

## **Volcanic eruption catastrophe loss modelling**

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Catastrophe loss modelling, first developed at the end of the 1980s, has become a critical component of the global insurance industry for determining how to price and reserve catastrophe insurance. Catastrophe models involve the generation of a virtual set of catastrophes: the equivalent of the full population of extremes expected over some time period, such as 100,000 years. The models include footprints of one or more hazards, as well as how that hazard will cause loss to the exposure at risk through vulnerability functions. The first catastrophe models were developed for earthquake and hurricane but have now expanded to cover severe convective storms, windstorms, rainfall and storm surge related floods, tsunamis and wildfire. However less attention has been paid to the probabilistic modeling of volcanic eruption impacts, principally because the insurance industry has not yet suffered a significant loss from this cause. However with globalization and expanding populations in the vicinity of volcanoes the risk is rising and volcanic eruption should be included alongside the other classes of insured catastrophe consequences. The paper will consider where the economic and insurance risk is most concentrated, what needs to be included in eruption catastrophe loss modeling and how the different agents of eruption damage would be covered by insurance contracts. Catastrophe models of potential fatalities may also be needed to help manage large scale evacuation for cities in the vicinity of volcanoes. In the future it will be much easier for volcano scientists to supply their own probabilistic catastrophe loss models to be used by the insurance industry.