

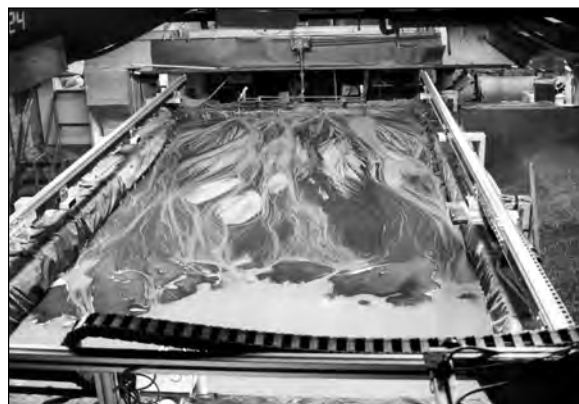
## New University Center to study Earth-surface dynamics

The creation and sculpting of Earth's surface spans environments and timescales, from a single landslide in an isolated watershed to the millennial workings of plate tectonics around the globe. It is also intimately bound to the life that inhabits it. To study a subject of such diversity requires collaborative research that crosses disciplines and institutions. This kind of collaboration and research is the mission of the newly created National Center for Earth-surface Dynamics (NCED) housed in the University of Minnesota's St. Anthony Falls Laboratory (SAFL), Department of Civil Engineering. NCED is less a physical center than a collaborative one whose partner institutions include the Science Museum of Minnesota, the University of California at Berkeley, Princeton University, the Massachusetts Institute of Technology, The University of Illinois Urbana-Champaign, and Fond du Lac Community and Tribal College.

NCED is the result of a \$19.3 million

grant from the National Science Foundation through the Foundation's Science and Technology Centers (STC) Program, with matching funding from the University of Minnesota's office of the Vice President for Research, the Institute of Technology, and the Office of Information Technology. The initial grant is for five years with the possibility of renewal for an additional five years.

Led by Professor Gary Parker (Civil Engineering), director of NCED, and co-directors Professor Efi Foufoula-Georgiou (Civil Engineering) and Professor Chris Paola (Geology and Geophysics), NCED will bring together scientists from a variety of fields to identify and quantify the major physical, biological and chemical processes that shape the Earth's surface. Parker describes NCED's goal as "an umbrella for



Facilities like SAFL's EXperimental EarthScope (XES) basin (above) are used to study Earth-surface dynamics.

research that promotes our understanding of how the Earth's surface is sculpted, how it changes, how it takes its form and how it responds to natural and human intervention." Due to the Center's interdisciplinary nature, its research isn't married to any one technology. Potential research will use fieldwork, numerical

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### Water Resources Center holds CLEANER workshop

The Water Resources Center hosted a workshop in October to discuss CLEANER (Collaborative Large-scale Engineering Assessment Network for Environmental Research), a proposed NSF initiative for large-scale environmental research possibilities. The workshop was organized by Patrick Brezonik, WRC and Civil Engineering, and Nick Clesceri of the NSF. Fifty-five environmental engineers and scientists from across the country met at the Hyatt Whitney Hotel in Minneapolis to develop ideas for the proposed program. Participants gave presentations on exciting advances in sensor technology, cyber-infrastructure, and other environmental engineering topics. The next CLEANER meeting will be held in February 2003 at Duke University.

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# Around the State



## WATER RESOURCES UPDATES

### Clean Water Act anniversary

Governor Ventura proclaimed the month of October to be “Clean Water Month” in Minnesota to recognize the 30<sup>th</sup> Anniversary of the Clean Water Act. As part of the celebration, the Volunteer Stream Monitoring Partnership (VSMP) assisted and coordinated volunteers of all ages in performing simple water chemistry tests in streams, rivers, lakes, and ponds throughout the metro area. Twenty-one teams monitored streams from October 12 through 27 and provided data to be entered into a national database. Thousands of groups from all over the United States participated in this event, coordinated by America’s Clean Water Foundation. This event is part of the Year of Clean Water activities, recognizing thirty years of widespread efforts to protect America’s water resources. For more information, or to look at data collected by volunteers throughout the nation, log onto [www.yearofcleanwater.org](http://www.yearofcleanwater.org).

### Water Resources Conference

The 35<sup>th</sup> Annual Water Resources Conference and workshop was held October 29-30 at the Thunderbird Hotel in Bloomington, Minnesota. The conference was attended by 230 engineers and environmental professionals from around the state. This year’s conference featured keynote sessions by Ben Urbonas, Master Planning Program, Urban Drainage and F.C.D., Denver, Colorado, who addressed the topic “Are BMPs Really Effective?” and Dean Djokic, ESRI, on “Has GIS Made a Difference in Water Resources Science and Engineering?” The conference featured three concurrent tracks throughout the day, featuring 30 presentations from water resources professionals

## From the Director’s Desk

### Shared Leadership



As you have read previously in this space, there remains a large amount of work to be done before the fishable and swimmable goals of the Clean Water Act are achieved despite decades of progress, particularly here in Minnesota. Agriculture will continue to face water quality issues as we try to balance production with environmental concerns. These concerns include Total Maximum Daily Loads (TMDLs), hypoxia in the Gulf of Mexico, and animal production and management strategies. At the same time, both at the state and national levels, we will continue to face major budget challenges due to the current deficits. The only way to continue progress solving our water quality problems will be to use our available resources more efficiently. This will require increased cooperation and collaboration between those agencies and organizations at state, regional and national levels that are concerned with solving the water quality problems.

To address the major water quality issues facing agriculture today, the University of Minnesota is participating in a new collaborative approach that will address water quality issues at watershed and basin scales. As part of the national water quality program of CSREES (Cooperative State Research, Education, and Extension Service) we are participating with the other Great Lakes States Land Grant Universities in EPA Region 5 to improve water quality management through education programs and research. The other five universities participating are the University of Illinois, Purdue University, the Ohio State University, Michigan State University and the University of Wisconsin, Madison.

The goals of this regional project are to increase coordination and collaboration on our research and education programs across states in the region, leverage university resources to address high priority water quality issues, and strengthen regional relationships with federal and state partners to provide an entry into university resources.

To make this shared leadership a reality, the Great Lakes Regional Water Quality Leadership Team and a regional coordinator held a strategic planning meeting in August. This session identified potential projects to support existing multi-state relationships and build new ones. These efforts will be focused on four broad areas: animal waste management, nutrient and pest management, watershed management, and drinking water and human health.

A joint meeting was held with EPA Region 5 staff at which several partnership opportunities were identified. We agreed to enhance communication between EPA and university staff, collaborate on efforts to evaluate watershed education and implementation plans, work on joint publications, and focus a collective effort on pathogen management.

A similar joint listening session was held with the NRCS regional office to discuss enhancing partnerships on the Conservation Title Programs of the 2002 Farm Bill.

Progress made by this regional water quality partnership will be highlighted in coming issues of the Minnegram.

Jim Anderson, WRC co-director

on GIS modeling and applications, alternative stormwater, hydrology modeling, pond design and aesthetics, and water quality assessment. Dean Djokic also presented a short course on October 30 that provided opportunities for

professionals to learn the fundamentals of GIS for water resources.

The Water Resources Conference was sponsored by the Minnesota Section of the American Society of Civil Engineers and the Water Resources Center.

## Second annual River Summit celebrates Minnesota's river volunteers

by Kevin Proescholdt, Outreach Coordinator, Volunteer Stream Monitoring Partnership, WRC

The Volunteer Stream Monitoring Partnership (VSMP) at the Water Resources Center hosted the second annual River Summit on Thursday, November 14, at the Minneapolis Convention Center.

About 200 volunteers, nonprofit staff, professionals, and agency staff attended the highly successful event.

Belinda Jensen, KARE-11 TV personality, emceed the morning plenary session. Minneapolis Mayor R. T. Rybak gave a heartfelt speech on the importance of the volunteers' work. He described how his career in public life originated from his own volunteer activism, working to improve water quality in Minneapolis lakes and to reduce airport noise.

Adam Hoffman, a freshman at St.



Minneapolis Mayor R. T. Rybak speaks with student volunteers.

John's University, spoke to the volunteers about his personal experience as a stream monitor in Joe Beattie's class at Hastings High School. Adam described how these experiences have helped shape his career so far at St. John's in Collegeville,

Minnesota.

Breakout sessions allowed participants to explore in depth the issues affecting rivers and streams in the seven-county Twin Cities region. Breakout sessions focused on the Vermillion River in Dakota County, Minnehaha Creek in Hennepin County, the Elm Creek/Shingle Creek watershed in Hennepin County, and a combined session for the Lower Minnesota River and the Upper Mississippi and St. Croix Rivers. In the final plenary session, individuals from the breakout sessions reported back to the

entire group on specific issues and concerns from their region.

Cassandra Champion, Environmental Scientist at the Metropolitan Council and a member of VSMP's steering committee, gave the closing address. She encouraged all the volunteer stream monitors to continue their important work, to continue to improve and expand their monitoring activities, and to become advocates for the use of their data in decision-making.



Belinda Jensen of KARE-11 TV with Lakeville High School students

## Multidisciplinary project studies nutrient cycling in human ecosystems

by Lawrence A. Baker, Senior Fellow, WRC

During 2002, a multidisciplinary group of researchers from the Water Resources Center, the Departments of Civil Engineering, Ecology, Forest Resources, and Soil, Water, and Climate, in collaboration with researchers from Arizona State University (ASU) conducted an "incubation" project, "Coupled Biogeochemical Cycles in Human Ecosystems." The project was funded through NSF's Biocomplexity Initiative.

Humans now dominate the world's nitrogen and phosphorus cycles. One consequence of the intensification of elemental cycles is widespread pollution that has not been abated by the first generation of pollution control efforts. Using nitrogen as an example, consider:

- Nitrogen pollution of U.S. rivers is widespread and has not always responded to pollution control efforts.

- Excessive nitrogen loading has had major deleterious impacts on the Gulf of Mexico.

- Nitrate contamination of aquifers is widespread in agricultural regions.

- NO<sub>x</sub> emissions in the U.S have remained virtually unchanged over the past 30 years.

Failure to control nutrient pollution has occurred in part because early pollution control efforts were narrowly focused. Hundreds of detailed, whole-ecosystem nitrogen balances have been published for forests, lakes, bogs, and other "natural" ecosystems, but only a few have been constructed for agricultural systems, and only one for a major city (Phoenix, AZ). Developing an understanding of nutrient cycling in human ecosystems undoubtedly would lead to pollution control strategies that are more effective,

less expensive, and more fair than current policies.

The conceptual framework for studying biogeochemical cycles in cities that has evolved from this project is built upon the concept of interlinked "couples":

- *Element-element (stoichiometric) coupling.* Preliminary calculations suggest that for conditions representative of the Minnesota agricultural watersheds, sufficient carbon input would occur when about 10% of the watershed is riparian forest.

- *Hydrologic coupling.* Humans modify their ecosystems to maintain mesic conditions. Hydrologic modification, such as irrigation and draining, profoundly alters nutrient cycling.

- *Spatial connectiveness.* Human

*Ecosystems continued on page 5*

# EPA program requires stormwater permitting

by Ron Struss, Education Coordinator, WRC and MN Board of Water and Soil Resources

By March 2003 approximately 200 Minnesota cities are required to apply to the Minnesota Pollution Control Agency for a National Pollution Discharge Elimination System (NPDES) Permit under Phase II of the EPA's stormwater program. Phase I of the program previously required cities with populations over 100,000 to apply for permits. Phase II cities have populations over 10,000 and include much of the seven-county Twin Cities Metro Area and the larger cities in Greater Minnesota. A list of affected cities can be found at <http://www.pca.state.mn.us/water/stormwater-phase2.html>.

In addition to cities, other public entities that operate stormwater conveyance systems must also apply for stormwater program permits. This includes counties, townships, state highways, campuses, jails, and hospitals.

Education on improved land-use practices is emphasized in the permit application process. Applicants are required to develop a stormwater Public Education and Outreach strategy plus additional educational strategies that address the "minimum control measures" in the following areas:

- Public participation and involvement (in stormwater program development and in activities such as stream clean-ups and water quality monitoring)
- Illicit stormwater discharge elimination (e.g., dumping waste into storm sewers)
- Construction site runoff control (keeping soil on site and out of waterways)
- Post-construction stormwater management (reducing the volume and pollution load of runoff from developed areas)
- Municipal pollution prevention (improved street sweeping, low impact

grounds maintenance, etc.)

Permit applicants are also required to explain how their education program is coordinated with other local clean water education efforts by soil and water conservation districts, watershed districts, lake associations, UM Extension, and non-profit organizations.



*Nonpoint source pollution is the largest threat to lakes and streams.*

The Water Resources Center has been active in assisting cities in developing their stormwater education programs. Through a subcontract with the League of Minnesota Cities, I have worked with Metro WaterShed Partners and Hamline University to create a guidance document for developing stormwater education programs. This was part of a larger service-for-fee effort that guided 109 of the League's cities through the stormwater permit application process. I also presented talks at workshops in St. Paul, Brainerd, and Mankato, which introduced the League's permit application guidance document to participating cities.

The Phase II stormwater permit application process gives cities four months to develop a document that will direct their city's stormwater management over the next five years. The WRC and others involved in stormwater education are strategizing how to assist in this effort by developing "ready-to-adapt" stormwater education materials for city use. The goal is to reduce duplication of effort, produce quality products, and provide consistent educational messages statewide.

The need for behavioral change has been and will continue to be emphasized in stormwater education. Education that does not lead to changes in behavior will not lead to improvements in water quality.

*NCED* continued from page 1

modeling, and experimental methods. The four major themes of NCED research are landscapes and seascapes, basin evolution, biogeomorphology/ecobiological fluid dynamics, and integration of morphodynamic process across environments and scales. Says Parker, "We're integrating disparate fields of inquiry into a new super-field in order to build a common analytical framework for the study of all the forces that shape the face of the Earth."

NCED is not solely a research center, however. NSF's Science and Technology Centers are expected to involve the local community by working to improve science and math in community schools and to strengthen training for undergraduate and graduate students in scientific fields. Centers are also expected to increase participation by typically underrepresented groups. Money and time are earmarked to meet these challenges. The grant "makes a difference in these 'put your money where your mouth is' diversity issues," says Parker. "Before, we only had a mouth."

Minnesota's NCED has found an exciting framework in which to meet NSF's outreach expectations. Through its partnership with the Science Museum of Minnesota (SMM), NCED has access to a preexisting educational program with activities ranging from in-school presentations to summer training institutes for teachers. The SMM is also offering land adjacent to its facility in downtown St. Paul for an outdoor Science Park. Another collaboration with the Fond du Lac Community and Tribal College allows a partnership with Minnesota's Native American population on issues specific to that community. One project involving several NCED researchers looks at the biogeomorphology of wild rice habitat in northern Minnesota.

The new Center is an opportunity to bring engineers, geologists, biologists, economists, oceanographers and others together to assemble a picture of Earth's changing surface. Says Parker, "Sometimes when you get people from different disciplines working together, there's an 'a-ha' factor. We hope to create an environment where that can happen."

# New state feedlot rules prompt farmer education

by Les Everett, Program Coordinator, WRC

After the publication of new state feedlot rules in 2000, livestock producers expressed considerable interest in knowing how the new rules would affect their operations. In anticipation of the need for education, the Water Resources Center and UM Extension Service partnered with the MN Pollution Control Agency (MPCA) and MN Department of Agriculture to obtain an EPA 319 grant to provide education on feedlot and manure management related to the new rules.

Over a two-year period, Regional Extension Educators Dennis Busch and Phil Nesse worked with Dave Wall (MPCA) and other Extension and agency staff to deliver two sets of programs. The first year concentrated on feedlot registration, permits, and an overview of the rules. The second year focused on three aspects of manure management specified in the rules for most operations: rates of application, management of manure in environmentally sensitive areas, and record-keeping.

To reach many livestock producers quickly, the state team developed publications addressing the key topics and concurrently delivered regional “train the trainer” sessions for county staff of Extension, Soil and Water Conservation Districts, County Feedlot Officers and others. These county staff then organized information meetings for livestock producers.

In the first year, while the rules were still “news,” over 60 county meetings were delivered and attendance exceeded 4,000. In the second year, meetings were held in 43 counties, with approximately 1,150 participants. End-of-meeting questionnaires in the second year indicated that over 80% of the producers in attendance were more likely to test soils, sample manure, and keep records as a result of the meetings.

As a follow-up, four pairs of focus group discussions were held across the state. One focus group of each pair was composed of farmers who had attended the county education sessions, and the other group of farmers who had not attended.

Some key findings included:

- Producers spreading solid manure often do not follow recommended rates because of manure variability and limits on time and availability of scales for spreader calibration.
- Suitable forms for field-by-field record-keeping are needed.
- More private sector agricultural professionals are needed to provide manure/nutrient management plans.
- Most farmers either don't use or seldom use the internet to get information. They prefer publications and workshops.
- Preferred topics for workshops and field days include: soil P levels and manure application rates in field selection, managing sensitive areas, and manure application technology.
- When asked about intentions to adopt a group of ten manure management practices, producers who had attended the county information sessions expressed a higher intended adoption rate than those who had not attended (92% vs 84%), even though they had started at a lower level of pre-2000 adoption.

*Ecosystems* continued from page 3

ecosystems are likely more interconnected than most natural systems. Consider the impact of protein consumption in cities on agricultural fertilizer use. In the U.S., we consume about one-third more protein than we need, two-thirds of which is provided by meat. If we (mostly urbanites) decreased protein intake to recommended levels and increased the percentage of protein from plants to 50%, we could use ~45% less fertilizer on farmland.

• *Coupling with the sociocultural system.* Understanding nutrient cycling within human ecosystems requires an understanding of the sociocultural system. Is the distribution of nutrient fluxes distributed normally among households, or do some households have high nutrient fluxes? What are the factors associated with high-flux households?

There is a wealth of data available on human ecosystems, such as air emissions inventories, agricultural statistics, landfill studies, and data from wastewater discharge permits, augmented by imagery from satellites and airborne sensors. There still is a need for ground-based research—we know very little about nutrient cycling in residential lawns, for example.

A full project report can be found on the WRC website: <http://wrc.coafes.umn.edu/>.

## Hands-on workshops teach manure management planning

Beginning this winter, UM Extension staff, in cooperation with local partners, will offer hands-on workshops where crop and livestock farmers across the state will have the opportunity to write crop nutrient and manure management plans based on information from their own fields. At the completion of the three-hour session, producers will understand how to complete a plan for their entire farm. The workshops are a good opportunity even for those producers who wish to employ a crop consultant to finish the plan: an understanding of how application rates are determined is useful for anyone applying manure and fertilizer. This opportunity will be of special interest to livestock producers

with operations between 300 and 1,000 animal units, since under state feedlot rules they are required by year 2005 either to have a plan prepared or to have manure applied by a certified operator. Kevin Blanchet and Jodi DeJong-Hughes of WRC and UM Extension are the project coordinators and will work with Regional Extension Educators throughout the state to set up and deliver these workshops. Blanchet will work with eastern counties (Kevin.Blanchet@co.dakota.mn.us), and DeJong-Hughes with western counties (dejon003@umn.edu). The project is funded by an EPA 319 grant managed by the Water Resources Center.



## U of M Water Community News

At the Extension Service Program Summit (October 23-24) WRC staff members **Mary Blickenderfer**, **Ron Struss** and **Barb Liukkonen** received the Dean and Director's Distinguished Team award and a \$1,000 stipend for effective shoreland education as part of the Shoreland Education Team. The team also received an Outstanding Natural Resources Program award from the Minnesota Community and Natural Resources Association.

**Ron Struss** (UM Extension), **Barb Liukkonen** (WRC), **Daniel Huff** (UM Extension), **John Bilotta** (UM Extension), **Bob Mugaas** (UM Extension), **Carl Rosen** (Soil, Water, and Climate), and **Brian Horgan** (Horticulture) received an Excellence in Educational Materials award for a fact sheet and brochure designed to reduce phosphorus runoff from urban residential environments.

In November **Patrick Brezonik** (WRC/ Civil Eng.) presented an invited paper at an OECD-sponsored workshop in Australia on agricultural production and ecosystem sustainability.

**Doug Schnurrenberger** (Geology and Geophysics and curator of the National Lacustrine Core Repository [NLCR]), traveled with **Michael Hillesheim** (NLCR) to Guatemala in May/June on a project with colleagues from the University of Florida and obtained 14 cores from Lake Peten to provide high-resolution records of regional Holocene paleoclimate. Schnurrenberger, **Amy Myrbo**, **Blas Valero-Garces**, and **Mark Shapley** (NLCR), traveled to Chile in November to retrieve cores from Lake Chungara to help resolve questions about the nature of Holocene climate in Andean South America.

**Kenneth Brooks** (Forest Resources), **Donald Wyse** (Agronomy and Plant Genetics), **K. William Easter** (Applied

Economics), **Craig Shaeffer** (Agronomy and Plant Genetics), **Dean Current** (Forest Resources), and **Nicholas Jordan** (Agronomy and Plant Genetics) received a \$556,500 grant for 2002-2005 for their study, "Improving Water Quality and Enhancing Hydrologic Stability of the Minnesota River Through Agroforestry and Other Perennial Cropping Systems." Brooks also was named chair of the Science and Technology Committee for the 2003 American Water Resources Association International Congress "Watershed Management for Water Supply Systems" to be held in New York City, June 29-July 2, 2003.

**Paige Novak** (Civil Engineering) received Minnesota Sea Grant funding for research on enhancing polychlorinated biphenyl (PCB) degradation in the Great Lakes.

In January, **Jacques Finlay**, Ph.D., will join the faculty of Ecology, Evolution, and Behavior (EEB). Finlay is a stream biogeochemist with experience in small and large flowing water systems, in stable isotopes and in carbon and nitrogen dynamics.

**Jim Cotner**, (EEB) will be the Co-organizer of the 2003 American Society of Limnology and Oceanography Aquatic Sciences Meeting in Salt Lake City.

**Lucinda Johnson** (Natural Resources Research Institute) was recently elected Secretary of the North American Benthological Society (NABS). The three-year term began during the recent NABS annual conference in Pittsburg, PA.

**Matt Simcik** and **Kelly Dorweiler**, (School of Public Health) presented results from a WRC-funded project, "Fluorochemicals in Minnesota waters: an emerging environmental issue," at the Society for Environmental Toxicology and Chemistry Meeting in Salt Lake City, UT, November, 17. Simcik also was an

### WRS alumna receives fellowship

WRS alumna Anne Jefferson (2002) is the recipient of a National Science Foundation Graduate Research Fellowship. This extremely competitive fellowship provides a stipend and cost of education allowance for three years of study towards a Ph.D. at the school of the recipient's choosing.

Jefferson is using her fellowship to work on geologic controls on flow regimes and geomorphology of High Cascades streams at Oregon State University in Corvallis, Oregon. Some High Cascades streams are fed by springs, but they have been little studied compared to the shallow subsurface flow-dominated Western Cascades streams. Jefferson's research is focused on spring-fed streams. Specifically she will be looking at the source and age of the spring water, the seasonal flow regime, and how these factors control stream geomorphology. This information will provide researchers with a better idea of the sensitivities of High Cascades stream systems to land-use and climate change.

invited speaker at the 4<sup>th</sup> International Symposium on Environmental Monitoring, Jeju South Korea, December 4.

**Lawrence Baker** (WRC) presented an invited talk, "Nutrient cycling in coupled urban-agricultural systems," at the workshop "Science of Nutrient Cycling in Coupled Systems," organized by **David Mulla** (Soil, Water, and Climate) for the College of Agriculture, Food and Environmental Sciences, September 23, 2002.

A poster by a team including **Les Everett** (WRC) won a blue ribbon in the "Educational Materials Awards Program" at the American Society of Agronomy Annual meetings in Indianapolis, IN. The award is presented by Division A-4, Extension Education.



## Upcoming Events

**Superior Science for You!** The University of Minnesota Sea Grant Program is hosting a free public speaker series. Hour-long talks will be held evenings in Duluth with duplicate presentations provided alternately in Grand Portage and Grand Marais.

Upcoming talks:

**Lake Superior's "canaries"—**

**Detecting ecological change.** Presented by Professor Gerald Niemi, Natural Resources Research Institute (NRRRI), UMD. 7 p.m.–8 p.m. January 15, EPA Mid-Continent Ecology Division Auditorium, Duluth, or January 16, Grand Portage Lodge, Grand Portage.

**Three quadrillion gallons, give or take a foot.** Presented by Dr. Cynthia Sellinger, Great Lakes Environmental Research Laboratory (GLERL). 7 p.m.–8 p.m. February 12, EPA Mid-Continent Ecology Division Auditorium, Duluth, or February 13, North House Folk School, Grand Marais.

**Wetlands—They're not just for mosquitoes anymore.** Presented by Dr. Janet Keough, U.S. EPA. 7 p.m.–8 p.m. March 12, EPA Mid-Continent Ecology Division Auditorium, Duluth, or March 13, Grand Portage Lodge, Grand Portage. The Duluth presentations will be broadcast live over the Internet from the Minnesota Sea Grant Web site at [www.seagrant.umn.edu/speakerseries/](http://www.seagrant.umn.edu/speakerseries/).

**How Your Community Can Find Viable Wastewater Solutions** The University of Minnesota Onsite Sewage Treatment Program announces six new

Small Community Wastewater Education seminars. These seminars will help to familiarize community members, community leaders, elected officials and professionals with the principles and processes involved in finding viable solutions to the wastewater needs of communities currently not served by centralized wastewater collection and treatment systems across Minnesota.

Seminar Dates & Locations:

January 9 - Alexandria

January 16 - Rochester

January 23 - Marshall

February 6 - Grand Rapids

February 20 - Medina

All seminars will be held from 9:00 a.m. to 3:15 p.m.; registration fee is \$40 and includes handouts. Call Greg Miller, Program Coordinator, U of M Onsite Sewage Treatment Program at 800-322-8642 or 612-625-9797 to register or for more information.

February 13-14, 2003. **River Leaders Summit.** Koinonia Retreat Center. This 1.5 day workshop sponsored by the Rivers Council of Minnesota (RCM) for Minnesota's river leaders will offer workshops to strengthen organizations with topics such as fundraising, communications, and implementation of the Clean Water Act. The results of research that RCM and the Minnesota Lakes Association have undertaken to evaluate the use of citizen monitoring data will be released. For more information, contact the Rivers Council at 320-259-6800.

February 26-27, 2003. **An Ecosystem Approach to the Health Effects of Mercury in the Great Lakes Basin** Cleary International Conference Centre Windsor, Ontario. Registration information, a workshop brochure with agenda, and information on the workshop are available online at: <https://www.glc.org/mercury/>.

June 28–July 2, 2003. **17th Annual Meeting of the Society for Conservation Biology.** Duluth, MN. The local organizing committee is now accepting abstracts for invited symposia, oral and poster presentations. The theme of the meeting is "Conservation of Land and Water Interactions." Deadline for submission is January 10, 2003. For more information, see [www.d.umn.edu/ce/conferences/scb2003](http://www.d.umn.edu/ce/conferences/scb2003).

### WRC Research Program

At this time of year, the Water Resources Center normally announces a request for proposals for our external grant program, which is funded primarily by the federal Water Resources Research Institutes Program. The Center is not issuing an RFP this year because of the large number of projects approved last year that are continuing in 2003. We expect that an RFP will be issued in October 2003.

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**Article Submissions:** *Minnegram* welcomes articles, letters to the editor, new stories, photos, or other materials for publication. Please address correspondence to: *Minnegram* Editor, Water Resources Center, 173 McNeal Hall, 1985 Buford Ave., St Paul, MN 55108, E-mail: [mng-ed@umn.edu](mailto:mng-ed@umn.edu), Web site: <http://wrc.coafes.umn.edu>, phone: (612) 624-9282.



# Publications and Resources



*Water Quality Reconstruction from Fossil Diatoms: Applications for Trend Assessment, Model Verification, and Development of Nutrient Criteria for Lakes in Minnesota, USA.* 2002. MPCA. Diatom reconstructions of historical phosphorus and chloride concentrations and sediment accumulation rate provide a unique opportunity for examining temporal and spatial trends in eutrophication, validating eutrophication models, and providing historical perspective for developing nutrient criteria. Comparisons were made between the historic values and two empirical models routinely used to help set in-lake phosphorus goals in Minnesota. For more information contact Steven Heiskary (651-296-7217) [steven.heiskary@pca.state.mn.us](mailto:steven.heiskary@pca.state.mn.us)

*Drinking Water and MTBE: A Guide for Private Well Owners.* 2002. University of Wisconsin Extension. This brochure provides private well owners with basic information about the gasoline additive

MTBE. Visit [www.uwex.edu/farmandhome/wqpaap/pdf/mtbe.pdf](http://www.uwex.edu/farmandhome/wqpaap/pdf/mtbe.pdf).

*The Minnesota Report Card on Environmental Literacy.* 2002. Hamline University and the Minnesota Office of Environmental Assistance. This publication documents the results of the first state-wide survey concerning environmental literacy of adults in Minnesota. It is a collection of baseline information concerning the knowledge about, attitudes toward, and behaviors related to the environment in Minnesota. For more information visit <http://www.moea.state.mn.us/ee/reportcard.cfm>.

*Simulated Fish Habitat Changes in North American Lakes in Response to Climate Warming.* Transactions of the American Fisheries Society 130: 459-477, 2001. H.G. Stefan, X. Fang and J.E. Eaton. This paper was voted by the AFS Awards Committee as one of the six highest-ranked papers in the Transactions in 2001. Copies available from St.

Anthony Falls Laboratory, Univ. of Minn., Third Ave. S.E., Minneapolis, MN 55414.

*Response of the St. Croix River Pools, Wisconsin and Minnesota, to Various Phosphorus-Loading Scenarios.* 2002. USGS in cooperation with the Wisconsin Department of Natural Resources. The pools in the lower reach of the St. Croix National Scenic Riverway are eutrophic due to high phosphorus loading. This report describes how changes in phosphorus loading would affect the trophic status of these pools. Copies of this report number WRIR 02-4181 may be purchased from the USGS, Branch of Information Services, Box 25286, Denver, CO 80225-0286.

*MN Mapper* is a new website that lets you quickly make, customize, and print a simple page-sized state map. The resulting map can be printed, pasted into a document, or saved to your hard drive. Visit <http://www.lmic.state.mn.us/chouse/mnmapper.html>.