

Next Generation UK Storm Surge Model for the Insurance Market: The London Case

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Abstract : Non-structural protection measures against flooding are becoming increasingly popular flood risk mitigation strategies. In particular, coastal flood insurance impacts not only private citizens but also insurance and reinsurance companies, who may require it to retain solvency and better understand the risks they face from a catastrophic coastal flood event. In this context, a framework is presented here to assess the risk for coastal flooding across the UK. The area has a long history of catastrophic flood events, including the Great Flood of 1953 and the 2013 Cyclone Xaver storm, both of which led to significant loss of life and property. The current framework will leverage a technology based on a hydrodynamic model (Delft3D Flexible Mesh). This flexible mesh technology, coupled with a calibration technique, allows for better utilisation of computational resources, leading to higher resolution and more detailed results. The generation of a stochastic set of extra tropical cyclone (ETC) events supports the evaluation of the financial losses for the whole area, also accounting for correlations between different locations in different scenarios. Finally, the solution shows a detailed analysis for the Thames River, leveraging the information available on flood barriers and levees. Two realistic disaster scenarios for the Greater London area are simulated: In the first scenario, the storm surge intensity is not high enough to fail London's flood defences, but in the second scenario, London's flood defences fail, highlighting the potential losses from a catastrophic coastal flood event.

Keywords : storm surge, stochastic model, levee failure, Thames River

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