

ACWI Meeting

Update

January 17, 2007

Herndon, VA

What is the Methods and Data Comparability Board (MDCB)?

- A partnership of water-quality experts from federal agencies, tribes, states, local governments, volunteer monitoring groups, and private organizations who all share a commitment to developing water-quality monitoring approaches that facilitate collaboration and comparability amongst all data-gathering organizations.

Summary of Presentation

- Recent accomplishments/highlights 2006
- Future Directions & Activities Plan
- Meeting in Cincinnati, OH Nov. 15-16, 2006
- Work Group Updates
 - Water Quality Data Elements—Physical Habitat
 - NEMI
 - Importance of Comparable Data for the NMN

Highlights 2006

- **New EPA Co-Chair (Steve Wendelken)**
- **Revamped Methods Board webpage (Dan Sullivan)**
- **San Jose Conference in May 2006**
 - Booth (all) and Session on WQDE (LeAnne Astin)
- **Two face to face meetings**
 - Tucson, AZ
 - Cincinnati, OH
- **NMN Chapter 4 on Importance of Data Comparability (Ed Johnson, Jerry Diamond, Eric Vowinkel)**
- **NEMI (Dan Sullivan)**
 - Green Methods (Larry Keith and Jennifer Young)
 - CRADA
- **WQDE Publication (LeAnne Astin)**
- **Bioassessment comparability guidance/pilots (Jerry Diamond and Laura Gabanski)**

Methods and Data Comparability Board

Current Projects

NEMI

Data Elements

Bioassessment
Comparability

Data Comparability
(National Monitoring Network)

Products & Publications

NEMI

Data Elements

Publications

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Welcome to the Methods Board

The Methods and Data Comparability Board is a partnership of water-quality experts from federal agencies, states, local governments, volunteer monitoring groups, and private organizations who all share a commitment to developing water-quality monitoring approaches that facilitate collaboration and comparability amongst all data-gathering organizations.

Water Quality Data Elements News:

The [Water Quality Data Elements User Guide](#) is now available in PDF format to download and print.

[download](#)

The [Data Elements workgroup](#) of the Methods and Data Comparability Board and the [National Water-Quality Monitoring Council](#) are preparing lists of what are believed to be the necessary or "core metadata" to allow comparability assessments. The proposed lists are not a set of required information but are recommended to help data collectors and data managers more effectively characterize their data and thereby facilitate and promote the use of those data by others. The [Water Quality Data Elements User Guide](#) was written to help facilitate the use of data elements by monitoring groups in their monitoring programs.

NEWS AND EVENTS

UPCOMING MEETINGS

Across the Board
latest issue



CONTACTS:

[Eric Vowinkel](#), Co-Chair
U.S. Geological Survey
New Jersey Science Center
(609) 771-3931

[Steve Wendelken](#), Co-Chair
U.S. Environmental
Protection Agency
(513) 569-7491

[Dan Sullivan](#), Exec. Secretary
U.S. Geological Survey
Wisconsin Water Science Center
(608) 821-3869

Future Directions

- **Concentrate on things we do well (higher priority)**
 - NEMI and NEMI/CBR
 - WQDE—Physical habitat
 - Support NMN comparability issues where appropriate
 - Support NWQMC/WIS work group where needed
- **New topics (lower priority)**
 - **Event monitoring**
 - Stormwater monitoring
 - Continuous and real-time monitoring
 - New technologies
 - Data storage issues
 - Data interpretation
 - Volunteer monitoring validation techniques
- **Contingent on funding requests**

Activities Plan 2007

- 3 face to face meetings
- Monthly Full Board conference calls
- Bi-monthly or monthly work group conference calls (NEMI and WQDE) as needed
- Keep web-page up to date
- 1 Across the Board Newsletter in FY07
- Assist with NWQMC/NMN comparability issues
- Assist with NWQMC May 2008 Conference
- Continue recruitment



Methods and Data Comparability Board

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Cincinnati, OH Meeting Nov. 15-16, 2006

Current Projects

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- [Wadeable Streams](#)

Workgroups

- [PBS/Nutrients](#)
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Meeting Location:

EPA
Office of GW & DW
Technical Support Center
26 W. Martin Luther King Dr
Cincinnati, OH 45268

[Street Map](#)

[City Map](#)

Hotel Location:

Vernon Manor Hotel
400 Oak Street
Cincinnati, OH 45219

Call for reservations in the "Methods Board" block:
(513) 281-3300 or
(800) 543-3999 ask for "in-house reservations"

Room rate = \$86/nite (federal per diem)
Rooms only available the nights of 11/14 and 15
-- anyone staying over Thursday nite will have to relocate to a different hotel.

Shuttle service is available to the EPA.

[DRAFT Meeting Agenda](#)

Challenges at Cincinnati Meeting

- NEMI
 - Complete CRADA ASAP
 - All methods to be used in the National Monitoring Network in NEMI by May 2008
 - Green methods updates complete
 - Statistical methods entered into NEMI
- WQDE
 - Public Web page for habitat elements
 - Physical Habitat elements publication by May 2008
- Work with NWQMC/WIS work group to provide timely products that are needed by WQ community

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Water Quality Data Elements

The [Water Quality Data Elements User Guide](#) is now available in PDF format to download and

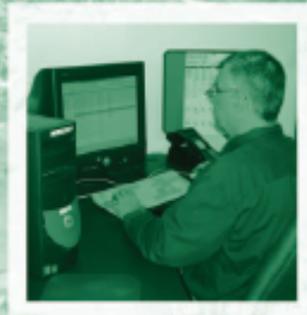
print. [download](#)

Many different entities collect water quality monitoring data using different data reporting templates. However, drawing comparisons and discerning trends in water quality are difficult due not only to large natural variations in conditions but also to widely disparate assessment methodologies, data system incompatibilities, and inconsistent data documentation standards. These problems are found in both surface water and ground water studies. These barriers impede coordination of data collection efforts and the productive exchange of water quality data among monitoring entities. Recent reports by federal, state, and non-governmental organizations including the U.S. General Accounting Office, the Association of State and Interstate Water Pollution Control Administrators, and the Environmental Integrity Project, have highlighted these problems.

Water Quality Data Element Lists

1. **Chemistry, Microbiology**
2. **Population /Community
Biological Assessments**
3. **Toxicological Analytes**
4. **Physical Habitat** (Draft list begun Oct. 2006)
5. Tissue
6. Sediment
7. Biomarkers

Water Quality Data Elements: A User Guide



National
Water
Quality
Monitoring
Council

WQDE

Who?

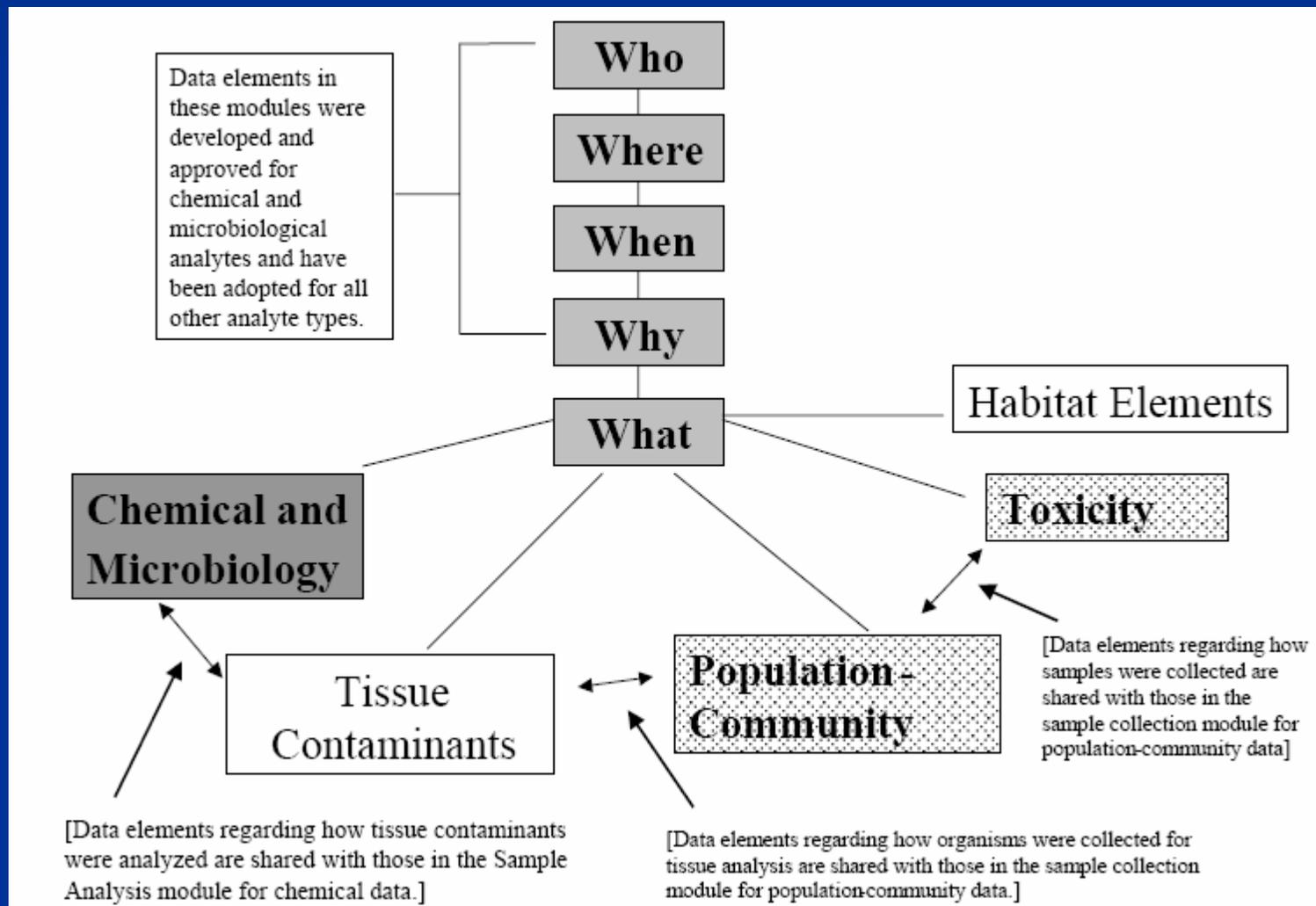
What?

Why?

When?

Where?

Water Quality Data Elements





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Methods Board Internal Homepage

The purpose of this site is to disseminate information on working projects within the Board and its workgroups, list upcoming calls, archive minutes from previous calls, and generally serve as a clearinghouse of information to Board members.

What's New on the Site:

- [Physical Habitat Data Elements workgroup](#)
- [Board presentation to ACWI \(6/06\)](#)
- [Board poster from San Jose \(5/06\)](#)

[Meetings](#)

[Public Web Site](#)

[IMPACT Article Information](#)

Physical Habitat Data Elements

- [DRAFT habitat data elements, Feb. 2005](#)
- [Link to Chem/micro, Population/Community, and Toxicity Test Data Elements](#)

Protocols

- [USGS NAWQA Stream Habitat Protocol](#)
- [EPA EMAP Physical Habitat Protocol for Wadeable Streams](#)
- [EMAP for Non-Wadeable Rivers](#)
- [EPA Rapid Bioassessment Protocols](#)
- [Mich. DEQ "GLEAS" Procedure 51](#)
- [Non-Wadeable Rivers in Michigan](#)

Background info

[ESAR - Environmental Sampling and Analysis Results](#)

[Review of Rapid Assessment Methods for Assessing Wetland Condition - EPA/620/R-04/009](#)

["Rapid" visual assessment metadata example](#)

[More-quantitative habitat assessment metadata example](#)

Conference calls

- Oct. 3 - [Minutes](#)
- Oct. 17 - [Minutes](#)
- Nov. 7 @ 11a.m. ET
- Nov. 15-16, face-to-face meeting in Cincinnati, OH (webex or other conference capabilities will be available)

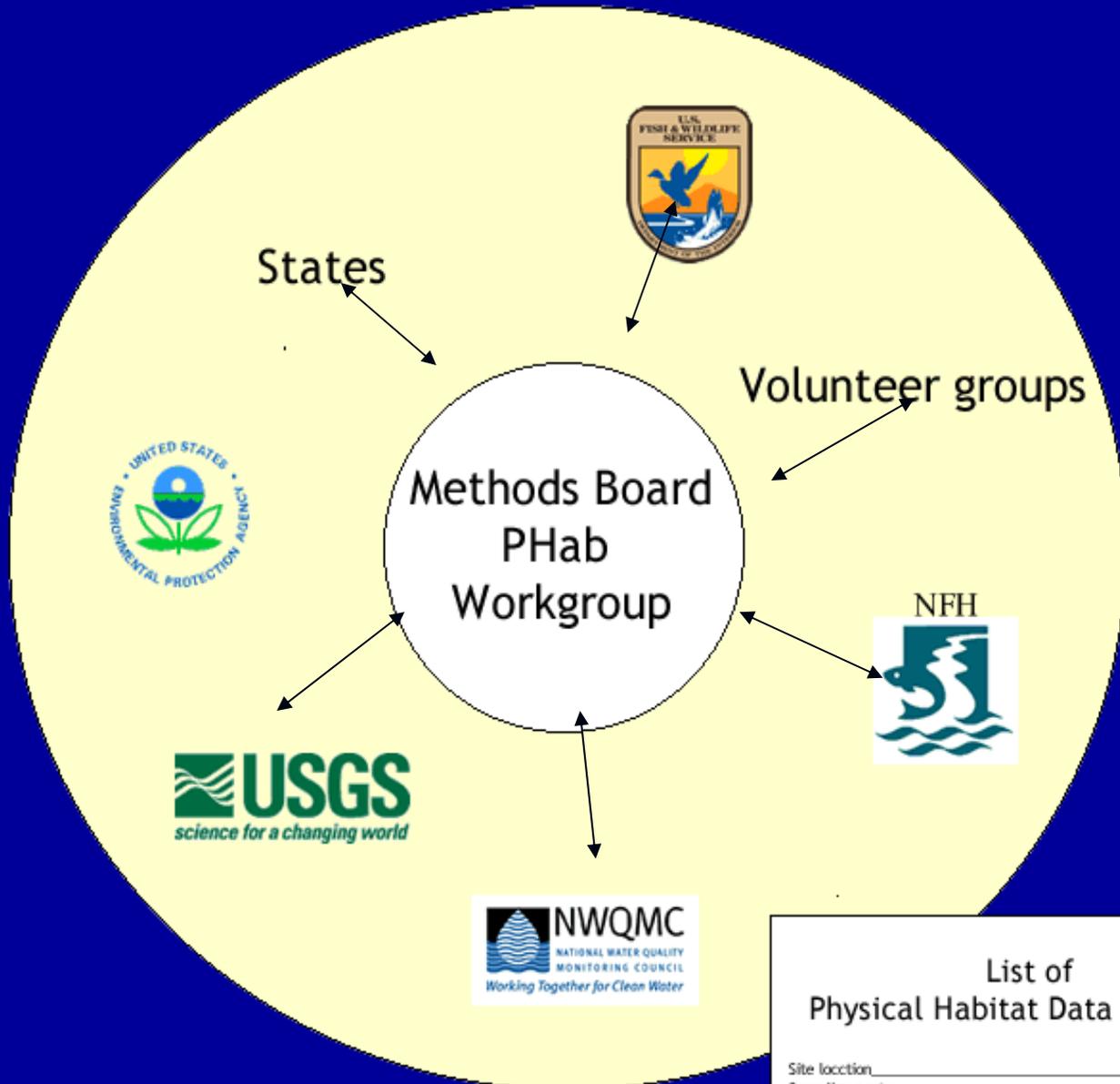
Workgroup Members

- [LeAnne Astin](#)* (ICPRB)
- [Doug Beard](#) (USGS-BRD)
- [Karen Blockson](#) (US EPA)
- [Tom Busiahn](#) (US F&WS)
- [Faith Fitzpatrick](#) (USGS WI)
- [Eli Greenbaum](#) (ORNL)
- [Mike Henebry](#), IL EPA
- [Revital Katznelson](#)* (UC-Berkeley Extension)
- [Phil Kaufmann](#), US EPA (Corvallis)
- [Mike Miller](#), Wis. DNR
- [Eric Russell](#) (Surfrider Foundation)
- [Chuck Spooner](#) (US EPA)
- [Eric Vowinkel](#) (USGS NJ)
- [Dan Sullivan](#) (USGS WI)

WQDE Work Group Internal Web Page and objectives

- Develop a general list of WQDEs for physical habitat
- Work on a few hydrologic systems to start?
 - Streams
 - Wetlands
 - Coastal Zone
- Publication and web site by May 2008
- Workshop at NWQMC Conference in May 2008

Physical Habitat Workgroup Interactions



List of Physical Habitat Data Elements

Site location _____
 Samplign party _____
 Gear _____
 Date _____ Start time _____ End time _____

Physical Habitat Workgroup Members/Liaisons

State/Interstate/University

LeAnne Astin, ICPRB

Revital Katznelson, UC-Berkeley Ext

Mike Henebry, State of IL

Mike Miller, State of WI

Nonprofit/Volunteer

Eric Russell, Surfrider Foundation

Federal

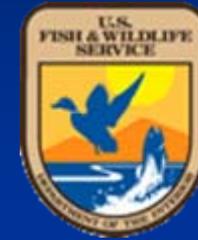
Faith Fitzpatrick, USGS

Eli Greenbaum, ORNL

Chuck Spooner, EPA

Eric Vowinkel, USGS

Dan Sullivan, USGS



Tom Busiahn, DC



Doug Beard

USGS-BRD, Reston



ESAR / WQX

Phil Kaufmann

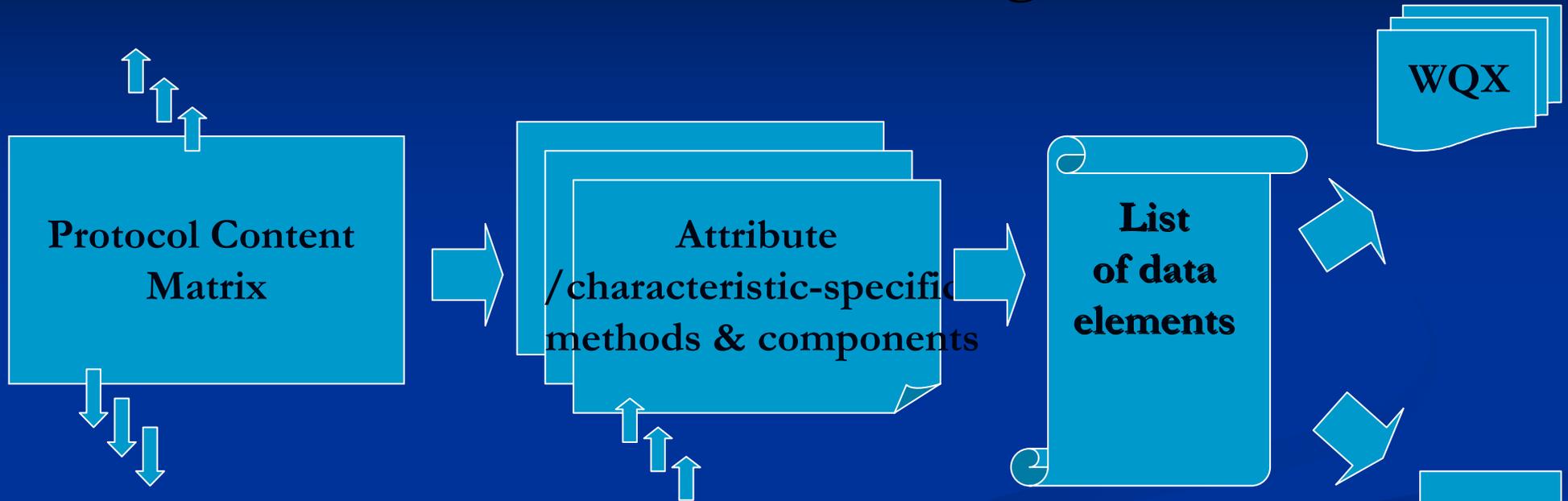


BioData/
BioShare



???

Products use, function, and target audiences



Dialog tool for:

Outreach and Inclusion

Target audience

Other protocol 'Inventors'

function

Nudge to comparability

Input from methods users/experts

PHab assessment
Practitioners & data users

Capture essential components

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NEMI: National Environmental Methods Index

Since 2002, NEMI (<http://www.nemi.gov/>) has helped the scientific community find the environmental methods they need with an easy-to-use, searchable online database of both regulatory and non-regulatory methods.

"Greener" Methods Profiles

A project that aims to define, identify, and promote analytical chemistry methods that use fewer harmful solvents, use safer chemicals, and minimize waste has been initiated by the American Chemical Society's Green Chemistry Institute. Working with the Board GCI is attempting to define metrics and rules and apply these to the methods in NEMI.

Help NEMI Grow

The USGS and the EPA are partnering with private organizations that would like to help NEMI continue to grow.

Through a Cooperative Research and Development Agreement (CRADA), potential partners are being identified to provide funding and assistance for the following activities:

- support the search for, and entry into the database of, new methods that can be included in NEMI
- suggest new types of regulatory information to include
- determine outreach approaches and prepare materials to broadcast the usefulness of NEMI in professional journals, newsletters, and on the Web

Cooperative partners will benefit by:

- gain visibility through public recognition of their involvement
- interact strategically with other leaders in the industry



National Environmental Methods Index

NEMI v2.0

Launch NEMI

Disclaimer

What is NEMI?

Background

Present & Future

What's New?

Method Submission

Other Information

Links of Interest

Help/FAQ

help
NEMI
grow

Click here to partner with
the USGS and the EPA

NEMI is a free, searchable clearinghouse of methods and procedures for both regulatory and non-regulatory monitoring purposes for water, sediment, air and tissues.

Use **NEMI** first to compare and contrast the performance and relative cost of analytical, text, and sampling methods for environmental monitoring.

SEARCH NEMI

Quick/Advanced Search

Use this option for a quick search for methods by **analyte name** or **code** (CAS* number)

NEW! Beta Test new methods in NEMI:

Population/community Biological Protocols

Toxicity Tests

General Search

Select a specific method by method number or search for methods under general categories

NEW! USGS field methods

for measurement of pH, D.O., conductance, redox, alkalinity, and temperature. Use the search options or click here to view these methods.

Regulatory Search

Search for methods approved for **drinking water** or **wastewater regulations**

Browse All Methods - List of all methods in NEMI



National Environmental Methods Index

[Analyte \(main\) Search](#)[General Search](#)[Regulatory Search](#)[Multi-Analyte Search](#)[Analyte Search BETA](#)

This page is utilizing a new query technology. If you find any bugs, please submit [comments](#).

Select Search Criteria

For this search, you must select an analyte, either by name or by **code**.

Type the exact analyte name or code into the appropriate field to the right. You may enter a name or code, but not both.

--OR--

If you are unsure of the spelling of an analyte name, press 'Find an Analyte by name or code'

Analyte Name or Code (required)

[Find an Analyte by Name or Code...](#)

Analyte Name:

- OR -

Analyte Code:

Media Name* :

Method Source* :

[View Results in a New Window \(Printable Format\)](#)

[Export results for Microsoft Excel](#)

[Export results as a tab separated text file \(can be opened in any text editor or spreadsheet\)](#)

Analyte: [Turbidity \(E-10617\)](#) [Click for list of synonyms](#)

3 methods were found in NEMI that match your criteria for the analyte turbidity.

Criteria Summary:

- Media Name equals WATER

| Method Number (Sort) | Source (Sort) | Method Descriptive Name (Sort) | Detection Level | Detection Level Type | Bias | Precision | Spiking Level | Instrumentation (Sort) | Relative Cost (Sort) |
|-------------------------|------------------|-----------------------------------|-----------------|----------------------|---------------|--------------|---------------|---------------------------|-------------------------|
| 180.1 | EPA-NERL | Turbidity by Turbidimeter | 0 NTU | UNKNOWN | N/A | 2.3 RSD (SL) | 26 NTU | TURBID | \$ |
| D1889 | ASTM | Turbidity of Water | 1 NTU | RNGE | 98 % Rec (ML) | 8 RSD (ML) | 4.5 NTU | TURBID | unknown |
| I-3860 | USGS-NWQI | Turbidity, nephelometric | .1 NTU | RL | N/A | 2 | .26 NTU | TURBID | \$ |

Analyte: Mercury (7439-97-6) [Click for list of synonyms](#)

12 methods were found in NEMI that match your criteria for the analyte mercury.

Criteria Summary:

- Media Name equals WATER

| Method Number (Sort) | Source (Sort) | Method Descriptive Name (Sort) | Detection Level | Detection Level Type | Bias | Precision | Spiking Level | Instrumentation (Sort) | Relative Cost (Sort) |
|-------------------------|---------------------------|-----------------------------------------|-----------------|----------------------|----------------------|----------------|---------------|---------------------------|-------------------------|
| 1631 | EPA-EAD | Mercury in Water Using CVAFS | .0002 ug/L | MDL | N/A | N/A | | CVAFS | \$\$ |
| 200.7 | EPA-NERL | Metals in Water by ICP-AES | 7 ug/L | MDL | N/A | N/A | | ICP-AES | \$\$\$ |
| 200.8 | EPA-NERL | Metals in Waters by ICP/MS | .2 ug/L | MDL | 86 % Rec (SL) | 13 RSD (SL) | 1 ug/L | ICP-MS | \$\$\$ |
| 245.1 | EPA-NERL | Mercury by CVAA | .2 ug/L | RNGE | 166 % Rec (ML) | 89 RSD (ML) | .21 ug/L | CVAA | \$\$ |
| 245.2 | EPA-NERL | Mercury by CVAA (Automated) | .2 ug/L | RNGE | N/A | 8 RSD (SL) | .5 ug/L | CVAA | \$\$ |
| D6502 | ASTM | Particulate and Dissolved Matter by XRF | 1 ug/L | ML | N/A | N/A | | XRF | \$\$ |
| I-1462 | USGS-NWQL | Mercury, dissolved, CVFAA | .5 ug/L | RNGE | N/A | 30 RSD (ML) | 3.46 ug/L | CVAA | \$\$ |

Toxicity Methods in NEMI: Beta Test (click on Method No. to see summary)

| Method No. | Description | Subcategory | Endpoint | Source | Media | Matrix | Test Species |
|-----------------------|----------------------------------------------------------------------------------------------------------------------|------------------|-----------------|---------------------------------------|----------------|------------|-----------------------------------------------------------|
| 100.1 | 10-d Survival and Growth Test for Sediments using <i>Hyalloella azteca</i> | Acute Toxicity | Growth/Biomass | EPA-ORD & EPA-OST | SOILS/SEDIMENT | Freshwater | Freshwater amphipod (<i>Hyalloella azteca</i>) |
| 100.1 | 10-d Survival and Growth Test for Sediments using <i>Hyalloella azteca</i> | Acute Toxicity | Survival | EPA-ORD & EPA-OST | SOILS/SEDIMENT | Freshwater | Freshwater amphipod (<i>Hyalloella azteca</i>) |
| 100.3 | Bioaccumulation Test for Sediments Using <i>Lumbriculus variegatus</i> | Chronic Toxicity | Bioaccumulation | EPA-NERL | SOILS/SEDIMENT | Freshwater | Freshwater invertebrate (<i>Lumbriculus variegatus</i>) |
| 100.5 | Life Cycle Test for Measuring the Effects of Sediment-associated Contaminants on Midge (<i>Chironomus tentans</i>) | Chronic Toxicity | Growth/Biomass | EPA-ORD & EPA-OST | SOILS/SEDIMENT | Freshwater | Midge (<i>Chironomus tentans</i>) |
| | Life Cycle Test for Measuring | | | | | | |

NEMI Internal Web Page & Objectives



Workgroup - NEMI

Sept. 25, 2006 Update: We are in the process of updating the content on this page. Some of the content we'll be putting up soon on this page includes:

- FY 2007 Workplan
- List of Priority New Methods by source
- Green methods
- Statistical methods

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- Finalize funding from EPA and USGS
- Complete CRADA
- Complete Green Methods
- Add all methods in NMN by Conference in May 2008
- Add field methods
- Add statistical methods



Green Methods

- ACS Petroleum Research Fund grant to Green Chemistry Institute (Jennifer Young and Larry Keith)
- Developed scale of “relative” greenness and applied to methods in NEMI
 - PBT – A persistent, bioaccumulative, and toxic chemical as defined by the EPA’s Toxics Release Inventory (TRI)
 - Toxic – A chemical is listed on the TRI or RCRA’s D, F, P or U lists.
 - Corrosive – pH is < 2 or > 12
 - Waste generated



NEMI CRADA

- Several private sector companies have agreed to commit \$\$\$ or in-kind services to help with NEMI
- Current CRADA members—YSI, Abraxis, Neptune, Tennessee Tech
- Need to determine priorities for in-kind services support



NEMI-CBR & CBR Advisor

- Chemical, Biological, and Radchem methods for water security
- Approved for release but not for public
- Need to generate funding for continued updates to CBR and CBR Advisor as new methods become available

Chapter 4--Importance of Comparable Network Data

A successful and efficient national-scale compilation and integration of environmental monitoring data will require the following elements:

- known and appropriate methods;
- documented quality assurance and quality control;
- metadata, and;
- access to data and related information.

Example of Inventory of Water Quality Monitoring Data in the Delaware River Basin

| Program | Agency | Sample Collection | Sample Processing / Analysis | QA/QC | | | | Metadata | | Data Reporting | | |
|---------|----------|-------------------|------------------------------|-----------------------------------------|-----------------------------------------|--------------------|----------------|-------------------|----------------|----------------------------------|---------------------------------|------------------|
| | | | | Method available to public on Internet? | Method available to public on Internet? | Replicate samples? | Matrix spikes? | Reference sample? | Split samples? | Recommended metadata maintained? | Publicly available on Internet? | Data electronic? |
| 1 | NJDEP | | | | | | | | | | | |
| 2 | DNREC | | | | | | | | | | | |
| 3 | PADEP | | | | | | | | | | | |
| 4 | DRBC #88 | | | | | | | | | | | |
| 5 | DRBC #36 | | | | | | | | | | | |
| 6 | USGS | | | | | | | | | | | |

Figure 4-1. Status of different monitoring elements, described under Section 4.2 in this chapter, for the major programs monitoring nitrate in the Delaware River. Green indicates that the program does meet the particular category. Orange indicates that the program does address the category as requested but that the information is not necessarily with the data on their web site (e.g., information may be in STORET on EPA’s Web site (need web site) or method information is on EPA’s Web site (URL). A blue cell indicates that the program does not apparently address the category. Need key to agency abbreviations.



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Event and Continuous Monitoring

References

- Wagner and others, 2000, [Guidelines and Standard Procedures for Continuous Water-Quality Monitors: Station Operation, Record Computation, and Data Reporting](#); USGS Techniques and Methods 1-D3
- Whelan and Regan -- [Antifouling strategies for Marine and Riverine Sensors](#), J. Env. Monitoring, 2006

Volunteer Monitoring Validation Techniques