

## **Is co-seismic landslide clustering due to topographic site effects?**

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We have documented the spatial and time variation of co-seismic landslides position along topographic hillslopes within six strong shallow earthquakes ( $M_w > 6$ ): the 1993 Finisterre, the 1994 Northridge, the 1999 Chichi, the 2004 Niigata, the 2008 Wenchuan, and the 2008 Iwate-Miyagi earthquakes. Landslides rate increases with the duration and level of ground motion. In a mountain area in most of the case the highest ground motion amplification occurs near or at the top of the crest due to the interaction of upcoming wave with topography. As a consequence, co-seismic landslides should tend to occur near or at the top of the ridge. The landslides were localized along slope using GIS mapping. We compare location of co-seismic landslides to the one of pre- and post-seismic landslides catalogues, when available. We show that a co-seismic signature of landslides position (i.e. crest clustering) is not systematically obvious, we identified crest clustering pattern in only three epicentral areas. Clustering patterns show no clear relation with lithology, topographic, or ground motion parameters. Hence earthquake-triggered landslides in some cases, may be the results of complex combination of predispose (lithology, slope, etc) and triggered (rainfall and earthquakes) parameters.