



What controls the size of earthquake-triggered landslides ?

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We documented the regional pattern of the landslides triggered by the 2004 Chūetsu earthquake ($M_w=6.9$, Japan). We use the relationship of Meunier et al (2007) describing the decay of the landslide density with distance to the seismic source to infer the best source location from the landslide pattern. The source we found is in good agreement with the patch of high slip inverted from seismic records. However, this inference to the best source is not valid when using a sub-dataset composed of the smallest landslides only. The critical size above which a correct source location appears (i.e. at the correct location) corresponds to:

1. The critical landslide size above which a trend (decay) appears in the plot of the size of individual landslide versus the distance to the source.
2. The maximum in the distribution of the landslides size (Pdf).

According to Stark and Guzzetti (2009), this maximum is also the critical size above which the landslides affect the bedrock. These results suggest that while the size of the bedrock landslides depends in the seismic energy released by the earthquake, the soil ruptures, though triggered by the wave, are controlled by the local properties of the substrate. This result also justifies the choice of a landslide density computed in cumulated area rather than in number for the description of the regional pattern of landsliding.

Regional patterns of earthquake-triggered landslides and their relation to ground motion, P. Meunier, N.Hovius, J. Haines, *Geophys. Res. Lett.*, 34, 2007.

Landslide rupture and the probability distribution of mobilized debris volumes, C.P., Stark, and F. Guzzetti, *J. Geophys. Res.*, 114, F00A02, 2009.