

**National Council
Highlights**

**Collaboration through
Partnerships**

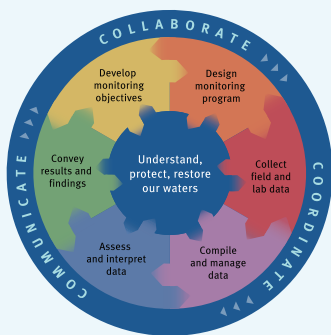
**Council Workgroup
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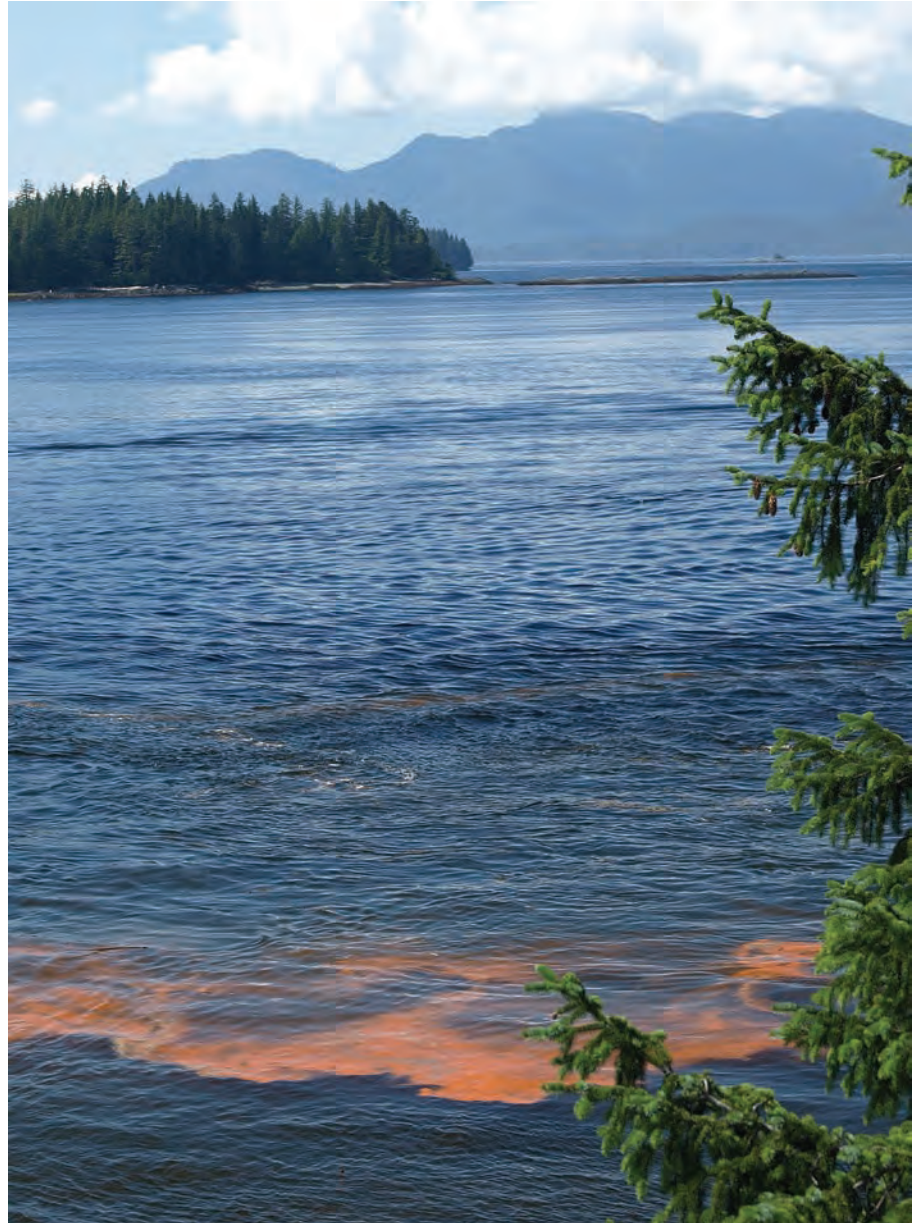
National Water Monitoring News

Highlights

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The National Water Quality Monitoring Council brings together scientists, managers, and citizens to ensure information about the quality of our water resources is accurate, reliable, and comparable. The Council fosters collaborative and cost-effective approaches to improve and advance the science of water-resources monitoring.



A *Noctiluca* bloom occurred in Southeast Alaska in 2008. Harmful algal blooms, commonly referred to as red tide, represent a growing threat to all U.S. coastal waters. The Phytoplankton Monitoring Network – a national network of volunteers monitoring for coastal algal blooms – was developed to increase public awareness and maintain an extended monitoring area along the U.S. coast. (Photo courtesy of Gary Freitag and Barbara Morgan)

The National Water Quality Monitoring Council
 Editor: Cathy Tate
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<http://acwi.gov/monitoring/>



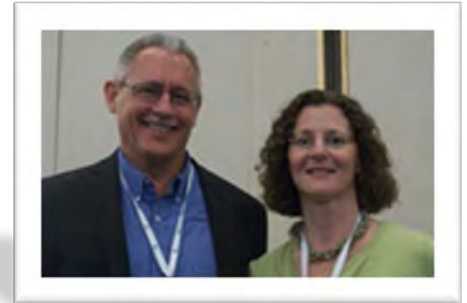
National Water Monitoring News – Greetings from the Council Co-Chairs

Welcome to the sixth edition of the Council's newsletter!

We are excited to bring you another issue packed full of cutting-edge science and important news from the world of monitoring. The newsletter has been and continues to be an excellent forum that supports the Council's mission to foster partnerships and collaboration; advance water science; improve monitoring strategies; and advance data integration, comparability, and reporting.

Among the topics you will find in this issue:

- ✓ Highlights from the Council's [8th National Monitoring Conference](#) (April 30 – May 4, 2012, Portland, OR)
- ✓ New Council Resource – Water Quality Data Portal
- ✓ New Tools and Technology:
 - Electronic field forms for the 2012 National Lakes Assessment
 - New *How's My Waterway?* mobile website
- ✓ Updates on monitoring including:
 - U.S. Geological Survey's Cooperative Water Program
 - U.S. EPA's National Aquatic Resource Surveys
 - U.S. Forest Service's Inventory, Monitoring, and Assessment Program
 - Chesapeake Bay Program monitoring of 2011 storm effects
 - Wildfire effects on source water quality
- ✓ Spotlight on the State monitoring programs from California, Vermont and Florida
- ✓ Volunteers monitoring and the coastal Phytoplankton Monitoring Network
- ✓ Updates on National Monitoring Networks including:
 - National Ground Water Monitoring Network
 - Albemarle Sound's study as part of the National Monitoring Network for U.S. Coastal Waters and Their Tributaries
 - Lake Michigan water quality near Chicago



We encourage everyone to be an active part of the Council through this newsletter. Please share your successes and challenges in monitoring, announce upcoming meetings and conferences, and share related Internet links and other water-related information. If you have an article idea or would like to write something yourself, don't hesitate to contact our editor, Cathy Tate, cmtate@usgs.gov, (303) 236-6927. New articles and ideas are always welcome!

On behalf of the entire Council and all those who contributed to this issue of our newsletter, thanks for reading and for helping to protect our Nation's waters. We hope you enjoy this newsletter and we encourage your input and future communication!

Sincerely yours,

Michael Yurewicz, USGS Co-Chair
mcyurewi@usgs.gov

Susan Holdsworth, EPA Co-Chair
holdsworth.susan@epa.gov

National Council Highlights

Highlights from the 2012 National Monitoring Conference

A total of 1053 attendees from nine countries, all 50 states, as well as the District of Columbia and Puerto Rico, and over 35 Tribes attended the Eighth National Monitoring Conference “*Water: One Resource – Shared Effort – Common Future*” in Portland, Oregon, April 30 – May 4, 2012. Conference participants included Federal (34%), State/Province (17%), Private/Commercial (16%), Academics (10%), Nongovernmental Organizations (9%), Local/Regional (9%), and Tribal (6%).

Attendees chose from about 336 platform presentations, more than 150 technical posters, and over 30 workshops, short courses and panels as well as interacting with over 40 exhibitors (acwi.gov/monitoring/conference/2012/index.html). The Council had its very own interactive session “*Understand, Restore, and Protect Our Waters: National Water Quality Monitoring Council Programs, Initiatives and Products*” and encouraged participants to get involved in Council’s workgroups (see acwi.gov/monitoring/workgroups/index.html).

A stellar lineup of plenary speakers included:

- Todd Ambs, (President, River Network)
- Ellen Gilinsky, (Senior Policy Advisor to the Acting Assistant Administrator for Water, Office of Water, U.S. Environmental Protection Agency)
- William Bradbury, (Council member, Northwest Power & Conservation Council)
- Eric Quaempts, (Director of the Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources).

In addition, over 90 River Rally participants joined the Conference on Friday’s Bridge Day which was designed with mutually developed themes, presentations, and breakout groups geared toward fostering improved collaboration between government and nonprofit groups working together for clean water. Here’s what one participant had to say about Bridge Day:

“I was skeptical about the format but pleasantly surprised. It is amazing how you can be at a conference with 900 people, learn a lot, but not really network or get to know the right people in a meaningful way. Bridge Day break out groups allowed us to really talk to individuals in our area in a facilitated and meaningful way.”

For additional information, contact: Cathy Tate, USGS, cmtate@usgs.gov, (303) 236-2697



Volunteer monitoring representatives formed a large contingent at the conference, and came to network, learn, and exchange information. Special thanks go to YSI for providing travel support for 31 volunteer monitoring coordinators! (Photo courtesy of Christina Anderson, Wisconsin Department of Natural Resources)



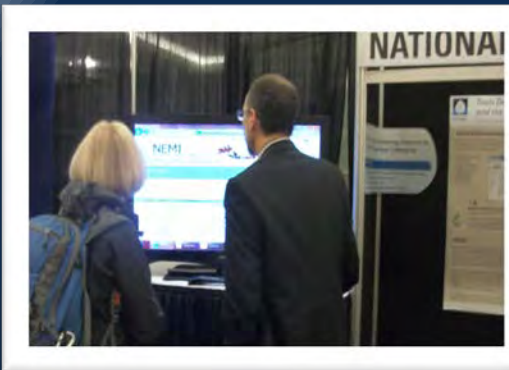
Attendees participated in seven field trips. Some featured Oregon’s natural beauty such as Multnomah Falls while learning about collaborative monitoring and restoration projects. Other field trips featured Portland’s innovative infrastructure projects for sustainable storm water management and advanced wastewater treatment. (Photo courtesy of Greg Pettit, Oregon Department of Environmental Quality)

Presentations Online from the 8th National Monitoring Conference are now available at:
acwi.gov/monitoring/conference/2012/

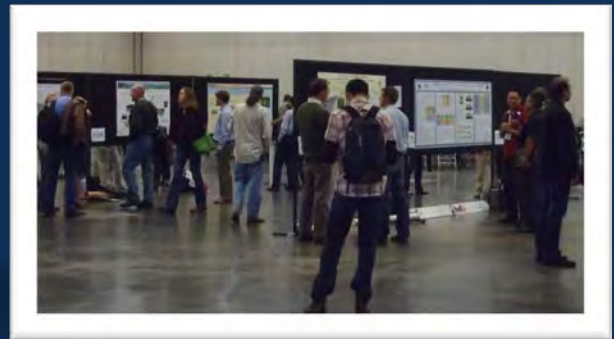
Many thanks to our colleagues at NALMS, Tetra Tech and USGS.

Mark your Calendars for the Ninth National Monitoring Conference to be held the week of April 28 - May 2, 2014.

8th National Monitoring Conference



Doug McLaughlin, Co-chair of Council's Water Quality and Assessments workgroup, demonstrates the beta version of the online NEMI-SAMS (Statistical and Assessments Methods Search) at the Council's booth. (Photo courtesy of Sheri Alcalde, USGS).



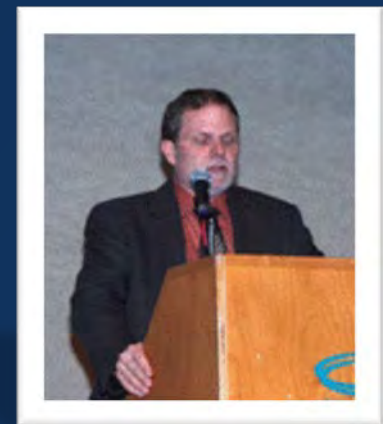
Attendees chose from more than 150 posters to view. (Photo courtesy of Jane Caffrey, University of West Florida)



Participants interacted with more than 40 exhibitors as well as networking with fellow participants. (Photo courtesy of Jason Jones, Arizona Department of Environmental Quality)



Attendees choose from about 336 platform presentations and over 30 workshops, short courses and panels (shown here). (Photo courtesy of Greg Pettit, Oregon Department of Environmental Quality)



Todd Ambs, President of River Network, not only spoke in the opening plenary session, but also sponsored Friday's Bridge Day where over 90 River Network's National River Rally participants joined the National Monitoring Conference to foster collaboration. (Photo courtesy of Steve Wolfe, Florida Department of Environmental Protection)



Participants interacted with more than 40 exhibitors. (Photo courtesy of Jason Jones, Arizona Department of Environmental Quality)

Award Recipients at the 2012 National Monitoring Conference – Congratulations!

Elizabeth J. Fellows Award



In recognition of his outstanding achievements, exemplary service, and distinguished leadership in water quality monitoring and environmental protection, the National Water Quality Monitoring Council presented the 2012 Elizabeth Jester Fellows Award to

Charles A. Peters
 Director, Wisconsin Water Science Center
 U. S. Geological Survey
 Middleton, Wisconsin

Vision Award



In recognition of extraordinary vision, collaboration, and leadership in water quality monitoring on a regional scale to enhance the management and protection of aquatic resources, the National Water Quality Monitoring Council presented the 2012 Vision Award to the

Central Plains Center for Bioassessment
 Director Don Huggins and Assistant Director
 Debra Baker
 Kansas Biological Survey
 Lawrence, Kansas
 Middleton, Wisconsin

Barry Long Award



In recognition of his exceptional perseverance, positive spirit, and significant contributions to water resource protection, the National Water Quality Monitoring Council presented the first 2012 Barry Alan Long Award to

Jay H. Sauber
 Section Chief – Environmental Sciences
 Section
 North Carolina Division of Water Quality
 Raleigh, North Carolina

First Fluid 5K was Fluid!



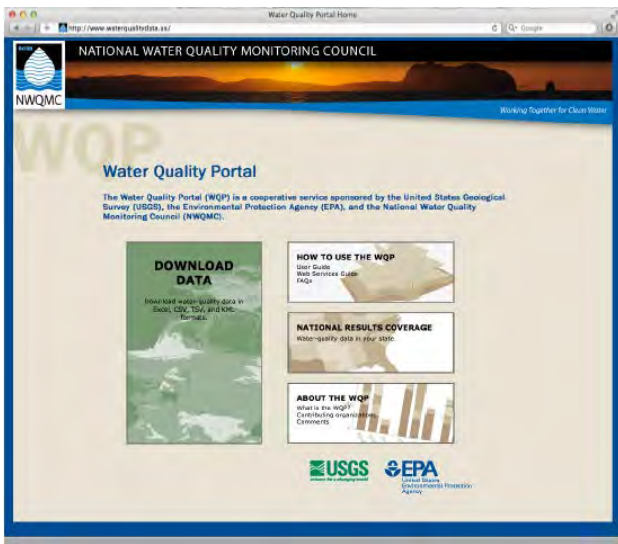
(Photo courtesy Christina Anderson, Wisconsin Department of Natural Resources)

The first biannual Fluid Five race was held at the 8th National Monitoring Conference in Portland, Oregon. Race day began as a rainy, cold day, but the weather cleared up enough that during the race, runners and walkers got plenty muddy, but it did not rain. Forty-one hearty racers opted to face the wet conditions and run (5K) or walk (3K) the race at Overlook Park located about a mile north of the Convention Center. In addition, thirty-one fantastic volunteers assisted with a variety of duties related to the event during the conference.

Special thanks go to Kris Stepenuck and her assistants Torrey Lindbo and Allison Hughes for organizing and planning the race. Thanks also go to the corporate sponsors that donated prizes and to the many individuals that sponsored racers to increase contributions to the Eleanor Ely Memorial Fund. Over \$1,700 was raised to start the Eleanor Ely Memorial Scholarship to support volunteer monitoring colleagues' attendance at future National Monitoring Conferences.



New Water Quality Portal Provides Access to Over 150 million Water Quality Data Records



The U.S. Geological Survey (USGS) and U.S. Environmental Protection Agency (USEPA) teamed up with the National Water Quality Monitoring Council to launch a new Water Quality Portal (portal) at the Council's 8th National Monitoring Conference last April. Currently, the portal brings together chemical, physical and microbiological data from USGS's National Water Information System (NWIS) and USEPA's Storage and Retrieval Data Warehouse (STORET).

The Water Quality Portal provides a single, user-friendly web interface showing where water quality information is available from federal, state, tribal and other partners to serve a wide range of prospective users including scientists, policy-makers and the public. The portal can assist data users searching, compiling, and formatting water monitoring data for analysis by providing a variety of query filters including geographic and sample parameters to narrow down the dataset, and by retrieving merged data from NWIS and STORET in a consistent format. Data can be acquired based on organization, state, county, watershed, site, sample characteristics, and sample date. Output formats available through the portal include comma-

separated, tab-separated, MS Excel, Keyhole Markup Language (KML), and Extensible Markup Language (XML).

Work planned for the 2013 fiscal year includes development of a map display for filtering and viewing datasets and working with partners to improve use of existing datasets and integrate new datasets into the portal.

To access the portal or contact the Water Quality Portal Team with questions and comments go to: www.waterqualitydata.us

Web Seminar Series

The Council's web seminars continue to be extremely popular, attracting hundreds of attendees from state, regional, and tribal councils; state, federal and local agencies; academia; and watershed groups and the volunteer monitoring community. The topics are timely and informative, and the format allows for discussion and follow-up communications with the presenters.

Recent webinars have covered wide ranging topics such as using the new Water Quality Portal, developing water quality report cards to make assessments more accessible, and harnessing the power of crowdsourcing to involve citizen scientists.

To view all webinars, visit: acwi.gov/monitoring/webinars/index.html or contact: Cathy Tate, cmtate@usgs.gov, (303) 236-6927.

Council Member Updates

Welcome New Council Members!

Jeff Thomas – Ohio River Valley Water Sanitation Commission (ORSANCO) Representative, Cincinnati, OH



Jeff is the Biological Programs Manager at the Ohio River Valley Water Sanitation Commission (ORSANCO) in Cincinnati, OH. He has been involved with large river fish community assessments since his days as an undergrad working at the Thomas More College Biology Field Station in northern Kentucky along the Ohio River. Upon completing his Master's Degree in Biology emphasizing on aquatics at Eastern Kentucky University, Jeff completed an internship with the electrofishing crews at ORSANCO and was hired on full-time in January of 2000. Since then he has had the opportunity to assist with the creation and implementation of various biological indices of integrity, including the Ohio River Fish Index (ORFI). He has also been involved with the design and/or implementation of several large-scale regional or national water quality surveys including Environmental Monitoring and Assessment of Great River Ecosystems (EMAP-GRE), a USEPA Region V Large River Regional EMAP (REMAP) project, and National Rivers and Streams Assessment (NRSA). Current areas of focus include monitoring and assessing the condition of the Ohio River for the Aquatic Life Use (using fish & macroinvertebrates) and the Fish Consumption Use for the 305(b) report. Jeff is also currently serving as the Chair of the Ohio River Basin Fish Habitat Partnership Steering Committee. Jeff can be contacted at: jthomas@orsanco.org.

Andrew Fayram – Great Lakes Representative, Wisconsin Department of Natural Resources, Madison, WI



Andy is the Monitoring Coordinator in the Office of the Great Lakes at the Wisconsin Department of Natural Resources. Andy has spent considerable time in the fisheries world but has picked up a thing or two related to water quality along the way. Poor water quality means fewer fish (usually but not always!). His primary research/management interests are biological aspects of water quality as well as developing monitoring strategies. He also likes to tinker with statistics. He received his BS in Zoology from the University of Wisconsin Madison, MS in Fisheries and Aquatic Sciences from the University of Washington, and his PhD in Biological Sciences (with a minor in Statistics) from the University of Wisconsin Milwaukee. He has worked for NOAA assessing instream habitat restoration projects in the Pacific Northwest and for the Wisconsin DNR as Treaty Fisheries Coordinator, Quantitative Fisheries Policy Specialist, and as Great Lakes Monitoring Coordinator. He served as an associate editor of the North American Journal of Fisheries Management and is currently a science editor for the journal Fisheries. Andy can be contacted at: andrew.fayram@wisconsin.gov.

Shaun McKinney – USDA, National Resources Conservation Service Representative, West National Technology Support Center, Portland, OR



Shaun is the Team Leader of the Water Quality and Quantity Development Team at the West National Technology Support Center. The NRCS West National Technology Support Center hosts a team of technical specialists that cover a broad range of water quality and quantity issues including: animal waste management, hydraulics & hydrology, nutrient management, market-based approaches, pest management, salinity management, stream restoration, water management, and water quality assessment. Each of these nine disciplines provides information, data, software, and support contacts. Shaun came to USDA from the US Forest Service where he was a Branch Chief responsible for managing national technology development and information systems for water quality, hydrology, and air issues. Prior to this position, he was a fisheries biologist/hydrologist working on major assessment projects and river restoration projects. He has extensive experience with hydrologic analyses and geomorphology as well as water quality monitoring and modeling. Shaun received a BS from Michigan State University in Fisheries Science and a MS at Oregon State University in Aquatic Science. Shaun can be contacted at: shaun.mckinney@por.usda.gov.

Martha Clark Mettler – Association of Clean Water Administrators (ACWA) Representative, Indiana Department of Environmental Management, Indianapolis, IN



Martha is the Deputy Assistant Commissioner of the Office of Water Quality at the Indiana Department of Environmental Management (IDEM). She has been with IDEM since 1995 and has served as the Chief of the Watershed Planning Branch and Chief of the Ground Water Section. She is primarily responsible for Water Quality Standards. Martha is also the treasurer of Association of Clean Water Administrators (ACWA) making her a part of the Executive Committee. She chairs the Monitoring, Standards and Assessment which meet by teleconference once per month and also serves as liaison to the EPA's Monitoring Assessment Partnership. Martha received her Master of Planning in Environmental Planning from Indiana University and a Bachelor of Science in Public Affairs from Indiana University. Martha can be contacted at: MCLARK@idem.IN.gov

David Neils – States of USEPA Region 1 Representative, New Hampshire Department of Environmental Services, Concord, NH



Dave Neils is the new Chief Water Pollution Biologist with the New Hampshire Department of Environmental Services (DES) where he is also the Director of the Jody Conner Limnology Center. He recently transitioned to this position after leading the DES biomonitoring unit for 10 years. During his tenure in the biomonitoring program, Dave developed a stream classification system and numeric biological indices for rivers and streams. Recently, his field efforts have been focused on the development of numeric nutrient criteria, stream fish temperature requirements, and implementation of probabilistic surveys of the state's surface waters. He is a graduate of Virginia Tech (M.S.) and Cornell University (B.S.). Dave can be contacted at: David.Neils@des.nh.gov.

Thanks to Outgoing Council Members!

The Council bids farewell to Peter Tennant, Neil Kamman, John Hummer, Gunnar Lauenstein, and Mary Ann Rozum, who have provided exceptional representation on behalf of their organizations.



Peter Tennant represented the Ohio River Valley Water Sanitation Commission (ORSANCO) for the Council since he joined in 2000. He served as both Chair and Co-Chair of the Water Information Strategies (WIS) Workgroup. His Co-chair on the WIS committee said of him, *"I have truly appreciated Peter's guidance, vision and leadership on the Council. During his tenure, Peter has been a tireless advocate of enhanced collaboration between State, Federal and Interstate agencies and improving access to data. He's been a mentor to new Council members and life-long friend to his Council colleagues. We'll miss the wisdom and humor that Peter brought to the Council."* Peter also served on the Steering Committee of the National Monitoring Network for U.S. Coastal Waters and Tributaries and was Co-Chair of the 4th National Monitoring Conference in 2004 in Chattanooga, Tennessee. He authored a Council fact-sheet in 2008 and has been a key contributor to many other Council products during his tenure. Peter led the effort to submit a proposal to hold the 9th National Monitoring Conference in Cincinnati. We are very fortunate to have Peter's experience, connections, leadership, and involvement for the next National Monitoring Conference. We wish Peter all the best in his new position as Executive Director of ORSANCO.



A long-time Council member said of Neil Kamman, *"You've brought a combination of energy and intellect that has spurred us on to greater accomplishments. Between your participation on the Council and your work on the Lakes assessment, you have accomplished a lot in raising the monitoring efforts in the US, and building greater cooperation among the states and our federal partners."* Neil represented the States of EPA Region I for the Council and the Vermont Department of Environmental Conservation. He was also an active member of the WIS Workgroup. More recently, Neil has contributed to the Executive Workgroup to establish a National Network of Reference Watersheds. During his tenure with the Council, he served on a detail with the U.S. Environmental Protection Agency, an assignment that brought a valuable new dimension to his contributions as a Council representative. Neil served 5-years on the Council, after graciously agreeing to extend his service by a year to continue his involvement in preparations for the 8th National Monitoring Conference. We wish Neil all the best as he continues his leadership role in monitoring and assessment in Vermont (see *"Protecting and Restoring Vermont's Surface Waters through Tactical Basin Planning"* in this newsletter).



A dedication to the Great Lakes and its abundant water resources led **John Hummer** to join the Council. Representing the Great Lakes Commission and Lake Michigan Monitoring Coordination Council, John was active in the Council’s Collaboration & Outreach Workgroup. A member since 2007, John agreed to a one-year term extension so he could assist in preparations for the 8th National Monitoring Conference. He served on the organizing committee for the Council’s State/Regional/Tribal workshops at both the 2010 and 2012 National Monitoring Conferences. He contributed newsletter articles about activities in the Great Lakes Region and gave a Council webinar on “Collaborative Monitoring in the Great Lakes: Sharing Monitoring Activities around the Lake Michigan Basin” (acwi.gov/monitoring/webinars/LMMCC_webinar_Dec8_2011.pdf). John continues to serve on the Editorial Board for the Council’s newsletter “National Water Monitoring News”.



As the long-time manager of NOAA’s Mussel Watch program, **Gunnar Lauenstein** brought a new and unique perspective to the Council. Shortly before he joined the Council in 2011, he served aboard the BP chartered ship *Ocean Veritas*, a research vessel working in the Gulf of Mexico while oil was still being released during the Deep Water Horizon incident. His experience in this area proved to be particularly valuable in discussing the need to better coordinate environmental disaster response activities across Federal agencies and across multiple layers of government. He informed the Council on NOAA’s National Status and Trends Program activities, including the Monitoring of Water Quality Impacts from BP Oil Spill in Gulf Waters and bivalve monitoring in the Great Lakes Region. Gunnar is retiring from federal service (congratulations Gunnar!) and we wish him all the best in his new life.



Mary Ann Rozum of the U.S. Department of Agriculture, National Institute of Food and Agriculture, was a Federal representative covering agricultural issues on the Council, starting in late 2010. Her experience with rural and farm water quality and quantity helped to inform Council discussions of watershed assessments, the Council’s collaborative network of reference watersheds, plans for a climate effects network, the EPA/State Monitoring and Assessment Partnership, and the third decade of the USGS National Water-Quality Assessment Program.

Collaboration Through Partnerships

Federal Partnerships

Working Together from the Ground Up: USGS Cooperative Water Program

The USGS Cooperative Water Program (CWP) continues to provide hydrologic data, science, and tools needed for the optimum use and management of our Nation’s waters. The CWP is USGS’s “bottom-up” cost-share program with jointly planned activities in every State and U.S. territory, done in partnership with more than 1,500 local, State, and tribal agencies (also known as Cooperators).

Priority activities for the CWP have been released for the upcoming year (water.usgs.gov/coop/about/CWP.science.priorities.pdf) and demonstrate support for USGS national interests in minimizing loss of property and life from water hazards and sustaining water availability to meet competing demands in the face of population growth, land development, and climate variability. In addition, USGS projects support “on-the-ground” science needs and management decisions of CWP Cooperators, such as related to flood and drought mitigation, safe drinking water, nutrient enrichment, stream protection and restoration, impacts of energy development, and land-use changes.



“On-the-ground” USGS projects, designed with Cooperators and partners, are proposed or ongoing in more than 15 States that monitor and assess possible impacts of energy production on water resources. Photo shows hydraulic fracturing operation in the Fayetteville Shale Formation on a farm in Arkansas. (Photo by Bill Cunningham, USGS)

To learn more, visit: water.usgs.gov/coop/. Let us hear from you so that we continue to address water-resource needs and decisions you face in your roles as managers, scientists, policy makers, and other interested citizens of the Nation.

For more information, contact: Pixie A. Hamilton, National Coordinator, USGS Cooperative Water Program, pahamilt@usgs.gov, (703) 648-5061.

USEPA Update: National Aquatic Resource Surveys

Working with partners in the states, tribes, and other federal agencies, U.S. Environmental Protection Agency (USEPA) is leading a series of statistically representative surveys of the nation's waters. These National Aquatic Resource Surveys (NARS) report on the condition of the nation's waters using core indicators and standardized lab and field methods. A number of NARS data analysis and design workshops were held at the National Water Monitoring Council conference in Portland, OR last May.

2012 has seen significant progress in all four assessments:

- **National Rivers and Streams Assessment (NRSA):** A draft report for the 2008-2009 NRSA is undergoing peer review and will be issued in December 2012. It includes an evaluation of changes in the condition of streams compared to the finding of the 2004 *Wadeable Streams Assessment*. The NRSA is also nearly finished with its design and planning stage for the 2013-2014 sampling season.
- **National Lakes Assessment (NLA):** Field sampling ended on September 30 for the NLA 2012, with nearly 1,250 sites sampled. Data for these sites, including biological and nutrient data and information on microcystins and triazines, are already being processed by labs across the country. NLA 2012 was the first time electronic field forms were used to more quickly and efficiently submit data to the NARS Information Management Center (see related story "Electronic Field Forms for the 2012 National Lakes Assessment").
- **National Coastal Condition Assessment (NCCA):** Field sampling for the NCCA took place during the summer of 2010. The survey is currently in its data validation/data analysis and report writing phase, with a report – the first under the NARS program -- scheduled to be released in 2013.
- **National Wetlands Condition Assessment (NWCA):** This first-ever survey of the ecological integrity of the nation's wetlands is also in its data validation/data analysis phase after a successful field season in 2011. A report is planned for 2013.

When the NWCA report is released, EPA will have national-scale reports describing the ecological condition of all aquatic resources in the conterminous U.S. The intent is to revisit each water type every five years.

For more information on the surveys, visit: www.epa.gov/aquaticsurveys.



Ryan Pack of the West Virginia Department of Environmental Protection (EPA), collects benthic macroinvertebrates for the 2012 National Lakes Assessment assisted by Jason Morgan, WVDEP, and Frank Borsk, USEPA. (USEPA photo by Eric Vance)

Forest Service Engages Heinz Center in Facilitating Improvements to Inventories, Monitoring, and Assessments



The USDA Forest Service has teamed up with the H. John Heinz III Center for Science, Economics and the Environment to conduct a national level workshop for improving inventory, monitoring, and assessments (IM&A) activities for natural resource management, including those related to social and economic dimensions. The Forest Service produced a Strategy for improving IM&A that is planned for release in the fall of 2012. The strategy was reviewed by all organizational units of the Forest Service and by partner agencies including the Bureau of Land



Management, National Park Service, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Geological Survey, and the National Association of State Foresters. Achieving the efficiencies envisioned in the IM&A Strategy necessitates an evaluation of past efforts, existing activities, and future needs and expectations of the Forest Service while working with partners on common or shared IM&A products and services.

The first implementation action in the Forest Service IM&A strategy will identify critical information needed to support the agency's mission. An organizing framework, based in part on "*The Montreal Process Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests*" and other similar frameworks, will provide the structure and a common language for agency staffs to conduct this evaluation. The organizing framework includes a theme for "*Conservation and Maintenance of Soil and Water Resources*".

At the national level workshop, the Heinz Center will facilitate discussions around the first step to identify critical information. Forest Service program leaders and managers will also identify national management questions and their existing performance measures and indicators. Workshop products will subsequently be used to help develop management questions at the regional and local levels and to conduct information needs assessment at all levels of the agency. This action will help the agency identify its core information and prioritize related IM&A activities and investments. Additionally, the Heinz Center may use these products in the development of a nation-wide report following up on "*The State of the Nation's Ecosystems*".

For additional information, contact: Tracy Hancock, tchancock@fs.fed.us, (202) 205-1724 or Jonathan Mawdsley, mawdsley@heinzctr.org or Martha Surridge, surridge@heinzcenter.org, (202) 552-4709.

Regional Partnerships

Mercury cycling, bioaccumulation, and risk across western North America: a landscape scale synthesis linking long-term datasets

A major mercury data synthesis initiative for western North America has been embarked upon by a team of scientists and resource managers from the United States, Canada, and Mexico. The team, comprised of scientists from government and academia, has been charged to determine spatial and temporal patterns of mercury in abiotic (chemical and physical factors in the environment) and biological resources across the region from data collected over the past several decades. The team will also analyze factors that drive mercury methylation and accumulation. To accomplish these tasks we are looking for data contributions from federal, state, regional and tribal agencies.

Mercury pollution is an issue of global concern, largely due to increases in emissions associated with the industrial revolution and the rise in fossil fuel combustion. Despite some improvements in emission controls, background concentrations and deposition rates are still at levels of concern. In North America, the western region may be disproportionately impacted by mercury due to an extensive legacy of mining, the distribution pattern of local emission sources, and its downwind proximity to distant global sources (Figure 1).

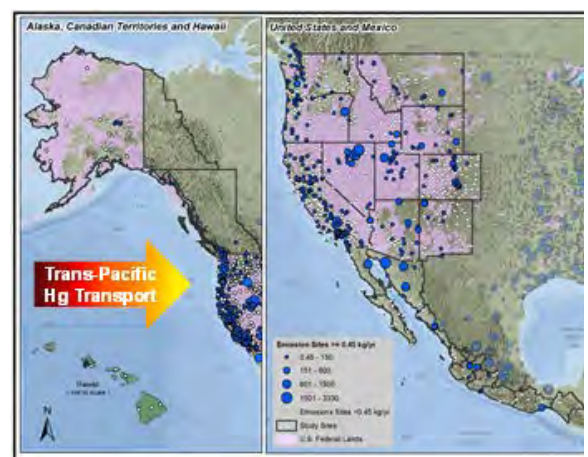


Figure 1. Map of synthesis region of Western North America. Dots represent known mercury sources and the size of the circle reflects total annual emissions (kg/year). Shaded region identifies US federally-owned and managed public lands within the region.

Several decades of mercury research and monitoring provide an opportunity for regional synthesis of existing data to facilitate a more quantitative understanding of mercury cycling, bioaccumulation, and ecological risk at landscape and regional scales. Initial support for this effort has been provided by the U.S. Geological Survey's John Wesley Powell Center for Integration and Synthesis (powellcenter.usgs.gov/) and the National Park Service Air Resources Division. This effort is being led and organized among scientists from the U.S. Geological Survey, the Biodiversity Research Institute, the University of Wisconsin at La Crosse, and Harvard University.

Anyone interested in contributing to this effort and becoming involved, contact: David Evers (david.evers@briloon.org), Collin Eagles-Smith (ceagles-smith@usgs.gov), Mark Marvin-DiPasquale (mmarvin@usgs.gov), or Jim Wiener (jwiener@uwlax.edu).

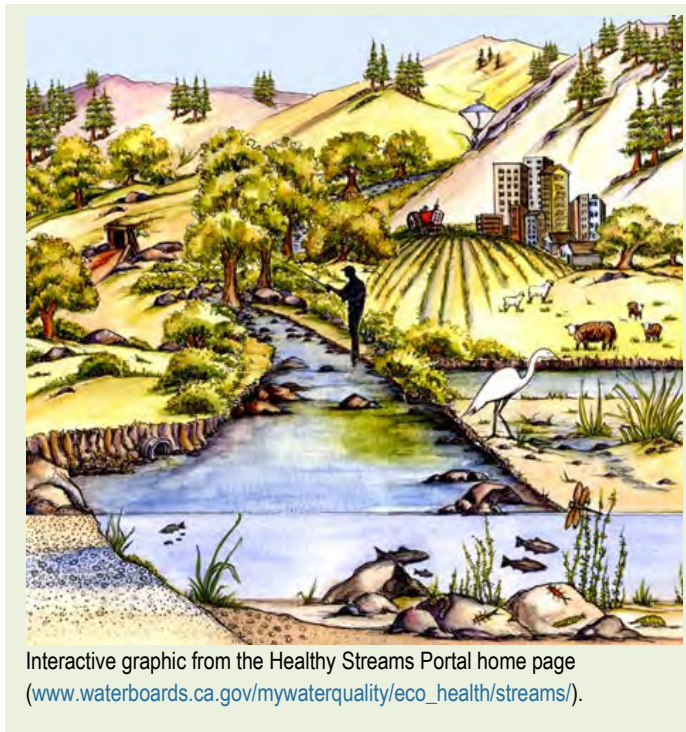
For more information, visit: www.briloon.org/mercuryconnections/western

Spotlight on States

Innovative New Web Portal for California's Rivers and Streams

The California Water Quality Monitoring Council has released its fourth *My Water Quality* internet portal to connect decision makers and the public with information on the location, extent, and health of the state's rivers and streams. The new portal can be viewed at www.CAWaterQuality.net under "Are Our Aquatic Ecosystems Healthy?" It includes interactive maps and monitoring data, and a novel, user-friendly home page graphic that provides insight into the many factors that make a healthy stream.

The portal is part of the larger *My Water Quality* website, which houses in one place a wide collection of water quality and ecosystem health data about California's lakes, rivers, streams, wetlands and ocean waters. The overall goal of the website is to provide timely information in an easy-to-understand manner for the public, environmental organizations, and water quality professionals.



Interactive graphic from the Healthy Streams Portal home page (www.waterboards.ca.gov/mywaterquality/eco_health/streams/).



"In many parts of California, streams, creeks and rivers provide free community spaces for swimming, fishing, wading, and paddling," says California Coastkeeper Alliance Policy Director Sara Aminzadeh, who represents the public on the Monitoring Council. "This new tool will empower Californians to access information about the cleanliness and health of these waterways." The Monitoring Council is a joint partnership between the California Environmental Protection Agency, the California Natural Resources Agency, and several stakeholder organizations from both inside and outside state government.

For its new portal, the Monitoring Council brings together water quality and ecosystem health information from a variety of organizations with special expertise in stream and river monitoring and assessment, coordinated through the California Healthy Streams Partnership.

For more information, visit: www.CaWaterQuality.net.

Protecting and Restoring Vermont's Surface Waters through Tactical Basin Planning

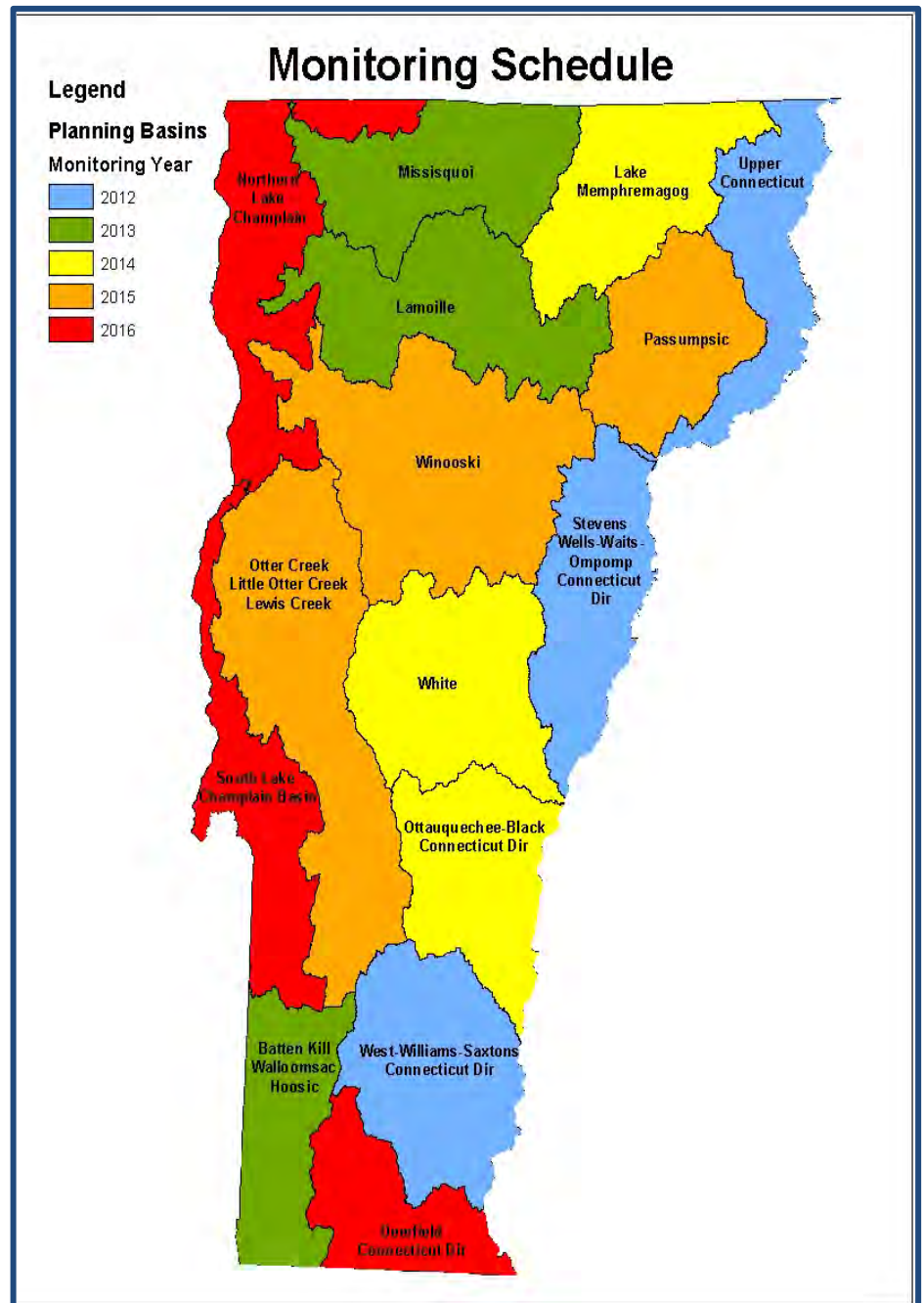
During 2011, the Vermont Department of Environmental Conservation established a comprehensively revised Vermont Surface Water Management Strategy to more effectively manage surface waters across the state. The Strategy, which improves upon the prior Continuing Planning Process, integrates monitoring and assessment data with regulatory, technical or financial assistance programs to protect, enhance, and restore rivers, lakes, and wetlands for each of Vermont's major watersheds. What makes this new watershed planning process different from previous CWA §208 basin planning efforts are its scope and geographic focus.



The Strategy adopts a stressor-based approach to surface water management, with specific management interventions associated with ten major stressors to Vermont's surface waters. It is implemented by means of a tactical basin planning process. While earlier basin plans focused on broad-scale strategies to promote surface water protection or improvement, tactical basin plans highlight, with geographic specificity, the projects or actions needed to protect or restore individual waters, pre-identify responsible parties, and pre-allocate specific Department restoration funds to complete the work. These new tactical basin plans will guide the watershed-based work of the Department and serve as detailed implementation planning documents for major TMDLs such as the Lake Champlain or Long Island Sound nutrient TMDLs.

There are 15 major planning watersheds in Vermont; the tactical basin plans will prioritize sub-basins of these watersheds for enhanced monitoring, assessment, project development, or project implementation. A web-based VT Integrated Watershed Information System is being developed to display implementation progress.

For more information on Vermont monitoring and assessment strategies, visit: Surface Water Management Strategy: www.vtwaterquality.org/swms.html, Vermont Water Quality Monitoring Strategy: www.vtwaterquality.org/wqd_mgtplan/swms_WQMS.htm, and Tactical Planning Process: www.vtwaterquality.org/wqd_mgtplan/swms_ch4.htm or contact: Neil Kamman, Manager, Monitoring, Assessment and Planning Program, Vermont DEC, Neil.kamman@state.vt.us, (802) 490-6137.



Monitoring and assessment schedule for Vermont's major planning watersheds under the Tactical Planning Process.

Building an Integrated Water Quality Monitoring Network in Southwest Florida

Representatives from local, State, Federal and non-governmental organizations and academia came together in June 2012 in Sanibel, FL, to discuss developing the capability for routine and rapid detection and prediction of water quality changes in Southwest Florida. Sponsored by the Gulf of Mexico Coastal Ocean Observing System (GCOOS) Regional Association (RA), the meeting objectives were to educate participants about the benefits of data sharing and to explore a pilot project in Southwest Florida to develop an integrated water quality monitoring network from rivers to the Gulf of Mexico. If successful, the network would be expanded gradually throughout the Gulf.

Currently, a tremendous amount of water quality data is being collected in Southwest Florida. However, there is no mechanism to share the information. The GCOOS-RA seeks to aggregate, integrate and serve the data through the GCOOS Data Portal. This would enable the water quality monitoring and management community to create data layers and compare information from multiple sources.

Two additional water quality monitoring projects were discussed at the meeting. First, Dr. Gary Kirkpatrick of Mote Marine Lab (MML) described a Harmful Algal Bloom (HAB) pilot study funded by the GCOOS-RA. MML is collaborating with the University of South Florida to coordinate glider operations on the West Florida Shelf to gain a better understanding of how to forecast and track harmful algal blooms through the use of offshore and nearshore tandem gliders.

Second, Dr. Alina Corcoran, Florida Fish and Wildlife Conservation Commission (FWC), reported on an expansion of the Harmful Algal Bloom Marine Observation Network (HABMON) (myfwc.com/research/redtide/research/current/habmon/). Dr. Corcoran and her colleague, Dr. Jim Ivey, are in the final stages of field-testing a HAB monitoring station to be partially supported by the GCOOS-RA. The platform will be deployed in Old Tampa Bay, FL, a system prone to blooms by the potentially toxic dinoflagellate, *Pyrodinium bahamense*. All data will be collected hourly and telemetered to a server for manual download and quality control, then shared via the GCOOS Data Portal.

For additional information, contact: Dr. Chris Simoniello, simo@marine.usf.edu, (727) 322-1318 or Dr. Ann Jochens, ajochens@tamu.edu, (979) 845- 6714; or visit: gcoos.org.



Participants in the GCOOS-RA Regional Southwest Florida Workshop for Potential Data Providers, Sanibel Island, FL, June 28, 2012. *Front row:* Chris Simoniello, GCOOS and Lisa Beever, CHNEP; *Second row:* Barbara Kirkpatrick, Mote Marine Lab (MML), Bridgette Froeske, USF, and Li Zhang, FGCU; *Third row:* Gary Kirkpatrick, MML, Eric Milbrandt, SCCF, Matthew Howard, TAMU/GCOOS, and Mindy Brown and Erin Rasnake, FDEP; *Fourth row:* Jason Scolaro USF, Jennifer Thera, Aquatic Preserves, Ray Leary, GOMA, Jay Leverone, SSBNEP; *Fifth row:* Keith Kibbey, LCEL, Alex Rybak, SCCF and USACOE, Jon Perry, Sarasota County, and Lars Sorderquist, USGS; *Top row:* Worth Nowlin, GCOOS, Julie Drevenkar, Aquatic Preserves, Eduardo Patino, USGS, Cheryl Clarke, Aquatic Preserves, A.J. Martignette, SCCF, and Erick Lindblad, SCCF. (Photo courtesy Sanibel-Captiva Conservation Foundation)

Internet Keeps Volunteers Connected to Coastal Phytoplankton Monitoring Network



PMN volunteer uses a 20 micron plankton net to collect marine algae samples in South Carolina. (Photo courtesy PMN)

The Phytoplankton Monitoring Network (PMN) – a national network of volunteers monitoring for coastal algal blooms – was developed to increase public awareness about harmful algal blooms (HABs) and maintain an extended monitoring area along U.S. coasts throughout the year. The PMN was established in 2001 by Dr. Steve Morton as part of South Carolina's *Pfiesteria* and harmful algal bloom surveillance program within NOAA's Marine Biotoxins Program.

The PMN uses the internet and other communication technologies to train and support its 300 or so geographically diverse volunteers, who commit to sampling their sites at least once every two weeks for at least one year. Volunteers use 20 micron plankton nets to collect samples, and identify potentially toxic marine algae as well as a number of nontoxic algae using basic light microscopy. Samples with target HAB species are shipped to the NOAA lab for enumeration and toxin analysis. Sampling sites can be anywhere, as long as they can be legally and safely reached and have a salinity of 10 ppt or greater. There are more than 200 sites in the program, with volunteers ranging from high school students to retired scientists.

At least once a year, volunteers participate in an on-line WebEx practice phytoplankton ID session with NOAA PMN staff in Charleston. PMN coordinators work with volunteers in any way needed and since travel is typically limited to visiting each state once every two years, communication technologies have become an integral part of this program for refresher trainings. Volunteers use the Internet for data entry and to get ongoing assistance with algal identification. They also receive *The Net*, an email newsletter that connects them to the Marine Biotoxins Program and provides information from across the network and the HAB field. Another free tool (developed by a PMN volunteer) is Phyto, a smartphone application that helps volunteers identify phytoplankton and improve their ID skills.

The PMN has many diverse partners including NOAA's National Coastal Data Development Center, the Centers for Disease Control and Prevention, the Alabama Volunteer Phytoplankton Monitoring Network, the New Hampshire Volunteer Phytoplankton Monitoring Program, the Alaska Harmful Algal Bloom program, the Washington SoundToxins HAB Program, the Texas Master Naturalists, Texas Parks and Wildlife Department and the Kachemak Bay Research Reserve.

To learn more, visit the PMN website at: www.chbr.noaa.gov/pmn/ or contact: Jeff Paternoster, NOAA, jeff.paternoster@noaa.gov. The website includes an on-line data entry tool for its database, which includes 11 years of data; a tutorial on downloading data; a data map; links to the Phyto smartphone app; an image gallery; educational material on HABs; and much more.

Contributed by: Alice Mayo, USEPA, Mayio.Alice@epa.gov, (202) 556 -1184.



Volunteers in Texas are trained how to identify potentially toxic marine algae as well as a number of nontoxic algae. (Photo courtesy PMN)

Update: Chesapeake Bay Program Partnership Monitoring Storm Effects on the Watershed and Bay

Following up on the Fall 2011 initial findings (see *National Water Monitoring News* Fall 2011 edition), the Chesapeake Bay Program's Science, Technical Analysis and Reporting Team held a meeting on April 19, 2012 in Baltimore, MD on "*Storms, High Flows and Effects*" to review the latest findings from watershed and Bay monitoring results associated with Hurricane Irene (August 2011) and Tropical Storm Lee (September 2011). For Chesapeake Bay, 2011 was punctuated by two wet periods – the monthly flows from the watershed to Chesapeake Bay were at near record high levels from February through April then again from the storms in September.

Key findings in the watershed assessment included:

- Hurricane Irene was more of a wind event while Tropical Storm Lee provided more rain and less wind.
- Storm effects were concentrated in the Susquehanna River basin.

- Peak Susquehanna River flow associated with Tropical Storm Lee was second only to the 1972 flows from Hurricane Agnes.
- Of the three reservoirs on the lower Susquehanna River, the first two reservoirs have been at sediment retention capacity, while the lowest reservoir behind Conowingo Dam is now nearing its capacity. USGS Mike Langland showed how the lower reservoir capacity has declined from 170,000 acre feet in 1929 to 13,000 acre feet in 2011. The ability of the dams to trap sediment is diminishing.
- Sediment data from the 2011 storm flows highlighted how the resulting bathymetry from the decline in reservoir capacity is allowing for scour to occur under lower flow conditions. More sediment now passes over Conowingo Dam from significant storm events than in the past.
- About 11.5 to 19 million tons of total sediment, estimated by multiple methods, passed over the dams.
- Clear changes in the flow-response behavior of total phosphorus on the lower Susquehanna River were found with greater phosphorus delivery under high flow events than in the past.
- Flows from Tropical Storm Lee delivered 31% of TN, 61% of TP and 78% of suspended sediment annual loads. However, even more remarkable results showed that 1.8% of TN, 9% of TP and 22% of suspended sediment for the 34 year period (1978 to 2011) was delivered in this single storm event.



USGS scientist collecting suspended sediment samples at the Conowingo Dam on Susquehanna River during storm-flow conditions. (Photo courtesy USGS)

The primary publication summarizing the Chesapeake Bay watershed assessment results and their historical context is Hirsch, 2012¹ which can be found at: pubs.usgs.gov/sir/2012/5185/

Key findings in the Bay included:

- Sediment delivered to Chesapeake Bay by the Susquehanna River over Conowingo Dam was characterized as 40% clay, 54% silt, and 6% sand.
- The deposition of sediment if evenly distributed over 25-100 miles of the upper Bay was expected to produce a sediment signal of less than 1 inch to 4.2 inches deep.
- Sediment assessments are underway. Where sediment signals appear evident they are within the expected range of thickness.
- During summer 2011, bottom water anoxia in Maryland's Chesapeake Bay was on track for its worst season since measurements began in 1985 before the storm effects mixed the water column and relieved the conditions. There was a brief return of anoxia to long term average conditions in October 2011.
- A variety of water quality measures in Maryland had higher spring values associated with the protracted high flows of late winter and spring compared with the water quality conditions associated with the storm events.
- Living resources appear to have fared well.
 - Oyster mortality in the northern Bay was affected by the protracted late winter and early spring high flows that lowered salinity in the upper Bay more than impacts from the high September flow event. On a Bay-wide scale however, the cumulative effects of the higher flows have yielded lower disease incidence and improved survival rates.
 - Declines in submerged aquatic vegetation measured in 2011 contain the lag effect of heat stress effects to grasses in the lower Chesapeake Bay from summer 2010 and high turbidity impacts from Hurricane Irene and Tropical Storm Lee on timing of aerial photography relative to peak biomass periods. 2012 results suggest a lower Bay rebound in grass beds and a mostly intact Susquehanna Flats in spite of 2011 conditions.
 - Benthic macroinvertebrate assessments through the benthic IBI assessment showed no significant change in Bay condition between 2010 and 2011.



National Aeronautics and Space Administration (NASA) Moderate Resolution Imaging Spectroradiometer (MODIS) photograph from the Terra satellite, September 13, 2011, showing sediment plume extending to near the mouth of the Potomac River, a distance of about 100 miles. (Figure from Hirsch 2012)



View of the Conowingo Dam on the Susquehanna River in the aftermath of Tropical Storm Lee. Photo taken at 4:30 p.m., September 12, 2011. Discharge at time of the photo was 220,000 cubic feet per second. Peak discharge for the flood was 778,000 cubic feet per second at 4:00 a.m. on September 9, 2011. (Photo by Wendy McPherson, USGS; Figure from Hirsch 2012)

Analyses will continue to assess any lag effects of 2011 conditions on 2012 water quality for Chesapeake Bay. Power Point presentations from the April 2012 meeting are available at: www.chesapeakebay.net/calendar/event/18189/

Contributed by: Peter Tango, PhD, Chesapeake Bay Monitoring Coordinator, USGS Chesapeake Bay Program Office, Annapolis, MD, ptango@chesapeakebay.net, (410) 267-9875, www.chesapeakebay.net

¹Hirsch, R.M., 2012, Flux of nitrogen, phosphorus, and suspended sediment from the Susquehanna River Basin to the Chesapeake Bay during Tropical Storm Lee, September 2011, as an indicator of the effects of reservoir sedimentation on water quality: U.S. Geological Survey Scientific Investigations Report 2012–5185, 17 p.

Wildfire Effects on Source-Water Quality—Lessons from Fourmile Canyon Fire, Colorado, and Implications for Drinking-Water Treatment



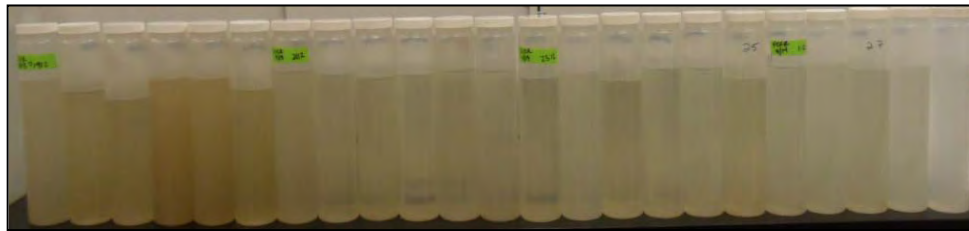
Fourmile Canyon wildfire burned 160 homes and degraded the source-water supply of two communities. (Photo courtesy of Dan Lack, Cooperative Institute for Research in Environmental Sciences, September 5, 2010)

Forested watersheds provide high-quality source water for many communities in the Western United States and are vulnerable to wildfires. Burned watersheds are prone to increased flooding and erosion, which can impair water-supply reservoirs, water quality, and drinking-water treatment processes. Limited information exists on the magnitude, timing, and duration of the effects of wildfire on water quality, making it difficult for drinking-water providers to evaluate the risk and develop management options.

The Fourmile Canyon fire in Boulder County, Colorado (September 6–10, 2010) burned 23 percent of the Fourmile Creek Watershed (10 square miles)

and destroyed more than 160 homes. The U.S. Geological Survey implemented sampling of Fourmile Creek at five monitoring sites upstream and downstream of the burned area to study water-quality changes during low flow, spring snowmelt, and summer thunderstorms after the fire. Principal findings of this study indicate that increases in dissolved organic carbon and nitrate concentrations downstream of the burned area during spring snowmelt runoff (April – June, 2011) were probably within the treatment capacity of most drinking-water plants. During and after high-intensity thunderstorms in July, however, turbidity, dissolved organic carbon, nitrate, and some metals increased by 1 to 4 orders of magnitude downstream of the burned area. Increases of such magnitude can pose the following problems for water-supply reservoirs and drinking-water treatment plants:

- Increased sediment loading of water-supply reservoirs, shortened reservoir lifetime, and increased maintenance costs;
- Increased nutrient (nitrate and phosphate) loading of reservoirs, which may promote algal blooms and associated disagreeable taste and odor;
- Increased turbidity (cloudiness caused by suspended material) or increased iron and manganese concentrations, which may increase chemical treatment requirements and produce larger volumes of sludge, both of which would increase operating costs; and,
- Increased dissolved organic carbon concentrations, which during disinfection may help form unwanted by-products (for instance, regulated carcinogens such as chloroform and trihalomethanes).



Water samples collected from Fourmile Creek upstream (top) and downstream (bottom) of the Fourmile Canyon fire during and after a thunderstorm on July 13, 2011. The downstream samples showed a substantial increase in turbidity (suspended material). (Photo by Sheila Murphy, USGS)

To learn more, see fact sheet: pubs.usgs.gov/fs/2012/3095/FS12-3095.pdf or contact: Jeff Writer, USGS, jwriter@usg.gov, (303) 541-3094 or Sheila Murphy, USGS, sfmurphy@usgs.gov, (303) 541-3023

To see video of flooding during summer thunderstorm on July 13, 2011 go to: co.water.usgs.gov/webcams/fourmile/video/20110713/index.html

Holding Time Requirements... Benefit or Liability in Assessing Recreational Water Quality?

The current 8-hour maximum holding time requirement for fecal indicator analyses creates significant problems for the sampling of remote ambient waters. Data are frequently categorized as unusable based on a qualified result of 'out of hold time'. From 2008-2011, the Florida Department of Environmental Protection (DEP) investigated the effects of increased holding times up to 30 hours in Florida Panhandle ambient fresh waters samples. Variability among 53 triplicate samples analyzed among four holding times (0, 8, 24 and 30 hours) was assessed for fecal coliform, *Escherichia coli* and enterococci that were analyzed using 40 CFR 136 approved methods. The main objectives of this study were to determine (1) if the proportion of replicates that exceeded the water quality criterion changed as the holding time was increased, (2) the relative variation occurring within a sample at each holding time and (3) the variability of results between sample holding times for each of the indicator species tested.

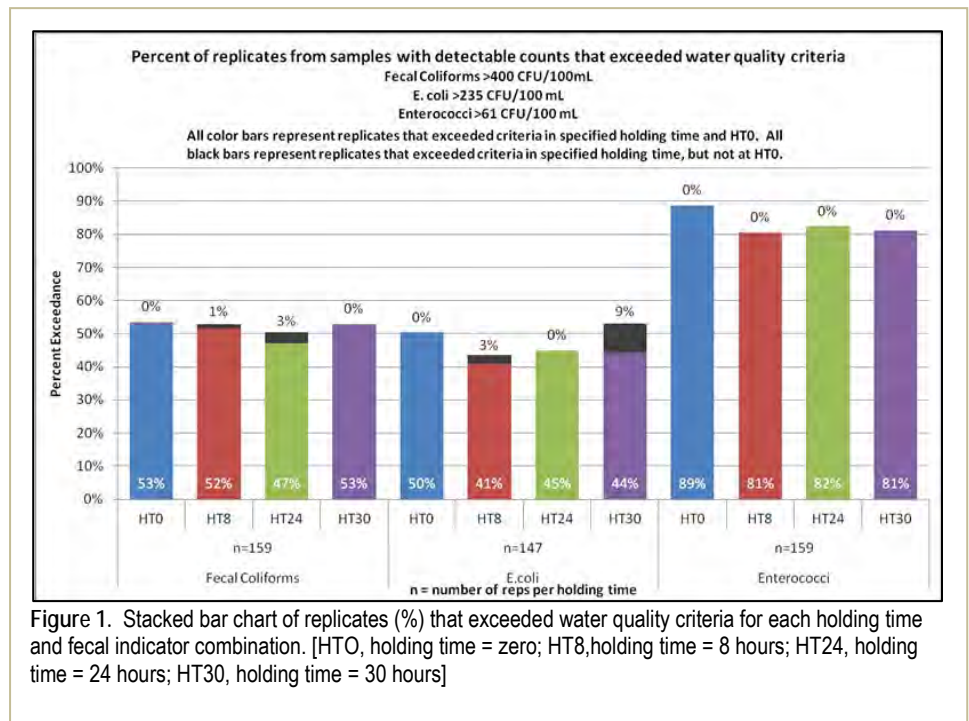


Figure 1. Stacked bar chart of replicates (%) that exceeded water quality criteria for each holding time and fecal indicator combination. [HT0, holding time = zero; HT8, holding time = 8 hours; HT24, holding time = 24 hours; HT30, holding time = 30 hours]

Results of this study demonstrated that the proportion of replicates that exceeded the regulatory threshold for each of the fecal indicator organisms did not substantially vary over the holding times studied. However, enterococci exceeded the regulatory criterion about twice as often as fecal coliform or *Escherichia coli* (Figure 1). Not shown in the figure, variability between replicates often overpowered the differences noted between holding times. Thus, it can be concluded that the variability between sample holding times resulted in no loss of data quality for samples processed up to 30 hours after collection for fecal coliform and *Escherichia coli* and up to 24 hours after collection for enterococci.

For more information, contact: David D. Whiting, Program Administrator, david.d.whiting@dep.state.fl.us, (850) 245-8191.

Work Group Updates

News from the Water Information Strategies Workgroup

The WIS workgroup defines and promotes strategies for monitoring designs; data management, access, and exchange; data integration and analysis; and information reporting to address water needs. The WIS workgroup recently completed a draft work plan that identifies activities and products scheduled for 2013 and 2014. The draft work plan can be found on the NWQMC website at acwi.gov/monitoring/workgroups/wis/index.html. Key features of the work plan are to:

1. Conduct regular webinars to showcase examples of successful monitoring and data integration efforts. Recent webinars include presentations on the Massachusetts Water Quality Report Card and “SMART” monitoring program. Future calls include a discussion of the Oregon Water Monitoring Summit (November 2012), Water Quality Indices (December 2012) and CUAHSI’s Hydro Desktop (January 2013).
2. Compile examples and stories of successful data integration and monitoring design that leveraged resources for multiple benefits.
3. Coordinate with the USGS and USEPA Water Quality Portal (WQP) team to help guide the WQP development and to increase state and local agency participation in providing data that can be made accessible through the portal.

WIS workgroup calls and webinars are generally held the second Wednesday of the month at 11:00 ET. For more information contact: Mary Skopec, Mary.Skopec@dnr.iowa.gov, (319) 335-1579

Tools and Technology

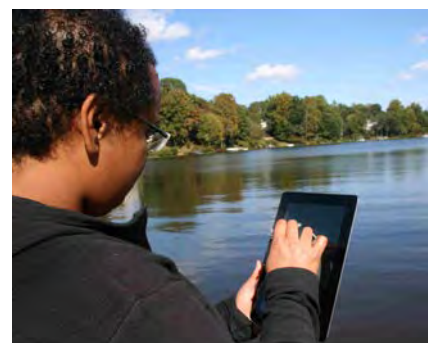
Electronic Field Forms for the 2012 National Lakes Assessment

The summer of 2012 marked a new era in data collection for the U.S. Environmental Protection Agency’s (USEPA) National Aquatic Resource Surveys (NARS). Many National Lakes Assessment (NLA) sampling crews for the first time used an alternative to paper forms to record data in the field: the newly created NARS App. The App was created in Windows, Android and iOS operating systems.

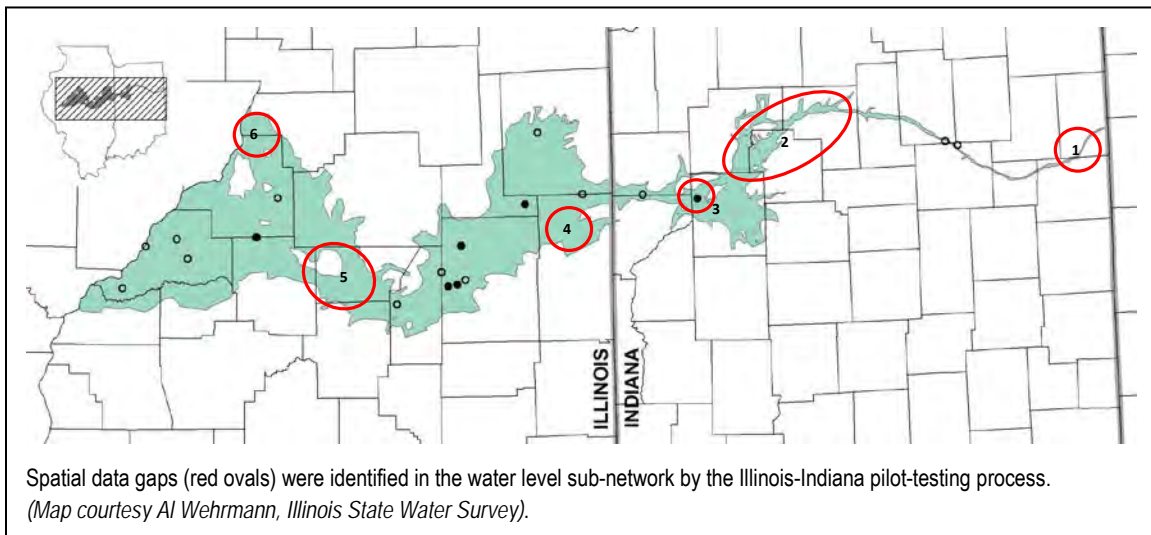
The App features separate tabs for each form, structured in a manner similar to the paper NLA field forms. Field crews complete each form, validate the data, and send it off through the App in an email to the NARS Information Management (IM) team. From there, the email system seamlessly imports the data into the NARS IM database after some validation checks. Data captured through the devices can also be emailed directly to the field crew leads, allowing them to store their field data immediately for their own uses.

Thus far for the 2012 NLA summer sampling season, 28 field crews (30%) submitted data through e-forms, providing data for 332 sites (26% of the NLA sites). This saves significant time and money in data processing. The NARS App is currently being modified for the National Rivers and Streams Assessment field season in 2013 and 2014.

For more information about the National Aquatic Resource Surveys, visit: www.epa.gov/aquaticssurveys or contact: Marsha Landis, USEPA, landis.marsha@epa.gov, (202) 564-2858



USEPA NLA team leader Amina Pollard demonstrates the use of the NARS app during field sampling. (Photo by Marsha Landis, USEPA)



Funding for Network implementation, authorized at least in part by the SECURE Water Act, remains elusive; thus, SOGW's non-Federal member organizations are continuing concerted efforts toward encouraging appropriation of funds by the Federal government to assist States and Tribes.

To move into full implementation, SOGW plans to extend the Network into additional partner States and tribal nation areas. Beyond that, the Network would head toward full coverage, with all States and other data-providers participating in the management and operations structure.

During 2012, SOGW members continued outreach to introduce the Network to groundwater and water resource professionals, and to many other stakeholders, including presentations for the NGWA Ground Water Summit, International Association of Hydrologists, Ground Water Protection Council Annual Forum, NWQMC biennial conference, a Congressional Briefing Session (attended by over 70 House and Senate office staff), a specially convened meeting of ACWI's Sustainable Water Resources Roundtable, and several presentations to Federal and State agencies and regional / local groups.

For further information, visit: acwi.gov/sogw

Contributed by: Robert Schreiber, non-Federal co-chair of SOGW and ASCE representative to ACWI, SchreiberRP@cdmsmith.com; and David Wunsch, SOGW founding member and former ACWI / NWQMC representative for AASG (American Association of State Geologists), dwunsch@UDel.Edu.

Acknowledgements: SOGW participants for assisting in the development of this article, and especially to William Cunningham, USGS, Federal co-chair of SOGW.



Multiple agencies participated in the Illinois-Indiana pilot-test of the Network.

Albemarle Sound Demonstration Study of the National Monitoring Network for U.S. Coastal Waters and their Tributaries

The U.S. Geological Survey's (USGS) North Carolina Water Science Center has begun a four-year demonstration project in the Albemarle Sound for the National Monitoring Network for U.S. coastal waters and their tributaries. A goal of the National Monitoring Network is to provide information about the health of coastal ecosystems and inland influences on coastal waters for improved resource management. The Network integrates biological, chemical, and physical features and links uplands to the coast. The purpose of the Albemarle project is to improve understanding of current and historic water quality in the Albemarle Sound.

- 1) Inventory current monitoring programs in the Albemarle Sound,
- 2) Conduct a gap analysis to determine current monitoring needs,
- 3) Implement a monitoring program to address data gaps, and
- 4) Create a web-based map portal of monitoring activities.

In the first year of the project, the USGS has been working with stakeholders to inventory current programs and design a monitoring program. In the summer and fall of 2012, the USGS has been sampling the water column and sediment at 32 sites distributed throughout the Albemarle Sound and its tributaries. This initial synoptic sampling targets specific data gaps for cyanotoxins, pesticides, and bed-sediment metals; provides current, quantitative data on phytoplankton composition for an estuary that has had historic harmful algal blooms; and provides a spatially-rich snapshot of water-quality through Albemarle Sound and its tributaries.

For more information, contact: Michelle Moorman,
mmoorman@usgs.gov, (919) 571-4013



USGS interns, Alex Cordaro and Kaite Weaver, sampling the Albemarle Sound. (Photo courtesy USGS)



Albemarle Sound near Oregon Inlet, North Carolina. (Photo courtesy USGS)



A survey of the Lake Michigan nearshore environment along the Chicago lakeshore was completed by the U.S. Geological Survey and the Chicago Park District on July 17-18, 2012. Using a manned boat in conjunction with an autonomous underwater vehicle (AUV), water-quality and hydrodynamic data were collected within a mile of the Chicago shoreline from Evanston, Illinois in the north to Rainbow Beach near the Indiana state line (figure 1). The AUV was equipped with basic water-quality sensors as well as sensors to measure turbidity, chlorophyll and blue-green algae concentrations, and water velocity. The AUV also collects bathymetry information with depth sensors and side-scan sonar.

The boat was also equipped with an acoustic Doppler current profiler (ADCP) to measure currents as well as several instruments to measure water-quality parameters near the water surface. One instrument measured temperature, specific conductance, pH, dissolved oxygen, and turbidity, while another sensor measured concentrations of colored dissolved organic matter (CDOM) and optical brighteners.

The survey consisted of two components: 1) an along-shore survey, where the boat followed a course parallel to the shoreline approximately three quarters of a mile offshore, and 2) a set of 22 transects perpendicular to the shoreline that were surveyed with both the boat and the AUV (figure 1). The along-shore survey consisted of measuring currents (flow) throughout the water column and water-quality data at the water surface. During the transect surveys, the AUV collected three-dimensional water quality and velocity data throughout the water column. The AUV is programmed to move in a “porpoising” manner as it starts at the surface, dives to just above the lakebed, and then rises again to the surface and repeats this pattern while traveling along the transects. Water-quality data were continuously logged from the flow-through sonde in the nose of the AUV. The AUV’s on-board GPS and bottom-tracking Doppler velocity log (DVL) were synched with all data.

Wind direction changed during the two-day survey when a storm passed through the area on the second day. On the first day, WSW winds at 10-20 miles per hour (mph) changed to northerly winds at 5-20 mph on the second day. The subsequent reversal of the observed nearshore currents (figure 2) illustrates the important role that wind direction plays in the hydrodynamics of the nearshore environment along this portion of the Lake Michigan shoreline.

The findings of this study indicate that even a relatively weak storm event may provide sufficient energy through currents and wave action to de-stratify the water in the nearshore area (figure 3). The result of this change in stratification can result in re-suspension of sediments and any contaminants associated with those sediments. The water-quality and hydrodynamic data collected during the survey continue to be analyzed by the USGS and Chicago Park District. This information will be used to further our understanding of the nearshore environment of Lake Michigan in the Chicago area.

For more information, contact: Jim Duncker, <mailto:jduncker@usgs.gov>, and Ryan Jackson, pjackson@usgs.gov, USGS Illinois Water Science Center. USGS National Monitoring Network funds partially supported this work.



Figure 1. The Chicago lakefront study reach with survey transects marked. Transects 2-14 were surveyed on July 17, 2012 and transect 12-23 were surveyed on July 18, 2012. The alongshore survey line (not shown) connects the offshore ends of the transects.

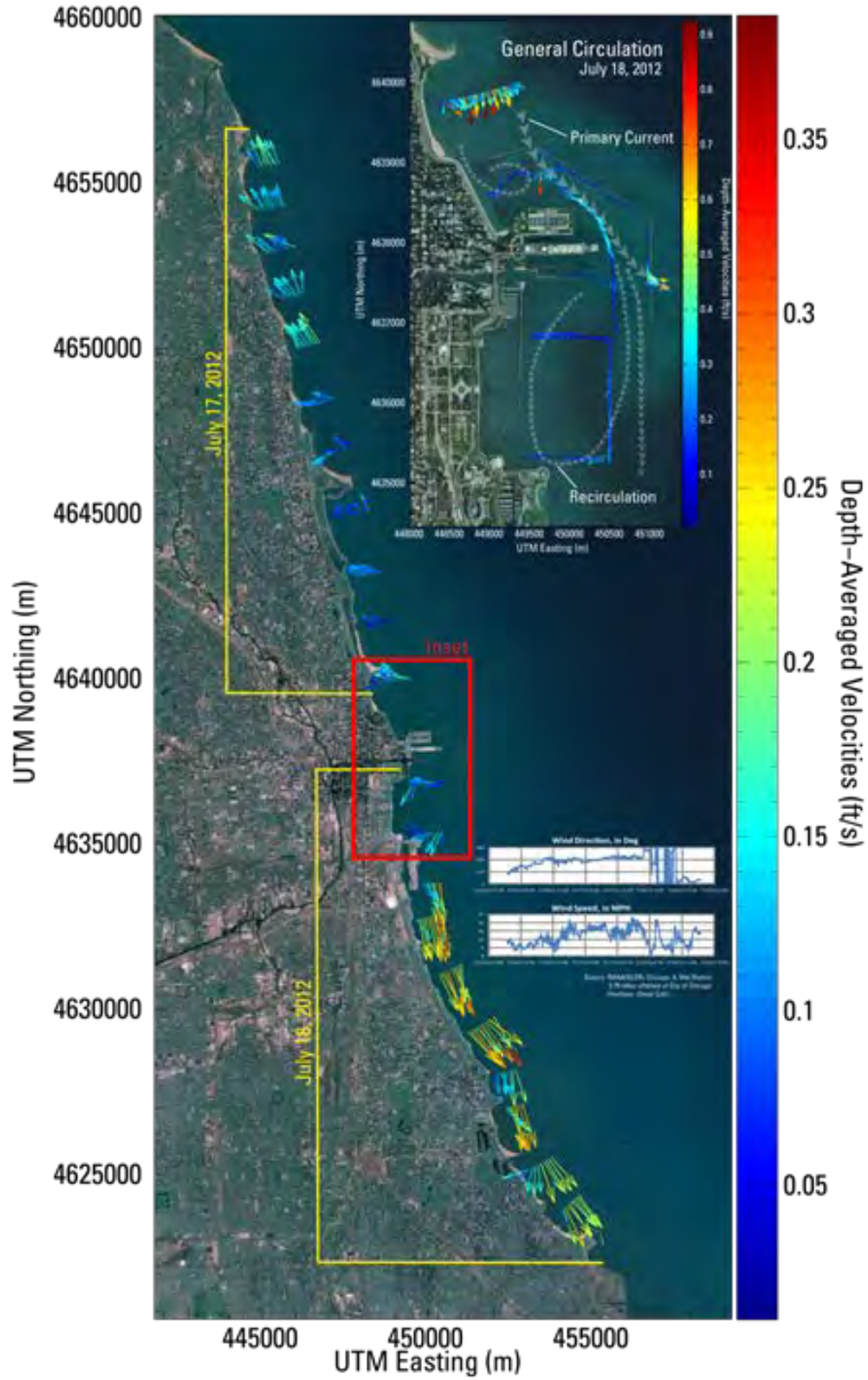


Figure 2. Observed depth-averaged water velocity along the Chicago lakefront on July 17 and 18, 2012.

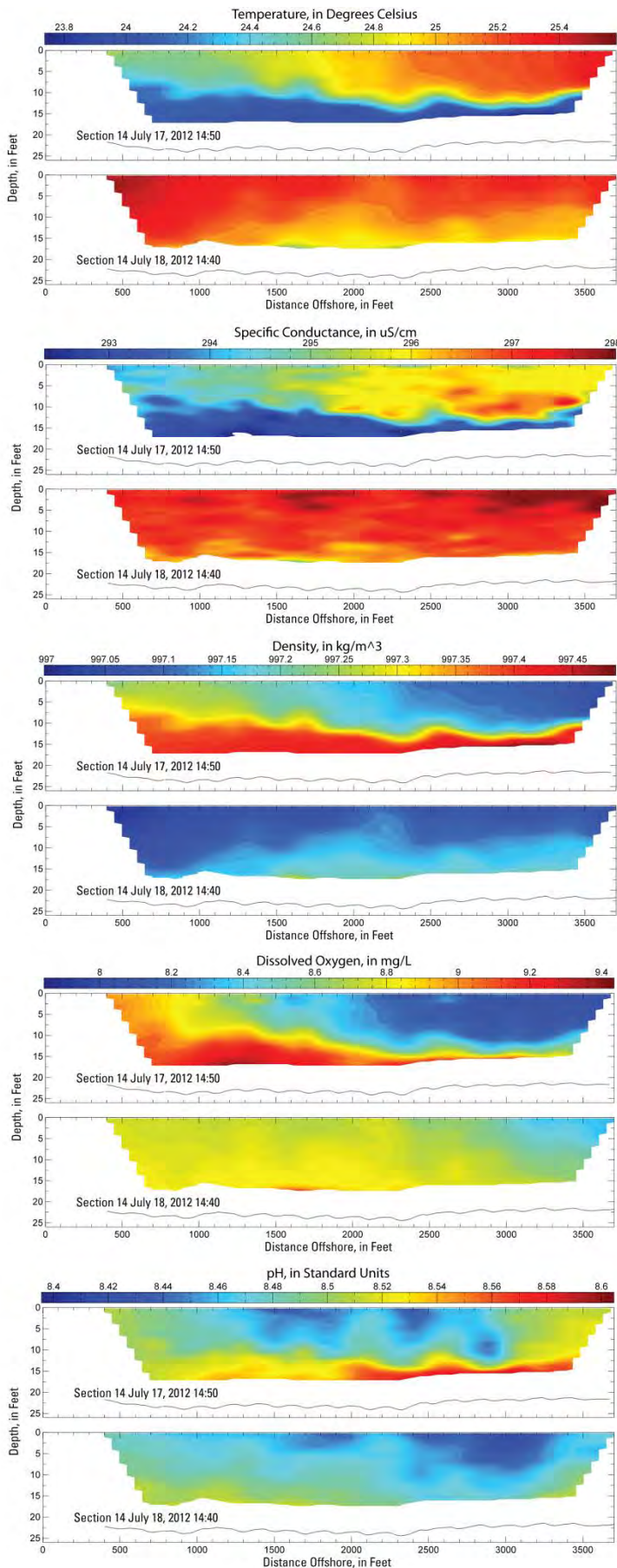


Figure 3. Spatial distributions of basic water quality parameters for section 14 (see Figure 1) for July 17 and 18, 2012.

Announcements

New Postings of Publications on Biological Assessment Comparability

These four papers are written based on the concept of quality control (QC) as providing the single most important building block of comparability analysis. Two papers published in the Journal of the North American Benthological Society (JNABS, now Freshwater Science) apply the concept to a) precision of taxonomic identifications used by the USEPA National Aquatic Resource Survey, and b) field sampling precision for stream indicators used by Montana DEQ. The paper published in Environmental Monitoring and Assessment applies the approach to evaluating comparability of biological monitoring and assessment programs in the USEPA Region 4 states, and the book chapter describes the logic and provides a more comprehensive structure for analysis of biological assessment comparability. To access these articles go to: acwi.gov/monitoring/pubs/index.html or for more information, contact: James B. Stribling, james.stribling@tetrattech.com



Maryland Water Monitoring Council's 18th Annual Conference – December 6, 2012 –

The Maryland Water Monitoring Council Annual Conference theme is "What Else is in your Water? From Arsenic to Zinc" and will be held at the Maritime Institute, North Linthicum, Maryland.

For more information, go to: mddnr.chesapeakebay.net/MWMC/MWMC2010/annualConference.asp or contact: Dan Boward, dboward@dnr.state.md.us, (410) 260-8605



"Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Study Areas Across the United States" – The impacts of urban development on stream ecosystems are the subject of a new publication that highlights the major findings of a comprehensive assessment by the USGS National Water-Quality Assessment Program. Urban development has been found to result in habitat destruction, increased loads of contaminants, and increased streamflow flashiness. These multiple stressors degrade stream ecosystems and can adversely affect biological communities (stream health). A nationally consistent study design was used in nine metropolitan study areas (Atlanta, GA., Birmingham, AL, Boston, MA,



Dallas, TX, Denver, CO, Milwaukee, WI, Portland, OR, Raleigh, NC, and Salt Lake City, UT) to describe and explain regional differences in the effects of urban development on stream hydrology, habitat, chemistry, and biological communities. The effects of urban development on the biological community varied geographically depending on the predominant land cover and the health of the stream prior to urban development. Although urban development creates multiple stressors, such as increase in concentrations of insecticides, chlorides and nutrients, that can degrade stream health – no single factor was universally important in explaining the effects of urban development on stream ecosystems. Additionally, the USGS developed an innovative modeling tool to predict how different combinations of urban-related stressors may affect stream health. Initially developed for the New England area, this tool can provide insights on how watershed management actions to improve one or more of these stressors may increase the likelihood of obtaining a desired biological condition. For more information, contact: Jim Coles, jcoles@usgs.gov, (603) 226-7845. Publications can be found at: Circular: pubs.usgs.gov/circ/1373/; fact sheet: pubs.usgs.gov/fs/2012/3071/; poster: pubs.usgs.gov/gip/143/; and videos, podcasts, and articles: water.usgs.gov/nawqa/urban/.



New USGS Publication on “Strategies for Managing the Effects of Urban Development on Streams” – Management strategies used throughout the U.S. to reduce the impacts of urban development on stream ecosystems are described in a new USGS report written in partnership with the Center for Watershed Protection in Maryland. This circular serves as a companion report associated with the “*Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Study Areas Across the United States*”. **Publication available at:** pubs.usgs.gov/circ/1378/

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