



## **An assessment of present climatological droughts in the western Mediterranean (Iberian Peninsula) by using high-resolution regional climate simulations**

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Droughts are a natural and recurrent feature of the Mediterranean climate that can have severe impacts on people and the environment. Within this context, the Mediterranean region registered the highest frequency of droughts during the last few decades. Droughts develop during or following periods of low cumulative rainfall and high temperatures relative to average conditions. As drought develops, rainfall deficits lead to persistently dry soil conditions, low river flows and groundwater recharge with consequences for crop growth, livestock, water supply and aquatic habitats. One way of assessing the changes in the frequency and characteristics of climatological droughts in complex areas as the Iberian Peninsula is to use climate simulations coming from Regional Climate Models (RCMs).

This contribution uses data from a 50-year simulation performed with the MM5-RCM encompassing the Iberian Peninsula. The simulation was driven by ERA40 reanalysis to fit it as much as possible to the actual evolution of the climate in the recent past, in particular during the target period, which covers the years 1959-2008. The complexity of the area covered forces to use high horizontal resolution data to accurately characterize the drought patterns and evolution. Thus, two two-way-nested domains were employed with a spatial resolution of 30 km and 10 km, respectively. The inner domain covers the Iberian Peninsula entirely. The simulation was stored every hour, thus allowing the study of short and extreme precipitation events, which have a strong importance in the dry season in the area of study.

We focus on meteorological drought, for which a number of indicators have been included in this work, such as the Palmer Drought Severity Index (PDSI), the Drought Severity Index (DSI) and the Standardized Precipitation Index (SPI). The results for these indices from the simulations are compared to those obtained using the Spain02 reference database. This database was developed following the ENSEMBLES E-OBS database methodology but using a much larger amount of daily station data. Thus, it is very suitable over the Iberian Peninsula to be compared with high resolution RCMs data at daily timescale.