

Significant contributions of upwind sources to ground-level ozone in the North China Plain

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With its adverse impacts on air quality, human health and ecosystem and increasing concentrations, ground-level ozone (O_3) is receiving increasing attention in China. Emissions of O_3 precursors, nitrogen oxides (NO_x) and volatile organic compounds (VOCs), vary significantly spatiotemporally. Background and long transport of O_3 and its precursors have been shown to be important for O_3 concentrations in the North China Plain (NCP). However, there is no study quantifying the contributions for designing effective controlling measures. This study uses a source-oriented version of the Community Multi-scale Air Quality (CMAQ) model with updated mechanisms to estimating contributions of different source regions to O_3 in the NCP in summer 2017. Anthropogenic emissions are generated by an improved Emissions Database for Global Atmospheric Research (EDGAR+) and biogenic emissions are from the Model for Emission of Gas and Nature (MEGAN). Emissions from open burning are based on the Fire Inventory from NCAR (FINN). This study provides evidences the importance of considering regional transport to understanding O_3 formation, O_3 -related human health risk and economic loss and helps policy makers in making control strategies.

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