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Model initialisation, data assimilation and probabilistic flood forecasting for distributed hydrological models

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The hydrological forecasting component of the Natural Environment Research Council's FREE (Flood Risk from Extreme Events) project "Exploitation of new data sources, data assimilation and ensemble techniques for storm and flood forecasting" addresses the initialisation, data assimilation and uncertainty of hydrological flood models utilising advances in rainfall estimation and forecasting.

Progress will be reported on the development and assessment of simple model-initialisation and state-correction methods for a distributed grid-based hydrological model, the G2G Model. The potential of the G2G Model for area-wide flood forecasting is demonstrated through a nationwide application across England and Wales.

Probabilistic flood forecasting in spatial form is illustrated through the use of high-resolution NWP rainfalls, and pseudo-ensemble forms of these, as input to the G2G Model. The G2G Model is configured over a large area of South West England and the Boscastle storm of 16 August 2004 is used as a convective case study. Visualisation of probabilistic flood forecasts is achieved through risk maps of flood threshold exceedence that indicate the space-time evolution of flood risk during the event.