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The big squeeze

North State water supplies under pressure as drought parches California

By [Alastair Bland](#)

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A thousand feet beneath the city of Chico, in the pitch-black waters of the Tuscan Aquifer, time has proceeded for ages without sound or sunlight, mostly unaffected by the world above. But in recent years, an increasing tug of upward force has been moving the Tuscan Aquifer's water toward the surface of the Earth—drawn, ultimately, by the thirst of fruit trees and vegetable fields hundreds of miles away.

And in 2014, there simply is not enough water to go around. The driest year in California's history ended just six weeks ago, and a second dry winter is underway. Gov. Jerry Brown declared a drought emergency on Jan. 17, and state and federal water agencies have warned farmers and cities that there will be virtually no allocations this year unless a great deal of rain should soon fall.

Recent weekend storms did little to dent the huge water deficit. Shasta Lake and Lake Oroville are up to 37 percent and 38 percent of capacity, respectively, whereas both were at 36 percent the week before. Folsom Lake is at just 26 percent. In the San Joaquin Valley, San Luis Reservoir—a major agricultural supplier filled with Delta water—is just 30 percent full, and streams and rivers that usually become wintertime torrents of mud-brown water have dwindled into quietly trickling brooks. Sierra Nevada snowpack—usually relied upon for late-summer water—is a fraction of its normal amount. As of last week, Black Butte Lake had entirely dried up.

To meet the needs of the parched state, water managers are increasingly relying upon the groundwater reserves of the Tuscan Aquifer, a trend that critics say is already proving unsustainable. The aquifer's volume has apparently been diminishing through the years as farmers are forced to drill deeper and deeper to tap the reservoir, according to Christina Buck, water-resources scientist with the [Butte County Department of Water and Resource Conservation](#). This not only threatens Chico's municipal water supply but also could eventually cause measurable shrinkage of surface rivers and lakes.

"Officials know that we could be looking at longer droughts in the future, and they're looking for another source of water as a life-extender," said Jim Brobeck, water-policy analyst with Chico-based [AquAlliance](#). "So they want to integrate our groundwater into the state water supply."

Brobeck says the chief threat to the region's underground water stores is an increasingly common practice called groundwater substitutions, or transfers, whereby landowners sell their own surface water to others in need—often making a healthy profit—and replace it with well water from the public supply.

This wasn't a problem years ago, when there was less demand for the state's water. During the previous worst-ever drought in California's history in the late 1970s, only 22 million people lived in the state. Today, almost 40 million people populate California, and more farmland than ever before is under intensive cultivation. Salmon and steelhead numbers are dropping as their spawning streams are increasingly diverted for human use. The governor now wants to build a pair of giant tunnels that could divert most of the already heavily used Sacramento River to the San Joaquin Valley—a project that critics argue will not solve the state's water shortage.

Forecasters expect a dry winter. Should March, April and May come and go with little to no rain, the

likelihood that any will fall before September is virtually zero. With growers in the Sacramento and the San Joaquin valleys already banking on reduced production, and salmon unable to spawn under current conditions, no one knows how California and its environment will cope should a second year pass with almost no rain.

Several miles south of Chico, straddling the line between Butte and Glenn counties, is the large property owned by John Thompson. The rice grower works 1,400 acres on land that his grandfather worked in the 1940s. Thompson produces several varieties of rice, mostly for table use but also for an Oregon sake brewery. His water comes from the Feather River and is provided on a contractual basis by the state's Department of Water Resources.

This year, though, there may be very little—even none—available.

"We still have a chance for some rain in February and March, but it's looking almost certain that our production will be cut by 50 percent," Thompson said. If the state allots him no water at all from the Feather River, he will still have his wells—though Thompson estimated that he could keep only 300 to 400 acres of his land in production using groundwater.

He noted that even the drought of 37 years ago did not reduce Lake Oroville as much as the current conditions have. "We're really in uncharted waters here," he said. "In '77, we had more water in the lake and less people in the state."



The receding of the lake has revealed all sorts of junky treasures, including this old car entangled with fallen tree branches.
PHOTO BY MELANIE MACTAVISH

While the Sacramento Valley's farmers will feel the strain caused by the drought, the severe absence of rainfall will devastate few agricultural areas as severely as it will the Westlands Water District, on the west side of the San Joaquin Valley. The region receives just six or seven inches of rainfall in an average year and relies almost entirely on water from the Sacramento Valley, transported south from the Delta via two canals. This year, hundreds of thousands of acres of Westland's farmland will almost certainly receive no water at all.

"We're bracing our farmers for possibly no allocation this year," said Jason Peltier, Westlands' deputy general manager. "If that happens, farmers will let their fields go dry and use what water they get to keep their orchards alive."

Peltier said his region's 600 farmers may need to fallow as much as a third of their land this summer—roughly 200,000 acres left to bake in the sun.

But many water-policy analysts say that Westlands' farmers are largely to blame for any drought-related grievances they may suffer. The region is a relatively young farming district whose contract with the federal government stipulates that other farming areas as well as environmental needs must come first in dry years. Chinook salmon, for example, must have enough water to spawn in and enough flowing downstream to the sea to carry juveniles safely past the two major pumps that serve the San Joaquin Valley.

Nonetheless, farmers in Westlands have been shifting en masse from annual field crops to fruit trees—especially almond orchards. Critics say this is a bad strategy in arid regions.

"Those trees need water every year," said Mike Hudson, a water activist and commercial salmon fisherman in Oakland. "You can't fallow them during drought. This is creating a constant demand for water in a state without a constant supply of water. It takes away all flexibility in management."

In years when vegetable farmers may have once simply fallowed their fields due to shortages in the state and federal supplies, nut and tree-fruit farmers now pay large amounts of



Water officials say Lake Oroville is at 38 percent of capacity.
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sky. Umbrellas came out, and clusters of people assembled under awnings and bus shelters. The roads grew slick and fishtails of spray erupted from passing cars in the streets. It was pouring.

But it wasn't nearly enough.

The culprit for the ongoing drought is a massive ridge of high pressure that remains anchored over the North Pacific Ocean. It has hardly shifted for 14 months and is creating a massive atmospheric rain shadow on the West Coast. Storms that would normally float eastward over California with the jet stream are being deflected northward by the ridge, which is roughly the size of the Andes Mountains. When this devastating barrier will dissipate is unclear.

Randall Osterhuber, the lead researcher at the Central Sierra Snow Laboratory near Donner Pass, said if this ridge breaks down, another large storm or two could still swoop in over California, soaking the valleys and cloaking the mountains.

"But every day that it's clear and dry," he said, "the statistical chances that we'll have an average or almost-average water year decline significantly."

Cadagan, who has lived through at least two severe droughts in California, says this one takes things to a new level. He is confident the state's residential water supplies will last the rest of 2014.

"But if we don't get rain this winter, and if next fall is dry, too, we're going to see people leaving the state," he said.

Ed George, a farmer near Davis, believes he may survive the year. He uses water from wells, which he suspects to be part of a subterranean water system fed and recharged by the perennial supply of Lake Berryessa—rather than the drainage of the dwindling Cache Creek—and George believes his water supply will hold out. He hopes so, anyway. Other growers, he is certain, will produce little to nothing in 2014.

"Food is going to be really expensive," he predicted.

George expects that ranchers will have to cull their herds of cattle when the dry spring provides no ample pasture.

And in fact, that's happening locally already, according to Orland-based cattle rancher Shannon Douglass. Last week, Douglass began selling some black Angus steers from the 50-head herd she and her husband, Kelly, have built up over the last decade.

"I just announced to customers this week that we will be out of beef very shortly, as we are forced to sell livestock that we would have kept for finishing," she told the CN&R.

Berton Bertagna, a fourth-generation farmer in Butte County, has more than 600 acres of orchards that could go dry this year if his water supply is cut off. Worse, his groundwater supply is dwindling—evidence, perhaps, that we are overdrafting the Tuscan Aquifer.

"I had to lower three different wells last year," he said, adding that many other area farmers will be tapping the aquifer if they receive no allocation from their irrigation districts.

"We're all really worried about the groundwater supply," Bertagna said. "Those of us who have orchards need to water those trees every year. But we might not get rain, and we might not get snowpack, so we're just hoping we can get our trees through the year with our wells."

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Chico farmer and winemaker Berton Bertagna is worried about water allocations for his 600 acres of orchards.
PHOTO BY MELANIE MACTAVISH

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