

Interactive comment on “A flume experiment on the effect of constriction shape on the formation of forced pools” by D. M. Thompson and C. R. McCarrick

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This is a straightforward report of a well-designed, focused experiment on an important problem of pool-riffle formation. I believe that the results are generally applicable to natural channels. The flume results are consistent with observations I have had in the field but couldn't test because of confounding influences of other factors. The only scientific issue that I have is that the scaled pool-riffle distance in the flume seems shorter than those in natural channels and may have been longer in the flume at a higher flow or longer duration of the experiment. According to the engineering scour literature, the maximum scour should occur at the threshold of particle entrainment outside of the

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area affected by the obstruction, e.g., bridge pier. What was the degree of achievement of the entrainment threshold in the experiment? My remaining comments are mostly technical (page/line number): 1946/18: rapidly? 1947/8: If the bank opposite the obstruction is alluvial and free to erode, is there necessarily a constriction? 1949/23: they impact. . . 1951/2: Sediment as well as water was recirculated? Was this a live bed, i.e., bedload was in transport? 1951/18: It would be useful to introduce Figure 2 here or provide another figure showing obstruction shapes and orientation in the flume. 1952/19: I don't understand this sentence. 1954/18: . . .than were the characteristics of the riffle. 1958/25: Any evidence that maximum scour at the obstruction created a slip-face upstream that did not depend on near-bed velocity or turbulence to create the positive slope? 1960/1: Suggest scaling the lag in distance from maximum scour depth to the point of upstream maximum constriction.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 1945, 2010.

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