

Impacts of Groundwater Salinity on Tree Mortality on Sapelo Island, Georgia

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Recently Sapelo Island, Georgia has been experiencing dead patches of vegetation within the marshes that make up the island. The patches are visible to the naked eye and consist of multiple dead trees grouped together as well as some other dead, low-growing plants within the vicinity. In some instances, a road or canal separates the dead and living vegetation. The research done for this project, in May of 2019, was designed to find out if the groundwater feeding the trees is being infiltrated by saltwater and therefore killing the trees via lack of freshwater. The parameters tested for this research were the temperature, water pressure, dissolved oxygen, conductivity, total dissolved solids, salinity, and pH. Piezometers were installed at each site where there was not already one present. A multi-probe YSI meter was used to measure all the parameters. Soil samples were collected in the field and salinity was measured in the lab. While salinity did vary between the sites, no statistical significance was found between the values of healthy sites and sites with tree death. The same result applied to all parameters. Although no definitive conclusions could be reached with the preliminary results from the May research, results from an earlier project showed the relationship between the tidal cycles and groundwater movement on the island. The tidal cycles fluctuated values establishing a relationship between the tidal cycle and movement of salinity in the groundwater. The combination of these research data sets will serve as a basis for ongoing research in 2019 and 2020 for the investigation of the dead vegetation on Sapelo Island, Georgia.