



Causes of the rich flood period recorded in the South of Europe in the middle of the 19th century

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At the end of the Little Ice Age an increase in flood frequency and impacts was produced in the Southwest of Europe. In France, the Loire River recorded three extreme floods on the years 1846, 1856 and 1866, while the Tech River and the Têt River recorded other important events on 1842 and 1843. This last one was more spread and also affected the Aude River that recorded other remarkable floods in 1858 and 1862. The Ardèche River recorded seven flood events between 1846 and 1861 (Lang et al, 2001) and some of these events also affected the Drac and Isère Rivers, with more than 20 flood events in Grenoble (Coeur, 2003). The Rhone River was also recorded extreme floods (2003). In Spain, more than 60 flood events were recorded in Catalonia on the period 1840-1870 (Llasat et al, 2005), but also the Duero River in the western part of the Iberian Peninsula, and the Turia, Jucar and Ebro Rivers in the Eastern part of the same experienced catastrophic floods. The contribution analyses the causes that have produced this anomalous flood period, with particular consideration to the fact that the usual meteorological situations associated to heavy rainfalls and floods in these regions and catchments are not the same, and that during this period land uses, urban planning and vulnerability experienced important changes. Potential changes in flood seasonality will be also considered. Early instrumental data collected on the framework of the European Project SPHERE and the Spanish National Project RAMSHES, between others and public information like 20th century reanalysis (Compo et al, 2011) will be also considered to reconstruct the meteorological patterns. Recent research on the impact of solar variability and teleconnections will be discussed, giving in mind the apparently contradictions between the dominant NAOI values during this period and the usual atmospheric circulation pattern associated to floods nowadays. Finally, a comparison with flood events recorded in the same period in other European regions will be made.