

NASA Earthdata Network

- Data Discovery
- Data Centers
- Community
- Science Disciplines

 **ORNL DAAC** Distributed Active Archive Center for Biogeochemical Dynamics[About Us](#)[Products](#)[Data](#)[Tools](#)[Help](#)[home](#) [sign in](#)

Metadata

[DAAC Home](#) > [Data](#) > [Field Campaigns](#) > [NACP \(North America\)](#) > Data Set Documentation

NACP Greenhouse Gases Multi-Source Data Compilation, 2000-2009

Get Data

Revision date: February 10, 2014

Summary:

This data set is a collection of measurements of carbon dioxide (CO₂) and non-CO₂ greenhouse gases made across North America by nine independent atmospheric monitoring networks from 2000 - 2009. During this North American Carbon Program (NACP) sponsored activity, data were compiled from the following networks: AGAGE, COBRA, CSIRO, INTEX-A, INTEX B, Irvine Latitude Network, NOAA CMDL, SCRIPPS, and from Stanley Tyler-UC Irvine. The files presented here are the products of merging multiple original measurement results files for selected sites across North America from each monitoring network. See Figure 1. The monitoring networks are described in Table 3. The primary focus of this effort was the compilation of non-CO₂ greenhouse gases over North America, but numerous CO₂ observations are also included.

The data files for each network are accompanied by detailed readme documentation files prepared by the respective network investigators. Project descriptions, objectives, references, sampling and analysis methods, and data file descriptions are included in these READMEs. Table 1 displays the monitoring network sites, sample types, analytes, and links to the detailed network README files. Network- and laboratory-specific data citations are included in the README documentation and should be used to acknowledge the use of these data as appropriate.

Non-CO₂ greenhouse gases (methane (CH₄), carbon monoxide (CO), nitrous oxide (N₂O)) are a major focus for the NACP (Wofsy and Harriss, 2002). Rising levels of CH₄ and N₂O together account for almost half of the radiative forcing due to CO₂; CO is a tracer for CO₂ emitted from mobile sources and biomass fires (e.g. Gerbig et al. 2003; Geels et al., 2004) and CO data help define factors influencing tropospheric ozone (O₃), another key contributor to radiative forcing. This synthesis project brought together data for CH₄, CO, and N₂O generated in the broad range of relevant research programs ongoing in the NACP.

The data files for each monitoring network and each sampling type (continuous or flasks) have been combined into one compressed (*.zip) file along with the detailed README document. There are 17 compressed files that when expanded contain data files which represent one year's data for that specific campaign and sampling method. The number of annual files that were compiled from a network into this collection varies. See Tables 1 and 2.



Figure 1. The data included here are from these selected sites across North America from the identified monitoring networks. It is difficult to capture all of the sites in one image. Please use the source file for this image, NACP_GHG_Data_Compilation_Sites.kml, which is provided as a companion file. Also, the coordinates for each site are provided in the NACP_GHG_Data_Compilation_Sampling_Locations.csv companion file.

Data and Documentation Access:

Get Data: http://daac.ornl.gov/cgi-bin/dsvviewer.pl?ds_id=1206

Supplemental Information:

- Coordinates for each site are provided in the [NACP_GHG_Data_Compilation_Sampling_Locations.csv](#) companion file.
- The interactive file of sampling locations, [NACP_GHG_Data_Compilation_Sites.kml](#), is provided as a companion file.

Data Citation:

Cite this data set as follows:

Wofsy, S.C. and A. Dayalu. 2014. NACP Greenhouse Gases Multi-Source Data Compilation, 2000-2009. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/1206>

Additional citations:

Network- and laboratory-specific citations are included in the detailed README documentation files prepared by the respective network investigators. Please include these citations as appropriate.

Table of Contents:

- [1 Data Set Overview](#)
- [2 Data Description](#)
- [3 Applications and Derivation](#)
- [4 Quality Assessment](#)
- [5 Acquisition Materials and Methods](#)
- [6 Data Access](#)
- [7 References](#)

1. Data Set Overview:

Project: North American Carbon Program (NACP)

The North American Carbon Program (NACP) (Denning et al., 2005; Wofsy and Harriss, 2002) is a multidisciplinary research program to obtain scientific

understanding of North America's carbon sources and sinks and of changes in carbon stocks needed to meet societal concerns and to provide tools for decision makers. Successful execution of the NACP has required an unprecedented level of coordination among observational, experimental, and modeling efforts regarding terrestrial, oceanic, atmospheric, and human components. The project has relied upon a rich and diverse array of existing observational networks, monitoring sites, and experimental field studies in North America and its adjacent oceans. It is supported by a number of different federal agencies through a variety of intramural and extramural funding mechanisms and award instruments.

This data set is a collection of measurements of CO₂ and non-CO₂ greenhouse gases made across North America by nine independent atmospheric monitoring networks from 2000 - 2009. During this NACP sponsored activity, data were compiled from the following networks: AGAGE, COBRA, CSIRO, INTEX-A, INTEX B, Irvine Latitude Network, NOAA CMDL, SCRIPPS, and from Stanley Tyler-UC Irvine. The files presented here are the products of merging multiple original measurement results files for selected sites across North America from each monitoring network.

Table 1. List of monitoring networks, sampling sites, sample types, analytes with years collected, and links to the detailed network README files.

Network	Sites	Sample Type	CO ₂	CO	CH ₄	N ₂ O	Halocarbons	Other Hydrocarbons	Other	Readme
AGAGE	Trinidad Head, CA Ragged Point, Barbados	Ground-based continuous			2000-2009	2000-2009	2000-2009		SF ₆ SO ₂ F ₂ TCE	README_agage.txt
CSIRO	Alert, Canada Mauna Loa, HI Estevan Point, Canada	Ground-based flasks	2000-2001	2000-2001	2000-2001				H ₂ dC13 in CO ₂	README_CSIRO_flasks.txt
Tyler- UCI Flask Data	Montana del Oro State Park, CA Niwot Ridge, CO	Ground-based flasks								README_TYLER_UCI_flasks.txt
Irvine Latitude Network	Network has an approximate latitudinal range of -47 to 71 degrees. Data included are North American sites, Alaska through Baja California, and Hawaii. ***	Ground-based flasks			2000-2001		2000-2001	2000-2001		README_irvinelatnet_flasks.txt
NOAA	Pt. Barrow, AK, Niwot Ridge, CO Mauna Loa, HI	Ground-based flasks	2000-2008	2000-2008	2000-2008	2000-2008	2000-2008		H ₂ dC13 in CO ₂ dC14 in CO ₂ dO18 in CO ₂	README_noaa_flasks.txt
NOAA	Pt. Barrow, AK, Niwot Ridge, CO Mauna Loa, HI	Ground-based continuous	2000-2008		2000-2008	2000-2008	2000-2008	2000-2008	SF ₆	README_noaa_continuous.txt
SCRIPPS	Barrow, AK Mauna Loa, HI Cape Kumukahi, HI La Jolla Pier, CA Alert, NWT, Canada	Ground-based flasks	2000-2001							README_scripps.txt
WMO-EnvCanada	Alert Canada Estevan Point Sable Island	Ground-based flasks	2000-2008	2000-2008	2000-2008					README_wmo_canada_flask.txt
	Alert Canada Candle Lake									

WMO-EnvCanada	East Trout Lake Egbert Canada Fraserdale Sable Island Chibougamou Lake Labiche	Ground-based continuous	2000-2008	2000-2008	2000-2008						README_wmo_canada_continuous.txt
COBRA	Continental US and southern Canada	Aircraft-based flask	2003-2004	2003-2004		2003-2004				d13C CO2 d18O in N2O H2 H2O O2:N2 SF6	README_cobra_2003_flask.txt
COBRA	Continental US and southern Canada	Aircraft-based continuous	2003-2004	2003-2004						H2O	README_cobra_2003.txt and README_cobra_2004.txt
INTEX-A and B	INTEX-A (2004) central and eastern United States; INTEX-B (2006) west coast US, Mexico City, and out in the Pacific region toward Asia.	Aircraft-based flask and continuous	2004-2006	2004-2006	2004-2006		2004-2006	2004-2006		COS H2O H2O2 NO O3 Ca, Cl, K, Mg, Na,NO3, NH4, SO4 Aerosol density and surface area	README_intex-a_dc8_2004_continuous.txt, README_intex-a_dc8_2004_flask.txt, README_intex-b_2006_c130_continuous.txt, README_intex-b_2006_c130_flask.txt, README_intex-b_2006_dc8_continuous.txt, and README_intex-b_2006_dc8_flask.txt

*** Irvine Latitude Network Sites

Kauai, HI Punta Baja, CA Barrow Weather Station (NOAA), AK Bodega Bay, CA WashingtonCreek,Fairbanks, AK Portage Glacier, Anchorage, AK Fort Abercrombie State Park, Kodiak, AK Pololu Valley, HI Yaquina Head Lighthouse Newport, OR Julia Pfeiffer State Beach, CA	San Simeon, CA Todos Santos, CA (23.44,-110.24) Upolu Airport, Big Isle, HI Piedras Blancas, CA Point Reyes Lighthouse, CA Hawaii Cabo San Lucas, MX Cape Blanco Lighthouse, OR La Pinta Hotel Beach, south of San Quentin, CA Ocean Shores, WA	Jalama Beach State Park,CA Ocean City Beach, WA MacKerricher State Park, Fort Bragg, CA Trinidad State Beach, CA Illwaco Beach, WA Point Arena, CA Cape Mendocino, CA Lihue, HI Ragged Point, CA Klamath, CA
---	---	--

2. Data Characteristics:

The data files for a monitoring network and sampling type (continuous or flasks) are combined in one compressed (*.zip) file along with the detailed README document. There are 17 compressed files that when expanded contain data files which represent one year's data for that specific campaign and sampling method. The number of annual files that were compiled from a network into this collection varies.

Table 2. Compressed file names and included network data files.

Network	Compressed File Names	Data File Names	README
AGAGE	agage_continuous.zip	agage_2000_continuous.csv agage_2001_continuous.csv agage_2002_continuous.csv agage_2003_continuous.csv agage_2004_continuous.csv	README_agage.txt

		agage_2005_continuous.csv agage_2006_continuous.csv agage_2007_continuous.csv agage_2008_continuous.csv agage_2009_continuous.csv	
CSIRO	csiro_flasks.zip	csiro_2000_flask.csv csiro_2001_flask.csv	README_CSIRO_flasks.txt
Tyler-UCI Flask Data	tyler_flasks.zip	tyler_flask_2000.csv tyler_flask_2001.csv	README_TYLER_UCI_flasks.txt
Irvine Latitude Network	irvinelatnet_flasks.zip	irvinelatnet_2000_flasks.csv irvinelatnet_2001_flasks.csv irvinelatnet_2002_flasks.csv irvinelatnet_2003_flasks.csv irvinelatnet_2004_flasks.csv irvinelatnet_2005_flasks.csv irvinelatnet_2006_flasks.csv irvinelatnet_2007_flasks.csv irvinelatnet_2008_flasks.csv	README_irvinelatnet_flasks.txt
NOAA	noaa_flasks.zip noaa_continuous.zip	noaa_2000_flasks.csv noaa_2001_flasks.csv noaa_2002_flasks.csv noaa_2003_flasks.csv noaa_2004_flasks.csv noaa_2005_flasks.csv noaa_2006_flasks.csv noaa_2007_flasks.csv noaa_2008_flasks.csv noaa_2000_continuous.csv noaa_2001_continuous.csv noaa_2002_continuous.csv noaa_2003_continuous.csv noaa_2004_continuous.csv noaa_2005_continuous.csv noaa_2006_continuous.csv noaa_2007_continuous.csv noaa_2008_continuous.csv	README_noaa_flasks.txt and README_noaa_continuous.txt
SCRIPPS	scripps_flasks.zip	scripps_2000_flasks.csv scripps_2001_flasks.csv	README_scripps.txt
WMO-EnvCanada	wmo_canada_flasks.zip wmo_canada_continuous.zip	wmo_canada_2000_flasks.csv wmo_canada_2001_flasks.csv wmo_canada_2002_flasks.csv wmo_canada_2003_flasks.csv wmo_canada_2004_flasks.csv wmo_canada_2005_flasks.csv wmo_canada_2006_flasks.csv wmo_canada_2007_flasks.csv wmo_canada_2008_flasks.csv wmo_canada_2000_continuous.csv wmo_canada_2001_continuous.csv wmo_canada_2002_continuous.csv wmo_canada_2003_continuous.csv wmo_canada_2004_continuous.csv wmo_canada_2005_continuous.csv wmo_canada_2006_continuous.csv wmo_canada_2007_continuous.csv wmo_canada_2008_continuous.csv	README_wmo_canada_flask.txt README_wmo_canada_continuous.txt
COBRA	cobra_flasks.zip cobra_continuous.zip	cobra_2003_flasks.csv cobra_2003_continuous.csv cobra_2004_continuous.csv	README_cobra_2003_flask.txt README_cobra_2003.txt README_cobra_2004.txt
	intex-a_dc8_2004_flasks.zip intex-a_dc8_2004_continuous.zip	intex_a_dc8_2004_flasks.csv	README_intex-a_dc8_2004_flask.txt README_intex-

INTEX-A and B	intex-b_2006_c130_flasks.zip	intex_a_dc8_2004_continuous.csv	a_dc8_2004_continuous.txt
	intex-b_2006_c130_continuous.zip	intex_b_c130_2006_flasks.csv	README_intex-b_2006_c130_flask.txt
		intex_b_c130_2004_continuous.csv	README_intex-b_2006_c130_continuous.txt
	intex-b_2006_dc8_flasks.zip	intex_b_dc8_2006_flasks.csv	README_intex-b_2006_dc8_flask.txt
	intex_b_dc8_2006_continuous.csv	README_intex-b_2006_dc8_continuous.txt	
	intex-b_2006_dc8_continuous.zip		

Data File Organization:

Each data file represents one year's data for the specific campaign with flask and continuous data from airborne campaigns in separate files.

- File organization and variables measured vary across campaigns. During the compilation process, no attempt was made to harmonize file organization or measurement variable names.
- Table 1 provides an overview of network sampling sites and the years of available data for the main measurement types.
- Details on file organization and variables are provided in the network README files.
- Data files are in comma separated format (*.csv).
- Date and time variables are consistent across all network data files.
 - The first three columns are consistent in all files in both name and format.
 - YYYYMMDD: Year, month, and day of sampling (UTC)
 - doy: Absolute day of year
 - UTC: Seconds from midnight of that day. Universal Coordinated Time (UTC)
- These sample identification and location variables are consistent across files, depending upon the sample type.
 - flask.ID: Canister identification number
 - station: NOAA three-letter station code. Three-letter codes assigned for non-NOAA station LJO
 - latitude: Latitude, in decimal degrees
 - longitude: Longitude, in decimal degrees
 - altitude: Altitude, in meters above sea level
- Data quality flags are provided for measurement variables.
 - Quality flags follow the NOAA format.
 - Data flags (species.flag), if any, are based on the 3-column (...) NOAA flag system. See accompanying network README file for details.
- Missing values.
 - Missing values are represented by "NaN".

Example Data File:

```
EXPLANATORY 10 LINE FOR STANLEY TYLER/UCI 2001 FLASK DATA

Fair Use Agreement: By using these data you agree to abide by our Fair Use Policy. Refer to the accompanying readme file for more information including how to cite these data. The user of this data is responsible for obtaining the latest data sets. For original data sets and information on updates and citations visit http://cdiac.ornl.gov/epubs/db/db1022/db1022.html

Today's date: August 24 2009. Data downloaded from website: August 4 2009

For more information about this data contact Stanley Tyler, styler@uci.edu.

"YYYYMMDD","doy","UTC","station","latitude","longitude","altitude","wind.m","wind.d",
"CH3D_UCI","SD.CH3D_UCI","CH4_UCI","SD.CH4_UCI","CH4C13_UCI",
"SD.CH4C13_UCI","CO_UCI","SD.CO_UCI","COC13_UCI","SD.COC13_UCI" 20010112,12,68400,"NWR",40.05,-105.58,3523,2.7,240,-
91.3,2.1,1782.1,NaN,NaN,NaN,NaN,NaN,NaN,NaN,NaN 20010112,12,68400,"NWR",40.05,
-105.58,3523,2.7,240,NaN,NaN,NaN,NaN,NaN,NaN,NaN,NaN,111.9,1.1,NaN,NaN 20010117,17,40860,"MDO",35,
-121,NaN,8.5,280,NaN,NaN,NaN,NaN,NaN,NaN,NaN,NaN,169.3,0,-26.72,0.27 20010117,17,84060,"MDO",35,-121,NaN,8.4,280,-
103.9,2.1,1863,6,NaN,NaN,NaN,NaN,NaN,NaN,NaN,NaN 20010126,26,65700,"NWR",40.05,
-105.58,3523,2.2,270,-93.8,0,1816.3,NaN,NaN,NaN,NaN,NaN,NaN,NaN,NaN 20010126,26,65700,"NWR",40.05,
-105.58,3523,2.2,270,NaN,NaN,NaN,NaN,NaN,NaN,NaN,NaN,129.9,1,NaN,NaN 20010205,36,46560,"MDO",35,
-121,NaN,2.2,300,NaN,NaN,NaN,NaN,NaN,NaN,NaN,NaN,180.1,0,-27.12,1.05 20010205,36,89760,"MDO",35,-121,NaN,2.2,300,
-98.8,1.6,1826,5,NaN,NaN,NaN,NaN,NaN,NaN,NaN,NaN
...
```

Site Boundaries: (All latitude and longitude given in decimal degrees)

--	--	--	--	--

Site (Region)	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
Overall North American area for data compilation	-165.4	-59.4167	82.47	13.1667

Site locations: See companion file with individual network sampling site locations:

NACP_GHG_Data_Compilation_Sampling_Locations.csv

Location Note: : In the Irvine Latitude Network, the Death Valley, CA site location is incorrect (in Arizona). These samples were grab samples and not from an established station. The coordinates provided are as reported in the README and no other information is available. Approximate Death Valley, CA coordinates from another source: 36.246944, -116.816944.

Time period: The data set covers the period 2000/01/01 to 2009/12/31

3. Data Application and Derivation:

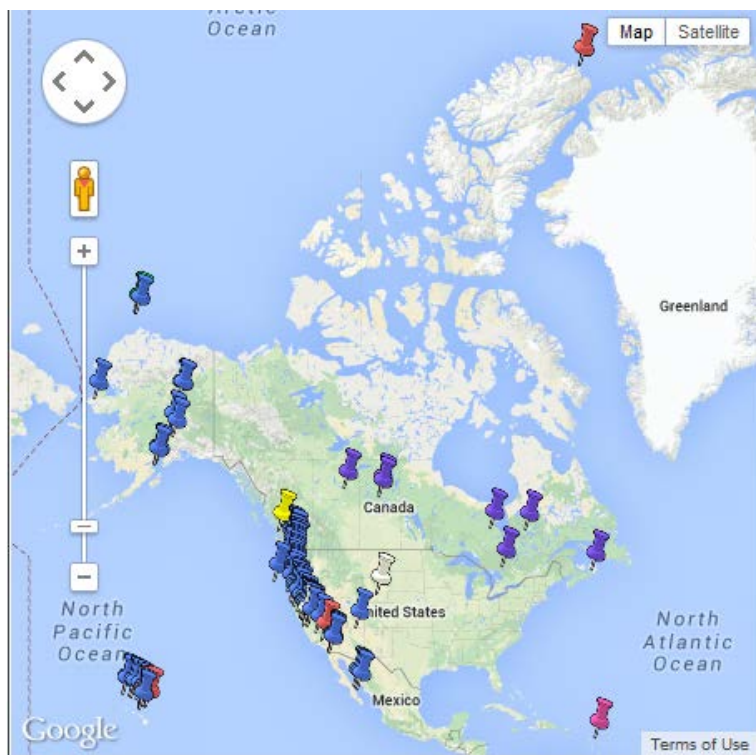
This data collection can be used in conjunction with modeling efforts to produce better quantitative knowledge of greenhouse gas sources in North America. See Miller et al. 2013 for a related application.

4. Quality Assessment:

Data flags are included in most of the data files with codes that will denote specific concerns for each measurement type. The specific codes are included in the associated README files. In addition, the methods section of the associated readme files includes details on method precision and quality control protocols for each campaign.

5. Data Acquisition Materials and Methods:

This data set is a collection of measurements of carbon dioxide (CO2) and several non-CO2 greenhouse gases made across North America by nine independent atmospheric monitoring networks from 2000 - 2009. Data were collected by the following networks: AGAGE, COBRA, CSIRO, INTEX-A, INTEX B, Irvine Latitude Network, NOAA CMDL, SCRIPPS, and from Stanley Tyler-UC Irvine. The files presented here are the products of merging multiple original measurement results files for selected sites across North America from each monitoring network. The primary focus of this effort was the compilation of non-CO2 greenhouse gases over North America, but numerous CO2 observations are also included. Figure 2 shows the Google Map representation of the sampling locations.



AGAGE: CSIRO: Canada_WMO: Irvine Lat Network:
 NOAA: Scripps: Tyler:

Figure 2. Google Map representation of the ground-based network sampling locations showing the complete geographic range. (source: http://www.nacarbon.org/cgi-bin/google_maps/nonco2_googlemap.pl)

The data files for each network are accompanied by detailed README documentation files prepared by the respective network investigators. Network descriptions, objectives, references, sampling and analysis methods, and data file descriptions are included in these READMEs. This network sampling and analysis information have been summarized in the tables in Tables 3 and 4 below.

Table 3. Includes the common network identifier, the full name, general description, and original source links to data and documentation.

Network	Name	Description	Source Links
AGAGE	Advanced Global Atmospheric Gases Experiment (AGAGE)	AGAGE and its predecessors have been measuring the composition of the global atmosphere continuously since 1978. The AGAGE is distinguished by its capability to measure over the globe at high frequency almost all of the important gas species in the Montreal Protocol (e.g. CFCs and HCFCs) to protect the ozone layer and almost all of the significant non-CO2 gases in the Kyoto Protocol (e.g. HFCs, CH4 and N2O to mitigate climate change	Data link ftp://nacp.ornl.gov/pub/non-CO2_GHG/data/
			Documentation link ftp://nacp.ornl.gov/pub/non-CO2_GHG/data/
			Source links http://agage.eas.gatech.edu/data_archive/agage/gc-ms-medusa/complete/ http://agage.eas.gatech.edu/data_archive/agage/gc-md/complete/
CSIRO	CSIRO Global Atmospheric Sampling Laboratory (GASLAB) Flask Sampling Network.	The CSIRO flask study presents data from 1984 to 2001, based at 9 stationary surface sites and one moving platform. The study traces four crucial gases: CH4, CO2, CO and H2 with a number of daily flask samples each week. The stations span the globe. The data in this dataset focus on the three North American sites in the study and the 2000-2001 time period.	Data link http://cdiac.ornl.gov/epubs/db/db1021/db1021.html
			Documentation link
			Source link http://www.marine.csiro.au/marq/edd_search.Browse_Citation?txtSession=8381
Irvine Latitude Network	Irvine Latitude Network Donald Blake, Department of Chemistry, University of California Irvine	The network investigates the presence of CH4 , other hydrocarbons, alkyl nitrates and chlorinated carbon compounds throughout the world. The network has an approximate latitudinal range of -47 to 71 degrees. The network takes roughly 80 samples per season over three- week periods in March, June, September and December. Data included here are from the North American sites (Alaska through Baja California as well as Hawaii)	Data link http://cdiac.ornl.gov/trends/otheratg/blake/blake.html
			Documentation link
			Source link http://cdiac.ornl.gov/trends/otheratg/blake/blake.html
Tyler-UCI	Contact: Stanley C. Tyler, Department of Earth System Science, University of California Irvine	This study measures CH4 and CO concentrations at two North American sites. Carbon and hydrogen isotopes are also measured. Data here cover the 2000-2001 time period.	Data link http://cdiac.ornl.gov/epubs/db/db1022/db1022.html
			Documentation link
			Source link http://cdiac.ornl.gov/epubs/db/db1022/db1022.html
NOAA	Multiple programs	The general mission of the Halocarbons and other Atmospheric Trace Species (HATS) group is to quantify the distributions and magnitudes of sources and sinks for atmospheric nitrous oxide (N2O) and halogen containing compounds. These data represent in-situ measurements from three of NOAA's ground-based stations in North America. NOAA flask data provide measurements eight species (CH4, N2O, CO, CO2,(C13, C14, O18), H2), drawing samples from ground –based sites as well as aircraft.	Data link
			Documentation link
			Source link http://www.esrl.noaa.gov/gmd/dv/data/
			HATS data http://www.esrl.noaa.gov/gmd/hats/insitu/cats/cats_conc.html
			CH4 continuous data http://www.mmnt.net/db/0/0/ftp.cmdl.noaa.gov/ccg/ch4/in-situ CO2 continuous data http://www.mmnt.net/db/0/0/ftp.cmdl.noaa.gov/ccg/co2/in-situ
SCRIPPS	Scripps CO2 Program	This study presents atmospheric CO2 concentrations spanning latitudes 82 degrees N to 90 degrees S although only North American data is included here.	Data link
			Documentation link
			Source link http://scrippsco2.ucsd.edu/data/atmospheric_co2.html
			http://cdiac.ornl.gov/trends/co2/sio-keel.html
			Data link

WMO-Environment Canada	World Meteorology Organization - Environment Canada	These data sets report CH4 and CO2 mixing ratios collected at seven station in Canada between 2000 and 2008	Documentation link
			Source link http://www.ec.gc.ca/donneesnatchem-natchemdata/default.asp?lang=En&n=732D8935-1 http://ds.data.jma.go.jp/gmd/wdcgg/cgi-bin/wdcgg/accessdata.cgi?lang=&contributor_index=200612120011
COBRA	CO2 Budget and Regional Airborne-North America (COBRA-NA)	The objective of COBRA is to test concepts for observations and data assimilation to determine the large scale sources and sinks of greenhouse gases and ozone destroying gases from North America. The study covers spatial scales from regional to continental. Gases of interest include; CO2, CO, CH4, N2O, CFCs, chlorinated solvents (CH3CCI3, CCl4), SF6, ozone, and H2.	Data link
			Documentation link
INTEX-A	Intercontinental Chemical Transport Experiment, Phase A	INTEX-NA is an integrated atmospheric field experiment consisting of two phases. Phase A (INTEX-A) occurred in the summer of 2004 over the central and eastern United States. The INTEX-NA mission seeks to answer questions about the transport and transformation of gases and aerosols on the transcontinental/intercontinental scales and their impact on air quality and climate.	Source link http://www.esrl.noaa.gov/gmd/hats/airborne/acats/projects/cobra-na/
			Data link
INTEX-B	Intercontinental Chemical Transport Experiment, Phase B	INTEX-NA is an integrated atmospheric field experiment consisting of two phases. Phase B (INTEX-B) occurred in the summer of 2006 over the west coast of the United States and out into the Pacific region towards Asia. The INTEX-NA mission seeks to answer questions about the transport and transformation of gases and aerosols on the transcontinental/ intercontinental scales and their impact on air quality and climate.	Documentation link
			Source link http://www-air.larc.nasa.gov/missions/intexna/dataaccess.htm http://www.espo.nasa.gov/intex-na/
INTEX-B	Intercontinental Chemical Transport Experiment, Phase B	INTEX-NA is an integrated atmospheric field experiment consisting of two phases. Phase B (INTEX-B) occurred in the summer of 2006 over the west coast of the United States and out into the Pacific region towards Asia. The INTEX-NA mission seeks to answer questions about the transport and transformation of gases and aerosols on the transcontinental/ intercontinental scales and their impact on air quality and climate.	Data link
			Documentation link
INTEX-B	Intercontinental Chemical Transport Experiment, Phase B	INTEX-NA is an integrated atmospheric field experiment consisting of two phases. Phase B (INTEX-B) occurred in the summer of 2006 over the west coast of the United States and out into the Pacific region towards Asia. The INTEX-NA mission seeks to answer questions about the transport and transformation of gases and aerosols on the transcontinental/ intercontinental scales and their impact on air quality and climate.	Source link http://www.espo.nasa.gov/intex-b/ http://www-air.larc.nasa.gov/missions/intex-b/dataaccess.htm
			Data link

Table 4. Summary of measurements and methods for each network compiled from individual READMEs.

Network	Chemical Species Measured	Instrument / Method	Comments
AGAGE	CFC-11, CFC-12, CH3CCI3, CCl4, N2O, CFC-113, CH4, CHCl3, CO, and H2.	AGAGE GC-ECD/FID/MRD system	continuous
	HFC-134a, HCFC-22, HCFC-141b, HCFC-142b, CH3Cl, CH3Br, Halon-1211, Halon-1301, HFC-152a, CH2Cl2, CHCl3, and CCl2CCI2	AGAGE GC-MS (ADS) system	continuous
	CFC-113, HCFC-22, HCFC-141b, HCFC-142b, HFC-125, HFC-134a, HFC-152a, HFC-365mfc, HFC-23, Halon-1211, Halon-1301, CH3Cl, CH2Cl2, CHCl3, CH3Br, CH3CCI3, CHCl3, CCl2CCI2, SF6, SO2F2, PFC-14, PFC-116, PFC-218 CO, H2	Medusa GC-MS instruments (installed at Trinidad Head in 2005)	continuous
CSIRO	CO, H2	GC with mercuric oxide, reduction. CO reduces HgO to Hg vapor which is detected by UV absorption. RGA3-1 (R1) Trace Analytical GC was used over the length of the record.	flasks
	CH4, CO2	GC/FID. Three Carle GC's were used: Carle-1, Carle-2, and Carle-3 (C1, C2, C3)	flasks
	13C CO2	Dual inlet stable isotope ratio mass spectrometry (M1, Finnigan MAT252), after CO2 was captured with automated cryogenic trapping system	flasks
Irvine Latitude Network	CCl4, C2Cl4, cfc11, cfc113, cfc12, CHCl3, CH3CCI3, CH3ONO2, EtONO2, H1211, i.PrONO2	GC/ECD	flasks
	n.butane, i.butane, CH4, ethane, ethyne, propane	GC/FID	flasks
Tyler-UCI	CO	Shimadzu Model 14A GC with a Model RGD2 reduction gas analyzer detector (HgO)	flasks
	CH4	Hewlett Packard 5880A GC /FID	flasks
	d13C CH4, dC13 CO2	Finnigan MAT Model 252 IRMS	flasks
		cf-GC/IRMS coupled to a custom-designed CH4 gas	

	dD-CH4	preconcentrator. A pyrolysis oven converts CH4 to H2 after its separation from the air stream and before its detection by the mass spectrometer	flasks
NOAA	CH4	GC/FID	flasks, continuous
	CO H2	GC/HgO	flasks
	CO2	NDIR	flasks
	dC13 CO2, dO18 CO2	dC13 CO2, dO18 CO2	flasks
	dC14 CO2	Accelerator MS	flasks
	N2O	GC/ECD	flasks
	CO2	NDIR	continuous
	CCl4, cfc11, cfc113, cfc12, CH3CCI3, CH3Cl, hfc22, hfc142b, H1211, N2O, SF6	GC for Atmospheric Trace Species (CATS). These GCs replaced the Radiatively Important Trace Species (RITS) GCs, which were in operation from 1986 to 2000	continuous
SCRIPPS	CO2	NDIR	flasks
WMO-Environment Canada	CH4, CO	GC/FID	flasks, continuous
	CO2	NDIR	flasks, continuous
COBRA	N2O, SF6, CFC-12 (CCl2F2), and halon-1211 (CBrClF2) H2), CO, CH4, CFC-11 (CCl3F), CFC-113 (CClF2-CCl2F), CHCl3, CH3CCI3, CCl4	ATS airborne GC, Airborne Chromatograph for Atmospheric Trace Species (ACATS-IV)	flasks
	CO2	LiCor CO2 analyzer	
	O2/N2, Ar/N2, and CO2/N2	MS	flasks
	13CO2/12CO2 and C18O16O/C16O16O	Micromass Otima MS at INSTAAR	flasks
	CO2, CO, CH4, N2O, H2, and SF6	GMD	flasks
INTEX-A DC-8	O3	NO/O3, Chemiluminescence	flasks, continuous
	CH2O,OH,HO2,NO,RO2	Laser Induced Fluorescence	flasks, continuous
	CO, CH4, N2O, CH2O	Tunable Diode Laser Absorption Spectrometry	flasks, continuous
	VOC's, CO_UCI, CH4_UCI, DMS_UCI	GC-FID/EC/MSGC-FID/EC/MS	flasks, continuous
	NO2, NOy, "alkyl" nitrates	Laser Induced Fluorescence and thermal dissociation	flasks, continuous
	CO2	NDIR; LI-COR 6252 Spectrometer	flasks, continuous
	PANs	Automated dual GC with cryofocusing	flasks, continuous
	methanol, ethanol, acetonitrile, HCN	Reduction Gas Detector	flasks, continuous
	acetaldehyde, acetone, MEK, benzene	Photo Ionization Detector	flasks, continuous
	H2O vapor	Open path Diode Laser Hygrometer (mixing ratio) Absorption Spectrometry	flasks, continuous
	HNO3, fine aerosol sulfate, bulk aerosol composition	Mist chamber/GC-IC isokinetic sampling through forward-facing aerosol inlet onto Teflon filter, ion chromatography	flasks, continuous
	SO2, HO2NO2, HNO3, H2O2, HCN, PAA	Chemical Ionization MS	flasks, continuous
	Bulk aerosol ionic composition	Particle into Liquid Sampling (PILS) coupled to ICs	flasks, continuous
	CH2O, PAA	Fluorometry (aqueous collection followed by enzyme fluorescence detection)	flasks, continuous
	CH3OOH, H2O2	HPLC-fluorometry	flasks, continuous
	Aerosol number, concentration, area density, volume	Wing Mounted Aerosol Probes	flasks,

INTEX-B DC-8	density		continuous
	O3	NO/O3, Chemiluminescence	flasks, continuous
	H2O mixing ratio, J(NO2)	Cryo-chill mirror, cryogenic hygrometer, filter radiometer, ICATS Navigation System	flasks, continuous
	CO, CH4, OCS, DMS, CS2, CFCs, VOCs	Grab samples analyzed with GC and GC-MS	flasks, continuous
	Aerosol Scattering Ratio, Aerosol Depolarization %, Wavelength Dependence, Troposphere and tropopause O3 profiles	UV Lidar (Airborne Differential Absorption Lidar- DIAL), Aerosol	flasks, continuous
	OH, HO2	Laser Induced Fluorescence (LIF)	flasks, continuous
	Aerosol absorption coefficients, size, concentration, scattering coefficients	3-wl Radiance Research Particle Soot Absorption Photometer (PSAP), Aerodynamic Particle Sizer (APS TSI 3221), TSI Condensation Particle Counter (CPC), Differential Mobility Analyzer (DMA and Long DMA), Optical Particle Counter (OPC) calibrated with PSL spheres, nephelometers (TSI 3563 and 3 Radiance Research-RR)	flasks, continuous
	NO2, HNO3, PANs, "alkyl" nitrates	Thermal Dissociation-Laser Induced Fluorescence	flasks, continuous
	Bulk aerosol ionic composition, HNO3, fine aerosol sulfate	Isokinetic sampling through forward-facing aerosol inlet onto teflon filter, mist chamber	flasks, continuous
	H2O vapor mixing ratio	Open path Diode Laser Hygrometer	flasks, continuous
	CH2O (formaldehyde)	Tunable Diode Laser	flasks, continuous
	H2O2, CH3OOH, CH2O	Fluorometry (aqueous collection followed by enzyme fluorescence detection and high-performance liquid chromatography-HPLC)	flasks, continuous
	HCl	Chemical Ionization Mass Spectrometry (CIMS)	flasks, continuous
	NO	NO Chemiluminescence	flasks, continuous
	O3 number density and mixing ratio, aerosol number	Excimer and Yag lasers	flasks, continuous
	H2O2	Aqueous collection followed by Chemiluminescence with acidinium ester	flasks, continuous
	CO, CH4, N2O	Diode laser spectrometer	flasks, continuous
	J(O3), J(NO2), J(N2O5), J(H2O2), J(HNO2), J(HNO3), J(CH2O), J(CH3CHO), J(C2H5CHO), J(CHOCHO), J(CH3COCHO), J(CH3COCH3), J(CH3OOH), J(CH3ONO2), J(PAN), J(CH3CH2CH2CHO), J(CH3COCH2CH3), J(HO2NO2), J(CH3CH2ONO2)	Scanning actinic flux spectroradiometer with photo multiplier tube (PMT) detector	flasks, continuous
	PAN, acetaldehyde, propanal, acetone, methyl ethyl ketone, (MEK), methanol, ethanol, acetonitrile, HCN	Automated dual gas chromatography with cryofocusing (PAN), Reduction Gas Detector (methanol, ethanol, nitriles)	flasks, continuous
	Total Gaseous Mercury (TGM)	Cold Vapor Atomic Fluorescence Spectrometry	flasks, continuous
NO, LOD	Laser-Induced Fluorescence (LIF)	flasks, continuous	
CO2	LI-COR 6252 Spectrometer	flasks, continuous	
	Trace organic gases	Trace Organic Gas Analyzer (TOGA)	flasks, continuous
	VOCs, CFCs	Grab samples analyzed with GC and GC/MS	flasks, continuous
	Aerosols: optical properties	Transmission electron microscopy	flasks, continuous
	CO	Vacuum ultraviolet (VUV) fluorescence	flasks, continuous

INTEX-B C-130	HO2, RO2, OH, H2SO4, methanesulfonate (MSA)	Chemical Ionization Mass Spectrometry (CIMS) instrument as component of Eisele/Mouldin 4-channel instrument	flasks, continuous
	Aerosol absorption coefficients, size, concentration, scattering coefficients	3-wl Radiance Research Particle Soot Absorption Photometer (PSAP), Aerodynamic Particle Sizer (APS, TSI 3321), TSI Condensation Particle Counter (CPC), Differential Mobility Analyzer (DMA and Tandem DMA), optical particle counter (OPC) calibrated with PSL spheres, nephelometer (TSI 3563)	flasks, continuous
	PANs, PiBN	PAN CIGARette Thermal Decomposition Chemical Ionization Spectrometer	flasks, continuous
	SO2	PAN CIGARette Thermal Decomposition Chemical Ionization Spectrometer	flasks, continuous
	Aerosol chemical composition	Aerodyne HR-ToF Aerosol Mass Spectrometer (AMS)	flasks, continuous
	Acetic acid, acetone, hydrocarbons, carbonyls, methyl ethyl ketone (MEK)	Proton Transfer Reaction Mass Spectrometry (PTR-MS)	flasks, continuous
	Aerosol number and mass	Single Particle Soot Photometer (SP-2) to distinguish non-incandescing and incandescing particles	flasks, continuous
	Latitude, longitude, roll, pitch, heading, ground speed, altitude, GPS measurements, rel. humidity, H2O vapor pressure, dew/frost point temperature, shortwave/UV irradiance, potential temperature	Honeywell YG1854 Inertial Reference System (IRS), Global Positioning System (GPS),	flasks, continuous
	Cloud Condensation Nuclei	Droplet Measurement Technologies streamwise thermal gradient CCN instrument	flasks, continuous
	Organic functional group composition of particles, elemental concentrations of particles	Fourier Transform Infrared (FITR), x-ray fluorescence, scanning x-ray transmission microscope	flasks, continuous
	Photolytic frequencies, J(O3), J(NO2), J(N2O5), J(H2O2), J(HNO2), J(HNO3), J(CH2O), J(CH3CHO), J(C2H5CHO), J(CHOCHO), J(CH3COCHO), J(CH3COCH3), J(CH3OOH), J(CH3ONO2), J(PAN), J(CH3CH2CH2CHO), J(HO2NO2), J(CH3CH2ONO2)	Scanning actinic flux spectroradiometer with photo multiplier tube (PMT) detector	flasks, continuous
	Bulk aerosol ionic composition	Particle into Liquid Sampling (PILS) coupled to ion chromatographs, PILS coupled with Sievers Total Organic Carbon instrument	flasks, continuous
	Formaldehyde	Difference frequency generation(DFG) tunable diode laser	flasks, continuous
	NO, NO2, NOy, O3	NOxy and O3	flasks, continuous
	Acetic acid, formic acid, H2O2, HCN, HNO3, mixed-base hydrogen peroxide (MHP), polyacrylic acid (PAA), propanoic acid, SO2	Chemical Ionization Mass Spectrometry (CIMS)-direct measurements in ambient air	flasks, continuous

Abbreviations:

GC = Gas Chromatograph; MS = Mass Spectrometer; FID = Flame Ionization Detector; ECD = Electron Capture Detector; NDIR = Non dispersive infrared analyzer; IRMS = Isotope-Ratio Mass Spectrometer

6. Data Access:

This data set is available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

Data Archive Center:

Contact for Data Center Access Information:

E-mail: uso@daac.ornl.gov

Telephone: +1 (865) 241-3952

7. References:

Denning, A.S., et al. 2005. Science implementation strategy for the North American Carbon Program: A Report of the NACP Implementation Strategy Group of the U.S. Carbon Cycle Interagency Working Group. U.S. Carbon Cycle Science Program, Washington, DC. 68 pp.

Gerbig, C., Lin, J.C., Wofsy, S.C., Daube, B.C., Andrews, A.E., Stephens, B.B., Bakwin, P.S. and Grainger, C.A. (2003). Toward constraining regional-scale fluxes of CO₂ with atmospheric observations over a continent: 2. Analysis of COBRA data using a receptor-oriented framework. *Journal of Geophysical Research* 108: doi: 10.1029/2003JD003770. issn: 0148-0227.

Geels, C., Doney, S. C., Dargaville, R., Brandt, J., and Christensen, J. H.: Investigating the sources of synoptic variability in atmospheric CO₂ measurements over the Northern Hemisphere continents: a regional model study, *Tellus B*, 56, 35–50, 2004.

Miller, Scot M. and Wofsy, Steven C., Michalak, Anna M., Kort, Eric A., Andrews, Arlyn E., Biraud, Sebastien C., Dlugokencky, Edward J., Eluszkiewicz, Janusz, Fischer, Marc L., Janssens-Maenhout, Greet, Miller, Ben R., Miller, John B., Montzka, Stephen A., Nehrkorn, Thomas, Sweeney, Colm. 2013. Anthropogenic emissions of methane in the United States. *PNAS* 110(50) 20018-20022. 10.1073/pnas.1314392110

Wofsy, S.C. and R.C. Harriss (Eds.). 2002. The North American Carbon Program (NACP). Report of the NACP Committee of the U.S. Interagency Carbon Cycle Science Program. Washington, D.C.: U.S. Global Change Research Program.



[Privacy Policy](#) | [Feedback](#) | [FAQs](#) | [Site Map](#)

[Follow @ORNLDAAC](#)

Home

About Us

- [About ORNL DAAC](#)
- [Who We Are](#)
- [User Working Group](#)
- [Biogeochemical Dynamics](#)
- [Data Citation Policy](#)
- [News](#)
- [Newsletters](#)
- [Workshops](#)

Products

- [Products and Services](#)
- [Product Overview](#)
- [Field Campaigns](#)
- [Validation](#)
- [Regional/Global](#)
- [Model Archive](#)

Data

- [How to Get Data](#)
- [Complete Data Set List](#)
- [Search for Data](#)
- [Field Campaigns](#)
- [Validation](#)
- [Regional/Global](#)
- [Model Archive](#)

Tools

- [Data Tools](#)
- [Advanced Data Search](#)
- [Website Search](#)
- [Search by DOI](#)
- [WebGIS](#)
- [SDAT](#)
- [MODIS Land Subsets](#)
- [THREDDS](#)

Help

- [ORNL DAAC Help](#)
- [FAQs](#)
- [Tutorials](#)
- [Data Management](#)

Contact Us