

Comments of the editor

Dear Fausto Guzzetti,

Thank you for the submission of your very interesting manuscript “Invited perspectives: Landslide populations – can they be predicted?”.

As you know, two reviewers have provided good and interesting suggestions on how to improve your manuscript, which you have replied to. Both reviewers recommended minor revisions, and therefore I would like to invite you to submit a revised version of your manuscript.

In view of the suggestions from the reviewers and your response, I would like to stress the following: My main and first priority is to publish an as valuable and as interesting “invited perspectives” as possible. My minor concern is the length or number of words necessary to present the perspective. From my point of view, the manuscript should be concise and not unnecessary lengthy (from which it is far away), but in case one or two pages more are necessary to provide some more information and particularly ideas for perspective and the way forward, this is not a problem. I also think, that it is good to have a figure included, so I suggest not to delete it.

I would like to particularly support the suggestion of referee #1: “Since this is an invited perspective, I suggest to elaborate more about the next steps and the way forward, in respect to what is needed from science, what scientific suggestions do you have, what approaches should be followed, which studies should be undertaken.

I look forward to seeing the next version of your manuscript which I will not send out for further review, but rather, will make the decision myself, assuming no major items come up in the revised manuscript for which I need outside reviewers to aid me in my decision.

Best regards

Heidi Kreibich

NHESS executive editor

Response to the comments of the editor

Dear Heidi,

Thank you for your comments and valuable recommendations on the first submission of my article.

Based on your recommendations and those of the two reviewers, I have prepared a new version of the article, which I submit for possible publication in the special issue of NHESS you are preparing.

The new version of the article is longer than the previous version (1746 words, excluding title, author, affiliations, references, and figure caption). I have accepted your recommendation to add relevant information. Nevertheless, I have tried to keep the overall article short, in the spirit of the special issue.

Following your recommendation and a similar recommendation of the first reviewer, for each of the main sections of the text I have added language to explain more clearly – albeit always shortly – what are the main efforts that are needed, in my opinion, to improve the existing landslide prediction capabilities. I have also clarified the problems and inherent limitations of the various predictions (where, when, how many / how large, etc.). Throughout the article, most of the new text was added for this scope.

Following the recommendation of one of the referees, I have added an entire new paragraph discussing what are the efforts that I consider more (and less) urgent for improved landslide hazard and risk prediction. The new text, towards the end of the article, reads “[Of the various factors governing landslide hazard the most uncertain and the one requiring more urgent efforts is the time prediction \(when, how frequently\), followed by the prediction of the size and number of expected failures. For both, multi-temporal inventories and landslide catalogues are essential to build innovative predictive models. To construct the records, systematic efforts are needed for landslide detection and mapping \(Mondini et al., 2021\). For susceptibility \(where\), the challenge is to prepare reliable regional, continental, or global assessments \(Stanley and Kirschbaum, 2017; Broeckx et al., 2018; Wilde et al., 2018; Mirus et al., 2020\). Critical are also novel modelling frameworks combining the hazard factors \(Lombardo et al., 2020\). But the goal is to reduce risk \(Glade et al., 2005\). For that, vulnerability studies, improved early warning capabilities, quantification of the benefits of prevention, and better risk communication strategies are crucial \(Guzzetti, 2018\). Much work is needed on these largely unexplored subjects.](#)”

The section on the temporal prediction of landslides (*when or how frequently*) is now longer, and more detailed. I have added language to discuss the use of physically-based models, their limitations, and the enhancements needed. The new text reads “[The major limitation of physically-based models is the scarcity of relevant data, which are hard to obtain for very large areas. New approaches to obtain relevant, spatially-distributed data are needed, as well as novel models able to extrapolate what is learned in sample areas to vast territories \(Bellugi et al., 2011; Alvioli and Baum, 2016; Alvioli et al., 2018; Mirus et al., 2020\)](#)”.

In addition, the section now contains a description of the enhancements suggested to improve the definition of rainfall threshold models. The new text reads “[The community](#)

needs shared criteria and algorithms coded into open-source software for the objective definition of rainfall events, of the rainfall conditions that can result in landslides, of rainfall thresholds (Melillo et al., 2015, 2018), and for the validation of the threshold models (Piciullo et al., 2017). This will not only provide reliable and comparable thresholds, allowing for regional and global studies (Guzzetti et al., 2008; Segoni et al.; 2018), but also increase the credibility of early warning systems based on rainfall threshold models (Guzzetti et al., 2020)".

Following the recommendation of one of the referees, I have modified the last paragraph, to explain how the adoption of the "converge research" paradigm can help improving landslide hazards and risk modelling and prediction. The new text reads "The community of landslide scientists should embrace the paradigm of "converge research", exploiting the vast amount of data, measurements, and observations that are available and will be collected, expanding the making and use of predictions, assessing the economic and social costs of landslides, designing sustainable mitigation and adaptation strategies, and addressing the ethical issues posed by natural hazards, including landslides (Bohle, 2019). I am persuaded that this will contribute to advancing knowledge and building a safer society (Guzzetti, 2018)".

Following your recommendation, I have left the Figure (Figure 1) and its captions. The Figure is now cited earlier on in the text.

Where I explain how the landslide spatial prediction ("where") is made, and how it can be improved, I have reversed the logic of the text, discussing first landslide detection and mapping, and then landslide susceptibility modelling. To abide to the request of one of the reviewers, I have added language to explain the types of remote sensing images used for landslide detection and mapping (e.g., optical, SAR, LiDAR).

Since there is no limit to the number of references, I have added quite a few of them, 27 in total. This has increased the length of the main text, due to the citations. Regarding the list of references, I have checked the style and made a number of changes and adjustments to be compliant with the journal formatting rules.

Ultimately, to reduce the sections of text identified in the "similarity report", I have checked the text, and I have changed / rephrased it, wherever this was possible.

Most of the changes and additions made to the text are outlined in red in the file: Text-r2v02-20210406-changes.docx.

I hope that in the present, revised form the manuscript is acceptable for publication in the special issue of NHESS.

I look forward to hearing your editorial decision.

Kind regards,

Fausto Guzzetti