
Water legislation a priority as 106th Congress comes to a close

In the last months of the 106th Congress, several pieces of water legislation aimed at improving the U.S.'s water resources were passed. This legislation addresses important issues such as water quality of America's beaches, restoring important estuary resources, restoring the Florida Everglades, and improving the national streamgaging network.

Beaches Environmental Assessment and Coastal Health Act

On October 10, 2000, President Clinton signed new legislation to strengthen protection of America's beaches and coasts by requiring states to adopt coastal water quality standards and notify the public when they are not being met. "This bill will greatly expand the public's right to know about threats from pollution to our beaches and to our health," remarked EPA Administrator Carol M. Browner. Only a few states currently test coastal water quality and notify citizens when waters are unsafe. This act includes a \$30 million authorization through 2005 to assist all states in developing and implementing monitoring plans.

The Beach Act amends the Clean Water Act to accomplish the following: adoption of state water quality standards for coastal recreational waters; a national assessment of potential health risks resulting from exposure to pathogens in coastal recreational water; improved detection of pathogens harmful to human health; improved public notice, including beach signs, that coastal waters are not meeting or are not expected to meet water quality standards; and a publicly available database of monitored coastal recreation waters.

Estuaries and Clean Waters Act

On October 25, 2000, Congress passed the Estuaries and Clean Waters Act of 2000. This legislation establishes a national goal of restoring one million acres of estuary habitat by 2010 and authorizes a total of \$275 million over the next five years in matching funds for local estuary habitat restoration projects.

The Act reauthorizes the National Estuary Program, the Chesapeake Bay Program, the Long Island Sound Program, and the Clean Lakes Program. It also authorizes pilot programs on alternative water sources, a Lake Ponchartrain restoration program, and funding for the cleanup of the Tijuana River near San Diego. The legislation also establishes an Estuary Habitat Restoration Council that is responsible for developing a National Habitat Restoration Strategy within one year and for reviewing and establishing funding priorities among restoration projects.

Everglades Restoration Act

On December 11, 2000, President Clinton signed legislation that authorized appropriations for initial construction projects for the Comprehensive Everglades Restoration Plan (CERP). This Plan, developed collaboratively by the U.S. Army Corps of Engineers and other federal, state, tribal, and local agencies, aims at capturing and storing wet season waters, making more water available during the dry season for the everglade ecosystem and urban and agricultural users. The Plan comprises 68 separate projects, including the removal of 240 miles of levees and canals, and building of a network of reservoirs, underground

Legislation continued on page 6

Water Resources Conference addresses hypoxia in the Gulf of Mexico

On October 30, over 300 water professionals attended the 33rd annual Water Resources Conference, held on the St. Paul campus of the University of Minnesota and sponsored by the University of Minnesota College of Continuing Education and the Minnesota Section of the American Society of Civil Engineers. Attendees came from across the state, representing a variety of public agencies, local city and county governments, and consulting and engineering firms. Morning plenary speakers addressed the issue of hypoxia in the Gulf of Mexico. Afternoon speakers in concurrent sessions covered local issues such as restoration projects, water quality issues, and long-term water quality monitoring.

The conference began with a description of hypoxia, a zone of oxygen-depleted coastal waters, in the Gulf of Mexico. Dr. Nancy Rabalais from the Louisiana

Conference continued on page 3

In This Issue

- 2 Around the State
- 3 Water Resources Conference
- 4 MN Sea Grant Research Grants
- 6 Community News
- 7 Upcoming Events



Around the State

WATER RESOURCES UPDATES

Workshop addresses methods for design of detention and retention basins

An all-day workshop for engineers, "Using Natural Resources Conservation Service (NRCS)-based methods for the design of detention and retention basins," was held on October 31 in conjunction with the 33rd Annual Water Resources Conference (see pg. 1). This workshop, held on the St. Paul campus of the University of Minnesota, was sponsored by the Minnesota Section of the American Society of Civil Engineers and presented by the University of Minnesota College of Continuing Education. Rocky

Keehn, Head of the Water Resources Department at Short Elliott Hendrickson, Inc., led the class. Participants were taught basic theory behind parameters used in NRCS methodology for designing detention and retention basins, and then given an opportunity to use the methodology in a sample project for the design of a detention and retention facility. The workshop also demonstrated software packages compatible with NRCS methodology and ways to accomplish what was taught on a typical project budget.

Due to high demand, this workshop will be held again on March 1, 2000. For more information, contact Bev Ringsak at (612) 624-3720 or E-mail: bringsak@cce.umn.edu.

Zebra mussel infestation in Duluth-Superior Harbor

Minnesota Department of Natural Resources (DNR) biologists recently confirmed a major infestation of zebra mussels in the Duluth-Superior Harbor. The extent of the zebra mussel infestation was discovered while biologists conducted the first comprehensive survey in the state for native freshwater mussels. Officials suspect three years of mild winters and warm summers have created ideal conditions for zebra mussels to multiply.

"One-hundred percent of the native mussels I found on the bayside of Park Point were heavily infested with zebra mussels," said Dan Kelner, DNR malacologist, who conducted the surveys by SCUBA diving. "A lot of the native mussels were already dead or dying because the zebra mussels make it difficult for them to eat and breathe," he said. "Every hard underwater surface was carpeted with zebra mussels."

More than 70 percent of the mussel species once found in North America are now extinct, endangered, or declining, said Kelner. In Minnesota, more than half

of native mussel species are listed as endangered, threatened, or of special concern.

For more information, contact the DNR at (651) 296-2835, or Sea Grant at (218) 726-8106.

Excerpted from a MN Sea Grant News Release

An "alarming" discovery for ruffe

When they are injured, Eurasian ruffe release a potent pheromone that repels other ruffe and could be useful in controlling this exotic fish. University of Minnesota Sea Grant researcher Peter Sorensen and his colleagues reported their findings in a recent issue of the *Journal of Great Lakes Research*. They found that damaged ruffe skin emits an odor, or alarm pheromone, repugnant to other ruffe, that dramatically suppresses their swimming and feeding activities.

Peter Maniak, Ryan Lossing, and Sorensen, University of Minnesota, have been studying pheromones—chemical signals that pass between organisms of the same species and are detected by an animal's sense of smell. Fish commonly use pheromones to coordinate activities, such as mating and schooling, in waters that are often turbid, vast, and relatively featureless. Alarm pheromones signal the presence of potential danger.

"To the best of my knowledge, no one is actively managing ruffe right now," said Sorensen. "They have given up for lack of ideas or funding." Since the alarm pheromone is non-toxic, specific, and easy to collect and apply, Sorensen hopes it will re-inspire efforts to manage ruffe.

For a free copy of the journal reprint, "Injured Eurasian Ruffe, *Gymnocephalus cernuus*, Release an Alarm Pheromone that Could be Used to Control their Dispersal," contact Minnesota Sea Grant at (218) 726-6191 or seagr@d.umn.edu.

Excerpted from a MN Sea Grant News Release

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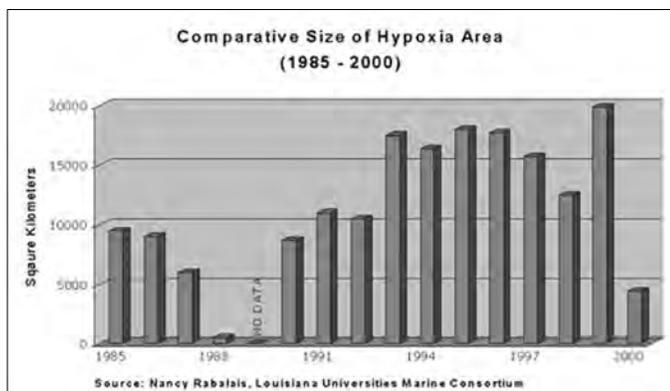
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Conference continued on page 3

Universities Marine Consortium gave a detailed summary of the cause and extent of this problem. Rabalais reported that outflows from the Mississippi and Atchafalaya Rivers contribute the dominant nutrient load to the continental shelf region in the Gulf of Mexico, where hypoxia occurs. These freshwater outflows, rich in nitrogen, rise above the dense salt water and encourage algal growth. The resulting increased respiration rate of the system quickly depletes available dissolved oxygen. When oxygen falls below 2 mg/L, hypoxia results and most biological activity no longer can be supported.

Rabalais stated that hypoxic waters in the Gulf of Mexico have been documented since the 1970s and most often occur between March and October. The mid-summer bottom extent of this



phenomenon has increased from an average of 8000-9000 km² in 1985-1992 to an average of 16,000-20,000 km² in 1993-1999. Rabalais said that increasing fertilizer use in the Mississippi River watersheds shows the strongest correlation with hypoxia in the Gulf. She concluded that nutrient reduction, and more specifically nitrogen reduction, is the key to preventing this annual phenomenon.

Don Goolsby, U.S. Geological Survey, followed Rabalais' talk, giving an overview of the sources of nitrogen to the Mississippi River system. He reported that 98% of the nutrient load in the Mississippi River watershed results from non-point sources. The system itself can be divided into 42 small sub-watersheds, and basins that contribute the highest nitrogen load are those with the highest percentage of row crops and urban runoff.

How can nutrient loads be reduced? James Boyd, Resources for the Future, stated that the first step toward nutrient reductions lies within a new concept of using ambient conditions to drive regulations. This concept is the center of the recently revised TMDL (Total Maximum Daily Load) program of the Clean Water Act.

Lanny Peissig, Minnesota Pollution Control Agency, described TMDLs as "pollutant reduction allocation studies that result in clean-up strategies." Studies will be performed to identify sources of a pollutant and the maximum load a resource can handle and still maintain its use. Implementation plans then

will be developed to reduce and allocate pollutant loads from each source. This program employs a 12-step process that involves stakeholders, EPA, state agencies, and various contractors.

As described by Boyd, several technical and jurisdictional challenges are created by this approach to water regulation. Non-point sources and their percent contributions are difficult to identify. A technical challenge facing this approach is the need to improve data quality and to integrate fate, transport and deposition modeling so non-point sources can be identified and regulated. Jurisdictional conflicts are likely to result when sources of pollutants cross political boundaries, as is the case with nutrient loading in the Mississippi River. Boyd concluded his presentation by suggesting that this new concept of using ambient conditions to drive regulations increases the importance of the interaction between science and law as scientific methods and findings will be evaluated in the legal arena.

How will new regulations be met? Gyles Randall, University of Minnesota, ended the morning session with a description of studies conducted at the Southern Research and Outreach Center in Waseca to evaluate the effects of management practices for crop production on nitrate losses from agricultural landscapes. Studies at the Center revealed that producing perennial cover crops rather than row crops, applying appropriate amounts of nitrogen, and timing the application of fertilizers to minimize impacts from rainfall events can minimize nitrate losses. He concluded, however, that although such techniques can reduce nitrate losses, the extent of this reduction and its effect on problems such as hypoxia depend on the number of farmers throughout the watershed who adopt these practices. He also stated that long-term drainage research has not been conducted on these practices, so it is unknown whether they will be "sufficiently effective to meet society's goals."

Afternoon concurrent sessions included presentations made by water professionals from several state and federal agencies, city governments, engineering firms, and the University of Minnesota, covering a variety of local issues. Early sessions discussed the effectiveness of restoration efforts made to wetlands and rivers in the metro area, as well as efforts to enhance the water quality and aesthetics of storm water ponds. An evaluation of techniques to improve pollutant removal in stormwater basins and an assessment of pollutant trading at the Southern Minnesota Beet Sugar Cooperative followed, along with reports from long-term studies of metro lakes, Lake Pepin, and the Upper Mississippi River Basin. The conference concluded with a case study of management techniques used on Lake McCarrons, located in the City of Roseville; more specifically, the effectiveness of the McCarrons Wetland Treatment System to treat runoff was evaluated.

For information about the conference, contact Bev Ringsak at (612) 624-3720 or E-mail: bringsak@cce.umn.edu.

Minnesota Sea Grant Awards \$738,000 for Aquatic Research

By Marie Zhuikov

Sea Grant recently selected ten re-search projects involving Lake Superior and Minnesota's inland lakes for funding. The award money, which is provided by the National Sea Grant College Program and matched by the University of Minnesota, collectively totals \$738,000. These projects focus on biotechnology, aquaculture, coastal communities, exotic aquatic species, and the Lake Superior ecosystem, and will be funded through University of Minnesota departments for 2001-2003.

Discovering the fate of Nemadji River sediments

Erik Brown, Nigel Wattrus, Large Lakes Observatory (LLO); Gary Parker, St. Anthony Falls Laboratory; John Swenson, UMD Department of Geological Sciences

Researchers will integrate field data with computer models to examine how the Nemadji River delivers sediments to Lake Superior and the relative roles of currents, waves, and other physical forces in dispersing these sediments. This study will help scientists, engineers, and port authorities understand how land use, harbor dredging, variations in lake levels, and climate-driven changes in lake circulation influence sediment deposition.

Exploring the distribution and productivity of zooplankton in western Lake Superior

Meng Zhou, Nigel Wattrus, LLO; Donn Branstrator, UMD Department of Biology; Donald Schreiner, Minnesota Department of Natural Resources

Researchers will explore physical and biological conditions in Lake Superior during critical periods of lake trout's life history by examining how zooplankton are distributed in space and time. The collapse of the lake trout population in Lake Superior and subsequent efforts to rehabilitate the stocks prompted this project, which questions the flow of energy through part of Lake Superior's food chain.

The role of bacteria in moving PCBs into the Lake Superior foodweb

James Cotner and Bopaiah Biddanda, Dept. of Ecology, Evolution, and Behavior, and Deborah Swackhamer, Dept. of Environmental and Occupational Health

Researchers will examine how bacteria, which account for a relatively high (80-90%) amount of the metabolic activity in Lake Superior, might also contribute to the bioaccumulation of contaminants. They will identify the factors that permit microbes to dominate relatively unproductive lakes and assess their relevance in transferring PCBs to lake trout and other higher-order predators.

Examining the bioaccumulation of contaminants in Great Lakes fish

Deborah Swackhamer, Department of Environmental and Occupational Health

This study will examine which contaminants, beyond proven and currently-monitored compounds, are accumulating in the tissues of Great Lakes fish. By alerting health experts to the presence of toxic and persistent chemicals and the degree to which they bioaccumulate, this study will assist federal and state agencies that monitor contaminants.

Identifying the sources of coliform bacteria in coastal ecosystems and their relationship to land use

Randall Hicks, UMD Department of Biology; Michael Sadowsky, Department of Soil, Water and Climate; Lucinda Johnson, Natural Resources Research Institute (NRRI).

Researchers plan to determine the source and distribution of fecal bacteria in the Lake Superior Basin by refining molecular and metabolic fingerprinting techniques. They will analyze strains of bacteria living in the intestines of animals including terns, gulls, deer, beaver, and humans, and compare them to bacteria in water samples from watersheds and the Duluth-Superior harbor. Their goal is to help wastewater treatment plants and

governing agencies quantify how land use relates to sources of fecal pollution.

Comparing the genetic diversity of coaster brook trout hatchery programs

Anne Kapuscinski, Dept. of Fisheries and Wildlife.

Researchers will compare genetic profiles of "coaster" brook trout hatchery broodstock to natural populations and will monitor genetic change within hatchery broodstocks. These comparisons will guide hatchery managers in their efforts to retain wild genetic diversity in captive stocks and to maximize the genetic diversity in restoration attempts.

Identifying critical elements of brook trout habitat in Lake Superior

Jeff Schuldt and Lucinda Johnson, NRRI.

Researchers will identify the fundamental characteristics of brook trout habitats along coastal areas of Lake Superior. This study will contribute to efforts to restore the "coaster" brook trout, once abundant throughout the lake.

Evaluating the benefits of consuming wild rice and waterfowl to Fond du Lac Band members and communicating the risks

Mary Renwick, Water Resources Center; Nancy Costa, Fond du Lac Band of Lake Superior Chippewa; Pat McCann, Minnesota Department of Health

Researchers plan to screen waterfowl and wild rice for contaminants and compare the cultural, nutritional, and economic benefits of these traditional Ojibwe foods against market substitutes. Because these preferred foods may contain mercury and other toxic pollutants, the researchers will make the information accessible to Fond du Lac Band members and other Minnesota Ojibwe.

Grants continued on page 5

Water Resources Science announces first Ph.D. graduate

The Water Resources Science program is pleased to announce the first Ph.D. graduate of the program. In December 2000, Mark Riedel completed his Ph.D. in Water Resources Science, working under advisors Ken Brooks, Department of Forest Resources and Sandy Verry, U.S.D.A.



Forest Service. Riedel began his work in the WRS program as a Master's student in 1995. Riedel entered the WRS program because he felt it would provide a balance between forestry, hydrology, and hydraulics, enabling him to receive hard-core training

in hydraulics as well as to learn hydrology, watershed management and ecology

During his Master's program, Riedel studied the impacts of watershed management and land conversion on mass wasting, more specifically looking at large-scale effects such as landslides and erosional processes on stream systems. For his Ph.D., he turned his attention to small-scale effects and researched the impacts of riparian land use conversion on the morphology and stability of clay channel streams in the Nemadji Watershed. He found that conversion of riparian land use from natural forest to pasture land resulted in destabilization of the streambanks. This in turn led to impacts such as channel enlargement, increased deposition within stream channels, and the loss of natural streambed features such as pool riffle sequences.

Upon receiving his Ph.D., Riedel accepted a position with the U.S. Forest Service at the Coweeta Hydrologic Laboratory, Southern Research Station in North Carolina. This station, the only outdoor hydrology laboratory in the Forest Service, employs an interdisciplinary group of scientists. Their mission is evaluate, explain, and predict

how water, soil, and forest resources respond to management practices, natural disturbances, and the atmospheric environment; and to identify practices that mitigate impacts on these watershed resources. The approach to this mission is to meld theory development, experimental testing, modeling, and applications - usually on a landscape scale - where the watershed is the unit of both hydrologic and ecosystem investigation. Research combines short-term (5 years or less) with long-term (decades) studies on the responses of forested watersheds to various kinds of natural and human-induced disturbances. Currently, Riedel is studying the effects of different forest management techniques on soil erosion and delivery to stream systems, and is working to develop methods to upscale existing models to deal with urban sprawl and forest conversion.

When asked what experiences in the program prepared him the most for his current job, Riedel said, "My advisors made me write my own proposals, develop a good research design, secure my funding, and deal with the University - basically learn the day-to-day grind of making a project work. Many people haven't had to deal with management during their graduate programs and are surprised by the bureaucracy and paperwork. You learn the science through your studies, but the management experience and training under someone else's wing teaches you how to get the job done."

The start of the 2000-2001 school year marked the fifth year anniversary for the founding of the Water Resources Science graduate major. The program, whose beginnings stemmed from a graduate minor in water resources, is now the largest graduate degree program on the St. Paul campus. It currently has 43 Master's and 29 Ph.D. students working on a variety of water-related topics at campuses in the Twin Cities and Duluth. For more information about the program, visit <http://wrs.coafes.umn.edu>. For more information about Riedel's research at the Coweeta Experiment Station, visit <http://sparc.ecology.uga.edu/>.

Grants continued from page 4

Monitoring fish physiology and behavior with acoustics and implants

Allen Mensinger, UMD Department of Biology

Scientists will develop acoustical telemetry tags that can be implanted in walleye and northern pike to monitor their activity, physiology, and behavior. This research will allow scientists to relate physiology with behavior and use the

fish as environmental "sensors" to continually monitor environmental conditions.

Weevil attractants released by Eurasian watermilfoil

Florence Gleason, Dept. of Plant Biology, and Ray Newman, Dept. of Fisheries and Wildlife.

Scientists will extend their research on the ability of a water-soluble compound released by Eurasian watermilfoil to attract a weevil that helps to control this

invasive plant. This attractant, possibly coupled with the synergistic action of other natural products, could help ecologists, natural resource managers, and agencies throughout North America manage invading populations of this plant.



Minnesota Water Community News

Al Sullivan (Dean, College of Natural Resources) recently assumed the chair of the National Association of State Universities and Land Grant Colleges' (NASULGC) Board on Natural Resources. The board promotes university-based programs dealing with natural resources, forestry, ecology, energy, water, fisheries, and wildlife to members of Congress, and state and federal agencies. NASULGC is the nation's oldest higher education association and represents roughly 200 member institutions. Sullivan also received the distinguished contributions award from the University of Minnesota Extension Service. The award was established to recognize outstanding leadership and contributions to the people of Minnesota.

Water-on-the-Web won the 2000 Technical Excellence Award for public education and research from the North American Lake Management Society in recognition of extending effective and creative education in lake restoration, protection, and management. Water-on-the-Web: Monitoring Water Resources on the Internet is a National Science Foundation-funded project that encourages high school and college students to learn real science through inquiry and hands-on experiences. Water quality data, tools to analyze the data, curriculum and interpretative materials, web links and supporting materials are provided (<http://www.nrri.umn.edu>). **Bruce Munson** (College of Education, UMD), **Cynthia Hagley** (Minnesota Sea Grant), **George Host**, and **Richard Axler** (Natural Resources Research Institute, UMD) are the principal investigators.

Julia Frost and **Mary Gullickson** have been hired as Program Coordinator and Technical Coordinator, respectively, for the Volunteer Stream Monitoring Partnership. The coordinators will help to

bridge the gap between citizen and agency efforts to monitor water quality of local streams in the seven county metro area. Both are housed in the University of Minnesota Water Resources Center.

Gary Parker (St. Anthony Falls Laboratory) will be the Crosby Lecturer for the Department of Earth, Atmospheric, and Planetary Sciences at the Massachusetts Institute of Technology from January 15 to July 15, 2002. Parker is an expert on river engineering, river morphodynamics and submarine gravity flows, and his lecture series will discuss subaerial (river) and submarine morphodynamics. More specifically, he will attempt to link theory with field expression of morphology.

Barbara Liukkonen (Water Resources Center) took part in a Public Television series "Minnesota: Rivers and Fields," developed in west-central Minnesota through the University of Minnesota-Morris. Liukkonen's segment about citizen involvement will air January 2. This 13-part series originally was broadcasted by Appleton Public Television and will be shown on Twin Cities Public Television beginning December 19. It will run from 10-11 p.m., Tuesday, evenings on Channel 17.

Legislation continued from page 1

storage wells, and pumping stations to capture and redistribute flow. The complete plan is estimated to require 36 years and \$7.8 billion to complete.

Appropriations to improve streamgaging network

Congress also passed the Interior Appropriation Bill for Fiscal Year 2001, which includes an increase for the USGS Real-Time Hazards Initiative that supports streamgaging stations and related network activities. This \$3.1 million increase, plus

an additional \$5 million that was granted for capital investments in the streamgaging network, will allow the USGS to make streamflow information more available and reliable during flood events. Improvements will include reactivating and adding stations that serve flood warning purposes, reinforcing other flood prone stations, extending rating curves to the 200-year level, adding satellite telemetry for transmitting real-time information to stations, and improving the data delivery systems.

"This Congressional action reflects the high visibility and importance of the streamgaging network to stakeholders across the country," remarked Robert Hirsch, Associate Director for Water of the USGS. "The funds will [also] be very important in advancing the development of the National Streamflow Information Program."

The National Streamflow Information Program (NSIP) was proposed in 1999 to develop a nationwide system for producing streamflow information. The program will follow the long-standing principles of the USGS streamgaging network, serving users with data that are freely shared, quality assured, readily accessible for current use and archived for future use. When fully funded, NSIP will consist of an infrastructure of baseline streamgaging stations that are fully supported by federal funds, additional gages supported cooperatively by the USGS and many state or local agencies, along with the associated data analysis and delivery capability, and the technology development to support and maintain fully the federal responsibilities of the national network.

Portions of this article were excerpted from EPA WaterNews, a USGS Legislative Announcement, and a Congressional Research Service Report



Upcoming Events

January 10-11. **Involving Citizens in Watershed Efforts.** New Ulm, MN. This workshop, sponsored by the Minnesota River Watershed Institute, will teach county water planners, city environmental services staff, Soil and Water Conservation District staff, watershed district personnel, county ditch inspectors, educators, citizen advocates, county commissioners and others working on land use issues that impact water quality how to engage the public in management efforts. For additional information, contact Steve Hansen at (952) 361-6590.

February 3. **Youth Ice Fishing Clinic.** Fridley, MN. Participants in this clinic will learn from the “experts” about basic skills and techniques, equipment, safety, and lake ecology needed for successful ice fishing ventures. This clinic is open to the public and is sponsored by North Metro-Muskies, Inc. and MinnAqua. For more information, contact Roland Sigurdson at (612) 625-1291.

February 24-25. **LiMNology 2001: So What?** Siren, WI. This conference aims to bring faculty and students from the University together to contemplate the societal relevance of current research and why non-scientists should care. For more information, visit <http://www.limnology.umn.edu>, or contact Bob Sterner at (612) 625-6790 or E-mail: stern007@tc.umn.edu.

March 1-2. **Plants out of Place: Invasive Plant Conference for the Upper Midwest.** Eau Claire, WI. This conference aimed at landowners, public land managers, agency staff who work with landowners, researchers, educators, nurseries, and restoration consultants. Topics covered will include major invasive plants in forest, grassland, and

aquatic ecosystems, and methods, laws, and education pertaining to their control. For more information, visit the conference website at <http://www.plantsoutofplace.org/>.

March 6-8. **17th Annual Minnesota Rural Water Association Technical Conference.** St. Cloud, MN. This conference, entitled “Quality on Tap: Our commitment, our profession,” will discuss current water and wastewater issues such as Safe Drinking Water Act implementation and recent trends in the water industry. Minnesota’s largest waterworks display featuring the latest innovations and products in the industry will also be held during the conference. For more information, contact the MRWA at (218) 685-5197.

April 17-20. **14th Annual National Conference on Enhancing the States’ Lake Management Programs.** Chicago, IL. This conference, entitled “Integrating Nonpoint Source Watershed Management with Lake Management Protection,” will focus on innovative approaches for connecting effective lake management and nonpoint source pollution control and will be the first formalized national gathering of Federal and State program staff representing both lake and nonpoint source management disciplines. The conference is sponsored by the Chicago Botanic Garden, US EPA Region 5, North American Lake Management Society, and Northeastern Illinois Planning Commission. For more information, contact Bob Kirschner at (847) 835-6837 or E-mail: bkirschn@chicagobotanic.org.

April 30-May 2. **Water Quality, Monitoring, & Modeling.** San Antonio, TX. This specialty conference, sponsored by the American Water Resources Association, will cover topics such as

case studies demonstrating effective monitoring and data interpretation, emerging state-of-the-art monitoring and modeling approaches, current and anticipated monitoring and modeling needs, and new sources of water quality related information and tools for synthesis. For more information, visit <http://www.awra.org/meetings/Texas2001/>

May 3-5. **Minnesota Lakes and Rivers Conference.** Brainerd, MN. This conference, co-sponsored by the Minnesota Lakes Association, the Rivers Council of Minnesota, state agencies, the Water Resources Center, and Minnesota Sea Grant Program, will blend professional and citizen topics, including updates on exotics, cumulative impacts of development, building sustainable organizations, mercury in the environment, aquatic plant management, water management in Minnesota, lake inventory tools, and more. For more information, contact the Minnesota Lakes Association at (800) 515-LAKE or E-mail: LAKES@mnlakesassn.org.

June 10-15. **5th International Conference on Diffuse Pollution.** Milwaukee, WI. This conference, sponsored by the International Water Association, Specialist Group on Diffuse Pollution, will point out the problems in the past and develop solutions for the new century. Topics discussed will include source identification and management, water quality impact, solutions to diffuse pollution, socioeconomic and policy considerations, and information management, transfer, and exchange. For more information, visit <http://www.mu.edu/environment/iwa-page.htm>.



New Publications

Effects of riparian buffers on landscape characteristics: implications for breeding birds. J.M. Hanowski, P.T. Wolter, G.J. Niemi. 2000. Pp.523-528 in P.J. Wignington, Jr. and R.B.L. Beschta (eds.), *Riparian ecology and management in multi-land use watersheds*. Proceedings of the International Conference of the American Water Resources Association. Available at <http://www.awra.org/proceedings/paper.html>.

Great Lakes Fishes. J. Tomelleri. 2000. This vivid poster, produced by Wisconsin Sea Grant, features 35 detailed and accurate illustrations of Great Lakes Fishes. Available from Minnesota Sea Grant at (218) 726-6191.

Minnesota watermarks: gauging the flow of progress 2000 - 2010. Minnesota Environmental Quality Board. 2000. Minnesota is implementing a unified plan, *Minnesota Watermarks*, to protect and conserve water throughout the state. Highlights of the report include a

statewide section providing a framework of goals, objectives and measurable indicators, locally developed basin sections providing an overview of unique environmental conditions and pressures and suggestions for measurable indicators, and maps and graphics to illustrate the state of our water resources. It is available at <http://www.mnplan.state.mn.us/press/2000/eqb/water.htm>.

Rapid bioassessment protocols: an introduction. M. T. Barbour, J. Gerritsen, B. D. Snyder, J. B. Stribling 1999. This training module reviews methods for assessing the health of streams and watersheds based on the fish, invertebrates, and plants found in streams. It is based on the document, *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish*, Second Edition. It is available at <http://www.epa.gov/owow/watershed/wacademy/acad2000/rbp/>.

Use of biological characteristics of common carp (Cyprinus carpio) to indicate exposure to hormonally active agents in selected Minnesota streams, 1999. K.E. Lee, V.S. Blazer, N.D. Denslow, R.M. Goldstein, P.J. Talmage. 1999. This report describes the relations of various biological characteristics of common carp to wastewater treatment discharge and land use. Available from USGS, Branch of Information Services, Box 25286, Federal Center, Denver, CO 80225. Water-Resources Investigations Report 00-4202.

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