Interactive comment on "Vegetation, ground cover, soil, rainfall simulation, and overland flow experiments before and after tree removal in woodland-encroached sagebrush steppe: the hydrology component of the Sagebrush Steppe Treatment Evaluation Project (SageSTEP)" *by* C. Jason Williams et al.

Anonymous Referee #1

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Williams et al. provide an important and highly valuable contribution to plot-scale experiments on runoff and soil erosion in the semi-arid Great Basin, USA. Up to my best knowledge, this is the most extensive data set currently available. These data are important to parameterize commonly applied runoff and soil erosion models, such as RHEM. While I am convinced that this data set is highly relevant for a wide array of

scientific disciplines for model applications and hypothesis testing, there are several suggestions, I'd like to point out: - The main section on 'Study sites and Experimental design' is hard to follow. Maybe the authors could better link the descriptions to Table 2 provided in the manuscript.

- In the field methods section, the authors did explain how foliage is estimated. I was wondering if the foliage is as static as described here or if foliage does differ over the seasons? In that case, additional information on the season the experiment was conducted should be provided.

- The applied rainfall intensities are assumed to reflect the natural rainfall distributions. However, the data from rain gauges close to the experimental sites is not shown. I suggest to include such a graph. It is well established that rainfall simulations often exceed natural rainfall intensities, sometimes up to an order of magnitude. This conflict complicates the transfer from small-scale findings to natural systems, e.g. modeling studies often on a larger spatial scale. Regardless, the authors should better explain their choice of rainfall intensities. Sometimes higher-than-natural intensities are intentionally chosen to amplify hydrological responses on diverse environmental settings.

- The authors state that 'wet' simulations are conducted on plots where rainfall was applied for the previous dry runs. The time lag between both runs (dry vs. wet) is 30 min (lines 274-275). While I see the general and often unavoidable restrictions with such difficult and comprehensive experiments, I was wondering if this experimental design is really appropriate. Given the first dry run preceding the wet run, one could expect that all fine, and thus, mobile soil sediment has been evacuated during the dry run and, consequently, the wet runs may be more supply limited than the previous dry run. Did the authors account for such potential shift in the soil erosion regime? The authors could, for example, provide exemplary sediment hysteresis to test for this. I am convinced that such a graph would add a lot of relevant information.

- By inspecting the data sets available for downloading, I saw that many of the exper-

iments were restricted to 45 minutes (e.g. small_time_series-csv). May the authors explain such time restriction?

- Lastly, while I highly appreciate the efforts the authors put into the generation of this data set, I was wondering how these data relate to previous studies conducted in other study areas but the ones presented here. Do the authors see the chance to use and/or transfer their data set for studies outside the Great Basin area?

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