CRABS TRANSFORM VEGETATION-SEDIMENT-FLOW-MORPHOLOGY FEEDBACKS IN SOUTHEASTERN US SALT MARSHES

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Vegetated coastal ecosystems are widely recognized as controlled by vegetation-sediment-flow-morphology feedbacks, which allow these systems to evolve dynamically and recover from external pressures such as manmade disasters, hurricanes, or sea level rise. Within these habitats, consumers, ranging from insects to crabs to horses, can modify vegetation structure and composition across landscapes and/or extirpate plants in localized areas. While consumers are well documented in ecological literature, their effects on altering hydrodynamics and geomorphology have received relatively little attention. To better understand the long-term fate of the vegetated, coastal systems, we need to consider the role of the consumer in vegetation-sediment-flow-morphology feedbacks. This study focuses on understanding the role of *Sesarma reticulatum* (purple marsh crab) in the vegetation-sediment-flow-morphology feedback in the southeast Atlantic Coast in the United States (Sapelo Island, GA). These burrowing crabs coalesce in high abundances in *Spartina alterniflora* dominated salt marsh creekheads, which denude vegetation and create extensive burrowing networks. Creeks with extensive crab grazing have been found to elongate at rates up to 3x faster than creeks without. Using a Riegel Terrestrial Laser Scanner, we quantified and characterized detailed evolution of a study grazed creekhead, and found that the creekhead advanced at a rate of 3.4 m/y. Detailed flows were measured with acoustic Doppler velocimeters and pressure sensors at five representative creeks with varying intensities of grazing. Analyses revealed enhanced flows with increasing crab grazing intensity. Modeling work in development of different creek network scenarios evaluate the alterations of flow and sediment delivery due to crab grazing effects. Taken together, these results demonstrate the importance of consumers in moderating the fate and evolution of these biogenic, coastal landscapes.

PRESENTER BIO: Collin Ortals is a PhD Candidate in the Coastal Engineering department. His research focus is understanding how flows and transport of material interacts with flora and fauna in southeast Atlantic salt marshes (USA).