

Interactive comment on “Rainfall thresholds for shallow landslides occurrence in Calabria, southern Italy” by C. Vennari et al.

Anonymous Referee #1

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Evaluation

The main objective of this work is to define empirical rainfall thresholds for shallow landslide occurrence in Calabria. The authors use the statistical frequentist approach developed by Brunetti et al. (2010) and Perucacci et al. (2012) to identify the precipitation thresholds and their uncertainties. This is carried out both at the regional scale and for different regional subdivisions based on lithology, soil types, rainfall and seasonal characteristics. The novelty of the work is represented by the use of the statistical frequentist method to investigate the statistical significance of the differences among the precipitation thresholds identified for the various regional subdivisions. The topic is clearly of interest to geologists and hydrologists involved in landslide risk management, and it is very well suited for publication in NHESS. The paper is also well-written,

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painstakingly methodical with very little editorial or reading hurdles. I must commend the authors for having spent some time on the readability as that really makes review easier. I have a number of comments which should be addressed for the paper to be acceptable for publication.

Specific comments

1. Use of units. A number of Equations for Intensity-Duration (ID) and Event-Duration (ED) thresholds are reported and discussed in the “Background” Section. These equations requires the specification of the units which are used in the writing (typically, these are mm, hours and mm/hours). The identification of the units is reported at P5149 L5, but this arrives too late in the ms for a correct understanding of the equations reported in the “Background” Section.
2. P5147 L14-18. “Individual landslides were mapped as points, and were given a level of geographic accuracy, in three classes: high ($P1 < 1 \text{ km}^2$), medium ($1 \leq P10 < 10 \text{ km}^2$), or low ($10 \leq P100 < 100 \text{ km}^2$) (Peruccacci et al., 2012)”. Please report how the surface measures provide a metric for the geographic accuracy. Moreover, please provide the relative frequency of landslides in each spatial and temporal accuracy class. This provides a measure for the accuracy of the gathered landslide data.
3. P5150 L1: Please provide a comment on the distribution of the landslide-triggering precipitation depths, in terms of recurrence intervals.
4. P5152 L23: “The trend for each lithological domain has to be confirmed by collecting a larger number of events.” Please better specify what the authors mean for “trend”.
5. P5158 L16-17. “We conclude that the established ED thresholds (..) are slightly lower than expected”. The meaning of this sentence (which is also reported in the Conclusions) is not completely clear to this reviewer. It seems that the sampling problem associated to the use of the 186 events (statistical granularity) imposes limits to the specification of the ED thresholds. Hence, the text reported to describe the problem

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should make clear that this is essentially a sampling problem. The asymmetry of the empirical distribution may also play a role, since it exacerbates the sampling problem.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 5141, 2013.

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