



Spatial Coherence - Risk of Widespread Flooding (phase 1)

Project Summary SC060088/S

On behalf of the Environment Agency, a team of flood risk and statistical scientists has developed and tested a method for assessing the risk of widespread flooding over wider areas. This allows for an improved assessment of the risk and likelihood of widespread flood events, such as winter 2000, but is also useful when generating plausible emergency planning scenarios.

For some time, the Environment Agency has used risk based policies and practices to manage the risk of flooding. Robust methods are available for assessing localised flood risk and long term average economic costs for larger areas, but currently we are not able to capture fully the spatial patterns in flooding to assess the risk of large scale events.

This limits our ability to fully assess and prepare for the risk of widespread flooding. Severe, widespread floods do occur in Britain; recent examples are the autumn and winter of 2000 and the summer floods of 2007. These are damaging events that we have previously not been able to fully capture in a risk assessment methodology.

In response to the Pitt Review of the Summer 2007 floods and other drivers the Environment Agency/Defra R&D Programme commissioned work to investigate and develop practical methods for assessing the risk of widespread flooding. Science project SC060088 'Spatial Coherence of Flood Risk' is a scoping study to identify, develop and trial methods for determining the likelihood of spatially extensive floods from single or multiple sources as well as the quantifying the probability of suffering large economic losses (or other measures of the consequence of flooding) for regions, or at the national level.

We demonstrated, through a proof of concept, that it is now technically possible to provide additional information on the spatial nature of flood risk at national and regional level. This information now allows us to consider explicitly the risk of widespread and catastrophic flood events in strategic flood risk management and decision making.

By applying the method developed here, it will be possible to answer a number of important strategic flood risk management questions such as:

- What is the probability of observing a certain annual economic loss for an Environment Agency region or the whole of England and Wales from river or coastal flooding?
- What is the chance within England of a 'catastrophic' flood that could over-load emergency responders?
- What was the probability of observing of the floods of 2007, 2000, 1998,...on a national level?
- How can we create realistic emergency response planning scenarios?

We have applied this method as part of a national case study to provide a 'taster' of what kind of practical outputs could be produced if the results from this work were to be implemented operationally. Report SR3 gives an illustration on what could be plausible widespread flooding scenarios and what may be the likelihood of certain flood events, such as winter 2000, when viewed from a national perspective. These results are based on certain assumptions and should be treated as illustration only.

Overall, we conclude that answers to these types of management questions would be very valuable to support strategic decision makers in Environment Agency, Government departments and national emergency responders in their flood risk management work.

Currently, the method developed and tested under phase 1 only covers river and coastal flooding and has not been implemented operationally. We are considering taking this work forward by including other sources of flooding and/or implementation as part of a second phase if there is sufficient interest from users.

This summary relates to information from project SC060088 reported in detail in the following outputs:

Evidence Report: SC060088/R1

Title: Technical Methodology Report
ISBN: 978-1-84911-247-5
Product Code: SCHO1011BUBR-E-E
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Evidence Report: SC060088/R2

Title: Proof of Concept Summary Report

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Evidence Report: SC060088/R3

Title: Results from a national case study

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This project was commissioned by the Environment Agency's Evidence Directorate, as part of the joint Environment Agency/Defra Flood and Coastal Erosion Risk Management Research and Development Programme.

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