



RMS FAQ: Research on Climate Change and Disaster Loss Costs and the IPCC

In 2007, an Intergovernmental Panel on Climate Change (IPCC) report referenced an RMS research paper on climate change and the cost of natural disasters. Recently, the RMS paper and the IPCC report have been the focus of a number of media articles. The following FAQs are intended to clarify RMS' position on a number of issues related to the debate over the IPCC report, and the linkage between climate change and the frequency or severity of catastrophes.

1. Which RMS research paper was referenced by the IPCC?

RMS conducted a research study to explore whether there was evidence of trends in global catastrophe losses after correcting or normalizing the losses for changes in the values and exposure at risk. The motivation for the study was to move beyond the existing research that was used to argue that there was a linkage between climate change and costs of disaster by showing an exponential increase in catastrophe losses over time without correcting the loss data for changes in value and wealth. The project was led by Dr. Robert Muir-Wood, chief research officer at RMS.

2. When was it written and peer reviewed?

The research was conducted during the first half of 2006 and the full paper summarizing the results was peer reviewed and accepted for publication in November 2006. This was a few weeks outside of the cut-off date for the IPCC 4th Assessment Report in October, which is why an earlier summary version of the paper—written for a scientific workshop held in May 2006 and published in the conference proceedings in October 2006—was referenced (the IPCC can only cite published material). Despite not being able to reference it, the IPCC was aware of the full report and that it had been accepted for publication before the 4th Assessment Report was finalized.

While the paper was completed and accepted for publication in November 2006, delays in publication meant that it did not officially appear as a book chapter until 2008.

3. What were the conclusions of the RMS paper?

The RMS paper concluded that, after correcting for changes in the value of assets at risk, there is a small statistically significant rising trend (with time) in global disaster losses from 1970 to 2005. Given that this was a slight trend, the IPCC reference to the paper included caveats, stating that:

“Once the data were normalized, a small statistically significant trend was found for an increase in annual catastrophe loss since 1970 of 2% per year. However, for a number of regions, such as Australia and India, normalized losses show a statistically significant reduction since 1970. The significance of the upward trend is influenced by the losses in the USA and the Caribbean in 2004 and 2005 and is arguably biased by the relative wealth of the USA, particularly relative to India.”

The full paper, published as a book chapter, also included a test for whether there is a trend between disaster costs and global temperature. After showing that it was possible to find statistical correlation, it was determined that the result was very sensitive to small changes in assumptions, so it was concluded that it was not possible to show a statistically convincing linkage at that time.

4. Does RMS believe the IPCC has fairly represented the research findings?

RMS believes the IPCC fairly referenced its paper, with suitable caveats around the results, highlighting the factors influencing the relationship that had been discovered between time and increased catastrophe costs. We believe it was appropriate to include the RMS paper in the report because, at that time, it was the only paper addressing global multi-peril catastrophe losses over time that had been normalized for changes in the values and exposure at risk.

A graph showing averaged global temperature and averaged catastrophe loss since 1970 was included in supplementary material rather than the IPCC report itself and was not itself published. RMS believes that the graph could be misinterpreted and should not have been included in these materials.

5. Will RMS be revisiting the study?

RMS plans to repeat the study to assess whether events since 2005 have impacted global trends, but the specific timeframe for research or publication are currently unknown. It is too early to predict what the conclusions of this study will be.

6. What is RMS' position on climate change?

Scientific research shows that the climate is changing due to increases in CO₂ emissions; it is highly likely that this will have an impact on the occurrence of extreme events at some point in the future. As an independent leader in risk modeling, it is RMS' responsibility to determine whether there is enough scientific evidence to suggest that the frequency and severity of

catastrophe events is changing to the extent that the historical record is no longer a sufficient baseline for determining medium-term activity rates. The medium-term is defined as the next five years.

Currently, RMS considers Atlantic hurricane to be the only modeled peril for which the long-term historical average of annual event frequency is an inadequate indicator of future activity over the next five years. However, it is not clear to what extent the higher-than-average activity levels are due to man-made climate change, or natural multi-decadal cycles of variability. While most hurricane experts believe that simply using the long-term historical average number of hurricanes is not the best way to estimate current and future activity,

there are differing opinions in the scientific community on the best single model for estimating activity for the next five years. This is why RMS has elicited the opinions of leading hurricane experts. Our five-year medium-term rates are revised regularly to incorporate the latest scientific research and new data.

Note that the research on trends in normalized catastrophe losses examined global losses across all modeled perils. However, if you were to look solely at Atlantic hurricane in the period 1970 to 2009, normalized losses are significantly higher in the second half of the record. This is compatible with RMS' medium-term perspective, which identifies a shift to higher Atlantic hurricane activity since 1995.

RMS will continue to review scientific research to determine whether our models need to be updated to reflect changes in the frequency and severity of events, including both increases and decreases. RMS will continue to provide an independent assessment of the evidence.