



Mid-Atlantic Network

Weather & Climate Resource Brief



Appomattox Court House National Historical Park & Booker T. Washington National Monument **2011 Status & Trends**

In 2011, 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.

2011 was characterised by:

- *above average temperatures in most months;*
- *the growing season was about one week longer than the 30-year average;*
- *higher than normal rainfall restored drought conditions to normal.*

Temperature: In 2011, temperatures were above the 30-year normal despite a cold January and a chilly October. Temperatures were continuously above normal from February through September.

The spring was much warmer than normal due to very mild nights, particularly in May and June. Overall, this season ranked as the 14th warmest in the 117 year record for the Western Piedmont. The summer months featured consistently warmer-than-average weather from July through September, becoming the 29th warmest on record. The number of hot days was well above normal, with the highest readings topping out at 100°F (37.8°C) compared to the long-term mean of 96°F (35.6°C). After a cool October, the next two autumn months were warmer than average to produce the 28th warmest fall on record. The number of sub-freezing days was exactly normal. The length of the growing season was about a week longer when compared to the 1981–2010 average.

Precipitation: In contrast to the normal trend, the seasons alternated with a dry winter, wet spring, moist summer, and

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.*

a very wet autumn. Annual precipitation ranged from 3.7 in (96 mm) above normal, or about an average month of rain and snow, at Roanoke to 5.9 in (150 mm) below normal at Huddleston. The number of heavy precipitation days was slightly above the long-term average.

January and February were noted by little precipitation, followed by a wetter March. This resulted in the 27th driest winter since 1895. In contrast, a wetter spring ranked as the 45th wettest on record. Summer rainfall varied across



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 2011 weather compares to long-term average.
- Help interpret natural resource observations in relation to 2011 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.

2011 Status & Trends...

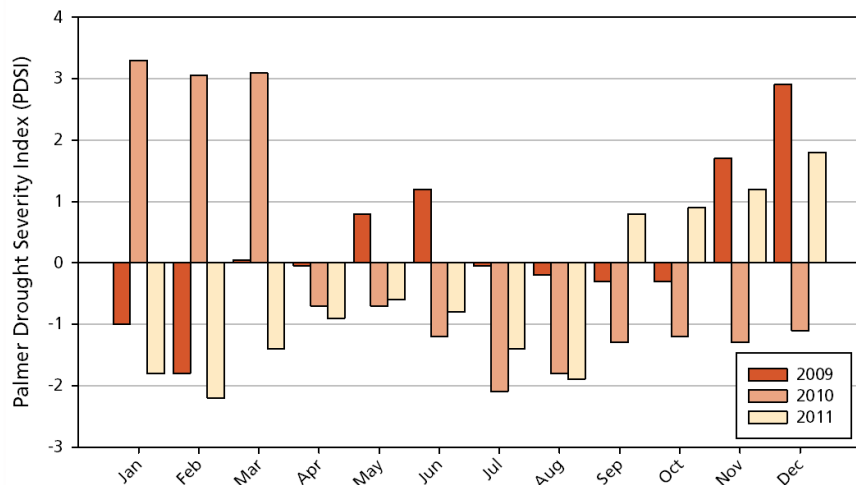
the region with the indirect effects from Hurricane Irene in late August and the direct effects of tropical storm Lee in

early September. This season averaged on the wet side, and ranked as the 50th wettest on record. The autumn was notably wet. October had relatively uniform precipitation, while November

and December had increasingly higher rainfall resulting in more than 120% higher rates than the long-term average. Snowfall was well below normal, with most sections measuring less than 2 in (5 cm), compared with long-term averages of 12 in (30 cm). Much of the snow for 2011 fell in January and the number of snowy days was half the normal.

Drought: 2011 started with near normal to moderate drought conditions, with wetter conditions returning during spring. Dry weather returned in the early summer and persisted until September. The wet conditions at the end of September into December improved conditions toward higher moisture. The full report can be found at: <http://science.nature.nps.gov/im/units/midn/ProtocolWeatherandClimate.cfm>

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Photos by James Comiskey (front) and Karen Peterson (below).



Palmer Drought Severity Index (PDSI) for the Western Piedmont, 2009–2011. 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.

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.



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

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