NIES-GOSAT2-SYS-20240201-017-00

Release Note

GOSAT-2 L4B Global CO_2 Distribution Product

Product version 01.02

March 2024

National Institute for Environmental Studies
GOSAT-2 Project

Revision History

Version	Revised	Page	Description
00	Mar. 2024	-	-

1 Introduction

The purpose of this document is to provide considerations for the Greenhouse gases Observing SATellite-2 (hereinafter referred to as “GOSAT-2”) products generated by the National Institute for Environmental Studies, Japan.
The product and its version described in this document are listed in Table 1-1.

Table 1-1 Product and version

Product name	Product version
GOSAT-2 L4B Global CO_2 Distribution Product	01.02

2 Difference from previous version

The difference between the previous version (01.01) and this version (01.02) is shown as follows:

2.1 Change of processing algorithm

There is no change in the processing algorithm for generating this product.

2.2 Change of input data

The change in the input data is shown as follows:

(1) GOSAT-2 L4A Global CO_2 Flux Product as the input data was updated. For more information, refer to the release note of GOSAT-2 L4A Global CO_2 Flux Product (NIES-GOSAT2-SYS-20240201-015-00).

2.3 Change of file format

The change in the file format of the product is shown as follows:

(1) Newly added the following variable.
- Near surface CO_2 concentration (conc_sfc)

3 Important information

The important information for this version is shown as follows:

(1) The L4 product version corresponding to this version is shown below.
- GOSAT-2 L4A Global CO_2 Flux Product: 01.02

(2) The atmospheric tracer transport model used in this version is shown below.
- NISMON-CO_2 (Non-hydrostatic Icosahedral Atmospheric Model (NICAM)-based Inverse Simulation for Monitoring CO_2)

(3) The period covered in this version is shown below.
- 13 months from October 2019 to October 2020

(4) The variables to be released in this version are shown below.
- Instantaneous values of the atmospheric CO_2 concentrations (mol mol^{-1}) every 6 hours (00, 06, 12, and 18 (UTC)) at 17 atmospheric pressure levels (975, 925, 900, 850, 700, 600, 500, 400, 300, 250, 200, 150, 100, 70, 50, 30, and 10 hPa) and near the surface for 2.5 degree horizontal resolution, as well as surface pressure (hPa)

(5) For the analyzed period of 13 months, instantaneous values of the atmospheric concentrations in the GOSAT-2 L4B CO_2 Distribution Product were compared with the observational data at 4 selected ground-based observation sites, prepared by Observation Package (ObsPack) Data Products (ver. obspack co2 1 GLOBALVIEWplus v7.0): Alert, Canada (82.28°N, 62.30°W); Barrow, AK, USA (71.32°N, 156.61°W); South Pole, Antarctica (90.00°S, 59.00°E); and Mauna Loa, HI, USA (19.54°N, 155.58°W) (Figure 3-1). Atmospheric concentration estimates corresponding to the sampling date and time at each site were calculated by interpolating the model estimates at model grid points being adjacent to the site in horizontal, vertical and time directions. The GOSAT-2 L4B CO_2 Distribution Product reproduced the observed variability of atmospheric concentrations with the mean of differences and their standard deviations: -2.2 ± 5.6, -1.9 ± 6.2, 0.5 ± 1.1, and -1.5 ± 2.5 ppm, respectively, for Alert, Barrow, South Pole, and Mauna Loa.

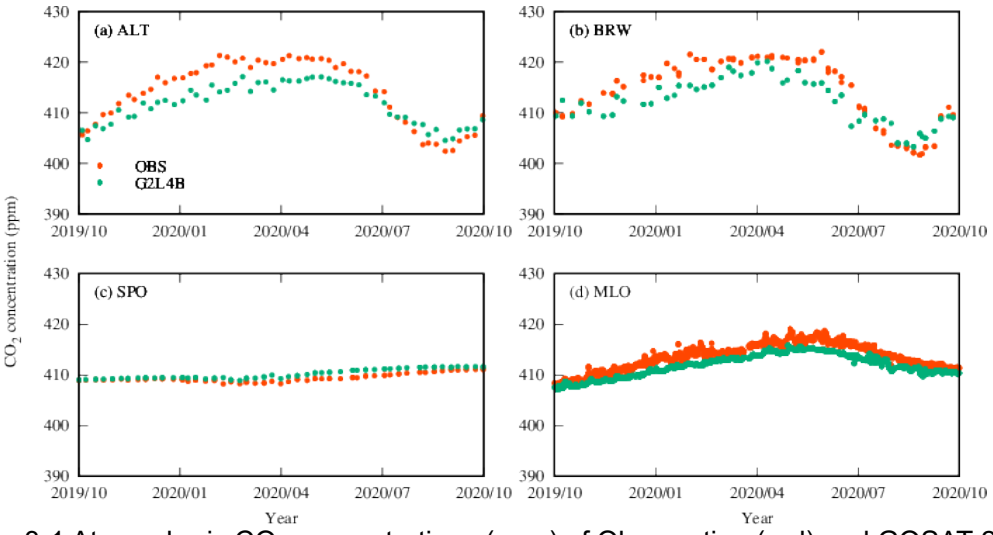

Figure 3-1 Atmospheric CO_2 concentrations (ppm) of Observation (red) and GOSAT-2 L4B product at 4 selected sites, (a) Alert, (b) Barrow, (c) South Pole, and (d) Mauna Loa

4 Version upgrade history

The version upgrade history of the product described in this document is shown in Table 4-1.

Table 4-1 Version upgrade history

Product version	Date	Remarks
01.01	Oct. 2022	Released to RA users
01.02	Mar. 2024	Changed input data Changed file format Changed important information Released to General users

Acknowledgement

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