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Global Monitoring Division Hot Items

## Fourth Pole-to-Pole Airborne Study of Greenhouse Gases and Black Carbon

**Global Monitoring Division - ESRL-GMD**

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**Introduction:** The fourth month-long HIAPER Pole-to-Pole Observations of Greenhouse Gases and Black Carbon (HIPPO/4) aircraft survey will take place from 14 June to 15 July utilizing 12 flights to cover a total distance of 52,450 km on NCAR's HIAPER or GV manned aircraft. Test flights were successfully completed on 7 June and 9 June. The purpose of HIPPO/4 survey is to examine air for trace gases and black carbon over the Central Pacific on the way down with one important exception from the other HIPPO aircraft surveys, the return flight from Antarctic will examine air over the Western Pacific flying over Australia to Darwin to Saipan to Midway and then Anchorage, Alaska.

**Background:** Previous HIPPO airborne surveys have occurred in January 2009 (HIPPO/1) with emphasis on Northern Hemispheric (NH) winter/Southern Hemispheric (SH) summer; November 2009 (HIPPO/2) in late NH fall/SH spring; and April 2010 (HIPPO/3) in early NH spring/SH fall. HIPPO/4 will examine the important early NH summer during the mid-latitude growing season and the start of the SH winter. The final survey, HIPPO/5, will follow in mid-August to mid-September of 2011. This will continue one of the most comprehensive airborne studies of atmospheric trace gases and black carbon measured during all seasons that involved in climate change, stratospheric ozone depletion, and air quality. Each HIPPO survey provides over 120 vertical profiles of atmospheric trace gases and black carbon in the troposphere. The US National Science Foundation and NOAA support the airborne surveys, with participating scientists from NOAA/ESRL, NCAR, Scripps, Univ. of Miami, Princeton, and Harvard University. Prof. Steven C. Wofsy of Harvard is the principal scientist of the HIPPO surveys.

**Significance:** Global climate models need upper tropospheric data to validate their models and support their predictions of future climate change. Seasonal information has been lacking in the past. One of NOAA's four major goals is Climate and the work described here is in support in the Atmospheric Composition and Climate program of NOAA. Ground based and vertical profiles of trace gases measured from the NOAA ESRL baseline observatories will be used for ground truth of the airborne measurements. This series of airborne surveys bridges the gap between NOAA's satellite and ground-based measurements of trace gases and black carbon.

**More information:** <http://hippo.ucar.edu/>

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