

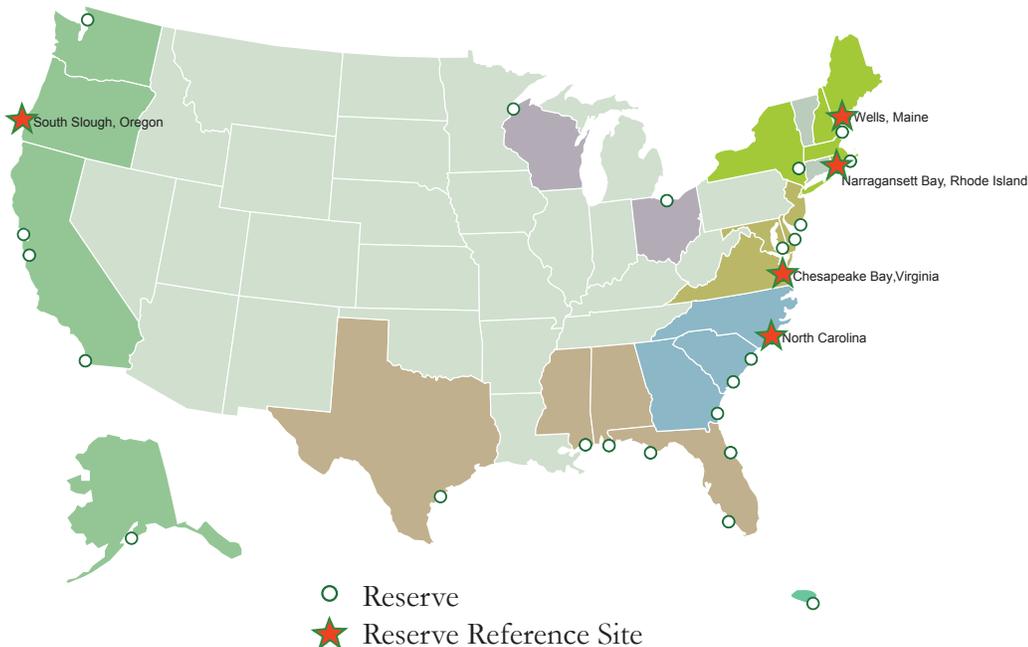
Application of NERRS Monitoring Data to Evaluate NOAA Restoration Center Funded Restoration Projects

In 2007, NOAA's National Estuarine Research Reserve System (NERRS) and Restoration Center collaborated to explore the viability of using the NERRS System-Wide Monitoring Program (SWMP) as reference data to evaluate the success of restoration projects. Results show that the NERRS data is a valuable contribution to restoration science.

The NERRS is a place-based network of 28 reserves located in estuaries along the nation's coasts and Great Lakes. The SWMP, a backbone of the Integrated Ocean Observing System, was established in 1995 to track short-term variability and long-term changes in estuaries and coastal areas, to understand how human activities and natural events can affect ecosystems. It provides valuable abiotic, biotic, and watershed land use data to researchers, natural resource managers and other coastal decision makers. On average the SWMP annually collects at least 13.5 million water quality data points, 34.4 million meteorological data points, and 31,104 nutrient data points. These types of data are critical indicators of environmental conditions for estuarine species and their habitats.

In this study five reserves were used as reference sites to evaluate the success of 17 local tidal wetland restoration projects funded since 2000. The tidal reference and restoration sites were located in and near the Wells, ME; Narragansett Bay, RI; Chesapeake Bay, VA; North Carolina; and South Slough, OR reserves. The restored sites included ten hydrologic sites and seven excavation/fill restoration sites.

NERRS Reference Sites



Since 2000, the Restoration Center has allocated approximately \$46M to support nearly 700 restoration projects.

Monitoring Parameters

The NERRS monitored a suite of biotic and abiotic parameters based on NOAA's reference manual for restoration monitoring.

Biotic parameters:

- species composition and percent cover of herbaceous vascular plants
- plant height
- stem density

Abiotic parameters:

- water fluctuation over time
- salinity in tidal areas
- soil organic content and bulk density
- wetland surface elevation

Conclusions and Implications

Key findings resulting from the project were:

- Most restoration projects surveyed in this study appeared to have achieved an intermediate level of restoration with two sites appearing to have become very similar to their paired reference sites, suggesting a high level of restoration. Most sites are still in transition to full restoration
- Two abiotic variables – 1) elevation of marsh platform; and 2) depth to groundwater were significantly correlated with plant community structure, providing important indicators of tidal wetland restoration performance.
- NERRS tidal wetland sites can provide appropriate long-term reference sites for local tidal wetland restoration projects
- The Restoration Performance Index (RPI) which compares change in variables over time between reference and restoration sites offers promise as an effective trajectory analysis strategy for measuring restoration status
- It is recommended that invasive species be added as an additional parameter to the RPI vegetation component because invasive species can be an important threat to tidal wetland restoration sites

Restoration at the Chesapeake Bay Naval Weapons Restoration Site



October, 2006



September, 2010

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