

Review of “Climate change overtakes coastal engineering as the dominant driver of hydrologic change in a large shallow lagoon ” by Huang et al.

In this manuscript, authors assessed the impacts of climate change and artificial channel on the water retention time, salinity and stratification of the Peel-Harvey Estuary (a large choked-type lagoon) in 1970-2016, and their evolvment under current climate projections, based on a 3D finite-volume hydrodynamic model. There are some issues which are as follows.

Major Points:

1. In introduction section, authors mainly introduced the importance of the topic and what they did. However, the related work of other researchers was not introduced.
2. In the Methods section, it is better that all data used and their resources were introduced together. It seems that some data was introduced, but some not. In page 7, lines 202-203, “Gauged flow rate data for the Murray River, Serpentine River and Harvey River were applied to the hydrodynamic model whenever they are available. For the missing periods in the gauged flows and the ungauged drains, the output from the Source ...”. Which data is available, and which is not available? Which periods are the missing periods? Where are the ungauged drains?
3. About the meteorological inputs of the model, there are various data sources: station Halls Head before 1981, climate model simulations 1981-2000, and station Mandurah since 2001. The different sources of data could influence the results.
4. There is no calibration of the model parameters.
5. Topography is also an important factor affecting the hydrology of an estuary. Between 1970 and 2016, how did the topography of the lagoon and the natural channel change and affect the hydrology? There is no anything about this.
6. The results for 2040 and 2060 based on projected climate seem to be too simple. And there is no any explanation.

7. In 4.1 section, the contents in paragraphs 1, 2 and 3 mostly repeated the results. Here, the compare between your results and other related research should be shown.

Minor points:

1. All important stations or locations mentioned in the manuscript should be occurred in Figure 1.
2. GL and mAHD should be changed to international units.
3. Impacts on the stratification were shown in the results and conclusions. Why were they not mentioned in abstract?
4. The citation of reference is disorder. If several references are cited together, they should be put in order according to publishing year.
5. In page 6, line 186, WA region means Western Australia? The indication of this abbreviation is not seen.
6. In Figure 1 "Peel Estuary" is indicated. However, in the text and other figures only "Peel Inlet" can be seen. Are they the same location? If yes, in Figure 1, text, and other figures they should be the same.
7. Page 10, lines 277-279, authors said "the tide elevations in the ocean showed similar characteristics in 1990 and 1998 in terms of the annual mean sea level (-0.071 mAHD and -0.027 mAHD in 1990 and 1998, respectively) and tidal range (both < 1 m)". The plot a of Figure 4 shows the detailed sea levels in 1990 and 1998. Why did you only compare the annual mean sea level? It can be seen from plot a that the sea levels in 1998 also had a wider range variation, similar to the estuary surface elevation.
8. Caption of Figure 4 is not proper. It looks like three figures.
9. Table 3: (1) In caption of the table, "Summary" should be deleted. (2) About the performance of salinity, it can be seen that errors after 1998 are clearly larger. Why?
10. Caption of Figure 10, "The darker symbols indicate the years with accidental summer rainfall events and caused the catchment inflows higher than 15 GL". In this sentence "and caused" seems syntax error.