

INSURANCE SPECIAL

RMS

Innovative modelling from RMS' perspective

Answered by: Robert Muir Wood, Chief Research Officer at RMS



How do you model the risk of a meteorite hitting the earth's surface? Have you?

The risk, from space impacts of all kinds, is actually one of the easier catastrophes to quantify. In terms of defining the hazard we can approach the problem in three ways:

- by observing the spectrum of what arrives at Earth each year
- by identifying the full range of orbiting near-Earth objects; and
- by exploring the rate of impacts large enough to leave craters from the geological record.

We have not yet built such a model because the risk is actually fairly low – below the typical level considered by insurers. However, we have thought about how we would build it, and of course there is the potential for very extreme 'global' events. The hazard is higher at low latitudes than at high latitudes (because most asteroids orbit in the same plane as the planets), but living close to sea-level on an oceanic coastline presents the highest hazard, as it could be susceptible to an asteroid-generated tsunami.

Is there a model for "the" earthquake in Tokyo?

The purpose of a probabilistic catastrophe model is to explore the full range of possible events. While the most likely significant earthquake beneath Tokyo is c. Magnitude 7, it would not be totally catastrophic. However, the model also allows for far less likely events - such as the M7.9 1703 earthquake, which would be a genuine 'Big One'.

Or a pandemic?

RMS has already developed a probabilistic pandemic influenza model that considers a wide range of possible viral outbreaks in terms of their infectiousness – as well as where the outbreak begins and how effective counter-measures prove to be - in all the different countries.

Is it possible to "quantify" and achieve "precision" or define parameters for catastrophes that are unknown (eg. lurking, undiscovered

deadly virus strains, etc.)

Where a source of catastrophe is completely unknown – such as a hypothetical new virus – the model can be used for exploring the implications and potential losses, but one cannot achieve 'precision' for a situation that is completely uncertain.

What are RMS' current model offerings and what does it takes to maintain those models at the cutting edge?

We continue to research all aspects of how we build models, accumulating new knowledge that can be employed when we rebuild a model. For example, we have been researching how to build physical models of all those processes that lead to increases in repair costs after the largest catastrophes. We have a strong culture that emphasizes the need for on-going research and innovation at RMS.

How do you fine tune your model for globally, unstable, weather patterns?

The model already includes a full range of climatological conditions driving extreme events. However, we are actively researching the way that climate change is expected to affect catastrophe occurrence and will be adding a 'future climate' perspective to the services we offer to clients.

...to accommodate varying intensities and frequencies for both naturally occurring and unknown man made catastrophes?

We encourage clients to understand model sensitivity by making it possible to explore how to test assumptions around the severity and frequency of events. In future we will make the ability to perform stress tests on assumptions a core part of the model.

...unexpected associated damage (fire is included - but how about water, the air, floods, epidemics. etc.)?

Models are becoming more comprehensive in modelling all sources of loss – for example shaking, tsunami and fire for an earthquake. We would like to ensure the 'unexpected' is being sampled in generating loss outcomes.

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