

# Increasing frequency of El Niño events expected by 2040

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Global weather fluctuations called El Niño events are likely to become more frequent by 2040, a new study shows.

El Niño—the unusual warming of surface waters in the eastern tropical Pacific Ocean—affects climate, ecosystems and societies worldwide.

The study examined four possible scenarios for future carbon emissions, and found increased risk of El Niño events in all four.

This means El Niño events and associated climate extremes are now more likely "regardless of any significant mitigation actions" to reduce emissions, the researchers warn.

Lead author Dr. Jun Ying, from the Second Institute of Oceanography, Ministry of Natural Resources in China and the University of Exeter, says that "we know from previous studies that, when measuring El Niño changes in terms of rainfall shifts in the eastern equatorial Pacific, models predict an increase in the frequency of events."

"This study shows that those changes could happen after the next two decades."

The study, published in *Nature Climate Change*, examines the "time of [emergence](#)" of changes in the tropical Pacific using state-of-the-art climate models.

The time of emergence is defined as when the signal of climate change emerges from the usual background noise of natural [climate](#) variability.

When looking at changes in El Niño rainfall patterns, the best estimate of the time of emergence of changes converges on 2040 in all of the four emissions scenarios considered.

Co-author Professor Mat Collins, from the University of Exeter and part of the Global Systems Institute, added that "what surprised us is that changes emerge regardless of the scenario we look at."

"Because rainfall in the tropics is associated with the warmest sea surface temperatures (SSTs), it is the relative changes in SST that are more important than the absolute change.

"This leads us to the rather stark conclusion that these changes are essentially unavoidable."

**More information:** Jun Ying, Emergence of climate change in the tropical Pacific, *Nature Climate Change* (2022). [DOI: 10.1038/s41558-022-01301-z](https://doi.org/10.1038/s41558-022-01301-z).  
[www.nature.com/articles/s41558-022-01301-z](https://www.nature.com/articles/s41558-022-01301-z)

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