

## INTERIM EXECUTIVE DIRECTOR NAMED FOR ALABAMA WATER INSTITUTE

**Mike Gremillion, who has led the Global Water Security Center at The University of Alabama for over a year, has been named the interim executive director of the Alabama Water Institute effective Sept. 19.**



*Interim Executive Director,  
Mike Gremillion*

**By Adam Jones**

Gremillion, an experienced weather professional in the military and intelligence communities, has also served as deputy director of the Alabama Water Institute while directing the GWSC

“Mike has been involved on the ground floor of all the major initiatives of AWI over the past two years with a key role in leading the development of AWI’s five-year strategic plan and securing input from stakeholders around campus,” said Dr. Russell J. Mumper, vice president for research and economic development. “We are very fortunate to have Mike and appreciate his willingness to take this critical leadership role to keep the momentum going.”

AWI guides UA’s commitment to be a premier research and education institution around water-related

issues. AWI’s goal is to become a world-class interdisciplinary water research institute that develops pathbreaking, holistic and environmentally friendly solutions to ensure people and ecological systems in its community, state, nation and around the world have access to clean water and are resilient to extreme events.

“I am excited to lead the Alabama Water Institute in this new role,” Gremillion said. “My vision is to con-

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His appointment comes after Rayder announced he is moving to a new opportunity outside UA. Earlier this year, Rayder oversaw the expansion of the institute with the largest research grant ever awarded to the University.

“I am indebted to Scott and the

tremendous team he has built at UA. Scott led amazing growth at AWI and its many affiliated centers focused on water. We wish him the very best in his exciting new opportunity,” said Mumper.

The institute led a consortium to win a competitive five-year [\\$360 million Cooperative Institute award](#) from the National Oceanic and Atmospheric Administration titled, Cooperative Institute for Research to Operations in Hydrology, or CIROH.

This was the largest externally sponsored award in UA’s history.

In addition, affiliated researchers across campus lead innovative projects related to water that improves society while enhancing the education of UA’s students.

Gremillion joined UA in 2020 after more than 27 years of providing scientific leadership and expertise for national security environmental support under the U.S. Department of Defense.

His last military assignment was senior meteorology and oceanography officer for National Geospatial-Intelligence Agency.

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## U.S. SEN. RICHARD SHELBY ADDRESSES INAUGURAL CIROH MEETING AT UA

The Cooperative Institute for Research to Operations in Hydrology recently held its inaugural science meeting at The University of Alabama, bringing together water researchers and professionals to establish its future vision and path.



By Brock Parker

CIROH was established in April 2022 with a five-year, \$360 million award from the National Oceanic and Atmospheric Administration, the largest external award in UA's history. The event marks the first time CIROH members and partners have gathered in person to develop, as a community, research priorities and educational activities.

U.S. Senator Richard Shelby, R-Ala., who was instrumental in bringing the [National Water Center](#) and [U.S. Geological Survey](#) partners to UA's campus, addressed the CIROH meeting attendees at UA's Bryant Conference Center. Shelby was joined by UA President Stuart R. Bell and Dr. Russell J. Mumper, vice president for research and economic development, in congratulating the University, CIROH and NOAA for ongoing efforts to translate water research into operations that improve the nation's ability to predict water-related hazards and effectively manage water resources.

"The world-class research conducted by this competitive cooperative institute will provide transformational support to the scientists and engineers charged with solving today's pressing water challenges," Shelby said. "UA is equipped with

the necessary tools, resources and minds to lead this initiative and defend one of our greatest resources, benefitting countless communities."

The main objectives during the meeting were to strengthen relationships among CIROH researchers, foster collaboration with NOAA personnel and refine ideas for education, outreach and engagement. Attendees also worked to develop research priorities that align with operational requirements and catalyze community innovation.

"The University of Alabama's stature as a forerunner in global water research continues to be bolstered through bold research partnerships," said Bell. "The inaugural CIROH meeting at our University was another progressive step forward as we discover new knowledge and prepare our students to be the solution finders in hydrological research."

Headquartered at the Alabama Water Institute, CIROH consists of a consortium of 28 academic institutions, non-profit organizations and government and industry partners bringing together a powerful team of hydrologic researchers across the United States and Canada. They will develop and deliver national hydrological analyses, forecast information, data, guidance and equitable decision-support services to inform essential emergency management and water resources decisions.

"We are pleased with the successful outcome of the science meeting. It was exciting to experience the productive sessions bringing together researchers and operational forecasting professionals from NOAA's National Weather Service, Office of

Water Prediction and National Water Center," said Dr. Steve Burian, CIROH executive director. "CIROH's connections to stakeholders were strengthened and ideas emerged to drive its research to operations goal."

Along with UA, CIROH's consortium members include: Brigham Young University; Colorado School of Mines; Tuskegee University; The University of Alabama in Huntsville; University of Arizona; University of California San Diego, Scripps Institution of Oceanography; University of Hawai'i at Mānoa; University of Iowa; University of Minnesota, Twin Cities; University of Saskatchewan; University of Utah; University of Vermont; and Utah State University.

**Consortium partners include: Baron Weather Inc.; Coastal Carolina University; Consortium of Universities for the Advancement of Hydrological Science Inc.; Dauphin Island Sea Lab; Gulf of Mexico Coastal Ocean Observing System; Jupiter Intelligence; New Mexico State University; Oak Ridge National Laboratory; Pennsylvania State University; RTI International; Stevens Institute of Technology; University of California, Davis; University of Illinois at Urbana-Champaign; and University of South Carolina.**



NOAA's Tom Graziano takes questions from the audience.

# UA CENTER RECOGNIZED AS PART OF NATIONAL GLOBAL WATER SECURITY STRATEGY

By Emily Fischer

The University of Alabama's [Global Water Security Center](#) has been recognized in the new U.S. Government [Global Water Strategy](#). The strategy, which aligns federal efforts to address global water challenges, includes U.S. government agency-specific plans. The Department of Defense will address "Strategic Objective 4: Anticipate and Reduce Conflict and Fragility Related to Water" with support from the GWSC.

The GWSC will provide research and analysis support on water and environmental issues that have the capacity to become national security threats. The center will prioritize drought, water scarcity and other resource limitations based on DOD guidance.

"I applaud the release of this document to address global water security issues," said Mike Gremillion, GWSC director and interim executive director of the Alabama Water Institute. "This strategy encourages the federal government to work collaboratively with inter- and intra-agency, academia and the private sector. The GWSC looks forward to working with all these communities to help them achieve these aspirations."

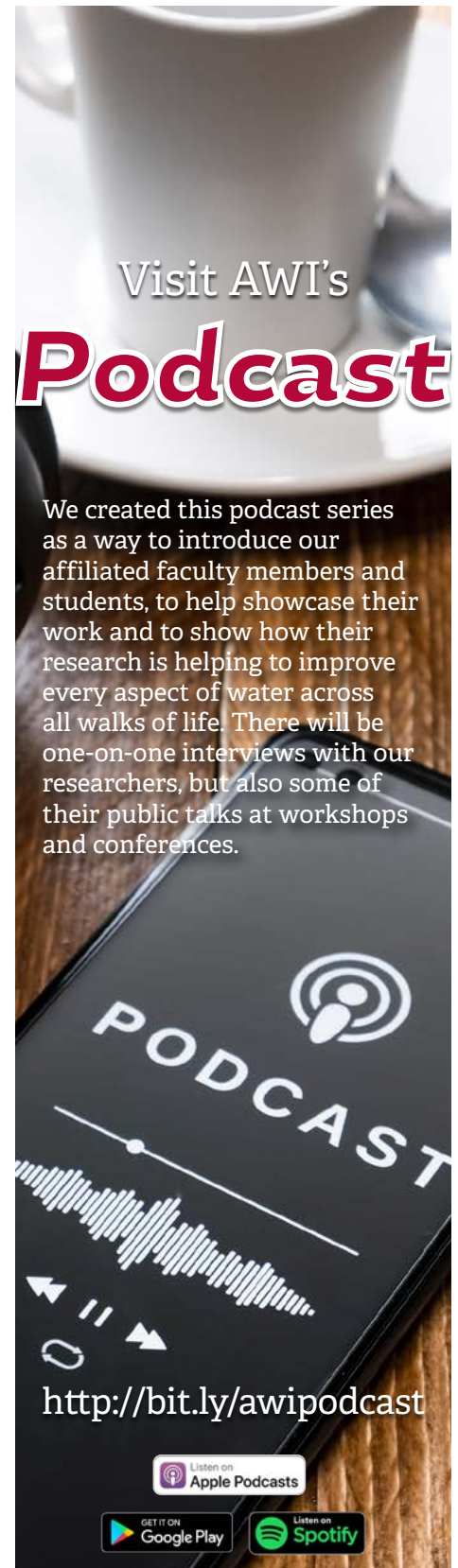
To overcome the challenges posed by the global water crisis, the U.S. government intends to strengthen sector governance, financing, institutions and markets; increase equitable access to safe, sustainable, and climate-resilient water and sanitation services and the adoption of key hygiene behaviors; improve climate-resilient conservation and management of freshwater resources and associated ecosystems; and anticipate and reduce conflict and fragility related to water. As part of DOD's support of these aims, the GWSC will move cutting-edge water research to

operational products. This research and analysis throughout the next several years will help to achieve the goals of the White House Action Plan on Global Water Security.

The integration of a water strategy into national security is crucial to the preservation of public health, food security, economic growth and governance. Beyond the scope of day-to-day water challenges, global stressors such as climate change and the COVID-19 pandemic create additional strain at home and abroad. Under the 2022-2027 Global Water Strategy, the U.S. will work to deploy all available resources in an effort to minimize the effects of water insecurity while also addressing inequalities and decreasing the risk of conflict and state failure.

Billions of people worldwide lack access to water, sanitation and hygiene services. Such issues produce higher rates of poverty, illness and disease, malnutrition, food insecurity, economic decline, ecosystem degradation and climate change. These inequalities become increasingly apparent when examining the contrast between rural and urban populations, ethnic majorities and minorities, the wealthy and the poor and those living in stable versus fragile regions. Additionally, women and girls are often a more vulnerable population.


Though there are many water-related challenges to overcome, water-related developments also serve as a vessel to strengthen central democratic principles of equality, transparency, accountability and human rights. The federal government envisions many opportunities to improve the conditions of people and institutions around the world so long as substantial resources and effort are devoted to the cause.





Visit AWI's  
**Podcast**

We created this podcast series as a way to introduce our affiliated faculty members and students, to help showcase their work and to show how their research is helping to improve every aspect of water across all walks of life. There will be one-on-one interviews with our researchers, but also some of their public talks at workshops and conferences.

<http://bit.ly/awipodcast>

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to schedule a recording.



# UA GLOBAL WATER SECURITY CENTER TO PARTICIPATE IN 2023 UN WATER CONFERENCE

The Global Water Security Center at The University of Alabama has been awarded special accreditation to participate in the [United Nations 2023 Water Conference](#). The GWSC is one of only 440 organizations worldwide and one of only 20 universities recognized with this distinction.



**UN**  
**2023 WATER**  
**CONFERENCE**

NEW YORK  
22-24  
MARCH  
2023

By Emily Fischer

“The GWSC is excited to have received this recognition, especially since we are a relatively new center within The University of Alabama,” said Mike Gremillion, GWSC director and interim executive director of the Alabama Water Institute.

Gremillion and Dr. Kate Brauman, GWSC associate director for analysis and communications, plan to attend the U.N. conference in March 2023. The accreditation positions them to weigh in during opportunities for public consultation, network with global leaders in the field and leverage the information they learn for an insider perspective to global water issues, Brauman said.

The GWSC will observe the U.N.’s

midterm review of the [Water Action Decade](#), which began on World Water Day, March 22, 2018, and ends in 2028. The decade strives to promote collaboration and highlight solutions

for water-related issues, including limited access to safe water and sanitation, increasing pressure on water resources and ecosystems, disasters and an exacerbated risk of droughts and floods. It will also boost international collaboration in research and innovation to facilitate sustainable development of water resources while integrating risk-informed management of these systems.

Water is a central pillar of food, healthcare, energy and the environment. Concentrating on water security ensures that drinking, agriculture, biodiversity and other water-reliant systems are also secure. Through rigorous innovation and research, the GWSC provides information to improve water access, food security, economic opportunities and health by empowering

water security decisions. The center creates the most reliable water and environmental security-related information, tools and analysis of the hydrologic cycle to communicate its potential impact and inform appropriate action and response by the United States.

“Water information is critical to effective decision-making across a wide range of issues,” Brauman said. “Our center is committed to make that information accessible and understandable to decision-makers.”

The conference will take place at the U.N. headquarters in New York and will be co-hosted by the governments of Tajikistan and the Netherlands. The conference layout will include six plenary meetings and five interactive dialogues. The assembly will work to achieve internationally agreed water-related goals and targets while furthering its vision statement, “Our watershed moment: uniting the world for water.”

## HOW TO GET AFFILIATED WITH THE ALABAMA WATER INSTITUTE

If you have expertise that could contribute to addressing complex water issues, please register yourself on our website. All registered members are considered affiliated with AWI and have access to all AWI resources.

To register, visit the AWI website: <http://awi.ua.edu>

### Eligibility Criteria:

- A faculty/staff/student appointment at UA.
- Research expertise in a water-related field.
- Completion of registration form.

For questions contact Stefanie O’Neill at: [soneill2@ua.edu](mailto:soneill2@ua.edu) or 205-348-9128

### Affiliated Member Information:

[awi.ua.edu/awi-affiliated-members/](http://awi.ua.edu/awi-affiliated-members/)

## FEDOROFF NAMED AWI DIRECTOR OF CULTURAL AND WATER RESOURCES PRESERVATION



By Brock Parker

The Alabama Water Institute has named Michael Fedoroff as its new Director of Cultural and Water Resources Preservation at The University of Alabama. Fedoroff is a seasoned water resource professional with experience in applied water resource infrastructure and environmental restoration for the Department of Defense.

As director, Fedoroff is responsible for developing applied research avenues that fulfill the cultural and water resource preservation needs of Indigenous groups and underserved communities across the nation.

"I am excited to highlight the importance of Indigenous knowledge systems and local knowledge in integrated water resource research, cultural resource preservation and water management," said Fedoroff.

A native of Mississippi, Fedoroff earned his bachelor's and master's degrees in anthropology from the University of Southern Mississippi. He has been working in the environmental and applied anthropology arena since 2009. His last assignment was serving as the deputy director and research lead for the U.S. Army

**"I will implement a series of research initiatives designed to incorporate Indigenous knowledge systems into a variety of water-related challenges both local and national in scale."**  
-Michael Fedoroff

Corps of Engineers national technical center for Tribal Nations, which is headquartered in Albuquerque, New Mexico. This position allowed him to work directly with Indigenous communities, the DoD and other federal agencies to collaborate and apply best science to water resource-related challenges across the U.S.

"I am passionate about building teams that consist of both hard science and the humanities, particularly incorporating non-Western approaches and knowledge into scoping research that serves local communities," Fedoroff said. "Exploring solutions in this manner often provides the key insights needed for the complexities of water resource-related challenges."

By hiring Fedoroff, AWI brings diverse ideas and non-Western perspectives to the institute to continue to increase its impact locally, regionally and nationally.

Fedoroff and his team will work to expand AWI's presence through applied research activities with its affiliated faculty members, other research centers, Indigenous communities and industry and government partners. Locally, Fedoroff will build upon existing water research efforts that will benefit both Alabama and amplify the efforts of the UA research community as a national leader in water research.

"I will implement a series of research initiatives designed to incorporate Indigenous knowledge systems into a variety of water-related challenges both local and national in scale," he said. "I am excited to work with the stellar team at AWI to serve these community needs."

# WaterWorks

Conversations at the Intersection of Water, Science, and Society



Friday, December 2, 2022 at 12:00 PM - 1:00 PM. Lloyd Hall, Rm. 202

## Compound Coastal Flood Modeling and Management; Challenges and Opportunities

**Guest Speaker:**  
**Hamed Moftakhari, UA Center for Complex Hydrosystems Research**

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## TESTING FLORIDA'S FRESHWATER LIMITS FOR POPULATION GROWTH



By Brock Parker

People move to Florida for several reasons, one of them being convenient access to the state's coastal areas. According to the U.S. Census, the population increased from approximately 9 million people in 1980 to around 22 million in 2020. While the state has plenty of saltwater surrounding it, there's a concern that freshwater systems might not be able to meet population demands if that growth continues.

That concern has State of Florida officials seeking out alternative freshwater sources: rivers. Thanks to funding from the National Science Foundation's Research Experience for Undergraduates, or REU, program, researchers and students from The University of Alabama are using the rings inside bald cypress trees to determine if rivers can provide adequate surface water for the future.

"The groundwater wells near the coast provide water to people for personal and agricultural use, but as the population and demand grows, the wells start getting brackish or saltwater intrusion coming in because they've been used for so long," said [Dr. Glenn Tootle](#), a civil engineering professor in UA's College of Engineering.

Moving the wells further inland may delay saltwater from entering, but the ability for the state's rivers to deliver and maintain the necessary

amount of freshwater is unknown. Tootle, [Dr. Matthew Therrell](#), a dendrochronologist and chair of UA's Department of Geography, and [Dr. Clay Tucker](#), a postdoctoral researcher in UA's Department of Geography, recently took seven undergraduate students – four from civil and environmental engineering and one each from biology, geology and environmental sciences – to gather tree cores along the St. Johns River.

The purpose was two-fold: determine if the longest river in Florida has a history of producing enough water to sustain a major population area and to make it an educational outing for their students.

"These real-life experiences make me excited about my future as an environmental engineer," said Calli Day, a senior at UA. "It is so rewarding to be a part of a research team that will directly benefit the Florida community."

The St. Johns River flows more than 300 miles between central and eastern Florida, closely winding to the two major metropolitan areas of Orlando and Jacksonville. Tootle, Therrell, Tucker and their team set up a base camp near Orlando where they scouted the bald cypress trees. Students twisted long, hollow metal tubes into the trees, which allowed them to retrieve thin rounded samples of the cores.

The cores were brought back to Therrell's lab at UA where they used high-resolution scanners and computers to count and measure the size of the rings. In addition to learning the age of the trees, the ring sizes tell them at which points in time they had both plentiful and scarce amounts of water.

Tootle said some of the samples collected dated back to around 1730, but they need additional samples, preferably older trees, to really determine the historical record of waterflow. This discipline is called paleohydrology, the study of streamflow prior to written records. Tapping into the older trees and having that extended historical record is what will tell the tale for Florida's freshwater future.

"We'd love to get 300 to 500 year records, so the ones we have are shorter than that, but it's a good preliminary start to where these students are seeing this is how you collect and save the data," he said. "What we would propose to do is to go back down there, resample those trees and then try to develop a reconstruction of the St. Johns River again to show water managers and planners in the region what we really feel is the long term deliverability of the river."

The Colorado River Compact of 1922 is one of the reasons to take an extended look through the St. Johns River's history. That compact was made at a time when the Colorado River's levels were higher than normal, and water was overallocated to the states served by it. Water shortages are now a constant issue in the western area of the U.S.

"Now we're finding out based on paleo records that they just so happened to have horrible timing when they did that allocation," said Tootle. "They can't sustain that. Paleo studies of tree rings are showing that it does not have that amount of water."

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## TESTING FLORIDA'S FRESHWATER LIMITS

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The same mistake can be avoided in Florida if they can continue to take students there to properly assess historical streamflow patterns. Tootle envisions a long-term program that will provide answers for the state and give undergraduates valuable research experience. It also opens the door for recruiting interested students from all over the country to come to UA where water research has become one of the University's top focuses.

"Participating in research that has the potential to positively impact communities while still in undergraduate school is invaluable to both personal and professional growth," said Abigail Phillips, a senior in civil engineering. "Outside of the research field, paleohydrology isn't a topic that is widely discussed, so it really shows just how many opportunities The University of Alabama has to offer."

[Dr. Steven J. Burian](#), a civil engineering professor in UA's College of Engineering, is collaborating with Tootle on a recently received [\\$3 million award from the National Science Foundation Research Traineeship](#) program to provide water resources-focused training to UA graduate students.

"The paleo and water resources research opportunities for graduate students here at UA in engineering and sciences are really world-class," Burian said. "It's wonderful to see these opportunities extended to our undergraduate students."

## ALABAMA'S WATER SAPPHIRE SPRINGS FORTH



By Brock Parker

The U.S. Geological Survey estimates that at least one-tenth of all freshwater originates or flows through Alabama. One of the state's most eye-catching drinking water sources is hiding in Blount County among the foothills of the Southern Appalachian Mountains. Protected beneath a white barnlike structure with a dark green roof, the 60-foot wide and 35-foot deep Blue Spring sits on approximately 88 acres where its water is collected and bottled by [Blue Spring Living Water](#) owners Cameron and Elizabeth Cardwell, both former students from The University of Alabama.

"It's a naturally occurring centuries-old spring that flows about a million gallons per day," said Elizabeth Cardwell. "It's 52 degrees year-round, and the water temperature never changes."

The spring originates deep below in the Bangor Aquifer. Its water takes quite a long time to surface – the current water in the harvesting pool began its trip up from the aquifer 300 years ago. During the time that today's water was being pushed to the surface, the spring itself was being discovered. The local story is that both Davy Crockett and Andrew Jackson stumbled upon it back in the 1800s.

"It's pretty amazing for us because if you think about three centuries, there's no groundwater contami-

nation, insecticides or any kind of industrial pollutants, but it flows through limestone and dolomite," said Cameron Cardwell.

The water is routinely tested and has a constant pH level of 7.1-7.2. It contains naturally occurring silica, magnesium and calcium.

The spring gets its name from the glowing bluish hue of the pool, and its clarity is striking. A few windows allow enough sunlight into the building where one can see straight to the bottom. A bridge stretching across the middle of the spring offers a clear view of the deepest part when looking down.

There is enough water flowing to fill roughly 6.5 million of Blue Spring Living Water's 500 milliliter bottles per day, but they can only produce approximately 20,000. The excess flows out into a pasture and down into Blue Spring Creek where not only plants and animals can enjoy it, but also patrons of the Spring Valley Beach water park a few miles downstream.

The land surrounding Blue Spring was owned by the Vanzandt family until 1950 when it was given to Ottis Shedd. In 1999, Shedd decided to bottle and sell the water. Cameron Cardwell learned about the spring in

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## ALABAMA'S SAPPHIRE SPRINGS

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2017 and took over its bottling and distribution from Shedd.

The bottling process takes place at the Blue Spring Living Water store and plant a few hundred yards from the actual spring. Workers take the empty bottles and place them onto a conveyor. The bottles ride the conveyor into a room where the water, which is filtered twice using a micro-filter and ozone filtering, is pumped into them before exiting the room for labeling and packaging.

The bottling line has a unique history of its own. According to the Cardwells, Shedd found an ad in the newspaper for the machinery in Atlanta around the time he started his bottling business. When he went to purchase it, he discovered its owner was Richard Williams, the father of tennis superstars Venus and Serena Williams.

"I think he had been doing a sports drink around that time, and it was one of the fastest water bottling lines in the state," said Cameron Cardwell. "It was putting out around 2,500 bottles an hour."

"And still putting out," added Elizabeth Cardwell.

Blue Spring Living Water uses bottles that are fully recyclable and BPA-free,



**"It's a naturally occurring centuries-old spring that flows about a million gallons per day. It's 52 degrees year-round, and the water temperature never changes."**

**-Elizabeth Cardwell**



AWI's Zach Krauss speaking with Cameron Cardwell.

and the packaging is also biodegradable. The company believes if its water is pure, its methods of bringing it to the public should be, too. We knew if we were going to build our brand, we wanted to be as sustainable as possible," said Elizabeth Cardwell.

The company services 700 households and offices across Alabama with five-gallon jugs, which is also part of their sustainable mission.

"Our distributor picks up those empty jugs, and we sanitize them, refill them, reuse them and get them back out there," she said.

Blue Spring Living Water currently serves about 500 retail stores and customers in addition to its jug program. It's expanding across the Southeast, hoping to bring a little bit of Alabama to everyone.

"The number one goal is to make sure that everyone that lives here has access to it and knows about what an incredible resource we have in our state," said Cameron Cardwell. "Not too many people realize it's in their backyard."

"We're on a mission to educate people and tell them what good water is about and why it's such an important and foundational pillar of health," said Elizabeth Cardwell. "A lot has been made about locally sourced food, having that connection to farmers and knowing where your food comes from, and that's how we want people to connect with water."

In the same way educating people and forming a bond with water is important to the Cardwells, they are eager to discover more about Blue Spring itself. Affiliated faculty members from the Alabama Water Institute will soon visit the spring to help them explore and learn more about their unique resource.



Blue Springs' bottling plant

### Alabama Water Institute Newsletter Vol. 5 No. 4

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