

Paleoenvironmental changes traced by calcareous nannofossils through the mid-Cretaceous

Bottini, C.^{1,*} and Erba, E.¹

1) *Department of Earth Sciences, Università degli Studi di Milano, Milano, Italy,*

**E-mail: cinzia.bottini@unimi.it*

Decades of multidisciplinary research focused on Mesozoic Oceanic Anoxic Events (OAEs) since they constitute ideal case-studies for the understanding of our planet's climate and environmental changes during perturbations of the carbon cycle. These perturbations were, in fact, characterized by excess CO₂, intense volcanism, and altered climate and oceanic chemistry. In particular, the Aptian–early Turonian time interval was marked by major environmental changes at regional to global scale. Specifically, it was a time of super-greenhouse conditions and the climate–ocean system experienced phases of stability perturbed by transient, sometimes prolonged, anomalies of the global carbon cycle. Several regional to global episodes occurred over this time interval: the early Aptian OAE 1a, the early Albian OAE 1b, the latest Albian OAE 1d, the Mid-Cenomanian Event (MCE I) and the Cenomanian–Turonian OAE 2. Most studies focused on these events and a complete record of long-term paleoenvironmental variations is not yet available. Here, we gathered new quantitative nannofossil data for the Tethys Ocean (Umbria Marche Basin, Italy) to derive climatic fluctuations and changes in ocean fertility during the late Albian–early Turonian in the Umbria-Marche Basin. Calcareous nannofossils are useful for reconstructing the marine ecosystem dynamics of the past, since calcareous nanoplankton is extremely sensitive to changes in surface water parameters like temperature and nutrient content, and interacts with the carbon cycle through biological processes and production of calcareous oozes. The new dataset has been integrated with the nannofossil data previously collected for the Aptian–early Albian time interval to provide a compilation of variations in temperature and surface water fertility over the long-term throughout the Aptian–early Turonian interval in the western Tethys.