Floods characterization: from impact data to quantitative assessment

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This study is based on the following flood databases from Catalonia: INUNGAMA (1900-2010) which considers 372 floods (Llasat et al, 2014), PRESSGAMA (1981-2010) and HISTOGAMA (from XIV Century on) - built as part of SPHERE project and recently updated. These databases store information about flood impacts (among others) and classify them by their severity (catastrophic, extraordinary and ordinary) by means of an indicators matrix based on other studies (i.e. Petrucci et al, 2013; Llasat et al, 2013).

On this research we present a comparison between flood impacts, flow data and rainfall data on a Catalan scale and particularly for the basins of Segre, Muga, Ter and Llobregat (Western Mediterranean). From a bottom-up approach, a statistical methodology has been built (trend analysis, measures of position, cumulative distribution functions and geostatistics) in order to identify quantitative thresholds that will make possible to classify the floods. The purpose of this study is to establish generic thresholds for the whole Catalan region, for this we have selected rainfall maximums of flooding episodes stored at INUNGAMA and they have been related to flood categories by boxplot diagrams. Regarding the stream flow, we have established a relation between impacts and return periods at the day when the flow is maximum. The aim is to homogenize and compare the different drainage basins and to obtain general thresholds. It is also presented detailed analyses of relations between flooding episodes, flood classification and weather typing schemes - based in Jenkinson and Collison classification (applied to the Iberian Peninsula by Spellmann, 2000). In this way it could be analyzed whether patterns for the different types of floods exist or not. Finally, this work has pointed out the need of defining a new category for the most severe episodes.