



COLLEGE OF AGRICULTURE & LIFE SCIENCES  
COOPERATIVE EXTENSION

## **WATER RESOURCES RESEARCH CENTER**



# **2021**

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## **ANNUAL REPORT**

**GREATER DEPTH,  
BROADER PERSPECTIVE  
FOR A CLEAR  
WATER FUTURE**

[wrrc.arizona.edu](http://wrrc.arizona.edu)

# 2021 ANNUAL REPORT



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**WATER RESOURCES  
RESEARCH CENTER**

## **GREATER DEPTH, BROADER PERSPECTIVE FOR A CLEAR WATER FUTURE**

We tackle key water policy and management issues, empower informed decision-making, and enrich understanding through engagement, education, and applied research.

### **Table of Contents**

Message from the Director .....	1
Partnerships .....	2
Organization.....	2
Working Together.....	3
Connecting with a Diverse Public .....	6
Affiliated Programs .....	8
Personnel and Facilities.....	9
Staff .....	10
Financial Health.....	11
Notes.....	12

**Appendix A: 2021 Metrics Report and Partnership Matrix**

**Appendix B: Supplemental Information**

Appendices are available at: <https://wrrc.arizona.edu/about#annual-reports>

**2021 Highlights: A two-page summary**

**Cover Photo:** James Bowman - Whitewater Draw, AZ (cropped). Full photo on back page.



# MESSAGE FROM THE DIRECTOR



Sharon B. Megdal -  
Dubai, March 2022

The year 2021 was an interesting one. Though the pandemic continued to impact interpersonal interactions, the Water Resources Research Center continued the programs and activities expected of us. I taught my first fully online graduate water policy class to as large a group of graduate students as I have hosted. With the help of a highly engaged group of advisors, we planned and delivered a fully virtual conference. Upon announcement of the Tier 1 Colorado River Shortage Declaration, the WRRC received an increased number of requests for presentations and interviews. Many news outlets, including *The New York Times*, *The Washington Post*, *The Hill*, and BBC Radio 5 Live, asked the WRRC to help explain the implications for Arizona of the declaration and continuing drought conditions. The WRRC continues to be

unwavering in its efforts to be a trusted source for reliable information. After perusing this Annual Report for calendar year 2021, I hope you will agree that, as Arizona and the region face unprecedented water challenges, the WRRC continues to fulfill its mission.

*Sharon B Megdal*

## About the Director

WRRC Director Sharon B. Megdal oversees programs and operations of the WRRC and engages with multiple partners on projects that investigate water resource policy issues and inform a range of audiences. After a one-year hiatus teaching her graduate class, *Water Policy in Arizona and Semi-arid Regions*, she returned to the (virtual) classroom. The year was also filled with more presentations and interviews than ever, and, in addition to penning several Reflections essays, Dr. Megdal co-authored several peer-reviewed publications. Professional activities included serving on professional boards and numerous committees involved in organizing conference programs. She embarked on the Diversifying Voices in Water Resources project and continued the Indigenous Water Dialogues initiative. In conjunction with the WRRC's Annual Conference, she worked with the UArizona Foundation to establish the Rodney Blaine Lewis Scholars Award. A detailed listing of her professional activities can be found [here](#).

A member of the faculty in the Department of Environmental Science, Dr. Megdal is the C.W. & Modene Neely Endowed Professor for Excellence in Agriculture and Life Sciences and University Distinguished Outreach Professor. She also holds numerous courtesy appointments in departments and colleges across campus.

# PARTNERSHIPS

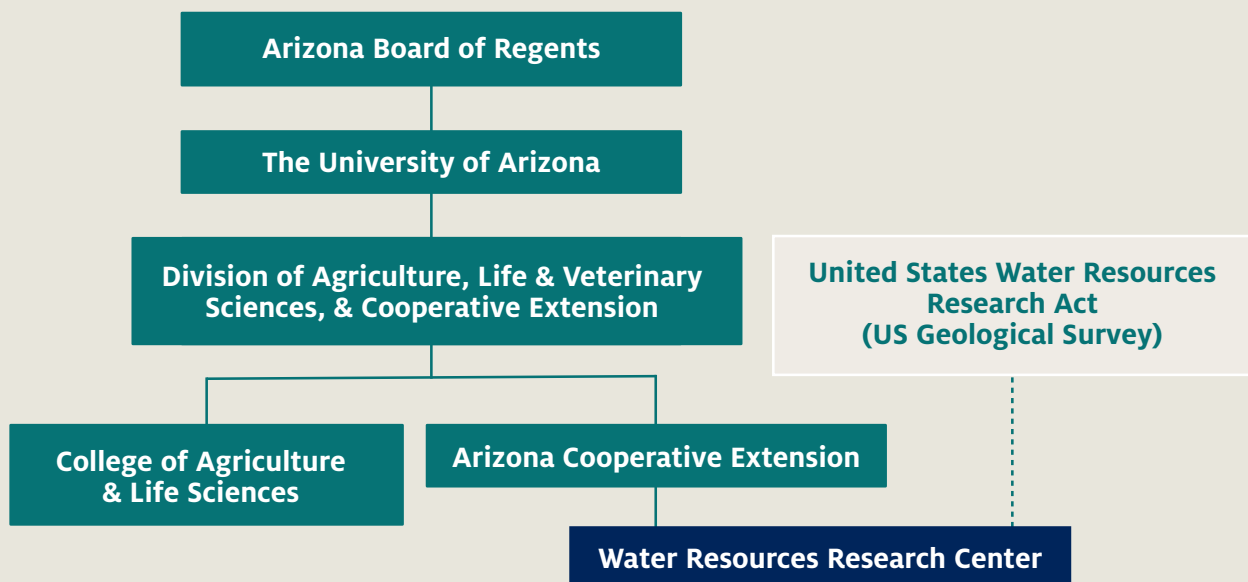
## External Advisory Committee

The WRRRC's External Advisory Committee met virtually on December 1, 2021. The members of the EAC and their affiliations as of December 2021 are listed below.

- Tom Buschatzke, *Arizona Department of Water Resources*
- Cynthia S. Campbell, *City of Phoenix*
- Guy Carpenter, *Stanley Consultants*
- William (Bill) Collings, *D.N.A. Inc.*
- Ted Cooke, *Central Arizona Project*
- Maria Dadgar, *Inter Tribal Council of Arizona*
- Tom Davis, *Yuma County Water Users' Association*
- Henry Day, *Arizona Public Service*
- Scott Deeny, *The Nature Conservancy*
- Alan Forrest, *AF Engineering Inc.*
- Andy Groseta, *Groseta Ranches*
- Joe Gysel, *EPCOR, Water USA, Inc.*
- Jason Hauter, *Akin Gump Strauss Hauter & Feld LLP and Attorney for the Gila River Indian Community*
- John Kmiec, *Tucson Water*
- Michael Lacey, *Freeport-McMoRan Copper and Gold*
- James (Jim) Leenhouts, *U.S. Geological Survey, Arizona Water Science Center*
- Melodee Loyer, *Farmers Water Co.*
- Randy Matas, *Arizona Department of Environmental Quality*
- Juliet McKenna, *Montgomery & Associates*
- Leslie Meyers, *U.S. Bureau of Reclamation*
- Joe Olsen, *Metropolitan Water District*
- Sarah Porter, *Morrison Institute for Public Policy, Arizona State University*
- Dave Roberts, *Salt River Project*
- Fred Schneider, *Arizona Water Company*
- Warren Tenney, *Arizona Municipal Water Users Association*
- Chris Udall, *Agribusiness & Water Council of Arizona*
- Christopher (Kip) Volpe, *The Estes Company*
- Dave Wegner, *Woolpert Engineering Inc., National Academy of Sciences, Water Science Technology Board*
- Sid Wilson, *Retired (Central Arizona Project)*
- Brian Wong, *BKW Farms*
- Francisco Zamora, *Sonoran Institute*

## ORGANIZATION

The University of Arizona Water Resources Research Center is Arizona's federally authorized water institute pursuant to the Water Resources Research Act, as administered by the US Geological Survey (USGS).





# WORKING TOGETHER



## Water Resource Planning

**Water Research and Planning Innovations for Dryland Systems (Water RAPIDS):** The Water RAPIDS program works at regional, state, watershed, and local scales to build capacity within communities for water resources and watershed planning. Water RAPIDS fosters holistic approaches that integrate water planning with land use planning.

*Supporting Rural Communities through Drought Preparedness and Response Planning:* The Water RAPIDS team launched a new project with the Climate Assessment for the Southwest (CLIMAS) program to apply current and emerging data to build more robust community drought preparedness and response plans that consider local watershed conditions and natural resources. This project will develop and demonstrate replicable methods for coproducing community-based climate adaptation and mitigation strategies. Working directly with community partners, these replicable data and collaborative processes can assist similarly situated communities in creating drought response plans that consider costs/benefits and policy trade-offs. The project team is a collaboration with UArizona College of Agriculture and Life Sciences (CALs) faculty and graduate students.

*Pivoting Watershed Planning in Response to Extreme Fires:* The Water RAPIDS team continued a collaborative watershed planning effort in the Globe-Miami area

of southern Gila County. In partnership with the US Bureau of Reclamation and Gila County Cooperative Extension, this project team focused on evaluating the role of ecosystem services in providing clean and reliable water supplies to this rural part of the state, and included consideration of the potential impacts of fire and changing climate. After the Telegraph and Mescal fires burned over 250,000 acres in 2021, creating short- and long-term changes in the watershed, project work pivoted to assess the recovery outlook in tandem with vulnerabilities highlighted by the fire. These efforts included co-convening the project's fourth public forum focused on post-fire impacts, which bridged perspectives among local governments, federal agencies, mining corporations, and other stakeholders.



### Engaging Rural Leaders about Post-Fire Watershed Recovery

After the Fire Video Series

## Stakeholder Engagement

*Assisting the Town of Superior in Understanding Environmental Flows for Queen Creek:* As a trusted partner throughout Arizona, the WRRC leads effective collaborative planning processes to assist communities in balancing human water demands with those of the natural environment. In 2021, the Water RAPIDS program received funding to act as a neutral party to evaluate and coordinate research and planning activities for the Town of Superior Queen Creek Working Group. In this role, the WRRC fostered engagement among diverse stakeholders and integrated efforts to develop a better understanding of management options for water resources in this region.

*Launching a Pilot Project with Arizona Water Company:* Water RAPIDS continued research activities with the Babbitt Center for Land and Water Policy, receiving a grant from the Lincoln Institute of Land Policy to be matched by the Arizona Water Company (AWC) for a one-year collaborative project. Based on past work, this project will develop the prototype for an Esri-supported data platform to help exurban communities access and use data to achieve their sustainability and resilience goals. The project team will collaborate with the Center for Geospatial Solutions, AWC, two communities served by AWC (Casa Grande and Coolidge), and Pinal County. This work is driven by a shared commitment to improving data quality and access for more informed decision making, especially in small to medium-sized communities with limited resources and capacity.

*Collaborating with ADEQ and CALS CCT on New Application:* In partnership with the College of Agriculture and Life Sciences Cyber Communications and Technologies (CCT) team and the Arizona Department of Environmental Quality (ADEQ), Water RAPIDS is providing support in cataloguing decades of records of surface water quality standards and creating a database to perform advanced queries of these records. Developing new technical capabilities suited to the needs and use case scenarios of ADEQ personnel, this project will result in a responsive and user-friendly web application/database.

## Working Across Borders

### Transboundary Aquifer Assessment Program

**(TAAP):** As the UArizona TAAP principal investigator, Dr. Megdal leads a team consisting of Dr. Mary-Belle Cruz Ayala, a WRRC post-doctoral researcher and former graduate research assistant; Dr. Elia M. Tapia, a research professor from Universidad de Sonora; and Dr. Eylon Shamir of the Hydrologic Research Center. TAAP activities include 1) collaboration with the USGS, the International Boundary and Water Commission, Universidad de Sonora, and other TAAP partners; 2) development of a water balance model and climate change assessment for the Nogales Aquifer and Nogales Wash; 3) integration of available water balance models for the transboundary Santa Cruz Aquifer; 4) reconnaissance work in other transboundary aquifers along the Arizona/Sonora border; and 5) investigation into the impact of transnational policies and contrasting modes of

governance on groundwater collaboration between the US and Mexico. The TAAP team published two articles in the Special Issue “Advances in Transboundary Aquifer Assessment” of the journal *Water*, for which Dr. Megdal served as lead editor, with another article under review. Team members gave presentations at regional, national, and international conferences. An additional year of federal funding was awarded in September 2021. The TAAP team also has been involved in other border groundwater forums, including a UNESCO-convened virtual conference on internationally shared aquifers.

**Middle East Water:** Although travel to the Middle East was curtailed in 2021, Dr. Megdal continued to work with individuals and organizations from the region. She served as one of two UArizona representatives to the board of the Jewish National Fund Joint Institute for Global Food, Water, and Energy Security, the university and the Arava Region of Israel are actively collaborating on agrivoltaics research, and on development and educational efforts related to Kenya through this joint institute.

In May, the WRRC coproduced a three-day international conference on arid lands with the International **Arid Lands Consortium (IALC)**, for which Dr. Megdal served as board president. Attracting nearly 400 attendees, the conference celebrated 30 years of IALC collaborative research and demonstration projects with a program of keynote speakers and expert panelists from Israel, Jordan, and the US. The conference marked the sunsetting of the IALC and ended with a call to action for other organizations to continue its work. The agenda, presentations, recordings, and highlight videos are posted on the **IALC website**. With the sunsetting of IALC in 2021, an IALC Scholars Award will be established for UArizona graduate students.



## Water Resources Research Act Programs

The WRRC is federally authorized under the Water Resources Research Act (WRRRA). The WRRRA base (104b) funding supports a portion of the WRRC’s information transfer activities and a small competitive research grants program, which is open to students and their faculty advisors at all three state universities. For the 2021-2022 project year, one UArizona student



submitted a proposal, "Distribution of Groundwater Ages to Constrain Paleo- to Modern Recharge", (principal investigator: Jennifer McIntosh, student co-PI: Chandler Noyes), and the WRRC submitted a student research project "Diversifying Voices in Water Resources", (principal investigator: Sharon B. Megdal, student co-PI: Simone Williams).

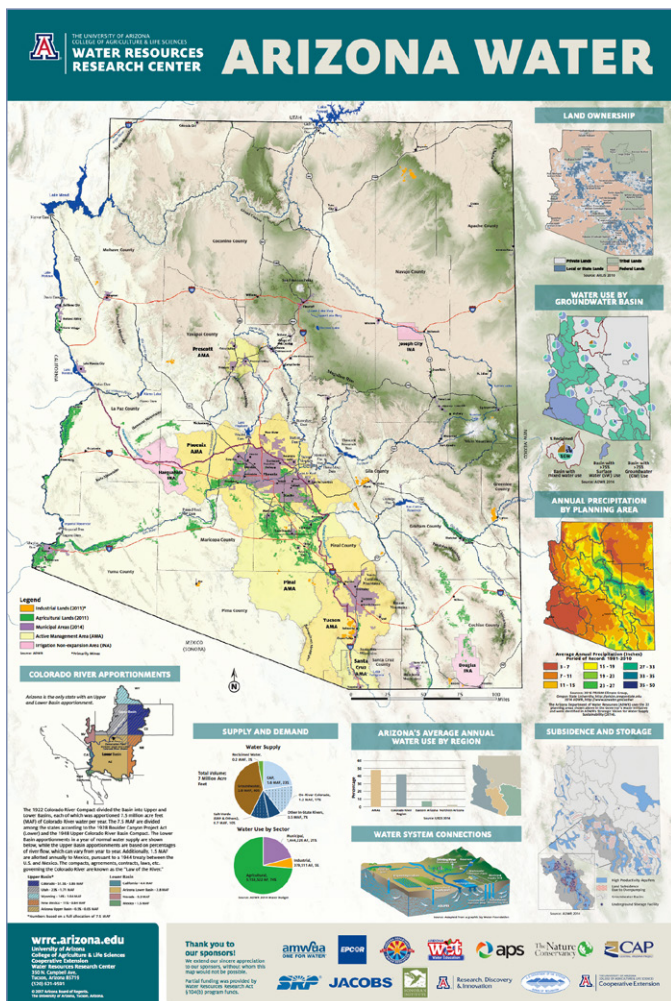
Because of delays in grant processing, the start date of the 2021-2022 project year was moved to September 1, 2021. As a result, project year 2022-2023 and subsequent cycles will begin on September 1 rather than March 1. The recently enacted federal infrastructure legislation reauthorized the Water Resources Research Act through fiscal year 2025. The national association of water resources research institutes had been working toward this reauthorization for a decade.

WRRR programs include the highly competitive Section 104(g) National Competitive Grant Program, for which the WRRC solicits proposals from researchers at any of

Arizona's three state universities and submits them to USGS. In 2021, the WRRC forwarded for consideration two proposals. Though an Arizona proposal was successful last year, neither proposal was selected this cycle.

## Multi-University Collaboration

In September, Dr. Megdal joined co-investigators from the University of California-Davis, California State University-Fresno, and New Mexico State University in an interdisciplinary project aimed at alleviating groundwater overdraft and sustaining irrigated agriculture in the Southwest. The project was awarded a \$10 million grant from the US Department of Agriculture, Agriculture and Food Research Initiative. The Arizona component will focus on agriculture in Pinal County. The Arizona team involves Simone Williams, a graduate research assistant, and Arizona Cooperative Extension partners.



## Arizona Water Map Poster

The Arizona Water Map Poster is available exclusively from the WRRC for \$12 (plus tax and shipping).

**Order:**  
<https://wrrc.arizona.edu/map>

# CONNECTING WITH A DIVERSE PUBLIC

## Cooperative Extension and Rural Engagement

The WRRC continued to develop its engagement efforts with county Cooperative Extension offices and rural communities throughout Arizona. Building from the collaborative Water 101 series of presentations produced with Maricopa County, the WRRC has developed a four-page factsheet template that concisely shares county-level water information. Factsheets for Pima and Cochise counties will be released in summer 2022, and Graham, Greenlee, Mohave, and Pinal Counties are in development. All factsheets will be posted on our [Arizona Water Factsheet website](#).

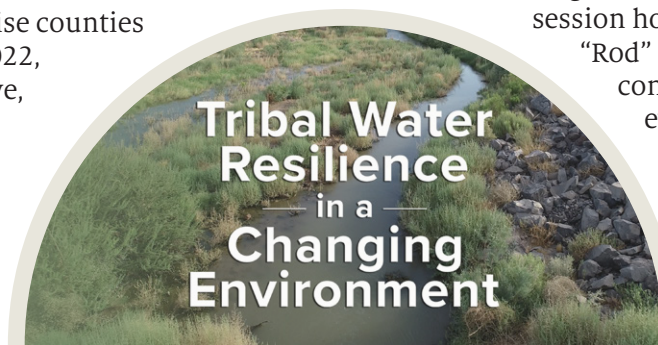
## Engagement and Outreach in the Virtual Environment

The WRRC engages with partners, stakeholders, and the public throughout Arizona and beyond through multiple media platforms. A committee of WRRC personnel meets weekly to coordinate work on outreach activities and products. WRRC personnel routinely respond to requests for information and media interviews.

**Annual Conference:** The 2021 Annual Conference, Tribal Water Resilience in a Changing Environment,

was held virtually from August 30 to September 1. This conference was developed with the tremendous assistance of the Committee of Advisors to the WRRC's Indigenous Water Dialogues Initiative, which is supported by the Agnese Nelms Haury Program in Environmental and Social Justice. The conference program consisted almost entirely of Indigenous voices, including Tribal leaders, emerging water professionals, advocates, and the bearers of traditional knowledge. A highlight was the first morning session honoring the late Rodney

"Rod" Blaine Lewis, to whom the conference was dedicated. The evening of the second night featured a special screening of the film *Paya: The Water Story of the Paiute*, followed by a panel discussion. A pre-conference webinar, "Tribal Water Rights and Settlements," on August 13, provided legal context for the broader discussion at the conference. The WRRC offered continuing legal education credit to Arizona attorneys who attended the webinar. The conference attracted nearly 800 attendees from 22 countries, 27 states, and 14 Arizona counties, and from over 40 Tribal nations and Indigenous communities. In October, WRRC organized a field trip to the Gila River Indian Community's MAR 5 recharge project and Gila River Interpretive Trail as a special post-conference event. Approximately 60 people who attended the annual conference participated in the visit.



### 2021 Annual Conference

**783 Attendees** from **22 countries**,  
**27 states**, **14 counties**, and over  
**40 Tribal Nations and Indigenous communities**



**Brown Bag Seminar Series:** The WRRC continued to deliver the Brown Bag Seminar Series as webinars, holding 19 discussions on a range of water topics with state, national, and international experts. The virtual platform continued to enable broad participation from diverse audiences. On average, 132 people attended Brown Bag webinars, up from 82 in 2020. With speaker permission, the WRRC website posts webinar recordings and copies of the slide presentations for each Brown Bag.

**Other Public Events, Presentations, and Posters:** WRRC staff and students make many oral and poster presentations to academic, professional, civic, and community groups locally, nationally, and internationally throughout the year. In celebration of World Water Day on March 22, 2021 the WRRC hosted an international webinar on managed aquifer recharge, which attracted over 300 attendees. The WRRC also co-sponsored events such as the six-episode webinar series, *Water Solutions for Our Warmer World*, a collaboration with the Arizona Institute for Resilient Environments and Societies and the Udall Center for Studies in Public Policy. Each episode featured panel discussions on different topics, including drought, infrastructure, biodiversity, water in Indian Country, and sustainability.

**Arroyo:** The *Arroyo*, WRRC's annual publication on a single topic of timely interest to Arizona, was sent to both email and print subscribers, including libraries, schools, firms, and nonprofits. Each year, the *Arroyo* content is linked to the previous year's Annual Conference. The 2021 *Arroyo* — "*Arizona Groundwater Management: Past, Present, and Future*" — covers the history of the 1980 Groundwater Management Act as well as subsequent legislation that created today's regulatory and management structure for addressing groundwater management issues and crafting solutions. The 2021 *Arroyo* was published in March.

The 2022 *Arroyo*, on Tribal water resilience, will attempt to capture the perspectives and wisdom of the participants in the WRRC 2021 Annual Conference. The student author of the 2021 *Arroyo*, Brian McGreal, led the effort to create a draft based on the event. The Southern Arizona Water Users Association and the University of Arizona Agnese Nelms Haury Program in Environment and Social Justice provided support for

the 2022 *Arroyo* through their conference sponsorships. Publication is expected in the summer of 2022.

## Using Electronic Media

**Weekly Wave e-news digest:** The WRRC published 38 editions of the *Weekly Wave* and five editions of the bimonthly *Summer Wave*. Each edition included WRRC and water community news, events, publications, and announcements. They also featured guest articles from collaborators around the state and region, including from the Central Arizona Project and the US Bureau of Reclamation. The *Weekly Wave* also published eight commentaries in Dr. Megdal's *Reflections* series. At the end of 2021, the *Weekly Wave* distribution list included over 3,000 subscribers. Its reach is enhanced through posting on our website and further distribution by recipients.

**WRRC Website and Communications:** The WRRC maintains two websites. The main site continues to feature news, events, and programs, as well as publications and other resources, such as Brown Bag webinar recordings. The second site features the **Conserve2Enhance program**. The WRRC continued to employ social media, specifically **Facebook**, Twitter (@AZWRRC), and Instagram (@uazwrcc), to share program updates and events and highlight publications. Twitter has become WRRC's primary social media platform.

**Annual WRRC Photo Contest:** The WRRC sponsors an annual contest for the best photographs of Arizona water in four categories (Best in Show, Water is Life, Water in the Built Environment, and Water in Nature) on the year's specific theme. The 2021 theme was "Aridity, Shortage, and Resilience," and the contest kept a category, new in 2020, for photos of water in arid regions outside of Arizona. Winning photographs were selected, and winners were notified before the end of 2021. Photographs are used in multiples ways, including in this report and other WRRC publications and social media.



**Average  
Brown Bag  
Webinar  
Attendance  
in 2021**

**132**

# AFFILIATED PROGRAMS

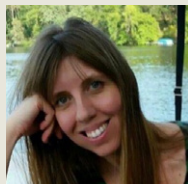
**Arizona Project WET Water Education Program:** 2021 was a transitional year for Arizona Project WET (APW). In June, Kerry Schwartz, associate specialist and APW director, retired from the University of Arizona. After a nationwide search, APW selected as its new director Holly Thomas-Hilburn, who has been working with APW for over a decade on virtually all of its programs. With the start of the new fiscal year in July, 2021 APW's administrative home moved to Cooperative Extension, ending the administrative connection to the WRRC. APW continues to share the WRRC's building and participate in WRRC activities. More information about APW can be found on its website.

**Water, Environment, and Energy Solutions (WEES):** In June 2021, the voter-approved Technology and Research Initiative Fund (TRIF) support the WRRC received through the WEES initiative came to an end. Control over TRIF funding is now with the Arizona Legislature, which initiated a new approach to distributing TRIF monies. The WRRC is grateful for the support of the Arizona Legislature and the University of Arizona's senior vice president for research and innovation, for continued funding.

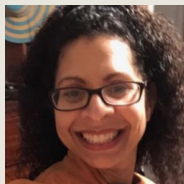
## Arizona Project WET Staff 2021



**Holly Thomas-Hilburn**  
Director of Arizona  
Project Wet



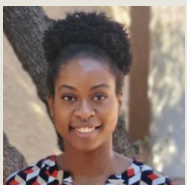
**Lorie Cavalli**  
Coconino County  
Program Coordinator



**Amber Hughes**  
Community Coordinator



**Sandra Hurlbut**  
Community Coordinator



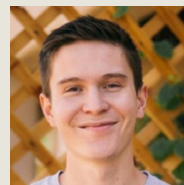
**Shevonda Joyner**  
Program Coordinator



**Pam Justice**  
Senior Education  
Coordinator



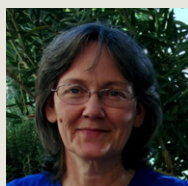
**Kirstyn Kay**  
Arizona Water  
Festivals Coordinator



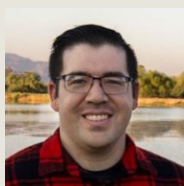
**Clayton Bruce Lyon**  
Community Outreach  
Assistant



**Josh Ruddick**  
Tucson Program  
Coordinator



**Mary Ann Stoll**  
Program Coordinator



**Brian Valencia**  
Community Outreach  
Specialist

## Retired 2021



**Kerry Schwartz**  
Director of  
Arizona Project WET



**Betsy Wilkening**  
Education Coordinator





# PERSONNEL AND FACILITIES

## Who We Are

<http://wrrc.arizona.edu/personnel-directory>

As WRRC director, Dr. Megdal supervised support and programmatic staff. A faculty member in the Department of Environmental Science, Megdal is also responsible for her individual research, Cooperative Extension activities, and teaching. Programmatic staff—Susanna Eden, Ashley Hullinger, Michael Seronde, and Mary-Belle Cruz Ayala—carried out research, Cooperative Extension, and education projects that focus on enhancing the capacity of stakeholders and communities to tackle water resource issues. John Polle continued to design, maintain, and update two websites and provide expertise in graphic design.

In 2021, Rose Veneklasen, Kayla Catacutan, Lynette Featherston, and Leslie Bonilla assisted in administrative and financial matters. Bonilla's administrative home is in the Environmental Science department, which has shared a business center with the WRRC since January 2018. A team responsible for the implementation of core outreach and engagement programs met weekly to coordinate communications and related activities. The third member of the administrative team, Lynette Featherston, assisted in a wide variety of administrative duties.

A cadre of outstanding students supported the WRRC's work in important ways. A list of WRRC students can be found in Appendix B: Supplemental Information. To

learn about our staff and outstanding graduate students, please visit the WRRC Personnel Directory.

Prior to the COVID-19 pandemic, the WRRC facility was open to the public and provided a reception area featuring informational materials on water-related topics and the Sol Resnick Conference Room, a space for water-related meetings. It closed in March 2020 and remains closed to the public except by appointment.

## Changes in 2021

Dr. Jean McLain curtailed her research program to focus on her responsibilities as Assistant Dean for Faculty Advancement in the College of Agriculture and Life Sciences. Though she continues to teach and maintains a faculty position in the Department of Environmental Science, her research affiliation with the WRRC ended in July 2021.

After retiring in January from the University of Arizona, WRRC Assistant Director Susanna Eden returned as a part-time research program officer to provide expert advice and assistance.

In September 2021, Dr. Mary-Belle Cruz Ayala assumed a post-doctoral research position at the WRRC. She graduated with a PhD in Arid Lands Resource Sciences in August 2021. Lynette Featherston, a long-time office assistant, moved to the Midwest to be near her new twin grandchildren. WRRC accountant Kayla Catacutan accepted a position with UArizona Facilities Management.





## STAFF

In 2021



**Sharon B. Megdal**  
Director



**Leslie Bonilla**  
Accountant



**Kayla Catacutan\***  
Accounting Assistant



**Mary-Belle Cruz Ayala**  
Post-doctoral Researcher



**Susanna Eden**  
Research Program  
Officer



**Lynette Featherston\***  
Office Assistant



**Ashley Hullinger**  
Program Director



**Jean E. McLain\***  
Research Scientist



**Martin Picazzo**  
Systems Administrator



**John Polle**  
Media Specialist



**Michael Seronde**  
Program Manager



**Rose Veneklasen**  
Administrative  
Associate

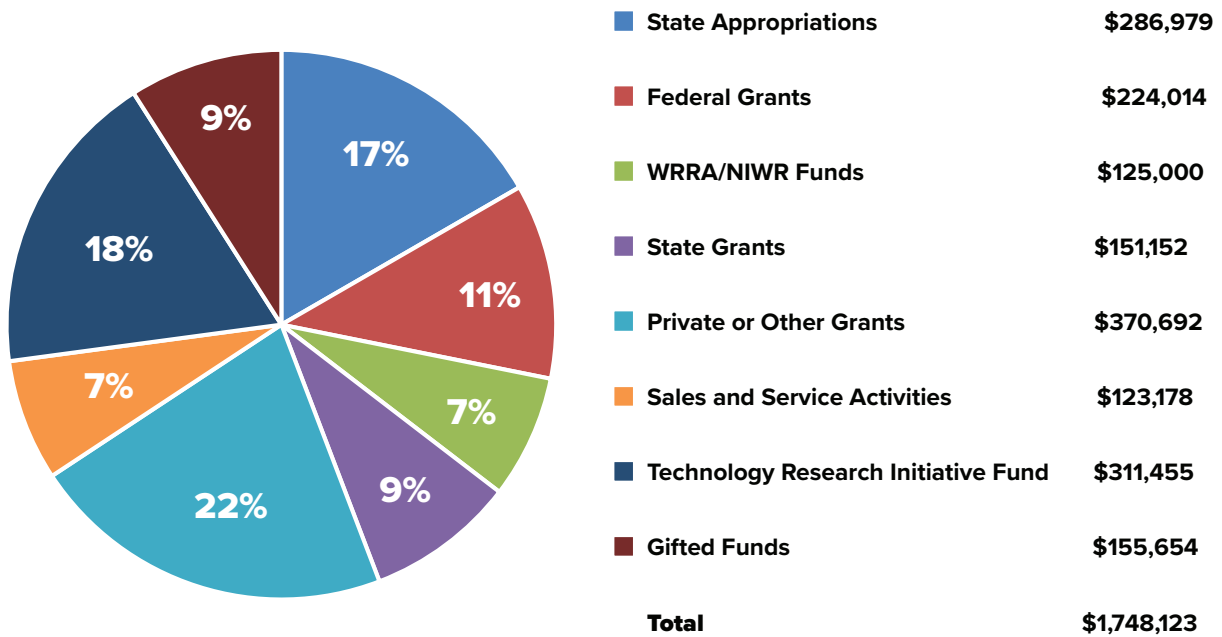
\*See personnel changes section on page 9.



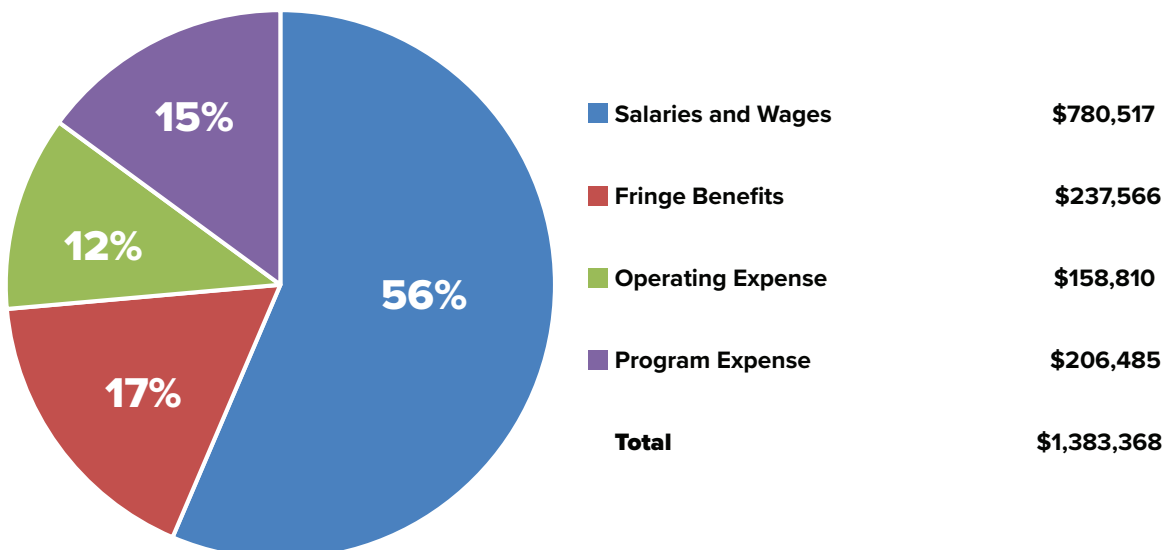
# FINANCIAL HEALTH CY 2021

In addition to state funding, financial support continues to come from grants, sales, service activities, and gifts. Of the WRRRC's total 2021 revenue, 44 percent came from government awards and the WRRRC received 9 percent of its funding came from private gifts. Support for staff and appointed personnel accounted for 73 percent of total expenses, while the remainder of expenses were for WRRRC operations and programs. The overall WRRRC budget remained stable despite shifts in funding, programs, and expenses. The voter-approved Technology and Research Initiative Fund, now under control of the Arizona Legislature, continues to support the WRRRC. While some travel expenses increased in 2021 as COVID-19 restrictions were lifted, other expenses decreased as a result staffing changes and the virtual delivery of the Annual Conference.

## Operating Support & Revenue



## Operating & Program Expenses



# NOTES

## Operating Support & Revenue

- **State Appropriations:** State General Fund and tuition collections appropriated to CALS by the State of Arizona.
- **Federal Grants:** Monies received for awarded competitive national federal grants and federally funded cooperative agreements awarded to the WRRRC.
- **WRRR / NIWR Funds:** U.S. Geological Survey 104(b) five-year Cooperative Agreement funded annually in March. The WRRRC receives this federal funding as Arizona's State Water Resources Research Institute.
- **State Grants:** Revenue provided by the State of Arizona through competitive grants awarded to the WRRRC by departments of the State of Arizona.
- **Private or Other Grants:** Revenues received by the WRRRC through the University and the UArizona Foundation from local governmental agencies and non-governmental organizations.
- **Sales and Service Activities:** Revenue from one-time transactions accrued over time by the WRRRC from publication sales, annual conferences, and miscellaneous services.
- **Technology and Research Initiative Fund (TRIF):** Revenue from TRIF, a state sales tax-derived fund supporting a range of educational programs. TRIF funding is distributed by the Arizona Legislature.
- **Gifted Funding:** One-time gifts from individuals and companies and revenue generated by endowment interest-bearing accounts.

## Operating and Program Expense

- **Salaries and Wages:** Includes salaries, wages and supplemental compensation paid to WRRRC faculty, appointed personnel, classified staff, graduate assistants, and student hourly employees.
- **Fringe Benefits:** Includes costs of employee fringe benefits (ERE) for insurance, medical, and retirement benefits.
- **Operating Expense:** Includes UArizona revenue and expense service fees; facilities and administration (indirect costs); UITS network funding fees (access to University communication systems for staff); background checks; membership dues; subscriptions; building and equipment maintenance and upgrades; employee training; Brown Bag seminar series; *Arroyo* Annual publication; and conference.
- **Program Expense:** Includes University and lecturer's fees, participant support and temporary labor; subcontractual research agreements for 104(b) grants at Northern Arizona University; printing and publications; communications; office, research, educational, and general supplies; employee travel; conference registration fees; facility and vehicle rental; and meetings and workshops.

## Photos

Table of contents: Lauren Hixson - Pools on the Esplanade, Grand-Canyon, 2018

Page 1: Steven Frank - Mother Nature is a Source of Life, 2021, Canoa-Ranch Pima County Park Near Green Valley Arizona

Page 3: Toby Cotter - Colorado River at Bullhead City

Page 6: Craig McGinnis - Spirit of Water 2019, Lower Colorado River, Grand Canyon

Page 8: Nicole Miller - Arizona Trail from Twin Tanks, 2021

Page 9: Ronald Stein - Fall Colors At Pena Blanca Lake, Nogales, Arizona

Page 10: WRRRC Building - WRRRC

Photos on pages 1-9 were submissions to the **2021 WRRRC Photo Contest**.





Photo: James Bowman - Whitewater Draw, AZ

# KEEP UP WITH WRRRC NEWS AND EVENTS

**WEEKLY WAVE**

The Weekly Wave e-news digest is distributed on Fridays and contains WRRRC news, events, and much more.

[wrrc.arizona.edu/subscribe](http://wrrc.arizona.edu/subscribe)



COLLEGE OF AGRICULTURE & LIFE SCIENCES  
COOPERATIVE EXTENSION

**WATER RESOURCES  
RESEARCH CENTER**

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