

Running dry: How the drought is forging a new California

By Carolyn
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Science

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Californians are living through a slow-motion natural disaster, a four-year drought that is combining with record heat to challenge the state in unprecedented ways.



Photo: Leah Millis, The Chronicle

A dust devil makes its way across hot land made white from dried minerals as a result of the natural lake-bottom buildup and evaporation process April 10, 2015 near Kings County, Calif. The land is situated in part of the San Joaquin Valley that used to contain the Tulare Lake, the largest freshwater lake in the western half of the continental United States. The lake was dried up by the year 1900 due to emerging agriculture in the region.

At the height of the Dust Bowl years of the 1930s, 5.7 million people lived in California. We now number nearly 40 million, our lives made possible by cheap, abundant water. But now the landscape is changing, nowhere more so

than in the Central Valley, where the competition for water between farms, nature and cities and towns is direct and acute.

Reported over two months this spring, these stories show a California struggling with a relentless new reality whose dimensions are just beginning to come into view.

EAST PORTERVILLE, Tulare County — Yolanda Serrato remembers the exact moment her tap went dry.

It was 11 months ago. Serrato, 55, stood watering her lawn and palm trees around the home she and her husband bought in East Porterville, the harvest of a life's work in the vineyards of Tulare County. Their water came from a 60-foot well.

Neighbors had already run out of water. But Serrato wasn't worried.

"I had a lot of pressure," she said. "I thought, 'I'm not going to run out of water.' So I was watering my yard. My yard was green. In July, it was green, green. And all of a sudden, just air started to come out of the hose."

California drought

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Disbelief ensued. Then panic. Then an awful new reality: Bathing from buckets hauled from outside. Family visits to Burger King restrooms. The impossibility of financing a deeper well, the hopelessness of selling a house without water. Her garden is now dust.



"Go to your house and turn off your water valve," Serrato said. "You won't last a day."

In the epic drama of California's drought — the end of lawns, the end of fish, the end of farms — the one bright certainty is that California will never actually run out of water.



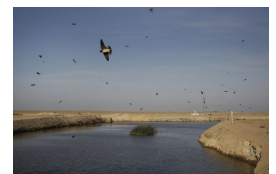
Maybe that's true in the abstract, but water gets specific very fast when it's your hose.

As water grows scarcer, Californians must decide how to parcel out a shrinking inheritance. There will always be some water. How much is unknown. How it's divided has consequences.



New world

California is showing what climate change looks like, drier and hotter than anything modern humans have experienced. The four-year drought is the worst in the instrument record, and by tree-ring and other measurements, the worst in 1,200 years.



Under the drought's relentless force, the conflict among the state's three primary water users — farms, cities and nature — is intensifying. Something has to give, and it is.

Species are going extinct. Farmers are draining aquifers to stay in business. Thousands of people have lost their water sources — in Tulare County alone, officials report, 1,244 households' wells had run dry by mid-May.

Centuries-long mega-droughts of the Middle Ages are a preview of what's to come, scientists say, giving pause to vague sureties that California will figure out a way, as it always has.



'It's scary'

"I think it's scary," said John Holdren, President Obama's top science adviser. "There are some folks who are writing about this and saying, 'You know we've always adjusted, we will adjust, it'll be fine.' But those adjustments don't happen automatically, and they're not cost-free."



Photo: Leah Millis, The Chronicle

Water slides that are used as part of a local business that runs completely off of recycled water May-Sept. can be seen dry during the off season April 9, 2015 in Tulare, Calif.

California engineered its way into existence, taking water from the wet north and delivering it to the dry south through a maze of dams and aqueducts. That plumbing supports more people and a vastly bigger economy than when it was put together in the last century.

With guarantees of water from that plumbing drying up, Californians are furiously draining groundwater, the state's buffer against catastrophe. Jay Famiglietti, a senior water scientist with NASA's Jet Propulsion Laboratory, says satellite measurements show aquifers declining at a "frightening" speed.



Photo: Leah Millis, The Chronicle

Image 1 of 7

Lizette Serrato, 25, checks out the waning health of her mother Yolanda Serrato's remaining fruit trees in their backyard in Porterville (Tulare County). Yolanda Serrato's well ran dry while she was watering her lawn in the summer of 2014. Her family recently received a large tank that holds about two weeks' worth of nonpotable water. More than 500 wells have gone dry in East Porterville since the beginning of the drought four years ago. The Porterville Area Coordinating Council has provided homes that have run out of water with 300-gallon tanks and the city has been filling them while the county replaces the small tanks with larger 1,500-2,500-gallon tanks as part of the county's household tank program. The larger tanks are filled every two weeks and the city has also been providing residents who sign up for the program with bottled water.

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How much water is left in the aquifers, no one knows. But "it's very difficult for people to even perceive that there's a problem," Famiglietti said — not when you look outside "and there's plenty of green and water's still flowing from the

taps.”

Pointing fingers

A journey through the drought’s epicenter in the Central Valley turns up cliches and contradictions, and assumptions that someone else’s sacrifices will solve the problem.

Some blame almond trees, which farmers are planting in abundance, saying each nut consumes a gallon of water. Yet presumably less wicked delicacies such as navel oranges do not spring from dry dirt. Nothing does. A glass of Chardonnay requires 18 gallons to produce, a cheeseburger nearly 700 gallons, the Sunday paper about 80.

The priciest water in California is no more than a penny a gallon. Primitive markets often are unable to send water from where it is squandered to where it is desperately needed.

Water is being wasted to the sea, farmers say, as if rivers are not supposed to reach the ocean. What by all accounts is truly being wasted is the wastewater of coastal cities like San Francisco, whose residents use pure Sierra runoff to flush their toilets.

“We discharge 1.5 million acre-feet of wastewater into the ocean,” said Lester Snow, executive director of the nonprofit Water Education Foundation. “I resist the idea that the way we can better hose off our sidewalks in our cities is by taking agriculture out of production.”



Photo: Leah Millis, The Chronicle

A dead tree sits on the edge of a recently harvested field just off of the San Luis Canal at sunset April 9, 2014 near Huron, Calif.

Dying fish

Misguided environmentalists worried about the endangered delta smelt are forcing farmers to fallow fields, politicians insist, but a lengthening line of bigger and lovelier fish like salmon and sturgeon are dying alongside the loathsome minnow that farmers blame for their woes.

“If the smelt goes extinct,” said UC Davis fish biologist Peter Moyle, “you have five other listed fish that will just move up the queue.” He counts 60 species of native California fish that may soon be eligible for listing as endangered or threatened.

City dwellers say farmers should not be farming a desert, but do not suggest that the Bay Area be relocated somewhere wetter. Farmers say they have made the desert bloom to feed the nation, but that desert was once a vast seasonal wetlands and prairie, remembered in books as “the American Serengeti” before its water was cut off.

Cities sprawl

Agriculture’s permanent tree and vine crops are blamed for “hardening” water demand because they cannot be fallowed during droughts. But lying in plain sight is the biggest permanent crop of all: people in burgeoning cities sprawling over floodplains and foothills, with plans for more.

Highway 99 runs like a Maginot Line through Modesto, where California Farm Bureau President Paul Wenger and others battle to keep the malls and subdivisions from spilling over to the prime farmland, including his walnut groves.



Photo: Leah Millis, The Chronicle

Lizette Serrato, 25, fills up glasses with drinking water for dinner using a City Council donation, a “DewPointe” machine that converts humidity from the air into water at the Serrato home in Porterville (Tulare County). Yolanda Serrato’s well ran dry while she was watering her lawn in the summer of 2014. Her family recently received a large tank that holds about two weeks’ worth of nonpotable water. More than 500 wells have gone dry in East Porterville since the beginning of the drought four years ago. The Porterville Area Coordinating Council has provided homes that have run out of water with 300-gallon tanks and the city has been filling them while the county replaces the small tanks with larger 1,500-2,500-gallon tanks as part of the county’s household tank program. The larger tanks are filled every two weeks and the city has also been providing residents who sign up for the program with bottled water.

“Once there’s houses on it, they’re going to have water,” Wenger said. “Those people expect water to come out of their tap.”

Yolanda Serrato was once like everyone else in such houses, taking for granted that the tap would always provide. Now her water comes from a tank hooked up to her house’s system, and she speaks with newfound scorn of a neighbor who is “always washing the cement with the hose. She has a really big well. She thinks she’s not going to run out of water like we are.”

Serrato refused to believe, against all evidence, that her well could go dry. She didn’t know the name of the Tule River that it tapped. Both are now dry, and she has discovered the one uncontested truth of an arid land: “Water. It’s a necessity.”

Most Californians are still standing where she was with her hose last summer.

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