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The role of meteorological factor in long-term variability of the river streamflow of the territory of north of the Russian (East European) plain

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Abstract

© 2014, Mediterranean Center of Social and Educational Research. All rights reserved. As is well-known, the river stream-flow as the main source of water resources, is formed and changed under the influence of climate conditions and physiographic characteristics of watershed basins. Snow storage, liquid precipitation in the period of snow-melt flood, degree of moisture of the area, etc. are the main hydro-climatic factors determining the amount of the annual river flow. On the territory under consideration, in this case the region of the North of the Russian Plain is selected as which, flow fluctuations are well-defined as a result of changes in space and time of the main forming it factors and, mainly, the meteorological factor. In this regard, the main objective of the work is to find the connection between rainfall and river flow, as well as to identify patterns of spatial and temporal changes of river flow and precipitation. During the study, the authors identified the dependencies between precipitation and the layer of the run-off in hydrological seasons. In particular, the closest connection was established between precipitation and the flow of summer-autumn period, where the correlation coefficient (r) for posts of Soyana - Soyana, Mudyug - Patrakeevskaya is r = 0,7 – 0,8, reaching r = 0,9 (Codina - Codino). Comparison of precipitation of the winter-spring period and the spring run-off did not reveal very close connection, except the site location of Sysola - Pervomajskij (the basin of the Northern Dvina), where r = 0,86. It is determined that during a year there are two maxima and two minima in the distribution of precipitation, while in the overland runoff they do not fully coincide with precipitation in time. Synchronous increase of share of precipitation and runoff was observed from May to July and in October, except August (precipitation) and April (run-off), where these periods did not coincide.

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Keywords

Gauging station, Hydrological season, Precipitation, Run-off