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# Surface retention capacity calculation

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Flood wave transformation in the floodplain is the phenomenon which is researched within interdisciplinary project NIVA – Water Retention in Floodplains and Possibilities of Retention Capacity Increase. The project focuses on broad range of floodplain ecosystem services and mitigation of flooding is one of them. Despite main influence on flood wave transformation is due to flow retardation, retention in surface depressions within floodplain has been analyzed to get better overview of whole transformation process. Detail digital relief model (DRM) has been used for given purposes to be able to analyze terrain depressions volumes. The model was developed with use of stereophotogrammetric evaluation of airborne images with high resolution of 10 cm. It was essential for purposes of presented analysis not to apply pit removal routines which are often used for generation of DRM for hydrological modelling purposes.

First, the methodology of analysis was prepared and tested on artificial surface. This surface was created using random raster generation, filtration and resampling with final resolution of 1000 x 1000 units and height of maximum 10 units above datum. The methodology itself is based on analysis of areas inundated by water at different elevation levels. Volume is than calculated for each depression using extraction of terrain elevations under corresponding water level.

The method was then applied on the area of Lužnice River floodplain section to assess retention capacity of real floodplain. The floodplain had to be cut into sections perpendicular to main river orientation for analyses as the method was tested for square shaped area without any significant inclination. Results obtained by mentioned analysis are presented in this paper.

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