



Water Quality Monitoring Program Summary

Network Parks Where Monitoring Occurs

Jean Lafitte National Historical Park and Preserve (JELA), Gulf Islands National Seashore (GUIS), Natchez Trace Parkway (NATR), San Antonio Missions National Historical Park (SAAN), Padre Island National Seashore (PAIS), Vicksburg National Military Park (VICK) and Big Thicket National Preserve (BITH).

Importance

All parks in the Gulf Coast Network include waterbodies that shape park character and sustain biotic life, and as such, water quality monitoring is a top priority for park managers. Of the eight Gulf Coast Network parks, three are coastal, with large areas of marsh, estuary, or marine waters. Four of the network's parks are inland with multiple prominent freshwater streams, rivers or bayous. Only one Gulf Coast Network park, Palo Alto Battlefield National Historical Park, lacks a permanent waterbody for long term monitoring, although it was once connected to the Rio Grande. In response to the monitoring needs of the seven parks, the Gulf Coast network developed a program and now monitors water quality in 56 sites, which are sampled on a set rotation.

Monitoring Objectives

The network's approach to water quality monitoring is to form a comparative database of a wide variety of water-quality parameters over time, using sites that provide maximum value to park managers. The program's primary objective is to detect changes over time using five standard field measurements –pH, specific conductance, dissolved oxygen, water temperature and turbidity – at all seven parks, plus *Escherichia coli* counts, chlorophyll *a* and nutrients at selected parks. These data are used in annual reports that document the condition of monitored park waters, whether water resources are meeting designated water-quality requirements and whether any major changes have been observed.



One of two continuous water quality stations at Padre Island National Seashore



The Little Swan Creek runs through the Meriwether Lewis Area of the Natchez Trace Parkway in Tennessee, and it is one of the sites monitored for water quality by the Gulf Coast Network.

Basic Approach

The Gulf Coast Network's water quality monitoring program is based on the National Water-Quality Assessment Program of the USGS and Texas' Surface Water Quality Monitoring Program.

Parks are sampled either monthly, in alternate months or quarterly, using on-site data collection of the five standard measurements and hand-grab samples. The grab samples are used for *Escherichia coli* (*E. coli*) counts and/or laboratory analysis of key ions and nutrients, such as nitrate, nitrite and phosphorous. At the two National Seashores, additional monitoring is done, including chlorophyll *a* measurement from grab samples and continuous autonomous sampling using data sondes, which record the five standard measurements every 15 minutes.



Tools for measuring water quality from a bridge where stream-side access is limited.

Park-Specific Approaches (Start Year)

BITH (2007): Water quality data are collected by network staff at six sites, once every other month, using the standard field measurements and lab analyses.

SAAN (2008): Water quality data are collected in four sites, once every other month, using the standard field measurements and lab analyses. Work is contracted to the San Antonio River Authority.

GUIS (2011): Water quality data are collected with monthly grabs and continuous autonomous sampling. In park waters in Florida, there are two permanent sites. In the Mississippi Sound, the USGS operates a continuous sonde. Work is completed through cooperative agreements.

JELA (2008): Water quality data are collected by network staff in five sites, once every other month, using the standard field measurements and lab analyses.

NATR (2010): Water quality data are collected on a quarterly basis in 33 core sites, using the standard field measures and analyses of E. coli and nitrate only.

PAIS (2008 and 2011): Water quality data are collected in two sites using autonomous sondes and grab samples every other month, completed through a task agreement.

VICK (2007): Water quality data are collected in three sites by network staff or park staff on a quarterly basis, using the standard field measurements only.



Above: A field crew member pulls a continuous data sonde from the water for maintenance.

Left: A water quality monitoring site on Village Creek, which is a waterbody that feeds into the Neches River of Big Thicket National Preserve.

About the Gulf Coast Network

In 1999, the National Park Service initiated a long-term ecological monitoring program, known as Vital Signs Monitoring, which is now active in more than 270 national park system units. This program works with and within parks to identify and implement long-term monitoring on a selected subset of park flora, fauna, and other key natural resources. The overarching purpose of the NPS natural resource monitoring program 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:

1. Determine the status and trends in selected indicators of the condition of park ecosystems,
2. Provide early warning of abnormal conditions,
3. Provide data to better understand the dynamic nature and condition of park ecosystems,

4. Provide data to meet certain legal and congressional mandates, and
5. Provide a means of measuring progress towards performance goals.

Effective long-term management and stewardship of natural resources begins with baseline knowledge of these resources and a scientifically-rigorous understanding of how they change over time. In collaboration with park staff and other stakeholders, the Gulf Coast Network strives to meet this need for the eight parks in its region. The network's geographic region encompasses portions of Florida, Alabama, and Tennessee, all of Mississippi and Louisiana, and the southeastern quarter of Texas.

For more information

Gulf Coast Network Home Page:
<https://www.nps.gov/im/guln/index.htm>

About the NPS Inventory & Monitoring Division:
<https://www.nps.gov/im/index.htm>