

Issues and progress in modeling intercontinental transport of ozone

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Exposure to ozone is associated with a variety of health outcomes ranging from mild breathing discomfort to mortality. Ozone and aerosol levels in many areas are now at levels at which contributions from sources on other continents must be considered as the international community strives to control excessively high levels of ozone and aerosols. Contributions to ozone include photochemical reactions involving natural emissions of VOCs, NO_x, and CO as well as the intercontinental transport of O₃ and its precursors. Stratospheric-tropospheric exchange (STE) of O₃ and a number of natural processes also need to be considered. Estimates of the contributions of these 'background' sources will be presented. We will focus on the ability of the current generation of global scale three-dimensional chemistry, transport models to simulate the contributions from different sources of ozone. Some different approaches to and methods for model evaluation will be presented. Issues associated with using models to estimate background levels; how atmospheric measurements have defined problems; how best to use models and measurements; and what measurements are needed to improve the quantification of background ozone and particles and their impact at the surface will be discussed.