

Minnesota Water conference tackles questions about the State's water future

Nearly 300 people gathered in Minneapolis on March 23–24 for “Minnesota Water 2004: Policy and Planning to Ensure Minnesota’s Water Supplies.” This year’s conference speakers addressed concerns about the safety and supply of Minnesota’s water resources in the face of a growing state population, surface and groundwater contamination, terrorism scares, and global climate change. Minnesota Water 2004 was sponsored by the WRC, with co-sponsorship by Minnesota Sea Grant and the National Resources Research Institute.

The State’s role

One of the highlights of this year’s conference was Minnesota governor Tim Pawlenty’s Tuesday luncheon address. Pawlenty spoke about Minnesota’s commitment to protecting its ground and

surface waters.

Pawlenty assured conference participants that his administration recognizes the value of clean water and has made preserving Minnesota’s water resources one of its top priorities. The Governor, while optimistic about the state’s ability to protect its lakes and rivers, was also realistic. In order to make progress while faced with budget shortages, Minnesota needs to take advantage of existing water programs. To increase collaboration between agencies, Pawlenty formed a Clean Water Cabinet which is made up of a key representative from each of the state agencies concerned with water quality: the Departments of Natural Resources, Agriculture, and Health, the Pollution Control Agency, the Environmental Quality Board, the Board of Water

and Soil Resources, and the Metropolitan Council.

Throughout his address, Pawlenty acknowledged the expertise of the



Minnesota Governor Tim Pawlenty speaks about his Clean Water Initiative.

audience members, and engaged them in conversation about state water issues. As the Governor ended his talk, he thanked attendees for their “advocacy

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Expert optimistic that global water sustainability is within reach



Gleick believes that changing how we think about water will lead to more sustainable use.

Dr. Peter Gleick launched the Kolshorn Lecture on April 20 with many reasons to be concerned about global water supplies. “The world’s water is in crisis,” he told the students and faculty who filled

of this crisis are the worst.” Gleick’s lecture was part of the President’s 21st Century Interdisciplinary Conferences, sponsored by a grant to the WRC from the University of Minnesota President’s Office.

Dr. Gleick’s opinion is highly respected in the world of water. He is the president and co-founder of the Pacific Institute for Studies in Development, Environment, and Security. He serves on the Water Science and Technology Board of the National Academy of Sciences and received a MacArthur Fellowship in

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the Bell Museum Auditorium to capacity. “To me,” he said, “the human dimensions

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Shoreland Education promotional materials receive award

The University of Minnesota Extension Shoreland Education Program received the Association of Natural Resource Extension Professionals (ANREP) Bronze Award for Educational Materials in the “Promotional Materials” category at the ANREP National Conference held May 16–19 in Wheeling, West Virginia.

The Shoreland Education Program is organized around three themes: the Shoreland Volunteer Program, Shoreland Revegetation, and Shoreland Plant Identification. Graphics for each theme were designed to be used separately or together in Shoreland Education Program promotional and educational materials. Promotional materials include a Shoreland Education Program brochure, an annual workshop brochure, and an information and registration website. The website can be viewed at: <http://www.extension.umn.edu/water/shore>.

University Extension Shoreland Education Team members for this award include: Mary Blickenderfer, Regional Extension Educator, Grand Rapids; Eleanor Burkett, Regional Extension Educator, Brainerd; Cindy Hagley, Minnesota Sea Grant; Barb Liukkonen, WRC and Sea Grant; and Ron Struss, WRC and Regional Extension Educator. Also included in the award is Wendy Strombeck, president of oneD design, who designed the materials.

Expo helps children learn the art and science of fly fishing

by Roland Sigurdson, MinnAqua Aquatic Education Specialist

Fly fishing experts and teachers came together in April for the Great Waters Fly Fishing Expo in Bloomington, Minnesota, the largest gathering of its kind in the Midwest. The Expo was also the first major fly fishing show anywhere to encourage a connection between the sport of fly fishing and environmental stewardship and conservation. The fundamental philosophy of the event was that it is no longer enough simply to be an angler; one must adopt an active conservation ethic to preserve and protect the nation’s wild rivers, lakes and streams. The Expo provided an opportunity to begin a personal evaluation of the very real threats to aquatic environments, and to learn how to become involved in efforts to eliminate or reduce them.

The MinnAqua aquatic education and angling program organized and ran Camp Fly Fish at the Expo, for new and upcoming members of the fly fishing community. Over 50



Two girls learn about aquatic insects at Camp Fly Fish.

children attended the clinic on Saturday and Sunday. During their time at camp, the kids learned how to tie basic fishing knots, created a damselfly fly, examined aquatic invertebrates, practiced their casting skills, and talked about the safety considerations of the sport. The kids had a great time at Camp Fly Fish, but perhaps more importantly, they began to make the connection between water quality, stream health, fish health, and the fun sport of fly fishing.

From the Director’s Desk

Water: A resource worth protecting

The Water Resources Center had the privilege of hosting Dr. Peter Gleick, MacArthur “Genius” Fellow and President of the Pacific Institute, for a special event on the University of Minnesota campus (see Page 1) during Earth Week. He reminded us of the lack of availability of safe drinking water and adequate sanitation for approximately one-third of the world’s population, a shocking and humbling fact for those of us in water-rich Minnesota. There are 2-5 million deaths per year due to water-related illnesses. Dr. Gleick presented his argument as to why this global crisis is getting worse, but also gave us his perspective on how to address it through conservation and better resource management. As we look out over our swollen rivers and lakes and our lush spring fields and yards, we must also remember that our water resources are not infinite and that we are using water faster than it is returning to our underground aquifers – even here in Minnesota. We all can do things, every-day things, to help: modern toilets use about 3.7 times less water than older models; new front loading washing machines are much better at conserving water than top-loading models. Not in the market for new appliances? Try turning off the tap when you’re brushing your teeth, or singing while drying off in the shower instead of letting the water run unnecessarily as accompaniment. There are also water-conserving showerheads available. Most importantly, be conscious of this precious resource, this basic need for life, and you’ll see ways to conserve it. Practice conservation, and your children and your grandchildren will thank you.



Deb Swackhamer, WRC co-director

A volunteer teaches participants the finer points of fly tying.



A volunteer teaches participants the finer points of fly tying.

Mekong visit strengthens partnership

by Steven A. Clarke, International Development Consultant, WRC

It was not chance that brought together folks from the Father of Waters (the Mississippi) and the Mother of Waters (the Mekong), names that exemplify these rivers' sanctity and significance to the indigenous peoples living on their shores.



Thai National Mekong Committee and U.S. team enjoying river life in SE Asia.

Rather, this two-week visit to the Mekong was a purposeful cross-basin and cross-cultural meeting of American and Asian professionals seeking to learn from each other's experiences preserving and protecting these

ivers as they go through the process of development.

This was the second of two meetings of these groups during the past six months. The first occurred in October 2003 when a 12-person delegation from the Mekong River Commission (MRC) visited the Mississippi for two weeks. The *Minnegram's* December 2003 issue described that visit as well as the background for this one-year preliminary project ("Mekong-Mississippi Partnership: Improving policy decision-making processes") funded by a grant from the Council of State Government's (CSG) State Environmental Initiative and implemented by the Water Resources Center (WRC) in collaboration with the Mississippi River Basin Alliance (MRBA).

The six-person U.S. team making the Mekong trip comprised Jim Anderson (WRC Co-Director), Tim Sullivan (MRBA Executive Director), Jim Johnson (recently retired Chief of the Planning and Policy Division, U.S. Army Corps of Engineers), Kerry St. Pé (Program Director of the Barataria-Terrebonne National Estuary Program in the Mississippi delta), Mary Renwick (WRC Fellow and water resource economist), and Steven Clarke, WRC. In addition, Karen Marshall, Environmental Policy Analyst at CSG headquarters in Kentucky, joined us for the first leg of the trip, and Peter Riggs, Asian specialist who serves on CSG's Environmental Advisory Panel, accompanied the group during the second week. Jane Nishida, Senior Policy Advisor for Washington-based PADCO (a private international development company), participated in the entire trip.

The team assembled in Bangkok and then began an eventful ten-day journey through the four MRC member countries in the Lower Basin: Thailand, Laos, Vietnam, and Cambodia. In each of the four countries, the National Mekong Committee briefed the team on the particular river issues and challenges they are addressing and the MRC programs they are conduct-



Majestic entrance and causeway leading to the main temple at Angkor Wat in Cambodia.

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2003. Gleick also authored *The World's Water: The Biennial Report on Freshwater Resources* (1998, 2000, 2002).

To illustrate social impacts of the water crisis, Gleick shared some alarming statistics: More than one billion people in the world lack access to clean drinking water, and nearly two billion lack access to adequate sanitation. Between two and five million people each year die of water-related illnesses.

In Gleick's opinion, the water crisis is due to the "hard path" that humans have traditionally taken to meet their water needs. The hard path is the path of infrastructure: enormous dams, heavy machinery, levees, and concrete. "The hard path brought many benefits to millions of people," he said. "But it also had very substantial, unanticipated costs."

To successfully end the water crisis, Gleick talked about the need to embark upon a "soft path" to a sustainable water future. Rather than asking how we can meet increasing demands for water, the "soft path" requires that we rethink what we really want. "We don't want to use water," Gleick said. "We want goods

and services. These require water. But often, they require less water than what we're using now."

For example, in the U.S., water use per capita has dropped 20% over the last 20 years. "This isn't what we're taught," Gleick said. "As the population and the economy grow exponentially, our use of resources is assumed to also have to grow exponentially. But that doesn't have to happen."

In order to use water more responsibly, humans' concepts of water need to change. We need to change the way we think about supply from building dams and pipelines to catching rain and using wastewater. We need to treat water more like the valuable resource that it is, and subject it to appropriate pricing. Gleick also called upon governments to get involved "to encourage protection, equitable distribution, and sustainable use of water resources."

Despite providing plenty to worry about, Gleick remained optimistic. His final message was one of empowerment: "I believe that we will move to a more sustainable path. It is already under way. It is up to us to accelerate it."

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and involvement in these important issues.” He pledged to take their comments and suggestions back to his administration for use in planning and policy development.

Minnesota’s changing population

Tuesday morning’s four plenary speakers set the tone for over 60 talks in 16 concurrent sessions and for the research presented at Tuesday afternoon’s poster session, by outlining current water issues and developments.

Tom Gillaspy, Minnesota State Demographer, began the conference with a look at the past, present, and future of Minnesota’s demographics. From 1990–2000, Minnesota’s population increased 12.4% to 4,919,479. By 2030, it is expected to exceed six million people.

In Minnesota, much of this growth is related to lakeshore development, so increased growth may affect lake water quality.

According to Gillaspy, water could play a very important role in demographic trends in Minnesota and throughout the country. “Continued growth depends on an ample supply of clean water,” he said. Water shortages in other parts of the country may influence populations here as people move to areas with more water.

Pathogens at the beach

“The question ‘Is my water safe?’ doesn’t have a yes or no answer,” began Joan Rose in the conference’s second plenary talk, “and that’s difficult to communicate to people.”

Rose, Homer Nowlin Chair in Water Research at Michigan State University, primarily researches waterborne pathogens in the Great



In her plenary session, Joan Rose talked about the risks of infection due to waterborne pathogens.

Lakes region. “While drinking water in the region is relatively pure,” she said, “there has been new interest in the water

quality at the beach.” Only one third of the Great Lakes’ 600 beaches are monitored for water quality. At those monitored beaches, closures ranged from 3 to 30 percent. “Spatially and temporally, we don’t have a good picture of what’s going on on our shorelines,” Rose said.

Many beach closures can be attributed to waterborne pathogens excreted by humans and animals. New microbiological tools are becoming available to determine the source of the contamination so that it can be prevented or eliminated.

While her talk specifically addressed beach contamination, Rose’s message was more general: More studies, more information, and more action are needed in order to better understand, treat, and prevent contaminated waters in the Great Lakes region.

Groundwater mapping technology

Dr. Harvey Thorleifson, Director of the Minnesota Geological Survey, presented information on a new technology that can help water managers better understand the linkages between surface and ground water.

“Groundwater is the key water source for drinking water and irrigation, is our only usable freshwater reserve, and it sustains wetlands and streamflow,” Thorleifson said. Therefore, it is important to ensure that groundwater usage is sustainable. New 3D mapping of groundwater systems can help do that.

Thorleifson showed full color 3D maps that displayed locations and densities of different geological layers and soil types. The models help researchers understand Minnesota’s land, and “do much more to protect and wisely use our water.”

Global climate change

In Tuesday’s final plenary session, Katharine Hayhoe of ATMOS Research and Consulting in Toronto, Canada, presented compelling reasons to include the potential effects of climate change in future water planning.

Over the last century, summer temperatures in Minnesota have increased 1.0° F and winter temperatures have increased 2.5° F. Seasonal shifts in precipitation have occurred, with more rain falling in winter and spring and less

falling in summer and fall. Climate change has the potential to diminish groundwater recharge and surface water flow, decrease lake levels, increase the probability of flooding, and shift aquatic ecosystems.

Hayhoe believes that the science of climate change is sound enough to prompt serious consideration of the effects that climate change may have on Minnesota agriculture, industry, recreation, and populations, by incorporating the potential effects of climate change into current and future water policy and planning.



WRC co-director Deb Swackhamer (left) with plenary speakers Katharine Hayhoe, Joan Rose, Harvey Thorleifson, and Tom Gillaspy.

Conference sessions

Tuesday afternoon’s poster session and Wednesday’s concurrent sessions (see page 5) highlighted Minnesota’s current water research and programs. Speakers from the Minnesota Department of Health talked about the training, protocols, and procedures in place to protect drinking water from contamination by terrorism, mining, and other pollution sources. University of Minnesota researchers presented new technologies to better monitor water resources. Concurrent session speakers described programs to monitor and reduce inputs of mercury, phosphorus, sediment, pathogens, environmental estrogens, and invasive species to Minnesota waters.

Louis Smith of the Rivers Council of Minnesota summed up the feelings of many conference speakers when he said, “clean water isn’t really an optional thing.” The simplicity of that comment belies the complexity of the efforts undertaken by Minnesota Water 2004 speakers and presenters in their work to provide a safe, clean water supply for future generations.



Commercial caged-fish production along the banks of the Mekong in northern Thailand across from Vientiane, Laos.

ing. The team also met with government ministers and many other officials responsible for overseeing river development and water resources. The fast-paced itinerary took us from Bangkok to Udon Thani in northern Thailand, by road

across the Australian-built Friendship Bridge to the Laotian capital of Vientiane, by plane to Hanoi and a day later to Ho Chi Minh City, by road and boat into and across the Mekong delta in Vietnam, and then by fast boat up the Mekong across the border into Cambodia and to the capital city of Phnom Penh.

In contrast to the Mississippi, the Mekong is one of the world's least developed rivers, but pressure comes from many quarters to build dams, levees and other infrastructure to meet the need for electrical power, to enable navigation for trade and economic growth, and to control flooding and prevent salt intrusion from the sea. The Lower Basin's fast-growing population of 60 million is heavily dependent on the river to support its fisheries and agricultural systems, and is thus extremely vulnerable to adverse changes occurring in the river and its

watershed.

Neither of the two Upper Basin countries, Myanmar (formerly Burma) and China, has accepted membership thus far in the MRC. Considerable concern exists among MRC officials about the impact unilateral decisions made upstream, particularly in China, will have on the Lower Mekong. Our visit occurred during the dry season when river levels are usually relatively low, but we were informed in Laos and Cambodia that the river was running at least one meter below average, attributed in part by some knowledgeable observers to new dams on the Upper Mekong in China (two recently completed, with others under construction).

At the end of the trip, the MRC organized a partnership planning workshop for representatives from the four National Mekong Committees, MRC staff, and the U.S. team to share insights and perspectives on the two river systems, to determine areas and issues of common interest, to identify specific joint start-up activities, and to draft a Memorandum of Understanding (MOU) to serve as the framework for future collaboration. The seed grant provided by CSG will end in June, hence efforts will now be focused on securing larger-scale, longer-term funding to support collaboration in selected areas identified in the MOU.

On our last night in Phnom Penh, the MRC Secretariat hosted a memorable farewell banquet under the stars at the popular Hang Neak restaurant on the banks of the Mekong. The spirited conversation and bursts of laughter attested to the growing professional relationships and personal friendships as well as the genuine enthusiasm for collaboration that have developed on both sides over the past year.

After a full and productive visit to the Mekong Basin, the U.S. team returned home inspired by this unique shared experience and enthusiastic about the value of connecting the Mekong and the Mississippi.

Minnesota Water 2004 concurrent sessions

Concurrent Session 1

- A: The Impaired Waters Initiative
- B: New Techniques for 21st Century Water Research and Monitoring
- C: Mercury and Aquatic Ecosystems of Minnesota
- D: Protecting Drinking Water

Concurrent Session 2

- A: Assessment of Impaired Waters
- B: Ecological Indicators
- C: Bacteria: Sources and Standards
- D: Urban Stormwater I: BMP Implementation and Evaluation

Concurrent Session 3

- A: Implications of Changes in State Water Programs
- B: Value of Restoring Wetlands
- C: Processes and Fate of Aquatic Contaminants
- D: Urban Stormwater II: Historical and Regional Analysis of Urban Water Quality Impacts

Concurrent Session 4

- A: Valuation and Perception of Water Resources
- B: Invasive Aquatic Species—Threats to Minnesota's Waters
- C: Distribution and Effects of Aquatic Contaminants
- D: Sustainability and Adaptive Management

WRS staff receives "Best DGS Assistant" award from University

Maria Juergens, WRC Administrative Professional, was one of four recipients of the "Best DGS Assistant" award from the University of Minnesota Graduate School in April.

Many DGS (Director of Graduate Studies) assistants serve as the graduate students' main contact in their program's office. The quality of the assistance given to a program's



Juergens was nominated for the award by WRS graduate students.

students depends greatly on the organizational and communication skills of the DGS assistant.

During the ten years Maria has been DGS assistant for WRS, she has made a significant impact in the lives and academic careers of many graduate students.



U of M Water Community News

Patrick Brezonik (Department of Civil Engineering and former co-director of the WRC) has been appointed Program Director in the Environmental Engineering and Technology Program of the Bioengineering and Environmental Systems Division of the National Science Foundation (NSF) in Washington, D.C., beginning in the fall.

Timothy LaPara (Civil Engineering) was awarded a research grant from the Center for Urban and Regional Affairs (CURA) for his project titled "The Potential Role of Municipal Wastewater Treatment Facilities in the Proliferation of Antibiotic Resistant Bacteria."

Timothy LaPara and **Michael Semmens** (Civil Engineering) received a research grant from the National Aeronautics and Space Administration (NASA). Their project, "Advanced Life Support: Development of the M2BR for biological treatment of wastewater generated during long-term space missions," will develop a novel wastewater treatment process that satisfies the unique wastewater treatment needs of long-term space travel.

Kristopher McNeill (Chemistry) was named a McKnight Land-Grant Professor for 2004–2006. The goal of this program is to advance the careers of the University's most promising junior faculty. Winners were chosen for their potential for important contribution to their field; the degree to which their past achievements and current ideas demonstrate originality, imagination, and innovation; and the significance of their research and the clarity with which it is conveyed to the non-specialist.

Shri Ramaswamy has been appointed Head of the Department of Bio-based Products (formerly the Department of Wood and Paper Science) by College of Natural Resources Dean Susan Stafford. Over the past year Dr. Ramaswamy served

as interim head, and guided the development of a broader vision for the department that will attract additional students, research funds, and private support.

Mary Renwick (Water Resources Center) and Francois Molle recently published "The politics and economics of water resource development: The Uda Walawe Irrigation Project, Sri Lanka," in International Water Management Research Series, Colombo, Sri Lanka.

Michael Sadowsky (Soil, Water, and Climate) was named a Distinguished McKnight University Professor for 2004. The purpose of the Professorship is to recognize the University's most outstanding mid-career faculty. Winners were chosen on the merit of their scholarly achievements; the extent to which their achievements have brought distinction to the University of Minnesota; the quality of their teaching and advising; and their contributions to the wider community.

Heinz Stefan (Civil Engineering) and co-authors Xing Fang, John Eaton, Howard McCormick and Shoeb Alam published "Simulated fish habitat in lakes of the contiguous U.S. under different climate scenarios" in *Ecological Modeling*, 172 (2004) 13-68. The three-part article outlines how fish habitat for cold-, cool- and warm-water fish is projected to change if atmospheric carbon dioxide doubles. Stefan also received the Charles W. Britzius Distinguished Engineer Award, the highest award of the MN Federation of Engineering Societies, for 2003.

Deb Swackhamer (WRC Co-Director) attended the annual meeting of the National Institutes of Water Resources (NIWR) directors in Washington, D.C., from February 29 - March 2, 2004. The WRC is one of 54 NIWR centers that receive funding from the USGS.

University of Minnesota Water Resources Science Program Degree Recipients

Andry Ranaivoson received a Ph.D. in January 2004. His dissertation was titled "Effect of fall tillage following soybeans and the presence of gravel filters on runoff losses of solids, organic matter, and phosphorus on a field scale." Ranaivoson's advisor was **John Moncrief** (Soil, Water, and Climate).

Matthew Hudson received an M.S. in February 2004. His thesis was titled "Microbial facilitation of contaminant transfer in the Lake Superior foodweb." Hudson was advised by **Deb Swackhamer** (Environmental Health Sciences).

Ronnie Daanen received a Ph.D. in March 2004. His dissertation was titled "Modeling liquid water in snow." Daanen was advised by **John Nieber** (Biosystems & Agricultural Engineering).

Matthew Laudon received an M.S. in April 2004. The title of his Plan B paper was "The importance of terrestrial arthropods to trout in Valley Creek, Minnesota." Laudon's advisor was **Bruce Vondracek** (Fisheries, Wildlife and Conservation Biology).

Brian Johnson received an M.S. in April 2004. His thesis was titled "Sulfate reducing bacteria and the role of nutrients in mercury methylation in sediments of Spring Lake, Minnesota." Johnson's advisor was **James Cotner** (Ecology, Evolution, and Behavior).

Jeffrey Werner received an M.S. in April 2004. The title of his Plan B paper was "The aquatic photochemical kinetics of three acidic pharmaceuticals: ibuprofen, clofibric acid and mefenamic acid." Werner was advised by **William Arnold** (Civil Engineering) and **Kristopher McNeill** (Chemistry).



Upcoming Events

September 12–15, 2004. **Self-Sustaining Solutions for Streams, Wetlands, and Watersheds.** Radisson Riverfront Hotel, St. Paul, MN. Goals of this conference, sponsored by the American Society of Agricultural Engineers, include: exploring stream and wetland restoration and management solutions that re-establish and maintain self-sustaining ecosystems; expanding understanding of stream and wetland processes; enhancing the capabilities of professionals involved in natural channel design; and providing knowledge and training that will enable participants to better protect and enhance water resources. For more information visit www.asae.org/meetings/streams2004/.

September 20–24, 2004. **Stream Assessment and Monitoring.** Whitewater State Park, Altura, MN. This workshop is designed to teach natural resource professionals to effectively determine a stream's health and to monitor it over time. Concepts taught include sediment transport, causes and rates of erosion, use of biological indicators, and understanding riparian vegetation. For more information contact Karen Terry at (218) 739-7576 x233 or by e-mail at karen.terry@dnr.state.mn.us.

October 19–20, 2004. **Wetlands 2004: Protecting Wetlands of International Significance.** Hilton Kansas City Airport, Kansas City, MO. This symposium will help build the capacity of states, local governments, federal agencies, and others

Conservation tillage field days

Farmers and others interested in conservation tillage can take advantage of five conservation tillage field days this summer, offered as part of the Conservation Tillage Demonstration 319 project. At sites across the state, strip-till, no-till, spring one-pass, and chisel plow techniques are being yield-tested in replicated strips. Attendees will have the opportunity to learn about the economics, agronomics, and equipment aspects of conservation tillage with University of Minnesota Extension Service, farmer, and invited speaker presentations.

Dates and locations of the field days are listed below, with more details available at <http://www.extension.umn.edu/programs/> under the keyword "tillage." All programs will be held from 10 a.m. to 1 p.m. For additional information on the field days or for more specific location information, contact project coordinator Dave Schwartz (schwa049@umn.edu) or the Soil and Water Conservation District in the host county.

Stearns County, July 20, Keith Landwehr farm near Watkins
Wabasha County, July 21, Steve and Paul McNallan farm west of Kellog
Sibley County, August 10, Todd Mesker farm near Henderson
Cottonwood County, August 17, Tom Muller farm northwest of Windom
Grant County, August 18, Mike Flint farm east of Elbow Lake

to monitor, assess, protect and restore wetlands of international significance. It will primarily focus on the protection and restoration of wetlands in the U.S.; however, a portion of the program will be devoted to Canada, Mexico, and the Caribbean. Wetlands 2004 is sponsored by the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, International Programs, and the National Oceanic and Atmospheric Administration. For more information or to register, visit www.aswm.org/calendar/wetlands2004/agenda2004.htm.

October 26, 2004. **37th Annual Water Resources Conference.** Earle Brown Heritage Center, Brooklyn Center, MN. This conference provides a professional development opportunity for consultants; city, county, and state engineers; and others interested in water resource issues. The 2004 Conference will highlight emerging technological developments, best practices in addressing water resource issues, and reports on effective projects. For more information contact Ruth Martin at (612) 624-3492, or e-mail rmartin@cce.umn.edu.

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Publications and Resources



AQUATOX. U.S. EPA. 2004. EPA's Office of Water has released an enhanced version of *AQUATOX*, a user-friendly simulation model for aquatic ecosystems. It will help users evaluate and illustrate the causal links between the chemical and physical environment and the living systems that inhabit our waters. *AQUATOX* can predict the fate of pollutants and their effects on the ecosystem. *AQUATOX* is a valuable tool for ecologists, biologists, water quality modelers, and anyone involved in performing ecological risk assessments. *AQUATOX* Release 2 and accompanying documentation can be downloaded from www.epa.gov/waterscience/models/aquatox/. CD-ROMs and hard copies of the documentation will soon be available from the National Service Center for Environmental Publications (NSCEP) at 1-800-490-9198.

Draft Integrated Feasibility Report and Programmatic Environmental Impact Statement for the UMR-IWW System Navigation Feasibility Study. U.S. Army Corps of Engineers. 2004. This draft report contains a preferred integrated plan as a framework for modifications and operational changes to the Upper Mississippi River and Illinois Waterway System to provide for navigation efficiency and environmental sustainability. The plan will include a \$5.3 billion first cost long-term framework for ecosystem restoration and a \$2.4 billion first cost long-term framework for navigation efficiency improvements. Comments on the draft report are requested by July 30, 2004. To request a copy of the report, e-mail DraftNavRptOrder@usace.army.mil. To comment on the report, e-mail DraftNavRptComments@usace.army.mil. For more information on this study, visit www2.mvr.usace.army.mil/umr-iwwsns/index.cfm?fuseaction=home.welcome.

A Quick Guide to Using Natural Resource Information. Minnesota Department of Natural Resources. 2004. This guide includes information on the importance of natural resources, the benefits of natural resources to communities, how to collect natural resource information, and how to use natural resource information to make local land use decisions. The guide was designed for users with a range of experience in natural resources issues, and will be helpful for concerned citizens, local officials, and land use professionals. The Quick Guide can be downloaded from <http://files.dnr.state.mn.us/assistance/nrplanning/community/nrig/brochure.pdf>.