

Fort Matanzas National Monument

National Park Service
U.S. Department of the Interior

Inventory & Monitoring Program
Southeast Coast Network



Fixed-Station Water-Quality Monitoring Data Summary, 2012

Vital Sign Overview

In 2010, Fort Matanzas National Monument (FOMA) began collecting water-quality data in conjunction with the National Park Service (NPS) Southeast Coast Network (SECN) Inventory and Monitoring Program in the estuarine waters near FOMA as part the NPS Vital Signs monitoring program. In July of 2012 SECN took over all aspects of the continuous monitoring data station at FOMA which is located at the visitors center dock. This station collects pH, dissolved oxygen, water temperature, salinity, turbidity and water-level data every 30 minutes. Nutrient data collected by Guana Tolomato Matanzas (GTM) National Estuarine Research Reserve System (NERRS) near FOMA are included to help asses water quality. The FOMA fixed-station water-quality monitoring site is part of the SECN estuarine water-quality monitoring program, which routinely collects data in the vicinity of seven coastal parks located along the southeastern U.S. coast. Information collected by this monitoring program will be used to help managers make better-informed decisions by understanding trends and variability related to water-quality conditions in park waters.

Significant Findings

Monthly averages for water temperature ranged from 17.1°C (62.8°F) in February to 27.2°C (81.0°F) in July. Individual readings for water temperature ranged from 11.4°C (52.5°F) in January, to 30.4°C (86.7°F) in July.

Turbidity levels were generally low throughout the year with no daily averages exceeding 35 NTUs. Monthly turbidly averages were highest in the summer, and did not exceed 14.6 NTUs.

Salinity levels ranged from 26.96 to 38.57 parts per thousand (ppt) throughout the year, with monthly averages ranging from 34.9 ppt in September to 36.9 ppt in July.

Mean monthly pH values ranged between 8.0 in August and September, and 8.4 in December.

Discrete sampling of water clarity and chlorophyll *a* were *good* throughout the year. September was the only month were dissolved inorganic nitrogen was rated *fair*; the rest of the year was considered *good*. Eight of the 12 months had *fair* results for dissolved inorganic phosphorus; the other four months had *good* results.

Dissolved oxygen levels were *good* throughout most of the year with only one *fair* measurement observed in August. There were no *poor* results from any discrete sampling in 2012 (Table 1).

Continuously-collected dissolved oxygen concentration data indicated *good* conditions, with the lowest monthly average level occurring in July (5.8mg/L). During the year there were no occurrences of the average daily value for dissolved oxygen dropping below 5 mg/L.

Status of Conditions

Table 1. Median measurements and ratings of monthly water-quality data collected by GTM NERRS near FOMA. Numbers in brackets indicate the number of months in 2012 when water-quality measurements indicated a *poor* rating. Green (■) = *good*; yellow (■) = *fair*; red (■) = *poor*. The light attenuation coefficient (*k*) was used as a relative measure of water clarity.

Water Clarity (<i>k</i>)	Chlorophyll <i>a</i> (µg/L)	Dissolved Inorganic Nitrogen (mg/L)	Dissolved Inorganic Phosphorus (mg/L)	Dissolved Oxygen (mg/L)
0.91 [0]	3.13 [0]	0.056 [0]	0.011 [0]	6.31 [0]

Sampling Area

Fort Matanzas National Monument (Figure 1) 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. 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.

River water quality at the Fort is heavily influenced by the daily tides and flows from upstream portions of the Matanzas River. Water quality is potentially affected by nearby urban and residential development which mostly occurs immediately adjacent to the eastern sides of the river both north and south of the Matanzas River Inlet.



Figure 1. Location of continuous water-quality monitoring station at Fort Matanzas National Monument.

About the Southeast Coast Network

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 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/publications.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>

Follow us on Twitter at: <http://twitter.com/SECoastNetwNPS> or [@SECoastNetwNPS](https://twitter.com/SECoastNetwNPS)