



## **Weather-driven natural hazards – Approaches of risk management in the German insurance industry**

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Winter storms still count among the most important natural hazards for insurers in Europe and Germany. Examples of these are the events Kyrill (2007: insured property loss: 2225 million ) or Jeanette (2002: insured property loss: 763 million ). Extreme convective events, accompanied by thunderstorm, hail and torrential rain, are mostly local events, but may cause considerable damage as well. A prominent example of this is the event of Villingen-Schwennigen in 2006 with an insured property loss of 234 million .

In the case of residential buildings storms are the greatest source of damage, in summer it is mostly hail events that lead to damage. In the case of losses in contents insurance lightning and overvoltage predominate. In the past, German insurers have learned to handle such hazards well. Various insurance solutions have been developed to cover these hazards. Contents and buildings insurances cover hazards like storm, hail and lightning. Insurance density for residential buildings storm/hail in Germany is currently 85%. Hydrologic-geomorphologic hazards, such as floods, backwater and landslides, are covered by extended natural hazards insurance. As protection against natural hazards is only offered since the mid-1990s, insurance density in this line is markedly lower than for storm/hail. Yet with about 4 million contracts, it is still of economic relevance. For risk assessment, information on official flood zones is available for medium-sized and large rivers. Although first estimates are available on large-scale torrential rain risks, little is known about the risk of flash flooding.

Ongoing debate on climate change requires additional information on meteorological hazards needed for improved risk management. Although storm and hail are covered together in insurance statistics, from a meteorological point of view they have to be separated from each other. While hail damage occurs extremely rarely in winter or does not occur at all, in summer hail losses usually dominate. However, storm damage may also occur in summer due to local wind gusts, downbursts and even tornados. Certain atmospheric situations responsible for extreme storms are accompanied by heavy precipitation and thunderstorms and may also cause considerable flood damage.

Consequently, from the insurers' point of view, there is still considerable need for climate change impact research. Is it likely that spatial and temporal shifts of extreme atmospheric conditions will lead to unprecedented risks? How could weather conditions alter and would they have an impact on storms, heavy precipitation or lightning? Is it possible that certain hazards will occur more frequently or become more extreme? Is any regional lessening of the hazards conceivable? What potential developments could be derived from various scenarios? What uncertainties are to be expected and how reliable are these statements?

The German Insurance Association has set up a research project to answer some of these questions. In cooperation with research institutes different multi model ensemble approaches with statistical and dynamical downscaling methods are used to analyse future hazards and risks. Trends of winter storms, hail, heavy rainfall and floods events will be investigated on large and regional scale. On the basis of these findings, insurers could develop optimized and more risk-adjusted products. Moreover, the information could be used for the purpose of improved education of different stakeholders. These might take further loss prevention measures and assume increased self-responsibility.

The main topics of the presentation will highlight the insurance landscape in Germany as well as the different approaches of risk management (GIS, statistics, models, etc.), with special emphasis on current approaches in cooperation with researchers and the needs of the German insurance industry.