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Envisioning Oklahoma's Water Secure Future

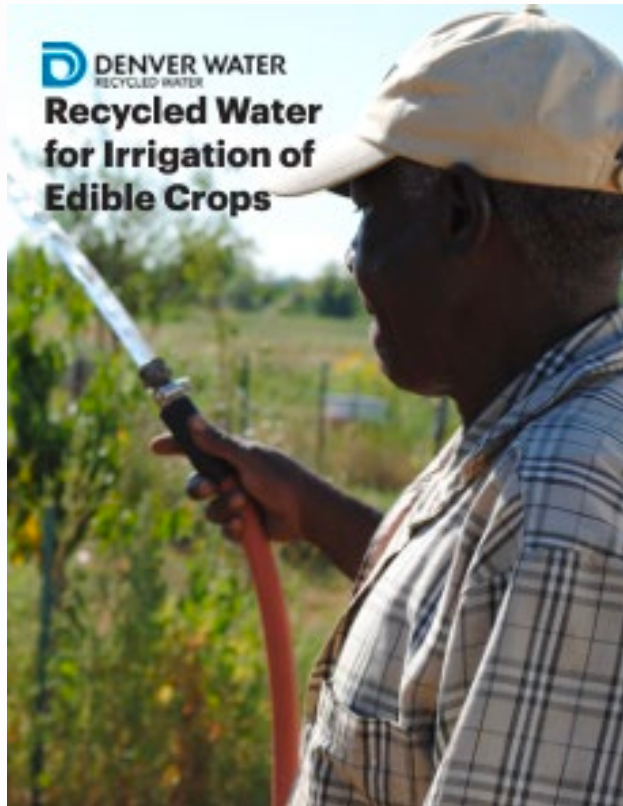
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Oklahoma Governor's Water Conference
November 29, 2023



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My Water Story: Food & Water



DENVER WATER
RECYCLED WATER
**Recycled Water
for Irrigation of
Edible Crops**

August 2013
CONTINUED FROM

Advancing Food Systems Issues in Colorado



COLORADO FOOD SYSTEMS
ADVISORY COUNCIL

Preparing for Food Security in an Age of Limited Natural Resources Part I:
Water

In order to provide state leaders and supporters to the field of food security, the Colorado Food Systems Advisory Council (CSFAC) commissioned a study and public reports that aim to efficiently use our state's water resources and provide a path forward. The CSFAC also provides a meta-analysis of existing and emerging water systems for use by state leaders to help Colorado's producers, consumers, and the state's water infrastructure.

This issue brief is one of three that explore aspects of water and energy – and the ways necessary to address Colorado's needs for production, food in growing populations and the continued needs of support production.

Issues Facing Agriculture Today

Climate change in Colorado is expected to impact water resources significantly. The Colorado Water Conservation Board (CWCB) estimates that Colorado's climate is expected to change significantly in the 21st century. The Colorado Water Conservation Board's 2010 report suggests a decrease in snowpack of 10% to 20% by 2050. This report also highlights the impact of more frequent and intense droughts, which will reduce the amount of water available for irrigation and other uses.

The Colorado River Basin Water Supply and Demand Study also reports that there are likely to be significant changes in water availability in the Colorado River Basin in the coming decades. The study also reports that there will be a significant increase in the amount of water used for irrigation and other uses.

Water conservation is a key strategy for addressing these challenges. The Colorado Water Conservation Board's 2010 report suggests that there will be a significant increase in the amount of water used for irrigation and other uses.

For more information on food security in an age of limited natural resources, visit www.pacinst.org.

Some of the many challenges that will require innovation include agricultural systems that are and will be threatened by drought, fire, and flood, as well as concerns over water quality (for growing and irrigation use) and the impact on agricultural production and natural resources. These challenges are found all over the country, but are particularly acute in the drought-prone agricultural regions and rapidly growing urban, suburban, and rural areas. For example, the Colorado Food Systems Advisory Council's 2013 report, *Preparing for Food Security in an Age of Limited Natural Resources Part I: Water*, discusses these challenges.

According to the Colorado Water Conservation Board, currently, agriculture accounts for 30% of water that is consumed in Colorado through agricultural, municipal, and industrial use. The high usage of water for agricultural and other uses, especially in the high-growth areas, is a significant concern for the state's water resources. With high-growth areas placed in water-rich areas, agriculture must become more efficient and innovative in its water use.

Among the primary water supply and demand challenges Colorado faces, the Colorado Water Conservation Board has identified agricultural drought. Unreliable agricultural water rights are a significant concern for the state's water resources. The Colorado Water Conservation Board's 2010 report suggests that there will be a significant increase in the amount of water used for irrigation and other uses.

Use of Reclaimed Water for Food Crops
This article was adapted from the *White Paper on Reclaimed Water for Denver Water*, authored by Denver Water's water conservation team in March 2011. A final draft of this paper was published by the end of 2012.

Reclaimed Water: An Overview

Reclaimed water refers to domestic wastewater that has received secondary treatment and has been treated to a level that meets or exceeds the standards for irrigation use. Reclaimed water is used for a variety of purposes, including irrigation, industrial use, and municipal use. In Colorado, reclaimed water is used for irrigation and industrial use. The Colorado Water Conservation Board's 2010 report suggests that there will be a significant increase in the amount of water used for irrigation and other uses.



The Colorado Department of Public Health and Environment (CDPHE) is responsible for regulating the use of reclaimed water. The CDPHE's 2010 report suggests that there will be a significant increase in the amount of water used for irrigation and other uses.

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HB18-1093
Reclaimed Water Use For Edible Crops
Concerning the allowable uses of reclaimed domestic wastewater, and, in connection therewith, allowing reclaimed domestic wastewater to be used for food crops and making an appropriation.

Regulation 84
PURPOSE The purpose of this regulation is to establish requirements, prohibitions, standards and concentration limits for the use of reclaimed water to protect public health and the environment while encouraging the use of reclaimed water.

A group of people in a blue raft are navigating white-water rapids. The raft is surrounded by splashing water, and the background shows a rocky riverbank with dense green trees. The scene is dynamic and captures the intensity of the activity.

Thriving in Unpredictable Times





Multiple Benefits: Creating Opportunities & Addressing Challenges

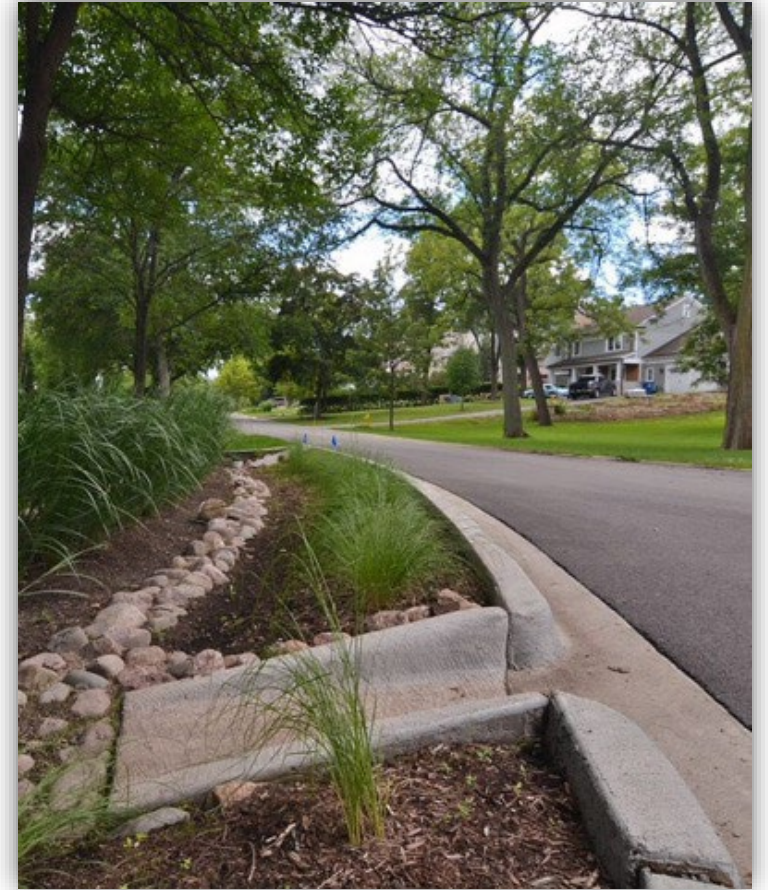


Diringer, Sarah, Heather Cooley, Morgan Shimabuku, Sonali Abraham, Madeline Gorchels, Cora Kammeyer, and Robert Wilkinson. 2020. *Incorporating Multiple Benefits into Water Projects: A Guide for Water Managers*. Oakland, Calif.: Pacific Institute.



The Benefits of Co-benefits

-  Provide a more objective and transparent basis for comparing of water management options
-  Optimize investment of time, money, and resources
-  Identify opportunities to share costs among project beneficiaries
-  Building community support for a project or program
-  Increase equitable investments in communities and reveal and mitigate adverse or unintended consequences



Unlocking the Potential of Water Reuse

Slides courtesy of the WaterReuse Association

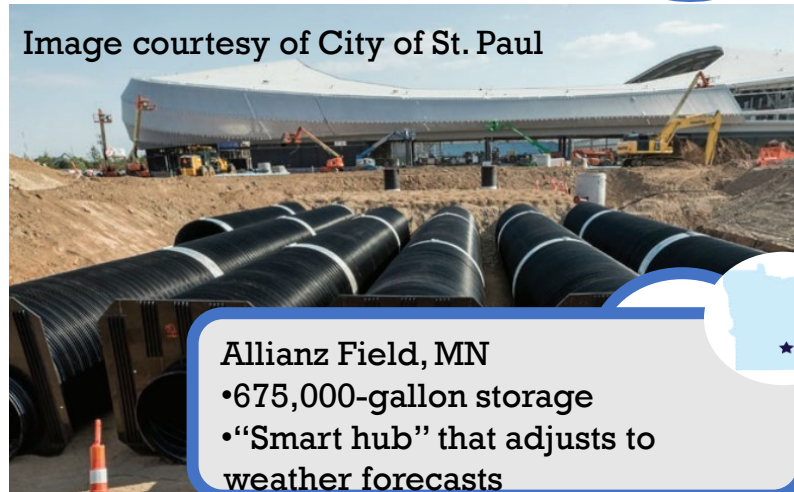
Industrial Reuse

A **fit-for-purpose** approach enables industries to create water for specific plant processes and avoid costly over treatment.



Stormwater Reuse

Stormwater often contributes to **flooding and contaminated waterways**. Stormwater reuse can address these issues as well as water scarcity and more.



Agricultural Reuse

Agriculture is one of America's largest water uses, and one of the **oldest and most widespread** water reuse applications.



Unlocking the Potential of Water Reuse

Slides courtesy of the WaterReuse Association

Potable Reuse

Multi-stage purification creates a **safe, reliable drinking supply** that can be served through existing drinking water infrastructure.



Orange County, CA

- 130 million gallons per day
- Recharges groundwater

Onsite Reuse

Onsite water reuse can provide water security for businesses, improve water access for underserved communities, and **improve climate resilience**.

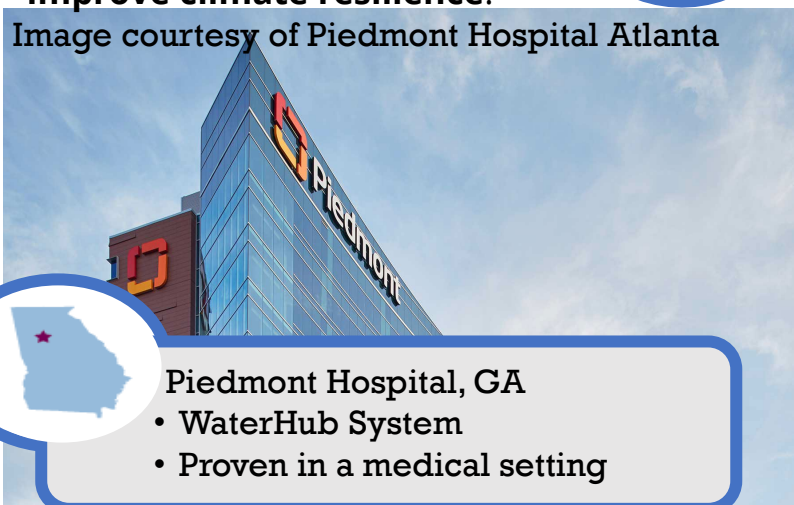


Image courtesy of Piedmont Hospital Atlanta



Piedmont Hospital, GA

- WaterHub System
- Proven in a medical setting

Environment

Water reuse can provide tremendous benefit to the environment and mitigate impacts associated with climate variability.



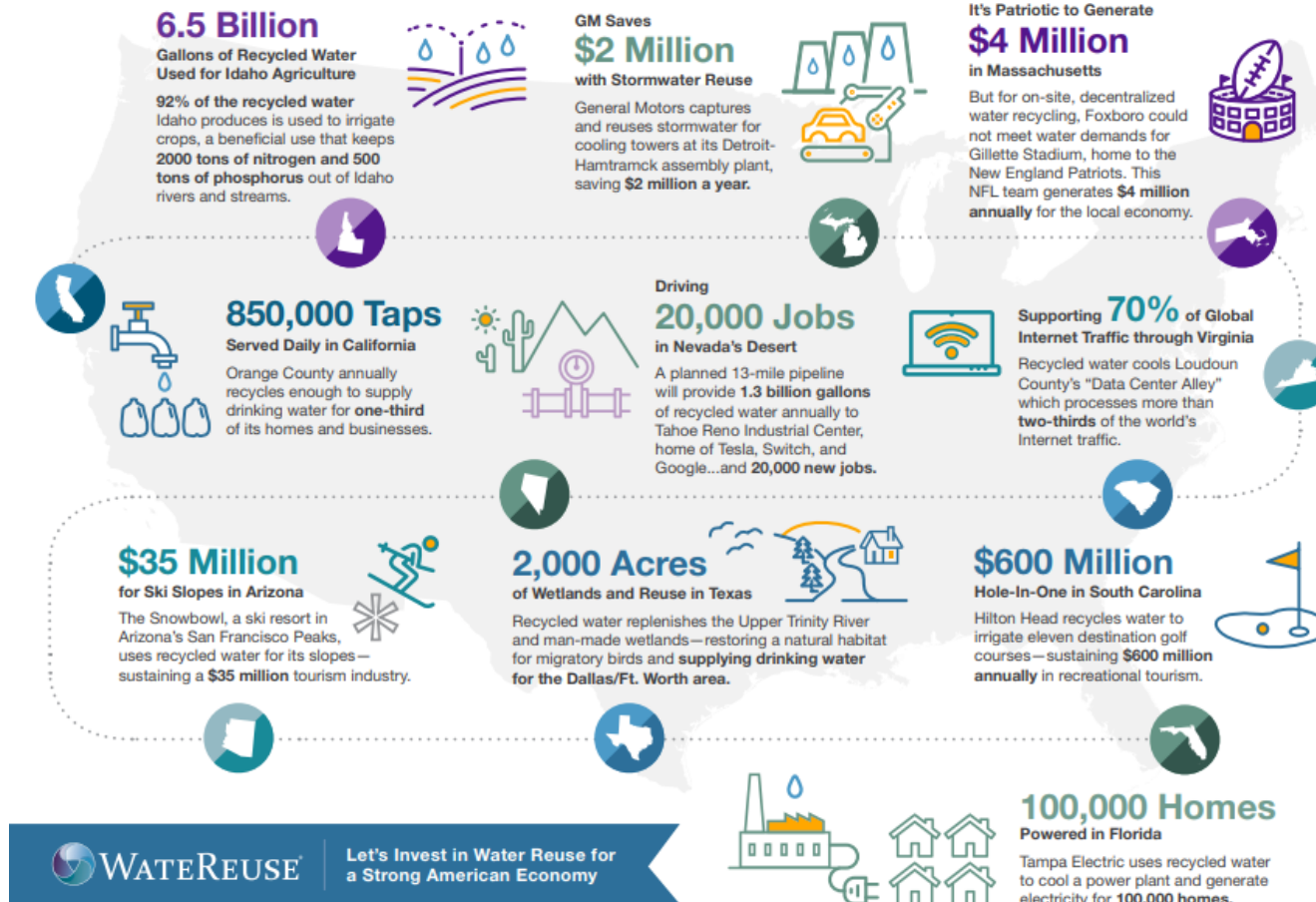
Image courtesy of City of Tarrant Regional Water District



Shannon Wetlands, TX

- Natural treatment step
- Habitat for 260 bird species

Water Reuse Across the United States



A National Perspective: WRAP Action 2.16

WRAP Action 2.16: Support Local and Regional Reuse Projects by Identifying Challenges, Opportunities, and Models for Interagency Collaboration

Authors: Eric Rosenblum, Felicia Marcus, Robert Raucher, Bahman Sheikh, Shannon Spurlock

chrome-extension://efaidnbnmnnibpcajpcglclefindmkaj/https://www.epa.gov/system/files/documents/2022-03/multi-agency_water_reuse_programs-lessons_for_successful_collaboration_march_2022.pdf



Lessons Learned

- Re-evaluate the water utility's mission in the light of current challenges
- Engage with regulators early and often
- Economic analysis should account for multiple benefits and take advantage of economies of scope.
- Collaboration proceeds “*at the speed of trust.*”
- Agency leaders can fulfill their core mission at the same time they serve long-term regional goals.

Spotlight: John Bunker Sands Wetland Center (TX)

Mission: The John Bunker Sands Wetland Center's mission is to educate the public and provide research opportunities in the areas of water reuse, quality and supply; wildlife conservation; and wetland systems.



Partnership & Collaboration: Governance in TX

[txcomptroller](https://www.instagram.com/txcomptroller)

By collaborating instead of competing, the Tarrant Regional Water District and Dallas Water Utilities are securing the region's water supplies at less cost to ratepayers. The North Texas Integrated Pipeline Project, affectionately nicknamed the Interplanetary Pipeline Project, will more than double the maximum delivery capacity of untreated water for the Dallas-Fort Worth Metroplex.

5/2019, <https://www.instagram.com/txcomptroller/>



Resident engineer Shelly Hatton and Jack Stevens, TRWD board president, stand in front of the four-story custom-built gate valve that became part of the North Texas Integrated Pipeline Project. *Photo courtesy TRWD*

Unlocking the Potential of Stormwater Capture & Use

Pure Potential: The Case for Stormwater Capture and Use (WRAP Action 3.3)

Urban SCU Drivers and Benefits

<https://www.epa.gov/system/files/documents/2022-03/wrap-pure-potential-report.pdf>

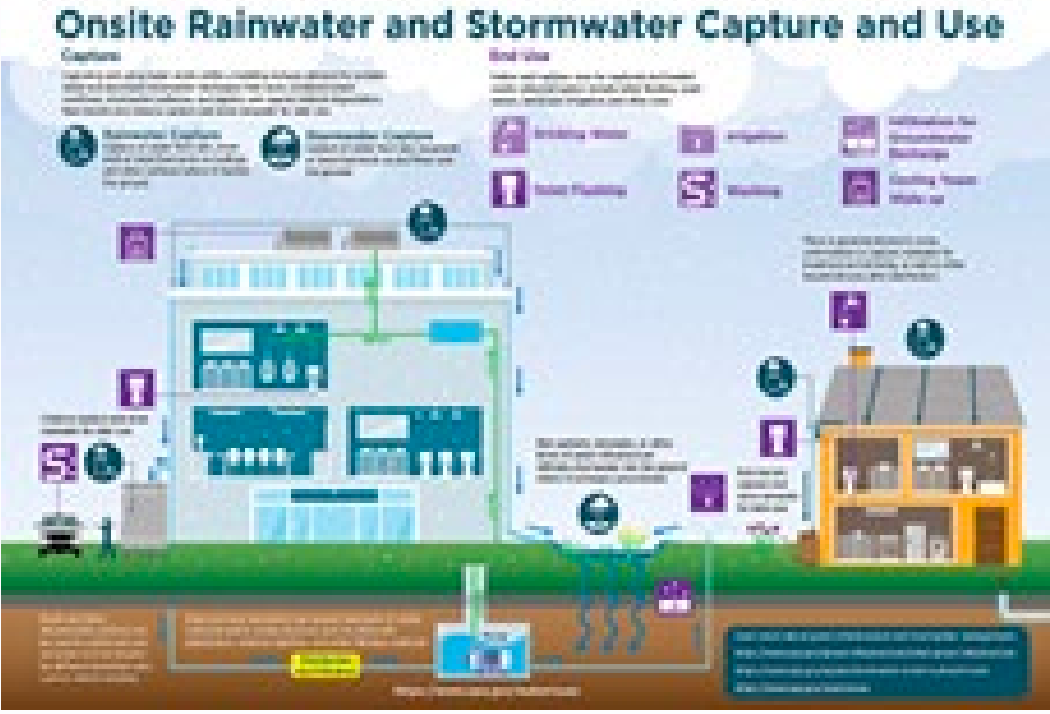


A Paradigm Shift: From Liability to Asset

“Tablets recovered from the time of Hammurabi also offer some insight into the development of institutions and rules for managing water resources for irrigation. . . . The same tablet indicates that the owner of a field can petition the city authorities to flog a neighbor who fails to cooperate in harnessing surface waters for irrigation.

Peter Gleick, The Three Ages of Water: Prehistoric Past, Imperiled Present, and Hope for the Future, pg. 83

Untapped Potential: Rainwater & Stormwater



<https://www.epa.gov/waterreuse/capturing-stormwater-source-water-reuse-resources>

Meeting Community Needs through Multiple Benefit Outcomes



Jackson Elementary School in Altadena before Measure W funding helped the school transform its asphalt yard into a "green schoolyard" with stormwater capture features such as permeable pavement, and more trees. The project was led by non-profit Amigos De Los Rios.

<https://laist.com/news/climate-environment/stormwater-program-has-helped-fight-the-drought-but-theres-a-long-way-to-go>

Of Global & Local Importance: Partnership & Collaboration

Sustainable Development Goal 17, which reads “Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development”, recognizes multi-stakeholder partnerships as important vehicles for mobilizing and sharing knowledge, expertise, technologies and financial resources to support the achievement of the sustainable development goals in all countries, particularly developing countries. Goal 17 further seek to encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.

<https://sdgs.un.org/topics/multi-stakeholder-partnerships>



Codifying Change for a Water Secure Future

Legal agreements do not create mutual trust, they only codify it.

Denis Qualls, Dallas Water Utilities



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Thank you!

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Learn more about our water work:

www.pacinst.org

Stay informed on important water issues:

<https://pacinst.org/email-sign-up/>