



Water Quality Monitoring 2020 Data Summary

Overview

The Gulf Coast Network (GULN) Water Quality Monitoring Program began in September 2007. The program monitors 54 sites across seven parks. The GULN Water Quality Monitoring Program was designed to provide 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 Gulf Coast Network began long-term monitoring of water quality at Gulf Islands National Seashore 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). Specifically, at the beginning of 2020, Naval Live Oaks and Spanish Cove were the active sites and Big Sabine was inactive. In October of 2020, our sites rotated per their schedule and Spanish Cove was deactivated, and Big Sabine and Naval Live Oaks became the two active monitoring sites. 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, 2020, through December 31, 2020. Calendar year 2020 was a trying year for sampling frequency and opportunities due to the COVID19 pandemic outbreak. GULN staff and cooperators sampled as frequently as possible while taking into consideration public health decisions, but the total number of samples collected in this particular year for many monitoring programs are reduced compared to other years. Our sampling schedule at GUIS was one such park where multiple sampling opportunities were lost due to the COVID pandemic restricting park access. 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) (<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: https://waterdata.usgs.gov/ms/nwis/uv?site_no=301527088521500.

Significant Findings

Highlights of Calendar Year 2020 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.

Water quality standards are a bit complex as the seashore is in two states. While there are no nutrient-specific standards in Mississippi, there are location-specific nutrient standards for Florida estuaries. There were only two possible violations of the Florida water quality criteria in calendar year 2020 with both violations occurring as exceedances of total phosphorus (Figure 1). While sampling frequency was reduced for 2020 there were fewer documented violations of total phosphorus than what has been seen in previous years. Historically, chlorophyll-*a* standard has been exceeded in most calendar years, but not in 2020 (Figure 2).



Above: Horn Island located within the Gulf Islands National Seashore.

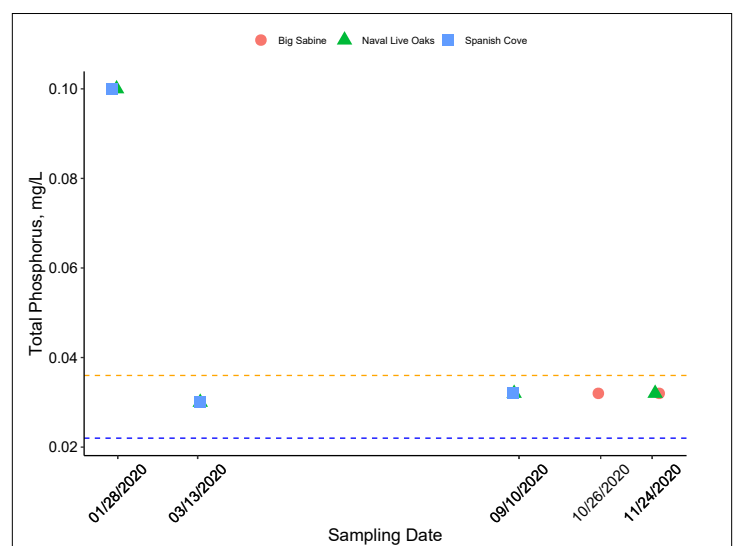


Figure 1. Total phosphorus measurements for GUIS for 2020. January sampling revealed a brief period of water standard exceedance that was not seen in the latter part of the sampling season. The blue dotted line denotes water quality standards in Santa Rosa Sound (Big Sabine and Naval Live Oaks), and the orange is for Big Lagoon (Spanish Cove).

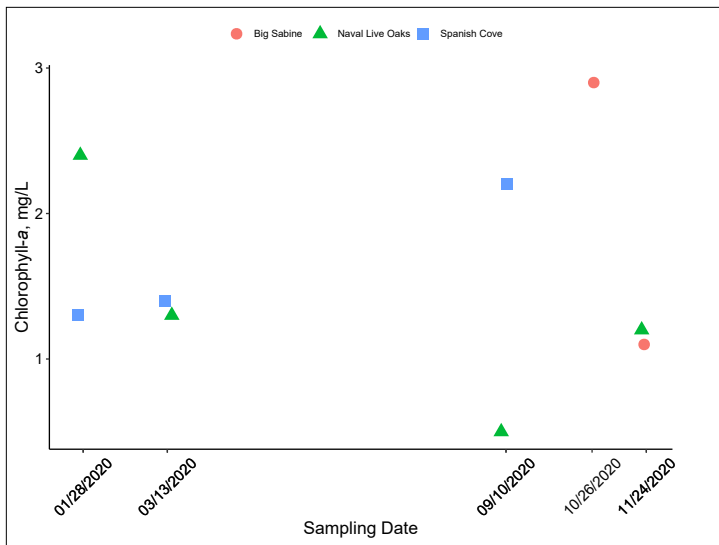


Figure 2. Chlorophyll-a measurements for GUIs in 2020. Chlorophyll-a did not exceed state standards at any sites in this sampling year. Chlorophyll-a standards vary for our two water bodies within the park (3.4 mg/L in Santa Rosa Sound, and 6.4 mg/L in Big Lagoon).

Water Quality Standards

The state of 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).

Below: 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

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,

Future Monitoring

Water quality monitoring will continue monthly sampling schedule through 2021.



Map of Gulf Islands National Seashore water quality monitoring sites.

- Provide data to meet certain legal and Congressional mandates, and
- Provide a means of measuring progress towards 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>