

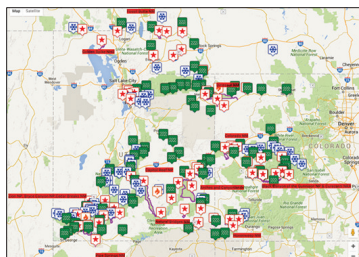


Natural Resource Monitoring at Black Canyon of the Gunnison National Park

The Northern Colorado Plateau Network

In 16 parks across four western states, the [Northern Colorado Plateau Network](#) (NCPN) is dedicated to providing National Park Service (NPS) managers with the information they need to make sound, science-based decisions. By conducting long-term monitoring of key indicators of ecological integrity, or “vital signs,” we help inform managers about the health of park resources and provide early detection of potential problems. In this way, we support the NPS mission of preserving the resources of America’s most special and treasured places for future generations. This brief describes recent NCPN activities at [Black Canyon of the Gunnison National Park](#).

Climate



NCPN weather stations.

The NCPN recently moved its [climate](#) monitoring toward interactive, user-defined data presentation. Network staff are working with developers of [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. Parameters include temperature and precipitation, snowfall and snowpack, and stream flow and water temperature. In July 2014, an NCPN version of [The Climate Analyzer](#) was launched, with data now available for each network park. In addition, “Climate dashboards” for Dinosaur NM and the Southeast

Utah Group parks (Arches NP, Canyonlands NP, Hovenweep NM, and Natural Bridges NM) 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. A dashboard for Black Canyon of the Gunnison NP and Curecanti NRA is currently under development. The page will continue to be refined as we receive feedback from users. More information can be found in our [2015 climate monitoring brief](#).

Landbirds



Pinyon jay.

The NCPN is partnering with the Bird Conservancy of the Rockies (BCR; formerly the Rocky Mountain Bird Observatory) to assess trends in breeding [bird](#) species in three habitats: lower riparian (LR), pinyon-juniper (PJ), and sage shrubland (SA). In 2014, the tenth year of monitoring was completed. In 2014, BCR recorded 1,421 birds of 68 species in PJ habitats across nine network parks, and 1,960 birds of 78 species in SA habitats across five network parks—including one PJ and one SA transect at Black Canyon of the Gunnison NP. Each loca-

tion was surveyed once. Throughout the network, BCR recorded 48 bird species of conservation or management concern and estimated densities for 29 of those species. As additional years of data accumulate, long-term trends underlying annual fluctuations will be revealed. Long-term monitoring will continue to be necessary for interpreting population status and trends for avian species of the NCPN. Reports for all years are available at http://go.nps.gov/NCPN_LBreports.

Water Quality

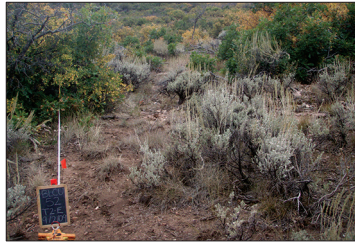


Red Rock Canyon.

In 2014, the NCPN published its third [water quality report](#), focusing on water years 2010–2012. These reports compare the data collected to state [water quality](#) standards. At Black Canyon of the Gunnison NP, over 96% of evaluations met state water quality standards. The Gunnison River had no indications of impairment. An irrigation return flow in Red Rock Canyon failed to meet state stan-

dards for selenium and bacteria, which may indicate fecal contamination. Total phosphorus was also higher than recommended on several occasions. In 2015, we made 14 years of water-quality data available to the public through the U.S. Environmental Protection Agency's online STORET database.

Uplands



Gambel oak shrubland.

At Black Canyon of the Gunnison NP, the NCPN monitors Gambel oak shrublands, pinyon-juniper woodlands, and sagebrush shrublands. This protocol measures soil stability, hydrologic function, and plant community characteristics, including vegetation and surface cover, density of woody species, and fuels. Its goal is to increase understanding of [upland](#) systems and provide park managers with early warning of undesirable change.

Monitoring at Black Canyon of the Gunnison NP began with a pilot study in 2008, followed by full implementation of the sampling design in 2011. In 2015, network staff completed the eighth year of monitoring at the park. Network staff are currently working on long-term trend reports for uplands at Canyonlands and Capitol Reef national parks. After those documents are complete, we will begin reporting for additional parks.

Big Rivers



Gunnison River.

The NCPN surveys geomorphology, monitors vegetation, and analyzes remote-sensing imagery on the network's [big rivers](#). This monitoring tracks the potential for channel simplification—a process that may result from increasing demands for water (and reduced flows) in the Colorado River watershed. Channel simplification may narrow the river channel, reduce the variety of geomorphic surfaces and habitats, disconnect the river from its floodplain, and alter riparian vegetation and biodiversity, placing both ecological and recreational

resources at risk. In 2014, an instantaneous peak flow of 9,650 cfs (cubic feet per second) was recorded at Black Canyon of the Gunnison NP, which was the highest flow recorded since 1995. Initial results indicated that these flows cleared some monitoring sites of colluvium (loose sediments) that had accumulated from side canyons. In 2015, NCPN completed the fourth and fifth years of monitoring at the Red Rocks and East Portal monitoring sites, respectively.

Land Surface Phenology



NASA

MODIS image of Earth, with an opening in cloud cover over the Colorado Plateau.

The NCPN is working with cooperators at Pennsylvania State University and Northern Arizona University to develop software that automates processing of MODIS (moderate resolution imaging spectrometer) satellite imagery. The greenness of Earth's surface, as measured by the MODIS satellite, provides a way to [track soil moisture and](#)

[vegetation condition](#) across large spatial scales in remote areas at 16-day intervals. These satellite data are being used to interpret climate effects on vegetation in NCPN parks. The data are being analyzed in conjunction with data from NCPN uplands monitoring to determine if observations from space match what we see on the ground.

Additional Efforts

In addition to the projects described in this brief, the NCPN also monitors [air quality](#), [invasive ex-](#)

[otic plants](#), and [landscape dynamics](#) at Black Canyon of the Gunnison National Park.

For more information

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