Supporting Information for

Frequent haze events associated with transport and stagnation over the corridor between North China Plain and Yangtze River Delta

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Supplemental Information

This supplemental information includes 3 tables and 6 figures.

Table captions

Table S1 Model configuration of WRF.

Table S2 The evaluation of daily meteorological parameters, including air temperature at 2m (T2), specific humidity at 2m (Q2), wind speed (WS10) and direction (WD10) at 10m from WRF model simulation and NCDC observation.

Table S3 The total number of the polluted days exceedance in SWLY during winters in 2014-2019.

Figure Captions

Fig. S1 The simulation domains of WRF (black square), CMAQ (magenta square) and the regions of NCP (red square), SWLY (green square), and YRD (blue square) used for the analysis.

Fig. S2 Scatter plot of simulated and observational daily mean $PM_{2.5}$ over three regions (NCP, SWLY, and YRD) from 2014 to 2019. The linear regression is marked in red line. The statistical parameters are also shown on the top left, including mean fractional bias (MFB), mean fractional error percent (MFE), and correlation coefficient (R), with the asterisk on the top left of R indicating statistical significance ($P < 0.05$).

Fig. S3 Duration and average $PM_{2.5}$ concentration of pollution events which $PM_{2.5}$ concentration is greater than 75 μg m^{-3} in SWLY and NCP in winter of 2014-2019.

Fig. S4 The cumulative distribution function of observational daily $PM_{2.5}$ in wintertime of SWLY in 2014-2019. The grey, green and orange dotted lines implies 75, 150, and 250 μg m^{-3} of $PM_{2.5}$ concentrations, respectively.

Fig. S5 The regional mean total frequency (a) and duration (b) of observational $PM_{2.5}$ for three categories (I: 75-150 μg m^{-3} II: 150-250 μg m^{-3}, III: greater than 250 μg m^{-3}) over SWLY, NCP and YRD in winter during 2014-2019.

Fig. S6 (a)-(c): Monthly average emissions of (t/month) from MEIC emission inventory in winter 2016; (d) The monthly average emissions of $PM_{2.5}$, NO_X, and SO_2 derived from MEIC in SWLY and NCP in winter 2016.

Table S1 Model configuration of WRF.

WRF configuration	Scheme
Microphysics	Morrison microphysics scheme (Morrison et al., 2009)
Land surface option	Unified Noah land surface model (Chen and Dudhia, 2001)
Longwave and shortwave radiation	Rapid Radiation Transfer Model Global (RRTMG) (Iacono et al., 2008; Morcrette et al., 2008)
Cumulus parameterization scheme	GrellFreitas cumulus parameterization scheme (Grell and Freitas, 2014)
Planetary boundary layer scheme	YSU (Hong et al., 2006)

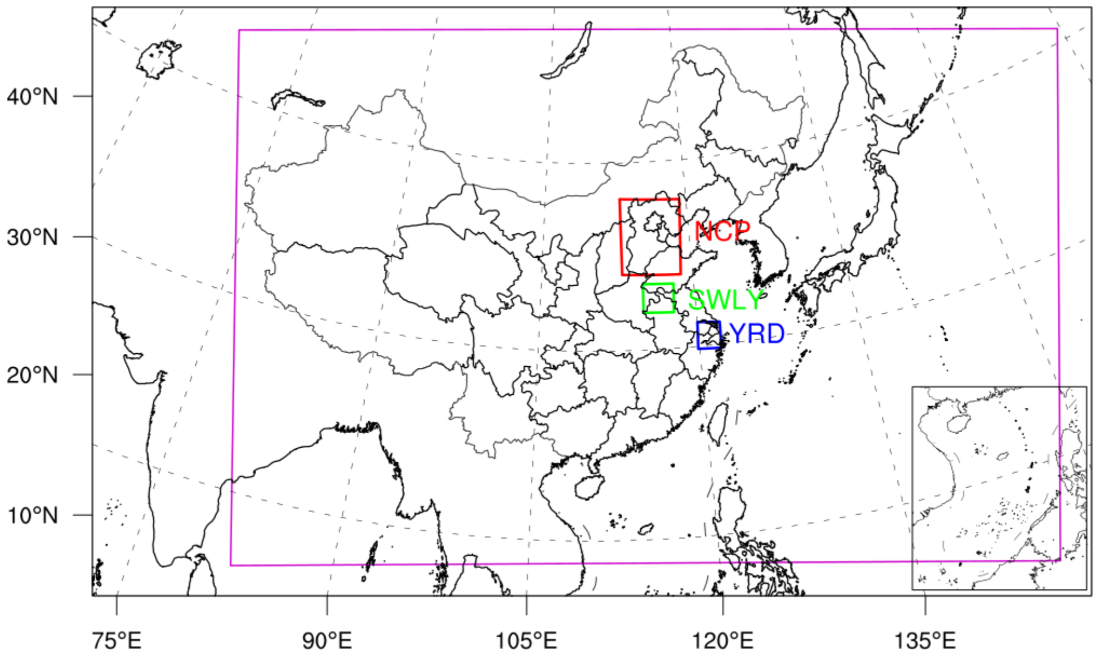
Table S2 The evaluation of daily meteorological parameters, including air temperature at 2m (T2), specific humidity at 2m (Q2), wind speed (WS10) and direction (WD10) at 10m from WRF model simulation and NCDC observation.

	Model evaluation				Benchmarks (Emery and Tai, 2001)			
	T2	Q2	WD10	WS10	T2	Q2	WD10	WS10
Bias	-0.28	0.01	0.03	0.85	$\leq \pm0.5$	$\leq \pm1$	$\leq \pm10$	$\leq \pm0.5$
Gross Error	1.97	0.01	45.98	/	≤ 2	≤ 2	≤ 30	/
RMSE	/	/	/	1.62	/	/	/	≤ 2

Table S3 The total number of the polluted days exceedance in SWLY during winters in 2014-2019.

	75-150 $\mu g\ m^{-3}$	150-250 $\mu g\ m^{-3}$	greater than 250 $\mu g\ m^{-3}$	total[a]
seesaw patterns	98	22	1	121
stagnation	105	32	1	138
other	118	10	0	128
total[b]	321	64	2	387

a indicates the total number of polluted days due to seesaw patterns, stagnation days and other; b indicates the total number of days in three categories.



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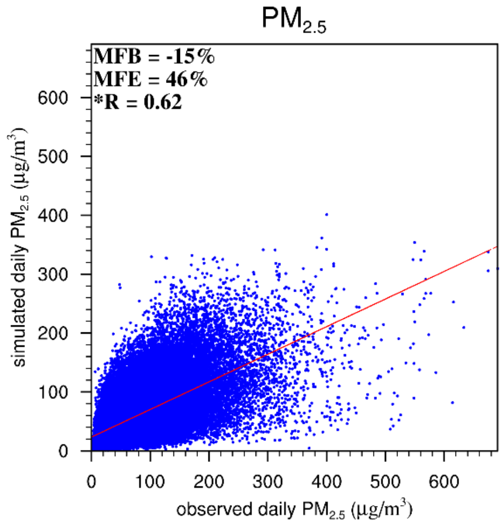

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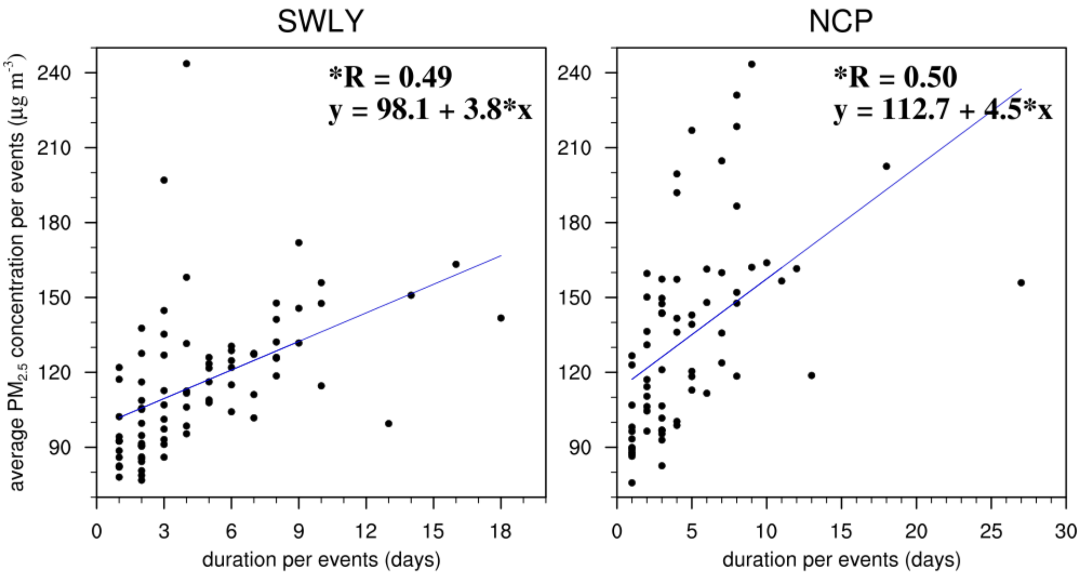

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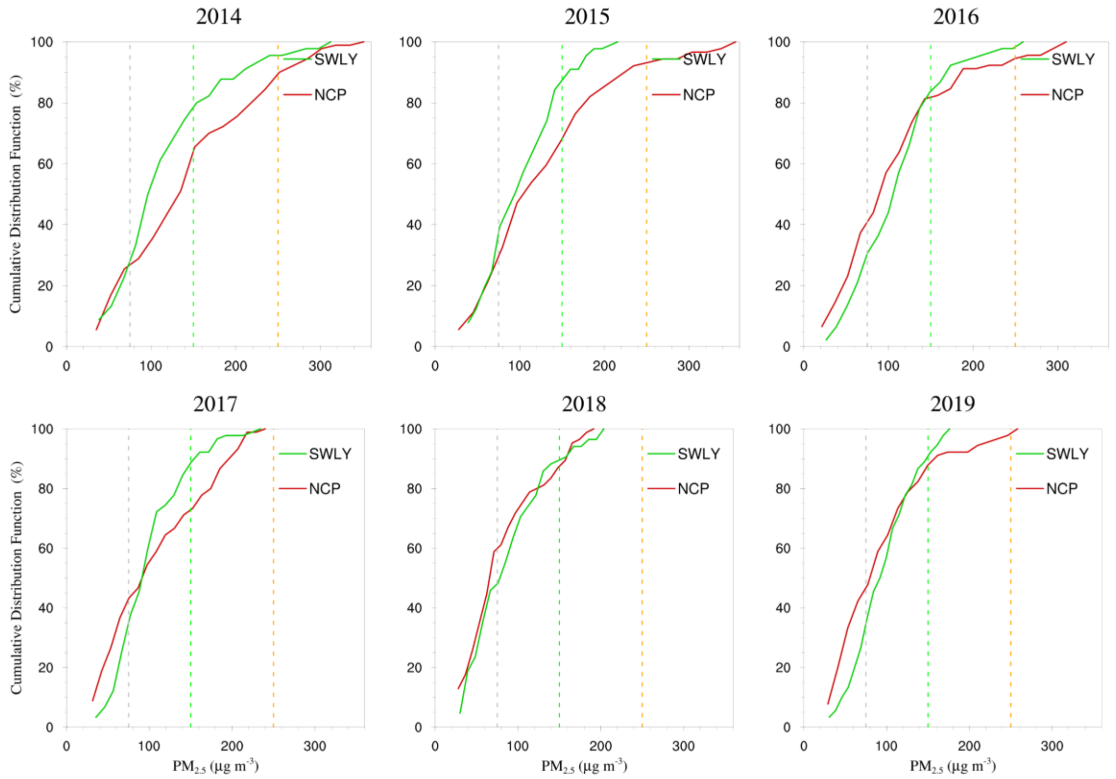

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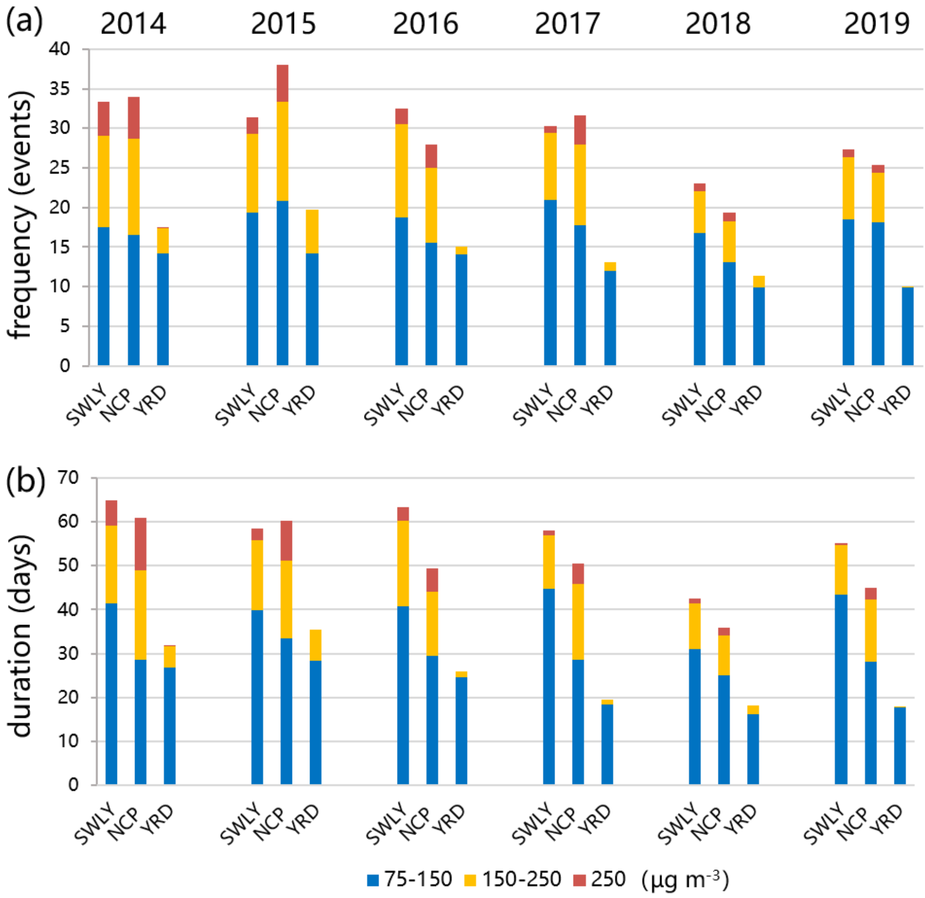

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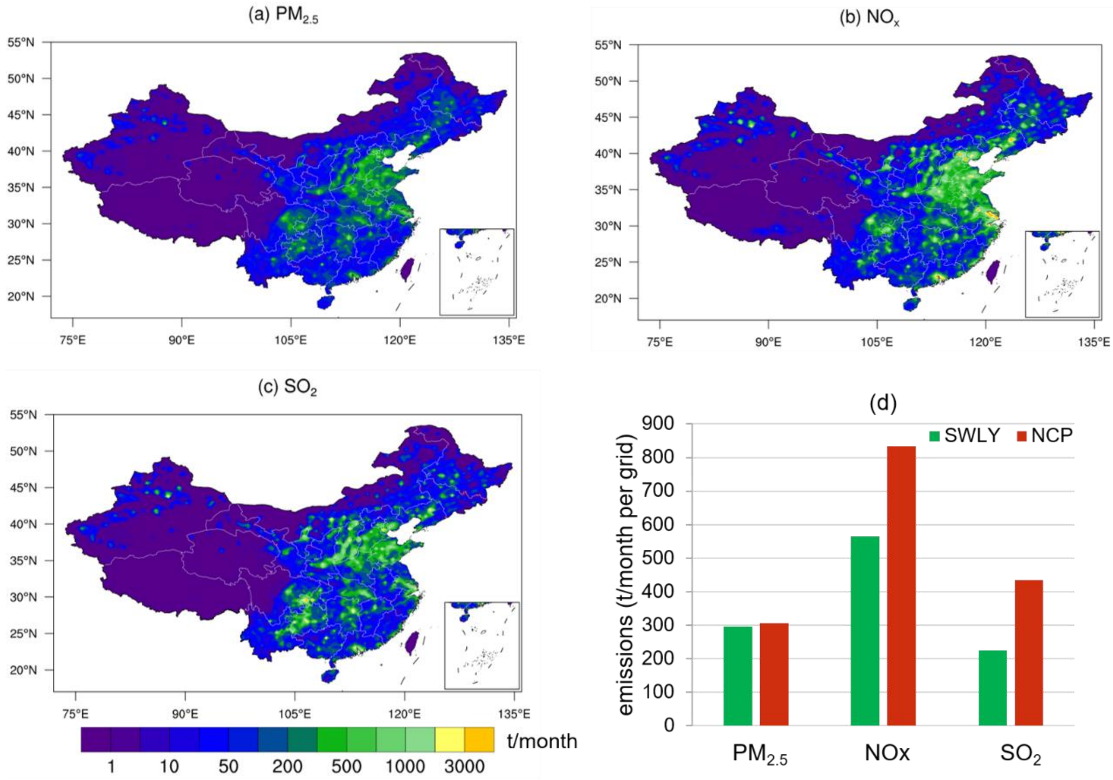

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