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Hydrological variability in the Southwest Pacific during the past 360 kyears

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Glacial-interglacial (G-I) hydrological variability at the southern margin of the Western Pacific Warm Pool (WPWP) was investigated using multi-species foraminiferal Mg/Ca and d18O (*Globigerinoides ruber*, *Globigerinoides sacculifer* and *Globorotalia truncatulinoides*) with alkenone unsaturation index obtained for the core MD972125 (22ºS, 161ºE) from the Coral Sea. G-I amplitude of sea surface temperature (SST) is 2 to 3 ºC for the whole record. At glacial terminations, the Coral Sea SST change preceded the continental ice volume change (benthic d18O record of core MD972125) by several kyr whereas such a lead is not systematically observed for the thermocline depth. Latitudinal SST gradient between the Coral Sea and the western equatorial Pacific (ODP806B, Lea et al., 2000) increased at Terminations II, III and IV. More pronounced surface water warming in the Western Equatorial Pacific supports the idea that the tropical ocean played a key role at glacial terminations. The increase in latitudinal SST gradient is strongly coupled with decrease in west-east equatorial zonal Pacific SST gradient (ODP806B and TR163-19, Lea et al., 2000) at Terminations II, III and IV. This result indicates that inverse relationship between the strength of Walker circulation and Hadley circulation was generally maintained at the terminations. Stronger Hadley circulation and weaker Walker circulation evoke the present El Niño conditions. However, the reconstructed thermocline temperature change is not consistent with the El Niño conditions. Our results support atmosphere-ocean interaction as a key mechanism of glacial terminations although the ENSO phenomena could not be an appropriate analogue to G-I variability.

Lea D. W., Pak D. K., and Spero H. J. (2000) Climate impact of late Quaternary Equatorial Pacific sea surface temperature variations. *Science* **289**, 1719-1724.