

ARKANSAS WATER RESOURCES CENTER

The Value of Water



JULY 23 & 24, 2018
AWRC Annual Conference
Fayetteville Town Center

WELCOME TO THE 2018 ANNUAL WATERSHEDS & RESEARCH CONFERENCE

Dr. Brian E. Haggard, Professor & Director
Erin E. Scott, Program Manager

2018 TECHNICAL ADVISORY COMMITTEE

Ryan Benefield - *ANRC*

Katherine Knierim - *US Geological Survey*

Nathan Wentz - *ADEQ*

Randy Easley - *Central Arkansas Water*

Robert Morgan - *Arkansas Forests and Drinking Water*

Michelle Evans-White - *University of Arkansas*

Jerry Farris - *Arkansas State University*

Reed Green - *US Geological Survey*

Hal Liechty - *University of Arkansas Monticello*

James McCarty - *Beaver Water District*

Michele Reba - *USDA-ARS*

Tim Snell - *The Nature Conservancy*

Darcia Routh - *ADH*

David Johnston - *Arkansas Geological Survey*

We appreciate your service!

Wi-Fi: Town Center Guest pw: welcomeguest

Need to send your water samples for analysis?

The AWRC Water Quality Lab serves...

- ✓ Researchers
- ✓ Non-profits
- ✓ Consulting firms
- ✓ The public

The lab measures...

- ✓ Nutrients
- ✓ Sediments
- ✓ Metals
- ✓ Chlorophyll a
- ✓ Chloride
- ✓ Fluoride
- ✓ Sulfate
- ✓ Bacteria
- ✓ Carbon
- ✓ Alkalinity
- ✓ Hardness
- ✓ Turbidity
- ✓ pH
- ✓ Conductivity

Certified by the Arkansas Department of
Environmental Quality.

<http://arkansas-water-center.uark.edu/water-quality-lab.php>



Funding Opportunity

AWRC-USGS 104B Grant Program

The AWRC is soliciting pre-proposals for water research in Arkansas through the US Geological Survey 104B Grant Program.



Benjamin Runkle (right) and his team, post-doctoral research associate Kosana Suvočarev (left), and PhD student Colby Reavis (center) collect data in a rice field.

Faculty researchers at institutions of higher education in Arkansas, and students with a faculty advisor are eligible to apply.

The deadline to submit a pre-proposal is **August 24, 2018**.

For details, visit
arkansas-water-center.uark.edu/funding.php

Current 104B Awards

Research projects include:

An *In Situ* Approach to Harmful Algal Blooms: Simultaneous Treatment of Cyanobacteria and Cyanotoxins in Natural Water Sources Using Catalytic Nanoparticle-Fiber Nets

Lauren Greenlee, University of Arkansas

Do Stream Phosphorus Dynamics Correspond with Biological Condition in the Lake Conway Point Remove Watershed, Arkansas?

Sally Entrekin, University of Central Arkansas

Overcoming Adoption Barriers to Promote Surface Water Irrigation in the Arkansas Delta Region

Kerr Adams and Kent Kovacs, University of Arkansas

Quantifying Flow Sources and Their Impacts on Water Quality in Forested Ozark Streams

Allyn Dodd and Michelle Evans-White, University of Arkansas

Monday July 23

7:00 am

Check-in, Coffee, Juice, Pastries

Session 1: What is the Value of Water?

Moderated by **Clell Ford**, Beaver Watershed Alliance

8:30 am

Conference Welcome & Introduction

Brian E. Haggard, AWRC Director, UA Department of Biological and Agricultural Engineering

8:40 am

The Value of Industry to the Community and Water Systems

Heath Ward, Springdale Water Utilities

9:10 am

Raising the World's Expectations for How Much Good Food Can Do

Jamie Burr, Tyson Foods

9:40 am Networking Break



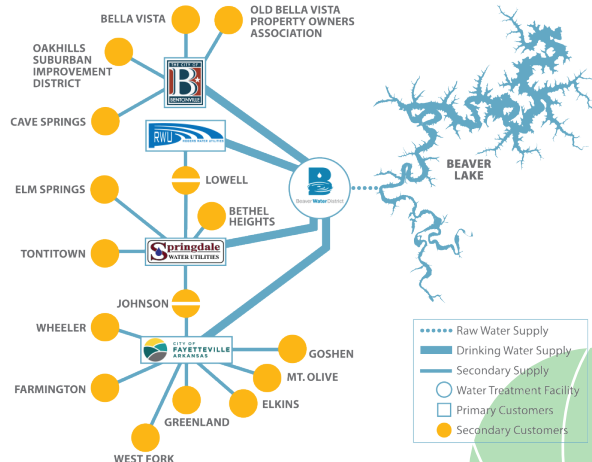
Beaver Water District

Beaver Water District is proud to partner with the AWRC on this annual research conference.

Visit the Beaver Water District Hydration Station table to fill your reusable cup with refreshing water sourced from Beaver Lake.

Secchi Day on Beaver Lake August 18

Come out and volunteer to collect samples and measure secchi depth!



Visit www.bwdh2o.org to learn more.

POSTER SESSION

UNDERGRADUATE STUDENT POSTERS

Metabolism of Drift-Rate Dicamba in Susceptible Soybeans with Variable Exposure to Water Stress

Student Katelynn Morgan, University of Arkansas
Mentor Dr. Cammy D. Willett, University of Arkansas
Co-mentor Erin Grantz and Dylan Milholen

Short-Term Evaluation of Rice Straw and Barley Straw for Inhibiting Algal Growth in Farm Ponds

Student Jacob Maris, University of Arkansas
Mentor Dr. Mary Savin, University of Arkansas

Assessing Cytotoxicity of Combinations of Disinfection Byproduct Mixtures on Mammalian Cells

Student Kyle Potts, University of Arkansas
Mentor Dr. Julian Fairey, University of Arkansas
Co-mentor Yonas Ghebremedhin

Characterization of Iron Nickel Oxide Nanoparticles for Surface Optimization for Oxygen Evolution Reaction

Student Jascha VanBrunt, University of Arkansas
Mentor Dr. Lauren Greenlee, University of Arkansas
Co-mentor Shelby Foster

Reducing Dissolved Phosphorus in Stream Water May Not Influence Estimation of Sediment Equilibrium Phosphorus Concentrations

Student Eleanor Henson, University of Arkansas
Mentor Dr. Brian Haggard, University of Arkansas
Co-mentor Abbie Lasater

Bicarbonate Production through Wafer Enhanced Electrodeionization and Determining Optimal Biomass Growth of Algae Using Bicarbonate as a Carbon Source

Student Katie Easter, Northeastern State University
Mentor Dr. Jamie Hestekin, University of Arkansas
Co-mentor Hymeyra Ulusoy-Erol

Microcystin and Algal Biomass in Streams Across a Land-Use Gradient in Northwest Arkansas

Student Daniel Lee, Central State University
Mentor Dr. Brian Haggard, University of Arkansas
Co-mentor Dr. Bradley Austin

Effects of Flow Regime on Body Condition of Crayfish *Faxonius negelectus*

Student Cherokee Gott, University of the Ozarks
Mentor Dr. Daniel Magoulick, University of Arkansas
Co-mentor Kayleigh Smith

The Effect of Flow Regime on Rainbow Darter (*Etheostoma caeruleum*) Body Condition in the Ozark Highlands

Student Amber Maner, Northeastern State University
Mentor Dr. Dan D. Magoulick, University of Arkansas

The Effects of MicroC 2000 on Denitrification at the Rogers Pollution Control Facility

Student Isabella Boddicker, University of Arkansas
Mentor Dr. Wen Zhang, University of Arkansas
Co-mentor Kaleb Belcher

Alkalinity's Effect on Fluorescence

Student Rylie Hickman, University of Arkansas
Mentor Dr. Julian Fairey, University of Arkansas
Co-mentor Thien Do

POSTER SESSION CONTINUED

Factors Influencing the Effects of Multiple Inlet Irrigation and Tailwater Recovery/ Reservoir on Groundwater Pumping Time in Eastern Arkansas

Student Jacob Askey, University of Arkansas

Mentor Dr. Qiuqiong Huang, University of Arkansas

Co-mentor Yefan Nian

Evaluation of Nutrient Influence on Algal Growth within an Urban Pond System

Student Brittany Craig, University of Arkansas

Mentor Dr. Brian Haggard, University of Arkansas

Co-mentor Brina Smith

Comparison of Three Methods for Measuring Chlorophyll in Water Samples

Student Hugo Eduardo Ontiveros Ledezma, Universidad Autónoma de Querétaro

Mentor Dr. Brian Haggard, University of Arkansas

Co-mentors Brina Smith and Dr. Bradley Austin

Effects of Peer Networks on Furrow Irrigation Practices in the Arkansas Delta

Student CJ Landram, University of Arkansas

Mentor Dr. Kent Kovacs, University of Arkansas

Biological and Ecosystem-Level Changes from the Addition of Reservoirs to Headwater Streams

Student Brian Staley, University of Central Arkansas

Mentor Dr. Sally Entrekina, University of Central Arkansas

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GRADUATE STUDENT POSTERS

Sub-Lethal Ion Concentrations Alter Shredder Performance and Leaf Litter Processing

Student Anastasia Mogilevsk, University of Central Arkansas

Advisor Dr. Sally Entrekina, University of Central Arkansas

Establishing the Relationships Among Land Use, Nutrients, and Aquatic Communities in Headwater Streams

Student Danielle Braund, University of Central Arkansas

Advisor Dr. Sally Entrekina, University of Central Arkansas

Incorporating Recent Geochemical and Isotopic Constraints in Age Dating the Waters of Hot Springs National Park, AR

Student Kristina Raley, University of Arkansas

Advisor Dr. Phillip Hays, University of Arkansas

Margaret White Springs Recharge Study, Buffalo National River, North-Central Arkansas, USA

Student Ashlon Leonard, University of Arkansas

Advisor Dr. Phillip Hays, University of Arkansas

Adsorption Potential of Benzobicyclon Hydrolysate in Arkansas Agricultural Soils

Student Matthew Sena, University of Arkansas

Advisor Dr. Cammy Willett, University of Arkansas

Low-Cost, Long-Term Monitoring of Dissolved Gases in Natural Waters

Student Joshua M. Blackstock, University of Arkansas

Advisor Dr. Phillip Hays, University of Arkansas



Monday July 23

Session 3: Ecosystem Services

Moderated by **Jim Wise**, Arkansas Department of Environmental Quality

1:30 pm

Restoring America's Greatest River:
Collaborative Conservation on the Lower Mississippi

Angeline J. Rodgers, *US Fish & Wildlife Service/
Lower Mississippi River Conservation Committee*

1:45 pm

Proposed Nutrient Trading Regulations for Arkansas: Innovation in the Marketplace or Creating Loopholes for Polluters

Jessie Green, *White River Waterkeeper*

2:00 pm

Land Use Effects on Surface Infiltration in the Lower Mississippi River Valley

Rebecca Anderson, *University of Arkansas
Department of Crop, Soil, and Environmental Sciences*

2:15 pm

The Stormwater Benefits of Creating High-Performance Urban Trees

Matthew Werle, *GreenBlue Urban*

2:30 pm Networking Break



Ozarks Water Watch works to preserve the water quality of the Upper White River Watershed in Northwest Arkansas and Southwest Missouri and...

- leads lake and stream volunteer water quality monitoring,
- produces the Annual Status of the Watershed Report,
- provides wastewater and septic system services,
- coordinates watershed educational activities and action projects promoting clean water quality.

www.ozarkswaterwatch.org

www.owwbeaverlake.org

For more information or to volunteer, contact Angela Danovi at 479-295-7717 or adanovi@ozarkswaterwatch.org.



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Monday July 23

Session 4: Water Quality in the Buffalo River Watershed Part I

Moderated by **Ryan Benefield**, Arkansas Natural Resources Commission

3:05 pm

Preliminary Study Update: A Comparison of Nutrient Water Quality in the Buffalo River Upstream and Downstream of Big Creek

Billy Justus, *US Geological Survey Lower Mississippi-Gulf Water Science Center*

3:20 pm

Stable Isotope and Geochemical Characterization of Nutrient Sources in the Big Creek Watershed of Northwest Arkansas

Kelly Sokolosky, *University of Arkansas Department of Geosciences*

3:35 pm

The Buffalo River, Karst, and CAFOs

Chuck Bitting, *National Park Service*

3:50 pm

What's in the Water? Results from E. coli Investigations at Sampling Sites in Close Proximity to C&H Hog Operation, Newton County Arkansas

Teresa Turk, *National Oceanic and Atmospheric Administration, retired*

4:05 pm

Overview of Buffalo National River's Continuous Dissolved Oxygen Monitoring Program

Ashley Rodman, *National Park Service*

7:00 pm Social at Marley's Pizzeria

Located at 609 W. Dickson St.

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Wi-Fi: Town Center Guest pw: welcomeguest

Tuesday July 24

7:45 am

Check-in, Coffee, Juice, Pastries

Session 5: Water Quality in the Buffalo River Watershed Part II

Moderated by **Steve Miller**, Jacobs Engineering

8:30 am

Preliminary Study Update: An Evaluation of Continuous Dissolved-Oxygen Variability for Boston Mountain Streams

Luke Driver, *US Geological Survey Lower Mississippi-Gulf Water Science Center*

8:45 am

Preliminary Study Update: Mill Creek (Newton Co.) Microbial Source Tracking Study

Billy Justus, *US Geological Survey Lower Mississippi-Gulf Water Science Center*

9:00 am

The Role of Karst Groundwater in Big Creek Basin, a Major Tributary of the Buffalo National River, and its Relation to Tourism

Van Brahana, *University of Arkansas Department of Geosciences, retired*

9:15 am

History of Filamentous Algae in the Buffalo River

Nathan Wentz, *Arkansas Department of Environmental Quality*

9:30 am Networking Break

Session 6: Water Needs in Agriculture

Moderated by **Trish Ouei**, UA System Division of Agriculture Cooperative Extension Service

9:45 am

Reducing Uncertainty in Estimates of Irrigation Water-Use

Drew Westerman, *US Geological Survey Lower Mississippi-Gulf Water Science Center*

10:00 am

Tailwater Recovery Systems in the Cache River Critical Groundwater Area: Preliminary Data Set on Herbicide Concentrations

Cammy D. Willett, *University of Arkansas Department of Crop, Soil, and Environmental Sciences*

10:15 am

Factors Influencing the Adoption of Irrigation Measurement Tools in the Arkansas Delta Buffalo National River, and its Relation to Tourism

Robert Rosene, *University of Arkansas Department of Agricultural Economics and Agribusiness*

10:30 am

Field Measurements of Wave-Induced Erosion of Irrigation Reservoir Levees

Daniel G. Wren, *US Department of Agriculture – Agricultural Research Service*

10:45 am Networking Break

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Tuesday July 24

Special Sessions Presented by the
Arkansas Chapter of the American
Water Resources Association

Session 8: Value of Citizen Science Programs in Watershed Water-Quality Management Part I

Moderated by **Ben Gilley**, Arkansas Department of
Health

1:15 pm

Special Section Introduction

Reed Green, *US Geological Survey Lower
Mississippi-Gulf Water Science Center*

1:20 pm

Beaver Secchi Day

Matthew Rich, *Beaver Water District*

1:40 pm

LakeSmart and StreamSmart Programs

Angela Danovi, *Ozarks Water Watch*

2:00 pm

Arkansas Master Naturalists – Statewide
Volunteer Monitoring Efforts

Ken Leonard, *Arkansas Master Naturalist*

2:20 pm

CyanoHAB Monitoring Techniques

Brie Olsen, *Arkansas Department of
Environmental Quality*

2:40 pm Networking Break

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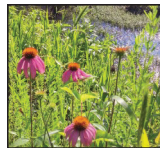
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Clean, Affordable Water is a pillar of sustainable modern life. Maintaining the quality and cost of clean water is only possible with the help of healthy watersheds. Whether we realize it or not, there are many reasons why healthy watersheds should be a



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- **Exceptional Water Quality**
- **Conservation of Natural Resources**
- **Ecological Stewardship**
- **Landscape Restoration**



Central Arkansas Water proudly
sponsors this year's conference.

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The mission of the Arkansas Section of the American Water Resources Association is to advance **multidisciplinary** water resources education, management, and research in Arkansas and surrounding states.

Join AR-AWRA at their annual business meeting immediately following the symposium.

Like them on Facebook @ARK.AWRA
<https://www.facebook.com/ARK.AWRA>

Thank You Moderators!

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If you have any questions regarding the conference sessions, please feel free to contact the session moderators at the email provided.



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If you have any questions regarding the conference presentations, please feel free to contact the speakers at the email provided.

Thank You Sponsors!



Water Monitoring Solutions.





Where to Go

Fayetteville Town Center

15 W Mountain St.
Fayetteville, AR 72701

The Chancellor Hotel

70 N East Ave.
Fayetteville, AR 72701

Marley's Pizzeria

609 W. Dickson St. #103
Fayetteville, AR 72701



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