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2021 Weather in Review: Fredericksburg and Spotsylvania National Military Park

In all, 2021 was extremely warm and moderately dry. The year ended as the 6th warmest and 36th driest on record. Data indicate that over the long term, annual average temperature and annual total precipitation have both increased (+0.19 °F per decade and +0.22 inches per decade, respectively).

This brief provides county-scale weather data averaged from all of the counties surrounding the park, including data from 1895–2021 (i.e. period of record). These counties include Caroline, Orange, Spotsylvania, and Stafford counties, VA. Data and analyses herein are courtesy of the National Oceanic and Atmospheric Administration's (NOAA) Climate at a Glance Program.

Temperature

In total, 2021 was the 6th warmest year ever recorded at the park, and all seasons were very warm (Figure 1). Ten months had higher than normal temperatures with March, August, October, and December all being more than 3.0 °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 2021 average temperatures to relevant averages from 1895–2020. Data are available at <https://www.ncdc.noaa.gov/cag/county/time-series>.

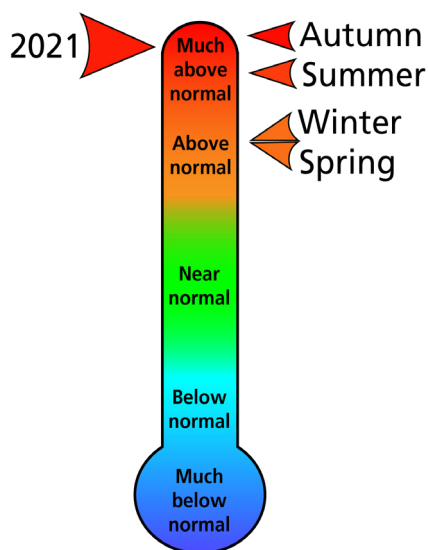


Figure 1. Seasonal and annual temperature rankings. An arrow at the top of the figure would represent the warmest year/season on record (since 1895); at the bottom, the coldest year/season on record. Data are available at <https://www.ncdc.noaa.gov/cag/county/rankings>.

Month/ Year	Average temperature (°F)	Departure from average (°F)
January	36.5	+2.0
February	36.6	+0.2
March	49.2	+4.2
April	56.2	+1.6
May	63.5	-0.5
June	74.2	+2.2
July	77.9	+1.8
August	77.6	+3.2
September	69.9	+1.9
October	63.5	+6.8
November	45.0	-1.0
December	46.0	+9.0
2021	58.0	+2.6

Precipitation

In 2021, the park experienced the 36th driest year since 1895 (Figure 2). In total, 38.1 inches of precipitation fell, approximately 4 inches less than the long-term average (Table 2).

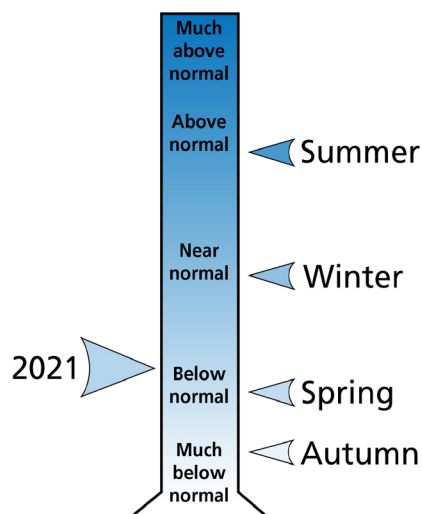


Figure 2. Seasonal and annual precipitation rankings. An arrow at the top of the figure would represent the wettest year/season on record (since 1895); at the bottom, the driest year/season on record. Data are available at <https://www.ncdc.noaa.gov/cag/county/rankings>.

Table 2. Monthly and annual total precipitation and departure from long-term averages. Departures from average are based on a comparison of 2021 precipitation to relevant averages from 1895–2020. Data are available at <https://www.ncdc.noaa.gov/cag/county/time-series>.

Month/Year	Total precipitation (in.)	Departure from average (in.)
January	1.98	-1.12
February	3.94	+1.18
March	2.89	-0.60
April	2.83	-0.52
May	1.90	-2.00
June	4.11	+0.06
July	4.62	+0.44
August	7.30	+2.91
September	2.89	-0.81
October	3.95	+0.60
November	1.13	-1.82
December	0.59	-2.54
2021	38.12	-4.25

Temperature and Precipitation (1895–2021)

Data for counties surrounding the park indicate that annual average temperature has increased approximately +0.19 °F per decade and annual total precipitation has increased approximately +0.22 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 2.9–8.8 °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 01/10/22.

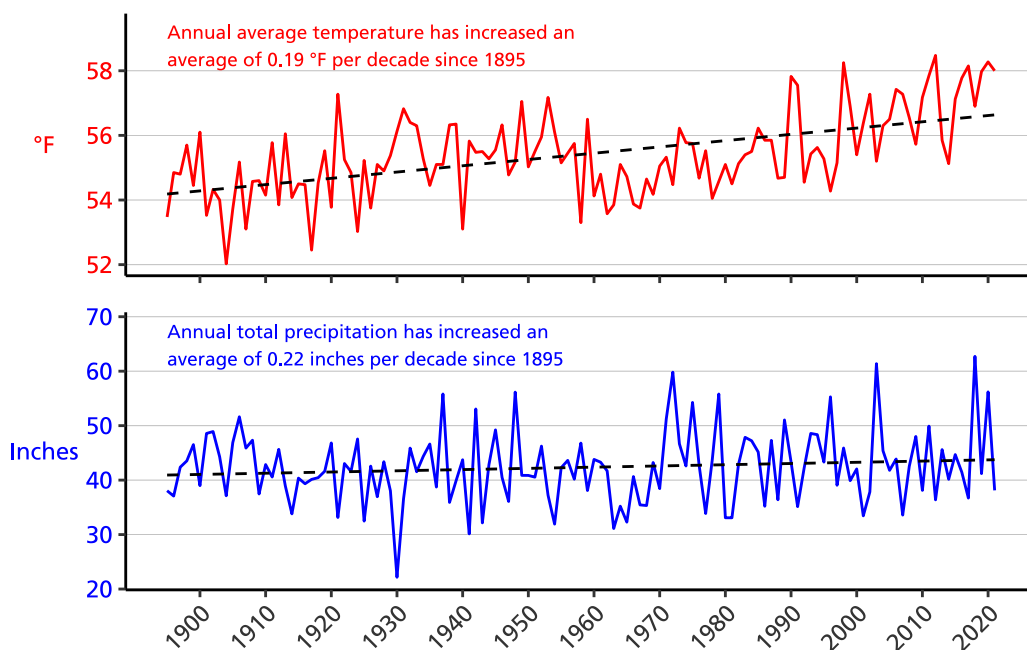


Figure 3. Annual average temperature (°F) and annual total precipitation (in.) from 1895–2021 for counties surrounding the park. Dashed lines represent linear estimates of change. Data are available at <https://www.ncdc.noaa.gov/cag/county/time-series>.

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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