NIES-GOSAT2-SYS-20251215-022-00

NIES GOSAT-2
Product File Format Descriptions
(Product edition)

Vol.9

GOSAT-2 L4A Global CH_4 Flux Product

December 2025

National Institute for Environmental Studies
GOSAT-2 Project

Revision History

Version	Revised	Page	Description
00	Dec. 2025	-	-

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1 Introduction

1.1 Purpose

The purpose of this document is to define the file format of GOSAT-2 L4A Global CH_4 Flux Product which is one of the Greenhouse gases Observing SATellite-2 (hereinafter referred to as “GOSAT-2”) products generated by the National Institute for Environmental Studies, Japan.

1.2 Product and version

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 L4A Global CH_4 Flux Product	01.01

2 GOSAT-2 L4A Global CH_4 Flux Product

(1) Product description

GOSAT-2 L4A Global CH_4 Flux Product stores monthly global CH_4 surface fluxes estimated from atmospheric CH_4 concentration data such as GOSAT-2 TANSO-FTS-2 SWIR L2 column-averaged dry-air mole fraction product (CH_4).

(2) Main contents

CH_4 surface flux (1.0-degree mesh, monthly)

(3) Category

Standard

(4) Unit

Annually

(5) Format

NetCDF

(6) File naming convention

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
G	O	S	A	T	2	Y	Y	Y	Y	M	M	y	y	y	y	m	m	_	4	A	C	H	4	F	V	M	M	N	N	R	R	o	o	o	o	.	n	c

GOSAT2: Satellite name (Fixed)
YYYYMM: Start month of flux estimation (Year, Month) (UTC)
yyyymm: End month of flux estimation (Year, Month) (UTC)
4A: Processing level (Fixed)
CH4F: Product code (Fixed)
V: Processing identifier (V: Steady, T: Test), added as necessary
MMNN: Product version (MM: Major version, NN: Minor version)
RR: Revision
oooo: Input data version
nc: Extension (Fixed)

(7) File size

Approx. 16 MB

3 File format

3.1 Components

The components of the product are shown in Table 3-1.

Table 3-1 Components of GOSAT-2 L4A Global CH_4 Flux Product

Dimensions	• Number of grid points along the longitudes • Number of grid points along the latitudes • Number of time steps
Variables	• Longitude • Latitude • Time • *A priori* anthropogenic CH_4 emissions except for rice paddy CH_4 flux • *A priori* rice paddy CH_4 flux • *A priori* wetland CH_4 flux • *A priori* natural CH_4 flux • *A priori* biomass burning CH_4 flux • *A priori* soil oxidation CH_4 flux • *A posteriori* total surface CH_4 flux

The special mention about “Variables” above is shown as follows:

- Time
  A day at the middle of the month, at 00:00:00, is given for indicating “Time” of the month.

- *A posteriori* total surface CH_4 flux
  A posteriori total surface CH_4 flux (flux_apos_tot) represents the sum of posterior fluxes from anthropogenic emissions, rice paddies, wetlands, soil oxidation, biomass burning, and other natural sources.

3.2 File format details

The file format details of the product are shown in Table 3-2.

Table 3-2 File format details of GOSAT-2 L4A Global CH_4 Flux Product

Dimensional variable / Data variable / Global attribute	Dimension	Attribute		Data type	Variable name / Global attribute name	Description
		Attribute name	Content			
dimensions						
lon	-	-	-	-	Number of grid points along the longitudes	360
lat	-	-	-	-	Number of grid points along the latitudes	180
time	-	-	-	-	Number of time steps	Number of monthly data
variables						
lon	lon	units	degrees_east	float	Longitude	East longitude as positive, west longitude as negative
		standard_name	longitude			
lat	lat	units	degrees_north	float	Latitude	North latitude as positive, south latitude as negative
		standard_name	latitude			
time	time	units	hours since YYYY-1-1 00:00:00	float	Time	Hour since 00:00:00 UTC on January 1st of the respective year
		standard_name	time			
flux_apri_anth	lat, lon	units	mg CH4 m-2 day-1	float	A priori anthropogenic CH4 emissions except for rice paddy CH4 flux	Emission as positive
		missing_value	-9999.0			
		long_name	A priori anthropogenic emissions except for rice paddy flux			
flux_apri_ricep	time, lat, lon	units	mg CH4 m-2 day-1	float	A priori rice paddy CH4 flux	Emission as positive
		missing_value	-9999.0			
		long_name	A priori rice paddy flux			
flux_apri_wetl	time, lat, lon	units	mg CH4 m-2 day-1	float	A priori wetland CH4 flux	Emission as positive
		missing_value	-9999.0			
		long_name	A priori wetland flux			
flux_apri_nat	lat, lon	units	mg CH4 m-2 day-1	float	A priori natural CH4 flux	Emission as positive
		missing_value	-9999.0			
		long_name	A priori natural flux			
flux_apri_bmb	time, lat, lon	units	mg CH4 m-2 day-1	float	A priori biomass burning CH4 flux	Emission as positive
		missing_value	-9999.0			
		long_name	A priori biomass burning flux			
flux_apri_soilo	time, lat, lon	units	mg CH4 m-2 day-1	float	A priori soil oxidation CH4 flux	Absorption as positive
		missing_value	-9999.0			
		long_name	A priori soil oxidation flux			
flux_apos_tot	time, lat, lon	units	mg CH4 m-2 day-1	float	A posteriori total surface CH4 flux	Emission as positive, absorption as negative
		missing_value	-9999.0			
		long_name	A posteriori total surface CH4 flux			
global attributes						
title	-	-	-	char	Product name	GOSAT-2 L4A Global CH4 Flux Product
product_version	-	-	-	char	Product version	VMM.NN (MM: Major version, NN: Minor version)
source	-	-	-	char	Source data	TANSO-FTS-2 SWIR L2 Column-averaged Dry-air Mole Fraction Product VMM.NN (MM: Major version, NN: Minor version)
history	-	-	-	char	Data production date	YYYY-MM-DD
references	-	-	-	char	References	Reference information about the product
comment	-	-	-	char	Product description	Monthly global surface CH4 fluxes estimated from TANSO-FTS-2 SWIR L2 Column-averaged Dry-air Mole Fraction Product
institution	-	-	-	char	Data producing agency	National Institute for Environmental Studies
email	-	-	-	char	E-mail address	gosat-2_desk@nies.go.jp
Conventions	-	-	-	char	NetCDF Climate and Forecast Metadata Conventions	CF-1.6