Porewater Salinity Response to Acute and Chronic Climate Disturbances Across Six Basins in Coastal Louisiana

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Coastal marshes are one of the most productive ecosystems on earth and provide many important ecosystem services – such as providing habitat and breeding grounds for many species, facilitating the carbon and nitrogen cycles, and protecting coastal areas from storms and other climate disturbances. Central to the function of these marsh systems is the structure provided by important vegetation, which can be sensitive to changes in porewater salinity. Both acute (flooding, storms, and drought) and chronic (sea level rise, erosion and land loss, and temperature change) climate events impact the hydrology of the coast and thus have the potential to influence porewater dynamics within the marsh. Comparing porewater data taken from a coastwide network of coastal monitoring stations (2007-2023) to indicators of climate disturbance (river discharge, relative sea level rise, change in marsh elevation, marsh vertical accretion, rainfall, flood percentage, and temperature data), this study examines the impact of these climate events on the porewater salinity in six basins in coastal Louisiana (Calcasieu, Mermentau, Vermillion, Terrebonne, Barataria, and Mississippi Delta). Results allow for the comparison of porewater response to climate disturbances in coastal basins with contrasting characteristics in the same geographical region.