Monitoring water quality in streams to identify water quality changes due to agricultural conservation practices.
Overview

State leadership role in NWQI watershed monitoring supported by EPA NPS program

States have historically assessed NPS and watershed monitoring projects funded with 319 money
Implement their own water quality standards

Monitoring challenges

Monitoring waters and runoff takes all of the scientific care as monitoring in fields, but must include extensive knowledge of the watersheds, and local land use management, changes in ownership, other hard to predict factors

Technical assistance from EPA and Tetra Tech
Forging new partnerships..... A key purpose is to develop stronger and more effective collaboration between state, local and federal partners.

State Nonpoint Source NPS Programs

National Water Quality Initiative

State and Local Watershed Projects
Various Roles

**State Role: In-stream Water Quality Monitoring**
Monitor at least one watershed per state
Encouraged to leverage existing/planned monitoring programs and $$$
Track progress in other NWQI watersheds

**EPA Role: In-stream Water Quality Monitoring Assistance**
Overall guidance on NWQI in-stream monitoring
Technical assistance for monitoring designs based on watershed circumstances.
Support direct use of 319 funds - as needed.

**USDA-NRCS Role: Edge of Field Monitoring and Assessment Tools**
Edge of Field Monitoring Financial Assistance: NRCS has developed a framework for edge of field monitoring in a few NWQI watersheds to track the effect of conservation practices on water quality at the field-level.
Edge-of-field data and State instream monitoring data will help develop stronger models for estimating load reductions
Water Quality Index-Ag (qualitative) in at least one watershed per state

http://wqiag.sc.egov.usda.gov/
And importantly....Farm Bill funding for implementation to small watersheds
A’s and the states monitoring objectives are to assess the water quality impacts of agricultural conservation practices for nutrients, sediment, and/or pathogens in QI watersheds: (from NWQI & other practices)

practices reducing pollution or helping to meet standards? (Concentrations, loads, or biological surces)
water quality improved and if so, can this be associated with agricultural practices?
Technical challenges....

- Variable weather (NPS pollution is precipitation-driven – Ches. Bay example)
- Proper selection/siting of Ps
- Misunderstanding of pollution sources
- Inadequate monitoring sign
- Confounding factors, e.g., within watershed
- Lag time
- Insufficient information on practices
Challenges identified in earlier CEAP Conservation Effects Assessment Projects started in 2003 NRCS, ARS, NIFA, and NOAA

The Right Practices in the Right Places for the Right Pollutants

Before implementing conservation practices, identify the pollutants of concern and the sources of the pollutants. Identify the critical source areas of the watershed—those that generate the most pollution—and prioritize conservation practices in those areas to ensure the most effective use of resources.

Monitoring must be done with care and informed by practices in the watershed.

- Design monitoring to specifically evaluate response to conservation practice implementation; provide necessary resources, expertise.
- To link water quality response to land treatment changes, conservation practices must be tracked by time and location.
technical assistance to states

A and its contractors have provided 3 webinars on effective monitoring designs for state and local watershed partners and are sharing information from published sources – including existing State – NRCS data-sharing agreements.

A is supporting states that request technical assistance with NWQI projects by viewing and recommending monitoring project designs and providing statistical approaches to planning projects and for analyzing data.

Key purpose of the assistance to develop monitoring approaches which have a high likelihood of measuring a change.

We are presently working with about 6 or 7 states on technical assistance questions.

A is working out how states will report on project progress each year.

In many cases, it could take 5-10 years to show impacts of practices.
Common technical support recommendations to states:

States should work with local technical and ag partners to understand what processes and land practices are occurring in the watersheds that are affecting water quality. Define and sometimes narrow their monitoring objectives to be able to answer specific questions about water quality trends. Organize and conduct exploratory analysis of baseline data, to better understand potential sources, watershed response to those sources, and minimum detectable change (MDC) analyses to plan their future sampling.

States should plan ahead for providing the technical resources and funds necessary for monitoring over the life of the project. In most cases we suggest that states narrow down their study areas to those close to lands targeted for implementation (less than the 12 digit HUC priority area for QI funding).