



## **Assessing performance of flood forecasting system based on medium range numerical weather forecasts and rainfall-runoff modelling in Slovakia**

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The applicability of medium range quantitative precipitation forecasts is explored in a flood forecasting system of a medium-size mountainous basin in Slovakia. The results were obtained within the project of the 5th Framework Programme of the European Commission called “European Flood Forecasting System” (EFFS). The goal of the project was the setup and semi-operational testing of a continental-scale flood forecasting system for major river basins in Europe. The principal research aim was to explore the possibility to extend the lead-time of the flood warning process up to 10 days into the future. Various deterministic and ensemble numerical weather forecasts delivered by national and international meteorological services have been used within the project to drive a sequence of hydrological rainfall-runoff models and hydraulic models for principal river systems or selected pilot basins. As a pilot region for the Slovak part of the project, the upper Hron River basin with a drainage area of 1766 km<sup>2</sup> was chosen. The basin is located in Central Slovakia and it was considered to be representative for mountainous regions where flood generation from cyclonic rainfall and snow melting processes play an important role. Meteorological forecasts provided by the European Centre for Medium Range Weather Forecast (ECMWF deterministic model and ensemble forecasts), by the Danish Meteorological Institute (DMI - HIRLAM model), by the German Weather Service (DWD LM and GME models), and the ALADIN model were used to drive a hydrological model. A conceptual semi-

distributed rainfall-runoff model developed at the Slovak University of Technology in Bratislava was used for modelling runoff. The model was calibrated and verified using data from the period of 1991-2000. Hindcasted flows for the floods, which occurred in the upper Hron river basin in July 1997 and August 2002, are compared with measured flows and the results are discussed.