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Seasonal Predictability and Dynamical Downscaling in Spain using ECMWF-System3 and RCA Models

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The skill of state of state-of-the-art operational seasonal forecast models (ECMWF System3) in extratropical latitudes (Spain) is assessed using a simple and robust tercile-based statistical methodology, considering both temperature and precipitation forecasts; the only significant average skill is found for dry events in autumn. We also analyze ENSO-conditioned skill, considering only forecasts for El Niña/La Niña years; in this case, skillful seasonal predictions are found in partial agreement with the observed teleconnections derived from historical records, for some variables, seasons and regions, thus providing "windows of opportunity" for operational seasonal forecasts in Europe.

Then, we analyze the possibility to enhance the skill of global seasonal predictions using regional climate models. To this aim, the Rossby Centre RCA model was applied to downscale the one-month lead time ECMWF System3 seasonal simulations in the European Atlantic domain for the period 1981-2001. We found some preliminary evidence showing that the skill of the regional seasonal predictions is significantly higher than that from the driving global model over large areas. The consideration of the whole ensemble (11 members) provided by the System3 forecast system did not overcome the regional model skill found with 5 members.