PPIC

Water for Cities

PPIC WATER POLICY CENTER

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Despite progress, California's cities face water management challenges

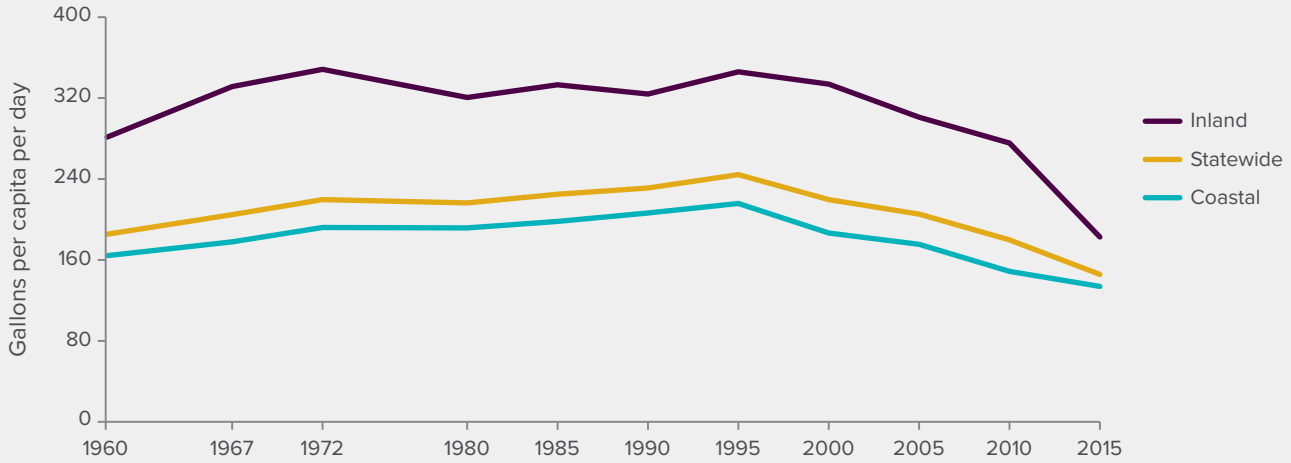
The water systems that supply California's households, businesses, and industries are vast and complex. More than 400 urban retail utilities—each serving at least 3,000 homes and businesses—supply more than 90 percent of the state's residents. Several dozen wholesale utilities deliver water to about half of these retailers; the largest wholesaler covers 19 million residents across six Southern California counties. Nearly 2,500 smaller utilities serve rural and some suburban communities. Most utilities are public agencies with locally elected governing boards. Privately owned utilities serve about 16 percent of Californians.

Large utilities can spread fixed infrastructure costs over a wide customer base. They often have several water sources and extensive technical expertise. Smaller utilities are often geographically isolated, and new investments incur high costs per customer. They usually rely on local groundwater and have limited in-house resources.

Decades of investments in conservation, storage, new supplies, and interconnections for sharing water have improved the large urban systems' drought resilience. Some small, isolated systems have not fared as well. Water utilities of all sizes experienced fiscal problems from reduced sales during the 2012–16 drought.

Large and small utilities face water supply and quality challenges. Many large utilities rely on imported water from the Sacramento–San Joaquin Delta and other distant locations. Infrastructure weaknesses and claims on water for the environment are making these sources increasingly vulnerable. Some utilities that rely on groundwater must address contamination, and many will face pumping limits under the 2014 Sustainable Groundwater Management Act. Utilities also need to prepare for a growing population and the likelihood that climate change will bring more severe droughts.

PER CAPITA URBAN WATER USE HAS BEEN FALLING AND FELL STEEPLY DURING THE LATEST DROUGHT



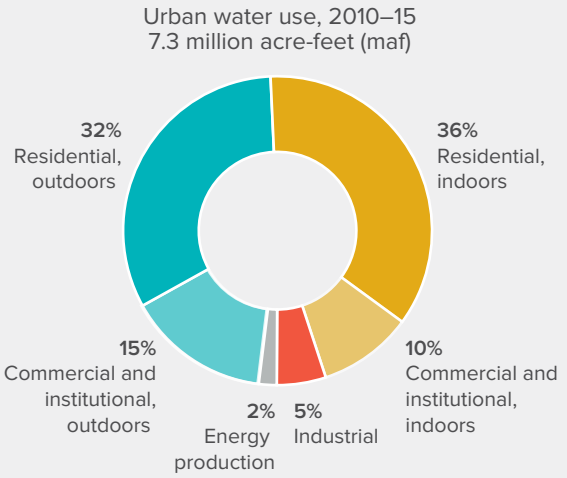
SOURCE: Author calculations using data from the California Department of Water Resources, *California Water Plan Update* (various years).

NOTES: The figure shows "applied" water delivered to homes and businesses. "Net" water use—i.e., the volume consumed by people or plants, embodied in manufactured goods, evaporated, or discharged to saline waters—is lower. The totals exclude water used by power plants and groundwater recharge projects and water lost during conveyance. Except for 2015 (a severe drought year), the estimates are for normal or "normalized" rainfall years (i.e., adjusted to levels that would have been used in a year of normal rainfall). Estimates are for water years (October to September). Inland areas tend to have higher per capita use because of higher temperatures and larger landscaped areas.

Water use in cities is changing

Following decades of increases, total urban water use began to flatten in the mid-1990s, reflecting per capita declines. Cities now use about 10 percent of California's available water, farms 40 percent. The remaining half is categorized as environmental, such as flows in wild and scenic rivers along the North Coast.

LANDSCAPING IS ROUGHLY HALF OF TOTAL URBAN WATER USE



SOURCE: California Department of Water Resources.

NOTES: The figure shows the average "applied" urban water use, as defined in the notes to the preceding figure. "Net" urban water use (also defined above) was lower (5 maf). Commercial and institutional outdoor use includes official estimates for "large landscapes" (parks, golf courses, cemeteries, etc.) and one-third of the total estimate for commercial and institutional demand, which includes other outdoor water use.

- **Per capita water use has been falling since the mid-1990s ...**

In 2010, average urban daily water use was 178 gallons per capita, down from 244 in 1995. The adoption of plumbing fixtures and household appliances that use less water has been a major factor. Since the early 1990s, water-saving toilets and showerheads have been required in new construction and encouraged in older buildings through rebate programs.

- **... and communities significantly cut use during the latest drought.**

Urban areas cut water use in response to voluntary local programs and a statewide conservation mandate that ran from April 2015 to June 2016. Water use declined by nearly 25 percent, bringing average per capita use down to 130 gallons per day. It is rebounding from drought levels, but it remains substantially lower than before the drought.

- **The urban economy has become less dependent on water-intensive activities.**

Many water-intensive industries have moved out of state, and manufacturing now uses only 5 percent of urban water, down from 8 percent in 1990. Overall, businesses have been reducing water use while continuing to grow. In 2014, cities generated more than three times the economic value per gallon than in 1967, measured by output of goods and services in inflation-adjusted dollars.

- **Landscape irrigation is the largest urban water use.**
  Outdoor watering accounts for roughly half of statewide urban water use and more in inland areas, where summers are hotter and yards tend to be larger. Savings can come from installing more efficient irrigation systems and replacing lawns with drought-tolerant landscaping. Many conservation efforts during the latest drought focused on reducing landscape watering.

Cities need to manage for reliability, cost, and financial stability

Utilities are pursuing a range of strategies to manage demand and diversify water sources. These investments are mainly funded by revenues from local water sales.

- **Pricing is important for managing demand ...**
  Water prices provide fundamental incentives for conservation. Providing information on bills about how a household's use compares with similar homes can also incentivize savings. Bills should also be easy to understand.
- **... and pricing must keep utilities fiscally strong.**
  To avoid financial problems, rate structures should recover costs when water sales fall or when supply costs increase. This was a challenge during the latest drought, when sales fell and costs rose, leaving many utilities in the red.
- **Improving efficiency has benefits, but makes it harder to cut use quickly during droughts.**
  Temporary reductions in outdoor water use generated much of the water savings during the latest drought. New state policy will increase indoor and outdoor efficiency over the long term. This could make it more difficult and costly to reduce urban water use during future droughts. To stay resilient, utilities should store some of the long-term water savings as a drought reserve rather than using all of it to accommodate growth.
- **Many utilities are developing local supplies.**
  Some investments can be relatively low cost, such as recharging local groundwater basins with surface water. Alternative supplies such as recycled wastewater and desalinated water are generally more expensive than traditional supplies, but they can boost reliability during droughts.

- **Imported supplies remain critical for most cities.**
  Cities in the San Francisco Bay Area and Southern California get more than half of their water from other regions. Some of this—notably imports from the Delta—will require major new investments to remain reliable. Cities must weigh the costs and reliability of imported versus local supplies in the context of diversifying their water sources.
- **Water trading is a growing supply source.**
  In several regions, cities have long-term agreements to lease water from farmers. More than 10 percent of Southern California urban supplies comes from such trades. Storing water in rural groundwater basins is also on the rise. Water leases and exchanges with neighboring cities were very valuable during the recent drought—though some utilities faced regulatory and infrastructure hurdles.
- **Proposition 218 poses challenges for urban water management.**
  This constitutional change, adopted by voters in 1996, specifies that some rates and fees cannot exceed the cost of providing a service to individual customers. Some courts have ruled that conservation-oriented rates (called tiered or budget-based rates) may violate this requirement. This may also constrain drought-responsive pricing, such as charging higher prices when supplies become scarce and water use goes down. Proposition 218 also restricts using water rates to fund lifeline programs, which help low-income customers. And it limits larger communities' ability to share the cost of annexing smaller systems—a promising way to ensure safe drinking water in some poor communities.
- **New state drought planning policies will increase local and state coordination.**
  One driver for the state's mandated conservation during the 2012–16 drought was lack of information on local drought plans and responses. This may have resulted in water savings beyond what was locally needed and undermined local programs to strengthen supplies. New state policy requires utilities to report annually on potential supply shortages and responses. Better state/local coordination may reduce the need for another statewide mandate.

Looking ahead

Although local utilities bear most frontline responsibility for providing safe and reliable water, state action is also important to support local efforts. The following areas address top concerns.

Consider a changing climate when planning for future droughts. New state policy requires utilities to assess the reliability of supplies in the event of a five-year drought. Instead of relying on past hydrology to simulate drought scenarios, utilities should evaluate impacts from longer, warmer droughts than 2012–16.

Evaluate local solutions in a regional context. Many opportunities exist for local utilities to improve how their systems work together. This includes investing in regional interconnections and sharing water. As utilities develop local sources such as recycled water, they should also consider regional impacts. For instance, because water recycling captures discharges, it can reduce streamflows that support ecosystems or supply communities downstream. Additionally, programs to encourage indoor water savings should consider the impact of reduced wastewater flows on wastewater management.

Develop flexible and robust water pricing. Utilities need to hone their rate structures to provide incentives for efficiency while maintaining their finances—for instance, by charging higher prices per gallon during drought.

Encourage more outdoor conservation. Low-water landscaping has the greatest potential for urban water savings. New state outdoor water use standards will promote this shift. Turf replacement programs set important examples, but they cost too much for widespread use. Making significant progress will require a mix of new technologies, economic incentives, building codes, and consumer awareness campaigns.

Keep an eye on costs. Utilities must weigh the costs and reliability of different supply options. And prices should be efficacious, fair, and affordable for low-income households.

Increase public education. Public concern about water rises sharply during drought and wanes somewhat once it abates. Wide-reaching educational programs can both encourage Californians to use less water *and* explain how higher prices help maintain resilient local systems. Information on the safety of highly treated recycled water is critical.

Guide the courts on water management priorities. Legislation can guide courts in interpreting Proposition 218's cost-recovery requirements. The legislature should emphasize supply diversification, conservation, and support for low-income customers to respond to growing water scarcity and affordability concerns.

Use new bond funds for cutting-edge actions. Recent bonds authorized significant new spending on urban water projects including conservation, recycling, desalination, and stormwater capture. The state should ensure these funds go to innovative projects rather than simply substituting for money urban utilities could raise from water bills.

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