Field Investigation into Hydrologic Drivers of Brown Marsh Formation and Potential Surface Erosion

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Study Initiated: August 2001 **Anticipated Completion Date**: Summer 2004

Study Site Location(s): Coastal Louisiana, Terrebonne and Timbalier Basins

Keywords: Elevation, Hydrology, Monitoring, Salinity, Sediment, *Spartina*, Soil chemistry, Water chemistry

Project Type: Intensive field monitoring and data collection

Project Outline:

Specific Aims: Identify site specific hydrologic and biochemical drivers that contributed to formation of salt-marsh dieback in coastal Louisiana; measurement of potential for marsh surface erosion and collapse

Methodology: Hydrologic instrumentation of adjacent paired interior live and dieback marshes at four location along a regional gradient of freshwater inflow; detailed soil biogeochemical measurements; detailed soil elevation monitoring

Results to Date: Marsh dieback occurred across a large gradient of flooding and soil characteristics; differential soil moisture deficits underlay pattern of interior dieback at 3 of 4 sites investigated; at fourth site, same pattern held, but was not statistically significant; marsh surface of dieback sites did not collapse dramatically or erode; substantial re-growth occurred at all four dieback marshes within 3 years of dieback; at three of the four sites, re-growth was close to 100%.

Lessons Learned: Paramount to have in place a monitoring system in the marsh environment in some manner, with a mix of continuous and discrete (4-6 week interval) measurements of diverse parameters, similar to those typically used by states to monitor rivers, lakes and groundwater.

Publications, reports, or web-accessible materials: (in preparation) *Field investigation into causes and potential consequences of marsh dieback in coastal Louisiana*, Swarzenski, Perez, Gambrell, Faulkner, and Michot

Suggested citation: Georgia Coastal Research Council, 2004. Proceedings of the Marsh Dieback Workshop, held February 3-4, 2004, Savannah Georgia.