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Discussions

Interactive comment on "Effect of winds and waves on salt intrusion in the Pearl River Estuary" *by* Wenping Gong et al.

Anonymous Referee #1

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This study investigated effects of winds and waves on salt intrusion in the Pearl River Estuary by conducting a series of numerical experiments. The topic is of interest and the results are reliable. Therefore, I recommend publication this manuscript in Marine Science after moderate revision.

The numerical model was validated using two observation data sets. Generally the model skills are low, particularly for the data set from Dec. 9 to 26, 2009. I understand that the bathymetry of Pearl River Estuary is rather complicated and to obtain a good performance of model simulation is not easy. However, the conclusion of "well performance" (see page 6, line 12 and line 29) is beyond the truth.

In the experiment without winds, the higher surface salinity during the spring was attributed to "lower freshwater inflow during the spring tide than during the neap tide

(page 7, line 27-28). However, the fact is that the river discharge of the Pearl River was higher during the spring than neap tides (see Fig. 3b).

Page 8, line 27 states "Generally, the local wind causes the landward salt flux to decrease", while line 29 states "overall, the total salt transport flux is seaward and decreased considerably under the local wind". Did local winds cause decrease in both landward and seaward salt flux? The two conclusions look contradictory.

In the experiment with remote wind, the subtidal water level increased across the entire domain (page 9 line 15). Does this mean the model failed to keep mass balance? Sea-level rise fills saltwater into the estuary and enhances salt intrusion. Does this filling effect affect the conclusion draw from the wind experiment?

The study found that the wind-induced water flux is larger during the spring (Day 46-48) than neap (Day 41-43) tides (page 9 line 25-26), and attributed this to tidal argument. I noticed that the winds were much stronger during the spring than neap tides (see Fig. 3 a). That accurately explains the change in wind-induced water flux from the spring to neap tides.

Figure 10, "T4" should be "T3".

Figure 15, Adding the contour of "0" might help identify landward and seaward flows.

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