

Marsh Salinity and Water Level Dynamics Between the Mississippi River Levee System and Adjacent Coastal Marshes

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In recent years there have been significant environmental challenges to Southeastern Louisiana, including marsh browning, drought, and sea-level changes. This project seeks to examine salinity and hydrological dynamics across a marsh system spanning Barataria Bay to the Mississippi River. The primary focus is to understand how water levels, salinity fluctuations, and salinity gradients influence vegetation health and distribution. To achieve this, we plan to deploy 15 monitoring devices (Solinst Leveloggers and Sender 5 units) throughout Barataria Bay to measure temperature, water level, and groundwater salinity. These measurements will allow us to analyze pore water and surface water salinity. By integrating our collected data with information from Coastal Reference Monitoring System (CRMS) stations, which currently track pore water, surface water, and vegetation characteristics, we strive to develop a more comprehensive understanding of marsh hydrodynamics. Along with data collection, we will conduct a conceptual analysis of vegetative health in the areas surrounding our installations to further understand the effects on vegetation. We aim to develop a more comprehensive understanding of marsh hydrodynamics and surface-groundwater interactions. The analysis of water level data will provide insights into water availability during wet and dry periods, allowing us to solve challenges related to flooding, storm surges, and drought. Additionally, this data will shed light on its effects on vegetation and provide ideas for improved habitat control and management. By combining water level and salinity measurements, this project will contribute to a better understanding of freshwater, brackish, and saltwater environments.