

1.147 Response of winter fine particulate matter concentrations to emission and meteorology changes in North China .

Early Career Scientist

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Abstract:

The winter haze is a growing problem in North China, but the causes have not been well understood. The chemistry version of the Weather Research and Forecasting model (WRF-Chem) was applied in North China to examine how the PM_{2.5} concentrations change in response to changes in emissions (sulfur dioxide (SO₂), black carbon (BC), organic carbon (OC), ammonia (NH₃), and nitrogen oxides (NO_x)), as well as meteorology (temperature, relative humidity (RH), and wind speeds) changes in winter. The sensitivity results indicate SO₂, OC and NH₃ emissions should be controlled preferentially to control winter haze. Based on the major sources of SO₂, OC and NH₃ emissions, natural gas should be promoted to take the place of coal and biofuel, and some animal feeding and animal housing strategies should be taken to control NH₃ emissions. The perturbations in temperature, RH and wind speed do not show significant impacts on numbers of haze days, suggesting that the haze occurrences are more likely to be associated with atmospheric circulation.