



Spatial extension of the reconstruction of 1874 Santa Tecla's flash floods in Catalonia (NE Iberian Peninsula)

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In September 23 1874, a sudden and severe rainstorm caused multiple flash floods in many small catchments (up to 200 km²) in the Southern half of Catalonia (NE Iberian Peninsula). These floods resulted in 575 fatalities and in a huge destruction of dwellings, roads, bridges, canals and crops and, thus, rank among the heaviest events in Catalonia since 1500. The damages were so great that the economic effects of the floods lasted several years.

Many flood mark plaques scattered across the affected area remember the date and keep a record of the maximum height reached by the water. This information enables the hydraulic calculation of the peak flow of the flood at the site of the flood mark; so far, this reconstructed peak flow has been calculated in seven sites: Mont-roig and Agramunt on the Sió River, Cervera and Tàrraga on the Ondara River, Vallfogona, Ciutadilla and Guimerà on the Corb River. Moreover, it has been possible to estimate the rainfall from the reconstructed hydrographs. The results agree with the destructive force of the floods: a specific flow of 10 m³•s⁻¹•km⁻² in Cervera, an approximate return period of 250 years in Tàrraga, and 150 mm of rain in nine hours in the Ondara catchment, for example.

There are many other flood marks that have not been used yet: Granyena on the Vallmajor River, Arbeca on the Turull Torrent, Espluga and Montblanc on the Francolí River, and Vendrell on the Bisbal Torrent. The reconstructed peak flows and rainfalls in these sites will give more insight into the big picture, that is, the temporal and spatial distribution of the meteorological and hydrological factors that produced the fatal event. Our final objective is to compare this regional picture with the even bigger one obtained from the analysis of the synoptic meteorological situation in the days immediately prior to the floods. A secondary objective is to compare this flood with a more recent one, such as the one occurred in September 1962 near Barcelona, in order to identify common generative processes and the influence of orography in the development of these extreme rainstorms.