



Drought trends in the Iberian Peninsula over the last 112 years

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The Iberian Peninsula is often affected by drought events with strong influences in ecosystems and the related social and economic impacts (Gouveia et al. 2012, Trigo et al., 2013). In the last decades the severity of droughts in Iberia have increased due to the higher atmospheric evaporative demand (Vicente-Serrano et al., 2014). The need for a deeper knowledge of drought frequency, duration and intensity over the Iberian Peninsula during the last 112 years is reinforced by the findings showing that the period of 1970-2010 over the Mediterranean region was considered drier when compared with 1901-1970. Together with the increasing dryness, the projections point for an increase of drought conditions during the twenty-first century (Hoerling et al., 2012) will tend to exacerbate these problems.

The evolution of drought in the Iberian Peninsula was analyzed, using the Standardized Precipitation Evapotranspiration Index (SPEI) and the Standardized Precipitation Index (SPI), for the period 1901-2012, and the sub-periods 1901-1937, 1938-1974 and 1975-2012. We have used SPI and SPEI for the time scale of 12 months, as obtained from CRU TS3.21 database between 1901 and 2012, using a spatial resolution of 0.5°.

The drought indices were analyzed in order to identify significant trends during the entire period and sub-periods. Trends in annual precipitation and PET were also performed. Drought's duration, magnitude and time spanned between drought events were computed. SPI and SPEI significant trends show areas with opposite signals in the period 1901-2012, following precipitation patterns. Precipitation trends are significant and positive in the Northwestern region of the IP, and significant and negative in the Southern areas. SPEI identified dryer conditions and an increase in the area affected by droughts, which is in agreement with the increase in PET on the majority of the territory. The same spatial differences were identified in the drought duration, magnitude and time between drought events, although no clear pattern has emerged.

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