
Overall evaluation:

Most of my concerns are well addressed in the revised manuscript. However, part of the new added content is verbose, and therefore the language needs to be improved greatly. I think this paper can be considered for publication after the following issues are resolved.

Response:

Thanks for your suggestions. We have modified the verbose sentences to make the description concise according to your suggestions. We also rectified the typographical errors and added the full name of CLDAS when it appears for the first time.

Specific issues:

[1] Line 59, what is the “Land-Atmosphere interaction region”? Land-Atmosphere interactions happen everywhere on Earth, so how to identify this process? Based on my understanding, I think it should be “Land-Atmosphere interaction hotspot region”.

Response:

Thanks for your suggestions. We have revised the description to “Land-Atmosphere interaction hotspot region”.

[2] Line 65, “while the opposite holds true” maybe not correctly used here.

Response:

Thanks for your suggestions. Following the third suggestion, we have concise the relevant description to “The significant influence of soil moisture on local precipitation has been extensively studied, revealing regional variations in the underlying mechanisms. Additionally, soil moisture can also trigger the atmospheric teleconnection wave trains or inducing large-scale circulation anomalies through impacting surface energy balance, which subsequently manifest as non-local and large-scale climate effects.” In line 68-73.

[3] The new added content (Line 59-68, 94-108) is very lengthy, please modify the sentences to make the description concise.

Response:

Thanks for your valuable comments and suggestions. Following your suggestions, we have revised the content in line 59-68 of the manuscript from “Spennemann et al. (2018) emphasized the significance of the identification of Land-Atmosphere interaction region, ... strengthen the atmospheric Rossby wave train, and ultimately result in abnormal summer precipitation patterns in South China.” to

“The significant influence of soil moisture on local precipitation has been extensively studied, revealing regional variations in the underlying mechanisms (Douville et al., 2001; Cioni and Hohenegger, 2017). Additionally, soil moisture can also trigger the atmospheric teleconnection wave trains or inducing large-scale circulation anomalies through impacting surface energy balance, which subsequently manifest as non-local and large-scale climate effects (Gao et al., 2020).” In line 68-73.

The relevant reference is:

Douville, H., Chauvin, F., Broqua, H.: Influence of soil moisture on the Asian and African monsoons. Part I: Mean monsoon and daily precipitation, *J. Climate*, 14, 2381-2403, [https://doi.org/10.1175/1520-0442\(2001\)014%3C2381:IOSMOT%3E2.0.CO;2](https://doi.org/10.1175/1520-0442(2001)014%3C2381:IOSMOT%3E2.0.CO;2), 2001.

Cioni, G., Hohenegger, C.: Effect of soil moisture on diurnal convection and precipitation in large-eddy simulations, *J Hydrometeorol*, 18, 1885-1903, <https://doi.org/10.1175/JHM-D-16-0241.1>, 2017.

Gao, C., G. Li, H. Che, and H. Yan.: Interdecadal change in the effect of spring soil moisture over the Indo-China Peninsula on the following summer precipitation over the Yangtze River basin, *J. Climate*, 33, 7063-7082, <https://doi.org/10.1175/JCLI-D-19-0754.1>, 2020.

And the content of line 94-108 have been revised from “Therefore, a lot of studies strive to acquire the precise spatial structural information of soil moisture to the greatest extent possible. Pauwels et al. (2001) ... particularly in key regions like the Qinghai-Tibet Plateau where land-air interactions are significant and there are large spatial variations of soil moisture.” to

“Therefore, a lot of studies strive to incorporate spatial structure information from soil moisture observation to land data assimilation, to enhance the accuracy of spatial pattern of soil moisture to the greatest extent possible (Pauwels et al., 2001; Han et al., 2012; Zhou et al., 2019). Enhancing soil moisture levels is of utmost importance; however, it is equally crucial to acquire a more precise comprehension of the spatial distribution of soil moisture for effective management strategies, particularly in key regions like the Qinghai-Tibet Plateau where land-air interactions are significant and there are large spatial variations of soil moisture.” in line 108-114.

[4] Line 167, CLM3 should be “CLM 3.0”.

Response:

We have revised “CLM3” to “CLM 3.0” in line 167.

[5] Line 278, the full name of CLDAS should be given when it appears for the first time.

Response:

We have added the full name of CLDAS (CMA Land Data Assimilation System) in line 278.