

Fort Matanzas National Monument

National Park Service
U. S. Department of the Interior

Inventory & Monitoring Program
Southeast Coast Network



Assessment of Estuarine Water and Sediment Quality, 2012

Vital Sign Overview

The Southeast Coast Network conducted an assessment of water and sediment quality at Fort Matanzas National Monument as a part of the Network's Vital Signs Monitoring program in July 2012. 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.

Significant Findings

Overall water quality index rating for the park area is *fair*, with three sites rated as *poor*, 21 rated as *fair* and seven rated as *good*. Individual site ratings indicated better water quality conditions in the waters immediately surrounding the park than in areas to the north and south of the park. *Poor* site ratings near the southern boundary of the assessed area may indicate an area of emerging concern.

A water-quality condition summary index was calculated for all sites at Fort Matanzas National Monument using the categorical assessments of water clarity, chlorophyll *a*, dissolved inorganic nitrogen (DIN) and dissolved inorganic phosphorus (DIP) concentrations and dissolved oxygen (Figure 1). This index indicated *fair* water-quality conditions at 68% of the sites sampled with water-quality conditions at 22% of sites rated as *good*, and only 10% rated as *poor*.

Water clarity was rated as *good* at 45% of sites in the assessed area with 19% rated as *poor*. Most of the sites rated as *poor* were generally grouped near the southern boundary of the assessed areas. The five sites nearest the park were rated as *good*.

Chlorophyll *a* levels were rated as *fair* at 81% of sites in the assessed area with 19% rated as *poor*. All of the sites rated as *poor* were located near the southern boundary of the assessed area. The sites nearest the park were rated as *fair*.

Dissolved inorganic nitrogen levels were rated as *good* at all 31 sites. Dissolved inorganic phosphorus levels were rated as *fair* in 65% of the sites, mainly in areas to the north and south of the Fort Matanzas, and *good* at 35% of the sites.

Dissolved oxygen levels were rated *good* at 71% of the sites and *fair* at 29% of the sites. No sites were rated *poor* due to low dissolved oxygen levels. Sites closest to the park rated from *good* to *fair*.

Status of Conditions

Percentages of sites rated as *good*, *fair*, or *poor* were calculated for water clarity, chlorophyll *a*, dissolved inorganic nitrogen, dissolved inorganic phosphorus, and dissolved oxygen (Table 1). A water quality index was calculated for each site and took into account the rating of each parameter at each location for all points sampled (Figure 1).

Table 1. Percentage of sites rated as *good*, *fair*, or *poor* near Fort Matanzas National Monument, July 2012.

Parameter	% Sites Rated		
	Good	Fair	Poor
Water Clarity (k)	45	32	19
Chlorophyll <i>a</i>	0	81	19
Dissolved Inorganic Nitrogen	100	0	10
Dissolved Inorganic Phosphorus	35	65	0
Dissolved Oxygen	71	29	0

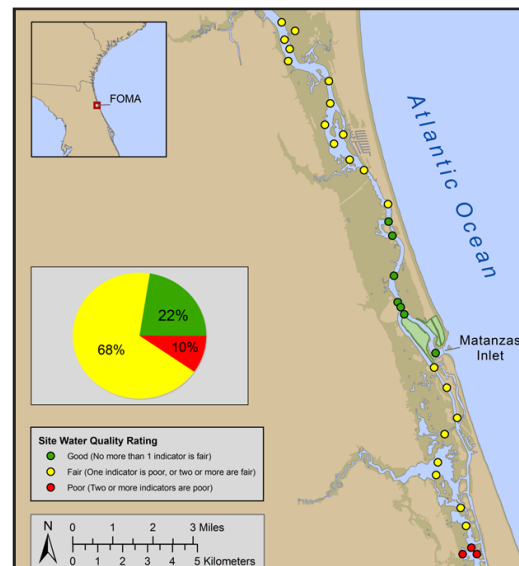


Figure 1. Water quality index rating by site near Fort Matanzas National Monument, July 2012. Graph shows percentage of sites in each condition category.

Sampling Area

Fort Matanzas National Monument (FOMA) is 14 miles south of St. Augustine on the northeast Atlantic coast of Florida. FOMA encompasses a total of 298 acres divided between the southern tip of Anastasia Island (108 acres) and the northern end of Rattlesnake Island (190 acres) by the Matanzas River Inlet (Figure 2).

The visitors center is located on a barrier island separated from the Florida mainland by the Matanzas River and the Intracoastal Waterway and consists of stabilized beach dunes rising as much as 7.6 meters above sea level. Predominant habitats in this portion of the park include beaches along both the Matanzas River and the Atlantic shore, stabilized sand dunes supporting maritime forest, secondary dunes further inland, and salt marsh. Land area at FOMA has actually increased in size by an estimated 13 acres over the past three decades due to shifting sand bars.

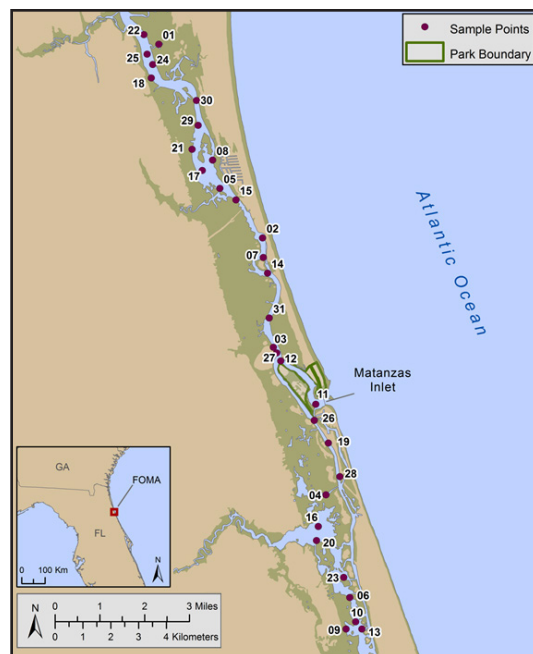


Figure 2. Sampling locations near Fort Matanzas National Monument, July 2012.

About the Southeast Coast Network

The Southeast Coast Network (SECN) 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 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.

About the Inventory & Monitoring Program

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:

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