



## Research Brief

### Global Climate Change Affects Ecosystem Variability



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#### *What is the relationship between ecosystem variability and global climate change?*

There is significant evidence that along with the onset of human-caused global climate change comes increased ecosystem variability. Ecological indicators have begun to show more variation, as is shown by the volatility of large-scale climate patterns during the 1990s as well as extreme fluctuations in the abundance of certain seabirds, such as the auklet, in the early 2000s.

#### *How did we come to our conclusions?*

We chose to study species that play essential roles in California marine ecosystems in order to determine whether increasing variance explains recent changes in the biological world. We considered data from ecosystem surveys performed by the National Marine Fisheries Service and others over the past three decades, which detailed the distribution and abundance of krill, rockfish, and seabirds. These data were compared to information about ocean currents in the North Pacific as well as recent upwelling patterns.



#### *Why are the results significant?*

Our results validate the claim that in the past two decades, the marine ecosystem of the North Pacific has seen an exceptional increase in variability. While variance has been considered by policy creators and ecologists, its importance has, thus far, been underestimated.

Understanding this variability is essential to comprehending ecosystem dynamics and making informed policy choices that would lead to ultimate ecosystem health.

#### *Caveat*

It is challenging to determine the effects of climactic change on the biological world due to the complexity of climate-prey and predator-prey relationships.

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