Working Together for Clean Water
9th National Monitoring Conference  April 28 – May 2, 2014  Cincinnati, Ohio

Conference Program

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Cover Photos
(top row, from left to right)
EPA crew deploying a CTD water sampler to measure conductivity, temperature, and depth for the National Coastal Condition Assessment. Credit: Eric Vance, EPA
Stream sampling. Credit: River Watch Groups in Colorado
Becky Woll, USGS, collecting a winter water-quality sample from a lake in Iowa. Credit: Bill Rose, USGS
Stan Skrobialowski (USGS) processing shoreline sediment samples from the Deep Horizon spill. Credit: Roland Tollett, USGS
Pete Lenaker of the U.S. Geological Survey Wisconsin Water Science Center collects a water sample from the Manitowoc River at Manitowoc, WI. The water was collected as part of the Great Lakes Restoration Initiative and analyzed for wastewater indicators, optical properties, and bacteria. Credit: Austin Baldwin, USGS
(bottom row, from left to right)
Dennis Demcheck, USGS, deploying a multi-parameter water-quality sonde, in response to the Deep Horizon spill. Credit: Jason Griffith, USGS
Missouri Stream Team volunteers sort and identify macroinvertebrates from the Deer Creek Watershed near St. Louis. Credit: Danelle Haake
Stream bioassessment. Credit: River Watch Groups in Colorado
Sampling at Spring Lake, Vermont, for the National Lakes Assessment. Credit: Hillary Snook, EPA Region 1
Analyzing samples. Credit: River Watch Groups in Colorado

Disclaimer
The information and suggestions presented at the National Monitoring Conference are subject to constant change and, therefore, should serve only as a foundation for further investigation. All information, procedures and materials contained or used as part of the Conference should be carefully reviewed and serve only as a guide for use in specific situations. Questions regarding such information, procedures and products should be directed to the specific individuals, companies and/or organizations submitting said items and information.

The opinions expressed by presenters, speakers, discussion panelists, committee members and exhibitors are those of said individuals and are not necessarily those of the National Water Quality Monitoring Council, the North American Lake Management Society nor the conference sponsors.

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Welcome to the Ninth National Monitoring Conference!

We are delighted to welcome you to Cincinnati to share accomplishments, developments and new ideas related to water monitoring. We have another outstanding program packed with a huge variety of presentations and opportunities for interaction and information sharing. Some of the conference topics covered this year include:

• Emerging technologies in the application of continuous, real-time sensors and remote-sensing data
• Multiple sessions and presentations associated with water quality of coastal waterbodies
• Monitoring approaches and findings from the National Aquatic Resource Surveys
• Strengthening State and Regional Council partnerships and volunteer monitoring groups
• Advances in promoting and implementing data-sharing programs
• Improving how we communicate science and data to decision-makers and the public

In addition to taking full advantage of the 280 oral presentations, 80 poster presentations, 27 panels and workshops, and 8 field trips, we hope you will:

✓ Visit our many demonstrations of data portals, software, new web pages, apps, etc. Check to see when demonstrations are scheduled at the EPA, USGS and ACWI booths, or when a topical expert will be available to chat. For the first time we will have a Conference Demo Booth, dedicated to provide additional demonstrations throughout the conference. If you have something new you would like to share with others, sign up for demo time at the booth.

✓ Make connections! We will have time set aside Tuesday afternoon from 1:30 – 3:00 for facilitated networking sessions with peers from your geographic region.

✓ The monitoring community continues to collaborate very closely with sensor and sampling manufacturers, providers of geospatial data, and laboratories that provide analytical services. Please be sure to explore your program’s needs and interests with the many exhibitors at the conference.

✓ Explore downtown! Go out with a group to a restaurant, go out for a ball game (the Cincinnati Reds have a home game each night at 7:10 p.m.), or take a stroll to see the Ohio River. Look for the Cincinnati Convention & Visitors Bureau booth for visitor guides, restaurant lists, and other material.

We hope this conference will help you meet your goals to advance water-quality monitoring programs wherever you may live. On behalf of the many individuals who made this conference happen, we wish to express our thanks to you for all you do and urge you to become involved in the National Water Quality Monitoring Council in the future. Your involvement in the Council or the many State and regional Councils around the country is vital to helping protect our water resources and showing the public the importance of clean natural resources.

Susan Holdsworth, Co-Chair NWQMC
U.S. Environmental Protection Agency

Michael Yurewicz, Co-Chair NWQMC
U.S. Geological Survey

Peter Tennant, Chair, Local Planning Committee
Executive Director, Ohio River Valley Water Sanitation Commission
Welcome volunteer monitors, friends and colleagues!

We are pleased to welcome you to this 9th National Monitoring Conference. We hope you’ll meet new colleagues, reconnect with old friends, share your perspectives and knowledge, learn about the latest developments in the field, explore areas of interest, and (of course) have fun. Here are some conference highlights that focus on volunteer monitoring:

**Volunteer Monitoring Training Track:** This year we have many extended sessions:

- Volunteer Monitoring: Getting Started and Growing Successfully (C8, E8)
- Exploring the Worlds of Volunteer Monitoring and Citizen Science (F8)
- Better Data, Better Partnerships: How can New Technologies Increase the Participation and Use of Volunteer Biomonitoring Data? (G8)
- Bacteria Monitoring 101: Get Hands-on with Four Methods to Monitor Bacteria in your Local Waterway (H8)
- Implementing Web-based Digital Technologies for Volunteer Monitoring and Watershed Stewardship Organizations and Agencies (N1, O1)

Also look for volunteer-focused sessions on communicating data, training and coordinating for better results, using volunteer data to meet state Clean Water Act goals, strengthening monitoring programs through collaboration, and much more. Your colleagues are speaking in many sessions and are presenting posters that will be on display throughout the conference.

**Volunteer Monitoring Exhibitor Booth:** Located in the exhibit hall next to the EPA table, this will be “volunteer monitoring central” for the conference. Drop off materials to share, check out the news board, write down a topic for discussion at our Wednesday gathering, learn about our volunteer monitoring webpage and resources, or just hang out to meet your colleagues.

**Wednesday Volunteer Monitoring Gathering and Dinner:** Wednesday after the concurrent sessions, we will gather to address topics of concern and discuss how to sustain our movement and increase communication between conferences. After the meeting, come for dinner at a nearby restaurant.

**“Fluid 5K” Run:** On Thursday at 7 a.m., join this race as a runner, walker or volunteer. Prizes will be awarded! Funds raised will be applied toward the Eleanor Ely Memorial Volunteer Monitoring travel scholarships for the next conference in 2016; if you won’t be running, consider sponsoring one of your friends or colleagues!

We extend our very special thanks to YSI, whose generous sponsorship helped more than thirty volunteer program coordinators travel to this conference. YSI’s many years of support have helped make this conference a rousing success for the nation’s volunteer monitoring community.

Once again, welcome!

*The Volunteer Monitoring Committee*
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Each day, water-quality issues become more complex and the need to address them more urgent. The demand for clean, pure water to support a complex web of human activities and aquatic ecosystems continues to grow. At the same time, budgets to monitor, assess, protect and restore our waters are tighter, forcing scientists and managers to attempt to do more with less. The National Water Quality Monitoring Council (Council) exists to bring together the diverse expertise that is needed to develop collaborative, comparable, and cost-effective approaches to monitor and assess our Nation’s water quality (http://acwi.gov/monitoring/). These approaches are fundamental to the successful management and sustainability of our water resources.

The Council and its partners have made significant advances in its priorities, including data management and information dissemination; compatible web services; State and regional councils; volunteer monitoring; assessment and statistical tools; sensors and real-time monitoring; and integrated land-to-sea assessments through the Network. Multiple Council products and services are now available to help meet water needs across the Nation.
### Council Workgroups

**Methods and Data Comparability Board (Methods Board)** – Provides a forum for evaluating and promoting methods that facilitate comparability among water-quality monitoring and analytical methods. *(Contacts: Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869 and April Dupre, dupre.april@epa.gov, (513) 569-7019)*

The **Aquatic Sensor Workgroup** is a subcommittee of the Methods Board that has focused on quality control and data management of sensor data. *(Contacts: Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869 and Chuck Dvorsky, cdvorsky@tceq.texas.gov, (512) 239-5550)*

**Water Information Strategies Workgroup** – Defines and promotes strategies for monitoring designs; data management, access, and exchange; data integration and analysis; and information reporting to address water needs. *(Contacts: Mary Skopec, mary.skopec@dnr.iowa.gov, (319) 335-1579, Doug McLaughlin, douglas.mclaughlin@wmich.edu, (269) 276-3545, Leslie McGeorge, Leslie.mcgeorge@dep.state.nj.us, (609) 292-1254, and Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869)*

**Collaboration and Outreach Workgroup** – Works to build partnerships that foster collaboration and communication within the water-quality monitoring community. *(Contacts: Cathy Tate, cmtate@usgs.gov, (303) 499-8946, Barb Horn, Barb.Horn@state.co.us, (970) 382-6667, and Danielle Donkersloot, Danielle.Donkersloot@dep.state.nj.us, (609) 292-1254)*

**National Network of Reference Watersheds** – Defines and promotes strategies for improved coordination and collaboration for sharing and accessing reference watershed information and water-quality data for freshwater streams *(Contacts: Mike McHale, mmchale@usgs.gov, (518) 285-5675 and Bill Wilber, wgwilber@usgs.gov, (703) 648-6878)*

**National Water Quality Monitoring Network for Coastal Waters and Their Tributaries** – Promotes strategies and opportunities for collaboration among different freshwater and coastal water-quality programs and networks. *(Contacts: Hugh Sullivan, Sullivan.hugh@epa.gov, (202) 564-1763, Dennis Apeti, dennis.apeti@noaa.gov, (301) 713-3028, ext 132 and Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869)*

### Water Quality Portal – Expanding Data Holdings and Data Use

Since being launched in 2012, the Water Quality Portal (Portal) has experienced increased growth and use. To date, over 10,000 unique visitors have accessed the Portal for water quality data records. On a given week day, there are between 50-100 visits and as many as 3,000 downloads per day via the Portal web services. The increased use of the services means that there are now more users accessing the Portal through automated processes than person visits. For data access and utility, this is a clear demonstration of the value of the Portal. In fact, in a recent 24 hour period, the web service calls downloaded 31,858,249 result records and 5,139,687 station records.

In early 2014, the Portal Team – supported by EPA and USGS – successfully deployed the addition of a new data partner, the USDA Agriculture Research Service, to make their data available through the Portal. STEWARDS (Sustaining the Earth’s Watersheds, Agricultural Research Data System) is the USDA ARS’s repository to compile, document and provide access to data from ARS research watersheds, which represents one of the largest research watershed data collections in the world. The teams worked together over the past two years to map ARS data to the Water Quality eXchange (WQX) schema and resolve other technical data migration issues. Now, users can query data from USGS National Water Information System (NWIS), USEPA Storage and Retrieval Data Warehouse (STORET), and USDA STEWARDS databases simultaneously. To date, ARS contributes 1,076,951 sample results from 168 sites across the country.

The Portal continues to expand its utility by accessing monitoring methods in the National Environmental Methods Inventory (NEMI). The Portal leverages the NEMI analytical method catalogue and provides an immediate display of station and data queries on the Portal mapping interface. Now, water managers and data analysts can quickly link a sample result to the full method that was used to determine that result.

The Water Quality Portal is a collaborative effort by the National Water Quality Monitoring Council, the USEPA, and the USGS to create a single user-friendly web interface to locate water-quality data collected by Federal, State, and tribal partners in a single format. It contains over 150 million public water-quality data records that can be accessed and downloaded in a variety of formats.

Visit the Water Quality Portal on the Web at: [www.waterqualitydata.us](http://www.waterqualitydata.us). *(Contacts: Charles Kovatch, kovatch.charles@epa.gov, (202) 566-0399 and Jim Kreft, jkreft@usgs.gov, (608) 821-3919).*
Establishing a National Network of Reference Watersheds for Freshwater Streams

A unique national network of pristine and minimally disturbed watersheds is the focus of a new Council effort to address the need for reliable long-term data and information from watersheds that are minimally disturbed by human activities. The collaborative, multipurpose design will emphasize chemical, physical, and biological aspects of water quality and integrate, to the extent possible, with existing networks. The National Network of Reference Watersheds (NNRW) is envisioned as a web-based data delivery system. The NNRW will define a set of “core” reference watersheds that includes the least disturbed watersheds having the longest periods of record for selected water-quality data. It is also envisioned that the NNRW web-based resource will allow users to define their own reference criteria to identify watersheds that best meet their specific needs and objectives. One major goal is to link the site information and the watershed database being developed for the NNRW to the National Water Quality Monitoring Council’s Water-Quality Portal to deliver water-quality data for sites of interest. Membership in the network will be voluntary and open to interested individuals and institutions. More information at: http://acwi.gov/monitoring/workgroups/wis/National_Reference_Network_for_Streams.pdf (Contact: Mike McHale, mmchale@usgs.gov, (518) 285-5675).

Aquatic Sensor Workgroup (ASW)

The ASW worked with partners in public and private sectors to develop the Continuous Monitoring track at the 2014 National Monitoring Conference. Among the session topics are innovative technologies, regulatory applications of sensor data, data quality assurance and data management, and sensor developments in energy production. In addition, a workshop that explores a myriad of issues associated with the large datasets produced by continuous monitoring with presenters from USGS, EPA, CUAHSI, academia, and states will provide an information-packed 3 hours in the middle of the conference.

Other products developed through the sensor partnership are available, including a checklist for users related to calibration and record keeping to ensure that data are of known and documented quality; a deployment guide to assist in siting and maintaining sensors in the field; a draft data elements (or metadata) for sensors; and a glossary of terms. A website (http://watersensors.org/) has been built to help disseminate this information and as a clearinghouse of information on emerging sensors information. (Contacts: Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869 and Chuck Dvorsky, cdvorsky@tceq.texas.gov, (512) 239-5550).

National Environmental Methods Index

The National Environmental Methods Index (NEMI), in its 12th year as one of the Council’s flagship products, is an online resource of laboratory methods and field protocols, including more than 1,200 methods for chemical, biological, and physical monitoring (see http://www.nemi.gov/). NEMI continues to evolve; a new version (4.0) was released this year that boasts numerous improvements. A “protocol library” is being developed that will provide access to field collection protocols and the key methods contained in them; USGS-NAWQA and EPA-NRSA protocols are the first to be incorporated. (Contact: Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869).

Water Quality Statistical and Assessment Methods Online Database Available!

An online searchable clearinghouse of methods to analyze water quality data and help support water quality assessments was implemented by the Council’s Water Quality Statistics and Assessments workgroup. The effort is being integrated with the Council’s popular National Environmental Methods Index (NEMI, http://www.nemi.gov/) and joins sensors and biological methods as recent additions to this growing resource. The user interface is designed to support a variety of queries. Some may be driven by basic water resources questions like “How do I compare the nutrient concentrations at two sites?” or “How do I look for patterns in macro-invertebrate data?” Or users may want to query “Statistical NEMI” (as it is called by the workgroup members) to find information on the latest methods used to evaluate temporal trends. The information in the database includes links to guidance documents and website, downloadable software, and more. Users also have the option of providing their own methods to the database. (Contacts: Doug McLaughlin, douglas.mclaughlin@wmich.edu, (269)-276-3545, Leslie McGeorge, Leslie.McGeorge@dep.state.nj.us, (609) 292-0427, and Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869).


A centerpiece forum for communication and collaboration among the monitoring community is the Council’s biennial national conference. The 9th National Monitoring Conference in Cincinnati, Ohio includes more than 500 water practitioners from all backgrounds. This national forum provides an exceptional opportunity for Federal, State, local, tribal, volunteer, academic, private, and other water stakeholders to
exchange information and technology related to water monitoring, assessment, research, protection, restoration, and management, as well as to develop new skills and professional networks. (Contacts: Cathy Tate, cmtate@usgs.gov, (303)-236-6927, Jeff Schloss, jeff.schloss@unh.edu, (603) 862-3848, and Alice Mayio, Mayio.Alice@epamail.epa.gov, (202) 566-1184).

Volunteer Monitoring and Citizen Science

Connecting volunteer monitoring groups to existing and new resources as well as to each other and with other monitoring efforts is the purpose of the Council’s new volunteer monitoring webpage. The page provides an explanation of why volunteer monitoring is effective and important, provides information and links to the USEPA’s National Directory of Volunteer Monitoring Programs and volunteer monitoring list serve, highlights volunteer monitoring success stories, links to a “how-to” library compiled by the National Water Resource project, and lists other key resources. Coming this spring, the website will include an interactive map of where volunteer monitoring programs are located. The website is also the home of the brand new e-newsletter Volunteer Monitoring News and provides a link to archived issues of the Volunteer Monitor Newsletter. Please visit: http://acwi.gov/monitoring/vm and provide your success story, program location or just share with others. (Contact: Barb Horn, Barb.Horn@state.co.us, (970) 382-6667 and Danielle Donkersloot, Danielle.Donkersloot@dep.state.nj.us, (609) 292-1254).

Advancing the Design and Objectives of the National Water Quality Monitoring Network for Coastal Waters and Their Tributaries (NMN)

The National Ocean Council released the National Ocean Policy Implementation Plan to address some of the most pressing challenges facing the ocean, our coasts, and the Great Lakes. One of the actions in the plan charges the NWQMC to further implement the design of the NMN, and to this end, we are promoting opportunities for collaboration among different freshwater and coastal water-quality programs and networks. Elements of the plan include promoting application of new sensor technologies, increasing accessibility of data, promoting linkages between freshwater and coastal nutrient models, and assessing how the design of the NMN can address important coastal water-quality issues in select estuaries. (Contacts: Hugh Sullivan, Sullivan.hugh@epa.gov, (202) 564-1763, Dennis Apeti, dennis.apeti@noaa.gov, (301) 713-3028, ext 132, and Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869 for more information on Council activities related to the NMN).

Demonstration studies of the Network are being conducted in Lake Michigan (Contact: Dan Sullivan djsulliv@usgs.gov, (608) 821-3869); Albemarle Sound, NC (Contact: Michelle Moorman, mmoorman@usgs.gov, (919) 571-4013); and Puget Sound, WA (Contact: Kathy Conn, kconn@usgs.gov, (253) 552-1677).

The Council Continues to Reach Out to the Water Monitoring Community by:

Publishing the bi-annual online issues of National Water Monitoring News, highlighting recent activities of the national, State, regional, and tribal councils, watershed partnerships, and volunteer monitoring groups; projects, publications, tools, findings or announcements of interest to the water monitoring community. (http://acwi.gov/monitoring/newsletter/).

Hosting webinars representing a wide range of topics and audiences including State and regional councils, volunteer and tribal monitoring, sensors, NEMI, data exchanges, Healthy Waters 101, Ecological Flows in the Shenandoah River Valley, EPA’s Water Contaminant Information Tool (WCIT), National Ecological Observatory Network (NEON) and much more!

Supporting the creation and sustaining of partnerships among the water monitoring community, including State, regional, and tribal councils, as well as watershed groups and alliances through webinars and organizing workshops at the National Monitoring Conference. (Contacts: Cathy Tate, cmtate@usgs.gov, (303) 236-6927, Barb Horn, Barb.Horn@state.co.us, (970) 382-6667, and Danielle Donkersloot, Danielle.Donkersloot@dep.state.nj.us, (609) 292-1254).

Additional information on Council activities can be found at the Council website, http://acwi.gov/monitoring/ and through the Council Co-Chairs, Susan Holdsworth, USEPA, holdsworth.susan@epa.gov, (202) 566-1187 and Gary Rowe, USGS, gilrowe@usgs.gov, (303) 236-1461.
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Elizabeth Jester Fellows was the Director of the EPA's Assessment and Watershed Protection Division until her death in November 2000. She dedicated her career to natural resources management, environmental protection, and public service. Elizabeth was the EPA cochair of the Intergovernmental Task Force on Monitoring (ITFM) and envisioned the creation of its successor, the National Water Quality Monitoring Council. She was a strong and effective advocate for developing a nationwide framework for coordinating, collecting, assessing, and communicating water quality monitoring information and results. Elizabeth was the personification of the goals and ideals of the monitoring Council, and her legacy has been an inspiration to those who have followed her and continue the Council's work. In her memory, the Council has established the Elizabeth Jester Fellows Award to recognize individuals for outstanding achievement, exemplary service, and distinguished leadership in water quality monitoring and environmental protection.

For 26 years, Linda has been the Program Director for the University of Rhode Island Watershed Watch, where she is the tireless leader of one of the most respected statewide volunteer monitoring programs in the nation. URIWW provides current information on the water quality of surface water resources throughout Rhode Island, including lakes, ponds, reservoirs, rivers, streams and the marine environment. However, back in 1988 when Watershed Watch was formed, state agency staff and other professionals challenged the value of volunteer generated data. The professional, upbeat manner with which Linda handled those early naysayers, combined with the high quality of data generated by her volunteers, not only changed minds but resulted in the use of volunteer data throughout the state of Rhode Island.

Among her many roles, Linda has been a leader of the New England Monitoring Council; an officer of the North American Lake Management Society; on the editorial board of The Volunteer Monitor Newsletter; a founding member of both the Rhode Island Volunteer Monitoring Advisory Board and the Rhode Island Monitoring Collaborative, which created partnerships between multiple watershed groups and state agencies; and the first volunteer monitoring representative appointed to the Council. Linda received the URI Cooperative Extension Educator of the Year award in 1994 and an EPA Merit Award in 1999 for her efforts to promote volunteer monitoring.

Linda's efforts to encourage volunteer monitoring programs across the Nation have ensured that the reach and impact of her work has extended far beyond Rhode Island. She has led three successful USDA projects to develop and implement a comprehensive support network for Cooperative Extension-affiliated volunteer monitoring initiatives. These projects have been critical in maintaining energy and focus for volunteer monitoring during an era of significant budgetary constraints. Representing her program and the national volunteer monitoring movement, Linda has been instrumental over the past two decades in helping the EPA, the USGS, and other organizations – including the Council – understand and value the contributions of volunteer water monitors and develop programs to support the movement.

Congratulations, Linda!
Barry Alan Long Award

Barry Long was a hydrologist and water quality specialist with the National Park Service, Bureau of Land Management, and the U.S. Forest Service. In June 2000, Barry was diagnosed with acute myeloid leukemia. His colleagues and supporters were moved by the tremendous perseverance, spirit, and courage he displayed during his long struggle with the disease. Barry continued his career as a tactful advocate for the protection of water resources and through his work on the Council, which included organizing the 2010 National Monitoring Conference in Denver, Colorado. In his memory, the Council established the Barry A. Long award to honor an individual who has demonstrated exceptional perseverance, positive spirit, and significant contributions to water resource protection.

In recognition of his significant contributions to water resource protection, the National Water Quality Monitoring Council is pleased to present the 2014 Barry Alan Long Award to:

Jim Harrington
Environmental Scientist
California Department of Fish and Wildlife
Rancho Cordova, California

Jim has been an environmental scientist with the California Department of Fish and Wildlife since 1987. Jim has provided support in water monitoring to not only the California Department of Fish & Wildlife and the state of California, but has also assisted many other state and Federal agencies, institutions, tribes, and local communities.

Jim established the Aquatic Bioassessment Laboratory in northern California, where he developed ecological assessment techniques for California’s river and stream ecosystems. In 1999, Jim developed the California Stream Bioassessment Procedure by adapting EPA’s Rapid Bioassessment Protocols. The result has been a cost-effective, consistent tool to determine the biological and physical integrity of California streams.

Jim’s California Aquatic Bioassessment Workshop is an annual gathering of scientists and researchers from California and nearby states. The upcoming 2014 workshop will be the 21st time that participants come together to share project information, learn about bioassessment approaches in other ecoregions, collaborate on projects of mutual interest, and meet and socialize with colleagues.

In addition to his workshops, Jim has established one of the best training forums for stream assessment protocols, including the latest field methods and data synthesis techniques. His students have included everyone from novices to seasoned scientists. In addition to training agency personnel in California, Jim has been extremely generous in responding to the training needs of tribes and citizen monitoring groups throughout the West. Jim’s training forums encourage and assist environmental resource managers and watershed stakeholders to incorporate measures of biological and physical/habitat into their water quality programs. The consistent use of the California Stream Bioassessment Procedure has also ensured that data generated by these efforts is compatible with a statewide bioassessment effort and can be used by regulatory agencies.

Jim Harrington exemplifies the intent of the BAL Award with his perseverance in promoting bioassessment, his positive spirit, and his work breaking down barriers between diverse stakeholders that represent both the regulators and the regulated.

Congratulations, Jim!
Vision Award

The National Water Quality Monitoring Council’s Vision Award recognizes a monitoring council or group that has demonstrated extraordinary vision and cooperation in the field of water quality monitoring on a local or regional level to enhance the management and protection of aquatic resources.

In recognition of extraordinary vision, collaboration, and leadership in water quality monitoring and environmental protection, the National Water Quality Monitoring Council is pleased to present the 2014 Vision Award to:

Florida LAKEWATCH
Mark Hoyer, Director
University of Florida
Gainesville, Florida

Florida LAKEWATCH was begun in 1986 by the University of Florida with the goal of collecting credible data on Florida’s aquatic systems. Officially established by the legislature in 1991, LAKEWATCH exemplifies the University of Florida’s land-grant ethic of teaching, research, and outreach/extension.

Since the program’s inception, thousands of LAKEWATCH volunteers have collected water quality data on more than 1,100 lakes, 175 coastal sites, 120 rivers, and 5 springs in 57 Florida counties. For long-term trend analyses, LAKEWATCH provides at least 20 years of monthly data on 27 lakes and 15 years of monthly data on 195 lakes. All the data collected by LAKEWATCH (currently about 45,000 samples per year) are publicly available in EPA’s STORET as well as on the Florida LAKEWATCH website (http://lakewatch.ifas.ufl.edu/LWCIRC.HTML), along with publications and other information generated by the program to promote the science-based management of Florida’s aquatic resources.

Data collected by LAKEWATCH volunteers have been shown to be comparable to data collected and processed by Florida Department of Environmental Protection (FDEP) professionals. These comparison studies allow FDEP to use LAKEWATCH data for regulatory decisions including development of numeric nutrient criteria, assessment of impaired waters, development of Total Maximum Daily Loads, and development of Basin Management Action Plans.

Over the last 25 years, LAKEWATCH data have been used in over 40 peer-reviewed scientific publications and three books. Florida LAKEWATCH has also cooperated with scientists from around the globe by sharing data for comparative ecological studies. Over 35 graduate students, all of whom received degrees in the lake management field, were mentored through the program. Undergraduate students are also mentored and supported in hands-on lake research and management activities.

The success of LAKEWATCH could not have been accomplished without contributions from many scientists, staff, and volunteers. However, it takes leadership to bring together such a diverse group, to grow a program and keep it vibrant and pertinent, and to maintain sources of funding. The leadership provided by Mark Hoyer, Director of LAKEWATCH, has enabled this important and valuable program to thrive.

Congratulations to the Director, staff, and volunteers of Florida LAKEWATCH!
Acknowledgments

The Council offers its gratitude to those who served on the 2014 Conference Planning Committee and its Subcommittees. The Council also acknowledges the commitment and hard work of all those who served on abstract review teams, session moderators, workshop/short course facilitators and trainers, panel organizers and speakers. Many thanks go to all who prepared presentations, posters, and exhibits for the conference and volunteered at the conference to make it run smoothly. Listed below are the numerous individuals who participated in organizing the 2014 conference:

Conference Planning Committee Chairs

Cathy Tate, US Geological Survey

Alice Mayio, US Environmental Protection Agency

Jeff Schloss, University of New Hampshire / NALMS

Conference Planning Committee Chairs

Cathy Tate, USGS
Alice Mayio, USEPA
Jeff Schloss, University of New Hampshire
Mike Yurewicz, USGS
Susan Holdsworth, USEPA
Curtis Cude, OR Health Authority (Program Committee Co-Chair)
Callie Oblinger, USGS (Program Committee Co-Chair)
Mary Skopec, Iowa Dept. of Natural Resources (Program Committee Co-Chair)
Barb Horn, Colorado Parks and Wildlife
Dan Sullivan, USGS
Monty Porter, Oklahoma Water Resources Board
Jeff Thomas, ORSANCO
Kris Stepenuck, University of Wisconsin Extension
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Greg Arenz, NALMS
Wendy Norton, USGS
Jeff Ostermiller, Utah Div. of Water Quality
Mike Higgins, US Fish and Wildlife Service
Leslie McGeorge, New Jersey Dept. of Environmental Protection

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Jeff Thomas, ORSANCO
Joseph Flotemersch, USEPA
Dick Bartz, USGS
Mindy Scott, SDI, Kentucky Water Watch
Bruce Whitteberry, Greater Cincinnati Water Works
Jim Lazorchak, USEPA
Erich Emery, USACE
Laith Alfaqh, Metropolitan Sewer District of Greater Cincinnati

Heather Mayfield, Foundation for Ohio River Education
Chris Heyer, Xylem, Inc
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Peter Bornhorst, YSI
Tim Grooms, YSI
Chris Heyer, YSI
Kris Stepenuck, University of Wisconsin Extension
Peter Tennant, ORSANCO
Jeff Thomas, ORSANCO

A Special Thank You to YSI

Volunteer Monitoring Committee

Barb Horn, Colorado Parks and Wildlife
Linda Green, University of Rhode Island Watershed Watch
Danielle Donkersloot, New Jersey Dept. of Environmental Protection
Julie Vastine, Alliance for Aquatic Resource Monitoring
Alice Mayio, USEPA
Kris Stepenuck, University of Wisconsin Extension

Workshops, Short Courses, and Panels Committee

Monty Porter, Oklahoma Water Resources Board

Acknowledgments

Alice Mayio, USEPA
Doug McLaughlin, National Council for Air and Stream Improvement
Steve Wolfe, Gulf of Mexico Alliance
Tony Shaw, Pennsylvania Dept. of Environmental Protection
Barb Horn, Colorado Parks and Wildlife
Mary Skopec, Iowa Dept. of Natural Resources
Jeff Thomas, ORSANCO
Dave Neils, New Hampshire Dept. of Environmental Services

Jeff Schloss, University of New Hampshire
Cathy Tate, USGS
Greg Pettit, Oregon Dept. of Environmental Quality
Rick Hooper, Consortium of Universities for the Advancement of Hydrogeologic Science, Inc.
Jeff Ostermiller, Utah Div. of Water Quality
Curtis Cude, Oregon Health Authority

Plenary Committee

Mike Yurewicz, USGS
Susan Holdsworth, USEPA
Glen Skuta, Minnesota Pollution Control Agency
Jeff Ostermiller, Utah Div. of Water Quality
Jim Lazorchak, USEPA

Awards Committee

Dan Sullivan, USGS
Andy Fayram, Wisconsin Dept. of Natural Resources
Monty Porter, Oklahoma Water Resources Board
Cathy Tate, USGS
Alice Mayio, USEPA
Conference Information

Registration
Conference registration is located in the Grand Ballroom Pre-function Lobby.

Hours:
- **Monday, April 28**: 12:00 pm – 6:00 pm
- **Tuesday, April 29**: 7:00 am – 5:00 pm
- **Wednesday, April 30**: 7:00 am – 5:00 pm
- **Thursday, May 1**: 7:00 am – 3:30 pm
- **Friday, May 2**: 7:00 am – 10:00 am

Meal Functions
All meals listed below are provided to all full conference registrants on Tuesday, Wednesday and Thursday. Daily registrants receive all meals on the day that they attend the conference.

**Continental Breakfast**
- **Wednesday, April 30**: 7:00 am – 8:00 am, Grand Ballroom B
- **Thursday, May 1**: 7:00 am – 8:00 am, Grand Ballroom B

**Morning Break**
- **Tuesday, April 29**: 9:30 am – 10:00 am, Grand Ballroom B
- **Wednesday, April 30**: 9:30 am – 10:00 am, Grand Ballroom B
- **Thursday, May 1**: 9:30 am – 10:00 am, Grand Ballroom B

**Lunch**
- **Tuesday, April 29**: 12:00 pm – 1:30 pm, Grand Ballroom B
- **Wednesday, April 30**: 11:30 am – 1:30 pm, Grand Ballroom B
- **Thursday, May 1**: 11:30 am – 1:30 pm, Grand Ballroom B

**Afternoon Break**
- **Tuesday, April 29**: 3:00 pm – 3:30 pm, Grand Ballroom B
- **Wednesday, April 30**: 3:00 pm – 3:30 pm, Grand Ballroom B
- **Thursday, May 1**: 3:00 pm – 3:30 pm, Grand Ballroom Pre-function Lobby

**Exhibit and Poster Reception**
- **Tuesday, April 29**: 5:15 pm – 7:00 pm, Grand Ballroom B

**Closing Plenary and Awards Dinner**
- **Thursday, May 1**: 5:15 pm – 8:00 pm, Grand Ballroom A
National Water Quality Monitoring Council Networking Block  
Tuesday, April 29 | 1:30 pm – 3:00 pm | D Session

Meet Your Peers – Who is Working in Your Backyard?
Look in your program for an insert that will display specific rooms for geographic breakouts.

Have you ever gone to a conference and wished you could have met more people in your geographic area? Great ideas often come from conversations with new people about a shared interest. Join this unique, facilitated networking session to share perspectives with a group of peers from your geographic region. We will discuss topics identified when participants registered for the conference. Start the conference with a set of familiar faces and continue to dialogue and build relationships throughout the week.

Here are the FAQs for this session:

Where do I go for this Networking Block?
Look in your program for an insert that will display specific rooms for geographic breakouts. Find what geographic breakout is most meaningful to you and go to that room, find your peers and begin three rounds of exchange. Groups are determined primarily by state, but for states with high attendance, further breakdown options are provided.

What if I do not work in a state, but work all over?
You have a choice. You can go to the state where you are based or to a state where you have worked or that is meaningful to you.

What if I am not from the USA?
You have a choice. There will be a breakout group for Canadians and all other international attendees. However, if you are working in or interested in a specific state, please attend that group.

How big is a group?
The goal is to make each group 10 people or less. This gives everyone enough time to meet and share information. Please subdivide yourselves to make groups of 10 or less, OR decide as a group to make your sharing time shorter for each round of information exchange.

What will we be sharing?
Three rounds of sharing will occur. There are 90 minutes to divide three rounds of sharing. That means 30 minutes per round, 3 minutes per person for 10 people. The first round will be introductions, exchanging name, organization and primary aspect of work. The second and third round will include exchanging information on a specific topic. During the registration process you were asked to rank the top three topic areas of most interest to you from the list below:

- Developing Monitoring Objectives, Identifying Data Users, Uses, Needs, Applications
- Designing Monitoring Programs, any aspects
- Collection of field or laboratory data, any aspect
- Compiling and managing Data, any aspect
- Assessing and Interpreting Data, any aspect
- Communicating Data, any aspect
- Coordinating or Collaborating on any aspect listed above

Furthermore, using your top three choices above, provide one meaningful question, statement or concern to discuss during the network block.
The second and third round information sharing is up to the group based on topic area interest. It does not matter if you remember what you selected, think of your answers now and bring them to your group. Your facilitator will have a summary of registrants’ responses to these two inquiries and will use as a guide.

**What if my group does not have a facilitator?**
Great! Thanks for noticing and either become your group's facilitator or select one. Waste no time!

**Facilitators Role**

- Get group started and either keep it to 10 people or less or manage time appropriately (<3 min./exchange).
- All get to share each round if they want too. **The group holds ALL responsible for brevity.**
- Round 1 – share names, organization, primary scope of work, 3 minutes each.
- Round 2* – 1st Topic area/question/concern share.
- Round 3* – 2nd Topic area/question/concern share.
- Encourage individuals to exchange contact information and continue to network at conference and beyond.

*Topic area decided by combination of registrant responses and whoever is present.*
Fluid 5K Run

Thursday, May 1, 2014 | 7 am

Location | Four blocks south of the Duke Energy Convention Center. The sidewalk at the junction of Elm and Mehring. Runners meet in the main entrance foyer of the Duke Energy Convention Center (5th Street and Elm Street entrance).

$30 registration fee | Runners and walkers are welcome; although not a public event, water professionals and their family, friends and colleagues are more than welcome to participate.

Cause | Money raised through the event will support the Eleanor Ely Memorial Scholarship Fund which helps volunteer water monitoring program coordinators attend future National Monitoring Conferences.

Who was Ellie Ely? | Ellie was one of the stalwarts of the volunteer monitoring movement and a prominent leader from its very beginnings. She was the editor and driving force behind The Volunteer Monitor from 1990 to 2010. During that time, this newsletter was the voice of volunteer monitoring; everyone relied on it for technical advice on monitoring, sustaining programs, training volunteers and many other topics. She was also instrumental in developing a national directory of volunteer environmental monitoring programs. Sadly, Ellie died in 2012 from ovarian cancer.

I’m not a runner. Are there other ways I can help or contribute? | We are looking for volunteers to help out on the day of the race. Contact Kris Stepenuck (kfstepenuck@wisc.edu) to learn more about how you can help.

You can also sponsor, or be a cheerleader, for someone who is running. Simply sign up on their Cheerleader Form with your pledge of support. The Cheerleading Team that contributes the most will win a prize! Runners can pick up a cheerleader form at the Volunteer Monitoring booth in the exhibit hall.

You may also donate money directly to the fund. Visit the conference registration desk to make your contribution.
The Council is coordinating various demos on data portals, mobile apps, software and models, new apps, and more!

The National Water Quality Monitoring Council (Council) is coordinating various demos at 3 booths: the ACWI/Council booth; the EPA booth; and the USGS booth. The purpose of the demos is to showcase products and activities related to Council workgroups and goals. The demonstrations will include data portals, new software and models, new mobile apps, and other technical topics. Be sure to check the demo schedules at these 3 booths to be sure you are aware of all the demos that will be scheduled, and some of the technical experts who will be on hand to chat. A complete schedule for demos will be available at the conference. In the meantime, some demos are already scheduled (times are subject to change). In some cases, you can arrange a different time for a one-on-one demo … check with staff at the booths.

BioData – Retrieving Aquatic Bioassessment Data
(Mitch Harris, USGS)
USGS Booth; Mitch will be there Tuesday 12:30 – 1:30 and Wednesday 9:30 – 10:00

The BioData Retrieval system (https://aquatic.biodata.usgs.gov/), is a one-stop location for USGS bioassessment data from across the United States. Scientists, resources managers, and the public can use this centralized, web-accessible database to select from, preview, and download over 15,000 fish, aquatic macroinvertebrate, and algae community samples. See how many samples you will retrieve in real time as you modify selection criteria -- then save data selection criteria for re-use and sharing. BioData delivers data using current taxonomic nomenclature, thus relieving users of the difficult and time-consuming task of harmonizing taxonomy among samples collected during different time periods.

EPA's Catchment-based Indexing Approach for Relating Multi-Scale/Multi-Source Geospatial data with NHDPlus
(Dwane Young, EPA)
EPA Booth Wednesday 12:00 – 12:30 pm

EPA has been exploring new methods for georeferencing state assessment units to the National Hydrography Dataset Plus (NHDPlus). Historically, this has been a labor and time-intensive process, and EPA has developed an automated approach that we're calling the 'Catchment-based indexing' approach. During this demo, EPA will walk through the specifics of how this new automated process works. EPA will also demonstrate some of the power of using NHDPlus catchments, and be available to answer specific questions about the process. This demo is a companion demonstration to three conference presentations in Session F2 and in Session M6 by Dwane Young, Wendy Reid, and Tommy Dewald, EPA.

NARS Data Entry Mobile App
(Marsha Landis, EPA)
EPA booth on Tuesday 6:00 – 6:30 pm and Thursday 12:30 – 1:00 pm

App technology is now available for field crews participating in the National Aquatic Resource Surveys. Many field crews are now collecting field data on tablets and sending it directly into a database. No scanning or transcription necessary. Come check out how we have transferred field forms into an App for the National Rivers and Streams Assessment 2013-14. Check out the added benefits of Apps over paper. Play around with the App on devices at the booth. Do you want to do this for your own monitoring programs?
The National Ground Water Monitoring Network Information Portal
(Bill Cunningham, USGS, ACWI Subcommittee on Ground Water)
ACWI/Council Booth; Bill will be at the booth Thursday 11:30 – 12:30

The National Ground-Water Monitoring Network (NGWMN) is a compilation of selected groundwater monitoring wells from Federal, State, and local groundwater monitoring networks across the nation. The NGWMN is a product of the ACWI Subcommittee on Ground Water. The Portal provides access to groundwater data from multiple, dispersed databases in a web-based mapping application. The portal contains current and historical data including water levels, water quality, lithology, and well construction. The current network includes data from 29 States and includes 48 principal aquifers. http://cida.usgs.gov/ngwmn/

The National Network of Reference Watersheds (NNRW)
(Mike McHale, USGS)
ACWI/Council Booth: Thursday, May 1, 12:30 – 1:30 pm

A National Network of Reference Watersheds (NNRW) is the focus of a new Council effort to address the need for reliable long-term data and information from watersheds that are minimally disturbed by human activities. The NNRW is envisioned as a web-based resource which utilizes a collaborative and multipurpose design which will emphasize chemical, physical, and biological aspects of water quality and integrate, to the extent possible, with existing networks. Membership in the network will be voluntary and open to interested individuals and institutions…swing by the booth to learn more!

Providing Better Public Access and Use of Point Source Wastewater Pollutant Discharge Information
(Wayne Davis and Carey Johnston, EPA)
EPA booth Wednesday 1:00 – 1:30 pm and Thursday 12 – 12:30 pm

EPA’s web tool, DMR Pollutant Loading Tool (“Loading Tool” at http://www.epa.gov/pollutantdischarges), makes it easy to see who is discharging, what pollutants they are discharging and how many pounds are released to water. The Loading Tool provides easy and flexible searching for your local area, a watershed, a specific company, a particular pollutant, or an overall industry group. The recently released enhancements to the Loading Tool make it easier to compare pollutant discharge estimates from millions of sampling records and matching releases reported to EPA as part of the Toxics Release Inventory (TRI) program. These comparisons help users gain a better understanding of the pollutants that are discharged to lakes, rivers, and streams. Additionally, users can also limit their searches to facilities that discharge to impaired waterbodies and whether the facilities are discharging pollutants that contribute to a waterbody impairment. Finally, users can limit their searches to facilities that are located in a county with Endangered Species Act listed aquatic species using data from U.S. Fish and Wildlife Service. Visit this booth to learn about the tool and how to use it from a variety of perspectives.

Querying the National Environmental Methods Index (NEMI) for Environmental Statistical Methods
(Doug McLaughlin, National Council for Air and Stream Improvement, Inc.)
ACWI/Council Booth; Doug will be at the booth Wednesday 11:30 am – 12:30 pm and again 3:00 – 3:30 pm

The National Environmental Methods Index (NEMI) – statistical methods, interoperability with the water quality portal, and more (Doug McLaughlin, National Council for Air and Stream Improvement, Inc., and Mary Bucknell and Dan Sullivan, U.S. Geological Survey) ACWI/Council Booth: Mary and Dan will be at the booth Tuesday from 12:30 – 1:30 p.m.; Doug will be at the booth Wednesday 11:30 am – 12:30 pm and Doug and Mary will be at the booth from 3:00 – 3:30 pm. USGS Booth: Mary will be at the booth from 12:30 – 1:00 p.m. on Thursday.

NEMI is a searchable database of environmental methods, protocols, and procedures that allows scientists and managers to find and compare data-collection methods and protocols for all stages of the monitoring process. Doug will show how to query NEMI to retrieve statistical methods for analysis of environmental data. Mary and Dan will provide query tips and explain new capabilities of NEMI v. 4.0. https://www.nemi.gov/
Retrieving data from the national Water Quality Portal (www.waterqualitydata.us)
USGS Booth; Jim Kreft, USGS will be at the booth Wednesday 12:30 – 1:30 pm and Thursday 1:00 – 1:30 pm
EPA Booth; Charles Kovatch or Dwane Young will be at booth on Wednesday and Thursday 9:30 – 10:30 am

The Water Quality Portal is collaborative effort by the National Water Quality Monitoring Council, the USEPA, and the USGS to create a single point to access water-quality data collected by Federal, State, and tribal partners in a common format. It contains over 200 million public water-quality data records that can be accessed and downloaded in a variety of formats either through the new mobile-friendly web interface or via a powerful API. Don't pass up this opportunity to become an expert at retrieving water-quality data…swing by the booth to get some valuable one-on-one time with the experts!

The SPARROW Decision Support System (SPARROW DSS)
(Steve Preston and Meredith Warren, USGS)
USGS Booth; Steve and Meredith will be on hand Wednesday 3:00 – 3:30 and Thursday 9:30 – 10:00, and other times upon request (contact staff at the booth).

This provides access to national, regional, and basin-wide nutrient models for watershed managers, researchers, and the general public. Models are available for a variety of water-quality constituents and time periods. For each model, users can: (a) map predictions of long-term average water-quality conditions (loads, yields, concentrations) and source contributions by stream reach and catchment; (b) track transport to downstream receiving waters, such as reservoirs and estuaries; (c) evaluate management source-reduction scenarios; and (d) overlay land use, shaded relief, street-level data, states, counties, and hydrologic units.

Technology Innovation and Acceleration for Better Nutrient Management
(Denice Shaw, EPA and Beth Stauffer, AAAS Fellow at EPA)
EPA booth on Tuesday 12 – 12:30 pm and 5:30 – 6:00 pm

EPA, USDA, USGS and NOAA are working together and with other organizations to accelerate the development, deployment, and adoption of affordable nutrient sensor technology. We are pursuing this goal through a number of innovative strategies involving a diverse set of partners and approaches. These sensors will provide data at sufficient resolution and richness for different decision-making needs and allow for a better understanding of the processes driving nutrient transport and impacts. Drop by the EPA booth to learn more about this initiative.

The USGS National Water Quality Laboratory
(Ed Furlong, USGS)
USGS Booth: Ed will be on hand Tuesday 3:00 – 3:30, and Thursday 9:30 – 10:00

About 75 to 80 percent of all the water-quality samples collected by the USGS are analyzed by NWQL. The NWQL determines organic and inorganic constituents in samples of ground and surface water, river and lake sediment, aquatic plant and animal material, and in precipitation samples. The NWQL receives about 30,000 samples every year for chemical analysis. Swing by and find out the latest on analysis of emerging contaminants. http://nwql.usgs.gov/

The USGS Sediment Data Portal
(Casey Lee and Meredith Warren, USGS)
USGS Booth; demos will be held Wednesday 3:00 – 3:30 and Thursday 9:30 – 10:00

An online, interactive, sediment data portal has been developed to improve the utility and accessibility of USGS suspended-sediment data. The database represents the best available compendium of suspended-sediment data for streams in the Nation, serving results from more than 600,000 discrete sediment samples and more than 10,000 cumulative years of daily sediment data. The demonstration will show how to identify and download suspended-sediment and related data. The sediment data portal can be accessed at: http://cida.usgs.gov/sediment.
WQM-TMDL-N Web App
(Elly Best, EPA)
EPA Booth Tuesday 6:30 – 7 p.m., Wednesday 12:30 – 1:00 p.m., Thursday 11:30 – 12:00 p.m.

A rapid and widely transferable modeling approach is being developed for estimating pollutant loadings and transport in watersheds, under various conditions of land use and BMP implementation, using a minimum amount of monitoring data. The WQM-TMDL framework (Water Quality Modeling for TMDL) includes mass balance constraints and risk assessment. It is integrated with ArcGIS, follows Open Geospatial Connectivity (OGC) standards, requires short calculation times and rapidly generates results once set-up. It can be used to estimate spatial and temporal patterns in pollutant loadings in watersheds, estimate TMDLs, compute the probability of exceedance of pollutant target levels at locations (or reaches) and time frames of interest, and visualize the exceedance probability via risk maps. It includes calculation procedures for N loading, and options for the implementation of on-land BMPs, in-stream BMPs for N decrease, and – potentially – an optimization procedure for N decrease and cost. Use of this framework by a variety of users is facilitated by preparation of a web-based application (Web App). A demonstration of the initial version of the Web App is provided. A poster and oral presentation on this work are included in the program.
We want you to share your insights, knowledge, questions, and creativity with us and with each other. Take advantage of these interactive opportunities:

**Networking Block**
Take part in our 90 minute facilitated networking block on Tuesday from 1:30 – 3:00 pm. Meet people in your geographic area, share perspectives, make friends and connections.

**Online Demo Booth**
For the first time ever, we have an Online Demo Booth dedicated to providing computer demonstrations throughout the conference. If you have something new you’d like to share with others – a website, an app, a tool, a database, something you mentioned in a presentation or in a discussion with a colleague – sign up for demo time at the booth! First come, first served, and demos only (no personal computer time!). If you are presenting and want to follow up with some time at the online demo booth, please reserve it before your session so that you can tell your audience when you’ll be available.

**Idea Wall**
We’d like your ideas on the future of monitoring, the role of the National Water Quality Monitoring Council, the nature of this conference, and much more! Drop by our “Idea Wall” located in the foyer by the registration table, answer questions, make suggestions, and let us know what you’re thinking.

**Create a Haiku Poem and Join in Collective Creativity!**
Throughout the conference we will be gathering your Haiku poems, reading a select few, and sharing them over the course of the next year on the Council website and newsletters. To participate, when inspiration hits, write your haiku poem down and look for our posting board near the conference registration booth; there will be also a basket for your haiku at the registration desk.

Anyone can write a basic haiku poem, which is a form of short verse poetry from Japan. It is characterized by three lines of verse; the first line is five syllables, the second is seven and the third is again five syllables. The essence of a haiku is “cutting” or presenting a juxtaposition of two images, ideas or concepts on how the two might be related. If all you want to do is get the 5-7-5 syllables, go for it! Here are some for illustration:

- Chicken or the egg?
  No Egg, No Chicken, Dummies
  It’s a no-brainer!

- Meet Up Water Talk!
  Friends, peers, collaborations
  Planning our future

- Water allows life
  Liquid, vapor, frozen ice
  One reality

- Water is the topic
  We share, discuss, learn and scheme
  Inspired again
## Conference Exhibitors

Registered Exhibitors as of March 30, 2014.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Phone Numbers</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abraxis LLC</strong></td>
<td>54 Steamwhistle Drive, Warminster, PA 18974-1450</td>
<td>215-357-3911</td>
<td><a href="http://www.abraxiskits.com">www.abraxiskits.com</a></td>
</tr>
<tr>
<td><strong>ACWI / National Water Quality Monitoring Council</strong></td>
<td>417 National Center, Reston, VA 20192</td>
<td></td>
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</tr>
<tr>
<td><strong>Aquatic Informatics Inc.</strong></td>
<td>2400 – 1111 West Georgia St., Vancouver, BC V6E 4M3, Canada</td>
<td>604-873-2782</td>
<td>acwi.gov</td>
</tr>
<tr>
<td><strong>C.I.Agent Storm-Water Solutions</strong></td>
<td>5142 Bolsa Ave., #105, Huntington Beach, CA 92649</td>
<td>562-619-8708</td>
<td></td>
</tr>
<tr>
<td><strong>Campbell Scientific, Inc.</strong></td>
<td>815 W. 1800 N., Logan, UT 84321</td>
<td>435-227-9000</td>
<td><a href="http://www.campbellscli.com">www.campbellscli.com</a></td>
</tr>
<tr>
<td><strong>Eco Analysts, Inc.</strong></td>
<td>1420 S. Blaine St., Ste. 14, Moscow, ID 83843</td>
<td>208-310-1396</td>
<td><a href="http://www.ecoanalysts.com">www.ecoanalysts.com</a></td>
</tr>
<tr>
<td><strong>EnviroScience, Inc.</strong></td>
<td>5070 Stow Rd., Stow, OH 44224</td>
<td>330-688-0111</td>
<td>/enviroscienceinc.com</td>
</tr>
<tr>
<td><strong>Eureka Environmental/Measurement Specialties Inc.</strong></td>
<td>2113 Wells Branch Parkway, Ste. 4400, Austin, TX 78728</td>
<td>512-302-4333</td>
<td><a href="http://www.meas-spec.com/eureka-environmental.aspx">www.meas-spec.com/eureka-environmental.aspx</a></td>
</tr>
<tr>
<td><strong>Fluid Imaging Technologies</strong></td>
<td>200 Enterprise Dr., Scarborough, ME 04074</td>
<td>207-289-3232</td>
<td>fluidimaging.com</td>
</tr>
<tr>
<td><strong>FTS</strong></td>
<td>1065 Henry Eng Place, Victoria, BC V9B 6B2, Canada</td>
<td>250-478-5561</td>
<td>ftsenvironmental.com</td>
</tr>
<tr>
<td><strong>Gold Systems / AWQMS</strong></td>
<td>2121 S. McClelland St., Ste. 204, Salt Lake City, UT 84106</td>
<td>801-456-6145</td>
<td><a href="http://www.awqms.com">www.awqms.com</a></td>
</tr>
<tr>
<td><strong>GreenWater Lab/CyanoLab</strong></td>
<td>205 Zeagler Dr., Ste. 302, Palatka, FL 32177</td>
<td>386-328-0882</td>
<td>greenwaterlab.com</td>
</tr>
<tr>
<td><strong>Hach Hydromet</strong></td>
<td>5600 Lindbergh Dr., Loveland, CO 80538</td>
<td>800-949-3766</td>
<td><a href="http://www.hachhydromet.com">www.hachhydromet.com</a></td>
</tr>
<tr>
<td><strong>In-Situ Inc.</strong></td>
<td>221 E. Lincoln Ave., Fort Collins, CO 80524</td>
<td>970-498-1500</td>
<td><a href="http://www.in-situ.com">www.in-situ.com</a></td>
</tr>
<tr>
<td><strong>KISTERS North America</strong></td>
<td>7777 Greenback Lane, Citrus Heights, CA 95610</td>
<td>905-531-9287</td>
<td><a href="http://www.kisters.net">www.kisters.net</a></td>
</tr>
<tr>
<td><strong>LaMotte Company</strong></td>
<td>PO Box 329, 802 Washington Ave., Chestertown, MD 21620</td>
<td>800-344-3100, ext. 7015</td>
<td><a href="http://www.lamotte.com">www.lamotte.com</a></td>
</tr>
<tr>
<td><strong>Modern Water</strong></td>
<td>15 Read’s Way, New Castle, DE 19720</td>
<td>302-669-6900</td>
<td><a href="http://www.modernwater.com">www.modernwater.com</a></td>
</tr>
<tr>
<td><strong>National Atmospheric Deposition Program</strong></td>
<td>2204 Griffith Dr., Champaign, IL 61820</td>
<td>217-224-0462</td>
<td>nadp.sws.uiuc.edu</td>
</tr>
<tr>
<td><strong>North American Lake Management Society (NALMS)</strong></td>
<td>PO Box 5443, Madison, WI 53705</td>
<td>608-233-2836</td>
<td><a href="http://www.nalms.org">www.nalms.org</a></td>
</tr>
<tr>
<td><strong>s::can Measuring Systems LLC</strong></td>
<td>1035 Cambridge St., Ste. 1, Cambridge, MA 02141</td>
<td>617-686-5498</td>
<td><a href="http://www.s-can.at">www.s-can.at</a></td>
</tr>
<tr>
<td><strong>Sequoia Scientific, Inc.</strong></td>
<td>2700 Richards Rd., Ste. 107, Bellevue, WA 98005</td>
<td>425-641-0944</td>
<td><a href="http://www.sequoiasci.com">www.sequoiasci.com</a></td>
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</tbody>
</table>

The 9th National Monitoring Conference
Solinst Canada Ltd.
35 Todd Rd.
Georgetown, ON L7G 4R8
Canada
905-873-2255
www.solinst.com

SonTek
9940 Summers Ridge Rd.
San Diego, CA 92121-3091
858-546-8327
www.sontek.com

Teledyne Isco
4700 Superior St.
Lincoln, NE 68504
402-770-2469
www.isco.com

Turner Designs
845 W Maude Ave.
Sunnyvale, CA 94085
408-749-0994
www.turnerdesigns.com

US Environmental Protection Agency
1200 Pennsylvania Ave.
Washington, DC 20460
202-566-1184
www.epa.gov

US Environmental Protection Agency
Office of Research and Development
26 W. Martin Luther King Drive
Cincinnati, OH 45268
513-569-7193
www.epagov

US Geological Survey National
Water Quality Assessment Program (NAWQA)
413 National Center
Reston, VA 20192
703-648-5716
water.usgs.gov/nawqa

WaterLOG
95 W. 100 S., Ste. 150
Logan, UT 84321
435-753-2212
www.waterlog.com

YSI
1725 Brannum Lane
Yellow Springs, OH 45387
937-767-7241, ext. 248
www.ysi.com
# 2014 National Monitoring Conference-at-a-Glance

## Monday, April 28

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30 – 5:30</td>
<td><strong>Field Trip:</strong> Native American Excursion – Fort Ancient Museum and Serpent Mound</td>
</tr>
<tr>
<td>12:30 – 5:30</td>
<td><strong>Field Trip:</strong> SD1 Green Building Tour &amp; USEPA Experimental Stream Facility Mesocosm/East Fork Watershed Cooperative Tour</td>
</tr>
<tr>
<td>12:30 – 6:30</td>
<td><strong>Field Trip:</strong> Canoe Trip on the Wild &amp; Scenic Little Miami River</td>
</tr>
<tr>
<td>1:00 – 4:00</td>
<td><strong>Field Trip:</strong> USGS Dry Creek Streamgage &amp; SD1 Wastewater Treatment Plant Tour</td>
</tr>
<tr>
<td>1:00 – 4:30</td>
<td><strong>Field Trip:</strong> Thomas More College Biology Field Station Tour with Boat Electrofishing Demonstration</td>
</tr>
</tbody>
</table>

### A Sessions

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>1:30 – 3:00</td>
<td><strong>Workshop:</strong> Best Practices for Continuous Suspended-Sediment Monitoring Using Acoustic Surrogates, Part 1 (Room 236)</td>
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</table>

### B Sessions

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>3:00 – 3:30</td>
<td><strong>Workshop:</strong> USGS Water Information NOW (Room 252)</td>
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<tr>
<td>3:30 – 5:00</td>
<td><strong>Workshop:</strong> Best Practices for Continuous Suspended-Sediment Monitoring Using Acoustic Surrogates, Part 2 (Room 236)</td>
</tr>
<tr>
<td>3:30 – 5:00</td>
<td><strong>Panel:</strong> Public-Private Partnerships: Collaborating to Address Critical Water Quality Monitoring Problems (Room 264)</td>
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</tbody>
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## Tuesday, April 29

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00 – 9:30</td>
<td><strong>C Sessions</strong></td>
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<tr>
<td>9:30 – 10:00</td>
<td><strong>Refreshment Break</strong> (Grand Ballroom B)</td>
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<td>Time</td>
<td>Event</td>
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<tr>
<td>10:00 – 11:45</td>
<td>Opening Plenary (Grand Ballroom A)</td>
</tr>
<tr>
<td>12:00 – 1:30</td>
<td>Lunch (Grand Ballroom B)</td>
</tr>
<tr>
<td>1:30 – 3:00</td>
<td>D Sessions: Remote Sensing, Temporal Changes in Groundwater Quality (Room 263), Continuous Monitoring: Innovations in Applications and Instrumentation, Part I (Room 261), Networking: Meet Your Peers – Who is Working in Your Backyard? (See program insert for details on where to meet)</td>
</tr>
<tr>
<td>3:00 – 3:30</td>
<td>Refreshment Break (Grand Ballroom B)</td>
</tr>
<tr>
<td>3:30 – 5:00</td>
<td>E Sessions: Building Capacity with the National Aquatic Resource Surveys (NARS) (Room 236), Successful Collaborative Monitoring Approaches (Room 262), Continuous Monitoring: Innovations in Applications and Instrumentation, Part 2 (Room 261), Assessing Effects of Climate Change (Room 237), Nutrient Monitoring and Modeling to Restore and Protect Freshwaters (Room 233), Monitoring the Benefits of Green Infrastructure on Water Quality (Room 232), Century Scale Trends in Water Quality (Room 231)</td>
</tr>
<tr>
<td>5:15</td>
<td>Exhibit and Poster Reception (Grand Ballroom B)</td>
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### Wednesday, April 30

<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
<th>Location</th>
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<tbody>
<tr>
<td>7:00 – 8:00</td>
<td>Continental Breakfast (Grand Ballroom B)</td>
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<tr>
<td>8:00 – 9:30</td>
<td><strong>F Sessions</strong></td>
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<tr>
<td>8:00 – 9:30</td>
<td>State Applications of Statistical Surveys</td>
<td>(Room 263)</td>
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<td></td>
<td>Bridging the Gap: Diverse Strategies for Better Decision-Making</td>
<td>(Room 262)</td>
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<tr>
<td>8:00 – 9:30</td>
<td>Continuous Monitoring: Regulatory Applications</td>
<td>(Room 261)</td>
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<tr>
<td>8:00 – 9:30</td>
<td>Harmful Algal Bloom and Cyanotoxin Reconnaissance</td>
<td>(Room 237)</td>
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<tr>
<td>8:00 – 9:30</td>
<td>Best Management Practices in Urban and Suburban Landscapes</td>
<td>(Room 233)</td>
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<tr>
<td>8:00 – 9:30</td>
<td>Integrating Remote Sensing into Assessment Programs</td>
<td>(Room 232)</td>
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<tr>
<td>8:00 – 9:30</td>
<td>Pollutant Trading: Overviews and Perspectives at Different Scales</td>
<td>(Room 231)</td>
</tr>
<tr>
<td>8:00 – 9:30</td>
<td><strong>Panel:</strong> Exploring the Worlds of Volunteer Monitoring and Citizen Science</td>
<td>(Room 236)</td>
</tr>
<tr>
<td>8:00 – 9:30</td>
<td><strong>Panel:</strong> Adapting to an Extreme Climate – Best Practices, Solutions, and Unanswered Questions</td>
<td>(Room 264)</td>
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<tr>
<td>9:30 – 10:00</td>
<td>Refreshment Break (Grand Ballroom B)</td>
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<tr>
<td>10:00 – 11:30</td>
<td><strong>G Sessions</strong></td>
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<tr>
<td>10:00 – 11:30</td>
<td>National Lake Assessment: National and State Perspectives</td>
<td>(Room 263)</td>
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<tr>
<td>10:00 – 11:30</td>
<td>Groundwater Monitoring and Protection</td>
<td>(Room 262)</td>
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<tr>
<td>10:00 – 11:30</td>
<td>Continuous Monitoring: Uncertainty and Bias and Precision … Oh My!</td>
<td>(Room 261)</td>
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<tr>
<td>10:00 – 11:30</td>
<td>Detecting and Predicting Cyanotoxins</td>
<td>(Room 237)</td>
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<tr>
<td>10:00 – 11:30</td>
<td>Quantifying the Source and Fate of Nutrients</td>
<td>(Room 233)</td>
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<tr>
<td>10:00 – 11:30</td>
<td>Challenging and Innovative Networks, Models, and Application of Conservation Information that Support the Chesapeake Bay TMDL</td>
<td>(Room 232)</td>
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<tr>
<td>10:00 – 11:30</td>
<td>Developing and Using Local and Regional Water Quality Data Exchanges</td>
<td>(Room 231)</td>
</tr>
<tr>
<td>10:00 – 11:30</td>
<td><strong>Panel:</strong> Better Data, Better Partnerships: How Can New Technologies Increase the Participation and Use of Volunteer Biomonitoring Data?</td>
<td>(Room 236)</td>
</tr>
<tr>
<td>10:00 – 11:30</td>
<td><strong>Panel:</strong> Multi-disciplinary Approaches to Biomonitoring of Large Rivers</td>
<td>(Room 264)</td>
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<tr>
<td>11:30 – 1:30</td>
<td>Lunch and Poster Viewing (Grand Ballroom B)</td>
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<tr>
<td>Sessions</td>
<td>1:30 – 3:00</td>
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<tr>
<td>3:00 – 3:30</td>
<td>Refreshment Break (Grand Ballroom B)</td>
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<tr>
<td>3:00 – 6:00</td>
<td>Field Trip: Cincinnati’s Green Bus Tour (meet in the main entrance foyer of the Duke Energy Convention Center (5th Street and Elm Street))</td>
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<tr>
<td>Sessions</td>
<td>3:30 – 5:00</td>
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<tr>
<td>Implementing EPA’s Healthy Watersheds Program (Room 263)</td>
<td>Assessing the Effects of Prolonged Drought and Wildfires on Water Quality and Habitat (Room 262)</td>
<td>Workshop: Megadata – Working with Continuous Time-Series Water-Quality Data, Part 2 (Room 261)</td>
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</tbody>
</table>

**Side Meetings**
Evening get-togethers followed by group dinner on-own; check bulletin boards by registration desk for additional interest group meetings.

- **5:15 – 7:00** Aquatic Sensor Workgroup (Room 261)
- **5:15 – 7:00** EPA Monitoring and Assessment Partnership (Room 236)
- **5:15 – 7:00** Volunteer Monitoring Gathering (Room 237)

Calling everyone involved with or interested in volunteer monitoring! This networking gathering will not only allow you to put faces to names and make new connections, but is an opportunity for you to find out about exciting happenings in volunteer monitoring and citizen science at the national level.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>7:00 – 8:00</td>
<td><strong>Fluid 5K</strong> <em>(Runners meet in the main entrance foyer of the Duke Energy Convention Center (5th Street and Elm Street))</em></td>
<td>(Room 263)</td>
</tr>
<tr>
<td>7:00 – 8:00</td>
<td><strong>Continental Breakfast</strong></td>
<td>Grand Ballroom B</td>
</tr>
<tr>
<td>All Day</td>
<td>NARS R Training</td>
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<tr>
<td>8:00 – 9:30</td>
<td><strong>J Sessions</strong></td>
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<tr>
<td></td>
<td>J1 National-Scale Water Quality Assessments</td>
<td>Room 263</td>
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<td></td>
<td>J2 Novel Biotic Indices</td>
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<td></td>
<td>J3 Continuous Monitoring: Tools and Tricks for Data Management</td>
<td>Room 261</td>
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<tr>
<td></td>
<td>J4 Monitoring Methods and Effects of Floods on Water Quality and Human and Ecological Health</td>
<td>Room 237</td>
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<tr>
<td></td>
<td>J5 Pesticide Monitoring, Modeling, and Risk Assessment</td>
<td>Room 233</td>
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<td>J6 Web and Smart Phone Apps for Collecting and Presenting Data</td>
<td>Room 232</td>
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<td>J7 Using Volunteer Data to Meet State Clean Water Act Goals</td>
<td>Room 231</td>
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<td></td>
<td>J8 Panel: Coastal Monitoring and Regional Ocean Partnership Alliances: Data Comparability and Links to the National Monitoring Network</td>
<td>Room 264</td>
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<tr>
<td>9:30 – 10:00</td>
<td><strong>Refreshment Break</strong></td>
<td>Grand Ballroom B</td>
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<tr>
<td>10:00 – 11:30</td>
<td><strong>K Sessions</strong></td>
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<tr>
<td></td>
<td>K1 Monitoring and Modeling to Restore and Protect Coastal Water Quality</td>
<td>Room 263</td>
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<tr>
<td></td>
<td>K2 Characterization of Regional Groundwater Systems</td>
<td>Room 262</td>
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<td></td>
<td>K3 Continuous Monitoring: Sensor Developments in Energy Production/Hydrofracking</td>
<td>Room 261</td>
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<td>K4 Microbial Source Tracking and Health Effects</td>
<td>Room 237</td>
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<tr>
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<td>K5 Monitoring to Reflect Water Quality Changes from Management Actions</td>
<td>Room 233</td>
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<tr>
<td></td>
<td>K6 Statistical Analysis Tools</td>
<td>Room 232</td>
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<td></td>
<td>K7 Research and Achievements in Community-Based Science</td>
<td>Room 231</td>
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<td>K8 Panel: National Scale Water Portals: Why Do We Have More Than One?</td>
<td>Room 264</td>
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<tr>
<td></td>
<td>K9 Panel: Approaches to Reviewing and Assessing Monitoring Programs</td>
<td>Room 236</td>
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<tr>
<td>11:30 – 1:30</td>
<td><strong>Lunch and Poster Viewing</strong></td>
<td>Grand Ballroom B</td>
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<td>Time</td>
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<tr>
<td>1:30 – 3:00</td>
<td><strong>L Sessions</strong></td>
<td><strong>The Big Picture: Holistic Approaches to Water Quality Assessments</strong> (Room 263)</td>
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<tr>
<td></td>
<td><strong>L1</strong></td>
<td>WORKSHOP: How can Remote Sensing Address Information Needs and Gaps in Water Quality and Quantity Management? (Room 264)</td>
</tr>
<tr>
<td></td>
<td><strong>L2</strong></td>
<td><strong>Assessment of Stream Condition with Macro-invertebrates, Part 1</strong> (Room 262)</td>
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<td><strong>L3</strong></td>
<td><strong>Energy Production Impacts</strong> (Room 261)</td>
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<td><strong>L4</strong></td>
<td><strong>Integrated Monitoring and Modeling to Restore and Protect a National Estuary – Barnegat Bay</strong> (Room 237)</td>
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<td><strong>L5</strong></td>
<td><strong>Multiple Stressors and Water Quality Impairments</strong> (Room 233)</td>
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<td><strong>L6</strong></td>
<td><strong>Spatial and Temporal Approaches for Monitoring</strong> (Room 232)</td>
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<tr>
<td></td>
<td><strong>L7</strong></td>
<td><strong>Making it Clear for the Public: Techniques in Data Communication, Part 1</strong> (Room 231)</td>
</tr>
<tr>
<td>3:00 – 3:30</td>
<td><strong>Refreshment Break</strong></td>
<td><strong>Short Course: New Tools for Water Quality Data Access and Trend Analysis: An Overview of the USGS R Packages: dataRetrieval and EGRET</strong> (Room 236)</td>
</tr>
<tr>
<td>3:30 – 5:00</td>
<td><strong>M Sessions</strong></td>
<td><strong>Regional Scale Monitoring Strategies</strong> (Room 263)</td>
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<td><strong>M1</strong></td>
<td>WORKSHOP: Dissolved Organic Matter – What, Why, How** (Room 231)</td>
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<td><strong>M2</strong></td>
<td><strong>Assessment of Stream Condition with Macro-invertebrates, Part 2</strong> (Room 262)</td>
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<td><strong>M3</strong></td>
<td><strong>Training and Coordinating for Better Results</strong> (Room 261)</td>
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<td><strong>M4</strong></td>
<td><strong>Mercury in Air, Water, and Fish Tissue</strong> (Room 237)</td>
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<tr>
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<td><strong>M5</strong></td>
<td><strong>Quantifying Agricultural Nonpoint Sources and Controls</strong> (Room 233)</td>
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<tr>
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<td><strong>M6</strong></td>
<td><strong>Geospatial Tools for Data Integration</strong> (Room 232)</td>
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<td><strong>M7</strong></td>
<td><strong>Making it Clear for the Public: Techniques in Data Communication, Part 2</strong> (Room 231)</td>
</tr>
<tr>
<td>5:15</td>
<td><strong>Closing Plenary and Awards Dinner</strong></td>
<td><strong>Short Course: Water Quality Applications of R Statistical Software</strong> (Room 236)</td>
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### Friday, May 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:00 – 8:00</td>
<td><strong>Continental Breakfast for Workshop Attendees Only</strong></td>
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<tr>
<td>All Day</td>
<td>NARS R Training</td>
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<tr>
<td>N Sessions</td>
<td>8:00 – 9:30</td>
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</table>
| N1           | **Workshop:** Implementing Web-based Digital Technologies for Volunteer Monitoring and Watershed Stewardship Organizations and Agencies, Part 1  
                *(Room 250)*                                                    |
| N2           | **Workshop:** Visualizing Geographically Referenced Data with Linked Micromaps, Part 1  
                *(Room 236)*                                                    |
| 8:00 – 12:30 | **Field Trip:** Licking River Fish, Mussel, & Crayfish BioBlitz *(meet in the main entrance foyer of the Duke Energy Convention Center (5th Street and Elm Street))* |
| 8:30 – 12:00 | **Field Trip:** Greater Cincinnati Water Works Richard Miller Treatment Plant Tour *(meet in the main entrance foyer of the Duke Energy Convention Center (5th Street and Elm Street))* |
| 9:30 – 10:00 | **Break for Workshop Attendees Only**                                |
| O Sessions   | 10:00 – 11:30                                                        |
| O1           | **Workshop:** Implementing Web-based Digital Technologies for Volunteer Monitoring and Watershed Stewardship Organizations and Agencies, Part 2  
                *(Room 250)*                                                    |
| O2           | **Workshop:** Visualizing Geographically Referenced Data with Linked Micromaps, Part 2  
                *(Room 236)*                                                    |
Plenary Agendas

Opening Plenary Session, Tuesday, April 29, 2014
10:00 Welcome to the 9th National Monitoring Conference
Michael Yurewicz, U.S. Geological Survey (USGS), NWQMC Co-Chair
10:10 What are we doing in Cincinnati?, and introduction of Sally Gutierrez
Peter Tennant, Executive Director, Ohio River Valley Water Sanitation Commission
10:20 Working together for clean water – embracing new technology and innovation
Sally Gutierrez, U.S. Environmental Protection Agency (USEPA)
10:50 Introduction of Robert Hirsch
James Morris, U.S. Geological Survey
10:55 The only way to determine what is happening to water quality is...
11:25 Charge to Conference Participants
Susan Holdsworth, USEPA, NWQMC Co-Chair; and Barb Horn, Colorado Parks and Wildlife
11:45 Adjourn

Closing Plenary Dinner, Thursday, May 1, 2014
5:15 Doors open to ballroom, cash bars open. Dinner served at 6:00
6:30 Reflections on the 9th National Water Quality Monitoring Council Conference
Curtis Cude, Oregon Health Authority; and Mary Skopec, Iowa Department of Natural Resources
6:40 Presentation of the Vision Award, Barry A. Long Award, and Elizabeth Jester Fellows Award
Dan Sullivan, U.S. Geological Survey
7:00 Introduction of Robert Glennon
Jerad Bales, U.S. Geological Survey
7:05 Unquenchable: America's Water Crisis and What To Do About It
Robert Glennon, Regent's Professor, Morris K. Udall Prof. of Law and Public Policy, University of Arizona
7:55 Closing comments
Gary Rowe, U.S. Geological Survey, NWQMC Co-Chair
8:00 Adjourn and book signing
Opening Plenary Speakers

Peter A. Tennant
Executive Director, Ohio River Valley Water Sanitation Commission

Peter Tennant is the Executive Director of the Ohio River Valley Water Sanitation Commission (ORSANCO), an interstate agency headquartered in Cincinnati which oversees water quality management of the Ohio River and its tributaries. Mr. Tennant has been with ORSANCO for over 35 years. He served as a member of the National Water Quality Monitoring Council for over ten years, acting as a conference co-chair in 2004 and as local arrangements lead for this conference. Mr. Tennant received a BS in Civil Engineering from Northeastern University in 1972. He is a registered professional engineer in the state of Ohio and a Board Certified Environmental Engineer by the American Academy of Environmental Engineers.

Sally C. Gutierrez
Director, U.S. Environmental Protection Agency Environmental Technology Innovation Cluster Development and Support Program

Sally C. Gutierrez is the Director of U.S. Environmental Protection Agency’s Environmental Technology Innovation Cluster Development and Support Program. This new effort seeks to advance environmental protection in tandem with economic development through the formation of public private partnerships. She has been leading EPA’s efforts to leverage its research and development capability in Cincinnati, Ohio with community based assets to establish the region as a water technology innovation hub and is leading an effort to network water innovation clusters across the U.S. (http://www2.epa.gov/clusters-program). Prior to this appointment, she was the Director of EPA’s National Risk Management Research Laboratory (NRMRL) in Cincinnati, Ohio for 8 years. NRMRL is one of three Federal research laboratories within the USEPA’s ORD and consists of 400 scientists and support staff. The Laboratory is responsible for conducting engineering and environmental technology research to support the Agency in policy and regulatory development and implementation. During her time as laboratory Director, she advanced sustainability research.

She was the Director of the Water Supply and Water Resources Division in NRMRL before becoming its Director and was responsible for leading a national technology demonstration program for control of arsenic in drinking water. Before coming to EPA she was responsible for administering water programs for the State of Texas environmental agency in the areas of drinking water, water monitoring, wastewater permitting, dam safety, water rights and utility rates. As a member of the Senior Executive Service, she holds the highest career rank in the Federal government.
Robert M. Hirsch
Research Hydrologist, U.S. Geological Survey

Robert M. Hirsch is a Research Hydrologist at the USGS. From 1994 through May 2008, he served as the Chief Hydrologist of the U.S. Geological Survey. In this capacity, Dr. Hirsch was responsible for all U.S. Geological Survey (USGS) water science programs. These programs encompass research and monitoring of the nation’s ground water and surface water resources including issues of water quantity as well as quality. Hirsch earned a B.A. in Geology from Earlham College, an M.S. in Geology from the University of Washington, and a Ph.D. from the Johns Hopkins University Department of Geography and Environmental Engineering. He began his USGS career in 1976 as a hydrologist and has conducted research on water supply, water quality, pollutant transport, and flood frequency analysis. He had a leading role in the development of several major USGS programs: 1) the National Water Quality Assessment (NAWQA) Program; 2) the National Streamflow Information Program (NSIP); and 3) the National Water Information System Web (NWISWeb). He has received numerous honors from the Federal Government and from non-governmental organizations. He is coauthor of the textbook, Statistical Methods in Water Resources. He has testified before congressional committees on many occasions and presented keynote addresses at many water-related meetings in the U.S. and in other countries. Since returning to a research position in 2008, he has focused his efforts on describing long-term changes in streamflow and water quality. This includes exploring century-scale trends in flooding nationwide. It also includes the development and applications of new methods for characterizing trends in nutrient transport for the rivers of the Chesapeake Bay, Lake Champlain, and Mississippi River watersheds. This research has provided important insights on causes of the observed trends and has also resulted in the development of software tools to help scientists analyze long-term water quality and quantity records.
Closing Plenary Speaker

Robert Glennon
Regents’ Professor and Morris K. Udall Professor of Law and Public Policy in the Rogers College of Law at the University of Arizona

Robert Glennon is Regents’ Professor and Morris K. Udall Professor of Law and Public Policy in the Rogers College of Law at the University of Arizona.

Glennon is the author of the highly-acclaimed Water Follies: Groundwater Pumping and the Fate of America’s Fresh Waters (Island Press, 2002). His latest book, Unquenchable: America’s Water Crisis and What To Do About It, was published in April 2009. Glennon has been a guest on The Daily Show with Jon Stewart, Talk of the Nation with Neal Conan, The Diane Rehm Show, C-SPAN2’s Book TV, and numerous National Public Radio shows. He has been a commentator for American Public Media’s Marketplace. He is featured in the recent documentary, Last Call at the Oasis.

Glennon’s other writings include pieces in the Washington Post, the Boston Globe, Bloomberg Businessweek, the Arizona Republic, and the Wall Street Journal. He is also a blogger for the Huffington Post and for National Geographic’s Water Currents.

Glennon has received two National Science Foundation grants and has served as an advisor to governments, law firms, corporations, and NGOs on water law and policy. He is also a regular commentator and analyst for various television and radio programs and for the print media.

His speaking schedule has taken him to more than 30 states and to Switzerland, Canada, Singapore, Australia, New Zealand, and Saudi Arabia.

In 2010, the Society of Environmental Journalists bestowed on Unquenchable a Rachel Carson Book Award for Reporting on the Environment and Trout magazine gave it an Honorable Mention in its list of Must-Have Books ever published on the environment.

Glennon received a J.D. from Boston College Law School and an M.A. and Ph.D. in American History from Brandeis University. He is a member of the bars of Arizona and Massachusetts.

Book Signing Event Thursday Evening Immediately at the Conclusion of the Dinner Reception

Unquenchable: America’s Water Crisis and What To Do About It
Copies of this book will be available for purchase from Joseph-Beth Booksellers, and the author, Robert Glennon, will be on hand to sign copies immediately following the Thursday evening reception on May 1.
Field Trips

Field trip participants will meet in the main entrance foyer of the Duke Energy Convention Center (5th Street and Elm Street).

Native American Excursion – Fort Ancient Museum and Serpent Mound
Monday, April 28
8:30 am – 5:30 pm | Price: $45

This all day excursion will provide an educational perspective on southwest Ohio's indigenous cultures. During your two hour guided tour of the museum and park grounds, you will learn about the culture of these first Ohioans and their interaction with the natural environment. The tour will leave at 8:30 am from the Duke Energy Convention Center and travel to the Fort Ancient State Memorial Park. Fort Ancient is a series of earthen embankments that extends for more than 3.5 miles around a high bluff along the Little Miami River. It was built by the Hopewell culture between 100 BCE and 400 CE. After the tour you will be provided with a box lunch and given 1.5 hours to eat and continue to explore the site and its several hiking trails. The bus will then depart for Serpent Mound. The mound is a 1,348 foot long, 3 foot tall effigy mound depicting an undulating serpent constructed by the Fort Ancient peoples in 1070 CE. You will have 1.5 hours to explore the trails around the mound and visit the observation tower and nearby museum. The bus will then return to the convention center around 5:30 pm.

SD1 Green Building Tour & USEPA Experimental Stream Facility Mesocosm/East Fork Watershed Cooperative Tour
Monday, April 28
12:30 pm – 5:30 pm | Price: $20

For the first part of this tour, SD1 invites you to visit Public Service Park (PSP) for a 2 hour guided tour. The park features environmental best management practices (BMPs) and cutting edge public educational programming. PSP is a national model for environmental outreach. This one-of-a-kind, innovative facility features the following educational tools and Best Management Practices (BMPs): vegetated roof, wetland classroom, storm water garden, retention and detention basins, vegetated bioswales, watershed plaza, oil/water separator, porous pavements, cistern, urban forest, environmental art sculptures, Native American creek walk and more! The final two hours of this tour showcases two facilities that have turned into regionally recognized tools for conducting eco-toxicalogical and watershed management R&D. An over-arching theme is to use monitoring, modeling, and economic tools to cost-effectively reduce nutrients in flowing waters. The Experimental Stream Facility (ESF) and East Fork Watershed Study (EFWs) is a research program implementing meso-scale research for more applicable water quality criteria development in flowing waters that facilitates watershed-scale, system-level analysis. It is a collaborative effort among government and academic scientists; local, state and regional water resource assessment and management professionals; USDA conservationists, and drinking water treatment and waste water management operators and experts. As a living laboratory the ESF/EFWs houses facilities, equipment and wet/dry lab space that allows for testing and transference of models and methods used for watershed management.

Canoe Trip on the Wild & Scenic Little Miami River
Monday, April 28
12:30 pm – 6:30 pm | Price: $45

This trip is an opportunity to learn about the National Wild & Scenic River System and experience Ohio’s first such designated river. Come on a peaceful, 6 mile (2-3 hour) canoe trip on the Little Miami River, long considered one of Ohio’s most beautiful waterways. The outfitter will provide everything you need for this educational canoeing trip just 30 minutes from downtown Cincinnati. Whether you're a river rookie or an outdoor expert, the outfitter’s friendly, knowledgeable staff will make sure your experience is informative and memorable. Cold refreshments, ice, and cooler space will be provided during the trip on the river. Feel free to bring your own drinks (non-alcoholic) and light snacks for the trip.
USGS Dry Creek Streamgage & SD1 Wastewater Treatment Plant Tour
Monday, April 28
1:00 pm – 4:00 pm | Price: $20

What is a streamgage? A streamgage is a structure located beside a river or stream that contains a device to measure and record the water level in the river. There are approximately 9,000 of these streamgages transmitting data via satellite, radio or phone for the USGS. When the data are received in the USGS office, computers use a site-specific “rating curve” to convert the water level (or “gage height”) data into information about the flow of the river or stream. To keep rating curves accurate and current, USGS personnel visit each streamgaging station about every 6-8 weeks to measure the flow directly and service/calibrate the equipment. The streamflow data and water level information are made available to the users and the public over the internet (http://ky.water.usgs.gov). The gage on Dry Creek also has a real-time continuous water quality Sonde along with weather sensors to show wind speed, wind directions and air temp. USGS personnel will go through the tasks of servicing this gage. The tour will also visit SD1’s award-winning Dry Creek Wastewater Treatment Plant. Operational in 1979, this Villa Hills, Kentucky plant cleans industrial, commercial and residential wastewater from more than 94,000 customer accounts in Boone, Campbell and Kenton counties in Northern Kentucky. Dry Creek’s dedicated and experienced staff treats an average of 34 million gallons of wastewater per day, seven days a week, 24 hours a day. See how millions of gallons of wastewater are treated every day as you explore everything from the primary settling tanks to the microbial-driven secondary tanks. Parts of both tours are outside, so visitors should dress accordingly.

Thomas More College Biology Field Station Tour with Boat Electrofishing Demonstration
Monday, April 28
1:00 pm – 4:30 pm | Price: $20

This field trip will consist of an in-depth two hour tour of the Thomas More College Biology Field Station facilities, with emphasis on the fathead minnow aquaculture laboratory, managed in conjunction with the USEPA, the freshwater mussel research conducted at the Field Station and the extensive herpetological and ichthyological fluid collections. Pending weather and interest level, boat electrofishing on the mainstem of the Ohio River will also be offered. The Field Station is a 25-acre teaching and research facility situated along the banks of the Ohio River (RM451) in Campbell County, Kentucky, just upstream from Cincinnati, Ohio. It was the previous site of the U.S. Government Lock and Dam 35, built in 1919, and one of 51 wicket dams along the Ohio River. The Field Station includes classrooms, research and teaching labs, a conference center & lodge, four houses, an interpretive nature trail and a fleet of research boats. The main activities involve undergraduate research in the field of aquatic biology and K-12 STEM outreach programs.

Cincinnati’s Green Bus Tour
Wednesday, April 30
3:00 pm – 6:00 pm | Price: $20

Cincinnati is gaining a national reputation in the sustainable management of stormwater to reduce combined sewer overflows (CSOs). Cincinnati Metropolitan Sewer District (MSD) is currently designing and/or implementing sustainable stormwater solutions that range from rain gardens and pervious pavement to stormwater detention basins and stream restoration (daylighting). As part of this initiative, MSD has partnered with a variety of public and private organizations across Hamilton County to demonstrate the use and effectiveness of Low Impact Development (LID) stormwater controls (capture less than 10 million gallons annually). The 2 hour Green Bus Tour highlights the CSO challenge facing Cincinnati with a tour of the largest CSO in Hamilton County, followed by tours of five nearby LID sustainable infrastructure projects at our partner sites.
Licking River Fish, Mussel, & Crayfish BioBlitz
Friday, May 2
8:00 am – 12:30 pm | Price: $20

This event will be a great opportunity to experience collection techniques for fish such as seining, backpack, boat and tote barge electrofishing, hand benthic trawling, and others as well as snorkeling and using bucket viewers for mussels. Participate in a modified BioBlitz at one of the most downstream riffles on the main stem of the biologically diverse Licking River in Butler, KY just 45 minutes from downtown Cincinnati. Wikipedia defines a BioBlitz as “an intense period of biological sampling in an attempt to record all living species within a designated area.” While this event will not focus on ALL living organisms, your 2-3 hours in the stream will be an opportunity to see first-hand as many as 45 fish species, several crayfish species, upwards of 20 mussel species, including the federally endangered Fanshell, as well as all sorts of other aquatic organisms. Join fish, mussel, and crayfish experts from the Kentucky Department of Fish & Wildlife Resources, Kentucky State Nature Preserves Commission, Kentucky Division of Water, Thomas More College, and more in an effort to document all current fish, mussel, and crayfish species from this unique riffle and adjoining habitats. Survey will be weather and river condition dependent. Some waders will be available for participants, but bringing your own would be helpful.

Greater Cincinnati Water Works Richard Miller Treatment Plant Tour
Friday, May 2
8:30 am – 12:00 pm | Price: $20

Greater Cincinnati Water Works serves about 1.1 million people in the Cincinnati, Ohio Area. About 900,000 of those people are served by the Richard Miller Treatment Plant (RMTP) which draws water from the Ohio River. This 2.5 hour tour will show you the overall treatment process at the RMTP including Granular Activated Carbon and our new state-of-the-art ultraviolet disinfection facility. This cutting edge drinking water treatment facility relies on much of the original early 1900s infrastructure while combining expanded and more modern treatment technologies. GCWW relies heavily on multiple types of analytical and monitoring equipment to evaluate source water, various stages in the treatment process and water quality in the distribution system. You will see how monitors and analytical equipment are used to ensure the drinking water is safe from the source to the tap. The tour will finish with a historical tour of the “Old River Station,” the original 1907 pumping station complete with the original steam engines which moved water from the river up to the treatment plant.
Extended Sessions

Extended sessions include workshops, panel discussions and short courses and are offered in addition to a full slate of concurrent sessions at any given time.

Monday, April 28
1:30 pm – 3:00 pm / 3:30 pm – 5:00 pm
Room 236

Organized by Mark Landers, US Geological Survey

Sediment in fluvial systems is a highly relevant issue to topics in water-quality, engineering, ecology, and agriculture. Acoustic surrogates are increasingly being used to estimate properties of suspended sediment in fluvial systems. However, measured acoustic backscatter requires detailed evaluation to correct for several instrument and environmental factors to isolate the surrogate-to-sediment relation. This workshop will demonstrate and engage attendees in generalized methods and standard protocols that are being developed for determining acoustic attenuation, adjusted backscatter amplitude, and sediment-size effects, and for required metadata and documentation. The workshop also will describe how to calibrate corrected acoustic backscatter to measured suspended sediment concentration. These methods are being developed as part of the multi-federal-agency Sediment Acoustic Leadership Team. The workshop will use and distribute Matlab-based software tools developed for this analysis.

Session A2: Workshop: USGS Water Information NOW
Monday, April 28
1:30 pm – 3:00 pm
Room 252

Organized by Donna Myers, US Geological Survey

A 90-minute session will include 30-minute USGS panel presentation and Q/A to briefly describe availability and access to USGS data and information products over the Web. The remaining hour of the session will be for instructors to assist provide one-on-one instruction and assistance to attendees to access USGS data on water levels and flows, water quality, and data for fish, invertebrates, and algae; as well as USGS electronic reports and other USGS electronic-library resources and electronic collections from USGS public Web sites.

Monday, April 28
3:30 pm – 5:00 pm
Room 264

Organized by Erik Host-Steen, Hach Hydromet

This panel will explore needs of the water quality monitoring community that are not being met currently but are within zone of possibility – either near term or midterm – via collaboration within the research community and/or with suppliers of water quality monitoring tools. Panelists are water quality professionals who are actively seeking solutions to critical problems or persistent issues and are collaborating with academic or private sector organizations to do so. During the session, the problems and issues will be defined, benefits of collaboration will be described, and best practices for collaboration will be shared. Scientists, practitioners, and suppliers are expected to benefit equally from the discussion.
Session C3: Panel: Continuous Water-Quality Information Anywhere and At Any Time! How Do We Get There?
Tuesday, April 29
8:00 – 9:30 am
Room 261

Organized by Andy Ziegler, US Geological Survey

An energetic and expert panel including Chuck Dvorsky (Texas Commission on Environmental Quality), and Brian Pellerin, Stewart Rounds, and Andy Ziegler (US Geological Survey), will kick off the continuous water-quality monitoring sessions for the week. Brief presentations and subsequent discussions by the panel and workshop participants will provide examples of current networks, instrument testing, guidance and protocols, applications in groundwater and surface water, applications of continuous water-quality data and surrogate measures in regulatory applications, defining uncertainty, and optical sensor advances. Impediments to attaining goals and possible solutions will be discussed. This is a MUST-attend session for any conference attendee interested in continuous water-quality monitoring!

Session C8 / E8: Workshop: Volunteer Monitoring: Getting Started and Growing Successfully
Tuesday, April 29
8:00 am – 9:30 am / 3:30 pm – 5:30 pm
Room 236

Organized by Julie Vastine, Director, Alliance for Aquatic Resource Monitoring

The Volunteer Monitoring: Getting Started and Growing Successfully workshop is a one stop shop to orient new volunteer monitoring coordinators or agencies looking to implement and sustain volunteer monitoring programs.

The first half will explore ways to get your program started, examining three different models and key resources. Topics will include:

1. Getting Started: Overview of the three most common approaches to volunteer monitoring programs.

2. Study Design & QAPPs:

3. Orientation to key resources.

The second half of the workshop will focus on tools and successful approaches to sustaining your program and will include great tips and lessons learned, as it will be an opportunity for volunteer monitoring programs to share why their program is successful and how they do it. Is it because you have a great partnership with your state agency, effective retention approaches, a well-known volunteer conference, fun outreach and social media tools, or a large group of local community coordinators to support you?

Session C9: Workshop: Building, Empowering & Sustaining State, Regional and Tribal Water Monitoring Councils, Partnerships and Alliances
Tuesday, April 29
8:00 am – 9:30 am
Room 264

Organized by Cathy Tate, US Geological Survey and Barb Horn, Colorado Parks & Wildlife, Cochairs Collaboration & Outreach Workgroup

This interactive discussion will focus on three aspects of building and sustaining successful water monitoring councils at the State, Regional or Tribal. Monitoring Councils is a broad name that includes partnerships, alliances and other collaborative formats. Specifically, we will have three interactive rounds that will include, first financial sustainability, second how to increase participation engagement, reach and/or scope and third each group will share a success or highlight from their effort that maybe transferable to other groups. These efforts are challenging, require persistence and it helpful to know you are not
alone and don’t have to reinvent the wheel. Please come prepared with your questions and information on these topics as the expertise and experience from around the country will brainstorm solutions just for you. Session will include National Water Quality Monitoring Council (NWQMC) products and services available as well as an exchange on how the NWQMC can assist your efforts. Likewise, ideas are welcome on how water monitoring councils, partnerships and alliances can assist the NWQMC in its mission.

Session D9: Panel: Using Quantitative PCR as a Tool for Evaluating Microbial Water Quality
Tuesday, April 29
1:30 – 3:00
Room 250

Organized by Natasha Isaacs and Christopher Kephart, US Geological Survey

The goal of this panel discussion is to start a dialog between researchers and regulators on the utility of the molecular based quantitative polymerase chain reaction (qPCR) in relation to water quality analysis. Currently, qPCR is being used to quantify fecal indicator bacteria and pathogens in drinking and recreational waters and is considered a valid and rapid alternative to traditional culture based analytical methods. This panel will invite colleagues from industry, academia, federal, state and local agencies and presentations will focus on using qPCR data for water quality determination. We will also address the inherent issues associated with qPCR such as reporting results, evaluating and storing metadata and the overall role qPCR plays as a tool for water quality analysis.

Tuesday, April 29
3:30 pm – 5:00 pm
Room 264

Organized by Mike Yurewicz, US Geological Survey

The Council organizes the National Monitoring Conference every two years, but there are many other things we also do! Come to this session to learn what we're doing, and more importantly, how we can help you and how you can be part of the solution! Come learn about:

- The Purpose and History of the Council, including its partners and members

- Water Quality Statistics and Assessments Workgroup’s Online Database – a web-based tool to address the need for better access to available information on methods for water quality assessment and data analysis to support water management programs.

- National Network of Reference Watersheds – a collaborative and multipurpose network will provide access to high quality observations from pristine and minimally disturbed watersheds.

- A national Water Quality Data Portal – an integrated portal to retrieve water-quality data from NWIS and STORET.

- Integrated Water Monitoring Activities White Paper – addresses the misconception that state and federal monitoring programs are duplicating activities and provides a template to use with resource managers and decision makers to facilitate discussions on how monitoring programs fit different needs and how we can better integrate our programs to meet multiple purposes.

- National Environmental Methods Index – a web-based tool to compare, contrast, and select methods for your environmental monitoring needs.

- Sensor Workgroup – a public-private partnership of water-quality monitoring agencies, industry, and academia. Our mission is to ensure that water-quality data collected by sensors are of known and documented quality.
• The National Water Quality Monitoring Network for U.S. Coastal Waters and their Tributaries – a national framework to integrate water-quality monitoring for freshwater, estuaries, and the ocean.
• Webinars and Newsletter – resources for communicating the latest in water quality monitoring.
• Volunteer Monitoring Web Page – providing resources and newsletters for the volunteer monitoring community.
• Support for State, Regional, Tribal Councils – providing support for sustaining and developing water monitoring councils, partnerships and alliances.

We want to hear from you! Whether you are new to the Council or an old friend, please plan to attend and give us your perspectives on critical monitoring issues.

Get involved! Workgroup participants do not have to be official active members of the Council and anyone in the monitoring community may serve on a Council workgroup.

Session F8: Panel: Exploring the Worlds of Volunteer Monitoring and Citizen Science  
Wednesday, April 30  
8:00 am – 9:30 am  
Room 236

Organized by Julie Vastine, Director, Alliance for Aquatic Resource Monitoring

While aquatic-based volunteer monitoring has been around for more than four decades, the term citizen science is generating a great deal of buzz and attention – resulting in international studies, new articles, and focused mini-conferences. With new agencies and programs coming to the community-based scientific research table, now is the time to discuss what exactly is volunteer monitoring and citizen science, synergies, as well as avenues for collaboration and increased integration.

This panel will explore the general fields of citizen science and volunteer monitoring, provide three models of volunteer monitoring program approaches, highlight the successes/outcomes of the volunteer monitoring field, and end with a discussion of how to learn from each other strengths, challenges, and discuss avenues for increased collaboration.

Session F9: Panel: Adapting to an Extreme Climate – Best Practices, Solutions and Unanswered Questions  
Wednesday, April 30  
8:00 am – 9:30 am  
Room 264

Organized by Monty Porter, Oklahoma Water Resources Board

Extreme or non-normal climatic events create both chronic and acute ecological/human health effects. Ranging from reoccurring 100-500 year floods and category 5 hurricanes to sustained droughts, climatic events outside the norm create unique issues for water quality managers and practitioners, including: planning/logistics challenges, period of record distribution/expectations (i.e., creation of outliers), data management, and management/policy decisions. Each event creates unique challenges, but also presents opportunities for the development of best practices, documentation of metadata, and dissemination/discussion within the water quality monitoring and management community.
Session G8: Panel: Better Data, Better Partnerships: How Can New Technologies Increase the Participation and Use of Volunteer Biomonitoring Data?
Wednesday, April 30
10:00 am – 11:30 am
Room 236

Organized by Jim Lazorchak, US Environmental Protection Agency

Aquatic biodiversity monitoring is generally more labor intensive and more reliant on highly trained experts than chemical, physical, and habitat monitoring. While regulators and other decision-makers need additional biomonitoring data, use of volunteer data in government reporting and decisions is relatively infrequent. This is partly due to concern or uncertainty that volunteer data consistently meets the required high standards. New technologies can, in theory, increase both the precision and quality assurance of biodiversity data, suggesting a path to greater power and reach of volunteer data. The panel will discuss barriers to greater use of volunteer data by regulators, the requirements of technologies to overcome these barriers, and possible technical solutions on the horizon.

Session G9: Panel: Multi-disciplinary Approaches to Biomonitoring of Large Rivers
Wednesday, April 30
10:00 am – 11:30 am
Room 264

Organized by Jeff Thomas, ORSANCO

Due in part to national programs such as the National Rivers and Streams Assessment (NRSA) and its predecessor, the Environmental Monitoring and Assessment Program - Great Rivers Ecosystems (EMAP-GRE), there has been a recent surge in monitoring and assessment of biotic communities in large and great rivers across the country. This panel discussion will enable participants from agencies with existing integrated large river programs to share their experiences regarding parameters investigated, sampling methods, and recommendations for future work with other agencies that may be starting (or contemplating) a large river program. A commonality of the presentations included in the short course will be how each program has been influenced either directly or indirectly by EMAP-GRE and/or NRSA. Topics will cover biotic community monitoring techniques, index development, collection and analysis of abiotic parameters associated with the biotic communities, and stressor identification.

Wednesday, April 30
1:30 – 3:00 pm / 3:30 pm – 5:00 pm
Room 261

Organized by Dan Sullivan, US Geological Survey

Advancements and innovations in technology have made water-quality sensors more reliable and cost-effective than ever. As a result, there has been a proliferation of continuous monitoring data, resulting in huge datasets that can easily overwhelm traditional approaches to data interpretation. The data produced by sensors present challenges that are distinct from the discrete data that most water-quality practitioners are accustomed to. It is imperative that data users understand how sensors work, and they need tools to help manage, store, share, and interpret these data.

Branko Kerkez (University of Michigan) and Zak Sihalla (Hydrotech ZS Consulting) will explore the physics behind how sensors function and what that means to the data user. Brian Pellerin (U.S. Geological Survey) will discuss the importance of common protocols and introduce new guidance for optical nitrate sensors. Dwane Young (EPA) and Jon Pollak (CUAHSI) will introduce data models and data sharing networks for continuous and discrete data. Jessica Thompson (U.S. Geological Survey) will demonstrate the functionality of an R package to develop surrogate regressions for real-time water quality prediction,
and discuss how qualitative decisions can be facilitated by the package. Finally, Timothy Straub (U.S. Geological Survey) will give an overview and example applications of the Sediment Acoustic Index Development tool, and show the real-time dissemination of predicted suspended-sediment concentration using sediment acoustic parameters.

**Session H8: Workshop: Bacteria Monitoring 101: Get Hands-on with Four Methods to Monitor Bacteria in Your Local Waterway**

Wednesday, April 30  
1:30 pm – 3:00 pm  
Room 236

*Organized by Kristine Stepenuck, University of Wisconsin-Extension and Wisconsin Department of Natural Resources*

This 90 minute workshop will introduce participants to *E. coli* and Enterococci monitoring in surface waters. Participants will learn about these indicator organisms’ importance and relevance for monitoring recreational waters, and about sources of bacterial pollution in surface waters. Demonstrations and/or hands-on training in use of the methods and opportunity for data results comparison will be provided for IDEXX, Colisan Easygel, 3M™ Petrifilm™, and LaMotte BioPaddles. Each participant will be provided with resources to better understand and carry out bacteria monitoring in surface waters as well as to present bacteria data effectively.

**Session H9: Panel: National and State Perspectives on Implementing the National Coastal Condition Assessment**

Wednesday, April 30  
1:30 pm – 3:00 pm  
Room 264

*Organized by Hugh Sullivan and Treda Grayson, US Environmental Protection Agency*

The National Coastal Condition Assessment, a component of the National Aquatic Resource Surveys program, is designed to assess the condition of the nation's coastal and nearshore water resources every five years. The data generated by the survey provides information that state, regional, local, academic and federal partners can use for water quality assessment, management and decision-making. This panel presents a discussion of various ways to incorporate NCCA data and benefits realized by partners who have incorporated the NCCA into various monitoring and assessment programs. Panelists will be encouraged to share additional ways data can be used.

**Session I8: Workshop: Craft a Powerful Message**

Wednesday, April 30  
3:30 pm – 5:00 pm  
Room 236

*Organized by Martha Merson, Technical Education Research Centers (TERC)*

Perhaps you have gotten a lengthy lab report with pages and pages of data and wondered how to distill if for others. Which results are most alarming and how do you alert the community? How do you convey what you know without turning people off? At this workshop, you will explore a variety of strategies to communicate factual information to community members, including those with minimal formal education. You will learn ways to make data more compelling. By changing the words, the way the numbers are expressed, or graphics are depicted, you can heighten awareness and increase the effectiveness of your message.
Session I9: Cancelled
Wednesday, April 30
3:30 pm – 5:00 pm

Session J8: Panel: Coastal Monitoring and Regional Ocean Partnership Alliances: Data Comparability and Links to the National Monitoring Network
Thursday, May 1
8:00 am – 9:30 am
Room 264

Organized by David Graves, South Carolina Department of Health and Environmental Control

A forum for the alliances forming the Regional Ocean Partnerships to investigate steps to assess and improve the data comparability of their water quality monitoring programs and to examine their roles in the National Monitoring Network.

(This initial meeting will focus on state and federal agency and NGO monitoring entities involved in the Regional Ocean Partnership alliances’ monitoring.)

Thursday, May 1
8:00 am – 9:30 am
Room 236

Organized by Stuart Lehman, US Environmental Protection Agency

NRCS, EPA and States are combining resources from the Farm Bill, Nonpoint Source Programs, and State Monitoring Programs to provide a national picture of water quality impacts from agricultural conservation practices in priority watersheds. The chief participants in this National Water Quality Initiative (NWQI) will detail the challenges, roles, types of monitoring conducted, and efforts being made to measure water quality changes attributable to agricultural practices and systems. The panel will promote a lively discussion of how this partnership is working and how others are achieving similar objectives.

Session K8: Panel: National Scale Water Portals: Why Do We Have More Than One?
Thursday, May 1
10:00 am – 11:30 am
Room 264

Organized by James Kreft, US Geological Survey

Recent years have seen a proliferation of water data portals. This session will allow attendees to become familiar with the major data portals in one session. We will cover what the data portals can do, and what they can't do, as well as the directions of the portals in the future.
Session K9: Panel: Approaches to Reviewing and Assessing Monitoring Programs
Thursday, May 1
10:00 am – 11:30 am
Room 236

Organized by Mike Yurewicz, US Geological Survey

This session will showcase and compare different approaches used to document, review, and assess monitoring programs in Indiana, Maryland, North Dakota, Oregon, and Texas, and discuss the types of outcomes and products of such reviews and assessments. Panelists will discuss how the reviews in their State have facilitated standardizing methods and increased sharing and accessibility of monitoring data. Where applicable, the role of water monitoring councils will be discussed.

Session L8: Workshop: How can Remote Sensing Address Information Needs and Gaps in Water Quality and Quantity Management?
Thursday, May 1
1:30 pm – 3:00 pm
Room 264

Organized by Christine M. Lee, National Aeronautics and Space Administration

Remote sensing and satellite imagery represent an important information resource for water managers who could potentially use this information to enhance their existing data networks that are used in decision-making processes. Water quality data that is utilized by water managers is primarily comprised of point data, obtained by in situ ground networks or laboratory measurements of field samples. This dataset can be enhanced with respect to temporal and spatial coverage for certain variables through the use of satellite-derived information. This session intends to explore the potential of and understand the current limitations of remote sensing in water quality monitoring applications by (1) providing and discussing examples of use and (2) providing a forum for identifying major technological challenges and operational information needs.

Thursday, May 1
1:30 pm – 3:00 pm
Room 236


The USGS has developed new software tools to facilitate obtaining and interpreting surface-water quality data. This short course, presented by the authors of these tools, will describe how these tools can be used. The tools are two, closely linked R packages (open source, platform independent). The first of these is dataRetrieval, which is designed to download water quality data, streamflow data, and metadata from USGS NWIS and EPA STORET. It downloads the data and structures it in standard formats for analysis. EGRET is designed to view and analyze these water quality data. It uses the Weighted Regressions on Time, Discharge, and Season (WRTDS) method to evaluate trends in concentration and pollutant flux. It is focused on producing graphical outputs that can help enhance the understanding of the nature and possible drivers of the observed trends.
Session M8: Short Course: Dissolved Organic Matter – What, Why, How
Thursday, May 1
3:30 pm – 5:00 pm
Room 264

Organized by George Aiken, US Geological Survey

DOM in surface and ground waters plays important roles in many ecological and geochemical processes. The concentration and properties of DOM measured in surface water reflect the myriad sources and processes that occur in watersheds, and form the basis for many important decisions about how to manage water quality in rivers and watersheds. The recent advent of high-speed laboratory optical measurements as well as in situ optical sensors provide the opportunity to monitor water quality on the rapid time scales in which changes occur. In particular, optical measurements of absorbance and fluorescence are effective sentinels of contaminant sources and water quality changes. Laboratory and in situ measurements are increasingly being used for a broad array of water quality assessments such as disinfection byproduct screening, pathogen screening, mercury and methyl mercury fluxes, wastewater detection, metals transport and others. In situ continuous sensors measuring attributes of DOM also provide tools for early trend detection, help identify monitoring gaps and ensure timely data for science-based decision support across a range of issues related to ecosystems and human health. This workshop will help users new to application of DOM optical analysis in their studies and monitoring programs incorporate these data in innovative and appropriate ways.

Session M9: Short Course: Water Quality Applications of R Statistical Software
Thursday, May 1
3:30 pm – 5:00 pm
Room 236

Organized by Monty Porter, Oklahoma Water Resources Board

This course will provide instructive talks on a variety of applications for R Statistical Software. An extensive library exists with applications for:

- Database Applications
- $303(d)/$305(b) assessments and Water Quality Report Cards
- Generating for Geospatial Uses
- Trend Analysis
- State-scale surveys
- Data Summaries
- Multivariate and Regression Analyses
- Best and easiest tools for R software, including R console and R TINN

The course will not be hands on, but is meant to provide introductory information.
Session N1 / O1: Workshop: Implementing Web-based Digital Technologies for Volunteer Monitoring and Watershed Stewardship Organizations and Agencies
Friday, May 2
8:00 am – 9:30 am / 10:00 am – 11:30 am
Room 250

Organized by Erick Burres, California Water Resources Control Board – Clean Water Team

Water is the most precious natural resource in the United States; and its value depends on its quality. Cleaner water can be put to greater uses, and requires less treatment prior to use. Improving and protecting water quality depends on a solid framework for monitoring; sound implementation projects to protect and restore beneficial uses; and effective outreach and education. These are not simple tasks, especially with dwindling budgets. To fulfill our stewardship missions, we have to find innovative ways to become more efficient, productive and expand our programs at a lower cost.

The internet offers more to volunteer monitoring programs than just having a website. Interactive websites, apps and emerging digital technologies can help implement, expand and build sustainability of watershed stewardship projects and water quality monitoring.

This workshop will be a survey with some live demonstrations of effective and efficient uses of web-based infrastructure (training tools, software, maps, webinars, education, meeting/event management…), online databases (Georgia Adopt-A-Stream…), collaboration resources (web-meetings, cloud…), social media (Facebook, YouTube, Pinterest…), crowdsourcing (CreekWatch…), fundraising (ChipIn…), mobile apps and QR-codes which can help your programs grow in effectiveness, become more innovative and build legacy during difficult times.

This 90 minute workshop will provide participants with an updated introduction to using social media, discuss and present uses of crowdsourcing along with how apps, web-based tools and mobile digital resources can help your water quality monitoring program. This workshop was filled beyond capacity during the 8th Monitoring Conference in 2012 and will include new material useful for water quality monitoring programs. The workshop will be led by Erick Burres, Citizen Monitoring Coordinator for California’s Clean Water Team (CWT). California’s citizen monitoring programs are as diverse as its natural resources and cultures. The use of internet based resources has been instrumental to the success of the Clean Water Team in helping volunteer monitors reach their goals.

Topics to be covered include:

- Apps
- Crowdsourcing
- Google Maps
- Web-based training and education materials
- Online monitoring resources
- Newsletters and blogs
- Videos and podcasting
- Web accessible online databases
- Fund raising, tracking volunteer hours and organizational tools
- And more …
Session N2 / O2: Workshop: Visualizing Geographically Referenced Data with Linked Micromaps
Friday, May 2
8:00 am – 9:30 am / 10:00 am – 11:30 am
Room 236

Organized by Michael G. McManus, US Environmental Protection Agency

This workshop focuses on producing linked micromaps to summarize monitoring data over areal units such as watersheds or ecoregions. We outline four steps to make a linked micromap using the R package micromap (version 1.8). The workshop will use a combination of lectures, demonstrations, and exercises so that participants get experience producing linked micromaps. Participants need to bring a laptop already loaded with the needed R packages so they can edit, write, and run example code to make linked micromaps. Open to practitioner/professional that can bring a laptop loaded with the needed R packages so they can edit, write, and run example code to make linked micromaps.
### Monday, April 28

1:30 – 3:00 pm | Room 236
(see page 38 for session description)

**Session A2: Workshop: USGS Water Information NOW**
1:30 – 3:00 pm | Room 252
(see page 38 for session description)

3:30 – 5:00 pm | Room 236
(see page 38 for session description)

**Session B2: Panel: Public-Private Partnerships: Collaborating to Address Critical Water Quality Monitoring Programs**
3:30 – 5:00 pm | Room 264
(see page 38 for session description)

### Tuesday, April 29

**Session C1: Innovative Condition Assessments**
8:00 – 9:30 am | Room 263
Moderator: Richard Bartz, USGS

- 8:05 am  

- 8:25 am  
  *Status, Trend and Change Evaluation and Web Displays of Data for Healthy Watershed Assessments*, David Paradies, California Central Coast Ambient Monitoring Program and Karen Worcester, Central Coast Regional Water Quality Control Board

- 8:45 am  
  *The Development and Application of a Temperature Assessment Methodology for Coldwater Streams in Maryland*, Matthew Stover, Maryland Department of the Environment

- 9:05 am  
  *Extending Trophic State Assessments Using Volunteer-Collected Water Quality Data*, Anthony Thorpe, University of Missouri

**Session C2: National Water Quality Portal: Lessons Learned**
8:00 – 9:30 am | Room 262
Moderator: Dwane Young, USEPA

- 8:05 am  

- 8:25 am  
  *Two Years of the Water Quality Portal: Improvements, Lessons, and Plans for the Future*, James Kreft, USGS

- 8:45 am  
  *A National Compilation of Water-Quality Monitoring Data to Support Local, Regional, and National Scale Water Quality Assessments*, Denise Argue, USGS

- 9:05 am  
  *Duplicate Water Data – Causes, Implications, Solutions*, Dorinda Gellenbeck, USGS

**Session C3: Panel: Continuous Water-Quality Information Anywhere and At Any Time! How Do We Get There?**
8:00 – 9:30 am | Room 261
(see page 39 for session description)
Concurrent Sessions – Tuesday

Session C4: Communicating Science for Action  
8:00 – 9:30 am | Room 237

Moderator: Sara Steiner, New Hampshire Department of Environmental Services


8:25 am *Visual Stream Monitoring: Exploring Georgia’s Newly Developed Habitat Assessment Program*, Harold Harbert, Georgia Environmental Protection Division

8:45 am *EcoAtlas and CRAM: Online Resource Management Support Tools*, Cristina Grosso, San Francisco Estuary Institute

9:05 am *Iowa’s Water Quality Index – From Data to Action*, Mary Skopec, Iowa Department of Natural Resources

Session C5: Nutrient Monitoring and Modeling to Restore and Protect Coastal Water Quality  
8:00 – 9:30 am | Room 233

Moderator: Jerad Bales, USGS

8:05 am *Hypoxia Forecast Models in Coastal Waters Used to Inform Nutrient Management*, Alan Lewitus, NOAA National Centers for Coastal Ocean Science

8:25 am *NEW Web-Based Capabilities for Using Spatially Referenced Regression Models to Support Decisions Related to the Management of Nutrient Loads to the Nation’s Estuaries*, Stephen Preston, USGS

8:45 am *Nutrient Threshold Development for Saint Louis Bay, Mississippi: Content and Context*, Michael Paul, Tetra Tech, Inc.

9:05 am *Monitoring Nutrient and Sediment Inputs to Texas Bays and Estuaries: A Comparison of Selected High Flow Events, 2009-13*, Michael Lee, USGS

Session C7: Evaluating Changes and Trends Using Statistical Surveys  
8:00 – 9:30 am | Room 231

Moderator: Sarah Lehmann, USEPA

8:05 am *Watershed-Scale Biological Monitoring and Assessment for Ecological Protection and Restoration Planning*, James Stribling, Tetra Tech, Inc.

8:25 am *Using Probabilistic Monitoring Data to Recommend Stressor Risk Levels in Aquatic Life Use Total Maximum Daily Load Studies*, Jason Hill, Virginia Department of Environmental Quality

8:45 am *Looking at Statewide Trends in Water Quality through State-Scale Statistical Survey Data*, David Chestnut, South Carolina Department of Health and Environmental Control

9:05 am *An Emerging Picture of Changes in Coastal Water Quality: Preliminary Results from the 2010 National Coastal Condition Assessment*, Treda Grayson, USEPA

Session C8: Workshop: Volunteer Monitoring: Getting Started and Growing Successfully, Part 1  
8:00 – 9:30 am | Room 236

(see page 39 for session description)

Session C9: Workshop: Building, Empowering and Sustaining State, Regional and Tribal Water Monitoring Councils, Partnerships and Alliances  
8:00 – 9:30 am | Room 264

(see page 39 for session description)

Session D1: Remote Sensing: Tools and Applications  
1:30 – 3:00 pm | Room 263

Moderator: Steven Wolfe, Gulf of Mexico Alliance/Florida Institute of Oceanography

1:35 pm *Initial Results from the Workshop on Developing a Great Lakes Remote Sensing Community*, Larry Liou, NASA Glenn Research Center

1:55 pm *Use of MODIS Earth Observation Data in Regional-Scale Models of Reactive Nitrogen in Watersheds*, Richard Smith, USGS
Session D2: Temporal Changes in Groundwater Quality
1:30 – 3:00 pm | Room 262
Moderator: Glenn Skuta, Minnesota Pollution Control Agency

1:35 pm Trends in Groundwater Quality in Principal Aquifers of the United States, 1988-2012, Bruce Lindsey, USGS
1:55 pm Pesticides in Groundwater of the United States: Decadal-Scale Changes, 1993-2011, Patricia Toccalino, USGS
2:15 pm Chloride and Nitrate Trends in Ohio’s Public Water System Wells, Michael Slattery, Ohio EPA

Session D3: Continuous Monitoring: Innovations in Applications and Instrumentation, Part 1
1:30 – 3:00 pm | Room 261
Moderator: Brian Pellerin, USGS

1:35 pm Real-Time Nitrate Monitoring in Groundwater within a Mixed-Use Watershed in Central Illinois, Kelly Warner, USGS
1:55 pm Using Continuous Real-Time Water-Quality Data to Estimate Organic Carbon Export from an Urban Stream, Jami Goldman, USGS
2:15 pm Characterization of Water-Quality Gradients in an Urban Midwestern Stream Using a Floating Sensor Platform Developed for Lagrangian Data Collection, Guy Foster, USGS
2:35 pm The Application and Utility of Continuous Instream Monitoring as Part of a Large River Assessment of the Susquehanna River, Pennsylvania, Dustin Shull, Pennsylvania Department of Environmental Protection

Session D4-D8: Networking: Meet Your Peers – Who is Working in Your Backyard?
1:30 – 3:00 pm | See program insert for meeting location details.

Session D9: Panel: Using Quantitative PCR as a Tool for Evaluating Microbial Water Quality
1:30 – 3:00 pm | Room 250
(see page 40 for session description)

Session E1: Building Capacity with the National Aquatic Resource Surveys (NARS)
3:30 – 5:00 pm | Room 263
Moderator: Chris Faulkner, USEPA

3:35 pm The aquamet Package for R: A Tool for Use with the National Rivers and Streams Assessment, Karen A. Blocksom, USEPA
3:55 pm Implementation of Oklahoma’s Statewide Probabilistic Survey Design for Surface Waters: Considerations, Implications, and Results, Monty Porter, Oklahoma Water Resources Board
4:15 pm Assessing the Ecologic Condition of Wetlands at National and Regional Scales: Status, Implications, and Preliminary Results of the National Wetland Condition Assessment, Gregg Serenbetz, USEPA
4:35 pm Discussion/Q&A

Session E2: Successful Collaborative Monitoring Approaches
3:30 – 5:00 pm | Room 262
Moderator: David Neils, New Hampshire Department of Environmental Services

3:35 pm Rural Action Watershed Restoration Program: Partnering to Improve the Future, Nathan Schlater, Rural Action
3:55 pm The Role of Collaborations in Volunteer Monitoring for Shale Gas Impacts, Kathryn Tomsho, Alliance for Aquatic Resource Monitoring @ Dickinson College
4:15 pm Butler County Stream Team: A Unique and Effective Partnership, Donna McCollum, Alex Del Valle, and Kevin Zacharyasz, Miami University
Concurrent Sessions – Tuesday

4:35 pm  Incorporating Citizen Volunteer Monitoring into Regional Water Quality Management, Thomas Herron, Idaho Department of Environmental Quality

Session E3: Continuous Monitoring: Innovations in Applications and Instrumentation, Part 2
3:30 – 5:00 pm | Room 261

Moderator: Andrew Ziegler, USGS


3:55 pm  Use of High Frequency Water Quality Data to Scale Ecological Processes in Estuaries, Michael Murrell, USEPA

4:15 pm  Relations between Continuous Real-Time and Discrete Water-Quality Constituents in the Little Arkansas River, South-Central Kansas, 1995–2011, Patrick Rasmussen, USGS

4:35 pm  Sound Science: Sediment Monitoring Using Acoustic Surrogates in the U.S. Geological Survey, Mark Landers, USGS

Session E4: Assessing Effects of Climate Change
3:30 – 5:00 pm | Room 237

Moderator: Michael Higgins, U.S. Fish & Wildlife Service

3:35 pm  Regional Vulnerability Assessments to Detect Climate Change Effects in Streams, Britta Bierwagen, USEPA

3:55 pm  Stream Classification in Support of Regional Monitoring to Detect Climate Change Effects, Jonathan Witt, USEPA

4:15 pm  Coastal Monitoring Network to Study Effects of Climate Change on Ecosystem Processes, Kimberly Matthews, RTI International

4:35 pm  Rising Air and Stream-Water Temperatures in Chesapeake Bay Region, USA, John Jastram, USGS

Session E5: Nutrient Monitoring and Modeling to Restore and Protect Freshwaters
3:30 – 5:00 pm | Room 233

Moderator: Jeffrey Frey, USGS

3:35 pm  Total Phosphorus Mass Balance Modeling in the Lower Boise River, Southwestern, Idaho, Alexandra Etheridge, USGS

3:55 pm  Continuous Nitrate Measurements in an Urban Stream Affected by Wastewater, Jennifer Graham, USGS

4:15 pm  Identifying Nutrient Reference Sites in Nutrient-Enriched Regions: Using Algal, Invertebrate, and Fish-Community Measures to Identify Stressor-Breakpoint Thresholds in Indiana Rivers and Streams, 2005-9, Shivi Selvaratnam, Indiana Department of Environmental Management

4:35 pm  Publicly Accessible Decision Support System of the SPAtially Referenced Regressions on Watershed attributes (SPARROW) Model and Model Enhancements in South Carolina, Celeste Journey, USGS

Session E6: Monitoring the Benefits of Green Infrastructure on Water Quality
3:30 – 5:00 pm | Room 232

Moderator: Chris French, Filterra Bioretention Systems

3:35 pm  Evaluation of Soil Media, Vegetative Diversity, and Projected Precipitation Effects on Bioretention Performance and Emission of Greenhouse Gases, Amanda Cording, University of Vermont

3:55 pm  Multimetric Evaluation of Detention Basin Retrofit to Reduce Hydrologic Alteration of Urbanization and Restore Stream Stability, Robert Hawley, Sustainable Streams, LLC

4:15 pm  Application of Automatic Stormwater Monitoring Systems for Integrated Management of Urban Streams in Daeguon, Korea, Dongil Seo, Chungnam National University


Session E7: Century Scale Trends in Water Quality
3:30 – 5:00 pm | Room 231

Moderator: Edward Stets, USGS

3:35 pm  The Perennial Value of Water-Quality Data for Long-Term Trend Analysis, Donna Myers, USGS

3:55 pm  Acidifying Processes in Watersheds Inferred from Century-scale Changes in Alkalinity and Major Ion Ratios, Edward Stets, USGS

4:15 pm  Using a Century of Carbon and Nitrogen Records to Quantify Social-ecological Relationships in Watersheds of the Continental U.S., Whitney Broussard, University of Louisiana at Lafayette

4:35 pm  Laboratory Analysis Rescue: Preserving Water-Quality Records from the Early 20th Century, Robert Swanson, USGS
Session E8: Workshop: Volunteer Monitoring: Getting Started and Growing Successfully, Part 2
3:30 – 5:00 pm | Room 236
(see page 39 for session description)

3:30 – 5:00 pm | Room 264
(see page 40 for session description)

Wednesday, April 30

Session F1: State Applications of Statistical Surveys
8:00 – 9:30 am | Room 263
Moderator: Amina Pollard, USEPA
8:05 am Lakeshore Habitat Condition of Wisconsin Lakes across Gradients in Land Use and Lake Area: Building on the National Lake Assessment, Catherine Hein, Wisconsin Department of Natural Resources
8:25 am Using Probabilistic and Targeted Sampling Strategies to Assess Wisconsin’s Wadeable Streams, Michael Shupryt, Wisconsin Department of Natural Resources
8:45 am Using R to Analyze Data from Probabilistic Monitoring in Oklahoma, Jean Lemmon, Oklahoma Conservation Commission
9:05 am Evaluation of a Geometric Sampling Design Used to Assess Stream Resources and Identify Environmental Stresses in Watersheds, Michael Miller, Wisconsin Department of Natural Resources

Session F2: Bridging the Gap: Diverse Strategies for Better Decision-Making
8:00 – 9:30 am | Room 262
Moderator: Douglas McLaughlin, National Council for Air and Stream Improvement, Inc.
8:05 am Toward Sustainable Water Information: Are Existing Water Monitoring Data Sufficient to Make Scientifically Sound Water Policy Decisions?, Elin Betanzo, Northeast-Midwest Institute
8:25 am Partnering to Establish a Sustainable Biological Monitoring Program, Julie Wood, Charles River Watershed Association

Session F3: Continuous Monitoring: Regulatory Applications
8:00 – 9:30 am | Room 261
Moderator: Jim Dorsch, Metro Wastewater Reclamation District
8:05 am Adapting Methods of Near Real Time Water-quality Monitoring to Meet Scientific and Regulatory Needs, Michael Canova, USGS
8:25 am Utilizing Continuous Water Quality Monitoring Data for Regulatory Assessment and Discharge Permit Development along an Effluent-Dominated Segment of the South Platte River, Jordan Parman and Jim Dorsch, Metro Wastewater Reclamation District
8:45 am Adaptive Management for Low Dissolved Oxygen in Grand and Hudson Lake, Lance Phillips, Oklahoma Water Resources Board
9:05 am Discussion/Q&A
**Session F4: Harmful Algal Bloom and Cyanotoxin Reconnaissance**

8:00 – 9:30 am | Room 237

**Moderator:** Jennifer Graham, USGS

8:05 am  Harmful Algal Bloom Monitoring By Citizen Scientists to Protect Human Health and Strengthen Stewardship, Dana Oleskiewicz, Ohio Lake Management Society

8:25 am  Indiana’s Cyanobacteria Monitoring Program: Analyzing Cyanobacteria and Cyanotoxins, Cyndi Wagner and Kristen Arnold, Indiana Department of Environmental Management

8:45 am  Cyanobacteria and Associated Toxins in Illinois, Paul Terrio, USGS

9:05 am  Determination of Algal Toxin Concentrations in Surface Waters at Isle Royale National Park (ISRO), Sleeping Bear Dunes National Lakeshore (SLBE), and Pictured Rocks National Lakeshore (PIRO), Joseph Duris, USGS

**Session F5: Best Management Practices in Urban and Suburban Landscapes**

8:00 – 9:30 am | Room 233

**Moderator:** Callie Oblinger, USGS

8:05 am  Digesting Multiple Lines of Evidence to Evaluate Possible Designated Use Impairments and Promising Restoration Options – Western Bays, Long Island, NY, Thomas Gulbransen, Battelle Memorial Institute

8:25 am  Assessing Watershed Scale Responses to BMP Implementation in Urban Watersheds, John Jastram, USGS

8:45 am  Evaluation of Pollutants in Wastewater Generated by Mobile Commercial Car Washing Operations in Durham, NC, Maverick Raber, City of Durham

9:05 am  Enumerating the Return on Investment for Restoration Projects in an Urban Watershed through Successful Partnerships and Volunteer Monitoring Efforts, Kara Scheerhorn, Mill Creek Watershed Council of Communities

**Session F6: Integrating Remote Sensing into Assessment Programs**

8:00 – 9:30 am | Room 232

**Moderator:** Blake Schaeffer, USEPA

8:05 am  Remote Sensing of Wintertime Groundcover on Agricultural Fields within the Chesapeake Bay Watershed: Performance of Winter Cover Crops for Water Quality Protection, W. Dean Hively, USGS

8:25 am  Satellite Remote Sensing and Crowd Sourcing to Monitor and Predict Cyanobacteria Blooms, Blake Schaeffer, USEPA

8:45 am  Multispectral Monitoring of New England Freshwater Resources to Assess Turbidity, Algal Blooms, and Water Quality for Enhanced Natural Resource Management, Tiffani Orne, NASA DEVELOP National Program

9:05 am  Predicting Algal Concentrations from Landsat Satellite Imagery in Kentucky Lakes, Mark Martin, Kentucky Department of Environmental Protection

**Session F7: Pollutant Trading: Overviews and Perspectives at Different Scales**

8:00 – 9:30 am | Room 231

**Moderator:** Matthew Heberling, USEPA

8:05 am  Water Quality Trading in the US: National Overview under the Clean Water Act, Bob Rose, USEPA

8:25 am  Point/Nonpoint Water Quality Trading: How Data and Monitoring Can Reduce Market Impediments, Marc Ribaudo, Economic Research Service – USDA

8:45 am  Nutrient Trading: How Farmers and Chesapeake Bay TMDL Efforts Can Find "Value" in Trading Tool Inventories- A Success Story of the Early Use of the Maryland Nutrient Trading Tool, Dana York, Green Earth Connection LLC

9:05 am  The Ohio River Basin Water Quality Trading Project, Gregory Youngstrom, Ohio River Valley Water Sanitation Commission

**Session F8: Panel: Exploring the Worlds of Volunteer Monitoring and Citizen Science**

8:00 – 9:30 am | Room 236

(see page 41 for session description)

**Session F9: Panel: Adapting to an Extreme Climate – Best Practices, Solutions, and Unanswered Questions**

8:00 – 9:30 am | Room 264

(see page 41 for session description)
Session G1: National Lake Assessment: National and State Perspectives
10:00 – 11:30 am | Room 263

Moderator: Aaron Borisenko, Oregon Department of Environmental Quality

10:05 am National Lakes Assessment: Project Overview, Status Update, and Preliminary Results, Amina Pollard, USEPA

10:25 am Minnesota’s 2012 National Lakes Assessment: National, State and Ecoregion-based Approach, Steven Heiskary, Minnesota Pollution Control Agency

10:45 am Comparison of Wisconsin’s Results from National Lake Assessments in 2007 and 2012, Paul Garrison, Wisconsin Department of Natural Resources

11:05 am Using the Results of the 2007 National Lakes Assessment to Influence Lake Management Policy in Vermont, Leslie Matthews, Vermont Department of Environmental Conservation

Session G2: Groundwater Monitoring and Protection
10:00 – 11:30 am | Room 262

Moderator: Greg Pettit, Oregon Department of Environmental Quality

10:05 am Relationships between Discharge and Water Quality in Florida Springs, Ann Shortelle, Suwannee River Water Management District

10:25 am Determining the Sources of Water for Conduit “Sandboil” Springs at the Nature Conservancy’s Nachusa Grasslands Preserve, Franklin Grove, Illinois, Clinton Bailey, USGS

10:45 am The Ohio Ambient Ground Water Quality Monitoring Program Documents Water Quality Impacts, Christopher Kenah, Ohio EPA

11:05 am Efforts to Characterize Ground Water Quality in Indiana through the Statewide Ground Water Monitoring Network, Kevin Spindler, Indiana Department of Environmental Management

Session G3: Continuous Monitoring: Uncertainty and Bias and Precision...Oh My!
10:00 – 11:30 am | Room 261

Moderator: Mary Giorgino, USGS

10:05 am Sensor Signal Integrity and Data Quality Management: Who is Doing What?, Revital Katznelson, University of California Extension


10:45 am Quantifying Uncertainty: Adding Value to USGS Time-Series Water-Quality Data, Stewart Rounds, USGS

11:05 am Estimating the Uncertainty of Mean Daily Water Temperature Using the GUM, Janice Fulford, USGS

Session G4: Detecting and Predicting Cyanotoxins
10:00 – 11:30 am | Room 237

Moderator: Martha Clark Mettler, Indiana Department of Environmental Management

10:05 am Long-term and Seasonal Trends in Phosphorus Loading to Lake Erie: Links to Harmful Algal Blooms with Insights from 2011 and 2012, Laura Johnson, National Center for Water Quality Research, Heidelberg University

10:25 am Understanding and Predicting Harmful Cyanobacterial Algal Blooms at Lake Erie and Ohio Inland Beaches, Erin A. Stelzer, USGS

10:45 am Development of a Molecular Toolbox for Analyses of Bloom-Forming and Toxin-Producing Cyanobacteria in Upper Klamath Lake, Oregon, Sara Eldridge, USGS


Session G5: Quantifying the Source and Fate of Nutrients
10:00 – 11:30 am | Room 233

Moderator: Jane Caffrey, University of West Florida

10:05 am Evaluation of Nitrogen Sources and Transport Processes in the Smith Creek Watershed, An Agricultural Basin in Virginia, Kenneth Hyer, USGS


10:45 am Connecting the Dots – Continuous Nitrate, Phosphorus, and Sediment Loads in the Illinois River, Paul Terrio, USGS

11:05 am Nitrogen in Minnesota Rivers: Conditions, Trends, Sources, and Reductions, David Wall, Minnesota Pollution Control Agency
Session G6: Challenging and Innovative Networks, Models, and Application of Conservation Information that Support the Chesapeake Bay TMDL

10:00 – 11:30 am | Room 232

Moderator: Tony Shaw, Pennsylvania Department of Environmental Protection

10:05 am  Give and Take: Building and Sustaining Integrated Long-term Water Quality Monitoring Networks in the Chesapeake Bay and Basin, Peter Tango, USGS @ Chesapeake Bay Program Office

10:25 am  Recording Progress in Agricultural Conservation on Chesapeake Bay Farms Using USDA Data Records: Balancing Privacy with Useful Information, W. Dean Hively, USGS

10:45 am  Linking Models of the Atmosphere, Watershed, and Estuary to Inform the Chesapeake Bay TMDL, Gary Shenk, EPA Chesapeake Bay Program Office

11:05 am  Application of the Chesapeake Bay Program Partnership’s Watershed Model in Support of the Chesapeake Bay TMDL, Gary Shenk, EPA Chesapeake Bay Program Office

Session G7: Developing and Using Local and Regional Water Quality Data Exchanges

10:00 – 11:30 am | Room 231

Moderator: Jim Kreft, USGS


10:25 am  WaDE: An Interoperable Data Exchange Network for Sharing Water Planning and Use Data, Sara Larsen, Western States Water Council

10:45 am  New Mexico’s SQUID (Surface water QQuality Information Database): Integrating Water Quality Data Management and CWA 303(d)/305(b) Reporting, Meghan Bell and Lynette Guevara, New Mexico Environment Department

11:05 am  Using Cloud Computing to Protect Ecology, Economy, and Tradition through the Wild Rice Wetlands Water Quality Data Sharing Project, Nancy Schultd, Fond du Lac Band of Lake Superior Chippewa Reservation Environmental Program and Mark LeBaron, Gold Systems, Inc.

Session G8: Panel: Better Data, Better Partnerships: How Can New Technologies Increase the Participation and Use of Volunteer Biomonitoring Data?

10:00 – 11:30 am | Room 236

(see page 42 for session description)

Session G9: Panel: Multi-disciplinary Approaches to Biomonitoring of Large Rivers

10:00 – 11:30 am | Room 264

(see page 42 for session description)

Session H1: Monitoring and Assessing Large River Ecosystems

1:30 – 3:00 pm | Room 263

Moderator: Rob Tewes, Ohio River Valley Water Sanitation Commission

1:35 pm  Creation of a Multi-metric Macroinvertebrate Index and Implications for Annual Ohio River Assessments, Ryan Argo, Ohio River Valley Water Sanitation Commission

1:55 pm  A Multi-Disciplinary Large River Assessment of Susquehanna River, Pennsylvania, Michael Lookenbill, Pennsylvania Department of Environmental Protection

2:15 pm  Ranking Relative Effects of Environmental Factors at Various Spatial Scales on Ohio River Biotic Condition, Jeff Thomas, Ohio River Valley Water Sanitation Commission

2:35 pm  The New England Non-wadeable Rivers Fish Assemblage Assessment Project, Chris Yoder, Midwest Biodiversity Institute

Session H2: Monitoring Councils and Coalitions: Examples and Lessons

1:30 – 3:00 pm | Room 262

Moderator: Dan Boward, Maryland Department of Natural Resources

1:35 pm  The Pacific Northwest Aquatic Monitoring Partnership: A Forum Regional Coordination, Gretchen Hayslip, USEPA

1:55 pm  Measuring the Effectiveness of California’s Water Quality Monitoring Council, Jon Marshack, California Water Quality Monitoring Council

2:15 pm  Partnerships for Communication and Cost Savings, Carrie Ruhlman, North Carolina Division of Water Resources

Session H3: Workshop: Megadata – Working with Continuous Time-Series Water-Quality Data, Part 1
1:30 – 3:00 pm | Room 261
(see page 42 for session description)

Session H4: Contaminants of Emerging Concern
1:30 – 3:00 pm | Room 237
Moderator: Leslie McGeorge, New Jersey Department of Environmental Protection
1:35 pm  Bottoms Up? Chemical and Microbial Contaminants of Emerging Concern in Source Water and Treated Drinking Water of the United States, Susan Glassmeyer, USEPA
1:55 pm  Pharmaceuticals and Other Contaminants of Emerging Concern (CECs) in Source and Treated Drinking Waters from 25 Drinking Water Treatment Plants: Compositions, Concentrations, and Reductions, Edward Furlong, USGS
2:15 pm  Effects of Treated Wastewater Effluent on Water-Quality, Sediment-Quality, and Biological Condition in Spirit Creek, Fort Gordon, Georgia, Paul Bradley, USGS
2:35 pm  Development of Indicators for Emerging Trace Organic Compounds, Carrie Turner, LimnoTech

Session H5: Methods and Management of Dissolved Oxygen Issues
1:30 – 3:00 pm | Room 233
Moderator: Alan Lewitus, NOAA
1:35 pm  Maximizing the Value of Existing Monitoring Technologies: Stream Temperature and Dissolved Oxygen as Best Case Examples, Bob Rose, USEPA
1:55 pm  Coming Up for Air: Perspectives from Five Years of DO Monitoring in Illinois, James Slowikowski, Illinois State Water Survey
2:15 pm  Causes of Low Dissolved Oxygen in the Smithland Pool of the Ohio River, Gregory Youngstrom, Ohio River Valley Water Sanitation Commission
2:35 pm  Hopkins Pond Restoration Using Underwater Aeration and Artificial Floating Wetlands, Mike Haberland, Rutgers University

Session H6: Monitoring the Effectiveness of Stream Restoration
1:30 – 3:00 pm | Room 232
Moderator: William Wilber, USGS
1:35 pm  Water Quality Benefits of Stream Reclamation – Cherry Creek Basin, Colorado, Craig Wolf, GEI Consultants, Inc.
1:55 pm  Bloomington’s EPA National Monitoring Project Demonstrated Improved Water Quality with Significant Nutrient Reduction and Enhanced Biotic Response from the Restoration of a Prairie Stream/Slough, Don Roseboom, USGS
2:15 pm  Watershed Restoration Using In-Stream Lime Dosing for Treating Acid Mine Drainage, Sheila Vukovich, West Virginia Department of Environmental Protection
2:35 pm  Top 5 Tips for Working on Stream Projects with Teens: Lessons from Austin Youth River Watch, Brent Lyles, Austin Youth River Watch

Session H7: Tracking Water Quality Trends
1:30 – 3:00 pm | Room 231
Moderator: Michael Higgins, U.S. Fish & Wildlife Service
1:55 pm  The Triangle Area Water Supply Monitoring Project: Tracking Water-Quality Trends and Emerging Issues for 25 Years, Mary Giorgino, USGS
2:15 pm  Nitrogen and Phosphorus Concentrations and Loads in the Great Miami River Basin, Ohio, Michael Ekberg, Miami Conservancy District
2:35 pm  Long-Term Trends in Concentrations of Selected Constituents in Indiana Streams, Martin Risch, USGS

Session H8: Workshop: Bacteria Monitoring 101: Get Hands-On with Four Methods to Monitor Bacteria in Your Local Waterway
1:30 – 3:00 pm | Room 236
(see page 43 for session description)

Session H9: Panel: National and State Perspectives on Implementing the National Coastal Condition Assessment
1:30 – 3:00 pm | Room 264
(see page 43 for session description)
Concurrent Sessions – Wednesday

**Session I1: Implementing EPA’s Healthy Watersheds Program**

3:30 – 5:00 pm | Room 263

**Moderator: Amina Pollard, USEPA**

3:35 pm  Using Integrated Assessments to Identify Healthy Watersheds at the State Scale, Owen McDonough, USEPA – ORISE

3:55 pm  Application of EPA’s Healthy Watersheds Initiative Concepts Enhances Protection of California’s Streams and Watersheds, Peter Ode, California Department of Fish and Wildlife

4:15 pm  Wisconsin’s Healthy Watersheds Initiative: Ranking Watersheds to Inform Management Actions, Catherine Hein, Wisconsin Department of Natural Resources

4:35 pm  Alabama’s Healthy Watersheds Initiative and Biological Condition Gradient: Two Tools for Prioritizing Restoration and Protection Efforts, Lisa Huff, Alabama Department of Environmental Management

**Session I2: Assessing the Effects of Prolonged Drought and Wildfires on Water Quality and Habitat**

3:30 – 5:00 pm | Room 262

**Moderator: Kelly Warner, USGS**


3:55 pm  Trial by Fire: Dedicated Volunteers Test Water during Extreme Drought in Texas, Jacob Apodaca, Lower Colorado River Authority

4:15 pm  Effect of Drought on the Transport of Nitrate in a Midwest Stream, Stephen Kalkhoff, USGS

4:35 pm  Monitoring the Recovery of Streams in the San Gabriel Mountains (CA) Following the Largest Wildfire in Los Angeles County History: Station Fire – 2009, Karin Patrick, Aquatic Bioassay & Consulting Labs

**Session I3: Workshop: Megadata – Working with Continuous Time-Series Water-Quality Data, Part 2**

3:30 – 5:00 pm | Room 261

(see page 42 for session description)

**Session I4: Contaminants of Emerging Concern: Perfluorinated Compounds (PFCs)**

3:30 – 5:00 pm | Room 237

**Moderator: Edward Furlong, USGS**

3:35 pm  Occurrence of Perfluorinated Compounds in New Jersey Public Water Supplies, Gloria Post, New Jersey Department of Environmental Protection

3:55 pm  Presence of Perfluorinated Compounds in Source and Treated Drinking Waters from 25 Drinking Water Treatment Plants in the United States, Susan Glassmeyer, USEPA

4:15 pm  PFC Contamination at the Former Wurtsmith Air Force Base; Extent, Sources, Fish Uptake, Human Exposure, Fate and Transport, Robert Delaney, State of Michigan

4:35 pm  Discussion/Q&A

**Session I5: Indicator Bacteria and Predictive Modeling**

3:30 – 5:00 pm | Room 233

**Moderator: Curtis Cude, Oregon Health Authority**

3:35 pm  A Comprehensive Assessment of the Occurrence and Distribution of Pathogenic Bacteria in Great Lakes Tributaries, March-September 2011, Angela K. Brennan, USGS

3:55 pm  Assessing Enterococci in the Nation’s Lakes, Reservoirs, Streams and Rivers: Results from the National Aquatic Resource Surveys, Sarah Lehmann, USEPA

4:15 pm  Improving Predictions of Bacterial Water Quality with Real-time Networked Sensors and Online Models, Benjamin Wetherill, University of Massachusetts Boston

4:35 pm  Advancing the Use of Predictive Models for Estimating Recreational Water Quality at Beaches, Donna Francy, USGS

**Session I6: Data Management Approaches for Diverse Monitoring Groups**

3:30 – 5:00 pm | Room 232

**Moderator: Elizabeth Herron, University of Rhode Island Watershed Watch**

3:35 pm  Using an Environment Information Lifecycle Framework to Improve the Quality and Sharing of Data and Information, Wayne Davis, USEPA

Concurrent Sessions – Wednesday / Thursday

4:15 pm  Developing an Interactive Database for Volunteer Stream Monitoring Results, Justin Stratton, Davey Resource Group

4:35 pm  Managing Spatial Data: The FlexiGrid Experience, Revital Katznelson, University of California Extension

Session I7: Measuring Invertebrates to Quantify Lake and Reservoir Conditions
3:30 – 5:00 pm | Room 231
Moderator: W. Reed Green, USGS

3:35 pm  Impact of Invasive Dreissenid Mussels (Dreissena polymorpha and Dreissena rostriformis bugensis) and Invasive Round Goby (Neogobius melanostomus) on the Benthic Macroinvertebrate Community and Ecological State of Lake Simcoe (Ontario, Canada), Brian Ginn, Lake Simcoe Region Conservation Authority

3:55 pm  Late Summer Crustacean Zooplankton Communities in Western US Reservoirs Reflect Ecoregion, Temperature and Latitude, John Beaver, BSA Environmental Services, Inc.

4:15 pm  Water Quality and Biological Assessment of the Lower Reservoirs of the Susquehanna River, Luanne Steffy and Aaron Henning, Susquehanna River Basin Commission

4:35 pm  Assessing Water Quality Effects of the Taum Sauk Hydroelectric Facility Reservoir Breach and Evaluating Recovery and Restoration Efforts, Lynn Milberg and Dave Michaelson, Missouri Department of Natural Resources

Session I8: Workshop: Craft a Powerful Message
3:30 – 5:00 pm | Room 236
(see page 43 for session description)

Session I9: Cancelled

Thursday, May 1
Session J1: National-Scale Water Quality Assessments
8:00 – 9:30 am | Room 263
Moderator: Greg Pettit, Oregon Department of Environmental Quality

8:05 am  The National Network of Reference Watersheds, Michael McHale, USGS

8:25 am  A Multi-Scale Monitoring and Modeling Approach for Assessing the Quality of the Nation’s Groundwater: Perspectives from the USGS National Water Quality Assessment Program (NAWQA), Kenneth Belitz, USGS

8:45 am  Status and Trends of the Nation’s Surface-Water Quality: The U.S. Geological Survey’s National Fixed Site Network, Charles Crawford, USGS

9:05 am  Assessing the Nation’s Waters: Accomplishments of the First Ten Years of the National Aquatic Resource Surveys (NARS) and Challenges for the Next Ten, Sarah Lehmann, USEPA

Session J2: Novel Biotic Indices
8:00 – 9:30 am | Room 262
Moderator: Jeff Ostermiller, Utah Division of Water Quality

8:05 am  Upper Mississippi River Mussel Community Assessment Tool, Heidi Dunn, Ecological Specialists, Inc.

8:25 am  Implementation of a Long-Term Quantitative Mussel Monitoring Program in Kentucky, Jacob Culp, Kentucky Department of Environmental Protection

8:45 am  Validation of a Headwater Index of Biotic Integrity for New Jersey’s High Gradient Streams, Brian Henning, New Jersey Department of Environmental Protection

9:05 am  Investigating a Rapid Floristic Quality Assessment Method for Mid-Atlantic Wetlands or What’s a Nice Intensive Assessment Method Like You Doing in a Rapid Assessment World Like This?, Sarah Chamberlain, Penn State University
Session J3: Continuous Monitoring: Tools and Tricks for Data Management
8:00 – 9:30 am | Room 261

Moderator: Dan Sullivan, USGS

8:05 am  Database Design for In Situ Water Quality Data, Amy Russell, Illinois State Water Survey

8:25 am  Combining Monitoring Data Spanning Multiple Temporal and Spatial Scales to Evaluate Water Quality Affecting Seagrass Habitat Extent in Northwest Florida Estuaries, James Hagy, USEPA

8:45 am  ODM Tools Python: Open Source Software for Managing Hydrologic and Water Quality Time Series Data, Jeffery Horsburgh, Utah State University

9:05 am  Temporally Dynamic Representations of Continuous Monitor Data through Animated Graphing, John Yagecic, Delaware River Basin Commission

Session J4: Monitoring Methods and Effects of Floods on Water Quality and Human and Ecological Health
8:00 – 9:30 am | Room 237

Moderator: Terry Schertz, USGS

8:05 am  Concentrations and Transport of Nutrients and Suspended Sediment in the Lower Mississippi-Atchafalaya River Basin during the 2011 Mississippi River Flood, April through July, Heather Welch, USGS

8:25 am  The Occurrence and Transport of Pesticides in the Lower Mississippi River during the 2011 Flood, Richard Coupe, USGS

8:45 am  Long Term Contaminant Threats to Ecosystems and Humans Due to Hurricane Sandy, Michael Focazio, USGS

9:05 am  Training and Equipment Required to Collect Water-Quality Samples on Large Rivers during High Flows, Stan Skrobialowski, USEPA

Session J5: Pesticide Monitoring, Modeling, and Risk Assessment
8:00 – 9:30 am | Room 233

Moderator: Tracy Perry, USEPA

8:05 am  Integration of Surface and Groundwater Modeling and Monitoring Data in Pesticide Ecological Risk Assessments, Mark Corbin, USEPA

8:25 am  Use of the Co-occurrence Pesticide Species Tool (CoPST) to Model Seasonal and Temporal Patterns of Pesticide Presence to Guide Water Quality Monitoring Timing and Location, Richard Breuer, State Water Resources Control Board, California Environmental Protection Agency

8:45 am  Pesticide Surface Water Monitoring: Bias Factors to Estimate Peak Concentrations and PRZM-Hybrid to Complete Measured Chemographs, Clint Truman, Syngenta Crop Protection, LLC

9:05 am  Pesticide Toxicity Index: A Tool for Assessing Complex Mixtures of Pesticides in Streams, Julia Norman, USGS

Session J6: Web and Smart Phone Apps for Collecting and Presenting Data
8:00 – 9:30 am | Room 232

Moderator: Charles Kovatch, USEPA

8:05 am  Better Public Access and Integration of Point Source Wastewater Pollutant Discharge Information and Receiving Waterbody Quality and Assessment Data, Wayne Davis, USEPA

8:25 am  Recr8OhioRiver: A Water Quality Recreation Management Application to Have a Safe and Enjoyable Time on the Ohio River, Laith Alfaqih, Metropolitan Sewer District of Greater Cincinnati

8:45 am  TestTheWater.org a Digital Water Data Management Solution, Lee Tremblay and Luke Warren, 4Marbles Inc.

9:05 am  A High Quality Cellphone-Based Portable Microscope for Stream Side Data Collection, Steven Steinberg, Southern California Coastal Water Research Project

Session J7: Using Volunteer Data to Meet State Clean Water Act Goals
8:00 – 9:30 am | Room 231

Moderator: Aaron Borisenko, Oregon Department of Environmental Quality

8:05 am  Monitoring Rhode Island’s Waters, Elizabeth Herron, University of Rhode Island

8:25 am  Citizen Monitoring Programs Helping to Keep Tahoe Blue: Locating Aquatic Invasive Species and Prioritizing Storm Water Point Sources, Jesse Patterson, League to Save Lake Tahoe

8:45 am  Using Biological Monitoring Data for Assessment-Our ‘A-Ha’ Moment, Danielle Donkersloot, New Jersey Department of Environmental Protection
Utilizing Volunteer Monitoring to Meet Local Stormwater Program Objectives, James Beckley, Virginia Department of Environmental Quality and Chris French, Filterra Bioretention Systems and Virginia Water Monitoring Council

Session J8: Panel: Coastal Monitoring and Regional Ocean Partnership Alliances: Data Comparability and Links to the National Monitoring Network
8:00 – 9:30 am | Room 264

(see page 44 for session description)

8:00 – 9:30 am | Room 236

(see page 44 for session description)

Session K1: Monitoring and Modeling to Restore and Protect Coastal Water Quality
10:00 – 11:30 am | Room 263
Moderator: Jim Hagy, USEPA

10:05 am Adaptation of a Weighted Regression Approach to Evaluate Water Quality Trends in Tampa Bay, Florida, Marcus Beck, USEPA – ORISE
10:25 am Albemarle Sound Demonstration Study of the National Monitoring Network for U.S. Coastal Waters and Their Tributaries, Michelle Moorman, USGS
10:45 am Suspended Sediment-Bound Toxic Chemical Loads from Large Rivers to Puget Sound, Washington, Kathy Conn, USGS
11:05 am Evaluating Water and Sediment Quality in the Gulf of Mexico Coastal National Parks, Jane M. Caffrey, University of West Florida

Session K2: Characterization of Regional Groundwater Systems
10:00 – 11:30 am | Room 262
Moderator: Kenneth Belitz, USGS

10:25 am Continuous Monitoring of Methanol Concentration in Water Treatment Processes Associated with Hydrofracturing, Kenneth Reardon, OptiEnz Sensors, LLC
10:45 am Preliminary Findings from Continuous Water Chemistry Monitoring in Watersheds Impacted by Shale Gas Drilling in the Susquehanna River Basin, Dawn Hintz, Susquehanna River Basin Commission
11:05 am Natural Variation of Specific Conductivity and Major Ions in Wadeable Streams of the Conterminous United States, Michael Griffith, USEPA

Session K3: Continuous Monitoring: Sensor Developments in Energy Production/Hydrofracking
10:00 – 11:30 am | Room 261
Moderator: Pete Penoyer, National Park Service

10:05 am Application of an Aqueous Methane Sensor to Evaluate Spatial and Temporal Changes in Dissolved Methane Concentrations in a Groundwater Monitoring Well, Andrew Barton, Battelle Memorial Institute
10:25 am Continuous Monitoring of Methanol Concentration in Water Treatment Processes Associated with Hydrofracturing, Kenneth Reardon, OptiEnz Sensors, LLC
10:45 am Preliminary Findings from Continuous Water Chemistry Monitoring in Watersheds Impacted by Shale Gas Drilling in the Susquehanna River Basin, Dawn Hintz, Susquehanna River Basin Commission
11:05 am Natural Variation of Specific Conductivity and Major Ions in Wadeable Streams of the Conterminous United States, Michael Griffith, USEPA

Session K4: Microbial Source Tracking and Health Effects
10:00 – 11:30 am | Room 237
Moderator: David Chestnut, South Carolina Department of Health and Environmental Control

10:05 am Location of E. coli Bacteria Sources in an Urban Watershed in Seattle, Washington Using a Combination of Repeat In-Stream Sampling, Rapid Bio-assessment, IDDE Sampling of Storm Drains, CCTV of Sanitary Drains, Bacteroides Analysis and Information on Urban Homeless Encampments, Jonathan Frodge, Seattle Public Utilities
10:25 am Examining Indicator Bacteria at Freshwater Swim Sites in the Los Angeles River Watershed, California, Kristy Morris, Council for Watershed Health
Concurrent Sessions – Thursday

10:45 am  Epidemiology Studies of Swimming-Associated Illness at Beaches with Non-Point Sources of Fecal Pollution, Yiping Cao, Southern California Coastal Water Research Project Authority

11:05 am  Implementing a Fecal Coliform TMDL Using Volunteer and Shellfish Sanitation Program Data to Identify Sources and Transport Pathways, Susan Libes, Coastal Carolina University

**Session K5: Monitoring to Reflect Water Quality Changes from Management Actions**
10:00 – 11:30 am | Room 233

**Moderator: Michael Eberle, U.S. Forest Service**

10:05 am  Water Quality and Biological Trends in Ohio: Pre-Construction Grants Program to the Present, Robert Miltnor, Ohio EPA

10:25 am  Monitoring and Analyzing the Effectiveness of the Lower Minnesota River Low Dissolved Oxygen Total Maximum Daily Load Study's Wastewater Phosphorus Permitting Implementation Activities, Glenn Skuta, Minnesota Pollution Control Agency

10:45 am  Farms, Fish, Phosphorus and Phytoplankton: Long-Term Dynamics of a Reservoir Ecosystem Associated with Changes in Watershed Agricultural Practices, Michael Vanni, Miami University

11:05 am  Multiple Uses of Data from an Automated Monitoring Network in a 6-Mile Urban Stormwater Tunnel, Britta Suppes, Capitol Region Watershed District

**Session K6: Statistical Analysis Tools**
10:00 – 11:30 am | Room 232

**Moderator: Mary Skopec, Iowa Department of Natural Resources**

10:05 am  Linked Micromaps: Statistical Summaries of Monitoring Data in a Spatial Context, Michael McManus, USEPA

10:25 am  STORET Analytical Tools, Amy Wesley-Snider, RTI International

10:45 am  Disaggregation of Pollutant Sources through the Implementation of Continuous, Surrogate-Based Regression Equations, James Riddle and Benjamin Hammond, Woolpert Inc.

11:05 am  Accounting for Confounders Leads to Clearer Effects-Thresholds for Some Stressors, Claire Buchanan, Interstate Commission on the Potomac River Basin

**Session K7: Research and Achievements in Community-Based Science**
10:00 – 11:30 am | Room 231

**Moderator: Julie Vastine, Alliance for Aquatic Resource Monitoring @ Dickinson College**

10:05 am  Assessing the Needs of US Volunteer Monitoring Programs: Recent Survey Results and Implications, Linda Green, University of Rhode Island Cooperative Extension

10:25 am  “I Want to Help Whoever Can Help the Water”: Explaining Citizen Involvement in Volunteer Water Quality Monitoring Programs, Jaime McCauley, Northern Kentucky University

10:45 am  Improving Understanding of Impacts of Volunteer Water Monitoring Programs on Natural Resource Policy and Management, Kristine Stepenuck, University of Wisconsin-Extension

11:05 am  Citizen Science and the Management of Natural Resources and Environments: A Systems Approach, Pierre Glynn, USGS

**Session K8: Panel: National Scale Water Portals: Why Do We Have More Than One?**
10:00 – 11:30 am | Room 264

(see page 45 for session description)

**Session K9: Panel: Approaches to Reviewing and Assessing Monitoring Programs**
10:00 – 11:30 am | Room 236

(see page 45 for session description)

**Session L1: The Big Picture: Holistic Approaches to Water Quality Assessments**
1:30 – 3:00 pm | Room 263

**Moderator: Barb Horn, Colorado Parks & Wildlife**

1:35 pm  Determining How Much Algae is too Much Algae in West Virginia Streams, Kevin Coyne, West Virginia Department of Environmental Protection

1:55 pm  Projected Economic Benefits Associated with the Removal of Excess Nitrogen and Phosphorus from Utah's Lakes and Streams, Jeff Ostermiller, Utah Department of Environmental Quality

2:15 pm  Collaborative Science and Monitoring to Support Integrated Watershed Planning, Alison Watts, University of New Hampshire

2:35 pm  Next-Generation of Urban Water Systems, Xin (Cissy) Ma, USEPA
Session L2: Assessment of Stream Condition with Macroinvertebrates, Part 1
1:30 – 3:00 pm | Room 262

Moderator: Timothy Oden, USGS

1:35 pm Evaluation of an Alternate Benthic Macroinvertebrate Sampling Method for Low Gradient Streams Sampled in the National Rivers and Streams Assessment, Karen A. Blocksom, USEPA

1:55 pm A Credible Water Quality Assessment Using Citizen-Collected Macroinvertebrate Data, Alene Onion, New York State Department of Environmental Conservation

2:15 pm Overview of the Biological and Water Quality Assessment Program and the Results for Metropolitan Sewer District of Greater Cincinnati Service Area, Cincinnati, Ohio, Laith Alfaqih, Metropolitan Sewer District of Greater Cincinnati

2:35 pm Environmental Drivers of Biological Stability and Persistence at Reference and Managed Sites within the Interior Columbia River Basin, USA, Scott Miller, Utah State University

Session L3: Energy Production Impacts
1:30 – 3:00 pm | Room 261

Moderator: Pete Penoyer, National Park Service

1:35 pm Assessment of Greenhouse Gas Emissions in a Tropical Brazilian Reservoir, Guilherme Andrade, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil

1:55 pm Disinfection By-Products Formed During the Treatment of Produced Waters at Wastewater Treatment Plants, Michelle Hladik, USGS

2:15 pm Wheeling, West Virginia Experience With Frackwater: What “Brinewater” and “Residual Waste” Trucks Are Really Carrying, Benjamin Stout, Wheeling Jesuit University

2:35 pm Preliminary Interpretation of the Impacts of Marcellus Shale Gas Extraction Activities on Small Streams, Based on Volunteer-Collected Data, Candie Wilderman, Alliance for Aquatic Resource Monitoring @ Dickinson College

Session L4: Integrated Monitoring and Modeling to Restore and Protect a National Estuary – Barnegat Bay
1:30 – 3:00 pm | Room 237

Moderator: Leslie McGeorge, New Jersey Department of Environmental Protection

1:35 pm Collaborative Water Quality Monitoring Program to Support Modeling and Restoration of Barnegat Bay, Hui (Helen) Pang, New Jersey Department of Environmental Protection

1:55 pm Hydrodynamic Modeling of Temperature-Salinity Dynamics in Barnegat Bay-Little Egg Harbor Estuary, NJ, Zafer Defne, USGS

2:15 pm Modeling of Water-Quality Dynamics and Responses to Nutrient and Other Stresses in Barnegat Bay-Little Egg Harbor, New Jersey, Frederick Spitz, USGS

2:35 pm Monitoring and Assessing the Restoration and Protection of the Barnegat Bay: Quo Vadimus?, L. Stanton Hales Jr., Barnegat Bay Partnership, Ocean County College

Session L5: Multiple Stressors and Water Quality Impairments
1:30 – 3:00 pm | Room 233

Moderator: Jaysson Funkhouser, USGS

1:35 pm Software for Analysis of Chemical Mixtures: Composition, Occurrence, Distribution, and Possible Toxicity, Kenneth Skach, USGS

1:55 pm Headwaters Stressor Identification Study for the Central Great Plains Ecoregion of Kansas and Nebraska, Kimberly Matthews, RTI International

2:15 pm Drowning In Data: Leveraging Multi-Parameter Datasets to Inform Adaptive Management-Based Restoration In the Long Creek Watershed, A Small Urban-Impaired Freshwater Stream In Coastal Cumberland County, Maine, Katherine McDonald, Cumberland County Soil & Water Conservation District

2:35 pm Discussion/Q&A

Session L6: Spatial and Temporal Approaches for Monitoring
1:30 – 3:00 pm | Room 232

Moderator: Kenneth Hyer, USGS

1:35 pm USGS Tributary Monitoring Network to Support Great Lakes Restoration Efforts, Dan Sullivan, USGS

1:55 pm Long-Duration High-Frequency Monitoring of Nutrients and Sediments in an Agricultural Watershed, William Renwick, Miami University

2:15 pm Using Critical Timing to Couple Continuous Water Quality Monitoring Data and Proposed Nitrate Reduction Strategies, Jessica Garrett, USGS

2:35 pm Dissolved Organic Matter as an Indicator of Watershed Processes, George Aiken, USGS
Concurrent Sessions – Thursday

Session L7: Making it Clear for the Public: Techniques in Data Communication, Part 1
1:30 – 3:00 pm | Room 231

Moderator: Alexandra Fries, University of Maryland Center for Environmental Science

1:35 pm Promoting Recreation in the Willamette River Post CSO Control, Peter Abrams, City of Portland

1:55 pm Turning Monitoring Data from Numbers into Watershed Priorities, Mindy Scott, SD1

2:15 pm Volunteer Monitoring for Science and Action, Tony Williams, Buzzards Bay Coalition

2:35 pm How to Turn 3000 Water Quality Measures from 11 Sources into an 8 Page Report Written for the General Public, Daniel Obrecht, University of Missouri

Session L8: Workshop: How can Remote Sensing Address Information Needs and Gaps in Water Quality and Quantity Management?
1:30 – 3:00 pm | Room 264

(see page 45 for session description)

1:30 – 3:00 pm | Room 236

(see page 45 for session description)

Session M1: Regional Scale Monitoring Strategies
3:30 – 5:00 pm | Room 263

Moderator: Mary Skopec, Iowa Department of Natural Resources

3:35 pm Assessing the Quality of Groundwater used for Public Supply across the Glacial Aquifer System, Paul Stackelberg, USGS


4:15 pm Design Basis for the Gulf Monitoring Network (GMN): Integrating Key Elements of Remote Sensing, Sampling, and Modeling, Steven H. Wolfe, Gulf of Mexico Alliance/Florida Institute of Oceanography

4:35 pm Design and Implementation of Regional Monitoring Networks to Detect Climate Change Effects in Freshwater Streams, Jen Stamp, Tetra Tech, Inc.

Session M2: Assessment of Stream Condition with Macroinvertebrates, Part 2
3:30 – 5:00 pm | Room 262

Moderator: Gretchen Hayslip, USEPA

3:35 pm Tracking Macroinvertebrate Trends in Water Quality With Respect to Flow Conditions and Other Variables, Jim Martin, Adrian College

3:55 pm Stream Characteristics and Other Considerations for Macroinvertebrate Bioassessment of Puerto Rico Streams, James Kurtenbach, USEPA

4:15 pm Evaluating the Effects of Spawning Bed Enhancement on Salmon Habitat, Water Quality, and Benthic Communities in a Yuba River Tributary in Northern California, Justin Wood, Sierra Streams Institute

4:35 pm Discussion/Q&A

Session M3: Training and Coordinating for Better Results
3:30 – 5:00 pm | Room 261

Moderator: Danielle Donkersloot, New Jersey Department of Environmental Protection

3:35 pm Training and Educating Digitally- How YouTube is Revolutionizing Water Quality Monitoring, James Beckley, Virginia Department of Environmental Quality

3:55 pm The Maryland Biological Stream Survey Training and Certification Program, Daniel Boward, Maryland Department of Natural Resources

4:15 pm Coaching Volunteers to Obtain Meaningful and Useful Data, Susan Higgins, Missouri Department of Natural Resources

4:35 pm Large-Scale Sampling Events: Using Volunteers to Monitor at the Watershed Level, Harold Harbert, Georgia Environmental Protection Division

Session M4: Mercury in Air, Water, and Fish Tissue
3:30 – 5:00 pm | Room 237

Moderator: Gary Rowe, USGS


3:55 pm The Great Lakes Atmospheric Mercury Monitoring Network, Martin Risch, USGS

4:15 pm Results of EPA’s Assessment of Fish Tissue from U.S. Rivers for Mercury and Legacy Organic Compounds with Implications for Aquatic Life and Human Health, John Wathen, USEPA
4:35 pm  Mercury Monitoring and Assessment in the Ohio River, Jason Heath and Eben Hobbins, Ohio River Valley Water Sanitation Commission

Session M5: Quantifying Agricultural Nonpoint Sources and Controls
3:30 – 5:00 pm | Room 233

Moderator: Andrea Bolks, USEPA–ORISE

3:35 pm  A Regional Assessment of the Effects of Conservation Practices on In-Stream Water Quality, Ana Maria Garcia, USGS

3:55 pm  Monitoring Methods Used to Improve Agricultural Best Management Practice Evaluations at the Edge-of-Field Scale, Jim Morris, USGS

4:15 pm  Neonicotinoid Insecticide Occurrence in Iowa Streams During the 2013 Growing Season, Michelle Hladik, USGS

4:35 pm  The National Water Quality Initiative’s Monitoring Framework, Erika Larsen, USEPA–ORISE

Session M6: Geospatial Tools for Data Integration
3:30 – 5:00 pm | Room 232

Moderator: Stephen Aichele, USGS

3:35 pm  The National Hydrography Dataset: A Geospatial Tool for Data Integration, Al Rea, USGS

3:55 pm  Innovative Applications of the New National Hydrography Dataset Plus (NHDPlus Version 2) – A National Surfacewater Geofabric, Tommy Dewald, USEPA

4:15 pm  Georeferencing Water Quality Assessments to NHDPlus Catchments – A New Approach to Evaluating and Measuring Progress in Surface Water Quality, Wendy Reid, USEPA

4:35 pm  Re-envisioning the National Hydrography Dataset, Stephen Aichele, USGS

Session M7: Making it Clear for the Public: Techniques in Data Communication, Part 2
3:30 – 5:00 pm | Room 231

Moderator: Julie Vastine, Alliance for Aquatic Resource Monitoring @ Dickinson College

3:35 pm  Talk to Me: Generating Interest in Water Quality through Better Reporting, Sara Steiner, New Hampshire Department of Environmental Services

3:55 pm  Calculating Water Quality Indicator Scores for Ecosystem Health Report Cards, Alexandra Fries, University of Maryland Center for Environmental Science

4:15 pm  Volunteer Stream Monitoring Data for Everyone: Making Information Publicly Accessible to the Community, Julie Powers and Gabriel Zawadzki, Mid-Michigan Environmental Action Council

4:35 pm  Where Are Our Wetlands and How Are They Doing?, Jon Marshack, California Water Quality Monitoring Council

Session M8: Short Course: Dissolved Organic Matter—What, Why, How
3:30 – 5:00 pm | Room 264

(see page 46 for session description)

Session M9: Short Course: Water Quality Applications of R Statistical Software
3:30 – 5:00 pm | Room 236

(see page 46 for session description)
### Friday, May 2

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<th>Session N1: Workshop: Implementing Web-based Digital Technologies for Volunteer Monitoring and Watershed Stewardship Organizations and Agencies, Part 1</th>
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Addressing Emerging Contaminants and Threats to Human Health and Aquatic Ecosystems

01 Developing a Diatom Index for Indiana Rivers and Streams, Kristen Arnold, Indiana Department of Environmental Management

02 Consideration of Monitoring Data in the Context of Human Health and Ecological Benchmarks for Pesticides, Mark Corbin, USEPA

03 Distinct Differences in Precipitation Mercury Concentrations between Urban and Rural Measurements, David Gay, University of Illinois

04 The National Atmospheric Deposition Program: Lessons from a Continental-Scale Monitoring Network, David Gay, University of Illinois

05 Water Quality of Two Principal Aquifers used for Public Supply in the Southeastern United States, Bruce Lindsey, USGS

06 Ecoregion and Land Use Influence Microcystin Concentrations in Planktonic and Littoral Regions of Lakes and Reservoirs, Erin E. Manis, BSA Environmental Services, Inc.

07 A Drinking Water Standard for Cr-6? What to Expect for Illinois, Patrick Mills, USGS

08 Fish Consumption and Contaminants in Fish from the Los Angeles and San Gabriel Rivers Watersheds, Karin Patrick, Aquatic Bioassay & Consulting Laboratories, Inc.

09 Assessment of Perfluorinated Compounds (PFCs) in Fish from U.S. Rivers and the Great Lakes, Leanne Stahl, USEPA

10 EPA's Assessment of Contaminants in Fish from U.S. Rivers, Leanne Stahl, USEPA

11 An Investigation of Mercury Concentration Trends in Fish Tissue in the Ohio River, Rob Tewes, ORSANCO

Advancing Innovation in Monitoring: Technology, Assessment, Modeling, and Methods

12 Application of Polyethylene Devices (PEDs) For Monitoring PCBs at a Freshwater Sediment Remediation Site, Mark Benotti, Battelle

13 Using a Water Quality Monitor to Predict Recreational Water Quality in Near Real-Time in the Cuyahoga River, Cuyahoga Valley National Park, Amie Brady, USGS

14 Efficient Strategies for Sampling Edge-of-Field Runoff, Dave Braun, Stone Environmental

15 The Use of Web-based and Digital Tools for Developing and Supporting Citizen Monitoring Programs Conducting Bioassessments in California, Erickson Burres and Janet Hsiao, California State Water Resources Control Board – Clean Water Team

16 Comparison of Volunteer and Automated Water Quality Data Suggesting Procedural Improvements, Jeffrey Campbell, Environmental Informatics

17 Cancelled

18 MiniSipper: A New, High-capacity, Long-duration, Automated In situ Water Sampler for Aquatic Monitoring, Thomas Chapin, USGS

19 STIC: A New Instrument for Rugged, Low-cost, Long-duration Stream Temperature, Intermittency and Conductivity Monitoring, Thomas Chapin, USGS

20 Development and Validation of a Colorimetric Microtiter Plate Based Receptor-Binding Assay for the Determination of Fresh Water and Marine Toxins Using the Nicotinic Cholinergic Receptor, Erin Faltin, Abraxis LLC

21 Development of New Analytical Methods at the National Water Quality Laboratory to Meet the Needs of National and State Programs, Ed Furlong, USGS

22 Continuous Groundwater Quality Parameters Enhance Groundwater Studies, Amy Gahala, USGS

23 Microbial Source Tracking Methodologies to Assess Human Contributions of Fecal Bacteria to a Freshwater Receiving Stream, David Graves, South Carolina Department of Health and Environmental Control

24 Time Integrative In Situ Field Extraction Techniques and Advantages, Brent Hepner, Aqualytical Services Inc.

25 U.S. EPA ETV Verification of a Coliform Detection Technology, Ryan James, Battelle
26 Assessing Agent Concentration and Pressure in Water using Targeted Acoustic Frequency Ranges, John Keady, Innovation Labs LLC

27 Rapidly Deployable Real-Time Stream Flow Sensor Networks, Branko Kerkez, University of Michigan

28 Study Design for Comparative Study of Michigan’s Rapid Bioassessment Methodology and National Rivers and Streams Assessment, Tamara Lipsey, Michigan Department of Environmental Quality

29 GIS Assessment of the Ecological Impacts of Farm Landscape Change in South Carolina Lower Region, Edmund Merem, Jackson State University

30 Using Emerging Mobile Technologies to Educate, Engage and Empower the Global Community on Water Quality Monitoring and Environmental Sustainability, Julie Moses, Northern Kentucky University

31 Identifying Canadian Priority Drainage Basins for Potential Risk to Water Quality and Aquatic Ecosystems Using a Risk Based Basin Analysis, Denis Parent, Environment Canada

32 Cancelled

33 Efficacy Review of a Phycocyanin-Detecting Continuous Imaging Particle Analyzer As Used For the Identification and Enumeration of Cyanobacteria, Brandon Rieff, Fluid Imaging Technologies

34 Results from Laboratory and Field Testing of Nitrate Measuring Spectrophotometers, Teri Snazelle, USGS

35 An Evaluation of XYLEM EXO Water-Quality Sondes and Sensors, Teri Snazelle, USGS

36 The U.S. Geological Survey Midwest Region River Sediments and Nutrients Investigations, Timothy Straub, USGS

37 Surrogate Analysis and Index Developer, Timothy Straub, USGS

38 Using Remote Sensing Tools to Target Stream Protection and Wastewater Treatment BMPs in Rural Kentucky, Barry Tonning, Tetra Tech, Inc.

39 Real-Time Nitrate Monitoring in Groundwater within a Mixed-Use Watershed in Central Illinois, Jacob Wikle, USGS

40 Merging Water Quality Standards and Monitoring and Assessment Produces Better Management Outcomes, Chris Yoder, Midwest Biodiversity Institute

41 Web-Based Communication of Water Quality Issues and Potential Solution Exploration, Elly P.H. Best, USEPA

42 The Effectiveness of Floating Treatment Wetlands for Water Quality Best Management Practices, Richard Bretz, Miami University

43 The Role of Citizen Scientists in the Monitoring and Management of the Global Water System, Diana Eddowes, Earthwatch Institute

44 Big Chico Creek Watershed Citizen Monitoring Program, Timmarie Hamill, California Urban Streams Alliance – The Stream Team

45 Approaches for Disseminating Water Quality Information: Development and Use of Applied Water Quality Indices and Report Cards, Brian Henning, New Jersey Department of Environmental Protection

46 Where Are Our Wetlands and How Are They Doing? Jon Marshack, California Water Quality Monitoring Council

47 California Estuary Monitoring Workgroup - Using Web Portals to Improve Scientific Understanding, Jon Marshack, California Water Quality Monitoring Council

48 Landowner Outreach: “Know Your Stream” Handouts, Jason Ramming, Oklahoma Conservation Commission

49 Building Public Awareness of Wisconsin’s Streams through Signage at Long-term Volunteer Stream Monitoring Sites, Heather Smith, University of Wisconsin – Extension

50 Source Water Protection For Drinking Water Production: An International River Memorandum, Peter Stoks, Association of Rhine Water works RIWA

51 Water-body Check-up: Monitoring and Ecological Modeling to Evaluate Risk of Preventable Health Problems, Harry Stone, Battelle

**Demonstrating the Value of Monitoring in Measuring Environmental Change**

52 Determining the Timing and Cause of Water Quality Changes from Increased Nutrient Loading to an Urban Kettle Lake near Toronto (Ontario, Canada): Using Paleolimnological Techniques to Set Lake Management Objectives, Brian Ginn, Lake Simcoe Region Conservation Authority

53 Economic Valuation of Monitoring Based on Nutrient Trading Ratios, Richard Smith, USGS

54 The Circumarctic Lakes Observation Network (CALON): Hierarchical Sampling of a Lake-Rich Region of Northern Alaska, Amy Townsend-Small, University of Cincinnati

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**Connecting Science to Action – Communicating Science and Data in Ways that Influence Behavior**

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