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Dynamical forcing factors of severe windstorms: their seasonal forecast skill and influence on seasonal windstorm predictions

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Seasonal forecasts of extratropical storms are of interest to the scientific community as well as insurers, government contingency planners and the general public.

In previous studies, seasonal forecasts of winter windstorm events over Europe from the Met Office GloSea5 model have shown significant skill especially over north-west Europe for windstorm frequency and were connected to large-scale patterns, i.e., the NAO. Recent investigations show links between windstorm intensities and the three dominant large-scale patterns over Europe (NAO, SCA and EA) which explain up to 80% of interannual windstorm variability.

This new investigation quantifies the role of additional, dynamical forcing factors that could influence windstorm predictions. The factor selection is based on known dynamical influences on cyclone development and is thus related to the existence to severe windstorms. We analyse the Eady-Growth-Rate (EGR), 200hPa jet speed and location, a proxy for Rossby wave source (RWS), and one factor related to tropical precipitation. The seasonal forecast skill of the factors themselves shows positive and significant skill in regions they are expected to be most influential or dominant, like for the RWS around its dipole over the south-west of the North Atlantic or for the EGR east of North America.

The links between these dynamical forcing factors to windstorm impact-relevant regions in the model and reanalysis data will be presented and the explanatory power of these factors for the overall model skill is discussed.