containing the whole Holocene record was recovered from this lake. With the aim to obtain new deeper insight into the development of climatic and environmental history of the Kola Peninsula during the present interglacial period and to improve the understanding of previous findings, we employed lithological and geochemical analyzes (XRF scanning, CNS, TOC/TIC) as well as measurement of magnetic susceptibility (MSCL logging) on an 8.5 m long sediment core (Co1410, N67°42.946', E33°05.107') recovered from Lake Imandra in September 2017. The results provide detailed information concerning changes in lake productivity, water and sediment loads into the lake basin, as well variations of lake level and lake-ice-cover conditions during and since the last deglaciation. The coarse-grained sub-angular moderately sorted sediments at the core base suggest fluvio-glacial processes and a short distance transport of these sediments. They are overlaid by organic-poor varved sediments of a proglacial lake, deposited under perennial ice cover and near anoxic bottom-water conditions likely during the first half of the Pleistocene-Holocene transition. Throughout the second half of the terminal Pleistocene and the Early Holocene an accumulation of organic-rich sediments was initiated, pointing to increasing lake productivity and related to well-oxygenated bottom waters suggesting prolonged ice-free periods. The elemental composition of the Holocene sediments speaks of low lithogenic input into the lake basin and increasing chemical weathering within the lake catchment, indicating a rise in air temperature and establishing of extensive vegetation cover stabilizing slopes and preventing erosion. The uppermost sediments indicate again the extreme local erosion linked to the beginning of apatite-nepheline and Cu-Ni mining close to Lake Imandra, which is resulted in a slight deterioration of conditions for producing autochthonous organic matter.

The sediment core is currently under investigation at the collaborating institutions in Germany and Russia. Here, we provide an overview about the fieldwork at Lake Imandra and highlight some of the initial interpretations made on the basis of existing analytical data.

This research including logistics for the expedition and all analytical works was funded by the DFG–SPbU project "Last and current interglacial environments of Kola Peninsula, as reflected in the sediment record of Lake Imandra" (No. 18.65.39.2017).

VARIATIONS IN SOLAR ACTIVITY AND CHANGES IN THE LEVEL OF KHAKASSIA SALT LAKES IN THE LAST MILLENNIUM

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Core samples of bottom sediments of salt lake Shira and Bele, located in the steppe zone of Southern Siberia (the Republic of Khakassia and the southern part of the Krasnoyarsk Territory) were investigated. The sediments have the thinly laminated structure with the annual stratification (varves), which makes it possible to build reliable time models of core depth vs sediment age with an accuracy of ~ 2% over a time interval of the last centuries. The scanning X-ray fluorescence microanalysis was carried out at the experimental station "Element Microanalysis" of the Siberian Synchrotron Radiation Center. The possibility of varying the spatial resolution of the analysis (scanning step) from 1 mm to 15 μm made it possible to study both the inter-annual and intra-annual variations in the chemical composition of the bottom sediments. Analysis of the distribution of microelements over the depth of the cores resulted in detection of a set of microelements (geochemical indicators) that react to changes in sedimentation conditions due to regional climatic conditions changes. Transfer functions based on geochemical time series have been calibrated in the interval of 1925 - 1985 AD according to regional instrumental meteorological observations. That enabled building quantitative paleoreconstructions of the lake level (salinity) change over the past 2000 years with a step of one year. Analysis of the

paleoreconstructions revealed presence of natural cycles with periods of ~ 100, ~200, ~ 460, and ~ 990 years. Comparison of the of Lake Shira level reconstruction with the low-frequency component of solar activity (Sun spots number) shows a significant correlation (the correlation coefficient is +0.64) over a time interval of the last three centuries (1670–1980).

PALAEOENVIRONMENTAL MESSAGES FROM MOUNTAIN LAKES OF EASTERN SIBERIA

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Sedimentary records from mountain lakes of eastern Siberia provide insight into palaeo-environmental changes over the late Pleistocene to Holocene, as revealed by palaeolimnological multiproxy approaches on the basis of sedimentological, geochemical, and micropalaeontological data series (diatoms, chironomids, pollen, palynomorphs).

Lake Billyakh in the central Verkhoyansk Mountains existed during the last 50 ka and was formed by tectonic and deglacial processes. Our lake record suggests final deglaciation around 35 ka BP in association with a high lake-level stage during the Karginian interstadial. Geomorpho-logical findings, however, point to earlier deglaciation already sometime after 85 ka BP. Karginian warming with muted signs of millennial climate variability is documented by short-term lake-level fluctuations and vegetation dynamics (40-31 ka BP). The Sartanian glacial stage was characterized by low lake level and colder and dryer conditions, followed by Holocene climate amelioration and lake-level rise after 11.5 ka BP.

Another palaeolimnological record comes from Lake Bolshoe Toko in southeastern Yakutia, Russia. The lake occupies a basin at the foot of the northern slope of the eastern Stanovoi mountain range. At its north-eastern margins the lake is bordered by moraines of three different glacial sub-periods. First findings from sediment cores reveal a glacial advance during the last glacial maxi-mum, which likely did not affect the whole lake, as former glaciations did. Postglacial development was characterized by a lake-level lowering during the mid-Holocene by at least six metres.

The overall climate history of eastern Siberia is consistent with trends across the higher northern hemisphere, while the sequence of mountain glaciation is out of phase with the global ice-volume pattern, possibly because of complex atmospheric moisture routing effects, which so far are poorly understood for eastern Siberia.

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