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The fight for water: Here's why the West's oldest battle could hit you at the tap

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Aerial photo of goosenecks on the Colorado River above Cataract Canyon in southern Utah, July 28, 2008. (Tom Smart, Deseret News)

Editor's note: This is the first in a three-part series on the impacts of the West's shrinking water supply and the costly battle to find solutions.

► Related list: [Dam locations that comprise the Colorado River Basin area](#)

LAS VEGAS, Nev. — The West is running out of water.

Its lifeblood, the Colorado River, is being hemorrhaged by cities, by farms and ranches, by power plants and by the more than 30 million people who depend on its water in the United States and another 6 million people in Mexico.

This year's flows are near historic lows with runoff about a third of average, pushing the seven states that share the river toward another year of drought. But those stresses are trumped by dire predictions from the agency managing the Colorado River system, forecasting demand far outstripping supply during the next 50 years, reaching crisis levels within two decades.

It reveals a coming tug-of-war over water resources that may pit Utah against other states in the fight for new development, jobs, housing and force an answer to one of the West's most enduring questions: Who is entitled to the water?

The answer will determine just how much it will cost you to turn on your tap at home or what type of lawn or garden you can have. And the answer is hidden within an expansive, multibillion-dollar effort



Pat Mulroy, general manager of the Southern Nevada Water Authority, stands in a replica of a pipe that delivers water to Las Vegas May 21, 2007 at the Las

being waged to keep the river flowing.

Vegas Springs Preserve. (Sam Morris, Las Vegas Sun)

"There are no innocent parties," said Nevada's Pat Mulroy, who manages a water-delivery system for more than two thirds of her state's residents. "No one on the river has the luxury of doing nothing."

The reason? Colorado River flows are shrinking.

Dealing with drought



The still water reflects off the canyons before whitewater rafting on the Colorado River in Cataract Canyon in southern Utah, July 28, 2008. (Tom Smart, Deseret News)

percent of the time over the next 50 years.

A warmer, more volatile climate will mean a drier Colorado River basin overall, with more water lost from the ground through evaporation and transpiration by plants; less snowfall; but more rainfall, which behaves differently in terms of shaping water supply.

As the Colorado River shrinks, so do personal choices of where to live, where to work, and how to navigate life in the West.

Communities may no longer grow. Cities and towns risk catastrophic fire because there's not enough water to extinguish blazes. Lawns are relegated as a luxury for the rich.

Across the vistas of the rural West, farms could become idle, brown and barren as irrigation water gives way to homes. Energy projects that grow jobs but use water could be threatened or eliminated. A

Even before drought gripped the river system beginning in 2000, a nearly three-decade look at data shows the combination of water use and loss in the Colorado River increased 23 percent, according to the U.S. Bureau of Reclamation. Think of it as a 23 percent increase in stress on the river system.

The bureau is shepherding a supply-demand study to be released in July that says residents of Utah and the other six basin states should expect droughts lasting five years or more 40



Colorado River below the Hoover Dam, Tuesday, April 10, 2012. (Winston Armani, Deseret News)

flourishing recreation industry dependent on the Colorado River and its tributaries could dry up and no longer funnel \$26 billion a year into the economies of the basin states or provide tourism or recreation jobs for a quarter of a million people.



Water splashes up over the boat during river rafting down Cataract Canyon in Moab on the Colorado River Monday June 13, 2005. (Scott G. Winterton, Deseret News)

Ensuring the availability of water is among Utah Gov. Gary Herbert's highest priorities.

"It is the only limiting factor to growth in Utah," the governor said. "We're going to have to worry about loss of flow and less capacity and volume in the river."

The state has set a water conservation goal to reduce by 25 percent the overall consumption of water by 2050. Utah's population is predicted

to double by that year, according to the state Water Resources Division and available water is not enough to keep urban taps flowing.

"Even meeting that goal of conservation, we will still need 200,000 acre-feet of new water from reservoirs, pipelines or wells," said Dennis Strong, director of Utah's Division of Water Resources.

An acre-foot of water is defined as the volume of an acre of water to a depth of one foot — about enough to sustain a family of four for a year.

Sharing water

Utah's share of undeveloped water from the Colorado River will be long gone by 2050, Strong said, noting problems with allocation levels.

"There's going to be real challenges for water managers in the future. There's already more water allocated than what exists, but of course not everybody is using the water all the time. It is going to get to the point where you can't take any more from the Colorado."



A Great Blue Heron walks along the shore of the Colorado River in Cataract Canyon in southern Utah, July 28, 2008. (Tom Smart, Deseret News)

California, which has historically enjoyed the excesses of the Colorado River, has been given a deadline to come up with ways to reduce its dependency on the water in the face of a growing Southwest and a river that is increasingly tapped by states that have rights to the water. Sooner or later, Strong said, all those rights will be used up, and what claims haven't been acted on will be as

dry as the paper they're written on.



Water outlet of the Hoover Dam, Tuesday, April 10, 2012. (Winston Armani, Deseret News)

Depending on those flows, most agree, is becoming more difficult given the water that has already been carved out and the fickle nature of the weather. Even those who question climate change concede the extreme variability in the amount of water flowing into the upper and lower basins and the increased demands on the system.

With this past winter's snowpack well below average for the Colorado basin states — dipping down at 50 percent

or below of what states normally get — this year is shaping up to be near-record setting for drought for the Colorado River system in Utah, Wyoming, Colorado and New Mexico.

Additionally, a complex water sharing agreement for the Colorado River mandates that 8.2 million acre-feet of water must flow downstream each year to the lower basin states of Nevada, Arizona and California, even if it means states like Utah have to curtail consumption.

"At the end of the day if the users of the Central Utah Project think they are going to be unaffected, they're delusional," Mulroy said. "You cannot fix this problem unless everyone's at the table. Quite frankly, the choice is very simple because failure is not an option."

Strong said the unpredictability built into the flows of the Colorado River makes it imperative to take care of the water delivery system already in place for Utah's residents.

Lawmakers, he said, will have to decide the importance of the state's future water supplies by committing money to new projects — like more efficient water treatment plants, lining canals to prevent loss of water or building new pipelines to convey water to where people reside.



A new drinking water intake being built at a shrinking Lake Mead, Tuesday, April 10, 2012. (Winston Armani, Deseret News)

If lawmakers decide having enough water is critical, Strong said they'll have to write a big check — \$15 billion — to make improvements and plug problems to the existing water



A lone waterskier enjoys making turns over smooth water. Water skiing is just one of the water sports possible at Lake Powell, August 10, 2009. (Ray Grass, For the Deseret News)

delivery system over the next 20 years. Otherwise, the water already there will be compromised by inefficiencies.

"We have to decide if water is an essential service like we have already decided with schools and roads," Strong said, pointing to an aging infrastructure in need of repairs.

The push for growth

With so much of the Colorado River water — 80 to 85 percent — being used for agriculture in the region, the lure is to grab and develop that water for use in homes, to keep cities thriving.

Politically, agricultural production occupies a lower rung on the ladder of priorities, subjugated to the thirst of burgeoning populations and the need to keep water flowing for public safety purposes. Utah signed into law just a few years ago the mandate that fields will dry up in a natural disaster so faucets in homes will keep running and hydrants will continue to unleash water to fight fires.

Farming has become more efficient over the years, even as crops have given way to new homes and that water has been converted for urban use.

Randy Parker, chief executive officer of the Utah Farm Bureau, said crop and livestock production is happening at a much more efficient rate than 60 or 70 years ago, achieving greater yields with less land and less water. But less water doesn't mean no water.

"Our leaders plan for the next earthquake because it is inevitable. Is this something our folks are going to have to take a hard look at? Our folks better, or we are headed for a crash."

Mulroy said idling farms isn't the answer because food security is paramount, but the irrigation of crops and pastures must become even more efficient and priorities have to shift.

She pointed to a massive, \$300 million venture in Southern California to line the All American Canal for 23 miles to save 65,000 acre-feet of water for urban use. The joint project by the San Diego Water Authority and Imperial Irrigation District, she said, "hasn't changed one acre of farm production," in terms of water efficiency.

But that delicate balancing act — keeping the water flowing to irrigate nearly 4 million acres of land in the Colorado River basin states and meeting the other needs of the population — is getting increasingly difficult to achieve.

"There's a lot of competition for that Colorado River water, more needs than what can be met," Strong said.

In fact, a recent study by the U.S. Geological Survey estimates that by the year 2070, the water sharing arrangement for the Colorado River will only be fulfilled 60 percent of the time.

Representatives of all states agree that the Colorado River Compact crafted 90 years ago was inherently flawed because it overestimated the amount of water in the river, drawing on numbers when the river was unusually flush.

Kent Jones, Utah state engineer over water rights, said applications approved over time to water in the Colorado exceed what has been allocated to Utah.

If the water sharing arrangement is ever revisited, Jones said he'd be concerned because of how Utah might fare.

"There are states that need more water than they have a right to, so they think the water should be reallocated. I think every state would say they need more water," Jones said, "but physically it's not there. It is a very limited resource and we are going to have to live within the limits of what that resource provides."

A stream of pressure

Threats on multiple fronts to the 1,450-mile river are providing a constant stream of pressure and challenges to water managers in the basin states: population growth, climate change, energy and mining development and invasive species are just a few.

The U.S. Census predicts an average of a 53 percent increase in population growth in the seven states by 2030 and climate change portends less water available overall in the Colorado River, according to the U.S. Geological Survey.

Its study predicts a 20 percent decrease in runoff to the river by the end of this century due to warmer temperatures and an earlier spring runoff that shortens the duration of snowpack accumulation. Earlier than usual runoffs pose particular problems for water managers, reducing the ability to store water, especially for late summer and fall use.

By 2050, the study warns that the increase in warming alone is likely to dry up soil to pose conditions more severe than the conditions during the nation's most extreme droughts, including the Dust Bowl of the 1930s.

Drought, coupled with the over-appropriation of Colorado River water, poses significant and constant challenges to water storage — the so-called insurance policies that appear as the more than 100 dams built along the Colorado River and its tributaries. They can hold approximately four times the annual flow of the river, or 60 million acre-feet.

Storage, however, can hold up only so long in the face of drought.

The two largest reservoirs in the system, Lake Mead in Nevada and Lake Powell in Utah and Arizona, have been experiencing drastic declines. It took 19 years to fill Lake Mead to a level of 24 million acre-feet in 1998, but by 2007, the lake's level had already decreased 54 percent. Mead supplies water to Las Vegas and surrounding communities — two-thirds of Nevada's population.

"The swings in the Colorado River are getting more wild and more severe," said J.C. Davis, spokesman for the Southern Nevada Water Authority. "I don't think that 'likely' is too strong of a word that levels at Mead are going to continue to drop."

By mid-April, Lake Mead was just more than half full, with levels expected to plunge another 14 feet by the end of the year. Declining levels at Lake Mead, impounded behind Hoover Dam, call into question the possibility it may someday be idled as a source of hydroelectric power.

Such a scenario would throw the power supply for 29 million people into question and cause a destabilization of the regional energy market, forcing utility companies to buy up power at considerably higher prices, which are eventually passed on to consumers.

Federal managers have already reduced the hydroelectric generating capacity by 23 percent at Hoover and are buying new equipment to make power generation as efficient as possible.

Rose Davis, with the Bureau of Reclamation, said the agency is installing a wide-head turbine and

has plans to add two more in the next year.

Lake Powell

Lake Powell, behind the Glen Canyon Dam, is experiencing a similar situation. It took 17 years to fill Lake Powell to its full capacity of 27 million acre-feet, and in just six years, between 1999 and 2005, the level of the lake was reduced by 60 percent.

The latest numbers projecting the volume of this year's runoff into Lake Powell show that in only two other years — 1977 and 2002 — was there less water, leaving water managers to yearn for the conditions of last year, which was the third wettest on record since the gates at Glen Canyon Dam were closed in the mid-1960s.

"Never in the historic record have we seen a swing in hydrology from wet to dry of this magnitude," said Rick Clayton, hydraulic engineer with the Bureau of Reclamation.

Malcolm Wilson, chief of water resources with the agency, agrees the threats of population growth and more demand on the limited supplies of the Colorado River loom as very real hazards. But they do not constitute the most severe threat.

He said the real problem is apathy born from ignorance.

"The biggest hazard in my mind is that people don't take this problem of future imbalances seriously," Wilson said. "They're not thinking hard about how we are going to address this and society will have to grapple with the tough choices."

COMING MONDAY: Solving the problem. A look at possible solutions to the shrinking Colorado River.

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