

**Table S1** Evaluation of high-resolution (1 km) MODIS MAIAC AOD against AERONET AOD over NUIST, Taihu, and Xuzhou-CUMT sites located in Jiangsu Province from 2000–2020.

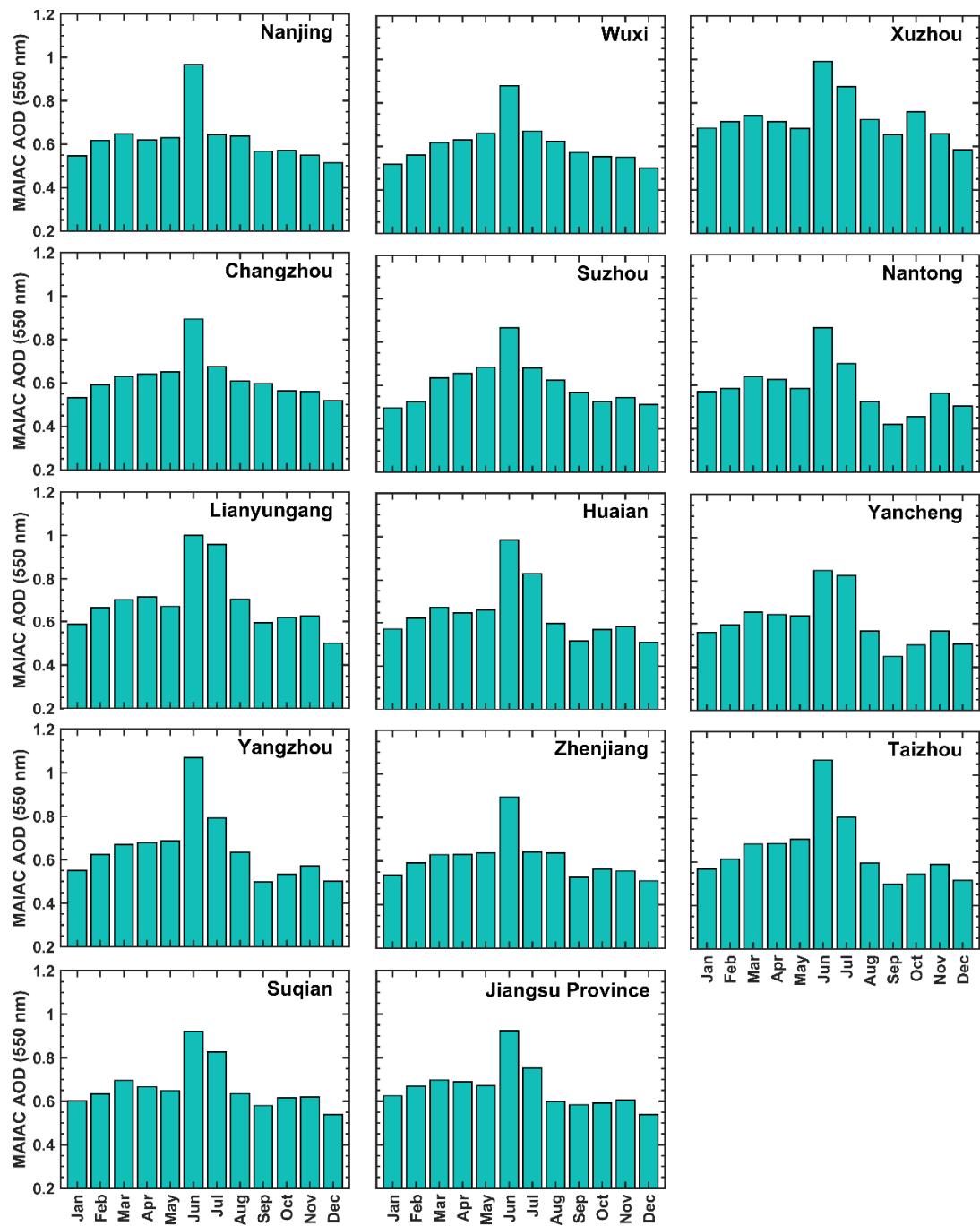
Sites	Statistical parameters	Annual	Winter	Spring	Summer	Autumn
NUIST	slope	0.971	0.873	1.224	1.006	-0.056
	intercept	-0.106	-0.046	-0.219	-0.222	0.381
	N	79	19	43	14	3
	r	0.867	0.857	0.880	0.966	-0.177
	RMSE	0.287	0.195	0.193	0.289	1.000
	MAE	0.179	0.153	0.143	0.214	0.689
	RMB	0.838	0.987	0.907	0.838	0.320
	above EE (%)	3.80	0.00	6.98	0.00	0.00
	within EE (%)	62.03	63.16	62.79	64.29	33.33
	below EE (%)	34.18	36.84	30.23	35.71	66.67
Taihu	slope	1.088	1.113	1.144	0.966	1.051
	intercept	0.102	-0.025	0.120	0.214	0.106
	N	368	49	138	52	129
	r	0.918	0.801	0.908	0.928	0.906
	RMSE	0.253	0.123	0.287	0.334	0.210
	MAE	0.198	0.100	0.241	0.253	0.167
	RMB	1.249	1.043	1.319	1.218	1.228
	above EE (%)	55.71	28.57	68.12	57.69	51.94
	within EE (%)	40.22	55.10	28.99	40.38	46.51
	below EE (%)	4.08	16.33	2.90	1.92	1.55
Xuzhou-CUMT	slope	1.131	1.131	1.242	0.958	1.104
	intercept	-0.035	-0.042	-0.091	0.072	-0.023
	N	389	144	117	23	105
	r	0.929	0.920	0.923	0.924	0.946
	RMSE	0.130	0.097	0.149	0.192	0.129
	MAE	0.091	0.072	0.109	0.142	0.084
	RMB	1.063	1.037	1.082	1.102	1.060
	above EE (%)	16.45	11.81	21.37	39.13	12.38
	within EE (%)	75.84	81.25	68.38	47.83	82.86
	below EE (%)	7.71	6.94	10.26	13.04	4.76

**Table S2** City-level trends of high-resolution MODIS MAIAC AOD in Jiangsu province from 2000 to 2009. The symbol asterisk (\*) represents change at a 95% significant level.

Time	Nanjing	Wuxi	Xuzhou	Changzhou	Suzhou	Nantong	Lianyungang	Huaian	Yancheng	Yangzhou	Zhenjiang	Taizhou	Suqian	Jiangsu
Jan	0.006	0.011	0.032*	0.005	0.012	0.022	0.028*	0.004	0.014	-0.0003	0.014	0.024	0.022	0.026*
Feb	0.040*	0.039*	0.045*	0.035*	0.005	0.027	0.040*	0.039	0.029*	0.040*	0.029	0.039	0.036	0.040
Mar	0.025*	0.025	0.015*	0.023*	0.019	0.013	0.020	0.014	-0.001	0.023	0.015	0.010	0.023	0.010
Apr	0.028*	0.023	0.032*	0.044	0.023*	0.023*	0.029*	0.023*	0.025*	0.022*	0.032*	0.020*	0.020*	0.025*
May	0.020	-0.007	0.018	-0.002	-0.009	0.010*	0.010	0.022	0.010	0.012	0.020	0.011	0.012	0.015
Jun	0.010	0.051	0.033	0.070*	0.079*	0.071*	0.069*	0.035	0.031	0.046	0.074*	0.042	0.025	0.027
Jul	0.065*	0.043	0.046	0.046	0.017	0.058	0.054	0.026	0.055	0.070*	0.055*	0.043	0.043	0.035
Aug	0.034	0.048*	0.021	0.029	0.040	0.042*	0.007	0.017	0.021	0.021	0.022	0.048*	0.009	0.032*
Sep	0.029*	0.032	0.024	0.035	0.029*	0.008	0.011	0.013	0.006	0.016	0.034	0.010	0.023	0.034
Oct	0.034*	0.041*	0.067	0.023	0.030*	0.029*	0.041	0.045	0.033*	0.036*	0.028*	0.032*	0.044*	0.051*
Nov	0.003	0.008	0.029*	0.015	0.012	0.021	0.023*	-0.003	0.018*	0.015	0.016	0.019	0.004	0.009
Dec	0.001	0.009	0.001	0.003	0.004	0.002	0.002	0.007	0.019	0.007	-0.003	-0.00005	0.003	0.009
Winter	0.016*	0.015*	0.025*	0.011	0.007	0.016*	0.023*	0.014	0.020*	0.022*	0.015	0.020*	0.018	0.026*
Spring	0.020	0.014	0.024*	0.019	0.015	0.017*	0.021	0.019	0.009	0.021	0.026	0.018*	0.018	0.021*
Summer	0.034	0.052*	0.037*	0.052*	0.051*	0.058*	0.041	0.036	0.034	0.036*	0.054*	0.036	0.028	0.036*
Autumn	0.032*	0.025*	0.027*	0.027*	0.025	0.020*	0.032	0.017	0.019	0.022*	0.023*	0.015	0.026*	0.033*
Annual	0.023*	0.027*	0.025*	0.028*	0.021*	0.026*	0.022*	0.016*	0.021*	0.028*	0.026*	0.020*	0.019	0.024*

**Table S3** City-level trends of high-resolution MODIS MAIAC AOD in Jiangsu province from 2010 to 2019. The symbol asterisk (\*) represents change at a 95% significant level.

Time	Nanjing	Wuxi	Xuzhou	Changzhou	Suzhou	Nantong	Lianyungang	Huaian	Yancheng	Yangzhou	Zhenjiang	Taizhou	Suqian	Jiangsu
Jan	-0.020	-0.022	-0.009	-0.019	-0.020	-0.024	-0.012	-0.023	-0.010	-0.004	-0.021	-0.021	-0.028	-0.021
Feb	-0.024	-0.039	-0.011	-0.027	-0.042	-0.034	0.016	-0.005	-0.019	-0.002	-0.029	-0.032	-0.010	-0.017
Mar	-0.019	-0.005	-0.005	-0.007	-0.011	-0.018	-0.007	0.002	-0.001	-0.001	-0.016	-0.007	-0.002	-0.003
Apr	-0.003	-0.0003	0.015	0.006	-0.004	-0.007	0.021	0.015	0.010	0.011	0.004	-0.002	0.020	0.007
May	-0.017	-0.026*	-0.030	-0.028*	-0.016	-0.022*	-0.010	-0.022	-0.027*	-0.031	-0.036*	-0.037*	-0.021	-0.015*
Jun	-0.074	-0.047	-0.106*	-0.059*	-0.021	-0.091*	-0.054	-0.079*	-0.084*	-0.066	-0.086	-0.092*	-0.067*	-0.070*
Jul	-0.054	-0.052	-0.069*	-0.045	-0.033	-0.033	-0.055	-0.045	-0.051	-0.062	-0.041	-0.064	-0.044	-0.032
Aug	-0.030	-0.041	-0.047*	-0.026	-0.033	-0.033	-0.077*	-0.047*	-0.048*	-0.046*	-0.069*	-0.034*	-0.037*	-0.046*
Sep	0.001	-0.009	-0.029	-0.008	-0.015	-0.002	-0.037	-0.012	-0.021	-0.011	-0.003	-0.007	-0.013	-0.016
Oct	-0.026*	-0.023	-0.033*	-0.019*	-0.024	-0.029	-0.027*	-0.016	-0.016	-0.014	-0.015	-0.024	-0.024	-0.026
Nov	-0.024*	-0.033*	-0.002	-0.028*	-0.029*	-0.035*	-0.011	-0.022*	-0.033*	-0.026*	-0.030*	-0.033*	-0.019	-0.022
Dec	0.009	0.003	-0.001	0.001	0.007	-0.006	0.004	0.001	-0.008	0.001	-0.004	-0.002	0.004	0.003
Winter	-0.017	-0.014	-0.012	-0.016	-0.016	-0.016	-0.007	-0.016	-0.010	-0.011	-0.016	-0.019	-0.013	-0.013
Spring	-0.013	-0.012	-0.009	-0.010	-0.011	-0.025	0.002	0.003	-0.006	-0.005	-0.013	-0.019	-0.001	-0.004
Summer	-0.053	-0.042*	-0.072*	-0.044	-0.037	-0.048*	-0.072*	-0.064*	-0.065*	-0.061*	-0.068*	-0.055*	-0.051*	-0.054*
Autumn	-0.016*	-0.018	-0.021	-0.021*	-0.019	-0.023*	-0.022	-0.019*	-0.023*	-0.015*	-0.017*	-0.020*	-0.019	-0.020*
Annual	-0.023*	-0.025*	-0.030*	-0.027*	-0.018	-0.026*	-0.020*	-0.023*	-0.022*	-0.026*	-0.033*	-0.032*	-0.020*	-0.019*



**Figure S1.** Monthly variations of high-resolution MODIS MAIAC AOD in 13 cities in Jiangsu Province from 2000 to 2020.