



## Changes in sea-surface conditions in the Equatorial Pacific during the middle Miocene-Pliocene (IODP Site 1338)

Gabrielle Rouselle (1), Catherine Beltran (1), Marie-Alexandrine Sicre (2), Isabella Raffi (3), and Marc De Rafélis (1)

(1) Laboratoire Biominéralisation et Environnements sédimentaires, UPMC, ISTeP-UMR 7193, Paris, France, (2) Laboratoire des Sciences du Climat et de l'Environnement, CNRS, Gif sur Yvette, France, (3) DiGAT-CeRS Geo Università "G. D'Annunzio, Chieti Scalo, Italy

The modern Equatorial Pacific setting is progressively developed during the Miocene and the Pliocene, with a gradual closure of the Central American Seaway (CAS) and the gradual constriction of the Indonesian seaway. In parallel, the Earth experienced a climatic transition from the mid-Miocene warm period to the modern “ice-house” climate with the growth of the Antarctic Ice-sheet (~ 13.9 Ma) and the appearance of large Northern Hemisphere Glaciations (NHG) (~ 3 Ma).

In order to study the evolution of the Eastern equatorial Pacific (EEP) during the last 14 Myrs, we present here the Mio-Pliocene alkenone-derived curve, combined with the oxygen stable isotopes record of bulk carbonate ( $\delta^{18}\text{O}_{\text{bulk}}$ ) and calcareous nannofossils dominated fractions ( $\delta^{18}\text{O}_{\text{Noelaerhabdaceae}}$ ), from IODP Site 1338. The originality of this work lies in that the calcareous nannofossils species that are concentrated in the fine fractions belong to the same family to the alkenone producers. We are then able to compare an organic and an inorganic record from the same producer.

Our data and those available from other sites of the same area show the extension of a cold tongue during the Early Pliocene (4.4-3.6 Ma). Indeed, our data suggest a shallowing of the thermocline in the EEP, between 6.8 and 6 Ma, and its shoaling between 4.8 and 4.0 Ma accompanying a sea surface cooling. Then, the timing of the thermocline shoaling does not agree with the idea that NHG initiated the Pliocene climate transition.

SST and  $\delta^{18}\text{O}_{\text{Noelaerhabdaceae}}$  time-series indicate periods of significant salinity variations. Then, comparison with the  $\delta^{18}\text{O}_{\text{Benthic}}$  curve from sediment cores of the Equatorial Pacific Ocean allow us to distinguish between global changes and local salinity variations in the EEP, with a freshening between 11.5 and 10 Ma, and between 6.8 and 6 Ma.

A  $\text{pCO}_2$  reconstruction based on  $\delta^{13}\text{C}$  of alkenone at site 1338 is currently measured and will eventually be presented, as well as TEX86 measurements in order to compare with the alkenone-based SST.