EPA-State Approach to Instream Monitoring for NWQI – Webinar 1

April 30, 2013
Overview

• Primary goals and objectives

• Summary of challenges

• Proposed approach to NWQI monitoring
  - 2014 NPS Grant Guidelines called for future guidance
  - Refined in response to input from USDA, OMB, EPA Monitoring Branch, and states (via comments on 319 guidelines)

• Schedule for implementing NWQI monitoring, with adaptive management

• State feedback, Q&A
NWQI Monitoring
Expectations in 319 Guidelines

• States will monitor in NWQI watersheds
  – Where watershed recommended (or OK’d) by state water quality agency
  – Where circumstances “aligned to assess the effects of conservation practices”
    • Refers to watershed characteristics, baseline data, and availability of information on conservation practices
  – Using state’s existing monitoring and QA/QC approaches
  – Considering extent of practices and lag time
NWQI Monitoring
Expectations in 319 Guidelines

• Guidelines: EPA will elaborate on these expectations, propose watershed selection criteria and further guidance
  – Starting with this webinar
• After opportunity for dialogue and state input, a guidance memorandum will be issued in advance of FY14
Additional Information on NWQI

• Final FY13 watershed count = 165
• Many changes to reflect interest of state WQ agencies, address rushed FY12 selections
• NRCS anticipates a multiyear investment in these watersheds, at 5% of EQIP funds
  – Does not anticipate significant change-over in watersheds in FY14
NWQI Water Quality Monitoring
Goals & Objectives

• **Goal:** Assess the water quality impacts of agricultural conservation practices for nutrients, sediment, and/or pathogens in NWQI watersheds: (NWQI & other practices)
  
  – **Objective 1** - Have water quality-related conservation practices resulted in the change? (causal relationship) This usually requires:
    • local knowledge of what practices are placed in the landscape, when they started and stopped (this goes for pre-existing practices as well). How they are sequenced and maintained.
    • Having a project with an adequate baseline database or good controls – subwatersheds or paired watersheds where additional conservation is not implemented during the project.

  – **Objective 2** – Have water quality conditions significantly improved over time in NWQI watersheds?
    • These studies usually show an association between the level of implementation and change in water quality. The strength of the association can be measured by regression or explained using a preponderance of evidence approach.
    • Multiple lines of evidence can be provided by biological, chemical, and physical (flow, scouring, etc., and habitat parameters) and other indicators. BMP information is still needed, but possibly at a lower level of detail.
Monitoring Effects of Ag BMPs Poses Scientific Challenges

- Practices vary considerably in ability to control target pollutants
- Conservation practices scattered broadly (untargeted) are less likely to impact WQ
- Must know the types, location, and timing of BMPs to show cause and effect results
- Robust baseline data is needed to report progress
  - Numerous sources of NPS variability require good baseline data to discern WQ signal change
Invest Monitoring Resources Strategically

- USDA CEAP, EPA NPS Monitoring program, etc. confirm it is difficult to discern WQ changes from NPS management practices at watershed scale
  - Practices/targeted pollutants/location inapplicable or insufficient
  - Insufficient monitoring design and/or information on watershed practices
  - Lag time 5-10 years+
  - Growth, new sources in watershed
  - Precipitation-driven variability year-to-year
- Monitoring is costly. Challenges above mean it must be done judiciously to document results
Overall Approach: NWQI Water Quality Monitoring

- Approach can succeed best where monitoring MOUs are secured at the state/watershed level
- States conduct instream monitoring in subset of watersheds is more likely to yield WQ results
  - Use criteria to select one watershed per state - where conditions favorable to detect WQ changes
  - Align with USDA EOF monitoring and other state or federal monitoring where feasible
  - Reevaluate whether to add more monitoring watersheds after an initial period of implementation (e.g., Q1, FY14)
Proposed Approach: NWQI Monitoring & Tracking (cont.)

- States encouraged to leverage existing/planned monitoring where it coincides with other NWQI watersheds and monitoring MOUs in place

- **Track progress at ALL** NWQI watersheds through a set of indicators (USDA & EPA) e.g. modeled load reductions, WQI\textsubscript{ag} index - *TBD*

- EPA **offers limited technical support** for state monitoring efforts – EPA Regions help select
Proposed NWQI Watershed Monitoring Selection Criteria

1) 12 digit HUC watersheds (smaller the better)
2) Agriculture is dominant land use
3) Ideally a TMDL or watershed plan in place
4) Sufficient monitoring baseline data for relevant parameters
5) Significant conservation practice implementation expected, so WQ change is more likely measurable in 5-7 years
6) Water quality monitoring activity and support (e.g., stations) expected to continue 5-7 years
7) Where feasible, build on existing monitoring partnerships with USDA, such as in MRBI, GLRI
Features of Proposed Approach

- Targeted investment of 319 or other funds
- Consistent with USDA and EPA science on where conservation monitoring more likely to succeed
- Depending on monitoring designs, data can also be used to calibrate or validate WQ models and provide indicators
- Monitoring MOUs re: location of practices and Edge of Field studies funded by NRCS will be important for better understanding of causality
- NWQI provides an opportunity to increase the collective understanding of agricultural water quality monitoring issues and technical support may be of broader utility to State NPS programs
# NWQI Monitoring – Potential Roles

<table>
<thead>
<tr>
<th>Scenario</th>
<th>NRCS Role</th>
<th>State Role</th>
<th>EPA Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focused monitoring</strong></td>
<td>- Targeted EQIP funded practices</td>
<td>- Instream at long term stations, up/downstream sites or paired sites</td>
<td>- Overall guidance on NWQI monitoring</td>
</tr>
<tr>
<td>For watersheds with</td>
<td>- Edge of Field Monitoring aligned where possible</td>
<td></td>
<td>- Limited contractor assistance</td>
</tr>
<tr>
<td>good WQ baseline,</td>
<td>- Monitoring MOU with state partner</td>
<td></td>
<td>- Support direct use of 319 funds</td>
</tr>
<tr>
<td>monitoring MOUs,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and WS or TMDL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>plans. <strong>One per state</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optional monitoring</strong> of</td>
<td>- Targeted EQIP funded practices</td>
<td>Optional leveraging of existing monitoring at other NWQI sites (e.g.</td>
<td>- Overall guidance on NWQI monitoring</td>
</tr>
<tr>
<td>additional NWQI watersheds</td>
<td>- Models or indices (e.g. WQIag index assessment)</td>
<td>rapid bioassessment, rotating basin assessments)</td>
<td>- Use National Aquatic Resource Surveys to extent possible to assess</td>
</tr>
<tr>
<td>– beyond the 1 per state.</td>
<td>- Monitoring MOU with state partner, if possible</td>
<td></td>
<td>ag practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tracking</strong></td>
<td>- WQIag index, leverage APEX model</td>
<td>- State modeling/other state monitoring efforts</td>
<td>- Regional or HQ assistance if needed (e.g. STEPL model assessment)</td>
</tr>
<tr>
<td>for remaining NWQI watersheds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– state ideas?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Technical Support for All States

- **EPA-sponsored webinars**
  - Introduction to NWQI monitoring approach and obtain state feedback
  - Acquiring sufficient baseline data and data management frameworks for nutrients, other parameters
  - Summarize various monitoring designs
  - Case studies of state NPS watershed monitoring

- **States can request follow-up information and limited technical support**
  - Possible additional webinars
  - EPA and its contractor may be able to provide useful links to reports and tools to assist states.

- **Engage USGS** where possible

- Explore feasibility of using data from **National Surveys** (e.g., NRSA) to describe trends in NWQI watersheds
Technical Support for Individual States

• Technical design support available for one state per region (will seek more funding in FY14)

• Technical contractor may help with:
  – Project and monitoring proposals
  – Annual review of monitoring progress, and interim data analysis
  – Final data analysis and reporting

• Or provide consulting services on reviewing baseline data, recommending designs, or helping with minimum data requirements, etc.

• Provide regions with one page summaries of proposed monitoring approach for focused monitoring
One-page Monitoring Summaries

• States summarize the monitoring approach for each NWQI watershed selected for causal or associative monitoring (at least one per state)

• Indicates whether or not the State would like 1-on-1 technical assistance from EPA contractors

• Summarizes the problems, existing baseline data, anticipated level of implementation (may be part of TMDL or WS plan)
Monitoring MOUs

- **Monitoring MOUs** with NRCS will be necessary to ensure adequate data is obtained for demonstration of “cause-and-effect” (Obj. 1) and “associative” (Obj. 2) effects of BMPs.

- **EPA will work at national level with USDA NRCS** on appropriate MOU elements.

- **Where States and NRCS** are ready or are developing a MOU are encouraged to continue to move forward.
Focused Monitoring Needs for NWQI/Potential Issues for Technical Assistance

• Establish clear objectives
• Follow recommended protocols
• Understanding of WQ problems, pollutants, and sources
• Screen watersheds for good monitoring candidates
• Consider ongoing and planned BMP implementation
• Monitor covariates including land treatment
• Specific experimental design that controls for weather, land use, and other external factors
• Pick needed design, then figure out how to support (rather than design based on funding)
• Strive for 5-7 year minimum monitoring period
• Decide how the resulting data will be stored, retrieved, analyzed, and interpreted; and
• Decide how the results will be communicated
## Proposed Schedule NWQI Activities

<table>
<thead>
<tr>
<th>Date</th>
<th>Description / Action</th>
<th>Responsible Party (ies)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 30, 2013</td>
<td>First Webinar - Context for NWQI monitoring, state feedback</td>
<td>EPA</td>
<td>Setting, objectives, approaches, selecting watersheds, state needs</td>
</tr>
<tr>
<td>May 24, 2013</td>
<td>States send input and tech questions to EPA regions</td>
<td>State 319/monitoring programs</td>
<td>Will inform the content of future webinars</td>
</tr>
<tr>
<td>May - June 2013</td>
<td>Second Webinar on monitoring issues</td>
<td>EPA and Contractor</td>
<td>Acquiring sufficient baseline data, data mgmt. frameworks for nutrients/State issues</td>
</tr>
<tr>
<td>July 2013</td>
<td>Third Webinar on monitoring Issues</td>
<td>EPA and Contractor</td>
<td>State issues, Case studies(?)</td>
</tr>
<tr>
<td>August 2013</td>
<td>Fourth Webinar on monitoring issues</td>
<td>EPA and Contractor</td>
<td>State issues, Monitoring designs(?)</td>
</tr>
<tr>
<td>Date</td>
<td>Description / Action</td>
<td>Responsible Party (ies)</td>
<td>Comments</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>July 1, 2013</td>
<td>States select NWQI watersheds for monitoring and provide EPA with One-page summaries</td>
<td>States with NRCS consultation</td>
<td>One-pagers help with technical assistance prioritization.</td>
</tr>
<tr>
<td>July ‘13 - Jan ‘14</td>
<td>Complete needed Monitoring MOUs</td>
<td>States/NRCS</td>
<td></td>
</tr>
<tr>
<td>August 30, 2013</td>
<td>EPA selects states for technical assistance</td>
<td>EPA Regions in consultation with HQ</td>
<td></td>
</tr>
<tr>
<td>August 13 - March ‘14</td>
<td>One-on-one State technical assistance</td>
<td>EPA/Contractor</td>
<td>One State per Region with existing funds</td>
</tr>
<tr>
<td>October 2013</td>
<td>National NPS Monitoring Workshop</td>
<td>EPA</td>
<td>NWQI session</td>
</tr>
<tr>
<td>Winter 2014</td>
<td>FY14 NPS workplans include NWQI activities</td>
<td>States in coordination with Regions</td>
<td></td>
</tr>
</tbody>
</table>
## Proposed Schedule – Cont’d

<table>
<thead>
<tr>
<th>Date</th>
<th>Description / Action</th>
<th>Responsible Party (ies)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 2014</td>
<td>If no MOU is forthcoming, states select alternative watersheds if desired to monitor Ag BMPs</td>
<td>States in consultation with Regions</td>
<td>Were BMP systems are likely to be effective and meet State NPS priorities</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>Monitoring begins in most states</td>
<td>States and partners</td>
<td>Depending on the projects: Monitoring may have begun in 2013 or earlier. This could also be pre-implementation monitoring for a few years to establish a baseline</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>First annual NWQI monitoring reports</td>
<td>States – EPA propose elements</td>
<td>Ideally will be part of GRTS reporting</td>
</tr>
</tbody>
</table>
Questions / State Feedback