

Interactive comment on “Analysing the sensitivity of a flood risk assessment model towards its input data” by Hanne Glas et al.

Anonymous Referee #2

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The paper explores the sensitivity of the damage estimation for the inundation caused by the tropical storm “Michelle” in Annotto Bay, Jamaica, on October, 28/29, 2001. For this, a benchmark model with the best available data was defined. Another eleven scenarios with less information, coarser spatial resolution or more rigorous assumptions were then used to investigate differences in the model outcomes. Differences were judged visually and were quantified with regard to the total estimated damage, the damaged area and a metric called spatial difference that quantifies the heterogeneity (and thus detailedness) of a raster map. Three damage types were considered: building, road and crop damage. The authors conclude that the scenario S4 delivers good results – although it is simple – and needs further investigation and that vector data are better than raster data.

While the paper has a reasonable aim, i.e. testing the sensitivity of damage models to

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input data, I have a number of major concerns with regard to the set-up of the testing scheme as well as the structure and general presentation of the paper.

Three damage types are considered in the paper: building, road and crop damage, whereof building damage accounts for 90% of the overall losses (see p.7, line 2). First, the choice of these three damage types should be better justified in the paper, ideally on the basis of empirical loss data from Jamaica or other SIDS-countries so that the importance of these three damage types becomes clear and can be discussed later. Second, the sensitivity analysis should not only look at effects on the overall damage estimations, but also at effects on each of the three damage models, separately, in order to have a better understanding of the models' reaction and sensitivity. For this, the damage models used should be explained in more detail and model choices should be better justified. Finally, results should be presented and discussed per damage type and with regard to the initial research question and motivation, particularly the relevance for the analyses for Small Island Developing States (SIDS). For example, the transferability of your assumptions (e.g. 3 persons per household) and the models used (e.g. building damage based on Dutta et al 2003) should be discussed more critically. Actually, the sensitivity of the model to such assumptions should be investigated in the paper. For example, what would be the outcome if you assumed 2 or 4 people per household? A sensitivity analysis should answer such a question.

The benchmark scenario that is based on the inundation of the 2001-event and the best available data to estimate damage should be better justified and described. Ideally, it should be accompanied by an event description and official information on its impacts (physical damage and ideally financial losses per damage type or as overall figure). In addition, the use of the best available data as benchmark is somehow contradictory to the findings of Apel et al. (2009), which are mentioned twice as a motivation for this study (p. 2, line 12/13 as well as line 26/27).

Focus and structure of the paper need some improvements, as well. The introduction should summarize the most important findings of the relevant literature as well as the

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contribution that this paper (or this case study) adds to the scientific literature. The method section is quite brief, since most of the methods are explained in the results section. You should clearly separate methods, results and discussion. Discussion and conclusion should address the initial research questions as well as the overall motivation of the research to highlight the contribution of this paper to the scientific literature. What can be learned from this analysis – in the specific area, for SIDS countries and beyond?

Conclusions should be based on the findings. The current general conclusion on the suitability of vector and raster data can be questioned in this respect.

Some minor issues: - p.1, line 24/25: Why do you mention flood losses in the UK as example? This does not make sense in the context of this paper. - The crop section (3.4) is not understandable. Provide more basic information on the agriculture in the investigated area and the damage models used. - Present the scenarios and the underlying data and assumption in a matrix table to provide a better overview of the different scenarios - The meaning of the metric “spatial difference” is unclear, in particular with regard to the comparison of different scenarios. - Change model parameters/input data gradually so that the sensitivity of damage models becomes clearer (see above).

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