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The Influence of Estuary Geomorphology on Accretion of Coastal Wetlands: A Potential for Priority Planning for New Jersey Coastal Areas Vulnerable to Sea Level Rise R/6210-0011

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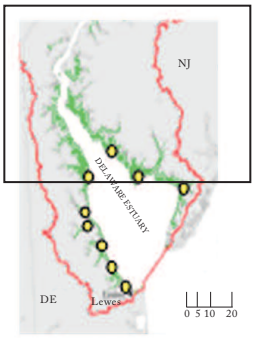
Coastal wetlands are extremely important ecosystems providing habitat for fish and wildlife, protection from storm surge and sea level rise, and nutrient and carbon removal services. In order for wetlands to be sustained with accelerating sea level rise, their elevation needs to increase through both sediment deposition and plant matter accumulation. These processes may occur at different rates in different types of estuaries. In coastal lagoons, such as Barnegat Bay, limited sediment deposition may result in a slower elevation increase than in coastal plain estuaries, such as the Delaware Bay, where sediment availability may be greater. Lower sedimentation rates can cause a negative feedback where plant growth is less vigorous and less plant material accumulates to build up the marsh surfaces. Salt marshes in some estuary types such as Barnegat Bay may be more vulnerable to sea level rise than salt marshes in estuaries where sediments are abundant.

To test this hypothesis, this project is measuring elevation change, plant biomass, historic accretion rates, and continuous water levels in New Jersey salt marshes along two estuary types: a coastal plain estuary (Delaware Bay) and a coastal lagoon estuary (Barnegat Bay). To better understand the sub-watershed level influences, the project will include a geographic information system (GIS) component to examine local wetland area change over time including quantifying the rate of shoreline edge erosion and landward transgression.

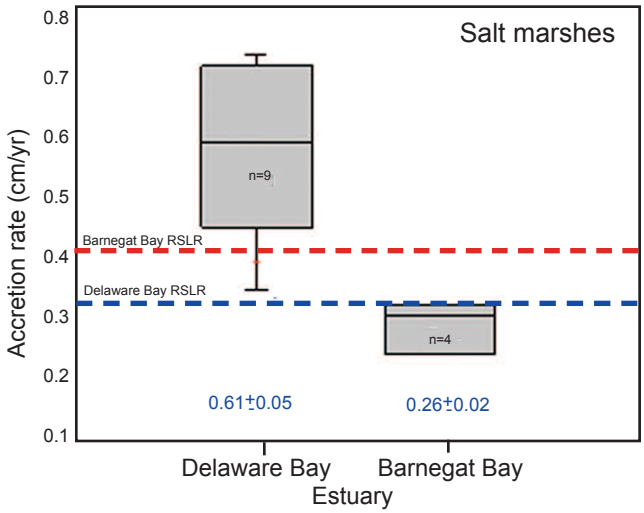
Preliminary data support the hypothesis.

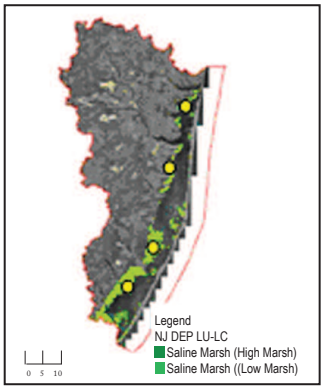
Accretion rates averaged over the last 50 to 100 years are over two times less in salt marshes of Barnegat Bay than salt marshes of the Delaware Bay. In addition, over the last 100 years, accretion rates in salt marshes of Barnegat Bay have been less than the rate of sea level rise.

This project will determine the fine scale mechanisms that are contributing to the difference in accretion and potentially the elevation change between salt marshes in Delaware Bay and Barnegat Bay, New Jersey.



Velinsky and Sommerfield in prep





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