

Review of: "Thermal Remote Sensing: A tool to Determine Temporal Land Surface Temperature in Hawassa City, Ethiopia"

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Potential competing interests: No potential competing interests to declare.

Comments to the Author

The study of thermal environment and its methods can provide decision-making basis and technical support for urban planning, heat island and fine urban management. The Author has retrieved the LST from the thermal infrared band of Landsat 8, and then mapped it in Hawassa City Administration, Ethiopia. Although this research topic is of interest in the field of urban thermal environment research, there are too many similar studies. In addition, the content and logical sequence of the article need to be modified. Therefore, the present status of the manuscript is not acceptable, but it needs major revision and before it could be resubmitted again. A series of recommendation is summarized in the following comments.

Detailed comments

1. The emphasis in the **Abstract** is on what the Author has done, which is not particularly appropriate. One or two sentences can be used to describe the background of the existing problems, what solutions have been proposed for these problems, and what conclusions have been obtained.
2. The **Introduction** part is the Author's summary of the existing research and an important motivation to conduct the study. This part mainly introduced the basic concepts of thermal environment, and the research content related to thermal environment is too lacking. The author needs to reorganize and supplement the relevant content of urban research on thermal environment related algorithms in time order or by method. The most important thing is to summarize the problems or difficulties of the existing research through this part, so as to draw out the author's research.
3. The description of the study area in **Section 2.1** should mainly focus on the geographical spatial location, temperature and spatial structure of the area. It is not necessary to add demographic statistics. If so, please indicate how population distribution affects LST in subsequent studies.
4. The data description in **Section 2.2** is very confusing. "Multi-temporal thermal image series acquired by Landsat -5 TM/8-OLI were used." Landsat 5 was mentioned in the last paragraph of the Introduction, but only the LST results of 2002 and 2019 were seen in the research results. Only the data of Landsat 8 were shown here, and complete data of Landsat 7

need to be supplemented. The band information in **Table 1** is well known, and these can be deleted. For Landsat calculations, it is recommended to describe the source, time, and resolution of the data you used for the Landsat series.

5. The "Source of Bands" in the flow chart of **Table 2** can be expressed in detail for the specific Landsat data sources.

6. The verification of LST inversion is questionable. The air temperature data of the station can be retrieved by the current algorithm for the comparison of LST in spatial distribution, and the numerical comparison can be verified by the comparison of relevant historical measurement data. This verification can be developed in a separate **Discussion section**.

7. The research **Results** mainly selected the results of March, in 2002 and 2019, the time period is too long and it is difficult to judge the trend by only selecting the results of two years. The Author can use the long time series analysis method to identify trends in LST within the region at an interval of 3 or 5 years. The Author could even carry out multi-factor analysis through the population distribution, geomorphic distribution, urban planning policies, land use data and other factors. This might enrich the manuscript.

8. At the end of the **Result Section** in the manuscript, there is no relevant comparison data or map distribution results from MODIS data results in this part, so it is suggested that it can be divided into a subsection of the **Discussion section** to improve the manuscript.

9. It is suggested to add a separate **Discussion section** in the manuscript, mainly considering the data verification, LST affecting by urban factors, or even LST on the block level of the city. These questions might be more interesting.

10. In the **Conclusion section**, it is concluded that rapid urbanization and vegetation degradation are the main reasons for LST rise, but the **Results section** does not provide the corresponding factor correlation verification, which can be expanded in the new **Discussion section**.