

Assessment of changes in forest composition in future decades in Slovakia and their impact on runoff processes

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The aim of the paper was the impact assessment of the change in forest composition as a result of climate change on the runoff processes in selected river basins.

The changes in forest composition in Slovakia were estimated by the National Forest Centre and Technical University in Zvolen for the 2075 horizons. Outputs from the KNMI and MPI climate scenarios were used to estimate future behaviour of climate characteristics as daily precipitation totals, mean daily air temperature and potential evapotranspiration.

In this paper, simulated changes in the runoff regime in the selected river basins due to changes in land use were estimated using the WetSpa mode. Distributed rainfall-runoff model simulations are often used to evaluate the impact of changes on the generation of runoff. These models have the advantage of reflecting the effects of land use on spatially distributed model parameters. The parameters of the model were estimated using climate data and three digital map layers: a land-use map, soil map and digital elevation model.

The results obtained suggest that such changes in land use (a change in a forest's composition) cannot have a significant impact on runoff changes in climatic conditions. On the other, based on the scenarios of the long-term average discharges of future horizons and their comparison with the reference period of 1981 – 2010, it seems that in the future we can expect considerable changes in the long-term mean monthly runoff in the simulated catchment.

Keywords: rainfall-runoff modelling, global climate change, land-use change, forest composition

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