



Hydrology and hydraulics of an extreme flash flood in South-West Germany: the 2nd June 2008 event on the Starzel river

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The June 2, 2008 storm on the Starzel river basin in SW Germany is examined as a prototype for organized convective systems that dominate the upper tail of the precipitation frequency distribution and are likely responsible for the flash flood peaks in this region. The availability of high-resolution rainfall estimates from radar observations and rain gauge networks, together with indirect peak discharge estimates from a detailed post-flood survey, provides the opportunity to study the hydrometeorological, hydrological and hydraulics mechanisms associated with this extreme flood. Observed rainfall, streamgauge data and indirect estimates of peak discharges are used along with a distributed hydrologic model to reconstruct hydrographs at multiple locations. A 2D hydraulic model is used to analyze the flood propagation in the channel and on the floodplain. Science questions examined in the work are: i) the consistency analysis of indirect peak discharges and associated rainfall estimates; ii) the impact of land use on runoff generation; iii) the impact of rainfall spatial and temporal distribution on runoff modeling; iv) the consistency of fluvial impacts with patterns of boundary shear stress and unit stream power derived from a simulation using the 2-D hydraulic model.