



## Is convective precipitation increasing? The case of Catalonia

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A recent work (Turco and Llasat, 2011) has been performed to analyse the trends of the ETCCDI (Expert Team on Climate Change Detection and Indices) precipitation indices in Catalonia (NE Iberian Peninsula) from 1951 to 2003, calculated from a interpolated dataset of daily precipitation, namely SPAIN02, regular at 0.2° horizontal resolution. This work has showed that no general trends at a regional scale have been observed, considering the annual and the seasonal regional values, and only the consecutive dry days index (CDD) at annual scale shows a locally coherent spatial trend pattern. Simultaneously, Llasat et al (2009, 2010) have showed an important increase of flash-flood events in the same region. Although aspects related with vulnerability, exposure and changes in uses of soil have been found as the main responsible of this increase, a major knowledge on the evolution of high rainfall events is mandatory. Heavy precipitation is usually associated to convective precipitation and therefore the analysis of the latter is a good indicator of it. Particularly, in Catalonia, funding was raised to define a parameter, designated as  $\beta$ , related with the greater or lesser convective character of the precipitation (Llasat, 2001). This parameter estimates the contribution of convective precipitation to total precipitation using 1-min or 5-min rainfall intensities usually estimated by rain gauges and it can be also analysed by means of the meteorological radar (Llasat et al, 2007). Its monthly distribution shows a maximum in August, followed by September, which are the months with the major number of flash-floods in Catalonia. This parameter also allows distinguishing between different kinds of precipitation events taking into account the degree of convective contribution.

The main problem is the lack of long rainfall rate series that allow analysing trends in convective precipitation. The second one is related with its heterogeneous spatial and temporal distribution. To deal with both questions the 1-min rainfall intensity provided by the Jardí pluviograph (Barcelona, Spain) and the 5-min rainfall intensity from the SAIH network have been used. The first is situated in the Fabra observatory, at an altitude of 414 m.a.s.l. and at a distance of 7.5 km from the sea, inland from the city of Barcelona. It started functioning in 1921 (Jardí, 1921), although only the series corresponding to the period 1927-1979 can be considered reliable (Burgueño et al, 1987), for this reason this series will be completed with information from other rain gauges. The SAIH network from the Internal Basins of Catalonia is constituted by 126 rain gauges and provides information since 1996 (Llasat et al, 2007). Thanks to this information is possible to see that more than 70% of the population of Catalonia lives in regions where the convective contribution to the total rainfall between May and November is above 50%. Consequently, any change in its distribution can have an important social impact.