Strong El Niño?

By John Benson

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1. Introduction

El Niño is coming "soon" and it could reach "very strong" levels later this year, according to a May 14 forecast released by climate scientists from NOAA's Climate Prediction Center (below).[1]

El Niño is likely to emerge soon (82% chance in May-July 2026) and continue through Northern Hemisphere winter 2026-27 (96% chance in December 2026-February 2027).

This and other forecasts are raising alarms globally because of the pattern's powerful influence over the world's weather. This includes its often-dramatic impact on hurricanes, where it can suppress the number of storms that form in the Atlantic basin but boost those in the Pacific.

2. Effects of Most Recent Strong El Niño

According to the NOAA California Current Integrated Ecosystem Assessment's annual report, the California Current Ecosystem pulled out of a strong El Niño pattern in 2024. That El Niño delayed the onset of the annual spring upwelling of nutrient-laden water that, was nevertheless strong enough to fuel the rich West Coast ecosystem and improve environmental conditions for salmon.[2]

NOAA Fisheries scientists presented the report to the Pacific Fishery Management Council to inform upcoming decisions on fishing seasons. The report provides a snapshot of ocean conditions, fish population abundance and habitat, and fisheries landings and fishing communities' conditions. It gives short-term forecasts and longer-term projections of how conditions across the ecosystem may evolve in 2025 and beyond.

2.1. Report Highlights

- *Upwelling resumed even more strongly and consistently than normal, supplying a greater influx of nutrient-rich waters that improved forage conditions for many species*
- *Productive waters supported abundant forage species such as anchovy and krill and strong production of young hake and juvenile rockfish that could contribute to commercial fisheries in future years*
- *Improved freshwater stream-flows should support survival of juvenile salmon migrating downstream in California to the ocean*
- *California sea lions found enough prey amid the El Niño warming, while experiencing harmful algal blooms that led to premature birth of pups and strandings along the coast*

[1] https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml

[2] NOAA Fisheries, "El Niño Yields to Upwelling in the California Current, Renewing Productivity of West Coast Ecosystem," March 07, 2025, https://www.fisheries.noaa.gov/feature-story/el-nino-yields-upwelling-california-current-renewing-productivity-west-coast-ecosystem

"Each year we learn more about how this marine ecosystem functions and what we should be watching to anticipate change," said Andrew Leising, a research oceanographer at NOAA Fisheries' Southwest Fisheries Science Center who coauthored the new report. "We're getting better at forecasting what is coming at us, at the same time we see some new twists."

This year (2025), though, cooler coastal waters should improve survival of young salmon entering the ocean in California. It could also promote improved Chinook salmon returns to the Columbia River system. The report predicted positive expectations for 2025 Columbia Chinook returns and better conditions for California salmon smolts migrating down rivers to the ocean.

The report adds that catches of juvenile yearling coho salmon were above average for a second straight year. This suggests an increasing five-year trend in their early marine survival.

The weight and growth of California sea lion pups in 2023 was slightly lower than usual. The renewed upwelling in 2024 supported enough forage species for above average pup survival. However, harmful algal blooms off Southern California produced a neurotoxin called domoic acid that affected sea lions in some rookeries and haul-outs. Many pups were born prematurely, and many were stranded on beaches, sometimes with seizures caused by the neurotoxin.

3. Potential Effects of Upcoming Strong El Niño

- *A potentially historic super El Niño could develop by late fall (2026).*[3]
- *For Southern California, the phenomenon could bring a wet winter that tamps down wildfire risk but also may trigger flooding, debris flows and coastal erosion.*

You're going to hear a lot about El Niño this year.

The term refers to warmer-than-average waters along the equatorial Pacific that can influence weather across the globe, raising the odds of searing drought in some regions and torrential rain in others. Indicators increasingly suggest such an event will develop later this summer, and it's possible it could be the strongest of the century to affect Southern California.

The prospect has been lighting up meteorology forums and bubbled into the mainstream consciousness this week with the release of an outlook by the European Center for Medium-Range Weather Forecasts indicating that sea surface temperatures could exceed the seasonal average by 2 degrees Celsius. A subsequent forecast released Thursday by the National Oceanic and Atmospheric Administration puts the odds of that happening by late fall at 1 in 4.

Some call El Niños that pass this threshold of warming super El Niños — relatively rare occurrences that are more likely to generate wide-ranging effects. "It's essentially the upper echelon of El Niño events," said Jonathan O'Brien, meteorologist with the U.S. Forest Service.

[3] Alex Wigglesworth, LA Times, "California may be in path of a 'super' El Niño. It could bring rain, floods, coastal erosion," April 9, 2026, https://www.latimes.com/california/story/2026-04-09/california-could-get-super-el-nino-heres-what-that-means

El Niño is one phase in a recurring global cycle known as the El Niño-Southern Oscillation (ENSO), with its counterpart being La Niña. This cycle occurs when changes in tropical wind patterns — or trade winds — allow a massive reservoir of sunbaked seawater to slosh east across the Pacific and up against the Americas.

This unusually warm water typically releases heat into the air, spiking global temperatures already climbing due to climate change from burning fossil fuels. It can also alter polar and tropical jet streams, sending storms on a path through Southern California and the southern United States, experts say.

The amount of warm water available for this year's event exceeds that in 1997-98, which was among the strongest El Niño events of the century, said Paul Roundy, professor of atmospheric science at the University of Albany.

That winter, a relentless string of storms caused flooding and debris flows in California, destroying homes, washing away roads and killing 17 people. Worldwide, a hurricane killed hundreds in Acapulco, and Indonesia recorded one of its worst droughts on record.

"If the signal continues to evolve as it currently is, it's possible that we achieve an event stronger than 1997," said Roundy, who predicts there's a roughly 20% chance that this year's El Niño is stronger than any other since the late 1870s, when an estimated 30 million to 40 million people died from droughts in Asia and the Middle East.

The latest NOAA outlook, released Thursday, forecasts a more than 90% chance that an El Niño will develop by fall and a 50% chance that it will be at least a strong event, said Nathaniel Johnson, a meteorologist at NOAA's Geophysical Fluid Dynamics Lab and a member of its El Niño-Southern Oscillation seasonal forecast team.

The transition could take place rapidly, he said, adding that some research suggests climate change is contributing to more frequent, extreme swings from La Niña to El Niño.

But even when strong El Niños do develop, they don't always translate into the weather conditions people have come to expect.

In 2015-16, a super El Niño was predicted — which some forecasters dubbed a Godzilla El Niño — but California's yearly rainfall totals ended up being about average, said state climatologist Michael Anderson.

But in 1982-83, when another super El Niño occurred, storms destroyed multiple piers and ripped away a 400-foot section of the Santa Monica Pier. The state's rainfall at the end of the year will be determined by more factors, such as the frequency and strength of atmospheric rivers, than whether it's technically an El Niño year, Anderson said.

In Southern California, strong El Niños increase the likelihood of wet winters that replenish water supplies and tamp down wildfire risk but can also unleash flooding, debris flows and coastal erosion. Still, the exact effects are impossible to predict.

El Niños typically strengthen the subtropical jet stream, meaning more of California's weather in the fall and winter months tends to come in from the south, as opposed to the north, bringing in warmer air that carries more moisture, said O'Brien, the U.S. Forest Service meteorologist.

This could help limit Southern California's wildfire potential in the fall and winter, something that is typically shaped by the presence of Santa Ana winds. El Niño tilts the odds toward the early arrival of the winter rainfall that could dampen the risk of those winds fanning flames, O'Brien said.

"We are cautiously optimistic that we will get rain in the fall that kind of preempts the Santa Ana winds and limits our potential heading into the fall and winter months of next year," he said.

The climate system in the tropical Pacific is naturally less predictable in March and April, and even the most advanced models can struggle to capture how conditions will evolve, Tim Stockdale, principal scientist at the European Center for Medium-Range Weather Forecasts, wrote in an email. The picture typically becomes clearer between late May and June, he said.

But it's not just creatures on land that have to keep an eye on El Niño.

The pattern, which can decrease the nutritional quality of plankton, is believed to have intensified the effects of an unusually warm blob of seawater along the California coast that persisted from 2013 through 2016, resulting in a mass die-off of sea lion pups whose starving mothers weren't able to produce enough milk to sustain them.

The sea lion breeding and pupping season is fast approaching at main rookeries such as the Channel Islands, according to Giancarlo Rulli, associate director of public relations for the Marine Mammal Center in Marin County. "Experts are eyeing current oceanography reports with a healthy level of concern," he wrote in an email.

3.1. Late Update

A super El Niño is increasingly likely later this year, and it could become record strong with potential global impacts on rainfall and temperatures from summer through winter, as well as the 2026 hurricane season. There is now an 82% chance that El Niño is likely to emerge over the next few months, up from the 61% chance estimated a month ago. And there's now a 96% chance that the climate pattern — characterized by warmer ocean waters in the central and eastern tropical Pacific — will be in force this winter, the National Weather Service's Climate Prediction Center said Thursday.[4]

The central and eastern equatorial Pacific waters continue a steady march toward El Niño following the La Niña that was in place since last summer. Note the warmer than average ocean water encroaching from both the east and west near the equator while the cool anomalies have faded since the middle of February.

3.1.1. Latest Model Forecasts

Various computer forecast models run this month continue to be bullish on this future El Niño.

For instance, the latest forecast from the European Centre for Medium Range Weather Forecasting has trended stronger for the upcoming El Niño compared to last month's forecast.

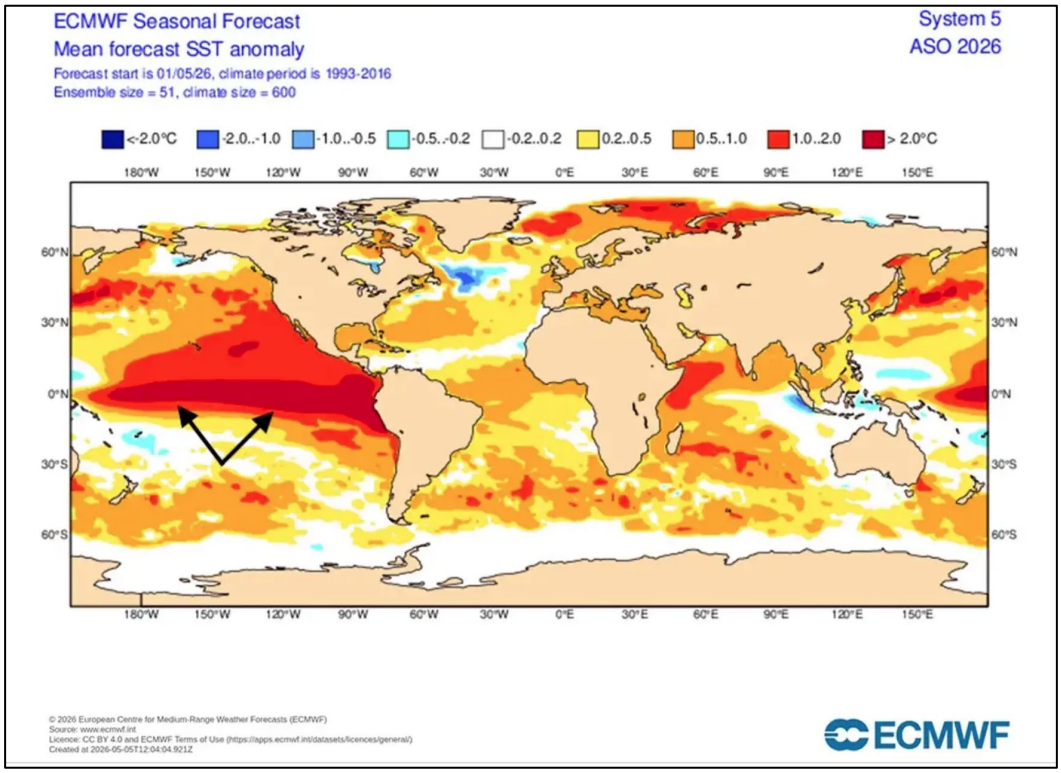
3.1.2. 'Super El Niño'

El Niño is a periodic warming of water in the central and eastern equatorial Pacific Ocean that can affect global weather patterns for months. There have been 27 El Niños since 1950, with one happening on average every three to four years. The last one happened from summer 2023 into early spring 2024.

[4] Jonathan Erdman, The Weather Channel, "A Super El Niño Is Increasingly Likely, And It Could Be Record-Strength." May 8, 2026, https://weather.com/news/climate/news/2026-05-07-super-el-nino-forecast-may2026

But this won't be your garden-variety, weak El Niño. The majority of model forecasts now suggest there is at least a 50-50 chance this El Niño could become a "super El Niño," one in which ocean surface temperatures are at least 2 degrees Celsius warmer than average.

These super El Niños are more rare. There have been only five since 1950, the last occurring 11 years ago from 2015-16. They also occurred in 1997-98, 1991-92, 1982-83 and 1972-73. Super El Niños have also been documented in 1888-89 and 1877-78.



3.1.3. Record Strength?

Several model forecasts now suggest this El Niño could eventually top out at least 2.5 degrees above average by autumn, placing it among the most intense on record.

"Confidence is clearly shifting higher on potentially the biggest El Niño event since the 1870s," wrote Paul Roundy, a University of Albany professor and El Niño expert, in a post on X Tuesday.

You can see this tongue of anomalously warm water forecast by the European model in the map above, stretching from the coast of South America to the central Pacific Ocean near the equator.

Another reason boosting confidence in this intense El Niño are surges of westerly winds near the equator in the western Pacific called westerly wind bursts.

"These periods of strong winds blowing west to east are pushing warm waters onto the equator and driving them eastward, contributing to rapid warming in the eastern Pacific," Roundy wrote in an earlier email to weather.com.

Roundy noted an early April burst was one of the strongest in at least several decades and in his same X post said, "The next substantial westerly wind event will likely occur during the last 10 days of May."

3.1.4. El Niño's Potential Impacts

El Niño (and its counterpart, La Niña) is only one influence on the global weather pattern. Also, every El Niño is different, much like every hurricane can have its own idiosyncrasies.

But, in general, the stronger the El Niño, the more likely it will impact global weather. Here are some of those potential impacts.

3.1.4.1. Hurricane season

A stronger El Niño tends to produce more sinking air and stronger wind shear in parts of the Atlantic Basin, both hostile to hurricanes.

So, in general, Atlantic hurricane seasons during strong El Niños are quieter than average. That's not always the case, as the 2023 season illustrated.

Meanwhile, eastern and central Pacific hurricane seasons are typically more active during strong El Niños.

3.1.4.2. Winter

In winter, the southern, or subtropical, branch of the jet stream usually is turbocharged in a stronger El Niño.

That means a wetter winter usually is the result across the southern tier of states from parts of California and the Desert Southwest to Florida and the Southeast. This could also mean more snow across these areas if the air is cold enough, as we illustrated in a previous deep dive.

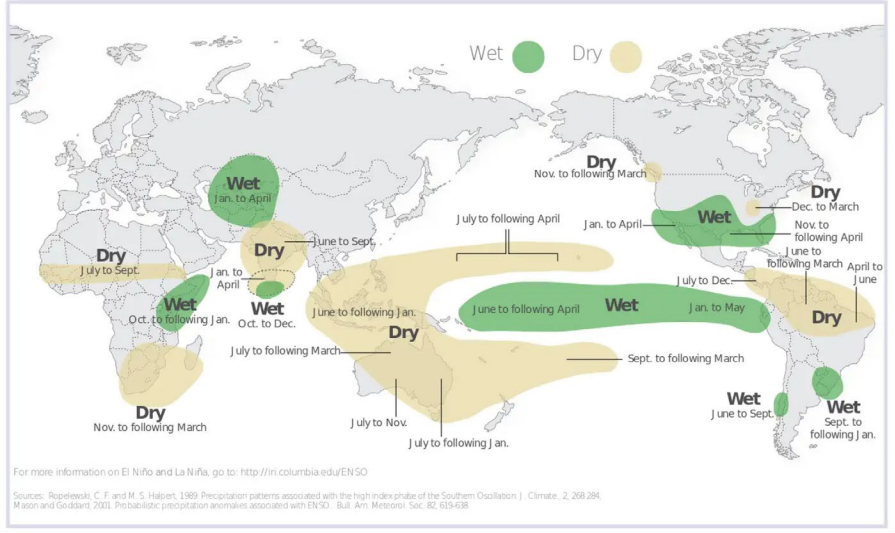
Meanwhile, much of the northern U.S. typically has a milder and drier winter during a stronger El Niño, from the Northwest and northern Rockies to the Northern Plains and Midwest.

3.1.4.3. Global Precipitation

El Niño's impacts typically extend around the globe. Those are highlighted on the map on the next page.

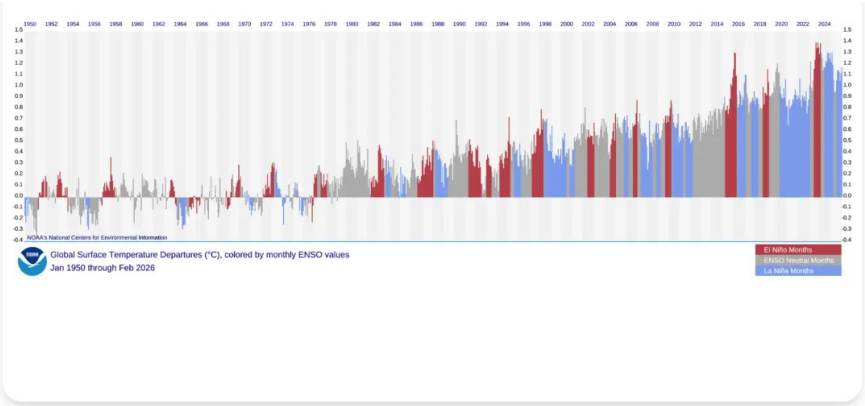
For example, parts of Africa, India, Australia, the Philippines, Indonesia, the Caribbean and northern South America trend markedly drier during El Niño.

On the other hand, warm water and lighter trade winds typically sets the table for heavier rain in parts of Ecuador and Peru. Parts of eastern Africa, central Asia, Chile, Uruguay and Paraguay are also usually wetter than average during El Niño.



3.1.4.4. Global Temperatures

One impact we're highly confident about is a spike in global temperatures during this El Niño. At the risk of oversimplifying, all this extra equatorial Pacific Ocean heat is released into the atmosphere, and all large swaths of drier conditions allow plentiful sunshine to heat the surface. As the graph below illustrates, the large majority of El Niños have triggered temperature spikes, including the last "non-super" El Niño in 2023.



Monthly global temperature anomalies in degrees Celsius from 1950 through February 2026. El Niño months are denoted in red, La Niña months are in blue, and months in a neutral phase are in gray. (NOAA/NCEI)

The previous super El Niño crushed previous global temperature records in 2015 and 2016. Those two years remain among the top 10 warmest years for the planet, all of which have occurred since 2015.

Given last year was the planet's third warmest year, it seems like a slam dunk that new heat records will be set in 2026, possibly again in 2027. From a climate change angle, this is worrisome.

A December 2025 study found super El Niño events can drive sudden "climate regime shifts" in both temperatures and precipitation, and that this effect could be increasing in a warming world.