Reconstructing the Thermocline in the Eastern Equatorial Pacific since the Last Glacial Period

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The mean state of the Eastern Equatorial Pacific (EEP) thermocline over the past 30 ka was reconstructed from oxygen isotope analyses of two species of planktic foraminifera from several marine sediment cores. The equatorial Pacific thermocline is deeper in the west, where warmer surface waters lie, and shallower in the east, where cool waters upwell and form a cold tongue. The zonal sea surface temperature gradient in the equatorial Pacific influences the inclination of the EEP thermocline, the El Niño-Southern Oscillation (ENSO), and global precipitation patterns. The EEP is also an area of high marine primary productivity due to the upwelling of nutrients along a shallow thermocline. The oxygen isotope composition of two species of planktic foraminifera, *Globigerinoides ruber* and *Neogloboquadrina dutertrei*, which live at the surface and in the thermocline, respectively, were used to reconstruct changes in the depth of the EEP thermocline between the Holocene and Last Glacial Maximum (LGM). Specimens from two core sites were analyzed: Ocean Drilling Program (ODP) 1239 (0.672°S, 82.78°W, 1414 m) and V19-28 (2.37°S, 84.65°W, 2720 m). Preliminary results indicate that the EEP thermocline was deeper during the LGM (approximately 20 ka) relative to the Holocene, agreeing with the previous findings of Ford et al. (2018), *GRL*. Mechanisms for changes in the depth of the EEP thermocline, including glacial-interglacial changes in climate and variations in solar insolation at the equator, were explored. Results were also compared to paleo-records of marine primary productivity and ENSO mean state. Additionally, calcium carbonate percentages were measured in bulk sediments from ODP 1239, V19-28, and ODP 1240 (0.02°N, 86.46°W, 2921 m) by coulometry. It was observed that calcium carbonate percentages were higher during the last glacial period and lower in the Holocene, which was likely a result of better preservation over this depth range during the glaciation.