



Eisenhower National Historic Site & Gettysburg National Military Park: 2016 Weather in Review

In 2016, two weather stations were selected to report the weather of Eisenhower National Historic Site (EISE) and Gettysburg National Military Park (GETT). The parks are located in the Lower Susquehanna climate division of Pennsylvania. This brief provides a summary of 2016 weather conditions.

Highlights — 2016 was characterized by:

- warmer than normal temperatures across all seasons — in all, 2016 was the 4th warmest year in 122 years of records;
- a growing season that was 3 weeks longer than average;
- less than normal annual rainfall resulting in the 28th driest year since 1895.

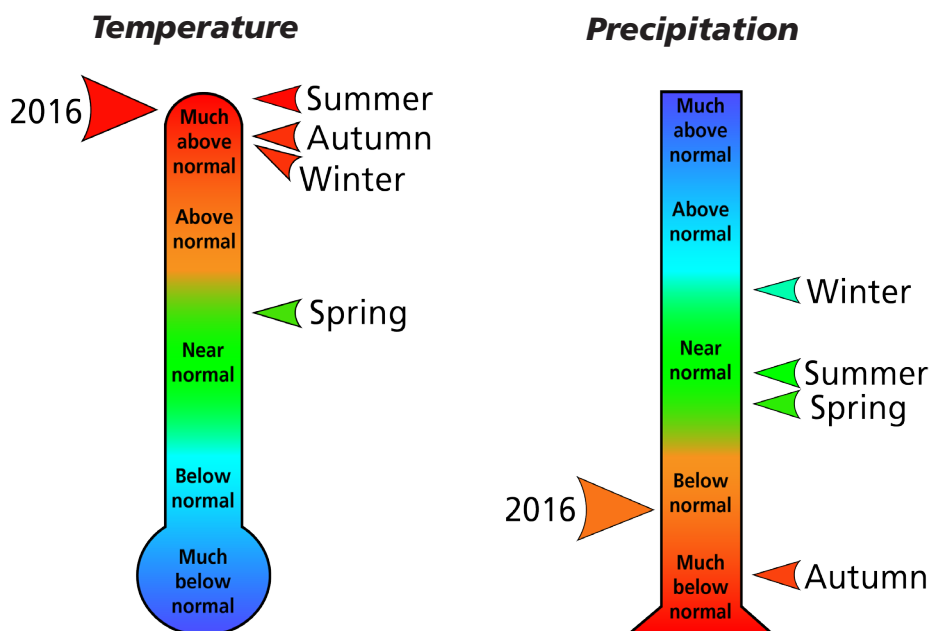
How does 2016 average temperatures and total precipitation in the Lower Susquehanna compare to the past?

Temperature and precipitation records collected since 1895 can be used to compare current climate conditions with those of the past. To do so, climate periods (e.g. seasons or years) can be ranked in order from the warmest to the coldest or the wettest to the driest. The figures below show these rankings over 122 years for the Lower Susquehanna climate division of Pennsylvania. The figures show how each season (and the year) ranks compared to the prior 122 seasons/years. A rank at the top of the figure would indicate the warmest or wettest season/year on record, and at the bottom, the coldest or driest on record.

2016 Temperature Ranking Statistics: It was the warmest summer on record, the 13th warmest autumn, the 14th warmest winter, and the 50th warmest spring since 1895. In all, 2016 was the 4th warmest year on record.

2016 Precipitation Ranking Statistics: It was the 45th wettest winter, the 59th driest summer, the 52nd driest spring, and the 13th driest autumn since 1895. In all, 2016 was the 28th driest year on record.

Source: [National Oceanic and Atmospheric Administration, 2017](#).





Hepaticas are among the first flowers to bloom in spring.

Climate Change - Spring is coming earlier at EISE and GETT!

Across the United States, national parks are already experiencing climate change. Changes in temperature and precipitation can influence the timing of seasonal biological events (e.g., leaf-out, flowering, migration, and reproduction). These seasonal events constitute one of the most immediate and easily observed responses to climate change. In order to evaluate the impact of climate change on the onset of spring, NPS scientists studied the “first bloom” and “first leaf” dates at 276 NPS sites (Monahan et al. 2016). They determined that EISE and GETT are now experiencing “extremely early” spring start dates when compared to historical averages (1901-2012).

Warming climates and earlier spring onsets may affect vegetation and animal populations in a variety of ways. In turn, national parks may have to alter or develop new management strategies to help protect park natural resources. For example, invasive plant treatments may need to start earlier in the year than they have in the past. Earlier growth of grasses and earlier bird nesting periods might also alter the timing of successful grassland management activities. For additional park specific climate change publications, please visit <https://science.nature.nps.gov/climatechange/index.cfm>.

Temperature: Almost all of the temperature metrics calculated from stations around EISE and GETT indicate that 2016 was a warm year. Throughout the year, most months had higher than average temperatures. March was particularly warm with temperatures more than 6.5 °F (3.6 °C) above normal. For the year, average annual temperatures were above normal at both weather stations. The number of hot days (days with maximum temperatures > 90 °F (32 °C)) was more than twice the historic average at the Biglerville station. In addition, average annual maximum temperatures and average annual minimum temperatures were also above average. The warm weather across the year resulted in a growing season length that was three weeks longer than normal at the Biglerville station. All of the seasons ranked warmer than average, and the summer of 2016 was the warmest ever recorded. In all, 2016 tied as the 4th warmest year since 1895.

Precipitation: Overall, the year’s precipitation was less than long-term averages, and the year ranked as the 28th driest on record. Three of the four seasons had below-average precipitation. Autumn was particularly dry, ranking the 13th driest with only 54% of normal rainfall. In contrast, the winter was relatively wet—February had 159% of average precipitation. The wettest day of the year occurred on September 8th with 2.8 inches (71 mm) of rain. The number of micro-droughts (periods of 7+ days without rain) was above normal (14 micro-droughts vs. a long-term average of 9). The longest dry spell occurred in November when the Biglerville station went almost 16 days without recording any precipitation. As a result of the dry autumn, by the end of the year the Lower Susquehanna was in “severe” drought conditions. For the full 2016 EISE and GETT weather report, see Wofford (2017) as cited below.



Two weather stations are utilized to report the weather of EISE and GETT. One station is near Biglerville, PA and the other is near Arendtsville, PA. The Arendtsville station (see photo above) is part of the Clean Air Status and Trends Network (CASTNET). CASTNET is a national monitoring network established to assess trends in pollutant concentrations, atmospheric deposition, and ecological effects due to changes in air pollutant emissions. CASTNET is managed by the U.S. Environmental Protection Agency.

Citations and Credits

Monahan W.B., Rosemartin A., Gerst, K., Fisichelli N.A., Ault T., Schwartz M.D., Gross J.E., and Weltzin J.F. 2016. Climate change is advancing spring onset across the US national park system. *Ecosphere* 7(10): e014565. doi: 10.1002/ecs2.1465

Wofford, J. E. B. 2017. Weather of Eisenhower National Historic Site and Gettysburg National Military Park: Mid-Atlantic Network summary report for 2016. Natural Resource Data Series NPS/MIDN/NRDS—2017/1099. National Park Service, Fort Collins, Colorado. Available here: <https://irma.nps.gov/DataStore/Reference/Profile/2239935>

Photographs : Cover photo, “Gaines Mill, Richmond Battlefield” © Buddy Secor; back page photos courtesy of NPS and EPA

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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