

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2021-272

Anonymous Referee #2

Referee comment on "Developing a framework for the assessment of current and future flood risk in Venice, Italy" by Julius Schlumberger et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-272-RC2>, 2022

The manuscript presents a flood damage assessment for a specific storm event for the city Venice, under a range of flood protection scenarios involving different closures of the MOSE barrier and protection measures at private level. The study is comprehensive, the modelling aspects seem technically sound and the analysis of damages is interesting. The manuscript is also generally well written and I like the adaptation scenarios that the authors developed and used, as well as the evaluation of estimated damages against damage claims.

I do however have some concerns, mainly related to the framing of the study and the terminology that the authors employ; and would also like to raise a few points that require clarification.

- The authors claim that they propose a risk assessment framework for the city of Venice. However, the study describes a flood damage estimation, for a particular event, using standard methods that are commonly employed in such types of assessments (several examples of such studies are cited in the manuscript). In which way(s) is this framework or method that the authors propose novel and how does it differ from previously proposed frameworks (e.g. the one the IPCC employs)? This needs to be clearly described in the manuscript. My understanding from reading the manuscript is that the study describes a detailed assessment in terms of flood damage estimates for a specific event under a range of scenarios using established methods; this is an important study but does not involve any methodological innovations. If this is the case and I have not missed something, then this should be communicated accordingly in the manuscript.
- I am a little concerned regarding the calculation of damages to cultural heritage – although the authors describe very clearly the method used for this calculation, actual damages of world heritage cannot always be substituted simply by higher expensive building costs (and I am not only talking about intangible damages). I'm worried that this calculation of tangible damages leaves a feeling that such damages are possible to address with increased investment, which is not the case. I am not suggesting that

what the authors have done is not useful but would propose that they spend a few lines in the discussion to address this point.

- The model setup, in particular the nesting (e.g. boundary conditions), is not very clearly described.
- I find interesting that the authors suggest that the use of the bathtub model results in acceptable damage estimates, as in other studies. Would this mean that we could avoid the computational and time costs related to the application of the hydrodynamic model? Or to what extent would this be possible? Maybe an extra line or two discussing this would be useful (just a suggestion).

Finally, I have listed below some further (secondary) points that would require clarification:

- Line 3: limited information of flood hazard? I would think that this is not the case in Venice?
- What is the return period of the modelled event? This is an important parameter, particularly when assessing risk.
- I can generally understand the use Google StreetView and estate-agent ads for assessing information on buildings. But was this information recent and accurate - how was this evaluated? Since some of the co-authors are actually based in Venice, this seems like something that could be easily done in the field.
- Line 245: how was it detected, where from?
- Although generally well written, the manuscript needs to be checked for some small language errors and some inconsistencies in the use of some terms (e.g. exposure)