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## 2024 Weather in Review: Shenandoah National Park

In all, 2024 was the warmest year on record for the counties surrounding the park (since 1895). Data indicate that over the long term, annual average temperature and annual total precipitation have both increased (+0.2°F per decade and +0.39 inches per decade, respectively).

This brief provides county-scale weather data averaged from all of the counties surrounding the park, including data from 1895–2024 (i.e., period of record). These coun-

ties include Albemarle, Augusta, Greene, Madison, Page, Rappahannock, Rockingham, and Warren counties, VA. Individual weather station data may vary from what is reported here. In particular, high elevations in the park may have experienced weather conditions that are different from those displayed in this brief. Data and analyses herein are courtesy of the [National Oceanic and Atmospheric Administration's \(NOAA\) Climate at a Glance Program](#).

### Temperature

In total, 2024 was the warmest year ever recorded in the counties surrounding the park, and all seasons were warmer than normal (Figure 1). Every month had higher than normal temperatures with February, March, and November all being at least 6°F above long-term averages (Table 1).

Table 1. Average monthly, average annual, and departures from long-term average temperatures. Departures from average are based on a comparison of 2024 average temperatures to relevant averages from 1895-2023. Data are available at <https://www.ncdc.noaa.gov/cag/county/time-series>.

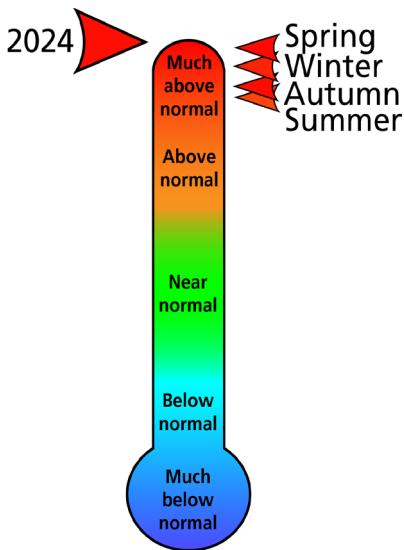


Figure 1. Seasonal and annual temperature rankings. An arrow at the top of the figure would represent the warmest year/season on record (since 1895); at the bottom, the coldest year/season on record. Winter = Jan–Mar, Spring = Apr–June, Summer = July–Sept, Autumn = Oct–Dec. Data are available at <https://www.ncdc.noaa.gov/cag/county/rankings>.

| Month/<br>Year | Average<br>temperature (°F) | Departure from<br>average (°F) |
|----------------|-----------------------------|--------------------------------|
| January        | 35.0                        | +3.0                           |
| February       | 41.3                        | +7.3                           |
| March          | 48.4                        | +6.0                           |
| April          | 57.0                        | +4.9                           |
| May            | 65.0                        | +3.5                           |
| June           | 72.5                        | +3.3                           |
| July           | 76.8                        | +3.6                           |
| August         | 73.7                        | +2.2                           |
| September      | 65.6                        | +0.3                           |
| October        | 56.7                        | +2.3                           |
| November       | 49.8                        | +6.0                           |
| December       | 35.9                        | +1.1                           |
| 2024           | 56.5                        | +3.6                           |

# Precipitation

The year 2024 was close to normal for total precipitation and ended as the 49<sup>th</sup> wettest year on record (Figure 2). Nevertheless, spring and autumn were dry, but summer and winter were very wet. In total, 42.4 inches of precipitation fell, 1.6 inches above long-term averages (Table 2).

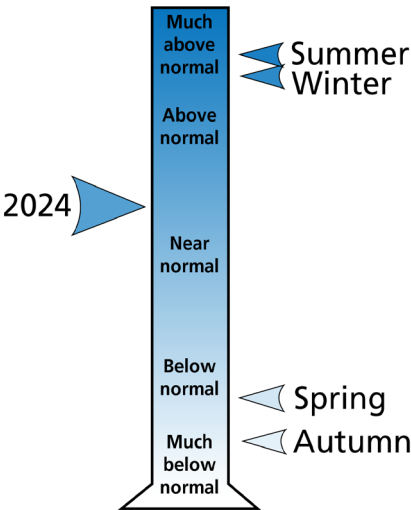


Figure 2. Seasonal and annual precipitation rankings. An arrow at the top of the figure would represent the wettest year/season on record (since 1895); at the bottom, the driest year/season on record. Winter = Jan–Mar, Spring = Apr–June, Summer = July–Sept, Autumn = Oct–Dec. Data are available at <https://www.ncdc.noaa.gov/cag/county/rankings>.

Table 2. Monthly and annual total precipitation and departure from long-term averages. Departures from average are based on a comparison of 2024 precipitation to relevant averages from 1895–2023. Data are available at <https://www.ncdc.noaa.gov/cag/county/time-series>.

| Month/Year | Total precipitation (in.) | Departure from average (in.) |
|------------|---------------------------|------------------------------|
| January    | 6.17                      | +3.32                        |
| February   | 1.97                      | –0.51                        |
| March      | 3.32                      | +0.05                        |
| April      | 2.31                      | –0.96                        |
| May        | 4.89                      | +0.93                        |
| June       | 1.32                      | –2.81                        |
| July       | 2.21                      | –1.89                        |
| August     | 6.42                      | +2.37                        |
| September  | 8.53                      | +4.91                        |
| October    | 1.63                      | –1.73                        |
| November   | 1.5                       | –1.36                        |
| December   | 2.17                      | –0.75                        |
| 2024       | 42.44                     | +1.57                        |

# Temperature and Precipitation (1895–2024)

Data for counties surrounding the park indicate that annual average temperature has increased approximately +0.2°F per decade and annual total precipitation has increased approximately +0.39 inches per decade since 1895 (Figure 3).

National Park Service scientists have forecast future changes in climate too. Models estimate that by 2100, annual average temperature at the park will increase by 3.1–8.8°F (from a best-case to worst-case scenario, respectively). Annual total precipitation is expected to increase by 8–14% (see [Gonzalez et al., 2018](#) for details).

Data in this brief are preliminary and were retrieved from NOAA on 01/07/25.

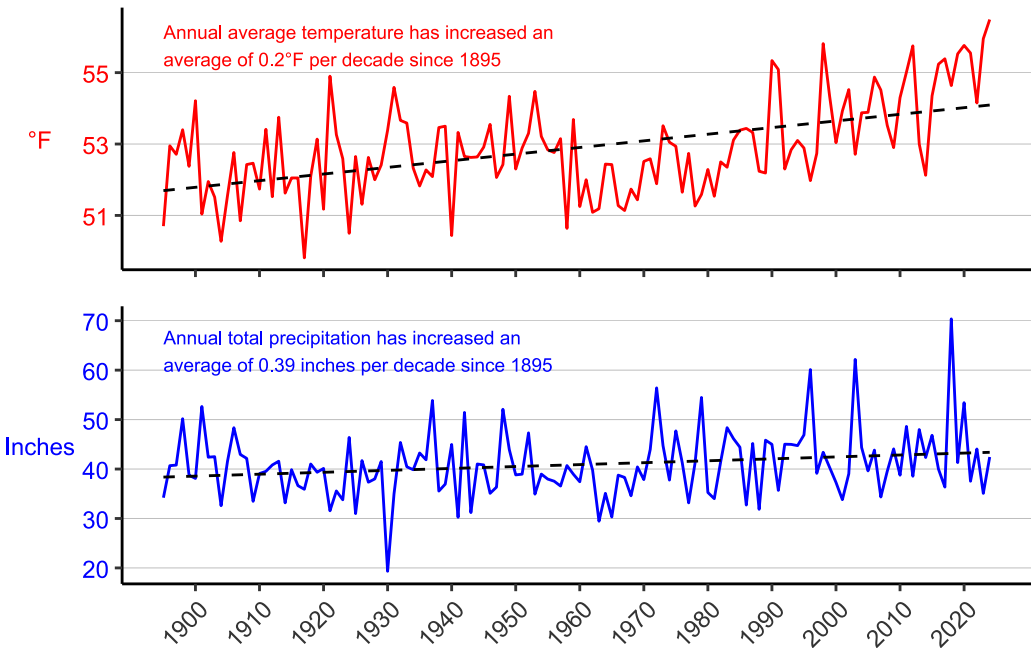


Figure 3. Annual average temperature (°F) and annual total precipitation (in.) from 1895–2024 for counties surrounding the park. Dashed lines represent linear estimates of change. Data are available at <https://www.ncdc.noaa.gov/cag/county/time-series>.