



## **Late Miocene nanofossil response to global climate change: A new record from the Eastern Equatorial Pacific (IODP Site 1338).**

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A significant reorganization of the nanofossil assemblages took place during the late Miocene leading to the worldwide collapse in the relative abundance of the larger forms of the prominent calcareous nanofossil genus *Reticulofenestra* and the gradual recovery and dominance of the small forms of this species.

This study investigates a 400 kyrs long “small *Dictyococcites* (<3 $\mu$ m) bloom-like” event observed during the onset of *R.pseudumbilicus* paracme in the Equatorial Pacific IODP site 1338. For this purpose, we produced a high-resolution (1 sample/10kyrs) multiproxy record of oxygen and carbon stable isotopes of the bulk sediment, the calcareous nanofossil separated fractions (CF) and the thermocline dweller *D.venezulana* as well as the alkenone-derived temperature (SSTs).

Traditionally, the occurrence of small *Reticulofenestra* acme events is interpreted as reflecting stressed environmental conditions such as cold and high-fertility waters. However, our alkenone and isotopic data show that the distribution of the *Dictyococcites* is poorly linked to SSTs. Moreover, there doesn't seem to be any clear relationship between the isotopic data from the bulk, the CF or even *D.venezulana* and with the nanofossil assemblage compositions except at the onset of the *Dictyococcites* production peak where both  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  increase.

Our record constructed from CF and planktonic foraminifera as well as bulk carbonate covary with Site 1085  $\delta^{18}\text{O}$  benthic record (Westerhold et al., 2005) which displays low frequency eccentricity (100 kyrs) reflecting changes in the Antarctic ice-volume. Furthermore, this *Dictyococcites* dominance interval coincides with a warm glacial regime in Antarctica and subsequent meltwater input (late Miocene motif 3 from McKay et al., 2009) suggesting that this equatorial bloom-like event reveals a complex paleoceanographic and paleoecological response to late Miocene high latitudes climatic changes.