

# How cities in the West have water amid drought

May 24 2022, by Suman Naishadham

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As drought and climate change tighten their grip on the American West, the sight of fountains, swimming pools, gardens and golf courses in cities like Phoenix, Las Vegas, Los Angeles, Salt Lake City, Boise, and Albuquerque can be jarring at first glance.

Western water experts, however, say they aren't necessarily cause for concern. Over the past three decades, major Western cities—particularly in California and Nevada—have diversified their water sources, boosted local supplies through infrastructure investments and conservation, and use water more efficiently.

Peter Gleick, president emeritus of the Pacific Institute, has studied water resources for decades. He calls the reduction in per capita water use a "remarkable story" and one that's not widely acknowledged.

"That's a huge success throughout the West," Gleick said. "All of the cities in the West have made progress."

But with less water flowing into the Colorado River, which serves 40 million people in the West and northern Mexico, experts say the measures taken by cities will still not be enough long-term.

Here's a look at how Western cities have prepared for a future with less water.

## **WHERE DO WESTERN CITIES GET THEIR WATER?**

Phoenix, Las Vegas, San Diego, Los Angeles, Denver, Salt Lake City, Tucson, Albuquerque and other Western cities use water from the 1,450-mile (2,334 kilometer) Colorado River for residential and commercial needs.

Overuse of the river, hotter temperatures, less melting snow in the spring, and evaporation have greatly reduced water flows in the river—by 20% on average since 2000.

Agriculture remains the single-largest consumer, using 70% of available water in the Colorado River basin, according to the Bureau of Reclamation.

While the river remains the lifeblood of the region, many cities have other water sources. That's due to spending billions of dollars over decades on infrastructure aimed at withstanding a future with less reliable water sources.

"It really has to do with the modern engineering marvels of the 20th and 21st centuries," said Daniel Swain, a climate scientist at the University of California, Los Angeles. "This is sort of the perennial story of the West."

Los Angeles imports the bulk of its water through a vast storage and delivery system. Its water sources include the Sierra Nevada mountains in Northern California, the Sacramento and San Joaquin rivers and the Colorado River in the east. It also uses some groundwater and recycled water.

"Los Angeles is less vulnerable," Gleick said, "because they do have this very broad, diverse set of options."

Still, Southern California's behemoth water supplier last month ordered about 6 million people to cut their outdoor watering to once a week due to record dry conditions. The Metropolitan Water District said a total ban on outdoor watering in the affected areas could follow in September if the restrictions don't work.

The lion's share of Las Vegas' water supply comes from the Colorado River. The agency serving the city of 2.4 million, its suburbs and 40 million annual visitors gets 90% of its water from the river and 10% from groundwater.

Nevada lost 7% of its share of Colorado River water this year as part of cuts announced by Reclamation, but Las Vegas was shielded from the effects thanks to water conservation and reuse.

"It's fair to say that Las Vegas has taken the most dramatic steps to reduce its dependence on Colorado River water," said Anne Castle, a senior fellow at the Getches-Wilkinson Center for Natural Resources, Energy and the Environment.

San Diego's water wholesaler gets two-thirds of its supplies from the Colorado River, but has sought other water sources since the early '90s. The San Diego County Water Authority gets 10% of its water from a \$1 billion desalination plant that removes salt and impurities from seawater. The city has also conserved more water and cut per-person use while its population has grown.

Phoenix, the nation's fifth largest city, relies on imported Colorado River water, too. It also gets water from the in-state Salt and Verde Rivers, which are nowhere as challenged as the Colorado River, said Sarah

Porter, director of the Kyl Center for Water Policy at Arizona State University. Phoenix also uses sterilized wastewater for limited uses, like maintaining parks and recharging some aquifers with groundwater.

Arizona was the hardest-hit among Western states losing Colorado River water this year, with 18% of its supply gone. But cities were spared from that round of cuts. Officials in Phoenix say they have enough water to weather future cuts because of diversified supplies and water saved and stored underground.

## **HAS CONSERVATION BOLSTERED WESTERN CITIES' WATER SUPPLIES?**

Yes. There may be no better example than Las Vegas. Sin City's fountains, swimming pools, and showers use recycled water. About 40% of the Southern Nevada Water Authority's water supply is for indoor use. Once used, much of that wastewater is treated and then returned to Lake Mead, the reservoir behind Hoover Dam, before it is drawn and used again.

Las Vegas started conserving, reusing and recycling water in 1999. Since 2002, the Southern Nevada Water Authority has slashed its use of Colorado River water by 26% while the region's population grew by 49%.

In 2003, the water authority banned front yard lawns in new subdivisions. Grass was prohibited in new commercial developments. Last year, Nevada outlawed what it called 'non-functional turf' in the Las Vegas area, or grass used at office parks, in street medians and at entrances to housing developments. Officials said the measure could save an amount equal to 10% of its Colorado River allocation.

Not all cities and states have acted with the same urgency. Phoenix does not offer rebates to tear out grass. Utah only recently passed a turf buyback measure.

In California, urban water use has steadily dropped since peaking in 2007, according to the Pacific Institute. Much of that progress is from repairing leaks, replacing lawns with more drought-proof landscaping, and installing efficient washers, dishwashers and other fixtures.

But even more water can be conserved, the Pacific Institute found in a recent report. California recycles 23% of its municipal wastewater. The report found the state's urban areas could cut consumption by another 30% to 48% by conserving more.

Gleick, one of the authors, pointed out that water use trends in California over the past few decades show that population growth no longer means additional water is needed to support more people.

"We're past the point where we can find a place to build another dam that makes sense or another river to tap," Gleick said. "We're now in a new era of efficiency and reuse."

## **WHAT ABOUT CLIMATE CHANGE?**

Even as Western cities diversify supplies, consume less and reuse more, scientists say climate change will be disruptive and could force cities to adopt more expensive technologies, like desalination, and mandate water cuts more often.

"There's an assumption baked into almost all of these drought mitigation strategies and plans and water allocations that in the long run, drought is temporary," said Swain of UCLA. "Increasingly, it's an assumption that is wrong."

Swain added that conservation is easier in its earlier stages.

"The first conservation gains are always the easiest," he said. "You fix leaks, put in (efficient) toilets and fixtures and things like that in urban areas. After a certain point, you then have to start going for the higher hanging fruit."

Last month, the Southern Nevada Water Authority announced that water levels at Lake Mead had fallen so low that Las Vegas is drawing water from deeper in the reservoir, from the so-called "third straw."

The pipeline near the bottom of the lake was completed in 2015 and built so that Las Vegas can still get water if the lake's surface drops below two other intake pipes.

"What we have now is a new reality of reduced flows in the whole Colorado River system," said Castle of the Getches-Wilkinson Center. "That's going to require the per capita usage in these various cities to continue to go down, and not just when the governor declares an emergency."

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Citation: How cities in the West have water amid drought (2022, May 24) retrieved 3 May 2024 from <https://phys.org/news/2022-05-cities-west-drought.html>

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