



Coastal Shoreline Change Monitoring Program Summary

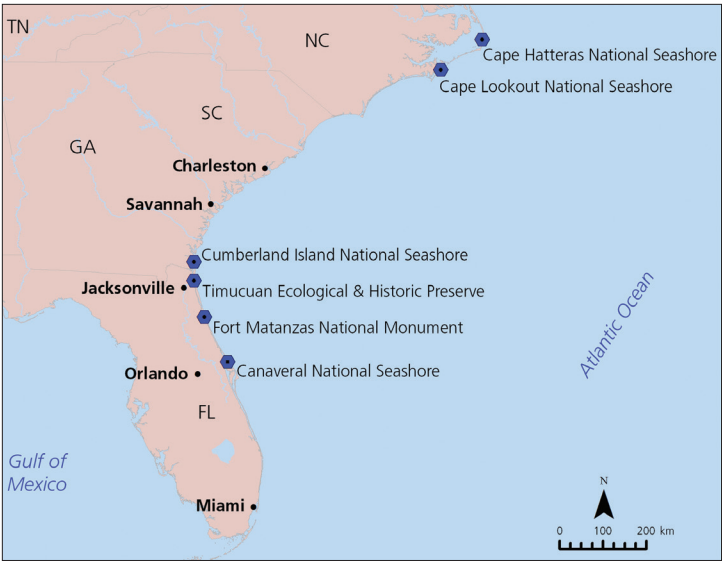
Overview

The problem of land loss/gain and landscape alteration at the marine edge is a fundamental issue facing coastal park resource stewards. Shoreline change is a prime geo-indicator of coastal environmental resource threats within parks. Change in shoreline position drives the alteration and replacement of established natural habitats, and shoreline retreat may destroy cultural resources, facilities, and other infrastructure. Geomorphologic change can influence change in other natural resource areas of interest within the NPS program: estuarine and subsurface water quality, species and habitats of concern, recreational visitor use, and even resource extraction.

Early identification of changes in past trends, along with an understanding of normal variability, is the key to recognizing ecological problems in coastal parks. An understanding of the spatial and temporal patterns of geomorphologic change is important for optimal management of any coastal park because the interface of marine and land systems is very dynamic and is driven by multiple forcing mechanisms which results in alterations to resource patterns and dynamics at habitat and ecosystem level and will eventually result in the loss of static resources. Local long-term monitoring programs will lead to an increased understanding of these effects.



High tide brings out the fishermen at Timucuan Ecological & Historic Preserve.



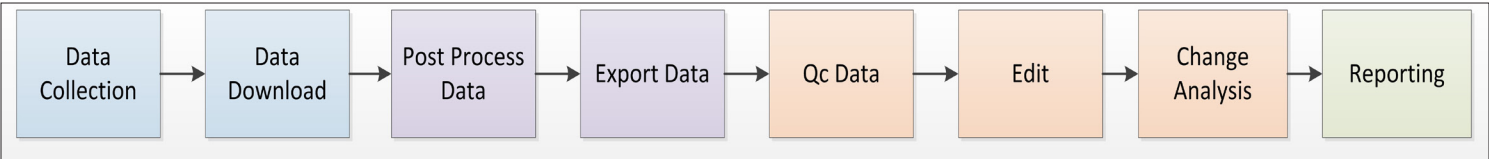
The network conducts coastal shoreline change monitoring in the vicinity of six SECN park units.

Approach and Objectives

The network has implemented shoreline change monitoring along the coastal shores of Cape Hatteras National Seashore, Cape Lookout National Seashore, Canaveral National Seashore, Cumberland Island National Seashore, Fort Matanzas National Monument, and Timucuan Ecological and Historic Preserve.

For ocean-facing and spit shorelines:

1. Determine seasonal and inter-annual changes in shoreline position
2. Determine spatial distribution of the type of shoreline change observed including the identification of areas of highly dynamic shorelines, and areas of accretion vs. erosion.



Workflow diagram of steps involved in the SECN shoreline monitoring protocol. The steps are colored denoting four main areas: blue represents the data collection and download, purple is processing, orange is analysis, and green is reporting.

Data Analysis and Reporting

A general breakdown of the workflow steps are listed below.

1. Surveyor collects shoreline monitoring data according to SOP-specific instructions and fills out the Field Data Form.
2. The raw GPS file (SSF) is post processed.
3. The corrected GPS file (COR) is exported in a GIS compatible format, generally a shapefile (.shp).
4. Quality control is performed on the shapefile using ArcGIS software.
5. The shapefile is edited using ArcGIS software.
6. Analysis is performed on the shorelines selected in the geodatabase using the Digital Shoreline Analysis System.
7. The results of the analysis are summarized and detailed in an annual report for the park.

These reports and resource briefs will be available on the IRMA web portal at <https://irma.nps.gov/DataStore/>. Additionally, updates are posted on Twitter when reports are published to IRMA.



Shoreline monitoring in a UTV at Cape Hatteras National Seashore.



Mapping the shoreline at Timucuan Ecological & Historic Preserve using a GPS unit.

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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