

Cape Lookout and Cape Hatteras National Seashores

National Park Service
U.S. Department of the Interior

Inventory & Monitoring Program
Southeast Coast Network



Resource Brief: Assessment of Estuarine Water and Sediment Quality, 2010

Vital Sign Overview

The Southeast Coast Network, in cooperation with the University of Georgia, conducted an assessment of water and sediment quality at Cape Lookout and Cape Hatteras National Seashores as a part of the Network's Vital Signs Monitoring program in July 2010. Monitoring was conducted following methods and standards developed by the U.S. Environmental Protection Agency as a part of the National Coastal Assessment Program and included parameter estimates of water clarity, chlorophyll *a*, total dissolved nitrogen, phosphorous, and dissolved oxygen. Sediment samples were also taken and then analyzed for concentrations of numerous metal and organic contaminants.

Significant Findings

Overall water quality at the park ranged from *fair* to *poor* with the majority of sites found to be in *fair* condition (83%).

Only one site was rated as *poor*, which was due to elevated nutrients.

Nitrogen levels were at concentrations considered *fair* at 77% of sites although *poor* conditions were noted at one site.

Phosphorus concentrations were generally *fair* to *good*.

Only a single site located just north of the Cape Hatteras Lighthouse rated *poor* due to elevated phosphorus levels.

Chlorophyll *a* and dissolved oxygen levels were *good* throughout most of the sampling locations.

Only 13% of sites rated in the *fair* range for chlorophyll *a* and only 3% rated as *fair* for dissolved oxygen.

Overall sediment conditions were considered *good* at all sites sampled showing only trace amounts of metals and little or no organic contamination.

Higher levels of nutrients, especially total dissolved nitrogen, were more common in the Seashores' northern waters potentially due to higher population densities in this area.

Continued monitoring of nutrient levels in the Seashores' waters, especially in high uses areas, should be considered.

Status of Conditions

Overall Condition				Water Chemistry			
	% Sites Rated				% Sites Rated		
	Good	Fair	Poor		Good	Fair	Poor
Water Quality Index*	13	83	3	Water Clarity*	26	0	0
Sediment Contamination ^a	73 ^a	0	0	Chlorophyll a	87	13	0
Total Organic Carbon ^a	73 ^a	0	0	Total Dissolved Nitrogen	77	0	23
Sediment Quality Index ^a	73 ^a	0	0	Total Dissolved Phosphorus	16	81	3
*May not sum to 100% due to rounding. ^a Missing data.				Dissolved Oxygen	97	3	0

*May not sum to 100% due to rounding. ^aMissing data.

*Many locations too shallow (<1m) to assess water clarity.

Sampling Area

Cape Lookout and Cape Hatteras National Seashores are adjacently located, and separately maintained, park areas along the Outer Banks of the North Carolina coast stretching from Beaufort Inlet in the south to Bodie Island in the north. Together these parks encompass over 59,000 acres of beaches, upland maritime forests, tidal creeks and salt marshes.

Cape Lookout National Seashore includes approximately 24,500 acres of land and is composed of two main islands known as Core Banks and Shackleford Banks. Cape Hatteras National Seashore contains 35,400 acres of land, and includes a series of barrier islands known as Bodie Island, Hatteras Island, and Ocracoke Island.

Thirty sites within the boundaries of Cape Lookout and Cape Hatteras National Seashores were randomly selected for monitoring following methods developed by the U.S. EPA (Figure 1).

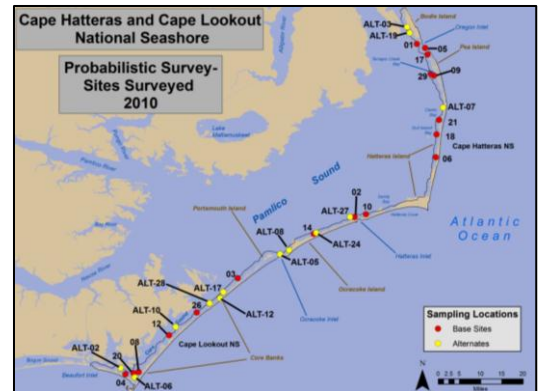


Figure 1. Location of sites sampled at Cape Lookout and Cape Hatteras National Seashores during July 2010.

About the Southeast Coast Network

The Southeast Coast Network (SECN) includes twenty parks, seventeen 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 missions also, including four national seashores, two national historic sites,

two national memorials, seven national monuments, two national military parks, as well as a national recreation area, national battlefield and an ecological and historic preserve. The parks 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 Network encompasses more than 253,000 acres.

About the Inventory & Monitoring Program

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 current 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:

- Determine the status and trends in selected indicators of the condition of park ecosystem,
- Provide early warning of abnormal conditions,
- Provide data to better understand the dynamic nature and condition of park ecosystems,
- Provide data to meet certain legal and Congressional mandates, and
- Provide a means of measuring progress towards performance goals.

For More Information

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

SECN Reports & Publications: <http://science.nature.nps.gov/im/units/SECN/reports.cfm>

Inventory & Monitoring Program: <http://science.nature.nps.gov/im/index.cfm>

Data Downloads via the Natural Resource Information Portal: <http://nrinfo.nps.gov/Home.mvc>

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