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Interactive comment on “Analysing the relationship between rainfalls and landslides to define a mosaic of triggering thresholds for regional scale warning systems” by S. Segoni et al.

Anonymous Referee #1

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This manuscript presents an approach to develop rainfall thresholds for a regional scale landslide warning system. The manuscript builds upon a previously published work on the same topic. Overall, the manuscript is interesting and potentially publishable. I have some comments for the authors that would improve the manuscript:

1- Please explicitly discuss how this particular work goes beyond Segoni et al., 2014,

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2-Related to the above comment, Abstract does not highlight the novelty of the work. Revise the abstract and mention how the work advances the state-of-the-art in the field.

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3-I suggest presenting the results in a probabilistic form. For example, instead of (or in addition to) showing values of the contingency table, include the probability of detection, false alarm ratio, etc.

4- The presented thresholds for the selected regions vary substantially (by a factor of 10). It would be good to explain this issue by providing more physically based discussions. Is this because of the topography of the region? Soil characteristics?

4-It is hard to put the results presented in Table 2 in perspective. I suggest presenting the results either in terms of ratio to the total (observations/simulations as appropriate) or percent of the total.

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6-P 2191: One of the steps of the methodology includes a-posteriori selection of the most appropriate rain gauge for the characterization of each landslide event, within all the rain gauges of the same Alert Zones. Explain a-posteriori selection procedure to make the manuscript stand-alone.

7-P 2193: What does “a significant number of landslides” mean here?

8- The literature review focuses on a small set of relevant prior work. However, there are many other types of statistical landslide models that rely on rainfall exceedance though their approaches may be different. The literature review should cover most relevant statistical landslide models (e.g., Larsen and Simon, 1993; Farahmand and AghaKouchak, 2013; Hong et al., 2006, Hong et al., 2007; Bovolo and Bathurst, 2012).

References

Bovolo, C. I., and Bathurst, J. C. (2012). Modelling catchment-scale shallow landslide occurrence and sediment yield as a function of rainfall return period. *Hydrological Processes*, 26(4), 579-596.

Farahmand A., AghaKouchak A., 2013, A Satellite-Based Global Landslide Model, *Natural Hazards and Earth System Sciences*, 13, 1259-1267.

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Hong, Y., Adler, R., and Huffman, G.: Satellite remote sensing for global landslide monitoring, *Eos*, 88, 357–358, 2007a.

Hong, Y., Adler, R., and Huffman, G. (2006). Evaluation of the potential of NASA multi-satellite precipitation analysis in global landslide hazard assessment. *Geophysical Research Letters*, 33(22).

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Segoni, S., Rossi, G., Rosi, A., and Catani, F. (2014). Landslides triggered by rainfall: A semi-automated procedure to define consistent intensity–duration thresholds. *Computers and Geosciences*, 63, 123–131.

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