



Desert Springs Monitoring



Monitoring a desert spring in Death Valley National Park. (NPS / Clarice Wheeler)

Background

Springs are natural water sources that form where groundwater reaches the land surface. They can range in size from seasonal seeps that go dry in the summer to perennial streams that flow all year long and support large wetland environments. Climate is the main driver of the groundwater system that recharges springs (Figure 1).

Compared to the surrounding desert, spring and wetland environments in the Mojave and Great Basin regions support a greater abundance and diversity of plant and animal life. Large mammals, like big-horn sheep and mountain lions, depend on springs to survive the harsh summer months. Many birds also depend on springs during their migratory seasons. Reliable water sources are scarce, so springs are often vital to the distribution and connectivity of wildlife habitat.

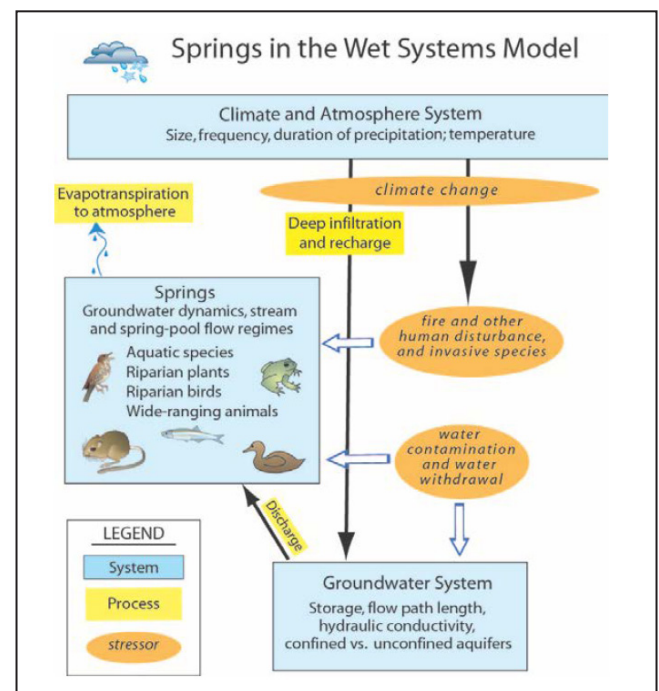


Figure 1. Springs in wet systems model (Chung-MacCoubrey et al. 2008).

What are the Threats to Desert Springs?

Springs are vulnerable to several stressors, including climate change. Warming temperatures have been documented in six Mojave Desert Network (MOJN) parks. Higher air temperatures can lead to increases in water consumption by existing vegetation, changes in vegetative communities, and changes in patterns of wildlife use. Springs fed by small, local aquifers are vulnerable to drought, with changes ranging from lower discharges and reduced aquatic habitat to seasonal or year-round drying.

Other stressors include groundwater withdrawal, surface water diversion, recreation, pollution, livestock grazing, invasive species, and illegal activity that damages spring habitat or harms animals or plants.

Monitoring Desert Springs

MOJN monitors the health of nearly 240 desert springs across five network parks – Death Valley, Joshua Tree, Lake Mead, Mojave, and Parashant.

Given the ecological importance of springs and the threats they face, MOJN's goal is to help inform resource management decisions and strategies by addressing the following monitoring questions:

1. *Is water availability at springs changing over time?*
2. *Is water quality at springs changing over time?*

To answer these monitoring questions, MOJN scientists collect long-term data that will allow them to detect changes in spring health across the parks. These data help them determine and assess the following measurable objectives:

1. *Status and trends of water availability (flow condition, discharge, and surface water dimensions).*
2. *Status and trends of water quality (temperature, pH, specific conductance, and dissolved oxygen).*

More Information:

The [protocol narrative](#) and [standard operating procedures](#) for desert springs monitoring were published in 2018.

Jennifer Bailard, Project Lead

Email: jennifer_bailard@nps.gov; Phone: 702-293-8731

Allen Calvert, MOJN I&M Program Manager

Email: allen_calvert@nps.gov; Phone: 702-293-8856



Scientist collects water quality data at a spring in Joshua Tree National Park. (NPS / Jennifer Bailard)

Sample Design

Field crews collect data at 120 springs each field season. Some springs are monitored every year, while other springs are monitored on a three-year rotating cycle.

Management Applications

Desert springs 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.
- Document types and levels of anthropogenic disturbance associated with monitored springs.

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>

