

## ***Interactive comment on “Analysis of the French insurance market exposure to floods: a stochastic model combining river overflow and surface runoff” by D. Moncoulon et al.***

### **Anonymous Referee #2**

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The paper shows a methodology for the estimation of the annual insurance losses in France, using a stochastic model based on a Monte Carlo simulation approach, and the combination of two deterministic models to obtain the runoff of some French rivers. . . . The results provided by the probability distribution are compared with the empirical losses distribution observed in the period 1995-2010. It is an ambitious paper that combines a lot of meteorological, hydrological and economic information and tries to improve the flood risk maps in France. The paper merits to be published, but I would like to add to the major comments made by the other anonymous referee about the model, the following minor ones:

C2813

p. 2, l. 21-28: The paragraph starts referring to all kind of natural disasters and the increase of global damages, but the explanation only refers to floods. Please, modify the paragraph in order to have a coherent discourse.

p. 2, l. 29-30, p.3, l.1-5: You are mixing the losses produced by floods with those ones produced by severe winds, hurricanes,.. (i.e. Sandy). Please, modify the text in accordance with the economical information supplied.

p.3, l. 16-18: You say in l. 6-8 that “Natural disaster is recognized by the abnormal intensity of a natural agent when the usual measures to be taken to prevent this damage were not able to prevent its occurrence or could not be taken”, but you introduce the return period of 10-years for river flow and rains. This is a very short return period, that usually is covered by any simple hydraulic structure, and the own French directive considers a value of return period of 100 years in the PPRI. Please, review this paragraph.

p.3, l.20: As it is the first time that you mention CCR in the paper, please, include the complete name.

p.3, l. 27-31: 10% of the global damage insurance premium in the world? Please, clarify this point and introduce the source of this information with the complete reference in the List of references.

p.4, l.23-24: The name of the broker and the modelling company are not relevant for the paper if any reference to their work (publication, web, . . .) is included.

p.4, l.31-p.5, l.3: Please, remove from here the information about flood losses; it is not a hypothesis. You can include it in any other previous paragraph about CCR.

p.6, l.2: Could you introduce the name of the rainfall-runoff model?

p.6, l.9: It is a strange definition of event, why 24 h before and 24 after the end of significant rain? Please, justify this criterium.

C2814

p.6, l.16: As you are referring to the previous equation, it should be “hourly potential evapotranspiration”

p.10, l.9: “in CCR” or “by CCR”? As I have told before, 10-y return period seems very low. Usually protections against floods are for major T.

p. 10, l.22: Modify the bracket position: “in Bradbook et al (2005). The same for other citations in the paper like p.24, l. 22.

p. 11, l.6 and l.9: What is the meaning of 328 million risks? Events? Please, clarify it. It is only referred to 2013? But you are working with the period 1995-2010, and the paper was written in 2013, perhaps there is a mistake. I think that it would be better to tell that “All damages and claims. . .” In the context of this paragraph it would be better, in the major part of the cases, to substitute “risk” by “damages”. Please, review it.

p. 18, l.23: What are CRESTA zones?

p. 20, l.9: “annual losses”

p. 23, l.17: I think the sentence should be “The probabilistic flood map shown on Fig. 5 is the first flood map in France at a national scale with a homogeneous method combining two perils: surface water runoff and river overflow”

p. 25, l.6: “Two perils...”

p. 25, l.9: Are you sure that official flood prone areas have no frequency information? Usually this kind of hazard map is built for certain return periods.

Finally, following the paper this methodology has been applied to the entire France, and some cartography has been generated. It would be interesting to know if this cartography is public, totally or partially, or if the results will be property of the insurance companies (or authors) and its access is restricted.

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