



EXECUTIVE SUMMARY

The Untapped Potential of California's Urban Water Supply: Water Efficiency, Water Reuse, and Stormwater Capture

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Water is the lifeblood of California, providing for the household needs of nearly 40 million people and supporting one of the most productive agricultural regions in the world, the health and viability of the state's aquatic and terrestrial ecosystems, and an economy that would make it the fifth wealthiest country in the world after the United States, China, Japan, and Germany.

Persistent water challenges, the ongoing severe drought, and the intensifying effects of climate change all highlight the vulnerability of California's water systems, but they also offer a new opportunity to rethink the state's water policies and strategies. The good news is that we are already seeing communities throughout the state rethink water "supply" and "demand." There has been tremendous progress across California in reducing water use through water conservation and efficiency and augmenting local supplies through water reuse and stormwater capture. Without these efforts, our current

challenges would be much worse, demands on limited water supplies would be even higher, and ecosystem destruction would be more severe.

In this assessment, we quantify the potential for a range of water strategies in urbanized parts of California to both reduce inefficient and wasteful water uses and expand local water supplies. This assessment finds that urban water-use efficiency improvements could reduce statewide urban water use by 2.0 million to 3.1 million acre-feet per year (AFY). The reuse potential of municipal wastewater is 1.8 million to 2.1 million AFY, and the stormwater capture potential is 580,000 AFY in a dry year to as much as 3.0 million AFY in a wet year. Previous assessments have shown that these efficiency and supply options are more cost effective than traditional – and increasingly hard to implement – options to expand supply. Programs to tap this potential would tremendously help solve California's long-standing water problems.



URBAN WATER EFFICIENCY POTENTIAL

Greater urban water conservation and efficiency can reduce unnecessary and excessive demands for water, save energy, reduce water and wastewater treatment costs, and eliminate the need for costly new infrastructure. Between 2017 and 2019, California's urban water use averaged 6.6 million AFY, far below previous levels. Despite past improvements, California's water efficiency potential remains large. **We estimate that adopting proven technologies and practices could reduce urban water use in California by 2.0 million to 3.1 million AFY, or by 30% to 48%.** Water efficiency opportunities can be found across the state but are highest in the South Coast hydrologic region, followed by the San Francisco Bay and Sacramento River hydrologic regions. Water savings are greatest for the residential sector, followed by the commercial, industrial, and institutional sectors and reducing losses in the water distribution system. Additionally, savings can be found inside and outside but are slightly higher outside homes, businesses, and institutions.

WATER REUSE POTENTIAL

Water reuse is a reliable, local water supply that reduces vulnerability to droughts and other water-supply constraints. It can also provide economic and environmental benefits by reducing energy use, diversions from rivers and streams, and pollution from wastewater discharges. There is a significant opportunity to expand the reuse of municipal wastewater in California. An estimated 728,000 AF of municipal wastewater is already beneficially reused in the state each year. Onsite reuse—including the use of graywater—is also practiced across California, although data are not available to estimate its extent. **We estimate that an additional 1.8 million to 2.1 million AFY of municipal wastewater is available for reuse in California.** Nearly three-quarters of this water is currently being discharged to marine environments and is recognized as a high priority for future reuse projects. Water reuse opportunities can be found across the state but are highest in the South Coast and San Francisco Bay hydrologic regions, the two most populated regions in the state. Continued reductions in

indoor per capita use can reduce the amount of water available for reuse, although population growth and increased economic activity could offset those reductions.

URBAN STORMWATER CAPTURE POTENTIAL

As water resources have become increasingly constrained, there is new interest in capturing urban stormwater runoff as a sustainable source of supply, with the added benefits of reducing flooding and protecting surface water quality. While no estimate of current stormwater capture exists, a growing number of communities, including Los Angeles and Fresno, are integrating stormwater into their water supply portfolios. In California, there are substantial opportunities to use stormwater beneficially to recharge groundwater supplies or for direct use in non-potable applications. **We estimate that the urban stormwater capture potential in California ranges from 580,000 AFY in a dry year to 3.0 million AFY in a wet year in urban areas overlying public supply aquifers.** This potential exists across scales—at the community, neighborhood, and even parcel or household scale—each of which will be essential for successfully capturing the full potential of this local water supply.

CONCLUSIONS AND RECOMMENDATIONS

California can fill the gaps between water supply and use with strategies that are technically feasible, cost effective, and compatible with healthy rivers and groundwater basins. Water efficiency options include the adoption of more comprehensive efficiency improvements that allow us to continue to provide the goods and services we want, with less water. New supply options include expanding water reuse and stormwater capture. These alternatives can provide effective drought responses in the near-term, permanent water-supply reliability in the long-term, and other co-benefits for the state. Efforts in these areas have been underway in California for decades, and laudable progress has been made, but much more can be done.

This assessment has identified the untapped potential to expand nontraditional supply options and increase urban water-use efficiency savings in California. This is the first step in tackling California's water problems, but it is also critical to adopt effective policies and programs to capture this potential. Here, we offer recommendations for helping to realize the untapped potential of water efficiency, reuse, and stormwater capture.

Expand Efforts to Improve Water Use Efficiency and Water Loss Control. There are significant opportunities to improve the efficiency of water use in California homes, businesses, and institutions and to reduce losses in water distribution systems. These improvements will make communities more resilient to climate impacts, cut water and energy costs, and provide additional co-benefits. Greater funding, combined with new and greater enforcement of regulations, expanded education and outreach, and additional technical assistance programs are needed to capture this untapped potential.

Expand the Supply and Use of Recycled Water. California has made considerable progress in expanding the reuse of high-quality treated wastewater, but large volumes of municipal wastewater continued to be discharged unused to local waterways, marine and estuarine environments, and land. A range of new actions and policies are needed to expand the supply and use of recycled water.

Increase Efforts to Capture and Use Stormwater. The variability of precipitation in California produces, at times, large volumes of stormwater that could be captured, used, or stored, expanding total water supply. This will require changes in local infrastructure and updated state and local policies and programs.

Improve State and Local Planning to Support Integration of Water and Non-Water Benefits into Water Management and Investment Decisions. Capturing the untapped potential for water efficiency, water reuse, and stormwater capture would benefit from broader improvements in state and local planning. In particular, efforts to incorporate multiple benefits—both water and non-water—into water management and investment

decisions can improve a project's financial viability and public acceptance while helping to minimize adverse and unintended consequences.

Support State-Level Data Collection Efforts and Integration Across and Within State Agencies. Data from two large-scale data collection efforts (Electronic Annual Reports and Volumetric Annual Reporting) were key to our analysis of the potential for efficiency and reuse in California. Consistently reported data collected at regular time intervals is an essential component of making informed projections about water use, water availability, and investment needs.

Investigate Research Gaps to Improve Effectiveness of Water Efficiency, Water Reuse, and Stormwater Capture. There remain outstanding scientific questions that must be addressed for effective implementation of these supply options. State agencies, academics, water agencies, and community organizations all have a role to play in filling research gaps.



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For the full report, “The Untapped Potential of California’s Urban Water Supply: Water Efficiency, Water Reuse, and Stormwater Capture,” please visit:
[*https://pacinst.org/publication/california-urban-water-supply-potential-2022*](https://pacinst.org/publication/california-urban-water-supply-potential-2022)



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