

EROSIP - Seasonal forecast of daily temperature distribution

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The EUROSIP forecasting system is the operational monthly production of 7-month 41-member forecasts by ECMWF, Met Office and Météo-France. It includes a 20-year hindcast period. Traditionally, the evaluation of seasonal forecasts is based on seasonal means. However a numerical forecast beyond day 10 is essentially probabilistic, and a season is a sequence of events which can be considered as random, from a probabilistic point of view. This random aspect can be conditioned by slowly evolving large-scale features like ENSO index. In other words, the probability distribution function (pdf) for a given season is yearly dependent. The forecast target of a given season can be represented by the pdf of the 90 daily observed value. The trivial forecast to be beaten can be represented by the pdf of all daily values of the 20 seasons.

We have examined the forecast of DJF temperature over Paris. Each individual model pdf is recalibrated so that the climatological (i.e. calculated with the 20 seasons) pdf of each model coincides with the climatological pdf of the observations. In fact, the evaluation is done in “leave but one” mode in which 19 seasons are used for the calibration of the remaining season. The ranked probability score (RPS) of the multimodel is less than the RPS of the climatology. Usually, model forecasts based on seasonal averages are poorer than climatology over Europe when evaluated with RPS. The present improvement is due to the fact that the pdf to be predicted is not the pdf of a constant (Dirac function) in the case of daily values, contrary to the case of seasonal means.