Response to Review Comments of the Reviewer

Dear Reviewer and Editors:

We are sincerely grateful to the editor and reviewer for their valuable time for reviewing our manuscript. The comments are very helpful and valuable, and we have addressed the issues raised by the reviewer in the revised manuscript. Please find our point-by-point response (in blue text) to the comments (in black text) raised by the reviewer. We have revised the paper according to your comments (highlighted in red text of the revised manuscript).

Sincerely yours,

Dr. Yuanjian Yang, representing all co-authors

I would like to thank the authors for their efforts in addressing my comments posted in the first round. Most of my concerns are solved except for the performance of XGBoost.

Response: Thank you for your recognition of our revised work. We apologize for the unclear description of the XGBoost model's performance in the previous version. We have provided a detailed response to this concern in the following section, and we hope this addresses your remaining worry.

1) Regarding my comments on the performance of XGBoost, authors add Figure S1to show that RMSE values are smaller than 0.05 (what is the unit) with R2 values around 0.5-0.6. How could the RMSE values be so small while the R2 is not high? This is crtical as XGBoost is used in subsequent analyses.

Response: Thank you very much for your careful review and professional comments. We made a critical error during modeling: the target variable (CUHII) was mistakenly reversed with the feature variables (urban form indicators). This led to the incorrect

compression of the predicted value range of CUHII in the original Figure S1 (e.g., the CUHII in the first panel was only 0~0.5°C, which contradicts its practical physical meaning).

After correcting the variable correspondence, the new results (second figure) align with the true amplitude characteristics of CUHII: during the daytime, CUHII is generally low (most actual values are < 2.0°C), so the RMSE is small (0.208~0.254°C); at night, especially during heat wave (HW) periods, CUHII itself has a larger amplitude (maximum value exceeding 3.0°C). Even though the R^2 for this period is relatively higher (0.465), the absolute error (RMSE = 0.663°C) has increased significantly due to the expanded amplitude—which is consistent with the rule that "the larger the variable amplitude, the naturally wider the range of absolute error".

In addition, we have reviewed all figures and tables in the manuscript one by one, corrected details such as data mapping and variable labeling, and prevented similar logical errors from occurring again. Thank you for helping us correct this core issue and ensuring the reliability of the research conclusions.

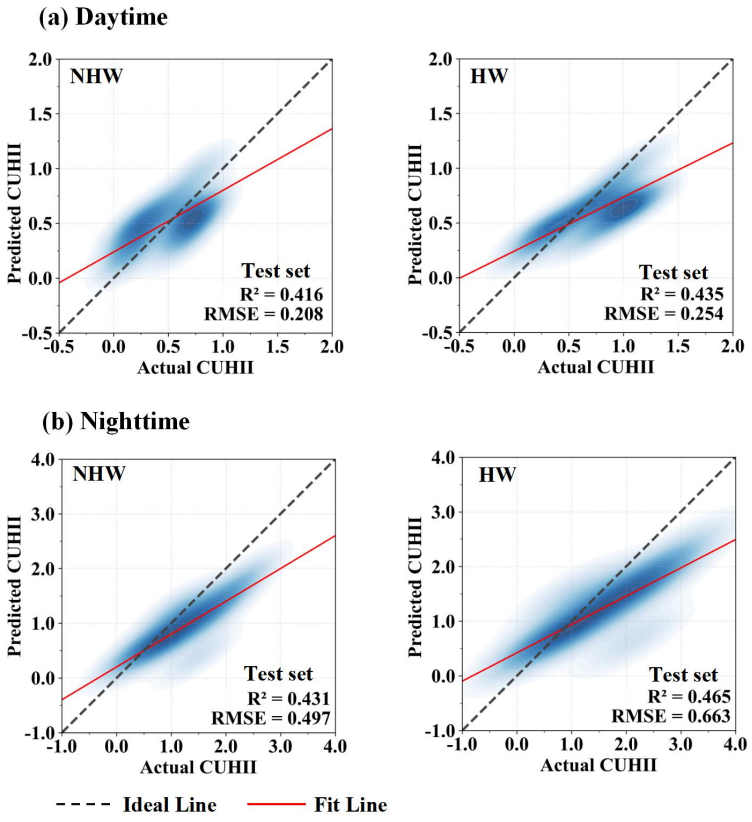

Figure. S1 The performance graph of the XGBoost model in predicting CUHII.