

# WHEN THE INDIAN OCEAN'S ANCIENT CLIMATE PATTERNS RETURN

Relevant for: Geography | Topic: Indian Climate including Monsoons

Global warming: If current trends continue, the new Indian Ocean El Niño could emerge as early as 2050, the study says. | Photo Credit: [scanned in chennai](#)

About 19,000-21,000 years ago, ice-sheets covered North America and Eurasia, and sea-levels were much lower, with Adam's Bridge exposed so that the Indian subcontinent and Sri Lanka were contiguous. This period, the peak of ice age conditions, is called the Last Glacial Maximum. Researchers analysed simulations of this past climate and predicted that the ongoing climate change could reawaken an ancient climate pattern of the Indian Ocean.

They find that this could be similar to the El Niño phenomenon of the Pacific Ocean bringing more frequent and devastating floods and drought to several densely-populated countries around the Indian Ocean region. If current warming trends continue, this new Indian Ocean El Niño could emerge as early as 2050. The results were published in *Science Advances*.

By studying microscopic zooplankton called foraminifera, the team had published a paper in 2019 which first found evidence from the past of an Indian Ocean El Niño. Foraminifera build a calcium carbonate shell, and studying these can tell us about the properties of the water in which they lived. The team measured multiple individual shells of foraminifera from ocean sediment cores and was able to reconstruct the sea surface temperature conditions of the past.

"In the previous paper, we argued for the existence of an 'Indian Ocean El Niño' during the Last Glacial Maximum. We suggest that the Indian Ocean has the capacity to harbour much larger climate variability than observed during the last few decades or a century," writes co-author Kaustubh Thirumalai, from the Department of Geosciences at the University of Arizona in an email to *The Hindu*. "In this paper, we argue that this climate variability in the Indian Ocean can arise under increased greenhouse gas forcing of global climate change."

He explains that there are many lessons to be learnt from this cooler period about our warmer future, "even though the Last Glacial Maximum consisted of vastly different conditions compared to where the world is headed... For example, global sea-level is rising and glacial ice is melting today whereas the opposite was true for the Last Glacial Maximum"

Prof. Thirumalai adds: "As it is, under present-day conditions, changes in the Indian Ocean Dipole and the El Niño–Southern Oscillation strongly affect Indian Monsoon variability from year to year. If the hypothesised 'equatorial mode' emerges in the near future, it will pose another source of uncertainty in rainfall prediction and will likely amplify swings in monsoon rainfall."

The paper adds that it could bring more frequent droughts to East Africa and southern India and increased rainfall over Indonesia. The team warns that further work is needed to accurately assess this new mode, particularly under lower-emission scenarios and also taking into account past climatic states other than the Last Glacial Maximum.

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