



Shenandoah National Park: 2017 Weather in Review

In 2017, eight weather stations were selected to report the weather of Shenandoah National Park (NP). The park spans the Northern Virginia, Central Mountains, and Western Piedmont climate divisions of Virginia. The majority of the park is located in the Northern Virginia division. This brief provides a summary of 2017 weather conditions.

Highlights—2017 was characterized by:

- warmer than normal temperatures across all seasons (with one exception—at Big Meadows, the summer was actually cooler than long-term averages);
- below average annual rainfall resulting in the 34th driest year since 1895;
- moderate drought conditions in Feb., Mar., Apr., and Dec.

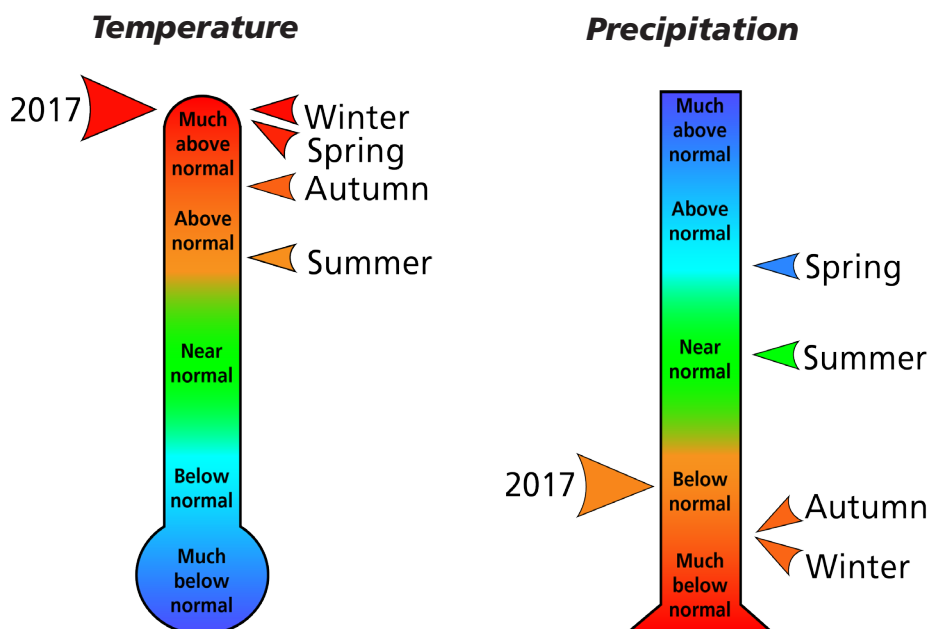
How does 2017 average temperatures and total precipitation in Northern Virginia compare to the past?

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 Northern Virginia climate division. 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 3rd warmest winter on record, the 5th warmest spring, the 20th warmest autumn, and the 37th warmest summer since 1895. In all, 2017 tied as the 3rd warmest year on record.

2017 Precipitation Ranking Statistics: It was the 39th wettest spring, the 60th wettest summer, the 24th driest autumn, and the 22nd driest winter since 1895. In all, 2017 was the 34th driest year on record.

Source: [National Oceanic and Atmospheric Administration](#), 2018.



Temperature: Almost all of the temperature metrics from stations around Shenandoah NP indicate that 2017 was a warm year. Many months had temperatures that were much higher than normal, and the winter ranked as the 3rd warmest on record in Northern Virginia. February was particularly warm with temperatures almost 9.0°F (4.9°C) above normal. For the year, average annual temperatures were 0.9-4.0°F (0.5-2.5°C) above normal across all of the reporting weather stations. Average annual maximum and average annual minimum temperatures were also above average. Surprisingly, the number of hot days (days with maximum temperatures > 90°F (32°C)) was less than normal in Luray (15 days vs. long-term average of 25 days). Even so, the growing season in Luray was 11 days longer than average. In Staunton, it was two months longer than normal. In all, 2017 was the 3rd warmest year in Northern Virginia since 1895.

Despite generally warm conditions across the park, temperature data from Big Meadows suggest that May–September was actually cooler than long-term averages at the park’s highest elevations. At Big Meadows, these months had temperatures

0.3-2.7°F (0.2-1.5°C) below normal. Even so, due to a few extremely warm months, the annual average temperature at Big Meadows was 0.9°F (0.5°C) higher than normal. It is important to recognize that despite regional patterns in temperature and precipitation, local conditions may vary.

Precipitation: Overall, the year’s precipitation was less than average, and the year ranked as the 34th driest on record. February was particularly dry with only 17% of normal rainfall. In contrast, the spring was wet with 132% of normal precipitation. The wettest day of the year occurred on May 5th with 3.0 inches (77 mm) of rain. The longest dry spell occurred from mid-September through early-October with a period of 26 days without any precipitation. The number of heavy precipitation days (days with ≥1.0 in (25 mm) of rain) was less than normal in both Luray and Staunton. The dry weather combined with warmer than normal temperatures created moderate drought conditions across Northern Virginia during February, March, April, and December.

For the full 2017 Shenandoah National Park weather report, see Wofford (2018) as cited below.

Climate Change - Bird communities are expected to change at Shenandoah National Park

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 Shenandoah National Park by mid-century. Under a high-emissions scenario, 20 new bird species may colonize Shenandoah NP in summer and 43 new species in the winter season. Despite the large number of potential colonizing species, other birds may find future park climates inhospitable. By 2050, the climate at Shenandoah may be unsuitable for 41 species of birds that currently reside there in summer and 5 species of birds that currently overwinter.

It is important to note that this study only assessed the impact of changing climate conditions and not potential changes in habitat or other ecosystem factors. As such, many species may not respond as anticipated. Therefore, projections noted above should be interpreted as primarily revealing potential trends in species richness. 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 Shenandoah National Park is expected to become unsuitable for the veery (Catharus fuscescens). It's possible that in a few decades veeries won't be found in the park during summer months.

Citations and Credits

Wofford, J.E.B. 2018. Weather of Shenandoah National Park: Mid-Atlantic Network summary report for 2017. Natural Resource Data Series NPS/MIDN/NRDS—2018/1170. National Park Service, Fort Collins, CO. Available here: <https://irma.nps.gov/DataStore/Reference/Profile/2253293>

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