

US Baseline Station Network

P. Tans

Climate Monitoring  
and Diagnostics Laboratory  
NOAA/ERL/CMDL

CLIMATE MONITORING AND DIAGNOSTICS LABORATORY  
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
 FORMERLY  
 GEOPHYSICAL MONITORING FOR CLIMATIC CHANGE

LONG-TERM ATMOSPHERIC MONITORING OF TRACE SPECIES RELATED TO  
 CLIMATE CHANGE AND STRATOSPHERIC OZONE DEPLETION

- CARBON DIOXIDE IR
- METHANE GC
- CARBON MONOXIDE GC
- OZONE - IN SITU Dasibi
- OZONE - STRATOSPHERE ECC sonde , Dobson
- NITROUS OXIDE GC
- EIGHT HALOCARBON SPECIES GC
- WATER VAPOR - STRATOSPHERE sonde
- AEROSOLS - IN SITU CN counters , soot
- AEROSOLS - STRATOSPHERE lidar

BASELINE OBSERVATORIES

- BARROW, ALASKA 71.3 °N 156.6 °W 10 M ELEV.
- MAUNA LOA, HAWAII 19.5 °N 155.6 °W 3.4 KM ELEV.
- CAPE MATATULA, AMERICAN SAMOA 14.3 °S 170.6 °W 30 M ELEV.
- SOUTH POLE, ANTARCTICA 90.0 °S 2.8 KM ELEV.

CMDL MEASUREMENTS AT MAUNA LOA

**GASES**

CARBON DIOXIDE	FLASKS
CARBON DIOXIDE	IN SITU
C-13 IN CARBON DIOXIDE	FLASKS
O-18 IN CARBON DIOXIDE	FLASKS
METHANE	IN SITU
METHANE	FLASKS
CARBON MONOXIDE	FLASKS
CARBON MONOXIDE (1992)	IN SITU
NITROUS OXIDE	FLASKS
NITROUS OXIDE	IN SITU
CFC-11	FLASKS
CFC-11	IN SITU
CFC-12	FLASKS
CFC-12	IN SITU
CFC-113	FLASKS
CFC-113	IN SITU
METHYL CHLOROFORM	FLASKS
METHYL CHLOROFORM	IN SITU
CARBON TETRACHLORIDE	FLASKS
CARBON TETRACHLORIDE	IN SITU
H-1301	FLASKS
H-1211	FLASKS
CFC-22 (1992)	FLASKS
OZONE	IN SITU
OZONE	TOTAL COLUMN
OZONE	UMKEHR PROFILES
OZONE	SONDE PROFILES

**AEROSOLS**

CONDENSATION NUCLEI	IN SITU
SCATTERING COEFFICIENT	IN SITU
BLACK CARBON	IN SITU
BACKSCATTER COEFFICIENT	LIDAR PROFILES

**SOLAR RADIATION**

DIRECT BEAM - ALLWAVE  
DIRECT BEAM - SPECTRAL  
GLOBAL FLUX - ALLWAVE  
DIFFUSE FLUX - ALLWAVE  
AEROSOL OPTICAL DEPTH - SUNPHOTOMETER  
UV FLUX - BROADBAND

**METEOROLOGY**

AMBIENT TEMPERATURE  
DEW POINT TEMPERATURE  
ATMOSPHERIC PRESSURE  
WIND SPEED AND DIRECTION  
PRECIPITATION AMOUNT

**PRECIPITATION CHEMISTRY**

PH, CONDUCTIVITY, CHEMISTRY	DAILY SAMPLES
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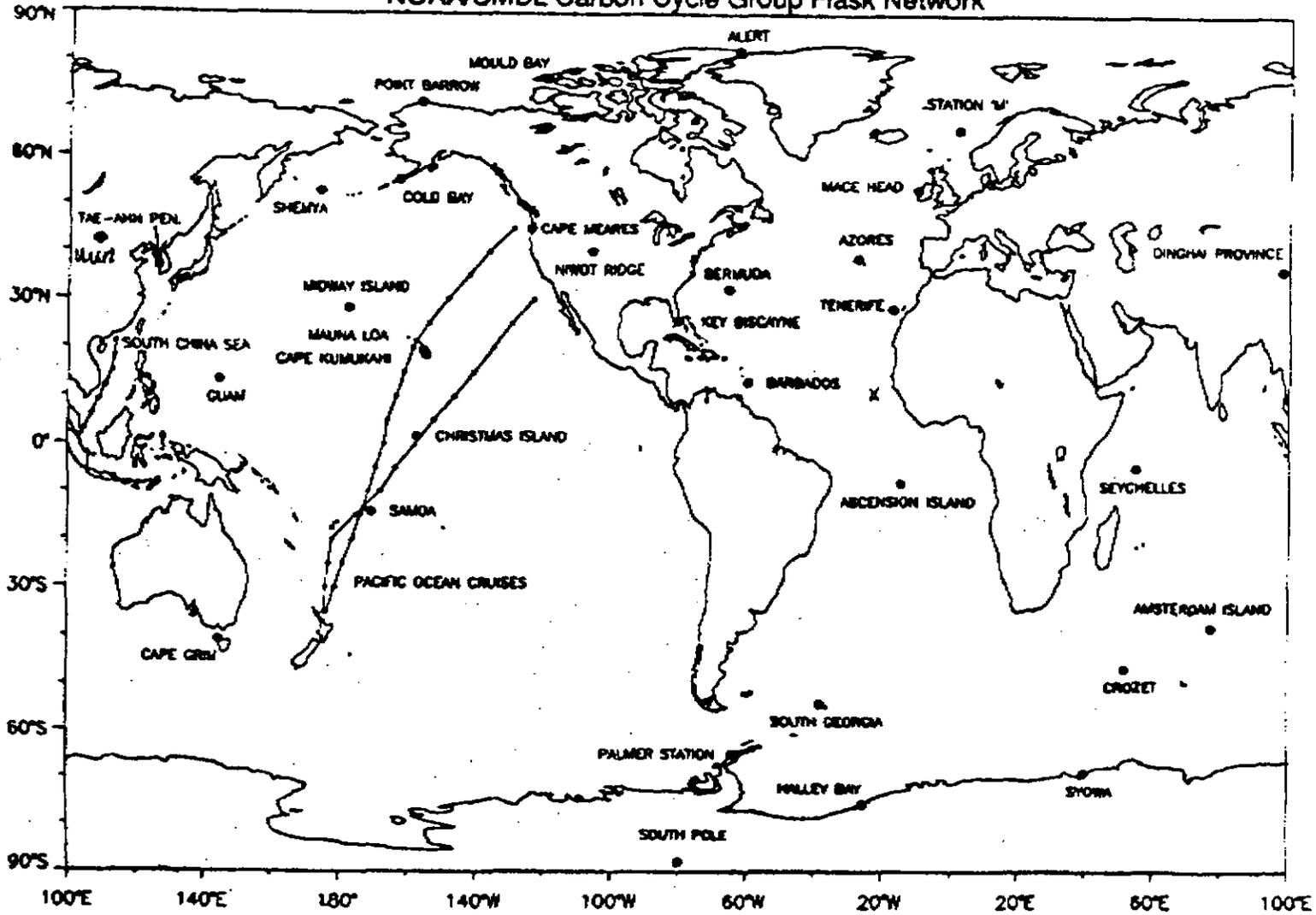
CONTINUING COOPERATIVE PROGRAMS AT MAUNA LOA

CARBON DIOXIDE (SIO) - FLASKS AND IN SITU  
CARBON-13 (USGS) - FLASKS *cu*  
METHANE-13 (USGS) - FLASKS *cu*  
METHANE-13 (U. OF WASH.) - FLASKS  
CARBON-13 (CSIRO) - FLASKS  
FREONS, OTHER TRACE GASES (OGC) - FLASKS  
FREONS, OTHER TRACE GASES (NCAR) - FLASKS  
TOTAL OZONE AND SO<sub>2</sub> (ATM. ENV. SERV. CANADA)  
SURFACE SO<sub>2</sub> (EPA) - IN SITU  
NITROUS OXIDE (SIO) - FLASKS  
NITRIC ACID (U. OF RHODE ISLAND) - FILTERS  
TOTAL SURFACE PARTICULATES (DOE/EML) - HI-VOL  
TOTAL SURFACE PARTICULATES (EPA) - HI-VOL  
ATMOSPHERIC AEROSOLS (U. OF WASH.)  
ATMOSPHERIC AEROSOLS (U.C. DAVIS) - FILTERS  
SOLAR RADIATION (U. OF ARIZONA)  
ULTRAVIOLET RADIATION (TEMPLE U.)  
SOLAR RADIATION (COLO. STATE U.)  
UV RADIATION (SMITHSONIAN BIOL. LAB.)  
PRECIPITATION COLLECTION (DOE/EML)  
PRECIPITATION COLLECTION (U. OF VIRGINIA)  
ATMOSPHERIC DEPOSITION (NADP)  
BERYLLIUM-10 (ISWS)  
RADON-222 (DOE, ANSTO)

RECENT SHORT-TERM COOP PROGRAMS AT MLO

AEROSOL CHARACTERIZATION (NASA/MSC, NOAA/WPL)  
PHOTOMETER CALIBRATION (NASA/GODDARD)  
TRACE GAS SPECTRA (U. OF DENVER)  
HELIUM ISOTOPIC CONC. (USGS)  
USSR KOROLEV CRUISE - LOGISTICAL SUPPORT  
PHOTOCHEMISTRY EXPERIMENT - MLOPEX (NCAR, NOAA/AL)  
ATMOSPHERIC AEROSOLS (U. OF HAWAII)

# NOAA/CMDL Carbon Cycle Group Flask Network



CO2 ANNUAL MEAN CONC. (PPM)

959 MB

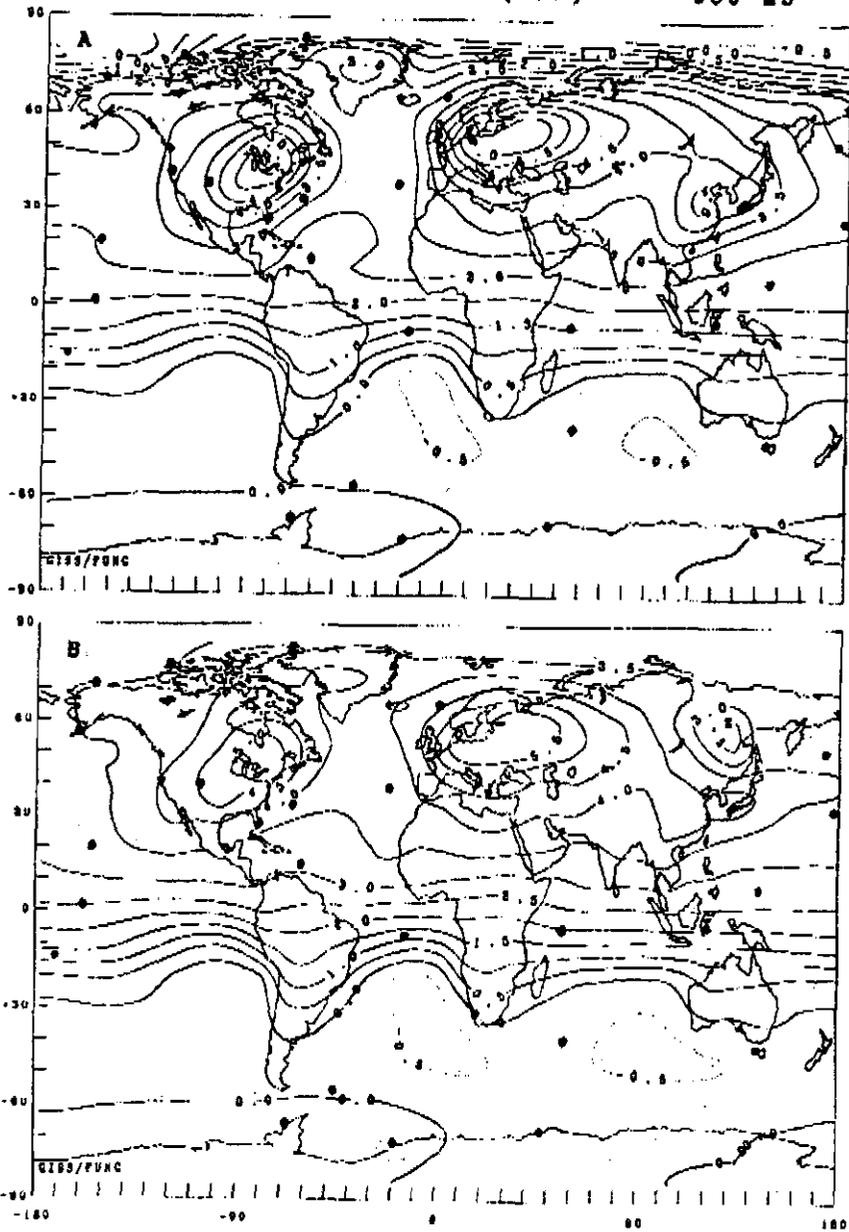


Fig. 1

## NOAA CMDL Carbon Cycle Group

### STANDARDS

- Gravimetric (Long-lived gases, with J. Elkins)
- Volumetric (CO2 only, WMO Central CO2 Laboratory)

### INTERCOMPARISONS

- WMO CO2 "round-robin" intercomparison
- T. Nakazawa (CO2, CH4, CO)
- M. Hirota (CH4)
- Australia-France-New Zealand (CO2, isotopes,.....)

### DATA DISTRIBUTION

- CDIAC, Oak Ridge (CO2 in-situ and flasks, CH4 flasks)
- WDCGG, Tokyo (CO2 in-situ)
- On-line, via Internet by anonymous FTP from
  - address "ccg.cmdl.erl.gov"
  - or "140.172.192.20"(currently CO2 in-situ, soon CH4 flasks, then CO2 flasks, etc..)

### STATION AUTOMATION

- Mauna Loa first, then other CMDL observatories

**NEW THRUSTS:**

Measurements on very high towers (600 m.)

Automated flask sampling from aircraft

Fast-cycling GC (2 min. per sample) (J. Elkins)

Measurements of direct radiative effect of aerosols countering greenhouse warming  
(Charlson's hypothesis)

*CGER*

Center for Global Environmental Research

National Institute for Environmental Studies

Environment Agency

The Government of Japan

16-2 Onogawa, Tsukuba, Ibaraki 305, Japan

Telephone: +[81]-(298)-51-6111, ext. 374, 377, 382

Telefacsimile: +[81]-(298)-58-2645