

Interactive comment on “Seismic and geologic controls on spatial clustering of landslides in three large earthquakes” by C. Rault et al.

Anonymous Referee #2

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In this paper, Rault and coauthors present a new statistical analysis of landslide position on hillslopes in four case studies: three coseismic and one rainfall-induced landslide event. From this analysis, the authors conclude that coseismic landslides do exhibit patterns grossly consistent with crest clustering, but that the distributions are best explained by a combination of both local geologic and seismic parameters. They further conclude that the typhoon example, Marakot in Taiwan, confirms that storm-induced landslides exhibit toe clustering.

The results are certainly interesting and worthy of publication. It's good to read a paper diving deeper into spatial patterns in landslides, especially using well inventoried case studies. I do, however, share many of the same concerns as Reviewer 1. Chief among these are the lack of explanation of the statistical methods employed in the analysis. I

C1

was unable to fully understand the methodology after reading through either the main text or the supplemental material. In revision, I suggest adding more information to the main text, as well as expanding/editing the supplement, to make it accessible to an audience unfamiliar with the particular statistical methods used in this paper.

The second main issue that I have relates to conclusions from the typhoon dataset. It's hard to justify making sweeping, general claims from the study of one storm-induced landslide event. I think the result of toe clustering, in this particular case study, is compelling and that the spatial distribution should certainly be discussed. I would, in doing so, resist the urge to extrapolate the results to all storm-induced landslides. For comparison, consider the variability discovered among the three coseismic study sites. This larger dataset allows the authors to go into detail about the different geologic and seismic circumstances that aligned to drive those spatial patterns. Now imagine if the authors had studied just one of those examples and then generalized the result. It would be an inaccurate representation of the variety in distribution that they actually found when comparing multiple sites. So, in the case of the storm-induced landslides, I feel one is too small of a sample set to draw meaningful conclusions universal to rain-induced slides.

In addition to these main points, I also add the following comments/edits:

Line 41 – “1,2 to 2.5” the use of commas versus periods is inconsistent throughout the manuscript

Line 75 – Xu et al., 2014b is not in the references, this should probably be Xu et al., 2014

Line 78 – typo with a period before 31.9.

Line 143 – the word confirm feels too strong here (see main comment number 2 above)

Line 156 – I don't follow what is meant by this statement. Do the combined three case study site really show this, I thought you just described many differences between the

C2

sites. Also, should be show not shows.

Line 163 – 174 – I suggest moving this section about scars vs. deposits to the supplemental material. It feels out of place and unnecessary at this position in the main text. Line 265 – So does this mean that the toe clustering in this case is a coincidence based on the position of weak rocks and/or faults? In other words, if weak busted up rocks or faults crossed through the middle of hillslopes (rather than toes) would you see more slides concentrated there or is there something particular about the toes?

Line 274 – typo – is should be in

Line 278 – what is meant by “may be revealed”, is this meant to be a future study?

Line 457 – Xu reference should start on the next line

Figure 2 caption – “the black curve” should be the black line

Figure 5 caption – Is a word missing after Sichuan? the Sichuan what? Line 493 – I do not understand this sentence.

Figure 8 – where are the snapshot locations on this map? Am I missing a small box showing location(s)??

Supplementary Materials: Text has many typos, misspellings.

Interactive comment on Earth Surf. Dynam. Discuss., <https://doi.org/10.5194/esurf-2018-82>, 2018.