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Interactive comment on “The role of climatic factors in evolving flood patterns in a Mediterranean Region (1301–2012)” by A. Barrera-Escoda and M. C. Llasat

Anonymous Referee #2

Received and published: 20 September 2014

General comments:

The paper deals with temporal changes in flood frequency in Catalonia during more than 700 years. In comparison with previous works, both the studied area and time period were enlarged. The authors attempt to explain detected changes in flood frequency by changes in causal factors, first of all the climatic ones. The results are interesting but not unequivocal in my opinion. The authors also correctly mention the role of other factors such as flood vulnerability, land use but they do not specify them (what happened when the flood frequency changes). Moreover, the observed trends in frequency of floods may be significantly influenced also by trends in frequency of avail-

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able data which is not enough discussed in the paper. In my opinion, it could explain the fact that trends in catastrophic floods are substantially less significant in comparison with extraordinary floods (= category 2) because representation of the latter ones is more sensitive to quality of data sources (it seems to be obvious if comparing for example Figs. 6a and 6b). The results are compared with central and eastern Europe but without any remark on the fact that floods can be due to thawing there – such events can be linked to climate factors in very different way.

Specific comments:

The title does not inform which Mediterranean Region is the paper about – it should be more concrete. Page 9149, line 26: Words “very convective” are colloquial in my opinion. Page 9150, line 24: Even if Barcelona is a good representative of precipitation in the region (not proved but Fig. 8 suggests it), it should be mentioned that especially flash floods can be due to only local rainfall that can miss the city. Page 9153, line 3: “Inter-annual” implicates that the authors compare individual years which is not the case here; “seasonal” would be probably better. Additionally, I am not sure whether the word “inter-decadal” (line 12) is used correctly for variability among decades or the authors mentioned the variability among individual years within a decade. Page 9153, line 16: The study contains also twelve years of the 21th century. Page 9154, lines 29-30: The statement seems to me not as unquestionable as it is presented. Page 9155, line 6: One of the words “more” and “less” is redundant in my opinion. Page 9156, line 13-14: The increase of the correlation coefficient could be due to rather small number of episodes when rainfall exceeded the highest threshold. It could be the case also for the short period 1862-1892 (lines 20-21). Page 9156, line 24: “Various” would be probably a better word instead of “different” at the end of the line. Page 9158, lines 15-17: The presented relation is problematic: while the period of high flood frequency lasted 1591-1623, the solar activity maximum started only three years before the period finished. It can hardly support the hypothesis that increases coincide in both solar and flood activity. Page 9158, lines 26-28: I do not see any support for this statement in

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the text; the difference in the sign of the correlation coefficient does not express the strength of the correlation. Table 1 and most of the figures: The data series are not of the same length; how authors deal with this problem in the evaluation?

Technical comments:

I have not found the following references in the text: page 9165, lines 32-33; page 9166, lines 21-22; page 9166, lines 7-8; page 9169, lines 20-22; page 9170, lines 10-12.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 9145, 2014.

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