ONE Planet
Doctoral Training Partnership

Natural
Environment
Research Council

Project title: A new approach to support flood risk management with storylines
Ref: OP2421
Keywords: climate change, storylines, flooding, risk.

One Planet Research Theme:
Climate & Climate Change ☒ | Earth System Processes ☒ | Anthropocene ☐ | Environmental Informatics☐

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Key Research Gaps and Questions:
- Are storylines a useful tool for decision makers in risk industries?
- What storylines can be constructed for flood risk to aid decision makers across annual to multi-decadal timescales?

The insurance industry is at the frontline of climate change, charged with appropriately quantifying and pricing risk in a world where the number of extreme weather events is increasing, driving vast amounts of loss and damage. At the same time, the insurance industry is at an early stage of using climate change information, often using historical data to assess present day risks, despite the rapidly changing climate. A challenge with climate change data is its uncertainty, particularly at the high resolution spatial scales of interest to the industry. A way of navigating the uncertainty is through storylines, which present a physically self-consistent unfolding of plausible futures. These allow stakeholders, who may not be climate specialists, to explore the uncertainty in future projections in a self-consistent way. Yet storylines have not been adopted as a standard approach in the insurance industry and there is not a coherent framework for their use. This provides considerable scope for this project to investigate their utility and explore and develop use cases, with a focus on flood risk.

Sponsored by the JBA Trust and co-supervised by flood modelling company JBA Risk Management, this project will use a suite of historical and future climate projections as well as state-of-the-art flood modelling software to develop a storylines perspective for flood risk. The project will consider (i) physical storylines across a range of climate projections, (ii) "bottom up" storylines to connect business risks to large-scale climate drivers, and (iii) the risks and impacts from catastrophic storylines, such as ice-sheet collapse. Skills which would be developed as part of the training for this project include analysis and use of climate model data, scientific programming, flood modelling, catastrophe modelling (understanding the chain from hazard to risk), an understanding of large-scale meteorology, and appreciation of how climate science is translated in the risk management industry.

Prerequisites: A degree in physical science, engineering, maths, statistics, or physical geography and a keen interest climate change impacts.
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