

Figure S1. Map of average PM_{2.5} observations for air quality monitoring stations during the study period.

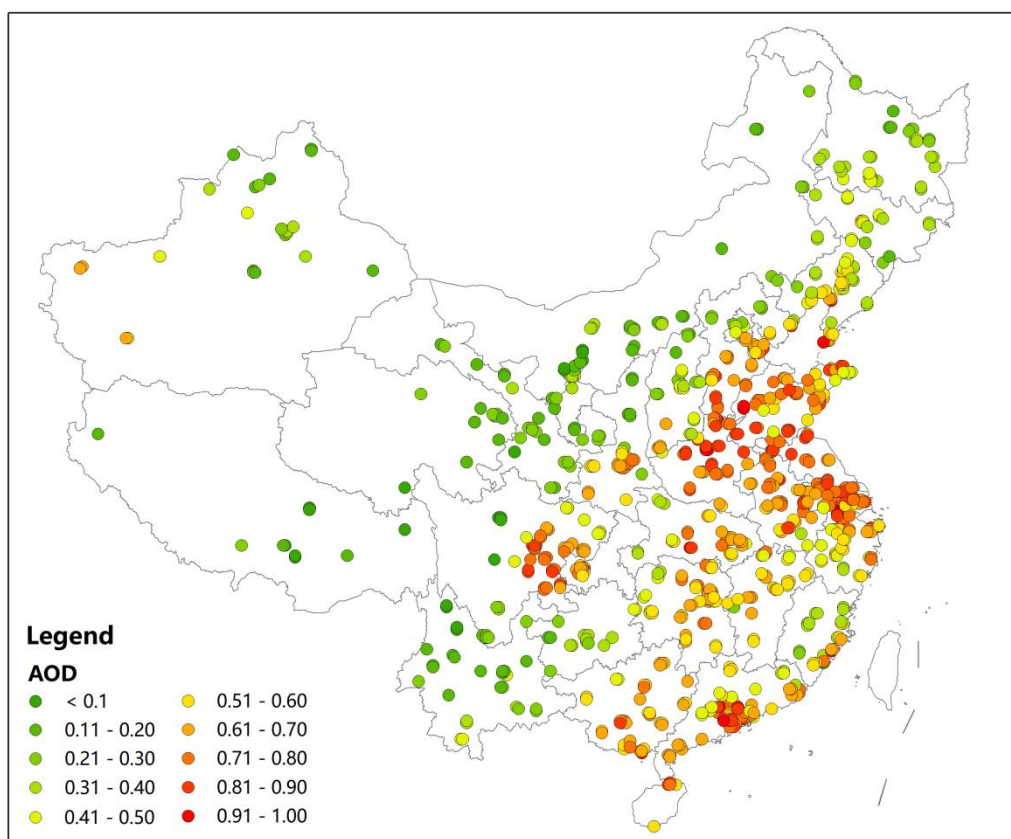


Figure S2. Map of average AOD for air quality monitoring stations during the study period.

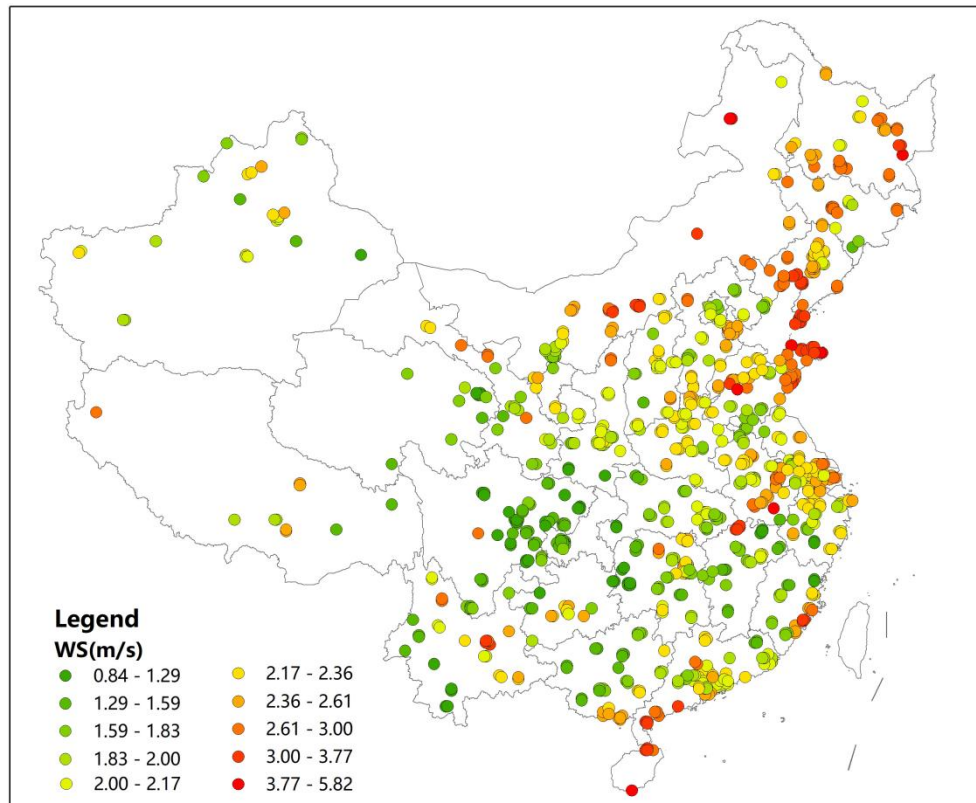


Figure S3. Map of average wind speed for air quality monitoring stations during the study period.

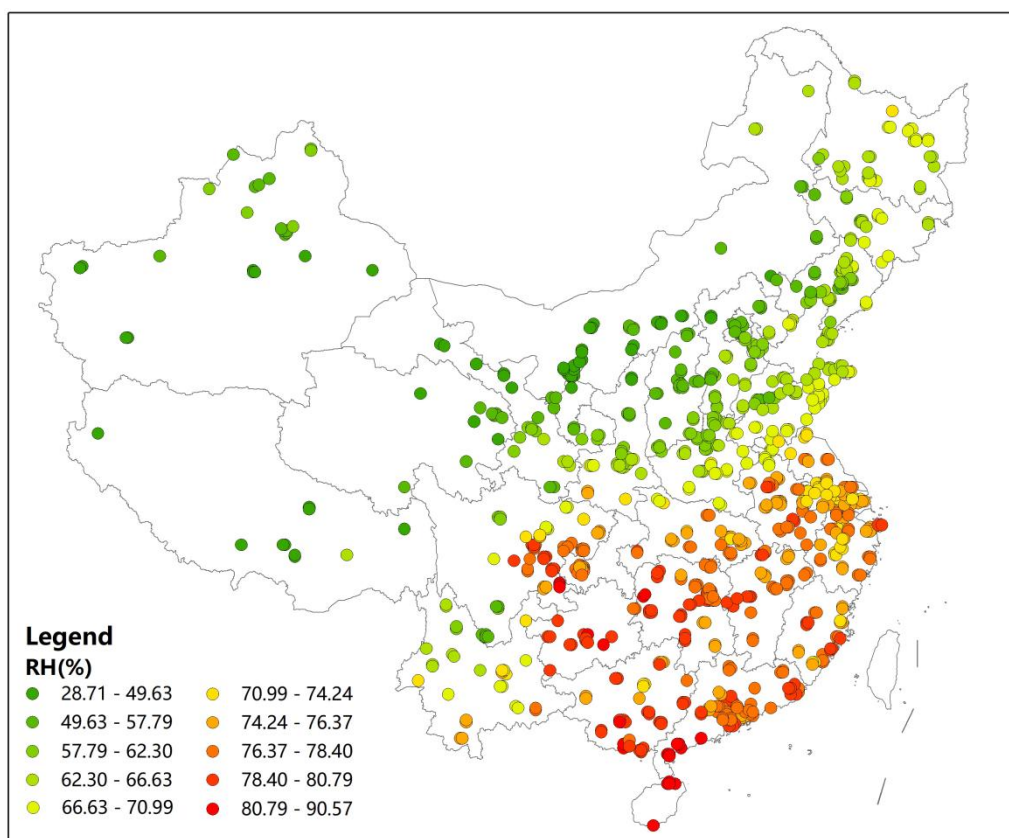


Figure S4. Map of average relative humidity for air quality monitoring stations during the study period.

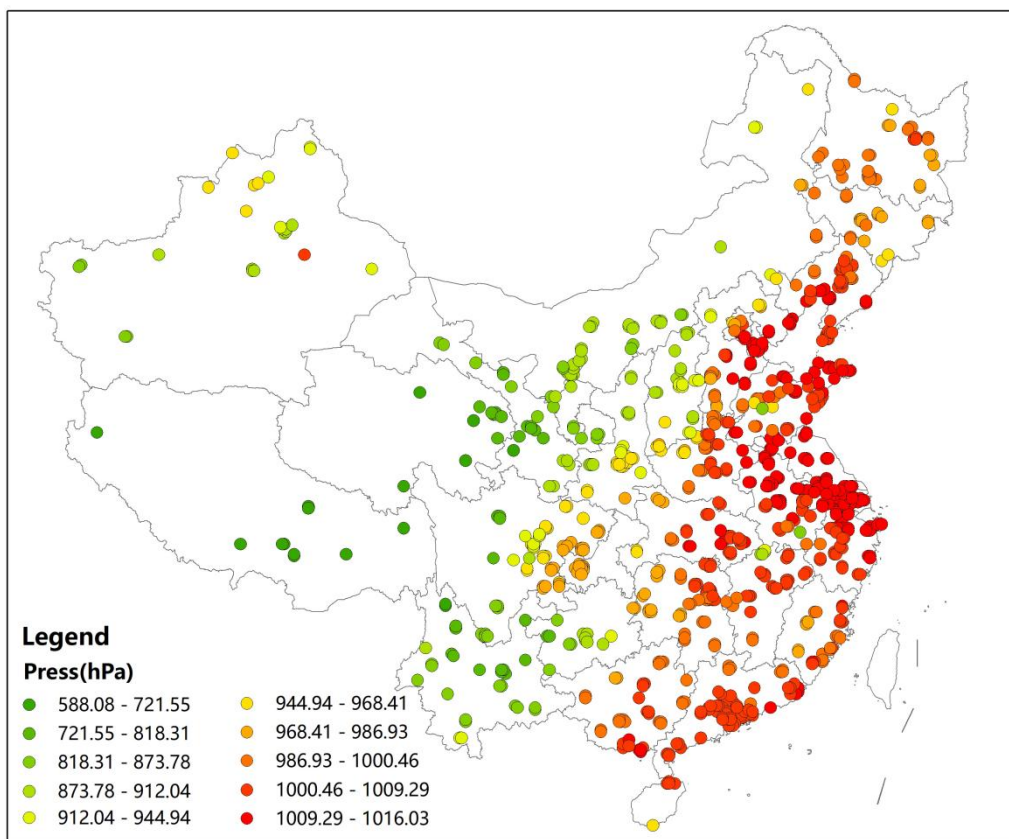


Figure S5. Map of average press for air quality monitoring stations during the study period.

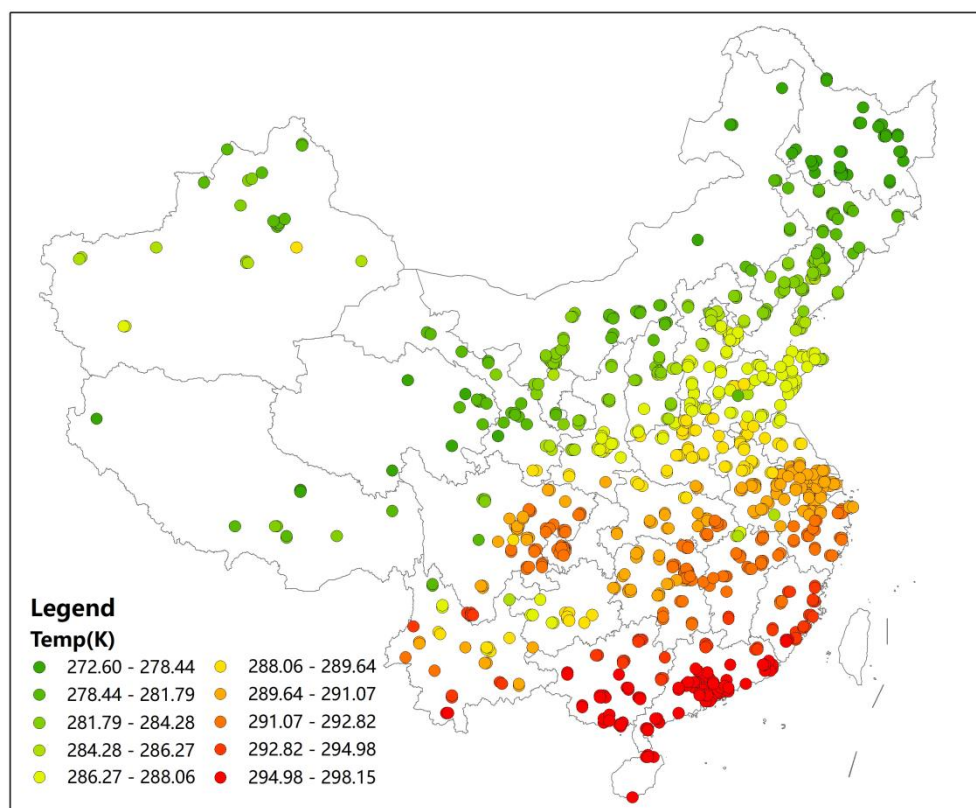


Figure S6. Map of average temperature for air quality monitoring stations during the study period.

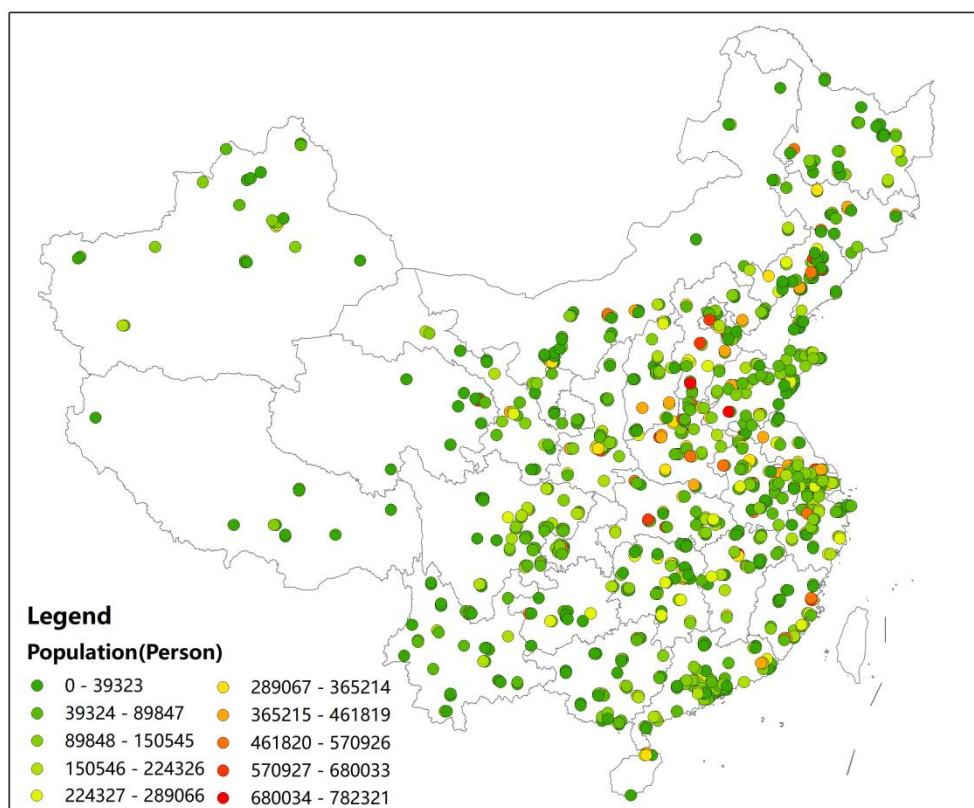


Figure S7. Map of population for air quality monitoring stations during the study period.

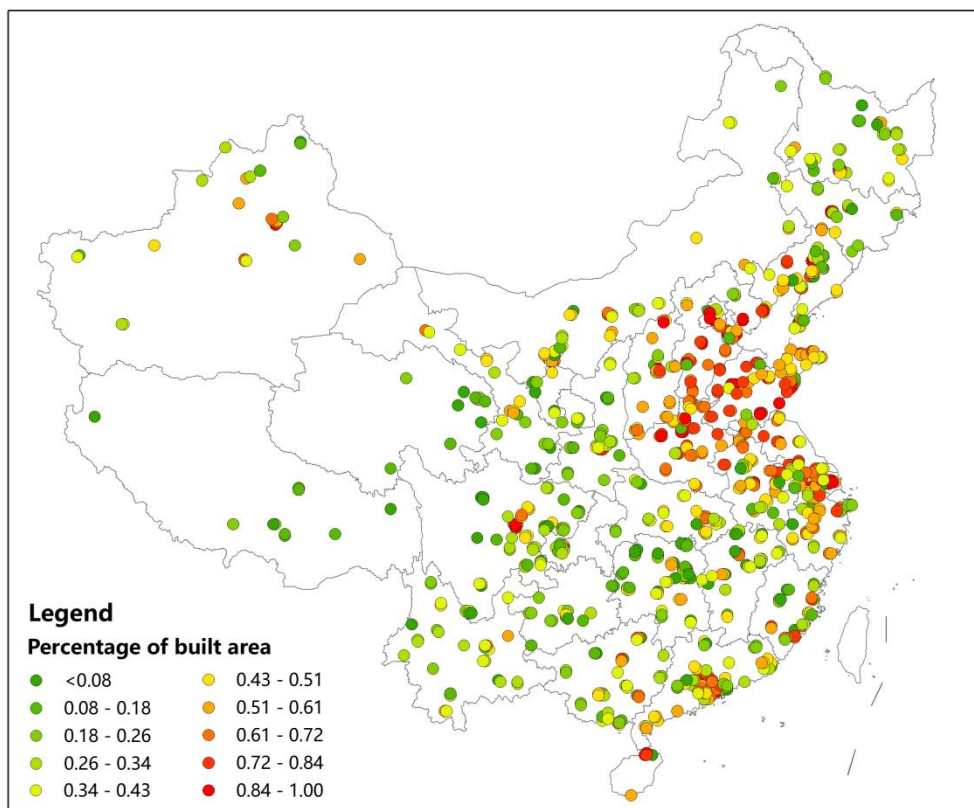


Figure S8. Map of percentage of built area for air quality monitoring stations during the study period.

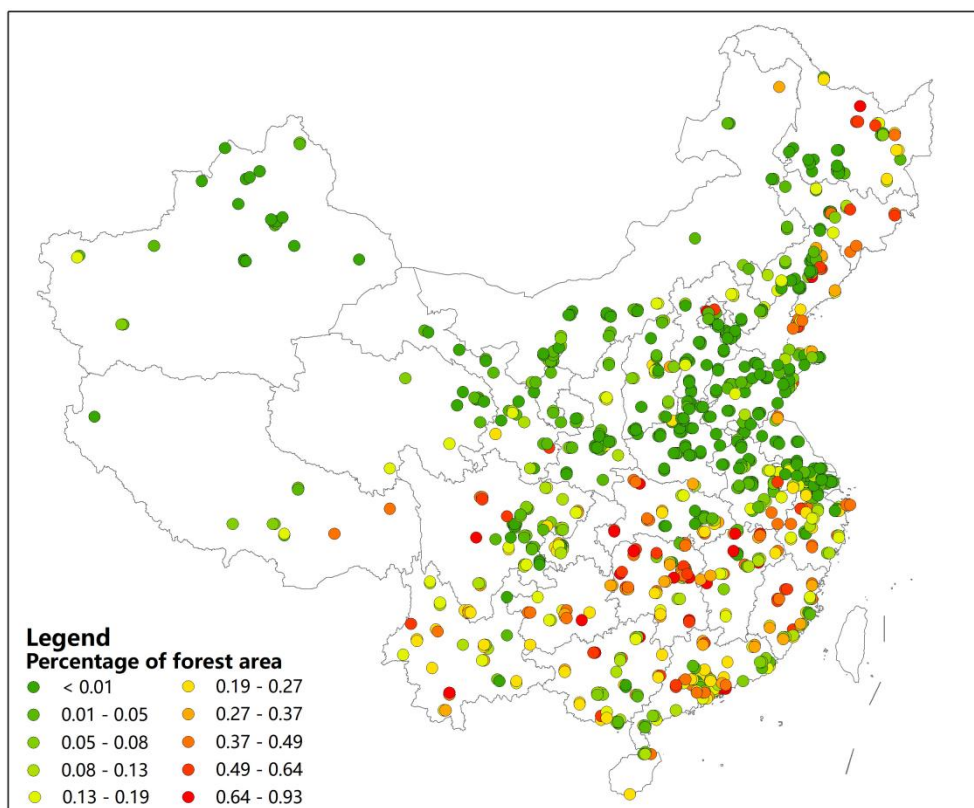


Figure S9. Map of percentage of forest area for air quality monitoring stations during the study period.

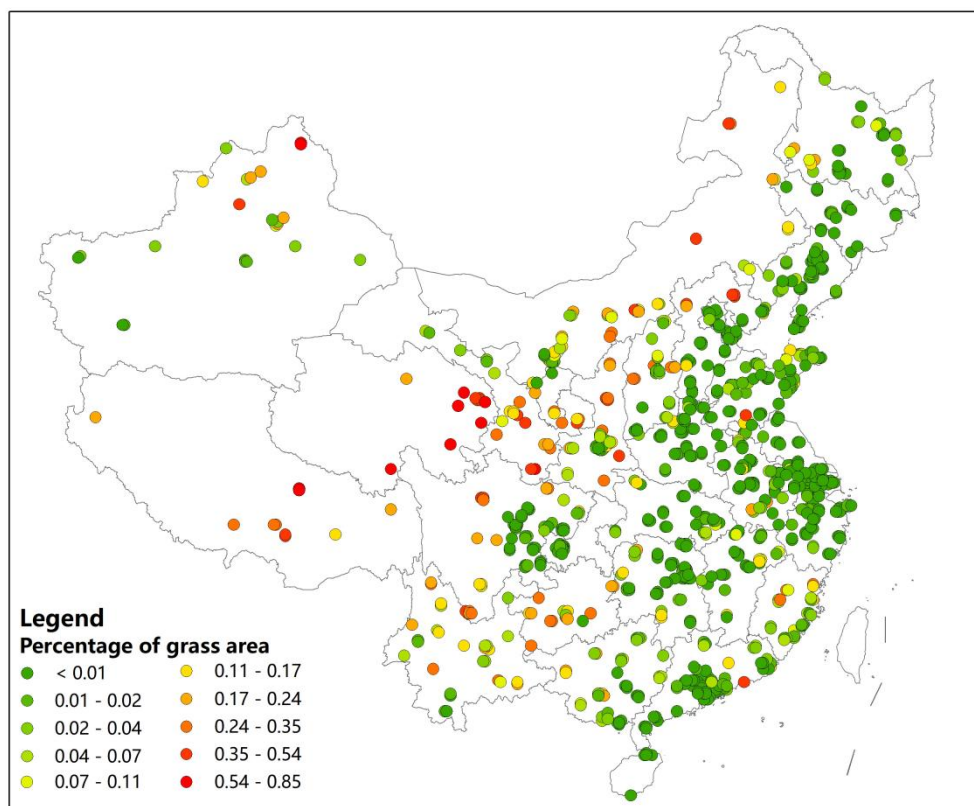


Figure S10. Map of percentage of grass area for air quality monitoring stations during the study period.

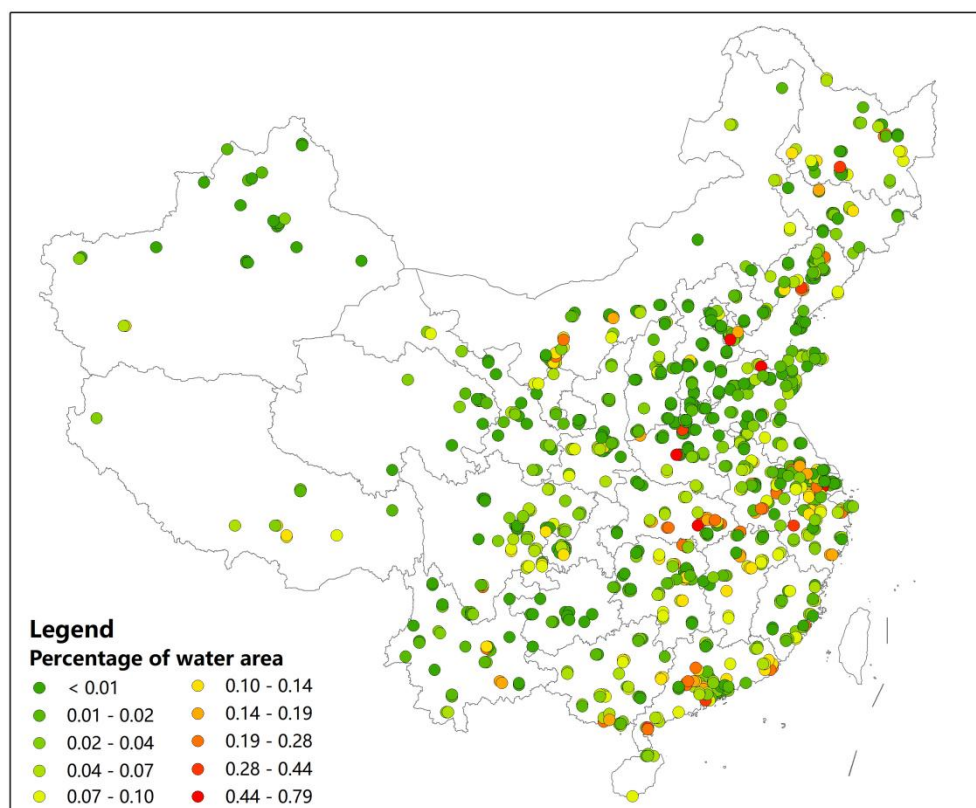


Figure S11. Map of percentage of water area for air quality monitoring stations during the study period.

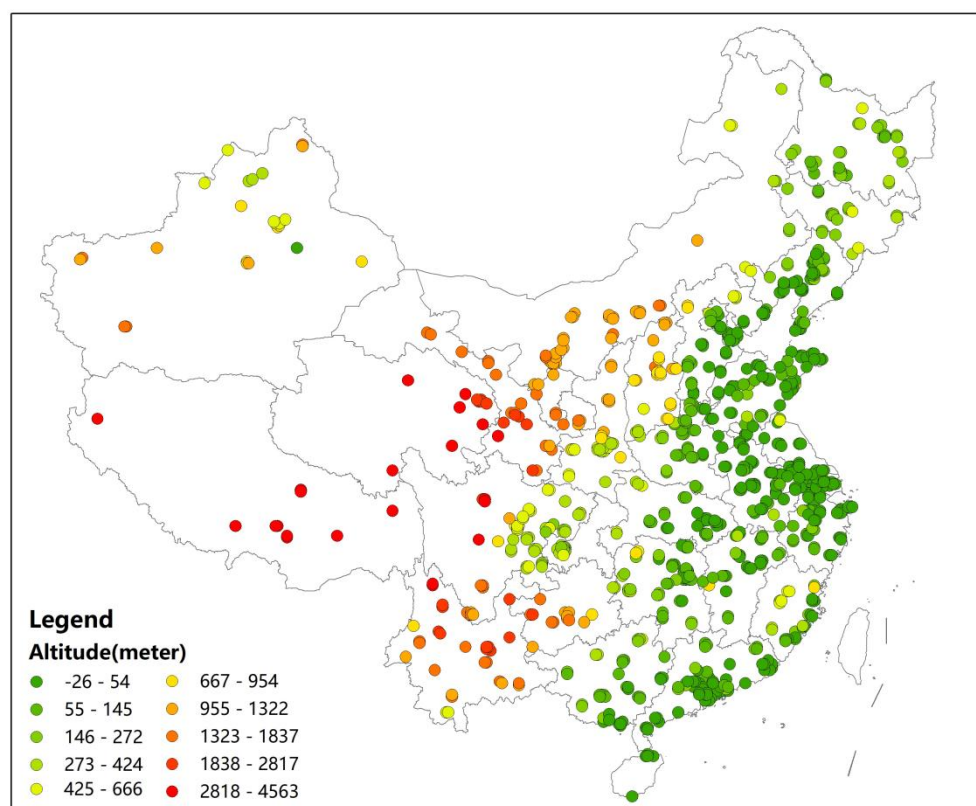


Figure S12. Map of altitude for air quality monitoring stations during the study period.

Table S1. Statistic of standard error of TSAM with different variable combination()

Explanatory Variables	Min	Q1	Mean	Q3	Max
AOD; WS; ForestPerc; WaterPerc	0.02	7.84	7.86	8.20	8.29
AOD; WS; WaterPerc	0.08	8.01	8.02	8.30	8.37
AOD; WS; Pop; WaterPerc	0.15	8.04	8.03	8.35	8.44
AOD; WS; Pop; ForestPerc	0.02	8.01	8.04	8.36	8.45
AOD; WS; ForestPerc	0.02	8.05	8.09	8.37	8.44
AOD; WS; RoadLen; WaterPerc	0.24	8.13	8.12	8.42	8.51
AOD; WS; Pop; RoadLen	0.28	8.22	8.23	8.52	8.61
AOD; WS; Pop	0.17	8.25	8.24	8.51	8.59
AOD; WS; Pop; RoadLen; WaterPerc	0.50	8.25	8.25	8.57	8.65
AOD; WS	0.11	8.24	8.27	8.48	8.53
AOD; WS; WaterPerc; BuildPerc	0.20	8.28	8.28	8.54	8.64
AOD; WS; RoadLen	0.23	8.31	8.33	8.57	8.64
AOD; WS; BuildPerc	0.10	8.33	8.37	8.61	8.69
AOD; WS; ForestPerc; WaterPerc; BuildPerc	0.21	8.41	8.41	8.68	8.78
AOD; WS; ForestPerc; GrassPerc; WaterPerc	0.44	8.46	8.44	8.72	8.78
AOD; WS; GrassPerc; WaterPerc	0.49	8.49	8.46	8.73	8.79
AOD	0.23	8.47	8.48	8.62	8.66
AOD; WS; Pop; ForestPerc; GrassPerc; WaterPerc	0.38	8.53	8.50	8.78	8.85
AOD; WS; Pop; WaterPerc; BuildPerc	0.55	8.52	8.50	8.76	8.85
AOD; WS; GrassPerc	0.32	8.53	8.51	8.75	8.80
AOD; WS; Pop; ForestPerc; BuildPerc	0.18	8.55	8.56	8.82	8.92
AOD; WS; Pop; GrassPerc; WaterPerc	0.82	8.61	8.58	8.85	8.92
AOD; WS; ForestPerc; GrassPerc	0.43	8.59	8.58	8.83	8.88
AOD; WS; Pop; ForestPerc; GrassPerc	0.35	8.61	8.59	8.85	8.91

Explanatory Variables	Min	Q1	Mean	Q3	Max
AOD; WS; Prec	0.00	8.62	8.59	8.82	8.86
AOD; WS; RoadLen; ForestPerc; WaterPerc	0.14	8.60	8.59	8.86	8.92
AOD; WS; ForestPerc; BuildPerc	0.17	8.58	8.60	8.84	8.92
AOD; WS; Pop; RoadLen; GrassPerc; WaterPerc	1.15	8.65	8.60	8.89	8.95
AOD; WS; RoadLen; GrassPerc; WaterPerc	0.91	8.64	8.61	8.88	8.94
AOD; WS; Pop; RoadLen; ForestPerc; WaterPerc	0.21	8.65	8.63	8.91	8.98
AOD; Prec	0.00	8.68	8.64	8.82	8.85
AOD; WS; RoadLen; GrassPerc	0.78	8.71	8.69	8.93	8.99
AOD; WS; ForestPerc; GrassPerc; WaterPerc; BuildPerc	0.57	8.73	8.70	8.96	9.04
AOD; WS; Pop; RoadLen; GrassPerc	1.24	8.75	8.72	8.97	9.03
AOD; WS; Pop; RoadLen; ForestPerc	0.21	8.75	8.75	8.99	9.06
AOD; WS; Pop; RoadLen; ForestPerc; GrassPerc; WaterPerc	0.29	8.80	8.76	9.02	9.09
AOD; WS; ForestPerc; GrassPerc; BuildPerc	0.54	8.79	8.77	9.01	9.07
AOD; WS; Pop; ForestPerc; GrassPerc; WaterPerc; BuildPerc	0.54	8.80	8.77	9.03	9.11
AOD; WS; GrassPerc; WaterPerc; BuildPerc	1.01	8.80	8.78	9.01	9.08
AOD; WS; RoadLen; ForestPerc; GrassPerc; WaterPerc	0.23	8.82	8.80	9.05	9.11
AOD; WS; Pop; RoadLen; ForestPerc; GrassPerc	0.32	8.84	8.81	9.05	9.11
AOD; WS; Pop; GrassPerc; WaterPerc; BuildPerc	1.30	8.85	8.82	9.06	9.14
AOD; WS; Pop; ForestPerc; GrassPerc; BuildPerc	0.56	8.85	8.83	9.06	9.14
AOD; WS; RoadLen; ForestPerc; GrassPerc	0.26	8.88	8.86	9.09	9.14
AOD; WS; Pop; GrassPerc; BuildPerc	1.25	8.92	8.89	9.12	9.18
AOD; WS; Pop; RoadLen; WaterPerc; BuildPerc	1.55	8.95	8.92	9.15	9.23
AOD; RH	2.63	8.99	8.98	9.11	9.15
AOD; RH; Prec	0.02	9.04	8.98	9.16	9.19
AOD; WS; RoadLen; WaterPerc; BuildPerc	1.36	9.02	9.00	9.21	9.28

Explanatory Variables	Min	Q1	Mean	Q3	Max
AOD; WS; Pop; RoadLen; BuildPerc	1.50	9.06	9.04	9.24	9.31
AOD; WS; RoadLen; GrassPerc; WaterPerc; BuildPerc	1.97	9.07	9.04	9.25	9.32
AOD; WS; Pop; RoadLen; GrassPerc; WaterPerc; BuildPerc	2.42	9.10	9.06	9.28	9.34
AOD; WS; RoadLen; BuildPerc	1.16	9.09	9.08	9.27	9.33
AOD; WS; RoadLen; ForestPerc; WaterPerc; BuildPerc	0.51	9.10	9.08	9.29	9.35
AOD; WS; Pop; RoadLen; GrassPerc; BuildPerc	2.29	9.12	9.09	9.29	9.35
AOD; WS; RoadLen; GrassPerc; BuildPerc	1.95	9.13	9.09	9.29	9.35
AOD; WS; Pop; RoadLen; ForestPerc; BuildPerc	0.58	9.12	9.10	9.29	9.36
AOD; WS; Pop; RoadLen; ForestPerc; WaterPerc; BuildPerc	0.71	9.15	9.12	9.32	9.38
AOD; WS; RoadLen; ForestPerc; BuildPerc	0.50	9.19	9.17	9.35	9.41
AOD; WS; RH	1.97	9.30	9.28	9.41	9.44
AOD; WS; RoadLen; ForestPerc; GrassPerc; WaterPerc; BuildPerc	1.01	9.35	9.34	9.51	9.57
AOD; WS; RoadLen; ForestPerc; GrassPerc; BuildPerc	0.94	9.37	9.35	9.51	9.56
AOD; WS; Pop; RoadLen; ForestPerc; GrassPerc; WaterPerc; BuildPerc	2.11	9.38	9.36	9.53	9.59
AOD; WS; Pop; RoadLen; ForestPerc; GrassPerc; BuildPerc	2.07	9.39	9.38	9.53	9.59
AOD; WS; RH; Prec	0.12	9.98	9.92	10.03	10.06

Min: minimum value; Q1: lower quartile; Mean: average; Q3: upper quartile; Max: maximum.

WS: wind speed; RH: relative humidity; Prec: precipitation;

BuildPerc: percentage of built area; ForestPerc: percentage of forest area; WaterPerc: percentage of water area;

GrassPerc: percentage of grass area; RoadLen: the total length of road; Pop: population in the grid.