Geophysical Research Abstracts
Vol. 14, EGU2012-5051, 2012
EGU General Assembly 2012


# Changes of benthic foraminiferal assemblages across the Middle Eocene climatic optimum (MECO) in the North Atlantic (OPD Site 1051, Blake Plateau)

I. Moebius (1,*), O. Friedrich (1), and K.M. Edgar (2)

(1) Institute for Geosciences, Goethe University Frankfurt, Altenhöferallee 1, 60438 Frankfurt am Main, Germany , (2) School of Earth and Ocean Science, Cardiff University, Park Place, Cardiff CF103AT, United Kingdom, (*) moebius@em.uni-frankfurt.de

The middle to late Eocene (49-34 Ma) represents a time period characterized by global cooling of ocean temperatures. Superimposed on this general cooling trend is a short-lived warming event, the Middle Eocene climatic optimum (MECO). Oxygen isotope data suggest a duration of ∼750 kyrs with peak temperatures around 40.1 Ma. Despite ongoing research within the last few years, little is known about the causation of this climatic reversal and its effects on marine ecosystems. Furthermore, research mainly focused on southern high-latitude and mid-latitude regions. Therefore, the MECO event is well documented in the Southern Ocean, but it's influence on the northern mid- and high-latitudes are still poorly understood.

To increase the global understanding of the processes across the event, we chose ODP Site 1051 in the North Atlantic (Blake Plateau, 30°N) for this study. Material from that location was used for a benthic foraminiferal assemblage analysis to investigate the effects of the MECO warming event on the benthic ecosystem. Benthic foraminifera from 36 samples across the MECO, as well as 8 samples before and 9 samples after the excursion were investigated in order to obtain a high-resolution record (1 m resolution during the MECO event, 2 m resolution before and after, respectively).

The results reveal that benthic foraminiferal assemblages undergo marked changes during the warming event at Site 1051. This is interpreted as a response to rising bottom-water temperatures as indicated by the increasing benthic foraminiferal $\partial$18O values. A marked shift from epifaunal species to infaunal species parallels the climatic trend. The correlation between the stable isotope record and the changes in species assemblages across the MECO event suggest a causal relationship of species abundance with organic matter flux and oxygen consumption.