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Hydrology and Earth System Sciences Discussions

Interactive comment on "The Hydropedograph Toolbox and its application" *by* C. B. Graham and H. S. Lin

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First of all, we thank the reviewers for their helpful comments. We appreciate the time the reviewers put in reading our manuscript, and the comments were valuable, refreshing, and thoughtful. We agree that the initially submitted manuscript was not yet quite suited for publication in HESS. Based on the feedbacks from the reviews, we decided to refocus the paper to present more substantive and interesting results coming out of the use of the toolbox that we developed. Thus, instead of responding to the review comments one-by-one, we thought that it would be easier and more fruitful to outline our revised manuscript, as follows:

1. As one of the reviewers indicated, considering the increasing number of soil water

monitoring sites in different parts of the world, there is very much a need of such a toolbox for the analysis of real time soil hydrology datasets. This general positive statement confirmed our initial intent to develop a toolbox as a community resource for this purpose. Hence, we hope this piece of work – once better done and presented – would be worth of publishing. Given the nature of this work at this stage, we feel that it would be more appropriate to make it a "technical note" instead of a full regular paper.

2. Within this technical note, our scientific focus will be reframed/refocused as "the impacts of soil types and landform units on the frequency of preferential flow occurrence" using the results from 35 monitoring sites distributed across the catchment (instead of 3 sites along a hillslope transect as initially presented). Our central scientific question is: Where in the catchment is more prone to preferential flow occurrence? To answer this question, we have used the toolbox to generate the results of preferential flow occurrence frequency from May 2011 to June 2012 using 10-minnute real-time monitoring data to investigate the differences in the frequency of preferential flow occurrence among 1) 5 soil series, 2) 5 landform units, and 3) south- vs. north-facing hillslopes.

3. From the results we obtained, some interesting conclusions can be made: 1) the Weikert soil series – the dominant soil type in the catchment (occupying 78% of total catchment area) – is most prone to preferential flow occurrence as compared to other 4 soil series mapped for the catchment; 2) planar hillslopes, especially north-facing planar hillslopes, are least likely to experience preferential flow, while the other landform units (swale, valley, hilltop, and convex hillslope) showed similar frequency distribution of preferential flow occurrence; 3) south-facing hillslopes are more prone to preferential flow than the north-facing hillslopes, and 4) while preferential flow occurred in at least one of the 35 sites during 94% of the 69 precipitation events over the monitored year, widespread simultaneous occurrence of preferential flow (either within the same soil type or landform unit, or throughout the entire catchment) was not common, reflecting the high degree of heterogeneity and a highly dynamic network of subsurface flow in

HESSD

9, C7195–C7197, 2013

the catchment.

We hope the revised manuscript, as outlined above, would be viewed as more suitable for publication in HESS. We would wait for the editor's decision to submit a fully-revised manuscript, as instructed in the email we received. Thanks for your further consideration of this manuscript.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 14231, 2012.