

A creek's hydrological model's generates in HEC-RAS

During my research I have studied the Ronyva creek's 3.7 kilometers long stage and the Ronyva-spillway, both are located in Sátoraljaújhely. The area had significant flood damages in 2010 which resulted great reconstructions along both beds. During my work I used all the available data, I have made the hydrological model of the streams, then I ran flood models according to real and hypothetic flowrate in the built-out model-environment. By the help of the models the mostly endangered areas during an inundation can be predicted, and the bed's ability of excess water control can be studied.

The collection of significant amount of data is required to create the model-environment. To build the geometrical frame of the model a DEM (Digital Elevation Model) was needed which covered the whole study area including the riverbed. Based on field survey and satellite images the Manning's Roughness Coefficients of the bed and the surface has been identified. The further components have been measured on the basis of topographical maps in 1:10000 scale and the results of the field surveys. The built-in modul of ArcGIS, the HEC-GeoRAS was used to develop the geometrical frame. Further modelling processes were performed in HEC-RAS.

I have added the flowrate to the geometrical frame in HEC-RAS. The 1D permanent models have been run with the value of 160 m³/s and 142 m³/s flowrates. I have studied both bed's ability of excess water control. The first given value is the specified design discharge from the studies of '70s, the second value is the highest measured flowrate. As the results showed, in the case of both defined flowrates the flood was not successfully drained. The water covered a significant part of the study area. The generated flood maps can support the watermanagement and the decision-makers to elaborate prevention plans for floodings.