1.124 Recent changes of trans-boundary air pollution over Northeast Asia: Implications for future air quality in South Korea.

Early Career Scientist

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Abstract:

The influence of Chinese pollution on air quality over South Korea is a major concern for the policymakers in South Korea. To investigate the inter-annual trends of the long-distance transport of air pollutants from China to South Korea, multi-year trend analysis was carried out for AOD (Aerosol Optical Depth, as a proxy of particulate matter) and gaseous CO (a water-insoluble air pollutant) and SO_2 (a partially water-soluble air pollutant) over the three regions in Northeast Asia. The Yellow Sea serves an ideal geographical situation where the inter-annual trends and the amounts of the trans-boundary air pollution from China to South Korea can be monitored. Decreasing trends of about 5-10%, 13-17% and 55-61% during the last decade were observed in surface CO, AOD and tropospheric SO_2 columns over North China Plain (NCP), Yellow Sea (YS) and South Korea (SK), respectively. Such decreasing trends were also found consistently during the last three, five, and seven years, indicating that the changes in the pollution levels are likely in response to recent policy measures taken by the Chinese and Korean governments to improve air quality over the regions. Due to these efforts, the amounts of air pollutants transported through the YS region from China to South Korea are expected to decrease in future years, at the likely rates of -5.1 % yr^{-1}, -16.9-21.8 % yr^{-1}, and -53.1-66.3 % yr^{-1} for CO, AOD, and SO_2, respectively. Given the ambitious plans recently announced by the Chinese government for COP21 and its co-benefit effects, the suggested percentage rates may be even conservative numbers.