



## **Patterns and mechanisms of warm pool hydroclimate change at the Last Glacial Maximum**

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A definitive answer on the mechanisms driving glacial-interglacial changes in tropical hydroclimate is lacking, particularly regarding the importance of greenhouse gases. We address this issue by evaluating mechanisms and patterns of rainfall change over the Indo-Pacific warm pool (IPWP) in climate model simulations and proxy data of the Last Glacial Maximum (LGM). Our simulations show two mechanisms explaining the proxy data. Exposure of the Sunda and Sahul shelves due to lowered sea level drives a weakening of the Walker circulation explaining the dipole of drier IPWP center and wetter eastern Indian Ocean. Ice sheet albedo alters the inter-hemispheric temperature gradient driving changes in the Asian monsoon that explain the dry condition over India and the northern IPWP. Proxy and model data show consistent patterns of cooling over the Indian Ocean and Arabian Sea, providing independent evidence for the proposed mechanisms. Together these results demonstrate that ice sheets are a first order driver of tropical climate on glacial-interglacial timescales. Greenhouse gases drive a response that is relatively negligible and therefore cannot be detected using the available proxy data.