



Water Quality Monitoring in CUPN Parks

Importance

The CUPN Water Quality Monitoring Program has been collecting samples since December 2002. With 103 sites in all 14 parks sampled on a set rotation the program is developed primarily from protocols of the USGS National Water Quality Assessment.

The CUPN Water Quality Program is designed to provide an integrated assessment of the spatial and temporal distribution of general water-quality conditions and the transport of major inorganic constituents of stream water in relation to hydrologic conditions and major sources.

Fixed-date monthly, bi-monthly, or quarterly sampling, schedule based upon the park's Water Resources Ranking, provides comparative statistics for the selected sites and parameters under variable flow conditions.

Sampling locations are either integrator sites (locations commonly at tributary confluences or springs which are representative of water quality issues within individual sub-basins) or indicator sites (locations downstream from either suspected or documented water quality threats or with pristine conditions).

Preliminary Monitoring Objectives

1. Fundamentally, the data from this program will form a backdrop to compare changes in the aquatic biologic communities.
2. Violations of state designated use water quality standards will be detected.
3. Stressors, such as land uses and land-use change within the watershed, will be monitored.
4. Regional effects of atmospheric contaminants (acid precipitation) can be determined.
5. Potential pollutant sources can be determined (non-point source contaminants versus point-sources).
6. Impacts to water quality by in-park activities within selected watersheds will be assessed.

Status and Trends

The CUPN began collecting water samples as early as December 2002 in some parks. As each park undergoes at least one year of inactivity, there are not enough data to describe trends. However, water quality status can be discussed. The CUPN uses the Designated Use Standards from each state and each water body as a means of status, or performance attainment. At this point each of the 103 CUPN water quality locations have been sampled at least 12 times. Only one site, Tilgham Branch at SHIL is not meeting designated use standards. The dissolved oxygen at this stream is typically below the TN standard for Fish and Wildlife of 5.0mg/l.

Contact

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Joe Meiman at Sinking Spring, ABLI. Photo by Katie Seadler.

Management Applications

To better understand threats to the aquatic ecosystems it is necessary to have a basic understanding of the relationship between park waters and their watersheds. Many parks within the CUPN are recharged by land outside park boundaries. Each land-use that occurs within a particular watershed contributes to the overall water quality. It must be noted that the parks themselves are not immune to contributing to water pollution, including roadways, parking lots, developmental erosion, pesticide and fertilizer use, and septic fields. Some land-uses produce contaminants, which can be divided into three main categories:

Acute Non-Point Source: Agricultural pollutants (animal waste, suspended sediments, and pesticides) and some urban pollutants (parking lot and road runoff) accumulate on the surface in virtual storage until they are washed into the streams or aquifers during rainfall events. Each year thousands of tons of sediments, animal wastes, nutrients, and pesticides are introduced into the streams of CUPN parks from these lands.

Chronic Non-Point Source: From land-uses such as oil and gas exploration and production (hydrocarbons and brines), urban development (septic waste), and agriculture (wastes deposited directly into streams), these pollutants are released into the watersheds at a relatively steady rate, regardless of precipitation. Precipitation itself, the ultimate source of waters in our network parks can bring its own assortment of contaminants, ranging from anthropogenic acids and pesticides.

Point-Source: Traversing the watersheds of many parks are transportation corridors. These roadways and railroads are sources of spills of hazardous materials. Any contaminant released along these routes is quickly washed into park streams.