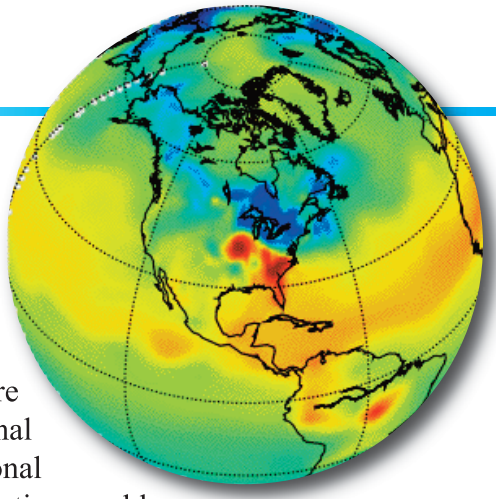
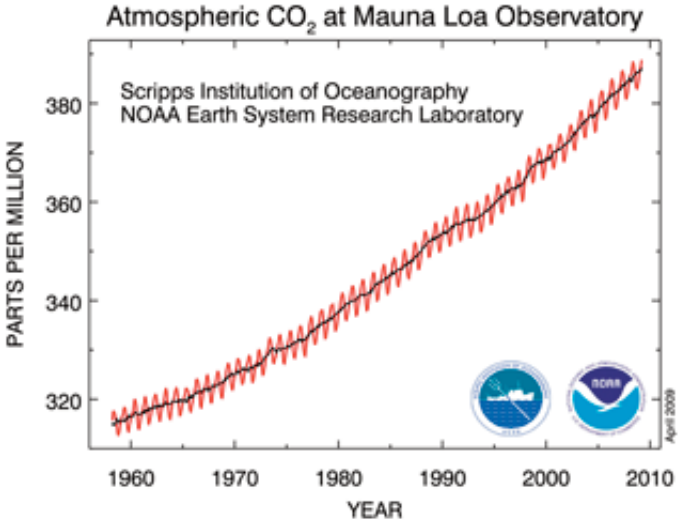
NOAA Knows...

Carbon Monitoring



Continuing the legacy of Dr. Charles D. Keeling in monitoring carbon dioxide, NOAA's Office of Oceanic and Atmospheric Research has a long history in monitoring greenhouse gases. OAR strives to record accurate measurements of greenhouse gases to improve understanding of the global carbon cycle and how greenhouse gases affect global and regional climate and the world's oceans.

1957 The U.S. Weather Bureau provides funding to Charles D. Keeling to begin monitoring carbon dioxide (CO_2) at the South Pole and Mauna Loa Observatory (MLO), Hawaii, as part of the International Geophysical Year. The record continues today under auspices of both NOAA and Scripps Institution of Oceanography.



Referred to as the Keeling Curve, this graph shows the monthly mean atmospheric carbon dioxide at Mauna Loa Observatory, Hawaii.

1958 MLO is now one of NOAA's five baseline observatories and, with more than 60 national and international partners collecting weekly flask samples around the globe, is taking the pulse of the atmosphere. The MLO and South Pole data sets are the first to show the rate at which CO_2 levels in the atmosphere are rising.

1968 Atmospheric measurements begin in 1968 at Niwot Ridge, Colo.; NOAA has monitored CO_2 worldwide since the early 1970s.

1970 NOAA is formed.

1989 The Climate and Global Change Program (C&GCP) office is established to conduct research on global climate change phenomena and reports directly to the NOAA administrator.

1990 The Climate Monitoring and Diagnostics Laboratory is formed from parts of NOAA's Air Resources Laboratory. C&GCP becomes the Office of Global Programs under OAR. Its primary mission is to provide scientific research on climate variability, predictions, and assessments, and to better understand the global climate system.

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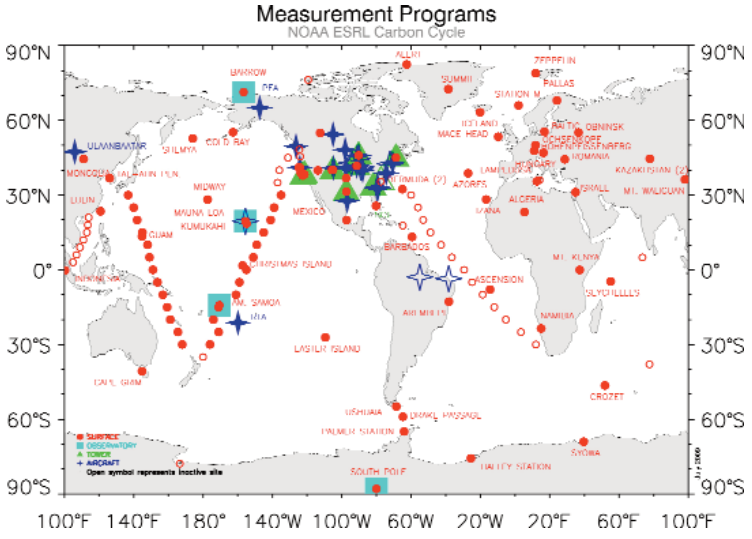

Global map of carbon monitoring sites.

1992 Light aircraft carrying automated flask sampling packages developed by NOAA's Earth System Research Laboratory (ESRL) begin sampling the carbon cycle gases higher in the atmosphere. The aircraft samples provide much-needed regular measurements of the vertical profile of such gases over continental areas. NOAA monitors atmospheric greenhouse gas concentrations to document rates of increase and to estimate the magnitude of sources and sinks from atmospheric concentration patterns. This information will help define policies addressing the human contribution to global climate change.

1992 First tall tower measurements of carbon cycle gas gradients starts near Grifton, N.C.

1995-2003 NOAA's ESRL develops and maintains the world standard references for CO_2 (1995), CO (1999), CH_4 (2003), and N_2O (2003).

1999 Interactive Data Visualization offers easy Web access to data and provides up-to-date plots of greenhouse gas data from NOAA's global carbon network of more than 60 sites.

2000 NOAA begins participating in the North American Carbon Program.

2005 The Climate Monitoring and Diagnostics Laboratory is merged with the radiation branch of Air Resources Laboratory to form the Global Monitoring Division of ESRL. The NOAA Annual Greenhouse Gas Index is introduced to provide a normalized standard that can be easily understood and followed.

2007 Carbon Tracker is launched, providing information on CO_2 distribution, weather, carbon fluxes, and their uncertainties over space and time.

2009 NOAA ESRL collaborates with the U.S. Coast Guard on flights over Alaska to gather the first wide-area, multi-seasonal data on carbon dioxide, methane, carbon monoxide, and other gases in a region where rapid climate change is already occurring.

To learn more, visit these Web sites:

- Global Monitoring Division, Earth System Research Lab: http://www.esrl.noaa.gov/gmd/ccgg/
- Carbon Tracker: http://www.esrl.noaa.gov/gmd/ccgg/carbontracker
- NOAA Web site: http://www.noaa.gov