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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Assessing ecosystem services under water stress in the largest inland river basin in China based on hydro-ecological modeling" *by* Yang Yu et al.

Anonymous Referee #2

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The submission entitled by 'Assessing ecosystem services under water stress in the largest inland river basin in China based on hydro-ecological modeling' is well written with clear objectives and convinced results. Current water cycle and ecosystem protection measures were simulated, and future land use change scenarios were proposed accordingly. China is on the frontline of ecosystem protection and afforestation, but according to the simulation results, the available water resources cannot support more vegetation in its largest inland river basin. Without an additional water supply, 25.9% of the existing area of natural vegetation will be degraded by 2050. After reading the manuscript, I would like to give a few comments to improve the quality of the submission.

1. Ecosystem services should be shorted as ESs instead of ESS. 2. Due to model complexity and computational time, it is very difficult for a single model to consider both hydrological processes and ESS changes. Two hydrological models (MIKE HYDRO and MODFLOW) were employed simulate hydro-ecological processes and assess ESS changes, but the theory of ESs assessment is still not clear in current version, please introduce more details about the methodology to assess ESs and include necessary references. 3. How to calculated carbon storage, wind erosion control, dust control services, please introduce more details and include necessary references. 4. Did you do the comparison between ESs estimated by your model with previous studies? 5. Did you validate the ESs estimation results? 6. Both the MIKE HYDRO and MODFLOW models were fully calibrated and validated to precisely simulate the water cycle, but the ESs estimation results should also be validated. 7. Please declare your main objectives of this study in a clear and concise manner in Introduction Section. 8. The figures made by Excel should be replotted by other software, because they are ugly and no Y axis was clearly labeled in current version. 9. Conclusions and discussion should be written in two sections, and the current discussion is still shallow, please add more in depth discussion. 10. Conclusion should be declared in a concise and clear manner. 11. I do not think the ESs estimated by your model are reliable without validations and comparisons with previous results. 12. Explain more about the resources of each variables in Fig. 9, how did you get the outcome and whether they are convinced. 13. It is a big challenge to include all the things in one or two models, so how to combine ESs and hydrological process is still a big question that should be replied in your study, and more work is needed. 14. Section three should be results and discussions.

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