
Sequence stratigraphic synthesis of the Late Barremian-Aptian of the Wessex-Channel and Weald Basins: Insights from well-logs correlations and outcrop-based field geological studies, Isle of Wight, Southern England

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Résumé

In order to understand the effects of the OAE1a on the sedimentary system in a Source to Sink approach, we studied the Late Barremian-Aptian sediments of the Wessex-Channel and Weald Basins and present a synthesis of the sequence stratigraphic framework and sedimentary patterns of the siliciclastic system developed during this time interval. We present a regional and detailed sequence stratigraphic model for the Lower Greensand Group and provide new stratigraphic insights.

This synthesis is based on field work (Isle of Wight) with focus on defining sedimentological and stratigraphic signatures using facies analysis and is coupled with published datasets and studies on bio-chemo-stratigraphy. The results are integrated with well-logs correlations for regional scale understanding.

It presents updated composite lithostratigraphic logs for three areas of the island which are correlated and provide a better 3D understanding for this part of the basin. The analysis and interpretation of the well database (84 petroleum exploration wells) contributed to understanding the regional architecture including the extent, facies distributions and thickness variations of the sediments. The sequence stratigraphic model includes 3rd order (composite) sequences within the context of 2nd order super sequences and a nomenclature in support of the model was proposed. Also, on the Isle of Wight, we present how the sedimentary system along with the relative sea level variations additionally recorded significant changes in terms of depositional environments. Finally, the applicability of the sequence stratigraphic model will be examined on a global scale for the proposal of a unified regional nomenclature in accordance with the global understanding of eustatic variations. Therefore, a long-distance correlation with already established schemes will be performed including France, Spain, the Southern Tethyan margin (Tunisia) and the Arabian plate.

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Mots-Clés: Sequence Stratigraphy, Sedimentology, OAE1a, Aptian