

WEEKLY WAVE



THE UNIVERSITY OF ARIZONA
COOPERATIVE EXTENSION

WATER RESOURCES RESEARCH CENTER



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The Water Resources Research Center - a research unit of the [College of Agriculture, Life and Environmental 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: Joshua Ruddick, Seminar Recap, Rebecca Bernat, Rodney B Lewis Scholars Award, Learning from Israel's Water Plan, Pecan Study, New Water Map Insets

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**Tucson Community Loses Champion of
Environmental Education and Social Justice**

Joshua R. Ruddick
November 25, 1967 – August 27, 2023

Joshua R. Ruddick of Tucson, AZ, passed away unexpectedly of natural causes on August 27, 2023. A passionate social justice advocate, environmentalist, and student of the world, Josh spent nearly 15 years as a high school science instructor before joining the University of Arizona Cooperative Extension Arizona Project WET as Tucson Program coordinator in 2021. Josh actively participated in many of APW's professional development workshops and served as a mentor teacher in the Recharge the Rain program. Josh was a co-founder, instructor, and former President of the Pima County Chapter of the Arizona Master Naturalist Association. Teaching was Josh's second career after he spent 17 years in executive management positions in the healthcare industry. For the last two years, he served on the board of education for Tucson Country Day School. His passion for education and project-based learning helped the school transition to its current model.

[Read More](#)

EVENTS

ENVS Colloquium Series: Upland Land Management Influences on Hydrogeologic Processes – Co-sponsored by the WRRC

Date: Monday, October 2, 2023

Time: 3:00 pm – 4:00 pm Arizona Time

Location: University of Arizona (Marley 230), 1145 E 4th St, Tucson, AZ; [Zoom](#)



Speaker:

Abe Springer, *Professor, School of Earth and Sustainability, Northern Arizona University*

Abe Springer is a Professor of Ecohydrogeology and was the Inaugural Director of the School of Earth and Sustainability at Northern Arizona. He has been the Fulbright Visiting Chair of Water and Environment at the University of Lethbridge, Alberta, Canada, studying the ecohydrology of springs of Western Canada. In 2022, he was the Birdsall-Dreiss Distinguished and LaMoreaux International Lecturer for the Hydrogeology Scientific Division of the Geological Society of America. Since arriving at NAU in 1994, he has taught courses in hydrogeology, geology of Arizona, environmental geology, applied geology, groundwater modeling, contaminant transport modeling, university colloquium, and others. Dr. Springer and his students study local and regional groundwater flow systems and human impacts on them, apply principles of sustainability to aquifer management through models, quantify the hydrological function of groundwater-dominated ecosystems, the role of land-use change and disturbance on groundwater flow systems, study karst hydrogeology, and restoration of riparian ecosystems.

Dr. Springer was awarded the Arizona Hydrological Society's Outstanding Service Award at the 2023 AHS Symposium held in Flagstaff earlier this month. Springer's talk is co-sponsored by the [Water Resources Research Center](#) and the [Center for Climate Adaptation Science and Solutions](#).

[Event Flyer](#)

[Zoom Link](#)

NVIS Fall 2023 Seminar: Merging Western Science and Traditional Knowledge of Produce Safety Within Arizona's Tribal Lands – Co-sponsored by the WRRC



Date: Tuesday, October 3, 2023

Time: 12:00 pm – 1:00 pm Arizona Time

Location: University of Arizona (ENR2 - N595), 1064 E Lowell St, Tucson, AZ; [Zoom](#)

Speaker:

Valerisa Gaddy, *Post-doctoral Researcher, Water Resources Research Center, UArizona*

Valerisa Gaddy, PhD, is currently a post-doctorate research associate at the University of Arizona – Water Resources Research Center in Tucson, AZ. Gaddy is originally from Gallup, NM, and is of the Diné (Navajo) people. Gaddy is an alumna of the University of Arizona receiving both her PhD and MS in Environmental Science with an emphasis in microbiology. Prior to UArizona, she received her BS in Microbiology from New Mexico State University. Gaddy's research and extension interests include developing and validating methods to assess microbial water quality and communicating modern water quality and produce safety methods to growers. Most recently, Gaddy was a 2022–2023 MIT Solve fellow and a 2022–2023 Agent of Change in Environmental Health fellow and is using her research to advocate for Tribal irrigation resources in Arizona. Gaddy is passionate about environmental science literacy and serving the Diné people through outreach and engagement.

[Event Flyer](#)

[Zoom Link](#)

Upcoming WRRC Events

Oct 12: [WRRC Water Webinar: Solar River, Covering and Powering Canals with Photovoltaic Energy](#)

Oct 30: [ENVS Colloquium Series Featuring Dave White, Director, Global Institute of Sustainability and Innovation, Arizona State University – Co-sponsored by the WRRC](#)

Nov 7: [NVIS Fall 2023 Seminar: From Metal Mining to Data Mining: How Indigenous Data Governance Supports Indigenous Sovereignty Within an Open Science Ecosystem – Co-sponsored by the WRRC](#)

Dec 5: [NVIS Fall 2023 Seminar: Culture, Education, and Water Sovereignty in Southern California Tribal Communities – Co-sponsored by the WRRC](#)

Other Events

Nov 6–7: [Tribal Water Law Conference](#)

NVIS Begins Fall Seminar Series

On September 12, Native Voices in Stem (NVIS) began their fall seminar series with a presentation from Joseph Hoover, assistant professor in the UArizona Department of Environmental Science. In his presentation, “Addressing environmental data gaps through community-engaged projects,” Hoover spoke about his experiences conducting research projects with Indigenous communities. He emphasized the importance of “community-engaged research” and developing relationships with individuals involved in each project. Much of his work has centered around abandoned uranium mines. Hoover has worked with multicultural and transdisciplinary research teams to answer questions about environmental impacts on water, plants, livestock, air quality, and human health, as well as possible avenues for remediation. Through his research, he also seeks to develop questions and answers that address water insecurity in Indigenous communities. He noted that many previous studies have been narrow in scope, primarily addressing infrastructure questions, but there are other factors to consider, including affordability, reliability, water chemistry, the presence of microorganisms, and varying use patterns for different water sources. Hoover and his collaborators have developed a combined dataset of “Unregulated Wells on the Navajo Nation,” which harmonizes data from multiple sources into a single location and format, and highlights data gaps for possible future research. It is available both as a GIS dataset for fellow researchers and as a more accessible web interface, Navajo WaterGIS, for public use.



- [View the Recording](#)
- [NVIS Seminars](#)
- [GIS Dataset](#)
- [Navajo WaterGIS](#)

WRRRC Alum Promoted to AWBA Manager

The WRRRC would like to congratulate Rebecca Bernat, former WRRRC Graduate Research Assistant and graduate of the UArizona Environmental Science PhD program, on her recent promotion to Manager of the Arizona Water Banking Authority (AWBA). Established in 1996, the AWBA stores Arizona’s unused Colorado River water, as well as other water sources including effluent, and administrates long-term storage credits that can be used to firm existing water supplies. Less than two years ago, Bernat accepted a position at the AWBA as Water Resources Specialist Associate & Technical Administrator. When AWBA Director/Manager Virginia O’Connell announced her retirement earlier this year, Bernat applied for the Manager position. She expressed her appreciation for the invaluable one-on-one training she received from O’Connell, calling it a “once-in-a-lifetime opportunity.” Bernat says her interest in Arizona water began in childhood when she saw a documentary about the Grand Canyon.



[Read More](#)

Danielle Elizaveta Kouyoumdjian Receives Rodney Blaine Lewis Scholars Award

The second recipient of the Rodney Blaine Lewis Scholars Award is Danielle Elizaveta Kouyoumdjian, who is enrolled at the University of Arizona pursuing a double major in Law and American Indian Studies, with a minor in Russian. This endowed award was announced at the WRRC's 2021 Annual Conference, *Tribal Water Resilience in a Changing Environment*, and supports students who are enrolled members of an Arizona Indian Tribe and who are enrolled in a program of study in water law, policy, or a closely related field. Kouyoumdjian is a member of the Tohono O'odham Nation, and her long-term goal is to serve as legal counsel for her Tribe "as a champion for water and resource rights" to ensure access to safe, clean drinking water. In her personal statement, she said, "It is my dream to create an Arizona-based inter-tribal legal team to ensure that our communities have access to water into perpetuity." We congratulate Kouyoumdjian on her selection for this award and wish her success in achieving her goals.



[More Info](#)
[Rodney Blaine Lewis' Legacy](#)

Opinion Article Suggests Arizona Can Learn from Israel's Water Plan

A recent opinion article in *The Conversation*, authored by Texas A&M University Professor of Law Gabriel Eckstein, Tel Aviv University Adjunct Professor of Environmental Studies Clive Lipchin, and WRRC Director Sharon B. Megdal, offers an overview of ways Arizona might learn from Israel's approach to water management. The authors discuss a proposal by the Israeli company IDE to import desalinated water from a plant built in Mexico on the Gulf of California, through a 200-mile pipeline through the desert. The authors note that they "recommend engineered projects like this one be considered as part of a broader water management portfolio that responds holistically to imbalances in supply and demand." They also emphasize that Israel's approach to water does not rely on any single solution, but rather a combination of solutions including water conservation, desalination, and efficiency and recycling programs, and assert that this approach "should apply to all sectors of the economy." The article concludes by noting that while desalination may be one solution, "Arizona could develop a water portfolio that would be far more likely than massive investments in seawater desalination to achieve the sustainable and secure water future that the state seeks."



Image: The proposed desalination plant in Mexico would pipe fresh water 200 miles to Arizona. [Water Infrastructure Finance Authority of Arizona/ENR Southwest](#), CC BY-ND

[Read the Article](#)

Estimating Consumptive Water Use of Pecans in Arizona

A recent University of Arizona Cooperative Extension bulletin by retired Extension Specialists Paul Brown and James Walworth summarizes the results of a three-year study

to better understand the consumptive water use of pecan trees in southern Arizona. The project used data from two monitoring towers set up in pecan orchards near Sahuarita and Bowie, Arizona. By measuring the vertical movement of water vapor, the researchers convert the resulting data into rates of evapotranspiration or consumptive use (CU). Over the three-year study period, growing season CU averaged 52.5” in the Sahuarita orchard and 51.5” in Bowie. The study also provides weekly estimates of pecan CU for southern Arizona for the growing season, March through November, and estimates weekly crop coefficients which can be used to estimate pecan CU in other areas with evapotranspiration values from local weather stations.

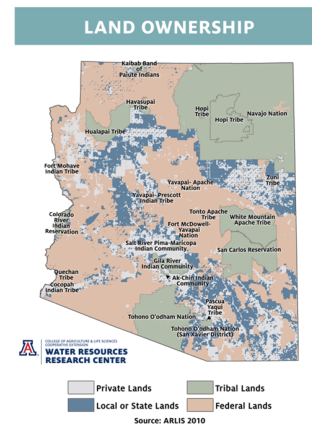


Image: Pecan trees near Hatch, New Mexico, bathed in irrigation water from wells.

[Read the Study](#)

Arizona Water Map Poster Insets Now Available Online

The WRRC's Arizona Water Map Poster is available both in print and as a PDF download. It provides a concise visual representation of Arizona's water resources. In addition to the main map, there are multiple inset images around the edges of the poster displaying several different kinds of visual data to provide additional information and context. These include Arizona's average annual water use, Colorado River apportionments, water use by groundwater basin, land ownership, annual precipitation by planning area, subsidence and storage, and water system connections. The land ownership inset, for example, is useful for illustrating how little Arizona land is privately held. The water map insets are now available on the WRRC website as PNG files for individual download and use.



[Water Map Poster & Insets](#)

WATER JOBS

- APW [Outreach Instructional Specialist I](#)
 - University of Alaska Fairbanks [Term Research Assistant Professor for Hydrology](#)
 - University of Minnesota [Water Quality and Soil Health Extension Educator](#)
 - USDA Natural Resources Conservation Service [Engineer \(Civil or Agricultural\)](#)
- Please visit [WRRC's website](#) for a complete listing of water jobs & opportunities.

ANNOUNCEMENTS

- **Sep 25:** [Prescott AMA Groundwater Users Advisory Council \(GUAC\) Meeting](#)

- **Sep 27:** [Governor's Water Policy Council Assured Water Supply Committee Meeting](#)
- **Sep 27–28:** [Southwest Drought Learning Network 2023 Annual Meeting](#)
- **Sep 28:** [CNRS International Emerging Actions – Proposal Submission Deadline](#)
- **Sep 29:** [AWRA 2024 Geospatial Water Technology Conference – Abstract Deadline](#)
- **Sep 30:** [Water Resources Management & Sustainability: Solutions for Arid Regions 2nd International Conference – Abstract Submission Deadline](#)
- **Sep 30:** [Sonoran Institute: Guided Dragonfly Tours](#)
- **Oct 1:** [RiversEdge West 2024 Conference – Oral Presentation Abstract Deadline](#)
- **Oct 2:** [BIO5 Postdoctoral Fellowship – Application Deadline](#)
- **Oct 2:** [ENVS Colloquium Series: Upland Land Management Influences on Hydrogeologic Processes; Dr. Abe Springer – Co-sponsored by the WRRRC](#)
- **Oct 3:** [NVIS Fall 2023 Seminar: Merging Western Science and Traditional Knowledge of Produce Safety Within Arizona's Tribal Lands; Dr. Valerisa Gaddy – Co-sponsored by the WRRRC](#)
- **Oct 3–5:** [AWWA WaterSmart Innovations 2023 Conference](#)
- **Oct 4:** [Governor's Water Policy Council Rural Groundwater Committee Meeting](#)
- **Oct 6:** [AWRA 2024 Spring Conference – Abstract Deadline](#)
- **Oct 7:** [Urban Wildlife Conservation Day: Rio Reimagined Salt River Clean-Up](#)
- **Oct 9:** [New Regional Leader for Rio Reimagined – Proposal Submission Deadline](#)
- **Oct 12:** [CAP Briefing & Updates on 2024-2025 Budget](#)
- **Oct 12:** [WRRC Water Webinar: Solar River, Covering and Powering Canals with Photovoltaic Energy](#)
- **Oct 19:** [Imagine a Day Without Water](#)
- **Oct 19-20:** [Upper Gila Watershed Forum - CANCELED](#)
- **Oct 21:** [19th Annual Research Insights in Semiarid Ecosystems \(RISE\) Symposium](#)
- **Oct 23:** [BSMAR18 — Abstract Submission Deadline](#)
- **Oct 25:** [Water Education Foundation's 39th Annual Water Summit: Taking on the Improbable in Western Water](#)
- **Oct 27:** [Arizona Water Protection Fund Fiscal Year 2024 Grant Applications – Deadline to Submit Public Comments](#)
- **Oct 30:** [ENVS Colloquium Series Featuring Dave White, Director, Global Institute of Sustainability and Innovation, Arizona State University – Co-sponsored by the WRRRC](#)
- **Nov 5–9:** [AWWA Water Quality Technology Conference](#)
- **Nov 6–7:** [Tribal Water Law Conference](#)
- **Nov 6–8:** [AWRA 2023 Annual Water Resources Conference](#)
- **Nov 6–9:** [Amsterdam International Water Week 2023](#)
- **Nov 7:** [NVIS Fall 2023 Seminar: From Metal Mining to Data Mining: How Indigenous Data Governance Supports Indigenous Sovereignty Within an Open Science Ecosystem – Co-sponsored by the WRRRC](#)
- **Nov 14–16:** [US Water Alliance One Water Summit 2023](#)
- **Dec 5:** [NVIS Fall 2023 Seminar: Culture, Education, and Water Sovereignty in Southern California Tribal Communities – Co-sponsored by the WRRRC](#)
- **Dec 5–7:** [AWWA North American Water Loss Conference & Exposition](#)
- **Dec 11–15:** [AGU23: Wide. Open. Science](#)
- **Jan 1, 2024:** [RiversEdge West 2024 Conference – Poster Presentation Abstract Deadline](#)
- **Jan 22–24, 2024:** [Growing Water Smart: Integrated Water and Land Use Planning Workshop](#)
- **Feb 11–13, 2024:** [AWWA/WEF Young Professionals Summit](#)
- **Feb 26–28, 2024:** [Water Resources Management & Sustainability: Solutions for Arid Regions 2nd International Conference](#)
- **Feb 27–29, 2024:** [2024 Southwest Adaptation Forum – Save the Date](#)
- **Mar 5–7, 2024:** [RiversEdge West 2024 Conference – Restoration for the Future: Promoting Resilience in Our Rivers and Communities](#)
- **Mar 11–14, 2024:** [AWWA WaterReuse 2024 Symposium](#)
- **Mar 25–27, 2024:** [AWRA 2024 Geospatial Water Technology Conference](#)

- **Apr 3–6, 2024:** [BSMAR18](#)
- **Apr 8–10, 2024:** [AWRA 2024 Spring Conference](#)
- **Jun 10–13, 2024:** [AWWA 2024 Annual Conference & Expo \(ACE24\): Transforming Our Water Future](#)

PUBLICATIONS & MEDIA

Waterloop Podcast Interview with Peter Gleick: A View From The Year 2099

It's the year 2099 and civilization has finally achieved global water sustainability. In this positive era, water is a human right, properly valued, efficiently and productively used, extensively reused, and part of thriving ecosystems. The path to this future is discussed in this episode with Peter Gleick, author of *The Three Ages of Water* and President Emeritus of the Pacific Institute. He explains the fundamental choice made in the 2020s that led to a sustainable water world and how obstacles were overcome in politics, pricing, efficiency, energy, and agriculture. [Listen to Episode #194](#)

OTHER NOTICES

In Memoriam: Frank Barrios

Frank Barrios, Arizona historian, engineer, community activist, author, retired St. Vincent de Paul President, and a heritage family descendant of Phoenix, AZ, passed away after a battle with a year-long illness. He was born on April 8, 1942. His lifelong career of service to his beloved Arizona began with the US Bureau of Reclamation and the Arizona Department of Water Resources. After graduating from Arizona State University, Frank worked at the BOR Phoenix Development Office in 1966. He left BOR in 1975 and moved to the state office called the Arizona Water Commission, later transitioned to the Arizona Department of Water Resources. He spent time as a Director for both the Pinal and Phoenix Active Management areas. He was a genuinely good person and well-respected in the water community. [Obituary](#)

ACTIVATE Research Team's Study Wins NASA Group Achievement Award

After conducting 179 research flights over the western Atlantic Ocean, an international team of scientists led by UArizona CHEE professor Armin Sorooshian has won the NASA Group Achievement Award, one of the agency's prestigious Honor Awards.

The ACTIVATE (Aerosol Cloud meTeorology Interactions oVer the western ATLantic Experiment) research team won the award for resilience while conducting critical atmospheric studies. The ACTIVATE mission investigates aerosol-cloud interactions, which are one of the largest uncertainties in simulating and studying climate change. [More Info](#)

Seeking New Regional Leader for Rio Reimagined

The Request for Proposals to secure the Rio Reimagined Ambassador to the Urban Waters Federal Partnership is now open. This full-time position will work closely with the Rio Reimagined (RIO) team at ASU and a wide variety of community partners engaged in the revitalization of the river corridor. They will have direct responsibility for the [Urban Waters Federal Partnership](#) (UWFP) program at the EPA. Applicants should have experience with federal grants, funding cycles, federal agencies, and political awareness, as well as an ability to serve as a trusted partner to local governments, and non-profit and community-based organizations. This regional leader will be contracted through the Maricopa Association of Governments (MAG). Proposals will be accepted until 3:00 pm MST on October 9, 2023. [More Info](#)

**Public Comment Period: Arizona Water Protection Fund Fiscal Year 2024
Grant Applications**

The Arizona Water Protection Fund Commission has received grant applications for its fiscal year 2024 funding cycle. These are available for public review at the [Arizona Water Protection Fund website](#). Written comments may be submitted during the 45-day public comment period, which ends on October 27 at 5:00 pm. Comments can be mailed, sent via email, or sent by fax. Please include application numbers and project titles with any comments. [More Info](#)

BIO5 Postdoctoral Fellowship Application

The BIO5 Postdoctoral Fellowship is an internal funding mechanism and recognition for outstanding postdoctoral researchers at the University of Arizona who are engaging in multi-disciplinary research projects aligned with the foci of the BIO5 Institute. These grants are specifically designed to support and enhance independent research goals, showcase research at a BIO5 Research Symposium via short talks and/or poster sessions, and facilitate a “forward thinking” mindset by requiring each fellow to form a three-member mentoring committee that will help in grant applications, career advice, and job talk preparations by providing funds for additional research training or experience pertinent to their current postdoctoral appointments. Applications are due by 5:00 pm on October 2, 2023. [More Info](#)

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

[Contact us here](#)