



**COLORADO
WATER CENTER**
COLORADO STATE UNIVERSITY



Connecting expertise

Convening conversations

Catalyzing collaboration

2023 Annual Report

Who We Are

The Colorado Water Center is one of 54 Water Resources Research Institutes created by the Water Resources Act of 1964, which collectively form the National Institutes for Water Resources. As a division under Colorado State University's (CSU) Office of Engagement and Extension, the Center aims to connect all water expertise in Colorado's higher education system with research and education needs of Colorado's water managers and users, building on the rich water history at Colorado State University.

- *We aim to connect all water expertise in Colorado's higher education system with research and education needs of Colorado's water managers and users.*

Our Mission

We facilitate transdisciplinary outreach, education, and applied research to address complex and evolving water-related challenges facing Colorado, the west, and beyond, by:

- Helping build relationships between higher education and Colorado's water institutions.
- Providing Colorado communities with the skills and knowledge to engage in water discussions.
- Educating and inspiring the next generation of water leaders.

Our Focus

Provide Education and Training

- Empower Colorado's water leaders to secure and advocate for our valuable freshwater resources.
- Support water education through undergraduate and graduate-level course and program offerings, Extension programs for Colorado communities, and K-12 learning initiatives.
- Disseminate water knowledge across a broad range of topics and disciplines.

Catalyze Meaningful Collaboration and Engagement

- Serve as a primary nexus between Colorado's institutions of higher learning and a diversity of water resource stakeholders, including state and federal agencies, non-governmental organizations, community members, the private sector, and our global network of partners and affiliates.
- Bridge the gaps between community members, scientists, and policymakers by strengthening water-resource literacy.
- Connect diverse water stakeholders to higher education resources and expertise needed to ensure clean and reliable water for all.
- Facilitate and support collaborative water dialogues and projects.

Facilitate the Development and Use of Actionable Water Science

- Foster university, faculty, and student-led research across the state.
- Connect university research to key information needs of water resource stakeholders in Colorado and beyond.

1,027 Media Mentions

4,200+ Presentation Attendees

80 Presentations Made

2.65 Million Media Reach

3,350+ Social Media Subscribers

18 Students Supported

5 University Collaborations

Program Highlights

Water Education and Workforce Development

The **Water Literate Leaders** (WLL) of Northern Colorado Program continued to expand its impact since its inaugural cohort in 2017, building water knowledge and capacity of community leaders for improved decision-making and dialogue around water planning and management. In May 2023, we celebrated the graduation of 21 community leaders from the program, while fall 2023 saw a record number of applications and selection of 20 leaders for the new cohort. WLL participants engage in complex regional water issues, including urban, agricultural, environmental, recreational, and business perspectives via presentations, dialogue, and field trips. The program also facilitates relationship development and networking for participants and water leaders.

The Colorado Water Center partnered with Larimer County to host a Water Education Series with monthly public gatherings August through November. The series featured “Water 101” talks to provide foundational knowledge on Colorado water as well as in-depth presentations and discussion on the following themes: 1) water supplies and risks, 2) water conservation and sharing, 3) watershed health and instream flows, and 4) what’s next for Larimer County Water. Over 100 people joined the sessions in person or virtually to learn about water. Presentations and session recordings are available online at larimer.gov.

Water Equity Program

The Colorado Water Center established a new leadership role, the Water Equity Program Leader position, filled by Jessica Thrasher in March of 2023 highlighting the Center’s commitment to advancing Diversity, Equity, and Inclusion (DEI) initiatives.

The Colorado Water Center’s DEI programming resonated widely across Colorado, reaching approximately 1600 students, water professionals, and community members through bilingual conference presentations, training sessions, and classes, fostering a more equitable and diverse landscape within the water community.

The **Water Fellows Program** underwent a substantial expansion this year, broadening its scope to encompass both undergraduate and graduate students from historically excluded or marginalized communities in the water sector. The 2023–2024 Water Fellows cohort at CSU expanded from eight in 2022 to 20 students in 2023, showcasing diversity across ethnic and racial backgrounds, identities, perspectives, 15 majors, and academic years. The program’s

- **Water Fellows Cohort**
- **2022: 8 students**
- **2023: 20 students**

reach extended beyond CSU, as funding from CSU Spur facilitated the expansion of the Water Fellows Program to Denver in collaboration with Metropolitan State University’s One World One Water Center. The inaugural Denver cohort included five students from four different majors and marked a significant leap towards geographic inclusivity.



Water Fellows cohort from the fall 2023 semester

Agricultural Water Management

We have increased our understanding of the water needs of viable alternative crops such as cow peas and Kernza through research and Extension activities across the western slope and in the northeastern plains. This work, led by CSU Extension Western Regional Specialist Perry Cabot and Eastern Region Specialist Joel Schneekloth, involved collaborations with agricultural producers across these regions to determine if these crops could yield more dollars per drop of water than traditional cash crops to help improve the long-term sustainability of irrigated agriculture in Colorado.

Expanding our Impact

Coordinating Water Engagement and Research across Colorado

Colorado Water Conservation Board Water Seed Grant Program

In 2023, the Colorado Water Center aided the Colorado Water Conservation Board in administering their Water Grants Seed program to support implementation of the Colorado Water Plan. This year, projects provided funding to researchers at CSU, Colorado School of Mines, the University of Colorado, and Metropolitan State University to address a wide range of water management challenges. Projects include:

- Coupling StateMod With Forest Disturbance Scenarios to Inform Agricultural Operations in the San Miguel Watershed
- Quantifying the Role of Mountain Block Recharge on the Denver Basin Aquifer System Water Budget Using the Stable Isotopes of Waters
- Low-Cost Internet of Things Technology for Runoff Water Quality Comparison With Traditional Methods
- Hydrologic Modeling to Investigate Irrigation Impacts on the White River Stream-Aquifer System
- Using Remote Sensing Data to Highlight Salinization Patterns Across an Irrigated River Basin in Relation to Contributing Factors
- Water Management After Wildfires: Developing Standardized Testing Methods
- Streamflow Forecasting in Colorado by Artificial Intelligence, Remote Sensing, and Data Mining for a Sustainable Future

The CSU Water Research and Outreach Seed Grant Program

In 2023 the Colorado Water Center provided funding to seed two projects that integrated research and outreach activities to create practical knowledge that could rapidly be translated into improved water management practices. The projects funded this year address significant challenges around irrigated agricultural water management:

- High Resolution Geospatial Evapotranspiration Modeling and Plant Health Monitoring of Irrigated Crops, Orchards and Vineyards Using Multispectral and Thermal Imagery
- Impact of Regenerative Agricultural Practices on Containing Non-Point Source Pollution in Corn and Wheat Production Systems of Western Colorado

The USGS Water Research Institute Graduate Research Investment Program

This year, funds provided by the United States Geological Survey through their 104B state grants program were used to invest in Colorado's future water workforce. Funds were made available to graduate students at universities across the state to support their research and education, while addressing some of Colorado's most intractable water resource challenges. These research efforts include:

- Historic Mapping of the Colorado River Headwaters
- Settler-Colonialism and the Role of Military-Government Relationships in Environmental Crises: Extended Case Study of Peterson Air Force Base PFAS Water Contamination
- Using Mental Models To Understand the Governance of Adaptive River Management for Aquatic Ecosystem Sustainability
- Geomorphic Factors Influencing Post-Wildfire Fluvial Response
- Evaluation of Simulated Wildfire and Wui-Fire Ash Through Toxicological Assays
- Evaluation of Polycyclic Aromatic Hydrocarbons in Ash and Surface Waters After Fires at the Wildland-Urban Interface
- Analysis of the Rainwater Harvesting Potential for Residential Irrigation in Colorado's Main Urban Areas Under Future Climate Conditions

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