

Analysis of the French insurance market exposure to floods: a stochastic model combining river overflow and surface runoff

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First, the authors would like to thank the anonymous Reviewer #2 for his helpful and useful comments. The authors will take into account the recommendations of this reviewer and try to improve the redaction of the paper. This letter is a direct answer to this reviewer. The paper will be improved and re-submitted.

In detail:

Question #1 and #2: the paper will be improved regarding the first and second remarks of the reviewer.

Question #3: the 10 year return period criteria for river flow or rainfall is the one used by French Natural Catastrophes commission to decide whether or not a commune has been concerned by a natural disaster. This threshold is the application of the law which says the natural disasters are recognized by an “abnormal intensity”.

Question #4: will be included

Question #5: Natural Disaster premium represent 10% of the damage premium, in France.

Question #6: references will be add

Question #7: the information about flood losses will be removed from here to another paragraph

Question #8: the rainfall-runoff model is developed in CCR and its name is *ARTEMIS* but it will not be known by hydrologists. But we will mention it here.

Question #9: the 24 hour before and after the significant rains is included to take into account the initial conditions of soil water and river flow (24 hours before) and to take partially into account the river flow decrease and propagation downstream (24 hours after).

Question #10: you are right it is the hourly etp (calculated by dividing the daily etp by 24).

Question #11: “by CCR”. The 10 year return period is used here in many cases. In major cities (Paris, Lyon, Toulouse, Bordeaux, Nantes, etc.) a higher return period for river overflow has been used. The return period has been defined by exploring the documentation about flood defenses in these town (for example 100yrs for Seine in Paris and 30yrs in the suburbs).

Question #12: you are right, we will modify references.

Question #13: I think we will modify these terms. In the insurance world, a risk is a building covered by an insurance policy. A risk can be an individual risk, a commercial risk, an agricultural risk or an industrial risk. 380 million risks is the number of risks in the CCR risk database. We will modify this paragraph regarding your other remarks.

Question #14: a CRESTA zone is a country-specific zone for the uniform and detailed reporting of exposure data usually relating to natural hazards. It has been developed by Swiss and German reinsurers (<https://www.cresta.org>). In France, CRESTA zones correspond to department level.

Question #15: text will be changed

Question #16: you are right we will change the sentence

Question #17: ok

Question #18: in France the official flood prone areas have no frequency information. They correspond to the highest known river flood zones (Atlas des Zones Inondables – Plus Hautes Eaux Connues).

The entire France cartography is property of CCR. It is published on an extranet site dedicated to your clients (insurance companies) and the French Government.

The authors- March, 17th 2014