

# National Network of Reference Watersheds

## National Water Quality Monitoring Council (NWQMC)

## Advisory Committee for Water Information (ACWI)



NATIONAL WATER QUALITY MONITORING COUNCIL

Working Together for Clean Water

<http://acwi.gov/monitoring/>

### Establishing a Collaborative and Multipurpose National Network of Reference Watersheds and Monitoring Sites for Freshwater Streams in the United States

A significant challenge faced by water-resource scientists in the public and private sectors is the need for reliable long-term data and information from watersheds minimally disturbed by human activities. Monitoring in areas with minimal human disturbance helps to provide (1) an understanding of natural patterns of variability that can be used to differentiate changes due to land and water use from changes associated with natural climatic cycles and (2) reference information that can be used to establish water-quality criteria or appropriate expectations for watershed restoration. Many agencies and organizations monitor streams in pristine and minimally disturbed watersheds or conduct research and other activities that would be useful to a reference watershed network (fig. 1). Much of the monitoring consists of one to several measurements at many sites, typically representing a particular hydrologic condition and a relatively short period of time. These synoptic measurements provide important information for understanding natural spatial patterns and variability. Unfortunately, there are relatively few sites among networks with long-term records for streamflow, water chemistry, and stream ecology necessary to distinguish changes associated with natural climatic cycles.

The National Water Quality Monitoring Council (NWQMC) is proposing the development of a collaborative and multipurpose national network of reference watersheds and monitoring sites that would provide quality-assured data and information for use in understanding the effects of land use change, water use, atmospheric deposition, and climate change on freshwater ecosystems. The scope of the collaborative effort will initially be limited to freshwater streams. Future collaborations would expand to freshwater lakes and wetlands. Membership in the network would be voluntary and open to individuals and institutions interested in participating in monitoring and (or) research in minimally disturbed and pristine watersheds. Funding support for the network would come from the participating agencies. The Council would provide the organizational structure and leadership to develop, enhance, and maintain collaborative, comparable, and cost-effective monitoring, research, and reporting among the Federal, State, tribal, interstate, academia, local and private sector organizations that choose to participate.

The collaborative effort would consist of three different types of activities in a tiered framework that are linked together by research and modeling. The three types of activities

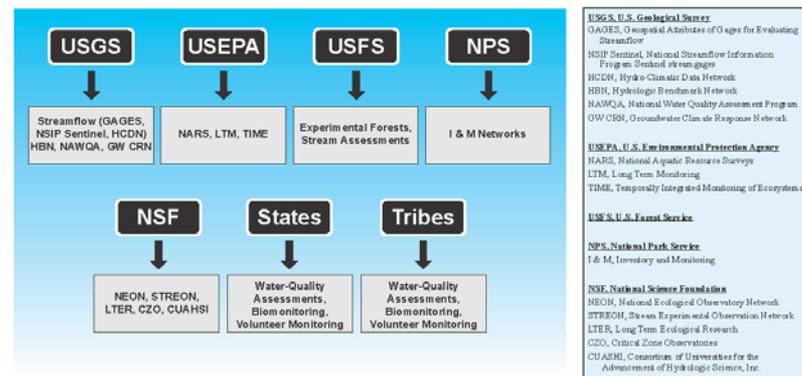


Figure 1. Monitoring networks and programs of Federal and State agencies and non-Governmental organizations that are candidates for inclusion in the design and operation of a collaborative reference watershed network.



# Workgroup Members

Executive Committee – Rick Haeuber, Neil Kamman, Doug McLaughlin, Bill Wilber

Ex-officio members – Denise Argue, Jeff Deacon, Clara Funk, Jason Lynch, Mike McHale, Mark Nilles

# Goals

- 💧 Provide access to documented quality data and information from minimally or least disturbed watersheds to be used in assisting with establishing “background” conditions for select hydrologic variables and water-quality.
- 💧 Increase the efficiency of monitoring with improved coordination and collaboration and increased opportunities to leverage existing reference sites, networks, and financial resources

# FY 2014 Workplan Tasks

1. Complete development of the NNRW Station Metadata database
2. Create an interactive network map
3. Develop default reference watershed criteria based on information available through existing web services.
4. Refinement of the network website based on user feedback.
5. Presentation at the NWQMC Meeting April 2014
6. Develop a plan to Link to the Water Quality Portal



# NNRW Current Status

Water Quality Portal

Station Metadata  
Database

Mapping Application  
(GIS Server)

User Interface  
Website

# Disturbance Metric

- ▶ It must be able to be calculated with readily accessible data.
  - ▶ It must produce a sample population that is spatially extensive.
  - ▶ It must be easily understood and have physical meaning.
  - ▶ Ultimately this is a water quality network so the metric must serve that purpose.
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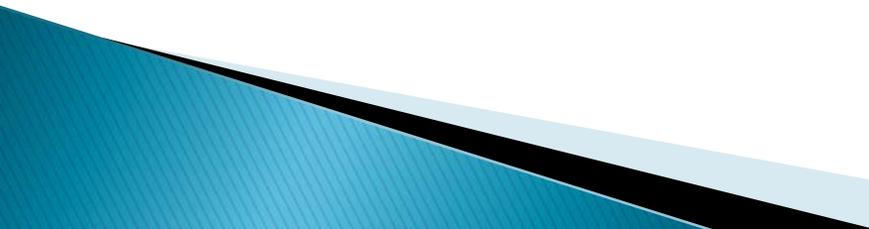
# NNRW “Core” Watersheds

- National “Core” Reference Watersheds  
(best of the best)

## Also considering:

- Agricultural “Core” Reference Watersheds
- Urban “Core” Reference Watersheds
- Pair all “Core” watersheds with  
NADP gages (n=261)

# FY2015 Draft Workplan

1. Web development/refinement: Fort Collins USGS
  2. Connection to QW Portal: USGS CIDA
  3. Identify additional data available for sites (biology, atm dep, etc)
  4. Develop workflow for incorporation of additional sites
  5. Incorporation of State Watersheds/Sites
  6. Incorporation of additional watersheds (University, Tribal, etc.)
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# NWQMC Conference

April 28 – May 2, 2014

## NNRW Presentations, May 1st:

1. National-Scale Water Quality Assessments  
Thursday 8:30 am – 20 minute Presentation
2. Thursday at 12:30– 13:30 ACWI/Council Booth