

## R&D Technical Summary W5C-013/5/TS/1

# Fluvial Flood Forecasting for Flood Warning Real Time Modelling

### Background to R&D project

The Agency aims to deliver accurate, reliable and timely forecasts of flooding at locations in England and Wales where the benefits justify the costs and where the provision of this service is technically possible. There are several R&D projects helping to further this aim covering different sources of flooding - estuarial, fluvial and coastal. The estuarial project is complete and was reported on in R&D Technical Summary W5-010/TS/3. The project covering coastal flood forecasting is due to report later in 2003. The fluvial flood forecasting project comprises two components - Rainfall Measurement and Forecasting (RMF) and Real Time Modelling (RTM). This Technical Summary covers the RTM component; the RMF component is reported on separately in R&D Technical Summary W5C-013/4/TS/1. In addition, Guidelines have been produced covering both RMF and RTM. These are published separately but referred to in the Technical Summaries for completeness.

### Results of R&D project

The project carried out a review of current forecasting methods and problems and produced guidelines for the selection of real time models for the use of flood forecasting staff.

### Technical Report W5C-013/5

This report provides supporting material used in preparation of the Guidelines for RTM together with a summary of priorities for future R&D in RTM. The report also describes modelling studies performed during this project into the impacts of uncertainties in rainfall and other input data on the accuracy of flood forecasts.

The main topics considered in this report are:

- A description of existing flood forecasting approaches currently used ranging from simple relationships such as level correlations and time of travel relationships, through to rainfall runoff models, hydrological routing and hydrodynamic routing models. The assumptions and ease of use of each approach are also identified.
- An overview of forecast uncertainty and a description of the practical approaches that can be adopted to minimise uncertainty in flood forecasts (e.g. model updating), together with a summary of exploratory modelling studies into the magnitudes of some of these effects.
- The main forecasting problems identified by Agency staff.
- The technical background to the Guidelines for RTM.

The report considers a number of issues which are relevant to RTM including the indicative accuracy of models, methods for evaluating model and overall forecasting system performance, approaches to dealing with uncertainty, how errors in data, forecasts etc propagate through to flow forecasts and current active research areas in RTM.

The report summarises the main conclusions for the categories of model defined currently in operational use within the Agency and includes findings on a range of other issues such as post event analysis and error propagation.

