Practical Manual

1. SDGSAT-1 Accessibility and Prerequisite Software

A. SDGSAT-1 Open Science Program Registration

The SDGSAT-1 practical session will begin with a comprehensive introduction to the satellite's mission objectives and demonstrated applications across various domains. After establishing this foundational knowledge, the instructor will guide participants through the complete operational process, starting with account registration for the SDGSAT-1 Open Science Program (**https://www.sdgsat.ac.cn/**) and proceeding through all necessary steps to successfully locate, select, and download datasets for research purposes. Attendees are encouraged to register with the Open Science Program before the session, while the instructor will prepare a hard drive with sample datasets to share with attendees since data account verification process can take several days.

Registration steps:

Step 1: Open https://www.sdgsat.ac.cn/

Step 2: Click Login

Fig. 1 Open Science Program interface

Step 2: Click User Registration

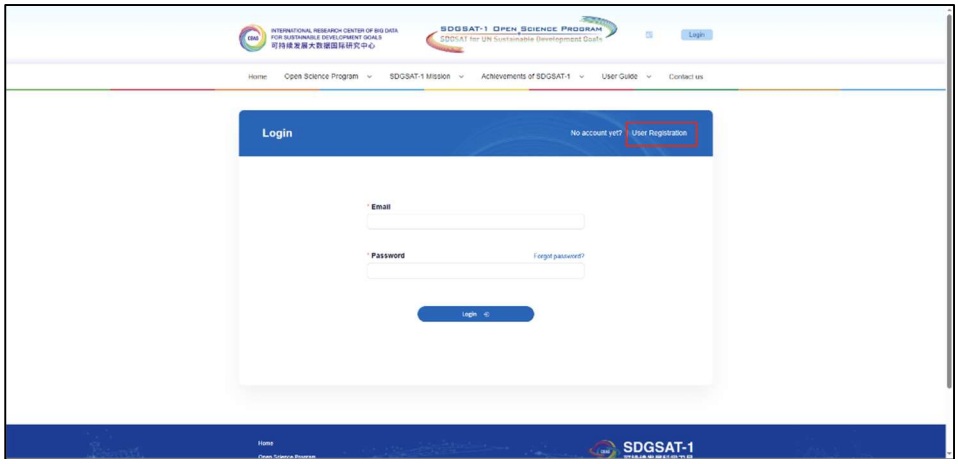


Fig. 2 Login interface

Step 3: Fill in the user registration information

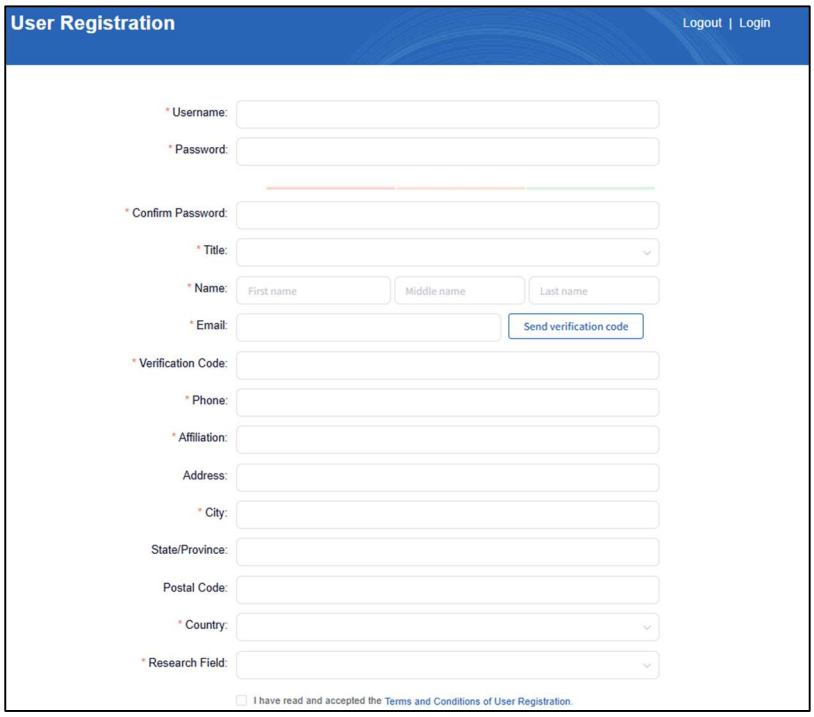


Fig. 3 Information required for SDGSAT-1 data user registration. (https://www.sdgsat.ac.cn/register)

After the registration, data quota (20 images) may not be readily available. You can contact sdgsat1@cbas.ac.cn, if data quota does not change for several days.

To increase the quota volume, data user need to submit a proposal (click proposal submission， Fig. 4) with research information (Fig. 5)

Fig. 4 Proposal submission.

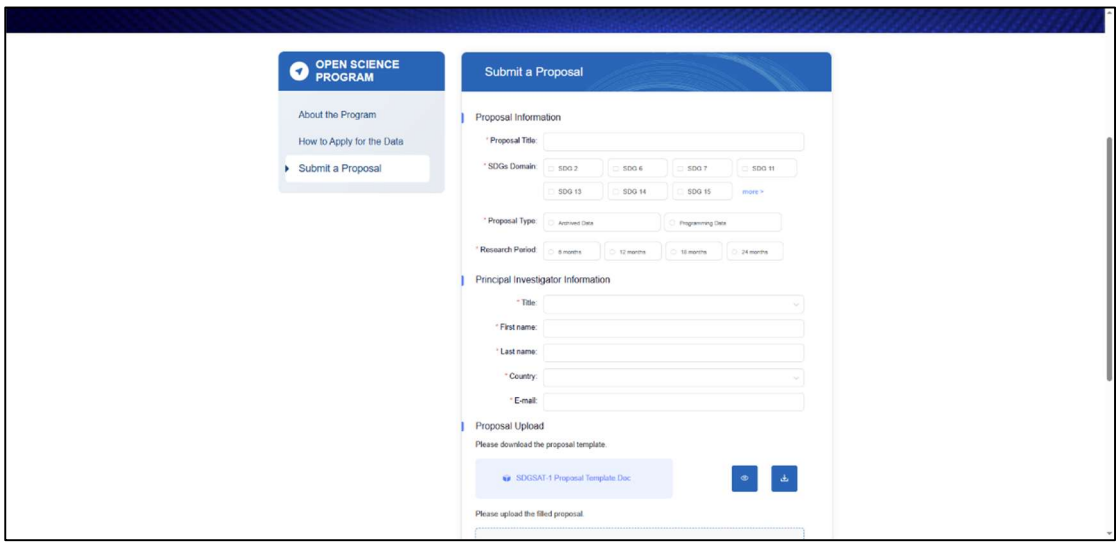
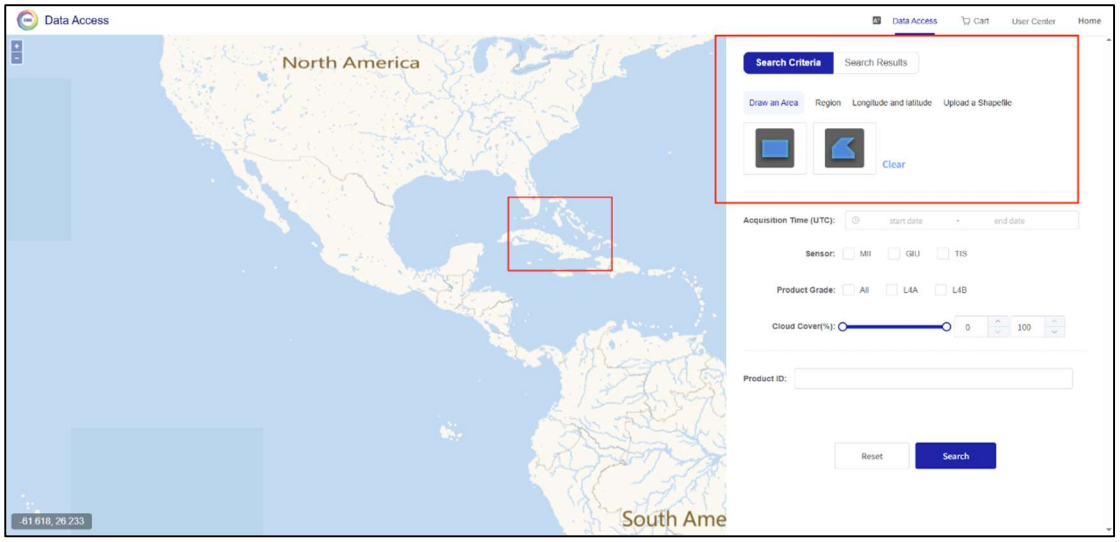


Fig. 5 Required Proposal information

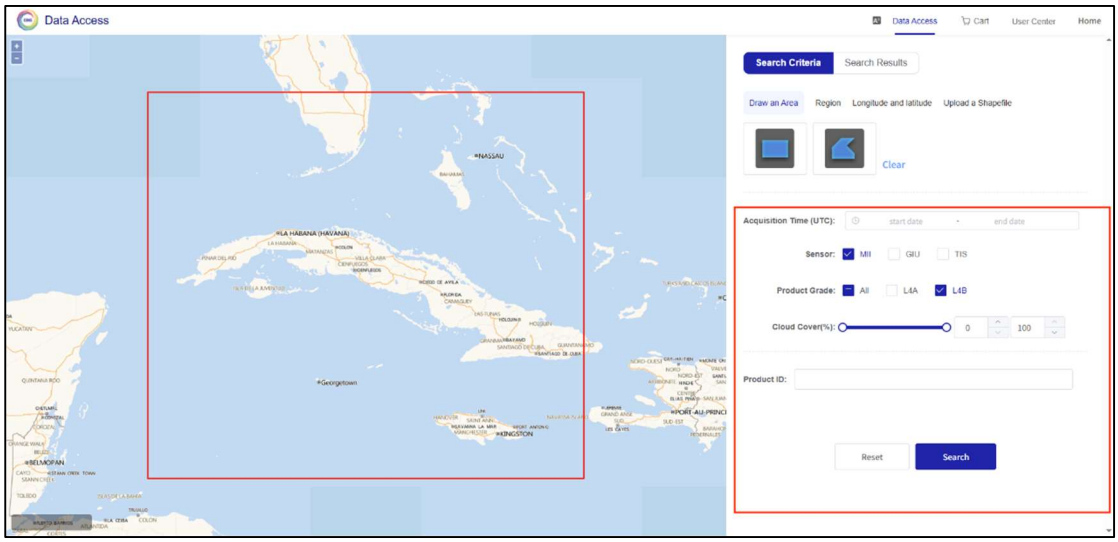
Data access steps:

Step 1: Click Data Access

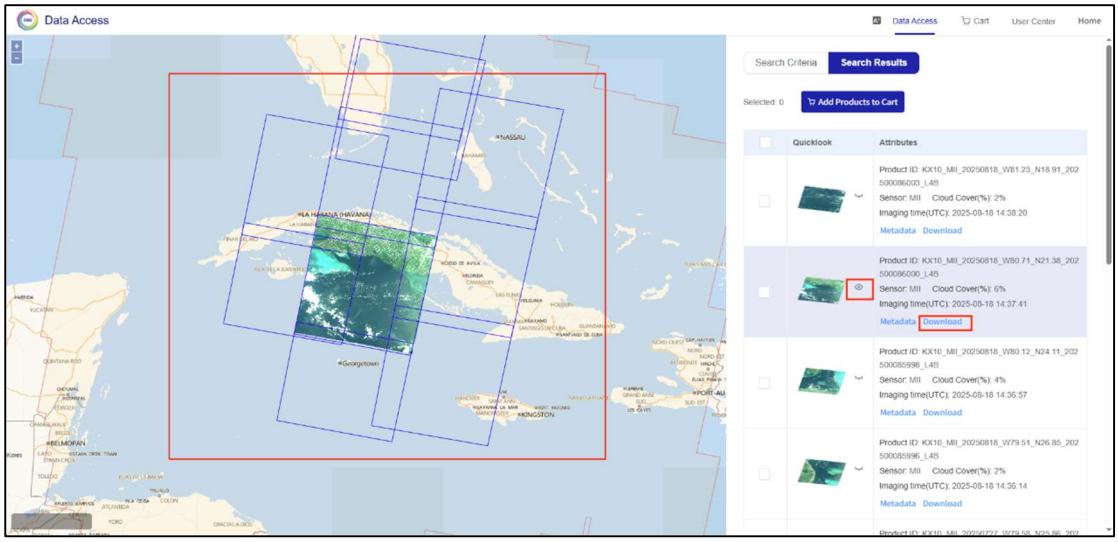
Step 2: Draw the area of interest with tools in Search Criteria



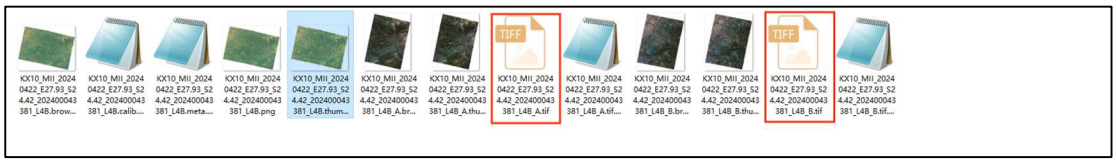
Step 3: Specify the time window, sensor type (MII for multispectral, GIU for glimmer, TIS for thermal infrared) and product grade (usually L4B for MII and TIS, L4A for GIU).



Step 4: Click Search bottom. The search result will show preview option and download bottom.



Step 5: Unzip. Unzipped files consist of preview images, metadata files and tiff data (the satellite images for analysis).



B. QGIS Installment

QGIS is a powerful open-source geographic information system capable of visualizing, processing, and exporting remote sensing data. During the workshop, the instructor will demonstrate core software functionalities, with particular emphasis on working with SDGSAT-1 datasets. Participants can install QGIS version 3.32.2 (**https://download.qgis.org/downloads/**) prior to the session, though the instructor will also provide installation support during the workshop. Attendees may also use alternative software such as ArcGIS based on their preference.

2. Basic SDGSAT-1 data processing

The instructor will outline essential preprocessing steps for SDGSAT-1 data—such as radiometric calibration, spatial clipping, and pan-sharpening—to ensure its suitability for downstream applications.

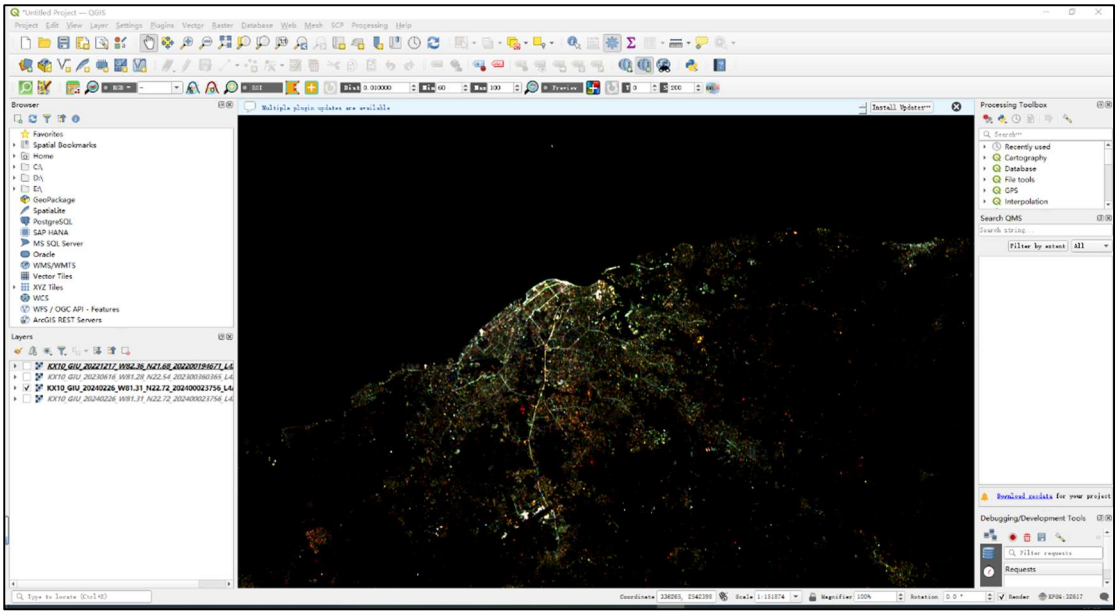


Fig. 6 QGIS interface after loading SDGSAT-1 GIU data.

3. SDG Monitoring in Island States

A. SDG 7 and 11

The instructor will demonstrate the application of SDGSAT-1 data for monitoring Sustainable Development Goal 7 (Affordable and Clean Energy) and Goal 11 (Sustainable Cities and Communities).

Fig. 7. Armed conflicts, civil unrest, and natural disasters can severely disrupt power grids, resulting in widespread outages detectable through SDGSAT-1 Glimmer nighttime. Armed conflicts have caused power outage in Khartoum, Sudan

B. SDG 13

The instructor will demonstrate the application of comprehensive geospatial data for monitoring Sustainable Development Goal 13 (Climate Action), showcasing analytical techniques to assess climate change impacts using Earth observation technologies.

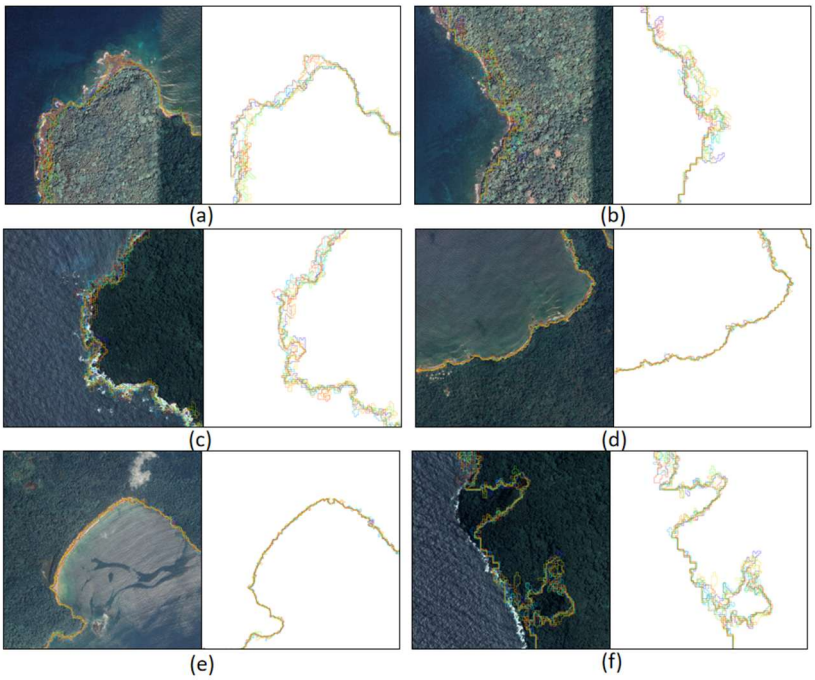


Fig. 8. Satellite remote sensing data can be applied to monitor the change of coastline.

C. SDG 14

The instructor will demonstrate the application of Earth observation data for monitoring Sustainable Development Goal 14 (Life Below Water), showcasing analytical techniques for assessing marine coastal ecosystems and anthropogenic impacts

Fig. 9. Red tide detection based on SDGSAT-1 multispectral data.

D. Further topics

The instructor will provide a concise overview of advanced remote sensing applications for SDG monitoring, covering Python-based automation techniques, essential open-source libraries, and emerging research frontiers in the field.