



Streams and Lakes Monitoring



Stella Lake, Great Basin National Park. (NPS / Mark Lehman)

Background

Lakes and streams in Great Basin National Park (GRBA) provide habitat for aquatic and terrestrial organisms, contribute to local water supplies, and are popular visitor destinations. Aquatic and associated riparian resources are disproportionately important compared to the land area they cover because they often host endemic biota, and many riparian and terrestrial species rely on aquatic habitats during part of their life cycle. For example, up to 80% of all invertebrates in the western United States depend on riparian areas for at least half of their life cycles, and more than half are completely dependent on riparian habitats.

Because Great Basin is so remote, water quality in streams and lakes is generally excellent. Measured water quality and chemistry parameters will be compared to regulatory limits. The benthic macroinvertebrate assemblages observed in the streams are consistent with healthy ecosystems. Macroinvertebrates are reliable indicators of water quality because they spend all or most of their lives in water, are easy to collect, and differ in their tolerance to pollution.

What are the Threats to Lakes and Streams?

As these streams and lakes are fed primarily by snowmelt, they are vulnerable to climate change impacts. Alterations of the hydrologic cycle related to climate change could include less discharge and changes in timing of discharge. Additional changes could include increased water temperatures and other effects on water quality.

Monitoring Streams and Lakes

The Mojave Desert Inventory and Monitoring Network (MOJN) monitors all nine perennial streams and six sub-alpine lakes (Figure 1). The overarching goal of the network's aquatic monitoring is to obtain information that will aid in the assessment, conservation, and restoration of surface water resources.

Monitoring Objectives

Monitoring of streams and lakes targets current status and long-term trends in water quality, quantity, and chemistry; macroinvertebrate assemblages (streams only); and ice-free season length (lakes only).

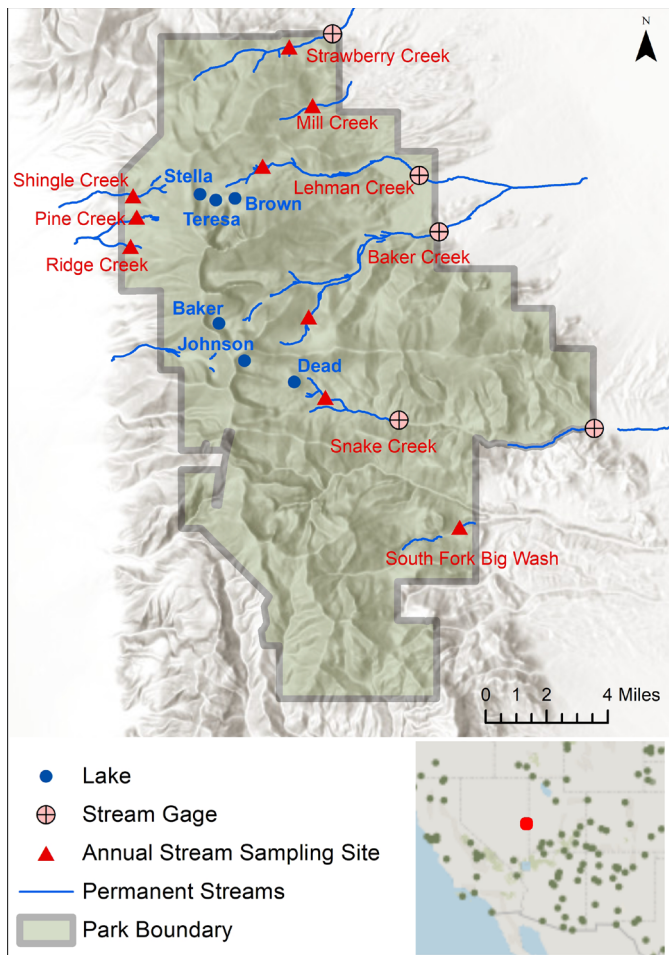


Figure 1. Lakes and streams monitoring locations, Great Basin National Park. Scientists collect these data: continuous water level, ice on/ off dates, and water chemistry, quality, and clarity (**lakes**); continuous discharge and water quality (**stream gages**); and benthic macroinvertebrates, water chemistry and quality (**annual stream sampling sites**).

Monitoring Questions

Perennial Streams: 1) What are long term trends in the quantity and seasonal patterns of discharge? 2) What is the status of and what are the trends in water chemistry? and 3) What is the status of and what are the trends in benthic macroinvertebrate assemblages?

Lakes: 1) Are water levels or the lake ice-free season changing over time? and 2) What is the status of and what are the trends in water chemistry?

More Information:

The [protocol narrative](#) and [standard operating procedures](#) for streams and lakes monitoring were published in 2012.

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Sample Design

Target populations for the streams monitoring include nine perennial streams for the annual water chemistry and benthic macroinvertebrate sampling. Discharge and core water quality parameters (temperature, specific conductance, dissolved oxygen, and pH) are monitored continuously at high flow.

The target population for lakes monitoring includes all six lakes. Lake level and temperature data are collected year-round with continuous measuring instruments. Water chemistry samples and core water quality parameters are collected once per year in September.

Management Applications

Streams and lakes monitoring will:

- Provide aquatic information for resource management planning and reporting efforts.
- Contribute to the protection and restoration of aquatic ecosystems.
- Generate research questions and provide a rich data set that can be a springboard for research projects.
- Assist with evaluation of whether water quality is in compliance with state standards and provide a foundation for working with other agencies to influence state and federal policies affecting water quality.



Collecting stream water quality measurements. NPS photo.

To learn more about the Mojave Desert Network Inventory and Monitoring Program, please visit our website at: <https://www.nps.gov/im/mojn/index.htm>

