

POSSIBILITIES AND BORDERS IN THE EMPLOYMENT OF NUMERIC HYDRAULIC SIMULATION MODELS AS TOOL AND SUPPORT TO COMMON CALCULATION METHODS AND/OR PROCEDURES FOR THE DELIMITATION OF HAZARD ZONES

A CASE STUDY FROM SALZBURG/AUSTRIA

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INTRODUCTION

Numeric hydraulic simulation models are used successfully in the range of flood documentation and event analysis. By these documentations, with the help of event data sets (precipitation, discharge data, water marks, ...) it is possible to calibrate the provided models and to win useful knowledge over the pro and cons and their application. In addition to that, with laser scan data sets, wide land models with high resolution can be built and used as a basis for numerical hydraulic simulations.

METHODOLOGY

For the project “Delimitation of hazard zones at the torrent Zederhausbach/Salzburg” two dimensional hydraulic simulation models took place in addition of the common planning methods (historical method, literature search, evaluation of past planning and appraisals). Upon expert opinion different scenarios and torrent sections were calculated, varying the input hydrograph, flooding process and blockage of bridges.

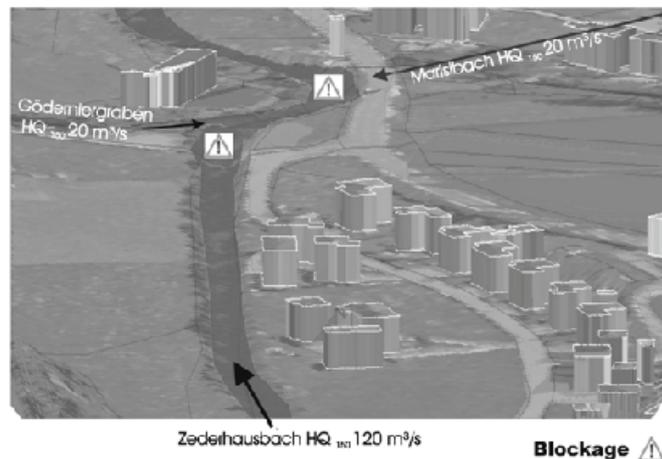


Fig. 1: Simulation area

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The selected sections lie in the valley bottom of the community Zederhaus with a slope angle between two and five percent. After evaluation of existing data sets with the help of historical event data in principle, two questions for the simulation resulted:

1. The effect of blockage of existing bridges for the overland flow
2. Retardation of flow due to the storage effect of overland flow for the main stream Zederhausbach

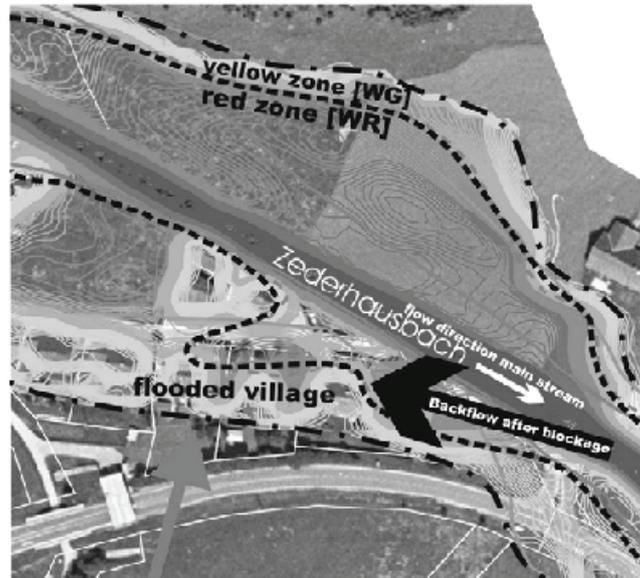


Fig. 2: Result Scenario 1

RESULTS

SCENARIO 1: The resulted effect of blockage of existing bridges shows the flooding of the village on the right side of the torrent. In comparison with the historical events and field work the resulted demarcation line from the simulation are nearly the same.

SCENARIO 2: The difference between the INFLOW- and the OUTFLOW-Hydrograph at the end of the simulation area shows a reduction of the discharge peak of about 2 percent.

PROBLEMS AND PLANS FOR THE FUTURE

The reciprocal effects of the subordinated processes and different discharge scenarios could be considered and analyzed. The results were used one the one hand as a support instrument for the demarcation of hazard zones and on the other hand as documentation material for the public work.

By the use of two dimensional simulation models the expert has one decision more – like the state of the art – for the demarcation of hazard zones. Expert opinion, the study of historical data and a field work is in addition to the simulation techniques very necessary for the work in the field of hazard zoning.

Keywords: Flood discharge, numeric 2-d simulation, delineation of hazard zones