



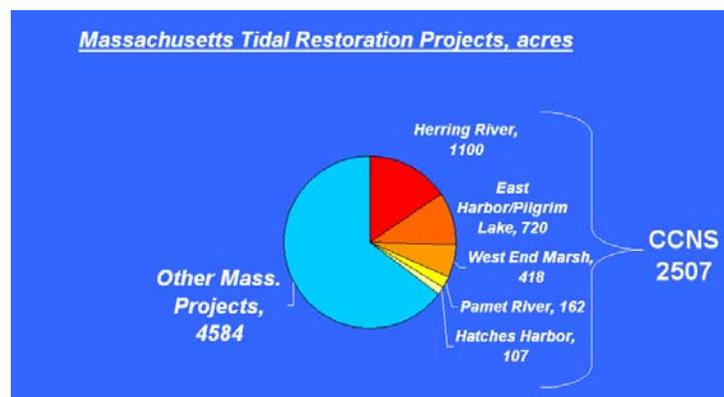
Tidal Restoration Monitoring

Background

Major portions of five of the seashore's six largest estuaries were diked off for roadway and railway construction and mosquito control prior to park establishment in 1961, with serious loss of salt-marsh plants and animals. Dikes also block sediment transport to marshes, making them more vulnerable to drowning in the face of accelerating sea-level rise. Consequently, Cape Cod National Seashore staff and cooperators are working to reverse this damage and to re-establish sustainable coastal wetlands through the restoration of tidal exchange. Currently, the seashore's 2500 acres of tide-restoration projects comprise over 35% of the entire diked wetland area targeted for restoration state-wide, and represent regional models for planning, implementation and monitoring.

Long-Term Monitoring

The selection of monitoring variables is guided by our expectations of system response, i.e. how tidal forces, water quality, and organisms will change with the restoration of each estuary's connection with the marine environment. Hydrodynamic modeling, based on copious field data, is used to predict the estuary's physical response. Conceptual models of how these physical changes will affect water quality and biota, based on the best available estuarine science, lead to specific testable hypotheses and identify key monitoring variables.



Cape Cod National Seashore restoration sites comprise over 35% of the area of planned tidal restoration projects statewide.



Aerial view of the diked Herring River (Wellfleet MA), 80% of which is within the Cape Cod National Seashore boundary.

Preliminary Monitoring Objectives

Coastal wetlands are most fundamentally defined by tides and saline surface waters; thus tide height and salinity monitoring are basic for each project area. Sediment deposition on the wetland surface, essential to keep ahead of sea-level rise, is also followed closely. Salt marsh health is gauged by monitoring salt marsh plants, whose productivity channels throughout the estuarine food web. Much of this production is exported to coastal waters by estuarine fish and crustaceans, sampled at all major restoration sites.

Management Applications

Because of the long history of disturbance, a wetland's response to tidal restoration is not completely predictable; therefore, we have adopted an incremental, adaptive-management approach. Intensive, multi-disciplinary monitoring of system response is essential to inform all management decisions.

Contact

Carrie Phillips
Chief, Natural Resources
Cape Cod National Seashore
99 Marconi Site Rd
Wellfleet MA 02667

ph: (508) 771-2144
email: Carrie_Phillips@nps.gov

