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	Republican River Basin Discovery Farms
Grant Request Amount	**$462,094.00**
Primary Category	$462,094.00
Agricultural Projects	
Total Applicant Match	**$52,697.00**
Applicant Cash Match	$34,999.00
Applicant In-Kind Match	$17,698.00
Total Other Sources of Funding	**$114,889.00**
Conscience Bay Research LLC	$60,330.00
Ground Up Consulting	$54,559.00
Total Project Cost	**$629,680.00**

Applicant & Grantee Information

Name of Grantee: Colorado State University
Mailing Address: 2002 Campus Delivery Fort Collins CO 80523

Organization Contact: Alexandra Firth
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Grant Management Contact: Alexandra Firth
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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

- [x] 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.
- [ ] 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	37.979759
Longitude	-105.602562
Lat Long Flag	
Water Source	
Basins	South Platte
Counties	Kit Carson; Sedgwick; Phillips
Districts	49-Republican River

Water Project Overview

Major Water Use Type	Agricultural
Type of Water Project	Study
Scheduled Start Date - Design	11/28/2025
Scheduled Start Date - Construction	

Description

The Republican River Basin Discovery Farms (RRB-DF) initiative will establish three long-term, on-farm research hubs to generate region-specific insights on how soil health practices influence water dynamics. In a region increasingly affected by water scarcity, this research supports sustainable agriculture by advancing practical, producer-informed conservation strategies.

Developed in partnership with farmers, the initiative centers producer knowledge and management constraints while applying rigorous scientific methods. Unlike one-size-fits-all models, Discovery Farms are designed for site-specific adaptation, encouraging context-driven innovation in water stewardship that is both scientifically credible and operationally relevant.

This effort builds on successful models from the Colorado River Basin and draws lessons from the diminished

Colorado Soil Health Program, while being tailored to the hydrologic, agronomic, and social conditions of the RRB. It complements existing research by deepening producer engagement and establishing long-term monitoring infrastructure.

The project has strong regional support, with letters from the Rocky Mountain Farmers Union, the Republican River Water Conservation District, and Kit Carson County Commissioners—all underscoring a shared commitment to agricultural resilience through collaborative, locally grounded science. Despite multiple outreach attempts via phone and email, the Grantee was unable to connect with the South Platte Basin Roundtable to secure a letter of support.

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
100 Number of Coloradans Impacted by Engagement Activity
Other

-Analysis and integration of soil moisture, soil health metrics, ET, and irrigation practices data into the IN-RICHES State of Colorado Soils Inventory,
-Final comprehensive report summarizing impacts on soil moisture, AWC, ET, irrigation efficiency, financial impacts, and regional challenges,
-Individual case study reports for each Discovery Farm,
-At least one article prepared for submission to peer-reviewed journals,
-Distribution of reports through networks to policymakers, conservation professionals, and producers.
-Final grant report to CWCB that summarizes the project and how it was completed; describes any obstacles encountered and how they were overcome; confirms that all matching commitments have been fulfilled, and includes photographs, meeting summaries, reports, or other relevant information.

Water Project Justification

The Colorado Discovery Farms and Ranches project is a direct response to the vision of Robust Agriculture laid out in the 2023 Colorado Water Plan (CWP). As Colorado faces a future marked by drier soils, hotter temperatures, and reduced water availability, the CWP calls for agricultural systems that are not only productive, but resilient, adaptive, and rooted in local innovation. The Discovery Farms initiative supports this vision by creating long-term, producer-driven research hubs that measure how soil health practices impact critical water dynamics—such as evapotranspiration, soil moisture retention, and irrigation efficiency, under real-world conditions.

These efforts are especially urgent in regions like the Republican River Basin, where communities are navigating the dual pressures of compact compliance and aquifer decline. The CWP emphasizes that “soils are becoming drier” and that agriculture must “adapt to less water availability while still supporting long-term viability” (CWP, pp.

38–39). The Discovery Farms offer producers data, tools, and peer engagement to do just that—making them a living laboratory for the kinds of practices the CWP envisions as essential to Colorado's agricultural future.

In addition to advancing the Water Plan's agricultural vision, this project delivers on the goals of Healthy Lands Action Area 2.10, which prioritizes conservation practices that integrate soil health and water stewardship (CWP, p. 131). With the recent reduction in the capacity of the Colorado Soil Health Program (CoSHp), the Discovery Farms step in as a vital bridge, maintaining momentum in soil-water innovation and expanding the state's capacity to generate and apply actionable, producer-informed data.

The Discovery Farms also strongly support the CWP's emphasis on education and outreach. As outlined in the Water Plan's section on agricultural education (CWP, pp. 193–197), peer-to-peer interaction, field demonstrations, and regionally relevant communication are key to widespread adoption of conservation practices. This project is designed around those principles. Through public field days, producer meetings, and open data sharing, the Discovery Farms create meaningful opportunities for co-learning, community connection, and locally adapted innovation.

Finally, the project incorporates cutting-edge technology, UAV-based evapotranspiration monitoring, real-time soil moisture sensors, and AI-powered data analysis—to strengthen both site-specific and statewide understanding of the soil-water nexus (CWP, pp. 13, 118, 132). These tools, combined with the locally driven structure of the initiative, offer a scalable and transferable model for advancing agricultural and watershed resilience across Colorado's diverse regions.
In sum, the Colorado Discovery Farms and Ranches initiative is a strategic, community-based investment in the long-term viability of agriculture, directly supporting the Water Plan's goals of robust agriculture, healthy lands, engaged communities, and sustainable water management.

Related Studies

Nielsen, D. C., & Vigil, M. F. (2018). Soil Water Extraction for Several Dryland Crops. Agronomy Journal, 110(6), 2447–2455. https://doi.org/10.2134/agronj2018.05.0335

Schmelzer, E. (2024, March 3). A top Colorado farming region is running out of water, must retire land to avoid well shutdown. The Denver Post.
https://coyotegulch.blog/2024/03/04/a-top-colorado-farming-region-is-running-out-of-water

Water Education Colorado. (2025, January 16). Water-short Republican River Basin hits farm dry-up milestone, as Kansas looks on.
https://watereducationcolorado.org/fresh-water-news/water-short-republican-river-basin-hits-farm-dry-up-milestone-

Taxpayer Bill of Rights

No Tax Bill of Rights provided