



## ***Interactive comment on “Projecting flood hazard under climate change: an alternative approach to model chains” by J. M. Delgado et al.***

**J. M. Delgado et al.**

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We thank the anonymous referee for her/his valuable comments and suggestions.

Reply to specific comments:

#1

The referee questions the level of confidence in the statement “There is abundant evidence that climate variability and climate change modify the frequency of extreme hydrologic events”. When reading the passage in the text again, we have to agree with the referee that “abundant evidence” is a rather strong expression, especially since the cited works do not present unequivocal evidence of the hypothesis. The reason behind

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this statement is rather the expectation based on physics that an increase in temperature will lead to a higher moisture content in the atmosphere and to increasingly intense rainfall events (in response to the Clausius-Clapeyron law).

The statement will therefore be adjusted and will take into consideration the “low confidence in projections of changes in fluvial floods“.

#2

We are aware of the suggested paper and agree that it should be cited at this stage.

#3

It is possible to include projections for the end of century. They will be added to the manuscript and discussed.

#4

We are aware of the paper by Räsänen et al. (2013), but citing it would be out of context in this paragraph as we are interested in projections of variance change.

#5

We partially agree with the reviewer’s comment and will move the “new” information to the Discussion.

#6

We restate that our method is a “complementary” approach due to its greatest merit: it offers lightweight climate-informed flood hazard projection. It therefore functionally complements the process model-chain in what is considered its greatest flaw: the combination of error propagation through the model chain with its large data and computational requirements. The analyst gains a method for projecting changes in flood hazard based directly on large-scale circulation and not having to deal with complicated climate downscaling and hydrological modeling.

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However, our method is based on the assumption that the past process chain remains constant in the projected future. As stated in the manuscript, it does not allow us to project changes in flood hazard that are caused by a change in the process chain. But it does allow projecting flood hazard in a climate-informed way and easily assessing the effect of large-scale circulation in the variability of the flood regime.

This issue will be shortly discussed in the revised manuscript.

Reply to minor corrections:

We thank the anonymous referee for her/his efforts in detecting minor errors in our manuscript. We will correct the manuscript accordingly.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 7357, 2013.

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