



2012

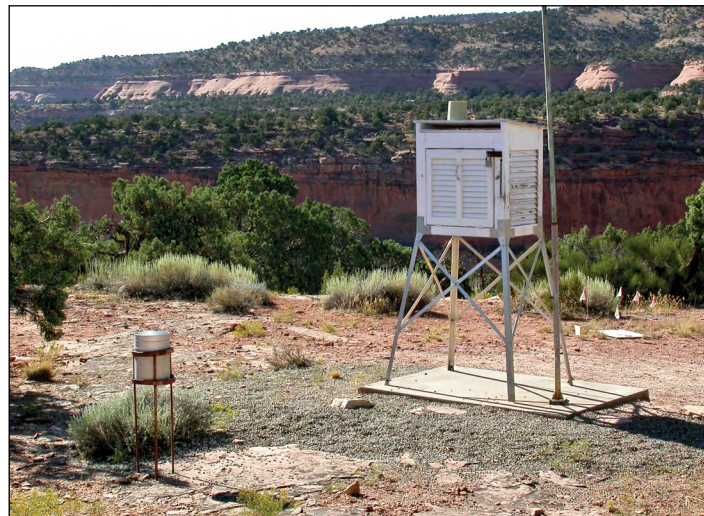
Climate Monitoring

Importance

Because of its crucial role in driving or regulating many biological and physical processes at the landscape scale, climate has been identified as a vital sign for all Northern Colorado Plateau Network (NCPN) parks. Precipitation and temperature are the primary factors that limit an ecosystem's structure and function. Secondary limiting factors include long-term climate patterns: the length and intensity of weather events, seasons in which they occur, and amount of variability between and among years. Together, these dynamics greatly influence the types of plant species that occur, and where; the ways in which nutrients are cycled; and the relationships between soil, plants, and water availability. They can also affect the susceptibility of an ecosystem to disturbance.

Monitoring Effort

The overarching goal of NCPN climate monitoring is to compile and present climate data in a form that helps us to understand the reasons for trends seen in other network vital signs monitoring efforts. The NCPN compiles climate data from two regional climate monitoring programs, including data from 19 weather stations in and around NCPN parks. Parks are then provided with monthly and annual summaries of variables such as air temperature, precipitation, and snowfall.



Cooperative weather station, Colorado National Monument.

Status and Trends

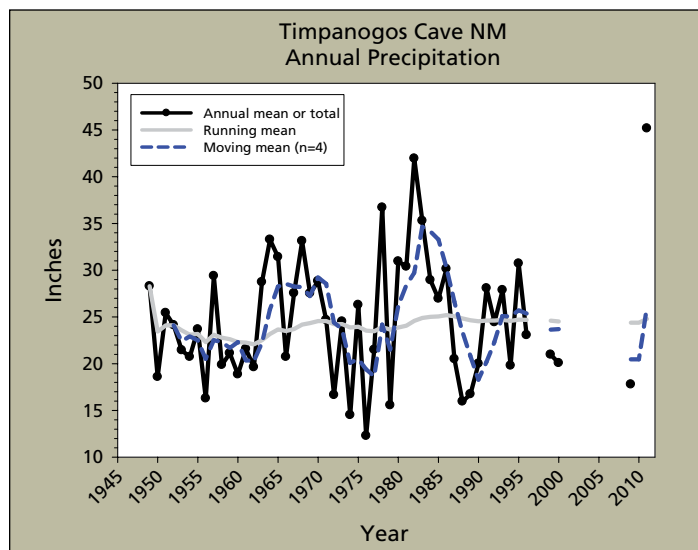
In 2011, mean annual maximum temperature tended to be below average while mean annual minimum temperature and total snowfall were average to below average throughout much of the NCPN region. There were no clear precipitation patterns, but it is notable that the weather station at Timpanogos Cave National Monument reported total annual precipitation 20 inches higher than the historical average, while total annual snowfall was more than 50 inches below historical averages. Differences between long-term means and this year's measures of average minimum and maximum temperature, total precipitation, and total snowfall were not related to elevation gradient.

A general increase in the four-year composite, moving mean for mean annual minimum temperature is evident for most of the weather stations in the NCPN over the past 25–50 years. There is evidence for a declining trend in snowfall from the 1980s to the mid-2000s, but during many of the last few years, snowfall exceeded long-term averages. Historical records for NCPN weather stations indicate that annual precipitation has been highly variable. Strong unidirectional trends for total precipitation and mean annual maximum temperature are not readily evident over the observation periods (8–84 years).

Climate is monitored in all NCPN parks except for Golden Spike National Historic Site. [Annual reports](#) on NCPN climate monitoring are available at the network's web site.

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Annual precipitation for Timpanogos Cave National Monument exceeded historical averages by 20 inches. Snowfall was more than 50 inches below historical averages in 2011.