



RESEARCH BRIEF

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One Water Management Strategy For Improving Sustainability

Adopting integrated or “one water” management that utilizes all available water sources to achieve more sustainable supplies has benefits for cities, agriculture and the environment.

Background

Climate change, drought and chronic overdraft represent growing threats to the sustainability of water supplies in dry environments. The Monterey/Salinas region in California exemplifies a new era of integrated or “one water” management that is using all of the water it can access to achieve more sustainable supplies to benefit cities, agriculture and the environment. This program is the first of its kind to reuse a variety of waters including wastewater, stormwater, food industry processing water and agricultural drainage water.

Sustainable water resource management is especially critical for Monterey County because the region is independent of any state or federal water supply projects. In addition, the county’s former heavy reliance on local surface and groundwater supplies which are no longer as available — and also now restricted by the state — only increases this urgency. Although conservation and efficiency measures can help extend existing water supplies, Monterey residents had already achieved high conservation levels.

LESSONS FOR RESOURCE MANAGERS

- ▶ **Leverage water supply stressors to elicit change.** Costs, regulatory hurdles and other barriers to water supply projects are unavoidable, so the justification for these projects must be communicated in equally concrete terms. Water resource management should focus on local solutions and build support for alternative supply projects.
- ▶ **Build strong regional partnerships.** Water managers and stakeholder groups working together to build trust can define potential advantages of regional planning, including: cost savings from shared infrastructure; equitable distribution of risks and benefits; flexibility matching supply and demand; and the availability of state and federal funding; all while broadening participation in water solutions.
- ▶ **Plan effectively under uncertainty.** Sustainability goals encourage long-term planning, but efforts must also consider the limitations of data and the tradeoffs between present and future costs, benefits and risks. Water managers should delineate between scientific data and value judgments, and engage their stakeholders to better understand value preferences. Adaptive solutions such as phased or expandable projects can lay the groundwork to meet future needs without requiring a large present investment.
- ▶ **Additional regulatory guidance on storage is needed.** A seasonal mismatch exists between recycled water supply and demand, especially for irrigation. Without adequate storage, investments in recycled sources and treatment to serve agricultural users can be utilized only during a fraction of the year. Opportunities for seasonal scale storage exist, but additional regulatory guidance addressing recycled water storage as distinct from effluent discharge would benefit communities considering reservoir or subsurface storage of recycled water.
- ▶ **Plan for growing demand.** Monterey’s water reuse program included proactive expansion plans which support sustained project benefits while also allowing managers to expand quickly when funding, public sentiment or regulatory support is available.

The development of Monterey's integrated water management network and the deployment of key innovations allowed this network to more effectively serve the area's agricultural and residential communities. While the network's success in leveraging local needs and regional partnerships through inclusion of diverse stakeholders, permitted the development of effective integrated water solutions. By increasing the supply of recycled water to Monterey's indirect potable use system, the region's potential need for seawater desalination may be delayed as much as 20-30 years, resulting in cost and energy savings, and providing the opportunity to resolve present planning concerns.

Although the Monterey region has demonstrated great progress in leveraging collaborative water projects to satisfy agricultural and urban needs, the future direction of the region's water supply is currently under debate. To better understand the challenges and opportunities facing similar California communities as they seek to sustainably manage agricultural-urban water supplies, a Stanford research team studied the partnerships, projects and innovations that shape Monterey's integrated water network. Water resource managers in other communities can learn from Monterey's success leveraging local needs and regional partnerships to develop effective integrated water solutions. However, key challenges remain in resolving mismatched timing between water availability and demand, funding alternative water supplies and planning effectively under uncertainty.

ABOUT THE AUTHORS



Richard Luthy

Richard Luthy is the Silas H. Palmer Professor of Civil and Environmental Engineering; director of the NSF Engineering Research Center for Re-inventing the Nation's Urban Water Infrastructure (ReNUWit) and affiliate of the Stanford Woods Institute for the Environment at Stanford University.



Bridget Gile

Bridget Gile is a Ph.D. student in Civil and Environmental Engineering at Stanford University.

This brief is based on "Integrated Water Management at the Peri-Urban Interface: A Case Study of Monterey, California," published in the journal *Water*.



FOR MORE INFORMATION

Office of Policy & Engagement
Stanford Woods Institute for the Environment
woods-extaffairs@stanford.edu
woods.stanford.edu