

ABSTRACT

Population growth and development present a daunting challenge to land use planners and designers, particularly in coastal communities where urbanization dramatically impacts water quality, habitat, other natural resources, and the delicate balance of sensitive environments. This study investigates the effect of changing land use and land cover (LULC) on water quality, and suggests changes in development policy to mitigate impacts. The Fish River watershed, located in Baldwin County, Alabama, USA, is used as a case study to examine both spatial and temporal domains. This watershed is of critical importance to the health of Weeks Bay, a designated Outstanding National Resource Estuary located at the watershed outlet. Water quality data and the Soil Water Assessment Tool (SWAT) are used to understand the LULC dynamics. Spatial comparisons between sub-watersheds showed that sites with large increases in urbanized land uses had substantially higher Total Suspended Solids (TSS). Nitrate trends over time showed a general decrease, while Total Phosphorus (TP) increased significantly. This may have very important implications as analysis at the spatial domain showed that urbanization increases Nitrogen (N) loadings, therefore posing an increased threat of eutrophication. Land development policy was examined and Low Impact Development (LID) Best Management Practices (BMPs) were identified to mitigate TSS, TP, and N within urban catchments. Policy changes that have resulted due to this research include new development policy that supports reduced impervious surfaces, conservation of natural resources, natural drainage courses, and minimization of clearing and grading.