

A new Quaternary record of regional tectonic, sedimentation and paleoclimate changes from drill core BDP-99 at Posolskaya Bank, Lake Baikal

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Abstract

This contribution presents the most recent sedimentary drill core section (BDP-99) from Lake Baikal. We discuss lithological composition and general stratigraphy, the BDP-99 age model, and draw implications for past sediment deposition changes at Posolskaya Bank in relation to tectonics and regional climate change. The BDP-99 drill core penetrated several sedimentary sequences identified in prior seismic surveys of the Selenga Delta area and helps to better constrain the age of these sequences. Lithological studies were used to identify erosional intervals apparently correlative with sequence boundaries at Posolskaya Bank. Intensified tectonic activity between ca. 1.15 and 0.8 Ma as observed at a number of locations in continental interior Asia, resulted in deposition of a ca. 90-m unit of remarkably uniform fine silty clay during the Jaramillo subchron with accumulation rates exceeding 100–160 cm/ka. A disconformity occurs at the top of this unit, and as a result, the sedimentary interval equivalent to ca. 1.0–0.8 Ma is not present in the BDP-99 section. At ca. 710–660 ka a transition to rather quiet hemipelagic sedimentation takes place as seen from an overall decrease in sedimentation rates and from higher diatom abundance in interglacial sediments.

The new late Pleistocene palynological record from BDP-99 drill core shows repetitive landscape changes from steppe and forest-steppe environments during glacials and interstadials to coniferous taiga conditions during the present and last interglacial. Every glacial/interglacial transition of the past 130 ka is marked by an early peak of Siberian spruce (*Picea*) pollen abundance. The MIS 4 interval is clearly divided into two zones due to changes in moisture availability. The late MIS 6 interval stands in stark contrast with subsequent glacial periods due to extremely low pollen abundance. Palynological records in the vicinity of the Selenga Delta contain overprinting signals from different landscape types in the extensive Selenga catchment basin.

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