



## Swackhamer named interim director of U institute

The University of Minnesota is taking new form in the wake of President Robert H. Bruinink's ambition for the University to be among the top public research institutions in the world. Dedication to this ambition has been demonstrated by an array of administrative initiatives that strive to sustain and expand the strong academic tradition of the University.

The creation of the Institute on the Environment (IonE) comes out of the Initiative for Environment and Renewable Energy. Initially recommended by the presidential strategic positioning task force for this initiative, the IonE was approved by the Board of Regents in the Spring of 2006. Over the summer, an advisory committee to the Provost developed blueprints for its implementation, and these were approved by the President and Senior Vice President and Provost for Academic Affairs

in September. By creating a competitive research institute and catalyzing a system-wide reform effort to amalgamate historically scattered University environmental programs, the IonE intends to enhance cutting-edge environmental research and facilitate coordination and communication among scholars and between the University and the community.

Intimately involved with its inception, Deb Swackhamer (Professor, Environmental Health Sciences and WRC Co-Director) has been appointed Interim Director of the Institute. Serving as co-chair of both the strategic positioning task force and of the advisory committee, Swackhamer, as interim director, is charged with sculpting an Institute that seeks solutions to

**Swackhamer** continued on page 2

## Water resources conference attracts record crowd

*Speakers Robert Glennon and David Tilman address water usage values, ethanol alternatives*

Nearly 600 people assembled at the Earle Brown Heritage Center in Brooklyn Center on October 24 and 25 for the second annual Minnesota Water and Annual Water Resources Joint Conference. Headlining the conference agenda were two plenary sessions and two luncheon presentations, complemented by 66 concurrent session presentations and 16 posters. The Conference was sponsored by the Water Resources Center and the College of Continuing Education and co-sponsored by the Department of Civil Engineering, the Minnesota Section of the American Society of Civil Engineers, the Minnesota Sea Grant College Program, and the Natural Resources Research Institute.

The conference commenced with the presentation of the Dave Ford Water Resources Award to Ron Harnack of the Board of Water and Soil Resources (BWSR). Harnack was recognized for his outstanding long-term achievements in water resource management and conservation, specifically for his role in CRP implementation and Wetland Conservation Act programs. Harnack is only the sixth



*BWSR Executive Director Ron Harnack (l) with BWSR Assistant Director for Operations Steve Woods. Woods presented Harnack with the Dave Ford Water Resources Award at the Minnesota Water and Annual Water Resources Joint Conference in October.*

recipient of this award in the past 20 years.

The first plenary session, "Effects Impaired Waters Have on Us," included presentations by Louis Smith, a water resources attorney from Smith Partners PLLP, Virginia Kibler of the EPA, and Brad Moore, Commissioner of the MPCA. Bringing to light topics such as the Anandale court decision on TMDLs relative

to development and the possibilities of water quality trading in Minnesota, the plenary presenters provided case-specific examples of the economic implications of impaired water identification and remediation. The presentations stressed the importance of balancing economic activity with environmental health, and

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## From the Director's Desk

As the curtains close on another year, we see that 2007 holds many changes for the WRC and for the University. In October I was named the Interim Director of the University's new Institute on the Environment, and since this is a full-time effort, Jim and I are bringing on board a replacement for me in early January. I do not take the setting aside of my WRC responsibilities lightly in any way; I see this as an exciting opportunity to shape a visionary new institute for Minnesota and in doing so improve the future for the WRC. The mission of the IonE is to enhance and expand interdisciplinary environmental research and to coordinate and facilitate the many dispersed environmental programs at the University. The WRC can only benefit from the increased research opportunities and enhanced visibility that the IonE will offer, and in turn can contribute its expertise in interdisciplinary research, outreach and public engagement to the IonE as it grows into its mission. Since my appointment in

the Provost's office is temporary, I will continue to be the *de facto* leader of the USGS grants programs.

Another change for the New Year: several members of the Minnesota Congressional Delegation have committee chairmanships and seats in the upcoming 110<sup>th</sup> Congress that directly affect the appropriation and authorization of the Water Resources Research Institute program, one of our main sources of funding. A long-time supporter of water-related programs in the state, Representative James Oberstar will likely serve as Chair of the House Transportation and Infrastructure Committee, and newly elected Senator Amy Klobuchar has a seat on the Senate Environment and Public Works Committee, which oversees the WRC program. We look forward to their leadership in water resources for the state.

We eagerly anticipate this upcoming Legislative Session and encourage its members to show a continued commitment to a solution for the state's impaired waters program. The solution calls for a

renewal and long-term funding of the Clean Water Legacy Act. The funds from last year have been dispersed and allocated to good use, but one year's worth of funding was a drop in the bucket (pun intended). Let's be bold, and address this problem with a comprehensive multi-year strategy.

Have a wonderful holiday season and a very happy and healthy New Year – I may be stepping aside for awhile, but I won't be far away –

Here's to 2007!



Deb Swackhamer, WRC Co-Director



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the earth's most pressing environmental problems. "We are in the beginning stages of getting it off the ground," said Swackhamer. An early task takes on a principal goal of the Institute: to make environmental information at the U more accessible. A Web site is currently being designed through the efforts of the Director and Provost's office that will serve, according to Swackhamer, as "the portal for all things environmental at the University."

Interdisciplinary research is a fundamental characteristic of the Institute's design. The IonE will bring together world-class environmental scholars from across the entire University system to conduct large-scale research projects that are revolutionary in scope. Finding solutions to complex environmental problems requires multiple perspectives and expertise, and the IonE will facilitate the integration of natural sciences, social sciences, engineering, the Academic Health Center professional schools, humanities, policy, law, and other disciplines. The Institute

Fellows will be resident in the Institute, have joint appointments with their home departments, and be selected using a competitive process for terms of up to five years. "The Provost and I will be selecting the twelve Founding Fellows of the Institute by the middle of January 2007," said Swackhamer.

In addition, the IonE has submitted two grants, one external and one internal. The external grant, submitted to the Legislative and Citizens Commission on Minnesota Resources, would develop a conservation and preservation plan for Minnesota spanning the next 50 years. The internal grant addresses the IonE's commitment to public involvement in its development. By funding workshops to bring together representative stakeholders, the grant will aid in the design of best practices for public engagement in IonE affairs.

As for Dr. Swackhamer's tenure as Interim Director, she expects a national search to be conducted sometime during

Spring Semester 2007. She will serve as Interim Director until a permanent director is in place. The Blueprint for the Institute on the Environment can be viewed at <http://www.academic.umn.edu/provost/interdisc/environment/>.

### IonE seeks Founding Fellows

The Institute on the Environment is now accepting nominations for twelve Founding Fellows to participate in establishing the newly established Institute on the Environment. Nominations are due electronically to Interim Director Deborah Swackhamer by Wednesday, December 20, 2006. The complete announcement with details of the nomination and selection process, as well as additional information on the Institute on the Environment, can be found at: <http://www.academic.umn.edu/provost/interdisc/environment/>.

## Sea Grant Program gains new state and national directors

The Minnesota Sea Grant College Program in Duluth welcomes a new director this fall, Dr. Stephen Bortone. Bortone arrives in Duluth from Sanibel Island, Florida, where he served as director of the Marine Laboratory at the Sanibel-Captiva Conservation Foundation. Bortone also holds a tenured position with the University of Minnesota–Duluth’s Department of Biology. He received his Ph.D. in marine sciences from the University of North Carolina–Chapel Hill, and was on the faculty at the University of West Florida for many years, focusing on fish biology, seagrasses in brackish water, and, lately, the use of the spotted sea trout to monitor environmental trends.

When asked why he would abandon an island paradise for the more ascetic charms of the North Shore, Bortone immediately cited the programs and professional staff in Duluth. “Minnesota Sea Grant has a national reputation for excellence. I’m excited to give leadership and direction to an already good program.” In particular, Bortone would like to add an international flavor. “It shouldn’t be difficult to take us to the next level,” he said.

And will he miss the subtropics? “I’ll miss the winters, but, honestly, everything there bites or stings or hurts. And the traffic is terrible.” Bortone succeeds former director Carl Richards who now directs the Environmental Protection Agency’s Mid-Continent Ecology Division in Duluth.

At the national level, NOAA’s National Sea Grant College Program named a new director, Dr. Leon Cammen, earlier this year. Cammen received a Ph.D. in zoology from North Carolina State University and has been with Sea Grant since 1990, serving in various administrative positions.

For more information about Sea Grant, visit: [www.seagrant.umn.edu](http://www.seagrant.umn.edu).

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proffered the common goal, as Virginia Kibler stated, to develop a “win-win-win for industry, agriculture and the environment.”

Robert Glennon, Morris K. Udall Professor of Law and Public Policy at the University of Arizona’s Rogers College of Law, delivered the second day’s plenary address. Presenting selected stories from his recent book “*Water Follies: Groundwater Pumping and the Fate of America’s Fresh Waters*,” Glennon highlighted the depletive convention of groundwater use in the U.S. This convention, he stressed, has been the product of continued adherence to a reasonable-use doctrine that allows for “limitless access to a finite resource.” It is here, Glennon explained, that we see “a difference in what legal rule permits and what hydrological science tells us.” With population and water-use on the rise, he urged that the cycle of unlimited access be broken. “Water has a value we have not yet appreciated,” said Glennon, suggesting that in order for the U.S. to recognize this value, water consumption prices should be increased and transfer of water from low- to high-value uses should be facilitated. A book-signing with the author followed his presentation.

Wednesday’s luncheon presentation was given by David Tilman, Regents Professor in the Department of Ecology, Evolution and Behavior at the University of Minnesota. Presenting “Impacts of Corn Ethanol and Other Biofuels on Water Quality and Carbon Gas Emissions,” Tilman discussed the social and environmental ramifications of current



Conference Chair Deb Swackhamer congratulates Dr. Robert Glennon following his plenary talk on groundwater usage.

ethanol and biodiesel production methodologies. He first illustrated energy inefficiencies regarding the harvest of these fuel types, stating that “energy out versus energy in is nearly evenflow.” Citing other problems such as insufficient land for food production and nutrient loading to waterways, Tilman expressed a concern for the future direction of ethanol and biodiesel markets. Tilman offered conference attendees an alternative based on his extensive research: high diversity prairie biomass on marginal lands. “We would see a higher energy efficiency output with zero fertilizer input,” said Tilman, adding that corn would continue to feed a hungry world, while leachates to aquatic systems would be dramatically curbed. “If we take the ethanol route, existing CRP lands will be converted to corn plots,” said Tilman. “Let’s use these biodiversity plots with a sustainable harvest.”

The two-day conference included 22 concurrent sessions, ranging from “Finding Urban Stormwater Pollutants” and “Assessing Agricultural Impacts,” to “Lake Pepin TMDLs” and “Contaminants of Concern.” The next Water Conference is scheduled for October 23–24, 2007.



Speakers in the Assessing Agricultural Impacts concurrent session discussed nutrient mass balance, nutrient management, and fecal coliform source tracking. Pictured (l to r) are Jim Anderson (moderator, WRC), Luke Stuewe (WRS alumnus), Brian Williams (MDA), and Scott Matteson (Mankato State University).

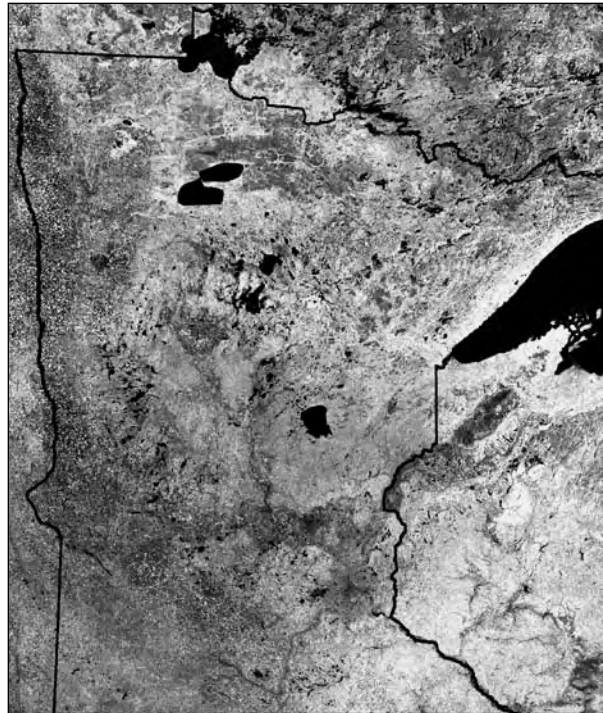


# Satellite monitoring economical, accurate

by Leif Olmanson, Research Fellow, and Marvin Bauer, Department of Forest Resources and Remote Sensing Geospatial Analysis Laboratory

Classification of lake clarity, a key indicator of water quality, using Landsat satellite imagery has proven to be an accurate and economical method to monitor the condition of lakes in Minnesota. The Remote Sensing and Geospatial Analysis Laboratory, with support from the Minnesota Pollution Control Agency and Legislative Commission on Minnesota Resources, has developed and extended the capability for using satellite remote sensing to classify the clarity of over 10,000 lakes at five points in time over the past 20 years.

Our research has documented a strong relationship between the spectral-radiometric responses of Landsat TM and ETM+ data and in-situ observations of water clarity (Secchi depth transparency). The geographic coverage, spatial resolution, availability and relatively low cost of Landsat data make it particularly useful for assessment of inland lakes. The geographic coverage of 12,000 square miles per Landsat image allows for the simultaneous assessment of thousands of lakes in lake rich areas. The



*Satellite remote sensing images cover large geographic regions, making them ideal to assess a considerable amount of inland lakes simultaneously.*

spatial resolution of 30 meters is suitable for all lakes down to about ten acres and can be used to map in-lake variability.

Classifications of Landsat data for

1985, 1995, and 2005 have recently been completed and added to previous classifications for 1990 and 2000. The five classifications at approximately five-year intervals over a 20-year period provide an unprecedented assessment of lakes in terms of number of lakes and geographic and temporal extent. We are analyzing the data for temporal and geographic patterns and trends, as well as relationships to land use and other factors that may cause changes in lake quality. Initial analysis indicates relatively stable conditions statewide, but more meaningful analyses are now possible for individual lakes, as well as by county, lakeshed, watershed, and ecoregion. The data are being used by the MPCA, by other agencies and by citizens.

Data for all lakes and years are available in the LakeBrowser, a web-based mapping tool that enables searches and display of results for individual lakes at: <http://water.umn.edu/>.

## WRS alumna directs citizen-driven development effort

*Regional sustainable development partnership connects faculty with community*

When WRS alumna Kathy Draeger (Ph.D. 2001) returned to the University as statewide director for the University's Regional Sustainable Development Partnerships (UMN RSDP), she realized that her work at the University had come full circle. Says Draeger, "my Ph.D. study on watershed organization effectiveness was really to see whether citizen-driven effort could really improve our water quality." Having answered that question affirmatively, Draeger, now part of the UMN RSDP, provides citizen boards an opportunity to define the needs of their communities and engage University faculty, staff, and resources to address those issues.

The UMN RSDPs have a unique model of citizen engagement that actually provides funding to regional boards to buy faculty time, support graduate

students, and engage community partners in advancing sustainable development. Traditionally, the UMN Regional Partnerships have focused on natural resources, sustainable agriculture, renewable energy, and sustainable tourism. Regional Partnerships have supported more than 300 projects throughout Greater Minnesota, over a third of which have addressed natural resources, including water quality. Specific examples of projects include researching cropping practices to reduce nitrate leaching under potato production areas in central Minnesota, restoring shoreland in the lakes region, producing educational materials on development pressures on the Mississippi River in Southeastern Minnesota, and conducting a shorebird census in the Big Stone Refuge.

The strength and credibility of the

UMN Regional Partnerships comes the citizens, says Draeger. Having considered citizen involvement as a strategy for protecting water quality, she is pleased to be working with hundreds of citizens around the state on complex issues of regional sustainable development and, importantly, helping to determine how the University can be a valued partner throughout the state.

The Regional Partnerships seek opportunities to connect faculty with communities throughout greater Minnesota who look to the University as a partner in improving quality of life and developing strategies for using our social, environmental and economic resources sustainably. Please visit the website at: <http://www.regionalpartnerships.umn.edu> for more information.

# StreamLab research bridges disciplines

by Cailin Huyck Orr, Postdoctoral Associate with the National Center for Earth-Surface Dynamics

As social demand for stream restoration increases, restoration practitioners are challenged by our limited understanding of stream disturbance and restoration dynamics in river and floodplain ecosystems.

River restorations can have multiple goals. These depend on the setting and the ecosystem functions that need to be rehabilitated. The motivation behind StreamLab is to determine how the stream

laboratory environment, while operating at a scale similar to a real stream.

The flume test reach in the Main Channel facility is 50 meters long and draws water directly from the Mississippi River. This has the benefit of providing ambient levels of nutrients and microorganisms, but also provides the challenges of the natural, seasonal variability in the river. While water is taken continuously from the river, the flume has a sediment recirculation system that allows experimenters to introduce different sizes of sediment.

Recent data collection carried out by the StreamLab team included examining nutrient uptake by algae and bacteria, autotrophic and heterotrophic biomass measurements and the impact of these on surface water chemistry done by NCED post-doc Cailin Huyck Orr and EEB graduate student Becky Stark. Jeff Clark, a visiting professor from Lawrence University, conducted measurements of water exchange with the hyporheic zone under different bed conditions. NCED post-doc Nancy Brown and UC Berkeley graduate student Mike Limm are currently measuring how strongly algae growth can limit sediment transport during flooding. Plans for next year include employing findings from StreamLab06 to NCED fieldsites at the Angelo Coastal Reserve in Northern California and in the new outdoor flume facility being built at SAFL.

More information about Streamlab can be found on the NCED Web site: <http://www.nced.umn.edu/Streamlab/>.



Photo by Brad Stauffer

NCED post-doc Nancy Brown works in the Main Channel facility to determine effects of algal growth on sediment transport during flood periods.

The scientific basis for stream restoration is insufficient, and the outcome of existing projects is often undetermined. This scarcity of information exists, in part, because the answers to restoration questions require interdisciplinary answers. Now the challenge of integrating research across disciplines is being met by a new approach at the National Center for Earth-Surface Dynamics (NCED) called "StreamLab" that combines physical, biological, and social sciences in an integrated approach to stream restoration.

StreamLab is a multi-phase research endeavor being conducted in the Main Channel flume at the St. Anthony Falls Laboratory of the University of Minnesota. This program brings together a spectrum of research expertise and includes investigators from several fields including Jacques Finlay (University of Minnesota, Ecology, Evolution and Behavior), Miki Hondzo (UMN, SAFL, eco-fluid dynamics), and Peter Wilcock (Johns Hopkins University, geomorphology).

parameters commonly manipulated during restoration impact basic ecosystem functions such as nutrient uptake and retention, periphyton biomass accumulation, gross primary productivity, and community respiration. Understanding these interactions will allow practitioners to design restoration projects that promote favorable and sustainable ecosystem function.

While it is possible to study some aspects of sediment transport and hydraulics in the laboratory using small-scale models, many key features of stream ecosystems cannot be scaled down. Thus consideration of ecological and biological aspects of stream restoration demands a physically realistic field-scale facility. The Main Channel facility, and a larger outdoor facility to be completed in 2007, will be ideal for such studies because each retains some aspects of a controlled



Cailin Huyck Orr, an NCED post-doc, retrieves a water sample from the Main Channel facility at St. Anthony Falls Laboratory.





# U of M Water Community News

**Jim Anderson** (Water Resources Center and Soil, Water and Climate) recently received two grants: one for a project titled “Impaired Waters: Conservation Drainage Research,” and the other for the Carbon and Minnesota Landscape Workshop. Both grants were awarded by the Minnesota Department of Agriculture.

**Larry Baker** (Water Resources Center) presented a paper titled “Source reduction for reducing pollutants to stormwater” at the Minnesota Water 2006 and Annual Water Resources Joint Conference, October 24–25.

**Paul Bloom** (Soil, Water and Climate), assumed the position of President of the International Humic Substances Society (IHSS) at its biennial conference held in Karlsruhe, Germany, in early August.

**Sara Christopherson** and **Dave Gustafson** (Water Resources Center) attended and presented at the National Onsite Wastewater Recycling Association 15th Annual Technical Conference: Integrated Watershed Management in Denver, CO, August 28–31.

**Holly Dolliver** (WRS PhD Candidate) received the Graduate Student Award from the Soil Science Society of America Division S6 (Soil & Water Management & Conservation) at the annual meeting in Indianapolis, IN, November 12–16, 2006.

**K. William Easter** (Applied Economics) traveled to Pretoria in South Africa and Colombo in Sri Lanka as Chair of the External Program Management Review Panel for the International Water Management Institute (IWMI), Oct. 13–31. The panel’s review covers the period 2000–06 and focuses on research output, organization and management.

**Leonard Ferrington** (Entomology) was awarded the 2006 International Achievement Award by the College of Food, Agricultural and Natural Resource

Sciences (CFANS).

**Paul Hartzheim** (Water Resources Science) presented a paper titled, “Urban landscape scenarios and cycling of carbon, nitrogen and phosphorus” at the Minnesota Water 2006 and Annual Water Resources Joint Conference, October 24–25. **Larry Baker** (Water Resources Center) was co-author of the paper.

**Randall E. Hicks** (Biology, UMD) recently received two grants for his projects titled “Assessing the Impact of Microbially Influenced Corrosion on the Accelerated Loss of Port Transportation Infrastructure,” and “Initiating the Assessment of Microbially Influenced Corrosion on the Accelerated Loss Steel Sheet Piling in the Duluth-Superior Harbor.”

**Barb Liukkonen** (Water Resources Center and Minnesota Sea Grant) presented a paper at the 14th National NPS Monitoring Workshop in Minneapolis Sept 25–28. Liukkonen was lead author of the paper, titled “Building the Capacity of Volunteer Monitoring for *E. coli* in the Upper Midwest.”

**David Mulla** (Soil, Water and Climate) served as a US delegate for a Water Management Workshop in New Delhi, India September 20–22. Mulla also co-authored a keynote paper presented at the Soil and Water Conservation Society’s Workshop on Managing Agricultural Landscapes for Environmental Quality in Kansas City, MO, held October 11–13. The paper was titled, “Methods for environmental management research at landscape and watershed scales.”

**Michael Semmens** (Civil Engineering) won a Senior Fulbright Scholarship to study in Norway during the spring semester of 2007. He will be working with a membrane research group at NTNU in Trondheim which is now headed by

## University of Minnesota Water Resources Science Program Degree Recipients

**Kim Grosenheider** received her M.S. in June 2006. The title of her thesis was “Human Health Risk of Using Waste Materials in Road Sub-Base.” Grosenheider was advised by **Paul Bloom** (Soil, Water, and Climate).

**Jeffrey Werner** received his Ph.D. in August 2006. His thesis was titled “The Environmental Photochemical Kinetics of Pharmaceutical Compounds in Natural Water and on a Clay Surface.” Werner was advised by **William Arnold** (Civil Engineering), and **Kristopher McNeill** (Chemistry).

Professor TorOve Leiknes, one of his former students.

**Summer Streets** (Water Resources Science) presented a paper at the North American SETAC in Montreal, November 5–9. The paper was titled “Partitioning and Bioaccumulation of PBDEs and PCBs in Lake Michigan.” Streets presented the same paper at the Minnesota Water 2006 and Annual Water Resources Joint Conference, October 24–25.

The University has been selected for their proposal, “A Training Partnership for Students and Postdoctoral Scientists with the University of Minnesota,” to partner with the US EPA Midcontinent Ecological Division of the National Health and Environmental Effects Laboratory on training students and postdocs in environmental research. **Randall Hicks** (UMD-Biology), **Deb Swackhamer** (Water Resources Center and IonE),

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## Upcoming Events

### Mark Your Calendars!

**The Minnesota Water 2007 and Annual Water Resources Joint Conference** has been scheduled for October 23–24, 2007. The Conference will be held at the Earle Brown Heritage Center in Brooklyn Center, Minnesota.

December 13, 2006. **The 6<sup>th</sup> Annual River Summit.** Discovery Hall, 4<sup>th</sup> Floor at the Science Museum of Minnesota. Summit information can be viewed at: <http://wrc.umn.edu/outreach/vsmp/riversummit/>.

January 11, 2007. **The Thirteenth Meeting of the Mississippi River Basin & Gulf of Mexico Watershed Nutrient Task Force.** Sheraton Crystal City Hotel, Arlington, Virginia. The meeting will feature a discussion regarding options for responding to the Gulf of Mexico hypoxia. More information can be obtained on the Task Force website at: <http://www.epa.gov/msbasin/taskforce/reassess2005.htm>.

February 5–8, 2007. **The Fourth USDA Greenhouse Gas Symposium.** Baltimore, Maryland. More information about this symposium may be viewed at: <http://www.acsmeetings.org/carbon/>.

January 22–23, 2007. **The American Water Resources Association Third National Water Resources Policy Dialogue.** Sheraton Hotel, Arlington,

Virginia. For registration information, visit the meeting's Web site at <http://www.awra.org/meetings/DC2007/program.html>.

February 1–2, 2007. **Wisconsin Wetlands Association's 12th Annual Wetland Science Forum: Riverine Wetlands: Connections, Corridors & Catchments.** Radisson Hotel, La Crosse, Wisconsin. Registration and Forum information may be viewed at: <http://www.wiscwetlands.org/2007forum.htm>.

March 10–14, 2007. **The 2007 NOWRA Water for All Life Conference.** Marriott Waterfront Hotel, Baltimore, Maryland. Participants at this conference will be involved in a series of sessions where they will learn practical applications for sustainability to ensure that their environment can provide "Water for All Life." The conference Web site is <http://www.nowra.org/?p=832/>.

March 11–13, 2007. **The ASABE's Fourth Conference on Watershed Management to Meet Water Quality and TMDL Issues: Solutions and Impediments to Watershed Management and TMDLs.** Crowne Plaza, Riverwalk, San Antonio, Texas. Visit the Web site at: <http://www.asabe.org/meetings/tmdl2007/>.

April 1–4, 2007. **The 10th International Symposium on Wetland Biogeochemistry.** Annapolis, Maryland. More information may be obtained at:

<http://www.serc.si.edu/conference/>.

April 9–12, 2007. **Emerging Issues: Along Urban/Rural Interfaces II.** Sheraton Hotel, Atlanta, Georgia. The theme of this conference links human aspects of land-use change with the ecological implications that follow. For more information, visit <http://www.sfw.su.auburn.edu/urbanruralinterfaces/focus.html>.

June 17–20, 2007. **ASABE Annual International Meeting.** Minneapolis, Minnesota. Updated information regarding the meeting's format and precise location will continue to be posted at: <http://www.asabe.org/meetings/aim2007/>.

July 31, 2007. **Midwest Strip-Tillage Expo 2007.** Hawkeye Community College, Waterloo, Iowa. Manufacturers, researchers and farmers will demonstrate equipment for strip-tillage and associated operations, and will present the latest information on strip-tillage related topics, including equipment selection, fertility management, and guidance technology. For more information, visit <http://wrc.umn.edu/outreach/stripillageexpo/midwest/>.

August 14, 2007. **Minn-Dak Strip-Tillage Expo.** Fergus Falls, Minnesota. For more information, visit <http://wrc.umn.edu/outreach/stripillageexpo/minndak/>.

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# Publications and Resources



*Simulation of Constituent Transport in the Red River of the North Basin, North Dakota and Minnesota, During Unsteady-Flow Conditions, 1977 and 2003–04.* United States Geological Survey, December 2006 (Report # 2006-5296). The U.S. Geological Survey, in cooperation with the Bureau of Reclamation, developed and applied a water-quality model to simulate the transport of total dissolved solids, sulfate, chloride, sodium, and total phosphorus during unsteady-flow conditions and to simulate the effects of the water-supply alternatives on water quality in the Red

River and the Sheyenne River. This publication may be viewed online at: <http://pubs.usgs.gov/sir/2006/5296/>.

*Tribal Resource Directory for Drinking Water and Wastewater Treatment.* U.S. Environmental Protection Agency, 2006 (EPA 832-R-06-007). This publication reviews more than 30 federal and non-federal programs that provide funding and assistance to help tribal communities attain safe drinking water and fundamental sanitation. Printed copies of the Directory can be obtained from: U.S. EPA, National Service Center for Environmental Publications, P.O. Box 42419, Cincinnati,

OH 45242. The directory may also be viewed on the web at: <http://www.epa.gov/owm/mab/indian/>.

*Watershed Achievements Report.* Minnesota Pollution Control Agency (MPCA), 2006. This publication is a report to the U.S. Environmental Protection Agency on Clean Water Act Section 319 and Clean Water Partnership Projects in Minnesota. The complete report may be viewed in pdf format at <http://www.pca.state.mn.us/publications/wq-cwp8-06.pdf/>.

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**Ray Newman** (Fisheries, Wildlife and Conservation Biology and Water Resources Science), and **Matt Andrews** (UMD-Biology and IBS) are the co-PIs.

The University of Minnesota Extension's Arsenic and Dairy Project team received

the Dean and Director's Outstanding Team Award, at the Extension Program Conference awards luncheon on September 28. Members of the team include **Vince Crary** (Otter Tail County), **Jim Linn** (Animal Science), **Mike Murphy** (Veterinary Medicine), **Mindy**

**Erickson** (WRS Alumna), **Judith Kashman**, (Veterinary Medicine Graduate Student), and **Barb Liukkonen** (WRC and Minnesota Sea Grant).

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