Authors´ responses to B. MacVicar (Referee #1)

We thank the reviewer, Bruce MacVicar, for his helpful commentary. We have responded to his comments in the attached supplement, and we have revised the manuscript accordingly.

Overall comments: This study is a detailed analysis of wood and morphologic response to a large flood in a Swiss River. Complemented by a rapid mobilization to obtain the appropriate data, the study does a good job of addressing the fundamental need for data to understand the dynamics and risks associated with wood in rivers. As noted by the authors, there are very few studies with which to compare as the data is typically not available after a big flood to generate a reasonable budget. For these reasons I think this is a valuable addition to the literature on wood in rivers and worthy of publication. I have a number of minor suggestions for grammar and points for clarification that should be easily addressed by the authors. I do have a few points that may warrant some consideration for framing the results and the discussion.

Authors' response: We are grateful for the constructive and detailed commentary provided by the reviewer. We have revised the manuscript to address the reviewer comments and responded to those comments below.

The first is that I don't think it is worth discussing insignificant trends. There is a lot of data here and I appreciate that it is difficult to tease out highly significant relations between the variables you use, but the fact is even the best model only explains less than half of the variability. There should be more discussion about what might be missing and why only a few things are significant rather than reaching for things that have been shown to not be important. Alternatively you could argue that the explanatory variables themselves are uncertain.

Authors' response: We agree with this comment. We tried to better discuss the uncertainties and to remove discussion about non-significant variables. Although in general terms we observed a large scatter in our data and that not all variables were significant, we did observe significant correlations, and some of the models explained up to 70% of the variability. We tried to better highlight the most meaningful results in the revised manuscript.

The confinement index, for example, relies on dem quality and the ability of the algorithm to accurately delineate the floodplain. If you think that there is a lot of error in that variable then maybe the error is partially obscuring the 'real' trend and it could be justified to look at trends that are close to significant.

Authors' response: The reviewer is right with this comment. There are of course uncertainties in the results given by the algorithm used to estimate the valley width. However, we do not think there is a lot of error in that variable. The DEM we used for the analysis is 2 m spatial resolution, which we believe is good enough to delineate the valley width. The quality of the results was checked by a visual evaluation, comparing the aerial images with the obtained valley delineation. We discuss this in the text.

The second point is that I think the study provides an opportunity to test some conceptual models such as that of Seo and Nakamura (2009) where they separate channels into different classes to explain differences in wood dynamics. It would be useful to understand whether this model holds for an individual flood and whether the morphologic variables used could be used to divide the channels into two or three classes rather than the rather arbitrary division used in the study of the Emme and everything else. Alternatively, the decision to group the channels as you did could be supported by using the conceptual model to justify the choice.

Authors' response: We thank the reviewer for this comment, and we appreciate the suggestion of bringing up new avenues of thought for considering our results. We considered Seo and Nakamura´s conceptual model, but we unfortunately could not apply this model to our data. They observed that LW dynamics (in terms of LW recruitment, transport, storage, and fragmentation and decay) varied along the gradient of watershed size. They classified their data in three size groups, small (<20km^2), medium (20-100km^2) and large (>100km^2) watersheds. A similar classification cannot be done with our dataset, as the largest watershed has an area of less than 100 km^2 (96km^2). Still, we grouped our dataset in the two smaller classes, small and medium watersheds, but we could not find significant differences in the variables analysed by Seo and Nakamura. The following figure shows our dataset grouped by the watershed size:

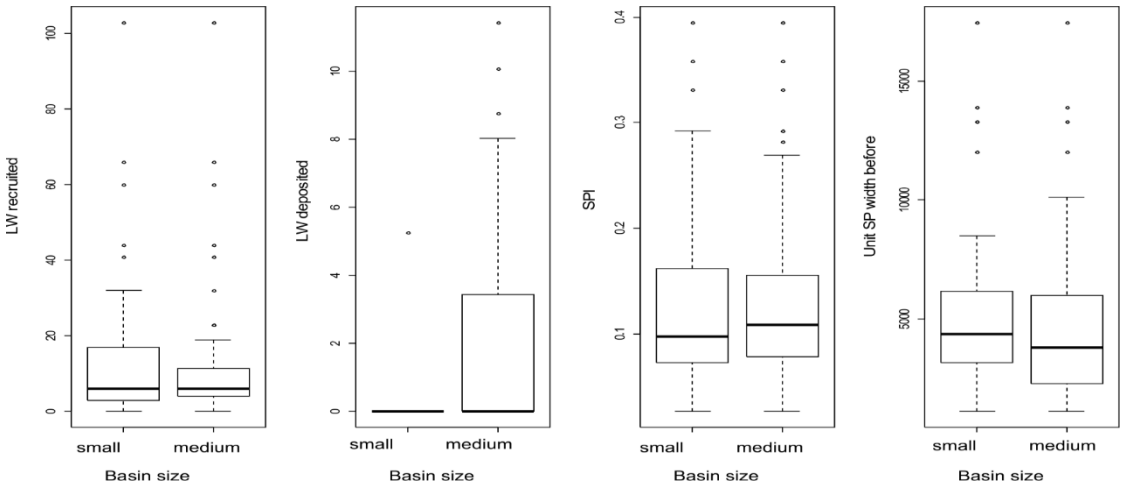

Figure: Boxplots of LW recruited (m^3/ha) and deposited volume (m^3/ha), stream power index and unit stream power calculated with the estimated discharge and the initial channel width for small and medium watersheds following the classification by Seo and Nakamura (2009).

We observed slightly similar trends to the trends in Seo and Nakamura in our data, regarding LW recruitment, which was much higher in the small watersheds (Emme tributaries) than in the larger watersheds (mostly the Emme subreaches and some larger tributaries), as it is shown in the figure above and in the Figure 7 in the manuscript. However, differences are not significant. LW storage was only analysed along the main stem of the Emme River and in two tributaries, so our dataset is not suitable to test the conceptual model proposed by these researchers. The same observation made for recruitment is also true for stream power. As the figure above shows, SPI (which is just based on drainage area and channel width) and unit stream power do not show significant differences between small and medium watersheds.

We added some discussion about that in the revised manuscript.

Please also note the supplement to this comment: https://www.earth-surf-dynam-discuss.net/esurf-2018-44/esurf-2018-44-RC1-supplement.pdf

Authors' response: Thank you, we accepted all suggestions made by the reviewer concerning the grammar and English usage and added them to the revised version of the manuscript.