Geophysical Research Abstracts
Vol. 18, EGU2016-15549, 2016
EGU General Assembly 2016

Changes in the East-West contrast of the upper equatorial Pacific Ocean over the last 10 Ma

Gabrielle Rousselle (1), Catherine Beltran (1,2), Marie-Alexandrine Sicre (3), Marc de Rafélis (4), and Stefan Schouten (5)

(1) Université Pierre et Marie Curie, ISTeP, Case 116 , 4 place Jussieu 75005 Paris, (gabrielle.rousselle88@gmail.com), (2) Department of Geology, University of Otago, PO Box 56, Dunedin 9054, New Zealand, (3) Sorbonne Universités (UPMC, Université Paris 06)-CNRS-IRD-MNHN, LOCEAN Laboratory, 4 place Jussieu, F-75005 Paris, France, (4) Géosciences Environnements Toulouse - UMR 5563 - 14, avenue Edouard Belin 31400 Toulouse, (5) NIOZ Royal Netherlands Institute for Sea Research, Department of Marine Organic Biogeochemistry, P.O. Box 59, 1790 AB Den Burg (Texel), The Netherlands

This study presents new data of the past 10 Ma climate in the Equatorial Pacific. Combining UK'37 and TEX86-derived temperatures as well as carbon and oxygen isotope of calcifying planktonic species living in surface and subsurface waters at the IODP site U1338 (Eastern Equatorial Pacific) and 806 (Western Equatorial Pacific) we investigate the temporal evolution of the zonal gradient across the equatorial Pacific. This multi-proxy approach is used to reconstruct changes in the asymmetric pattern between the Eastern and Western Equatorial Pacific surface and thermocline depth waters. Based on the cross-analysis of our data and those available in the literature we propose a schematic view of long-term La Niña- and El Niño-like alternations from the upper Miocene in the equatorial Pacific Ocean. We suggest a general shoaling of the thermocline along the equator from about 11 Ma ago demonstrate that this shoaling is linked to the equatorial upwelling and the establishment of the Eastern Pacific Cold tongue particularly discernible during three time intervals referring to La Niña-like periods (11.5 - 9 Ma, 6.8 - 6 Ma and 4.8 - 1.4 Ma). Our study also reveals intervals of weakened oceanic circulation during El Niño-like periods (9 - 6.8 Ma and 6 - 4.8 Ma). The role of global ice sheet, the Indonesian seaway restriction and the Central American seaway closure as driving factors of the observed changes are discussed.