

# Fort Frederica National Monument

National Park Service  
U.S. Department of the Interior

Inventory & Monitoring Program  
Southeast Coast Network



## Resource Brief: Summary of Weather and Climate Monitoring, 2010

### Vital Sign Overview

Weather and climate are key drivers for ecosystem patterns and processes, affecting both biotic and abiotic components alike. Continuous weather monitoring is an important factor in separating the effects of climate from the effects of human-induced disturbance on other vital signs (e.g., plant and animal communities and population dynamics). In support of these efforts, the SECN has compiled and analyzed data from existing sources to (1) determine status, trends, and variability of precipitation and temperature over time inside and around SECN park units; (2) determine the status, trends, and variability of derived weather data (i.e., drought indices) inside and around SECN park units; (3) track the location, magnitude, and frequency of extreme weather events that affect SECN park resources.

### Significant Findings

Average monthly temperatures at weather stations near FOFR ranged from a low of 45.8 °F to a high of 84.3 °F at the Brunswick weather station. Average monthly temperatures were above normal at most locations during the summer months and below normal during the winter.

Average monthly precipitation was above average during January, but below average the rest of the year except during August at the Brunswick weather station.

Average monthly maximum relative humidity ( $RH_{max}$ ) ranged from 78%–100%, with the lowest  $RH_{max}$  occurring in October and December at Stafford – CUIS and Brunswick Malcolm McKinnon Airport weather stations respectively. Average monthly  $RH_{min}$  ranged from 41%–100% with the lowest occurring in October and December.

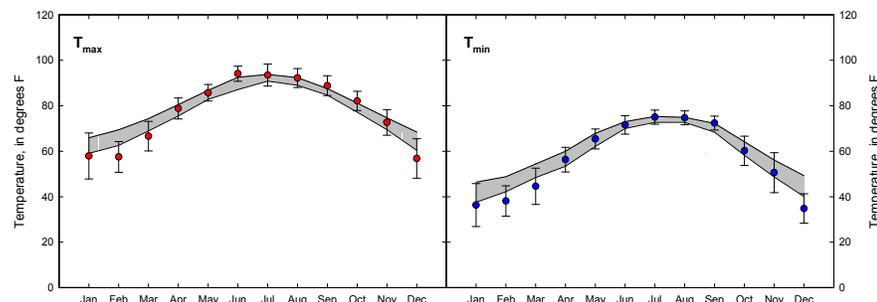
Derivative climate measures indicated that the growing season length was 275 days across all weather stations used in this analysis and derived climate measures were consistent between stations (Table 1).

**Table 1.** Derived climate measures across nearby weather stations for annual temperature-based events at FOFR.

Measure	Min	Max
Growing Season Length (days)	275	275
Maximum Temp. °F ( $T_{max}$ )	101	102
Number of Days $T_{max} \geq 90^\circ\text{F}$	62	62
Number of Days $T_{min} \leq 32^\circ\text{F}$	28	28
Last Spring Date $T_{min} \leq 32^\circ\text{F}$	6-Mar	6-Mar
Earliest Fall Date $T_{min} \leq 32^\circ\text{F}$	6-Dec	6-Dec

### Status of Conditions – Temperature

Comparisons of 2010 temperature data to the 30-year temperature average at Brunswick station show that January, February, March and December were colder than average (Figure 1). The average annual temperature was also colder than average for both stations. Temperatures for the rest of the year were slightly warmer than average, with the exception of average minimum monthly temperatures ( $T_{min}$ ) during October and November (Figure 1). This pattern was fairly consistent across all weather stations relevant to SECN parks where a long-term average was calculated.



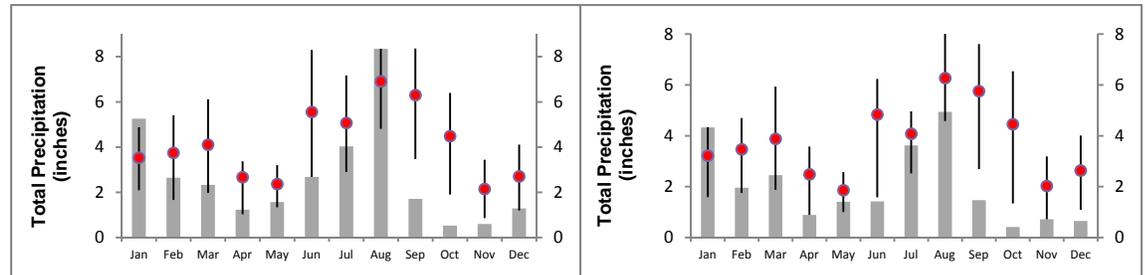
**Figure 1.** 2010 temperature departures from 30-year (1981 – 2010) average for Brunswick weather station. Depicted in these graphs are average maximum monthly temperature ( $T_{max}$ ) and average minimum monthly temperature ( $T_{min}$ ). Gray shaded region represents 30-year average and standard deviation. Error bars represent standard deviation of  $T_{max}$  and  $T_{min}$  during 2010.

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## Status of Conditions – Rainfall

Comparisons of 2010 precipitation data to the 30-year average at Brunswick station show that January and August experienced higher than average precipitation (Figure 2). Precipitation during the rest of 2010 was lower than average. Total annual precipitation was 32.23 inches during 2010, which is 17.39 inches below normal.

Comparisons of 2010 precipitation data to the 30-year average at Brunswick Malcolm McKinnon station show that January experienced higher than average precipitation (Figure 2). Precipitation during the rest of 2010 was lower than average. Total annual precipitation was 24.27 inches during 2010, which is 20.73 inches below normal.



**Figure 2.** Total monthly precipitation during 2010 and the 30-year (1981 - 2010) monthly averages for Brunswick (left) and Brunswick Malcolm McKinnon Airport (right) stations. The gray columns represent 2010 total monthly precipitation. The red circles represent the 30-year average; the lines indicate the 25th and 75th percentile of the 30-year normal data for each month.

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## 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.

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## 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 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.

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## 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/reports.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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