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Tools used by the insurance industry to assess risk from hydroclimatic extremes

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Probabilistic catastrophe models are widely used within the insurance industry to assess and price the risk of natural hazards to individual residences through to portfolios of millions of properties. Over the relatively short period that catastrophe models have been available (almost 30 years), the insurance industry has built up a financial resilience to key natural hazards in certain areas (e.g. US tropical cyclone, European extra-tropical cyclone and flood). However, due the rapidly expanding global population and increase in wealth, together with uncertainties in the behaviour of meteorological phenomena introduced by climate change, the domain in which natural hazards impact society is growing. As a result, the insurance industry faces new challenges in assessing the risk and uncertainty from natural hazards.

As a catastrophe modelling company, AIR Worldwide has a toolbox of options available to help the insurance industry assess extreme climatic events and their associated uncertainty. Here we discuss several of these tools: from helping analysts understand how uncertainty is inherently built in to probabilistic catastrophe models, to understanding alternative stochastic catalogs for tropical cyclone based on climate conditioning. Through the use of stochastic extreme disaster events such as those provided through AIR's catalogs or through the Lloyds of London marketplace (RDS's) to provide useful benchmarks for the loss probability exceedence and tail-at-risk metrics outputted from catastrophe models; to the visualisation of 1000+ year event footprints and hazard intensity maps. Ultimately the increased transparency of catastrophe models and flexibility of a software platform that allows for customisation of modelled and non-modelled risks will drive a greater understanding of extreme hydroclimatic events within the insurance industry.