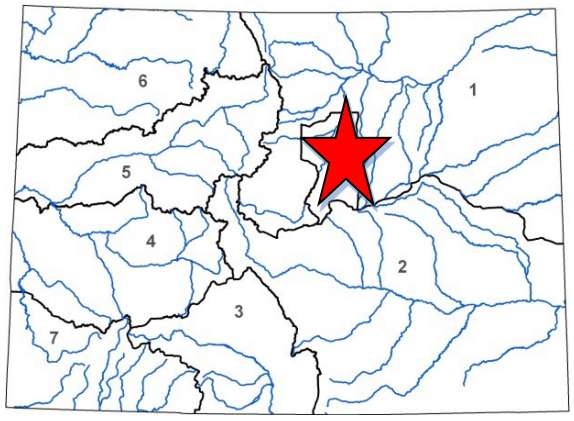
COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Evaluating & Optimizing Large-Scale Landscape Irrigation Management & Transformation Strategies
Alliance for Water Efficiency

Water Plan Grant Application

September 2023 Board Meeting



LOCATION	
Counties: Larimer; Weld; Boulder; Broomfield; Logan El Paso; Washington; Morgan; and Sedgwick	
Drainage Basin:	Arkansas & South Platte

DETAILS	
Total Project Cost:	$92,500.00
Water Plan Grant Request:	$69,375.00
Recommended amount:	$69,375.00
Other CWCB Funding:	$0
Other Funding Amount:	$0
Applicant Match:	$23,125.00
Project Type:	*Study*
Project Category:	*Conservation and Land Use Planning*
Measurable Results:	200 Coloradans Impacted by engagement activity

The Alliance for Water Efficiency (AWE), a nonprofit dedicated to the efficient and sustainable use of water, has requested funding to fill a research gap related to quantifying the water conservation potential of various programs focused on large landscapes (i.e., non-single family residential landscapes) and evaluating existing programs to determine the most effective structures and features. This research will focus on both landscape transformations, which are often referred to as "cash for grass" or xeriscaping programs, and irrigation optimization strategies such as irrigation audits, landscape water budgets, technology or equipment incentives/rebates, report services, repair/upgrade services, and more. This project has support from Aurora Water, Colorado Springs, Fort Collins, City of Greeley, and Northern Water.

AWE will complete this project through 5 tasks: 1) Discovery and documentation; 2) Data sharing, Transfer, and Clean-up; 3) Analyze Water Savings; 4) Market Readiness Assessment; and 5) Learning Cohort, Report, and Education,

Anticipated project outcomes will be a document summarizing how utilities are designing and implementing large scale landscape transformation programs, the data set compiled on customer water use before and after implementation of a range of large landscape programs, recommendations of key factors and program features influencing property owner and building manager interest and participation, strategies achieving multiple benefits like creating pollinator habitat or mitigating urban heat, resources necessary for agency and customer participation, and the role that ordinances and policies play in enhancing or detracting from these efforts. This data set will be publicly available.

Funding Recommendation: This project is recommended for full funding of the $69,375 requested.

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Water Plan

Water Project Summary

Name of Applicant	Alliance for Water Efficiency
Name of Water Project	Evaluating & Optimizing Large-Scale Landscape Irrigation Management and Transformation Strategies
Grant Request Amount	**$69,375.00**
Primary Category	$69,375.00
Conservation & Land Use Planning	
Total Applicant Match	**$23,125.00**
Applicant Cash Match	$18,500.00
Applicant In-Kind Match	$4,625.00
Total Other Sources of Funding	**$0.00**
Total Project Cost	**$92,500.00**

Applicant & Grantee Information

Name of Grantee: Alliance for Water Efficiency
Mailing Address: 33 North La Salle Street Chicago IL 60602
FEIN: 300,416,781

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Grant Management Contact - Alternate: Jeffrey Hughes
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Description of Grantee/Applicant

The Alliance for Water Efficiency is a national, stakeholder-based nonprofit dedicated to the efficient and sustainable use of water. The AWE network brings together more than 500 stakeholders including municipalities, water utilities, businesses, government agencies, non-profit organizations, academic institutions, associations and citizens. AWE brings together innovative technical resources to facilitate adoption of water conservation programs, cutting-edge research, a joined up approach to advocacy efforts, high quality expertise to equip professionals to make a difference, and a collaborative dialogue amongst diverse stakeholders that enables real progress.

Type of Eligible Entity

- ☐ 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.
- ☐ 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	83.833900
Longitude	104.821400
Lat Long Flag	Other: Coordinates based on other boundaries or locations
Water Source	
Basins	Arkansas; South Platte
Counties	Larimer; Weld; Boulder; Broomfield; El Paso; Washington; Morgan; Sedgwick; Logan
Districts	

Water Project Overview

Major Water Use Type	Municipal
Type of Water Project	Planning
Scheduled Start Date - Design	9/12/2023
Scheduled Start Date - Construction	

Description

This project aims to quantifying the water conservation potential of various programs focused on large landscapes (i.e., non-single family residential landscapes) and evaluating existing programs to determine the

most effective structures and features. This research will focus on both landscape transformations, which are often referred to as “cash for grass” or xeriscaping programs, and irrigation optimization strategies such as irrigation audits, landscape water budgets, technology or equipment incentives/rebates, report services, repair/upgrade services, and more.

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)
1,500,000	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning
200	Number of Coloradans Impacted by Engagement Activity
Other	

We entered no savings generated from this research effort, but anticipate with this research, Colorado communities and beyond will be able to create and enhance programs that generate significant water savings and sustainable landscapes. The population is based initial on the populations served by the participating partner organizations. The engagement number is a conservative number based on engagement with participating utilities, participating customers, and landscape industry stakeholders for the core part of the project, but we anticipate that through outreach and presentations with the final project deliverables, many more will be reached.

Water Project Justification

Research is needed to help utilities quantify water use and water savings from large-scale landscape transformations and irrigation optimization strategies. Utilities want to optimize water used on landscapes to save water, reduce peak demands, reduce run-off, protect water quality, maintain beneficial landscapes, and more. Utilities are testing irrigation management strategies like requiring dedicated irrigation meters, direct repair/upgrade services, landscape water budget programs, watering schedules, incentivizing advanced smart irrigation technologies, auditing requirements, and more. Further, many utilities are considering or actively investing in large-scale landscape transformation programs. States have allocated additional funding for turf replacement programs, 30 cities in the Colorado River Basin signed an MOU to reduce non-essential turfgrass by 30%, and some have banned irrigation of non-essential turf. Optimizing water use on large-scale landscapes can generate significant savings. Variation in savings is expected across climates and by program design. By doing this work across multiple utilities, it greatly expands the body of knowledge and creates more widely useful results.

There is no comprehensive published research about water savings from large-scale landscape and irrigation optimization strategies. It is predicted that water savings will be different from residential programs – but by how much? Large-scale landscapes have different functions and are managed differently than single-family residential landscapes. There are multiple stakeholders involved, like property owners, property managers, landscape and irrigation contractors, and the occupants/users of the landscapes.

This project aims to address these opportunities and challenges by answering these questions:

· How are utilities designing and implementing programs and services to either transform large-scale landscapes and/or optimize water use on large-scale landscapes?
· How effective are these programs, what drives differences across programs, and what factors might improve participation and water savings?
· How are these strategies achieving multiple benefits like offering pollinator habitat, mitigating urban heat, providing public education, stormwater capture, etc.?
· What resources are involved from both the agency and the participating customers including monetary expenses, time, and skilled contractors (irrigation and landscapers)?
· What ordinances, rules, or policies enable or enhance these programs? Conversely, what are the potential negative outcomes of such ordinances, rules, and policies on the programs.

Colorado Water Plan

This project ultimately connects to the Colorado Water Plan's vision for Vibrant Communities by helping water providers and other in related landscape industries come together to learn the smart practices for creating "water conscious and attractive urban landscapes" to sustain highly livable and vibrant communities into the future (p. 9). This CWP notes that "combined with more severe droughts and long-term aridity, many of Colorado's current urban landscapes will be unsustainable in a warmer and drier climate" and this work is necessary as climate change will drive landscape irrigation needs higher (p. 20, 180). The project will also help highlight irrigation technologies that are supporting more sustainable and water conscious landscape design and practices (p. 20, 180).

The CWCB "recognizes municipal water conservation and efficiency will be an important tool for reducing water use. Water conservation programs are relatively less expensive ways to reduce water demand through water efficiency and will be a critical implementation strategy to optimize water supply in Colorado" (p. 167). This project will help identify the smart practices for the suite of conservation and efficiency strategies this project aims to assess, help Colorado communities apply the findings to the unique conditions across Colorado. By including Colorado communities directly in the project, it will ensure that the research is directly informed by and inspired by Colorado experiences and challenges.

The Colorado Water Plan (CWP) states that "communities need to continue advancing programs and planning that strive for ever-greater levels of indoor and outdoor water efficiency" and partners across the state need to work on "planning for and creating low-water-use landscape" (p. 180). It further supports One Water strategies that integrate water and land use planning, including focus "on minimizing outdoor water use" (p. 187). This project will help demonstrate where landscape transformation can be successful, and perhaps worked into land use planning considerations as communities grow, redevelop, and become denser.

This project directly supports agency action 1.7 "Identify turf replacement options that support transformative landscape change", specifically helping with the need for "evaluating how to sustain long-term water savings". This effort is in alignment with HB22-1151, which created a turf replacement program, and will help CWCB in its goals to "actively conduct and support research on turf replacement best practices, alternative tools for driving turf replacement, addressing underlying irrigation concerns, and identifying the optimal low-water replacement materials that could be sustained on as little as one day of efficient irrigation per week." This project will also help provide insights into "the role and capacity of landscapers as well as contractors, developers, municipalities, and other groups to support this transformation" (p. 188).

Further this work will explore how landscape-related strategies can support multiple benefits like stormwater mitigation, support pollinators, create habitat, mitigate urban heat impacts, and more. This supports the CWP's desire for more "holistic planning for urban landscapes that improve quality of life" (p. 180).

Basin Implementation Plans

This project initially impacts the Arkansas, Metro, and the South Platte Basins, however, depending on the broader and longer-term impact, the information and analysis generated could impact all basins in Colorado. According to the most recent Basin Implementation Plan updates (January 2022), these basins all expect to see a gap in supplies and demands for the municipal and industrial sectors and want to support strategies to reduce the projected gaps, including fundamental strategies to “maintain and promote municipal and industrial conservation and efficiency” (South Platte/Metro BIP p.27).

Statewide Water Education Action Plan

Additionally, this project is likely to positively promote the following strategies outlined by the Statewide Water Education Action Plan (SWEAP, Water Education Colorado 2020). This project will increase the proportion of Coloradoans that are demonstrating sustainable water behaviors and will demonstrate the potential of achieving water savings through relevant local and state policies, regulations and practices. Specifically, this work will support increasing the “proportion of Coloradoans in each river basin that are demonstrating sustainable water behaviors” (Outcome 7), the “proportion of Coloradoans in each river basin who have confidence in having the knowledge necessary to take an active role in water stewardship in their community” (Outcome 3), and increasing “participation in community discourse and decision processes about water at the state, regional, and local levels” (Outcome 5).

This project meetings the overall aims for the Water and Land Use Project Grants as outlined in the CWP Grant guidelines document (p. 8) by:
• Assessing increasingly common strategies that, if done well, can reduce overall future water needs through cost-effective water efficiency measures.
• Connecting to actions identified in locally adopted water conservation, efficiency or drought management plans.
• Bringing together many stakeholders and helps promote a water efficiency ethic throughout Colorado.
• Informing smart practices for integrating land use and water planning.
• Advancing conservation planning efforts.
• Reducing impacts and prepare for the impacts of climate change.

The Alliance for Water Efficiency (AWE) and the five committed organization partners have the passion, the technical expertise and experience to successfully carry out this project. Each of the five partner organizations has successfully piloted, gained traction for, and scaled up landscape transformations in their water service areas. Further, the staff across the five agencies have many years of experience to add valuable insight for this project. Though not explicitly included in the budget, each agency will contribute in-kind time to the project through a peer learning cohort, interviews, and support reviewing and providing feedback on the various deliverables.

AWE has been engaged with water efficiency, conservation, and sustainability issues since its inception in 2007. How to address and optimize outdoor water use is a growing need across the Western U.S. and the findings of this project will be widely applicable and will be publicly available and shared across Colorado and beyond. AWE has conducted previous research on single-family residential scale landscapes and is proud to advance research and knowledge for other types of landscapes that are critical to vibrant communities. The nature of the project will allow Colorado partners to learn from other water agencies and landscape and irrigation experts as the research is being conducted, generating near-term benefits while the final deliverables will help generate long-term benefits through more effective and efficient strategies to achieve outdoor water savings. This project leverages existing funding resources, momentum, and achieves the 25% match requirement. This project is ready to

proceed upon receipt of funding.

The Alliance for Water Efficiency is a nonprofit dedicated to the efficient and sustainable use of water. AWE serves as an advocate across North America for water efficient products and programs, provides information and assistance to a variety of stakeholders, including water utilities, and creates new knowledge to advance water conservation and efficient. AWE has 42 members in Colorado alone. This grant will provide direct benefits to participating water utilities and Colorado residents, indirect benefits to many more by providing currently missing data and information to support decision making. Given that AWE has members across the U.S and Canada and has secured over a dozen participants across other western states, this project will surely deliver value and impact far beyond Colorado, too. This is increasingly important as regional and basin-wide coordination is needed for a sustainable water future.

Related Studies

Alliance for Water Efficiency successfully conduced a multi-agency study on Residential-Scale Landscape Transformations. “Landscape Transformation: Assessment of Water Utility Programs and Market Readiness Evaluation”, related Utility Guide, and related AWWA Water Science article.
https://www.allianceforwaterefficiency.org/impact/our-work/landscape-transformation-assessment-water-utility-progr

https://www.allianceforwaterefficiency.org/impact/our-work/sustainable-landscapes-utility-program-guide
https://awwa.onlinelibrary.wiley.com/doi/abs/10.1002/aws2.1167
The Multi-Benefits of Landscape Transformation (California Water Efficiency Partnership)
https://calwep.org/wp-content/uploads/2020/05/CalWEP_Mulit-Benefits_Energy-GHG.pdf
Landscape Transformation Studies: This is from an EPA WaterSense webinar and summarizes some recent research.
https://www.epa.gov/sites/default/files/2020-04/documents/ws-case-studies-march-2020-webinar-recap.pdf
Water Budgeting for Commercial Landscapes: This is from an EPA WaterSense webinar and summarizes some recent research
https://www.epa.gov/system/files/documents/2022-07/ws-webinars-recap-Water-Budgeting-Commercial-Landscape

Peter Mayer, et al. “Outdoor Water Use: Abundant Savings, Scarce Research.” Journal (American Water Works Association), vol. 107, no. 2, 2015, pp. 61–66. JSTOR, https://www.jstor.org/stable/jamewatworass.107.2.61

Taxpayer Bill of Rights

N/A.