

Paleoclimatic evolution during the early Paleogene: Inferences from calcareous nannoplankton assemblages of the Paleogene Newfoundland Basin (NW Atlantic)

There is a general agreement that short or long-lived prominent changes in the carbon and oxygen isotopic composition can be used to describe the Earth's climatic evolution in the past. These geochemical proxies are preferentially measured in marine sediments and provide, if integrated with other important tools as for instance the study of marine microfossils, realistic scenarios and reliable paleoenvironmental reconstructions. Throughout its long history, Earth has experienced complicated and articulated changes in short and long term trends. In this context, the Paleogene, the focus of this project, could be considered one of the most dynamic and interesting periods of the entire Cenozoic, representing the transition from the "Greenhouse" to "Icehouse" world, which in turn imply the transition from no-ice to ice world. To date, the sedimentary successions recovered during oceanic drilling provide most of the information available, for this reason our project will be focused on the study of the sediments recently recovered by the Integrated Ocean Drilling Program (IODP) Exp. 342 (NE Atlantic, Norris et al., 2011; Norris et al. 2012).

Within this context, the aim of the project is to study continuous and expanded marine sedimentary successions, which document the short and long term climate evolution during the early Paleogene, in fact stable carbon and oxygen isotope compilations available from the literature (e.g. Zachos et al., 2001; Miller et al., 2005) point out that the variations observed in the marine sediments deposited between 60 and 45 Ma are the most prominent of the entire Cenozoic (Shackleton and Hall, 1984; Zachos et al., 2001; Kurtz et al., 2003). The present project will deal with the study of calcareous nannofossil assemblage during early to middle Eocene hyperthermals, these climatic events are considered to be partial analogous of the ongoing global warming. Standard analyses will be associated with innovative studies, which eventually provide a robust dataset to be used for biostratigraphic and /or paleoclimatic/paleoecologic aims with the final goal to propose new paleoceanographic proxies. One of these new proxy is represented by the estimation of calcareous nannofossil carbonate production (Young & Ziveri, 2000), which, considering the importance of the role by these organisms in the (paleo) marine ecosystems, will certainly give us important clues on paleoecosystem perturbations during the climatic events occurred during the early to middle Eocene.

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