We would like to thank you for the positive and constructive feedback, which help improving the quality of the paper. You have pointed out issues that required further improvements or explanations. Below we addressed each specific issue and the manuscript has been updated accordingly.

1. The Introduction should be rewritten to highlight the significance of this study. That is the global map of hydraulic conductivity/permeability lacks realistic data points in TP, such as SoilksatDB (Gupta et al, ESSD, 2020) and permeability database (Gleeson et al., GRL, 2011). This study could fill the scientific and data gaps in a global view.
Gupta, S., Hengl, T., Lehmann, P., Bonetti, S., & Or, D. (2020). SoilKsatDB: global soil saturated hydraulic conductivity measurements for geoscience applications. Earth System Science Data Discussions, 1-26.
Gleeson T, Smith L, Moosdorf N, Hartmann J, Dürr HH, Manning AH, van Beek L P H, Jellinek A M 2011. Mapping permeability over the surface of the Earth. Geophysical Research Letters [J], 38: n/a-n/a.

Many thanks for this comment. A paragraph has been added and the introduction has been modified.

Efforts have been made to develop the global map of permeability (Gleeson et al., 2014; Gleeson et al., 2011), hydraulic conductivity (Gupta et al., 2020; Montzka et al., 2017), groundwater table depth (Fan et al., 2013), groundwater volume and distribution (Gleeson et al., 2016). Nevertheless, due to the remoteness and harsh environment over TP (Yao et al., 2019), the above studies lack reliable in situ data in TP.

`````` The paper is focusing on field hydrogeological, hydrogeophysical surveys, and corresponding datasets, aiming to fill the scientific and data gap in TP from a global view.``````

2. Line 43: Since the hydraulic conductivity is a key parameter for the groundwater system, I would like to suggest using the groundwater model or integrated surface-groundwater model, instead of IHM.

Thanks for this suggestion. IHM has been replaced by integrated surface-groundwater model.

3. Line 72: "Some investigations have been done on the TP based on DEMs." Investigations on what? How these previous works are related to your study? Need to clarify.

Thanks for this comment. The paragraph has been modified:
Investigations on various fields, such as geomorphology, climate change, glacier, and permafrost have been carried out on the TP based on different DEMs. Zhang et al. (2006) analyzed the geomorphic characteristics of the Minjiang drainage basin with SRTM (Shuttle Radar Topography Mission) data. Wei and Fang (2013) assessed the trends of climate change and temporal-spatial differences over the TP from 1961–
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2010, with a generalized temperature zone–elevation model and SRTM. Ye et al. (2015) calculated the glacier elevation change in the Rongbuk catchment from 1974 to 2006 based on topographic maps and ALOS. Niu et al. (2018) mapped permafrost distribution throughout the Qinghai–Tibet Engineering Corridor based on ASTER Global DEM. However, different DEMs used in different studies may lead to potential inconsistencies for understanding relevant physical processes. For Maqu catchment, it is crucial to understand the accuracy of different DEMs, since it controls the flow field of groundwater in this mountainous region. Therefore, we evaluate the accuracy of DEMs with a Real-time Kinematic-Global Positioning System (GPS-RTK), which has not been given attentions in many studies over the TP.

4. Line 94: what is the data source for geomorphology and geology? Need references.

Thanks for pointing out this issue. The sentence has been revised:

Based on the field survey of geomorphology and geology, the catchment can be divided into two parts.

5. Figure 1: Since not every reader is familiar with the position of TP, it is necessary to add the position of TP in the China map and its neighboring countries.

Thanks for this suggestion, Figure 1 has been modified accordingly.

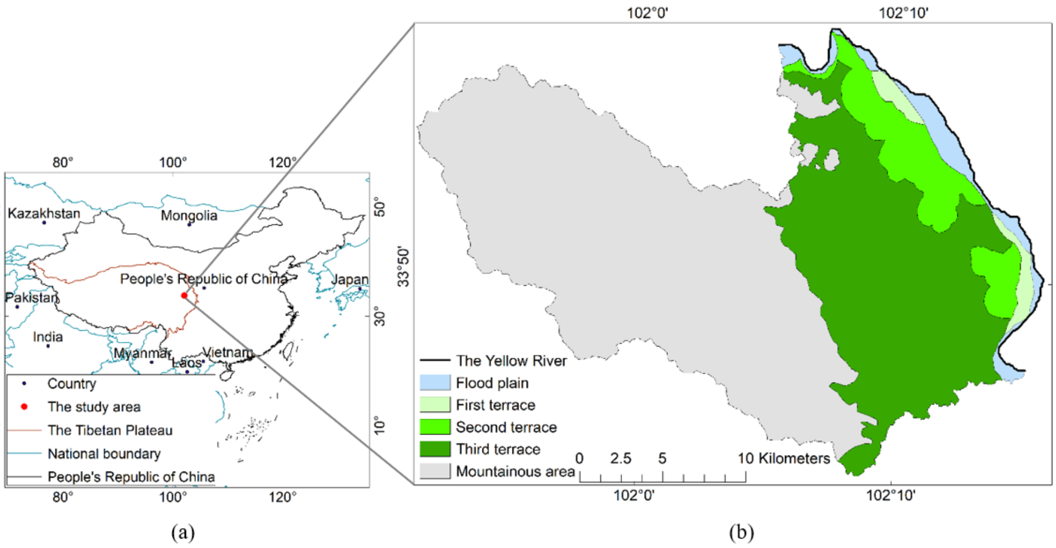


Figure 1. The geographical location of Maqu catchment in the TP and geomorphologic map. (a) The geographical location and boundary of the TP (Zhang et al., 2014a; Zhang et al., 2014b), and the geographical location of Maqu catchment; (b) The geomorphologic map of Maqu catchment.

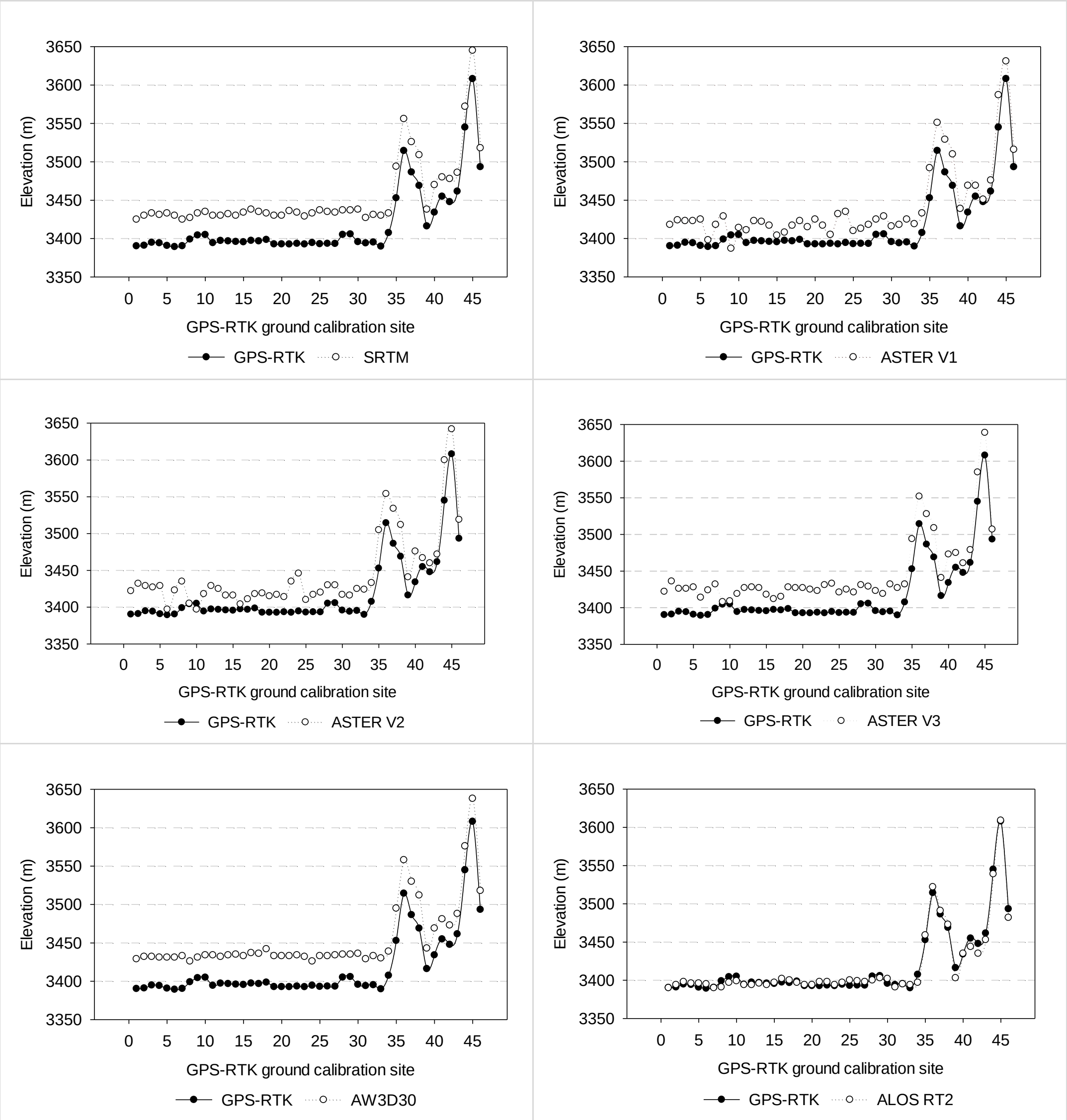
6. Lines 113-120: Authors should give an explanation of workflow for Figure 2 rather than only listing methods. It is redundant to describe the time for each survey because all this information has been listed in Table 1.

Thanks for this comment, this paragraph has been revised:
Figure 2 shows the fieldwork workflow towards establishing a hydrogeological conceptual model, which includes the borehole core lithology analysis, altitude survey, soil thickness measurement, hydrogeological survey, and hydrogeophysical survey

(Table 1 and Fig. 2). Yellow boxes in Fig. 2 represent the fieldwork, green boxes represent the results of fieldwork, which finally contribute to the hydrogeological conceptual model shown in a blue box. The obtained information on lithology, soil thickness, and elevation provides basic knowledge in the study area. Hydrogeological measurements of water table depth and hydraulic conductivity provide important input that can be used to deduce the direction and rate of regional groundwater flow. For hydrogeophysical results, magnetic susceptibility ensures the suitability of applying MRS, which provides information on water content and transmissivity. Furthermore, ERT not only provides information on underground resistivity but also integrated with MRS for retrieving water content and transmissivity. The locations of the surveys and measurements are shown in Fig. 3 and Fig. 4.

7. Figure 6: It should redraw Figure 6 using professional tools which are used for scientific graphs in publication format.

Thanks a lot. Figure 6 has been redrawn:



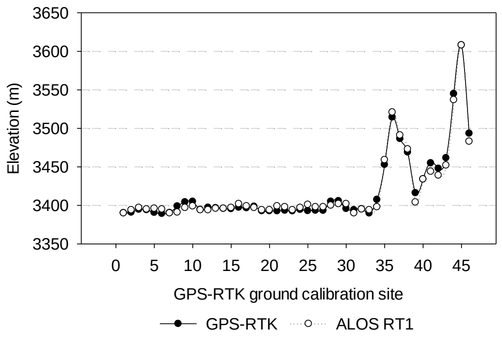


Figure 6. GPS-RTK elevations vs. DEM elevations.

8. Figure 8: There must be something wrong with water table depth (a) and (b). The eastern boundary is the Yellow River, and the elevation is decreasing from west to east, so the value of water table depth is supposed to be big in the western areas and small close to the river. However, the water table depth is 19m near to river while 0 m in the alluvial plain?? Same to Figure 9. Besides, the chromatogram should be changed to better present the gradient of results.

Thanks for the query and suggestion. The eastern boundary is the Yellow River, and the elevation is decreasing from west to east. This is likely to result in big hydraulic heads in the west and small hydraulic heads in the east, so that groundwater flows from the west to the east according to Darcy's law. As for the water table depth, which is the distance from the ground surface to the groundwater table, is not necessarily big in the west and small in the east. The chromatogram has been adjusted to better present the gradient of the groundwater table in Figure 8.

The chromatogram of the 2019 water table depth (m) in Figure 9 has been removed to avoid confusion.

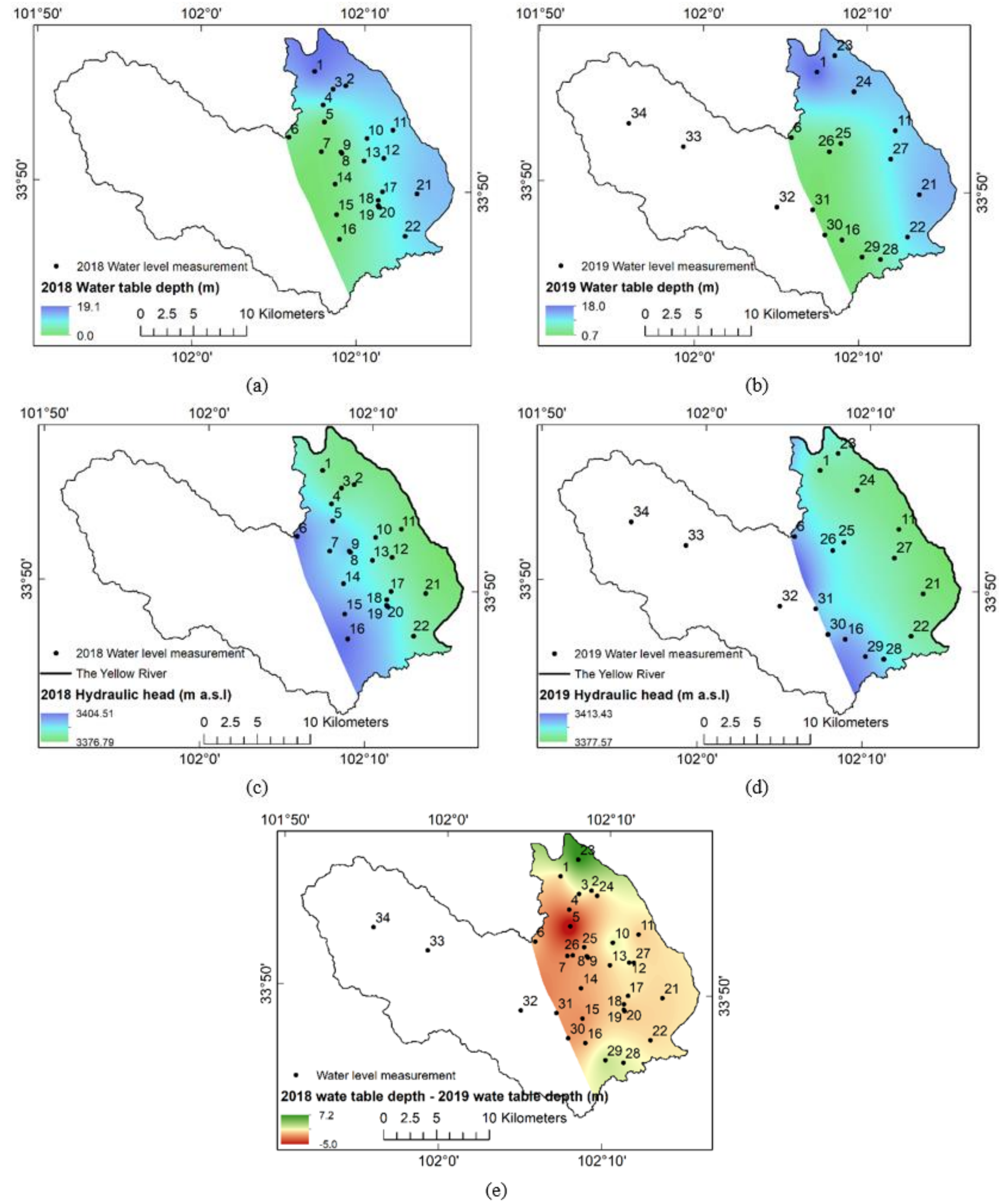


Figure 8. Water table depths (m) and piezometric heads (m a.s.l) of east Maqu catchment. (a) and (b) are water table depths (m) of east Maqu catchment in 2018 and 2019, respectively; (c) and (d) are piezometric heads (m a.s.l) of eastern Maqu catchment in 2018 and 2019, respectively; (e) is the difference (m) of water table depth between 2018 and 2019. Numbers from 1 to 34 are identification numbers of boreholes listed in Table 6.

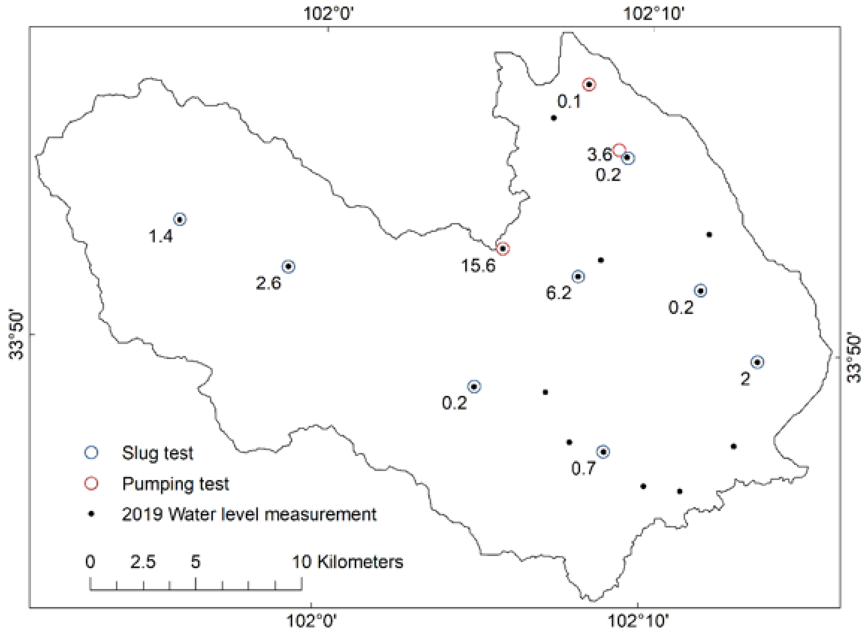


Figure 9. Hydraulic conductivity (m.d^{-1}) obtained from aquifer tests, east of Maqu catchment.

9. Section 4.4.2, Why did authors put equations of aquifer tests in the part of Results and Discussion? This should move to the Method part.

Thanks for this comment. The equations have been moved to section 3.4.2 Aquifer tests part.