

2014 was California's hottest year, and it wasn't even close

By Kurtis Alexander

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Photo: Michael Short, File Photo

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Due to the ongoing drought, receding waters at the Almaden Reservoir have revealed a car that was illegally dumped years ago and is now stuck in the lake bed, in San Jose, CA, Thursday, January 16, 2014.

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Lea Markegard, 12, puts down her lamb Cottonball in front of her family's home Nov. 4, 2014 in Half Moon Bay, Calif. After the lamb was the only one of a set of triplets rejected by its mother, Lea took on the responsibility of raising it. The Markegards started their grass-fed business nine years ago on 1,000 acres of land they've leased for years in Half Moon Bay. Their business offers locally born, raised and processed certified grass-fed beef and lamb, and pasture raised pork and dairy. The couple also have four children that they home school. As the drought worsened

this year, they saw their 16 water sources shrink to just one. They’ve had to move their 4-500 head of cattle to land leased off the property because all of the water sources on their land have dried up, including the spring that used to provide water for their home. Now they have to haul in water for their family once about every three weeks. “We watch every drop,” said Doniga about their water conservation. Because their business is so small and the cattle are so specially raised with the least amount of handling to provide them the best lives possible, moving them around to different grazing lands is a hardship. Normally this time of year, Doniga would be picking up a second part-time job to help supplement the family’s income. But now, there’s just no time. “At this point, I’ve maxed out the amount of time and energy I’m willing to put into leasing land,” Doniga said. If the drought does not let up, the couple will be forced to sell the herd they’ve been building for 10 years.

California not only sweated through its hottest year on record in 2014 but obliterated the previous mark by nearly 2 degrees, federal scientists said Thursday, while experiencing firsthand some of the worst fears of a warming planet — from intensified drought to melting snowpack.

The state’s average temperature last year was 61.5 degrees, more than 4 degrees above the 20th century average, the [National Oceanic and Atmospheric Administration](#) reported. The previous hottest year was 1934, at 59.7 degrees, though many of the balmy periods have come more recently, with seven of the 10 hottest years within the past two decades.

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“There’s a very clear warming trend in California,” said [Noah Diffenbaugh](#), an associate professor of environmental Earth system science at [Stanford University](#) who studies climate change. “And not only are we seeing clear evidence of global warming and its impacts, but we’re now seeing the impacts of global warming right here in western North America.”

Scientists say rising temperatures have sometimes contributed to smoggier air, stunted growth of plants, extreme weather events and other abnormalities in the Golden State, but the biggest impacts recently have come with the crippling drought. Though many are hesitant to blame the state’s three-year dry spell on global warming, consensus is that hot weather has exacerbated the situation — for example, by increasing evaporation.

“The warm year in California did make the drought conditions worse,” said [Jake Crouch](#), a climate scientist at NOAA’s [National Climatic Data Center](#). “The drought and the heat kind of reinforced each other.”

While acknowledging the connection between temperature and dry times, a study led by NOAA, released in December, concluded that the cause of the drought was not man-made warming, but naturally changing ocean conditions. Other research, however, has suggested a link between climate change and the high-pressure weather system that hung over the Pacific Ocean in recent years and steered storms away from California.

The state’s lack of precipitation also combined with last year’s warm temperatures to make for very little snow in the Sierra. As of Thursday, the state’s snowpack, which is vital because it provides the bulk of California’s water supply, was just 41 percent of average. Long-term studies suggest that snowpack in Western states has been in decline since the 1950s.

Dirty Air

Rising temperatures can also damage air quality. Seyed Sadredin, the executive director of the San Joaquin Valley Air Pollution Control District, said it’s hard to parse out the impacts of heat and drought, but that the combination helped make 2014 one of the dirtiest years in decades.

Dry weather fueled stagnation and temperature inversions, Sadredin explained, trapping in pollutants, most significantly in the Central Valley and Los Angeles area. A lack of storms, meanwhile, kept bad air from clearing out, he said.

“Theoretically, of course, if we do get a rise in temperatures that’s a recipe for an increase in ozone and smog ultimately,” he said. “But we shouldn’t reach to broad conclusions yet.”

Since the valley air district has little control over the weather, it has sought to cut vehicle and industrial emissions in the region.

“Because of all the work that has been done by business and the public, that’s what really saved the day,” he said.

Temperatures, of course, have varied over the centuries. But human activities in the past 100 years, namely the burning of fossil fuels and deforestation, have increasingly added carbon dioxide and other greenhouse gases to the atmosphere and trapped heat. Scientists expect temperatures to continue to climb.

On Monday, Gov. [Jerry Brown](#) announced a plan for California to attack warming by increasing the amount of electricity derived from renewable sources from 33 to 50 percent and reducing the state’s reliance on petroleum products by half.

The state already leads the nation in climate regulation.

Long-term trend

Last year, California was among three other Western states — Nevada, Arizona and Alaska — that experienced their warmest year since NOAA’s record-keeping began in 1895, the data show.

Anchorage, Alaska, boasted the anomaly of not seeing a single day last year below zero degrees for the first time in the 101 years of records there.

The heat in the West helped to push the average nationwide temperature above the 20th century average for the 18th year in a row, according to NOAA. The contiguous United States recorded its 34th warmest year in 2014 with an average temperature of 52.6 degrees.

The nationwide average wasn’t higher because much of the eastern United States experienced cooler weather last year compared with the rest of the nation — and the world — the data show.

NOAA also reported Thursday that last year’s weather included eight disasters in the U.S., each causing more than \$1 billion of damage: six severe storms, flooding in Michigan and the Northeast, and the drought in the West. Scientists generally agree that extreme weather events are more likely as the planet warms.

NOAA plans to release global temperature data next week, but already one of four major international weather services is chalking up 2014 as the planet’s hottest.

The [Japan Meteorological Agency](#) reported this week that the average worldwide surface temperature was 1.1 degrees warmer last year than the 20th century average — and the warmest since the agency’s record-keeping began in 1891.

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