



Flood Risk Assessment strategies – a comparative study

H. Apel (1), G. Aronica (2), H. Kreibich (1), A. Thieken (1)

(1) GeoForschungsZentrum Potsdam (GFZ), Germany, (2) Dipartimento di Ingegneria Civile, Università di Messina, Italy (hapel@gfz-potsdam.de / Tel: +49 331 288 1538)

Flood risk assessments, especially in urban areas, very often pose the question of how detailed the assessment need to be in order to give a realistic figure of the expected risk. The methods used in research and practical applications range from very basic approaches with numerous simplifying assumptions up to very sophisticated, data and calculation time demanding applications both on the hazard and vulnerability part of the risk. In order to shed some light on the question of required model complexity in flood risk assessments and outputs sufficiently fulfilling the task at hand, a number of combinations of models of different complexity both on the hazard and vulnerability side were tested in a case study.

The different models can be organized in a model matrix of different complexity levels: On the hazard side the approaches/models selected were a) linear interpolation of gauge water levels and intersection with a DEM, b) a mixed 1D/2D hydraulic model with simplifying assumptions (LISFLOOD-FP) and c) a full 2D parabolic hydraulic model considering the build environment and infrastructure. On the vulnerability side models used are in order of increasing complexity: a) a simple damage function, b) a meso-scale rule based model based on CORINE and INFAS data and c) a micro-scale rule based model applied to a detailed building inventory considering other influential factors than inundation depth, e.g. preparedness and secondary damages like oil spills.

The models were applied in a town in southeast Germany, Eilenburg. It has suffered extraordinary damages during the flood of August 2002, which are well documented as well as the inundated areas and inundation depths. It could be shown that for the case study an approach of intermediate complexity yielded the best results and is consequently the best compromise between analysis effort and an acceptable accuracy.