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## An Arid West No Longer Waits for Rain

By [RANDAL C. ARCHIBOLD](#) and [KIRK JOHNSON](#)

A Western drought that began in 1999 has continued after the respite of a couple of wet years that now feel like a cruel tease. But this time people in the driest states are not just scanning the skies and hoping for rescue.

Some \$2.5 billion in water projects are planned or under way in four states, the biggest expansion in the West's quest for water in decades. Among them is a proposed [280-mile pipeline](#) that would direct water to Las Vegas from northern [Nevada](#). A proposed reservoir just north of the [California](#)-Mexico border would correct an inefficient water delivery system that allows excess water to pass to Mexico.

In Yuma, Ariz., federal officials have restarted an idled desalination plant, long seen as a white elephant from a bygone era, partly in the hope of purifying salty underground water for neighboring towns.

The scramble for water is driven by the realities of population growth, political pressure and the hard truth that the Colorado River, a 1,400-mile-long silver thread of snowmelt and a lifeline for more than 20 million people in seven states, is providing much less water than it had.

According to some long-term projections, the mountain snows that feed the Colorado River will melt faster and evaporate in greater amounts with rising global temperatures, providing stress to the waterway even without drought. This year, the spring runoff is expected to be about half its long-term average. In only one year of the last seven, 2005, has the runoff been above average.

Everywhere in the West, along the Colorado and other rivers, as officials search for water to fill current and future needs, tempers are flaring among competing water users, old rivalries are hardening and some states are waging legal fights.

In one of the most acrimonious disputes, Montana filed a suit in February at the [United States Supreme Court](#) accusing Wyoming of taking more than its fair share of water from the Tongue and Powder Rivers, north-flowing tributaries of the Yellowstone River that supply water for farms and wells in both states.

Preparing for worst-case outcomes, the seven states that draw water from the Colorado River — Colorado, Wyoming, Utah and New Mexico in the upper basin and California, [Arizona](#) and Nevada in the lower basin — and the United States Bureau of Reclamation, which manages the river, are considering [plans](#) that lay out what to do if the river cannot meet the demand for water, a prospect that some experts predict will occur in about five years.

“What you are hearing about [global warming](#), explosive growth — combine with a real push to set aside extra water for environmental purpose — means you got a perfect situation for a major tug-of-war contest,” said Sid Wilson, the general manager of the Central Arizona Project, which brings Colorado River water to the Phoenix area.

New scientific evidence suggests that periodic long, severe droughts have become the norm in the Colorado River basin,

undermining calculations of how much water the river can be expected to provide and intensifying pressures to find new solutions or sources.

The effects of the drought can be seen at Lake Mead in Nevada, where a drop in the water level left docks hanging from newly formed cliffs, and a marina surrounded by dry land. Upriver at Lake Powell, which is at its lowest level since spring 1973, receding waters have exposed miles of mud in the side canyons leading to the Glen Canyon Dam.

In California, Gov. [Arnold Schwarzenegger](#) has sounded alarm bells by pushing for a ballot measure in 2008 that would allocate \$4.5 billion in bonds for new water storage in the state. The water content in the Sierra Nevada snowpack has reached the lowest level in about two decades, state hydrologists have reported, putting additional pressure on the nation's most populous state to find and store more water.

“Scientists say that global warming will eliminate 25 percent of our snowpack by the half of this century,” Mr. Schwarzenegger said recently in Fresno, Calif., “which will mean less snow stored in the mountains, which will mean more flooding in the winter and less drinking water in the summer.”

In Montana, where about two-thirds of the Missouri River and half of the Columbia River have their headwaters, officials have embarked on a long-term project to validate old water-rights claims in an effort to legally shore up supplies the state now counts on.

Under the West's water laws, claims are hierarchal. The oldest, first-filed claims, many dating to pioneer days, get water first, with newer claims at the bottom of the pecking order.

Still, some of the sharpest tensions stem more from population growth than cautionary climate science, especially those between Nevada and Utah, states with booming desert economies and clout to fight for what they say is theirs.

Las Vegas, the fastest-growing major city in the country, and the driest, developed the pipeline plan several years ago to bring groundwater from the rural, northern reaches of the state. The metropolitan area, which relies on the Colorado River for 90 percent of its water, is awaiting approval from Nevada's chief engineer.

Ranchers and farmers in northern Nevada and Utah are [opposed to the pipeline plan](#) and have vowed to fight it in court, saying it smacks of the famous water grab by Los Angeles nearly a century ago that caused severe environmental damage in the Owens Valley in California.

“Southern Nevada thinks it can come up here and suck all these springs dry without any problems,” said Dean Baker, whose family's ranch straddles the Nevada-Utah border, pointing out springs that farmers have run dry with their own wells. “We did this ourselves. Now imagine what pumping for a whole big city is going to do.”

Meanwhile, Utah has proposed a \$500 million, 120-mile pipeline from Lake Powell to serve the fast-growing City of St. George and Washington County in the state's southwestern corner. Nevada officials have said they will seek to block that plan if Utah stands in the way of theirs.

“Utah is being very disingenuous, and we're calling them on it,” said Patricia Mulroy, the chief executive of the Southern Nevada Water Authority, the agency responsible for finding water for Las Vegas and its suburbs. “St. George, Utah, is growing as fast as southern Nevada, because the growth is going right up the I-15 corridor.”

Dennis J. Strong, director of the Utah Division of Water Resources, said Nevada was protesting too much and instead should be cheering the Lake Powell project because Colorado River water that Utah does not use would flow in Nevada's direction. Mr. Strong said that Nevada's protests "may be a bargaining chip." He said he hoped for a compromise that would allow both projects to move forward.

In Yuma, near the Arizona border with Mexico, officials have pinned hopes on a desalination plant built 15 years ago. The plan then had been to treat salty runoff from farms before it made its way into Colorado River headed to Mexico, thus meeting the terms of an old water treaty.

But a series of unusually wet years made it more efficient to meet the treaty obligations with water from Lake Mead, so the plant sat idle. Drought has changed all that. Arizona water managers, who are first in line to have their water cut in a shortage under an agreement with other states, called for the plant to be turned on.

Under an agreement with environmentalists, the federal Bureau of Reclamation plans to monitor the environmental effects of using the plant, and study, among other things, using the purified water for purposes other than meeting its treaty obligations, like supplying the growing communities around Yuma.

"It never made sense to me to just dump bottled-water quality water into the river anyway," said Jim Cherry, the bureau's Yuma area manager.

What unites the Western states is a growing consensus among scientists that future climate change and warmer temperatures, if they continue, could hit harder here than elsewhere in the continental United States.

"The Western mountain states are by far more vulnerable to the kinds of change we've been talking about compared to the rest of the country, with the New England states coming in a relatively distant second," said Michael Dettinger, a research hydrologist at the [United States Geological Survey](#) who studies the relationships between water and climate.

Mr. Dettinger said higher temperatures had pushed the spring snowmelt and runoff to about 10 days earlier on average than in the past. Higher temperatures would mean more rain falling rather than snow, compounding issues of water storage and potentially affecting flooding.

In some places, the new tensions and pressures could even push water users toward compromise.

Colorado recently hired a mediator to try to settle a long-running dispute over how water from the Rocky Mountains should be shared among users in the Denver area and the western half of the state. Denver gets most of the water and has most of the state's population. But water users in the mountains, notably the ski resort industry, also have clout and want to keep their share.

Robert W. Johnson, the Bureau of Reclamation commissioner, said he shared the optimism that the disputes could be worked out, but he said he thought it might take a reconsideration of the West's original conception of what water was for.

The great dams and reservoirs that were envisioned beginning in the 1800s were conceived with farmers in mind, and farmers still take about 90 percent of the Colorado River's flow. More and more, Mr. Johnson said, the cities will need that water.

An agreement reached a few years ago between farmers and the Metropolitan Water District of Southern California, the chief supplier of water to that region, is one model. Under the terms of the agreement, farmers would let their fields lie fallow and send water to urban areas in exchange for money to cover the crop losses.

“I definitely see that as the future,” Mr. Johnson said.

*Randal C. Archibold reported from Yuma, Ariz., and Kirk Johnson from Denver.*

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