

## Structure of bottom sediments in Lake Hövsgöl: geological and climate controls

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### Abstract

A new experiment of the Hövsgöl Drilling Project was carried out in Lake Hövsgöl in 2004, as part of the international program of scientific drilling in the Baikal Rift. The reported data include a preliminary description of the recovered lake sediments (HDP-04 core), with their compositions and physical properties, and a tentative age-depth model based on the paleomagnetic polarity scale. This is the first evidence that the lithology of sediments deposited for the past ~1 Myr records periodic alternation of carbonate-free diatomaceous mud and carbonate-bearing silty clay.

The diatom intervals in the record are interpreted as corresponding to interglacials by analogy with the periodicity known since the Last Glacial. The core bears signature of at least nine lithological change events. The sediment lithology records extremely low stand of Paleo-Hövsgöl (shallow-water facies produced by erosion of older sediments at the point where the today's lake reaches a depth of 240 m). Correlation of the HDP-04 core data with reflection profiling evidence confirms the presence of quite a large gap in the Pleistocene sedimentary record from the Hövsgöl rift basin.

The discovery of alternating carbonate-rich/carbonate-free cycles and evidence for sudden lake level changes impart special importance to the Hövsgöl archive: It can provide a deeper insight into the regional water budget and humidity history than it has been so far possible for the Middle and Late Pleistocene.

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### Introduction. Scientific drilling in the Baikal Rift

The challenge of the international Hövsgöl Drilling Project has been to obtain new evidence of paleoclimate change in

continental Eurasia. The Hövsgöl project continues the Baikal Drilling Project run successfully from 1989 through 1999 (BDP-96 Members, 1997; BDP Members, 2000, 2001; Kuzmin et al., 2001; The Baikal Drilling Project Group, 1998). The rhythmic structure of the Baikal lake sediments which records cyclic climate change driven by orbital forcing provides a reliable stratigraphic and chronological basis for

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