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FAUNA OF THE UNDERWATER SLOPES OF THE NORTHERN PART
OF LAKE LADOGA

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Benthic communities were studied on the underwater slopes of the Valaam Archipelago in the Northern part of Lake Ladoga at depths of up to 30 m. The research involved the use of diving operations, diver-operated video, and remotely operated vehicles. In total, more than 160 invertebrate taxa were recorded. Depth proved to be the most significant factor determining the quantitative parameters of the communities at all studied sites. Wave activity affected zoobenthos abundance in the upper 10-meter layer. In a closed bay, the maximum values of zoobenthos abundance and biomass are observed in the littoral zone (up to 8 m). In a semi-closed bay and in open coastal areas, the peak of abundance shifts to the sublittoral zone (deeper than 8 m), where wave exposure diminishes. Substrate type significantly influenced only the species composition of the communities but not their quantitative characteristics. Large-scale changes are occurring in the lake's littoral zone – numerous invasions of alien species and an increase in trophic status caused by water warming and pollution. At the same time, starting from a depth of 8 m (sublittoral and profundal zones), changes in the communities are practically unobserved, and the majority of the benthic biomass (more than 70%) is composed of cold-water relict crustaceans. The proposed integrated approach complements the initial survey with detailed work on the underwater slopes and provides the most reliable assessment of the fish forage base and the ecological state of the lake ecosystem. Taxonomic diversity was more fully determined; the biomass of forage benthos in coastal areas and on the underwater slopes was estimated; and the spatial distribution of key benthic species (including relict crustaceans) was determined in relation to topography, substrate, and wave conditions. Annual monitoring observations further enable comparison of changes in the ecological state and food supply of bottom fish across a significant area of the lake's deep-water zone.

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