

## **INTERCOMPARISON OF RAINFALL-RUNOFF MODELS FOR FLOOD WARNING**

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Choosing a rainfall-runoff model for use in flood forecasting is not a straightforward decision and indeed may involve the selection of more than one. The Environment Agency (EA), responsible for operational flood warning in England and Wales, commissioned research aimed at providing guidance on choice of model for different types and sizes of catchment and for different meteorological situations. The study began with a literature review of models, focussing first on models in operational use by the EA but expanding to include models developed elsewhere and of distributed form. Following this review a subset of the models was chosen for inclusion in a data-based intercomparison of models. The intercomparison employed 8 models across 9 catchments of varying size, land use, relief and lithology. For three of the catchments weather radar data were used to obtain “best estimate” rainfalls as an alternative to raingauge estimates. The data record for each catchment, extending up to 10 years in duration, was split into calibration and evaluation datasets. Models were evaluated in simulation mode and in updating mode. The range of models included different updating methods based on error prediction, state correction and parameter adjustment. Performance was judged using a range of statistics ( $R^2$ , skill scores on threshold crossings), scatter plots of observed and forecast peaks, and hydrograph plots. The results have been used to draw up guidelines on model choice for different catchment situations.