



Natural Resource Monitoring at Arches National Park



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First light on Turret Arch, framed by North Window, Arches National Park.

The Northern Colorado Plateau Network

The Northern Colorado Plateau Network (NCPN) covers a geologically and biologically diverse region comprising 16 national parks in four western states. These parks contain desert grasslands, shrublands, forests, caves, large rivers, perennial streams, seeps, springs, and striking geology. Invasive species, trampling and grazing by livestock, and adjacent land-use activities are some of the most significant threats to NCPN parks. The NCPN is designing and implementing a long-term monitoring program to measure key indicators of ecological integrity, or “vital signs.” Multiple monitoring efforts will help inform managers of the health of park resources and provide early detection of potential problems. This brief describes recent NCPN activities at Arches National Park.

Nutrient Enrichment



Colorado River.

NPS/A. Wright

Nutrient impairment by nitrogen (TN) and phosphorus (TP) deposition is a primary cause of water-quality degradation nationwide. In response to recent state efforts to develop numeric nutrient water-quality criteria, the U.S. Geological Survey and NCPN published a report on nutrient concentrations in streams and rivers near and in NCPN parks during 1972–2007. Most sites showed either no trends or downward trends in TN or TP concentrations, which may be linked to improved man-

agement of water resources. Although negative changes may indicate cause for concern, some cases of elevated nutrient concentrations were likely the result of natural processes, such as geologic weathering. At Arches NP, four stream sites persistently exceeded TN criteria while only one site persistently exceeded criteria for TP. Two sites had downward trends in TN and two sites had downward trends in TP. The full report is available at <http://pubs.usgs.gov/sir/2012/5043/>.

Springs and Seeps



Alcove columbine.

NPS

Spring-flow monitoring continued at three sites, one of which is a former Southeast Utah Group water quality monitoring site. Core water quality measures of pH, specific conductance, and water temperature were measured as part of the springs monitoring program for the first time. An analysis of spring-flow data indicated that from 2001 to 2011, two of the sites saw decreases in flows of approximately 37% and 55%, while one site remained stable. The root caus-

es of the declines are not apparent. Vegetation monitoring methods were tested at 15 hanging garden sites in 2012–2013. Two observers independently counted endemic plants to determine whether this is a repeatable measure for long-term monitoring. Data have undergone a preliminary evaluation, but additional data are needed to determine our long-term ability to detect trends in endemic plants at hanging gardens.

Wadeable Streams



Courthouse Wash.

The NCPN monitors wadeable streams in selected riparian areas, which involves the collection of biological and physical measures, such as riparian vegetation, non-native species invasions, streamflow, alluvial groundwater dynamics, and changes in channel form. Credible, efficient monitoring approaches will help the NCPN to assess riparian-system health and provide early warning of system degradation. Monitoring of Courthouse Wash began in 2010 and has expanded each year since. To date, five integrated monitoring reaches have been sampled for vegetation, cross-sections of the chan-

nel and the location of the thalweg have been surveyed at four reaches, and shallow groundwater-monitoring wells have been installed at one reach. In 2013, one new reach was established, vegetation was sampled at two reaches, geomorphology surveys were performed at three reaches, and hydrologic monitoring continued at the one reach with shallow groundwater wells. The proposed monitoring plan for Arches NP includes monitoring seven reaches throughout the wash, and should be fully implemented in 2016.

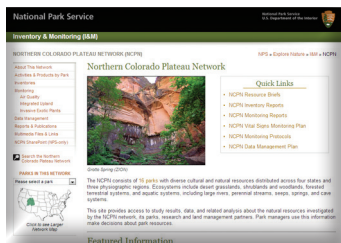
NCPN on Facebook



Since its inception in July 2012, the [NCPN Facebook page](#) has quickly become the most popular I&M page on the site. What started out as an effort to keep park staff better informed about our activities has turned into an opportunity to talk to several hundred people each day about science in the national parks and our contribution to it. Photos and posts from the field (our most popular content) help people to know who we are and what we do, and put

a human face on our program. As of October 2013, the NCPN page had 975 followers. Most lived in the Colorado Plateau area, but 16% hailed from 44 foreign countries. We usually reach about 1,000–1,500 people each week, but that number has risen into the several thousands on occasion. The goals of the page, and the barometers by which we gauge success, are evolving, but to this point we feel that the rewards have been worth the effort.

Website Re-design



It's now easier to find everything you need from us at the [NCPN website](#). The network staff has completed the website re-design process planned for all 32 I&M networks. The result is a streamlined site that is easier to navigate. Each network park also has its own page where users can go to find out what the network is do-

ing at that park and access all NCPN products and publications relative to that park. The site continues to offer interactive features, such as the ability to retrieve a current park species list, and is more tightly integrated with the IRMA Data Store, which allows new publications to be posted to the site more quickly.

Budget Sequester Impacts



U.S. Capitol.

The federal budget sequestration begun in March 2013 forced the suspension of some NCPN monitoring activities this year. Decisions about which vital signs would not be monitored were made in discussions between network staff and staff at each NCPN park. The Southeast Utah Group, which spread their sequestration cuts across the four parks they manage, chose to suspend the pinyon-juniper and grasslands portions of uplands monitoring

at Arches NP, and wadeable streams monitoring at Natural Bridges NM. If the sequestration budget cuts are continued into Fiscal Year 2014, then network staff, park staff, the Technical Committee, and Board of Directors will have to have a detailed discussion that re-examines all vital signs and develops a strategic, longer-term approach to monitoring activities under the reduced funding levels.

Additional Efforts

In addition to the projects described in this brief, the NCPN also monitors air quality, landscape dynamics, land surface phenology, cli-

mate, water quality, uplands, and landbirds at Arches National Park.

For more information

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