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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Impacts of Changing Hydrology on Ravine Growth: Experimental Results" *by* Stephanie S. Day et al.

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Thank you, Dr. Wendling, for this thoughtful and thought-provoking comment. We had considered this issue before, but this got us thinking of better ways to look at the data, resulting in significant modification of figure 5. The figure now shows the sum percent of the sediment removed through time, resulting in a figure that more clearly shows changes to sediment discharge through time. We would expect that if we were capturing the second stage of ravine evolution where sediment discharge decreases significantly we would see a non-linear trend, yet this is only seen in a few of the experimental runs. These runs correspond with those runs where the channel interacted with the basin walls. By modifying this figure, we were able to more clearly see that we do not in fact capture the second stage of ravine evolution with a low

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discharge regime as we originally believed, with a few exceptions. This finding may suggest that the result we have found is only true in the first high discharge stage of ravine evolution. This is consistent with our data with the exception of runs 6 and 11 where there was a peak captured and a later decrease in sediment discharge. These runs were consistent in the total volume of sediment removed for the 190 litres, which suggests that perhaps the volume sediment discharge relationship is correct, yet more study would be required to identify this relationship over both stages of ravine evolution. We have modified the discussion and conclusion to reflect these changes to our thinking in how our results fit into the two stage ravine growth model. We have also edited the manuscript to reflect all proposed modifications to the conclusion.

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