

California drought: El Niño could bring big storms next winter, new report says

By Paul Rogers

progers@mercurynews.com

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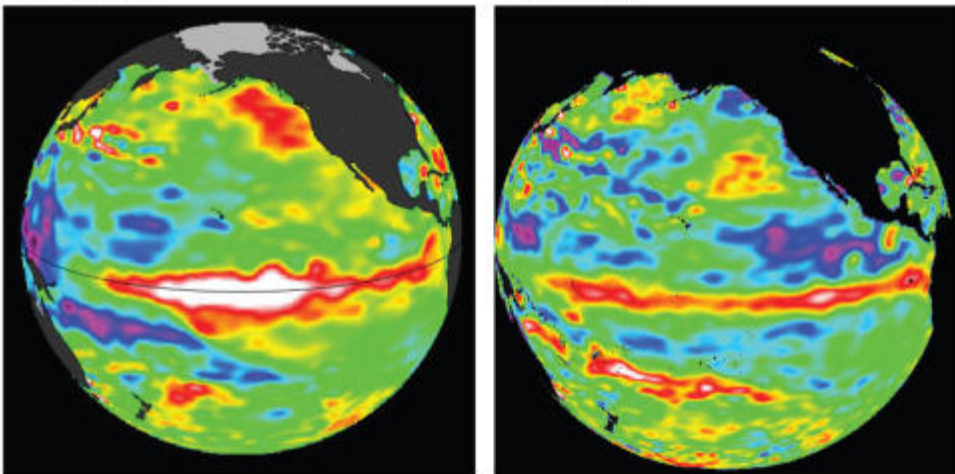
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Sign of a wet winter ahead?

Depicted in these images as a red and white band at the equator, a Kelvin wave is an area where the sea is warmer in its upper layers and the surface is several inches higher than normal. The condition is often a precursor of an El Niño winter, which can bring heavy rain to California. When large Kelvin waves occurred in spring 1997, rainfall the following winter was double the average.

March 22, 2014

April 25, 1997



Sea level compared to normal



Source: NASA Jet Propulsion Laboratory

KARL KAHLER/BAY AREA NEWS GROUP

Raising hopes that California's severe drought could end with a series of soaking storms next winter, federal scientists on Thursday announced there is now a 2-in-3 chance of an El Niño climate pattern developing in the Pacific Ocean by the end of this year.

"We're seeing a pretty strong tilt toward El Niño," said Michelle L'Heureux, a meteorologist with the National Oceanic and Atmospheric Administration's Climate Prediction Center in College Park, Md.

But what could end one extreme could begin another: Researchers are particularly intrigued by an enormous mass of warm water flowing through the Pacific that has been linked to heavy winter downpours and flooding in the past.



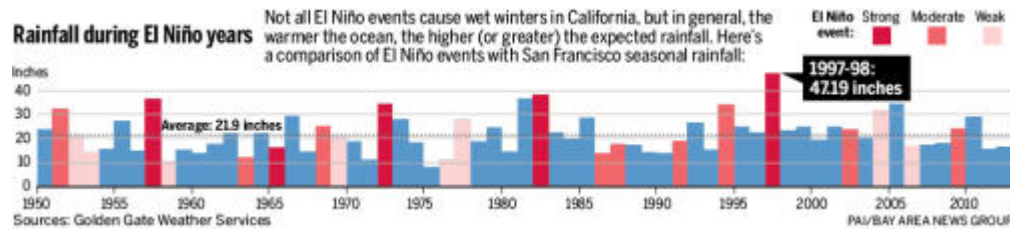
The Golden Wheel mobile home park on Oakland Road in San Jose in February 1998, an El Niño year. (Mercury News)

On Thursday, NOAA meteorologists increased the likelihood of El Niño conditions to 66 percent by November -- up from 52 percent last month, based on computer models and measurements from buoys, satellites and other equipment.

During El Niño events, water temperatures in the Pacific near the equator are warmer than normal at the surface. The warmer the water, the greater likelihood of wet winters in California.

Although researchers cautioned there's no guarantee that next winter will be more rainy than normal, scientists point to the emerging water mass near the equator, known as a Kelvin wave, that is as large as the United States and is slowly moving from Indonesia toward South America, with subsurface temperatures up to 10 degrees Fahrenheit warmer than historic averages. Such waves, named after Lord Kelvin, the 19th-century Irish physicist who discovered them, are only a few inches high and are often linked to the start of El Niño winters because their warm undersea waters can bubble up to the surface, affecting the weather.

"Considering the desperate situation we are in here in the American West, wouldn't it be sweet if the great wet hope came riding over the horizon on these Kelvin waves?" said Bill Patzert, a research scientist and oceanographer at NASA's Jet Propulsion Laboratory in Pasadena.



The Kelvin wave now in the central Pacific is larger and warmer than any since records were first kept 35 years ago -- even exceeding the Kelvin wave of 1997-98. That winter was the last major El Niño event, when rainfall across California was double the historic average, rivers flooded and mudslides closed highways. Seeing similar conditions shaping up, even early in the year, is attracting scientists' attention.

"This is really one of those unusual situations," said Daniel Swain, a Stanford University doctoral candidate in the Department of Environmental Earth System Science who is tracking the trend on his blog, weatherwest.com. "We think there's an enhanced risk of a strong El Niño event. Certainly no guarantees, but this isn't something we see every year or even every decade."



The deck of a Pacifica home hangs precariously over an eroding bluff in February 2008, during a winter of heavy storms. (Associated Press)

California suffered through the driest year in its recorded history in 2013. And this rainy season is the third in a row with below-average precipitation.

Although there were decent rainstorms in February and March, California is still under a state-designated drought emergency. Precipitation totals this season are still below half of the historic average in most major cities, including San Jose at 44 percent, Oakland at 49 percent, Los Angeles at 43 percent and Fresno at 40 percent. The fire risk this summer will be extreme.

Equally ominous, the Sierra Nevada snowpack, a key source of water for farms and cities, is only 33 percent of the historic average. And California's major reservoirs, including Shasta, Oroville and Folsom, although boosted a little by the spring rains, are still only half full

heading into the dry summer months. Many communities have already put in place summer conservation rules to save dwindling supplies.

NOAA scientists say the trend toward El Niño conditions also includes a shift in the Pacific trade winds. Winds that normally blow east-to-west are dying down. And winds that blow the other way and bring tropical weather, are cropping up. However, those conditions could still change, scientists say.

"The question of whether you'll get more rainfall and how much you'll get is very much an open question," L'Heureux said. "Right now the trend is more encouraging for rainfall in California than it has been in the past several years, but there's no guarantee."

One thing is clear: Not all El Niño years are created equal.

Since 1951, there have been five winters with strong El Niño conditions. In four of them, rainfall between the Bay Area and Bakersfield was at least 40 percent more than normal. Some of California's wettest winters occurred during those winters, including 1982-83, when mudslides killed 10 people along Santa Cruz County's Love Creek and San Jose's Coyote Creek burst its banks, flooding Alviso under 8 feet of water.

In more moderate El Niño years, when ocean waters are only slightly warmer than normal, rainfall sometimes is above average, but just as often it's below average. For example, during a moderate El Niño in 2002, Northern California rainfall was just 3 percent more than normal. And in a similarly moderate El Niño in 1986, rainfall was just 60 percent of normal.

Scientists now are closely watching the Pacific and will know with more certainty in two or three months what the winter should bring. For now, all the trend lines are showing a greater likelihood of a wet winter than a dry one, particularly with the massive Kelvin wave still moving.

"Don't hyperventilate yet," Patzert said. "It's a little too early to say the drought will be over, but this Kelvin wave is no dud. This is a stud."

Paul Rogers covers resources and environmental issues. Contact him at 408-920-5045. Follow him at [Twitter.com/PaulRogersSJM](https://twitter.com/PaulRogersSJM).