



The Middle Miocene Climate Transition in the central Mediterranean: changing paleoenvironments as revealed by benthic foraminifera.

A.A. Mourik (1), J. Sprong (2), T.J. Kouwenhoven (1), H.A. Abels (1), F.J. Hilgen (1), G.J. van der Zwaan (1,3)

(1) Dept. of Earth Sciences, Utrecht University, Utrecht, the Netherlands, (2) Dept. of Geography and Geology, K.U. Leuven, Leuven, Belgium, (3) Faculty of Biology, University of Nijmegen, Nijmegen, The Netherlands (mourik@geo.uu.nl / Phone: +31 (0)30-2535170)

The Middle Miocene Climate Transition is one of the major steps in Cenozoic climate evolution. After the Mid Miocene Climatic Optimum (~17-15 Ma), a rapid expansion of the East Antarctic Ice Sheet (EAIS) at 13.82 Ma changed global climate considerably. The associated sea level fall may have affected the already narrowed Tethyan seaway connecting the Atlantic, via the Mediterranean, to the Indian Ocean. Narrowing and closure of the eastern part of this seaway will have caused major changes in ocean circulation both on a regional and a global scale.

To gain more insight into the combined effects of climate change and seaway closure on paleoenvironments and circulation patterns, we have analysed benthic foraminiferal assemblages from the Maltese Islands (Malta, Gozo: central Mediterranean). In our studied sequence (~14.9-13.1 Ma), there is a remarkable transition from limestone (Globigerina Limestone Formation) to clay (Blue Clay Formation), exactly coinciding with the phase of major EAIS expansion.

Benthic foraminiferal assemblages of the Globigerina Limestone Formation suggest well-ventilated bottom waters in the interval preceding the major climate step. However, changes in the paleoenvironment are already reflected by trends in the species composition. After the onset of the Blue Clay Formation there is a gradual increase in the percentage deep infaunal taxa. The Blue Clay fauna is indicative of a relatively

stressed and poorly oxygenated environment, which can be interpreted as an increase in organic matter supply as well as to a decreased ventilation of the basin.