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Opportunities for Reuse & Recharge in Minnesota

Shannon Spurlock
Senior Researcher, Public Policy & Practice Uptake

Moos Webinar
June 27, 2024



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A group of people in a blue raft are navigating white-water rapids in a forested canyon. The raft is splashing through turbulent, white water. The people are wearing helmets and life jackets, and some are using yellow paddles. The background shows a steep, rocky bank covered in dense green forest. The overall scene is dynamic and adventurous.

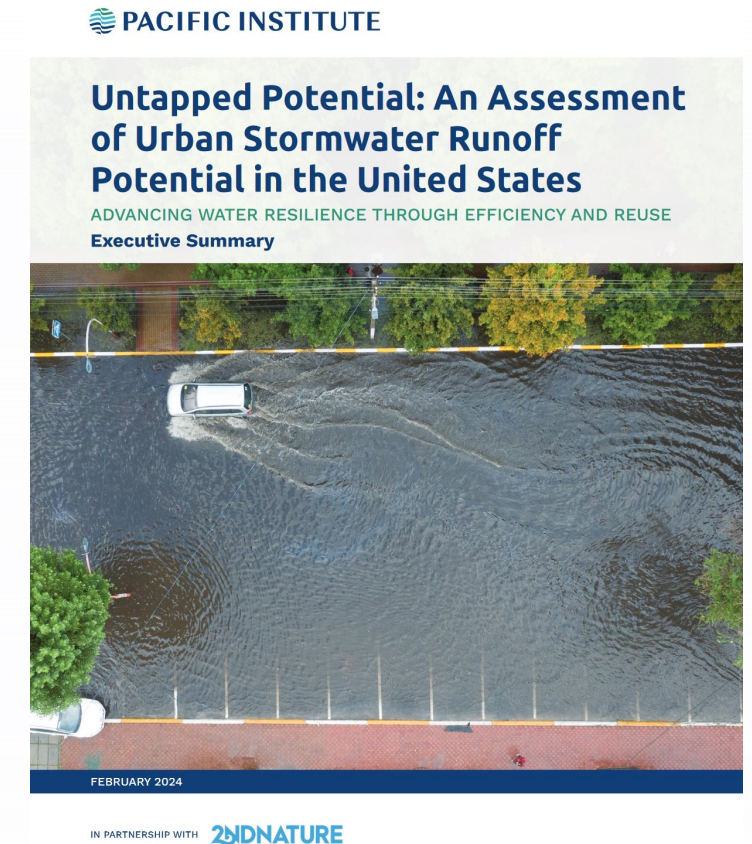
Thriving in Unpredictable Times

Stormwater Capture & Reuse: Results from a National Assessment

National Stormwater Runoff Potential
= **59.5M acre-feet per year (51.3 BGD)**

- Roughly covering 45 million football fields in 1 ft of water
- Represents 93% of Municipal and Industrial Water Use in 2015

*Part of WRAP Action 5.5



Shifting Paradigms: Elevating Reuse

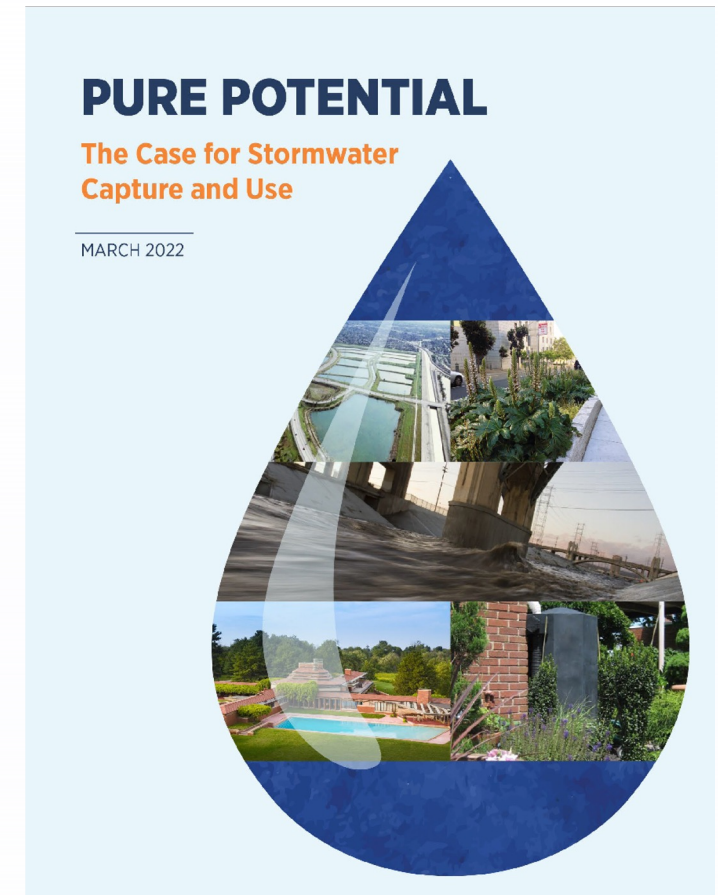
Action 2.1: Compile Existing State Policies and Approaches to Water Reuse

Action 3.1: Compile Existing Fit-for-Purpose Specifications

Action 3.3: Convene Experts on Urban Stormwater Capture and Use

Action 5.5: Quantify the National Volumes of Water Potentially Available for Reuse for Municipal Wastewater and Stormwater

Action 5.8: Evaluate Stormwater Capture and Use in Colorado



Reuse & Social Determinants of Health

What are social determinants of health?

Social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.

SDOH can be grouped into 5 domains:

- Economic Stability
- Education Access and Quality
- Health Care Access and Quality
- Neighborhood and Built Environment
- Social and Community Context



Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved November 11, 2023, from <https://health.gov/healthypeople/objectives-and-data/social-determinants-health>

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 basis for comparing of water management options
- 💰 Optimize investment of time, money, and resources
- 🤝 Identify opportunities to share costs
- 👥 Building community support for a project or program
- ⚖️ Increase equitable investments and mitigate adverse impacts



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.



Green Bay Packaging, WI
Public-Private Partnership
with NEW Water

Stormwater Reuse

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

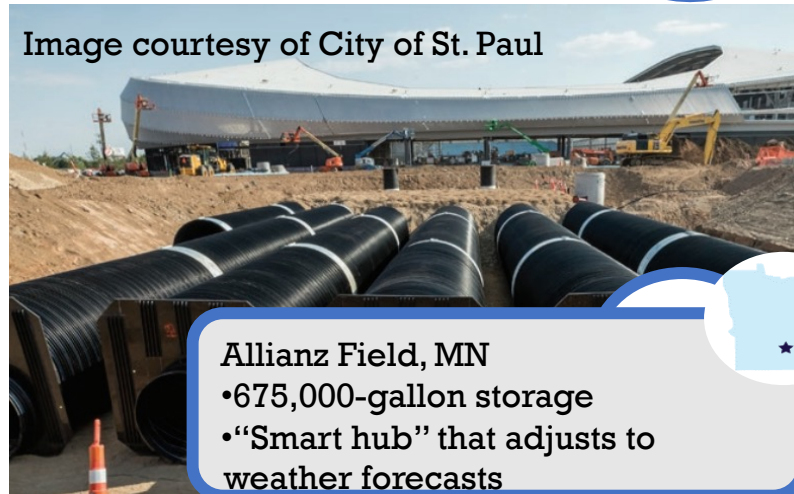


Image courtesy of City of St. Paul

Allianz Field, MN
•675,000-gallon storage
•“Smart hub” that adjusts to
weather forecasts

Agricultural Reuse

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



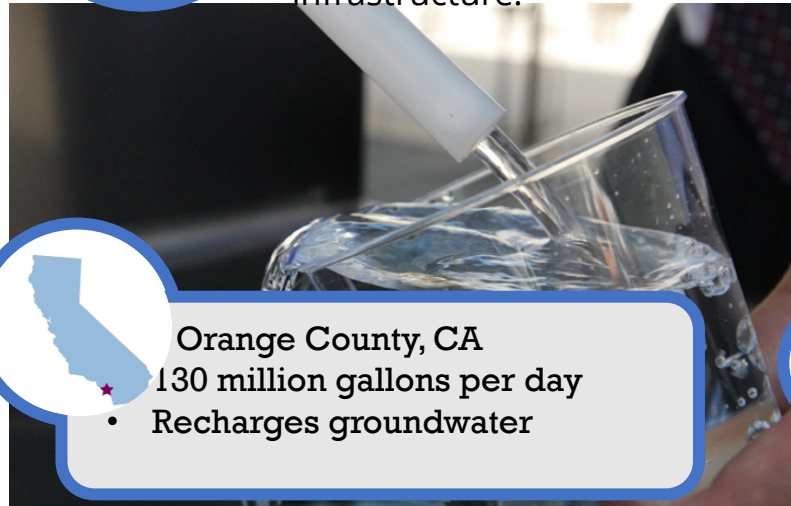
Piccadilly Farm, MD
•Water from Kent County
•Growing corn & soybean crops

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

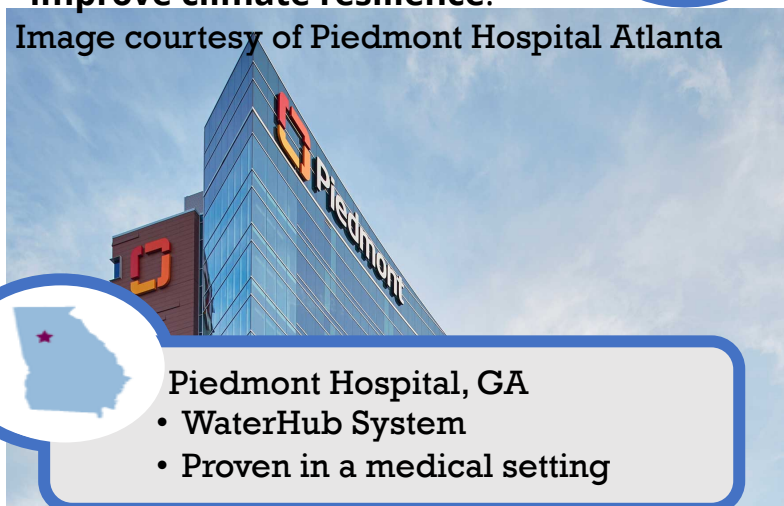
- 130 million gallons per day
- Recharges groundwater

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.



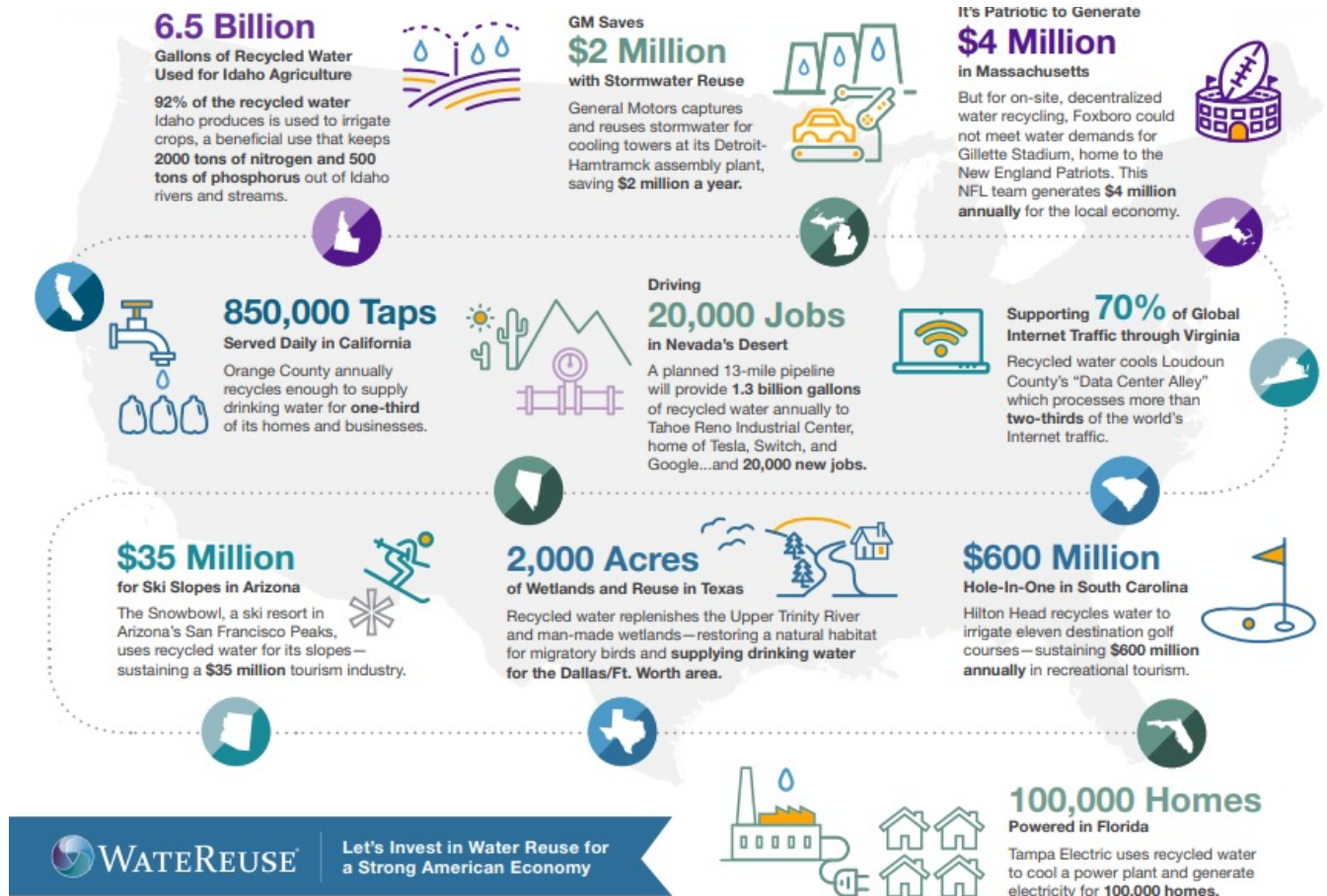
Image courtesy of City of Tarrant Regional Water District



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://efaidnbmnnnibpcajpcglclefindmkaj/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: Towerside Innovation District (MN)

The 300-acre Towerside District is located in a formerly industrial, rapidly redeveloping neighborhood. It's the first designated "innovation district" in Minneapolis and Saint Paul focused on creative, sustainable community development. The Mississippi Watershed Management Organization (MWMO) saw a rare opportunity to manage and treat urban stormwater runoff on a district scale. The community system reduces landowner costs, implements more effective and environmentally friendly stormwater treatment, and provides public greenspace.

<https://www.barr.com/Awards/Towerside-district-stormwater-management-system>



Spotlight: Hampton Roads Sanitation District, SWIFT Program (VA)



HRSD developed its “Sustainable Water Initiative for Tomorrow” (SWIFT) program to divert 100 MGD of wastewater effluent from Chesapeake Bay by treating it to drinking water standards and storing it in the local aquifer for reuse.



Photo courtesy Chesapeake Bay Bridge Tunnel

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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sspurlock@pacinst.org

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