



Trends and interannual variability of heating and cooling degree-days in Spain under present and future climate conditions.

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Heating and cooling degree-days estimate the influence of the meteorological variability on the domestic energy demand. They are obtained from daily mean temperatures weighted by a ratio of the local population that is experiencing such weather to the total population of the region under study. In this paper we investigate the evolution of heating and cooling degree-days in the case of Spain, under future atmospheric composition (scenario A1B) as simulated with four high resolution Coupled Regional Climate Models in the Mediterranean Region developed for the project 'Climate Research Experiment and Impacts: The Mediterranean Environment' (CIRCE). The present day simulated variability (1950-2000) is validated with help of observed degree-day computed from daily mean temperatures at 32 stations through Spain (1958-2005). Decreasing trends are found for heating degree-days, and increasing trends in the case of cooling degree-days.

In the case of the observations, statistical tests find, at some of the stations under study, significant differences between heating degree-days in years where the North Atlantic Oscillation is in the positive phase and years where it is in the negative phase. The differences in autumn are of opposite sign to those found in winter. These differences can be explained by the differences between the behaviour of diurnal and nightly degree days in autumn and summer. The influence of El Niño-Southern Oscillation is also considered.

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