

Dear editor,

On behalf of my co-authors, we thank you for giving us a chance to revise and improve the quality of our article.

We have read your comments carefully and have made revision. We have tried our best to revise our manuscript according to the comments: "Application of Wave-current coupled Sediment Transport Models with Variable Grain Properties for Coastal Morphodynamics: A Case Study of the Changhua River, Hainan (egusphere-2024-2154)".

Here is a point-by-point response to the comments (12 comments.).

Thank you for taking the time to consider our research and we look forward to hearing from you at your earliest convenience.

Sincerely,

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Detailed comments part:

Point 1: Line 117. "V is an average velocity" is not precise: "the depth-average"? "of the fluid flow" can be omitted.

Response (Line 117): Thank you for your meticulous review and insightful comments on our manuscript. We have carefully considered your suggestion regarding the precision of terminology used in Line 117.

We have revised Line 117 to read: "V is the depth-averaged velocity," which accurately reflects the meaning and provides the necessary precision as suggested. This change aligns with standard hydrodynamics terminology and clarifies the nature of the velocity being referenced, ensuring that the description is both precise and unambiguous.

Point 2: Line 122. ". . Shields"

Response (Line 122): Thank you for your attention to detail and for pointing out the formatting issue in Line 122 of our manuscript.

We have corrected Line 122 to accurately reflect the proper noun or term as follows: "the Shield's parameter," ensuring that the reference is clear and grammatically correct.

Point 3: Line 126 ". . Van Rijn specifies its variation as a function of D . ." and refer here to figure S1.

Response (Line 126): Thank you for your meticulous review and for drawing our attention to the need for clarity in referencing Figure S1.

We have revised Line 126 to include a clear reference to Figure S1, which now reads: "...Van Rijn specifies its variation as a function of D^* , as illustrated in Figure S1." We have also ensured that Figure S1 is properly labeled and that it clearly depicts the variation of the parameter as a function of D^* , aligning with the description provided in the text.

Point 4: Line 168. (Wentworth, 1922) has the concept of a logarithmic scale but I did not see any such scale as ϕ defined there. Maybe a paper by Udden also needs to be cited.

Response (Line 168): Thank you for your insightful comment on Line 168 regarding the reference to the logarithmic scale by Wentworth (1922). We have reviewed the literature and made the following revisions to ensure accuracy and completeness in our citations.

We have verified the reference to the Udden-Wentworth scale, which indeed uses a logarithmic scale for grain size classification. Line 168 has been updated to: “Here, ϕ represents the Udden-Wentworth scale (Udden, 1914), a logarithmic scale used to classify sediment grain sizes (Wentworth, 1922).”

We have added a citation for Udden (1914) to acknowledge the contribution to the understanding and application of the ϕ scale in sedimentology.

Point 5: Line 180. Refer to figure S2.

Response (Line 180): Thank you for your comment on Line 180 regarding the reference to Figure S2. We have made the necessary revisions to ensure that the figure is appropriately cited and that the content is accurately represented.

We have added a reference to Figure S2 in Line 180, which now reads: “Based on the sampling and testing results of the river course (Figure S2), ...”

Point 6 : Line 203. “value range of NSE is 0 to 1. When . . .” Except that NSE < 0 is possible.

Response: Thank you for your insightful comment on Line 203 regarding the Nash-Sutcliffe

Efficiency (NSE) coefficient. We appreciate your attention to the accuracy of our model evaluation metrics.

We have revised the manuscript by deleting the specific value ranges for NSE. This change streamlines the presentation and maintains clarity without sacrificing the integrity of our model evaluation.

Point 7: Table 4. Your response to the reviewer was that the Manning number should be 0.028

Response (Table 4): Thank you for your attention to the details regarding the Manning number in Table 4.

Upon reviewing our calculations and data sources, we confirm that the Manning number used in our study is indeed 0.028. This value is based on the specific conditions of the study area and aligns with the typical values used for similar environments as documented in our references.

Point 8: Line 250. “. . sectors. We calibrate . .”

Response (Line 250): Thank you for your comment on Line 250 regarding the clarification needed for the mention of sectors and the calibration process.

We have revised Line 250 to provide a clearer explanation of the sector setting in our model and the associated calibration process. The updated sentence now reads: " We calibrate the parameters using multi-year wave data from the Dongfang Ocean Station."

Point 9: Figure 6 caption. Better “Depth-averaged current speed and direction verification. (a) speed . .”?

Response (Figure 6 caption): Thank you for your suggestion regarding the caption for Figure 6. We have revised the caption for Figure 6 to better reflect the content and to incorporate the term "Depth-averaged" as you suggested. The new caption reads: "Depth-averaged current speed and direction verification. (a) ..."

Point 10: I think It would be good to add hours in the x axis in all panels (as already done in panel b).

Response (Figure 6): Thank you for your suggestion to include hours on the x-axis for all panels in Figure 6. We have reviewed Figure 6 and added hour markings on the x-axis for all panels, consistent with the format already present in panel b. This enhancement provides a clearer temporal context for the data presented in each panel, improving the overall readability and understanding of the figure.

Point 11: Figure 7 caption. Omit "across the water column" because you already stated "depth-averaged".

Response (Figure 7 caption): Thank you for your feedback on the caption of Figure 7. We have revised the caption for Figure 7, omitting the phrase "across the water column" as suggested. The updated caption now reads: "Figure 7: Flow field inside the estuary, displaying depth-averaged flow velocities. (a) moment of the maximum flood current; (b) moment of the maximum ebb current"

Point 12: Figure S3. I have not found a reference to this figure in the text, and I don't see where in the text it would be relevant. Please omit Figure S3 or give it

relevance and refer to it.

Response: Thank you for your observation regarding Figure S3. Upon review, we have decided to omit Figure S3 from the supplementary materials as it does not have a clear reference or relevance within the main text of our manuscript.

Once again, we appreciate the time and effort you have dedicated to evaluating our manuscript. Your expertise and guidance have been invaluable in strengthening our research!