

Role of freshwater in ameliorating ground and surface water salinity intrusion and effects in degraded forests

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Coastal freshwater swamps along the northern Gulf of Mexico in the St. Marks and Suwannee NWR are threatened by changes in hydrology and salinity. These changes in water quality have degraded the health of freshwater tree species, and driven some of these forest into a relict status, particularly near the coast (e.g., Ecofina Hickory unit). This study will look at the relationship of ground and surface water salinity intrusion and forest health using population matrix modeling. The study will rely on long-term and newly field data collected by Middleton and Kaplan (UFL) to accomplish the work by supporting a UFL graduate student, and USGS biologist. Specifically, this project will monitor surface and groundwater quality, particularly with regards to salinity and forest health in freshwater coastal wetlands of the northern Gulf Coast by gathering information from a network of surface water, groundwater, and/or vadose (root) zone monitoring stations across a range of salinity levels across the Florida portion of the northern Gulf of Mexico: (<1 to 4 ppt). Floodplain hydrology and salinity (surface and groundwater) will be monitored in conjunction with measures of ecosystem health (production, regeneration and tree growth) in previously established plots of the North American Baldcypress Swamp Network. The field information from the project will be used to construct models of forest health and regeneration using population matrix modeling and an ecohydrological model to improve understanding of the major hydrological drivers of ecological change in historically freshwater coastal wetlands with respect to freshwater extraction, hydrologic alteration, sea level rise and climate change.