

Late-Holocene anthropogenic impact on tropical climate

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Climate models indicate that rising *preindustrial* greenhouse gas (GHG) levels since 7 ka caused increase in mean annual temperatures (MAT) comparable to that observed since the industrial revolution. However, geochemical temperature proxies offer inconsistent evidence, which was termed “*The Holocene Conundrum*”. Specifically, Mg/Ca records in planktonic foraminifera from the Western Pacific warm pool (WPWP) record cooling in direct opposition to alkenone derived temperature records from the South China Sea and to simulated trends. Here, we present a new, centennially resolved record of planktic foraminifer (*G. ruber ss*) Mg/Ca-derived sea surface temperatures (SSTs) spanning the current and last interglacial (LIG) periods from the WPWP and compare these data to two transient climate simulations. Taking advantage of a stronger seasonal contrast during the LIG, we demonstrate that Mg/Ca-derived SSTs reflect late Fall SSTs, rather than mean annual. Applying this seasonal relationship to the Holocene, we reconcile the proxy record with model output, assess the WPWP SST sensitivity to GHGs, and ultimately confirm that preindustrial warming has doubled the anthropogenic total. We will also examine possible effects on precipitation in the Western Pacific warm pool.

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