



The HBV spatially distributed flash flood forecasting model – The Slovenia case study

I.K. Tsanis (1), M. G. Grillakis (1), G. Blöschl (2), and N. Pogačnik (3)

(1) Water Resources and Coastal Engineering Laboratory, Environmental Engineering Dept, TU of Crete, Greece, (2) Institut für Wasserbau und Ingenieurhydrologie Technische Universität Wien, Austria, (3) Environmental Agency of Republic of Slovenia, Vojkova 1b, Ljubljana, Slovenia

The HBV distributed flash flood forecasting model which is in operational use in northern Austria is applied to a watershed in northwest Slovenia, a case study for the FP6 project HYDRATE. The selected watershed consists of 6 sub-basins with a total area of 646 Km². Model setup and calibration was performed in this watershed and three long duration rainfall – runoff periods were simulated in order to examine the efficiency of the model. The selected periods included rainfall events that produced high outflows on the exit of the watershed, such as the September 2007 event that caused a flash flooding and severe damages to the towns of Zali Log and Zelezniki. The model uses 1km grid rainfall and temperature data of fifteen minute time intervals in order to simulate the rainfall - runoff process. Inverse distance weighting interpolation is used in order to generate the spatially distributed rainfall and temperature while the hydrological parameters are defined for each 1km grid cell that correspond to one hydrological response units (HRU - areas with analogous hydrogeological characteristics). The basic calibration of the HBV model is based on hydrological parameters of each HRU, parameters that control the rainfall – runoff process within the basin and non HRU parameters that control the river routing between the basins. The model performance is based on seven efficiency criteria that were selected as appropriate for long simulation periods, e.g. coefficient of determination R² and Nash Sutcliffe efficiency E. The HBV model produced satisfactory results for the three rainfall periods and could be used as an operational model in Slovenia as well.