



Inventory & Monitoring Reports, 2000-2013

Southeast Coast Network Overview

The Southeast Coast Network (SECN) is one of 32 National Park Service Networks (NPS) established to implement an integrated monitoring program under the Natural Resource Challenge. In 2001, the SECN began planning and implementing its long-term Vital Signs Monitoring Program, and completed its long-term monitoring plan in 2008 (DeVivo et al., 2008). Beginning in FY2010, with the new Administration's focus on climate change science, the SECN began planning for enhancing its original program as a part of the Department of the Interior (DOI) and NPS strategy to improve the ability of resource managers to include climate change science in planning and management.

The SECN contains 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 range in size from slightly more than 20 to nearly 60,000 acres, and when considered with non-federal lands jointly managed with SECN parks the Network encompasses more than 253,000 acres.

The following is a catalog of current science products developed by the Inventory and Monitoring Program for Cumberland Island National Seashore (CUIS; Figure 1).

About the Park

Cumberland Island National Seashore, a 17.5 mile long sandy barrier island, is one of the larger and more diverse islands on the Atlantic Coast. It totals 36,415 acres, of which 16,850 are estuarine. A *Spartina* grass dominated salt-marsh, oyster mud flats, and six tidal creeks provide habitat for a diverse marine-based fauna. The remaining acreage is terrestrial. A live oak-palmetto dominated forest backs an extensive dune system, and as the elevation of the island rises on the northwest, it transitions to a mixed pine-deciduous forest. The island is known for nesting loggerhead sea turtles, abundant shorebirds, undeveloped dune fields, maritime forest ecosystems, and historic structures on the National Register of Historic Places. Cumberland Island and its surrounding waters provide habitat for at least 13 federally listed threatened or endangered species.

Many of the resource issues at CUIS stem from either external development or past human uses of the island. The southeast Georgia coast is experiencing profound growth in new, residential communities, many of which incorporate marinas. Recreational pressure will in turn increase on the island, much of it uncontrolled, and the threat to resources and critical habitat will intensify. Additionally, the dredging and maintenance of the adjacent Intracoastal Waterway and St. Marys Inlet complicate the natural processes of sand budgets and tidal flow, which are key components in the island's stability and ecology. Boat wakes are likely contributing to erosion on the back-barrier (west) side of the island. The nearby urban centers of



Figure 1. Location of Cumberland Island National Seashore, GA.

St. Marys, Fernandina Beach, Brunswick, and Jacksonville may also contribute to a range of island issues, from air and water quality to light pollution. Regional industries, such as commercial fishing and paper mills, also have an impact on Cumberland Island's resources and Kings Bay Naval Submarine Base is located immediately across the Cumberland Sound from the park.

Program Overview and Planning Documents

DeVivo, J. C., C. J. Wright, M. W. Byrne, E. DiDonato, and T. Curtis. 2008. [Vital signs monitoring in the Southeast Coast Inventory & Monitoring Network](#). Natural Resource Report NPS/SECN/NRR—2008/061. National Park Service, Fort Collins, Colorado. ([Appendices](#)).

DeVivo, J. C., T. Curtis, M. W. Byrne, M. B. Gregory, and C. J. Wright. 2011. [Southeast Coast Network Climate Science Strategy](#). Natural Resource Report NPS/SECN/NRR—2011/436. National Park Service, Fort Collins, Colorado.

Wright, C. J., J. C. DeVivo, and K. Funk. 2008. [Information management and archiving plan, Southeast Coast Inventory and Monitoring Network](#). Natural Resource Report NPS/SECN/NRR—2008/062. National Park Service, Fort Collins, Colorado. ([Appendices](#)).

Inventory & Monitoring Protocols

Monitoring protocols are detailed study plans that explain how data are to be collected, managed, analyzed, and reported. They are a key component of quality assurance for natural resource monitoring programs and are necessary to ensure that changes detected by monitoring efforts are not the result of measurements taken by different people or in slightly different ways over time. The SECN is developing several protocols and associated standard operating procedures, the following of which have been published.

Byrne, M. W., J. C. DeVivo, B. D. Smrekar, L. M. Elston, C. J. Wright, and E. Thompson. 2013. [Protocol for monitoring vocal anuran communities in Southeast Coast Network parks](#). Natural Resource Report NPS/SECN/NRR—2013/720. National Park Service, Fort Collins, Colorado.

Gregory, M. Brian, J. C. DeVivo, E. M. DiDonato, C. J. Wright, and E. Thompson. 2013. [Protocol for monitoring estuarine water and sediment quality in selected Southeast Coast Network parks](#). Natural Resource Report NPS/SECN/NRR—2013/644. National Park Service, Fort Collins Colorado.

National Park Service. 2004. [Ozone monitoring protocol for the National Park Service](#). Report No. NPS D-1654. National Park Service, Air Resources Division, Lakewood, Colorado.

Rasmussen, T. C., J. F. Dowd, R. J. McKinnon, B. M. Price, and R. D. Sherrell. 2009. [Southeast Coast Network groundwater monitoring: Protocol development and analysis of existing data](#). Natural Resource Report NPS/SECN/NRR—2009/126. National Park Service, Fort Collins, Colorado.

Monitoring Data Reports

Data reports are concise reports that summarize the most recent year's data collection efforts as well as highlight any issues of potential concern. All data reports contain a bulleted list of significant findings as part of the executive summary section and are generally published in conjunction with a two-page resource brief containing an abbreviated subset of significant findings along with some limited project information including broader programmatic overview of the sampling effort. Data reports are produced for all active monitoring efforts undertaken by the I&M program at the network and national levels.

Air Quality

Sullivan, T. J., G. T. McPherson, T. C. McDonnell, S. D. Mackey, and D. Moore. 2011a. [Evaluation of the sensitivity of inventory and monitoring national parks to acidification effects from atmospheric sulfur and nitrogen deposition: Southeast Coast Network \(SECN\)](#). Natural Resource Report NPS/NRPC/ARD/NRR—2011/375. National Park Service, Denver, Colorado.

Sullivan, T. J., T. C. McDonnell, G. T. McPherson, S. D. Mackey, and D. Moore. 2011b. [Evaluation of the sensitivity of inventory and monitoring national parks to nutrient enrichment effects from atmospheric nitrogen deposition: Southeast Coast Network \(SECN\)](#). Natural Resource Report NPS/NRPC/ARD/NRR—2011/329. National Park Service, Denver, Colorado.

Weather and Climate

Wright C. J. 2012. [Summary of weather and climate monitoring in Southeast Coast Network parks, 2011](#). Natural Resource Data Series. NPS/SECN/NRDS—2012/365. National Park Service, Fort Collins, Colorado.

Wright C. J. 2013. [Summary of weather and climate monitoring in Southeast Coast Network parks, 2012](#). Natural Resource Data Series. NPS/SECN/NRDS—2013/477.

Wright, C. J., E. Thompson, B. A. Blankley, M. W. Byrne, T. Curtis, and M. B. Gregory. 2011. [Summary of weather and climate monitoring in Southeast Coast Network parks, 2010](#). Natural Resource Data Series NPS/SECN/NRDS—2011/309. National Park Service, Fort Collins, Colorado.

Fixed-Station Water Quality

Gregory, M. Brian, J. Dingle, C. Wright, and E. Thompson. 2011. [Fixed station water quality monitoring at Cumberland Island National Seashore: 2010 data summary](#). Natural Resource Data Series NPS/2011/NRDS—2011/197. National Park Service, Fort Collins, Colorado.

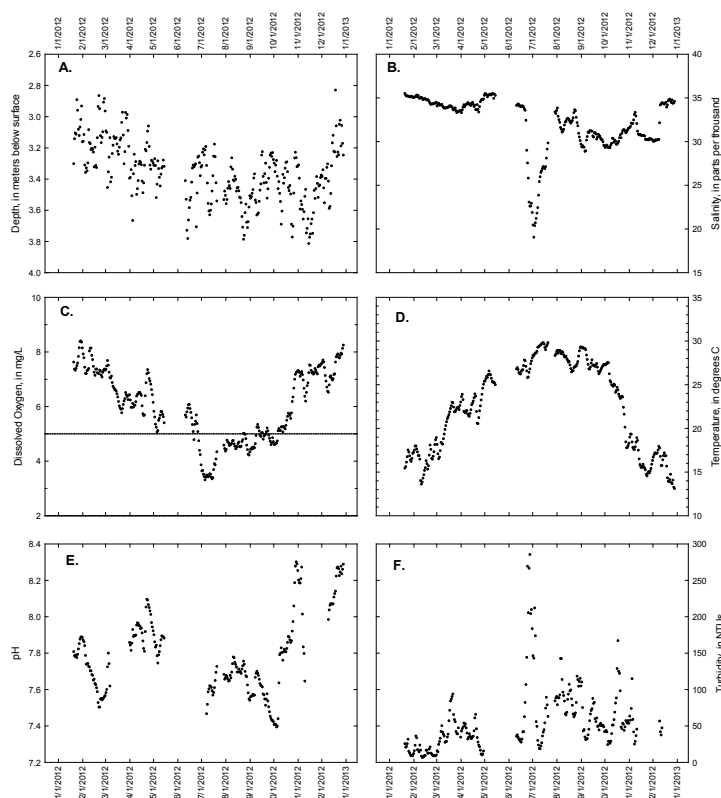


Figure 2. Mean daily water quality parameters at Sea Camp Dock in Cumberland Island National Seashore (CUI) during 2012: (A) relative depth/tidal range, (B) salinity, (C) dissolved oxygen (DO), (D) temperature, (E) pH, and (F) turbidity (NTU). Breaks in data record indicate missing and/or flagged data.



Figure 3. Juvenile little blue heron (*Egretta caerulea*) was a priority species detected at Cumberland Island National Seashore (CUIS) in 2010. Photo by Katherine Whittemore.

Rinehart, A., M. B. Gregory, and W. Wright. 2013. [Fixed-station water-quality monitoring at Cumberland Island National Seashore: 2012 data summary](#). Natural Resource Data Series. NPS/2013/NRDS—2013/491. National Park Service. Fort Collins, Colorado. Published Report-219521.

Wright, W., M. B. Gregory, and A. Rinehart. 2012. [Fixed-station water-quality monitoring at Cumberland Island National Seashore: 2011 data summary](#). Natural Resource Data Series NPS/SECN/NRDS—2012/390. National Park Service, Fort Collins, Colorado.

Coastal Water and Sediment Quality Assessment

Gregory, M. B., J. C. DeVivo, P. H. Flournoy, and K. A. Smith. 2010. [Assessment of estuarine water quality at Cumberland Island National Seashore, 2007](#). Natural Resource Data Series NPS/SECN/NRDS—2010/121. National Park Service, Fort Collins, Colorado.

Rinehart, A. P., M. B. Gregory, and W. Wright. 2013. [Fixed-station water-quality monitoring at Cumberland Island National Seashore: 2012 data summary](#). Natural Resource Data Series. NPS/2013/NRDS—2013/491. National Park Service, Fort Collins, Colorado.

Groundwater Dynamics

Wright, C. J., and M. W. Byrne. In Review. [Groundwater Conditions in Southeast Coast Network Parks, 2010](#). Natural Resource Data Series NPS/SECN/NRDS—2012/275. National Park Service, Fort Collins, Colorado.

Wright, C. 2012. [Groundwater Conditions in Southeast Coast Network Parks, 2011](#). Natural Resource Data Series. NPS/SECN/NRDS—2012/326. National Park Service, Fort Collins, Colorado.

Land Birds

Byrne, M. W., J. C. DeVivo, and B. A. Blankley. 2011. [Landbird](#)

[community monitoring at Cumberland Island National Seashore, 2010](#). Natural Resource Data Series NPS/SECN/NRDS—2011/295. National Park Service, Fort Collins, Colorado.

Amphibians

Byrne, M. W., and M. N. Moore. 2011. [Incidence of chytrid fungus, *Batrachochytrium dendrobatidis*, in Southeast Coast Network parks](#). Natural Resource Technical Report NPS/SECN/NRTR—2011/477. National Park Service, Fort Collins, Colorado.

Byrne, M. W., L. E. Elston, B. D. Smrekar, and P. A. Bazemore. 2010. [Summary of amphibian community monitoring at Cumberland Island National Seashore, 2009](#). Natural Resource Data Series NPS/SECN/NRDS—2010/094. National Park Service, Fort Collins, Colorado.

Smrekar, B. D., M. W. Byrne, L. Kleinschmidt, and N. Schwartz. 2013. [Amphibian community monitoring at Cumberland Island National Seashore, 2012](#). Natural Resource Data Series. NPS/SECN/NRDS—2013/531. National Park Service. Fort Collins, Colorado. Published Report-219825.

Plants

Byrne, M. W., S. L. Corbett, and J. C. DeVivo. 2012. [Vegetation community monitoring at Cumberland Island National Seashore, 2009](#). Natural Resource Data Series NPS/SECN/NRDS—2012/260. National Park Service, Fort Collins, Colorado.

Inventory Reports

The NPS Inventory & Monitoring Program developed a strategy in 1992 for developing and delivering a minimal set of products for twelve “baseline” natural resource inventories for all park units containing significant natural resources. The primary purpose of natural resource inventories is to document the presence of resources in parks, and to assess and document the current condition and knowledge of natural resources in the parks. Baseline inventories for CUIS are either complete or underway (Table 1), and have been augmented by additional inventory projects of interest to the Park. Inventories with published reports are listed below, although data are available for all completed reports.

Table 1. Status of 12 baseline inventories at Cumberland Island National Seashore [● – Complete; ● – In Progress]

Inventory	Inventory Status
Air Quality Data	●
Air Quality Related Values	●
Base Cartography Data	●
Baseline Water Quality Data	●
Climate Inventory	●
Geologic Resources Inventory	●
Natural Resource Bibliography	●
Soil Resources Inventory	●
Species Lists	●
Species Occurrence and Distribution	●
Vegetation Map Inventory	●
Water Body Location and Classification	●

Baseline Inventories

- Byrne, M. W., and D. M. Lagana. 2009. [Live-specimen key for the mammals of Southeast Coast Network parks](#). Natural Resource Report. NPS/SECN/NRR—2009/122. National Park Service, Fort Collins, Colorado.
- Davey, C. A., and Others. 2007. [Weather and Climate Inventory, National Park Service, Southeast Coast Network](#). Natural Resource Technical Report. NPS/SECN/NRTR—2007/010. National Park Service, Fort Collins, CO.
- Frick, E. A., M. B. Gregory, D. L. Calhoun, and E.H. Hopkins. 2002. [Water quality and aquatic communities of upland wetlands, Cumberland Island National Seashore, Georgia, April 1999 to July 2000](#). U.S. Geological Survey Water Resources Investigations Report 02-4082, Atlanta, Georgia.
- Kohut, R. J. 2004. [Ozone risk assessment for Southeast Coast Network](#). National Park Service. Fort Collins, Colorado.
- Tuberville, T. D., J. D. Willson, M. E. Dorcas, and J. W. Gibbons. 2005. [Herpetofaunal species richness of southeastern national parks](#). *Southeastern Naturalist* 4(3): 537-569.
- Webster, W. D. 2010. [Mammalian diversity in nineteen Southeast Coast Network parks](#). Natural Resource Report NPS/SECN/NRR—2010/263. National Park Service, Fort Collins, Colorado.
- Zomlefer, W. B., and L. M. Kruse. 2011. [Scientific Note: Addendum to the Flora of Cumberland Island National Seashore, Camden County, Georgia](#). *Castanea*. 76(2):183-186. Journal Article-2174319.
- Zomlefer, W. B., and Others. 2008. [Vascular Plant Survey of Cumberland Island National Seashore, Camden County, Georgia](#). *Castanea*. 73(4):251-282.
- National Park Service. 1997. [Baseline water quality data inventory and analysis: Cumberland Island National Seashore](#). Technical Report NPS/NRWRD/NRTR-97/104. National Park Service, Water Resources Division, Fort Collins, Colorado.

Additional Inventories

- Alber, M., J. Flory, and K. Payne. 2005. [Assessment of coastal water resources and watershed conditions at Cumberland Island National Seashore, Georgia](#). National Park Service, Water Resources Division, Technical Report NPS/NRWRD/NRTR-2005/332, Fort Collins, Colorado.
- Hymel, S. N. 2009. [Inventory of marine and estuarine benthic macroinvertebrates for nine Southeast Coast Network parks](#). Natural Resource Report NPS/SECN/NRR—2009/121. National Park Service, Fort Collins, Colorado.

For More Information

The NPS Integrated Resource Management Applications (IRMA) portal (<http://irma.nps.gov>) is the start of a web-based “one-stop” for data, reports, and other information related to National Park Service natural and cultural resources. IRMA allows users to search,

view, download, and print information from multiple sources and systems, all from a consistent user interface. No logins or passwords are required.

Information on activities of the SECN can be found at <http://science.nature.nps.gov/im/units/secn/>, including the Network’s monitoring plan, descriptions of inventory and monitoring efforts, and links to data and final project reports.

For notification on the release of new reports from the SECN and job/internship opportunities follow us on Twitter [@SECoastNetwNPS](#) or <http://twitter.com/SECoastNetwNPS>.



National Park Service. 2014. Inventory & Monitoring Reports, 2000-2013: Cumberland Island National Seashore. Southeast Coast Network, National Park Service, Athens, GA.