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Biogeosciences Discussions

Interactive comment on "Integrating Multi-Media Models to Assess Nitrogen Losses from the Mississippi River Basin to the Gulf of Mexico" *by* Yongping Yuan et al.

Anonymous Referee #2

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It's an interesting paper. You tested a new integrated modeling tool (IMS) and compared IMS with other modeling approaches. A new method could significantly improve the strength of the modeling approach on examining environmental problems. However, several revisions are needed to clarify your work in the paper. 1. Please clearly explain your research design. After reading the introduction, I expected that since you proposed IMS by integrating SWAT into FEST-C and will only show results from IMS. Your method section suddenly stated that SWAT-HAWQS and SWAT-HAWQS-WRF were tested together. At least, you should briefly introduce SWAT-HAWQS and SWAT-HAWQS-WRF and simulations from those two methods will be compared with IMS. 2. This comment is related to the comment above. I have a confusing on terms.

FEST-C is equal to EPIC+WRF+CMAQ and to improve FEST-C, SWAT was added. Is SWAT+FEST-C equal to IMS? Is IMS equal to the integrated multi-media modeling system? SWAT-HAWQS and SWAT-HAWQS-WRF mean the integrated multi-media modeling system? It seemed to me that you used the multiple terms that have the same meaning. Please simplify it. 3. Section 2.2 is too lengthy. Make sub-sections for 2.2 and explain each model at each section. 4. Please show the climate comparison results first and then streamflow. Streamflow pattern is mainly affected by climate data. If the climate results are first shown, it would be easier to understand streamflow results. 5. You should add any fertilizer application timing information for IMS and HAWQS. Fertilizer is a major N source. Comparing timing and amount of fertilizer between IMS and HAWQS is vital for this paper. At least, you must mention any differences or similarity on fertilizer between IMS and HAWQS based on literature.

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