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Severe European Wind Storms in RCM ensemble simulations

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This study investigates the risk of wind storms affecting Germany under anthropogenic climate change conditions. Wind storm episodes identified in global climate model (ECHAM5-OM1) simulations are resimulated with a regional climate model (CCLM), applying a new technique for generating ensemble simulations: By shifting the simulation domain of the regional model relative to the large-scale fields, variations in the boundary conditions are induced, leading to different evolutions of the individual storm events.
For all storm episodes and all realisations, an objective measure for the storm severity is calculated (Storm Severity Index, SSI). Extreme value analysis techniques are then applied to the SSI values. Fitting a General Pareto Distribution, return periods of intense wind storms and the inherent statistical uncertainty are calculated. As a result, a clear decrease in return periods of storms affecting Germany can be observed towards the end of the 21st century.