

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

Greetings to samplers and network affiliates! Thank you for your diligent work in collecting air samples over the last year. We would like to welcome the newest members of the global network: Arembepé, Brazil; Lampedusa, Italy; Lulin, Taiwan; and Hohenpeissenberg, Germany. In the coming year we hope to start up sites in Mexico and Russia. With this newsletter we are including a plot showing carbon dioxide

(CO₂) data from the air samples collected at your site and a red line showing the CO₂ global average. This global average is calculated from approximately 30 background sites in our network. Many sites' data will vary from this average because of the terrestrial biosphere's seasonal cycle and stronger continental influence. We include the global average to allow for comparison of the general trend in CO₂ concentration at your site with that of the world on average.

CarbonTracker

CarbonTracker is a new scientific-based tool developed in the Carbon Cycle Greenhouse Gases group at NOAA ESRL to better understand the global carbon cycle and to support carbon management policies. CarbonTracker is a system which calculates carbon dioxide uptake and release at the Earth's surface over time, estimating the carbon dioxide exchange from an atmospheric point-of-view. Since CO₂ mole fractions in the atmosphere reflect the sum of all the CO₂ exchange at the surface, they form the ultimate record of the combined human and natural influence on CO₂ levels. Together with long-term monitoring of atmospheric CO₂, CarbonTracker will help improve our understanding of how carbon uptake and release from land ecosystems and oceans are responding to a changing climate; increasing levels of atmospheric CO₂ (the CO₂ fertilization effect); and other environmental changes, including human management of land and oceans. The open access to all CarbonTracker results means that anyone can scrutinize our work, sug-

gest improvements, and benefit from our efforts. This will accelerate the development of a tool which can monitor, diagnose, and possibly predict the behavior of the global carbon cycle and the climate that is so intricately connected to it. This program is the result of an ongoing international and multi-agency collaboration; to be improved, it will require local and global commitments to maintain and expand atmospheric CO₂ measurements and to pursue efforts in the modeling of the weather and climate systems. Figures 1 and 2 below show the spatial distribution of carbon sinks (left) and sources (right). CO₂ measurements from the CCGG Cooperative Global Air Sampling Network are an essential component in CarbonTracker. Without these weekly samples from around the world, models would not be validated by real data over time.

Website: <http://www.esrl.noaa.gov/gmd/ccgg/carbontracker/>

Figure 1: The long-term mean biological uptake

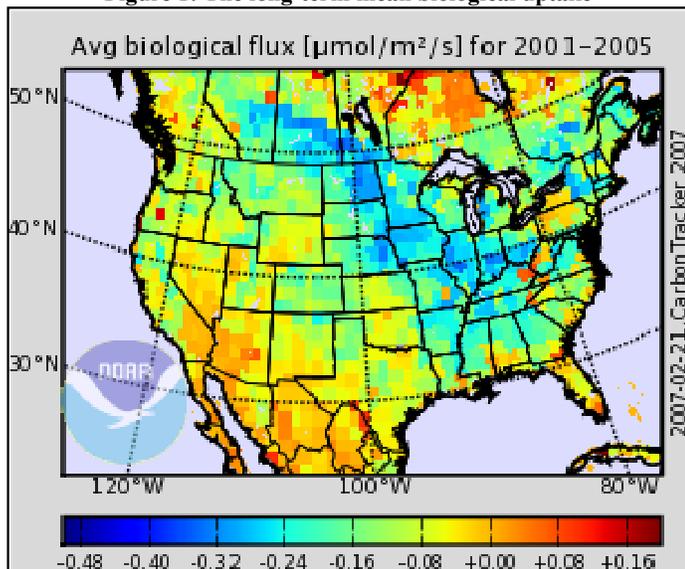
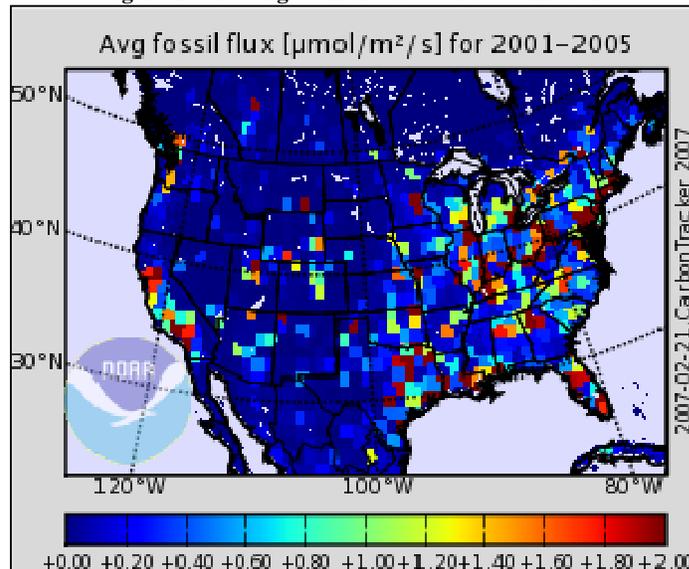


Figure 2: The long-term mean fossil fuel emissions



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

[GMD home page: www.esrl.noaa.gov/gmd](http://www.esrl.noaa.gov/gmd)

[CCGG home page: www.esrl.noaa.gov/gmd/ccgg](http://www.esrl.noaa.gov/gmd/ccgg)

[Cooperative Air Sampling Network home page: www.esrl.noaa.gov/gmd/ccgg/flask.html](http://www.esrl.noaa.gov/gmd/ccgg/flask.html)

[Interactive Data Visualization home page: www.esrl.noaa.gov/gmd/ccgg/iadv](http://www.esrl.noaa.gov/gmd/ccgg/iadv) (unavailable at time of printing)

Sampling Tips

NEW! We have added sampling-related instructions to our website. To find links for topics such as proper sample collection, changing the battery in a sampler, and more, go to: www.esrl.noaa.gov/gmd/ccgg/psu/index.html

NEW! In the next few months, we will begin shipping flasks that are *not* consecutively numbered to all the sites. Please collect samples as usual even though flasks may no longer be numerically paired

NEW! When recording the sample time, note the flask filling *end* time. Please add a note in the remarks field the first time you do this.

When recording information on a sample sheet, please remember to:

- Fill out the sample sheet completely.
- Mark the appropriate units for time and wind speed.
- Double check that you have recorded the correct flask numbers.
- Return the correct sample sheet with the corresponding flasks.

FLASK #	2501-99
FLASK #	13-99
DAY	05
MONTH	04
YEAR	2012
HOUR	11
MINUTE	32
WIND SPEED	15.1
WIND DIRECTION	225

UNIVERSAL TIME (UTC)
 LOCAL STANDARD TIME (LST)
 DAYLIGHT SAVINGS TIME (DST)

m/s
 KNOTS
 MPH

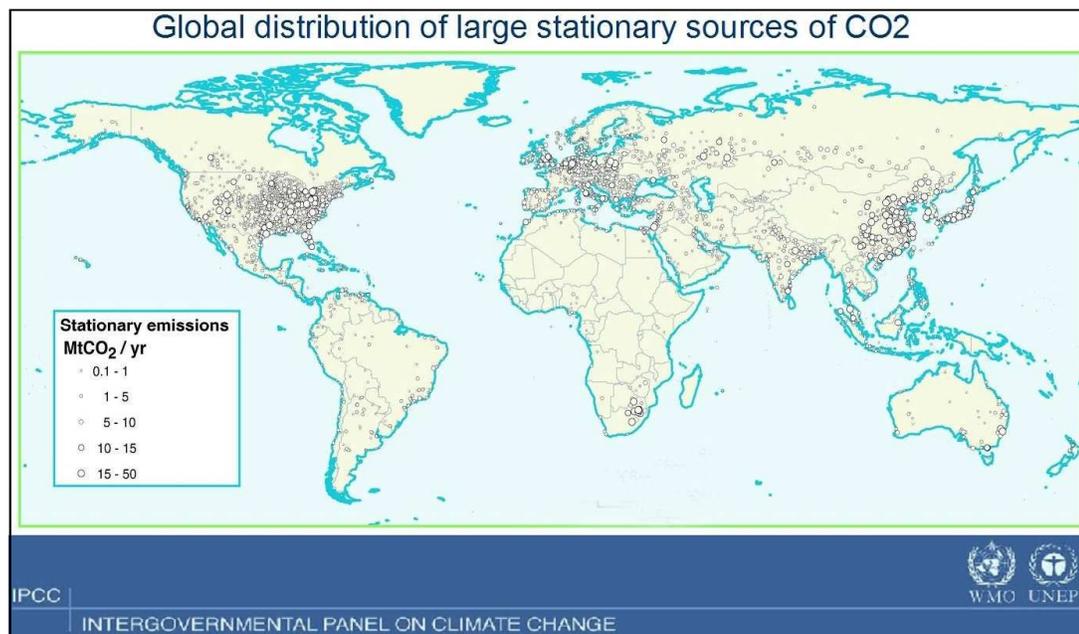
(DEG)

Intergovernmental Panel on Climate Change

The United Nations Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environmental Programme (UNEP). The IPCC is policy-neutral and does not conduct research on its own; rather, its core objective is to assess scientific, technical and socio-economic information relevant to the understanding of climate change. The IPCC has published three *Assessment Reports* (1990, 1995 and 2001) and is currently finalizing the *Fourth Assessment Report*, "Climate Change 2007". 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." Among other things, this report concluded 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. Group 2 released "Impacts, Adaptation and Vulnerability" in April; and Group 3 released "Mitigation of Climate Change" in early May. The "Synthesis Report" is scheduled to be released in November 2007.

Data collected in 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 please go to <http://www.ipcc.ch/>.

Figure 3. Spatial distribution of CO₂ emissions across the Earth. It is easy to locate large cities and thriving countries. Most fossil fuel consumption occurs in the United States, Europe, Japan and China.



Spotlight

NOAA has awarded its Environmental Hero Award to one of the CCGG group's sample collectors! Oskar Jakob Sigurdsson was born in 1937 in the Vestman Islands off the south coast of Iceland. At the age of nine he began assisting his father, who was the weather observer and Storhofdi lighthouse keeper in Vestmannaeyjar, Iceland. In 1952 Oskar began regular weather observations and, when his father died in 1966, Oskar took over the weather observing and lighthouse duties. Weather observations are made every three hours, every day of the year. Oskar has not missed a single one while on duty except when a volcanic eruption occurred in the village in 1973. In 1992 Oskar began collecting air samples for NOAA and has done so weekly ever since. In addition to NOAA, various other U.S., Canadian and Norwegian research groups have benefited from his meticulous work in monitoring the atmosphere (not to mention tagging nearly 85,000 seabirds!) at this wild location in the North Atlantic. Later this year, Oskar will retire, at least from part of his duties. Congratulations and thank you to Oskar! (Thank you to Johanna Thorlacius of the Icelandic Meteorological Office for providing information for this award).

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Thank you sample collectors and network affiliates!