

Congaree National Park

National Park Service
U.S. Department of the Interior

Inventory & Monitoring Program
Southeast Coast Network



Fixed-Station Water-Quality Monitoring Data Summary, 2012

Vital Sign Overview

In 2006 Congaree National Park (CONG), in conjunction with Southeast Coast Network (SECN) Inventory and Monitoring Program, began collecting water-quality data at Cedar Creek as part of the NPS Vital Signs monitoring program. The continuous monitoring station is located on the bridge over Cedar Creek and collects data at 30-minute intervals. The station collects pH, dissolved oxygen, water temperature, specific conductance, turbidity and water-level data. Methods used are adapted from the water-quality monitoring program established by the National Estuarine Research Reserve Program. The CONG fixed-station water-quality monitoring site is part of the SECN water-quality monitoring program, which collects data in the vicinity of seven coastal parks located along the southeastern U.S. coast. Information collected by this monitoring program will be used to help managers make better-informed decisions by understanding trends and variability related to water-quality conditions in park waters.

Significant Findings

Specific conductance values ranged from 19 to 43 $\mu\text{S}/\text{cm}$. There were no major spikes in specific conductance during 2012. This may be due to the drier than average spring flow conditions, when floods and bank full conditions are common.

The South Carolina standard for maximum turbidity values in freshwater is 50 NTUs provided existing uses are maintained. Turbidity values were generally below 10 NTUs in Cedar Creek throughout much of the year (83% of readings). Mean daily turbidity values above 50 NTUs were observed three times during 2012, occurring potentially during, and after, summer rainfall events. The lowest monthly average for turbidity occurred in November (1.7 NTUs) during an extended period of stable low-flow conditions. The highest monthly average for turbidity was 24.5 NTUs in August, with high variability throughout the month.

Dissolved oxygen concentrations ranged from a low of 4.8 mg/L in July to a high of 11.8 mg/L in February. No daily average concentrations were lower than the South Carolina freshwater standard for daily averages of 5.0 mg/L during 2012 (Figure 1).

South Carolina does not set a daily or monthly average for pH, but has established an acceptable range of 6.0 to 8.5. During 2012, values for pH ranged between 5.47 and 6.14, with approximately 99% of measurements below the 6.0 standard. The monthly averages for pH ranged from 5.8 to 5.9 throughout the year. Daily averages for pH were below 6.0 for the entire year (Figure 2).

Water temperature ranged 5.7–30.4°C (42.2–86.7°F). The lowest monthly average water temperature of 10.9°C (51.6°F) occurred in January, and the highest monthly average of 27.7°C (81.9°F) occurred in July.

Status of Conditions

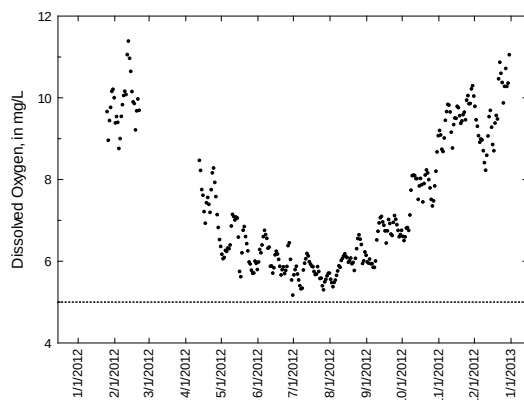


Figure 1. Mean daily Dissolved Oxygen (DO) values at CONG during 2012. Dashed line is the South Carolina state limit for DO in freshwater.

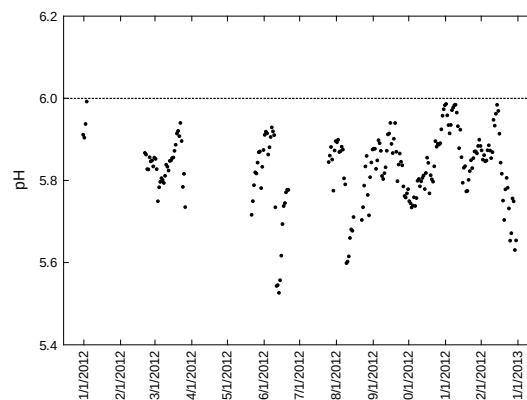


Figure 2. Mean Daily pH values at CONG during 2012. Dashed line is the South Carolina state standard for pH in freshwater.

Sampling Area

Congaree National Park supports diverse aquatic communities and provides recreational opportunities (mainly canoeing and fishing) for Park visitors. In 2006 waters of Cedar Creek within Congaree National Park were reclassified from a general “freshwater” classification to an Outstanding Resource Waters (ORW), and a portion of Cedar Creek was upgraded to Outstanding National Resource Waters (ONRW), the first such designation of its kind in South Carolina. Cedar Creek outside of the Park boundary is classified as freshwater, from the Park boundary to Wise Lake is classified as ORW (this is the section that the water-quality station is on), and from Wise Lake to the confluence of the Congaree River is classified as ONRW.

Portions of three water bodies (Congaree River, Tom’s Creek and Cedar Creek) adjacent to Congaree National Park are 303(d) listed as impaired or threatened for a variety of reasons (Figure 3).

Cedar Creek is a “black water” system characterized by clear, tea-colored water associated with organic acids leached by groundwater percolating through the soil profile. This translates into relatively high dissolved organic carbon values and relatively low values for dissolved oxygen, conductivity, and pH.

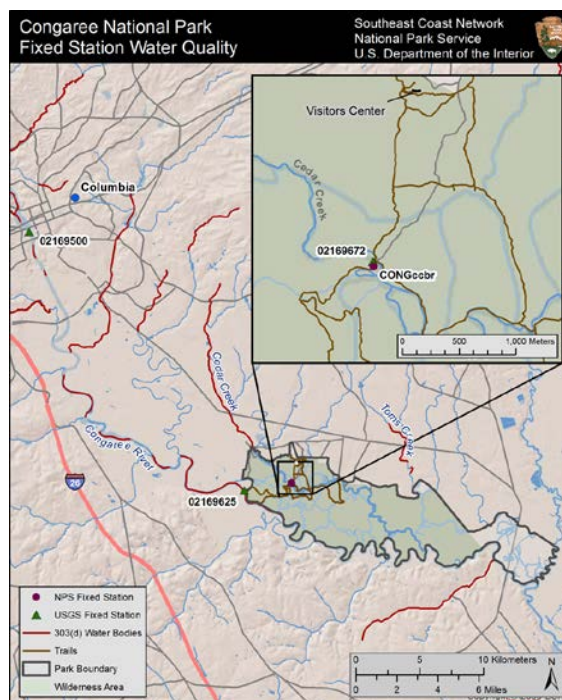


Figure 3. Location of continuous water-quality monitoring station at Congaree National Park.

About the Southeast Coast Network

The Southeast Coast Network (SECN) includes 20 parks, 17 of which contain significant and diverse natural resources. In total, SECN parks encompass more than 184,000 acres of federally-managed land across North Carolina, South Carolina, Georgia, Alabama, and Florida. The parks span a wide diversity of cultural missions also, including four national seashores, two national historic sites,

two national memorials, seven national monuments, two national military parks, as well as a national recreation area, national battlefield and an ecological and historic preserve. The parks range in size from slightly more than 20 to nearly 60,000 acres, and when considered with non-federal lands jointly managed with NPS, the Network encompasses more than 253,000 acres.

About the Inventory & Monitoring Program

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 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.

For More Information

SECN Home Page: <http://science.nature.nps.gov/im/units/secn/index.cfm>

SECN Reports & Publications: <http://science.nature.nps.gov/im/units/secn/publications.cfm>

Inventory & Monitoring Program: <http://science.nature.nps.gov/im/index.cfm>

Data Downloads via the Natural Resource Information Portal: <http://nrinfo.nps.gov/Home.mvc>

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