Times Standard

Not My Fault: Here comes El Niño

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Photos from the California Coastal Records Project compare the Big Lagoon Park coastline in 1979 and 1987, before and after the super El Niño of 1982-83. About 55 feet of the bluff retreated and the nine houses nearest to the coast were moved inland. The arrow is pointing to the same house in both images.

The headlines are ominous: Super El Niño, El Niño Apocalypse, Wettest Winter on record, Mind-blowing El Niño. What will actually happen on California's North Coast is uncertain. Warmer ocean temperatures mean slightly higher sea level with greater potential for flooding and coastal bluff erosion. This winter may be wetter than normal; but it could be drier. There may be more and bigger storms; there might be fewer. In short, prepare as you should for any winter: clear your gutters and inspect your roof, remove tree limbs that could fall, check the grading near your home so that water doesn't accumulate along walls, store supplies of food, water, medicine for at least two weeks, and know how to get emergency notifications. If you are in or near a flood zone, learn where to get sandbags and how to use them now and not as the water level begins to rise.

El Niño means that water temperatures in the eastern equatorial Pacific are warmer than the long-term average. It is a natural part of the climate system, alternating with La Niña (colder

equatorial water) on a scale lasting roughly nine months to a year and occasionally longer. Water temperature drives the winds and climate and, from past El Niño years, we have a pretty good picture of the general weather impacts.

Water in the eastern Pacific is always colder than in the west because of the ocean circulation pattern. The Humboldt current in the southern hemisphere and the California current in the northern cycle cold waters from the polar regions towards the equator where they converge, move west and warm. Colder water means colder air and higher pressure; warm water causes the opposite. This pressure difference drives the trade winds and, the larger the contrast, the stronger the winds.

Warmer water in the eastern Pacific lowers the pressure difference between the eastern and western Pacific, weakening the trade winds. That can have dire consequences for much of the Pacific, and in some El Niño years, the trade winds can die out completely, never pushing the moisture laden winds to southeast Asia and Australia. Strong El Niño conditions don't only affect the Pacific region but cause droughts in the Amazon basin and southern Africa. Even parts of North America far from the Pacific can be affected as change in pressures can divert storm tracks from normal patterns.

El Niño Southern Oscillation or ENSO is the name for this complex pattern of weather deviations from normal and its relative strength can be measured. The most direct way is tracking surface sea temperature (SST) from NOAA's ocean buoy network, satellites, and commercial ships. The Relative Oceanic El Niño Index (RONI) is determined by subtracting the background temperature trend of the global tropical ocean belt from the SSTs off the coast of Ecuador and Peru. If the eastern Pacific waters are warmer than average, RONI is positive; colder than average gives a negative value and indicates La Niña conditions. I've simplified the process, if you want to dig deeper visit https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso/roni/pdf/roni-info-may-2026.pdf.

NOAA defines the strength of an El Niño or La Niña by its deviation from normal. Neutral conditions are a RONI value of ± 0.5° Celsius, strong is a deviation of 1.5° and very strong is in excess of 2° from the average. Only three very strong El Niño events have been documented since 1975: 1982-83 (NOAA's benchmark El Niño event), 1997-1998 (the expensive in modern times), and 2015 – 16 (largest heat anomaly).

There is plenty of evidence the ENSO cycle has been around for a very long time. The oldest written account goes back to Pizarro and his attempts to explore/conquer Peru in the early 16th century. It took him three attempts to find favorable winds to sail south from Panama. His expeditions in 1524 and 1526 were thwarted by slow progress, brutal weather, and lack of food. In 1531, El Niño conditions prevailed, allowing the Spanish ships to sail south relatively easily. Geology can extend the El Niño timeline much further back. Droughts in Egypt and Mesopotamia indicate periodic El Niño events in ancient civilizations and lake sediment records from the Andes show similar patterns of excess rainfall as the modern record.

The 2026 El Niño officially began on June 11 when NOAA's Climate Prediction Center issued an El Niño Advisory and RONI passed the +0.5 level. Since then, ocean temperature anomalies and wind patterns confirm a deepening El Niño and current forecast modeling gives a 97%

likelihood of persisting into the spring of 2027. Current RONI values are about 1° above average, and modeling gives an 81% probability of exceeding the 2° threshold for a 'super' event.

NOAA scientists aren't the only ones modeling this year's El Niño. A multi-model consensus estimates a 77% likelihood that 2026 will set an all-time RONI high with a maximum reaching +3.6° above average, outstripping the 2015 peak by more than a full degree. One degree of temperature change seems negligible to most of us, but its potential to change global weather is uncharted ground.

The three well-documented super El Niño events have a number of features in common: record-breaking rainfall (Peru and Ecuador), extreme drought and wildfires (Indonesia, Brazil, southern Africa), massive coral bleaching, fishery collapse in South America, damage to infrastructure from storms, all likely to occur this year. But it's difficult to forecast precise impacts and how an even stronger event might affect the world, especially as this year's event will coincide with hotter average temperatures and a higher sea level than previous events.

Modelers have been active trying to foresee the future. On the positive side, a strong El Niño usually means a weaker Atlantic hurricane season because they cause wind shear that suppresses hurricane formation. But nature isn't as kind in the Pacific where more tropical storms are likely, driven by increased heat in the eastern and central Pacific basins. Hawaii has been particularly hard hit in past events, both by drought when trade winds collapse, and by hurricanes from shifted storm tracks.

What about the U.S. West Coast? Two of the super El Niño events were very wet in Southern California, causing mudslides and coastal erosion. Expectations of similar impacts were high in the 2015 – 2016 El Niño, but rainfall that year didn't even reach normal levels. San Francisco was wet in 1982 and 1997, but near normal in 2015. In Seattle, temperatures are warmer, snowpack reduced, and rainfall generally less.

Eureka's El Niño history is mixed, sometimes wetter and sometimes drier. We are in the transition zone, and some events put us in the high precipitation zone and others in the low. In the 2015 El Niño, we were about 120% wetter than average. Atmospheric rivers are the primary driver of major flooding in our area and there appears to be no direct correlation between their formation and El Niño. Warmer oceans mean warmer air and a greater moisture-carrying, so a similar-sized storm will cause greater precipitation. But whether those storms materialize or not is an unknown.

Urban flooding is exacerbated by higher sea levels. Even without major storm events, king tides could produce more flooding. Higher sea levels also mean that waves can attack our beaches more easily, removing sand and triggering bluff failures. The 1982 – 83 super El Niño was an example of what might happen in the future. Winter storms usually remove sand from our beaches, moving it offshore. The greater wave activity in '82-'83 caused many of our beaches to retreat and in Big Lagoon, the loss of sand exposed the bluff to direct wave activity. There was some bluff retreat that year, but the biggest impacts occurred in the following two years when the bluff retreated 55 feet.

Big Lagoon Park Company community has an unusual mitigation method for coastal erosion. People own their cabins but not their land. If a cabin is in danger of falling off the cliff, it is hoisted onto a truck and moved inland to a spot where it is safe. In the severe bluff retreat of 1985, nine cabins were moved just in the nick of time, and none were lost. The bluff has been retreating at a much slower rate since then but could accelerate in the future.

I'm approaching this winter as I would any year. I don't know what the big disaster story will be – flooding, beach erosion, wildfire, earthquake, tsunami. Maybe we will be lucky, and it will be a quiet year for us but be prepared just in case. The Humboldt County Fair opens its 2026 run on Wednesday and the Redwood Coast Tsunami Work Group's Earthquake Tsunami Booth returns to Hindley Hall. This year we will be providing El Niño information in addition to seismic hazards. It's an easy and fun way to become prepared for all disasters.

Lori Dengler is an emeritus professor of geology at Cal Poly Humboldt, and an expert in tsunami and earthquake hazards. The opinions expressed are hers and not the Times--Standard's. All Not My Fault columns are archived online at https://kamome.humboldt.edu/taxonomy/term/5 and may be reused for educational purposes. Leave a message at (707) 826-6019 or email Kamome@humboldt.edu for questions and comments about this column or to request copies of the preparedness magazine "Living on Shaky Ground."