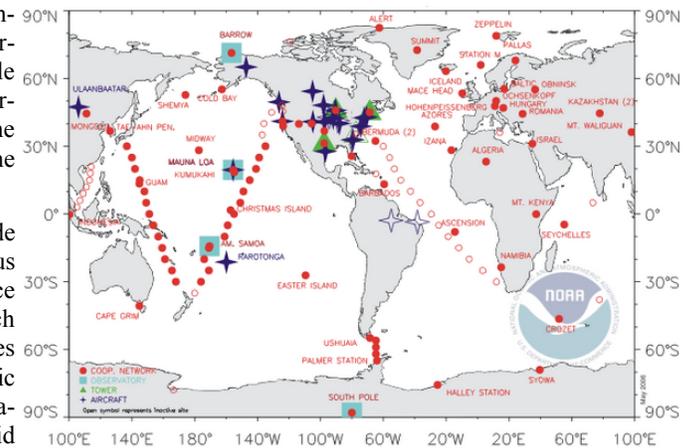


The Aircraft Air Sampling Network Newsletter from the Carbon Cycle Greenhouse Gases (CCGG) Group

Greetings, Pilots! Thank you for your diligent work in collecting air samples for us. With the help of people like you all over the world, the Carbon Cycle Greenhouse Gases (CCGG) group has been making air sample measurements from land and sea surface sites since 1967, and from aircraft beginning in 1992. Continuous measurements of gases affecting the carbon cycle have been made at remote baseline observatories since the 1970s and from tall towers since 1992.

Samples are analyzed in Boulder, Colorado, by CCGG for carbon dioxide (CO₂), methane (CH₄), carbon monoxide (CO), hydrogen (H₂), nitrous oxide (N₂O), sulfur hexafluoride (SF₆) and hydrocarbons and other trace species. In addition, the Institute of Arctic and Alpine Research (INSTAAR) at the University of Colorado-Boulder analyzes the samples for the stable isotopes of CO₂ and CH₄, ¹⁴CO₂ and for volatile organic compounds (VOCs). Results are used to identify long-term trends, seasonal variability, and spatial distribution of carbon cycle gases and to aid in our understanding of the global carbon cycle.



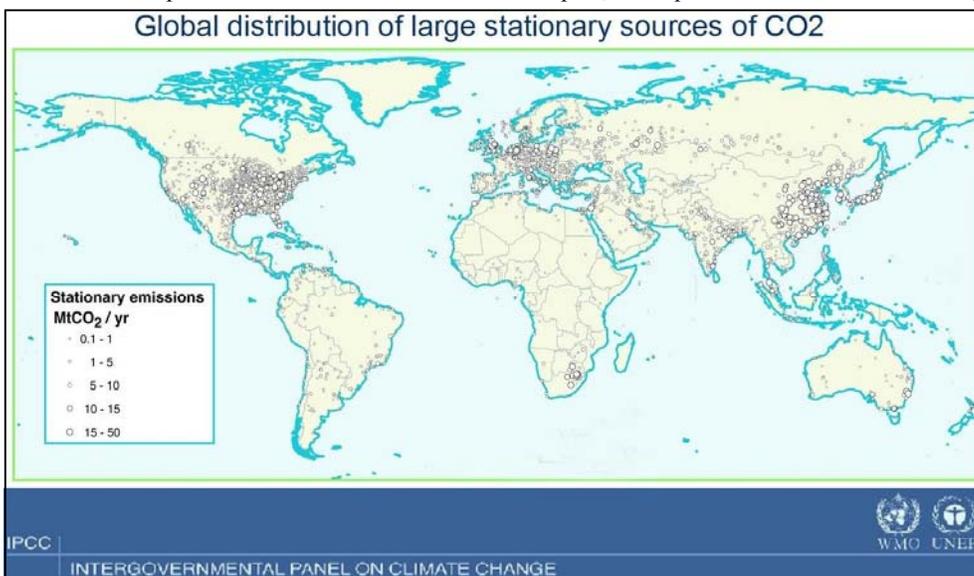
CCGG Sampling Locations

Intergovernmental Panel on Climate Change Wins Nobel Peace Prize!

Along with former U.S. Vice President Al Gore, the United Nations Intergovernmental Panel on Climate Change (IPCC) was awarded the 2007 Nobel Peace Prize. The IPCC, established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environmental Programme (UNEP), is policy-neutral and does not conduct research on its own. The core objective of the IPCC is to assess scientific, technical and socio-economic information relevant to the understanding of climate change. The IPCC just finalized its Fourth Assessment Report, "Climate Change 2007", with previous reports having been published in 1990, 1995 and 2001. The IPCC consists of three working groups that provide a comprehensive and up-to-date assessment of the current state of knowledge on climate change. In February of this year, Working Group 1 released its report, "The Physical Science Basis." This was followed by Group 2's release of "Impacts, Adaptation and Vulnerability" in April, and a May release by Group 3 of "Mitigation of Climate Change." The "Synthesis Report" was just released in November. Among other things, the report concludes that understanding of warming and cooling influences on climate has improved since the Third Assessment Report; the report's authors now have "very high confidence" that warming since 1750

has been significantly influenced by human activities, especially from increased greenhouse gas concentrations in the past 50 years.

Data collection by the CCGG air sampling network is extremely valuable for reports like the IPCC's "Climate Change 2007." This long-term record of numerous species enables researchers to track atmospheric changes, which can help in making predictions about future climate change. To obtain further IPCC information and summaries, go to <http://www.ipcc.ch/>. In particular, the "Summary for Policymakers" is recommended as an overview of the report's conclusions.



If you have Internet access & are interested in learning more about GMD's projects, you may check these links:

GMD home page: www.esrl.noaa.gov/gmd

CCGG home page: www.esrl.noaa.gov/gmd/ccgg

Aircraft Air Sampling Network home page: www.esrl.noaa.gov/gmd/ccgg/aircraft.html

Interactive Data Visualization home page: www.esrl.noaa.gov/gmd/ccgg/iadv

Shipping Address:

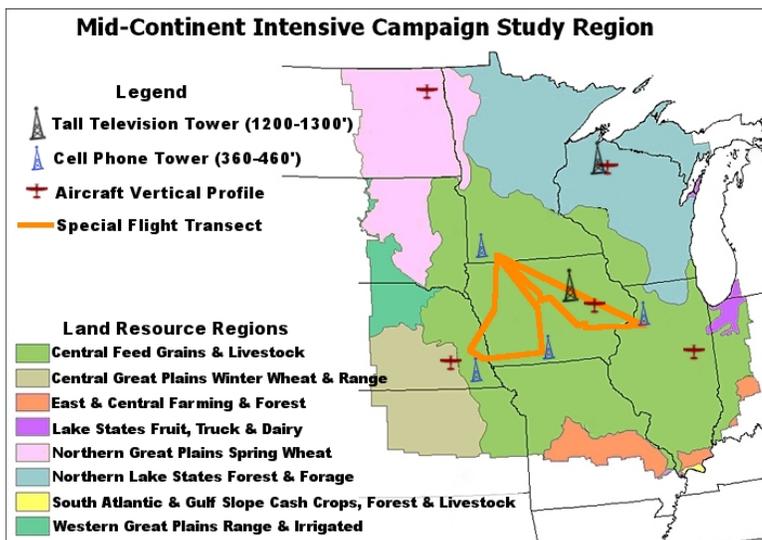
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Mid-Continent Intensive (MCI) Field Campaign



During May, June and July CCGG participated in the Mid-Continent Intensive (MCI) Field Campaign. The MCI is an ongoing, multi-agency study to improve understanding of carbon flux, the amount of carbon that flows into and out of land surfaces and the atmosphere. Various approaches are used to quantify whether a region is a net source or sink of carbon (i.e. whether a land area gives off or takes up more carbon over the course of a year), and one of the main goals of the MCI is to compare and improve these approaches. In addition, the study will help improve understanding of how agriculture compares to other land use types in terms of being a net source or sink. The large agricultural coverage, as well as significant forest cover in the northern and southern portions of the MCI region, which includes Iowa and portions of surrounding states, make the area practical for such a campaign. Additionally, the relatively flat topography limits some of the potential variables in such a study, making data interpretation easier. As part of the MCI, CCGG requested extra sample-

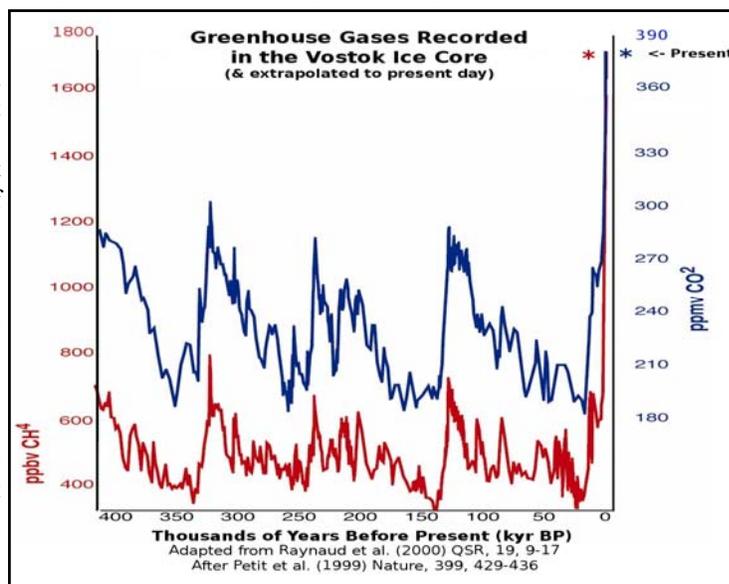
collection flights from its Midwest pilots in Iowa, Nebraska, Wisconsin and North Dakota during the campaign. These results will be combined with atmospheric measurements made from towers around the region to facilitate various computer models that are used to evaluate carbon fluxes.

Funding for the MCI was provided by a variety of sources including the National Aeronautics & Space Administration (NASA), National Oceanic & Atmospheric Administration (NOAA), Department of Energy (DOE), National Science Foundation (NSF), United States Department of Agriculture (USDA), Argonne National Laboratory, and Lawrence Berkeley Laboratory.

Data Analysis and Results

Global CO₂ Trends: Ice cores collected from Antarctica and Greenland contain information that can be used to reconstruct past climates. As snow accumulates on ice caps and ice sheets where temperatures usually remain below freezing year round, it lays down a record of the environmental conditions at the time of its formation. Over time, as the snow is buried under further accumulations, it is compacted to ice, preserving the climatic information. Air bubbles trapped in the ice can be analyzed to reconstruct the atmospheric composition at the time when the ice formed.

Measurements of the amount of greenhouse gases in these bubbles show that the "pre-industrial" amount of CO₂ in the atmosphere was about 280 parts per million (ppm), approximately 100 ppm below today's value. CO₂ amounts have increased about 35% in the last 200 years, and mixing ratios are now higher than any seen in at least the past 650,000 years.



Individual Site Data Plot: With this newsletter, we are including a plot with data from the air samples collected at your site, including data from the start of sampling flights through the present. The black diamonds represent the date and altitude of samples while the colors represent the concentrations of CO₂ in parts per million (ppm), with CO₂ values being interpolated between sampling altitudes. Depending on your location, you may be able to see seasonal trends with higher CO₂ levels in winter and lower levels of CO₂ during the summer when vegetation is using more of the available CO₂ for photosynthesis. If your site has a longer historical record, you may be able to see a general increase of CO₂ in more recent years.

Please help us by including the following on all your invoices:

- Date of flight
- Flight hours
- Tail number
- Name(s) of pilot(s)
- If samples couldn't be collected (equipment failure or similar).