EFFECTIVENESS ASSESSMENT OF THE DESIGNED MEASURES IN THE BASIN

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This article describes part of results of the project "QJ1520268 The new procedures of optimization systems integrated protection area in the context of their economic sustainability". The aim is effectiveness assessment of the designed measures in the Litava basin in hydrological model created in software HEC-HMS (Hydrology Engineering center – Hydrologic modeling system) [1]. For computing hydrologic loss and flood transformation was used SCS CN method. Designing of the measures affected schematization of the basin (fig. 1) and for flowless measures was computed retention capacity. The east part of Litava basin (area 136.85 km^2) was chosen for morphological fragmentation, large agricultural use and many locations threatened by flash floods. This article also describes the creation of runoff model in HEC-HMS, including calibration (fig. 3), verification and simulation of the designed land use with line measures in the model. There are only two flow measurements in Litava basin in Brankovice and Rychmanov, so the hydrological model was created for large part of the Litava basin and next the priority part was calculated. In the priority part is about 59.38% agricultural used land and about 56.72% is fertile ground. The area erosion control measures were designed on the 93.91% of the fertile ground. Localization and design of erosion control measures is shown on fig. 4, types, areas and numbers of all measures are shown in table 1 and table 2. The most used method to schematization of the measures to the precipitaion-runoff model is projection to CN number. Graph of CN number, peak flow and runoff volume is shown on figure 5. We want to achieve by further research better schematization of the measures in the model. The flowless measures could be inserted to HEC-HMS as component "reservoir" as infinitely small tank without functional objects and drainage measures could be inserted to the model as reaches of the river. This would be connected with hydraulic model HEC-RAS to project hydraulic flowing in the reach. On figure 6–9 is shown comparsion of hydrographs in two profiles for 4 real flood episodes with and without the measures. The runoff volume was reduced by 5.3–16.3% and the peak flow was reduced by 4.8–18.4%. So the effectiveness assessment of the designed measures in the basin is not insignificant.