

Nat. Hazards Earth Syst. Sci. Discuss., author comment AC1  
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## Reply on RC1

Katrin M. Nissen et al.

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Author comment on "Quantification of meteorological conditions for rockfall triggers in Germany" by Katrin M. Nissen et al., Nat. Hazards Earth Syst. Sci. Discuss.,  
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Dear Reviewer,  
thank you very much for your kind and constructive comments.  
This reply is not a paper revision. Here, we would like to describe how we intend to  
address your main suggestions and to answer the most important questions.

### **Operative perspective:**

The advantage of the logistic regression model is that it can be used to determine/predict the probability for a rockfall event if the local meteorological and hydrological conditions are known/forecasted. (This procedure was used in order to construct Figure 4). Which probability is regarded as a low, medium or high risk can be defined by the operator using the model. With a predefined matrix this flexibility would be lost.

However, we would like to note that an operational warning system only based on the meteorological and hydrological conditions is not practical in our study region. This becomes clear when looking at Figs. 4a and 4c. The probability for a rockfall event is climatological (i.e. number of events divided by length of the time series) if subsurface water (D) and daily precipitation are of median values. The rockfall probability becomes above average if D and/or precipitation are further increased. Thus, a mid-hazard warning would have to be issued in almost 50 percent of all days. As the climatological probability in our study region is so low, on most of these days this would be a false alarm.

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 to address your points #23 and #24.

### **Structure:**

We were hoping that deviating from the classic structure (with a separate methods section) and including the description of the methods in the sections they are actually used in, would help the flow of the paper. Our approach has the advantage that we can explain the method using the actual application as an example. We will rethink this decision. Hopefully, our second reviewer will also comment on that issue.

### **Terminology**

We will check and clarify our use of the terms dealing with subsurface water and porosity.

### **Discussion:**

We agree that an additional paragraph comparing the results with previous literature on the topic is needed.

**Answer to specific questions:**

1. The performance of D refers to its ability to improve the statistical model.

4. Yes, "promote" is used to say that the weathering mechanisms are preparatory-predisposing factors.

8. For most events the exact date is known. These are the events that were used in the analysis. The hour is not needed as we evaluated the daily maximum of hourly precipitation.

13. When the model is applied to climate simulations a terrain filter will indeed be necessary.

14. The number of bins was set to 6. The restriction that each bin has to contain the same number of events, determines the range included in a bin.

16. The sentence refers to the spatial resolution.

18. (and 20) This might become clear if you look at Fig. 4. Without the interaction term the relationship shown in Fig. 4a would be the same as in 4b and that in 4c would be the same as in 4d. The approach is able to reflect that precipitation is more effective if the preconditions in terms of sub-surface water are favourable