

Hydrodynamic 2D-models as a basis for the elaboration of hazard maps in urban areas

Introduction

GEOTEST was able to carry out two major revisions of hazard maps in the canton of Zurich, Switzerland. Several hundreds of weak points had to be simulated using a hydrodynamic 2d-model (project requirement). Basement v 3.1 was selected for the task. Due to the high number of simulations, a high degree of automatisisation had to be achieved.

In flat, urban environments the simulations often showed very large flooded areas, even with rather small peak discharges. Two methods were tested to reduce the flow distance of a flood.

Control of the Flow Distance

The parameter “*minimum water depth*” sets a threshold below which no fluxes are calculated, and the cells are treated as dry. The parameter can thus also be used to control the reach of a simulation to a certain extent. A sensitivity analysis was carried out for the parameter using a range between 0.001 – 0.03 m. The effect on the flow distance of the flood was found to be comparably small, as Figure 1 shows.

Another way to reduce the flow distance of a simulation is the modification of the resulting flooded areas within the postprocessing routine. Thresholds can be defined in the scripts and cells with maximum flow depth below a certain value are treated as dry.



Figure 1: Resulting flooded surfaces for two *minimum water depth* values.

Conclusions

Due to the complex modelling perimeters, the resulting flooded areas mainly had to be delimited during the postprocessing routine and through manual editing. Information from field work was key for these modifications. Eventually the parameter “*minimum water depth*” was not altered from the default value of 0.01 m.

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