Seven weeks of near-record low snowfall in the Colorado River Basin have water managers worried

Lake Powell could soon see its level drop below the critical elevation where the Glen Canyon Dam stops being able to generate power.

The water level in Lake Powell was at a record low when rain and snow began to fall across the Colorado River Basin in

October, soaking dry soils ahead of the winter season.

Water managers, who hoped the trend would build into an above-average snow year that might delay a looming water crisis in the Southwest, watched the snowpack drop to near zero in November. Then, after a massive storm cycle brought six feet of snow to parts of the Rockies around the New Year, they again breathed a sigh of relief.

In the weeks since, however, snowfall throughout the watershed has been at a record or near-record low. Lake Powell, which is filled to just over a quarter of its capacity, could soon see its level drop below the critical elevation where the Glen Canyon Dam stops being able to generate power, even after this week's storms.

(Christopher Cherrington | The Salt Lake Tribune)

Heather Patno, a hydrologist with the Bureau of Reclamation, which oversees operations at Lake Powell, compared the snow season to a yo-yo or a roller coaster that has required forecasts to be repeatedly revised.

The latest projections, Patno told a Glen Canyon Dam working group earlier this month, predicted runoff into the Colorado River will be around 76% of average, and, unless more storms arrive soon, that could drop to 59% of average.

Glen Canyon Dam hydropower production at

risk

The low range of probable forecasts, Patno said, show that hydropower generation at the dam may become impossible before the end of 2022, marking an uncertain new reality for the 40 million people who rely on Colorado River water between Denver and Tijuana.

The dam's hydroelectric intakes are at 3,470 feet above sea level, but as the reservoir level drops below 3,525 feet the risk of equipment damage increases due to the possibility of air passing through the turbines.

(Bureau of Reclamation) Lake Powell elevation forecast. January 2022.

"Part of the reason that 3,525 is critical," said Gene Shawcroft, chair of Utah's Colorado River Authority, "is because ... the hydropower generated from Glen Canyon is absolutely crucial from the energy supply standpoint. There are a lot of people that rely on that power."

Shawcroft said that the revenue generated by power production at the dam is also a key source of funding for environmental programs like endangered fish recovery programs on the Colorado and San Juan rivers.

A drought response plan that is expected to be finalized by the Bureau of Reclamation and other parties in April will

propose methods to prop up Lake Powell, which could include releases from upstream reservoirs and other measures, Shawcroft said.

Glen Canyon Dam is already releasing less water than usual into Grand Canyon and on to Lake Mead to keep Lake Powell's level from dropping too rapidly.

But environmental groups and some water managers say the plan, a draft of which which is open to public comment, may be insufficient for addressing the scale of the water problems in the region.

(Rick Egan | The Salt Lake Tribune) The Glen Canyon Dam on the Colorado River in northern Arizona, on Tuesday, Aug. 3, 2021.

Analyzing tree ring data since 800 A.D., a study from the University of California found that the past 22 years have been the driest the Colorado River has seen in 1,200 years — and the pattern is linked to human-caused climate change.

"The scale of response has to be proportional to the scale of the issue," said Dave Kanzer, director of science and interstate matters for the Colorado River Water Conservation District in Glenwood Springs, Colo. Kanzer used a metaphor common in water discussions, comparing water use in the basin to an unbalanced budget that is draining water

“savings” in reservoirs far faster than they can be replenished.

“We have to live within our means,” he said, noting that water withdrawals from Lake Mead, the nation’s largest reservoir, are greater than inflows being delivered from Lake Powell. Kanzer believes the drought response agreement “should result in significant reduction in lower basin over use” by California, Arizona and Nevada, but he added that all users in the basin will need to reduce water use.

“If we conserve a little bit across all seven states,” he said, “if all Colorado River water users pitch in a little bit — it’s going to make a big difference.”

Correcting past inequities

Crystal Tulley-Cordova, a principal hydrologist for the Navajo Nation Department of Water Resources, said the drought has hit the Navajo Nation particularly hard, increasing food and water insecurity in a region where over a third of households are not connected to running water.

“What our priority is, first and foremost, for the Department of Water Resources is to ensure that Navajo residents have safe, clean water,” she said. As levels in Lake Powell and the Navajo Reservoir on the San Juan River have dropped, Tulley-Cordova said the Navajo Nation is advocating

management plans that protect the viability of water diversions and hydropower production at the Glen Canyon Dam, which supplies homes on the reservation with electricity.

For decades, the tribal government has been working to secure its water rights through settlements with state and federal governments that were promised in 19th-century treaties. Congress approved a water rights settlement for the Utah portion of the Navajo Nation in late 2020 that appropriated $220 million for water projects.

(Leah Hogsten | The Salt Lake Tribune) Christopher Chee waited in line for two hours to fill his water tank in Oljato-Monument Valley, San Juan County, on June 22, 2020. More than one-third of Navajo Nation households lack running water, and the problem is even worse in San Juan County where half of Navajo Nation residents have to haul water. Families fill jugs at communal wells or buy bottled water from stores — both costly and time-consuming burdens that have become only more difficult during the pandemic and the tribe's daily and weekend curfews.

But Tulley-Cordova said increased construction costs related to the pandemic and other factors have delayed some construction projects, and that there is still a long road ahead.

Thirty federally recognized tribes in the Colorado River basin, including the Navajo Nation, are negotiating with the seven U.S. states of Utah, New Mexico, Colorado, Wyoming, Arizona, Nevada and California to update the century-old Colorado River Compact of 1922 over the next four years.

When the original compact was developed, Tulley-Cordova said, Indigenous people weren't considered U.S. citizens. "That provided an inequitable environment for being able to secure these rights that we are now securing," she said, noting that the water rights on paper don't always align with the water actually available in the river.

"We have to account for the wet water that is available now," she said, "so having an opportunity to change what is within those documents is important."

Will drought response plans prove futile?

In a letter sent to Reclamation last month, John Weisheit and Robin Silver, co-founders of Living Rivers and the Center for Biological Diversity respectively, wrote that demand for water in the basin has outpaced supply for over two decades as the Southwest has been locked in a cycle of megadrought.

The ultimate goal of water managers, according to Weisheit and Silver, should be to "balance the water budget" by

immediately reducing consumptive water use in the basin by 20%. Temporarily tweaking release schedules from Lake Powell, the letter said, will not solve the underlying issue that the basin states are using more water than is actually available in the river.

The Glen Canyon Institute, which advocates for the decommissioning of the Glen Canyon Dam, recently sent an email to its members highlighting a line within the Bureau of Reclamation's draft plan that addresses the same issue.

"If dry conditions persist or worsen," the draft document states, "available storage volumes for potential adjustments or releases may be insufficient to protect the Target Elevation [of 3,525 feet] at Lake Powell. As such, Drought Response Operations may be ineffective and therefore futile."

(Rick Egan | The Salt Lake Tribune) Lone Rock at Powell, on Sunday, September 6, 2020 and Tuesday, Aug. 3, 2021.

Long-term forecasts produced by the Bureau of Reclamation in the early 2000s did not take into account the climate change-based models available at the time. In 2007, the federal agency set interim drought guidelines that are still largely in effect today, using a model that concluded there was less than a 10% probability that Lake Powell's elevation would fall below 3,570 feet by 2050. The reservoir reached

that level last March.

Other climate science-based models produced 15 years ago, which were cited in geochemist James Powell's 2008 book "Deadpool," proved to be more accurate in hindsight.

Critics say it's past time to rethink assumptions that have set water policy for decades, and the Glen Canyon Institute criticized the Bureau of Reclamation for not mentioning the words "climate change" in the current draft of its drought planning document.

In a white paper released last year through Utah State University's Center for Colorado River Studies, a dozen researchers called for existing water management agreements — which are sometimes referred to as the "Law of the River" — to be adapted. The researchers pointed to a fundamental imbalance between runoff and water demand in the river basin and said "aggressive commitments to water conservation" are critical over the next 25 years to prevent reservoirs from becoming further depleted.

Culture of green lawns

The vast majority of water in Utah, as is the case in the rest of the basin, is used for agriculture. But Utah has the highest per capita residential water use in the Southwest, according to some estimates, and Utahns pay the lowest water bills in

the seven Colorado River states. Proposals for more diversions, like the Lake Powell Pipeline in southwest Utah, would draw even more water from the river.

(Rick Egan | The Salt Lake Tribune) Abandoned bouy's that used to protect the "Three Roof Ruin" from boaters during high water, sit at the bottom of the Escalante River, in Glen Canyon, on Monday, May 17, 2021.

Shawcroft, who represents Utah in interstate water negotiations, said it's important for people to know that drinking water supplies won't be cut off as part of the drought response this year. But he acknowledged the basin does face a serious challenge that will require those who rely on Colorado River water to change their behavior.

Shawcroft believes landscaping is one place Utahns could cut back their water use. "How do we deal with our culture of having a lot of grass?" he asked. "That, in my mind, needs to change."

He said he was glad to see that Utahns became more comfortable with having brown spots on their lawns last summer, when the runoff was around 30% of average.

"There are a number of landscape opportunities that use significantly less water than the typical turf from wall to wall," Shawcroft said. "Developers are catching on to that."

“So we’re headed in the right direction,” he added. “I just hope we’re headed fast enough.”

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