

**1st International Conference
'Processes and Palaeo-environmental
changes in the Arctic:
from past to present'
(PalaeoArc)**



Book of abstracts

Adam Mickiewicz University, Poznań, Poland

Poznań, 20–24 May 2019



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New late Quaternary paleoenvironmental record from Lake Emanda (Verkhoyansk Mountain, East Siberia)

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The environmental history of the region was investigated within the scope of the German-Russian project PLOT. The Lake Emanda field campaign with seismic profiling and sediment coring was carried out in August 2017. The lake is about 7.5 km long, 6.5 km wide and located in Verkhoyansk Mountains (65°17.64'N, 135°45.55'E, 671 m a.s.l.). Coring was built on seismic profiling conducted with the Innomar equipment. The shallow seismic revealed that the lake is made up of a western and eastern lake basins. Core Co1412 was retrieved from the western basin at and a water depth of 14.6 m. A 6.1 m sediment sequence was retrieved using the UWITEC equipment. Stratigraphic and geochemical analysis of the core include grain size analysis, X-Ray Fluorescence scanning, Multi-Sensor Core Logger measurements, determination of TIC, TOC, TN, TS and water content as well as pollen, chironomid, diatom studies.

The revealed pollen assemblages can be subdivided into 7 main zones (PZ): PZ 1 (605–425 cm) is dominated by *Betula*, *Alnus*, *Pinus* and *Larix* pollen. The assemblages indicate that the sediments were formed during an interval with climate conditions similar to the Holocene ones. However, high contents of *Sphagnum* spores as well as Cyperaceae and Ericales pollen point to wetter soil conditions. The interglacial character of the revealed pollen assemblages may point to MIS 5 age of the sediments. The sediments also contain numerous green algae remains (*Pediastrum*, *Botryococcus*, Volvocales). PZ 2 (425–240 cm) is dominated by pollen of Poaceae, Cyperaceae and *Artemisia* indicating the cold and dry climate conditions. According to AMS ¹⁴C dates the sediments were accumulated during MIS 2. PZ 3 (240–150 cm) is dominated by Poaceae, Cyperaceae, *Artemisia*, *Betula*, and *Alnus* pollen indicating the warmer climate conditions in comparison with PZ 2 interval. PZ 3 sediments were accumulated during Bölling/Allerod. *Betula* and *Alnus* pollen contents are lower in PZ 4 (150–125 cm) pointing to colder and drier climate coinciding with Younger Dryas cooling. The upper PZs show increase of *Betula*, *Alnus*, *Pinus* and *Larix* pollen contents reflecting changes in local vegetation during the Holocene.

The sediments are also studying for chironomid. The highest species diversity has been found at the Holocene and late glacial sediments (0–150 cm) with the strong decline of the species diversity and presence in the sediments between 344 and 432 cm. The only Holocene sediments (121–0 cm) contain diatoms which can be subdivided in 3 zones reflecting the stages of lake history during the Holocene. The 27 Holocene samples were also processed for $\delta^{18}\text{O}_{\text{diatom}}$ analysis. The $\delta^{18}\text{O}$ values range between +22.5 and

+27.3‰. Maximum values (+26.7–27.3‰) at the 84–93 cm depth probably reflect the Holocene Thermal Maximum. The absolute minimum (+22.5‰) at the 5 cm depth likely corresponds to the Little Ice Age. The observed gradual depletion of 4.8‰ in $\delta^{18}\text{O}_{\text{diatom}}$ in line with an overall Holocene temperature decrease.