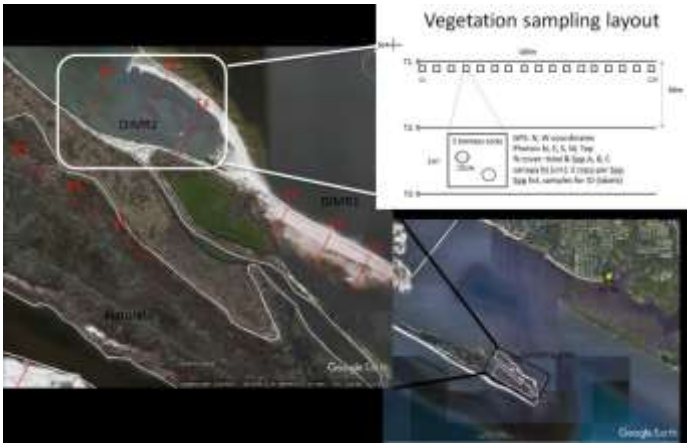
Evaluating Ecological Success of Beneficial Use on Deer Island

Ecosystem Management and Restoration Research Program

Background

Beneficial use (BU) restoration projects have potential to provide marsh habitat and substantial ecological function to systems, but quantifying these benefits are important for planning and project justification. To gain a better quantitative understanding of marsh restoration following BU site development, Engineer Research and Development Center Environmental Laboratory (ERDC-EL) researchers are studying Deer Island.

Deer Island is a 4.5 mile long island located near the mouth of Biloxi Bay, in the Mississippi Sound (Top Figure). The island has been highly impacted by numerous tropical storms and hurricanes leading to decreased island stability and habitat. To restore lost habitat due to shoreline erosion, Deer Island was used as a pilot BU project by the U.S. Army Corps of Engineers (USACE) Mobile District (SAM) and the Mississippi Department of Marine Resources (MDMR) in 2002–2004 and continues to serve as a restoration site through RESTORE Act funding (2015).



Objectives

The objective of this project is to quantitatively compare marsh habitat restoration in similar sites across time by analyzing plant, macroinvertebrate, and bird communities in a 12-year old BU site, a recent 2-year old BU site, and an adjacent natural control marsh site. Identifying initial patterns of habitat change and comparing them to patterns seen in an older restoration site will help quantify restoration success, ecosystems goods and services, and lessons learned.

Approach and Applications

Transects were established in two marsh restoration sites of different ages (2 yr, 12-14 yr), and an adjacent natural marsh site (Bottom Figure). Surveys of invertebrate, bird and plant diversity and density, as well as above and below ground plant biomass were conducted seasonally for 1.5 years. In an additional concurrent effort, sediment grain size and microbial diversity were also measured. These data were used to establish patterns of community variation and similarity in restoration sites of different ages to begin to understand restoration trajectories in this marsh habitat.

Outcomes and Products

A technical report is currently in development summarizing the results of this work. This initial project will be incorporated as a case study in to a new work unit that uses multiple approaches to assess marine marsh restoration trajectories.

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