

Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on **essd-2021-465**

Anonymous Referee #2

Referee comment on "Stable water isotope monitoring network of different water bodies in Shiyang River basin, a typical arid river in China" by Guofeng Zhu et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-465-RC2>, 2022

This data description manuscripts refers to an extensive dataset, consisting of water stable isotope from different hydrological compartments and hydrological data, derived from a single river catchment in north central China. The data are deposited at Mendeley in the form of three excel spreadsheets. Authors note, that these data will be extended in the future.

The data are certainly interesting and relevant for a community of hydrologists and isotope geochemists, and principally this is a work that justifies publication in ESSD. However, there is some weakness in the way the data are organized and presented. Especially, some inconsistencies in labelling the sites makes it difficult for the reader to approach and comprehend the presented data (see specific comments below).

Further a conclusive statement describing the broader relevance of the data (picking up the aim of the study as formulated in the introduction) is missing.

The authors put specific emphasis on isotopes (starting with the title). I think the accompanying hydrological data are equally interesting and should be further highlighted.

Data interpretation (section 6) does not need to be extensive in a data description manuscript, and I think is sufficient in the present form. However, also here some adjustments in presenting the data would further highlight the value of the data; for example I'd like to see seasonal isotope values plotted for each year, instead of average values for 2015-2020 (Fig. 5).

Concluding, I recommend acceptance of this manuscript, in case authors succeed in

revising their manuscript, following the major comments mentioned above and the specific comments listed below.

Specific comments

Datasets:

hydrological dataset:

are all these data in each spreadsheet for QTH? => clarify.

There is a mixture of abbreviations and full names in the "monthly flow" spreadsheet

why not combining "daily flow" and "water level" to one single spreadsheet?

isotope dataset:

there is some inconsistency in the format of reporting sampling date in the different spreadsheets

l62: define JTL and CQQ.

l77ff: these sample counts do not match the numbers as reported in the Mendeley datasets (description and data tables)

l75 and l. 88 and original datatables (and other parts of the manuscript): the authors should try to make it as easy as possible for the reader to comprehend the abbreviations and relate them to study sites. For example, the data tables only contain abbreviations, with some singular explanations ("SRB stands for the Shiyang River Basin"). I think data tables should contain one sheet with an additional table with abbreviations, full name, coordinates. In the manuscript text, authors should be consistent with reporting either full names, abbreviations, or both. For example, figure caption 1 would benefit from also have the abbreviations included alongside the full names of sites. I'd suggest not to use a - h for labelling the sample points in the topmost panel of Fig. 1, but instead the respective abbreviations, similar in the labelling of the figures sub panels.

Mendeley abstract: related to the point above, it is not clear to which points P1-P12, S1-S35, etc precisely are referring to. => please try to be consistent in labelling the data in both the original dataset and the manuscript.

Fig. 1: panel (d) is occurring twice while (f) is missing. Error in caption "Observation system".

l96: maybe providing a picture of the rain sampler in the supplement would be an option?

l113: please provide information, at which spot soil samples have been taken in text and table caption. Why just reporting soil characteristics from one site (there have been multiple sites samples, according to the datatable)?

l137: rather write "isotope analysis" instead of isotope experiment

l165 and 167: there is something wrong with these sentences. I suggest rephrasing, e.g. don't start with "the error is..." or the "error in..." but rather write "for vegetation samples..." etc.

l189ff: there is some repetition to the methodology section in this paragraph

l196: "The stable isotope data set and the meteorological and hydrological data set are combined into one data set." Actually this is not the case, i.e. they are in separate sheets.

Table 3: where are evaporation data are coming from?

Fig. 4 and 5: I think it's not "different water bodies" but rather different hydrological compartments (plant, soil water, etc). The color codes do not come out clearly in each of the sub figures legends of Fig 5.

Fig. 4: while this is interesting, there appears to be large variability in the seasonal isotope values from the different years, especially in the soil and lake compartments. Maybe it would make more sense to present data similar as for discharge flows in Fig3 (i.e. different colours for different years, instead of average values across the sampling period).

l275: "Due to systematic error, there are some errors in isotopic measurement results. However, the observation accuracy is affected by the operation characteristics of the instrument and the sensitivity difference of moisture to specific spectralabsorption, and the observation results usually have obvious nonlinear response problems, which require a lot of experimentation." => yes, but what's the conclusion from this statement? Are the data reliable or not? I suggest rephrasing this paragraph.