Recent World Data Centre for Greenhouse Gases (WDCGG) activities

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Contents

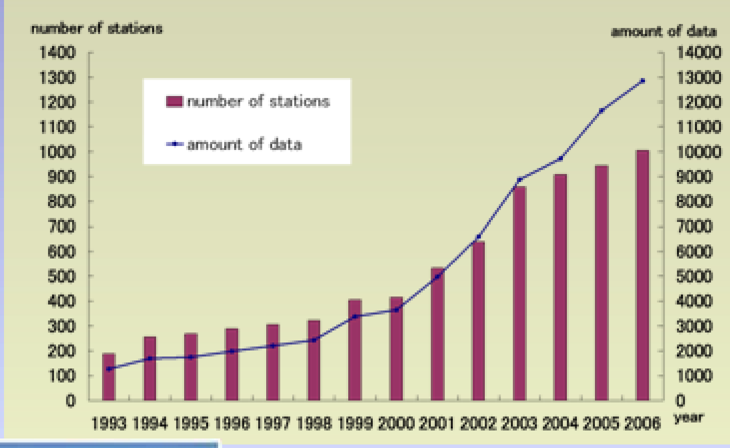
1. Overview of the WDCGG

GAW/WDCGG Overview

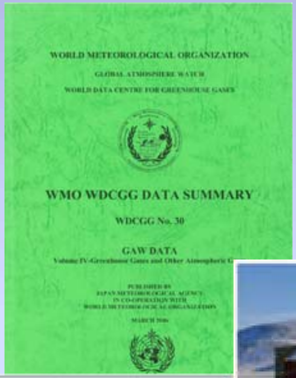
Function of WDCGG

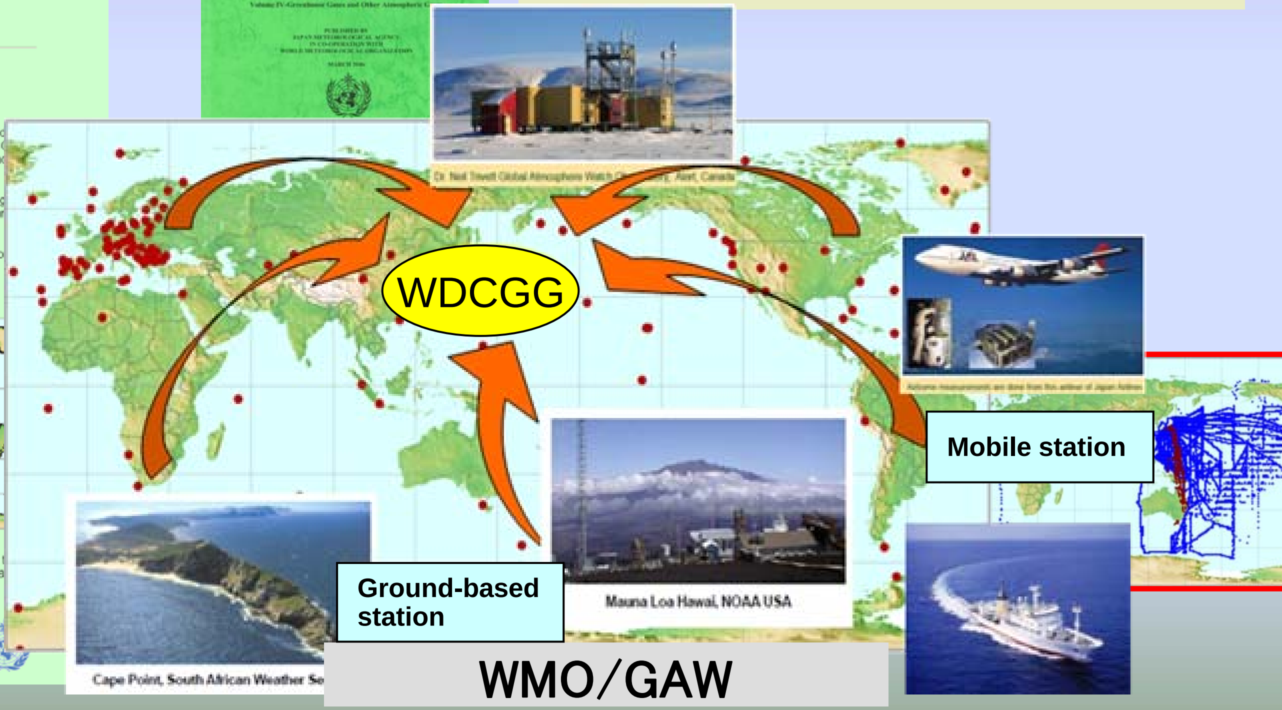
- Gathering data and their quality check
- Archive of observation data
- Creation of value added products
- Dissemination of data and products

Annual increase of Archived data



WDCGG website





2. WDCGG in the environmental conventions

WDCGG in the environmental conventions

UNFCCC

Article 5

Research and Systematic Observation

support ⇕ **Implementation Plan**

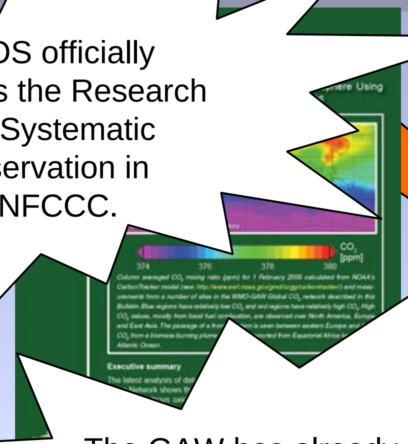
Global Climate Observing System (GCOS)

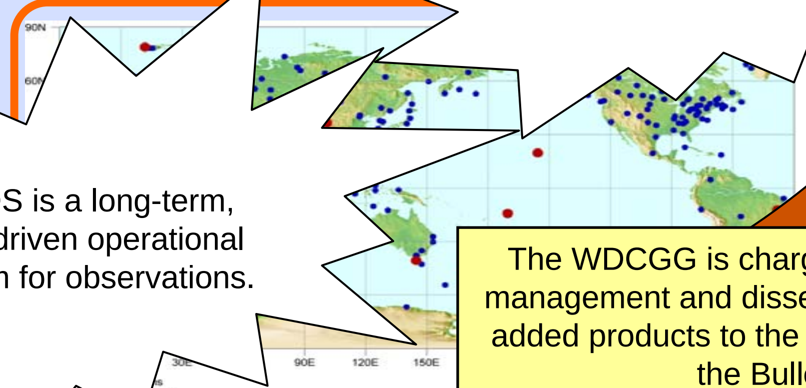
(WMO, UNESCO, IOC, ICSU, UNEP)

- **Atmosphere**
  - **ground**
  - **upper layer**
  - **composition**
- **Ocean**
- **Terrestrial**

WMO/GAW

WMO Greenhouse Gas Bulletin





GCOS officially supports the Research and Systematic Observation in UNFCCC.

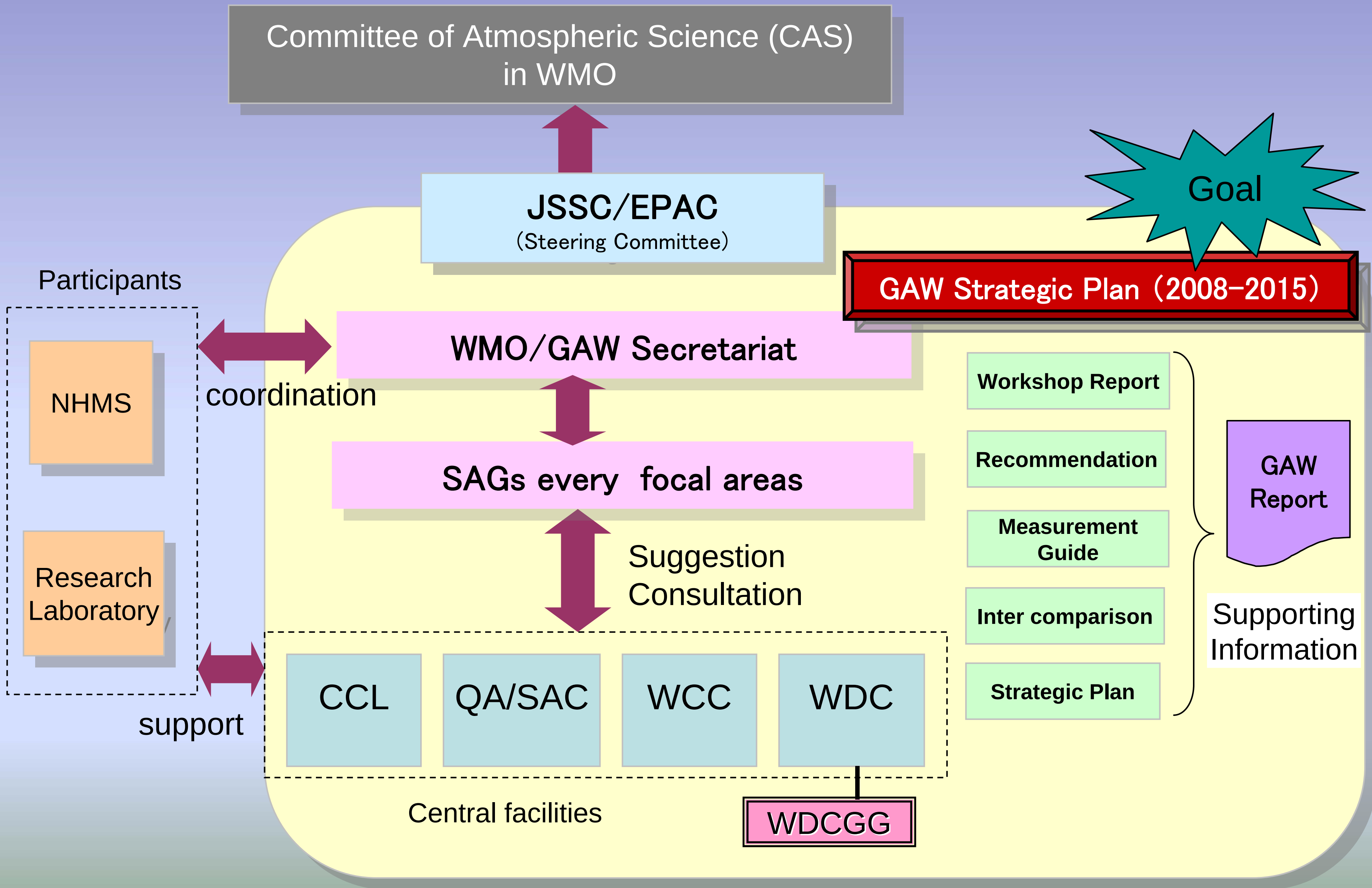
The GAW has already been identified as atmospheric composition networks in GCOS.

GCOS is a long-term, user-driven operational system for observations.

The WDCGG is charged with the data management and dissemination of value-added products to the UNFCCC through the Bulletin

3. WDCGG in the GAW Strategic Plan

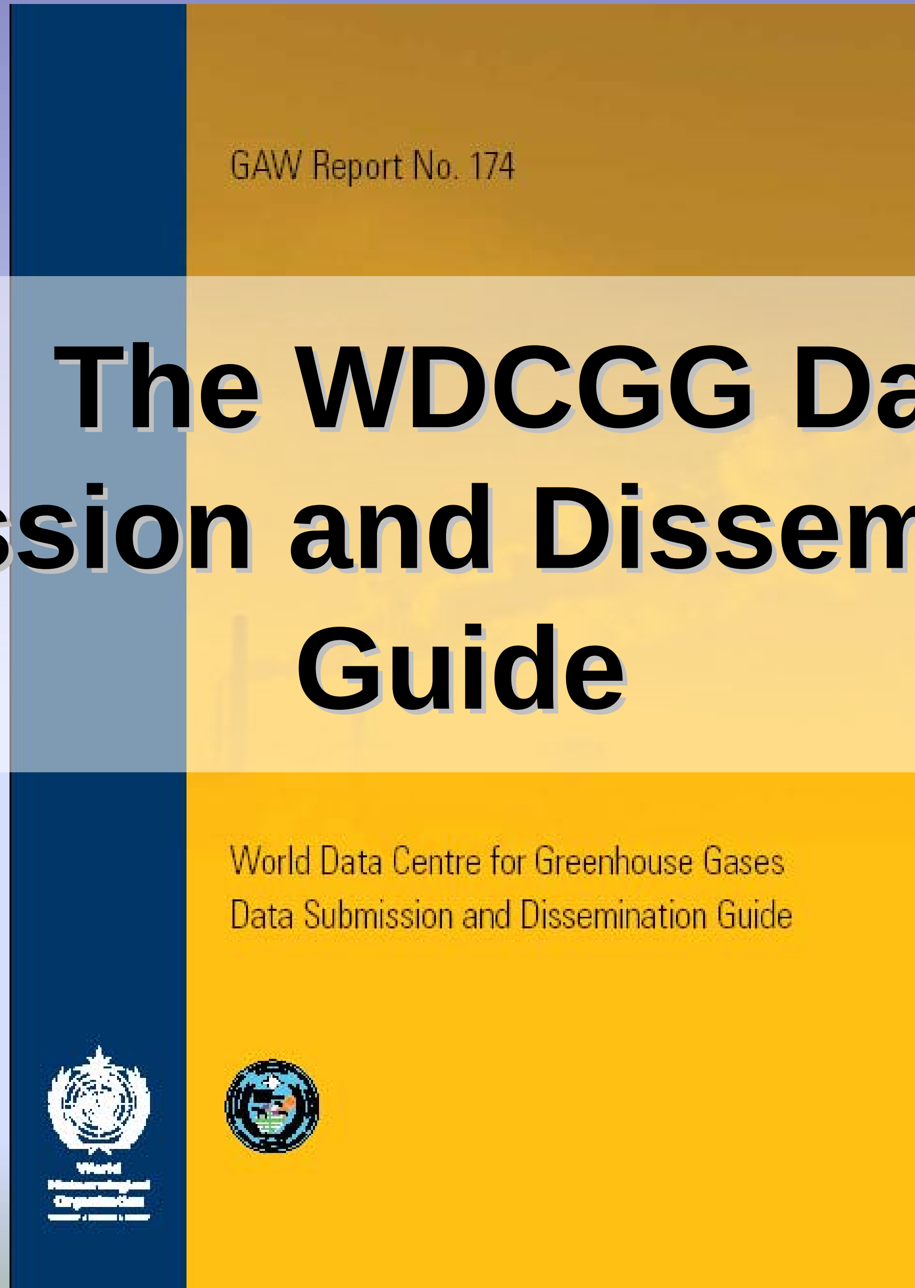
Architecture of GAW programme



Main tasks of WDCGG in the GAW Strategic Plan

- Task 3.10 Encourage archiving greenhouse gases data from aircraft monitoring programmes in WDCGG.
- Task 5.11 Implement data management under the agreement between GCOS and WMO/GAW.
- Task 7.21 Review the internal consistency of CO_2 observations archived at the WDCGG.
- Task 7.24 Develop the capability to accept and archive CO_2 column data from satellite observations.
- Task 7.25 Archive and develop integrated data sets using satellite, aircraft and surface-based measurements of CO_2.

4. The WDCGG Data Submission and Dissemination Guide



4-1 Clear definition of observation categories and their Archived data format

Measurement data are classified into six observation categories.

1. *Air sampling observation at ground-based stations*
2. *Air sampling observation for vertical profile (e.g. multi heights observation using a tower)*
3. *Air sampling observation by mobile platforms (e.g., aircraft, ships, etc.)*
4. *Ice core observation*
5. *Surface seawater and overlying atmosphere observation*
6. *Hydrographic sampling observation by ships*

4-2 Change of file format for Archived (dissemination) data

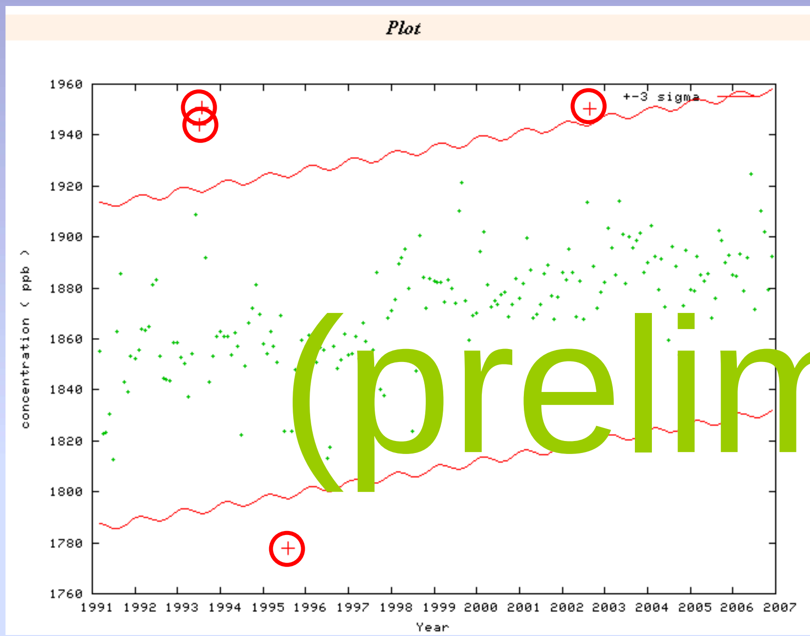
The WDCGG has established new data dissemination file formats.

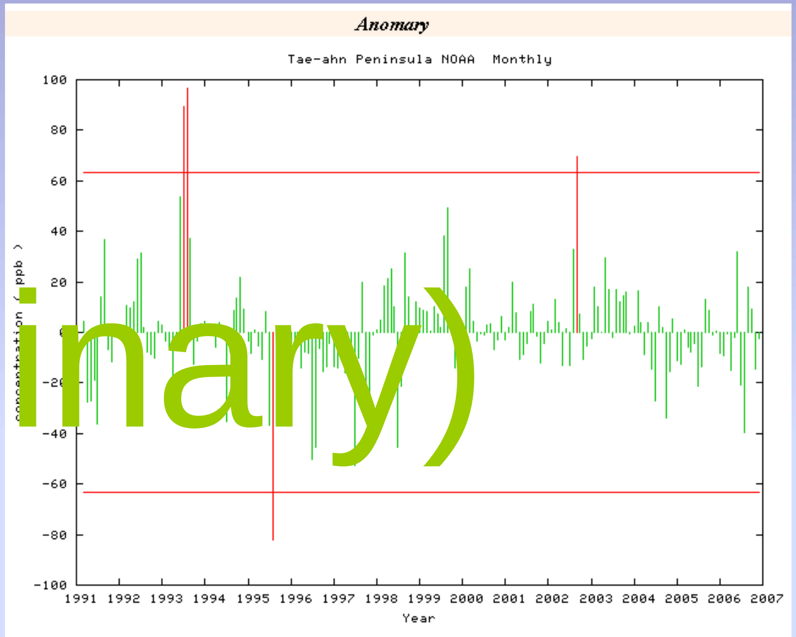
1) FORTRAN fitting format is employed (in order to provide users with more computer-familiar data handlings and to keep minimum users' efforts).
2) The WDCGG simplifies the new formats,
   - each file contains mole fraction values of only one parameter;
   - mole fraction data and ancillary meteorological data are separated;
   - all information to read the data file is included in the header part.
3) The WDCGG prepared a sample program to read the Archived data file (the program is available on the WDCGG website).

4-3 Archive of all versions of data

- When existing data are replaced by new data that have different quality, a new Archive data version is assigned.
- All versions of Archived data are available (only by FTP for the moment) as well as the latest Archived data on the WDCGG website.

4-4 Submission-data plausible check before acceptance





(preliminary)

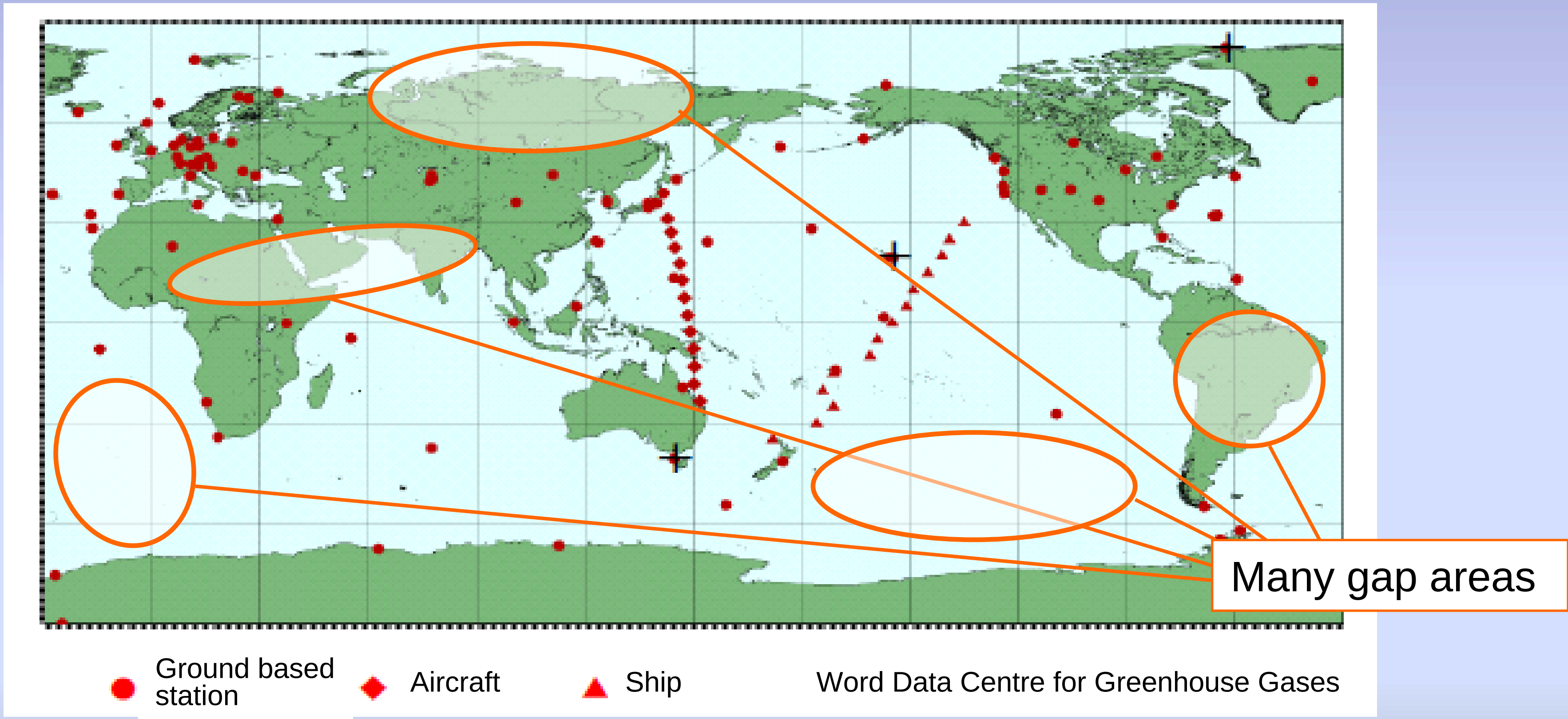
The WDCGG is now testing the check method.

Ex. Statistical check using a standard deviation from climatology.
Threshold = Trend + Monthly Variation + Standard Deviation

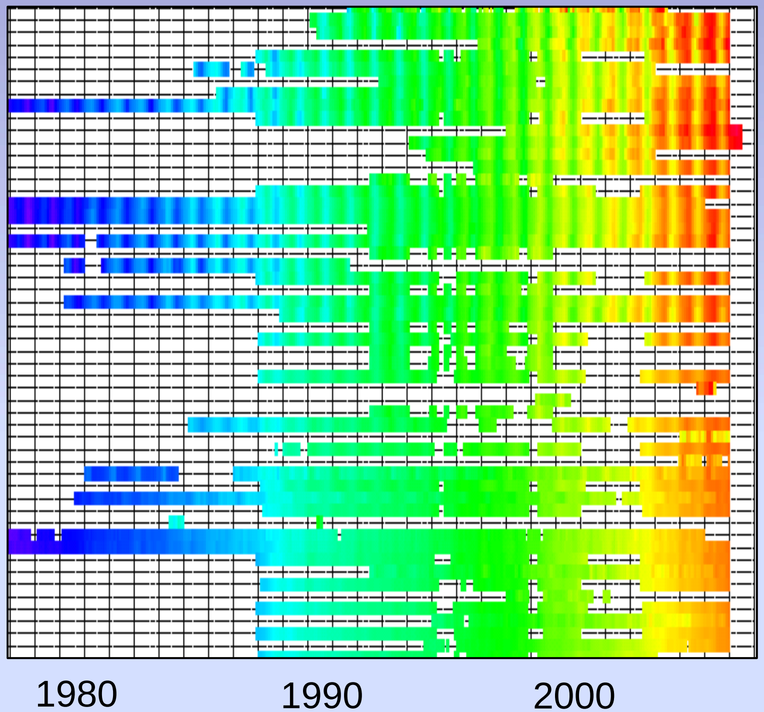
The WDCGG has begun to communicate with some stations.
However, we are now accumulating cases to be checked.

5. Global Analysis Method in the WDCGG

Problem for GAW observation network for greenhouse gases

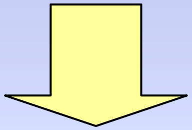


Problems of observation data



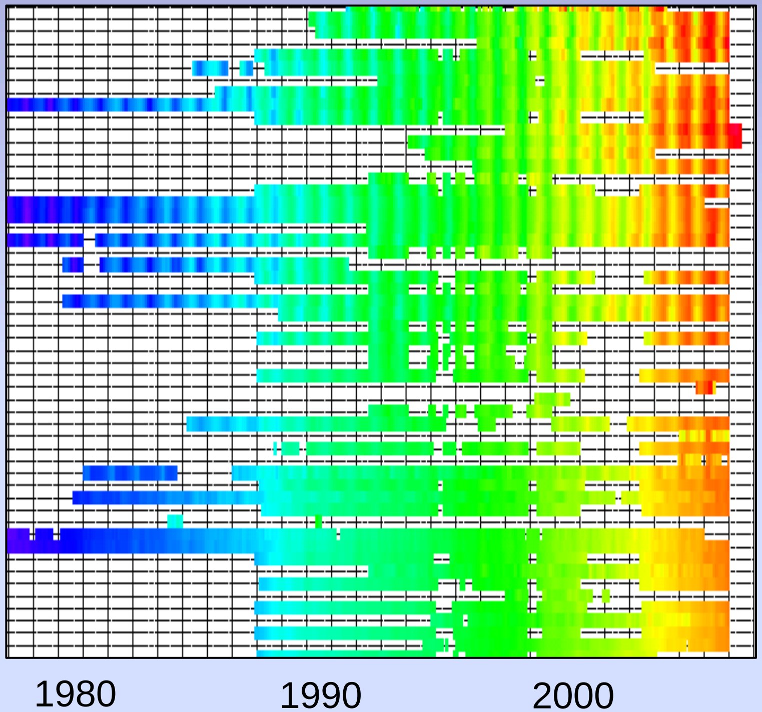
Monthly mean CO_2 data history for all sites.
The sites are set from north to south.

1. Many sites have data gaps during observation period.
2. Observation periods every site are not synchronized



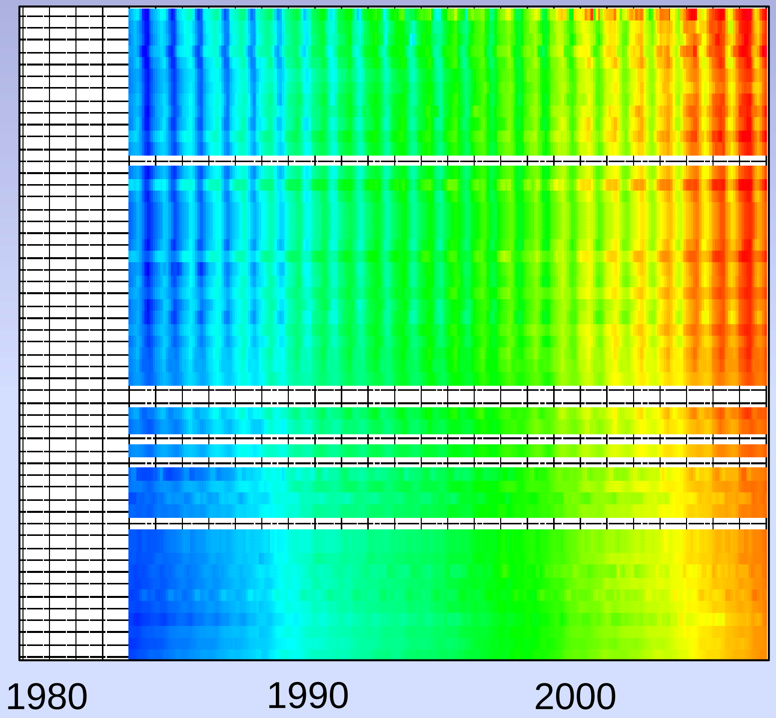
- Therefore, we cannot perform global analyses because station number or station data number have different weights in regions and periods.

A synchronized dataset without no observation gap



Submitted (original) dataset

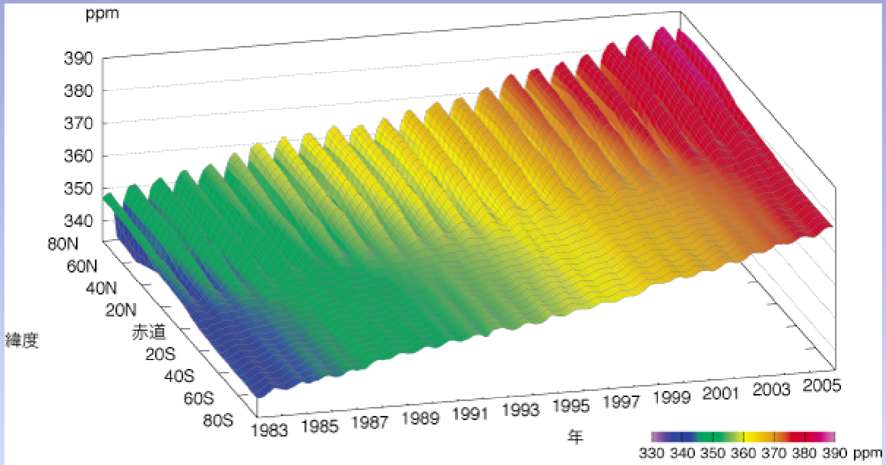
Mathematical method



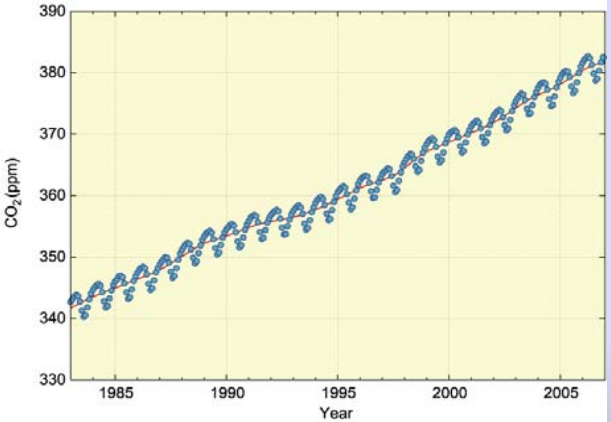
A synchronized dataset without no observation gaps is produced by the WDCGG

This dataset enable us to calculate global statistics.

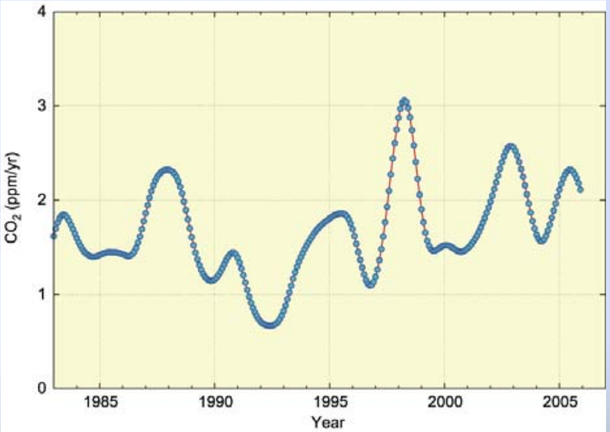
Current analyses on global greenhouse gases



Variation of zonally averaged monthly mean CO_2 mixing ratios (CO_2 carpet)



Global mean CO_2 mole fractions （ppm）

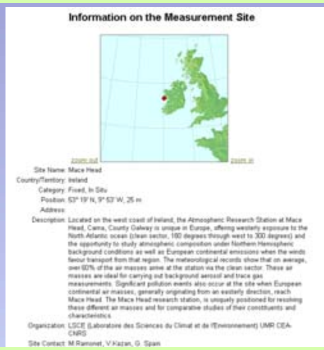


Global mean CO_2 growth rate （ppm/year）

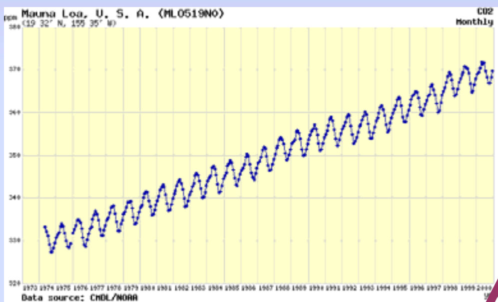
6. Products by the WDCGG

Contents in the WDCGG Website

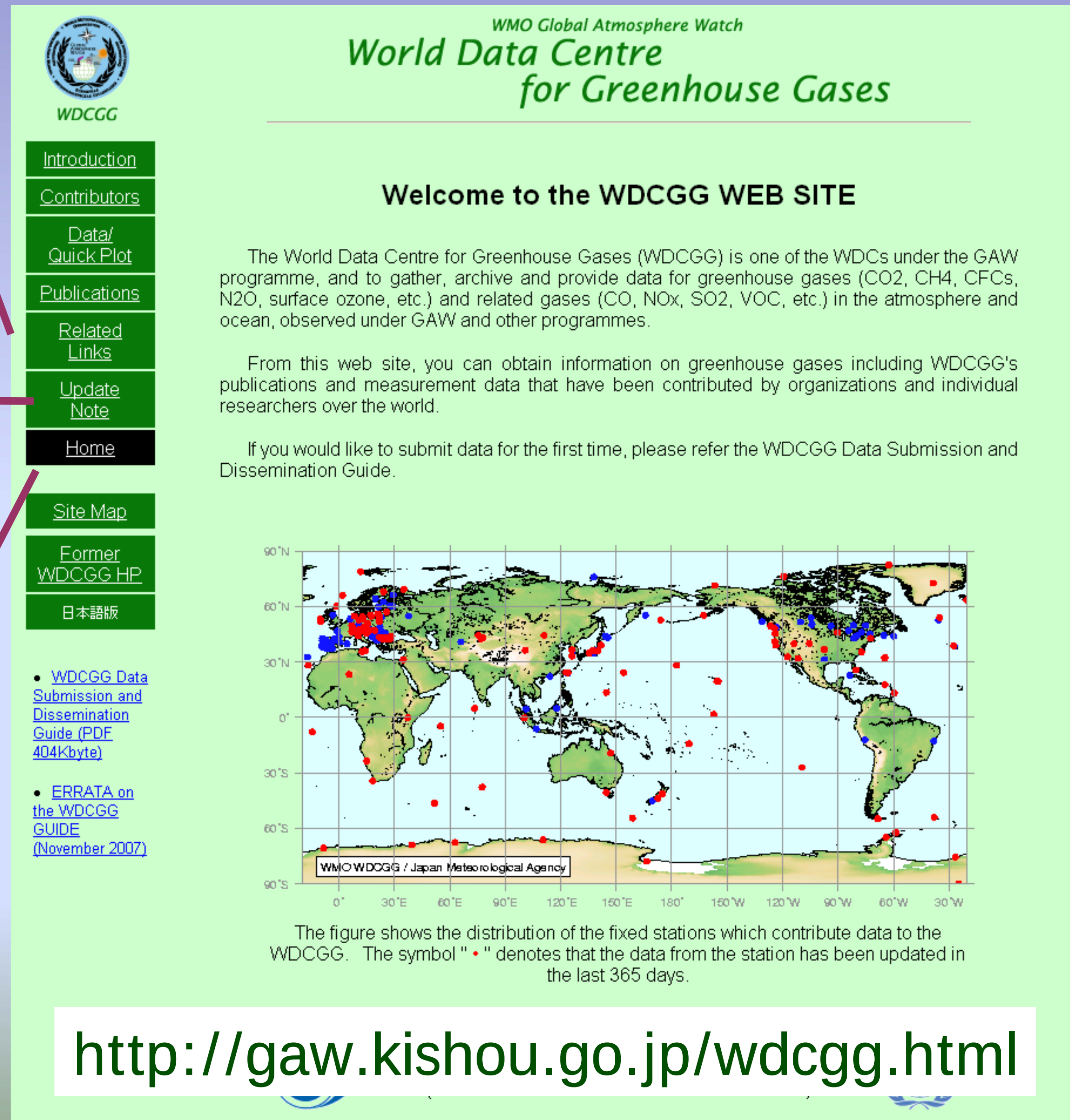
Searchable Station Directory & Metadata



Online Data Search & Plot

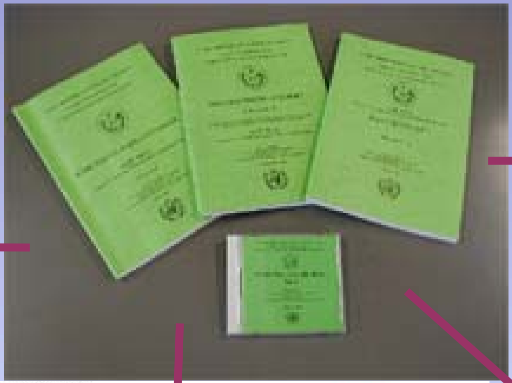


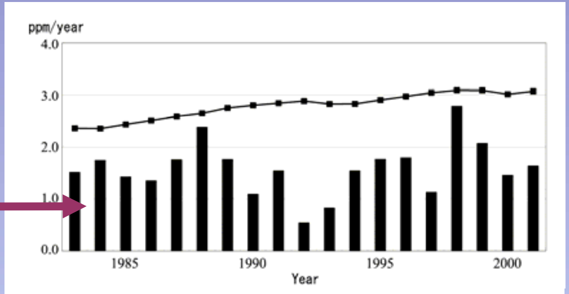
Downloadable Data & Publications



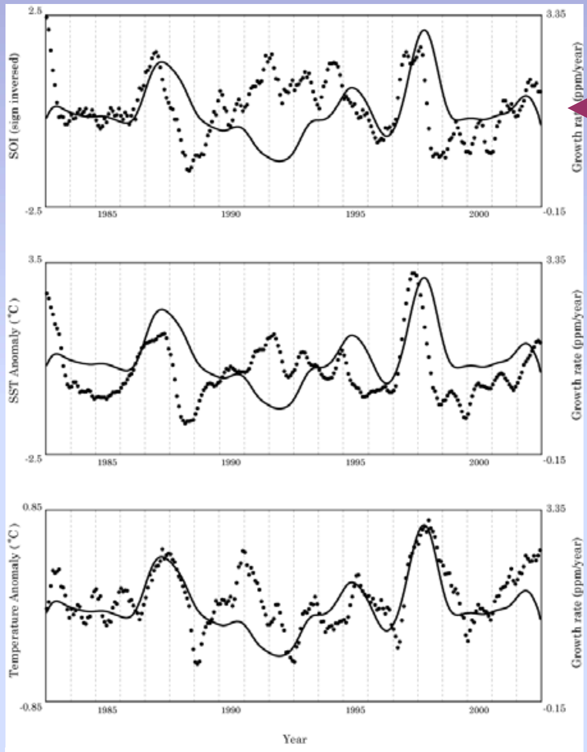
http://gaw.kishou.go.jp/wdcgg.html

Contents in the WDCGG Data Summary

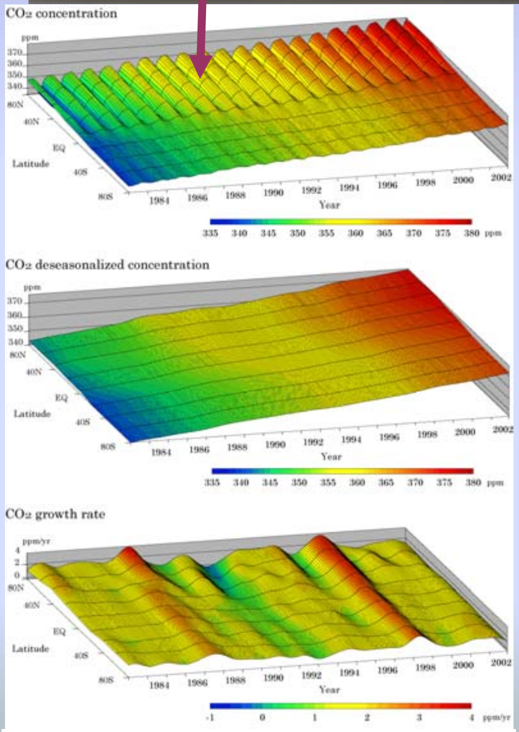




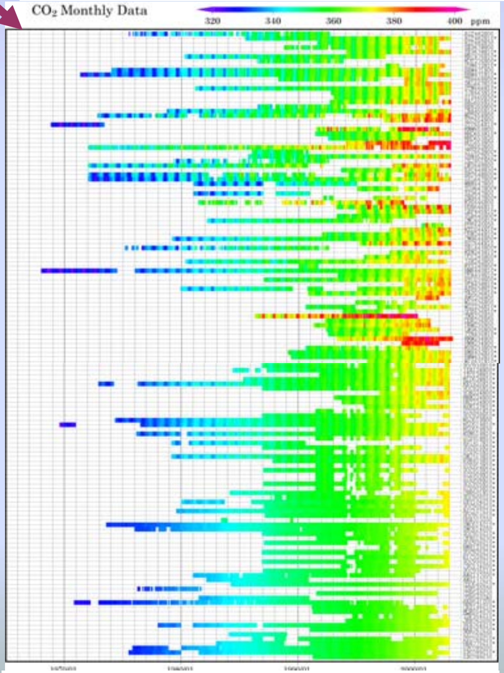
Time series of observed annual mean CO_2 growth rate in the atmosphere and its comparison with estimated growth rate from anthropogenic emissions. CO_2 Emissions were calculated by CDIAC based on the United Nations Energy Statistics.



Correlations of CO_2 growth rate in tropics and SOI, SST in the east equatorial Pacific and temperature anomaly of 1000 hPa on land in the tropics.

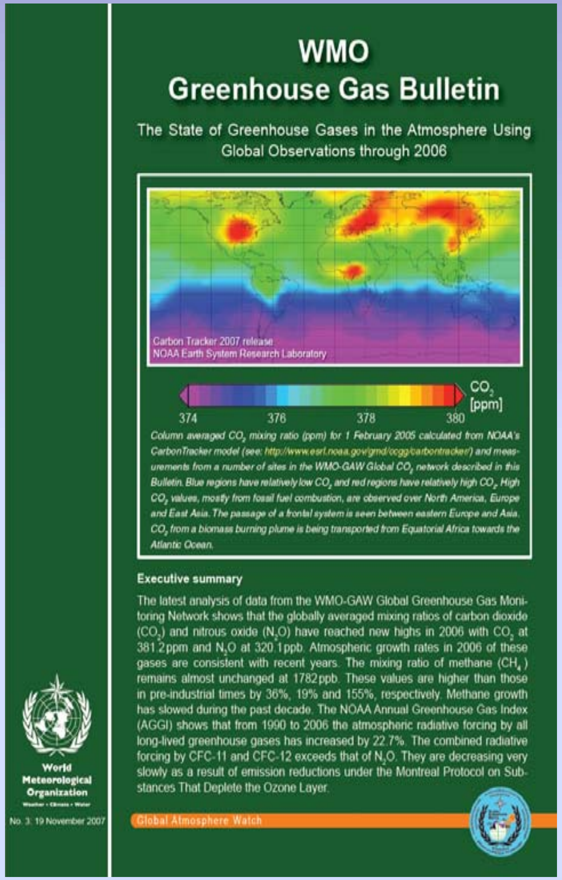


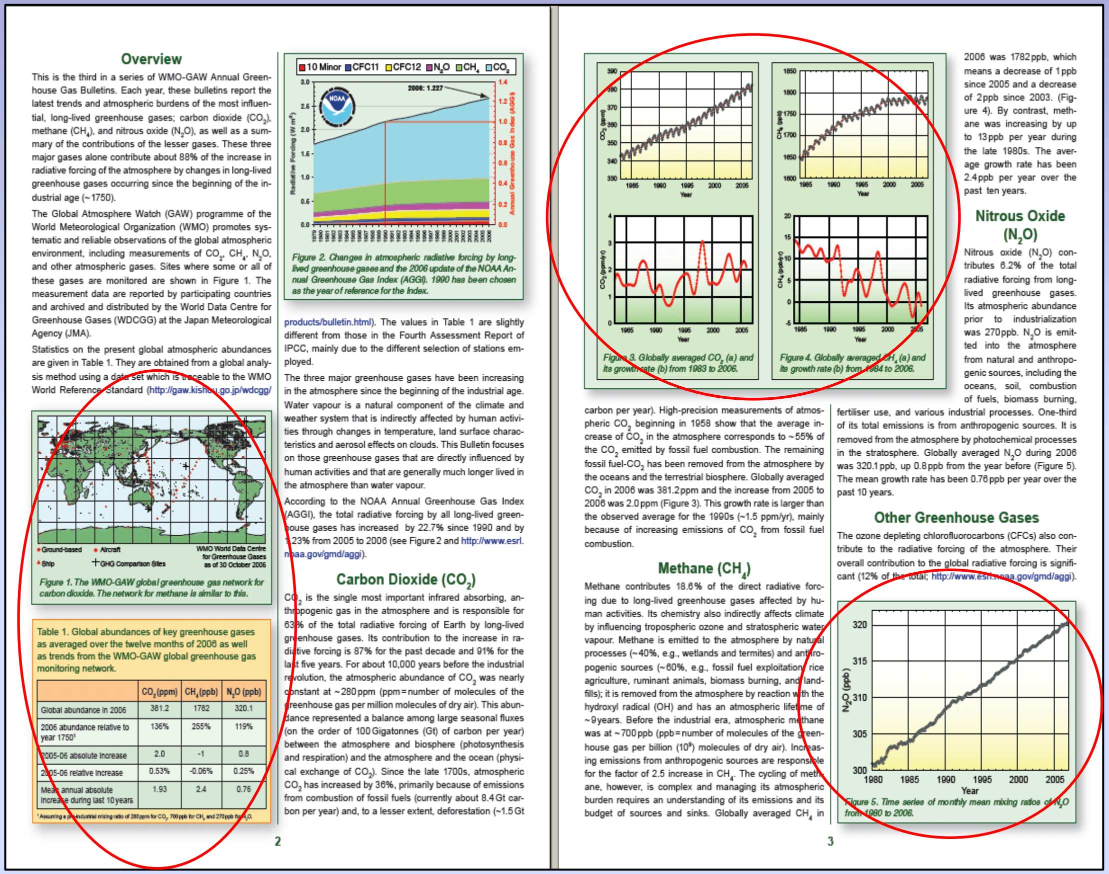
Three dimensional representations of latitudinal distributions of concentrations (CO_2 carpet).



Monthly data history for all stations reported the the WDCGG. Concentrations are illustrated in colors.

WMO Greenhouse Gas Bulletin





The WDCGG produces some of the contents in the Bulletin.

WDCGG

WMO Global Atmosphere Watch

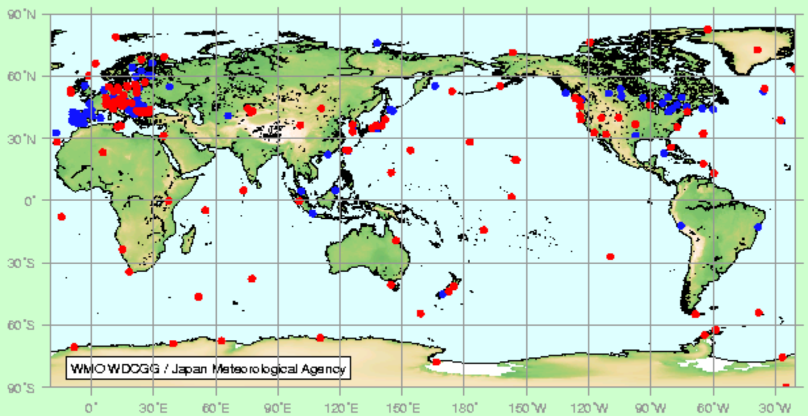
World Data Centre for Greenhouse Gases

- Introduction
- Contributors
- Data/ Quick Plot
- Publications
- Related Links
- Update Note
- Home
- Site Map
- Former WDCGG HP
- 日本語版

- WDCGG Data Submission and Dissemination Guide (PDF 404Kbyte)
- ERRATA on the WDCGG GUIDE (November 2007)

Welcome to the WDCGG WEB SITE

Thank you



The figure shows the distribution of the fixed stations which contribute data to the WDCGG. The symbol " • " denotes that the data from the station has been updated in the last 365 days.

This site is maintained by the Japan Meteorological Agency in cooperation with the World Meteorological Organization (Created : 2001/07/02 Modified : 2007/11/26)

Solution

- Continuous observation data are decomposed into a seasonal variation and a long-tern trend by Fourier polynomials.
- A linear line is interpolated as a trend during data gaps, and the seasonal variation is superimposed on the trend. As a result, the monthly variations during data gaps are retrieved.
- For synchronizing data period, the long-term trend is extrapolated along with an averaged trend derived from the stations within the same latitudinal band. The monthly variations are retrieved after superimposing a seasonal variation.