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Comment on **essd-2021-460**

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Community comment on "A 148-year precipitation oxygen isoscape for China generated based on data fusion and bias correction of iGCMs simulations" by Jiacheng Chen et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-460-CC2>, 2022

General comments:

Obtaining a high-resolution long-term precipitation oxygen isoscape dataset can be critical for relevant hydrological studies. This study presented a first attempt to solve this issue, really appreciate, but from my point of view, it is still a rather premature dataset and have limited value. The authors downscaled and fused eight iGCMs precipitation oxygen isoscape using five different methods from a coarse spatial resolution ($\sim 2/3$ degree) to a higher spatial resolution (0.5 degree). However, the work is not innovative and no important and robust findings were obtained. The results do not convince me since this method highly depends on the training data, which cover a short period, are unevenly distributed across regions, and insufficient to train model. Moreover, as we know, the precipitation oxygen isoscape is highly dependent on local climate conditions, terrain factors, as well as large-scale atmospheric and local circulation. No such physical-based ancillary data were used in this study, which limited the further applications of produced 0.5-degree data. The sub-pixel spatial patterns within a coarse pixel changes, but the current methodology cannot get this information. For the implementation of models, uncertainty of the datasets resulting from the model structures, parameters, training and testing strategies is not even discussed. Data-quality assessment at finer scale is poor presented. I have concerns about the reliability of spatial-temporal variations in your new data product at fine resolution.

In conclusion, this is a good attempt to generate a high-resolution dataset based on the fusion of in-situ data and iGCMs simulations, however, due to the above-mentioned issues, I don't think this dataset meet the high standard of ESSD.