Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., community comment CC1
https://doi.org/10.5194/hess-2021-244-CC1, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on hess-2021-244

Li Zongxing

Community comment on "Can we use precipitation isotope outputs of isotopic general circulation models to improve hydrological modeling in large mountainous catchments on the Tibetan Plateau?" by Yi Nan et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-244-CC1, 2021

General comments:

The tracer-aided hydrological model was recognized to have value on improving the rationality of model structure and parameter, which was especially important for mountainous catchments. However, the application of tracer-aided model was limited to small and middle scale because of the low availability of isotope data in large scale. The authors developed a procedure to correct the iGCM data and force tracer-aided model in a large basin on the Tibetan Plateau, and had good effect on improving the model behavior. The results open a new window to expand the application of tracer-aided model to larger scales. Meanwhile, the paper is well structured and the language is well written. I recommend its publication on HESS after a moderate revision properly addressing some specific comments.

Specific comments:

- In the multiple-objective calibration methods, the evaluation indexes of different objects are added together directly. I am concerned about the reasonability of this procedure considering that the NSE, RMSE and MAE have different measurement units.
- Why did the authors interpolate the measured data using the terms longitude and elevation, but correct the isoGSM data only using the term elevation.
- Is it enough to only use the average measured isotope data to correct isoGSM data? How about the seasonal characteristic of the bias?
- The runoff is divided into rainfall, snowmelt and glacier melt. How did the authors consider about the groundwater?
- How did the authors determine the isotope composition of snowmelt and glacier melt?