General comments:

This study presents two valuable global datasets spanning 2000-2020: land surface sensible heat flux (H) and land surface-air temperature difference (Tsa), generated using data-driven approaches. Recognizing that Tsa is the primary driver of H, the authors first refine the estimation of Tsa and subsequently employ it to predict H. Overall, the article is well-structured, with detailed explanations of the algorithm design, variable selection, and comparative analyses against existing products across multiple scales. The generated datasets hold significant value for global energy balance studies.

Re: Appreciations to your positive comments. All the comments have been replied one by one as following.

Point1:

A notable limitation is the absence of data for 2021–2024.

Response1: Thank you for your comment. The absence of data beyond 2020 is primarily due to the limitation of one key input variable, LST, which is currently available only up to 2020. Other auxiliary datasets have been updated to 2022 or 2023. Once the LST data and other inputs are further updated, we will update our product accordingly.

Additionally, a few minor issues should be addressed:

Point2:

Table 3: the last row, there is a spelling mistake on "Leaf area index"; keep the initial letter case consistent for variable names in the first column of the table.

Response2: Thank you for pointing this out. We have corrected the spelling of "Leaf area index" in the last row of Table 3 and ensured that the initial letter case is consistent for all variable names in the first column.

Point3:

In Section 2.2.2, the GLASS product provides ET and FVC data at an 8-day temporal resolution, whereas the model requires daily input. Please clarify how this temporal discrepancy was addressed (e.g., through interpolation, or another method). A detailed explanation should be included for reproducibility.

Response3: Thank you for your valuable comment. To address the temporal resolution discrepancy, we applied linear interpolation to convert the 8-day GLASS ET, FVC and ABD data to daily values, ensuring temporal consistency with the model inputs. This interpolation was performed for each pixel across the time series. We have added a detailed description of this procedure in lines 240-242 in Section 2.2.2 as "....., and the 8-day composite datasets were linearly interpolated to daily values to maintain temporal alignment with the model inputs." to enhance clarity and reproducibility.