High Country News

FOR PEOPLE WHO CARE ABOUT THE WEST

One in 30 wells in the West failed in recent years

New research shows just how many wells ran dry between 2013 and 2015.

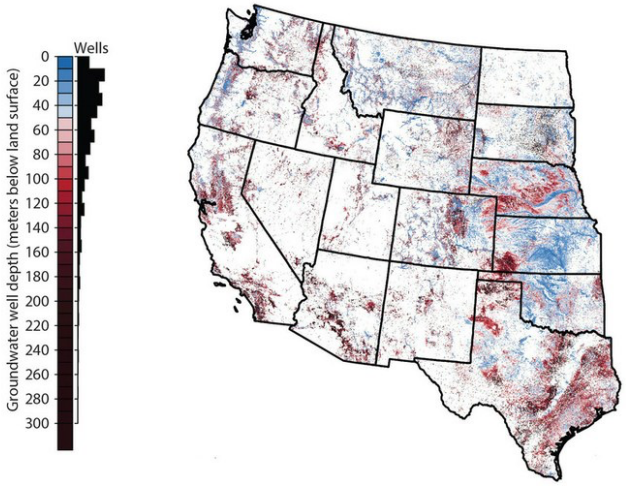
Emily Benson | **NEWS** | **Oct. 13, 2017**

When their taps began spitting out air instead of water a few years ago, one family in Paso Robles, California, was forced to snake a hose from a neighbor's property (http://www.desertsun.com/story/news/environment/2015/12/10/california-overdraft/76372340/) into their home for drinking water. They ate from paper plates instead of dishes, could no longer wash their laundry at home and watched their vegetable garden dry up. For households that rely on well water — a common situation across the rural West — the impacts can be severe when a well runs dry.

Stories like that one streamed out of California during the drought that officially ended earlier this year (http://www.hcn.org/articles/californias-drought-may-be-over-but-water-problems-remain), but the extent of the problem — exactly how many wells were affected — was unclear. Now, new research suggests that one in 30 groundwater wells in the West, wells that supply farms in addition to homes, went dry between 2013 and 2015 (http://iopscience.iop.org/article/10.1088/1748-9326/aa8ac0).

To arrive at that number, California-based researchers Debra Perrone and Scott Jasechko compiled location and depth records for wells constructed between 1950 and 2015 across Western states. Counting the number of wells that were shallower than nearby groundwater levels allowed them to estimate how many had run dry. The scientists identified 3.7 million well records overall, about three-quarters of which supply drinking water; about one-quarter are for

agriculture. (Industrial use accounts for the remaining 4 percent.) “The sheer number of dots on our map illustrates the importance of groundwater to millions of people,” says Perrone, a postdoctoral researcher at Stanford University.

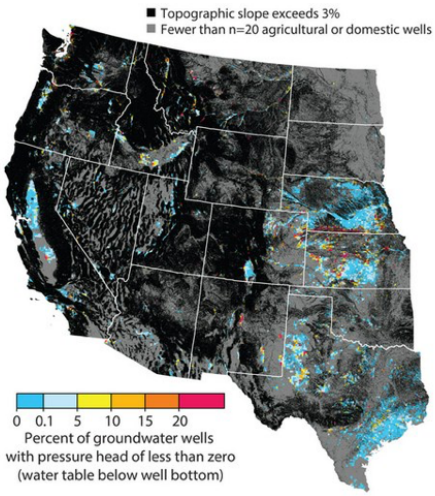


About 2 million well records included the depth of the well. Red dots represent deeper wells. Blue dots indicate shallower wells, which are more susceptible to drying. Data were unavailable for parts of California’s Central Valley at the time of the analysis, yet effective groundwater management requires consistent and reliable information across regions, Perrone says.

Perrone & Jasechko 2017 / CC

Groundwater accounts for about 20 percent (https://pubs.usgs.gov/circ/1405/) of the water used nationwide, but in many places, it’s being sucked up from aquifers faster than it’s being replenished. According to U.S. Geological Survey data from 2010, the most recent year for which data are available, pumping rates in the West were highest in California’s Central Valley, Idaho’s Snake River Plain, and the High Plains of Nebraska, Kansas and Texas.

Over-pumping intensifies during droughts, when dwindling rivers and reservoirs mean water users rely more heavily on groundwater. That can disrupt ecosystems, collapse overlying ground, buckle roads and canals, allow seawater to infiltrate aquifers — and dry up wells.



Colored portions of the map show the estimated percent of wells that were shallower than the nearby water table between 2013 and 2015; in other words, wells that likely ran dry.

Perrone & Jasechko 2017 / CC

"Drought highlights how important groundwater resources are," Perrone says, but combating declining groundwater levels requires management during both wet and dry periods. Because aquifers often cross state lines and other political boundaries, region-wide groundwater policies are necessary, Perrone says. Such policies might include things like permitting water withdrawals, collective fees designed to reduce groundwater use (http://www.hcn.org/articles/after-years-of-drought-and-overuse-a-water-basin-refills-in-the-san-luis-valley), water markets, and aquifer recharge programs.

Some regions where Perrone and Jasechko identified many dry wells are improving. During last year's wet winter, for example, a recharge program in Idaho added 317,000 acre-feet of water to the Eastern Snake River Plain Aquifer (http://geology.isu.edu/Digital_Geology_Idaho/Module15/mod15.htm), which spans nearly 11,000 square miles. "The trick is being able to do that over the long term," says Wesley Hipke, the Idaho Department of Water Resources employee who manages the program. It's especially important to add as much water as possible during wet years, he says, to make up for years when water is less abundant.

Idaho's program is still relatively new — last winter was the third year of full-scale operation — but, combined with a 2015 agreement to reduce pumping and promote recharge (http://www.capitalpress.com/Idaho/20150812/idaho-groundwater-entities-all-support-aquifer-

agreement), officials hope to keep boosting the aquifer. Lessons learned from Idaho's program could be a model for other places. "Every state needs to grapple with this," Hipke says, "especially in the West."

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