

## ***Interactive comment on “The hydrodynamic and environmental characteristics of tributary bay influenced by backwater jacking and intrusion of main reservoir” by Xintong Li et al.***

### **Anonymous Referee #2**

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This paper aimed at evaluating the hydrodynamic and water environment effect of backwater jacking and intrusion of the main reservoir on the tributary bay. The topic is novel and of high interest for the relationship between main reservoir and tributary bay. The results are valuable for water environment treatment of the tributary bay. This paper is innovative and suitable to publish in HESS. However, there are also some comments that need to be addressed. After the revision, the paper can be accepted.

Specific comments:

- 1) Section 1 Introduction: Some sentences in Introduction need references to support.
- 2) Fig. 1: The gray area in the upper left picture of Figure 1 should be the area of the  
C1

picture in the lower left picture. Some irrelevant places in the upper left picture are marked as gray. Please modify them again.

- 3) Line 131-139, the reason of selection CE-QUAL-W2 is better to put in introduction part.
- 4) Section 2 Materials and methods: For the mathematical applications, it is necessary to illustrate the grid division of your study area. It's better to add some explanations or
- 5) a figure of grid structure in Section 2.
- 6) Table 1, the format of the temperature unit is messy code. Please correct.
- 7)  $TLI(\sum)$ , please uniform the format of  $\sum$ , in roman or italics.
- 8) Fig. 4, the legend is necessary to be added.
- 9) Section 2.2.3 Boundary conditions: What was the period of the boundary conditions used for simulation? Is it the data of a certain year or the average value of multi-year data? Please specify this in the corresponding section.
- 10) Section 3.1 Hydrological situation: To my knowledge, density-driven water can intrude into the tributary bay in the process of TGR impoundment at the end of flood season in autumn, and you specify the backwater intrusion time is from July to October. Do you consider the density-driven water in your simulation? The intrusion time you specify needs some references to support.
- 11) Fig. 6: You'd better add titles to the vertical axes to make the figure easier to understand.
- 12) Section 3.5 Water eutrophication: In your conclusion, the risk of eutrophication in the tributary bay was highest in the section within 0.5 km of the confluence from May to June. Any facts or references in tributary bays of the TGR that can support your conclusion?
- 13) Line 502- Line 508: You calculated the backwater intrusion time in Section 3.1 and

it is a meaningful result. I think you should add this result in the first conclusion.

14) Line 552- Line 555:What is the interaction between the main reservoir and the tributary bay? Asthetributary is a much smaller water body compared with the main stream, so it's easy to understand the influence of main reservoir on tributary.But can the tributary bay affect the main reservoir conversely? I think there needs more details.

15) The conclusion part is better to be condensed and proposed some specific conclusion, or some quantify result.

16) Future work: You mentioned some existing measures to improve the environment of tributary bays, can you propose some possible new methods in your future work section?

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