



- HOME
- About Us
- Research
- People
- International Cooperation
- Education & Training
- Join Us
- Publications
- Papers
- Links



Real-Time Panorama of Olympic Park Zone [CLICK TO VIEW](#)

Location: Home > Research Express

Future PM_{2.5} air pollution over China

With rapid industrialization and urbanization over the past decades, China has experienced widespread air pollution induced by fine particulate matter with a diameter of 2.5 μm or less (PM_{2.5}). To protect human health and meet the newly implemented annual PM_{2.5} target (less than 35 $\mu\text{g m}^{-3}$), great efforts are needed to reduce emissions effectively. It is, therefore, essential to understand how future PM_{2.5} concentrations are affected by changes in anthropogenic emissions.



IMAGE: The photo shows a panoramic view of the Beijing Olympic Park Zone, taken from HD cameras placed at the 280-meter platform of the 325-meter high meteorological observation tower of the Institute of Atmospheric Physics, Chinese Academy of Sciences <http://view.iap.ac.cn:8080/imageview/> (CREDIT: Institute of Atmospheric Physics, Chinese Academy of Sciences)

Researchers from Institute of Atmospheric Physics and their co-authors, by using a global chemical transport and future emission scenarios (the representative concentration pathways, RCPs), projected that by 2030 wintertime (summertime) PM_{2.5} concentrations averaged over Beijing-Tianjin-Hebei, Yangtze River Delta, Pearl River Delta, and Sichuan Basin will be 49–56 (31–40), 40–50 (23–29), 22–27 (8–11), and 56–68 (19–24) $\mu\text{g m}^{-3}$, respectively, with the ranges of PM_{2.5} concentrations obtained on the basis of the four RCPs.

"In consideration of annual PM_{2.5} target, controlling PM_{2.5} pollution in Beijing-Tianjin-Hebei and Sichuan Basin will be challenging," said LIAO Hong, who is the corresponding author of this research published in *Journal of Geophysical Research: Atmospheres*. "In these two regions, it will take at least two decades to achieve the annual PM_{2.5} target under the RCP2.6, RCP4.5, and RCP8.5 scenarios, and PM_{2.5} concentrations will keep increasing under RCP6.0."

In the meantime of improving air quality, policymakers are suggested considering the impacts on climate induced by decreases in aerosol concentrations, as experienced in the US and Europe. The IPCC has estimated that the global mean surface temperature exhibited a warming of 0.85°C (0.65–1.06°C) from 1880 to 2012, and the associated radiative forcings by greenhouse gases and aerosols were +2.83 and –0.90 W m^{-2} , respectively. "Thus, the predicted positive aerosol direct radiative forcing of 0.7–1.9 W m^{-2} over eastern China (20°–45°N, 100°–125°E) in 2050 relative to 2000 under all RCPs except for RCP6.0 have important implications for regional climate," said LIAO.

"There is a long way to go to mitigate future PM_{2.5} pollution in China based on the emission scenarios," said LIAO. "At the same time, the consequent warming from reduced aerosols is also significant and inevitable."

References

Li, K., H. Liao*, J. Zhu, and J. M. Moch (2016), Implications of RCP emissions on future PM_{2.5} air quality and direct radiative forcing over China, *J. Geophys. Res. Atmos.*, 121, doi:10.1002/2016JD025623. <http://onlinelibrary.wiley.com/doi/10.1002/2016JD025623/full>

Contact: Hong Liao, hongliao@nuist.edu.cn

