1.132 Inverse modeling and satellite data analysis for improving emission inventories.

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Abstract:

High time resolution surface measurements of pollutant concentrations were used as input to an inverse model in order to constrain emission estimates from a range of sources. By using a combination of particle backward trajectories, forward grid simulations and tracer concentrations, an inverse model was used to estimate the diurnal and seasonal variation of anthropogenic emissions as well as biomass burning emission factors for species such as mercury and carbonaceous aerosols.

Shifting from in-situ measurements to remote sensing, satellite retrievals were used to estimate trends in emissions for urban areas and industrial point sources. A multiple linear regression model was developed to analyze long time series of individual pixel data from satellite retrievals. This enabled the identification of day of week and seasonal variability as well as the impact of the economic cycle and the implementation of control policies on year to year variability. Examples will be shown using OMI NO2 data for areas around the world.