

The development and application of machine learning in atmospheric environment studies

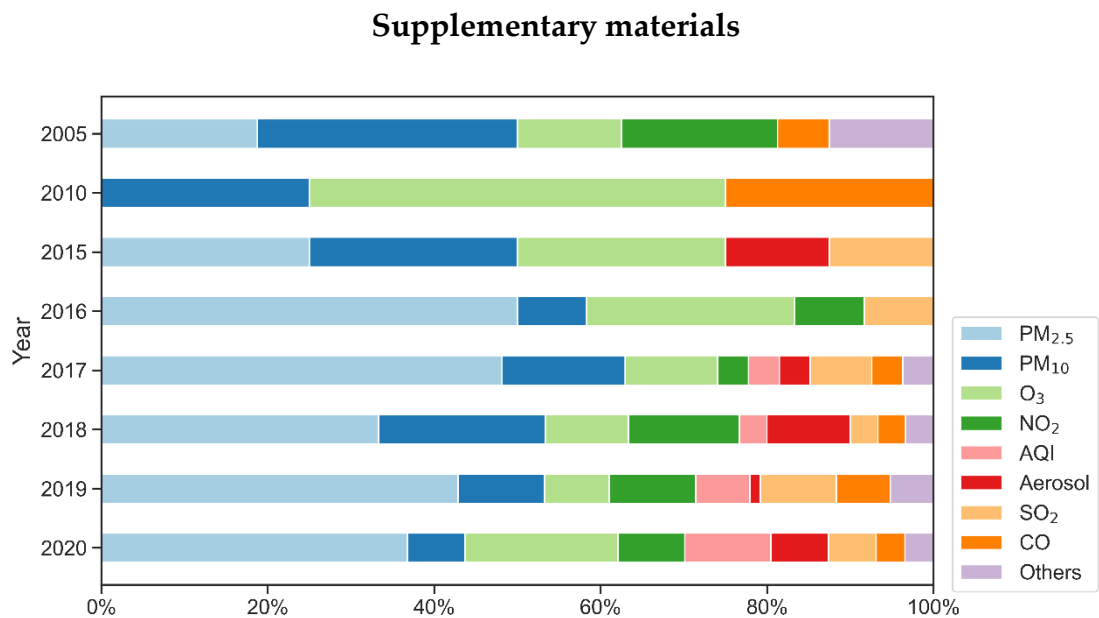


Figure S1. Annual species proportion of ML application to atmospheric pollution. “Aerosol” refers to aerosol chemical composition classification.

Table S1. Full name of variables for model variable importance.

Data type	Variable	Abbreviation
Meteorological variables	Planetary boundary layer height	PBLH
	Temperature	T
	Relative humidity	RH
	Surface pressure	SP
	U component of wind	U
	V component of wind	V
Pollutant variables	Satellite AOD	S_AOD
Auxiliary variables	Visibility	VIS
	Land use	LU
	Personal income	PI
	Population density	PD
	Traffic data	Traffic
	Day of the year	DOY
Historical data	Historical data	History

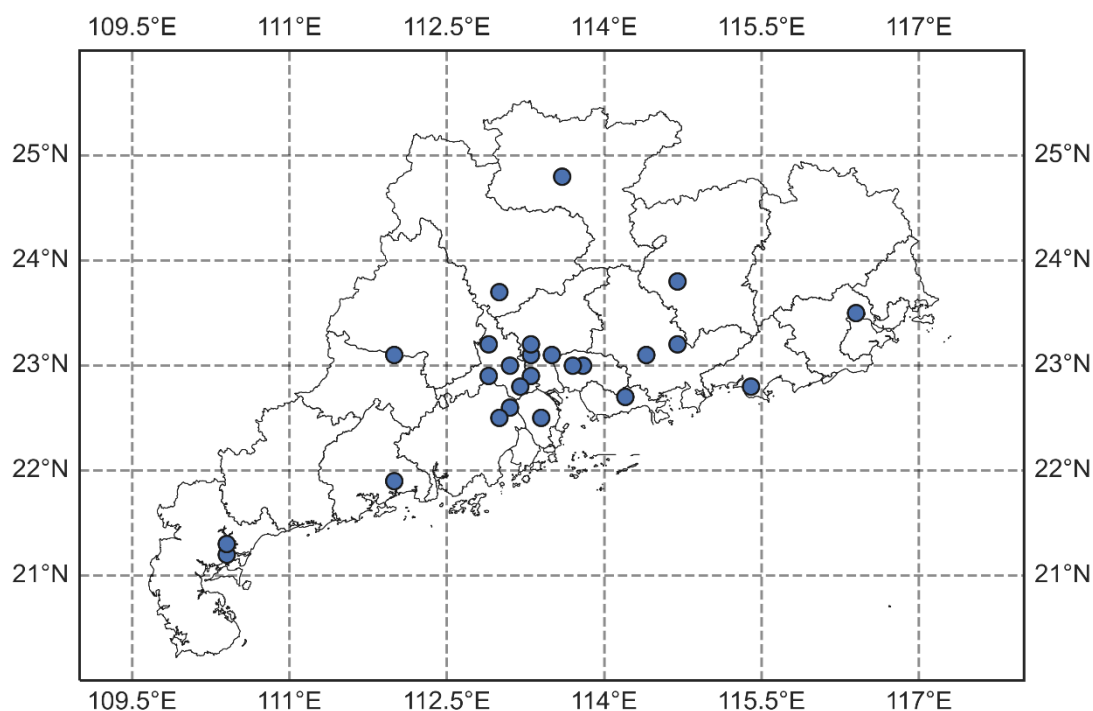


Figure S2. Spatial location of nitrate wet deposition sites in Guangdong province.

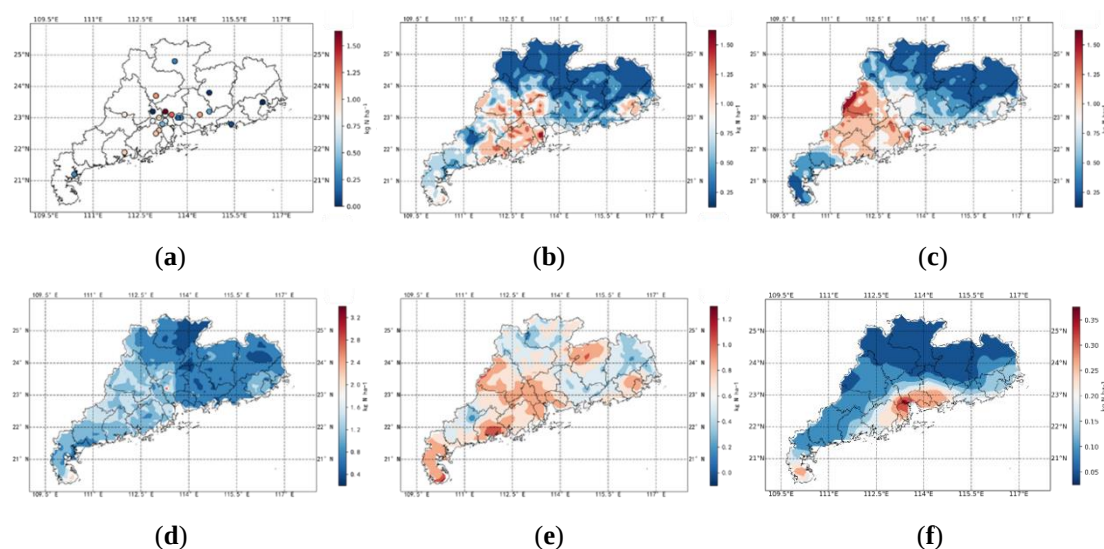


Figure S3. Spatial estimation of nitrate wet flux in July 2014: (a) observations (data unavailable at 4 sites), (b) CNN, (c) MLP, (d) RF, (e) MLR, (f) WRF-EMEP.