

# Losses due to Severe Wind Storms over Europe in a Future Climate

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## Objectives: Estimation of future losses and cost of no adaptation

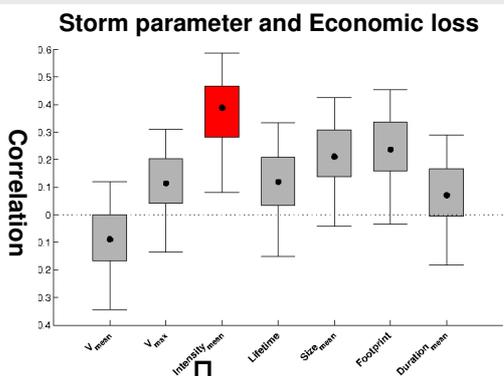
- Winter storms over Europe are a major cause of severe damages to infrastructure and socioeconomic values
  - accounting to > 60% of insured losses e.g. in Germany over the last 30 years
- Different possibilities to quantify severe storms are addressed
- Potential losses of winter storms in a future climate (SRES A1B) are estimated from an ensemble mean of numerical simulations (9 GCMs and 8 RCMs)
- Loss produced assuming an adaptation to the changing climate are compared to those produced without adaptation

## Analysis of past winter storms: Which factors are most relevant for the origin of losses?

Analysis of 60 winterstorms in the recent past (ONDJFM 1972/1973 - 2001/2002)

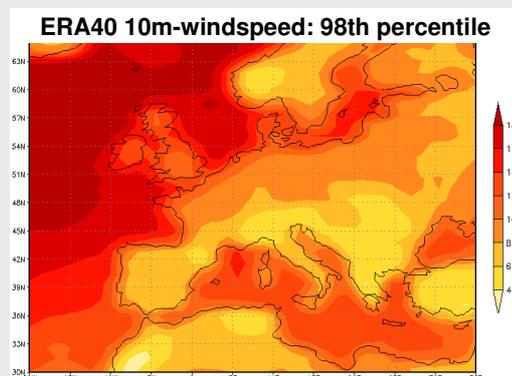
- calculation of different physical characteristics out of ERA40-reanalysis data
- correlations to economic loss data for Europe provided by reinsurance-industry

Definition of storm intensity implies assumption of infrastructure adapted to local wind speed climatology



Definition of storm intensity:  
Normalised excess over local climatological windspeed threshold (98th percentile, see right)

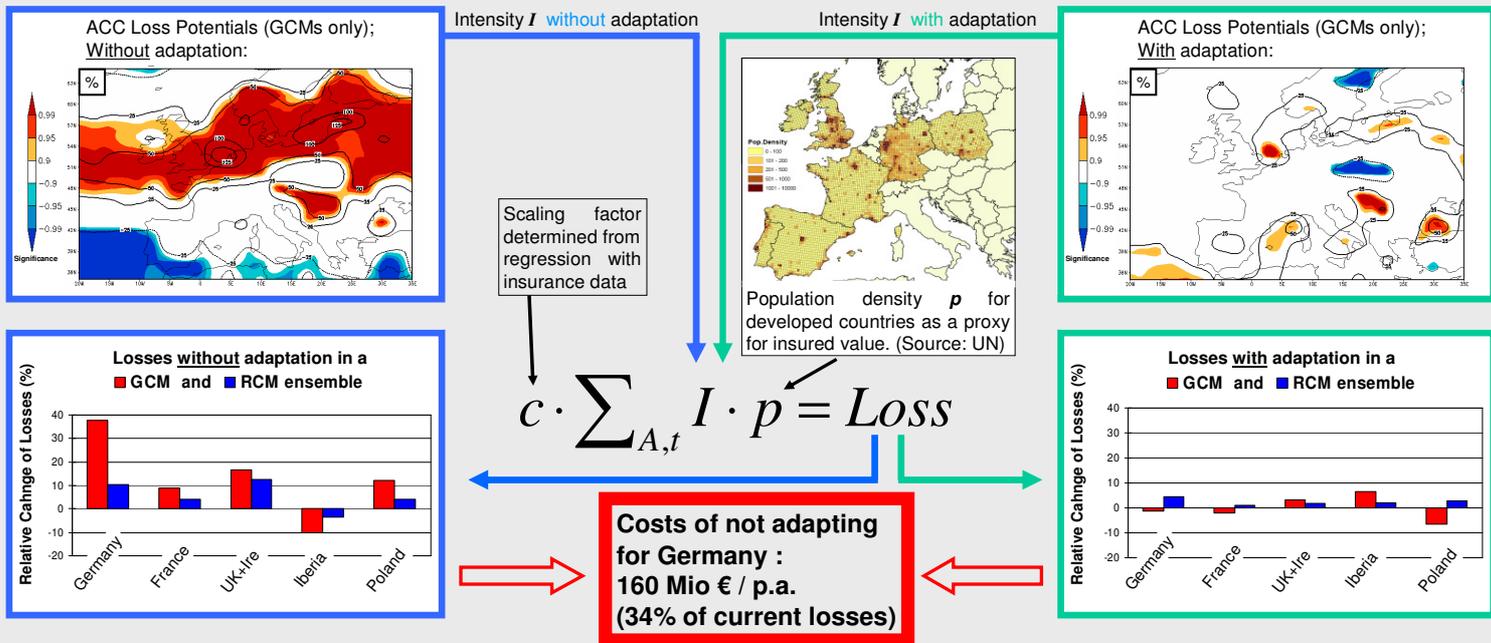
$$I = \max \left( 0; \left( \frac{v - v_{98}}{v_{98}} \right)^3 \right)$$



Storm intensity most suitable factor for estimating economic losses !!!

## Losses under ACC in a Multi-Model-Ensemble: Estimation of future losses (2071-2100)?

Differences of losses in a future climate (A1B - 20C) assuming an adaptation (cyan) are compared to those produced without adaptation (blue).



## Results:

### No Adaptation

- Increase of potential losses without adaptation up to 35% for several countries in Europe
  - Increase in Germany, France, Great Britain and Poland
  - Decrease for the Iberian Peninsula

### Adaptation

No significant change of potential losses due to winter storms with adaptation of infrastructure

GCMs and RCMs generally show same signal although with different magnitudes