



Geomorphological features of the bottom of Lake Ladoga

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Lake Ladoga is the largest lake in Europe.

The NW zone of this lake is located within the Baltic crystalline shield, relief of bottom is caused by tectonic features of its south-eastern margin, composed of Archaean-Proterozoic crystalline rocks. In the SO direction, the shield slopes beneath the sedimentary cover of the Russian platform, the crystalline rocks are covered by an increasingly thicker layer of Riphean, Vendian and Phanerozoic sediments.

As a result of long-term studies of the Ladoga bottom, the Institute of Limnology RAS has created a digital relief model, on the basis of which it is possible to compile bathymetric maps over a wide range of isobath sections. This gives an opportunity to take a fresh look at the relief of the bottom of Lake Ladoga.

In the NW zone of the lake, the relief is high (depth differences of 100-200 m). Here the linearly extended forms of the relief predominate, mainly NW stretches.

To the south-east the relief is reduced (1-10 m). Forms lose a clear direction and linearity. This is due to the overlapping of the block structures of the shield by the sedimentary rocks of the platform cover and the glacial deposits of the quarter.

Based on the DEM of the bottom of Lake Ladoga, the authors compiled the Geomorphological Map of Ladoga Lake. On this map, the bottom of the lake is divided into 3 large zones - 1) the structural-denudation valley-ridge relief in the northern part of the lake (the zone of the Baltic Shield); 2) abrasion-accumulative, mainly glacial, relief in the central part of the lake; 3) the accumulative relief in the southern part of the lake. Also allocated are areas of coastal relief.

In each zone, the genetic types of the relief are distinguished: valleys and ridges in the zone of structural-denudation relief, glacial elevations and depressions in the zone of abrasion-accumulative relief and areas of accumulative plains of different levels in the zone of accumulative relief.

By combining chains of linear forms of relief, lineaments are determined - polygenic linear objects of the surface, presumably being surface signs of faults. Directions of lineaments at the bottom of the Ladoga Lake are grouped in systems of 140°, 0°, 90°, 40°. When comparing the selected lineaments with the already known faults in this region (V.A. Rudnik, B.G. Dvermitsky, A.V. Amantov, B.A. Assinovskaya), it can be seen that the known faults fit well into the system of lineaments selected by the authors that confirms its reliability. A dedicated network of lineaments can serve as a basis for clarifying and supplementing the network of faults.

The configuration of the lineaments of the bottom of Lake Ladoga shows the blockage of the basement, which is subordinate to the four main directions - meridional, latitudinal, diagonal SW (40-50°) and diagonal SE (140°), i.e. directions of the global regmatic network.