

Assessing London's flood risk up to 2100

Professor Jonathan Gregory | Professor Jason Lowe (*Met Office visiting professor*)

Summary

London and the Thames Estuary have always been subject to flood risk. With the recognition that exposure to flood loss was increasing and that climate change may lead to increases in flood risk along UK coastlines, a review was undertaken by the Environment Agency to use the latest scientific approaches to assess the risk of catastrophic flooding in the Thames Estuary for the remainder of the 21st century.

Background

London is also the seat of government and home to an economy worth £230 billion per annum. Over £200 billion of capital assets, and over a million people, are located within the floodplain of the river Thames in London - including 500,000 properties, nearly 100 tube/train stations, the City airport, 400 schools, 16 hospitals and 8 power stations. Accordingly, there is a high level of protection against coastal floods. However, climate change is expected to lead to changes in the frequency of flooding along UK coastlines, owing both to rising sea levels resulting from the warming of oceans and reduction of ice on land (glaciers and ice sheets), and to changes in mid-latitude storminess. The Environment Agency (EA) launched the Thames Estuary 2100 (TE2100) project recognising that exposure to flood loss was increasing and that flood protection infrastructure – including the Thames Barrier – would need upgrading in the future. Because of its importance to such a large population the TE2100 plan has enormous economic implications, and received considerable media attention.

How is University of Reading research contributing?

Research within the Department of Meteorology and within the Met Office examined both sea level rise and storm track changes around UK coasts, using global and regional climate models and a storm surge model. It was found that the height of the 'once in 50 year' flood around south-east coasts of England is likely to be increased by several tens of cm by 2100, due to a combination of changed storminess and more frequent surges, rises in sea level and long-term sinking of south-east England following the removal of ice sheets at the end of the most recent Ice Age.

What impact has our research had?

This work was crucial to TE2100 planning and risk assessments, and suggested considerably lower worst-case flood levels than previously estimated. As a result, TE2100 concluded that a second Thames Barrier (estimated cost £10-20 billion at today's prices) would not be needed by 2030, but may be needed by 2070. The results have also been used to ensure that the risk of flooding in London is kept within acceptable levels, while avoiding unnecessary costs.



“The TE2100 project was the first major infrastructure planning project to put adapting to the impacts of climate change at its centre ... research from the University of Reading as a component of the TE2100 project has proved very valuable, not only to the TE2100 plan but also to the wider UK.”

Tim Reeder
Regional Climate Change
Programme Manager,
Environment Agency Thames
Region



Find out more...

- Department of Meteorology, University of Reading, UK
- www.met.reading.ac.uk