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Influence of Elevation Data Source on 2D Hydraulic Modelling

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A b s t r a c t

The aim of this paper is to analyse the influence of the source of various elevation data on hydraulic modelling in open channels. In the research, digital terrain models from different datasets were evaluated and used in two-dimensional hydraulic models. The following aerial and satellite elevation data were used to create the representation of terrain – digital terrain model: airborne laser scanning, image matching, elevation data collected in the LPIS, EuroDEM, and ASTER GDEM. From the results of five 2D hydrodynamic models with different input elevation data, the maximum depth and flow velocity of water were derived and compared with the results of the most accurate ALS data. For such an analysis a statistical evaluation and differences between hydraulic modelling results were prepared. The presented research proved the importance of the quality of elevation data in hydraulic modelling and showed that only ALS and photogrammetric data can be the most reliable elevation data source in accurate 2D hydraulic modelling.

Key words: digital terrain model (DTM), hydraulic modelling, LIDAR, aerial photogrammetry, satellite imagery.