

Interactive comment on “The role of different factors related to social impact of heavy rain events: considerations about the intensity thresholds in densely populated areas” by L. Barbería et al.

Anonymous Referee #1

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Comments on the manuscript “The role of different factors related to social impact of heavy rain events: considerations about the intensity thresholds in densely populated areas” from L. Barbería, J. Amaro, M. Aran and M. C. Llasat.

The manuscript deals with the evaluation of the social impact caused by heavy rainfall events. In order to estimate heavy rain impacts on society, the applications for weather reports that insurance companies perform to Meteorological Services are taken and used as proxy data to define some indices that represent these impacts in a compact

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form. Using a cumulative index (CI) defined in a previous paper, and analyzing the deviation of this index in particular cases, the authors show the need to consider, in an improved version of the index, the daily accumulated rainfall in relation to the population density. For Barcelona city it is also demonstrated the need to include the precipitation intensity. From this reasoning, a new index is introduced that shows improvements over the original CI. The article is well constructed and follows the classic structure of the works on social impact of meteorological phenomena. Although the results given by the new index (RCI) still suffer from a lack of significant discrimination between rain events with high and low social impact (values of RCI does not get close to the maximum possible value in cases of very high impact), the manuscript represents a new step toward characterizing the impacts of adverse weather events. The RCI index defined for Barcelona is only applicable to this city and its application to other cities (especially in Catalonia) would need, in many cases, studies not available right now. In my opinion the article can be accepted for publication provided that some improvements are made:

a) English should be improved (e.g. “associated to” has to be changed throughout the text by “associated with”. Verbs should be written using the same time within a paragraph, e. g. Pag 3, first paragraph) b) It should be made explicit that the CI index is applied to the Balearic Islands or to Catalonia, not to both regions together. The maximum precipitation collected in the Balearic Islands in 24 hours should not affect the CI index for Catalonia or viceversa. c) To make the article more self-consistent, the tables corresponding to the values of LR, LP, LTR and LTW from Amaro et al (2010) should be incorporated. d) Pag 7 second paragraph. Improve writing. “Concentration of population in relation with the land” means “population density”? e) In some parts it is written “inhabitants km⁻²”, in others “inh km⁻²”. It should be convenient to unify notation. f) Remove “Eq (1)” at the top of page 4. g) Remove “Eq (2)” at the end of page 7. h) Equation (2) must be at the top of page 8. i) Pag 8 line 5. Delete “only the precipitation between 40 mm and 60 mm is taken in account as ”

j) Pag 8 line 12. After RCI add “for Catalonia” k) The increase in the visits to the

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websites of the SMC and the free availability of data from automatic weather stations doesn't seem like a reasonable causes of the decline in requests for reports from insurance companies. Insurance companies most likely need official reports from the SMC and not simple copies of the website for their business. l) Pag 11, line 26. Explain better the no inclusion of 'population factor '. m) Pag 13 line 17. Delete " the following (Eq. 4) " n) Pag 14, line 13: The same as in l) o) The references in a paper shall be available to the interested reader (as easy as possible). The 3 references indicated as "poster contribution" are not available to the interested reader. At least the reference of the corresponding abstract should be included if published. Otherwise these references should be removed.

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