



Eisenhower National Historic Site & Gettysburg National Military Park 2015 Status & Trends

2015 was characterized by:

- A cold winter and exceptionally warm spring and autumn; the autumn of 2015 was the warmest in 121 years of records;
- a growing season that was a few days longer than average;
- highly variable seasonal rainfall, but overall, near-normal total precipitation.

In 2015, two weather observing stations were selected to report the weather of Eisenhower National Historic Site and Gettysburg National Military Park. The parks are located in the Lower Susquehanna climate division of Pennsylvania.

Temperature: Average annual temperatures for 2015 were above the 30-year average despite a cold winter season (January – March). Ultimately, 2015 was the 17th warmest year since 1895 in the Lower Susquehanna (see table below).

The year began colder than normal with February having temperatures almost 12°F (6.5°C) below normal. In contrast, spring, summer, and autumn all had temperatures well above normal. In fact, the spring of 2015 ranked as the 3rd warmest, and the autumn ranked as the warmest ever recorded for the Lower Susquehanna. The maximum temperature of the year was 95.0°F (35.0°C). The minimum temperature of the year was -5.0°F (-20.6°C).

Monitoring Objective

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.

Despite the warm weather, the number of hot days (days with maximum temperature > 90°F (32°C)) was just below long-term averages. The number of sub-freezing days (days with temperatures < 32°F (0°C)) was near normal. Ultimately, the warm spring and fall resulted in a growing season that was slightly longer than normal (188 days vs. long-term average of 180 days, as reported by the Biglerville weather station).

Lower Susquehanna Climate Division Rankings (1895-2015)

	Temperature Rank 2015	Precipitation Rank 2015
Winter (Jan. – March)	116	106
Spring (April – June)	3-T	18
Summer (Aug. – Sept.)	17-T	71
Autumn (Oct. – Dec.)	1	65
2015 (Jan. – Dec.)	17-T	63-T

A ranking of 1 indicates the warmest (or wettest) period on record, and 121 represents the coldest (or driest) period. A "T" indicates that there was a tie in the rankings. Near-normal conditions would rank between 40 and 80.

Climate Rankings - 2015 had the warmest autumn on record

Weather records collected since 1895 can be used to compare current climate conditions with those of the past. To make those comparisons, climate periods (e.g. months or years) can be ranked in order from the warmest to the coldest, or the wettest to the driest. The table to the left displays these rankings over 121 years for the Lower

Susquehanna climate division of Pennsylvania. The table indicates that the autumn of 2015 was the warmest ever recorded in the Lower Susquehanna. The spring of 2015 tied as the 3rd warmest on record. The spring was also wet, being the 18th wettest since 1895. In contrast, the winter of 2015 was colder and drier than normal.



Climate Change

Climate change will affect natural and cultural resources in parks across the country. In order to characterize the extent of the threat, the National Park Service recently completed a climate change exposure assessment for 289 parks. In the study, recent climate conditions were compared to historical normals (i.e. post 1901). For both Gettysburg NMP and Eisenhower NHS,

none of the recent temperature metrics assessed were considered to be abnormal. In contrast, recent precipitation patterns and amounts are now vastly different than those in the past. There is now increased precipitation overall and wet periods are wetter. In addition, dry periods are also drier. For details, please see <http://www.nps.gov/subjects/climatechange/climateexposure.htm>.

2015 Status & Trends...

Precipitation: The year started dry but became increasingly wet. By the end of the year, total precipitation was near average, and 2015 tied as the 63rd wettest year in 121 years of record.

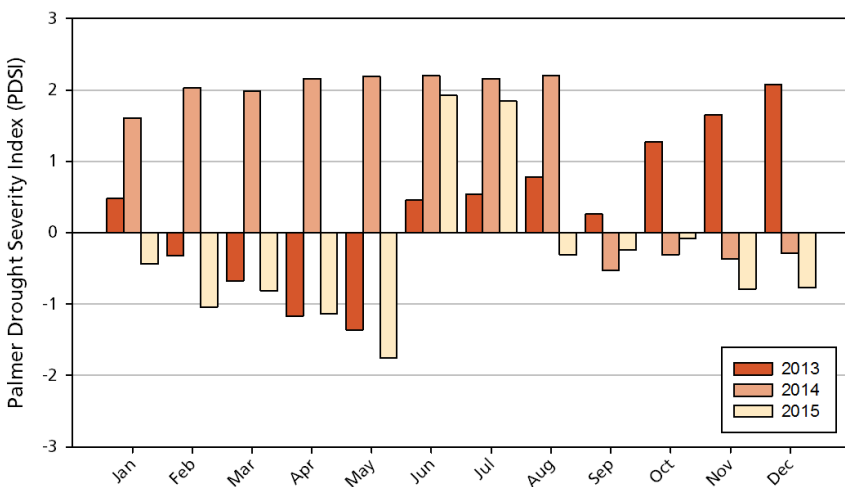
Winter was relatively dry. For example,

February precipitation totals were just 43 to 55% of normal. Even so, annual snowfall totals were higher than long-term averages with Biglerville reporting more than 41.1 in (104.4 cm). Rainfall was variable through most of the spring, but it became increasingly wet as spring came to an end. During June, both the

Biglerville and Arendstville weather stations reported more than 300% above normal rainfall. Due to the very wet June, the spring ultimately ranked as the 18th wettest since 1895. Summer and autumn had variable rainfall. For instance, Biglerville reported 194% of average in August and just 38% of normal in November. Nevertheless, in total, both summer and autumn seasons had near-normal precipitation.

Drought: 2015 started with near-normal to slightly dry conditions that persisted until June (see figure to left). As summer progressed into autumn, PDSI values remained near normal conditions until the year's end. Compared with 2014, 2015 was much drier during the first half of the year.

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 Lower Susquehanna, 2013–2015. 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).

Resource brief composed by Jeb Wofford. Photos courtesy of the National Park Service (front header) and Nicolas Raymond (below).

A Final Note

The Weather and Climate Monitoring Protocol is led by Kyle Imhoff, Pennsylvania State Climatologist, and Arthur Person, research assistant, 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. The data stream can be found at: <http://climate.met.psu.edu/NPS/interface.php>. Up-to-date monthly, seasonal, and annual summaries are also available at the website. This monitoring effort is a collaborative project with the NPS Eastern Rivers and Mountains Network.



Lead Scientist

Jeb Wofford
Jeb_Wofford@nps.gov
Biologist/Science Communicator

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

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