VERIFICACIÓN DE PREVISIONES ESTACIONALES MULTISISTEMA DE MODOS DE VARIABILIDAD CLIMÁTICA EUROPEA

MULTI-SYSTEM SEASONAL FORECASTS VERIFICATION OF EUROPEAN CLIMATE VARIABILITY MODES

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SUMMARY

The wintertime North Atlantic Oscillation, and some other modes of variability, can be skilfully forecast by different seasonal forecast systems, as shown in recent studies. Due to the influence of these modes of variability on temperature and precipitation in Europe, accurate forecasts of their phase can lead to significant improvements in seasonal forecasting. Here we show a verification of the predictability of these modes of variability, using different prediction systems, different lead times, and different methodologies. According to our results, The North Atlantic Oscillation and the Scandinavian Pattern show higher predictability, as opposed to the East Atlantic / Western Russia, which is the worst predicted pattern.

Accurate seasonal forecasts can be very useful for taking adaptation and prevention measures to unfavourable weather conditions, such as droughts, heatwaves, extreme precipitation events or high fire risk conditions (Soares et al., 2018; Turco et al., 2018; White et al., 2017). In a region with a very marked seasonal cycle and a high inter-annual variability of atmospheric conditions such as the Iberian Peninsula, the demand for improved seasonal forecasting becomes even more compelling.

Currently operational seasonal forecasting systems have considerable scope for improvement in their ability to predict mid-latitude temperature or precipitation. However, some of these systems have shown some skill in predicting, months in advance, the phase of some modes of variability such as the North Atlantic Oscillation (Athanasiadis et al., 2017; Baker et al., 2018; Dunstone et al., 2016; Lledó et al., 2020; Scaife et al., 2014; Smith et al., 2016).

Here we present an analysis of the skill of 8 seasonal forecasting systems in reproducing different the main European modes of variability during winter: the North Atlantic Oscillation (NAO), the East Atlantic (EA), the East Atlantic/Western Russia (EAWR) and the Scandinavian pattern (SCA). Different verification metrics were used, both deterministic and probabilistic, all defined as in the WMO forecast guidance (WMO, 2018).

The results show that some modes of variability can be skilfully predicted months in advance, providing an opportunity to improve seasonal forecasts using model weighting methods driven by their ability to predict modes of variability.

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