

PICKING EXTREMES: SINGLE-FORAMS AND MODELS UNCOVER EL-NIÑO-LIKE VARIABILITY IN THE GLACIAL INDIAN OCEAN

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Despite relatively minor variations in equatorial sea-surface temperature (SST) compared to the other tropical oceans, ocean-atmosphere dynamics in the Indian Ocean cause widespread droughts, wildfires, and flooding. Greenhouse warming could lead to changes in background conditions conducive to stronger SST variability, but model projections remain uncertain. Here we use proxy measurements and model simulations to investigate Indian Ocean climate variability during the Last Glacial Maximum (LGM), a period when background changes followed a pattern analogous to that expected from greenhouse warming. Individual foraminiferal analyses reveal large increases in sea-surface temperature variability in the eastern equatorial Indian Ocean, which we attribute to increased seasonal and interannual variability. As with the El Niño/Southern Oscillation in the Pacific Ocean, these interannual events are amplified by ocean-atmosphere interactions. The emergence of an “ENSO mode” during the LGM demonstrates that the Indian Ocean can harbor more powerful variability under altered background conditions.