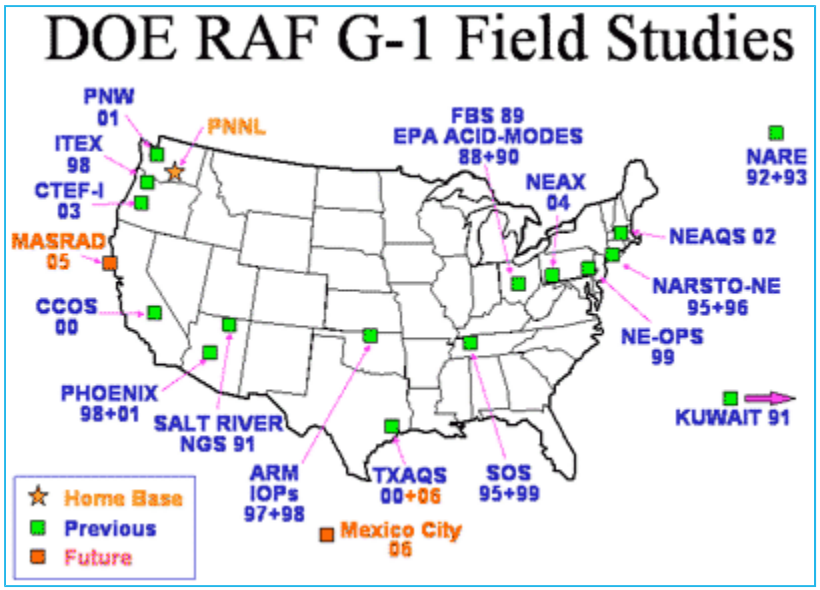
Atmospheric Science & Global Change Division

Field Campaigns

The G-1 has participated in many field campaigns related to air quality, acid precipitation, aerosols, visibility, and instrument development.

The map below shows the area or base of operations for each of the studies mentioned on this page.



Acid Model Operational and Diagnostic Evaluation Study (ACID-MODES)
The National Acid Precipitation Assessment Program and the U.S. Environmental Protection Agency used the G-1 in 1988 and 1990 to collect air quality data over the northeastern United States for use in a multi-national evaluation of U.S. and Canadian acid rain models.

Frontal Boundary Study (FBS)
In the last field study of the U.S. Department of Energy's Processing of Emissions by Clouds and Precipitation program, the G-1 collected air quality data in 1989 to chemically characterize the air flowing into frontal storms.

Navajo Generating Station Visibility Study (NGS)
The G-1 collected air quality, aerosol, and tracer data to assess the effects of the emissions from a power-generating station on visibility in the Grand Canyon in 1991.

Kuwait Oil-Fires Plume Study
Researchers used the G-1's aerosol and chemical sensors to measure the chemical and physical characteristics of smoke plumes from

the Kuwait oil fires in 1991.

North Atlantic Regional Experiment (NARE)

Scientists tested new measurement capabilities, studied the horizontal and vertical distribution of pollutants in a maritime environment, and characterized aerosol and cloud microphysical properties for the Department of Energy in 1992 and 1993.

Airborne Multisensor Pod System

The G-1 served as a test and development platform for the Air Concentrator Ion Trap Mass Spectrometer and the Real-Time Airborne Radionuclide Analyzer and Collector prior to their deployment in a pod for another aircraft in 1994.

Southern Oxidant Study Nashville/Middle Tennessee Valley Field Study (SOS)

Researchers from several DOE laboratories used the G-1 to measure the vertical and regional distribution of ozone and its precursors to quantify the contribution of urban emissions to ozone production in 1995. The Nashville area was revisited in 1999 but G-1 engine problems curtailed this study.

DOE Atmospheric Chemistry Program - Northeast Field Study (NARSTO-NE)

Scientists used the G-1 to test new chemical and aerosol instrumentation and measure distributions of ozone and its precursors in the growing boundary layer in the ozone transport region of the northeastern United States in 1995 and 1996.

DOE Atmospheric Radiation Measurements Program (ARM-IOP)

The G-1 was part of a multi-aircraft operation to support two cloud and aerosol intensive observation periods. Measurements of aerosol and cloud microphysics, radiative fluxes, and state parameters were made over the Southern Great Plains Cloud and Radiation Testbed site in Oklahoma in 1997.

Phoenix Air Quality Studies

DOE laboratory scientists used the G-1 to study the role of boundary layer mixing processes in the formation and processing of ozone in the drier environment of the Phoenix, AZ area in 1998 and 2001.

Instrumentation Test Experiment (ITEX)

DOE laboratory and Battelle researchers flight tested a new Atmospheric Pressure Inlet Mass Spectrometer and the new Argonne National Laboratory gas chromatograph with chemiluminescence detection system for PAN and NO2 measurement during nighttime flights in the Portland, OR area in 1998.

Northeast Oxidant and Particulate Study (NE-OPS)

Scientists from DOE laboratories, in collaboration with university scientists investigated the relationship between ozone, its precursors and particles in the area around Philadelphia, PA in 1999.

Texas Air Quality Study (TXAQS)

DOE laboratory scientists used the G-1 to investigate the relationship between ozone and major sources of its precursors in the Houston, TX area as part of a large consortium of federal laboratories, state agencies, and universities in 2000.

Central California Ozone Study (CCOS)

DOE laboratory scientists based the G-1at Fresno, CA for flights over the Central Valley and over the Pacific Ocean in a study designed to obtain a database suitable for grid-based photochemical modeling of effects of emissions on ozone concentrations in 2000.

Pacific Northwest 2001 Air Quality Study (PNW)

In this EPA/DOE funded investigation, DOE scientists examined the distribution of ozone, organic vapors, and particles in the Puget Sound basin using a new Proton Transfer Reaction Mass Spectrometer for trace organic gases in 2001.

Aerodyne Aerosol Mass Spectrometer (NEAQS)

A new aerosol inlet was developed for use with the new Aerodyne aerosol mass spectrometer as part of a DOE/SBIR project. The inlet

and mass spectrometer were test flown in 2002.

Northeast Aerosol and Oxidant Study (NEAQS)
DOE laboratory scientists study the in-flow of pollutants into the New England area in 2002. The results will be used in the planning of a future multi-agency study in this area in 2004.

Nighttime Aerosol and Oxidant Study (NEAQS)
DOE laboratory scientists used constant altitude balloons to follow the Boston pollution plume and trace the changes in aerosol, ozone, other trace gases, and particles at night in 2002.

Chemical Processing of Terpene Emissions from Forests - Isoprene Fast Response Instrument Tests (CTEF-I)
Argonne National Laboratory scientists tested a new fast-response sensor for measuring isoprene concentration and aircraft eddy accumulation systems for measuring isoprene vertical fluxes from natural sources in the summer of 2003.

Northeast Aerosol Experiment (NEAX)
DOE laboratory scientists measured aerosol concentrations and chemical properties in western Pennsylvania as part of a larger multi-agency field study of air quality in the northeastern United States in 2004.

Potential Future Campaigns

Marine Stratus Radiation Aerosol and Drizzle (MASRAD)
A joint DOE Atmospheric Radiation Program and DOE Atmospheric Science Program study of the optical properties of aerosols and marine stratus clouds off the coast of California to be conducted in 2005.

Megacity Aerosol Life Cycles (Mexico City)
A multi-agency study of the chemical and physical life cycles of aerosols released from a megacity (Mexico City) to be conducted in 2006.

Texas Air Quality Study (TXAQS)
A multi-agency study in which DOE scientists study the formation of secondary aerosol and the chemical and physical transformations of aerosols downwind of major sources to be conducted in 2006.

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