Supplementary Tables

Table S1 Keywords and associated SED for Beijing and New Delhi.

Panel A: Baidu Index in Beijing			
Baidu Index	**Max**	**Mean**	**Std.**
"Beijing" AND "Air quality"	1500.00	199.40	136.50
"Beijing" AND "Pollution"	367.00	27.20	50.20
"Beijing" AND "Haze"	4034.00	202.30	245.00
Beijing's $PM_{2.5}$	53703.00	2079.90	3632.80
$PM_{2.5}$ extraordinary in Beijing	434560.00	293.40	10269.90
$PM_{2.5}$ forecasting in Beijing	715.00	52.10	75.40
Beijing's weather	1111.00	398.00	113.30
Weather forecast for Beijing area	913.00	314.40	73.60
Today's air quality in Beijing	365.00	58.80	57.90
Air quality in Beijing	83409.00	2993.60	4801.70
Beijing air quality report	1041.00	139.10	130.40
Beijing's air quality forecast	1374.00	184.30	166.00
Beijing air quality index	23385.00	1872.20	2282.00
Weather forecast for Beijing city	4211.00	1138.70	321.50
Weather in Beijing	930129.00	195024.50	90577.80
Weather $PM_{2.5}$ in Beijing	1182.00	70.30	95.90
Weather forecast for Beijing	119111.00	21481.70	9074.30
Weather forecast for 15 days in Beijing	15617.00	3278.00	1798.90
Weather forecast for a week in Beijing	10325.00	2205.40	1433.20
Pollution of Beijing	1434.00	109.50	88.80
Haze of Beijing	921548.00	1705.80	23653.40
Red alert for haze in Beijing	497212.00	548.80	13854.30
Haze event in Beijing	273.00	15.00	34.10
Picture of haze in Beijing	5787.00	129.10	288.60
Haze forecasting for Beijing	2167.00	139.00	222.00
Alert for haze in Beijing	1620.00	42.10	108.70
Causes of haze in Beijing	1764.00	58.80	101.40
Beijing haze index	6307.00	454.10	462.60
Beijing haze index forecasting	2030.00	138.70	396.10
Weather in Beijing	9769.00	279.40	610.80
Weather forecasting in Beijing	7944.00	1209.50	553.30
Haze in Beijing	2228.00	53.80	101.60

Table S1 Keywords and associated SED for Beijing and New Delhi (Continued).

Panel B: Google Trends in New Delhi		
Google Trends	**Mean**	**Std.**
New Delhi air pollution	9.38	10.77
Air pollution in New Delhi	15.22	14.97
New Delhi pollution	7.82	11.67
Pollution New Delhi India	14.86	15.46
Delhi India pollution	7.94	10.79
Delhi India air pollution	10.25	10.95
New Delhi air quality index	10.12	16.17
New Delhi air quality	9.92	12.38
New Delhi air quality forecast	4.78	20.36
New Delhi air quality index today	6.02	18.00
New Delhi air pollution level	8.23	16.84
New Delhi air pollution index	6.16	15.29
New Delhi air pollution causes	3.89	18.45
New Delhi air quality real time	2.49	12.79
Delhi air pollution AQI	3.83	9.66
Delhi air pollution today	4.55	9.48
Delhi air pollution odd even scheme	3.58	14.30
Delhi air pollution report today	6.01	17.05
Delhi air pollution level	3.88	8.83
Delhi air pollution odd even	10.84	19.39
Delhi air pollution index	6.98	10.76
Delhi air pollution case study	15.51	20.62
Delhi air pollution after Diwali	0.95	7.17
Delhi air pollution report	11.68	16.15
Delhi air pollution news	3.49	8.55
Delhi air pollution latest news	4.60	14.36
Delhi air pollution live	5.28	13.98
Delhi air pollution causes	16.24	17.60
Delhi air pollution data	18.89	22.40
Delhi air pollution solutions	9.14	20.68
Delhi air pollution reasons	10.70	21.79
Delhi air pollution level today	4.57	10.99
Delhi air pollution mask	5.71	11.85
Delhi air pollution 2017	4.03	9.04
Delhi air pollution 2019	4.94	15.70

Table S1 Keywords and associated SED for Beijing and New Delhi (Continued).

Panel B: Google Trends in New Delhi		
Google Trends	**Mean**	**Std.**
Delhi air pollution data today	5.74	22.36
Delhi air pollution essay	14.42	19.71
Delhi air pollution index today	5.92	12.57
Delhi air pollution video	2.50	9.02
Why Delhi air pollution	11.27	15.20
Delhi air pollution map	12.52	21.95
Delhi air pollution problem	11.00	20.40
Delhi air pollution level today live	2.49	10.44
Delhi air pollution forecast	4.68	16.51
Air pollution in Delhi	5.69	9.62
Pollution New Delhi	7.21	11.15
Air pollution in New Delhi India	9.08	17.81
New delhi air quality today	8.17	17.06
Delhi air pollution AQI today	2.14	9.78
Delhi air quality AQI	6.49	12.61
Delhi air quality after Diwali	1.30	7.72
Best air pollution mask for Delhi	3.79	12.28
Best mask for Delhi air pollution	3.79	12.28
Mask for Delhi air pollution	6.46	14.16
Air pollution mask for Delhi	6.46	14.16
Air pollution causes in Delhi	12.38	15.83
Causes of Delhi air pollution	12.65	18.24
What causes Delhi air pollution	11.05	25.74
Reasons for Delhi air pollution	3.44	12.61
Delhi air pollution case study pdf	6.01	22.52
Delhi air pollution before and after	3.94	18.69
Delhi air pollution emergency	2.81	15.21
Delhi air pollution images	4.37	11.57
Delhi air pollution odd even policy	1.78	12.87
Delhi India pollution	8.45	10.73
Delhi air pollution why	9.96	13.71
Delhi air pollution mask	5.43	12.38

Table S2 Results of PCA and correlation analysis in Beijing.

Related big data	Principal component	Eigenvalue	Cumulative explained variance	Pearson correlation coefficient		Spearman correlation coefficient	
				Correlation	Prob.	Correlation	Prob.
Other air quality data	1st	3992.83	93.95%	0.88	0.00	0.83	0.00
Meteorological data	1st	0.46	98.32%	-0.11	0.00	0.02	0.29
	1st	0.45	37.42%	0.71	0.00	0.57	0.00
	2nd	0.20	16.60%	-0.01	0.78	0.08	0.00
	3rd	0.14	11.49%	-0.15	0.00	-0.12	0.00
SED	4th	0.11	8.79%	0.10	0.00	0.09	0.00
	5th	0.05	4.50%	0.06	0.01	0.29	0.00
	6th	0.05	3.89%	0.13	0.00	0.12	0.00
	7th	0.03	2.64%	-0.05	0.03	0.03	0.23

Table S3 Results of PCA and correlation analysis in New Delhi.

Related big data	Principal component	Eigenvalue	Cumulative explained variance	Pearson correlation coefficient		Spearman correlation coefficient	
				Correlation	Prob.	Correlation	Prob.
Meteorological data	1st	95.38	95.06%	-0.69	0.00	-0.65	0.00
SED	1st	4860.22	30.73%	0.53	0.00	0.69	0.00
	2nd	927.99	5.87%	0.31	0.00	0.26	0.00
	3rd	768.85	4.86%	-0.23	0.00	-0.25	0.00
	4th	598.99	3.79%	-0.09	0.22	-0.08	0.24
	5th	575.35	3.64%	0.14	0.04	0.11	0.11
	6th	528.96	3.34%	-0.05	0.46	-0.08	0.28
	7th	488.06	3.09%	0.08	0.28	0.07	0.32
	8th	462.18	2.92%	0.06	0.39	0.01	0.91
	9th	447.02	2.83%	-0.01	0.88	0.02	0.73
	10th	399.05	2.52%	0.01	0.86	-0.14	0.05
	11th	363.84	2.30%	-0.09	0.21	-0.10	0.14
	12th	350.81	2.22%	-0.11	0.13	-0.15	0.04
	13th	317.11	2.01%	0.04	0.60	0.07	0.29
	14th	307.76	1.95%	-0.02	0.72	0.01	0.88
	15th	301.74	1.91%	0.01	0.84	0.04	0.54
	16th	290.29	1.84%	0.03	0.69	-0.02	0.76
	17th	263.65	1.67%	-0.12	0.08	-0.03	0.62
	18th	246.03	1.56%	0.05	0.43	-0.01	0.84
	19th	226.71	1.43%	-0.06	0.35	-0.10	0.16
	20th	212.97	1.35%	-0.03	0.64	-0.12	0.07
	21st	201.87	1.28%	-0.09	0.20	-0.04	0.54
	22nd	189.45	1.20%	-0.09	0.22	-0.18	0.01
	23rd	174.21	1.10%	0.05	0.48	0.03	0.68

Table S4 Results of augmented Dickey-Fuller test, co-integration test and Granger causality test in Beijing.

Panel A: Stationarity via augmented Dickey-Fuller test			
No.	**Related big data**	***T*-statistic**	**Prob.**
1	$PM_{2.5}$	-4.63	0.0001***
2	Other air quality data	-3.39	0.0114**
3	SED	-3.51	0.0076***
Panel B: Co-integration between $PM_{2.5}$ and related big data			
No.	**Related big data**	***T*-statistic**	**Prob.**
1	Other air quality data	-5.54	1.49E-05***
2	SED	-5.89	2.80E-06***
Panel C-I: H0: Related big data does not Granger cause $PM_{2.5}$ concentration			
No.	**Related big data**	***T*-statistic**	**Prob.**
1	Other air quality data	153.29	2.2e-16***
2	SED	5.39	0.02038**
Panel C-II: H0: $PM_{2.5}$ concentration does not Granger cause related big data			
No.	**Related big data**	***T*-statistic**	**Prob.**
1	Other air quality data	121.40	2.2e-16***
2	SED	65.97	8.367e-16***

Notes: ***, ** and * denote the significances at 1%, 5% and 10%, respectively.

Table S5 Results of augmented Dickey-Fuller test, co-integration test and Granger causality test in New Delhi.

Panel A: Stationarity via augmented Dickey-Fuller test			
No.	**Related big data**	***T*-statistic**	**Prob.**
1	$PM_{2.5}$	-4.37	3.39E-04***
2	Meteorological data	-4.97	2.58E-05***
3	SED	-4.78	5.94E-05***
Panel B: Co-integration between $PM_{2.5}$ and related big data			
No.	**Related big data**	***T*-statistic**	**Prob.**
1	Meteorological data	-6.38	2.31E-07***
2	SED	-3.46	0.0362**
Panel C-I: H0: Related big data does not Granger cause $PM_{2.5}$ concentration			
No.	**Related big data**	***T*-statistic**	**Prob.**
1	Meteorological data	8.33	0.004309***
2	SED	16.80	5.989e-05***
Panel C-II: H0: $PM_{2.5}$ concentration does not Granger cause related big data			
No.	**Related big data**	***T*-statistic**	**Prob.**
1	Meteorological data	25.29	1.075e-06***
2	SED	1.16	0.28

Notes: ***, ** and * denote the significances at 1%, 5% and 10%, respectively.

Table S6 Timescales of the common modes extracted by MEMD for Beijing and New Delhi.

Panel A: Beijing (days)				
Mode	**$PM_{2.5}$ concentrations**	**Other air quality data**	**Meteorological data**	**SED**
IMFs 1	2.07	1.74	1.75	2.03
IMFs 2	4.80	3.92	4.93	3.92
IMFs 3	7.60	7.60	6.19	7.60
IMFs 4	12.59	12.59	14.04	19.21
IMFs 5	36.50	36.50	30.42	36.50
IMFs 6	91.25	91.25	87.00	91.25
IMFs 7	182.50	182.50	182.50	182.50
IMFs 8	>=T_1	>=T_1	>=T_1	>=T_1
IMFs 9	>=T_1	>=T_1	>=T_1	>=T_1
Residues	>=T_1	>=T_1	>=T_1	>=T_1
Panel B: New Delhi (weeks)				
Mode	**$PM_{2.5}$ concentrations**	**Meteorological data**	**SED**	
IMFs 1	1.99	1.85	1.51	
IMFs 2	3.51	3.72	2.35	
IMFs 3	6.52	6.64	4.68	
IMFs 4	13.04	13.04	13.52	
IMFs 5	26.07	24.33	26.07	
IMFs 6	52.14	52.14	60.83	
IMFs 7	91.25	91.25	91.25	
Residues	>=T_2	>=T_2	>=T_2	

Notes: T_1 = 182.5 (days) and T_2 = 91.25 (weeks) denote the length of the sample period for Beijing and New Delhi, respectively.

Table S7 Results of DM test between different types of models in terms of *S*-statistic in New Delhi.

Panel A: Effectiveness of meteorological data						
Targets	**Benchmarks**	**Forecasting techniques**				
(with meteorological data)	(without meteorological data)	**LR**	**SVR**	**BPNN**	**ELM**	**RVFL**
M2-2 (with meteorological data)	**M1** (single models)	-0.51	-1.34*	-0.40	-1.27*	-0.58
M2-2 (with meteorological data)	**M2-3** (with SED)	0.72	-2.93***	0.35	-0.62	-0.73
Panel B: Effectiveness of multi-source big data analysis						
Targets	**Benchmarks**	**Forecasting techniques**				
(with multi-source big data)	(without multi-source big data)	**LR**	**SVR**	**BPNN**	**ELM**	**RVFL**
M0 (with MEMD)	**M4-2** (with meteorological data and BEMD)	-4.41***	-2.04**	-2.02**	-4.22***	-4.76***
M0 (with MEMD)	**M4-3** (with SED and BEMD)	-3.46***	-3.03***	-1.31*	-2.70***	-3.94***
M3 (single models)	**M1** (without big data)	-1.47*	-1.30*	-1.80**	-2.06**	-0.20

Table S7 Results of DM test between different types of models in terms of *S*-statistic in New Delhi (Continued).

Panel C: Effectiveness of multi-scale analysis						
Targets	**Benchmarks**	**Forecasting techniques**				
(with multi-scale analysis)	(without multi-scale analysis)	**LR**	**SVR**	**BPNN**	**ELM**	**RVFL**
M0 (with multi-source big data and MEMD)	**M3** (with multi-source big data)	-5.99***	-6.14***	-4.12***	-5.36***	-6.30***
M4-2 (with meteorological data and BEMD)	**M2-2** (with meteorological data)	-5.71***	-2.99***	-4.06***	-3.93***	-4.82***
M4-3 (with SED and BEMD)	**M2-3** (with SED)	-5.25***	-5.12***	-4.15***	-4.66***	-5.06***

Notes:***, ** and * denote the significances at 1%, 5% and 10%, respectively.

Table S8 *IR* between different types of methods regarding *MAPE* in Beijing.

Panel A: Effectiveness of Internet big data					
Targets (with SED)	**M2-3**				
Benchmarks (without SED)	**M1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	16.07%	23.18%	25.27%	25.15%	23.05%
SVR	9.82%	8.08%	24.87%	24.72%	18.23%
BPNN	26.78%	18.86%	27.36%	29.37%	25.63%
ELM	12.51%	23.20%	28.96%	32.20%	25.63%
RVFL	11.54%	22.63%	31.87%	35.52%	27.12%
Targets (with SED)	**M2-3**				
Benchmarks (without SED)	**M2-1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	0.34%	10.87%	16.66%	18.41%	12.92%
SVR	0.25%	2.75%	4.75%	12.30%	5.62%
BPNN	1.68%	10.26%	23.84%	17.12%	14.75%
ELM	2.04%	10.19%	18.03%	23.11%	14.75%
RVFL	5.96%	11.42%	20.65%	29.34%	18.25%
Targets (with SED)	**M2-3**				
Benchmarks (without SED)	**M2-2**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	16.17%	21.77%	24.55%	25.03%	22.46%
SVR	14.88%	10.01%	21.48%	21.56%	17.48%
BPNN	15.53%	17.47%	31.48%	32.01%	25.42%
ELM	15.96%	25.16%	29.39%	33.55%	27.17%
RVFL	12.43%	23.35%	31.42%	36.47%	27.59%

Table S8 *IR* between different types of methods regarding *MAPE* in Beijing (Continued).

Panel B: Effectiveness of multi-source big data analysis					
Targets (with multi-source big data)	**M0**				
Benchmarks (without multi-source big data)	**M4-1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	-1.42%	3.67%	9.68%	14.59%	7.56%
SVR	10.01%	10.05%	14.31%	11.14%	11.55%
BPNN	9.33%	10.92%	4.01%	2.12%	5.05%
ELM	12.15%	8.03%	11.36%	22.45%	14.26%
RVFL	7.73%	5.97%	7.25%	12.68%	8.64%
Targets (with SED)	**M0**				
Benchmarks (without SED)	**M4-2**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	-4.87%	1.08%	4.43%	10.11%	4.44%
SVR	6.82%	4.69%	6.80%	4.38%	5.59%
BPNN	3.72%	5.79%	1.08%	1.08%	2.78%
ELM	19.48%	17.94%	5.24%	3.98%	11.37%
RVFL	6.57%	11.94%	3.95%	5.61%	7.02%
Targets (with SED)	**M0**				
Benchmarks (without SED)	**M4-3**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	5.63%	7.55%	11.95%	14.03%	10.21%
SVR	16.86%	11.31%	11.80%	5.54%	11.01%
BPNN	16.94%	9.06%	12.41%	2.81%	9.97%
ELM	16.75%	6.90%	2.68%	10.78%	9.09%
RVFL	14.64%	6.34%	5.80%	10.03%	9.05%
Targets (with SED)	**M3**				
Benchmarks (without SED)	**M1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	19.13%	22.74%	20.67%	18.18%	20.24%
SVR	9.32%	-11.49%	5.41%	9.45%	3.30%
BPNN	21.72%	20.44%	22.95%	17.86%	20.65%
ELM	7.86%	17.28%	23.03%	20.69%	18.33%
RVFL	9.91%	18.89%	24.06%	21.28%	19.57%

Table S8 *IR* between different types of methods regarding *MAPE* in Beijing (Continued).

Panel C: Effectiveness of multi-scale analysis					
Targets (with multi-scale analysis)	**M0**				
Benchmarks (without multi-scale analysis)	**M3**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	37.01%	48.06%	48.07%	49.46%	46.48%
SVR	36.19%	49.41%	48.24%	42.65%	45.04%
BPNN	58.33%	50.93%	46.94%	47.56%	48.11%
ELM	47.34%	53.81%	49.77%	48.13%	49.93%
RVFL	45.20%	53.12%	50.44%	49.28%	49.84%
Targets (with multi-scale analysis)	**M4-1**				
Benchmarks (without multi-scale analysis)	**M2-1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	40.36%	51.67%	49.13%	47.23%	47.74%
SVR	28.88%	33.66%	27.57%	31.92%	30.64%
BPNN	38.28%	54.08%	55.35%	48.35%	50.29%
ELM	38.15%	51.43%	49.67%	39.84%	45.33%
RVFL	43.12%	53.70%	52.74%	49.89%	50.47%
Targets (with multi-scale analysis)	**M4-2**				
Benchmarks (without multi-scale analysis)	**M2-2**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	51.48%	58.69%	56.48%	53.92%	54.98%
SVR	41.39%	42.07%	45.10%	43.41%	43.19%
BPNN	50.07%	57.85%	61.02%	58.08%	57.53%
ELM	42.12%	54.64%	59.44%	58.01%	54.82%
RVFL	47.70%	57.22%	60.56%	58.32%	56.89%
Targets (with multi-scale analysis)	**M4-3**				
Benchmarks (without multi-scale analysis)	**M2-3**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	35.69%	43.50%	37.38%	35.74%	38.21%
SVR	22.83%	30.82%	26.11%	26.98%	26.96%
BPNN	31.47%	47.10%	35.75%	37.24%	38.50%
ELM	33.38%	46.57%	44.07%	31.99%	39.52%
RVFL	34.62%	47.52%	41.36%	31.17%	39.14%

Table S9 *IR* between different types of methods regarding *MAPE* in New Delhi.

Panel A: Effectiveness of meteorological data			
Targets (with meteorological data)	**M2-2**	**M2-2**	
Benchmarks (without meteorological data)	**M1**	**M2-3**	
Horizon	**One**	**One**	
LR	-1.23%	9.23%	
SVR	9.08%	-14.75%	
BPNN	3.97%	5.89%	
ELM	5.89%	0.05%	
RVFL	0.96%	-0.78%	
Panel B: Effectiveness of multi-source big data analysis			
Targets (with multi-source big data)	**M0**	**M0**	**M3**
Benchmarks (without multi-source big data)	**M4-2**	**M4-3**	**M1**
Horizon	**One**	**One**	**One**
LR	31.82%	13.63%	8.19%
SVR	11.15%	0.59%	1.68%
BPNN	18.57%	11.57%	12.25%
ELM	35.37%	13.96%	14.87%
RVFL	32.82%	17.79%	0.36%
Panel C: Effectiveness of multi-scale analysis			
Targets (with multi-scale analysis)	**M0**	**M4-2**	**M4-3**
Benchmarks (without multi-scale analysis)	**M3**	**M2-2**	**M2-3**
Horizon	**One**	**One**	**One**
LR	63.17%	51.01%	57.40%
SVR	59.34%	50.52%	61.46%
BPNN	52.75%	46.99%	48.13%
ELM	58.93%	42.52%	56.81%
RVFL	66.10%	49.23%	58.84%

Table S10 *IR* between different types of methods regarding *RMSE* in Beijing.

Panel A: Effectiveness of Internet big data					
Targets (with SED)	**M2-3**				
Benchmarks (without SED)	**M1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	4.57%	6.78%	8.00%	8.66%	7.19%
SVR	1.18%	6.05%	0.39%	-3.04%	1.16%
BPNN	10.25%	5.86%	7.28%	10.33%	8.37%
ELM	-5.76%	5.56%	8.05%	4.57%	3.73%
RVFL	5.55%	8.94%	8.22%	8.08%	7.85%
Targets (with SED)	**M2-3**				
Benchmarks (without SED)	**M2-1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	3.40%	3.75%	5.31%	5.77%	4.65%
SVR	-1.01%	-5.18%	-5.66%	1.85%	-2.48%
BPNN	-3.97%	1.66%	5.24%	4.29%	2.28%
ELM	-13.55%	-4.45%	1.13%	1.28%	-3.16%
RVFL	2.72%	2.47%	1.85%	4.03%	2.78%
Targets (with SED)	**M2-3**				
Benchmarks (without SED)	**M2-2**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	5.51%	6.51%	6.81%	7.65%	6.70%
SVR	3.07%	-3.06%	-0.42%	1.83%	0.25%
BPNN	5.51%	6.20%	11.46%	14.19%	9.73%
ELM	-5.46%	4.06%	6.68%	7.34%	3.77%
RVFL	6.18%	9.22%	8.27%	10.65%	8.77%

Table S10 *IR* between different types of methods regarding *RMSE* in Beijing (Continued).

Panel B: Effectiveness of multi-source big data analysis					
Targets (with multi-source big data)	**M0**				
Benchmarks (without multi-source big data)	**M4-1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	7.25%	20.96%	29.68%	30.20%	24.14%
SVR	13.74%	25.50%	31.52%	28.98%	26.44%
BPNN	8.70%	14.63%	21.36%	27.66%	19.62%
ELM	7.61%	22.36%	30.77%	34.67%	26.52%
RVFL	8.49%	13.02%	20.62%	29.11%	19.55%
Targets (with multi-source big data)	**M0**				
Benchmarks (without multi-source big data)	**M4-2**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	3.52%	1.14%	4.44%	9.57%	5.01%
SVR	11.25%	7.03%	9.14%	11.46%	9.73%
BPNN	2.73%	3.65%	2.95%	12.56%	5.97%
ELM	22.99%	22.10%	7.58%	20.04%	18.06%
RVFL	9.47%	10.81%	6.67%	12.93%	10.05%
Targets (with multi-source big data)	**M0**				
Benchmarks (without multi-source big data)	**M4-3**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	10.29%	17.30%	26.12%	28.04%	21.94%
SVR	18.19%	22.65%	30.51%	28.72%	26.03%
BPNN	10.40%	6.92%	17.76%	25.69%	16.57%
ELM	9.45%	8.69%	10.99%	22.69%	13.89%
RVFL	14.03%	8.73%	12.93%	23.54%	15.50%
Targets (with multi-source big data)	**M3**				
Benchmarks (without multi-source big data)	**M1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	2.04%	7.17%	9.44%	10.12%	7.58%
SVR	0.23%	-9.07%	-10.09%	-2.08%	-5.71%
BPNN	8.38%	8.91%	9.04%	6.23%	8.11%
ELM	8.04%	11.90%	10.99%	8.28%	9.92%
RVFL	5.90%	10.41%	10.64%	8.90%	9.18%

Table S10 *IR* between different types of methods regarding *RMSE* in Beijing (Continued).

Panel C: Effectiveness of multi-scale analysis					
Targets (with multi-scale analysis)	**M0**				
Benchmarks (without multi-scale analysis)	**M3**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	41.79%	43.51%	36.14%	35.97%	39.18%
SVR	44.47%	52.45%	47.94%	39.01%	46.29%
BPNN	49.54%	43.10%	36.35%	39.87%	40.81%
ELM	43.94%	45.99%	39.08%	39.23%	41.88%
RVFL	44.37%	45.16%	39.34%	40.34%	42.12%
Targets (with multi-scale analysis)	**M4-1**				
Benchmarks (without multi-scale analysis)	**M2-1**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	37.77%	31.51%	15.35%	14.95%	23.88%
SVR	34.35%	22.07%	11.21%	16.49%	19.97%
BPNN	35.97%	36.58%	24.75%	16.81%	27.84%
ELM	40.10%	32.22%	15.77%	11.74%	23.66%
RVFL	41.08%	39.49%	26.97%	19.95%	31.07%
Targets (with multi-scale analysis)	**M4-2**				
Benchmarks (without multi-scale analysis)	**M2-2**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	41.48%	46.81%	38.69%	35.66%	40.52%
SVR	38.77%	38.81%	36.41%	33.00%	36.53%
BPNN	45.38%	46.40%	43.03%	38.30%	43.02%
ELM	33.25%	37.95%	40.44%	32.32%	36.14%
RVFL	42.55%	45.08%	41.95%	39.32%	42.14%
Targets (with multi-scale analysis)	**M4-3**				
Benchmarks (without multi-scale analysis)	**M2-3**				
Horizon	**One**	**Two**	**Three**	**Four**	**Average**
LR	33.39%	31.98%	14.91%	12.45%	22.42%
SVR	31.48%	28.64%	17.20%	15.23%	22.34%
BPNN	37.25%	40.86%	24.07%	15.38%	28.86%
ELM	46.17%	44.82%	33.74%	24.45%	36.85%
RVFL	35.52%	40.88%	32.17%	22.67%	32.49%

Table S11 *IR* between different types of methods regarding *RMSE* in New Delhi.

Panel A: Effectiveness of meteorological data			
Targets (with meteorological data)	**M2-2**	**M2-2**	
Benchmarks (without meteorological data)	**M1**	**M2-3**	
Horizon	**One**	**One**	
LR	8.97%	1.67%	
SVR	13.02%	-21.59%	
BPNN	4.61%	0.39%	
ELM	12.51%	-2.46%	
RVFL	9.18%	-2.01%	
Panel B: Effectiveness of multi-source big data analysis			
Targets (with multi-source big data)	**M0**	**M0**	**M3**
Benchmarks (without multi-source big data)	**M4-2**	**M4-3**	**M1**
Horizon	**One**	**One**	**One**
LR	24.47%	9.44%	13.10%
SVR	13.20%	8.26%	11.08%
BPNN	19.81%	12.67%	8.63%
ELM	26.48%	6.66%	19.56%
RVFL	25.37%	10.80%	8.04%
Panel C: Effectiveness of multi-scale analysis			
Targets (with multi-scale analysis)	**M0**	**M4-2**	**M4-3**
Benchmarks (without multi-scale analysis)	**M3**	**M2-2**	**M2-3**
Horizon	**One**	**One**	**One**
LR	57.64%	46.46%	54.58%
SVR	57.46%	49.90%	61.01%
BPNN	55.65%	47.03%	51.17%
ELM	52.52%	40.62%	54.35%
RVFL	60.25%	46.07%	55.77%

Table S12 *MAPE* and *RMSE* between different types of models using different lag periods in Beijing.

Lag	Type	LR		SVR		ELM		RVFL		BP	
		MAPE	*RMSE*	*MAPE*	*RMSE*	*MAPE*	*RMSE*	*MAPE*	*RMSE*	*MAPE*	*RMSE*
	M1	1.21	27.16	0.96	25.81	1.11	28.27	1.10	28.32	1.16	28.49
	M2-1	0.99	26.66	0.87	25.81	1.05	33.28	0.97	26.32	0.95	27.57
	M2-2	1.21	27.23	1.03	26.19	1.11	28.13	1.10	27.13	1.13	27.37
	M2-3	1.01	25.87	0.86	25.67	0.94	37.05	1.00	30.47	1.02	26.68
Lag=2	M3	0.94	26.40	0.87	25.87	0.92	26.56	0.95	25.34	1.00	25.63
	M4-1	0.65	18.02	0.56	16.55	0.69	23.65	0.61	16.85	0.58	16.82
	M4-2	0.62	16.73	0.55	15.25	0.79	53.91	0.61	16.16	0.64	16.56
	M4-3	0.68	18.18	0.61	16.64	0.61	16.11	0.65	16.66	0.65	16.93
	M0	0.69	16.43	0.53	14.35	0.57	16.37	0.58	15.05	0.59	16.04
	M1	1.18	26.86	0.96	25.76	1.09	27.79	1.06	27.38	1.14	27.59
	M2-1	0.97	26.56	0.86	25.72	0.96	26.10	0.97	25.94	0.97	26.17
	M2-2	1.18	27.14	1.03	26.07	1.10	28.02	1.08	27.07	1.15	27.62
	M2-3	1.02	25.85	0.87	25.66	1.00	29.29	1.02	25.73	1.00	25.48
Lag=3	M3	0.95	26.47	0.86	25.54	1.02	25.71	1.01	25.43	0.94	25.92
	M4-1	0.62	16.76	0.60	15.29	0.65	16.49	0.61	15.69	0.65	15.93
	M4-2	0.59	16.18	0.56	15.59	0.66	22.94	0.63	17.33	0.60	15.41
	M4-3	0.66	17.26	0.62	16.04	0.63	15.87	0.65	16.29	0.64	16.42
	M0	0.65	16.14	0.53	14.38	0.56	14.93	0.59	15.53	0.59	15.90
	M1	1.18	26.88	0.97	25.80	1.12	27.79	1.11	27.17	1.09	26.98
	M2-1	1.01	26.63	0.90	25.63	0.99	26.43	1.01	25.97	1.02	26.18
	M2-2	1.19	27.19	1.03	26.19	1.11	27.50	1.10	27.17	1.12	27.15
	M2-3	0.97	25.53	0.88	25.46	0.93	26.56	0.94	25.53	0.95	25.95
Lag=5	M3	0.95	26.15	0.91	25.58	0.98	25.37	0.98	25.45	0.95	25.77
	M4-1	0.60	16.58	0.56	15.96	0.58	15.77	0.60	15.22	0.64	16.02
	M4-2	0.58	15.91	0.57	16.34	0.60	15.71	0.60	15.22	0.60	16.91
	M4-3	0.64	17.11	0.62	16.69	0.63	16.33	0.63	16.67	0.63	16.57
	M0	0.64	15.98	0.56	15.18	0.58	15.35	0.59	15.13	0.60	16.05
	M1	1.16	26.72	0.96	25.75	1.14	27.55	1.12	26.85	1.10	26.63
	M2-1	1.01	26.60	0.90	25.64	1.00	26.21	1.01	25.85	1.14	26.76
	M2-2	1.17	27.08	1.03	26.21	1.12	28.13	1.13	27.67	1.14	28.12
	M2-3	0.97	25.55	0.89	25.46	0.96	26.31	0.94	25.70	0.94	25.90
Lag=6	M3	0.96	26.24	0.93	25.81	0.97	25.70	0.96	25.85	0.98	26.50
	M4-1	0.60	16.73	0.61	16.91	0.58	17.01	0.60	15.23	0.64	16.34
	M4-2	0.58	15.92	0.57	16.52	0.58	15.51	0.60	15.44	0.89	20.58
	M4-3	0.64	17.18	0.58	15.92	0.63	16.49	0.63	16.67	0.67	17.07
	M0	0.64	16.06	0.57	15.40	0.59	15.46	0.60	15.23	0.66	16.38

Table S13 *MAPE* and *RMSE* between different types of models using different lag periods in New Delhi.

Lag	Type	LR		SVR		ELM		RVFL		BP	
		MAPE	*RMSE*	*MAPE*	*RMSE*	*MAPE*	*RMSE*	*MAPE*	*RMSE*	*MAPE*	*RMSE*
	M1	0.14	29.91	0.14	31.07	0.14	30.99	0.14	30.14	0.15	29.58
	M2-2	0.15	29.48	0.14	29.27	0.14	28.79	0.15	28.76	0.14	27.92
	M2-3	0.13	26.65	0.14	28.62	0.16	36.05	0.17	38.56	0.14	29.16
Lag=2	M3	0.13	26.72	0.13	28.02	0.15	32.20	0.16	33.77	0.13	28.48
	M4-2	0.08	15.71	0.07	15.22	0.07	14.51	0.07	15.05	0.08	15.96
	M4-3	0.08	14.86	0.08	17.25	0.07	13.94	0.07	13.96	0.07	15.09
	M0	0.06	11.97	0.06	11.59	0.06	11.70	0.06	11.27	0.06	12.82
	M1	0.15	31.47	0.14	32.60	0.15	30.78	0.15	30.87	0.17	34.97
	M2-2	0.16	30.15	0.15	29.36	0.15	28.71	0.15	29.40	0.14	28.05
	M2-3	0.14	27.92	0.14	30.11	0.16	34.16	0.16	33.73	0.16	36.17
Lag=3	M3	0.14	27.29	0.14	28.93	0.14	27.82	0.16	31.95	0.13	27.67
	M4-2	0.08	15.22	0.08	15.33	0.08	16.13	0.08	15.14	0.08	16.66
	M4-3	0.07	14.60	0.08	16.67	0.07	13.32	0.07	13.73	0.07	13.94
	M0	0.05	11.27	0.06	12.28	0.05	11.00	0.05	10.43	0.06	13.45
	M1	0.15	31.14	0.15	32.29	0.15	31.03	0.15	31.28	0.15	30.59
	M2-2	0.16	29.64	0.15	28.60	0.14	26.93	0.15	28.21	0.14	29.64
	M2-3	0.14	27.48	0.14	30.06	0.13	27.51	0.15	30.58	0.14	27.54
Lag=5	M3	0.14	27.01	0.15	29.71	0.13	25.53	0.15	30.02	0.13	25.24
	M4-2	0.08	15.27	0.08	15.85	0.08	15.39	0.08	14.83	0.08	16.06
	M4-3	0.07	13.68	0.08	15.95	0.07	13.53	0.07	13.15	0.08	15.81
	M0	0.05	10.93	0.07	13.77	0.06	12.39	0.05	10.41	0.07	14.65
	M1	0.15	32.09	0.14	32.80	0.16	33.07	0.16	33.38	0.15	32.18
	M2-2	0.16	29.80	0.15	29.87	0.15	27.57	0.16	29.05	0.15	28.92
	M2-3	0.13	27.42	0.14	30.72	0.13	28.26	0.15	31.13	0.13	29.26
Lag=6	M3	0.14	26.83	0.16	31.50	0.13	26.06	0.16	30.82	0.14	28.44
	M4-2	0.08	15.54	0.08	16.33	0.08	15.58	0.08	15.03	0.08	16.70
	M4-3	0.07	13.78	0.08	15.77	0.08	14.00	0.07	13.40	0.09	15.66
	M0	0.05	10.93	0.07	14.04	0.06	13.95	0.05	10.75	0.07	16.41