



United States Department of Agriculture
Natural Resources Conservation Service



The National Water Quality Initiative's Monitoring Framework

Erika Larsen

ORISE Participant, Nonpoint Source Control Branch, US Environmental Protection Agency



(NRCS)



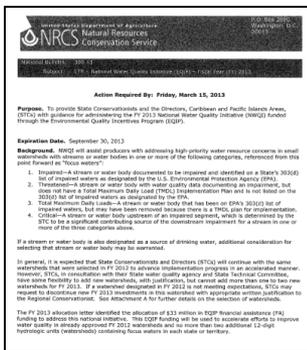
Outline

- Overview of the National Water Quality Initiative
- Framework for NWQI monitoring
 - ◆ Goals and objectives of instream monitoring
 - ◆ Roles of EPA, NRCS, States
 - ◆ Instream monitoring criteria
 - ◆ NRCS edge-of-field monitoring
- Vermont case study
- Conclusions, moving forward with the NWQI, and Q&A

Scope of NWQI

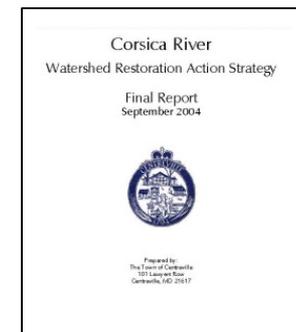
- USDA Natural Resources Conservation Service (NRCS) launched the National Water Quality Initiative (NWQI) in FY12
- NRCS is coordinating with EPA and state water quality agencies to address agricultural sources of pollution: N, P, Sediment and Pathogens
 - Additional consideration was given where the water is also a drinking water source
- NRCS targets voluntary, private lands conservation investments to improve water quality in 173 small (HUC 12) watersheds nationwide
- State WQ agencies are monitoring water quality in at least one NWQI watershed
- **Goal: Remove streams and other water bodies**
 - from 303d list, or
 - from threatened status, or
 - from contributing to impairments, or
 - to adequately address a TMDL plan.





NWQI watershed selection

- NRCS State Conservationists, state technical committees, and other partners consult with state WQ agencies on the selection of priority watersheds for conservation and monitoring investments.
- Priority placed on watersheds with high nonpoint source nutrient and sediment loadings, and the opportunity to make significant progress in reducing those loads.
 - Many have a Section 319 watershed-based plan (WSB) that estimates needed load reductions and identifies critical areas for pollution control practices



NWQI Funding and collaboration

- USDA NRCS invests on average \$33 million annually of targeted EQIP funds in the NWQI- about 5% of EQIP financial assistance
- Collaboration grows stronger each year
 - The initiative now includes at least one or more watersheds recommended by the state water quality agency in every state.
- We anticipate a multiyear investment in these watersheds
 - Do not anticipate significant change-over in watersheds in FY15



Examples of conservation practices offered in the NWQI

NWQI emphasizes a systems approach to address water quality resource concerns by encouraging producers to incorporate practices that avoid, control, and trap nutrient, sediment, and pathogens runoff.

Core Practices	Code	Avoiding	Controlling	Trapping
Waste Storage Facility	313	X	X	
Animal Mortality Facility	316		X	
Composting Facility	317	X	X	
Conservation Cover	327	X		X
Conservation Crop Rotation	328	X		
Residue and Tillage Management, No Till/Strip Till/Direct Seed	329		X	X
Contour Farming	330		X	X
Contour Orchard and Other Perennial Crops	331		X	X
Contour Buffer Strips	332			X
Cover Crop	340	X		X
Critical Area Planting	342		X	X
Residue Management, Seasonal	344		X	X
Residue and Tillage Management, Mulch Till	345		X	X
Residue and Tillage Management, Ridge Till	346		X	
Well Water Testing	355	X		
Waste Treatment Lagoon	359		X	
Waste Facility Closure	360	X		
Anaerobic Digester	366		X	
Field Border	386		X	X
Riparian Herbaceous Cover	390			X

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)**
- **NWQI Monitoring Objectives:**
 1. *Are practices reducing nutrient, sediment, and/or pathogen pollution?*
 - Concentrations, loads, or biological measures
 2. *Has water quality improved and if so can this be associated with practices?*

Monitoring Effects of Ag BMPs

must invest monitoring resources strategically and have a sense of:



- Need good source assessments
 - TMDLs and WSB plans
 - Local teams and experts on watershed dynamics
- Need good baseline Or possibility of doing “long-term trend” design with explanatory parameters
- Knowledge of existing conservation practices and additional vulnerable lands needing conservation
 - Good area coverage
 - Right locations and types
- A plan to get the needed resources to carry out a monitoring strategy

NWQI Assessment



- Assessment goal: track progress at all NWQI watersheds to assess water quality impacts of agricultural conservation practices
- **State Role: Instream Water Quality Monitoring**
 - Conducted in at least one watershed per state by the state WQ agencies
 - Encouraged to leverage existing/planned monitoring where it coincides with other NWQI watersheds
- **EPA Role: Instream Water Quality Monitoring**
 - Overall guidance on NWQI in-stream monitoring
 - Technical assistance for monitoring designs based on watershed circumstances.
 - Support direct use of 319 funds
- **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/>

Overall Approach: NWQI Water Quality Monitoring



- **Approach can succeed best where all entities involved in a monitoring strategy are sharing information, e.g. through a data sharing agreement at the state/watershed level**
- **States encouraged to leverage existing/planned monitoring** where it coincides with other NWQI watersheds and monitoring MOUs in place
- **Track progress in** NWQI watersheds through a set of indicators (USDA & EPA) e.g. modeled load reductions, WQIag index
- EPA **offers limited technical support** for state monitoring efforts

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

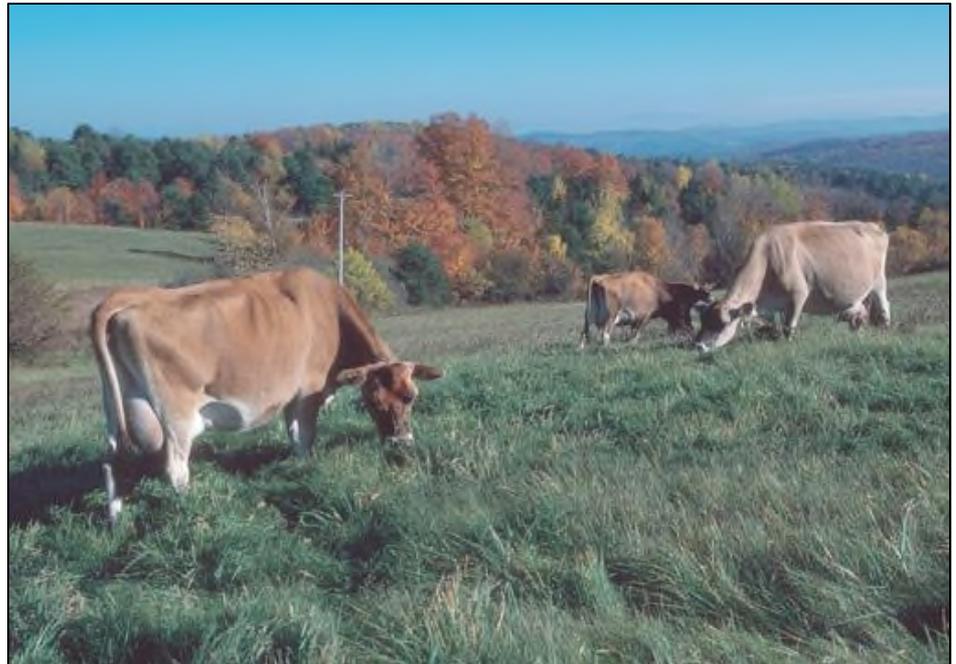
NRCS Edge of Field Monitoring:

- 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.

- NRCS plans to use their edge-of-field data and State instream monitoring data to develop stronger models for estimating load reductions



Case study: Vermont Rock River Watershed

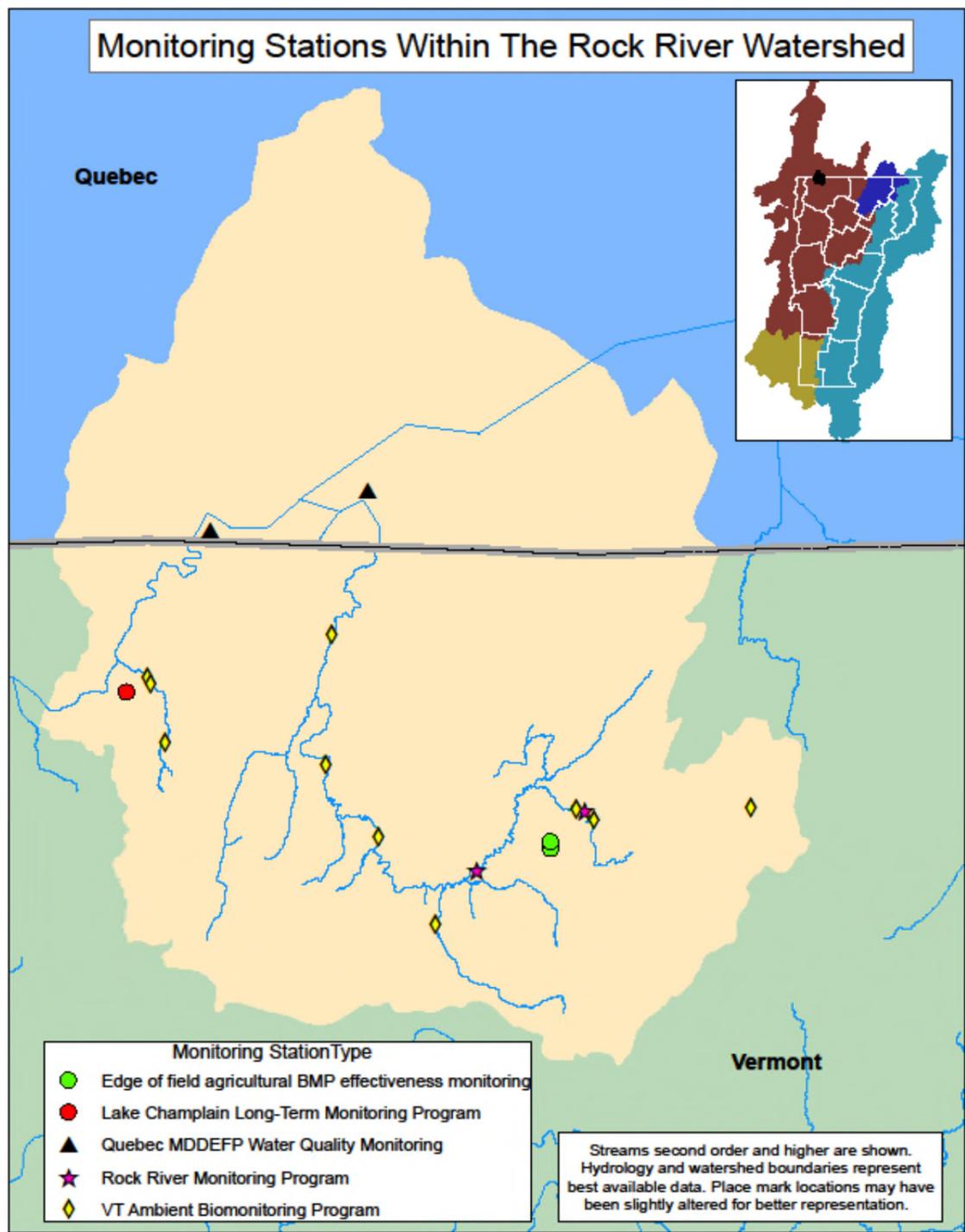


Case Study: Rock River Watershed, VT

- Primarily dairy farms, some crop farms, beef, and vegetable
- Rock River: 303d list (approx. 17 miles); pollutants (nutrients & sediment); surface WQ problems (algal growth, agricultural runoff, nutrient enrichment, fish kills)
- The Rock River Monitoring Program (initiated in 2010) :
 - Evaluate the water quality improvements expected from targeted agricultural BMP implementation in a small catchment area
 - Two stations were established in order to implement a before-and-after, upstream-downstream nested paired watershed design
 - continuous USGS stream flow gage stations installed downstream
- VT Ambient Biomonitoring Program (established 1985):
 - monitor long-term trends in water quality
 - Sites are monitored no less than every five years in conjunction with ongoing tactical river basin planning process or more frequently as needed.

•Water quality monitoring in NWQI watershed (Rock River) involves 5 levels that have been in place for varying lengths of time

•Bio-monitoring is part of VT DEC's on-going statewide rotational assessment



MOU in Vermont Lake Champlain Basin



- Strengthen cooperation for coordinated delivery of assistance affecting agricultural soil and water management in Vermont portion of Lake Champlain Basin
- MOU signatory parties involve: USDA-FSA, USDA–NRCS, VT Association of Conservation Districts, VT Agency of Agriculture, Food and Markets, Poultney-Mettowee NRCD, University of Vermont, VT Department of Environmental Conservation, Lake Champlain Basin Program, US Fish & Wildlife Service
- MOU in effect 5 years (2012 – 2016)
- Will be used in NWQI to quantify the nature, type, extent and location of agricultural land treatment to determine what changes if any could be attributed to agricultural implementation

Moving forward with the NWQI

- Continued targeted EQIP conservation practices including EOF monitoring
- Continued instream monitoring by states
- Annual reporting of instream monitoring efforts
- Building partnerships
 - State WQ agency
 - NRCS
 - EPA
 - Conservation Districts



Questions?



Roles for Monitoring and Implementing the National Water Quality Initiative

Scenario	NRCS Role	State Role	EPA Role	Potential Partners
Focused monitoring One watershed per state. Ideally watersheds have good water quality baseline data, high level of practice adoption, and watershed plans/TMDLs to track progress towards water quality goals	<ul style="list-style-type: none"> •Targeted EQIP funded conservation systems •Edge of Field WQ Monitoring (EoF) aligned where possible, based on voluntary participation •Support/participate in data sharing agreements where appropriate. 	<ul style="list-style-type: none"> •Instream monitoring at long term stations, up/downstream sites or paired sites •Support/participate in data sharing agreements where appropriate. 	<ul style="list-style-type: none"> •Overall guidance on NWQI in-stream monitoring •Technical assistance for monitoring designs based on watershed circumstances. •Support direct use of 319 funds 	<ul style="list-style-type: none"> •NRCS, States, and EPA may provide contactor or partner support in any of these tasks. •These contractors and partners may be universities, other federal and state agencies, non-profits, or private entities.
Optional monitoring of additional NWQI watersheds – beyond the 1 per state.	<ul style="list-style-type: none"> •Targeted EQIP funded conservation systems •EOF Monitoring where possible based on participation •Data sharing agreements as appropriate 	<ul style="list-style-type: none"> •Optional leveraging of existing monitoring at other NWQI sites (e.g. rapid bioassessment, rotating basin assessments) •Data-sharing agreements as appropriate 	<ul style="list-style-type: none"> •Overall guidance on NWQI in-stream monitoring •Use National Aquatic Resource Surveys to extent possible to assess trends in NWQI vs. other ag. watersheds 	<ul style="list-style-type: none"> •Support/participate in data sharing agreements where appropriate. •Landowners and partners for EoF monitoring
Tracking for remaining NWQI watersheds	<ul style="list-style-type: none"> •WQIag, leveraging with APEX and/or other models •Annual report on progress 	<ul style="list-style-type: none"> • Annual report on progress 	<ul style="list-style-type: none"> •Annual report on progress summarizing participation, instream monitoring activity 	