Geophysical Research Abstracts
Vol. 16, EGU2014-15492, 2014
EGU General Assembly 2014

Assessing extreme droughts in North-East Spain from rogation ceremonies

José M Cuadrat (1), Mariano Barriendos (2), Ernesto Tejedor (3), Miguel Ángel Saz (4), and Roberto Serrano (5)

(1) Departamento de Geografía. Universidad de Zaragoza. España (jmcuadrat@unizar.es), (2) Departamento de Geografía. Universidad de Barcelona. España , (3) Departamento de Geografía. Universidad de Zaragoza. España , (4) Departamento de Geografía. Universidad de Zaragoza. España , (5) Departamento de Geografía. Universidad de Zaragoza. España

Among the different meteorological hazards, droughts are those with the highest socio-economical impact on the Iberian Peninsula. In the present work, drought events that occurred in North-East Spain during the period 1600–1900 have been analysed, using historical information. The abundant documentation available in historical archives and the detail of the meteorological event records allows us the systematic and continuous summary of the drought events from 16th to 19th centuries.

Rogation (ceremonies to ask God for rain: pro-pluvia, or to stop raining: pro-serenitate) analysis is an effective method to derive information about climate extremes from documentary sources. These documents are homogeneous information that permit the reconstruction of drought frequency series and create continuous drought indices. Weighted annual sum by levels has been a widespread technique to analyze such data but this analysis is liable to be biased to spring values as these ceremonies are strongly related to farming activities and crop development. The analysis of the length of pro-pluvia periods (the time span during which rogations are carried out in relation to a drought event) and the combination of annual and seasonal information offers a more objective criterion for the analysis of the drought periods and an increase in the resolution of the study.

Two drought maxima appear during the 1650–1675 and 1765-1795 periods, characterized by rogations during almost all the year, with a middle stage (1676–1710) when droughts were less frequent and their length shortened. Results indicate that drought evolution during the past four centuries often coincides in time with the evolution recorded in other Mediterranean areas. Between the sixteenth and nineteenth centuries the most important droughts were recorded in the last quarter of the eighteenth century, which coincided with a period of high climatic variability known as the “Maldá” anomaly. In general, the eighteenth century was drier than the seventeenth and nineteenth centuries.