



Flood risk changes in Northeastern part of Iberian Peninsula: from impact data to flow data

Maria-Carmen Llasat (1), Joan Gilabert (1), Montserrat Llasat-Botija (1), Raül Marcos (1), Pere Quintana-Seguí (2), and Marco Turco (3)

(1) University of Barcelona, Department of Astronomy and Meteorology, Barcelona, Spain (carmell@am.ub.es), (2) Observatori de l'Ebre (Universitat Ramon Llull-CSIC), Roquetes, Spain, (3) ISAC-CNR, Turin, Italy

The analysis of the temporal evolution of historical floods usually is based on proxy data obtained collecting flooding information from continuous records in municipal, ecclesiastic and private documentary sources. This kind of documentary series usually provide details of the damage caused by the flooding, with the exact date and duration, and in some occasions, some details on the behaviour of the rising water (duration, magnitude, indirect measurements), further details about the precipitation episode that gave rise to it, and the characteristics and dimensions of the riverbeds and the infrastructure associated with the watercourse (dams, bridges, mills, dykes). Based on this information, the first step is to estimate the flood impacts and, usually, in order to build flood data series, the event is classified following some criteria (i.e. catastrophic, extraordinary, ordinary). Exceptionally, some events are reconstructed and the maximum flow or level of the inundation is estimated. However, there are not so many studies that compare flow series and flood series obtained from proxy data. The interest of doing it is, not only to check the quality of the information and to compare the trend of both kind of series, but also to identify the role of other variables and their potential change in the flood risk evolution. Besides this, a potential relationship between the flood classification criteria and the flood frequency distribution obtained from flow data could be done.

The contribution departs from the INUNGAMA database that contains 372 flood events recorded in Northeastern of Iberian Peninsula from 1900 to 2010 (Barnolas and Llasat, 2007; Llasat et al, 2013); the PRESSGAMA database that includes more than 15,000 news related to natural hazards and climate change published between 1981 and 2010 and with detailed information for each flood event (Llasat et al, 2009) and the historical flood database with data since the 14th century for the rivers Ter, Llobregat and Segre (Llasat et al, 2005). Daily flow data for the rivers Muga (1971-2013), Ter (1912-2013) and Llobregat (1912-2013) has also been obtained from the Catalan Water Agency. Precipitation and temperature daily data has been provided by Spain-02 (Herrera et al 2012) for the period 1950-2008. First of all, the quality of all the series has been checked and a consistency analysis between them has been done. The correlation between rainfall and flow series has been studied for some specific catchments. Then, trend analysis of different series has been made by applying the Mann-Kendall method and a resampling method (Turco and Llasat, 2011), in order to identify decadal changes. Finally, a flood event has been selected as case study to illustrate the different factors that can be involved.

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