Simulations of Multiple Pollutants over the Pacific Regions Using the Models-3/CMAQ System

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Brief Description:

There is increasing evidence that air pollutants originating from regions outside of North America such as Asia could impact U.S. domestic air quality and NAAQS attainment. The impact of intercontinental transport of pollutants is expected to worsen with the rapid emissions growth within these regions, particularly the developing countries such as China and India. At the same time, the U.S. is both an importer and exporter of air pollutants. EPA's Air Quality Modeling Group at Office of Air and Radiation has been undertaking a series of modeling efforts to help understand and mitigate these issues related to the intercontinental transport of air pollutants, including a pioneer modeling effort initiated in 2002 referred to as the "Intercontinental Transport and Climatic Effects of Air Pollutants" (ICAP) project. The Phase I of the ICAP project has been completed and the results and further details of this project are available at the website (http://www.cep.unc.edu/empd/projects/ICAP/). The focus of the on-going Phase II project is to assess the impacts of intercontinental transport of air pollutants, including ozone (O3), particulate matter (PM), and mercury (Hg). The Phase-II efforts include a series of modeling (108-km grid resolution) and emissions related activities over the pacific regions, including a 2001 Base year simulation, 2030 scenarios (IPCC's A1B and B2 scenarios), and several sensitivity studies (e.g., removal of man-made Asian emissions and North America emissions, etc.). The trans-Atlantic modeling effort has also been under way. The key modeling tool used in this project is the Models 3/Community Multi-scale Air Quality (CMAQ) modeling system developed at EPA. In addition, a related modeling and emission inventory effort under this project is to conduct China national (36-km grid) and regional (12-km grid) model simulations. The China model simulation results will be presented and a comparison against the U.S. model simulations will also be illustrated. An expansion of this China modeling effort to urban fine-grid modeling (4-km grid) in Beijing and Shanghai has also been undertaken.