Geophysical Research Abstracts
Vol. 18, EGU2016-14943, 2016
EGU General Assembly 2016


# The Kimmeridge Clay Formation (Upper Jurassic-Lower Cretaceous) of the Norwegian continental shelf and Dorset, UK: a chemostratigraphical correlation

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The type section of the Kimmeridge Clay Formation (KCF) at Dorset, (UK) stands at the forefront in multidisciplinary research on climatic cyclicity, orbital forcing, sea level change and the productivity vs. preservation controversy. In economic terms, it is a prime source rock of the North Sea hydrocarbon province containing up to 35% total organic carbon. Lateral equivalents of the KCF occur widely in the North, Norwegian and Barents Sea regions of north-western Europe under other names: the Draupne, Mandal, Spekk, Hekkingen and Agardhfjellet (Svalbard) formations.

Carbon isotopes and clay mineralogy have been extensively studied from the KCF type section at Dorset. However, between the North Sea and Western Barents Sea, little is known of these records. Correlation using both clay mineral and $\delta$13Corg profiles across these areas would provide insights for our understanding of Late Jurassic climatic developments in north-western Europe. New chemostratigraphical records through the KCF of five Norwegian exploration wells of Lundin Petroleum and one of Statoil, are compared with the Kimmeridgian of Sub-Boreal Dorset, along with a correlation between Svalbard records with the Tithonian cores sampled in this project. Dinoflagellate biostratigraphy accompanies isotope stratigraphy in the placement of each core in time. Initial results show a strong overall correlation.

On a smaller timescale, several events are described from Dorset, including a distinct mid-Eudoxus positive isotope peak reflecting a sea level rise, and the Hudlestoni aridity peak as recorded by low kaolinite/illite ratios. Off the Norwegian Continental Shelf, how are these events recorded, if recorded at all, in a $\delta$13Corg and clay mineralogical profile? Such events are useful tools in correlation, and their identification regionally reduces the likelihood of local influence on oceanographical conditions, such as palaeoproductivity response to nutrient influxes, and instead reflects changes in the overall isotopic composition of inorganic dissolved carbon in the oceans.