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Relation of human and natural factors in the development of lakes according to a complex analysis of lake sediments

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The question of establishing the features of the anthropogenic factor in the development of lakes at different stages is particularly relevant at the present time due to the human activities on the lakes. Recently, the processes of eutrophication by the influence of anthropogenic factors are studying by the scientists. The mechanism of a natural eutrophication is still poorly understood. To understand this mechanism needs data of reconstruction of trophic status of lakes over a long period (few millenniums), and the reasons of changes of their productivity.
We received new data from sediment core of the central part of Lake Ladoga (60º28'10" N, 31°19'18" E) from a depth of 72 m. The thickness of core is 47cm. Every centimeter of the core was studied by using the pollen analysis on the content of organic matter in sediments, metals (Fe, Mn, Cu, Ni, Pb, Zn, Cr, Co, V), general, mineral and organic phosphorus.
Age sediments studied about 2500 years. We calculated rate of sedimentation. According to a complex analysis revealed the dynamics of all the studied components in pre-industrial and industrial periods. In the period 2500-500 years ago there was no human impact on the productivity of the lake. Only about a few hundred years ago, the anthropogenic factor has more important role in the development of the lake. Since the beginning of the industrial period, impact of anthropogenic factors exceeded the impact of natural. According to our results (of content of organic matter, metals and phosphorus) we developed a method of percentage ratio of influence of natural and anthropogenic factors. In consequence, we received the data that the pollutions of human activities are not as large as previously thought.