



Assessing the influence of topographical data and of the calibration procedure on the estimation of flood inundation probabilities and associated uncertainty

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Floods are considered the most frequent natural disaster world-wide and may have serious socio economic impacts in a community. In order to accomplish flood risk mitigation, flood risk analysis and assessment is required to provide information on current or future flood hazard and risks. Hazard and risk maps involve different data, expertise and effort, depending also to the end-users. In general praxis, more or less advanced deterministic approaches are usually used, but probabilistic approaches seem to be more correct and suited for modelling flood inundation. Two very important matters remain still opened for research: the calibration of hydraulic model (oriented towards the estimation of effective roughness parameters) and the uncertainties (e.g. related to data, model structure and parameterisation) affecting flood hazard mapping results.

Here, the new way to incorporate uncertainty in flood hazard will be applied using more accurate topographical data and a new mesh for a complex two-dimensional hyperbolic finite element model. Through a comparison among resulting hazard maps, the influence of these kinds of data will be shown. Moreover, in order to show the influence of the calibration procedure to the final hazard maps, a further comparison will be effected. The calibration of the 2D hydraulic model will be carried out by combining more than one type of observational data. To date, limited applications still exist chiefly because data sets for historical events are quite rare.

The procedures were tested on a flood prone area located in the southern part of Sicily, Italy.