

IOWA WATER NEWS

Iowa State Water Resources Research Institute

Summer • 2001

News Briefs

Iowa Spends \$11.2 Million on Water Quality

The Iowa Water Quality Initiative began this spring after the Iowa Legislature approved \$11.2 million in funding to improve water quality in the state. The money will be used to monitor water quality and create wetlands and buffer strips to protect lakes and streams. Federal environmental officials labeled 159 of Iowa's waterways impaired and have asked the state to take more aggressive measures to ease pollution.

Jeff Vonk New Director of Iowa Department of Natural Resources

Jeff Vonk, a former state conservationist, began his duties as IDNR director in March. Vonk served as the California State Conservationist for the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) from July 1998 until taking this position.

Emerging Water Quality Problems in Iowa

The potential implications of endocrine and pharmaceutically active chemicals in drinking water supplies and wastewater pose new challenges for Iowa. The potential nitrate and phosphorous contamination of rivers and streams from animal waste is another challenge.

These challenges will require the prioritization of research needs and



Sarah Spaulding, a research scientist at the California Academy of Sciences in San Francisco, and Lyn Countryman, a graduate student at the University of Northern Iowa, collect algae or diatoms for analysis at the Iowa Lakeside Laboratory on West Okoboji.

development at ISWRRI. The expansion of ISWRRI's research programs will permit the institute to participate in solving some of Iowa's emerging water quality and quantity problems.

Mississippi River Research Station to Open

The Mississippi Riverside Environmental Research Station (MRERS), scheduled to open in early 2002, will be the only station of its kind to analyze all aspects of the Mississippi River, according to V.C. Patel, director of the Iowa Institute of Hydraulic Research (IIHR). The Iowa Department of Natural Resources (IDNR) is providing three acres of land near Muscatine at no charge to build and operate the station.

Watershed Management Vital to Water Quality

The Maquoketa Headwaters Watershed Council is a grassroots group that hopes to reduce pollutants entering Backbone Lake by 50 percent in five years. The council is working with local leadership to manage agricultural watersheds in eastern Iowa. The EPA and USDA have awarded \$540,000 for the project.

Henry A. Wallace Endowed Chair for Sustainable Agriculture

Lorna Michael Butler was named the first Henry A. Wallace Endowed Chair for Sustainable Agriculture at Iowa State University in February 2000.

Continued on page 5

From the Director:



The Iowa State Water Resources Research Institute (ISWRRRI) will publish a summer and winter newsletter each year to increase communication with its stakeholders and share new developments and research findings. ISWRRRI is a multi-campus institute that has conducted research, educational and outreach programs on Iowa's water-related problems for the past 36 years. ISWRRRI's mission is to develop statewide linkages between universities and public and private sectors and promote education, research and information transfer on water resources and water quality issues in Iowa. ISWRRRI is important to Iowa because its work focuses on protecting Iowa's waters, a resource that makes Iowa a leader in agricultural production.

Protecting Iowa's natural resources has been a major challenge for Iowa. Several positive things have happened in the recent past. Last year, Iowa's legislature and the governor took major steps in developing a new \$11.2 million Water Quality Initiative to protect Iowa's water resources. This initiative provides ISWRRRI an excellent opportunity to work with state agencies in developing joint projects and interdisciplinary teams to solve current and emerging water quality problems in Iowa. Iowa's three regent universities and other educational institutions have outstanding faculty and staff working in the water science area.

The Water Resources Act of 1984 requires that ISWRRRI be evaluated periodically to determine its eligibility for continued support of federal funds. In November 1999, ISWRRRI was placed on probation and faced the threat of losing those funds. I was appointed ISWRRRI's new director in December 1999 and my major challenge was to regain federal funding within one year. ISWRRRI's newly appointed faculty advisory council and state advisory research panel provided exemplary leadership, energy and time in developing ISWRRRI's new five-year (2001-2005) strategic plan. The dean of ISU's College of Agriculture, who also is the director of the Iowa Agricultural Experiment Station, and the vice provost for research made a three-year commitment to provide additional funds to strengthen ISWRRRI's competitive research grants program. The additional funding and visionary guidance of ISWRRRI's faculty advisory council and support from the Iowa Departments of Natural Resources and Agriculture and Land Stewardship allowed the development of several new programs in 2000. In March 2001, ISWRRRI won back its standing and was removed from probationary status.

The summer issue of the newsletter provides information about ISWRRRI's activities including student internships, award winners and faculty research projects. This is a brief glimpse of some of ISWRRRI's contributions in protecting Iowa's water.

Ramesh Kanwar, Director of Iowa State Water Resources Research Institute
Iowa State University



ISWRRRI Funded Projects

Robert Andrews Jr., microbiology, Iowa State University (ISU), "Effect of swine waste effluent application on Tn916 content of surface waters," \$27,275.

Bill Evangelou, agronomy, ISU, "Predicting sorption, mobility, accumulation, and degradation potential of antibiotics in Iowa's soil/water environment," \$20,000.

Jeffery Lorimor, ag and biosystems engineering, ISU, "Effect of liquid swine manure application on water quality from soil infiltrated areas and wetlands," \$28,000.

James Russell, animal science, ISU, "Effects of grazing management on sediment and phosphorus losses from pastures," \$19,500.

William Simpkins, geological and atmospheric sciences, ISU, "Estimation of the nutrient load to Clear Lake from groundwater using analytic element and parameter estimation models," \$21,983.

U. Sunday Tim, ag and biosystems engineering, ISU, "Modeling, Geographic Information Systems, and technology transfer in support of total

maximum daily limit (TMDL) development and implementation in Iowa," \$19,879.

Richard Valentine, civil & environmental engineering, University of Iowa, "Occurrence and formation of nitrosamines in drinking water distribution systems," \$47,704.

Arnold van der Valk, botany, ISU, "Evaluating the effectiveness of restored wetlands for reducing nutrient losses from agricultural watersheds," \$26,000 from ISWRRRI and \$52,000 from the Leopold Center.

Soil Pit Offers Hands-on Learning

Checking out what's below the soil's surface is a hands-on experience at Iowa State University's Northeast Research and Demonstration Farm. Last year ISWRRRI provided \$2,000 to help build a soil pit on the farm near Nashua. The pit is bordered on three sides by three different crops; corn, alfalfa and soybeans.



The soil pit also provides an unusual view for farm visitors. The soil pit is five feet deep, four feet wide and eight feet long. Ken Pecinovsky, research



Alissara Reungsang, a former graduate student in agricultural and biosystems engineering, and Ken Pecinovsky, Northeast Research farm manager, get a first-hand view of plant roots below the soil's surface.

“People get to see plant root growth, earthworm burrows, and rock formations. It’s something they don't typically get to see.”

farm manager, said walking into the pit is an experience that both children and farmers enjoy.

“People get to see plant roots growing, earthworm burrows and rock formations,” Pecinovsky said. “It’s something they don’t typically get to see.”

About 200 visitors have checked out what's below the soil's surface during the past year. Pecinovsky said it's a learning tool that will give students and adults a better understanding of the soil.



State Funded Water Resources Research Projects

Iowa Lakes Survey 2000.
Funded by the Iowa Department of Agriculture and Land Stewardship for \$1,885,155. John Downing, ISU animal ecology. The objective of this program is to sample 132 of Iowa's principal recreational lakes and to characterize current water quality.

Upper Maquoketa Watershed River Monitoring.
Funded by the Iowa Department of Natural Resources for \$201,292. J. L. Baker, S. W. Melvin, R. S. Kanwar, P. Gassman, and G. A. Miller, ISU. The research is an effort to obtain water quality monitoring data, including bacterial sampling, for the Upper Maquoketa River watershed.

Agricultural Drainage Wells - Research and Demonstration Project.
Funded by Iowa Department of Agriculture and Land Stewardship for \$487,643. S. W. Melvin, J. L. Baker, and W. Crumpton, ISU. The objective of this project is to determine the water quality benefits of improved chemical management systems (in particular, effects of rate, method, and timing of methods of nutrient and pesticide applications).

ISWRRI Awards Presented at Water Conference



ISWRRI award winners included Paul Johnson, Decorah; Marjorie Welch, Creston; Martin Helmke, Iowa City; Jennifer Durham, Wagner, South Dakota; and John Downing, Ames.

The Iowa State Water Resources Research Institute (ISWRRI) presented awards to five Iowans for their exceptional contributions in understanding and conserving water resources during 2000. The first annual awards were presented March 6 at the Agriculture and the Environment Conference held on the Iowa State University campus.

Paul Johnson, Decorah, received the Outstanding Water Resources Citizen Award. Johnson was selected because of his long record of service to conserving and protecting Iowa's water resources in the capacity of farmer, legislator and administrator.

John Downing, Iowa State animal ecology professor, received the Outstanding Water Resources Researcher Award. Downing's award was based on his research and ability to communicate research results to the public.

Marjorie Welch, a chemistry and environmental science instructor at

Southwestern Community College, received the Outstanding Water Resources Educator Award. Welch was selected for her commitment to educating secondary and elementary students about the importance of water resources.

Martin Helmke, an Iowa City resident and graduate student in the Iowa State geological and atmospheric sciences department, received the Outstanding Water Resources Graduate Student Award. Helmke's award was based on his strong academic performance, research and teaching skills.

Jennifer Durham, a sophomore at Buena Vista University, received the Outstanding Water Resources Undergraduate Student Award. Durham was selected because of her strong academic performance, commitment to water resources research and interest in public information and policy affecting water resources.

Upcoming Events:

August 2001

6-8 International Specialty Conference on Globalization and Water Management: The Changing Value of Water. University of Dundee, West Park Centre, Dundee, Scotland, e-mail: p.k.wouters@dundee.ac.uk.

13-16 Water Security for the 21st Century - Building Bridges Through Dialogue - 11th Stockholm Water Symposium. e-mail: symoos@siwi.org).

27-30 Monitoring and Modeling Nonpoint Source Pollution in Agricultural Landscapes - 9th National Nonpoint Source Monitoring Workshop. Indianapolis Ind., e-mail ctic@ctic.purdue.edu.

September 2001

2-6 IV Inter-American Dialogue on Water Management, Foz do Iguacu, Parana, Brazil, e-mail: bgriesinger@oas.org; web: www.iwrn.net.

5-6 Wetlands and Remediation: 2nd International Conference, Burlington Vermont, e-mail: young@battelle.org; web: www.battelle.org/environment/er/wetlandscon/.

24-26 Water Resources Management 2001. Halkidiki, Greece web: www.wessex.ac.uk/conferences/2001/wrm01/.

November 2001

12-15 AWRA's Annual Water Resources Conference. Albuquerque N.M., e-mail: info@awra.org.

26-29 Water for Human Survival - International Regional Symposium. New Delhi, India, e-mail: cbip@nda.vsnl.net.in.

March 2002

4-6 Agriculture Environment Conference. Iowa State University, Ames, Iowa. Contact: Richard Larson at (515) 294-6429.

U.S. Geological Survey Funds Three Year ISWRRI Project

University of Iowa researchers Marian Muste, Allen Bradley and Anton Kruger have developed an image based non-intrusive technique to monitor flow measurements in the laboratory

and in some field conditions. For the next three years this technique will be applied in the field and at the Mississippi Riverside Environmental Research Station. The researchers will

receive \$85,070 to conduct a three year study on "Complementary investigations for implementation of remote, non-contact measurements of streamflow in riverine environment."

Water Quality Conference Focuses on State and Federal Water Initiatives

Water quality issues were discussed at the “Agriculture and the Environment: State and Federal Water Initiatives” conference held March 5-7 at Iowa State University. Participants examined agriculture’s impact on water quality and policies relating to watershed management.

State and federal agencies are monitoring water quality for non-point pollution problems. Richard Larson, Iowa State agronomist, said the conference was helpful in providing information to producers about state and federal water initiatives.

“If things don’t change, these agencies may implement standards that will directly affect producers,” Larson said. “We want producers to avoid overuse of nutrients so they may be able to avoid more regulation.”

The conference provided a forum for discussion about the critical issues affecting water resources. Larson said it gave everyone involved at the water quality conference a chance to share information.

“It allowed an exchange of ideas between those with experience and those who are just getting started on projects,” Larson said.

Conference topics included:

- Iowa 2000 Water Initiative
- State Watershed Task Force Report recommendations
- Future water quality programs:
A national perspective
- Hypoxia
- State nutrient management strategy
- Conservation in the 2002 Farm Bill
- Results of the 2000 lake monitoring program
- Iowa Nutrient Management Task Force Report
- Overview of total maximum daily loads and update of state activities
- Update on animal feeding and confinement operations standards
- Wetlands and water quality

The conference sponsors included Iowa State’s College of Agriculture, ISU Extension, the Iowa State Water Resources Research Institute, the Leopold Center for Sustainable Agriculture and the Iowa Department of Natural Resources.

Water Conference Topics from the Past

- 1996 - Agriculture and the Environment: Building Local Partnerships. The conference provided an in-depth discussion of many of Iowa’s local watershed and water quality projects.
- 1997 - Discussion of nonpoint source pollution prevention efforts in Iowa and at the national level.
- 1998 - Safe Drinking Water Act and its impacts.
- 1999 - Global Water Issues - held in conjunction with the EPA Region VII Nonpoint Source Pollution Conference.
- 2000 - Federal Clean Water Act and its impact on nonpoint source pollution in agricultural watersheds.

The proceedings from each year are available by contacting Agribusiness Education Programs, 2104 Agronomy Hall, Iowa State University, Ames, IA, 50011. The 2000 proceedings are posted at <http://extension.agron.iastate.edu/aged/>.

The next Agriculture and Environment conference is scheduled to be held March 4-6, 2002 at Iowa State University.



News... continued from page 1

Butler was an extension anthropologist and professor in the Department of Rural Sociology at Washington State University in Puyallup, Washington.

New Leopold Center Director

The president of a 3,500-acre North Dakota organic farming operation was appointed the director of the Leopold Center for Sustainable Agriculture at Iowa State University. Frederick Kirschenmann assumed responsibilities at the center on July 1, 2000.

Kirschenmann’s broad experience includes service as a faculty member and administrator at four colleges; positions of leadership in state, national and international agricultural organizations; and more than 20 years of hands-on experience in putting theories of sustainability into practice on his farm.

Kirkham Conference 2000

The first annual Kirkham Conference was held Nov. 2 and 3, 2000 at Iowa State University. The conference honored the late Don Kirkham, Curtiss Distinguished Professor of Agriculture

and professor of physics, and his wife Betty. Kirkham served as ISWWRI’s first director from 1964-1973.

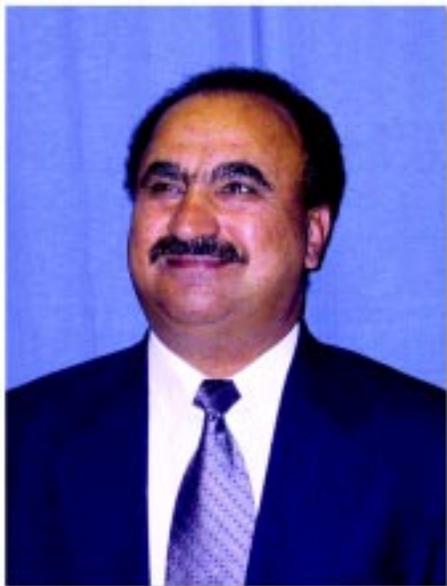
First Annual Water Monitoring Conference

Iowa’s first annual water monitoring conference was held March 29, 2001 at Iowa State University. Highlights included a summary of the Iowa Department of Natural Resources water monitoring plan. The plan includes streams, rivers, lakes, groundwater and beaches. Monitoring of chemical, physical and biological indicators began in the summer of 1999.

Faculty Profiles

Mahdi Al-Kaisi

Assistant professor of soil science at Iowa State University. Al-Kaisi is originally from Baghdad, Iraq and came to Iowa State in April 2000.



Academic Degrees:

1974 - Bachelor's degree in soil science from the University of Baghdad.
1982 - Master's degree and in 1996 doctorate degree from North Dakota State University in soil physics.
1987 - Assistant professor of soil science at the University of Baghdad.
1989 - Research associate in soils department at North Dakota State University.
1991 - Water quality specialist at Colorado State University.

Current Duties:

His current position in soil management/environment is a split appointment between extension and research.

Research:

Research areas include conservation tillage, cropping systems, water quality, nutrient management, carbon sequestration, sustainable agriculture and wetland systems.

Al-Kaisi is involved in a carbon sequestration project to establish a data baseline for the state of Iowa under various tillage and crop rotation

systems. The project was established last fall to determine the impact of crop rotation systems on soil carbon changes. The work may enable researchers to quantify carbon changes that take place.

Maureen Clayton

Assistant professor of biology and environmental programs at the University of Northern Iowa, a position she has held since 1998.



Academic Degrees:

1990 - Bachelor's degree in marine science from Eckerd College.
1996 - Doctorate in biological oceanography from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in oceanography and oceanographic engineering.
1996 - postdoctoral investigator for the Woods Hole Oceanographic Institution and the Swiss Federal Institute for Environmental Science and Technology.

Current Duties:

Teaches environment, technology and society; invertebrate zoology; marine ecology of the western Gulf of Mexico and environmental biology.

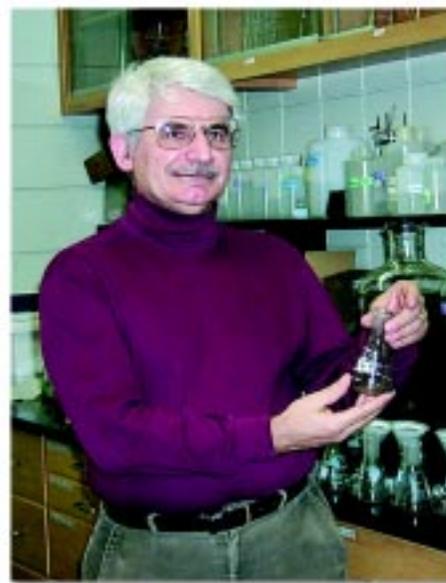
Research:

Research interests include sublethal effects of organic, organometallic, heavy metal contaminants on marine and freshwater organisms, development

and use of biomarkers on the effects of environmental contaminants, ecotoxicological effects of phytoplankton toxins and the physiology of toxic phytoplankton.

Bill Evangelou

Iowa State University agronomy professor since 1999.



Academic Degrees:

1972 - Bachelor's degree in General Agriculture from California State University, Chico.
1974 - Master's degree in Plant Sciences from California State University, Chico.
1981 - Doctorate degree in Soil-Water Chemistry-Mineralogy from the University of California, Davis.

Current Duties:

Teaches advanced graduate and undergraduate courses in environmental soil-water chemistry and environmental surface chemistry. Also conducts research on properties of Iowa soils and their physical and chemical behavior.

Research:

Soil and its interactions with water and chemicals. Research focuses on understanding the fundamental physical-chemical properties of soil and how those properties can be used to model and predict behavior of agrochemicals in soil and the soil's quality in the future. Received

\$200,000 from the fertilizer industry and \$40,000 from ISWRRI to study nitrogen fertilizer and pesticide behavior in soil and understand/model their long-term implications in soil/water quality in Iowa.

Rob Malone

USDA-ARS agricultural engineer at the National Soil Tilth Lab in Ames, Iowa since April 2001.



Academic Degrees:

1986 - Bachelor's degree in engineering physics from West Virginia Wesleyan College.

1992 - Master's degree in agricultural engineering from the University of Kentucky.

1996 - Doctorate degree in biosystems and agricultural engineering from the University of Kentucky.

Current Duties:

Research at USDA-ARS, National Soil Tilth Lab.

Research:

Modeling the effect of agricultural management on hydrology and water quality.

Specific research projects include:

- Reducing nitrate contamination to surface waters from artificially drained soils.
- Development of an integrated research information and decision support system for resource conservation planning and water quality protection.

Michelle Scherer

Assistant professor of civil and environmental engineering at the University of Iowa. She began teaching in 1998.



Academic Degrees:

1989 - Bachelor's degree in systems engineering, University of Virginia.

1994 - Master's degree from University of Connecticut.

1998 - Doctorate degree in environmental science and engineering from Oregon Graduate Institute of Science & Technology in Portland.

Current Duties:

Teaches environmental chemistry and hazardous waste remediation and enjoys interacting and working with students on graduate research.

Research:

Research focuses on two primary areas—remedial technologies and contamination fate. The purpose of the research is to gain an understanding of the interactions between elements dumped on the ground and minerals found in the ground.

Please contact us if you have questions or comments. You can call (515) 294-8921; fax (515) 294-9573; or email bamcman@iastate.edu. Iowa Water News is available free from the Iowa State Water Resources Research Institute, Iowa State University, Ames, IA 50011.

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Summer Research Interns 2001

Jennifer Durham, Buena Vista University, will work with John Downing, Iowa State animal ecology.

Tamara Ewaldt, ISU student, will work with Bill Simpkins, Iowa State geological and atmospheric sciences.

Andrew Fish, Buena Vista University, will work with Robert Buckmiller, U.S. Geological Survey, Iowa City, IA.

Holly Karnitz, Drake University, will work with Steve Mickelson and Tom Richard, Iowa State ag & biosystems engineering.

Joshua Peppers, Iowa State student, will work with Dean Lemke, Iowa Department of Ag & Land Stewardship, Des Moines, IA.



Kenyari, Moore, a high school junior, worked as an intern during the summer of 2000 with Ramesh Kanwar, ISWRRI director and Iowa State professor of ag and biosystems engineering.

Joe Whitney, University of Iowa, will work with Richard Valentine, University of Iowa, civil & environmental engineering.

ISWRRI Strategic Plan

Vision

To be recognized as a leader in research, education and information transfer on issues related to Iowa's water resources.

Mission Statement

Expand water resources programs for the benefit of the citizens of Iowa by leading innovative efforts in research, education and information transfer.

Goals and Characteristics

1. Promote research and scholarship in water-related environmental programs by developing innovative and interdisciplinary research projects, and increase collaborative partnerships between universities, state agencies, commodity groups, municipalities and public and private sectors.
2. Enhance learning of graduate and undergraduate students on water resources programs by creating enrichment opportunities.

3. Engage with stakeholders in information transfer related to water resources and water quality issues of Iowa to meet the needs of state agencies, communities and society.

The complete strategic plan text is available on the ISWRRI web site at <http://www.water.iastate.edu>



Biennial Water Quality Report Released

Overall water quality in Iowa appears to be good, according to a biennial report recently completed by the Iowa Department of Natural Resources. The biggest threat to water quality statewide is excessive sediment and nutrients and habitat alteration, although spills of chemicals and manure also are causes for concern.

The report summarizes the water quality in Iowa from October 1997 through September 1999. The report was compiled using a number of monitoring programs during this two-year period. It is required by the federal Clean Water Act and is often referred to as a Section 305(b) report. The next 305(b) report is due in 2002 and will cover the period from October 1999 through September 2001. That report will include data from Iowa's enhanced water quality monitoring program that began in 2000.

View the full report at <http://www.water.iastate.edu/>

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