

Interactive comment on “Runoff reaction from extreme rainfall events on natural hillslopes: A data set from 132 large scale sprinkling experiments in south-west Germany” by Fabian Ries et al.

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Dear reviewer,

Thank you for reviewing our manuscript and the valuable comments and recommendations to our manuscript. Please find your questions and comments marked as e.g. “R2.C1” followed by our reply marked as e.g. “R2.A1” including a description of changes in the manuscript.

Best regards Fabian Ries (on behalf of all co-authors)

C1

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R2.C1: The manuscript presents the experiments in a concise way. It would improve from more details on the test sites and from a more detailed description of the results. The manuscript lacks completely any interpretation and comparisons to similar experiments.

R2.A1: Following also comments of reviewer 1 we will add further data on vegetation height, slope aspect, soil organic matter, stone content and water storage capacity of each individual plot in the data file “1_site_data.txt”. Concerning the suggestion of the reviewer to add interpretation and comparison we would like to refer to the journals aims and scope that explicitly state that: “Any interpretation of data is outside the scope of regular articles”. Nevertheless, we are currently in the process of publishing results based on this data set in another journal which is currently under review.

R2.C2: The authors should mention that similar sprinkling experiments on the hillslope scale were already carried out by others. Please name some of the most important sprinkling experiment studies. How does your experimental set-up and your results compare to the findings of others?

R2.A2: In line with the reviewer’s comment we will mention sprinkling experiments from other studies and briefly compare their experimental setup to ours in the introduction section. The comparison of our results to other studies however is outside the scope of this journal (see response R2.A1).

R2.C3: It would be useful to have more information on the test sites, e.g. what was the soil depth above the soil-bedrock-interface? Was the bulk density and the density of macropores evaluated?

R2.A3: Thank you for this comment. As mentioned in the manuscript we collected data on bulk density, stone content and macropore density and will add respective data to the data file “1_site_data.txt”. We did not measure depth to the soil-bedrock interface. Nevertheless, we installed piezometers up to a depth of 90 cm at most locations without reaching the soil-bedrock interface. We will add a respective comment in the revised

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manuscript.

R2.C4: The manuscript would improve from a more detailed description of the results. In particular, a more detailed overview and a comparison of the results on the different test sites would be helpful.

R2.A4: A manuscript including a more detailed description of results, comparison and analysis is currently in the process of being published. Our intent of publishing our observations in a data paper is to encourage others to freely make use of the data set for their own research interests. Thus, we would like to refrain from a detailed intercomparing of individual experimental sites and analysis.

R2.C5: In addition some interpretation of the results would be very interesting. In the introduction section pluvial floods are mentioned as a motivation for the study. What is the interpretation of your results with regard to pluvial floods? The runoff coefficients show large differences at the different sites. How can this be explained? The runoff coefficients show partially extremely high values of 100% (and more?). How can this be explained?

R2.A5: Concerning an interpretation of the results we would like to refer to response R2.A2. For some experiments, runoff coefficients of individual measurement intervals exceeded 100% due to measurement errors in rainfall and runoff rates or spatial rainfall interpolation. However, experimental runoff coefficients were always below 100%. We will add a respective sentence to the manuscript to chapter “4.2 Runoff measurements”.

R2.C6: Equation 1 and axis labels of Figure 4 are not readable.

R2.A6: We will increase font size of Equation 1 and the axis labels of Figure 4 and add axis descriptions to Figure 4.

R2.C7: The data set is partially incomplete with regard to soil moisture data, precipitation input and information on site and experiment number.

R2.A7: The time series with the individual variables of each location in file “3_experi-

ment_time_series.txt” starts with the day of the first experiment. This structure enables a systematic reading of the respective data sets. The experiment number as well as calculated spatial rainfall values for the subplots are only given for the time period of the respective experiment plus 10 minutes to include the runoff recession into e.g. water balance calculations. Soil moisture and other variable values are recorded starting with the installation of the respective sensors. Time periods before installation are indicated by NA values. Only few sensors failed at recording values for short periods of time during some of the experiments which are likewise marked with NA. A description of the individual variables of each data file are provided in the file headers. This information is missing in the manuscript. We will add additional information on how to read the data in section “5 Data availability and structure”.

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