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Comment on nhess-2021-111

Lorenzo Marchi (Referee)

Referee comment on "A data-driven evaluation of post-fire landslide susceptibility" by Elsa S. Culler et al., Nat. Hazards Earth Syst. Sci. Discuss.,
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This work explores the relationships between wildfires and landslide susceptibility in various regions of the world. The results outline the complexity of these relationships and have permitted to derive some conclusions on the smaller amounts of precipitation needed for landslide triggering in burned areas and on the seasonal shift in landslides occurrence. I am reporting below some suggestions for paper revision.

How were the study regions selected? Since the availability of data on both vegetation fires and landslides is fundamental in the choice of the study areas, one could ask why other regions where such data are available, for instance, Europe and Australia, were not considered.

Although this paper deals with rainfall-triggered landslides, other factors that influence the occurrence of landslides - e.g. earthquakes - could be mentioned, even if only to clarify that these factors are not relevant in the study regions and the considered years.

Although it focuses on a specific issue and a particular type of mass movement, the work by Riley et al. (2013) on the frequency-magnitude relationships of debris flows could be mentioned in the introduction and/or in the discussion as it compares fire-related and non-fire related debris flows at the global scale. *Riley KL, Bendick R, Hyde KD, Gabet EJ. 2013. Frequency-magnitude distribution of debris flows compiled from global data, and comparison with post-fire debris flows in the western US. Geomorphology, 191: 18–128. <https://doi.org/10.1016/j.geomorph.2013.03.008>.*

While it is important to acknowledge the problems in the quality of data, the possible occurrence of "many false positive burned landslides" mentioned in the discussion (page

20, lines 414-416) could partly undermine the results of this study. Saying that a validation of which landslides were truly post-wildfire is outside the scope of the study is a rather weak way to cope with this issue. The authors could try to better clarify which datasets are affected by these problems and delimit the extent and severity of these errors.

Caption of Fig.3: it could be specified that the grey belt corresponds to the day of landslide occurrence.

The caption of Fig. 4 is very long and not easy to follow: I wish to suggest moving part of it to the text of the manuscript.