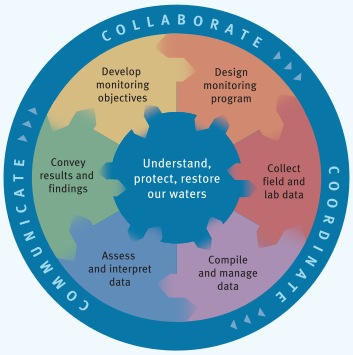
NWQMC
NATIONAL WATER QUALITY MONITORING COUNCIL
Working Together for Clean Water

National Water Monitoring News

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.



Highlights

The Yukon River Inter-Tribal Watershed Council monitors Alaskan waters and reconnects native people and the environment during their annual "Healing Journey" canoe trip. (Photograph by Jon Watershouse, YRITWC)

The Council explores a long-term monitoring collaborative to better serve the public in responding to disasters, such as the BP oil spill in the Gulf of Mexico. (Photograph by Dwight Bradshaw, LDEQ)

The National Water Quality Monitoring Council
Editor: Tracy Hancock
(804) 261-2618 (phone) • email: thancock@usgs.gov
http://acwi.gov/monitoring/

National Water Monitoring News – Words from Council Co-Chairs

Welcome to the second 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 of communication among water practitioners across the Nation. In support of the Council's mission, this newsletter is geared to foster partnerships and collaboration, advance water science, improve monitoring strategies, and advance data integration, comparability, and reporting. This second edition highlights many events, activities and new products even since last April when many of us gathered in Denver at the Council's 7th Biennial conference. We hope the information is useful for your water needs (http://acwi.gov/monitoring). Among the topics you will read about are:

- ✓ Highlights from the Council's 7th National Monitoring Conference and web seminar series.
- ✓ Development of a web portal for aquatic sensors and considerations for building a national reference site network.
- ✓ Integrated assessments from the IOOS® Regional Associations and the National Network for Coastal Waters and a multiregional water quality project for protecting beach health.
- ✓ Updates on monitoring including:
    - o Federal agency efforts in the Gulf of Mexico waters and a long-term monitoring collaborative that could better serve the public in responding to disasters.
    - o National Ground Water Network pilot projects.
    - o Lake Michigan Monitoring Coordination Council implementation of Great Lakes Restoration Initiative.
    - o Volunteer monitoring of the environmental impacts of Marcellus Shale gas extraction.
    - o Native American monitoring of Alaska waters including a "Healing Journey" canoe trip.

As always, we encourage you to be an active part of this forum – and specifically to share your successes and challenges in monitoring, 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 future editor, Cathy Tate, cmtate@usgs.gov, (303) 236-6927. New articles and ideas are always welcome!

We end with much appreciation to Tracy Hancock (USGS) and greatly thank her for her perseverance, creativity and initiation of the Council newsletter and serving as editor for its first two issues.

So, 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!

Sincerely yours,

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

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

National Council Highlights

Highlights from the 7th National Monitoring Conference

Almost 950 attendees from all 50 of the United States as well as the District of Columbia and Puerto Rico, 23 Tribes, and 8 countries attended the Seventh National Monitoring Conference "From the Summit to the Sea" in Denver, Colorado, April 25-29, 2010. Attendees chose from hundreds of presentations, workshops, and poster presentations as well as interacted with over 40 exhibitors. A stellar lineup of accomplished plenary speakers included Anne Castle (Assistant Secretary for Water and Science, DOI), Tracy Mehan III (Principal, The Cadmus Group, Inc.), Thomas Tidwell (Chief, U.S. Forest Service), and Robert Hirsch (USGS Research Hydrologist). Awards were presented to Robert Ward (2010 Elizabeth Jester Fellows Award), Terry Flemming, USEPA, (Council's Visionary Award), and Friends of the North Fork of the Shenandoah River (YSI Foundation's Minding the Planet Award). Ten Federal agencies with water quality and water stewardship responsibilities were represented along with State, regional and municipal agencies, watershed districts, volunteer monitoring coordinators, tribal leaders, laboratories, private practitioners, consultants, industry, academics and students.

Presentations On-Line from the 7th National Monitoring Conference

Presentations from the Council's biennial National Monitoring Conference are now available at: http://acwi.gov/monitoring/conference/2010/. Many thanks to our colleagues at NALMS, Tetratech, and USGS.

Council to host 8th National Monitoring Conference in 2012

The Council looks forward to hosting the 2012 National Water Quality Monitoring Conference. For updates, look for announcements in future newsletters and on the Council website: http://acwi.gov/monitoring/.

For additional information, contact: Jeffrey Schloss, jeff.schloss@unh.edu, (603) 862-3848.

Web Seminar Series

The Council continues to host quarterly web seminars (webinars) involving State, regional, and tribal councils, as well as watershed groups and alliances and the volunteer community from across the Nation, for up-to-date information exchange. 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 new organizers of the webinar series, Cathy Tate and Barb Horn. Suggestions and participation are always welcome! We thank Tracy Hancock (USGS), former webinar organizer, for her help in designing and kicking off this seminar series.

Five web seminars have been hosted to date, highlighting the following presentations:

- 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
- Integration of citizen monitoring data into Virginia's State assessment report and an online database tool managed by the Virginia Monitoring Council
- New web technologies and social media tools for the water monitoring community
- An Introduction to Aquatic Sensors and the Council's Aquatic Sensor Workgroup
- Using the California Water Environmental Data Exchange Network (CEDEN) co-sponsored by the California Water Quality Monitoring Council

Presentations from past and upcoming web seminars are available on line: http://acwi.gov/monitoring/workgroups/co/webinars.html

For more information, contact: Cathy Tate, cmtate@usgs.gov, (303) 236-6927 or Barb Horn, Barb.Horn@state.co.us, (970) 382-6667.

Tributes

In Memory of Council Member Barry Long

Barry Long served the Council as the National Park Service (NPS) representative for 10 years, where he assisted with the development of the National Monitoring Network, served on the Collaboration and Outreach Workgroup, and was a primary organizer of the 7th National Monitoring Conference in Denver during 2010.

Barry, a 19-year employee of the NPS, served as a water quality specialist with the Water Resources Division in Fort Collins, Colorado, and recently assumed the position of surface water program coordinator for the U.S. Forest Service in Washington, D.C. Barry was most identified with the development and administration of the USGS-NPS water quality partnership program. His 11 years of coordinating this program resulted in 124 project completion reports for projects in 99 park units. Barry will be remembered as a dedicated and tactful advocate for the protection of water resources, and he grasped the complex connections between seeming divergent water resources issues. During his spare time, Barry enjoyed bicycling, hiking, and skiing throughout the Rocky Mountains and supporting the Denver Broncos.

Barry, a devoted husband and father, died in Washington, D.C., on September 8. Barry will be missed by his many friends and colleagues on the Council and in the water monitoring community. A Celebration of Life was held on Sunday, October 3, at the Drake Centre in Fort Collins. Contributions can be made in Barry's memory to The Leukemia and Lymphoma Society.

Contributed by: Gary Rosenlieb (NPS), Gary_Rosenlieb@nps.gov, (970) 225-3518.

In Honor of Former Council Co-Chair Chuck Spooner

Chuck Spooner has retired from the USEPA after a 28 year career. Chuck served as the USEPA co-chair of the National Water Quality Monitoring Council for 12 years, leading the Council through a period of growth and accomplishment. He served as co-chair of the second through seventh National Water Quality Monitoring Conferences, helping to grow the conference into the premiere event for the Nation's water monitoring community. He had a hand in every one of the Council's accomplishments, and was instrumental in increasing the number of collaborators in national, State, regional, and tribal councils. Most importantly, Chuck made the Council more than a collection of individuals representing various interests; he set the tone for the development of friendships among the Council members, making it more than just another collaboration. Chuck looks forward to spending time in retirement with his wife at their home on Cape Cod while still keeping in touch with the Council through his involvement with the Sensors Workgroup. All members of the Council, past and present, wish their good friend Chuck all the best in the next chapter of his life story.

Contributed by: Peter Tennant, ptennant@orsanco.org, (513) 231-7719.

Welcome New Council Members!

Richard Hooper - Academic Representative
Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI)
Medford, Massachusetts

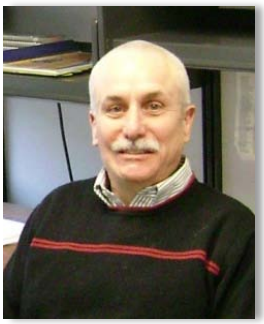
Richard Hooper has served as President and Executive Director of the Consortium of Universities for the Advancement of Hydrologic Science, Inc. since 2003. CUAHSI is a consortium of 134 universities, colleges, and research centers. CUAHSI's mission is to enable the water science community to advance the understanding of water and its centrality to life, Earth, and society through the development of research infrastructure. Richard has an educational background in Environmental Systems Engineering and Applied Mathematics and worked for many years as a research hydrologist for the USGS. His research interests include hillslope hydrology, catchment biogeochemistry, and multivariate analysis of water-quality data. Through his service to the Council, Richard plans to further multi-collaborative data integration efforts.

Barb Horn - Volunteer Monitoring Representative
Colorado Division of Wildlife
Durango, Colorado

Barb Horn is a Colorado native, who has worked on water quality issues in Colorado rivers since 1986, while working as a water resource specialist for the Colorado Division of Wildlife. She founded the Rivers of Colorado Water Watch Network, a volunteer monitoring program which annually monitors over 400 stations on more than 500 rivers in Colorado. Barb chairs the 16-year-old Rocky Mountain Watershed Network volunteer program. She is current Co-Chair of Colorado's Water Quality Monitoring Council and Outreach, Chair for their Data Sharing Network Project, and a member of the Colorado Non Point Source Alliance. Through her service to the National Council, Barb desires to more effectively integrate and elevate the scientific and technical work and collaborations between Federal agencies, the National Council, State and regional councils, and volunteer monitoring organizations.

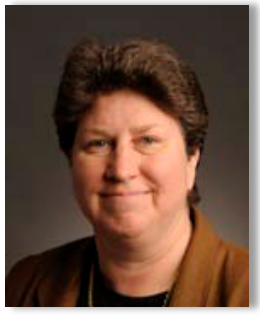
Gunnar Lauenstein - National Oceanic and Atmospheric Administration (NOAA) Representative
National Centers for Coastal Ocean Science (NCCOS)
Silver Spring, Maryland

Gunnar Lauenstein has worked for NOAA's National Status and Trends program since 1984 and has been responsible for various aspects of the Mussel Watch program since its inception in 1986. He is now the Branch Chief for the Coastal Ocean Assessments, Status, and Trends Branch. Gunnar was a representative NOAA scientist aboard the BP chartered ship *Ocean Veritas,* the research vessel in the Gulf of Mexico during the time when oil was still being released during the Deep Water Horizon incident. Through his service to the Council, Gunnar hopes to further the collaborative development of measurement and assessment tools for evaluating the impact of environ-mental disasters on Great Lakes, coastal, and marine ecosystems so that restoration measures may be planned.



Carl Myers - Technical and Educational Organization Representative
Water Environment Federation
Alexandria, Virginia

Before joining the Water Environment Federation (WEF) as Assistant Director, Public Policy, in February 2009, Carl Myers had 33 years experience developing and overseeing national Clean Water Act programs, including watershed management, nonpoint sources and Clean Lakes, water-quality monitoring and assessment, TMDLs, and water-quality data systems that modernized STORET. Carl served for 15 years as USEPA Deputy Division Director responsible for national Clean Water Act watershed programs; he is recognized as a national expert on nonpoint source water pollution and related agricultural issues. In a 2004 executive exchange, he chaired the USDA inter-agency task force responsible for initiating and overseeing the Conservation Effects Assessment Project to quantify the environmental benefits of Farm Bill conservation programs. As a licensed Professional Engineer in Virginia, Carl plans to represent environmental and technical interests on the Council.



Mary Ann Rozum - National Institute of Food and Agriculture Representative
U.S. Department of Agriculture
Washington, D.C.

Mary Ann Rozum is trained in soils and hydrology and has 32 years of USDA experience with rural and farm water quality and quantity. Her current duties include working on programs in the Conservation Title of the Farm Bill with the USDA Natural Resources and Environment and Farm Services Agency, as well as any regulatory programs originating from EPA for the agriculture sector. Mary Ann is assigned to USDA National Institute of Food and Agriculture competitive grant programs in Climate Change, Food Safety, and Rural Development. While serving on the Council, Mary Ann plans to consider how water monitoring studies provide critical input for climate change models, and also for irrigation water to edible crops from a food safety standpoint. Water supplies are critical to rural development for drinking-water supplies, agriculture production, and processing.

Collaboration Through Partnerships

Federal Partnerships

A Long-Term Monitoring Collaborative Could Better Serve the Public in Responding to Disasters

The Council considers developing a long-term monitoring collaborative in the Gulf of Mexico that could better serve the public in responding to various kinds of disasters. *(Photograph by Jackie Millet, LDEQ)*

The importance of our government organizations' ability to deploy resources quickly to protect public health and the environment was underscored in the Federal and State response to the Deepwater Horizon oil spill. Governments have the responsibility to monitor the environment to protect the public from exposure to hazardous materials; to document the extent of contamination; to evaluate the impact on water quality and aquatic life; and to document the social, environmental and economic damage. All organizations involved responded quickly and effectively to initiate sampling to meet their program mandates.

For USEPA, this meant providing a continuous stream of information on levels of contaminants detected in air, water, and sediment as the oil reached the shoreline. The USGS responded by establishing baseline conditions in water chemistry, bottom sediments, and aquatic invertebrates prior to landfall of the oil spill and by helping to develop methods to detect indicators of the oil spill and clean-up efforts. For NOAA and other trust agencies, this meant documenting the damage to natural resources and tracking the plume in Gulf currents. Many of these emergency response efforts were funded by BP.

Now, as the mission in the Gulf transitions from emergency response to restoration and recovery, and as resources for monitoring become more limited, it is even more important to collaborate across organizations. An enduring monitoring collaborative can efficiently provide the core data and information needed to direct restoration priorities and document the long-term recovery of the Gulf of Mexico.

In 2004, the Council on Environmental Quality charged the National Water Quality Monitoring Council to prepare a National Monitoring Network for Coastal Waters (Network). While the Network continues to evolve, key features are to:

- address management issues—including nutrient enrichment, oxygen depletion, toxic contaminants, and beaches—that are important to a broad community of users,
- leverage existing monitoring, including federal agencies, state and local government, volunteer organizations and the Integrated Ocean Observing System and its regional associations,
- include monitoring designs to meet multiple objectives,
- share data using common data standards, and
- provide for data comparability through performance-based methods.

In the Gulf of Mexico, we are fortunate to have long-term, consistent water-quality data from previous Federal investments in monitoring the condition of coastal water resources (see articles on the National Aquatic Resource Surveys and Federal Agency Monitoring of Water Quality Impacts from Deepwater Horizon Oil Spill in Gulf Waters). Though these data may not include all contaminants of concern, they will support evaluation of changes following the spill and subsequent restoration activities.

A key mission of the National Water Quality Monitoring Council is to raise awareness and facilitate dialogue among monitoring partners across the country. We must also ask ourselves if we are prepared to document and evaluate changes in water quality whether in response to a disaster, a changing climate, or other pressures facing our nation's water resources.

Contributed by: Susan Holdsworth, holdsworth.susan@epa.gov, (202) 566-1187.

Federal Agency Monitoring of Water Quality Impacts from Deepwater Horizon Oil Spill in Gulf Waters

USEPA Oil Spill Response

USEPA regional and contractor crews have been collecting pre- and post-spill samples along the shoreline and beyond for chemicals related to oil and dispersants; supporting and advising federal partners in efforts to clean reclaimed oil and waste from shorelines; and monitoring the effects of dispersants in subsurface waters. USEPA is assessing the data against risk-based aquatic life and human health benchmarks, and posting the data on the web (http://www.epa.gov/bpspill). These data will also be compared to historic baseline data, primarily National Coastal Assessment data from 2000 to 2006 (http://www.epa.gov/emap/nca/index.html) to document impacts of the oil spill and determine if contaminants are accumulating over time. USEPA continues to coordinate with federal agencies such as NOAA, USGS, and FDA to provide sampling locations, advocate indicators to sample, and share data and protocols.

Contributed by: Treda S. Grayson, USEPA, grasyon.treda@epa.gov, (202) 566-0916.

USEPA and State agencies have monitored levels of contaminants in air, water, and sediment as oil reached the shoreline. *(Photograph by Dwight Bradshaw, LDEQ)*

NOAA monitored the Gulf of Mexico waters for hydrocarbons and other oil-spill related constituents with their ship the Thomas Jefferson and the BP chartered ship Ocean Veritas as part of a collaborative interagency

NOAA is Collecting Baseline Data and Tracking the Plume

NOAA's National Status and Trends (NS&T) Program has monitored chemical contaminants and bioeffects along the nation's coasts since 1986. Data from the Program can provide evidence of increasing or decreasing contamination, and are useful in providing baseline information when an environmental disaster occurs, such as the Deepwater Horizon oil spill in the Gulf of Mexico. In addition to the sampling of bivalve mollusks and sediments in nearshore waters shortly after the incident, NS&T scientists have also been involved in offshore sampling of Gulf waters to assess the location and depth of the oil plume, and the presence and magnitude of chemical dispersants, closer to the damaged oil rig.

Contributed by: Gunnar Lauenstein, NOAA, gunnar.lauenstein@noaa.gov, (301) 713-3028.

USGS Oil Spill Response

The USGS, as part of the U.S. Department of the Interior (DOI), continues to mobilize equipment and personnel to gather scientific data and information on the ecological footprint of the Deepwater Horizon oil spill on coastal habitats over time as conditions change from response to recovery and restoration (http://www.usgs.gov/oilspill/). USGS scientists are collecting, publishing, and disseminating satellite imagery to assess the impact of oil on wetlands and coasts; maps showing NOAA projections of spill trajectory with respect to DOI Lands; tests to determine cause of mortality of wildlife; models that depict how local tidal and current conditions will interact with seafloor bathymetry to carry oil over barrier islands; and decision support tools to help DOI land managers mitigate the effects of the oil spill and assist in restoration efforts. Also, USGS is producing data and reports on water and sediment quality, oil fingerprint and biomarker analysis, pore-water toxicity, benthic organisms, dispersant concentrations, and naturally occurring microbes at 50 post-landfall and 70 pre-landfall shoreline locations along beaches and wetlands in Alabama, Florida, Louisiana, Mississippi, and Texas.

Contributed by: Donna Myers, USGS, dnmyers@usgs.gov, (703) 648-5012.

To assess pre-oil baseline levels of petrochemicals in the Gulf waters, USGS scientists deployed semi-permeable membrane devices (SPMDs) in advance of oil landfall. *(Photograph courtesy of USGS)*

National Aquatic Resource Surveys (NARS) Continue to Build Strong Monitoring Programs

The USEPA and its state partners are conducting a series of aquatic resource surveys on different waterbody types using probability-based sampling designs, core indicators, and consistent monitoring methods and lab protocols to provide statistically-defensible assessments of water quality at the national scale. These National Aquatic Resource Surveys are helping build stronger monitoring programs across the country by fostering collaboration across partner organizations on new methods, new indicators, and new water quality research. For more information: www.epa.gov/aquaticsurveys.

As part of the National Aquatic Resource Surveys, the USEPA and its state partners collect a zooplankton sample in Texas for the National Lakes Assessment. *(Photo courtesy Texas Commission on Environmental Quality)*

Findings and future directions include:

- The Wadeable Streams Assessment, published in 2006, found that nearly 30% of the nation's small streams support healthy biological communities.
- Following two years of sampling, data analysis is underway for the National Rivers and Streams Assessment, which will allow us to compare more recent water quality conditions with the original wadeable streams report.
- The first National Lakes Assessment (NLA), released in 2009, found that 56% of our lakes are in good biological condition; planning is underway for the NLA II.
- Field sampling is currently winding up for the fourth National Coastal Assessment; NCA 2010 is the largest national survey ever conducted of the coastal and Great Lakes regions in a single year. As of September 23, NCA samples had been collected from more than 1,300 sites.
- In 2011, USEPA and the states will be conducting a groundbreaking survey of the condition of the nation's wetlands, with a report planned for 2013.

Contributed by: Alice Mayio, mayio.alice@epa.gov, (202) 566-1184.

State and Regional Councils Collaborate

Spotlight on the Indiana Water Monitoring Council

Field Day – A Cost-Effective Capacity-Building Collaboration

During the Indiana Water Monitoring Council Field Day, Chuck Bell, IDEM, demonstrates methods for collecting nutrient samples to water resources professionals during a hands-on teaching session. *(Photo by Bonny Elifritz, IDEM).*

The recently founded Indiana Water Monitoring Council (InWMC) (http://www.inwmc.org/), which facilitates communication, collaboration, and coordination of professionals, organizations, and individuals involved in water monitoring in Indiana, held its first Field Day in September 2010. The InWMC Field Day was designed to help water monitoring organizations make more informed choices about the methods they use. This event brought together water resources professionals from throughout Indiana.

The InWMC Field Day was a hands-on event. Participants were encouraged to bring their water monitoring supplies and equipment to collect their own data side-by-side with the agencies. Results were compiled and will be posted on the InWMC website, allowing for comparison of the different methods.

The cost for this event was minimal. Each agency provided 2-4 staff to develop content, and the InWMC coordinated the planning meetings, handled reservations, logistics and marketing. Based on evaluations, participants found the event valuable; attendees want the InWMC to sponsor more Field Days, and several suggested making them all-day events. Having made the initial investment to develop content, each agency wants to make the InWMC Field Day an annual event. With InWMC assistance, this collaboration will require less staff time, becoming increasingly cost effective in the future.

The three agencies that conduct or facilitate statewide water monitoring collaborated for this even were:

- *U.S. Geological Survey (USGS)*
- *Indiana Department of Environmental Management (IDEM)*
- *Indiana Department of Natural Resources (IDNR) Hoosier Riverwatch Program*

For more information, go to: http://www.inwmc.org/Default.aspx?pageId=303781&eventId=181506&EventViewMode=EventDetails

Contributed by: Jody Arthur, jarthur@idem.in.gov, (317) 308-3179.

Great Lakes Restoration Initiative Approaches for Science Based Management Solutions

In 2009, the Great Lakes Restoration Initiative (GLRI) (http://www.epa.gov/greatlakes/glri/) was funded by the Federal government to support restoration efforts across the Great Lakes basin, including Lake Michigan. Focused monitoring and research is included as part of the GLRI's funding priorities. Due to the coordination efforts of the Lake Michigan Monitoring Coordination Council (LMMCC) and its Nearshore Monitoring Workgroup (NEMO), the monitoring and research community are well positioned to develop coordinated approaches to implementing the GLRI. As a result, the data collection, data management, data analyses, and the resultant information that managers will use to determine appropriate science-based responses to restoration decisions and adaptive actions will be better available to assure effective stewardship of Lake Michigan.

For additional information, contact: John Hummer, jhummer@glc.org, (734) 971-9135 or Judy Beck, beck.judy@epa.gov, (312) 353-3849.

Lakewide Management Plan

Since its formation in 1999, the LMCC has been instrumental in providing technical and coordination support to the Lakewide Management Plan (LaMP) for Lake Michigan (http://www.epa.gov/glmpo/michigan.html). The LMMCC supports coordination of monitoring and research activities conducted in all resource components (tributaries, embayments, beaches, wetlands, groundwater, open lake, and airshed) of Lake Michigan.

The Great Lakes Environmental Indicator Project developed a Condition Index that indicates the region's environmental condition by watershed. The index was based on human-induced stressors that were summarized, and the resulting scores were distributed over a gradient from worst (red) to best (green), indicating the environmental condition of each coastal watershed. Managers can produce similar condition indexes for their area. Modified from Lake Michigan Lakewide Management Plan, 2008: http://www.epa.gov/glnpo/lmichigan.html. Source: New Index of Environmental Condition for Coastal Wetlands in the Great Lakes Basin, glei.nrri.umn.edu.

Tributary Monitoring Efforts Enhance Nutrient Loading Information

In 2005, the LMMCC spurred an update of the 1994-2000 Lake Michigan Mass Balance Study's tributary monitoring efforts. The update, funded by the USEPA Great Lakes National Program office (www.epa.gov/glnpo/michigan.html), allowed Lake Michigan monitoring personnel to revisit selected Lake Michigan tributaries (Lower Fox, Grand, Kalamazoo, St. Joseph, and Grand Calumet Rivers) to characterize present-day water column contaminant concentrations and loadings. Additionally, the LMMCC spearheaded preparation of the proposal for Lake Michigan's consideration as a National Monitoring Network pilot site for the Council (http://acwi.gov/monitoring/network/index.html). Since its selection as a pilot site in 2007, the LMMCC's NEMO Workgroup and the USGS have been helping direct research and monitoring activities that support enhanced nutrient loading information and tools development to help scientists and resource managers better understand the interaction of tributary loadings to the embayments and nearshore of Lake Michigan.

For additional information, contact: John Hummer, hummer@glc.org, (734) 971-9135 or Charlie Peters, capeters@usgs.gov, (608) 821-3810.

Volunteers Monitor Environmental Impacts of Marcellus Shale

The Alliance for Aquatic Resource Monitoring (ALLARM: www.dickinson.edu/ALLARM) is a Dickinson College-based program that provides technical support to community organizations interested in monitoring and improving the quality of Pennsylvania's waterways. ALLARM developed a protocol that allows residents to monitor small streams on a weekly basis for the purpose of early detection and prevention of stream contamination from Marcellus Shale gas extraction. In addition to measuring flow and conducting a visual assessment, volunteers measure total dissolved solids (TDS) and conductivity as indicator chemicals. Monitors incorporate internal and external quality assurance / quality control procedures into their monitoring program to ensure they are collecting credible data. A manual, entitled *Marcellus Shale Gas Extraction: A study design and protocol for volunteer monitoring,* is available at http://www.dickinson.edu/about/sustainability/allarm/content/Marcellus-Shale/.

Involving volunteer monitors in documenting impacts from gas extraction is a cost-effective way to collect data over a wide geographic area. Residents can easily gain access to private property in their neighborhoods and can sample frequently. Residents are caring stakeholders and often have access to all parties involved in the issues. Volunteers also have a strong local knowledge base upon which to build robust programs. As a result, volunteers gain increased public awareness and scientific education, leading to better decision making and more accurate public risk assessment, increased sense of citizen empowerment leading to stronger participation in civic processes, and better opportunities for community organizing, all of which can provide a context for collaborative problem-solving among neighbors. The presence of trained volunteer monitors around and near the well sites is also an incentive for companies to implement best management practices in their extraction activities.

Contributed by: Candie Wilderman, wilderma@dickinson.edu, (717) 245-1573, and Jinne Woodward, ALLARM@dickinson.edu, (717) 245-1565.

The Marcellus Shale

The Marcellus Shale, an organic-rich gas-bearing shale that underlies several States in the Appalachian Highlands, has become the hot-spot for natural gas extraction in the United States. In Pennsylvania alone, 4,635 permits have been issued to drill in the Marcellus Shale – 2,046 of which were issued between January and August 2010 (Pennsylvania Department of Environmental Protection, 2010: http://www.dep.state.pa.us/dep/deputate/minres/oilgas/new_forms/marcellus/marcellus.htm).

The recent growth of activity to extract natural gas from the Marcellus Shale is taking place in a space of uncertainty – environmental impacts may include forest fragmentation, surface water and groundwater contamination, water depletion, air pollution, and increased erosion and sedimentation.

Giovania Tiarachristie of the Alliance for Aquatic Resource Monitoring (ALLARM) at Dickinson College teaches members of the Wysox Creek Watershed Association how to monitor for Marcellus Shale-related impacts (Bradford County, PA, 2010). *(Photo courtesy of ALLARM)*

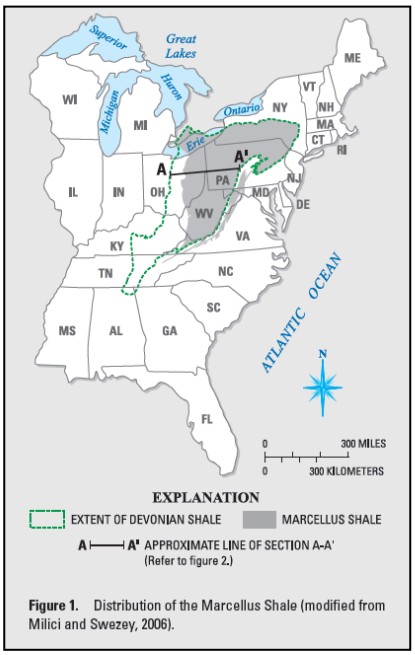


Figure 1. Distribution of the Marcellus Shale (modified from Milici and Swezey, 2006).

Coordinated efforts of volunteers complement the collaborative efforts of many organizations in monitoring impacts of new gas-drilling technologies in large natural gas development regions, such as the Marcellus Shale. Map from Soeder, D.J., and Kappel, W.M., 2009, *Water resources and natural gas production from the Marcellus Shale: U.S. Geological Survey Fact Sheet 2009–3032,* 6 p.

Tribal Water Quality News

Native American Monitoring and Environmental Protection of Bristol Bay, Alaska

The Bristol Bay Native Association (BBNA), Inc. is a Tribal Consortium made up of 31 Tribes, organized as a non-profit corporation to provide a variety of educational, social, economic, and related services to the Native people of the Bristol Bay region of southwest Alaska. Bristol Bay is also home to one of the largest wild salmon spawning and rearing habitats, accounting for 40 percent of the Nation's commercial catch (http://www.ourbristolbay.com/about-bristol-bay.html). Environmental threats to Bristol Bay have resulted in the development of a Drainage Comprehensive Water Resources Management Plan, which focuses on investigations of macroinvertebrates and diatoms, anadromous fish distribution, and water chemistry in the vicinity of the Pebble Mine (http://www.ourbristolbay.com/the-bristol-bay-protection-effort.html). The BBNA maintains an environmental program focusing on monitoring and protection of land and waters (http://www.bbna.com/website/NaturalEnviro.html). Summer internships are offered, focusing on the biological and social sciences that help manage Bristol Bay fisheries and ecosystems, including field experience on fisheries research projects.

For more information, contact: Dave Fuller, dfuller@pgst.nsn.us or tribal_water_council@hotmail.com, (541) 783-3590.

Bristol Bay, Alaska, is home to numerous Native Alaskan Villages and communities, and much of the food supply for these communities is subsistence based. Wild salmon are plentiful in this watershed but may be threatened because of environmental changes.

A Healing Journey along a River Inspires Reconnection with People and the Environment

Jon Waterhouse, Alaska Region Director of the Yukon River Inter-Tribal Watershed Council (YRITWC), led the 2010 Healing Journey down the Kovukuk River in Alaska.

Since summer 2007, the Yukon River Inter-Tribal Watershed Council (YRITWC) (http://www.yritwc.org/) has led an annual Healing Journey in Alaska. Each Healing Journey river trip is a vessel to carry local traditional knowledge and modern science across vast Alaskan watersheds, and it is used as a medium to share stories, visions, and water-quality data with people around the world. Healing Journey participants paddle canoes, one of which tows a multi-probe data sonde that collects and stores readings on 11 water-quality parameters every two minutes. In analysis of the data profile, the YRITWC can correlate patterns and anomalies with the stories of the people living within the local watershed.

The most recent Healing Journey traveled 570 miles down the Koyukuk River in Alaska and was featured on National Geographic's BlogWILD (blogs.nationalgeographic.com/blogs/blogwild) and News Watch site (nationalgeographic.com/news). The next YRITWC Healing Journey will begin in the headwaters of the Yukon River during the summer of 2011 and is planned to culminate at the annual Summit for the YRITWC in Ruby on August 4-6, 2011 (http://www.yritwc.org/Summit/tabid/94/Default.aspx). Healing Journeys have been supported by generous partners who see the value of these efforts and connections including the National Geographic Society, the USGS, and REI.

For more information, contact: Jon Waterhouse, jwaterhouse@yritwc.org, (907) 258-3337.

YRITWC Receives Partners in Conservation Award

The Yukon River Inter-Tribal Watershed Council received the Partners in Conservation Award from the U.S. Department of the Interior in 2010 for their collaborative work with the U.S. Geological Survey evaluating river water quality during these Healing Journeys. (http://www.doi.gov/partnerships/awards.html)

World Water Monitoring Day

World Water Monitoring Day Kick-off Celebration

The World Water Monitoring Day™ (WWMD) kick-off event was event held on September 16, 2010, at Hains Point in Washington, D.C. World Water Monitoring Day is an international education and outreach program that builds public awareness and involvement in protecting water resources around the world by engaging citizens to conduct basic monitoring of their local water bodies. This kick-off event was coordinated by the Water Environment Federation and the International Water Association and cosponsored by USEPA, USGS, and others. U.S. Congresswoman Donna F. Edwards (D-MD) gave remarks on water quality and education. Twenty exhibitors, including Federal, State, and local organizations, demonstrated water-quality sampling equipment and hands-on water monitoring exhibits. About 200 school children from the Washington, D.C., metropolitan area participated in educational water monitoring activities and conducted simple monitoring tests on Potomac River water. Throughout 2009, over 120,000 people in 81 countries tested water around the world. Results are shared with participating communities around the globe through the WWMD Web site: http://www.worldwatermonitoringday.org.

During WWMD events, children and adults use test kits to sample local water bodies for a core set of water quality parameters, including temperature, acidity (pH), clarity (turbidity), and dissolved oxygen which are common indicators of water health.

Contributed by: Tracy Hancock, thancock@usgs.gov, (804) 261-2618.

Organizations Partner in World Water Monitoring Day Events to Provide Education and Public Awareness

Scientists from the USEPA Region 8, CH2M Hill, and the Colorado Department of Public Health and the Environment hosted 100 fifth graders for a WWMD event on the South Platte River in Denver on September 22, 2010. In addition to sampling for temperature, pH, turbidity, and dissolved oxygen using WWMD test kits, the students learned about biological monitoring and how macroinvertebrates serve as indicators of water quality.

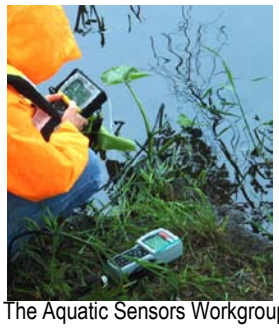
Contributed by: Alice Mayio, mayio.alice@epa.gov, (202) 566-1184.

Workgroup Updates

News from the Aquatic Sensor Workgroup of the Methods and Data Comparability Board

The Methods Board's Aquatic Sensors Workgroup (ASW) continues to build on efforts begun in 2008 that focus on water-quality sensors and real-time monitoring. Guides for QC and field deployment of sensors were released in 2010 (http://watersensors.org/). Hundreds of professionals and volunteers in the water-quality monitoring field have attended web seminars held to disseminate information about these guides.

For more information, contact: Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869 or Gayle Rominger, grominger@ysi.com, (937) 767-7241.



The Aquatic Sensors Workgroup (ASW), which includes governmental and non-governmental organizations, developed guides for deploying freshwater sensors.

Since its inception, the ASW's hallmark has been the collaborative and inclusionary process by which its products have been developed, and upcoming efforts continue this pattern. Industry, government, and academia are equal partners in efforts related to specifications, data management, and data quality objectives. Looking ahead, the ASW will continue to lead efforts to define standardization of specifications and metadata for these rapidly evolving technologies. If you are interested in any of these topics, please consider participating in the Workgroup. Most Methods Board business is conducted via conference calls and web conferencing, and although travel to the occasional face-to-face meeting can help spark interactions, attendance at these meetings is not required.

For More Information, contact: Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869.

asw
Aquatic Sensor Workgroup
methods and data comparability board

Web Portal in Development for Aquatic Sensors

Another exciting collaboration will increase the visibility and accessibility of information about sensors and provide information on the benefits to the monitoring community that can be gained by increased use of sensors for water-quality monitoring. Tentatively entitled the "Methods of Environmental Measurement and Observation (MEMO)", a web portal is under development in a collaborative project between NOAA's Alliance for Coastal Technologies (ACT; http://www.act-us.info/) and the National Environmental Methods Index (NEMI; https://www.nemi.gov/). With funding from EPA and NOAA, MEMO will allow users to access information on specific environmental parameters, including listings of both standard analytical methods and commercial instruments to measure and quantify parameter of interests. MEMO will also provide a platform for display and critique of the Methods Board's efforts to develop accepted standards for sensor performance specifications.

For more information, contact: Dan Sullivan, djsulliv@usgs.gov, (608) 821-3869 or Mario Tamburri, tamburri@umces.edu, (410) 326-744.

ALLIANCE FOR COASTAL TECHNOLOGIES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

USGS science for a changing world

Efforts planned for 2010-11 include:

Define standards for data management

Create sensors specifications for ambient monitoring

A draft list of data elements will undergo refinement and review.

In addition, a workgroup is forming to take up the topic of Data Quality Objectives for continuous monitoring stations.

Water Quality Data Exchange Developments and Web Portal Project

USEPA Office of Water Bronze Medal Awarded for Water-Quality Data Sharing

The joint USGS/USEPA team was awarded a USEPA Office of Water Bronze Medal on September 30, 2010, in Washington, D.C. The medal was presented for innovative cost saving in efforts to revolutionize the sharing of water quality data.

Work continues on improving the data standards and associated web services that have enabled water quality data integration from USGS and USEPA systems. A web portal is under development that will integrate chemical, physical, and biological data from the USGS National Water Information System (http://qwwebservices.usgs.gov) and USEPA's STORET data warehouse (http://storetnwis.epa.gov/storetqw/portal.html). The portal will provide a map display that queries a common data catalog of the USGS and USEPA systems. Users will be able to download water-quality datasets based on a given geography and group of water-quality parameters of interest.

The USGS/USEPA Data Exchange activities began in 2003, resulting from an interagency *Agreement on the Management of Water Quality Data*, supported by the Advisory Committee on Water Information. Efforts also are underway with NOAA's Integrated Ocean Observing System (http://www.ioos.gov/) and associated regional associations to link the Data Exchange with coastal data and to improve capabilities beyond discrete data to include continuous sensor-derived water-quality measurements.

For more information, contact: Nate Booth, nlbooth@usgs.gov, (608) 821-3822 or Kristen Gunthardt, gunthardt.kristen@epa.gov, (202) 566-1194.

News from the Water Information Strategies Workgroup

Building a National Reference Site Network

Reference sites provide valuable information on the background quality of aquatic ecosystems, to help ensure the viability of surrounding communities and wildlife. Leeds Creek in the Virgin River watershed is part of Utah's reference site network for high desert streams. *(Photograph by Jeff Ostermiller, Utah DEQ)*

The Council's Water Information Strategies (WIS) Workgroup has been discussing development of a consistent and comparable national monitoring network of reference sites for water-quality conditions. A primary consideration is the need for a comprehensive national catalog of sites that serve multiple uses, including establishing and/or documenting bio-criteria, implementing the Clean Water Act, and assessing trends. Additional considerations include building a long-term network of reference sites, acknowledging the role and utility of metadata, developing a definition of "reference sites," and defining protocols for selection.

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 following topics listed below and several priority topics have been identified for upcoming Workgroup conference calls and as products.

August 11, 2010: National Assessments - Identifying the missions and interrelationships of various projects that conduct national assessments of water quality (such as the USGS National Water-Quality Monitoring Assessment Program and the USEPA National Aquatic Resource Surveys).

September 8, 2010: Monitoring of Spills - Improving planning and preparedness when major disasters strike.

October 13, 2010: Reference Sites - What needs to be done to develop a consistent and comparable national monitoring network of reference conditions.

November 10, 2010 - Statistics and Assessment Methods.

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

Current and developing reference site networks include:

- National Park Service administers a vital signs monitoring network: http://www.nature.nps.gov/water/infoanddata/index.cfm
  (Contact: Gary Rosenlieb, Gary_Rosenlieb@nps.gov)
- Oregon has documented their process for "Selecting Reference Condition Sites: An Approach for Biological Criteria and Watershed Assessment": http://www.deq.state.or.us/lab/techrpts/WSA04-002.pdf
  (Contact: Greg Pettit, pettit.greg@deq.state.or.us)
- Utah samples 120 reference sites on a rotating basin approach
  (Contact: Jeff Ostermiller, jostermiller@utah.gov)
- USGS is building a collaborative monitoring network of reference conditions for streams and rivers, encompassing existing USGS networks, such as the Hydrologic Benchmark Network
  (Contact: Bill Wilber, wgwilber@usgs.gov)
- USEPA is developing reference site networks for multiple water components, building off NARS
  (Contact: Ellen Tarquino, tarquino.ellen@epa.gov)

Integrated Assessments from the IOOS® Regional Associations and the National Network for Coastal Waters

A multiregional water quality project will focus on coastal and Great Lakes beach health. Beaches in close proximity to industry, sewer outfalls, and other sources of pollution are particularly vulnerable to contamination. *(Photograph by David Riecks, Illinois-Indiana Sea Grant.)*

The National Water Quality Monitoring Network and Integrated Ocean Observing System (IOOS®) are national observation systems that share similar goals and objectives. Three IOOS® Regional Associations along the east coast of the Nation, USGS, NOAA, and USEPA organized an Interagency Water Quality Workshop, in January 2010, to discuss issues relative to nutrient enrichment and dissolved oxygen depletion (hypoxia), harmful algal blooms, and beach water quality. Examples of integrated-science based solutions to water quality issues of major concern from the three IOOS® Regions and demonstration projects were explored during this workshop. These assessments and projects illustrate the integration of monitoring, data, and analytical tools on multiple levels, to inform and benefit management decisions on major water quality issues within watersheds, estuaries, Great Lakes, coasts, and oceans. Information on gaps, challenges, and outcomes from the workshop, as well as potential future work toward a multiregional water quality project for beach water quality, is available at:
http://acwi.gov/monitoring/network/three-region_workshop/presentations/index.html

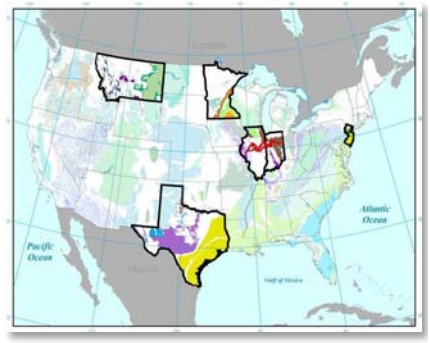
The Interagency Ocean Policy Task Force Considers Water Quality

Final recommendations of the Interagency Ocean Policy Task, led by the Council on Environmental Quality, suggests establishing a National Policy for the Stewardship of the Ocean, Coasts, and Great Lakes and creating a National Ocean Council to strengthen ocean governance and coordination. One objective relates to water quality and sustainable practices on land, which aligns with Council goals and the National Monitoring Network. The Council will continue to collaborate with strategic actions as the plan moves forward. On-line access to the Ocean Policy Task Force recommendations: http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf

For additional information, contact:
Jawed Hameedi, jawed.hameedi@noaa.gov, (301) 713-3034 x170.

For more information, contact: Pixie Hamilton, pahamilt@usgs.gov, (804) 261-2602.

National Groundwater Network Pilots Underway



The federal Subcommittee on Ground Water (SOGW) is conducting five Pilot Projects with partners to evaluate the feasibility of a National Ground Water Monitoring Network for the Nation's principal and major aquifers.

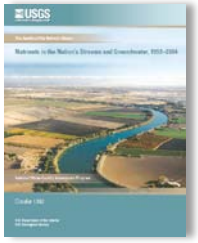
The National Ground Water Monitoring Network framework, proposed by the federal Subcommittee on Ground Water (SOGW), is being tested in Illinois and Indiana (in a cross-boundary exercise), Minnesota, Montana, New Jersey, and Texas. The Pilot Project objectives include evaluating the gaps that exist between the data elements and protocols recommended in the national framework plan, and current protocols used by partner monitoring organizations. Pilots will also provide information to evaluate the feasibility of designing network segments within one or more principal and major aquifers representing unique geography and hydrogeology, and using conceptual ground-water flow models as the primary network design element. A key aspect of the national plan is to determine robust methods and criteria for identifying and establishing unstressed (ambient) and targeted (stressed) sub-networks within the target aquifer(s).These sub-networks will allow users to evaluate and discern changes in groundwater that are induced by anthropogenic activities versus potential changes related to climate change and other natural factors. For more information, check the SOGW website at: http://acwi.gov/sogw/index.html

Contribution by: David Wunsch, david.wunsch@des.nh.gov, (603) 271-6482.

Announcements

USGS NAWQA Program Developing Plans for Cycle 3 (2013-2022) – The NAWQA Cycle 3 Planning Team issued a Science Framework (http://pubs.usgs.gov/of/2009/1296/) to document water-quality issues, and with advice from the National Research Council, external stakeholders, and USGS scientists, the planning team drafted a plan that focuses on contaminants, excess nutrients, sediment, and streamflow alteration (http://water.usgs.gov/nawqa/design_plans.pdf). A meeting with the NAWQA National Liaison Committee (http://acwi.gov/nawqa/) will be held in Washington D.C. on November 19, 2010. For more information, contact: Gary Rowe, glrowe@usgs.gov, (303) 236-1461.

New USEPA's Healthy Watersheds Initiative – The new Healthy Watersheds Initiative takes a fresh approach to water quality protection by encouraging states, local governments, watershed organizations, and others to take a strategic, systems approach to conserve healthy components of watersheds, and, therefore, avoid new water quality impairments in the future. This healthy watersheds approach is a major theme of the Administrator's 2010 strategy for achieving clean water (see http://blog.epa.gov/waterforum/). An archived October 13, 2010 USEPA Watershed Academy Webcast on the Healthy Watersheds Initiative is available at http://water.epa.gov/learn/training/wacademy/webcasts_index.cfm. For more information: http://www.epa.gov/owow_keep/nps/healthywatersheds/ or contact Laura Gabanski at gabanski.laura@epa.gov, (202) 566-1179. Contributed by: Alice Mayio, USEPA, mayio.alice@epa.gov, (202) 566-1184.



New USGS Publication on "The Quality of Our Nation's Waters—Nutrients in the Nation's Streams and Groundwater, 1992–2004" – This Circular describes nutrient concentrations in the Nation's water resources, key sources of nutrients, factors affecting nutrient concentrations, potential effects on humans and aquatic life, and changes in concentrations since the early 1990s. Findings are relevant to developing nutrient criteria, controlling nutrient loadings to our estuarine ecosystems, land-use planning, and protecting drinking water from streams and groundwater. For more information, contact: Neil Dubrovsky, nmdubrov@usgs.gov, (916) 278-3078. Publication available at: http://water.usgs.gov/nawqa/nutrients/pubs/circ1350/.

National Climate Effects Network Promotes Data Sharing – A national Climate Effects Network (CEN) has been established to provide an early warning system to anticipate and respond to the effects climate change. CEN is pursuing this goal by making maximum use of existing data collection, which requires collaboration with multiple federal and non-governmental partners for information and data sharing and integration of existing long-term records into new environmental monitoring to optimize the usefulness of historic records. For more information: http://www.nrmsc.usgs.gov/node/1750 or contact: Peter Murdoch, pmurdoch@usgs.gov, (518) 285-5663.

Changing the Planet's Climate -- One Painting At a Time – The FOCUS (Forests, Ocean, Climate -- and Us) program marks the first-ever outreach partnership between the USFS, NOAA, and the Wyland Foundation. The nationwide campaign uses art and science activities, online programs, student documentary films, and traveling exhibitions to teach young people about our forests and ocean -- and how these two irreplaceable resources hold the future of our supplies of freshwater, climate and global environmental health. For more information: http://www.wylandfoundation.org/education-FOCUS.shtml or contact: Cindy McArthur, cmcarthur@fs.fed.us, (202) 577-7863.

Maryland Water Monitoring Council Annual Conference – November 18, 2010 – The Maryland Water Monitoring Council Annual Conference theme is "Environmental Justice: Healthy Waters, Healthy Communities" and it will be at the Maritime Institute in N. Linthicum, MD. For more information, go to: http://mddnr.chesapeakebay.net/MWMC/index_files/annual_conference.htm or contact Dan Boward, dboward@dnr.state.md.us, (410) 260-8605.

New Jersey Water Monitoring and Education Summit – December 1 and 2, 2010 – The 8th Annual NJ Water Monitoring and Education Summit, co-sponsored by the NJ Water Monitoring Council and the NJ Watershed Watch Network, will be at Montclair State University, NJ. For more information, go to: http://www.state.nj.us/dep/wms/wmcchome.html or contact Alena Baldwin-Brown, alena.baldwin-brown@dep.state.nj.us, (609) 292-1623.

Subscribe to USEPA Water Headlines – To receive Headlines from USEPA's Office of Water, subscribe to the Water Headlines listserv. Send an email message, leave the subject line blank, and address it to: waterheadlines-join@lists.epa.gov.

Subscribe to USGS Water Alert – This service by the USGS sends e-mail or text messages when certain parameters measured by a USGS data-collection station exceed user-definable thresholds. Visit the USGS website to subscribe: http://water.usgs.gov/wateralert/.