



## **Predicting extremes a season ahead: From circulation to user-relevant predictions**

E. Wallace, A. Brookshaw, and D. Fereday

Met Office Hadley Centre, Exeter, United Kingdom (emily.wallace@metoffice.gov.uk)

In 2012 it was demonstrated that the UK Met Office seasonal forecasting system was able to predict inter-annual fluctuations in the frequency of large scale extreme daily weather events a season ahead. This predictability is vital for early warning systems of high impact events, and is an important prerequisite for models used for event attribution. Since then the Met Office seasonal forecast system has been updated. Amongst other improvements, winter NAO predictability has increased dramatically. I demonstrate the effect that this improvement in circulation has had on the model's ability to predict extreme weather events in winter over Europe.

Skilful representation of key processes lends credibility to predictions, especially at long range. Many studies on predictability of Northern Hemisphere seasonal variability have connected drivers with anomalies in atmospheric circulation. I will take this reasoning a step further by using cluster analysis to associate variability in user-relevant extremes with variability in atmospheric circulation types. As well as increasing confidence in estimates of model skill, I show that this flexible technique can boost predictability, and be used to provide spatially-downscaled, user-relevant probabilistic forecasts for derived quantities such as heating degree days.