

More frequent El Niño Southern Oscillation might not be bad for seabirds

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As global climate changes, the frequencies of important environmental events like El Niño may change. Many populations are known to respond to environmental conditions and the number of young produced by a population each year may closely track the ups and downs of particular environmental processes. But what happens if the ups and downs become more frequent? Or less frequent?

We used Point Blue's long-term data from the Farallon Islands on one species of seabird, Brandt's cormorant, to model how changing the frequency of the El Niño Southern Oscillation (ENSO) might affect seabirds in the future.

In the past, El Niño events have been observed to lead to fewer young produced in the Farallon cormorant population, so we expected to find that increasing the frequency of such events would have a negative effect on the population. But because ENSO is an oscillatory process that alternates between the

unfavorable El Niño and more favorable La Niña phases, increasing the frequency of the ENSO process led to increasing the frequency of favorable conditions as well as poor, and overall the population was larger and less prone to extinction. When the ENSO process was slowed down, the periods of poor conditions and good conditions both lasted longer, but the poor conditions had more of an impact and the population declined.

We show that Brandt's cormorants, and other long-lived, slow reproducing species, are likely to respond much more negatively to slowly varying processes rather than to rapidly varying ones. This is important to take into account when attempting to predict extinction risk for a population.

These results also highlight the need to better understand how environmental processes may change in the future. If the nature of the oscillation were to change, with unfavorable El Niño conditions becoming more frequent or longer, while

favorable La Niña conditions did not change, then the results could be very different.

Main Points

More frequent climate variability may be favorable for seabirds and other long-lived species.

It is important to understand a species' response to different frequencies of climate variability, and how those frequencies may change, when estimating extinction risk.

Annie E. Schmidt, Louis W. Botsford, D. Patrick Kilduff, Russell W. Bradley, Jaime Jahncke, John M. Eadie. 2018. [Changing environmental spectra influence age-structured populations: increasing ENSO frequency could diminish variance and extinction risk in long-lived seabirds.](https://doi.org/10.1007/s12080-018-0372-5) *Theoretical Ecology*.
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