

Response to editor

We are very grateful for your valuable comments. We have thoroughly revised the manuscript by addressing your comments. The review comments are listed below and marked in blue, followed by the responses marked in black. The sentences added in the revised manuscript were marked in red and italic.

Kind regards,

Xiaobo He

(on behalf of the co-authors)

Thank you for submitting a revised version of your manuscript and replying to the comments from the referee. I have one final clarification that I would like you to make, following up on one of the referee comments and your response. You have now clarified that soil moisture and temperature were measured at several depths, however, Figure 2 shows only one line for soil moisture and one line for soil temperature - which depths are used in this figure, and in Figure 5?

Response: Thank you for the comments. The soil moisture and temperature data that we used in Figure 2 and Figure 5 were the average value over all soil layers. Because we believe that the average value can represent the average soil temperature and moisture of the whole soil profile. We have added this statement in Figure 2 and Figure 5 of the revised manuscript as follows:

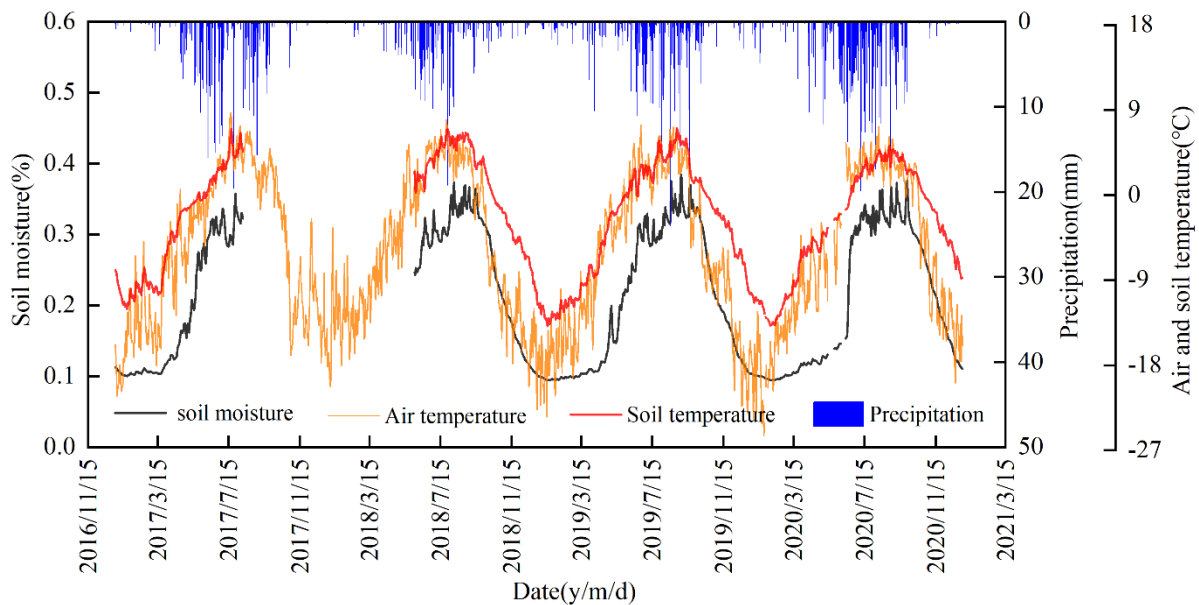


Figure 2. Temporal variation of soil moisture, soil temperature, air temperature, and precipitation from 2017 to 2020. The soil moisture and temperature data were the average value over all soil layers (5, 20, 40, 60, 100, 160, 220, and 300 cm).

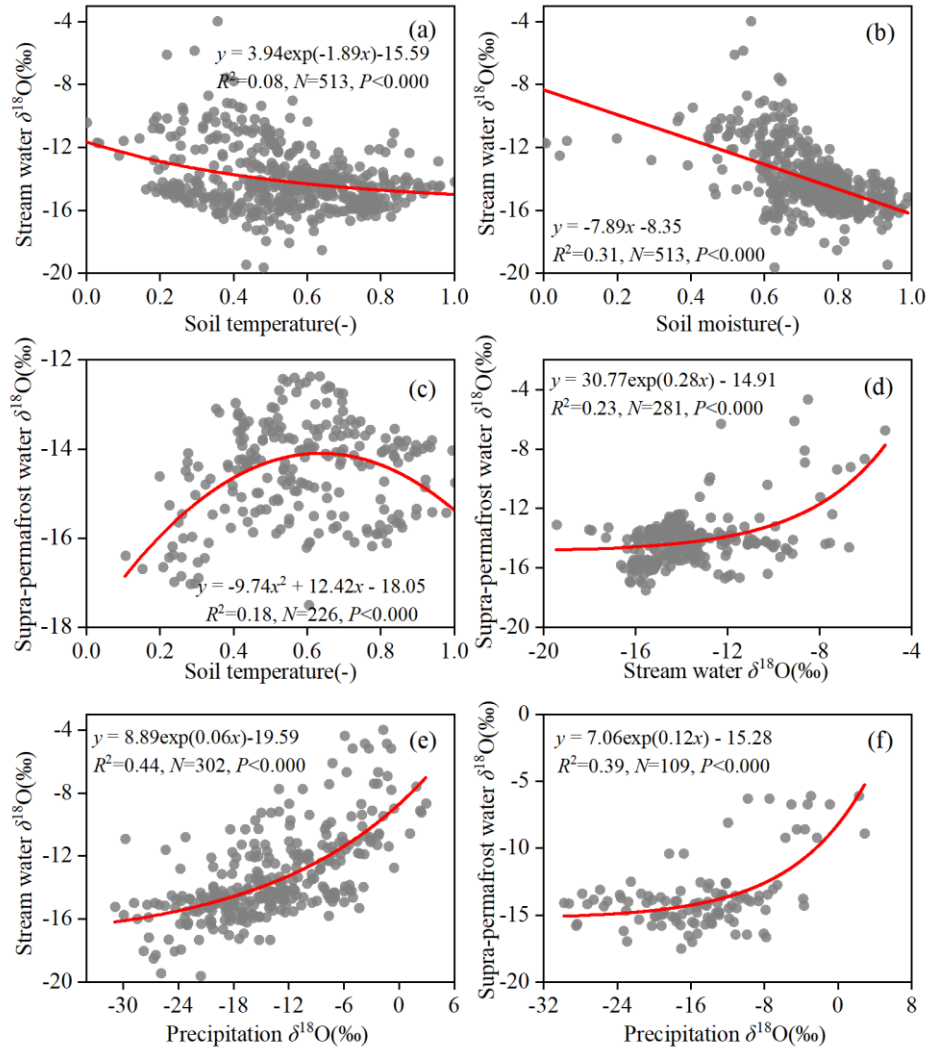


Figure 5. Correlation analysis between stable isotopes and influencing factors. (a) and (b) correlations between stream water $\delta^{18}\text{O}$ with: soil temperature and moisture, respectively; (c) and (d) correlations between supra-permafrost water $\delta^{18}\text{O}$ with: soil temperature and stream water $\delta^{18}\text{O}$, respectively; (e) and (f) correlations between precipitation $\delta^{18}\text{O}$ with: stream and supra-permafrost water $\delta^{18}\text{O}$, respectively; Red line is the fitted line; Soil moisture and temperature data used in correlation analysis were normalized. "-" presents dimensionless. The soil moisture and temperature data were the average value over all soil layers (5, 20, 40, 60, 100, 160, 220, and 300 cm).