

THE AQUAHOMAN

FEBRUARY 2005

VOLUME 1 NUMBER 1

A PUBLICATION OF THE OKLAHOMA WATER RESOURCES RESEARCH INSTITUTE

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THE AQUAHOMAN is published four times a year by the Oklahoma Water Resources Research Institute (OWRRI) at Oklahoma State University.

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2ND Annual Oklahoma Water Conference: A Great Success

The 2nd Annual Oklahoma water conference "Oklahoma Water 2004" brought together professionals involved in Oklahoma water resources to present research updates and discuss future research needs.

Two days of meetings were organized into sessions addressing the Tar Creek Superfund site, urban and rural water issues, and watershed planning. Myron Knudson, Senior Policy Advisor for EPA Region 6, delivered a keynote address titled, "Arsenic in Drinking Water".



Myron Knudson addressing conference attendees

The conference was sponsored by the Oklahoma Water Resources Research Institute and the Biosystems and Agricultural Engineering Department at Oklahoma State University. The program was planned by the Oklahoma Water Resources Research Institute, USDA-ARS Grazinglands Research Lab, U.S. Geological Survey, U.S. Army Corps of Engineers, University of Oklahoma, Oklahoma Conservation Commission, and Oklahoma State University.

More than 130 people attended the presentations. To view abstracts of the presentations visit the OWRRI website at environ.okstate.edu/ei/owrri/2004_waterconf. Planning has begun for "Oklahoma Water 2005" to be held in October.

OWRRI Recertified

The USGS has recertified OWRRI's eligibility to receive grants under the provisions of section 104 of the Water Resources Research Act of 1984, as amended. This allows the Institute to sponsor water research projects for the next five years.

WATER RESEARCH NATIONAL COMPETITIVE GRANTS PROGRAM REQUEST FOR PROPOSALS FY 2005

The U.S. Geological Survey in cooperation with the National Institutes for Water Resources requests proposals for matching grants to support research on the topics of water supply and water availability, which are issues of importance nationwide. Proposals are sought in not only the physical dimensions of supply and demand, but also quality trends in raw water supplies, the role of economics and institutions in water supply and demand, institutional arrangements for tracking and reporting water supply and availability, and institutional arrangements for coping with extreme hydrologic conditions. For planning purposes, the amount available for research under this program is estimated to be \$1,000,000 in federal funds, though there has not been a FY 2005 appropriation of funds for this program as of the date of this Announcement and the Government's obligation under this program is contingent upon the availability of appropriated funds. Any investigator at an institution of higher learning in the United States is eligible to apply for a grant through a Water Research

Institute or Center established under the provisions of the Water Resources Research Act of 1984, as amended. Proposals involving substantial collaboration between the USGS and university scientists are encouraged. Proposals may be for projects of 1 to 3 years in duration and may request up to \$250,000 in federal funds. Successful applicants must match each dollar of the federal grant with one dollar from non-federal sources. Proposals must be filed on the Internet at <https://niwr.org/> by 5:00 PM, Eastern Standard Time, February 22, 2005 and must be approved for submission to the National Competitive Grants Program not later than 5:00 PM, Eastern Standard Time, March 4, 2005 by the Institute or Center through which they were submitted. The Announcement (Request for Proposals) may be obtained either by going to <https://niwr.org/> and then clicking on "view the RFP" under National Competitive Grants Program -104G or by going directly to https://niwr.org/2005_104G_RFP.

OWRRI PROJECTS RECEIVING FUNDING IN 2005

Optimal Selection of Management Practices, Policies, and Technological Alternatives for Phosphorus Abatement: Using GIS and Economic Methodology to Model a Watershed is an evaluation of the economic efficiency of a set of policies designed to remedy phosphorus pollution problems in the Eucha-Spavinaw watershed in Eastern Oklahoma and Western Arkansas. A basin-level mathematical programming model will be used to simultaneously determine the: a) optimal location of processing facilities for and the quantity of poultry litter to be converted to energy, b) quantity of litter to be transported from poultry houses to locations within and out of the watershed, and c) best management practices for applying poultry litter in each HRU within the watershed so that the total cost of meeting specific phosphorus emission targets is minimized.

Estimating the Orientation and Intensity of Fractures in Sedimentary Rocks Using Multicomponent 3-D Ground-Penetrating Radar is a feasibility study to determine if multicomponent 3-D ground-penetrating radar (GPR) technique can be used effectively to map the fracture orientation and intensity in fractured rocks. The investigators will select a field location where fractures of different aperture, degree of occlusion, and intensity are present. The fracture orientation and intensity mapped by GPR will be verified by hydraulic tests in the field. The results of this study could be used to refine hydrologic modeling in fractured rock aquifers.

Science, Development and Public Opinion: The Adjudication of Groundwater Policy for the Arbuckle-Simpson Aquifer is a longitudinal study that will follow the impact of a scientific study being conducted by the Oklahoma Water Resources Board. The project assembles baseline public opinion data from newspaper articles, public comment letters, and in-depth semi-structured interviews. These baseline data account for public opinion toward the Arbuckle-Simpson aquifer *prior to* the release of significant scientific findings from the Oklahoma Water Resources Board. These baseline data will be compared against subsequent data to measure the change in public opinion over time. The results will provide important insights into the role of science in the adjudication of groundwater policy in the Arbuckle-Simpson case. In the final analyses, the investigators hope to discern the ultimate impact of science on Oklahoma groundwater law.

A Protocol to Determine the Optimal Placement of Riparian/Buffer Strips in Watersheds will be developed and tested to maximize the efficiency of riparian strips to remove sediment and nutrients and improve water quality. This study is the first step in developing a tool to assist the design and placement of buffer strips in agriculture dominated watersheds.

OWRRI PROJECTS FUNDED IN 2004

Springs in Time: Comparison of Present and Historical Flows

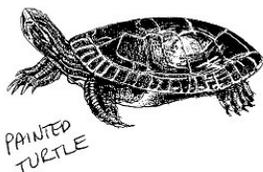
Groundwater is an important commodity in Oklahoma, with extensive use by agriculture, industry, municipalities, and private landowners. Regional plans have been developed to further tap aquifers and streams for water sales to distant municipalities. This poses a risk to maintenance of minimum stream flows to protect stream invertebrate communities. This study will determine whether spring discharge in each of five aquifers is being impacted by groundwater mining and document the faunal biodiversity of Oklahoma springs that are at risk from groundwater mining based on historical and predicted future trends.

Evaluation of Chemical and Biological Loading to the Blue River

Rivers and streams contain a variety of microorganisms. Most are naturally occurring and have little impact on human health. A few, however, do pose risks to human health. Bacterial water quality standards are guidelines for determining whether a fecal contamination indicator such as *E. coli* represent an acceptable risk. These levels are determined by the water use in which the standard is set at 1 CFU/100 ml. However, to assess such risk accurately, an understanding of the local environment and dominant mechanisms for bacterial survival is required. This background can then be used to assess the risk associated with anthropogenic loading as measured by increases in bacterial concentrations. Oklahoma's Blue River presents a unique opportunity to conduct this type of assessment because its genesis is the Arbuckle-Simpson aquifer and its watershed includes both undeveloped wilderness areas, trout fisheries, and developed areas. The findings of this study will support Oklahoma's efforts to develop appropriate risk-based criteria for bacterial contaminants in surface water.

Optimal Selection of Management Practices for Phosphorus Abatement Using GIS and Economic Methodology in the Modeling of a Watershed

Lake eutrophication has been blamed on excessive land application of poultry litter and resulting phosphorus runoff. The proposed research will provide spatially optimal, least-cost allocations of management practices between point and non-point sources to reduce phosphorus runoff in a watershed. Second, it will provide recommendations on management practices each producer should adopt. It investigates the feasibility of a cooperative venture to convert poultry litter into electricity and commercially saleable byproducts, which will reduce the land application of poultry litter. The amount of litter allocated to this plant and the plant's expected net income/loss will be included with the alternative management practices to determine the plant's effect on cost of achieving TMDLs.



Water Management Research Needs: A 2003 Survey of Water Resource Professionals

Dr. Will Focht*

At the first Oklahoma Water Symposium in 2003, we asked water management professionals in Oklahoma about their priorities for needed research to address pressing water resource questions. The results were obtained from an on-line survey (27 respondents) and a survey administered at the water symposium (26 respondents). The results of these two surveys demonstrate that the highest water research priorities relating to water quality are nonpoint source pollution (particularly from nutrient runoff from animal feeding operations, but also from urban runoff), riparian area function and restoration, sediment pollution, and microbial pollution, in that order. Highest priorities for research related to water quantity concern interbasin water transfers and aquifer declines, water rights, water inventories and demand forecasting, water conservation and recycling, and ground water-surface water interfaces also in that order. Water quality research needs were rated more important than water quantity research needs in both surveys.

This year, we will administer a follow-up survey at the symposium. The National Academy of Sciences has just published *Confronting the Nation's Water Problems: The Role of Research*. This report as well as the 2001 NAS report entitled *Envisioning the Agenda for Water Resources Research in the Twenty-First Century* will be the focus of a meeting of the Powell Consortium, a group of Directors of western states' Water Resources Research Institutes, (which includes the Oklahoma Water Resources Research Institute) in Las Vegas on October 21. The survey that will be administered at this year's Oklahoma Water Symposium will be informed by the results of the Powell Consortium meeting.

To view the full paper presented at Oklahoma Water 2004 Conference, visit the OWRRI website at: http://environ.okstate.edu/ei/owrri/2004_waterconf/index.htm

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Conferences

February 7-9, 2005

National Water Quality Conference
Research, Extension and Education for Clean Water
San Diego Marriott
La Jolla, CA
<http://www.soil.ncsu.edu/swetc/waterconf/main.waterconferenc.htm>

Feb 13-25, 2005

Water & Wastewater Leadership Center
Chapel Hill , North Carolina United States

February 16-17, 2005

Source Water Protection: Planning for the Future of
Source Water (seminar)
Nashville , Tennessee United States

February 17-18, 2005

AWWA Water Conservation Workshop
Savannah , Georgia United States
<http://www.awwa.org/conferences/conserve/>

February 21st, 2005

DEADLINE for paper submissions for Water
Quality Technology Conference and Exposition
November 6-10
Quebec City, Quebec
<http://www.awwa.org/conferences/wqtc/call/>

March 5-8, 2005

The National Institutes for Water Resources
Annual Meeting
Washington, DC
<http://water.montana.edu/NIWR>

June 27-29, 2005

American Water Resources Association
Spring Specialty Conference
Honolulu, Hawaii
www.awra.org

July 12-14, 2005

The Universities Council on Water Resources
Annual Meeting
Portland, Maine
<http://www.ucowr.siu.edu/05CoP.pdf>

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