

# Changing El Nino could reshape Pacific Ocean biology

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Over the past few decades, the scientific understanding of El Nino has grown increasingly complex. Traditionally viewed as a periodic warming focused largely in the eastern equatorial Pacific Ocean, El Nino is associated with reduced productivity in South American fisheries and changing temperature, pressure, and rainfall patterns around the world.

In the 1990s, however, researchers started to notice a new kind of [El Nino](#), one where anomalous [ocean temperatures](#) were concentrated mainly in the central equatorial Pacific Ocean. This previously unknown mode of variability, now termed the Central Pacific (CP) El Nino, in contrast to the classical Eastern Pacific (EP) El Nino, has increased in frequency and intensity over the past 30 years. Some scientists expect CP El Ninos to become the dominant El Nino variant in response to global warming, so understanding their differing effects is a pressing concern.

Comparing the major 1997-98 EP and 2009-10 CP El Nino events, Gierach et al. determined the effect of each on surface [ocean biology](#). Using a satellite-based proxy measurement for phytoplankton biomass, they find that the EP event brought about a strong decrease in both eastern and central Pacific biomass. The CP event ties to a larger decline in central Pacific phytoplankton biomass but has little effect on eastern Pacific activity.

They find that during the CP event, strong westerly winds brought warm nutrient-depleted waters to the central Pacific from the west. For the EP

El Nino, westerly winds weakened upwelling and vertical mixing in the eastern Pacific, inhibiting the supply of nutrients from the [subsurface ocean](#). In both cases, a reduction in nutrient supply caused a drop in productivity in the near-surface tropical waters.

The authors suggest that a shift to more frequent CP El Ninos in the future could alter ecosystem dynamics in the equatorial Pacific Ocean, enhancing productivity in the eastern basin while reducing it in the central basin.

**More information:** Biological response to the 1997-98 and 2009-10 El Nino events in the equatorial Pacific Ocean *Geophysical Research Letters*, [doi:10.1029/2012GL051103](https://doi.org/10.1029/2012GL051103) , 2012.

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