

Groundwater Conditions in Southeast Coast Network Parks

National Park Service
U.S. Department of the Interior

Inventory & Monitoring Program
Southeast Coast Network



Summary of Conditions, 2011

Vital Sign Overview

All Southeast Coast Network (SECN) parks and ecosystems are linked to aquifers that constitute the groundwater system. These aquifers are affected by modifications to surface waters (e.g., impoundments), long-term precipitation patterns, and extraction. Because aquifers serve as a water supply for industrial, commercial, residential, and agricultural needs, anthropogenic demands on this freshwater resource are high. Aggregate influences of changes in groundwater can influence hydrologic processes, wetland function, freshwater availability for fish and wildlife, plant-community species distribution, composition, diversity, and structure, and potentially affect the integrity of park ecosystems. This report summarizes trends in groundwater data collected in or near all SECN parks through 2011 following the SECN groundwater monitoring protocol.

Summary of Findings

Trend analyses of 32 groundwater wells identified as relevant to SECN parks were conducted for this report (Figure 1, Table 1).

34% of wells showed an increase in groundwater quantity over the period of record for the well.

50% of wells showed a decrease in groundwater quantity over the period of record for the well.

15% of wells showed no discernible change in groundwater quantity over the period of record for the well.

Well trends at Fort Frederica National Monument and Congaree National Park have changed from a positive or no trend to a negative trend since 2010 (Table 1).

Forty wells relevant to SECN parks are not included in this report since no data have been collected since 2010.

Trends in Groundwater Wells at or Near SECN Parks

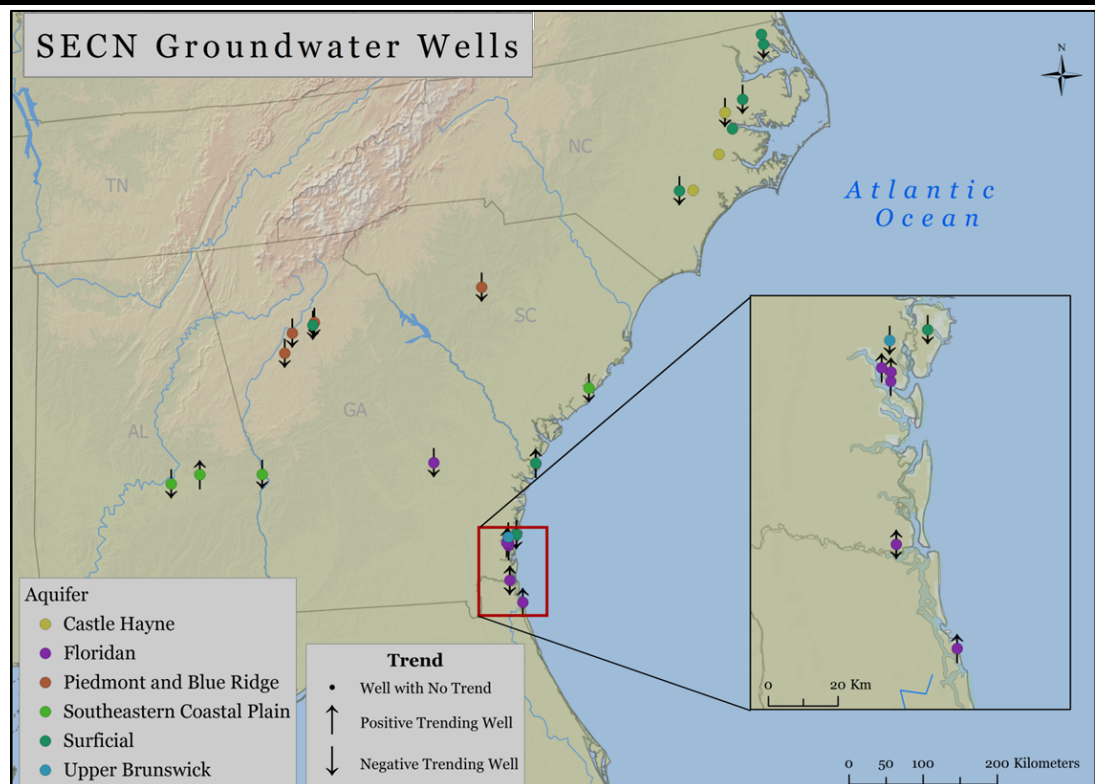


Figure 1. Trends for wells analyzed within the SECN monitoring well network. Arrows indicate direction of trend and colors indicate the aquifer in which each well is located. Points without arrows denote wells where no trend was observed.

Status of Conditions

Table 1. Groundwater trends presented by park and aquifer. Direction and confidence in trend denoted by thickness of line encircling the arrow. Dashed line indicates lower confidence, thick line indicates higher confidence.

Park(s)	Aquifer Description	Trend ¹	Explanation of Trend
Coastal Parks			
Fort Raleigh National Historic Site, Wright Brothers National Memorial, Cape Hatteras National Seashore	Surficial		Daily measurements collected >10 years indicate gradual decline in water level.
	Castle Hayne Limestone		Gradual decline since 2003, although measurements only taken annually.
Cape Lookout National Seashore	Surficial		Daily measurements collected since 1986 indicate gradual decline in water level.
	Castle Hayne Limestone		Gradual decline since 2003, although measurements only taken annually.
Fort Sumter National Monument and Charles Pinckney National Historic Site	Southeastern Coastal Plain		Daily measurements collected since 1990 indicate overall decline in water level although levels appear to be increasing since 2005.
Fort Frederica National Monument	Surficial		Daily measurements indicate slight decrease since 2007. This trend has changed from positive to negative since 2010.
	Upper Brunswick		Daily measurements since 1998 indicate decrease in water level.
	Upper Floridan		Daily measurements indicate slight increase since 2007.
Fort Pulaski National Monument	Surficial		Daily measurements since 1998 have no significant trends.
	Southeastern Coastal Plain		Daily measurements since 1987 indicate gradual increase in water level.
	Upper Floridan		Daily measurements collected since 1974 indicate gradual decline in water level.
Cumberland Island National Seashore	Surficial		Daily measurements since 1998 indicate increase in water level.
	Upper Brunswick		Daily measurements since 1998 indicate increase in water level.
	Lower Floridan		Multiple wells with different periods of record indicate both increasing and decreasing trends.
Fort Caroline National Memorial and Timucuan Ecological and Historic Preserve	Floridan		One well indicates long-term increasing trend (>10 years), but fewer than 12 measurements per year taken.
Inland Parks			
Chattahoochee River National Recreation Area	Surficial		Gradual decline since 2003. Measurements taken on a weekly basis.
	Piedmont & Blue Ridge		Daily measurements collected since 1980 indicate gradual decline in water level.
Congaree National Park	Piedmont & Blue Ridge		Significant negative trend; previous analysis through 2010 indicated no significant trend.
Kennesaw Mountain National Battlefield Park	Piedmont & Blue Ridge		Daily measurements collected >30 years at two wells indicate decline in water level.
Horseshoe Bend National Military Park	Southeastern Coastal Plain		Water levels have been increasing since 2006, but overall decline since records began in 1952.
Moore's Creek National Battlefield	Castle Hayne		No significant trend found and few observations over period of record.
	Surficial		Significant negative trend although data only collected every 4–8 weeks and no data collected since August 2011
Ocmulgee National Monument	Southeastern Coastal Plain		Significant downward trend documented since 1952. Water level has decreased approximately 50 feet since 1960.

About the Southeast Coast Network

The Southeast Coast Network (SECN) includes twenty parks, seventeen 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.

For More Information

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