Geophysical Research Abstracts
Vol. 12, EGU2010-2366-2, 2010
EGU General Assembly 2010

Starvation when everywhere else was plenty: Was the northern Penninic Ocean an inhospitable desert during OAE 2?

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The oceanic anoxic event at the Cenomanian-Turonian boundary (OAE 2) led to different, usually organic rich, sedimentary successions in various parts of the world. In order to trace the paleoceanographic processes at the northern Tethyan margin, we investigated samples from the unique Rehkogelgraben section in the Eastern Alps. Paleoecologic conditions were reconstructed for strata before, during and after OAE-2 by combining the results of assemblage counts of indicative microfossil groups from planktic (foraminifera, radiolaria) and benthic (foraminifera) realms. Microfossil assemblages, size distributions and accumulation rates show a tripartite subdivision for surface and bottom waters. They indicate oligotrophic surface conditions and oxic bottom waters with a resonably high food supply for the late Cenomanian interval. The OAE period with black shale deposition is characterized by very low numbers but relatively high diversities and a lack of high productivity indicators among planktic foraminifera. Benthic foraminifera show extremely low accumulation rates and are of small size exclusively, pointing to low oxic or dysoxic conditions at the sea floor. Post-OAE assemblages are characterized by mesotrophic planktic species and benthic foraminifera point to a reappearence of oxic bottom waters. It took about 300 Ky to re-establish a pelagic carbonate-producing regime. The Rehkogelgraben record points to unusual paleoceanographic conditions during the OAE 2. The semi-enclosed basin situation of the Penninic Ocean is thought to be responsible for the apparent differences between the high productivity in most parts of the world ocean and the overall absence of high productivity indicators in the foraminiferal assemblages at Rehkogelgraben. Our records show higher benthic and planktic foraminiferal diversities during OAE 2 compared with high productivity areas elsewhere. The Penninic Ocean may have even served as a retreat area during the environmental crisis.