



# Springs, Seeps, and Hanging Garden Community Monitoring

2007

## Importance

Springs, seeps, and hanging gardens provide essential water, food resources, and wildlife habitat, and are important oases of biodiversity and productivity in desert landscapes that typically exhibit low productivity. Because of their inherent fragility, spring and seep ecosystems are sensitive to a variety of human activities that have reduced the ecological integrity of these ecosystems through recreation, groundwater diversion, and livestock grazing. Monitoring spring and seep ecosystems will enable a more thorough understanding of the impacts of human activities on these ecosystems.

## Long-term Monitoring

The primary goal for long-term monitoring of springs, seeps, and hanging gardens is to assess trends in key indicators of spring and seep ecosystem health. To establish a starting point, the Northern Colorado Plateau Network and Southern Colorado Plateau Network, in collaboration with Northern Arizona University, conducted a baseline inventory of springs across both networks. Data were collected on discharge, water quality, plant diversity, and invertebrate diversity and abundance. This information will serve as the basis for selecting future core monitoring parameters. Given the fragile nature of these areas, the monitoring design will attempt to minimize observer impact.

## Monitoring Objectives

Preliminary objectives for springs and seeps monitoring are to:

1. Determine long-term trends in discharge;

Upper  
Grotto  
Spring, Zion  
National  
Park.



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2. Determine long-term trends in core and site-specific water chemistry parameters;
3. Determine long-term trends in habitat area;
4. Determine long-term trends in vegetation composition and structure; and
5. Determine long-term trends in diversity and abundance of aquatic and riparian invertebrates.

## Management Applications

Information gathered from this monitoring will be used to:

- Identify ecologically impaired springs and seeps;
- Identify priority restoration needs for springs and seeps;
- Establish regional abundance and diversity of vegetation and invertebrates in Colorado Plateau springs and seeps; and
- Improve understanding of spring and seep ecosystems in parks.

## Contact

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Measuring  
discharge at  
Lower Echo  
Canyon  
Spring,  
Colorado  
National  
Monument.

## Network park units where springs, seeps, and hanging gardens will be monitored

|                                 |                    |
|---------------------------------|--------------------|
| Arches NP                       | Dinosaur NM        |
| Black Canyon of the Gunnison NP | Hovenweep NM       |
| Canyonlands NP                  | Natural Bridges NM |
| Capitol Reef NP                 | Zion NP            |
| Curecanti NRA                   |                    |

NP = National Park; NM = National Monument; NRA = National Recreation Area