Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-491

Zhengdong Cao (Referee)

Referee comment on "A new large-scale suspended sediment model and its application over the United States" by Hong-Yi Li et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-491-RC1, 2021

This study developed a new process-based suspended sediment module based on MOSART within E3SM. The new model, MOSART-sediment, consists of an existing soil erosion module, a new riverine sediment module and a new resevoir module with both reservoir trapping and regulation mechanisms incoroporated. It is then applied to CONUS for long-term average suspended seidment discharge simulations. The historical data are reasonably captured, and the reservoir effects are well analyzed. Overall, the manuscript is of a high quality considering that 1) two study objectives are clearly stated and well acheieved; 2) model implementations and results are clearly described; 3) model uncertainty and reservoir effects are also discussed.

My main comment is on section 2.2.1, where I think the authors should describe the ELM-erosion model even more briefly and focus more on how it is applied/manipulated in this study. For example, how did this study 'refine the MMF'? Another obvious place needs improvement is the description of the paper outline at around Line 145; I have highlighted it in the manuscript. I also provided some comments/edit suggestions in the attached pdf file. I believe the manuscript is ready to be published once these are addressed. I am happy to take another round of review but I don't think it is necessary.

Please also note the supplement to this comment:
https://hess.copernicus.org/preprints/hess-2021-491/hess-2021-491-RC1-supplement.pdf