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Dear *Earth Surface Dynamics* Editorial Board,

We have addressed all minor concerns raised by both reviewers for the original manuscript titled “Marsh induced backwater: the influence of non-fluvial sedimentation on a delta's channel morphology and kinematics” and think it is worthy of publication in *Earth Surface Dynamics.* We have responded to all comments and concerns raised by the reviewers in a response document and directly to the comments made in the pdf by Reviewer 1. We have edited the manuscript accordingly (see bold text for changes; line numbers correspond to the track changes article file). We outline a summary of the changes below.

The first concern of the reviewers was that the manuscript needed more context for the experimental set-up to be considered a standalone manuscript. We have added a table in the methods section (Table 1), as well as expanded on some details related to experimental set-up and data collection (lines 110-111, 119-125, 129-130, 133-139, and 143-144).

Another concern was that the discussion of channel kinematics needed to be expanded upon. We have added significant detail to Discussion section 4.1 (lines 370-401) to clarify why basin-wide lateral channel mobility is similar in both experiments, as this finding is indeed counterintuitive. We find that despite significant differences in channel morphology, basin-wide, long-term channel mobility is controlled by compensation and mass balance in this experimental setting. We have also added a paragraph to discuss how this finding might be different if the experimental boundary conditions were different (lines 402-412).

Another concern was that we did not include discussion of the temporal dynamics of channel kinematics. To keep the manuscript at a reasonable length, we have not expanded much on this front. Because the experiments were run in equilibrium, the temporal dynamics observed in the study are related to autogenic processes. While this is an interesting area for further study, it warrants an entire manuscript dedicated to exploring this topic and is outside the scope of this manuscript (lines 110-111). A colleague currently has a manuscript in preparation that looks at temporal dynamics of shorelines and channel movement in the stratigraphic architecture and we think the reviewers will find that study equally as interesting as the current one! We now mention that the temporal variability of backwater length is an avenue for future research (see lines 367-369).

The last concern was the quality of the figures. We have made significant improvements to the figures based on the reviewers suggestions and we feel that they are greatly improved! For example, we have increased the legend size and moved the shoreline locations on to the mean lines in Figs. 3, 4, 6, and 7. Further, we have updated Fig. 1b to better illustrate the concept of the “marsh window.”

We believe that our manuscript shows the importance of the interaction of fluvial and non-fluvial sedimentation on channel morphology and kinematics and highlights that non-fluvial sedimentation is a new control on hydrodynamic backwater. The treatment experiment sheds light on the equilibrium state of river deltas subject to significant non-fluvial deposition, which is essential information for all engineering and restoration plans of our coastlines. We believe this manuscript is appropriate for publication by *Earth Surface Dynamics*, as the findings of our paper show a significantly different channel morphology and kinematics when non-fluvial sedimentation is present.

Please address all correspondence regarding this manuscript to me at: ksanks@tulane.edu.

Thank you again for your consideration,

Dr. Kelly Sanks