State of the art of Seasonal and Subseasonal Wind and Wind Power Forecasting for the Iberian Peninsula and the Canary Islands

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Renewable energy plays a key role to play in the transition towards a low-carbon society and many countries have been investing in R&D and deployment of renewables over the last few decades. Despite its importance, relatively little attention has been focused on the crucial impact of weather and climate on energy demand and supply, or on the seasonal forecast generation or operational planning of renewable technologies. In particular, to improve the operation and longer-term planning of renewables it is essential to consider seasonal and subseasonal weather forecasting. Unfortunately, reports that focus on these issues are not common in the scientific literature. Here we present a systematic review of the seasonal forecasting of wind and wind power for the Iberian peninsula and the Canary Islands, a region leading the world in the development of renewable energies (particularly wind), and thus an important illustration in global terms. To this end, we consider the scientific literature published over the last eleven years (2008-2018). An initial search of this literature produced 8355 documents, but our review suggests that only around 0.3% are actually relevant to our purposes. The results show that the teleconnection patterns (NAO, EA, and SCAND) and the stratosphere are important sources of predictability in the Iberian Peninsula and that GloSea5 is an effective model for seasonal wind forecasting for the region. We conclude that the existing literature in this crucial area is very limited, which points to the need for increased research efforts. Moreover, the approach and methods developed here could be applied to other areas for which systematic reviews might be either useful or necessary.