How to visualize Land Surface Temperature products

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This document describes how to search, download and process products using G-Portal. And this document introduces example of using the SGLI user tool from among various tools available from G-Portal. In this example, we use the SGLI user tool to display the products observed by GCOM-C, cut out any image, save them as an image data, and copy the image to clipboard.

In this explanation, the product of land surface temperature observed by GCOM-C on June 29, 2019 is used as an example.

1. Search and download products using G-Portal

(1) Click “Physical quantities” left pane on the top menu (Refer to Fig.1-1) and move to the search window shown the physical quantities tree (Refer to Fig.1-2).

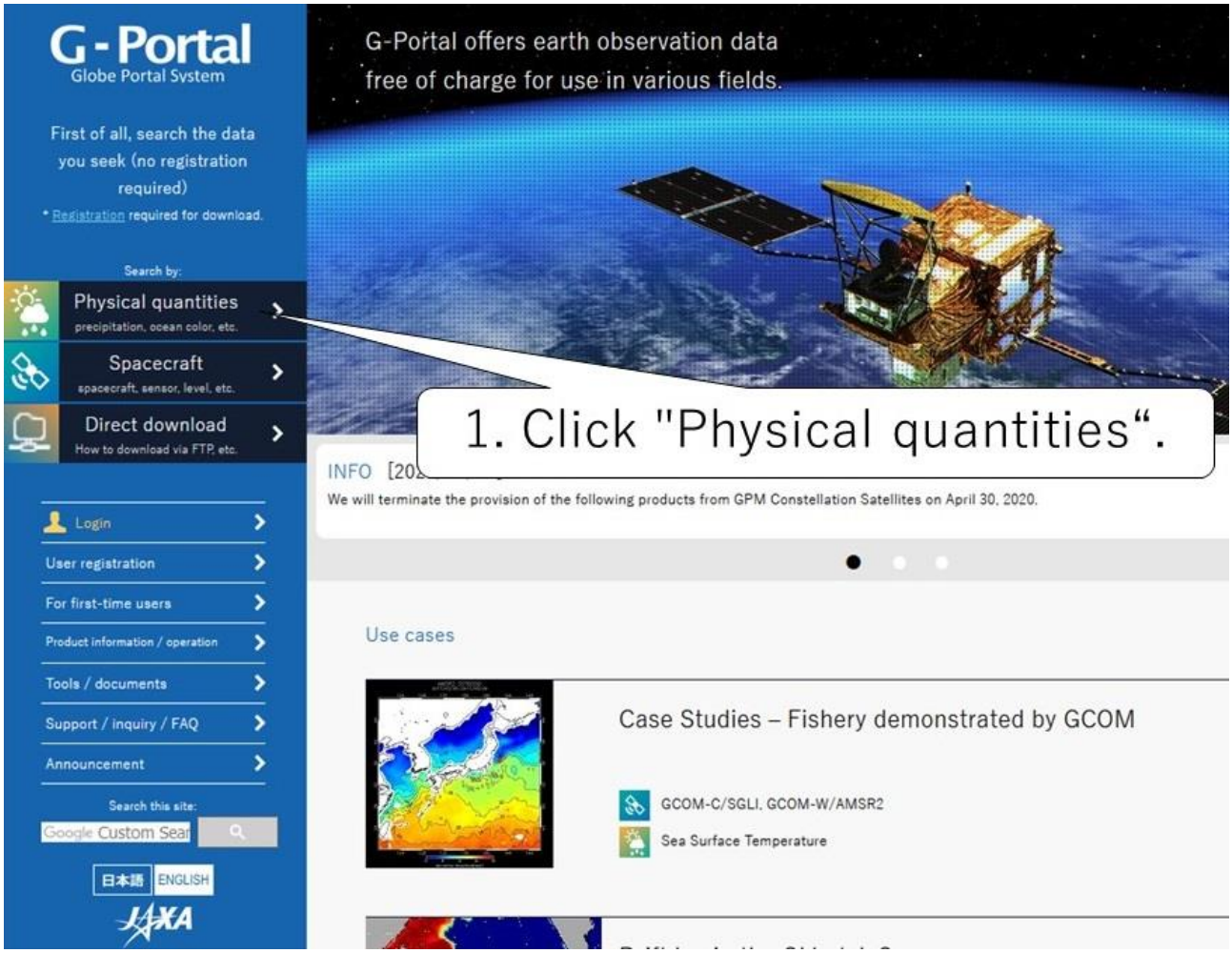


Fig.1-1. G-Portal top window

(2) Each category shows the group list to physical quantities to a tree format on the search window.

- Click ”▶” on physical quantities group, and physical quantities in the group are shown.

You can refine products by word related to physical quantity such as precipitation, sea surface temperature and vegetation.

As an example, we will explain how to use the "Refine Search by word” function to narrow down to the physical quantity of "Land-Surface Temperature" (Refer to Fig.1-2).

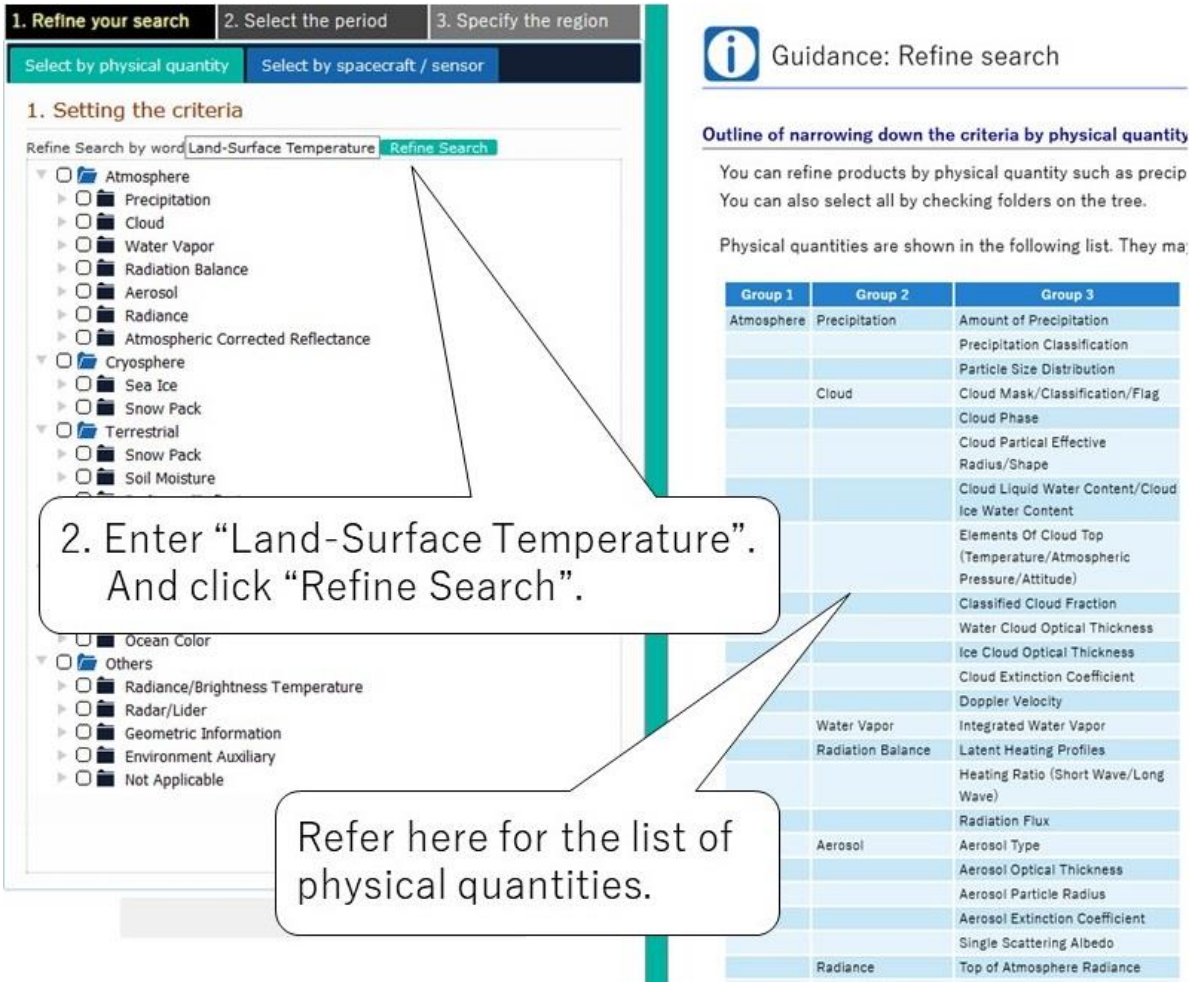


Fig.1-2　Example of the search by physical quantities(1)

(3) After checking “Land-Surface Temperature”, click “2. Select the period” on the top of the window (Refer to Fig.1-3).

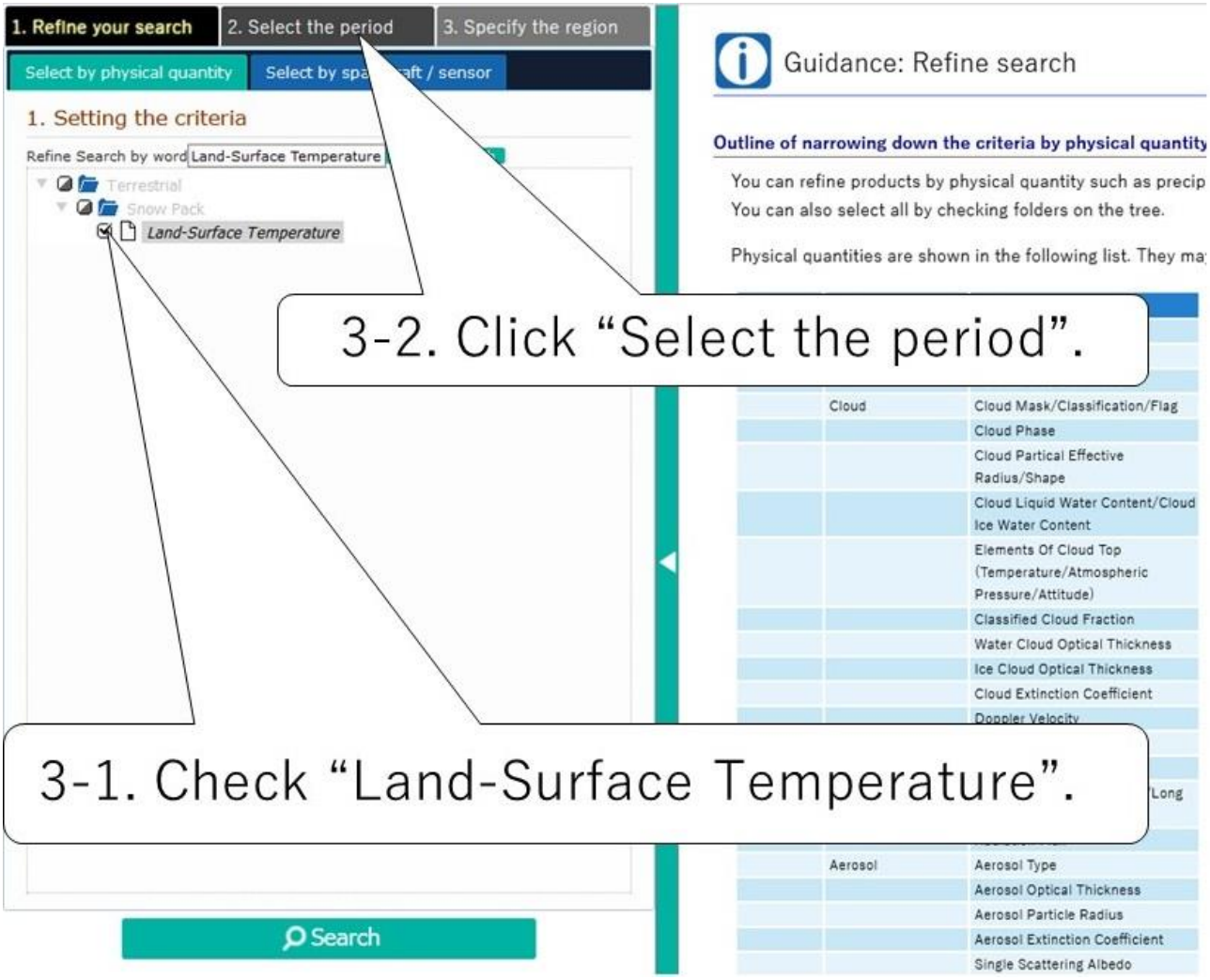


Fig.1-3 Example of the search by physical quantities(2)

(4) The left pane specifying “observation period” appears

As an example, specify the observation start date and end date to June 29, 2019 (Refer to Fig.1-4).

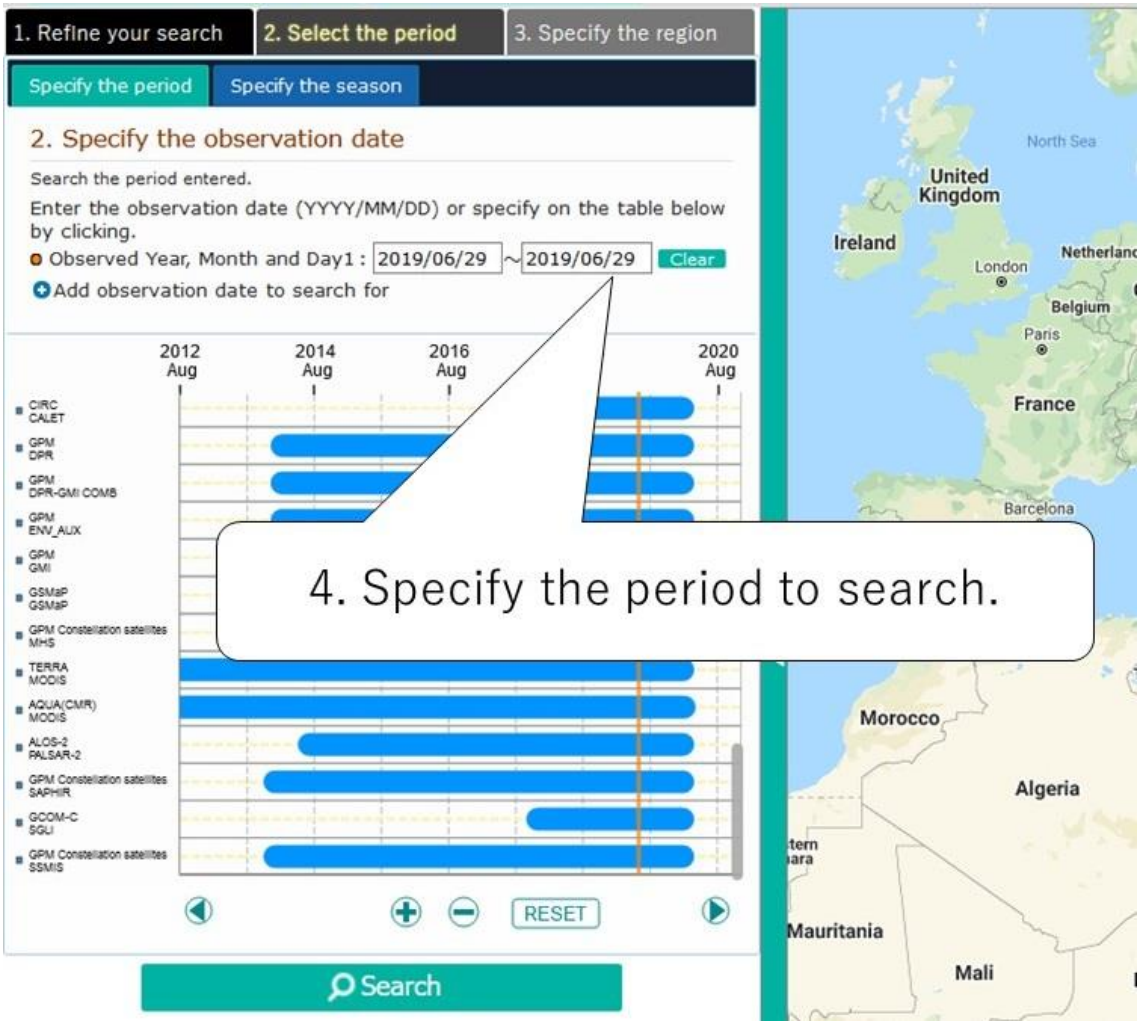


Fig.1-4 Screen of “Select the period” (1)

- Specify the period to search. There are two selection methods for the period as follows:
  - Specify period: Enter the start date and end date of the observation.
  - Specify season: Search the specified month and date of multiple years. You can search the summer period of each year, for example.
- There are three ways on “Specify Observation Period” as follow.
  - Input by text
  - Input from the calendar UI
  - Input by bar-chart to observation period

(5) Click “3. Specify the region” on the top of a window (Refer to Fig.1-5).

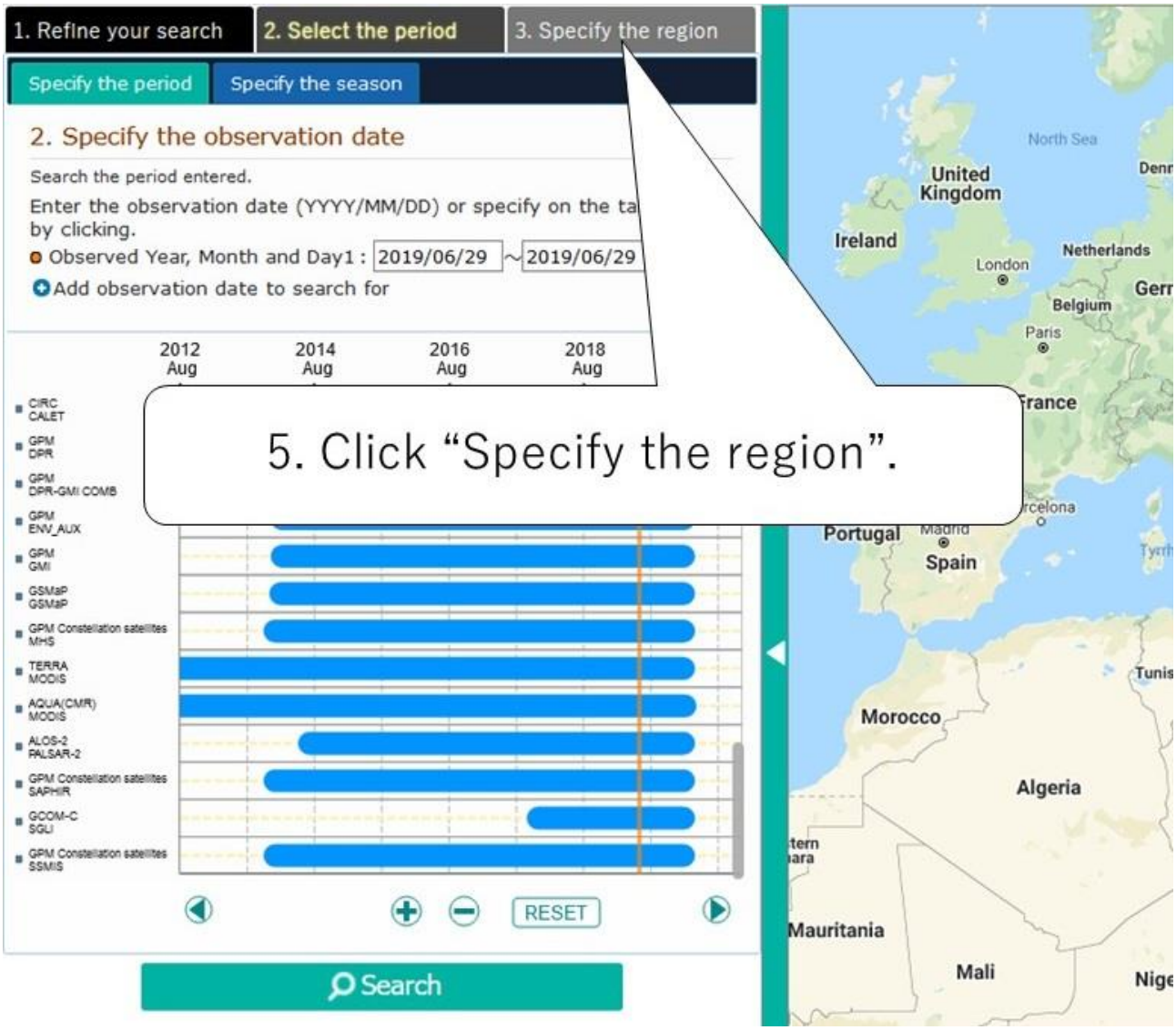


Fig.1-5 Move to Screen of “Specify the region”

(6) Click "Specify the rectangle", when appear a window specifying search region (Refer to Fig.1-6).

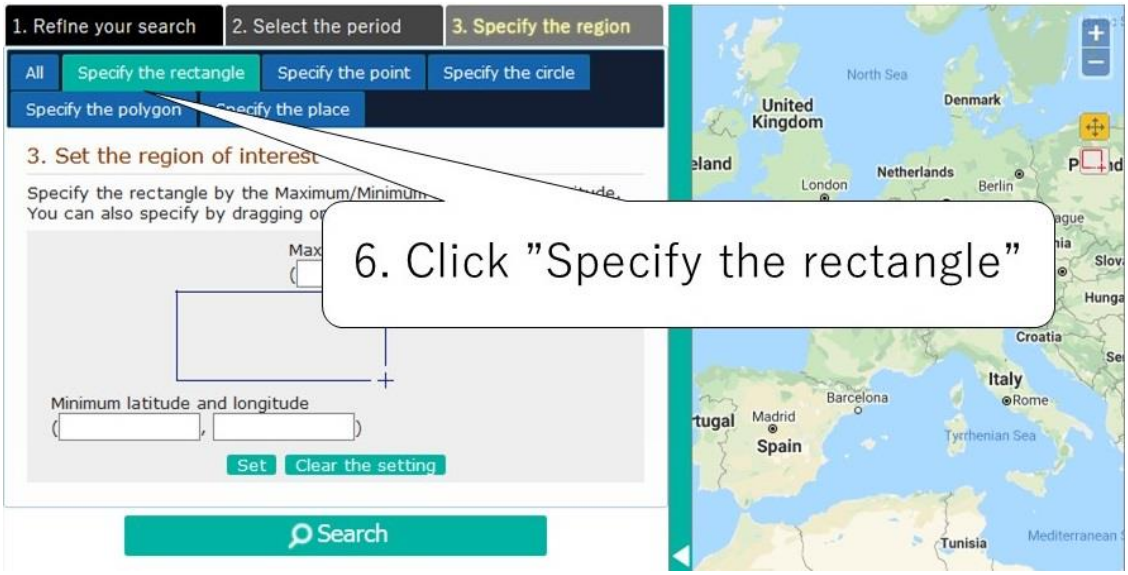


Fig.1-6 Screen of “Specify the rectangle” (1)

(7) The “Specification by the rectangle” has a “method of specifying from a map” and a “method of specifying with a value”.

As an example, specify the observation region from the map. After specifying the observation region, click the "Search" button to start the search (Refer to Fig.1-7-1).

- A click of "Clear" will clear the value inputted into the text box and selection on the map.

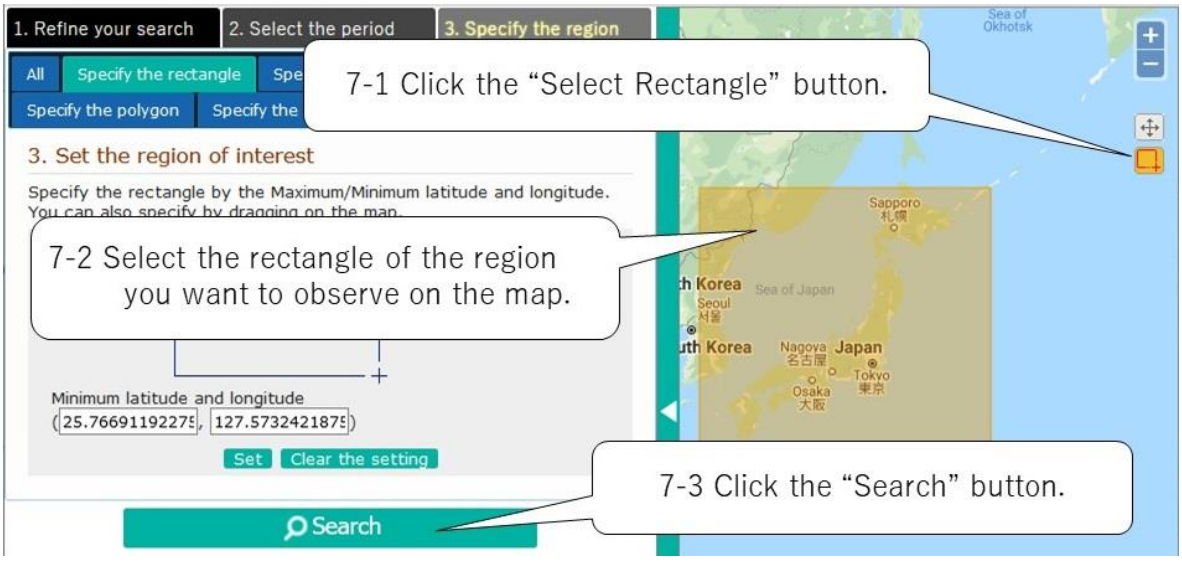


Fig.1-7-1 Screen of “Specify the rectangle” (2)

[Additional Explanation]

As an additional explanation, the following describes how to respond when the message shown in Fig.1-7-2 is displayed.

Message shown in Fig.1-7-2: "Too many search results. Please narrow down the search criteria such as period and range and try again."

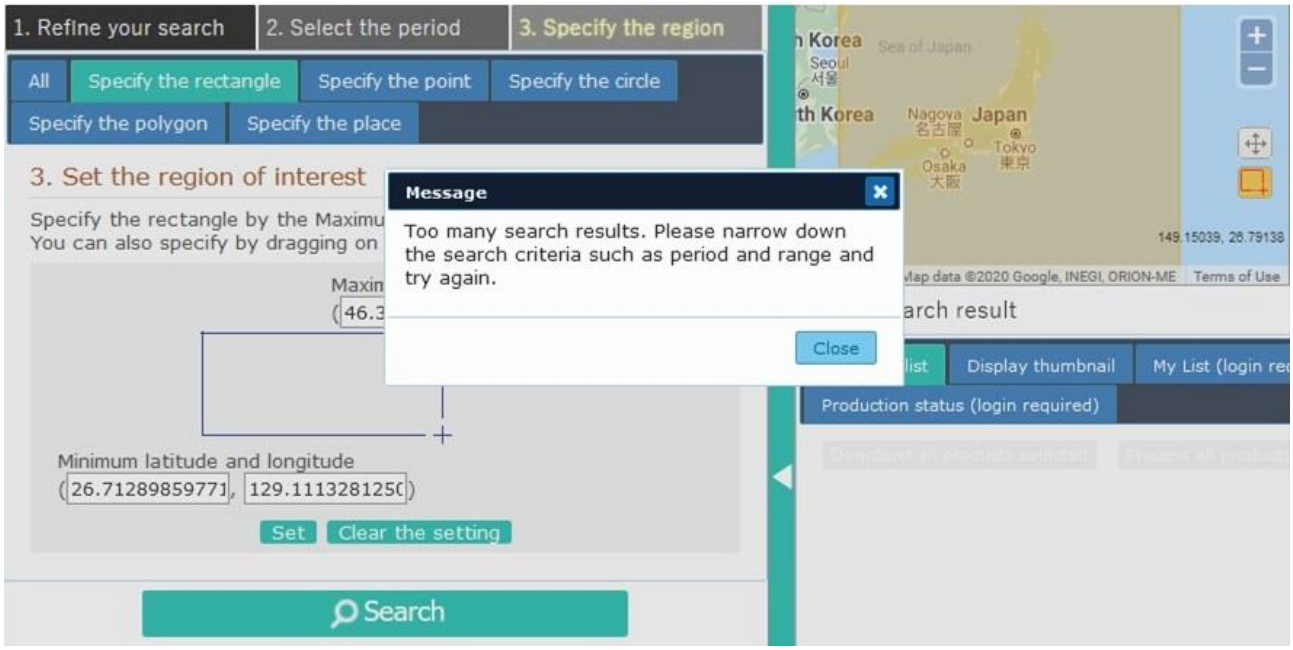


Fig. 1-7-2 Search failed message

- Cause and avoidance method
  - Due to the long observation period set, the search limit was exceeded.
    - Avoidance 1: Shorten the observation period on the “2. Select the period” screen.
    - Avoidance 2: Increase the number of search results that can be displayed (Refer to Fig.1-7-3).
  - The observation region was too large and the search limit was exceeded.
    - Avoidance 1: Narrow the observation region specification on the “3. Specify the region” screen.
    - Avoidance 2: Increase the number of search results that can be displayed (Refer to Fig.1-7-3).
  - Unnecessary products were included in the satellite/sensor products to be searched.
    - Avoidance 1: Set conditions for narrowing down satellite products (Refer to Fig.1-7-4).
    - Avoidance 2: Increase the number of search results that can be displayed (Refer to Fig.1-7-3).

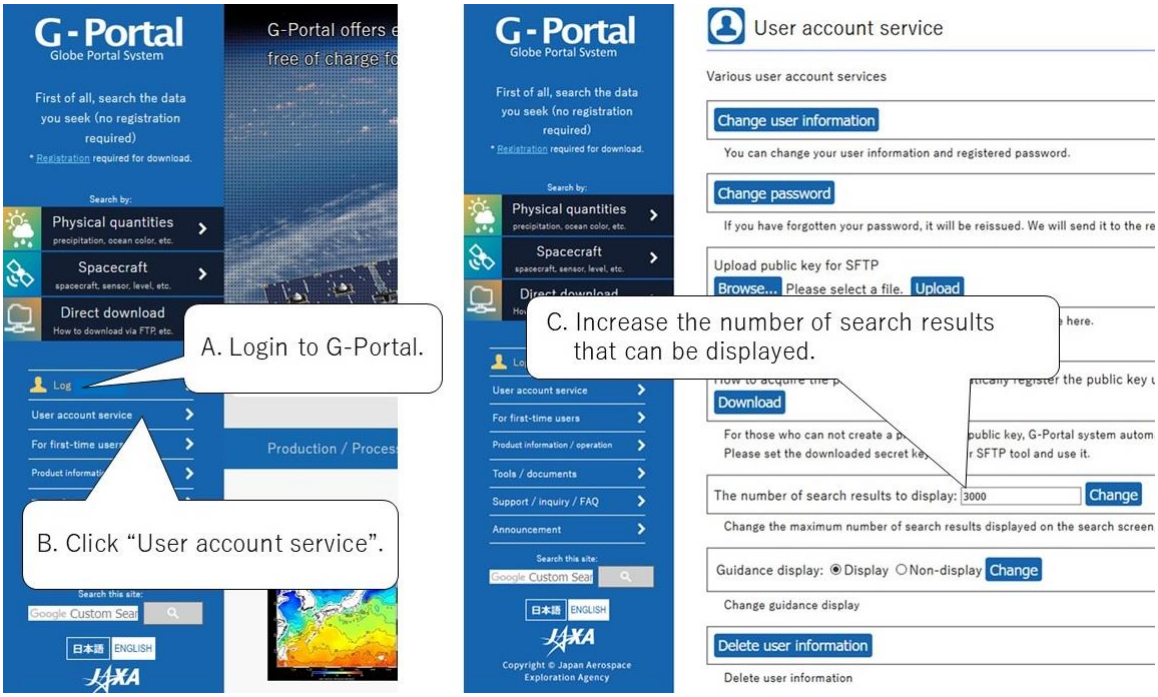


Fig.1-7-3 The number of search results to display

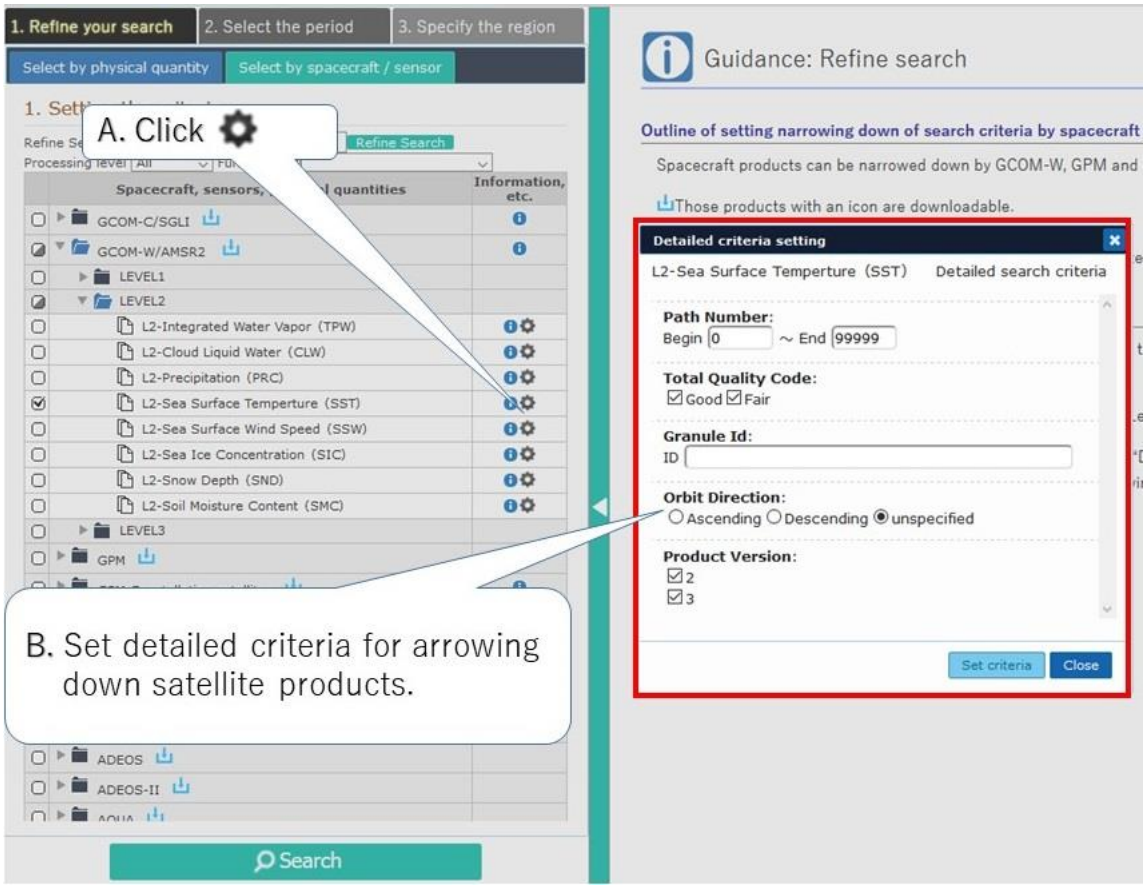


Fig.1-7-4 Detailed criteria setting

(8) When the search is performed, the search result screen as shown in Fig. 1-8-1 is displayed.

- If the same physical quantity has been calculated from observation data from multiple satellite sensors, all applicable products are displayed on the search result screen (Refer to Fig.1-8-1-A).
- Click the “Details” button in the list of search result (Refer to Fig.1-8-1-B).
  Detailed information will be displayed in a separate window (Refer to Fig.1-8-2).

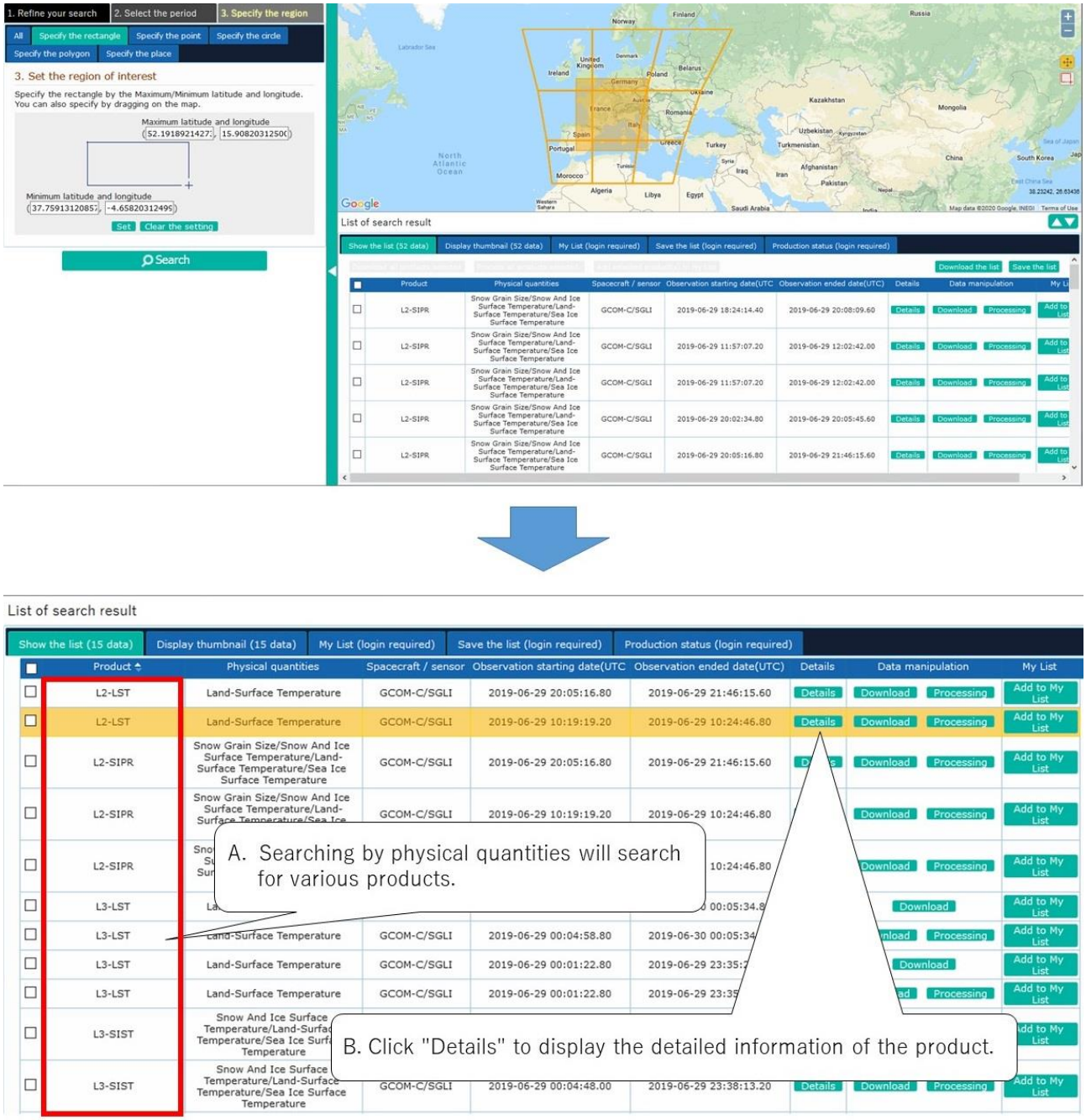


Fig.1-8-1 Example of the list of search result

■ An example of the detailed information screen is shown in Fig.1-8-2.

A. The observation region is displayed on the map.
B. A browse image will be displayed for products with browse images available. An image with “No Image” will be displayed if no browse images are available for that product.
C. To products on the browse images, the image pulldown appears. Browse (Browse or sub-browse) image switches.
D. Detailed information of the product will be displayed.

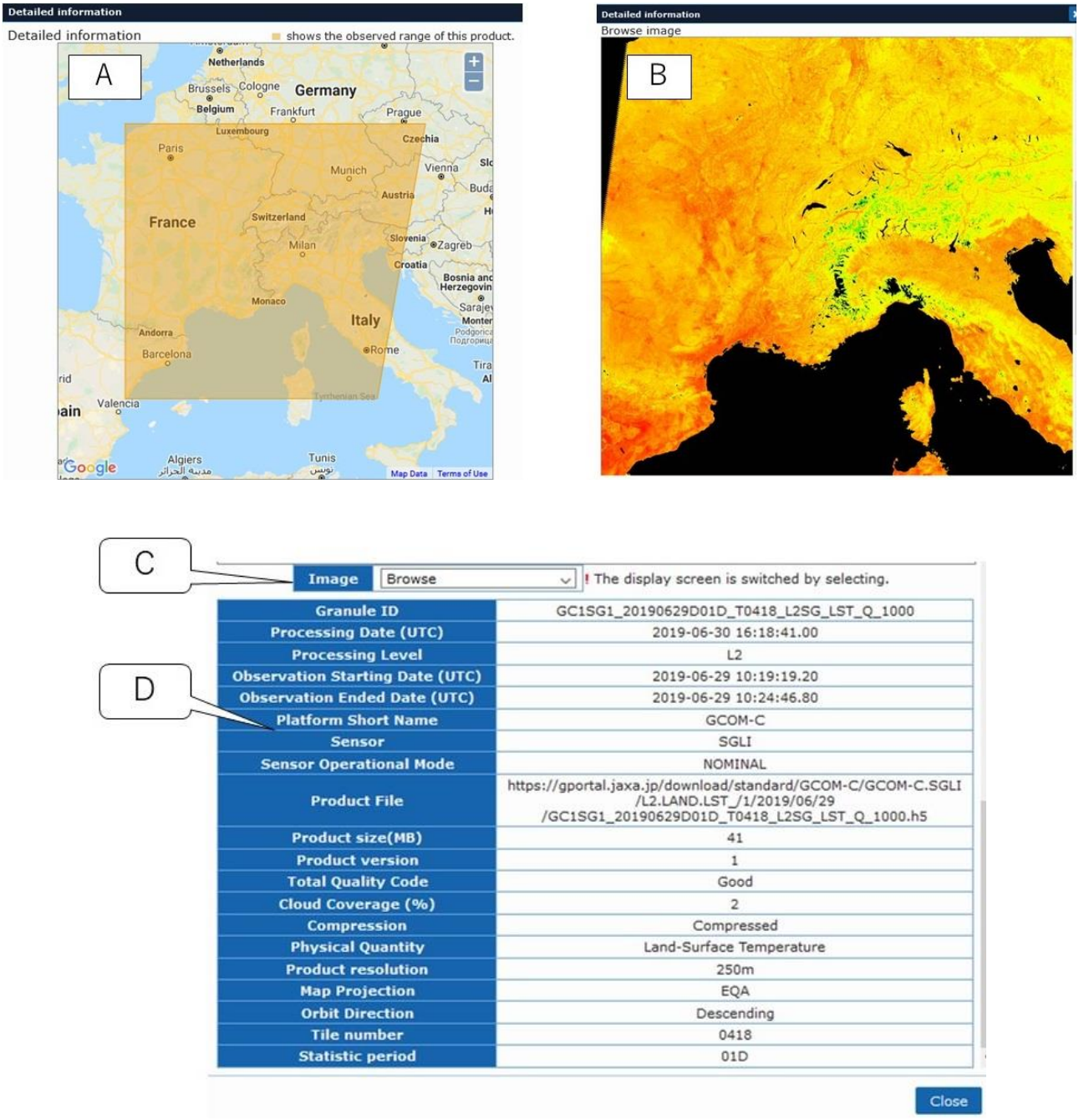


Fig.1-8-2 Example of the detailed information screen

(9) You can directly download the products on a list of researching result.

As an example, download the product of land surface temperature observed by GCOM-C / SGLI (Refer to Figure 1-9-1).

A. Click the "Download" button for the product.
B. A window appears asking you to “open a file” or “save a file”. Select "Save" and click "OK" button to save the downloaded file to your computer.

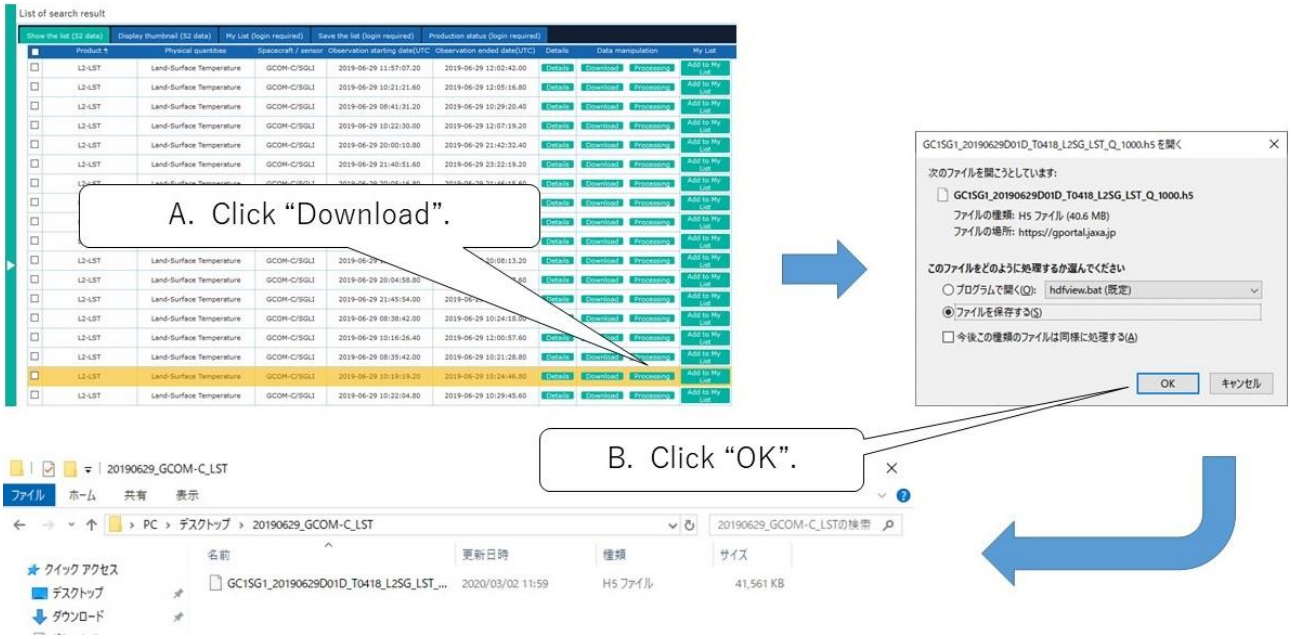


Fig.1-9-1 Product download procedure

[Additional Explanation]

This section explains how to use the “Download all products selected” button in the List of search result.

- If you check the check box at the left end of the list of search result about multiple products, you can press the button "Download all products selected". However, this button is a function that can be used only when the product that includes the "Production" button is displayed in the "Data manipulation" column.
  - “Fig. 1-9-2 How to use the ‘Download all products selected’ button (1)” describes the case that Product with" Production" button is not selected".
  - “Fig. 1-9-3 How to use the ‘Download all products selected’ button (2)” describes the case that Product with" Production" button is selected". .

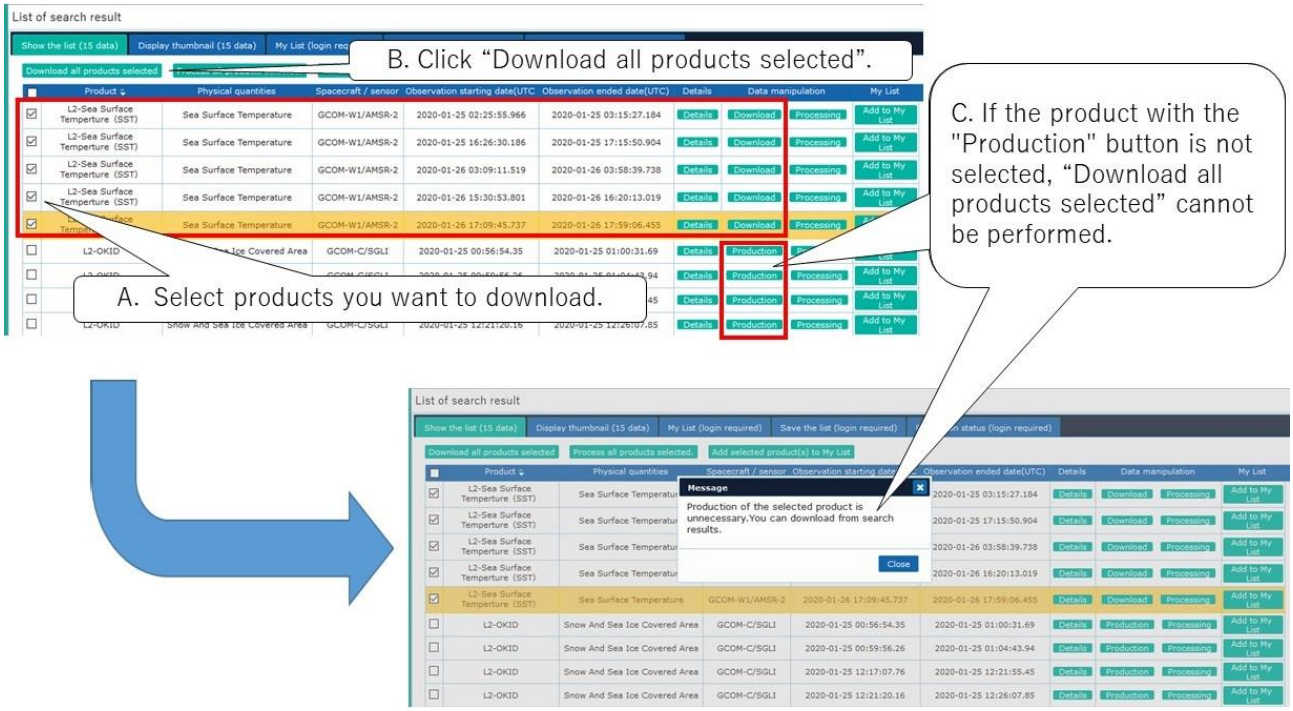


Fig. 1-9-2 How to use the “Download all products selected” button (1)

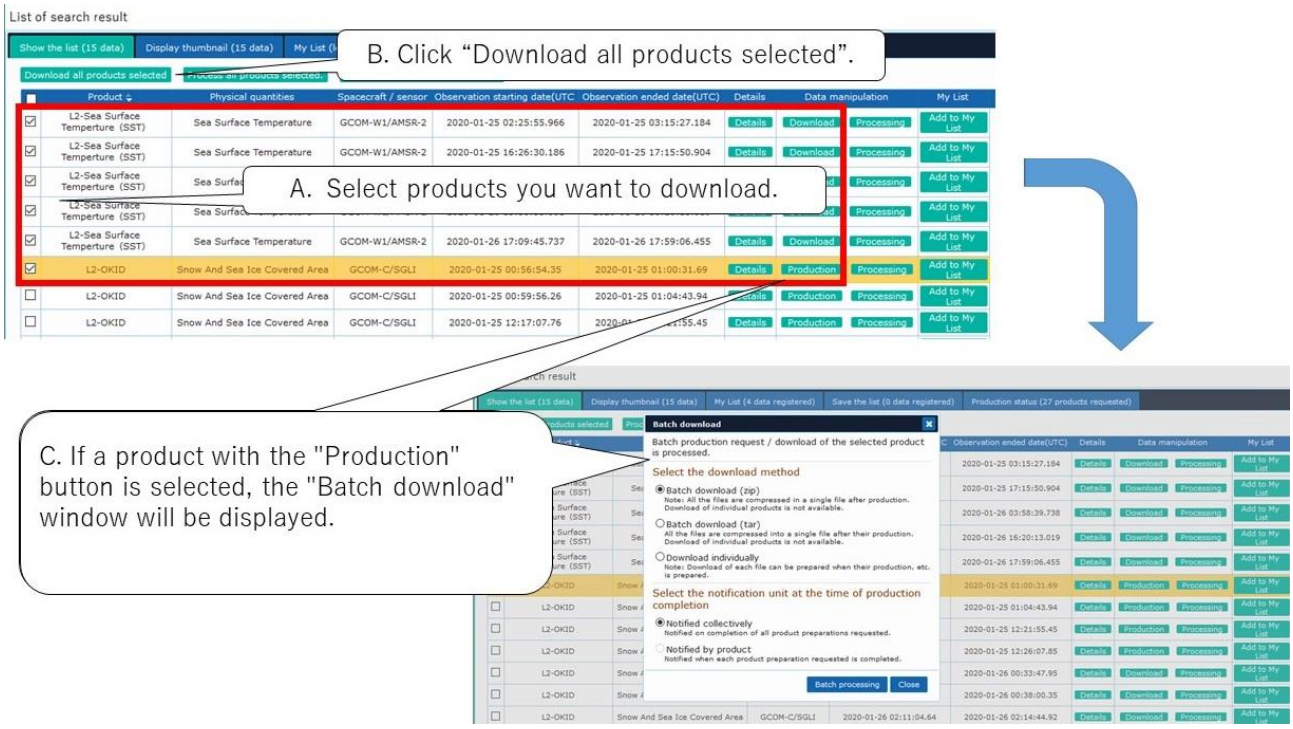


Fig. 1-9-3 How to use the “Download all products selected” button (2)

This concludes the explanation of data search and download.

2. Process products using G-Portal

2.1. Product processing

You can make processing request for cut out/shift and format conversion for products of satellites shown in Table 2-1.

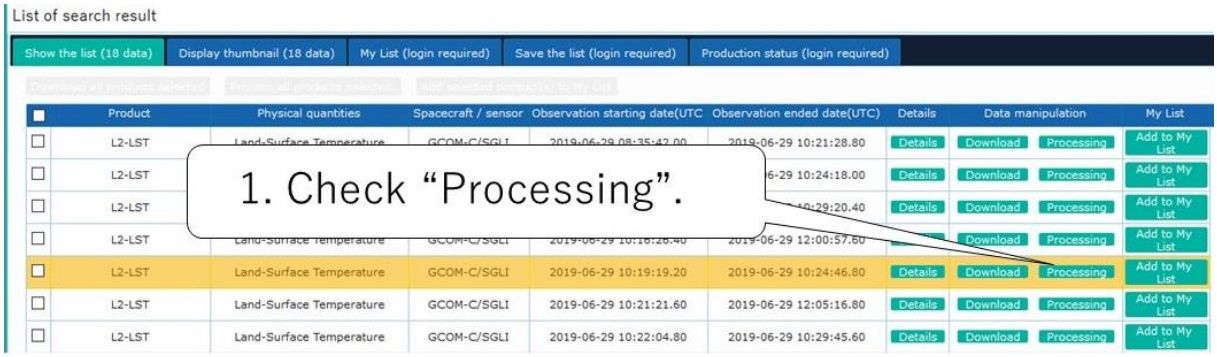
Table 2-1 Satellite and Processing of Product

Target satellite	Target processing
■ GPM ■ GSMAP ■ AQUA ■ GCOM-W	■ Cut out ■ Format conversion (ASCII, NetCDF)
■ GCOM-C	■ Cut out/Shift ■ Format conversion (GeoTIFF, NetCDF)

2.2. Example of product processing

This section introduces how to use the G-Portal processing function to cut out an arbitrary region from the land surface temperature product of GCOM-C / SGLI from the “list of search result” displayed in Chapter 1 (9).

(1) Select the product you want to process from the list of search result and click the “Processing” button (See Figure 2.2-1).



Product	Physical quantities	Spacecraft / sensor	Observation starting date(UTC	Observation ended date(UTC)	Details	Data manipulation	My List
L2-LST	Land-Surface Temperature	GCOM-C/SGLI	2019-06-29 08:35:42.00	2019-06-29 10:21:28.80	Details	Download Processing	Add to My List
L2-LST				6-29 10:24:18.00	Details	Download Processing	Add to My List
L2-LST				10:29:20.40	Details	Download Processing	Add to My List
L2-LST				2019-06-29 12:00:57.60		Download Processing	Add to My List
L2-LST	Land-Surface Temperature	GCOM-C/SGLI	2019-06-29 10:19:19.20	2019-06-29 10:24:46.80	Details	Download Processing	Add to My List
L2-LST	Land-Surface Temperature	GCOM-C/SGLI	2019-06-29 10:21:21.60	2019-06-29 12:05:16.80	Details	Download Processing	Add to My List
L2-LST	Land-Surface Temperature	GCOM-C/SGLI	2019-06-29 10:22:04.80	2019-06-29 10:29:45.60	Details	Download Processing	Add to My List

Fig. 2.2-1 Example of the list of search result

(2) The “Request processing” dialog is displayed (See Figure 2.2-2).

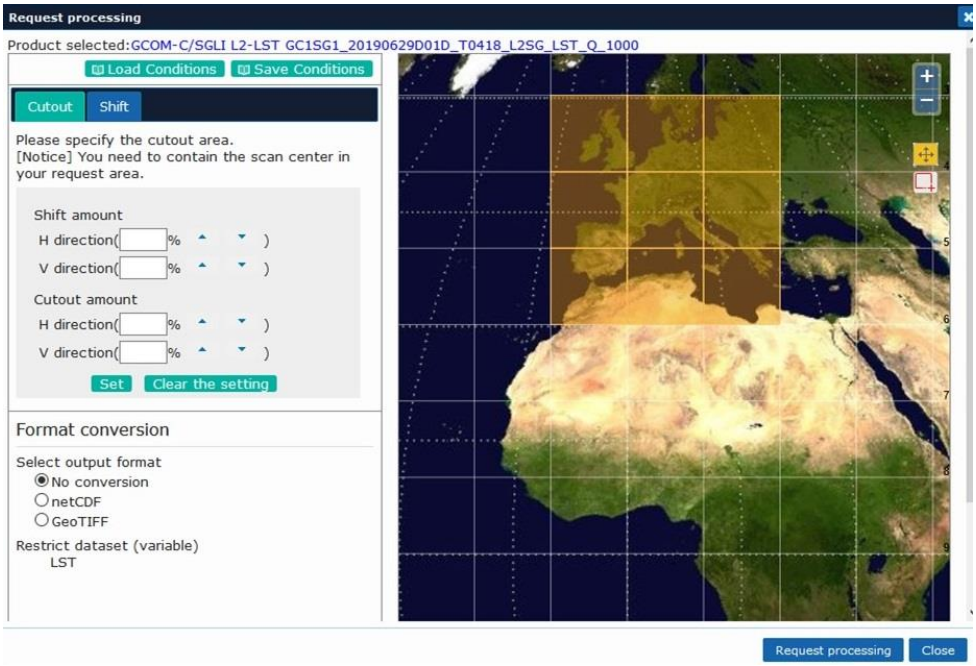


Fig. 2.2-2 “Request processing” dialog (1)

(3) After specifying the observation region and select the output format, click the "Request processing” button (Refer to Fig.2.2-3).

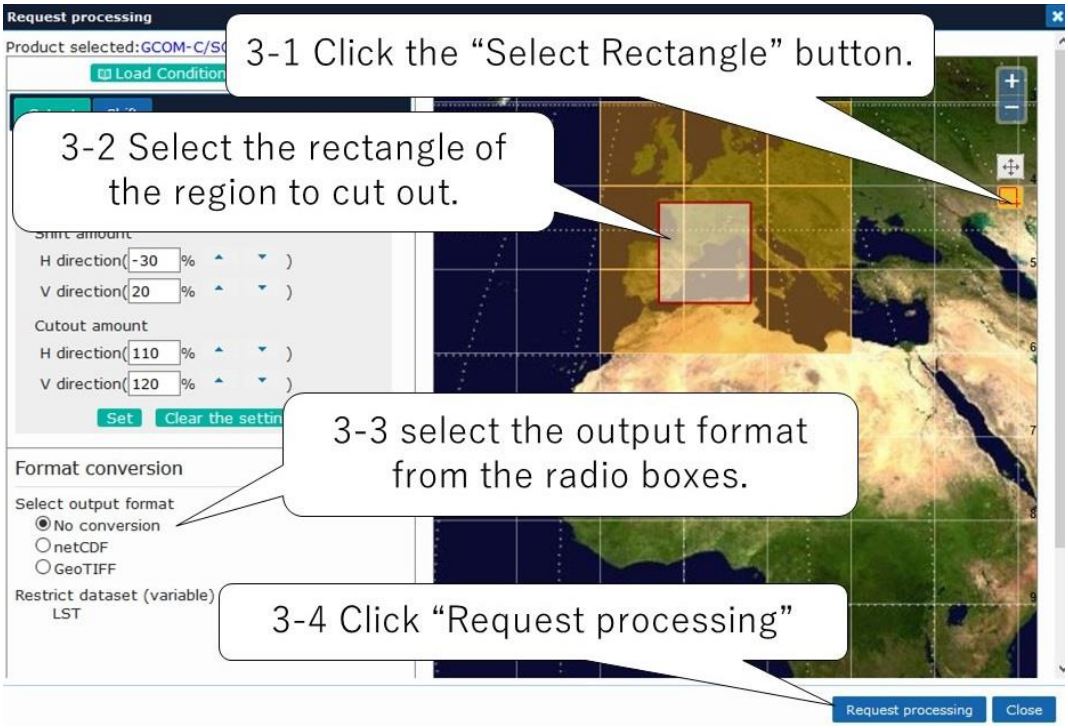


Fig. 2.2-3 “Request processing” dialog (2)

(4) Click “OK” to send the processing request (Refer to Fig.2.2-4).

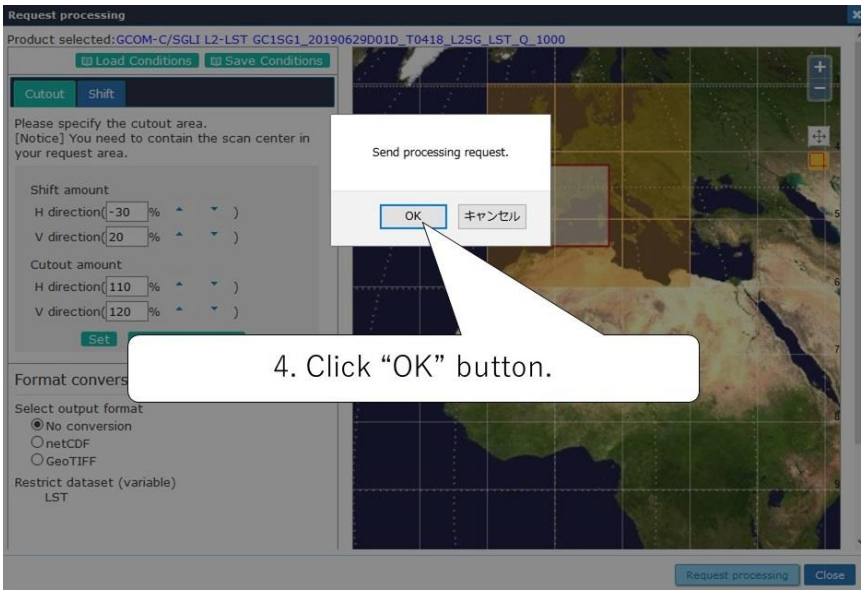


Fig. 2.2-4 Sending of processing request

(5) The production request number is displayed (Refer to Fig.2.2-5).

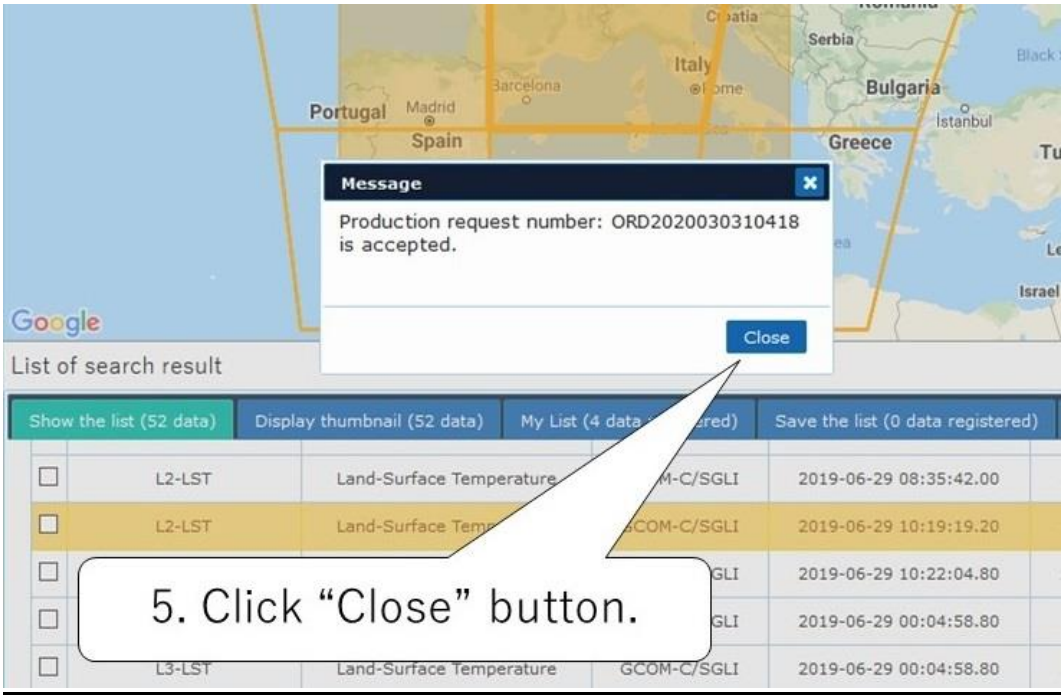


Fig. 2.2-5 Production request number

(6) When you click the "Production Status" tab in the "List of search result", you can confirm the production status of "Processing Request" (Refer to Fig.2.2-6).

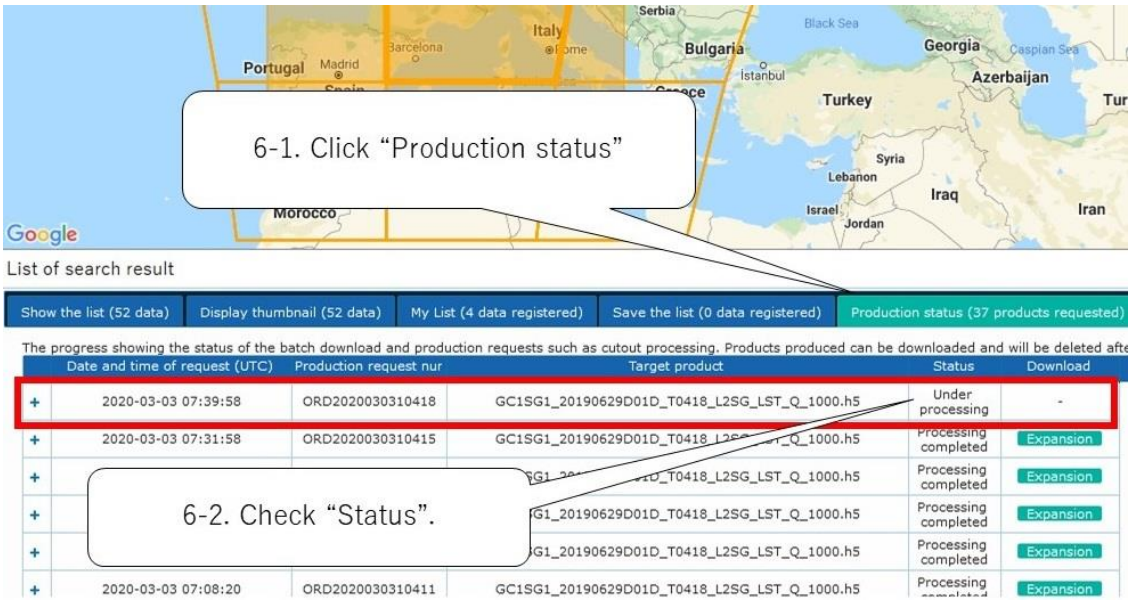


Fig. 2.2-6 Check the processing status (1)

(7) When the processing is completed, click on “Expansion” (Refer to Fig.2.2-7).

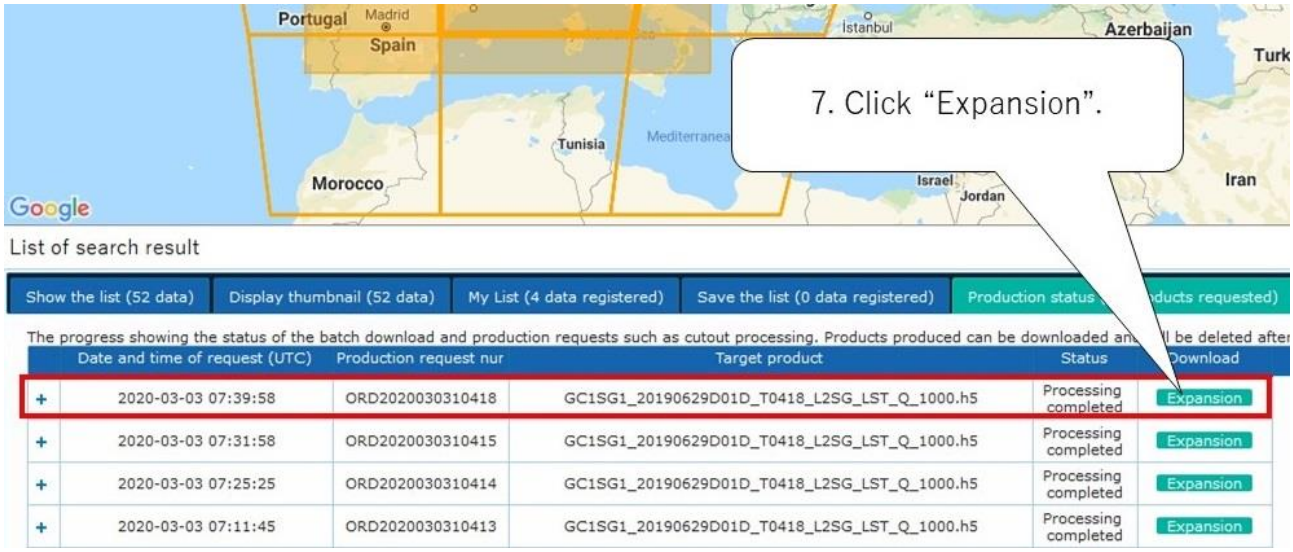


Fig. 2.2-7 Check the processing status (2)

(8) When you click “Download”, the processed file will be downloaded to your computer (Fig. 2.2-8-1).

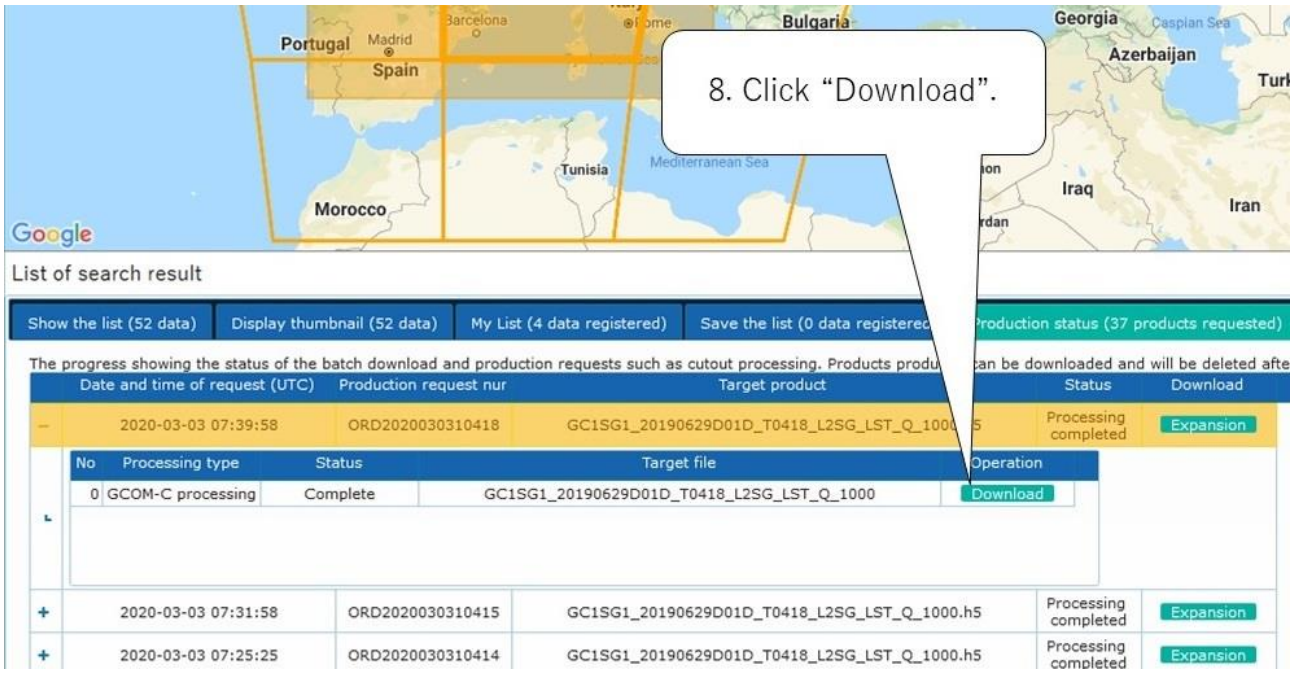


Fig. 2.2-8 Download of processing product

3. Imaging the acquired product

This chapter introduces how to display, process and image the GCOM-C/SGLI land surface temperature products downloaded in Chapter 1 using the SGLI User Tool.

SGLI User Tool provides users with various functions to use earth observation data of GCOM-C/ SGLI. You can display, edit, clip and project them on a map.

3.1. Installation of SGLI User Tool

(1) Click “Tools / documents” left pane on the top menu (Refer to Fig.2-1).

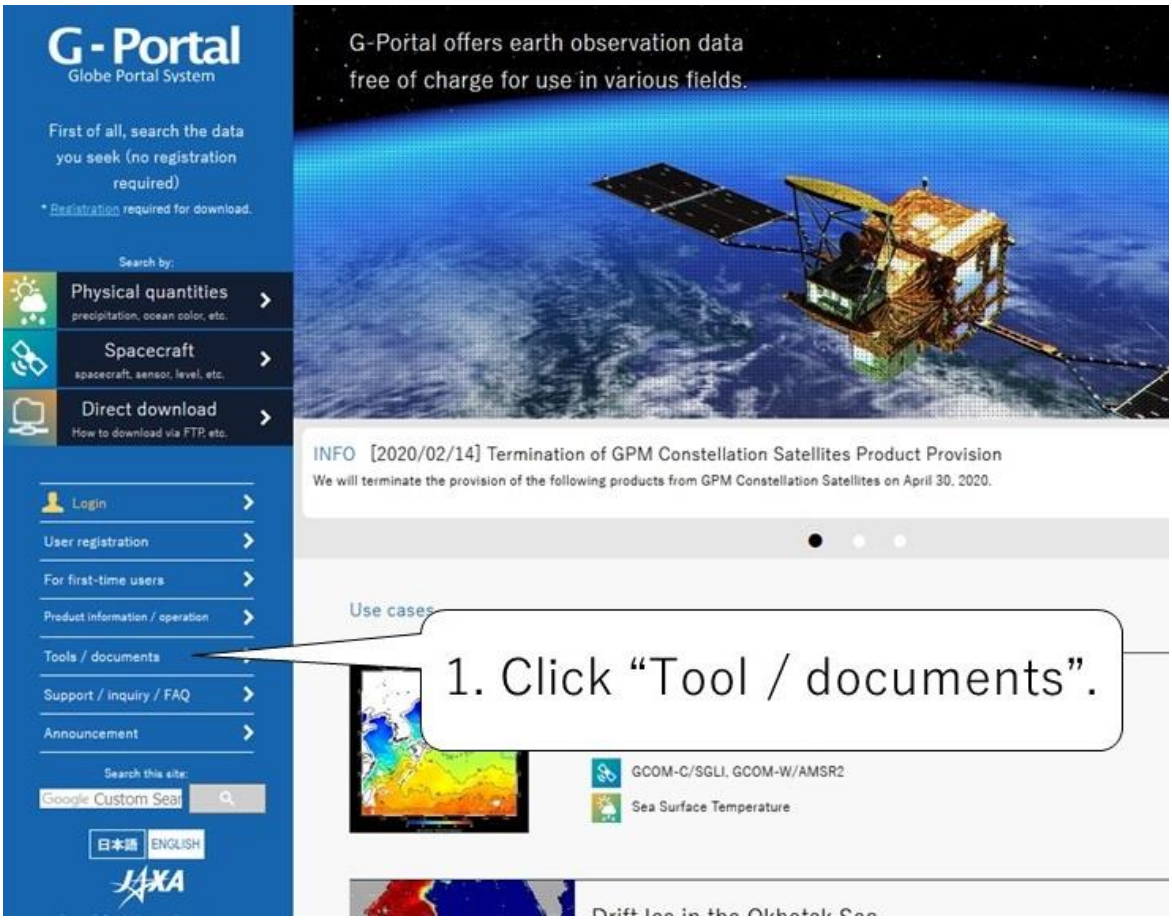


Fig.3.1-1. G-Portal top window

(2) When the "Tools / Documents" screen is displayed, click "GCOM-C" (Refer to Fig.1-2).

- Tools for using satellite products and documents related to product format and other information are available from the "Tools / Documents" window.

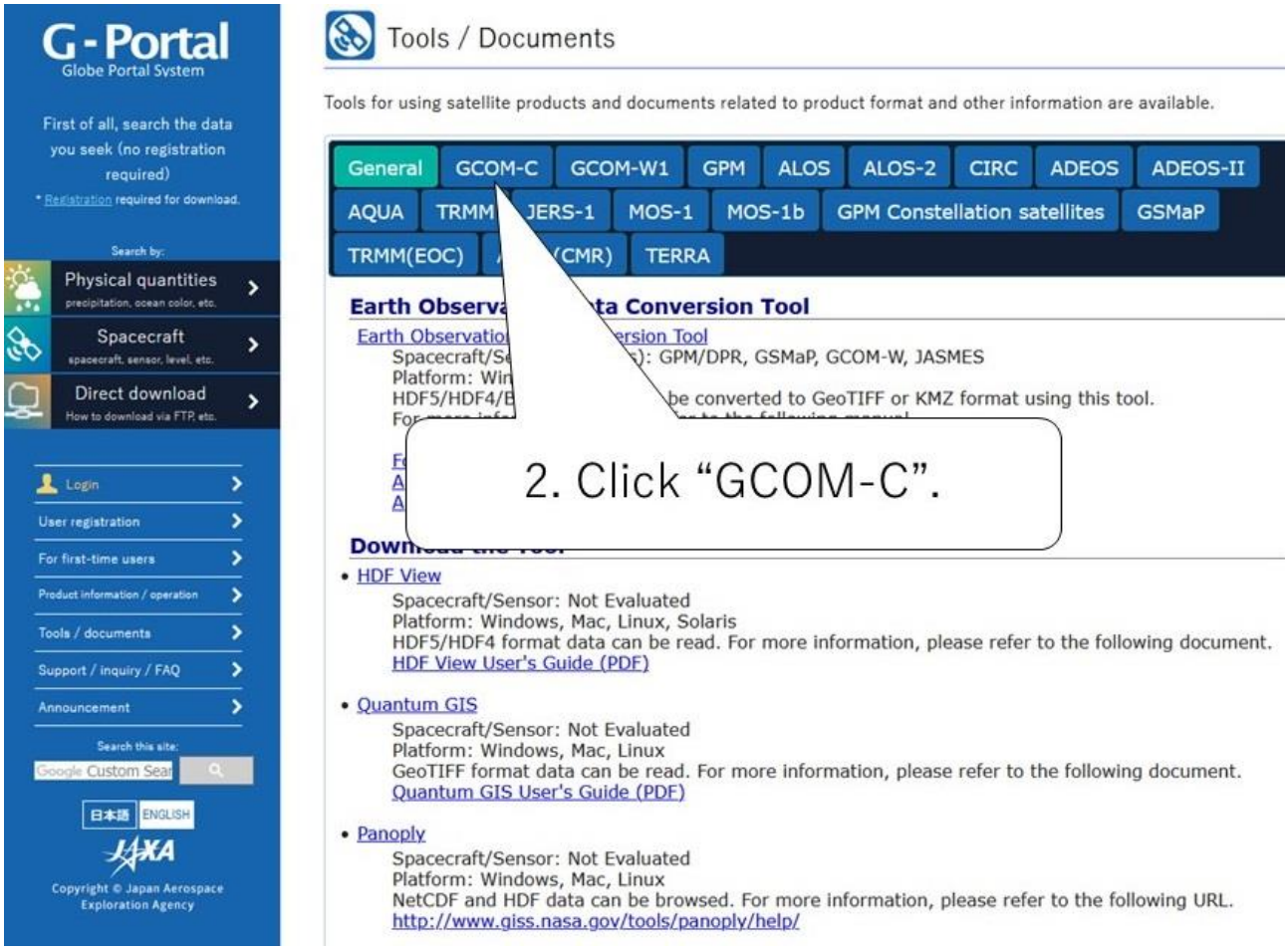


Fig.3.1-2. G-Portal Tools / Document Page (General)

(3) Click “Download” of SGLI User Tool to download the Installer (SGLIUserToolInstaller.msi).

- In the High-resolution version, memory may be insufficient depending on the usage environment. In that case, please use Low-resolution version.

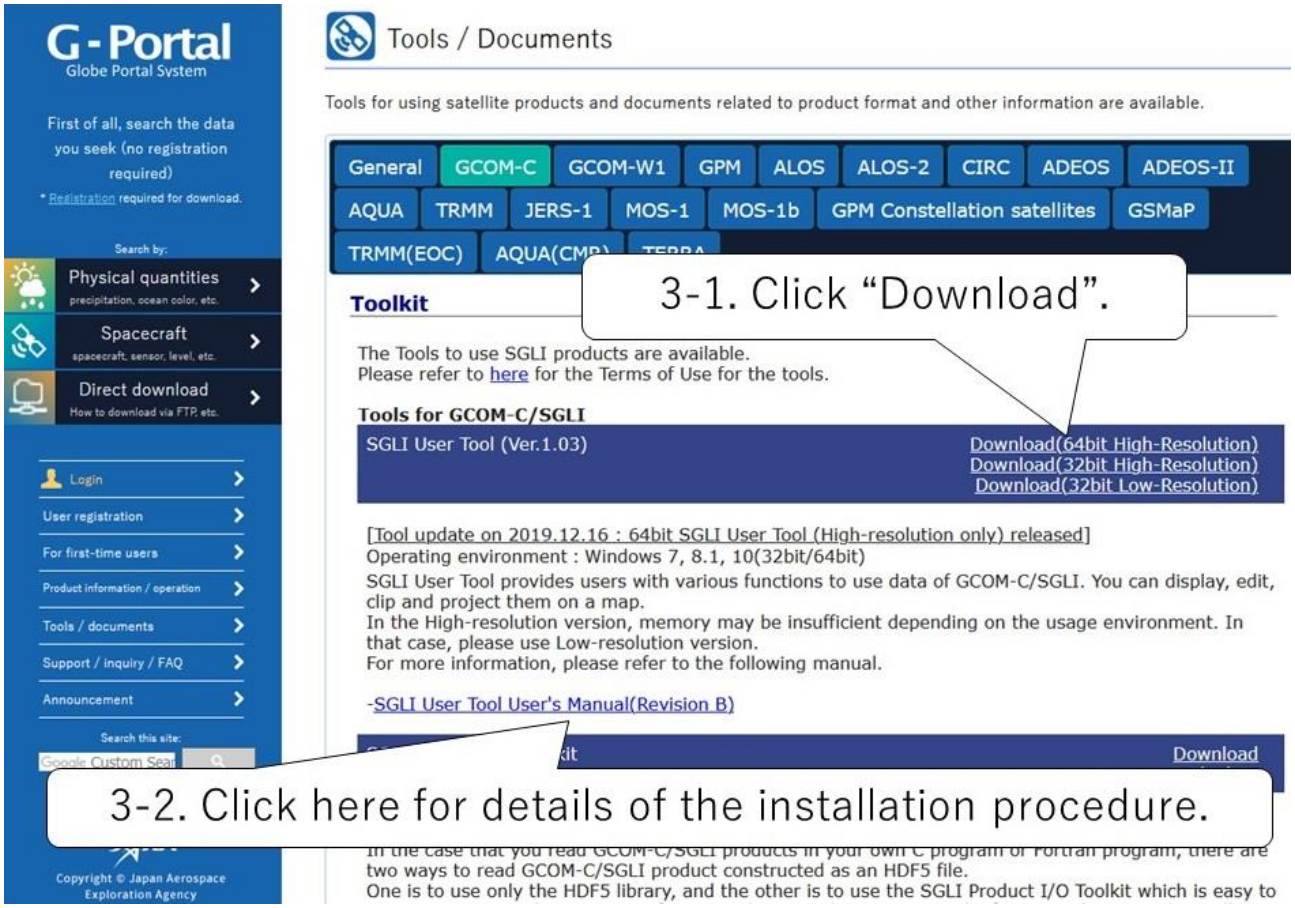


Fig.3.1-3. G-Portal Tools / Document Page (GCOM-C)

(4) Execute the downloaded SGLI User Tool installer (SGLIUserToolInstaller.msi) to start installing the SGLI User Tool.
For details on the installation procedure, refer to the SGLI User Tool User Manual "1.5 Installation".

3.2. Display products using SGLI User Tool

(1) When SGLI User Tool is started, the screen shown in Figure 2.2-1 will appear. Click the “Open (SGLI)” icon.

Fig. 3.2-1 Initial screen of SGLI User Tool

(2) Drag and drop the GCOM-C observation product file to “File Name“ field as shown in Fig.3.2-2.

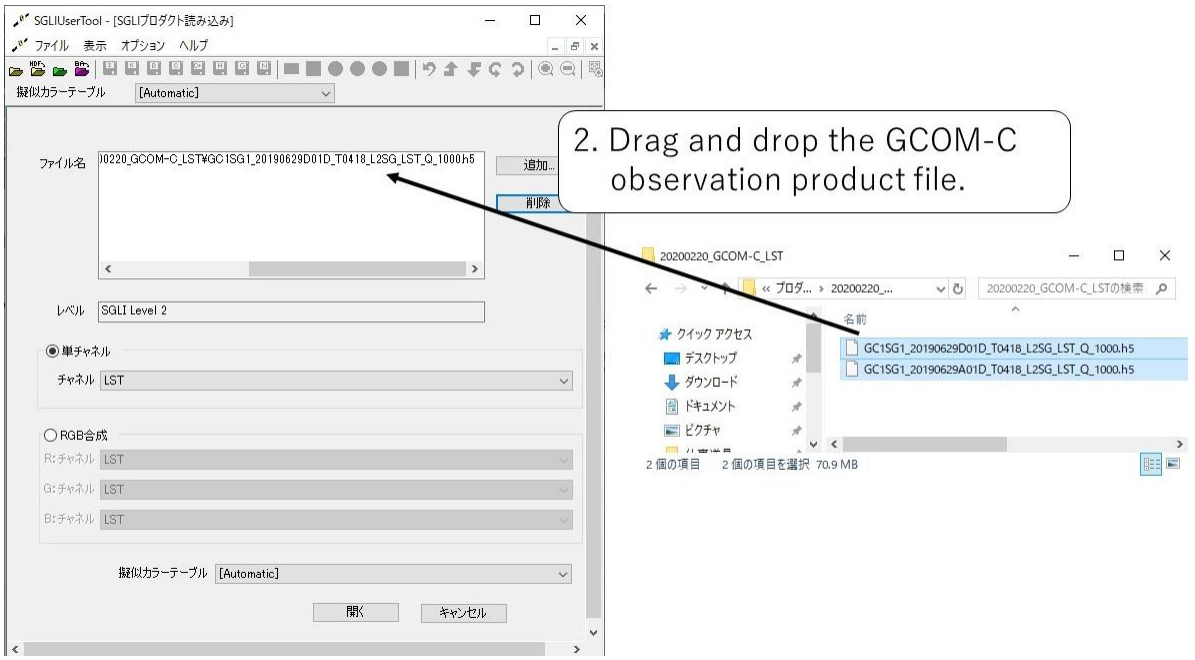


Fig.3.2-2 Drag & Drop Operation

(3) Click the “Open” button to display the product on the map.

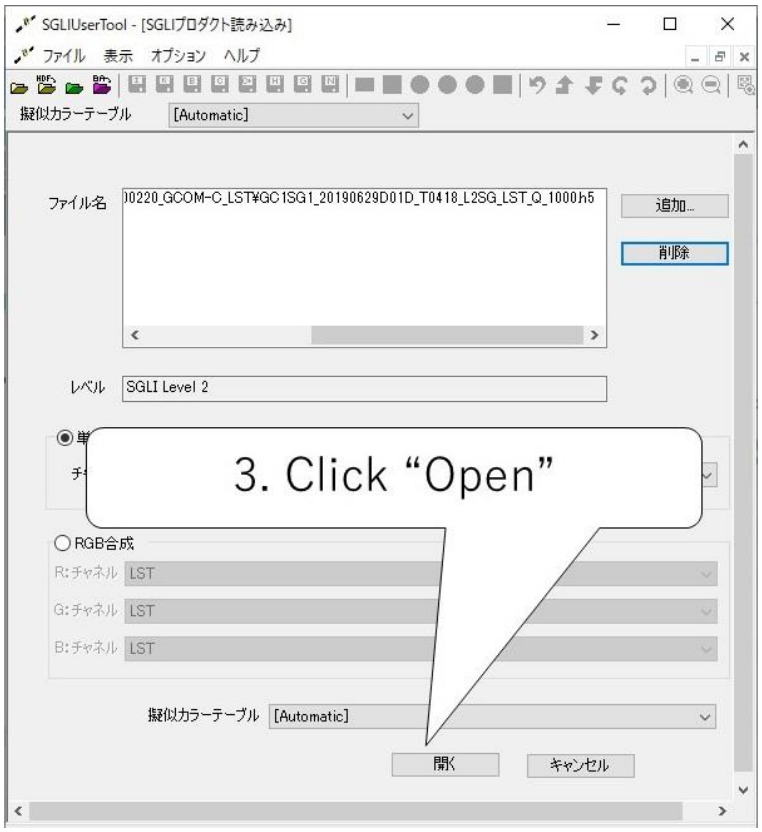


Fig.3.2-3 File Open Dialog

(4) The screen of product and map display as shown in Fig.3.2-4 is displayed.

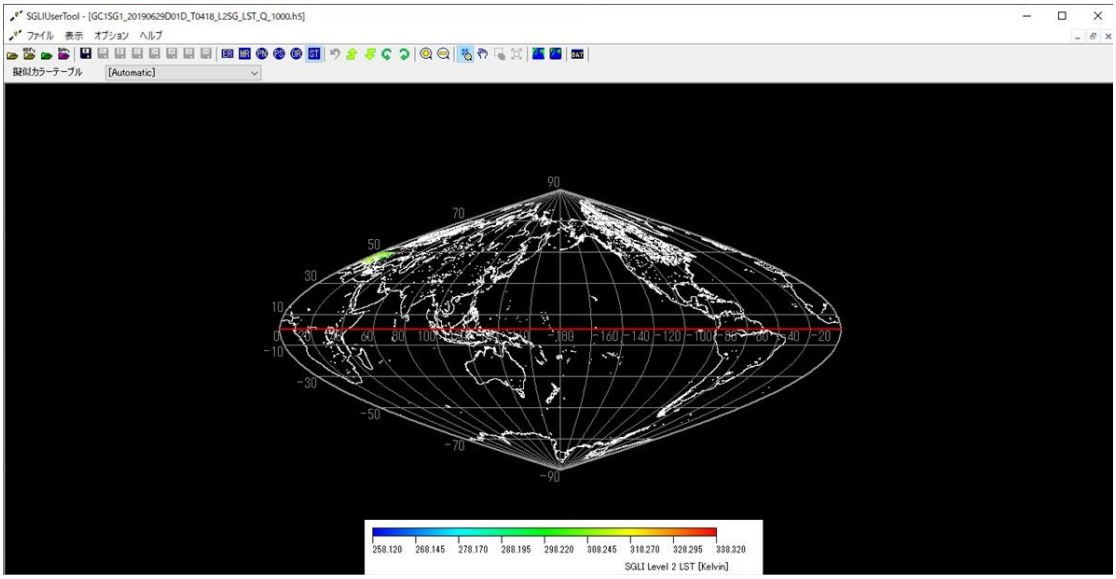


Fig.3.2-4 Product and Map Display (1)

(5) The observation region can be displayed by operating the icons shown in Fig.3.2-5-1.

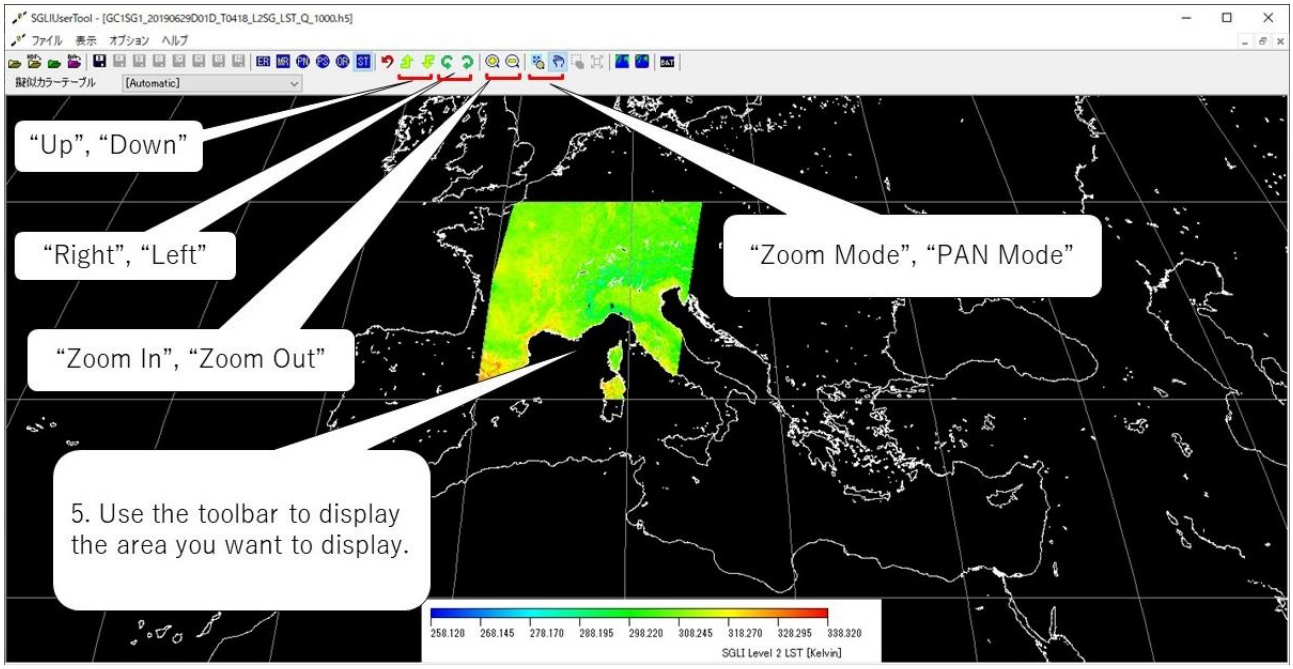


Fig. 3.2-5-1 Product and Map Display (2)

[Reference Information]

- The functions of each button on the toolbar of the SGLI User Tool are as shown in Fig.3.2-5-2.

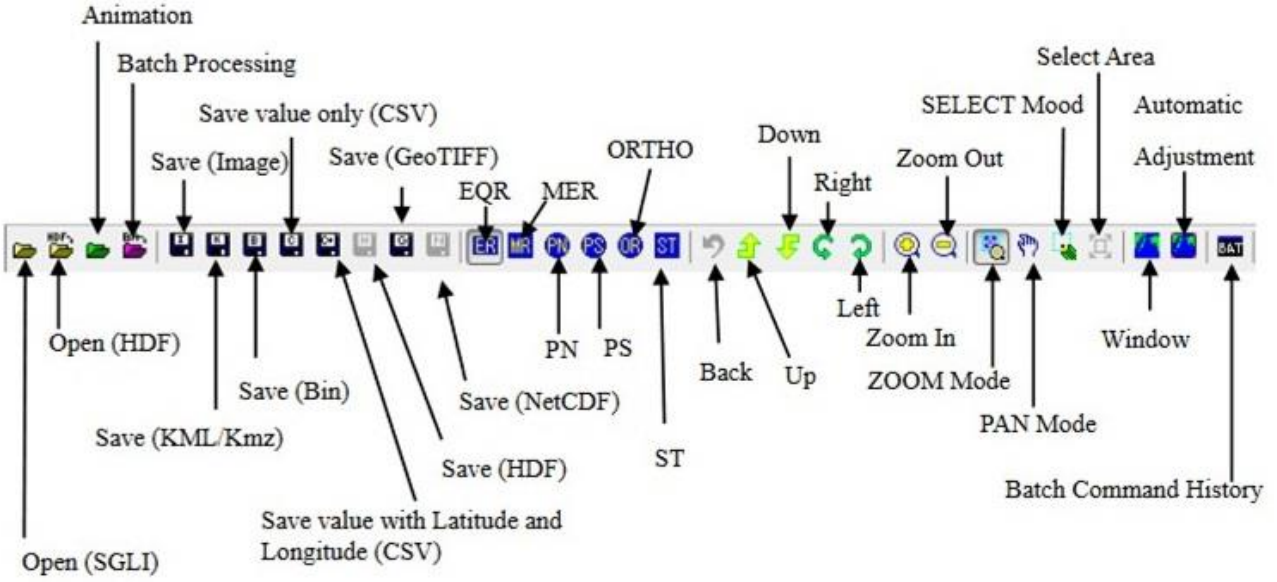


Fig.3.2-5-2 Tool bar

3.3. Cut out and save the image of product

Using the SGLI User Tool, you can cut out any observation region from the observation product image displayed on the map and save it in HDF5 format, image format, KML format, binary format, CSV format, etc. You can also copy it to the clipboard.

We will explain how to save the cut data in image format, and copy it to the clipboard.

3.3.1. Cut out an image and save it in image format

(1) To cut out the product image in HDF5 format, click the “Open (HDF)” icon (Refer to Fig.3.3.1-1), specify the target product file, and open the image. (Refer to Fig.3.2-2 to Fig.3.2-5-1 for the operation procedure.)

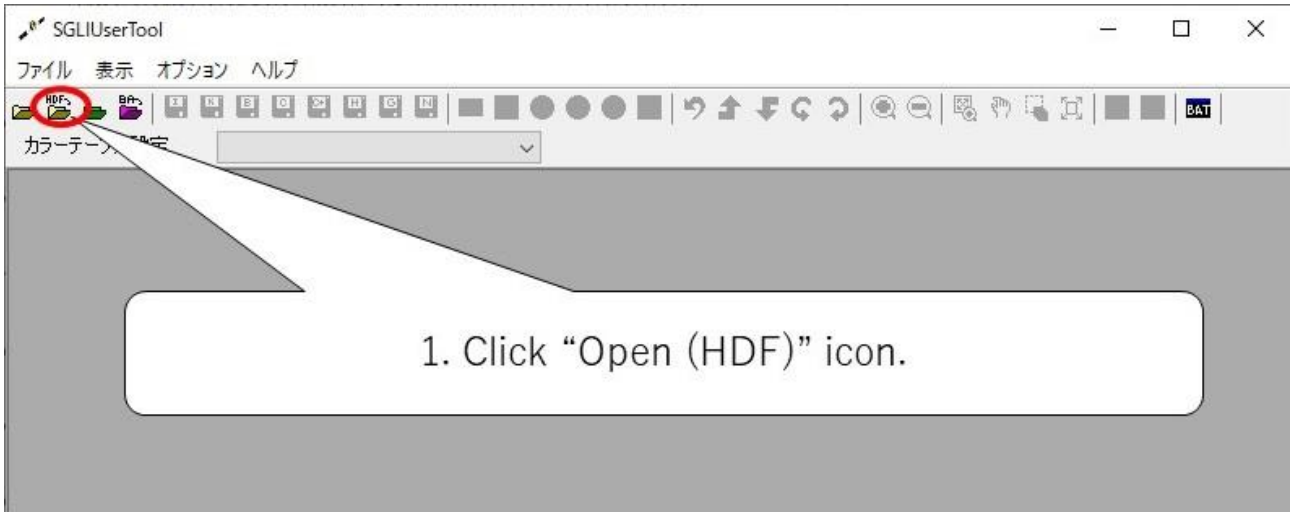


Fig.3.3.1-1 Initial screen of SGLI User Too

(2) The product/map display window is displayed in EQA (sinusoidal equal area) projection as shown in Fig.3.3.1-2. Click the “MR” icon to display the product/map display window in Mercator geographic projection as shown in Fig.3.3.1-3.

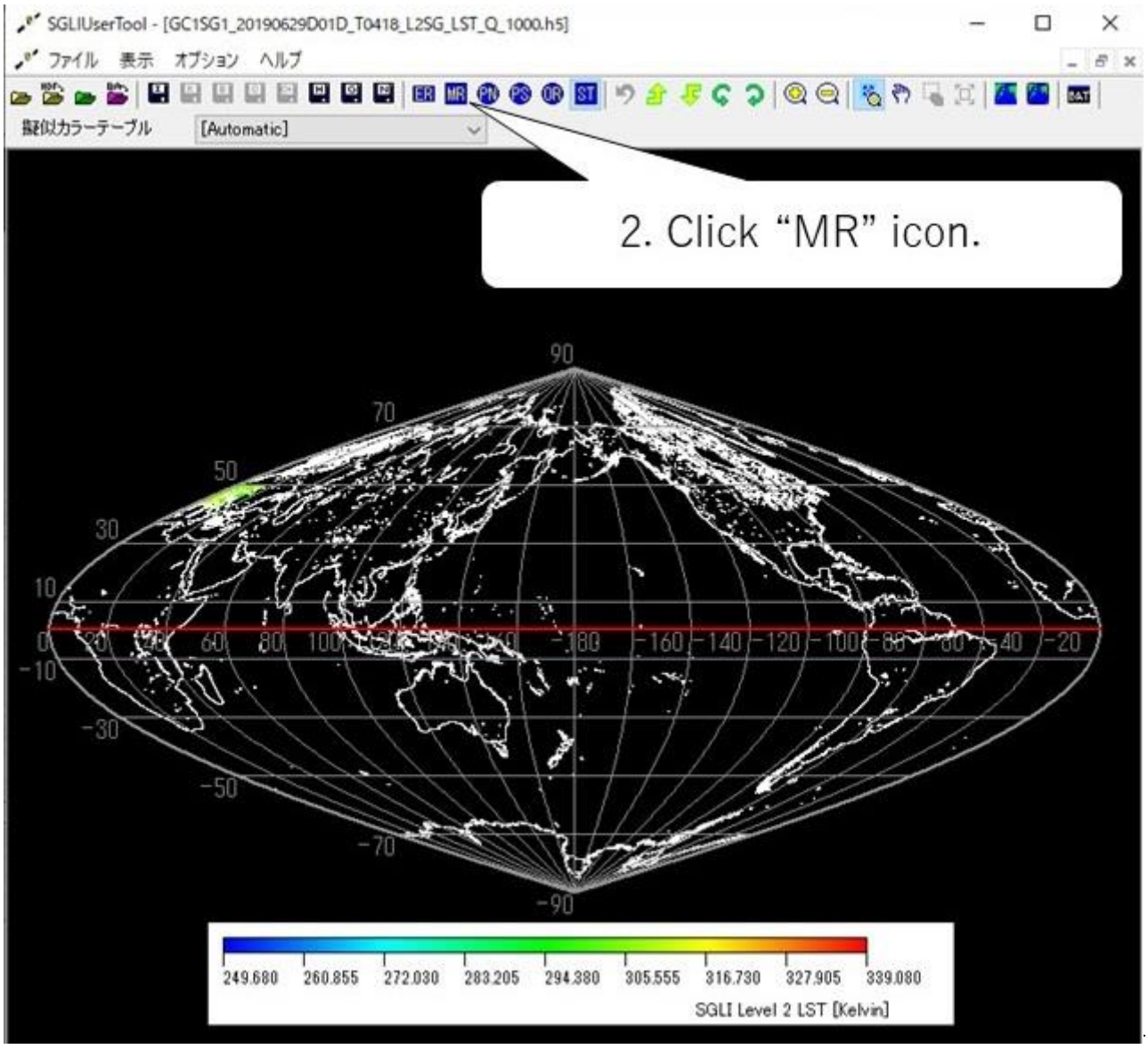


Fig.3.3.1-2 Image of EQA projection

(3) When the product/map display window in Mercator geographic projection is displayed, operate the icons on the toolbar to display the region you want to see. (Refer to Fig.3.3.1-3)

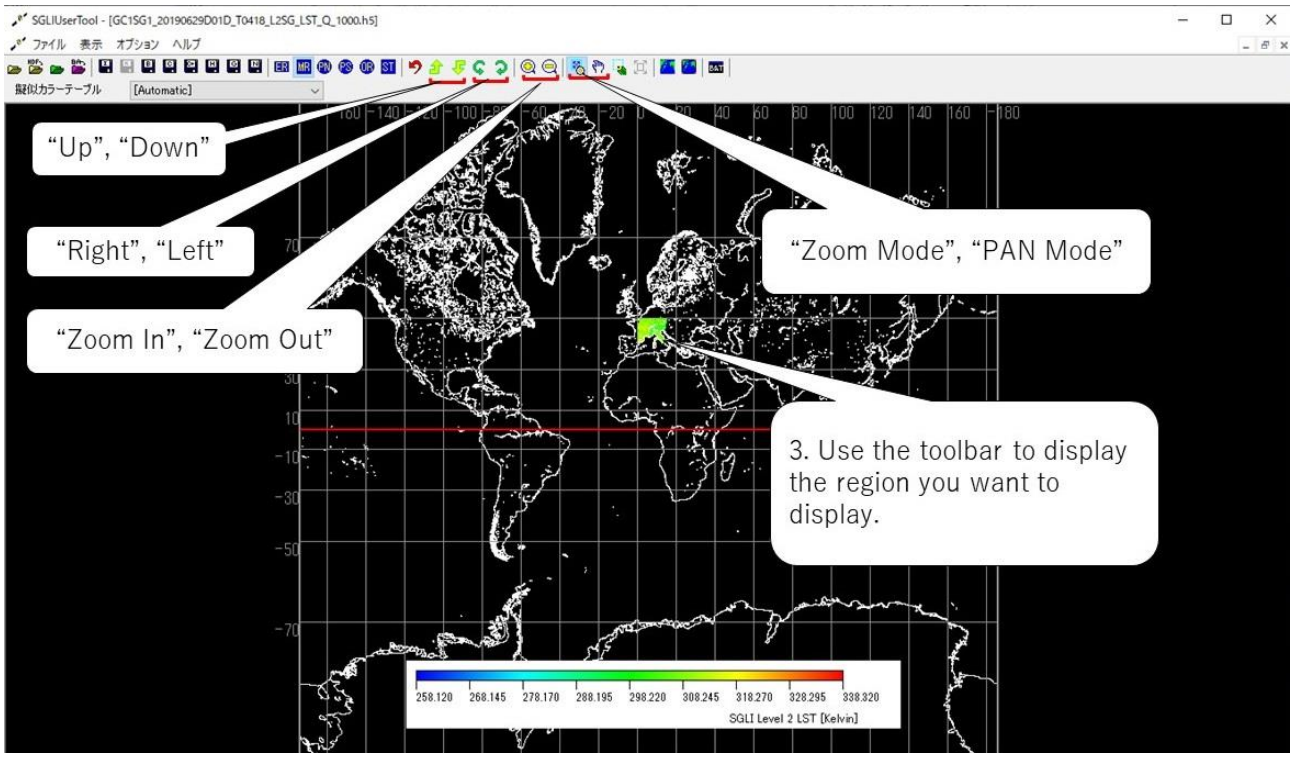


Fig.3.3.1-3 Operation of SGLI User Tool (1)

(4) After specifying the region to cut out, click the "Save (Image)" icon on the toolbar (Refer to Fig.3.3.1-4-1). This region will be saved in image format (jpg). (See Fig. 3.3.1-4-2)

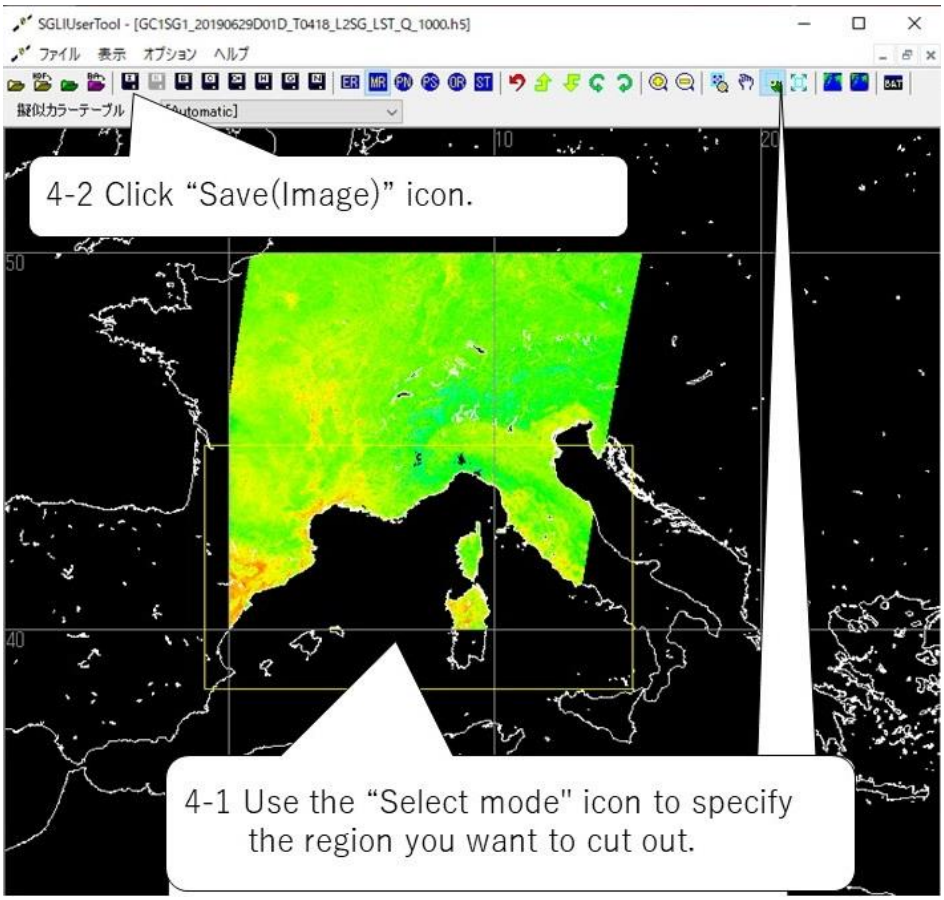


Fig.3.3.1-4-1 Operation of SGLI User Tool (2)

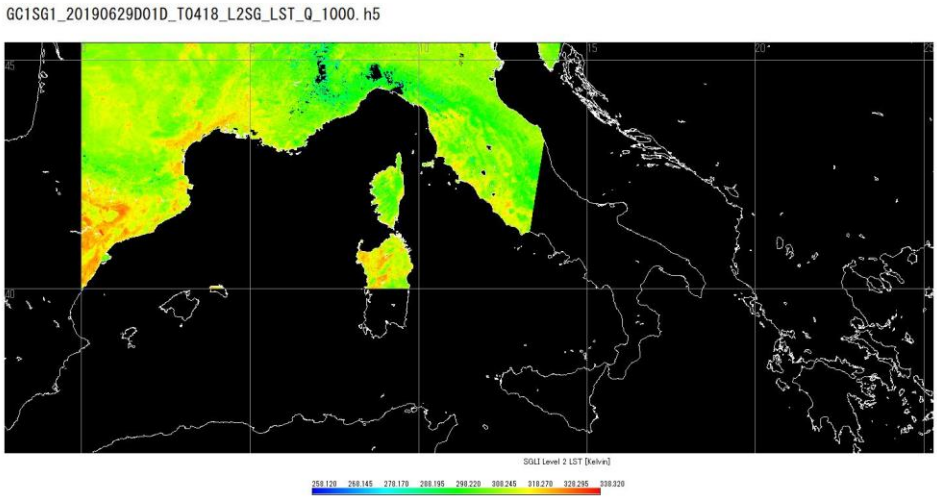


Fig.3.3.1-4-2 Cut out image

3.3.2. Copy the image cut out from the product to the clipboard

(1) From the initial screen of the SGLI User Tool, display the file saved in 3.3.1. (Refer to 3.3.1(1), (2) for the operation procedure.)

(2) Adjust the size and position of the displayed image using the icon of the user tool. (Refer to 3.3.1(3), (4) for operation procedure.)

(3) Click "File" and select "Copy to Clipboard" from the displayed pull-down menu (Refer to Fig. 3.3.2-1). The pull-down menu will appear, allowing you to select "Copy (Window)" or "Copy (Selected Area)".

- This function is to copy a displayed image to Windows clipboard. You can copy the displayed image to another application easily. This menu has the following two kind of sub function.
  - "Copy (Window)": Copy an image on the window.
  - "Copy (Selected Area)": Copy the selected area on image window.「

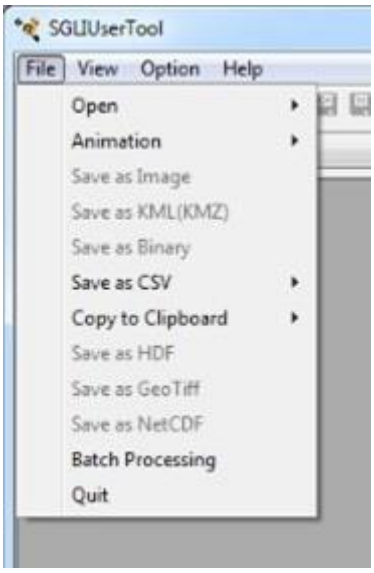


Fig.3.3.2-1 File Menu Pull Down