

## Not every Californian has access to safe and reliable drinking water

Most Californians have safe drinking water. The vast majority of the state’s nearly 3,000 community water systems consistently meet safety standards, and public health violations are both rare and quickly addressed. But some regions have ongoing water quality challenges, mostly affecting smaller, rural, disadvantaged communities. Although this is a persistent issue, it is also a manageable one with the right leadership and resources.

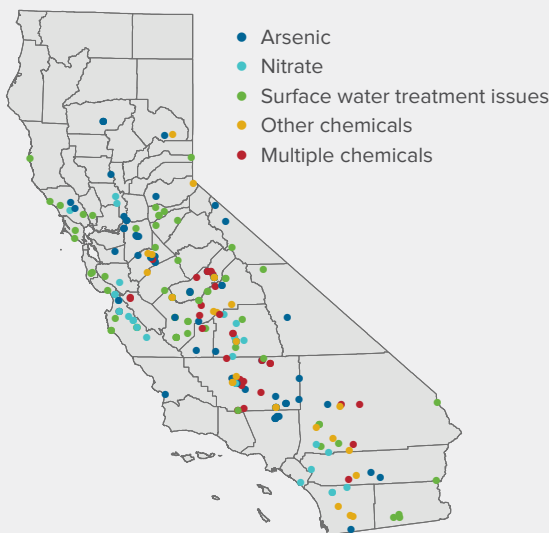
Local, state, and federal agencies all have responsibilities for ensuring adequate and safe drinking water under the federal Safe Drinking Water Act and related state laws. In 2012, California’s legislature passed the Human Right to Water Act, which recognizes that “every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.”

The State Water Board now has primary oversight of safe drinking water programs, and in 2015 it created a special office to focus on the problems of disadvantaged communities. Even so, some still lack safe water.

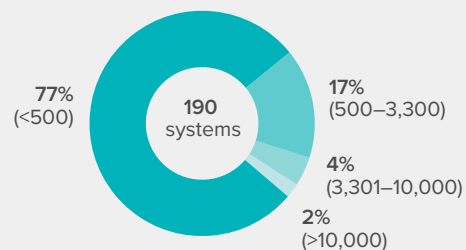
In addition, some rural communities saw their water supply disappear during the 2012–16 drought, as their wells went dry from falling groundwater levels. The state stepped in with emergency assistance, but many of these communities remain vulnerable.

### SOME WATER SYSTEMS HAVE BEEN UNABLE TO PROVIDE SAFE DRINKING WATER FOR YEARS

Noncompliant water systems by type of pollutant



Systems with violations for three or more years (size by population served)



SOURCES: Developed by the authors using data from the State Water Board’s Human Right to Water (HR2W) portal and the US Environmental Protection Agency’s ECHO portal.

NOTES: The map shows the 233 community water systems (serving 357,000 people, or 0.9% of the population) that were out of compliance in July 2018 as reported in HR2W. The circle chart uses ECHO to obtain data on quarters out of compliance for these 233 systems; only 7 had been out of compliance for less than a year. Since HR2W is updated monthly and ECHO is updated quarterly, the two data sets do not match up perfectly.

## Some communities are routinely unable to provide safe drinking water

The full extent of California’s unsafe drinking water problem is difficult to grasp. Compliance information is best for community water systems with at least 15 connections. According to state data, in July 2018 more than 230 systems, serving roughly 357,000 people (0.9% of the population), had unsafe drinking water. More than 400 schools have their

own water systems, and 33 of them (serving 13,000 people) were also out of compliance. Recent efforts to test for lead in all schools' water supplies have found some contamination as well. Not much is known about water quality in the roughly 1,300 very small, county-regulated water systems (serving 5 to 14 connections) and the more than 350,000 domestic wells that serve one or several homes.

- **Groundwater contamination is the major issue.**

Most systems with unsafe water rely on groundwater as a primary source. Various natural and human-caused contaminants are widespread in California's groundwater basins. Nitrate—mainly from nitrogen fertilizers and manure—is a problem in many areas. Naturally occurring contaminants such as arsenic and uranium also pose challenges. Additional contaminants continue to be identified and regulated.

- **Smaller systems are especially vulnerable.**

Almost all systems that fail to meet safety standards are small—serving fewer than 3,300 people—and located in rural or unincorporated areas. Problems are particularly persistent in systems serving fewer than 500 people. Since groundwater needs little treatment unless there is a violation, these systems were developed cheaply, by drilling wells. But now they lack the technical, managerial, and financial resources to address contamination problems. Technology for removing contaminants is expensive to build and operate, and small systems do not have economies of scale. And water is often only one of many basic-service challenges facing these communities.

- **Problems are especially common in agricultural regions.**

Roughly half of all noncompliant systems are in the San Joaquin Valley—the state's largest farming region and home to a third of California's disadvantaged communities. Most of these systems have been out of compliance for at least three years.

### SOME COMMUNITIES FACE DRINKING WATER SHORTAGES DURING DROUGHT



SOURCES: Developed by the authors using data from the California Department of Water Resources (household water shortages) and the State Water Board (water systems).

NOTES: The map shows households reporting water supply outages on a state website (<https://mydrywatersupply.water.ca.gov/report/publicpage>) that tracks dry domestic wells and other outages from systems serving fewer than 15 connections, as well as 153 community water systems (with 15 connections or more) that sought emergency assistance. Just 15 of these serve more than 3,300 residents.

### During droughts some small communities have unreliable water supplies

Some rural water systems and domestic wells are affected when farmers increase groundwater pumping during droughts, which can cause shallow wells to go dry and degrade their water quality. Some foothills communities that rely on aquifers with limited storage capacity are highly vulnerable to drought shortages, as are communities that depend on small, rain-fed surface water catchment areas.

- **The recent drought led to water shortages and dry wells.** At least 2,600 well-dependent households in California faced drinking water shortages in the recent drought. Additionally, more than 150 water systems applied for emergency state funding to address water supply and quality problems. Most households with dry wells were in the San Joaquin Valley (78%), where groundwater pumping for agriculture markedly increased.

- **Water shortages can persist after droughts end.** Local, state, and federal governments provided emergency funding to restore water supply during the drought. But these solutions were often stopgap—trucking in bottled water or delivering water to temporary holding tanks. Many affected wells are still dry, and some people still rely on temporary supplies. This is a recurring problem from past droughts, reflecting a need for longer-term solutions to prevent drinking water shortages in vulnerable communities.

## Addressing these challenges requires a range of responses

Providing safe drinking water to poor communities affected by water contamination or shortages requires one of two things: water treatment or alternative sources of supply. The specific solutions could range from investment in a centralized treatment system to installation of decentralized treatment technology to consolidation with a larger neighboring system. Every scenario requires funding and partnerships.

- **Without reliable funding, many solutions are out of reach.**

Recent bonds have made more funds available for capital investments, but the cost of water treatment systems' ongoing expenses can be a major hurdle. For example, the unincorporated community of Lanare in Fresno County struggled to deliver safe drinking water to its residents due to arsenic contamination. In 2007, the county built a \$1.3 million treatment plant for them with help from state funds. But because Lanare lacked resources to operate the technology, the facility shut down after six months, leaving the community with a \$100,000 debt. Avoiding such failures will require reliable, long-term funding to support small system operation and maintenance.

- **Consolidating water systems is a promising approach.**

Often the best way to provide safe drinking water is by consolidating small water districts into larger ones. This can bring lower per unit costs and improved service. Consolidation can be either physical—where the systems are connected—or administrative—where they remain separate but share technical and managerial resources. It often involves difficult financial and technical issues, particularly when a smaller system needs costly upgrades to become compatible. A 2015 law gives the State Water Board authority to mandate mergers if necessary, and there were 13 mandatory consolidations as of summer 2018. Voluntary consolidations are also on the rise: there were 72 by summer 2018. Other bills propose new authorities to consolidate failing systems and to improve their management capacity.

- **Lack of reliable data impedes solutions.**

An estimated 1 to 2 million Californians rely on domestic wells, yet there is no reliable data on the number of domestic wells, their location, their condition, or the population served. Data on the roughly 1,300 very small, county-regulated systems is also limited. This means key information is lacking on water availability and contamination for many residents—hindering effective planning and response.

- **Local planning and organization can help.**

Much of the difficulty in implementing solutions reflects the limited capacity of small water systems to tackle problems on their own. But other local entities can help. For example, groundwater sustainability agencies established under the 2014 Sustainable Groundwater Management Act should develop programs to promptly mitigate dry wells caused by drought-related pumping. This model is already used effectively in Yuba County and parts of Kern County. Under new regulations in the San Joaquin Valley, agricultural and urban dischargers will soon need to form nitrate management zones, with responsibility for providing safe drinking water in their areas.

## Looking ahead

There is growing awareness and action on the issue of providing safe and reliable drinking water to all Californians. This problem could be resolved in the near term with dependable funding and a clear state action plan.

**Improve estimates of the population at risk from unsafe drinking water.** Despite recent strides in understanding the extent of the safe drinking water challenge, there are still major data gaps and reporting problems. Developing more comprehensive and clearer metrics on quality is key to prioritizing actions and tracking progress. The state has made recent strides by digitizing well completion reports and making them publicly available. But much more can be done—for example, providing funding for well sampling and mandating reporting on well water quality when a property is sold.

**Identify durable funding sources.** PPIC estimates that solutions for small, poor communities would cost up to \$160 million annually. Although state bonds and various federal programs support some infrastructure upgrades, more durable funding—including for operations and maintenance—is needed. One option is to establish new taxes or fees—recent bills proposed taxes on agricultural chemicals and dairies and voluntary surcharges on urban water bills. Another is to include ongoing expenses in bond-funded projects by appropriating money from the General Fund to pay for needed operation and maintenance.

**Support cost-effective solutions.** The State Water Board should continue to promote physical or administrative consolidation between small and large systems. Since private water companies play an important role, the California Public Utilities Commission should also emphasize reviewing consolidations. Developing affordable and effective ways to deliver safe water to communities that will need small-scale treatment—such as with remote monitoring systems—is also a priority.

**Develop programs to mitigate the risk of dry drinking-water wells during droughts.** In the recent drought, the state worked with counties and community groups to provide emergency supplies. State and local partners should use this experience to plan for the next drought. This includes identifying the communities at highest risk, connecting them to larger systems where feasible, and devising drought response programs for the others. Groundwater sustainability agencies should incorporate measures in their plans to mitigate the risk of wells running dry from local pumping. These agencies could also help create an inventory of domestic wells.

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