

“The Hidden Reservoir”

Diversifying Water Supply Through Land Use Planning



4623: Integrating Land Use and Water Resources: Planning to Support Water Supply Diversification

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October 24, 2017 - Colorado WaterWise Symposium – Denver, CO



Agenda

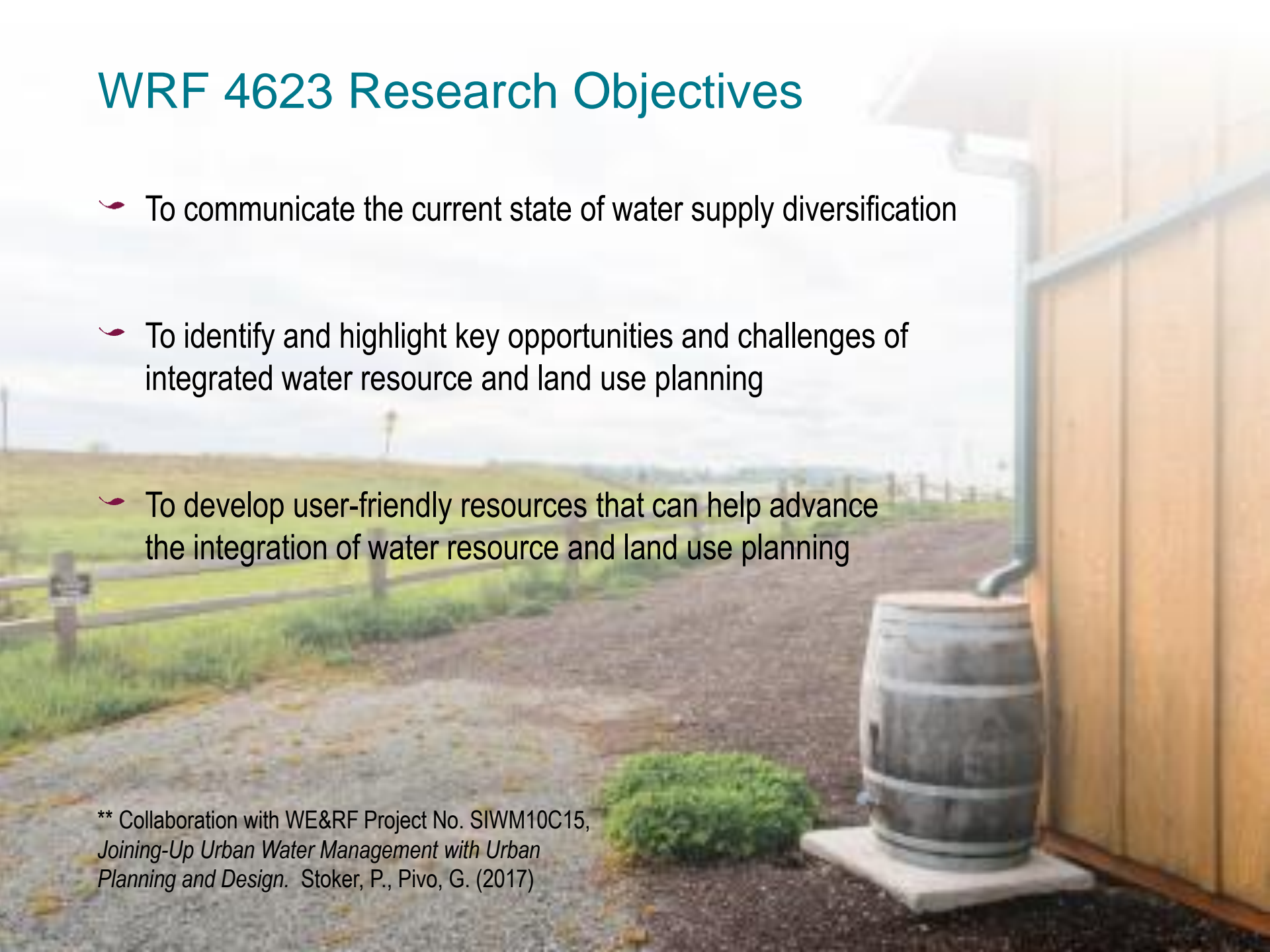
- Introduction and Background
- Research Approach
- Results
- What's Next



WRF 4623 Research Objectives

- To communicate the current state of water supply diversification
- To identify and highlight key opportunities and challenges of integrated water resource and land use planning
- To develop user-friendly resources that can help advance the integration of water resource and land use planning

** Collaboration with WE&RF Project No. SIWM10C15,
*Joining-Up Urban Water Management with Urban
Planning and Design.* Stoker, P., Pivo, G. (2017)

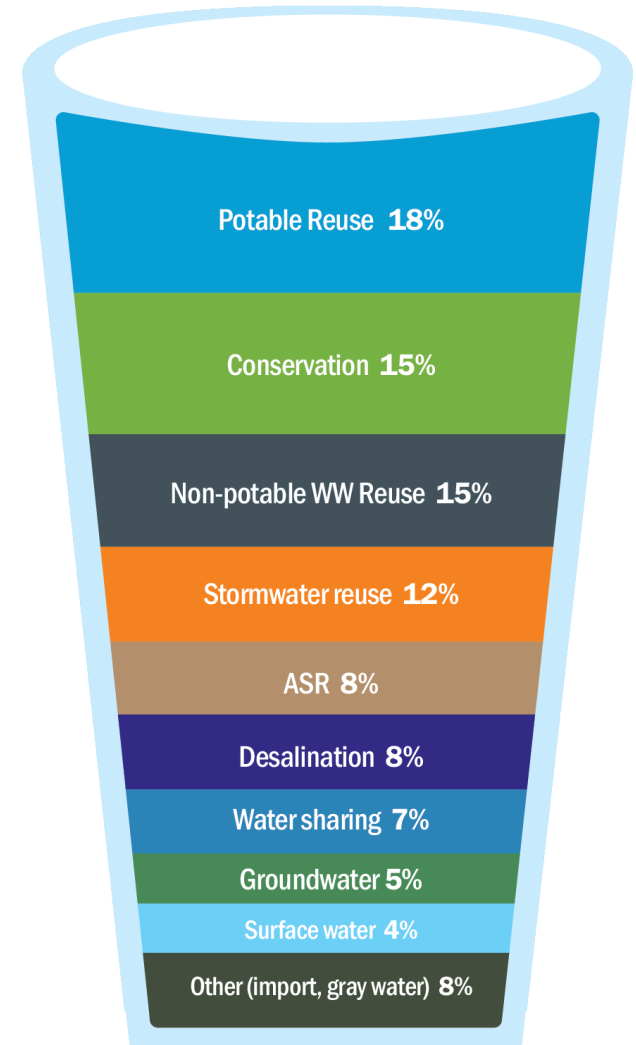


Drivers to Diversify

- ❑ **Water shortages**
- ❑ **Water quality**
- ❑ **Reliability and resiliency**
- ❑ **Population growth**
- ❑ **Policy changes**
- ❑ **Less energy intensive**
- ❑ **Environmental protection**
- ❑ **Economic benefits**

Alternative Water Supplies

- Auxiliary/augmentation supplies
- Supplement more traditional surface and groundwater supplies
- Right water, right source (scale, demands/use, etc.)



Paradigm Shift – One Water

“One Water is the future of the water industry. Many benefits are realized when the barriers traditionally separating water, wastewater, stormwater, and reuse are broken down. One Water is a guiding principle of the Water Research Foundation, which works to advance the science of water in all portions of the water cycle .”

-Robert C. Renner, PE, BCEE
CEO, Water Research Foundation

Water is a Top Planning Issue

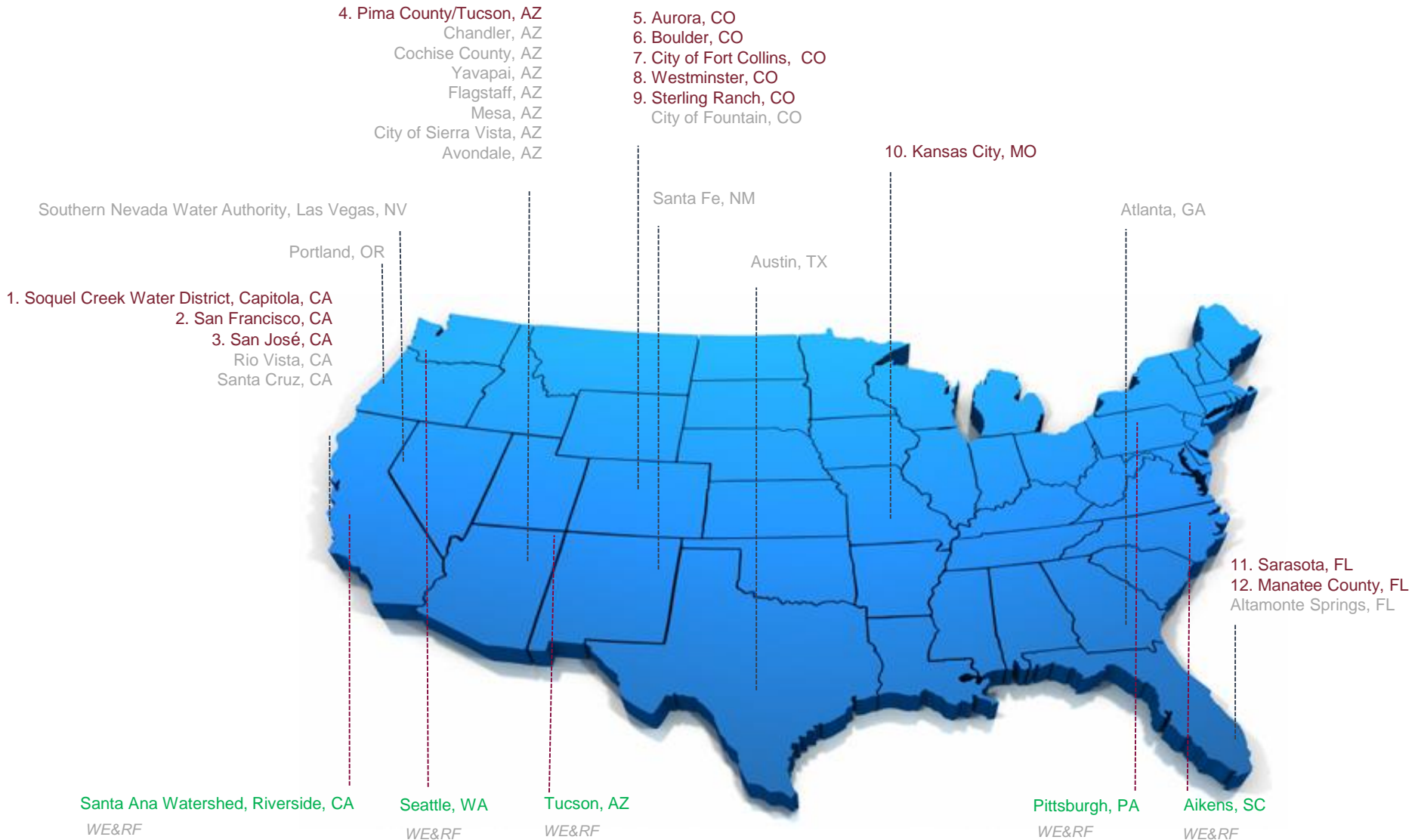
- APA Water Survey
- Water is a top or top ten issue (91% of respondents)
- Concerns:
 - ✓ Stormwater mgmt (82%)
 - ✓ Flooding (70%)
 - ✓ Water supply (67%)
 - ✓ Water resource/env degradation (62%)
- Water supply key issue in dry states
- Flooding key issue in *both* wet & dry states



American Planning Association

Making Great Communities Happen

Case Studies

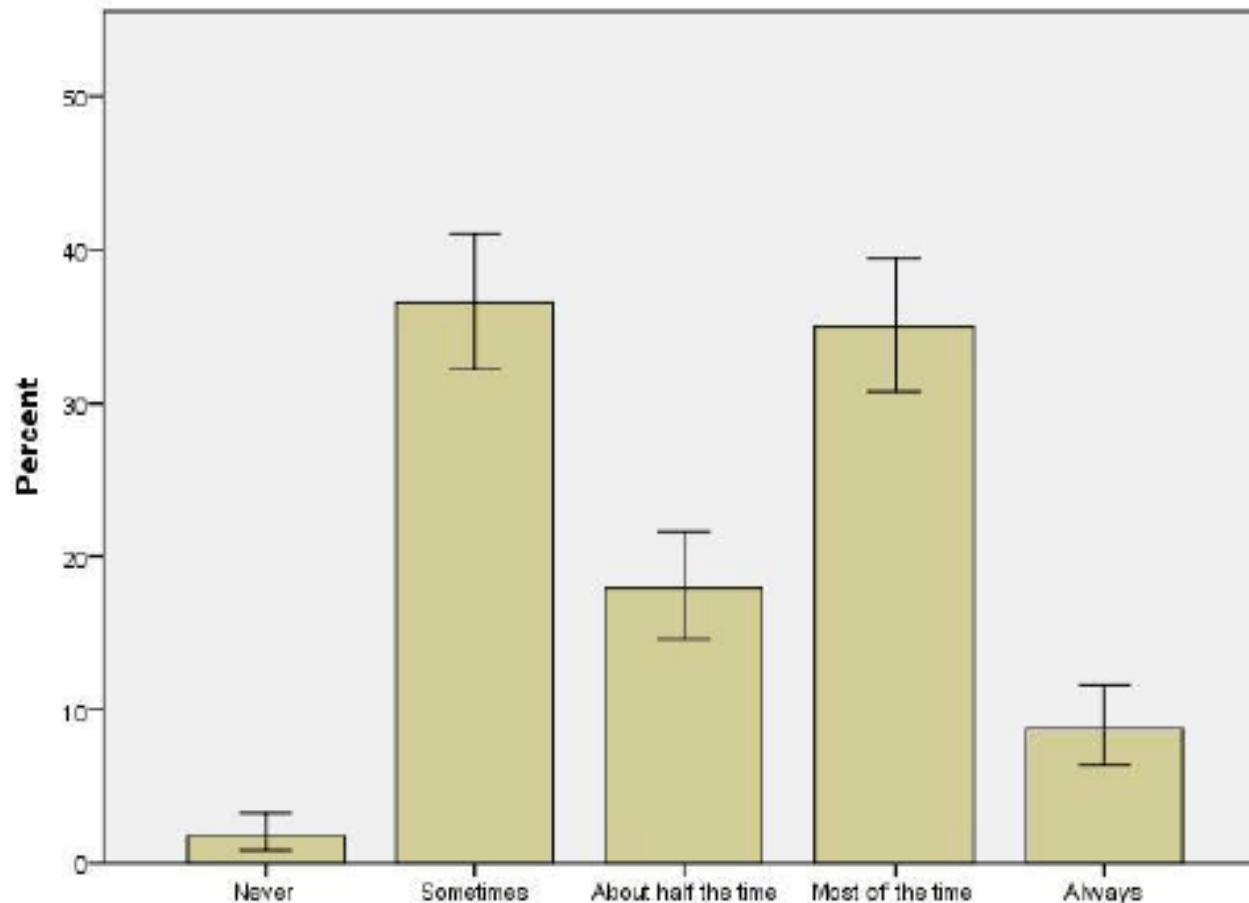


Survey Approach

- Literature Review: 50+ documents
- Survey: 450+ respondents nationwide, planners, water and stormwater utilities, consultants etc.
- 4 Focus Groups: for deeper dive into four issue areas, including a ‘Developer Focus Group’
- 12 Community Interviews: uncover motivations, approach, outcomes and replicability

Survey Results

How much collaboration happens in your community?

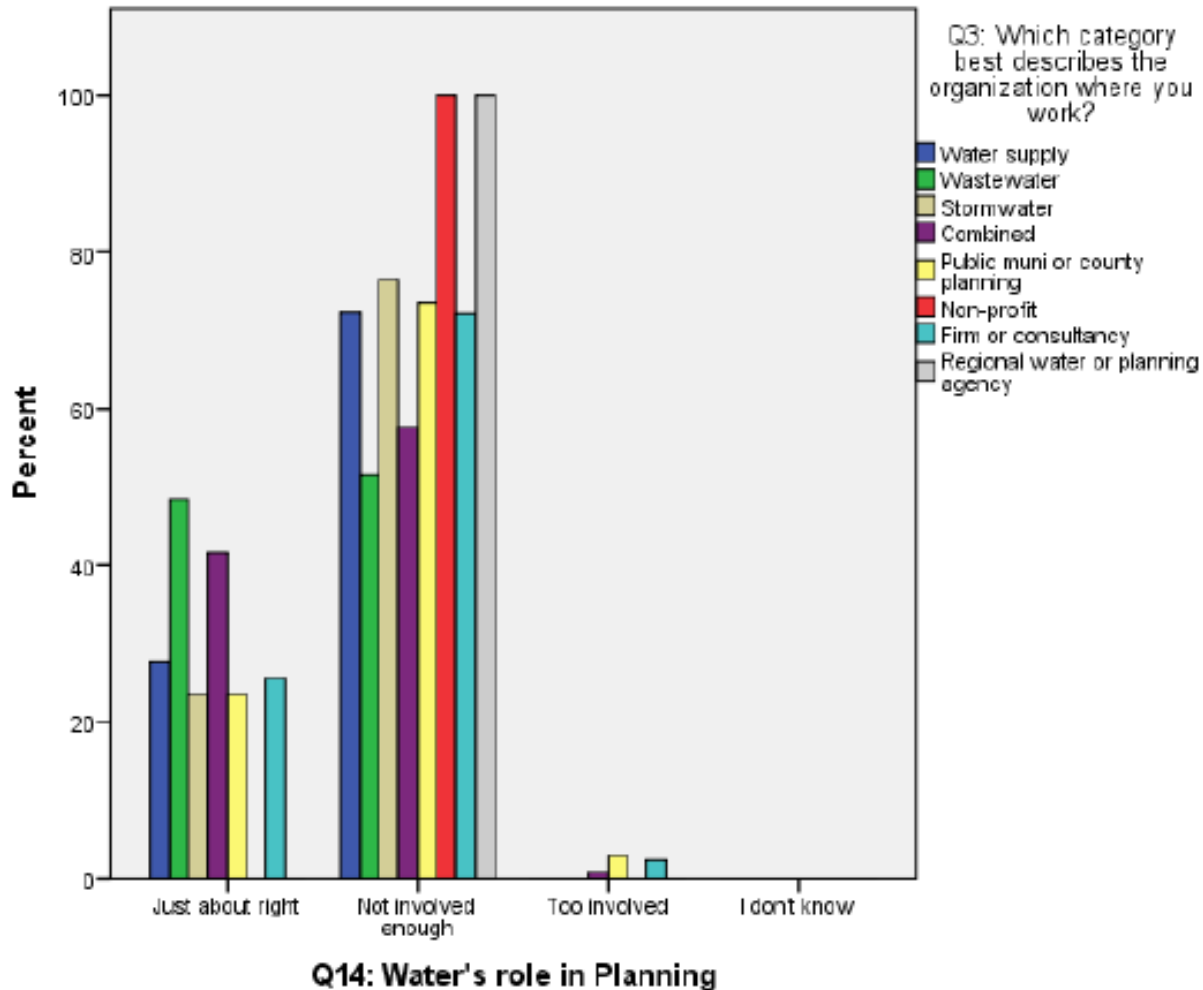


Q12: How much collaboration happens in your community?

Error Bars: 95% CI

Survey Results

Is there enough collaboration?



Survey Key Results

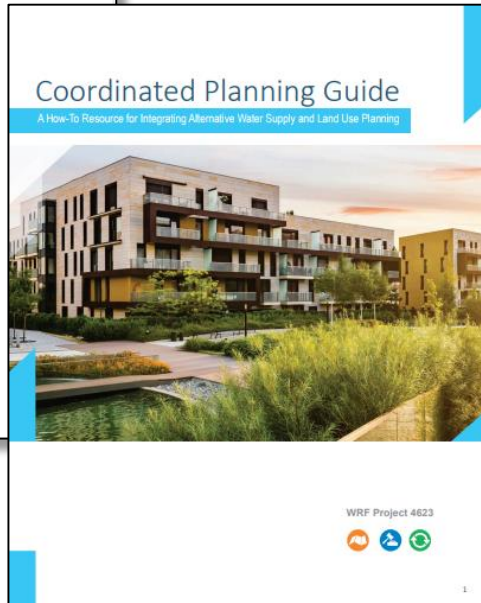
- **Primary Barriers** are Institutional/Organizational: Lack of time, no mandates/incentives, no one responsible for coordinating
- **Most Effective Tools** for collaboration:
 - Joint visioning/scenario planning
 - Coordination on land development projects
 - Data sharing
 - Coordinated planning processes (mandatory or otherwise)

Report & Planning Guide

Integrating Land Use and Water Resources: Planning to Support Water Supply Diversification

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- Practical guide for how and when to integrate water and land use.
- Specific focus on alternative water supply and cross-cutting themes.

EXAMPLES:

- ▶ Researchers at Portland State University in Oregon worked with the Portland Water Bureau to investigate the links between land use patterns and water consumption and how land use policies could play a role in influencing water availability. Using GIS to combine tax assessor information with water billing records, researchers assessed how neighborhood conditions, such as age of development, income, and other demographic factors, affect water use. From this evaluation, researchers identified specific water demands for each type of land use – single family residential, multi-family residential, commercial and industrial – and an indication of the water requirements of new development at current water use rates.
- ▶ The Atlanta Regional Commission, a regional planning and intergovernmental coordination agency for the Atlanta, Georgia metropolitan area, uses the same population projections for land use, transportation, and water planning purposes. This consistency makes submitting Regional Water Plans faster and easier for regulated water providers in the area.
- ▶ The City of Westminster, Colorado, has developed water use data for each of its major land use types and uses this in combination with the community's zoning map to estimate future water demands and wastewater flows. This information is used in long-range water infrastructure planning and in long-range land use planning to ensure the city maintains a sustainable water supply.
- ▶ In 1991 the Gillette Stadium (Foxborough, Massachusetts), home to the NFL's New England Patriots football team and other events, was projected to require more water and wastewater treatment capacity than the small town of Foxborough had. To resolve this issue, an on-site water reuse system was installed that helped to address both issues. The stadium has a closed-loop, membrane bioreactor treatment plant that generates water suitable for up to 250,000 gallons of reuse per day with a 500,000-gallon elevated storage tank for storing the treated water. In addition, the stadium can store 700,000 gallons of untreated wastewater for future treatment, which can be generated during a busy weekend. The system returns high-quality treated wastewater both to the stadium and the adjacent Patriot Place, a 1.3-million-square-foot shopping destination with shops, restaurants, and hotel lodging. The recycled water is used for toilets, facilities cooling, and other purposes.



Coordinated Planning Guide: Sneak Peek

LONG RANGE PLANS



- Baseline and Forecasting
- Visioning and Goal Setting
- Scenario Planning and Alternatives Analysis
- Stakeholder Engagement

CODES AND REGULATIONS

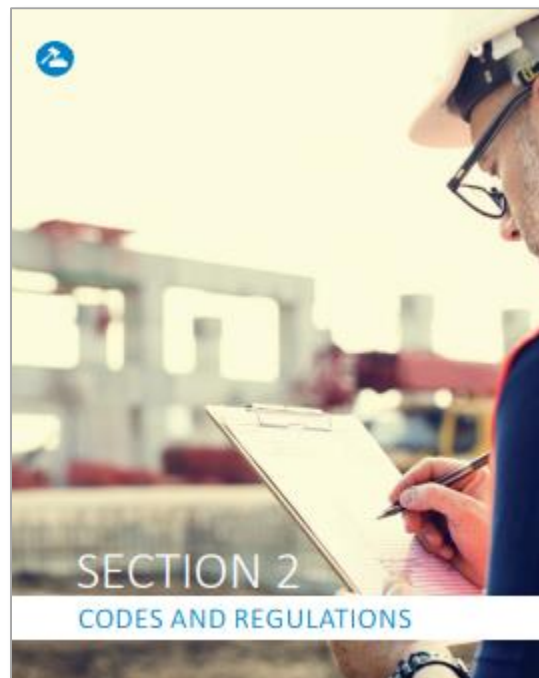


- Zoning Codes
- Subdivision Regulations
- Development Codes
- Water Sustainability Ordinances

DEVELOPMENT REVIEW PROCESSES



- Pre-application Meeting
- Development Plan Application and Review
- Development Agreements and Fees
- Permit Review and Inspections
- Post-occupancy Considerations



Long Range Plans: Community Examples

LONG RANGE PLANS 

- Baseline and Forecasting
- Visioning and Goal Setting
- Scenario Planning and Alternatives Analysis
- Stakeholder Engagement



The comprehensive plan in Manatee County, Florida, requires the lowest quality water to be matched to the lowest quality need, driving the use of an extensive non-potable water system for irrigating agricultural fields and municipal landscapes.

Codes & Regulations: Community Example

CODES AND REGULATIONS



- Zoning Codes
- Subdivision Regulations
- Development Codes
- Water Sustainability Ordinances



Cochise County, AZ

*Cochise County adopted zoning regulations that establish special water conservation standards for new residential and non-residential construction within a **Water Conservation Overlay Zone**, a hydrologically defined zone where groundwater pumping might impact flow in the San Pedro River. Within the zone, new residential, commercial, industrial, multi-family, and public development is required to include specified water conserving features, such as greywater stub outs for new homes and water recycling systems for car washes.*

Development Review: Community Example

DEVELOPMENT REVIEW PROCESSES



- Pre-application Meeting
- Development Plan Application and Review
- Development Agreements and Fees
- Permit Review and Inspections
- Post-occupancy Considerations



Pre-application meetings in Westminster, Colorado, always include water provider staff, allowing the opportunity to communicate to the developer how their choice of plumbing fixtures and outdoor landscaping will influence the water fees that will be charged. In Westminster, fees charged are based on projected water demands of a development, and water staff uses these pre-application meetings as the primary opportunity to influence and reduce those demands.

10 Steps to Better Collaboration



LONG RANGE PLANS

1. Conduct Research

Identify the alternative water supply types in use or available in your community and establish a baseline of information about them. Use this information and research to inform all next steps, taking into account which land use planning activities are best suited to the alternative water supplies of interest.

2. Review Plans

Review your community's comprehensive plan and water management plans to see if/how alternative water supplies are addressed.

3. Align Projections

Check on the sources for the land use planning population projections; compare against the population projections/sources used by water utilities.



CODES AND REGULATIONS

4. Evaluate Regulations

Evaluate your community's zoning, subdivision, and development regulations to see where there may be unintended barriers to implementing alternative water supply projects.

5. Review Fees and Incentives

Review fee structures and code requirements to see if there are any opportunities to incentivize or promote alternative water supply projects.

6. Integrate Ordinances

Review any separately adopted water sustainability ordinances and see if there are ways to integrate them with zoning, subdivision, and/or development regulations.



DEVELOPMENT REVIEW PROCESSES

7. Build Teams

Invite your water utility or community planner counterpart to a meeting to get to know them and explore opportunities for enhanced collaboration on alternative water supplies. If such a relationship already exists, expand your efforts to establish a multi-disciplinary team of water and land use planning professionals and set up a mechanism for routine coordination.

8. Clarify Review Processes

Examine the steps in the development review process to see where/how water utilities can or should be more engaged. Formalize those opportunities for collaboration via steps or sub-steps in your development review process.

9. Inform Decision Makers

Provide training or information to elected and appointed officials (especially those involved in land use approvals) about alternative supply types, methods, options, and/or challenges in your community.

10. Revisit Inspection Procedures

Review your community's inspection procedures and staffing assignments to ensure that inspections are happening at the right time(s) and that staff has sufficient training.

Thank you!

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