

# Pathfinding Partnerships Award

For research that engaged four or more distinct research entities in Colorado (with at least two being federally-funded labs) whose results leveraged the resources and strengths among partnering organizations – and demonstrated the power of collaboration.

## We Are Water exhibit and research program inspires awareness and change in desert Southwest

### NOMINATION'S DESCRIPTION OR ABSTRACT:

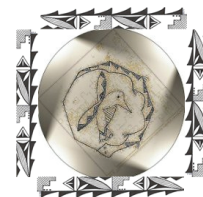
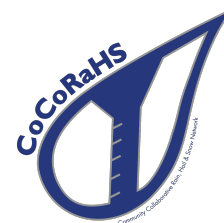
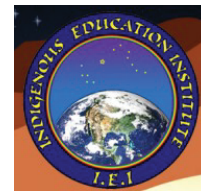
Communities in the US Southwest are increasingly experiencing disruptions from climate change, including drought, wildfire, and other extremes. A CIRES education-focused research team saw an opportunity to build community resilience to those impacts by creating spaces where communities and individuals could engage with these topics and learn from each other. The resulting project, We Are Water, pulled together a diverse array of partners in the desert Southwest, including Indigenous education organizations, local libraries, and climate scientists. These partners collaborated deeply to create—and then study the impact of—water exhibits, storytelling sessions, lessons, book clubs, and other community activities. Importantly, many of these activities were conducted in English, Spanish, and Navajo (and where possible Ute). This collaborative work has not only inspired community engagement around issues of water, including drought, it has also resulted in measurable changes in participants' interest, awareness, and respect for multiple ways of knowing about water. Program developers learned how to center the expertise and lived experiences of all collaborators, which required more thoughtful work. The result was a truly thoughtful and inclusive exhibit and body of work that is already inspiring more thoughtful, deliberate, and high-impact community-research partnerships.

### DESCRIBE THE BACKGROUND CONTEXT SHAPING THE NEED AND INTEREST IN THIS RESEARCH

Communities in the US Southwest are—increasingly—experiencing disruptions from climate change, including drought, wildfire, and other extremes. In 2020, CIRES' Education & Outreach Program began looking for opportunities to build community resilience to some of those impacts by creating spaces where people could tell their own stories about water topics and engage with others (including, but not limited to, scientists). Ultimately, the goal was to build awareness and understanding by inspiring these community conversations and honoring multiple ways of knowing about water.

For the We Are Water program, they pulled together a diverse array of desert Southwest partners including Indigenous education organizations; rural libraries; experts in climate, weather, and hydrology; community organizations; and others. The program, which includes a robust education research component, started with the foundational idea that water, critical and scarce in the Four Corners Region, connects diverse communities through our shared place and unique stories.

The team narrowed in on rural libraries and community centers as important gathering places, anchoring their work there, and collaborating deeply to develop a high-impact, high-visibility traveling exhibit and associated programming around water topics. The work involved storytelling, community discussions and panels, an interactive exhibit, film festivals, and more (more details are below). These elements are known to support inclusive, multi-generational engagement around



Reimagine  
Research  
Group



### NAME OF PRINCIPAL INVESTIGATOR(S):

- Brigitta Rongstad, WAW program manager, CIRES
- Benét Duncan, WAW Assessment managing director and principal investigator, CIRES
- Tina Meiners, Montrose Regional Library, head of youth and outreach services
- Nancy Maryboy, president and founder Indigenous Educational Institute
- Shelly Valdez, Native Pathways owner and manager
- Noah Newman, education and outreach coordinator of CoCoRaHS, the NOAA-funded Community Collaborative Rain, Hail, and Snow Network
- Education associate, Claire Ratcliffe Adams of the Space Science Institute

DESCRIBE THE BACKGROUND CONTEXT SHAPING THE NEED AND INTEREST IN THIS RESEARCH (CONTINUED)

contentious and vital environmental topics, supporting critical awareness building and laying the groundwork for community action. We Are Water drew from this hopeful model, to bridge partisan conversations about these topics into something more rewarding and ultimately, more high-impact.

Critical to the design of the We Are Water program were curiosity and respect. Curiosity was not only about people's and communities' lived experiences with water but also curiosity about the best ways to inspire broader and deeper awareness and interest in water challenges. This was the research component of the project and it has proved to be one of the most high-impact components of the work, transforming the ways that participants and organizations involved in the project engage with diverse cultural groups and the local communities. Respect for and elevation of diverse voices—those of Indigenous, Latinx people, and the local rural community, in particular—was critical at all phases of the work, including the development of the exhibit and other interactives and planning for research data collection and analysis. And increased respect for diverse voices and multiple ways of knowing is a key outcome of the work, as well, as described below.

DESCRIBE THE COMPELLING FACETS OF THE, OR THIS TEAM/PERSON'S, RESEARCH AND WHAT WAS THE ULTIMATE KNOWLEDGE AND INSIGHT DISCOVERED

The We Are Water program, funded by the National Science Foundation, began with a "needs assessment," comprised of surveys and conversations with community members, to identify what water topics were most important. These discussions included diverse communities in the Four Corners Region of the U.S. Southwest, with a focus on Indigenous, Latinx, and rural communities. Then, the group collaboratively planned, built, and deployed local exhibits. Details varied, depending on community discussions and languages spoken, but in general, each location featured:

1. A central physical piece, including:

- a. an augmented reality sandbox in which viewers can change the shape of the sand and then see how virtual water flows differently over the evolving landscape;
- b. an interactive Plinko game in which balls (raindrops) dropped from the top change paths as they drop, falling in a fairly regular pattern—until viewers change parameters such as diverting more or less water to agriculture, recreation, or the environment, for example;
- c. a life-sized Connect 4 game featuring different colored pucks that represent animals, plants, other landscape features, and weather.

Participants are encouraged to create a story about how the pucks connect;

d. a story wall featuring video and audio stories—in multiple languages—of people reflecting on water in their own lives, and water-themed science podcasts. The wall includes a community art mosaic, places to pin opinions and art, and a community-customized local water-centered map; and

e. Takeaway materials, such as "Be a Water Detective Kit"; Water patch scout activity book; coloring books; and word search games.

2. An opening celebration. These community events generally included hands-on activities about the water cycle, led by Noah Newman of CoCoRaHS, and other activities led by local organizations and library staff.

3. Other community activities, such as film festivals about local water issues (screening of short films or video clips about water in the communities, followed by a speaker panel), storytelling events, stop-motion animation workshops, educator workshops, photo and story contests, and book clubs.

4. Online engagement opportunities.

a. The program webpage is a beautiful and effective portal to access all the stories and materials developed by the program: <https://wearewater.colorado.edu/>

b. The website and social media channels highlight community stories (video and audio) and results from a water-themed photo and story contest. For example, for the Bayfield, Colorado, engagement, community stories included English, Spanish, and Navajo stories collected by local interviewers, and an original poem (Spanish and English) by Olivia Romo, a poet and water activist.

DESCRIBE THE COMPELLING FACETS OF THE, OR THIS TEAM/PERSON'S, RESEARCH AND WHAT WAS THE ULTIMATE KNOWLEDGE AND INSIGHT DISCOVERED (CONTINUED)

c. The website and social media also linked to vetted STEAM (science, technology, engineering, art, math) curricula for formal and informal educators

d. The website also includes produced videos that share scientific concepts related to water and the Colorado River.

5. Training opportunities. We Are Water partners offered trainings to library staff, requested by staff, themselves. Trainings in 2022 and 2023 included: facilitation strategies, cultural responsiveness, developing community partnerships, deploying hands-on STEAM activities, and more. We Are Water staff checked in monthly with each library to identify and provide further areas of support or training needed.

6. Multiple languages. Stories, exhibit signage, and takeaways were translated into English, Spanish, Navajo, and Ute, depending on location.

#### The Locations

2022

CU Boulder Campus\*

Lafayette Public Library \*

Aztec Public Library in Aztec, NM

Navajo Nation Library and Museum in Window Rock, AZ

Pine River Library in Bayfield, CO

\*unplanned initially, these locations helped the team test protocols and exhibit mechanics. COVID restrictions prevented early deployment in rural communities.

2023

Zuni Tribal Archives

Ignacio, CO

Page, AZ

#### The Results

Thousands of people visited We Are Water installations in community centers, mostly libraries, across the Four Corners region, including in Southwestern Colorado. They engaged with the physical exhibits—the augmented reality sandbox was the most popular component—and watched or listened to stories in person as well as online. And they took home, collectively, 2,800 kits so far. These hands-on activities, easily done at home, engaged families in We Are Water activities during the early days of the coronavirus pandemic, when local restrictions closed many physical buildings and library materials were hand-out only.

Collectively, these activities helped communities and individuals translate complicated science topics (water scarcity in the Colorado River Basin, water rights, etc.) into engaging, hopeful experiences. Communities explored their shared watershed and local ecosystems, and people connected with neighbors through common and unique experiences with water in the region.

One key outcome of the work was the expansion of community partnerships and relationships through community events and in-person programming: library staff became involved with community leaders they had not known before, water managers engaged with informal learning groups like Girl and Boy Scouts, and K-12 teachers learned not only about new curricula but about how to embed multiple ways of knowing into classroom settings.

DESCRIBE THE COMPELLING FACETS OF THE, OR THIS TEAM/PERSON'S, RESEARCH AND WHAT WAS THE ULTIMATE KNOWLEDGE AND INSIGHT DISCOVERED (CONTINUED)

Analysis also showed that library staff participating in We Are Water developed greater comfort with facilitating STEAM learning experiences and answering patrons' questions. This was especially true for their engagement with Latinx and Indigenous audiences; library staff indicated that they felt their library was a more inclusive place. They also expressed a need to engage in more outreach programs and communication with Latinx and Indigenous communities and to further research the needs of these communities and how local libraries can best support these communities.

Post-exhibit interviews and engagement with library/community center patrons also demonstrated that visitors left more engaged in water issues. Many participated in a 20-min "Talk Story" interview and a "Water Meaning Map" activity in which they drew pictures or wrote what water in their community means to them. Importantly, the team shifted data collection strategies in response to feedback from partners and visitors. For example, in one case, this meant hiring local students (eg, 2 students from Fort Lewis College) to collect feedback and support We Are Water community events. In others, it meant responding to feedback that evaluation seemed "extractive" and adapting evaluation plans to better involve community members in decisions and processes.

HOW HAS THIS RESEARCH BEEN APPLIED, UTILIZED, COMMERCIALIZED OR OTHERWISE ADOPTED OUTSIDE YOUR LAB?

One critical result of the We Are Water project was the establishment of new protocols within the field of science education research. CIRES' education researchers are already incorporating these protocols in new research and proposals, and upcoming papers will share lessons learned with the broader research community. To explain briefly, We Are Water team members adopted a model of collaboration called the Yucca Model, depicted below, inspired by Indigenous ways of knowing. People and place are central to this model, and in the case of We Are Water:

- yucca roots represent a commitment to build collaborative relationships among partners, including communities and libraries, and to honor multiple ways of knowing about water.
- foliage grows from regional connections and community perspectives represented in collaborative planning and then deploying exhibits and other programming, and
- flowers represent sustainable transformation of programs, for example, the increased self-efficacy of library staff in facilitating STEAM learning experiences—something likely to transform library involvement in STEAM programming well into the future.

This outcome should not be undervalued: the leaders of the We Are Water program truly centered the expertise and lived experiences of all the collaborators. This meant that sometimes decisions took a little longer, but the end result was a really thoughtful and inclusive exhibit and body of work.

Based on the successes of the project, We Are Water is hoping to expand into several other desert Southwest libraries (including Alamosa, Colorado) with a smaller-footprint exhibit and programming schedule. If funded by NSF, this supplemental work would include:

- Co-creation with community partners and existing water organizations
- Kits, backpacks, and modular exhibit development
- Oral histories, storytelling, and art - representation of community voices
- Scaled-down exhibit components, including takeaway kits, guides for water festivals, film festivals, and more.

Ultimately, the lessons from We Are Water are scalable and transferable: The leaders of We Are Water hope and expect that their lessons learned will improve scientific and educational research and projects in the future.

Related awards, recognitions and media about this research.

The We Are Water team won a 2023 Outstanding Performance Award from CIRES, for “an ambitious public education program focused on water in the desert Southwest. As communities across the Four Corners region are increasingly experiencing disruptions from climate change, this culturally responsive exhibit inspired community dialogue around water by both designing an interactive, traveling exhibit, take-home activities, and library programs and implementing them on-site with partnering libraries. This innovative model of inspiring public dialogue about a contentious and societally relevant topic in rural areas raises awareness about these changes and hazards within communities and inspires engagement and resilience. The exhibit is an excellent example of translating complicated science topics into engaging, hopeful, and interactive outreach.”

Farmington Daily Times: <https://www.daily-times.com/story/news/local/2022/05/03/we-water-connecting-communities-opens-may-6-aztec-library/9630850002/>

Durango Herald: <https://www.durangoherald.com/articles/we-are-water-traveling-exhibit-makes-its-way-to-pine-river-library/>

Durango Herald: <https://www.durangoherald.com/articles/pine-river-library-joins-virtual-book-club-for-the-secret-knowledge-of-water/>

Montrose Daily Press: [https://www.montrosepress.com/news/library-teaches-water-is-essential-with-new-exhibit-we-are-water-will-be-here-until/article\\_9c05a1e4-ad77-11ed-bd22-ff79cd7b96a9.html](https://www.montrosepress.com/news/library-teaches-water-is-essential-with-new-exhibit-we-are-water-will-be-here-until/article_9c05a1e4-ad77-11ed-bd22-ff79cd7b96a9.html)

High Plains Library District: <https://www.mylibrary.us/news/2021/06/04/we-are-water-june/>

Aztec Library: <http://www.azteclibrary.org/pdf/WeAreWater2022.pdf>

**Regarding the Pathfinding Partnerships Award, CIRES Director - Waleed Abdalati claimed, 'I'm so pleased this team has been recognized for its highly collaborative and high-impact work in Colorado and beyond. We Are Water is founded on the principle of authentic partnership; how appropriate that it has earned a Pathfinding Partnership award!'**



About CO-LABS:

Started in 2007, CO-LABS is a non-profit consortium of federal laboratories, research institutions, businesses and economic development organizations that provide financial and in-kind support for programs that promote the retention and expansion of Colorado's federally-funded scientific resources. Through events, economic analyses, strategic communications and networking activities we work to:

- PROMOTE Colorado as a global leader in research and technology
- EDUCATE the public about federal research labs' and institutions' impact, and importance of sustained funding for research
- CONNECT the labs, universities, economic development organizations and businesses to facilitate partnerships and technology transfer

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