Dear Reviewer:

Thank you for your letter and for the reviewer’s comments concerning our manuscript entitled "Stable water isotope monitoring network of different water bodies in Shiyang River basin, a typical arid river in China" (Manuscript Number: essd-2021-79).

According to the reviewer’s comments, we have carefully checked the data and research methods, and seriously modify our manuscript. The modified portions have been marked in red in the manuscript changes version. The primary corrections and the response to the reviewers’ comments are as follows.

Responses to the reviewer’s comments:

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.

Response: We have gradually improved it by carefully revising every recommendation you mentioned.

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.

Response: Thank you very much for your suggestion. We have added information from experiments and sample collection to the manuscript and the added content is as follows:

4 Data and Methods

4.1 Sample collection

4.1.1 Collection of precipitation

We have set up 16 weather stations in the Shiyang River Basin to collect precipitation, including rain barrels used to collect precipitation. The rain barrel is placed in an open outdoor area and consists of rain gear, funnel, water bottle and rain cup. The diameter of the rain gear is 20 cm, and the port of the device is horizontal. The height of the rain opening of the instrument is set to 70 cm from the ground level. We placed an anti-evaporation polyethene ball at the funnel's mouth and added a layer of paraffin oil to the bottom of the container to prevent evaporation from causing isotope fractionation. Immediately after each precipitation event, transfer the collected liquid precipitation to a 100 ml high-density sample bottle. Solid precipitation must be transferred to a high-density polyethene sample bottle after it becomes liquid water at room temperature (23°C). The sample bottle is sealed with Parafilm. The polyethene bottle is labelled simultaneously, indicating the date of collecting the sample, the type of precipitation (rain, snow, hail), and the volume of precipitation. Store the collected samples in a refrigerator at about 4°C for later analysis. For multiple precipitation events in a day, we sample by precipitation events.

4.1.2 Collection of surface water and groundwater

Polyethene bottles are used to collect surface water (rivers, lakes, reservoirs). Stratified sampling is carried out at different depths (surface layer, middle layer, bottom layer. Groundwater samples were obtained from the groundwater monitoring wells of the Shiyang River Basin Administration, China Hydrological Administration and Gansu Hydrological Administration. The bottle of the sample is sealed with parafilm film and then frozen until the experiment. Simultaneously, the polyethene bottle sample is labelled with the sample's date, sampling depth, and the stream and tributary stream. The collected water samples should be placed in places where the sunlight is not direct to avoid the evaporation of water, which would affect the validity of the data. The samples were taken back to the freezer in the laboratory for refrigeration within 10 hours.

4.1.3 Collection of soil and plant water

The soil sample is collected at a depth of 100cm, and samples are taken sequentially at 10cm intervals. The upper reaches of the Shiyang River Basin are mainly clay, and the middle and lower reaches are clay and sand, but sand is the main soil type. Table 2 shows the characteristics of soil in the farmland area of the Shiyang River Basin The soil samples collected were divided into two parts, put into a 50 ml glass bottle. The bottle mouth was sealed with parafilm membrane and transported to the observation station within 10 hours after the sampling date was marked for cryopreservation to test stable isotope data. The other part of the sample was placed in a 50 ml aluminium box and used the drying method to test the soil moisture content since 2019.

Table 2 Basic information of soil samples (Zhu et al., 2021)

Soil depth (cm)	Clay (%)	Silt (%)	Sand (%)	Soil bulk density (g/cm^3)
0-10	10.20	38.85	50.95	1.052
10-20	12.94	37.76	49.30	1.194
20-30	10.33	44.23	45.44	1.298
30-40	13.48	38.69	47.83	1.180
40-50	12.01	35.09	52.90	1.140
50-60	11.21	42.83	45.96	1.206
60-70	10.34	42.98	46.68	1.208
70-80	11.09	38.96	49.95	1.106
80-90	11.75	37.72	50.53	1.200
90-100	7.21	35.97	56.82	1.272

Plant sample collection: For trees and shrubs, we collect xylem, and for herbs, we collect non-green parts at the junction of rhizomes. When sampling, we use scissors to collect vegetation stems, peel off the bark, put them in 50ml glass bottles, seal them, and freeze them until experimental analysis. Table 3 shows the plant information collected in the Shiyang River Basin.

Table 3 Basic information of plant samples

Sampling points	Vegetation types	Sample size
BDZ	Agropyron cristatum	30g ±0.5
CQQ	Corn (stem), reed, jujube (Branches), dryland willow (Branches)	30g-100g
DT	Reed	30g±0.5
DTX	Spring wheat (stem), corn (root, stem)	30g±0.5
HJX	Willow (Branches)	100g±0.5
HLD	Qinghai Spruce (Branches)	100g±0.5
HLZ	Qinghai Spruce (Branches)	100g±0.5
WWPD	Corn (stem), wheat (stem)	30g±0.5
XYWG	Poplar (Branches), wheat	100g±0.5
YXB	Corn (stem)	30g±0.5
SWX	Corn, wheat (stem)	30g±0.5
LLL	Salsola purpurea	30g±0.5

4.1.4 Collection of meteorological data

The local meteorological data were obtained and recorded during the sampling period by the automatic weather stations (watchdog 2000 series weather stations) erected near the sample plot. Meteorological data include temperature (℃), relative humidity (%), atmospheric pressure (hPa), dew point temperature (℃) and precipitation amount (mm).

4.2 Experiment analysis

4.2.1 Water extraction experiment

We use vacuum condensation to extract soil and plant water. The extraction equipment used is LI-2100 automatic vacuum condensation extraction equipment. Before water extraction is performed on the soil and plants, the collected samples need to be taken out of the refrigerator to thaw, and each sample bottle should be stuffed with a small ball of cotton to prevent the water from evaporating. When extracting water, we set the extraction time to 150 minutes (180 minutes for plants), the temperature to 190°C, the upper limit of the vacuum pressure to 800pa, and the leakage rate to 0. The water evaporates from the soil or plant sample by heating it for a specified time and then freezes it in a liquid nitrogen cold trap. After the extraction is completed, the sample is thawed at room temperature and shaken. Use a 1ml syringe to extract the water sample into a labelled sample bottle, seal it and wait for the isotope experiment.

4.2.2 Isotope experiment

All the collected water samples were analyzed in the stable isotope laboratory of Northwest Normal University using liquid water isotope analysis (DLT-100, Los Gatos Research, USA). Each water sample and isotope standard sample were injected six times in a row. We discarded the first two injections and used the average of the last four times as the final result to eliminate the instrument memory effect. The result of the isotope measurement is expressed by the symbol "δ" and expressed in thousandths of the difference relative to the Vienna Standard Mean Ocean Water (Craig, 1961):

$$\delta_{sample}\,(‰) = \left[\left(\frac{R_{\text{sample}}}{R_{v\text{-}smow}}\right) - 1\right] \times 1000 \tag{1}$$

In the formula, Rsample is the ratio of $^{18}O/^{16}O$ or $^{2}H/^{1}H$ in the collected sample, Rv-smow is the ratio of $^{18}O/^{16}O$ or $^{2}H/^{1}H$ in the Vienna standard sample.The analytical accuracy of $\delta^{2}H$ and $\delta^{18}O$ are ±0.6‰ and ±0.2‰, respectively.

4.2.3 Modification of plant water isotope data

Suppose the water sample contains compounds with the same absorption characteristics of the same wavelength. In that case, it will lead to errors in the measurement of the laser liquid water analyzer, and the most likely pollutants to cause errors are methanol and ethanol. So using deionized water with different concentrations of pure methanol and ethanol, the combination of Los Gatos company LWIA - Spectral Contamination Identifier v1.0 Spectral analysis software (NB) to determine methanol and ethanol (BB) pollution degree of spectrum measurement, establishing the $\delta^{2}H$ and $\delta^{18}O$ correction method for the spectra of pollution (Meng et al., 2012; Liu et al., 2013). In the correction process, methanol and ethanol solution concentration configuration were similar to Meng's experiment (2012). Correction results for methanol its broadband measurements of NB metric logarithmic respectively with $\Delta\delta D$ and $\Delta\delta^{18}O$ are significantly quadratic curve relationship, respectively is:

$$\Delta\delta D = 0.018(\ln NB)^3 + 0.092(\ln NB)^2 + 0.388\ln NB + 0.785(R^2 = 0.991,\ p > 0.0001) \quad \text{(2-1)}$$

$$\Delta\delta^{18}\mathrm{O} = 0.017(\ln NB)^3 - 0.017(\ln NB)^2 + 0.545\ln NB + 1.356(R^2 = 0.998,\ p < 0.0001) \quad \text{(2-2)}$$

Its broadband measurements for ethanol correction results in BB metric and $\Delta\delta D$ and $\Delta\delta^{18}O$, a quadratic curve and linear relationship respectively, are:

$$\Delta\delta D = -85.67BB + 93.664(R^2 = 0.747, p = 0.026)(BB < 1.2) \quad \text{(2-3)}$$

$$\Delta\delta^{18}\mathrm{O} = -21.421BB^2 + 39.935BB - 19.089(R^2 = 0.769,\ p < 0.012) \quad \text{(2-4)}$$

4.3 Data quality

It has always been a difficult problem to control the experimental error to the minimum. We use Manner-Kendall to test meteorological and hydrological data, eliminate abnormal values, and use interpolation to obtain vacant values. For the isotope data, we first use the LIMA software to check the original isotope data. We stipulate that when one or more of the 6 data of a sample is marked in red, we call the sample an error sample, even though the sample is in the display on the liquid water analyzer is normal, and we will re-experiment the sample until it passes the LIMA software verification. Then we will use SPSS software to check the normality of the obtained isotope data. At present, our errors mainly come from the following aspects:

4.3.1 Sample collection

The error caused by precipitation sample collection mainly comes from the sampling personnel's failure to transfer the rainwater in the rain gauge or mixing two or more rainwaters after each precipitation event, which will cause the rainwater in the rain gauge to evaporate and affect the data.

The error is caused by the collection of vegetation samples mainly from the samples collection process, and the vegetation is exposed to the air, which causes the vegetation to fractionate water.

The error in collecting soil samples is that we collected soil samples that contained many microorganisms, which impact the data results.

4.3. 2 Experiment

The experimental error is mainly because we set the same moisture extraction parameters for samples with different soil characteristics. It is difficult to make post-mortem corrections for soil properties or the effects of extraction conditions because such information is rarely reported, and massive variability in method details is common (Walker et al., 1994). In addition, there are still measurement uncertainties during the extraction of water, which also come from the loss of water vapor during the vacuum of the extraction system and the non-temperature heating temperature, which will lead to experimental errors.

Our calibration of plant sample data only considers methanol and ethanol pollution, but the plant and soil water extracts may contain various other pollutants, leading to experimental errors. In addition, studies have shown that the mismatch between xylem and plant water sources is due to the fractionation of isotopes in the process of water absorption (Poca et al., 2019), which questioned the fact that plants do not undergo fractionation during the process of water absorption (Porporato, 2001; Meissne et al., 2014) this traditional view. However, there is no better solution, so we still use traditional methods to collect samples and conduct experiments.

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.

Response: Thank you very much for your suggestion. We have added reference standards for isotope experiments and isotope data to the manuscript, and the added content is as follows:

4.2.2 Isotope experiment

All the collected water samples were analyzed in the stable isotope laboratory of Northwest Normal University using liquid water isotope analysis (DLT-100, Los Gatos Research, USA). Each water sample and isotope standard sample were injected six times in a row. We discarded the first two injections and used the average of the last four times as the final result to eliminate the instrument memory effect. The result of the isotope measurement is expressed by the symbol "δ" and expressed in thousandths of the difference relative to the Vienna Standard Mean Ocean Water (Craig, 1961):

$$\delta_{sample}(‰) = \left[\left(\frac{R_{\text{sample}}}{R_{v\text{-}smow}}\right) - 1\right] \times 1000 \tag{1}$$

In the formula, Rsample is the ratio of $^{18}O/^{16}O$ or $^{2}H/^{1}H$ in the collected sample, Rv-smow is the ratio of $^{18}O/^{16}O$ or $^{2}H/^{1}H$ in the Vienna standard sample.The analytical accuracy of $\delta^{2}H$ and $\delta^{18}O$ are ±0.6‰ and ±0.2‰, respectively.

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.

Response: We have added a critical comment on stable isotope technology to the manuscript, adding the following content:

Simultaneously, the fractionation of isotopes also runs through every link of the water cycle (Song et al., 2007; Dansgaard, 1953, 1964). For example, Meißner et al. (2014) emphasized that the change of $\delta^{18}O$ largely depends on the soil type (Araguás-Araguás et al., 1995). Orlowskii et al. (2016) showed that incomplete water extraction in the cryogenic distillation process might fractionate water isotopes. Therefore, clay requires a longer extraction time and temperature to reduce the fractionation effect in the extraction process. In addition, a study by Sofer and Gat in 1975 showed that the formation of hydrated spheres around cations in aqueous solutions would fractionate the oxygen isotopes of the water. Gaj et al. (2017) showed that the isotope characteristics are biased due to a process different from Rayleigh distillation that we cannot reduce the effect caused by the mineral-water interaction entirely.

Studies have shown that physicochemical soil properties may cause the fractionation of hydrogen and oxygen in soil water (Meißner et al., 2014). Because we do not know whether the unstable hydrogen fraction during the low-temperature extraction process will cause isotope fractionation (Orlowski et al., 2016). In addition, we know little about the effect of soil microbial activity on the extracted water isotope results (Orlowski et al., 2018). However, from previous studies, it is still difficult to make post-correction in terms of soil properties or the effects of extraction conditions because such information is rarely reported, and huge variability in method details is common (Walker et al., 1994). We have always known these"problems" exist, but water vacuum extraction is still the standard method for extracting soil and plant water in ecological hydrology (Ingraham et al., 1992). In most plants, the isotopic composition of water does not change due to root absorption and transport through the stem xylem (White et al., 1985). However, more and more studies have shown a difference between the isotope composition of xylem water and plant water sources (Poca et al., 2019), and the fractionation can occur along the root water absorption pathway. This fact does not make the isotope method in the soil-plant-atmosphere useless to track water in the continuum, and δD and $\delta^{18}O$ can still be used similarly to study water absorption of various plants (Poca et al., 2019).

Araguás-Araguás, L., Rozanski, K., Gonfifiantini, R., and Louvat, D.: Isotope effects accompanying vacuum extraction of soil water for stable isotope analyses, Journal of Hydrolog, 168, 159–171, https://doi.org/10.1016/0022-1694(94)02636-P, 1995.

Orlowski, N., Breuer, L., and McDonnell, J. J.: Critical issues with cryogenic extraction of soil water for stable isotope analysis. Ecohydrology, 9(1) 1-5, 2016.

Sofer, Z., and Gat, J.: The isotope composition of evaporating brines: effect of the isotopic activity ratio in saline solutions. Earth Planet. Sci. Lett. 26 (2), 179–186, 1975.

Gaj, M., Kaufhold, S., Königer, P., Beyer, M., and Himmelsbach, T.: Mineral mediated isotope fractionation of soil water. Rapid Communications in Mass Spectrometry, 31(3), https://doi.org/10.1002/rcm.7787, 2017.

Meißner, M., Köhler, M., Schwendenmann, L., Hölscher, D., Dyckmans, J.: Soil water uptake by trees using water stable isotopes (d^2H and $d^{18}O$) a method test regarding soil moisture, texture and carbonate. Plant and Soil 376 (1–2), 327–335, https://doi.org/10.1007/s11104-013-1970-z, 2014.

Orlowski, N., Breuer, L., Angeli, N., Boeckx, P., and Mcdonnell, J. J.: Inter-laboratory comparison of cryogenic water extraction systems for stable isotope analysis of soil water. Hydrology and Earth System Sciences Discussions, 1-36. https://doi.org/10.5194/hess-2018-128, 2018.

Walker, G. R., Woods, P. H., and Allison, G. B.: Interlaboratory comparison of methods to determine the stable isotope composition of soil water, Chem. Geol., 111, 297–306, https://doi.org/10.1016/0009-2541(94)90096-5, 1994.

Walker, G. R., Woods, P. H., and Allison, G. B.: Interlaboratory comparison of methods to determine the stable isotope composition of soil water, Chem. Geol., 111, 297–306, https://doi.org/10.1016/0009-2541(94)90096-5, 1994.

Poca, M., Coomans, O., Urcelay, C., Zeballos, S. R , and Boeckx, P.: Isotope fractionation during root water uptake by acacia caven is enhanced by arbuscular mycorrhizas. Plant and Soil (3), https://doi.org/10.1007/s11104-019-04139-1, 2019.

Ingraham, N. L., and Shadel, C.: A comparison of the toluene distillation and vacuum/heat methods for extracting soil water for stable isotopic analysis. Journal of Hydrology, 140(1), 371-387, https://doi.org/10.1016/0022-1694(92)90249-U, 1992.

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.

Response: We have added relevant content to the summary and outlook of the manuscript. The added content is as follows:

This study collected the stable isotope values of different water bodies in the Shiyang River Basin of China's arid inland river basin from since 2019. As of 2019, we have collected 6,760 isotope data one by one and formed a data set. Through the analysis of different water stable isotopes in the Shiyang River Basin, the main conclusions reached are: (1) The slope and intercept of the LMWL in the Shiyang River Basin are both smaller than GMWL, which is the same as that of the study area located in the arid inland of Northwest China. When raindrops fall to the surface, they are subject to strong evaporation. (2) The main source of replenishment in the Shiyang River Basin is precipitation. The stable isotopes in the Shiyang River Basin show periodic fluctuations, depleted in winter and spring and enriched in summer and autumn. (3) The fluctuation of the stable isotope of lake water is greater than that of other water bodies, and the coefficient of variation is the largest. This is related to the large seasonal differences in the evaporation. (4) The change of groundwater lags behind that of surface water. This data set provides a new basis for studying the stable water isotopes of different water bodies in the inland river basins of China. Through these data, we can study the water conservancy connection between different water bodies, study the impact of human activities on water cycle, and provide certain guidelines for the rational use of water resources in arid regions.

The accuracy of the isotope data we obtained is relatively high, but we have ignored some factors that lead to experimental errors in the experiment. For example, we have soil microorganisms in the collected soil samples, and the activity of soil microorganisms may affect the experiment. During the extraction experiment, we did not consider the nature of the soil and set the experimental parameters of all soil samples to be the same. However, the eco-hydrology and soil science communities still lack standard norms and suggestions on these issues. Studies have shown that new continuous in situ measurements of the isotopic composition of soil and plant water may overcome the problem of isotopic fractionation observed when we extract water. However, the fractionation problem caused by different soil characteristics during the experiment can only be studied through a large number of experiments in the future.

As our field observations proceed, our data set will be updated year by year. To improve the dataset, we encourage users of the dataset to contact the author for suggestions.

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.

Response: We have added the relevant content of isotope ecology to the manuscript, and the added content is as follows:

Most surface water comes directly from runoff from rainfall, groundwater discharge, or a combination of these two water bodies (Surinaidu et al.,2012; Hutchinset al., 2018). Once surface water is exposed to rivers or lakes, it may change the isotope values of surface water through evaporative fractionation (Gremillion et al., 2000; Andrew et al., 1992). The lake has more time for direct contact with the atmosphere due to its long residence time, making lakes more susceptible to evaporation than rivers, leading to isotope changes (Ambrosetti et al., 2003). Because surface water easily changes its isotope value through evaporation, the observation of surface water is usually regarded as limited in practice (Gat and Airey, 2006). Generally speaking, we measure surface water for a specific purpose, such as finding local leak sources (for example, from a dam) (Zhu et al., 2021) or determining the larger-scale hydraulic connection between surface water and groundwater (Atkinson et al., 2015). In the farmland ecosystem, whether it is atmospheric precipitation or irrigation water, it can only provide the water needed for crop growth after it is converted into soil water (Zhu et al., 2021). Soil water is the centre of mutual transformation of atmospheric precipitation, surface water, groundwater and plant water and has an essential impact on the regional water cycle (Liu et al., 1997). Although technology development has made it easier for us to analyze stable isotopes in soil water, the fractionation mechanism of soil water isotope is affected by factors such as local climate, soil texture, hydrological conditions and human activities. Therefore, more research is needed to accurately understand the soil water activity of farmland and the law of crop water absorption.

Ambrosetti, W., Barbanti, L., and Sala, N.: Residence time and physical processes in lakes. Journal of Limnology, 62(1), 1-15. https://doi.org/10.4081/jlimnol.2003.s1.1, 2003.

Andrew, H. L., Chris, B. J., Phillip, M. G., and John, O. M.: A stable isotope investigation of groundwater-surface water interactions at lake tyrrell, victoria, australia. Chemical Geology, 96(1-2), 19-32, https://doi.org/10.1016/0009-2541(92)90119-P, 1992.

Atkinson, A. P., Cartwright, I., Gilfedder, B. S., Hofmann, H., Unland, N. P., Cendón, D. I ., and Chisari, R.:A multi-tracer approach to quantifying groundwater inflows to an upland river; assessing the influence of variable groundwater chemistry. Hydrological Processes, https://doi.org/10.1002/hyp.10122, 2015.

Gat, J. R., and Airey, P. L.: Stable water isotopes in the atmosphere/biosphere/lithosphere interface: scaling-up from the local to continental scale, under humid and dry conditions. Global and Planetary Change, 51(1/2), 25-33, https://doi.org/10.1016/j.gloplacha.2005.12.004, 2006.

Gremillion, P., and Wanielista, M.: Effects of evaporative enrichment on the stable isotope hydrology of a central florida (USA) river. Hydrological Processes, 14(8), 1465-1484, 2000.

Hutchins, M. G., Abesser, C., Prudhomme, C., Elliott, J. A., Bloomfield, J. P., Mansour, M. M., and Hitt. O, E.: Combined impacts of future land-use and climate stressors on water resources and quality in groundwater and surface waterbodies of the upper Thames river basin, UK. Science of the Total Environment, 631-632, 962, https://doi.org/10.1016/j.scitotenv.2018.03.052, 2018.

Liu, C. M.: Research on the interface process of water movement in the soil-plant-atmosphere system. Acta Geographica Sinica, 64(4), 366-373, https://doi.org/10.11821/xb199704011, 1997.

Surinaidu, L., Bacon, C., and Pavelic, P.: Agricultural groundwater management in the upper bhima basin, India: current status and future scenarios. Hydrology and Earth System Sciences, 9(9), https://doi.org/ 10.5194/hess-17-507-2013, 2012.

Zhu, G. F., Sang, L.Y., Zhang, Z. X., Sun, Z. G., Ma, H. Y., Liu, Y. W., Zhao, K. L., Wang, L., and Guo Huiwen.: Impact of landscape dams on river water cycle in urban and peri-urban areas in the Shiyang River Basin: Evidence obtained from hydrogen and oxygen isotopes: Journal of Hydrology, https://doi.org/10.1016/J.JHYDROL.2021.126779, 2021.

Zhu, G. F.,Yong, L. L., Zhang, Z. X., Sun, Z. G.,Wan, Q. Z., Xu, Y. X., Ma, H. Y., Sang, L. Y., Liu, Yu. W., Wang, L., Zhao, K. K., and Guo, H.W.: Effects of plastic mulch on soil water migration in arid oasis farmland: Evidence of stable isotopes: Catena, https://doi.org/10.1016/J.CATENA.2021.105580, 2021.

Specific comments:

1. L11-12: I think time information should be added here.

Response: We have added the time information, the revised content is as follows:

We have established a stable water isotope monitoring network since 2015 in the Shiyang River Basin in China’arid northwest.

2. L15-16: Arrange six observation systems in the order of upstream, midstream, and downstream.

Response: We have adjusted the order of these six observing systems according to your suggestion, and the revised content is as follows:

The monitoring station covers the upper, middle and lower reaches of the river basin, with six observation systems: river source area, oasis area, ecological restoration area, reservoir canal system area, oasis farmland area, and salinized area.

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.

Response: We have made changes based on your suggestions, and the revised content is as follows:

The data set includes stable water isotope data, meteorological data and hydrological data in the Shiyang River Basin.

4. L24: "these " not "theae ".

Response: We have made changes based on your suggestions, and the revised content is as follows:

This observation network’s construction provides us with stable water isotopes data and hydrometeorological data, and we can use these data for hydrological and meteorological related scientific research.

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.

Response: We have added a description of the purpose of setting up six observation systems in the manuscript. Among them is a mention of the impact of water conservancy projects on arid areas: we used stable isotopes to analyze the effect of reservoirs on plant water use strategies and water conservancy projects on the water cycle in arid regions.We studied the isotope characteristics of different water bodies in cities and suburbs in the upper and middle reaches of the Shiyang River Basin from 2015 to 2019 and assessed the hydrological effects of urban landscape dams at the basin scale in arid regions where water resources are scarce and ecosystems are fragile. Our results of evaporation loss rate show that landscape water is 0-5% higher. Moreover, the cumulative effect of multiple landscape dams has led to a large loss of water resources in arid regions. The study also shows that evaporation is an essential factor leading to changes in the isotope composition of landscape water in the Shiyang River Basin. Therefore, we believe that the potential adverse effects of urban landscape dams in arid regions should be highly considered in long-term water sustainability planning (Zhu et al., 2021).

Zhu, G. F., Sang, L.Y., Zhang, Z. X., Sun, Z. G., Ma, H. Y., Liu, Y. W., Zhao, K. L., Wang, L., and Guo Huiwen.: Impact of landscape dams on river water cycle in urban and peri-urban areas in the Shiyang River Basin: Evidence obtained from hydrogen and oxygen isotopes: Journal of Hydrology, https://doi.org/10.1016/J.JHYDROL.2021.126779, 2021.

6. L37: The format of the references needs to be revised.

Response: We have revised the reference based on your comment, and the revised content is as follows:

Simultaneously, the fractionation of isotopes also runs through every link of the water cycle (Song et al., 2007; Dansgaard, 1953, 1964)

7. L41: "Hepp et al., 2015" not "Hepp et al. 2015", please pay attention to the punctuation in the manuscript.

Response: We have made changes based on your comments, and the revised content is as follows:

Stable isotopes of hydrogen and oxygen in water have been widely used in the water cycle (Gibson et al., 2010; Penna et al., 2013; Timsic et al., 2014; Evaristo et al., 2015; Negrel et al., 2016), paleoclimate and paleoenvironmental evolution (Wei et al., 1994; Speelman et al., 2010; Steinman et al., 2010; Hepp et al., 2015), reconstruction of pale plateau height (Thompson et al., 2000; Yao et al., 2008; Xu et al., 2015; Li et al., 2017) and other fields.

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.

Response: We have added control factors for other water bodies according to your suggestions, and the added content is as follows:

Most surface water comes directly from runoff from rainfall, groundwater discharge, or a combination of these two water bodies (Surinaidu et al.,2012; Hutchinset al., 2018). Once surface water is exposed to rivers or lakes, it may change the isotope values of surface water through evaporative fractionation (Gremillion et al., 2000; Andrew et al., 1992). The lake has more time for direct contact with the atmosphere due to its long residence time, making lakes more susceptible to evaporation than rivers, leading to isotope changes (Ambrosetti et al., 2003). Because surface water easily changes its isotope value through evaporation, the observation of surface water is usually regarded as limited in practice (Gat and Airey, 2006). Generally speaking, we measure surface water for a specific purpose, such as finding local leak sources (for example, from a dam) (Zhu et al., 2021) or determining the larger-scale hydraulic connection between surface water and groundwater (Atkinson et al., 2015). In the farmland ecosystem, whether it is atmospheric precipitation or irrigation water, it can only provide the water needed for crop growth after it is converted into soil water (Zhu et al., 2021). Soil water is the centre of mutual transformation of atmospheric precipitation, surface water, groundwater and plant water and has an essential impact on the regional water cycle (Liu et al., 1997). Although technology development has made it easier for us to analyze stable isotopes in soil water, the fractionation mechanism of soil water isotope is affected by factors such as local climate, soil texture, hydrological conditions and human activities. Therefore, more research is needed to accurately understand the soil water activity of farmland and the law of crop water absorption.

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Zhu, G. F.,Yong, L. L., Zhang, Z. X., Sun, Z. G.,Wan, Q. Z., Xu, Y. X., Ma, H. Y.,

Sang, L. Y., Liu, Yu. W., Wang, L., Zhao, K. K., and Guo, H.W.: Effects of plastic mulch on soil water migration in arid oasis farmland: Evidence of stable isotopes: Catena, https://doi.org/10.1016/J.CATENA.2021.105580, 2021.

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.

Response: According to your suggestion, we have added the disadvantages of hydrogen and oxygen stable isotope technology compared with traditional hydrological methods. The added content is as follows:

Simultaneously, the fractionation of isotopes also runs through every link of the water cycle (Song et al., 2007; Dansgaard, 1953, 1964). For example, Meißner et al. (2014) emphasized that the change of $\delta^{18}O$ largely depends on the soil type (Araguás-Araguás et al., 1995). Orlowskii et al. (2016) showed that incomplete water extraction in the cryogenic distillation process might fractionate water isotopes. Therefore, clay requires a longer extraction time and temperature to reduce the fractionation effect in the extraction process. In addition, a study by Sofer and Gat in 1975 showed that the formation of hydrated spheres around cations in aqueous solutions would fractionate the oxygen isotopes of the water. Gaj et al. (2017) showed that the isotope characteristics are biased due to a process different from Rayleigh distillation that we cannot reduce the effect caused by the mineral-water interaction entirely.

Studies have shown that physicochemical soil properties may cause the fractionation of hydrogen and oxygen in soil water (Meißner et al., 2014). Because we do not know whether the unstable hydrogen fraction during the low-temperature extraction process will cause isotope fractionation (Orlowski et al., 2016). In addition, we know little about the effect of soil microbial activity on the extracted water isotope results (Orlowski et al., 2018). However, from previous studies, it is still difficult to make post-correction in terms of soil properties or the effects of extraction conditions because such information is rarely reported, and huge variability in method details is common (Walker et al., 1994). We have always known these"problems" exist, but water vacuum extraction is still the standard method for extracting soil and plant water in ecological hydrology (Ingraham et al., 1992). In most plants, the isotopic composition of water does not change due to root absorption and transport through the stem xylem (White et al., 1985). However, more and more studies have shown a difference between the isotope composition of xylem water and plant water sources (Poca et al., 2019), and the fractionation can occur along the root water absorption pathway. This fact does not make the isotope method in the soil-plant-atmosphere useless to track water in the continuum, and δD and $\delta^{18}O$ can still be used similarly to study water absorption of various plants (Poca et al., 2019).

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Sofer, Z., and Gat, J.: The isotope composition of evaporating brines: effect of the isotopic activity ratio in saline solutions. Earth Planet. Sci. Lett. 26 (2), 179–186, 1975.

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10. L101：Replace the description with exact data.

Response: We have made changes based on your suggestions, and the revised content is as follows:

The precipitation in the Shiyang River Basin is mainly from July to September, and the average relative humidity in summer (46.79%)and autumn (44.79%)is higher than that in winter(43.82%) and spring(32.18%).

11. L114-115: The purpose of each observing system should be introduced.

Response: We have added the purpose of setting up six observation systems to the manuscript, and the added content is as follows:

Currently, our research using six observing systems includes but is not limited to the following: (1) River source area: We use the stable isotopes to analyze the influence of water vapor source and altitude on precipitation isotope and analyze Hydrological transmission time in arid regions. (2) Oasis area: We use the stable isotope to analyze the impact of human activities on the water cycle. (3) Reservoir system area: We use the stable isotopes to analyze the impact of reservoirs on plant water use strategies and the impact of water conservancy projects on the water cycle in arid regions. (4) Oasis farmland area: We use the stable isotope to analyze the effects of different agricultural models on soil water movement in arid oasis areas. (5) Ecological restoration area: We use stable isotopes to analyze water sources and water use strategies in riparian wetland artificial ecological forests. (6) Salinization area: We use stable isotopes to analyze the evaporation, leakage and storage of soil moisture in different vegetation areas in the lower reaches of the Shiyang River.

12. L128: Information about the device used to collect precipitation, such as pictures, should be added.

Response: We use a rain gauge to collect precipitation. The picture of the rain gauge is shown below:

Rain measuring cylinder and measuring cup

13. L132: This sentence is repeated, and it is recommended to delete it.

Response: We delete this sentence from the manuscript based on your suggestion.

14. L138-139: How to calculate the precipitation isotope value of that day after sampling multiple times of precipitation in one day?

Response: For water samples with multiple precipitations in a day and multiple samplings in a precipitation event, the stable isotope value in the precipitation of that day is the weighted average of the precipitation of all water samples of the day, calculated with the following formula:

$$\overline{\delta X_p} = \frac{\sum P_i \delta X_i}{\sum P_i}$$

Where P_i is the precipitation of the i-th water sample in a day, δX_i isthe stable isotope value of oxygen or hydrogen in the first water sample on that day.

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

Response: In all soil sampling points, except for the sampling point of DTX, the surface soil is collected in the form of 0-5cm, 5-10cm, and the surface soil of the other soil sampling points is collected in the form of 0-10cm, 10-20cm. Collected in this way in DTX is to analyze the agricultural activities better and crop water use research in the area.

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

Response: Yes, it is. Two soil samples were collected for each soil layer. Part of the soil samples were dried to measure the soil moisture content, and the other part was used to conduct isotope experiments to obtain soil water isotope values.

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”.

Response: In our 12 vegetation sampling sites, we collected a total of 10 vegetation. Among them, the vegetation we collected in BDZ was Agropyron cristatum; the vegetation we collected in CQQ were Corn (leaf), reed, jujube (Branches), dryland willow (Branches); the vegetation we collect in DT is Reed; the vegetation we collect in DTX is Spring wheat (stem), corn (root, stem, leaf); in HJX we collect ear vegetation is Willow (Branches); in HLD The vegetation we collect with HLZ is Qinghai Spruce (Branches); the vegetation we collect in WWPD is Corn (leaf), wheat (leaf); the vegetation we collect in XYWG are Poplar (Branches), wheat; the vegetation we collect in YXB The thing is Corn (leaf); the vegetation we collect in SWX is Corn, wheat (leaf); the vegetation we collect in LLL is Salsola purpurea. Our sampled stems are located at the bottom right of the tree canopy, which means we are collecting the oblique branches of the tree. The sample size of Qinghai spruce and poplar we collected is about 50cm, and the sample size of herbaceous plants such as

Salsola is about 10cm. We have changed "xylem stem" to "stem". In addition, we have also added the basic information table of vegetation samples, the newly added table is as follows:

Table 3 Basic information of plant samples

Sampling points	Vegetation types	Sample size
BDZ	Agropyron cristatum	30g ±0.5
CQQ	Corn (stem), reed, jujube (Branches), dryland willow (Branches)	30g-100g
DT	Reed	30g±0.5
DTX	Spring wheat (stem), corn (root, stem)	30g±0.5
HJX	Willow (Branches)	100g±0.5
HLD	Qinghai Spruce (Branches)	100g±0.5
HLZ	Qinghai Spruce (Branches)	100g±0.5
WWPD	Corn (stem), wheat (stem)	30g±0.5
XYWG	Poplar (Branches), wheat	100g±0.5
YXB	Corn (stem)	30g±0.5
SWX	Corn, wheat (stem)	30g±0.5
LLL	Salsola purpurea	30g±0.5

18. L141: Which reservoir of water was measured?

Response: Among our sampling points, there are 3 sampling points in our reservoirs, Hongyashan Reservoir(HYSSK), Xiying Reservoir(XYSK) and Nanying Reservoir (NYSK).

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

Response: Groundwater samples were obtained from the groundwater monitoring wells of the Shiyang River Basin Administration, China Hydrological Administration and Gansu Hydrological Administration. The sampling interval is monthly. Groundwater samples were taken from the groundwater monitoring wells of the Shiyang River Basin Administration, the China Hydrological Bureau and the Gansu Provincial Hydrological Bureau. Distributed in the Shiyang River Basin, the sampling interval is monthly. There are few groundwater sampling points in the upper reaches of the Shiyang River. The groundwater depth is between 15m and 30m, the groundwater depth in the middle reaches between 2.5m and 60m, and the groundwater depth in the downstream is between 2.5m and 30m.

20. L145: "telling the date"?

Response: We have revised this sentence in the manuscript, and the revised content is as follows:

Simultaneously, the polyethene bottle sample is labelled with the sample's date, sampling depth, and the stream and tributary stream

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

Response: We put the collected samples in a refrigerator at about 4° C so that we can perform isotope testing later.

22. L150: What types of soil are collected?

Response: The upper reaches of the Shiyang River Basin are mainly clay, and the middle and lower reaches are clay and sand, but sand is the main soil. Table 2 shows the characteristics of soil in the farmland area of the Shiyang River Basin.

Table 2 Basic information of soil samples (Zhu et al., 2021)

Soil depth (cm)	Clay (%)	Silt (%)	Sand (%)	Soil bulk density (g/cm^3)
0-10	10.20	38.85	50.95	1.052
10-20	12.94	37.76	49.30	1.194
20-30	10.33	44.23	45.44	1.298
30-40	13.48	38.69	47.83	1.180
40-50	12.01	35.09	52.90	1.140
50-60	11.21	42.83	45.96	1.206
60-70	10.34	42.98	46.68	1.208
70-80	11.09	38.96	49.95	1.106
80-90	11.75	37.72	50.53	1.200
90-100	7.21	35.97	56.82	1.272

Zhu, G. F.,Yong, L. L., Zhang, Z. X., Sun, Z. G.,Wan, Q. Z., Xu, Y. X., Ma, H. Y., Sang, L. Y., Liu, Yu. W., Wang, L., Zhao, K. K., and Guo, H.W.: Effects of plastic mulch on soil water migration in arid oasis farmland: Evidence of stable isotopes: Catena, doi:10.1016/J.CATENA.2021.105580, 2021.

23. 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.

Response: We have added relevant content to the manuscript, and the added content is as follows:

4.2.2 Isotope experiment

All the collected water samples were analyzed in the stable isotope laboratory of Northwest Normal University using liquid water isotope analysis (DLT-100, Los Gatos Research, USA). Each water sample and isotope standard sample were injected six times in a row. We discarded the first two injections and used the average of the last four times as the final result to eliminate the instrument memory effect. The result of the isotope measurement is expressed by the symbol "δ" and expressed in thousandths of the difference relative to the Vienna Standard Mean Ocean Water (Craig, 1961):

$$\delta_{sample}(‰) = \left[\left(\frac{R_{\text{sample}}}{R_{v\text{-}smow}}\right) - 1\right] \times 1000 \tag{1}$$

In the formula, Rsample is the ratio of $^{18}O/^{16}O$ or $^{2}H/^{1}H$ in the collected sample, Rv-smow is the ratio of $^{18}O/^{16}O$ or $^{2}H/^{1}H$ in the Vienna standard sample.The analytical accuracy of $\delta^{2}H$ and $\delta^{18}O$ are ±0.6‰ and ±0.2‰, respectively.

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

Response: We have revised this sentence according to your suggestion, and the revised content is as follows:

We use Manner-Kendall to test meteorological and hydrological data, eliminate abnormal values, and use interpolation to obtain vacant values. For the isotope data, we first use the LIMA software to check the original isotope data.

25. L199: How to screen experimental data?

Response: We stipulate that when one or more of the 6 data of a sample is marked in red, we call the sample an error sample, even though the sample is in the display on the liquid water analyzer is normal, and we will re-experiment the sample until it passes the LIMA software verification.

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

Response: Thank you very much for your suggestion. We have unified the hydrogen in the article as "δD".

27. L233："...we can found that...".

Response: We have revised this sentence according to your suggestion, and the revised content is as follows:

In Fig. 3, we can found that.

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

Response: We have revised this sentence according to your suggestion, and the revised content is as follows:

According to the precipitation isotope data of the Shiyang River Basin from January 2016 to December 2019 (Figure 5), we used the least square method to obtain the local meteoric water line equation (LMWL):

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

Response: We have revised the full names of LMWL and GMWL, and the revised content is as follows:

According to the precipitation isotope data of the Shiyang River Basin from January 2016 to December 2019 (Figure 5), we used the least square method to obtain the local meteoric water line equation (LMWL): $\delta D = 7.65\delta^{18}O + 9.75$, compared to the global meteoric water line equation (GMWL),

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

Response: "By comparing the slope and intercept of the relation expressions $\delta^{18}O$ and δD of GMWL and different water bodies, it can be seen that, as far as the slope is concerned, precipitation is the highest (7.65), followed by groundwater (5.11), lake water is the lowest (2.14). There is little difference between the slope of precipitation and groundwater, which means there is a mutual recharge relationship. " The number in parentheses in this sentence represents the slope. The slope of the LMWL is 7.65, the slope of the GWL is 5.11, and the slope of the LWL is 2.14. "In terms of intercept (d), the precipitation was the highest (9.75), followed by the river (-8.44). " The number in parentheses in this sentence indicates the intercept, the intercept of LMWL is 9.75, and the intercept of RWL is -8.44.

31. L309: Both "underground weater" and "ground water" are used in the manuscript. I suggest use one of them.

Response: Thank you very much for your suggestion.We unified the term as "groundwater" in the article.

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.

Response: The Shiyang River system is not the Shiyang River Basin. The Shiyang River system refers to the tributaries and main streams of the Shiyang River Basin. We have improved the clarity of the picture, and the revised picture is as follows:

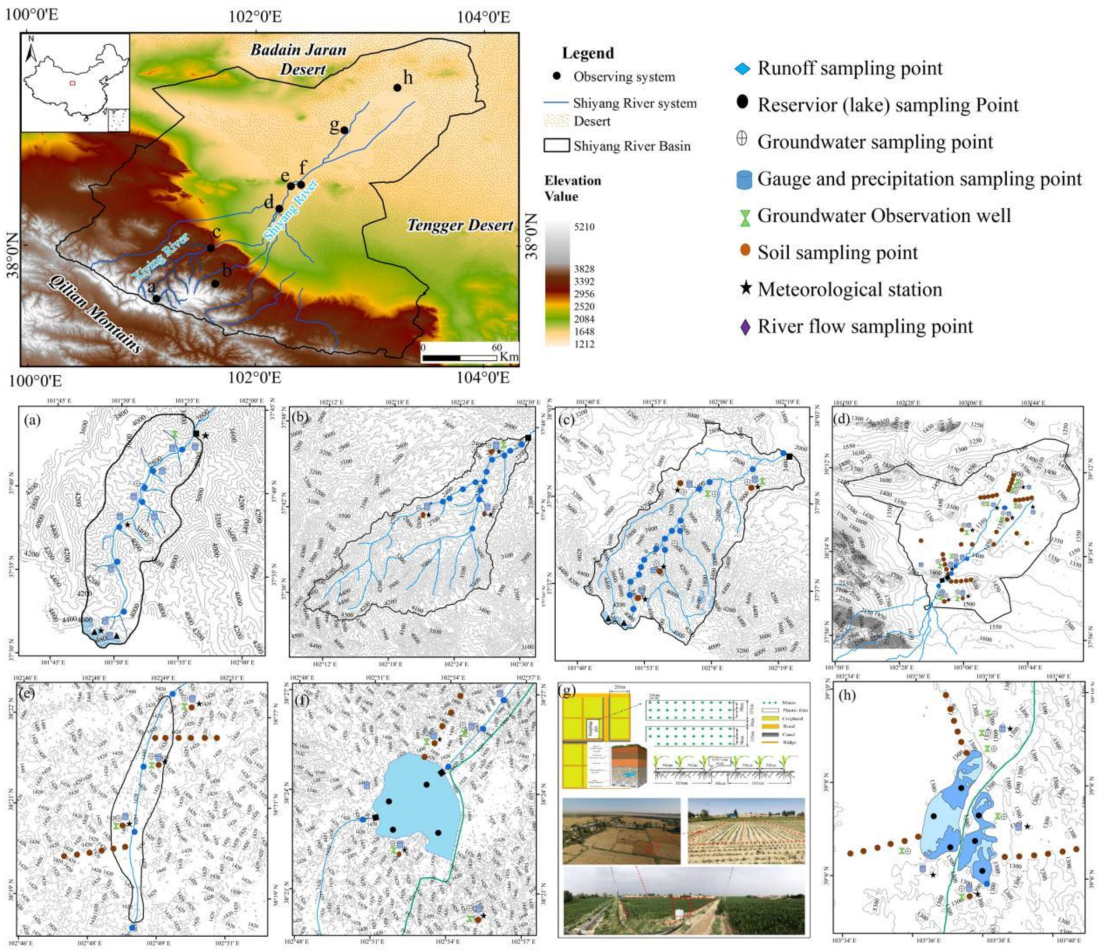

Figure 3: I think it is easier to compare the isotopes of different water bodies on one picture.

Response: We have put the isotopes of different water bodies on the same picture according to your suggestion. The revised picture is as follows:

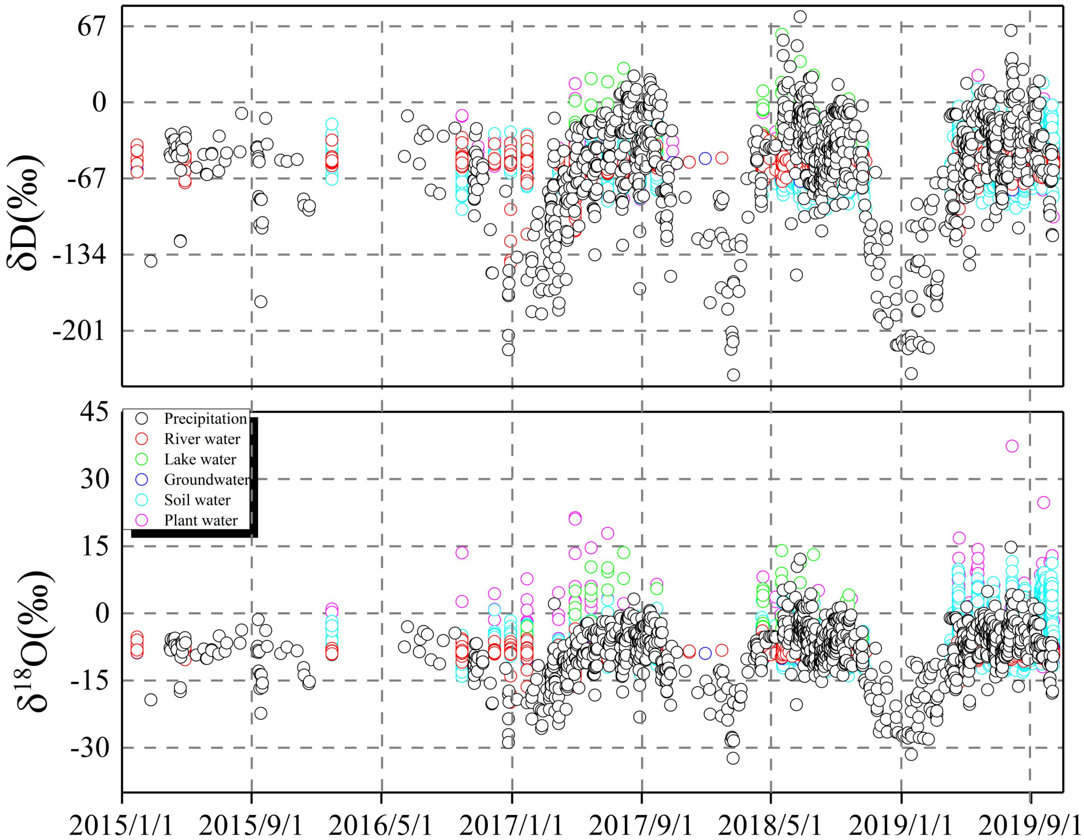

Table 1: The unit is unclear. It is not clear whether the precipitation is annual or multi-year average? It is also unclear whether the temperature is air temperature? It is recommended to arrange the sampling points in order from upstream to downstream.

Response: In Table 1, precipitation is the average annual precipitation, and temperature is the average annual air temperature. We have revised Table 1 according to your suggestion, and the revised Table 1 is as follows:

Table 1 List of basic parameters

Abbreviation	Full name	Longitude	Latitude	Elevation (m)	Average annual air temperature (℃)	Average annual precipitation (mm)	Sampling type (abbreviation)	Sampling type (full name)	Location
QHLYXM	Qinghai Forestry Project	101°51'	37°32'	3899	-	-	hs	river water	a
MK	Colliery	101°51'	37°33'	3647	-0.20	595.10	hs	precipitation	a
BDZ	Transformer Substation	101°51'	37°33'	3637	-	-	tr, zw, hs	soil, plant, river water	a
LLL	Lenglong Ling	101°28'	37°41'	3500	5.78	350.34	Js, zw	precipitation, plant water	a
SDHHC	Tunnel Junction	101°50'	37°34'	3448	-	-	hs	river water	a
LXWL	Winding Road	101°50'	37°34'	3305	-	-	hs	river water	a
NQ	Ningqian	101°49	37°37'	3235	-	-	hs	river water	a
SCG	Ningtanhe Middle East	101°50'	37°38'	3068	-	-	hs, js, tr	river water, precipitation,	a

	branch mixed water							soil	
MTQ	Wood Bridge	101°53'	37°41'	2741	-	-	hs	river water	a
HLZ	Ranger Stations	101°53'	37°41'	2721	3.24	469.44	hs, js, tr, zw, dxs	river water, precipitation, soil, plant, groundwater	a
SCLK	Three-way Intersection	101°55'	37°43'	2590	-	-	hs	river water	a
JTL	Nine Ridge	102°02'	37°51'	2267	-	-	dxs	groundwater	a
WGQ	The Bridge of the Cultural Revolution	102°07'	37°53'	2174	-	-	hs	river water	a
BGH	Binggou River	102°17'	37°40'	2872	5.28	-	hs, tr,	river water, soil	b
LKS	Two Pine	102°17'	37°40'	2832	5.69	-	hs, tr	river water, soil	b
QSHSY	Spring River	102°22'	37°38'	2747	-	-	qs	spring water	b
JCLK	Intersection	102°20'	37°41'	2544	-	-	hs, tr	river water, soil	b
QXZ	Meteorological Station	102°20'	37°42	2543	3.34	510.56	js, dxs	precipitation, groundwater	b
YHRJ	A family	102°20'	37°42'	2543	-	-	hs	river water	b
SGZZ	Sigou stckade	102°23'	37°40'	2492	10.34	675.54	hs	river water	b
SYQ	Laboratory Area	102°22'	37°42'	2438	-	-	hs, tr	river water, soil	b
JZGD	Construction Site	102°25'	37°41'	2303	-	-	hs	river water	b
XCL	Small Valley	102°24'	37°43'	2267	-	-	hs	river water	b
NCHHLH	South Nancha River	102°26'	37°43'	2163	-	-	hs	river water	b
HLD	Confluence	102°26'	37°44	2146	-	-	hs, tr, zw	river water, soil, plant	b
NYSKRK	Nanying Reservoir	102°29'	37°47'	1955	7.82	330.16	hs	river water	b
XBZ	Xuebai Toen	103°01	38°32'	1387	10.77	-	js	precipitation	b
GGKFQ	Reform and Opening Bridge	101°58'	37°46'	2590	-	-	hs	river water	c
HJX	Huajian Township	102°00'	37°50'	2390	7.65	262.64	hs, dxs, js, tr	river water, groundwater, precipitation, soil	c
XYSK	Xiying Reservoir	102°12'	37°54'	2058	-	-	hs	river water	c
XYWG	Xiying Wugou	102°10'	37°53'	2097	7.99	197.67	hs, js, tr, zw	river water, precipitation, soil, plant	c
XYZ	Xiying Town	102°26'	37°58'	1748	10.44	491.35	js	precipitation	c
WW	Wuwei	102°37'	37°53'	1581	5.23	300.14	hs	river water	c
ZZXL	Zhuaxi Xiulong	103°20'	37°18'	3556	-2.37	500.17	js	precipitation	d
QLX	Qilian Township	102°42'	38°08'	3394	5.13	300.15	js, qs	precipitation, spring water	d
BHZ	Protection Station	102°29'	38°09'	2787	-	-	dxs	groundwater	d
SCG	Shangchigou	102°25'	38°03'	2400	7.28	377.13	js, hs, dxs	precipitation, river water, groundwater	d
YXB	Yangxia Dam	102°41'	38°01'	1489	10.76	-	js, dxs, tr, zw	precipitation,	d

								groundwater, soil, plant	
WWPD	Wuwei Basin	102°42'	38°06'	1467	-	-	js, dxs, tr, zw	precipitation, groundwater, soil, plant	d
JDT	Jiudun Beach	102°45'	38°07'	1464	10.54	-	js	precipitation	d
HSH	Hongshui River	102°45'	38°13'	1454'	-	-	hs	river water	d
CQQ	Caiqi Bridge	102°45'	38°13'	1443	5.63	300.26	dxs, hs, tr, zw	groundwater, river water, soil, plant	d
HGG	Hongqi Valley	102°50'	38°21'	1421	8.34	113.16	js, dxs	precipitation, groundwater	d
MQBQ	Minqin Dam	103°08'	39°02'	1400	8.33	113.19	tr	soil	d
XXWGZ	Xiyin Wugou Township	102°58'	38°29'	1393	-	-	dxs	groundwater	d
SWX	Suwu Township	103°05'	38°36'	1372	9.82	155.84	dxs, tr, zw, hs	groundwater, soil, plant, river water	d
XJG	Xiajiangou	102°42'	38°07'	1200	9.36	110.18	dxs	groundwater	d
DT	Dongtan	102°47'	38°16'	1434	8.90	240.05	hs,tr, zw	river water, soil, plant	e
HYSSK	Hongyashan Reservior	102°53'	38°24'	1416	7.81	100.17	hs, dxs, tr	river water, groundwater, soil	f
BDC	Beidong Township	103°02'	38°32'	1367	9.52	155.45	dxs	groundwater	g
DTX	Datan Township	103°14'	38°46'	1349	11.49	-	js, dxs, soi, zw, hs	precipitation, groundwater, soi, plant, river water	g
QTH	Qingtu Lake	103°36'	39°03'	1313	7.86	110.79	js, dxs, ls, tr	precipitation, groundwater, lake water, soil	h

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

Response: We have changed Table 2 to a three-line table based on your suggestion, and the revised table is as follows:

Table 2 Comparison of water bodies δ^{18}O and δD in the Shiyang River Basin from 2015 to 2019

Water Type	δD(‰)				δ^{18}O(‰)			
	Min	Max	Average	Coefficient of variation	Min	Max	Average	Coefficient of variation
Precipitation	-238.62	75.41	-54.63	-0.85	-31.22	14.79	-8.39	-0.71
River Water	-94.14	-28.89	-53.37	-0.12	-13.98	-3.44	-8.62	-0.11
Lake Water	-57.84	13.56	-18.43	-1.11	-9.86	30.01	1.96	4.4
Underground Water	-76.99	-43.72	-52.42	-0.10	-10.44	-6.57	-8.80	-0.08
Soil Water	-102.95	11.81	-59.39	-0.20	-13.94	11.62	-7.61	-0.37
Plant Water	-86.41	23.87	-48.15	-0.32	-11.43	37.37	-2.27	-2.54