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Climate-Linked Alteration of Ecosystem Services in Tidal Salt Marshes of Georgia and Louisiana

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The investigators' objective is to elucidate the effects of climate change on tidal marsh ecosystem services in tidal salt marshes of Georgia and Louisiana. The goal of this research is to better understand how the ecosystem services of eutrophication control, carbon sequestration, sustainable habitat, and faunal support are influenced by climate change, specifically increased drought severity, in salt marshes with tidal amplitudes ranging from mesotidal (Georgia) to microtidal (Louisiana).

This research project takes advantage of a unique and timely opportunity afforded by recent, multi-year, severe drought events in the tidal salt marshes of both Louisiana and Georgia that resulted in large areas of sudden salt marsh dieback. Within each state, six large study areas will be identified in which permanent plots will be established in habitats that represent a range of salt marsh response to drought from relatively unimpacted, reference (high vegetation cover) to severely impacted (complete dieback and loss of vegetation cover). Additionally, *Spartina alterniflora*, the dominant salt marsh grass, will be artificially established at low and high stem densities within areas of complete dieback (bare) marsh as a mechanism of controlling plant density independently from the drought-induced dieback. Alteration to the ecosystem services mentioned above will be evaluated at several scales over two growing seasons.

The proposed research will greatly increase the understanding of how climate change and severe drought events impact crucial salt marsh ecosystem services. By conducting this research in a natural laboratory that brackets a range of hydrogeomorphic conditions (deltaic plain/microtidal to coastal plain/mesotidal), the data generated on the effects of climate change on tidal salt marsh ecosystem services will have widespread applicability and value to coastal managers.

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