P1.2 GLOBAL TROPOSPHERIC EXPERIMENT: TROPOSPHERIC CHEMISTRY DATA SPANNING 18 YEARS AVAILABLE FROM THE NASA LANGLEY ATMOSPHERIC SCIENCES DATA CENTER.

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The NASA Global Tropospheric Experiment (GTE) was initiated in the early 1980's and consists of an ongoing series of global airborne measurement campaigns to study the influence of humans and the natural environment on the global troposphere. Figure 1 is a map showing the geographical regions for the GTE campaigns.

The Chemical Instrumentation Test and Evaluation [CITE-1, -2 and –3] campaigns were initiated to evaluate our ability to measure critical tropospheric species. The field studies known as Atmospheric Boundary Layer Experiments (ABLE -1, -2A and -2B, and -3A and -3B) were conducted to study ecosystems that are known to exert major influences on global chemistry and, in some cases, are undergoing profound changes. The impact of long range transport of continental emissions, natural and anthropogenic, has been studied through the field campaigns TRAnsport and Chemistry near the Equator in the Atlantic (TRACE A), the Pacific Exploratory Missions in the Pacific (PEM West-A and –B and PEM-Tropics A and B), and the recent TRAnsport and Chemical Evolution over the Pacific (TRACE P).

CITE 1 focused on the evaluation of instrumentation for measuring carbon monoxide, nitric oxide, and the hydroxyl radical. CITE-1 consisted of a ground-based campaign at Wallops Island, VA (Gregory, et al., 1985) in the summer 1983; and airborne campaigns in the fall 1983 and spring 1984 (Beck, et al., 1987). The CITE-2 mission (August 1986) focused on intercomparison of techniques for measuring nitrogen dioxide, nitric acid and peroxyacetylnitrate (PAN), as well as a re-evaluation of nitric oxide techniques (Hoell et al., 1990). The CITE-3 mission (July 1989) focused on intercomparison of techniques to measure sulfur dioxide, dimethylsulfide, hydrogen sulfide, carbonyl sulfide, and carbon disulfide (Hoell, et al. 1993).

The ABLE-1 mission (June 1984), focused on studying the chemistry and transport processes over the tropical Atlantic Ocean and the rain forest of French Guyana (Gregory, et al., 1986). The ABLE-2 mission focused on the chemistry and transport over the Amazon Rain Forest during the dry season of 1985 (ABLE-2A) (Harriss, et al., 1988) and during the wet season of 1987 (ABLE-2B) (Harriss, et al., 1990). The ABLE-3 mission also conducted in two phases (July-August 1988 and July-August 1990) focused on the chemistry in the northern latitudes and the Arctic tundra as a source/sink of methane, ozone, and carbon monoxide (Harriss, et al., 1992 and 1994).

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A major focus of the GTE campaigns beginning in the early 1990's has been the characterization of the impact of long-range transport and photochemistry with particular emphasis on the impact of the growing emissions from the Asian continent.

The TRACE A experiment (September-October 1992) was focused on determining the relative importance of natural versus anthropogenic emission processes on the formation of seasonal enhancements in tropospheric ozone over a large region of the South Atlantic Ocean between the coasts of Brazil and southern Africa (Fishman, et al. 1996).

The PEM-West A and B campaigns, in the north western Pacific, focused on characterizing the impact of the natural and anthropogenic emissions from the Asian continent on the chemistry of the troposphere over the north western Pacific ocean. The PEM-West A, was conducted during September and October (1991), a period of minimum out-flow from the Asian continent (Hoell, et al. 1996). PEM-West B was conducted during February and March (1994), a period of maximum outflow from the Asian continent (Hoell, et al. 1997).

The central objective of the PEM-Tropics campaigns was to improve our knowledge of the factors controlling ozone, OH, aerosols, and related species over the tropical Pacific. PEM-Tropics A (September-October 1996) was conducted during the dry season of the southern tropical Pacific region (Hoell et al., 1996), while PEM-Tropics B (March-April 1999) was conducted during the wet season (Raper et al., in press).

The more recent TRACE P campaign (March-April 2001) was a more focused study of the Asian outflow than the earlier PEM-West A and B campaigns (Jacob, et al.). TRACE P involved coordinated flights between the instrumented NASA DC-8 and P-3B aircraft, and collaboration with the ACE-Asia campaign (http://saga.pmel.noaa.gov/aceasia /index.html).

The data from the GTE campaigns typically contain measurements of ozone, carbon monoxide, nitrogen oxides, non-methane hydrocarbons, aerosol size and chemical composition, and ancillary meteorological parameters. The archives from the more recent PEM Tropics A and B and TRACE P campaigns also contain measurements of the hydroxyl radical, along with a more extensive suite of hydrocarbon and halocarbon measurements.

The archived data from all the GTE campaigns are available through the Atmospheric Sciences Data Center, (http://eosweb.larc.nasa.gov) at NASA's Langley Research Center. Examples of the data in each archive will be presented and CD-ROMS of selected data sets will be available. An Immersa Desk will also be available for 3D visualization of data from the TRACE P and PEM West A and B archives.

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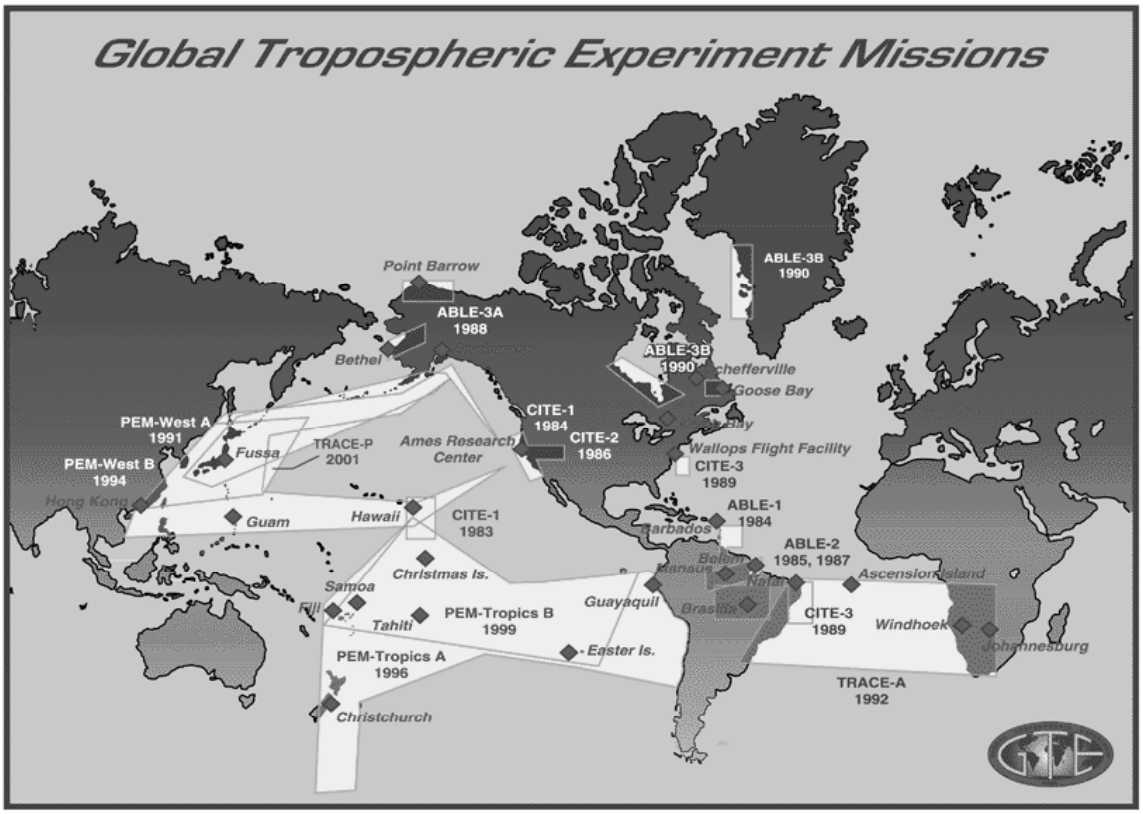

Figure 1. Study areas of GTE field campaigns.