



Supplement of

**Spatiotemporal linkage and transmission of urban heat islands
in the Yangtze River Delta urban agglomeration:
the role of urban heat advection**

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Table S1. Number of automated weather stations in different regions.

	U1	U2	U3	U4	U5	U6	U7	U8	U9	U10	Rural
Number	2	19	12	20	9	45	9	24	3	3	22

S1. The criteria for demarcating the rural reference area in the model

A rectangular rural reference area was delineated based on the locations of automatic weather stations situated in rural regions. The selected area meets the following criteria: (i) altitudes below 100 m, and (ii) land use/land cover type classified as Savannas, Croplands, or Cropland/Natural Vegetation Mosaics.

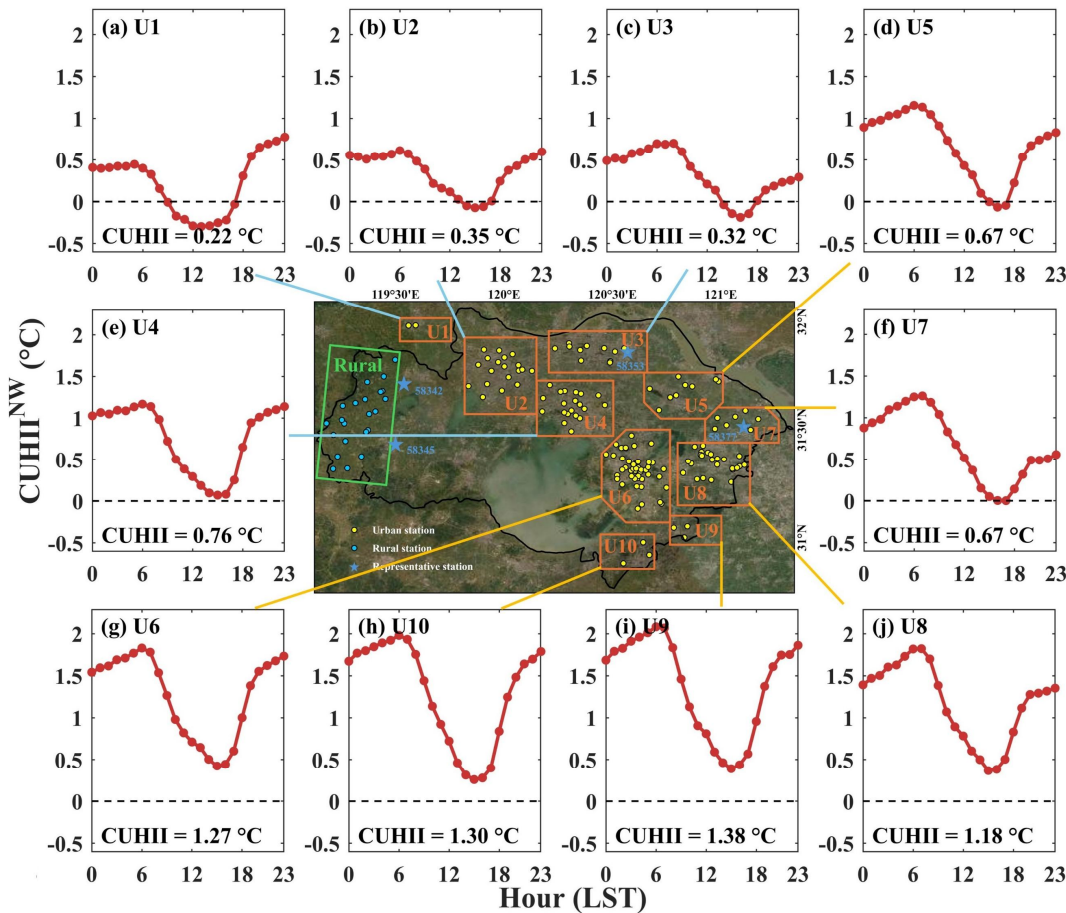


Figure S1. Diurnal variation of hourly CUHII across different regions under northwest wind conditions (background map source: Esri | Powered by Esri). The numerical values indicate the daily-averaged CUHII for each region.

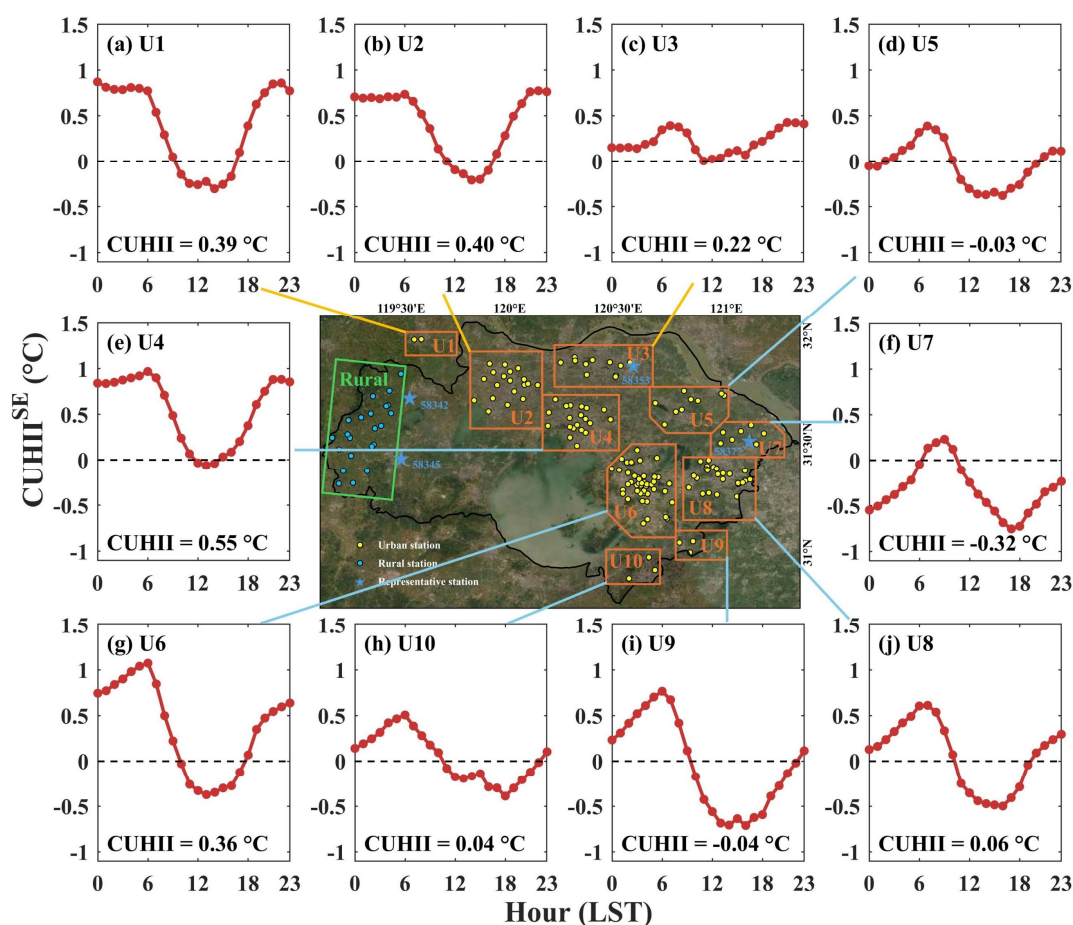


Figure S2. Same as Figure S1, but under southeast wind conditions (background map source: Esri | Powered by Esri).

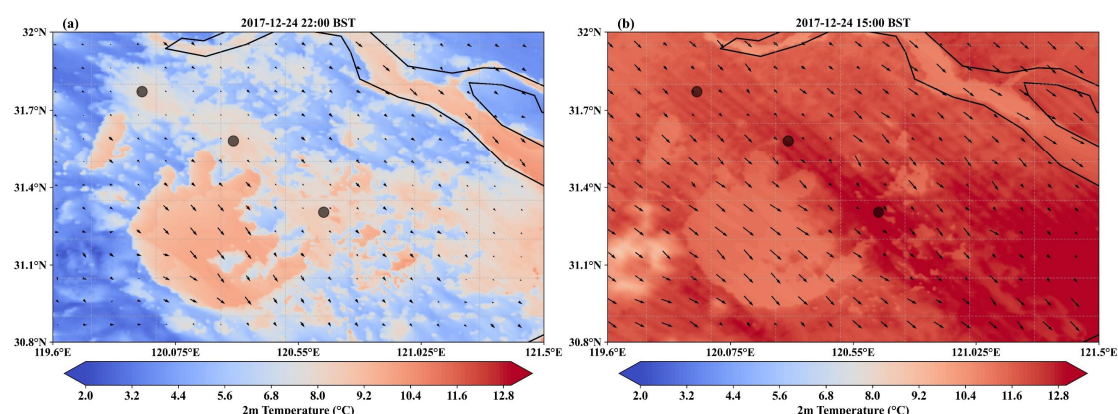


Figure S3. (a) Nocturnal and (b) diurnal 2-meter temperature and 10-meter wind field of the control simulation at (a) 22:00 BST and (b) 15:00 BST. The three marked locations from northwest to southeast correspond to downtown areas of Changzhou (U2), Wuxi (U4), and Suzhou (U6), respectively.

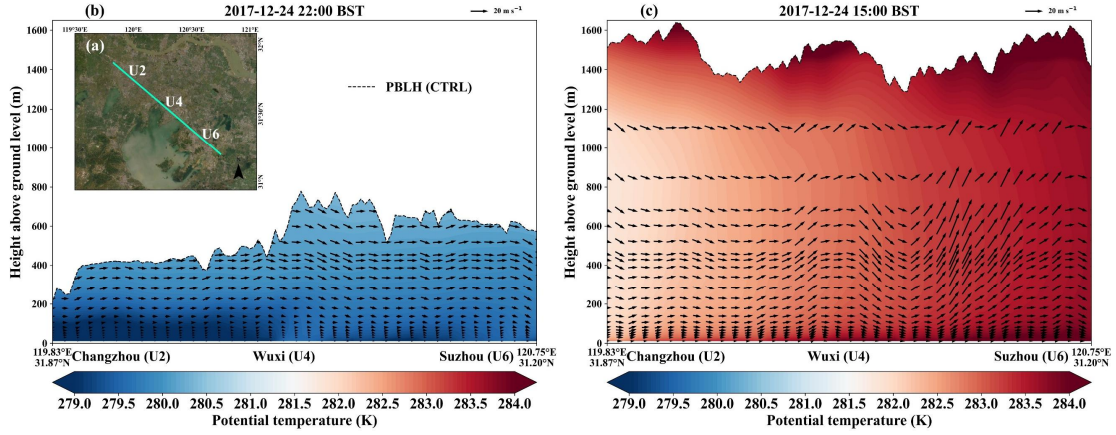


Figure S4. (a) Geographical location of the vertical cross-section (background map source: Esri | Powered by Esri). (b, c) Vertical cross-sections of the potential temperature of the control simulation (CTRL) at (b) 22:00 BST and (c) 15:00 BST. Wind vectors were synthesized by rotating u (along the transect axis) and scaling ω (ω multiplied by 100). The black solid lines denote the PBLH in the CTRL.

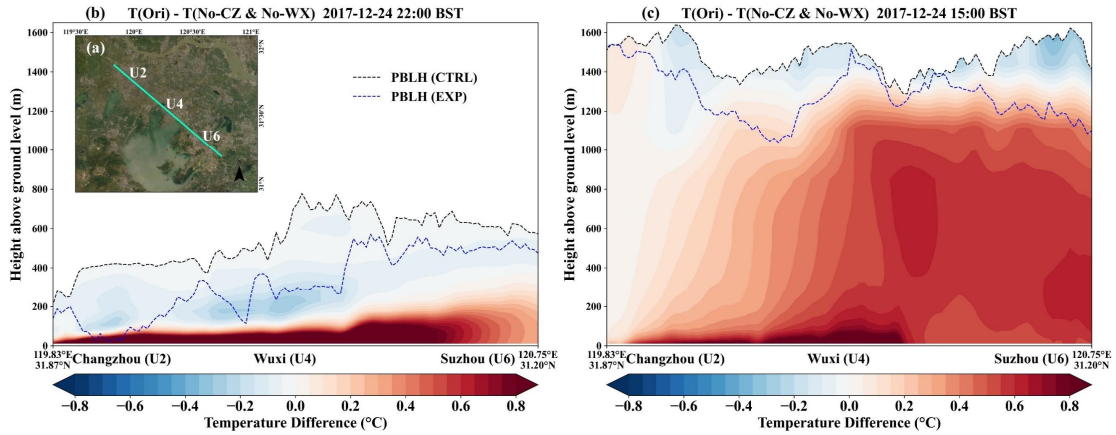
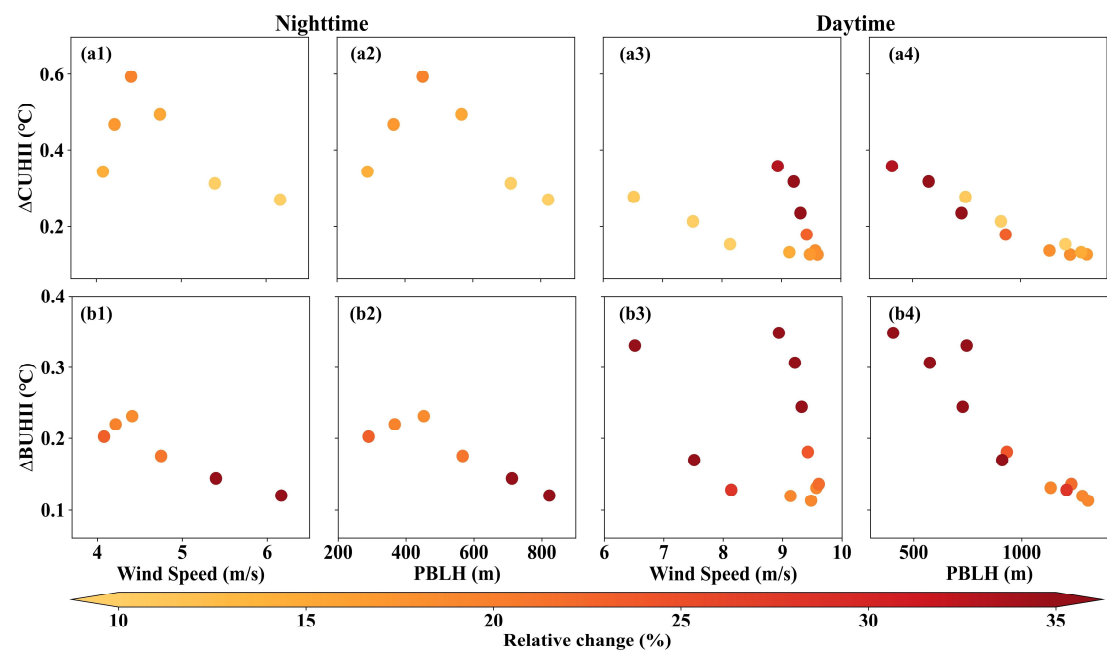


Figure S5. (a) Geographical location of the vertical cross-section (background map source: Esri | Powered by Esri). (b, c) Vertical cross-sections of the potential temperature differences between the control simulation and the sensitivity experiment (CTRL minus EXP) at (b) 22:00 BST and (c) 15:00 BST. The black and blue solid lines denote the PBLH in the CTRL and EXP simulations, respectively. Note that in addition to Changzhou (U2), LULC in Wuxi (U4) was also replaced by croplands in the sensitivity experiment.

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42 **Figure S6.** Same as Figure 12, but for SLUCM with the YSU PBL scheme.

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