

## WRC awards research grants to University professors Projects to focus on nitrogen removal, riparian forestry, and urban biodiversity

Three research projects were selected for funding in the 2002 grant competition sponsored by the Water Resources Center (WRC). The projects were selected by a review panel from a pool of eight proposals after an extensive peer review process. These projects will further understanding of the following issues of concern in Minnesota: nitrogen removal at wastewater treatment facilities, impacts of riparian harvest on instream processes, and biodiversity of urban ponds and lakes. Funding for the projects is provided by

the Water Resources Research Institute program of the USGS, and the Center for Agricultural Impacts on Water Quality, a program of the College of Agricultural, Food and Environmental Sciences.

### Characterization of nitrifying bacterial populations in wastewater treatment bioreactors

Tim LaPara, assistant professor in Civil Engineering, was awarded a grant to develop and apply molecular-genetic assays to characterize the populations of

nitrifying bacteria in wastewater treatment systems. His project will study the nitrifier community structure and nitrifier biomass in municipal wastewater treatment reactors. LaPara will attempt to identify specific nitrifying bacteria associated with excellent nitrification efficiency. Characterizing changes in number and community structure will contribute to the understanding of population dynamics of nitrifying bacteria in wastewater treatment. The study may improve strategies to prevent nitrification inhibition and to reduce the recovery time from upset conditions.

The study addresses the current need to improve nitrification efficiency. However, the lack of understanding of nitrifying bacterial population dynamics in wastewater treatment bioreactors contributes to poor nitrification efficiency. Improving the efficiency will

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## EPA Administrator visits Twin Cities to announce \$21 million community-based watershed initiative

On January 25, Environmental Protection Agency (EPA) Administrator, Christie Whitman, held a press conference at the Minnesota Valley National Wildlife Refuge to announce the federal government's \$21 million, 2003 budget allocation for a new EPA watershed initiative. A key component of the initiative is a focus on community-based water resources organizations to provide leadership for national watershed protection. The EPA plans to work cooperatively with state governors, tribes, and other interested parties to target up to 20 of the most highly-valued US watersheds for grants. Whitman said the initiative "recognizes the important role that

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Whitman discusses the community-based action plan for the Lower Minnesota River Watershed, coordinated by the WRC and the Friends of the Minnesota Valley, with Karen Studders and John Hickman (see story on pg. 5).

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# Around the State



## WATER RESOURCES UPDATES

### Environmental coalition to launch “Protect Our Water” initiative

by Kevin Proescholdt

The Minnesota Environmental Partnership (MEP), a coalition of 73 nonprofit environmental organizations, launched its “Protect Our Water” initiative on January 31 in St. Paul. The launch was part of the 6th annual Minnesota Environmental Partnership Legislative Forum, where state senators, representatives, and officials from the governor’s office offered general support for the “Protect Our Water” package.

The initiative focuses on protecting or improving the waters of the state. Individual legislative bills include such efforts as moving to phosphorus-free lawn fertilizer, removing obsolete dams to improve the health of streams and fisheries, and providing adequate funding for the Clean Water Partnership program.

For more information contact the Minnesota Environmental Partnership at 651-290-0154, E-mail: [info@mepartnership.org](mailto:info@mepartnership.org), or visit the Web site at <http://www.MEPartnership.org>.

### U of M to host cooperative ecosystems studies unit

The University of Minnesota has tentatively been selected as the host university for the Great Lakes-Northern Forest Cooperative Ecosystem Studies Unit (CESU). These units provide research, technical assistance, and education to federal land management, environmental, and research agencies and their potential partners. The official selection will be made by early April.

For more information contact Jerrilyn Thompson at [thompson@umn.edu](mailto:thompson@umn.edu).

## From the Director’s Desk

### Water Resources, Science, and Funding



The announcement by EPA Administrator Whitman of a watershed protection initiative (see front page of this issue) is a small ray of hope in an otherwise dismal outlook for federal support to protect our nation’s water resources. Not that the current administration came to office with a strong agenda on this topic, but it seems that “fallout” from the tragic events of September 11—the need to fight terrorism, an emphasis on homeland security, and further stresses on the nation’s economy and federal budget—are being used to justify placing environmental issues even further down on the priority list than they were a year ago.

The President’s 2003 budget is particularly austere (as it also was last year) for the nation’s premier science agency dealing with water resources—the U.S. Geological Survey. The budget proposes to eliminate several programs, including the \$14-million-a-year Toxic Substance Hydrology program. Ironically, just this week the program issued a major report (<http://toxics.usgs.gov/regional/emc.html>) on the nationwide occurrence in surface waters of pharmaceuticals, hormones, personal care products, and other household chemicals described as “emerging contaminants.” This name reflects the fact that so much remains to be discovered about the environmental fate of many commonly used chemicals. Slated for a major reduction in the President’s budget is the only coordinated effort to assess water quality and the factors affecting it at the national scale—the USGS’s NAWQA program, although there is widespread agreement that it has been a highly productive program.

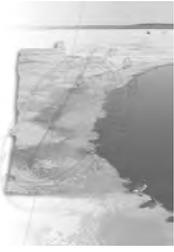
The budget also eliminates funding for the Water Resources Research Institutes (WRRI) program, which provides base funding to this Center and others like it at land-grant universities across the country. Our WRRI funds are used almost entirely to support an external grant program (see front page) that provides support to faculty researchers to study water problems of state and national significance. The EPA’s budget for water also took a major hit, and the EPA has announced plans to end its highly competitive STAR fellowship program, which has supported the graduate training of the best and brightest of students with career plans in environmental protection and management.

My concerns are not based on a belief that the answer to every problem is to throw more federal money at it or that every federal program is worth saving. Nonetheless, the programs mentioned above have demonstrated their productivity and usefulness in many ways. Safeguarding our nation’s water resources, including its drinking water supplies is a matter of homeland security, both in the narrow sense of protecting against terrorist attacks and the broader sense of protecting against our own actions that inadvertently (or otherwise) pollute our waters. Moreover, the above programs fulfill this administration’s goals to promote collaboration among federal and state agencies, promote the development of sound science to support decision making on environmental issues, and to promote education.

Given the strong support that environmental protection continues to enjoy at the grass roots level, these cuts are especially difficult to understand. A visit to Capitol Hill last week gave me some hope that Congress will not agree to the above (and other water-related) funding cuts. If you are as concerned as I am about maintaining an appropriate level of federal support for research and implementation activities to protect and enhance the quality of our nation’s waters, I encourage you to express your views to our Senators and Congressional representatives.

*Pat*

Patrick Brezonik, WRC co-director



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

## **Minnesota Water 2002 & The Minnesota Lakes and Rivers Conference**

**St. Cloud Convention Center, St. Cloud, MN**  
**April 17–20, 2002**

The Minnesota Lakes Association, Rivers Council of Minnesota, Minnesota Sea Grant College Program, and the University of Minnesota Water Resources Center are joining together to offer four days of presentations on managing Minnesota's waters during this time of changing climate, demographics, water and land-use patterns; increasing development; and growing recreational conflicts. Generally, the sessions on April 17 and 18 will feature technical presentations on a wide variety of topics, and the sessions on April 19 and 20 will feature citizen-oriented community-planning topics, as well as a special track for local units of government. **Registration deadline: April 3. Space is limited.**

### **Wednesday, April 17: Technical Sessions**

**Plenary Session** • Interpreting Global Climate Change from Lake Sediments, *Tom Johnson, Director, University of Minnesota Large Lakes Observatory* • Global Change: A Minnesota Perspective • Managing Minnesota's Water Resources in a Time of Change • Minnesota's Water Unification Plan **Luncheon/Speaker** • A New Regional Growth Strategy—Blueprint 2030, *Ted Mondale, Chair of Metropolitan Council* **Concurrent Sessions** • Ground Water in the Twin Cities: Implications for Land-Use Decisions • Understanding Agricultural Drainage • New Tools for Monitoring and Modeling • Minimizing Agricultural Impacts

### **Thursday, April 18: Technical Sessions**

**Luncheon/Speaker** • Present-day Agriculture in Southern Minnesota—Is it Sustainable? *Gyles Randall, University of Minnesota* **Concurrent Sessions** • Assessing Sources and Effects of Nutrients • The Next Million People by 2030: Growth and Natural Resources • Ensuring a Safe Water Supply • TMDLs: Changing Land Use, Changing Policies • Malformed Frogs • Emerging Contaminants: Endocrine Disruptors • Community Planning and Decision-Making • Mercury Contamination in Fish • Arsenic: New Standards and Water Supply Implications • Global Climate Change **Technical Poster Session**

### **Friday, April 19: Leadership and Community Planning**

**Plenary Session** • The State We're in: A Contradiction of Values, *Dennis Anderson, outdoor columnist, Minneapolis Star Tribune* **Concurrent Sessions** • Understanding Your Watershed • Impacts of Land-Use Changes on Watersheds • The ABCs of TMDLs • Emerging GIS Tools • Getting Ahead of Growth and Development • Public Policy Update • Getting Shoreland Erosion Control Projects Done • Runoff Best Management Practices • The Challenges and Opportunities of Public Participation **A Celebration of Minnesota's Lakes and Rivers—evening reception** • Environment—Population—Sustainable Development: Where Do We Go From Here? *Gaylord Nelson, former Wisconsin Governor, U.S. Senator and Earth Day founder*

### **Saturday, April 20: Leadership and Community Planning**

**Concurrent Sessions** • Aquatic Plant Management • River History: Lessons of the Past, Hope for the Future • Strategic Communications Action • Managing Your Non-Profit Organization • Exotic Species • Lake and River Management Planning • Building Membership • Shoreland Landscaping Matters • Solving Unique Sewage Treatment Problems for Shoreland Properties and Communities • Data to Information to Action: Volunteer Citizen Monitoring

**For a complete schedule, conference registration forms, and lodging information, please visit the WRC Web site at: <http://wrc.coafes.umn.edu/>.  
Registration deadline: April 3. Space is limited, so register early!**

## WRS student studies decline of wild rice

by Tara Carson

Wild rice is an important aquatic plant species because it contributes to wetland diversity and provides food and habitat for many organisms. However, wild rice, the only cereal native to North America, is disappearing. In 1988 and 1989, David Biesboer, a plant biologist at the University of Minnesota, and his colleagues collected wild rice from across North America and Canada. Biesboer said, "We found that wild rice no longer was present in about 50% of the places it occurred historically."

Researchers with the University of Minnesota are working to understand why. A two-year study I have been conducting under the direction of Paul Bloom (Soil,



Wild rice growing in Rice Lake National Wildlife Refuge, McGregor, Minnesota.

Water, and Climate) is identifying factors that might explain the decline of wild rice in a highly productive wild rice lake in Rice Lake National Wildlife Refuge (RLNWR) near McGregor, Minnesota.

The study focuses on two major questions: (1) why have aquatic perennials slowly crowded out wild rice following the installation of a more effective water control structure on the lake; and (2) what factors control the boom and bust cycles in wild rice populations?

In 1938, a study hypothesized that perennial plants prevent rice stands from expanding and may even crowd out established stands. This appears to be happening at RLNWR, as well as at lakes managed on the Fond du Lac Reservation.

Preliminary data suggest that competition for nutrients does not explain the expansion of perennials, and although competition for light is important, it may not be sufficient to explain perennial dominance.

Water control structures installed 30 years ago ended a fluctuating water regime that may have restricted perennial plant populations. The consistent water levels encourage pickerelweed, water lily, watershield, and hardstem bulrush to establish thick rhizomes, which are energy

storage organs that allow plants to regenerate and expand. Results support the idea that a major factor in annual yield fluctuation is water depth. Very poor yields in 2001 compared with 2000 were associated with high water in June. The average June water depth increased from 66 cm in 2000 to 109 cm in 2001, while average wild rice biomass dropped from 155 g/m<sup>2</sup> in 2000 to 19 g/m<sup>2</sup> in 2001.

The data also show that nutrient levels in sediments are important in limiting wild rice production. Low phosphorus appears to limit yields in parts of the lake but is not a factor associated with annual yield fluctuations.

Nitrogen limitations, however, seem to be associated with annual yield fluctuations. If wild rice production is low in one year, plant-available nitrogen can accumulate in the sediment, contributing to higher yields the following year. Also, straw deposition on the lake bottom may contribute to annual yield variations. Deposition of large quantities of wild rice straw in high yield years may act as a barrier to seedlings and reduce production the following year.

Although wild rice (*Zizania palustris*) is still found in the upper Midwest and adjacent regions of Canada, the plant once covered a vast portion of the Eastern United States. Minnesota has designated wild rice as the state grain, and has 70 water bodies called Rice Lake. For centuries, Native Americans of the upper Midwest such as the Ojibwe and Menomonee, relied on the grain as an important source of protein, and they view it as a sacred gift. European pioneers also depended on the grain for dietary requirements. Many animals, including waterfowl, consume rice and forage in the rice beds for aquatic crustaceans and insects that form the foundation of most wetland food chains.

## New VSMP Outreach Coordinator joins WRC staff

Kevin Proescholdt joined the Water Resources Center (WRC) in January as the Outreach Coordinator of the Volunteer Stream Monitoring Partnership (VSMP), a collaborative program that works to support, improve, and extend volunteer stream monitoring in the seven-county Twin Cities area. He brings 20 years of nonprofit environmental advocacy and policy development in Minnesota to the position.

VSMP works with state, regional, and local agencies, nonprofit environmental organizations, and volunteers to coordinate monitoring efforts.

Proescholdt was the director of the National Audubon Society in Minnesota for 4 years, where he lobbied on natural resource issues at the Minnesota Legislature and promoted policy initiatives with state and federal agencies. He served as the executive director of the Friends of the Boundary Waters Wilderness for 16 years.

In the mid-1990s, Proescholdt designed and implemented a public campaign to protect the Boundary Waters Canoe Area Wilderness from Congressional bills that would have opened the popular wilderness region to more motorboat use, would have allowed trucks and jeeps on portage trails, and would have formed a local control committee with veto authority over management decisions of the U.S. Forest Service.

Proescholdt has written extensively on wilderness topics. His book, *Troubled Waters: The Fight for the Boundary Waters Canoe Area Wilderness*, is being used as a text in a University of Minnesota Natural Resources class. Recently, he edited and compiled the Minnesota Environmental Partnership's "Minnesota Environmental Briefing Book" for the 2002 session of the Minnesota Legislature.

He has presented papers at a variety of wilderness conferences, including the World Wilderness Congress and the last two national wilderness conferences. In 2000, U.S. Secretary of Agriculture Dan Glickman appointed him to a national rule-making committee dealing with wilderness policy.

## **EPA Watersheds** cont'd from page 1

states and local communities have in helping to achieve common goals by giving them the power to do what works.”

Whitman selected Minnesota for the press conference because the state is home to the headwaters of rivers that flow south to the Gulf of Mexico (Mississippi), east to the Atlantic ocean (Nemadji and St. Louis), and north to Hudson Bay (Red and Rainy).

EPA strategies to address complex national watershed challenges emphasize local assessment, involvement, and commitment. One goal of the initiative is to replicate successful watershed protection approaches and techniques throughout the country and capitalize on lessons learned from community-based protection efforts.

According to an EPA press release, the strongest candidates for the grants will incorporate a broad spectrum of partners and interests in achieving clean and healthy watersheds, such as representatives from private landowners, public interest groups, industry, academic institutions, concerned citizens, and local governments. In addition, the EPA is inviting state governors to help design the details of the program as a way for the states to take a leadership role in nominating candidate watersheds. This is meant to ensure that environmental objectives are integrated with economic stability and other social goals.

The initiative's focus is much broader than water quality protection and includes watershed resources that provide services to support human health, economic stability, ecosystem integrity, recreational opportunity, and natural or cultural significance. The initiative will support community efforts to improve existing protection measures with tools, training, and technical assistance.

The press conference was a preliminary step in the initiative's implementation. Next, the EPA will seek the views of Congress, states, and local interest groups in developing details of how the initiative should be designed and implemented. A technical assistance program should be in place by summer, and pending budget approvals, watersheds will be selected by next winter. Funds should be disbursed

## **Lower Minnesota River Action Plan presented to EPA head**

Mary Renwick, economist with the Water Resources Center; John Hickman, President of Friends of the Minnesota Valley; and Karen Studders, Director of the Minnesota Pollution Control Agency, presented EPA Administrator, Christie Whitman with a copy of the *Strategic Action Plan for the Citizens of the Lower Minnesota River Watershed*. Following Whitman's announcement of the new EPA watershed initiative (see page 1), Renwick spoke to Whitman about the plan, emphasizing the strength of its community-led approach to improving water quality. Published in October 2001, the plan outlines a strategy to foster and strengthen collaboration to improve the ecological health of the Minnesota River, focusing on citizen-based initiatives. For more information, visit <http://wrc.coafes.umn.edu/lowermn/LMreport/lmrwhome.htm>.

and implementation underway by summer of 2003.

## **WRC Grants** cont'd from page 1

provide better removal of reduced nitrogen forms (un-ionized ammonium) that are toxic to fish. Nitrification also is the first of two steps that can convert fixed nitrogen to innocuous nitrogen gas (N<sup>2</sup>). This is important in controlling eutrophication of coastal waters. The hypoxic zone that has developed in the northern part of the Gulf of Mexico is one example. Various Midwest river basins, including many in southern Minnesota, have been identified as the primary nitrogen sources to the hypoxic area.

## **Effect of riparian forest harvest on instream habitat and fish and invertebrate communities**

Ray Newman, Bruce Vondracek, and Jim Perry, professors in Fisheries, Wildlife and Conservation Biology, were awarded a grant to experimentally determine the site-based effects associated with

applying various riparian management practices on aquatic habitat. Four levels of riparian harvest at five replicate stream sites will provide an initial assessment of the effects of harvest treatment and will establish a baseline for long-term assessment. The results will be used to determine the effects of riparian harvest on instream processes and to inform water quality managers and policy makers of the efficacy of current and alternative forest harvest best management practices to protect aquatic resources.

Intact riparian zones are vital to the health of stream systems. Removal of trees can alter stream hydrology and morphology through changes in runoff amounts and timing, thermal regime, quantity of organic matter, and alteration of soils and sediment inputs to streams. Most studies on the effectiveness of riparian buffers at protecting streams from upslope harvest have focused on the width of the buffer and have not considered harvest within the buffer zone.

## **Biodiversity in urban ponds and lakes: human effects on plankton populations**

Bob Sterner, a professor in Ecology, Evolution and Behavior, was awarded a grant to assess biodiversity of ponds and lakes in the Twin Cities metropolitan region. Sterner's overall objective is to assess relationships between urbanization and plankton biodiversity by sampling a variety of aquatic ecosystems dispersed across a gradient of highly urbanized to non-urbanized land.

Reduced biodiversity ranks amongst the most critical problems in aquatic ecosystem management, and the maintenance of aquatic biodiversity has been identified as a freshwater research priority. Most of the organisms in any given water body are less than or equal to one centimeter. These small organisms respond to the same factors (e.g., nutrients, sediments, toxins, etc.) as large species. The effect of humans on the biodiversity of small aquatic organisms, however, is virtually unknown.



## U of M Water Community News

**Efi Foufoula-Georgiou** (St. Anthony Falls Laboratory) was awarded the John Dalton Medal of the European Geophysical Society for 2002. This medal was established in honor of John Dalton's significant contributions to hydrology as a science and recognizes eminence in hydrology.

**Tom Johnson** (Large Lakes Observatory) was invited to present a paper at the Dead Sea Drilling Workshop, held in Potsdam, Germany. The International Continental Drilling Program sponsored the workshop.

**Ray Newman** (Fisheries, Wildlife, and Conservation Biology) is on sabbatical in Europe from mid-February until early November 2002. Newman will study the response of European aquatic herbivores to the watercress chemical defense system while at the Max Planck Institute of Chemical Ecology, in Jena, Germany. He will also work on European herbivores of Eurasian watermilfoil at the University of Konstanz. He received a German Academic Exchange Study Visit Grant for some of this work.

**Gary Parker** (Civil Engineering) received the G.K. Warren Prize from the National Academy of Sciences. The prize, awarded every four years, recognizes Parker's distinguished contribution to fluvial morphology and closely related aspects of the geological sciences.

**Jim Perry** (Fisheries, Wildlife, and Conservation Biology) traveled to Brazil to present two papers. Hosted by COPASSA and CEMIG, Perry presented "Environmental management in the next 25 years: What can we expect?" to a multi-agency and industry audience. While visiting the Catholic University of Minas Gerais, Perry presented "Environmental management and the future of the university system: Where do we go from here?"

**Carl Richards** (Minnesota Sea Grant) was named chair of the Great Lakes Sea Grant Network Directors for 2002. In that capacity he will coordinate the directors' actions and serve as a liaison between Sea Grant and external groups.

**Jim Russell** (Limnological Research Center [LRC]) was in Uganda during winter break as a part of a multi-national team to core several crater lakes. Cores from the lakes are used to recover late Holocene paleoclimate records from the tropical zone of Africa.

**Doug Schnurrenberger** (Limnological Research Center [LRC]) and **Mike Hillesheim** (LRC) will travel to Guatemala with the LRC Kullenberg coring rig to help researchers with the University of Florida obtain sediment cores. The Florida team has been working to decipher the connection between climate change and the collapse of the Mayan civilization.

**Blas Valero-Garces** (Geology and Geophysics) and **Emi Ito** (Limnological Research Center) cored several lakes in Uruguay and Argentina during winter break. The Uruguayan fieldwork is a joint venture with Prof. Daniel Panario of UNICEP, Uruguay, and the work in Argentina is a joint project with researchers at the Geophysics Institute at the National University of Buenos Aires.

**Marie Zhuikov** (Minnesota Sea Grant) was named chair of the Great Lakes Sea Grant Network communications group for 2002. This group represents communication specialists working in Sea Grant programs throughout the Great Lakes. Zhuikov will serve as a liaison between communicators, other formal Sea Grant groups, and external groups.

### Winter 2001-2002 University of Minnesota Water Resources Science Program Degree Recipients

**Jeffrey Christopherson** received a M.S. in September 2001. Advised by **Kenneth Brooks** (Forest Resources), Christopherson's thesis was titled "Hybrid poplar plantation effects on frost depth and snow distribution on agricultural lands in Northwestern Minnesota."

**Michael Friedel** received his Ph.D in January 2002. His dissertation was titled "Simultaneous estimation of coupled water, heat, and solute transport parameters—application to ground-water studies in arid and semi-arid regions of the United States." Friedel was advised by **John Nieber** (Biosystems and Agricultural Engineering).

**James Musielewicz** received a M.S. in February 2002. Advised by **Erik Brown** (Geological Sciences and Large Lakes Observatory), Musielewicz's thesis was "Estimates of sediment transport in conjunction with the Keweenaw Current using copper mine tailings as a sediment tracer."

**Keith Pilgrim** received his Ph.D in February 2002. His dissertation was titled "Evaluation of the benefits and potential adverse effects of alum treatment to remove phosphorus from lake inflows." **Patrick Brezonik** (Water Resources Center and Civil Engineering) was Pilgrim's advisor.

**David VanderMeulen** received a M.S. in December 2001. Advised by **John Pastor** (Biology and Natural Resources Research Institute) VanderMeulen's thesis title was "Litter Decomposition in Boreal Wetlands."



## Upcoming Events

April 4-5. **The 2002 Great Lakes Economy Conference.** The Federal Reserve Bank of Chicago will hold a conference on economic linkages in the Great Lakes region at its Detroit Branch. The conference will assess the extent to which the Canadian and American Midwest economies have become integrated with respect to trade, investment, business travel, immigration and tourism. For more information, contact Ella Dukes at 312-322-5757, E-mail: [edukes@frbchi.org](mailto:edukes@frbchi.org), or visit <http://www.chicagofed.org/newsandevents/conferences/detroit-conference.cfm> or <http://www.cmif.org/GLcollaborative.htm>.

April 17-20. **Working Together in a Climate of Change to Manage Minnesota's Water Resources. Minnesota Water 2002 and The Lakes and Rivers Conference.** St. Cloud, MN. The conference will emphasize how shifts or trends in the global environment, economy, technology, or policies impact decisions about ground water, lakes, or rivers in Minnesota. This year's conference will include technical presentations and a poster session on days one and two, and outreach and community planning workshops on days three and four. Plenary and breakout sessions will focus on changes in global conditions that affect research, planning, and management of Minnesota's waters. For more information, visit <http://wrc.coafes.umn.edu/water2002/>.

April 23-26. **Enhancing the State's Lake Management Programs, "Manag-**

**ing Invasive Species in Lakes and Reservoirs."** Chicago, Illinois. Co-sponsored by five organizations, including the U.S. Environmental Protection Agency and the North American Lake Management Society, the 15<sup>th</sup> Annual National Conference will focus on how states are using innovative approaches for preventing or minimizing invasive species impacts. State programs and scientific staff will share their successes and failures in managing infestations with biological controls, chemical agents, public education programs, and more. Contact Bob Kirschner at 847-835-6837, or E-mail: [bkirschn@chicagobotanic.org](mailto:bkirschn@chicagobotanic.org).

September 23-25. **Challenges in a Diverse Landscape.** Hinckley, MN. This local water planners conference will focus on wastewater management, land-use decision making, managing disasters, and other water planning issues. Emphasis will be on programs that can be adapted to other locations, and Minnesota/Wisconsin initiatives that further the work of local water planning. Contact Mary Darragh Schmitz for more information at [mdschmi@co.chisago.mn.us](mailto:mdschmi@co.chisago.mn.us).

October 13-17. **Hydrologic Extremes: Challenges for Science and Management.** Portland, OR. The American Institute of Hydrology's 2002 Annual Meeting and Conference is a forum for discussion and exchange of information on a broad spectrum of areas in hydrology and hydrogeology, water quality, water resources, planning and management, as well as climate, ecology, environment, and

human health. Some themes of the program include riparian processes, climate change, droughts and floods, and managing forest health. Additional information is available at [AIHydro@aol.com](mailto:AIHydro@aol.com), or visit the Web site: <http://www.aihydro.org>.

### **University professor donates new textbook for overseas students**

Jim Perry, Head of Fisheries, Wildlife, and Conservation Biology, has published a textbook, entitled, *Ecosystem Management in Central & Eastern Europe*. The book is for application in Eastern Europe and is aimed at senior and postgraduate level students in universities in Central and Eastern Europe. The book is intended to help students think in terms of integrated resource management. Commercial publishers expressed interest in the manuscript, but would have charged the market price (e.g., \$35-\$40/copy). According to Perry, students will be able to pay no more than \$8/copy given the weak economy of the region. Therefore, copies of the text either will be donated to libraries or sold at \$6-\$8. Perry is currently seeking support to ship 800 copies of the text to university libraries and bookstores throughout the region. For more information or to contribute to the effort, contact Jim Perry at [jperry@cnr.umn.edu](mailto:jperry@cnr.umn.edu).

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# Publications and Resources



*Minnesota Department of Natural Resources online USGS quadrangle maps for Minnesota.* Site users can browse every United States Geological Service 1:24,000, 1:100,000 and 1:250,000 quadrangle for Minnesota. Visit the Web site: <http://maps.dnr.state.mn.us/tomo/>.

*Duluth Values Open Space.* Glenn Kreag. 2001. This booklet describes the results of a survey of Duluth residents and their perceptions about open spaces in the city. To request a free copy, contact Minnesota Sea Grant at 218-726-6191 or E-mail: [seagr@d.umn.edu](mailto:seagr@d.umn.edu).

*Restore Your Shore.* Minnesota Department of Natural Resources. 2002. This instructional CD ROM has information on shoreland ecosystems and natural shoreland management techniques, a database of over 400 native plant species, and examples of how lakeshore problems have been resolved. Step-by-step guidance through the design and implementation process of protecting a natural shoreline

or restoring a degraded shore is provided. For more information visit the Web-site: <http://www.comm.media.state.mn.us/bookstore/welcome.asp>.

*Testing the Waters: Using Satellites to Monitor Lake Water Quality.* National Aeronautics and Space Administration. 2002. This Web site outlines the work of University of Minnesota scientists who developed procedures to use Landsat imagery to map the water clarity of over 10,000 Minnesota lakes. The maps can be used to evaluate water quality patterns across the state. For more information, visit the Web site: <http://earthobservatory.nasa.gov/Study/WaterQuality/>.

*Implementation and Enforcement of the Combined Sewer Overflow Policy.* Environmental Protection Agency. 2002. This report documents progress made by EPA, states, and municipalities in implementing and enforcing the 1994 CSO policy. For more information, visit <http://www.epa.gov/npdes> and follow the link for

## **New WRS Web site**

The Water Resources Science (WRS) Web site has been renovated and redesigned. Find new information on research and course opportunities in the Twin Cities and Duluth; students, faculty, and alumni web pages; WRS seminars; employment opportunities; course descriptions; and more!

**Visit the WRS Web site:**  
<http://wrs.coafes.umn.edu>

“Combined Sewer Overflows.” EPA 833-R-01-003.

*Lake Access Web site.* 2002. This web site offers realtime and historical water quality data from Twin Cities’ lakes. Visit the website for recent results from research in the Medicine Lake watershed that assessed phosphorus loading from residential properties. For more information, visit the Web site: <http://www.lakeaccess.org>.