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Water Management Conference

2018



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

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March 28, 2018



WESTERN RESOURCE
ADVOCATES



THE
Water
Research
FOUNDATION

Acknowledgements and Related Research

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

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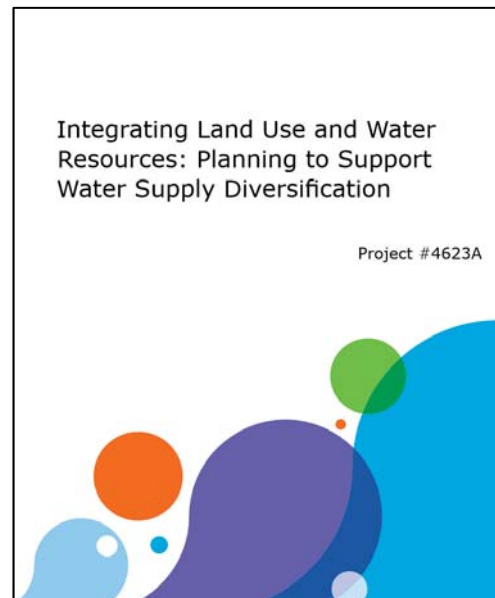
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Research Objectives

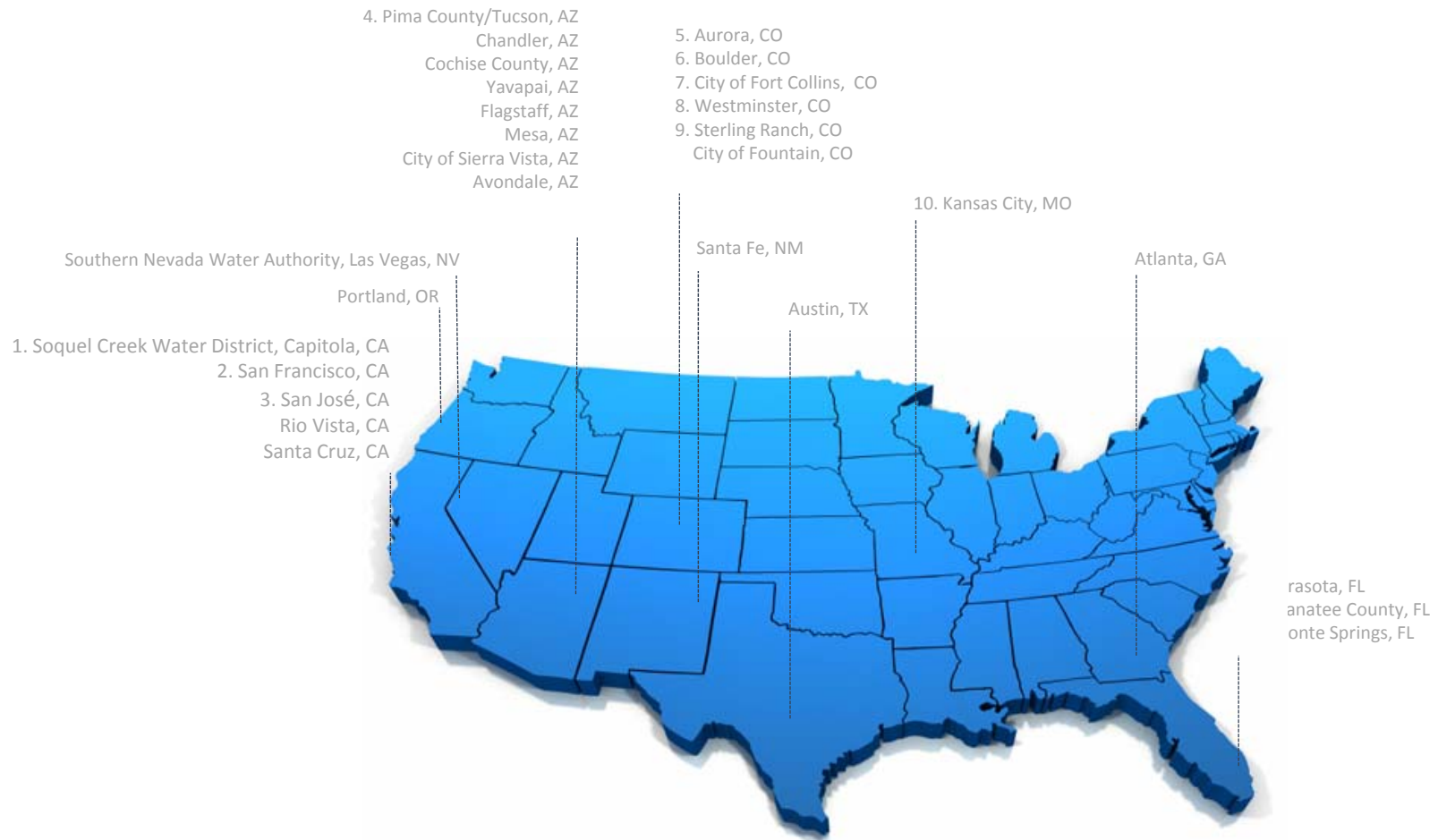
- To identify and highlight **key opportunities and challenges** for integrated water resource and land use planning.
- To communicate the **current state of water supply diversification**.
- To develop **user-friendly resources** that can help advance the integration of water resource and land use planning.

Research Approach and Outcomes

- Literature review
- Joint survey
- Interviews
- Focus groups
- Case studies











Case Studies



Case Study Outcomes









- Key Policy and Program Findings
- Alternative Supply Considerations
- Integrated Planning Solutions
- Policy and Program Successes
- Opportunities for Replication

Community/ Example	Alternative Water Solutions	 Funding Solutions	 Cost Benefit Tools	 Institutional Collaboration	 Planning at the Right Scale	 Public Education & Engagement	 Policies & Regulatory Changes	 Data Collection & Sharing	 New Technology & Innovation
Aurora, CO	-Conservation -Potable reuse			•		•	•	•	•
Boulder, CO	-Conservation -Stormwater capture	•			•		•		
Fort Collins, CO	-Conservation -ASR (considered) -Water sharing	•	•		•				
Kansas City, MO	-Stormwater capture -Non-potable reuse (proposed)			•	•	•			
Manatee County, FL	-Conservation -Desalination (considered) -Water sharing			•	•		•		

(Partial list)

Source: Fedak et al., 2018

Barriers, Solutions, and Learning by Example

BARRIERS	INTEGRATION SOLUTIONS	CASE STUDY EXAMPLES
Inadequate Economic Justification	 <p>Funding solutions, such as alternative funding sources, pilot projects, and improved financial planning and budget priorities, can help to address the significant capital outlay required for many water supply projects.</p>	pg. 21
	 <p>Cost-benefit tools help make the financial case for integration and highlight the benefits of collaboration.</p>	pg. 29
Lack of Coordination and/or Control	 <p>Institutionalized collaboration through inter-agency and interdisciplinary approaches that define clear roles and responsibilities can help in prioritizing water from planning to implementation.</p>	pgs. 7, 12, 15, & 31
	 <p>Planning at the right scale and knowing when it is important to expand the reach to a larger geographic scale (e.g., from municipal to regional or watershed) will help to ensure the right stakeholders are at the table for decision making and building trust and relationships.</p>	pgs. 14, 15, & 22
Lack of Public and Political Support	 <p>Public education and stakeholder engagement through early communication, education and branding, and consistent messaging enable greater public buy-in.</p>	pgs. 14, 15, 21, 23, 25, & 29-31
	 <p>Informing decision makers to enact policy and regulatory changes can also go a long way towards creating the appropriate mandates and/or incentives for increased collaboration (e.g., requiring a comprehensive plan water element).</p>	pgs. 7, 15, 18, 21-25, & 30-31
Gaps in Current Knowledge	 <p>Data collection and sharing can help to better link water provider and community planning processes while also filling knowledge gaps and getting all stakeholders aligned.</p>	pgs. 12, 18, 22-23, & 30-31
	 <p>New technology and innovation will continue to increase the performance of alternative water supply technologies, making them more cost effective, and thereby encouraging greater adoption.</p>	pgs. 12 & 21-25

▶ The City of Tucson, Arizona, adopted a commercial rainwater ordinance in 2008—the first of its kind in the nation. Adoption was spurred by an interest in water harvesting as one mechanism to address the water demand of increasing growth and to delay the need to acquire more costly long-term water supplies. A stakeholder group composed of builders, developers, environmental groups, city planners, and others was convened to develop an acceptable proposal. The ordinance requires all commercial development to submit a rainwater harvesting plan with a landscape water budget that shows how 50 percent of the estimated yearly landscape water budget will be provided by a rainwater harvesting system. Failure to meet the requirement is considered water wastage subject to monetary fines.⁴¹

Source: Fedak et al., 2018

Drivers to Diversifying Water Supplies

Water shortages

Less energy intensive

Water quality

Environmental

Reliability/resiliency

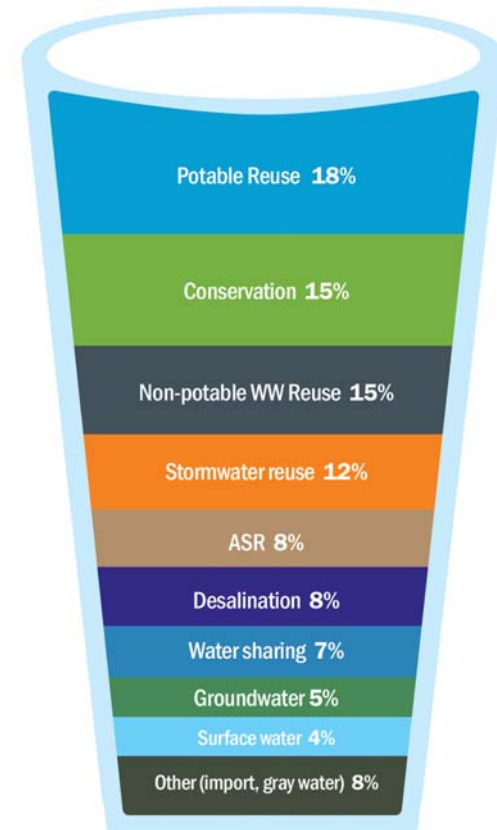
Economic benefits

Population growth

Policy changes

Current State of Alternative Water Supplies

- Auxiliary/augmentation supplies
- Supplement more traditional surface and groundwater supplies
- One Water: Right water, right source



Source: Paulson and Williams 2015
ASR = aquifer storage and recovery

Why coordinated planning is important (and hard)

- Water is a top ten issue – 91% of planning survey respondents agree.
- Planners and water managers know they should be coordinating.
- Many water management strategies would benefit from better coordination with planners.
- Resistance to coordination comes from limitations in staff time and interest, political will, and existing mandates.

Sources:

APA, 2016

Stoker and Pivo, 2017

Understanding both sides

- From the engineering perspective

Who and when?

- Long-range planners (future)
- New project reviews (near-term)
- Building department (happening now)

Involves people

Involves politics

- From the planning perspective

Technical understanding

Legal issues (water rights)

Water Professionals in Land Use Planning: Top 10 Things to Do



COORDINATE 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. Understand the challenges regarding the existing/future water supplies for your community. Also review state/local water and health laws for any pertinent requirements. 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, capital improvement 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. Population can be a first step to more in depth discussions about projections of the future, considering additional topics such as climate change and the economy, commercial/industrial/institutional customer trends, etc.

Source: Fedak et al., 2018

Water Professionals in Land Use Planning: Top 10 Things to Do



COORDINATE CODES AND REGULATIONS

4. Evaluate Regulations

Evaluate your community's zoning, subdivision, and development regulations, as well as state laws and regulations, to see where there may be unintended barriers to implementing alternative water and/or One 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, environmental management, and environmental conservation codes/ordinances and see if there are ways to integrate them with zoning, subdivision and/or development regulations.

Source: Fedak et al., 2018

Water Professionals in Land Use Planning: Top 10 Things to Do



COORDINATE DEVELOPMENT REVIEW PROCESSES

7. 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.

8. 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.

9. Inform Decision Makers













































Provide training or information to elected and appointed officials (especially those involved in land use approvals) about best practices for protecting existing water resources as well as 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.

Source: Fedak et al., 2018

Land Use Planners in Alternative Supply: Understanding the Options

ALTERNATIVE WATER SUPPLY	DEFINITION		APPLICABLE SCALE			ASSOCIATED PLANNING ACTIVITY		
			Site	Utility	Regional	Plans	Regulations	Review Process
Potable Wastewater Reuse	Treats wastewater to drinking water quality standards with the intent of either direct or indirect reuse. Direct reuse systems send the treated wastewater directly into the water distribution system while indirect systems mix treated wastewater with raw water and are sent through standard drinking water treatment processes before use.							
Conservation	The act of reducing water consumption through activities, such as efficiency improvements/equipment upgrades and end user behavior change, and eliminating system leaks and other transmission inefficiencies.							
Non-potable Wastewater	Treats wastewater for reuse but limits the use of the treated water to applications with less human contact than potable reuse thereby reducing the level of treatment required.							
Stormwater Capture	Captures the runoff from rainfall events and makes the water available for beneficial uses instead of allowing it to run off into surface waterbodies							
Aquifer Storage and Recovery	Uses groundwater aquifers as an underground storage reservoir with the intent of future recovery and reuse. Storing water underground reduces losses due to evaporation and may even provide some treatment of the water. Water is introduced to the aquifer either through surface infiltration or direct injection, and recovered later from wells.							
Desalination	Treats either seawater or brackish groundwater to remove the salts. With further treatment, the water may be used as a potable water supply.							
Water Sharing	Facilitates the transfer of water from regions or users that have an abundance to those who are facing a lack of water.							
Greywater	A specific category of wastewater coming from showers and tubs, clothes washers, and bathroom sinks. Limiting greywater to these sources, which have limited organics, greatly improves the quality compared to traditional wastewater and makes it suitable for non-potable reuse with limited treatment.							

Source: Fedak et al., 2018

In Conclusion

- Land use planners are already coordinating with other entities (transportation, fire departments, health departments)
- Coordination with water utilities has lacked strong drivers and both sides have information gaps
- There's no easy button, but the research report and coordinated planning guide are free and publicly available.

Questions?

Thank you!

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