

Interactive comment on “A reduced-complexity model for river delta formation – Part 2: Validation of the flow routing scheme” by M. Liang et al.

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In this companion paper, Liang et al. conduct a series of tests of the hydrodynamic component of the model presented in Part 1. In essence this is more of a nitty-gritty paper that has the objective of assuaging those that would take objection to the simplification of hydrodynamics employed in the full morphologic model. I think that it was a good decision to split this test of hydrodynamics into a separate submission as the tests here are meant to develop trust in the model approach, but the results here do not necessarily affect any of the findings in the first part.

Perhaps I am being overly pedantic, but my largest concern with the MS is the use throughout of “validation” as an objective and an outcome of the research that is presented. Of course, much technical and philosophical debate can be made about “vali-

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ation,” and the authors touch upon some of this discussion in the background. To me, validation typically would require a “thumbs up” or “thumbs down” final assessment, or at least a quantification between these binary limits. However, I’m not sure that the types of model tests here are best termed as validation. First, they are varied and the comparisons are, for the most part, generally in the category of “sniff tests” of qualitative behavior. Second, and more importantly, the tests here are mostly comparisons to the results of the RCM with theory or depth-averaged runs of the Delft3D model, neither of which is nature. These are mostly model-model tests – comparison of the model results to nature is of course what is needed for a true validity test. Perhaps I am only arguing semantics, but I think the authors could use more useful and specific terminology to describe the types of model tests and comparisons that they are making.

This follows from comments I had about the unconstrained parameters from Part 1, as the objective here is a test of the model hydrodynamic routine, I find it surprising that the authors present no systematic tests of the vital unconstrained hydraulic parameters. Otherwise it seems like the model recreates hydrodynamics once those values (may) have been sufficiently tweaked, with the exception of the backwater test (which may or may not be calibrated).

As this work has a strict focus on hydrodynamics, I agree with the anonymous reviewer that perhaps the authors could do a more thorough job reviewing previous published applications of RCM’s for fluid modeling (rather than the morphodynamic ones listed here). One that might be of interest is the Murray and Reydellet, 2001, model that also uses simplifications and smoothing for flows where there are small slopes. Other models exist for estuaries and lagoons. Regardless, the background should address hydrodynamic models.

I find the format of presenting all of the experiment set-ups and then all of the model results to be rather distracting. This seems to be one of those times when the methods-results approach becomes too limiting. Why not present the model set-up and then the

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results for each test case immediately after? It certainly would help the reader from flipping back and forth through the MS.

Otherwise, I appreciate the effort that the authors have taken to perform these numerous tests of the model algorithm. Some tests seem to be more successful than others, but there is a benefit that these differences are highlighted. I don't know if these tests necessarily add more significance to the general results of Part 1, but it does help establish that the hydrodynamic model is doing most of what it should be doing, at least in terms of other hydrodynamic models.

Regards,

Andrew Ashton

- - - Other notes:

P879 L13. "both the x"

L881 L13. "domain sizes"- check for consistency for how groups are addressed.

P882 L6. Change of tense. Check for the same tense (past or present) throughout.

Figure 6. This figure could use some touch up: the model result boxes are so large and numerous that the empirical backwater curve cannot be seen. This leaves the impression Also the caption text could use cleaning up.

Figure 7. Legend needs labels.

Figure 10. Caption needs cleaning up.

References

Murray, A.B., Reydellet, G., 2001. A rip current model based on a hypothesized wave/current interaction. *J. Coast. Res.* 17,3,517-530.

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