



Visualising uncertain flood inundation maps

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Effective flood risk management depends on methods for estimating flood hazard and an appraisal of the dominant uncertainties in the analysis. Typically hydraulic models are used to simulate the extent of flooding for a given probability of exceedance. However, this definition causes problems at river confluences where flows derive from multiple sources. Here a model-based approach was adopted to describe the multisite joint distribution of river flows for three rivers that converge on the city of Carlisle (UK). Monte-Carlo methods were used to generate an ensemble of flood events with realistic spatial dependence between tributaries which would occur over a 100 year period. Each event was then simulated with a two-dimensional hydraulic model of the whole city. Simulations from the hydraulic model were used to visualise the uncertainty in the predictions of inundation for the 1 in 100 year flood, using a visualisation tool based in Google Maps. The visualisation tool is designed to provide information and interrogation facilities for different types of users.