Complex investigation of Lake Bannoe sediments (South Ural, Russia)

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In paper presented results of complex investigations of Lake Bannoe (53°34'40.5"N 58°38'05.0"E) and its sediments. The origin of the Lake is tectonic. Seismoacoustic investigations were carried out for choose the best places for coring with continuous sedimentation and avoid gas saturated sediments. 4 long cores of sediments (up to 5.5 meters) were collected with using special hydraulic corer.

To study the sediments, a set of methods was used including petromagnetic and paleomagnetic studies, the study of mineralogical and elemental composition. According radiocarbon dating the maximum age of samples is 12.5 thousand. The age of samples increases with depth naturally, which means we have continuous sedimentation without hiatus.

Measurements of magnetic susceptibility (MS), hysteresis parameters and thermomagnetic analysis were carried out to determine changes in magnetic mineralogy and sedimentation conditions. Thermomagnetic curves measured on Curie express balance, coercitive parameters on J-coercivity spectrometer and magnetic susceptibility on multi-function kappabridge MFK1-FA (AGICO). The elemental composition was studied on an S8 Tiger X-ray fluorescence wave dispersion spectrometer. X-ray diffraction was performed on a Bruker D2 Phaser for studying mineralogical composition.

Changes in the magnetic susceptibility along the section are not significant, which indicates the constancy of sedimentation conditions. Only lower part, below 4.7 meters, MS increasing which corresponds to big input of terrigenous material. Most common magnetic minerals of sediments are pyrite and magnetite. Main minerals are quartz, albite, mica, from 1.3 meters and below in sediments detected calcite and dolomite.

Obtained data from all methods (magnetic properties, minerology, elemental composition) used for preliminary paleoclimatic and paleoenvironmental reconstructions of South Ural region for last 12.5 kyr. According petromagnetic data there is no big changes in sedimentation conditions. Also elemental composition shows the same, no big changes. Bottom part of sediments core are consist of more coarse material this is reflected both in magnetic properties and in elemental composition.