Referee's report for "Global Projections of Heat-Stress at High Temporal Resolution Using Machine Learning"

The authors of this paper applied machine learning to provide temporally downscaled data and outputs of the temperature-humidity index (THI) for the cattle sector. The manuscript has undergone significant modification since the first round of review, and the authors have responded thoroughly to the suggestions made. I have two main suggestions to make that I believe would lead to a publishable article.

Firstly, the authors could provide more detail on the THI. It is difficult to interpret the variations and errors presented and discussed throughout the paper without greater context. The authors refer to specific THI thresholds but do not describe them nor their methods' impact on them, potentially missing a way of demonstrating the added value of temporally downscaling the THI.

Secondly, the authors could provide a plot relating mean absolute error to altitude. The dataset has spatially dependent errors, attributed by the authors primarily to altitude: "This discrepancy likely originates from the unique microclimates and larger diurnal variations often observed at higher altitudes". It would therefore be sensible to plot MAE against altitude to explore this attribution. This could be included as another panel in Figure 6.

I also have two minor suggestions. The first is to avoid using the blue-to-neutral-to-red colourmap for data that doesn't centre around zero. The second is to expand Figure C1 to include the entire globe, rather than just Antarctica, as it would be interesting to explore the seasonal variation of MAE across the entire globe.