

FLOOD RISK ASSESSMENT IN A POORLY GAUGED BASIN

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5.1 ABSTRACT

An approach for flood risk assessment in a poorly gauged basin has been proposed and tested for the Sosna River basin in European Russia. The approach involves searching a data-rich small proxy basin which is hydrologically similar to the poorly gauged study basin, developing a physically based model of flood generation in the proxy basin, and transferring the developed model with adjustments to the study basin. In this case study, the adjustment was carried out through the model calibration against snow and soil freezing survey data in the study basin; streamflow data were not used for the calibration. Long-term artificial time series of daily weather variables were Monte Carlo simulated and input to the hydrological model to generate a corresponding series of snowmelt flood hydrographs in the study basin. Frequency distributions of flood characteristics (volume and peak discharge) were derived from the long-term series of the modelled hydrographs. The approach allows the derivation of frequency distribution of flood volume without utilizing any streamflow observations in the study basin; however, in order to obtain reliable frequency distribution of flood peak discharge, several years of streamflow observations should be used for the additional calibration of the model. The proposed approach is targeted for hydrological engineering practice and considered as a suitable alternative to the traditional methods of flood risk assessment in ungauged or poorly gauged basins.

5.2 RÉSUMÉ

Une approche d'évaluation des risques d'inondation dans un bassin fluvial avec un nombre insuffisant de limnimètres a été proposée et essayée pour la rivière de Sosna située dans la partie européenne de Russie. Cette approche