

Southeast Coast Network

Inventory & Monitoring Program

National Park Service
U.S. Department of the Interior

Inventory and Monitoring Division
Southeast Coast Network



Salt Marsh Monitoring Program Summary

Overview

Salt marshes are valuable coastal resources that provide a variety of ecosystem functions. These include high primary productivity, high detrital production which is important for fish nurseries and estuarine systems, and high detrital decomposition -- the major pathway for energy flow within salt marshes.

Tidal salt marshes along the southeastern Atlantic Coast are located from the Chesapeake in Virginia, south to north-central Florida. Numerous fish, invertebrate, bird, and reptile species routinely use these diverse estuarine habitats for a multitude of critical functions such as refuge from predators, foraging, and reproduction. Although the marshes within this range are in some respects quite distinctive, within a given salinity range and community type, they share similar flora and, combined, comprise 82% of the existing marshes on the East Coast of the U.S.

Salt marshes in SECN parks are influenced by a variety of factors at the local and landscape scales. Changes in salt marsh extent, diversity, and quality are presumed to be related to a combination of sea level rise, tidal variability, and other local/regional issues such as changes in surrounding land and water use that can affect subsidence rates. Additionally within several parks, recreational use by visitors or impacts from non-native or naturalized animal populations can further affect various components of marsh wetland ecosystems through trampling, grazing or nutrient enrichment. Understanding the effects of multiple concurrent stressors affecting parks, and mitigating the impacts of those stressors at multiple spatial and temporal scales is an ongoing challenge for SECN park managers. Changes in sea level and tidal patterns as well as overall marsh condition are addressed through SECN coastal shoreline and salt marsh community monitoring.



Salt marsh at Fort Frederica National Monument.

Approach and Objectives

To characterize the effects of relative sea level rise on salt marsh communities, the network monitors surface elevation, soil salinity, accretion, and the vegetative community within each site. Each component is integral to the group as a whole to provide a complete picture of surface elevation dynamics and vegetation response.



The network conducts salt marsh monitoring in the vicinity of SECN park units. Salt marsh data collection is performed at Fort Matanzas National Monument by GTMNERR staff, in partnership.

Surface elevation, porewater, accretion, and vegetation are sampled from sites at each park. These permanent monitoring stations are located within areas of the marsh that are regularly flooded or inundated at the surface twice daily by semidiurnal tides.

Permanent stations are equipped with platforms which allow for access to accretion plots, soil porewater monitoring plots, and vegetation plots. A Rod-Surface Elevation Table (RSET) monitoring benchmark is also installed at each permanent station.

Protocol objectives for the salt marsh monitoring program include:

- Determine the magnitude, rate, and within-site variability of change in ground surface elevation.
- Determine the status, trends, and within-site variability in surface sediment accretion or erosion.
- Determine the status and trends in the surveyed elevation of station benchmarks relative to the national elevation network.
- Determine the status and trends in soil porewater salinity.
- Determine the status and trends in salt marsh vegetation species composition, cover, and height.

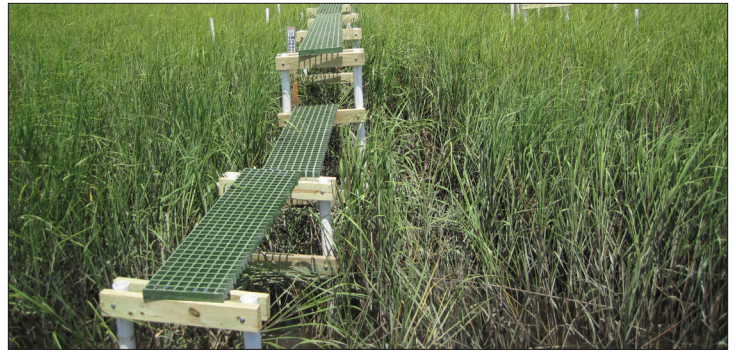
The full dataset and metadata are available from the NPS data store at the Integrated Resource Management Applications portal (<https://irma.nps.gov/App/Portal/Home>).

Data Analysis and Reporting

The RSET technique is used to measure vertical changes of the marsh surface over time. Using data that is collected, the rate of elevation change can be calculated to provide status and trends with respect to changes occurring at the surface. In addition to ground surface elevation, subsidence, sediment accretion, and erosion (if present) are determined for each site. Soil porewater salinity, vegetation composition, and percent cover and height are measured at each site.



A coastal ecologist measures saltmarsh elevation using a Rod-Surface Elevation Table technique at Cape Hatteras National Seashore.



Platform at Timucuan Ecological & Historical Preserve.



Calipers measuring accretion at a salt marsh site in Cape Hatteras National Seashore.

About the Southeast Coast Network

In 1999, the National Park Service initiated a long-term ecological monitoring program, known as “Vital Signs Monitoring,” to provide the minimum infrastructure to allow more than 270 national park system units to identify and implement long-term monitoring of their highest-priority measurements of resource condition. The overarching purpose of natural resource monitoring in parks is to develop scientifically sound information on the status and long-term trends in the composition, structure, and function of park ecosystems and to determine how well current management practices are sustaining those ecosystems.

The NPS Vital Signs Monitoring Program addresses five goals for all parks with significant natural resources:

1. Determine the status and trends in selected indicators of the condition of park ecosystems,
2. Provide early warning of abnormal conditions,
3. Provide data to better understand the dynamic nature and condition of park ecosystems,
4. Provide data to meet certain legal and congressional mandates, and
5. Provide a means of measuring progress toward performance goals.

The Southeast Coast Network includes 20 parks, 17 of which contain significant and diverse natural resources. In total, SECN parks encompass more than 184,000 acres of federally-managed land across North Carolina, South Carolina, Georgia, Alabama, and Florida. The parks span a wide diversity of cultural and natural resource missions, as they include four national seashores, two national historic sites, two national memorials, seven national monuments, and two national military parks, as well as a national recreation area, a national battlefield, and an ecological and historic preserve. The park units range in size from slightly more than 20 to nearly 60,000 acres, and, when considered with non-federal lands jointly managed with NPS, the Southeast Coast Network encompasses more than 253,000 acres.

For More Information

SECN Home Page:

<http://science.nature.nps.gov/im/units/secn/index.cfm>

About the NPS Inventory & Monitoring Division:

<http://science.nature.nps.gov/im/index.cfm>

Data Downloads via the Natural Resource Information Portal:

<http://irma.nps.gov>

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