

Study finds that leaks are an untapped opportunity for water savings

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Amanda Rupiper of the UC Davis Center for Water-Energy Efficiency conducts a water quality analysis. Credit: Paul Fortunato/UC Davis

Before a drop of treated water in California ever reaches a consumer's faucet, about 8% of it has already been wasted due to leaks in the delivery system. Nationally, the waste is even higher, at 17%. This represents an untapped opportunity for water savings, according to a study from the University of California, Davis.

The study, published in the journal *Environmental Research Letters*, is the first large-scale assessment of utility-level water loss in the United States. It found that leak reduction by utilities can be the most cost-effective tool in an urban water manager's toolkit, provided utility-specific approaches are used.

"When I first heard about '[leaks](#)' I thought it sounded boring, but leaks are a huge component of our water systems and have a larger opportunity than many other water-saving methods to make an impact," said lead author Amanda Rupiper, a postdoctoral scholar with the UC Davis Center for Water-Energy Efficiency. "As the first state to regulate its water losses, a lot of eyes are watching California, and this is an opportunity to impact policy here and elsewhere."

Amid a multiyear drought, the passage of Senate Bill 555 in 2015 made California the first in the nation and among the first in the world to require water utilities to regulate their water losses.

Be specific

Using data from more than 800 utilities across California, Georgia, Tennessee and Texas, the authors characterized water losses across the country. They developed a model to assess the economically efficient level of losses, and used that model to compare various water loss regulations and modeling approaches.

The study found that one-size-fits-all approaches to leak management are not effective, economical or equitable for utilities, which vary in size and resources. Uniform approaches could lead to the mismanagement of [urban water](#) losses. However, applying utility-specific performance standards can deliver a similar amount of water savings at a profit for both utilities and society.

"Regulations that impose a uniform standard across all utilities will result in water reductions that are too stringent in some cases, too relaxed in others, and too costly overall," the paper concludes.

Saving drips without draining utilities

Ideally, no leaks would occur in a system. However, while some leaks are obvious and accessible, others can be harder and more cost-prohibitive for some utilities to find and repair. The authors' model assessed when utilities could save the most water for their dollar to find and fix leaks in the system.

They found that for the median utility, it is economically efficient to reduce water losses by 34.7%, or 100 acre-feet per year. The median cost of water [savings](#) from leak management is \$277 per acre-foot—cheaper than most traditional water management tools, including conservation campaigns and rebate programs.

"It's cost-competitive to do this and should be part of the profile of how we manage our water," Rupiper said. "We tend to think of leaks as being a little drip, but leaks are not inconsequential. Drips add up to big flows, and we can't ignore them anymore."

The study's co-authors include Frank Loge, Joakim Weill and Katrina Jessoe of UC Davis, and Ellen Bruno of UC Berkeley.

More information: Amanda Rupiper et al, Untapped potential: leak reduction is the most cost-effective urban water management tool, *Environmental Research Letters* (2022). [DOI: 10.1088/1748-9326/ac54cb](https://doi.org/10.1088/1748-9326/ac54cb)

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