Supplemental Material

Ensemble Predictions of Air Pollutants in China in 2013 for Health Effects Studies Using WRF/CMAQ Modeling System with Four Emission Inventories

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Table S1. Total Emissions of major pollutants within China in a typical workday of each season. Unit for CO is billion moles/day. Unit for NOx, VOCs, SO_2, and NH_3 is Mmoles/day. Unit for EC, OC, and $PM_{2.5}$ is kton/day. SD is the standard deviation between the four inventories.

	CO	**NOx**	**VOCs**	**SO_2**	**NH_3**	**EC**	**OC**	**$PM_{2.5}$**
January								
MEIC	21.0	1292.5	899.2	1050.8	1255.1	6.7	15.9	37.5
SOE	/	866.4	491.4	621.3	5249.7	5.3	16.1	26.6
EDGAR	10.7	1042.4	899.3	1343.3	2996.0	2.5	14.6	45.1
REAS2	18.5	1133.5	1354.3	1071.5	2560.1	4.5	10.3	30.4
SD	4.4	154.1	305.3	258.4	1440.4	1.5	2.3	7.1
April								
MEIC	10.2	1274.0	575.8	814.7	1733.9	3.1	5.6	20.4
SOE	/	933.6	395.1	576.0	2815.9	2.9	8.4	19.6
EDGAR	6.9	972.9	490.2	1343.2	872.6	1.4	5.1	27.5
REAS2	14.7	1125.1	1029.4	1059.3	2479.9	3.1	5.4	26.3
SD	3.2	134.6	243.4	284.9	747.6	0.7	1.3	3.5
July								
MEIC	9.7	1281.5	585.1	826.0	2145.5	2.9	5.2	19.8
SOE	/	906.3	341.9	560.8	6406.4	2.6	6.7	16.3
EDGAR	6.3	983.8	459.2	1376.3	712.5	1.3	4.4	26.8
REAS2	13.9	1148.0	1004.0	1068.6	2478.0	3.0	5.2	25.8
SD	3.1	145.5	249.9	301.0	2110.8	0.7	0.8	4.3
October								
MEIC	10.1	1251.2	597.9	817.9	1367.7	3.1	5.6	20.5
SOE	/	934.9	390.5	582.4	3641.6	2.9	5.2	19.4
EDGAR	6.9	970.8	485.8	1351.3	845.1	1.4	5.0	27.4
REAS2	13.9	1066.5	1028.5	991.5	2481.5	2.9	5.3	24.8
SD	2.9	122.6	243.9	280.4	1076.1	0.7	0.2	3.2

Table S2. MNB and MNE of the ensemble predictions in different regions of China using the monthly average predictions and observations of $PM_{2.5}$ and O_3-1h; and MNB, MNE and the weighting factors (w) of each set of predictions using different inventories.

		MEIC			SOE			EDGAR			REAS2			ENSEMBLE	
		w	MFB	MFE	w	MFB	MFE	w	MFB	MFE	w	MFB	MFE	MNB	MNE
$PM_{2.5}$	NE	0.12	-0.22	0.32	0.40	0.25	0.44	0.00	-0.32	0.35	0.41	-0.14	0.32	-0.05	0.31
	NCP	0.00	-0.28	0.34	0.26	-0.33	0.36	0.00	-0.41	0.43	0.98	-0.21	0.27	-0.05	0.23
	NW	0.00	-0.87	0.87	0.53	-0.81	0.82	0.30	-0.85	0.85	1.00	-0.82	0.82	-0.47	0.56
	YRD	0.08	-0.25	0.31	0.01	-0.23	0.29	0.54	-0.20	0.27	0.48	-0.09	0.24	-0.06	0.23
	CNT	0.50	-0.09	0.27	0.11	-0.04	0.24	0.00	-0.25	0.28	0.35	0.09	0.28	-0.06	0.20
	SCB	0.00	0.11	0.28	0.66	0.25	0.30	0.00	-0.10	0.26	0.08	0.08	0.29	-0.11	0.24
	SOUTH	0.00	-0.29	0.36	0.00	-0.14	0.24	0.47	-0.02	0.28	0.65	-0.21	0.27	-0.02	0.21
	CHINA	0.13	-0.32	0.39	0.16	-0.25	0.37	0.23	-0.32	0.39	0.63	-0.21	0.33	-0.12	0.31
		w	MNB	MNE	w	MNB	MNE	w	MNB	MNE	w	MNB	MNE	MNB	MNE
O_3-1h	NE	0.08	0.35	0.35	0.00	0.11	0.20	0.56	0.31	0.32	0.17	0.32	0.34	0.06	0.18
	NCP	0.73	0.16	0.21	0.00	0.09	0.19	0.02	0.22	0.27	0.15	0.25	0.28	0.06	0.16
	NW	0.00	0.50	0.53	0.81	0.41	0.45	0.00	0.53	0.57	0.00	0.51	0.54	0.14	0.29
	YRD	0.11	0.08	0.21	0.92	0.02	0.19	0.00	0.09	0.23	0.00	0.15	0.24	0.06	0.20
	CNT	0.42	0.19	0.33	0.00	0.10	0.30	0.00	0.23	0.38	0.48	0.24	0.37	0.10	0.29
	SCB	0.82	0.44	0.49	0.00	0.29	0.39	0.00	0.44	0.50	0.00	0.43	0.51	0.19	0.33
	SOUTH	0.83	0.24	0.31	0.00	0.15	0.29	0.00	0.21	0.32	0.00	0.26	0.34	0.03	0.21
	CHINA	0.27	0.20	0.28	0.06	0.11	0.25	0.00	0.22	0.32	0.55	0.26	0.32	0.09	0.23

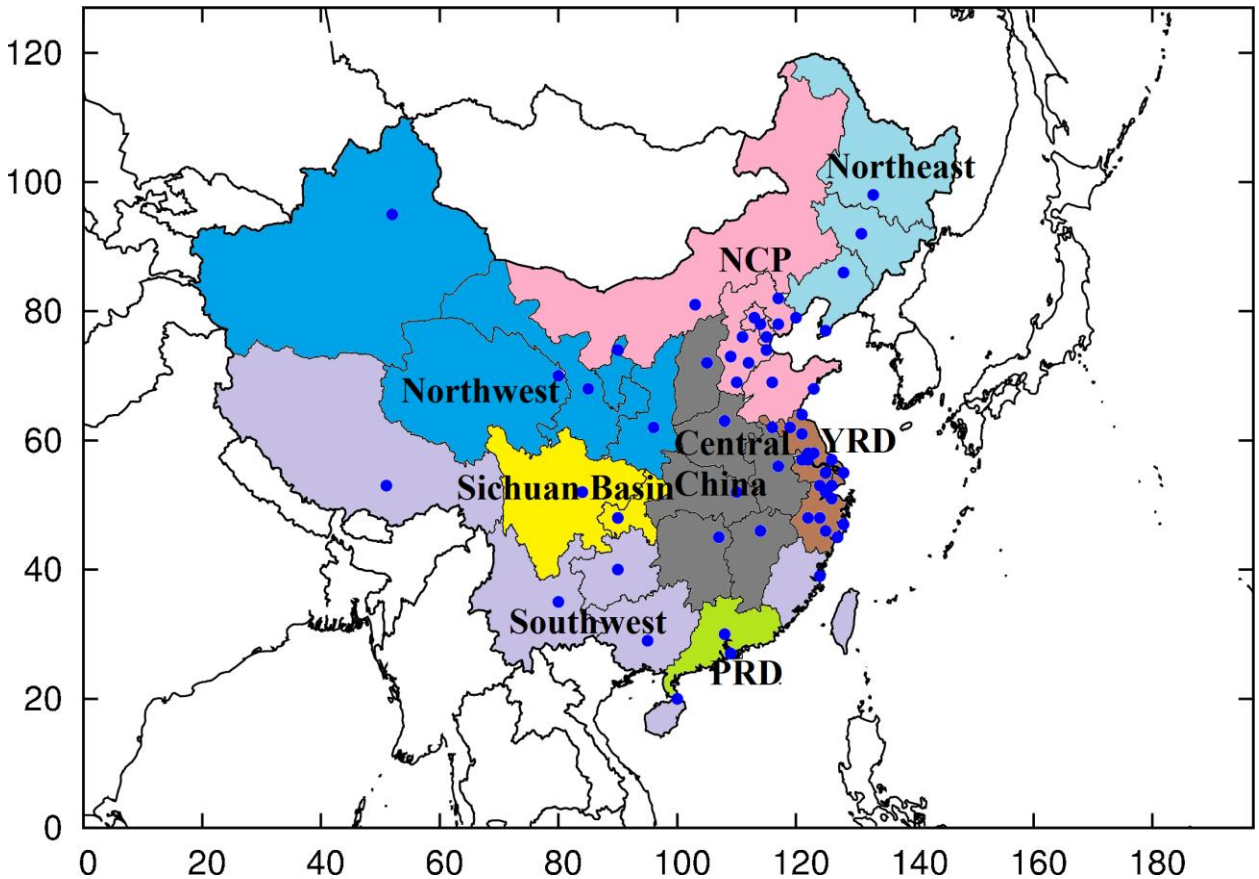


Figure S1. The WRF/CMAQ modeling domain and the regions in China. The dots represent the 60 cities where observational data are available for ensemble analysis.

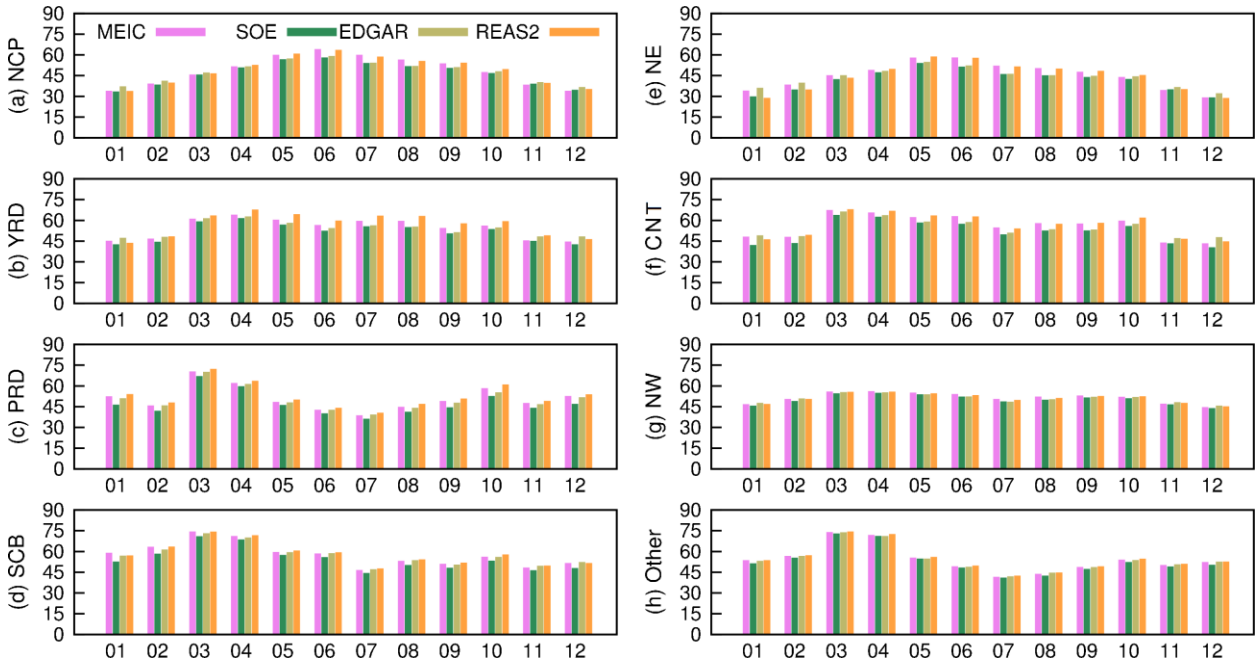
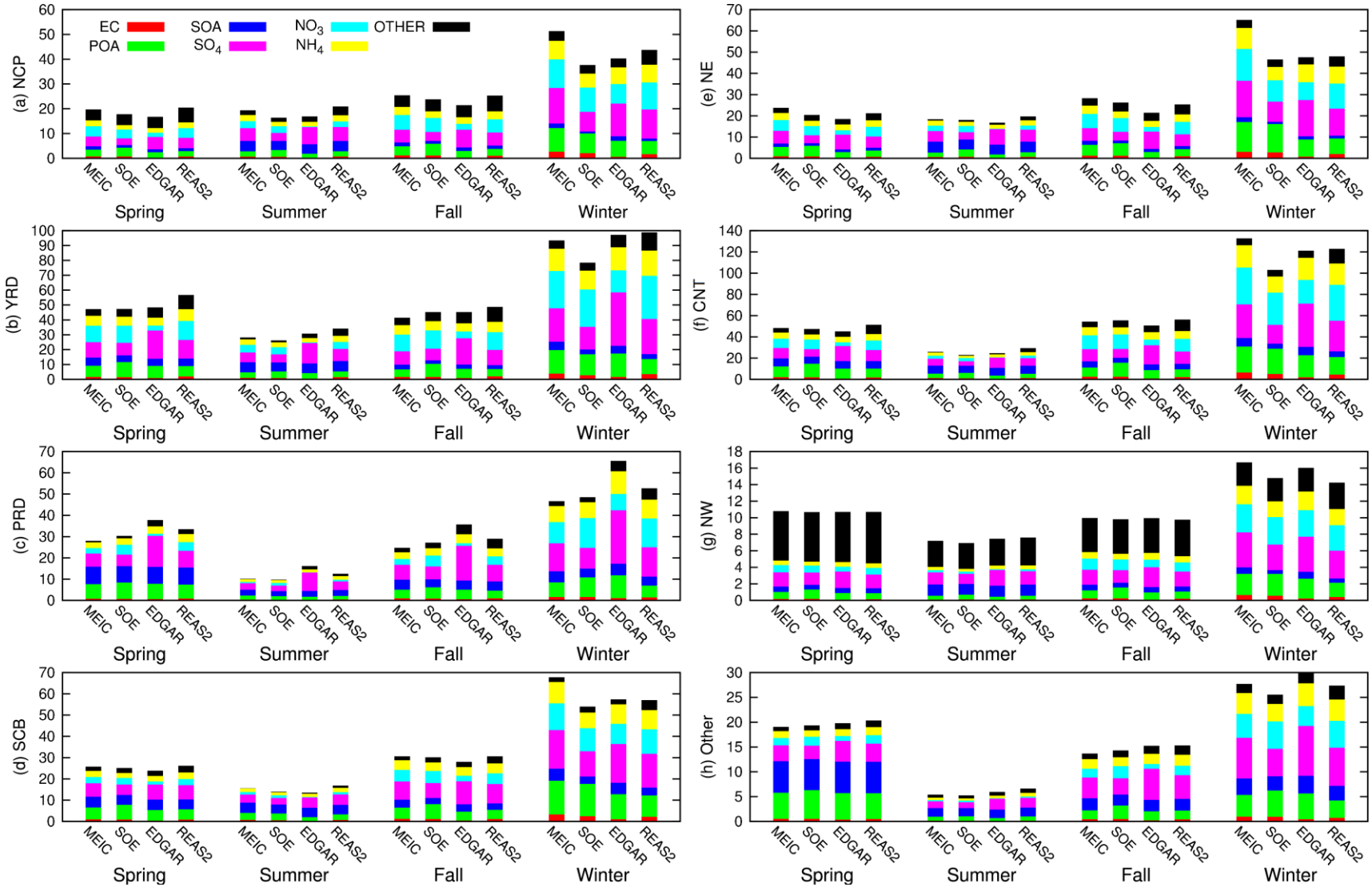


Figure S2. Comparison of predicted O_3-1h concentration in different months in different regions.



FigureS3. Comparison of predicted $PM_{2.5}$ component concentrations in different seasons in different regions.

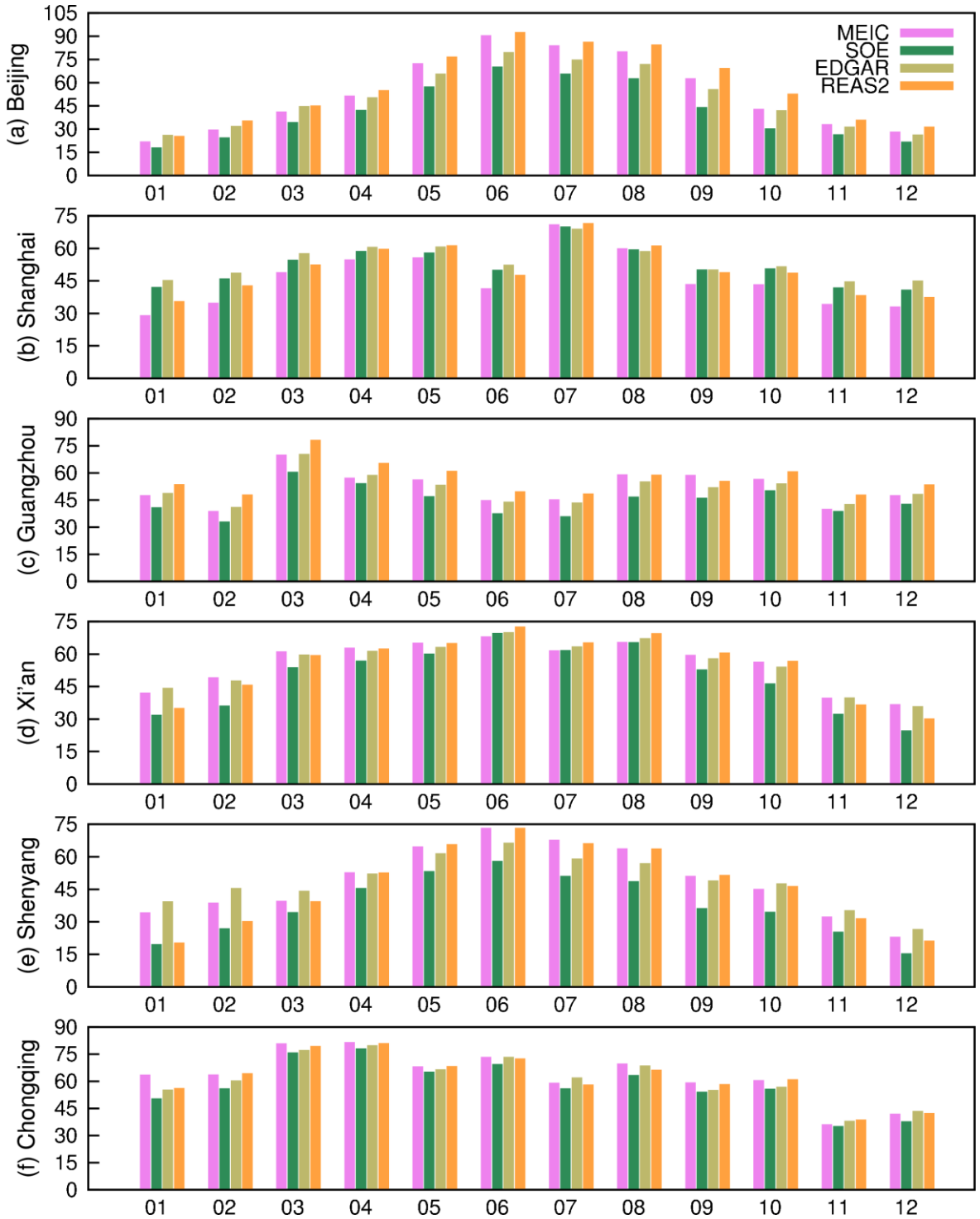


Figure S4. Comparison of predicted O_3-1h concentration in different months in 6 major cities: Beijing in NCP, Shanghai in YRD, Guangzhou in PRD, Xi'an in NW, Chongqing in SCB, and Shenyang in NE.

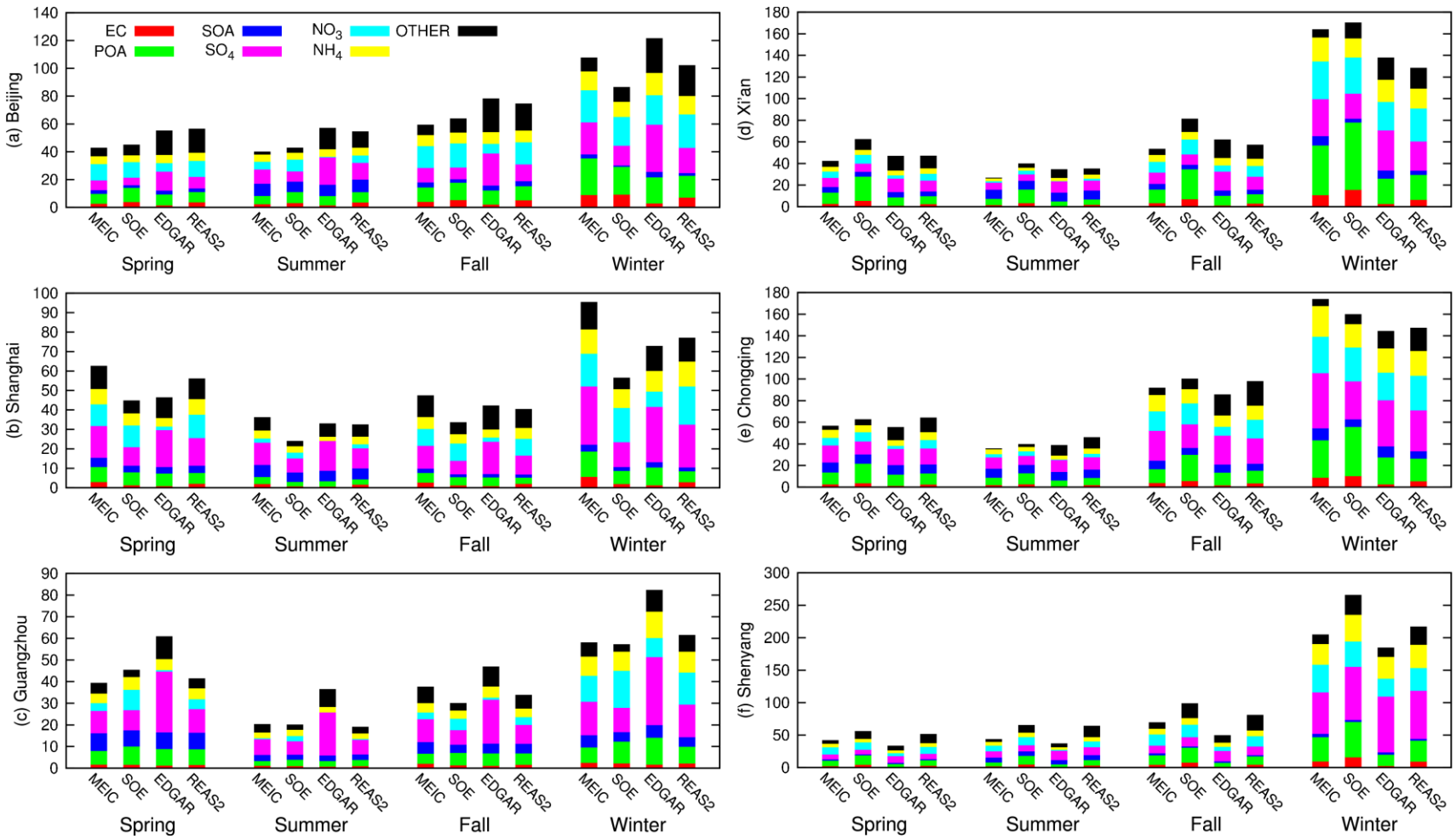


Figure S5. Comparison of predicted $PM_{2.5}$ component concentrations in different seasons in 6 major cities: Beijing in NCP, Shanghai in YRD, Guangzhou in PRD, Xi'an in NW, Chongqing in SCB, and Shenyang in NE.