Boulder Water Utility

Avoiding too much and too little water

Project at a Glance

Utility Overview

- Utility: Boulder Water Utility
- Location: Boulder, Colorado
- Population served: 107,125
- Service area: 25.7 square miles

Challenges

- Drought
- Flooding

Solution

- Comprehensive water conservation programs using localized, community-based strategies such as fixture rebates, new water budget rate structures, and a system of greenway corridors to manage flood waters.

Costs and Funding Sources

- Total conservation budget: $350,000
  - Utility Operating budget: $60,000
  - Partnership contracts: $290,000
- Total greenways budget (excluding the costs of the flood conveyance structures): $2,652,202
  - Annual Operating budget: $80,000
  - Annual Capital budget: $320,000
- Funding sources:
  - Utility operating budget (conservation & greenways programs)
  - Transportation Fund, Flood Control Fund, and the Lottery Fund (greenways capital spending)

Benefits

Enhances administrative efficiencies

Creates community partnerships

Boosts resilience in the face of droughts and climate change

Residential indoor and outdoor water savings averaging 5,000 gallons per household per year

Outdoor irrigation consultations saving an average of 5,000 gallons per household in the first year following the consult

Commercial savings of ~7 million gallons per year

BACKGROUND

The city of Boulder, Colorado, is located northwest of Denver in Boulder Valley where the Rocky Mountains meet the Great Plains. The city covers 25.7 square miles, and Boulder Creek flows through the middle of town. Temperatures vary widely during the day on a year-round basis due to the high elevation, but the climate is usually mild with occasional extreme winters and summers. Boulder gets an annual average of 18 inches of rain, less than half of the U.S. average of 39 inches. Culturally, Boulder has a legacy of being home to residents who are interested in protecting and living in connection with the natural environment. As a college town, the city hosts students and educators that contribute to this culture.

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CHALLENGE

Boulder faces challenges from both droughts and floods given its semi-arid climate and location adjacent to Boulder Creek and its 14 tributaries. Current conservation efforts were prompted by the 2002 drought, which was one of the most severe droughts in Western North America's hydrologic records. Following this extreme drought, Boulder along with many other Colorado communities recognized the need for more formalized drought preparedness measures, of which water conservation is a key component.

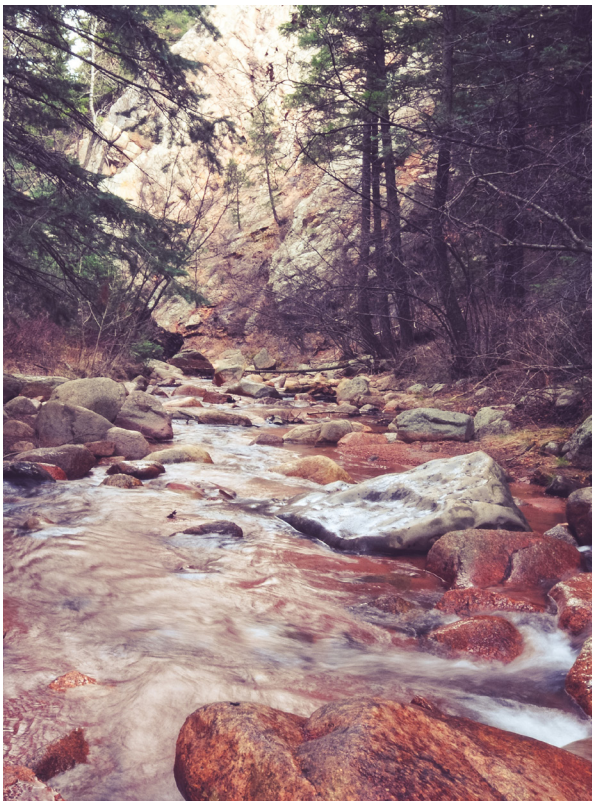
The Boulder area has also had a long history of flooding issues. In 1910, Frederick Law Olmsted, Jr. warned the city of the dangers of building upon the floodplain of Boulder Creek, and in 1969, Boulder experienced a moderate flood that cost $5 million in infrastructure repairs. More recently, the city incurred flooding in 2013 that prompted additional planning to prioritize flood mitigation efforts along the city's major drainageways.

As threats of droughts and floods in Boulder increase, Boulder's Water Utility is collaborating with climate scientists and consultants to incorporate climate resilience into its water management strategies.

SOLUTION

Water Conservation

Boulder first began prioritizing water conservation in 1992 and increased these efforts after periods of severe drought in 2002. As the program has evolved, Boulder's Water Utility has deepened the synergies between resources development and conservation through a suite of localized, community-based strategies to help residents and businesses reduce their water usage.



In collaboration with Resource Central, a local nonprofit, Boulder's Water Utility offers Boulder residents free irrigation consultations and landscaping seminars, Water-Wise garden kits and turf, and high-efficiency toilet replacement opportunities that also include free installation for income-qualified customers. For its commercial programs, Boulder's Water Utility partners with outside organization Partners for a Clean Environment to provide free water conservation assessments, fixture upgrades, and employee training in water conservation tactics. In 2004, the City Council boosted the program's efforts by approving a block water budget rate structure designed to encourage water conservation. The water budget rate structure was further refined in the city's 2018 budget.

In 2010, Boulder updated its Drought Plan with mandatory drought response measures, including access to water budget tools to mitigate drought effects and providing real-time water use data to customers to drive household water use management.

Greenways

Boulder's stewardship extends beyond the built environment to the city's important riparian areas that lessen the flooding impacts by providing multiple channels for flood water. Its Greenways Program combines flood management, riparian habitat, and community recreation through a series of corridors for biking and walking along Boulder Creek and its 14 major tributaries.

The Greenways Program is administered by the Utilities Division of the City of Boulder's Public Works Department. Utilities staff also work together with the Planning, Open Space and Mountain Parks, and Parks and Recreation Departments and the Transportation Division of the Public Works Department.

RESULTS

Water resource benefits

Over the past 25 years, Boulder's conservation programs have helped to make the city more resilient against cycles of extreme drought and flooding. The city plans to build on its ability to use data from its billing system to measure gallons of water saved through its programs as well as evaluating the effectiveness of its water budget rate structure. To evaluate the benefits of Boulder's conservation program to its water resources, the city has measured the number of products delivered annually.

To date, Boulder has delivered the following:

- **2,900** Water-Wise garden kits since 2005 saving an average of 1,000 gallons per household per year
- **900** ultra-high-efficiency toilets (0.8 gpf) since 2014 saving an average of 4,000 gallons per household per year
- **1,200** Irrigation consultations since 2005 saving an average of 5,000 gallons per household in the first year
- **2,200** direct equipment installs in businesses (aerators, pre-rinse spray valves, etc.) since 2011 saving about 7 million gallons per year across all businesses.

Boulder's efforts to maintain the natural character of Boulder Creek and its tributaries helps the city maintain its community ideals by providing open space and recreation areas

Sources

Boulder Water Utilities Division
Water Resources Advisory Board
Boulder Water Utilities Division Water Conservation
Boulder Drought Plan Volume 1
Greenways Program Master Plan
Greenways Capital Improvement Program
WaterNow Alliance November 16, 2018, call with Boulder Water Utilities Division Staff Member
WaterNow Alliance November 20, 2018, call with Boulder Water Utilities Advisory Council Member

Environmental benefits

The Greenways Program provides multiple environmental benefits as a result of preserving the stream corridors and associated natural character, including improved flood management and water quality, habitat restoration and preservation, erosion control, and weed management.

By accommodating flood waters through the Greenways Program, the city reduces the costs of flood damage repairs. The city works to prevent the redevelopment of significantly flood-damaged properties in high hazard areas by offering to purchase that property—a cost lower than would otherwise be incurred if that property were rebuilt and damaged again in a later flood. This cost-savings benefit is evaluated according to the number of properties acquired though the city and will be regularly reevaluated for subsequent iterations of the Flood Master Plan.

Boulder's efforts to maintain the natural character of Boulder Creek and its tributaries helps the city maintain its community ideals by providing open space and recreation areas, creating new opportunities for walking and bicycle commuting, sparking public education, and connecting local residents and visitors to nature. Each of these benefits has inherent value to Boulder and its public health and safety.

Administrative Benefits

Boulder's Utilities Division's integrated organizational structure creates administrative benefits that also foster the success of its conservation program and beyond. First, as an integrated agency, the Utilities Division enjoys economies of scale in implementing its programs. Second, because the Utilities Division includes water, stormwater, and wastewater programs, each enterprise is able to work together in a holistic way with open lines of communication. Third, the same governing body—Boulder City Council—sets the goals for all three utilities. This reduces the risk of conflicting priorities. Finally, the integrated structure allows the city's Water, Stormwater, and Wastewater Utilities to focus on substantive missions such as water conservation.