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# Future projections of insured losses in the German private building sector following the A1B climatic change scenario

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We present an overview of a complementary-approaches impact project dealing with the consequences of climate change for the natural hazard branch of the insurance industry in Germany. The project was conducted by four academic institutions together with the German Insurance Association (GDV) and finalized in autumn 2011. A causal chain is modeled that goes from global warming projections over regional meteorological impacts to regional economic losses for private buildings, hereby fully covering the area of Germany. This presentation will focus on wind storm related losses, although the method developed had also been applied in part to hail and flood impact losses.

For the first time, the GDV supplied their collected set of insurance cases, dating back for decades, for such an impact study. These data were used to calibrate and validate event-based damage functions which in turn were driven by three different types of regional climate models to generate storm loss projections. The regional models were driven by a triplet of ECHAM5 experiments following the A1B scenario which were found representative in the recent ENSEMBLES intercomparison study.

In our multi-modeling approach we used two types of regional climate models that conceptually differ at maximum: a dynamical model (CCLM) and a statistical model based on the idea of biased bootstrapping (STARS). As a third option we pursued a hybrid approach (statistical-dynamical downscaling). For the assessment of climate change impacts, the buildings' infrastructure and their economic value is kept at current values.

For all three approaches, a significant increase of average storm losses and extreme event return levels in the German private building sector is found for future decades assuming an A1B-scenario. However, the three projections differ somewhat in terms of magnitude and regional differentiation. We have developed a formalism that allows us to express the combined effect of multi-source uncertainty on return levels within the framework of a generalized Pareto distribution.