



Variability of the extreme rainfall events in the South of the Iberian Peninsula

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A study of the variability of the extreme rainfall events in the South of the Iberian Peninsula during the second half of the 20th century is presented. A dataset of 100 stations for the period 1961-2004 was used, and a quality control of daily precipitation records was carried out to ensure the homogeneity of the series.

Some of the extreme rainfall indices recommended in the STARDEX (Statistical and Regional dynamical Downscaling of Extremes for European regions) Project for the analysis of observed changes in extremes were used. For the annual analysis 9 indices of extreme rainfall were examined: the 95th percentile (pq95), the fraction of total precipitation above 95th percentile (pf95), the maximum number of consecutive dry and wet days (pxcdd and pxcwd respectively), the greatest 3-day total rainfall (px3d), the simple daily intensity (pint), the number of events greater than long-term 90th percentile (pnl90), the percentage of total rainfall from events greater than long-term 90th percentile (pfl90) and the greatest 1-day total rainfall (px1d). For seasonal analysis 5 of the above indices were studied (px1d, px3d, pxcdd, pxcwd and pint), except in summer, in which only pxcdd was analysed. The Mann-Kendall statistic and a linear regression model were used to assess annual and seasonal trends in the indices of extreme rainfall for all 100 stations. In addition, the means of two subperiods (1961-1980 and 1981-2004) were calculated in order to apply a t-test to difference between them.

In general, the results, especially in annual and winter analysis, show a negative trend in the intensity rainfall indices across the region under study, except in the Southeast, where a positive trend has been found in the most of this area. The different character of the precipitation in the Southeast, due to the orography of the region and its distance from the Atlantic influence, could be the reasons of this behaviour. For the index of maximum consecutive dry days (pxcdd), in the annual analysis a positive trend was observed for the southern of Iberian Peninsula, which is closely related with the positive trend observed in summer. Conversely, a negative trend of this index was found in autumn.

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