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Water for Cities

PPIC WATER POLICY CENTER

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DESPITE PROGRESS, CALIFORNIA'S CITIES FACE WATER MANAGEMENT CHALLENGES

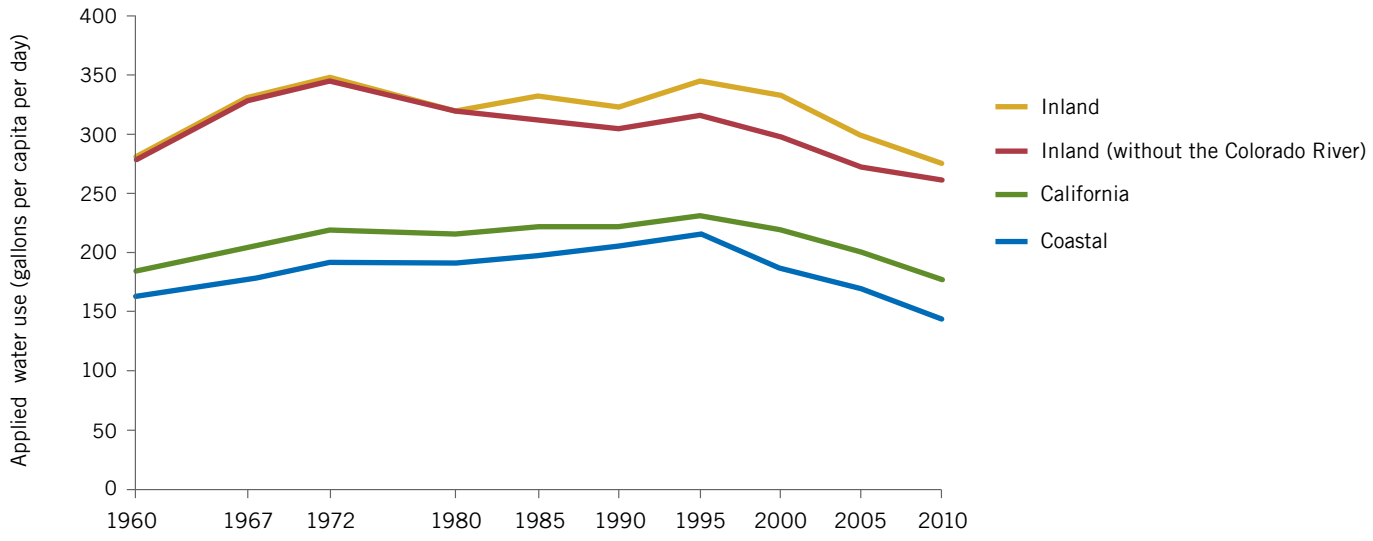
The water system that supplies California's households, businesses, and industries is vast and complex. Nearly 400 large utilities—each serving more than 10,000 people—supply more than 90 percent of the state. Thousands of smaller utilities provide water to rural communities. Most utilities are public agencies with locally elected governing boards. Privately owned utilities serve about 16 percent of Californians.

Large utilities enjoy many advantages. They can spread fixed infrastructure costs over a wide customer base. They often have several water sources and extensive technical expertise. In recent decades, they have expanded connections with neighboring utilities, which allows water sharing during shortages. By contrast, smaller utilities are often geographically isolated and face high costs per customer for new investments. They usually rely on local groundwater and have limited in-house resources.

Despite the addition of more than eight million new residents, the state's large urban systems were better prepared for the latest severe drought than for the last one (1987–92). This improvement reflects significant investments in conservation, storage, new supplies, and interconnections. Some small systems have not fared as well.

Both large and small utilities face water supply and quality challenges. Many large utilities import water from the Sacramento–San Joaquin Delta from other distant locations. Infrastructure weaknesses and claims on water for the environment are making these sources increasingly vulnerable. Many utilities that rely on groundwater must contend with contamination. Utilities also need to prepare for a growing population and the likelihood that climate change will bring more frequent and sustained droughts.

PER CAPITA URBAN WATER USE HAS BEEN FALLING SINCE THE MID-1990s



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

NOTES: The figure shows applied water use—the amount delivered to homes and businesses—and excludes energy use, conveyance losses, and active groundwater recharge. Outdoor water use is much higher in inland areas because of hotter temperatures and larger lot sizes. The low-desert Colorado River region, including areas such as Palm Springs, has especially high per capita use, in part because of golf-based tourism.

WATER USE IN CITIES IS CHANGING

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

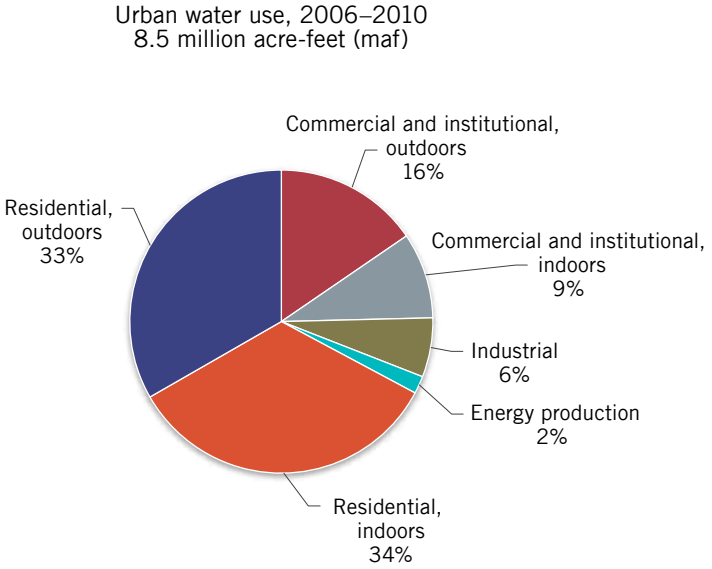
- **Per capita water use is falling …**
  In 2010, average urban daily water use was 178 gallons per capita, down from 232 in 1995. More recent estimates suggest continued declines. The adoption of low-flow plumbing fixtures and appliances has been a major factor. Low-flow toilets and showerheads have been required in new construction since the early 1990s and encouraged in older buildings by rebate programs.

- **… while the value of water in the urban economy is rising.**
  California's urban economy depends less and less on water-intensive activities, such as computer chip manufacturing. Industry now uses only 6 percent of urban water, down from 8 percent in 1990. Businesses in other sectors have been reducing water use while continuing to grow. In 2010, water used by cities generated roughly 2.4 times more economic value per gallon than it did 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 use and more in inland areas, where summers are hotter and lots tend to be larger. Despite recent progress, outdoor use remains an important frontier for conservation. Savings can come from installing more efficient irrigation systems and replacing thirsty lawns with more drought-tolerant plants.

- **Demand is more responsive to local conditions than to statewide mandates.**
  In January 2014, Governor Jerry Brown called on Californians to reduce water use by 20 percent. In July, the State Water Resources Control Board issued restrictions on outdoor water use. Communities that faced near-term shortages—including Santa Cruz and the Folsom area—achieved large reductions. In many areas, though, the cuts were smaller—often reflecting less urgent local conditions. Some utilities prefer not to carry out major short-term conservation efforts unless conditions are dire, in part because large drops in water sales can slash revenue.

LANDSCAPING ACCOUNTS FOR ROUGHLY HALF OF TOTAL URBAN WATER USE



SOURCE: California Department of Water Resources.

NOTES: The figure shows the average applied urban water use, excluding water used to recharge groundwater basins (5%) and conveyance losses (2%). Net water use—i.e., the volume consumed by people or plants, embodied in manufactured goods, evaporated, or discharged to saline waters—is lower (5.9 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.

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 and revenue.**
  Many utilities use regulations and rebates to encourage conservation. But water prices provide fundamental incentives. Many agencies now use tiered rates, with higher prices per gallon for higher levels of water use. Such rate structures—especially those that give customers a baseline water budget reflecting household and lot size—can be very effective. To avoid financial problems, rate structures need to be designed to recover costs when water sales fall or when supply costs increase.

- **To increase resilience, many utilities are developing local supplies.**
  Investments in local supply include a range of actions. Some are relatively low-cost, such as recharging local groundwater basins with recycled wastewater and stormwater. Others are more costly, such as building new surface storage facilities or seawater desalination plants. Some local sources require agencies to work together in new ways. For instance, several water utilities may share the cost of new interconnections or a desalination plant. Expanding recycled water use or stormwater capture usually requires water utilities to work with other agencies that have traditionally operated separately.

- **Imported supplies remain critical for many cities.**
  Bay Area and Southern California cities get more than half their water supplies from other regions. Some of this water—notably imports from the Delta—will require major new investments to remain reliable. In developing their water portfolios, cities must weigh the relative cost and reliability of imported versus local supplies, while keeping in mind the value of diversifying water sources.

- **Water trading is a growing supply source.**
  In several regions, cities are reaching long-term agreements to lease water from farmers and store water in rural groundwater basins. Leases and exchanges with neighboring cities are also taking place—and have proven very valuable during the latest drought.

- **Proposition 218 poses challenges for water management.**
  This constitutional change, adopted by voters in 1996, specifies that certain rates and fees cannot exceed the cost of providing a service. Narrow court interpretations of this strict cost-recovery requirement have put in question the legitimacy of tiered water rates and the use of water sales revenue to fund recycled water programs. Proposition 218 also restricts the use of water rates to fund lifeline programs, which energy utilities use to help low-income customers. In addition, the proposition limits the ability of larger communities to share the cost of annexing smaller systems—a promising solution for ensuring safe drinking water in some rural communities.

LOOKING AHEAD

Although local agencies bear most frontline responsibility for providing safe and reliable water supplies, state action is also important to shape the regulatory environment and provide financial incentives. The following areas warrant near-term state and local attention.

Guide the courts on water management priorities. Legislation can guide the courts in interpreting Proposition 218's cost-recovery requirements. The legislature should emphasize the importance of supply diversification and conservation as strategies for responding to growing water scarcity.

Use new bond funds for cutting-edge actions. Urban agencies are eligible for more than $2.3 billion in state bond funds for regional water supply and water quality projects under Proposition 1, approved by voters in November 2014. The state should ensure that these funds go primarily to innovative projects—especially those that require new types of investment and collaboration—rather than simply substituting for money that urban utilities can raise from water bills.

Consider local solutions within a regional context. As utilities develop local sources such as recycled water and stormwater capture, they should consider the regional impacts. By reducing discharges, these local projects can reduce streamflows that now provide important environmental benefits or supply water to communities downstream.

Develop flexible and resilient water pricing. Utilities need to hone their rate structures to provide incentives to conserve while maintaining financial stability. They must anticipate how to remain financially healthy during droughts while encouraging conservation; for instance, by charging higher prices per gallon during droughts.

Encourage more outdoor conservation. Although indoor water conservation efforts are still desirable, the low-hanging fruit in residential use has moved outdoors. The shift to low-water landscaping has great potential. Rebate programs—such as the turf-replacement program now common in Southern California—set important examples but cost too much for widespread use. A combination of price incentives and changes in attitude is needed to make significant progress.

Step up public education. Public concern about water has been very high during the latest drought, but it will probably wane once the drought abates. Wide-reaching education programs are needed to encourage Californians to use water more sustainably. Information on the safety of highly treated recycled water is critical, and campaigns to encourage households and businesses to use less water in landscapes and gardens can be useful.

Keep an eye on costs. Utilities must weigh the relative costs and reliability of different supply options. And, when setting prices, they need to consider water affordability for lower-income households.

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PPIC PUBLIC POLICY INSTITUTE OF CALIFORNIA

The PPIC Water Policy Center spurs innovative water management solutions that support a healthy economy, environment, and society—now and for future generations.

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