BUILDING ADAPTIVE FOUNDATIONAL RESILIENCE FOR COASTAL WETLANDS: A POTENTIAL EVERGLADES EXPERIMENT

Fred H. Sklar[1], *Carlos Coronado-Molina*[1], *Tiffany Troxler*[2], *Michael Brown*[1] *and Walter Wilcox*[1]

[1]South Florida Water Management District, West Palm Beach, FL, USA

[2]Southeast Environmental research Center, Florida International University, Miami, FL, USA

Sea level rise (SLR) is expected to affect natural and urban areas by shifting habitats and inundating coastal developments in South Florida. Given this challenge of SLR, building resiliency within South Florida's natural communities is imperative, not only to protect the natural habitat where fish and wildlife species thrive, but also as a means of reducing risk to the built environment from coastal storm hazards and saltwater intrusion. For coastal wetlands to exist into the future, soil accretion must match or outpace SLR. Adaptive Foundational Resilience (AFR) is the ability of the foundational vegetation (freshwater marshes and mangroves) to adapt to sea level rise by building elevation as a function of water depth and hydroperiod, porewater salinity, water quality and flow. It is based upon some 20 years of understanding the process of peat collapse, subsidence and coastal accretion. Here we describe the use of the AFR as an evaluation of coastal resilience in the face of SLR and as a function of water management and wetland restoration plans. Also, as the goal of an "active adaptive management" experiment and as an implementation of AFR, an Everglades Mangrove Mitigation Assessment (EMMA) program has been designed, but not yet funded, to enhance scrub mangrove productivity and transgression into fresh and brackish marsh habitats as an adaptive mechanism for SLR. The EMMA project is field manipulation of freshwater flow, phosphorus addition, and sediment increase to enhance the resilience of coastal mangroves, increase land elevations, and evaluate the ability of coastal plant communities to shift to communities that are resilient to sea level rise. This scientific experiment will primarily evaluate the ability of Thin Layer Placement (TLP), an innovative nature-based management measure that spreads "clean" dredge/spoil sediments across a scrub mangrove community, to enhance net primary productivity and increase sediment accretion rates within coastal wetlands.

PRESENTER BIO: Dr. Sklar is Director of the Everglades Systems Assessment Section of the SFWMD, has over 100 scientific publications associated with wetland and coastal ecology, and has over 30 years' experience planning, designing, and monitoring Everglades restoration projects.