



Water Quality Monitoring 2021 Data Summary

Overview

The Gulf Coast Network (GULN) Water Quality Monitoring Program began in September 2007. The program monitors 54 sites across seven parks on a set rotation. The GULN Water Quality Monitoring Program provides an integrated assessment of the spatial and temporal distribution of general water quality conditions of stream and estuary water in relation to hydrologic conditions and major sources.

The network began long-term monitoring of water quality at Gulf Islands National Seashore (GUIS) in February 2011, conducting monthly grab sampling and continuous autonomous sampling. There are three sites in the Florida District (see map on next page) which include sites in two different bodies of water (Big Lagoon and Santa Rosa Sound). Field sites include Spanish Cove (in Big Lagoon), and Naval Live Oaks and Big Sabine (in Santa Rosa Sound). Sampling sites rotate with two of these three sites active each year, and one site in the Mississippi Sound at Ship Island (sampled and monitored by the USGS). Grab samples are collected for a common suite of nutrients standard to the Gulf of Mexico Alliance, a state-led network of partners working on priority issues along the Gulf Coast. These data are integrated into our routine seagrass monitoring program to better understand estuary health.

This brief summarizes data collected from January 1 through December 31, 2021. Water quality data are available upon request to the Gulf Coast Network. Past water quality reports and briefs are available on the Gulf Coast Network website (<https://www.nps.gov/im/guln/monitoring-reports.htm>).

Additionally, data for the western portion of the park in Mississippi are found at the following United States Geological Survey link: [MISSISSIPPI SOUND AT USGS EAST SHIP ISLAND LIGHT - USGS Water Data for the Nation](#)

Significant Findings

Highlights of Calendar Year 2021 Monitoring

The estuaries of Gulf Islands National Seashore are part of a much larger ecosystem directly influenced by human activities that can alter the natural physiochemical range of the water. To better define this range, a set of water quality parameters, focused on nutrients, was chosen for routine analysis based on park specific needs and matched to regional water quality monitoring standards.

Water quality standards are complex as the park is split between two states. While there are no nutrient-specific standards in Mississippi, there are location-specific nutrient standards for Florida estuaries. There were zero violations of the Florida water quality criteria in calendar year 2021. Many of the nutrients measured by certified laboratories came back as below detection limit which likely played a role in the relatively low chlorophyll-*a* measurements seen over the year (Figure 1). Historically, the chlorophyll-*a* standard has been exceeded in most calendar years, but not in 2021.

Future Monitoring

Water quality sampling will continue monthly through 2022.

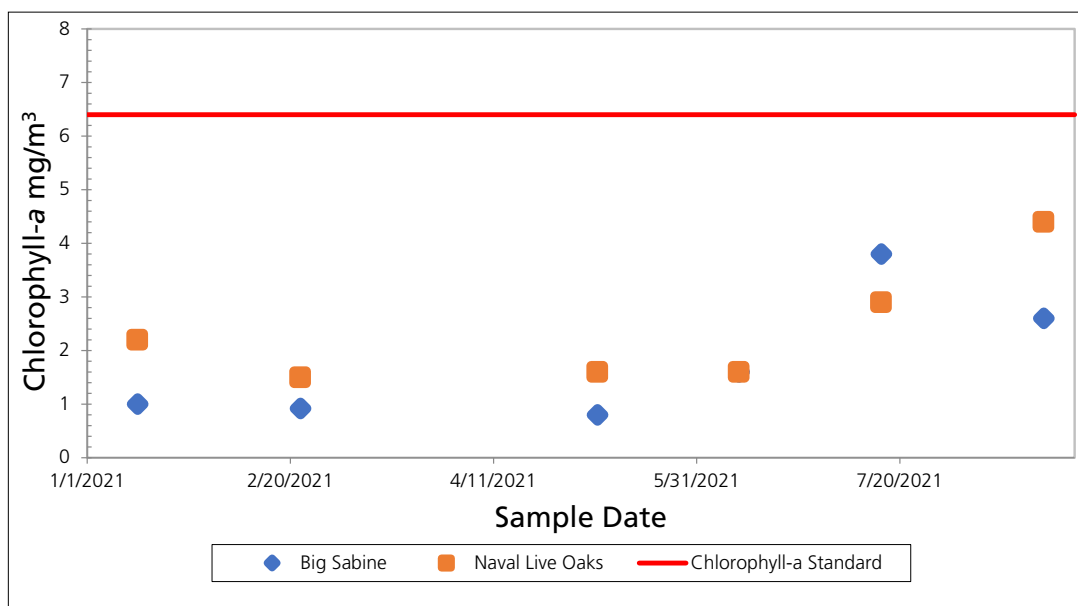


Figure 1. Chlorophyll-*a* measurements at our two sites that were active in 2021. Chlorophyll-*a* water quality standards are represented by the orange line. There were zero violations of chlorophyll-*a* in 2021. Coinciding with this was year-round, low nutrient measurements within the park's waters.

Water Quality Standards

Florida designates the estuaries of the seashore as “Outstanding Florida Waters” (Rule 62-302.532 F.A.C.) with site-specific water quality standards (Rule 62-302.700).

Table 1. Parameters and criteria.

Parameter	Santa Rosa Sound	Big Lagoon
Water temperature	—	—
Dissolved oxygen	**	**
pH	—	—
Chlorophyll-a	< 3.4 mg/m ³	< 6.4 mg/m ³
Total nitrogen	< 0.041 mg/L [†]	< 0.61 mg/L [†]
Total phosphorus	< 0.022 mg/L [†]	< 0.036 mg/L [†]

** Based on averages of various sampling periods

† Annual geometric mean



Map of Gulf Islands National Seashore water quality monitoring sites for the Florida side of the park that is sampled by NPS staff and cooperators.



Open water view within the Gulf Islands National Seashore boundaries. NPS photo / GULN staff.

About the Gulf 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 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 ecosystems,
- 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 toward performance goals.

Gulf Coast Network Website:

<https://www.nps.gov/im/guln/index.htm>

Gulf Coast Network Reports and Publications:

<https://www.nps.gov/im/guln/reports-publications.htm>

About the NPS Inventory & Monitoring Program:

<https://www.nps.gov/im/index.htm>

Data Downloads via the Natural Resource Information Portal:

<https://irma.nps.gov>