



Assessing the financial impact of climate change on flood risk using catastrophe models.

Sarah Jones (1), Emma Raven (1), Ian Millinship (1), and Rob Lamb (2)

(1) JBA Risk Management, Skipton, United Kingdom (hello@jbarisk.com), (2) JBA Trust, Skipton, United Kingdom (info@jbatrust.org)

Flood damage causes financial losses of between GBP250 million and over GBP1 billion annually in the UK, and nearly 20% of all buildings in England and Wales are at significant risk to flooding. In the future, projections suggest that the number of properties exposed to frequent flooding will increase by ~20% by the 2050s. It is therefore important to analyse how insured losses may change with flood risk in the future.

We have used data available from national research projects to develop the UK's first climate change flood catastrophe model. The national research projects, including the UK Climate Change Risk Assessment, have assessed the regional impact of climate change on river flows, extreme rainfall and sea level rise and have contributed to the development of a series of climate change allowances. We have used these allowances to adjust the intensity of the river, surface water and coastal flood hazard within our model. By comparing outputs from our climate change model against model outputs representing present-day risk in the UK, we can assess the potential impact of climate change on insured losses by 2040. Results suggest there may be a 25-30% increase in Annual Average Loss across the UK by 2040. The results highlight regional variability with some areas experiencing a decrease in future flood risk.

Our climate change model provides users, typically from the insurance industry, with a better understanding of future flood risk, including helping to identify areas that are more (or less) susceptible to changes in flood risk in the future. These are areas where users may wish to avoid taking on new business. The model can also be useful in proactive planning focusing on mitigation, damage prevention and damage reduction, for example by those involved in planning flood defences.