

WATER USE IN CALIFORNIA

Jeffrey Mount, Emma Freeman, Jay Lund

► **Water in California is shared across three main sectors.**

Statewide, average water use is roughly 50% environmental, 40% agricultural, and 10% urban. However, the percentage of water use by sector varies dramatically across regions and between wet and dry years. Some of the water used by each of these sectors returns to rivers and groundwater basins, and can be used again.

► **Environmental water provides multiple benefits.**

Environmental water use falls into four categories: water in rivers protected as “wild and scenic” under federal and state laws, water required for maintaining habitat within streams, water that supports wetlands within wildlife preserves, and water needed to maintain water quality for agricultural and urban use. Most water allocated to the environment does not affect other water uses. More than half of California’s environmental water use occurs in rivers along the state’s north coast. These waters are largely isolated from major agricultural and urban areas and cannot be used for other purposes. In the rest of California where water is shared by all three sectors, environmental use is not dominant (33%, compared to 53% agricultural and 14% urban).

► **Agricultural water use is holding steady even while the economic value of farm production is growing.**

Approximately nine million acres of farmland in California are irrigated, representing roughly 80% of all human water use. Higher revenue perennial crops—nuts, grapes, and other fruit—have increased as a share of irrigated crop acreage (from 27% in 1998 to 32% in 2010 statewide, and from 33% to 40% in the southern Central Valley). This shift, plus rising crop yields, has increased the value of farm output (from \$16.3 billion of gross state product in 1998 to \$22.3 billion in 2010, in 2010 dollars), thereby increasing the value of agricultural water used. But even as the agricultural economy is growing, the rest of the economy is growing faster. Today, farm production and food processing only generate about 2% of California’s gross state product, down from about 5% in the early 1960s.

► **Despite population growth, total urban water use is also holding steady.**

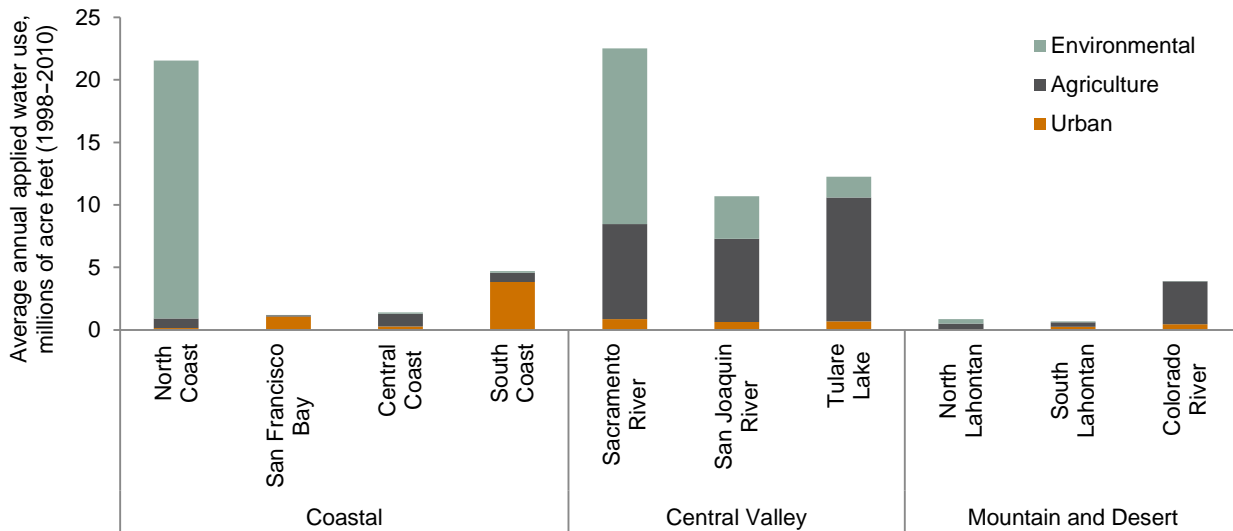
The San Francisco Bay and South Coast regions account for most urban water use in California. These regions rely heavily on water imported from other parts of the state. Roughly half of urban water use is for residential and commercial landscaping. Despite population growth and urban expansion, total urban water use has remained roughly constant over the past 20 years. Per-capita water use has declined significantly—from 232 gallons per day in 1990 to 178 gallons per day in 2010—reflecting substantial efforts to reduce water use through pricing incentives and mandatory installation of water saving technologies like low-flow toilets and shower heads. Coastal regions use far less water per capita than inland regions—145 gallons per day compared with 276 gallons per day in 2010—largely because of less landscape watering.

► **The current drought exposes major water use challenges.**

In the Central Valley, where most agricultural water use occurs, the failure to manage groundwater sustainably limits its availability as a drought reserve. The increase in perennial crops—which need to be watered every year—has made the region even more vulnerable. In urban areas, the greatest potential for further water savings lies in reducing landscaping irrigation—a shift requiring behavioral changes, not just the adoption of new technology. Finally, state and federal regulators must make tough decisions about how and when to allocate water to the environment during a drought. They are faced with balancing short-term economic impacts on urban and agricultural water users against long-term harm—even risk of extinction—of fish and wildlife.



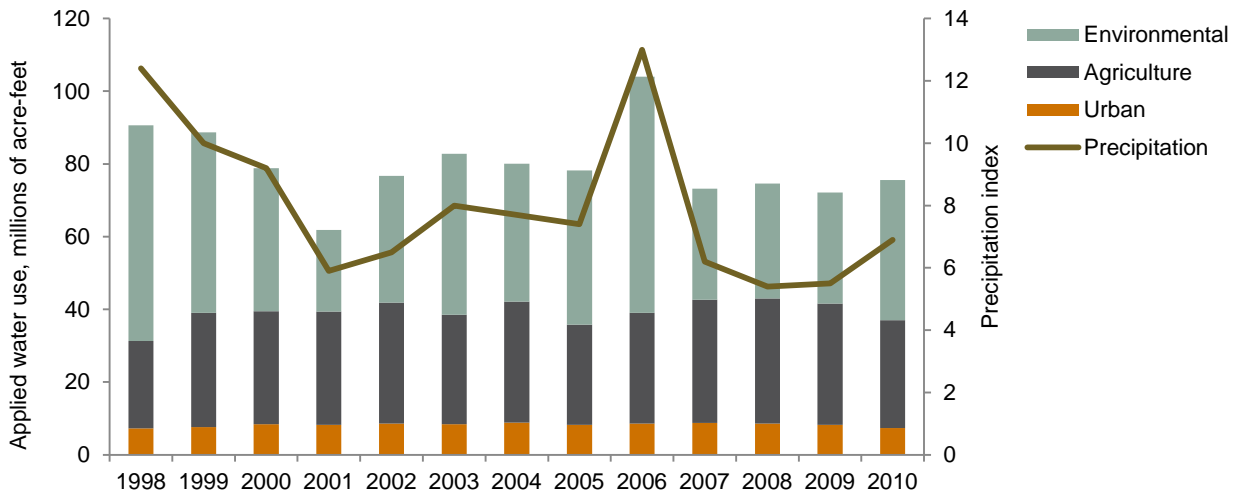
Water uses vary dramatically by region



Source: Department of Water Resources.

Note: Environmental includes water for "wild and scenic" rivers, required Delta outflow, instream flows, and managed wetlands. Urban includes residential, commercial, and industrial uses, and large landscapes. Agricultural includes water for crop production. 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 figure excludes water used to recharge groundwater basins (3% for urban and 1% for agriculture on average), conveyance losses (2% for urban and 7% for agriculture), and water used for energy production (less than 2% of urban use). The North Lahontan region covers most of the northeastern Sierras; South Lahontan covers the eastern Sierras and high desert including Mono, Inyo, and parts of Kern, Los Angeles, and San Bernardino Counties; and the Colorado River region covers the southeastern portion of the state including Imperial, and parts of Riverside, San Bernardino, and San Diego Counties.

Environmental water use fluctuates most



Source: Department of Water Resources.

Note: Precipitation is measured by the Sacramento Valley Water Year Index, which accounts for water in storage from the previous year. Water use definitions are as described in the previous figure.

Sources: California Department of Water Resources (water use and crop acreage data; all numbers are for 1998–2010), U.S. Bureau of Economic Analysis (gross state product).

Contact: mount@ppic.org

Supported with funding from The S. D. Bechtel, Jr. Foundation