Overall response:

We would like to thank the editor and two anonymous reviewers for their suggestions, which are helpful to improve this manuscript. During this revision, we have considered the suggestions seriously by correcting the typos, revising figures, unifying the units, and finally improving the writing. The revisions are marked using the “Track Changes” function in the revised manuscript, and the point-by-point responses to the reviewers’ comments are listed below.

Referee Comments#1:

General comments:

I appreciate the authors' efforts in addressing my concerns and making revisions. While the efforts are appreciated, I found the writing has not been polished in this revision, so the writing still needs more efforts.

Response: Thanks very much for your kind consideration of this manuscript. During this revision, we have considered your suggestions seriously by correcting the typos, revising figures, unifying the units, and finally improving the writing.

For example, "m^3/m^3" has been changed as "$m^3\ m^{-3}$", and "mm/year" has been changed into "mm a^{-1}".

Furthermore, "~" has been changed into "-".

Below are a few examples:

1. L285-286: it is not clear what do you mean by "considering the chancing tendancy", and what do you mean by "conditional constraints of satellite sensors". Please revise the writing. It is better to consult native speakers.

Response: "considering the chancing tendancy" has been changed into "with respect to temporal variation", and "conditional constraints of satellite sensors" has been changed into "which may be because of large percentage of missing data".

Line 287-288: *ESA CCI yields the worst seasonal cycle results with respect to temporal variation, which may be because of large percentage of missing data.*

2. L374-380: change to "and found that xxx was possibly due to xxx".

Response: Corrected as suggested.

Line 380-382: *Beck et al. (2021) found that ESA CCI SM performed better in eastern Europe in terms of high-frequency fluctuations, and found that the overall performance of ESA CCI may be not so good was possibly due to the incorporation of ASCAT that performed less well.*

3. L374-308: change to "due to the incorporation of ASCAT that performed less well"

Response: Corrected as suggested.

Line 380-382: *Beck et al. (2021) found that ESA CCI SM performed better in eastern Europe in terms of high-frequency fluctuations, and found that the overall performance of ESA CCI may be not so good was possibly due to the incorporation of ASCAT that performed less well.*

4. L390-392: it is incorrect to say "which gives one the explanation", what do you mean

exactly? It needs to be revised.

Response: This sentence has been changed into “which gives one of the explanations”.

Line 393-395: *The largest bias of precipitation overestimation using the hourly 31-km-resolution ERA5 reanalysis data is found over the Tibetan and Yun-Gui Plateaus, the North China Plain, and the southern mountains, which gives one of the explanations why reanalysis products represent the worst performance over the NC region.*

L385-366: change to "have shown"

Response: Corrected.

Line 360-361: *Previous studies have shown that soil moisture is influenced by the combination of precipitation and evaporation, in which land surface evaporation is linked with temperature and surface net radiation (Jasper et al., 2006; Harmsen et al., 2009).*

L401-403: I don't think "maybe not improve more than" is correct in English. Please revise.

Response: “maybe” has been changed into “may”.

Line 413-415: *Beck et al. (2021) concluded that assimilating satellite soil moisture estimate may not improve more than increasing model resolution or improving soil moisture simulation ability, which is in line with our results.*

Other issues with very vague wordings:

L385-366: due to which special soil type? Please offer more details.

Response: “special soil type” has been changed into “large fraction of sand”.

Line 366-367: *The correlation coefficient is low for all meteorological variables in the NW region, which may be attributed to the large fraction of sand there.*

L306-308: what "some other meteorological variables"? These words are too vague and please clarify/revise.

Response: The detailed information about the meteorological variables has been added.

Line 308-310: *The information of soil moisture autocorrelation gives hint for the assimilation of surface soil moisture into land surface models (Crow and Van den Berg, 2010), in which during summer and winter, the influence of meteorological elements (e.g., precipitation, temperature, evaporation, etc) should be considered more.*

These are just some examples captured here. I suggest the authors to thoroughly revise the writing by consulting native speakers or professional academic writing, before publishing their paper.

Referee Comments#2:

General comments:

The authors have clearly responded to all the questions raised before. Now I have no more suggestions. After correcting some typos, I am willing to support the publication of the manuscript. For example, in Fig.2 the units should be represented properly using a superscript.

Response: Thanks very much for your kind consideration of this manuscript. During this revision, we have considered your suggestions seriously by correcting the typos, revising figures, unifying the units, and finally improving the writing. For example, in Fig.2 the units have been represented properly using a superscript. Furthermore, some issues with very vague wordings have been resolved.

For example, "m^3/m^3" has been changed as "$m^3\ m^{-3}$", and "mm/year" has been changed into "mm a^{-1}".

Furthermore, "~" has been changed into "-".