Overall comments:

The manuscript presented huge field works of soil water/ice sampling in the permafrost area of the Headwater region of Three Rivers, obtaining 1140 samples. The isotope data collection in the Three-Rivers headwater region is a meaningful work. The manuscript elucidated the soil isotopic characteristics of different soil layers under different topographic gradients, vegetation and soil characteristics, estimated the contribution of different water sources in the soil water, and discussed influence factors on soil water sources. This work provides data support for the ecological restoration and maintenance of the Headwater region of the Three Rivers. Nonetheless, many results in the article are too repetitive and the discussion provides many new results but no real discussion on what was learned in this study. There are still many issues that need to be carefully modified.

Featured comments:

1. The contribution of precipitation and ground ice to soil water was quantified. But the soil water mixing process was very complex, processes of glacier/snow melting, permafrost freezing and thawing, as well as the water exchange between the surface and subsurface were not well considered and discussed.

2. The spatial and temporal differences of isotope data in different water sources are significant, and the uncertainty should be estimated in the quantification of the contribution of different water sources in the soil water. How to consider the heterogeneity of soil properties across such a huge study area? How did the sampling process distinguish the soil water or ice?

3. The influence of various factors on the soil water is difficult to distinguish by simple correlation analysis. What's the meaning of those correlation analysis in the discussion with very low correlation coefficients? How to identify the mutual influence from several factors on the soil water and also the interrelationship among various factors?

4. The authors should carry out a comprehensive language edit of the paper to make it concise and clear.

5.The formatting needs to be carefully laid out, including the formatting of references, etc.

Major issues:

Study Area:

1. It is suggested to introduce the types of frozen soil and soil properties in the study area. The introduction of the study area is not specific enough and a little broad.

Sampling methods:

1.Repeated sampling methods are not recommended.

Results:

1. The result part is a little long and the style of writing is not recommended in this part.

2. There are too many speculative descriptions, and it would be better to show more definite conclusions.

3. About point 6, please confirm that the runoff segmentation result only refers to July in the study area? The sampling time described is from June 2019 to July 2020. Why does the author only analyse the water source in a single month? Is it the average value of the whole basin? More discoveries may be made according to watershed zoning.

Discussion:

1. Some contents of the discussion part and the results are repeated, and it is not recommended to put too much data.

2. It is suggested to compare and discuss the research results of other scholars in this regard, and it

is not recommended to put the research views of others behind the findings of the article.

Conclusion:

1. The conclusion is repeated with the summary. It is not recommended to put too much data and refine it again.

Figures and Tables:

1. Please note the format of the table. You can see the requirements of submission.

2. The correlation information on the figure has been discussed in the article, so it is recommended not to repeat it.

References:

1. References are repeated and check if there is a problem with the format.

2. Please check that the DOI and title of some references do not correspond.

Minor issues:

1.Line229 Please explain the relationship between supra-permafrost water and soil water.

2.Line 224, Line235, Line243 repeat the narration.

3.Line 344 The relationship with the previous logical reasoning is unclear.

4.Line 410 Please explain what the same pattern is.

Technical corrections:

1. Pay attention to the format of the article, the upper and lower symbols of the text should be unified, and there are small details such as punctuation.

2.It may be necessary to explain the definition of soil water in this paper, the relationship between soil water and supra-permafrost water, and the relationship between the depth of soil water research section and the depth of active layer.

3. It is suggested to put forward the dominant influencing factors affecting the soil water content of different soil layers in permafrost according to different regions. There are many influencing factors mentioned in the article, but there is no focus.

4. This paper repeatedly mentioned the effects of evaporation and soil water migration on soil water isotopes, and there are few explanations for the isotopic characteristics of the soil layer near the underground ice.

5. Please explain that only two end elements are considered in the runoff division, whether the contribution of snow and ice meltwater is considered, or why snow and ice meltwater is not considered.

6. The part of runoff segmentation need to add uncertainty analysis.

7. At present, the distribution of water content in each soil layer under different conditions reflected by isotope monitoring is beneficial or harmful to the ecological environment. It is suggested to supplement it, so as to promote the goal of better maintaining the ecological environment.