



## Improving probabilistic flood risk modelling capabilities – R&D Summary SC090008/S1

A project by the Environment Agency looked at how to improve our confidence in the use of probabilistic flood modelling as part of risk assessments, to help manage flood risk.

Probabilistic models provide a better estimate of risk by considering uncertainty and hence give an estimate of confidence helping users to make more informed decisions. However, challenges remain, such as how to best validate probabilistic results and how to best use more detailed models in a probabilistic manner.

Our work produced new evidence and prototype methods which improved our knowledge and understanding by:

- Developing and testing a new approach to validate probabilistic flood model results (Work Package 1).
- Trialling methods to conduct locally applicable probabilistic flood risk assessments (Work Package 2).

The main findings from Work Package 1 are:

- There are benefits in focussing on the *intended uses*, and hence desired accuracy of the results, when validating probabilistic model results. It can help foster confidence in the use of these types of models.
- *Overall uncertainty (stemming from data and methods)* in the modelling process needs to be considered to determine the overall confidence users can have in probabilistic outputs.
- There is an opportunity to place the use of probabilistic results in the light of current and likely future model capabilities.

Work Package 2 trialled approaches using detailed hydraulic flood models to support more locally applicable probabilistic flood risk assessments.

The main findings from this work package are:

- It is possible to use existing detailed models in a probabilistic context.
- There are trade-offs between the accuracy of the models and the number of scenarios needed to capture uncertainties around predictions, such as the performance of flood defences.
- Industry opinion is varied over whether automated or more manual, expert-led approaches are best for determining the most important scenarios for this type of analysis.
- As a first step, detailed model results can be used in a probabilistic manner for locations where no formal flood defences are present. A variety of tools are available to do this.
- Further development work will be necessary to enable the operational use of more detailed models in a probabilistic framework.

This summary relates to information from project SC090008. A separate summary, S2, describes in more detail the validation framework for probability flood models.

If you would like to find out more about this work please contact [fcrm.evidence@environment-agency.gov.uk](mailto:fcrm.evidence@environment-agency.gov.uk)

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**Project Executive:** Dr Mike Steel, FCRM Directorate

**Project manager:** Stefan Laeger, Evidence Directorate

**Research Contractor:** Halcrow and JBA Consulting (Dr Jon Wicks and Dr Rob Lamb).

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