

## ***Interactive comment on “Brief Communication: An update of the article “Modeling flood damages under climate change conditions – a case study for Germany”” by F. F. Hattermann et al.***

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This brief communication reports on a sound and interesting study, but I am not convinced this is worth publishing for several reasons. First reason is that the communication reads as a follow-up report on a previous study by the authors. In that previous study only one GCM was used, whereas now a broader set of GCM and RCM simulations were considered. The second reason is that the current study combines older and newer generation climate models and greenhouse gas scenarios: older generation climate model runs from the ENSEMBLES project, which are based on the outdated SRES greenhouse gas emission scenarios from the IPCC (2001, hence 15 years old);

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newer generation EURO-CORDEX & CMIP5 climate models, which are based on the current RCP based greenhouse concentration scenarios. The third reason is that the differences in flood related damages are simply reported without much explanation. The final result that “single runs may have a slight decrease in damages from one scenario period to another” is very trivial. So, in conclusion, the research work is fine and probably very useful for the local decision makers, but, in my opinion, the scientific innovation is too limited, apart from some other limitations as explained above, to have this published in NHESS.

Reply to the comments: We do acknowledge the comments of reviewer 2 and are grateful for the advice. However, we do think that the study is fully within the scope of a Brief Communication in NHESS and that there are important scientific findings and new information worthy of being reported, as also indicated by the reviewer 1.

Comment 1: First reason is that the communication reads as a follow-up report on a previous study by the authors. In that previous study only one GCM was used, whereas now a broader set of GCM and RCM simulations were considered.

Reply to comment 1: This is absolutely correct and not hidden – being explicitly clear from the title. The idea of our Brief Communication is to report on a new and what we think also remarkable development which supports and corroborates the essential findings of the paper by Hattermann et al. 2014 in NHESS, viz that climate change will increase flood hazard and flood risk in Central Europe. All regional climate models used in the first paper were driven by only one GCM (ECHAM5) and different studies show that GCMs are the largest source of uncertainty in climate impact projections. One conclusion of the Hattermann et al. 2014 paper was therefore that more studies are needed using a wider range of climate projections to challenge the statement that flood hazard is increasing in the region under climate change. This has been done in the current study and we do think that the fact that all projections agree on the direction of change, towards increasing flood hazard and flood risk, is a very strong and remarkable outcome, despite all the uncertainties which are involved in climate

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and impact modeling. This has also been indicated by the first reviewer. Also the information that the newer climate projections give even a higher increase is original. We have chosen the format of Brief Communication exactly because we wanted to report about this remarkable and original outcome without burdening the reader with lengthy methodological descriptions which have been published in our first NHESS paper anyway.

We also do think that this fits to the scope of a Brief Communication in that: We report and discuss a new development and also novel aspects related to flood risk in Central Europe, which are scientifically significant because they show that some impact trends are robust despite the overall uncertainty in the impact model chain and that the RCP high end scenario results in higher damages than the scenarios of the SRES generation. Comparison of RCP and SRES scenarios in this context is valuable per se.

Our short paper clearly meets the definition of a Brief Communication in NHESS, as being “timely, peer-reviewed, and short (2–4 journal pages)”, reporting “(a) . . . new developments, significant advances, and novel aspects of experimental and theoretical methods and techniques which are relevant for scientific investigations within the journal scope”; as well as reporting and discussing “(b) . . . significant matters of policy and perspective related to the science of the journal”.

Comment 2: The second reason is that the current study combines older and newer generation climate models and greenhouse gas scenarios: older generation climate model runs from the ENSEMBLES project, which are based on the outdated SRES greenhouse gas emission scenarios from the IPCC (2001, hence 15 years old); newer generation EURO-CORDEX & CMIP5 climate models, which are based on the current RCP based greenhouse concentration scenarios.

Reply to comment 2: Well, we do not really combine but compare them. We think this analysis is of scientific interest and importance. Actually, this stance is also visible

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in other studies. Comparing climate data and impacts for different scenarios helps understand the range of uncertainty. Comparison of SRES and RCP approaches is recognized as an important activity in IPCC reports and the literature cited therein. For instance, Jacob et al. 2014 compare climate scenarios of the SRES generation with climate scenarios of the RCP generation for Europe, and we think the analysis of the related impacts is also of scientific and public interest (see full reference in the article).

Comment 3: The third reason is that the differences in flood related damages are simply reported without much explanation.

Reply to comment 3: We fully acknowledge this comment and offer to improve the description and explanations accordingly, for example when explaining the reasons for increases in flood damages in the different scenarios.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 7231, 2015.

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