

## Comment on hess-2022-247

Anonymous Referee #1

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Referee comment on "Effect of tides on river water behavior over the eastern shelf seas of China" by Lei Lin et al., Hydrol. Earth Syst. Sci. Discuss.,  
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Using transport pathway, time scale and the concentration as indicators, this study examined the influence of tides on the river water behaviours over the shelf of the marginal sea. The results are important to understand and improve the climate model in the global water and biogeochemical cycles. The methods are solid, and the results are reasonable. Several points can be further clarified at this stage.

- Several indicators including the pathway, time scales, tracer concentrations were used in this study. The links and discrepancies among those indicators can be further explained, thus give better illustration on the influence of tide. Such as there is high water age in the region of YSCWM, which trapped the river waters, while the emergence possibility there is relatively low.
- The transit time shows high STD, which is comparable to the mean values. There is also remarkable seasonal variability. While those variabilities were not well discussed or explained.
- How the emergence possibility represents the "pathway" of the river water? The emergence possibility is discontinuous spatially, should give a better explanation
- Why the tidal effect induced more dispersed transport for the Yellow and Yalujiang Rivers' waters but more concentrated transport for the Changjiang River water?
- The tide has different effect on the river behaviour in Bohai& Yellow Seas and the East China Sea, due to the semi-enclosed geometry or the water depth?

Some minor comments:

- What's the frequency of the hydrodynamic model data used to drive the particle tracking and passive tracer model.
- For the transit time and water age, did authors consider the re-entry processes?
- The changes of mixing intensity can be shown

- Line 165: "The Yalujiang River water passes mainly through the western Yellow Sea", western or eastern?
- Figure 10 should be improved to make the arrows more clear
- In some figures, the STD is too larger. Refine the figure to make it clear