



Calibrating the FloodMap model based on geomorphological fieldwork and terrain analysis to improve the integrated HydroProg-FloodMap system for forecasting inundation

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HydroProg is a novel system (research project no. 2011/01/D/ST10/04171 of the National Science Centre of Poland) which produces early warnings against high flows. The system has been experimentally implemented for the upper Nysa Klodzka river basin (SW Poland). HydroProg is also integrated with the well-established hydrodynamic model known as FloodMap. The aim of this integration is to forecast flood inundation (HydroProg is used for computing hydrograph prediction, while FloodMap is utilized for mapping the hydrograph prognosis into spatial domain). The HydroProg-FloodMap solution currently works at four sites (Szalejow Dolny, Zelazno, Gorzuchow and Krosnowice) situated within the Nysa Klodzka river basin in the Southwestern Poland. The FloodMap model has been already calibrated for Zelazno (the Biala Ladecka river), and now we want to obtain model parameters for Gorzuchow (the Scinawka river). We carry out several simulations from the FloodMap model at this site, based on historical and recent flow records, to check where potential inundation may take place. Using the 1-metre LIDAR (Light Detection and Ranging) data we identify old channels of the Scinawka river in this area. In addition, we carried out several field campaigns with the unmanned aerial vehicle (UAV) to produce digital surface model (DSM) which can show morphological changes within an alluvial river valley. This can be perceived as an evidence of past inundations. Both the LIDAR mode and DSM obtained using UAV appeared to be not accurate enough to fully reconstruct the pattern of paleo-fluvial relief. Hence, we additionally performed geodetic survey using a self-reducing theodolite Dhalta 010A. Moreover, to confirm the pattern of the paleochannel of the Scinawka river, paleohydraulic analysis is performed. Finally, calibration of the FloodMap model for the Gorzuchow site becomes possible due to access to newly-acquired data on past inundation episodes.