

INVASIVE HOGS ALTER SALT MARSH FUNCTIONING, ECOSYSTEM SERVICE PROVISIONING, AND RESILIENCE

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Invasive wild hogs are a known nuisance in Florida, the Southeast US, and globally. Through their wallowing and rooting activities, they reduce vegetation cover, release buried soil carbon, and reduce biodiversity in salt marshes. In addition, hogs consume ribbed mussels, a key foundation species in salt marshes ecosystems. To assess the direct impacts of hog disturbance and hog predation of mussels in marshes, we compared marshes with no hog access to marshes with known hog activity in Northeast Florida. Marshes with hog access showed a significant reduction in mussel cover and mussel aggregations contained fewer individuals than at marshes without hogs. A caging experiment revealed that hogs, not small mammals or nektonic predators, strongly contribute to the differences in mussel populations. We further quantified the effects of hogs on marsh functions that are mediated by mussels: invertebrate community composition, sediment denitrification, carbon storage, and sediment deposition. We found that the presence of hogs significantly reduced marsh crab densities within mussel aggregations and increased surface soil organic carbon. The reduction in mussel cover by hogs led to a reduction in biodeposition on the hog impacted marshes. However, hog activity enhanced sediment denitrification. Overall, hogs are transforming the marsh landscape through their disturbance to vegetation and sediment and their consumption of a foundational marsh species. These impacts generally, though not exclusively, reduce the ecosystem services provided by marshes and the resilience of marshes to sea level rise.

PRESENTER BIO: Hallie Fischman is a PhD student in Environmental Engineering Sciences. Her work focuses on the ecology and restoration of coastal ecosystems including salt marshes, sand dunes, and oyster reefs.