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Climate Change and the Risk of European Wind Storms

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The risk of severe European wind storms and related losses is estimated from climate simulations, driven with increasing greenhouse gas forcing. The model runs are evaluated in terms of a chain of related phenomena, including extra-tropical cyclone tracks and intensities, large-scale flow, extreme wind speeds and related loss potentials. The robustness of the climate change signals is estimated by considering multi-model simulations and by comparing the signals based on the different (complementing) analysis methods.
While all considered models agree in generating a reduced total number of cyclones in the Northern Hemisphere under the future scenario conditions, an increased activity of extreme cyclones is found over the eastern North Atlantic in most models and also in the ensemble mean. Consistently, an increased frequency of storm days in Central Europe is found, as well as increased extreme wind speed values over northern Central and Western Europe. Applying a simple storm loss model reveals an increase of loss in Central and Western Europe in the ensemble mean, with a considerable spread of the signals in individual ensemble members.