



## **Evidence for enhanced ENSO variability during glacial periods**

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The El Niño-Southern Oscillation (ENSO) is a driver of global atmosphere-ocean dynamics, but projections of frequency and magnitude in different climate states remain uncertain. Palaeoclimate records offer the potential to improve our understanding of ENSO behaviour but most are fragmentary, suffer low resolution, and/or typically do not cover periods warmer than present day. Here we report a continuous, inter-annually resolved record of hydroclimate spanning 220-80 ka from Lynch's Crater in tropical northeast Australia, a region highly sensitive to ENSO. We find subdued ENSO variability during globally warmer periods (including super-interglacial Stage 5e) but enhanced during the glacial state. Precise correlation to an offshore record suggests that during glacials, weaker Walker Cell circulation (and associated trade winds) led to a shallowing of the equatorial Pacific thermocline, enhancing El Niño-like conditions. Our results imply an ENSO dependence on mean climate, with limited ENSO variance during interglacials globally warmer than present.