



Water Quality Summary, 2016

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 United States Geological Survey (USGS) National Water Quality Assessment and the Texas Commission of Environmental Quality's Surface Water Quality Monitoring Program. The program monitors 54 sites across seven parks which are sampled on 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 long-term monitoring of water quality at Jean Lafitte National Historical Park and Preserve in July 2008. Water quality is measured every month at five sites: Bayou Bardeaux and Whiskey, Pipeline, Tarpaper (Figure 1) and Millaudon Canals. Field measures include water temperature, specific conductance (SpC), pH, dissolved oxygen (DO) and turbidity. Samples are collected for *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. 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 also push saline water from the Gulf of Mexico some 60 kilometers (15.5 miles) to the south deep into the preserve.



Figure 1. Tarpaper Canal, May 24, 2017. Image by Whitney Granger.

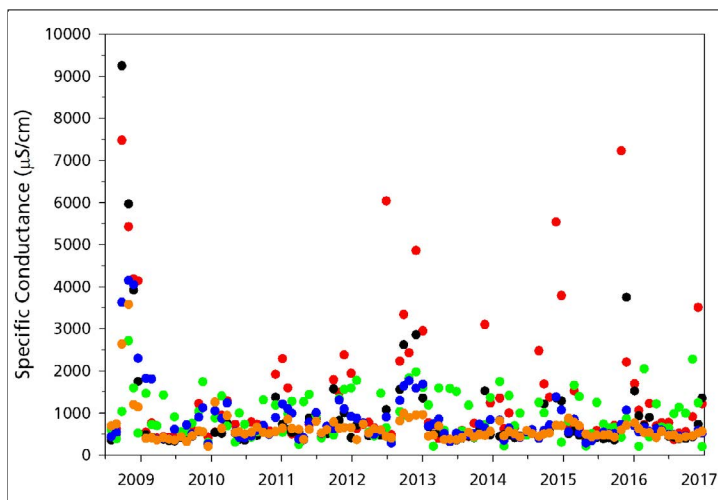


Figure 2. Specific Conductance (SpC) at Jean Lafitte Barataria Preserve 2008–2016. The elevated SpC during the autumn of 2008 was the result of hurricane Gustav.

This brief highlights data collected from January 1, 2016 through December 31, 2016. Water quality data are available upon request to the Gulf Coast Network or our website: <http://science.nature.nps.gov/im/units/guln/index.cfm>

Significant Findings

Highlights of Calendar Year 2016 Monitoring

There were 25 violations of Louisiana water quality standards. With exception of Bayou Bardeaux, there were nine violations of seasonally-dependent dissolved oxygen standards. Low dissolved oxygen is more likely to occur in the interior canals of the Preserve where there is limited aeration and flow communication to adjacent water bodies, especially in the hot summer months. All sites had at least one violation of the *E. coli* limit. As seen in the past, Millaudon Canal, which receives pump water from the adjacent communities, had the most exceedances with six.

Elevated Specific Conductance Associated with South Winds

Specific conductance is a measure of water's ability to conduct electrical current. Distilled water is not conductive as it has no dissolved material. Conversely, seawater readily conducts electricity due to the abundance of dissolved ions. As mentioned above, saline water from the lower Barataria can be pushed into the canals of the preserve, not just from tropical storms but from strong southerly winds (Figure 2). Our monitoring program began in July 2008, two months before hurricane Gustav. The effects of Gustav on SpC could easily be seen in late 2008. Each winter and early spring, an increase in SpC from southerly winds is also documented. The most affected site is the southern-most monitoring station at the lower end of Pipeline Canal, which is removed from the open waters of the Barataria is Millaudon Canal. SpC is elevated at this site when pumps are activated and urban runoff is pumped into the preserve.

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 the warmer months while a higher standard is used during the cooler months.

Parameter	Criteria
Specific conductance	No standard
Dissolved Oxygen	> 2.3 mg/L March 1–November 30 > 5.0 mg/L December 1–Feb. 28
<i>Escherichia coli</i>	298 MPN/100mL
pH	Between 6.0 and 8.5 standard units
Water Temperature	< 32.2°C

Future Monitoring

Water quality sampling will continue on a monthly schedule throughout 2017.

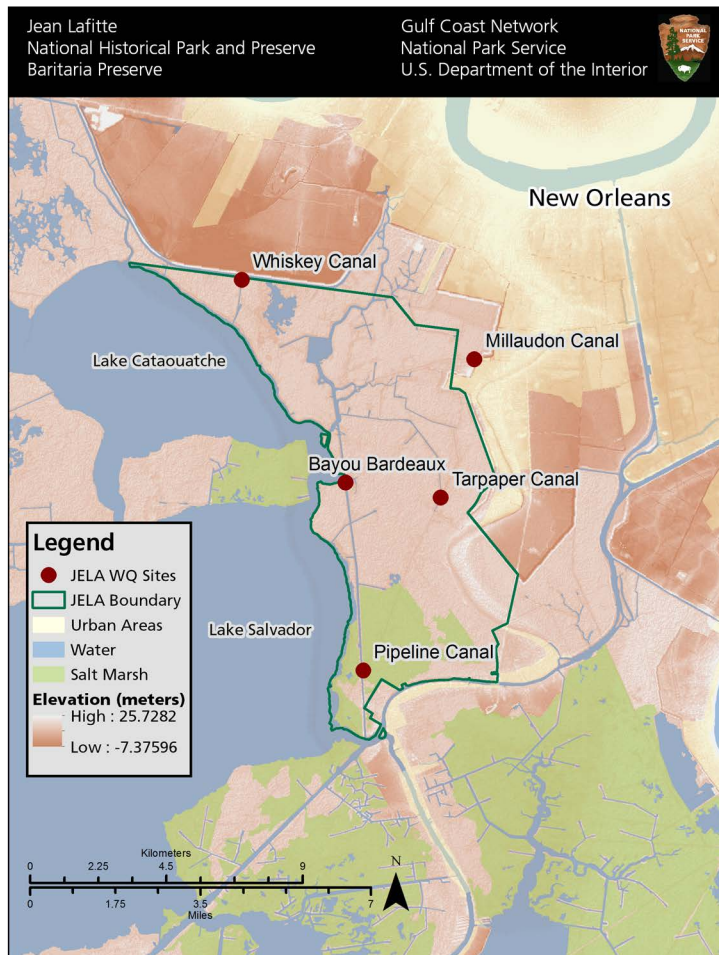


Figure 3. Map of Jean Lafitte Barataria Preserve water-quality monitoring sites.

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 ecosystem,
- 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 towards performance goals.

Effective long-term management and stewardship of natural resources in the Gulf Coast Network begins with baseline knowledge of these resources. To acquire this knowledge, an inventory program was established by the National Park Service with the goals of acquiring baseline information for a variety of resources, from bibliographic information to species occurrence and distribution.

For More Information

GULN Home Page:

<http://science.nature.nps.gov/im/units/guln/index.cfm>

GULN Reports & Publications:

<http://science.nature.nps.gov/im/units/guln/publications.cfm>

About the NPS Inventory & Monitoring Program:

<http://science.nature.nps.gov/im/index.cfm>

Data Downloads via the Natural Resource Information Portal:

<http://irma.nps.gov>