

Rivers & Streams Monitoring

FACT SHEET



Rivers and streams monitoring data are important indicators for determining compliance with water quality standards, tracking general water quality trends, and identifying pollution problems.

Historically, most water quality rivers and streams monitoring performed by the Oklahoma Water Resources Board (OWRB) has occurred at targeted sites, such as bridges over large rivers and streams. While this type of monitoring provides helpful information for specific sites, it does not give a comprehensive view of the overall condition of Oklahoma's rivers and streams.

An integrated approach to monitoring is required to answer the following questions:

How good is the water quality of Oklahoma's rivers and streams?

What is the condition of all rivers and streams in Oklahoma?

To answer these questions, the OWRB has implemented probabilistic monitoring, which involves random selection of river and stream reaches across the entire state to be sampled. Sites are determined by a computer program that gives each site an equal probability of being selected. This approach is similar to how public opinion polls are conducted for large groups of people, where the data from a relatively small, representative, random sample are used to describe the characteristics of a much larger population.

The goal of the OWRB's probabilistic monitoring program is to provide statistically sound, unbiased information on the health of Oklahoma's rivers and streams. At each site, staff collect a broad suite of parameters to assess the condition of the river or stream as well as the organisms that live there.

Water Chemistry

Water samples are taken at each site and analyzed for nutrients, metals, minerals, alkalinity, hardness, turbidity, dissolved oxygen, pH, and specific conductivity.

Algae Collection

Samples are collected and analyzed for types and amounts of algae present in both the water column and on the bottom substrate. One algae collection occurs in the summer between June 1 and September 30 at each selected site.

Macroinvertebrate Collection

Aquatic macroinvertebrates are collected from various habitats within each river and stream reach during the summer index period between June 1 and September 30 at each selected study site.

Fish Collection

Fish are collected from each river or stream reach using either seines or electrofishing equipment. Most fish are identified in the field, and released alive. Unidentifiable fish are vouchered and removed for later identification. At selected sites, predator fish may also be kept for fish tissue analysis. One annual fish collection will occur at each site between mid-May and early October.

Physical Habitat Assessment

A physical habitat assessment is performed at each river or stream reach. The habitat assessment involves measuring and estimating several characteristics of the streambed and riparian zone, including stream substrate composition, stream width and depth, canopy cover, bank vegetation, stream discharge, erosion, and overall riparian condition. A single habitat assessment is performed annually at each site on the same day as the fish collection.



Collection of biological samples at a statistical survey monitoring site.

Data Application

Data collected through the program are used both locally and nationally. In 2004, Oklahoma participated in the National Wadeable Streams Assessment, which was led by the U.S. Environmental Protection Agency (USEPA).

Through partnerships with the Oklahoma Conservation Commission, USEPA, and the Office of the Secretary of Energy and Environment, the OWRB has been able to participate in several additional probabilistic monitoring studies as the program has grown.

The most recent study was the 2018-2019 National Rivers and Streams Assessment, which was conducted to assess the health of the nation's waters.

The OWRB plans to continue to participate in future national and statewide studies of Oklahoma's flowing waters to monitor the health and water quality of Oklahoma's rivers and streams.

More information can be found on the OWRB website:

www.owrb.ok.gov/monitoring