

# ***Interactive comment on “Regional landslide forecasting in Piemonte (Italy) and in Norway: experiences from 2013 late spring” by Davide Tiranti et al.***

**Anonymous Referee #3**

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The article describes two landslide warning systems adopted by two regional forecasting services located in Norway and Italy, respectively. The purpose of the work is sharing the experiences from the two different systems, which is an interesting and promising target. However, I have some concerns on the effective scientific contribution of the paper to the NHESS journal readers, at least in its actual form. My impression is that the presentation is not well oriented to a sound scientific analysis. Probably, the submission as a technical note, would be more appropriate.

Please, read in the following my main concerns.

1. The analyzed study cases are interesting. In section 6 the observed events are de-

scribe, as well as the occurred landslides. I wonder why a validation is not presented. I suggest to add an objective evaluation of the system results by using objective metrics, such as AUC, ROC, etc.

2. The two case studies share the same triggering meteorological event. However, the geology and the susceptibility to landslide may be different. I would describe the effects of the same event by emphasizing the similarity and/or the differences of the effects on the two areas and of the two warning systems. Are the types of landslide the same (which actually depend more on the type of soil and slope)? Which are the main differences in terms of areas prone to landslides??This would add more value to the choice of describing these two case studies together.

3. With regard to the Piemonte's landslide forecasting service, 3 different systems are described; however, it is not clear how and if the three systems interact and how the overall service operate. Does the use of one or other model depend on a pre-susceptibility analysis or are they applied to the entire area anyway?

4. Literature review lacks of some contributions in the specific field of early warning system for landslide. I suggest to add some contributions at p2L11. (i.e. Baum and Godt, 2010; Liao et al., 2010; Segoni et al., 2015; Pumo et al., 2016).

Baum R.L. and J W. Godt (2010). Early warning of rainfall-induced shallow landslides and debris flows in the USA. *Landslides*, 7:259–272 DOI 10.1007/s10346-009-0177-0

S. Segoni, A. Battistini, G. Rossi, A. Rosi, D. Lagomarsino, F. Catani, S. Moretti, and N. Casagli (2015) Technical Note: An operational landslide early warning system at regional scale based on space–time-variable rainfall thresholds. *Nat. Hazards Earth Syst. Sci.*, 15, 853-861

Z. Liao, Y. Hong, J. Wang, H. Fukuoka, K. Sassa, D. Karnawati, and F. Fathani. 2010. Prototyping an experimental early warning system for rainfall-induced landslides in indonesia using satellite remote sensing and geospatial datasets, *Landslides*.

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Please, read in the following my minor comments.

1. P3L2: revise verb of the sentence.
2. P3L17: you could include also April.
3. P5: description of geology is very technical. To facilitate the not geological reader, authors could emphasize the relation of the types of geology domains with the rainfall-triggered landslide (as done in the Norway case). E.g. which are the domains most susceptible to rainfall-triggered landslides?
4. Fig.2a: a map of DEM with hillshade would be more useful and direct. Please improve the quality of the figure and locate Italy in Europe.
5. Fig.2b: to not geological readers, the map of the geological domains does not give information about the propensity to landslides. Actually, it would be preferable to show the slope distribution, which have a clear correlation with landslide, or maybe simplifying the map. Please improve the quality of the figure.
6. Fig. 4: . Please improve the quality of the figure and locate Norway in Europe. Again, DEM and slope distribution would be more helpful than fig.4a.
7. P9L20: remove 'slope phenomena'; it is specified later.
8. P13L3-8: initial conditions are mentioned: please specify at the beginning the selected period for the analysis otherwise it is not clear to what the initial conditions refer to. Description is a bit generic (e.g. "temperature lower than the normal", p13L3). Do you have statistics? Could you quantify?
9. P13L6: is this an annual maximum? Same for p13L10 ("the winter was cold"), too generic.

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## Interactive comment

5. P14, Section 5.2: authors state that the analyzed event had significant impacts in southern Italy. This is in contrast with the choice of Piemonte (northern Italy) as study case! I suggest to modify the sentence.

10. P14L8: In the abstract the period April 27 – May 19 is mentioned. Please, be clear with the selected period.

11. P15L5: Please, specify the duration of recorded rainfall.

12. Is fig.8 important? How about reporting the maxima precipitation daily intensity or the total precipitation?

13. Fig.9: you could add the historical hyetograph measured in one station (e.g. in Turin).

14. Fig.11: please improve quality of figures. Please note that the colors in the map (e.g., light green) do not correspond with those in the legend (e.g. yellow or orange). Is there any transparency effect? Please, solve it, for example, by removing background colors.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2017-411>, 2017.

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