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BOOK OF ABSTRACTS

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THE LONG-TERM FORECASTING OF HYDROLOGICAL CONDITION OF SMALL RIVERS AND FILLING OF THE LAKES IN DANUBE REGION DURING THE SPRING PERIOD OF YEAR

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To accomplish the task, a scientific method of long-term forecasting of spring flood on small rivers and reservoirs of the Danube region was proposed. The main problem of scientific study was the basically absent of hydrological observation network in the basins of the lakes and rivers in the whole north-western Black Sea region. Therefore, the methodological framework forecasting of the characteristics of spring floods and rain floods hardly developed. There are no recommendations how to estimate the probability of occurrence of the phenomenon in the long-term period.

The authors propose consolidation of modeling scale of the studied region and the involvement of territories with the existing hydrometeorological observation network and sufficiently studied in hydrological terms. In this case, it is expedient to involve data from long-term observations of Pivdenny Buh basin and other rivers of north-western Black Sea region.

Forecasting sequence of the spring flood layers include:

1) Typification of spring floods in accordance with their water content according to the model of discriminant function DF, which takes account of the complex of factors having an influence upon conditions of spring flood formation.

In vector-factor of discriminant function, hydrometeorological factors of the flood are included (expressed in the module coefficients):

- total water-storage in the reception basin, which take part in the spring flood formation;
- the soil moistening and frost zone;
- meteorological characteristics of the winter and simultaneity of the spring snowbreak.

2) Determination of the forecast modular coefficient of the spring flood by the regional dependence on the total moisture content of the reception basin.

3) Setting the probability of the forecasting flow layers in the long-term period.

The predicted values of spring floods are presented by map-schemes of their distribution over the territory and the probability of occurrence of the phenomenon in the long-term period, which makes it possible to estimate the scale of the spring floods, including the rivers not investigated hydrologically, which are small rivers of the Danube region.

The income of surface waters at the Danube lakes in the spring, are determined by:

a) the initial water level in the lake at the date of the forecast;

b) using the curve of the volume set the initial volume of water in the lake;

c) determining the volume of water into the lake during the period of the spring flood

g) calculating of the expected volume of water in the reservoirs for the spring flood according to the water balance equation of the lake. It is assumed that the rainfall in the water basin of the lake is compensated by evaporation with its water surface;

e) using the magnitude of the predicted volume of water in the lake during the period of spring flood on the volume curve, the maximum level of water in the lake is established, m BS.

Estimation of the filling of the lakes (million m_3) and the maximum water level (m BS) in the spring is presented as a diagram and a deviation of the allowable error.

Conclusion: For the first time, the method of the long-term forecast of surface water during the spring period for small rivers and lakes of the Danube Region was substantiated. The actual problems associated with water management of the Danube lakes for a strong and sustainable economic and social development of the Danube Region Basin were considered.

Keywords: long-term forecasting, discriminant functions, the spring flood, filling of the lakes.