



The results of geological and geomorphological studies of the bottom and shores of Lake Ladoga 2015-18 years

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In 2015–18 year, Institute of Limnology RAS made geological and geomorphological studies of the bottom and shores of Lake Ladoga, including:

- field study of shores, sampling, photo and video recordings from a UAV, underwater photo and video recording, and large-scale echo sounding;
- study of the bottom of the lake, including bottom ground and water sampling, echo sounding, interpretation of the digital bottom relief model, lineament analysis.

According to these studies, the resulting materials were made, including terrestrial, aerial and underwater photographs, video clips of all types of coastal zones of the Lake, map of types of lakeshores, geomorphological map of the lake, map of the distribution of the heavy fraction in coastal sediments, a set of lineament schemes, echo sounder profiles of the bottom, the scheme of groundwater springs at the bottom of the Lake, etc.

Based on the results of our research, the following conclusions were drawn on the geological and geomorphological structure of the bottom and shores of Lake Ladoga:

1. The shores of Lake Ladoga are of the 7 main types - abrasion fiard-shkhorny, abrasion-accumulative boulder-block, accumulative, including beach, beach-dune, delta; the eutrophial and technogenical shores are presented as separate types.
 2. The bottom of Lake Ladoga is divided into 3 geomorphological zones - the zone of accumulative plains (southern part of the Lake), the zone of abrasive-accumulative, mainly glacial forms (central part of the Lake) and the zone of structural-denudation valley-ridge relief which is the northern part of the Lake.
 3. The structural plan of the bottom of Lake Ladoga consists of a number of linear structures — lineaments with 4 main directions — the meridional, latitudinal, diagonal NE (40-50°) and the diagonal SE (140°), with a predominance of the SE system, i.e. directions of the planetary regmatic network.
 4. The study of the distribution of heavy fraction of coastal sediments showed that there exists the long-time near bottom benthic water coastal current directed clockwise.
 5. The distribution of groundwater springs at the bottom of the northern part of the lake speaks of their connection to faults distribution.
 6. The use of the underwater camera in the coastal zone of Lake Ladoga revealed a number of new facts about the state of the bottom landscapes, which requires the further studies of the bottom by this method.
- The combined use of UAVs and underwater photo and video filming in combination with traditional methods has shown the high efficiency of these methods.