Supplement of

Circulation regulated impacts of aerosol pollution on urban heat island in Beijing

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Table S1. Basic information of automatic weather stations in Beijing.

Station ID	Station Name	Longitude (°E)	Latitude (°N)
54399	Haidian	116.2906	39.9869
54406	Yanqing	115.9689	40.4494
54419	Huairou	116.6272	40.3575
54421	Shangdianzi	117.1117	40.6589
54424	Pinggu	117.1178	40.1694
54511	Guanxiangtai	116.4694	39.8061
54597	Xiayunling	115.7403	39.7289

Table S2. Basic information of CNEMC stations in Beijing.

Station ID	Station Name	Longitude (°E)	Latitude (°N)
1001A	Wanshouxigong	116.366	39.8673
1002A	Dingling	116.17	40.2865
1003A	Dongsi	116.434	39.9522
1004A	Tiantan	116.434	39.8745
1005A	Nongzhanguan	116.473	39.9716
1006A	Guanyuan	116.361	39.9425
1007A	Wanliu	116.315	39.9934
1008A	Shunyixincheng	116.72	40.1438
1009A	Huairou	116.644	40.3937
1010A	Changing	116.23	40.1952
1011A	Aotizhongxin	116.407	40.0031
1012A	Gucheng	116.225	39.9279
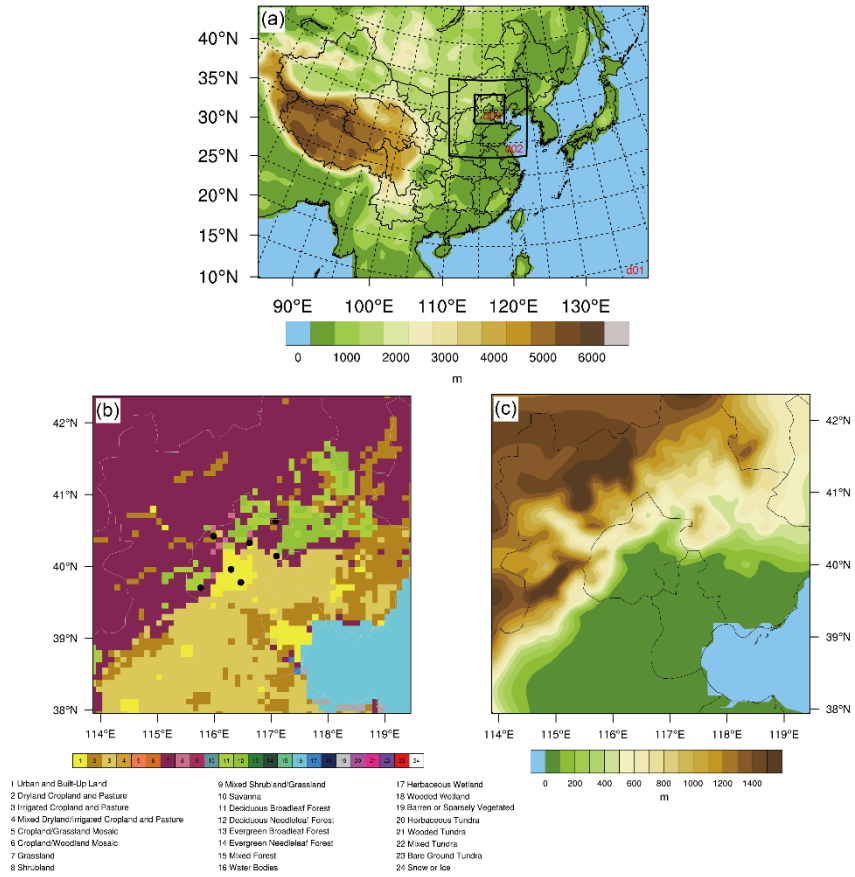
Figure S1. WRF-Chem domain configuration with terrain height (a), land use categories of the innermost domain (b) and terrain height of the innermost domain (c). (Black dots in b represent locations of automatic weather stations.)
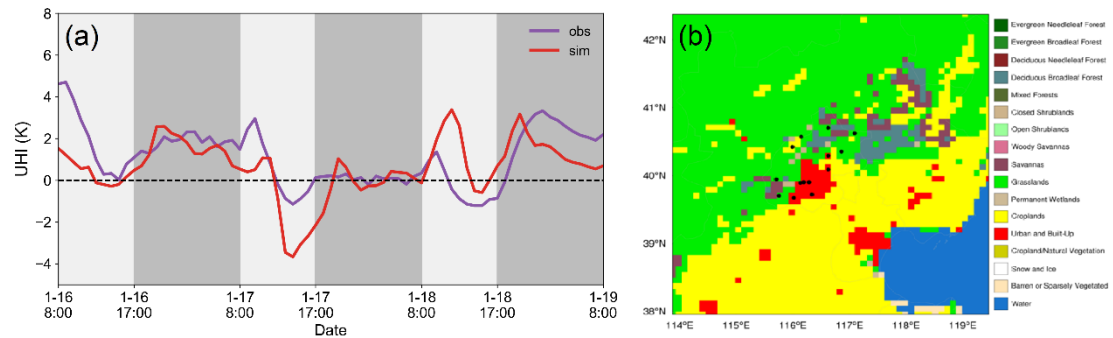
Figure S2. Simulated and observed UHII in Beijing (a) and the locations of the used sites (b).
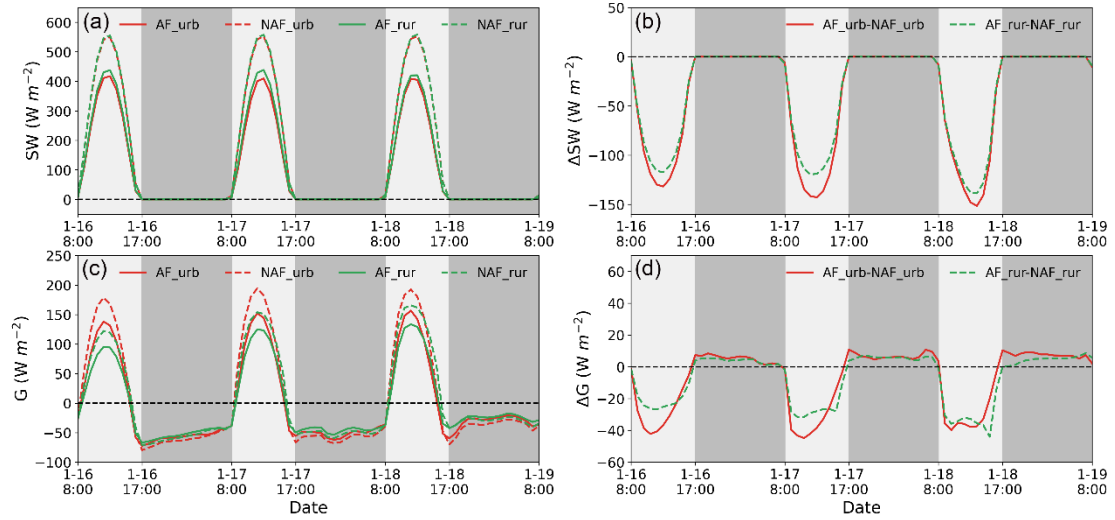
Figure S3. Variations of (a) downward shortwave radiation, (b) difference of downward shortwave radiation between AF and NAF, (c) heat storage and (d) difference in heat storage between AF and NAF in urban and rural areas.
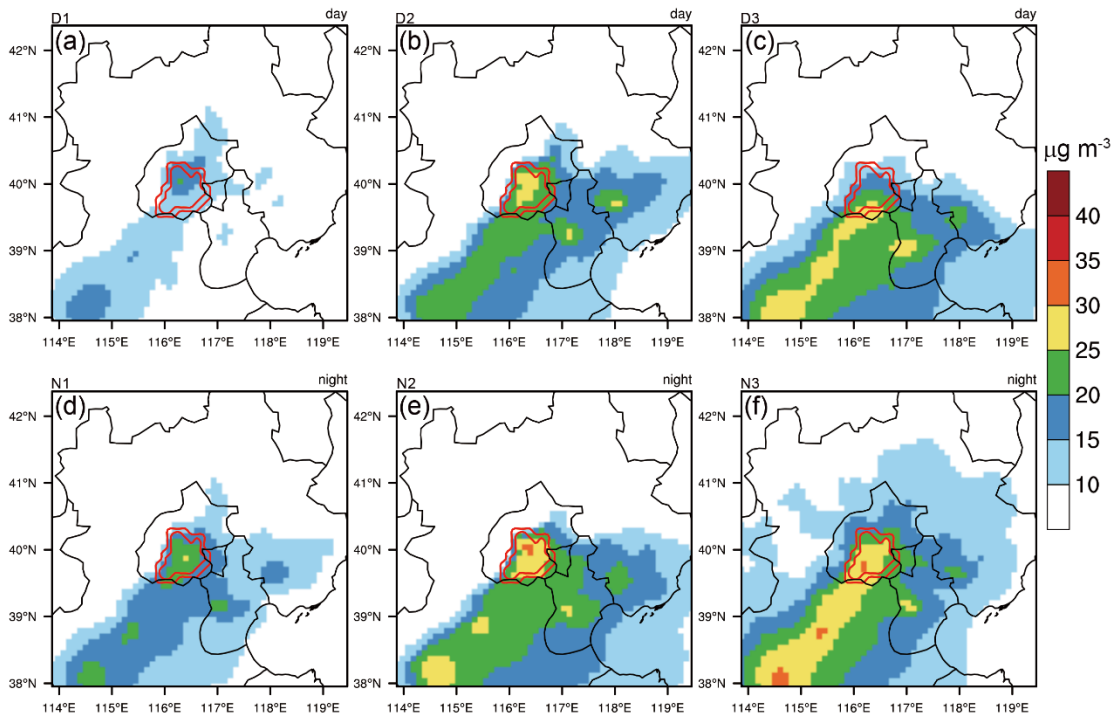
Figure S4. Simulated black carbon concentration on (a) D1, (b) D2, (c) D3, (d) N1, (e) N2 and (f) N3. The areas within the inner red line are urban areas. The areas between the two red lines are rural areas having the same size as the urban areas.
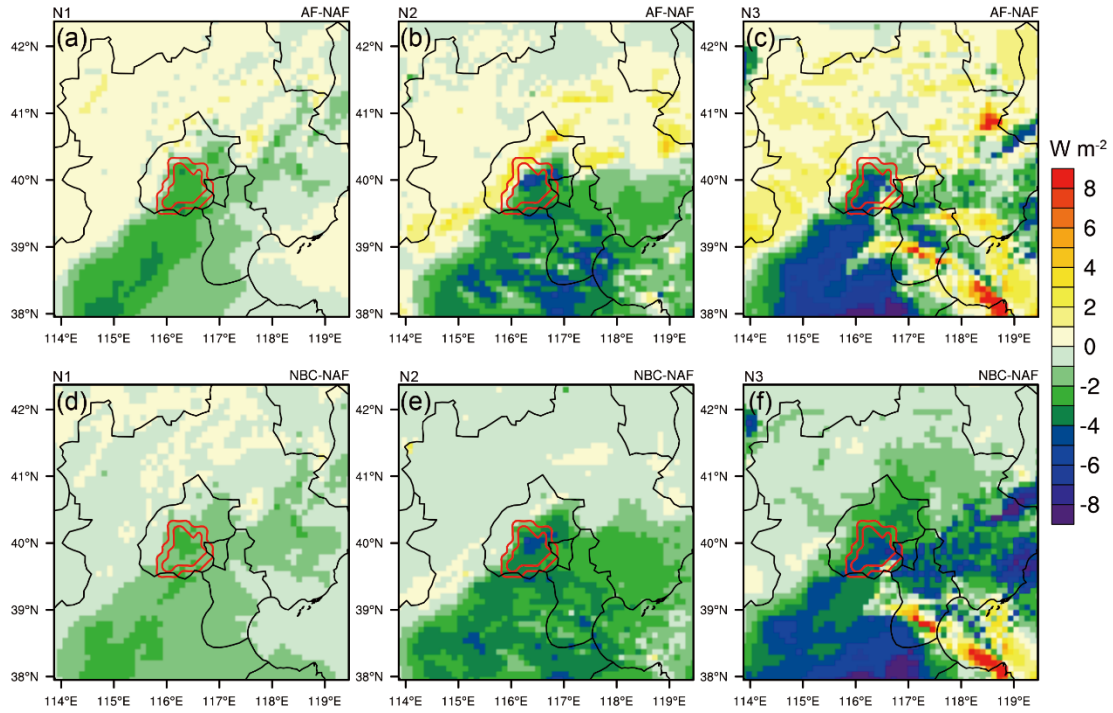
Figure S5. Simulated difference in downward longwave radiation between AF and NAF (first row), NBC and NAF (second row) at nighttime. The areas within the inner red line are urban areas. The areas between the two red lines are rural areas having the same size as the urban areas.
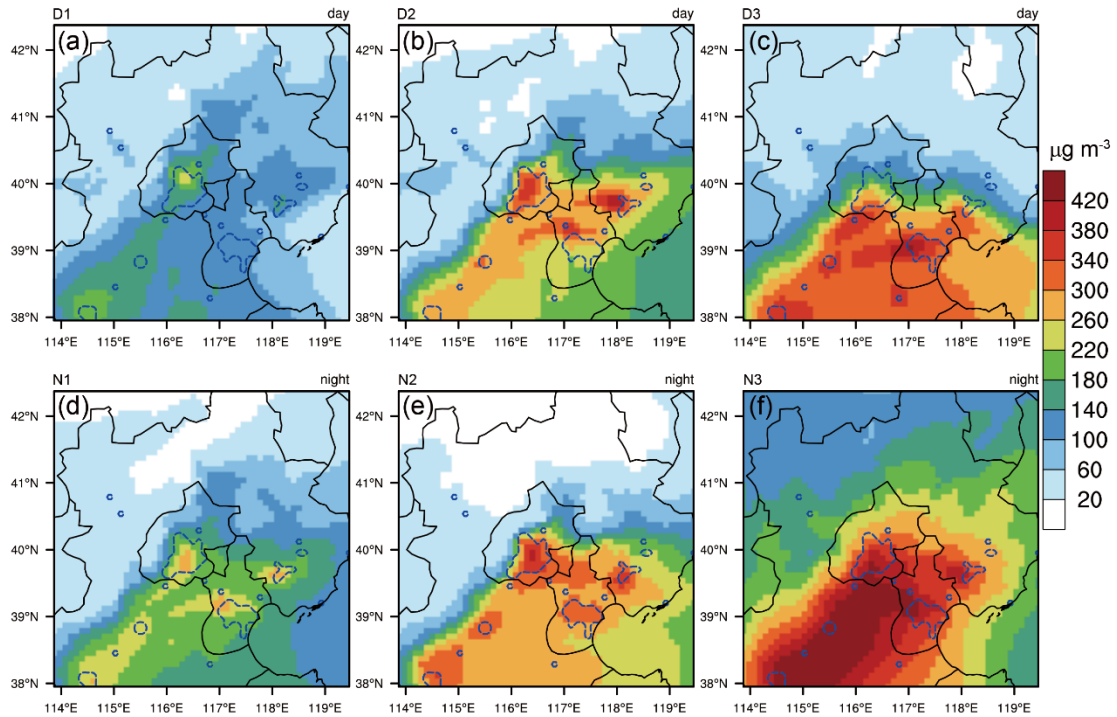
Figure S6. Simulated PM$_{2.5}$ concentration on (a) D1, (b) D2, (c) D3, (d) N1, (e) N2 and (f) N3.