

Depositional Environments and Sequence Stratigraphy of Lower Cretaceous fluvial deposits in the NE Siberia (Lena River, Chekurovka area)

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Summary

This study specifically targets on two sections of Lower Cretaceous rocks located on the Lena River, NE Siberia. We documented the fluvial section in terms of sequence stratigraphy. The succession of Lower Cretaceous rocks was divided in four sequences, which were correlated between two separated sections and they potentially correlate throughout the whole basin.

Abstract

The study area is located in the northern part of the Priverkhoyansk foredeep. The Priverkhoyansk foredeep contains a thick succession of Mesozoic sedimentary rocks. The lowermost Cretaceous (Berriasian-lower Valanginian) rocks were deposited in submarine deltaic or open basin environments. Abrupt shift to fluvial sedimentation occurred in Valanginian and reflects an orogenic event in the Verkhoyansk fold and thrust belt.

The main task of our research was to apply modern concepts of sequence stratigraphy to Lower Cretaceous fluvial deposits. Two sections of Lower Cretaceous rocks exposed along the Lena River and located on the Chekurovka Cape (key section) and Chucha Cape were studied. We subdivided the fluvial section into two systems tracts, a low-accommodation systems tract characterized by amalgamated channel belts and a high accommodation systems tract characterized by channel belts dispersed within fine-grained floodplain deposits. These systems tracts are considered to record variations between low rates of accommodation vs. sediment supply (low-accommodation) and high rates of accommodation vs. sediment supply (high accommodation)

We identified four sequences in the Chekurovka Cape the Lower Cretaceous deposits: Each of the four sequences identified within the Chekurovka section was also identified within the Chucha Cape section. Although thickness of the individual sequences varies, all sequences with high and lower accommodation systems tracts are recognized and correlated between these two sections and they potentially correlate throughout the whole basin. Variability in the amounts of available fluvial accommodation probably was connected with decreases and increases of basin's subsidence rate.

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