



# Managing the flood before it happens

## Flood Forecasting

Flood forecasting is an essential method of flood risk management to reduce impact on vulnerable communities.

Halcrow's extensive experience and capability in flood forecasting and hydrometeorology delivers competitive and innovative solutions to our clients, whatever the weather. You can trust our skills in all areas of flood forecasting, including rainfall forecasting, rainfall-runoff and hydraulic modelling, forecasting systems development, through to flood warning and warning dissemination.

We have expertise, experience and capability in:

- **Development** of river and coastal flood forecasting models
- **Probabilistic** flood forecasting techniques, including operational decision-support frameworks
- **Training** in forecasting, hydrometeorology and model development
- **Forecasting feasibility** studies (e.g. probabilistic forecasting feasibility in China)
- **Prediction** of onset and duration of flood season in tropical zones
- **Assessing performance** of forecasting models and other forecasting techniques
- **Development** of operational rainfall triggers and alerting mechanisms for national meteorological centres

- **Forecasting meteorology** (including NWP model output, ensemble QPF, nowcasting, weather radar)
- **Developing** forecasting contingency methods
- **Development** of station stage-discharge ratings to high return periods
- **Integration and configuration** of models within the international Flood Early Warning System (FEWS) and National Flood Forecasting System (NFFS)

### Hydrometeorology

Our experts have a thorough understanding of both meteorology and hydrology. Halcrow is expert at using meteorological products to improve flood forecasting reliability. Our specialists also advise on how to use and compare data from a broad range of hydrological applications. Bringing these two areas of expertise together ensures you have confidence in developing forecasting, prediction and warning solutions.

### Hydrological & Hydraulic Modelling

In close collaboration with forecasting officers, we use a range of approaches to develop a robust understanding of catchment response and flooding mechanisms in your area. We develop integrated real-time forecasting models using extensive experience of a wide array of hydrological and hydraulic modelling tools. We select and apply the most appropriate and approach, often combining different systems to provide efficient and cost-effective solutions.

## Delivering value – case studies

### ■ Applying Probabilistic Flood Forecasting in Flood Incident Management

We are leading this study for the Environment Agency of England & Wales to assess how probabilistic flood forecasting can be used in reducing flood risk, covering case studies in coastal, fluvial and surface water environments.

### ■ Developing Alerting Criteria for Surface Water Flooding

Using cutting edge science, the UK provides probabilistic alerts of the risk of surface water flooding to around 1,000 response organisations. This project has proven which criteria influence surface water flooding to allow more targeted alerts.

### ■ Probabilistic forecasting feasibility for China

In this innovative project we were part of a joint UK/Chinese team delivering a prototype probabilistic flood forecasting system in China. We undertook a review of the potential for the Novel Early Flood Warning and Risk Assessment System (NEWS) for application in China. We also assessed the use of ISIS modelling software to propagate forecast hydrographs through the river system.

### ■ Prediction of onset and duration of flood season in Mekong Delta

We have developed and used modelling tools to help predict the onset and duration of the flood season on the Mekong river delta, vital for both water resources planning and flood risk management

### ■ Forecasting Options for Rapid Response Catchments Scoping Study

In this national R&D study we developed practical and feasible options for flood forecasting in particularly challenging fast-responding catchments.

### ■ Flood forecasting model development

We have a long pedigree in forecasting model development. Our services include feasibility studies, model development, performance assessment & improvement and model configuration onto national systems. We work closely with Deltares, developers of FEWS.



We are using the latest meteorological technology to help forecast flash flooding (Bosccastle flood, UK, August 2004)

### ■ Development and delivery of Hydrometeorology Training Programmes

With unique skills in hydrometeorology we devised and delivered a 12-month training programme for all operational hydrometeorologists in the Flood Forecasting Centre of England & Wales, also assisting their routes to professional accreditation

### ■ Weather radar for bathing water quality prediction

For Scotland and Northern Ireland's forum for Environmental Research (SNIFFER) we developed a method for making use of Meteorological Office radar data to predict bathing water quality in real time. This is the first time radar data have been used in this way in the UK.

## Contact us

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