

# **GOSAT Plugin**

## **User Manual**

**March 25,2025**

**Tellus Inc.**

## Table of Contents

1. [Software Overview](#)
2. [Operation confirmed environment](#)
3. [Setup procedure](#)
4. [Access to each menu](#)
5. [Setup Menu](#)
6. [Users Guide](#)
7. [Main Menu](#)
  - 7.1. [Search screen](#)
  - 7.2. [Analysis tools](#)
    - 7.2.1. [Global Mesh 2D Analysis Data Visualization Tool \(L3/L4A\)](#)
    - 7.2.2. [Global Mesh 3D Analysis Data Visualization Tool \(L4B\)](#)
    - 7.2.3. [Global Point Cloud 2D Observation Data Visualization Tool \(L2 SWIR\)](#)
    - 7.2.4. [Global Point Cloud 3D Observation Data Visualization Tool \(L2 TIR\)](#)
8. [Appendix](#)

## 1. Software Overview

- This software has been developed as a plugin for QGIS. With this plugin, users can search for data from GOSAT products available on Tellus, download data, and perform various analyses.
- The various APIs of Tellus require user registration and authentication. This plugin is designed for registered Tellus users who have obtained the necessary API tokens in advance.

## 2.Operation confirmed environment

- Windows10 64bit
- QGIS 3.34 LTR

Reference information for QGIS recommended environment(Japanese website)  
[https://qgis.mierune.co.jp/posts/howto\\_1\\_install\\_qgis](https://qgis.mierune.co.jp/posts/howto_1_install_qgis)

## 3.Setup procedure

[STEP 1] Download QGIS and GOSAT plugin

1. Download QGIS from [the QGIS download site](#)  
Operation of this plugin has been confirmed with QGIS Ver. 3.34LTR.

Reference information to download QGIS installer(Japanese website)  
[https://qgis.mierune.co.jp/posts/howto\\_1\\_install\\_qgis](https://qgis.mierune.co.jp/posts/howto_1_install_qgis)

2. Download the GOSAT plugin.  
Please check [the GOSAT Plugin Terms of Service](#) (Terms), and download the GOSAT Plugin ZIP file from the download URL listed at the bottom of the Terms.

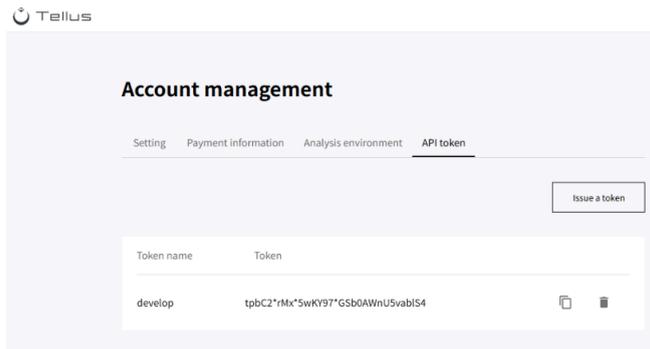
[STEP 2] Tellus account registration and Obtaining an API token

To use GOSAT plugin, you need to register for a Tellus account and issue an API token.

1. Tellus Account Registration(If you do not have a Tellus account)  
Please access the [Tellus official website](#) and register for a new account.

Please see the following page for details.  
[Register a Tellus Account | Guide to Tellus](#)

2. Obtaining an API token  
After creating an account on [the Tellus official website](#), go to “Account management”->”API token” to issue an API token.



Please see the following page for details.  
[How to issue an API Token](#)

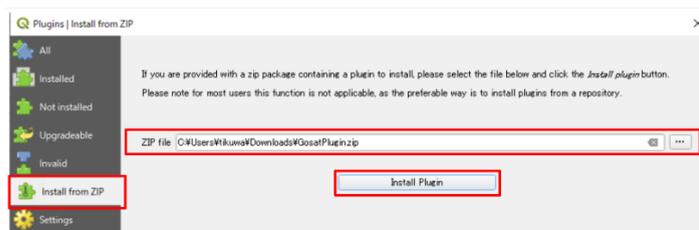
[STEP 3] Install GOSAT plugin and set up API token

1. Install GOSAT plugin  
 Install the QGIS plug-in, downloaded in [STEP 1], on QGIS.

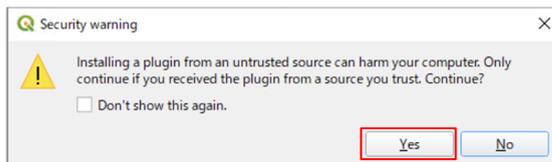
Start QGIS and click on “Plugins” -> “Manage and Install Plugins...” on the menu bar.



Click on “Install from ZIP”.



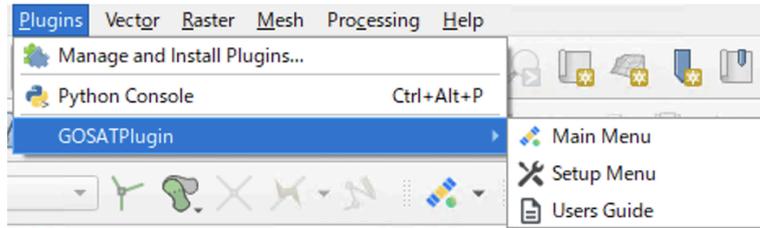
Select the GOSAT Plugin file named “GOSAT\_plugin.zip” and click “Install Plugin”.  
 \* If a security warning appears on screen during installation, please select "Yes."



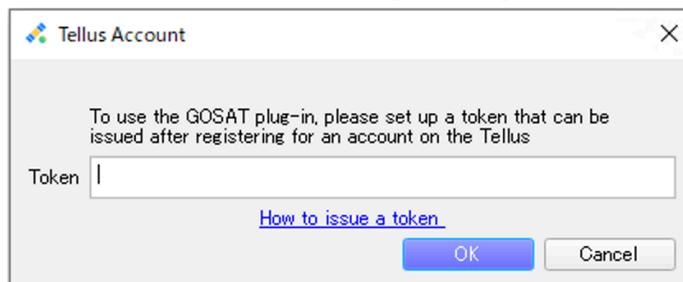
## 2. Setting the API Token

Set the API token issued in [STEP 2].

After installing the plugin, the “” icon will appear on the toolbar, and "GOSATPlugin" will be added to the "Plugins" section of the menu bar. Click the icon or the triangle next to "GOSATPlugin," then select "Setup Menu" from the displayed list of menu.



Enter the API token issued in [STEP 2] in the “Token” field and click the “OK”.



You can access the Tellus token settings screen from the "How to issue a token" . (Login to Tellus account is required.)

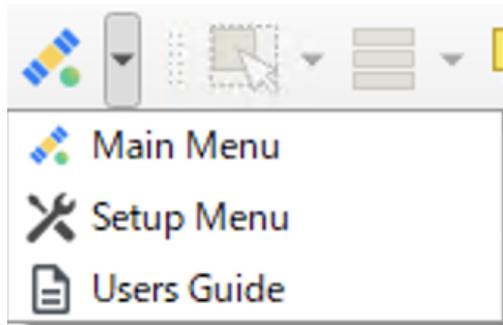
Now the setup is completed.

## 4. Access to each menu

### Toolbar

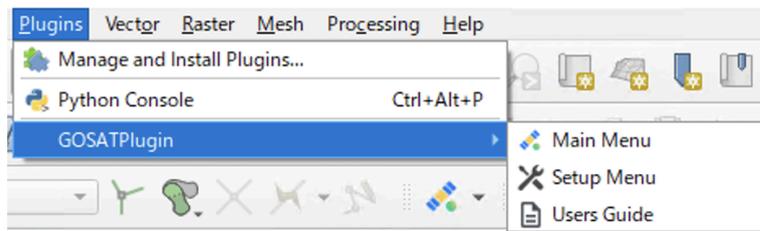
After installing the plugin, you can access each menu by clicking the triangle next to the “

” Icon in the toolbar.



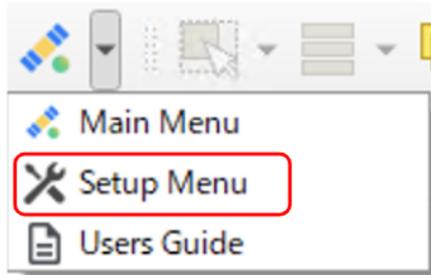
### Menu bar

You can also open each screen from the “Plugins” -> “GOSATPlugins” on the menu bar .

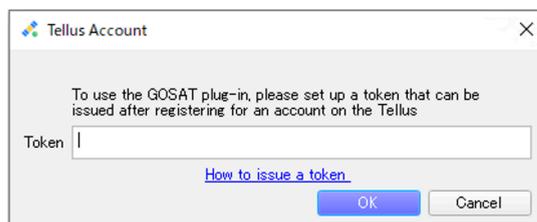


## 5.Setup Menu

Click on the "Setup Menu", and the token settings screen will open.



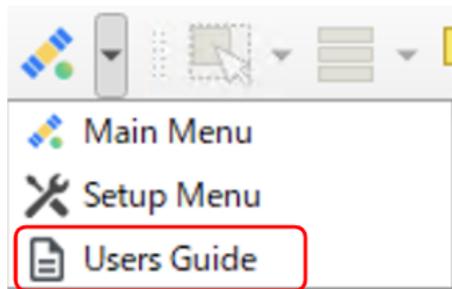
GOSAT plugin can be used by entering the API token issued in "3.Setup procedure". You can also reset it to a different token.



You can access the Tellus token settings screen from the "How to issue a token" . (Login to Tellus account is required.)

## 6.Users Guide

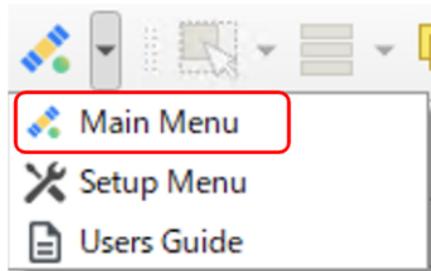
Click on the "Users Guide", and you can read the manual in your web browser.



## 7.Main Menu

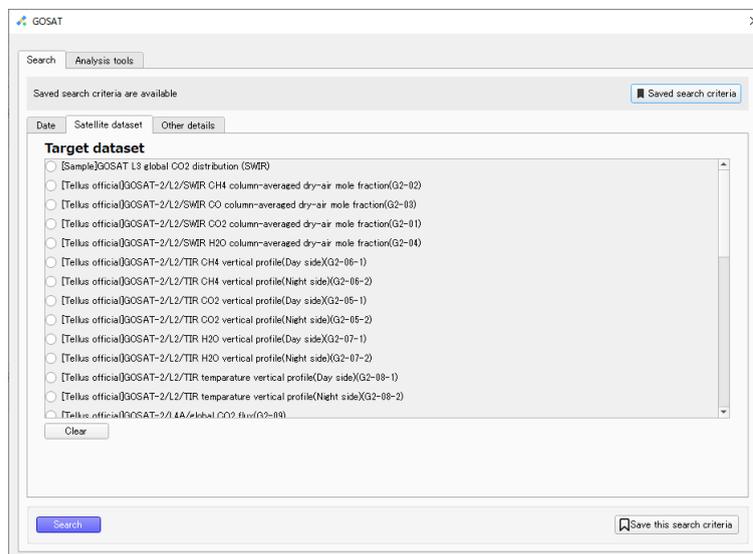
Open the "Main Menu", and the "Search" tab will be displayed.

Clicking the " " icon will also open the "Search" tab.



This screen is displayed in the forefront window of the QGIS map view.

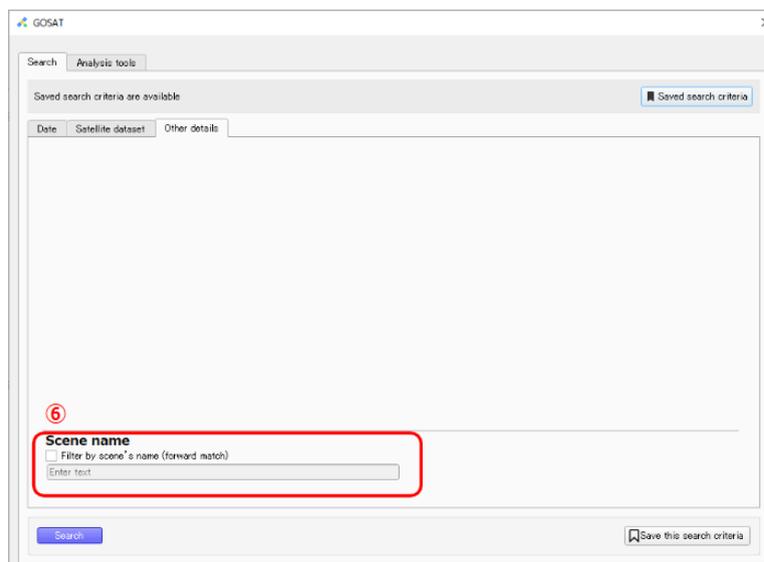
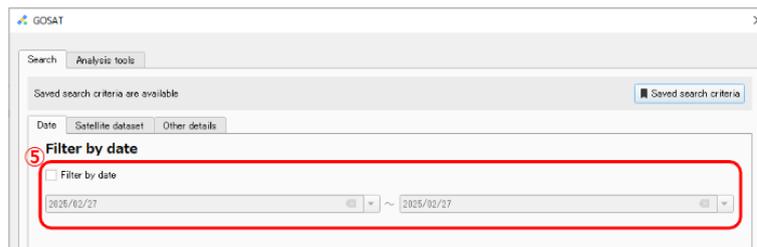
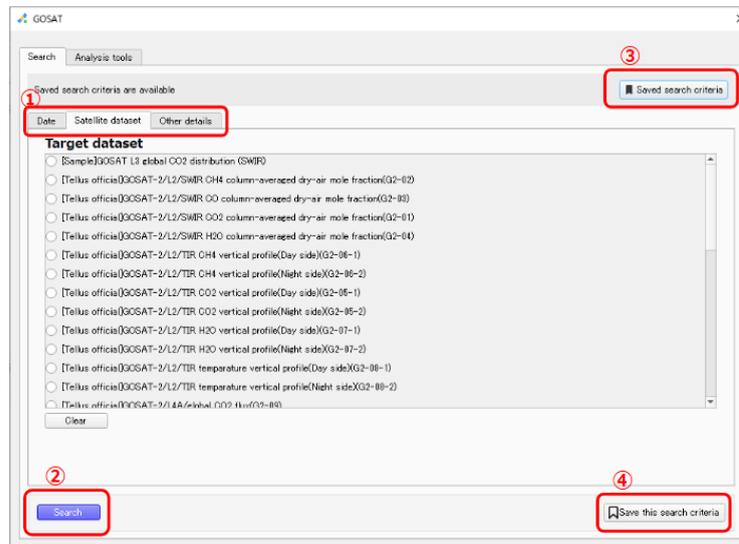
Selecting the "Satellite dataset" tab, it will display various GOSAT datasets provided by Tellus.



## 7.1. Search screen

You can filter and search the GOSAT dataset available on Tellus by date or scene name.

### Display of the “Search” tab



(1) "Date", "Satellite dataset", and "Other details" tabs

In the "Satellite Dataset" section, the list of datasets is retrieved using the Tellus API. You can also set filtering conditions for scene searches.

- You can set the filtering criteria from "Date", "Satellite dataset" and "Other details".
- Enter the "Date" directly or select it from the calendar.  
The default setting is no specification (not filtered by date).  
This setting is not required.
- In "Satellite Data Set," you can select a data set to search.  
\*You have to select one of the data sets to search.
- From the "Other details" tab, you can search the data by specifying the "Scene Name." The "Scene Name" can be found in the basic information of the search results or the scene details in Tellus Traveler. This setting is optional.

(2) "Search" button

This is to execute a scene search process using the entered search criteria.

Search results are displayed on [7.1.3. Scene List Screen and Map Specifications](#).

(3) "Save search criteria" button

This is to set a new search condition and overwrite the previous search condition.

The search condition will be saved on your Tellus account and shared in Tellus Traveler.

Please refer to [7.1.1. Save search criteria screen](#) for details.

(4) "Save this search criteria" button

This is to use, update, or delete saved search criteria.

Please refer to [7.1.2. Save search criteria list](#) for details.

(5) "Filter by date"

You can filter scenes by date.

The "Date" can be entered manually or selected from the calendar.

By default, no date is specified (Scenes are not filtered by date). This setting is optional.

(6) "Scene name"

You can filter scenes by scene name.

From the "Other details" tab, you can search the data by specifying the "Scene name."

The "Scene name" can be found from the General information of the search results or the scene details in Tellus Traveler. This setting is optional.

### 7.1.1. Save search criteria screen

When you click "Save this search criteria" on the Search screen, the following screen will appear.

```
{
  "datasets": [],
  "query": {},
  "intersects": {
    "epsg": "EPSG:4326"
  }
}
```

#### (1) Search criteria name

- You can set it up yourself.

#### (2) Email Notification Radio Button

- If you select "Notify by email (Once a day)", an email notification will be sent to the email address registered in your Tellus account whenever a scene matching your search criteria is added to Tellus.

#### (3) Details(JSON)

- The contents of this form are saved and can be edited manually.
- The current search conditions will be given in data output as JSON.
- The settings for "Date" and "Scene Name" will be reflected.
- In the "Overwrite" tab, you can enter conditions in the overwrite form.

#### (4) New save

- "Search criteria name" must be entered to save.

\*Search criteria saved in the GOSAT plugin will be shared in Tellus Traveler.

## 7.1.2. Save search criteria list



(1) You can check the Search criteria name and whether email notifications are enabled.

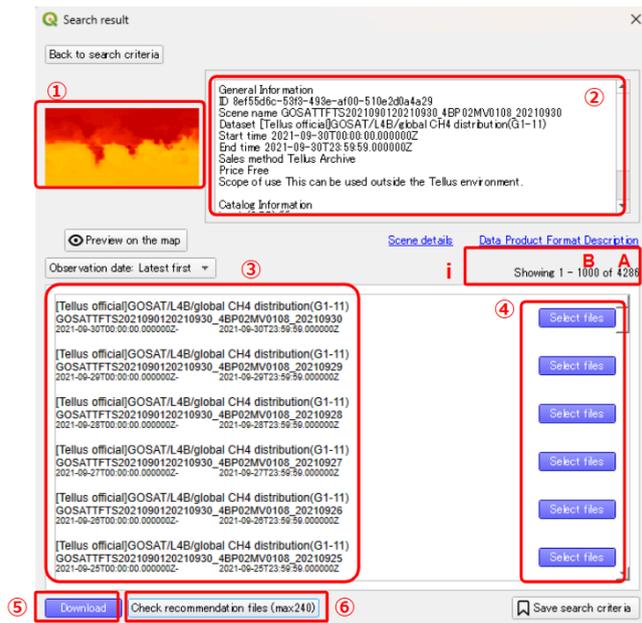
(2) Operation buttons for search conditions

- By Clicking "Use", the search conditions will be applied to the search condition screen.
  - If the search criteria set in Tellus Traveler include conditions that cannot be configured in the GOSAT plugin, only the criteria that can be set in the GOSAT plugin will be applied to the search.
- “” button is to edit the search condition.
- “” button is to open a dialog box to confirm deletion of the search condition.

\*Search criteria saved in Tellus Traveler are also reflected in “Save search criteria list”.

### 7.1.3. Scene List Screen and Map Specifications

The scene list is displayed when the search process is completed.



#### (1) Thumbnail image

- For GOSAT datasets, thumbnail images are displayed for datasets with processing levels L3, L4A, and L4B. However, thumbnails are not displayed for L2 data, as thumbnail display does not support vector data.

#### (2) General Information Display Area

- You can find general and catalog information about the scenes in Tellus. See [8.Appendix](#) for details.

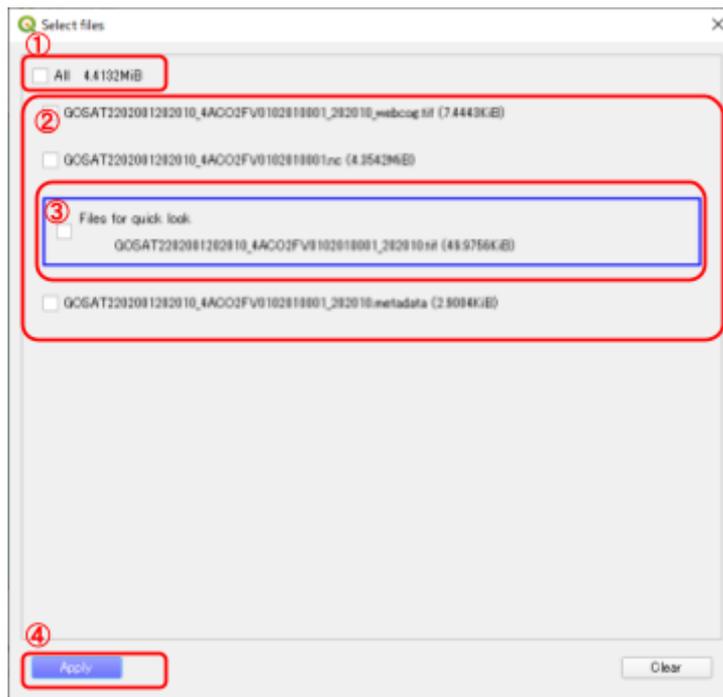
#### (3) Scene List

- A list of scenes that corresponds to the search criteria will be displayed.
  - You can also sort the datasets by the observation date, either in ascending or descending order.
- By clicking on an element in the list
  - The scene thumbnail in (1) will be updated.
  - The contents of the General information display area of (2) will be updated.
- An overview of the scene is displayed for each single element.
  - First line: Data setname
  - Second line: Scene name
  - Third line: Start time (observation start time) to End time (observation end time)
- i ) The maximum number of top B cases is 1,000 when displaying the top B cases out of A cases.

#### (4) "File Selection" Button

- Obtain a list of files to download from the API and input it in the download file selection dialog.

## Download file selection dialog



1. By clicking on "All", all checkboxes will be ticked.
2. Files related to the scene
  - You can also select metadata and thumbnails.
3. Recommended display files for those who want to take a first look
  - For processing level L2 (point cloud), FlatGeobuf format files (.fgb) are highlighted as the recommended display files.
  - For L3, L4A, and L4B (mesh), Cloud Optimized GeoTIFF (COG) format files (.tif) are highlighted as the recommended display files.
  - For L4B, four COG format files (6 hours each) per scene (one day) will be highlighted.
4. Determination of download target
  - You can click the "Apply" button only when you have selected one or more files.
  - You can check the number and size of the selected files.
  - Clicking "Clear" will deselect all selected files.

(5) "Download" Button

- The selected files for download will be downloaded sequentially.
- You can choose the destination folder for downloading files.

If You Want to pause the Download

- Pressing the "Back to Search criteria" button will suspend the ongoing file downloads.
  - If any files have already been downloaded, the process will proceed to complete downloads.
  - Files downloaded before the suspension will be saved. When re-downloading, modify the search conditions or delete existing downloaded files as needed before re-downloading.
- Once the download is complete, you can choose whether to display the data on the map. By selecting "Yes", it will display the data on the map. At this stage, the data on the map is in its pre-visualized state.
- \*The thumbnail image of (1) shows the image from Tellus Traveler.
- \*Due to API specifications, when downloading more than 50 items of data, a delay will be added to the download interval for each item.

(6) "Check recommendation files (max 240)" Button

- Automatically selects up to 240 analysis target files from the search results. If the search results contain more than 240 files, 240 files will be selected at equal intervals from the displayed results.
- To deselect all selections, click the button again.
- The L4B data of the 12:00 PM observation is selected from the four daily observation datasets.

\*If multiple Search Screens are launched and used for file selection, unexpected behavior may occur.

Please make sure that only one Search Screen is open when using Search Screens.

## 7.2. Analysis tools

After downloading the data, to use the tool for animation display or graphing, select one tool from the "Tool" dropdown under the "Analysis tools" tab.

### 7.2.1. Global Mesh 2D Analysis Data Visualization Tool (L3/L4A)

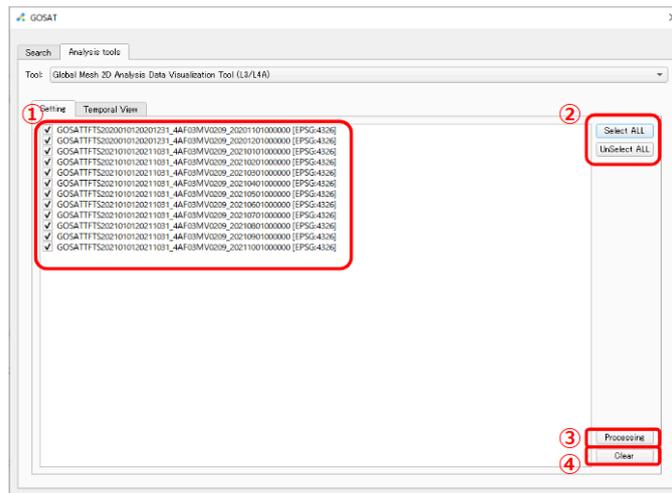
The tool can display a time-series animation of global mesh data showing the column-averaged mixing ratio data of CO<sub>2</sub> and CH<sub>4</sub>, as well as their flux distribution data. It also provides the graph of analytical values for specific points of interest (POI) or areas of interest (AOI).

#### Target dataset

You can visualize COG format files (.tif) of the following datasets.

- GOSAT
  - GOSAT/L3/SWIR global CO<sub>2</sub> distribution(G1-06)
  - GOSAT/L3/SWIR global CH<sub>4</sub> distribution(G1-07)
  - GOSAT/L4A/global CO<sub>2</sub> flux(G1-08)
  - GOSAT/L4A/global CH<sub>4</sub> flux(G1-09)
- GOSAT-2
  - GOSAT-2/L4A/global CO<sub>2</sub> flux(G2-09)

#### “Setting” tab



#### (1) Select files

- A list of data that can be processed with the tool will be displayed from the satellite data shown in the layers.
  - Check the files you want to visualize.
  - Only the scene name of the dataset to be analyzed will appear in the list.
  - If multiple types of datasets are included, animation will not be available.

#### (2) “Select All” “Unselect All”

- "Select All" is to select all the data displayed in ①.
- "Unselect All" is to unselect all the data displayed in ①.

(3) "Processing"

- In the "Temporal View", the data is displayed in chronological order with automatic color coding and animation settings.
- The display range and color ramp for each dataset are processed as follows.
- When re-displaying the animation or generating a graph after saving the project, please reprocess the data.

Dataset name	unit	Display range	Color comps
GOSAT/L3/SWIR global CO2 distribution(G1-06)	ppm	370 ~ 435	Turbo
GOSAT/L3/SWIR global CH4 distribution(G1-07)	ppm	1.6 ~2.05	Turbo
GOSAT/L4A/global CO2 flux(G1-08)	gC/m <sup>2</sup> /day	-5 ~ 5	blue-white-red
GOSAT/L4A/global CH4 flux(G1-09)	mgCH4/m <sup>2</sup> /day	-10 ~ 60	blue-white-red
GOSAT-2/L4A/global CO2 flux(G2-09)	gC/m <sup>2</sup> /day	-5.0 ~ 5.0	blue-white-red

Color coding of values for each data set



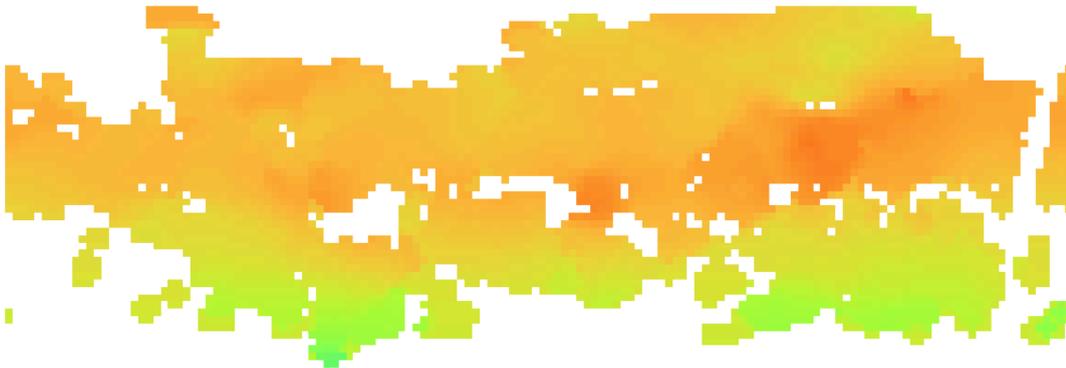
Color Ramp:Turbo



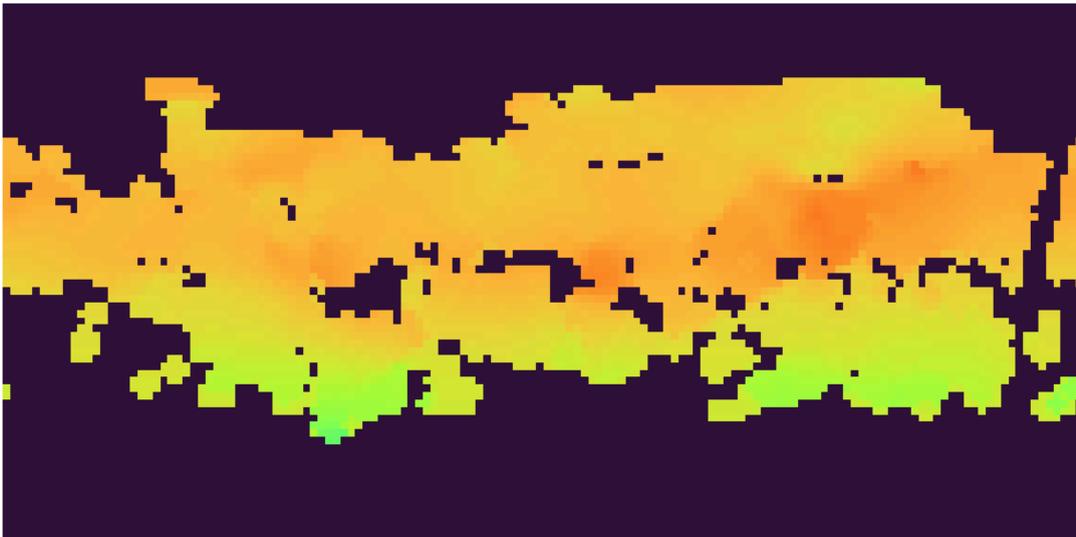
Color Ramp:blue-white-red

\*When the project is saved and restarted after processing, the areas with no data, which were transparent, are colored. In this case, select the colored file in the “Analysis Tools” screen again, and then execute “Processing”.

Before saving project



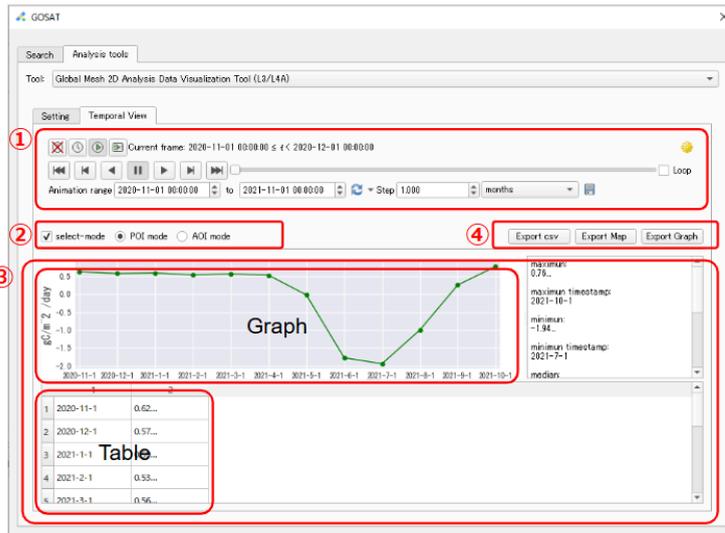
After saving and reopen project



(4) "Clear"

- The time series and other settings will be reset.

## "Temporal View" tab



### (1) Time Manager

- The “” icon disables animation display.
  - You can control the animation of a time series of data displayed on the map.
  - The animation time interval is automatically set for a month.
    - You can also change the time interval for the selected file.
    - Among the time interval settings, "source timestamps" cannot be used for animation with GOSAT data.
- The “” icon disables animation display.
- The “” icon allows you to change the start and end dates of the animation.
- The “” icon allows you to set the duration of the animation.

### (2) Select-mode

- By checking the box, you can select and acquire physical quantities for any point or area from the layer screen.
- You can select a location (POI) and an area (AOI).
  - POI: Select and acquire data from a single point on the map.
  - AOI: Select an area on the map using a rectangle to acquire data.
- The selected and acquired physical quantities will be displayed in graphs, tables or statistics.
  - \*When AOI is selected, the physical quantities will be given as average values.

### (3) Graph & Table

- The graph displays the physical quantity on the vertical axis and the time series on the horizontal axis.
- The summary information next to the graph will show various statistical values.
- In the table, the first column displays the time, and the second column displays the physical quantity.

#### (4) Export

- “Export CSV”
  - You can save the table in CSV format.
- “Export Map”
  - You can save the map display image for each animation frame in PNG format.
  - You can perform the same operation using the  icon next to the dropdown menu that switches the display between days and months.
- “Export Graph”
  - You can save the graph in PNG format.

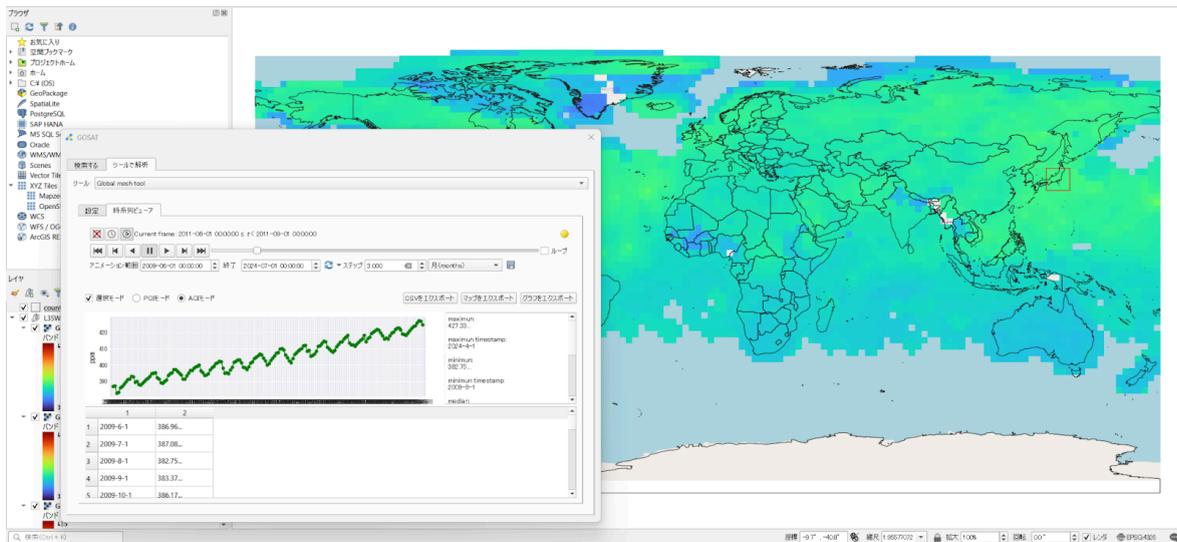


Image of display with Global Mesh 2D Analysis Data Visualization Tool (L3/L4A)

## 7.2.2. Global Mesh 3D Analysis Data Visualization Tool (L4B)

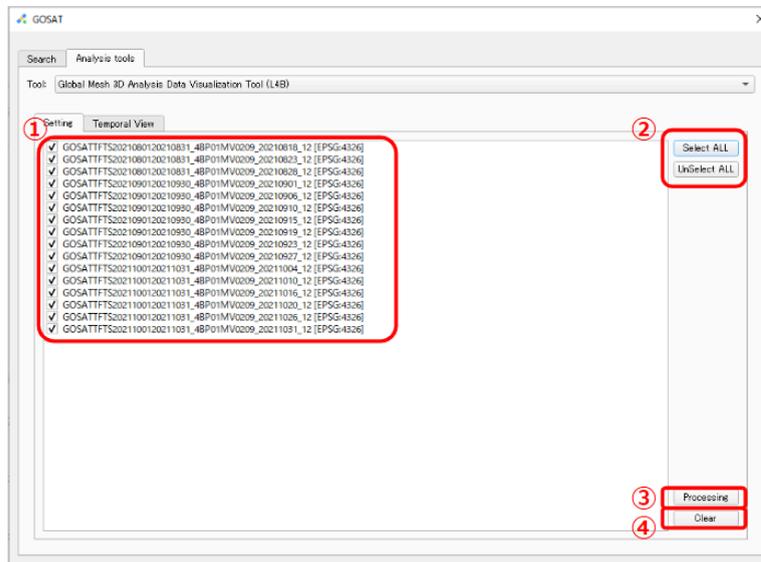
The tool can display a time-series animation of three-dimensional distribution of CO2 and CH4 on a global mesh image. It also provides the graph of data for specific POI or AOI, with the function to switch to different pressure levels for display.

### Target dataset

You can visualize COG format files (.tif) of the following datasets.

- GOSAT
  - GOSAT/L4B/global CO2 distribution(G1-10)
  - GOSAT/L4B/global CH4 distribution(G1-11)
- GOSAT-2
  - GOSAT-2/L4B/global CO2 distribution(G2-10)

### “Setting” tab



#### (1) Select files

- A list of data that can be processed with the tool will be displayed from the satellite data shown in the layers.
  - Check the files you want to visualize.
  - Only the scene name of the dataset to be analyzed will appear in the list.
  - If multiple types of datasets are included, animation will not be available.

#### (2) “Select All” “Unselect All”

- "Select All" is to select all the data displayed in ①.
- "Unselect All" is to unselect all the data displayed in ①.

(3) "Processing"

- In the "Temporal View" data is displayed in chronological order, with automatic color coding and animation settings applied.
- The display range and color ramp for each dataset are processed as follows.
- When re-displaying the animation or generating a graph after saving the project, please reprocess the data.

Dataset name	unit	Display range	Color comps
GOSAT/L4B/global CO2 distribution(G1-10)	ppmv	360 ~ 440	Turbo
GOSAT/L4B/global CH4 distribution(G1-11)	ppbv	1600 ~ 2000	Turbo
GOSAT-2/L4B/global CO2 distribution(G2-10)	ppmv	360 ~ 440	Turbo

Color coding of values for each data set

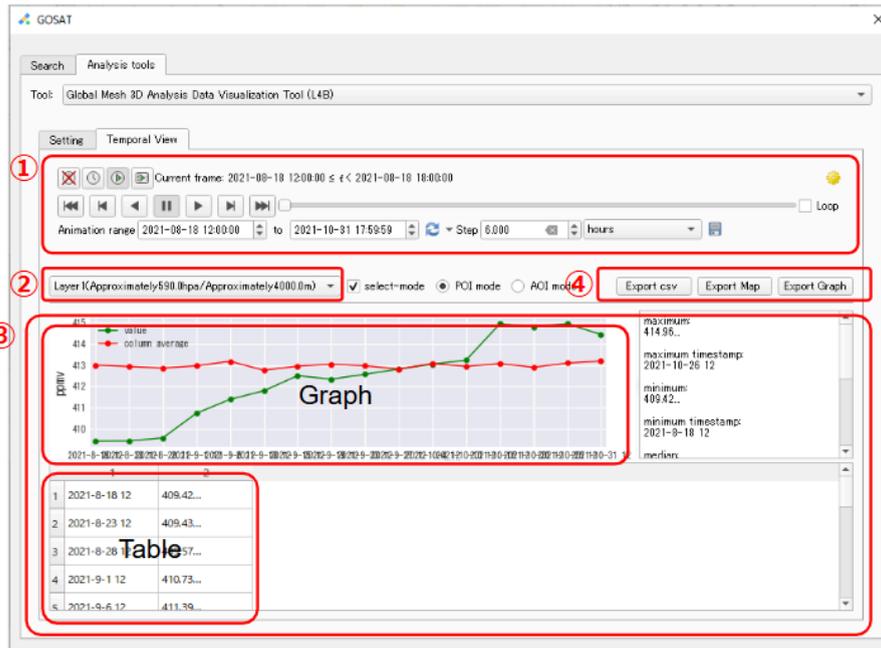


Color Ramp:Turbo

(4) "Clear"

- The time series and other settings will be reset.

## "Temporal View" tab



### (1) Time Manager

- The “” icon disables animation display.
  - You can control the animation of a time series of data displayed on the map.
  - The animation time interval is automatically set months.
    - You can also change the time interval depending on the selected file.
    - Among the time interval settings, "source timestamps" cannot be used for animation with GOSAT data.
- The “” icon disables animation display.
- The “” icon allows you to change the start and end dates of the animation.
- The “” icon allows you to set the duration of the animation display in seconds.

### (2) Select-mode

- The pressure level selection dropdown allows users to choose from the column-averaged concentration plus 17 pressure levels.
- The concentration of the selected pressure level is reflected in both the map and the time series graph. Concentrations for each pressure level are displayed in a green graph.
- By default, "Column-Averaged Concentration" is selected, representing the average concentration across all pressure levels. In the graph, this average value is shown in red.
- When the tool is closed, the data of the last selected pressure level will remain displayed on the map.
- By checking the box, you can select and acquire physical quantities for any point or area from the layer screen.

- You can select a location (POI) and an area (AOI).
  - POI: Select and acquire data from a single point on the map.
  - AOI: Select an area on the map using a rectangle to acquire data.
- The selected and acquired physical quantities will be displayed in graphs, tables or statistics.
  - \*When AOI is selected, the physical quantities will be given as average values.
- If an area without data is selected, a dialog indicating the absence of data will be displayed, and no analysis will be given.

### (3) Graph & Table

- The graph displays the physical quantity on the vertical axis and the time series on the horizontal axis.
- The summary information next to the graph will show various statistical values.
- In the table, the first column displays the time, and the second column displays the physical quantity.
- When "Column-Averaged Concentration" is selected, only the average concentration will be graphed.

### (4) Export

- “Export CSV”
  - You can save the table in CSV format.
- “Export Map”
  - You can save the map display image for each animation frame in PNG format.
  - You can perform the same operation using the “” icon next to the dropdown menu that switches the display between days and months.
- “Export Graph”
  - You can save the graph in PNG format.

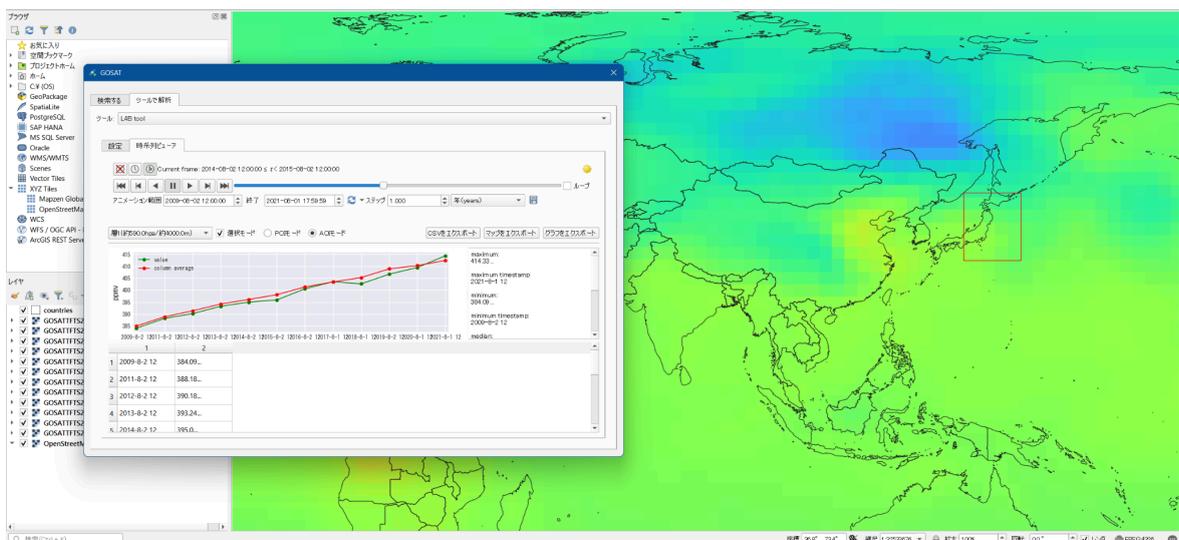


Image of display with Global Mesh 3D Analysis Data Visualization Tool (L4B)

### 7.2.3. Global Point Cloud 2D Observation Data Visualization Tool (L2 SWIR)

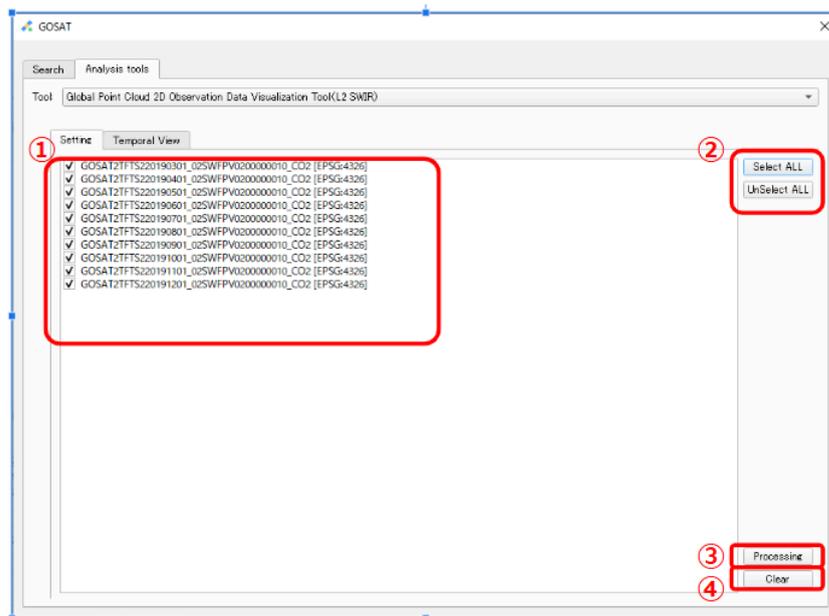
The tool can display a time-series animation of column amounts for substances such as CO2 and CH4 as point cloud data. It also provides the graph of observed values for specific POI or AOI.

#### Target dataset

You can visualize FlatGeobuf format files (.fgb) of the following datasets.

- GOSAT
  - GOSAT/L2/SWIR CO2 column amount(G1-01)
  - GOSAT/L2/SWIR CH4 column amount(G1-02)
  - GOSAT/L2/SWIR H2O column amount(G1-03)
- GOSAT-2
  - GOSAT-2/L2/SWIR CO2 column-averaged dry-air mole fraction(G2-01)
  - GOSAT-2/L2/SWIR CH4 column-averaged dry-air mole fraction(G2-02)
  - GOSAT-2/L2/SWIR CO column-averaged dry-air mole fraction(G2-03)
  - GOSAT-2/L2/SWIR H2O column-averaged dry-air mole fraction(G2-04)

#### 「設定」画面



#### (1) Select files

- A list of data that can be processed with the tool will be displayed from the satellite data shown in the layers.
  - Check the files you want to visualize.
  - Only the scene name of the dataset to be analyzed will appear in the list.
  - If multiple types of datasets are included, animation will not be available.

#### (2) "Select All" "Unselect All"

- "Select All" is to select all the data displayed in ①.
- "Unselect All" is to unselect all the data displayed in ①.

(3) "Processing"

- In the "Temporal View" data is displayed in chronological order, with automatic color coding and animation settings applied.
- The display range and color ramp for each dataset are processed as follows.
- When re-displaying the animation or generating a graph after saving the project, please reprocess the data.

Dataset name	unit	Display range	Color comps
GOSAT/L2/SWIR CO2 column amount(G1-01)	ppm	370 ~ 435	Turbo
GOSAT/L2/SWIR CH4 column amount(G1-02)	ppm	1.6 ~2.05	Turbo
GOSAT/L2/SWIR H2O column amount(G1-03)	ppm	0 ~ 10000	Turbo
GOSAT-2/L2/SWIR CO2 column-averaged dry-air mole fraction(G2-01)	ppm	370 ~ 435	Turbo
GOSAT-2/L2/SWIR CH4 column-averaged dry-air mole fraction(G2-02)	ppm	1.6 ~2.05	Turbo
GOSAT-2/L2/SWIR CO column-averaged dry-air mole fraction(G2-03)	ppm	0.0 ~0.2	Turbo
GOSAT-2/L2/SWIR H2O column-averaged dry-air mole fraction(G2-04)	ppm	0 ~ 10000	Turbo

Color coding of values for each data set

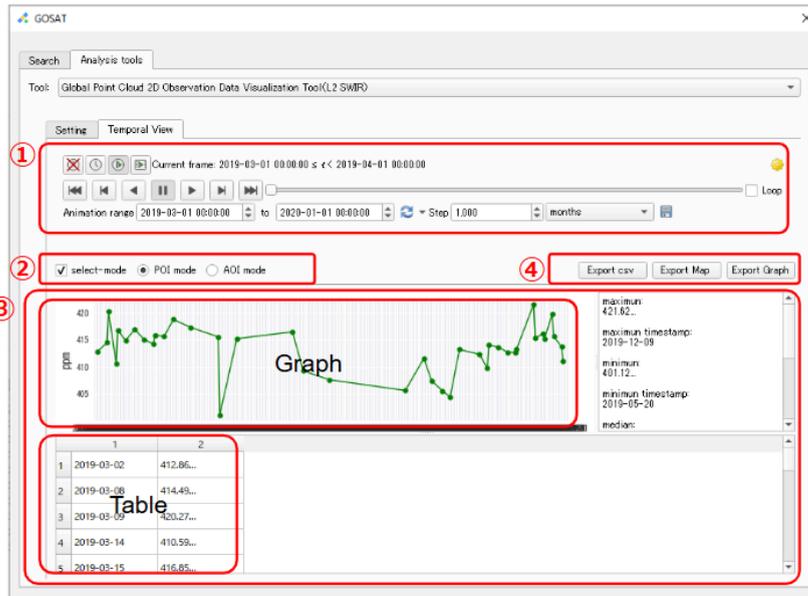


Color Ramp:Turbo

(4) "Clear"

- The time series and other settings will be reset.

## "Temporal View" tab



### (1) Time Manager

- The “” icon disables animation display.
  - You can control the animation of a time series of data displayed on the map.
  - The animation time interval is automatically set months.
    - You can also change the time interval depending on the selected file.
    - Among the time interval settings, "source timestamps" cannot be used for animation with GOSAT data.
- The “” icon disables animation display.
- The “” icon allows you to change the start and end dates of the animation.
- The “” icon allows you to set the duration of the animation display in seconds

### (2) Select-mode

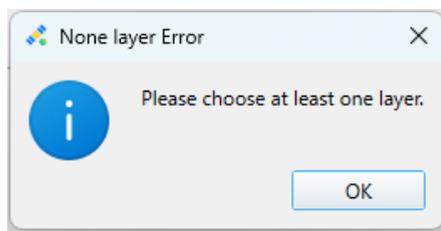
- By checking “select-mode”, you can select and acquire physical quantities for any point or area from the layer screen.
- You can select a location (POI) and an area (AOI).
  - POI: Select and acquire data from a single point on the map.
  - AOI: Select an area on the map using a rectangle to acquire data.
- The selected and acquired physical quantities will be displayed in graphs, tables, or statistics.

\*When POI is selected, point cloud data within a 10-pixel radius around the chosen location is loaded. The number of selected point cloud data points varies depending on the zoom level.



\*When AOI is selected, the physical quantities will be given as average values.

- If an area without data is selected, a dialog indicating the absence of data will be displayed, and no analysis will not be given.



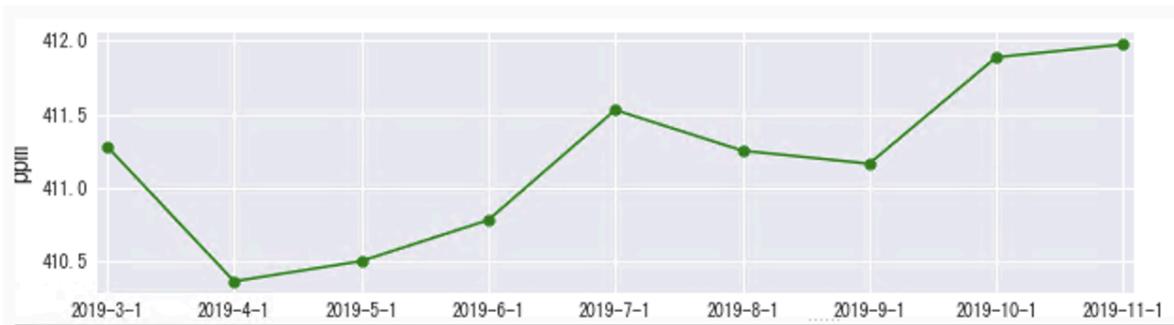
- In some cases, a graph may be generated even when point cloud data is not displayed in the selected POI/AOI location. This occurs because points outside the displayed time series range may also be included in the selection.
- Click the "❌" or "🕒" icons to display all data on the map.

### (3) Graph & Table

- The graph displays the physical quantity on the vertical axis and the time series on the horizontal axis.
- The summary information next to the graph will show various statistical values.
- In the table, the first column displays the time, and the second column displays the physical quantity.



The POI selection graph is generated based on the attribute value date.



The AOI selection graph is generated based on the monthly average physical quantity.

#### (4) Export

- “Export CSV”
  - You can save the table in CSV format.
- “Export Map”
  - You can save the map display image for each animation frame in PNG format.
  - You can perform the same operation using the  icon next to the dropdown menu that switches the display between days and months.
- “Export Graph”
  - You can save the graph in PNG format.

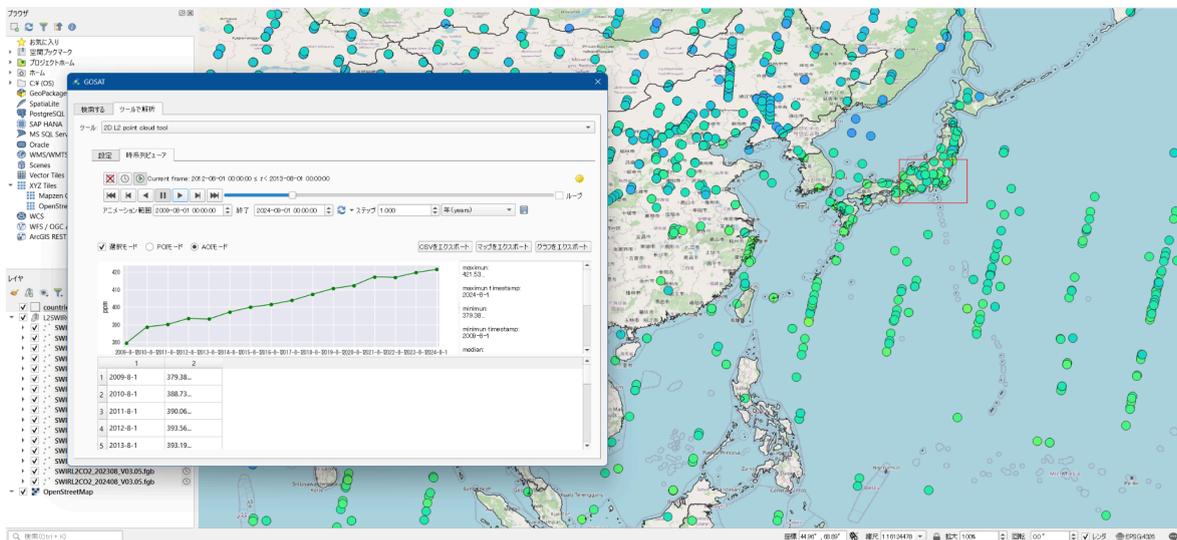


Image of display with Global Point Cloud 2D Observation Data Visualization Tool (L2 SWIR)

## 7.2.4. Global Point Cloud 3D Observation Data Visualization Tool (L2 TIR)

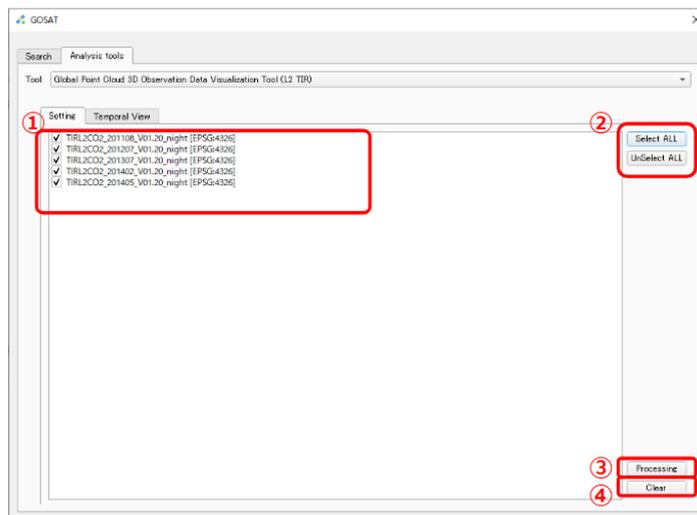
The tool can display a time-series animation of concentration altitude distributions for substances such as CO<sub>2</sub> and CH<sub>4</sub> as point cloud data. It also provides the graph of observed values for specific POI or AOI, with the function to switch to different pressure levels for display.

### Target dataset

You can visualize FlatGeobuf format files (.fgb) of the following datasets.

- GOSAT
  - GOSAT/L2/TIR CO<sub>2</sub> vertical profile(Day side)(G1-04-1)
  - GOSAT/L2/TIR CO<sub>2</sub> vertical profile(Night side)(G1-04-2)
  - GOSAT/L2/TIR CH<sub>4</sub> vertical profile(Day side)(G1-05-1)
  - GOSAT/L2/TIR CH<sub>4</sub> vertical profile(Night side)(G1-05-2)
- GOSAT-2
  - GOSAT-2/L2/TIR CO<sub>2</sub> vertical profile(Day side)(G2-05-1) \*in preparation
  - GOSAT-2/L2/TIR CO<sub>2</sub> vertical profile(Night side)(G2-05-2) \*in preparation
  - GOSAT-2/L2/TIR CH<sub>4</sub> vertical profile(Day side)(G2-06-1) \*in preparation
  - GOSAT-2/L2/TIR CH<sub>4</sub> vertical profile(Night side)(G2-06-2) \*in preparation
  - GOSAT-2/L2/TIR H<sub>2</sub>O vertical profile(Day side)(G2-07-1) \*in preparation
  - GOSAT-2/L2/TIR H<sub>2</sub>O vertical profile(Night side)(G2-07-2) \*in preparation
  - GOSAT-2/L2/TIR temperature vertical profile(Day side)(G2-08-1) \*in preparation
  - GOSAT-2/L2/TIR temperature vertical profile(Night side)(G2-08-2) \*in preparation

### “Setting” tab



#### (1) Select files

- A list of data that can be processed with the tool will be displayed from the satellite data shown in the layers.
  - Check the files you want to visualize.
  - Only the scene name of the dataset to be analyzed will appear in the list.
  - If multiple types of datasets are included, animation will not be available.

(2) "Select All" "Unselect All"

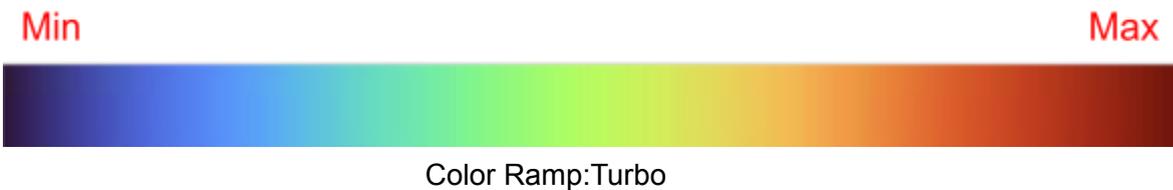
- "Select All" is to select all the data displayed in ①.
- "Unselect All" is to unselect all the data displayed in ①.

(3) "Processing"

- In the "Temporal View" data is displayed in chronological order, with automatic color coding and animation settings applied.
- The display range and color ramp for each dataset are processed as follows.
- When re-displaying the animation or generating a graph after saving the project, please reprocess the data.

Dataset name	unit	Display range	Color comps
GOSAT/L2/TIR CO2 vertical profile(Day side)(G1-04-1)	ppm	370 ~ 435	Turbo
GOSAT/L2/TIR CO2 vertical profile(Night side)(G1-04-2)	ppm	370 ~ 435	Turbo
GOSAT/L2/TIR CH4 vertical profile(Day side)(G1-05-1)	ppm	1.6 ~2.05	Turbo
GOSAT/L2/TIR CH4 vertical profile(Night side)(G1-05-2)	ppm	1.6 ~2.05	Turbo
GOSAT-2/L2/TIR CO2 vertical profile(Day side)(G2-05-1) *in preparation	ppm	370 ~ 435	Turbo
GOSAT-2/L2/TIR CO2 vertical profile(Night side)(G2-05-2) *in preparation	ppm	370 ~ 435	Turbo
GOSAT-2/L2/TIR CH4 vertical profile(Day side)(G2-06-1) *in preparation	ppm	1.6 ~2.05	Turbo
GOSAT-2/L2/TIR CH4 vertical profile(Night side)(G2-06-2) *in preparation	ppm	1.6 ~2.05	Turbo
GOSAT-2/L2/TIR H2O vertical profile(Day side)(G2-07-1) *in preparation	ppm	0 ~ 10000	Turbo
GOSAT-2/L2/TIR H2O vertical profile(Night side)(G2-07-2) *in preparation	ppm	0 ~ 10000	Turbo
GOSAT-2/L2/TIR temperature vertical profile(Day side)(G2-08-1) *in preparation	K	250 ~ 350	Turbo
GOSAT-2/L2/TIR temperature vertical profile(Night side)(G2-08-2) *in preparation	K	250 ~ 350	Turbo

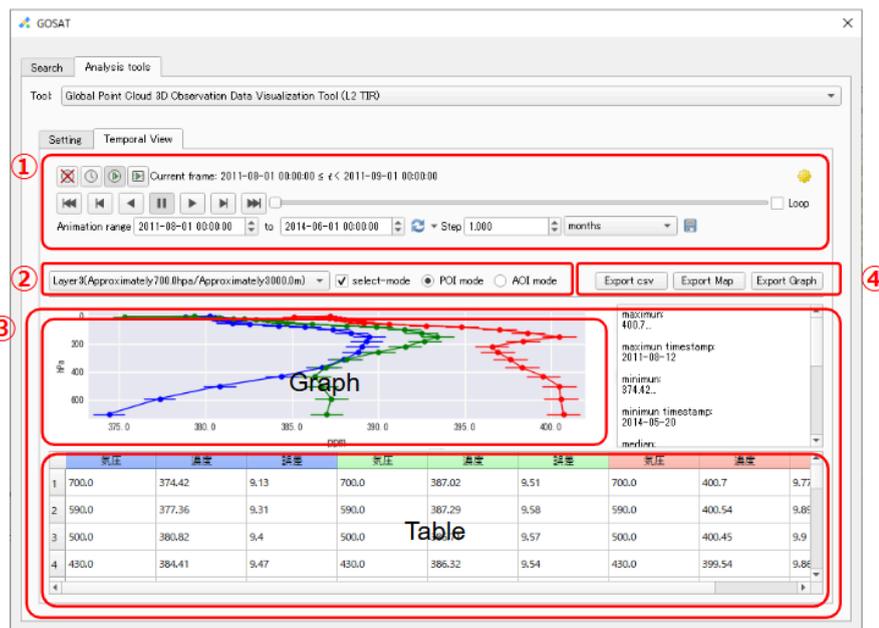
Color coding of values for each data set



(4) "Clear"

- The time series and other settings will be reset.

## "Temporal View" tab



### (1) Time Manager

- The “” icon disables animation display.
  - You can control the animation of a time series of data displayed on the map.
  - The animation time interval is automatically set months.
    - You can also change the time interval depending on the selected file.
    - Among the time interval settings, "source timestamps" cannot be used for animation with GOSAT data.
- The “” icon disables animation display.
- The “” icon allows you to change the start and end dates of the animation.
- The “” icon allows you to set the duration of the animation display in seconds

### (2) Select-mode

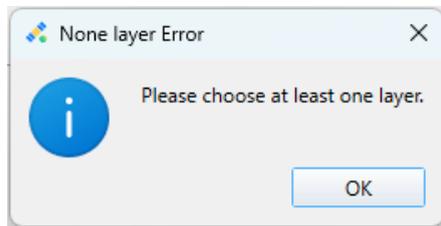
- You can change the pressure level using the dropdown menu. By default, approximately 700 hPa / 3,000 m is displayed. Changes will only be reflected on the map display.
- By checking the box, you can select and acquire physical quantities for any point or area from the layer screen.
- You can select a location (POI) and an area (AOI).
  - POI: Select and acquire data from a single point on the map.
  - AOI: Select an area on the map using a rectangle to acquire data.
- The selected and acquired physical quantities will be displayed in graphs, tables, or statistics.

\*When POI is selected, point cloud data within a 10-pixel radius around the chosen location is loaded. The number of selected point cloud data points varies depending on the zoom level.



\*When AOI is selected, the physical quantities will be given as average values.

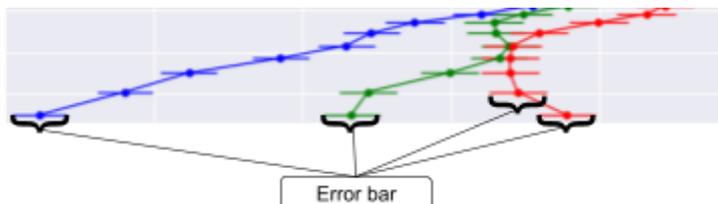
- If an area without data is specified, a dialog indicating the absence of data will be displayed, and the analysis will not be performed.



- In some cases, a graph may be generated even when point cloud data is not displayed in the selected POI/AOI location. This occurs because points outside the displayed time series range may also be included in the selection.
- Click the "❌" or "🕒" icons to display all data on the map.

### (3) Graph & Table

- This graph is a vertical graph of pressure levels, where the vertical axis represents the pressure levels and the horizontal axis represents the physical quantity.
- The POI generates a graph of overlapping points. The colors of the graph and table are designated based on the physical quantity at the 700 hPa pressure level: the lowest value is blue, the middle value is green, and the highest value is red.
- When the tool is closed, the data of the last selected pressure level will remain displayed on the map.
- The AOI generates a graph and table based on the average values of each pressure level within the selected area's point cloud.



- The concentration error is displayed as error bars on the graph.

### (4) Export

- "Export CSV"
  - You can save the table in CSV format.

- “Export Map”
  - You can save the map display image for each animation frame in PNG format.
  - You can perform the same operation using the  icon next to the dropdown menu that switches the display between days and months.
- “Export Graph”
  - You can save the graph in PNG format.

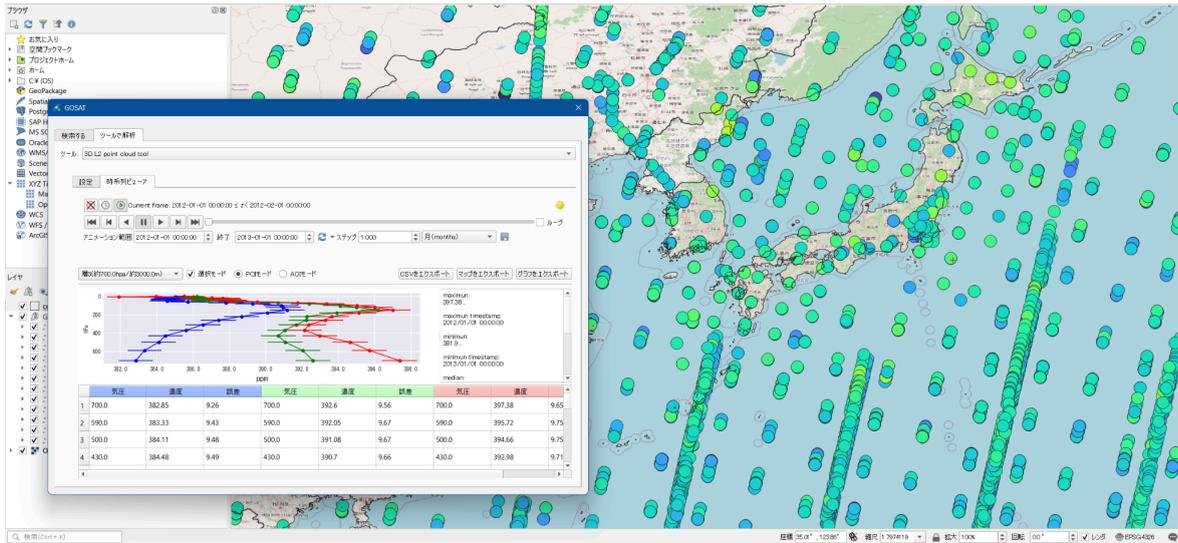


Image of display with Global Point Cloud 3D Observation Data Visualization Tool (L2 TIR)

## 8. Appendix

### 7.1 (2) General Information Display Area

#### General Information

ID {Scene ID}  
Scene name {Scene Name}  
Dataset {Dataset Name}  
Start time {Observation start time}  
End time {End time of observation}  
Sales method {Sales method}  
Price {Price}  
Scope of use {Scope of use}

#### Catalog Information

bands(OPS) {Observation band}  
processing level {Processing Level}  
GSD {Resolution(m)}  
process configure {Analysis SW Version}