

## ***Interactive comment on “Field investigation of preferential fissure flow paths with hydrochemical analysis of small-scale sprinkling experiments” by D. M. Krzeminska et al.***

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1 General Comments This article describes a set of small scale (~1m<sup>2</sup>) sprinkling experiments designed to determine flowpaths in an active landslide. While the experiments are not especially novel, the location of the work (in an active slow moving landslide) increases the interest of the work. With some additional discussion on how this work can help understand hillslope hydrological and landslide developmental processes, I feel that this would be a valuable contribution. 2 Specific Comments 1) Broader impacts: This work, and the discussion therein, adequately describe the hydrological processes occurring at these sites. While I have concerns about the wa-

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ter application rate (is 40-60 mm/hr common in this area? Seems high!), the authors clearly demonstrate 3 different hydrological regimes. What is missing, is some discussion of what we learned from these observations: Possible questions: a. How are these three regimes related to interesting geographic features, such as topographic position, aspect, etc...? b. How are the observed regimes influenced by the landslide, vs. a more stable hillslope? c. How do the observed regimes influence the landslide development? d. Are these regimes widespread in this location, or are they localized? 2) Application rate: When applying artificial precipitation, it is often difficult to get the precipitation rates low enough to mimic natural events. In this work, the applied rate averaged 40-60 mm/hr, which seems high. I think some discussion is warranted about whether these precipitation rates are consistent for the area. If not, discussion of the implications of such high rates is needed. 3) Deep percolation: Deep percolation is brought up late in the paper (page 650), and does not appear to be included in the water balance calculation on page 642. I would include some mention of deep percolation (including your definition) when discussing the water balance. Deep percolation will have a significant impact, and cannot be ignored from a water balance perspective. More and more research has shown that systems previously thought to be underlain by “impermeable” bedrock are quite leaky (Graham et al., 2010, Tromp-van Meerveld et al., 2007, Aishlin and McNamara, 2011). It is unclear from your discussion and figures 4 and 6 how Deep Percolation is being dealt with.

3 Technical Corrections 1) Page 638, line 4: Replace “but at the same” with “while at the same” 2) Page 638, line 47: Replace “notion of mass” with “understanding of mass” 3) Page 640, line 3: Remove word “The” at beginning of paragraph. 4) Page 640, line 8: Replace “there is no plot” with “there are no plot” 5) Page 642, line 7: List make, model of pressure devices, with measurement uncertainty 6) Page 642, line 18, Remove second “for” – “water balance and tracer” 7) Page 643, line 1: Remove Moreover 8) Page 643, lines 6:9: I would combine sentences 9) Page 644, lines 5-14: This paragraphs uses “can” throughout. I believe that you mean “is”, as these methods are used in the paper 10) Page 645, line 5 and 8: I would identify A, B and C as plots,

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rather than experiments, as that is how they are referred throughout the manuscript

- 11) Page 645, line 47:end: Do you have depth to bedrock measurements? If so, it would be helpful to include in the soil descriptions.
- 12) Page 648, line 21: Plot C appears initially drier than B, rather than wetter.
- 13) Page 648, line 24: replace “about 75%” with 74% if that is the correct number
- 14) Page 649, line 7: “around constant” is an awkward phrase – replace with “relatively constant”?
- 15) Page 649, line 20: replace “form” with “from”
- 16) Page 649, line 21: replace “till” with “until”
- 17) Page 650, line 3: replace “short” with “shortly”
- 18) Page 651, line 2: replace “porosity with” with “porosity by”
- 19) Page 651, line 28: replace 0.5 with 50% for consistency
- 20) Page 652, line 25: “In the case of”
- 21) Page 653:655: I would consider replacing Concept 1-3 with Flow Regime 1-3, or something similar. You are really describing 3 hydrological systems, rather than 3 concepts
- 22) Page 653, line 15: move “also” in front of “highly permeable”
- 23) Page 653, line 24: replace “proofs” with “demonstrates”
- 24) Page 656, line 16: remove quotes around “plot C”
- 25) Figure 4: I do not know what the lowest slope parallel dashed line is. h<sub>0</sub>? Also, some people will just look at the figures, and not read the article. I would add substantial description of the figure here.
- 26) Figure 6: The “Rain” text boxes are not consistent. I would either put the precip rates in each one, or remove from Plot C.

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Interactive comment on Earth Surf. Dynam. Discuss., 1, 637, 2013.