



Summer 2023

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Register Now for the 2023 Arkansas Water Resources and Watershed Conference

Register now to attend the 2023 Arkansas Water Resources and Watersheds Conference on **July 18 - 20 2023!** Attendees will meet at the Don Tyson Center for Agricultural Sciences in Fayetteville, Arkansas. Details are listed below.

The Arkansas Water Resources Center is continuing the theme of partnership with our annual conference. This year, the list of partners has expanded to include the Arkansas Department of Agriculture Forestry Division, Arkansas



Calendar of Events

July 1

[Drop in and Discover July 1: Oil Spill Clean-Up](#)
Erie, PA

July 12

Women in Wetlands Section
Webinar: [Does restoration work? An amphibian-centric look at restoration in geographically isolated wetlands](#)
Online

July 13

[Water Testing at Tom Ridge Environmental Center](#)
Erie, PA,

July 20

July 2023
Webinar - [A Broad Scale 2,500 Acre Wetland Habitat Restoration Project in](#)

Forests and Drinking Water Collaborative, Beaver Watershed Alliance, University of Arkansas Division of Agriculture, and the Illinois River Watershed Partnership.

The goal of this conference is to bring people together to share ideas and experiences that will help researchers, state agencies, and other stakeholders address current water resource challenges. The conference will provide informative presentations, poster sessions and a local tour relating to managing water quality and protection.

Click here to [register for the conference](#).

Arkansas Water Resources Center Selects Projects for 2023 Funding

The Arkansas Water Resources Center has selected six projects to receive seed funding from our 104(b) base grant this year. Projects will be conducted at four Arkansas institutions and will train at least seven students. Topics range from PFAS monitoring methods to better understanding and detection of the conditions that lead to harmful algal blooms.

Here are the projects for 2023:

- Monitoring Perfluoroalkyl and Polyfluoroalkyl Substances in Central Arkansas Water Systems, by Dr. Gunnar Boysen, Associate Professor, University of Arkansas for Medical Sciences
- Development of On-Site Fluorescence PFAS Sensors, by Dr. Lei Guo, Assistant Professor, University of Arkansas Fayetteville

[South Florida Online](#)

July 24 - 27
[2023 APMS 63rd Annual Meeting](#)

Indianapolis, Indiana

August 17

August 2023 Webinar

- [Conservation Planning in Municipalities: Case Studies of Urban Wetlands & Waterways](#)
Online

August 20

[153rd Annual Meeting of The American Fisheries Society](#)

Grand Rapids, Michigan

August 29

[FLMS / SENALMS 34th Annual Technical Symposium](#)

Panama City Beach, Florida

September 15 - 17

[Shoreline Cleanup](#)

H2Ozarks Table Rock Lake, Lake

- Influence of phytoplankton stoichiometry on the production of secondary metabolites in a central Arkansas reservoir, by Dr. Felicia Osburn, Post-Doctoral Researcher, and Dr. Halvor Halvorson, Assistant Professor, University of Central Arkansas
- Investigating Electrocoagulation as a Pretreatment for the Nanofiltration of Cyanotoxin-Contaminated Water Sources, by Dr. Ranil Wickramasinghe, Distinguished Professor, University of Arkansas Fayetteville
- Identifying Genetic Markers for Microcystin-Producing Algal Blooms, by Dr. Wen Zhang, Associate Professor, University of Arkansas Fayetteville
- Why and When does Microcystin Exceed Recreational Guidelines at Lake Fayetteville?, by Dr. Brian Haggard, University of Arkansas Division of Agriculture

The AWRC also uses its base grant to fund essential program administration, education and outreach, and information transfer activities. These core projects will provide training opportunities to an additional five students.

New this year, the AWRC will fund three undergraduate research internships in summer 2024. Contact the Program Manager, Erin Grantz at egrantz@uark.edu to inquire about this new program.

AWRC Staff News

Join us in welcoming Alfonso Chinchilla, Luke Norman, and Henry Holtkamp!

Alfonso Chinchilla is a Program Technician in the Water Quality Lab at the AWRC. He joined the AWRC in May 2023 and is originally from Salt Lake City, Utah. Alfonso previously completed a Bachelor of Science in Chemistry with a Forensic Emphasis from Southern Utah University. Alfonso's favorite thing about

Taneycomo, Bull Shoals Lake



Job Openings

Natural Resources Research Institute

Aquatic Ecologist Research Associate
Duluth, MN

Central Arkansas Water

Water Distribution Specialist I
Little Rock, AR

New Hampshire Department of Environmental Services

Environmentalist IV - TMDL Program Coordinator

working at the AWRC is troubleshooting the analytical instruments in the lab. In his free time, he enjoys playing musical instruments, movies, and video games.

Luke Norman is joining the AWRC as an Agriculture Lab Technician this summer and will be a Graduate Research Assistant in the fall. Luke earned his Bachelor of Science degree in Horticulture at Texas A&M University this spring. He is originally from Godley, TX, a small town near Dallas-Fort Worth. This fall, he will begin work on a Master of Science in Environmental Dynamics at the University of Arkansas. Luke is looking forward to getting out in the field during his time with the AWRC. His hobbies include pickleball, hiking, and rooting for the Texas Aggies.

Henry Holtkamp is a Lab and Field Technician Intern with the AWRC this summer. He joined the AWRC at the end of May. He is from Green Forest, AR and is about to start his senior year of a Bachelor of Science in Biological Engineering at the University of Arkansas. Henry's favorite part of working at the AWRC is helping out with field work. In his free time, he likes to get out to recreate on the beautiful waters of Arkansas.

Farewell and best wishes to Evan Jurick and Mallory Hoff!

Evan Jurick worked as a Program Technician with the AWRC from December 2021 to April 2023. He is returning to one of his favorite places, Glacier National Park, as a seasonal worker this summer. Then he will spend a year in South America, where his wife is a Fulbright Teaching Assistant in a local school.

Mallory Hoff worked as an Agriculture Lab Technician with the AWRC last semester. She is headed to graduate school in Texas in Fall 2023.

Congratulations are in order!

*New Hampshire
Department of
Environmental
Services*

City of Cave Springs

Public Works

Director

*Cave Springs,
AR*

EcoAnalysts , Inc.

Algae

Taxonomist

Moscow, ID

Lake Stewards of Maine

Executive

Director

Auburn, ME

Brittany McIntyre, a Graduate Research Assistant at the AWRC since 2021, completed her Master of Science in Environmental Dynamics in May 2023 and is leveling up to the Ph.D. program this fall. Brittany previously earned her Bachelor of Science in environmental science and sustainable technology from the University of the West Indies in 2017. Brittany's thesis research investigated water quality applications for biochar, including harmful algal bloom treatment and mitigation. Her Ph.D. work will continue with an applied focus.

Anna Grace McCarty is a Lab and Field Technician Intern with the AWRC again this summer. Anna Grace has worked at the AWRC since June 2022 and is studying environmental science at the University of Arkansas. She also received a Student Undergraduate Research Fellowship to investigate trends in atmospheric deposition chemistry with Dr. Brian Haggard. Check out the feature on Anna Grace below to learn more about her research experience!



Celestene Sebag Investigates Antibiotic Resistant Genes in Water Resources

Celestene Sebag, graduate student from the University of Arkansas, worked with Dr. Wen Zhang to quantify the concentration of antibiotic resistance genes in water that would be used for agricultural irrigation or for reuse.

“We wanted to focus on the separation of extracellular and intracellular antibiotic resistance genes because sometimes studies ignore one or the other, so it’s not quite an accurate representation of the actual amount in the water,” Sebag said.

For the project, Sebag sourced water from several sites, which included surface water reservoirs, livestock waste ponds, water and waste treatment plants and rice fields.

Standard water treatment methods do not completely remove contaminants. Antibiotic resistance genes can lead to human health risk if reclaimed water is not properly treated. Arkansas does not currently have any reuse water regulations in place. This research could be used to help shape policies for water reuse guidelines.

“I’m passionate about sustainability, and overall water consumption is a big issue environmentally,” said Sebag. “My research would contribute to that water reuse problem because agriculture is one of the biggest users of fresh water.”

Sebag mentioned that the extraction kits and methods they currently have need more research and development to improve the recovery efficiency when extracting the DNA. However, the findings in her research showed the prevalence of ARGs in reuse water, and that determining the best method for reducing those

levels is the best way to prevent antibiotic resistance from spreading.

Sebag received a seed grant from the AWRC under Section 104(b) of the Water Resources Research Act administered by the U.S. Geological Survey.



Ashworth's Research Investigates Manure Seepage in Karst Soil Landscapes

Research soil scientist, Amanda Ashworth, explained her FY2021 project about animal manure seepage in Karst soil landscapes. Ashworth works for the United States Department of Agriculture's Agricultural Research Service.

Karst landscapes are hollow by nature and the potential for groundwater pollution is high. With rainfall and flooding, animal manure can seep into the groundwater, along with other nutrients and antibiotics. However, this has not been previously quantified systematically.

"When you have a lot of animal manure that's going on the soil surface and potentially leaching into the groundwater in these karst systems, we need to know what that looks like and what the potential risk is for environmental degradation," said Ashworth.

The research team extracted several large intact columns and placed grids with collection bottles underneath them from karst and non-karst geographies. By using water leachate collection bottles, they were able to see the potential for the contaminated water to go into groundwater aquifer systems.

By observing the leaching of nutrients from the top of the column to the bottom, they found six times more phosphorus in the karst system than non-karst.

"There is a huge potential for leaching of antibiotics and nutrients from these karst systems," said Ashworth.

Ashworth and her research team are linking this information with a web tool to locate karst geologies in the state of Arkansas in order to help with animal manure management.

“Knowing where these karst systems are in the landscape can help target manure management so that we’re not putting excess nutrients and antibiotics from animal agriculture into groundwater,” said Ashworth.

Sheela Katuwal, a former post-doctoral researcher, in Ashworth's group received a seed grant from the AWRC under Section 104(b) of the Water Resources Research Act administered by the U.S. Geological Survey.

For more information about the project and results, visit <https://access.onlinelibrary.wiley.com/doi/epdf/10.1002/vzj2.20160> <https://access.onlinelibrary.wiley.com/doi/10.1002/saj2.20424>

Images courtesy of Dr. Amanda Ashworth



Anna Grace McCarty Presents Research at UCOWR Conference

University of Arkansas senior, Anna McCarty received a Student Undergraduate Research Fellowship to research atmospheric deposition in Arkansas and Tennessee with Dr. Brian Haggard, director of the Arkansas Water Resource Center.

Atmospheric deposition is a transportation process for gases and compounds from the atmosphere to Earth's surface.

"We're looking at eight different nutrients and elements such as calcium, magnesium, potassium, sulphate, nitrate, sodium and a couple of others," McCarty said.

If concentrations of these nutrients are too high, they can potentially cause harmful algal blooms when they flow into water streams. Monitoring concentrations would help determine if there's a need for worry or actions that need to be taken to protect water supplies.

"We're using the National Atmospheric Deposition Program for our data source," said McCarty.

There are stations all over the U.S. and McCarty and Haggard plan to look at six of them.

"So far, we've looked at the station here in Fayetteville, and calcium, magnesium, and potassium have not really changed much over time in concentration," said McCarty. "Sulfate and nitrate are actually decreasing over time, which is cool to see, and ammonium is increasing over time."

McCarty and Haggard will look at the next five sites to for trends. The analysis will show what is happening in the atmosphere currently, and whether it's something to worry about.

“It’s more of an assessment of where we are currently, how it’s changed over time and if there needs to be any changes made in the future,” McCarty said.

McCarty plans to use this research for her honors thesis project. She also had the opportunity to present at the Universities Council on Water Resources Annual Conference at Colorado State University this month.

McCarty emphasized that this experience has been a great opportunity to network with professionals and become a better researcher.

“The UCOWR conference was a fantastic opportunity for me to gain experience presenting my work, learn about other current studies in many areas of water quality research and talk with experienced professionals about their careers,” said McCarty.

July is Lakes Appreciation Month!

You work and play on them. You drink from them. But do you really appreciate them? Growing population, development, and invasive species stress your local lakes, ponds, and reservoirs. All life needs water; let’s not take it for granted!

Learn more about [how you can get involved in your community during Lakes Appreciation Month.](#)
