



Changes in floods due to changes in forest composition in two small mountainous basins in Slovakia

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Forests are an important part of the hydrological cycle; they affect the quality and quantity of water, runoff rates, the extend of flooding or the rate of erosion. In recent decades many forests in Slovakia, especially those in mountain basins, have been devastated by wind or snow calamities.

Hence, the study focuses on the problematics of the afforestation caused by wind calamities on the two neighbouring basins of the Boca and Ipoltica rivers, which are located in the Low Tatras National Park, Slovakia. The main aim of the study is to analyze changes in forest composition and estimate their possible effect on the changes in runoff from the Boca and Ipoltica river basins in Slovakia for historical (1990) and present land use. For estimating the changes in runoff and floods, the Curve Number Method as well as fully distributed hydrological model WetSpa were used.

The analyses of land use maps show that the Boca River basin was more affected by the wind calamities. The land use maps of the Boca River basin in 1990 compared to the land use maps in present show significant forests decrease but also agricultural land decrease, natural grasslands decrease, and the negligible decrease for urban areas. For the Ipoltica River basin we can also expect forests decrease as well as pastures decrease, and natural grasslands decreased. The forest decrease compare to the Boca River basin is not so significant. On the contrary we can expect negligible agricultural land increase for the Ipoltica River basin.

Based on the above research it is logical to expect more significant runoff changes in the Boca River basin than in the Ipoltica River basin.

The values of floods in both river basins have increased over time when comparing the results from 1990 and present. These results have been also confirmed by the simulation of fully distributed hydrological model WetSpa.