



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 network began monthly long-term monitoring of water quality at Jean Lafitte National Historical Park and Preserve (JELA) in July 2008. Changes to sampling frequency occurred in October 2017, where water quality is measured every other month at five permanent monitoring sites in the Barataria Preserve: Bayou Bardeaux (BARD), Whiskey Canal (WAGG), Pipeline Canal (Lower Tarpaper Canal [LTAR]), Tarpaper Canal (Upper Tarpaper Canal [UTAR]) and Millaudon Canal (MILL). Field measures include water temperature, specific conductance (SpC), pH, dissolved oxygen (DO) and turbidity. Water samples are collected for laboratory determination of *Escherichia coli* (*E. coli*), nitrate, nitrite and phosphorous.

Water in the Barataria Preserve originates from three main sources: rainfall, pumped storm water from the adjacent communities, and saline storm surges. Massive pumping stations are required to prevent flooding in the adjacent towns of Westwego and Estelle, and the preserve receives urban runoff via 10 pump stations draining five developed basins. A fourth source of water for the preserve may originate from the Davis Pond diversion that is located to the west of the park boundaries. Tropical storms and seasonal southern winds may also push saline water from the Gulf of Mexico approximately 60 kilometers (15.5 miles) to the south into the preserve and are a concern for salinity changes within the park.

This brief summarizes data collected from January 1, 2020, through December 31, 2020. 2020 was limited in sampling frequency and opportunities due to the COVID pandemic. GULN staff sampled as frequently as possible while taking into consideration public health determinations, but the total number of samples collected in this

particular year are significantly reduced compared to other years and only half of the normal sampling was able to be performed. 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>).

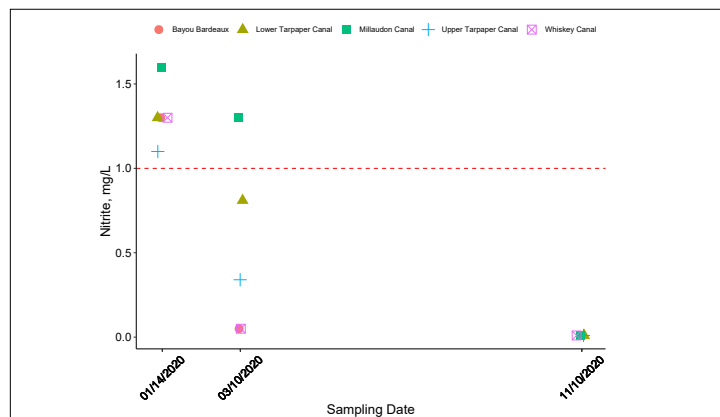


Figure 1. Nitrite measurements for all five sites for 2020. The horizontal red line is the EPA nitrite-nitrogen ($\text{NO}_2\text{-N}$) drinking standard as a visual reference but is not an actual water quality criteria designation for the park waters.

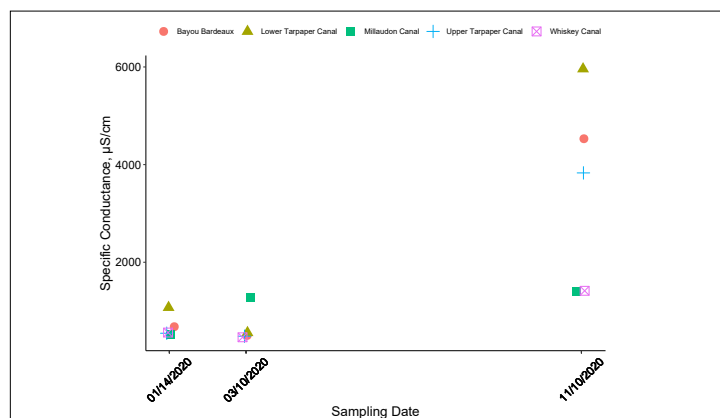


Figure 2. Specific conductance ($\mu\text{S}/\text{cm}$) measured at all sites on three sampling events in 2020. While no state standards exist, SpC was notably elevated in November of 2020 compared to earlier in the calendar year and previous years.



Above: Upper Tarpaper Canal at Jean Lafitte National Historical Park and Preserve. Photo taken by GULN staff during routine sampling.

Significant Findings

Highlights of Calendar Years 2020 Monitoring

For calendar year 2020, there were a few violations of Louisiana water quality standards and EPA drinking water standards. All sites violated EPA drinking water standards for nitrite, and while this park is not classified under drinking water but as primary/secondary recreation, nitrite values are notably elevated at the onset of the year (Figure 1). In previous years, the park experienced brief spikes of nitrite comparable to values seen in 2020 with only occasional or no values

Significant Findings (continued)

exceeding the drinking water standard. This is a notable change from 2019 when every site exceeded 1.0 mg/L NO₂-N for the entire year. Nitrite most commonly occurs from sewage (including municipal and industrial wastewater, and septic tanks), animal waste/feed lots, runoff from fertilizers and erosion of natural sources. Elevated nitrite levels are potential hazards for human contact, as well as aquatic biota and nitrite levels should be carefully monitored moving forward as they may pose a risk for the ecosystem.

While no standard exists for specific conductance, SpC was found to be extremely elevated in November of 2020. Specific conductance ranged from approximately 1,500 µS/cm (within the normal range for the park) to 6,000 µS/cm (notably higher than the average value over 13 years of monitoring). Increases in saline water infiltration into the park may be responsible for these spikes as they are elevated from measurements at the start of the year. With a loss of sampling between March and November due to travel restrictions from the on-going pandemic we lack detail of how, and when specific conductance may have begun to climb to the elevated values we recorded in November (Figure 2).

Water Quality Standards

The state of Louisiana designates the waters of the preserve as “Primary and Secondary Contact Recreation and Fish and Wildlife Propagation.” Furthermore, the state has set dissolved oxygen (DO) standards to reflect the naturally seasonally-depressed DO of the Bayou Segnette Waterway and associated canals. Lower DO levels are permitted during warmer months while a higher standard is used during cooler months.

Below: Parameters and criteria.

Parameter	Criteria
Specific conductance	No state standard
Dissolved oxygen	> 2.3 mg/L March 1–November 30 > 5.0 mg/L December 1–Feb. 28
<i>E. coli</i>	< 298 MPN/100mL
pH	Between 6.0 and 8.5 Standard Units
Water temperature	32°C

About the Gulf Coast Network

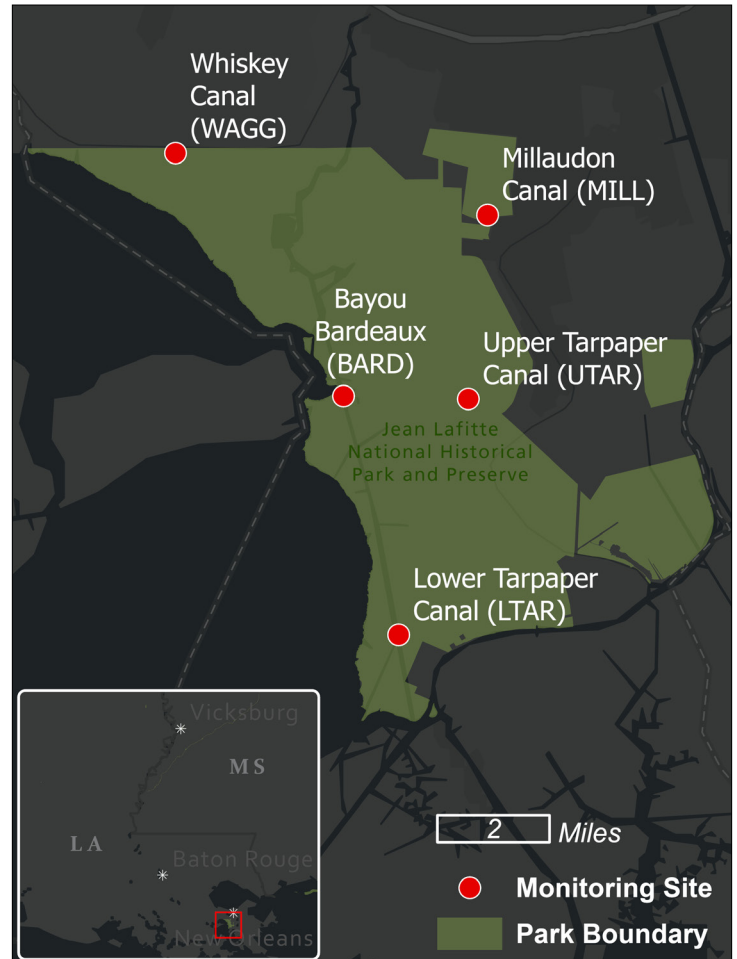
In 1999, the National Park Service initiated a long-term ecological monitoring program, known as “Vital Signs Monitoring,” to provide the minimum infrastructure to allow more than 270 national park system units to identify and implement long-term monitoring of their highest-priority measurements of resource 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 sampling will continue on an every-other-month schedule through 2021.



Map of Jean Lafitte Barataria Preserve water quality monitoring sites. The smaller map in lower left shows the full extent of the preserve, with a red inset box showing the expanded area at right.

- 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>