

Observations	Variables	Location	Temporal resolution	Time period
Environmental stations	PM _{2.5}	~ 1600 sites ^a	Hourly	Jan 2012–Jun 2017
Meteorological stations	WS/WD	~ 900 sites ^b	Hourly	Jan 2012–Jun 2017
MPL	PBLH, extinction	Beijing	15 s	Mar 2016–Dec 2017
AERONET	AOD (550 nm),	Beijing	~ Hourly	Jan 2016–Dec 2017
MODIS	AOD	Whole China	Daily	Jan 2006–Dec 2017
CALIPSO	PBLH	Orbits in Fig. 1d	Daily	Jun 2006–Dec 2017
MERRA	PBLH	Whole China	Hourly	Jan 2006–Feb 2016