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Comment on nhess-2022-57

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Referee comment on "What drives landslide risk? Disaggregating risk analyses, an example from the Franz Josef Glacier and Fox Glacier valleys, New Zealand" by Saskia de Vilder et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2022-57-RC2, 2022

This is a very useful and interesting paper, and I enjoyed reading it. My comments are mainly focused on the human dimension, specifically the tourism sector and the risk communication aspects.

L62 - Visitors are described as being able to 'easily access and experience a glacier environment '. For day visitors (unlike more dedicated trampers/mountaineers) I would suggest the access is no longer easy, and that visitors are entering what could almost be described as a post-glacial environment in the lower reaches of the valleys. In the 1990s and early 2000s it was possible for day visitors to walk to the terminus and do a Glacier Walk on a paid tour. This is no longer possible because of the extent of glacial retreat, meaning that visitors have to take a tour via helicopter to fly above the glacier and do a glacial landing in order to get a full glacier experience. Thus the risk to tourists is not just downstream of the terminus, but on the glacier itself during landings. Was this factored into your analysis? It would also be useful to cite some data on the approx. proportion of visitors (pre-Covid) doing glacier flights compared to walking up to the viewing areas in the valleys. DOC would hold this data as concession manager.

L71 - the sentence about the Alpine Fault as a major earthquake source needs a reference – the Howarth et al. 2021 Nature Geoscience paper is the best most recent.

Figure 1 – the text size on c) and d) is too small.

Line 140 – can you provide some background context of the nature of the workforce in the glacial valleys? What types of jobs do they do, and how frequently are they undertaking these jobs? (Noting that this analysis is reported elsewhere in Massey 2018). Are they working in a limited area, or do they range across the valleys, and roughly how much time are they exposed to risk per day?

Line 175 – before you talk about risk exposure of tourists, you need to provide visitor data for the valleys (DOC and Stats NZ are the best sources), and also provide some context on the past two years of low visitor international visitation due to the pandemic. The pandemic hit following several years of strong tourism growth in NZ. The glaciers, alongside Aoraki/Mt Cook and Piopiotahi/Milford Sound were experiencing a million visitors per annum, causing significant pressure on tourism infrastructure and other social/community pressures. Glacier Country / South Westland had a heavy reliance on international visitors pre-Covid and has been one of the hardest hit regions of NZ in terms of reduced visitation when the international borders closed. Unlike other parts of NZ that moved to a domestic market quite effectively, South Westland is less accessible and can't attract e.g. weekend visitors because of its remoteness. This sort of context has implications for exposure and vulnerability (i.e. internationals are less likely to speak English and thus may not understand risk communication information).

L225 – Southern Alps should be capitalised

Visitor exposure – walking speed isn't thoroughly explained and will be highly variable, e.g. family groups with young children are potentially more exposed due to frequent stopping, and slow pace.

Figure 5a – the entirely blue colour gradient makes it very difficult to discern specific risk zones. Also 5c has a colour legend which is hard to match to the chart. Likewise with 6c.

L420 – Fox River, capitalised

Use of the term societal risk – it is unclear. E.g Individual risk is clearly risk present to one person, but societal risk speaks to a much broader impact, while here you use it to describe risk to N or more people, i.e. mulitiple injuries or fatalities. Consider a different term.

Risk communication – Fig 10 is a useful way to attempt to convey comparative risks across commonly used activities. Effective communication of technical, complex risk scores with big numbers/exponents and uncertainties in order to support policy and practice is a huge challenge. While it is beyond the scope of this paper, the findings offer very interesting food for thought on how we can improve the translation of scenario-based risk data to maximise the societal benefits from a disaster risk reduction perspective. The use of qualitative measures/scales to translate risk into risk acceptability/tolerance data would be useful, but would require a detailed study of the local stakeholder and visitor perceptions of risk in order to generate appropriate risk tolerance outputs.

Thank you for a very good contribution.