

Links between watershed activities and the degradation of coastal, tidal salt marshes in southern New England USA

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Human activities (e.g., land development, wastewater) in coastal watersheds in New England USA are linked with community- and system-level changes in tidal, organic-rich salt marshes. Significant relationships between various indicators of watershed activities and ecosystem structure and function were found among Narragansett Bay (RI) coastal, tidal marshes. Positive relationships were found between the human activity indicators and the extent of tall *Spartina alterniflora*, marsh detritivores, mud flat infauna, denitrification enzyme activity, and soil respiration. In contrast, there were negative relationships with plant species richness, the extent of *S. patens*, and marsh condition. In the highly urbanized watershed of Jamaica Bay (JB) (NY), salt marsh islands are disappearing at a rate of about 45 acres per year, soil respiration rates are elevated, and roots and rhizomes, especially in the soils at depth are significantly diminished. In the JB marsh soils there is an eutrophication signal, evidenced by an elevated stable nitrogen isotopic signature mirroring the human population rise beginning in the 1850s in the watershed. The results suggest that urbanization can have a negative effect on coastal, tidal salt marsh condition.

Keywords: watershed development; salt marsh; condition; Narragansett Bay; Jamaica Bay, urbanization