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Discussions

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Interactive comment on "Australian tidal currents – assessment of a barotropic model with an unstructured grid" *by* David A. Griffin et al.

Anonymous Referee #1

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General comments

In general, this manuscript seems to be a 'report' dealing with establishment and assessment of a tidal model. I cannot find any new or interesting scientific finding even though a vest amount of data analysis and comparison were conducted to establish the model. In addition, the sentences in the manuscript tend to be long and some sentences are not so clear. I recommend that the authors should make the manuscript concise with novel scientific findings. In conclusion, it seems to me that this manuscript is not appropriate to publish in Ocean Science, as it is.

More specific comments follow to help the authors address their manuscript's weakness. - On p. 3 lines 53-54: Is there any reason to choose a depth-averaged configuration even though COMPAS is 3D model?

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- On p. 4 lines 72-73: Need to explain why the onsite depth measurements did not use for estimation of the model topography.

- Figs. 1-2: Need to describe a space interval in bar graph.

- On p. 3 lines 61-62: The authors need to clearly explain how to give tidal current speed for a dual weighting function to generate the mesh.

- On p. 5 line 84: So, was the Herzfeld et al. (2020) scheme used?

- On p. 5 line 89: Need to explain how to determine the value of 0.003 for the bottom drag coefficient.

- On p. 5 lines 92-96: I think that these sentences are not so clear. Need to re-write them. Is there any reason to choose the starting date as 24 Feb 2017 for the model running? Did you predict tides from T_Tide using observation derived harmonic constants? How long have observation records been used to calculate these harmonic constants? And which cases did you run 7 or 30 days? Is the running period related to observation period? How long did you run the model for spin-up time? What kind of 'parameters' did you tune and how to adjust the model?

- On p. 5 line 97: Is there any reason to run the model over 222 days? As you know, at least 183 days are required to separate out the S2 (K1) and K2 (P1).

- On p. 5 line 106: Is there any reason to use UTide for tidal current analysis rather than T_Tide which was used for tidal analysis?

- On p. 7 line 160: Information on record length is important to determine whether the S2 (K1) are fully resolved or not. I recommend that the authors check this point.

- On p. 7 line 162: Put equation number for a penalty function along with reference for this.

- On p. 7-8 lines 169-170: Put equation number for reM2, rebarM2 and reLF (if possible). Need to be multiplied by 100 in order to match the value of Table 3. From these

equations I could not obtain these values listed in Table 3. Need to check equations.

- On p. 22 lines 330-332: I do not understand the authors' arguments on tidal potential forcing. On p. 5 lines 90-91, they stated that effect of tidal potential forcing was minor, resulting in no consideration. Need to explain this point clearly. I think, if tidal potential forcing is important in a certain area such as Bass Strait, it should be used.

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