Natural Hazards
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Discussions

Interactive comment on "Regional tropical cyclone impact functions for globally consistent risk assessments" *by* Samuel Eberenz et al.

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Review of Regional tropical cyclone impact functions for globally consistent assessments by Eberenz et al.

This manuscript dives into loss functions used in a Tropical Cyclone (TC) damage model and tries to adjust damage functions by region to better match the observed record of damages. The paper is generally well written and should be published in Natural Hazards and Earth System Sciences with minor revisions.

I have some specific comments below, but I would like to see a bit more explanation for some of the figures and analysis. Especially, some of the appendix (and the two figures) could be folded into the main text. Also, it's not clear whether the trend for

simulated damages is an over or under estimation of damages before calibration and whether this is due to strong or weak storms. Maybe this is in the figures, and could be mentioned in the discussion/conclusions.

Also, the analysis focuses on tuning v-half. What would happen if you either used or added v-thresh (the minimum wind speed for damages) as an adjustment parameter? Would that help? Why or why not? Can you test it?

In addition, US Damage is conveniently a function of wind speed for a specific reason: damage is often insured loss and that does not include flood. Can you comment on that?

Wouldn't it be wise to check the large scale data against 'small scale' engineering data based on different structure types? Or generally, why is the damage different, is it a physical reason (buildings are stronger or weaker than the US.) or a social reason: lower capital, less cost to rebuild, lower value? It would be nice to discuss this, in the conclusions if necessary.

Finally, would this be applicable to other models beyond CLIMADA? Why or why not?

Specific Comments:

Page 3, L81: Figure 1 is hard to follow. I suggest that perhaps each panel can be labeled a,b,c, etc, and then referred to in the text, rather than focusing on the section numbers. I had to read this 3 times to follow it, and only some of the panels are discussed.

Page 3, L90: figure 1: careful with the arrows. For example the arrows in the second row probably point the wrong way. You want 2.2.4 and 'simulated damage' to point to 2.3.2. Not. 2.3.1 pointing to them. This highlights the nomenclature problem with the figure.easier to label a,b,c, etc.

Page 3, L103: chosen resolution.

Page 3, L106: this description is a little confusing, and I think it is because you need to be clear about terminology. What is a hazard? What is exposure data? Maybe start from the concept of damage = exposed assets x damage ratio, and damage ratio is an impact function x hazard intensity. I think those are the correct terms.

Page 4, L145 : can be constrained

Page 5, L175: is v-thresh fixed? Seems like you just vary v-half, but I can see how v-thresh depends on building type. I.e wood v. Stone.

Page 7, L226: is the 20% difference significant? Or is the goal here to make sure the 58% number from climada matches the 76% value from observations?

Page 7, L234: what does the distribution of EDR look like un optimized? Can you plot it?

Page 7, L238: a plot of the TDR by country would be useful too.

Page 7, L245: is a data point a matched storm event? I.e 43 of the 376 events have damage in the USA and Canada?

Page 8, L281: what if you fit v-thresh instead or in addition? Might this help? Why or why not?

Page 9, L286:figure a1 and a2 should be part of the main text. Comment further please on the uncertainties. Is damage higher or lower? Where? What are the general issues?

Page 9, L291: higher or lower?

Page 9, L300: maybe it's just showing and figA1 and A2, but I in you should show one more step before figure 5. It's too hard to interpret what the optimization is doing and whether simulated damage is generally too high or too low.

Page 10, L324:is there a clearer way (eg fig A1) to show h overestimation?

C3

Page 19, L591: can you speculate a little more on what next steps might be? Modify or add a flood risk component?