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Frequency and Intensity of drought events over Ebro River basin

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Lately, several researchers have pointed out that climate change is expected to increase temperatures and lower rainfall in Mediterranean regions, simultaneously increasing the intensity of extreme rainfall events. These changes could have consequences regarding rainfall regime, erosion, sediment transport and water quality, soil management, and new designs in diversion ditches. Climate change is expected to result in increasingly unpredictable and variable rainfall, in amount and timing, changing seasonal patterns and increasing the frequency of extreme weather events. Consequently, the evolution of frequency and intensity of drought periods is of most important as in agro-ecosystems many processes will be affected by them.

Realising the complex and important consequences of an increasing frequency of extreme droughts at the Ebro River basin, our aim is to study the evolution of drought events at this site statistically, with emphasis on the occurrence and intensity of them. For this purpose, fourteen meteorological stations were selected based on the length of the rainfall series and the climatic classification to obtain a representative untreated dataset from the river basin. Daily rainfall series from 1957 to 2002 were obtained from each meteorological station and no-rain period frequency as the consecutive numbers of days were extracted. Based on this data, we study changes in the probability distribution in several sub-periods. Moreover we used the Standardized Precipitation Index (SPI) for identification of drought events in a year scale and then we use this index to fit log-linear models to the contingency tables between the SPI index and the sub-periods, this adjusted is carried out with the help of ANOVA inference.

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