



Mid-Atlantic Network

Weather & Climate Resource Brief



Appomattox Court House National Historical Park & Booker T. Washington National Monument **2012 Status & Trends**

In 2012, five weather observing stations were selected to report the weather of Appomattox Court House NHP and Booker T. Washington NM which are located in the Western Piedmont climate division.

2012 was characterized by:

- *significantly above average temperatures in most months;*
- *the growing season was about three weeks longer than the 30-year average;*
- *well below normal rainfall resulted in gradually increasing drought conditions toward the end of the year.*

Temperature: In 2012, temperatures were significantly above the 30-year normal despite a cool June and a chilly November, resulting in the 14th warmest year in the 118 year record for the

Western Piedmont. Temperatures were continuously above normal from January through May.

The winter was milder than average resulting in the 6th warmest on record, 4.4°F (2.4°C) above normal. Spring, summer, and fall featured temperatures that were close to normal, despite a cold November, the 10th coldest on record with temperatures 3.6°F (2.0°C) below normal. The number of hot days was well above average, with the highest readings topping out at 103°F (39.4°C) compared to the long-term mean of 96°F (35.6°C). The number of sub-freezing days was well below normal, while the lowest temperatures of the year were about 10°F (5°C) above average. The length of the growing season at Roanoke was about three weeks longer when compared to the 1981–2010 average.

Precipitation: Annual rainfall was well

Objectives

1. *Document current status and long-term trends in air temperature and precipitation at multiple temporal scales (e.g., daily, monthly, seasonal, annual, and decadal) and spatial scales (e.g., individual stations and aggregated stations such as climate divisions) utilizing existing weather and climate monitoring programs and datasets.*

below normal, with Lynchburg recording 11.8 in (300 mm) less than the 30 year average, or the equivalent of about ten weeks of rain and snow, resulting in the 15th driest year on record. The number of days with heavy precipitation was about half the long-term average.

January and February were noted by little precipitation, followed by a wetter March. The dry trend continued in spring, while the summer had rainfall values close to normal. The fall was very dry, the 25th driest since 1895, with most



Importance

Climate is a dominant factor driving physical and ecological processes, and is responsible for short- and long-term changes that have profound effects on park ecosystems. Individual storm events do occasionally alter the structure of plant and animal communities. Future climate changes will likely cause migrations of plant and animal communities both northward and to higher

elevations. Superimposed on these trends is a long history of human use in the region, with its associated landscape fragmentation that will influence the ability of the plant and animal communities of the MIDN's parks to adapt to climate changes. Because of its influence on the ecology of the park units and the surrounding areas, climate was identified as a high-priority vital sign.

Management Applications

- Illustrate the effects of local climate change.
- Document how yearly weather compares to long-term average.
- Help interpret natural resource observations in relation to that year's weather.
- Provide a baseline for future comparisons.

Long-term Monitoring

A total of 32 weather observing stations were selected across the network based on their proximity to the network parks, the representativeness of the station to each park's elevation profile, the type and frequency of observations, the period of record of the data, data availability, and the percentage of time a station reports a particular parameter. Some of the stations with a longer period of record are used for comparison to a

30-year normal, while others are used to illustrate monthly averages. Two drought indices are used to estimate the severity of drought in an area. The Palmer Drought Severity Index (PDSI) is based on soil moisture, while the United States Drought Monitor (DM) – Drought Intensity Index is a synthesis of multiple indices (including the PDSI) and impacts which represents a consensus of federal and academic scientists.

2012 Status & Trends...

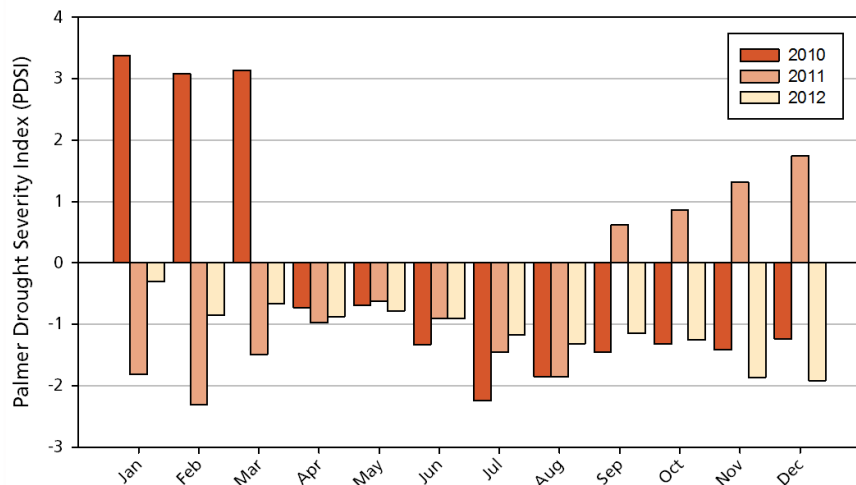
stations receiving about half the normal precipitation levels. In particular, November was very dry receiving 2.6 in (72

mm) less than normal across the region and resulting in the 8th driest on record. Snowfall was well below normal, with most stations measuring between 6 - 8 in (15 - 20 cm), compared with long-term

averages of 12 in (30 cm). There were no effects of hurricanes or tropical storms experienced in the area, and the number of days with precipitation over 1 in was about half the normal value.

Drought: 2012 started with near normal to moderate drought conditions that remained into the spring. Dry weather returned in the late summer and persisted until December. The net result was that during the growing season, conditions were classified as abnormally dry. Compared to the previous two years, drought conditions deteriorated throughout 2012.

The full report can be found at: <http://science.nature.nps.gov/im/units/midn/ProtocolWeatherandClimate.cfm>.



Palmer Drought Severity Index (PDSI) for the Western Piedmont, 2010–2012. Scale values are: 0 to ± 2 = near normal; ± 2 to ± 3 = moderate drought/moist; ± 3 to ± 4 = severe drought/very moist; ± 4 and above = extreme drought/moist.

.....
Photos by James Comiskey (front) and Kelly Armentrout (below).

A Final Note

The Weather and Climate Monitoring Protocol is led by Paul Knight, Pennsylvania State Climatologist, and his team including Kyle Imhoff, Chad Bahrmann, and Sonya Miller at the Pennsylvania State Climate Office. In addition to the summary information available in technical reports, a near real-time data stream is available for the selected weather observing stations, along with monthly, seasonal, and annual summaries at: http://climate.met.psu.edu/gmaps/NPS_DEVELOPMENT/interface.php. This project is a collaborative effort with the Eastern Rivers and Mountains Network.



Lead Scientist
James Comiskey
Jim_Comiskey@nps.gov
Program Manager/Ecologist

Mid-Atlantic Network
120 Chatham Lane
Fredericksburg, VA 22405
science.nature.nps.gov/im/units/midn

Parks monitored: Appomattox Court House NHP • Booker T. Washington NM • Eisenhower NHS • Fredericksburg & Spotsylvania NMP • Gettysburg NMP • Hopewell Furnace NHS • Petersburg NB • Richmond NBP • Shenandoah NP • Valley Forge NHP