Blue Carbon Stability: Spanning Across Geographical Boundaries

Anthony J. Mirabito *[1], Avalon Ramsey[1], Nia Hurst[2], Jacob Berkowitz[2] and Lisa G. Chambers[1]*

[1]University of Central Florida, Orlando, FL, USA

[2]U.S. Army Engineer and Research and Development Center, Vicksburg, MS USA

Coastal wetlands have been attributed to being a crucial carbon sink in terms of the global carbon budget. Compared to tropical rainforests, coastal wetlands can store 3-5 times more carbon per area and sequester atmospheric carbon dioxide at a rate 10 times faster. Coastal wetlands are often referred to as “blue carbon ecosystems” due to their unique ability to efficiently and effectively function as a carbon reservoir. Despite there being large amount of research and resources quantifying soil carbon pools in coastal wetlands, it is important to acknowledge that not all soil carbon has the same fate. Investigating both the quantity and quality of soil carbon in coastal wetlands provides the ability of accurately predicting how much carbon will remain in the ecosystem and out of the atmosphere. One pool of soil organic matter that is continuously referred to as one of most stable pools of organic carbon in mineral associated organic matter. Mineral associated organic matter is organic matter that is adsorbed to mineral surfaces, and this chemical interaction protects the organic matter from mineralization. While the pool is heavily research among terrestrial scientists, there is limited research investigating its role in coastal wetlands. This research investigates the proportion of soil organic matter that is in the mineral associated organic matter pool and compares natural wetlands to restored wetlands that have been restored with the addition of dredged sediment across five geographically different locations in the United States. While we predict that the restored wetlands will have a lower quantity of soil carbon than their reference sites, we do expect the restored sites to have a higher proportion of their total carbon in the mineral associated organic matter pool due to the dredged sediment providing more mineral content to form mineral associated organic matter.