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Interactive comment on "Numerical study of hydrodynamic and salinity transport process in Pink Beach wetlands of Liao River Estuary, China" *by* Huiting Qiao et al.

Anonymous Referee #2

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"Numerical study of hydrodynamic and salinity transport process in Pink Beach wetlands of Liao River Estuary, China"

This paper applies the Mike unstructured mesh model to the Liao River. The aim of the model investigation is to understand how the presence of vegetation impacts the flow, and salt intrusion in the estuary. Landsat imaginary is used to derived the vegetation cover input to the model, then Mike is used to simulate hydrodynamics and salinity.

Main suggestion Salinity is supposed to be the key result, so please map it, and discuss it more thoroughly. I would like to see more analysis of the type shown in figure 17. The impact of vegetation on the flow, but also on the salinity. How does the map of

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salinity look in these 2 simulations? How do the patterns change with different seasons, comparing wet/dry discharge? How different are the maps at high/low tide?

You mention P25, line 9 - that there is more salinity intrusion when discharge is low - but you have not really evidenced this in your paper. The modelling work is nice, and the impacts of vegetation are an interesting subject for study. However, overall the paper is pretty simple, and needs more analysis of the results to be more well-rounded.

Minor comments P8 model domain, what is the max/min element size? P11, Figure4. It looks like the tidal range is a little underpredicted in the model.

Please add some simple statistics to the assessment of water level, e.g. correlation, mean-square error. What is being shown in the right hand panels of figure 5 and 6? Is is the current direction? If so, is it just current speed on the left, not velocity? Legends need expanding to make this clear.

Figure 8 is hard to read. Maybe better to plot onshore/offshore current speeds? or reduce the number of vector arrows. Also there is no key, so it is impossible to interpret the absolute magnitude in figures 7 and 8.

Figures 9 and 10 are unnecessary, you could just make a 1 line mention of the mean and standard deviation to show that the salinity is well captured.

p19 having M for manning coefficient (P7). Then defining nv as the vegetation manning roughness is a little confusing, with m then as the number of vegetation elements. It is all consistent and correct, but different naming might make it more straightforward. P20, line 14 'model is relatively accurate' - not quantitative, some statistics please.

The experiment is using different river run-off rates, defined on P21, line 6-7. To me, this is the most interesting part, and could be expanded. For example, I would suggest adding a map, showing the position of salinity contours, with different discharge rates.

Figure 17: Again, this is a really interesting result, the impact of vegetation on the flow: I think this is the key figure, and could do with more explanation in the legend. It also

needs a key again, showing the speed indicated with each vector arrow. Could also highlight where the vegetation is in the 2 different configurations.

Figure 18: I don't learn anything from this figure, other than the salinity remains relatively constant at all sites. If you keep this figure in, you need a map to show where these sites are, instead I would suggest showing a contour map of salinity across the whole domain.

Figure 19 - again cut this, and just explain in the text.

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