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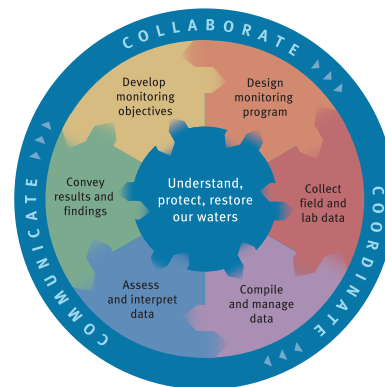


IOWATER volunteer monitoring macroinvertebrate in Briggs Woods, Iowa. (Photo by Jacklyn Gautsch, IOWATER)



The Fond du Lac Band of Lake Superior Chippewa has been actively working and collaborating with Federal agencies and the University of Minnesota to protect and restore culturally significant wild rice waters on their reservation in northeastern Minnesota. The floating-leaf stage, seen here, is especially sensitive to water fluctuations.

(Photo courtesy of Nancy Schuldt, Fond du Lac Band of Lake Superior Chippewa)



The National Water Quality Monitoring Council provides a voice for monitoring practitioners across the Nation and fosters increased understanding and stewardship of our water resources.

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



National Water Monitoring News – Words from Council Co-Chairs

Welcome to the third edition of the National Water Quality Monitoring Council (“Council”) newsletter! As Co-Chairs of the Council, we are pleased to continue providing this newsletter as a readily accessible forum for communication among water practitioners across the Nation. In support of the Council’s mission (<http://acwi.gov/monitoring/>), this newsletter is geared to foster partnerships and collaboration; advance water science; improve monitoring strategies; and advance data integration, comparability, and reporting. This third edition highlights many events, activities and new products. We hope the information is useful for your water needs. Among the topics you will read about are:

- ✓ The Council’s upcoming 8th National Monitoring Conference (April 30 – May 4, 2012)
- ✓ Highlights from the Council’s web seminar series
- ✓ Updates from the Utah, California, Maryland, and New Jersey State Water Monitoring Councils
- ✓ Updates on monitoring including:
 - The National Wetland Condition Assessment being conducted by EPA and the States and Tribes
 - The National Groundwater Networks Pilot Studies
 - The Great Lakes Restoration Initiative
 - Monitoring harmful algal blooms across the Nation and in Oregon
 - Native American efforts to protect and restore wild rice waters
 - Monitoring in the Monongahela Basin
 - How volunteer monitoring in Iowa helps schools meet State educational standards
- ✓ South Carolina’s survey of States’ use of outside data for regulatory decision making
- ✓ New tools including an online guide to “Diatoms of the United States” and a method for screening for optical brighteners

As always, we encourage you to be an active part of this forum and share your successes and challenges in monitoring, announcements about upcoming conferences, 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 whole Council and all the contributors to this issue, we hope you enjoy this newsletter and we encourage your input and future communication!

Pixie Hamilton, USGS Co-Chair
pahamilt@usgs.gov

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

A note to our readers: As of April 4, 2011, Pixie Hamilton stepped down as co-chair of the Council to accept a new position as National Coordinator of the USGS Cooperative Water Program. The Council will sorely miss her strong and energetic leadership of the last 2 and one half years. We wish her well in her new job!

National Council Highlights

NWQMC Announces Its Eighth National Monitoring Conference



Photo courtesy of Travel Portland (Larry Geddis)

Mark your calendars for the ***Eighth National Monitoring Conference – Water: One Resource – Shared Effort – Common Future***, to be held in Portland, Oregon from April 30th – May 4th, 2012. This biennial forum provides a unique opportunity for water practitioners from all backgrounds—including governmental and tribal organizations, academia, watershed and environmental groups, and the private sector—to exchange information, develop new skills, showcase new findings, and highlight recent innovations and cutting-edge tools in water-quality monitoring, assessment, and reporting.

For the first time, the NMC conference will be coordinated with the River Network's National River Rally, featuring an overlap day (May 4th) with mutually developed themes and presentations geared toward fostering improved collaboration between government and nonprofit groups working together for clean water.

To learn more about the Eighth National Monitoring Conference, please visit <http://acwi.gov/monitoring/> or contact: Cathy Tate, cmtate@usgs.gov, (303) 236-6927 or Jeff Schloss, jeff.schloss@unh.edu, (603) 862-3848.

Web Seminar Series

The Council's web seminars have proven to be extremely popular, not surprising given the high caliber of presentations. Hundreds of attendees from state, regional, and tribal councils, as well as watershed groups and alliances and the volunteer community from across the nation, have signed on for up-to-date information exchange. The topics are timely and informative, and the format allows for discussion and follow-up communications with the presenters. **Web seminars to date include the following presentations:**

- **State and Regional Councils:** Updates on the California, Florida, and Lake Michigan Monitoring Councils, status of tribal monitoring groups, and ideas to facilitate use of data and data sharing among monitoring councils
- **Volunteer Monitoring:** Integration of citizen monitoring data into Virginia's state assessment report and an online database tool managed by the Virginia Monitoring Council
- **Social Media Tools:** New web technologies and social media tools for the water monitoring community
- **Sensors:** An introduction to water-quality sensors and the Council's Aquatic Sensor Workgroup
- **Marcellus Shale:** Marcellus Monitoring: The role of volunteers in baseline data collection
- **Data Exchange Network:** Using the California Environmental Data Exchange Network (CEDEN) co-sponsored by the California Water Quality Monitoring Collaboration Network
- **Quality Assurance and Sensors:** Water quality monitoring sensors co-sponsored by the California Water Quality Monitoring Collaboration Network
- **Tribal Monitoring:** Tribal science, monitoring and partnerships to address environmental issues

Mark Your Calendar and Join us for this future web seminar:

June 16, 2011: "Introduction to the Environmental Methods Index (NEMI)" by Dan Sullivan, co-sponsored by the California Water Quality Monitoring Collaboration Network.

When: Thursday, June 16, 2011
2:30 pm – 3:30 pm Eastern Time

Presentations from past web seminars are available online at: <http://acwi.gov/monitoring/workgroups/co/webinars.html>

We encourage you to be an active part of these webinars and to share your successes and challenges in monitoring. If you have a webinar idea or would like to present something yourself, don't hesitate to contact the organizers of the webinar series, Cathy Tate and Barb Horn. Suggestions are always welcome!

For more information, contact: Cathy Tate, cmtate@usgs.gov, (303) 236-6927 or Barb Horn, Barb.Horn@state.co.us, (970) 382-6667 or go to <http://acwi.gov/monitoring/workgroups/co/webinars.html>

Council Member Updates

Welcome New Member!



Derric Iles

**Association of American State Geologists (AASG) Representative
South Dakota Geological Survey
Vermillion, South Dakota**

Derric Iles has served as the State Geologist of South Dakota for 13 years and has 34 years of experience working with groundwater, dominantly in glacial sediments, examining groundwater movement in low-permeability sediments, and defining the subsurface geologic framework within which groundwater occurs. He led the effort in South Dakota to design and install a statewide groundwater quality monitoring network that examines shallow groundwater in some of the state's aquifers that are the most sensitive to human activities at land surface. The network presently consists of 150 wells at 85 sites in 26 aquifers and, in large part, has been operative for approximately 15 years. Derric is a Certified Professional Geologist and intends to represent the varied interests of all states in the U.S. and to support efforts that will enable well-informed decisions regarding the development and protection of groundwater resources.

Thanks to Outgoing Council Members

The Council bids farewell to Dave Wunsch and Don Dycus, who have provided exceptional representation on behalf of the Association of American State Geologists and the Tennessee Valley Authority, respectively.

Dave has provided a valuable groundwater perspective for the Council's water-quality discussions during his tenure and has served as a vital link between the Council and ACWI's Subcommittee on Ground Water. In addition, Dave has held positions with both the New Hampshire and Kentucky Geological Surveys, served as a Congressional Science Fellow for the House Subcommittee on Energy and Mineral Resources, authored or co-authored more than 40 publications in groundwater science, and served two terms on the Board of Directors of the Association of Ground Water Scientists and Engineers.

Don has represented TVA on ACWI since 1996, and has served on the Council since 1998. He has more than 30 years of experience in monitoring and evaluating water quality and aquatic biological conditions on TVA reservoirs. As the TVA representative on the Council, he provided unique insights on issues relating to all stages of the monitoring process – network and study design, sample collection and analysis, data evaluation, reporting, and collaboration. He has been an active member of the Council's Water Information Strategies Workgroup.

Monitoring in the Gulf of Mexico - Now and Into the Future

Monitoring in the Gulf of Mexico was on the agenda during the Council's February 2011 meeting in Pensacola, Florida.

- Steve Wolfe, Florida Department of Environmental Protection, gave an overview of the Gulf of Mexico Alliance (GOMA) (<http://gulfofmexicoalliance.org/>).
- Phil Bass, GOMA Executive Director, described the Gulf of Mexico Research Initiative being funded by BP (\$500 million over 10 years) that GOMA will administer (<http://www.gomri.org/index.php>).
- Gunnar Lauenstein (NOAA) described NOAA's response to the Deep Water Horizon Spill.
- Donna Myers (USGS) showed a video of the USGS monitoring efforts in the Gulf (<http://gallery.usgs.gov/videos/340>).
- Jan Kurtz (USEPA, Gulf Breeze) described the formation of the Restoration Task Force created to develop the Gulf Regional Ecosystem Restoration Strategy (<http://www.restorethegulf.gov/>).
- Richard Ingram, Mississippi Department of Environmental Quality, described the current Hypoxia Task Force activities related to the "2008 Action Plan" -- a national strategy to address hypoxia in the Northern Gulf of Mexico and improve water quality in the Mississippi River Basin (<http://www.epa.gov/msbasin>).
- Ann Jochens, Texas A & M University, gave an overview of Gulf of Mexico Coastal Ocean Observing System designed to detect and predict changes in the state of the ocean (<http://gcoos.org>).
- Peter Sheng, University of Florida, described the Florida Coastal Ocean Observing Systems designed to develop a cohesive and scientifically defensible integrated observing and predicting system throughout Florida waters (<http://www.marine.usf.edu/flcoos/>).
- Fred Zeile (NOAA, National Coastal Data Development Center) gave an overview of the NOAA Gulf Data Bases (<http://www.nodc.noaa.gov/General/gulfmex.html>).

More information, including presentations, can be found at: http://acwi.gov/monitoring/ppt/pensacola_0211/ or contact: Susan Holdsworth, holdsworth.susan@epa.gov, (202) 566-1187.



Collaboration Through Partnerships

Federal Partnerships

The National Wetland Condition Assessment: National Data on Wetland Quality to Inform and Improve Wetlands Protection

The U.S. EPA, in collaboration with states, tribes, the U.S. Fish and Wildlife Service (FWS), and other federal partners, will conduct the first-ever National Wetland Condition Assessment (NWCA) in 2011.

This survey is the fifth in a series of National Aquatic Resources Surveys carried out by EPA and state partners to improve understanding of the quality of the nation's waters. The results of the NWCA will be published in 2013, with repeat surveys every five years, resources permitting. The NWCA is designed to build on the success of the FWS Wetland Status and Trends (S&T) Report. Just as the S&T Report characterizes wetland acreage by category across the conterminous United States, the NWCA will characterize wetland condition nationwide for many of the same wetland classes. When paired together, the two efforts will provide the public and government agencies with comparable, national information on wetland quantity and quality.

For the NWCA, 900 wetland sites were randomly selected from S&T plots using a survey design that ensures the site is representative of wetland resources at national and regional scales. Some states



Participants in the NWCA Field Operations Manual Technical Review Panel set up a vegetation sampling plot. (Photo by Joan Hurley, EPA ORD Western Ecology Division)

invested additional resources to supplement the survey design to provide state-scale reporting of wetland quality. The NWCA will use a reference-based approach to assess wetland quality, comparing survey data to assessments of high quality wetlands of similar type and geographic region.

The selection of NWCA field methods and indicators was driven by the goal of collecting the most meaningful data and information within the limits of NWCA timing and resources, such as the need to complete travel and sampling for each site in one day. At each site, field crews will sample vegetation, algae, soils, hydrology, and (where standing water is present) water chemistry. The NWCA will also verify the utility of the newly developed USA Rapid Assessment Method (USA RAM) across regions and wetland classes. USA RAM is designed to

effectively assess wetland condition in a comparatively short time frame. Once verified, it will provide states and tribes with a wetland assessment framework that can be adapted to meet their own monitoring needs.

More information on the NWCA can be found at:

www.epa.gov/wetlands/survey, or contact: Michael Scozzafava, Scozzafava.MichaelE@epamail.epa.gov, (202) 566-1376.

WaterSMART: A Strategy to Sustain and Manage America's Water Resources for Tomorrow

In response to the need for a more cohesive approach to water management, the Department of the Interior has developed a new water sustainability strategy for the United States. This strategy is being implemented through a joint initiative involving USGS and the Bureau of Reclamation.

The USGS budget requests \$10.9 million for WaterSMART in 2012, including \$1 million in grants to state water agencies to assist them in advancing their water use programs, and \$9.9 million for a wide suite of USGS efforts: estimating freshwater resources and how they are changing over time; evaluating factors affecting water availability (energy development, changes in agricultural practices, increasing population); and assessing water use and distribution for human, environmental, and wildlife needs.

The Bureau of Reclamation's 2012 budget request of \$58.9 million for WaterSMART includes competitive cost-share grants for short-term water conservation and efficiency projects (\$18.5 million), basin studies in partnership with states and localities (\$6 million), assistance for establishing collaborative watershed groups (\$0.3 million), Title XVI Water Reclamation and Reuse programs to investigate opportunities to reclaim and reuse wastewater and naturally impaired waters (\$29 million), and assistance for local water conservation planning activities, demonstration projects, education, and training (\$5.1 million).

For more information, visit: <http://www.doi.gov/watersmart/html/>, or contact: Eric Evenson, eevenson@usgs.gov.



Regional and State Partnerships

Water-Quality Monitoring as part of the Great Lakes Restoration Initiative

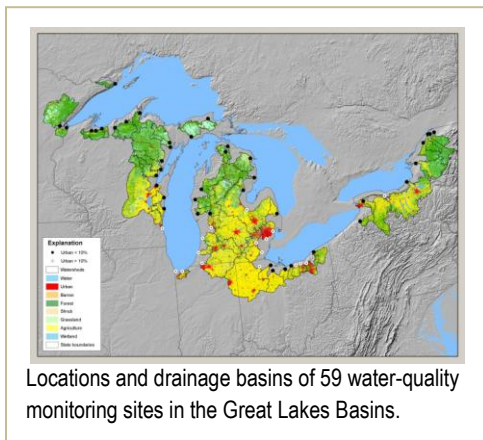


The quality of many tributary rivers in the Great Lakes basin has been significantly impaired due to sedimentation and nutrient loads. Large areas of inland forests and wetlands that once served to regulate the quantity and quality of water flowing into tributaries have been lost. As a result, tributaries pass on their pollutant and sediment loads to the lakes. Pollution from agriculture, industry, and urban development has polluted rivers and contaminated sediments. The result is the contamination of fish and wildlife that depend on river habitats.

In 2010, President Obama announced millions in new funding for the Great Lakes Restoration Initiative (GLRI), the largest investment in the Great Lakes in two decades. The Initiative, which seeks to begin restoring the Great Lakes for the 30 million Americans who depend on them for drinking water and which underpin a multi-billion dollar economy, targets some of the most serious threats to the Great Lakes: invasive species, nonpoint source pollution, and contaminated sediment.

This work will build on current monitoring efforts in the Great Lakes. The results of this effort will support the Lakewide Management Plans, Remedial Action Plans, and state management plans.

The water-quality monitoring component of the GLRI includes a network of 30 surface-water monitoring sites on tributaries to the Great Lakes



Locations and drainage basins of 59 water-quality monitoring sites in the Great Lakes Basins.

(see map), which are a subset of 59 sites that were initially sampled in 2010. Information on the occurrence and distribution of contaminants was collected in 2010 to provide baseline information, measure progress towards restoration goals, and assess new threats. Additional information is being collected in 2011 at the 30 monitoring sites to provide an understanding of how contaminants reach the Great Lakes and where they come from, so that the effects of future actions can be assessed and predicted.

At each of the monitoring sites, a multi-parameter sonde has been deployed to collect near-continuous data on pH, specific conductance, dissolved oxygen, temperature, and turbidity. In addition, water samples will be collected using a combination of automatic and manually collected samples for analysis for concentrations of nutrients, chloride and other major ions, and suspended sediment. At a subset of 17 sites, additional samples will be collected and submitted for analysis for wastewater-associated contaminants and

bacteria. A further subset of eight of those 17 sites will be analyzed for a suite of viruses and mercury. Sampling began in late February of 2011 and will be conducted at baseflow and during high-flow events to accurately estimate loads from tributary streams.

For more information, visit: <http://cida.usgs.gov/glri/>, **or contact:** Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869.

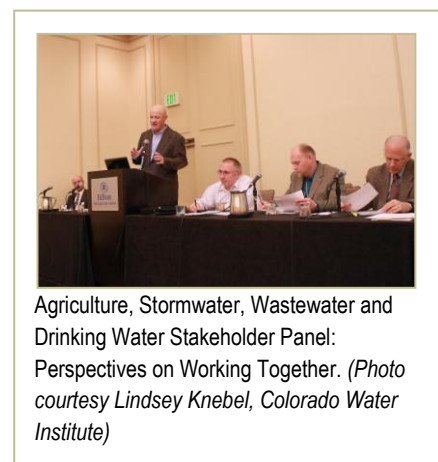
Collaboration in the Rocky Mountains on Nutrients and Water Quality

Over three cold February days in 2011, 185 people gathered to explore the science and institutional context surrounding two essential elements in water: nitrogen and phosphorus. The impact of this collaboration may be difficult to see in the short term; however, many seeds were planted that may grow into creative solutions for developing and implementing nutrient standards to protect beneficial uses in the Rocky Mountain states.

Initiated and sponsored by EPA Region VIII, the meeting was planned by a team that included EPA, the Utah Water Research Laboratory, the Colorado Water Institute, and the Northern Plains and Mountains Regional Water Program, a partnership of USDA and land grant colleges and universities. Attendees represented diverse state, federal, and local agencies and organizations, including EPA, USGS, US Fish and Wildlife Service, State water quality agencies, soil conservation districts, university extension services, nonprofits, academia, irrigation districts, municipalities, individual producers, and more.

The primary goal of the workshop was to build a better informed and more tightly linked community of nutrient researchers, regulators, managers, policy makers, and stakeholders, leading to collaborative approaches for developing and achieving nutrient controls. Panel discussions, presentations, and case studies addressed the nature and impacts of nutrients in surface water and groundwater; perspectives on nonpoint sources, waste water, storm water, nutrient trading, and animal feeding lots; the connection between groundwater and surface water nutrients; economic assessment of costs and benefits of nutrients; nutrient treatment success stories; and perspectives on collaboration. The workshop ended with recommendations specifically for EPA Region VIII. **Presentations, notes, and recommendations will be available in April 2011 at:** www.cwi.colostate.edu/nutrients.

Contributed by: Barb Horn, Barb.Horn@state.co.us, (970) 382-6667.



Agriculture, Stormwater, Wastewater and Drinking Water Stakeholder Panel: Perspectives on Working Together. (Photo courtesy Lindsey Knebel, Colorado Water Institute)

Harmful Algal Blooms

Harmful Algae Blooms and Public Health

Algae are vitally important to marine and fresh-water ecosystems, and most species of algae are not harmful. However, a harmful algal bloom (HAB) can occur when certain types of microscopic algae grow quickly in water, forming visible patches that may harm the health of the environment, plants, or animals. HABs can deplete the oxygen and block the sunlight that other organisms need to live, and some HAB-causing algae release toxins that are dangerous to animals and humans. HABs can occur in marine, estuarine, and fresh waters, and appear to be increasing in U.S. coastal and surface waters, according to the National Oceanic and Atmospheric Administration (NOAA).

Although scientists do not yet understand fully how HABs affect humans, we do know that exposures to these powerful cyanotoxins can cause adverse health effects. Authorities in the United States and abroad are monitoring HABs and developing guidelines for HAB-related public health action. The Centers for Disease Control and Prevention (CDC) works with public health agencies, universities, and federal partners to investigate how HABs may affect public health. CDC developed the Harmful Algae Bloom-related Illness Surveillance System (HABISS) and funded 10 States (FL, IA, MA, MD, NY, OR, SC, VA, WA, WI) to collect information about HABs and related illnesses to enable public health surveillance (<http://www.cdc.gov/hab/surveillance.htm>).

The U.S. Environmental Protection Agency (EPA) has added certain algae associated with HABs to its Drinking Water Contaminant Candidate List. This list identifies organisms and toxins that EPA believes are priorities for investigation. The U.S. Geological Survey is working to characterize the sources, occurrence, transport, and fate of cyanotoxin mixtures in various environmental settings. Recent work shows that these cyanotoxin mixtures consistently co-occur with taste and odor-causing algal compounds (http://toxics.usgs.gov/highlights/algal_toxins/). NOAA maintains multiple HAB research, management, and response efforts through the National Centers for Coastal Ocean Science. NOAA efforts range from remote sensing to tracking and forecasting coastal blooms to biomolecular research to investigate the cause of blooms, as well as the effect on coastal health, fisheries resources, and human health (<http://www.cop.noaa.gov/stressors/extremeevents/hab/current/noaaHab.aspx>).

Harmful Algae Blooms in Oregon



Mikeal Jones of the U.S. Forest Service samples Lemolo Lake in Oregon. (Photo by Jennifer Ketterman, Oregon HAB Surveillance program)

Oregon's Public Health Division (OPHD) has issued public health advisories for HABs in lakes, reservoirs, rivers, and streams since the mid-1990s. Oregon's Department of Fish and Wildlife and Department of Agriculture monitor the Pacific coast and recreational shellfish for marine algae blooms (http://www.oregon.gov/ODA/FSD/shellfish_status.shtml).

The HAB Surveillance Program at OPHD relies on water-quality monitoring data collected by partner agencies including local, state, and federal land and reservoir managers, parks and recreation providers, water and power generation providers, and others. Partner agencies provide the algal cell count and/or algal toxin data OPHD needs to determine whether an advisory is warranted. OPHD works with their partners, county health departments, and the media to alert the public when a HABs hazard exists and when it is safe to resume water contact activities.

Funding from the CDC HABISS program enables OPHD to systematically track HABs, collect HAB-related illness reports and raise HAB awareness among Oregonians. OPHD developed HAB awareness posters, signs, and newsletter articles and participated in radio interviews. This increased awareness might be a factor in the recent dramatic increase in HAB advisories (five advisories during 2005 versus 22 advisories during 2010). Collection of illness reports allowed OPHD to learn that HABs-related dog deaths occur in still and slack water adjacent to flowing streams, thus expanding their focus from lakes and reservoirs.

OPHD is working with partners to improve guidance for water-quality monitoring of HABs, with the objective of protecting public health. They are also working to engage public audiences at affected waterbodies with new permanent signage and hope to use social media outlets like Twitter to alert Oregonians about new or lifted public health advisories. Through the State Drinking Water Program, OPHD is engaged with drinking water providers to provide guidance for monitoring, treatment, and customer communications strategies. OPHD hopes to sponsor algal identification and toxin testing workshops, as in the past, for partners engaged in HAB monitoring. **For more information about the Oregon HAB Surveillance Program, visit <http://healthoregon.org/hab>.**

Contributed by: Curtis Cude, Oregon Public Health Division, curtis.g.cude@state.or.us, (971) 673-097.

Monitoring Council Recommends Comprehensive Monitoring Program Strategy for California



In late December 2010, the California Water Quality Monitoring Council presented to the Secretaries of the California Environmental Protection Agency and the California Natural Resources Agency its recommended Comprehensive Monitoring Program Strategy for California. As mandated by California Senate Bill 1070 (Statutes of 2006) and a

Memorandum of Understanding between the two agencies, the Comprehensive Strategy is a 10-year plan to achieve ambitious goals for monitoring in California. These essential ingredients to effective decision making to protect, restore, and improve water quality and aquatic ecosystems statewide include the design and implementation of water quality and associated ecosystem monitoring programs, the use of monitoring data in assessments, and the development of tools and supporting infrastructure to enable wide access to data and information products. Since its inception in late 2007, the Monitoring Council has made significant progress toward these goals, working with limited resources and the cooperation of other agencies and programs. The 10-year plan presented in the Comprehensive Strategy describes the specific actions needed to

build on this initial success and create lasting benefits for the state's water quality and associated ecosystem management programs.

The recommended Comprehensive Monitoring Program Strategy builds on the Monitoring Council's 2008 Recommendations report and two years of progress by its theme-specific workgroups developing a set of *My Water Quality* Internet portals (www.CaWaterQuality.net).

The strategy is available at:

http://www.waterboards.ca.gov/mywaterquality/monitoring_council/index.shtml#product.

The Comprehensive Strategy was developed in coordination with the State Water Resources Control Board, and includes an update of the Board's Surface Water Ambient Monitoring Program (SWAMP) monitoring and assessment strategy, assessment framework and needs assessment, reflecting the benefits of increased coordination and integration of information from other agencies and information sources. The SWAMP Strategy is discussed in the article below.

For more information, contact: Jon Marshack, California Monitoring Council Coordinator, jmarshack@waterboards.ca.gov

SWAMP Releases 2010 Monitoring and Assessment Strategy

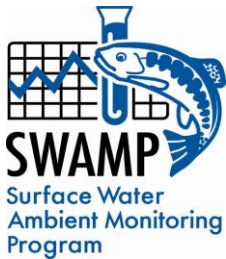


In late December, the California State Water Board's Surface Water Ambient Monitoring Program (SWAMP) released the 2010 update to its *Comprehensive Monitoring and Assessment Strategy to Protect and Restore California's Water Quality* (2010 SWAMP Strategy), **available at:**

http://www.waterboards.ca.gov/water_issues/programs/swamp/reports.shtml#plan_docs

The 2010 SWAMP Strategy reports on the progress SWAMP has made in the first five years of a 10-year effort to develop a coordinated and comprehensive monitoring and assessment framework for California Water Board programs. It also highlights steps that need to be implemented to complete the framework and integrate it into other California Water Board programs and improve coordination among other agencies, non-governmental organizations, and other entities that monitor surface water throughout the state. The 2010 SWAMP Strategy also emphasizes collaboration with the California Water Quality Monitoring Council and SWAMP's commitment to their theme-specific workgroup and *My Water Quality* web portal approach as a way to identify opportunities for improved coordination of monitoring activities, share guidance and information on indicators and their appropriate use, and ultimately lead to increased data sharing and comprehensive assessments based on data from multiple programs.

For more information, contact: Adam Ballard, aballard@waterboards.ca.gov



The Maryland Water Monitoring Council holds its 16th Annual Conference



The theme of the Maryland Council's 2010 annual conference held on November 18th at the Maritime Institute, North Linthicum, Maryland, was *Environmental Justice: Healthy Waters, Healthy Communities*.

The conference brought together

individuals from diverse groups to discuss environmental justice, environmental issues, and the application of sound science in water monitoring and decision making. A morning plenary session included talks by Vernice Miller-Travis (Vice Chair of the Maryland State Commission on Environmental Justice and Sustainable Communities) and Steward Pickett (Director of the Baltimore Ecosystem Study Long-term Ecological Research Program), and five concurrent technical sessions. During lunch, 25 posters were displayed for perusal by conference attendees. The afternoon consisted of eight concurrent technical sessions on topics including Innovative Monitoring Methods, Citizen Science and Stewardship, Stream Restoration, Climate Change Adaptation, Urbanization and Eco-hydrology, Education and Outreach, Stream Health Assessments, and Restoration Success Stories.

More information, including presentations and photos from the conference, can be found at:

<http://mddnr.chesapeakebay.net/MWMC/MWMC2010/annualConference.asp> or contact: Daniel Boward, dboward@dnr.state.md.us

Highlights from February 2011 New Jersey Water Monitoring Council Meeting



About 35 members of the New Jersey Water Monitoring Coordinating Council (NJWMCC) met at USGS' New Jersey Water Science Center (NJWSC) on February 9 to discuss data exchange, monitoring networks, and water-quality sensors. In the morning session, focus

was on the NJ Water Quality Data Exchange and Brick Township Ambient Monitoring Network. The afternoon discussion focused on sensors, led off by Leslie McGeorge, Co-Chair of the NJWMCC, discussing the inventory, history, and other issues related to the use of sensors for water monitoring in New Jersey. Discussion of sensors continued as Dan Sullivan, chair of the NWQMC Methods and Data Comparability Board, provided information on the Aquatic Sensor Workgroup and their tools for generating data of known quality. Eric Vowinkel from the NJWSC presented findings of a USGS study (funded by the EPA's, Office of Research and Development) that tested four optical nitrate sensors in waters of different salinity, turbidity, and organic carbon in New Jersey. The use of sensors for monitoring of ambient and regulatory purposes was discussed in presentations by both EPA Region 2 and the NJ Department of Environmental Protection (NJDEP). Differences between federal and state requirements were discussed. The NJWMCC's next meeting will be held at the Delaware River Basin Commission on May 25, 2011. Monitoring in the Barnegat Bay watershed and estuary will be the the main technical topic.

For more information, including presentations, visit:

<http://www.state.nj.us/dep/wms/wmcchome.html> or contact: Eric Vowinkel, vowinkel@usgs.gov

Happy Birthday to the Utah Monitoring Council – Now One Year Old!

In 2010, the Utah Department of Environmental Quality facilitated formation of a statewide Monitoring Council to coordinate water-quality monitoring in Utah. Stakeholders include a broad base of state, federal, and non-profit agencies, as well as industry and the public. Monitoring Council meetings are open to all interested parties and are held several times a year. The initial objectives of the group are to coordinate monitoring efforts, develop water quality training for citizen monitors, and assess comparability of monitoring procedures among partner monitors. The most recent meeting of the Utah Council focused on topics such as Utah's citizen monitoring efforts, volunteer lake monitoring, quality assurance and quality control for citizen monitoring data, *E. coli* monitoring, and protocols for sampling of Chlorophyll-a.



For more information, visit: <http://www.waterquality.utah.gov/Monitoring/Council/index.html>, or contact: Rob Bird, Utah Water Monitoring Council Coordinator, rbird@utah.gov, (801) 536-4362.

Volunteer Monitoring

Volunteer Monitoring Helps Iowa Schools Meet State Standards



Iowa students measuring dissolved oxygen.
(Photo courtesy of Christopher Soldat, Grant Wood Area Education Agency)

Iowa's citizen monitoring program, IOWATER, celebrated its 10th anniversary in 2010. Along the way, IOWATER trained hundreds of K-12 teachers in chemical, physical and biological monitoring protocols. However, teachers faced problems integrating the IOWATER program into the established school curriculum and conducting field trips, especially when the field trips were not considered integral to helping students achieve state educational standards.

To address these issues, the IOWATER program and the Grant Wood Area Education Agency collaborated on a U.S. Department of Education Math and Science Partnership Grant to provide professional training and technical support for 50 high school teachers in Eastern Iowa. The iGISST grant (Inquiry: Geographic Information Systems in Science Teaching) was a three-year program aimed at helping Iowa teachers meet new state educational standards also known as the Iowa Core Curriculum. The Iowa Core emphasizes student inquiry and the notion that science content and process are inextricably linked in science education.

According to the Iowa Core, science instruction should be engaging and relevant for students with a strong connection to their daily lives. Allowing the students to pose questions on Iowa's water quality and formulate investigations based on their concerns or interests is more meaningful than conducting experiments where the outcome is already known. Volunteer monitoring programs are important in supporting inquiry-based education since they are able to provide the authentic research component often missing in science curriculum. In Iowa, the IOWATER monitoring protocols can be easily modified for use with K-12 students and can be adapted to fit into a variety of science classes with grade-appropriate inquiry.

During the three-year iGISST grant, the IOWATER team provided 100 hours of professional development by mentoring science teachers on volunteer monitoring methods, locating water quality monitoring data in the IOWATER database, using various online tools (such as the Iowa Water Quality Atlas), and locating the latest information on Iowa's water quality. IOWATER data have become increasingly important to educators as they use the IOWATER database to help students evaluate their own data and gather historical data on monitoring sites. The IOWATER team assisted in formulating questions and providing advice to teachers and classes as needed. As a final project, students prepared posters and presented their investigations at a University of Iowa symposium, discussing their research with other students and fielding questions from professionals. Feedback from the students and teachers was overwhelmingly positive. Based on the success of the event, IOWATER is evaluating the feasibility of holding an annual state-wide symposium for our student researchers.



Eastern Iowa teachers collecting IOWATER equipment at a training workshop. (Photo courtesy of Jacklyn Gautsch, IOWATER)

Contributed by: Mary Skopec, Mary.Skopec@dnr.iowa.gov.

Taming the QAPP Beast

As state budgets shrink and the complexity of water protection and restoration efforts increases, the role and impact of volunteer monitoring may also be increasing. Regulatory agencies can use volunteer-collected monitoring data to assist them in tracking sources of point and nonpoint source pollution; analyzing water-quality trends; developing watershed or source-water protection plans; monitoring the effectiveness of Best Management Practices; identifying impaired waters; or evaluating compliance with total maximum daily load allocations.

Agencies can, and often do, use volunteer data if the data are of known and documented quality. The first step in ensuring this is to have a Quality Assurance Project Plan (QAPP) – a standardized format that communicates the quality of collected data. Agency data users must know the answers to the following questions in order to determine if volunteer data meet their needs:

- Why were the data originally collected?
- What indicators were selected and are they the right ones for this purpose?
- What methods were used in the field and laboratory?
- Where and when were samples collected?
- What did collectors do to ensure the quality of the data?
- How were data recorded and managed, and in what format are they stored?

These questions can be answered in a QAPP that is reviewed and approved by the state agency. However, in many instances the QAPP development, review and approval process can be time consuming and frustrating, especially for cash strapped non-profits. Many groups depend on funding sources that require a QAPP before any monitoring can begin. Time spent waiting for approvals consumes precious resources that could have been used for actual monitoring or analyses.

Therefore, the QAPP review and approval process needs to be standardized and streamlined. A successful, standardized review process requires commitment from agencies and volunteers alike, and would include the following:

1. *Agencies* determine and document study design essentials (what, when, where, methods, data quality objectives, data management and reporting) and document their known minimum data quality requirements. Once agencies have determined the information they need for decision making and have established a process to review external data, associated agency QAPP guidance and requirements are made clear to all external data generators. Agencies need to have a transparent way for the volunteers to submit the QAPP and provide constructive feedback to the groups during the review process.
2. *Volunteers* document their study designs and use the QAPP tool to demonstrate that they are capable of meeting agency needs.
3. *All documentation from both agencies and volunteer monitoring organizations is available* on the web or in accessible files, including existing QAPPs, Standard Operating Procedures, methods, instrumentation, forms, and reports. If the content of the material is complete and easily accessible, communication problems will not be a barrier or a frustration for either entity.

Collaboration is the key to successfully managing our water resources. Let's start by taming the quality assurance beast and harnessing the energy of volunteers, on the ground and in the water.

For more information on the QAPP process, please visit:

<http://www.usawaterquality.org/volunteer/>
<http://www.dickinson.edu/about/sustainability/allarm/content/Technical-Assistance/>
<http://water.epa.gov/type/rsl/monitoring/qappcovr.cfm>
<http://www.uri.edu/ce/wq/ww/Qapps.htm>
<http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/quality-assurance>

Contributed by: Danielle Donkersloot, Danielle.Donkersloot@dep.state.nj.us, (609) 633-9241; Nancy Roberts-Lawler, Musconetcong Watershed Association; and Barb Horn, Barb.Horn@state.co.us, (970) 382.6667.

Protecting Manoomin (Wild Rice) Through Modern Science and Traditional Ecological Knowledge



Wild rice is harvested by hand (ricing) annually by the Ojibwe. (Photo courtesy of Nancy Schuldt, Fond du Lac Band of Lake Superior Chippewa)

The Fond du Lac Band of Lake Superior Chippewa has been working to protect and restore culturally significant wild rice waters on their reservation in northeastern Minnesota, 20 miles inland from Lake Superior. This work has involved a special use designation and criteria in the Band's water quality standards, targeted monitoring for the unique hydrologic and water chemistry requirements for *Zizania aquatica*, and rigorous scientific research projects. Traditional, sustainable harvesting of this subsistence resource has been central to Ojibwe culture for centuries, and wild rice or manoomin is considered a sacred gift from the creator.

The Stoney Brook watershed, where the rice waters are located, was extensively ditched in the early 1900s to encourage settlement and agriculture, and the result was a loss of over 2,000 acres of productive wild rice beds. The remaining rice beds are vulnerable to rapid fluctuations in water levels from large storm events, which can easily uproot the plants, especially during the floating-leaf stage in late spring (see Front Cover). The altered hydrology has also enabled native perennial aquatic vegetation to out-compete the annual wild rice plants.



Ditching in the early 1990s resulted in the loss of about 2,000 acres of wild rice beds. (Photo courtesy of Nancy Schuldt)

Fond du Lac constructed a series of water control structures to assist in the water level management of the wild rice lakes, and is using mechanical cutters and harvesters to remove several hundred acres of sedge mat, cattails, pickerel weed, and other robust aquatic plants that have succeeded in the areas that once supported wild rice. Coupled with aggressive re-seeding efforts, these management activities will help restore much of the lost wild rice resource within the reservation.

The Band is currently engaged in several research projects designed to improve management and advance understanding of the functional ecology of wild rice. Together with the U.S. Geological Survey (USGS) and the Natural Resource Conservation Service (NRCS), the Band collaborated on a watershed model that couples surface water and groundwater responses to precipitation events, allowing managers to better maintain optimal hydrologic conditions in the wild rice beds. NRCS developed the surface water component of the model, including detailed surveys and cross-sections of the ditch network. The objective of the USGS component of the study was to assess hydraulic gradients, flow directions, and recharge rates to shallow aquifers, and assess the effect of the judicial ditch system on surrounding groundwater resources in the Stoney Brook Watershed. In the future, the Band will also use model output to identify good candidate ditch segments for decommissioning.



Students examine a sediment core taken from a wild rice bed. (Photo courtesy of Nancy Schuldt)

The Band has also collaborated with University of Minnesota researchers on two major National Science Foundation (NSF) funded projects. Dr. John Pastor of the University of Minnesota Duluth has led a multi-year study of nutrient cycling dynamics to determine factors that contribute to long-observed 'boom' and 'bust' population cycles of natural wild rice. Historically, the Ojibwe have adapted to these cycles by harvesting from many different wild rice lakes and flowages throughout the region, as each rice bed's annual productivity varies independently. The second NSF project involves sediment coring and paleoanalysis of historic conditions, including diatoms, pollen, ostracods and phytoliths (species-specific silica structures in plant cell walls) from wild rice beds. This project is in partnership with the University of Minnesota's LacCore facility, and includes substantial research opportunities for tribal students.

Contributed by: Nancy Schuldt, Water Projects Coordinator, Fond du Lac Environmental Program, Fond du Lac Band of Lake Superior Chippewa, NancySchuldt@fdlrez.com.

World Water Monitoring Day

Global Participation in World Water Monitoring Day™ Increased by 73 Percent in 2010



A total of 212,502 people worldwide visited their local streams, rivers, lakes and other water bodies in celebration of World Water Monitoring Day™ (WWMD) 2010, according to the program's Year in Review report released in February 2011 by the Water Environment Federation (WEF) and the International Water Association (IWA). The 2010 results represent a 73 percent increase in program participation from the previous year. WWMD is officially observed each year on September 18.

As an international education and outreach program that builds public awareness and involvement in protecting water resources around the world, WWMD engages citizens to conduct basic monitoring of their local water bodies. Although some participants acted as individuals, many took part with schools, universities, civic, environmental, and faith-based groups. Data was reported from 85 countries including the United States with 2,931 monitored sites, followed by Spain (1,485), Romania (301) and Malaysia (290).

Participants from Albania to Zimbabwe tested their local waterways for four key water quality indicators: dissolved oxygen (DO), pH (acidity), temperature, and turbidity (clarity). Some groups also monitored for the presence of certain macroinvertebrates such as dragonflies, mayflies and scuds. Samples were taken in a range of settings—agricultural, commercial, residential and industrial—on six continents. Throughout 2010, the program distributed more than 16,500 WWMD monitoring kits worldwide—500 more kits than those distributed in the previous year. Participants can monitor and report data to the WWMD database anytime from March 22 (World Water Day) until December 31.

WEF and IWA received financial and in-kind support from the program's primary sponsors including the U.S. Geological Survey, the U.S. Environmental Protection Agency, PerkinElmer, ITT Corporation, Sinclair Knight Merz, and Smithfield Foods.

For a complete list of program partners, as well as more detailed statistics, please see: "World Water Monitoring Day 2010 Year in Review" at www.worldwatermonitoringday.org **or via request:** wwmd@wef.org **or contact:** Lori Harrison, (703) 684-2480, lharrison@wef.org

Contributed by: Carl Myers, Water Environment Federation, cmyers@wef.org, (703) 684-2416.

Workgroup Updates

News from the Water Information Strategies Workgroup

The Council's Water Information Strategies (WIS) Workgroup continues to assist with the development of a national network of comparable reference sites. Bill Wilber and Jeff Deacon, the USGS Co-chairs for this reference network, presented a draft concept paper to the Workgroup in February, 2011. The WIS Workgroup will be helping to craft a strategy to move forward with national reference network.

In other activities, the WIS workgroup is examining the role of volunteers in monitoring programs and how the Council can better support volunteer monitoring efforts. As part of this effort, the State of South Carolina has been evaluating how states use third party data (data not generated by the state programs) for water quality assessment. Results of this study will help to formulate the next steps to engage with volunteer communities (see article on "South Carolina Exploring Use of Outside Data for Regulatory Decision-Making").

The WIS Workgroup meets on the second Wednesday of each month and in conjunction with Council meetings, which occur three times a year. Workgroup calls have focused on the topics listed below and several priority topics have been identified for upcoming Workgroup conference calls and as products.



Christopher Case is conducting a survey of states' use of outside or third party data in their regulatory process. (Photo by Dave Chestnut)

Upcoming topics:

- Water Quality Statistics and Assessment
- Integrated Approaches to Monitoring and Assessment (Local, State, and Federal programs)
- Use of Volunteer Monitoring Data in State Monitoring and Assessment Programs

For more information, or if you wish to participate in these Workgroup calls, contact: Peter Tennant, ptennant@orsanco.org, (513) 231-7719.

South Carolina Exploring Use of Outside Data for Regulatory Decision-Making

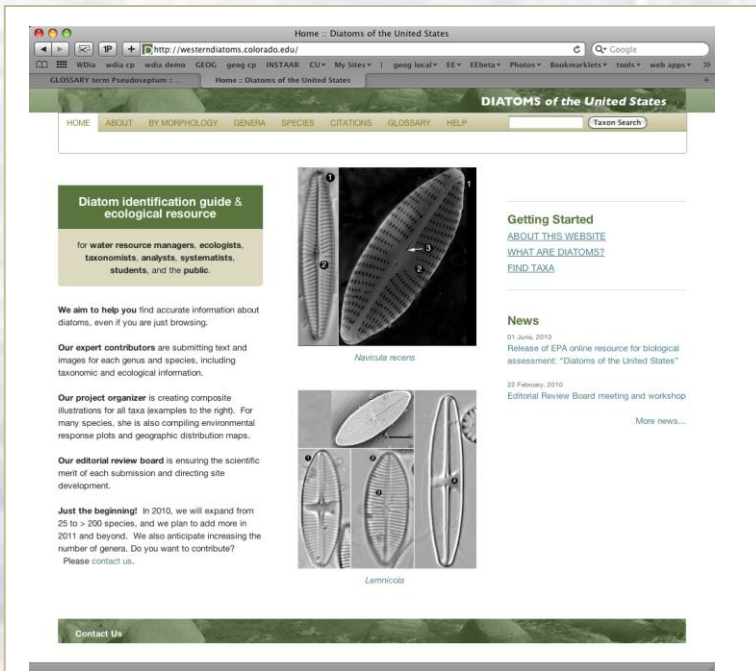
Many state water quality agencies are struggling to maintain their ambient water quality monitoring activities in this time of shrinking budgets and reduced staffing. The South Carolina Department of Health and Environmental Control (SCDHEC) is exploring options for using water quality data generated from sources outside the agency, such as volunteer monitoring organizations.

SCDHEC is conducting a survey into how states use outside or third party monitoring data in their regulatory processes, such as developing Section 303(d) lists of impaired waters, conducting water pollution enforcement actions, developing TMDLs, and documenting water quality restoration or improvement. The survey asks questions such as: Is there a distinction between regulatory and non-regulatory data quality? What sorts of data quality assurance requirements are in place to ensure legally defensible data? How are monitoring organizations run? How are the data managed and by whom? To date, 34 states, five monitoring councils, and several SC monitoring organizations have been interviewed. An online questionnaire for volunteer monitoring organizations (<http://www.surveymonkey.com/s/3HHQJ5V>) was developed for the survey.

The final goal of this project is to develop some models for state use of third party data. These models will contain information about different possible organizational structures, identifying stakeholders and potential involved parties, data quality control requirements, training and possible certification options, data management needs, and potential funding opportunities. SCDHEC expects that the results of this project will also be of use to others and will help promote the collection of regulatory-quality data through volunteer monitoring or other groups.

Contributed by: Christopher Case and David Chestnut, chestnde@dhec.sc.gov, (803) 898-4066.

An Online Guide to "DIATOMS of the United States" Now Available



The online guide "Diatoms of the United States" includes 178 diatom taxa, with an additional 200 planned by the end of 2011. (Image courtesy of Sarah Spaulding)

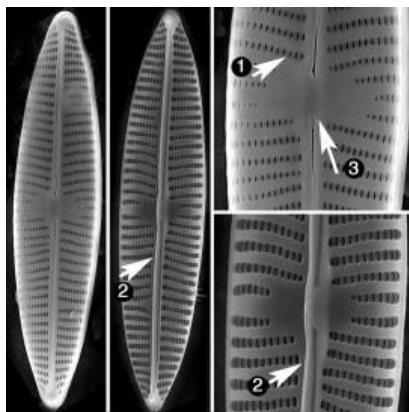
Diatoms are algae that are present in nearly all streams, lakes and estuaries and are sensitive to natural and human impacts. As such, they are important indicator organisms, and monitoring their condition provides information about ecosystem health. Together with aquatic invertebrates and fish, diatoms are included in federal and state monitoring and assessment programs as key indicators of biological condition.

To date, taxonomic and ecological research on North American diatoms has been incomplete or out-dated, constraining the ability of federal and state agencies to consistently assess the biological condition of aquatic ecosystems. A new online guide will promote taxonomic consistency and serve as the primary ecological resource on diatom biodiversity for the nation. The online guide is targeted toward laboratory analysts, taxonomists, ecologists, students, water resource managers and the public.

The online guide "Diatoms of the United States" integrates taxonomic, distributional and ecological information, as well as images of diatom species in the United States. Individual species pages are prepared using a standard data aggregation procedure. Species are grouped by genus and common morphological type, providing user flexibility, especially for non-specialists, in making identifications through a visual key. All data are peer-reviewed by recognized experts in diatom taxonomy.

"Diatoms of the United States" was developed with support from the USGS National Water-Quality Assessment Program and the U.S. EPA's Environmental Monitoring and Assessment Program and National Aquatic Resource Surveys.

To access "Diatoms of the United States", including readily-accessible images for identification, go to: <http://westerndiatoms.colorado.edu>, or for more information, contact: Sarah Spaulding, sarah.spaulding@usgs.gov, (303) 492-5158.



The online guide to diatoms includes detailed images, such as this image of *Navicula*, for accurate identification. (Image courtesy of Sarah Spaulding)



Attached algae growing in an eastern Utah stream shows the characteristic golden brown color of diatoms, and is made up of a mixed assemblage of diatoms attached by stalks - *Gomphonema* and *Gomphoneis* species. (Photo courtesy of Sarah Spaulding)

Screening for Optical Brighteners

Optical brighteners are used in common household items such as laundry detergent, make-up, and some shampoos and conditioners. When optical brighteners are detected in local water bodies, this can be a good indicator that effluent from the neighboring households may be impacting water quality. Thus, testing for optical brighteners can be a simple and effective way of determining if water is being impacted by wastewater effluents.

There are several different methods that can be used to detect optical brighteners in local waterbodies. While some methods can be very complex, requiring expensive monitoring equipment, other methods can be very simple, using items that you can find at the local hardware store and a black light.

One of the simplest methods is to place fabric made from unbleached cotton in the water. Unbleached cotton, when placed under a black light, will not fluoresce. However, cotton that has been exposed to optical brighteners will fluoresce when placed under a black light.

In order to use this method, water needs to pass directly through unbleached cotton. To make sure this occurs, it may be beneficial to attach the unbleached cotton cloth to the end of a piece of two-inch PVC pipe. This will allow the water to pass through the pipe and the unbleached cotton (see Figure 1). For best results, deploy the device for a period from several days to a week. Since some people only do laundry a couple times a week, you may miss your window if your device is only deployed for one day.

After retrieving the device, remove the unbleached cotton cloth from the end of the pipe. Take the unbleached cotton into a dark room and place it under a black light. If optical brighteners are present the cloth will fluoresce under the black light (See Figure 2).

Note: The method described here may be an effective way to determine if optical brighteners are present in local water bodies; however, it is not a quantitative measure of the amount of optical brighteners present in the water. To determine concentrations, it is necessary to use additional monitoring equipment such as fluorimeters.

Contributed by: Jim Bowcutt and Jeff Ostermiller, Utah Division of Water Quality, jostermiller@utah.gov, (801) 536-4370.



Figure 1. Monitoring apparatus used in field. (Photo courtesy of Jim Bowcutt)



Figure 2. Positive results (on left) of the presence of optical brighteners compared to an unused piece of unbleached cotton cloth (on right). (Photo courtesy of Jim Bowcutt)

National Monitoring Network

National Groundwater Network's Pilot Studies Complete One Year Projects

In 2007, the Advisory Committee on Water Information (ACWI) formed a Subcommittee on Ground Water (SOGW) to develop and encourage implementation of a nationwide, long-term groundwater quantity and quality monitoring framework. The SOGW is a collaboration of scientists from private industry, nongovernmental organizations, federal, state, and local governments, and academia. SOGW completed a comprehensive design plan for a "National Ground Water Monitoring Network" (NGWMN) in 2009, and five volunteer pilot projects began in January 2010 to test the proposed network design and implementation concepts. These five state- and aquifer-based pilots — Montana, Texas, Minnesota, Illinois-Indiana, and New Jersey— have completed their one-year projects.

Wells were selected within principal and major aquifers in a pilot area that met the overall design criteria of the NGWMN. Key elements of this design include the spatial distribution of sites, measurement/sampling frequency, field methods, and data management procedures. A major step for the pilot studies was selecting representative monitoring points considering four

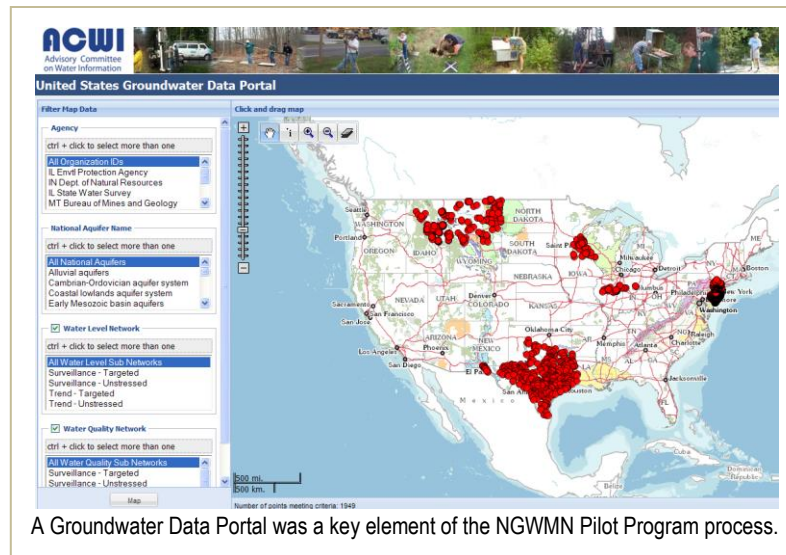
dimensions – the three-dimensional groundwater flow system and time. Each pilot study culled through all of the wells or springs in their state monitoring program to meet this objective. Using the NGWMN's purpose-driven classification system, each monitoring point was classified, thus providing supplemental hydrogeologic knowledge that

cannot be determined from the data alone. A NGWMN Internet data portal was developed using state-of-the-art informatics processes to unify data provided from nine disparate data systems. Site data and measurements from NGWMN sites are unified and available through the network data portal.

Individual pilot reports and the SOGW's pilot synthesis report were provided to ACWI in early April and are available to the public at: <http://acwi.gov/sogw>. The pilot process successfully

demonstrated the feasibility of a collaborative national groundwater monitoring network that would provide information necessary for the planning, management, and development of groundwater supplies to meet current and future water needs. The SOGW hopes to enter the implementation phase of the NGWMN in 2012.

Contributed by: Bill Cunningham, wcunning@usgs.gov, (703) 648-5005.



Announcements

Archiving Information about Sustainable Water Resources – Applying the concept of sustainability to water resources requires combining information about water quality with many other types of data; water availability, water use, and related natural resources all are involved. Recent literature search shows that sustainability continues to be important in public policy. To promote coordination of information about the various issues related to sustainability, a website to archive water sustainability information has been developed:

(<http://sites.google.com/site/sustainablewaterresources/>). This site is not focused solely on the work of any one organization, but covers the general discipline, including information from many sources. Users are invited to send pertinent information to etsmithsiri@aol.com for possible inclusion on the site. Because this site is nongovernmental, it does not represent policy positions of any agency or organization. **Contributed by:** Tim Smith, etsmithsiri@aol.com.

NAWQA Science Framework Review by National Research Council – In 2009, USGS requested that the National Research Council's Water Science and Technology Board review and provide guidance on the direction and priorities of the National Water Quality Assessment (NAWQA) Program. This review, which was completed in late 2010, included perspective on past accomplishments and the current and future design and scope of the program as it moves into its third decade of water quality assessment. **Full review available at:**

http://water.usgs.gov/nawqa/NRC_review.pdf, **or contact:** Gary Rowe, glowe@usgs.gov, (303) 236-1461.

Third Maryland Streams Symposium – The Third Maryland Streams Symposium will be held August 10 – 13, 2011 at Carroll Community College near Westminster. Sponsored by the Maryland Department of Natural Resources and the Maryland Water Monitoring Council, the event will be an exciting mix of technical and non-technical presentations, posters, hands-on workshops, field trips, and interactive discussions. The Symposium is open to the public. Educators, students, interested citizens, agency staff, and those working with private businesses are encouraged to attend. **A Hold the Date flyer can be found at:** <http://www.dnr.state.md.us/streams/pdfs/SSSaveTheDate.pdf>. Details will follow as plans for the Symposium unfold. **For more information, contact:** Dan Boward, dboward@dnr.state.md.us, (410) 260-8605.



The USGS NAWQA Program Initiates Quarterly Highlights in January 2011 – Highlights are from the USGS National Water-Quality Assessment Program (NAWQA), which has assessed the physical, chemical and biological characteristics of streams, rivers, and groundwater across the nation since 1991. **To learn more, please visit:** <http://water.usgs.gov/nawqa/>.

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