

Oklahoma Conservation Commission Water Quality Monitoring

Our Mission: To conserve and improve the water resources of the State of Oklahoma through assessment, planning, education, & implementation.

The Oklahoma Conservation Commission (OCC) has an extensive and unique monitoring program. While OCC conducts several distinct types of monitoring activities, it is important to note that monitoring efforts are primarily focused on determining the extent, nature, and probable source(s) of non-point source (NPS) pollution. The principle goal of the OCC monitoring program is direct and vital support of the agency's mission:

To conserve and improve the water resources of the State of Oklahoma through assessment, planning, education, & implementation.



The Oklahoma Conservation Commission conducts several types of monitoring:

- **Ambient** - routine collections to assess quality of state waters. E.g., OCC's Rotating Basin, Probabilistic, and Blue Thumb programs
- **Diagnostic** - targeted efforts to more accurately identify causes, effects, and sources of water quality problems
- **Implementation** - sampling to assess effects of best management practices on water quality
- **Reference condition** - assessment of streams or sites for comparative use
- **Other** - efforts to fulfill specific requests by other agencies (e.g., TMDL monitoring)

Table 1. Number of samples collected and field hours spent by monitoring type. (5-year period; Blue Thumb not reflected)

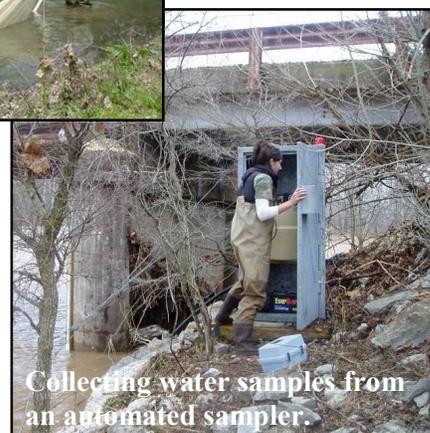
Monitoring Type	WQ Samples	Fish Samples	Invertebrate Samples	Total Field Hours
Rotating Basin	5,000	350	1720	14,500
Implementation	2,274	20	66	13,644
Special Projects	1,900	5	36	1,500
TOTAL	9,174	375	1,822	29,644

Implementation Monitoring Program:

Implementation monitoring is performed to determine the effects of best management practices (BMPs) on water quality in high priority watersheds. Implementation monitoring usually involves sampling streams during defined periods before and after BMPs are installed in a watershed. Currently, **21 sites are being monitored with automated samplers to collect continuous flow-weighted measurements**, which will allow determination of reductions in critical NPS pollutants due to installation of BMPs.



Seining for fish.



Collecting water samples from an automated sampler.

Rotating Basin and Probabilistic Monitoring Program:

Comprising a significant component of Oklahoma's ambient monitoring effort for streams, this program produces data in support of national mandates to assess the quality of state waters. For the RB Program, **a total of 245 fixed sites are monitored on a staggered, rotational schedule by basin** (map below). During a five year cycle, sites are sampled every five weeks for two consecutive years. Approximately 100 sites are assessed each year for water quality, aquatic habitat, and biological communities.



Measuring physical water quality parameters.

Probabilistic sampling, or sampling of sites which have been randomly selected to represent a population of sites with known statistical confidence, has been increasingly requested of state water quality programs. In 2008, the OCC permanently incorporated a probabilistic component into its monitoring strategy. Fifty randomly chosen sites are visited once each year for collection of water quality, habitat, fish and macroinvertebrate samples. Resulting data are used to make statements with statistical confidence regarding the status of all streams from the basin sampled.

Water quality parameters assessed:

In field:

dissolved oxygen
water temperature
pH
turbidity
conductivity
alkalinity
hardness
inst. discharge

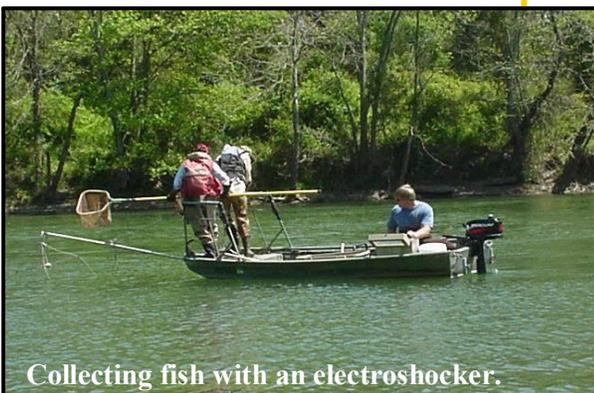
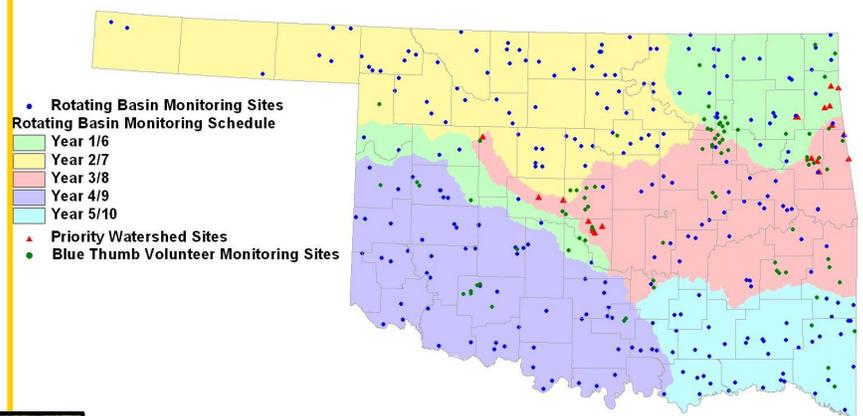
Lab:

ammonia
nitrite
nitrate
total Kjeldahl nitrogen
ortho-phosphate
total phosphorous
chloride
sulfate
total dissolved solids

WHY THE EFFORT?

OCC data is used for many purposes including use support assessments for Oklahoma's Integrated Report, general project reporting, trend analysis, watershed targeting, TMDL development, and effectiveness monitoring. OCC's extensive biological database has afforded opportunity to take a significant step toward development of much needed statewide reference conditions.

OCC Water Quality Monitoring Program Sites



Collecting fish with an electroshocker.

Blue Thumb Monitoring Program:

Blue Thumb is OCC's water quality environmental education program that teaches citizens about reducing NPS pollution and trains them to monitor streams throughout the state. Blue Thumb volunteers across the state assess water quality at now over **100 sites each month**.

Monitoring is vital to showing success in improving and protecting water quality.