



## Water Quality Monitoring 2019 Data Summary

### Overview

The Gulf Coast Network (GULN) Water Quality Monitoring Program began collecting samples in September 2007. The program was developed primarily from protocols of the U. S. Geological Survey (USGS) National Water-Quality Assessment Program and the Texas Commission of Environmental Quality's (TCEQ) Surface Water Quality Monitoring Program. The GULN program monitors 54 sites across seven parks which are sampled on a set rotation.

The GULN Water-Quality Program was designed to provide an integrated assessment of the spatial and temporal distribution of general water-quality conditions and the transport of major inorganic constituents of stream and estuary water in relation to hydrologic conditions and major sources.

The network began monthly long-term water quality monitoring at Jean Lafitte National Historical Park and Preserve (JELA) in July 2008. Since October 2017, water quality is measured every other month at five permanent monitoring sites: Bayou Bardeaux, Whiskey Canal, Lower Tarpaper Canal, Upper Tarpaper Canal and Millaudon Canal (see map on next page). Field measures include water temperature, specific conductance (SpC), pH, dissolved oxygen (DO) and turbidity. Water samples are collected for determination of *Escherichia coli* (*E. coli*), nitrate, nitrite and phosphorous.

Sampling sites located in the preserve are all within the Barataria Preserve. 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. Annual average precipitation at the preserve is 160 centimeters (63 inches), but at times of 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 km (15.5 miles) to the south deep into the preserve.



Above: Whiskey Canal. NPS photo.

This brief summarizes data collected from January 1, 2019 through December 31, 2019. 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](#).

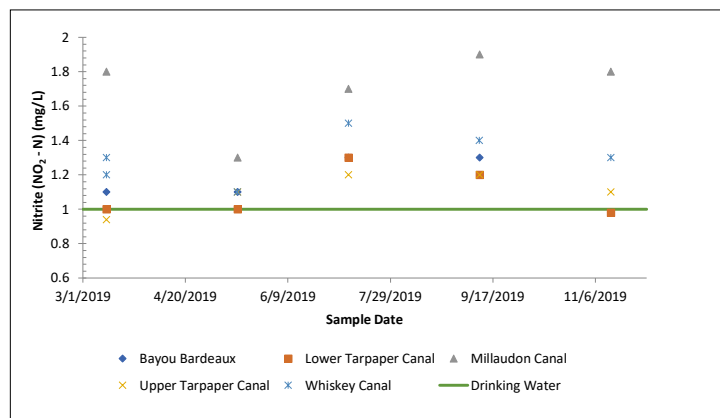


**Figure 1.** Nitrite measurements for all five sites for 2019 including QA/QC measurements. Horizontal green line is the EPA nitrite-nitrogen ( $\text{NO}_2\text{-N}$ ) drinking standard as a reference.

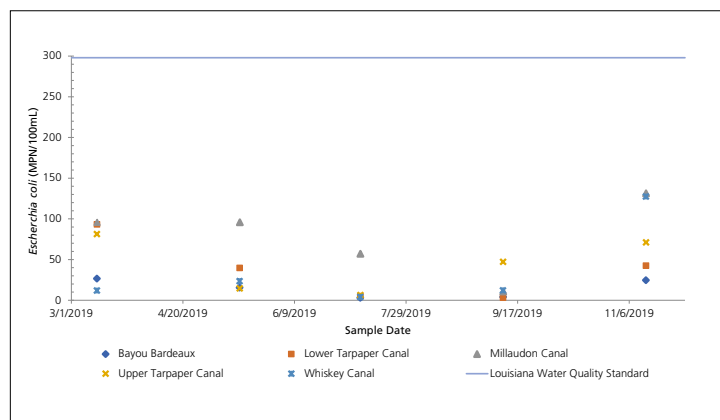


**Figure 2.** *E. coli* measurements for 2019. Overall *E. coli* levels appear lower than previous years, and at no point did they exceed the state's water quality criteria.

### Significant Findings

For calendar year 2019, there were multiple violations of Louisiana water quality standards and EPA drinking water standards. Two sampling sites violated the seasonally-dependent dissolved oxygen standard (once for Lower Tarpaper Canal, and three times for Upper Tarpaper Canal) totaling four violations. Low dissolved oxygen is more likely to naturally occur in the interior canals of the preserve where there is limited aeration and flow communication to adjacent open water bodies, especially in the hot summer months. All sites violated EPA drinking water standards for nitrite, and while this park is not

## Significant Findings (continued)

classified under drinking water but as primary/secondary recreation, nitrite values are notably elevated compared to prior years. Previously, the park experienced brief spikes of nitrite increases but 2019 was in exceedance of 1.0 mg/L NO<sub>2</sub>-N at almost every site for the entire year (Figure 1). Nitrite most commonly occurs as a result of sewage (including municipal and industrial wastewater, as well as 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. Nitrite levels should be carefully monitored moving forward in case they do not return to previous levels.

Lastly, unlike previous years, *E. coli* was never in exceedance of Louisiana state criteria, which is set at a single event measurement of > 298 MPN/100 mL of water. This was the first year since at least 2016 where *E. coli* was not found to be in exceedance of the Louisiana water standard at any point during the sampling year (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<br>> 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

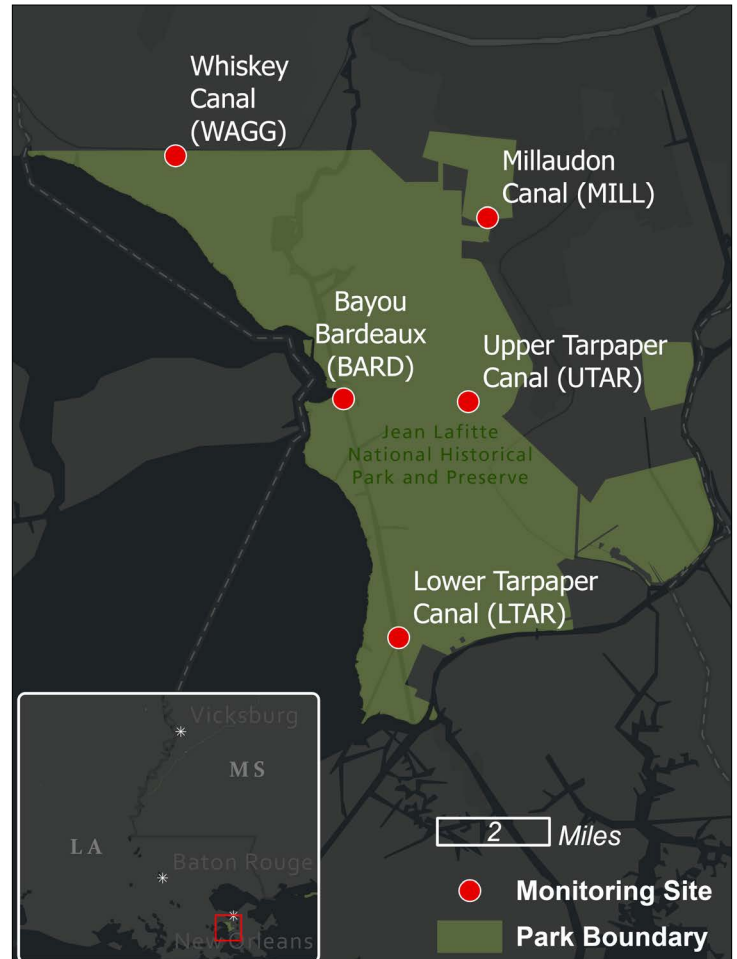
In 1999, the National Park Service initiated a long-term ecological monitoring program, known as “Vital Signs Monitoring,” to provide the minimum infrastructure to allow more than 270 national park system units to identify and implement long-term monitoring of their highest-priority measurements of resource 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 2020.



Map of Jean Lafitte Barataria Preserve water-quality monitoring sites. The smaller map in lower left shows the preserve's location within Louisiana, with a red inset box showing the expanded area.

- 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>