



## 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 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 (see map next page): 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. A fourth source of water in the preserve may originate from the Davis Pond Diversion that is to the west of the preserve. 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. Annual average precipitation at the preserve is approximately 160 centimeters (63 inches), but during tropical storms, daily totals can exceed 25 centimeters (9.8 inches). Tropical storms and seasonal southern winds may also push saline water from the Gulf of Mexico approximately 60 kilometers (15.5 miles) into the preserve.

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>).

### Significant Findings

#### Highlights of Calendar Year 2021 Monitoring

There were a few violations of Louisiana water quality standards and EPA drinking water standards in 2021. 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 end of the year for Millaudon Canal (Figure 1, all sites were sampled for nitrite for all sampling events however many

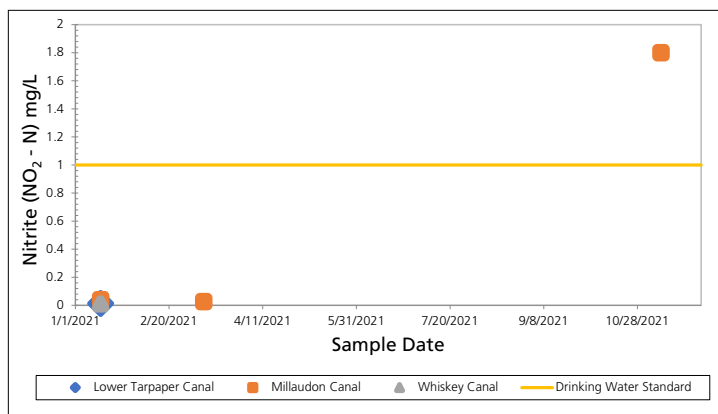


**Figure 1.** Nitrite measurements for all five sites for 2021. Horizontal orange line is the EPA nitrite-nitrogen ( $\text{NO}_2\text{-N}$ ) drinking standard as a visual reference but is not an actual water quality criteria designation for the park waters.

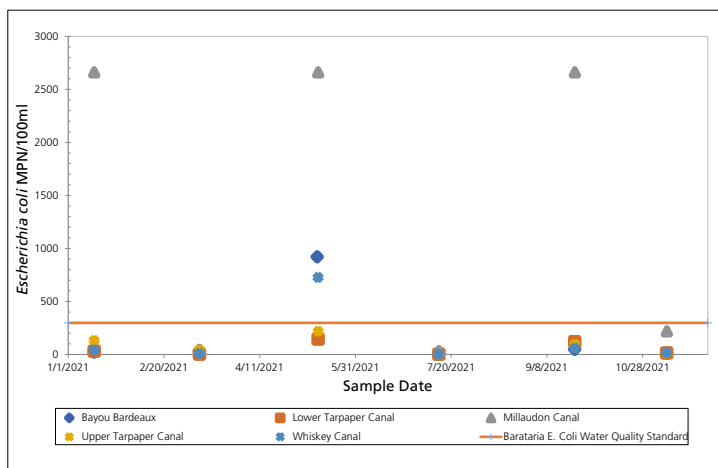


**Figure 2.** *Escherichia coli* measurements for 2021. There were multiple violations of state water quality standards for *E. coli* in 2021.

site samples came back below detection limits and are not represented in the figure). Nitrite values at this location seem to spike periodically throughout the year while many times it is at or near our certified laboratories detection limit (effectively unmeasurable). 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.

*E. coli* has a water quality standard set at a single event measurement of greater than 298 MPN/100 mL as determined by the state of Louisiana. There were multiple violations of this standard throughout the year ranging from February through October (Figure 2).

## Water Quality Standards

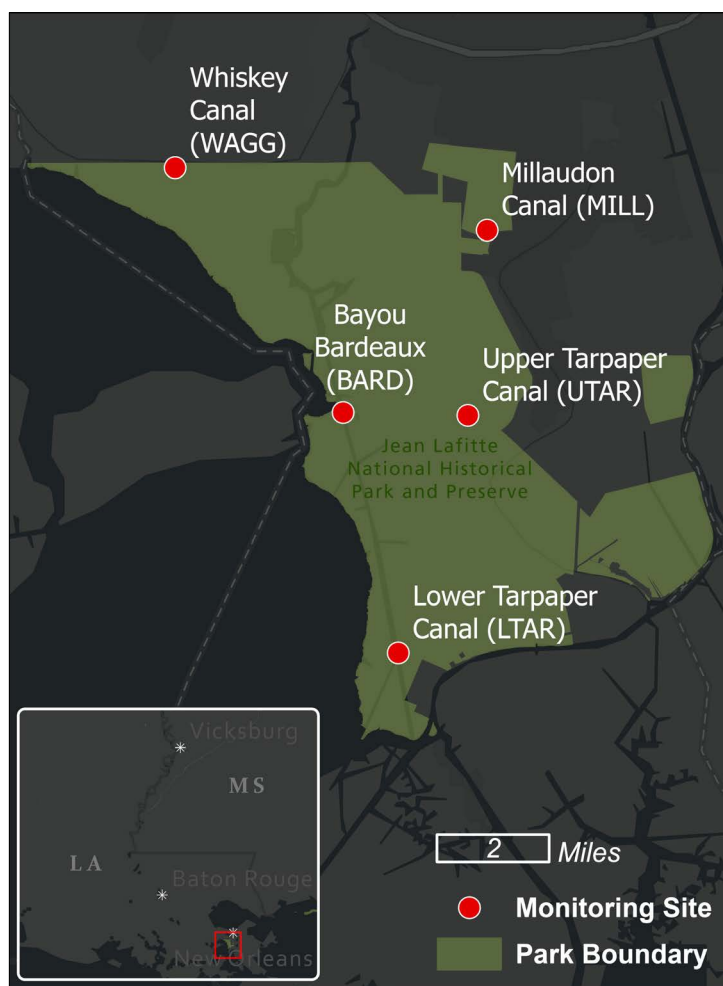
Louisiana designates the waters of the Preserve as “Primary and Secondary Contact Recreation and Fish and Wildlife Propagation.” Furthermore, the state has set dissolved oxygen (DO) standards to reflect the seasonally dependent DO of the Bayou Segnette Waterway and associated canals with lower DO standards permitted during the warmer months and higher standards used during the cooler months.

**Table 1.** Field variables and water quality standards.

| Field Variable                             | Water Quality Standard                                 |
|--------------------------------------------|--------------------------------------------------------|
| <i>Escherichia coli</i> ( <i>E. coli</i> ) | 298 MPN/100 mL                                         |
| Dissolved oxygen (DO)                      | > 2.3 mg/L Mar 1 - Nov 31<br>> 5.0 mg/L Dec 1 - Feb 28 |
| pH                                         | > 6.0, < 8.5 standard units                            |
| Specific conductance (SPC)                 | No standard                                            |
| Water temperature                          | 32°C                                                   |

### Future Monitoring

Water quality sampling will continue every other month through 2022.



Map of Jean Lafitte National Historical Park water quality monitoring sites.

## 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>