



Seasonal precipitation extreme indices in mainland Portugal: trends and variability in the period 1941-2007

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Changes in the precipitation regimes are expected to be accompanied by variations in the occurrence of extreme events, which in turn could be related to low frequency variability. The impact on the society and environment requires that the regional specificities are understood.

For mainland Portugal, this work reports the results of the analysis of trends in selected precipitation indices calculated from daily precipitation data from 57 meteorological stations, recorded in the period 1941-2007; additionally we have also investigated the correlations between these indices and several modes of low frequency variability over the area. We focus on exploring regional differences and seasonal variations in the intensity, frequency and duration of extreme precipitation events. The precipitation indices were assessed at the seasonal scale and calculated at both the station and regional scales.

Results sometimes highlight marked changes in seasonal precipitation and show that:

- i) trends in spring and autumn have opposite signals: statistically significant drying trends in the spring are accompanied by a reduction in precipitation extremes; in autumn, wetting trends are detected for all precipitation indices, although overall they are not significant at the 5% level;
- ii) there seems to be a tendency for a reduction in the duration of the rainy season;
- iii) the North Atlantic Oscillation (NAO) is the mode of variability that has the highest influence on precipitation extremes over mainland Portugal, particularly in the winter and autumn, and is one of the most important teleconnection patterns in all seasons.

This work was partially supported by FEDER (Fundo Europeu de Desenvolvimento Regional) funds through the COMPETE (Programa Operacional Factores de Competitividade) and by national funds through FCT (Fundação para a Ciência e a Tecnologia, Portugal) through project STORMEx FCOMP-01-0124-FEDER-019524 (PTDC/AAC-CLI/121339/2010).