COLORADO
Colorado Water Conservation Board
Department of Natural Resources

## Colorado Water Conservation Board

# Water Plan

## Water Project Summary

| | |
|---|---|
| Name of Applicant | Colorado State University |
| Name of Water Project | Water Quality Sound Project |
| Grant Request Amount | **$57,855.57** |
| Primary Category | $57,855.57 |
| *Engagement & Innovation Activities* | |
| Total Applicant Match | **$14,512.40** |
| *Applicant Cash Match* | $5,000.00 |
| *Applicant In-Kind Match* | $9,512.40 |
| Total Other Sources of Funding | **$5,000.00** |
| *Mighty Arrow Family Foundation* | $5,000.00 |
| Total Project Cost | **$77,367.97** |

## Applicant & Grantee Information

Name of Grantee: Colorado State University
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## Description of Grantee/Applicant

No description provided

## Type of Eligible Entity

- [x] Public (Government)
- [ ] Public (District)
- [ ] Public (Municipality)
- [ ] Ditch Company

- [ ] Private Incorporated
- [ ] Private Individual, Partnership, or Sole Proprietor
- [ ] Non-governmental Organization
- [ ] Covered Entity
- [ ] Other

## Category of Water Project

- [ ] Agricultural Projects
  *Developing communications materials that specifically work with and educate the agricultural community on headwater restoration, identifying the state of the science of this type of work to assist agricultural users among others.*
- [ ] Conservation & Land Use Planning
  *Activities and projects that implement long-term strategies for conservation, land use, and drought planning.*
- [x] Engagement & Innovation Activities
  *Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website.*
- [ ] Watershed Restoration & Recreation
  *Projects that promote watershed health, environmental health, and recreation.*
- [ ] Water Storage & Supply
  *Projects that facilitate the development of additional storage, artificial aquifer recharge, and dredging existing reservoirs to restore the reservoirs' full decreed capacity and Multi-beneficial projects and those projects identified in basin implementation plans to address the water supply and demand gap.*

## Location of Water Project

| | |
|---|---|
| Latitude | 40.000000 |
| Longitude | 105.000000 |
| Lat Long Flag | |
| Water Source | |
| Basins | South Platte |
| Counties | Larimer |
| Districts | 3-Cache La Poudre River |

## Water Project Overview

| | |
|---|---|
| Major Water Use Type | |
| Type of Water Project | Education |
| Scheduled Start Date - Design | 10/1/2025 |
| Scheduled Start Date - Construction | |

Description

The Water Quality Sound Project is a community engagement project promoting vibrant communities, thriving watersheds, and resilient planning in the South Platte River Basin, specifically in the Cache la Poudre River watershed, delivered by Colorado State University's Radical Open Science Syndicate, with key supporters at the Coalition for the Poudre River Watershed and the City of Fort Collins.

The project will take real-time water quality data from the Poudre River and turn it into sound. These sounds will be used to create a soundscape, combined with environmental field recordings taken from the Poudre, community-sourced reflections on the river, and meditations on three critical water concepts: water is essential to life, water cycles naturally through the watershed but is diverted by man, and both humans and nature impact

water quantity and quality. This soundscape will be paired with a video installation featuring timelapse and video footage of the watershed.

The project will debut in Fort Collins, CO at the Museum of Discovery and will travel to CSU Spur in Denver. After its tour, it will be hosted online for listeners around the world with open-source tools and resources for creating your own water quality soundscape for statewide educational purposes.

## Measurable Results

New Storage Created (acre-feet)
New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
Existing Storage Preserved or Enhanced (acre-feet)
New Storage Created (acre-feet)
Length of Stream Restored or Protected (linear feet)
Length of Pipe, Canal Built or Improved (linear feet)
Efficiency Savings (dollars/year)
Efficiency Savings (acre-feet/year)
Area of Restored or Preserved Habitat (acres)
Quantity of Water Shared through Alternative Transfer Mechanisms or water sharing agreement (acre-feet)
Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
2,500 Number of Coloradans Impacted by Engagement Activity
Other
No additional measurable results provided

## Water Project Justification

As climate change introduces new threats to watershed health and water quality through increased number and severity of wildfires, rising temperatures, and reduced flows, it is imperative that community members understand these issues and how they affect their local watershed. However, climate change issues can be divisive, and science itself has seen a recent decline in trust—2023 Pew Center data indicates that only 57% of Americans say science has had a mostly positive impact on society (Kennedy & Tyson, 2023).

Additionally, local water quality data in Fort Collins is robust and accurate, and monitoring efforts are technologically advanced, but many community members lack a thorough understanding of water quality and water monitoring efforts. In partnership with the City of Fort Collins, we conducted surveys in both English and Spanish at community events throughout 2024 to capture the perspectives of diverse populations. We found that 52% of respondents do not know or are unsure where their water comes from. 59% of respondents said they “somewhat” understand what river water quality means, 38% “totally” understand and 2% do not understand at all. While 63% of those who chose to respond report using the river for drinking water, it remains unclear whether others rely on alternative sources or are unaware that their drinking water originates from the Poudre River Watershed. 52.5% of respondents were “very” interested in learning more about water quality.

The Water Quality Sound Project (WQSP) takes data from a network of real-time sensors installed throughout the Cache la Poudre River that collect data for key water quality parameters. This network is a collaborative project between the City of Fort Collins and Colorado State University (CSU), built in part to better understand the effects of the 2020 Cameron Peak wildfires on the watershed. The network includes eight water quality stations strategically located upstream, throughout, and downstream of the City of Fort Collins metropolitan area. These stations report water quality data every six hours and measure parameters like temperature, turbidity, and dissolved oxygen, providing key quality insights to City staff and delivering high-precision data to CSU

researchers. This game-changing method for monitoring water quality allows resource managers to make informed decisions, ensuring resiliency as the watershed faces increasing threats from climate change.
The WQSP will take the data from this project and “sonify” it (turn it into sound) using a novel data processing technique. Through this process, listeners can hear and feel a song composed by the Poudre River itself while engaging with the story of how the river has responded to wildfire. Data sonification increases access to science by creating a unique and inclusive way to experience and understand scientific information. This new access can open possibilities for people who might otherwise be intimidated by analyzing graphical information or who would be unwilling to interface with climate related data.

The Water Quality Sound Project will use the following to create a soundscape that tells a water quality story:
1. Actual sonified water quality data from the Cache la Poudre River.
2. Environmental sound recordings taken at monitoring sites in the Poudre Watershed.
3. Community-sourced reflections on the river and watershed.
4. Reflections on the three critical water concepts we aim to address, including water’s essentiality to life, water’s natural cycles and man-made manipulations, and water quality and quantity.
5. The soundscape will be accompanied by a video installation of drone footage and timelapse imagery of the Poudre River.

By working with artistic media, we can transform water quality data into interactive, creative, and critically reflective experiences that build trust in local knowledge and engender a sense of community with and through the Poudre River. Through this project, we hope to foster trust between communities and the institutions responsible for their water, empower individuals with knowledge and the ability to advocate for water protection, and create meaningful watershed stewardship by inviting people to see themselves as part of the Poudre’s story.

The WQSP supports many of the goals articulated in the following documents:

1. Colorado Water Plan
2. South Platte Basin Implementation Plan
3. Statewide Water Education Action Plan

Our project will contribute measurable outcomes to goals related to outreach, engagement and education, and protecting watershed health and water quality.

The project sits at the intersection of three partner action categories—resilient planning, thriving watersheds, and vibrant communities—and aims to use a research-backed creative approach to address a critical gap between robust water quality data and community understanding, engaging the public on two key challenges identified in the Colorado Water Plan specific to the South Platte Basin:
1. “Climate change may degrade watershed health, increase the risk of wildfire, impair water quality, and increase risk to environmental and recreation attributes.” (Colorado Water Plan 2023, pg 120)
2. “Traditional metrics for monitoring stream health are outdated or difficult to monitor.” (Colorado Water Plan 2023, pg 121)

Engaging the community in these issues will directly contribute to the following goal in the South Platte Basin Implementation Plan:
1. “Broaden South Platte Communications, Outreach, and Education” (pg 39)
The outreach and education efforts in this project will highlight the work in the South Platte and Poudre Watershed specifically to address the following two goals:
1. “Enhance and Protect Environmental Attributes” (pg 36)
2. “Protect and Enhance Watersheds” (pg 72)

Additionally, this project will highlight three Critical Water Concepts from the Statewide Water Education Action Plan (SWEAP) 2020-2025 (pg 12):
1. Water is essential for life, our economy, and a key component of healthy ecosystems.
2. Water cycles naturally through Colorado's watersheds, often intercepted and manipulated through an extensive infrastructure system built by people.
3. The quality and quantity of water, and the timing of its availability, are all directly impacted by human actions and natural events.

By incorporating these concepts into the educational dialogue and materials that accompany the exhibit, we will directly contribute to two outcomes in the SWEAP (pg 14):
1. The proportion of Coloradans who can identify how water supports their quality of life, as well as the threats to and potential solutions for a sustainable water supply, increases.
2. The proportion of Coloradans who can articulate at least three Critical Water Concepts increases.

Colorado Water Plan: How the WQSP supports partner actions in the Resilient Planning, Vibrant Communities, and Thriving Watersheds categories

Vibrant Communities

Chapter 6 (pg 181) of the Colorado Water Plan states that "Every resident should have the opportunity to engage in water issues, know their local water sources, and understand how to conserve. Engagement helps promote inclusion and larger support for water. Inclusive outreach and education tailored to meet regional needs and diverse populations, and age groups will need to be conducted to achieve this objective."

The WQSP is a place-based learning experience that helps residents know their local water source (the Poudre River) by hearing directly from the water itself through creative interpretation of high-quality, real-time water quality data. The water issues explored in the WQSP—water quality and its effects on watershed communities and climate threats to water quality—are issues faced across the basin and state. While the data from the project is specific to the Poudre Watershed, the concepts are applicable to other locations and travelling the project to Denver and creating a toolkit for making your own soundscape help broaden the reach of these issues.

Part of the vision of the WQSP is to increase accessibility to complex water quality monitoring data through both visual and auditory means, engaging all reading levels and ages. Using a multimedia approach can provide a touchpoint for diverse populations to engage with science and stewardship. Certain offerings will be available in both English and Spanish.

Thriving Watersheds

Chapter 6 (pg 207) of the Colorado Water Plan states that, "Engaging local residents in thriving watersheds can be achieved through activities such as community science and local watershed groups. Watershed planning relies heavily on the site-specific knowledge and ideas of individuals. Engaging with residents who are not traditionally involved in watershed planning will be key."

The WQSP will invite a diverse group of community members to share site-specific reflections on the Poudre River and engage in conversations about issues and challenges facing the watershed. This project means to engage residents not traditionally involved in watershed planning by housing data and watershed health education in a sound-based medium. This helps residents connect emotionally first, hearing from the river itself, and interfacing with scientific data in a way that makes it accessible to community members with little experience

reading charts or graphs, for those whom climate data might feel divisive, and to residents of all ages interested in art and creativity but not necessarily drawn to “science.”

Resilient Planning

The Colorado Water Plan (pg 8) outlines Resilient Planning Action Areas as “climate adaptation, planning for climate extremes, embracing EDI (equity, diversity, inclusivity), education, outreach and engagement, supportive government.”
The Water Quality Sound Project takes data from a network of real-time sensors installed throughout the Cache la Poudre River that collect data for key water quality parameters. This network is a collaborative project between the City of Fort Collins and Colorado State University (CSU), built in part to better understand the effects of the 2020 Cameron Peak wildfires on the watershed. The project will speak to climate-related issues facing water quality and the innovative technological solutions being employed to help us adapt. It will engage community members through informal means at informal locations, intentionally inviting a diverse representation of Larimer Country residents through a targeted outreach campaign.
Thus, the WQSP addresses each of the issues laid out in this partner action as the data used in the project specifically informs climate adaptation and planning for climate extremes, it embraces EDI by specifically employing an innovative and accessible technique for education, outreach, and engagement, and it highlights a successful partnership with a supportive government.

Chapter 6 (pg 223) of the Colorado Water Plan references the Water Equity Task Force goals, created to supplement the plan via an equity, diversity, and inclusion lens. The second goal of the task forces is to “Promote collaboration, new voices, and greater community engagement in water discussions.”

The WQSP helps achieve this goal by using an informal, accessible, attractive, and innovative method for sharing data and inviting discussion. The project is specifically created to invite new voices to the table and promote greater community engagement by connecting people to site-specific water quality and watershed science that affects their everyday lives, inviting them to be active members in a resilient plan for a shared water future.

South Platte Basin Implementation Plan

South Platte Basin Implementation Plan (SPBIP) Goals 11, 3, and 7

The WQSP helps meet one of the defined goals outlined in the South Platte BIP, Goal 11, which is to “Broaden South Platte Communications, Outreach, and Education” (pg 39). It does so by creatively sharing innovative ways that all the partners on this project are meeting Goal 7 of the BIP, “Enhance and Protect Environmental Attributes,” including maintaining, increasing, or enhancing “general river health” and “water quality and impacts associated with temperature and other pollutants” (pg 36) and Goal 3 – “Protect and Enhance Watersheds” (pg 72).

The outreach for this project is directly related to water quality and watershed management. As outlined in Table 8 (pg 72) “clean water is critical to all water use” and “water quality can be severely impacted by forest disturbances like wildfires.” All of the data we will sonify in this project is post-2020 wildfire data that tells a story about how the river has been affected by these incredible events. Generally, the project will use water quality data to dialog with the public about water quality impacts to the Poudre River, how clean water is essential to all life and water projects, and how stakeholder partners across Larimer County are maintaining river health by monitoring water quality through innovative technology.

Statewide Education and Action Plan

The WQSP will engage the public on three critical water concepts (pg 12):
1. Water is essential for life, our economy, and a key component of healthy ecosystems.
2. Water cycles naturally through Colorado's watersheds, often intercepted and manipulated through an extensive infrastructure system built by people.
3. The quality and quantity of water, and the timing of its availability, are all directly impacted by human actions and natural events.

We will explore these concepts in the soundscape itself, the accompanying public outreach events, and the online hosting of the soundscape and open-source tools.
Soundscape: The soundscape will incorporate spoken meditations and educational excerpts exploring each of these issues. Using the Appendix explanation in the SWEAP and available tools, we will pull general information and create site-specific information using the Poudre River as an example. For instance, highlighting real diversions and ecosystem features in the visual component while reflecting on concepts in the sound, referring specifically to human actions and natural events that have had an impact on the Poudre, such as the 2020 wildfires and pollution inadvertently carried out by residents.

Outreach Events: Events will be tailored around these critical water concepts and will a) speak to how the project and the data it pulls from inform and are informed by the concepts b) how these concepts are utilized in practice by water managers, farmers, researchers, volunteers, and municipalities and c) invite community members to learn about and directly reflect on these concepts.

Online Hosting: The soundscape and tools to create your own will be hosted on a dedicate website after the in-person screenings are finished. This website will incorporate not only the water concepts themselves and information about them but also reflections from the community for each concept. It will also include information on the rest of the water concepts in the SWEAP and ways to explore each one.

This approach contributes to the SWEAP Knowledge and Skills outcome by utilizing the strategy 2b. "Facilitate incorporation of Critical Water Concepts in educational programming," and the Awareness outcome by using strategy 1a. "Implement a multi-channeled public relations and media campaign that can be applied at various scales throughout the state" (pg 15).

By incorporating the above concepts from the Colorado Water Plan and the SPBIP into the educational dialogue and materials that accompany the exhibit, we will directly contribute to three outcomes in the Statewide Education and Action Plan (SWEAP) (pg 14):
1. The proportion of Coloradans who can identify how water supports their quality of life, as well as the threats to and potential solutions for a sustainable water supply, increases.
2. The proportion of Coloradans who can articulate at least three Critical Water Concepts increases.
We will measure that we have helped contribute to these goals through attendance numbers and in person and online surveys distributed during and after events.

Citations

Colorado Water Conservation Boad. (2023b). Colorado Water Plan 2023. Denver, Colorado; CWCB. Retrieved 2025 from:
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Kennedy, B. (2023, November 14). Americans' trust in scientists, positive views of science continue to decline.

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## Related Studies

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## Taxpayer Bill of Rights

N/A