

# MINNEG RAM

September 2001

## State to reorganize its water programs

by Gretchen Sabel, Minnesota Environmental Quality Board

This year's Omnibus Agriculture and Environment funding act (Laws of Minnesota 2001 First Special Session, Chapter 2, Section 155) required the Director of the Office of Strategic and Long Range Planning to develop a plan for the reorganization of state water programs and functions. Work on the project began in early July; it is being conducted by staff of the Minnesota Environmental Quality

Board (EQB), with advice from the EQB's Water Resources Committee. The project team includes Peder Otterson, Michael Tietz, John Wells, and Gretchen Sabel. The law provides that three goals are to be met in the plan: 1) all specific plans and implementation projects should be coordinated with and relate to an overall water management plan; 2) similar programs and functions should be assigned to a single agency when feasible; and 3) inherent conflicts of interest should be avoided.

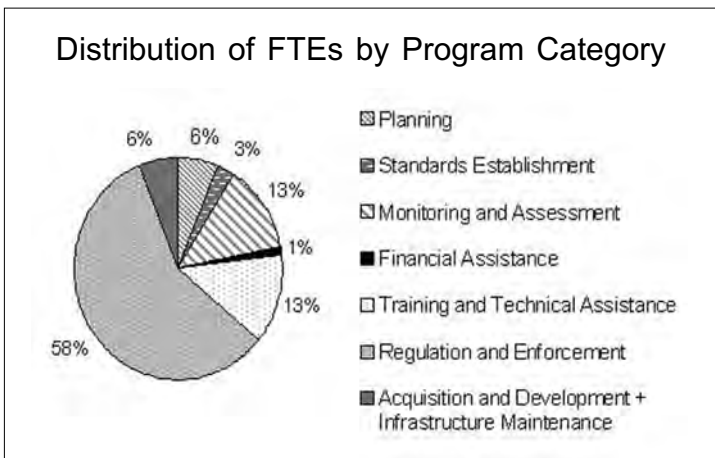
The reorganization plan is to be designed to ensure regulatory efficiency and program effectiveness. The project provides an opportunity for Minnesotans to consider how water resource needs are met within the current organizations, and whether or not changes could improve water management. This project focuses only on reorganization of state water programs, and is not looking at local or federal programs.

Three work products are to be submitted to the Legislature from this project: reallocation of programs, functions and FTEs to agencies, will be submitted along with a summary of outcomes expected from each program.

**Due February 15, 2002**

A final plan with a chart and draft legislative language to accomplish the reorganization will be submitted. The reorganization may be staged over a number of years.

Legislators have indicated that they will hold hearings on this project in early winter, after submittal of the preliminary plan. Public testimony will be taken during those hearings. Comments, thoughts, or ideas on this project can also be submitted via the EQB's Water website listed above, by email to: [peder.otterson@state.mn.us](mailto:peder.otterson@state.mn.us) or [gretchen.sabel@state.mn.us](mailto:gretchen.sabel@state.mn.us), or in writing to: Water Reorganization Project, Minnesota Environmental Quality Board, 300 Centennial Office Building, 658 Cedar Street, St. Paul, Minnesota 55155.



Allocation of full-time equivalents of staff resources (FTEs) by categories.

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**Due November 15, 2001**

A preliminary plan for reorganizing state water programs and functions, including a chart showing proposed

project:

**Delivered August 15, 2001**

A chart has been developed and submitted to the legislature as requested. It lists the current water programs and functions of state government, providing a description of the programs, the full-time equivalents of

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# Around the State



## WATER RESOURCES UPDATES

### Minnesota Legislature funds CREP program

The Minnesota Legislature passed a bonding bill in June that earmarked \$51.4 million in state appropriations and qualified Minnesota for \$163 million in federal matching funds for the Minnesota River Conservation Reserve Enhancement Program (CREP).

With a vote of 115 to 17 in the House of Representatives and 57 to 0 in the Senate, the state's bonding bill was passed, paving the way for the state to move ahead with the final implementation of the Minnesota River Conservation Reserve Enhancement Program (CREP). Governor Ventura signed the bill on June 30, 2001.

CREP is a state-federal partnership program that pays landowners in the Minnesota River basin to take marginal cropland out of production as a way to improve water quality and wildlife habitat. With the full funding, the target goal of enrolling 100,000 acres can be reached.

"We're thrilled to see the final passage of the bonding bill," said Ron Harnack, executive director of the Minnesota Board of Water and Soil Resources (BWSR). "This is the single most important initiative we have to clean up the Minnesota River and reclaim its heritage."

As of mid-June, 42,237 acres were enrolled in the program, according to figures from BWSR. An additional 23,893 acres were in process or pending approval at Soil and Water Conservation District offices.

*Excerpted from River Monitor, August 2001*

### New grant expands reach of Water on the Web project

Water on the Web (WOW) has received an \$800,000 grant from the National Science Foundation's Advanced

## From the Director's Desk



### The Constancy of Change

The aphorism "All is flux, nothing stays still," is attributed to the Greek philosopher Heraclitus (540-480 BC). A more recent pundit (whose name I have forgotten) put it this way: "The only thing constant in life is change." These musings came to mind as I sat down to write this new column. Change is all around us. Weather-wise, the days are getting shorter, the nights cooler, and the occasional maple already has a few red leaves—signs of the change in season from summer to fall. Students are back on campus too; a new academic year is beginning. The campus to which students have returned does not look much different than it did when they left last May, but it has been changing—although incrementally rather than dramatically. Some faculty have retired; some new ones are beginning their careers; there are a few new courses, some new research initiatives, and a new tuition scale. But change at the scale of a mega-university is more easily seen from the perspective of a decade or so. The University of Minnesota of 1991 was quite different than that of 2001. It's hard to believe, but ten years ago for most of us there was no internet and no e-mail; web-enhancement of courses was not even on the radar screen of most faculty.

So too is change a continuing characteristic of *Minnegram*. When the WRRC, our predecessor organization, began to publish *Minnegram* in 1986, it was much less sophisticated in format and content than it is today. It has had six editors over the years and gradually has undergone many improvements. This issue represents another incremental improvement both in format (note its new, smooth recycled paper and blue color, more reflective of the ideal northern lake) and content (e.g., this column). In coming issues, Jim Anderson and I will alternate responsibility for writing this column, and we hope to use it as a means of stimulating discussion on important water resources issues as they evolve and change with time. We hope you like the new look of *Minnegram* and the news it covers. We also hope that our university readers will have much success during the coming academic year in promoting positive change as they study and conduct research in the fields of water resources science and management.

*Pat*

Patrick Brezonik, WRC co-director

Technological Education program for the project, "Training water science technicians for the future—a national online curriculum using advanced technologies and real-time data."

Through an on-line curriculum, students will learn to apply their knowledge and skills to problems using RUSS data collected in their region and other relevant environmental and land-use data. Curriculum materials will be developed with the help of college-level instructors in the Pacific Northwest, Southwest, Southeast, Northeast, and Midwest. Each region will be associated with real-time water quality data delivered to the WOW

site by a partner water management agency or university. The project's efforts will be guided by a national panel representing industry, agencies, and higher education.

"We are excited to be able to take WOW from supplemental internet-based basic science curriculum to a year-long water resources management course that will address water quality issues important to each region," said Bruce Munson, Minnesota Sea Grant marine educator and associate professor with the U of M Duluth's Department of Education. Visit the WOW website at: [wow.nrri.umn.edu/wow/](http://wow.nrri.umn.edu/wow/).

*Excerpted from WOW Newsletter, June 2001*

## WRS grad earns Marine Policy Fellowship

Erik Heinen, a graduate student in Water Resource Science at the University of Minnesota Duluth, is Minnesota Sea Grant's newest Dean John A. Knauss Marine Policy Fellowship finalist. He will



travel to Washington, D.C., in December to work on water policy issues with members of the executive branch of the federal government.

"I was excited and surprised to be offered this opportunity," said Heinen, who is looking forward to applying his background in environmental and social sciences to resource management and global environmental concerns.

The National Oceanic and Atmospheric Administration's (NOAA) National Sea Grant College Program matches selected graduate students with hosts in the legislative branch, executive branch, or appropriate institutions in the Washington, D.C., area. The program is named in honor of one of Sea Grant's founders, former NOAA Administrator, John A. Knauss. Heinen's \$32,000 fellowship begins in February 2002 and will be administered by Minnesota Sea Grant.

In December, Heinen will travel to Washington, D.C., for orientation, interviews with prospective hosts, and placement.

"Erik has the essential elements that will maximize his success as a Knauss Fellow," said Carl Richards, director of Minnesota Sea Grant. "He has done excellent work examining nutrient dynamics within Lake Superior and has worked in one of the most innovative laboratories on the Great Lakes for limnological studies. Erik's combination of academic background, personal experiences, and personality will serve him well."

Heinen's passion for environmental issues led him to Africa as an intern for a Swedish agro-forestry organization and the

## WRS begins its seventh year

Fall 2001 marked the Water Resources Science Program's seventh year as a graduate major. Six master's and eight Ph.D. students joined the program, raising the total number of WRS students to 79 active students, 45 master's and 34 Ph.D. students, on the two campuses. Patrick Brezonik and Howard Mooers again assumed the roles of Director of Graduate Studies (DGS) on the Twin Cities and Duluth campuses, respectively. Both served as DGS from 1995-1999, and Brezonik was one of the founding faculty members of the program. Brezonik replaces Jim Perry, who recently became head of Fisheries, Wildlife, and Conservation Biology, and Mooers replaces Erik Brown, who is on sabbatical in France. Brezonik and Mooers will direct the program until an election is held in 2002.

Also new to the program is an expanded set of areas of emphasis for elective courses. Along with core courses and a technical elective course, students take a minimum of two elective courses in an area of emphasis. The new areas of emphasis are: hydrologic science, environmental chemistry, aquatic biology, water management technology, water resources economics, limnology, water quality, watershed management, and water policy. For more information about the WRS program, visit the WRS website at: [wrs.coafes.umn.edu](http://wrs.coafes.umn.edu).



New WRS students (front to back, left to right): Yuhu Yan, Darin Albrecht, Andry Ranaivoson, Larry Gunderson, Matt Hudson, Melinda Erickson, Melissa Atkinson, Lindsay Anderson, and Anne Jefferson. Missing: Adam Birr, Adam DeWeese, Wendy Hieb, Meghan Smith, and Kevin Springob.

Kenya Marine Fisheries Research Institute. Heinen is currently examining carbon and nutrient cycling in Western Lake Superior with James McManus, assistant professor at the University of Minnesota's Large Lakes Observatory and WRS faculty.

"Working on Lake Superior, and interacting with the research community studying the lake raised my awareness of the diverse challenges that face managers of large complex ecosystems," Heinen said. "The Knauss Marine Policy Fellowship immediately caught my eye as a unique opportunity to look at coastal...problems through policy and to introduce different perspectives into government agencies."

"I hope to build a career dedicated to protecting and preserving the Earth's life support," said Heinen. "It's possible that I'll continue in policy in Washington, D.C., after this year. I'm sure my time in D.C. will be very rewarding."

To learn more about the Dean John A. Knauss Marine Policy Fellowship, contact Minnesota Sea Grant at (218) 726-8107.

*Excerpted in part from an article written by Sharon Moen in the Seiche newsletter, August 2001, Minnesota Sea Grant*

# Using peat filters for pretreatment of septic tank effluent

by Jim Anderson, co-director, WRC

This is the second in a series of articles that will highlight the results of an alternative sewage treatment research project. A full discussion of these results and other project activities can be found at the website: [www.bae.umn.edu/~septic/LCMR/](http://www.bae.umn.edu/~septic/LCMR/). The topic in this article is the use of peat filters with individual residences.

A peat filter pretreats septic tank effluent by filtering it through a two-foot-thick layer of sphagnum peat before sending it to the soil treatment system. Peat is partially-decomposed organic material with a high water-holding capacity, large surface area, and chemical properties that make it very effective in treating wastewater. Unsterilized peat is also home to a number of microorganisms, including bacteria, fungi, and tiny plants. All of these characteristics make peat a reactive and effective filter.

Research conducted in Minnesota showed that peat filters can remove high concentrations of nutrients (nitrogen and phosphorus) and produce a high-quality effluent containing less than 30 mg/liter biological oxygen demand (a measure of organic material), less than 25 mg/liter

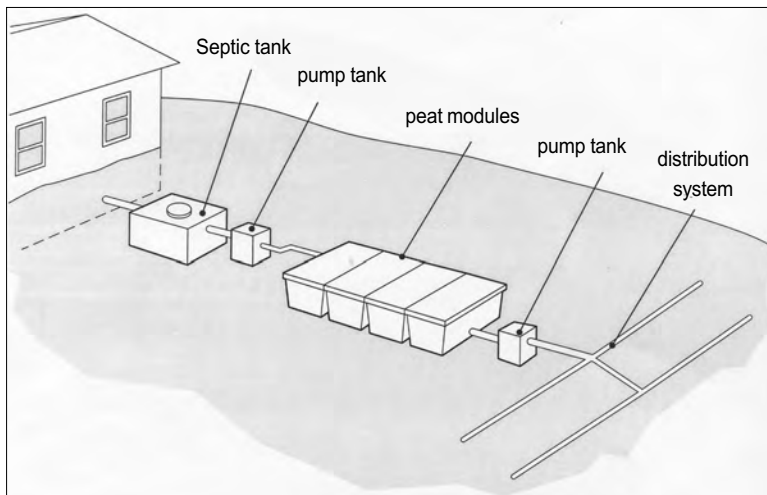


Diagram of an on-site sewage treatment system using peat modules for pretreatment.

total suspended solids (TSS), and less than 1,000 cfu/100ml fecal coliform bacteria.

The two main types of peat filters are modules and lined filters. Modules are manufactured plastic peat treatment cells. Lined peat filters are built on site and are usually lined with 30 mil polyvinyl chloride (PVC).

## Peat Filter Application

The wastewater leaving a peat filter system is a high-quality effluent, which may allow the soil in the trench or mound soil treatment system to accept it more easily and the system itself to last longer. Because peat filters produce such a “clean” product, they are useful in areas where only disturbed soil (e.g., compacted, cut, or fill soils) are available for the soil treatment system.

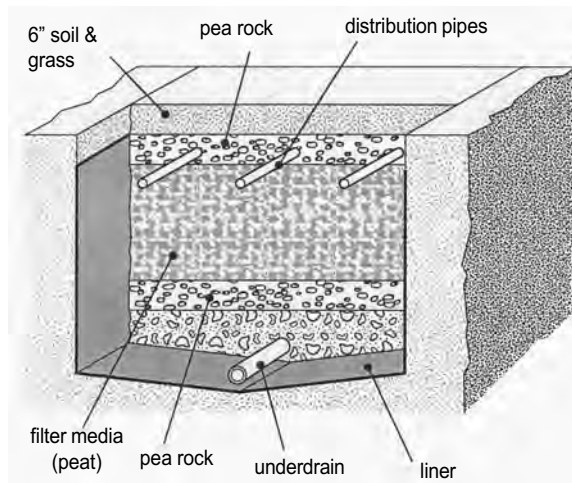
Peat filters can also be used in environmentally sensitive areas. In Minnesota, these sensitive locations are found near lakes and in shallow bedrock, aquifer recharge, or wellhead protection areas. Pretreatment may allow a reduction in the required three-foot separation distance between the bottom of the seepage trench of the soil treatment system to the limiting layer (i.e., water table or bedrock).

In locations that are difficult to access, such as small lots, lakeshores, or heavily wooded areas, modular peat filters may be easier to install than other systems.

## How Do Peat Filters Work?

Wastewater flows from the home into a septic tank where the large solids settle out and the remaining liquid flows into a pump tank. An effluent screen or filter is often installed to restrict smaller solids and grease flowing out of the pump tank. The liquid effluent is then pumped to the peat filter, where it is pretreated and pumped to the soil treatment system for final treatment.

A peat filter has three components: the peat, a pressure distribution system, and a drain. Most of the *peat* used in Minnesota comes from the northern regions of the state. It is harvested from large natural



Cross-section of a lined peat filter.

beds and screened for consistency. Bord na Mona brand modular filters use a coarser peat from Ireland. Systems using this coarser medium also provide excellent treatment. Wastewater must move through the peat under unsaturated conditions. The peat layer should be approximately 2–2.5 feet deep.

With a gravity distribution system, wastewater may pond on top of the peat and compress it, reducing the flow of wastewater through the filter. In a *pressure distribution* system, wastewater is applied evenly over the peat surface, allowing a more rapid infiltration rate. Filters using a pressure distribution system last longer and provide better treatment of wastewater.

The *drain* consists of a liner or module to hold the effluent inside the filter. The drain collects the effluent and delivers it to the soil treatment system. In a lined filter, the drainage system comprises a four-inch slotted PVC pipe surrounded by drainfield rock, approximately twelve inches deep. The bottom of the filter should be sloped slightly (one inch in eight feet) to keep effluent from ponding. If a module peat filter is used, the drainage system is built

into the module.

### Designing a Peat Filter

In a modular peat filter system, the typical recommended design is one module per bedroom. For a constructed peat filter, the recommended size is based on a loading rate of one gallon per ft<sup>2</sup> per day.

To determine the design size of the filter, the volume of wastewater flow from the residence is divided by the loading rate. The length-to-width ratio is not as critical as a good distribution system for applying wastewater to the filter surface. Ideally, the filter will receive wastewater evenly over its surface at regular intervals. Timed dosing is recommended.



Installed prefabricated peat modules.

### Final Disposal of Wastewater

Effluent leaving a peat filter is sent to a soil treatment system. Options for soil treatment systems include trenches, mounds, drip distribution systems, and linerless peat filters. In a linerless or “bottomless” drain system, the effluent from the peat is allowed to drain directly into the soil.

With peat-filtered effluent, the biomat layer does not form to the extent that it does in a soil treatment system receiving effluent from septic tanks. As a result, application requires the use of a pressure distribution network to apply effluent evenly throughout the system.

### System Classification

The soil treatment system will likely last longer when treating effluent from a peat filter than it will treating effluent from a conventional septic tank. It may be possible to make the soil treatment system somewhat smaller than those designed to receive conventionally pretreated effluent. It also may be possible to reduce the vertical separation to the seasonal high water table or bedrock. Systems with these modifications are called “performance systems,” and require local approval and an operating permit. The operating permit requires a monitoring and mitigation plan and the installation of a flow meter.

Researchers in Minnesota, Wisconsin, and Pennsylvania are currently testing size reductions for soil systems using pretreated effluent.

### Operation and Maintenance

Routine operation and maintenance practices suggested for on-site treatment systems apply equally to peat filters. (See *Septic System Owner's Guide*, Extension publication PC-6583, for details.)

Peat filters require more maintenance than conventional septic-tank-drainfield systems. A maintenance contract is strongly recommended. Depending on the local governmental

unit requirements and the recommendations of the manufacturer, the system may require quarterly to yearly maintenance. Maintenance includes inspecting all components and cleaning and repairing when needed. The flow meter and timer should be checked to ensure that the right amount of effluent is being applied to the system. A visual inspection of the effluent is required, and a lab analysis of effluent is often necessary. In addition, because of the high organic content of the peat itself, the filter media must be replaced periodically. This means physically removing the layer of peat when it has begun to decompose. Life expectancy of the peat media in a filter is estimated to be ten to fifteen years. The system design should account for this by making it simple to remove and replace the peat. Module peat filters are easier to maintain than lined peat filters because they are open to the surface.

Daily running costs for a peat filter are based on the cost of operating a small submersible pump; costs average less than one dollar per month for an individual home. Overall operational costs of \$200–\$500 per year include pumping, repairs, maintenance, and electricity.

Because of the unique treatment abilities of peat and its availability in the state, the peat filter appears to be a very promising method of treatment for Minnesota's wastewater treatment needs.

## USGS online data system launched

The US Geological Survey (USGS) launched its new, online National Water Information System (NWISWeb), opening the doors to more of the 100 years of water data collected by the federal earth science agency.

The new website, [water.usgs.gov/nwis/](http://water.usgs.gov/nwis/), allows users to access several hundred million pieces of archival and real-time data.

“Our users can now gain easy access to over 100 years of water information, all with the click of a mouse,” said Robert Hirsch, USGS associate director for water. “This not only saves them time, money, and effort, but also allows our hydrologists and technicians to concentrate on collecting data and processing the information derived from it. We have been providing real-time streamflow and historical streamflow data on the web for several years now.

“What this new system does is to improve that service and integrate it with many other types of water data, including historical water-quality data from rivers and aquifers, historical groundwater level data, and real-time water quality, precipitation, and groundwater levels.”

NWISWeb is an integral part of the USGS mission to disseminate important water quality and quantity data, the agency said. It can help water managers, engineers, scientists, emergency managers, recreational water users and utilities to evaluate current water supplies and plan for future supplies, forecast floods and droughts, and operate reservoirs for hydropower, flood control or water supplies.

For more information, visit the NWIS website: [water.usgs.gov/nwis/](http://water.usgs.gov/nwis/).

*Excerpted from Water Technology Online,  
July 17, 2001*



## U of M Water Community News

### Perry approved as head

It's official—all academic approvals were recently granted for professor Jim Perry to become the new head of the Department of Fisheries, Wildlife, and Conservation Biology. Perry served as interim head of the department since early 2000 and has been with the College of Natural Resources as a water resources professor since 1982.



In announcing Perry's acceptance of the position, Dean Al Sullivan praised his management style and creative, energetic leadership. "Jim is very responsive to faculty and students, inspires us all to achieve more than we dream, and brings an exciting vision for the curriculum. Jim will also be a strong advocate for interdisciplinary programs."

*Excerpted from the College of Natural Resource's Monday Memo, 8/20/01*

**Fiona Nagle** (Fisheries, Wildlife, and Conservation Biology Ph.D. candidate), advised by professors **Bruce Vondracek** and **Kristen Nelson** (Fisheries, Wildlife, and Conservation Biology), received a grant from the Consortium on Law and Values in Health, Environment and Life Sciences for her project, "Conservation land-use laws in island landscapes: planning and decision-making for conflicting land-uses."

**Mary Renwick** (WRC) was invited by the University of Minnesota's MacArthur Program to become a member of its program faculty. The interdisciplinary program has approximately 50 faculty

members and currently oversees several initiatives including those concerning biotechnology and sustainability, which are coordinated by the College of Natural Resources-sponsored Institute for Social, Economic, and Ecological Sustainability.

Faculty members at St. Anthony Falls Laboratory have received several grants since February 2001. **Roger Arndt**, **Miki Hondzo**, **Fernando Porte-Agel**, and **John Gulliver** received an NSF grant for the project, "An integrated stereoscopic particle image velocimetry system for ecosystem studies: subgrid parameterization." **Hondzo** also received a U.S. Army Corps of Engineers grant for the project, "Technical assistance in the analysis of oxygen demand in reservoir with bubble diffusers." **Gulliver** received a U.S. Army Corps of Engineers grant for the project, "Oxygen transfer experiments and data analysis from diffused aeration systems." **Arndt** received a grant from the Office of Naval Research for the study, "Feasibility study of a hydrodynamic test facility at the Detroit Dam." **Gary Parker** received an NSF grant for the project, "Mechanics of downstream fining in long reaches of large, low-slope sand-bed rivers." **Chris Paola** received an NSF grant for his project, "Collaborative research: experimental and theoretical study of linked sedimentary systems."

**Professor Porte-Agel** also received a NSF Career Award for Exceptional Potential in Research and Education for the project, "Effect of land-surface heterogeneity on regional-scale fluxes using a new generation large-eddy simulation."

**Jim Perry** (Fisheries, Wildlife, and Conservation Biology) and five colleagues from the Ukraine, Turkey, Sweden, and Azerbaijan received funding from the International Research and Exchanges Board (IREX) and the STARR foundation for "De-eutrophication strategies for the Black and Caspian Seas." Perry traveled to

Istanbul to join 25 colleagues in the new IREX Black and Caspian Sea Project and also spent time in Hungary working with the United Nations Environmental Program on the Global Environmental Outlook.

**Carl Richards**, **Anne Hershey**, **Chris Luecke**, **John O'Brien**, and **Steve Whalen** were awarded a grant from the NSF entitled, "A geomorphic trophic hypothesis for Arctic lake productivity."

**Brian May** and **Tom Johnson** (Large Lakes Observatory) received a Major Research Instrument grant from NSF for "Acquisition of instruments for Great Lakes reasearch." This \$323,540 grant will be used for an undulating tow vehicle with various sensors and a free-fall turbulence sensor. **Johnson** also was a keynote speaker at the Pole-Equator-Pole Transect III (PEP III) paleoclimate conference in Aix-en-Provence, France, on August 27, 2001.

**Meng Zhou** left the Large Lakes Observatory for a faculty position in Marine Services at the University of Massachusetts-Boston.

**Barb Liukkonen** (WRC) and **Cindy Hagley** (Minnesota Sea Grant) received a gold award from the Association of Natural Resource Extension Professionals for the *Minnesota Shoreland Management Resource Guide*, located at the website: [www.shorelandmanagement.org](http://www.shorelandmanagement.org).

### Oops!

In our last issue, we neglected to mention **Deborah Zak** (UM Extension) as being among the those who received the Secretary's Honor Award from the United States Department of Agriculture for the White Earth Reservation Science and Math Program. Zak was instrumental in beginning this award-winning program. Our apologies for the omission.



## Upcoming Events

October 5-7. **Midwest Environmental Chemistry Workshop.** Minneapolis, MN. This is the 24th annual meeting in a series focusing on student and faculty research. For registration visit the website: [envirochem.umn.edu/faculty/mwecw/](http://envirochem.umn.edu/faculty/mwecw/) or call the WRC for more information.

October 14-17. **Hydrologic Science: Challenges for the 21<sup>st</sup> Century.** Minneapolis, MN. This annual meeting of the American Institute of Hydrology will cover topics ranging from sustainability of groundwater to surface water quality and aquatic biology. For more information, visit the website: [www.aihydro.org](http://www.aihydro.org).

October 19-21. **Women Sustaining Environment Sustaining Women: Discussions and Dialogues on Women and the Environment.** St. Paul, MN. This conference will explore the evolving role of women in environmental issues and education and will help develop a support network for women pursuing degrees in Environment Studies and careers in environmentally-related fields. For more information, visit the website: [www.stthomas.edu/wec](http://www.stthomas.edu/wec).

October 30. **34<sup>th</sup> Annual Water Resources Conference.** Bloomington, MN. Sessions in this conference will focus on Low-Impact Development issues such as cost, planning, and engineering as well as associated topics involving rural issues, ponding, and restoration issues. For more information, contact Noreen Hunting at (612) 625-6748 or e-mail: [hnunting@cce.umn.edu](mailto:hnunting@cce.umn.edu).

October 31. **Designing and Evaluating Low Impact Developments.** Bloomington, MN. This technical workshop, designed for land use or development planners, civil or environmental engineers, landscape architects, and environmental professionals or consultants, will provide hands-on training on how to design and evaluate development projects to meet the goals and objectives of "low impact development." This innovative approach to storm water management emphasizes the control of runoff at the source. For more information, contact Noreen Hunting at (612) 625-6748 or e-mail: [hnunting@cce.umn.edu](mailto:hnunting@cce.umn.edu).

November 7-9. **Bridging the Gaps between Science, Policy and Practice.** Madison, WI. The 21st International Symposium of the North American Lake Management Society will focus on the use of sound science to make high-quality public policy. Citizens, scientists, lawmakers and lake managers will learn and share examples of real world projects. For more information, the website: [www.nalms.org/symposia/madison/index.htm](http://www.nalms.org/symposia/madison/index.htm).

November 8-9. **Working Landscapes in the Midwest: Creating Sustainable Futures for Agriculture, Forestry, and Communities.** Delavan, WI. This conference will establish an ongoing dialogue between and amongst farmers, landowners, foresters, agency representatives, academicians, special interest organization members, and the concerned public regarding policies and practices affecting the economic and environmental character of the working landscape. For more

**Mark your calendars now!**

### Minnesota Water 2002

*Working Together in a Climate of Change to Manage Minnesota's Water Resources*

**April 17-20, 2002**

**St. Cloud Civic Center**

Minnesota Water 2002 will be held in conjunction with the Minnesota Lakes and Rivers Conference. The first two days will emphasize technical presentations and the latter two days will focus on applied research and management and citizen-based concerns. For more information, contact the WRC at (612) 624-9282.

information, visit the website: [www.forestrycenter.org/library/admin/uploadedfiles/Midwest\\_Working\\_Landscapes\\_Conference\\_2.htm](http://www.forestrycenter.org/library/admin/uploadedfiles/Midwest_Working_Landscapes_Conference_2.htm).

November 15. **River Summit.** St. Paul, MN. Volunteers and professionals from the Twin Cities metro region will gather to share stream monitoring data and build a community of river stewards. For more information, call the Volunteer Stream Monitoring Partnership at (612) 625-6781.

December 9-12. **63<sup>rd</sup> Annual Midwest Fish and Wildlife Conference.** Des Moines, IA. For more information, visit the website: [www.state.ia.us/midwest2001](http://www.state.ia.us/midwest2001).

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## Publications and Websites



*WATERS.* U.S. Environmental Protection Agency. The Watershed Assessment, Tracking and Environmental Results (WATERS) information system enables users to quickly identify the water quality status of individual waterbodies and obtain summary reports on all waters of a state. Visit the website: [www.epa.gov/waters](http://www.epa.gov/waters).

*Managing River Flows for Biodiversity.* U.S. Environmental Protection Agency. This 25-minute case study video is available at (303) 541-0344. EPA document number EPA 841-V-00-001.

*What's Up With Our Nation's Waters?* U.S. Environmental Protection Agency. This 24-page booklet, designed primarily for children ages 10 to 15, presents key findings of the National Water Quality Inventory in an easy-to-read format. The booklet includes projects for school or for fun, a water quiz, a glossary, and a list of resources for more information. On the web at: [www.epa.gov/owow/monitoring/nationswaters/](http://www.epa.gov/owow/monitoring/nationswaters/).

*Plant It Right: Restoring Our Streams.* Washington State University Cooperative Extension. This 17-minute video, geared for students and volunteers, demonstrates how to plant trees and shrubs in the correct manner for success. It is accompanied by a 2-page fact sheet that covers the same information in a succinct manner and is laminated for field use. Available on the web at: [wawater.wsu.edu](http://wawater.wsu.edu).

*"One-Stop Shop" Web Site for Federal Grants.* Inter-Agency Electronic Grants Committee. This Federal Commons web site allows users to search the General Services Administration catalog of all federal grant programs. Visit the website: [www.cfda.gov/federalcommons](http://www.cfda.gov/federalcommons).

*Great Lakes Hydrometeorological Station Directory.* Great Lakes Information Network. This directory is an online mapping application featuring 20,000 listings of station characteristics for over 11,000 hydrological and meteorological stations throughout the Great Lakes

region. It is intended as a resource for determining period of record, types of data collected, and data availability. The mapping tool provides a geographic orientation and allows the database to be searched both by station characteristics and by location. Visit the website: [www.glin.net/gis/online/hydromet.html](http://www.glin.net/gis/online/hydromet.html).

*National Aquatic Nuisance Species Clearinghouse Website.* New York Sea Grant. This website provides access to an international library of research, public policy, and outreach education publications pertaining to invasive marine and fresh water aquatic nuisance species in North America. Visit the website: [www.aquaticinvaders.org](http://www.aquaticinvaders.org).

*Sea Grant Nonindigenous Species CD.* Minnesota Sea Grant. This updated CD of the Sea Grant Nonindigenous Species Web site provides the most accurate scientific material available on aquatic nuisance species. All products have been peer-reviewed. Available at (218) 726-8106.

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