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USING MACHINE LEARNING METHODS TO MODEL ICE DATES
ON RIVERS ON THE LAKE SEVAN BASIN

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Ensuring safe navigation, protecting hydraulic structures, minimizing economic damage from hazards: all these tasks are priorities in the field of ice study at water bodies. Among the most important types of ice forecasts is the determination of the start and end dates of ice formation, which is a complex process, but substantially different in terms of factors of formation. Therefore, the aim of the study is to introduce machine learning methods (decision tree methods and Naive Bayes classifier) into the practice of modeling ice processes on the rivers of the Lake Sevan basin. The suggested algorithms are based on the probabilistic inclusion of individual traits in a particular class (group). Five hydrological sites of the Sevan basin, where ice phenomena are observed, were chosen for the study: Dzknaget River (observation point (OP) Tsovagyugh), Drakhtik River (OP Drakhtik), Pambak River (OP Pambak), Vardenis River (OP Vardenik), Bakhtak (OP Tsakkar). The work used hydrometeorological data from 2015 to 2023 ("Hydrometeorology and Monitoring Center" SNCO of MOE of RA). Also, for quality check of methods, the source samples were divided into instructional (from 2015 to 2022) and test (2023) parts. Decision trees and the Naive Bayes classifier method were considered. An analysis of ice phenomena for the rivers of the Lake Sevan basin is presented. Testing of the proposed methods showed that the actual onset of ice phenomena begins later than the forecast dates. Also, the models are worse at determining the end date of ice phenomena. When comparing the relative number of correct forecasts for the entire period of the test sample, the Naive Bayes classifier method has a slight advantage in accuracy.

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