DOI: 10.46991/JISEES.2025.SI1.194

# To the Question of Forecasting of Water Discharge of Armenia Rivers

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## ABSTRACT

The paper considers the physical-geographical and climatic conditions formation of the river runoff of the rivers of Armenia. Two mountain rivers were considered Armenia: r. Arpa and r. Dzoraget. Relevance. Forecasts allow the most rational use of the country's water resources, as well as to prepare in advance for dangerous hydrological phenomena and these prevent or significantly reduce the damage they cause to the people au pair. The purpose of the study is to test the mathematical models for mountainous and semi-mountainous rivers of Armenia and analysis of the results, obtained in the implementation of these models. Methods. For forecasting runoff of mountain rivers, an approach based on the application of dynamic models of daily water consumption formation. Used models presented as differential equations of the first and second order for predicting the process of changing characteristics river flow. As the initial data, water consumption for hydrological posts in Jermuk for 2017 – 2024 and for the city of Stepanavan for 2017 – 2024, average daily air temperature (°C), sum daily precipitation (mm), snow cover thickness (cm) according to weather stations Jermuk and Stepanavan. Results. Cost forecasting methods tested waters on the semi-mountain rivers of Armenia and on their analogues on the territory of Russia. For the Arpa and Dzoraget rivers, the models of the first and second orders are insignificantly underestimate and overestimate the predicted values, respectively. When conducting verification forecasts of water discharges on the mountain rivers Arpa and Dzoraget in the period of high water and rain floods, the best results are obtained by mathematical model in the form of a differential equation of the first order. This model does not take into account subsurface runoff. Revealed that with a short lead time, the model parameters can be optimized with a large error, for example, the coefficient responsible for snowmelt intensity. In general, dynamic models show a satisfactory result in assessing their effectiveness. It is also noted that when forecasting with a daily lead time, the values model parameters that are obtained by dynamic parameterization on material preceding the release date of the forecast, characterized the process runoff formation for such a relatively short future period time. It should not be expected that the parameters can be suitable for greater advance. Therefore, you should associate model parameters with weather elements that can be predicted for several days forward. The task of developing a dynamic model becomes relevant of the first order, taking into account the melting of snow reserves in the catchment area and change in the sum of positive temperatures.

**Keywords:** spring flood, forecast, mountain and semi-mountain rivers, Arpa river, Dzoroget river, Republic of Armenia

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