



New Insights on co-seismic landslide clustering

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Earthquake-triggered landslides tend to cluster along topographic crests while rainfall-induced landslides should occur downslope preferentially, where pore pressure induced by groundwater flows is the highest [1]. Past studies on landslide clustering are all based on the analysis of complete dataset or subdataset of landslides associated with a given event (seismic or climatic) as a whole. In this work, we document the spatial and temporal variations of the landslide position (on hillslopes) within the epicentral area of the 1994 Northridge, the 1999 Chichi, the 2004 Niigata, the 2008 Iwate and the 2008 Wenchuan earthquakes. We show that crest clustering is not systematic, non uniform in space and exhibit patterns that vary a lot from one case to another. These patterns are not easy to interpret as they don't seem to be controlled by a single governing parameter but result from a complex interaction between local (hillslope length and gradient, lithology) and seismic (distance to source, slope aspect, radiation pattern, coseismic uplift) parameters.

[1] Meunier, P., Hovius, N., & Haines, J. A. (2008). Topographic site effects and the location of earthquake induced landslides. *Earth and Planetary Science Letters*, 275(3), 221-232