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Verification of post-processed seasonal predictions

André Düsterhus
Maynooth University, ICARUS, Department of Geography, Maynooth, Ireland (andre.duesterhus@mu.ie)

Traditionally, verification of (ensemble) model predictions is done by comparing them to deterministic observations, e.g. with scores like the Continuous Ranked Probability Score (CRPS). While these approaches allow uncertain predictions basing on ensemble forecasts, it is open how to verify them against observations with non-parametric uncertainties.

This contribution focuses on statistically post-processed seasonal predictions of the Winter North Atlantic Oscillation (WNAO). The post-processing procedure creates in a first step for a dynamical ensemble prediction and for a statistical prediction basing on predictors two separate probability density functions (pdf). Afterwards these two distributions are combined to create a new statistical-dynamical prediction, which has been proven to be advantageous compared to the purely dynamical prediction. It will be demonstrated how this combination and with it the improvement of the prediction can be achieved before the focus will be set on the evaluation of those predictions at the hand of uncertain observations. Two new scores basing on the Earth Mover's Distance (EMD) and the Integrated Quadratic Distance (IQD) will be introduced and compared before it is shown how they can be used to effectively evaluate probabilistic predictions with uncertain observations.

Furthermore, a common approach (e.g. for correlation measures) is to compare predictions with observations over a longer time period. In this contribution a paradigm shift away from this approach towards comparing predictions for each single time step (like years) will be presented. This view give new insights into the performance of the predictions and allows to come to new understandings of the reasons for advantages or disadvantages of specific predictions.