



## Sedimentary record from Lake Hovsgol, NW Mongolia: Results from the HDP-04 and HDP-06 drill cores

Hovsgol Drilling Project Members

### ARTICLE INFO

#### Article history:

Available online 24 February 2009

### ABSTRACT

The Hovsgol Drilling Project retrieved Pleistocene sediment section with the basal age of ca. 1 Ma from the Hovsgol rift basin, NW Mongolia. Detailed lithologic data on drill cores is presented and compared with analogous sediment facies in the radiocarbon-dated records of the last glacial–interglacial transition. Drill cores from two sites, presently in 239 m and 235 m water depth, represent somewhat different depositional settings. The shorter HDP-06 drill core (26 m) at the base of the gentler SE slope of the rift basin contains lithologic evidence for several recent lake lowstands on the order of ~200 m. The longer HDP-04 drill core (81 m) some 8 km away at the base of the steep NW underwater slope is composed of finer sediments and contains at least 10 characteristic transitions from calcareous to carbonate-free (diatomaceous) layers. These lithologic transitions are interpreted here as signals of repeated Pleistocene lake transgressions in the Hovsgol basin. Transgressions appear to have been associated with lower sedimentation rates and with the deposition of thin turbidite beds at the drill site. Comparison of drill core lithology with the available seismic data shows reasonable agreement in terms of the number of lowstand events and the general trends of changing lake level. HDP-04 drill core retrieved shallow-water facies containing sand and carbonate oolites deposited at the time of the most dramatic mid-Pleistocene regression of the lake. At ca. 24 m core depth, this interval corresponds to a major basinwide angular unconformity apparent in the seismic pattern. Lake Hovsgol, a smaller sister rift lake of the grand Lake Baikal, has a confined local catchment, which makes it very sensitive to regional variations in the effective moisture. Consisting primarily of calcareous mud, the sedimentary record of Lake Hovsgol provides a unique regional sedimentary archive. Future multi-proxy studies of the Hovsgol sedimentary records will allow constraint of the mid-late Pleistocene history of the hydrologic budget in the Baikal region of continental interior Asia.

© 2009 Elsevier Ltd and INQUA. All rights reserved.

### Alphabetical list of Hovsgol Drilling Project Members:

A.A. Abzaeva<sup>a</sup>, E.V. Bezrukova<sup>a</sup>, V.A. Bychinsky<sup>a</sup>, S.A. Fedenya<sup>b</sup>, K. Fukishi<sup>c</sup>, V.F. Gelety<sup>c,a</sup>, A.V. Goreglyad<sup>a</sup>, E.V. Ivanov<sup>a</sup>, G.V. Kalmychikov<sup>a</sup>, K. Kashiwaya<sup>c</sup>, T. Kawai<sup>d</sup>, E.V. Kerber<sup>a</sup>, M.Yu. Khomutova<sup>a</sup>, G.K. Khursevich<sup>b,e</sup>, J.-Y. Kim<sup>f</sup>, M.A. Krainov<sup>a</sup>, N.V. Kulagina<sup>g</sup>, M.I. Kuzmin<sup>a</sup>, P.P. Letunova<sup>a</sup>, K. Minoura<sup>h</sup>, W.-H. Nahm<sup>i</sup>, Ts. Narantsetseg<sup>j</sup>, Ts. Oyunchimeg<sup>j</sup>, A.A. Prokopenko<sup>k</sup>, H. Sakai<sup>k</sup>, E.P. Solotchina<sup>l</sup>, Y. Tani<sup>m</sup>, L.L. Tkachenko<sup>a</sup>, D. Tomurhuu<sup>l</sup>, T. Watanabe<sup>n</sup>

<sup>a</sup>Institute of Geochemistry, Siberian Branch of Russian Academy of Sciences, Irkutsk 664033, Russia

<sup>b</sup>Institute of Geological Sciences, National Academy of Sciences of Belarus, Minsk 220141, Belarus

<sup>c</sup>Kanazawa University, Kanazawa, Ishikawa 920-1192 Japan

<sup>d</sup>Department of Earth and Planetary Sciences, Nagoya University, Chikusa, Nagoya 464-8602, Japan

<sup>e</sup>Department of Botany, M. Tank State Pedagogical University, Minsk 220809, Belarus

<sup>f</sup>Korean Institute of Geology and Mineral Resources (KIGAM), Daejeon 305-350, Korea

<sup>g</sup>Institute of the Earth Crust, Siberian Branch of Russian Academy of Sciences, Irkutsk 664033, Russia

<sup>h</sup>Tohoku University, 6-3 Aramaki Aza Aoba, Aoba-ku, Sendai 980-8578, Japan

<sup>i</sup>Institute of Geology and Mineral Resources, Ulaanbaatar 210351, Mongolia

<sup>j</sup>Department of Geological Sciences, University of South Carolina, 701 Sumter Street, Columbia, SC 29208, USA

<sup>k</sup>Toyama University, 3190 Gofuku, Toyama 930-8555, Japan

<sup>l</sup>United Institute of Geology, Geophysics and Mineralogy, Siberian Branch of Russian Academy of Sciences, Novosibirsk 630090, Russia

<sup>m</sup>Institute for Environmental Sciences, University of Shizuoka, Suruga-ku, Shizuoka 420-8526, Japan

<sup>n</sup>Corresponding author. Tel.: +1 803 777 3983, Email address: [sasha@geol.sc.edu](mailto:sasha@geol.sc.edu) (A.A. Prokopenko)