



Project Location

Weeks Bay National Estuarine Research Reserve

Project Duration

September 2015 to September 2018

Project Lead

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Project Type

Collaborative Research – generating science that informs decisions

Project Partners

- Alabama Department of Conservation and Natural Resources
- Dauphin Island Sea Lab
- Mobile Bay National Estuary Program
- The Nature Conservancy
- University of South Alabama
- Weeks Bay National Estuarine Research Reserve

End-User-Derived Research to Improve the Effectiveness, Sustainability, and Prevalence of Coastal Restoration Projects

Overview

Coastal habitats have been heavily degraded over the course of human history, with major declines seen in oyster reefs and coastal wetlands. Coastal restoration efforts are critical to restoring these habitats, but projects are often carried out with little to no monitoring and evaluation of success. Without monitoring and evaluation, it is difficult to make comparisons across restoration designs to determine which are most functional, sustainable, and cost-effective. This reality, in combination with limited “best practices” resources for coastal restoration, significantly hinders project implementation.

The project team is collaborating with a group of coastal managers, researchers, and outreach specialists to help fill these gaps and evaluate several coastal restoration designs at the Weeks Bay National Estuarine Research Reserve. The designs compare nursery-grown marsh plants with naturally colonized marshes both with and without offshore breakwaters. Additionally, these combinations of restoration designs are being evaluated for the potential effects of sea-level rise. Information gained from this research, and the regulatory knowledge provided by the advisory group, will be combined with pre-existing literature to produce manuals and workshops and inform stakeholder meetings. The project team will share the manuals and workshops with private property owners, contractors, and agencies. The research and outreach associated with this project will improve the effectiveness and ease of implementation of coastal restoration projects.

This project follows a previously supported Science Collaborative project from the National Estuarine Research Reserve System that examined the effectiveness of varying densities of marsh plantings at removing nutrients. More information is found [here](#).

Anticipated Benefits

- An improved understanding of the effectiveness of several coastal restoration designs, including the use of breakwaters and nursery grown sods versus naturally colonized plants.
- Better designed coastal restoration projects with the tools for monitoring success.
- A stronger and more informed network of coastal property owners and restoration contractors and consultants.

Project Approach

- Conduct a manipulative field study to answer the following questions identified by the advisory group of coastal managers and researchers:
 - How does the presence of a breakwater on the seaward side of marsh affect marsh colonization and functionality?
 - How do nursery grown marsh plant sods compare to naturally colonized marsh in terms of restoration cost-effectiveness?
 - How will sea level rise affect the functionality and sustainability of marsh, breakwaters, and the combination of the two?
- Quantify the effectiveness of restoration designs using the following metrics: shoreline dynamics (accrual and erosion); plant density, growth and upland and seaward expansion; fisheries enhancement; and water quality.
- Gather information about regulatory status and procedures across Alabama, Mississippi, and Florida that could affect restoration projects and case studies of permitting applications.

Targeted End Users and Anticipated Products

- Workshops for coastal property owners about the environmental and the economic benefits of using restoration for shoreline protection.
- Workshops for contractors and coastal property owners about the current state of restoration science, how to identify a suitable restoration site, and how to implement and monitor a restoration project.
- Restoration permitting manual for coastal property owners and restoration contractors.
- Pamphlet on the environmental and economic benefits of coastal restoration for coastal property owners, restoration contractors, and resource agencies.

About the Science Collaborative

The National Estuarine Research Reserve System's Science Collaborative supports collaborative research that addresses coastal management problems important to the reserves. The Science Collaborative is managed by the University of Michigan's Water Center through a cooperative agreement with the National Oceanic and Atmospheric Administration (NOAA). Funding for the research reserves and this program comes from NOAA. Learn more at www.nerrs.noaa.gov or www.graham.umich.edu/water/nerrs.