



The seismostratigraphy and the 50-60 ka sedimentation history of Lake Bolshoye Schuchye, Polar Ural, Arctic Russia

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The seismostratigraphic studies of the 12 km² and the 136 m deep Lake Bolshoya Schuchye, Polar Ural, Arctic Russia, have unrevealed that the lake is apparently preserving up to a 160 m thick pile of acoustic laminated sediment units. With aid of a detailed grid of Sparker array profiles (208 km long) the sediment stratigraphy, architecture and volume of the sediment units have been mapped out in some details. Three informal regional seismic horizons are defined and dated with aid of a 24.5 m long well-dated core retrieved from the lake. The detailed and continuous time constrains available on the stratigraphic units offer also excellent possibility to calculate the variability in sediment fluxes taking place in this high arctic Polar area since the Last Glacial Maximum (25 ka BP). The flux rates calculated show that the initial laminated sedimentation in the lake basin must have started no later than around 50 ka BP. This finding is also supported by a number of ¹⁰Be and OSL dates as well as glacial geological observations available from the surrounding mountain areas; all pointing to a period in this area mainly dominated with local glacial conditions within this time period. Acoustic laminated units, draping over the underlying bedrock morphology, is the sediment style characterizing the lake sediments. This depositional setting demonstrates that the dominating sedimentation process prevailing in Lake Bolshoya Schuchye is the hemipelagic sedimentation only punctuated by thin layers of turbidities and/or minor slumping processes. Identification of submerged delta-type geometric features at 26 m depth below the present lake level suggest that the lake must have dried in and the present level be lowered by 26 m during the LGM period. This finding offer a new insight into the climate condition in the Polar Ural area, Arctic Russia, during the LGM and the early deglaciation period.