

## Water Resources Center

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The Water Resources Center is affiliated with the College of Food, Agricultural and Natural Resource Sciences and University of Minnesota Extension.

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## WRC hosts October Minnesota Water Conference

The Water Resources Center will host the Minnesota Water Resources Conference October 19–20, 2010, at the St. Paul RiverCentre. The conference will present innovative and practical water resource engineering solutions, management techniques, and current research about Minnesota's water resources. The conference will offer six ninety-minute concurrent sessions addressing lessons learned from the implementation of engineering projects; best practices discovered in the design and application of water resource management techniques; implications of water policy decisions; and research into current and emerging issues. The conference facilitates interaction among engineers, water resources managers, researchers, and local, state and federal agency staff.

Four keynote speakers, including Congressman Collin Peterson, (see below) will present, and four hour-long breakout topics will be offered during the two-day conference. There will be a poster session and reception at the end of the first day, and posters will be available for viewing throughout both days.

The conference is sponsored by the Water Resources Center, and College of Continuing Education, University of Minnesota, and co-sponsored by the Department of Civil Engineering, University of Minnesota, the Minnesota Section of the American Society of Civil Engineers, Minnesota Sea Grant College Program, University of Minnesota, and the Natural Resources Research Institute, University of Minnesota.

Register at: [wrc.umn.edu](http://wrc.umn.edu)

## Keynotes span research, political, and agricultural spheres



Peggy Knapp, Hamline University

**Peggy Knapp**, *Testing the Waters: Science and Environmental Education in Minnesota*. Knapp is an assistant professor in Hamline University's School of Education. She teaches in the Master of Arts in Education: Natural Science and Environmental Education (NSEE) degree program and offers professional development for teachers in grades K–12. Knapp works with Hamline University's nationally acclaimed Center for Global Environmental Education (CGEE), focusing on a systems-based approach to understanding the interactions between social and natural systems, and science and environmental education, specific pedagogies. Knapp has written science and environmental curricula that support CGEE's award-winning educational media tools, and has presented at national, state and local conferences. Her scholarly work centers on environmental education leadership, diversity in environmental education and the integration of science and literacy.

**Collin Peterson**, *The Future of Farm Policy*. Congressman Peterson was first elected to the U.S. House of Representatives from the Seventh Congressional District of Minnesota in 1990. Peterson is Chairman of the House Committee on Agriculture, which has jurisdiction over a wide range of agriculture and rural development issues, including the Farm Bill, renewable energy, disaster assistance, nutrition, crop insurance, conservation, rural development, international trade, futures market regulation, animal and plant health, agricultural research, bioterrorism, and forestry. Peterson guided the successful passage of the 2008 Farm Bill, which preserved the safety net for farmers while making new investments in food, farm, and conservation programs.



Collin Peterson, U.S. House of Representatives

Keynotes, continued on page 5



As I sit to write this column, my mind drifts back to the family who hosted me during my recent stay in Sierra Leone and the many differences between my life and theirs. They live without adequate health care, without electricity and running water, farming with tools more basic than I use in my backyard garden. I saw the amount of time it takes to access clean water and good sanitation, a problem that exists for many impoverished people in the world. One of my family members carried the five-gallon bucket for my nightly bath on her head; in fact, the family carried all the water for bathing, cooking and drinking. During the rainy season, they are able to collect wash water from their roof in a collection barrel, but drinking water comes from the village well, and the family latrine is a good city block away. Because of the stark contrast in our daily lives, I found it difficult to share details without drawing attention to how easy my life is in comparison. Instead, I talked to my hosts about my family and other people in my life, and I told them that I work on clean water.

My host family and I clearly shared the desire for access to clean water and improved sanitation. While we are at different places in addressing clean water issues, I felt we were connected by this goal. Part of my efforts in the villages was to introduce a simple method for testing for *e-coli* in drinking wells. This would not have been possible were it not for the advances made here in Minnesota and in the U.S. The work of water professionals in Minnesota not only advances clean water here in Minnesota, but also across our nation and the world.

The Minnesota Water Resources Conference, coming October 19 and 20, is a chance for us in Minnesota and surrounding states to share and learn of new research, new implementation techniques, and successes in education and outreach at the local, state, and national levels. In addition to the keynote and luncheon speakers highlighted on the Minnogram front page, there will be concurrent and poster sessions addressing issues such as drought and flooding, urban and rural land practices that lead to water quality improvements, management of our groundwater for long-term sustainability, and management of our water resources through regulation and policies, and other topics. There will also be an opportunity to hear about the status of the Minnesota Water Sustainability Framework, which will also be available for public comment and review after November 1, at [wrc.umn.edu](http://wrc.umn.edu).

So as you read this online or from a hard copy, I hope you will pause to think about how different your life would be without electricity, without a reliable postal system and without clean water from a tap. I also hope you will think about your work in clean water, and how it has contributed to the lives of Minnesotans and those in other parts of the world.

  
Faye Sleeper, WRC co-director

## Congressman Collin Peterson talks about the 2012 Farm Bill

**What changes do you envision in the reauthorized 2012 Farm Bill, in particular to conservation and other programs that impact our water resources?**

It's still too soon to tell how the 2012 Farm Bill will differ from the 2008 bill. The fiscal situation facing this country is serious, and we are going to have to live within the budget we currently have when we write the next bill. Given this, we need to make sure support is going to farmers to implement conservation practices on their lands and make sure that they have the technical assistance and resources they need.

**How will Minnesota be affected by these changes?**

One provision I would like to see in the next farm bill that would directly affect Minnesota is flood control for the Red River Valley. We need to look beyond previous flood control efforts, which haven't worked, and look for ways to seek permanent solutions to the problem. One part of the solution will be tiling in the Valley. When done right, current tiling technology can reduce runoff, prevent flooding, and even increase crop yields.



Photo credit: David L. Hansen

Congressman Peterson hopes the new farm bill will support farmers' conservation practices, providing technical assistance and resources.

**How will the reauthorized bill help ensure that water resources in Minnesota and the country will be protected?**

Farmers remain the first conservationists and they understand the importance of protecting their resources, soil and water. Existing programs are in place to provide resources farmers can use to help their efforts. Further, the Environmental Protection Agency (EPA) aggressively seeks to regulate and it is more important than ever that producers and landowners have access to technical resources and farm bill conservation programs. I have serious concerns about the regulations EPA is imposing on our farmers, and we need to make sure the farm bill continues to include the tools necessary for them to meet these requirements.

# WRC co-director helps Sierra Leone villagers work toward self-sufficiency

WRC co-director Faye Sleeper spends most of her professional life protecting clean water sources, and this spring she devoted some personal time helping to provide access to safe drinking water for three remote villages in Sierra Leone.

Sleeper worked with OneVillage Partners, a philanthropic organization founded by a former Peace Corps worker and dedicated to improving the lives of Sierra Leone citizens since the devastating civil war in the 1990s. OneVillage received a \$50,000

shallow ground wells that may be contaminated and tend to go dry during protracted times of little rainfall. It's about a 45-minute walk through the bush from the farms to the village, so hauling water from the village wells provided by OneVillage Partners is not a practical solution. The team and villagers concluded that the best and most economical method of sanitation for the individual farms was to boil the farm well water, placing it in clean containers, and leaving it overnight to cool.

OneVillage Partners volunteers also worked to transfer water leadership duties to local water committees, which continue the work of the program after the volunteers leave. On this mission, OneVillage Partners presented to the local committees the benefits of building new latrines: portability, low cost, lower human-to-latrines ratio, and closer proximity to dwellings. When the new latrines are moved, the waste can be composted for fruit tree fertilizer. New latrine construction is controversial due in part to cultural attitudes regarding human waste, and the topic is still under review by the local committees.

Sleeper says that she found it rewarding, if sometimes tiring, to wake beneath mosquito netting at 5:00 a.m. as the call to prayer from the local mosque mingled with the sounds of the early stirring of goats and roosters. After breakfasting with her host family, she would hurry out to complete water testing before the tropical heat dictated the end of the work day.

She returned home to Minnesota grateful for her life here and the abundance of water we enjoy. Rather than merely reminiscing about her efforts in Sierra Leone, Sleeper is focusing her efforts more than ever on water issues in Minnesota, her work at the WRC, and global water issues. "We are a global community, and those of us fortunate to be born in a place where we rarely have to worry about basic needs should in some way contribute to bettering the lives of those who don't have the same resources."

For more information on OneVillage Partners, visit [www.onevillagepartners.org](http://www.onevillagepartners.org)



Photo Credit: Faye Sleeper

A woman in the Sierra Leone Village of Foindu, pumps water from one of the new wells provided by OneVillage Partners.

Rotary grant to install drinking water wells and build new latrines in Foindu, Jokibu, and Pujehun, located in eastern Sierra Leone. Sleeper wanted to be part of the project. "I find it helps my professional work in water, which is often focused on policy and management, to use my knowledge and skills in a way that makes a large impact in a short time. This project fit the bill, perfectly."

The goal of the OneVillage Partners is self-sufficiency for the villages; creating access to clean drinking water and sanitation is a key part of the goal. On this trip, Sleeper and other team members showed villagers water sanitation methods for individual farms where water comes mostly from

## Legislative Update

### Congress considers reauthorization of Water Resources Research Act

Our Water Resources Center has 53 sister institutions, collectively known as the Water Resources Research Institutes (WRRI), created by Congress in 1964. The goal of the Water Resources Research Act (WRRRA) was to engage researchers at the Land Grant colleges and universities in water research on local issues, train water professionals, and create a statewide water resource. The enabling legislation has been reauthorized about every five years, and is due for renewal again next year. Reauthorization bill H.R. 5487 has been introduced in the House of Representatives by Rep. Napolitano, chairwoman of the Water and Power Subcommittee of the House Committee on Natural Resources. Dr. Henry Vaux, former WRRI director for the University of California, Mr. John Tubbs, Deputy Assistant Secretary of Interior for Water and Science, and Deb Swackhamer were called on to testify in support of the bill. A similar bill has been introduced in the Senate, but it is unclear at this time if the bills will progress and pass either chamber prior to the close of this Congressional session.

The WRRI also receive an annual appropriation from Congress through the US Geological Survey, within the Department of Interior. Congress has not yet passed the funding bill for the Department of Interior for the coming fiscal year (FY11), due to begin October 1, and it is unlikely that they will prior to the close of this Congressional session.

The White House Council of Environmental Quality (CEQ) issued the National Policy for the Stewardship of the Ocean, Coasts, and Great Lakes in July, 2010, and President Obama has made it official through Executive Order. The US Environmental Protection Agency has recently issued their draft Strategy for Achieving Clean Water, reinvigorating improvements in water quality throughout the nation, tackling the most critical pollution issues, and promoting healthy watersheds and sustainable communities.

## WRC-sponsored study finds rising dioxin levels from common antibacterial agent in Mississippi sediments

Specific dioxins derived from the antibacterial agent triclosan, used in many hand soaps, deodorants, dishwashing liquids and other consumer products, account for an increasing proportion of total dioxins in Mississippi River sediments, according to new University of Minnesota research funded by a grant from the National Science Foundation and the Water Resources Center. A research team lead by Water Resources Sciences professor Bill Arnold found that over the last 30 years, the levels of the four dioxins derived from triclosan have risen by 200 to 300 percent, while levels of all the other dioxins have dropped by 73 to 90 percent.



William Arnold's research found an increase in levels of the four dioxins derived from triclosan of 200–300 percent over the last 30 years.

Earlier research conducted by Arnold's group showed that triclosan generated a specific suite of four dioxins when exposed to sunlight. In this recent study, core samples of Lake Pepin sediments, which contain a 50-year record of pollutant accumulation, were analyzed for triclosan, the four dioxins derived from it, and the entire family of dioxin chemicals.

"In the deepest part of the sediment, there is no triclosan and these dioxins are not present," Arnold said. "Once triclosan was introduced, a record of triclosan and these four dioxins appears in the sediment."

Triclosan was added to commercial liquid

hand soap in 1987, and by 2001, about 76 percent of commercial liquid hand soaps contained it. In fact, it's so prevalent, that seeking a liquid soap without triclosan is challenging—Arnold's own wife spent a half an hour walking the aisles of a supermarket trying to find a hand soap that didn't contain it.

About 96 percent of triclosan from consumer products goes down residential drains, and much of it eventually reaches wastewater treatment plants, where it is not completely removed. When treated wastewater is released into rivers, sunlight converts some of the triclosan into dioxins.

"Neither toxicity of the dioxins derived from triclosan nor the extent of the dioxins distribution in the environment is well understood," said Arnold. "But we do know that soap without triclosan works perfectly well."

## "Minnesotans and Their Water" survey—early results find common water values

The Minnesota Water Sustainability Framework, available for public review November 1, presented an opportunity to check the pulse of Minnesotan's water values and opinions. Because developing water policy involves values as well as science, the project's Citizen Stakeholder Advisory Committee, one of nine subject-specific work teams, set out to find out how Minnesotans feel about a range of water-related issues through a survey, listening sessions, and stakeholder feedback. The 16-member team was co-chaired by Barb Liukkonen, an educator with the Water Resources Center, and Marian Bender, executive director of Minnesota Waters. Representatives included environmental groups, recreational organizations, tribal partners, agricultural and business interests, forestry interests, and local units of government, as well as shoreland property owners.

The committee launched a "Minnesotans and Their Water" survey at last year's Minnesota State Fair and distributed surveys at more than 50 meetings statewide including

nine listening sessions. It was also available online throughout the year. The survey gathered 4500 responses from all corners of the state, giving people a chance to share their opinions on how water resources are—and should be—managed in Minnesota.

"We heard about what was important to people at the local level and how they feel about statewide programs and current policies," said Liukkonen. "And frankly, we're surprised by the commonality of the answers." While the results are still being compiled, early findings include:

- Minnesotans support the idea that healthy water needs to be available for ecological uses as well as for drinking water, recreational and commercial benefits to humans.
- Minnesotans believe we need to change our behavior in order to reverse the trend toward decreased water quality. And they feel that education, coupled with incentives and strong, enforced regulations, can make a difference.
- Minnesotans want dollars raised from the

Clean Water, Land and Legacy Amendment to be invested and distributed differently than typical competitive pools. They want the appropriation process to be less political, with some funding allocated at a regional level, rather than all at the state level.

- Minnesotans want funding to be made available to nonprofit and citizen volunteer organizations working toward clean water, as well as to state agencies and local government.

In terms of rank, drinking water was identified as the most important use of Minnesota's water, followed by ecological uses for wildlife and plants, agricultural use, and recreational use. Among the most serious threats to Minnesota's water supply, responders ranked chemical pollution, followed by excessive nutrients, invasive species, and loss of wetlands.

*Water Framework survey, continued on page 6*

## UM Extension and OSTP customize workshops for Sewer Camp

The University of Minnesota Extension and the Leech Lake Band of Ojibwe partnered on a project addressing waste water issues in Indian Country. The project is the result of a Federal Recognized Tribal Extension grant. The waste water issue was a perfect fit with the Leech Lake Environmental Department's desire to increase the professional capacity of staff working on waste water projects and improve home owner knowledge of septic system care and maintenance.

One aspect of this project is Sewer Camp, which customized the WRC's Onsite Sewage Treatment Program (OSTP) standard professional training and certification workshops to include additional

group activities in homework and field days. Twenty tribal professionals from Leech Lake, Red Lake and Indian Health Service received certification for Introduction to Onsites,

Installing Onsites, Design of Onsites, Soils and Inspecting Onsites. Some of the unique opportunities that resulted from the customized field days included participants assessing site conditions for two new homes

and working together to design systems for those homes. A special soils field day gave participants an opportunity to study local soil conditions on Leech Lake Reservation.

Jennilynn Bohm from the Red Lake DNR and a Sewer Camp participant, found the workshops helpful. "It was an opportunity to interact with members of other tribes, forming networks with them and the University of Minnesota as well. The hands-on experience was a great educational tool."



Photo credit: Sara Heger

OSTP's Dan Wheeler and Dave Gustafson examine a soil sample with Sewer Camp participant Sam Malloy.

### Keynotes, continued from page 1



Stephen Polasky, University of Minnesota

**Stephen Polasky**, *Valuing Nature: Incorporating Ecosystem Services into Decision-Making*. Polasky received a Ph.D. in Economics from the University of Michigan in 1986. He previously held faculty positions in the Department of Agricultural and Resource Economics at Oregon State University and the Department of Economics at Boston College. Dr. Polasky was the senior staff

economist for environment and resources for the President's Council of Economic Advisers 1998–1999. He was elected into the National Academy of Sciences in 2010. He was elected as a Fellow of the American Academy of Arts and Sciences in 2009 and a Fellow of the American Association for the Advancement of Science in 2007.

**Larry Barber**, *Effects of Biologically Active Consumer Product Chemicals on Aquatic Ecosystems*. Barber is a research geochemist with the U.S. Geological Survey in Boulder, Colorado. He received his Ph.D. and M.S. degrees in geology

from the University of Colorado and his B.S. degree in Geology at the University of Arkansas. For the past twenty years he has conducted research on the fate of organic and inorganic chemicals in natural water systems, with a focus on consumer-product derived contaminants in treated wastewater

and the implications for water reuse. His research involves field and laboratory studies that quantitatively integrate chemistry, biology, hydrology, and geology in evaluating the environmental fate of contaminants.



Larry Barber, USGS

## 2011 Research Grant Competition

The Water Resources Center holds an annual competition for research funds provided by Congressional appropriation to the Water Resources Research Institutes through the US Geological Survey. We are pleased to announce the WRC research grant competition for 2011. Proposals should emphasize innovative approaches advancing the scientific understanding or imaginative strategies for solving important water resource problems. Proposals are invited from researchers from any college or university in Minnesota, and are sought on a wide range of subjects related to water resources science and engineering. Proposals will be evaluated on scientific merit and relevance to state and national needs, on potential to attract extramural funding, and on clearly articulated and relevant impacts of the research. Proposals will be reviewed by both in-state and out-of-state reviewers, and an advisory panel will select the proposals for funding. We encourage proposals from junior faculty. The submission deadline is noon, **Friday, November 12, 2010**. Decisions will be made by early January 2011. Funding is contingent on the appropriation of funds by Congress. For the full Request for Proposals, visit: [wrc.umn.edu](http://wrc.umn.edu)

**Karly Eckman** (WRC) presented "Evaluating Social Outcomes in Water Resources Projects: Lessons from Minnesota," co-authored by **Valerie Were** (NRSM), at the 2010 Universities Council on Water Resources (UCOWR) conference in Seattle, WA, July 13, 2010. **Were** presented "Non-Governmental Organizations and Natural Resources Management in the Lake Victoria Basin," co-authored by **Eckman**.

**Stephanie Guildford** (WRS graduate faculty, UMD Biology, LLO) and her team received a Major Grant Award of \$249,000 for "Linking the Past, Present, and Future: Ecosystem Change in Lake Malawi."

**John Gulliver** (WRS graduate faculty, CE), **Andrew Erickson** (SAFL) and **Pete Weiss** of Valparaiso University have re-

ceived a three-year U.S. EPA 319 grant of \$400,000, "Assessing Enhanced Swales for Pollution Prevention."

The Office of Technology Commercialization has applied for a patent on the SAFL Baffle, invented by **Omid Mohseni** (CE), **John Gulliver** (WRS graduate faculty, CE) and **Adam Howard** (SAFL). The SAFL Baffle assists in stormwater pollution prevention by retaining sediments that collect in storm sewer sumps and preventing washout during storms.

**Robert Hecky** (WRS graduate faculty, UMD Biology, LLO) and team received a \$30,000 seed grant for "Global Great Lakes: Enhancing Utilization of Lake Victoria Fisheries Information for Decision Support."

**Nathan Johnson**, (WRS graduate faculty, UMD CE), recently joined the WRS faculty. His interests include environmental aquatic chemistry, sediment biogeochemistry, and biological and chemical processes related to contaminant transport and transformations.

**Sergei Katsev** (WRS graduate faculty, UMD Physics, LLO) and his team received seed funding for the proposal "Methane in Lake Kivu: Towards a Safe and Environmentally Responsible Use of a Unique Geoenery Resource."

**Ed Nater** (WRS graduate faculty, SWC) stepped down as head of the department of Soil, Water, and Climate, June 20, 2010, after serving in that post since December, 2001. Nater will continue to teach Soil Science and Environmental Science courses, as well as pursue his study of the biogeochemistry of mercury. **Carl Rosen** (WRS graduate faculty, SWC) is the new department head of SWC, in addition to holding a secondary appointment in the department of Horticultural Science.

The Northland NEMO program team, **John Bilotta**, **Barb Liukkonen** (UM Extension), **Jesse Schomberg** and **Cindy Hagley**, (UM Extension, MN Sea Grant), received a bronze award for their creation of the Watershed Game from the Association of Natural Resource Extension Professionals (ANREP) at the National Conference held June 27–30, Fairbanks, Alaska. The NEMO program team, in partnership

with **Wendy Strombeck**, designer and owner of One.D.Design, also received a bronze Summit Creative Award for individual graphic design from Summit International Awards for the Watershed Game.

**Euan Reavie** (UMD, NRRI) and **Amy Kireta** (UMD, NRRI) received a grant from Minnesota Sea Grant of \$110,000. Their project will study the paleolimnology of Lake Superior to track anthropogenic impacts in the forms of nutrient enrichment and climate change.

**Faye Sleeper** (WRC co-director) attended the UM Crookston RiverWatch Boot Camp. She presented a talk on the Clean Water Act and impaired waters, and interacted with other participants over the two-day program.

**Deborah Swackhamer** (WRS graduate faculty, WRC co-director) testified in Washington D.C. on June 17, 2010 before the Water and Power Subcommittee of the Environment and Natural Resources Committee of the House of Representatives, in support of HR 5487, the reauthorization of the Water Resources Research Act that authorizes the network of centers that includes the Water Resources Center. **Swackhamer** was in Raleigh, N.C., June 14–16, 2010, attending a two-day administrative retreat with the U.S. EPA Science Advisory Board. **Swackhamer** also attended the Gordon Research Conference on Environmental Sciences: Water, in Holderness, N.H., June 21–25.

### *Water Framework survey, continued from page 4*

The survey also queried Minnesotans about process—specifically, how they'd like to see water-related investments made. "Respondents want to see water investments divided equally between restoring impaired waters and protecting healthy waters, including groundwater," said **Liukkonen**. "This is particularly interesting as current policy and practices are primarily set up to address impaired surface waters. And it is not surprising that Minnesotans want measurable outcomes, accountability, and clear assessments of whether waters are improving."

To access the full report, visit [wrc.umn.edu](http://wrc.umn.edu)

**Brian Beck** began his M.S. work in June, investigating the role of sulfate reduction in driving mercury methylation in surficial sediment of the St. Louis River Estuary. His project is jointly funded by the Minnesota DNR, USGS, and WRC. Beck is advised by **Nathan Johnson**.

**Christy Dolph** received a Butler and Jensen Water Resources Science Fellowship award to further her research regarding the effect of restoration activities on the structure and function of stream ecosystems in the Minnesota River basin. Dolph is the second WRS recipient of the Fellowship.

**Sarah Elliot** received her M.S. in June 2010. Her thesis title was: "Water Quality Characteristics of Three Rain Gardens Located within the Twin Cities Metropolitan Area, MN." Elliot was advised by **Mary Meyer** and **Gary Sands**.

**Scott Haire** presented the poster, "Three Decades of Biomonitoring from the Upper Mississippi River," at the North American Benthological Society Annual Meeting in Santa Fe, NM, June 6–11, 2010. Haire is advised by **Leonard Ferrington**.

**Edmund Isaac** received his M.S. in May 2010. His thesis title was: "An Evaluation of the Importance of Mysis relicta to the Lake Superior Fish." Isaac was advised **Thomas Hrabik** and **Jason Stockwell**.

**James Johnson** received his M.S. in May 2010. His thesis title was: "Evaluation of Lake-Wide, Early-Season Herbicide Treatments for Controlling Invasive Curlyleaf Pondweed (*Potamogeton crispus*) in Minnesota Lakes." Johnson was advised by **Raymond Newman**.

**Ajay Jones** presented "Response of Native Macrophyte Communities to Early Season Herbicide Treatments of *Potamogeton*

*crispus*," at the Aquatic Plant Management Society Annual Meeting in Bonita Springs, FL, July 11–14, 2010. Jones is advised by **Raymond Newman**.

**Megan Kelly** presented "Direct and Indirect Photolysis of Phytoestrogens," at the Gordon Research Conference at Holderness School, NH, June 20–25, 2010. Kelly is advised by **William Arnold**.

**Messias Macuiane** received a pre-dissertation award of \$15,000, for his proposal, "Impact of Cage Culture on the Endemic Fish Community of Lake Malawi." Macuiane is advised by **Robert Hecky** and **Stephanie Guildford**.

**Derrick Passe** received his M.S. in July 2010. His thesis title was: "Providing Safe Drinking Water in Guatemala through Collaboration, Metering and Monitoring." Passe was advised by **John Gulliver**.

**Mina Rahimi** presented a poster, "Lidar Mapping of Sinkholes in Winona County, MN," at the Geological Society of America Meeting, Branson, MO, April 11–13, 2010. Rahimi is advised by **E. Calvin Alexander**.

**Claire Serieyssol Bleser** received her Ph. D. in June 2010. Her dissertation title was: "Determining the Impacts of Dams, Water-Level Fluctuations, Climate, and Landscape Changes in Voyageurs National Park and Vicinity." Bleser was advised by **Leonard Ferrington** and **Mark Edlund**.

**Jared Trost** received his M.S. in June 2010. His thesis title was: "Effects of Perennial and Annual Vegetation on a Soil Water Balance and Groundwater Recharge." Trost was advised by **John Nieber**.

## October 13, 2010

### St. Croix River Research Rendezvous

*Warner Nature Center*

*Marine on the St. Croix*

Sponsored by the St. Croix Watershed Research Station, the Rendezvous has been a significant forum for the presentation and discussion of scientific investigations of the St. Croix River watershed. For more information, visit:

[www.smm.org](http://www.smm.org)

## October 19–20, 2010

### Minnesota Water Resources Conference

*RiverCentre, St. Paul, MN*

The Minnesota Water Resources Conference presents innovative and practical water resource engineering solutions, management techniques and current research about Minnesota's water resources. For more information, visit:

[wrc.umn.edu](http://wrc.umn.edu)

## November 8–10, 2010

### Minnesota-Wisconsin Invasive Species Conference

*Crowne Plaza, St. Paul, MN*

An all-taxa conference covering invasive aquatic and terrestrial plants, animals, pests and pathogens, addressing prevention and management. For more information visit:

[www.minnesotaswics.org/2010](http://www.minnesotaswics.org/2010)

## May 30–June 3, 2011

### IAGLR 54th Conference on Great Lakes Research

*Duluth, MN*

Hosted by the University of Minnesota-Duluth. The deadline for submitting scientific sessions is October 22, 2010.

For more information, visit:  
[www.iaglr.org/conference/](http://www.iaglr.org/conference/)

## Minnegram

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**Editor:** Christine Hansen

**Submissions:** Minnegram welcomes articles, community news, news stories, photos, and other materials for publication.

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# Publications & Resources

Yu, S.Y., S.M. Colman, T.V. Lowell, G.A. Milne, T.G. Fisher, A. Breckenridge, M. Boyd, J.T. Teller. "Freshwater Outburst from Lake Superior as a Trigger for the Cold Event 9300 Years Ago," *Science*, v. 328, p. 1262-1266.

Stepenuk K., L. Wolfson, B. Liukkonen, J. Iles, T. Grant. "Volunteer Monitoring of *E. coli* in streams of the upper Midwestern United States: a comparison of methods," *Environmental Monitoring and Assessment*, May 8, 2010.

Reavie, E., A. Cangelosi, L. Allinger. "Assessing ballast water treatments: Evaluation of viability methods for ambient freshwater microplankton assemblages," *Journal of Great Lakes Research*, 2010.

Lorenz, D. L. "Trends in streamflow and nutrient and suspended-sediment concentrations and loads in the Upper Mississippi, Ohio, Red and Great Lakes Basins," 1975-2004. [pubs.usgs.gov/sir/2008/5213/](http://pubs.usgs.gov/sir/2008/5213/)

Brigham, M.E. "Methylmercury in aquatic ecosystems of the United States" National Monitoring Conference, Denver, Colorado, April 25-29, 2010, p. 133. [www.aslo.org/meetings/santafe2010/files/aslo\\_nabs\\_2010-abstracts.pdf](http://www.aslo.org/meetings/santafe2010/files/aslo_nabs_2010-abstracts.pdf)

Lorenz, D.L., D.M. Robertson, D.A. Saad, J.R. Stark. "Nutrient trends in the United States part of the Great Lakes Basins, 1993 to 2004: Ecology of Lake Superior, Integrated Approaches and Challenges in the 21st Century," May 2010, p. 24. [www.aehms.org/conf/ELS\\_Program\\_Abstracts2010.pdf](http://www.aehms.org/conf/ELS_Program_Abstracts2010.pdf)

Christensen, V. G. and R. Maki. "Nutrient cycling and relation to changes in water levels for Kabetogama Lake, Voyageurs National Park, 2008-09." Lake of the Woods Water Quality Forum, March 10-11, 2010, International Falls, Minnesota, p. 12. [lowwsf.com/component/docman/doc\\_view/18-2010-program-lake-of-the-woods-water-quality-forum.html](http://lowwsf.com/component/docman/doc_view/18-2010-program-lake-of-the-woods-water-quality-forum.html)

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