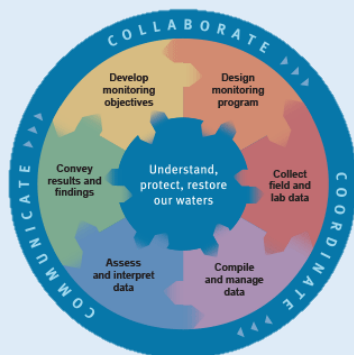


# National Water Monitoring News



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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.*



USGS scientist Bryan Downing checks on performance of the on-board real-time underway measurement system aboard the USGS R/V Mary Landsteiner while sampling in Suisun Bay, California.



USGS scientists (from left) Judy Drexler, Tamara Kraus and Bryan Downing and Katy O'Donnell preparing to take spot field measurements in the San Francisco estuary.



# National Water Quality Monitoring Council

Working together for clean water



## Words from the Council Co-chairs

Welcome to the 13th edition of Council's Newsletter!

Wow, it's hard to believe that the 10<sup>th</sup> National Monitoring Conference, held in Tampa Bay, Florida, happened about five months ago, but leaves are turning so it must be so! We thank our Conference Co-Chairs Alice Mayo (USEPA), Callie Oblinger (USGS), and Jeff Schloss (NALMS), local co-chair Kim Haag (USGS), and all members of the Conference Planning Committee. We also thank all our sponsors, vendors, and most important, the 700-plus attendees whose participation was critical to making this a very successful conference. As for the 11<sup>th</sup> National Monitoring Conference, that will be held in spring of 2018, and the Council is currently exploring a venue somewhere in the south-central or southwestern United States. Stay tuned!

Since the conference, the Council work groups have turned their attention to a number of important topics including completing new fact sheets on monitoring designs and evaluation of water-quality data, recently completed a strategic plan for the Water Quality Portal, expanding the number of candidate watersheds in the National Network of Reference Watersheds website, supporting the application of new sensor technology to difficult water-quality problems, developing methods to better communicate monitoring results to policymakers and the public, and reinvigorating Council interaction with the citizen science community through the formation of a new volunteer monitoring work group (page 4). We also continue to track the latest monitoring developments with respect to high visibility water-quality issues such as harmful algal blooms and emerging threats to drinking water quality and aquatic ecosystem health. Last, several Council members have completed their terms, and we wish to thank them for their years of dedicated service (page 6). At the same time we welcome three new members to the Council (page 5); we are confident they will bring the same degree of dedication and enthusiasm to the Council as their predecessors did.

A new feature we are instituting with this issue is an electronic "suggestions box." We'd like to hear about water-quality monitoring topics or issues you'd like to see this newsletter, and by extension, the Council, address in coming months and years. We can't promise we'll get to every suggestion we receive but we'll do our best address concerns or issues that are raised repeatedly by our readers.

In closing we are happy to bring you the Fall 2016 edition of the newsletter. This issue features a report out on the 10<sup>th</sup> National Monitoring Conference held this past May, other news about Council activities, cutting edge science, new tools and technology, information on water-quality monitoring activities at the local, state, regional, and national level, announcements regarding upcoming meetings and conferences, and other important news concerning water-quality monitoring. We also invite you to submit your water-quality news, successes and challenges, announcements, or findings to our newsletter editors for the Spring 2017 newsletter.

Best Regards,

Gary Rowe, USGS Co-Chair  
[glrowe@usgs.gov](mailto:glrowe@usgs.gov)

Susan Holdsworth, EPA Co-Chair  
[holdsworth.susan@epa.gov](mailto:holdsworth.susan@epa.gov)



## National Council Highlights

### Monitoring Community Meets to Learn and Network in Tampa

Over 700 people from across the country attended the NWQMC's 10<sup>th</sup> National Monitoring Conference (NMC), held May 2-6, 2016, in Tampa, Florida. This successful and vibrant conference featured 300 oral presentations; 70 posters; 8 field trips; 20 workshops, short courses, panels, and discussion sessions; ample opportunities for attendees, presenters, and exhibitors to network and expand connections; and interactive demonstrations of a wide range of products and services including data portals, apps, software, and models. Three NWQMC awards were presented to individuals and groups who have made significant contributions to water quality monitoring and water resource protection (page 4).

This biennial national forum provides an exceptional opportunity for federal, state, local, tribal, volunteer, academic, private, and other water stakeholders to exchange information and new technology related to water monitoring, assessment, research, protection, restoration, and management. This year's themes included monitoring harmful algal blooms; implementing continuous monitoring and remote sensor networks; managing, sharing, displaying and communicating water data; monitoring emerging and legacy contaminants; and building and sustaining monitoring collaborations. Speakers at two plenary sessions included Gary Rowe ("The NWQMC – 20 Years of Success"), Dr. Ellen Gillinsky ("Monitoring is Fundamental"), Dr. Deborah Schackhamer ("Assessing our Waters, Old Ways and New"), and Holly S. Greening ("Collaboration and Long-Term Monitoring: Keys to Estuarine Recovery in Tampa Bay, FL"). The conference also featured the Fluid 5K Run along the beautiful Tampa waterfront, and a visit from WaterVentures Florida's Learning Lab, a traveling science center customized for environmental outreach and education.

The NWQMC would like to thank everyone who contributed to making the Conference a success. We hope to see everyone again in 2018!

To see many of the conference presentations and a conference photo gallery, please visit [acwi.gov/monitoring/conference/2016/index.html](http://acwi.gov/monitoring/conference/2016/index.html).



Attendees networked with peers working on similar issues and monitoring concerns. Photo by Alice Mayio.



Field trip adventures in one of the nearby Florida waterways. Photo by Revital Katznelson.



The third Fluid 5K race took place on May 5, 2016, beginning and ending at Cotanchobee Fort Brooke Park. A record 76 runners and walkers traversed a section of Tampa's Riverwalk on a beautiful morning. With support of 15 volunteers who assisted before, during and after the race, funds were raised for the Eleanor Ellie Memorial Scholarship, which provides travel assistance for volunteer monitoring professionals to the National Monitoring Conference in future years. The top three men's finishers were Peter Tango, Scott Shupe, and Lee Ganske, while the top three women's finishers were Amber Bethe, Tatyana DiMascio, and Tina Greenlee.



## Congratulations to the Winners of the 2016 Council Awards

To read more about these winners, visit the [2016 Conference webpage](#).



### **Elizabeth Jester Fellows Award**

*In recognition of outstanding achievements and distinguished leadership in water quality monitoring and environmental protection, the 2016 Elizabeth Jester Fellows Award was presented to:*

William G. "Bill" Wilber  
USGS, Chief, National Water Quality Assessment Program (retired)



### **Barry Alan Long Award**

*The Barry Long award recognizes significant contributions to water resource protection. The winner of this award in 2016 is:*

Faith Zerbe  
Director, Delaware Riverkeeper Monitoring Network



### **Vision Award**

*For extraordinary vision, collaboration, and leadership in water quality monitoring on a regional scale to enhance the management and protection of aquatic resources, the 2016 Vision Award was presented to:*

Georgia Adopt-A-Stream  
Program Manager: Harold Harbert  
Georgia Environmental Protection Division

## Volunteer Monitoring Representatives Convene at the 2016 National Monitoring Conference

The National Monitoring Conference is always a wonderful gathering point for members of the volunteer monitoring (VM) community. At the 2016 National Monitoring Conference, there were more than 65 members of the community presenting 24 talks, workshops, and a handful of posters. The VM community had a vibrant volunteer monitoring booth (thank you EPA!) and another successful Fluid 5K run to raise money for scholarships to help members of the volunteer community to attend the 2018 NMC.

One of the highlights of the National Monitoring Conference was the meeting for representatives of the volunteer monitoring community. At the meeting, the vision for the new Volunteer Monitoring Workgroup was shared and discussed. During the meeting, there were smaller group discussions which helped identified needs in the VM community and key areas for the workgroup to focus on for the next couple of years.

The VM Workgroup would like to thank the volunteers and Council members for their support and the resources to make this workgroup possible. Look for upcoming meetings, webinars, and guidance specifically designed for the Volunteer Monitoring Community on the [Council's webpage](#).

If you would like to learn more about the growing Volunteer Monitoring Workgroup or any other information related to volunteer monitoring, please contact Julie Vastine ([vastine@dickinson.edu](mailto:vastine@dickinson.edu)) at the Alliance for Aquatic Resource Monitoring or Danielle Donkersloot ([ddonkersloot@iwla.org](mailto:ddonkersloot@iwla.org)) at the Izaak Walton League of America.



Attendees of the Volunteer Monitoring Meeting at the 2016 NMC. Photo by Alliance for Aquatic Resource Monitoring.

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## Leslie McGeorge: Council Member Receives Special Honor

On Tuesday evening, June 14, 2016, Leslie McGeorge was honored by the New Jersey Chapter of the Society of Women Environmental Professionals (NJ SWEP), at their 10<sup>th</sup> annual Gala, for her outstanding achievements and exemplary leadership in the environmental field. At the Gala, she was presented with the 2016 “Growing Great Women in the Garden State” award. The award is given to a female environmental leader based on: her commitment to the field of environmental protection, conservation, and research; her contributions to communicating and sharing knowledge; her dedication to mentoring the next generation of environmental leaders; and her innovative approaches to science and/or policy.



## NWQMC Membership Updates

### Welcome New Council Members!

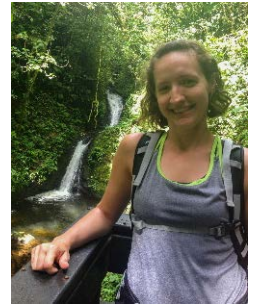
#### Chandra S. Pathak, Ph.D., P.E., D.WRE, F.ASCE, U.S. Army Corps of Engineers Representative

Dr. Chandra S. Pathak has a distinguished career with over 35 years' experience in water resources and environmental engineering, including surface-water and groundwater hydrology and hydraulics, water quality, storm-water management, GIS, and computer modeling for hydrology, hydraulics, and water quality. Currently, he is a senior hydrologic and hydraulic engineer at the Engineering and Construction Division at the U.S. Army Corps of Engineers Headquarters. Prior to this position, he served as a Principal Engineer at the South Florida Water Management District for 12 years. He is an adjunct professor at George Mason University and was formerly an adjunct professor at Florida Atlantic University. Since 2006, he has served as associate editor of *Journal of Hydrologic Engineering*.



#### Nichole Halsey, Sea-Bird Coastal, Industry Representative

Nichole Halsey is Director of Product Management for Sea-Bird Coastal. She received her Bachelors from Boston University and a Masters of Business Administration from Northeastern University. She is also a U.S. Army Veteran who served for 6 years. She has been involved in water-quality monitoring, monitoring network design, and instrumentation design for the past 8 years. She started with Hach Company (which manufactures and distributes analytical instruments and reagents for water-quality testing) in 2008 as Regional Manager. In 2012, she moved to Sea-Bird to work as a product manager. She works closely with Sea-Bird engineers and customers to create monitoring solutions including hardware, software, and real-time data analytics. She currently lives in Seattle, WA, and can often be found exploring the city with her trusty camera.



#### Marie DeLorenzo, PhD, NOAA Representative

Marie DeLorenzo serves as the Environmental Physiology and Microbiology Program Lead within the Estuaries and Land Use Branch of the National Centers for Coastal Ocean Science laboratory in Charleston, SC, where she has worked for 18 years. Her research at NOAA includes environmental toxicology of estuarine species, physiological mechanisms of contaminant effects, climate and multi-stressor assessments, and coastal resource management. Marie serves on the graduate faculty at the College of Charleston for the Marine Biology and the Environmental Studies programs, the Medical University of South Carolina's Marine Biomedicine and Environmental Sciences program, and Florida A&M University's School of the Environment. Marie is vice president of the Carolinas Chapter of the Society of Environmental Toxicology and Chemistry. She has also served as president of the Southeastern Estuarine Research Society and as board member of the Coastal and Estuarine Research Federation.



## The Council Bids Farewell to Our Departing Members

### Steven H. Wolfe, Watershed and Wetland Representative



Steve Wolfe crewed on FSU's research vessel and directed a spiny lobster mariculture program in Florida and the Bahamas for Perry Oceanographics before joining the Florida Department of Environmental Protection's (FDEP) Biology Laboratory in 1980.

He became FDEP's lead aquatic toxicologist, running the ecotoxicology lab where he became involved in ecological risk assessments and the models that drive them. Steve became the Administrator of the FDEP Central Biology Laboratory which, in addition to its ecotoxicology work, included a field sampling program, one of the largest invertebrate and algal taxonomic identification programs in the country, and analytical sample processing (e.g., chlorophyll, BOD, sediments). In 2002, he left the lab and was subsequently instrumental in creating the Florida Oceans and Coastal Council and the Florida Water Resources Monitoring Council, acting as the first liaison for each. Beginning in 2005, Steve was also involved in the creation and startup of the Gulf of Mexico Alliance (GOMA). Upon its formal launch in 2006, he spent several years as the Team Lead for the Water Quality Team, one of the six Priority Issue Teams of GOMA. He became the Program Administrator at FDEP and the full-time Lead Coordinator of the expanded Water Quality Team, with particular responsibility for the Harmful Algal Bloom and Pathogens Workgroups.

Steve served on the National Water Quality Monitoring Council from 2008 to 2016, and was an active member who helped to plan Conferences. He will also be remembered for his contributions as the unofficial Council photographer, capturing several wonderful moments.

### Glenn Skuta, EPA Region 5 Representative



Glenn Skuta served on the Council from November 2012 – May 2016. During that time he was the Surface Water Monitoring Section Manager for the Minnesota Pollution Control Agency (MPCA). While on the Council, Glenn enjoyed making stronger connections with the USGS on monitoring and data analysis approaches, and helped with organizing the Council's biennial conferences. Glenn also shared with other states Minnesota's experience of capitalizing on a state constitutional amendment that dedicates a portion of sales tax to clean water programs to implement a watershed approach to monitoring. Glenn became the MPCA's Watershed Division Director in February 2016, and thus stepped down from the Council.

### Erik Host-Steen, Industry Representative



Erik Host-Steen's [deep and broad experience](#) across sales, marketing, and product development comes from nearly 20 years of working in and studying these disciplines, within and for several business to business industries and companies, from small family-owned businesses to the biggest publicly-traded enterprises. Erik's favorites are small to mid-sized technically-oriented B2B product companies with engineers and scientists as associates and customers.

While on the Council, Erik was involved with the Sensors Workgroup and helped to plan the National Monitoring Conference. The highlight for Erik was being part of the incredible collaboration and cooperation that spans such a complete cross-section of the water quality monitoring community. He has gone on to found [SMP Alignment](#), a company that helps business leaders align sales, marketing, and product development practices to address unmet market needs.



## Collaboration Through Partnerships

### Federal Partnerships

#### Forest Service Research Improves Road Management and Runoff

Roads can provide avenues for rain water to rapidly gather and carry sediment across a landscape before flowing into streams and rivers. Poorly placed or poorly designed roads can result in degraded local water quality, increased erosion, and an increased risk of landslides and other hazards.

Forest Service researchers collaborated with partners such as Utah State University and ESRI to develop [analytic tools](#) that identify specific areas where water drains off forest roads and carries unwanted sediment into waterways. These tools, [GRAIP](#) (Geomorphic Road Analysis and Inventory Package) and [GRAIP-Lite](#), have been used to inform [new Environmental Protection Agency \(EPA\) policy decisions](#).

Due to the availability of tools such as GRAIP and GRAIP-Lite and the various institutional programs and rules already in place for road sediment reduction, the EPA concluded there was no need for additional Clean Water Act regulations related to forest road runoff to waterways. In addition to influencing policy and helping demonstrate that new regulations are not needed, these tools also help to save costs and prevent wide-scale disruption of roadways by empowering land managers to localize their roadwork efforts on smaller portions of roads instead of closing down entire sections.

GRAIP evaluation of roadways and runoff utilizes traditional manpower and GPS devices to inventory and map a road and its characteristics, such as slope and alignment. These inventory data are run through a GIS analysis tool which predicts erosion, sediment movement, landslides, and other risks.

In contrast, the EPA-funded GRAIP-Lite uses existing corporate road data and GIS to compare and map how much sediment washes into waterways from different roads. Land managers can use this less detailed version of GRAIP to efficiently prioritize roadwork on a larger scale and compare the effects of proposed alternative treatments on small watershed sediment impacts. Tools like GRAIP and GRAIP-Lite help minimize societal impacts on natural landscapes and save time and money in the process – it's a win all around. For more information, visit the GRAIP website at: [www.fs.fed.us/GRAIP/](http://www.fs.fed.us/GRAIP/).



A crewmember examines a collapsed stream crossing in Idaho as part of GRAIP's forest road inventorying process.

#### New Cyanobacteria Monitoring Tools for Citizen Science

EPA New-England and a cyanobacteria monitoring collaborative have developed and recently launched three coordinated monitoring projects to understand and locate harmful cyanobacteria. The projects are tiered to allow participation from the public, trained citizen scientists, and professionals.

- The *bloomWatch* smartphone app is a crowdsourcing tool to engage the public in finding and reporting potential cyanobacteria blooms;
- *Cyanoscope* helps trained citizen scientists, professional water quality managers, and the public collect water samples and upload microscope slides to better understand where and when cyanobacteria species occur; and
- The *Cyanomonitoring* project engages professionals and trained citizen scientists in monitoring for cyanobacteria using a fluorometer to test for blue-green phycocyanin pigment in water samples.



Find out more about these projects at [cyanos.org](http://cyanos.org)



## Results of 2011 National Wetland Condition Assessment Released

In May 2016, EPA released the National Wetland Condition Assessment (NWCA) 2011 results, the latest in a series of National Aquatic Resource Surveys conducted by EPA and its partners to answer key questions about the condition of the Nation's waters. The next National Lakes Assessment is expected to be released this fall. This report is the first national assessment of the ecological condition of the Nation's wetlands, encompassing both tidal and non-tidal wetlands.



Field personnel collect data for the NWCA study.

### Key findings of the NWCA:

- Nearly half of wetland area (48%) is in good condition; 32% is in poor condition and the remaining 20% is in fair condition.
- Physical disturbances to wetlands and their surrounding habitat such as compacted soil, ditching, and removal or loss of vegetation, are the most widespread problems across the country. Wetlands with high levels of compacted soil are about twice as likely to have poor plant communities.
- Non-native plants are a problem across the country, particularly in the interior plains and West. 46% of wetland area in the interior plains and 72% of wetland area in the West have high or very high levels of stress from non-native plants.

The NWCA and recent studies on wetlands gains and losses by the U.S. Fish and Wildlife Service suggest that more needs to be done to protect and restore our wetland resources in order to ensure healthier waters for future generations.

For more information, read the NWCA and download data at [www.epa.gov/national-aquatic-resource-surveys/nwca](http://www.epa.gov/national-aquatic-resource-surveys/nwca).

In addition, an archived webcast on the design and findings of the NWCA is available at EPA's Watershed Academy [website](#).

## A Decadal Look at Groundwater Quality: USGS Online Mapper

A new [online interactive mapping tool](#) provides summaries of decadal-scale changes in groundwater quality across the Nation.

About 140 million people—almost one-half of the Nation's population—rely on groundwater for drinking water. Tracking changes in groundwater quality and investigating the reasons for these changes is crucial for informing management decisions to protect and sustain our valuable groundwater resources.

This tool can be used to:

- Track how concentrations of 24 contaminants, such as nutrients, pesticides, metals, and volatile organic compounds, are changing over decadal periods in 67 groundwater networks across the Nation,
- View the distribution of wells sampled within an aquifer,
- Download the water quality data,
- Learn more about the statistical approaches used to track decadal changes in groundwater quality.



Increases in chloride concentrations were observed in 31 groundwater networks across the Nation. The online mapper examines decadal changes in 24 contaminants, such as nutrients, pesticides, metals, and volatile organic compounds.







## Academia and Other Water Organizations

### Northeast-Midwest Institute Study Identifies Water Monitoring Needs for Detecting Effects of Shale Gas Development in the Susquehanna River Basin

A study released by the [Northeast-Midwest Institute](#) found that current water quality monitoring by federal, state, local and academic water monitoring groups is inadequate for detecting potential surface water or groundwater quality impacts from shale gas development activities in the Susquehanna River Basin. A lack of information on water quality before and after development has fueled worries about contamination of surface water and groundwater that could result from shale gas development. Even though intense shale gas development has been ongoing in the Basin for nearly 10 years, there is still no systematic, large-scale, long-term groundwater monitoring network to confirm or reject these water quality concerns.

Water monitoring to measure the effect of new industries on water resources requires targeted sampling plans and relevant monitoring parameters. Existing long-term monitoring sites in the Basin are not in the right locations and do not collect the type of data needed to detect water quality change related to shale gas development. Out of approximately 14,700 surface-water monitoring sites in the Basin, only 10 have enough barium data (an indicator associated with high volume hydraulic fracturing (HVHF) development) for a water-quality trend analysis, and none are located in watersheds with a substantial number of active HVHF wells. Few of the 26 recommended surface-water monitoring parameters are available for monitoring sites with a long-term data record. The report did find that newer surface-water monitoring programs through the Susquehanna River Basin Commission and Pennsylvania Department of Environmental Protection are collecting water data in locations that will detect changes related to shale gas development, but additional parameters, increased sampling frequency, long-term data collection, and continuous streamflow data are needed.

The study calls for increased monitoring in watersheds with a high density of active HVHF wells and a new systematic, long-term groundwater monitoring program for detecting water quality change related to shale gas development in freshwater aquifers that underlie the Basin. Coordination among water monitoring organizations, the shale gas development industry, and local citizens is essential to efficiently collect the data needed to track any water quality changes in the Basin. For more information on this project, visit the study [website](#), or contact Elin Betanzo at [ebetanzo@nemw.org](mailto:ebetanzo@nemw.org).

### New Northeast Regional Integrated Sentinel Monitoring Network Partnership

The ocean and coastal ecosystems of the Northeast U.S. are under pressure from numerous local, regional, and global system drivers, including climate change, resource exploitation, invasive species, human population growth, and changes associated with coastal development. Managers and communities need accurate, objective, and accessible information of quantified ecosystem changes in response to these system drivers in order to make adaptive plans for the future.

Recognizing this need, the Northeast Regional Ocean Council (NROC) and the Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS) partnered to develop a Science and Implementation Plan for the development of an Integrated Sentinel Monitoring Network (ISMN) for the Northeast ocean and coastal ecosystems. Edition 1 of the plan, available at [www.neracoos.org/sentinelmonitoring](http://www.neracoos.org/sentinelmonitoring), represents the 3-year culmination of the multidisciplinary efforts of nearly 50 state, federal, university and private entity collaborators and contributors. The plan lays the groundwork for an improved, cost-effective monitoring collaboration that builds on and adapts existing monitoring capacities through coordination, integration, gap analysis, and targeted enhancements.



The Northeast U.S. region stretches from the Eastern New York Bight to the Scotian Shelf. It includes two distinct subregions, the Gulf of Maine and Southern New England, and spans international boundaries as it encompasses and is directly influenced by eastern Canadian Maritime waters. ©NERACOOS



Moving forward, NERACOOS will maintain the ISMN website and work to establish an Oversight Committee to guide implementation of the plan. The ISMN plans to build partnerships and support research groups proposing new synergistic observing activities to funding agencies. A key component of the implementation strategy will be continued coordination with and functional support of the Northeast Regional Ocean Plan. Additional financial support will be sought to fully implement ISMN within the operational structure provided by NERACOOS. To sign up for the ISMN mailing list, contact Jackie Ball at [jball@neracoos.org](mailto:jball@neracoos.org) or visit the project website [www.neracoos.org/sentinelmonitoring](http://www.neracoos.org/sentinelmonitoring).

## Spotlight on States

### New Web Portal Streamlines Access to South Carolina Water Monitoring Data

The South Carolina Sea Grant Consortium launched a new, web-based visualization portal for water resource monitoring in South Carolina, the South Carolina Coastal Water Monitoring Network (SCCWMN). The initial version of the SCCWMN portal was launched in August 2016 and is a readily accessible, common platform for illustrating and sharing information on hydrological and water-quality monitoring site locations. The portal is designed to be useful to many people, including scientists, resource managers, policy-makers, and the public. Users will be able to gather information on the organizations that are conducting the monitoring, review the parameters being monitored and measured, and, where available, access the data directly. Both long-term monitoring programs and event-based monitoring, such as the response to the October 2015 rain/flood event in South Carolina, will be included.

The portal will enhance understanding of the status of water resources in South Carolina, and will provide context for assessing the influence of climate and weather events on water quantity and quality. Users can adjust the time frame of the display to observe trends and patterns over time. The portal will continue to be updated to include additional monitoring stations as they are identified, reflect changes in monitoring locations, and monitoring in response to events. Partners in the effort to date include [Coastal Carolina University](#); [College of Charleston](#); [S.C. Department of Natural Resources](#); [S.C. Department of Health and Environmental Control](#); [University of South Carolina](#); [U.S. Forest Service](#); [U.S. Geological Survey](#); and [North Inlet –Winyah Bay National Estuarine Research Reserve](#). Additional water-monitoring partners will continue to be identified and invited to join the effort.

The SCCWMN portal is accessible from the [S.C. Sea Grant Consortium's](#) homepage. For state regulatory agency water quality monitoring sites, data is provided through the [Water Quality Portal](#). For more information, contact Andrea Sassard ([andrea.sassard@scseagrant.org](mailto:andrea.sassard@scseagrant.org)).

### California Statewide Monitoring Pilot Study for Contaminants of Emerging Concern

California's State and Regional Water Boards are evaluating Contaminants of Emerging Concern (CECs) in surface water throughout the state. CECs are unregulated chemicals that originate from a variety of point and non-point source waste discharges. The presence of CECs in California waterways and their potential hazards to human health and aquatic life are the focus of the Southern California Coastal Water Research Project (SCCWRP). The SCCWRP developed a [Statewide CEC Monitoring Guidance](#) and [Quality Assurance and Quality Control Guidance](#), as a blueprint for a statewide CEC pilot study.

A chemical-specific risk-based assessment framework was used to identify those chemicals that have the greatest potential to adversely affect aquatic organisms. Those CECs with the highest impact will be monitored in Phase 1 of the study. The pilot study is intended to provide baseline information for Water Boards programs and the public. For additional information see the California Waterboards [newsletter](#).



## California Develops HABs Portal

The California Harmful Algal Blooms (HABs) Portal is a new tool that presents information on the health and environmental effects of HABs in California's lakes, reservoirs, rivers, and marine waters. This update to California's innovative *My Water Quality* website will help citizens answer the question: "Are harmful algal blooms affecting our waters?" The goal is to provide timely, easy-to-understand information for the public, environmental organizations, water resource managers and public health professionals.

The portal is the latest product of California Cyanobacteria and Harmful Algal Bloom (CCHAB) Network. In California, as in other states, warm temperatures, increased nutrients, and low discharge aggravated by drought conditions and climate change are favoring toxin-producing cyanobacteria and algae; a number of lakes, reservoirs, and river systems are suffering blooms as a result. Persistent blooms in Clear Lake, the Klamath watershed, the Sacramento-San Joaquin River Delta, East San Francisco Bay Area lakes, Pinto Lake, and other California waters present serious challenges to recreational users, water supply providers, and water quality managers.

To help understand and address HABs, the CCHAB Network was established in 2006 to provide a forum for coordination of HAB response efforts by agencies, organizations, and tribes dealing with these blooms. The CCHAB Network developed and is now updating guidance on the voluntary posting of water bodies experiencing blooms. One key network partner is the Surface Water Ambient Monitoring Program (SWAMP) of the State Water Resources Control Board, which is helping to coordinate HABs monitoring and response actions statewide. View the California Harmful Algal Blooms Portal at: [www.MyWaterQuality.ca.gov](http://www.MyWaterQuality.ca.gov).

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## Indiana Department of Environmental Management Breaking Down Barriers to Data Sharing

Sound management of our nation's surface water resources begins with the collection and analysis of water quality data. However, many state agencies today charged with protecting and restoring their surface waters are faced with increasing data needs without a corresponding increase in the funding needed to meet them. In recent years, static or falling funding levels for monitoring has had the effect of incentivizing greater use of secondary data by state agencies to meet multiple program objectives—that is, if the internal and external barriers to data sharing can be broken down.

One of the biggest barriers is the amount of staff time required to review secondary data. State agencies have the responsibility to review all the data sets they receive from outside sources prior to their use in decision-making to ensure the data are scientifically robust and free from intentional bias. However, many states lack the necessary resources and infrastructure to review and manage secondary data, which can vary significantly from one data set to the next. States may also struggle with concerns regarding the legal defensibility of using secondary data in regulatory decisions that may be subject to appeal.

Given these issues, using secondary data in decision-making processes remains a difficult proposition for most state agencies. However, the Indiana Department of Environmental Management (IDEM) has developed a process that breaks down many of the barriers to effective data sharing. The agency's External Data Framework provides a systematic, transparent, and voluntary process for external organizations to submit their water-quality data.

IDEM's External Data Framework has paved the way for greater collaboration with organizations engaged in water-quality monitoring throughout the state. But it wasn't easy getting there. The challenges IDEM encountered when developing the External Data Framework and the solutions it implemented were addressed in a [presentation](#) the agency gave at the 2016 National Monitoring Conference.

Details on the External Data Framework are available on [IDEM's website](#). For more information, contact Jody Arthur at [jarthur@idem.IN.gov](mailto:jarthur@idem.IN.gov) or at (317) 308-3179.



## Volunteer Monitoring News

### Monitoring pollution in the Athabasca River

Since 2013, Keepers of the Athabasca has been leading community based water monitoring at 12 sites along the Athabasca River in Alberta, Canada. Monitoring efforts have focused on the Lower Athabasca, which flows through Canada's oil-rich tar sand region. Monitoring has also addressed data gaps in the Upper Athabasca watershed. An ongoing concern along the Athabasca River is gravel mining in floodplains, alluvial aquifers, and wetlands, and the recent release of mining sludge and water into the river from an unlisted holding pond. Discharge from mining activities causes increased sedimentation, pollution, and warming of downstream water bodies.

On October 3, in 2013, the Obed Coal Mine breached an unlisted holding pond, releasing almost a billion liters of mining sludge and water into the Athabasca River. This destroyed fish and wildlife habitat in the Apetowan and Plante Creeks (Athabasca River tributaries), including habitat of Alberta's endangered provincial fish, the bull trout. While Alberta Environment tested river water at that time, they didn't release the results. However, Alberta Health released information that mercury was nine times higher than normal in the Athabasca River, while cancer causing PAH's were four times higher than allowable while the plume dispersed. Because of the huge amount of sludge deposited, pollutants will continue to be mobilized each spring for many years to come, increasing the significance of monitoring. Charges are being pressed against the Obed mine owners.

This year, Keepers of the Athabasca formed a partnership with Alexis Nakota Sioux Nation, and trained eight of their members in Environment Canada's Canadian Aquatic Biomonitoring Network (CABIN) program for community based water monitoring. The training was delivered by Keepers and Living Lakes Canada, and focuses on benthic invertebrates. Involving local people and communities in citizen science allows them to become connected, invested, and empowered to create positive change for the environment. Keepers of the Athabasca are currently working with the University of Alberta Community Service Learning program to develop a written report detailing findings from their monitoring efforts; to find out more, visit their [website](#).

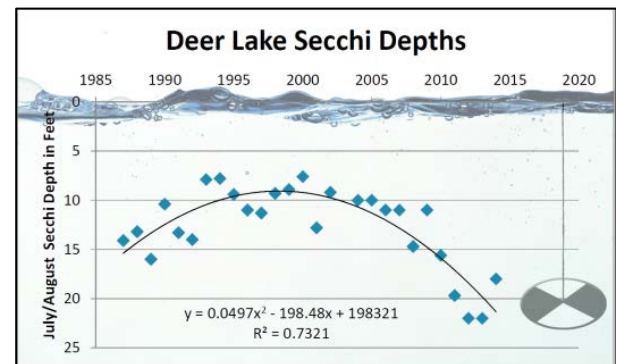


Keepers of the Athabasca community water monitoring training group in Fall 2015, with Alexis Nakota Sioux First Nation Youth group. Project Manager Donna Mendelsohn at right.

### Improved Water Quality in Deer Lake, Wisconsin

Two decades of planning and on-the-ground conservation has led to a 15-foot water clarity improvement for the 812-acre Deer Lake in Polk County, Wisconsin. Volunteers began measuring water clarity on Deer Lake in 1987 and yearly measurements suggested that the lake had increasing nutrient concentrations. Between 1992 and 2015, the Deer Lake Conservancy invested \$1.3 million (\$846,000 from state grants) to address watershed management and land preservation opportunities to reduce nutrient loads. At around the same time, Polk County developed the Balsam Branch Priority Watershed Plan which established an in-lake water quality goal of 19 ug/l summer phosphorous concentration.

According to lake models, achieving this goal required a total phosphorous loading reduction of 36% (equivalent to 65% reduction of watershed



Secchi depth measurements over time in Deer Lake, WI



loading) from levels in the early 1990s. The Deer Lake Conservancy reduced estimated annual watershed phosphorous loading to Deer Lake between 1996 to 2009 by 53% by focusing on direct draining area and purchasing property, converting critical row-cropped farm fields to prairie, restoring wetlands, and installing sedimentation and infiltration basins. Projects have been installed on nearly all intermittent streams that drain to the lake.

The in-lake water quality results of this work are striking. Secchi depth measurements are taken twice a month (when the lake is not frozen). While major storm water management projects were installed from 1997-2006, a visible trend of clearer water appeared around 2011 and continues to this day. Deer Lake Conservancy received the 2015 Lake Management Success Story award at the 2015 North American Lake Management Society Symposium this fall.

The experience at Deer Lake illustrates that citizen volunteers can and do make a difference for Wisconsin Lakes. It can take years, even decades to coalesce the energy and funding needed to both plan for and implement watershed protection, but when done right, protection efforts can result in permanent landscape improvements that yield water-quality gains. For more information, contact [Alex.Smith@wisconsin.gov](mailto:Alex.Smith@wisconsin.gov) or check out the full length article in [Wisconsin Natural Resource Magazine October edition](#).

## Tribal News

### Dehcho Community Based Water Quality Monitoring Program

The Dehcho Aboriginal Aquatic Resources and Ocean Management (AAROM) program has an agreement with the government of the Northwest Territories of Canada to be involved in community based water monitoring. This agreement has greatly strengthened our Aquatic Monitoring Program by providing state-of-the-art equipment, scientific analysis, recording of the collected data and documentation of any completed training. Dehcho AAROM works with member First Nations in eight communities to deploy, maintain and retrieve water quality and contaminant monitoring equipment. First Nations involved are Pehdzeh Ki, Liidlii Kue, Jean Marie River, Nahanni Butte, Deh Gah Gotie, Katlodeeche, Sambaa K'e and Ka'a'gee Tu.

Study locations and sampling sites were selected to address community concerns. Monitoring stations are located on the Mackenzie River near Fort Providence, Fort Simpson and Wrigley, as well as in Trout Lake, Kakisa Lake and the Liard, South Nahanni and Hay rivers. The Dehcho AAROM program continually measures temperature, pH, dissolved oxygen, conductivity, turbidity, redox potential and chlorophyll during the open water season. Grab samples are analyzed for 70 substances including dissolved hydrocarbons and dissolved metals. Dehcho AAROM has worked with member First Nations to hire boat patrol monitors to observe and record activities on their waters, including fishing activity and wildlife sightings in support of other Dehcho AAROM studies. Monitoring results for the previous year are reported back to the communities each year. For more information on these results, please visit the Dehcho AAROM [website](#).



Samples are collected by field personnel. Photo by George Low, Dehcho AAROM Coordinator



## Tools and Technology

### The Nutrient Sensor Challenge: Verification Testing Underway

Nutrients occur naturally in the environment. However, excessive levels of nutrients – primarily forms of nitrogen (N) and phosphorus (P) – can harm our health, ecosystems, and economy. Challenging Nutrients, a collaboration of federal agencies, universities, and non-profit organizations, was launched in 2014 to tackle the intractable issues preventing us from making significant progress on nutrient pollution. The coalition recognized that a lack of available data was one of the problems holding us back, and launched an effort to develop a suite of effective and affordable sensors to measure nutrients in water and soil. Due to the coalition's efforts to reduce nutrients in waterways, the Challenging Nutrients Coalition was listed as one of the 100 Examples of President Obama's Leadership in Science, Technology, and Innovation released by the White House in June 2016.

The Nutrient Sensor Challenge, an effort to develop affordable, reliable, and accurate sensors measuring N and P in water, has transitioned into verification testing. Five sensor developers have submitted their technologies for full-scale testing with the Alliance for Coastal Technologies (ACT) at three field locations – Ohio, Maryland, and Hawaii – and in rigorous laboratory tests. In total, four sensors measuring N and four measuring P are being evaluated. Testing in the Maumee River in Ohio (freshwater) took place in June, and sensors are currently undergoing a challenging three-month deployment at ACT headquarters in the Chesapeake Bay (estuarine water). During these field deployments, sensors are deployed to collect data at hourly or more intervals while reference samples are collected each day to provide benchmarks against which they will be evaluated. Testing in Hawaii (marine water) was completed in October.

For the Coalition, this verification testing will provide the data needed for an independent judging panel to make decisions on first, second, and third place in the N and P categories. These awards will be made in early 2017 – stay tuned! Acceptable performance in the verification testing phase will also inform piloting prizes to be launched following the end of the Challenge. These pilots will push the sensors into additional applications, environments, and systems that are beyond the scope of the Challenge and directly connect the sensor developers with the users of their technologies. The Challenging Nutrients Coalition continues to develop interagency involvement with the pilot program as the Nutrient Sensor Challenge works toward innovative technology to address the pressing environmental issue of nutrient pollution.

For more information, visit [www.nutrients-challenge.org](http://www.nutrients-challenge.org)



Challenge participant describing a sensor component to Challenging Nutrients Coalition participants in Solomons, MD.



Technicians deploy nutrient sensors for testing at the Chesapeake Biological Laboratory as part of ACT's verification process.



## Sensor Challenges: What's Next?

The success of the Nutrient Sensor Challenge (see page 15 for an update) has spawned a number of similar efforts. Two of those are highlighted here.

### *Arsenic Sensor Prize Competition*

Current methods for measuring arsenic in water are costly, time-consuming, and do not capture the full complexity of arsenic's behavior in the environment. A rapid, low-cost way to measure arsenic in water would help resource managers, water system developers, and private well owners understand and manage water quality, and provide utility operators with data to make real-time treatment decisions. New monitoring technology would also benefit fields such as wastewater monitoring, contaminated site remediation, and scientific research.

The U.S. EPA is collaborating with the U.S. Bureau of Reclamation and a number of other agencies in launching the Arsenic Sensor Prize Competition to accelerate the development of new arsenic monitoring technology.

The first phase of the Arsenic Sensor Prize Competition, to begin in autumn 2016, seeks ideas for how to rapidly, accurately, and cost-effectively measure arsenic in water. Winners will receive cash prizes. A second phase, focused on sensor prototype development, may begin in 2017. Phase 2 working prototypes would be invited for testing and evaluation under field and laboratory conditions, and winners would receive cash prizes.

If you are interested in receiving notifications about the Arsenic Sensor Prize Competition, email [PRIZE@usbr.gov](mailto:PRIZE@usbr.gov) with "Arsenic Sensor Prize Competition" in the subject line. The official prize competition announcement as well as a preview will be posted on [Challenge.gov](http://Challenge.gov).

### *Toxicity Pathways in Drinking Water Challenge*

The increasing load of undocumented pollutants from agricultural, municipal, and industrial outfalls present in U.S. and foreign source waters is an emerging public health concern. The compounds can include pesticides, herbicides, heavy metals, natural toxins such as cyanobacterial toxins, and a host of other organic and inorganic chemical pollutants and their degradates. Current methods to detect/identify many of these contaminants require specialized labs and are expensive and time-consuming.

An upcoming challenge seeks innovative concepts and solutions for development of a sensor to detect the effect of chemical pollutants and natural toxins from various water types (e.g. surface waters, drinking water, wastewater effluent, and landfill leachate). The challenge will not require the sensor to identify the specific chemical(s) producing the effect, but it should recognize perturbations in one or more toxicity pathways and be capable of quantifying those responses.

The development of this sensor will support regulations which mandate periodic monitoring of water quality, such as the Safe Drinking Water Act of 1974 and its amendments. This challenge is sponsored by U.S. EPA, USGS, NOAA, U.S. Army, Water Environment Foundation, and Greater Cincinnati Water Works. The challenge is expected to be issued in late fall 2016. Visit [www.challenge.gov](http://www.challenge.gov) for updates or contact Eunice Varughese ([Varughese.Eunice@EPA.gov](mailto:Varughese.Eunice@EPA.gov)) to have updates sent to you.





## Upcoming Conferences and Workshops

### Maryland Water Monitoring Council Conference

The Maryland Water Monitoring Council will hold its 22nd Annual Conference at the Maritime Institute, North Linthicum, Maryland, on Friday, December 2, 2016. The conference will include a plenary session, six concurrent breakout sessions, and lots of posters and exhibitor tables. The theme of the 2016 MWMC conference is *A River Runs Through It – Strengthening Networks and Connections*. To register, please visit the Conference [webpage](#).



### 36<sup>th</sup> International Symposium of North American Lake Management Society

The Alberta Lake Management Society and Living Lakes Canada invite you to join us at the 2016 NALMS Symposium to help us celebrate, explore the area, and engage in discussions about science, stewardship and finding a balance between the environment, economy and social goals in lake management. The 2016 NALMS Symposium will be at the Fairmont Banff Springs Hotel November 1-4, 2016. For more information, visit the symposium [website](#).

## Council News

### New! Electronic Suggestion Box

Do you have water-quality monitoring topics or issues you would like to see in the next edition of the newsletter or covered in a webinar? Are there topics you would like the National Water Quality Monitoring Council to address in coming months and years? If so, feel free to reach out and let us know about your ideas.

Please contact us by emailing [NationalMonitoringCouncil@gmail.com](mailto:NationalMonitoringCouncil@gmail.com) with "Suggestion Box" in the subject line, or visit our website to submit a suggestion. We will do our best to address concerns and issues that are raised by our audience.



### Three New NWQMC Webinars Available on YouTube



Visit our YouTube channel ([www.youtube.com/user/NWQMC](http://www.youtube.com/user/NWQMC)) to view recordings of our most recent webinars:

- Potential Corrosivity of Untreated Groundwater in the United States
- Exploring the Worlds of Citizen Science and Volunteer Monitoring
- Using the Right Tools to Develop Effective Science-Based Messages for Any Audience

Webinars are hosted frequently and cover a broad range of topics. New webinars are uploaded to this site shortly after the initial broadcast, and slides are available on the [NWQMC's website](#). Subscribe to our Webinar Announcement Listserve on our [webinar page](#).



## Fluid 5K Gallery



A record 76 runners and walkers participated in the third Fluid 5K. For a full recap of the Fun Run and other Conference highlights, see pages 3 and 4.

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