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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Continental Portuguese Territory Flood Susceptibility Index – contribution for a vulnerability index" *by* R. Jacinto et al.

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Reply on Lonrenzo Marchi Review of the paper NHESSD – 7521-2014

General comments Concerning the procedures for assigning weights to the variables used for developing the susceptibility index, as stated on lines 26 to 28, page 7531, the methodology developed by Reis (2011) was applied. The applied method comprised an interactive comparison of different weighting results with the 100 year floodable areas for the Portuguese main rivers. Different combinations were tested, and the selected one is the one which describes better the 100 year floodable areas and, at the same time, didn't overestimate Alentejo and Algarve regions, due to its general low slope and high river-density network, as described in page 7526, lines 15-20. The

definition of susceptibility classes was performed regarding the range of results and its histogram distribution of the values of FSI and the adjustment for four classes was done according to different flood (hazard and risk) maps. While defining classes, and according to what was done on the variables weighting, a sensibility evaluation of the classes in order to not overestimate the susceptibility in Alentejo and Algarve regions.

Datasets Since no Land Use dataset, or other permeability dataset in use, could correctly represent the human occupation and its impact in soil permeability, Flow Number was used instead of SCS Curve Number, has it also includes Corine Land Cover data for Portugal (the study area).

Methods The question regarding the description of the spatial aggregation method on page 7531, lines 8-12, is described on page 7531, lines 12-28 and page 7532, lines 1-4, page 7536, lines 21-24. Variable weighting was one of the most discussed point in this index formulation, as well as the selection of variables, which as clearly demonstrated on the results and discussion, as well as noted by the reviewers, come out only 3; and initially and as also referred on the paper other variables could have been included such as precipitation. While weighting several different combinations were made with expert judgement and applying different authors methods/weights, although to present all that process would completely put the focus on that point and that was not the objective of this paper, which aims to present an overview of the entire index elaboration. The combination of cost distance matrix with the flow number was used to dissolve the overestimation of the FSI in the Alentejo and Algarve regions clearly shown by the Flow number. Due to the before referred and clearly stated in the paper about this issue, and as this over weight of this combination was the better combination regarding the validation, the presented methods will remain the same, although theoretically the argument presented by the reviewers is correct but in this case is not applicable. The study area presented large ranges of flow accumulation and there were few datasets which could be used as coherent validation datasets, this was a constriction which left few methodological options. Regarding

NHESSD

2, C3543–C3545, 2015

the two higher susceptibility classes, the distance to the river network and the cost distance matrix were also used in the validation process, as well as the highest risk classes and events registered in DISASTER Database. Regarding the structure, the paper was re-organized regarding the recommended changes. About the references in Portuguese, to make a synthesis of all those works would take pages and other authors authorization, therefore it will not be possible. Specific comments In fact, in this paper the term progressive floods refers to long term floods in large rivers, same as 'fluvial floods', therefore the suggestion is accepted and there was a replacement for 'fluvial floods'. Page 7532, line 19, the resolution is wrong by mistake, it is in truth the same as reported before, 90m. Page 7533, lines 8-9, the 'N' for number of occurrences was replaced by 'NO'.

Please also note the supplement to this comment:
http://www.nat-hazards-earth-syst-sci-discuss.net/2/C3543/2015/nhessd-2-C3543-2015-supplement.pdf

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 7521, 2014.