

WEEKLY WAVE



COLLEGE OF AGRICULTURE & LIFE SCIENCES
COOPERATIVE EXTENSION
**WATER RESOURCES
RESEARCH CENTER**



March 31, 2023 / Volume 11, Issue 13

The Water Resources Research Center - a research unit of the [College of Agriculture and Life Sciences](#) and an Extension unit in [UA Cooperative Extension](#) within the Division of Agriculture, Life & Veterinary Sciences & Cooperative Extension. [Land Acknowledgement.](#)

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IN THIS ISSUE: Transboundary Groundwater Article, Patagonia Drought Planning Workshop, WAM, Factsheet, LC Conservation Program, CAGR Article



New Article on Transboundary Groundwater from WRRC Director

WRRC Director Sharon B. Megdal's opinion paper, "Increasing the visibility of transboundary groundwater," was published on March 21 in PLOS Water. In her introduction, Megdal references the 2022 United Nations World Water Development Report, *Groundwater: Making the invisible visible*, noting that unlike lakes, rivers, and other surface waters, groundwater is easy to overlook and transboundary aquifers, which

cross jurisdictional borders, “can be particularly challenging” to characterize. Using US-Mexico transboundary aquifer assessment and management as an example, Megdal explores the successes and challenges of binational cooperation. She observes that “A critical condition for groundwater management in the transboundary setting is a functioning mechanism for cooperation, one that is built upon trust and mutual respect.” Megdal concludes by stating, “Reliance on groundwater is increasing. Careful management of this vital but invisible resource is essential to the water security of regions throughout the world. The work can be particularly challenging in transboundary settings, but water professionals must lead the way so that communities can benefit from their efforts to make the invisible visible.” The article is open access and available to read at the link below.

Image: Map from Transboundary Aquifers: "Challenges and the Way Forward" published in 2022 in UNESCO

- [Read the Article](#)
- [PLOS Water](#)
- [Transboundary Aquifer Assessment Program \(TAAP\)](#)

EVENTS

NVIS Seminar Series: Tribal Hoop House Project in Northern NV

Date: Tuesday, April 5, 2023

Time: 12:00 pm – 1:00 pm Arizona Time

Location: [Webinar Only](#)

Speaker:

Reginald Premo, *Community Outreach Specialist, University of Nevada*



Reggie Premo is a member of the Shoshone-Paiute Tribes of the Duck Valley reservation that encompasses northeastern NV and southern ID, he is a descendant of the Tosawihí (White Knife) band of Western Shoshone. Reggie was raised on a cattle ranch and currently grows alfalfa hay and assists local producers on the reservation with cropland development. Reggie has been employed with the University of Nevada Cooperative Extension Native Programs as the Community Outreach Specialist based on the Duck Valley Reservation in Owyhee, NV since yr. 2010. He is responsible for coordinating and scheduling educational activities regarding nutrition, organizational development, natural resources, and agriculture for constituents. Constructing hoop houses and providing education and outreach assistance for Nevada tribes & communities have been a major part of his work.

- [Register Here](#)
- [More Info](#)
- [NVIS Spring 2023 Seminar Series](#)

WRRRC Seminar Series: Severe Sustained Drought in the Colorado Basin Revisited

Date: Wednesday, April 12, 2023
Time: 12:00 pm – 1:15 pm Arizona Time
Location: [Webinar Only](#)



Moderator:

George Frisvold, *Professor & Extension Specialist, Department of Agricultural & Resource Economics, UArizona*

Speakers:

- Bonnie G. Colby, *Professor, Department of Agricultural and Resource Economics, UArizona*
- Dari Duval, *Economic Impact Analyst, Department of Agricultural & Resource Economics, UArizona Cooperative Extension*
- Kathy Jacobs, *Director, Center for Climate Adaptation Science and Solutions, Arizona Institute for Resilient Environments and Societies; Professor, Environmental Science, UArizona*
- Pamela Nagler, *Research Physical Scientist, US Geological Survey*
- Connie Woodhouse, *Regents Professor, School of Geography, Development, and Environment and Laboratory of Tree-Ring Research, UArizona*

Image: Adobe Stock, Sunken boat on mud bed in Lake Mead

The JAWRA Featured Collection, *Severe Sustained Drought Revisited: Managing the Colorado River System in Times of Water Shortage 25 Years Later*, follows up on a series published more than 25 years ago to present collaborative research studies supported by the Powell Consortium. That original special issue, “Severe Sustained Drought: Managing the Colorado River System in Times of Water Shortage,” and the publications that arose from it have “shaped thought and encouraged multi-disciplinary research on drought and water scarcity in the United States Southwest.” The 2022 JAWRA Featured Collection was published in two issues and highlights the work of researchers throughout the region. This WRRRC webinar will feature presentations from a panel of authors who contributed papers to the Collection.

[Register Here](#)

Upcoming WRRRC Events

Apr 19 at 12:00 pm: [WRRRC Seminar Series: Golf Course Water Usage: Effective Policy and Effective Water Efficiency Strategies](#)

May 2 at 12:00 pm: WRRRC Seminar Series: Arizona Water Banking Authority; Rebecca Bernat – Save the Date!

May 3 at 12:00 pm: [NVIS Seminar Series: Indigeponics: Indigenizing Controlled Environment Agriculture and Off-Grid CEA Greenhouse for Food Production](#)

May 17 at 12:00 pm: WRRRC Seminar Series: Green Infrastructure in Tucson, AZ; Adriana A. Zuniga-Teran – Save the Date!

External Events

May 18-19: [CLE International’s Law of the Colorado River 23rd Annual Conference: The Next Century of River Policy](#)

Aug 3-4: [31st Annual Arizona Water Law Conference](#)

MARK YOUR CALENDARS!



WRRC
2023
ANNUAL
CONFERENCE

JULY
11-12



Photo: Kim Holmes - Reflective Morning 2021
Green Valley - WRRC Photo Contest



Arizona Gives Day April 4, 2023

As you consider your annual donations on Arizona Gives Day, please remember the Water Resources Research Center.

 **DONATE TODAY**

NEWS

WRRC Getting Out in Arizona – Drought Planning in Patagonia

On March 22 and 24, [CLIMAS](#) and the WRRC's [Water RAPIDS](#) team partnered with the Town of Patagonia to hold a Drought Planning Workshop and field trip in one of the most beautiful and biologically diverse areas of southern Arizona. Both events were convened in Patagonia as part of an ongoing collaborative project with CLIMAS to develop drought planning response options specific to the Town's unique context. The workshop brought together local stakeholders including representatives from the Town of Patagonia, Santa Cruz County, Friends of Sonoita Creek, Tucson Audubon Society, The Nature Conservancy (TNC), Borderlands Restoration Network, and highly engaged community members. Opening remarks from Vice-Mayor Michael Stabile and Town Manager Ron Robinson put ongoing community work into perspective, highlighting the exceptional partnerships that drive watershed health efforts in the region. WRRC staff shared the results of our data collection, drought policy review, and drought indicators development to inform productive discussions focused on drought response options.



[Read More](#)

April is Arizona Water Awareness Month!

Arizona Water Awareness Month (WAM) is kicking off with the first-ever Water Awareness Month Festival, to be held Saturday, April 1 from 10 am to 2 pm at Wesley Bolin Memorial Plaza in Phoenix. The event, hosted by the Arizona Department of Water Resources (ADWR), will feature “fun activities, giveaways, food, music, and useful information from over 25 organizations throughout the State,” including Arizona Project Wet. The goals of WAM are to raise awareness about our state’s most precious resource and provide opportunities for Arizona residents to learn about water conservation. ADWR will hold additional WAM events throughout the month to educate and engage the community. Their website also offers Tips & Resources for water conservation. Now is the perfect time to learn more about water!

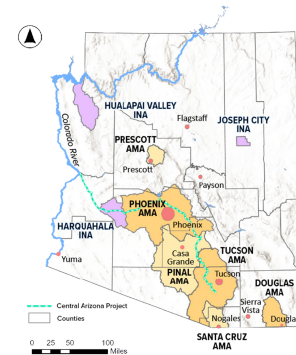


- [More Info](#)
- [Festival Registration](#)
- [Other WAM Events](#)
- [Tips & Resources](#)
- [ADWR Article](#)



Did You Know?

Despite growing by 6 million people, Arizona uses less water than it did in 1957 – thanks in large part to the 1980 Groundwater Management Code. Areas that were heavily reliant upon groundwater were designated as Active Management Areas (AMAs), and Irrigation Non-Expansion Areas (INAs) were also created to prohibit the expansion of new irrigated acreage within established boundaries. After decades of maintaining the same established AMAs and INAs, the Douglas AMA and Hualapai Valley INA were newly designated within the last few months, reflecting growing concern about groundwater overdraft in rural parts of the state. Check out the WRRC’s updated map showing all of Arizona’s AMAs and INAs, including the new additions!



[More Info](#)
[Arizona Water Factsheets](#)

Reclamation Requests Input for Lower Colorado River Conservation Program

The Bureau of Reclamation (Reclamation) is requesting input from Colorado River stakeholders for the development of the Lower Colorado River Basin System Conservation and Efficiency Program (LC Conservation Program). The program aims to “establish longer-term durable system efficiency improvements that result in water conservation benefitting the



lower Colorado River System and its water users.” This LC Conservation Program is part of the Department of the Interior’s August 16, 2022 commitment to address the drought crisis with “prompt and responsive actions and investments.” Reclamation is seeking input for the next phase of the program, which will solicit project proposals from water delivery contract or entitlement holders, specifically regarding eligibility and evaluation criteria for those projects. Input will be accepted until Thursday, April 6, 2023, and should be sent via email to LCBEfficiency@usbr.gov. Any questions should be directed to the same address.

Image: Karletta Chief, WRRC 2022 Photo Contest

[More Info](#) [LC Conservation Program](#)

New Article on CAGRDR Published

A newly published article by former WRRC graduate student Rebecca Bernat and others at UArizona, *Stakeholder Opinions on the Issues of the Central Arizona Groundwater Replenishment District and Policy Alternatives*, reports on research to understand stakeholder opinions on the agency that allows new residential growth and development by replenishing the resulting groundwater use. Several issues with the operation of this agency, the Central Arizona Groundwater Replenishment District (CAGRDR), have been raised in recent years. Bernat and co-authors Sharon B. Megdal, Susanna Eden, and Laura A. Bakkensen describe the results of a stakeholder survey and expert interviews aimed at revealing the CAGRDR issues considered top priority problems and their potential solutions. The research found that a majority of stakeholders saw a problem where CAGRDR replenishment is disconnected from the groundwater pumping it is offsetting, but disparities between the opinions of different stakeholder categories could make implementation of potential solutions politically difficult.

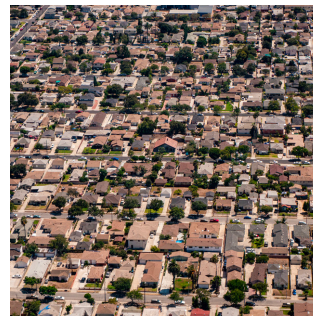


Image: Adobe Stock, Phoenix, AZ

[Read the Article](#)

WATER JOBS

WRRC TAAP Research Analyst

The WRRC is currently hiring for the position of Research Analyst for its Transboundary Aquifer Assessment Program (TAAP). This newly created position will involve project research focused on investigating the socio-economic dimensions of transboundary aquifers in the US and Mexico and the impact of contrasting modes of governance in shared groundwater resources, writing journal articles and reports, giving presentations, and identifying opportunities for collaboration and organizing meetings with partners in the US and Mexico. [More Info](#)

WRRC Student Communications and Outreach Assistant (Hourly)

The WRRC is seeking a student employee with interest and experience in writing about water and/or environmental topics to assist with outreach communication. Applicants are encouraged to visit the WRRC website for more information on WRRC programs and activities. Accepting applications until the position is filled. [More Info](#)

- Babbitt Center for Land and Water Policy [Program Manager](#)
- Montgomery & Associates [Hydrogeologist](#)
- Montgomery & Associates [Senior Hydrogeologist](#)
- Udall Center [Postdoctoral Res Assoc Indigenous Environmental Governance & Policy](#)

Please visit [WRRC's website](#) for a complete listing of water jobs & opportunities.

ANNOUNCEMENTS

- **Apr 1:** [ADWR Water Awareness Month 2023 Kick-off Festival](#)
- **Apr 3:** [UArizona Shades of Urban Greening Symposium](#)
- **Apr 3:** [CEC Youth Innovation Challenge: Water Solutions for Sustainable Development – Submission Deadline](#)
- **Apr 3:** [Rodney Blaine Lewis Scholars Award – Application Deadline](#)
- **Apr 4:** [Arizona Gives Day: Please Consider Making a Gift to the WRRC](#)
- **Apr 5:** [NVIS Seminar Series: Tribal Hoop House Project in Northern NV](#)
- **Apr 6:** [Santa Cruz Watershed Collaborative \(SCWC\) Spring 2023 Forum – Conference Day](#)
- **Apr 7:** [2023-2024 NRWD Fellowship – Application Deadline](#)
- **Apr 8:** [Friends of Sonoita Creek Annual Meeting: Watershed Restoration Ecology](#)
- **Apr 12:** [WRRC Seminar Series: Severe Sustained Drought in the Colorado Basin Revisited](#)
- **Apr 13:** [EPA Region 9 PFAS Community Engagement Session](#)
- **Apr 13:** [Desert Laboratory Lecture – Sonoran Desert Plants in a Changing Climate: What Do Long-Term Data Tell Us?](#)
- **Apr 13:** [CAP Stakeholder Rate Briefing](#)
- **Apr 15:** [Rio Reimagined Earth Day Salt River Cleanup](#) **POSTPONED – New date will be shared soon!**
- **Apr 15:** [City of Glendale Water Awareness Day](#)
- **Apr 17-20:** [90th Annual Western Snow Conference](#)
- **Apr 19:** [WRRC Seminar Series: Golf Course Water Usage: Effective Policy and Effective Water Efficiency Strategies](#)
- **Apr 20:** [Flood Justice Symposium](#)
- **Apr 20-21:** [Santa Cruz River Research Days](#)
- **Apr 21:** [2023 AHS Symposium – Call for Abstracts Deadline](#) **EXTENDED!**
- **Apr 21:** [AHS 2023 Herman Bouwer Intern Scholarship – Application Deadline](#) **EXTENDED!**
- **Apr 21:** [AHS 2023 Halpenny Intern Scholarship – Application Deadline](#) **EXTENDED!**
- **Apr 23-25:** [American Society of Irrigation Consultants 2023 National Conference](#)
- **Apr 24-25:** [NGWA Conference: Managed Aquifer Recharge: Unleashing Resiliency, Protecting Groundwater Quality Conference](#)
- **Apr 25:** [Arizona Water Innovation Initiative Kick-off Event](#)
- **Apr 25:** [Rocky Mountain Research Station Webinar: Using an Understanding of Stream and Riparian Geomorphic Sensitivity and Ecological Resilience to Guide Management: Part 1 – Watershed Processes and Traits](#)
- **Apr 26:** [Southwest Tribal Drought Conversation](#)
- **Apr 27:** [Rocky Mountain Research Station Webinar: Using an Understanding of Stream and Riparian Geomorphic Sensitivity and Ecological Resilience to Guide Management: Part 2 – Meadow Hydrology and Traits](#)
- **Apr 27-28:** [Law Seminars International 10th Annual Comprehensive Conference on Tribal Water in the Southwest](#)
- **Apr 30:** [AHS 2023 Avery Intern Scholarship – Application Deadline](#) **EXTENDED!**

- **May 2:** [WRRRC Seminar Series: Arizona Water Banking Authority – Save the Date!](#)
- **May 3:** [NVIS Seminar Series: Indigeponics: Indigenizing Controlled Environment Agriculture and Off-Grid CEA Greenhouse for Food Production](#)
- **May 5:** [32nd Desert Horticulture Conference](#)
- **May 7-10:** [National Association of Environmental Professionals \(NAEP\) 2023 Conference](#)
- **May 8-11:** [Water for Food Global Conference: Cultivating Innovation: Solutions for a Changing World](#)
- **May 8-12:** [Arizona Water Professionals Appreciation Week](#)
- **May 9-10:** [2023 Corridors, Connectivity, and Crossings Conference](#)
- **May 9-11:** [96th Annual AZ Water Conference & Exhibition](#)
- **May 17:** [WRRRC Seminar Series: Green Infrastructure in Tucson, AZ – Save the Date!](#)
- **May 18-19:** [CLE International's Law of the Colorado River 23rd Annual Conference: The Next Century of River Policy](#)
- **May 19:** [NAMWUA Water Utility Leadership Forum \(WULF\)](#)
- **May 23-25:** [Rural Water Association of Arizona 2023 Annual Spring Conference](#)
- **May 31:** [US Water Prize 2023 – Application Deadline](#)
- **May 31:** [NWRI Fellowship Program 2023-24 – Application Deadline](#)
- **Jun 13-15:** [UCOWR/NIWR 2023 Annual Water Resources Conference](#)
- **Jun 15-16:** [2023 Next Generation Water Summit](#)
- **Jul 11-12:** [WRRRC 2023 Annual Conference: What Can We Do? Solutions to Arizona's Water Challenges](#)
- **Jul 17-19:** [AWRA 2023 Summer Conference: Connecting Land & Water for Healthy Communities](#)
- **Jul 23-25:** [Arizona Water Reuse 2023 Symposium](#)
- **Aug 3-4:** [31st Annual Arizona Water Law Conference](#)
- **Sep 13-16:** [Arizona Hydrological Society 35th Annual Symposium](#)
- **Nov 6-8:** [AWRA 2023 Annual Water Resources Conference](#)

PUBLICATIONS & MEDIA

Guayule Cultivation and Irrigation Methods for the Southwestern United States

As water becomes scarce in Arizona there is a desire by growers to grow crops that use less water. With hundreds of acres already planted across the state and the plan to scale to 10,000 acres over the course of three years, guayule has become a more water wise crop than traditional desert row crops like silage corn, alfalfa, and cotton. In this guide, cultivation and irrigation methods will be discussed to increase area under guayule across the state. [More Info](#)

Three New Publications from WRRRC Director Sharon B. Megdal

- Bernat, Rebecca F. A., Sharon B. Megdal, Susanna Eden, and Laura A. Bakkensen. 2023. "Stakeholder Opinions on the Issues of the Central Arizona Groundwater Replenishment District and Policy Alternatives" *Water* 15, no. 6: 1166. <https://doi.org/10.3390/w15061166>
- Matherne, Anne-Marie, and Sharon B. Megdal. 2023. "Advances in Transboundary Aquifer Assessment" *Water* 15, no. 6: 1208. <https://doi.org/10.3390/w15061208>
- Megdal, Sharon B. 2023. "Increasing the visibility of transboundary groundwater" *PLOS Water* 2, no. 3: e0000113. <https://doi.org/10.1371/journal.pwat.0000113>

Western Water Article: "Testing at the Source: California Readies a Groundbreaking Hunt to Check for Microplastics in Drinking Water"

Tiny pieces of plastic shed from food wrappers, grocery bags, clothing, cigarette butts, tires and paint are invading the environment and every facet of daily life. Researchers

know the plastic particles have even made it into municipal water supplies, but very little data exists about the scope of microplastic contamination in drinking water. After years of planning, California this year is embarking on a first-of-its-kind data-gathering mission to illuminate how prevalent microplastics are in the state's largest drinking water sources and help regulators determine whether they are a public health threat. [More Info](#)

UArizona Cooperative Extension Publication: Water Irrigation Efficiency Program
Ethan Orr, Robert Masson, and Stephanie Brennan [More Info](#)

2023 World Water Development Report

Annual report from the United Nations, produced by the UNESCO World Water Assessment Programme. This year's report focuses on partnerships and cooperation in water management and development and their role in achieving progress towards Sustainable Development Goal 6. [More Info](#)

OTHER NOTICES

Arizona Gives Day 2023

Water touches the life of every person in Arizona and WRRC is the go-to organization for key water issues. Donors have a big impact on our ability to conduct in-depth research, top-level education, and purposeful engagement. On this Arizona Gives Day, please support our efforts with your tax-deductible donation. [Donate Here](#)

US Water Prize 2023

Awarded on an annual basis, the US Water Prize celebrates outstanding achievement in the advancement of sustainable, integrated, and inclusive solutions to our nation's water challenges. It is the preeminent national recognition program for exemplary efforts to secure a sustainable water future for all. The deadline to apply is Wednesday, May 31 at 8:00 pm ET. [More Info](#)

Water Awareness Month Festival 2023

Join ADWR for a fun day of celebrating the importance of water in our daily lives! Featuring fun activities, giveaways, food, music, and useful information from over 25 organizations throughout the State! Date & Time: Saturday, April 1, from 10 am–2 pm; Location: Wesley Bolin Plaza, Downtown Phoenix. This event is FREE and open to all! Feel free to reach out to Némesis Ortiz-Declet (nortizdeclet@azwater.gov) with any questions. [More Info](#)

Haury Program Spring 2023 Graduate Student Native Pathway Awards

The Haury Program invites applications for its Spring 2023 Native Pathway Awards, supporting UArizona graduate student research in the areas of Tribal water sustainability and Native American and Indigenous resilience. Successful proposals may receive up to \$20,000 per student and will be evaluated until funds are exhausted. [More Info](#)

Do you have a story idea, water job announcement, or event to share?

[Contact us here](#)