Natural Hazards and Earth System Sciences Discussions

Nat. Hazards Earth Syst. Sci. Discuss., author comment AC3
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Reply on RC1

Katrin M. Nissen et al.

Author comment on "Quantification of meteorological conditions for rockfall triggers in Germany" by Katrin M. Nissen et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2021-243-AC3, 2021

Addition to AC1
This addition addresses the remaining points we haven't covered in our first reply to RC1

General:

While presenting the results of both the selection of predictors procedure and the logistic regression model, often some aspects are not shown. Since the manuscript is very concise and there isn't an excessive number of figures, I suggest to show some additional detail.
In order to keep the paper short and concise we would like to refrain from adding additional figures. All figures needed to understand the methodology are already included. Rather than expanding the main paper we will add a supplement showing additional material e.g. the result of the sensitivity analysis performed for the WOE analysis and the effect of different predictor combinations in the logistic regression model on the prediction of the rockfall probability.

Comments related to specific contents:
1. Please see AC1.
2. L18-20: The seasonal cycle does indeed show a peak in winter and spring.
3. L27-28: We will extend the introduction and add more references.
4. Please see AC1.
5. L36: Both reviewers pointed out a number of expressions that need to be defined more detailed (porosity, pore-water, promote, soil moisture). We will address this by defining the terms and homogenizing their usage in the revised version of the manuscript.
6. L40-44: Earthquakes are indeed not relevant for our study region.
7. L52: We will extend the introduction adding additional information.
8. Please see AC1.
9. L94-96: We will restructure the manuscript adapting a more classical outline (introduction, data, methods, results, discussion and conclusions).
10. L112-119: We will extend our description of the soil moisture model.
11. L120: We will replace the term "operationally available" by "stored".
12. L133-134: For D accumulation periods between 14 and 6 days were tested in terms of their ability to improve the logarithmic skill score of the logistic regression model. The skill increased with decreasing duration and reached its peak at 7 days.
13. Please see AC1.
14. Please see AC1.
15. L149-164: We will restructure the manuscript adapting a more classical outline

(introduction, data, methods, results, discussion and conclusions). We will also add a supplement showing additional figures.
16. Please see AC1.
17. L209: Using the clusters as an additional predictor has the effect of fitting 4 different models, one for each cluster. We will rephrase L227 where this is explained.
18. L212-213: The best result in terms of the logarithmic skill score is achieved by using all possible combinations. The relationship between D and precipitation is linear if only the sum is used. A linear relationship does not reflect the fact that precipitation becomes more efficient if D is high. The product reflects this fact but seems to overestimate the probabilities for high precipitation or D percentiles. Including the sum in addition to the product has a dampening effect on the high probabilities. We will extend the discussion and include this information. A figure will be added as supplementary material.
19. L218-219: We will add a methods section and move the introduction of the AIC.
20. Please see our reply to 18.
21. L227-228: Models 9, 10 and 12 don't improve the logarithmic skill score.
22. L242: This is not shown. We can add a figure to the supplementary material. We think that adding figures for all the sensitivity studies we performed to the paper makes it more difficult to follow the main story.
23. L258-259: We will add extra information in the revised version of the paper on the number/percentage of events that occurred under different meteorological and hydrological conditions.
24. L262-263: See answer to 24.
25. L267-298: We agree that an additional paragraph comparing the results with previous literature on the topic is needed.
26. L275: Both reviewers suggest to be more restrictive when naming the region in which the statistical model can be applied. The intention was to express that the applicability of the model does not stop at the state borders. We will change the title of the manuscript and discuss in more detail the possibility to apply the model in other Central European low mountain regions with similar climatological, hydrological, geological and topographical characteristics.
27. Please see AC1.
28. L312: We will rephrase this sentence.