

Interactive comment on “Probabilistic landslide ensemble prediction systems: Lessons to be learned from hydrology” by Ekrem Canli et al.

Anonymous Referee #3

Received and published: 17 January 2018

GENERAL COMMENT

The article “Probabilistic landslide ensemble prediction systems: Lessons to be learned from hydrology” presents an analysis of ensemble prediction systems in order to apply them in the probabilistic prediction of landslide occurrence.

The paper is very long, especially in the introduction. However, it is well written, in a good English language. It follows somehow the IMRaD structure, even with some drawbacks, that should be improved. The subject is within the topic of special issue of NHESS journal.

In my opinion, the manuscript needs major revisions before being accepted for publication.

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Mainly, the theoretical background described in the introduction is extremely long! I suggest a strong revision of this part aimed at shortening it. The same is for the conclusions section, which can be shortened. There are some parts of the introduction that should be moved in the discussion.

On the other hand, the description of the method used for validating the background is quite fast, as for the results and discussion. Moreover, it seems that the Authors applied a method different from that extensively presented and discussed in the introduction. All these issues should be addressed in the revised version of the paper.

SPECIFIC COMMENTS

At page 1, lines 28-30, Authors state: “In this paper, we use prediction systems synonymously with early warning systems for terminological consistency within the landslide community although we acknowledge that early warning should also cover dissemination and response strategies”. I strongly disagree with this terminological association. As acknowledged, an early warning system includes a prediction system and many other components. Thus, if the “landslide community” has used the two terms as synonyms since now, this paper could be a milestone in proposing a separation between them. I suggest to distinct the two items.

Page 3, lines 23-24: Also, Intrieri et al. (2013) have presented a complete scheme for landslide early warning systems.

Page 4, lines 13-14: Please give some examples of prototypal landslide early warning systems.

Page 7, lines 1-3: I think that the time between triggering/propagation and collapse stages varies also according to the landslide types.

Section 7.2.1 is a description of a model, thus it should not be in the “Case study” section.

Page 11, lines 18-19: Recently, Tran et al. (2017) proposed an application of TRIGRS

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with a 3D model to analyze 3D slope stability.

At page 12, line 7, Authors state that they computed 25 model runs. At page 13, line 20, they refer to 24 model iterations. Please explain.

Please check all the brackets in the text: somewhere, in particular in relation to references, there are many of them.

Please check the acronyms in the text. Use always acronyms after defining them.

FIGURES

Figure 1.

I suggest to add a map of the whole Austria with the indication of Lower Austria (for non-European readers).

I can't understand the meaning of the elevation classes. I suggest using a continuous scale.

Figure 3.

This figure is extremely hard to see and read. It's quite impossible to see the differences between the different maps. I suggest to split it in 2 or 3 figures or to leave in the text just 6 or 9 significant cases and to put the other maps in an ancillary file.

Figure 4.

There are incongruities in the legends of "probability of failure" and "building exposure". As an example, a pixel with probability of failure (or building exposure) equal to 0.25 is in the first or in the second class? The same for values equal to 0.50 and 0.75. Please correct them including or excluding the extremes in the classes as appropriate.

Why the forested areas are reported in the map?

Figure 5.

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As for the previous figure, I suggest to correct the incongruities in the legends and to explain why the forested areas are reported in the map.

I can't understand the symbols used for indicating landslide head scarps. If two dimensions are not needed, I suggest using a point layer.

TECHNICAL CORRECTIONS

Page 3, line 14: please delete "p. 1".

Page 3, line 16: please delete "p. 1".

Page 9, line 1: please correct "this event".

Page 10, line 16: please correct "km2".

Page 10, line 18: please change "," into ";" in the references.

Page 13, line 10: insert "of" in "representation surface topography".

Page 16, line 30: Replace "a couple" with "some".

Page 18, line 7: correct "landslides types".

REFERENCES

Intrieri, E., Gigli, G., Casagli, N., and Nadim, F.: Brief communication "Landslide Early Warning System: toolbox and general concepts". *Nat. Hazards Earth Syst. Sci.* 13, 85–90, doi:10.5194/nhess-13-85-2013, 2013.

Tran, T.V., Alvioli, M., Lee, G., and An, H.U.: Three-dimensional, time-dependent modeling of rainfall-induced landslides over a digital landscape: a case study. *Landslides*, doi:10.1007/s10346-017-0931-7, 2017.

Interactive comment on *Nat. Hazards Earth Syst. Sci. Discuss.*, <https://doi.org/10.5194/nhess-2017-427>, 2017.

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