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Local flood forecasting using guided model construction, data assimilation and web interfaces

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An important aspect of improving resilience to flooding is the provision of timely warnings to flood sensitive locations thus allowing mitigating measures to be implemented. For specific locations such small communities (often in head water catchments) or river side factories the ability of traditional centralised forecasting systems to provide timely & accurate forecasts may be challenged. This is due in part to the finite resources of monitoring agencies which results in courser spatial scales of model and data collection then may be required for the generation of accurate forecasts.

One strategy to improve flood resilience at such locations is to install adequate telemetered monitoring equipment; generally a water level sensor and a rain gauge; which allows the construction of a local flood forecast. In this presentation we outline a methodology for providing detailed and location specific forecasts which can be computed either 'on-' or 'off-site'. The basis of this is a guided model building process which incorporates both data assimilation and representation of the forecast uncertainty. The process requires the modeller to make only a few choices thus allowing rapid model deployment and revision.

To be of use such forecasts require must be made available in real time and updated frequently; maybe every five minutes. Traditional practices in issuing warnings dependent on expert interpretation must therefore be altered so that those at the site of interest become their own 'experts'. To aid in this a web interface, showing both the predictions and past performance of the model, designed to encourage realistic interpretation of the forecasts and their uncertainties is presented. This tool and the guided model build are outlined using case studies based in the North West of the UK.