FRAPPÉ
FRONT RANGE AIR POLLUTION & PHOTOCHEMISTRY EXPERIMENT

Air Quality Study :: 16 July - 16 August 2014
Two major field campaigns - FRAPPÉ and DISCOVER-AQ - will merge to study air quality this summer in the Colorado Northern Front Range Metropolitan Area (NFRMA).

The Front Range frequently experiences elevated summertime ozone levels which exceed the national health standards and can have adverse effects on human health and the environment. The two campaigns will characterize the diverse pollution sources in this area, including emissions from transportation, power generation, oil and gas extraction, agriculture, natural vegetation, and wildfires, as well as characterize the regional inflow and outflow of pollution, and how air circulation patterns over the complex mountain terrain move pollutants around.

Collaborative Research
FRAPPÉ and DISCOVER-AQ will work closely through a series of collaborated research flights.

DISCOVER-AQ flights will entail repetitive profiling of pollution above air quality monitoring sites across the NFRMA. This will lead to better information for satellites that face challenges in distinguishing between pollution in the atmosphere and surface-level pollution sources.

FRAPPÉ flights will fly more broadly to sample specific emission sources across the NFRMA, characterize mountain-driven recirculation effects, as well as fly upwind and downwind to distinguish local pollutants versus those transported from regions outside of Colorado. All flights will be tightly coordinated with ground observations integrated into the air quality monitoring network operated by the State of Colorado to provide more continuous monitoring of air quality and its controlling factors.

Learn more about FRAPPÉ: www.eol.ucar.edu/frappe/eo
Learn more about DISCOVER AQ: http://discover-aq.larc.nasa.gov/
Research Aircraft
The NSF/NCAR C-130 and NASA’s P-3B and King Air are flying laboratories fully-equipped with scientists, inlets, air sampling instrumentation, and remote sensors. These research platforms will be flying at altitudes from about 1000-28,000 feet.

Front Range Ground Sites
Many instruments at the ground sites will operate 24/7 and provide data during the flights as well as when the aircraft are on the ground. In addition to sampling at ground level, soundings will be taken from the BAO research tower, a tethered balloon, upward-looking lidars, and other remote sensors distributed across the NFRMA. Several mobile labs will add flexibility to the ground observations providing information when and where it is most valuable.

Community Benefits
The multi-perspective sampling will provide the most comprehensive characterization of air quality ever conducted in our region. The resulting data will be used to test and improve computer model predictions of current and future air quality as well as contribute to improving current and next-generation satellite capabilities for the interpretation of surface air quality. These tools will further enhance our capabilities to determine the factors controlling air quality and develop effective and informed mitigation strategies.