



Temperature and Precipitation Extreme Events on the Iberian Peninsula: Evaluation of ENSEMBLES Regional Climate Models simulations

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Regional Climate Model simulations have uncertainties which are due to the model, the scenario used and boundary conditions. Therefore, in order to rely on future climate projections, simulations for recent-past need to be compared to observations. This way, the deviation of models from observed climate can be assessed as well as model uncertainty. Recent-past (1961-2000) simulations of daily values of precipitation, maximum, minimum and mean temperatures with a horizontal resolution of 25 km for the Iberian Peninsula (IP) are grouped into two sets: ERA40-driven and GCM-driven. The first is used to evaluate the difference between the RCMs since the lateral boundary is the same while the second provides the RCM sensitivity to the boundary forcing. These two groups were analysed using an equitable weight ensemble of the simulations, accompanied by the associated uncertainties estimated by the spread across the ensemble. Annual and seasonal ETCCDI extreme indices are computed from both ensembles and E-OBS dataset. Comparisons between modelled and observed indices are made in both their time-mean and their time-variability. The skill of the RCMs is determined using statistical measures such as the root mean square, BIAS, standard deviation error and Pearson Correlation. As expected, temperature indices have lower uncertainty than precipitation. Furthermore, indices that distinguish the presence or lack of rain rather than the amount of rain not only have lower ensemble uncertainty but also show better performance. Also a better overall performance is found in areas with less complex orography and worse in mountainous regions and coastal areas. The variability of the observed indices is used to assess recent-past climate change, as well as the ability of the RCMs to reproduce it, taking into account the uncertainties. It was found that recent-past changes point to the IP having become warmer and drier during the period under study.