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So far, no high-resolution reconstructions of climate and glacier variations based on lake sediment properties are available in Caucasus Mountains. In other presently glaciated regions this approach is proved to be very useful for this purpose (e.g. Nesje et al., 2001, 2011; Bakke, 2005, Nesje, 2009) In this paper we report the first results of the sediment coring of Donguz-Orun Lake (N 43°13'26", E 42°29'35") situated in the upper reaches of Donguz-Orun-Kyol, a tributary of Baksan river in the Elbrus region of Northern Caucasus, a typical proglacial lake dammed by a lateral moraine deposited by the Donguz-Orun Glacier.

It is a drainage lake with several inflowing glacial streams and effluent river Donguz-Orun. The surface area is around 105 000 m² with a water volume of 465 000m³. The average water depth is around 4.5 m, with a maximum water depth of 14 m. The deepest part is found close to the moraine dam in the narrow northern part of the lake. This is normally consistent with this type of glacial lake systems. An intensive gravitational drift of the moraine material towards the lake is observed. These non-rounded moraine boulders constitute a significant part of the lakebed. Lacustrine sediments are present though.

The coring campaign from Institute of Geography, Russian Academy of Sciences (August 2012) used a modified piston corer with a 110 mm-diameter plastic tube (Nesje, 1992) mounted on the inflatable catamaran to obtain lake sediments from Lake Donguz-Orun. A 28-cm long core was retrieved from a water depth of around 7 m. The sediments consist of regularly laminated, fine beige clay, with several interlayers of sand. The coring process appeared to be challenging due to the stiffness of clay, which led to extreme bending of the sediment layers in the basal part of the core. The original thickness of the sediments was obviously higher than observed in the core.

In order to clarify the recent history of the Donguz-Orun glacier, we used lichenometry and dendrochronology for dating its lateral and terminal moraines.

The upper part of the core (0-170 mm) was scanned applying X-ray fluorescent microanalysis using synchrotron radiation and sampled for dating using ¹³⁷Cs and ²¹⁰Pb. The assumption that the sediment stratification represents annual layering (spring flood) is generally confirmed with correlation of the Rb/Sr-ratio (that supposedly marks grain-size variations in the sediments) curve and the image of the sediment core. Calculations of Rb/Sr peaks or visual layers yield an accumulation rate of around 2 mm/yr. Analogous results (1.73 mm/yr) are derived from ¹³⁷Cs-dating. With this high accumulation rate, the sediment core of Lake Donguz-Orun represents an important source of information for high-resolution reconstructions of climatic parameters and glacier variations of the region.

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