



Hopewell Furnace National Historic Site & Valley Forge National Historical Park: 2017 Weather in Review

In 2017, six weather stations were selected to report the weather of Hopewell Furnace National Historic Site (NHS) and Valley Forge National Historical Park (NHP). The parks are located in the Southeastern Piedmont climate division of Pennsylvania. This brief provides a summary of 2017 weather conditions.

Highlights — 2017 was characterized by:

- warmer than normal temperatures across all seasons — in all, 2017 was the 5th warmest year in 123 years of records;
- a growing season more than 5 weeks longer than average;
- slightly less than normal annual rainfall resulting in the 52nd driest year since 1895.

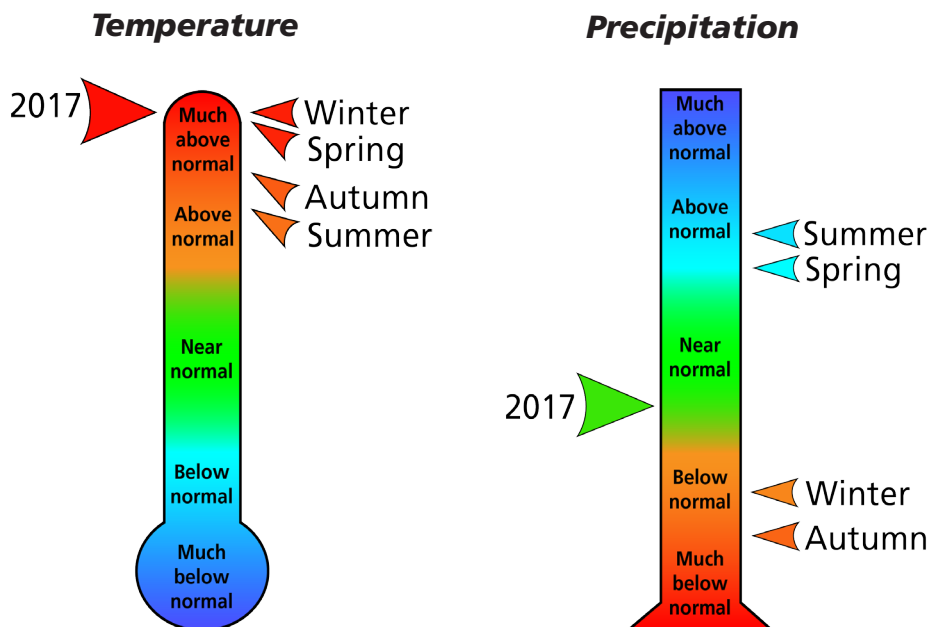
How does 2017 average temperatures and total precipitation in the Southeastern Piedmont compare to the past?

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 123 years for the Southeastern Piedmont climate division of Virginia. The figures show how each season (and the year) ranks compared to the prior 123 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.

2017 Temperature Ranking Statistics: It was the 5th warmest winter on record, the 7th warmest spring, the 19th warmest autumn, and the 27th warmest summer since 1895. In all, 2017 was the 5th warmest year on record.

2017 Precipitation Ranking Statistics: It was the 32nd wettest summer, the 40th wettest spring, the 30th driest winter, and the 22nd driest autumn since 1895. In all, 2017 was the 52nd driest year on record.

Source: National Oceanic and Atmospheric Administration, 2018.



Temperature: Almost all of the temperature metrics calculated from stations around Hopewell Furnace NHS and Valley Forge NHP indicate that 2017 was a warm year. Over the course of the year, most months had higher than average temperatures. February was particularly warm with temperatures almost 8.0°F (4.4°C) above normal. For the year, average annual temperatures were well above normal at all of the reporting weather stations. At Phoenixville, average annual maximum and average annual minimum temperatures were also above average. In addition, there was almost a week of additional hot days (days with maximum temperatures > 90°F (32°C)) compared to normal. As a result of the warm weather, the growing season at Phoenixville was more than five weeks longer than normal. All of the seasons ranked warmer than average, and the winter of 2017 was the 5th warmest on record. In all, 2017 was the 5th warmest year in the Southeastern Piedmont since 1895. (Note: long-term averages for Phoenixville were derived from the nearby West Chester 2NW station).

Precipitation: Overall, the year's precipitation was slightly less than average, and the year ranked as the 52nd driest on record. The fall season (Oct.-Dec.) was particularly dry with only 65% of normal rainfall. In contrast, the summer had 131% of normal precipitation. The wettest day of the year occurred on October 30th with 2.4 inches (61 mm) of rain. The longest dry spell occurred from mid-September through early-October with a period of 19 days without any precipitation. The number of micro-droughts (periods of 7+ days without rain) was slightly above normal (8 micro-droughts vs. a long-term average of 6). The prior year ended very dry and thus, 2017 began with severe drought conditions in the Southeastern Piedmont. Nevertheless, by the end of April, the Southeastern Piedmont was experiencing normal conditions and normal conditions remained through the end of the year. For the full 2017 Hopewell Furnace NHS and Valley Forge NHP weather report, see Wofford (2018) as cited below.

Climate Change - Bird communities are expected to change at Hopewell Furnace NHS and Valley Forge NHP

National Park Service and National Audubon Society scientists recently studied the potential effects of climate change on seasonal bird communities in national parks. They predict that major changes in bird communities may occur at Hopewell Furnace NHS and Valley Forge NHP by 2050. Under a high-emissions scenario, 20 new bird species may colonize Hopewell Furnace NHS in summer and 27 new species in the winter season. At Valley Forge NHP, 19 new species may colonize the park in summer and 29 in winter. Despite the large number of potential colonizing species, other birds may find future park climates inhospitable. By mid-century, the climate at Hopewell Furnace NHS may become unsuitable for 20 species of birds that currently reside there in summer and 7 species of birds that currently overwinter. Similarly, at Valley Forge NHP, 19 species in summer and 6 species in winter may be seasonally extirpated.

It is important to note that this study only assessed the possible impact of changing climate conditions and not potential changes in habitat or other ecosystem factors. Therefore, projections noted above should be interpreted as primarily revealing potential trends in species richness. Bird monitoring in the park will assess these potential community changes over the coming decades. For more information on park specific results, visit <https://www.nps.gov/subjects/climatechange/birdsinparks.htm>.



By 2050, under a high-emissions scenario, the summer climate at Hopewell Furnace National Historic Site and Valley Forge National Historical Park is expected to become unsuitable for grey catbirds. It's possible that in a few decades catbirds will no longer be found in either of these parks during summer months.

Citations and Credits

Wofford, J.E.B. 2018. Weather of Hopewell Furnace National Historic Site and Valley Forge National Historical Park: Mid-Atlantic Network summary report for 2017. Natural Resource Data Series NPS/MIDN/NRDS—2018/1164. National Park Service, Fort Collins, CO. Available here: <https://irma.nps.gov/DataStore/Reference/Profile/2253207>

Photographs : Cover photo, "September Glow" by Thomas J. Caldwell (CC BY-SA 2.0); back page photo courtesy of NPS

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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