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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Communicating public avalanche warnings – what works?" *by* Rune V. Engeset et al.

Anonymous Referee #1

Received and published: 8 July 2018

I have reviewed the manuscript "Communicating public avalanche warnings – what works?" and offer the following comments:

The subject matter of this manuscript important and offers a solid contribution to the avalanche literature as many public avalanche warnings have not been tested. The topic is appropriate for publication in NHESS.

Overall I found the writing quality to be good, but at times wordy and difficult to interpret what the author was trying to say. I found I had to re-read significant portions of the manuscript, and in some cases I remain uncertain if I understand what the authors are getting at.

I have two overriding concerns with the paper, which might be attributed to my inability

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to understand the writing (rather than the method), but I believe the paper needs more clarity on the following:

1. The use of the Expert Survey. It is described that the survey was given first to a group of experts in order to derive a template of "correct" answers. Further on it is described that the experts answers were used to establish a "communications effectiveness score". I remain unable to understand how the opinion of the experts should be/was used as the correct answers with which to compare recreational or novice users? A more thorough explanation of the relationship between the two survey groups, and why the expert's answers are suitable for being an answer template is necessary.

2. Comprehension testing. The testing method for comprehension does not seem very robust. Comprehension of an avalanche warning should be demonstrated by specific actions on the ground, in the terrain. People need to be able to say "where" the avalanche warning applies, and where it doesn't in order to demonstrate comprehension and this requires being specific. They need to be able to make choices about which trips/slopes they will do, and which trips/slopes they will avoid. The 9 questions posed (table 3) do not seem specific enough to infer comprehension of an avalanche warning. My impression is that the questions asked are not sufficient for making any conclusive statements about people's comprehension of an avalanche warning.

Following are additional comments:

1. P1 Line 20 – what is indented comprehension? 2. P2 Line 27 – cite a reference for the 100 km2 statement 3. P2 Line 28 – Jamieson et al 2008 is not listed in the references 4. P3 Line 7 – add "locations" as part of recently observed avalanches in the region 5. P4 line 10 – I question calling avalanches a "low probability phenomena". Particularly in relation to other natural hazards, avalanches have an annual return period and many locations release multiple times per winter. I do not consider this low probability. 6. Figures 1, 2 & 3 – these figures are mostly unreadable. I recommend

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making higher quality figures where the subject of the figures can actually be read. Currently only the general layout of the web screen is available from these figures. No detail can be read, yet this detail is essential to see the product that is being tested. 7. P4 Line 30 – typo halter? Should this say “halt” 8. Figure 2 – consider breaking this into 3 figures so that it can be read. 9. P8 Line 12 – I do not think RegObs is the only open-access online real-time distribution system for avalanche forecasting (see MIN, Avanet). 10. P11 Line 9 – Section D in Table 1. Typo? No section D in table 1. 11. Figure 3 – same as comment on Figure 2 – currently the details of this figure are not readable, and they need to be since they are the basis for the testing. Break into several figures. 12. Table 3 – I cannot find an explanation of the “4-scenario response”. This needs to be clear as its not clear from just the table alone. 13. P12/13 – the description of how the communication effectiveness score was obtained is not clear. Despite reading several times, I remain unsure if I understand this. Ensure this method is explained well. 14. P26 Lines 22/26 – We need to teach (1) is a poor header that does not communicate.

In Summary

- The manuscript is good and I recommend it be published after minor revisions are completed - Needs better figures. Current figures 1,2 3 are poor and unreadable - Overall the writing could be streamlined to improve comprehension. - Better explanation of how the expert survey was used as an answer template plus a defence of why the experts are the ones to measure against. - Comprehension testing methods seem questionable – need a better explanation

And finally – the concept of avalanche terrain is lacking throughout this manuscript which is understandable because the goal was to test the NAWS product. However, interpreting an avalanche warning and putting it on the ground in avalanche terrain is fundamental to comprehension of an avalanche warning and the lack of discussion regarding avalanche terrain stood out for me as I read this paper. For example, the genesis of avalanche problems was because different problems manifest in different

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places in the terrain. True comprehension of an avalanche problem would be understanding where the problem does and does not exist. I was always wondering, where is the terrain part? This paper does not demonstrate the ability of anyone to read an avalanche warning and then put their understanding to work in the field.

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