

**CLIVAR-SPAIN contributions: Present and future climate simulations over Spain and surrounding areas through regional climate models in the frame of ESCENA project**

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The ESCENA project (2008-2012) is a Spanish initiative which applies the dynamical downscaling technique to generate high resolution (25 km) climate change scenarios based on an ensemble of Regional Climate Models (RCMs). The studied domain is centered over Iberian Peninsula and also includes countries like Portugal and Morocco. An evaluation of present climate (1990-2007) has been simulated, forced by ERA-Interim reanalysis, together with a collection of climate change scenario simulations (1950-2050). ESCENA dataset will complement PRUDENCE and ENSEMBLES dataset through the use of improved or additional RCMs (PROMES, WRF, MM5 and REMO), nested in three Global Climate Models (GCMs) (HadCM3, ECHAM5 and ARPEGE) and a larger set of emissions scenarios (A1B, A2 and B1), giving as a result an almost complete matrix of combinations GCM/RCM over the propose domain. An important difference with respect to ENSEMBLES project is that the domain covers larger parts of the Atlantic Ocean, including the Canary Islands. The daily precipitation and temperature of peninsular Spain and Balearic Islands from present climate simulations has been compared with the Spain02 observational database (0.2°). This database was developed using a large amount of daily station data. Regarding mean fields, there is a better agreement between observed and simulated minimum surface air temperature than for maximum surface air temperature. For precipitation, the models tend to show dry biases during all seasons. The agreement between observed and simulated precipitation interannual variability is better than for temperature. All models tend to overestimate the Spain02 standard deviation, being winter when the differences in the interannual variability are the highest among models for both, temperature and precipitation. The precipitation frequency distributions have also been analyzed as well as several precipitation and temperature climate extreme indices. The shape of the simulated precipitation frequency distribution is in good accordance with the Spain02 data and the specific behaviour over each subregion differs among models. The intensity precipitation extreme indices present lower spread than the frequency ones. Regarding temperature, the models present low spread in all the basins for all percentiles, showing a basin-based spatial distribution of the percentiles close to Spain02, and underestimate the intensity of cold days. Due to the minor differences obtained, the results point out the ability of these RCMs to reproduce the mean fields, the interannual variability and climatic extremes in a very complex area such as the Iberian Peninsula, showing a great diversity of climatic behaviours, from Alpine or Atlantic to semiarid conditions. Climate change simulations have been performed and are being currently analyzed. Preliminary results will also be shown.