

Risk of Colorado River shortage is on the rise, could hit within 5 years, officials say



The risks of water shortages continue to grow along the Colorado River, which supplies about 40 million people from Wyoming to Arizona.

Federal water managers released projections Tuesday showing higher odds of shortages occurring within the next five years.

The Colorado River is in the 21st year of a severe drought

that's being compounded by hotter temperatures influenced by climate change, and the river's flows have increasingly been insufficient to meet all the demands of cities and farms across the region.

Last year, representatives of seven states and the federal government met in a ceremony overlooking Hoover Dam and signed a set of agreements aimed at reducing the risks of reservoirs dropping to shortage levels that would require major cutbacks.

But following a hot and extremely dry spring and summer, the [Bureau of Reclamation's latest projections](#) show that in a scenario of continuing drought between now and 2025, the chances of Lake Mead falling into a shortage has increased to nearly 80%.

The odds of the reservoir dropping to critically low levels by 2025 under this scenario was estimated at nearly 20%.

Compared with earlier projections this spring, the latest results show an increase by as much as 12% in the chances of Lake Mead and Lake Powell falling to critically low levels within five years.

"We have greater uncertainty than we did last year," Reclamation Commission Brenda Burman said in an online news conference.

She said the drought contingency agreements that were signed at Hoover Dam are working by helping to boost the level of Lake Mead, which supplies water for Arizona, Nevada, California and Mexico.

Water deliveries were reduced last year to Arizona and Nevada under those states' agreement with California. And the two states, along with Mexico, will again leave some of their allocated water in Lake Mead in 2021 as part of the effort to shore up the reservoir's levels.

Lake Mead now stands at just 40% of its full capacity, while the upstream reservoir Lake Powell is 48% full.

Burman said because of the drought agreements, the region made "remarkable contributions to the river." That extra conservation, she said, helped boost the water level in Lake Mead last year by about 6 feet.

MORE: [‘Megadrought’ points to drier future in the West](#)

And even before those deals were negotiated, the federal government had other programs in place encouraging conservation, said Terry Fulp, the bureau's regional director.

"All told, if we include all of that conservation, our estimate is Lake Mead is about 40 feet higher today than it would have been absent that conservation," Fulp said. This boost from voluntary conservation efforts has helped keep the

reservoir above the threshold that would trigger a shortage and larger cuts in water deliveries.

“We’re always encouraging as much conservation as possible,” Fulp said.

The bureau releases its five-year projections at least three times a year. They’re intended to help water officials in the Colorado River Basin in looking ahead at possible scenarios.

Over the winter, the Rocky Mountains were blanketed with a snowpack that was slightly above average, initially raising hopes among water managers that reservoir levels would turn out to be higher.

But the government said runoff [turned out to be just 55% of average](#). The extremely hot and dry conditions, including record heat in places across the West, have dried out the soils and decreased the amount of runoff reaching the river.

Scientists have found that the river is highly sensitive to warming. In [one recent study](#), researchers estimated warmer temperatures were behind about half of the decline in the river’s flow since 2000, and they projected the river could lose about a fourth of its flow by 2050 as global temperatures continue to rise with emissions of greenhouse gases.

“We know that warmer temperatures have contributed to

the drought over the last 21 years. We know they have exacerbated it," Burman said.

Federal officials say they've sought to incorporate the latest science in their projections, including by looking at what they call a ["stress test" hydrology](#) scenario. This involves zeroing in on data for the past three decades of higher temperatures and diminished river flows.

"The benefit is to understand how high the risks can get under a pretty extreme dry future," said Carly Jerla, a hydrologist and manager of the bureau's modeling and research team. "It's definitely not a worst-case scenario, but it's a worse-er type scenario."

She said this scenario assumes the current drought continues at the same severity and without much relief between now and 2025. The projections of possible reservoir levels, Jerla said, "give an indication of the types of risks that we could see if that future was to pan out."

MORE: [Six states push back against Utah's proposal to build Colorado River pipeline](#)

Arizona gets nearly 40% of its water from the Colorado River. The state will [see its water take reduced](#) by 6.9% of its total allotment for a second year in 2021, reducing deliveries for agriculture and eliminating water for "banking" and

[replenishing groundwater](#) in places along the Central Arizona Project Canal.

If a shortage is eventually declared, Arizona and Nevada would face bigger cuts. California has agreed to receive less water if reservoir levels continue to drop.

The deals that were signed last year — one for the three Lower Basin states and the other for the Upper Basin states of Colorado, Wyoming, Utah and New Mexico — are designed as a temporary “bridge” solution to help boost the reservoirs through 2026.

The Bureau of Reclamation plans to start a review by the end of this year to examine how the existing rules have worked and how the guidelines for shortages could be improved after 2026.

Burman praised the previous negotiations that led to last year’s agreements. She said officials across the Colorado River Basin have worked well in developing fixes to adapt to the situation.

“Everyone came together to address the risks we've seen on this system,” Burman said.

She said she wishes the projection numbers were better, and she hopes the region will head into a stretch of wet years, “but we know if we're not, we're going to come

together and we're going to make sure we address it."

The government's projections coincided with the release of [new report](#) from Utah State University's Center for Colorado River Studies in which researchers focused on how dry future conditions might become. They reconstructed past flows from tree-ring records and examined the most severe droughts of the past 600 years. They found that more severe droughts are increasingly likely.

In a [summary of their findings](#), the researchers said their results show the approach of planning using the "stress test" scenario, looking at the three decades from 1988 to 2018, "might not consider drought scenarios that are sufficiently extreme."

"The future might be far drier than managers currently anticipate," the researchers wrote. They also cited climate studies showing that with warming, runoff will decline in the future.

In studying past droughts, the team found possible scenarios in which for long periods Lake Powell's levels would fall too low for Glen Canyon Dam to produce hydroelectric power.

The caveat about such a scenario is that it's assuming a future in which we don't change the way we operate the

river system, said David Tarboton, a co-author of the study and director of the university's Utah Water Research Laboratory. "If we reduce demands, if we change the way that we are consuming water, then the reservoirs don't have to go down as much."

The researchers said their findings show a need for new strategies and plans to confront severe droughts.

"We have to be prepared for even worse conditions than we have already experienced," said Jack Schmidt, a professor who coauthored the report. "Even more changes to water allocation agreements are going to have to be made."

MORE: [Arizona endorses a company's plan to sell Colorado River water](#)

Schmidt said the government's latest projections reinforce the need for all parties to consider their uses of the Colorado River, and to carefully consider "how to share the pain" in a drought even longer and more severe than the current "Millennium Drought."

"It will do no good to cling to agreements of the past that were negotiated during a time when runoff was plentiful," Schmidt said.

Burman and other federal water officials expressed confidence that they and their counterparts in the seven

states will be able to put together measures to meet the challenges. They didn't elaborate on what if any additional steps might be needed over the next five years.

"There is uncertainty and risk on the horizon," Burman said. "But the policy decisions we're making have been made to address that risk."

Fulp said the region's water officials have "a history of dealing with uncertainty, and that uncertainty clearly is growing."

"We have a good set of programs in place," he said, "and we will react accordingly."

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