ARCTAS Mission Summary
April-July 2008

NASA is conducting a major science field campaign in 2008 to study the atmosphere in the Arctic and the high northern latitudes. Arctic Research of the Composition of the Troposphere from Aircraft and Satellites (ARCTAS) is being conducted as part of the International Polar Year (IPY), a major international scientific research effort. The purpose of the ARCTAS mission is to improve understanding of how the composition of the Arctic atmosphere is influenced by long-range transport of pollution from lower latitudes as well as local emissions from boreal wildfires and their impact on Arctic air quality and climate. Validation of NASA satellites which continuously monitor the global atmosphere will also be a major focus in this mission.

NASA is deploying three research aircraft, along with ground stations, weather balloons, and modeling and forecast teams to collect science data in two campaign phases. Many of the scientific instruments on the NASA aircraft are one-of-a-kind and are built to measure the properties and amounts of specific atmospheric constituents including greenhouse gases, pollutant gases, and particulate matter, or aerosols.

The first phase of ARCTAS will be based in Fairbanks and Barrow, Alaska with some flights to Thule, Greenland in April and will focus on thick aerosol layers known as “arctic haze” The second phase will follow in July based from Cold Lake, Alberta and the Northwest Territories focusing on the emissions from large boreal forest fires in northwest Canada. The NASA research aircraft involved in the ARCTAS mission are the DC-8, P-3B, and B-200, all of which will be carrying over 35 scientific instruments to measure a wide variety of atmospheric constituents. Approximately 125 scientists, aircraft crew, and support personnel will be working in the field during this effort.

Wallops Flight Facility P-3B
Flies from the surface to 20,000 ft
9 research instruments on board

Langley Research Center B-200
Flies at 25,000 ft
2 research instruments on board.

Dryden Flight Research Center DC-8
Flies from the surface to 40,000 ft.
22 research instruments on board

ARCTAS is sponsored by the NASA Headquarters Tropospheric Chemistry and the Radiation Science Programs and includes participants from over 6 NASA centers, 14 universities, and 8 private research firms. The International Arctic Research Center (IARC), the Geophysical Institute (GI) and the University of Alaska are local key players providing valuable support. Aircraft from the Department of Energy (DOE) and the National Oceanic and Atmospheric Administration (NOAA) will also be conducting airborne atmospheric research in Fairbanks during the Spring ARCTAS deployment. All of these aircraft will be collaborating in support of the larger international project known as the Polar Study using Aircraft, Remote Sensing, Surface Measurements and Models, of Climate, Chemistry, Aerosols, and Transport (POLARCAT), which is focused on characterizing the Arctic atmosphere in support of the International Polar Year.

Additional details can be found on the ARCTAS mission web site at http://www.espo.nasa.gov/arctas, the NASA IPY web site at http://www.nasa.gov/ipy, and the POLARCAT web site at http://www.polarcat.no/polarcat