HYDROLOGICAL MODELING OF PRECIPITATION-RUNOFF PROCESS IN THE "HUSÍ POTOK" BASIN

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The aim of the project "QJ1520268 The new procedures of optimization systems integrated protection area in the context of their economic sustainability" is to create a design optimized system of management of water and soil resources in the long term, including balancing the soil-plant-atmosphere system and also in order to reduce the impact of climate change on agricultural ecosystem, which is highly topical issue today. To assess the effects of specific changes in the "Husí potok" basin the runoff model in HEC-HMS was created and this model will be used for further assessment. This article describes the creation of runoff model in HEC-HMS, including calibration, optimization and verification and simulation of two different ways of land use. First simulated variant of land use was application of agro-technical and organizational erosion control measures. Second simulated variant of land use was application of grassland on all agricultural soil. These models demonstrate that change of land use could affect the characteristics of flood – peak flow and flood volume, but not enough (see *Fig. 5*). That is the reason to design the complex and strategic solutions around the "Husí potok" basin for all area of the basin and not just a local solution in individual cadastre. There is only one flow measurement in "Husí potok" basin in Fulnek city, so the hydrological model was created for this outlet. The sub-basin to outlet in Funek is about 41% of all "Husí potok" basin. Another problem is absence of weather station in the basin. We took data from weather station Vítkov (12.74 km from Fulnek) and Mošnov (14.74 km from Fulnek). These big distances are one of the reasons, why the shape of flood is not 100% (see *Fig. 3* and *4*). However, due to Nash–Sutcliffe model efficiency coefficient, which was 0.933 (calibration) and 0.854 (verification), the model was found sufficient for further use. Characteristics from this created and tested hydrological model will be used for a full basin model.