

In the previous 30 years, I have done a lot of similar work in the European Alps and Asian Hengduan Mountains, but I have to say that this is an impressive article. The author measured the stable isotopes of different water bodies in the whole Shiyang River Basin and collected corresponding hydrological and meteorological data in this manuscript. The data set from 2015 to 2019, with 53 observation points and 6760 experimental data obtained. This data set is one of the most systematic data sets (the matching of different water bodies is almost perfect) I have seen so far, and it is very influential, the key is that the data are all sample experimental data. I checked the data set, and the observation is very systematic and scientific (at least in the various documents I have seen). I believe that the publication of this data set will promote the research of global isotope hydrology. Therefore, I support the publication of this article as soon as possible! However, a significant article must have good writing, and this article needs further improvement in expression and language.

Major comments

1. Data articles should be easy to read and use by other researchers, the entire manuscript, including the data set, lacks some basic information, especially information about experiments and sample collection. The six observation systems established by the author are excellent and should be illustrated the purpose of observation, you cannot expect that every reader is a professional, and the writing should be clear.
2. The author has been publishing data continuously, and there are many other data sets worldwide. The compatibility and matching of data should be considered.

Therefore, the author should add isotope experiments in the current manuscript, especially the reference standards for isotope data, which is very important for data quality.

3. A good author should think critically about the problem. In the current version of the manuscript, I have not seen the author's critical comments on stable isotope technology.

4. In addition to providing rich data to readers, data articles should also guide readers to use these data to solve scientific problems. In the current version of the manuscript, the author's outlook on the data set is short, and it is difficult for readers to be inspired by this article.

5. As a data set article, there are many soil and vegetation data in the data set. Among them, there are 3,779 soil samples and 509 plant samples. The acquisition of these data is essential. I believe this is also the study of agricultural activities and crop water use in the arid regions of Central Asia. However, the introductory part of the article focuses on the indications of stable isotopes of precipitation to the water cycle. It is recommended that the relevant discussions on isotope ecology be added to the introductory part of the article.

Specific comments:

1. L11-12: I think time information should be added here.
2. L15-16: Arrange six observation systems in the order of upstream, midstream, and downstream.

3. L21: Change stable isotope data to water stable isotope data, the same in other parts of the manuscript, please keep the terminology consistent in the manuscript.
4. L24: "these " not "theae ".
5. L26: How to provide a scientific basis for the construction of water conservancy projects in arid areas? The author did not mention in the manuscript.
6. L37: The format of the references needs to be revised.
7. L41: "Hepp et al., 2015" not "Hepp et al. 2015", please pay attention to the punctuation in the manuscript.
8. L49: I think adding the control factors of other water body isotopes here will be a good combination with the previous precipitation isotope factors.
9. L62: Compared with traditional hydrological methods, what disadvantages are hydrogen and oxygen stable isotope technology? In the current manuscript, I have not seen critical comments on the stable isotopes of hydrogen and oxygen.
10. L101: Replace the description with exact data.
11. L114-115: The purpose of each observing system should be introduced.
12. L128: Information about the device used to collect precipitation, such as pictures, should be added.
13. L132: This sentence is repeated, and it is recommended to delete it.
14. L138-139: How to calculate the precipitation isotope value of that day after

sampling multiple times of precipitation in one day?

15. L150: Are all soil samples at 10cm intervals? I saw 5cm intervals in the data set.

16. L151-152: Are there any replicates for soil samples of each soil layer?

17. L155-157: How many plant species are sampled? How about the position of sampled stems in the canopy? What is the size of stem samples? "xylem stem" should be "stem".

18. L141: Which reservoir of water was measured?

19. L142: How is the groundwater sampled? What is the depth of water table at each

20. sampling point.

21. L145: "telling the date"?

22. L146-147: Where is the water sample placed?

23. L150: What types of soil are collected?

24. L177-190: The article did not mention the accuracy of the hydrogen and oxygen stable isotope data and the standard samples used in the experiment, which is missing for an article introducing the data.

25. L197: "to test the hydrological data" not "to test the isotopes data".

26. L199: How to screen experimental data?

27. L232: Both " δD " and " $\delta^2 H$ " are used in the manuscript. I suggest use one of them.

28. L233: "...we can found that...".

29. L264-266: This sentence lacks a subject.

30. L266-267: Please check the full names of LMWL and GMWL.

31. L278-281: What does the data in brackets mean?

32. L309: Both "underground weater" and "ground water" are used in the manuscript.

I suggest use one of them.

Figure 1: "Shiyang River system"? Is it "Shiyang River Basin"? Improve the clarity of the picture. The picture in the current manuscript is very blurry, so I can't get relevant information from the picture well.

Figure 3: I think it is easier to compare the isotopes of different water bodies on one picture.

Table 1: The unit is unclear. It is not clear whether the precipitation is annual or multi-year average? It is also unclear whether the temperature is air temperature? It is recommended to arrange the sampling points in order from upstream to downstream.

Table 2: Please change Table 2 to a three-line table.