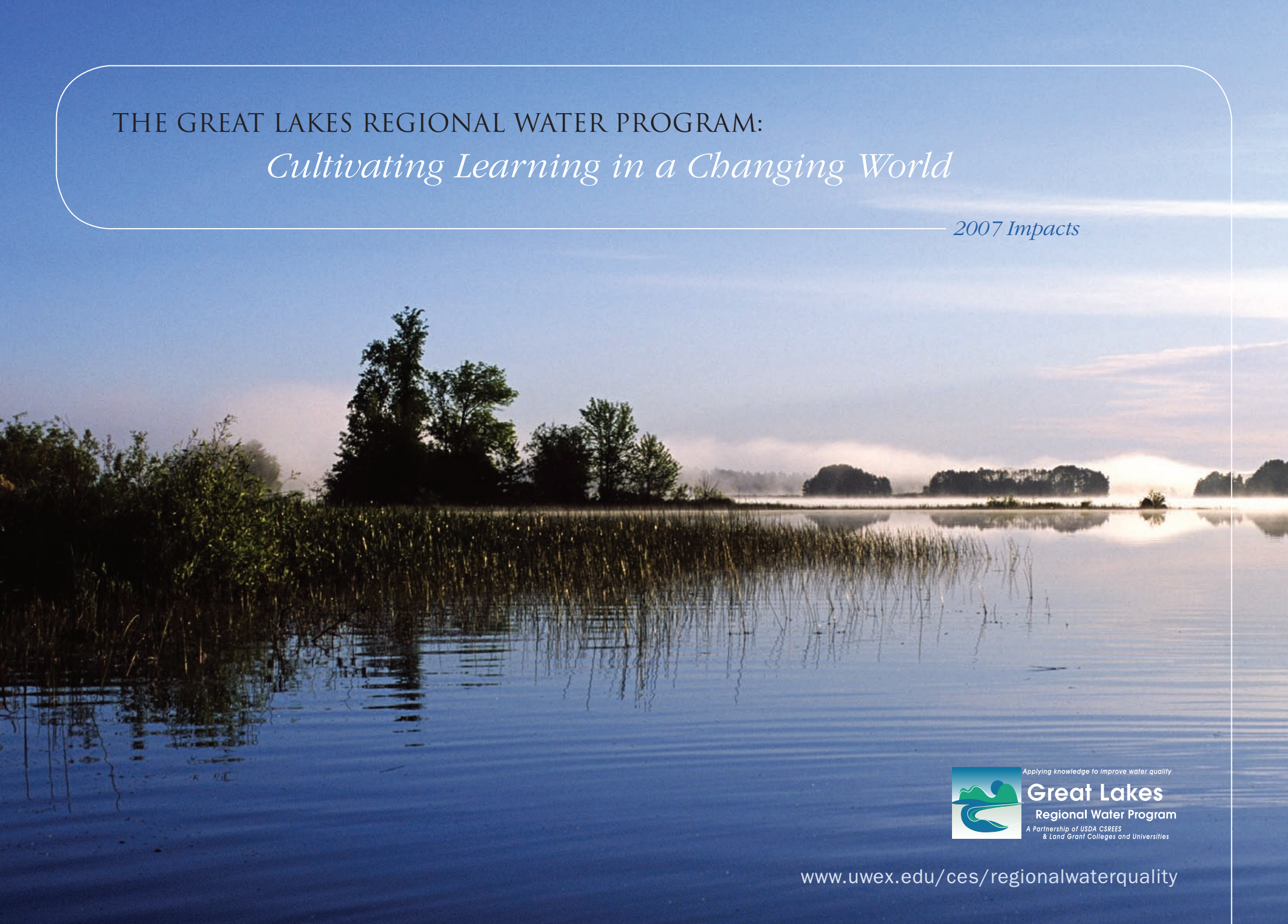
# THE GREAT LAKES REGIONAL WATER PROGRAM:

## *Cultivating Learning in a Changing World*

*2007 Impacts*



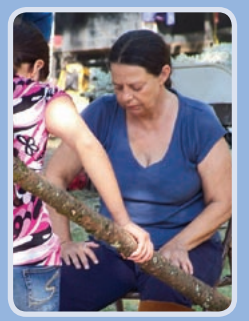
Applying knowledge to improve water quality

Great Lakes
Regional Water Program

A Partnership of USDA CSREES
& Land Grant Colleges and Universities

www.uwex.edu/ces/regionalwaterquality

ILLINOIS | INDIANA | MICHIGAN | MINNESOTA | OHIO | WISCONSIN



**We dedicate** this 2007 celebration of learning and the land, water, and people of the Great Lakes Region to Jewell Kathleen "Kathy" Hoagland, who died in November of this year. Below are words from a memorial message sent out to Kathy's friends and family.

*Kathy built her dream with traditional camps, day labor programs, garden projects, starting a non-profit "Sah kah tay"… She also enjoyed being in the woods with her husband, Earl Hoagland, gathering traditional foods and medicines to help others.*

*While living up to her given name, "Mii zi weg kaa miig ogema kwe" meaning "all over the Earth Boss Lady", Kathy never overlooked her children and grandchildren. She greatly enjoyed being with family and teaching them to help others while having fun.*

*To look at her family is to look at her, to walk your dream is to walk her dream, to use her teachings is to honor her memories.*

Thank you, Kathy, for your dreams and your teachings.

www.uwex.edu/ces/regionalwaterquality

GREAT LAKES Regional Water Program

Photos: scenic photos – Jeffrey J. Strobel; others courtesy of Pat Robinson, Dale Kakkak, and Great Lakes Regional Water Program participants

Graphic design by Jeffrey J. Strobel, UW-Extension Environmental Resources Center

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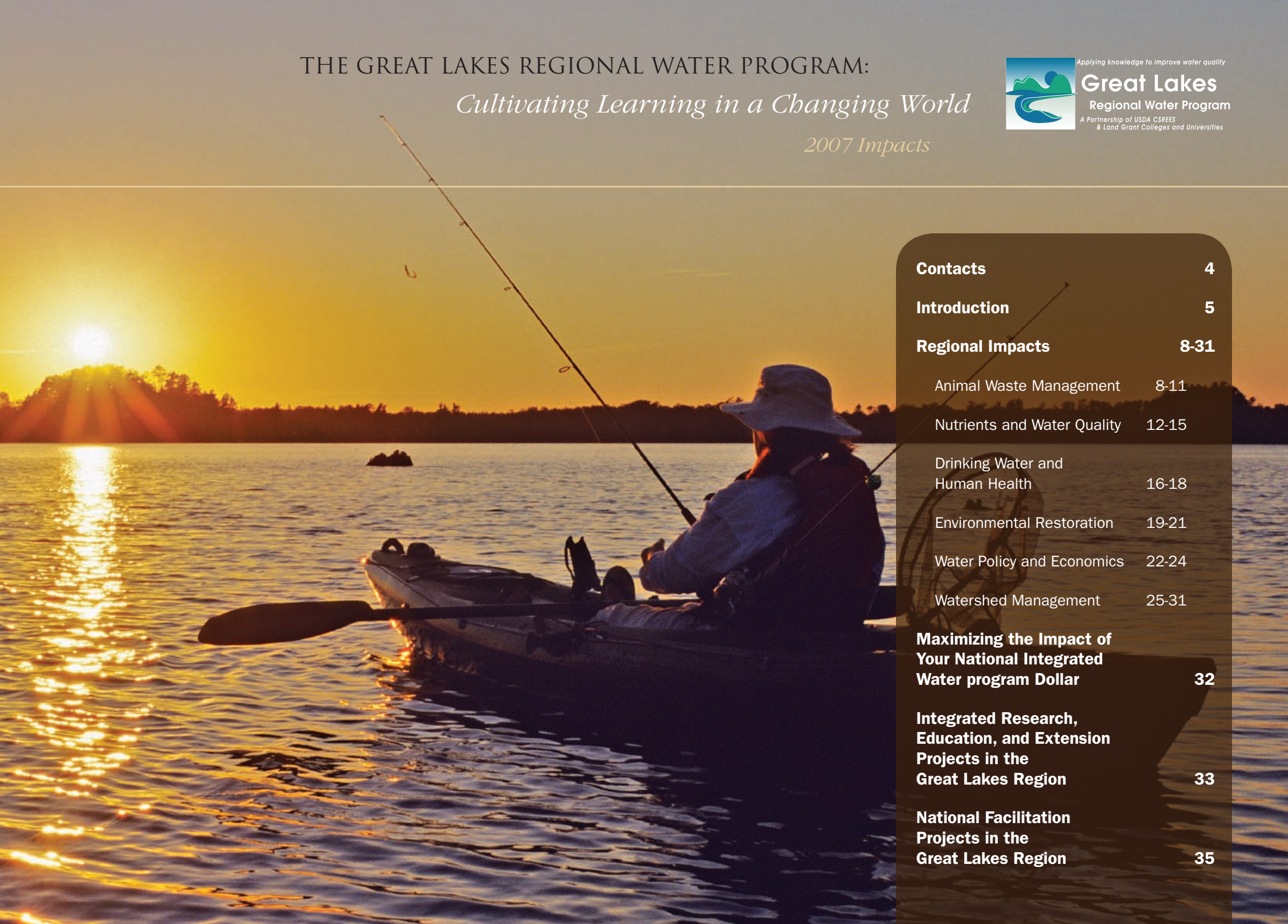

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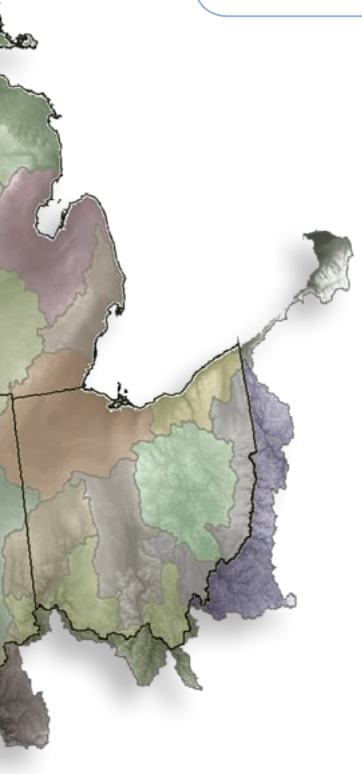


## *The Great Lakes Regional Water Quality Program – Cultivating Learning in a Changing World*

If you were to stand in St. Vincent, Minnesota, the northwest corner of the Great Lakes Region, and look out more than a thousand miles in the direction of Marietta, Ohio in the southeast, your eyes would take in a rich, life-sustaining landscape. You might first notice sweeping coniferous and hardwood forests, productive wetlands, sparkling lakes, and the remnants of once vast prairies and oak savannas. Next, you might be inspired by fertile agricultural lands, vibrant small communities, and thriving cityscapes. These human contributions have been built from nature's raw materials and the hopes, dreams, and hard work of diverse Midwestern peoples that have made their homes here since the retreat of the glaciers. Finally, you would be struck by the great rivers and lakes tying the region together like shining ribbons and celebratory bows.

Please take a few moments to celebrate and learn from these landscapes, and the efforts of the people working to maintain clean and reliable water supplies for farmers, small communities, hunters and anglers, and other recreational users, and our region's industries. Walk through these pages like you would walk along a Lake Superior shoreline or a revitalized community riverfront. The stories we place along your path are a few of colorful fruits that have ripened in 2007. We have learned a lot from them, and we hope some will spark your interest enough that you will take them home and plant their seeds in your own communities. But first, to set the stage, a bit about the Great Lakes Regional Water Program…

In today's fast paced and changing environment, knowledge and the ability to use it effectively are the two most valuable assets an individual, organization, or community can have. The Land-Grant universities and our primary federal partner, the United States Department of Agriculture Cooperative State Research Education and Extension Service (CSREES), are uniquely equipped to support the creation and use of knowledge to ensure clean and reliable water resources for current and future needs.

The Great Lakes Regional Water Program (GLRWP), is a partnership among the Land-Grant universities in Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, along with CSREES. Through a grant from the CSREES National Integrated Water Quality Program (**www.usawaterquality.org**) that increases our ability to work across state lines, we deliver and share research, education, and outreach programs that either lead directly to cleaner water, or increase the capacity of people to manage water resources. We make every effort to take advantage of the diverse knowledge bases available in each state, as well as the economies of scale available when the Land-Grant universities and colleges and our partners in the region address water resource issues collaboratively. For more information about the Program, please visit our website at: **www.uwex.edu/ces/regionalwaterquality**

The GLRWP, along with our partners, has been learning and growing since 2000. The last seven years have been fruitful, strengthening partnerships among Land-Grant universities and colleges, federal and state agencies, local communities, and the private sector. Results from a 2007 survey of GLRWP

*"Coming together is a beginning.*

*Keeping together is progress.*

*Working together is success."*

– HENRY FORD

stakeholders from across the region indicated that the Program has increased collective knowledge and expanded the network of professional colleagues working on water quality. This has led to:

- Increased communication across states and organizations;
- Increased collaboration on projects, research, and training;
- A better understanding of existing efforts and more respect for the work of people in other organizations.

A quote from one of the survey respondents sums up what the Program hopes to cultivate through regional collaboration:

> *"Research is improving because of greater awareness of what others are doing. Attitudes are becoming more optimistic due to knowing of others who are also interested and knowledgeable and who have overcome some of the obstacles to adoption. Outreach has improved because presenters can now discus work in other states of the region, with more knowledge and confidence, and this also stimulates further ideas and innovations by the producers."*

In addition, one GLRWP stakeholder highlighted wild rice research, outreach, and management efforts as one way that the Program has improved water resources and aquatic ecology.

> *"The RWP has had a very positive impact on regional water quality and ecological health. For example, the RWP has significantly enhanced efforts to restore and preserve wild rice on a regional scale…"*

The following stories provide some examples of what the Program has accomplished in 2007, with the help of many national, multi-state, state, and local partners. We extend our sincere thanks to these partners, colleagues and advisors that have strengthened the Program. Without them, these achievements would not have been possible.

# Animal Waste Management

## *Leveraging Staff and Curriculum, States Prepare Conservation Staff for the Future*

The Conservation Professional Development and Training program is a six-state project that provides both a base level of training for conservation staff (soil and water conservation districts/partner agencies, Extension, private sector and NGOs) and advanced technical targeted training in specialized areas (such as pest management, comprehensive nutrient management planning, forestry, etc.).

Each program is developed in consultation with Land Grant specialists, conservation agency staff and Certified Crop Advisors in each state. Courses include Integrated Pest Management, CNMP, Grazing, and Conservation Planning. Conservation Professional Training programs are implemented in a variety of ways by various states in the region. Regionally developed CNMP training was offered jointly in a tri-state area for Ohio, Indiana and Michigan. Minnesota and Wisconsin offered the same curriculum. In 2007, a variety of conservation courses were implemented in Minnesota, including introductory and advanced RUSLE2, CNMP and Upland Treatment. Minnesota used CNMP and RUSLE 2 curriculum with minor modifications (saving at least 4 weeks of FTE time for NRCS staff).

Wisconsin will be using Minnesota's newly developed Rusle 2 advanced training, saving Wisconsin NRCS and Extension staff at least one week of FTE time. 2007 also saw the completion of three new courses that were piloted in Wisconsin (Introductory Forestry, Managing Karst/Ag BMPs, and Invasive Plant Management).

The project has fostered greater understanding of how Extension can assist its partner conservation agencies by providing training and professional development. Private sector Conservation and CNMP Planners report using the skills learned in the site assessment training to make suggestions for implementing environmentally beneficial practices on each farm for which they have written a CNMP or Conservation Plan. More than 130 595/Pest Management plans have been written in Wisconsin by planners trained under the program. More than 150 CNMPs have been written in Wisconsin and Minnesota by planners trained under the program.

**Contacts: Ingrid West – iwest@wisc.edu and Kevin Erb – kevin.erb@ces.uwex.edu**

## *Best Management Practices for Pathogen Control in Manure Management Systems – Online Bulletin*

Livestock waste contains many microorganisms such as bacteria, viruses, and protozoa. Some of these microorganisms do not cause sickness in animals or humans. However, some others are pathogens, meaning they are capable of causing disease in animals and/or humans. No matter what the size of their farms, all livestock producers have an important role in limiting pathogen movement from their operation to the environment. The purpose of this University of Minnesota bulletin is to provide livestock producers with tools to help control pathogens in their production systems.

**Contacts: Mindy Spiehs – spie0073@umn.edu, and Sagar Goyal – goyal001@umn.edu**

**Publication: www.extension.umn.edu/distribution/livestocksystems/M1211.html**

### ANIMAL WASTE MANAGEMENT – SELECTED IMPACTS

- More than 150 CNMPs have been written in Wisconsin and Minnesota alone by planners trained under the program.
- A regional pathogen control publication helps producers reduce pathogen pollution from their operations.
- Ohio research and outreach provides information for farmers and service providers on alternative time windows for manure nutrient applications that are economically viable and better utilize nutrients available in manure.
- Preliminary 2007 data indicate that farmer training programs in Wisconsin will generate approximately 142 nutrient management plans on 42,600 acres.

# Animal Waste Management – continued

## *Manure Rate On-Farm Demonstration Project, 2004-2008*

The objective of this On-Farm Manure Management Demonstrations project is to reduce delivery of pathogens, phosphorus, nitrogen, and organic materials from livestock manure to impaired surface waters of Minnesota. This objective is accomplished through enhanced farmer adoption of Best Management Practices (BMPs) and new technology for field application of manure.

On-farm manure management workshops were held with more than 150 farmers attending. Presentations on manure research and management were made to 75 corn producers. Results of on-farm manure rate trials were presented to 115 farmers, agronomists, commercial agriculture waste technicians and agency staff in four meetings. Small group nutrient workshops to determine the economic value of manure were delivered in six locations to 83 producers, consultants, commercial applicators, and agency staff. Results from a compost dairy barn manure study were presented to 200 farmers and agriculture professionals.

**Contact: Les Everett – evere003@umn.edu**

## *Ohio Demonstrates that Manure Equals Money for Midwest Farmers*

The objective of the manure nutrient recycling educational program is to demonstrate alternative time windows for manure nutrient applications. The time windows would be economically viable and better utilize nutrients available in animal manure.

Demonstrations have included top-dress wheat with liquid swine manure and side-dress corn with liquid swine manure. Liquid swine manure was successful in replacing 80% of the purchased inorganic sources of nitrogen fertilizer for the 2006 growing season on Ohio's Putnam County plots. Corn yields at all sites, regardless of nitrogen source, were not significantly different.

This represents a potential reduction in purchased nitrogen fertilizer of about $55/acre of corn. Liquid swine manure was successful in replacing petroleum based fertilizer in the production of wheat in Putnam and Crawford Counties. When fully utilized, this nutrient resource could replace about $40/acre of purchased nitrogen fertilizer. Partners include producers, county Extension staff, and Putnam and Crawford Soil & Water Conservation District personnel.

**Contact: Jon Rausch – rausch.7@osu.edu**

## *MAL-What?*

In Wisconsin, the Multi-Agency Land and Water Education Grant (MALWEG) Program was started to help integrate educational programming and local conservation efforts. Program support comes from the Natural Resources Conservation Service, the Wisconsin Department of Natural Resources, the Wisconsin Department of Agriculture, Trade and Consumer Protection, the Farm Service Agency (FSA), and the University of Wisconsin-Extension. The Program provides competitive money for local projects to help farmers and other private landowners develop nutrient management plans and improve on-farm environmental performance.

The program provided funding for 11 projects ($142,008 in grant money) in the fall of 2006 for training to be completed from late 2006 through 2007. These projects are delivering nutrient management training to approximately 150 Wisconsin farmers. Final project reports will be compiled in early 2008. Prior history of agricultural producers participating in these trainings indicate that average farm size is 300 cropland acres, and that through the training process 95% of participating farmers follow through to develop their own nutrient management plan. Using preliminary 2007 student numbers, this project session has the potential to generate 142 nutrient management plans on 42,600 acres.

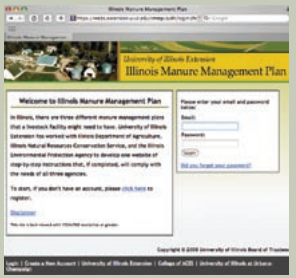
A key point in this training and delivery mechanism is that producers voluntarily participate in small group and one-on-one activities, using their own farm information and management goals to actively develop their own nutrient management plan. The end product is a nutrient management plan that each participant owns, understands, and is willing to implement as a result of their direct participation in the process.

**Contact: Andy Yencha – andrew.yencha@ces.uwex.edu**

## *Manure Management Moves Online In Illinois*

Developing a comprehensive manure management plan just got easier for livestock producers in Illinois. The Illinois Manure Management Plan is now available online at **www.immp.uiuc.edu**

The online manure management resource was developed by the University of Illinois Extension with financial support from various Illinois livestock groups including the Illinois Pork Producers Association & the Pork Checkoff, Illinois Beef Association, Illinois Milk Producers Association, IL Livestock Development Group, Illinois Farm Bureau, and the Illinois Environmental Protection Agency. Extension specialists at the University of Illinois who developed the original workbook are certain the web version of the IMMP will allow producers of large and small facilities to spend more time managing their animals, and less time worrying about manure.




**Contacts: Ted Funk – funkt@uiuc.edu, and Randy Fonner - refonner@uiuc.edu**

# Nutrients and Water Quality

## *Evaluation of a Cover Crop Root System for Retaining Bacterial Contaminants in the Root Zone*

The need to better understand the fate and transport of pathogens in land-applied manure was identified as the top research priority at the 2004 conference, "Liquid Animal Manure Application on Drained Cropland: Preferential Flow Issues and Concerns" in Columbus, Ohio. Additionally, the need for pathogen-based BMPs in animal waste management was identified in 2005 by the Great Lakes Water Program as one of the top priorities research priorities.

The specific objectives of this project were to: 1) increase the use of cover crops on farm ground for water quality protection, and 2) evaluate the bacteriological water quality of tile line effluent (following manure application over tile lines with vegetative and non-vegetative surface covers.

The project has demonstrated that with low-disturbance pre-tillage and controlled (low) liquid manure application rates (e.g. 6,000 gallons per acre), there is little risk of rapid movement of manure contaminants to subsurface drains on the Blount loam soils in no-till cropping systems characteristic of SE Michigan and NW Ohio. These recommendations have become the basis for discussions with livestock producers regarding the adoption of new manure management practices that protect surface and groundwater from manure contamination.

The project increased the awareness and understanding of potential water quality impacts from manure application, improved the understanding of factors contributing to bacterial contamination. The work provides a foundation for a balanced management approach that expands the use of conservation tillage and cover crops, and provides new knowledge for developing pathogen-based BMP's for manure land application which protect water quality. A research report is in progress.

**Contact: Tim Harrigan – harriga1@msu.edu**

**Partners: This project involved the collaboration of Michigan State University, Ohio State University, the USGS, the owners of Bakerlad's Dairy Farm in Lenawee Co., MI, the owners of Make-n-Bacon Farms in Wyandot Co., OH and Aer-Way Manufacturing.**

## *Drainage Management to Reduce Nitrate Loads from Midwestern Agriculture*

In 2007, we continued to work with the Agricultural Drainage Management Systems Task Force to promote increased collaboration among research, extension, industry, farmers and professionals.

Research focused on watershed-scale analysis of the potential of this practice to reduce nitrate loading. Education and outreach focused on enabling producers and contractors to understand drainage management alternatives and benefits, and utilized the regional extension bulletin described below. We also conducted an analysis to estimate the potential for drainage water management in Indiana based on soil drainage class, agricultural land use, and slope. These estimates will be used to help in promotion and analysis of the practice's potential.

Partners in this project have distributed 8,000 copies of the regional Extension bulletin (Questions and Answers on Drainage Water Management) funded by this project throughout the region and nationally. We are doing a second printing of 12,000 copies to meet requests. The bulletin has been used in workshops, at field days, regional drainage schools, and by state and federal agency staff in each state.

The practice is still not widely used, but the groundwork is being laid for a mindset that drainage can no longer be unmanaged. The extensive demand for the publication demonstrates the broadening interest in drainage water management.

**Contact: Jane Frankenberger – frankenb@purdue.edu**

**Partners: This project is unique because of the strong partnerships with the private sector. The non-profit Agricultural Drainage Management Coalition, drain tubing manufacturers, and drainage contractors in several states have distributed our publication to their clients. We collaborated closely with USDA Agricultural Research Service in developing it, and EPA and USDA- NRCS staff participated as reviewers and collaborators.**

**Publications: *Questions and Answers on Drainage Water Management* www.uwex.edu/ces/regionalwaterquality/Flagships/DrainageDocs/purduedrainagepub.pdf**

*"We can use our scientific knowledge to improve and beautify the earth, or we can use it to … poison the air, corrupt the waters, blacken the face of the country, and harass our souls with loud and discordant noises, [or]…we can use it to mitigate or abolish all these things."*

– JOHN BURROUGHS

# Nutrients and Water Quality – continued

## *Onsite Waste Water Treatment Using Natural Ion Exchange Media*

This initiative created an umbrella project to research and provide outreach/education on phosphorus removal and recycling of on-site generated wastewater and animal manure from agricultural facilities. The project tied together several ongoing novel research and education/outreach efforts. Specific objectives included:

- examining regeneration, recovery and beneficial re-use of media that removes phosphorus from water;
- conducting an economical analysis of current and novel phosphorus removal systems;
- developing outreach and education materials on phosphorus removal from these sources; and
- developing a strategy to expand the umbrella project by increasing the number of partners, identifying demonstration sites throughout the great lakes region, and identifying potential funding opportunities.

The project directly increased the professional capacity to understand and engineer water treatment systems relating to phosphorous for the seven undergraduate students who worked on the project. These students were previously unaware of the challenges facing professionals in researching and designing technologies for high priority pollutants and did not have either the knowledge of conventional treatment approaches or the knowledge and skills to research the potential of novel technologies. Additionally, a presentation to approximately 50 professionals was given at the Water Environment Federation's Annual Technical Exhibition and Conference on the novel phosphorus treatment techniques.

**Contact: Steven Safferman – safferma@msu.edu**

**Partners: Michigan USDA NRCS, Michigan Department of Environmental Quality, the Michigan State University Extension, the University of Minnesota Extension, MetaMateria (in Ohio), Phase 3 Renewables, and the Michigan Onsite Wastewater and Recyclable Association.**

### NUTRIENTS AND WATER QUALITY – SELECTED IMPACTS

- Producers and Extension staff awareness and understanding have been increased regarding potential water quality impacts from manure applications, along with improved knowledge of factors contributing to bacterial contamination.
- A "questions and answers" publication on drainage water management enables producers and contractors to understand drainage water management alternatives and benefits.

## *Minnesota's Onsite Sewage Program Provides Comprehensive Community Assistance*

The Onsite Sewage Treatment Program at the University of Minnesota is dedicated to protecting public health and the Minnesota environment through proper onsite wastewater treatment. Staff includes engineers, soil scientists, Extension educators and University faculty. Specific objectives of the program are to:

- teach proper system operation and maintenance;
- teach proper design, installation and inspection;
- provide research-based information about new and existing technology;
- assist residents and local governmental units with regulations and planning; and
- help small communities develop and implement wastewater treatment systems with an emphasis on management.

This program trains approximately 2,000 professionals each year in design, inspection, installation and maintenance of on-site sewage systems.

The program also works on the development of technical assistance programs for small communities that are faced with up grading wastewater treatment facilities. The results of this program include informed homeowners using the best management practices, communities finding cost-effective solutions, public funding agencies resolving more problems with limited resources and improved protection of invaluable human and natural resources. The Minnesota Pollution Control Agency reports non-compliance with septic regulations (either polluting surface or drinking water) has decreased by 30 percent in the last 10 years.

**Contact: Sara Christopherson – heger001@umn.edu**

- The University of Minnesota Onsite Sewage Treatment program trains approximately 2,000 professionals each year in design, inspection, installation, and maintenance of on-site sewage systems. This program has helped to decrease septic system non-compliance in Minnesota by 30% in the last 10 years.

# Drinking Water and Human Health

## *Social Dimensions of Private Well Testing*

Why do people test – or not test – their water? Researchers have some guesses, but they may not be accurate or complete.

This project is working in Minnesota, Wisconsin, and Michigan to characterize the social dimensions of private well testing and identify barriers or challenges that prevent or discourage well owners from getting a water test. Accomplishments to date include establishing state advisory groups to contribute stakeholder perspectives and ensure that results are used, and designing and conducting a tri-state survey that generated 1,687 completed surveys (62% return rate).

The approach has already been shared at two professional conferences (one national) to increase the awareness of the project. The tri-state survey will allow examination of results within and among states and lead to recommendations for how to increase private well testing rates for at-risk wells or populations.

**Contacts: Barbara Liukkonen – liukk001@umn.edu, Lori Severtson – djsevert@wisc.edu, and Ruth Kline-Robach – kliner@msu.edu**

## *Building Volunteer Capacity to Monitor E. coli in Surface Water*

This initiative builds the capacity of volunteer monitoring programs to understand and use the most appropriate E. coli testing protocols and watershed-based sampling strategies.

As part of this effort, a variety of test methods used by volunteers have been compared to certified laboratory analyses and recommendations have been made as to which kits perform well when used by citizens.

As a result of this project, citizen volunteers have a better understanding of sources and modes of transport of E. coli bacteria in the environment. They have increased knowledge and awareness about what the presence of E. coli bacteria in the environment means to their own health and to community health.

Finally, they have gained skills that enable them to address local water

quality concerns related to E. coli bacteria, by being able to conduct the monitoring to assess the water in a safe and scientifically valid manner.

In short, this project combines the best of the research and Extension missions of land-grant universities to support well-informed community involvement in water quality issues.

**Contacts: Jerry Iles – Iles.9@osu.edu and Lois Wolfson – wolfson1@msu.edu**

**Website: www.uwex.edu/ces/regionalwaterquality/Flagships/Volunteer.htm**

**Publications:**

**E. coli fact sheet – www.uwex.edu/ces/regionalwaterquality/publications/factsheets/ecoli07.pdf**

***Citizens Monitoring Bacteria – A Training Manual for Monitoring E.coli* www.usawaterquality.org/volunteer/Ecoli/Manual.htm**

**The Volunteer Monitor Newsletter – Volume 18(1) – www.epa.gov/owow/monitoring/volunteer/newsletter/volmon18no1.pdf**

## DRINKING WATER AND HUMAN HEALTH – SELECTED IMPACTS

- Volunteers have gained a better understanding of how E. coli bacteria enters and moves through the environment; increased knowledge and awareness about the effect of E. coli bacteria on individual and community health; and the skills to monitor water quality in a safe and scientifically valid manner.
- The project is providing knowledge that states and local communities need to increase private well testing rates for at-risk wells or populations.
- Self- assessments and decision-support tools are helping communities take a proactive approach to protecting valuable groundwater resources.

# Drinking Water and Human Health – continued

## *Michigan Helps Local Communities Think Ahead to Protect Drinking Water*

Owners of the thousands of non-community water supply systems are being encouraged to take a proactive approach to source water protection. Self-assessment tools modeled after Michigan State University Extension's highly successful Farmstead and Homestead Assessment System program materials were developed for this purpose.

In addition, Michigan State University faculty and staff members have worked with the Michigan Department of Environmental Quality Source Water Protection Unit to develop a decision support system that can (at a relatively minimal cost) aid in the protection of public drinking water supplies. This system links the state of Michigan's extensive groundwater database and other related data to an interactive groundwater modeling tool, which provides science-based maps of the source-water contributing areas.

When coupled with outreach and education activities, these map products are invaluable aides that help the community take actions to protect their groundwater resources.

**Contact: Ruth Kline-Robach – kliner@msu.edu**

## *Assessing the Impact of Arsenic on Upper Midwest Dairies*

Led by the University of Minnesota Water Resources Center, this project is being conducted by the University of Minnesota Extension Service, College of Veterinary Medicine, and Department of Animal Science, as well as the Wisconsin Department of Natural Resources and University of Wisconsin-Extension.

Previous research has shown that there are elevated arsenic levels in groundwater and well water in western Minnesota, Wisconsin, and other Great Lakes states. With funding from the Extension Great Lakes Regional Water Program we conducted an initial study (2004-2005) on dairy cattle from four farms (in MN and WI) with high arsenic concentrations in well water (>50 ppb). We identified that urine serves as a reliable biomarker of arsenic exposure in dairy cattle and that arsenic was not detected in bulk milk from the four farms. Additional funding from the University of Minnesota's Agricultural Rapid Response program allowed us to further explore the effects of arsenic on dairy products and beef from dairy cattle exposed to arsenic in drinking water. Feed, mineral supplements, bulk milk, urine, and meat from cull cows was sampled from 18 farms, and cheese was made from milk at farms with high and low arsenic concentrations.

Arsenic was not detected in milk or whey (at 5 ppb detection limit) or in cheese (at 50 ppb detection limit). Arsenic was not detected (at 50 ppb detection limit) in meat samples or organ tissues, except kidney. Work continues to verify kidney arsenic levels and to explore additional funding to characterize animal health risks.

**Contact: Barbara Liukkonen – liukk001@umn.edu**

# Environmental Restoration

## *Multi-State Support for Wild Rice and Wild Rice Culture in the Upper Great Lakes Region*

The Great Lakes Regional Water Program, in partnership with Ferris State University in Michigan and the Lac Vieux Desert Band of Lake Superior Chippewa, led a diverse coalition that convened the Wild Rice Restoration and Preservation Conference in August, 2006.

The conference had significant educational outcomes (see the 2006 National Impact Report), and built social networks that led to additional outcomes in 2007. The same coalition organized a strategic planning session at the Menominee Tribal College in March.

Following priorities set at the planning session, the group has updated a highly valued regional brochure on wild rice, and worked with White Earth tribal elders to assist tribal community members from other states in attending wild rice camps that teach traditional Anishinaabeg ricing.

In addition, the project continues to grow partnerships between the 1862 and 1994 land-grants, and has contributed to increased dialogue between the University of Minnesota and tribal communities concerned about wild rice genomic research.

**Contacts: Patrick Robinson – patrick.robinson@ces.uwex.edu and Deborah Zak – dzak@umn.edu**

**Publications: Wild Rice Brochure – www.uwex.edu/ces/regionalwaterquality/Publications/WildRiceBrochure.pdf**

**Partners: This initiative has engaged wild rice managers from state, regional, and federal resource management agencies, tribal communities and tribally affiliated Land-Grant colleges.**

# Environmental Restoration – continued

## *Expanding the National Estuarine Research Reserve Program in the Great Lakes Region*

The Great Lakes Regional Water Program, through University of Wisconsin-Extension staff affiliated with the Environmental Restoration Theme, has partnered with the Wisconsin Coastal Management Program and Wisconsin Department of Natural Resources to co-lead an effort to designate a National Estuarine Research Reserve (NERR) site on Wisconsin's Lake Superior shoreline.

In 2007, a site selection process and feasibility study for a Lake Superior NERR site was conducted. Site selection and outreach processes have multi-state and diverse representation, including a variety of public and private entities with federal, state, and local interests.

To begin fostering further regional collaboration related to Great Lakes freshwater estuary outreach and research efforts, representatives from Michigan, Minnesota, and Wisconsin universities were invited to a meeting to explore opportunities for future collaboration. Meeting participants expressed an interest in furthering regional collaborative efforts.

An assessment of freshwater estuary applied research, management, and outreach needs was also completed in 2007 and will provide important information to help direct future efforts.

This initiative has increased awareness and understanding of freshwater estuary issues nationally, in participating states, for Land-Grant researchers and Extension educators, and in local communities involved in the process. The target date for nominating a NERR site is spring of 2008.

**Contact: Patrick Robinson – patrick.robinson@ces.uwex.edu**

**Partners: ABDI Land and Water Conservation Department, Bayfield Regional Conservancy, City of Ashland, City of Bayfield, City of Superior, Douglas County, Wisconsin, Friends of South Shore Estuaries, Friends of the Superior Municipal Forest, Great Lakes Indian, Fish, and Wildlife Commission, Lake Superior Binational Forum, National Park Service, Natural Resources Foundation, Northland College, St. Louis River Citizens Action Committee, The Nature Conservancy (Minnesota and Wisconsin), University of Minnesota Duluth, University of Wisconsin-Extension, University of Wisconsin-Madison, University of Wisconsin Sea Grant, University of Wisconsin Superior, U.S Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Forest Service, West Wisconsin Land Trust, Wisconsin Coastal Management Program, Wisconsin Department of Natural Resources**

## *Minnesota's Shoreland Management Education Program*

The Shoreland Education Program, sponsored by the University of Minnesota Extension Service in cooperation with the University of Minnesota Water Resources Center and Minnesota Sea Grant, works to improve water quality, habitat, and aesthetics of lakes and rivers. The program provides educational resources for shoreland property owners, the landscape and nursery industry, natural resource professionals, realtors, developers and local government agencies.

Key components of the program include workshops, hands-on field experience, educational materials, and research and demonstration sites. Workshops cover a range of water-related topics such as, basic limnology, Best Management Practices for shoreland property, aquatic and wetland plant identification, erosion control, invasive species control, shoreland revegetation, and shoreland maintenance and management. Many of these workshops provide hands-on and field experience that build participant confidence, resulting in long-term impacts in urban and rural areas of Minnesota. Educational products supporting the shoreland education programs include an award-winning web site (www.shorelandmanagement.org) and promotional materials, a regular newsletter, fact sheets, how-to workbooks, the Lake Home and Cabin Kit, and nine videos/DVDs addressing shoreland issues.

Since 1997, more than 150 shoreland restoration demonstration sites have been implemented on public and private lake and river shorelines. Research has included appropriate installation methods and alternative erosion control techniques. These demonstration and research sites are used to forward the science of shoreland restoration and provide the basis of many of the shoreland educational materials. Coordination of Minnesota, Wisconsin, and Michigan shoreland education programs will begin in 2008.

**Contact: Barbara Liukkonen – liukk001@umn.edu**

### ENVIRONMENTAL RESTORATION – SELECTED IMPACTS

- Understanding of wild rice ecology and diverse ricing traditions has increased, and partnerships between 1862 and 1994 land grant institutions are continuing to grow.
- Understanding of freshwater estuary research, outreach, and management needs has increased nationally, in participating states and communities, and among affiliated Extension educators and Land-Grant researchers.
- Extension shoreland programs are building long-term support and capacity for shoreland restoration and management.

# Water Policy and Economics

## *Midwest Cover Crop Council Seeks Systemic Change*

The energy from a multi-state Cover Crop Summit in August 2006 resulted the pooling of resources from the Great Lakes Regional Water Program and the W. K. Kellogg Foundation to support a strategic planning meeting in April, 2007. The strategic planning meeting resulted in an official name for the multi-state initiative – the Midwest Cover Crop Council (MCCC).

The mission of MCCC is to improve the ecological and environmental functioning of the predominant annual cropping systems in the upper Mississippi and Great Lakes basins by incorporating cover crops on 30 percent of these acres in 15 years.

Participants included a diverse group from academia, production agriculture, non-governmental organizations, commodity interests, private sector, and representatives from federal and state agencies, all collaborating to address soil, water, air, and agricultural quality concerns in the Great Lakes and Mississippi River basins.

The Council has identified five major priority areas under which a series of activities and initiatives over five years will be undertaken to fulfill the overall goal of increasing cover crops adoption in the Great Lakes/Upper Midwest region. These priorities include policy, communications, research, education/outreach, and fundraising.

Members of the Council's network have developed five-year action plans in each of these areas that will increase funding for research and development, enhance public awareness and support for cover crops, develop policy incentives and programs to increase farmer adoption of cover crops in the region, and provide education and training necessary to farmers and agencies to make the appropriate shifts to facilitate this adoption.

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**Partners: The MCCC is a Great Lakes regional initiative connecting seven states and Canada. MCCC is also recognized by Green Lands Blue Waters as a subgroup which expands the network down the Mississippi River. The W.K. Kellogg Foundation has also contributed funding for the initiative.**

## *Minnesota Terrestrial Carbon Sequestration Program*

Terrestrial carbon sequestration is the capture and storage of atmospheric $CO_2$, a potent greenhouse gas, in plants and soils. Numerous land management practices that are well-known for conserving soils, water quality, and wildlife habitat (e.g., conservation tillage, use of perennial and cover crops, reforestation and afforestation, and wetland and grassland management) also sequester carbon.

Determining optimal strategies for increasing carbon sequestration in Minnesota's landscape would promote increased sustainability of diverse ecosystems and – by adding a potentially valuable commercial product (sequestered carbon credits) – could promote new economic opportunities in the state.

This project generated three white papers that were used as the basis for a legislative initiative, funded at $385,000 in the initial year. A report is due to the legislature in Feb 2008 to look at available programs and opportunities to sequester C in Minnesota landscapes.

The original steering committee was expanded and now includes both Farmers Union and Farm Bureau. Finally, investigators expect to launch pilot programs in mid to late 2008 to encourage C sequestration in Minnesota.

**Contact: Jim Anderson – ander045@umn.edu**

### WATER POLICY AND ECONOMICS – SELECTED IMPACTS

- The Midwest Cover Crop Council has increased understanding of cover crop research and outreach needs and has built significant regional capacity and momentum to address water quality pollution through cropping systems.
- The University of Minnesota provided a research-based foundation for a Minnesota legislative initiative to sequester carbon in Minnesota landscapes. The University of Minnesota continues to be a partner in this effort.
- A water withdrawal assessment and tool are helping determine whether groundwater withdrawals could cause adverse impacts to local waters or water-dependent natural resources.

# Water Policy and Economics – continued

## *TMDL Training for Water Resource Professionals – A Multi-State Pilot*

This project piloted the first in a series of workshops to bring together professionals with various backgrounds from federal, state and local agencies, academia, non-governmental organizations (NGOs), and the consulting sector. Goals for the workshop series include 1) increasing understanding of the biological, chemical, and physical interactions at a watershed scale, 2) identifying and recognizing the gaps in knowledge among the many specialists, and, most importantly, 3) developing synergistic interactions among professionals with common TMDL and water quality goals.

The first workshop was conducted on October 22, 2007 at the Annual Minnesota Waters Conference. Fifty people attended, from universities, state agencies and private consultants. Participants indicated that their knowledge of the TMDL process and the importance of an interdisciplinary approach increased from fair to good. The evaluations also clearly reflected the ongoing need for regular, basic TMDL process training.

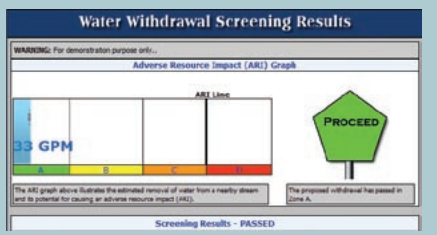
The workshop also led to the establishment of a research symposium to be conducted in February, 2008 to bring together decision makers at the state and federal level, active implementers, researchers, and non-governmental organizations who focus on science to identify the current state of knowledge and research needs to manage surface waters. This should help establish a research agenda for the next 5 to 10 years, and provide a foundation for multi-state work.

**Contact: Faye Sleeper – fsleeper@umn.edu**

## *Water Withdrawal Assessment Tool Web Interface*

In 2006, legislation was enacted to manage large water withdrawals in Michigan. A Groundwater Conservation Advisory Council, was appointed the task of developing a water withdrawal assessment screening process and tool that could be utilized by a person proposing a new or increased large quantity withdrawal.

The tool was designed to help determine whether the proposed withdrawal could cause an adverse impact to the waters of the state or to water dependent natural resources. The Institute of Water Research at Michigan State University is developing a web based program incorporating the models used in the tool's development. The tool is now being beta-tested and should be made available in the upcoming months. It is expected to facilitate informed decisions regarding the reasonable use of large-quantity withdrawals from any specific location within the state. The Institute will also develop training sessions on the use of the system and the proposed registration process.




**Contact: Jon Bartholic – bartholi@msu.edu**

REGIONAL IMPACTS

# Watershed Management

## *Developing Social Indicators for Nonpoint Source (NPS) Management*

NPS pollution results from aggregate impacts of individual actions across the landscape. Effective management of NPS water pollution requires addressing both environmental conditions and the choices people make that impact the environment.

This project is intended to improve and protect water quality through the design and implementation a system for integrating social indicators into NPS planning, implementation, and evaluation. The project team has developed a suite of social indicators for NPS management that provide information about awareness, attitudes, constraints, capacity, and behaviors that are expected to lead to water quality improvement and protection. The team has also developed a handbook and a data management and analysis system that will help NPS managers integrate social indicators into NPS planning, implementation, and evaluation.

By bringing social indicators and water quality indicators together, water quality managers can 1) target outreach activities where they will have the greatest environmental impact, and 2) assess whether their outreach efforts are accomplishing changes expected to improve and protect water quality. The products of this project will be pilot-tested in all Great Lakes Region states over the next three years.

**Contacts: Ken Genskow – kgenskow@wisc.edu and Linda Prokopy – lprokopy@purdue.edu**

**Website: www.uwex.edu/ces/regionalwaterquality/Flagships/Indicators.htm**

**Partners: This initiative has developed strong partnerships with USEPA Region 5 and state water quality agencies in the region, and has actively engaged local nonpoint source managers in developing and testing the system. CSREES has contributed additional funds to this initiative through a NIWQP integrated grant.**

*"A river cuts through rock, not because of its power, but because of its persistence."*

– JIM WATKINS

# Watershed Management – continued

## *Looking for Innovative Stormwater Practices? Look Here!*

This initiative is currently focused on developing and implementing web-based tools to increase the capacity of local communities, regulatory agencies, and others to collect, store, view, query, manipulate, analyze, and mine spatially referenced data on stormwater Best Management Practices.

The initiative recently completed the first version of a web-based, geo-referenced searchable database to house examples of innovative stormwater projects or traditional stormwater management techniques that have been used in an innovative manner. This database will provide access to a subset of innovative projects in the region that agencies, municipalities, researchers, Extension educators, and others can use to measure performance, document design, installation and maintenance costs, and inform others about the strengths and challenges associated with innovative stormwater management efforts.

Information about specific projects will be submitted to the database through an online submission form that can be found in a link at www.uwex.edu/ces/regionalwaterquality/flagships/stormwater. The submitted information will be stored in a database and displayed on a project webpage when queried by a user of the system. The database will be integrated into the Michigan State University Institute for Water Research's Digital Watershed (www.iwr.msu.edu/dw).

**Contacts: Jon Witter – witter.7@osu.edu**

**Publications: www.uwex.edu/ces/regionalwaterquality/Publications/factsheets/swdatabase07.pdf**

**Website: www.uwex.edu/ces/regionalwaterquality/flagships/stormwater**

**Partners: This initiative is a partnership between the Extension systems in Great Lakes Region states, state agencies with oversight responsibility for stormwater management, local municipal partners, and USEPA.**

## *Watershed Planning and Management Tools – On the Web*

The purpose of this project is to: 1) Increase watershed group awareness and access to on-line watershed tools; 2) improve integration and coordination of on-line watershed tools among land grant institutions and USEPA; and 3) provide feedback to tool developers and managers.

Three web meetings were held during the summer of 2007 for Extension educators to learn about the on-line tools in each of the states and discuss the potential for improving access, integration, and use of on-line watershed tools. An on-line forum with participation from Michigan, Ohio, Indiana, and Illinois was held in October of 2007 to identify potential for collaboration among the Great Lakes states.

Outcomes for this project include increased awareness among Extension educators across the region about existing tools from the Great Lakes Land-Grant institutions and USEPA, identification of priority tools, and the design of an education plan to increase awareness and use of priority tools.

Information about the watershed tools will be hosted on the USEPA watershed webpage. USEPA Region 5 staff will also participate in future meetings and educational programs.

**Contact: Anne Baird – baird.41@osu.edu**

**Partners: USEPA Region 5**

WATERSHED MANAGEMENT – SELECTED IMPACTS

- This effort fills a critical evaluation need for NPS programs. It provides a suite of indicators that measure impacts related to human behavior that often precede water quality improvement.
- A web-based, geo-referenced, searchable database has been developed to collect and display examples of innovative stormwater projects.
- Watershed leadership programs have improved watershed leaders' knowledge of watershed planning, land use planning, and ways to involve stakeholders. It has also increased their leadership skills.
- The High Impact Targeting System can be used to focus limited resources on the most serious erosion and pollution problems.
- Wisconsin's Basin Education program delivers research-based information and promotes cooperation and communication among the agencies and organizations involved in water resource management in Wisconsin. Topics addressed include agricultural performance standards, municipal stormwater regulations, construction site erosion control, groundwater and wetland protection, and invasive species identification and control.

# Watershed Management – continued

## *Extraordinary People Can Make an Extraordinary Difference*

This project uses multi-state video conferences with local facilitated meetings, a website, and watershed leadership trainings to share the stories of decision makers who have improved their communities and watershed by linking land use and watershed planning.

Evaluation information was collected from video conference participants who responded through a self reported retrospective questionnaire three months following video conference. Evaluation data was also collected via small discussion groups immediately following the video conference.

Major findings from the questionnaire showed that 56% of respondents stated that the video conference increased their knowledge about linking land and water management; 28% of respondents reported that they had already applied or used in their work a part of the video conference; and 46% of respondents reported that they were "likely" to apply or use in their work part of the video conference.

Specific changes participants planned to make included increasing the diversity of stakeholder involvement in watershed planning, increasing collaboration with municipal planners, and increasing farmer involvement in watershed planning.

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**Website: http://ohiowatersheds.osu.edu/ep**

**Partners: Purdue University Extension, Indiana, Minnesota Department of Agriculture, University of Minnesota, the Olentangy Watershed Alliance (OH), Friends of Conneaut Creek (OH), Delaware County Muncie Metro Planning Commission (IN)**

## *Illinois River Conference*

In October 2007, the 11th Biennial Governor's Conference on the Management of the Illinois River System was held. More than 60 agencies and organizations, including University of Illinois Extension (UIE), sponsored the conference, which drew 400 participants. Prior to the event, Bob Frazee, Extension Educator – Natural Resources Management, UIE and member of the Regional Project Advisory Committee, was interviewed about the River Conference on the RFD Illinois radio network, which includes 83 stations. The Conference Evaluation indicates a 100% good/excellence overall rating for the conference.

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## *Minnesota Stormwater Leadership Provides a Model for Great Lakes Region States*

The University of Minnesota Stormwater Management Assessment Project recently completed a comprehensive stormwater research program with the goal of developing the manual *Assessment of Stormwater Best Management Practices*. The on-line document (http://wrc.umn.edu/outreach/stormwater/bmpassessment) includes a novel 4-level assessment protocol for different types of stormwater BMPs, as well as a chapter on source reduction.

The Minnesota Pollution Control Agency (MPCA) has renewed its contract with the University of Minnesota, through St. Anthony Falls Laboratory and the Water Resources Center, for the next biennium to expand and update this document to incorporate maintenance and additional case studies. The document will be newly titled *Assessment and Maintenance of Stormwater Best Management Practices.* The renewed project will continue trainings and outreach, incorporate maintenance procedures into an expanded manual, examine groundwater and thermal pollution associated with stormwater, and demonstrate the incorporation of stormwater BMPs into TMDLs.

**Contact: Jim Anderson – ander045@umn.edu and John Gulliver - gulli003@umn.edu**

## *High Impact Targeting (HIT) System*

Michigan State University and its partners are completing the first phase in the development of the High Impact Targeting (HIT) System. The system is being used as a tool to focus limited conservation resources on the most serious erosion and pollution problems.

The HIT system can be used to identify and target specific areas in agricultural fields that cause the greatest volumes of sediments deposited in waterways and adversely impact water quality and aquatic habitat. The intent is to maximize the beneficial impacts from the installation of new conservation practices on the highest-risk sediment yield areas. HIT relies on advanced geographical information systems (GIS) technology and innovative applications of computer modeling.

The HIT system provides data on sediment delivery and agricultural erosion presented in map formats, tables, and other graphic formats. HIT is an interactive system so users can choose the appropriate scale to visualize the GIS data on high-risk areas that are of the greatest interest to them. Users can either compare risk areas in their local watersheds or zoom down to field level and see specific farms with color-coded high risk areas.


HIT was specifically designed for use by soil conservation districts, farmers, watershed organizations, the Michigan Department of Agriculture, NRCS, and other conservation organizations. HIT is available on the web at http://35.9.116.206/hit/hit.asp. The site is under development and thus serves as a beta version. While this project is being piloted in Michigan, it has significant value across the Great Lakes Region.

**Contact: Jon Bartholic – bartholi@msu.edu**

# Watershed Management – continued

## *Ohio Watershed Academy Builds Local Leadership*

The Ohio Watershed Academy is a professional development course for watershed coordinators, water resource professionals, and volunteers interested or involved in watershed protection efforts. The Academy builds the capacity of watershed groups and watershed professionals to plan and implement watershed protection plans.

For the 2007 edition of the class, two new modules were created on Geographic Information Systems and Stream Dynamics. These modules were developed in collaboration with specialists from the Ohio Department of Natural Resources. Evaluations indicated that Academy students benefited most from being exposed to new ideas and real world examples from other watershed group leaders. Twenty-two of 24 students indicated that they had established new professional relationships as a result of their participation in the course. Nearly all students (minus one non-respondent) indicated that they would recommend the Academy to others. Pre- and post- self-assessment forms indicated that students felt they had a higher level of knowledge of watershed planning, higher level of knowledge of stakeholder involvement and an increased ability to lead a watershed protection effort after completing the Academy.

Typical quotes from Ohio Watershed Academy participants include “I used the economic evaluation to see what dollar value improvements to fishing will have as a result of a planned dam removal,” and “My group has a serious need for a sustainable development plan, and the skills and knowledge I obtained through this course have provided me with ideas on where to begin.”

**Contact: Joe Bonnell – bonnell.8@osu.edu**

**Partners: The Ohio Environmental Protection Agency and the Ohio Department of Natural Resources**

## *Indiana’s Watershed Leadership Academy*

The Indiana Watershed Leadership Academy was created to increase the capacity of watershed leaders to develop scientifically-sound watershed management plans that active involve, engage, and are supported by the community. These groups are playing an increasing role in protecting and restoring water quality.

Fifty-four emerging watershed leaders have participated in the Indiana Watershed Leadership Academy. As graduates, professional and volunteer watershed leaders are using what they learn to enhance stakeholder involvement, educate their communities more effectively, and make changes on the land to restore water quality. Many participants say they have used what they learned in the Academy to become more effective in their watershed activities.

For example, a 2007 participant wrote: “I had an opportunity to speak with 400 citizens at a public hearing with information gathered for one of the

modules. Nobody had been exposed to the information before." With a steering committee representing 20 Indiana agencies, organizations, and companies concerned about watershed management, the Academy has emerged as a key training program to enhance the skills of people working to improve water quality in Indiana.

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**Website: www.purdue.edu/watersheds**

**Partners: Several of the distance education modules are based on the Ohio Watershed Academy. An Internet video conference was held in the spring including presenters from Ohio, Indiana, and Minnesota, and participants from the Ohio and Indiana Watershed Academies. Our Steering Committee includes 20 of the most important conservation agencies in Indiana.**

## *Wisconsin's Basin Education Program*

The Wisconsin Basin Education Program involves a team of 15 University of Wisconsin-Extension Basin Educators located throughout Wisconsin in areas coinciding with the state's major river and Great Lakes basins. Staff at the University of Wisconsin-Extension Environmental Resources Center provide statewide support for program evaluation and the development of regional and statewide educational materials.

The Basin Education Program works with the Wisconsin Department of Natural Resources and the Natural Resources Conservation Service to provide statewide, watershed-based natural resources education. The program promotes the integration of management activities across disciplines and interests and emphasizes ecosystem-oriented management approaches where feasible.

Through a variety of interactive processes, citizens, agency staff and other key stakeholder groups work together to identify and address the important resource issues in their particular basins.

During 2007, the Basin Education Program conducted watershed-based outreach and education activities, programs, and workshops and developed education materials related to topics such as agricultural performance standards and prohibitions, municipal stormwater regulations, construction site erosion control, groundwater and wetland protection, rain garden implementation, and invasive species identification, removal and control.

Through these projects and activities, the Basin Education Program delivered research-based information and promoted cooperation and communication among the numerous agencies and organizations active in protecting Wisconsin's water and land resources.

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**Website: http://clean-water.uwex.edu/basin.html**

## *Maximizing the Impact of Your National Integrated Water Program Dollar*

Cultivating learning means cultivating connections among individuals and organizations doing complementary work. The CSREES National Integrated Water Quality Program funds three types of grants in addition to the Regional coordination grants like the GLRWP.

One of the goals of regional coordination is to make the most of federal, state, and local resources for water research, education, and outreach. One way the GLRWP accomplishes this goal is to share successful water research and outreach programs across the region and the nation.

In this year's impact report, we are highlighting the integrated research, education, and extension grants and national facilitation grants based in the Great Lakes Region. While these projects are funded directly through the CSREES National Integrated Water Quality Program, they often build on or collaborate with GLRPW efforts. In addition, they demonstrate other excellent contributions universities and their partners in the Great Lakes Region are making toward managing water resources.

# Integrated Research, Education, and Extension Projects

## *Enhancing Phosphorus Reduction Strategies in Michigan's Kalamazoo River Basin*

This project has integrated research on phosphorus loading and sources, Extension outreach to local stakeholders, and community leadership to reduce phosphorus in the Kalamazoo River Basin.

Total Maximum Daily Load (TMDL) organizations and volunteers are charged with developing strategies to meet established phosphorus (P) reduction goals with limited knowledge of and data on the unique watershed characteristics influencing phosphorus sourcing, transport, transformation, and fate.

Identification and modeling of the interactions between total phosphorus, total dissolved P, land use, watershed characteristics, and stream chemistry may provide tools for developing phosphorus reduction strategies and assessing their effectiveness. Evaluation of the large and complex database acquired during the project is leading to an understanding of the sources, fate and transport of P in the watershed.

These data, combined with project facilitation and watershed-wide education efforts is contributing to P reduction within the Kalamazoo River Basin. Seasonally adjusted P loading to Lake Allegan in 2005 indicated a TP reduction of 21 percent (11.8 percent in non-point loading and 35.5 percent point source reduction) compared to 1998 levels. Phosphorus reduction efforts will continue through institutionalized coordination through the Kalamazoo River Watershed Council.

**Contact: Dean Solomon – solomon@msu.edu**

# Integrated Research, Education and Extension Projects – continued

## *Using Social Indicators to Improve Adoption of Land Management Practices to Protect Water Quality in Four Midwestern Watersheds*

This project is working to increase understanding of the factors that foster and impede adoption of agricultural best management practices (BMPs) and to develop tools that will enable practitioners to develop more effective education, outreach, and incentive programs – ultimately resulting in improvements in water quality.

This project builds on work initiated by the Great Lakes Regional Water Program (see p. 25). Research and outreach activities are being conducted in four agricultural watersheds in the Midwest (Ohio, Indiana, and Illinois) using a social indicator framework to identify and address the specific factors that foster or impede adoption of practices.

While this project is only in the beginning of its second year, there is already increased understanding among the project team about the ecological and social linkages in the watersheds due to conversations with project partners and analysis of GIS data. In addition, a method has been developed for selecting watersheds for paired watershed studies that combine both ecological and social data.

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*"The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired in value."*

– THEODORE ROOSEVELT

# National Facilitation Projects

## *Changing Public Behavior: Increase Citizen Involvement Using Target Audience Information*

The Changing Public Behavior (CPB) project provides resources and training, like the workshop referred to above, to help natural resource professionals take social science research from theory to practice. When educators focus on specific audiences, their work is more likely to lead to desired results, but many factors can influence whether an individual will adopt a significant behavior. The project provides guidance for analyzing those factors. Project resources developed in Year 1 include:

- A draft, online self-study module that provides a 7-step process for learning new skills. Step 4 of the module, About social assessment tools: Purpose, use, selection, application, was developed with the help of a team of national social science experts and includes background information and practice opportunities.
- A searchable database of educational findings from 150 research studies published from 1988 - 2004. The database allows educators to search by citation, audience, study theme, or best education practice. Findings are derived from research papers describing studies that could claim to identify best education practices for specific audiences. We are in the process of reviewing additional studies (2004 – 2007).
- A draft in-person training curriculum on how to find and incorporate information about targeted audiences into outreach planning and evaluation. The curriculum has been pilot tested with Extension natural resource professionals and with agency administrators. Training materials include case studies related to regional priority water management themes, and worksheets that encourage application and practice.

These activities support a Community of Practice (CoP) that focuses on improving participant skills and resources for assessing target audiences.

**Contact: Elaine Andrews - eandrews@wisc.edu**

**Web site: http://wateroutreach.uwex.edu/CPBhomepage1.cfm**

# National Facilitation Projects – continued

## *EPI-NET*

The Environmental Pathogens Information Network (EPI-NET) is a stable, centralized source of environmental microbiological contamination information. Its purpose is to encourage information sharing, connect a network of stakeholders, regulatory officials, and technical experts, provide a reliable point of reference (methods and data interpretation) and increase our ability to develop a coherent national research agenda and good public policy.

EPI-NET's primary communication mechanism is through their website, where visitors will find valuable references and the recent news related to pathogen contamination and detection in water and food. In addition, EPI-NET held one symposium and two workshops in 2007. The symposium increased participants' understanding of the principles and applications of modern approach to Microbial Source Tracking (MST), and evaluated how current methodologies are applied in watersheds.

The workshops provided current, research-based information to professionals working on pathogens and E. coli as part of a beach monitoring program and increased their ability to appropriately use Microbial Source Tracking (MST) to reduce the public health risk posed by beaches with high pathogen levels.

**Contacts: Ronald Turco – rturco@purdue.edu, and Militza Carrero-Colón – carreroc@purdue.edu**

**Website: www.epi-net.org/eng**

## *Volunteer Monitoring National Facilitation Project*

Volunteer water quality monitoring programs can be the critical first link that engages the public in watershed stewardship. They improve the understanding of local water resources, encourage individual and community involvement in protection and restoration efforts, and help communities make informed decisions that improve water quality. This project's goals are to 1) expand and strengthen the capacity of existing Extension volunteer monitoring programs and 2) support development of new ones. The project also strives to enhance integration of volunteer monitoring in research, education, and extension activities.

In 2007, the Volunteer Monitoring National Facilitation Project has 1) enhanced communication among existing Extension volunteer monitoring programs nationwide; 2) reduced the effort needed to start new volunteer monitoring programs or to expand existing programs; 3) lent support and credibility to previously isolated programs; 4) facilitated local data sharing and internet learning; 5) expanded volunteer opportunities due to enhanced local and state capacity for Extension volunteer monitoring programs; 6) strengthened strategic partnerships within the Extension Volunteer Monitoring Network and between CSREES and other agencies, and 7) enhanced recognition of CSREES volunteer monitoring efforts as a viable component of the water monitoring community.

**Contacts: Linda Green – lgreen@uri.edu and Kris Stepenuck – kfstepenuck@wisc.edu**

**Website: www.usawaterquality.org/volunteer**

## *Great Lakes Radio Consortium's The Environment Report Brings "The Great Coast" to Millions*

The Environment Report, a Great Lakes Radio Consortium (GLRC) production at Michigan Radio, creates a free, weekly 29-minute satellite newsfeed of environmental reports used by more than 160 public radio stations in 18 states. CSREES enables The Environment Report staff to produce and distribute 120 public radio stories focused on the dynamic relationship between the agricultural sector and water quality in the Great Lakes watershed and beyond.

An evaluation of a previous CSREES grant indicated that listeners had greater awareness of each of the following topics (comparing 2002 and 2004): loss of farmland due to urban sprawl, the effect of pesticides on water quality, the effect of fertilizer or nitrogen on water quality, and the effect of animal feed operations on water quality.

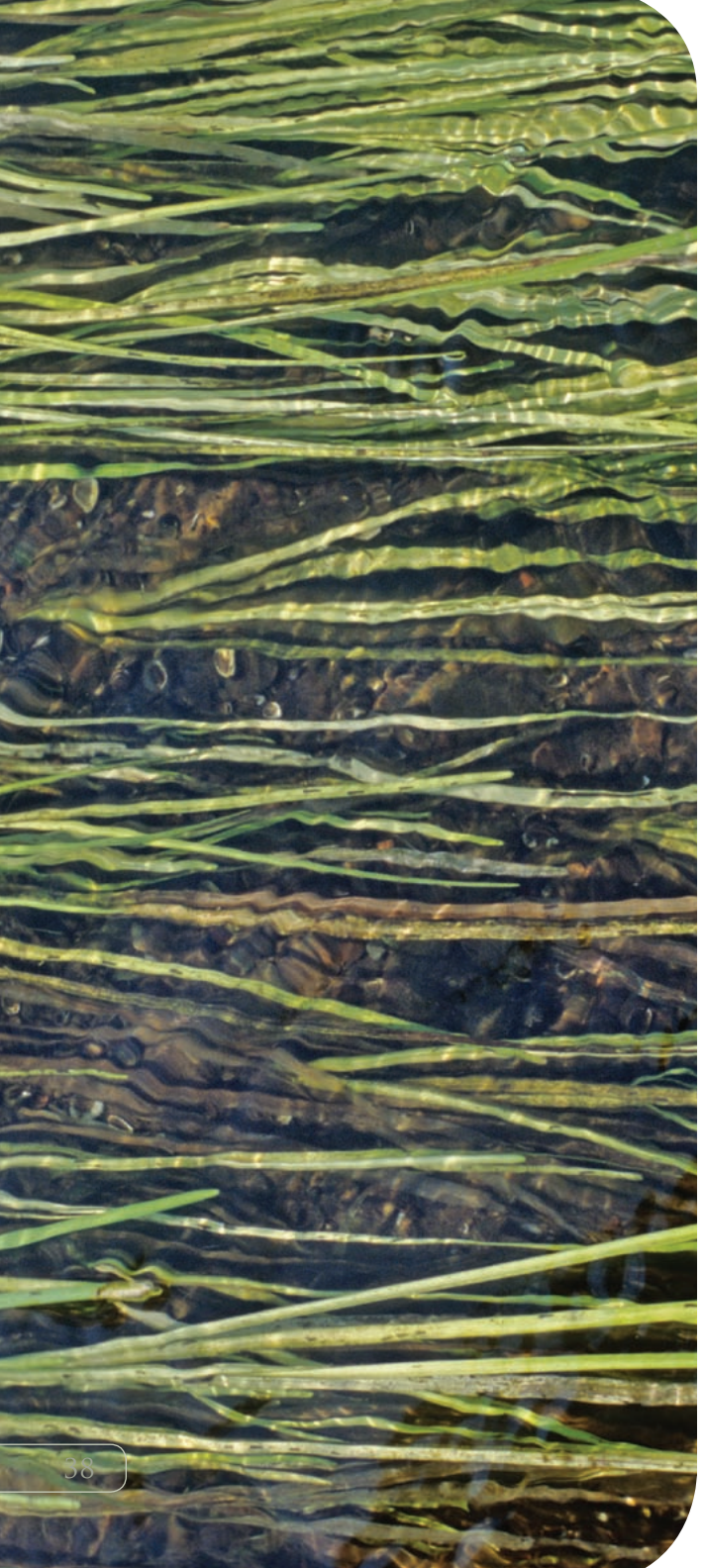
The Environment Report is now expanding its evaluation of listener knowledge and attitudes by initiating an independent study to determine if reporting has an effect on the actual behavior of public radio listeners.

The initial evaluation phase of the current project found that stories are doing a better job at connecting with listeners and providing them with real understanding of these subjects. Focus group respondents indicated that the reports would have an influence on listener behavior.

The Environment Report continues to improve upon web elements related to the newsfeed to enrich the educational reach of the project. Since modifying the website to make it more helpful to the public, the web audience has increased by six percent and an improvement in web streaming capabilities has led to a 46% increase in the number of mp3 audio files downloaded from the website.

**Contact: Mark Brush – brush@glrc.org**

**Website: www.environmentreport.org**



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THE GREAT LAKES REGIONAL WATER PROGRAM:

*Cultivating Learning in a Changing World*

# *2007 Impacts*

www.uwex.edu/ces/regionalwaterquality

Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

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This material is based on work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement No. 2004-51130-03111

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Purdue University Knowledge to Go
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