

Advanced Study Program Seminar

Wednesday, October 26th, 2005 at 11 a.m.

Foothills Laboratory, FL2, Room 1022

Refreshments at 10:30 am

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Observations of the Climate-Forcing Properties of Aerosols

The goal of aerosol research at ESRL/GMD is to obtain measurements of aerosol properties that, when combined with chemical transport models, radiative transfer models, and global satellite observations, will allow evaluation of the anthropogenic climate forcing by aerosols. Aerosol radiative, chemical, and microphysical properties are measured in a variety of locations so that a wide range of aerosol types are included, allowing the radiative properties of the particles to be linked to chemical sources. Most of the observations are made at fixed ground stations that operate continuously on decadal time scales, such as the NOAA baseline station at Barrow (Alaska) and the regional aerosol station at Bondville (Illinois). These long-term observations are supplemented by year-long deployments of a movable aerosol sampling system, by routine vertical profiling from light aircraft, and by shorter term intensive field programs. Identical sampling protocols and instrumentation are used to ensure that results from the different locations can be compared quantitatively. Taken together, GMD's worldwide observations of the radiative climate-forcing properties of aerosols form a unique data set needed to derive aerosol effects on climate. This talk will describe the measurement approaches used by NOAA to develop climatologies of aerosol radiative properties, and present results of a recent study, conducted as part of the U.S. Climate Change Science Program, that combined measurements of aerosol climate-forcing properties with chemical transport models to improve estimates of aerosol climate forcing over oceanic regions downwind of major continental pollution sources.