Author's response (AR) to reviewer #3:

We would like to thank the reviewer for his/her insightful comments.

General comments

RC: A "Technical Note" format might proof more useful.

AR: We consider this manuscript to go beyond what is usually reported in a technical note. It is not on a technical aspect of an existing method, but broader. We developed and tested the method for a case study area. We therefore believe that a regular paper would be more appropriate for this manuscript.

RC: The discussion section could strongly improve from discussing limitations of the proposed method more in detail. It could also address whether this method is transferable to other geological settings and catchment types.

AR: We will discuss the limitations of the method in more detail as well as the transferability to other (e.g. in non-karstic) regions and additional processes in the revised manuscript.

Specific Comments

RC: p1, l10: "spatial distribution" or "occurrence"

AR: It is the spatial distribution of the frequency of runoff occurrence. We will extend the sentence to read ".. to understand the spatial distribution of the frequency of surface runoff ..".

RC: p1, l17: please put "in the study area" at the end or beginning of this sentence.

AR: "in the study region" will be moved to end of sentence.

RC: P3, l15 How did you delineate the catchment extent? I assume that this is derived from GIS delineation based on the surface topography (not accounting for the subsurface catchment)?

AR: There are catchment boundaries available from previous studies estimated by geological and hydrological considerations including isotope data and tracer experiment data (see references). However, the mapped area is somewhat larger than the catchment area, and the plotted polygon follows the mapped area. We will make a note to this effect in the manuscript.

RC: P4, l16 How was the lookout point chosen? Were there logistical constrains?

AR: We will add a short description of how the lookout points were chosen in terms of line of sight, interesting landscape features and logistical constraints.

RC: P5, l1-5 Please rephrase here

AR: We will rephrase adding more detail for clarity.

RC: P5, l19 show

AR: OK

RC: P8, l11-12 rephrase

AR: We will rephrase adding more detail for clarity.

RC: P11, l8 runoff instead of runon

AR: We actually are meaning to say “runon” to refer to surface runoff that eventually infiltrates. The word “runon” is used in the karst literature and other hydrological literature (e.g., Calvo-Cases et al. 2003).

Figures

RC: Fig. 1 Please put the label “LKAS2” in the map and show the state Austria in a smaller map with the location of this study area.

AR: OK

RC: Fig. 2 Why does Zone no 7 not go further downslope into Zone no 1? As the visible bedrock outcrop emerges below Polygon.

AR: The slope is flatter, so that a thin soil layer has developed in Zone no. 7 resulting in denser vegetation. In No. 1 vegetation is negligible and so it is classified as bare rock. However, one cannot compare this kind of vegetation with the vegetation on e.g., areas with organic soils in no. 17. We will add a statement for clarification.

RC: Fig. 3 Please enlarge labels in the cross-section.

AR: Ok

RC: Fig6/7 Please use a) and b) labels for both subplots. Also use a colour for the Spitzboden catchment extent in the lower subplot.

AR: OK