



## **Development of a flash flood warning system based on real-time radar data and process-based erosion modelling**

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Extreme rainfall events and resulting flash floods led to massive devastations in Germany during spring 2016. The study presented aims on the development of a early warning system, which allows the simulation and assessment of negative effects on infrastructure by radar-based heavy rainfall predictions, serving as input data for the process-based soil loss and deposition model EROSION 3D. Our approach enables a detailed identification of runoff and sediment fluxes in agricultural used landscapes.

In a first step, documented historical events were analyzed concerning the accordance of measured radar rainfall and large scale erosion risk maps. A second step focused on a small scale erosion monitoring via UAV of source areas of heavy flooding events and a model reconstruction of the processes involved. In all examples damages were caused to local infrastructure. Both analyses are promising in order to detect runoff and sediment delivering areas even in a high temporal and spatial resolution. Results prove the important role of late-covering crops such as maize, sugar beet or potatoes in runoff generation. While e.g. winter wheat positively affects extensive runoff generation on undulating landscapes, massive soil loss and thus muddy flows are observed and depicted in model results.

Future research aims on large scale model parameterization and application in real time, uncertainty estimation of precipitation forecast and interface developments.