

Dear Editor and Reviewer:

We are submitting this cover letter which includes our response to reviewer's comments.

We thank the reviewer for taking the time to review our manuscript. We have carefully considered reviewer's comments and made the necessary revisions in the revised manuscript; please see below for detailed replies.

Reviewer 2

The article is very well developed and presented. Some small details to improve:

* Line 135: Correct 2.1 to 2.2.

Thank you for catching it. It was corrected.

* Section 2.5.

I understand the values presented in Table 1 correspond to those described in 2.5. Please mark it explicitly and relate the value in the Table to the values in Figure 2.

Thank you for your valuable feedback and suggestions. We added a sentence to clarify the relationship between Figure 2 and Table 1. This sentence was added: "All freshwater inflows into the Basin due to the increase river input for 2009, 2010, and 2011 were 11.4, 13.2, and $16.0 \times 10^9 \text{ m}^3 \text{ yr}^{-1}$, respectively (Table 1)."

* Section 3.1 Line 289:

It is mentioned that the performance of the model is evaluated over the whole domain, how is the information from the 26 WQ stations synthesized, it is with an average?, please explain.

Thank you for your question regarding the data preparation for model performance evaluation. We have expanded our explanation on how the model and observed data were synthesized and included this sentence:

"The observed and modeled water quality timeseries data were collected from all 26 stations in the Basin for the years 2009 through 2011. Statistical metrics, such as correlation coefficients and biases between the modeled and observed data, were calculated for each station. These metrics were then averaged across all stations to evaluate the overall agreement between the model and observed data in the entire Basin. These metrics quantify the degree of agreement between the model and observational data."

* Appendix B. I think the last paragraph of page 21 (lines 682-693) could

I think the last paragraph of page 21 (lines 682-693) could be included (or instead the main idea) in the conclusions as it warns of some errors in the model that are important to keep in mind when drawing conclusions.

Thank you for your comment regarding the limitations of the model mentioned in the appendix. We acknowledge that the model may not fully capture temporal changes in a specific period, such as seasonality. However, in this article, we evaluated the nutrient budgets in terms of the average of the entire system using spatially and temporally averaged data. We have already presented the limitations of

our model in the results section. Therefore, we believe that it is more appropriate to maintain the current conclusion instead of adding the limitations mentioned in the appendix within the flow of the main text.

** Appendix B. Table B1 is cited in the text after the figures (B1to B4), so it is recommended to move it to the end or change the order of the citation in the text.*

Thanks for your suggestion. We moved the table after the figures.