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## For some Californians, effects of punishing drought not over

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By: Scott Smith

HANFORD, Calif. — Knee-high tufts of grass dot the streets of Hardwick, a rural neighborhood with a few dozen homes hemmed in by vineyards and walnut and almond orchards in California's agriculture-rich San Joaquin Valley.

Nearby, the Kings River — swollen with rainwater and Sierra Nevada snowmelt — meanders through fields. Water is abundant in the river but it may not last.

Despite winter storms that have turned much of California's parched landscape to vibrant green, the drought has yet to loosen its grip on thousands of residents in the valley. Many people must still use water stored in large tanks in their yard to wash dishes and bathe.

Scientists at Stanford University and NASA say excessive pumping of wells during the drought has tapped out some underground sources of water that will never recover.

At the height of the drought, nearly 2,400 wells dried up, affecting 12,000 people, state officials said.

The drought emergency remains in effect in Kings, Fresno, Tulare and Tuolumne counties, even after one of California's wettest winters in years prompted officials to declare an end to the historic, five-year dry spell in nearly all of the nation's most populous state.

David Miguel relies on water from a large, black emergency tank located just steps from the front door of his mobile home. A water delivery truck tops it off every few weeks.

"You can take a bath with it, do dishes — no problem," said Miguel, a 64-year-old retired farm hand who was raised on his family's long-gone dairy operation in Hardwick. "I wouldn't drink it."

Miguel and his neighbor survive on the trucked-in water and deliveries of bottled drinking water. They live in the last two Hardwick homes awaiting a state grant to hook into a reliable water main.

Miguel doesn't know when his home will get connected to the new 470-foot community well outside the county fire station, but he anticipates a \$50 monthly water bill — more than it costs to run his own well.

Miguel laughed when asked what he thinks about Gov. Jerry Brown's recent declaration that the drought is over for most of California.

"Oh, is that so?" he joked.

Keeping the emergency declaration in place in a few areas allows officials to prolong efforts to find permanent water supplies for desperate residents.

In parts of the San Joaquin Valley, underground aquifers — layers of earth saturated by water — collapsed from over-pumping during years of dry weather, according to scientists at Stanford and NASA who studied satellite imagery to measure sinking land.

They say layers of clay soil have compacted, permanently reducing natural aquifer storage capacity.

Throughout the San Joaquin Valley, the situation has left roughly 900 homes relying on storage tanks for residential water.

Emergency water tanks for residents have cost the state nearly \$28 million since 2014, with more than half in Tulare County.

Calls for help have slowed significantly, said Susan Atkins of Self-Help Enterprises, a nonprofit organization that helps residents get tanks and navigate government bureaucracy.

"But they're still coming in," she said about the calls.

In Hardwick, which has no sidewalks or streetlights, residents say their wells began drying up after farmers on three sides of the community dug deep wells to irrigate their orchards during the drought, when water from rivers and canals was scarce.

Resident Alvin Lea said his 120-foot well that was drilled in the 1960s dried up, costing him \$17,000 for a new one that was more than 100 feet deeper.

Lea, 77, a retired mechanic, keeps his swimming pool full for his great grandchildren to play in during scorching summer days. He raises 200 exotic birds, which also need to drink, he said, tipping back the brim of his hat to peer at them through a wire mesh enclosure.

Randy Herman, a long-distance trucker with a family, says it's obvious to him that his community is a long way from rebounding from drought.

After his well ran dry, he connected to a large water tank before finally hooking up to the community well. Not all of his neighbors are so fortunate, he said.

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