

# Climate change may alter natural climate cycles of Pacific

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While it's still hotly debated among scientists whether climate change causes a shift from the traditional form of El Nino to one known as El Nino Modoki, online in the journal *Nature Geoscience*, scientists now say that El Nino Modoki affects long-term changes in currents in the North Pacific Ocean.

El Nino is a periodic warming in the eastern tropical Pacific that occurs along the coast of South America. Recently, scientists have noticed that El Nino warming is stronger in the Central Pacific rather than the Eastern Pacific, a phenomenon known as El Nino Modoki (Modoki is a Japanese term for "similar, but different").

Last year, the journal *Nature* published a paper that found [climate change](#) is behind this shift from El Nino to El Nino Modoki. While the findings of that paper are still being debated, this latest paper in *Nature Geoscience* presents evidence that El Nino Modoki drives a [climate pattern](#) known as the North Pacific Gyre Oscillation (NPGO).

"We've found that El Nino Modoki is responsible for changes in the NPGO," said Emanuele Di Lorenzo, associate professor in the School of Earth and Atmospheric Sciences at the Georgia Institute of Technology. "The reason this is important is because the NPGO has significant effects on fish stocks and ocean nutrient distributions in the Pacific, especially along the west coast of the United States."

The NPGO, first named two years ago by Di Lorenzo and colleagues in a

paper in [Geophysical Research Letters](#), explained for the first time long-term changes in [ocean circulation](#) of the North Pacific, which scientists now link to an increasing number of dramatic transitions in coastal [marine ecosystems](#).

"The ecosystems of the Pacific may very well become more sensitive to the NPGO in the future," said Di Lorenzo. "Our data show that this NPGO is definitively linked to [El Nino](#) Modoki, so as Modoki becomes more frequent in the central tropical Pacific, the NPGO will also intensify."

Provided by Georgia Institute of Technology

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