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PALEOCLIMATE RECORDS OF THE HOLOCENE INFERRED FROM PROGLACIAL LAKE BOTTOM SEDIMENTS OF EAST SIBERIA

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Currently, glacier area in the south part of East Siberia is not extensive. In most causes, these glaciers are less than 1 km^2 [Margold and Jansson, 2011; Stokes et al., 2013; Osipov and Osipova, 2014; Kitov et al., 2015]. However, alpine relief and other geomorphological evidences such as terminal moraines, fossil shorelines and deltas of glacial lakes indicate extensive glaciation of the area in the past [Back and Strecker, 1998; Osipov et al., 2003].

The goal of this study is to reconstruct a glacier response to climate changes during the Holocene based on high-resolution geochemical proxies inferred from the East Siberian proglacial lakes of the East Sayan Ridge, the Baikalsky Ridge and the Kodar Ridge.

Dating of the sediments cores and fluvio-glacial deposits was based on ^{210}Pb and ^{137}Cs chronology for the upper sediment layers, and radiocarbon (14C) calibration performed by AMS built by Budker Institute of Nuclear Physics, Novosibirsk, Russia.

According obtained 14C data, forming of Tompuda moraine (Northern Baikal) was two studies. The first study begun from Belling-Allered and ended to 11.8-12.4 ka BP. The second study of deglaciation was 9-11 ka BP. In general, Pleistocene glaciers of the East Sayan Ridge, the Baikalsky Ridge and the Kodar Ridge were melted to the early Holocene. The modern glaciers most likely formed during the Little Ice Age.

The intensity of the supply of surface water into proglacial lakes has primarily depended upon a rate melting of glaciers and summer air temperature. The distribution of Rb, Zr, Nb, Y and Th will be closely associated with the clastic material and can be related with a rate melting of glaciers. The elemental composition of bottom sediments were investigated by two methods: X-ray fluorescence spectrometry and inductively coupled plasma mass spectrometry. X-ray fluorescence spectrometry was undertaken to provide quantitative information on 20 trace elements (from K to U) and a time resolution in “year-season”[Stepanova et al., 2015; Trunova et al., 2015].

We defined three periods of significant increased glacier flow/melting during the last 210 years. The first period (ca. 1800-1890), the supply of suspended material by meltwater into proglacial lakes of the East Sayan Ridge was not intense until 1850 and into proglacial lakes of the Kodar Ridge did until 1875. However, a rate of the supply of meltwater into proglacial lakes of the Baikalsky Ridge was high during the Little Ice Age and decreased at a transition from the Little Ice Age to the Recent Warming. During the second period (ca.1890- 1940) the regional glacier water balance were most likely positive. The third period (ca. 1940 - the present), the malting rates of glaciers located on the Baikalsky Ridge and the Kodar Ridge were moderate, in contrast to the East Sayan Ridge demonstrated the highest ratio of melting and changes in outlines during this period.

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FEATURES OF FORMATION OF AUTHIGENIC MINERALS IN HOLOCENE BOTTOM SEDIMENTS OF SMALL LAKES OF WESTERN SIBERIA

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Research of features of modern mineral formation and laws of generating of components of autigenic minerals in natural reservoirs of the Western Siberia is actual in connection with need of an assessment of influence of organic matter on processes of sedimentation and stability of biogeochemical cycles of macro elements (C, O, H, Ca, Si, Fe, etc.) in them. The biogeochemical aspect of sedimentology attracts wide attention of researchers, but due to the complexity of the object of study, many questions remain unclear [Lee, 1992 et.al.]. There is practically no information on the influence of biochemical transformation of organic substances on the mineral composition of bottom sediments of lakes in the process of their accumulation, in the early stages of diagenesis and their geochemical features.

This article discusses the features of modern mineral formation in small shallow lakes (171) located in taiga, forest-steppe and steppe landscapes in the south of Western Siberia. Primary field