



The structure of the water budget of the Udy River (Ukraine) under the influence of present climate change

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The water budget of a certain area for a certain time interval is one of the quantitative characteristics of the hydrological cycle, which reflects the objectively existing in nature relations between the inflow, losing, and change of humidity reserves.

The paper presents the results of calculating the components of the water budget of the Udy River Basin (the Siverskyi Donets River Basin) based on the available observation materials, and also describes their long-term dynamics. Total evaporation was calculated from the temperature and absolute humidity by the Konstantinov method. For the study, four meteorological stations data, which zones of influence belong to the studied basin, and the hydrological gauge the Udy River - Bezlyudivka data were used. In order to identify changes that have already occurred with the water body, it was compared the hydrometeorological characteristics of the present period (1991-2020) with the period of climatological normal (1961-1990).

Since meteorological stations observations characterize discrete values of meteorological indicators at individual points, and hydrological gauges observations show integrated values of water runoff related to the upper basin situated, meteorological data were reduced to their average values in the river basin. For this purpose, the weighing method was used - the basin is graphically divided by the system of Thiessen triangles into zones of influence of a separate meteorological station within the studied basin. The amount of precipitation, temperature, and relative humidity were determined using the calculated weights coefficient.

The study of the water budget of the Udy River Basin revealed an increase in air temperature within the basin and the associated increase in the value of total evaporation, a decrease in spring flood runoff, and an increase in total runoff of the low-water period. It is determined that the annual runoff in the present period has decreased by 17%. The total amount of precipitation for the two study periods is characterized by the same amount, but there was a change in their distribution during the year. The amount of precipitation decreased in the period of spring flood at the present period compared to the period of climatological normal and increased in the low-water period.

