



Mid-Atlantic Network

Weather & Climate Resource Brief



Petersburg National Battlefield & Richmond National Battlefield Park 2013 Status & Trends

In 2013, four weather observing stations were selected to report the weather of Petersburg NB and Richmond NBP which are located in the Tidewater and the Eastern Piedmont climate divisions.

2013 was characterized by:

- *near average temperatures;*
- *the growing season was about one week shorter than the 30-year average at Richmond;*
- *high rainfall amounts resulted in the 10th wettest year on record for the Eastern Piedmont climate division.*

Temperature: 2013 was a near average year for the area around Petersburg NB and Richmond NBP. Only January, April, October and December had widespread above the 30-year normal readings, leaving eight months near normal or cooler

than average. The annual maximum temperatures averaged 1.0°F (0.6°C) below normal and minimum readings averaged as much as 1.2°F (0.7°C) above normal. The growing season was slightly shorter than normal at Richmond.

The year started with a mild January. February turned colder with daytime readings below average. The cold spell culminated in March with average readings as low as 5.8°F (3.2°C) below the long-term mean. In spring, April was quite mild with monthly temperatures up to 3.1°F (1.7°C) above normal, while May and June had temperatures closer to the average. The spring season ranked as the 27th warmest in the Tidewater climate division records began in 1895. In contrast, summer was moderate to cool, ranking as the 40th coolest in the Tidewater. November had a monthly temperature below average, while October and December showed high posi-

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.*

tive anomalies. December departures as high as 5.3°F (2.9°C) above normal were recorded.

Precipitation: The year was wetter than normal, with rainfall of between 9.9 and 13.7 in (253-340 mm) above the long-term average. It was the 10th wettest year on record for the Eastern Piedmont Division.

The winter months were quite wet, while annual snowfall totals were near the long-term average. Despite a dry spell of seven days, January was notably wet with

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.

2013 Status & Trends...

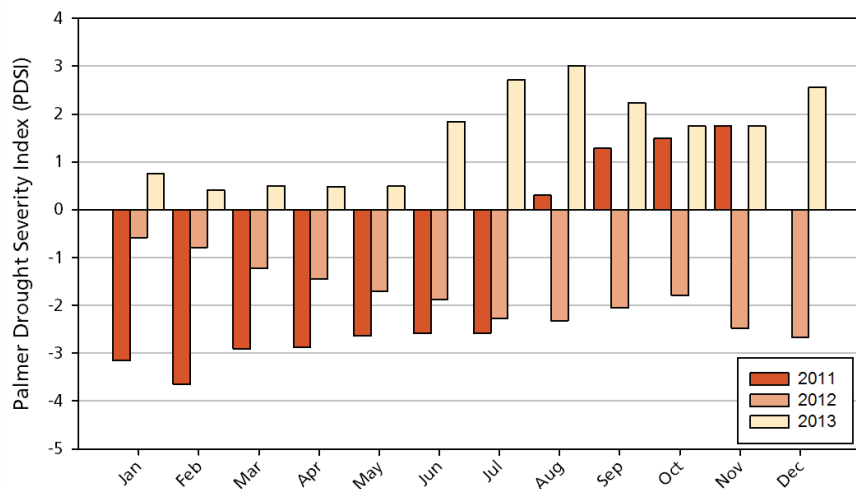
197 to 268 percent of normal precipitation falling. April showed a close to average amount of rain, but with a moist

May and an even wetter June, spring was the 9th wettest recorded in the Eastern Piedmont. Summer rainfall varied across the Petersburg NB and Richmond NBP region. As an example, the Tidewater

reported the 37th driest summer in 119 years of records, while the adjacent Eastern Piedmont only tallied its 53rd wettest summer of record. September's rainfall was low, with 13-52 percent of normal. The final three months of the year were increasingly wet; while precipitation in October was less than normal, in December it was well above average. The fall months were the 13th wettest on record in the Tidewater Division.

Drought: The year was notably wetter than 2011 and 2012, intensifying over the summer to very moist levels in August and again in December.

The full report can be found at: http://science.nature.nps.gov/im/units/midn/monitor/weather_climate.cfm.



Palmer Drought Severity Index (PDSI) for the Eastern Piedmont, 2011–2013. Positive values indicate periods of above normal precipitation (0 to 2: near normal; 2 to 3: moderate moisture; >3: very moist) and negative values indicate periods of drought (0 to 2: near normal; 2 to 3: moderate drought; >3: severe to extreme drought).

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Photos by Ron Zanoni (front header), James Comiskey (front) and NPS (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/NPS/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 • Eisenhower NHS • Fredericksburg & Spotsylvania NMP • Gettysburg NMP • Hopewell Furnace NHS • Petersburg NB • Richmond NBP • Shenandoah NP • Valley Forge NHP

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