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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Simple rules to minimize exposure to coseismic landslide hazard" *by* David G. Milledge et al.

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Dear authors,

I enjoyed reading your manuscript, which I believe can be a useful contribution towards landslide risk reduction in highly seismic regions.

I have a few questions, mostly regarding the robustness of your findings, which I list as follows:

- You mentioned multiple times that the DEM resolution can influence some of your results. It would be nice to quantify this influence at least for one inventory for which a higher resolution DEM is available (e.g. Northridge). Perhaps, moving from 30 m to 10 m DEM will only produce marginal improvements while increasing the computational

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cost significantly, or on the contrary it will change the result significantly.

- There are cases in which several inventories are available for the same study area (e.g. Wenchuan). These inventories are sometimes quite different from each other. Among others, we discussed this in a recent submission, still under review (see the revised manuscript in the discussion at https://www.earth-syst-sci-data-discuss.net/essd-2018-105/) and we found substantial areal mismatches (up to 67%) between inventories in the Wenchuan, and rather low pixel-based correlations (R-squared as low as 0.35). We showed that this translates in quite some differences in landslide-size probability distributions and hence in landslide volume estimations. This might condition some types of hazard assessments based on volume-runout correlations. However, we did not go deeper into the topic, as it was out of the scope of our manuscript, and we did not investigate how this mismatch between inventories translates into statistics of controlling factors (e.g. slope, upstream contributing area, etc.). It would be interesting if you could estimate to what extent choosing a different inventory for the same study area would affect your assessment.

- Also, again about the Wenchuan case, you only chose a subset of the inventory by Li et al. (2014) containing about 1/3 of the landslides. It would be good to explain whether this subset can be thought as representative of the entire study area (e.g. in terms of landslide metrics, topography, lithology, distance from epicentre and fault rupture, etc.) so that one would be confident that the results you obtain have more general validity and are not biased by your choice, which was only due to a data availability issue. What you report in the conclusion (see my point below), that is that the site-specific and averaged rules perform similarly, is comforting in this sense, but what if it is just a coincidence?

- From your analyses you obtained a set of simple and easily understandable rules to minimise the exposure, and you wrote that the hazard area calculated with averaged parameters performs only slightly worse than hazard area calculated with site-specific parameters. This is encouraging and, as you wrote, it suggests that the average param-

eters can be applied to other inventories (or subsets of inventories). Thus, it would be very interesting to see these averaged parameters being applied to other inventories, across a variety of landscapes, climates and seismic characteristics. Also, it would be interesting to apply your rules to a highly seismic region in which no recent earthquake has occurred, and relate it to the current distribution of population and exposed goods (but I recognise the latter is out of the scope of this work, so it is just an idea).

Thanks again for your excellent contribution.

Gianvito Scaringi

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