Optimism and obstacles as California strives for sustainable groundwater use

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Five years after the Sustainable Groundwater Management Act (SGMA) became law in California, USC Sol Price School of Public Policy researchers examined the progress made and the obstacles stakeholders

face as the state aims for sustainable groundwater use by 2042.

Price Associate Professor William Leach and Professor Shui-Yan Tang, along with USC Price alumnus and Georgia Institute of Technology Professor Brian An, published their findings in two journals this fall. Their work is supported by a grant from the John Randolph Haynes and Dora Haynes Foundation.

Many may not realize that groundwater provides nearly 40% of water used in California in normal years, and up to 60% in drought years like 2021. To prevent overdraft, which occurs when groundwater is repeatedly pumped at a faster rate than it can be replaced, lawmakers passed SGMA in 2014. It requires local stakeholders like irrigation districts and county governments to form Groundwater Sustainability Agencies (GSAs). Together, they are tasked with creating plans that show how they will eliminate overdraft within 20 years.

The research team surveyed 68 GSAs in the summer and fall of 2019, and quickly learned that forming GSAs did not always come easily.

In their first paper, published in the *Journal of the American Water Resources Association* they found the two most common obstacles to organizing GSAs were a lack of trust and too many diverse interests among stakeholders. Indeed, 57% of respondents said they somewhat agree, agree or strongly agree that "stakeholders did not trust one another," and 51% said "stakeholders had too many diverse interests."

Once formed, GSAs also sometimes struggled to come up with a plan to achieve groundwater sustainability within the two-decade timeframe. The most significant barriers to producing an attainable plan, according to the research, were the lack of financial resources and the state's requirement to coordinate plans among GSAs in the same region.

The research team asked respondents a number of questions, including some centered on what they believe to be the most significant problems facing water basins. Perhaps surprisingly, a majority of those surveyed only rated one issue as at least a "moderate problem": the depletion of groundwater levels. Other problems, including groundwater quality and storage, did not rank as highly.

The research also revealed promising answers from stakeholders about SGMA's mission: about three-fourths of respondents at least somewhat agreed that SGMA will enhance groundwater sustainability. Interestingly, those surveyed in the South Central region had the highest confidence in the Act and in GSA governance despite being in the area with the biggest groundwater challenges.

"This juxtaposition suggests that groundwater stakeholders in the South Central region may have matched their greater needs with more effective investments in building GSAs capable of meeting those needs," the research states.

In the second paper, published in *Environmental Science and Policy*, An, Tang and Leach argued that rules designed to protect stakeholder autonomy can encourage a diverse group of members to participate and share resources, including those who are often marginalized. They suggest that this approach also boosts confidence in sustainability efforts thanks to strengthened collaboration.

The Price professors believe lawmakers can alleviate stakeholders' frustrations through sensible policies.

"For any mandate to work, the state government needs to establish rewards and penalties to hold local entities accountable. Simultaneously, the state government must also allow for considerable flexibility and assist local entities in resolving potential conflicts before committing to

any formalized collective-choice arrangements," Tang said.

Leach said that because climate change is causing increasingly dry and unreliable winters, groundwater managers are facing "a moving target" when aiming to hit 2042 goals.

"To succeed, they will need to make thousands of difficult choices," said Leach, who also teaches classes for Price's online Master of Public Administration program. "Still, there's reason for hope because SGMA gives California its first compressive statewide framework for managing groundwater."

Leach believes SGMA gives local leaders enough authority and incentives to achieve sustainability. However, just in case, he noted that the Act includes a "state backstop"—an insurance policy which enables Sacramento to step in if GSAs fail. Just this month, the Los Angeles Times reported that the Department of Water Resources notified six agencies in the San Joaquin Valley that their plans have deficiencies requiring correction.

As Leach and Tang acknowledge in their research, the rules included in SGMA are complex. Yet their intention is simple: ensure future generations of Californians have enough clean water.

Given the state's vital agricultural position (two-thirds of America's fruits and nuts grow here) SGMA's success is critical to the entire country.

"Overall, I'm optimistic that Californians will rise to the challenge of achieving sustainable use ahead of the statutory deadline of 2042. Researchers at USC and around the nation are tracking SGMA implementation closely to verify whether that optimism is warranted," Leach said.

It may be easy to be daunted by the enormity of the task, and stakeholders have only just begun their journey toward sustainability. Still, the research shows that by blending collaborative partnerships with support from the state, the ambitious goals are genuinely achievable.

More information: William D. Leach et al, Evaluating California's Sustainable Groundwater Management Act: The First Five Years of Governance and Planning, *JAWRA Journal of the American Water Resources Association* (2021). DOI: 10.1111/1752-1688.12967

Brian An et al, Protective Rules and Collaborative Governance: Modeling Anticipated Success in Sustainable Management of Common-Pool Resources, *SSRN Electronic Journal* (2020). DOI: 10.2139/ssrn.3589908

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