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THE PROJECT PLOT (PALEOLIMNOLOGICAL TRANSECT) - OVERVIEW AND PRELIMINARY RESULTS ON THE PREGLACIAL TO POSTGLACIAL HISTORY OF THE RUSSIAN ARCTIC

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The effects of global warming are documented and predicted to be most pronounced in the Arctic, which plays a crucial, albeit not yet well-understood role within the global climate System. This so-called “Arctic Amplification” is traced back to interplays of temperature, water vapour, cloud cover, Arctic Ocean sea ice, and associated feedbacks, and is hypothesised to trigger mid-latitude climate variations. The reliability of climate projections for high northern latitudes is, however, hampered by the complexity of the underlying natural variability and associated feedback mechanisms. A prerequisite for the improvement and validation of climate projections is a more thorough understanding of the natural variability of past Arctic climate change on a range of geological timescales, when external forcings and boundary conditions have been different. A key record of the climate history in the Arctic has recently become available from Lake El´gygytgyn, NE Russia (e.g. Melles et al. 2012, Science 337, p. 315-320). This record covers the entire Quaternary and penetrates down to 3.6 Ma BP into the Pliocene. Its investigation has provided a number of key findings concerning the long-term climate variability of the Arctic, however, it partly remains an open question, how representative the information is for the circum-arctic history.

As a consequence, we established the project ´PLOT – Paleolimnological Transect´, which aims to recover lake sediment sequences along a >6000 km long longitudinal transect across the Russian Arctic in order to investigate the Late Quaternary climatic and environmental history. The PLOT

project is conducted under the umbrella of a bilateral Russian-German agreement in the field of polar and marine research and is funded by the German and Russian Research Ministries. Since 2013 extensive fieldwork, including seismic surveys, coring, and hydrological investigations, was carried out at lakes Ladoga (NW Russia), Bolshoye Shuchye (polar Urals), Emanda (Verkhoyansk Range), Levinson-Lessing and Taymyr (both Taymyr Peninsula), with the special aim to recover preglacial sediments. Fieldwork in the Ural Mountains and on the Taymyr Peninsula was conducted in collaboration with the Russian-Norwegian CHASE (Climate History along the Arctic Seaboard of Eurasia) project. A multiproxy analysis strategy was applied to all cores, including (bio-)geochemical, sedimentological, physical, and biological analyses. First data implies the presence of preglacial sediments in the cores from all lakes except Lake Emanda. Age-depth models, based on radiocarbon dating, OSL dating, paleomagnetic measurements, identification of cryptotephra, and varve counting (where applicable), are in progress. Here, we present and discuss the most important results available thus far from the geophysical site surveys and core analyses, and provide an outlook on the future strategy and foci of the project.

STUDY OF LAKES MORPHOMETRY IN THE BORDERS OF PLEISTOCENE GLACIATIONS OF THE NORTHWEST RUSSIA

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Abstract: There are lakes on the territory of the North-West of Russia within the Pleistocene glaciations different in genesis and morphometric parameters. The study of the lakes is necessary for the future pattern of development of lakes and territories on which they are located.

Key words: paleolimology, GIS, morphometry.

The aim of the work is to create a database of morphometry of lakes in the glacial and periglacial zones of the North-West of Russia.

The structure of the database is created in MS Excele and includes the name of the lake, the coordinates, the height of the lake above sea level, the relation to the glaciation boundaries, the catchment basin, the area, the length of the shoreline, the average width, the length of the lake, the average depth, coefficients of ruggedness of the coastline and elongation, the state of the lake.

The database serves the purpose of systematization of freshwater land basins and contributes to the further study of the complexes of the lakes of the Northwest of Russia.

Numerous glaciations in the Pleistocene occurred on the territory of the Northwest of Russia, which reached 50^0 latitude. After various glaciations, the lakes developed in accordance with their landscape features.

In each separately developing landscape, the lakes have a unique morphology and history of development.