Indo-Pacific hyroclimate change over the past 200 years: new insights from the Iso2k synthesis

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Despite the importance of tropical Indo-Pacific climate variability for regional to global hydroclimate, significant uncertainties remain in the magnitude and even sign of the hydrological response to warming since the preindustrial period. A number of challenges contribute to these uncertainties, including the paucity of historical precipitation data, ability for climate models to resolve topography and key cloud processes, and our understanding of non-deterministic hydroclimate proxy records. We use a new synthesis of water isotope records from the Iso2k project, proxy system modelling, and isotope enabled climate models to reconstruct changes in Indo-Pacific sea surface temperature, precipitation $\delta^{18}O$, and seawater $\delta^{18}O$ over the past 200 years. We show that “hydro-sensitive” corals show a significant freshening of the western tropical Pacific. We examine potential impacts on terrestrial climate via teleconnections to the Western US and Asian monsoon systems.