Supplement

S1 Statistical metrics

Correlation coefficient (R), mean bias (MB), normalized mean bias (NMB), and root mean square error (RMSE) were applied to assess the accuracy of coupled models in simulating meteorological parameters and air pollutants against the ground-based and satellite observations with the following equations:

$$R=\frac{\sum_{i=1}^{N}(p_i-\bar{p})(o_i-\bar{o})}{\sqrt{\sum_{i=1}^{N}(p_i-\bar{p})^2}\sqrt{\sum_{i=1}^{N}(o_i-\bar{o})^2}} \quad (1)$$

$$MB=\frac{1}{N}\sum_{i=1}^{N}(p_i-o_i) \quad (2)$$

$$NMB=\frac{\sum_{i=1}^{N}(p_i-o_i)}{\sum_{i=1}^{N}(o_i)} \quad (3)$$

$$RMSE=\left[\frac{1}{N}\sum_{i=1}^{N}(p_i-o_i)^2\right]^{1/2} \quad (4)$$

where p_i and o_i are the simulated and observed parameters, respectively, n is the total number of the values used for validation, and $\bar{p}$ and $\bar{o}$ are the averages of the simulation and observation, respectively.

Table S1. Statistic metrics (R, MB, NMB and RMSE) between simulated and observed annual SSR, T2, RH2, Q2, WS10, WD10, precipitation, and PBLH at LT 08:00 and 20:00) in eastern China. The best results are in bold, while mean simulations and observations are in italics.

Variables	Statistics	WRF-CMAQ_NO	WRF-CMAQ_ARI	WRF-Chem_NO	WRF-Chem_ARI	WRF-Chem_BOTH	WRF-CHIMERE_NO	WRF-CHIMERE_ARI	WRF-CHIMERE_BOTH
SSR (*155.22* W m^{-2})	Mean_sim	*191.12*	*171.14*	*194.52*	*180.04*	*191.71*	*197.88*	*188.63*	*189.54*
	R	0.88	**0.89**	0.88	**0.89**	0.88	0.85	0.85	0.85
	MB	35.89	15.91	39.30	24.82	36.48	42.65	33.41	34.32
	NMB (%)	23.12	**10.25**	25.32	15.99	23.50	27.48	21.52	22.11
	RMSE	133.05	**120.60**	134.16	123.94	134.45	154.71	147.73	148.57
T2 (*13.68* ℃)	Mean_sim	*12.81*	*12.61*	*12.99*	*12.84*	*12.96*	*11.84*	*11.68*	*11.69*
	R	**0.97**	**0.97**	**0.97**	**0.97**	**0.97**	0.96	0.96	0.96
	MB	-0.86	-1.06	-0.68	-0.83	-0.71	-1.83	-2.00	-1.98
	NMB (%)	-6.33	-7.76	**-4.97**	-6.09	-5.21	-13.39	-14.60	-14.50
	RMSE	**2.88**	2.94	3.05	3.07	3.05	3.87	3.94	3.97
Q2 (*8.87* g kg^{-1})	Mean_sim	*8.69*	*8.51*	*8.57*	*8.54*	*8.58*	*8.35*	*8.30*	*8.30*
	R	**0.90**	**0.90**	0.89	0.89	0.89	0.88	0.88	0.88
	MB	-0.18	-0.35	-0.30	-0.32	-0.28	-0.52	-0.57	-0.56
	NMB (%)	**-2.00**	-3.98	-3.36	-3.66	-3.19	-5.84	-6.37	-6.35
	RMSE	**2.93**	2.95	3.09	3.09	3.10	3.17	3.18	3.18
RH2 (*67.48* %)	Mean_sim	*71.03*	*70.51*	*70.01*	*70.33*	*70.13*	*70.41*	*70.58*	*70.46*
	R	**0.73**	**0.73**	0.68	0.68	0.68	0.65	0.65	0.65
	MB	3.55	3.03	2.53	2.85	2.64	2.93	3.10	2.97

	NMB (%)	5.26	4.49	**3.74**	4.22	3.92	4.34	4.59	4.41
	RMSE	**18.92**	18.98	19.78	19.79	19.84	20.81	20.82	20.84
WS10	Mean_sim	*3.27*	*3.23*	*3.30*	*3.29*	*3.30*	*3.85*	*3.83*	*3.83*
(*2.81* m s^{-1})	R	**0.62**	0.61	0.60	0.59	0.59	0.47	0.47	0.47
	MB	0.45	0.42	0.49	0.48	0.49	1.04	1.02	1.02
	NMB (%)	16.16	**14.98**	17.45	17.11	17.53	36.98	36.27	36.34
	RMSE	1.89	1.88	1.92	1.92	1.93	2.46	2.45	2.45
WD10	Mean_sim	177.13	176.62	177.87	177.82	178.11	171.97	171.53	171.68
(*175.27* °)	R	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
	MB	1.85	1.35	2.60	2.55	2.83	-3.31	-3.74	-3.60
	NMB (%)	1.06	0.77	1.48	1.45	1.62	-1.89	-2.14	-2.05
	RMSE	149.57	149.45	149.45	149.38	149.57	148.70	148.47	148.71
Precipitation	Mean_sim	*2.46*	*2.31*	*3.24*	*3.19*	*3.26*	*3.31*	*3.24*	*3.21*
(PREC)	R	**0.59**	**0.59**	0.50	0.50	0.50	0.35	0.34	0.34
(*2.72* mm d^{-1})	MB	-0.27	-0.42	0.51	0.46	0.53	0.59	0.52	0.48
	NMB (%)	**-9.80**	-15.35	18.86	16.83	19.43	21.46	18.96	17.63
	RMSE	8.03	**7.96**	10.32	10.26	10.33	10.87	10.85	10.93
PBLH00	Mean_sim	*253.54*	*251.61*	*288.41*	*263.16*	*282.81*	*276.45*	*270.28*	*269.63*
(*432.13* m)	R	**0.21**	**0.21**	0.17	0.17	0.17	0.17	0.17	0.17
	MB	-178.59	-180.52	-143.72	-168.97	-149.32	-155.68	-161.85	-162.50
	NMB (%)	-41.33	-41.77	**-33.26**	-39.10	-34.55	-36.03	-37.45	-37.61
	RMSE	380.23	378.79	**371.27**	379.72	372.14	373.78	375.85	374.52
PBLH12	Mean_sim	*230.14*	*236.80*	*358.05*	*332.45*	*346.54*	*363.47*	*360.13*	*359.03*
(*547.02* m)	R	**0.40**	**0.40**	0.39	**0.40**	0.39	0.34	0.35	0.35
	MB	-316.88	-310.22	-188.97	-214.57	-200.48	-183.55	-186.89	-188.00
	NMB (%)	-57.93	-56.71	-34.55	-39.22	-36.65	**-33.56**	-34.16	-34.37
	RMSE	505.64	502.24	459.64	460.51	**459.50**	470.39	467.90	469.19

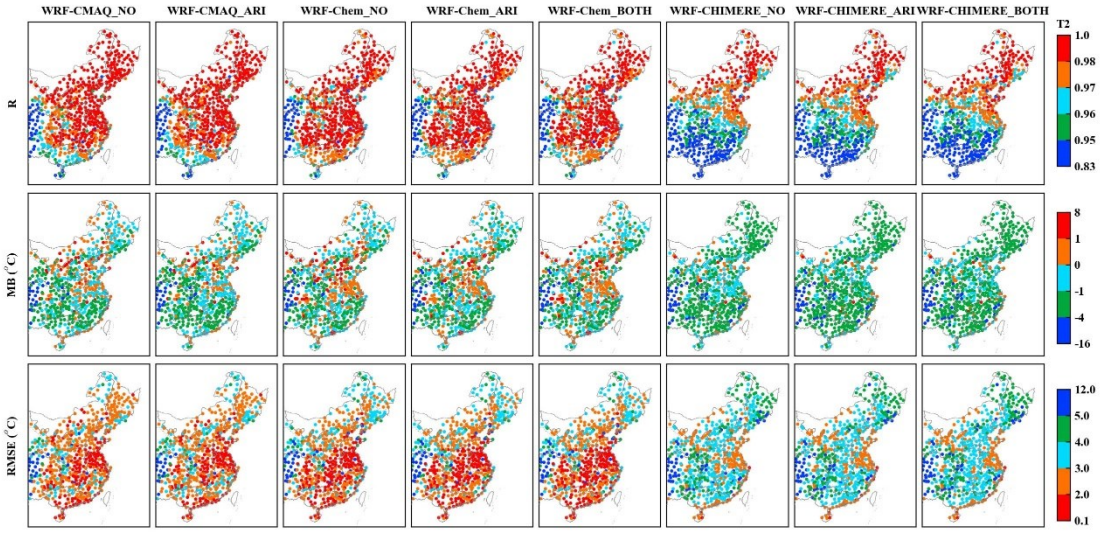

Figure S1. Statistics metrics (R, MB and RMSE) between simulated and observed annual T2 in eastern China.

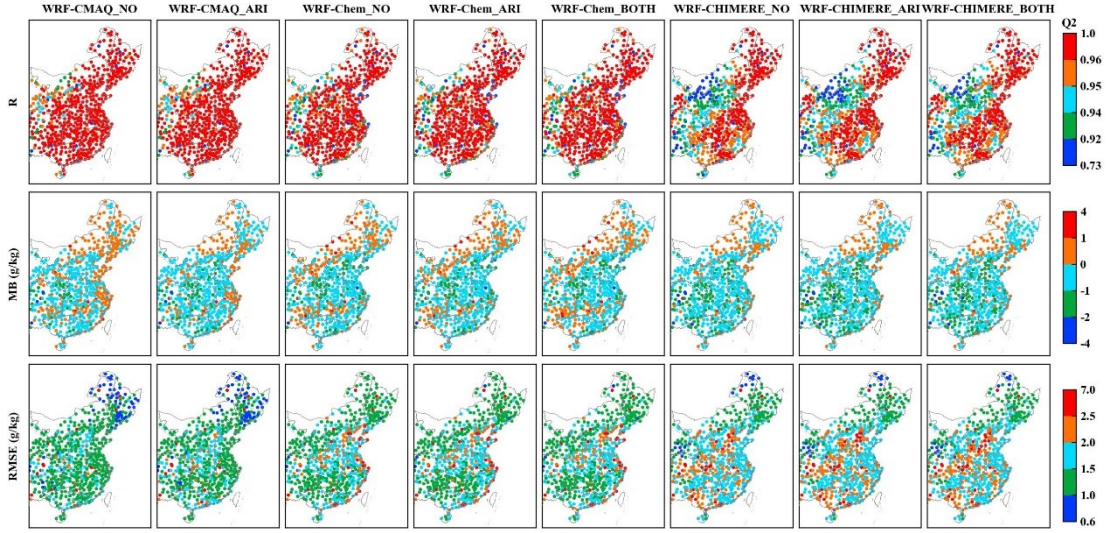

Figure S2. The same as Fig. S1 but for Q2.

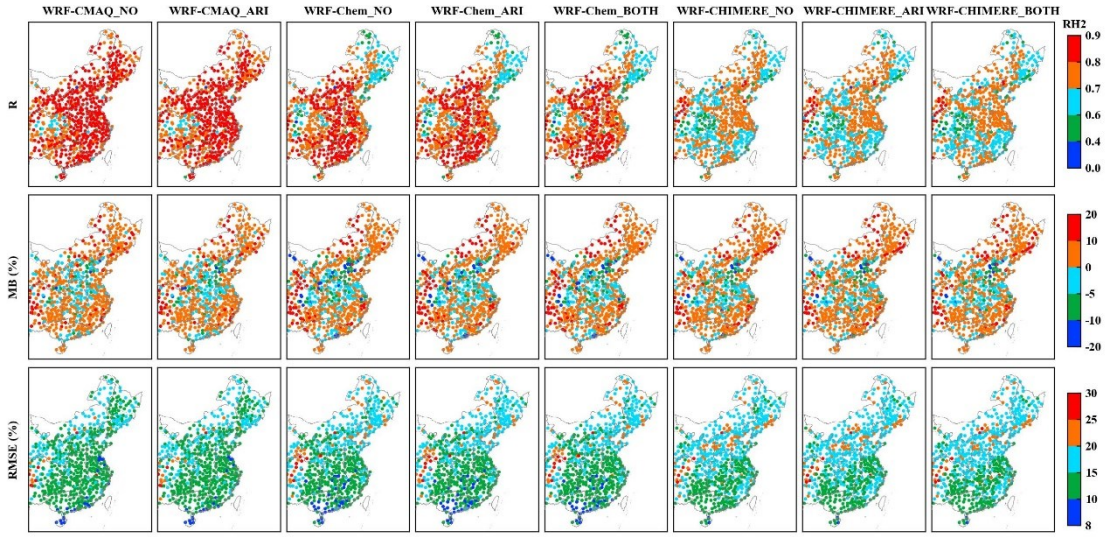

Figure S3. The same as Fig. S1 but for RH2.

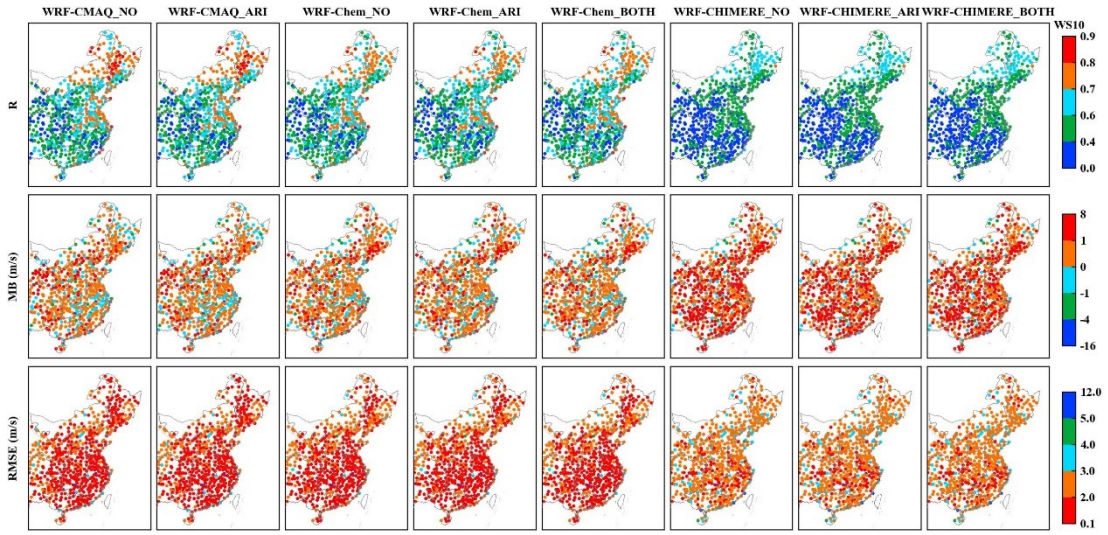

Figure S4. The same as Fig. S1 but for WS10.

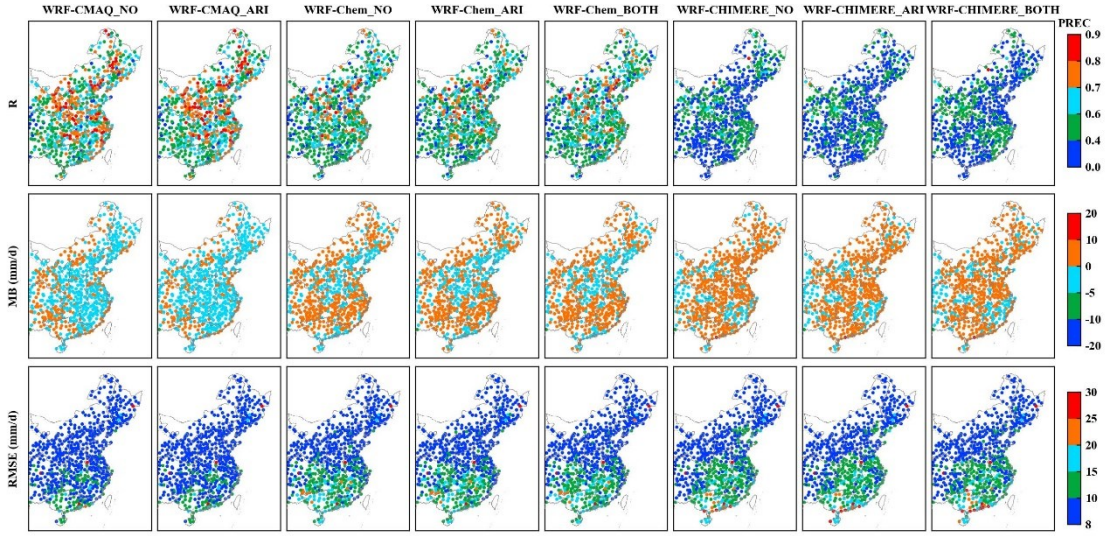

Figure S5. The same as Fig. S1 but for PREC.

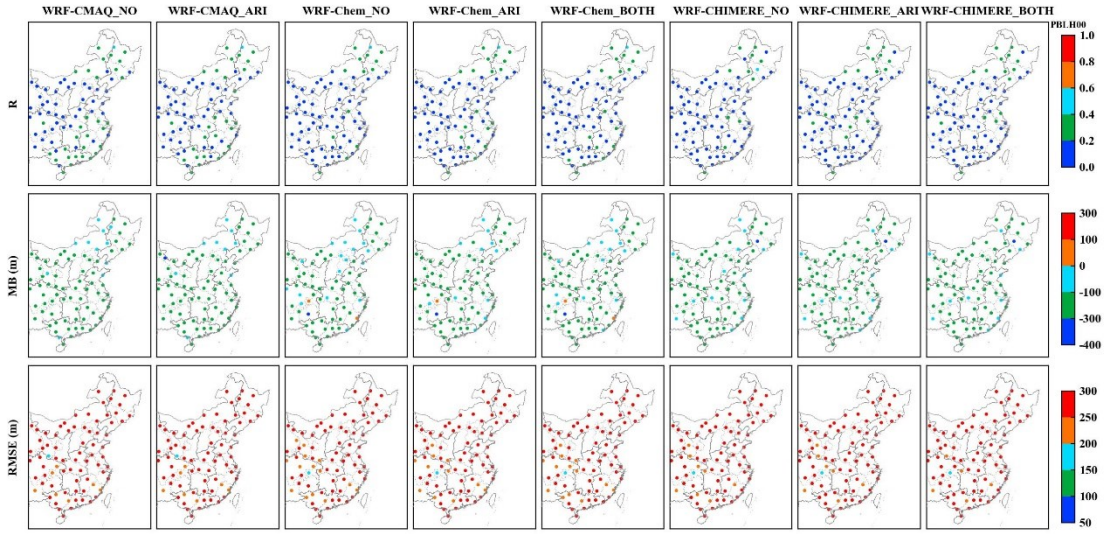

Figure S6. The same as Fig. S1 but for PBLH00.

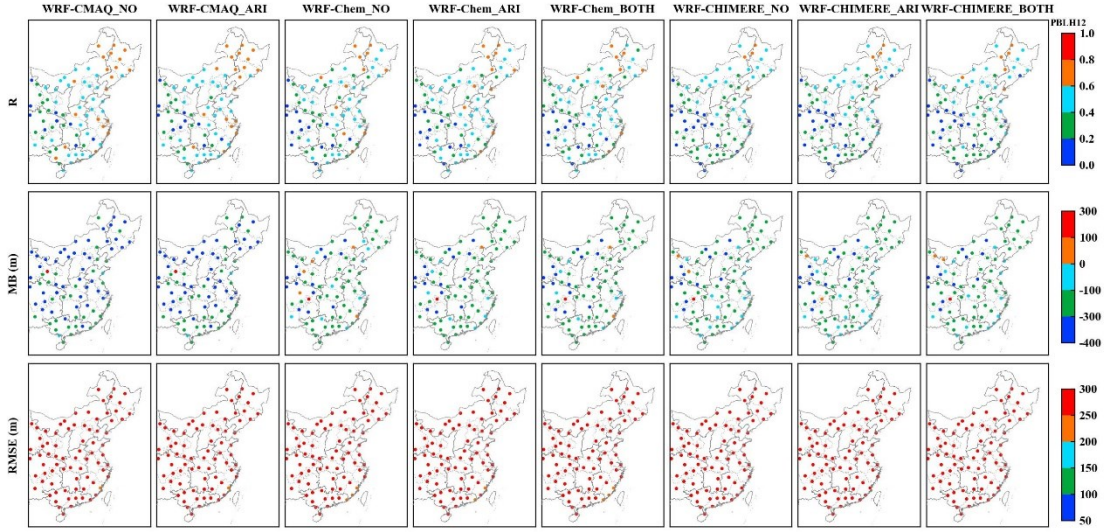

Figure S7. The same as Fig. S1 but for PBLH12.

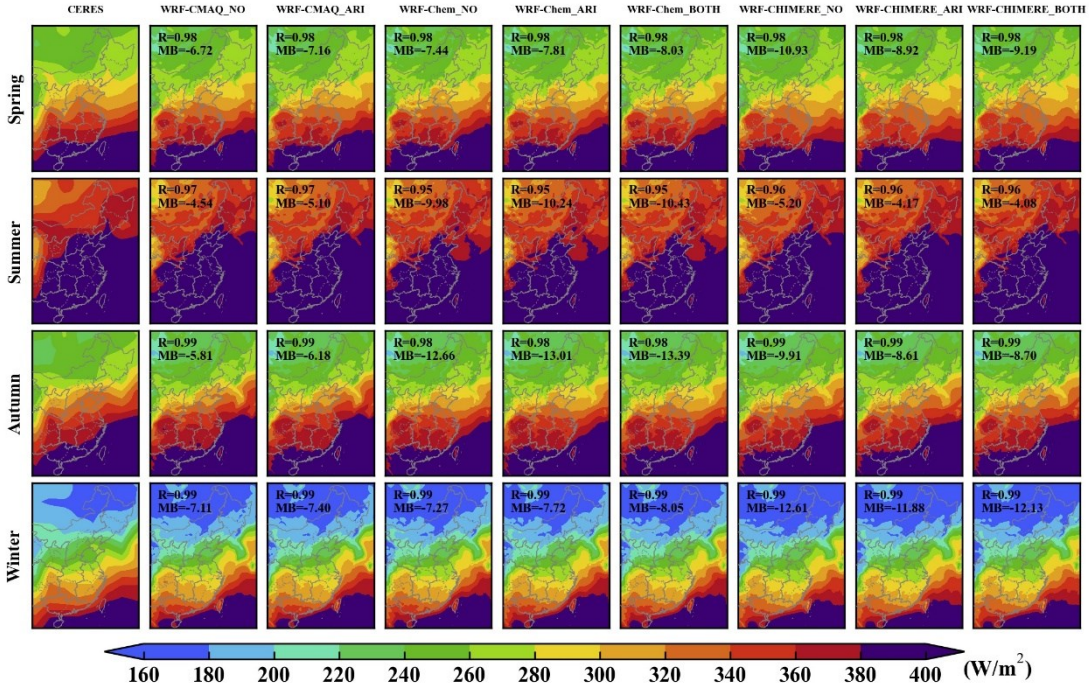

Figure S8. Spatial distributions of seasonal SLR between CERES observations and simulations from WRF-CMAQ, WRF-Chem, and WRF-CHIMERE with and without aerosol feedbacks in eastern China.

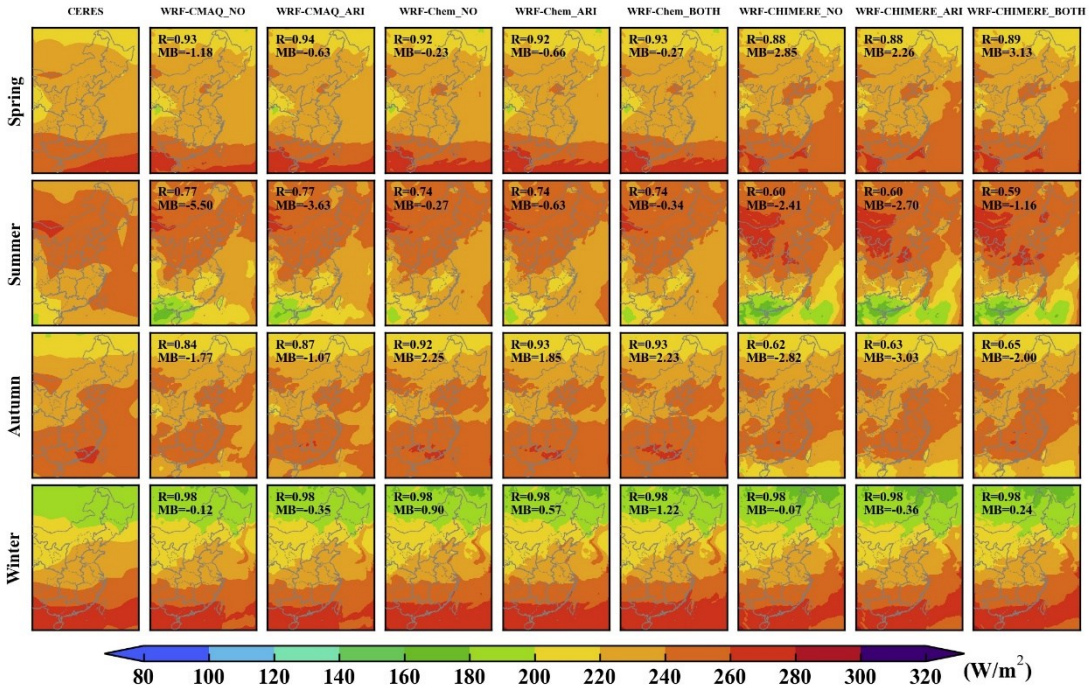

Figure S9. The same as Fig. S8 but for TOA longwave radiation.

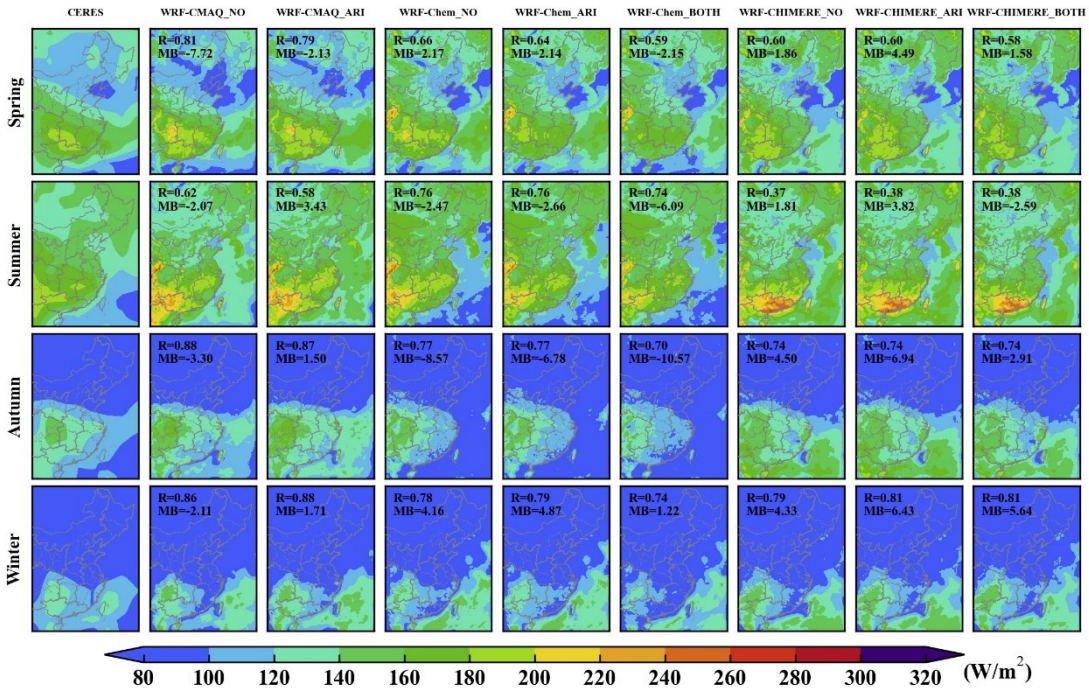

Figure S10. The same as Fig. S8 but for TOA shortwave radiation.

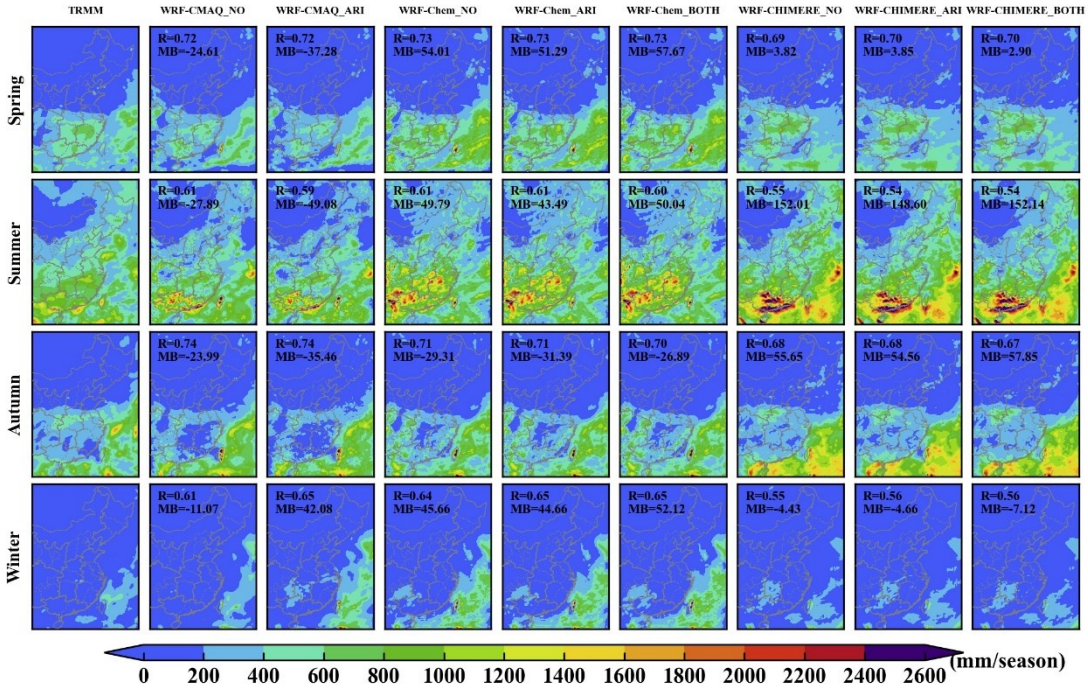

Figure S11. Spatial distributions of seasonal precipitation between TRMM observations and simulations from WRF-CMAQ, WRF-Chem and WRF-CHIMERE with and without aerosol feedbacks in eastern China.

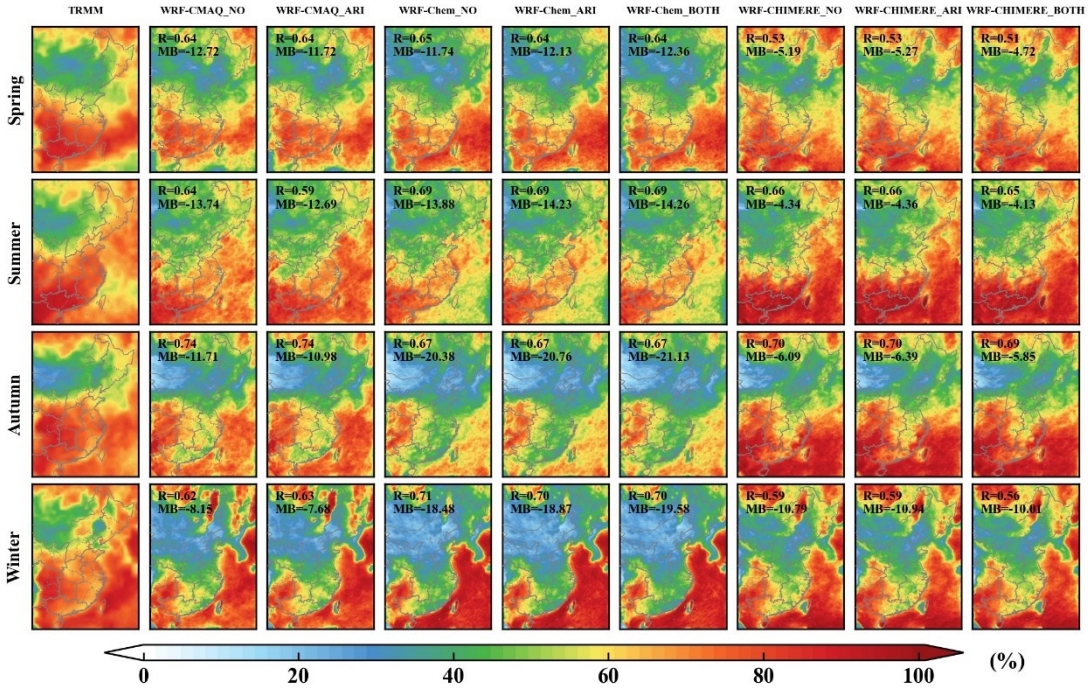

Figure S12. Spatial distributions of seasonal cloud fraction between MODIS observations and simulations from WRF-CMAQ, WRF-Chem and WRF-CHIMERE with and without aerosol feedbacks in eastern China.

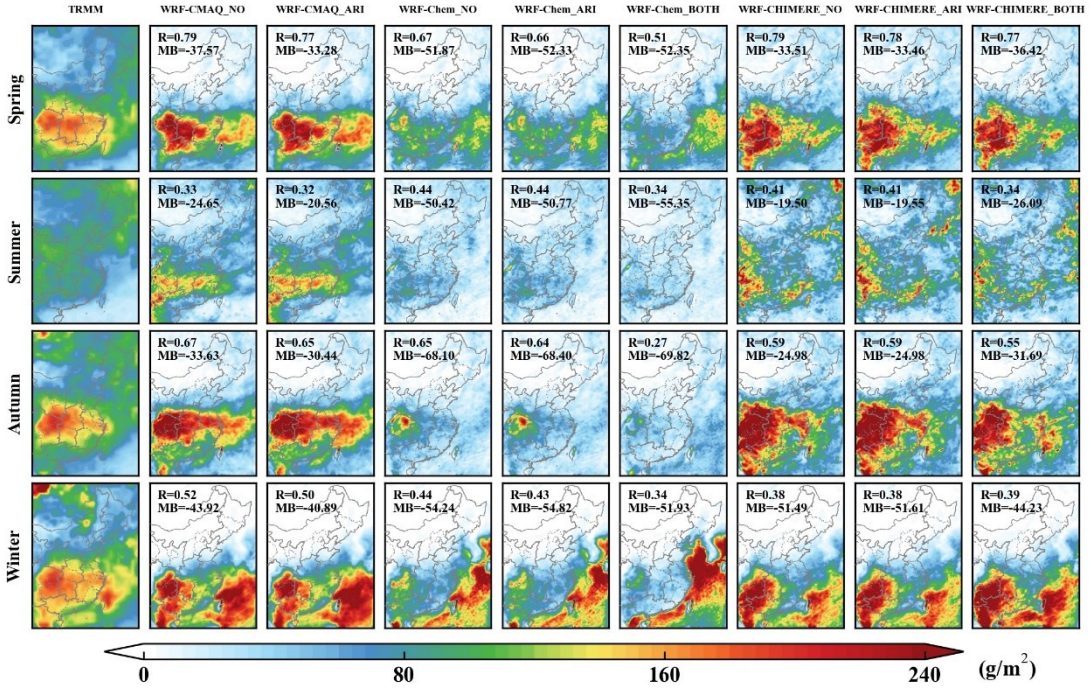

Figure S13. The same as Fig. S8 but for liquid water path.

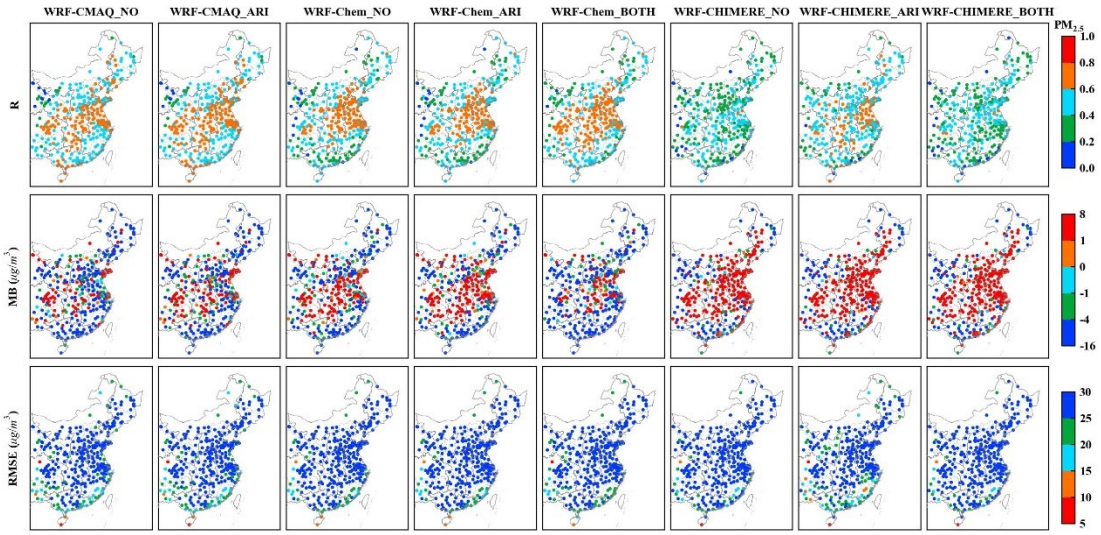

Figure S14. Statistics metrics (R, MB and RMSE) between simulated and observed annual $PM_{2.5}$ concentrations in eastern China.

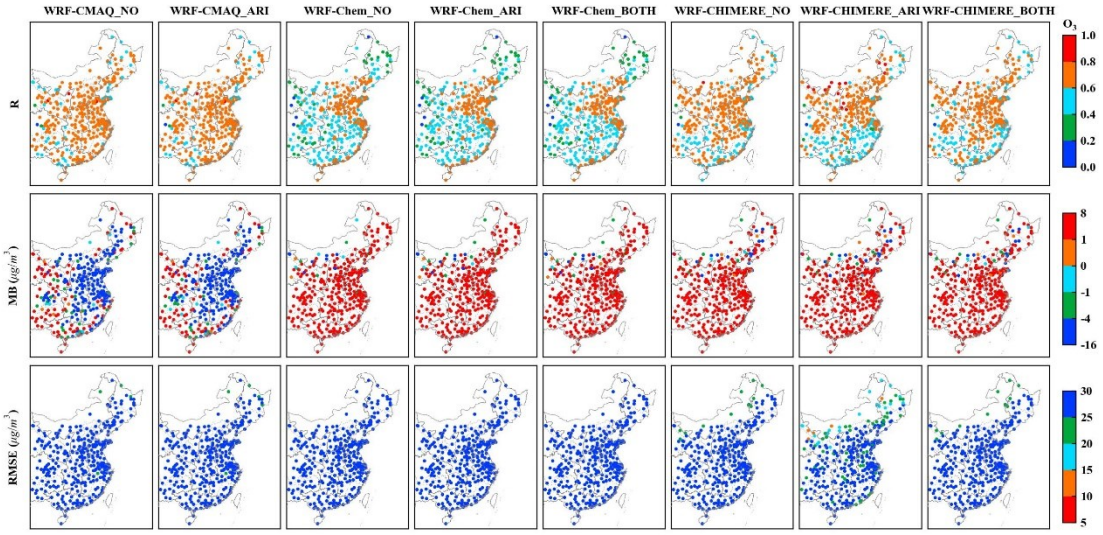

Figure S15. The same as Fig. S14 but for O_3.

Figure S16. The same as Fig. S14 but for NO_2.

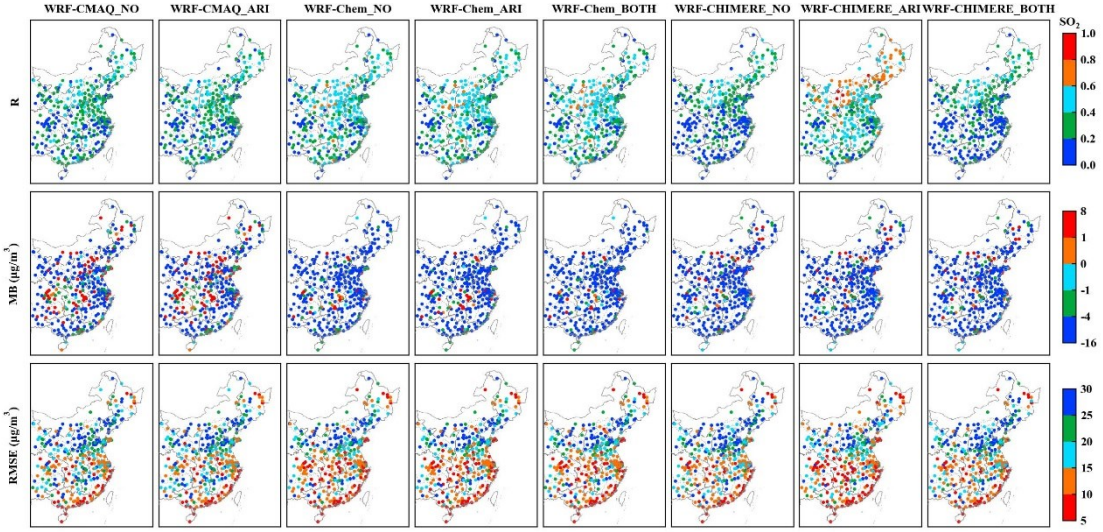

Figure S17. The same as Fig. S14 but for SO_2.

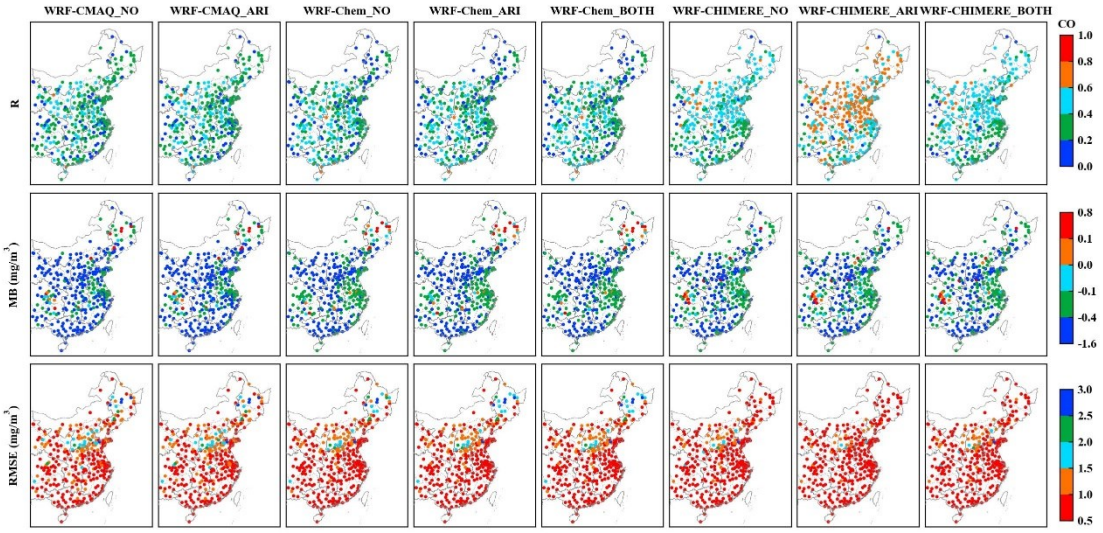

Figure S18. The same as Fig. S14 but for CO.

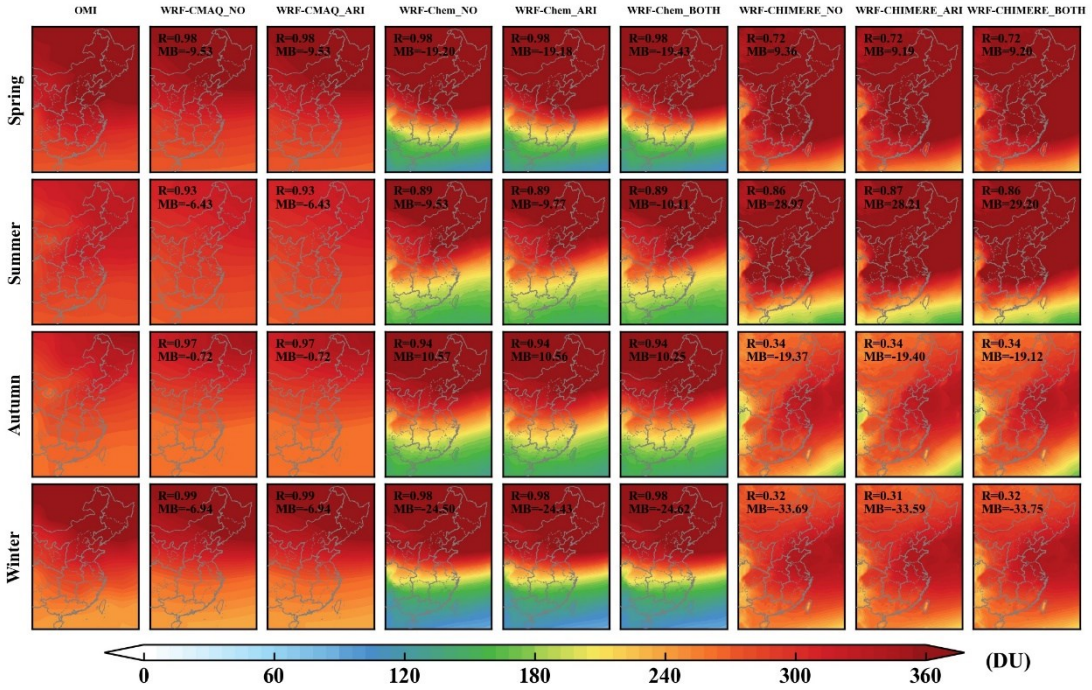

Figure S19. Spatial distributions of seasonal total column ozone between OMI observations and simulations from WRF-CMAQ, WRF-Chem and WRF-CHIMERE with and without aerosol feedbacks in eastern China.

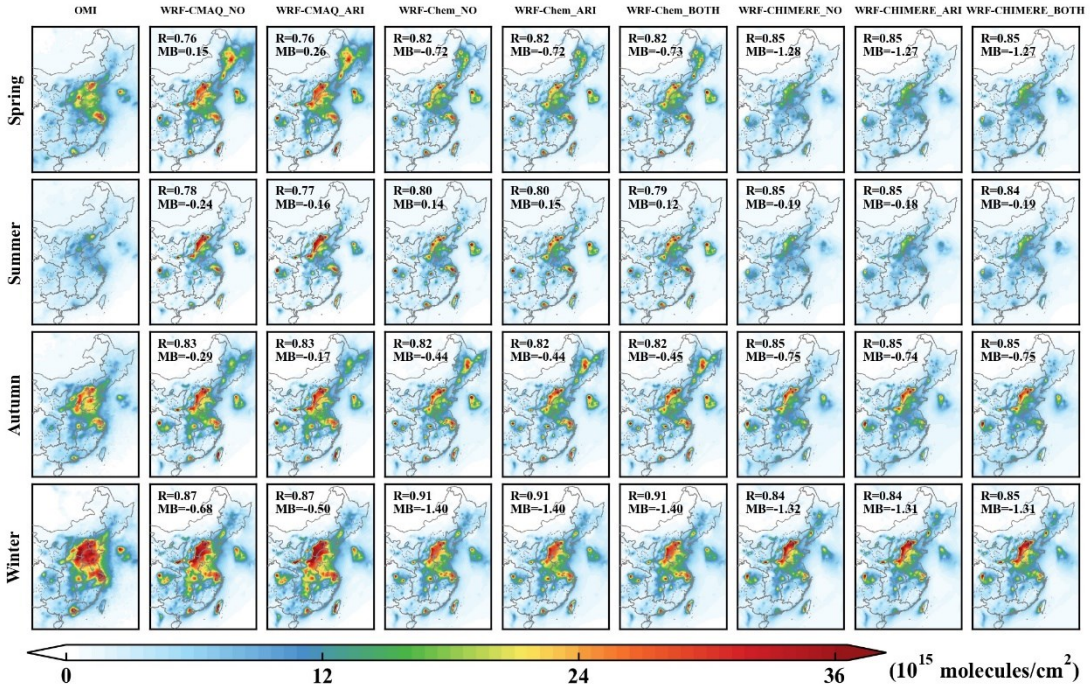

Figure S20. The same as Fig. S19 but for tropospheric NO_2 column.

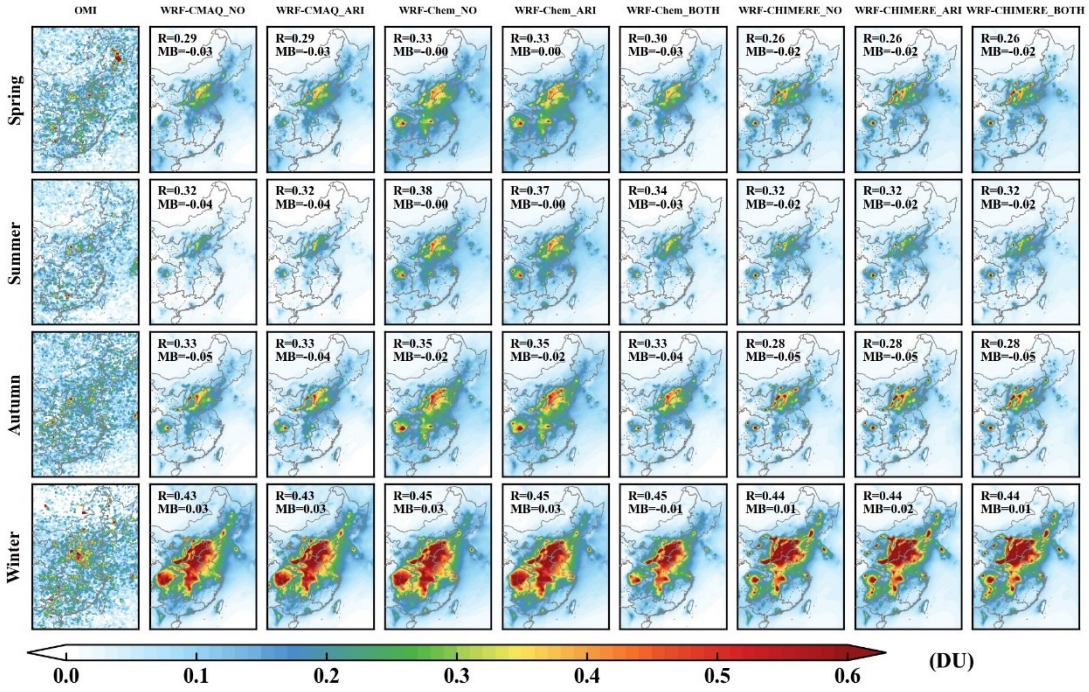

Figure S21. The same as Fig. S18 but for PBL SO_2 column.

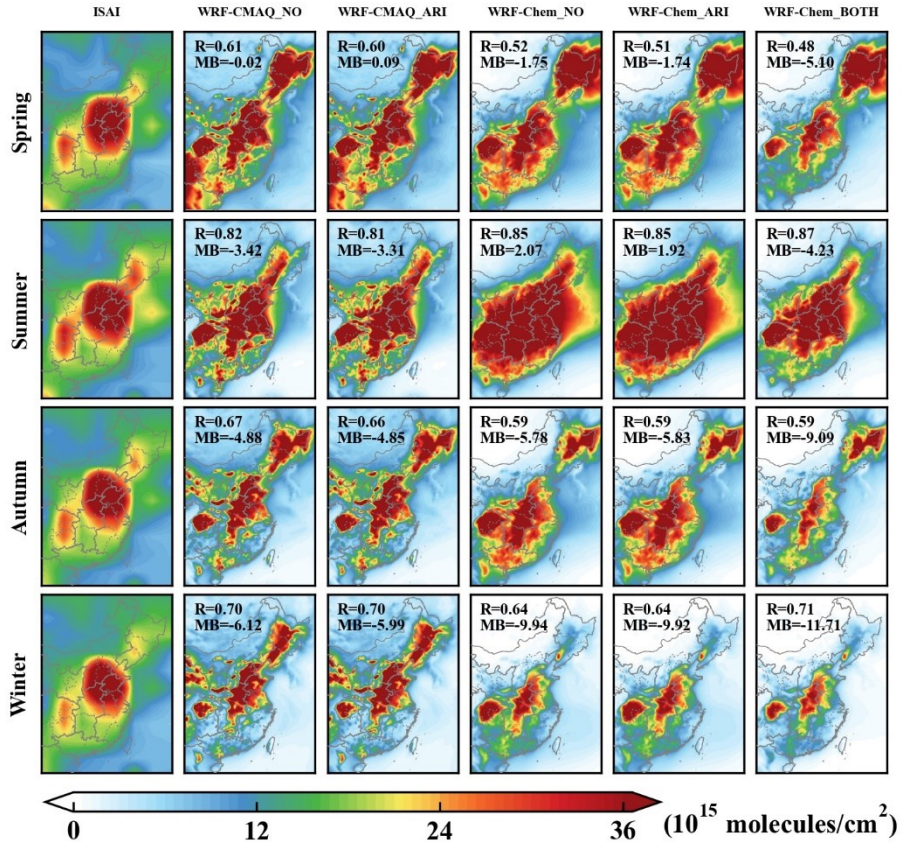

Figure S22. Spatial distributions of seasonal total NH_3 column between MOPITT observations and simulations from WRF-CMAQ and WRF-Chem with and without aerosol feedbacks in eastern China.

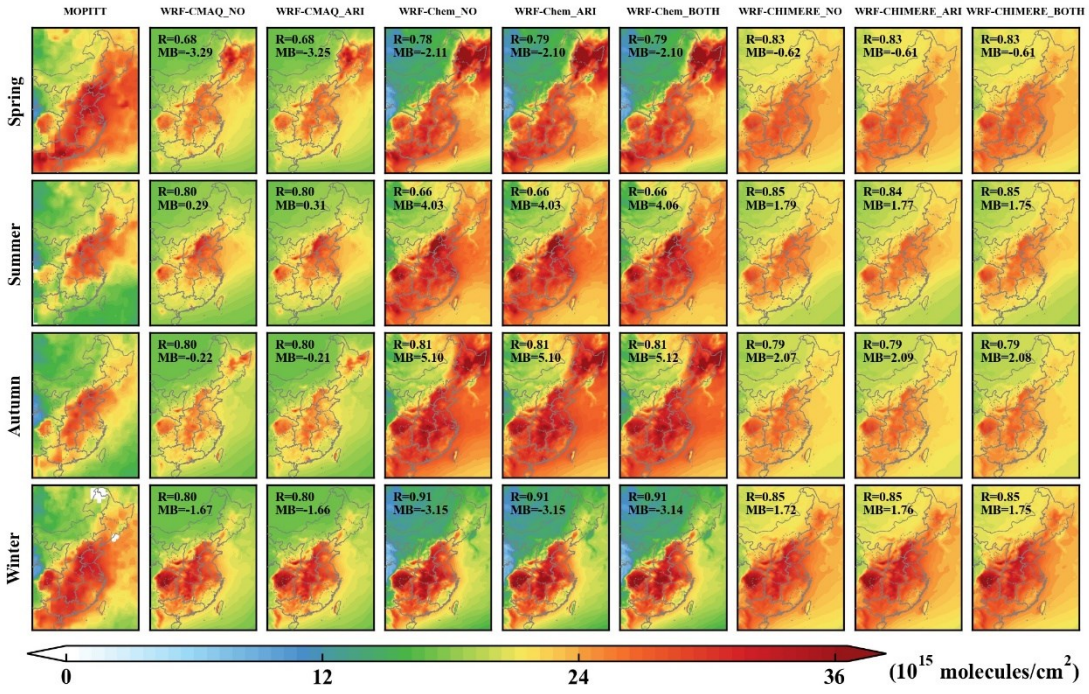

Figure S23. Spatial distributions of seasonal total CO column concentrations between MOPITT observations and simulations from WRF-CMAQ, WRF-Chem and WRF-CHIMERE with and without aerosol feedbacks in eastern China.

Table S2. Effects of aerosol feedbacks (ARI and/or ACI) considered in different coupled models on evaluation metrics between annual and seasonal meteorological and air quality simulations and observations in eastern China

Surface observations		WRF-CMAQ_ARI	WRF-Chem_ARI	WRF-Chem_ACI	WRF-Chem_BOTH	WRF-CHIMERE_ARI	WRF-CHIMERE_ACI	WRF-CHIMERE_BOTH
SSR	Annual	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Spring	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Summer	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
	Autumn	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Winter	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
T2	Annual	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Spring	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Summer	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)
	Autumn	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)
	Winter	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)
SH2	Annual	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Spring	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)
	Summer	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Autumn	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↑)
	Winter	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
Q2	Annual	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Spring	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Summer	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)
	Autumn	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(-)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Winter	R(↓), MB(↓), RMSE(-)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
WS10	Annual	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)
	Spring	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)

	Summer	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
	Autumn	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Winter	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)
PBLH_00	Annual	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)
	Spring	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)
	Summer	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)
	Autumn	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)
	Winter	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)
PBLH_12	Annual	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Spring	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)
	Summer	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
	Autumn	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Winter	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
Precipitation	Annual	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Spring	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Summer	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Autumn	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Winter	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)
$PM_{2.5}$	Annual	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)
	Spring	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
	Summer	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
	Autumn	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)
	Winter	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)
O_3	Annual	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Spring	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)

	Summer	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Autumn	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Winter	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)
NO_2	Annual	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)
	Spring	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)
	Summer	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↑)
	Autumn	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Winter	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)
SO_2	Annual	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
	Spring	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Summer	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)
	Autumn	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)
	Winter	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
CO	Annual	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
	Spring	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
	Summer	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Autumn	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
	Winter	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)

Satellite observations		WRF-CMAQ_ARI	WRF-Chem_ARI	WRF-Chem_ACI	WRF-Chem_BOTH	WRF-CHIMERE_ARI	WRF-CHIMERE_ACI	WRF-CHIMERE_BOTH
SSR	Annual	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Spring	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Summer	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Autumn	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)
	Winter	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)

SLR	Annual	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)
	Spring	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)
	Summer	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)
	Autumn	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)
	Winter	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)
TSR	Annual	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
	Spring	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)
	Summer	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
	Autumn	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)
	Winter	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)
TLR	Annual	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)
	Spring	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)
	Summer	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)
	Autumn	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)
	Winter	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)
Precipitation	Annual	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Spring	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
	Summer	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Autumn	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Winter	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
CF	Annual	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Spring	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Summer	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Autumn	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Winter	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)

LWP	Annual	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Spring	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Summer	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)
	Autumn	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)
	Winter	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)
AOD	Annual	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Spring	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)
	Summer	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)
	Autumn	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Winter	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
O3 VCDs	Annual	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)
	Spring	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
	Summer	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)
	Autumn	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Winter	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)
NO_2 VCDs	Annual	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Spring	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)
	Summer	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Autumn	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)
	Winter	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)
SO_2 VCDs	Annual	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↓)
	Spring	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Summer	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Autumn	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)
	Winter	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↓), MB(↑), RMSE(↑)

CO VCDs	Annual	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Spring	R(↓), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
	Summer	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)
	Autumn	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↑), RMSE(↑)
	Winter	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↓)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↑), RMSE(↑)
NH_3 VCDs	Annual	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)			
	Spring	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↓), MB(↓), RMSE(↑)			
	Summer	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)	R(↑), MB(↓), RMSE(↓)			
	Autumn	R(↓), MB(↑), RMSE(↑)	R(↓), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)			
	Winter	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↑), RMSE(↑)	R(↑), MB(↓), RMSE(↑)	R(↑), MB(↓), RMSE(↑)			