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Holocene/Pleistocene: Sediments of basins, ridges and near-coast areas of Lake Baikal, Russia

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Short sediment cores (up to 1.5 m) were collected at morphologically different sites of Lake Baikal (deep-water plains, ridges and near-coast areas) and detailed investigated.

Deep-water plains: In most cores sampled on the deep-water plains of the lake bottom turbidites were interstratified to pelagic mud. Pelagic mud is composed of autochthonous biogenic material (mainly diatoms) and some allochthonous terrigenous matter. Turbidites contain high amounts of sandy, terrigenous material. Abundant turbidites were found also in the long core of the Baikal Drilling Project. According to lithology and evidence from diatom analyses, thickness of Holocene deposits of core BDP-97 core is about 8 m [1].
Mineralogical and diatom analyses showed that sources of Holocene turbidites within Southern Baikal are the S- and SE-shores of the lake. Presence of turbidites in cores taken near the N-coast in the area of Ivanovskii Cape from water depth of 1360 m testifies the existence of high energy, suspension currents, which are responsible for long-distance transport of material and the deposition of the turbidites.

Underwater ridges (rises): Sediments from Continent Ridge, an morphological extension of Akademicheskii Ridge, were investigated. Continent Ridge has the same tectonic position, but is separated from Akademicheskii Ridge by transverse faults. Holocene mud (thickness: 2 - 115 cm) and Late Pleistocene clay represent deposits on the underwater ridge. The upper part of the sediments is characterized by a Holocene diatom community. The occurrence of the diatom species Stephanodiscus flabellatus in lower parts of the cores proves that these parts can be attributed Late Pleistocene age. Total concentration of diatoms within Holocene mud is much higher compared to Late Pleistocene clay. Holocene sediments from the slopes of Continent Ridge often have smaller thickness and incomplete diatom records, caused possibly by down-slipping of already deposited material, following results of detailed lithological descriptions of 37 short cores.

Near-coast areas: Sediments of cores taken approx. 700 m near the N-shore of Southern Baikal, in the area of Ivanovskii (water depth 550 m) show large admixtures of sand (23 - 30.5 %). Turbidite layers are absent. Diatom analyzes testify that Holocene deposits overlay Late Pleistocene sediments in the cores. Similar to sediments from ridges, the Holocene parts of these deposits have a small thickness of 18 to 27 cm. Late Pleistocene deposits are characterized by clastic, silty sandy, clayey material. A peak of the Late Pleistocene diatom species Stephanodiscus flabellatus (approx. 14'000 years BP) is observed at the upper part of these deposits.

[1] Vologina, E.G., Kashik, S.A., Sturm, M., Vorob'eva, S.S., Lomonosova, T.K., Kalashnikova, I.A., Khramtsova, T.I. and Toshchakov S.Y. 2007. Results of research into Holocene sediments of the South and Central basins of Lake Baikal (BDP-97 and short cores). Russ. Geology and Geophysics (Geologiya i Geofizika) 48 (4), 312–322.

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