SEAGRASS SPECIES IDENTITY AND HISTORICAL COVER INFLUENCE SEDIMENT ORGANIC CARBON STOCKS

Alexandra L. Bijak[1]*, Laura K. Reynolds*[1]*, and Ashley Smyth*[1,2]

[1]Soil and Water Sciences Department, University of Florida, Gainesville, FL, USA

[2]Tropical Research and Education Center, University of Florida, Homestead, FL USA

Biodiversity can promote ecosystem functioning in coastal systems. In general, diverse communities are more productive and recover from disturbance faster than communities with less variation, and diversity can enhance restoration success. We are investigating the role of seagrass species diversity in the ecosystem function of organic carbon storage. While species-specific seagrass morphology and physiology may impact organic matter trapping and sediment microbial activity, the effect of seagrass species diversity on sediment organic carbon storage remains unclear. Since sediment organic carbon stocks represent accumulation over time, seagrass cover and variability in cover over time may predict organic carbon stocks. We examined the effect of contemporary seagrass cover and richness, as well as historical cover and variability in cover over the past 15 years, on surface sediment organic carbon (0-10 cm) in subtropical meadows in Cedar Key, Florida. This region is host to several tropical seagrass species that are underrepresented in carbon stock estimates. We found that meadows where *Thalassia testudinum* (turtlegrass) was present contained higher stocks than meadows where turtlegrass was absent, and stocks increased with turtlegrass biomass. The highest carbon stocks were found in monotypic stands of turtle grass and diverse mixed stands with *Syringodium filiforme* (manateegrass). The lowest carbon stocks were found in monotypic and mixed *Halodule wrightii* (shoalgrasss) meadows and unvegetated sediments. We also found that sediment organic carbon stocks increased with average historical seagrass cover and declined with increasing variability in cover. These findings suggest both meadow history and contemporary species identity are drivers of local-scale variability in sediment organic carbon stocks.

PRESENTER BIO: Alex Bijak is a 3rd year PhD student interested in how biodiversity promotes ecosystem functioning. She has an educational background in conservation biology and population genetics and gained professional experience in nation-scale water quality monitoring through an ORISE fellowship at the U.S. EPA.