Solutions to water research problems requires new national agenda, new funds

"Will our drinking water be safe?" Dr. Henry Vaux, Jr., asked the audience at the third Power of Water Lecture on April 6 at the Bell Museum. "Will there be enough for both people and the environment? Can water quality be maintained and enhanced?" Dr. Vaux, a professor of resource economics, emeritus, at the University of California, chaired both the National Research Council Committee on Assessment of Water Resources Research and the Water Science and Technology Board (WSTB), which studied the implications of our country's water research policy. "If the answer to any of these questions is no," he said, "it will portend a very difficult future."

His lecture, "Envisioning Solutions to the Nation's Water Problems," was part of the President's 21st Century Interdisciplinary Conferences, sponsored by a grant to the Water Resources Center from the University of Minnesota President's Office.

To address his opening questions, Vaux detailed two recent WSTB publications that focused on water resources research, *Envisioning the Agenda for Water Resources Research in the Twenty-First Century* (2001) and *Confronting the Nation's Water Problems: The Role of Research* (2004). In preface, he noted that "a vibrant and robust research program by itself is not sufficient to guarantee that we will not experience [future water crises], but the more knowledge and more research that we are able to generate the better our chances will be to confront these difficulties effectively."

Vaux believes coordintated research is crucial to dealing with future water challanges.

The first of these reports organized water resources research into three distinct categories: water availability, water use, and water institutions. From these three categories, the WSTB made 43 recommendations for the future of water resources research. Vaux summarized these recommendations by saying, "The challenge of solving the nation's water problems will require a renewed national commitment that includes changes in the way research, agendas, and priorities are established—and infusions of federal funding." In addition, he stated that water quantity and quality are inherently related and must be considered in an integrated manner, and that more attention must be provided to social sciences and institutions. The WSTB also recommended that a National Water Research Board be formed to establish and oversee the national water

Vaux lecture continued on page 5

Minnesota Water and Annual Water Resources conferences combine to take on water issues

On October 25–26, 2005, researchers and water resource professionals will gather at the Earle Brown Heritage Center in Brooklyn Center, Minnesota, for the first Minnesota Water 2005 and Annual Water Resources Joint Conference. The two-day conference will feature 60 technical presentations, four plenary speakers, and a poster session. Participants will hear about cutting-edge research, new modeling techniques, lessons learned through implementation of Best Management Practices (BMPs), and other current water resource management issues. This first joint conference combines the 38th annual Water Resources Conference and the 11th biennial Minnesota Water conference, bringing together researchers, engineers, consultants, agency staff, students, and educators.

Each day will open with a plenary session, followed by three concurrent sessions addressing agricultural water, storm water and construction BMPs, surface waters (lakes, rivers, wetlands), Total Maximum Daily Loads, contaminants,

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Around the State

WATER RESOURCES UPDATES

Ground-water investigation finds PFCs in Lake Elmo wells

A total of 173 private wells have been sampled in Lake Elmo as part of an investigation, with 63 wells showing low levels of perfluorochemicals (PFCs). Previous sampling has shown the presence of PFCs in the Oakdale municipal water supply and one private well in Oakdale contained levels below the health-based criteria.

The Minnesota Department of Health (MDH) and Minnesota Pollution Control Agency (MPCA) staff are closely examining the sample results to determine if a pattern exists based on well locations and depth. The full impact of the PFC contamination is not yet clear, and additional well sampling in the area will be completed later this month.

The ground-water investigation continues for PFCs as four private wells in Lake Elmo tested above the MDH's criteria for long-term safe use.

PFCs were detected in 41 of 110 wells sampled in April. Thirty-seven wells tested below the health-based criteria established by the MDH and 69 showed no presence of the chemicals. Residents of the four homes with PFCs above the health-based criteria have been advised to discontinue use of the water and are being supplied with bottled water by the MPCA.

The MPCA suspects that the Washington County Landfill is a source for PFCs. The agency will take the necessary response actions since this landfill is in the Closed Landfill Program.

In March, the MPCA and the MDH tested for PFCs in 38 private wells and found eight wells contaminated above the health-based criteria in the western Lake Elmo area. The other wells showed low levels or no detection of PFCs. The MPCA will provide all 12 homes above the PFC health-based criteria with a granular activated carbon filter to reduce the contaminant levels. The other wells with PFC levels below the MDH criteria will be monitored on a regular basis.

A map showing the areas where private wells have been sampled can be found at the following link: www.health.state.mn.us/divs/eh/hazardous/sites/washington/lakeelmo/wellmap.pdf.

Perfluorooctane sulfonate (PFOS) and perfluorooctanic acid (PFOA) are in a family of [manufactured] chemicals, PFCs, [that] have been used for decades to make products that resist heat, oil, stains, grease and water. Common uses include nonstick cookware, stain-resistant carpets and fabrics, components of fire-fighting foam and other industrial applications.

Minnesota is one of the few states in the country where these chemicals were made. The 3M Company made PFCs at its Cottage Grove facility beginning in the 1940s and phased out the production of PFOS and PFOA by 2002. Wastes from the

PFCs continued on page 6

From the Director's Desk

Let's pass the Clean Water Legacy Act

Well, another legislative session has ended, but our state's impaired waters are still impaired and the number of listings is increasing. The State's 303(d) report to the U.S. Environmental Protection Agency (EPA) states the need for 1890 Total Maximum Daily Load (TMDL) reports, an increase over previous years, representing the impairment of approximately 40 percent of Minnesota's water resources.

While the Minnesota Pollution Control Agency (MPCA) has tried valiantly to address this backlog of work, they need significant resources to do so. A two-year collaborative effort led by the Minnesota Environmental Initiative brought together a highly inclusive set of stakeholders that resulted in a comprehensive framework for addressing the assessment, load allocation, and restoration of the State's vast water resources. This framework, and its funding mechanism, was introduced to the State Legislature as the innovative Clean Water Legacy Act. The plan was to assess a $36 per year fee from residences and a 3-tiered fee for businesses up to a maximum of $600 per year in order to raise a significant portion of the approximate $80 million needed. The legislation passed through several layers of committee before getting stalled, and ultimately failed to reach the floor for a vote.

There are many related and unrelated reasons why legislation doesn't survive a given session, and this case was no different, getting tangled in the concepts of "fee" versus "tax," debating what governmental body would assess the fee, and facing the continued problem of having limited dollars for many worthy causes. We pride ourselves on having more water resources than any of the other lower 48 states, but we should be ashamed that 40 percent of them are impaired. The State Legislature needs to get the message that we are willing to pay our $36 per year to fix this. Call your State Representatives and Senators and let them know that the State's water resources belong to everyone, and spreading the cost over everyone is fair and reasonable. Let's keep this legislation alive, and get it passed *next* session.

Deb Swackhamer, WRC Co-Director

WRS student tests BMPs, hydrologic model in southeast Minnesota agricultural watersheds

By Brennon Schaefer, WRS Graduate Student

For the last two years, I have been working under the supervision of my advisor, John Nieber (Biosystems and Agricultural Engineering), and Greg Johnson (Minnesota Pollution Control Agency) on the "Whitewater River Paired Watershed Monitoring Project." The purpose of the project is to gather information needed to evaluate the effectiveness of agricultural best management practices (BMPs), provide long-term monitoring to evaluate pollution problems and solutions in the Whitewater River watershed, and test a detailed hydrologic model for the watershed.

The project began in 1994 with the selection of two small headwater watersheds near the town of St. Charles, Minnesota. Two additional small headwater watersheds were established in 1997. With the help of Brad Hansen (Biosystems and Agricultural Engineering), I am monitoring automated sampling equipment to record precipitation, streamflow, and water quality in the four watersheds. Brad installed the monitoring equipment at the beginning of the project and he has been instrumental in maintaining the monitoring system and assisting graduate students with fieldwork.

To measure the saturated hydraulic conductivity of the soil, I use a Guelph Permeameter.

The landscape in southeast Minnesota and our four study watersheds is dominated by agricultural cropland and pastureland. Because of this agriculture-heavy landscape, the BMPs I am investigating are rotational grazing, conservation tillage, the Conservation Reserve Program, field and riparian buffers, and the addition of a perennial crop to crop rotation. I collect hydrologic data for each of the BMPs and for traditional agricultural practices. By comparing the BMPs data to the traditional practices data, I can infer the hydrologic effect of converting traditional agricultural practices to the newer, more environmentally friendly best management practices.

The landscape above is typical of pastureland used for livestock grazing in southeast Minnesota and the four study watersheds.

With the help of Greg Eggers (United States Army Corps of Engineers), I am testing the Gridded Surface Subsurface Hydrologic Analysis (GSSHA) model, developed by the Corps of Engineers. The GSSHA model is a two-dimensional hydrologic model that can be used to predict soil moisture and runoff and flood volumes. Monitoring data I collect and other parameters measured in the field are used as inputs to the GSSHA model. In particular, I am interested in using the model to simulate runoff events for the watersheds. I can compare the simulated runoff to the monitoring data from the field to see how closely the model represents the natural system.

After it has been calibrated and validated, the model can be used to simulate runoff events for the different BMPs. My monitoring data will show which BMPs are most effective at reducing runoff and improving water quality. Together, these two components of the project can guide future decisions in the watershed aimed at improving water

Watersheds continued on page 5

WRS student receives grant to conduct biogeochemical research in Albania this summer

Paul Hartzheim, a Water Resources Science graduate student, was awarded a Walter H. Judd International Graduate and Professional Fellowship from the University of Minnesota Office of International Programs and Graduate School to expand his research project to Albania. With the support of his advisor, Larry Baker (Water Resources Center), Hartzheim will travel to Albania in late summer to conduct a series of household consumption and behavior surveys to analyze household carbon, nitrogen, and phosphorus cycles in this rapidly developing country. The data will provide a contrast to similar surveys conducted in Falcon Heights, Minnesota, in late 2004, as part of the Coupled Biogeochemical Cycles in Human Ecosystems project, headed by Baker, Patrick Brezonik (Civil Engineering), Dave Mulla (Soil, Water, and Climate), Sarah Hobbie (Ecology, Evolution, and Behavior), and Kristen Nelson (Forest Resources and Fisheries, Wildlife, and Conservation Biology) at the University of Minnesota.

OSTP protects Minnesota water through education, research, and training

In excess of 600,000 Minnesota households treat their wastewater using an onsite sewage treatment system. In an effort to protect public health and the Minnesota environment through proper onsite wastewater treatment, the Onsite Sewage Treatment Program (OSTP) provides information for homeowners, consultation and education for communities, and licensure training for septic professionals, realtors, consultants, and others. In addition, there is a strong research program to test conventional and alternative wastewater technologies and incorporate this research into the other aspects of OSTP.

Homeowners may not understand their complex underground septic systems. OSTP provides information to educate homeowners about ISTS function and maintenance.

In Minnesota, individual sewage treatment system (ISTS) professionals, such as installers, designers, inspectors, and maintainers, are required to be registered with the Minnesota Pollution Control Agency (MPCA). To obtain this registration, individuals must receive the proper training, gain the necessary experience, and pass the requisite exams. The exams are offered by the MPCA and administered on the last day of the OSTP pre-license courses. The pre-license courses provide the knowledge necessary to pass the registration exams, and are held across the state throughout the year. In addition to the pre-license courses, OSTP continuing education courses are designed to keep registered ISTS professionals up-to-date with changes in treatment systems and ISTS regulations, and provide additional education in areas such as large septic systems, soils, and system troubleshooting. So far this season, which runs from October 2004 through July 2005, over 1950 people have completed OSTP courses. To build on the workshops, OSTP staff have worked to produce fact sheets, design work sheets, and instructional materials for ISTS professionals.

OSTP also conducts the Small Community Wastewater Education Program (SCWEP). SCWEP seminars guide residents and leaders of unsewered communities towards viable wastewater treatment solutions based on their individual environmental, financial, and social needs. SCWEP provides information on the technical aspects of treatment systems as well as financial and legal information relating to system construction and operation.

For homeowners unfamiliar with their septic systems, OSTP offers fact sheets and articles that explain how septic systems work and explain in detail the necessary seasonal care and maintenance of septic systems. In particular, the *Septic System Owners Guide* provides much of this information in a handy pocket folder. All this information helps homeowners keep their septic systems in tip-top shape, discharging clean water to the environment.

Some ISTSs discharge directly to surface waters. OSTP strives to protect these waters by training ISTS profesionals on proper system design, installation, and repair.

Research conducted by OSTP staff is diverse, ranging from a long-term soil hydrology investigation, which relates hydrologic patterns to parent geology and soil, to a project on dairy milk house waste, which evaluates the how well three different onsite sewage treatment systems treat milk house wastewater. OSTP has partnered with everyone from individual homeowners to the U.S. Natural Resources

OSTP continued on page 5

WRC and OSTP welcome new staff member

In May 2005, Nick Haig joined the staff of the Water Resources Center as the new program associate for the Onsite Sewage Treatment Program (OSTP).

Haig manages workshop registration, designs and edits workshop materials, coordinates new seminars, tours, and workshops, and answers phone calls. In addition, he will soon begin managing the OSTP Web site (http://septic.umn.edu/).

Before coming to OSTP, Haig worked for the Southeast Minnesota Water Resources Board. As a Community Sewage Treatment Facilitator involved in the Southeast Minnesota Wastewater Initiative, he provided education and technical support for individuals and small communities confronted with wastewater issues in an eleven-county area.

Nick was born and raised in Wauwatosa, Wisconsin, but has been a resident of the Twin Cities for the last three years. He received a B.S. in Environmental Policy and Philosophy from St. Norbert College in De Pere, Wisconsin, just south of Green Bay.

Nick and his fiancé, Kael Wherry, plan to marry in October. In his free time, Nick enjoys home-improvement projects, playing softball and disc golf, and honing his barbequing skills.

Vaux lecture continued from page 1

resources research agenda. "Water-related environmental issues will be especially important targets of research," declared Vaux.

The second report, issued in part as a follow-up to the first, examined present and past investments in water resources research, and expanded upon the recommendation for a National Water Research Board, including options for the framework of this Board. Vaux relayed some surprising details from this report: real levels of water resources research funding have remained relatively constant since the mid-1970s, and water resources research funding has not paralleled growth in demographic and economic parameters such as population and Gross Domestic Product. In particular, funding for water supply, water quality, and water planning research, and data collection has decreased since the mid-1970s.

The WSTB put forward three models for the National Water Research Board in the second report: using the existing Federal Council on Science and Technology Policy's Subcommittee on Water Availability and Quantity, forming a neutral third party consisting of representatives from a broad array of stakeholders, and using an Office of Management and Budget-run body consisting of senior agency managers. A recommendation to use a standing committee of the WSTB to develop water resources research agendas and priorities was deemed too self-serving by the WSTB and not included as an option in the report.

Dr. Vaux and WRC Senior Fellow, Larry Baker, chat during the post-lecture reception at the Bell Museum.

Vaux's April lecture was the third Power of Water lecture. For more information about previous lectures by Dr. Peter Gleick of the Pacific Institute for Studies in Development, Environment, and Security, and Dr. Malin Falkenmark of the Stockholm International Water Institute, see the Water Resources Center Web site: http://wrc.coafes.umn.edu/powerofwater/.

WRC Co-Director participates in Beautiful U Day event

The groundbreaking ceremony for the installation of a rain garden at St. Paul Lot S101 was attended by (front row, l to r) Les Potts, Grounds Superintendent, Facilities Management-Landcare; Jim Anderson, Co-Director, Water Resources Center; Bob Baker, Director, Parking and Transportation Services; and Ann Hill Duin, Associate Dean of Academic Programs and Student Services, College of Agriculture, Food, and Environmental Sciences. A Beautiful U Day grant awarded to Parking and Transportation Services for improvements to Lot S101 that treat stormwater runoff from the parking lot. Funding for the grant was provided by all University of Minnesota departments.

Watersheds continued from page 3

quality by reducing excess nutrients, sediments, and other pollutants, which are linked to runoff.

In April, John Nieber presented a poster for the modeling portion of this project titled "Simulation of rainfall runoff using the Gridded Surface Subsurface Hydrologic Analysis (GSSHA) model" at the European Geophysical Union Conference in Vienna, Austria. This was an important event and the first public showing of the modeling portion of the project. I am continuing to collect monitoring data to test the GSSHA model. The project will be completed by the end of the year.

The Whitewater River Paired Watershed Monitoring Project was established under the National Monitoring Program of the Clean Water Act, Section 319. The project will serve as the basis for my thesis, which will fulfill a requirement towards a Master of Science degree in Water Resources Science.

OSTP continued from page 4

Conservation Service to investigate individual sewage treatment systems.

OSTP staff includes Sara Heger Christopherson and Dave Gustafson, who offer technical support, and Nick Haig, the program associate. In addition to technical support, Heger Christopherson also leads the research portion of the program, while Gustafson conducts the professional workshops. Jim Anderson (Water Resources Center and Department of Soil, Water, and Climate) lends his background as a professor of soil science. University of Minnesota Extension Educators from the Natural Resources & Environment Capacity Area, Janelle Eggert, Doug Malchow, and Valerie Prax, conduct the homeowner and small community education programs. Dan Wheeler, a Research Fellow from the Department of Soil, Water, and Climate, conducts soils training workshops. Bonnie Anderson and Janelle Benusa provide office support and accounting services for OSTP.

OSTP programs are delivered by the Water Resources Center and the University of Minnesota Extension Service, with support from the College of Natural Resources, the College Agriculture, Food, and Environmental Science, and the Minnesota Pollution Control Agency.

To find out more about the Onsite Sewage Treatment Program, visit their Web site at http://septic. umn.edu/ or email septic@umn.edu.

U of M Water Community News

Larry Baker (Water Resources Center) attended the National Science Foundation Biocomplexity in the Environment workshop, March 21–23, in Alexandria, Virginia, and presented a poster titled "Coupled Biogeochemical Cycles in Human Ecosystems."

Kevin Blanchet (Water Resources Center and Extension Service) was featured in the cover story of the April 2005 issue of *Successful Farming*. The article was titled "Manure Happens." The topic is nutrient and manure management in Minnesota, with an emphasis on the fertilizer-replacement value of manure. The on-line version is available by visiting www.agriculture.com and searching for "Successful Farming."

Melinda Erickson (Water Resources Science) and her advisor, **Randal Barnes** (Civil Engineering), recently had the article "Well Characteristics Influencing Arsenic Concentrations in Ground Water" accepted by the journal *Water Research*.

John Gulliver (Saint Anthony Falls Laboratory and Civil Engineering) will begin a Fulbright Fellowship to teach and perform research at the University of Chile-Santiago in July 2005. He will be in Santiago through December.

Barbara Liukkonen (Water Resources Center and Sea Grant) presented an invited poster at the International Water Conference, April 5-7, in Winnipeg, Manitoba. The poster was titled "Guide to Aquatic Invertebrates of the Upper Midwest," and co-authored by **Will Bouchard** (Entomology).

Barbara Liukkonen presented a paper at the International Association of Great Lakes Research conference held May 23–27, in Ann Arbor, Michigan. The paper was titled, "The University of Minnesota Shoreland Education Program: Creating Shoreland Stewards."

Mike Murphy (Veterinary Medicine), **Barbara Liukkonen**, **Jim Linn** (Agriculture, Food, and Environmental Science), **Vince Crary** (Otter Tail Co. Extension Educator), and **Gary Horvath** (Minnesota Dept. of Agriculture), received $122,000 in COAFES Rapid Response funds for continuing research on the implications of arsenic exposure on dairy cattle.

Water Resources Science students **Stanley Asah**, advised by **Jim Perry** (Fisheries, Wildlife, and Conservation Biology), and **Meghan Brown**, advised by **Don Branstrator** (Biology, UMD), were awarded Doctoral Dissertation Fellowships from the University of Minnesota Graduate School. **Filiz Dadaser Celik** (Water Resources Science) advised by **Pat Brezonik** (Civil Engineering), was awarded a Graduate School Doctoral Dissertation International Research Grant. **Paul Hartzheim** (Water Resources Science), advised by **Larry Baker**, was awarded a Walter H. Judd International Graduate and Professional Fellowship from the Office of International Programs and the Graduate School. For more information on Hartzheim's research, refer to page 3.

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production process were placed in several local disposal sites, including Washington County Landfill and the 3M Oakdale Dump.

PFCs are very stable chemicals that do not change or break down in the environment. Therefore, they may build up in soil, sediment or in other places. Some studies indicated PFCs easily enter ground water and move long distances.

While there is only limited information about human health effects, animal studies indicate high concentrations of PFCs harm the liver and other organs. Developmental problems have been seen in the offspring of pregnant rats exposed to PFCs.

Contents taken from a Minnesota Pollution Control Agency press release, May 9, 2005

University of Minnesota Water Resources Science Program Degree Recipients

Melinda Jo Granley received her M.S. in November 2004. Her thesis was titled "Nutrient and Sediment Loads and Storage in a Peri-Urban Trout Stream." Granley was advised by **Jim Perry** (Fisheries, Wildlife, and Conservation Biology).

Johanna Schussler received her M.S. in March 2005. Her thesis was titled "A Comparison of Phosphorus Sources and Fate in Eleven Minnesota Watersheds." Schussler was advised by **Larry Baker** (Water Resources Center).

Melinda Erickson received her Ph.D. in April 2005. Her thesis was titled "Arsenic in Minnesota Groundwater: Occurance and Geochemical Mobilization Mechanisms." Erickson was advised by **Randal Barnes** (Civil Engineering).

Jennifer Olson-Swenson received her M.S. in April 2005. Her thesis was titled "Infiltration as a Stormwater Management Technique: A Catalog and Inventory of Infiltration Practices in the Twin Cities Metropolitan Area and Ground Water Mounding Beneath an Infiltration Basin." Olson-Swenson was advised by **John Nieber** (Biosystems and Agricultural Engineering).

Dennis Busch received his Ph.D. in May 2005. His thesis was titled "Vertical-Flow Wetlands for the Treatment of Subsurface Agricultural Tile Drainage Water." Busch was advised by **Jim Anderson** (Water Resources Center and Soil, Water, and Climate).

Upcoming Events

June 16 and September 10, 2005. **Lake Data Assessment Workshops for Citizen Volunteer Monitoring Programs.** Have lake data, but not sure how to analyze and interpret it? Then this half-day interactive workshop is for you. You will be guided step by step through the process of gathering, organizing, "crunching" and interpreting Secchi disk, total phosphorus and chlorophyll 'a' data in conjunction with data from other sources. Two separate workshops will be held at local college computer labs: June 16, Minnesota State Community & Technical College, Detroit Lakes, Minnesota, and September 10, Central Lakes College, Brainerd, Minnesota. For registration or information, contact Sandra Holm at (218) 765-8329 or RNSholm@brainerd.net.

July 14–15, 2005. **Lake Superior Basin Wetlands Research and Management Conference**. University of Minnesota-Duluth, Duluth, Minnesota. This conference will focus on "no net loss" of wetlands, national perspectives on wetland conservation, and technical papers. For more information, contact Mark Nelson with the Duluth Board of Water and Soil Resources at (218) 723-4923, or visit the Minnesota Sea Grant Web site at www.seagrant.umn.edu/news/.

July 21, 26, 27 and August 10, 2005. **Conservation Tillage Field Days**. These events will be held on four farms where four tillage systems are being compared in replicated trials. Speakers will include the host farmers, University of Minnesota Extension faculty, and agency staff addressing crop management in reduced tillage systems, economics, and equipment selection. Conservation tillage equipment will be demonstrated. Dates and locations are July 21, Keith Landwehr farm, Watkins, Minnesota, hosted by Stearns County SWCD; July 26, Pete Kramer farm, Gibbon, Minnesota, hosted by Sibley County SWCD; July 27, Mark Bauer farm, Faribault, Minnesota, hosted by Rice County SWCD; August 10, Randy Reese farm, Hancock, Minnesota, hosted by Stevens County SWCD.

August 11, 2005. **Upper Midwest Manure Handling Expo**. University of Minnesota Research and Outreach Center, Waseca, Minnesota. This multi-state event will include field demonstrations of manure handling equipment, a trade show with over 50 vendors, and educational breakout sessions. For more information, visit www.manure.umn.edu/fieldday05/.

September 19–23, 2005. **MTS/IEEE Oceans 2005**. Washington, D.C. The theme of "One Ocean" emphasizes the vital need for global cooperation and engagement to protect our internationally connected waters, as well as the critical role that the "One Ocean" plays in global commerce, weather, jobs, food supply, recreation, national defense, and mineral and energy resources. "One Ocean" also reinforces the many interrelationships among the scientific and engineering disciplines, and this conference provides an opportunity to network with colleagues from across the spectrum of oceanic and marine interests. Visit the conference Web site (www.oceans2005.org) for more information.

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Geographic Information Systems and remote sensing, and education and planning. The conference planning committee received nearly 90 abstracts for the 60 available time slots, making the selection process challenging. A poster reception will be held from 4:30–5:30 p.m. on the 25th. Lunch each day is included with conference registration, and will coincide with a lunchtime plenary session.

As more information on the conference location, schedule, and registration becomes available, it will be posted to the WRC Web site (http://wrc.coafes.umn.edu/waterconf/). A conference brochure and registration will be mailed to Minnegram recipients in August. To add your name to the list, contact Tracy Thomas Wilson at thoma032@umn.edu.

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Publications and Resources

Better Living on Our Lakes and Rivers. University of Minnesota Extension Service. 2005. Shoreland homes and cabins are extremely popular on Minnesota's lakes and rivers. Protecting the water quality is a responsibility that comes with lake home and cabin ownership. These nine short videos describe how you can protect that investment. This DVD series has value for any lake or river shoreline property owner, from a new cabin owner to the long-time resident. Included are: Culverts: Not Just Something to Pass Over; Keeping Our Shores: Shoreland Best Management Practices; The Living Shore: Best Management Practices for Shoreland Vegetation; Rivers: Ribbons of Life; Standing Firm Against Erosion: Best Management Practices for Shoreland Stabilization; Septic Systems Revealed: A Guide to Operation, Care, and Maintenance; Shoreland Restoration: A Growing Solution; Stop Exotics: Clean Your Boat; and Water Conservation: Managing Our Precious Liquid Asset. For more information, visit the Extension Web site at www.extension.umn.edu/units/dc/item.html?item=08307.

Lake Home and Cabin Kit Producer. University of Minnesota Extension Service. 2005. This portable, boxed kit of quick, easy answers to common lake home and cabin questions contains 50 cards of information on Home and Septic Systems; Trees and Woodlands; Waterways and Shorelands, and Wildlife and Insects. No lake home or cabin owner should be without the University of Minnesota Extension Service's Lake Home and Cabin Kit. Sturdy, additional cards are provided to store pertinent personal information about the owner's property and other important contacts. The box is an attractive addition to any cabin owner's bookcase, providing tabbed sections for fast access to all information. For more information, visit the Extension Web site at http://www.extension.umn.edu/catalog/item.html?item=08304.

Metro WaterShed Partners Media Packets. Metro WaterShed Partners. 2005. The media packets include car washing tips, lawn mowing tips, and phosphorus-free lawn fertilizer information. Each media packet contains a press release, tip sheet, flyer, illustrations/photos, and links for more information. The media packets are designed to provide ready-to-use or ready-to-adapt materials that cities, counties, and townships can use in their stormwater education outreach. For more information, visit www.cleanwatermn.org.