

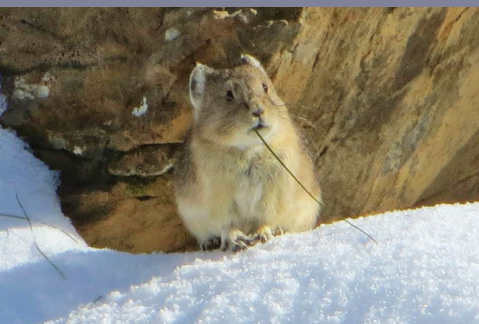


Climate Monitoring

*in the Northern Colorado
Plateau Network*



Long-term changes in climate patterns have the potential to touch every aspect of our ecosystems.



PHOTOS

FROM TOP: SUMMER STORM, CANYONLANDS NATIONAL PARK (NPS/A. WASHUTA); PONDEROSA PINE, BRYCE CANYON NATIONAL PARK (NPS/A. WASHUTA); PIKA (A. W. BIEL)

Why Monitor Climate?

Climate plays a crucial role in driving or regulating many ecological processes at the landscape scale. Precipitation and temperature are two of the primary factors that limit an ecosystem's structure and function. Secondary factors include long-term climate patterns and the amount of variability between years. Together, these dynamics greatly influence which plant species occur where; how nutrients are cycled; and the relationships between soil, plants, and water availability. They can also affect the susceptibility of an ecosystem to myriad disturbances—including future climate events.

What's the Most Recent News?

For several years, the NCPN compiled climate data from two regional climate monitoring programs and then provided parks with monthly and annual summaries of climate variables.

More recently, after consulting with park staff about how to make our climate monitoring program more useful, we switched the focus of this protocol toward interactive, user-defined data presentation. Network staff started working with developers for *The Climate Analyzer*, an interactive website that allows users to create custom graphs and tables from historical and current weather-station data that update every 24 hours (see page 2).

In addition to the main website, which focuses on historical data, *The Climate Analyzer* offers “dashboards” that present current conditions, forecasts, and recent data for numerous weather stations in one easy-to-access location. The dashboards also present the current condition

of drought severity in the region through a link to the U.S. Drought Monitor. Climate dashboards are currently available for Dinosaur National Monument and the Southeast Utah Group parks. In the future, we plan to work with the developer to add more climate dashboards.

How is the Information Used?

The overarching goal of NCPN climate monitoring is to compile and present climate data in a way that helps us to understand the reasons for trends seen in other network vital signs. Given the customization capability of *The Climate Analyzer*, however, park staff should be able to use it to answer many resource-related questions.

Where is Climate Monitored?

All network parks have at least one climate station with data available to users via *The Climate Analyzer*.

How is the Monitoring Done?

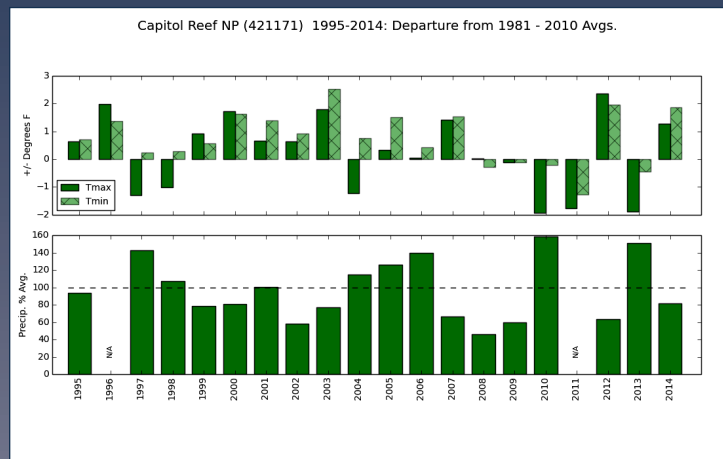
The Climate Analyzer draws its data from multiple sources in and near NCPN parks, including the National Weather Service (Cooperative Observer Network and Remote Automated Weather Stations), the USDA Natural Resources Conservation Service (SNOTEL stations), and the U.S. Geological Survey (stream gages), and a variety of other met stations and dataloggers. All of these data update every 24 hours.

How Can I Learn More?

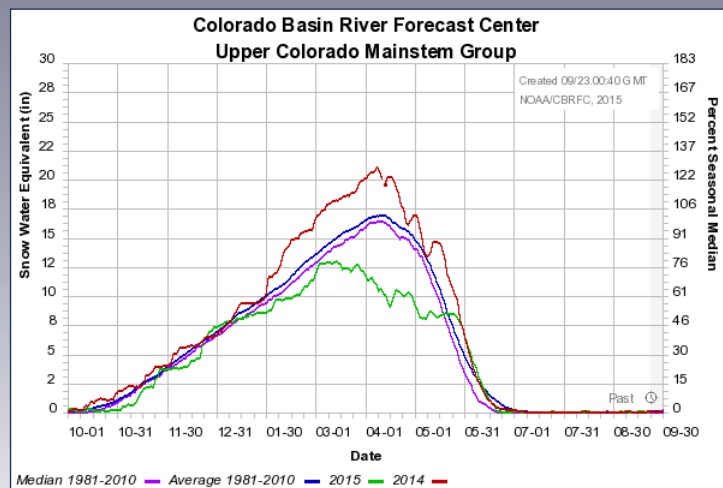
Visit <http://go.nps.gov/NCPNclimate>, http://www.climateanalyzer.org/NCPN/map_html, or contact dana_witwicki@nps.gov.



Got Questions? The Climate Analyzer Has Answers!



This figure of 30-year departures from the average illustrates the warm, dry year of 2012 and the cooler, wetter year of 2013. Weather in 2014 varied across the region, but was a little warmer and drier than average at Capitol Reef National Park.

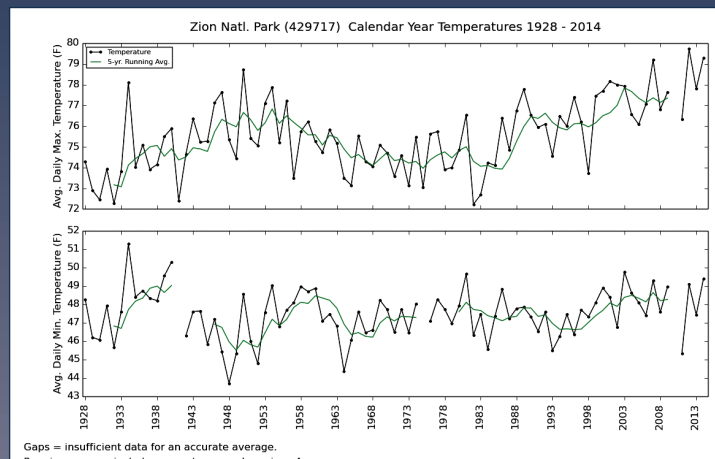


One of the features on the climate dashboards is a graph of snow water equivalent for watersheds of major rivers in the NCPN. These can be used to help predict spring runoff, which has helped our staff to plan big rivers monitoring trips.

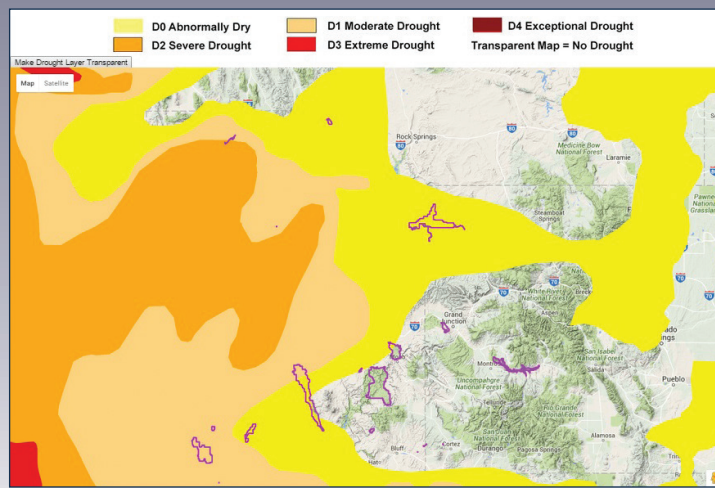
Using data from four types of climate stations in and around NCPN park units, The Climate Analyzer walks users through a series of questions that help them obtain the averages, totals, or other summaries needed for analysis of a given time period. The language and parameters used vary from fairly technical (“Interpolated Precipitation Average compared to long-term”) to non-technical (Precipitation during many years). Information may be requested in graphs or tables.

The range of options varies by parameter type. Users can investigate data related to temperature and precipitation, snowfall and snowpack, and stream flow and water temperature in NCPN parks. Our ecologist generated the graphics on this page at a rate of about one per minute. From the information she requested, she was able to determine that:

- 2012 was a warm and dry year, especially during the first half of the growing season.
- 2013 was cooler and wetter in many parts of the region but closer to average in other areas. Many places were especially wet in late summer and fall.
- 2014 was a fairly average year for temperature and precipitation, though some areas were a little warmer than average. Precipitation varied across the NCPN region.
- As of October 15, 2015, much of the NCPN region was no longer in a drought. Moderate drought was indicated for western and northern areas.



The temperature record for Zion National Park is the longest of any NCPN park. While minimum temperatures are on the rise at many other NCPN parks, the three years with the highest maximum temperatures on record at Zion occurred within the last 10 years.



The Climate Analyzer makes it easy to see which areas of the network are considered to be experiencing drought conditions (and which are not).