



Monitoring Aquatic Macroinvertebrates

Importance

Aquatic macroinvertebrates, such as insect larvae, crayfish, snails, and worms, play a vital role in stream ecosystems, both as a food source and as consumers of algae and other organic matter. Because macroinvertebrates are sensitive to environmental change, monitoring them can help us to detect chemical, physical, and biological impacts to aquatic ecosystems. Long-term macroinvertebrate monitoring will complement water quality assessment methods, thus providing a more complete evaluation of overall stream health. Because the four states represented within Southern Colorado Plateau Network (SCPN) parks (AZ, CO, NM, UT) all use macroinvertebrates as part of their water quality monitoring programs, SCPN monitoring efforts will also contribute to a broader regional understanding of aquatic conditions.

Sampling aquatic macroinvertebrates along the Mancos River, Mesa Verde NP.



SYMONI THOMAS

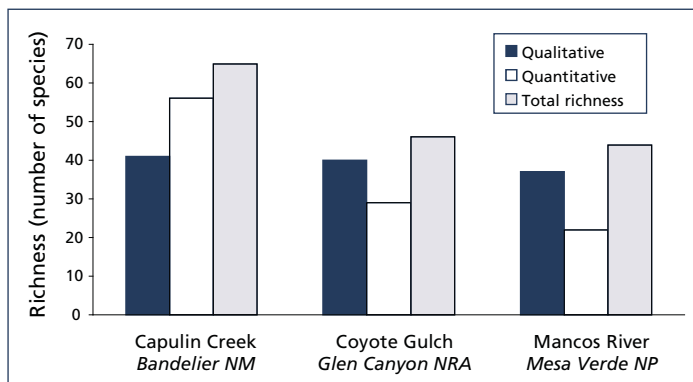
Long-term Monitoring

In five SCPN parks, aquatic-macroinvertebrate assemblages are monitored annually along 1–3 reaches of selected streams. Two types of samples are collected from each reach: (1) quantitative samples from five riffle habitats, and (2) one pooled qualitative sample from

all available habitats within the reach (see graph). Basic water quality measurements and physical habitat characteristics (e.g., water depth, water velocity, canopy closure, and substrate size) are also collected within each stream reach. Monitoring began in 2007, with reaches established in three parks. Additional reaches will be established in 2008.

Management Applications

Human-caused stream alterations can lead to structural and



Species-richness estimates from 2005 pilot monitoring.

functional changes to aquatic ecosystems. Land uses can pollute streams or otherwise affect the condition of aquatic resources, and disturbance events may contribute to accelerated erosion and increases in suspended and bedload sediment. Persistent changes in climate can affect the composition, structure, and functioning of aquatic ecosystems, and climate-related changes in precipitation patterns and temperature typically interact with existing anthropogenic stressors.

The first few years of monitoring data will be used to document baseline conditions in SCPN streams. Over the long term, macroinvertebrate data will be used to (1) examine responses of aquatic life to changing water quality or physical habitat conditions, (2) follow the recovery of aquatic-macroinvertebrate assemblages after major disturbance events, such as catastrophic fires and floods, and (3) document changes in macroinvertebrate community structure in response to climate change.

Contact

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Network park units where aquatic macroinvertebrates are being monitored

Park	Site(s)
Bandelier NM	Capulin Creek, Rito de los Frijoles
Canyon de Chelly NM	Tsaile Creek
Glen Canyon NRA	Coyote Gulch, Wahweap Creek
Grand Canyon NP	to be determined
Mesa Verde NP	Mancos River

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