One California community shows how to take the waste out of water

February 25 2021, by Bridget Gile

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Caught between climate change and multi-year droughts, California communities are tapping groundwater and siphoning surface water at unsustainable rates.

As this year's below-average rainfall accentuates the problem, a public-private partnership in the Monterey/Salinas region has created a novel water recycling program that could serve as a model for parched communities everywhere.

As Stanford civil engineers report in the journal *Water*, this now urbanized region, still known for farming and fishing, has used water from four sources—urban stormwater runoff, irrigation drainage, food processing water and traditional municipal wastewater—and treated it so that this recycled water now supplies one-third of all drinking water on the Monterey Peninsula while providing irrigation water for 12,000 acres of high-value crops in the northern Salinas Valley.

This first-of-its-kind program creates a sustainable management plan by taking a "one water" approach that considers all of the region's water, new and used, as part of one network. The effort began in 1972 when agricultural, residential and industrial users started the process of consolidating their individual wastewater treatment plants into one regional center to meet the stricter environmental standards of the federal Clean Water Act. The idea was to reuse wastewater to irrigate fruit and vegetable crops. But first they had to determine whether it was safe. Their landmark study affirming the safety of this plan led to a $75 million water treatment and distribution system that opened in 1998 and pioneered the practice of using recycled water to irrigate freshly edible fruit and vegetable crops.

But while the irrigation water system was under development, seawater intrusion continued to threaten the region's groundwater supplies. State authorities declared a key aquifer critically overdrafted. And the State Water Board ordered the Peninsula's private water supplier, California American Water, to stop excessive pumping from the Carmel River. The region, which had already formed the Monterey One Water utility to implement the crop irrigation project, responded with another water

recycling innovation. In collaboration with other groups, Monterey One Water collected wastewater from urban runoff, irrigation drainage and food processing plants to create a $124 million treatment plant that opened in 2020. Its goal is to bring this former wastewater up to potable standards and then store it in the groundwater basin where it is later pumped for drinking water supply.

The research team studied the history, agreements, design and performance of Monterey's one water program to help other communities considering similar approaches. But the region can't rest on its laurels. Peninsula communities are currently considering whether to invest in a $60 million expansion to its recycled water system, or spend $400 million to build a seawater desalination project. This high-stakes decision depends on how soon water demand will outpace recycled water supply, which has been variously estimated at 10, 20 or 30 years. The wrong decision would be costly to local ecosystems and residents, who already pay among the highest water rates in the nation.

Dick Luthy, the Silas H. Palmer Professor of Civil and Environmental Engineering at Stanford and a co-author of the article in *Water*, said the region has the proper mindset to make the right call because its agricultural, residential and industrial users have a history of cooperating instead of bickering.

"The moral of the Monterey/Salinas story is that working collaboratively and imaginatively, different users in water-scarce regions can address their challenges in ways that are equitable, protective of the environment and supportive of local economies."

More information: Bridget C. Gile et al, Integrated Water Management at the Peri-Urban Interface: A Case Study of Monterey, California, *Water* (2020). DOI: 10.3390/w12123585

Provided by Stanford University School of Engineering