Hydrology and
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Discussions

Interactive comment on "Derivation and evaluation of landslide triggering thresholds by a Monte Carlo approach" *by* D. J. Peres and A. Cancelliere

Anonymous Referee #3

Received and published: 22 April 2014

The manuscript is well written and describes an interesting and innovative approach to obtaining landslide triggering thresholds. The paper would benefit by clarification of a few minor points:

p. 2765, line 14. Please explain why 24 hours was selected as the time interval between separate storms. Was it an arbitrary selection or is this interval related to observed rainfall patterns for the study area? Does it have any connection with soil drainage rates for the study area?

p. 2768, line 17, and elsewhere, change "indefinite slope model" to "infinite slope model"

p. 2769, line 23 to p. 2770, line 1, what is meant by "a lamination effect?"

p. 2771, section 3. Note that Staley et al. 2013 have recently published a similar approach, applying ROC analysis to instrumental data for deriving thresholds.

Staley, D.M., Kean, J.W., Cannon, S.H., Schmidt, K.M., Laber, J.L., (2013) Objective definition of rainfall intensity–duration thresholds for the initiation of post-fire debris flows in southern California. Landslides, 10(5):547-562.

p. 2776, lines 3 - 25. The finding described here seems consistent with intense, short-duration rainfall being mainly responsible for inducing shallow landslides. If I am interpreting Figure 6 correctly, periods of higher intensity rainfall, sometimes following hours of low-intensity rainfall was a major factor in landslide triggering during most of your observed events. If so, then perhaps high-intensity rainfall during storms should be the primary focus of efforts to improve early-warning thresholds for shallow land-slides.

p. 2778, line 18, change "as soon soil" to "as soon as soil"

Fig. 4. The flattening of the curve at long duration for the deterministic threshold shown in Fig. 4 results from competition between drainage and decreasing infiltration rates in the TRIGRS model for unsaturated infiltration. As the ratio of infiltration rate to Ks decreases, infiltration rate eventually becomes so small that pressure head cannot rise sufficiently to produce a factor of safety less than 1.

p. 2781, please add the following reference:

Baum, R. L., and J. W. Godt (2013), Correction to "Estimating the timing and location of shallow rainfall induced landslides using a model for transient, unsaturated infiltration", J. Geophys. Res. Earth Surf., 118, doi:10.1002/jgrf.20100.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 2759, 2014.