure. Physical immersion and sensory deprivation, along with an empathic feeling for the threatened and extinct flora, creates an exchange between the viewer and the subject matter...The exclusion of light and colour especially create a sombre visceral reaction: a counter-aesthetic experience (2009 pp.68-69).

This use of sensory control and deprivation could be a powerful design strategy for landscapes and buildings. Marcus Vergetts series of *Time and Tide Bells*, installed in the UK from 2009 to 2014, aims for a different kind of sensory engagement. The bells are positioned at high-tide locations, and the movement of

the waves creates patterns of sound. As sea level rises, the pitch and frequency of the bell strikes will change, giving an auditory accounting of change. Just as the bells seek to bring unexpected sounds into everyday life, other projects have attempted to bring awareness to the hazards of climate change and human impacts on the environment into everyday urban life. The Berlin artists group Realities United have designed a special waste release system for a waste to energy plant designed by the Bjarke Ingels Group in Copenhagen. After a certain amount of CO<sub>2</sub> is collected, giant rings of vapor, each 25 meters in diameter and 3 meters high will be released. This will transform emissions from the plant into a symbol of the waste that we release into the atmosphere, seeking to give the abstract debate about emissions a distinct size and visible shape. For the HighWater Line project, started in 2007, Eve Mosher used a sports field marker to inscribe a line in New York City that defined 70 miles of flood zone. This line brought the current reality of urban life into waterfront communities in Brooklyn and lower Manhattan, marking the predicted 10-foot above sea level mark in the case of a major storm event. Moving beyond lament and mourning, such projects speak of an inextricable interconnectivity.

*Revival Field: Projection & Procedure*, started by sculptor Mel Chin in 1990 during his residency at the Walker Art Center, involved close collaboration with scientists. Chin designed a garden of hyperaccumulator plants, which can draw heavy metals from contaminated soil, at an old landfill near St. Paul, Minnesota. A small square area was enclosed by a chain-link fence within which a circular planting bed crossed by two paths was created. The developing form of the sculpture is informed by a close relationship with scientific knowledge and the specific life cycle of plants. Here, the unseen waste below the ground is brought to the surface and given visual expression. This approach recognizes environmental degradation while at the same time expressing the possibility of remediation and future growth - giving form to two contrasting edges of ecological interrelationally.

Maya Lin has brought her experience with memorial design to species loss with *What is Missing?*, a project employing a multi-media approach that includes sculpture, video, sound installation, hand-held electronic devices and a website. This has its roots in *The Extinction Project*, a large bronze-lined "listening cone" that visitors are invited to sit inside of to hear the sounds of animals facing extinction or those already lost. First exhibited at the California Academy of Sciences in 2009, Lin describes the project as about loss, but "not about doom and gloom." She asks, "how can we protect it if we don't even see it as existing?" The cone creates an immersive soundscape, where people can hear sounds that are no longer available in natural environments.<sup>iv</sup> The *What is Missing?* website is accessible from anywhere, and visitors find an interactive map, a sound gallery, and a number of personal stories, to which they can contribute their own. The website aims to recreate sensory experiences and provide a forum for memories and stories of loss.

At a larger scale construction is currently underway on the Jurassic Coast of England for MEMO, the Mass Extinction Monitoring Observatory. This project, founded by a UK charity in educational partnership with the E.O. Wilson Biodiversity Foundation, is dedicated to "building a global beacon for biodiversity." Their patrons include the Duke of Edinburgh and David Attenborough. The project proposes to collect images of species that have gone extinct in modern times. Their likenesses will be carved by artists all over the world, and those carvings will become the walls of MEMO. "The ultimate goal of MEMO is to inspire their [species] protection. And perhaps a global symbol which combines all the soul of the arts with the authority of science can provide the kind of cultural lightning rod which the geological drama of the moment surely demands."<sup>v</sup> Designed by David Adjaye, the building has been inspired by the twisting form of the Portland Screw fossil. Visitors move along a spiral ramp overlooking a central space dedicated to performances and events, and housing a large bell which will ring whenever a species goes extinct. The entire project is conceived of an educational tool, with on-site programs, artists' residencies in schools all over the world, and training for skills such as carving. As such, it attempts to link art and science, and to connect to living practices and educational initiatives.

A diverse range of projects is presented above. What connects them is a sensibility that attempts to bring to light interconnectivity. As such, they begin to illustrate how interactions with non-human species and the natural world have shaped human lives. Spaces that memorialize changes and mark losses can give shape to connection and contingency. They can allow for mourning, lament, and elegy, but also recognition and celebration of that which remains.

## 6 CONCLUSION

In many ways, addressing the losses of the Anthropocene challenges generally accepted concepts of mourning - largely drawn from Freud's 1917 essay on "Mourning and Melancholia," where grief is viewed

as something to be “worked through” in order to release the lost other. Erica Doss points out that Freud’s later work revised these understandings, and more recent theoretical and critical approaches “emphasize the inseparability of life from death – or the ‘continuing’ bonds between the living and the deceased” (2010 p.80). In relation to environmental losses, the Freudian concept of mourning the lost object falters, in that the project of separation of us from the natural “other” becomes impossible.

Any efforts to commemorate such losses must recognize the ongoing nature and uncertainty of changes that have not reached a clear conclusion point. Such a project differs from memorials that mark the end of wars or conflict, and can be more closely related to memory and heritage projects that support dynamic and flexible engagements with the past (Bakshi, 2017). Many of the dominant assumptions about how memorials work within a framework of “sociotherapeutic assumptions that trauma can be represented and must be cured...” (Doss, 2010 p.146) need to be challenged. Today’s project cannot aim for such closure, but would do better to give form to and allow for the experience of open-ended changes. Such an approach must move past representations of a pastoral environment that never existed and visions of future devastation that are meant to admonish and caution. As Heise questions, “Is it possible to move beyond the story templates of elegy and tragedy and yet to express continuing concern that non-human species not be harmed more than strictly necessary?” (2016 p.13) Paul Wapner suggests a “middle path” for American environmentalism, that operates “across the faultlines of philosophical contestation,” and fashions “the tension itself into insight and practice” (2013 p.27). This same sensibility should be brought to the project of commemoration. An environmentalism that remains mired solely in doom and gloom will be difficult to engage with, and fear has its limitations. Living in a “world of wounds,” as Aldo Leopold wrote, is difficult and foments despair and despondency.

Instead, an appeal that engenders emotional engagement is required: an immersive experience of empathic engagement with loss, interconnectivity, and possibility.<sup>v</sup> Landscape architects might draw on some of the strategies outlined in this article: McCarthy’s “defense through joy;” Pryor’s use of sensory deprivation as a design strategy; the creation of disruptions in everyday life in Mosher’s *High-water Line* or Vergette’s *Time and Tide Bells*; the collective visual and educational project of MEMO; or the interactive, multimedia approach employed by Maya Lin.

Growing developments in the sciences have led to increased understandings of interconnected systems, from George Perkins Marsh’s early work in *Man and Nature* (1864), to Ludwig von Bertalanffy’s general systems theory (1968), and the Deep Ecology Movement of the 1970s (Macy, 1995 p.14). Yet, such connections are difficult for most people to grasp. Landscape architects can play a crucial role by designing spaces that make such connections visible, experiential, and material, building off of existing landscape architecture theory discussed above. While this article has focused mainly on the creation of spaces that mark absence and acknowledge loss and associated emotions, there are other important scales and registers of intervention. In addition to creating spaces for mourning and interconnectivity, there is also a need to create places that make abstract numbers associated with climate change understandable. We need sites that reveal what these figures mean for living environments today and in the future. There is also the need to create places that people will stumble into in their everyday lives, that will allow for moments to experience joy and wonder and connection, helping to build a sense of interconnectivity into what are increasingly urban daily lives.

Anthropogenic changes are both highly present and strangely difficult to see and to capture. According to Amitav Ghosh, “The climate events of this era...are distillations of all of human history: they express the entirety of our being over time” (2016 p.155). It is impossible to extricate “us” from such events, which only furthers their shadowy opacity. The impacts are so strong - wildfires, the devastation of coastal towns, the disappearance of entire species - yet they are not indelible, and physical expression and points of clarification are missing. The pressing question that designers must address is: How can we experience ourselves in larger scales? We must understand ourselves as situated in overlapping temporal, historical, and spatial scales. Just as memorials can help communities to make sense of historical chronologies and drastically altered territories and borders, we must seek to make sense of the Anthropocene and the materiality of the scales we have brought into being. A phenomenological approach to climate change is possible.

## 7 REFERENCES

Albrecht, G. (2005). Solastalgia, A new concept in human health and identity, *Philosophy Activism Nature* 3, 41-44.

- Aldern, C. (2016). Mountaintop removal country's mental health crisis. *Grist*. [online] Available at: < <http://grist.org/climate-energy/mountaintop-removal-countrys-mental-health-crisis/>> [Accessed 9/16].
- Bakshi, A. (2017). *Topographies of Memories: A New Poetics of Commemoration*. New York: Palgrave Macmillan.
- Bennett, J. (2005). *Empathic Vision: Affect, Trauma, and Contemporary Art*. Stanford CA: Stanford UP.
- Boym, S. (2001). *The Future of Nostalgia*. New York: Basic Books.
- Caruth, C. (1996). *Unclaimed Experience: Trauma, Narrative and History*. John Hopkins UP.
- Clayton, S., Manning, C. M., Krygsmann, K., & Speiser, M. (2017). *Mental Health and Our Changing Climate: Impacts, Implications, and Guidance*. Washington, D.C.: American Psychological Association, and ecoAmerica.
- Cordial, P., Riding-Malon, R., & Lips, H. (2012). The Effects of Mountaintop Removal Coal Mining on Mental Health and Well-Being in Central Appalachia. *Ecopsychology*, 4(3), 201-209.
- Coyle, K. & Van Susteren, L. (2012). *The Psychological Effects of Global Warming on the United States: And why the U.S. Mental Health Care System is not Adequately Prepared*. National Forum and Research Report, National Wildlife Federation Climate Education Program.
- Doss, E. (2010). *Memorial Mania: Public Feeling in America*. Chicago: U of Chicago Press.
- Ghosh, A. (2016). *The Great Derangement: Climate Change and the Unthinkable*. Haryana, India: Penguin Random House India.
- Heise, U. (2016). *Imagining Extinction: The Cultural Meaning of Endangered Species*. Chicago & London: University of Chicago Press.
- Herrington, S. (2007). Gardens Can Mean. *Landscape Journal*. 26(2), 302-317.
- Hobbs, R., Higgs, E. & Harris, J. (2009). Novel Ecosystems: implications for conservation and restoration. *Trends in Ecology and Evolution*. 24(11), 599-605.
- Hunt, J.D. (2000). *Greater Perfections: The Practice of Garden Theory*. Philadelphia: University of Pennsylvania Press.
- Kolbert, E. (2015). *The Sixth Extinction: An Unnatural History*. NY: Picador.
- Leakey, R. & Lewin, R. (1995). *The Sixth Extinction: Biodiversity and its Survival*. London: Phoenix.
- Lifton, R. (1982). Beyond psychic numbing: A call to awareness. *American Journal of Orthopsychiatry*, 52(4), 619-629.
- Lippard, L. (1997). *The Lure of the Local: Senses of Place in a Multicentered Society*. New York: The New Press.
- Macy, J. (1995). Working Through Environmental Despair. From *EcoPsychology*- Roszak, Gomes & Kanner, eds. (Sierra Club, 1995).
- McCarthy, M. (2015). *The Moth Snowstorm: Nature and Joy*. London: John Murray Publishers.
- McKibben, B. (2006). *The End of Nature*. Random House.
- Meyer, E. (2008). Sustaining beauty. The performance of appearance, *Journal of Landscape Architecture*. 3(1), 6-23.
- Meyer, E. (2000). The Post-Earth Day Conundrum: Translating Environmental Values into Landscape Design. In: M.Conan, ed. 2000. *Environmentalism in Landscape Architecture*. Washington DC: Dumbarton Oaks.
- Meyer, S. (2006). *The End of the Wild*. Boston: MIT Press.
- Parenti, C. (2011). *Tropic of Chaos: Climate Change and the New Geography of Violence*. New York: Nation Books.
- Reed, C. & Lister, N. (Eds.). (2014). *Projective Ecologies*. Harvard GSD.
- Roberts B., Harris W., Hilton G. & Marsden S. (2016) Taxonomic and Geographic Bias in Conservation Biology Research: A Systematic Review of Wildfowl Demography Studies. PLoS ONE 11(5): e0153908. <https://doi.org/10.1371/journal.pone.0153908>
- Ryan, J. (2009). Why Do Extinctions Matter? *Philament ABSENCE – December 2009*.
- Schneider, H.J. (2007). Nature. In: M.Brown, ed. 2007. *The Cambridge History of Literary Criticism, Volume 5: Romanticism*. Cambridge: Cambridge University Press.
- Scranton, R. (2015). *Learning to Die in the Anthropocene: Reflections on the End of a Civilization*. San Francisco: City Lights Books.
- Smithson, R. (1996). *The Collected Writings*. Ed. Jack Flam. Berkeley: University of California Press.
- Spirn, A.W. (1985). *The Granite Garden: Urban Nature and Human Design*. Basic Books.

Treib, M. (Ed.) (2009). *Spatial Recall*. Routledge.

Visvanathan, S. (1996). Footnotes to Vavilov: An Essay on Gene Diversity. In: F. Apffel-Marglin, ed. 1996. *Decolonizing Knowledge: From Development to Dialogue*. Oxford & New York: Oxford University Press.

Wapner, P. (2013). *Living Through the End of Nature: The Future of American Environmentalism* Cambridge MA & London: MIT Press.

Ware, S. (2008). Anti-Memorials and the Art of Forgetting. *Public History Review*. 1, 61-76.