



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



State NPS/Monitoring
Programs & Local Watershed
managers



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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.

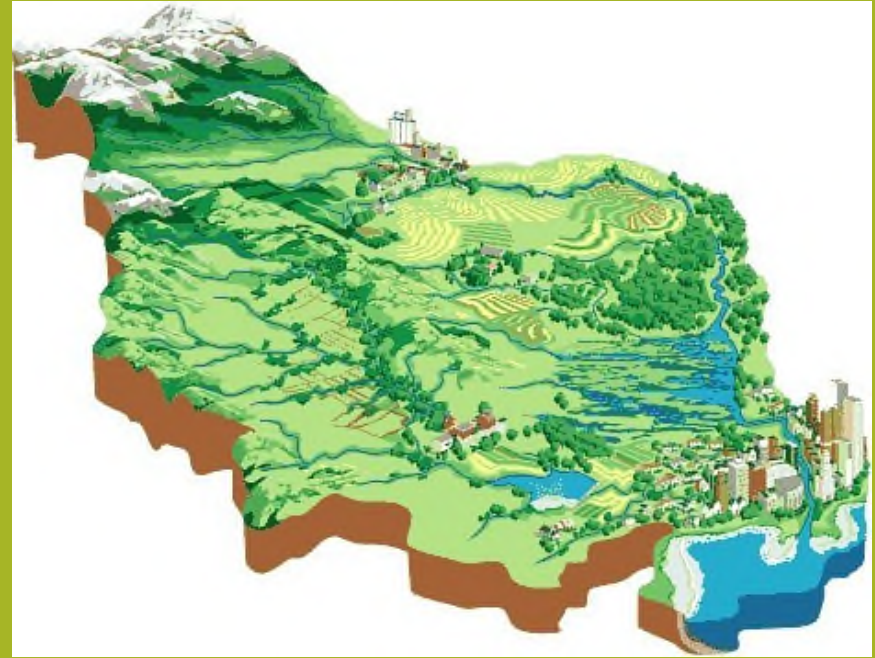
Edge-of-field data and State instream monitoring data will help develop stronger models for estimating load reductions

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

NWQI



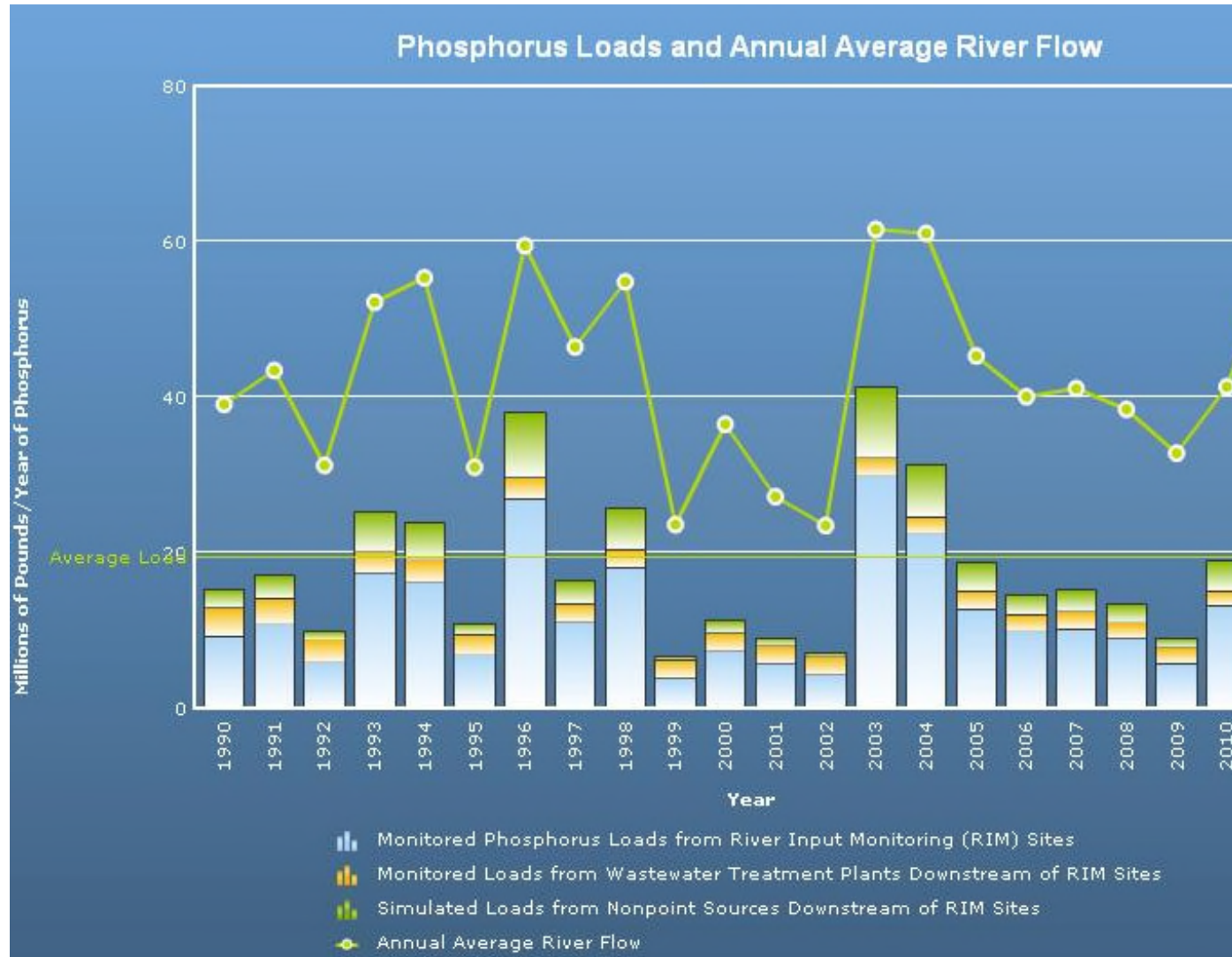
A's and the states monitoring objectives are to assess the water quality impacts of agricultural conservation practices for nutrients, sediment, and/or pathogens in QI watersheds: (from NWQI & other practices)

practices reducing pollution or helping to meet standards? (Concentrations, loads, or biological measures)

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 P_s
- misunderstanding of pollution sources
- inadequate monitoring design
- confounding factors, e.g., land use change in watershed
- lag time
- insufficient information on hydrologic processes

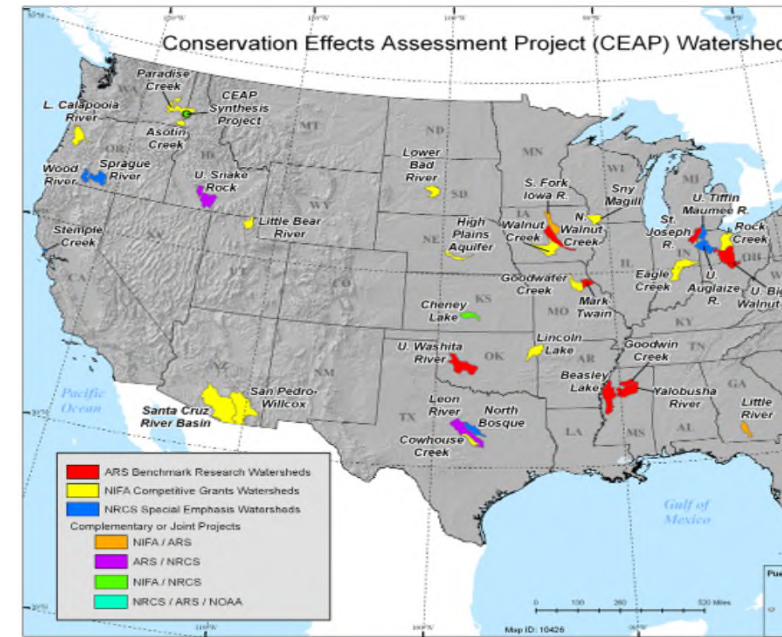


Challenges identified in earlier CEAP (Conservation Effects Assessment Projects) conducted in 2003 NRCS, ARS, NIFA, and NOAA

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

fine 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 range (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)