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STUDY OF HYDROCHEMICAL PARAMETERS OF LAKE PITYEVOYE,
SOLOVETSKY ARCHIPELAGO

Ksenia V. Titova *, Anatoliy A. Sloboda, Tatiana A. Zhibareva, Natalia M. Kokriatskaya,
Sergey S. Popov, Irina S. Eliseeva, Vladimir M. Bykov

*N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the RAS,
Arkhangelsk, Russia*

The formation and development of the Spaso-Preobrazhensky Solovetsky Monastery on Bolshoy Solovetsky Island in the White Sea required ensuring its sustainable water supply. The final lake in the Western lake-canal system, which provides water for the needs of the monastery, is Potable. It is connected by a channel (originating from it) with a length of more than 2 km (a drinking canal) to the Lake Pityevoye. Currently, for the water management needs of the monastery and the village. Solovetsky, which is located around the walls of this monastery, water intake is carried out approximately in the middle of the Drinking Canal. The lake under study is currently not under obvious anthropogenic influence. There are no residential buildings or industrial enterprises on its shores. The recreational impact of rowing boats and electric motors is currently negligible, but the tourist flow to the Solovetsky Islands is increasing every year. Studies of hydrochemical parameters of various reservoirs in Russia and abroad indicate that, in addition to anthropogenic effects, climatic changes can affect the properties of water. The purpose of this study was to summarize the data obtained on the hydrochemical parameters of Lake Pitevoe over 5 years (2020–2024) and identify possible changes in their natural conditions. Drinking lake is located Northeast of the village Solovetsky. By origin, it is a glacial–tectonic reservoir. The shape of the lake is lobed. The basin stretches from Northwest to Southeast. Two deep depressions are clearly marked in the bottom relief: North and South, separated by an underwater threshold with a depth of 1.8 m above it. Water samples were taken from the boat in layers with a 2-liter horizontal polycarbonate bathometer at a 10 m deep-water station near the source of the Drinking Channel. The conducted studies have shown that climatic fluctuations in air temperature and precipitation led to fluctuations in temperature and water level in the studied reservoir. The combination of these changes influenced the variations in hydrochemical parameters. Chromaticity, electrical conductivity, dissolved iron content (increase) and pH, and mineralization (decrease) depended more on the amount of precipitation. The water temperature affected the oxygen content, and the creation of oxygen-free conditions in the bottom layers of the lake was observed. The occurrence of anaerobic processes in the bottom layers of the lake was accompanied by an increase in the degradation products of organic matter, in particular, bicarbonates. At the same time, there was no increase in the content of hydrogen sulfide, its concentrations for the entire study period did not exceed 5 mcg/L. The results obtained indicate the need for annual monitoring studies at drinking-water facilities, even though fluctuations in hydrochemical parameters are currently mainly associated with changes in climatic conditions.

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* **Corresponding Author:** Ksenia V. Titova, Cand. of of Geograph. Sci., Senior Research, N. Laverov Federal Center for Integrated Arctic Research, Ural Branch RAS, Nikolsky Ave., 20. Arkhangelsk, Russian. E-mail: ksyu_sev@mail.ru