

6.130 Aircraft and Satellite Measurements to Support Numerical Simulation of Urban Smog formation: Policy Relevant Science.

Presenting Author:

Russell R. Dickerson, The University of Maryland, rrd@umd.edu

Co-Authors:

Tomothy Canty, UMCP

Hao He, UMCP

Daniel Goldberg, Argonne National Lab.

Ross Salawitch, UMCP

Xinrong Ren, UMCP/NOAA

Zhanqing Li, UMCP

Sheryl Ehrman, UMCP

Abstract:

Ground level ozone continues to be a problem in the Eastern United States as well as East Asia. We present a compilation of recent studies demonstrating how photochemistry and meteorology conspire to generate high levels of secondary pollutants (ozone and aerosols) on regional and local scales. In situ observations from the surface and aircraft as well as remotely sensed data are used to constrain and improve numerical simulations performed with CMAQ and CAMx. We demonstrate improvements in emissions (vehicular NO_x) chemical mechanisms (the removal of alkyl nitrates) and vertical transport (high resolution WRF meteorology) that bring model results closer to observations and provide guidance for abatement strategies in the Mid Atlantic States. These are contrasted with the chemistry and meteorology of central China. Results provide insight into the most effective means of improving air quality.