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Assessment of global flood exposures – developing an appropriate approach

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Increasingly complex probabilistic catastrophe models have become the standard for quantitative flood risk assessments by re/insurance companies. On the one hand, probabilistic modelling of this nature is extremely useful; a large range of risk metrics can be output. However, they can be time consuming and computationally expensive to develop and run. Levels of uncertainty are persistently high despite, or perhaps because of, attempts to increase resolution and complexity. A cycle of dependency between modelling companies and re/insurers has developed whereby available models are purchased, models run, and both portfolio and model data 'improved' every year. This can lead to potential exposures in perils and territories that are not currently modelled being largely overlooked by companies, who may then face substantial and unexpected losses when large events occur in these areas.

We present here an approach to assessing global flood exposures which reduces the scale and complexity of approach used and begins with the identification of hotspots where there is a significant exposure to flood risk. The method comprises four stages: i) compile consistent exposure information, ii) to apply reinsurance terms and conditions to calculate values exposed, iii) to assess the potential hazard using a global set of flood hazard maps, and iv) to identify potential risk 'hotspots' which include considerations of spatially and/or temporally clustered historical events, and local flood defences. This global exposure assessment is designed as a scoping exercise, and reveals areas or cities where the potential for accumulated loss is of significant interest to a reinsurance company, and for which there is no existing catastrophe model. These regions are then candidates for the development of deterministic scenarios, or probabilistic models.

The key advantages of this approach will be discussed. These include simplicity and ability of business leaders to understand results, as well as ease and speed of analysis and the advantages this can offer in terms of monitoring changing exposures over time. Significantly, in many areas of the world, this increase in exposure is likely to have more of an impact on increasing catastrophe losses than potential anthropogenically driven changes in weather extremes.