

5 March, 2010

Global Monitoring Division Hot Items

Third Pole-to-Pole Airborne Greenhouse Gas Study

Global Monitoring Division - ESRL-GMD

This story entered on 5th Mar, 2010 09:26:58 AM PST

Integration of instruments onto the NCAR high altitude GV (HIAPER) research aircraft has begun in preparation for the third HIAPER Pole-to-Pole Observations of Greenhouse Gases (HIPPO/3) mission, March 22-April 15, 2010. The HIPPO program studies seasonal vertical and hemispheric distributions of greenhouse gases and black carbon on pole to pole transects. NOAA/ESRL has five instruments on the aircraft: a fast response ozone monitor, a black carbon aerosol detector, two gas chromatographs and a whole air sampler. The 48,600 km flight path begins in Colorado with stops in Alaska, Hawaii, American Samoa (or Cook Islands depending on weather); New Zealand, and then in reverse. The GV will fly as close as possible to the North and South Poles (fuel and weather dependent) and will conduct vertical profiles over NOAA/ESRL Atmospheric Baseline Observatories at Pt. Barrow, AK; Mauna Loa, HI; and Cape Matatula, AS.

Background: This is the third of five similar missions, each flown in a different season over the three year project funded by NSF and NOAA (previous seasons include winter and fall 2009). During the HIPPO/2 flights (Oct-Nov 2009), NOAA/ESRL scientists collected 460 discrete flask samples of air for later analysis, 300,000 water vapor and ozone measurements, well over 1 million mass mixing ratios (ng/kg) and counts of black carbon, and 40,000 in situ measurements of non-CO₂ greenhouse gases. The mission includes scientists from Harvard and Princeton Universities, Scripps Institute of Oceanography, National Center for Atmospheric Research (NCAR), CIRES (University of Colorado), and NOAA/ESRL. The Principal Investigator of HIPPO is Professor Steven C. Wofsy of Harvard.

Significance: This program will, for the third time, provide unprecedented seasonal pole-to-pole snapshots of greenhouse and ozone depleting gases in the troposphere, data that will permit climate modelers to verify models and improve model projections of future climate change. Climate is one of NOAA's four main goals.

More information: http://www.eol.ucar.edu/deployment/field-deployments/field-projects/hippo_global_3/hippo

Contact information

Name: James W Elkins

Tel: (303) 497-6224

James.W.Elkins@noaa.gov



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