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Published in:
The 29th IAS Meeting of Sedimentology

Publication date:
2012

Document version
Peer reviewed version

Citation for published version (APA):
Boussaha, M., Stemmerik, L., & Thibault, N. R. (2012). Sedimentology and stratigraphy of the upper cretaceous chalk in Stevns-2 core: paleoenvironmental and paleoclimatic implications. In *The 29th IAS Meeting of Sedimentology: Sedimentology in the heart of the alps* (pp. 502). The International Association of Sedimentologists.

Sedimentology and stratigraphy of the Upper Cretaceous Chalk in Stevns-2 core: Paleoenvironmental and Paleoclimatic implications.

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The Stevns-2 core located in eastern Denmark recovered upper Campanian–Maastrichtian sediments of the upper Chalk Group which is well studied for its reservoir properties. New data have been obtained on the stratigraphy and sedimentology of this core. The core is composed of 350m of white chalk and intervals of cyclic chalk-marl in the upper Campanian and upper Maastrichtian also observed in the near Stevns-1 core.

An integrated study of the Stevns-2 core is hereby presented and comprises the facies description, calcareous nannofossil biostratigraphy, ichnology, gamma ray log analysis and bulk oxygen and carbon stable isotope geochemistry. Carbon isotopes, biostratigraphy and gamma-ray logging allow correlation of Stevns-1 and Stevns-2 in the Danish basin, and the reliability of an integrated stratigraphic scheme for the Upper Cretaceous of the Boreal Realm.

The Stevns-2 core presents different facies including thin and thick bioturbated chalk, marls, conglomerate and laminated chalk. The total abundance of ichnofossils abundances seems to be related to clay content of the chalk. Changes in the abundance of inoceramids may be linked to climatic changes as expressed in bulk $\delta^{18}\text{O}$. Variations of the $\delta^{18}\text{O}$ match closely those of Stevns-1 and show warming and cooling trends of the upper Campanian–Maastrichtian which have been found throughout the different oceanic domains (Atlantic, Pacific and Tethyan realms). Preliminary results on cyclostratigraphy allow estimation of the duration of these climatic episodes in the Boreal realm as well as estimation in the variation of sedimentation rates.

These results also shed light on the sharp changes in sedimentation expressed by several transitions between alternating chalk/marl and pure white chalk.

Acknowledgments: Funding for this study was provided by Maersk Oil, the Danish Natural Science Research Foundation and the University of Copenhagen.