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 peak flows. It works in real time and uses outputs from multiple hydrologic models to compute the multimodel ensemble prediction of riverflow, i.e. the hydrograph. The system has been experimentally implemented for the upper Nysa Kłodzka river basin (SW Poland). We also integrated the system with the well-established hydrodynamic model, known as FloodMap, to forecast flood inundation (HydroProg computes hydrograph prediction and FloodMap maps the hydrograph prognosis into terrain). The HydroProg-FloodMap solution works at five sites. The real-time experimental forecasts are available at http://www.klodzko.hydroprog.uni.wroc.pl/.

The FloodMap model is calibrated at each site on a basis of the available Digital Elevation Model (DEM) or Digital Surface Model (DSM) and hydrograph data. However, since the launch of the HydroProg-FloodMap solution no true data on inundation has been available to check the model outputs against observation, and hence to redo the calibration if necessary. If we consider past events, which occurred before the launch of the system, there exists the observed inundation map for the Żelazno site. It was produced by geomorphological mapping of consequences of the flood in June 2009. The aim of the study is therefore to use this specific data set for a single site, calibrate the FloodMap model using inundation data, and identify the physical-geographical characteristics of terrain under which we are allowed to extrapolate the parameters to the other four sites.

We conducted a spatial analysis of land use (based on Polish national database of topographical objects) and topography (based on DEM/DSM from the Light Detection and Ranging (LiDAR)) in order to identify similarities of the studied areas and hence to improve the estimates of the Manning’s roughness coefficient.