DOES MORE VARIETY MEAN HIGHER STABILITY? EXPLORING HOW SEAGRASS SPECIES DIVERSITY IMPACTS RESILIENCE

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Anthropogenic climate change is altering seawater temperature and chemistry. As a result of warming temperatures, tropical species are migrating away from the equator (i.e. tropicalization), and tropical herbivores are subsequently overgrazing subtropical seagrasses and macroalgae, resulting in the loss of these foundation species and the functions they provide. Since seagrasses reduce erosion, improve water quality and clarity, sequester carbon, and support diverse fish and invertebrate species (including endangered species and fishery species), loss of seagrasses has direct economic, cultural, and ecological consequences. The response of plant communities to increased grazing pressure depends on their diversity, both in terms of species diversity and genetic diversity. For seagrasses, the role of genetic diversity is well established, but fewer studies have investigated the role of species diversity. In this study, we used seagrasses in the northern Gulf of Mexico as a model system to understand the role of species diversity in ecosystem resilience.

Seagrass meadows along the Gulf Coast of Florida often contain multiple seagrass species, making this an ideal location to investigate the effects of seagrass species diversity. Warming temperatures will indirectly impact Gulf of Mexico seagrasses through tropicalization, with growing populations of herbivorous emerald parrotfish, green turtles, and manatees resulting in greater grazing pressure on seagrasses. To investigate how seagrass species diversity influences seagrass resilience to increased grazing pressure, we conducted a manipulative field experiment in Crystal River, FL where we simulated green turtle grazing in plots containing one, two, three, and four different seagrass species. Through this experiment, we aimed to improve our understanding of how seagrass species diversity impacts ecosystem services, functions, and stability, as this knowledge is important for designing effective seagrass management and restoration strategies.

PRESENTER BIO: Jamila Roth is a Ph.D. student in the School of Natural Resources and Environment, advised by Dr. Laura Reynolds in the Soil and Water Sciences Department. For her dissertation, she is researching the effects of environmental change and species diversity on seagrass resilience and seagrass-herbivore interactions.