

Electronic Supplementary Material to: Comparison of Ozone and PM_{2.5} Concentrations over Urban, Suburban, and Background Sites in China

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Table 1. The urban-to-suburban differences of MDA8 O₃ (units: ppbv), PM_{2.5} (units: μg m⁻³), NO₂ (units: ppbv), SO₂ (units: ppbv), NO₂ to O₃ ratio, and PM_{2.5} to PM₁₀ ratio in summer (JJA) and winter (DJF) in four regions.

	BTH		YRD		PRD		SCB	
	JJA	DJF	JJA	DJF	JJA	DJF	JJA	DJF
MDA8	-2.1	-7.0*	2.6	-0.9	-4.7	-2.5	-1.3	-6.3*
PM _{2.5}	3.7	32.7*	-0.04	-0.6	2.9	5.1	2.1	2.5
NO ₂	6.6*	10.0*	3.3*	4.8*	5.5	6.5	4.9*	6.0*
SO ₂	1.0	4.0	0.1	0.8	0.5	0.1	-0.1	0.3
NO ₂ /O ₃	0.2*	1.2*	0.1*	0.4*	0.3*	0.4	0.2*	0.8*
PM _{2.5} /PM ₁₀	-0.03	0.04	-0.03	-0.09*	-0.04	-0.07	-0.01	-0.004

Note: *Statistically significant ($P < 0.05$).

Table 2. Diurnal, weekly, seasonal, and interannual variations of the urban-to-suburban differences of O₃ (diurnal variations: hourly O₃; weekly variations: daily O₃; seasonal and interannual variations: MDA8 O₃) and PM_{2.5}.

		O ₃ (ppbv)				PM _{2.5} (µg m ⁻³)			
		BTH	YRD	PRD	SCB	BTH	YRD	PRD	SCB
Diurnal	0	-7.4*	-1.2	-1.8	-7.5*	17.9*	-0.03	5.4	3.8
	1	-7.8*	-1.0	-0.5	-7.0*	17.5*	0.01	5.4	3.9
	2	-8.1*	-1.4	-0.01	-6.2*	17.6*	-0.1	5.2	3.9
	3	-8.2*	-0.9	0.6	-5.6*	19.0*	0.002	5.2	3.6
	4	-8.2*	-0.8	0.7	-5.1*	19.3*	0.3	5.2	3.4
	5	-8.3*	-0.9	0.9	-4.7*	19.8*	0.4	5.3	3.5
	6	-8.2*	-1.4	0.4	-4.5*	20.0*	0.7	5.6	3.6
	7	-8.5*	-2.2	-1.5	-5.0*	20.5*	1.1	6.1	3.8
	8	-8.7*	-2.4	-1.8	-5.5*	21.0*	1.3	6.4	3.9
	9	-8.0*	-1.6	-1.8	-5.0*	20.9*	0.7	5.3	4.1
	10	-6.8*	-0.7	-1.8	-3.8*	20.1*	0.3	3.6	3.9
	11	-4.4*	0.5	-1.5	-2.8*	18.2*	-0.4	2.3	3.3
	12	-2.3	1.4	-1.4	-2.1	15.5	-0.8	1.0	2.5
	13	0.01	2.1	-1.6	-1.7	13.7	-1.3	0.3	2.2
	14	1.0	2.3	-2.5	-1.3	11.4	-1.6	-0.3	2.0
	15	1.0	2.3	-3.5	-1.2	10.3	-1.6	-0.7	1.5
	16	0.5	1.7	-4.6	-1.3	10.1	-1.2	-0.9	1.2
	17	-0.2	0.9	-5.1	-1.8	10.0	-0.9	-0.7	1.0
	18	-1.7	-0.3	-4.6*	-3.0	11.2	-0.2	0.1	1.2
	19	-3.3*	-1.1	-5.5*	-5.0*	12.4	0.4	1.9	1.6
	20	-4.5*	-1.4	-6.4	-6.9*	15.1*	0.5	3.6	2.4
	21	-5.6*	-1.5	-5.9	-8.3*	16.3*	0.6	4.2	2.8
	22	-6.6*	-1.4	-4.8	-8.7*	17.0*	0.3	4.7	3.2
23	-7.0*	-1.4	-3.4	-8.3*	18.0*	0.1	5.1	3.6	
Weekly	1	-5.5*	-0.6	-2.9	-4.8*	16.5*	-0.1	3.4	3.3
	2	-5.2*	-0.5	-2.6	-5.0*	15.0	-0.6	3.1	2.5
	3	-5.0*	-0.4	-2.6	-4.7*	16.4*	-0.5	2.9	2.9
	4	-5.0*	-0.6	-2.3	-4.7*	15.6*	0.5	2.7	2.9
	5	-4.9*	-0.5	-2.2	-4.6*	17.4*	0.3	4.0	3.1
	6	-5.0*	-0.3	-2.5	-4.6*	19.1*	0.008	3.8	2.9
	7	-4.7*	-0.5	-1.9	-4.6*	16.0*	-0.5	3.2	3.2
Seasonal	MAM	-2.3	3.6	-3.9	-2.5	10.2	1.1	2.4	2.5
	JJA	-2.1	2.6	-4.7	-1.3	3.7	-0.04	2.9	2.1
	SON	-3.3*	-1.4	-2.9	-4.9*	16.5*	-1.7	3.4	2.6
	DJF	-7.0*	-0.9	-2.5	-6.3*	32.7*	-0.6	5.1	2.5
Interannual	2015	-7.0*	4.3	-5.5	-2.8	19.5*	3.0	2.9	6.2
	2016	-7.9*	3.4	-3.1	-2.5	17.9*	0.1	6.0	2.9
	2017	-0.5	-1.5	-3.7	-4.4*	17.2*	-1.6	2.9	3.1
	2018	0.8	-2.5	-1.7	-5.2*	11.6	-1.6	1.8	-0.3

Note: *Statistically significant with $p < 0.05$.

Table 3. Daily mean [O₃] on weekdays, at weekends, and their differences (delta = weekdays – weekends; units: ppbv) in urban and suburban areas.

	Urban			Suburban		
	Weekdays	Weekend	Delta	Weekdays	Weekend	Delta
BTH	28.6	27.4	1.2	33.9	29.6	4.3
YRD	33.4	35.2	-1.8	32.4	25.6	6.8*
PRD	22.3	23.2	-0.9	28.9	27.7	1.2
SCB	19.0	18.6	0.4	31.7	25.3	6.4

Note: *Statistically significant with $p < 0.05$.

Table 4. Information on 10 background sites in central-eastern China (18°–43°N, 100°–125°E), including name, longitude (°E), latitude (°N), number of nearby urban/suburban sites (within a 2° × 2° grid cell), and their distances to the corresponding background site (km).

Site ID	Name	Longitude	Latitude	Nearby urban sites	Distances	Nearby suburban sites	Distances
1	Panguangou, Shanxi	111.47	37.85	3	46–89	0	N.A.
2	Wuyishan, Fujian	117.73	27.59	10	95–116	2	94–100
3	Changdao, Shandong	120.74	38.19	15	40–116	0	N.A.
4	Shenlongjia, Hubei	110.27	31.45	1	127	1	127
5	Hengshan, Hunan	112.68	27.11	21	22–110	3	27–98
6	Nanling, Guangdong	112.90	24.70	6	68–110	0	N.A.
7	Wuzhishan, Hainan	109.49	18.84	2	63–65	0	N.A.
8	Hailuogou, Sichuan	101.97	29.55	0	N.A.	0	N.A.
9	Lijiang, Yunnan	100.25	27.23	3	37–86	1	41
10	Menyuan, Qinghai	101.29	37.59	4	77–130	1	102

Note: N.A., no data.

Table 5. The urban-to-background differences in concentrations of MDA8 O₃ (units: ppbv) and PM_{2.5} (units: μg m⁻³) in summer (JJA) and winter (ND) during 2017 between 10 background sites and their surrounding urban sites within a 2° × 2° grid cell.

Site ID	MDA8		PM _{2.5}	
	JJA	ND	JJA	ND
1	-4.5	-7.2*	22.5*	82.3*
2	-5.1*	-18.2*	9*	31*
3	-0.2	5.5*	-0.1	3.1
4	3.3	-21.3	16.8	80.2
5	0.6	-22.2*	9.4*	49.5*
6	6.8*	-9.1*	19.9*	32.9*
7	-2.3	-9.8*	2.0	4.5*
8	N.A.	N.A.	N.A.	N.A.
9	1.1	-3.9	4.8	8.8*
10	-3.6	-10.1*	6.9	34.3

Notes: *Statistically significant ($p < 0.05$); N.A., no data.

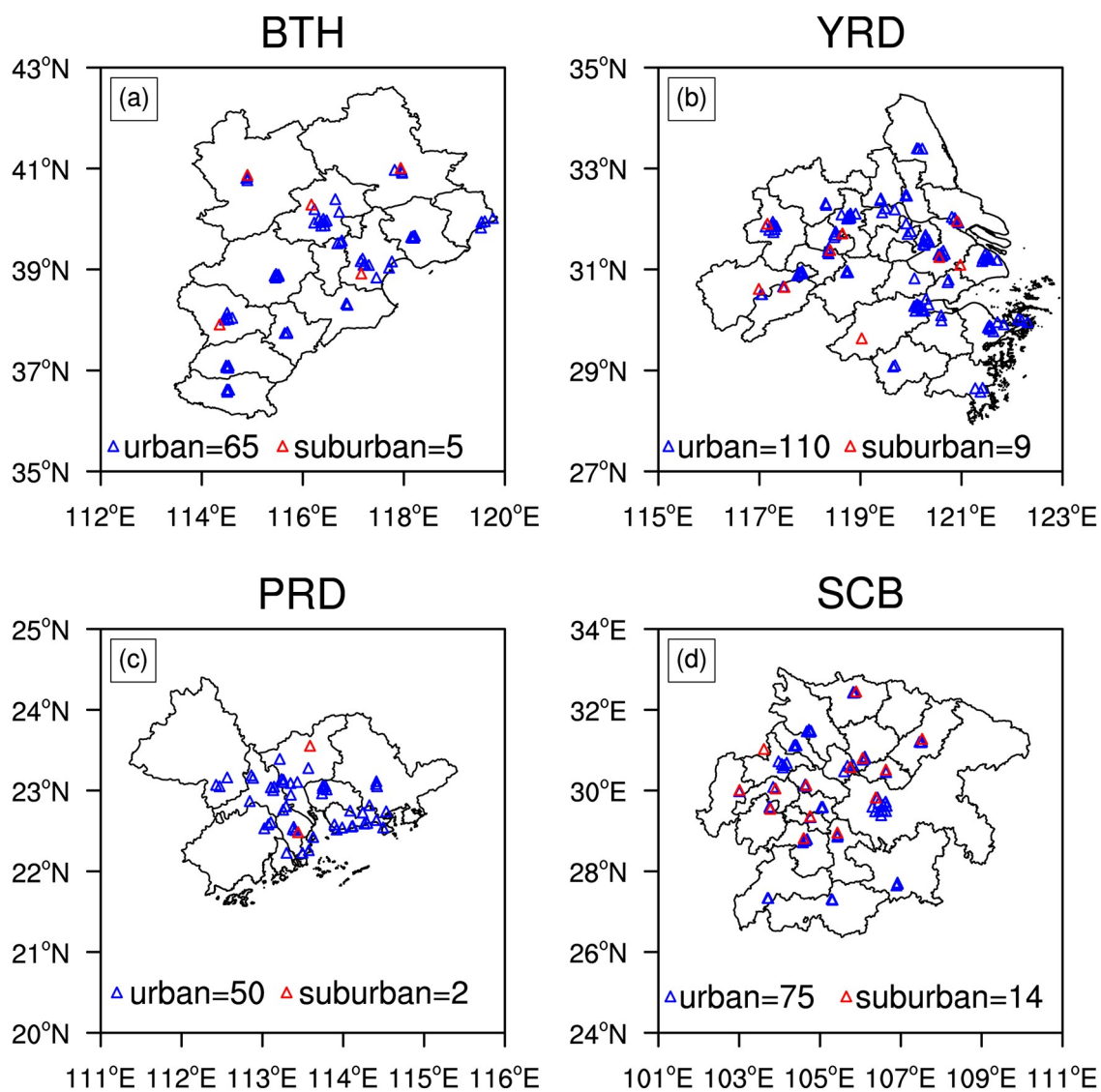


Fig. S1. Distribution of urban (blue) and suburban (red) sites in four regions. The numbers of sites are shown in each plot.