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Discussions

Interactive comment on "Economic assessment of measures aimed at reducing flood damage to buildings using computer modelling and expert judgement" *by* Claire Richert et al.

Anonymous Referee #2

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This study adopts a synthetic flood loss model to assess the efficacy and cost-efficiency of three types of precautionary measures of dwellings. The article is generally well written and there is some content of interest here to the flood loss modelling and risk community. However, in my opinion the article requires a complete overhaul before it can be considered publishable.

General comments:

Cost-benefit analyses are one of the fundamental reasons for performing risk assessment studies, and have been carried out for years by all types of stakeholders involved in disaster risk reduction (e.g. governmental bodies, industry, academia). I do not see

anything particularly innovative from a scientific viewpoint in Section 3.5. As such, the novelty of the article and the approach is assumed to relate to the application of a new synthetic loss model called floodam to support such analyses.

In this context, it should be noted that the scientific field of flood loss modelling has received increasing attention in the last couple of decades, and the body of literature has become vast. The introduction of this article, which attempts to explain why it is relevant, does not engage with much of the relevant literature on this topic. There are both empirical and synthetic models which use precautionary measures or other building properties to explain flood loss, and can therefore be used to make similar analyses. See for example Gerl et al., 2016; Sairam et al., 2019. This does not mean that there is no scope to propose new flood loss models – on the contrary. Flood loss modelling remains an open field where more research is certainly warranted. However, the reader should be able to understand what is the novelty of this research, which is currently not the case. This is the main shortcoming of your article.

Since the model is based on a synthetic approach, this modeling approach should be given particular attention in your literature review and in positioning your new model among it. I can think of at least three articles proposing synthetic flood loss models comparable to this one, i.e. where losses are obtained based on losses to individual building components: Custer and Nishijima, 2015; Dottori et al., 2016; Nadal et al., 2010. The general description presented in Section 3.3. of your article could apply almost word by word to any of these models. In light of this, I would suggest you restructure the article such that much more emphasis is given to the new flood loss model, and that you then illustrate its application through the economic analyses performed here. From the user manual of floodam, it appears to be a well-structured model that deserves to be presented to the scientific community following peer-review.

Specific comments:

Given the extensive revision that I think the article requires, I am only making two

specific comments at this point. The first is related with the calculation of the annual expected efficacy (AEE). In P2-L8 the authors correctly state the AAE can be obtained through a probability weighted average of the values of efficacy for different flood intensities. However, it is not clear in the article how the authors have actually calculated this. The probability of exceeding certain flood intensity measures such as water depth depends on the asset location, and as such, the average annual losses are site-dependent. Therefore, the cost-efficiency of precautionary measure is necessarily also site-dependent. What was considered here? This should be clarified in a new version of the manuscript. The second comment relates to the applicability of your findings. I assume these are meant to apply to France, but no explicit reference is made to this aspect in the article. In the abstract you also mention some findings (e.g. "according to our results, dry-proofing and elevating a dwelling are unlikely to be cost-efficient for dwellings that are not exposed to floods with a return period lower than 100 and 30 years, respectively") but a reference to where they are assumed to be valid is missing.

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