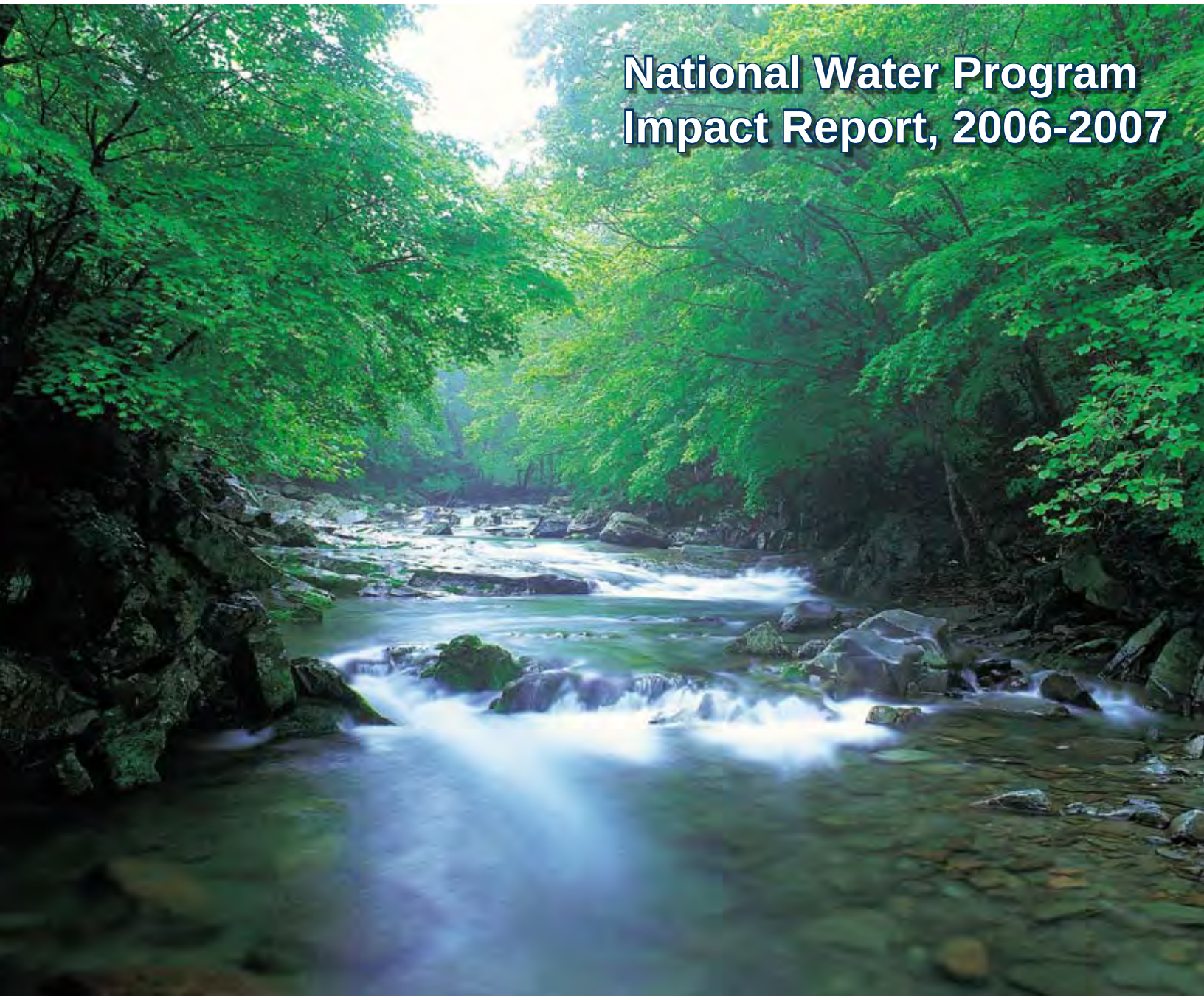
Applying knowledge to improve water quality

National Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities



National Water Program Impact Report, 2006-2007

CSREES · EDUCATION · RESEARCH · EXTENSION · USDA

The Land Grant University System

A network that responds to water resource issues by advancing knowledge through research, education and extension projects.

Contents

Written by State Water Quality Coordinators and other Section 406 National Water Program Project Principal Investigators. Edited by Dr. Diane Boellstorff and Kelly Addy. Photography by Tina Johnson, State Water Quality Coordinators and Juniper Images except where indicated.

Note: Please submit all errors, omissions, or suggested changes to dboellstorff@taexgw.tamu.edu.

Contact the CSREES National Water Program:

National Program Leader
Co-Chair, Committee for Shared Leadership
Dr. Michael P. O'Neill
USDA-CSREES
Mail Stop 2210
1400 Independence Avenue, SW
Washington, D.C. 20250-2210
Phone: 202-205-5952
Fax: 202-401-1706
moneill@csrees.usda.gov

Co-Chair, Committee for Shared Leadership
Dr. Reagan Waskom
Colorado State University
CSU Water Center
Fort Collins, CO 80523-1033
Phone: 970-491-2947
Fax: 970-491-1636
reagan.waskom@colostate.edu

Co-Chair Elect, Committee for Shared Leadership
Dr. Chris Obropta
Rutgers University
Dept. Environmental Sciences
14 College Farm Rd., Rm. 232
New Brunswick, NJ 08901
Phone: 732-932-9800 ext. 6209
Fax: 732-932-8644
Obropta@envsci.rutgers.edu

Past Co-Chair, Committee for Shared Leadership
Dr. Bob Mahler
PSES, 2339
University of Idaho
Moscow, ID 83844-2339
Phone: 208-885-7025
Fax: 208-885-7760
bmahler@uidaho.edu

1890 Representative
Dr. Cassel (Cass) Gardner
Cooperative Extension
Florida A&M University
202-J Perry-Paige Bldg., S.
Tallahassee, FL 32307
Phone: 850-599-3546
Fax: 850-561-2151
cassel.gardner@famu.edu

1994 Representative
Mr. Virgil Dupuis
Salish Kootenai College
Salish Kootenai College Extension
PO Box 70 (shipping 52000 Hwy 93)
Pablo, MT 59855
Phone: 406-275-4899
Fax: 406-275-4809
virgil_dupuis@skc.edu

National Water Program

www.usawaterquality.org/

CSREES National Water Program

This impact report provides key examples of how water resource professionals at universities and colleges, in cooperation with CSREES, are working with citizens, communities and partner agencies to address critical water resource problems across the United States.

The goal of the Cooperative State Research, Education, and Extension Service (CSREES) National Water Program is to protect or improve water resources throughout the United States, particularly in agricultural, rural and urbanizing watersheds. The CSREES National Water Program brings university scientists, instructors, and extension educators into more effective and efficient partnerships with Federal interagency programs to address priority water quality issues in U.S. agriculture. A key emphasis of the program is integration of extension, research and education resources to solve water quality problems at the local level.

The program is guided by a unique model for shared leadership that includes representatives from each of the 10 regional projects, representatives from the 1890 and 1994 Land Grant University institutions and the CSREES National Program Leader for Water Quality. This group is called the CSREES Committee for Shared Leadership for Water Quality (CSL-WQ).

The CSREES National Water Program website (http://www.usawaterquality.org/) enhances communication and coordination within the CSREES/University network and with its national and regional partners. The website is designed for scientists, instructors, and extension educators to share and access information about successful water quality improvement programs from across the nation.

http://www.usawaterquality.org

This impact report provides key examples of how water resource professionals at universities and colleges, in cooperation with CSREES, are working with citizens, communities and partner agencies to address critical water resource problems across the United States.

For more information about the CSREES National Water Program, please contact the National Program Leader, Dr. Michael P. O'Neill at moneill@csrees.usda.gov; 202-205-5952 or Bruce Mertz, Program Specialist, at bmertz@csrees.usda.gov; 202-401-4601.

Applying knowledge to improve water quality

New England Regional Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

The New England Program centers around 9 regional Focus Areas that tailor the National Themes to the strengths of New England Land Grant Universities' research, education, and Extension programs and capture the strengths of partners and stakeholders to deliver programs that improve the quality of New England's surface and ground water resources.

New England's Focus Areas:

- New England NEMO
- Volunteer Water Quality Monitoring
- Animal Waste Management
- Agricultural Nutrient and Pest Management
- Sustainable Landscaping
- New England Private Well Initiative
- River and Stream Restoration
- New England On-Site Wastewater Training Center
- The Green Valley Institute

Selected Regional Impacts

The New England Private Well Initiative

The Initiative hosted the 2007 New England Private Well Water Symposium in December in Newport, Rhode Island. In the spirit of our first symposium, this year's event continued to integrate research, Extension, education, and regulatory efforts within the field of private well protection in an effort to protect groundwater quality, drinking water wells and the health of those who depend on these resources. Over 120 people attended this 2-day event, which brought together a variety of people including:

- Federal, state, and local agencies
- University researchers, educators, and students
- Nonprofit organizations
- Private sector professionals

The Symposium is an effort of the New England Private Well Initiative, an interagency partnership that began in 2001 between CSREES New England Regional Water Program, EPA-New England and state drinking water agencies.

Agricultural Nutrient and Pest Management

In 2006, a pilot course developed at the University of Vermont demonstrated that encouraging and enabling farmers to create their own nutrient management plans that meet the NRCS 590 standard has lead to increased plan implementation. Thirty farms have taken the five-week course and 28 farms have developed plans on 14,342 acres. As a result, 50 percent of the farmers expect to apply less nitrogen and phosphorus and 67 percent expect to save money. This curriculum, which fosters research-based education and cost-effectiveness, is available to all states involved in the New England Program. It is being piloted in Rhode Island with support from the RI NRCS beginning in January 2008.

On the web at: http://www.usawaterquality.org/newengland

Applying knowledge to improve water quality

New York - New Jersey Puerto Rico - Virgin Islands

Regional Water Coordination Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

Lake Loiza in Puerto Rico. The Lake Loiza Watershed is the focus of the Puerto Rico Watershed Stewardship Program along with the Lake La Plata Watershed.

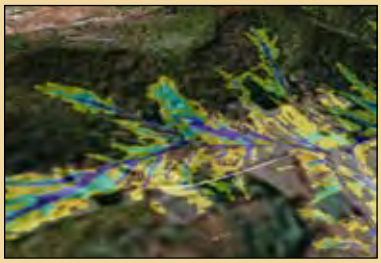
Selected Regional Impacts - Watershed Management

The Regional Priority Area of Watershed Management has different facets across the region. Several example projects with corresponding impacts are highlighted.

The **Restore-a-Waterway** program in New Jersey has been established to provide hands-on technical assistance to citizen volunteer groups wanting to take action in restoring the quality of a waterway and increasing public knowledge in the community. Restore-a-Waterway can provide this assistance in a variety of ways depending upon the needs of a particular group, including: physical, biological and chemical monitoring; interpretation and analysis of data; designing solutions to mitigate the identified problems; and securing funds to implement the designed solutions. Over $125,000 has been secured from non-profit foundations in collaboration with watershed groups to date. Restore-a-Waterway also conducts technical workshops on watershed restoration topics concurrently with hands-on collaboration.

Watershed Restoration and Protection Planning Workshop in January 2007 at the Rutgers EcoComplex (co-sponsored by NJ Sea Grant)

An integrated research, education and extension project on **Variable Source Area (VSA) hydrology** is currently being conducted. VSA hydrology is the concept that runoff-generating areas in the landscape will vary in location and size over time. Manure application, fertilizers, pesticides, and other human-applied substances can pollute streams, especially if applied to VSAs when the ground is saturated. Knowing which areas are more prone to runoff in a given watershed helps land users to make better decisions regarding application of substances and placement of best management practices. The initial research study for the Town Brook watershed in New York has led to a comprehensive website (http://soilandwater.bee.cornell.edu/) with tools available for download. The available research findings and tools are targeted to extension professionals and land use managers requiring innovative approaches to nutrient management planning.



Google Earth image of the Variable Source Area hydrology analysis for the Town Brook Watershed. (Yellow is <0.2 cm, teal is 0.2 to 0.4 cm, blue is >0.4 cm; average runoff depth)

On the web at: http://rwqp.rutgers.edu/

The Puerto Rico **Watershed Stewardship Program** is a partnership between the United States Environmental Protection Agency, the Puerto Rico Aqueduct and Sewer Authority, the Puerto Rico Environmental Control Board and the Puerto Rico Department of Health. The Regional Water Coordination Program (RWCP), represented by Rutgers University and the University of Puerto Rico (UPR), has participated in this initiative since its inception three years ago. The program, initially focusing on two key watersheds, has identified discharges from onsite wastewater treatment systems and phosphorus loading from household laundry detergents as major sources of impairment. A demonstration onsite wastewater treatment system was installed and will complement training sessions to commence early 2008. The trainings will also be conducted in the US Virgin Islands, with local facilitation provided by the University of the Virgin Islands.

Applying knowledge to improve water quality

Mid-Atlantic Regional Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

Selected Regional Impacts

Initiating a Discussion on Biofuels and Water Quality

While much of America rushed to produce corn-based ethanol, little consideration was given to any unintended consequences, including water quality impacts. In early 2007, the Mid-Atlantic Water Program (MAWP), with the Chesapeake Bay Foundation and USDA-ARS, convened a conference to initiate a region-wide discussion of the impacts and benefits of using agricultural feedstocks in biofuels production. The conference's key findings and recommendations raised regional and national awareness, and inspired widespread discussion on ethanol and water quality. These efforts resulted in dozens of news stories and numerous editorials, including an invited Op-Ed in the Sunday *Washington Post*.

Expanding Well Water Safety

Unlike those served by public water systems, homeowners with private wells must manage all aspects of their drinking water. Yet, few know how to properly maintain safe drinking water. To assist these homeowners, the MAWP has supported and expanded the Master Well Owner Network (MWON), an effort that teaches well owners how to manage their water systems. This award-winning project has been recognized for its effectiveness in educating well owners and increasing adoption of practices that ensure safe drinking water. Initially implemented in Pennsylvania, the MWON has been expanded to the Delmarva Peninsula, with more recent expansions in West Virginia. Further funding received in 2007 allowed expansion across Virginia.

Refining BMP Definitions and Effectiveness Estimates

The Chesapeake Bay Program (CBP) uses models and BMP effectiveness estimates to estimate progress and develop policies, regulations, and programs for restoring the Bay. In 2003, the *Washington Post* reported that the BMP effectiveness estimates were overestimated and did not represent actual Bay pollutant removal capacity. The MAWP led CBP's efforts to develop science-based definitions and effectiveness estimates that more accurately reflect average operational conditions. The refined effectiveness estimates have been approved by the Bay Partnership and are being widely used in Bay restoration activities, nutrient credit trading, watershed planning and TMDL implementation plans.

Contacts:

Tom Simpson
Regional Coordinator
tsimpson@umd.edu

Daphne Pee
Regional Liaison
dpee@umd.edu

Jake Vandevort
Assistant Coordinator
jvandevo@umd.edu

On the web at: http://www.mawaterquality.org

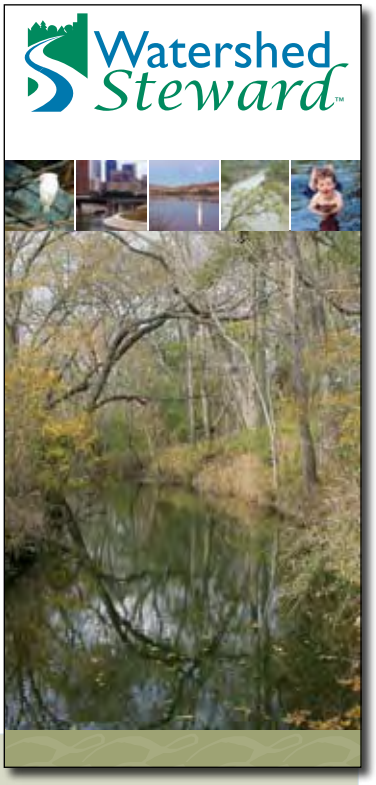
Applying knowledge to improve water quality

Southern Regional Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

Selected Regional Impacts

Watershed Education - *Educating and empowering local citizens to address critical water resource needs is a core purpose of the regional effort, and several coordinated, multi-state programs are accomplishing this goal.*



The Regional Watershed Stewards program improves understanding of the causes and prevention of nonpoint source pollution. Pre/post testing has shown the program increases knowledge to an average of 91% and stimulates individual and community involvement in local watershed planning efforts. To facilitate implementation, Watershed Steward Coordinators across the region developed and shared curricula and evaluation tools conserving over $450,000 in personnel and resources. In addition, the program has successfully leveraged $1,100,000 in external funding from EPA, state water resource agencies and other key partners.

To enhance regional capacity, advanced watershed protection training is being provided to water resource professionals through Regional Watershed Academies. Over 240 professionals from federal and state agencies and non-governmental organizations have been trained at 8 events conducted in 5 states in the region. At the same time, by capitalizing on team expertise available from key states, an estimated $750,000 in personnel and resources have been conserved.

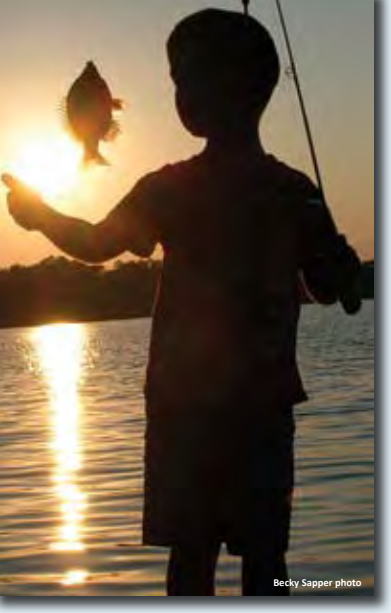
A Regional Yards and Neighborhoods program has been developed to better address water pollution concerns of southern homeowners. Most recently, technology transfer from Florida to other states in the region has expedited program implementation and saved over $150,000 by minimizing duplication of effort.

Regional Water Quality Conference Facilitates Regional Program and Resource Sharing among Institutions and Faculty

The goal of the Southern Region's Water Quality Conference is to strengthen capacity for Extension to develop and deliver water quality programs by sharing research information and successful education strategies and programs addressing current and potential water quality issues, and providing a forum for exchange of ideas and information. Pre- and post-conference workshops and technical tours offer opportunities for in-depth training on key issues while conference sessions present state-of-the-art strategies for addressing critical water resource issues facing the citizens of the Southern Region.


Photo by Tina Johnson

More than 600 water resource professionals have been trained at the biennial regional conferences; the most recent of which was held in October, 2007 in Fayetteville, AR. The success of these events is demonstrated by survey results indicating program delivery capacity of 97% of conference participants was substantively increased. In addition, resulting collaborations and technology transfer have saved thousands of hours of professional time by minimizing duplicative efforts in program and resource development. Conference proceedings and evaluation results are available through http://srwqis.tamu.edu/proceedings.aspx.



Applying knowledge to improve water quality

Great Lakes Regional Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

The Program seeks to enhance the delivery and sharing of successful water programs across our region and the nation through multi-state and multi-region efforts to protect and restore water resources. We utilize the diverse knowledge bases available in each state, as well as the economies of scale available when states share water research, classroom curricula, and outreach programs and publications. The Program has adopted six priority National Themes: Animal Waste Management, Drinking Water and Human Health, Environmental Restoration, Nutrients and Water Quality, Water Policy and Economics and Watershed Management.

Selected Regional Impacts

Building Volunteer Capacity to Monitor E. coli in Surface Water

Volunteers Gain:

- A better understanding of how *E. coli* bacteria enter and move through the environment;
- Increased knowledge and awareness about the effect of *E.coli* bacteria on individual and community health;
- The skills to monitor water quality in a safe and scientifically valid manner.

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. 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. 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 Lois Wolfson – wolfson1@msu.edu*
Website: *http://www.uwex.edu/ces/regionalwaterquality/Flagships/Volunteer.htm*

Developing Social Indicators for Nonpoint Source Management

This project has developed a suite of social indicators for nonpoint source (NPS) management that provide information about human dimension changes that are expected to lead to water quality improvement and protection. The project 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. The products of this project will be pilot-tested in Great Lakes Region states over the next three years. Project partners include USEPA Region 5, state water quality agencies, and Great Lakes Region Land-grant Universities.

This project helps water quality managers:

- Target outreach activities where they will have the greatest environmental impact;
- Assess whether their outreach efforts are accomplishing changes expected to improve and protect water quality.

Contacts: *Ken Genskow – kgenskow@wisc.edu Linda Prokopy – lprokopy@purdue.edu*
Website: *http://www.uwex.edu/ces/regionalwaterquality/Flagships/Indicators.htm*

Sharing Wild Rice Traditional Ecological Knowledge 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 (see the 2006 National Impact Report). 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: *Pat Robinson – patrick.robinson@ces.uwex.edu Deb Zak – dzak@umn.edu*
Website: *http://www.uwex.edu/ces/regionalwaterquality/flagships/wildrice.htm*

On the web at: http://www.uwex.edu/ces/regionalwaterquality

Applying knowledge to improve water quality

Heartland Regional Water Coordination Initiative

A Partnership of USDA CSREES & Land Grant Colleges and Universities

Building Institutional Capacity through Regional Coordination

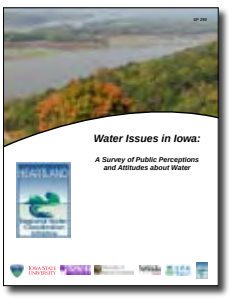
The Heartland Regional Water Coordination Initiative develops and strengthens networks that build institutional capacity through enhanced communication, coordination and resource integration within the four-state region. Heartland's regional, issue-based working groups, roundtables, workshops and publications have added value to water quality and watershed programs of land grant university partners, state and federal agencies and voluntary organizations with water quality missions. Increased capacity includes broadened vision and leadership among staff, targeting and achievement of organizational goals and responsiveness to stakeholders on priority water issues.

Focus group studies document Heartland Initiative impacts on institutional capacity. Partners recognize Heartland as a facilitator of regional networks and partnerships as well as a source of research-based knowledge. Regional issue teams have had a major impact on linkages among agencies and universities. Further, environmental agency staff and researchers report greater awareness of related work in other organizations and states, and are more likely to seek out land grant resources. Participants report that Heartland has given them increased access to EPA staff and programs.

Increased awareness and communication has directly influenced leveraging of regional resources. The EPA 319 Program is providing computer technology and training for improved stream assessment to all Heartland states as a result of the Nutrient and Pesticide Management (NPM) teams' 2007 workshop "Targeting Critical Source Areas". EPA's investment will improve watershed management planning throughout the region. The NPM and Animal Manure Management (AMM) teams have also had a region-wide impact on improved phosphorus management by facilitating the review, and modification in some cases, of state-developed P Indexes and CNMP formats. At least 6,000 livestock operations that use the P Index to meet agency nutrient plan requirements will be impacted by principles and methodologies resulting from Heartland efforts.

Multi-state working groups facilitated by the AMM team have had an impact on regulatory compliance management conditions for livestock producers through contributions to CAFO policy. The development of a regional response to EPA's 2006 CAFO Proposal and subsequent follow-up on strategic versus tactical aspects of CNMPs has influenced management options presented in the 2007 Proposed CAFO Rule. Collaborative research and demonstration involving the AMM team has also resulted in EPA Region 7 acceptance of states' permitting Vegetative Treatment Systems, on a case-by-case basis, for the first time in over 30 years of CAFO regulation.

The 2007 Regional Water Issues Survey documents public perceptions and attitudes about water. Survey results are being used by agencies and universities to create more responsive water programs. Staff of the Iowa Department of Natural Resources have used the survey to inform policy makers about the awareness and needs of Iowans for environmental programs. The survey and recommendations of working groups at the Heartland Regional Water Conference also influenced Iowa State University Extension program teams in their development of the 2008-2012 Plan of Work. The new Plan places greater emphasis on natural resources and environmental stewardship education, including water quality, and addresses emerging priority issues and non-traditional audiences. This result will impact the availability of resources and water education for all Iowans.



On the web at: http://www.heartlandwq.iastate.edu

The goal of The Northern Plains & Mountains Regional Water Quality Program is to protect and improve the quality of water resources by facilitating development, delivery and implementation of new and existing practices throughout the region.

Applying knowledge to improve water quality

Northern Plains & Mountains Regional Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

Regional Programming

The Northern Plains and Mountains Regional Water Program provides a means for leveraging technical and financial resources of the states to comprehensively address critical water quality and related water quantity issues. The program places an emphasis on providing leadership for water resources research and education to help people, industry and governments address these issues. The program has provided a consistent, long-term source of funding that has been used to create highly valued regional partnerships. Regional leveraging in FY 06-07 totaled over $2.6 million, with partners ranging from the U.S. Department of Energy, USGS, NASA, BLM, and EP, to conservation districts, state departments of environmental quality, as well as a wide array of water resources organizations throughout our region. Regional priorities include: **Watershed Management, Production Agriculture Water Quality, Agricultural Water Conservation and Protection, and Drinking Water Protection for Human and Livestock Health.**

Selected Regional Impacts

Water Resources Protection in Agricultural, Small Acreage, and Urbanizing Environments

- Five well protection mini-grants were funded, reaching over 550 well owners and resulting in over 250 well owners testing their wells for the first time.
- A regionally funded "Well Educated" project resulted in having 273 participants test their wells for bacteria in Montana.
- Regional workshops have trained dozens of residents on proper monitoring of water quality on their property in areas of oil and gas development – utilizing the regionally produced "Land and Water Inventory Guide".
- The region supported the publication and distribution of eight issues of *Barnyards and Backyards: Rural Living in Wyoming* to over 3,000 subscribers.
- The region has also produced *A Guide to Changing Plant Communities* and a DVD concerning impacts of coal bed methane production titled, *Prairies and Pipelines* – which have been distributed to hundreds of people.

- A region-wide effort is currently underway to provide drinking water quality standards, guidelines and interpretations using an Online NPM Regional Water Quality Interpretation Tool. This online resource will offer instant water quality analysis for thousands of residents throughout our region.

Region 8 Contact
Reagan Waskom
Colorado State University
reagan.waskom@research.colostate.edu

Tribal Contact
Virgil Dupuis
Salish Kootenai College
Virgil_Dupuis@sku.edu

On the web at: http://www.region8water.org

Applying knowledge to improve water quality

Southwest States & Pacific Islands Regional Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

Selected Regional Impacts

Leptospirosis is a waterborne disease of significant concern throughout temperate and tropical regions of the world, including the Pacific islands. Ongoing work of the Regional Program has focused on animal waste management, specifically waste from pigs which are common throughout the Pacific and are potential vectors of the pathogenic *Leptospira* bacteria. While initial work focused on changing behavior to eliminate practices that wash wastes directly into waterways, recent research has focused more specifically on composting pig wastes and determining conditions under which *Leptospira* do not survive. Long thought to be an effective tool for managing animal wastes, agricultural assistance agencies have been reluctant to recommend manure composting to farmers because of the uncertainty of *Leptospira* survival in compost. With research data that now shows specific conditions under which spirochetes will die, instructional materials can now be distributed to encourage composting of pig manure to Pacific island farmers.

Additional Highlights

Dry Litter Waste Management (DLWM) - Regional work has continued in promoting and building dry litter waste management systems for small-scale piggeries in the islands. This alternative to traditional liquid waste management practices of small/family piggeries that frequently send animal wastes directly into surface waters or leaves them untreated and susceptible to leaching nutrients and pathogens, has now spread throughout the region. As a result of the collaborative efforts and relationships built between the Northern Marianas College - CREES team and the local NRCS office in demonstrating and promoting the DLWM, NRCS agents are now actively advertising the Dry Litter System for Managing Hog Waste as a potential system to be cost-shared under the NRCS-EQIP program. At least two applicants have been approved for EQIP and the systems for these farms are being designed and approved by NRCS engineers; one site is near completion.

Coordinated Management of Water Quality and Food Safety - Recent concerns about food safety, particularly of leafy green vegetables, have led to industry recommendations and restrictions on farm practices. Some of these recommendations, however, are in stark contrast with long held water quality management practices. To highlight this disconnect and foster a concerted effort to bring the two sides to common ground, the Region 9 program co-sponsored a conference dedicated to this issue for water quality and food safety researchers and professionals. Follow-up from the conference has included a survey of participants to identify research priorities and next steps which will be pursued in the coming year.

On the web at: http://ag.arizona.edu/region9wq/

Applying knowledge to improve water quality

Pacific Northwest Regional Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

Educational Programming Impacts

We collected this information through our 2007 Water Issues Survey sent to residents of Alaska, Idaho, Oregon, and Washington. The purpose of the survey was to document changes in public awareness, aptitudes, attitudes, and actions taken toward water resource issues since 2002. This statistically designed survey was administered by mail to over 1,800 residents in the region in 2007. We achieved a response rate of over 50 percent, resulting in a sampling error of less than 4 percent.

Actions Taken to Address Water Quality

A majority of Pacific Northwest residents have addressed water quality issues since 2002 through individual action. For example:

- Over 46 percent of survey respondents have changed how they dispose of household wastes. This includes disposing of yard wastes at a composting facility or through special trash pick-ups, and disposing of hazardous wastes at special collection events instead of dumping these chemicals down the drain or placing them in the regular trash.
- Another 31 percent of residents have changed the amounts of, or how they use pesticides and fertilizers in their yards.
- Over 29 percent of surveyed respondents are now disposing of used motor oil in a more water quality friendly manner than they were in 2002.
- Only about a quarter (26.2 percent) of survey respondents indicated that they have not taken individual action in the last five years to address water quality.

Actions Taken to Address Water Quantity

Over 80 percent of the region's adults have made lifestyle changes in the last five years to address water quantity issues. For example,

- A majority of residents (58.8 percent) have installed or used a water saving appliance in their residence since 2002.
- Another 46 percent reported that they have changed how they use water in their yard.
- Almost 43 percent of those surveyed reported changes in household water use in this five-year time period.
- Almost one third of residents have reduced water used when washing their vehicles.
- Conversely, only 17.5 percent of people surveyed have not taken any actions to reduce water use since 2002.

The Bottom Line

The results presented above are important because they document that the majority of adults in the Pacific Northwest have taken positive actions to address both water quality and water quantity issues in the last five years. Our PNW regional team believes that investing money in public education is a very efficient way to affect change. Our survey results support our beliefs and programming efforts.

On the web at: http://www.pnwwaterweb.com/

Project Impacts for:

Integrated Research, Education and Extension Projects
Extension Education Projects
National Facilitation Projects

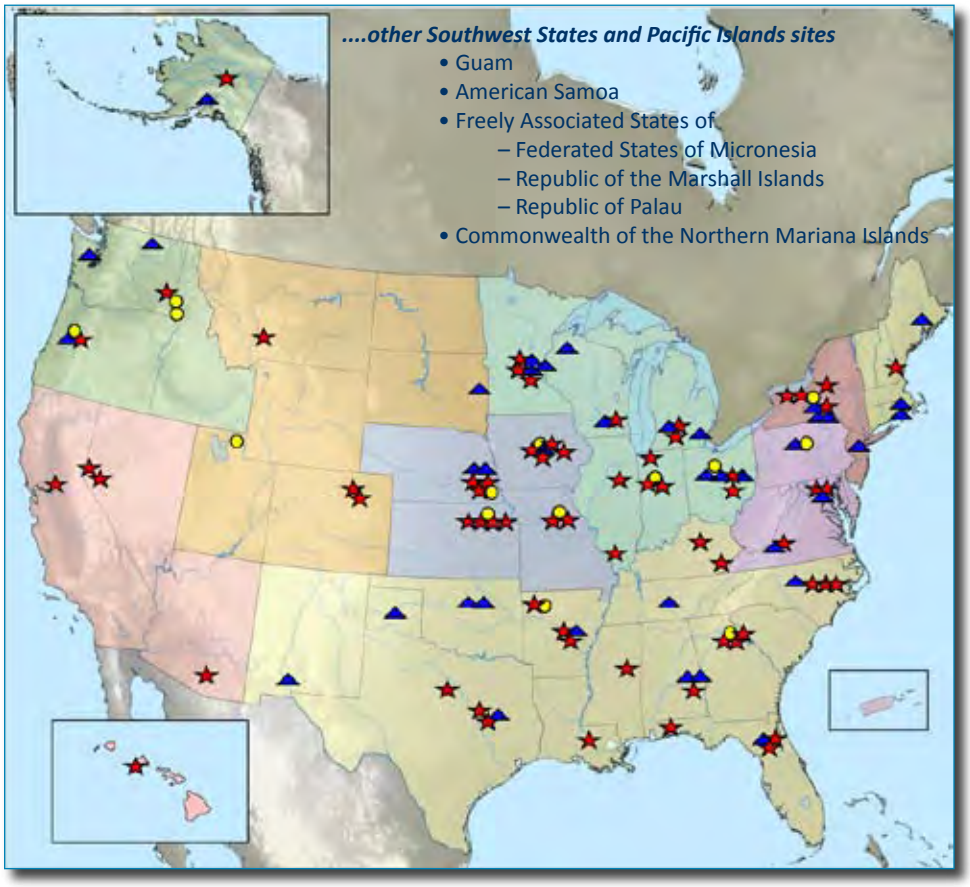
In addition to Regional Coordination Projects, three other types of projects are being supported by AREERA Section 406 competitive grants:

Integrated Research, Education and Extension Projects integrate water research, education, and extension to solve water resource problems at the watershed level. These projects target a specific watershed and utilize an integrated approach to address an existing problem or concern. Integrated projects awarded in 2000-2007 are indicated on the map by red stars. Conservation Effects Assessment Projects (CEAP) awarded in 2004-2007 are indicated on the map by yellow circles.

Extension Education Projects provide leadership and effective partnership for water resource education to help people, industry, and governments prevent and solve current and emerging water resource problems. Extension Education Projects focus on outreach to affect changes in knowledge and management which enhance and protect the Nation's water resources. Projects awarded in 2000-2007 are indicated on the map by blue triangles.

National Facilitation Projects develop and initiate nationally coordinated programs that contribute to an increase in public understanding and involvement in community decision-making, that facilitate the development of recommendations and tools to inform public policy, and evaluate impacts on water resources (e.g., decisions about land use, land management practices, and waste water management alternatives). The result is more citizen involvement, wider dispersal of information, and more rational analysis of environmental decisions in communities and across the nation.

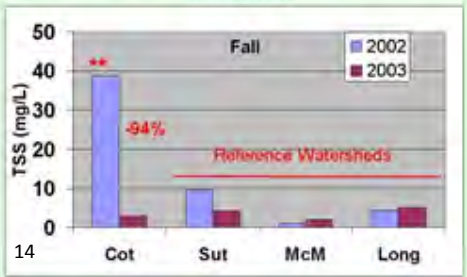
Integrated Research, Education and Extension Projects (★) Conservation Effects Assessment Projects (●) and Extension Education Projects (▲) awarded in 2000-2007.



The following impact reports are key examples of these important project types.

Experimental Manipulation of Entire Watersheds through Best Management Practices (BMPs): Nutrient Fluxes, Transport and Biotic Responses

Major decrease in soil loss in experimental watershed with "gully plugs", but not in reference watersheds



Situation: Mitigation of soil and nutrient loss from agricultural watersheds in the Finger Lakes Region of New York State and, in general, within the country continues to be a major issue. The goals of the Conesus Lake Project are to:

- Demonstrate that implementation of BMPs in agriculturally dominated watersheds will preserve soil and reduce nutrient loss from a series of subwatersheds.
- Evaulate the impact of implemented BMPs by considering the impacts on the downstream lake community at the watershed scale.
- Evaluate fate and transport of nutrients over space and time.

Actions:

To determine the effect of implemented management plans on soil and nutrient retention within the watershed, total farm planning and implementation of at least one BMP occurred in experimental watersheds. BMPs included the elimination of winter manure practices in highly erodable and hydrologically sensitive areas and the use of gully plugs to decrease soil erosion. The project utilizes the experimental watershed approach, where BMPs are implemented in a number of experimental watersheds. Soil and nutrient monitoring results from experimental watersheds are then compared to results from control watersheds where BMPs have not been implemented. Small experimental subwatersheds (33 to 325 ha) were chosen for this study because they are predominantly in agriculture (over 70%) and are farmed by only one or two landowners. This approach ensures that any effects on downstream systems (stream, stream mouths and nearshore of the lake) will be a result of implemented BMPs; that is, results are not confounded by other land use practices often observed in large watershed approaches.

Impacts/Outcomes:

- Demonstration of the effectiveness of implemented BMPs, allowing regional policy makers and managers to develop optimal strategies for improving land usage in watersheds while significantly improving water quality and decreasing the abundance of nuisance plant species in downstream ecosystems.
- Significant decreases in particulate forms of nutrients and a 94% decrease in soil loss during the fall season.
- Significant reductions in total coliform bacteria and the percent cover of metaphyton near experimental stream mouths.

On the web at: http://www.envsci.brockport.edu/Conesus_Project/

Integrated Agricultural Management Systems for Improving Water Quality in Kansas

Situation:

Two limitations in addressing total maximum daily load (TMDL) issues are:

1) Determining the net effect of best management practices (BMPs) designed for single contaminants on a mix of contaminants in runoff, and
2) Modeling the net impact of BMP adoption on a watershed scale.

Actions:

This project developed and applied a model utilizing local, field-scale research knowledge (surface runoff studies in sorghum-soybean rotation in three watersheds for multiple years) to simulate the effects of nutrient, sediment, and pesticide BMPs on water quality at the watershed scale. This model application allowed development of BMP strategies to directly address TMDL issues in a pilot Kansas watershed through Extension activities aimed at local conservation districts as well as local citizens and landowners. A complete economic analysis was performed to identify economic barriers to BMP implementation.

Impacts/Outcomes:

- In field studies, chisel/disk tillage systems and broadcast applications at planting generally had small losses for all tested parameters (bioavailable P, soluble P, total P, ammonium, nitrate, total N, sediment, atrazine, and metolachlor) and may be the best practice to simultaneously control nutrient, herbicide, and sediment losses in the settings observed.
- Modeling results generally have indicated that reductions in sediment, total N, total P and atrazine loading to streams in the Lower Little Blue River subbasin can be achieved through implementation of various BMP combinations.
- Farms using reduced tillage were relatively more cost efficient.
- Data from the project has also been used to validate the Kansas Phosphorus Site Index.
- Results from the Extension modeling project are incorporated into Watershed Restoration and Protective Strategies efforts, especially for recommendations of BMPs for meeting water quality goals within the basin, by local watershed groups.
- Watershed citizenry became educated about the water quality impacts of various management alternatives and better enabled to make informed decisions leading to improved water quality in the watershed.

Performance-based Environmental Management Incentive Projects in Northeast Iowa

Situation: While 90% of Iowa water contaminants have been attributed to agriculture, farm operators have never been asked to organize and collectively address their impacts on water quality. Yet their day-to-day management decisions are crucial to reducing nonpoint source pollutants. In Northeast Iowa, Iowa State University Extension is facilitating a locally-directed program of performance-based management incentives to help producers and watershed communities address their own environmental goals more effectively.

- Residents' watershed councils provide aggressive, proactive local leadership for water improvement.
- Farmers act voluntarily on personal environmental goals when they can measure their progress.
- $1.25 million for performance programs has been leveraged by CSREES funding.
- Participants find the performance incentive program to be practical and profitable, as well as having a positive effect on the environment.
- Results are cost-effective due to contributions of local leadership, peer pressure, volunteerism, rural community pride and the desire to avoid regulation.

Partners

- USDA CSREES National Integrated Water Program
- Iowa Corn Growers
- Iowa Farm Bureau
- Iowa Watershed Improvement Review Board
- U.S. EPA Region VII Watershed Improvement Program
- NRCS Conservation Innovation Grant Program

Contact

John Rodecap
ISUE Performance Based Watershed Projects Coordinator
PO Box 487
Fayette, IA 52142
563-425-3233
jrodecap@iastate.edu

This work is supported in part by the U.S. Department of Agriculture Cooperative States Research, Education and Extension National Integrated Water Program under Agreement No. 2004-51130-002255.

Actions

Farm operators in Northeast Iowa priority watersheds are implementing a pilot conservation program that recognizes the need to incorporate day-to-day management decisions with traditional cost-share practices to improve water quality. The Cornstalk Nitrate test, P Index and Soil Conditioning Index (SCI), are used as qualitative performance indicators. Cooperators receive incentives to conduct baseline field-by-field analyses of their farms' current risk of excess sediment and nutrient delivery to local waters. Incentives in following years reward continuing improvement in indicators. A watershed council sets incentives based on their knowledge of local contaminant sources. Extension provides facilitation and education for the councils and technical assistance delivered as an educational program for cooperators. Education and rewards for outcomes gives cooperators flexibility to select management alternatives they will adopt to improve their performance scores.

Impacts/Outcomes

The extension coordinator is supported by the CSREES National Integrated Water Program. He worked with watershed council leaders to secure three years' incentive funds from the Iowa Farm Bureau Federation ($90,000) and the Iowa Corn Growers Association ($180,000). These resources leveraged over $978,000 in other grants and $400,000 in-kind for the projects.

Performance results shared neighbor-to-neighbor build local pride in watershed improvement and peer pressure for new participation. Enrollment has grown by the second year to 45-55% of farm operators in the watersheds. In a recent survey of participants, over 90% were confident that the program rewards a conservation systems approach, encourages farmers to change their management - including neighbors who are not participants, has a positive effect on the environment and is also profitable.

The program is simple and cost effective. The sample performance contract is one page long. Nitrogen application has been reduced, often by increasing manure credit. In the longest watershed project (3 years) the stalk nitrate test average score was reduced 33% between years 1 and 2 and an additional 29% between years 2 and 3. In the first two years cooperators installed or improved 22 miles of waterways or buffers on 19,200 acres of cropland, with significant impact on their PI and SCI scores, for a total incentive expenditure of $16,700.

Leaders of the watershed councils have taken many opportunities to communicate their engagement and enthusiasm for the program to their elected representatives.

On the web at: http://extension.agron.iastate.edu/waterquality/performance.html

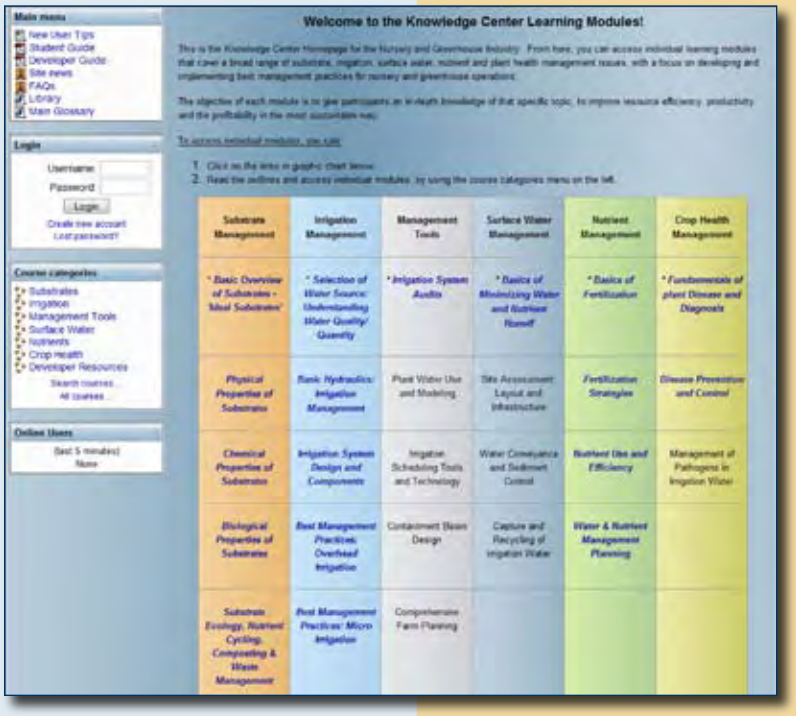
Developing an E-learning Resource for Water and Nutrient Management and Conservation for the Nursery and Greenhouse Industries

Situation

Today, ornamental crop production is among the fastest growing sectors of agriculture. The American Nursery and Landscape Association has ranked water and nutrient management as one of their top five research priorities. Container-nursery and greenhouse systems differ radically from traditional agronomic-type agricultural operations in terms of water and nutrient use, and there is an acknowledged lack of up-to-date information in these knowledge areas.

Actions

Extension Faculty from six states (in Mid-Atlantic and Southern regions) developed a web-based educational resource center to provide research-based knowledge on water (both irrigation and surface water) management and nutrient management for the nursery and greenhouse industry. Users are directed to information resources on the greenhouse and nursery industries in the six states, including information on regulations, best management practices (BMPs), active research areas, accreditation and certification as well as the gateway to the learning modules. Tests involving 50 growers, industry consultants and educators were completed of ten learning modules. Additional development and testing of the remaining modules occurred in 2007. Users also have access to a large number of specific journal articles (as searchable PDFs) with password-secure access through Moodle.



Impacts/ Outcomes

Development of these e-learning resources for a large geographic area:

- Facilitates public policy education.
- Provides research-based knowledge for the implementation of water and nutrient BMPs to change behavior at the farm level.
- Leads to individual actions to undertake water conservation, reduce runoff, and improve nutrient management, thereby reducing non-point source pollution in these operations' watersheds.
- Forms partnerships between growers, green-industry groups, Cooperative Extension, and state and federal agencies, most notably NRCS, for accreditation purposes.

On the web at: http://waternut.org

Changing Public Behavior

Increase Citizen Involvement Using Target Audience Information

Situation:

Community involvement and education have been identified as key components for successfully implementing state and federal agency water management plans. Research indicates that when educators focus on specific audiences, their work is more likely to be successful.

Extension's water professionals want to know when and how to use target audience information and social science tools in community-based outreach efforts.

The Water Outreach Education NFP (2000-2004) connects natural resource professionals with information and best education practices to help citizens improve their understanding of water issues and develop water stewardship skills. Project resources help educators to:

- Connect the situation with the people
- Choose achievable goals
- Select relevant outreach techniques
- Get measurable results

Actions:

The second phase of this work, the Changing Public Behavior NFP (2006-2008) trains scientists, natural resource professionals, and educators to develop and use target audience information to improve citizen understanding and involvement in community decision-making for water resources.

Project materials are developed with the advice of national leaders in education, social sciences, and training. We have:

- Translated research-based, target audience information into findings that include audience studied, and outreach practices and best education practices employed. We've created an online searchable database for accessing the findings.
- Collected information on easy to use, cost-effective community analysis tools that are "doable" for natural resource professionals.
- Developed a draft in-person training curriculum on how to find and incorporate information about targeted audiences into outreach planning and evaluation.
- Developed a draft, self-study module that provides a step-by-step process for learning new skills. This on-line training resource provides background information and practice opportunities.
- Started pilot testing the in-person training curriculum with Extension natural resource professionals and with agency administrators.
- Identified measures for participants to evaluate their skill development at three accomplishment levels.

Impacts/Outcomes:

- Launched a Website resource with education and social assessment tools including the draft self-study training module and a searchable target audience database.
- Developed new partnerships among federal agencies (USDA/CSREES, USFS, EPA) and universities based on the need to build education and social assessment skills for natural resource professionals.
- Created interest among Extension natural resource professionals for additional in-person trainings and for use of the self-study module.
- Supported activities for a Community of Practice that improves participant skills and resources for assessing target audiences.

Photo courtesy of NRCS

Project Staff:
University of Wisconsin

Elaine Andrews
608-262-0142
eandrews@wisc.edu

Kate Reilly
608-265-5496
klreilly@wisc.edu

On the web at: http://wateroutreach.uwex.edu

Facilitating the Development of Stakeholder-driven, Performance-based Policies for Agricultural Nonpoint Source Pollution Control

This project is focused on the use of performance-based incentives, where the payments are triggered by a designated environmental outcome and not associated with any specific practice. This gives farmers the flexibility and incentive to achieve performance targets in the most cost-effective and appropriate way for their farm business.

Situation:

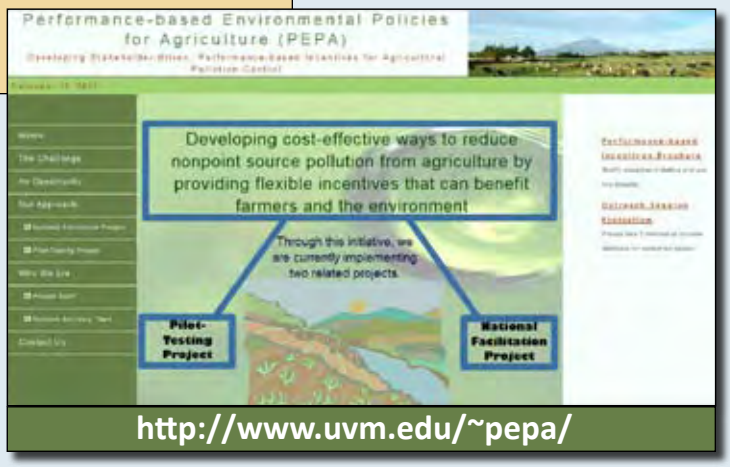
Agriculture remains the leading contributor of nonpoint source (NPS) pollution to ground and surface waters in the U.S. Current programs for controlling NPS pollution are focused on cost-sharing best management practices and compensating farmers for idling selected tracks of working land. While these programs have been important and valuable tools, they do not often (1) fully utilize farmers' knowledge of their land and operations, (2) encourage farmers to take the most cost-effective actions, or (3) inspire new and innovative solutions to reduce NPS pollution from their farming operations.

Contact:

Jonathan Winsten
Agricultural Economist
208G Morrill Hall
University of Vermont
Burlington, VT 05405
802-656-0036
jwinsten@winrock.org

Actions:

- Created an informational brochure introducing the performance-based incentives concept and providing project information. The brochure has been distributed to over 600 individuals through conferences, meetings, and targeted outreach.
- Launched the project Web site, http://www.uvm.edu/~pepa/. The site was designed to be accessible and useful for the general public and practitioners seeking project information, performance-based incentives materials, and water-quality related news.
- Conducted outreach presentations at seven professional conferences and nine watershed and targeted outreach sessions. Audiences have included farmers and other stakeholders, scientists, local, state, and federal agency staff, and policymakers.



Impacts/Outcomes:

- Outreach presentations on the performance-based incentives concept have reached over 300 individuals in the project's first year.
- As a result of project outreach, efforts to develop specific watershed-level recommendations for the use of performance-based incentives are being considered in California, Oregon, Florida, Maryland, and Missouri. These efforts will complement previously developed recommendations currently being pilot-tested in Vermont and Iowa.
- Outreach presentations have been effective at increasing understanding of this innovative approach. Over 87% of presentation attendees have reported that the presentation contributed either "somewhat well" or "extremely well" to their understanding of the performance-based incentive concept.
- Four articles highlighting the efforts of watershed groups working with the project were printed in *Agri News*, an independent agricultural newspaper distributed in Minnesota and Iowa.

On the web at: http://www.uvm.edu/~pepa/

Applying knowledge to improve water quality

Volunteer Water Quality Monitoring

National Facilitation Project

A Partnership of USDA CSREES & Land Grant Colleges and Universities

The Volunteer Water Quality Monitoring National Facilitation Project supports volunteer water quality monitoring efforts across the country.

Situation:

Volunteer water quality monitoring programs engage people in watershed stewardship. They improve understanding of local water resources, encourage individual and community involvement, and help communities make informed decisions in protection and restoration efforts. In many cases monitoring takes place where there never had been any, adding a local perspective and validating local concerns that are often missed in large-scale efforts. We need to support and expand volunteer monitoring in order to get more people in and on the water.

Actions:

We help new programs get started and strengthen existing ones. We integrate our efforts with other national facilitation projects to expand our collective impact. We have:

- Located and linked over 50 Extension-affiliated volunteer monitoring programs in more than 30 states.
- Created our flagship website www.usawaterquality.org/volunteer to house our outputs, and provide a virtual hub for our activities.
- Produced a series of factsheet learning modules which are easily downloaded from the website. They provide one-stop shopping for those who are just getting started or interested in growing their programs.
- Created the listserv CSREESVolMon@lists.uwex.edu, for questions, suggestions and advice, information and news. This listserv reaches over 350 members!
- Created an online archive for the listserv discussions to capture these lively information exchanges. It currently houses exchanges on over 60 topics.
- Conducted workshops at many statewide, regional and national conferences, tailored to meet the needs of the audience. Presentations are archived on the website to enhance access to the information provided.
- Co-sponsored and co-hosted the 2006 National Water Quality Monitoring Conference, developing a comprehensive series of workshops and sessions. We provided support for the more than 100 volunteer monitoring attendees among the nearly 900 conference participants.
- At the invitation of EPA's Watershed Academy, presented a webcast on "Getting Started in Volunteer Monitoring" that reached over 200 participants in 34 states and several foreign countries, archived at http://www.clu-in.org/conf/tio/owvolwq_101106/.

Impacts/Outcomes:

- Recognized as national service provider leaders for volunteer water quality monitoring,
- Enhanced communication among Extension volunteer monitoring programs nationwide,
- Reduced effort to start new volunteer monitoring programs or to expand existing ones,
- Lent support and credibility to previously isolated programs,
- Expanded volunteer opportunities due to enhanced local and state acceptance,
- Strengthened partnerships within and between CSREES programs and other agencies, and
- Enhanced recognition volunteer monitoring efforts as a viable component of the water monitoring community.

On the web at: http://www.usawaterquality.org/volunteer

Nonpoint Education for Municipal Officials (NEMO)

The National NEMO (Nonpoint Education for Municipal Officials) Network is a confederation of programs around the country that educate local land use decision makers about the relationship of land use to water resource protection.

Situation:

Land use is decided not only by individual property owners, but by community officials sitting on local land use boards and commissions. These officials need information, tools and education to help them do a better job of protecting their water resources as they grow their communities.

The 32 programs of the NEMO Network educate local officials about the link between land use and water resource protection. The Network is coordinated by the University of Connecticut Cooperative Extension, which leverages CSREES funding with other support to help develop new NEMO programs and strengthen existing programs through trainings and the exchange of methods, publications and resources.

Impacts/ Outcomes:

- Creation of 32 NEMO programs in 30 states.
- Enhanced communication between member projects, resulting in multi-state educational efforts and adapted educational materials and programs.
- Innovative, new educational products, such as the CT NEMO's Online Community Resource Inventory (CRI).
- Expanded educational tools for Network programs, including open space planning education, forest resource protection education, geospatial tools, and low impact development/site design research.
- Increased awareness of Extension's leadership role in assisting community decision makers.

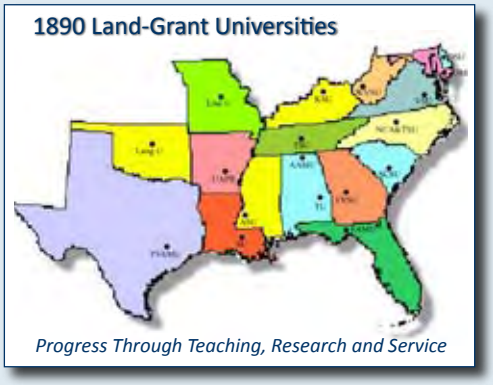
Actions:

- Conducted over 100 "scoping workshops" to assist multi-organizational collaborations in other states adapt NEMO to their natural resource and land use challenges.
- Provide new programs with a startup kit that includes sample presentations, publications and tips.
- Provide technical (GIS) and topical (land use planning) trainings for Network members.
- Created the National NEMO Network website (http://nemonet.uconn.edu), which allows programs to share educational materials, report successes and impacts, and connect with a variety of resources.
- Issue a semiannual newsletter that profiles member programs, announces upcoming events and conferences, reports on national policy developments, and provides a status update on the network.
- Manage the National NEMO Network listserv, an interactive forum for NEMO coordinators to share experiences, seek advice and discuss educational approaches.
- Organize the NEMO University (or NEMO U) National Network conference, an opportunity for Network members to develop new educational strategies, collaborate, and share methodologies and research. The sixth conference is scheduled for October 2008 in California.
- Issue a biennial Network Progress Report, encapsulating both Network-wide progress and individual NEMO project impacts.

Contact: ***David Dickson***
University of Connecticut
Cooperative Extension System
860-345-4511, david.dickson@uconn.edu

On the web at: http://nemonet.uconn.edu

Facilitation of 1890 Institutions' Water Resource Education, Extension and Research Efforts



Recognizing the need to provide water resource programming to underserved audiences in rural and urbanizing communities nationwide, the 1890s established a water resource network of education, extension and research personnel.

Situation:

There is a strong interest in water resource education, extension and research at most of the 1890 Institutions. Recognizing the strong interest in, and commitment to providing water resource programming to underserved audiences in rural and urbanizing communities nationwide, the 1890s established a water resource network of education, extension and research personnel. The coalition will increase the involvement of the 1890 Land-Grant Universities (LGUs) in the USDA-CSREES National Water Resource Program as well as build on mutually beneficial partnerships among 1994 and 1862 LGUs. Such partnerships would build upon common goals and interests shared by minority-serving land grant institutions with water quality programs, while at the same time, drawing upon the diversity of resources and expertise found among the 1862 institutions. The coalition involves ten of the eighteen 1890 institutions that currently have water quality research or extension programs. The other 1890 institutions will be encouraged to join as they begin to build their capacity in the water resource arena.

Actions:

- Developed criteria for the mini-grant awards with the assistance of the project coordination committee. The mini-grant projects will enhance water resource deliverables at 1890 institutions. Five mini-grants were awarded to five of the coalition universities in FY 2007. Alcorn State University, Delaware State University, Florida A&M University, Langston University and Lincoln University were the recipients.
- Facilitated extramural grant proposal writing amongst 1890 institution research and extension faculties. Proposals addressed critical issues in water resources.

Contact: ***Dr. Sam O. Dennis***
Institute of Agricultural and Environmental Research
Tennessee State University
3500 John A. Merritt Blvd.
Nashville, TN 37209-1561
(615) 963-5822
sdennis@tnstate.edu

Impacts/Outcomes:

- Enhancement of emerging water resource programs at 1890 Institutions.
- Water resource outreach to communities served by the 1890s.
- Enhanced regional and multi institutional collaboration in water resource research and extension programs.
- Networking across multiple disciplines and institutions.

Livestock and Poultry Environmental Learning

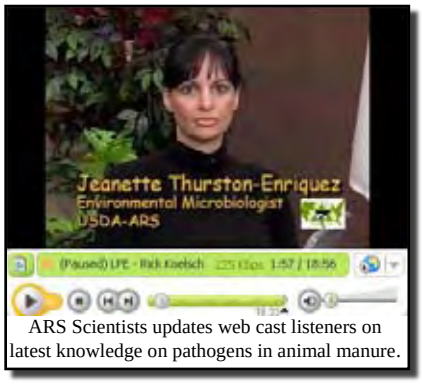
Situation:

A national team has established a national Livestock and Poultry Environmental Learning Center committed to:

- Implementing a customer driven outreach initiative driven by critical and emerging issues.
- Coordinating the assembly of our best science-based information targeting these issues.
- Implementing innovative outreach models for connecting those who create new knowledge with the end users of that knowledge.

Actions:

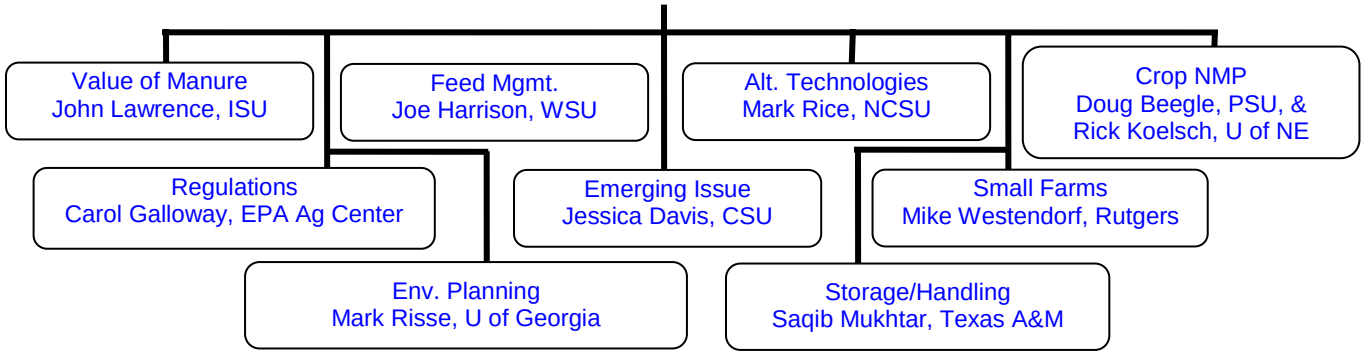
As of the end of 2007, the Learning Center has hosted 15 web cast seminars on animal manure management issues for a national audience. The comments received in the post-web cast evaluations are overwhelmingly positive. Thirteen continuing education units (CEUs) from the International Certified Crop Advisers (CCA) and 13 CEUs for the American Registry of Professional Animal Scientists (ARPAS) have been approved for webcast attendance.



ARS Scientists updates web cast listeners on latest knowledge on pathogens in animal manure.

The Learning Center is an approved eXtension Community of Practice. To develop its content, the project has assembled nine issue teams to which more than 100 land grant university faculty and NRCS staff are contributing or reviewing content. The Learning Centers web site for eXtension is due to go live March 2008 and will replace our current web resource (http://lpe.unl.edu).

Learning Center issue work groups and their leadership for developing eXtension web content.



Impacts/Outcomes:

This project is connecting individuals involved in public policy issues, animal production, and delivery of technical services with the nation's best science-based resources responsive to priority environmental issues in animal agriculture.

The project connects with more than 1,000 subscribers on at least a monthly basis through a Learning Center newsletter. Through the end of October 2007, the web casts have been viewed live by 1403 individuals. Viewership is further increased by the 5000+ accesses of the archived web casts. The average individual viewing a live web cast reports that they interact with 124 producers during a calendar year. The web site provides an additional connection to our clientele and currently averages 4,000 unique visits per month.

Recently completed web cast seminars have addressed changes to federal Confined Animal Feeding Operation regulations, value of manure as an energy source, vegetative treatment systems for open lots, application of treatment technologies, and managing manure as a nutrient resource. Thirty national experts from 12 universities, US EPA, USDA (ARS, CSREES, and NRCS), and USGS have contributed to the web casts.

On the web at: http://lpe.unl.edu

Tribal Colleges and Universities National Facilitation Project for Increasing Tribal Involvement in the National Water Program

Water resources on reservations are emerging critical issues in Indian Country. Tribes nationwide are challenged to develop water programs to address water quality and quantity issues.

Lac Courte Oreilles Ojibwa Community College in Hayward, Wisconsin is conducting research on aquatic invasive plants and conducting community education to mitigate environmental and water quality impacts. Salish Kootenai is building an invasives network in the Flathead Basin, Montana, headwaters of the Columbia River System.

Northwest Indian College and multiple partners successfully implement a bacterial TMDL for dairy in the Nooksak River Watershed, Washington leading to protection of an important commercial tribal shellfish industry and water quality standard attainment.

Contact:
Virgil Dupuis
Extension Director
Salish Kootenai College
virgil_dupuis@skc.edu

Situation:

Tribes across the country are faced with building water programs to address critical emerging water quality and quantity issues in Indian Country. The colleges are building capacity to assist their communities in addressing water issues that are affecting tribal cultures, economies, and their communities' future. The lack of program building mechanisms and institutional capacities limit progress in conserving and improving water resources.

Actions:

- Expanding participation, discussion, and coordination of water issues within the colleges in environmental science, water, technology, and engineering fields.
- Survey of colleges' water interests, needs, and issues.
- Represent tribal college issues with USDA, EPA, NSF, land grant partners, natural resource advisory boards, and the Committee for Shared Leadership.
- Colleges participating at regional and national levels of the National Water Program, and building partnerships with other local, regional, and federal entities.
- Identified priority issues: Drinking water, developing water quality professionals and providing training opportunities for Native American students, developing water quality regulation capacity, toxics, ecological restoration, water quantity for existing and future community, agricultural, and other needs, sharing and developing programs, laboratories, capacity, and funding.

Impacts/Outcomes:

- Expanding participation to fourteen tribal colleges. United Tribes initiating Volunteer Monitoring and mobile testing.
- Salish Kootenai College and Menominee collaborative planning in sustainable resource management.
- Building an upcoming Tribal College Environmental Research Symposium with a water focus.
- Expanding analytical laboratories at colleges at Sitting Bull, Salish Kootenai, and Northwest Indian College.

Participating Institutions:

- Salish Kootenai College
- Fort Belknap Community College
- Chief Dull Knife Community College
- College of Menominee Nation
- Haskell Indian Nations University
- Sitting Bull College
- Little Big Horn College
- Dine College
- Blackfeet Community College
- Fond du Lac Tribal and Community College
- Northwest Indian College
- United Tribes Technical College
- Lac Courte Oreilles Ojibwa Community College
- Southwest Indian Polytechnic Institute

National Facilitation Projects

Great Lakes Radio Consortium's *Environment Report*

The Environment Report is a news service committed to revealing the relationship between the natural world and the everyday lives of people.

Situation:

A NEETF/Roper Starch Worldwide survey in 1998 found that "most Americans rely on outdated or incorrect information when making decisions about the environment and use common myths to guide their behavior." Despite the negative results, the study also found that as people became aware of environmental issues they took action. By learning about the relationship between water quality and agriculture, citizens will be better able to make informed decisions with respect to the environment. *Environment Report* stories seek to inform listeners about these issues.

Actions:

In the first year of this project, 27 radio stories were produced and distributed to more than 140 public radio stations. These stories were a combination of longer features (4 to 5 minutes), and news spots (~1 minute). Topics covered included CAFO pollution, assessments of nitrogen reduction programs, pesticide exposure, and the dead zone in the Gulf of Mexico. In July of 2006, the GLRC promoted and released a five-part series titled "Pollution in the Heartland" (see photo). Overall, the reporting is intended to strengthen the public debate about the water quality impacts of current and proposed agricultural practices.

Stories are archived on our website (environmentreport.org), and are also available through a podcasting partnership with National Public Radio. The evaluation portion of this project will use a series of surveys and focus groups to determine whether these reports have an effect on listener behavior. The first focus group sessions were conducted by Market Trends Research, Inc. in November 2006.

Contact:
Mark Brush, Sr. Broadcast Producer
GLRC's *Environment Report*
brush@glrc.org

Impacts/Outcomes:

Ratings analyses show that these 27 stories made over 5 million listener impressions; visits to environmentreport.org nearly doubled since the summer of 2005; and podcasts were download by approximately 6,000 people per month. Through the use of natural sound, scene-setting, and a variety of voices, *Environment Report* stories draw listeners in, helping them to understand even complex scientific topics. As our past work with the USDA CSREES program has shown, this approach works. A 2004 report that the GLRC commissioned from Market Trends Research found that "the impact of GLRC reporting appears to be substantial." Comparing 2002 to 2004 results, the percentage of listeners who considered themselves well informed about environmental issues in general increased by 14%. Listeners reported greater awareness even of highly specific subjects, such as the effect of nitrogen on water quality. Also, recent focus group studies (Winter '06) suggest the reports are having positive impacts on listener behavior. These results indicate that *Environment Report* stories are making important connections with listeners.

On the web at: http://environmentreport.org

http://environmentreport.org

Liquid waste being injected into a field in southern Michigan

Promotional card for the GLRC's five-part series

A new tile drain in Ohio

The Environmental Pathogens Information Network (EPI-net)

EPI-net aims to empower stakeholders and policy-makers with the knowledge to make sound decisions about issues associated with the presence of pathogens in the environment.

Situation:

The challenges associated with managing microbial contamination of water resources and the roles that science plays in addressing those challenges are at the forefront of water policy discussions across the country. To maximize the effectiveness of information exchange regarding this issue, a National Facilitation Project titled: The Environmental Pathogens Information Network (EPI-net) is being developed and managed at Purdue University.

Impacts/Outcomes:

The project establishes a foundation for collaborative education and outreach efforts to facilitate a widespread understanding of the environmental behavior of pathogenic microorganisms in the environment. The workshops had a great impact on the attendees. The workshops are set up as a class, some of the topics discussed include: Pathogens in the environment, Survival of pathogens and indicator in the environment, and Microbial Source Tracking. We had participants from different government agencies (EPA, USGS, IDEM), universities and other nonprofit environmental organizations. Evaluations were great; participants found these workshops very useful for their research and professional careers. EPI-net is developing more workshop series for the following year.

Actions:

The creation of **EPI-net.org** as a keystone web-based organization provides a stable, centralized resource of water-related environmental microbiological contamination information; encourages information sharing; connects a network of stakeholders, regulatory officials, and technical experts; provides a reliable point of reference (methods and data interpretation); and increases our ability to develop a coherent national research agenda and good public policy. We developed a nationally representative advisory structure consisting of members from government, academia, and the private sector. The website hosts a wealth of existing environmental microbiology (e.g., *E. coli*) data and information available from both the refereed literature and state and federal sources in an on-line information repository to facilitate data sharing to produce a level of common knowledge that lays the foundation for discussions between the science and stakeholder groups. EPI-net also organizes a series of small workshops on topics related to pathogens in the environment and is writing mini reviews on pathogens-related topics as part of the website.

EPI-net Manager
Ronald Turco
915 W. State Street
Purdue University
West Lafayette, IN 47907
765-494-8077
rturco@purdue.edu

EPI-net Coordinator
Militza Carrero-Colon
915 W. State Street
Purdue University
West Lafayette, IN 47907
765-496-7737
carreroc@purdue.edu

On the web at: http://www.epi-net.org

Contact the CSREES National Water Program

National Program Leader

Dr. Michael P. O'Neill
USDA-CSREES, Mail Stop 2210
1400 Independence Avenue, SW
Washington, D.C. 20250-2210
Phone: (202) 205-5952
Fax: (202) 401-1706
moneill@csrees.usda.gov

Committee for Shared Leadership Members

The Committee for Shared Leadership for Water Quality is an internal working group created to foster development of the National Water Quality Program. Members include the 10 Regional Coordinators from Regional Projects funded through the Section 406 Integrated Water Quality Grants Program, an 1890 and a 1994 Representative, and the CSREES National Program Leader for Water Quality.

Region 1

Dr. Art Gold
University of Rhode Island
Natural Resources Science Dept.
1 Greenhouse Road
Coastal Institute in Kingston
Kingston, RI 02881
Phone: (401) 874-2903
Fax: (401) 874-4561
agold@uri.edu

Region 2

Dr. Chris Obropta
Rutgers University
Dept. of Environmental Sciences
14 College Farm Rd., Rm. 232
New Brunswick, NJ 08901
Phone: (732) 932-9800 ext. 6209
Fax: (732) 932-8644
obropta@envsci.rutgers.edu

Region 3

Dr. Thomas Simpson
University of Maryland
Chesapeake Bay Programs
1439 AnSc/AgEn Building
College Park, MD 20742
Phone: (301) 405-5696
Fax: (301) 314-9023
tsimpson@umd.edu

Region 4

Dr. Greg Jennings
North Carolina State University
Biological and Ag Engineering
Box 7625, Room 210A Weaver Labs
Raleigh, NC 27695-7625
Phone: (919) 515-6791
Fax: (919) 515-6772
jennings@ncsu.edu

Region 5

Dr. Robin Shepard
University of Wisconsin - Madison
625 Extension Building
432 N. Lake Street
Madison, WI 53706
Phone: (608) 262-1748
Fax: (608) 262-9166
rlshepar@wisc.edu

Region 6

Dr. Mark L. McFarland
Texas A&M University
Texas AgriLife Extension Service
Soil & Crop Sciences Department
348 Heep Center
College Station, TX 77843-2474
Phone: (979) 845-2425
Fax: (979) 845-0604
ml-mcfarland@tamu.edu

Region 7

Dr. Gerald A. Miller
Iowa State University
College of Agriculture
132 Curtiss Hall
Ames, IA 50011-1050
Phone: (515) 294-4333
Fax: (515) 294-5745
soil@iastate.edu

Region 8

Dr. Reagan Waskom
Colorado State University
CSU Water Center
E102Engineering Bld.
Fort Collins, CO 80523-1033
Phone: (970) 491-2947
Fax: (970) 491-1636
reagan.waskom@colostate.edu

Region 9

Dr. Kitt Farrell-Poe
University of Arizona
Yuma Agricultural Center
6425 W. 8th Street
Yuma, AZ 85364
Phone: (928) 782-3836
Fax: (928) 782-1940
kittfp@ag.arizona.edu

Region 10

Dr. Bob Mahler
University of Idaho
PSES, 2339
Moscow, ID 83844-2339
Phone: (208) 885-7025
Fax: (208) 885-7760
bmahler@uidaho.edu

1890 Representative

Dr. Cassel (Cass) Gardner
Florida A&M University
Cooperative Extension
202-J Perry-Paige Bldg., S.
Tallahassee, FL 32307
Phone: (850) 599-3546
Fax: (850) 561-2151
cassel.gardner@famu.edu

1994 Representative

Mr. Virgil Dupuis
Salish Kootenai College
Salish Kootenai College Extension
PO Box 70 (shipping 52000 Hwy 93)
Pablo, MT 59855
Phone: (406) 275-4899
Fax: (406) 275-4809
virgil_dupuis@skc.edu

On the web at: http://www.usawaterquality.org

CSREES National Water Conference

The CSREES National Water Program's annual conference held in Savannah, Georgia in February, 2007 enabled water resource professionals engaged in research, extension, and education to share knowledge and resources, identify emerging issues, and to strengthen the network of the CSREES National Water Program.

Over 120 technical presentations and 180 posters addressing key water resource issues were presented to more than 500 participants attending the conference.

Participants at the National Water Conferences include State extension water quality coordinators; university scientists, instructors, and extension educators who focus their efforts on water resource issues; USDA-CSREES staff members who work directly or indirectly with state water quality specialists; EPA staff involved with water resource issues; and others who work with or for public or private institutions involved with water resource management.

Proceedings for the 2003 - 2007 conferences are posted to http://www.usawaterquality.org/conferences/.

The next Conferences are scheduled for Feb. 3-7, 2008 in Sparks, Nevada and Feb. 1-5, 2009 in St. Louis, Missouri and will emphasize **Research, Extension and Education for Water Quality and Quantity**. Mark your calendars!

For further information, contact:

Dr. Greg Jennings
North Carolina State University
Biological and Agricultural Engineering
Box 7625
Room 210A Weaver Labs
Raleigh, NC 27695-7625
Phone: (919) 515-6791
jennings@ncsu.edu

Publication date: February 2008. This publication is produced by the CSREES Committee for Shared Leadership for Water Quality with support by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, National Integrated Water Quality Program, under Agreement No. 2004-51130-03114.

The U.S. Department of Agriculture prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.