

The Cretaceous Oceanic Anoxic Event 2: geochemical constraints from a long in-situ sedimentary section of the Atlantic margin

BONACINA G.^{1*}, SANFILIPPO A.¹, PREVIDE MASSARA E.², SCOTTI P.², VIAGGI P.², PIVA A.²

¹Dipartimento di Scienze della Terra e dell'Ambiente, Univ. of Pavia, Via Ferrata 1a, 27100, Pavia, Italy

(*correspondence:

greta.bonacina01@universitadipavia.it,
alessio.sanfilippo@unipv.it)

²Eni S.p.A. Upstream Research and Technological Innovation, 20097 San Donato Milanese, MI, Italy
(elisabetta.previde@eni.com, Paolo.Scotti@eni.com,
Paolo.Viaggi@eni.com, Andrea.Piva@eni.com)

The OAE2 (Cenomanian – Turonian: ca 94 Ma) represents the most severe global climatic perturbation in Cretaceous time. This event is marked by a strong increase in the preservation of marine and terrestrial organic matter, also associated to positive excursion in the carbon isotopes ($\delta^{13}\text{C}$), global warming, high atmospheric CO_2 , weathering, increased hydrothermal activity, high sea level and changes in oceanic circulation [1]. Here, we present preliminary geochemical data from a sedimentary section recovered in a ~3.3 km-thick well located on a passive margin of the Atlantic Ocean. We focus on a ~28 m-thick interval representing the OAE2. This interval consists of a sedimentary sequence made up of carbonates and shales intercalations, with TOC content up to 9 wt%. It is also marked by a noticeable increase in $\delta^{13}\text{C}$, from ~ -27‰ up to ~ -23‰. Prior to the anoxic event it is clear an enrichment of the redox-sensitive elements (e.g. Mo, U and V) at increasing TOC, probably related to increasing anoxia. However, during the OAE2 the data show a strong increase in TOC corresponding to a prominent drawdown of the redox-sensitive elements. Similar decreases in these elements have been documented in sediments deposited during the OAE2 (also called Bonarelli Level [2]) and generally related to the wide extent of euxinia that has drawdown bio-essential trace metals [3]. The continuous sedimentary record allows investigating in detail the environmental changes at the onset and at the end of this Oceanic Anoxic Event.

[1] Takashima *et al.* (2006) *Oceanography*, **19**, 4. [2] Sabato *et al.* (2007) *Boll. Soc. Geol. It. (Ital. J. Geosci.), Special Issues*, **7**, 57-54. [3] Goldberg *et al.* (2016) *Earth and Planetary Science Letters*, **440**, 81-91.