

Interactive comment on “A global long-term (1981–2000) land surface temperature product for NOAA AVHRR” by Jin Ma et al.

Anonymous Referee #2

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This manuscript reports a global land surface temperature dataset derived from the historical NOAA AVHRR data. According to my understanding, the most important contribution is that this global dataset was built over a long period of time from 1981 to 2000, and is needed by the scientific community in the field of geoscience. The second contribution is that the authors also conducted orbit-drift correction for the land surface temperature. With this dataset, I believe that the scientific community in the field of geoscience can better address the issues associated with climate change, hydrology, environment, etc. Therefore, this manuscript is definitely within the scope of ESSD. Additionally, this manuscript is well organized and written.

Nevertheless, I suggest that the authors consider the following comments and then improve the manuscript.

1. Line 38: the authors claim that the coarse resolution and high penetration depth are two main problems, which affect the accuracy of surface temperature from passive microwave remote sensing. However, the authors should keep in mind that the surface emissivity, as well as other physical mechanisms beyond our understanding, are also the main reasons. The authors need to clearly mention these points here.
2. Line 43-44: according to my experience, I also think that the algorithm selection depends on the availability of the required input parameters. I suggest revising here.
3. Line 46: There are many satellite sensors with both the 11 and 12 microns. I suggest mentioning the NOAA AVHRR and ENVISAT AATSR before SLSTR.
4. Line 57: The authors state 'no single SWA performs the best under all conditions'. How can you obtain such a conclusion? Please explain here and add supporting references here.
5. Line 58-59: The products cannot be retrieved. Also, cite the following references for the MODIS LST products: Wan, 2002, RSE; Wan, 2008, RSE.
6. Line 65: check the status of Sentinel-3C and make any necessary revision.
7. Line 82: I'm confused by 'cover progressively smaller areas'.
8. Line 97: I would suggest deleting the last sentence. It may appear in the wrong place. It should be in the methodology section instead of the introduction.
9. Line 117: Add references for the SST.
10. Line 139: How did you obtain these 48 land surface emissivities? Please explain. Such information is important for the authors.
11. Line 165: many studies use the SURFRAD data to validate the surface temperature derived from satellite data. I would suggest adding more references.
12. Line 180: you used the random forest to integrate multiple algorithms. Please

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explain why you selected this method?

13. Line 185: how do you conduct the monthly averaging?

14. Line 192: please give the reason why you use 0.12 K?

15. Line 209-210: Please note that here is the method part, so you have not conducted the integration yet. Therefore, from the logical sequence, you don't know whether this method can get stable and robust results.

16. Line 243: as for the NDVI threshold method, I suggest citing Sobrino et al. (2008). Please check this reference.

17. Line 315: please simply give the results for NOAA-7 and NOAA-11 AVHRR here or somewhere.

18. Line 335: why the accuracy depends on the land cover type?

19. Line 397: what are the WMO requirements? Please explain.

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