

Supplementary material

Compact algorithms for predicting of atmospheric visibility using PM_{2.5}, Relative Humidity and NO₂

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Table A. 1 The comparison of regression results for the predictions from different models based on global data with observations from every city

City	Model I		Model II		N
	R^2	RSS	R^2	RSS	
Beijing	0.66	4548.2	0.64	7795.0	557
Hangzhou	0.80	734.6	0.79	1030.9	514
Guangzhou	0.74	1621.9	0.75	1317.8	342
Ningbo	0.73	1721.4	0.69	2414.7	619
Xiamen	0.65	1232.7	0.65	941.7	395
Shijiazhuang	0.72	4696.1	0.74	6974.1	692
Chongqing	0.73	1932.0	0.70	2616.0	682
Shanghai	0.74	1161.9	0.71	945.7	385
Xinbei	0.34	5346.4	0.36	4186.4	1198
Pinzhen	0.18	2723.6	0.28	1988.0	460
London	0.61	3460.6	0.61	3236.6	612
Toronto	0.31	2703.4	0.32	2845.4	700
New York	0.21	2378.9	0.30	3711.8	674
Sacramento	0.06	6772.9	0.04	10385.8	1350
Coyhaique	0.28	1174.6	0.29	1185.0	370
Sydney	0.34	1460.6	0.56	1843.8	557

RSS: Residual Sum of Squares; N: number of dataset samples.

Table A. 2 The regression value of a_1 , b_1 , c_1 and d_1 in Model I derived from the single city data

City	a_1	b_1	c_1	d_1
Beijing	0.00116±0.00015**	-1.30286±0.09983**	0.00135±0.00030**	0.13625±0.00649**
Hangzhou	0.00169±0.00025**	-1.39857±0.09288**	0.00303±0.00071**	0.09046±0.00725**
Guangzhou	0.00121±0.00011**	-0.98898±0.03745**	0.00045±0.00025	0.23351±0.00634**
Ningbo	0.00143±0.00013**	-1.01366±0.05215**	-0.00025±0.00023	0.13735±0.00432**
Xiamen	0.00097±0.00014**	-1.14071±0.07078**	0.00013±0.00019	0.17444±0.00659**
Shijiazhuang	0.00168±0.00013**	-1.02956±0.06493**	0.00042±0.00013**	0.11757±0.00478**
Chongqing	0.00128±0.00011**	-1.18208±0.04449**	0.00285±0.00020**	0.11942±0.00710**
Shanghai	0.00165±0.00019**	-0.55512±0.05501**	0.00047±0.00029	0.32513±0.00770**
Xinbei	0.00394±0.00041**	-0.61307±0.04390**	-0.00236±0.00054**	0.34481±0.01458**
Pinzhen	0.00028±0.00010**	-2.35647±0.20852**	-0.00231±0.00056**	0.18754±0.01150**
London	0.00213±0.00032**	-0.85667±0.0674**	-0.00087±0.00007**	0.22632±0.00536**
Toronto	0.00005±0.00002	-2.47126±0.27688**	0.00021±0.00022	0.26676±0.00354**
NewYork	0.00002±0.00001*	-3.25893±0.26023**	0.00002±0.00014	0.24825±0.00258**
Sacramento	0.00220±0.00014**	0.93580±0.12239**	-0.00036±0.00009**	0.24387±0.00124**
Coyhaique	0.00328±0.00127*	0.00000±0.00000	-0.00125±0.00122	0.18548±0.03767**
Sydney	0.00104±0.00023**	-1.85503±0.13183**	-0.00205±0.00021**	0.19983±0.00572**
Combined data	0.00143±0.00004**	-1.10731±0.01964**	-0.00073±0.00002**	0.21376±0.00126**

*Significance level of 0.05; ** Significance level of 0.01.

Table A. 3 The regression value of a_2 , b_2 , c_2 , d_2 and e_2 in Model II derived from the single city data

City	a_2	b_2	c_2	d_2	e_2
Beijing	0.36650±0.14763 [*]	-0.34909±0.10176 ^{**}	0.00132±0.00028 ^{**}	-0.27978±0.15167	256.56246±69.25226 ^{**}
Hangzhou	0.00783±0.00252 ^{**}	-1.69701±0.13947 ^{**}	0.00387±0.00058 ^{**}	0.11052±0.01079 ^{**}	26.09368±1.91673 ^{**}
Guangzhou	0.15657±0.04808 ^{**}	-0.41951±0.06291 ^{**}	0.00006±0.00024	-0.01306±0.06395	85.50794±12.64137 ^{**}
Ningbo	0.11339±0.03866 ^{**}	-0.48963±0.08627 ^{**}	0.00028±0.00024	-0.03561±0.05088	78.03318±12.33001 ^{**}
Xiamen	0.01774±0.00778 [*]	-0.90786±0.13317 ^{**}	0.00028±0.00019	0.13888±0.02021 ^{**}	31.06265±4.03150 ^{**}
Shijiazhuang	0.14429±0.03365 ^{**}	-0.45461±0.06715 ^{**}	0.00053±0.00014 ^{**}	-0.04830±0.03833	101.31674±12.43555 ^{**}
Chongqing	0.12058±0.02907 ^{**}	-0.59669±0.06731 ^{**}	0.00266±0.00020 ^{**}	-0.05940±0.04111	84.03014±8.48055 ^{**}
Shanghai	0.24417±0.11163 [*]	-0.20051±0.05777 ^{**}	0.00053±0.00029	0.01159±0.12937	128.75789±31.66089 ^{**}
Xinbei	0.02800±0.01255 [*]	-0.71568±0.10413 ^{**}	-0.00207±0.00053 ^{**}	0.38693±0.03628 ^{**}	28.41802±3.68806 ^{**}
Pinzhen	0.10464±0.09953	-0.60894±0.29667 [*]	-0.00251±0.00050 ^{**}	-0.00472±0.12712	67.73657±34.44815 [*]
London	0.44835±0.34193	-0.15276±0.0869	-0.00083±0.00006 ^{**}	-0.30947±0.3547	103.17687±56.09885
Toronto	0.00094±0.00056	-1.95297±0.26353 ^{**}	0.00041±0.00022	0.25536±0.00482 ^{**}	19.61940±3.23285 ^{**}
NewYork	0.00094±0.00044 [*]	-2.30095±0.22448 ^{**}	0.00031±0.00014 [*]	0.23560±0.00338	68.12171±46.29293
Sacramento	0.00861±0.00157 ^{**}	1.97490±0.23264 ^{**}	-0.00026±0.00008 ^{**}	0.25043±0.00127 ^{**}	14.83332±1.01588 ^{**}
Coyhaique	-0.68578±0.2672 [*]	0.29395±0.22307	-0.00041±0.00118	0.68527±0.30322 [*]	-174.27472±153.50281
Sydney	0.41026±0.26821	-0.26242±0.13183 [*]	-0.00131±0.00017 ^{**}	-0.30543±0.2744	245.47564±135.79310
Combined data	0.06561±0.00563 ^{**}	-0.59352±0.02576 ^{**}	-0.00075±0.00002 ^{**}	0.11489±0.00764 ^{**}	50.19809±1.79130 ^{**}

*Significance level of 0.05; ** Significance level of 0.01.