



Improving European winter temperature forecasts using NAO and ENSO teleconnections

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Seasonal forecasts of European winter (DJF) temperature by the UK Met Office have used a statistical method based on the NAO, a dynamical method based on the GloSea coupled climate model, or a combination of the two. The combined statistical-dynamical method was successful in forecasting the cold European winter of 2005/6. The work reported in this paper incorporates ENSO teleconnections into the combined statistical and dynamical forecasts for European winter temperature.

Recently published research shows a relationship between the strength of El Niño events and their impact on mean sea level pressure (MSLP) across the North Atlantic-European region in winter, and suggests that different dynamical mechanisms are associated with ENSO teleconnections between the tropical Pacific and Europe during strong and moderate events. The present research has investigated the relationships between El Niño events (classified as either strong or moderate on the basis of Nino3.4 sea surface temperatures) and winter temperatures across Europe, in the period 1870-2005. Gridded observed seasonal temperatures (CRUTEM3), adjusted for climate change using a method based on ensembles of HadCM3 modelled temperature anomalies, have been used to characterise European-region temperatures in DJF and JF during strong and moderate El Niño events.

The temperature signal across Europe is stronger in winters when a moderate El Niño event is present in the tropical Pacific than during strong events, which is consistent with the MSLP results reported previously. Moderate events are associated with significantly below average winter temperatures across much of northern Europe and the

UK, whereas large parts of Europe are warmer than average during strong events. The paper discusses the composite anomaly characteristics used to develop a probabilistic method that incorporates the impact of El Niño event magnitude on winter temperatures into the combined statistical (NAO) and dynamical (GloSea) forecast, and the impact on forecast skill.