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Skill improvement of wind speed monthly forecasts

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Monthly forecasting, also known as sub-seasonal forecasting, fills the gap between medium-range weather forecasting (up to two weeks) and seasonal forecasting (1-6 months). Weekly averages of monthly forecasts of 10-m wind speed already demonstrated to produce statistically significant skill in Europe (1).

In this work, wind speed is validated employing the two most recent versions of ECMWF monthly forecast system, the former with five ensemble members during hindcast period 1994-2013 and the latter with eleven members during 1996-2015. Both versions generate forecasts up to 32 days in advance with a spatial resolution of 0.56°. For each month of the year, reliability and skill are compared for the two versions, identifying where and when they have improved, in terms of Ensemble Mean Correlation, Fair Ranked Probability Skill Score, Fair Continuous Ranked Probability Skill Score and Reliability diagram. Four forecast times are employed in this study to average 6-hourly wind speed data in weekly means: 5-11, 12-18, 19-25 and 26-32 days. Chosen reference dataset is ERA-Interim (0.70°).

Results describe the skill improvements found, particularly for the Reliability diagrams, which are much more robust when employing a higher number of simulations. A special emphasis is given to European regions which show large skill improvements and those, on the contrary, where skill decreases in the latest version of the model.

(1) Lynch, J., Brayshaw, J. & Charlton-Perez, A., 2014. Verification of European Subseasonal Wind Speed Forecasts. American Meteorological Society, pp.2978–2990