



## Quality control of the RMS US flood model

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The RMS US flood model predicts the flood risk in the US with a 30 m resolution for different return periods. The model is designed for the insurance industry to estimate the cost of flood risk for a given location. Different statistical, hydrological and hydraulic models are combined to develop the flood maps for different return periods. A rainfall–runoff and routing model, calibrated with observed discharge data, is run with 10 000 years of stochastic simulated precipitation to create time series of discharge and surface runoff. The 100, 250 and 500 year events are extracted from these time series as forcing for a two-dimensional pluvial and fluvial inundation model. The coupling of all the different models which are run on the large area of the US implies a certain amount of uncertainty. Therefore, special attention is paid to the final quality control of the flood maps.

First of all, a thorough quality analysis of the Digital Terrain model and the river network was done, as the final quality of the flood maps depends heavily on the DTM quality. Secondly, the simulated 100 year discharge in the major river network (600 000 km) is compared to the 100 year discharge derived using extreme value distribution of all USGS gauges with more than 20 years of peak values (around 11 000 gauges). Thirdly, for each gauge the modelled flood depth is compared to the depth derived from the USGS rating curves. Fourthly, the modelled flood depth is compared to the base flood elevation given in the FEMA flood maps. Fifthly, the flood extent is compared to the FEMA flood extent. Then, for historic events we compare flood extents and flood depths at given locations. Finally, all the data and spatial layers are uploaded on geoserver to facilitate the manual investigation of outliers. The feedback from the quality control is used to improve the model and estimate its uncertainty.