

2014

Arkansas Water Resources Center Annual Summary



A YEAR IN REVIEW

The Arkansas Water Resources Center continues to focus on helping local, state and federal agencies manage and protect Arkansas' water resources. The Center succeeds in this effort through research activities, education and training outreach and disseminating water resources information to stakeholders throughout the State and region.

The AWRC has contributed substantially to the State's understanding of its water resources by conducting and funding scientific research and monitoring activities. Current projects generally focus on:

- drinking water treatment
- non-point source pollution
- water quality and quantity related to agricultural activities in the delta
- impacts of land use and climate change on water quality and its availability
- sensitive ecosystems

The training of students - Arkansas's future generations of scientists and engineers - is a top priority for the Center. For example, when soliciting research proposals, AWRC requires that proposals further this mission by describing how students will be involved and supported by the grant.

Another important component of the AWRC is the transfer of information to water resources stakeholders. Some of the ways the Center disseminates information are through an annual conference, publications available on the AWRC website and the use of other media outlets like Facebook and email newsletters.

The mission of the AWRC is to support and conduct water resources research, train future scientists and engineers and transfer water research results to stakeholders throughout the State. This document serves as a summary of the Center's projects and activities as related to its mission.



WHAT KIND OF RESEARCH DO WE DO?

Scenic Rivers Joint Study Committee -

Director, Brian Haggard, serves as co-chair overseeing the research by Dr. Ryan King of Baylor University. How does algal biomass and composition change with increasing phosphorus in the Illinois River Watershed? Will the scenic rivers TP criteria need to be changed?

Beaver Lake Chlorophyll a and Secchi Transparency Standard -

Teamed up with Dr. Thad Scott of the University of Arkansas to provide suggestions on how the existing numeric criteria should be evaluated. Results were used by the Department of Environmental Quality to inform policy.

Impact of Unconventional Natural Gas Development -

Collected the final of four years worth of data to evaluate how land use change might influence water quality in the South Fork of the Little Red River.

Alum Study -

Evaluated the use of aluminum sulfate to reduce nutrient release from sediments in Lake Wister. Alum was very successful in the short term and a long-term study will follow.

Turbidity Impairments -

28 river miles are listed as impaired on the West Fork of the White River. But, is turbidity really a problem in this entire stretch? Preliminary data show that just 8 miles exceed the standard.

Non-point source pollution -

Completed the third year of sampling for water quality in the Upper Illinois River Watershed and Upper White River Basin. Data will be used to estimate constituent loads and answer the question, how is water quality changing through time? This project also included sampling for pathogens and dissolved oxygen in streams that are on the 303(d) list of impaired waterbodies.

Also completed sampling for water quality in the Lower Ouachita-Smackover Watershed. Data were used to calculate constituent loads and calibrate and validate the Soil and Water Assessment Tool in order to prioritize sub-watersheds.

Water Quality Lab -

Analyzed over 32,000 constituents this year and served landowners, researchers and others throughout the State.



2014 104B FUNDED PROJECTS



The Arkansas Water Resources Center funded eight projects, including four faculty proposals and four projects that supplemented graduate student research, selected through external peer review by the Technical Advisory Committee in 2014, including:

Assessing Total Nitrosamine Formation and Speciation in Drinking Water Systems, Drs. Julian Fairey and Wen Zhang, Department of Civil Engineering, University of Arkansas

Improved Ensemble Forecast Model for Drought Conditions in Arkansas using Residual Resampling Methods, Dr. Yeonsang Hwang, Department of Civil Engineering, Arkansas State University

Economics of Multiple Water-Saving Technologies across the Arkansas Delta Region, Drs. Kent Kovacs and Qiuqiong Huang, Department of Agricultural Economics and Agribusiness, University of Arkansas

Lower Cutoff Creek Monitoring, Drs. Kelly Bryant and Hal Liechty, Departments of Agriculture and Forest Resources, University of Arkansas Monticello

Is Persistence of Plasmids in Antibiotic Resistant E. coli Isolated from Stream Water Impacted by Integrons and Conjugation or Mobilization Genes?, Dr. Mary Savin and Suhartono, Department of Crop, Soil, and Environmental Sciences, University of Arkansas

Visible Water-Quality Dynamics over the Receding Limbs of the Hydrograph in Five Northwest Arkansas Recreational Rivers, Dr. Thad Scott and Amie West, Department of Crop, Soil and Environmental Sciences, University of Arkansas

Microbial Community under the Changing Pre-Oxygenation Regime at Beaver Water District, Dr. Wen Zhang and Connie Moloney, Department of Civil Engineering, University of Arkansas

Hydrogeology and Biogeochemical Evolution of Groundwater in Big Creek and Buffalo River Basins and Implications for Concentrated Animal-Feeding Operations, Dr. Phillip Hays and Victor Roland, Department of Geosciences, University of Arkansas

The funded research addresses our congressional authorized mission and promotes the national mission and objectives of the U.S. Geological Survey.

HOW DO WE TRAIN FUTURE WATER SCIENTISTS?



EAST initiative

Research Experience for Undergraduates -

Mentored an undergraduate student in water research. The student developed skills related to the scientific method which culminated in presenting research results at AWRC's annual conference.

Freshman Engineering Research -

Mentored freshman students who developed their research and scientific skills, including project design, water sample collection, data analysis, reporting and presenting their findings.

Student Summer Internship -

Partnered with the Environmental and Spatial Technology program at a local high school. The Student was trained in GIS software to delineate watersheds and create professional maps.



Annual Conference -

Over 150 people attended from throughout Arkansas and the region, including water stakeholders from state agencies, research institutions, non-profit groups, and the public. Topics included:

- Unconventional natural gas development - policy and research
- Environmental flows and changes to hydrologic conditions
- Drinking water supplies and the formation and control of disinfection byproducts
- Nutrient management for a confined animal feeding operation near the Buffalo National River and associated policy

Water Words that Work Workshop -

Even the most important messages won't mean anything if you're not connecting with your audience. Speaker Eric Eckl guided participants in the development of effective communication skills that allows them to successfully inform and persuade the public into action on environmental issues.

Water Resources Policy -

Director Brian Haggard testified at the Senate Committee hearing in support of appropriations for the Water Resources Research Institutes.

National Institutes for Water Resources -

Director Brian Haggard transitioned from president to past-president, guiding the new president into the position and continues to serve this national organization.

Electronic Newsletters -

Current water news was emailed monthly to the AWRC listserv of several hundred professionals, students and citizens. Newsletters included stories about AWRC and USGS activities, current research funded through the 104B program, and other relevant news and events.

Website -

Continued to improve the usability of the website and the availability of water resources information. Nearly all AWRC publications are now available electronically and can be accessed on the Center's website. Users can also find information about upcoming conferences and how to use the AWRC Water Quality Laboratory for sample analysis. The website is critical to the information transfer mission of the Center.

Publications -

Published water research and monitoring reports conducted by the Center. This publications directory not only holds AWRC related reports, but is also a platform used by other scientists to make available important information in addition to or in lieu of peer-reviewed articles.

Social Media -

Utilized Facebook and twitter to disseminate information about the activities of the Center as well as sharing stories from other water resource or environmental organizations.

Like our Facebook page and follow us on twitter @AWRC_uark.

