


Data of Greenhouse Gases by CONTRAIL Project

1. IDENTIFICATION INFORMATION

Name	Data of Greenhouse Gases by CONTRAIL Project
Metadata Identifier	CONTRAIL_GHG_NIES_MRI20230727073822-DIAS20221121113753-en

2. CONTACT

2.1 CONTACT on DATASET

Name	Toshinobu MACHIDA
Organization	Center for Global Environmental Research, National Institute for Environmental Studies
Address	Onogawa 16-2, Tsukuba, Ibaraki, 305-8506, Japan
TEL	+81-29-850-2525
E-mail	tmachida@nies.go.jp

2.2 CONTACT on PROJECT

2.2.1 Data Integration and Analysis System

Name	DIAS Office
Organization	Japan Agency for Marine-Earth Science and Technology
Address	3173-25, Showa-Cho, Kanazawa-ku, Yokohama-shi, Kanagawa, 236-0001, Japan
E-mail	dias-office@diasjp.net

3. DOCUMENT AUTHOR

Name	Toshinobu MACHIDA
Organization	Center for Global Environmental Research, National Institute for Environmental Studies
E-mail	tmachida@nies.go.jp

4. DATASET CREATOR

Name	Toshinobu MACHIDA
Organization	Center for Global Environmental Research, National Institute for Environmental Studies

E-mail	tmachida@nies.go.jp
--------	---------------------

Name	Hidekazu MATSUEDA
Organization	Oceanography and Geochemistry Research Department, Meteorological Research Institute
E-mail	hmatsued@mri-jma.go.jp

Name	Yosuke SAWA
Organization	Oceanography and Geochemistry Research Department, Meteorological Research Institute
E-mail	ysawa@mri-jma.go.jp

Name	Yosuke NIWA
Organization	Center for Global Environmental Research, National Institute for Environmental Studies
E-mail	niwa.yosuke@nies.go.jp

5. DATE OF THIS DOCUMENT

2023-07-27

6. DATE OF DATASET

creation : 2016-01-22

7. DATASET OVERVIEW

7.1 Abstract

The first phase of the JAL project from 1993 to 2005 was carried out using an automated flask sampling system to obtain a long-term record of CO₂ and other trace gases in upper troposphere. The CO₂ record over the western Pacific has provided valuable information on the latitudinal distribution of the atmospheric CO₂ seasonal cycle and on the inter-annual variation of long-term increasing trends in the upper troposphere of both the Northern and Southern Hemispheres (Matsueda et al., 2002).

For the second phase of the JAL project (Comprehensive Observation Network for TRace gases by AirLiner: CONTRAIL), an improved Automatic air Sampling Equipment (ASE) for flask sampling and a new Continuous CO₂ Measuring Equipment (CME) for in-situ CO₂ measurements were installed on Boeing 747-400 (retired), Boeing 777-200ER and Boeing 777-300ER aircraft. In all, one or both of these instruments have been installed on several Boeing aircraft operated by JAL with regular flights from Japan to Australia, Europe, East, South and Southeast Asia, Hawaii, and North America, providing significant spatial coverage, particularly in the Northern Hemisphere (Machida et al., 2008; Sawa et al., 2012; Matsueda et al., 2015).

7.2 Topic Category(ISO19139)

climatologyMeteorologyAtmosphere

7.3 Temporal Extent

Begin Date	2005-11-05
------------	------------

End Date	Under Continuation
----------	--------------------

7.4 Geographic Bounding Box

North latitude	bound	75
West longitude	bound	-180
Eastbound longitude		180
South latitude	bound	-35

7.5 Grid

7.6 Geographic Description

7.7 Keywords

7.7.1 Keywords on Dataset

Keyword Type	Keyword	Keyword thesaurus Name
theme	Atmosphere > Atmospheric Chemistry > Carbon and Hydrocarbon Compounds > Carbon Dioxide, Atmosphere > Atmospheric Chemistry > Carbon and Hydrocarbon Compounds > Methane	GCMD_science

7.7.2 Keywords on Project

7.7.2.1 Data Integration and Analysis System

Keyword Type	Keyword	Keyword thesaurus Name
theme	DIAS > Data Integration and Analysis System	No_Dictionary

7.8 Online Resource

CONTRAIL project (NIES) : <http://www.cger.nies.go.jp/contrail/index.html>

CONTRAIL project (JAL) : <http://www.jal.com/ja/csr/environment/social/detail01.html>

WDCGG Data (Japanese) : <http://ds.data.jma.go.jp/gmd/wdcgg/cgi-bin/wdcgg/catalogue.cgi?lang=JP>

WDCGG Data (English) : <http://ds.data.jma.go.jp/gmd/wdcgg/cgi-bin/wdcgg/catalogue.cgi>

7.9 Data Environmental Information

7.10 Distribution Information

name	version	specification
------	---------	---------------

8. DATA PROCESSING

9. DATA REMARKS

10. DATA POLICY

10.1 Data Policy by the Data Provider

The CONTRAIL project is being jointly conducted by NIES, the MRI, JAL, JAMCO and JAL Foundation. The CONTRAIL Database contains all the CO2 data measured by CME, as well as the information from the aircraft data system (aircraft position, temperature, wind direction and wind speed).

The data was processed and checked by the following Principal Investigators (PIs), before being submitted to the Database.

Toshinobu Machida (NIES) & < tmachida(at)nies.go.jp >

Hidekazu Matsueda (MRI) & < hmatsued(at)mri-jma.go.jp >

Yousuke Sawa (MRI) & < ysawa(at)mri-jma.go.jp >

Yosuke Niwa (NIES) & < niwa.yosuke(at)nies.go.jp >

If you want to use CONTRAIL datasets in your research, please contact Toshinobu Machida by e-mail with your name, affiliation, institute, mail address, and a brief description of your research project as well as the data you are requesting (period, area, vertical or horizontal, etc.). Once your request is accepted by the PIs, they will provide you with the available datasets for your research.

Before using CONTRAIL data in a presentation or publication, please contact the PIs to discuss the results as well as co-authorship and collaboration. In any case of presentation and publication, the data source from the CONTRAIL project and our publication should be cited. Distribution of the CONTRAIL data to a third person is prohibited.

10.2 Data Policy by the Project

10.2.1 Data Integration and Analysis System

If data provider does not have data policy, DIAS Terms of Service (<https://diasjp.net/en/terms/>) and DIAS Privacy Policy (<https://diasjp.net/en/privacy/>) apply.

If there is a conflict between DIAS Terms of Service and data provider's policy, the data provider's policy shall prevail.

11. LICENSE

12. DATA SOURCE ACKNOWLEDGEMENT

12.1 Acknowledge the Data Provider

12.2 Acknowledge the Project

12.2.1 Data Integration and Analysis System

If you plan to use this dataset for a conference presentation, paper, journal article, or report etc., please include acknowledgments referred to following examples. If the data provider describes examples of acknowledgments, include them as well.

” In this study, [Name of Dataset] provided by [Name of Data Provider] was utilized. This dataset was also collected and provided under the Data Integration and Analysis System (DIAS), which was developed and operated by a project supported by the Ministry of Education, Culture, Sports, Science and Technology. ”

13. REFERENCES

Matsueda, H., H.Y. Inoue, and M. Ishii (2002), Aircraft observation of carbon dioxide at 8-13 km altitude over the western Pacific from 1993 to 1999. *Tellus*, 54B, 1-21.

Machida, T., H. Matsueda, Y. Sawa, Y. Nakagawa, K. Hirotsu, N. Kondo, K. Goto, N. Nakazawa, K. Ishikawa and T. Ogawa (2008), Worldwide measurements of atmospheric CO₂ and other trace gas species using commercial airlines, *J. Atmos. Oceanic Technol.*, 25(10), 1744-1754, doi:10.1175/2008JTECHA1082.1.

Sawa, Y., T. Machida, and H. Matsueda (2012), Aircraft observation of the seasonal variation in the transport of CO₂ in the upper atmosphere, *J. Geophys. Res.*, 117(D05305), doi:10.1029/2011JD016933.

Matsueda, H., T. Machida, Y. Sawa, Y. Niwa (2015), Long-term change of CO₂ latitudinal distribution in the upper troposphere, *Geophys. Res. Lett.*, 42, doi:10.1002/2014GL062768.