SENTINEL ASIA

ANNUAL REPORT 2024

Sentinel Asia

Annual Report 2024

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1. Introduction

1.1. Purpose and Scope of This Document

This document describes the activities of Sentinel Asia (SA) in 2024 for member organizations and external relations.

1.2. Structure of This Document

This report follows the following structure:

Chapter 1 Introduction

Chapter 2 Sentinel Asia and Major Disasters: overview and target disaster events related to Sentinel Asia.

Chapter 3 Emergency Observation Operations in 2024: results of emergency observation activities in 2024.

Chapter 4 External Relations: explanation of the integration of new members, progress, external relationships, and Cooperating Bodies.

Chapter 5 Conference and Releases: reports on all communication activities undertaken throughout the reporting period.

Chapter 6 Assessment of Sentinel Asia Operations: assessment of the overall impact of Sentinel Asia as a service in supporting disaster response, and of system performance, products, and services.

Chapter 7 Conclusions: outline of significant achievements and conclusions throughout the reporting period.

1.3. List of Acronyms

ADRC	Asian Disaster Reduction Center
AHA Centre	ASEAN Coordinating Centre for Humanitarian Assistance on disaster management
AIT	Asian Institute of Technology
ALOS	Advanced Land Observing Satellite
APRSAF	Asia-Pacific Regional Space Agency Forum
ASEAN	Association of South-East Asian Nations
BRIN	Badan Riset dan Inovasi Nasional
BWBD	Bangladesh Water Development Board
CEA	Institute of Geology, China Earthquake Administration
DAN	Data Analysis Node
DDM	Department of Disaster Management
DHM	Department of Hydrology and Meteorology
DPN	Data Provider Node
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
EOR	Emergency Observation Request
EOS	Earth Observatory of Singapore
GIC	Geoinformatics Center
GIS	Geographic Information System
GISTDA	Geo-Informatics and Space Technology Development Agency
ICIMOD	International Centre for Integrated Mountain Development
ICT	Information and Communication Technology
IDC	International Disaster Charter
ISRO	Indian Space Research Organisation
IWM	Institute of Water Modelling
JAXA	Japan Aerospace Exploration Agency
JPTM	Joint Project Team Meeting
MAF	Ministry of Agriculture and Forestry
MBRSC	Mohammed Bin Rashid Space Centre
METU	Middle East Technical University
MIMU	Myanmar Information Management Unit
MO	Manila Observatory
MOHA	Ministry of Home Affaires

MONRE	Ministry of Natural Resources and Environment
MRC	Mekong River Commission
NCHM	National Center for Hydrology and Meteorology
NDRMO	National Disaster Risk Management Office
NDRRMA	National Disaster Risk Reduction and Management Authority
NCSRT	National Center of Space Researches and Technologies
NDMI	National Disaster Management Research Institute
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PhilSA	Philippine Space Agency
PHIVOLCS	Philippine Institute of Volcanology and Seismology
RSO	Regional Support Office
SA	Sentinel Asia
SAWG	Space Applications for Societal Benefit Working Group
SOP	Standard Operating Procedure
SPC	The Pacific Community
TASA	Taiwan Space Agency
TUINS	Toyama University of International Studies
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNOOSA	United Nations Office for Outer Space Affairs
VAP	Value Added Product
WFP	United Nations World Food Programme
WINDS	Wideband InterNetworking engineering test and Demonstration Satellite

2. Sentinel Asia and Major Disasters

2.1. Overview of Sentinel Asia

2.1.1. Background and History of Sentinel Asia

Natural hazards have been on the rise worldwide, including in the Asia-Pacific region (Figure 1). The Asia-Pacific region suffers from different types of natural hazards, such as earthquakes, cyclones/typhoons, floods, landslides, droughts, tsunamis, volcanic eruptions and forest fires. Several of them are large-scale, devastating disasters. Given the high population level (about 3 billion) as well as the high frequency and severity of natural hazards in the region, an integrated use of space technology, such as earth observation satellite data and geographic information systems, can be an effective means to reduce the magnitude of the severity, or can provide timely management in the event of a large-scale natural hazard or disaster. In light of the increasing frequency of natural hazards and an elevated loss of life and property from these events, SA, a collaborative regional project, was conceptualized in 2005, and began Emergency Observation Request (EOR) activity in 2007. It is engaged in activities to share and provide disaster-related information, including earth observation satellite images via the internet, in order to contribute toward disaster management in the Asia-Pacific region. Space agencies from the Asia-Pacific Region Space Agency Forum (APRSAF) community, including the Japan Aerospace Exploration Agency (JAXA), and disaster risk reduction agencies in the Asia-Pacific region, such as the Asian Disaster Reduction Center (ADRC), cooperate in forming a Joint Project Team (JPT) and promoting SA. As of December 2024, it consists of 123 member organizations, including 104 agencies from 30 countries/regions, and 19 international organizations. JAXA has been serving as the secretariat of the JPT.

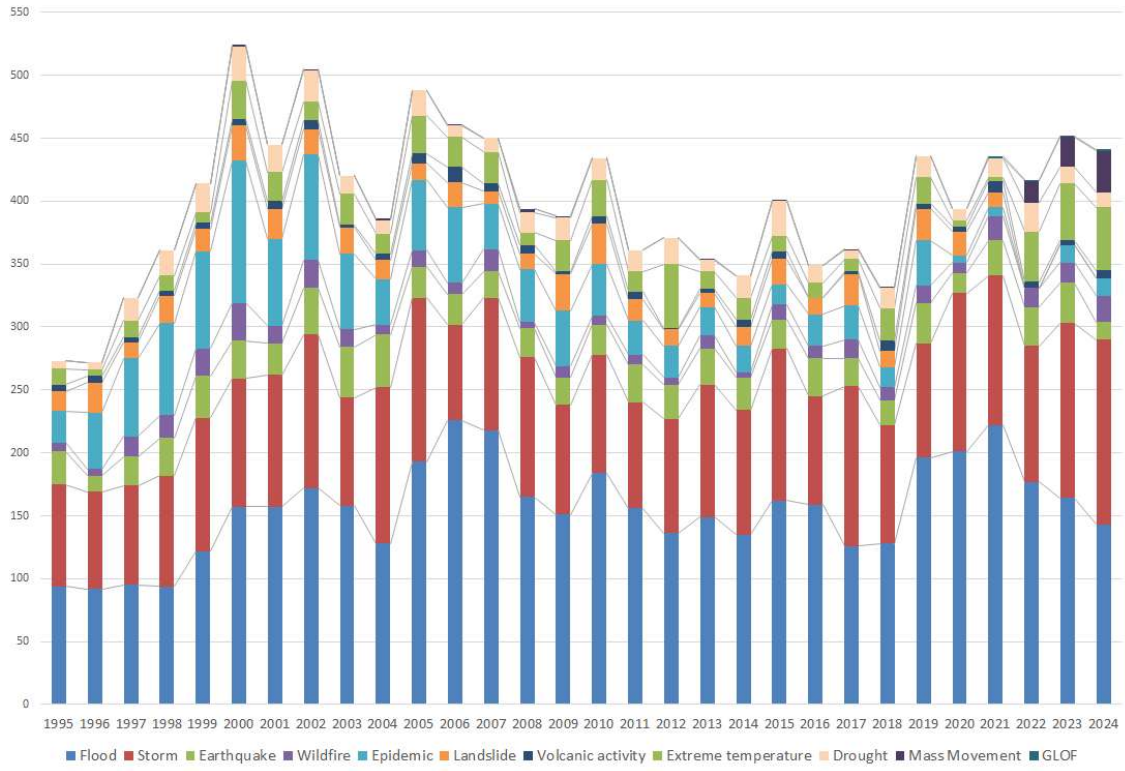

Figure 1: Incidence of Natural Hazards (in and after 1995)

A stepwise approach for the implementation of data and information dissemination systems through SA as proposed by the APRSAF was as follows:

Step 1: Implementation of the backbone 'Sentinel Asia' data dissemination system and associated Nodes (Feb. 2006–Dec. 2007)

Step 2: Expansion of the dissemination backbone with new Satellite Communication Systems (2008–2012)

Step 3: Establishment of a comprehensive 'Disaster Management Support System' in the region (2013 onwards)

Sentinel Asia initiated an emergency observation request system in 2007 to provide image data (and analyzed images) acquired through the satellites operated by participating space agencies on the internet and via JAXA's Wideband InterNetworking engineering test and Demonstration Satellite (WINDS), also known as Kizuna, in the event of a disaster in the Asia-Pacific region.

During that time, Sentinel Asia participated in the International Disaster Charter (IDC) in 2010 to expand its activities and cooperation on a global scale. Sentinel Asia also established the Regional Support Office (RSO) for the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) at ADRC in June 2009, which serves as a contact (liaison) office for emergency observation requests, to expand the range of its activities and increase international interest.

2.1.2. Aims and Activities of Sentinel Asia in a Nutshell

SA aims to: (i) improve safety in society with the use of modern Information and Communication Technology (ICT) and space-based technology; (ii) improve the speed and accuracy of disaster preparedness and early warnings; and (iii) minimize the number of victims, as well as social and economic losses. To achieve these goals, various activities have been undertaken.

The main activities of the SA are summarized as follows:

- Emergency observation by earth observation satellites (e.g., ALOS-2, FORMOSAT-5, RESOURCESAT-2/2A, CARTOSAT-2S/3, EOS-4, Thaichote, VNREDSat-1A, TeLEOS-1, KhalifaSat, DIWATA-2, and NovaSAR-1) in the event of major disasters
- Acceptance of observation requests for major disasters in the Asia-Pacific region from ADRC member organizations and the representative organizations of JPT members to support disaster management in the region
- Capacity building of member organizations (e.g., through training) for the utilization of satellite images for disaster management

The following is an overview of the main data and products provided by SA to its members: (i) satellite imagery (and data permitted by data providers) and value-added images with an extraction of the affected area, etc.; (ii) on-site digital camera images; (iii) wildfire hotspot information and data; (iv) rainfall (short-term and long-term) information and data; and (v) meteorological satellite imagery and data.

2.1.3. Framework and Emergency Observation Mechanisms of Sentinel Asia

SA is promoted under cooperation among the following three communities: (i) the Space Community (APRSAF); (ii) the International Community (e.g., AIT, AHA Centre, ASEAN, UNOOSA); and (iii) the Disaster Reduction Community (ADRC and its member countries), as illustrated in Figure 2. The JPT was established to promote the activities of SA, and it is open to all APRSAF member countries, disaster prevention organizations and regional/international organizations who wish to participate in disaster information sharing activities.

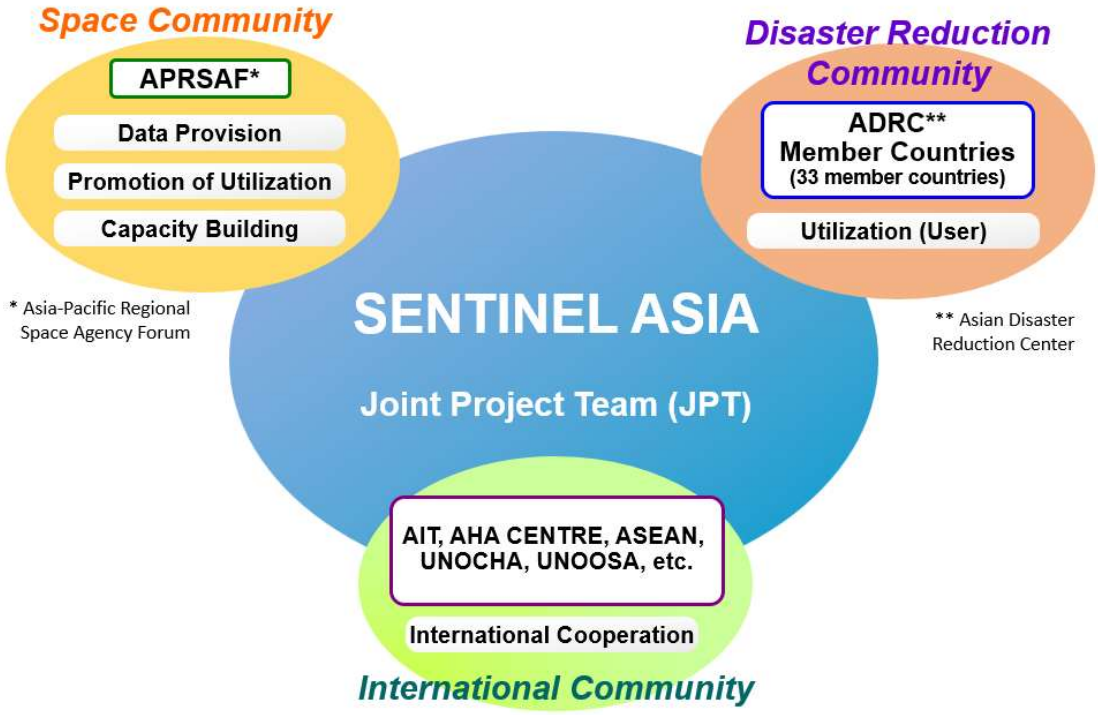

Figure 2: Framework of Sentinel Asia

SA is composed of two Nodes (Data Provider, and Data Analysis) . The Data Provider Node (DPN) provides their own satellite imagery and other relevant data to JPT members upon an EOR from a JPT member, to the extent permitted by the data policy of each DPN when a disaster occurs; while the Data Analysis Node (DAN) analyzes the satellite data provided by DPN, makes a Value Added Product (VAP) and uploads and shares the result through the Sentinel Asia EOR system "OPTEMIS", which started operation in 2019 (Figure 3). Between 2007 and 2024, 546 EORs have been made or accepted, and data and products have been provided to its members to support disaster

management. The four WGs are working toward the establishment and improvement of early warning/forecasting systems, as well as monitoring and planning for disaster management in their respective fields.

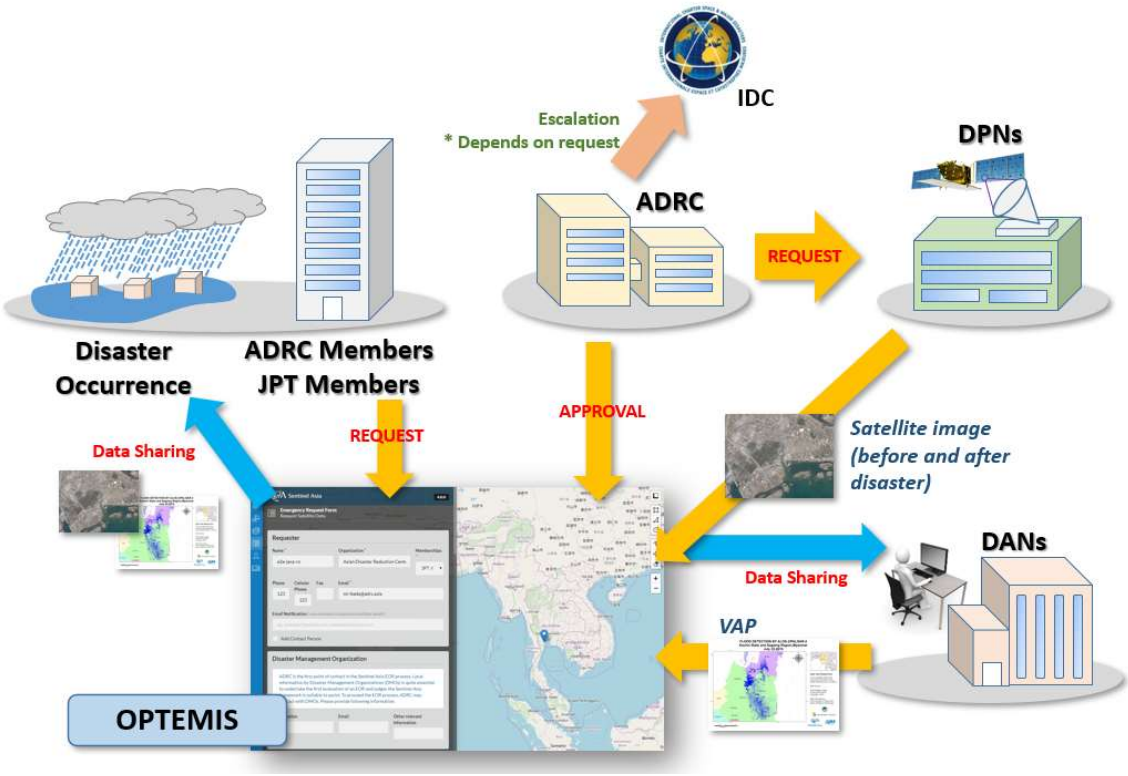

Figure 3: Flow of Sentinel Asia Emergency Observation

2.1.4. Current Phase (Step 3) and Ongoing Actions of Sentinel Asia

Out of the 3 Steps employed by Sentinel Asia, Steps 1 and 2 have so far been declared successfully completed. Step 3 began in 2013, defining its priority areas based on experiences in the earlier Steps and user requests leading to necessary actions as shown in Figure 4.

The key features of Step 3 are:

- Covering all phases in a disaster management cycle
- Employing a wide variety of satellites, including earth observation satellites, communication satellites and navigation satellites
- Being managed as a joint project by participating agencies, through the planned construction of a joint management system
- Promoting the use of services by expanding human networks through capacity

development and outreach activities

Figure 4: Current Phase (Step 3) and Actions of Sentinel Asia

2.2. Major Disasters with Emergency Observation (2007–2024)

Table 1 shows the number of requests, activations, and rejections for each type of disaster. Requests related to floods, earthquakes, typhoons, landslides, volcanoes, and cyclones are activated for more than 85% of all requests.

Table 1: Number of Requests, Activations, and Rejections for Emergency Observations by Disaster (2007–2024)

	Number of Requests	Number of Activations	Number of Rejections	Activations/Requests (%)
Flood	274	259	15	94.5%
Earthquake	69	64	5	92.8%
Typhoon	46	44	2	95.7%
Landslide	35	30	5	85.7%
Volcano	29	26	3	89.7%
Cyclone	28	24	4	85.7%
Forest Fire	19	9	10	47.4%
Oil Spill	9	7	2	77.8%
Others	37	32	5	86.5%
Total	**546**	**495**	**51**	

Figures 5 and 6 show a breakdown of emergency observations with requests and emergency observations with activations by disaster. Floods represent the largest number of disasters with 274 requests (50.2%), followed by earthquakes at 69 (12.6%), typhoons at 46 (8.4%), landslides at 35 (6.4%), volcanos at 29 (5.3%), cyclones at 28 (5.1%), forest fires at 19 (3.5%) and oil spill at 9 (1.6%). Generally, around 90.7% of requests for most disasters are activated.

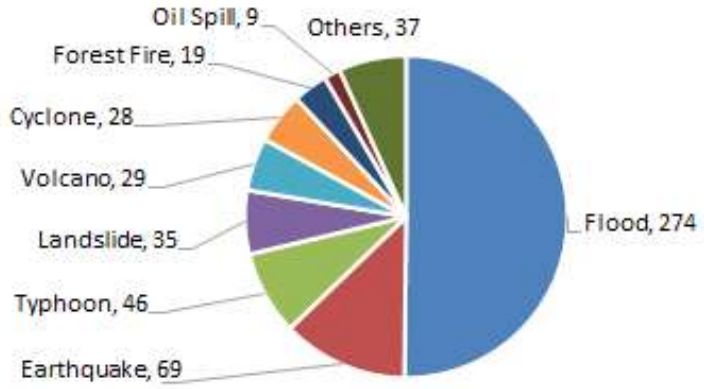

Figure 5: Breakdown of Emergency Observations by Disaster (2007–2024)

***Requests (N=546)**

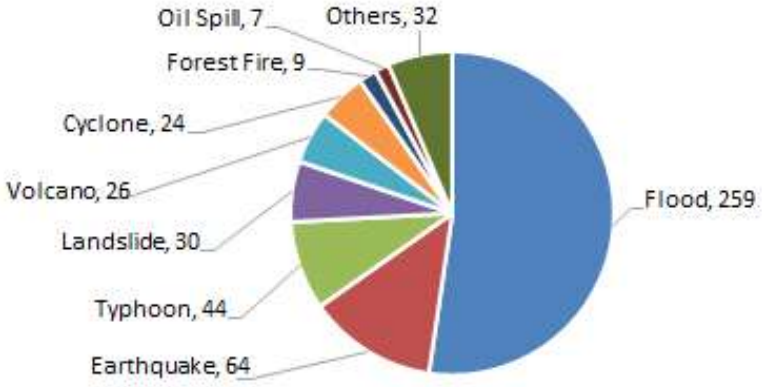

Figure 6: Breakdown of Emergency Observations by Disaster (2007–2024)

***Activations (N=495)**

3. Emergency Observation Operations in 2024

3.1. Emergency Observation Requests

Figure 7 shows the number of requests, activations and rejections involving emergency observations from 2007 to 2024. The number of requests and activations peaked in 2010 and 2012, with the number declining subsequently thereafter, but the number increased once again from 2015 to 2016. The number has begun decreasing gradually once more since 2016. Out of the 68 requests that were submitted in 2024, 64 were activated and 4 were rejected.

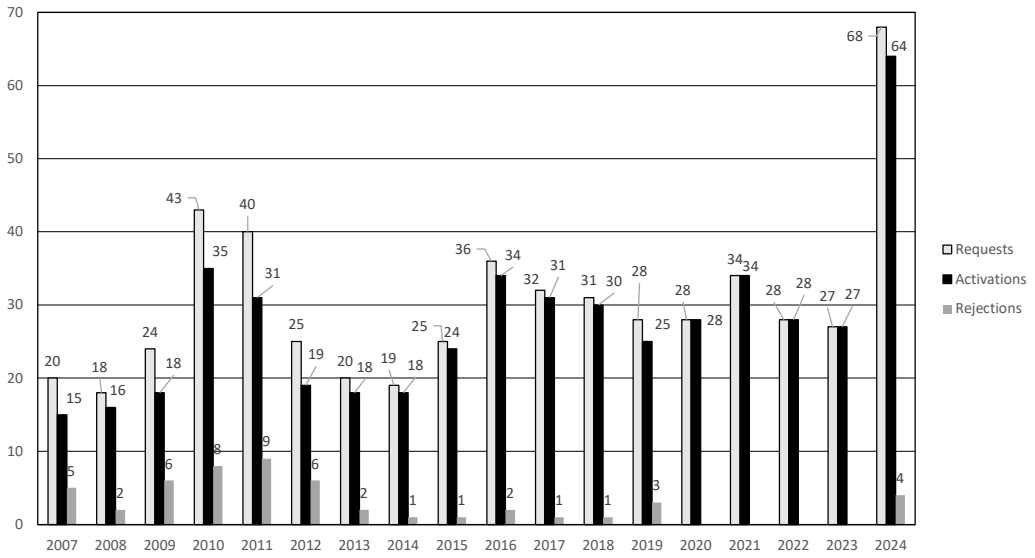

Figure 7: Comparison of the Number of Requests, Activations and Rejections for Emergency Observations

Figures 8 and 9 show a breakdown of emergency observation requests and activations by disaster. On a request basis, floods represented the largest number of disasters, with 36 requests (52.9%), followed by earthquakes and typhoons, with 4 each (5.9%).

(Note: In this report, actual disasters that had the greatest impact are identified and categorized. Therefore, some disaster types differ from those registered in OPTEMIS. Note that "other" includes avalanches, GLOF, mudflows, tropical storms, and storm surges. These disasters cannot be selected in OPTEMIS.)

Table 2: List of 2024 Activations

Activation Number	Country	Disaster Type	Implementation	Requester
479	Japan	Earthquake	2024/1/2	JAXA
480	China	Earthquake	2024/1/23	CEA
481	Indonesia	Flood	2024/3/21	BRIN
482	Kazakhstan	Flood	2024/4/2	NCSRT
483	Taiwan	Earthquake	2024/4/3	TASA
484	Indonesia	Volcanic Eruption	2024/4/19	BRIN
485	Pakistan	Flood	2024/4/19	JICA
486	Nepal	Flood	2024/4/22	DHM
487	Kyrgyzstan	Flood	2024/4/22	CAIAG
488	United Arab Emirates	Flood	2024/5/2	MBRSC
489	Indonesia	Landslide	2024/5/12	BRIN, BNPB
490	Indonesia	other (flash flood)	2024/5/13	BRIN, BNPB
491	Turkmenistan	Flood	2024/5/18	CAIAG, Ministry of Defence of Turkmenistan
492	India	Cyclone	2024/5/29	ISRO
493	Bangladesh	Flood	2024/6/3	BWDB
494	Vietnam	Flood	2024/6/10	MONRE
495	Kyrgyzstan	other (mudflow)	2024/6/25	CAIAG
496	Nepal	Flood	2024/6/28	DHM
497	Kyrgyzstan	other (mudflow)	2024/7/1	CAIAG
498	Myanmar	Flood	2024/7/1	MIMU
499	Vietnam	Flood	2024/7/3	MONRE
500	Nepal	Flood	2024/7/7	DHM
501	Nepal	Flood	2024/7/8	DHM
502	India	Flood	2024/7/11	ISRO
503	Vietnam	Flood	2024/7/15	MONRE
504	Tajikistan	other (mudflow)	2024/7/15	CAIAG
505	Uzbekistan	other (mudflow)	2024/7/15	CAIAG
506	Kyrgyzstan	other (mudflow)	2024/7/15	CAIAG
507	Philippines	Flood	2024/7/15	PAGASA
508	Philippines	Flood	2024/7/23	PhilSA
509	Vietnam	Flood	2024/7/24	MONRE
510	Philippines	Flood	2024/7/24	PhilSA
511	Kyrgyzstan	other (mudflow)	2024/7/24	CAIAG
512	Philippines	Oil spill	2024/7/25	PhilSA

Activation Number	Country	Disaster Type	Implementation	Requester
513	Taiwan	Typhoon	2024/7/25	TASA
514	Nepal	Flood	2024/8/5	DHM
515	Tajikistan	Flood	2024/8/6	WFP
516	Bhutan	Flood	2024/8/11	NCHM
517	Nepal	other (GLOF)	2024/8/16	DHM
518	Kyrgyzstan	other (mudflow)	2024/8/20	CAIAG
520	Bangladesh	Flood	2024/8/22	BWDB
521	Vietnam	Flood	2024/8/23	MONRE
522	Nepal	other (avalanche)	2024/8/24	DHM
523	Vietnam	Flood	2024/8/27	MONRE
524	India	Flood	2024/8/29	ISRO
525	Philippines	Cyclone	2024/9/2	PhilSA
526	Vietnam	Typhoon	2024/9/4	MONRE
527	Myanmar	Flood	2024/9/12	MIMU
528	Thailand	Flood	2024/9/12	GISTDA
529	Laos	Flood	2024/9/13	AHA Center, (NDMO)
530	Vietnam	other (tropical storm)	2024/9/19	MONRE
531	Nepal	Flood	2024/9/29	DHM
532	Philippines	Typhoon	2024/9/30	PhilSA
534	Philippines	Flood	2024/10/23	PAGASA
537	Vietnam	Typhoon	2024/10/25	MONRE
538	India	Cyclone	2024/10/24	ISRO
539	Philippines	Landslide	2024/10/30	PAGASA
540	Indonesia	Volcanic Eruption	2024/11/5	AHA Center, (BRIN)
541	Philippines	other (tropical storm)	2024/11/11	PhilSA
542	Philippines	other (storm surge)	2024/11/16	PhilSA
543	Thailand	Flood	2024/11/29	GISTDA
544	Indonesia	other (complex disaster)	2024/12/6	BRIN
545	Philippines	Volcanic Eruption	2024/12/9	PHIVOLCS
546	Vanuatu	Earthquake	2024/12/17	SPC, Vanuatu National Disaster Management Office

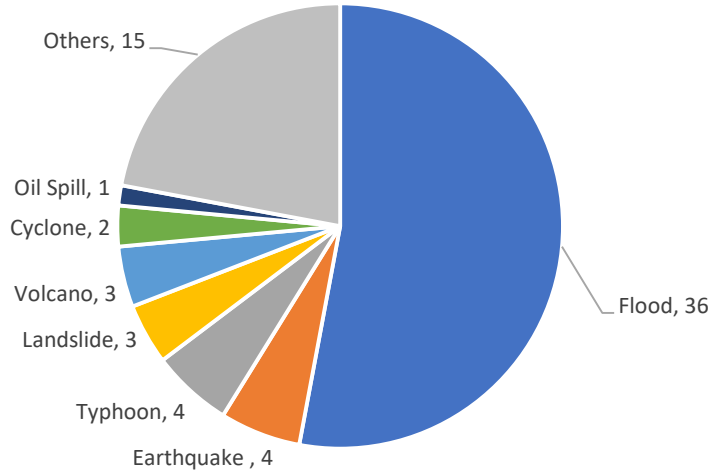

Figure 8: Breakdown of Emergency Observations by Disaster in 2024

***Requests (N=68)**

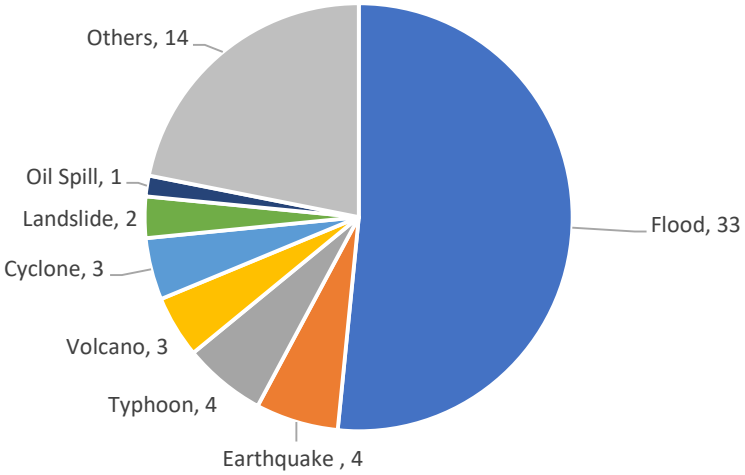

Figure 9: Breakdown of Emergency Observations by Disaster in 2024

***Activations (N=64)**

3.2. Results of Emergency Observations

During 2024, the monthly average of activations was 5.3. Figure 10 shows the monthly distribution of activations throughout 2024. The peak of activations occurred in July to September (35 activations), corresponding to 54.7% of the total number.

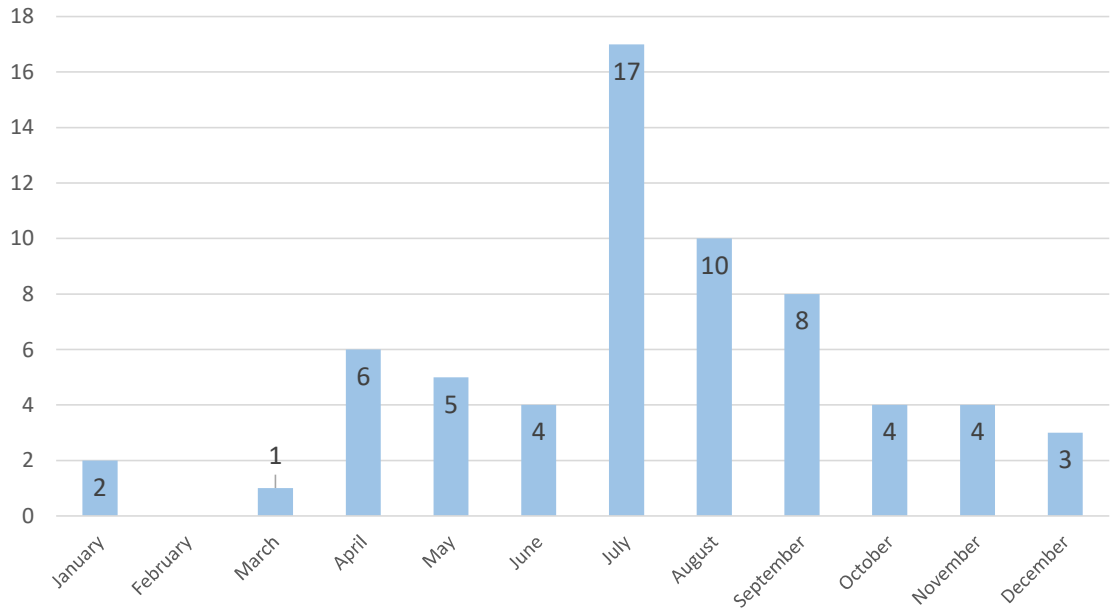

Figure 10: Number of Monthly Activations in 2024

Figure 11 shows the number of emergency observations by country and region. Countries and regions with a large number of requests are mostly located in Southeast Asia and South Asia, including, the Philippines, Vietnam, Nepal, Indonesia, and India. The country with the highest number of activations was the Philippines, with 11 activations.

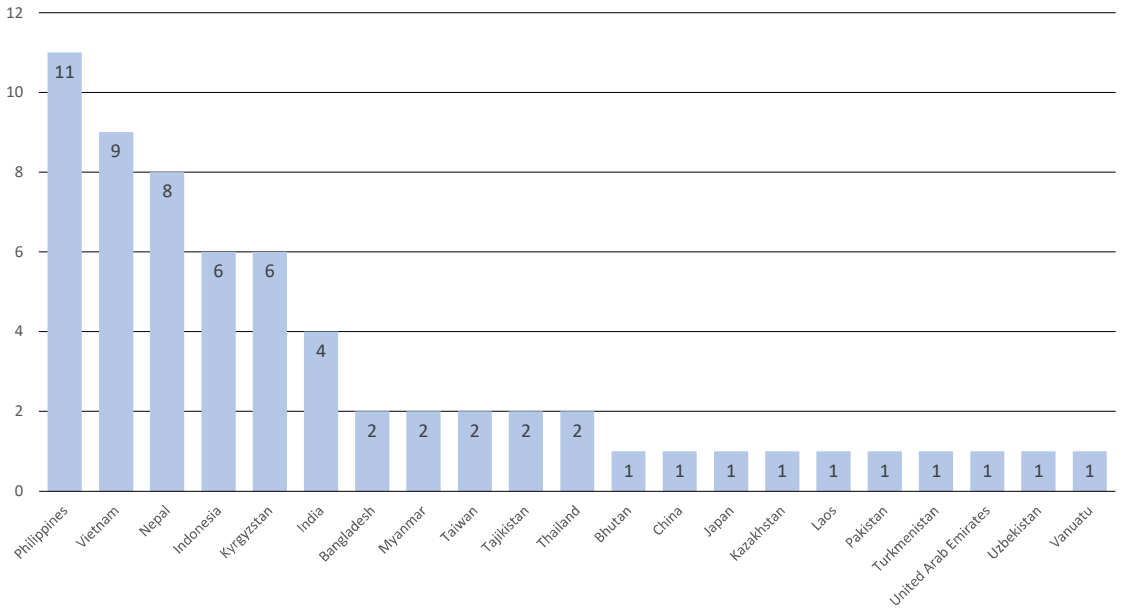

Figure 11: Number of Activations by Country and region in 2024

Figure 12 shows the number of implementations for providing Archive data and New Acquisition by DPN. In total, there were 68 implementations fo+r providing Archive data by JAXA and TASA, and 183 implementations for providing New Acquisition by JAXA, ISRO, TASA, CRISP, GISTDA, and MBRSC in 2024.

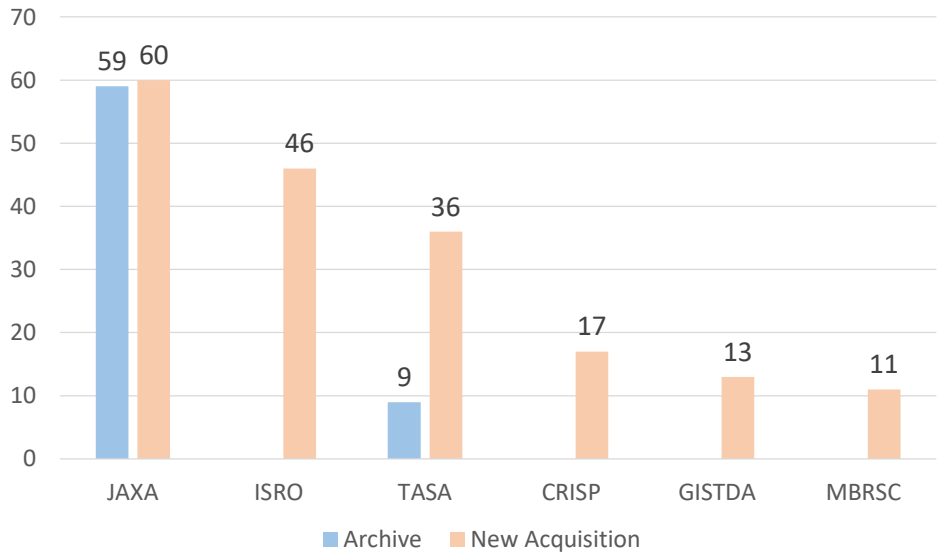

Figure 12: Number of Responses by DPN in 2024

DPN has been providing a large number of satellite images, including optical and radar data, when an EOR is activated. DAN have also been supportive by providing VAPs, including KMZ files and shapefiles for GIS. This data is uploaded to OPTEMIS and the SA website (https://sentinel-asia.org/EO/EmergencyObservation.html).

Figure 13 shows the quantity of optical and radar data by DPN which were uploaded to the SA website. In total, 910 satellite images were provided to requesters.

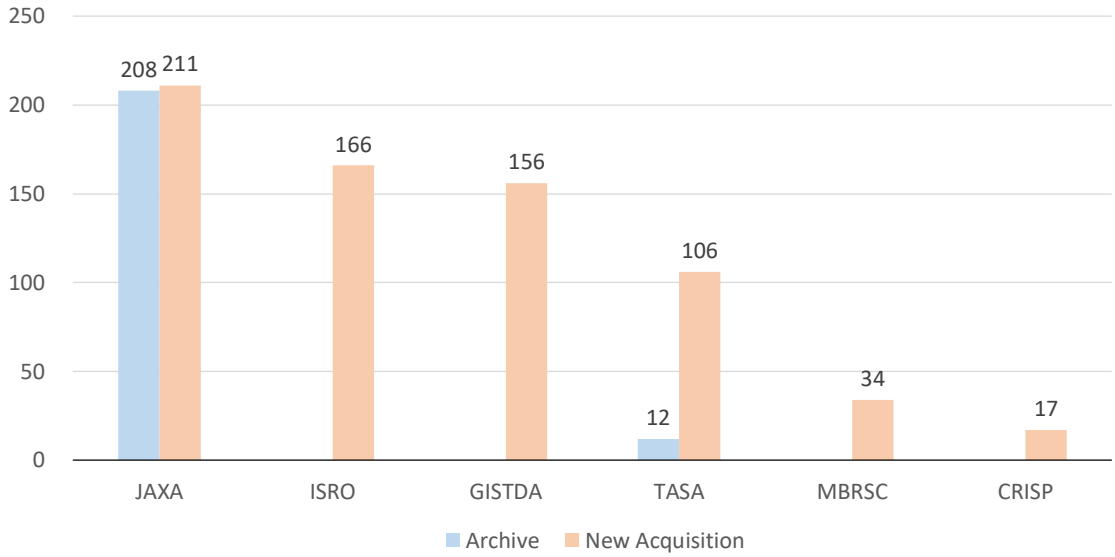

Figure 13: Data Consumption (Archive and New Acquisition) by DPN in 2024

Figure 14 shows the number of implementations by DAN in 2024. Figure 15 shows the number of provided VAPs in 2024. In total, 181 were implemented, and 403 VAPs were provided to requesters.

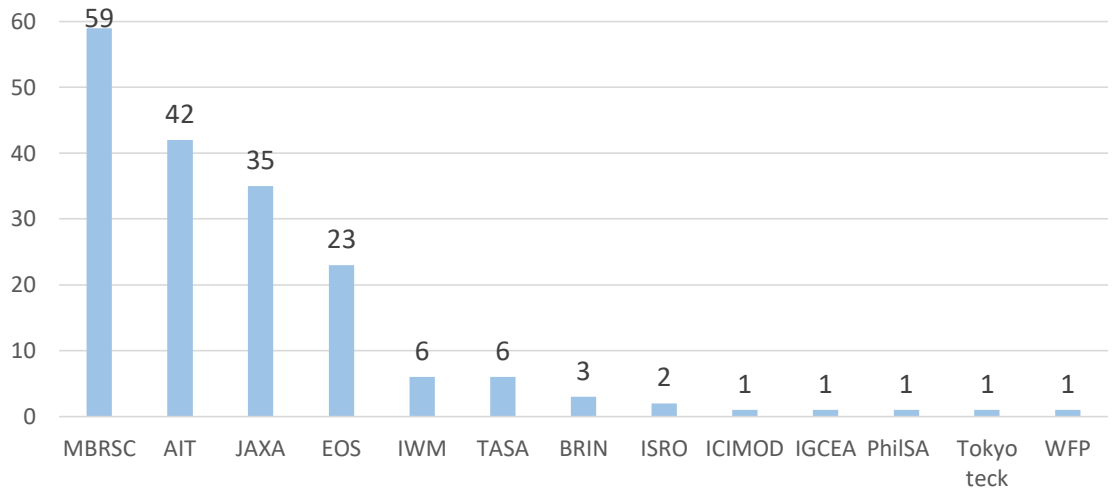

Figure 14: Number of Responses by DAN in 2024

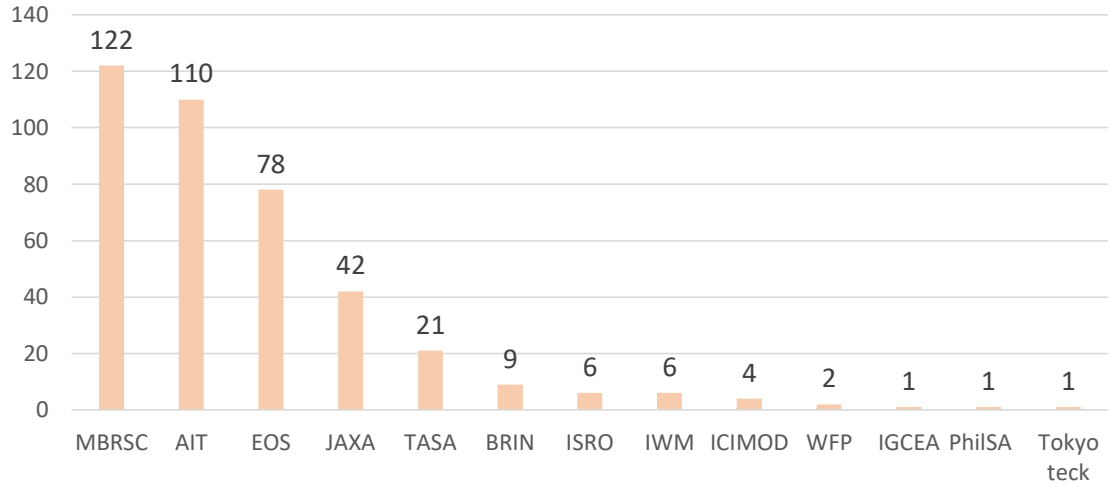

Figure 15: Number of VAP by DAN in 2024

3.3. Good Practices

3.3.1. Earthquake in Japan (January 2024)

[EOR Requester] Asian Disaster Reduction Center (ADRC)

[SA website URL] https://sentinel-asia.org/EO/2024/article20240101JP.html

The 2024 Noto Peninsula Earthquake struck on January 1, 2024, at 16:10 JST, with its epicenter located about seven kilometers northwest of Suzu City in Ishikawa Prefecture. The earthquake registered a magnitude of Mw 7.5 (USGS). The quake caused significant ground uplift—up to four meters in parts of the northern peninsula—reshaping coastlines and generating a tsunami of more than five meters that struck ports such as Iida and reached as far as Niigata Prefecture. The disaster caused severe damage, resulting in 672 confirmed deaths, more than 1,400 injuries, and two people reported missing according to a report of the cabinet office of Japan.

After a discussion with the Secretariat of Sentinel Asia, ADRC registered and activated an EOR on 2 January 2024. The first satellite images from the DPN were provided on 3 January. Finally, 39 satellite images were provided by ISRO, JAXA, TASA, and MBRSC. And the first VAP from the DAN was provided on 6 January. Eighteen (18) VAPs were provided by AIT, EOS, MBRSC, and TASA. Also, JAXA provided a Web-GIS service that allows users to zoom in and out analysed damaged areas and optical satellite data which observed after the disaster by overlaying on map information. Satellite images and VAPs were provided to the Government of Japan, to grasp the disaster situation.

Web-GIS:

(https://storymaps.arcgis.com/collections/a09e7f2007f444e2919615494ee2fcd8?item=1)

Source:

(https://www.bousai.go.jp/updates/r60101notojishin/r60101notojishin/pdf/r60101notojishin_59.pdf)

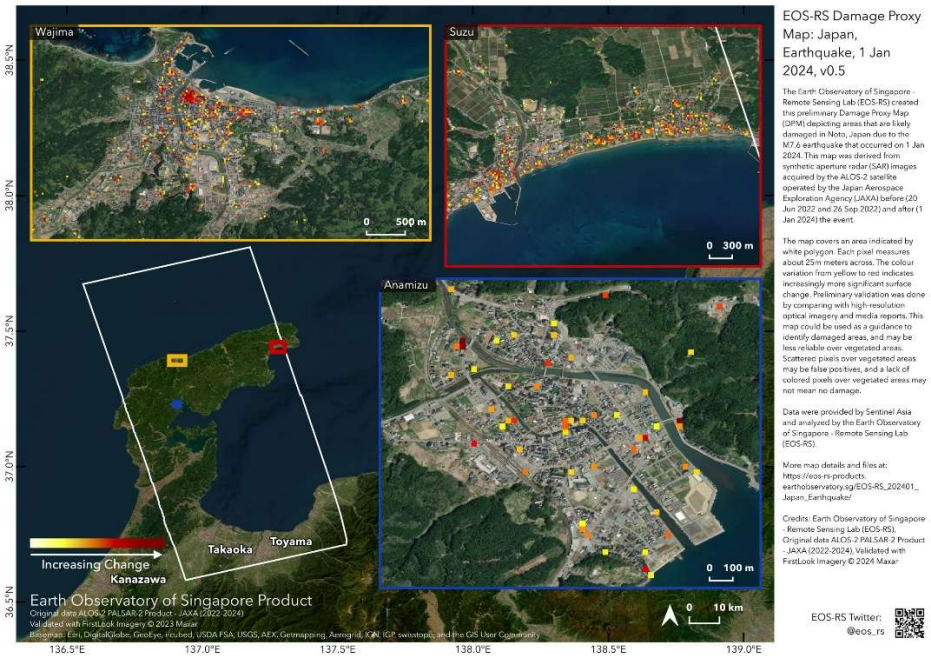

Figure 16: VAP (provided by EOS)

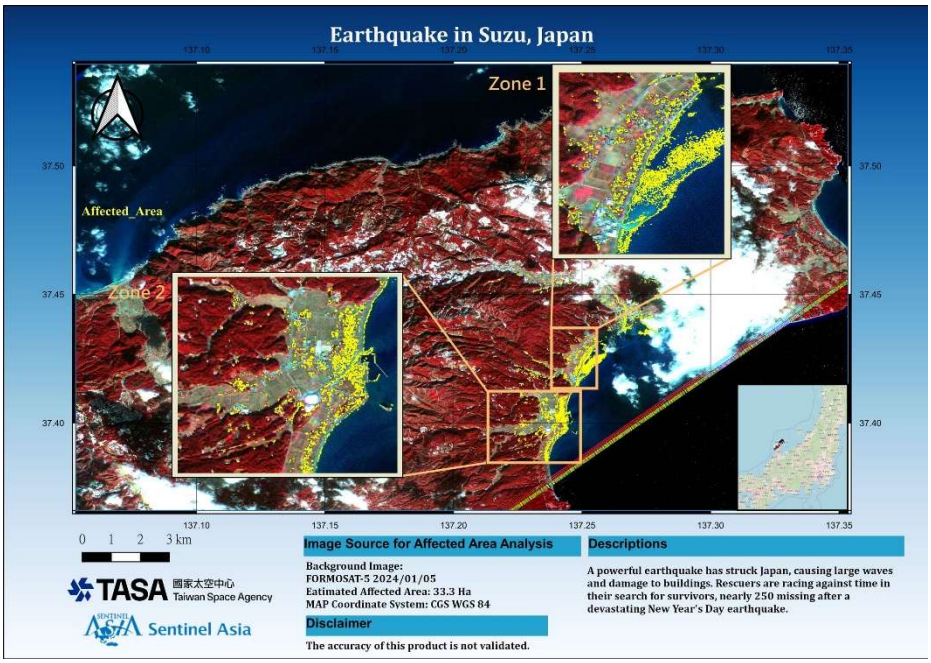

Figure 17: VAP (provided by TASA)

3.3.2. GLOF at Birendra Lake in Nepal (April 2024)

[EOR Requester] Department of Hydrology and Meteorology (DHM), Ministry of Energy, Water Resources and Irrigation

[SA website URL] https://sentinel-asia.org/EO/2024/article20240421NP.html

On 21 April 2024, an unusual flood occurred at Birendra Tal in west-central Nepal's Gorkha District when a massive ice avalanche, caused by the calving of ice from the snout of the Manaslu Glacier (8,163 m asl), plunged into the lake and generated a displacement wave that released water into the Budhi Gandaki River, without breaching or significantly damaging the moraine dam.

ADRC received the EOR from DHM and transferred DPNs/DANs on 22 April 2024. The first satellite images from the DPN were provided on 24 April. Finally, 3 satellite images were provided by ISRO, JAXA, and TASA. And the first VAP from the DAN was provided on 22 April. Three (3) VAPs were provided by JAXA and MBRSC. Also, JAXA provided a Web-GIS service for this request.

DHM utilized the provided satellite images and VAPs for internal discussions on the causes and effects of the outburst flood, for documentation, research assessment, and record keeping for future reference, while also using the information during meetings and discussions with other related DRM organizations such as NDRRMA, ICIMOD, and the media, and sharing river water level data with relevant organizations for further analysis of the Birendra Tal GLOF; the flood water from the Birendra Tal outburst reached the Arughat hydrological station on the Budhigandaki River, located about 85 km downstream of the lake, at around 5:00 p.m.

Source:
(https://www.icimod.org/cryosphere-water/insights-behind-the-unexpected-flooding-in-the-budhi-gandaki-river-gorkha-nepal/)

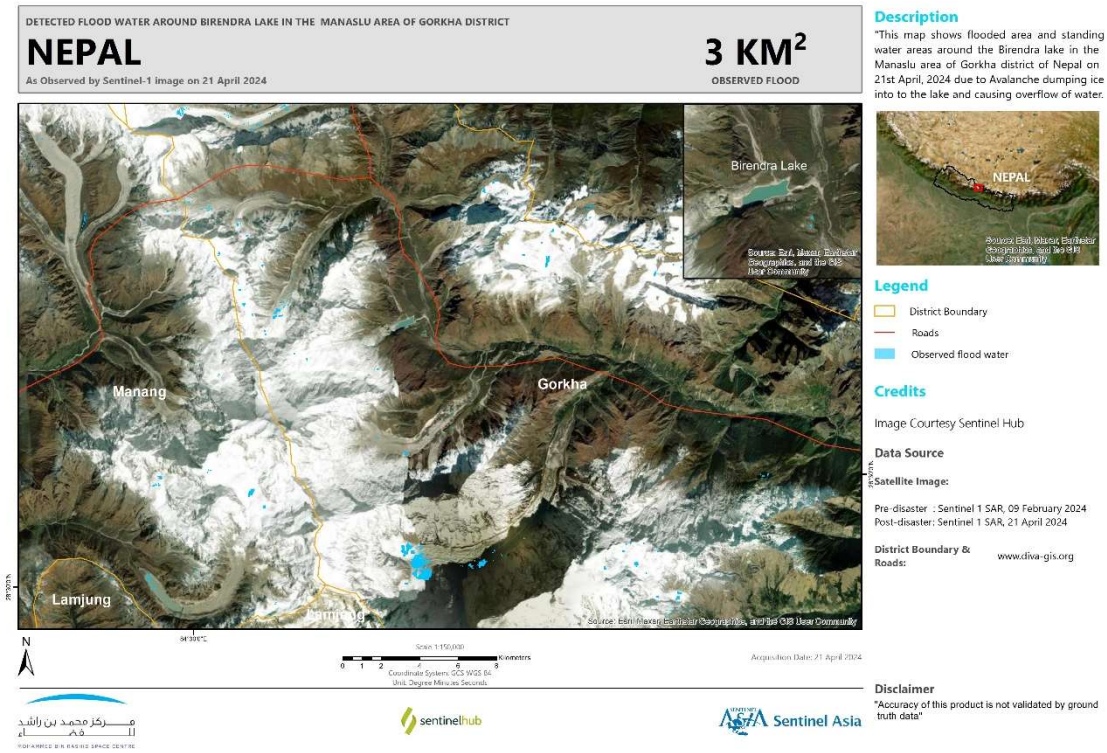

Figure 18: VAP (provided by Mohammed Bin Rashid Space Centre (MBRSC))

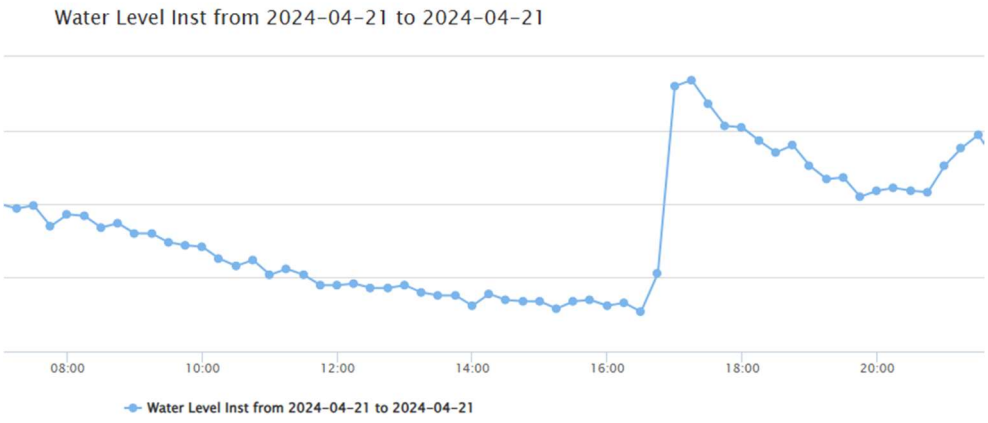

Figure 19: Water level on site during disaster (DHM)

3.3.3. Flood (related to the Typhoon YAGI) in Lao PDR (September 2024)

[EOR Requester] ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre)
[SA website URL] https://sentinel-asia.org/EO/2024/article20240912LA.html

Typhoon Yagi, which formed east of the Philippines on 1 September 2024, rapidly intensified into one of the strongest storms in decades, striking China's Hainan Island and northern Vietnam with winds over 230 km/h, causing catastrophic flooding, landslides, and more than 300 deaths, before weakening inland and leaving billions of dollars in damage across Southeast Asia including Lao PDR.

ADRC received the EOR from AHA Centre and transferred DPNs/DANs on 13 September 2024. The first satellite images from the DPN were provided on 17 September. Finally, 4 satellite images were provided by JAXA, and TASA. And the first VAP from the DAN was provided on 19 September. Five (5) VAPs were provided by AIT, IWM, and MBRSC. Also, JAXA provided a Web-GIS service that allows users to zoom in and out analysed detected water areas and optical satellite data which observed after the disaster by overlaying on map information.

AHA Centre used provided satellite images and VAPs for own DRR activities. And it was shared to related disaster management organizations. Detail activities are shown in the report "Situation Update".

Source:
(https://ahacentre.org/wp-content/uploads/2024/09/AHA-Situation_Update-no5-TC-YAGI-SWM-1.pdf)

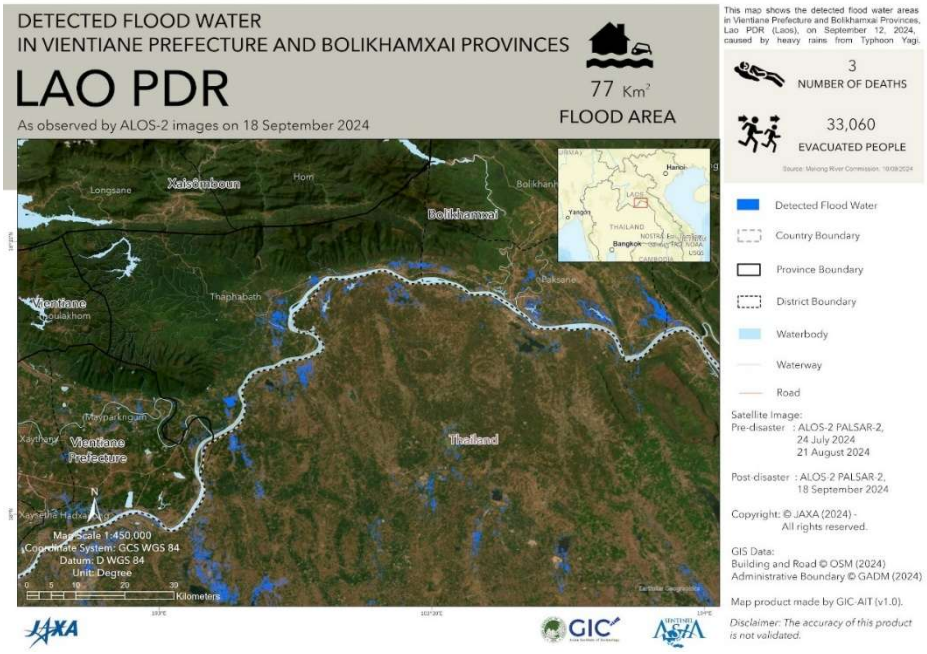

Figure 20: VAP (provided by AIT)

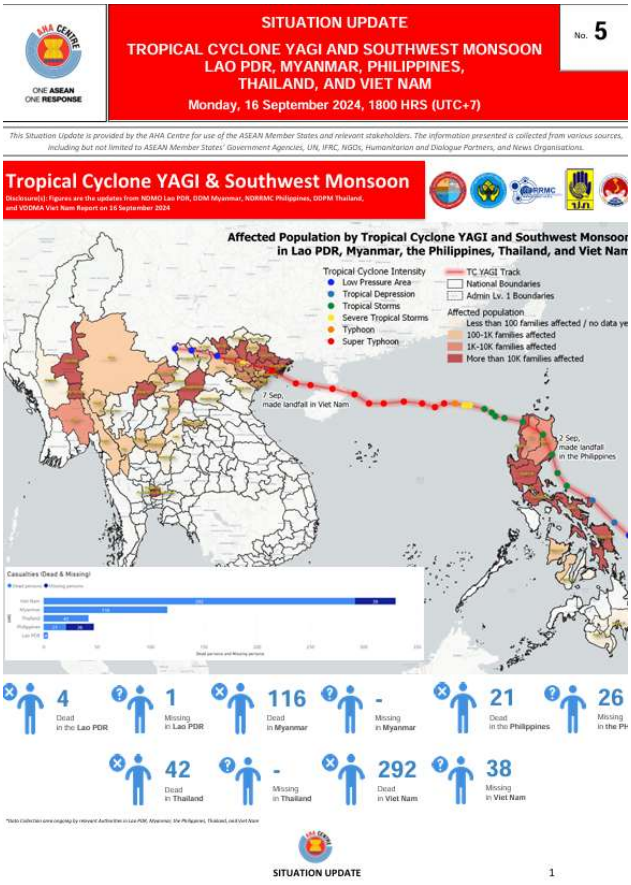

Figure 21: Situation Update (provided by AHA Centre)

3.3.4. Oil spill in Philippines (July 2024)

[EOR Requester] Philippine Space Agency (PhilSA)

[SA website URL] https://sentinel-asia.org/EO/2024/article20240725PH.html

On 25 July 2024, the Philippine tanker MT Terra Nova sank off Limay, Bataan during rough seas caused by the southwest monsoon and Typhoon Gaemi, spilling over 1.4 million liters of industrial fuel oil that spread across Manila Bay, severely affecting thousands of fisherfolk and coastal residents, prompting fishing bans and a state of calamity declaration, while the Philippine Coast Guard recovered 97.4 percent of the spill by mid-September, leaving experts warning of long-term ecological and economic impacts on the bay's marine environment and highlighting weaknesses in maritime safety and disaster response.

ADRC received the EOR from PhilSA on 25 July 2024. The first satellite images were provided on 26 July. Finally, 5 satellite images were provided by ISRO and JAXA. And the first VAP was provided on 30 July. AIT, MBRSC and PhilSA provided 5 VAPs. Also, JAXA provided a Web-GIS service that allowed users to zoom in and out analysed forest fire areas and optical satellite data which observed after the disaster by overlaying on map information.

PhilSA utilized satellite images from ALOS-2 and EOS-04 through Sentinel Asia, and satellite images from GeoEye-1, and RCM-2 through the International Disaster Charter (via Sentinel Asia) to produce oil spill extent maps. All of the produced maps were distributed to relevant agencies such as the Office of Civil Defense (OCD), National Coast Watch Center (NCWC), Presidential Office for maritime Concerns (POMC), Marine Science Institute (MSI), Department of Science and Technology (DOST), Department of Interior and Local Government (DILG), and the Department of Environment and Natural Resources (DENR) for monitoring, ground operations, and research applications.

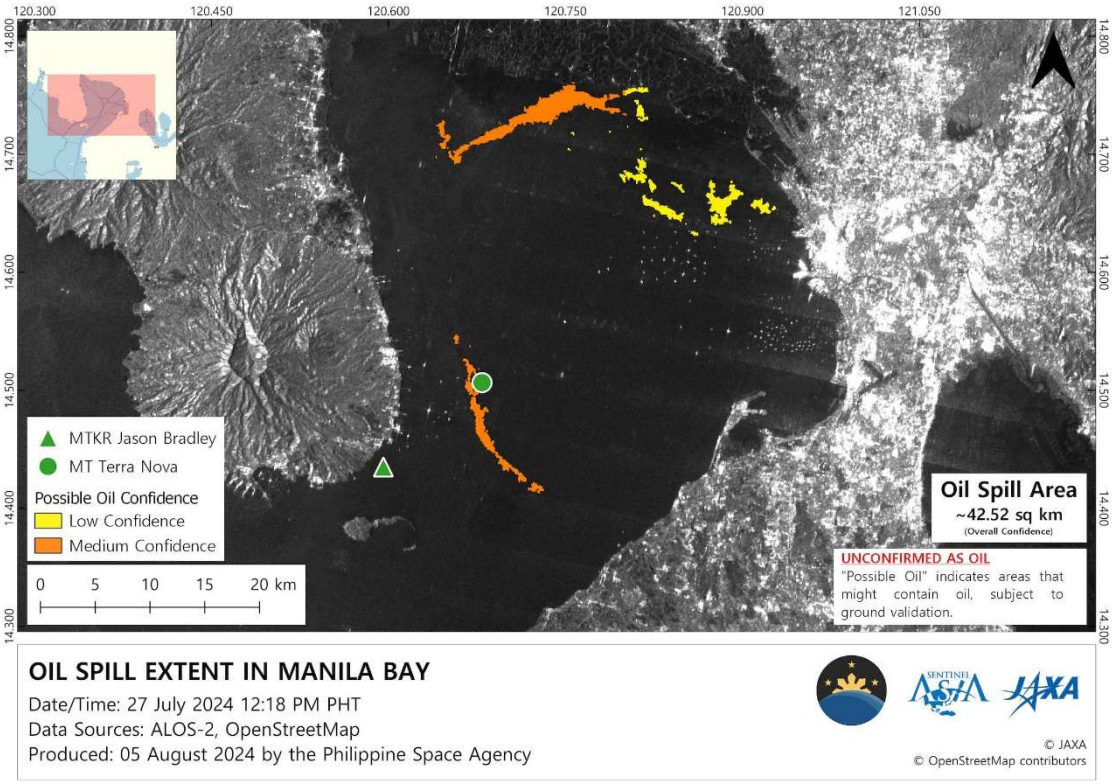

Figure 22: VAP (provided by PhilSA)

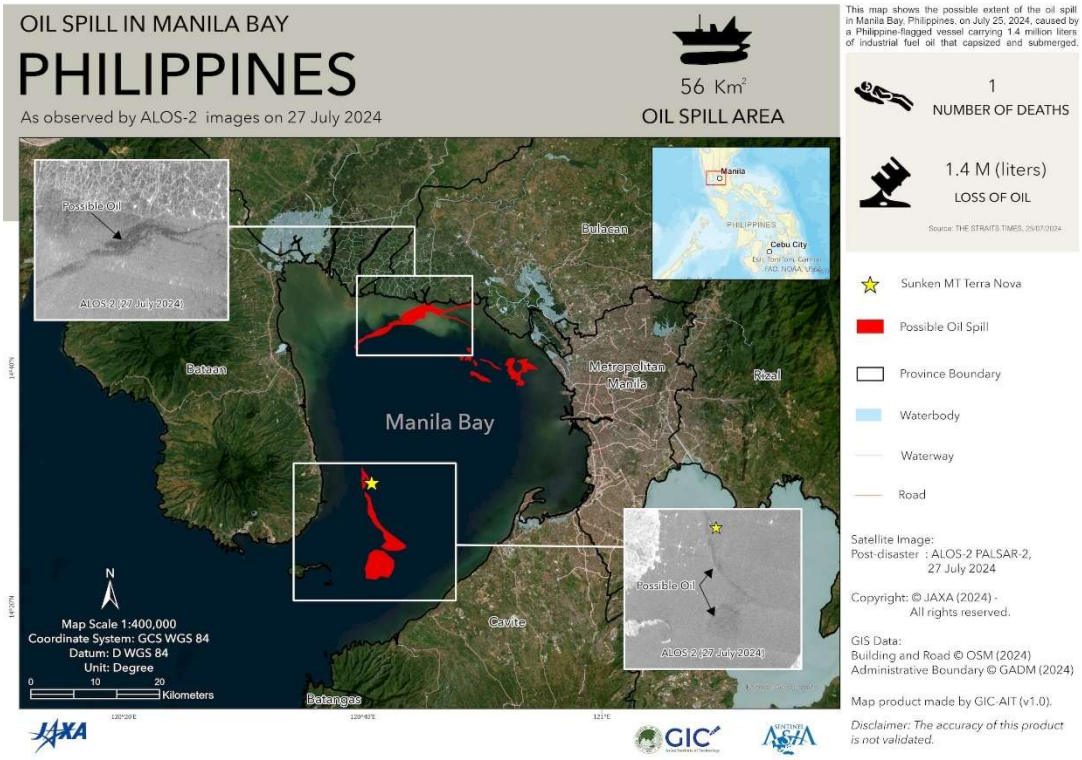

Figure 23: VAP (provided by AIT)

3.3.5. Lewotobi Laki-laki Volcano Eruption in Indonesia (November 2024)

[EOR Requester] ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre)

[SA website URL] https://sentinel-asia.org/EO/2024/article20241103ID.html

Mount Lewotobi Laki-Laki in Indonesia experienced explosive eruptions in November 2024. A significant event on November 3 involved the expulsion of volcanic materials, including hot lava, rocks, and ash, impacting nearby villages and causing at least 10 fatalities. Authorities declared a state of emergency, elevated the alert level, and facilitated the evacuation of thousands. Ash plumes from the eruptions led to disruptions in air travel. Aid was provided by government and humanitarian organizations, and recovery efforts are underway.

ADRC received the EOR from AHA Centre on 5 November 2024. The first satellite images were provided on 6 November. Finally, 17 satellite images were provided by CRISP, GISTDA, ISRO, and JAXA. And the first VAP was provided on 5 November. AIT, BRIN, EOS, and MBRSC provided 9 VAPs. Also, JAXA provided a Web-GIS service that allowed users to zoom in and out analysed detected flood areas and optical satellite data which observed after the disaster by overlaying on map information.

AHA Centre shared this information to BNPB as national disaster management organization in Indonesia. BNPB included Sentinel Asia's activities in its report “DATA BENCANA INDONESIA 2024”. And BRIN shared own VAP to JPT member of Sentinel Asia.

Source:
(https://bnpb.go.id/storage/app/media/Buletin%20Info%20Bencana/Buku%20Data%20Bencana%202024/20250613_Buku%20Data%202024.pdf)

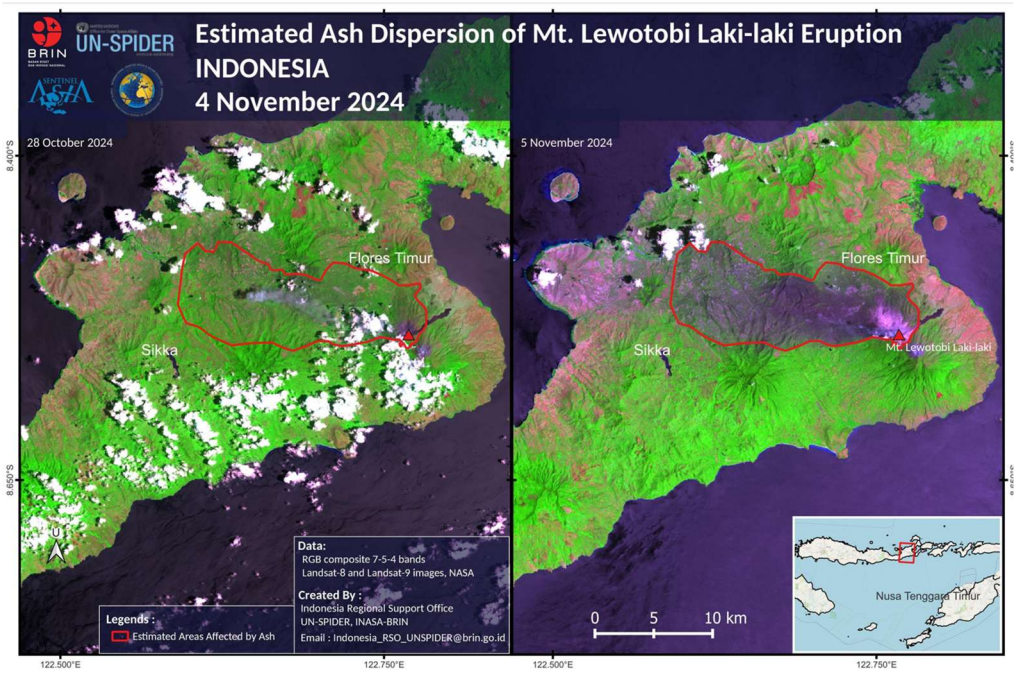

Figure 24: VAP (provided by BRIN)

Figure 25: DATA BENCANA INDONESIA 2024 (provided by BNPB)

4. External Relations

4.1. Accession of New Members

In 2024, the following organizations joined SA.

- Institute of Water Modelling (IWM), Bangladesh
- National Center for Hydrology and Meteorology (NCHM), Bhutan
- Toyama University of International Studies (TUINS), Japan
- Japan Water Agency (JWA), Japan
- Ministry of Agriculture and Forestry (MAF), Lao P.D.R.
- National Disaster Risk Management Office (NDRMO), Tonga
- Middle East Technical University (METU), Türkiye
- UNOCHA's Centre for Humanitarian Data
- Mekong River Commission (MRC)

4.2. Collaboration and Cooperation

4.2.1 International Disaster Charter

The rollout to IDC began in February 2010 as required. Sixteen (16) disasters were escalated through SA in 2024 as shown in Table 3. This figure means that 16 out of 64 EORs, corresponding to 25.0%, were referred to IDC via Sentinel Asia.

Table 3: List of Charter Escalations in 2024

Activation Number	Country	Disaster Type	Activation Date	Requester	Project Manager
479	Japan	Earthquake	2-Jan-24	ADRC on behalf of JAXA	Yamaguchi University
484	Indonesia	Volcanic Eruption	19-Apr-24	ADRC on behalf of BRIN	BRIN
489	Indonesia	Landslide	12-May-24	ADRC on behalf of BRIN	BRIN
490	Indonesia	other (flash flood)	14-May-24	ADRC on behalf of BRIN	BRIN
495	Kyrgyzstan	other (mudflow)	25-Jun-24	ADRC on behalf of CAIAG	AIT
501	Nepal	Flood	8-Jul-24	ADRC on behalf of DHM	ICIMOD
511	Kyrgyzstan	other (mudflow)	25-Jul-24	ADRC on behalf of CAIAG	UNITAR
512	Philippines	Oil spill	25-Jul-24	ADRC on behalf of PhilSA	PhilSA
517	Nepal	other (GLOF)	16-Aug-24	ADRC on behalf of DHM	ICIMOD
518	Kyrgyzstan	other (mudflow)	20-Aug-24	ADRC on behalf of CAIAG	AIT
526	Vietnam	Typhoon	4-Sep-24	ADRC on behalf of MONRE	MONRE
527	Myanmar	Flood	12-Sep-24	ADRC on behalf of MIMU	UNOSAT
531	Nepal	Flood	29-Sep-24	ADRC on behalf of DHM	ICIMOD
534	Philippines	Flood	23-Oct-24	ADRC on behalf of PAGASA	PhilSA
540	Indonesia	Volcanic Eruption	5-Nov-24	ADRC on behalf of BRIN	BRIN
544	Indonesia	other (complex disaster)	6-Dec-24	ADRC on behalf of BRIN	BRIN

5. Conferences and Press Releases

5.1. Conferences

5.1.1 22nd Steering Committee Meeting of Sentinel Asia

The 22nd Steering Committee Meeting of Sentinel Asia was held at TASA (Taiwan Space Agency) in Taiwan, from January 30 to 31, 2024. This two-day meeting involved reviewing recent activities, welcoming new members, and reporting progress. On the first day, participants discussed advancements in satellite data, value-added products, and end-user enhancements. A significant focus was placed on improving the Disaster Analysis Node (DAN), featuring modules for flood analysis in Bangladesh and landslide detection. The day also included discussions on Sentinel Asia's involvement in recent disasters in India, Nepal, Türkiye, Vietnam and Indonesia as well as extensive capacity-building sessions. The second day concentrated on further enhancing DAN capabilities by sharing knowledge on optical data utilization among member organizations. Discussions also covered collaboration with other international organizations, including the International Disaster Charter. The final part of the program was dedicated to exploring and strengthening support during the mitigation and recovery phases of disasters, including early warning systems (EWS), GLOF risk monitoring, and emergency observation history map visualization. Participants shared experiences on each initiative for disaster risk reduction (DRR) through Sentinel Asia.

Photo 1: Group Photo

5.1.2 Understanding Risk Global Forum 2024

The Understanding Risk Global Forum (UR24) was held in Himeji, Hyōgo Prefecture, Japan, from June 16 to 21, 2024. It drew more than 1,700 participants from 135 countries, representing over 700 organizations in government, academia, civil society and the private sector. The forum focused on sharing innovations and best practices in Disaster Risk Management (DRM), emphasizing collaboration and new knowledge.

The Sentinel Asia Secretariat set up an exhibition booth during UR24 to introduce an overview of Sentinel Asia presented at the panel discussion "Digital Earth Partnership - Space for Resilient Development" and showcase best practices in emergency monitoring. Many visitors attended, providing an opportunity to raise broad awareness of Sentinel Asia's activities.

Photo 2: Group Photo

5.1.3 Asia-Pacific Ministerial Conference on Disaster Risk Reduction 2024

The Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR 2024) took place from October 14 to 18, 2024, at the Philippine International Convention Center in Manila, the Philippines. It was co-hosted by the Government of the Philippines and the United Nations Office for Disaster Risk Reduction (UNDRR). As the main regional platform in Asia and the Pacific, APMCDRR serves to monitor, review, and strengthen cooperation in implementing the Sendai Framework for Disaster Risk Reduction 2015–2030. A partner event titled "Urban Resilience of Metropolises: Incorporation of Multi-Sectoral Spatial Risk Assessment in City Planning for Investing

in Resilient Metropolises, and Augmenting Local Solutions to Disaster Risk Reduction/Build Back Better with Space Satellite Services" was leadingly-organized by Japan International Cooperation Agency (JICA). In this event, Dr. Shiro Kawakita from JAXA highlighted the importance of utilizing space technology through Sentinel Asia. Additionally, Dr. Gerald Potutan from ADRC introduced the QZSS DC Report which can deliver early warning messages to remote mountainous and island regions lacking internet or cellular access. It also functions as a backup communication system when terrestrial networks are disrupted by disasters. Moreover, as a positioning satellite, QZSS enables location-specific transmission of warnings to affect communities.

In addition, Sentinel Asia Secretariat ran an exhibition booth and Dr. Kawakita introduced about Sentinel Asia to Mr. Kamal Kishore, Special Representative of the United Nations Secretary-General for Disaster Risk Reduction, and Head of UNDRR.

Photo 3: Group Photo

5.1.4 9th Joint Project Team Meeting

The 9th Joint Project Team Meeting for Sentinel Asia STEP-3 (JPTM 2024) took place from November 5 to 7, 2024, in Manila, the Philippines. It was co-hosted by the Philippine Space Agency (PhilSA) and JAXA.

A record 135 participants from 40 organizations attended the event. Opening remarks were made by Dr. Ariel C. Blanco (PhilSA) and Dr. Shiro Kawakita. Dr. Joel Joseph Marciano, Jr., Director General of PhilSA, delivered the keynote speech. He emphasized the value of satellite technology and regional collaboration for disaster resilience. The meeting included four sessions: overview, new memberships, user session, and a special Philippine session. Training workshops were also conducted, focusing on studies by Sentinel Asia members. Additionally, new members from Bangladesh (IWM), Bhutan (NCHM), and Tonga (NDRMO) were introduced. More details about JPTM 2024 including presentation materials and a summary of JPTM 2024 are available on the Sentinel Asia website: https://sentinel-asia.org/meetings/SA3JPTM9/

Photo 4: Group Photo

5.1.5 30th Asia-Pacific Regional Space Agency Forum

The 30th Asia-Pacific Regional Space Agency Forum (APRSAF-30) was held from November 26 to 29, 2024, in Perth, Australia, with co-organization by the Australian Space Agency (ASA), JAXA, and support from Western Australia. The theme of this

conference was “Collaborating to Build a Sustainable and Responsible Regional Space Sector”. It attracted over 700 participants from more than 30 countries, including government, industry, and academia. Working groups addressed topics such as satellite applications for society, space capability enhancement, space education, frontier exploration, and space law/policy. The forum also deepened discussion on sustainable and responsible use of space, shared practices on Earth observation and positioning to address social challenges and welcomed involvement from Pacific Island nations. Sentinel Asia session was held on November 27, chaired by Dr. Shinichi Sobue (JAXA). In this session, JAXA, PhilSA, and Yamaguchi University reported on Sentinel Asia’s current status and recent activities. More details about APRSAF-30 are available on the APRSAF website:
https://www.aprsaf.org/annual_meetings/aprsaf30/meeting_details.php

Photo 5: Group Photo

5.1.6 23rd Steering Committee Meeting of Sentinel Asia

The 23rd Sentinel Asia Steering Committee was held at IWMI in Sri Lanka, from December 12 to 13, 2024. This meeting aimed to review the Strategic Plan, improve operations across DPN, DAN, and Disaster Management Organization (DMO), and strengthen user interaction. On the first day, it began with opening remarks, membership updates, and a report on Sentinel Asia’s 2024 activities, including

highlights from JPTM and APRSAF-30. Leading agencies gave presentations on their progress in six categories, such as satellite data provision, value-added products, and user enhancement. Sessions also addressed Step-3 activities, collaboration, and linkage with the Sendai Framework for DRR. On the second day, the focus was on improving DPN and DAN operations through sharing experience in geospatial and optical data use. Participants discussed ground-truth data collection and lessons learned from recent disasters like the Hualien Earthquake.

Photo 6: Group Photo

5.2. Documents, Press Releases and Papers

5.2.1 Satellites Watch Over Us From Above

Satellite data is revolutionizing the way we deal with natural disasters, from warning systems to mapping hazard areas to prevention.

Posted on Renewable matter on January 16, 2024

(https://www.renewablematter.eu/en/artificial-intelligence-satellites-watch-over-us-from-above)

5.2.2 Japan's Support for Response to the Oil Spill Incident in the Philippines

On August 7, the Japan Coast Guard (JCG) held an online meeting with the Philippine Coast Guard (PCG) to assist in the response to the oil spill incident in the vicinity of Manila Bay.

Posted on the Embassy of Japan in the Philippines website on August 8, 2024

(https://www.ph.emb-japan.go.jp/itpr_en/11_000001_01572.html)

5.2.3 JICA Magazine (August 2024)

An overview of Sentinel Asia's activities was presented, including good practices regarding the EOR request for Volcanic Eruption of Mount Semeru, which occurred in Indonesia, 2021.

Published in the JICA Magazine, Japan in August 2024 (page 17, only in Japanese)

(https://jicamagazine.jica.go.jp/cms/wp-content/uploads/2024/07/JICA-Magazine_20240801_J_spread.pdf)

6. Assessment of Sentinel Asia Operations

6.1. Analysis of Operational Performance

Figure 26 summarizes the average number of days from the occurrence of a disaster to the request for each disaster and their respective years. Overall, this shows that it took a number of days from the first occurrence of the disaster to a request for the period between 2011 and 2024.

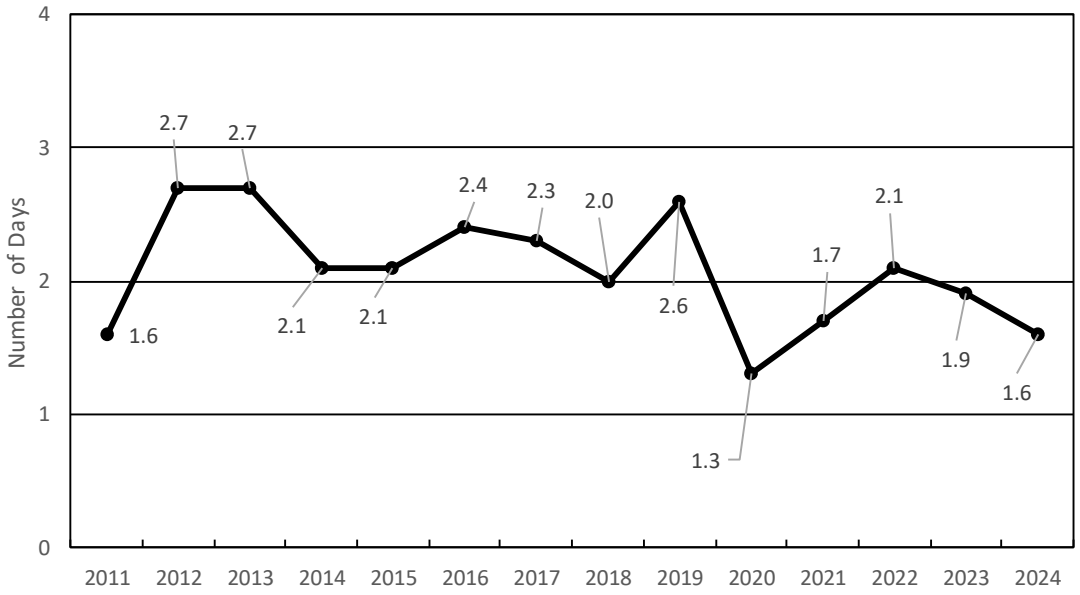

Figure 26: Number of Days Required from Disaster Occurrence to Request

Figure 27 shows the average number of days that were required from the date the request was received to activation. Overall, it took 0.14 days from request to activation in 2024.

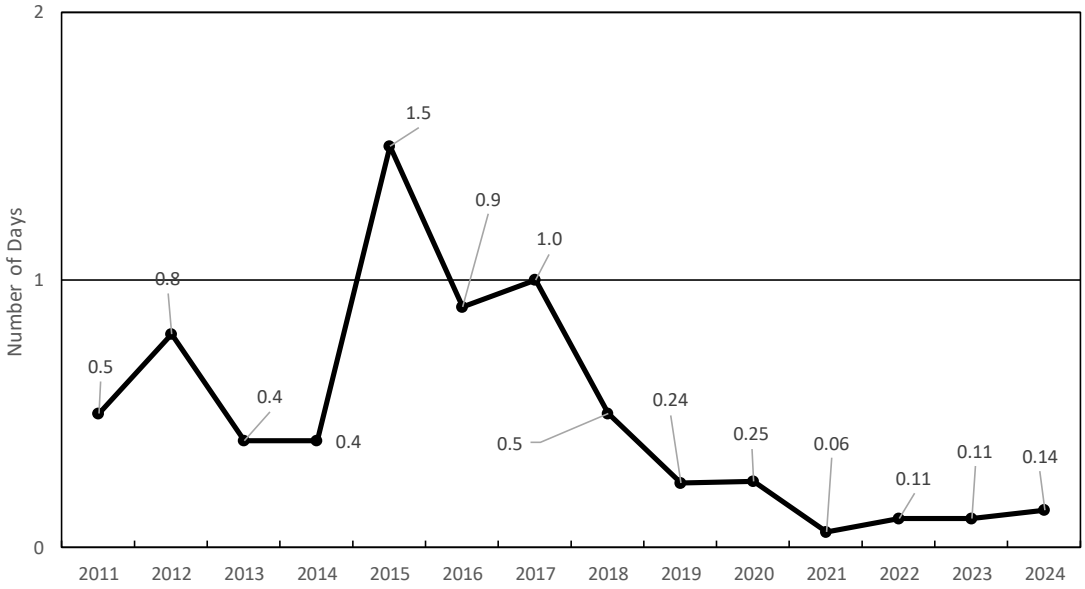

Figure 27: Number of Days Required from Request to Activation

Figure 28 shows the average number of days required to provide archive satellite data after activation (shown by the black line), and how often data could be provided relative to the total number of requests (shown by the blue line).

The provision rate for Archive Satellite Data in Figure 28 indicates that the percentage of provisions improved from 2016 to 2024. This figure in 2024 was 90.1%, and the average number of days was 2.5 days.

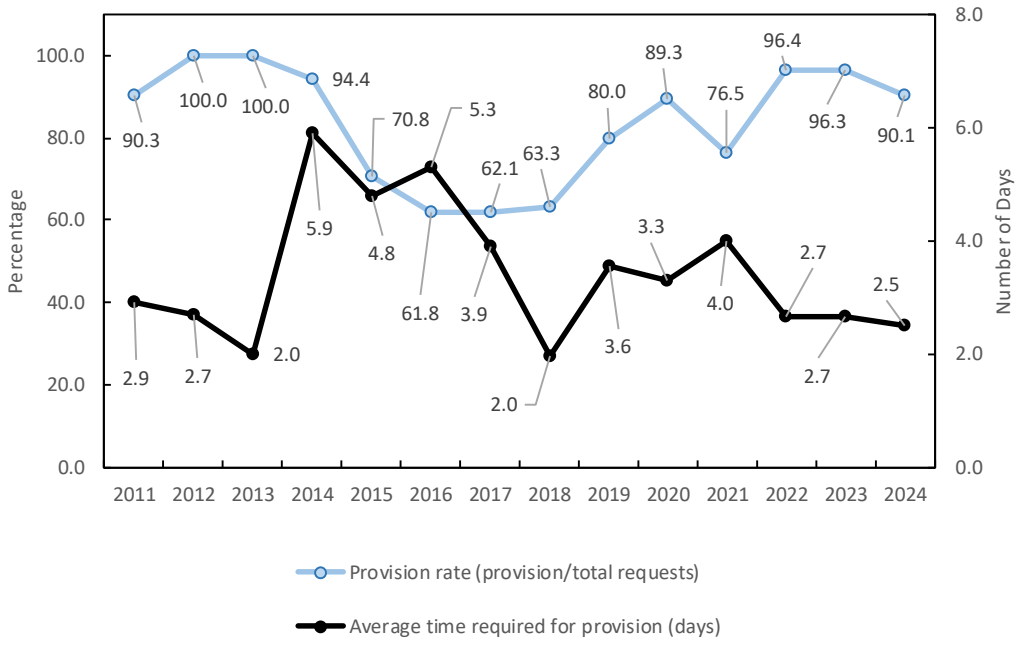

Figure 28: Average Number of Days Required to Provide Archive Satellite Data and Provision Rate for Each Year

Figure 29 shows the average number of days required to provide post-disaster satellite data after activation (shown by the black line), and how often data could be provided relative to the total number of requests (shown by the blue line).

The provision rate for Satellite Data after Disaster in Figure 29 shows that the percentage of provisions increased sharply from 2014 onward, while the number of days required for data provision has decreased in recent years. The average number of days required for provision in 2024 was 3.5 days. And the provision rate in 2024 reached 100%.

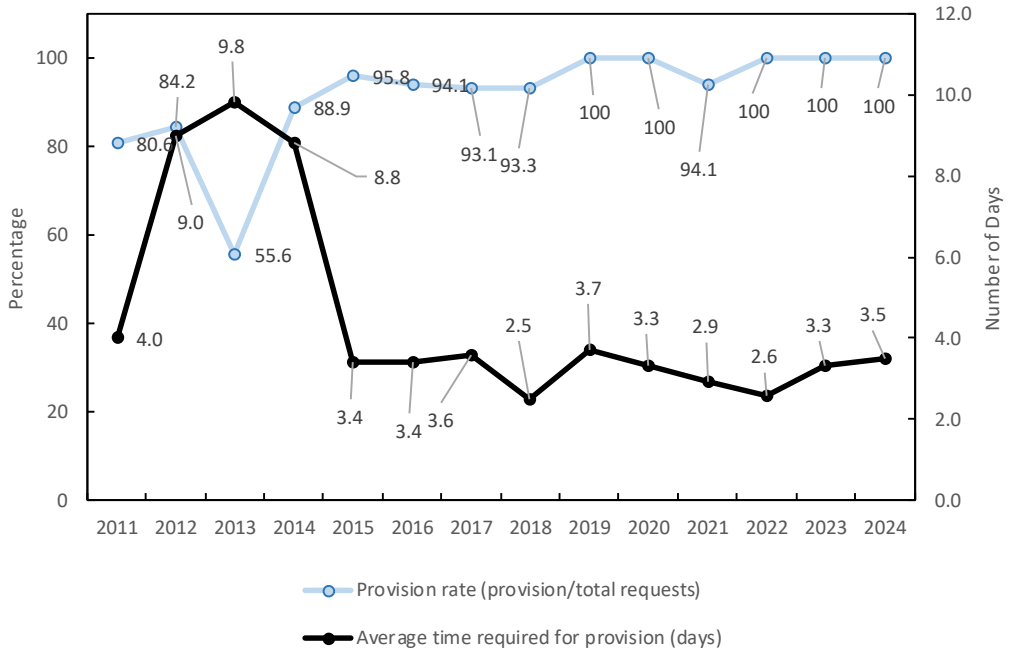

Figure 29: Average Number of Days Required to Provide Satellite Data After Disaster and Provision Rate for Each Year

Figure 30 shows the average number of days required to provide products after activation (shown by the black line), and the how often data could be provided relative to the total number of requests (shown by the blue line).

The provision rate for products in Figure 30 was 100% in 2024. Many DANs supported the provision of products for each EOR. The average number of days required for provision was 5.2 days in 2024.

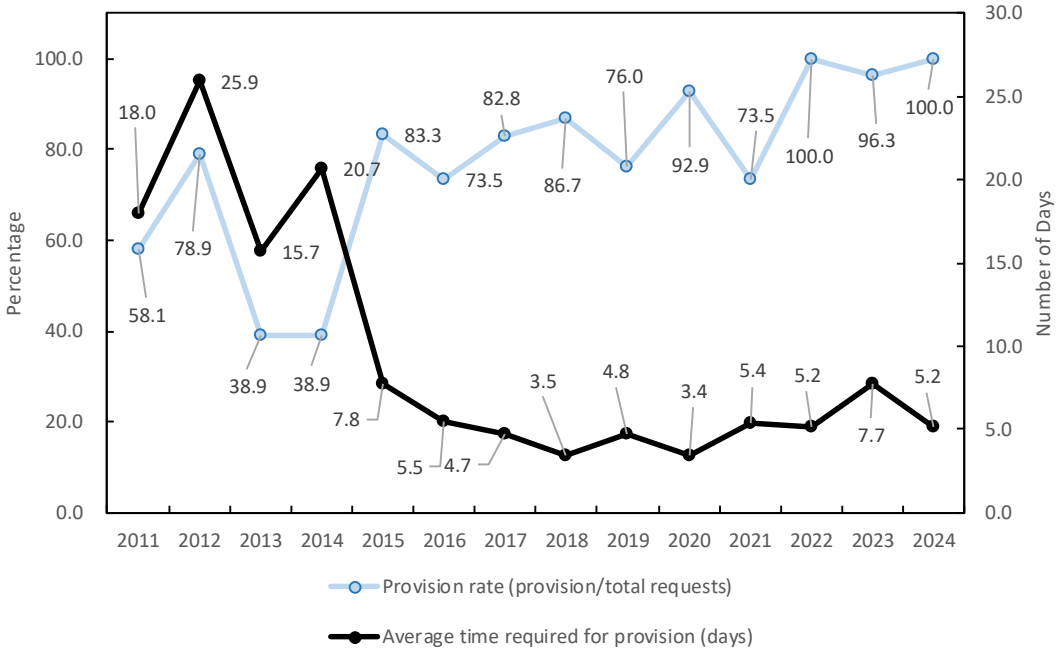

Figure 30: Average Number of Days Required to Provide Products and Provision Rate for Each Year

(Note: There are rare cases where a large number of days was required to provide VAPs. In this case, the average number of days required to provide products could vary significantly.)

7. Conclusions

Since the start of 2007, we have accepted 546 EORs and activated 495. In 2024, 68 EORs were requested and 64 EORs were activated. The number of requests in 2024 was the highest ever for EOR activity. One major incident was the January 2024 earthquake disaster in Japan. This earthquake occurred on January 1, New Year's Day. However, Sentinel Asia had prompt communications and contributed support by providing effective data even in times of disaster. Another major topic for 2024 is the many new JPT members: Institute of Water Modelling (IWM) from Bangladesh, National Center for Hydrology and Meteorology (NCHM) from Bhutan, Toyama University of International Studies (TUINS) from Japan, Japan Water Agency (JWA) from Japan, Ministry of Agriculture and Forestry (MAF) from Lao P.D.R., National Disaster Risk Management Office (NDRMO) from Tonga, Middle East Technical University (METU) from Türkiye, UNOCHA's Centre for Humanitarian Data, and Mekong River Commission (MRC).

The following points are conclusive statements based on activities in 2024.

- In 2024, 68 EORs were requested and 64 EORs were activated.
- The largest number of activations were submitted from the Philippines, with 11 EORs, followed by Vietnam, with 9 EORs.
- In total, 910 satellite images and 403 VAPs were provided by DPN and DAN.
- Sixteen (16) out of sixty-four (64) Sentinel Asia activations were escalated to the IDC.
- Several conferences and meetings, such as steering committee, JPTM, APRSAF, APMCDRR2024, were held in 2024.
- Nine (9) new JPT members joined Sentinel Asia in 2024.

** January 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 30 January)
2. [Report] Sentinel Asia Annual Report 2022 has been published!
3. [Interview] Mr. Abdullah Muhammad Mustofa Sorwar, Bangladesh Water Development Board (BWDB)
4. How to send an Emergency Observation Request
5. Using Sentinel Asia Operation System, OPTEMIS

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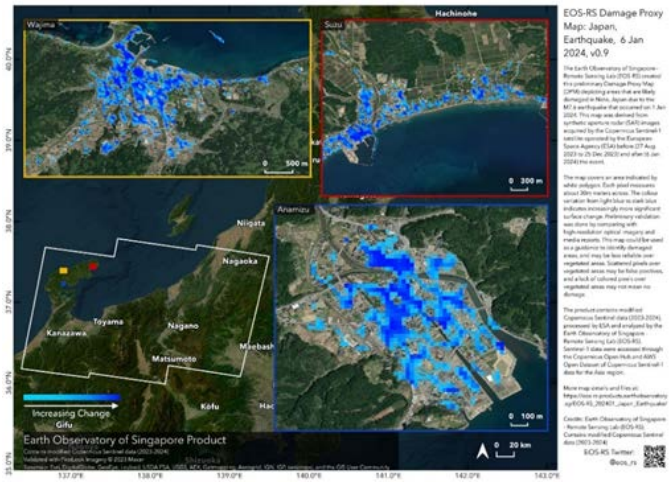
1. [News] Emergency Observation of Disasters (as of 30 January)

(1) Earthquake in Japan on 1 January, 2024 (GLIDE Number EQ-2024-000001-JPN)

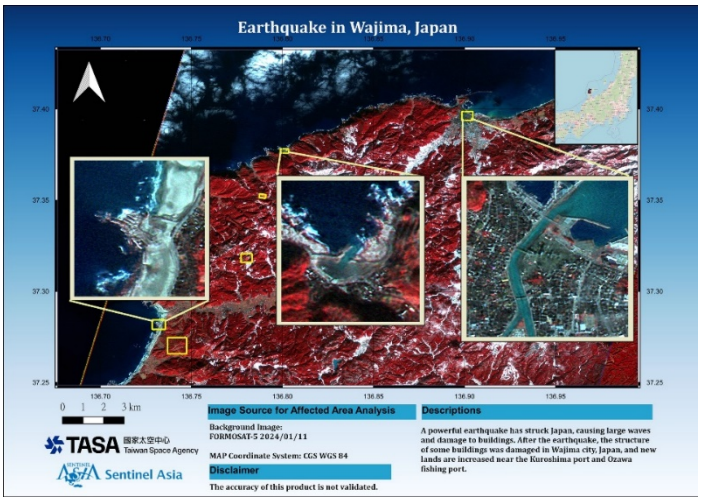
A 7.6 magnitude earthquake hit western Japan and tsunami waves of up to 1.2 meters (4 feet) hit a number of areas along the country's western coast on 1 January 2024.
According to NHK WORLD, this earthquake caused the deaths of more than 200 people, with 22 others still unaccounted for. In addition, water was cut off to more than 49,000 households CNN reported power outages were also severe, with approximately 33,000 homes in Ishikawa Prefecture hit by the quake experiencing power outages.

https://edition.cnn.com/asia/live-news/japan-ishikawa-earthquake-01-01-24/index.html
https://www3.nhk.or.jp/nhkworld/en/news/20240122_06/

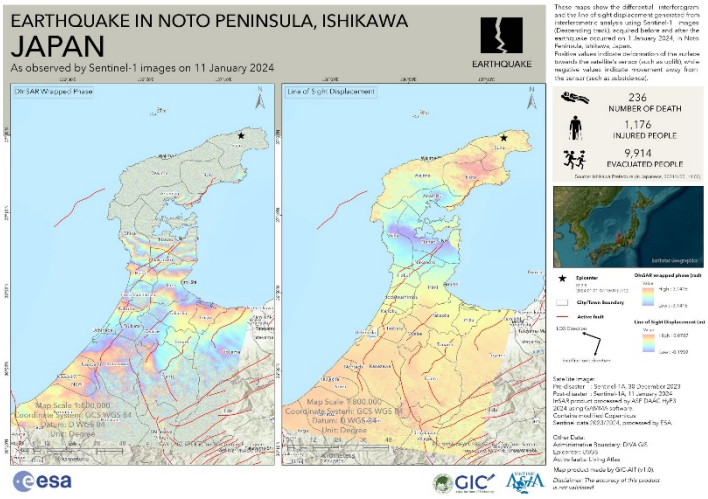
The Asian Disaster Reduction Center (ADRC) made an EOR to Sentinel Asia on 2 January and this EOR was escalated to the International Disasters Charter. Yamaguchi University assumed the role of Project Manager for this Charter activation.
Among DPNs, JAXA, TASA, ISRO, and MBRSC provided data. Among DANs, EOS, TASA, AIT, and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240101JP.html



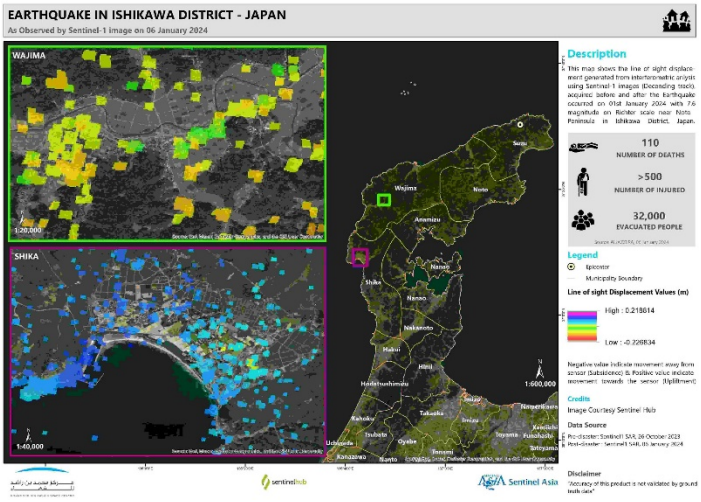
Value-Added Product by EOS



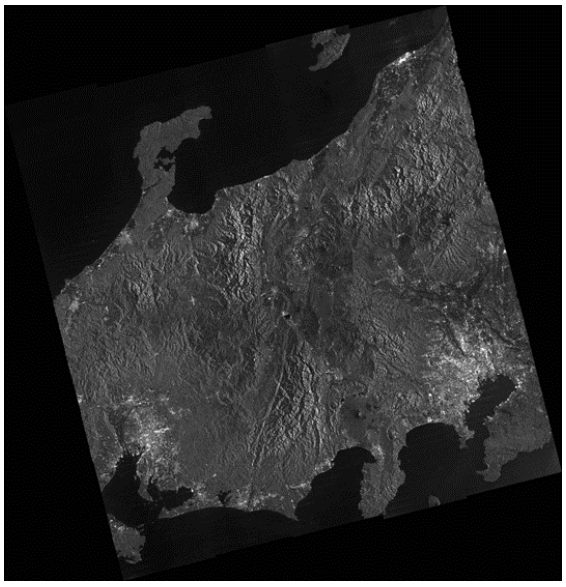
Value-Added Product by TASA



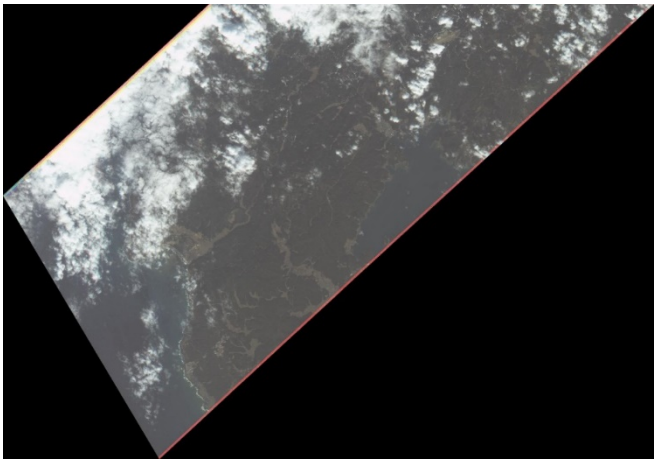
Value-Added Product by AIT



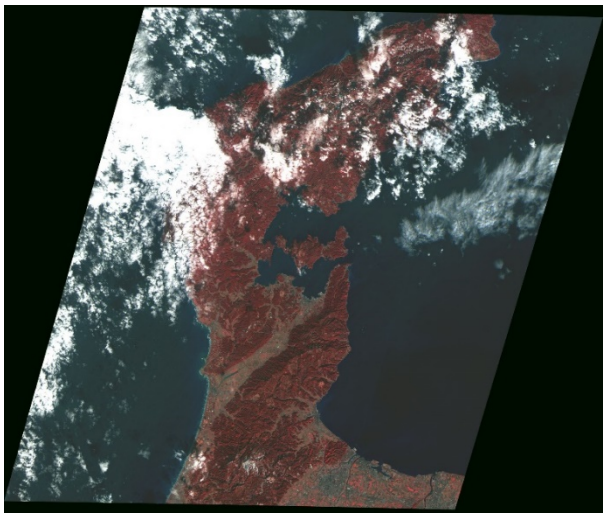
Value-Added Product by MBRSC



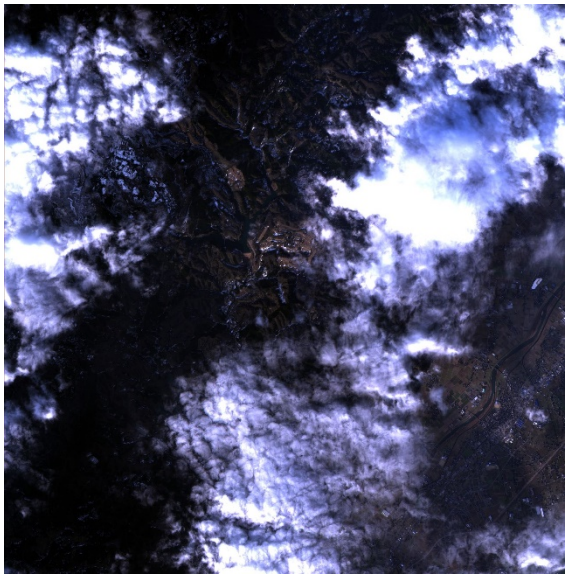
Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA



Post-disaster satellite image (Resourcesat-2) provided by ISRO

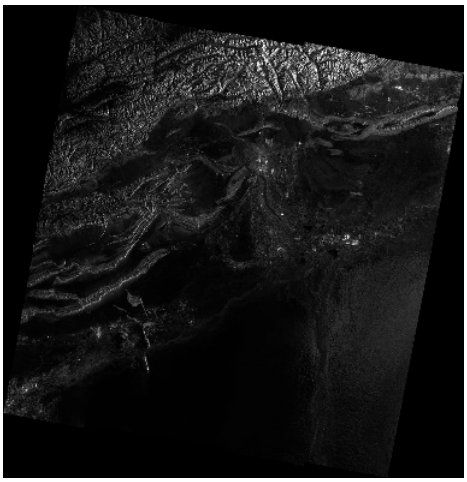


Post-disaster satellite image (KhalifaSat) provided by MBRSC

(2) Earthquake in western Xinjiang, China, on 22 January, 2024 (GLIDE Number EQ-2024-000004-CHN)

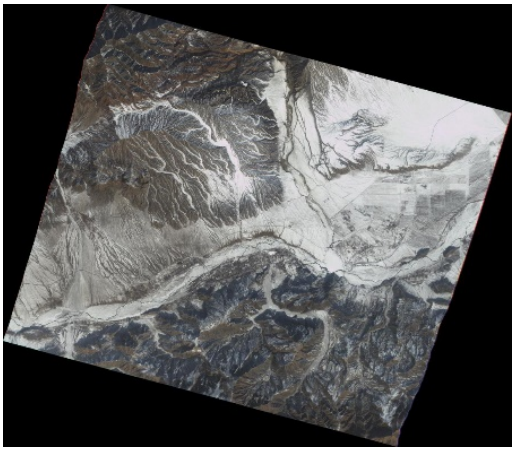
CBS News reported that a magnitude 7.1 earthquake struck a sparsely populated part of China's western Xinjiang region on 22 January, injuring six people, two with serious injuries and four with minor injuries. In addition, 47 houses collapsed, 78 were damaged, and some agricultural structures collapsed.
https://www.cbsnews.com/news/earthquake-china-xinjiang-region/

The Institute of Geology, China Earthquake Administration (IGCEA) made an EOR to Sentinel Asia on 23 January. Among DPNs, JAXA, TASA, and ISRO provided data. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240122CN.html



Post-disaster satellite image (ALOS-2) provided by JAXA

Post-disaster satellite image (CARTOSAT-2E) provided by ISRO



Post-disaster satellite image (FORMOSAT-5) provided by TASA

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2. [Report] Sentinel Asia Annual Report 2022 has been published!

Sentinel Asia’s activity report for 2022 has been published. The report features, among others, (i) a detailed review on EORs conducted in 2022 including good practices; (ii) external relations such as news, publications, and reports on conferences; and (iii) an analytical survey of Sentinel Asia’s operations.

In 2022, as in previous years, the Joint Project Team Meeting (JPTM) of Sentinel Asia was forced to be called off due to the COVID-19 pandemic. In this regard, this Annual Report provided JPT members with an alternative opportunity to report their Sentinel Asia-related activities, which would have been provided as part of the JPTM. In response to the invitation by the Sentinel Asia secretariat team, 21 JPT members contributed their activity reports, which are in the Appendix of the Annual Report.

The Annual Report is available on the Sentinel Asia web page at https://sentinel-asia.org/reports/Reports/SA_Annual_Report_2022.pdf

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3. [Interview] Mr. Abdullah Muhammad Mustofa Sorwar, Bangladesh Water Development Board (BWDB)

Bangladesh Water Development Board (BWDB) is the leading water resources management organization in Bangladesh. They are responsible for Flood Forecasting and Warning, Flood Damage Assessment, etc. Its Central GIS Directorate has the responsibility to assess ex-post damage due to floods. They became a member of Sentinel Asia's Joint Project Team (JPT) in May 2023.

Sentinel Asia secretariat interviewed Mr. Abdullah Muhammad Mustofa Sorwar, Superintending Engineer at Central GIS Directorate of BWDB to introduce their activities.

Sentinel Asia Secretariat

The Bangladesh Water Development Board (BWDB) participated in Sentinel Asia in May 2023. Can you introduce your organization for our readers? In addition, please also introduce the section that is the point of contact within BWDB.

Mr. Abdullah Muhammad Mustofa Sorwar

BWDB is a government organization that promotes the sustainable development of the country's water resources through participatory water management, the improvement of people's socioeconomic conditions by ensuring food security through the development of irrigation systems, and the protection of people's lives and property through water-related disaster management.

After the independence of Bangladesh, a former Entity called WAPDA (Water and Power Development Authority) was restructured in 1972 into two different organizations to deal with water and power separately. As such BWDB was created under the Bangladesh Water and Power Development Boards Order 1972 (P.O. No. 59 of 1972) as a fully autonomous organization. As the principal agency of the government for managing water resources of the country it was given the responsibility of accomplishing the tasks of executing flood control, drainage and irrigation projects to increase productivity in agriculture and fisheries. Reformed under the BWDB Act, 2000, BWDB has since been managed by a Governing Council with 13 members headed by the Minister, Ministry of Water Resources.

Vision of BWDB is:

- Sustainable development of water resources in Bangladesh through participatory water management
- Protection of people's lives and property through water-related disaster management
- Improvement of socio-economic condition of the people by ensuring food security through irrigation system development

And its Mission is:

- Flood control under strategic planning
- Development of drainage and irrigation systems
- Food security and alleviation of poverty
- Prevention of river erosion
- Addressing salinity intrusion problem
- Land reclamation
- Management of water-related disasters
- Addressing the adverse effects of climate change in line with integrated coastal management
- Increasing public engagement through people's participation in integrated water resource management

The Central GIS Directorate of BWDB is the point of contact/focal point for Sentinel Asia within BWDB. This office made its debut in December 2020 with just one official. Now, with

four engineers and three support staff, we are continuing our journey in the field of GIS/RS and mathematical modelling. Every now and then, requests from various offices come to us for mapping service, catchment delineation, morphological planform analysis, erosion prediction, and so on. During floods, we prepare flood extent maps from freely available satellite imagery including what are received from Sentinel Asia. We have sophisticated hardware and software resources for image analysis and GIS mapping. Recently we have received water modelling software from DHI and we have implemented a license server to which BWDB Design and Planning offices connect and use this tool as a decision support system. We also set up our own GIS portal (https://gis.bwdb.gov.bd/arcgis/home) and website (https://gis.bwdb.gov.bd).

Sentinel Asia Secretariat
What is the reason of your participation to Sentinel Asia?

Mr. Abdullah Muhammad Mustofa Sorwar
Sentinel Asia is an important platform for accessing near real-time satellite data, enhancing our ability to monitor and respond to water-related disasters promptly.
The motivation behind BWDB's involvement in Sentinel Asia is to improve our capacity for disaster management by using advanced technologies and to promote global cooperation.

Several key reasons for our active engagement with Sentinel Asia are as follows:

- Sentinel Asia provides access to near real-time satellite data and imagery through Emergency Observation Requests (EORs), which help us monitor and assess water-related disasters promptly. This is crucial for timely decision-making and effective response during emergencies.
- Participation in Sentinel Asia enhances our early-warning systems by integrating satellite data for more accurate and timely disaster forecasts. This approach will allow us to better prepare and mobilize resources, minimizing the impact of disasters on communities.
- Collaborating with Sentinel Asia enables BWDB to stay up to date with technological innovation in disaster response. The platform offers cutting-edge tools and value-added products that enhance our situational awareness and decision-making capabilities.
- Participation in Sentinel Asia contributes to the continuous professional development of our team. Engaging with the platform helps our personnel to acquire new skills, stay informed about the latest advancements in satellite technology, and improve our overall disaster management capacity.

Sentinel Asia Secretariat
How is your participation in Sentinel Asia recognized within BWDB and other agencies in your government?

Mr. Abdullah Muhammad Mustofa Sorwar
The recognition of BWDB's participation in Sentinel Asia is widespread within our organization. The significance of our involvement is acknowledged through several key aspects:

- Our strategic participation in Sentinel Asia aligns with our vision of sustainable water-related disaster management, utilizing satellite technology and international collaboration to stay at the leading position of disaster response capabilities.
- Participation in Sentinel Asia offers benefits like near real-time data, early-warning systems and improved decision-making, enhancing disaster management capacities and operational effectiveness.
- Our participation in Sentinel Asia promotes collaboration with other agencies. The collaboration is appreciated within the government, as it aligns with broader efforts to promote coordination among agencies involved in disaster management, satellite technology, and related fields.

Sentinel Asia Secretariat

The BWDB's vision includes "Protection of people's lives and property through water-related disaster management". Could you tell us about your activities for this purpose?

Mr. Abdullah Muhammad Mustofa Sorwar

The Bangladesh Water Development Board (BWDB) is dedicated to fulfilling its vision of "Protection of people's lives and property through water-related disaster management" through structural and non-structural interventions. Some key activities include:

- For non-structural interventions, BWDB operates and maintains early-warning systems to provide timely alerts to communities at risk of water-related disasters such as floods and cyclones. These systems incorporate near real-time data, including information from satellite sources, to ensure swift and accurate notifications to vulnerable populations.
- For structural interventions, BWDB is involved in the construction of embankments, river bank protection works, and drainage systems to control water flow, prevent flooding, and protect communities and agricultural lands from the adverse effects of excessive water.
- The BWDB conducts training programs to enhance the preparedness of BWDB officials. This includes the development of response plans, coordination mechanisms, and the pre-positioning of resources to ensure swift and effective responses during emergencies.
- The BWDB is actively involved in research and innovation to stay ahead of emerging challenges in water-related disaster management. This includes exploring new technologies, such as satellite remote sensing and geographic information systems (GIS) to improve the accuracy of risk assessments and response strategies.
- Collaboration with international organizations, including participation in initiatives like Sentinel Asia, allows BWDB to access global expertise, share best practices, and benefit from advanced technologies. This collaborative approach strengthens the organization's capacity to manage water-related disasters effectively.

Sentinel Asia Secretariat

To realize this vision, what do you expect from satellite remote sensing?

Mr. Abdullah Muhammad Mustofa Sorwar

Satellite remote sensing plays a crucial role in helping BWDB realize its vision of "Protection of people's lives and property through water-related disaster management." The expectations from satellite remote sensing include the following key aspects:

- Satellite remote sensing provides near real-time and high-resolution data on weather patterns, precipitation, and so on. This information is vital for early-warning systems, enabling BWDB to anticipate and respond to potential water-related disasters such as floods and cyclones. Timely and accurate forecasts contribute to effective disaster preparedness and evacuation planning.
- After a disaster event, satellite imagery facilitates rapid damage assessment. This information is crucial for understanding the extent of the impact, identifying affected areas, and prioritizing response efforts.
- Satellite and remote sensing data helps to create detailed maps, including flood extent mapping and identification of areas prone to erosion. This information helps in land-use planning, infrastructure development, and the identification of high-risk vulnerable areas, which contributes to long-term disaster risk reduction.
- Satellite remote sensing data serves as a valuable resource for research and modelling activities such as hydrological modelling, flood forecasting. By integrating satellite data into these models, BWDB can enhance its understanding of water-related processes and improve the accuracy of predictions.
- Integration of satellite remote sensing into disaster management efforts facilitates international collaboration. Participating in Sentinel Asia allows BWDB to share information, access data from neighboring regions, and collaborate with other countries facing similar challenges. This approach enhances the effectiveness of disaster response strategies.

Sentinel Asia Secretariat

In addition to BWDB, the Bangladesh Space Research and Remote Sensing Organization (SPARSSO) is another member of Sentinel Asia. Do you have any cooperation with them? If so, could you introduce some cases?

Mr. Abdullah Muhammad Mustofa Sorwar

There is always a scope of exchange of views between BWDB and SPARRSO, as both are government organizations. BWDB officials sometimes participate in the workshops of research projects carried out by SPARRSO that are in line with BWDB interests. Previously, BWDB and SPARRSO officials jointly participated in some capacity-building mini projects with collaboration from Sentinel Asia and JAXA. With the help of the membership in Sentinel Asia, a collaboration between BWDB and SPARSSO is possible in processing satellite imagery provided by Sentinel Asia for disaster management.

Sentinel Asia Secretariat

You sent an Emergency Observation Request (EOR) to Sentinel Asia for Cyclone MOCHA last May. How were data and Value Added Products (VAPs) provided by Sentinel Asia used by the agencies in Bangladesh? If you have any lessons learned, could you share them?

Mr. Abdullah Muhammad Mustofa Sorwar

The high-resolution satellite imagery provided by Sentinel Asia was important in conducting damage assessment in the aftermath of Cyclone MOCHA. The imagery facilitated a quick and comprehensive overview of the affected areas, helping us to identify the extent of damage to infrastructure, residential areas, and agricultural land. The satellite imagery and Value Added Products (VAPs) were used to identify priority areas that required immediate attention and intervention.

Lessons Learned is that EOR to Sentinel Asia for Cyclone MOCHA shows the value of satellite data in disaster response. One lesson learned was the importance of timely data delivery. While the data received from Sentinel Asia was invaluable, there were instances such as during a flash flood in the city of Sylhet, Bangladesh in 2022 where even faster access to information could have further improved the initial response. The experience also aids in ongoing capacity building for more effective and efficient disaster management.

Sentinel Asia Secretariat

What do you think of the benefits of Sentinel Asia?

Mr. Abdullah Muhammad Mustofa Sorwar

The benefits of Sentinel Asia for BWDB and other agencies involved in disaster management in Bangladesh are substantial. Some key benefits of Sentinel Asia are:

- Sentinel Asia provides timely access to satellite data and imagery through EORs, enabling rapid response to natural disasters. This information is crucial for identifying the extent of damage to infrastructure, residential areas, and agricultural land and effective decision-making during emergencies.
- By leveraging Sentinel Asia, BWDB can enhance its disaster preparedness efforts. The platform provides valuable insights into potential risks, allowing for proactive measures such as pre-positioning of resources, evacuation planning, and the implementation of preventive measures.
- Sentinel Asia offers access to high-resolution satellite imagery, which is essential for detailed damage assessment and identification of high-risk prone vulnerable areas for intervention.
- Participation in Sentinel Asia provides BWDB with exposure to global best practices in satellite-based disaster management. Knowledge sharing and collaboration with other member countries contribute to the adoption of innovative approaches, enhancing continuous improvement in disaster response strategies.
- Sentinel Asia offers opportunities for capacity building through training programs, workshops, and collaborative projects. This enables BWDB personnel to enhance their skills in satellite image interpretation, data analysis, and the utilization of advanced technologies for disaster.
- Sentinel Asia encourages the adoption of innovative technologies for disaster management. BWDB can continuously improve its capabilities by keeping in touch with Sentinel Asia, ensuring a more resilient and adaptive approach to water-related disasters.

Sentinel Asia Secretariat
Are there any challenges such as water-related disaster management or socio-economic conditions in your country that could be solved by Sentinel Asia or other satellite technologies?

Mr. Abdullah Muhammad Mustofa Sorwar
Bangladesh faces several challenges related to water-related disaster management and socio-economic conditions. And obviously satellite technologies offered by Sentinel Asia can contribute significantly to addressing these challenges. Some of the key challenges and how satellite technologies can help are as follows:

- Bangladesh is prone to monsoon flooding and flash flooding, which poses a significant threat to lives, property, and agriculture. Satellite technologies provide near real-time data on rainfall, river levels, and flood extent. This information aids in early warning, flood monitoring, and the development of flood models for better preparedness and response.
- Cyclones and storm surges are common in the southern part of Bangladesh, posing a serious risk to coastal areas. Satellite data assists in tracking cyclones, predicting their paths, and assessing storm surge potential. This information supports evacuation planning, resource allocation, and early warning dissemination to vulnerable coastal communities.
- Riverbank erosion is a recurring issue, impacting communities and agricultural land. Satellite imagery helps monitor morphological changes in river courses, identify erosion-prone areas, etc. This information aids in land-use planning and the development of strategies to mitigate the impacts of erosion.
- Agriculture is a key sector, and ensuring food security is a priority. Satellite imagery data aids in crop monitoring, yield prediction, and early detection of issues affecting agricultural productivity.
- Ensuring the conservation of natural resources is crucial. Satellite technologies contribute to environmental monitoring, allowing for the assessment of deforestation, changes in land cover, and the impact of climate change.

Sentinel Asia Secretariat
What are your expectations of and how do you cooperate with Sentinel Asia?

Mr. Abdullah Muhammad Mustofa Sorwar
As a member of Sentinel Asia, we have specific expectations and a cooperative approach:

- We expect Sentinel Asia to continue providing timely and reliable satellite data, especially during emergency situations such as cyclones, floods, and other water-related disasters. We will actively participate in the data-sharing network and promptly submit EORs when necessary.
- We look forward to the continued development and availability of advanced technologies and VAPs that enhance the usefulness of satellite data for disaster management. We will actively engage in testing and providing feedback on new technologies and VAPs. This includes participating in training programs and workshops organized by Sentinel Asia to build the capacity of our personnel in utilizing these tools effectively.
- We anticipate opportunities for collaborative research and development projects that

utilize satellite data for innovative solutions in disaster management. We actively seek collaboration with other member countries and organizations within the Sentinel Asia network to undertake joint projects. This collaborative approach fosters the exchange of knowledge, expertise, and best practices.

- We expect continued support for capacity-building initiatives that enhance the skills of our personnel in satellite image interpretation, data analysis, and the application of satellite technologies. We will actively participate in capacity-building programs organized by Sentinel Asia. This includes training sessions, workshops, and knowledge-sharing events to ensure that our team remains well-equipped with the latest skills and knowledge.
- We expect efficient and responsive support in processing EORs submitted during emergency situations. We will cooperate closely by providing detailed EORs, specifying the information needed, and collaborating with other member countries to ensure a swift and coordinated response to emerging disaster situations.
- We expect the continued evolution of the platform to meet the dynamic challenges of water-related disasters. We will remain committed to contributing and benefitting from the collaborative efforts within the Sentinel Asia community.

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4. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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5. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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Sentinel Asia Project Office
Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)
Ochanomizu Sola City, 4-6 Kandasurugadai, Chiyoda-ku, Tokyo 101-8008 Japan
E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

** February 2024 News from Sentinel Asia Project Office **

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Topics:

1.[Interview] Dr. Makoto IKEDA and Mr. Masami SUGIURA, Asian Disaster Reduction Center (ADRC)
2. How to Send an Emergency Observation Request
3. Using the Sentinel Asia Operation System, OPTEMIS

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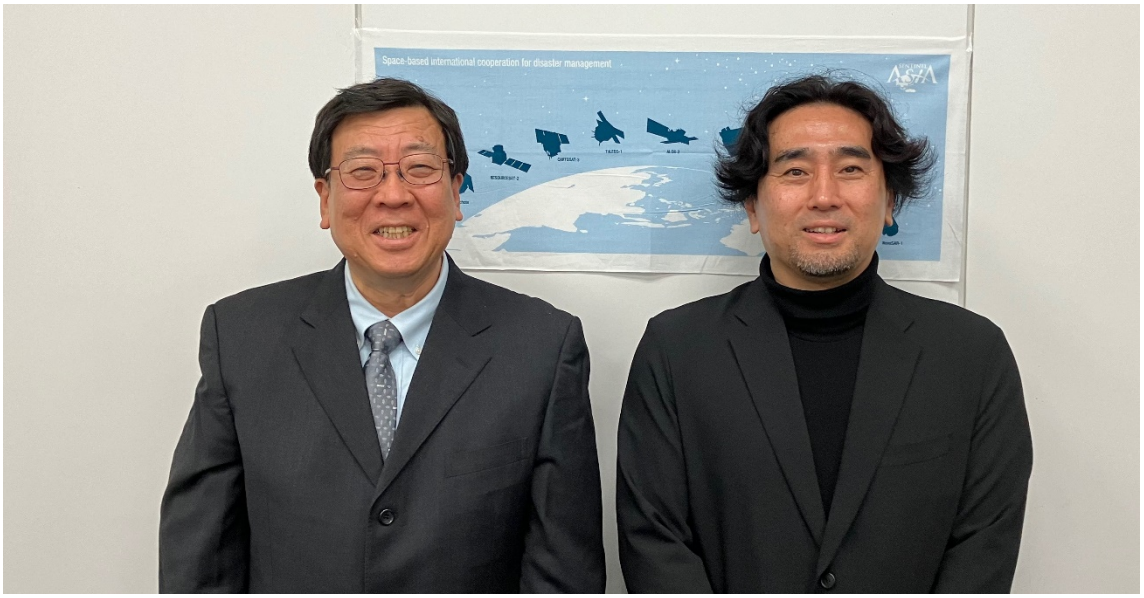
1. [Interview] Dr. Makoto IKEDA and Mr. Masami SUGIURA, Asian Disaster Reduction Center (ADRC)

The Asian Disaster Reduction Center (ADRC) was established in 1998 in Kobe, Hyogo Prefecture, in Japan and has been important member of Sentinel Asia since the beginning of this initiative. It plays crucial role within Sentinel Asia not only for emergency response to disasters but also for capacity building and other activities.
The Sentinel Asia Secretariat interviewed Dr. Makoto IKEDA, Senior Researcher, and Mr. Masami SUGIURA, Senior Project Researcher, at ADRC to introduce their activities.



Mr. Sugiura (Left) and Dr. Ikeda (Right)

Sentinel Asia Secretariat

The Asian Disaster Reduction Center (ADRC) was established in 1998 following the 1995 Great Hanshin-Awaji Earthquake. Please tell us about the organization and mission of the ADRC.

ADRC

As you said, the ADRC was established in 1998 in Kobe, Hyogo Prefecture, in Japan. Our mission is enhancing the disaster resilience of its member countries, building safe communities, and creating a society where sustainable development is attainable. The ADRC works to build disaster-resilient communities and to establish multi-lateral networks among Asian countries, including personnel exchanges.

Sentinel Asia Secretariat

ADRC plays a special role among the Sentinel Asia members, such as being the keystone when we receive Emergency Observation Requests (EORs). Can you tell us about the relationship between the ADRC and Sentinel Asia, including its past history?

ADRC

Related to the previous question, the ADRC is an organization established in 1998. Since its establishment, the ADRC has been involved in a variety of activities, with national disaster management organizations in Asian countries as our counterparts. On the other hand, Sentinel Asia, whose members are space agencies, disaster management organizations, universities and research institutes, and international organizations as JPT members, started operating in 2006. We feel that the connections among these organizations through Sentinel Asia are very important for us, too, to expand our network and to broaden our disaster management activities.

For example, we have given lectures on Sentinel Asia to the staff of in charge of disaster management in Asian countries at training sessions by the Japan International Cooperation Agency (JICA) or in the ADRC's training programs, etc., and have built awareness in the utilization of space technology. When an EOR is activated, we also receive feedback on good practices of various data provided to end users (e.g., agencies in charge of disaster management in disaster-stricken areas), through which we hear Sentinel Asia's usefulness in its promoting disaster management activities. In addition, we promote Sentinel Asia in ADRC member countries that don't have Sentinel Asia member organizations.

We also monitor the disaster information and contact the countries or regions who have disasters and discuss whether they would like Sentinel Asia observation. In cases where we cannot contact them, the ADRC requests Sentinel Asia observation for them if necessary.

Thus, the ADRC feels that participation in Sentinel Asia is a very valuable opportunity for us to expand our activities.

Sentinel Asia Secretariat

Can you share with us some Sentinel Asia activities that you remember most?

Dr. Ikeda

The most memorable event that still remains in my memory is my first participation in the first Joint Project Team Meeting of Sentinel Asia STEP2 held in Kobe in June 2008. I was encouraged by Mr. Suzuki, then ADRC Director, who was the co-chair of Sentinel Asia, to participate and I never expected to be involved in the same project for so many years. I am now one of the oldest members of Sentinel Asia, but it has been an asset for me to get to know so many people.

Mr. Sugiura

From April 2011, after the Great East Japan Earthquake, JAXA's earth observation satellite ALOS ceased its observation. And at the end of 2014, the next-generation ALOS-2 data became available. So, for more than three years, Japan was unable to provide satellite data on the affected areas, except archived data. During this period, satellite data from other Sentinel Asia Data Provider Nodes was actively provided, as well as value-added products processed with those data by Data Analysis Node. I think that this was a challenge in the early days of Sentinel Asia, and at the same time, one of the major opportunities for the member organizations to establish the current close cooperative relationship.

In addition, for Afghanistan, which is still in conflict today and a non-member of Sentinel Asia, the International Centre for Integrated Mountain Development (ICIMOD) sent EORs when earthquakes occurred there in June 2022 and October 2023, and we were able to establish relations with its local institutions. In this way, I was strongly impressed by the cooperative activities of countries and agencies that transcended politics and religion when facing challenges related to disasters.

Sentinel Asia Secretariat

From the ADRC's point of view, what are the challenges for Sentinel Asia in the future? If you have any suggestions for improvement, please share them with us.

Mr. Sugiura

ADRC currently has 32 member countries out of more than 50 countries in the Asian region. We actively exchange personnel with member countries through the annual Asian Conference on Disaster Reduction (ACDR) and the Visiting Researcher Program, but when a disaster occurs in other Asian countries that are not members, it is very difficult to obtain information about the situation. In such cases, we obtain information and cooperation in sending EORs through United Nations' agencies and international organizations such as the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre). However, we do not have sufficient information on the scope of the request, such as Area Of Interest, which is the most important element of EORs. Another issue is how to provide information when a disaster occurs in countries with conflicts.

Dr. Ikeda

Current concept of Sentinel Asia is to cover all disaster cycles. However, I think it is inevitable due

to the nature of Sentinel Asia, but our main activities are on the “emergency response” phase. Of course it is important, but it would be better if the follow-up to the mitigation and preparedness phases could also be enhanced. For example, if we could support the creation of hazard maps, or get involved in the formulation of disaster prevention plans in member countries and regions, I think this would make Sentinel Asia more widely known to the public.

Sentinel Asia Secretariat

Is there anything you can do to improve Sentinel Asia activities, such as networking with ADRC member countries and international organizations and sharing knowledge?

Mr. Sugiura

Sentinel Asia activities related to Emergency Observation Requests (EORs) require speed, but it is unpredictable when such a situation will occur, and in some countries, it may happen only once every few years. What is important is daily drills and manuals of procedures. Although drills and establishment of SOPs (Standard Operating Procedures) have been conducted in various countries, mainly by JAXA, these activities need to be continued regularly. We believe that the ADRC needs to actively cooperate in these activities to address such issues.

Dr. Ikeda

In terms of Sentinel Asia activities, we have opportunities to share information with all parties concerned through international conferences and EOR activities. On the other hand, I understand that each country and region is promoting its own Sentinel Asia activities, for example, by holding online workshops. Since Sentinel Asia is a voluntary-based initiative, we are very pleased to hear about these efforts. Therefore, rather than the Sentinel Asia Secretariat acting on its own initiative, I feel that the promotion of activities such as these on members’ own initiative will lead to the expansion of the network and the sharing of knowledge.

Sentinel Asia Secretariat

Could you please give a message to the member organizations of Sentinel Asia, including the member countries of the ADRC?

Mr. Sugiura

It is predicted that the risk of natural disasters will increase in the Asian region in the future due to expected population growth combined with global warming. Under the circumstances, I believe that Sentinel Asia’s mechanism for sharing disaster data using the advanced technology of satellite data will become an increasingly important need in the future. I hope that this cooperative relationship, which has existed since the inception of Sentinel Asia, will continue to grow in the future.

Dr. Ikeda

We all live in different countries and regions, and belong to different institutions and departments. However, I believe that we all share the same idea to “protect lives and property from disasters.” To this end, I feel that we will continue to value our connections with all of the members as we have in the past. We appreciate having the continued support of Sentinel Asia members.

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2. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html.

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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3. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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** March 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 28 March)
2. [Interview] Ms. Litea Biukoto and Mr. Kaliopate Tavola, The Pacific Community (SPC)
3. [Interview] Mr. Kabir Uddin, International Center for Integrated Mountain Development (ICIMOD)
4. How to send an Emergency Observation Request
5. Using Sentinel Asia Operation System, OPTEMIS

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1. [News] Emergency Observation of Disasters (as of 28 March)

(1) Flood in Central Java Island, Indonesia, on 15 March, 2024 (GLIDE Number FL-2024-000026-IDN)

Flooding triggered by high-intensity rain struck central Java, Indonesia, on 14 March, causing confusion and damage.

According to ReliefWeb, as of 21 March, the flood displaced 542 people, affecting the same number of households in Pekalongan City, central Java.

The Central Java Province regional disaster management agency continues to coordinate with its counterpart in Pekalongan City regarding flood developments.

https://reliefweb.int/report/indonesia/indonesia-flooding-pekalongan-city-central-java-14-mar-2024

The National Research and Innovation Agency (BRIN) made an Emergency Observation Request (EOR) to Sentinel Asia on 20 March.

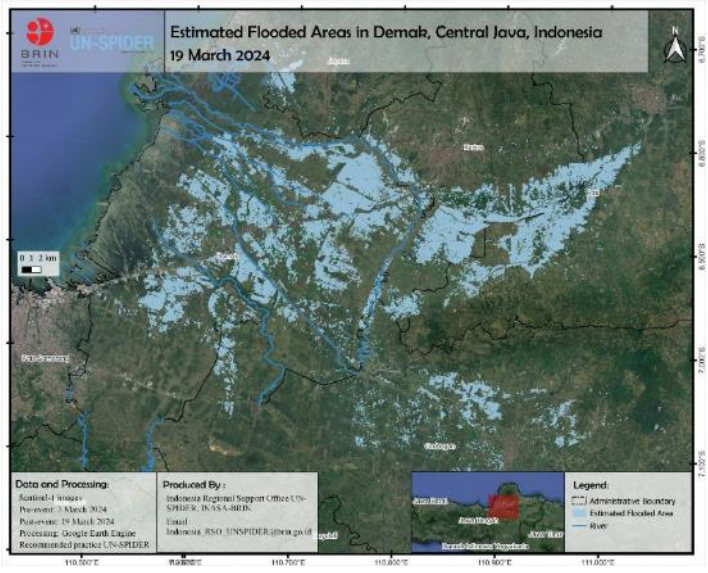
Among DPNs, JAXA, TASA, ISRO, and CRISP provided their data. Among DANs, JAXA, AIT, EOS, BRIN, and MBRSC provided their VAPs.

Information on the latest response by Sentinel Asia is available at the link below.

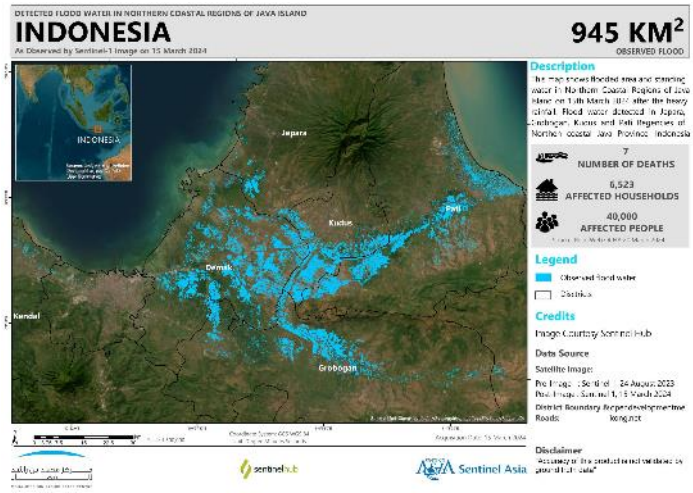
https://sentinel-asia.org/EO/2024/article20240315ID.html

Value-Added Product by AIT

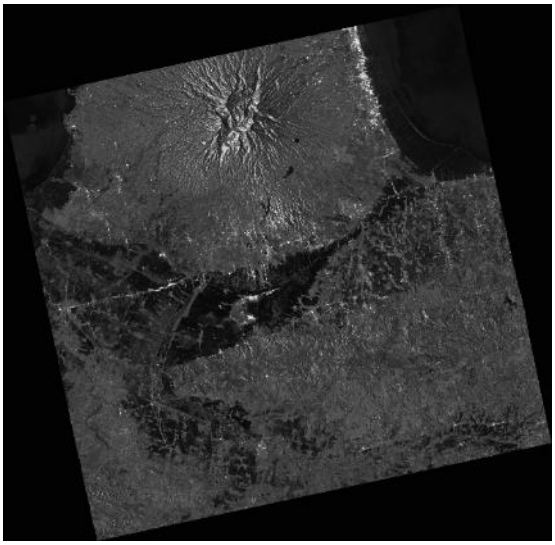
Value-Added Product by EOS



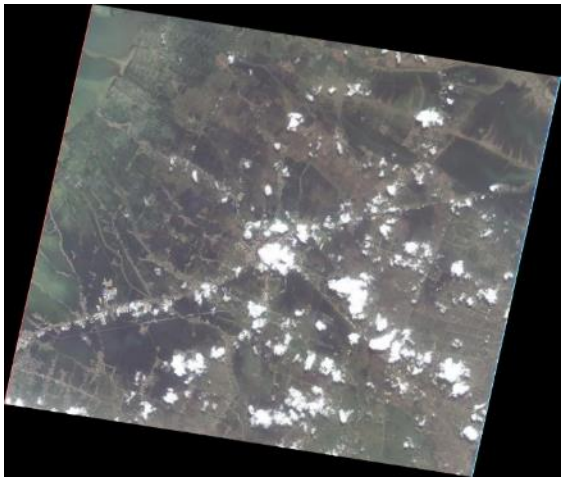
Value-Added Product by BRIN



Value-Added Product by MBRSC

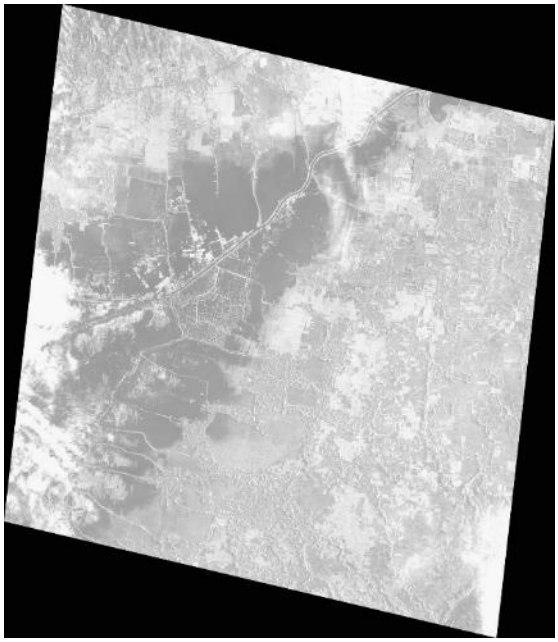


Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA

Post-disaster satellite image (Resourcesat-2) provided by ISRO



Post-disaster satellite image (TELEOS-1) provided by CRISP

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2. [Interview] Ms. Litea Biukoto and Mr. Kaliopate Tavola, The Pacific Community (SPC)

The Pacific Community (SPC) is a longtime member of Sentinel Asia, originally having joined as South Pacific Applied Geoscience Commission (SOPAC), which is now the Geoscience, Energy and Maritime Division (GEM) of SPC. SPC has 27 member countries and territories in the Pacific region. They support their members in the event of disasters as Sentinel Asia's Joint Project Team (JPT) member as well as its Data Analysis Node (DAN), including sending Emergency Observation Requests (EORs).

The Sentinel Asia Secretariat interviewed Ms. Litea Biukoto and Mr. Kaliopate Tavola to introduce

their contribution to the area and to Sentinel Asia.

Ms. Litea Biukoto

Mr. Kaliopate Tavola

Sentinel Asia Secretariat

SPC has participated in Sentinel Asia since the very beginning. Can you introduce your organization and activities for our readers?

SPC

SPC is the principal scientific and technical organization in the Pacific region, proudly supporting development since 1947. We are an international development organization owned and governed by our 27 country and territory members, 5 of them metropolitan countries. SPC works across key sectors through its technical divisions – Climate Change and Environmental Sustainability; Educational Quality and Assessment; Fisheries, Aquaculture & Marine Ecosystems; Geoscience, Energy and Maritime; Human Rights and Social Development; Land Resources; Public Health; and Statistics for Development.

SPC, through its Geoscience, Energy and Maritime, coordinates regional disaster risk management activities in the Pacific: https://gem.spc.int/key-work/DCRP.

Sentinel Asia Secretariat

Could you also introduce the framework whereby SPC shares information on disasters with the Pacific countries and your cooperation with these countries in emergency response, including in the case of Sentinel Asia's Emergency Observation Requests (EORs)?

SPC

SPC convenes the annual Regional Disaster Managers Meeting to facilitate the coordination of disaster risk management activities in the Pacific, including providing policy guidance, information sharing, and identifying future direction for resourcing.

Areas where we work with the National Disaster Management Offices and other government

agencies:

- Early warning and preparedness
- Recovery planning, particularly with Post-Disaster Needs Assessments
- Risk assessments – exposure mapping. Post-disaster technical assessments, information management.
- Training and capacity development – design and delivery of accredited and non-accredited training, workshops. Supporting peer-to-peer exchanges, conducting exercises and drills.
- Resource mobilization

Sentinel Asia Secretariat

Regarding the past Emergency Observation Requests (EORs) from SPC and SOPAC, could you tell us the memorable cases and how the data from Sentinel Asia was used in those cases?

SPC

Tropical Cyclone Harold in April 2020. The cyclone passed through Fiji and Vanuatu during a time when COVID-19 travel restrictions were in place. As with other activations in the Pacific, the images captured and the information products delivered were the first impressions of areas affected and the extent of impact. While the government through the National Disaster Management Office was planning its efforts, we were able to have initial discussions with UNDP (United Nations Development Program) and the Department of Strategic Policy, Planning and Aid Coordination on the need for a PDNA (Post-Disaster Needs Assessment).

Sentinel Asia Secretariat

In Pacific countries, the main targets of Earth observation are floods caused by storms, and volcanic eruptions, we suppose, along with your EORs. Could you tell us what satellite data and value-added-products are useful for your activities?

SPC

We would like to have more high-resolution satellite data for building footprint extraction to inform some of the work we do around exposure mapping and asset modelling.

The challenge with using visible imagery immediately after weather-related events is cloud cover. Satellite imagery acquired sometime after an event is also useful as the effect ‘footprint’ is still quite visible.

The geographic footprint of a disaster is useful particularly when trying to gauge the extent of impact. In the case of tropical cyclones, though the response effort is often prioritized near the track, areas that are also affected by rain and flooding are potentially farther away. Ensuring that these areas are adequately serviced can be assisted with the provision of maps showing areas affected.

Sentinel Asia Secretariat

Does anything stand out as memorable in your experience with Sentinel Asia activities?

SPC

The Secretariat has reached out to check if an activation is needed when requests are not forthcoming. I've also found the Secretariat to be very responsive when requests are submitted.

Sentinel Asia Secretariat

What do you think of the merits of Sentinel Asia, for example, image processing by DAN in a timely manner?

SPC

The timely image processing is valuable. Requests can be made with relative ease.

Sentinel Asia Secretariat

At JPTM 2023 held in this September, you introduced your activities including the Digital Earth Pacific project and capacity building program. Do you have any programs that can be shared with Sentinel Asia members?

SPC

The Digital Earth Pacific (DEP) aims to simplify the utilization and accessibility of decades' worth of satellite data, enabling decision-makers throughout the Pacific region. This digital infrastructure ensures that every Pacific nation has the necessary access to tools, technologies, and capabilities for consistent monitoring and tracking of challenges related to climate change, food insecurity, or disaster risk. It provides decision-ready products that are regularly updated with each satellite overpass.

The platform can be accessed by Sentinel Asia Members https://digitalearthpacific.org/

Sentinel Asia Secretariat

Do you have any expectations of Sentinel Asia, and at the same time, what SPC can contribute to Sentinel Asia?

SPC

SPC is providing a lot more data online, which may be useful to DANs. This data includes population statistics and locations of communities.

Sentinel Asia provides a valuable service to the Pacific region. Sharing applications of satellite data

used by other small islands or coastal communities would be useful.

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3.[Interview] Mr. Kabir Uddin, International Center for Integrated Mountain Development (ICIMOD)

The International Centre for Integrated Mountain Development (ICIMOD) cooperates and supports its eight member countries in Hindu Kush Himalaya (HKH) region, including disaster response and many other aspects. They also contributed to Sentinel Asia for a long time.

Sentinel Asia secretariat interviewed Mr. Kabir Uddin, GIS and Remote Sensing Specialist at ICIMOD to introduce their disaster management activities and contribution to Sentinel Asia.

Mr. Kabir Uddin

Sentinel Asia Secretariat

We appreciate your continued participation in Sentinel Asia and your contribution as a Data Analysis Node (DAN) member. Could you introduce your organization and how you decided to join Sentinel Asia?

Mr. Kabir Uddin

The International Centre for Integrated Mountain Development (ICIMOD) serves as an intergovernmental knowledge and learning hub, dedicated to the well-being of the people residing in the Hindu Kush Himalaya (HKH) region. Headquartered in Kathmandu, Nepal, ICIMOD operates across eight regional member countries – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan. Given the frequent occurrence of disasters such as flooding, earthquakes, and landslides across this vast area, access to remote sensing information is crucial for effective ground assessment and response efforts.

Recognizing the critical role of timely data in disaster management, ICIMOD decided to collaborate with Sentinel Asia, and as a member of the Data Analysis Node (DAN), ICIMOD contributes to space-based disaster management initiatives in the Himalayan region. Sentinel Asia offers rapid observation for major disasters like floods and forest fires, aiding in timely response and mitigation efforts. Notable instances include the response to the Koshi flooding in Nepal in 2008, the flooding in Bhutan in July 2010, and the Pakistan floods in the same year.

In furtherance of our commitment to disaster preparedness, ICIMOD established a receiving station for JAXA WINDS (Wide-band Interworking Engineering Test and Demonstration Satellites) at our Kathmandu headquarters in October 2010. WINDS, a high-speed Internet satellite, played a pivotal role in ensuring uninterrupted communication during emergencies and enhancing connectivity in remote areas. Leveraging WINDS, ICIMOD gained swift access to satellite imagery from Sentinel Asia data providers, facilitating informed decision-making during crises.

While ICIMOD is widely recognized for its expertise in geographic information systems (GIS) and remote sensing, it's important to note that our scope extends beyond disaster management. Nonetheless, disaster preparedness remains a cornerstone of our training initiatives, encompassing areas such as flood mapping and earthquake damage assessment. Through our comprehensive training programs, we empower stakeholders across the region to harness geospatial technologies for effective disaster response and resilience-building endeavors.

Sentinel Asia Secretariat

As you said, ICIMOD responds to the disasters in the HKH mountain area over eight countries. Could you introduce your relations with these countries and how you cooperate with them, including in the case of Sentinel Asia activations?

Mr. Kabir Uddin

ICIMOD maintains strong partnerships with the governments and relevant agencies of the eight regional member countries, fostering collaboration in disaster response and resilience-building efforts. One illustrative example is our response to the devastating 2015 Nepal earthquake. During this crisis, ICIMOD and the Nepal government sought support from countries like Japan, drawing upon their extensive experience in earthquake management. In response, ICIMOD mobilized approximately 30 volunteers alongside our professionals. Temporary tents were erected to accommodate these volunteers, facilitating their active involvement in addressing the needs arising from the disaster.

Similarly, in 2016, when reports of flooding emerged, ICIMOD promptly engaged in providing support by generating inundation maps to aid in response efforts. The assistance rendered by Sentinel Asia during this event garnered significant media coverage, highlighting the effectiveness of satellite-based observations in disaster management. (Refer to: Mapping floods in Bangladesh caused by Cyclone Amphan to support humanitarian response

https://www.icimod.org/article/mapping-floods-in-bangladesh-caused-by-cyclone-amphan-to-support-humanitarian-response/).

ICIMOD's collaborations extend beyond disaster response to encompass various sectors critical for the region's sustainable development. For instance, we closely collaborate with institutions such as the Bangladesh Water Development Board, the Bangladesh Meteorological Department, the Bangladesh Engineering Department, and the Bangladesh Remote Sensing Organization through formal memoranda of understanding (MoUs). Additionally, we engage in informal partnerships with numerous organizations, driven by a shared commitment to addressing regional challenges.

While ICIMOD is often recognized for its expertise in geographic information systems (GIS) and remote sensing, our engagements transcend these domains. While we provide extensive training in GIS and remote sensing, disaster management remains a primary focus area. Through capacity-building initiatives, we empower stakeholders across the region to leverage geospatial technologies effectively, enhancing their preparedness and response capabilities in the face of disasters.

ICIMOD operates on the principle that partnerships, formal or informal, should be driven by the imperative to address pressing needs. Thus, whether through established collaborations or informal engagements, we remain steadfast in our commitment to supporting the region's disaster mitigation efforts to the best of our abilities.

Sentinel Asia Secretariat

About your past 9 Emergency Observation Requests (EORs) to Sentinel Asia, could you tell us how Sentinel Asia observations were used for the disasters?

Mr. Kabir Uddin

Certainly. One notable example of the invaluable role played by Sentinel Asia observations occurred during the devastating floods in India in 2016. Despite India's advanced space infrastructure, the urgency of the situation prompted the disaster management authorities to request our assistance in generating flood inundation maps immediately following the disaster. This instance underscores the critical importance of timely and accurate information in disaster response efforts. The flood inundation map produced by ICIMOD in collaboration with Sentinel Asia provided vital insights into the extent and severity of the flooding, enabling authorities to prioritize and coordinate response activities effectively (refer to: India's Most Flood-prone State Aided by New Satellite Mapping https://www.voanews.com/a/indias-most-flood-prone-state-aided-new-satellite-mapping/3530550.html). Such examples serve as compelling evidence of ICIMOD's contributions to disaster mitigation efforts in the region.

Through our engagement with Sentinel Asia, ICIMOD has leveraged satellite observations to support various emergency response initiatives across the Hindu Kush Himalaya region. These observations have been instrumental in facilitating rapid assessments, informing decision-making, and enhancing the overall effectiveness of disaster response efforts.

Sentinel Asia Secretariat

Among your EORs, were there any cases in which Sentinel Asia was used effectively, and why?

Mr. Kabir Uddin

Indeed, Sentinel Asia has proven to be highly effective, particularly in disaster-prone areas like the expansive Hindu Kush region. The vast geographical coverage of this area necessitates satellite imagery for comprehensive disaster management. Given the time-sensitive nature of disaster response, relying on commercial providers for imagery procurement, while feasible financially, is impractical due to the delays involved. Sentinel Asia addresses this challenge by consolidating various satellite data and products onto a single platform, thereby streamlining access for public and societal benefit. Beyond merely providing data, Sentinel Asia goes a step further by sharing products, especially in instances where organizations lack the capacity for timely data processing and analysis.

One of the notable applications of Sentinel Asia is its effectiveness in flood management. Flooding events often affect large areas, making timely and accurate detection of inundated areas crucial for effective response efforts. Inundation maps generated through Sentinel Asia not only delineate the extent of the flooded areas but also guide authorities in identifying safe locations for temporary shelters (Example: Potential flood hazard zonation and flood shelter suitability mapping for disaster risk mitigation in Bangladesh using geospatial technology https://www.sciencedirect.com/science/article/pii/S2590061721000454). Additionally, flood mapping supports urban planners in developing hazard maps and optimizing land use planning to mitigate future risks.

In summary, Sentinel Asia's comprehensive platform, coupled with its provision of timely products and support, makes it an indispensable tool for disaster management in the Hindu Kush region and beyond.

Sentinel Asia Secretariat

Do you have any memorable EORs in which you processed the observation data as DAN?

Mr. Kabir Uddin

One particularly memorable experience for me was during an Emergency Observation Request (EOR) when our internet connectivity was extremely slow. Downloading just one ALOS satellite scene took us four to five hours, significantly delaying our response efforts. However, in contrast with those challenges, today, accessing ALOS-2 data takes only a couple of minutes, thanks to advancements in technology and infrastructure. Moreover, the availability of tools like the SNAP toolbox has streamlined data preprocessing, making it much more efficient and accessible. Having experienced the frustrations of slow internet and limited resources firsthand, I deeply appreciate the significance of timely information in disaster response.

Reflecting on these experiences, it's evident that our capacity and capabilities have significantly

improved over time. This evolution has translated into more reliable and efficient disaster response efforts. As someone from a disaster-prone region, I understand the vital importance of leveraging technology to enhance our resilience and effectiveness in addressing crises.

Sentinel Asia Secretariat

Do you have any other memorable moments with your Sentinel Asia activities?

Mr. Kabir Uddin

One particularly memorable experience for me was during Sentinel Asia's Joint Project Team Meeting (JPTM) in Bangkok. The event stands out because it provided me with a valuable platform to share my expertise in flood mapping with fellow participants. Drawing from my extensive experience in this field, I had the opportunity to contribute to discussions and offer support to other members in their flood and inundation mapping endeavors. As a Data Analysis Node (DAN) member, I realized the importance of knowledge dissemination during such gatherings. It was gratifying to see how sharing our experiences and insights could empower others and enhance the collective capabilities of the Sentinel Asia community.

Participating in events like the JPTM reaffirms the significance of collaborative efforts in disaster management. By pooling our expertise and resources, we can strengthen our resilience and effectiveness in addressing the challenges posed by natural disasters.

Sentinel Asia Secretariat

What is the benefit of Sentinel Asia for you, for example, the timely provision of data, and effectiveness in case of disasters?

Mr. Kabir Uddin

The benefits of Sentinel Asia are manifold, particularly in terms of the timely provision of critical data and its effectiveness in disaster response. One of the key advantages of Sentinel Asia is its ability to deliver data promptly during disasters, ensuring that decision-makers have access to crucial information when it matters most. Moreover, the Sentinel Asia platform serves as a valuable centralized repository, aggregating emergency observation data from various space agencies. This consolidation eliminates the need for redundant efforts in sourcing data from multiple sources, streamlining the response process significantly.

Beyond providing raw observation data, Sentinel Asia often shares derived products, which is particularly beneficial for countries with limited resources and capacity for data processing. These products enable governments and organizations to leverage actionable insights derived from satellite observations, enhancing their ability to make informed decisions and effectively manage disaster situations.

In summary, Sentinel Asia's timely data provision, comprehensive platform, and sharing of derived

products play a pivotal role in bolstering disaster response efforts. By facilitating quick and efficient access to vital information, Sentinel Asia contributes significantly to enhancing the resilience and effectiveness of disaster management initiatives.

Sentinel Asia Secretariat

Recently, Sentinel Asia has been considered to contributing to the challenges to solve socio-economic issues, which is mentioned in Nagoya Vision of Asia-Pacific Regional Space Agency Forum (APRSAF)

https://www.aprsaf.org/annual_meetings/aprsaf26/outcome_documents.php

Do you have any ideas on how Sentinel Asia can contribute more to solve these socio-economic issues in the Asian region, including the Hindu Kush Himalaya mountain?

Mr. Kabir Uddin

With the increasing number of satellites and advancements in data analysis techniques, satellite information has emerged as a valuable resource for addressing various socio-economic challenges beyond just disasters. Sentinel Asia, with its extensive satellite imagery and improved data reliability, has the potential to play a significant role in addressing these issues across the Asian region, including the Hindu Kush Himalaya Mountain area.

One avenue for enhancing Sentinel Asia's contributions to socio-economic issues involves closer collaboration with governmental bodies such as the Bureau of Statistics or statistical departments. These entities handle a wide range of reports and data related to socio-economic indicators, including those impacted by disasters. By partnering with such agencies, Sentinel Asia can leverage its satellite information to enhance the accuracy and timeliness of socio-economic analyses and reports. This collaboration could facilitate better-informed policymaking and resource allocation decisions, ultimately contributing to more effective socio-economic development strategies.

In summary, by leveraging its satellite capabilities and fostering collaboration with key stakeholders, Sentinel Asia has the potential to make significant contributions to addressing socio-economic challenges in the Asian region, including the unique socio-economic dynamics of the Hindu Kush Himalaya Mountain area. Continued dialogue, partnership-building, and innovation will be essential in maximizing Sentinel Asia's impact in this regard.

Sentinel Asia Secretariat

What do you expect in Sentinel Asia, and on the contrary, how can you contribute to Sentinel Asia?

Mr. Kabir Uddin

Looking ahead, I see two key areas for improvement within Sentinel Asia. Firstly, there's a need for increased investment and effort in automating various processes involved in extracting information from satellite imagery. Automation can significantly enhance the efficiency and

accuracy of data processing, enabling faster response times and more comprehensive analysis during disasters.

Secondly, building capacity among Data Analysis Node (DAN) members is crucial for improving both the quality and quantity of contributions to Sentinel Asia. I advocate for longer and more consistent training programs, to ensure the effective dissemination of new techniques and technologies. By providing DAN members with continuous learning opportunities, Sentinel Asia can empower them to leverage cutting-edge tools and methodologies in their disaster response efforts.

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4. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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5. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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** April 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters
2. How to send an Emergency Observation Request
3. Using Sentinel Asia Operation System, OPTEMIS

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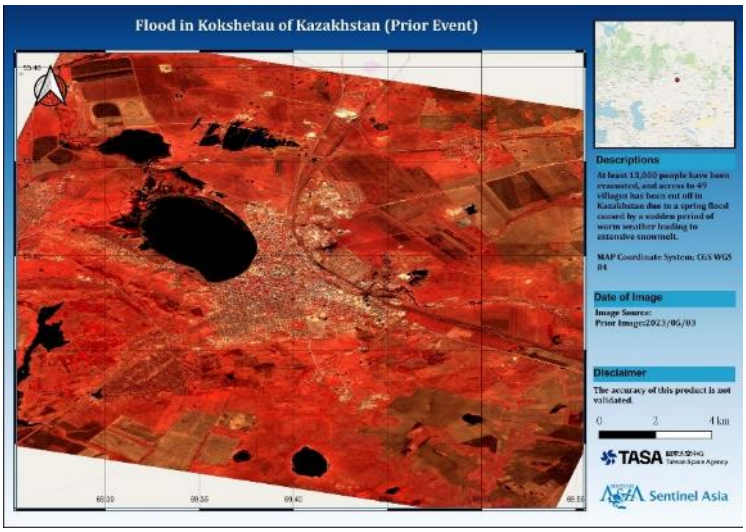
1. [News] Emergency Observation of Disasters (as of 29 April)

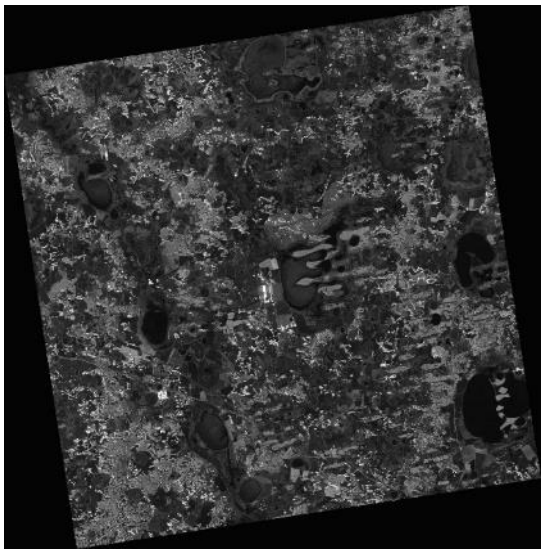
(1) Flood in Kazakhstan on 30 March, 2024 (GLIDE Number FL-2024-000039-KAZ)

On March 30, 2024, Kazakhstan experienced devastating flooding due to rising temperatures and torrential rain. According to ReliefWeb, more than 2,000 people were evacuated and more than 300 homes were flooded. This led to the mobilization of the army and military aviation units.
https://reliefweb.int/report/kazakhstan/kazakhstan-flood-03-2024-floods-several-regions-2024-03-29

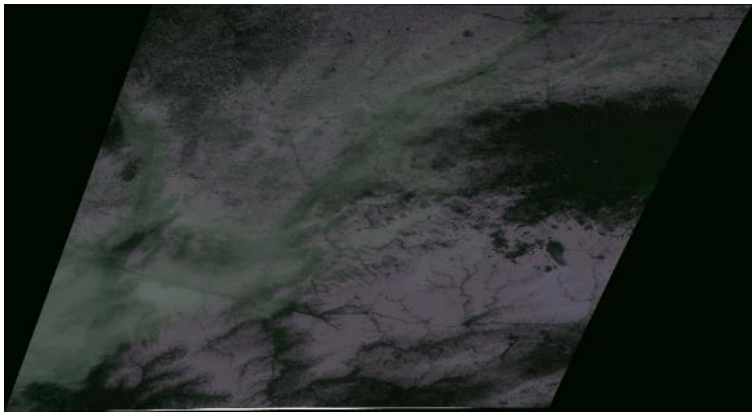
The National Center of Space Research and Technologies (NCSRT) of Kazakhstan made an Emergency Observation Request (EOR) to Sentinel Asia on 2 April. Among Data Provider Nodes (DPNs), JAXA, ISRO, TASA and MBRSC provided data. Among Data Analysis Nodes (DANs), JAXA and TASA provided their Value-Added Products (VAPs). Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240330KZ.html



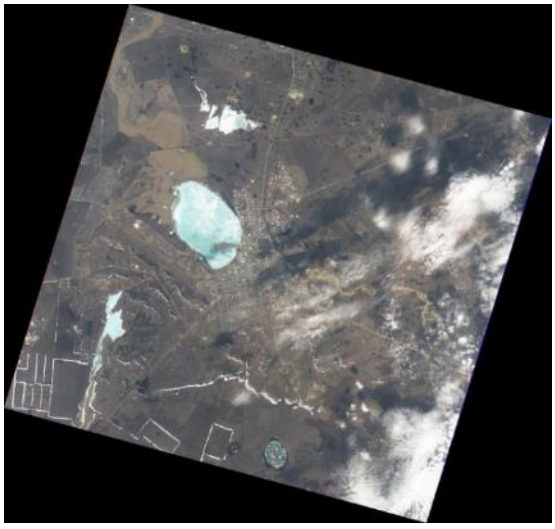
Value-Added Product by TASA



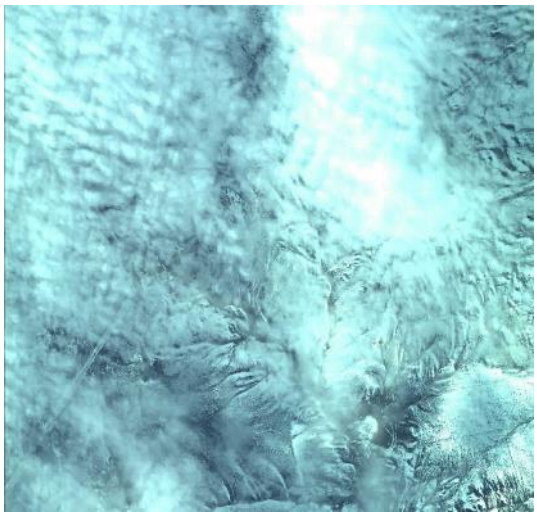
Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (Resourcesat-2) provided by ISRO



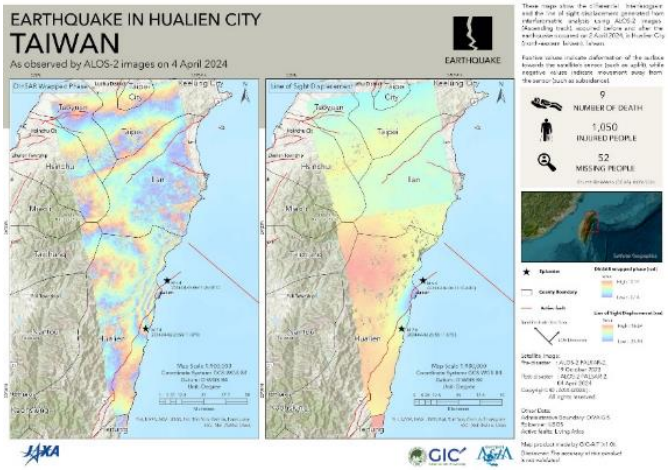
Post-disaster satellite image (FORMOSAT-5) provided by TASA



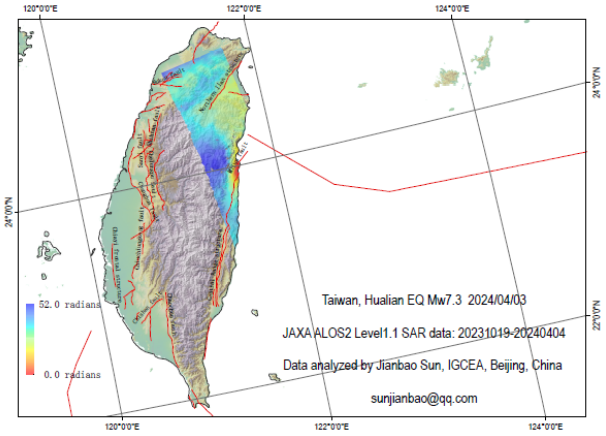
Post-disaster satellite image (KhalifaSat) provided by MBRSC

(2) Earthquake in Taiwan on 3 April, 2024 (GLIDE Number EQ-2024-000040-TWN)
A 7.4 magnitude quake struck Taiwan, the strongest in 25 years. CNN reported that the quake has caused landslides and collapsed structures. Thirteen people have died as a result, and more than 1,100 others were injured, with over 100 buildings damaged. The quake was followed by 29 aftershocks greater than a magnitude of 4.0 near the epicenter in east Taiwan until the next day, according to the United States Geological Survey (USGS). Tremors was felt across the island, including in Taipei.
https://edition.cnn.com/asia/live-news/taiwan-earthquake-hualien-tsunami-warning-hnk-intl/index.html

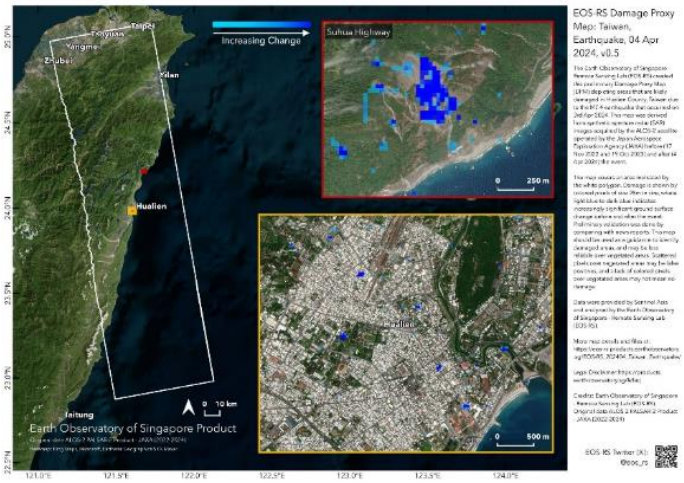
TASA made an EOR to Sentinel Asia on 3 April. Among DPNs, JAXA and ISRO provided data. Among DANs, AIT, Institute of Geology, China Earthquake Administration (IGCEA), EOS and Tokyo Institute of Technology (Tokyo Teck), and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240403TW.html



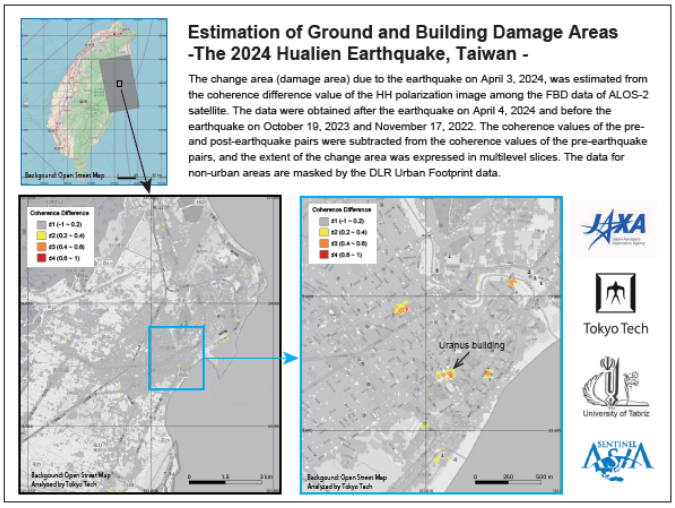
Value-Added Product by AIT



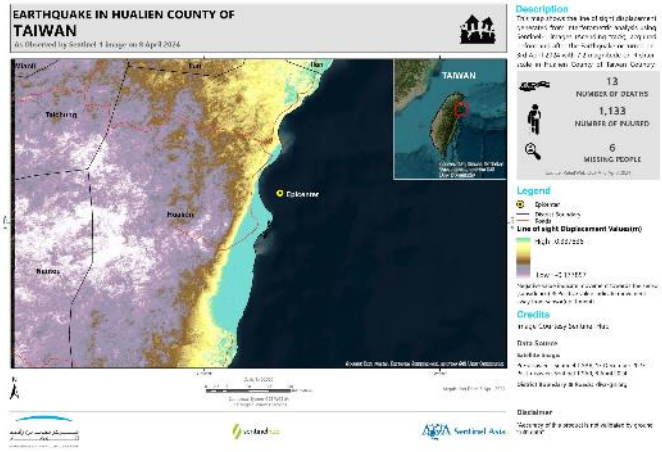
Value-Added Product by IGCEA



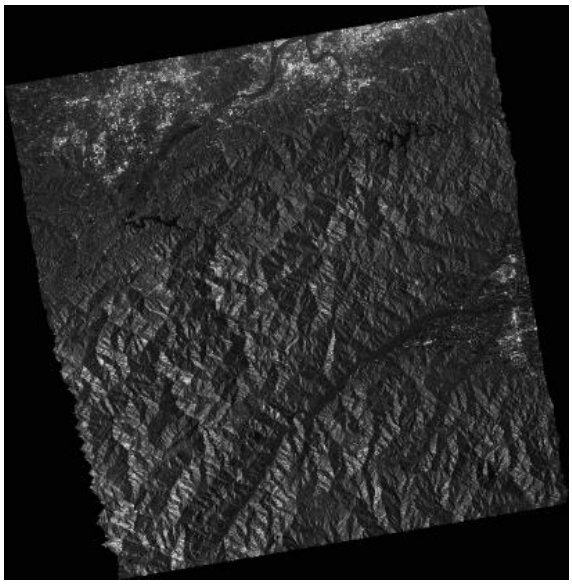
Value-Added Product by EOS



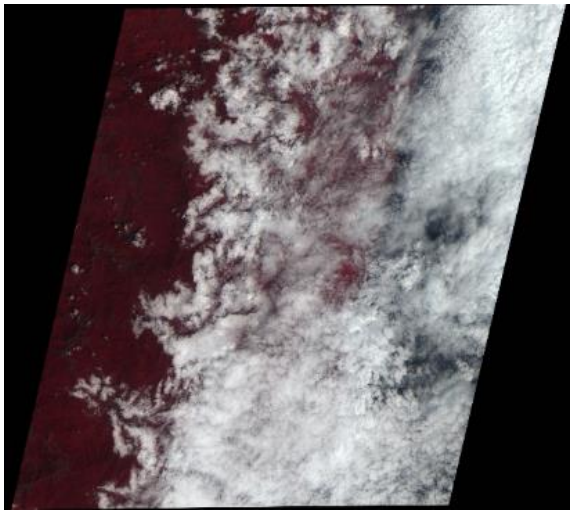
Value-Added Product by Tokyo Teck



Value-Added Product by MBRSC



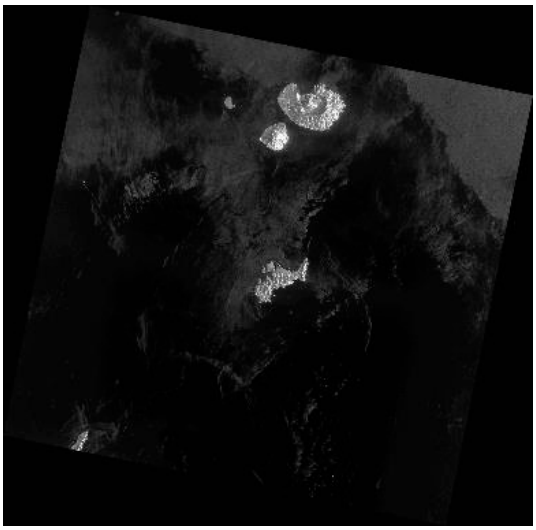
Post-disaster satellite image (ALOS-2) provided by JAXA



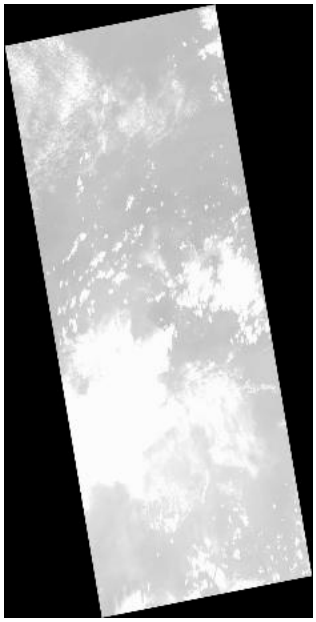
Post-disaster satellite image (Resourcesat-2) provided by ISRO

(3) Volcano eruption in Indonesia on 16 April, 2024 (GLIDE Number VO-2024-000046-IDN)
Mount Ruang volcano in Indonesia's North Sulawesi Province erupted on 16 April. Reuters reported the eruption caused extensive damage, including falling rocks and volcanic ash. Over 800 people were evacuated and the airport in Manado, the provincial capital, was closed.
https://www.reuters.com/world/asia-pacific/indonesian-volcano-eruption-forces-evacuations-airport-closure-2024-04-18/

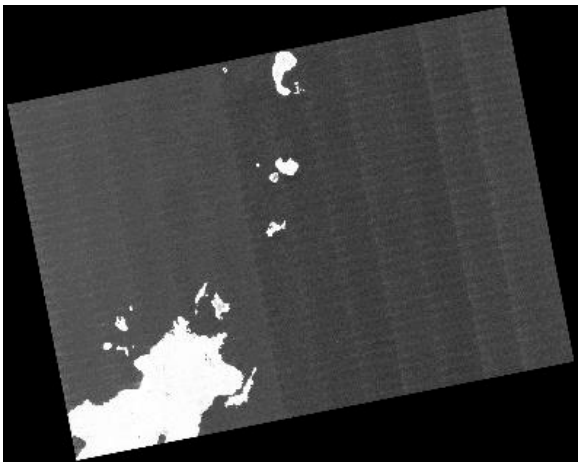
The National Research and Innovation Agency (BRIN) made an EOR to Sentinel Asia on 19 April. This EOR was escalated to the International Disasters Charter. BRIN assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA, CRISP, and ISRO provided data. Information on the latest response by Sentinel Asia is available at the following link:
https://sentinel-asia.org/EO/2024/article20240416ID.html



Post-disaster satellite image (ALOS-2) provided by JAXA



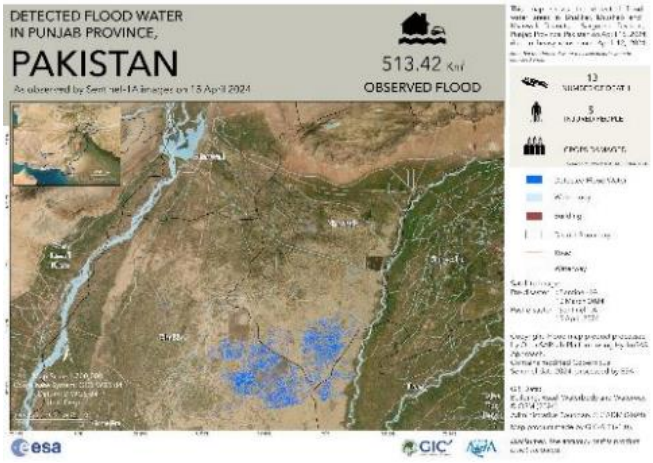
Post-disaster satellite image (TelEOS-1) provided by CRISP



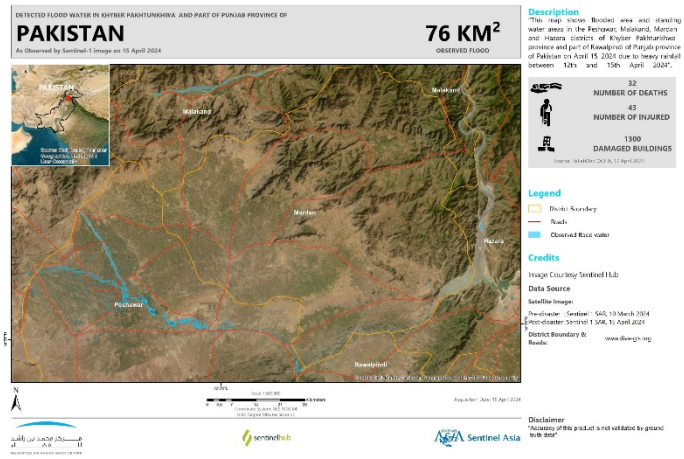
Post-disaster satellite image (EOS-04) provided by ISRO

(4) Flood in Pakistan on 14 April, 2024 (GLIDE Number FL-2024-000041-PAK)
Torrential rains and flash floods occurred in Pakistan from 12 to 16 April. ReliefWeb reported that the disaster caused damage to the wheat harvest, infrastructure, and homes, and led to a loss of at least 50 lives.
https://reliefweb.int/report/pakistan/pakistan-flash-floods-flash-update-no1-17-april-2024

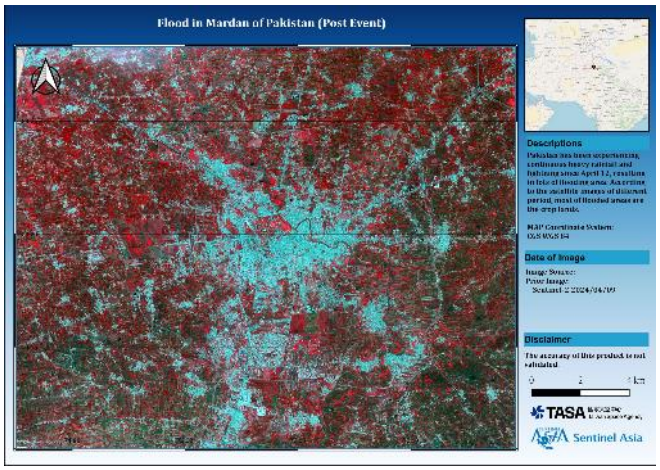
The Japan International Cooperation Agency (JICA) made an EOR to Sentinel Asia on 19 April. Among DPNs, JAXA, ISRO and TASA provided data. Among DANs, JAXA, AIT MBRSC and TASA provided its VAPs. Information on the latest response by Sentinel Asia is available at the following link:
https://sentinel-asia.org/EO/2024/article20240414PK.html



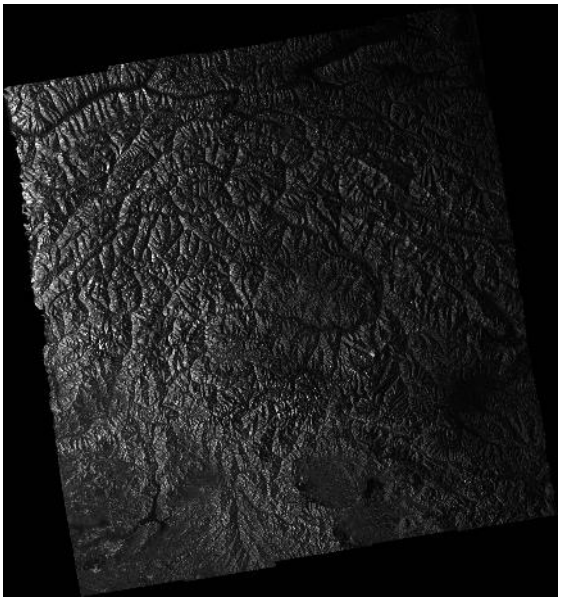
Value-Added Product by AIT



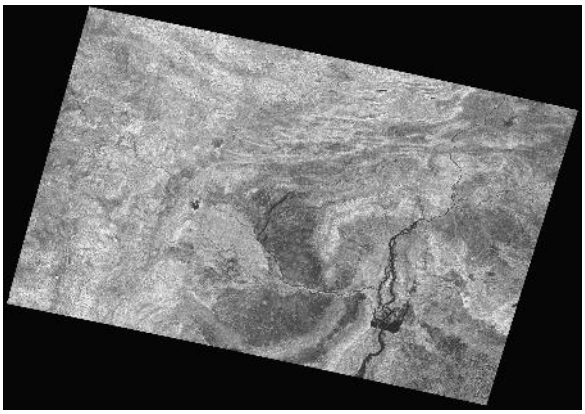
Value-Added Product by MBRSC



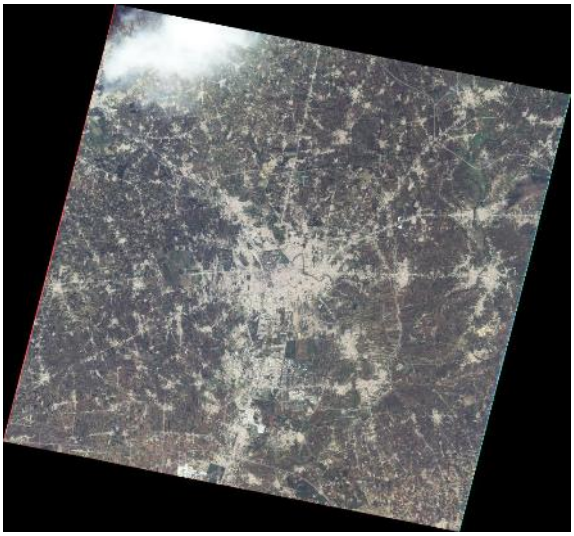
Value-Added Product by TASA



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04) provided by ISRO

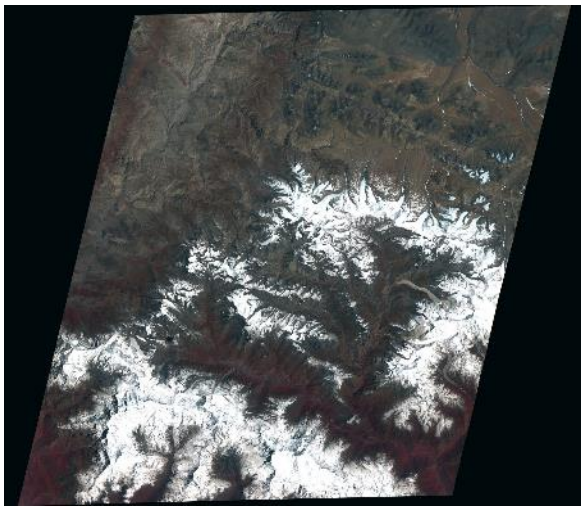


Post-disaster satellite image (FORMOSAT-5) provided by TASA

(5) GLOF at Birendra Lake in Nepal on 21 April, 2024 (GLIDE Number FL-2024-000052-NPL)

A glacial lake outburst flood (GLOF) occurred in the lower reaches of Birendra Lake on the Manaslu Glacier in Nepal on 21 April. According to Khabarhub, regional authorities have issued a warning to residents in the lower reaches.
https://english.khabarhub.com/2024/21/351756/

The Department of Hydrology and Meteorology (DHM), Ministry of Energy, Water Resources and Irrigation of Nepal made an EOR to Sentinel Asia on 22 April. Among DPNs, ISRO provided data. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240421NP.html

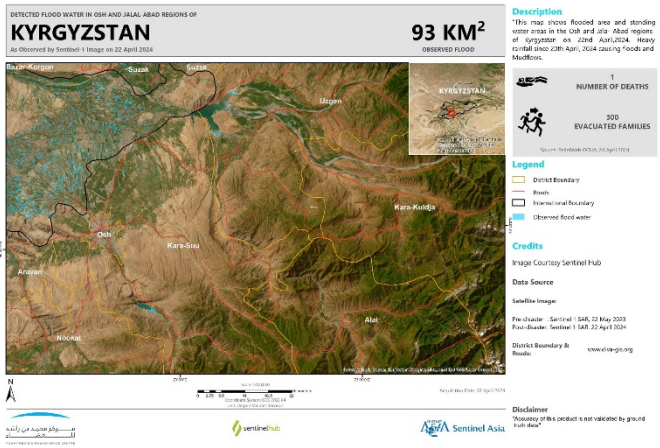


Post-disaster satellite image (Resourcesat-2) provided by ISRO

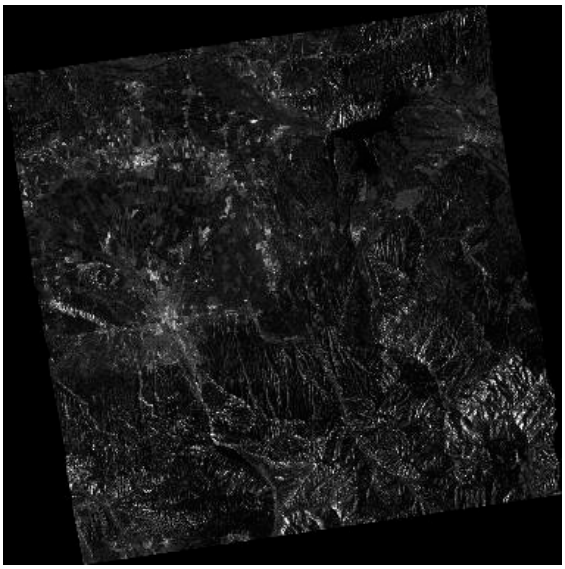
(6) Rain, Mudflow, and Mudslide in Kyrgyz on 20 April, 2024 (GLIDE Number FL-2024-000053-KGZ)

Heavy rains have affected a wide area in Kyrgyz since 20 April, with mudflows damaging houses in the Jalal-Abad region., according to news agency 24.kg.
https://24.kg/english/292251_Mudflows_flood_almost_50_courtyards_in_Suzak_district/

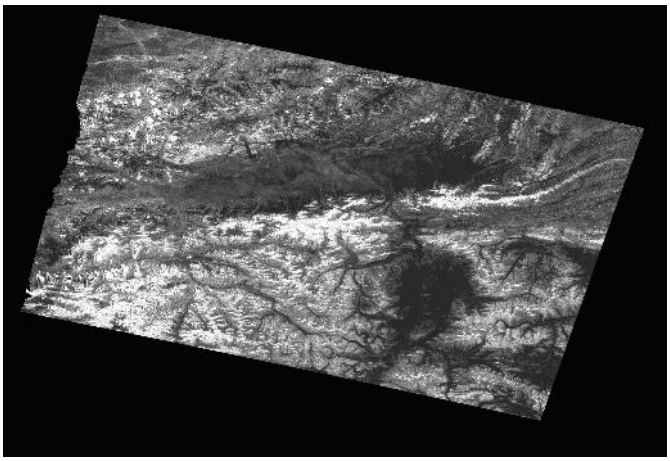
The Central Asian Institute of Applied Geosciences (CAIAG) made an EOR to Sentinel Asia on 22 April. Among DPNs, JAXA, ISRO and TASA provided data. Among DANs, JAXA and MBRSC provided its VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240420KG.html



Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04) provided by ISRO

Post-disaster satellite image (FORMOSAT-5) provided by TASA

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2. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html.

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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3. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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Sentinel Asia Project Office
Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)
Ochanomizu Sola City, 4-6 Kandasurugadai, Chiyoda-ku, Tokyo 101-8008 Japan
E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

** May 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 30 May)
2. [Interview] Mr. Ulan Abdybachaev, Central Asian Institute for Applied Geosciences (CAIAG)
3. How to send an Emergency Observation Request
4. Using Sentinel Asia Operation System, OPTEMIS

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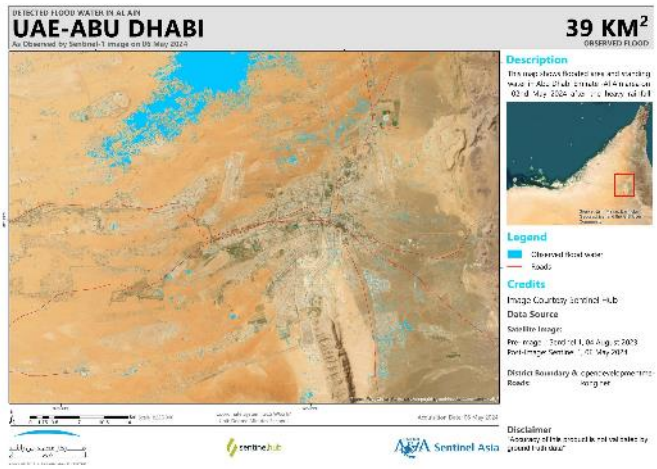
1. [News] Emergency Observation of Disasters (as of 30 May)

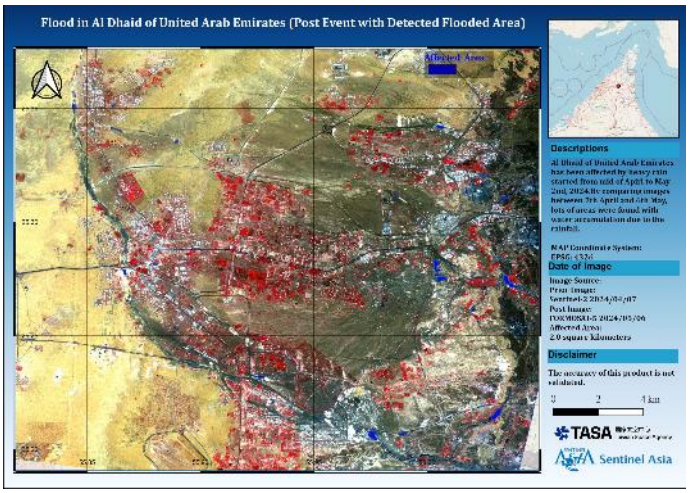
(1) Storm flooding in United Arab Emirates (UAE) on 2 May, 2024 (GLIDE Number FL-2024-000062-ARE)

On May 2, there were heavy rains again in the United Arab Emirates following record downpours two weeks ago. According to CNN, the rainfall was not as heavy as the event two weeks ago, but Dubai experienced 20 millimeters in 12 hours, more than twice what it usually receives over April and May combined. Abu Dhabi saw 34 mm in 24 hours, more than four times what it would usually see over April and May.
https://edition.cnn.com/2024/05/02/middleeast/uae-rain-storm-dubai-flights-disruption-climate-intl/index.html

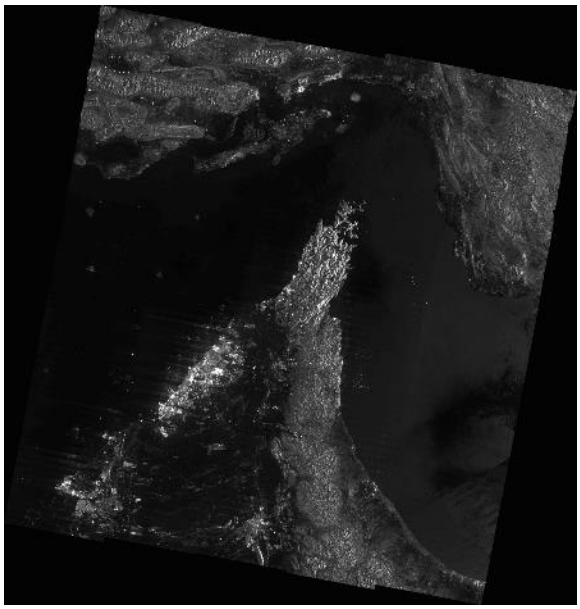
The Mohammed Bin Rashid Space Centre (MBRSC) made an Emergency Observation Request (EOR) to Sentinel Asia on 1 May. Among Data Provider Nodes (DPNs), JAXA, ISRO and TASA provided data. Among Data Analysis Nodes (DANs), JAXA, MBRSC and TASA provided their Value-Added Products (VAPs). Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240502AE.html



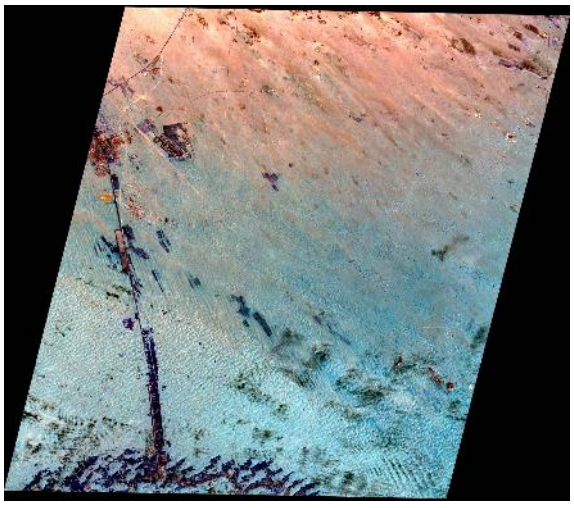
Value-Added Product by MBRSC



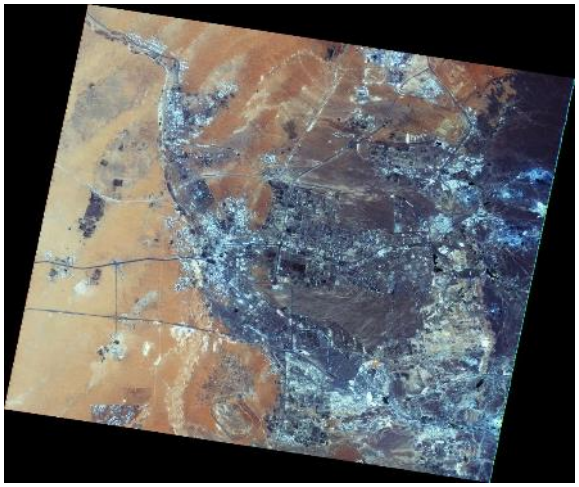
Value-Added Product by TASA



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (Resourcesat-2) provided by ISRO

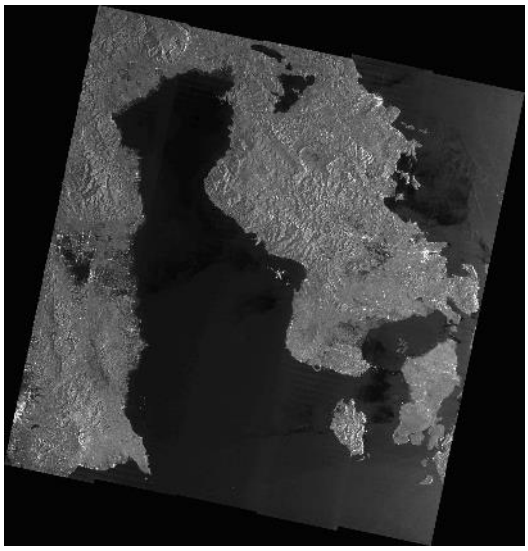


Post-disaster satellite image (FORMOSAT-5) provided by TASA

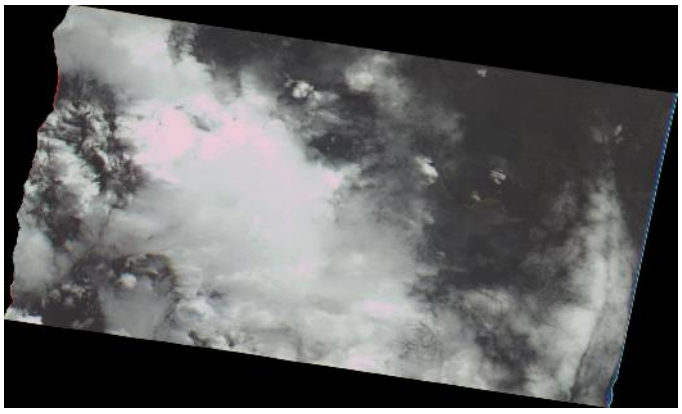
(2) Flood and Landslide in Indonesia on 2 May, 2024 (GLIDE Number LS-2024-000067-IDN)
A flood and a landslide hit Indonesia's Sulawesi island. CBS reported that torrential rain pounding the area since 2 May triggered a landslide in Luwu district in South Sulawesi province, a local rescue chief was quoted as saying. Floods up to 3 meters (10 feet) have affected 13 sub-districts as water and mud covered the area. More than 1,000 houses were affected, with 42 of them swept off their foundations, killing at least 14 people.
https://www.cbsnews.com/news/indonesia-sulawesi-island-flood-landslide/

The National Research and Innovation Agency (BRIN) of Indonesia made an EOR to Sentinel Asia on 12 May. This EOR was escalated to the International Disasters Charter. BRIN assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA and TASA provided data. Among DANs, JAXA and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240502ID.html

Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



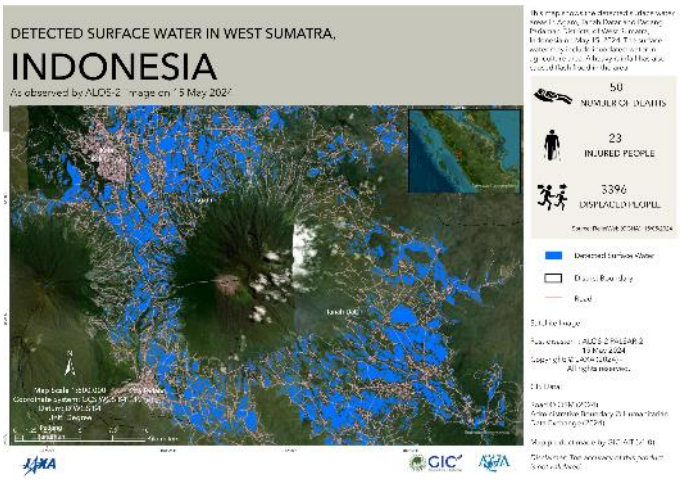
Post-disaster satellite image (FORMOSAT-5) provided by TASA

(3) Flash Flood in West Sumatra, Indonesia on 11 May, 2024 (GLIDE Number LS-2024-000067-IDN

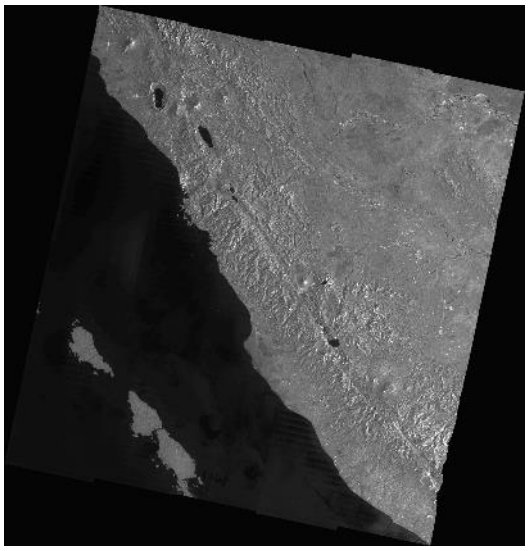
Flash floods and cold lava flow hit Indonesia's Sumatra island. According to AP News, heavy rains and torrents of cold lava and mud flowing down a volcano's slopes on Indonesia's Sumatra island triggered flash floods that killed at least 37 people, with more than a dozen others missing.
https://apnews.com/article/indonesia-mount-marapi-flash-flood-cold-lava-flow-56a874306a7f5e3e3d6a521c8c999a92

BRIN made an EOR to Sentinel Asia on 13 May. This EOR was escalated to the International Disasters Charter. BRIN assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA and ISRO provided data. Among DANs, MBRSC and AIT provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240511ID.html

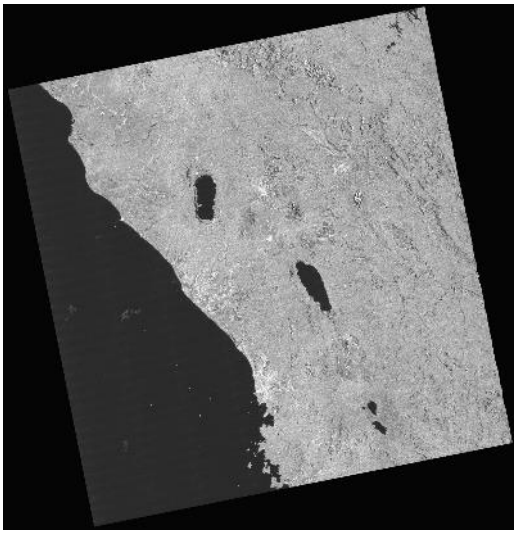
Value-Added Product by MBRSC



Value-Added Product by AIT



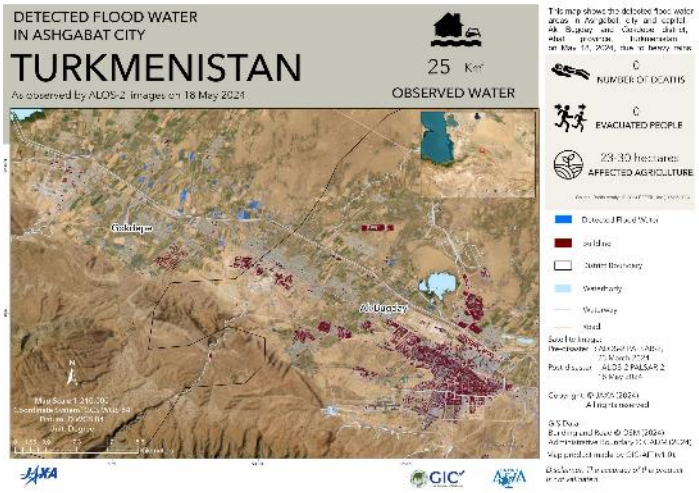
Post-disaster satellite image (ALOS-2) provided by JAXA



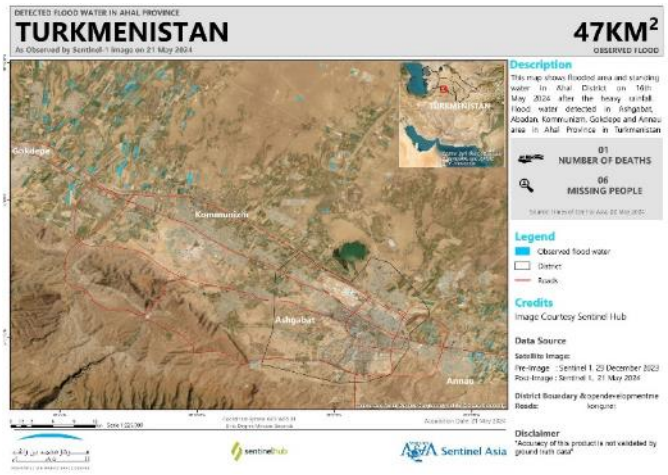
Post-disaster satellite image (EOS-04) provided by ISRO

(4) Flood in Turkmenistan on 16 May, 2024 (GLIDE Number FL-2024-000072-TKM)
Turkmen.news reported heavy rains persisted in Ashgabat for several days. It caused many roads to flood in the Choganly residential area.
https://turkmen.news/v-ashabade-idut-silnye-dozhdi/

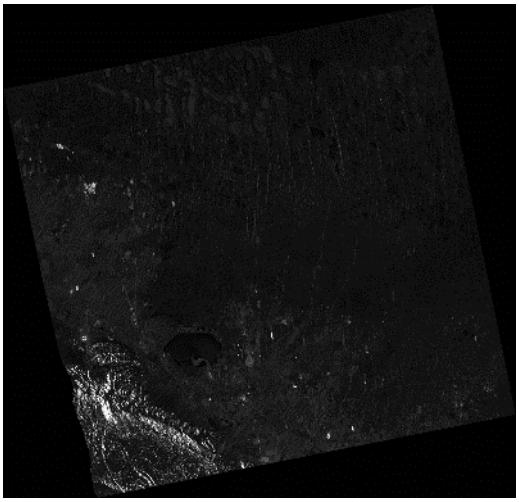
The Central Asian Institute of Applied Geosciences (CAIAG) made an EOR to Sentinel Asia on 18 May. Among DPNs, JAXA,TASA and ISRO provided data. Among DANs, JAXA, AIT and MBRSC provided their Value-Added Products (VAPs). Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240516TM.html



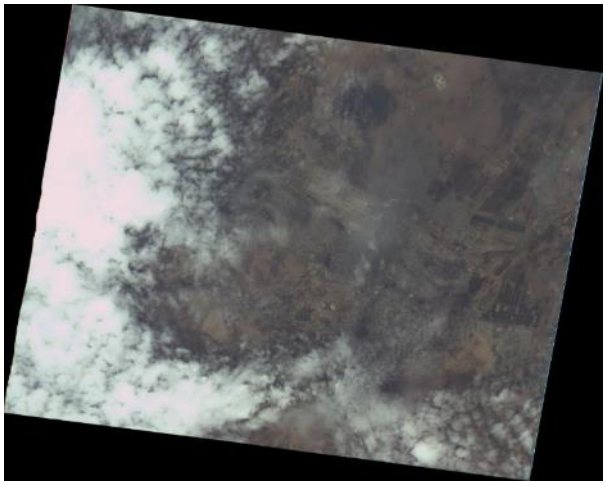
Value-Added Product by AIT



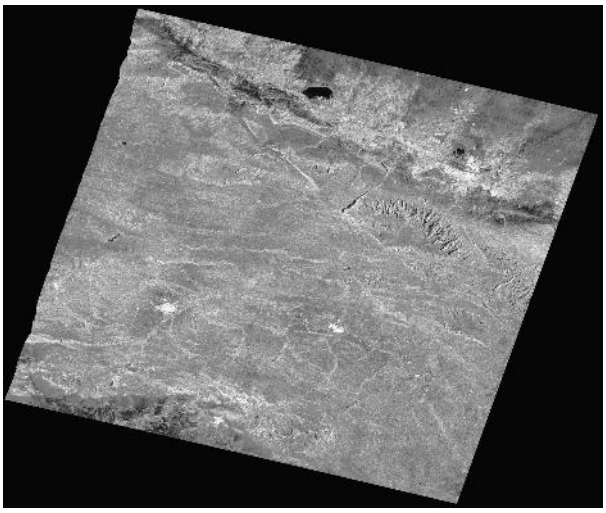
Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA



Post-disaster satellite image (EOS-04) provided by ISRO

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2. [Interview] Mr. Ulan Abdybachaev, Central Asian Institute for Applied Geosciences (CAIAG)

Since its participation in 2009, the Central Asian Institute for Applied Geosciences (CAIAG) has been an active member of Sentinel Asia. It was founded by the Government of the Kyrgyz Republic and the German Research Center for Geosciences but it also works to respond the disasters in Central Asian countries, not limited to Kyrgyz. The Sentinel Asia Secretariat interviewed Mr. Ulan Abdybachaev, Depute of Head of Department of Geodynamics and Georisks, CAIAG, to introduce the latter's activities relating to Sentinel Asia.

Mr. Ulan Abdybachaev,
Central Asian Institute for Applied Geosciences (CAIAG)

Sentinel Asia Secretariat

CAIAG joined as a Joint Project Team (JPT) member of Sentinel Asia in the very early days and has contributed as a Data Analysis Node (DAN). The Secretariat is very grateful for your contribution. First of all, could you introduce your organization to our readers?

Mr. Ulan Abdybachaev

CAIAG was established in 2002 by the Government of the Kyrgyz Republic and the German Research Center for Geosciences, Potsdam, Germany. At CAIAG, there are two co-directors, one representing the Kyrgyz Republic and the other representing the German side. As of today, the total number of employees amounts to 62, including administrative and technical staff. Our research spans geodynamics and geohazards; climate, water, and geo-ecology; and the usage and protection of natural resources. We emphasize technical infrastructure development, information management, and the education and professional qualification of our researchers. Although the focus on remote sensing at CAIAG has somewhat diminished in recent years, our Department of Geodynamics and Georisks remains a key player in conducting remote sensing analyses.

Sentinel Asia Secretariat

CAIAG is very active in disaster response in Central Asian countries. Could you explain the framework of your cooperation with these countries? Also, could you explain how you support these countries in the area for the Sentinel Asia Emergency Observation Requests (EORs)?

Mr. Ulan Abdybachaev

In the context of our scientific research collaboration, our contact information is grounded in memorandums of cooperation signed previously. We maintain our relationship through e-mail requests.

However, considering the culture, mentality, and economic and social aspects of Central Asian countries, and based on our experience with Emergency Observation Requests (EORs), I have identified a pressing issue. Specifically, there is a lack of consistent feedback from disaster management organizations in Central Asian countries. This problem often arises when the designated contact person leaves their position within the organization, and the new appointee is not informed or engaged with ongoing projects.

A potential solution is to update existing memorandums and conduct a ‘reset’ or updating our collaboration with the objectives of Sentinel Asia.

Sentinel Asia Secretariat

We have had 11 EORs from CAIAG so far. Could you pick out some cases and show how the data/products from Sentinel Asia were used in these countries?

Mr. Ulan Abdybachaev

Most of the 11 cases were water-related, such as flooding in Kazakhstan in 2010, or the trigger was rainfall resulting in landslides in Tajikistan, and also landslides and mudflows in Kyrgyzstan and Uzbekistan in 2021. However, there were also earthquakes in Afghanistan in 2022 and a fire in Kazakhstan in 2023.

Satellite images such as ALOS PALSAR as well as other optical images were often used.

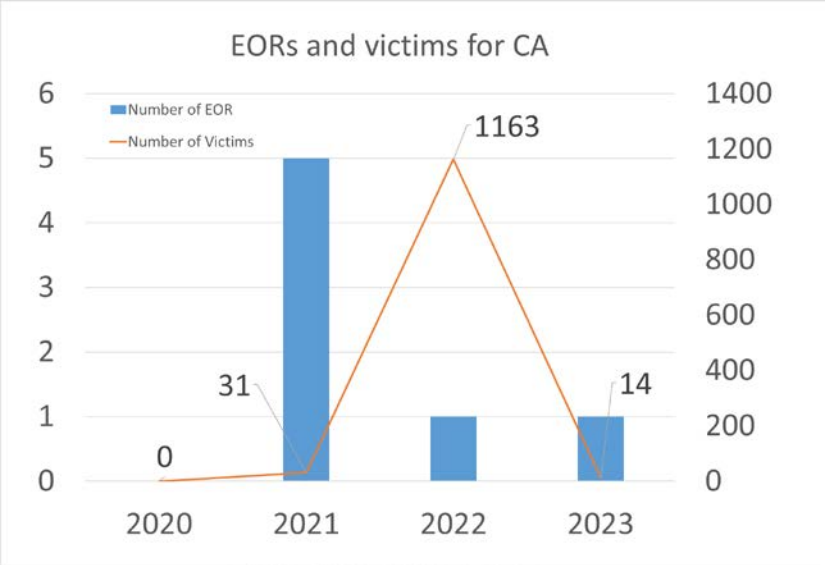
Sentinel Asia Secretariat

About the past EORs from CAIAG, could you tell us about memorable cases and where the data from Sentinel Asia was used effectively, and why?

Mr. Ulan Abdybachaev

Regarding memorable cases, I recall the forest fire in Kazakhstan in 2023 and the mudflow event in Kyrgyzstan in 2021. For these events, satellite data from members of the Sentinel Asia organization were effectively used. These data were used by the Ministry of Emergency Situations to analyze and assess the zones and scale of damage of these events.

I think what has been successful has been the solidarity within the Sentinel Asia community, which is truly a key element in achieving resilience and effective response to catastrophic events. And taking this opportunity, I would like to express my deep gratitude to everyone who is involved in this program and who supports and contributes to its development.



Sentinel Asia Secretariat

What are the merits of Sentinel Asia, for example, image processing by DAN in a timely manner?

Mr. Ulan Abdybachaev

I believe that timely image processing is a foundational aspect and one of the principal advantages of Sentinel Asia. This efficiency is crucial for an objective assessment of the magnitude of natural events, enabling the extraction of critical data to prioritize decisions effectively. Additionally, Sentinel Asia is invaluable for its capacity to provide diverse types of data, including optical and radar imagery. These resources offer a comprehensive view of the situation, enhancing our understanding of the unfolding events.

Sentinel Asia Secretariat

Are there any challenges relating to disaster management and other socioeconomic conditions in Central Asia that could be solved by Sentinel Asia or other satellite technologies? Or if you have already coordinated with satellite technologies on your activities, could you introduce examples of them?

Mr. Ulan Abdybachaev

As mentioned earlier, one of our main challenges is the limited number of expert human resources, which significantly impacts our activities. In addition to human resources, socioeconomic conditions also pose challenges to utilizing satellite information, particularly in Kyrgyzstan, Kazakhstan, and Uzbekistan. The field of remote sensing is not widely popular in these regions, and due to its low popularity coupled with limited budgets and incomes, young staff frequently transition to new fields. This challenge necessitates efforts to change perceptions and raise the profile of the remote sensing sector. Furthermore, the field of remote sensing is closely linked with national security, often leading to conversations being curtailed due to security concerns. Despite these challenges, CAIAG is actively working to change this situation. For instance, recent discussions in Kyrgyzstan about developing an early warning system for earthquakes have provided CAIAG with an opportunity to showcase the potential of the space industry and remote sensing in enhancing evaluations for early warning systems.

One of the challenges faced in Central Asia is flooding from glacial lake outburst floods. CAIAG is involved in implementing the project “Reducing the vulnerability of the population in the Central Asian region to glacial lake outburst floods (GLOF) in the context of climate change,” with financial support from the Adaptation Fund and UNESCO, aimed at addressing such challenges. The project covers Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan. One of the key outcomes of this project is the use of satellite imagery to assess the level of threat from glacial lake outburst floods, which will make a significant contribution to effectively addressing these challenges in the target countries.

Sentinel Asia Secretariat

Do you have any expectations for Sentinel Asia, and conversely, what CAIAG can contribute to Sentinel Asia?

Mr. Ulan Abdybachaev

Our expectations from the Sentinel Asia program boil down to the continuation of cooperation and ensuring sustainable development in the Central Asia region. We place particular emphasis on technical support and consultations, as we consider them crucial in the context of improving disaster response. As part of the development and popularization of remote sensing methods and data, CAIAG launched a master’s program in Applied Geology (Georisks) in 2021. The availability of data on 11 events in the Central Asia region, which were previously mentioned, has become the basis for creating case studies. These and other cases will be used to train young professionals and demonstrate opportunities for target users. With the support of Sentinel Asia, training CAIAG staff in new skills for post-processing satellite images and remote sensing

products will also make a significant contribution to enhancing the potential for quality knowledge transfer and tools for the younger generation.

Supplementary material by CAIAG

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3. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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4. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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** June 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 26 June)
2. [Interview] Dr. Morimasa Tsuda, JICA Expert, Bangladesh Water Development Board (BWDB)
3. How to send an Emergency Observation Request
4. Using Sentinel Asia Operation System, OPTEMIS

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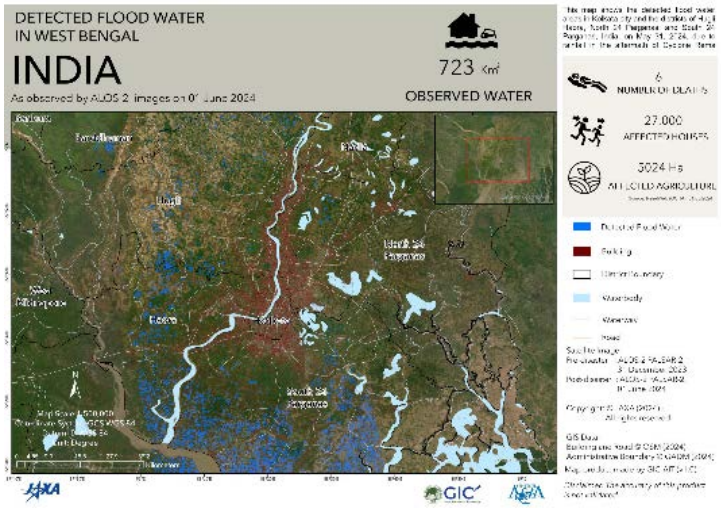
1. [News] Emergency Observation of Disasters (as of 26 June)

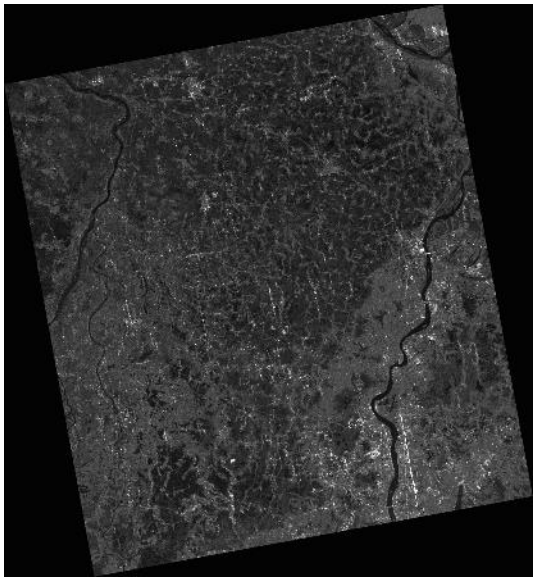
(1) Heavy Rains by Cyclone in India on 27 May, 2024 (GLIDE Number TC-2024-000083-IND)
Cyclone Remal hit India on 26 May. ReliefWeb reported that the cyclone claimed six lives and caused extensive damage to infrastructure and property in coastal areas. More than 1,700 utility poles were damaged, and many trees were uprooted. Approximately 2,500 houses were destroyed and 27,000 partially damaged. More than 147,500 people live in these houses, with about 33% of the children in the most vulnerable and unreached communities. According to government reports, in the South 24 Pargana district alone, 5024 hectares of farmland and 85 hectares of sea used by fishermen were adversely affected.
https://reliefweb.int/report/india/unicef-india-west-bengal-situation-report-no-3-cyclone-remal-31-may-2024

The Indian Space Research Organisation (ISRO) made an Emergency Observation Request (EOR) to Sentinel Asia on 29 May. Among Data Provider Nodes (DPNs), JAXA,TASA and MBRSC provided data. Among Data Analysis Nodes (DANs), JAXA, AIT and MBRSC provided their Value-Added Products (VAPs). Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240527IN.html

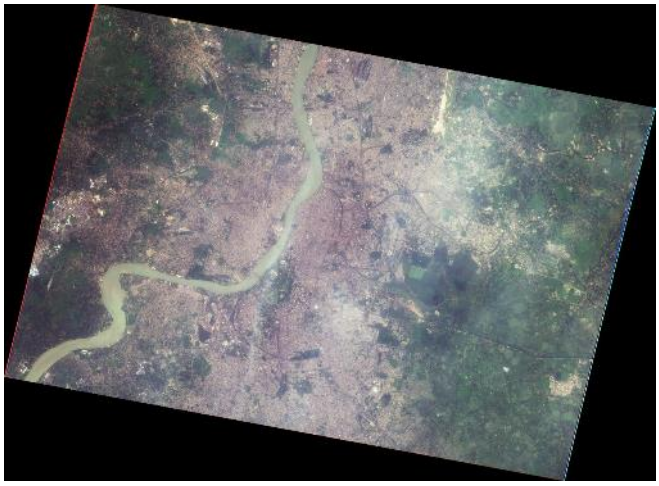


Value-Added Product by AIT

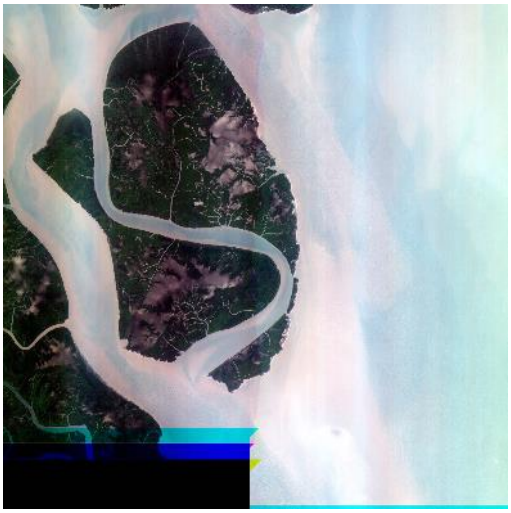
Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



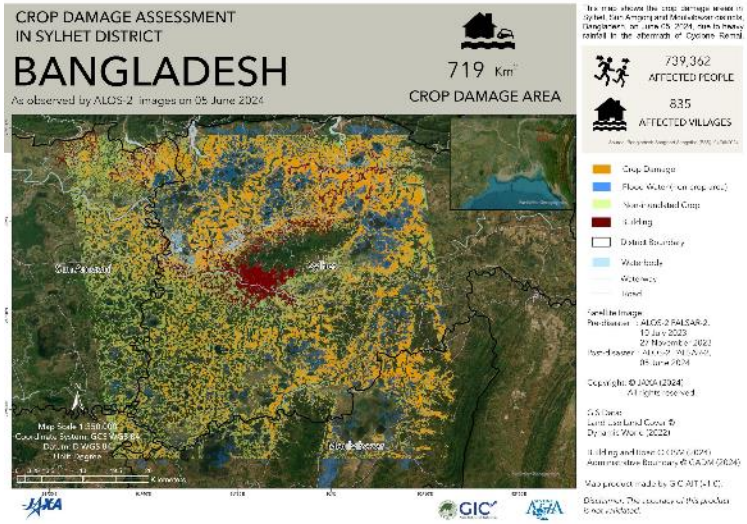
Post-disaster satellite image (FORMOSAT-5) provided by TASA



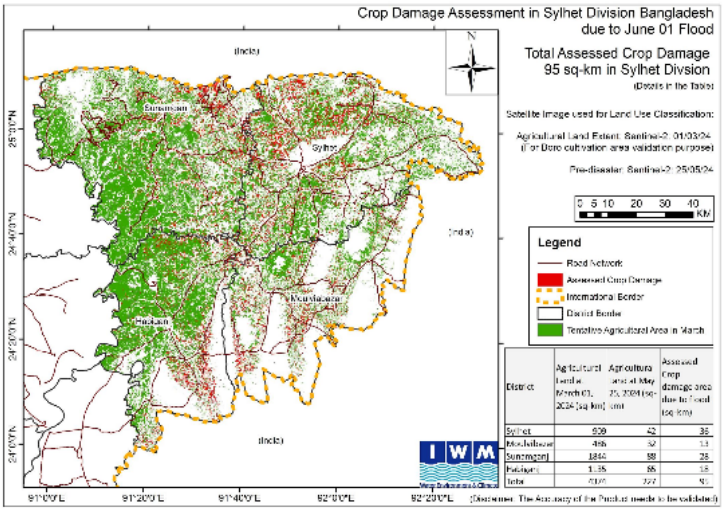
Post-disaster satellite image (KhalifaSat) provided by MBRSC

(2) Flood in Bangladesh on 1 June, 2024 (GLIDE Number FL-2024-000088-BGD)
According to Dhaka Tribune, persistent rain has led to the Surma River overflowing, flooding different parts of Sylhet and causing water to enter homes. In 24 hours from 2 until 3 June, the region recorded 226.6 millimeters of rain, followed by an additional 28 mm in the next three hours. The Bangladesh Meteorological Department classifies downpours exceeding 88 mm as very heavy rainfall.
https://www.dhakatribune.com/bangladesh/nation/348240/heavy-rain-submerges-sylhet

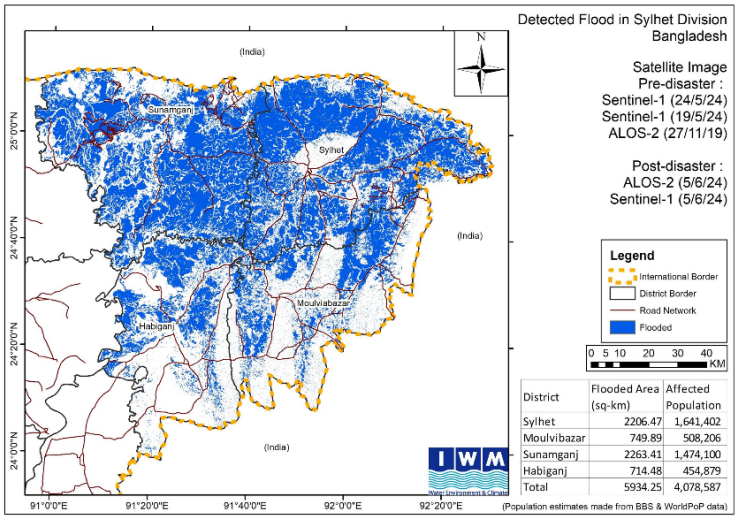
The Bangladesh Water Development Board (BWDB) made an EOR to Sentinel Asia on 3 June. Among DPNs, JAXA and ISRO provided data. Among DANs, JAXA, AIT and the Institute of Water Modelling of Bangladesh (IWM) provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240601BD.html



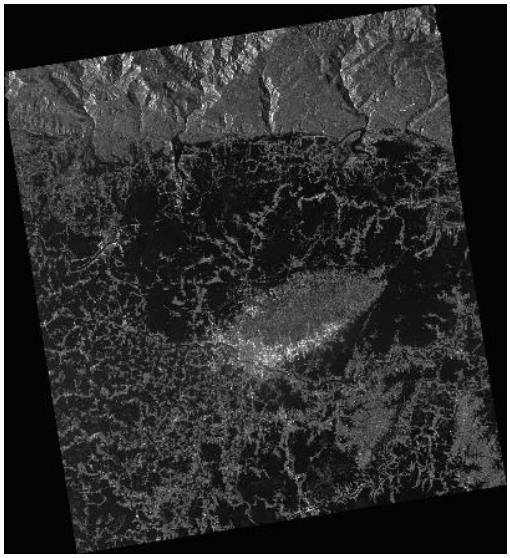
Value-Added Product by AIT



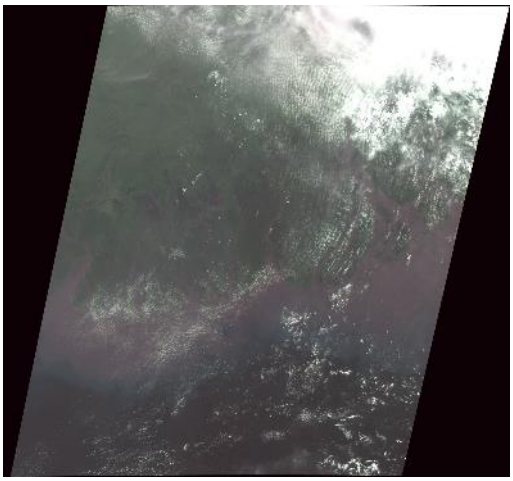
Value-Added Product by IWM



Value-Added Product by IWM



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (Resourcesat-2) provided by ISRO

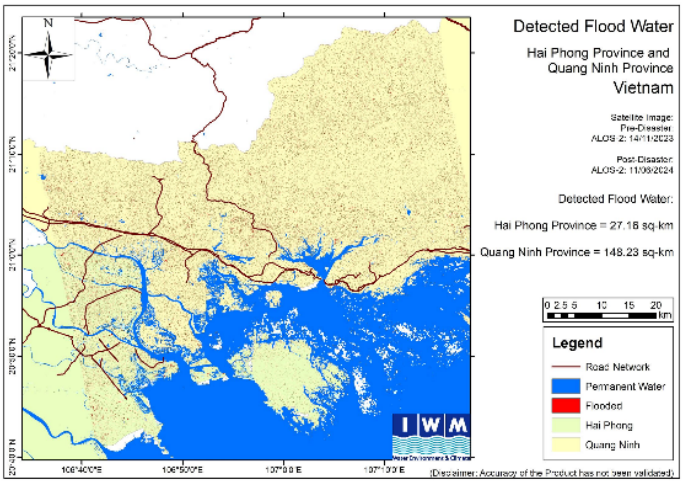
(3) Flood and Landslide in Vietnam on 9 June, 2024 (GLIDE Number FL-2024-000089-VNM)

According to ReliefWeb, on 9-10 June, heavy rain affected northern Vietnam, causing floods and landslides that resulted in casualties and damage. As of 11 June, the ASEAN Disaster Information Network (ADINet) and national authorities reported three fatalities in Ha Giang Province. A total of 9,628 people have been affected across the provinces of Dien Bien, Lao Cai, Ha Giang, Yen Bai, Cao Bang, Lang Son, Thai Nguyen, Bac Giang, Quang Ninh and Hai Phong. In addition, 2,407 houses and seven bridges have been damaged, and at least 41 landslides have been reported in Hoang Su Phi district, Ha Giang Province, blocking some road sections.

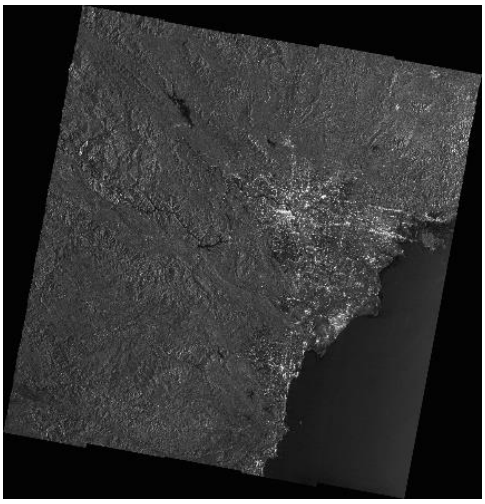
https://reliefweb.int/report/viet-nam/vietnam-severe-weather-and-landslides-adinet-national-authorites-nchmf-echo-daily-flash-11-june-2024

The Ministry of Natural Resources and Environment (MONRE) made an EOR to Sentinel Asia on 10 June. Among DPNs, JAXA, ISRO and TASA provided data. Among DANs, JAXA and IWM provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.

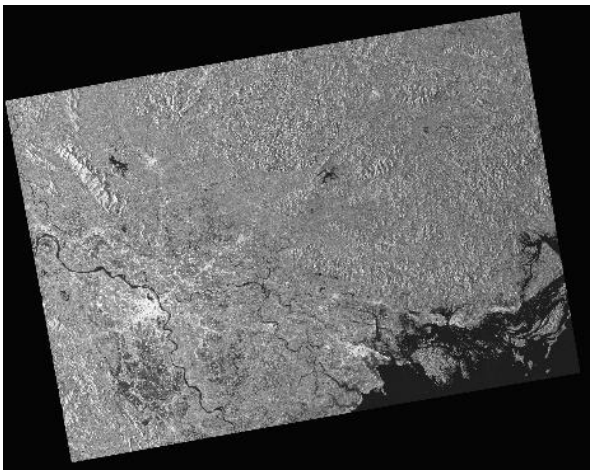
https://sentinel-asia.org/EO/2024/article20240609VN.html



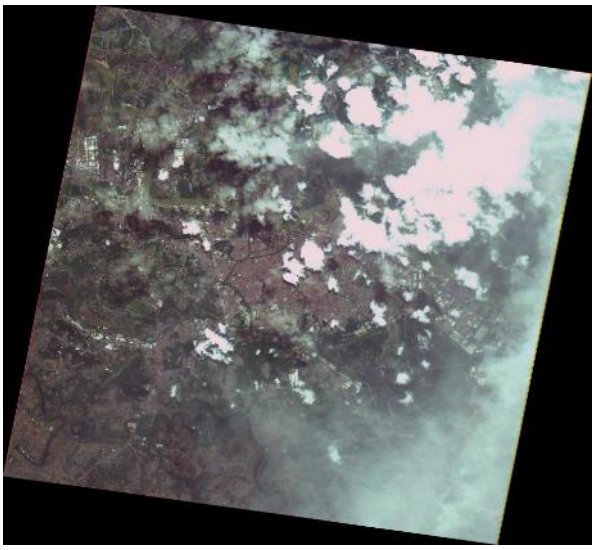
Value-Added Product by IWM



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04) provided by ISRO



Post-disaster satellite image (FORMOSAT-5) provided by TASA

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2. [Interview] Dr. Morimasa Tsuda, JICA Expert, Bangladesh Water Development Board (BWDB)

Dr. Morimasa Tsuda, a Japan International Cooperation Agency (JICA) long-term expert, dispatched from the Japan Water Agency to the Bangladesh Water Development Board (BWDB), is an advisor regarding the advancement of integrated water resource management in Bangladesh, including the use of satellite technology for disaster risk management. His contributions have been pivotal in bringing BWDB and the Institute of Water Modelling (IWM) to join the Sentinel Asia initiative in 2023 and 2024, respectively, and establishing Standard Operating Procedures (SOP) for emergency observation requests in Bangladesh.

Dr. Morimasa Tsuda
JICA Expert, Bangladesh Water Development Board (BWDB)

Sentinel Asia Secretariat
Could you tell us about your background?

Dr. Morimasa Tsuda
I began my career with the Japan Water Agency in 1999, focusing primarily on development and management of water resources. I was dispatched as a water technology and policy advisor to BWDB in June 2022. In this role, I assist in river planning and management, as well as in coordinating and building relationships with related agencies. I believe the Sentinel Asia framework can be highly effective in fostering these relationships.

Sentinel Asia Secretariat
How did you begin utilizing satellite data for disaster risk management? Could you provide specific examples of how you have used satellite data? Additionally, can you share any experiences with satellite applications and disaster risk management outside of Bangladesh?

Dr. Morimasa Tsuda

During my tenure at the International Centre for Water Hazard and Risk Management (ICHARM) from 2014 to 2017, I participated in a UNESCO project aimed at creating a flood forecasting and warning system for the Indus River in Pakistan. The primary challenge was managing the rain data to input into the model. JAXA was also involved in this project, where they corrected the GSMaP (Global Satellite Mapping of Precipitation) data with ground rain gauge information. As GSMaP relies on calculations between observations, the rain position sometimes shifted. However, this correction program adjusted the rain position to align with ground observations. This experience taught me that combining satellite and ground observations significantly improves data usability.
When I arrived in Bangladesh, where the Ganges, Brahmaputra, and Meghna rivers converge, I realized the difficulty in collecting accurate precipitation information, as only 7% of the river area flows through Bangladesh, with upstream rainfall impacting the country. I recognized the potential effectiveness of GSMaP and consulted JAXA. Around this time, BWDB was joining Sentinel Asia, and I have been collaborating with BWDB activities since then.
Moreover, I believe combining satellite images and ground observation could be instrumental in monitoring riverbank erosion. As water and sediment flow into Bangladesh from upstream, the fragile riverbank leads to the loss of houses and fields each year. We have been using satellite images to monitor erosion, but by integrating water levels to generate topography data, we can better monitor erosion around river structures. I have been advocating for Bangladesh to utilize this approach.

Sentinel Asia Secretariat

Could you tell us about any appealing points or challenges of Sentinel Asia? For instance, you requested an emergency observation in 2023—how was that experience?

Dr. Morimasa Tsuda

BWDB requested emergency observations during Cyclone Mocha in May 2023 https://sentinel-asia.org/EO/2023/article20230514BD.html .
The procedure was straightforward, and we received a substantial amount of information. In times of disaster, the simplicity of the procedure is a significant advantage.
During Cyclone Midhili in November 2023
https://sentinel-asia.org/EO/2023/article20231117BD.html ,
I appreciated the proactive concern from ADRC and JAXA regarding the impending cyclone. Initially, we were uncertain about requesting an emergency observation, but their support made it easier to proceed. It was reassuring to have them reach out to us in such a manner.

Sentinel Asia Secretariat

What are the challenges for Sentinel Asia?

Dr. Morimasa Tsuda

As we can only submit one Emergency Observation Request (EOR) per disaster, it is essential to coordinate with other domestic agencies due to the extensive coverage required. Additionally, as

the information is sent only to the organization that submitted the EOR, there is a need for a mechanism, such as WebGIS, to share this information with other domestic organizations.

Sentinel Asia Secretariat

You coordinated the roles among the relevant organizations in Bangladesh during the EOR and established the Standard Operating Procedures (SOP). Could you share what you consider to be the significance of the SOP, what you found useful, and the challenges you encountered during the coordination?

Dr. Morimasa Tsuda

Given that the target area changes from time to time, it was clear that a system to coordinate the target area in advance was necessary. To address this, we held a coordination meeting with relevant Bangladeshi agencies, and agreed on and established the SOP. With ADRC providing the template, the discussion process was straightforward. As a JICA expert, I supported the formulation of the SOP, and I found it beneficial that this process also strengthened relationships with related organizations.

Sentinel Asia Secretariat

You gave a lecture on flood monitoring using GSMaP-IF at Joit Project Team Meeting (JPTM) held in Jakarta, Indonesia in 2023 https://sentinel-asia.org/meetings/SA3JPTM8/index.html .
Could you share your comments on your participation in JPTM? Additionally, do you have any advice on the use of GSMaP for human capacity development?

Dr. Morimasa Tsuda

First and foremost, I am delighted to have participated in JPTM. It was particularly gratifying to meet and build relationships with the individuals who responded to the EOR in May.
Lecturing on GSMaP at JPTM was also a valuable experience. Some participants mentioned that they found the talk engaging. I firmly believe that the combination of satellite and ground observations is highly effective. This concept applies to other satellite data as well. I hope that DAN and DPN will consider this approach, as it could lead to the development of practical technologies that are user-friendly for disaster risk management agencies.
(Dr. Tsuda's presentation at the JPTM 2023 can be found here:
https://sentinel-asia.org/meetings/SA3JPTM8/agenda/Day2/Day2_Workshop2_2.2_BWDB.pdf)

Sentinel Asia Secretariat

Could you tell us about any appealing points about joining Sentinel Asia?

Dr. Morimasa Tsuda

Sentinel Asia is unique because it is based on volunteer-driven activities, making it easy to join and recommend to other organizations. Additionally, Sentinel Asia has been operating for over 10 years. This longevity provides a stable foundation for ongoing activities and collaborations.

Sentinel Asia Secretariat
How does Bangladesh use space technology for disaster response, and what are the challenges?

Dr. Morimasa Tsuda
Riverbank erosion is a significant focus, with IWM using satellites to monitor long-term changes. Other agencies are also studying this issue. Additionally, I have heard of using satellites to observe local river shape changes over time, which is useful when designing river infrastructure.
One major challenge is cloud cover, which hinders our ability to observe river conditions during the summer. In this context, JAXA's ALOS-2 satellite, having Synthetic Aperture Radar (SAR) sensor onboard, is advantageous because it can make observations regardless of weather conditions. However, utilizing ALOS-2 is technically challenging because we are not yet fully familiar with handling satellite data.

Sentinel Asia Secretariat
Please let us know if you have any expectations for Sentinel Asia to improve our activities.

Dr. Morimasa Tsuda
Sentinel Asia is a remarkable initiative with over a decade of success. However, there is a need for greater awareness of the participation procedures; encouraging more institutions to join could significantly enhance its impact.

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3. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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4. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

** July 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 23 July)
2. [News] JAXA's New Radar Satellite “ALOS-4” that will serve Sentinel Asia successfully launched!
3. How to send an Emergency Observation Request
4. Using Sentinel Asia Operation System, OPTEMIS

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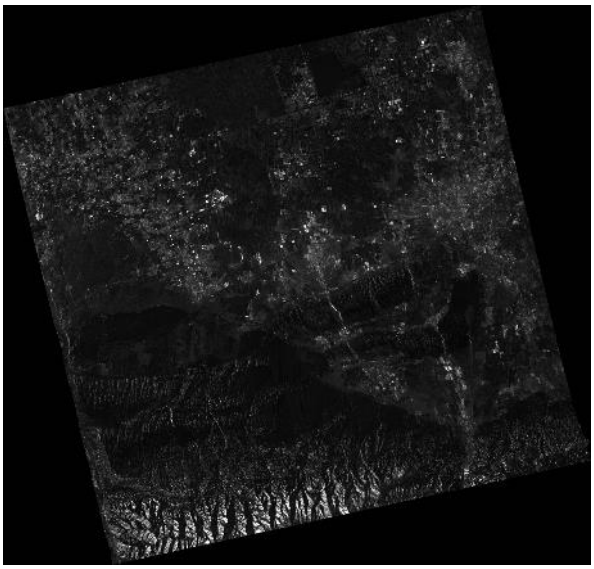
1. [News] Emergency Observation of Disasters (as of 23 July)

(1) Mudflow and Mudslide in Kyrgyz on 24 June, 2024 (GLIDE Number MS-2024-000101-KGZ)

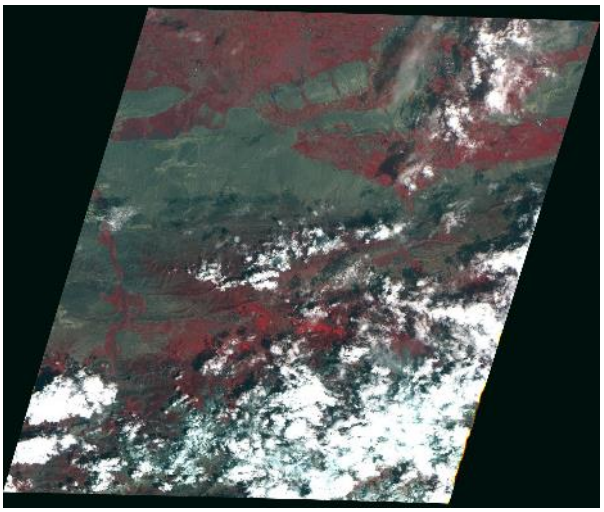
According to CGTN, 5 people died as a result of a mudflow triggered by heavy rainfall in Nookat in southern Kyrgyzstan’s Osh region, the press service of the country’s Ministry of Emergency Situations reported. Two other missing persons are reported to have been swept away by the mudslide.
https://news.cgtn.com/news/2024-06-29/news-1uPGGL2hbaM/p.html

The Central Asian Institute of Applied Geosciences (CAIAG) made an Emergency Observation Request (EOR) to Sentinel Asia on 26 June. This EOR was escalated to the International Disasters Charter. AIT assumed the role of Project Manager for this Charter activation. Among Data Provider Nodes (DPNs) JAXA, ISRO and TASA provided data. Among Data Analysis Nodes (DANs), JAXA and MBRSC provided their Value-Added Products (VAPs).
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240624KG.html

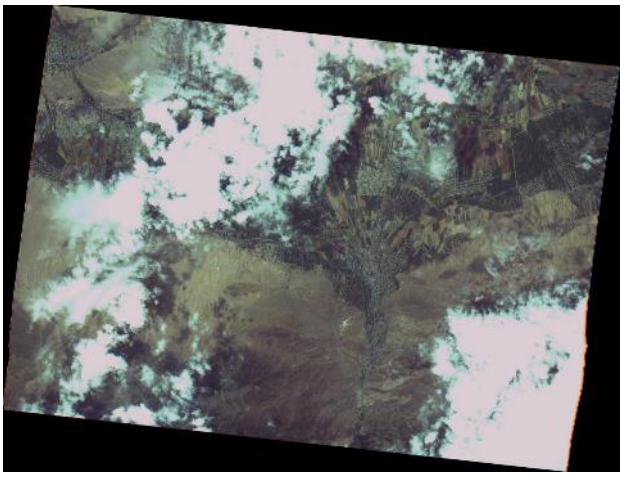
Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (Resourcesat-2) provided by ISRO

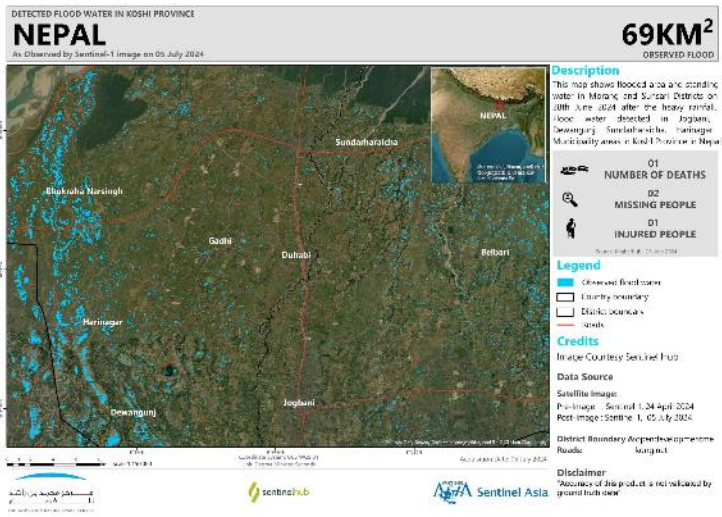


Post-disaster satellite image (FORMOSAT-5) provided by TASA

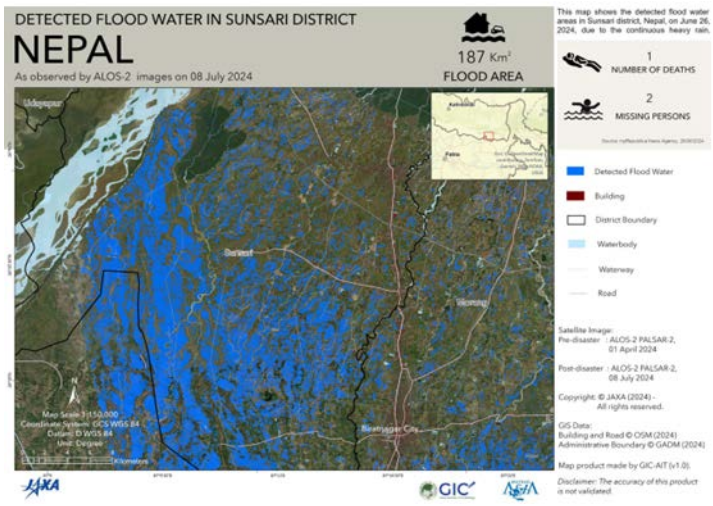
(2) Flood in Nepal on 26 June, 2024 (GLIDE Number FL-2024-000103-NPL)

On 26 June, 2024, heavy rainfall triggered landslides and flash floods in Nepal. US News reported that this resulted in the loss of at least 11 lives. Additionally, 9 people were killed by lightning strikes during the same period. Landslides swept away 3 houses in the Lamjung district, west of Kathmandu, claiming 4 lives, including 2 children. In the Morang district, southeast of the Nepali capital, flooding caused the deaths of 4 people. Three others lost their lives in landslides in Kaski (western Nepal) and Okhaldhunga (eastern Nepal).
https://www.usnews.com/news/world/articles/2024-06-26/heavy-rains-in-nepal-kill-20-in-two-days-amid-landslides-lightning-strikes

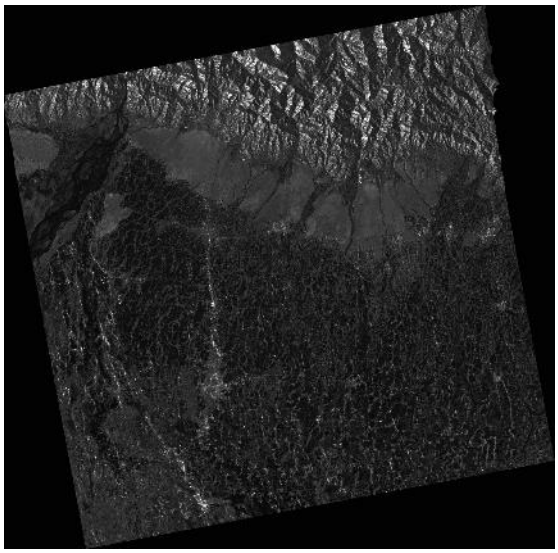
The Department of Hydrology and Meteorology (DHM), Ministry of Energy, Water Resources and Irrigation made an EOR to Sentinel Asia on 28 June. Among DPNs, JAXA, ISRO and MBRSC provided data. Among DANs, JAXA, MBRSC and AIT provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240626NP.html



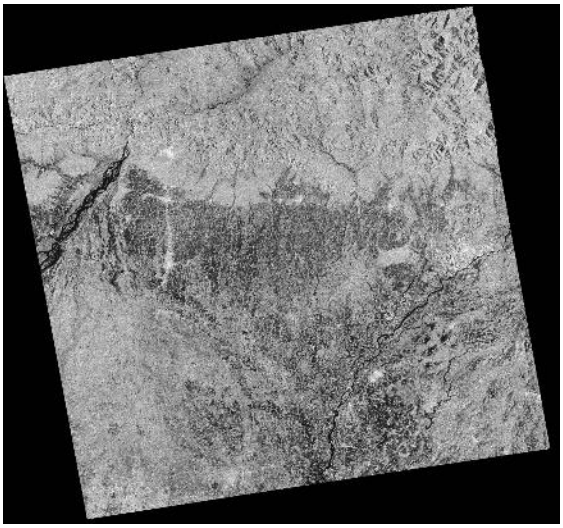
Value-Added Product by MBRSC



Value-Added Product by AIT



Post-disaster satellite image (ALOS-2) provided by JAXA

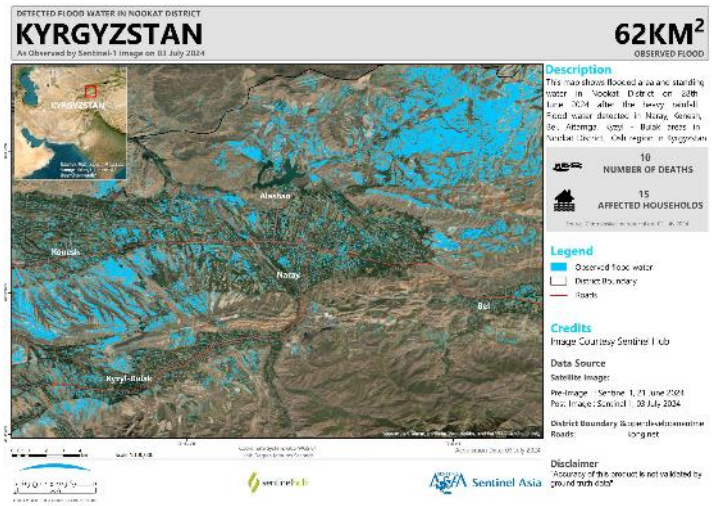


Post-disaster satellite image (EOS-04) provided by ISRO

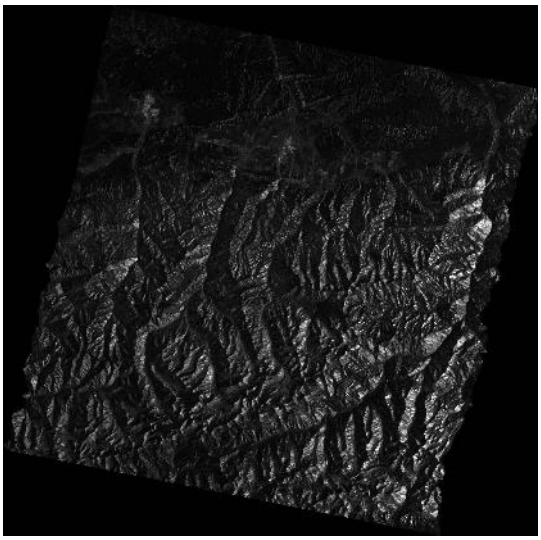
Post-disaster satellite image (KhalifaSat) provided by MBRSC

(3) Flood and Mudflow in Nookat district, Kyrgyz on 28 June, 2024
(GLIDE Number MS-2024-000101-KGZ)
According to ReliefWeb, on 28 June, between 16:00 and 16:30, heavy rains in the mountainous area triggered floods in 3 villages of the Nookat district in the Osh region. The floods caused significant damage to village infrastructure and affected 23 households. Tragically, 5 children lost their lives as a result of the mudflows.
https://reliefweb.int/report/kyrgyzstan/kyrgyzstan-flood-06-2024-floods-osh-4-2024-06-29

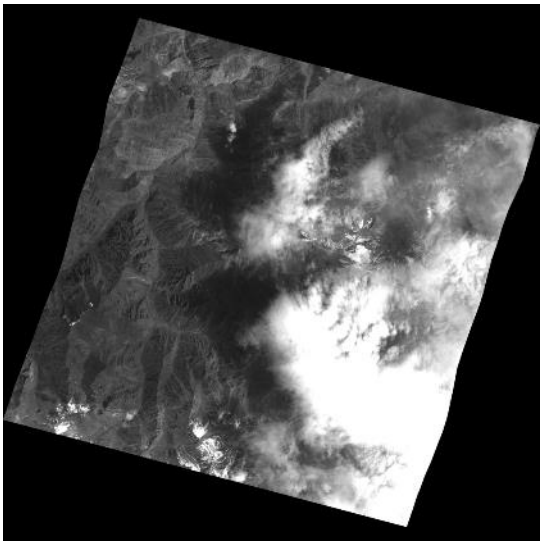
CAIAG made an EOR to Sentinel Asia on 1 July. This EOR was escalated to the International Disasters Charter. AIT assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA, GISTDA, MBRSC and TASA provided data. Among DANs, JAXA and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240628KG.html



Value-Added Product by MBRSC

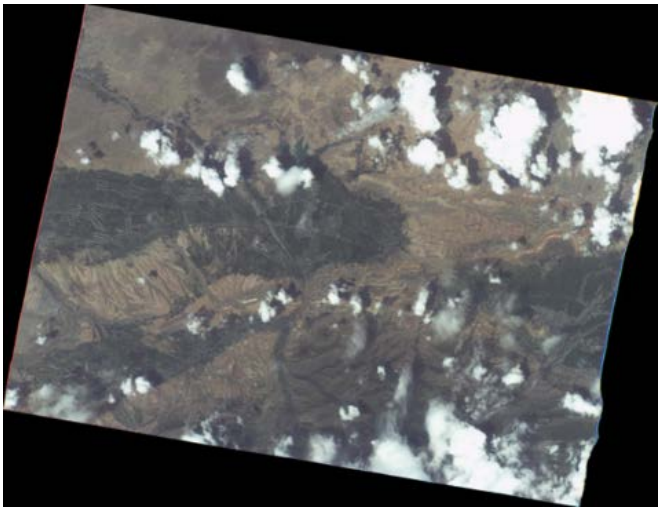


Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (THEOS1) provided by GISTDA

Post-disaster satellite image (KhalifaSat) provided by MBRSC



Post-disaster satellite image (FORMOSAT-5) provided by TASA

(4) Flood in Kachin State, Myanmar on 1 July, 2024 (GLIDE Number FL-2024-000104-MMR)

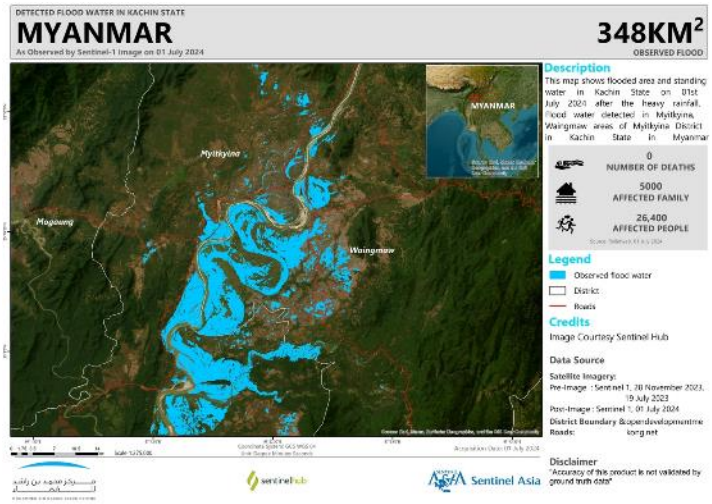
On 1 July, 2024, severe flooding occurred in Kachin state, Myanmar.

The Star reported that the disaster displaced about 31,000 people. The flood victims came from 6,320 households, and the areas affected by the floods included Kachin State and the Sagaing, Magway and Mandalay regions. At least 23,298 people were affected in Kachin, 7,478 in Sagaing, 146 in Magway, and 56 in Mandalay. The disaster management department has established a total of 128 relief shelters in the affected areas, with 73 of them in Kachin, 48 in Sagaing, 3 in Magway, and 4 in Mandalay.

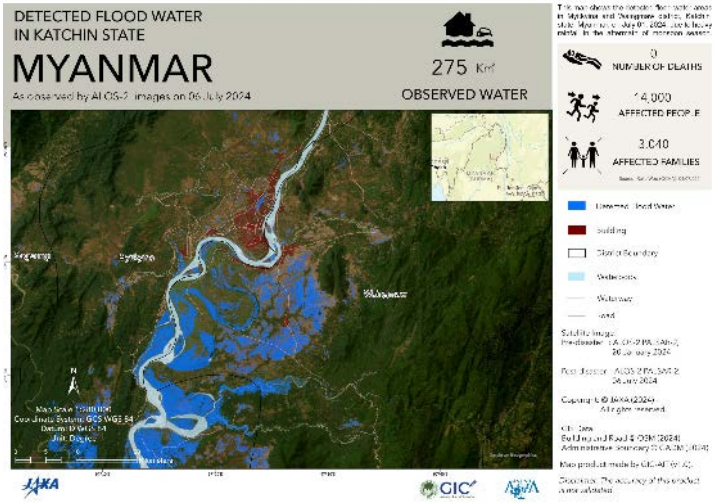
https://www.thestar.com.my/aseanplus/aseanplus-news/2024/07/11/some-31000-evacuated-as-monsoon-floods-devastate-myanmar

The Myanmar Information Management Unit (MIMU) made an EOR to Sentinel Asia on 1 July. Among DPNs, JAXA and CRISP provided data. Among DANs, JAXA, MBRSC, AIT, IWM and EOS provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.

https://sentinel-asia.org/EO/2024/article20240701MM.html



Value-Added Product by MBRSC



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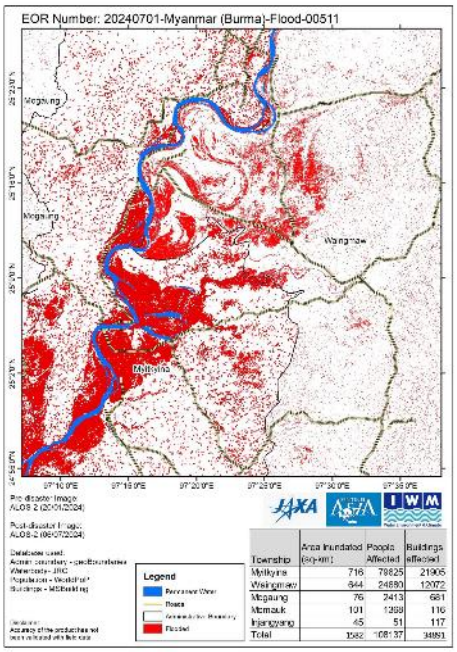
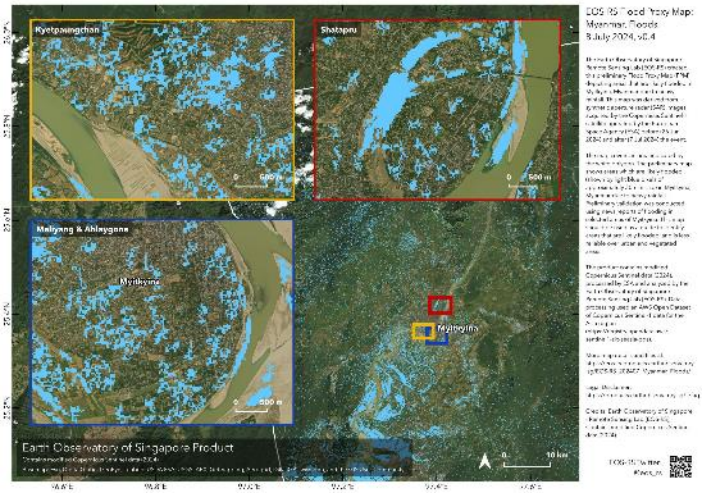
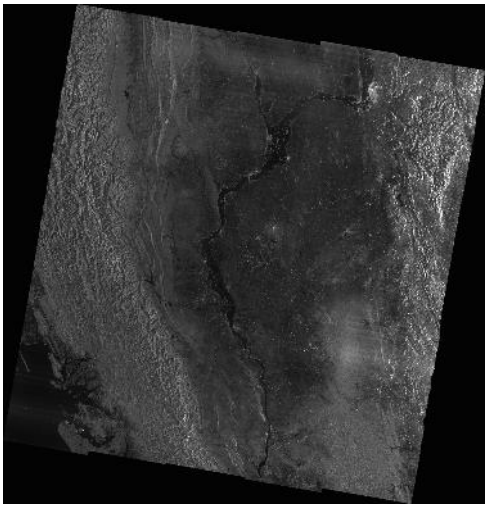


Value-Added Product by IWM



Value-Added Product by EOS



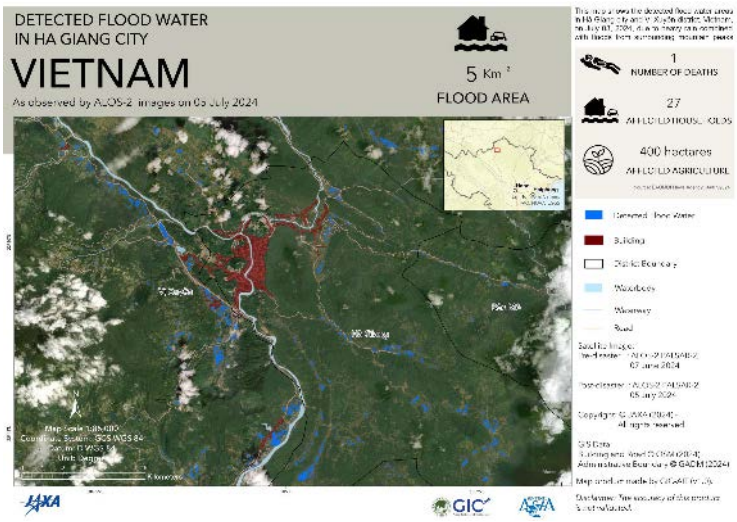
Post-disaster satellite image (ALOS-2) provided by JAXA

Post-disaster satellite image (TelEOS-1) provided by CRISP

(5) Flood and Landslide in Northern Vietnam on 3 July, 2024 (GLIDE Number FL-2024-000106-VNM)

ReliefWeb reported that on 2 and 3 July, heavy rainfall and strong winds hit the northern and southern regions of Vietnam, causing floods and triggering landslides, resulting in casualties and damage. The worst-hit areas are An Giang, Lào Cai, Lang Son, Thái Nguyên and Tian Giang. According to the ASEAN Disaster Information Network (ADINet), 1 person died due to a severe weather-related incident while 420 people were affected and 105 houses were damaged (1 of them destroyed).
https://reliefweb.int/report/viet-nam/vietnam-severe-weather-floods-and-landslides-adinet-vmd-echo-daily-flash-04-july-2024

The Ministry of Natural Resources and Environment (MONRE) made an EOR to Sentinel Asia on 3 July. Among DPNs, JAXA and ISRO provided data. Among DANs, JAXA, AIT and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240703VN.html



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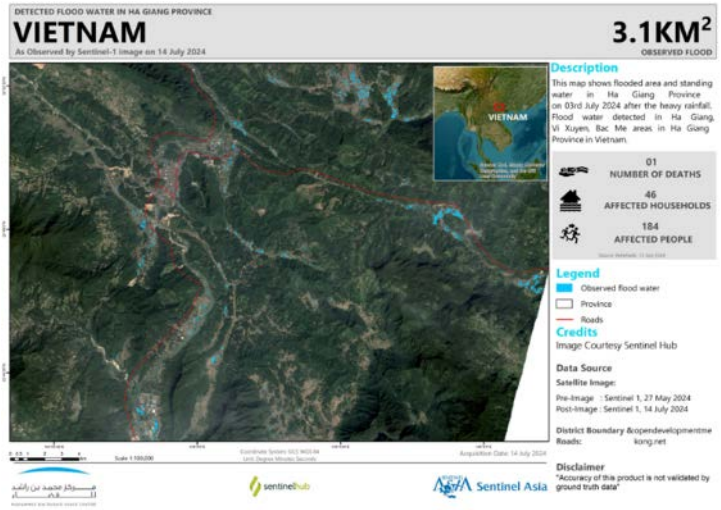

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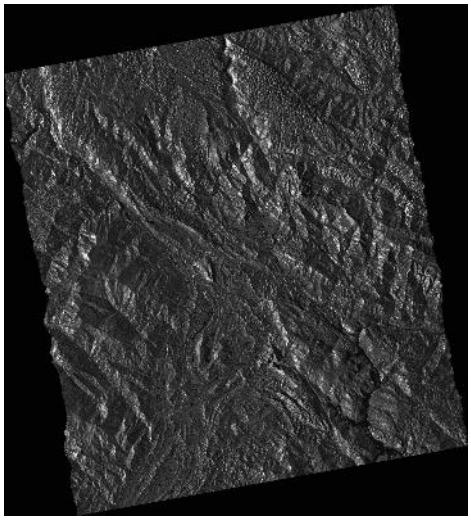
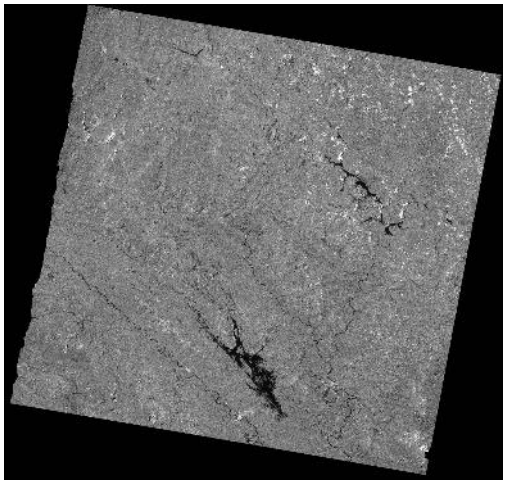


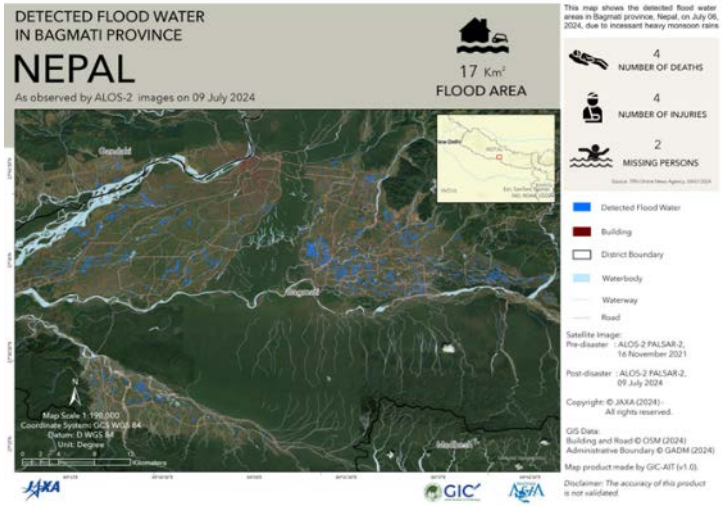
Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04) provided by ISRO

(6) Flood in Gandaki Province, Nepal on 6 July, 2024 (GLIDE Number FL-2024-000107-NPL)
Floods in Gandaki Province, Nepal, on 6 July, 2024, caused significant destruction. According to The Kathmandu Post, incessant monsoon rains have wreaked havoc in various places across the country. The floods and landslides triggered by heavy rains over the past 24 hours destroyed several houses while vehicular movement was disrupted on major highways and road sections. Gandaki Province has been the hardest hit by monsoon-induced disasters, with at least 7 people killed.
https://kathmandupost.com/national/2024/07/07/floods-landslips-cause-havoc-across-country

DHM made an EOR to Sentinel Asia on 7 July. Among DPNs, JAXA, TASA and GISTDA provided data. Among DANs, JAXA, AIT and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240706NP.html



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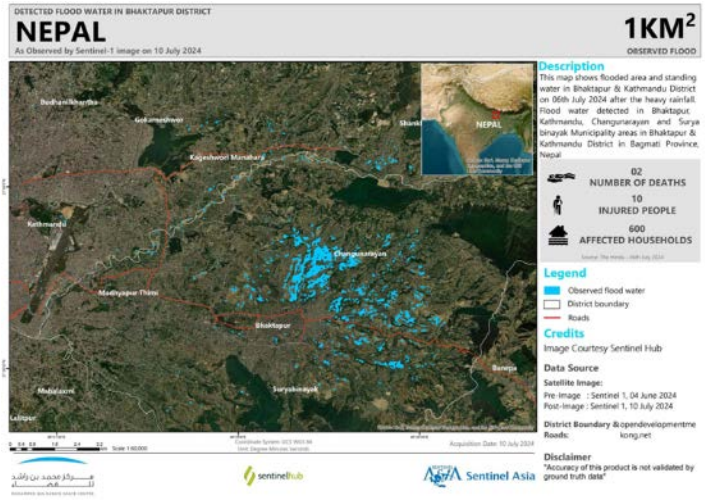
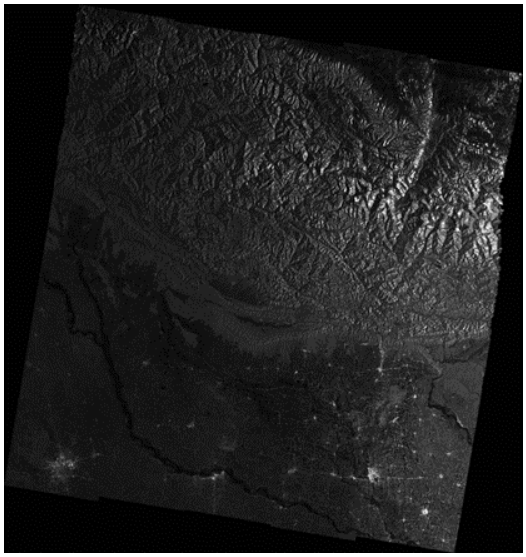
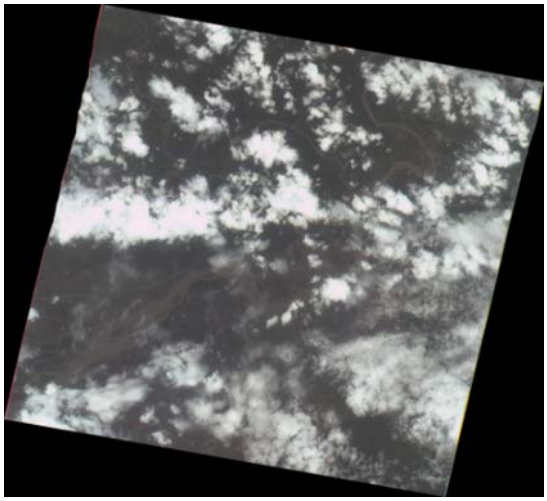


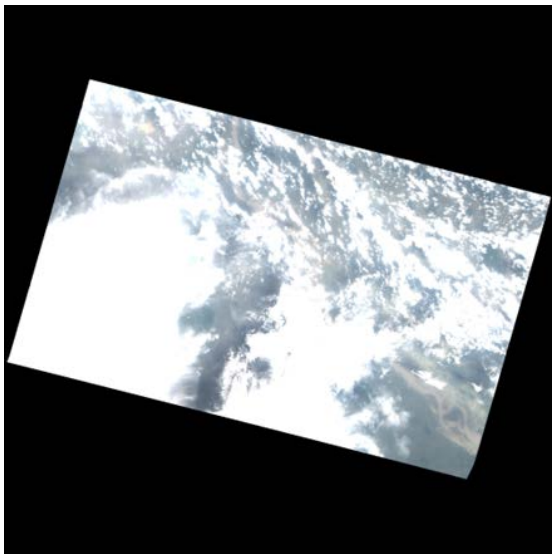
Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



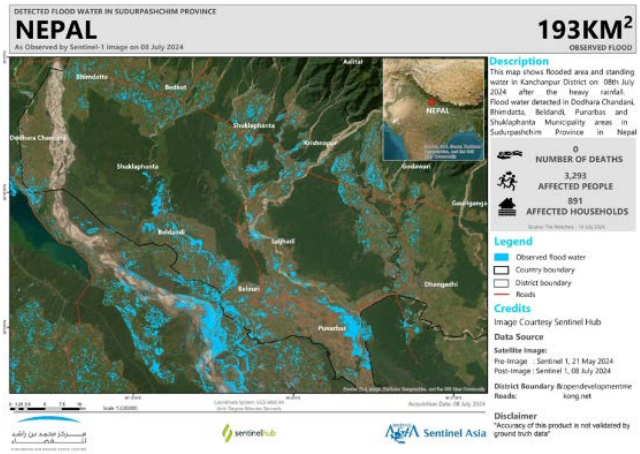
Post-disaster satellite image (FORMOSAT-5) provided by TASA



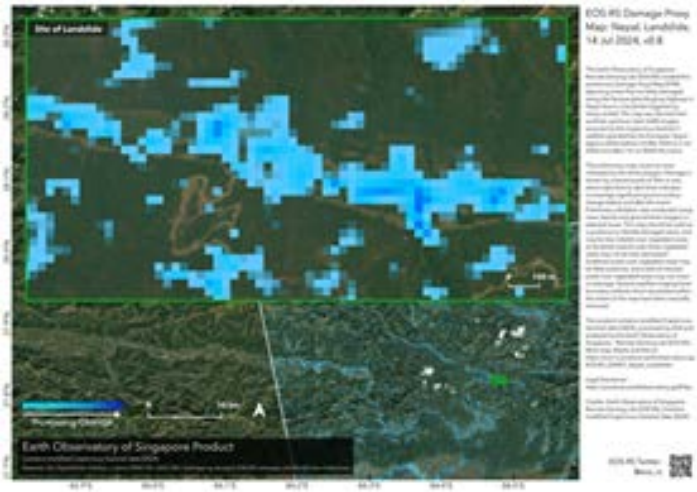
Post-disaster satellite image (THEOS1) provided by GISTDA

(7) Flood in Western Region, Nepal on 7 July, 2024 (GLIDE Number FL-2024-000108-NPL)
The Himalayan reported that over 1,600 people were affected due to floods in Kanchanpur. Incessant rain-triggered floods submerged some settlements in Kanchanpur. According to the District Police Office, Kanchanpur, most of the areas have been affected by the flood. Three settlements of Dodhara Chandani municipality-10 have been inundated after the Mahakali and Jogbuda rivers overflowed into the settlements. Kutiyakabhar of Jogbuda and Shanti tole and Lisani tole of Wari have been inundated. Similarly, Bhimdutta municipality, Bedkot, Shuklaphanta, Krishnapur municipality and most of the settlements in the southern region of Kanchanpur have been flooded.
https://thehimalayantimes.com/nepal/over-1600-people-affected-due-to-floods-in-kanchanpur

DHM, Ministry of Energy, Water Resources and Irrigation made an EOR to Sentinel Asia on 8 July. This EOR was escalated to the International Disasters Charter. ICIMOD assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA and ISRO provided data. Among DANs, MBRSC and EOS provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240707NP.html



Value-Added Product by MBRSC



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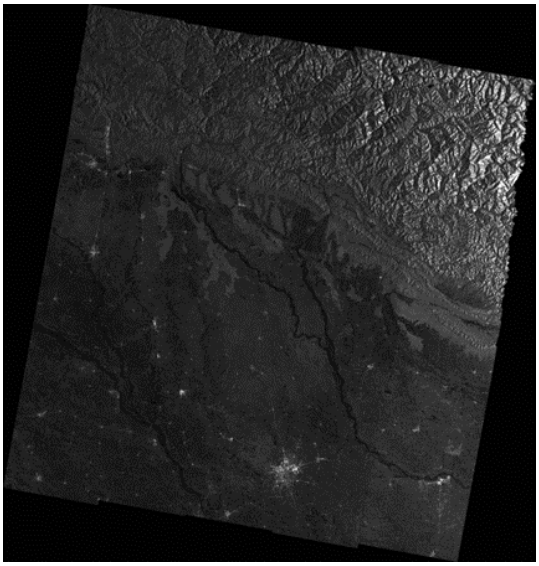
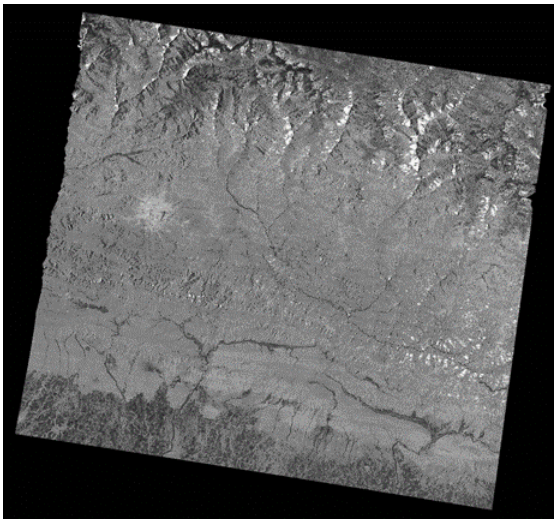


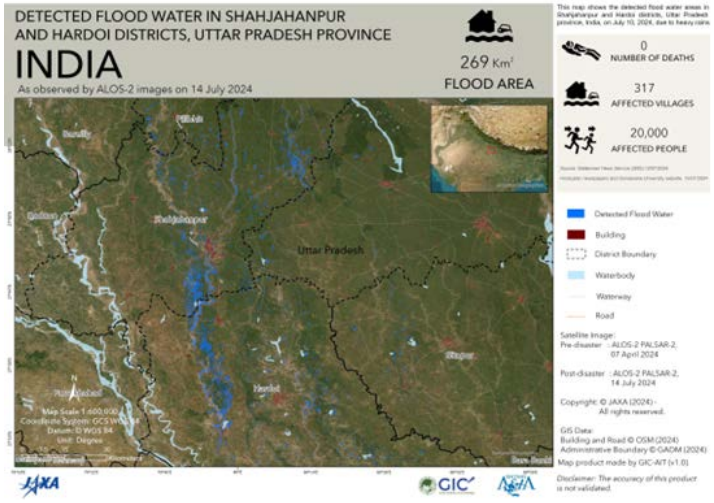
Post-disaster satellite image (ALOS-2) provided by JAXA



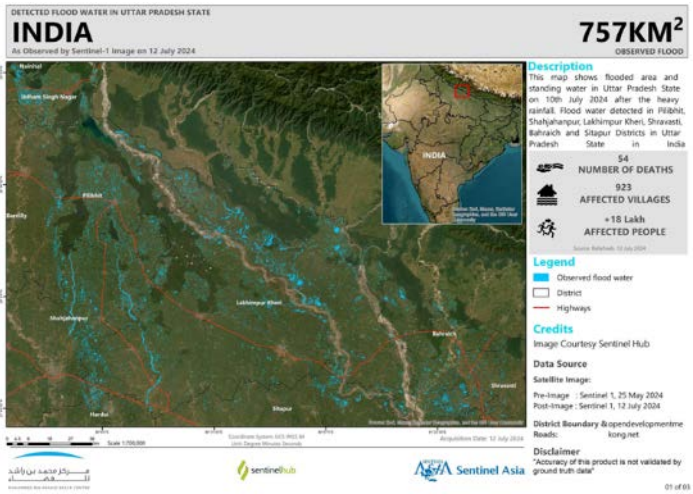
Post-disaster satellite image (EOS-04) provided by ISRO

(8) Flood in Uttar Pradesh of India on 10 July, 2024 (GLIDE Number FL-2024-000109-IND)
NDTV reported that the flood situation in Uttar Pradesh, India, on 10 July, 2024, was severe. More than 600 villages across 12 districts were affected by the floods. Nineteen people lost their lives in rain-related incidents within a 24-hour period. The casualties included 16 individuals struck by lightning, 2 who drowned, and 1 who died from a snake bite.
https://www.ndtv.com/india-news/flood-in-over-600-villages-in-up-19-killed-in-rain-related-incident-6077680

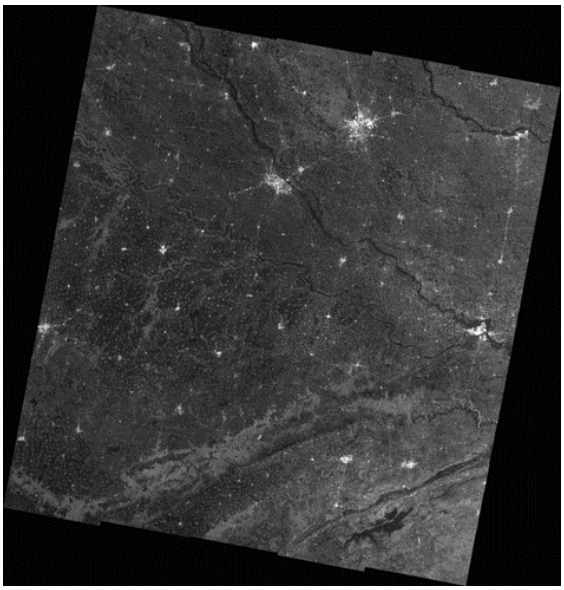
ISRO made an EOR to Sentinel Asia on 11 July. Among DPNs, JAXA and GISTDA provided data. Among DANs, JAXA, AIT and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240710IN.html



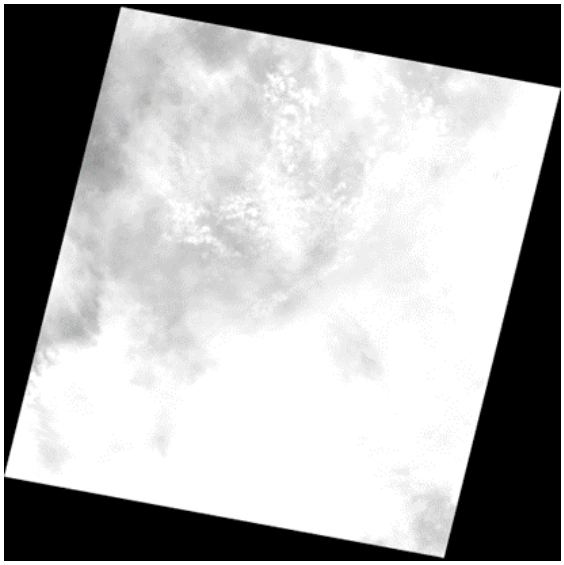
Value-Added Product by AIT



Value-Added Product by MBRSC



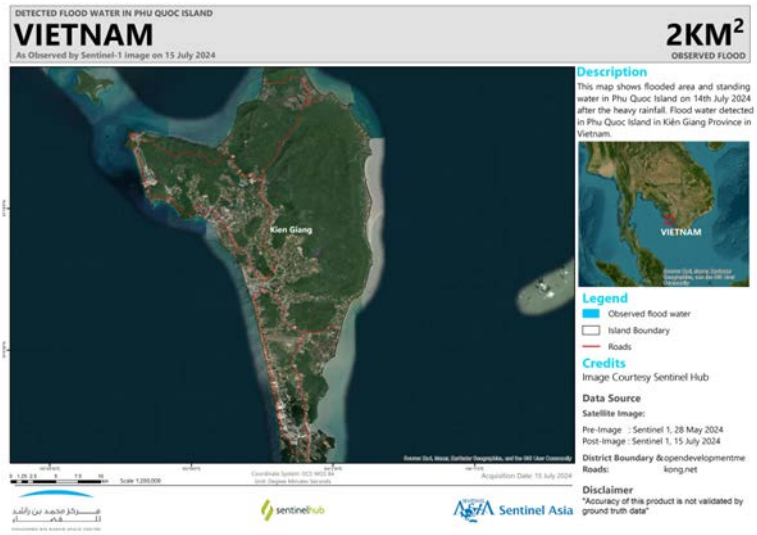
Post-disaster satellite image (ALOS-2) provided by JAXA



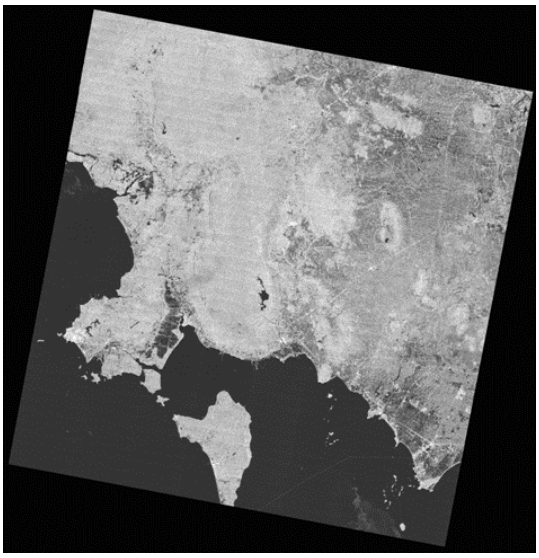
Post-disaster satellite image (THEOS1) provided by GISTDA

(9) Flood and Landslide in Vietnam on 14 July, 2024 (GLIDE Number FL-2024-000111-VNM)
On July 14, 2024, Vietnam experienced severe weather conditions that led to flooding and landslides. VNEXPRESS said that Phu Quoc City was heavily affected by rainfall reaching 100-120 mm, causing significant flooding. The heavy rain started on 14 July and continued until the morning of next day.
https://vnexpress.net/mua-tu-khuya-toi-sang-phu-quoc-ngap-thanh-song-4769814.html

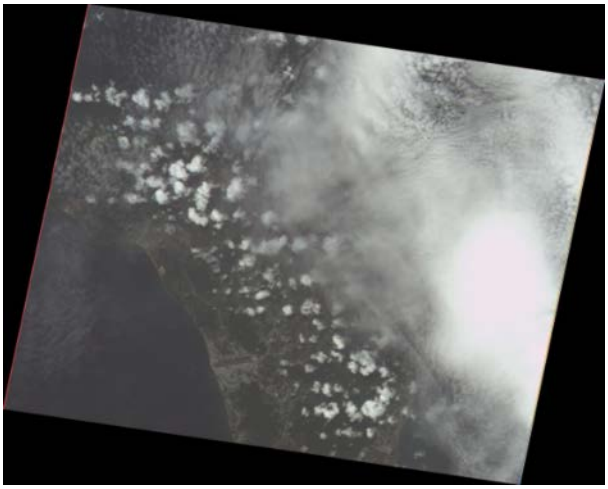
MONRE made an EOR to Sentinel Asia on 15 July. Among DPNs, ISRO and TASA provided data. Among DANs, MBRSC provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240714VN.html



Value-Added Product by MBRSC



Post-disaster satellite image (EOS-04) provided by ISRO

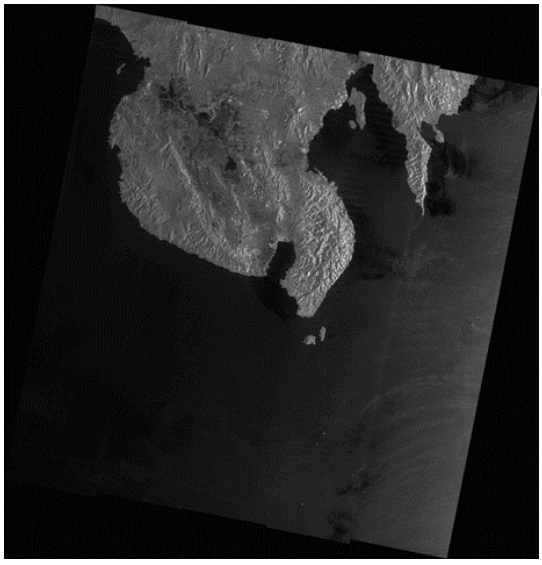


Post-disaster satellite image (FORMOSAT-5) provided by TASA

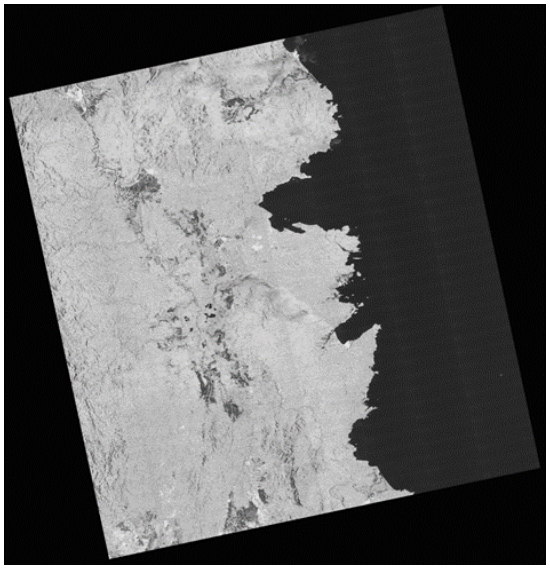
(10) Flood in Mindanao Island, Philippines on 15 July, 2024 (GLIDE Number FL-2024-000112-PHL)

According to CRISIS 24, heavy rainfall associated with the southwest monsoon struck, triggering widespread flooding and landslides across parts of Mindanao. As of July 15, authorities reported 2 weather-related fatalities, 1 in Northern Mindanao and 1 in Davao Region, with 2 others injured and 1 missing. More than 54,000 people were affected by the severe weather across Bangsamoro Autonomous Region in the Muslim Mindanao, Davao, Northern Mindanao, and Soccsksargen regions. About 17,800 people were displaced and at least 73 homes were damaged.
https://crisis24.garda.com/alerts/2024/07/philippines-disruptions-ongoing-due-to-flooding-and-landslides-across-parts-of-mindanao-island-as-of-july-15

The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) made an EOR to Sentinel Asia on 15 July. Among DPNs, JAXA and ISRO provided data. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240715PH.html



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04) provided by ISRO

(11) Flood and Mudflow in Tajikistan on 13 July, 2024 (GLIDE Number MS-2024-000114-TJK)

Asia Plus said on the evening of 13 July that heavy rains caused mudflows on the territory of the village of Iskodar, Ayni district, Sughd region in Tajikistan. Mudflows that descended on the territory of the village of Pasrud in the same district blocked the inter-settlement road. Also, on 13 July at 16:00, mudflows descended on the territory of Kosatarosh, Shing, Loik Sherali and Voru in the suburbs of Panjakent.

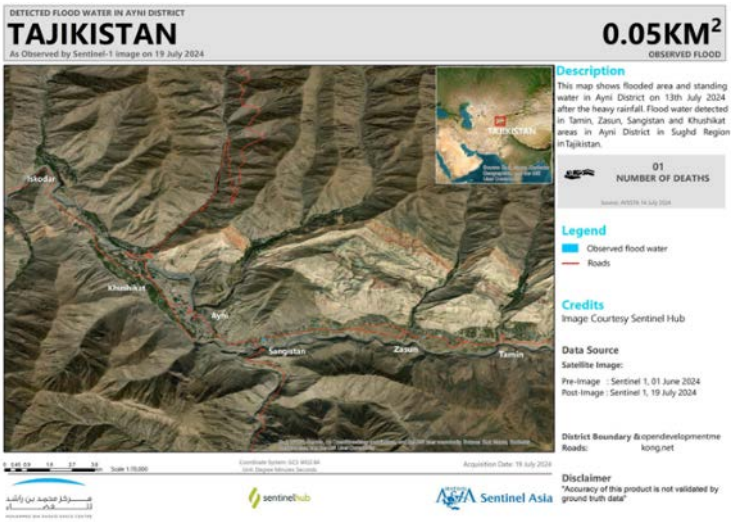
“The mud mass damaged local roads, as well as agricultural land and power lines. There are no casualties,” the Emergency Situations Committee noted.

https://vox.today/57419/jitelnica-aininskogo-raiona-pogibla-v-rezyltate-shoda-selevogo-potoka-v-sele-iskodar/

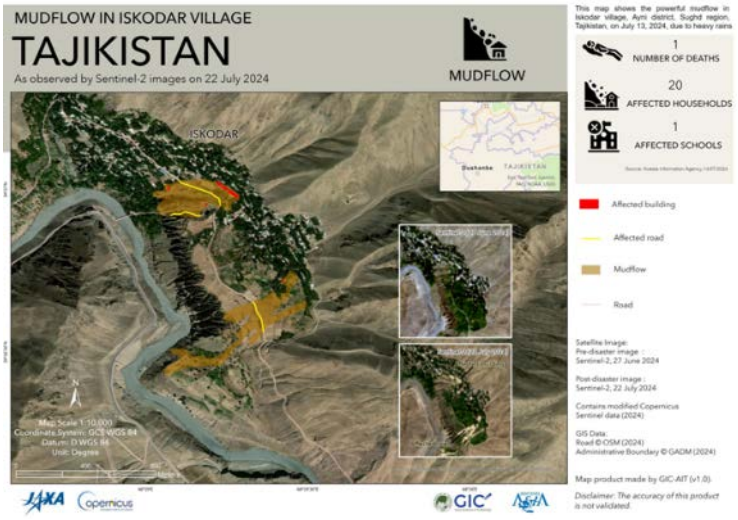
CAIAG made an EOR to Sentinel Asia on 15 July. Among DPNs, JAXA, TASA and ISRO provided data. Among DANs, JAXA, MBRSC and AIT provided their VAPs.

Information on the latest response by Sentinel Asia is available at the link below.

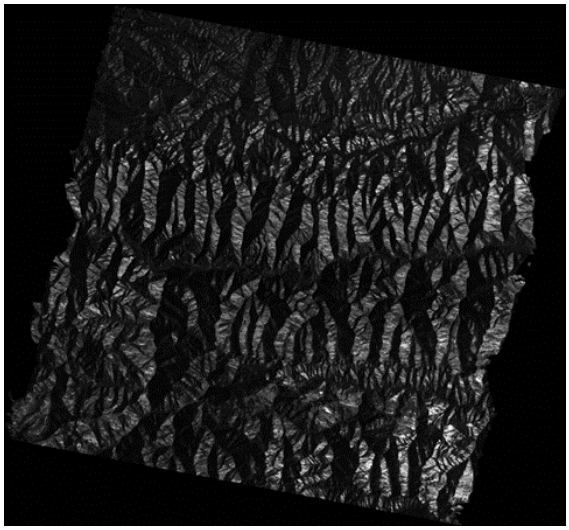
https://sentinel-asia.org/EO/2024/article20240713TJ.html



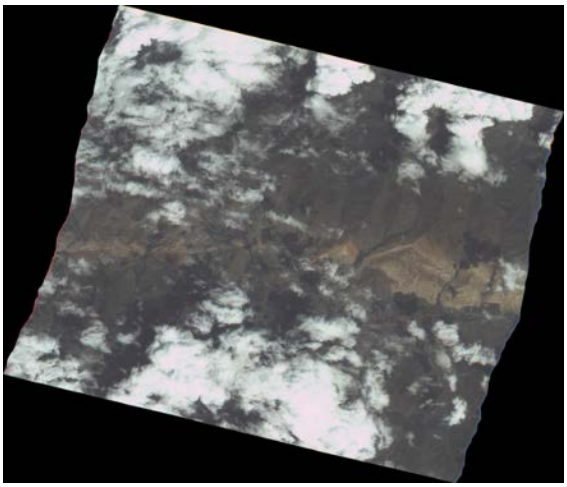
Value-Added Product by MBRSC



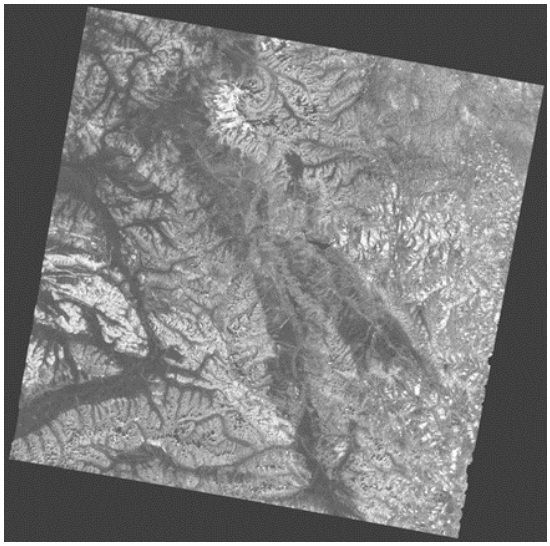
Value-Added Product by AIT



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA

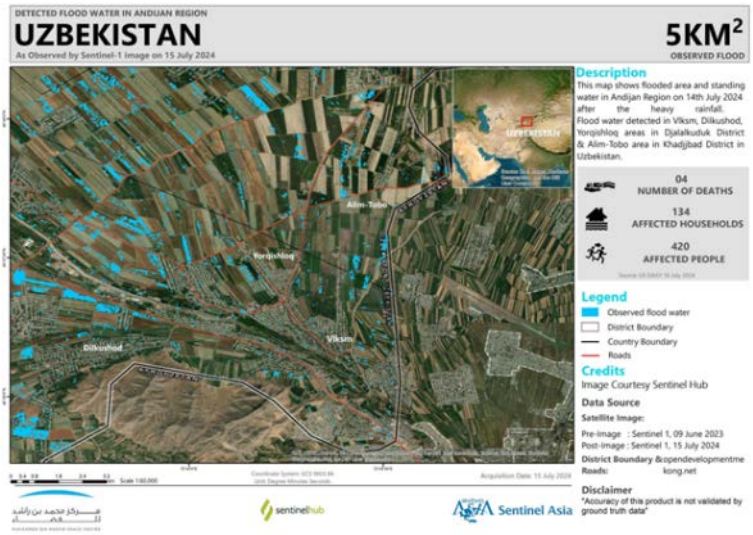


Post-disaster satellite image (EOS-04) provided by ISRO

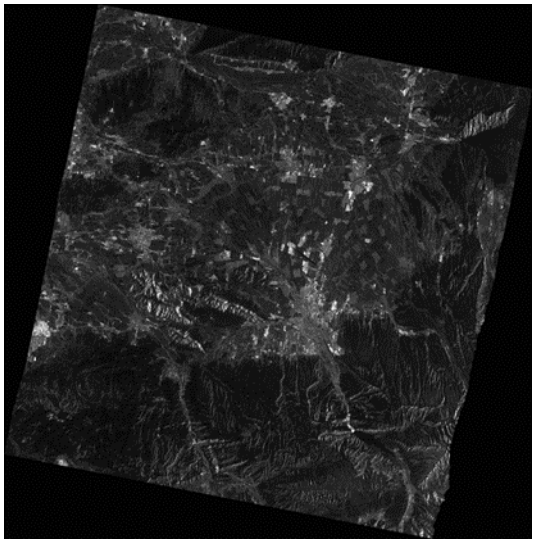
(12) Flood and Mudflow in Uzbekistan on 14 July, 2024 (GLIDE Number MS-2024-000113-UZB)

According to KPACHAR BECHA, the bridge collapsed due to the erosion of the bridge base as a result of mudflows in the village of Yorkishlok in the Andijan region of Uzbekistan, the press service of the administration of the Khojaabad district of the region reported on 14 July.
The bridge connected the Khojaabad and Jalakuduk districts of the Andijan region.
It was specified that there were no casualties.
https://rossaprimavera.ru/news/c4a313c3

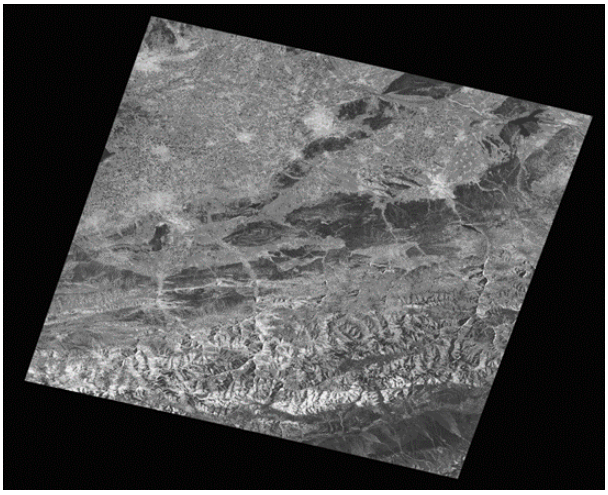
CAIAG made an EOR to Sentinel Asia on 15 July. Among DPNs, JAXA and ISRO provided data. Among DANs, MBRSC provided its VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240714UZ.html



Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04) provided by ISRO

(13) Flood and Mudflow in Kyrgyz on 14 July, 2024 (GLIDE Number MS-2024-000115-KGZ)

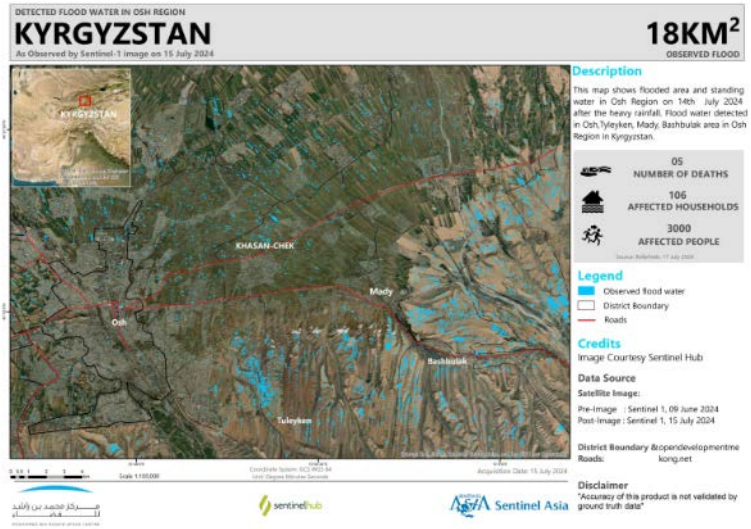
According to ASTANA TIMES, a mudflow, which occurred on 14 July, claimed the lives of 5 people and caused extensive damage in Osh city and the Osh region. The settlements of Mady, Datka and Bash-Bulak were affected, with 642 residential buildings, 4 schools, a kindergarten, 2 hospitals, a museum, and a first aid station being flooded. In Osh city, 146 residential buildings and a kindergarten suffered damage.

https://astanatimes.com/2024/07/kazakhstan-sends-40-tons-of-humanitarian-aid-to-kyrgyz-republic-after-mudflows/

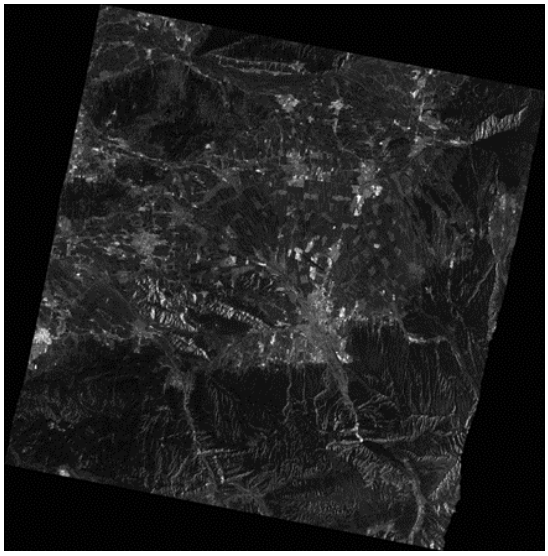
CAIAG made an EOR to Sentinel Asia on 15 July. This EOR was escalated to the International Disasters Charter. AIT assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA, TASA and ISRO provided data. Among DANs, JAXA and MBRSC provided their VAPs.

Information on the latest response by Sentinel Asia is available at the link below.

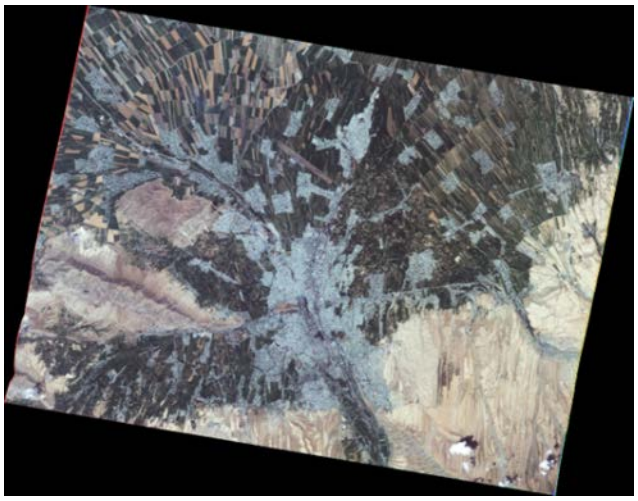
https://sentinel-asia.org/EO/2024/article20240714KG.html



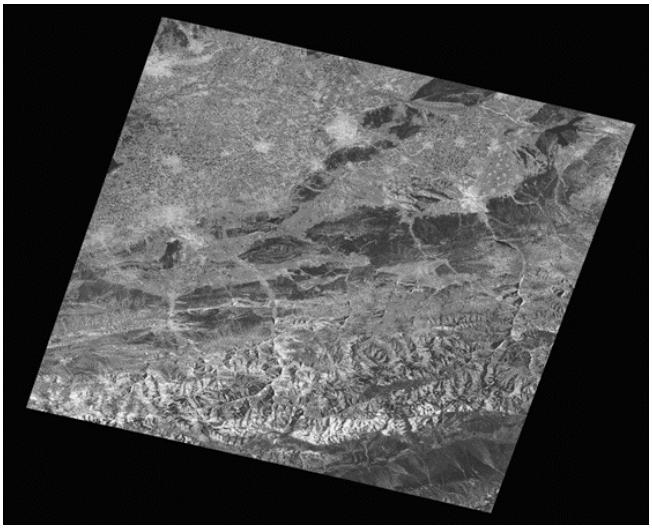
Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA

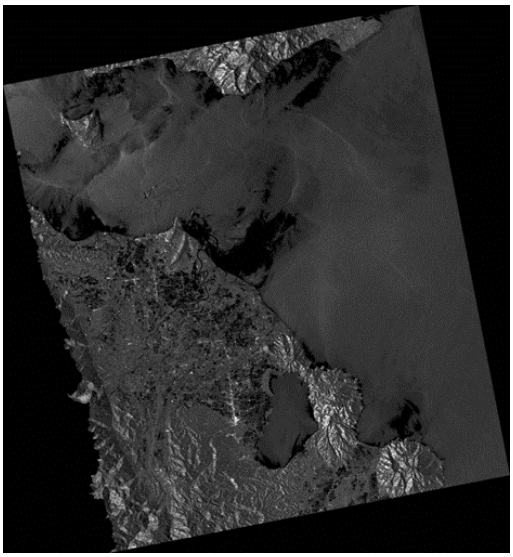


Post-disaster satellite image (EOS-04) provided by ISRO

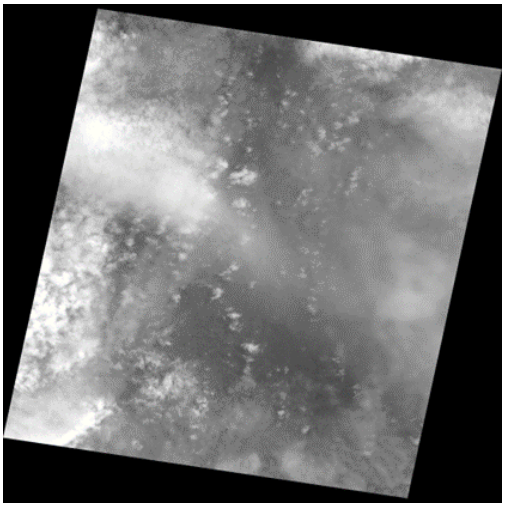
(14) Flood and Landslide in Philippines on 18 July, 2024 (GLIDE Number FL-2024-000112-PHL)

ReliefWeb reported the Southwest Monsoon has affected 573,000 people (118,000 families) across 7 regions, 17 provinces, and 53 cities/municipalities. There have been 349,000 displacements, and 53 evacuation centers were activated. The disaster resulted in 7 fatalities, 2 injuries, and 1 missing person. Additionally, 133 houses were damaged, and 71 road sections, 5 bridge sections, and 1 seaport were affected. Power and water supplies were disrupted in several areas, and agricultural damage is estimated at $364,000.
https://reliefweb.int/report/philippines/philippines-flood-crisis-situation-report-update-23rd-july-2024

The Philippine Space Agency (PhilSA) made an EOR to Sentinel Asia on 23 July.
Among DPNs, JAXA and GISTDA provided data.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240718PH.html



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (THEOS1) provided by GISTDA

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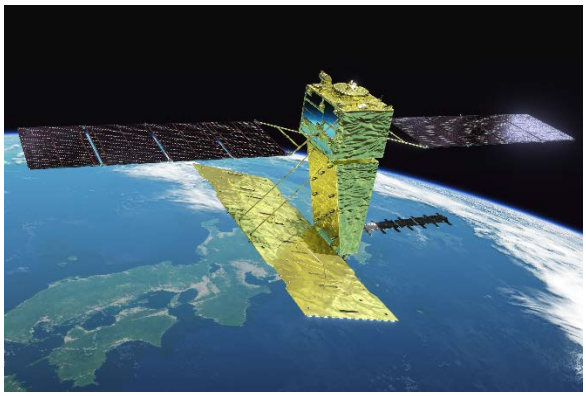
2. [News] JAXA's New Radar Satellite "ALOS-4" that will serve Sentinel Asia successfully launched!

JAXA launched its new satellite, "Advanced Land Observing Satellite-4 (ALOS-4)," or "DAICHI-4," onboard the third H3 Launch Vehicle from the Tanegashima Space Center on July 1, 2024 (JST). This new satellite carries L-band Synthetic Aperture Radar (SAR), like its predecessor "ALOS-2" but with enhanced capability. Although the resolution is the same as that of ALOS-2, the swath of ALOS-4 is much wider, allowing it to observe a much larger area of the surface of the Earth in a single acquisition. Its swath is 200 km with 3 m, 6 m, and 10 m resolution in Stripmap mode, and 700 km with 25 m resolution in ScanSAR mode. The satellite entered the initial functional verification operations phase of about 3 months to confirm the functionality of its onboard equipment. From 2025, ALOS-4 will move into the nominal phase and start providing data to Sentinel Asia. ALOS-4 will contribute to Sentinel Asia by taking advantage of these merits to observe and monitor disasters worldwide including in the Asia-Pacific region.



©JAXA

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3. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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4. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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Sentinel Asia Project Office
Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)
Ochanomizu Sola City, 4-6 Kandasurugadai, Chiyoda-ku, Tokyo 101-8008 Japan
E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

** August 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 23 August)
2. How to send an Emergency Observation Request
3. Using Sentinel Asia Operation System, OPTEMIS

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1. [News] Emergency Observation of Disasters (as of 23 August)

(1) Flood and Landslide in Son La City, Vietnam on 23 July, 2024 (GLIDE Number TC-2024-000126-VNM)

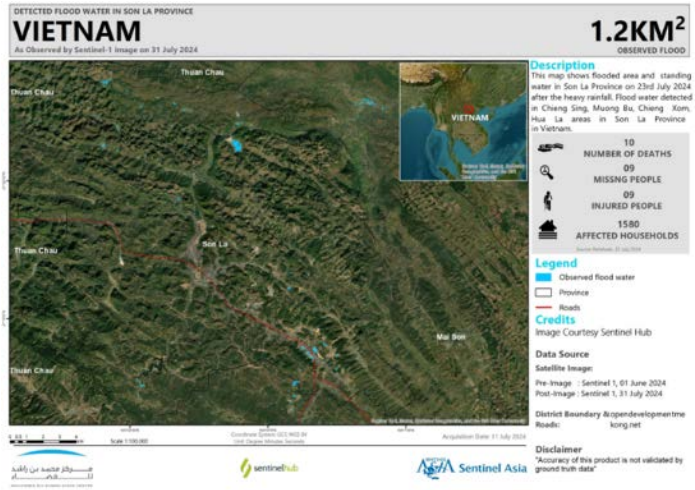
According to VNEXPRESS, landslides triggered by heavy rains brought by storm Prapiroon have destroyed five houses in Mai Son District of the mountainous Son La Province, resulting in three deaths.

https://e.vnexpress.net/news/news/environment/landslides-leave-3-dead-5-missing-in-northern-vietnam-after-storm-prapiroon-4773716.html

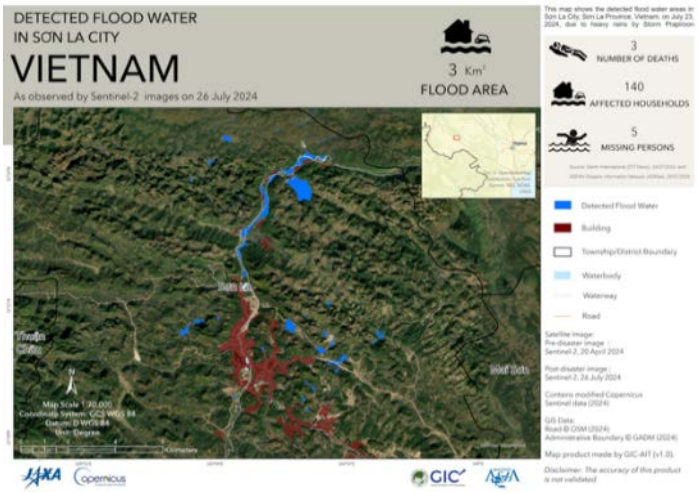
The Ministry of Natural Resources and Environment (MONRE) made an Emergency Observation Request (EOR) to Sentinel Asia on 24 July. Among Data Provider Nodes (DPNs), ISRO provided data. Among Data Analysis Nodes (DANs), MBRSC and AIT provided their Value-Added Products (VAPs).

Information on the latest response by Sentinel Asia is available at the link below.

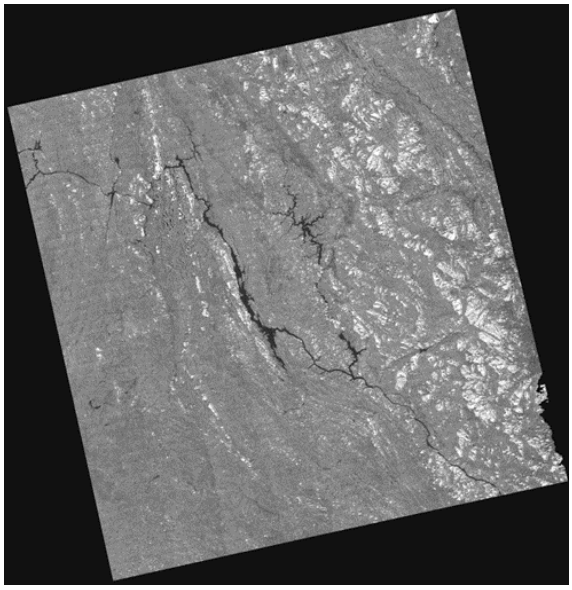
https://sentinel-asia.org/EO/2024/article20240723VN.html



Value-Added Product by MBRSC



Value-Added Product by AIT

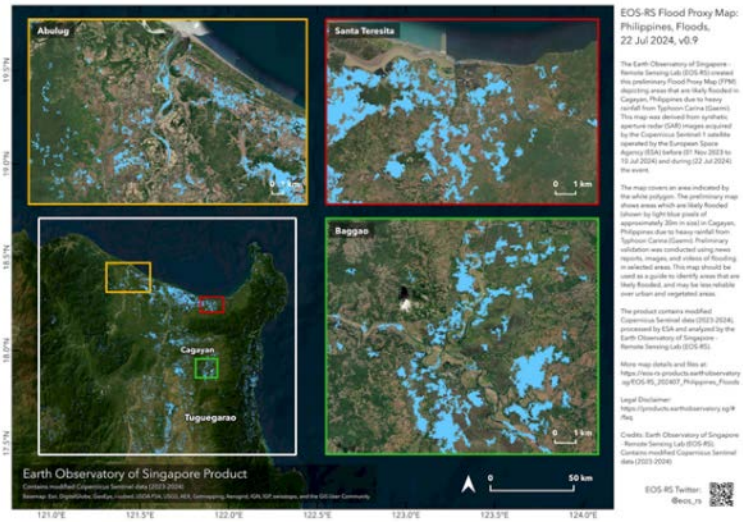


Post-disaster satellite image (RISAT-1A) provided by ISRO

(2) Flood by Typhoon Carina in Philippines on 23 July, 2024 (GLIDE Number TC-2024-000127-CHN)

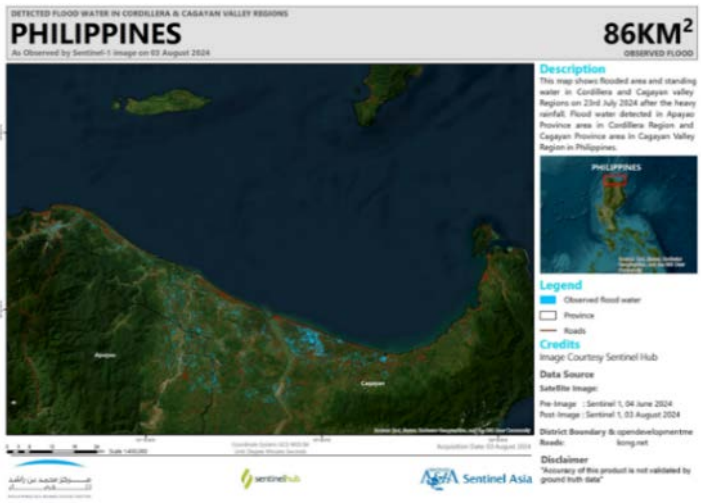
According to Philstar Global, almost 100 people fled their homes in Cagayan province on the island of Luzon in the northern Philippines as Typhoon Carina (international name: Gaemi) made landfall in force on the morning of 23 July, the Cagayan Provincial Disaster Risk Reduction and Management Office (PDRRMO) reported.
https://www.philstar.com/nation/2024/07/23/2372351/nearly-100-flee-homes-cagayan-due-carina

The Philippine Space Agency (PhilSA) made an EOR to Sentinel Asia on 24 July. Among DPNs, JAXA provided data. Among DANs, EOS, AIT, and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240723PH.html

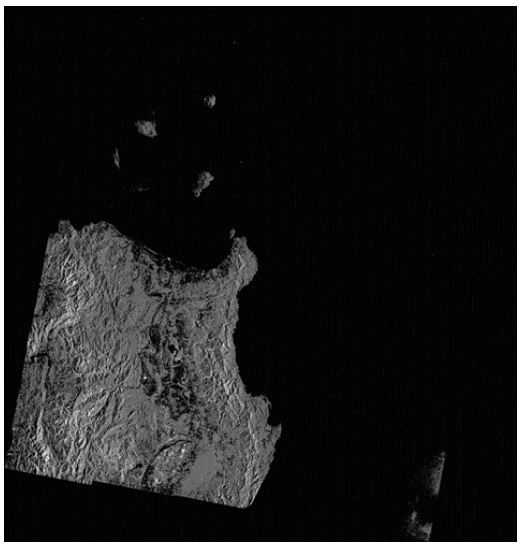


Value-Added Product by EOS

Value-Added Product by AIT



Value-Added Product by MBRSC

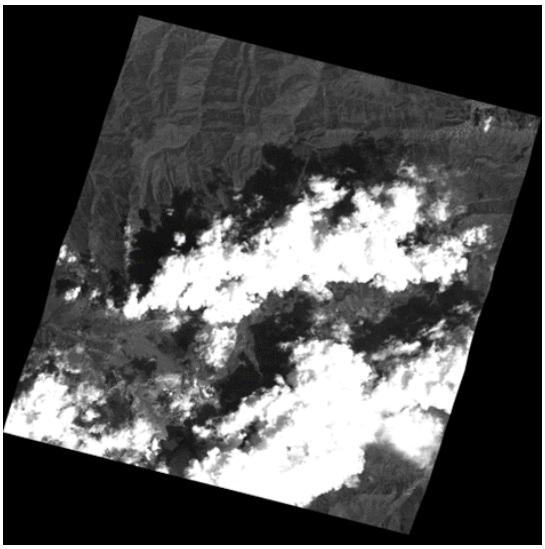


Post-disaster satellite image (ALOS-2) provided by JAXA

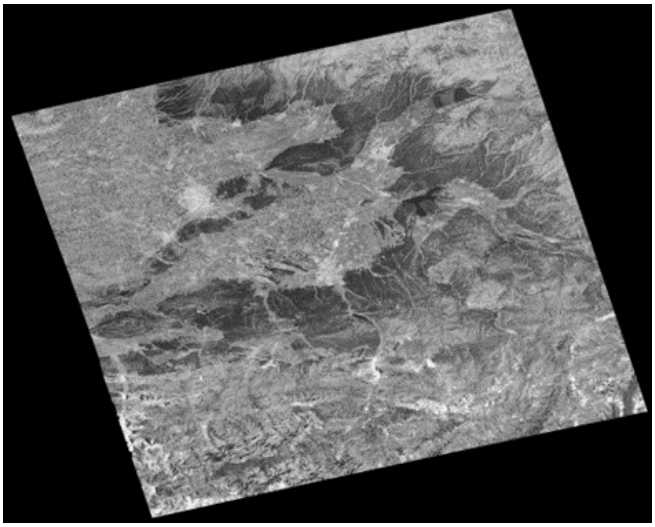
(3) Mudflow in Arstanbap, Kyrgyz on 23 July, 2024 (GLIDE Number MS-2024-000115-KGZ)
According to TuraNews, mudflow occurred on 23 July in the village of Arstanbap in the Bazar-Korgon district of Jalalabad Oblast in southwestern Kyrgyzstan. The powerful mudflow swept away 23 cars, flooded a hospital and a shopping center, destroyed 5 bridges, and damaged 1 kilometer of an inland road. The mudflows have had a significant impact on the country.
https://turanews.kz/en/news/mudflows-cause-over-1-1-billion-soms-in-damage-in-kyrgyzstan/

The Central Asian Institute of Applied Geosciences (CAIAG) made an EOR to Sentinel Asia on 24 July. This EOR was escalated to the International Disasters Charter. UNITAR assumed the role of Project Manager for this Charter activation.
Among DPNs, GISTDA, ISRO, and TASA provided data. Among DANs, MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240723KG.html

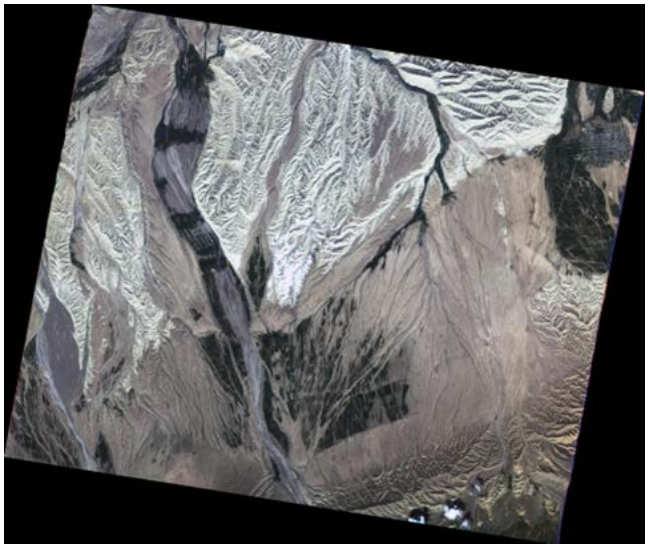
Value-Added Product by MBRSC



Post-disaster satellite image (THEOS1) provided by GISTDA



Post-disaster satellite image (RISAT-1A) provided by ISRO



Post-disaster satellite image (FORMOSAT-5) provided by TASA

(4) Oil Spill in Philippines on 25 July, 2024 (GLIDE Number TC-2024-000127-PHL)

GMA News Online reported that 1 person died after a motor tanker capsized and caused an oil spill in Bataan on 25 July, according to the Philippine Coast Guard (PCG).

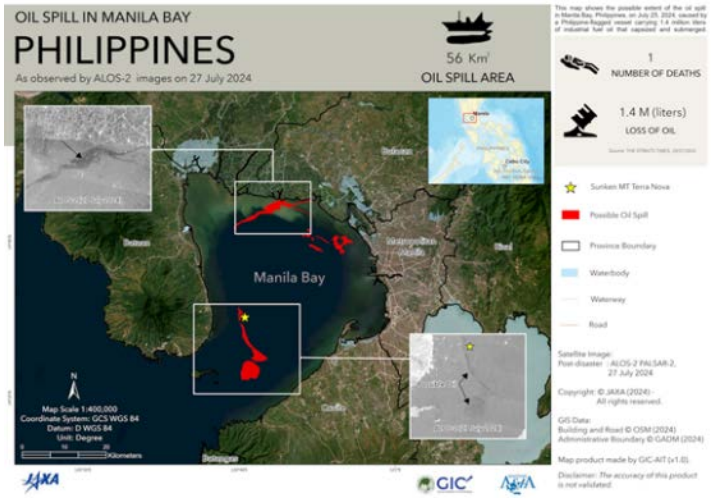
In a statement, a PCG spokesperson said the incident involving the tanker “MT Terra Nova” happened 3.6 nautical miles east off Lamao Point in Limay town.

Sixteen of the 17 crew on board have been rescued. MT Terra Nova, which was heading to Iloilo, was carrying 1.4 million liters of industrial fuel.

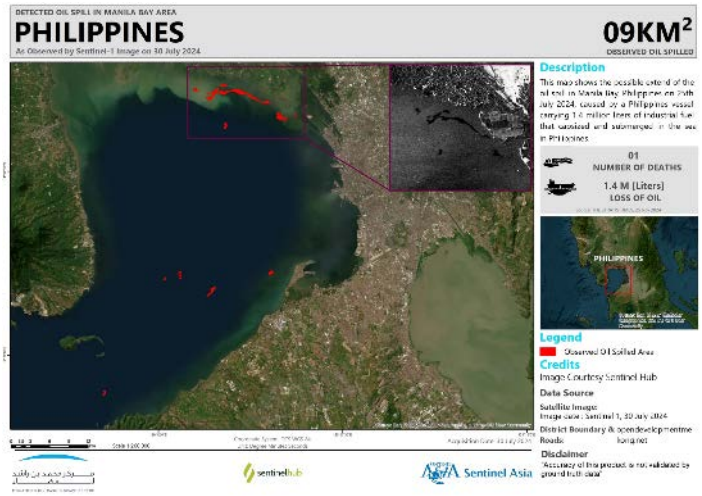
https://www.gmanetwork.com/news/topstories/regions/914672/oil-spill-bataan-capsized-motor-tanker/story/

PhilSA made an EOR to Sentinel Asia on 25 July. This EOR was escalated to the International Disasters Charter. PhilSA-SMCOD assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA and ISRO provided data. Among DANs, AIT, MBRSC, and PhilSA provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.

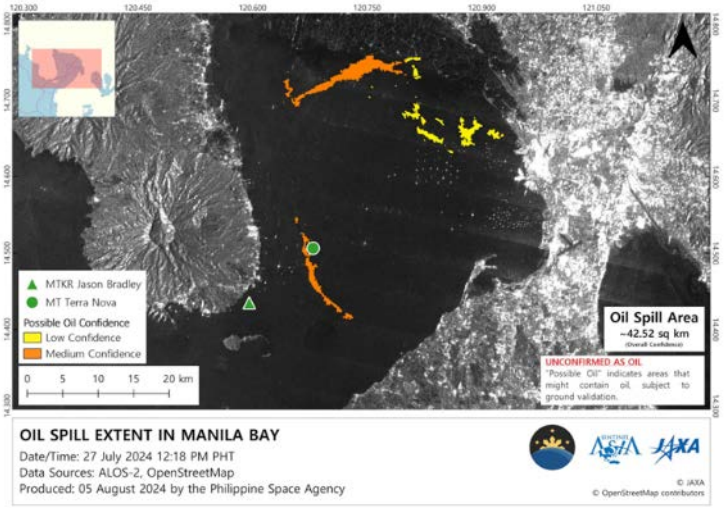
https://sentinel-asia.org/EO/2024/article20240725PH.html



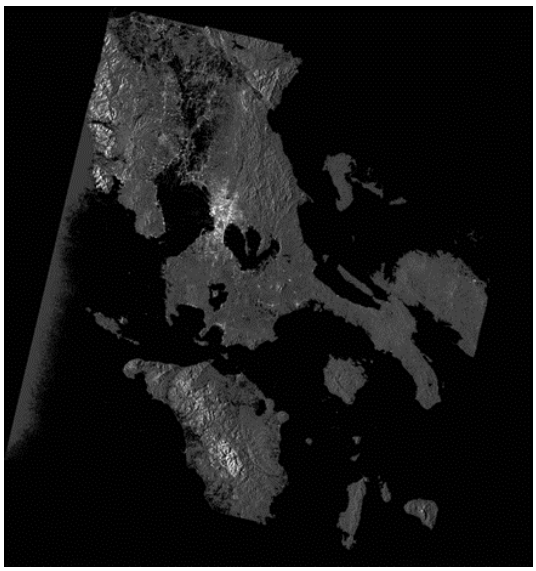
Value-Added Product by AIT



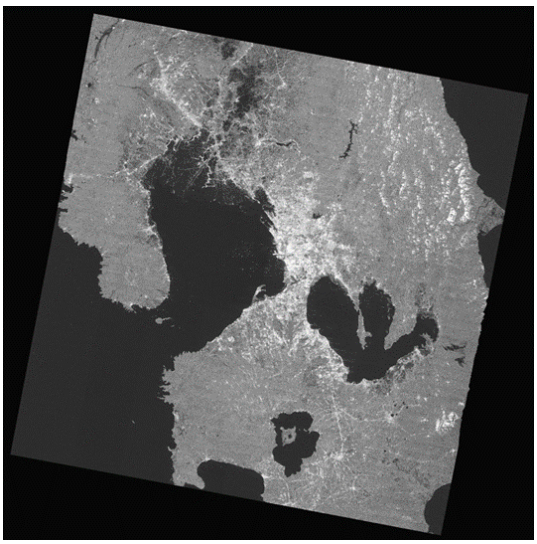
Value-Added Product by MBRSC



Value-Added Product by PhilSA



Post-disaster satellite image (ALOS-2) provided by JAXA

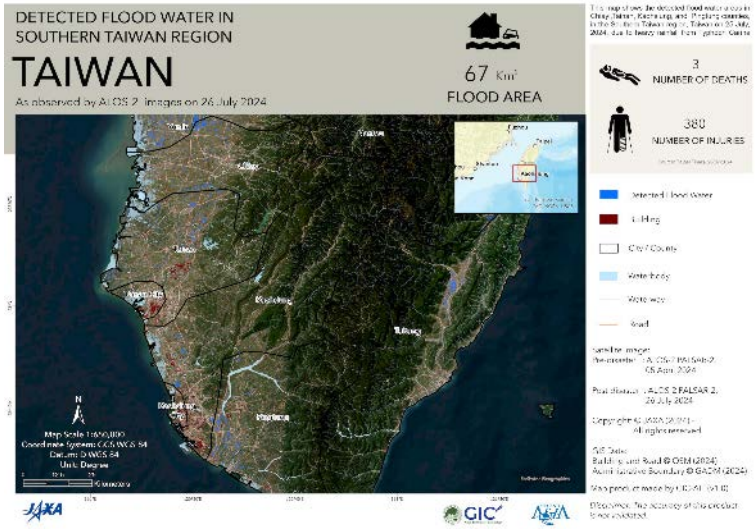


Post-disaster satellite image (RISAT-1A) provided by ISRO

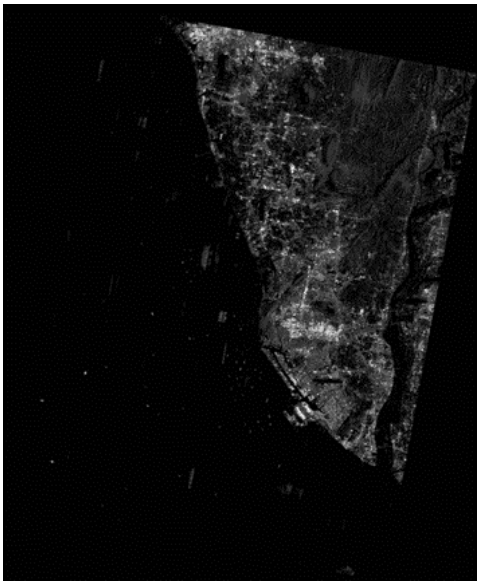
(5) Flood by Typhoon Gaemi in Taiwan on 25 July, 2024 (GLIDE Number TC-2024-000127-CHN)
According to Taiwan News, Typhoon Gaemi caused significant damage in Taiwan on 25 July. The typhoon led to severe flooding, landslides, and heavy rainfall, particularly affecting the southern regions. Three people lost their lives, and hundreds were injured. The storm also caused power outages to over 700,000 homes and disrupted water supply to many areas.
https://www.taiwannews.com.tw/news/5907938

Taiwan Space Agency (TASA) made an EOR to Sentinel Asia on 25 July. Among DPNs, JAXA and ISRO provided data. Among DANs, JAXA, MBRSC, and AIT provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240725TW.html

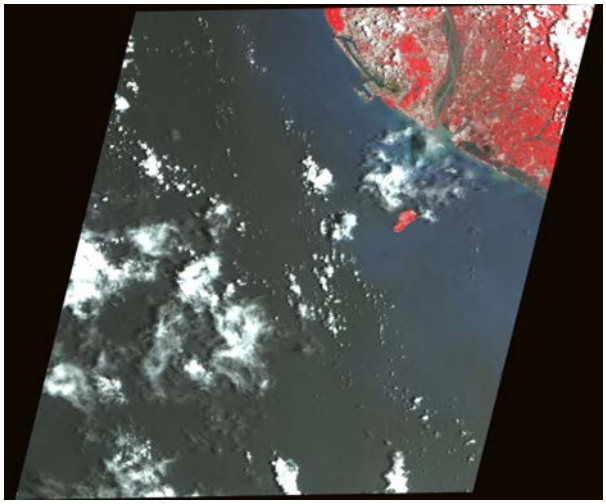
Value-Added Product by MBRSC



Value-Added Product by AIT



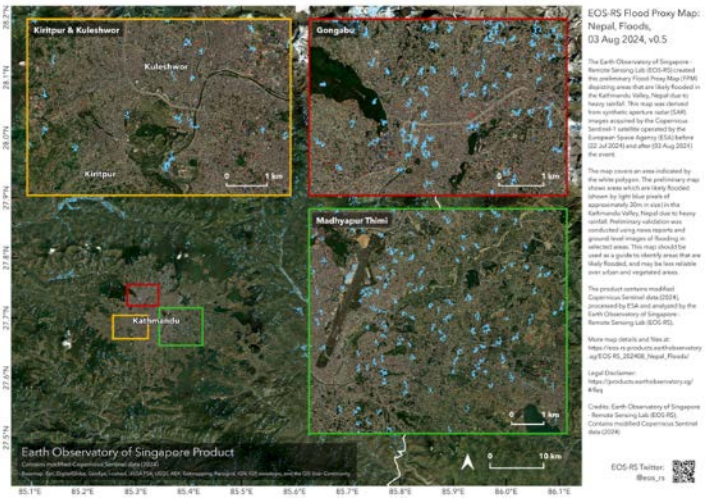
Post-disaster satellite image (ALOS-2) provided by JAXA



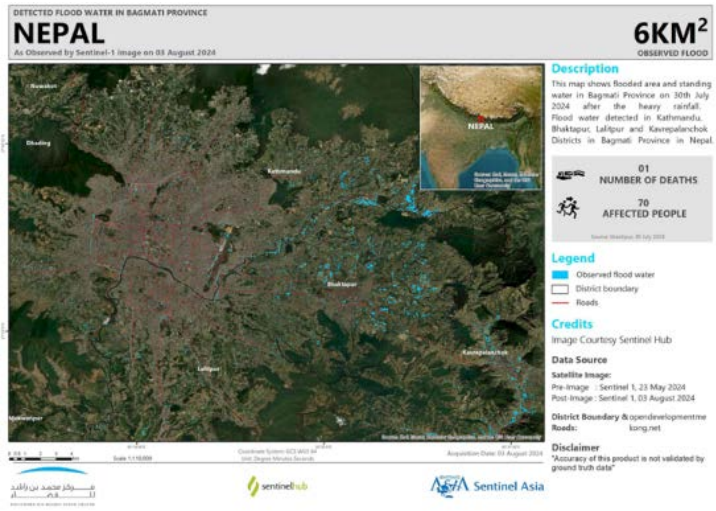
Post-disaster satellite image (Resourcesat-2A) provided by ISRO

(6) Flood in Kathmandu, Nepal on 30 July, 2024 (GLIDE Number FL-2024-000132-NPL)
Floods in Kathmandu Province, Nepal on 30 July caused significant destruction. According to myRepública, heavy rains caused river flooding affecting the lives of people in Kathmandu. Nepal Police spokesman said 12 people were rescued from Kathmandu and 24 from Lalitpur.
https://myrepublica.nagariknetwork.com/news/36-people-rescued-from-kathmandu-flood/

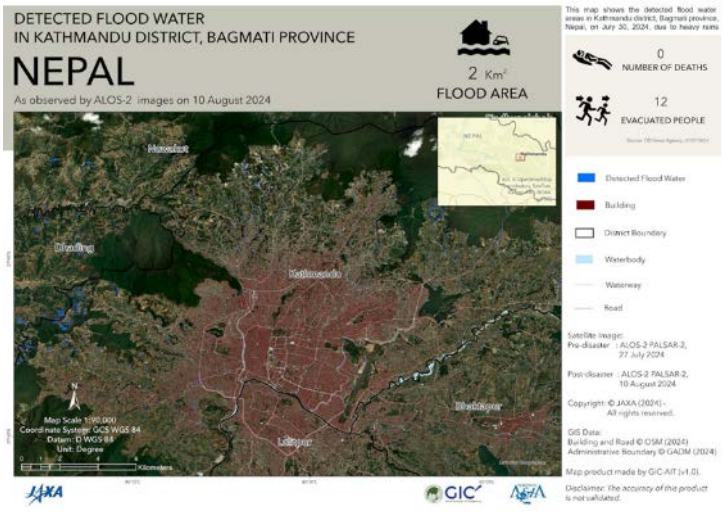
The Department of Hydrology and Meteorology (DHM) and the Ministry of Energy, Water Resources and Irrigation of Nepal made an EOR to Sentinel Asia on 5 August. Among DPNs, JAXA and ISRO provided data. Among DANs, EOS, JAXA, MBRSC, and AIT provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240730NP.html



Value-Added Product by EOS



Value-Added Product by MBRSC



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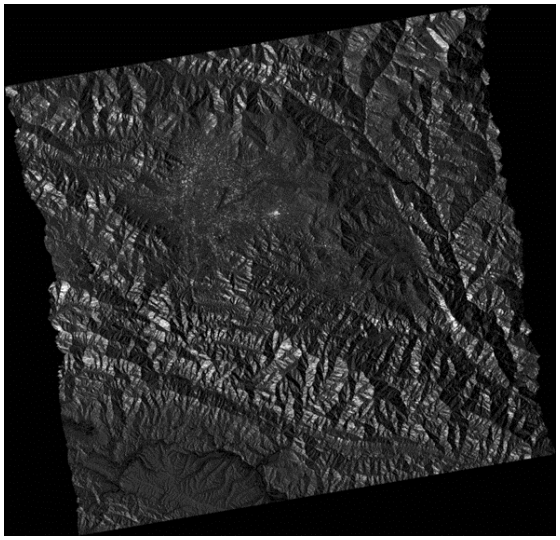
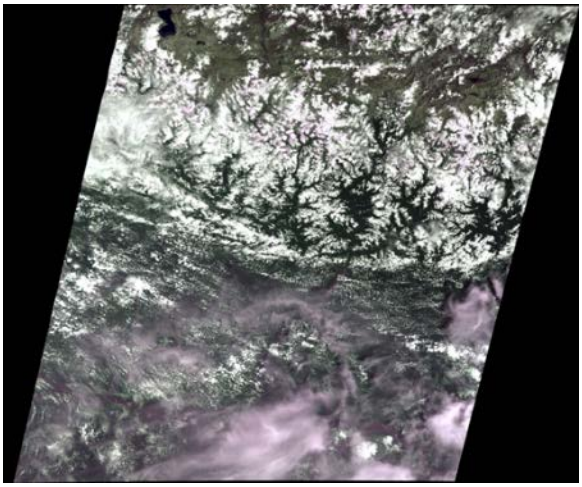


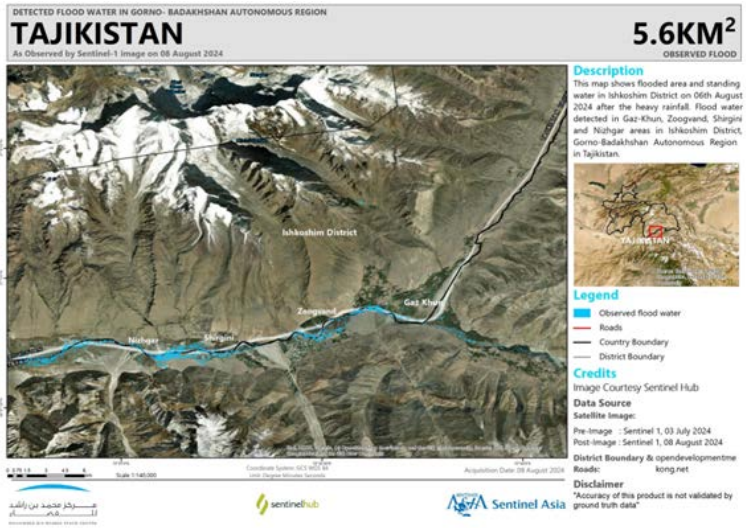
Post-disaster satellite image (ALOS-2) provided by JAXA



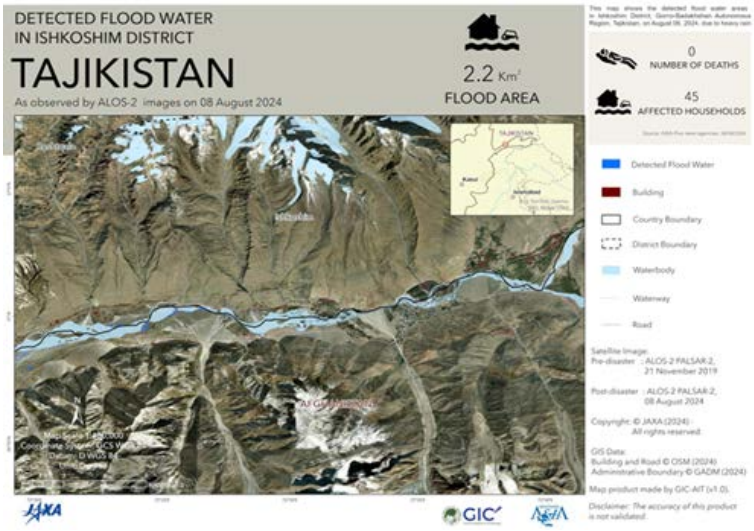
Post-disaster satellite image (ResourceSat-2A) provided by ISRO

(7) Flood and Landslide in Tajikistan on 6 August, 2024 (GLIDE Number FL-2024-000133-TJK)
Bomdod reported that due to the rise in temperature, in Zugvand Zong village, Ishkoshim district, Kuhiston Autonomous Region, Badakhshan the water level in the river of this mountain village rose significantly, and tens of houses, yards, gardens, and roads of Zugvand residents were destroyed. was under water. According to the Committee of Emergency Situations and Civil Defense, no one was injured due to this natural disaster, but 45 families were temporarily moved to safer places.
https://www.bomdod.com/2024/08/06/seli-saht-dar-dehai-zugvandi-nohijai-ishkoshim-dahho-honaro-zeri-ob-kard-video/

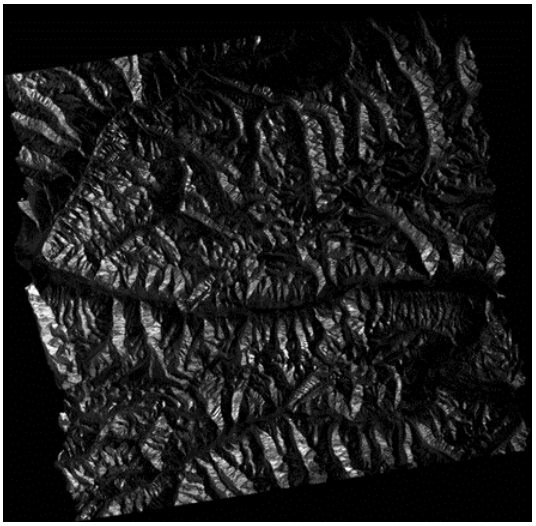
The UN World Food Programme (WFP) made an EOR to Sentinel Asia on 6 August. Among DPNs, JAXA, ISRO, and TASA provided data. Among DANs, JAXA, MBRSC, and AIT provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240806TJ.html



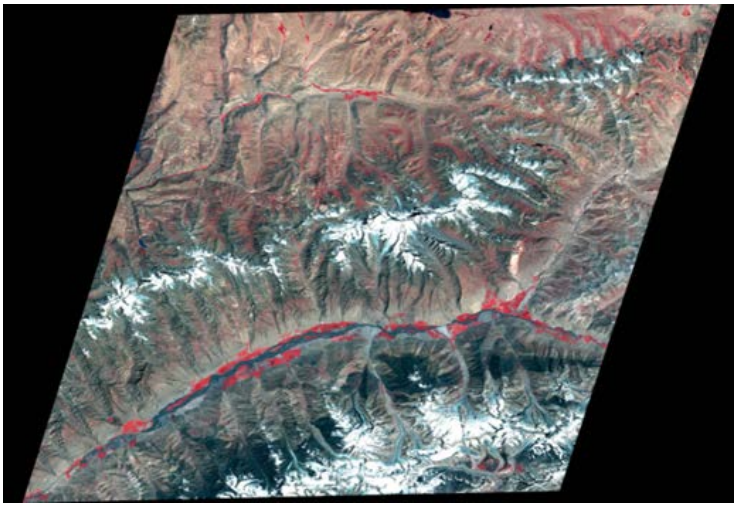
Value-Added Product by MBRSC



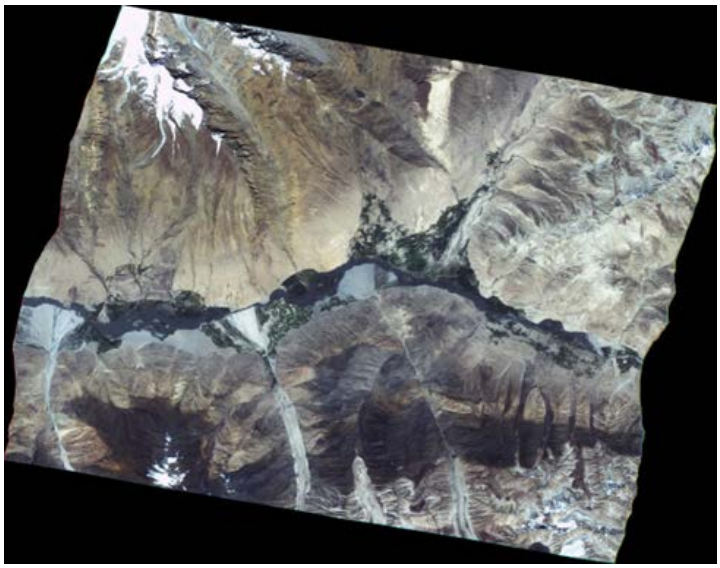
Value-Added Product by AIT



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (Resourcesat-2A) provided by ISRO

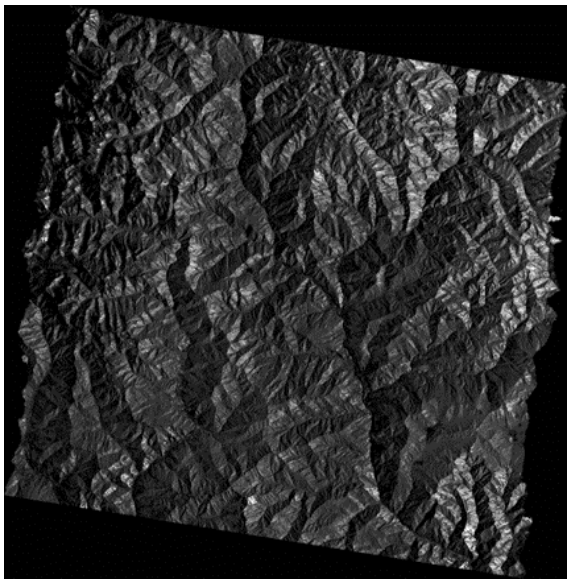


Post-disaster satellite image (FORMOSAT-5) provided by TASA

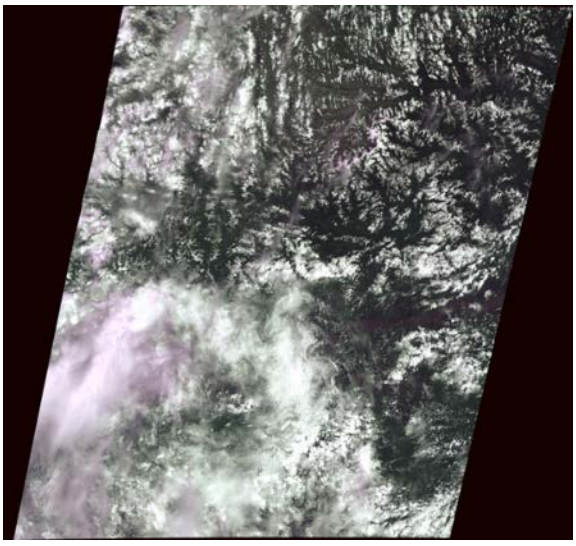
(8) Flood and Landslide in Bhutan on 10 August, 2024 (GLIDE Number FL-2024-000140-BTN)
According to The Bhutan Live, a severe flood struck Dechencholing in Thimphu on 10 August. The disaster, attributed to a convective thunderstorm, left about 30 homes affected and about 70 households displaced. The flood also caused significant damage to about 15 vehicles.
https://thebhutanlive.com/nation/dechencholing-devastated-by-flood-community-rallies-for-relief/

The National Center for Hydrology and Meteorology (NCHM) of Bhutan made an EOR to Sentinel Asia on 10 August. Among DPNs, JAXA, ISRO, and TASA provided data. Among DANs, JAXA, EOS, MBRSC, and AIT provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240810BT.html

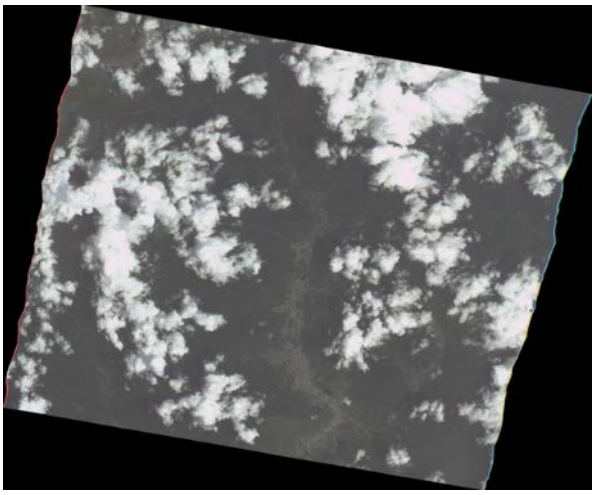
Value-Added Product by EOS



Post-disaster satellite image (ALOS-2) provided by JAXA



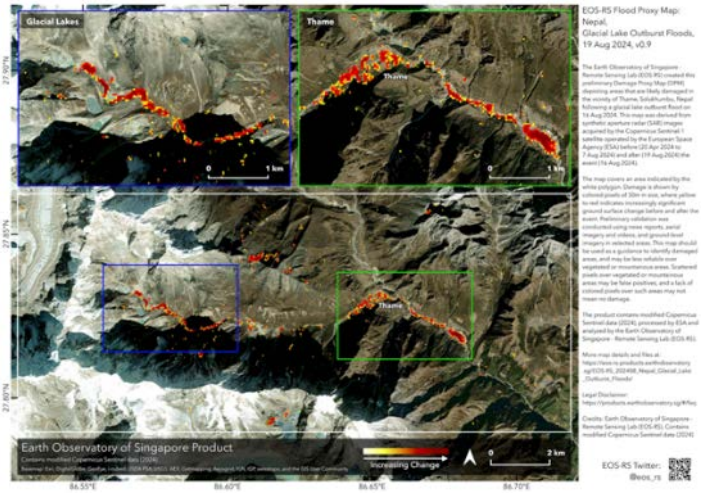
Post-disaster satellite image (Resourcesat-2A) provided by ISRO



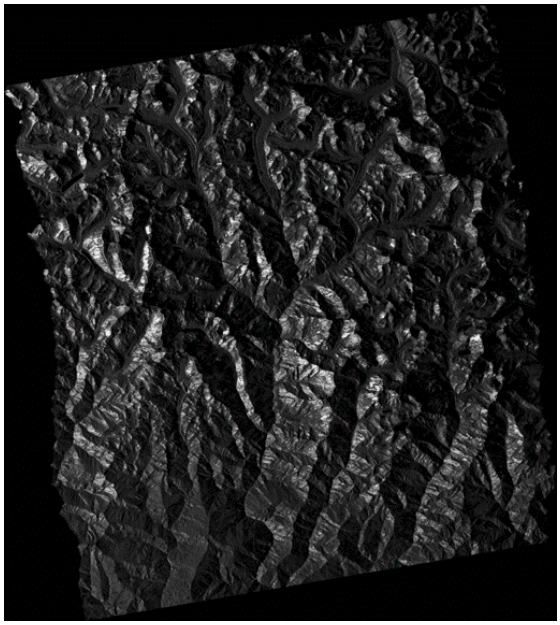
Post-disaster satellite image (FORMOSAT-5) provided by TASA

(9) GLOF in Solukhumbu, Nepal on 16 August, 2024 (GLIDE Number FL-2024-000146-NPL)
According to The Kathmandu Post, in an unusual flooding event in the Everest region, the swollen Thame River destroyed 12 houses, including a school and a hotel, in ward 5 of Khumbu Pasang Lhamu Rural Municipality in Solukhumbu District on 16 August. A local resident went missing in the flood, police said.
https://kathmandupost.com/national/2024/08/16/flood-in-solukhumbu-destroys-12-houses

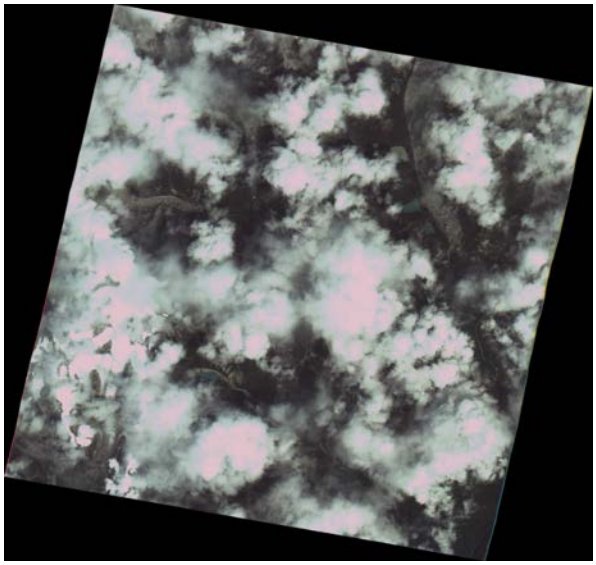
DHM, Ministry of Energy, and Water Resources and Irrigation made an EOR to Sentinel Asia on 16 August. This EOR was escalated to the International Disasters Charter. ICIMOD assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA and TASA provided data. Among DANs, EOS and JAXA provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240816NP.html



Value-Added Product by EOS



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA

(10) Mudflows flood in the Issyk-Kul district, Kyrgyz on 18 August, 2024 (GLIDE Number MS-2024-000151-KGZ)

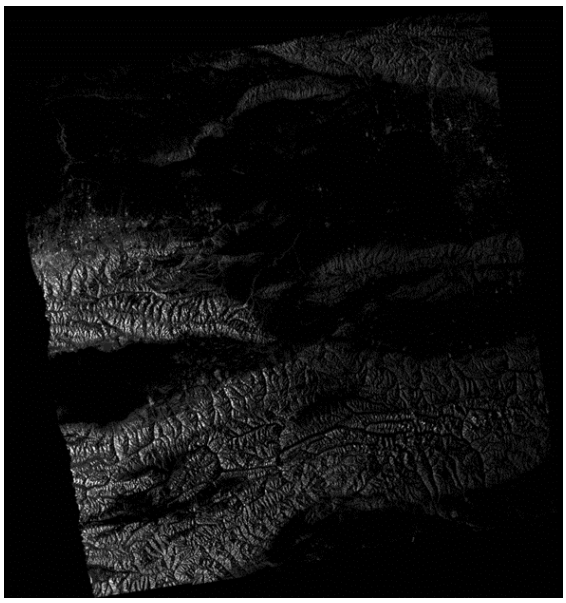
Mudslides and floods caused by heavy rains damaged hundreds of houses in towns and villages around Kyrgyzstan's resort region of Issyk-Kul on 18 August.

According to Current Time, in the Issyk-Kul region of Kyrgyzstan, more than 100 houses were flooded as a result of mudflows. This was reported by the Kyrgyz service Radio Liberty with reference to the press service of the Ministry of Emergency Situations.

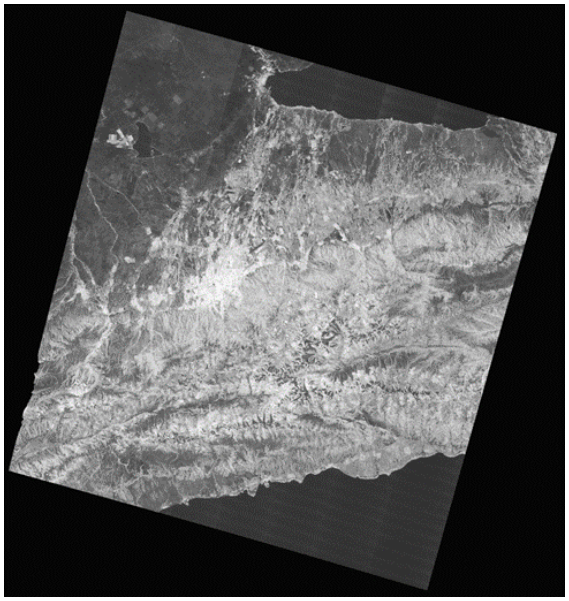
https://www.currenttime.tv/a/kyrgyzstan-seli/33083971.html

CAIAG made an EOR to Sentinel Asia on 20 August. This EOR was escalated to the International Disasters Charter. AIT assumed the role of Project Manager for this Charter

activation. Among DPNs, JAXA and ISRO provided data. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240818KG.html



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04 SAR) provided by ISRO

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2. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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3. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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Sentinel Asia Project Office
Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)
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E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

** September 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 27 September)
2. How to send an Emergency Observation Request
3. Using Sentinel Asia Operation System, OPTEMIS

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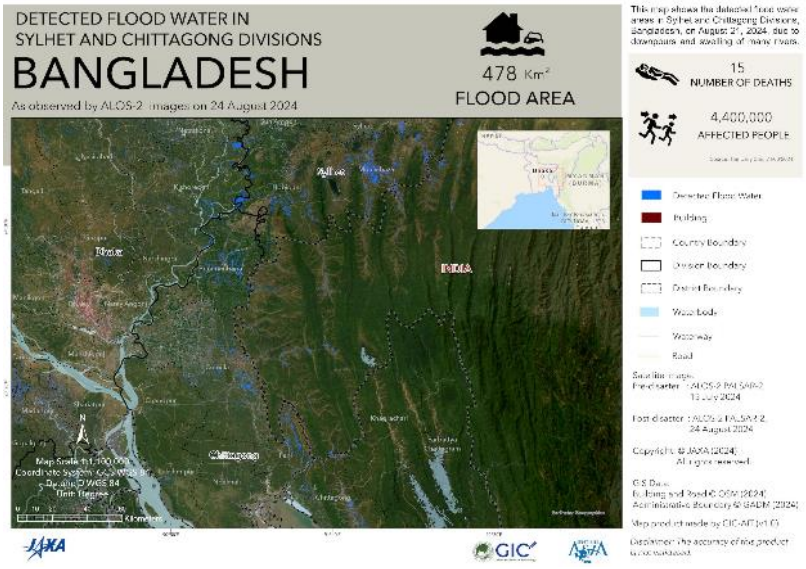
1. [News] Emergency Observation of Disasters (as of 27 September)

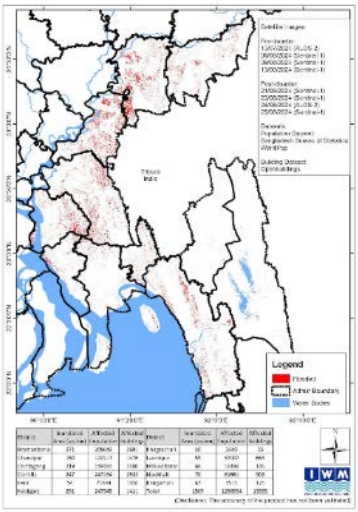
(1) Flood in Bangladesh on 21 August, 2024 (GLIDE Number FL-2024-000088-BGD)

On 21 August, the Daily Star reported that more than 1.9 million people were stranded in Noakhali, Bangladesh, due to flooding caused by incessant rains and rising water levels in several rivers, including the Chhota Feni river.
https://www.thedailystar.net/environment/climate-crisis/natural-disaster/news/3-million-stranded-flood-hits-eight-districts-3683166

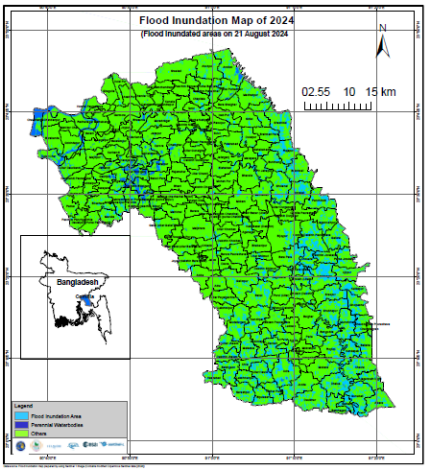
The Bangladesh Water Development Board (BWDB) made an Emergency Observation Request (EOR) to Sentinel Asia on 22 August. Among Data Provider Nodes (DPNs), JAXA, ISRO, and TASA provided data. Among Data Analysis Nodes (DANs), AIT, IWM, ICIMOD, and MBRSC provided their Value-Added Products (VAPs).
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240821BD.html



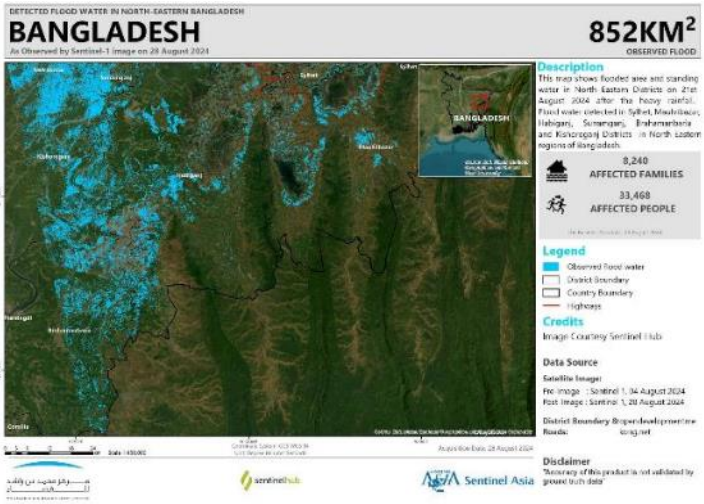
Value-Added Product by AIT



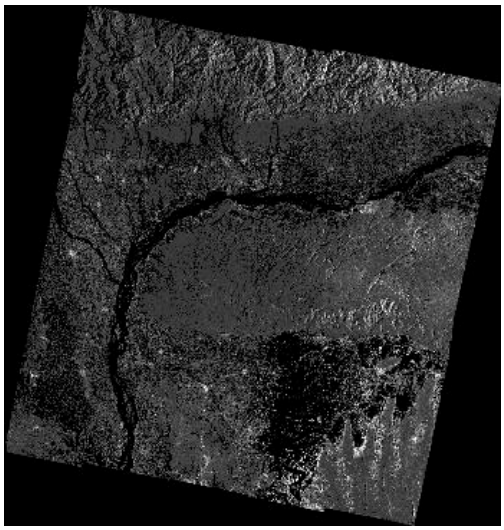
Value-Added Product by IWM



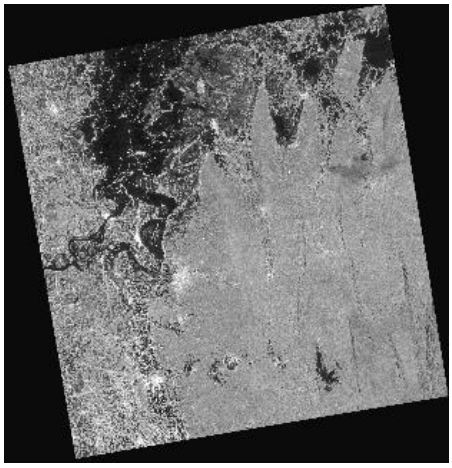
Value-Added Product by ICIMOD



Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



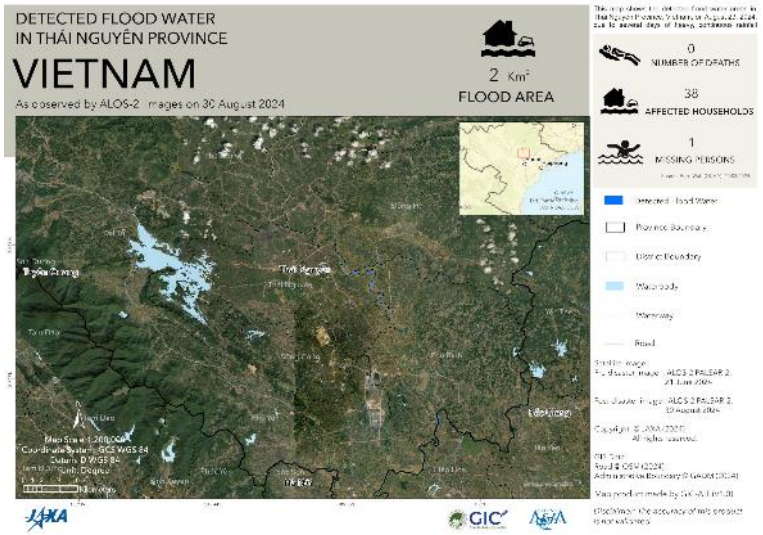
Post-disaster satellite image (EOS-04 SAR) provided by ISRO

Post-disaster satellite image (FORMOSAT-5) provided by TASA

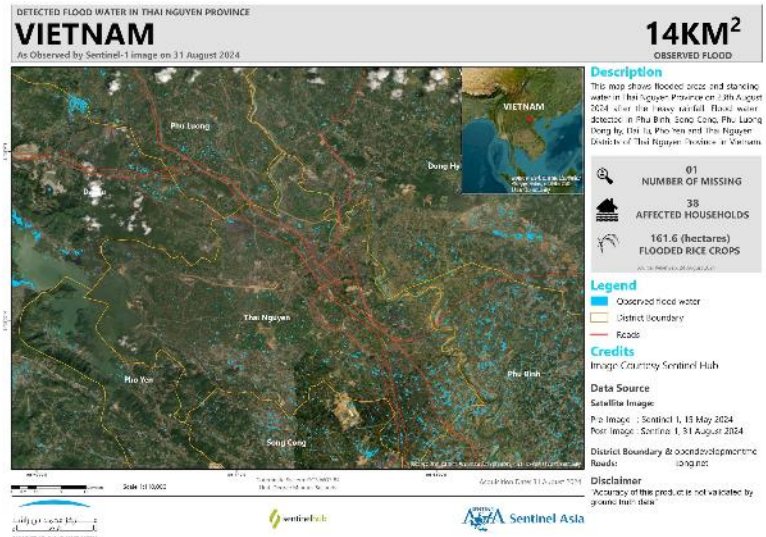
(2) Flood and Landslide in Thai Nguyen City, Vietnam, on 23 August, 2024 (GLIDE Number FL-2024-000155-VNM)

According to VNEXPRESS, heavy rains that have been falling since 22 August have caused water levels to rise sharply in Thai Nguyen of Vietnam, with several major roads submerged in 40-60 cm of water.
https://e.vnexpress.net/news/news/environment/cars-swept-away-by-floods-after-heavy-rains-batter-northern-vietnam-4784741.html

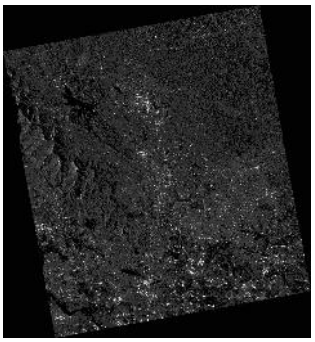
The Ministry of Natural Resources and Environment of Vietnam (MONRE) made an EOR to Sentinel Asia on 23 August. Among DPNs, JAXA, GISTDA, CRISP, and TASA provided data. Among DANs, JAXA, AIT, and MBRSC provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240823VN.html



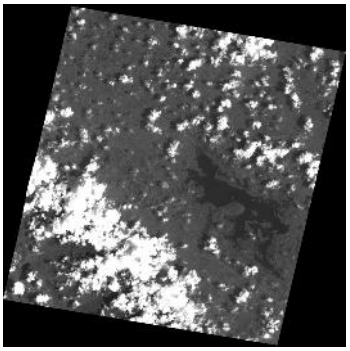
Value-Added Product by AIT



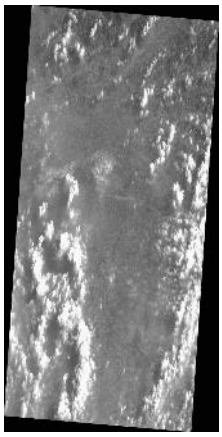
Value-Added Product by MBRSC



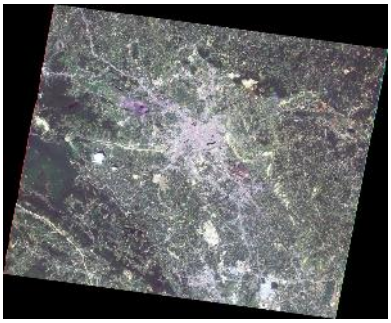
Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (THEOS1) provided by GISTDA



Post-disaster satellite image (TELEOS-1) provided by CRISP

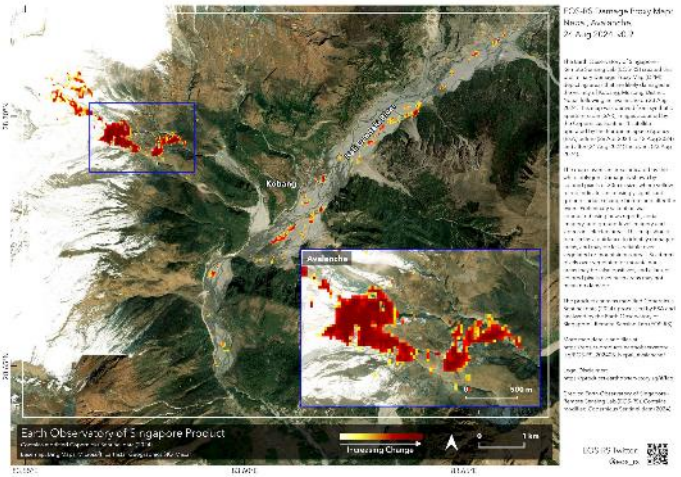


Post-disaster satellite image (FORMOSAT-5) provided by TASA

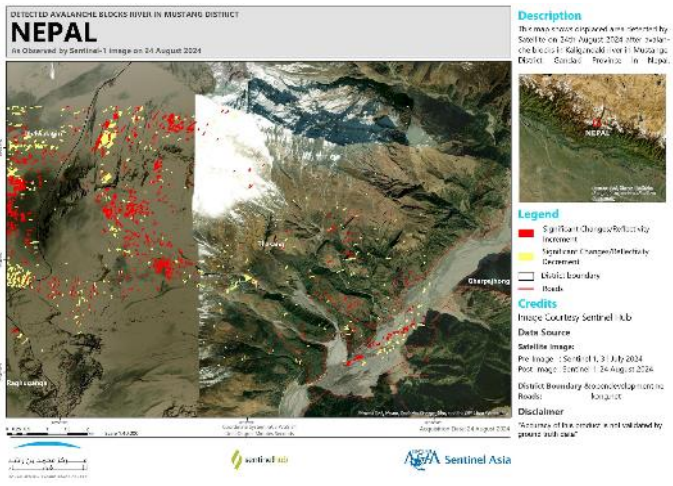
(3) Avalanche blocks Boksi River in Mustang, Nepal, on 23 August, 2024 (GLIDE Number AV-2024-000157-NPL)

As reported in the Kathmandu Post, an avalanche from the Dhaulagiri Icefall blocked about 80% of the flow of the Boksikhola on 23 August. There is no immediate danger, but if the lake created by the avalanche breaks, flash flooding could occur downstream.
https://kathmandupost.com/national/2024/08/23/avalanche-blocks-river-in-mustang

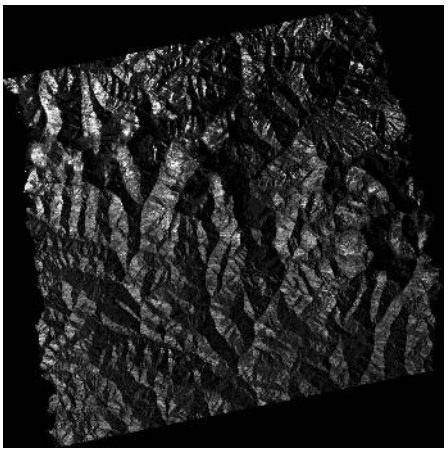
The department of Hydrology and Meteorology (DHM), Ministry of Energy, Water Resources and Irrigation (MoEWRI) made an EOR to Sentinel Asia on 24 August. Among DPNs, JAXA provided data. Among DANs, EOS, JAXA, and MBRSC provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240823NP.html



Value-Added Product by EOS



Value-Added Product by MBRSC

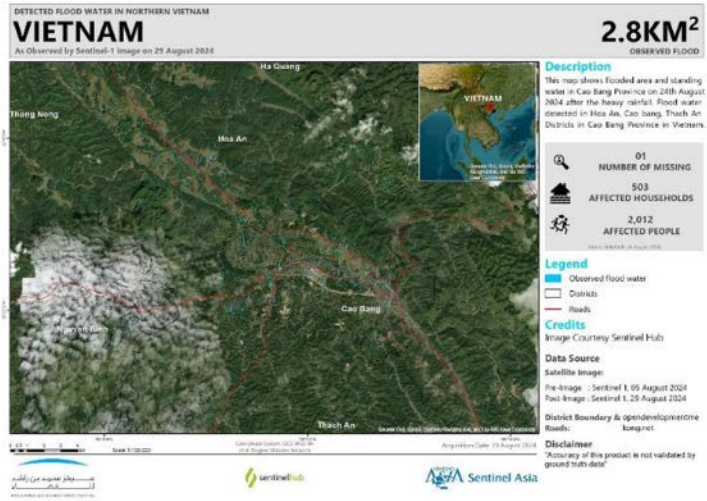


Post-disaster satellite image (ALOS-2) provided by JAXA

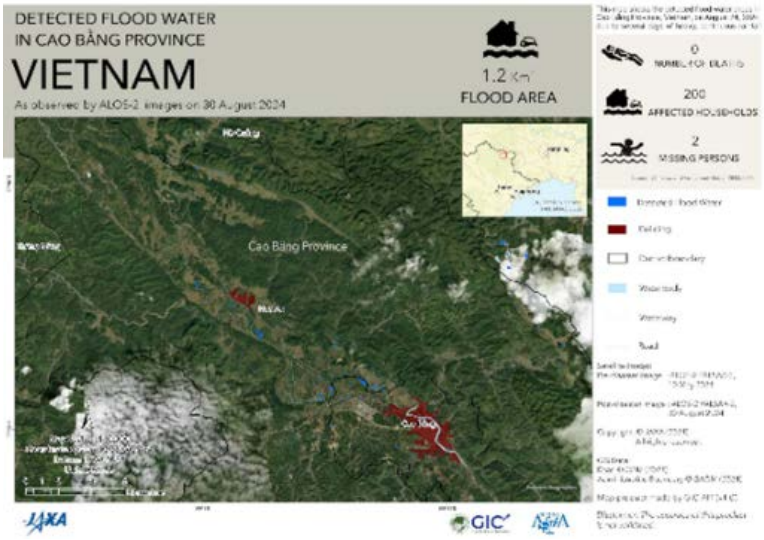
(4) Flood and Landslide in Cao Bang City, Vietnam, on 24 August, 2024 (GLIDE Number FL-2024-000155-VNM)

VietNamNet reported that the Cao Bang city in Vietnam was hit by heavy flooding due to torrential rains that began on 23 August, damaging more than 190 houses and about 400 hectares of crops and vegetation.
https://vietnamnet.vn/en/cao-bang-city-faces-largest-flood-in-two-decades-nearly-200-homes-submerged-2315581.html

The Ministry of Natural Resources and Environment of Vietnam (MONRE) made an EOR to Sentinel Asia on 27 August. Among DPNs, JAXA, GISTDA, and ISRO provided data. Among DANs, MBRSC and AIT provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240824VN.html



Value-Added Product by MBRSC



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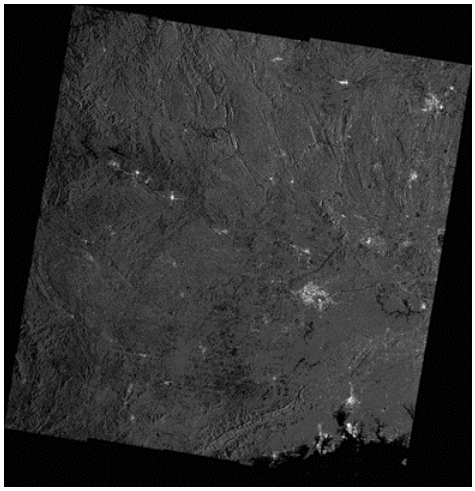
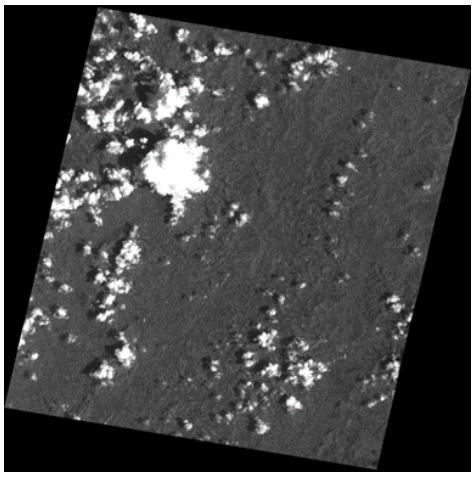
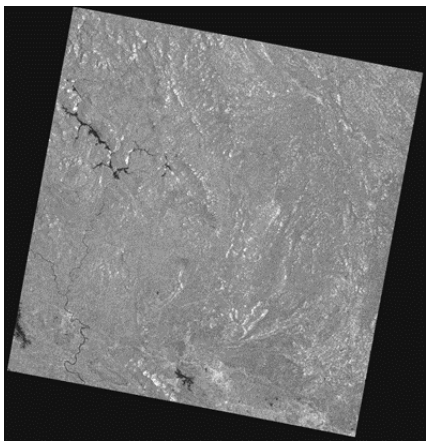


Post-disaster satellite image (ALOS-2) provided by JAXA



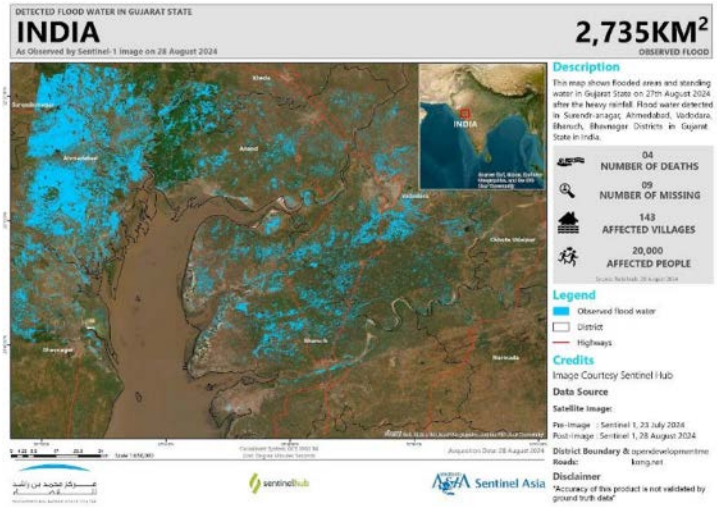
Post-disaster satellite image (THEOS1) provided by GISTDA



Post-disaster satellite image (EOS-04 SAR) provided by ISRO

(5) Flood in Gujarat State, India, on 27 August, 2024 (GLIDE Number FL-2024-000109-IND)
In Gujarat State of India, flooding caused by continuous rains has forced around 40,000 people to evacuate affected areas, and the death toll from rain-related incidents had risen to 28 as of 29 August, according to the Hindustan Times.
https://www.hindustantimes.com/india-news/gujarat-flood-toll-rises-to-28-with-over-40-000-displaced-101724870697067.html

The ISRO made an EOR to Sentinel Asia on 29 August. Among DPNs, JAXA and TASA provided data. Among DANs, MBRSC and AIT provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240827IN.html



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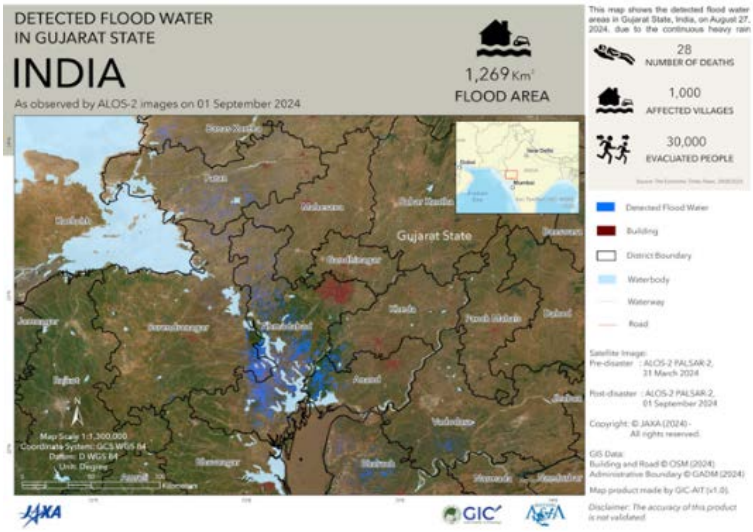

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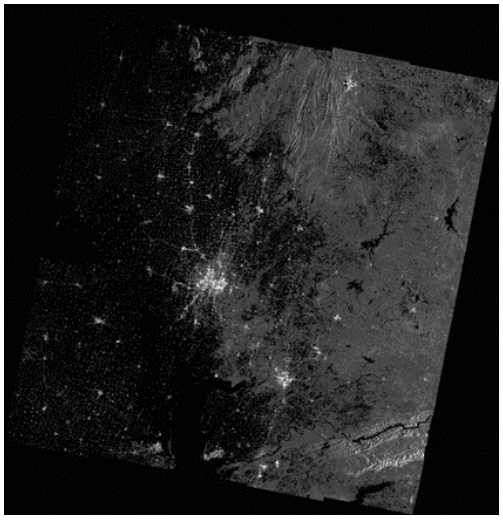
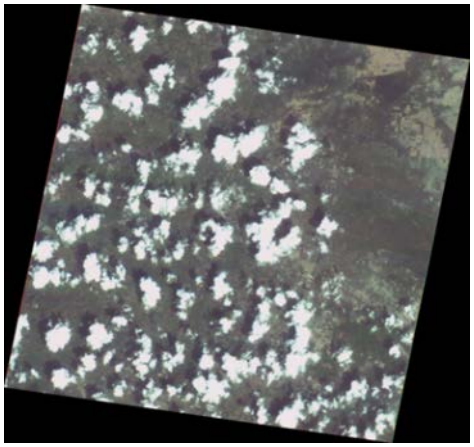


Post-disaster satellite image (ALOS-2) provided by JAXA

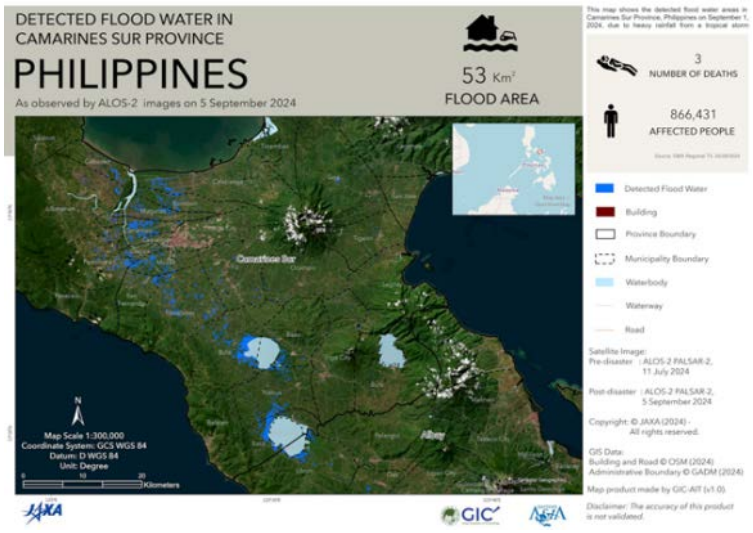


Post-disaster satellite image (FORMOSAT-5) provided by TASA

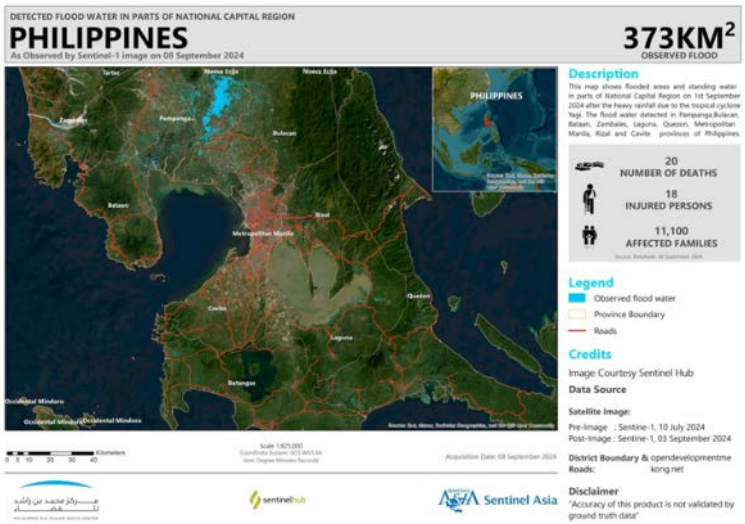
(6) Tropical Storm Floods in Philippines on 1 September, 2024 (GLIDE Number TC-2024-000161-PHL)

Tropical Storm Yagi caused flooding and other devastation across much of the Philippines, leaving at least 10 people dead in Calabarzon, Central Visayas, and Western Visayas as of 1 September, according to the Cebu Daily News.
https://cebudailynews.inquirer.net/593103/live-updates-enteng

The Philippine Space Agency (PhilSA) made an EOR to Sentinel Asia on 2 September. Among DPNs, JAXA, ISRO, and TASA provided data. Among DANs, AIT and MBRSC provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240901PH.html

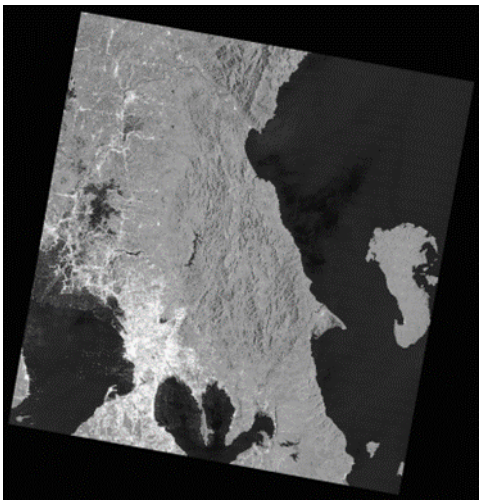


Value-Added Product by AIT

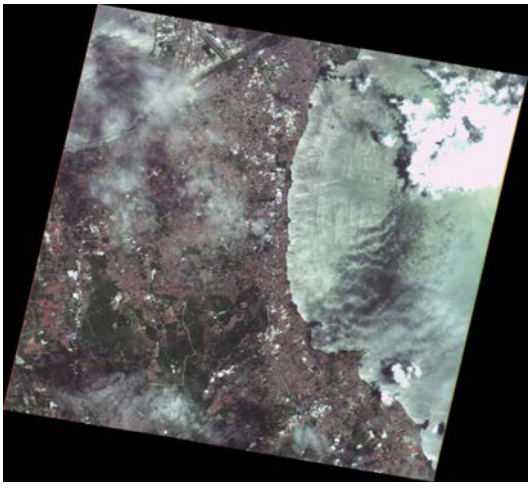


Value-Added Product by MBRSC

Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04 SAR) provided by ISRO

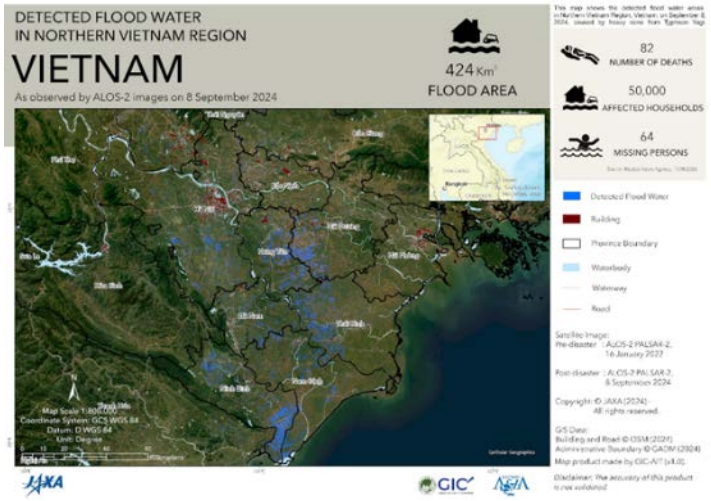


Post-disaster satellite image (FORMOSAT-5) provided by TASA

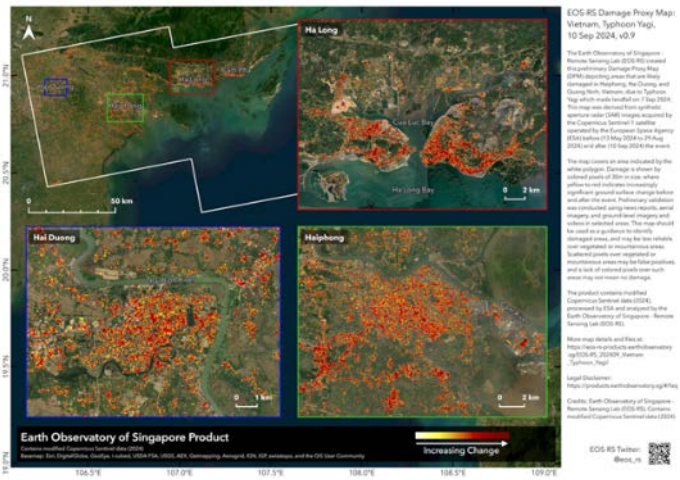
(7) Tropical Storm Floods in Vietnam on 8 September, 2024 (GLIDE Number TC-2024-000161-VNM)

VNExpress reported that Tropical Storm Yagi entered Vietnamese waters on 3 September, and since its landfall has caused torrential rains, flooding, and landslides in the north, including the capital Hanoi. As of 11 September, the death toll from the storm had risen to 197, with 128 people remaining missing.
https://e.vnexpress.net/photo/environment/650-rescuers-dig-through-mud-for-victims-as-flash-flood-wipes-out-lao-cai-village-4791977.html

The Ministry of Natural Resources and Environment of Vietnam (MONRE) made an EOR to Sentinel Asia on 4 September. This EOR was escalated to the International Disasters Charter. MONRE assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA provided data. Among DANs, JAXA, AIT, EOS, and MBRSC provided their VAPs. Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240908VN.html



Value-Added Product by AIT



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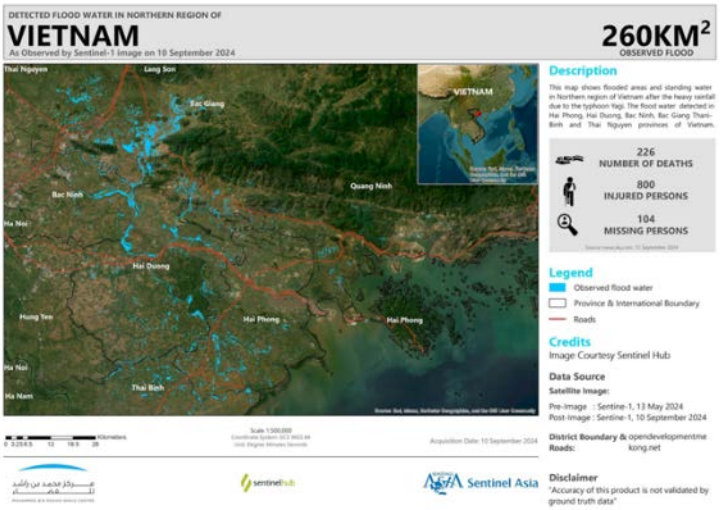
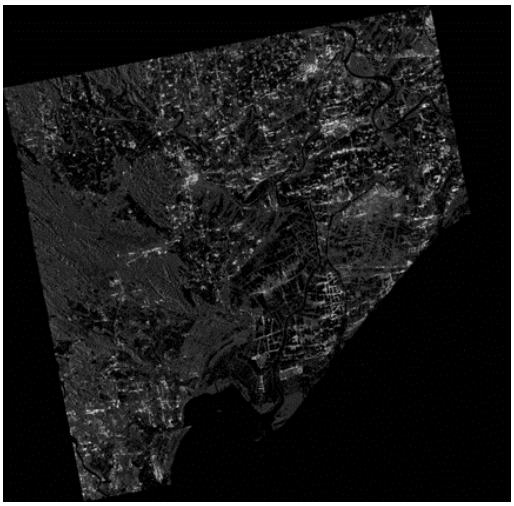


Value-Added Product by MBRSC

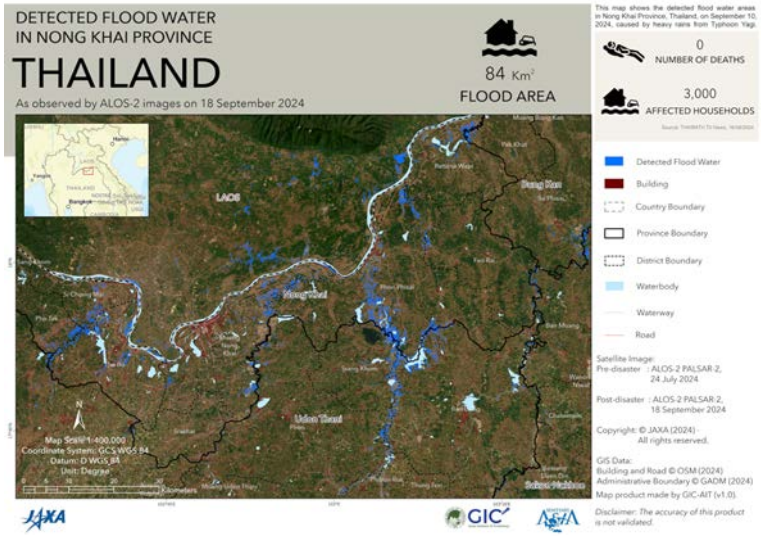


Post-disaster satellite image (ALOS-2) provided by JAXA

(8) Flood in Northern Thailand, Thailand, on 10 September, 2024 (GLIDE Number TC-2024-000161-THA)

According to the Bangkok Post, prolonged rains have caused river overflows, floods, and landslides in the northern provinces of Chiang Rai and Chiang Mai, killing at least six people as of 12 September.
https://www.bangkokpost.com/thailand/general/2863563/deadly-landslides-floods-in-storm-hit-north

The Geo-Informatics and Space Technology Development Agency (GISTDA) made an EOR to Sentinel Asia on 12 September. Among DPNs, JAXA, TASA, ISRO, and MBRSC provided data. Among DANs, AIT and MBRSC provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240910TH.html



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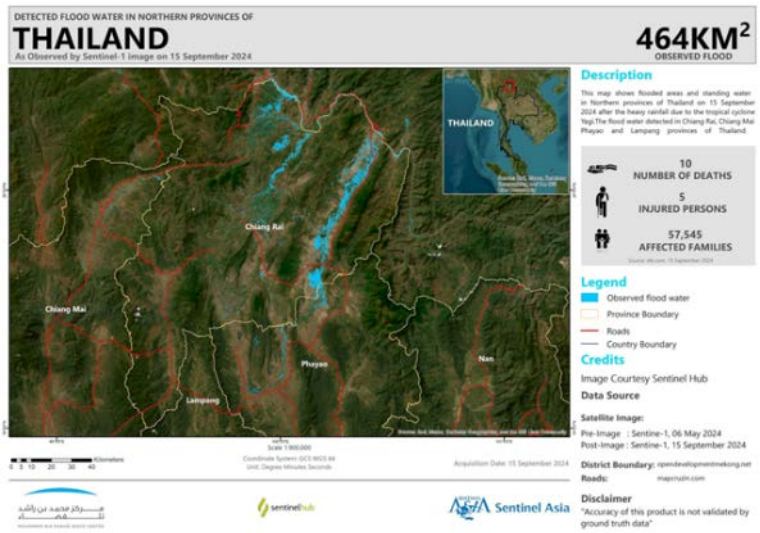
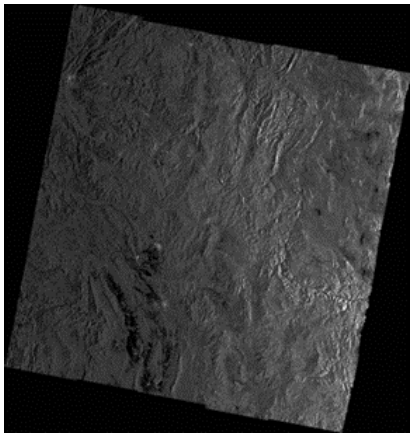
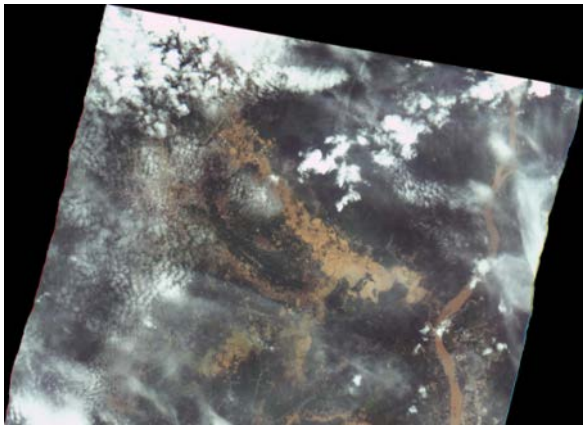


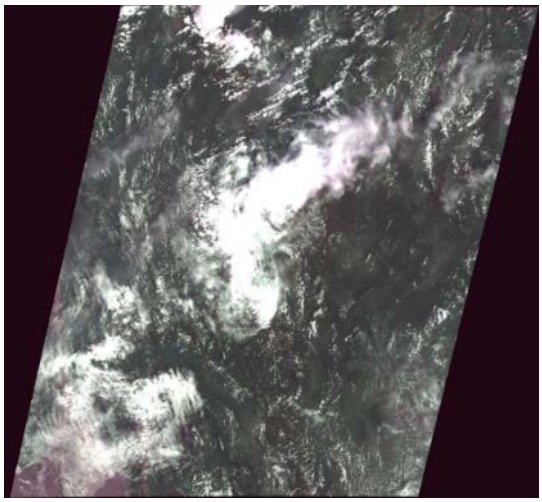
Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA



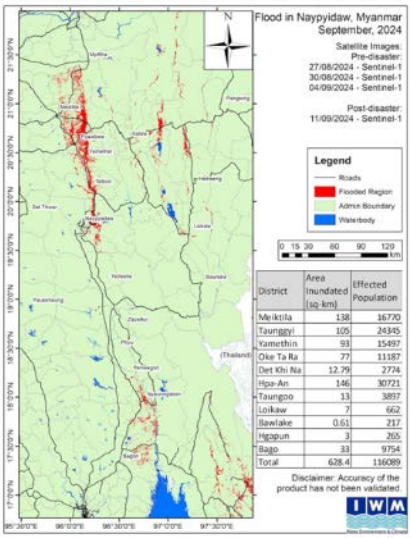
Post-disaster satellite image (Resourcesat-2) provided by ISRO

Post-disaster satellite image (KhalifaSat) provided by MBRSC

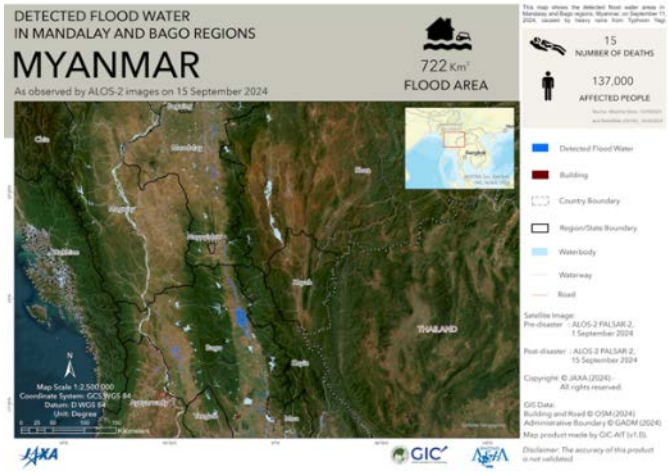
(9) Flood in Naypyidaw, Myanmar, on 11 September, 2024 (GLIDE Number TC-2024-000161-MMR)

Tropical Storm Yagi, the strongest storm to hit Asia so far this year, weakened to a tropical depression after making landfall and dumped heavy rains over eastern and central Myanmar on 10 September, causing severe flooding in Shan State, Kayah State, and Naypyidaw, Burma News reported. In Shan State, more than 170 villages around Inle lake were inundated.
https://www.bnionline.net/en/news/more-170-villages-around-inle-lake-flooded

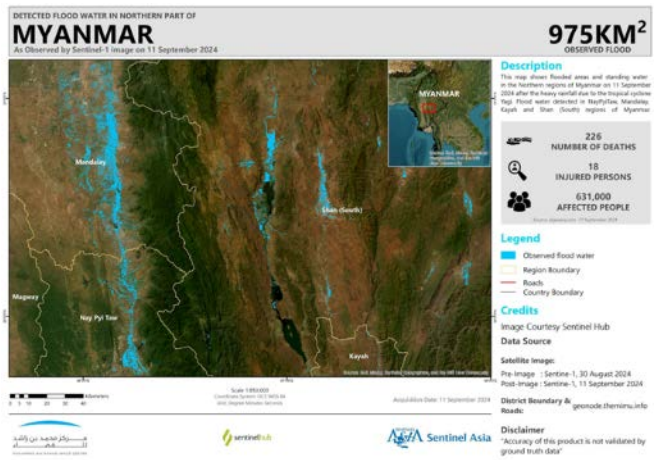
The Myanmar Information Management Unit (MIMU) made an EOR to Sentinel Asia on 12 September. Among DPNs, JAXA, TASA, ISRO, and CRISP provided data. Among DANs, IWM, AIT, MBRSC, EOS, and WFP provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240911MM.html



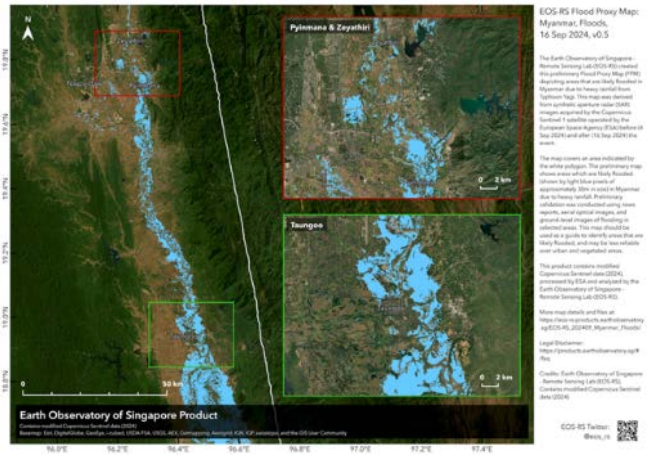
Value-Added Product by IWM



Value-Added Product by AIT



Value-Added Product by MBRSC



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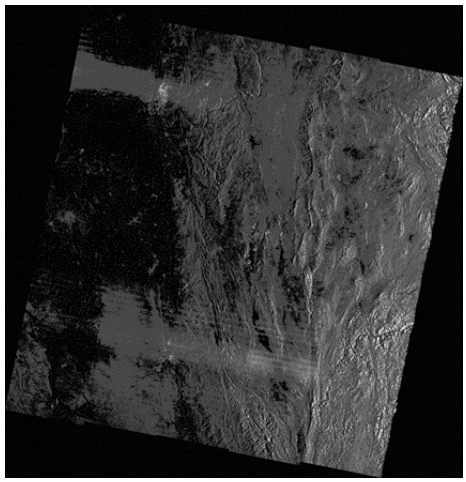
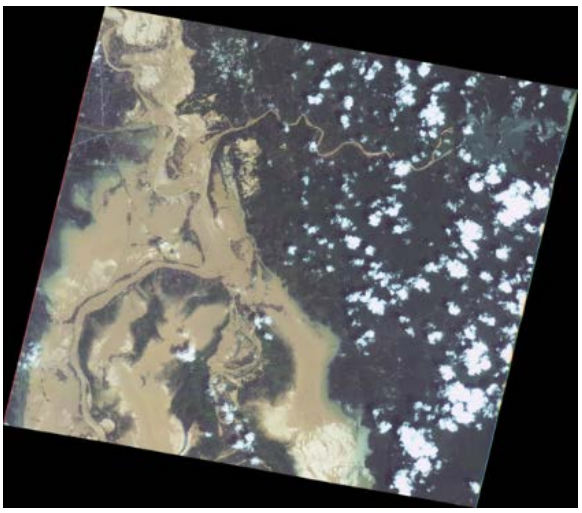
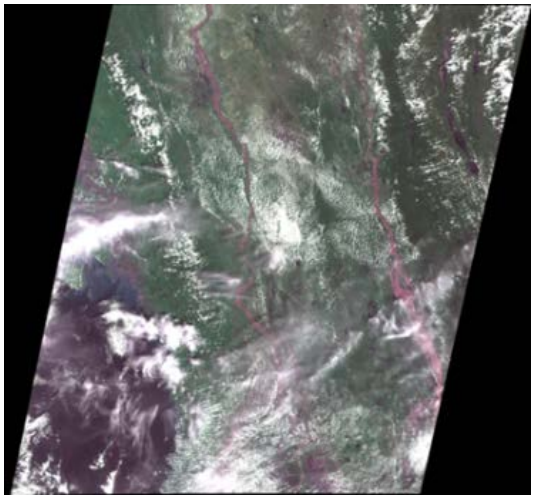


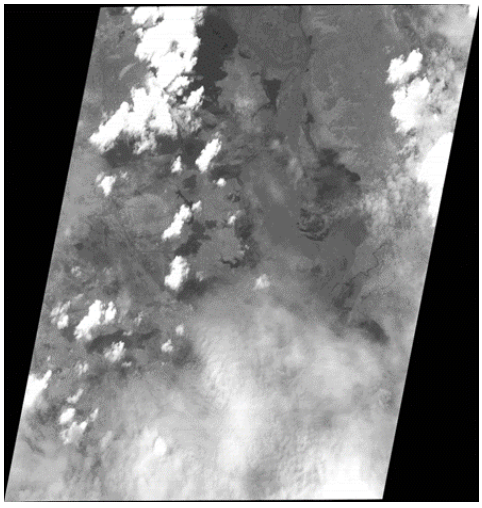
Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA



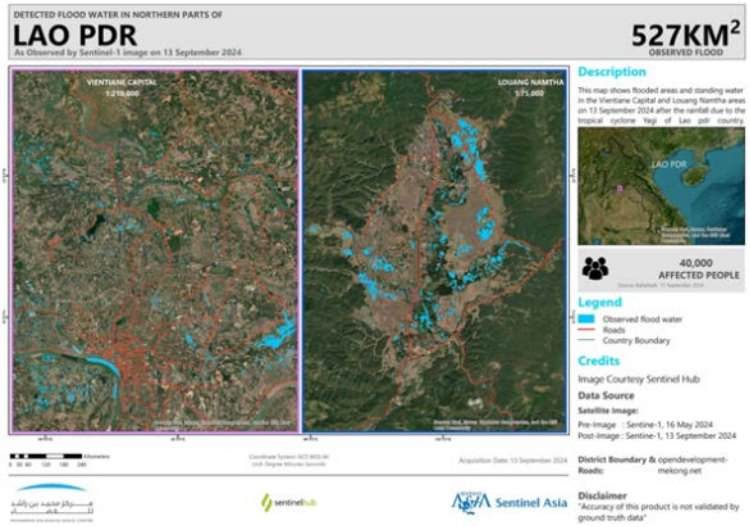
Post-disaster satellite image (Resourcesat-2) provided by ISRO



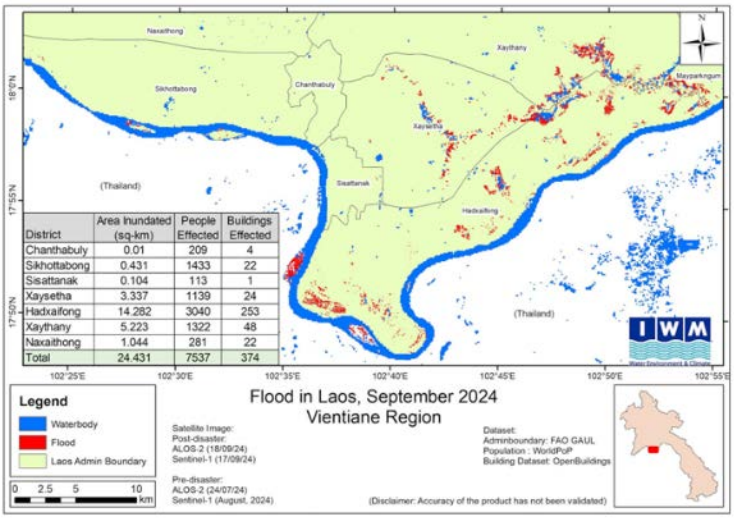
Post-disaster satellite image (TELEOS-1) provided by CRISP

(10) Flood in Lao PDR (Laos) on 12 September, 2024 (GLIDE Number TC-2024-000161-LAO)
According to Vientiane Times, water levels in the Mekong River and its tributaries are expected to rise on 12-13 September, and local authorities in Laos have advised residents in low-lying areas to prepare to move their belongings to safer areas, as many homes have already been affected by flooding in the wake of Tropical Storm Yagi. On 9 September, floods and landslides occurred in Luang Namtha province, where recovery efforts are still ongoing.
https://asianews.network/mekong-overflows-in-laos-luang-prabang-further-flooding-expected/

The ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre) made an EOR to Sentinel Asia on 13 September. Among DPNs, JAXA and TASA provided data. Among DANs, MBRSC, IWM, and AIT provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240912LA.html



Value-Added Product by MBRSC



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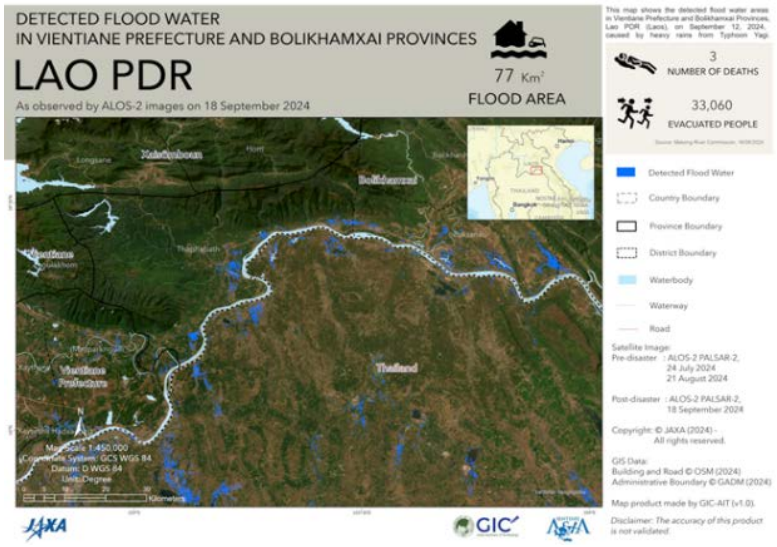

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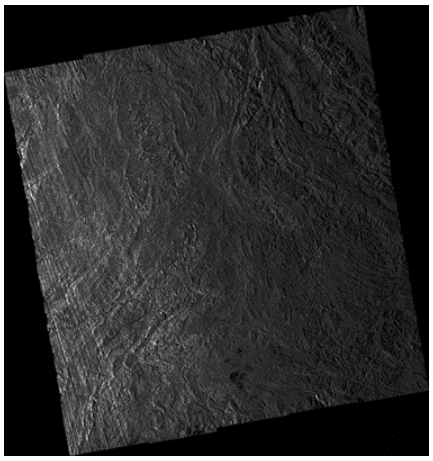
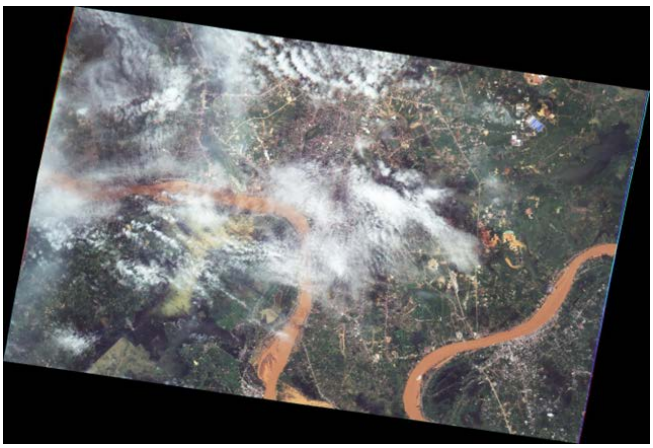


Post-disaster satellite image (ALOS-2) provided by JAXA

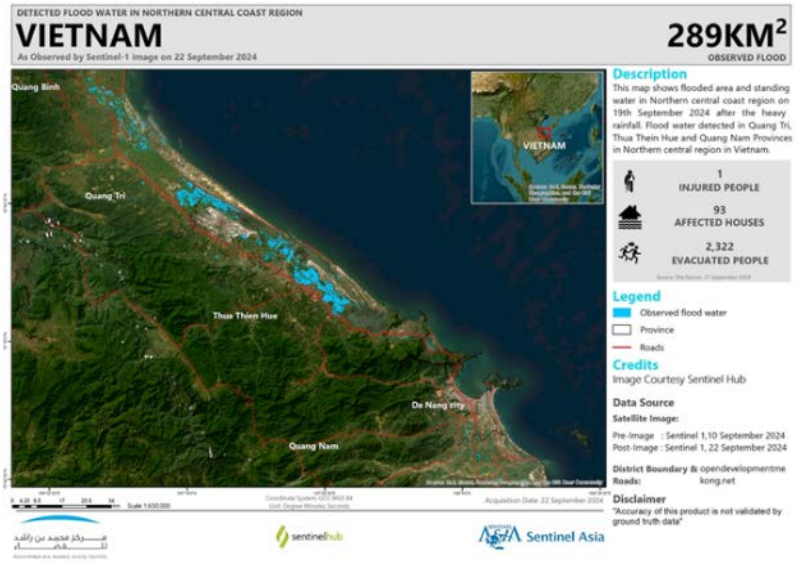


Post-disaster satellite image (FORMOSAT-5) provided by TASA

(11) Tropical Storm Floods in Central Vietnam on 19 September, 2024 (GLIDE Number TC-2024-000172-VNM)

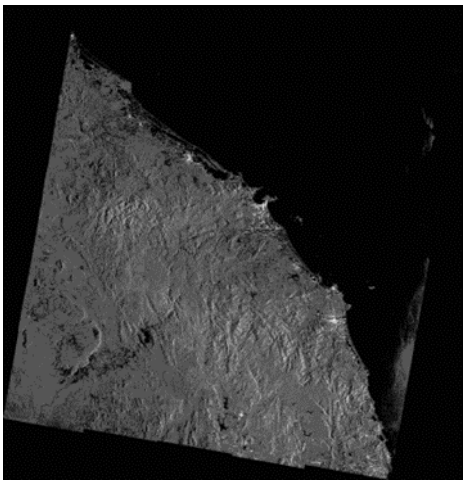
Since making landfall, Tropical Storm Soulik has damaged 96 homes and 16 roads and caused more than 100 landslides in central Vietnam as of 20 September, in accordance with Viet Nam News.
https://vietnamnews.vn/environment/1663415/central-region-provinces-flooded-and-cut-off-after-tropical-storm-soulik.html

The Ministry of Natural Resources and Environment of Vietnam (MONRE) made an EOR to Sentinel Asia on 19 September. Among DPNs, JAXA provided data. Among DANs, MBRSC and EOS provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240919VN.html



Value-Added Product by MBRSC

Value-Added Product by EOS



Post-disaster satellite image (ALOS-2) provided by JAXA

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2. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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3. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)
Ochanomizu Sola City, 4-6 Kandasurugadai, Chiyoda-ku, Tokyo 101-8008 Japan
E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

** October 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 23 October)
2. [Event] Promotion of Sentinel Asia's activities at the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR)
3. How to send an Emergency Observation Request
4. Using Sentinel Asia Operation System, OPTEMIS

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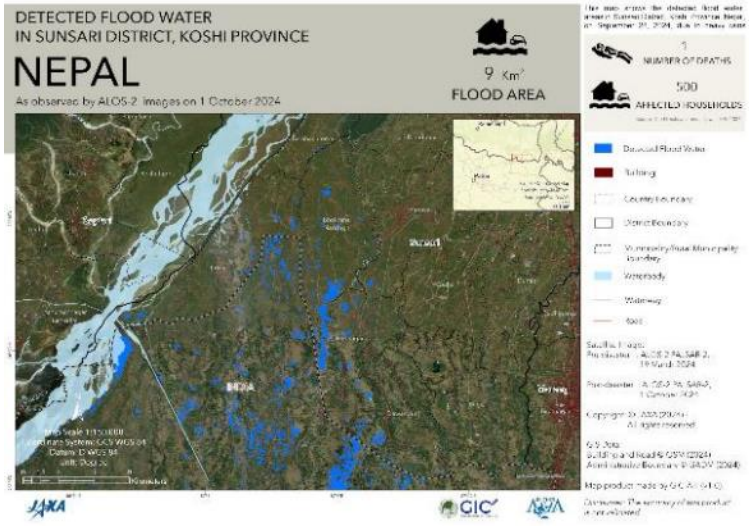
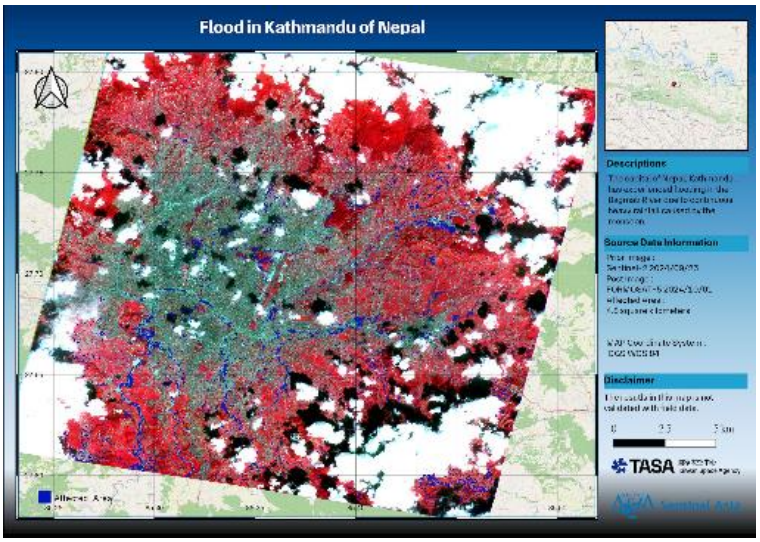
1. [News] Emergency Observation of Disasters (as of 23 October)

(1) Widespread Floods in Nepal on 28 September, 2024 (GLIDE Number FL-2024-000177-NPL)
As reported by the Kathmandu Post, torrential monsoon rains that began on 26 September caused massive landslides and river flooding in various provinces of Nepal, blocking the Araniko and BP highways, submerging 500 houses in the Koshi district, and forcing thousands of people to evacuate.
https://kathmandupost.com/national/2024/09/28/at-least-nine-dead-and-dozens-missing-as-incessant-rain-wreaks-havoc-in-various-provinces

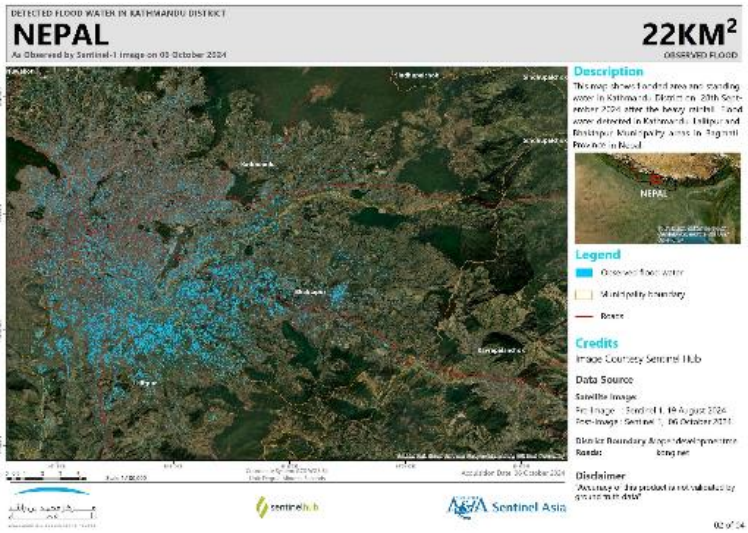
The Department of Hydrology and Meteorology (DHM) under the Ministry of Energy, Water Resources and Irrigation (MoEWRI) made an Emergency Observation Request (EOR) to Sentinel Asia on 28 September. This EOR was escalated to the International Disasters Charter. The International Centre for Integrated Mountain Development (ICIMOD) assumed the role of Project Manager for this Charter activation. Among Data Provider Nodes (DPNs), JAXA, TASA, ISRO, and GISTDA provided data. Among Data Analysis Nodes (DANs), AIT, TASA, JAXA, and MBRSC provided their Value-Added Products (VAPs).
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240928NP.html



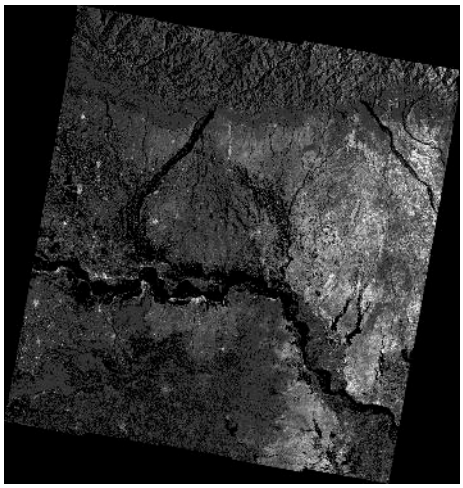
Value-Added Product by AIT



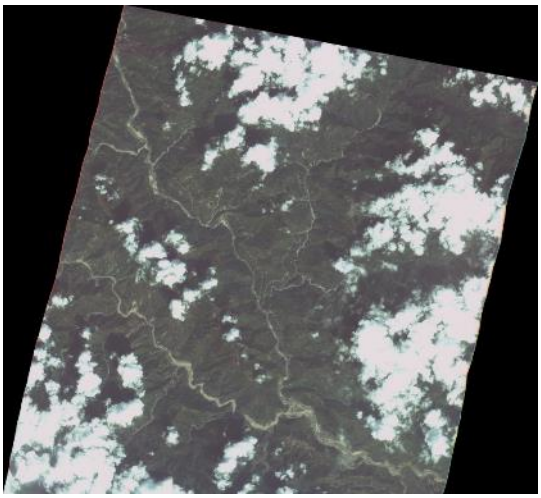
Value-Added Product by TASA



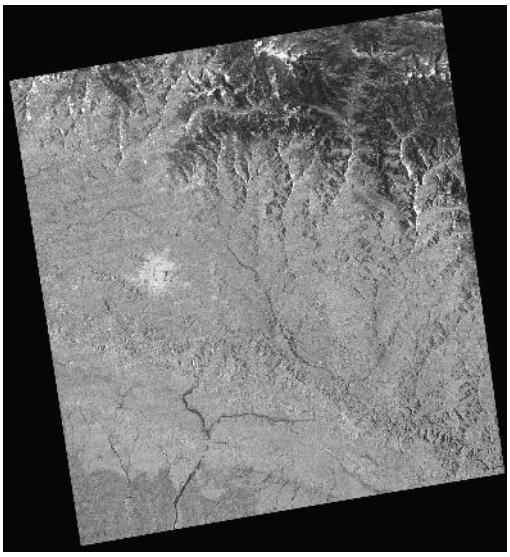
Value-Added Product by MBRSC



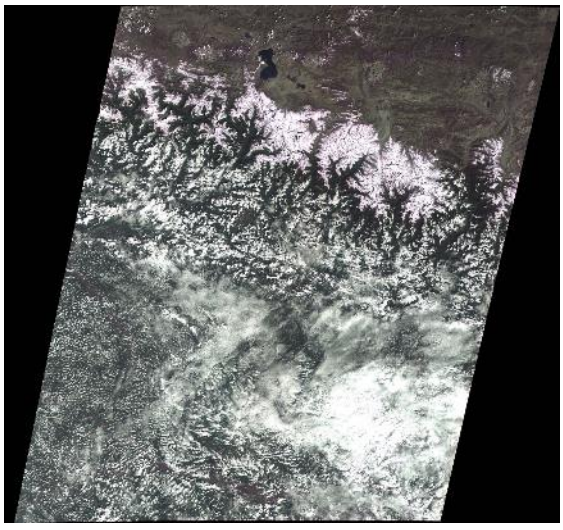
Post-disaster satellite image (ALOS-2) provided by JAXA



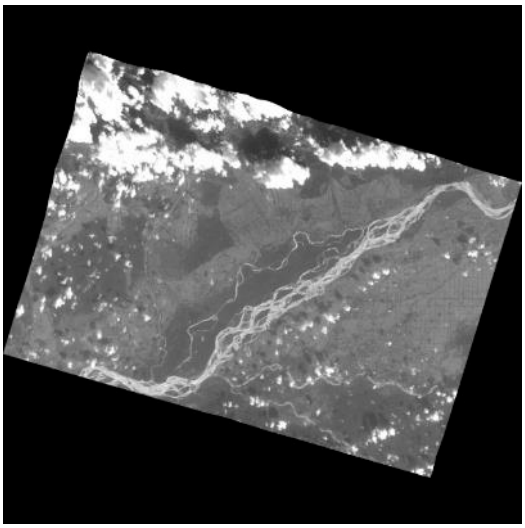
Post-disaster satellite image (FORMOSAT-5) provided by TASA



Post-disaster satellite image (EOS-04 SAR) provided by ISRO



Post-disaster satellite image (Resourcesat-2A) provided by ISRO

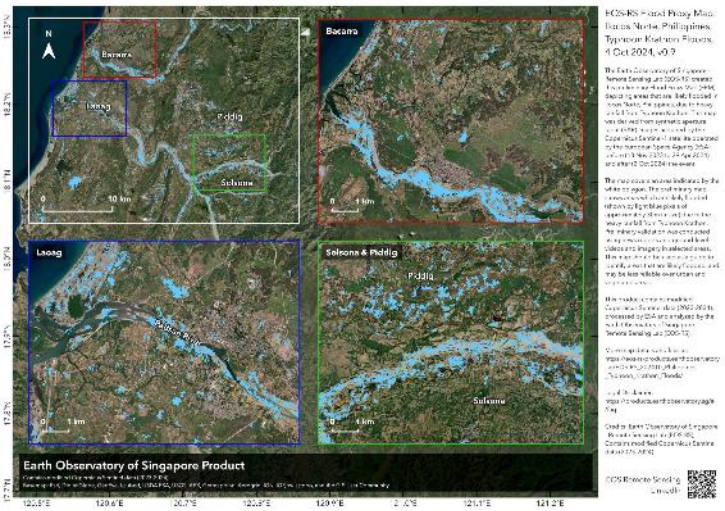


Post-disaster satellite image (THEOS1) provided by GISTDA

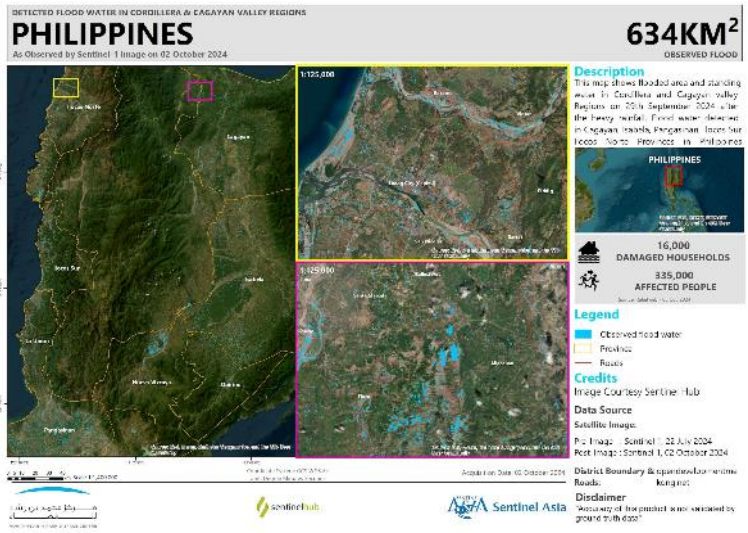
(2) Flood by Typhoon Krathon in Philippines on 29 September, 2024 (GLIDE Number TC-2024-000178-PHL)

In the northern Philippines, the strong impact of Typhoon Krathon, known as Super Typhoon Julian in the Philippines, caused landslides in the province of Benguet, and flooding affected 13,000 families in the provinces of Ilocos Norte and Ilocos Sur as of 1 October, GMA News Online reported.
https://www.gmanetwork.com/news/topstories/regions/922144/julian-floods-landslide-luzon/story/#goog_rewarded

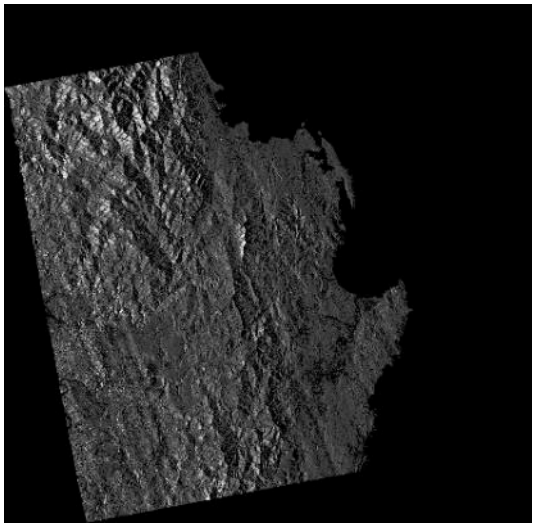
The Philippine Space Agency (PhilSA) made an EOR to Sentinel Asia on 30 September. Among DPNs, JAXA, TASA, ISRO, and GISTDA provided data. Among DANs, JAXA, EOS, and MBRSC provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20240929PH.html



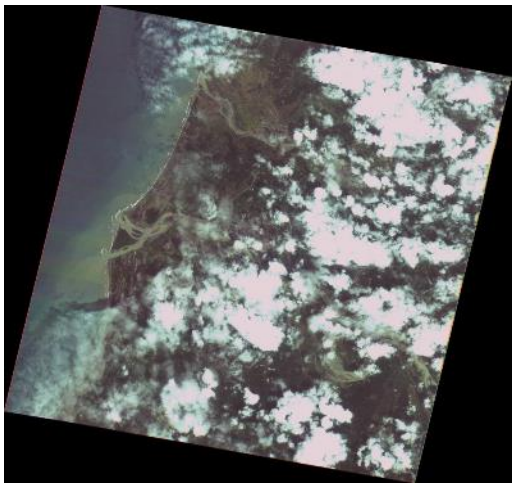
Value-Added Product by EOS



Value-Added Product by MBRSC



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA

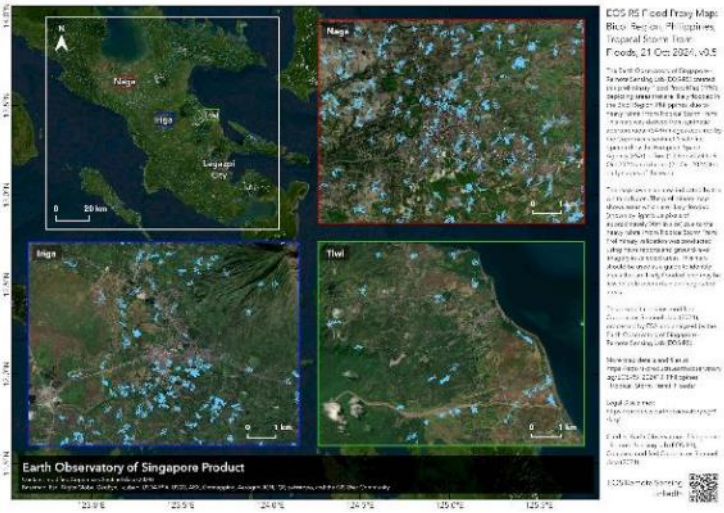
Post-disaster satellite image (Resourcesat-2) provided by ISRO

Post-disaster satellite image (THEOS1) provided by GISTDA

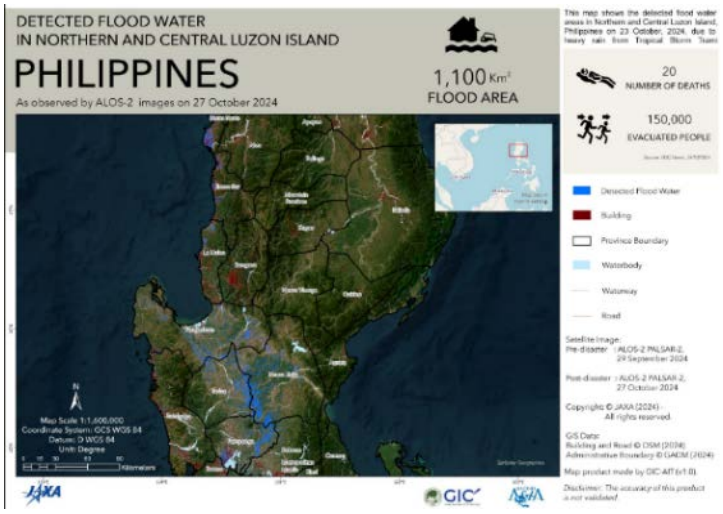
(3) Flood by Tropical Storm Trami in Philippines on 23 October, 2024 (GLIDE Number TC-2024-000193-PHL)
Powerful tropical storm Trami, known as Kristine in the Philippines, made landfall in the Philippines, forcing the evacuation of more than 500,000 people, and as of 27 October, the death toll from the storm had reached 110, with many more missing, ABS-CBN News reported.
https://news.abs-cbn.com/news/2024/10/27/death-toll-from-kristine-rises-to-110-2116

The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the Philippine Space Agency (PhilSA) made an EOR to Sentinel Asia on 23 October. This EOR was escalated to the International Disasters Charter. The PhilSA-Space Mission Control and Operations Division (SMCOD) assumed the role of Project Manager for this Charter activation. Among DPNs, JAXA and ISRO provided data. Among DANs, EOS, JAXA, and AIT provided their VAPs.

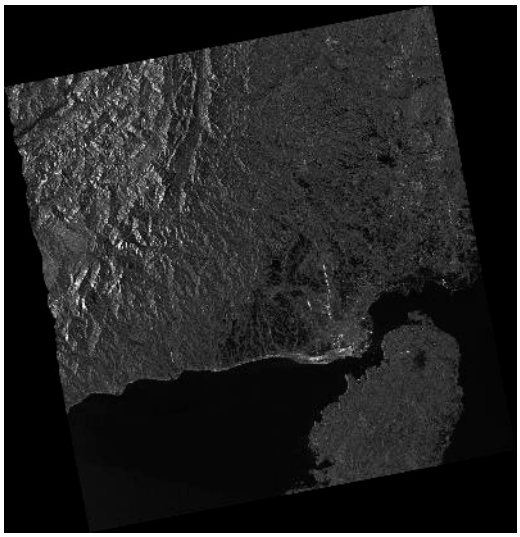
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241023PH.html



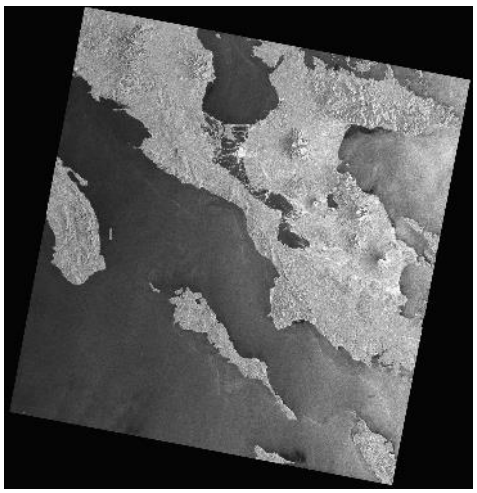
Value-Added Product by EOS



Value-Added Product by AIT



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04 SAR) provided by ISRO

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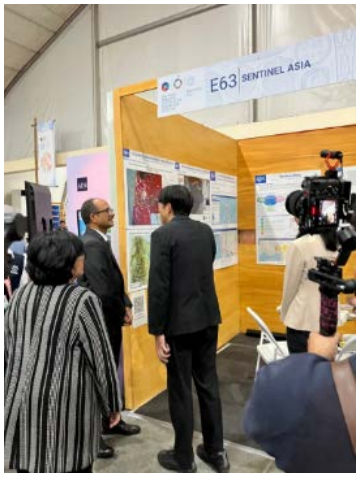
2. [Event] Promotion of Sentinel Asia's activities at the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR)

The Asia-Pacific Ministerial Conference on Disaster Risk Reduction was held from 14 to 18 October 2024 in Manila, the Philippines. The Sentinel Asia Secretariat ran an exhibition booth to promote Sentinel Asia's activities during the APMCDRR2024. The Sentinel Asia booth welcomed more than 100 participants including Mr. Kamal Kishore of India, Special Representative of the Secretary General for Disaster Risk Reduction. For more information on APMCDRR 2024, please refer to https://apmcdrr.undrr.org/.

Opening Ceremony

Sentinel Asia Exhibition booth



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3. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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4. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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Sentinel Asia Project Office
Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)
Ochanomizu Sola City, 4-6 Kandasurugadai, Chiyoda-ku, Tokyo 101-8008 Japan
E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

** November 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 27 November)
2. [Event] JPTM 2024 was successfully held
3. How to send an Emergency Observation Request
4. Using Sentinel Asia Operation System, OPTEMIS

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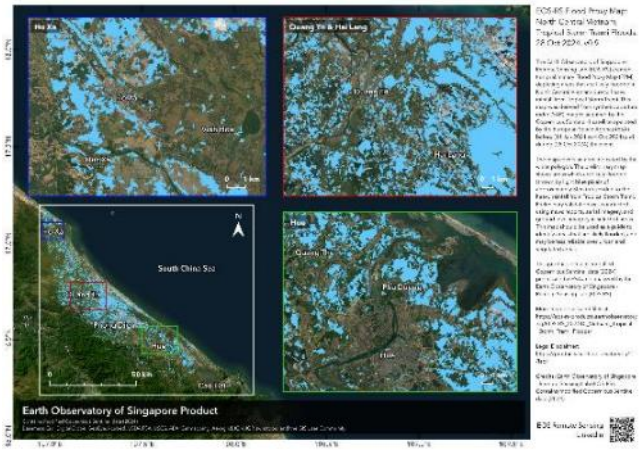
1. [News] Emergency Observation of Disasters (as of 27 November)

(1) Flood by Tropical Storm Trami in Vietnam on 27 October 2024 (GLIDE Number TC-2024-000193-VNM)

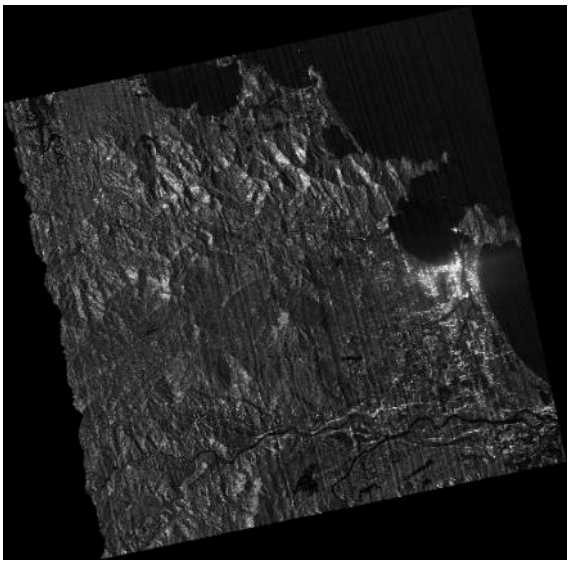
Crossing over the Philippines, Typhoon Trami (Philippine name: Kristine) made landfall on Vietnam on 27 October. As reported in ADINet, 8 people died and 143,424 were affected.
https://adinet.ahacentre.org/report/viet-nam-flooding-landslides-storms-and-winds-in-central-region-tc-trami-20241027

The Ministry of Natural Resources and Environment (MONRE) of Vietnam made an Emergency Observation Request (EOR) to Sentinel Asia on 24 October in anticipation of the typhoon's landfall on Vietnam. Among Data Provider Nodes (DPNs), JAXA provided data. Among Data Analysis Nodes (DANs), JAXA, EOS, and MBRSC provided their Value-Added Products (VAPs).
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241027VN.html



Value-Added Product by EOS

Value-Added Product by MBRSC



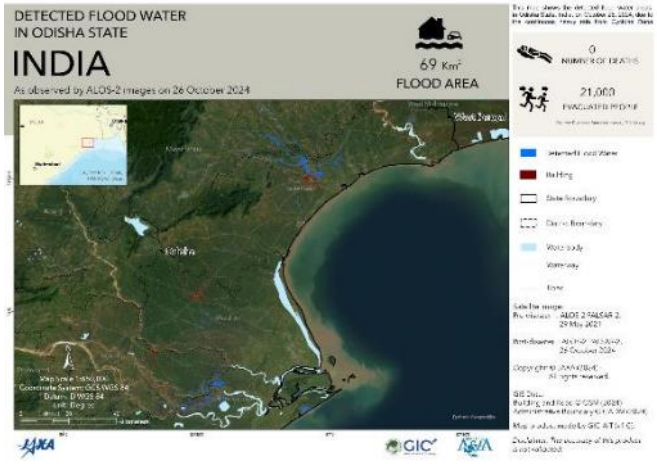
Post-disaster satellite image (ALOS-2) provided by JAXA

(2) Cyclone Dana in India on 25 October, 2024 (GLIDE Number TC-2024-000194-IND)
On 25 October, Tropical Cyclone Dana made landfall along the Indian coast with heavy rain and high winds, CNN reported. Before the storm's landfall, around 300,000 people had been evacuated.
https://edition.cnn.com/2024/10/25/india/storm-dana-india-evacuates-intl-hnk/index.html

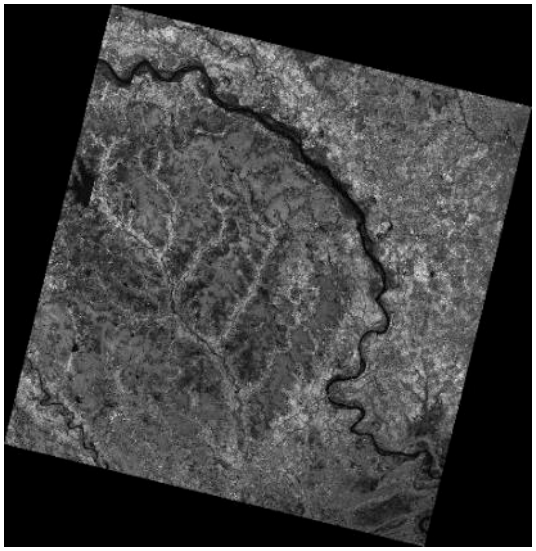
ISRO made an EOR to Sentinel Asia on 24 October in anticipation of the cyclone's landfall on India. Among DPNs, JAXA provided data. Among DANs, JAXA, EOS, AIT, and MBRSC provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241025IN.html

Value-Added Product by EOS

Value-Added Product by MBRSC

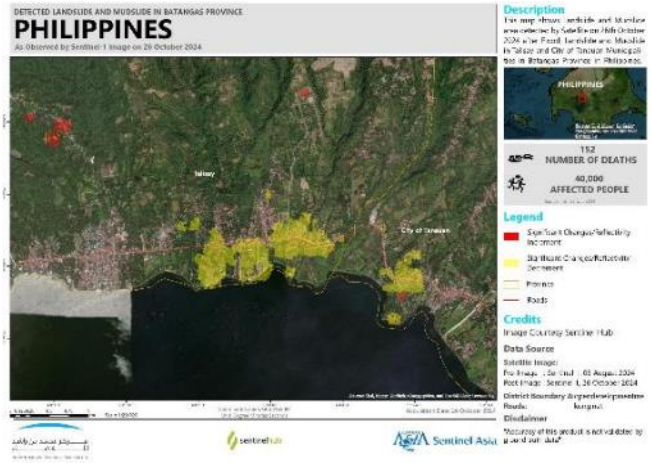


Value-Added Product by AIT

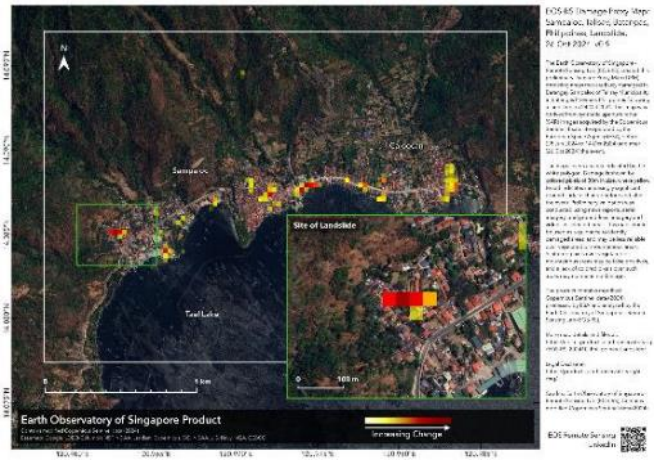

Post-disaster satellite image (ALOS-2) provided by JAXA

(3) Flood and Landslide in Philippines on 24 October, 2024 (GLIDE Number TC-2024-000193-PHL)
Powerful tropical storm Trami, known as Kristine, left extensive damage in the Philippines. According to ReliefWeb, more than 100 people died and more than 7 million people have been affected after Trami passed over the Philippines.
https://reliefweb.int/report/philippines/tropical-storm-trami-submerges-homes-rice-fields-philippines

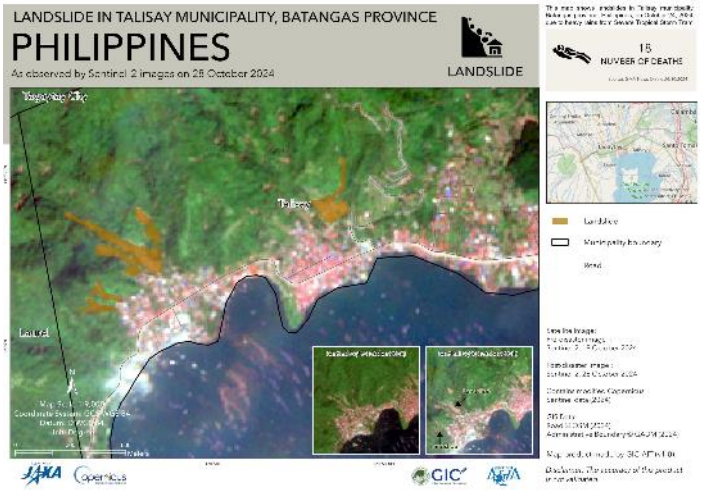
The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) renewed their EOR on 30 October. Among DPNs, CRISP and TASA provided data. Among DANs, EOS, MBRSC, and AIT provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241024PH.html



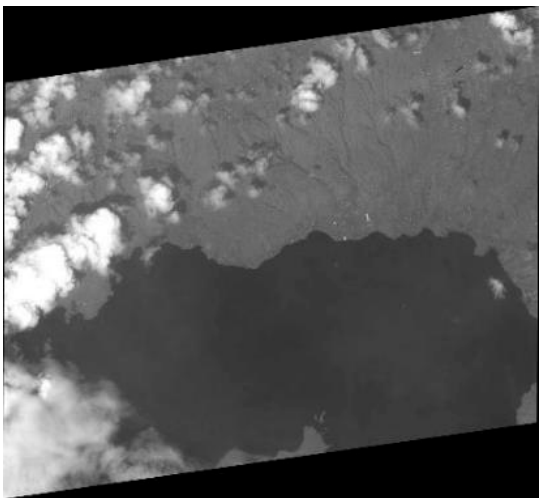
Value-Added Product by MBRSC



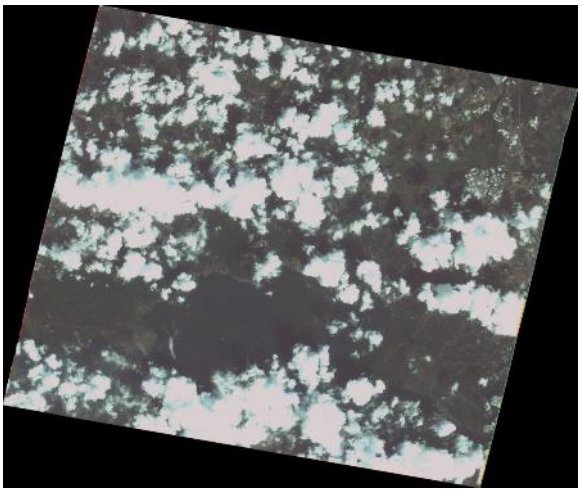
Value-Added Product by EOS



Value-Added Product by AIT



Post-disaster satellite image
(TELEOS-1) provided by CRISP



Post-disaster satellite image
(FORMOSAT-5) provided by TASA

(4) Lewotobi Laki-laki Volcano Eruption in Indonesia on 3 November, 2024 (GLIDE Number VO-2024-000202-IDN)

Mount Lewotobi Laki-laki erupted on 3 November in East Flores, East Nusa Tenggara, Indonesia. Asia News Network reported that a volcanic material column had reached 6,000 meters above the crater and lava flows toward the northeast had reached 4,340 m from the eruption center. The danger zone radius expanded to 9 kilometers from the summit of the mountain.

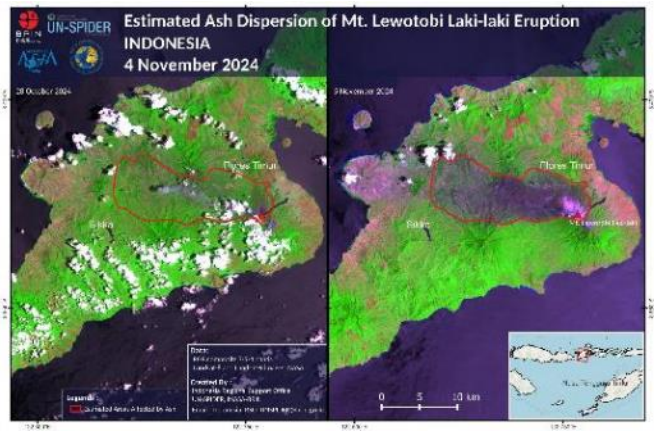
https://asianews.network/indonesias-mount-lewotobi-exclusion-zone-widened/

ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre) made an EOR to Sentinel Asia on 5 November. This EOR was escalated to the International Disasters Charter. National Research and Innovation Agency of Indonesia (BRIN) assumed the role of Project Manager for this Charter activation. Among DPNs, CRISP, GISTDA, ISRO, and JAXA provided data. Among DANs, AIT, BRIN, EOS, and MBRSC provided their VAPs.

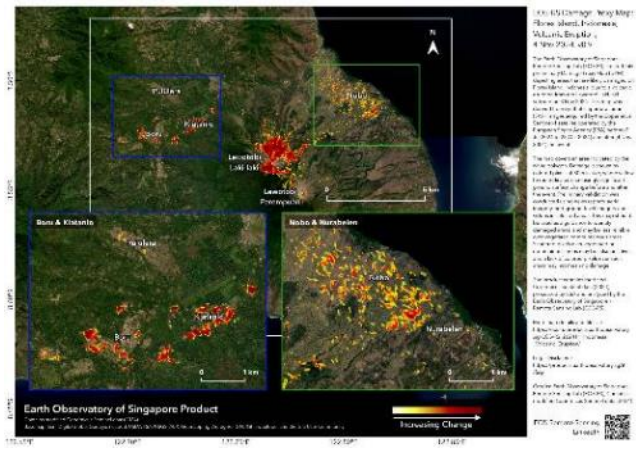
Information on the latest response by Sentinel Asia is available at the link below.

https://sentinel-asia.org/EO/2024/article20241103ID.html

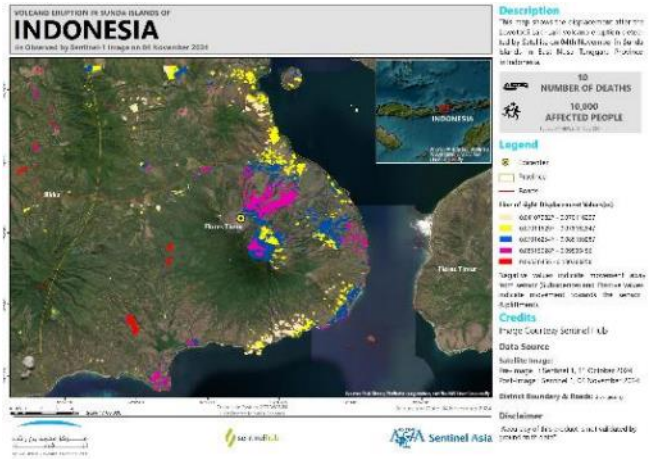
Value-Added Product by AIT



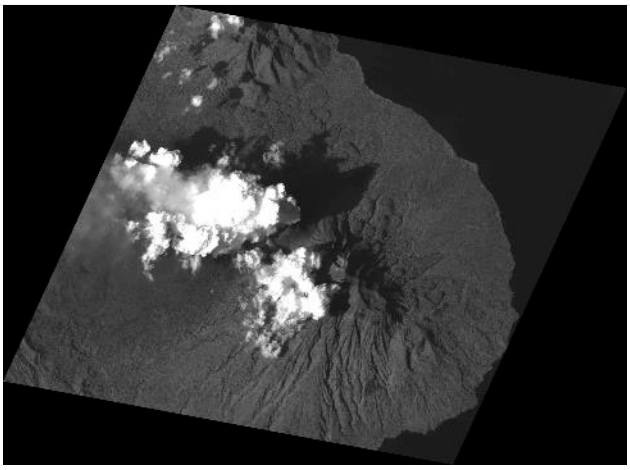
Value-Added Product by BRIN



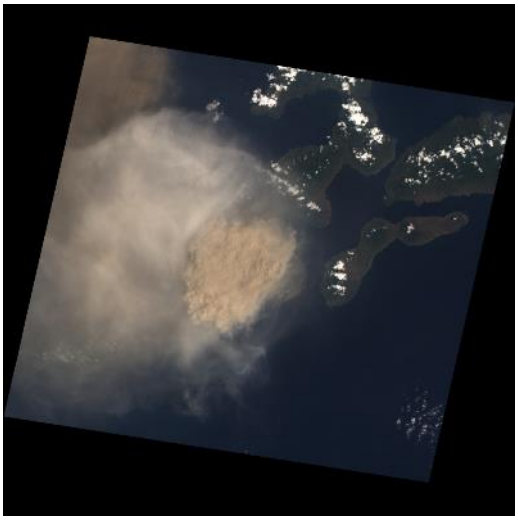
Value-Added Product by EOS



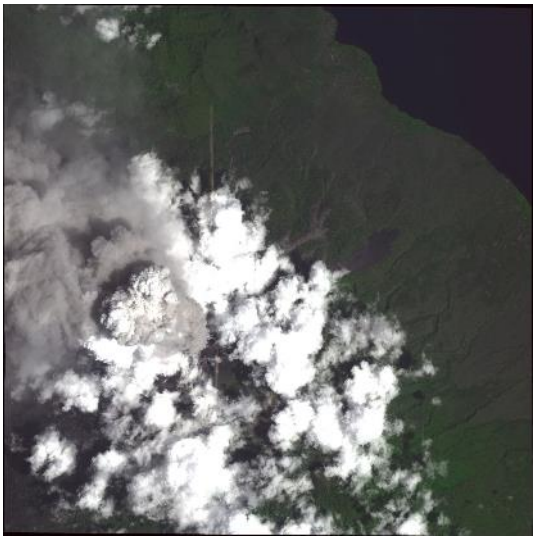
Value-Added Product by MBRSC



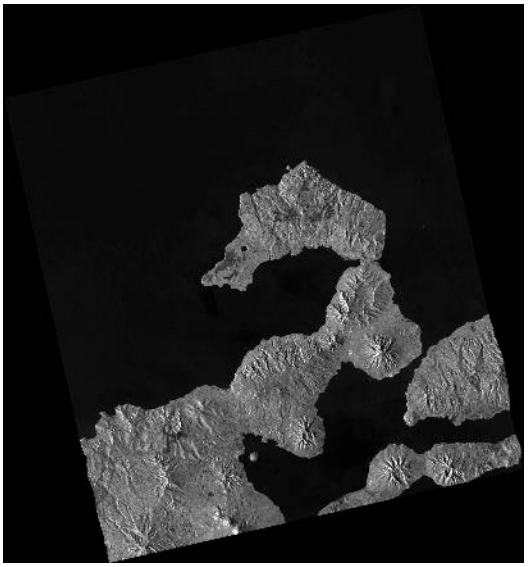
Post-disaster satellite image (TELEOS-1) provided by CRISP



Post-disaster satellite image (THEOS1) provided by GISTDA



Post-disaster satellite image (CARTOSAT-2E) provided by ISRO



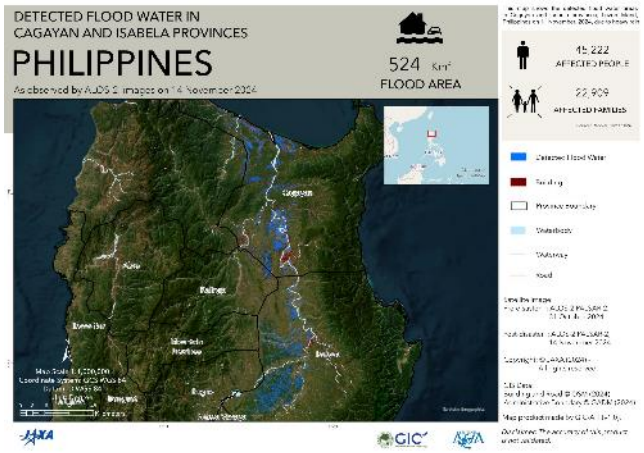
Post-disaster satellite image (ALOS-2) provided by JAXA

(5) Flood and Landslide in Philippines on 11 November, 2024 (GLIDE Number TC-2024-000208-PHL)

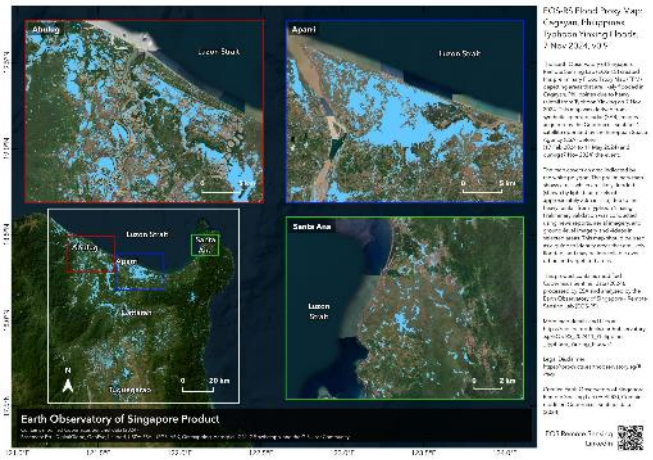
Typhoon Ofel (international name: Usagi) made landfall on Luzon island, the Philippines, on 14 November. DW reported that more than 24,000 people have been evacuated from Cagayan province in the northern Luzon region.
https://www.dw.com/en/mass-evacuations-as-typhoon-usagi-hits-philippines/a-70775901

PhilSA made an EOR to Sentinel Asia on 11 November in anticipation of landfall on the Philippines. Among DPNs, ISRO, JAXA, and TASA provided data. Among DANs, AIT, EOS, and JAXA provided their VAPs.

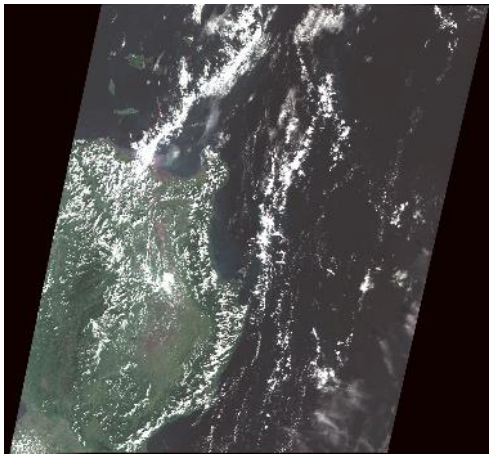
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241111PH.html



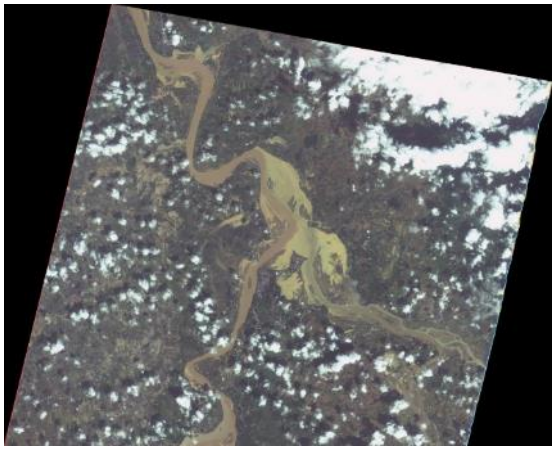
Value-Added Product by AIT



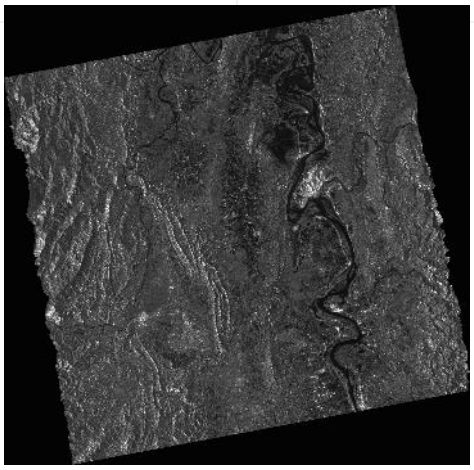
Value-Added Product by EOS



Post-disaster satellite image (Resourcesat-2) provided by ISRO



Post-disaster satellite image (FORMOSAT-5) provided by TASA

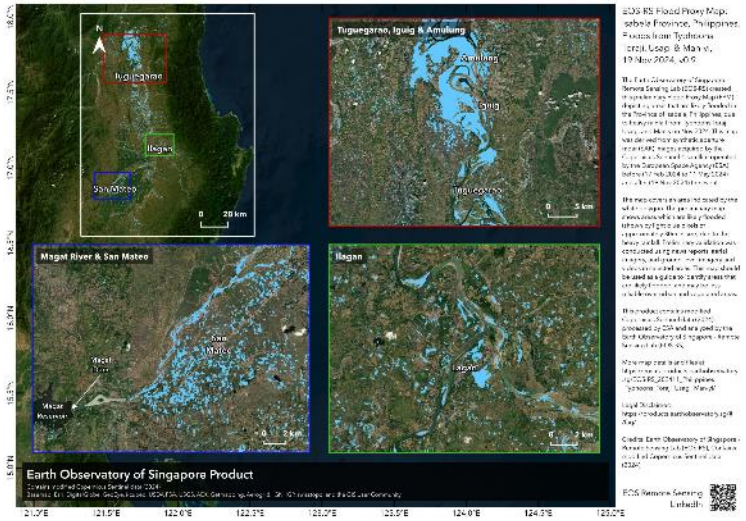


Post-disaster satellite image (ALOS-2) provided by JAXA

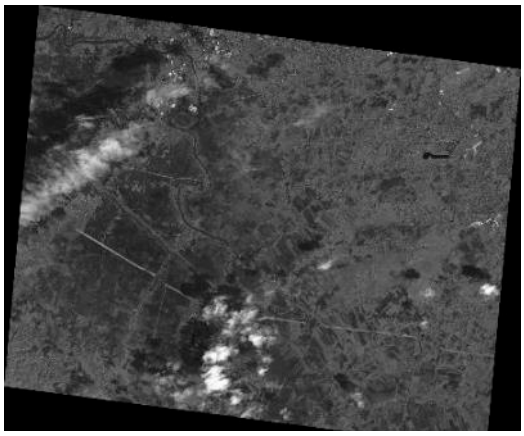
(6) Flood by Typhoon Man-yi in Philippines on 16 November, 2024 (GLIDE Number TC-2024-000213-PHL)

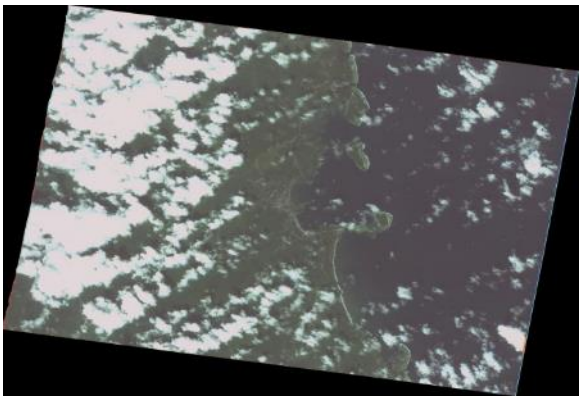
Super Typhoon Man-yi, (Philippine name: Pepito) made landfall on Luzon Island, the Philippines, on 16 November, bringing heavy rainfall. The typhoon triggered the evacuation of over 1 million people and caused significant damage to buildings in multiple areas. According to ABS-CBN news, more than 24,000 families, or 75,000 people, are staying in 566 evacuation centers and another 11,000 families or 36,000 people are sheltering with relatives or with friends.
https://news.abs-cbn.com/news/2024/11/17/ndrrmc-more-than-24k-families-in-shelters-due-to-series-of-storms-1532

PhilSA made an EOR to Sentinel Asia on 16 November. Among DPNs, CRISP and TASA provided data. Among DANs, EOS provided its VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241116PH.html



Value-Added Product by EOS


Post-disaster satellite image (TELEOS-1) provided by CRISP


Post-disaster satellite image (FORMOSAT-5) provided by TASA

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2. [Event] JPTM 2024 was successfully held

The 9th Joint Project Team Meeting for Sentinel Asia STEP3 (JPTM 2024) was held on 5–7 November in Quezon City, the Philippines, co-hosted by the Philippine Space Agency (PhilSA) and Japan Aerospace Exploration Agency (JAXA). A record 135 participants from 40 organizations gathered.

Participants at JPTM 2024

The meeting started with opening remarks by two co-chairs, Dr. Ariel C. Blanco, Director of PhilSA-SIIB, and Dr. Shiro Kawakita, acting Executive Secretary of Sentinel Asia. Dr. Joel Joseph Marciano, Jr., Director General of PhilSA, delivered a keynote speech emphasizing the importance of harnessing satellites and collaboration for regional disaster resilience and stressed the usefulness of Sentinel Asia with an introduction of the Philippines' space activities and various accomplishments. The meeting consisted of four sessions - overview, new membership, user's session, and special session (Philippine session) - and 10 training workshops offering opportunities to learn about the studies by Sentinel Asia members.

Mr. Goro Takei from the Sentinel Asia secretariat reported on the recent activities of Sentinel Asia and its Steering Committee. And as new members to Sentinel Asia, Institute of Water Modelling (IWM), Bangladesh, National Center for Hydrology and Meteorology (NCHM), Bhutan, and National Disaster Risk Management Office (NDRMO), Tonga, introduced their organizations and activities. In the special Philippine session titled "Space for DRRM: The Philippine Perspective", six panelists from various Filipino organizations who are engaged in disaster management talked about their activities and experiences, with the moderation by Ms.

Princess Angela Young, PhilSA.

The Philippine Session

At the user session, the presenters introduced their activities relating to space activities and disaster management, including the promotion of Sentinel Asia.

Ten training workshops were held over two days and the presenters introduced their activities for Sentinel Asia, shared experiences, and some lecturers including Mr. Syams Nashrrullah Suprijatna from the Geoinformatics Center at Asian Institute of Technology (GIC-AIT), Mr. Kabir Uddin from the International Centre for Integrated Mountain Development (ICIMOD), and Prof. Masahiko Nagai and Dr. Arnob Bormudoi from Yamaguchi University gave hands-on training on satellite data analysis.

Training workshop on SAR data analysis by Yamaguchi University

More details about JPTM 2024 including presentation materials and a summary of JPTM 2024 are available on the Sentinel Asia website:

https://sentinel-asia.org/meetings/SA3JPTM9/

JPTM 2025 is planned to be held in Thailand with the Asian Disaster Preparedness Center (ADPC) and Japan Aerospace Exploration Agency (JAXA) as co-hosts.

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3. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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4. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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Sentinel Asia Project Office
Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)
Ochanomizu Sola City, 4-6 Kandasurugadai, Chiyoda-ku, Tokyo 101-8008 Japan
E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

** December 2024 News from Sentinel Asia Project Office **

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Topics:

1. [News] Emergency Observation of Disasters (as of 27 December)
2. [Interview] Dr. Joel Joseph S. Marciano Jr., Director General, Philippine Space Agency
3. How to send an Emergency Observation Request
4. Using Sentinel Asia Operation System, OPTEMIS

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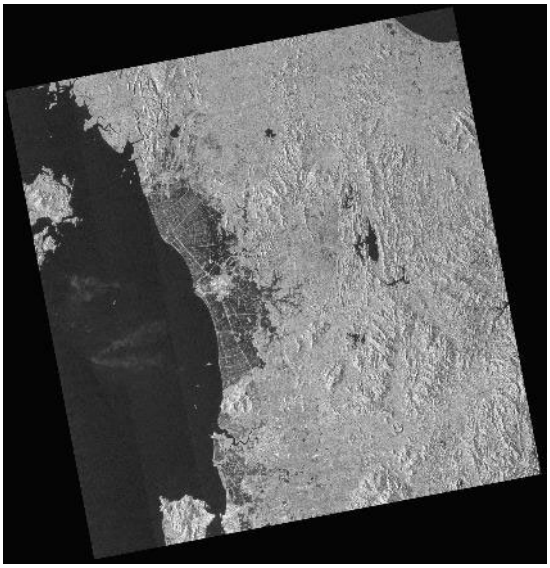
1. [News] Emergency Observation of Disasters (as of 20 December)

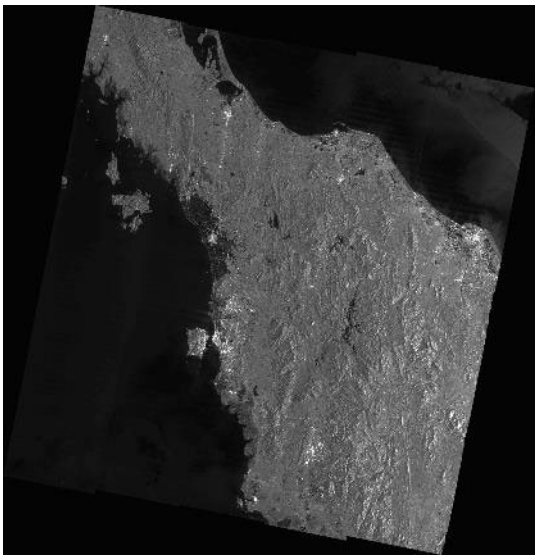
(1) Flood by Northeast Monsoon in Southern Thailand on 26 November, 2024 (GLIDE Number TC-FL-2024-000217-THA)

According to ReliefWeb, continuous heavy rains brought by the northeast monsoon caused floods and flash floods over the southern region of Thailand in late November. A total of 136,219 households were affected in Satun, Surat Thani, Nakhon Si Thammarat, Songkhla, Pattani, Narathiwat, and Yala provinces, it reported.
https://reliefweb.int/report/thailand/flash-update-no-01-flooding-malaysia-and-southern-thailand-28-november-2024

GISTDA made an Emergency Observation Request (EOR) to Sentinel Asia on 29 November. Among Data Provider Nodes (DPNs), ISRO, JAXA, and TASA provided data. Among Data Analysis Nodes (DANs), AIT, EOS, and MBRSC provided their Value-Added Products (VAPs).
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241126TH.html

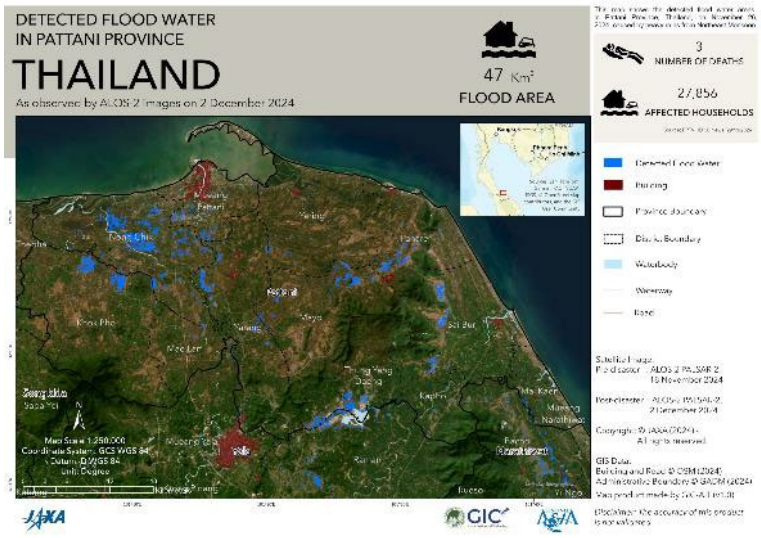


Post-disaster satellite image (EOS-04) provided by ISRO

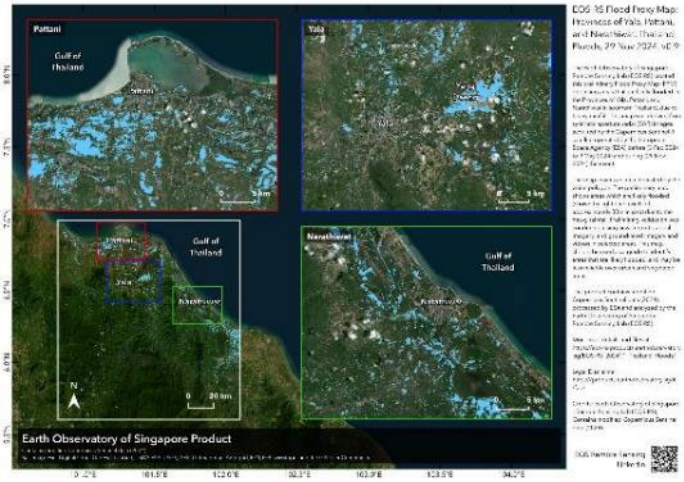


Post-disaster satellite image (ALOS-2) provided by JAXA

Post-disaster satellite image (FORMOSAT-5) provided by TASA



Value-Added Product by AIT



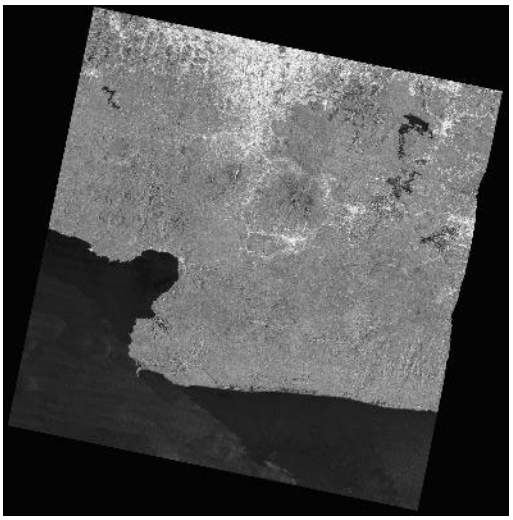
Value-Added Product by EOS

Value-Added Product by MBRSC

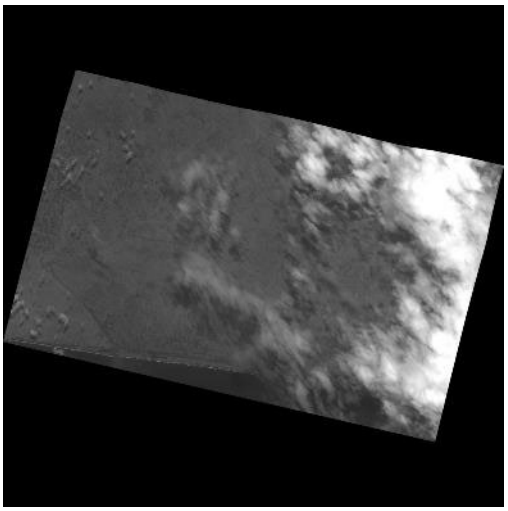
(2) Flood and Landslide in West Java, Indonesia on 03 December, 2024 (GLIDE Number FL-2024-000221-IDN)

The Tempo reported that floods and landslides hit Sukabumi Regency, West Java, in early December and Acting Governor of West Java confirmed that three people died and four remain missing in the aftermath of these events.
https://en.tempo.co/read/1949403/landslides-floods-strike-west-javas-sukabumi-3-killed-4-missing

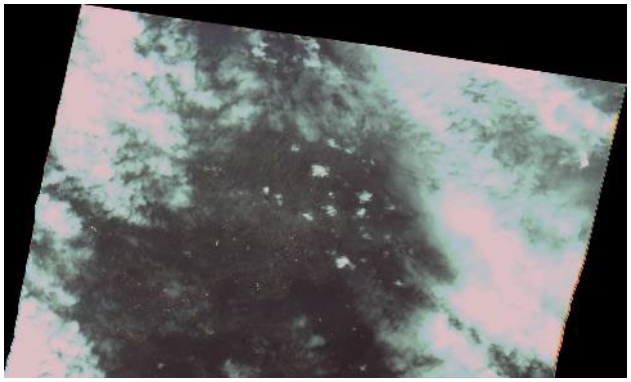
The National Research and Innovation Agency of Indonesia (BRIN) made an EOR to Sentinel Asia on 6 December. This EOR was escalated to the International Disasters Charter. BRIN assumed the role of Project Manager for this Charter activation. Among DPNs, ISRO, GISTDA, and TASA provided data. Among DANs, BRIN, EOS, and MBRSC provided their VAPs.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241203ID.html



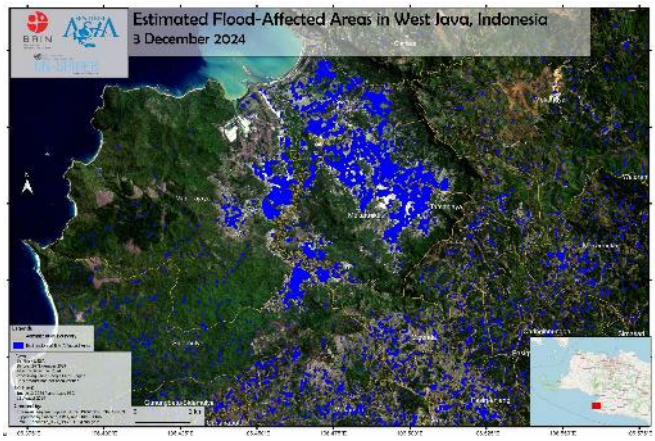
Post-disaster satellite image (EOS-04) provided by ISRO



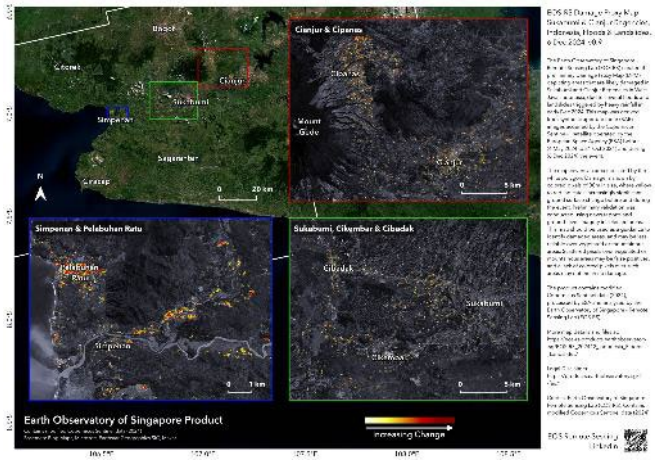
Post-disaster satellite image (THEOS-1) provided by GISTDA



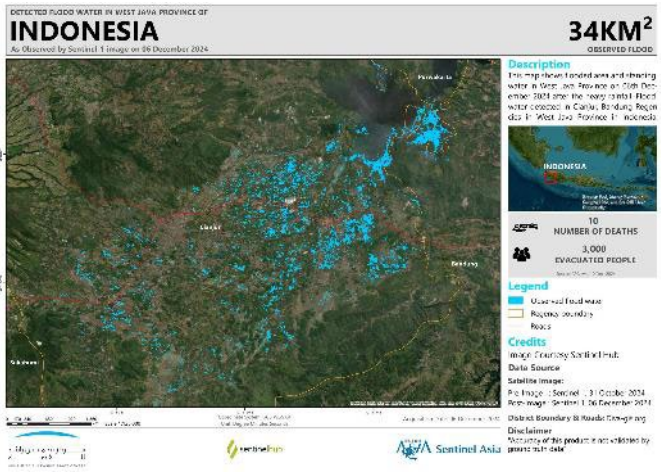
Post-disaster satellite image (FORMOSAT-5) provided by TASA



Value-Added Product by BRIN



Value-Added Product by EOS



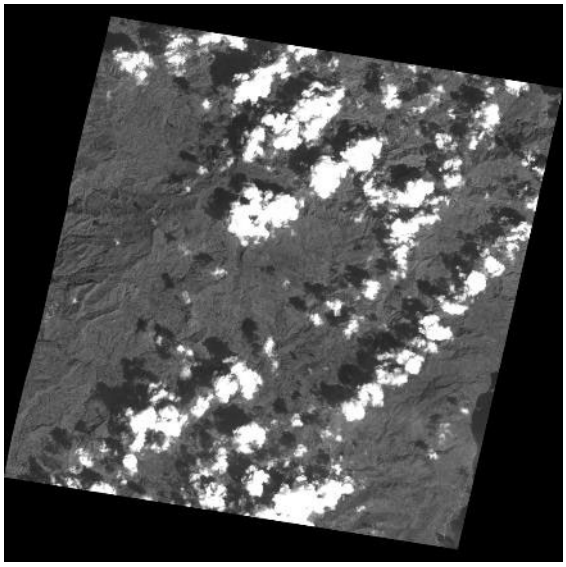
Value-Added Product by MBRSC

(3) Eruption Occurred Kanlaon Volcano in Philippines on 09 December, 2024 (GLIDE Number VO-2024-000222-PHL)

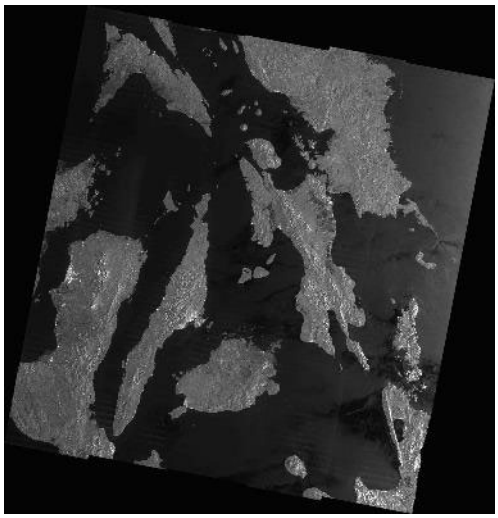
The Philippine Institute of Volcanology and Seismology (PHIVOLCS) issued a report stating that

an explosive eruption occurred at the summit vent of Kanlaon Volcano on 9 December 2024. The eruption produced a voluminous plume that rapidly rose to 3,000 meters above the vent. Pyroclastic density currents descended the slopes on the general southeastern edifice based on IP and thermal camera monitors. PHIVOLCS raised the volcano alert to Level 3 (magmatic unrest). https://www.phivolcs.dost.gov.ph/index.php/volcano-advisory-menu/28593-kanlaon-volcano-raisingalert-level-2-to-3

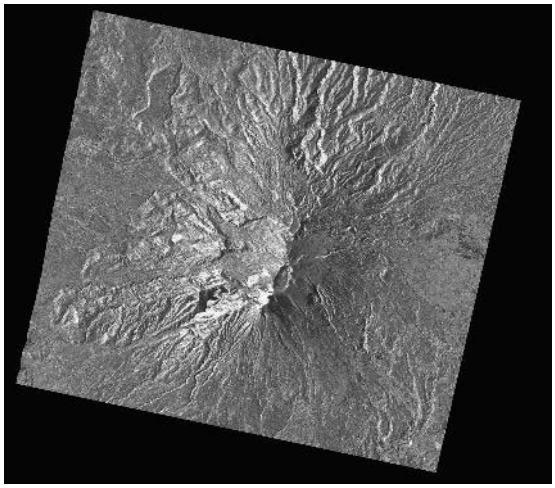
PHIVOLCS made an EOR to Sentinel Asia on 6 December. Among DPNs, GISTDA, JAXA, and ISRO provided data. Among DANs, MBRSC provided its VAP as of 27 Dec.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241209PH.html



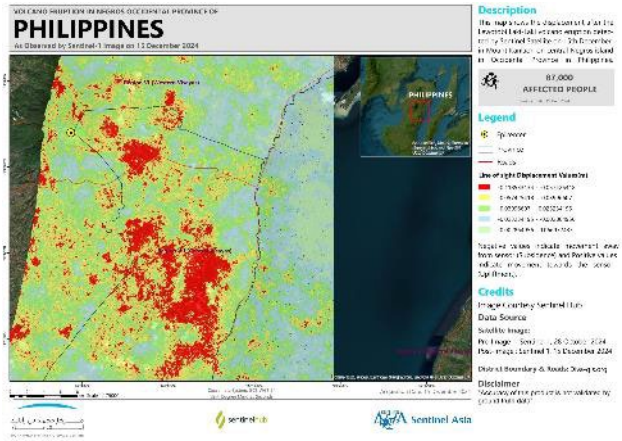
Post-disaster satellite image (THEOS-1) provided by GISTDA



Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (EOS-04) provided by ISRO

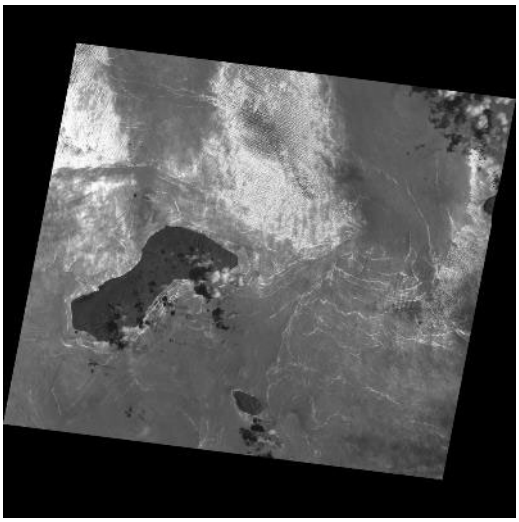


Value-Added Product by MBRSC

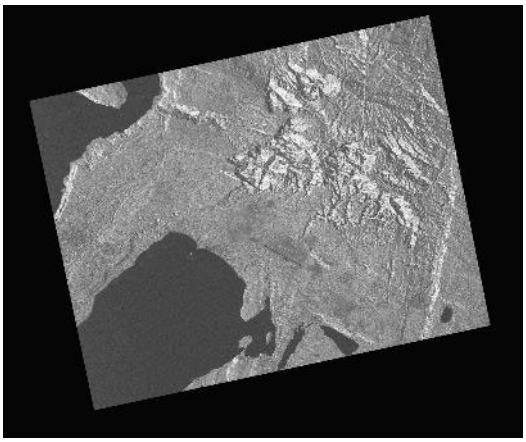
(4) Earthquake in Vanuatu on 17 December, 2024 (GLIDE Number EQ-2024-000227-VUT)

CNN reported that a 7.3-magnitude earthquake hit Vanuatu on 17 December. The quake struck 30 kilometers west of Port Vila, the capital of Vanuatu, at about 57.1 kilometers deep according to the United States Geological Survey (USGS). It was followed by a 5.5-magnitude aftershock. At least 14 people were reportedly killed and 200 have been treated for injuries.
https://edition.cnn.com/2024/12/16/world/earthquake-vanuatu-intl-hnk/index.html

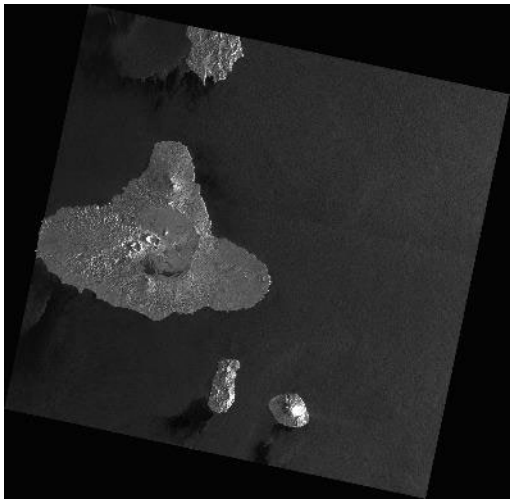
Pacific Community (SPC) made an EOR to Sentinel Asia on 17 December. Among DPNs, GISTDA, ISRO, and JAXA provided data. Among DANs, EOS provided its VAPs as of Dec 27.
Information on the latest response by Sentinel Asia is available at the link below.
https://sentinel-asia.org/EO/2024/article20241217VU.html



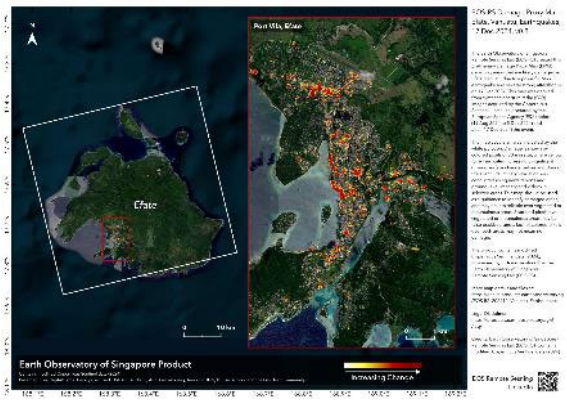
Post-disaster satellite image (THEOS-1) provided by GISTDA



Post-disaster satellite image (EOS-04) provided by ISRO



Post-disaster satellite image (ALOS-2) provided by JAXA



Value-Added Product by EOS

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2. [Interview] Dr. Joel Joseph S. Marciano Jr., Director General, Philippine Space Agency

Established in 2019 under Republic Act No. 11363, or the Philippine Space Act, the Philippine Space Agency (PhilSA) is actively expanding its operations. As a Data Provider Node (DPN) for Sentinel Asia since January 2023, PhilSA has been instrumental in providing critical satellite data to support disaster response and management efforts in the Philippines, a country frequently affected by natural disasters such as storms, earthquakes, and volcanic eruptions. In November 2024, PhilSA co-hosted Sentinel Asia's Joint Project Team Meeting (JPTM), which was held in Quezon City, Philippines. During the event, Dr. Joel Joseph S. Marciano Jr., Director General of PhilSA, was interviewed by the Sentinel Asia Secretariat to introduce the agency's activities, particularly its involvement with Sentinel Asia and its contributions to the global space community.

Sentinel Asia Secretariat
Over the past 10 years, much has changed in the Philippines regarding space policy and

stakeholder involvement. Given that the Philippine Space Agency (PhilSA) was established in 2019, could you share the story behind its establishment and its purpose?

Dr. Marciano
The establishment of PhilSA is a significant milestone for the Philippines. Before its creation, the Department of Science and Technology (DOST) managed various projects in space science and applications while simultaneously supporting activities related to space policy formulation. It became increasingly clear to DOST—and the nation as a whole—that the Philippines needed to build capabilities in space technology to address challenges like natural disasters while also leveraging this technology in areas such as national and food security and marine resource management. This realization led to initiatives such as developing microsatellites in collaboration with Japanese universities and JAXA.
On the policy front, the efforts culminated in the Philippine Space Policy, signed in 2019, outlined the principles and necessity of having a space program. This policy emphasizes the importance of being a global actor, keeping pace with other nations in space innovation, ensuring representation in international space-related bodies, and leveraging space technologies for scientific advancement, disaster and climate resilience, and economic progress.

The policy identifies six key development areas where space science and technology can contribute. These include national security and development, hazard management and climate studies, space industry capacity building, space research and development, education and awareness, and international cooperation. PhilSA's mandate is to address these areas, fostering a domestic space ecosystem while coordinating national policies and initiatives.
PhilSA also benefits from strategic oversight. The Philippine Space Act established the Philippine Space Council, chaired by the President and vice-chaired by the Secretary of National Defense and the Secretary of Science and Technology, with other members from various government departments and the legislative branch. This positioning underscores the agency's pivotal role in integrating space technology into national socioeconomic development and resilience strategies.

Sentinel Asia Secretariat
What is PhilSA's role within the Philippine government for space development, particularly in disaster management using space technologies?

Dr. Marciano
PhilSA's role is rooted in our national space program, which, in turn, is aligned with the Philippine Space Policy. Our vision is to bridge, uplift, and empower the nation through the peaceful uses of outer space, and our mission is to promote a robust space ecosystem that creates value across all sectors of society. To achieve this, we use the space value chain as a strategic framework that guides us in ensuring that investments in space capabilities yield socioeconomic benefits.

One key area of our work is the development of satellites and upstream infrastructure, which play a critical role in disaster risk reduction and management and address other pressing concerns in the Philippines. We have engineers building satellites and collaborating with stakeholders to

determine requirements for data and applications. This process is reflected in our decadal survey, which outlines gaps and opportunities in Earth observation over the next 10 years.
Once data is gathered—whether from our satellites, commercial sources, or open platforms such as the International Disasters Charter or Sentinel Asia—our focus shifts to ensuring its effective utilization. Partnerships with agencies and organizations are vital for producing insights and maps that address real-world needs. However, the true value of these outputs is realized only when they are actively used by stakeholders. Engaging end users through feedback loops is key to maximizing the societal benefits of space investments.

Our work involves bridging gaps, fostering collaboration, and ensuring that space technology outputs are integrated into decision-making processes. Without widespread adoption, the potential of space technology to contribute to disaster management and national development remains untapped.

Sentinel Asia Secretariat
What is PhilSA's position in relation to Sentinel Asia?

Dr. Marciano
Sentinel Asia provides a platform that aligns perfectly with PhilSA's functions and mandate. Initially, the Philippines participated as a data user. Now, with PhilSA inheriting satellite operations from DOST, we have progressed to being a Data Provider Node (DPN). Developing space missions and operating satellites have put us in an excellent position to contribute actively to the Sentinel Asia community.

Beyond data contribution, we see Sentinel Asia as an opportunity to share experiences— both in generating data and in how it is applied. Each member country has unique use cases, from emergency response to disaster management. Sharing insights about how data is distributed, presented, and used by various groups can lead to valuable lessons for everyone involved. For instance, feedback from end users, whether high-level decision-makers or local responders, helps refine how data is delivered and ensures that it has practical value.
Sentinel Asia also emphasizes capacity building, ensuring that skilled professionals can analyze and apply data effectively. By participating in this platform, we aim to both learn from and contribute to the growing knowledge and capabilities of the regional space community.

Sentinel Asia Secretariat
Could you tell us about PhilSA's plans for developing future Earth observation satellites?

Dr. Marciano
Strengthening the entire space value chain also entails building satellites and upstream infrastructure. Our goal is to enhance proficiency in satellite manufacturing, particularly in Earth observation technologies. This journey began before PhilSA was established, through DOST-led projects developed in partnership with Japan.
The success of these projects lies in the skills acquired by the people involved. Many of them have gone on to mentor younger engineers, contributing to a growing pool of talent in space

technology. For example, our recent multispectral satellite, which includes a 5-meter resolution camera, addresses applications such as agriculture and environmental monitoring. These missions are based on identified gaps and national needs, and they underscore the importance of continuity in satellite development.

While one satellite alone cannot address all challenges, it builds the foundation for future collaborations. Our goal is to reach a level of proficiency where we can contribute meaningfully to international missions, whether by building entire satellites or developing

specific components. Collaboration also extends to downstream activities, such as data analysis and utilization.

Building satellites is not just about technology; it's about building expertise and ecosystems. We're working with universities to train the next generation of scientists and engineers, ensuring that the Philippines remains an active participant in the global space community.

The Philippines' next earth observation satellite
"Multispectral Unit for Land Assessment" (MULA)

Sentinel Asia Secretariat
PhilSA co-organized Sentinel Asia's Joint Project Team Meeting (JPTM) 2024, and you personally participated in the event. What are your impressions of the meeting, and what was the purpose and outcome of hosting it?

Dr. Marciano
Hosting JPTM was an invaluable opportunity for PhilSA. As a young agency, such events allow us to grow and learn from the broader regional and global space community. More importantly, they reaffirm our commitment to collaboration, which is central to the work of any space agency. Through initiatives such as JPTM, we contribute to and benefit from the shared knowledge, expertise, and experience of the Sentinel Asia community.

For the Philippines, the meeting also showcased our hospitality and highlighted our aspirations to play a meaningful role in regional cooperation. Hosting JPTM gave us a chance to engage more deeply with other countries, share our progress, and reflect on how we can continue to contribute

to Sentinel Asia's mission.

Sentinel Asia Secretariat

What do you expect from Sentinel Asia, and how will PhilSA contribute to it in the future?

Dr. Marciano

Sentinel Asia is fundamentally about fostering collaboration and sharing experiences. Disasters know no borders, and this shared understanding drives the need for cooperation. Each country brings unique capabilities and needs to the table, and platforms like Sentinel Asia help align these for mutual benefit.

Moving forward, we hope Sentinel Asia continues to focus on the downstream use of satellite data, particularly in operationalizing insights for disaster response. Sharing practical experiences—how data is mobilized, who uses it, and the feedback received—can strengthen the entire community. We also anticipate deeper discussions on data timeliness and how more member groups can contribute to and benefit from Sentinel Asia's output.

PhilSA is committed to supporting these goals by enhancing our data provision capabilities, engaging with stakeholders, and collaborating with other members. We believe that by working together, we can build stronger space ecosystems across the region.

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3. How to send an Emergency Observation Request

JPT member organizations are entitled to send an Emergency Observation Request (EOR) for disasters in the Asia-Pacific region. Please refer to https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

EOR Order Desk:
Asian Disaster Reduction Center (ADRC)
HP: http://www.adrc.asia/
E-mail: sarequest@adrc.asia
FAX: +81-78-262-5546,
TEL: +81-78-262-5540

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4. Using Sentinel Asia Operation System, OPTEMIS

Sentinel Asia launched a new operation system, OPTEMIS. Please refer to the website on how to create an account for OPTEMIS.
https://sentinel-asia.org/e-learning/Emergency_Observation_Request.html

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Sentinel Asia Project Office
Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)
Ochanomizu Sola City, 4-6 Kandasurugadai, Chiyoda-ku, Tokyo 101-8008 Japan
E-mail: Z-SENTINEL.ASIA@ml.jaxa.jp

List of JPT Members *as of Dec 2024*

123 JPT members (104 organizations from 30 countries/regions and 19 international organizations)

No.	Country / Region	No.	Organization	Data Provider Node (DPN)	Data Analysis Node (DAN)
1	Armenia	1	Ministry of Emergency Situation (MES)		
2	Australia	2	CSIRO Office of Space Science and Applications (COSSA)		
		3	Geoscience Australia (GA)		
		4	Bureau of Meteorology (BOM)		
3	Bangladesh	5	Bangladesh Space Research and remote Sensing Organization (SPARRSO)		
		6	Bangladesh Water Development Board (BWDB)		
		7	Institute of Water Modelling (IWM)		✓
4	Bhutan	8	Department of Disaster Management, Ministry of Home and Cultural Affairs		
		9	National Land Commission		
		10	Sherubtse College, Royal University of Bhutan		
		11	Department of Geology and Mines (DGM)		
		12	Ministry of Works and Human Settlement (MoWHS)		
		13	National Center for Hydrology and Meteorology (NCHM)		✓
5	Brunei	14	Survey Department (SD), Ministry of Development		✓
6	Cambodia	15	Ministry of Land Management, Urban Planning and Construction		
		16	National Committee for Disaster Management (NCDM)		
7	China	17	National Disaster Reduction Center of China (NDRCC), Ministry of Civil Affair		
		18	College of Disaster and Emergency Management, Beijing Normal University (BNU)		
		19	Institute of Geology, China Earthquake Administration (CEA)		✓
		20	Sichuan University		✓
		21	The Chinese University of Hong Kong (CUHK)		✓
		22	Institute of Mountain Hazards and Environment (IMHE), Chinese Academy of Sciences (CAS)		✓
8	Fiji	23	National Disaster Management Office, FIJI (NDMO)		
9	India	24	Indian Space Research Organization (ISRO)	✓	✓
		25	University of Kashmir		
		26	Gauhati University		
		27	Symbiosis Institute of Geoinformatics (SIG) , Symbiosis International University (SIU)		✓
10	Indonesia	28	National Disaster Management Agency (BNPB)		
		29	National Research and Innovation Agency (BRIN)		✓
		30	Institute of Technology Bandung (ITB)		
		31	Universitas Jenderal Achmad Yani (UNJANI)		
		32	Center for Remote Sensing and Ocean Sciences (CReSOS) Udayana University		✓
		33	Ministry of Marine Affairs and Fisheries		✓

11	Japan	34	Keio University		
		35	Japan Aerospace Exploration Agency (JAXA)	✓	✓
		36	Infrastructure Development Institute (IDI) Japan (IFNet)		
		37	Hokkaido University		
		38	Yamaguchi University		✓
		39	Chubu University		✓
		40	Chiba University		✓
		41	Hiroshima Institute of Technology		✓
		42	Tokyo Institute of Technology (TIT)		✓
		43	International Research Institute of Disaster Science, Tohoku University		✓
		44	University of Tokyo		✓
		45	National Research Institute for Earth Science and Disaster Resilience (NIED)		✓
		46	Japan International Cooperation Agency (JICA)		
		47	RIKEN		✓
		48	Kobe University		✓
		49	Toyama University of International Studies (TUINS)		✓
		50	Japan Water Agency (JWA)		
12	Kazakhstan	51	National Center of Space Researches and Technologies (NCSRT)		✓
13	Korea	52	Korea Aerospace Research Institute (KARI)	✓	✓
		53	National Disaster Management Research Institute (NDMI)		✓
14	Kyrgyz	54	Central Asian Institute of Applied Geosciences (CAIAG)		✓
15	Lao P.D.R.	55	Ministry of Labor and Social Welfare		
		56	Natural Resources and Environment Institute (NREI), Ministry of Natural Resources and Environment (MONRE)		
		57	Ministry of Agriculture and Forestry (MAF)		
16	Malaysia	58	National Security Division, Prime Minister's Department		
		59	Malaysian National Space Agency (ANGKASA)		✓
17	Mongolia	60	Information And Research Institute Of Meteorology, Hydrology And Environment (IRIMHE)		
18	Myanmar	61	Department of Meteorology and Hydrology (DMH)		
		62	Relief and Resettlement Department (RRD)		
		63	Myanmar Earthquake Committee (MEC) , Myanmar Engineering Society (MES)		
19	Nepal	64	Survey Department (SD)		
		65	Department of Water Induced Disaster Management (DWIDM), Ministry of Irrigation		
		66	Land Management Training Centre		
		67	Department of Hydrology and Meteorology (DHM), Ministry of Population & Environment		

20	Pakistan	68	Pakistan Space & Upper Atmosphere Research Commission (SUPARCO)		✓
21	Papua New Guinea	69	National Disaster Centre (NDC)		
22	Philippines	70	Office of Civil Defense (OCD), National Disaster Risk Reduction and Management Council (NDRRMC)		
		71	National Mapping and Resource Information Authority (NAMRIA)		✓
		72	Bureau of Soils and Water Management (BSWM), Department of Agriculture		
		73	Mines and Geoscience Bureau (MGB), Department of Environment and Natural Resources		
		74	Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)		✓
		75	Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD)		
		76	Philippine Institute of Volcanology and Seismology (PHIVOLCS)		✓
		77	Manila Observatory (MO)		✓
		78	NOAH Center of the University of the Philippines Resilience Institute		✓
		79	Philippine Space Agency (PhilSA)	✓	✓
23	Singapore	80	Centre for Remote Imaging, Sensing and Processing (CRISP)	✓	✓
		81	Earth Observatory of Singapore (EOS)		✓
24	Sri Lanka	82	Survey Department of Sri Lanka		✓
		83	Ministry of Disaster Management		✓
25	Taiwan	84	Taiwan Space Agency (TASA)	✓	✓
		85	National Applied Research Laboratories (NARL)		✓
		86	Center for Space and Remote Sensing Research, National Central University (CSRSR, NCU)		✓
26	Thailand	87	Geo-Informatics and Space Technology Development Agency (GISTDA)	✓	✓
		88	Department of Disaster Prevention and Mitigation (DDPM)		
		89	Department of Water Resources (DWR)		
		90	Royal Forest Department (RFD)		
		91	National Park, Wildlife and Plant Conservation Department		
		92	Royal Irrigation Department (RID)		
		93	Land Development Department (LDD)		
		94	Andaman Environment and Natural Disaster Research Center, Prince of Songkla University (ANED, PSU)		✓
27	Tonga	95	National Disaster Risk Management Office (NDRMO)		✓
28	Turkiye	96	Disaster and Emergency Management Presidency (AFAD)		
		97	Middle East Technical University (METU)		✓

29	United Arab Emirates	98	Mohammed Bin Rashid Space Centre (MBRSC)	✓	✓
30	Vietnam	99	Vietnamese Academy of Science and Technology (VAST)	✓	✓
		100	Ministry of Agriculture and Rural Development (MARD)		
		101	Ministry of Natural Resources and Environment (MONRE)		✓
		102	Cartography Department, Ministry of Defense (MOD)		
		103	Ministry of Science and Technology (MOST)		
		104	Vietnam Institute of Geosciences and Mineral Resources (VIGMR)		
31	International Organization	105	Asian Institute of Technology (AIT)		✓
		106	The ASEAN Secretariat		
		107	United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)		
		108	United Nations Office for Outer Space Affairs (UNOOSA)		
		109	International Center for Integrated Mountain Development (ICIMOD)		✓
		110	Coordinating Committee for Geoscience Programmes In East and South East Asia (CCOP)		
		111	International Centre for Water Hazard and Risk Management (ICHARM)		
		112	Asian Disaster Reduction Center (ADRC)		✓
		113	Secretariat of the Pacific Community (SPC/SOPAC)		✓
		114	The World Bank (WB)		
		115	International Water Management Institute (IWMI)		✓
		116	Asian Development Bank (ADB)		✓
		117	ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre)		
		118	World Wide Fund for Nature (WWF) - Pakistan		
		119	Asian Disaster Preparedness Center (ADPC)		✓
		120	Myanmar Information Management Unit (MIMU)		✓
		121	UN World Food Programme (WFP)		✓
		122	UNOCHA's Centre for Humanitarian Data		
		123	Mekong River Commission (MRC)		
				9	54

Emergency Observation Requests (2007 – 2024)

					Number of requested EOR (by year)																		
	Request	Activation	Rejection	Percentage of Activation	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
					Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	Num.	
Vietnam	75	69	6	92.0	2	2	4	7	2	1	2		2	3	12	6	4	5	4	2	8	9	75
Indonesia	71	64	7	90.1	7	2	5	9	2	4	2	4	2	7	3	4	2	4	3	3	2	6	71
Philippine	76	71	5	93.4	1	1	6	1	4	4	3	1	2	4	4	2	5	4	8	7	5	14	76
India	44	40	4	90.9			1	4	3	1	2	2	1	2	1	3	3	5	4	6	2	4	44
Japan	27	27	0	100.0		2		1	4	1	3	3	2	1		2	3	2	2			1	27
Nepal	32	31	1	96.9	1	2	2	1	2	1	1	1	4	2	2		2		1	1	1	8	32
Thailand	20	18	2	90.0	2	3		1	2	1	1				1	2	1		1	3		2	20
Sri Lanka	16	15	1	93.8			1	2	2	1		1	1	1	1	2		1	3				16
Taiwan	18	18	0	100.0				2	1				2	5	3	2				1		2	18
Myanmar	19	16	3	84.2		1			2		1		2	4		3	1		1		1	3	19
Pakistan	14	10	4	71.4	1	2		3	1		1		2	2						1		1	14
China	14	12	2	85.7		2		1	1	2	1	1			2		1			1	1	1	14
Bangladesh	15	15	0	100.0	3			1					1	2	2			1		1	2	2	15
Tajikistan	12	12	0	100.0	1			2	1	1		1	1						2		1	2	12
Kyrgyzstan	14	11	3	78.6				1	3	1							1		2			6	14
Bhutan	9	7	2	77.8				2		1			2	1			1				1	1	9
Kazakhstan	8	6	2	75.0				1	2	3											1	1	8
Mongolia	6	0	6	0.0	1		2	2	1														6
Australia	5	5	0	100.0		1	3		1														5
Brunei	5	3	2	60.0					3	1		1											5
Turkey	5	5	0	100.0													1	2	1		1		5
Cambodia	4	4	0	100.0				2	1									1					4
Lao PDR	5	5	0	100.0		1								1		1	1					1	5
Afghanistan	3	2	1	66.7								1								1	1		3
Solomon	3	3	0	100.0	1						1	1											3
Malaysia	3	3	0	100.0							2	1											3
Korea	3	3	0	100.0											1	1	1						3
Fiji	3	3	0	100.0						1				1			1						3
Tonga	3	3	0	100.0								1				1				1			3
PNG	2	2	0	100.0						1						1							2
Vanuatu	3	3	0	100.0									1					1				1	3
New Zealand	1	1	0	100.0					1														1
Iran	1	1	0	100.0														1					1
Lebanon	1	1	0	100.0														1					1
United Arab Emirates	2	2	0	100.0												1						1	2
Timor-Leste	1	1	0	100.0															1				1
Turkmenistan	1	1	0	100.0																		1	1
Uzbekistan	2	2	0	100.0															1			1	2
Total	546	495	51	-	20	19	24	43	39	25	20	19	25	36	32	31	28	28	34	28	27	68	546

	Number of requested EOR (by each disaster)																			
	Flood		Earthquake		Landslide		Typhoon		Forest fire		Volcanic Eruption		Cyclone		Oil Spill		GLOF/others	
	Num.	(%)	Num.	(%)	Num.	(%)	Num.	(%)	Num.	(%)	Num.	(%)	Num.	(%)	Num.	(%)	Num.	(%)
Vietnam	56	74.7	0	0.0	2	2.7	12	16.0	1	1.3					2	2.7	2	2.7
Indonesia	24	33.8	15	21.1	6	8.5			2	2.8	17	23.9					7	9.9
Philippine	28	36.8	12	15.8	1	1.3	17	22.4	1	1.3	6	7.9	3	3.9	2	2.6	6	7.9
India	27	61.4	1	2.3			3	6.8	1	2.3			9	20.5			3	6.8
Japan	12	44.4	6	22.2	3	11.1	2	7.4			4	14.8						
Nepal	20	62.5	3	9.4	3	9.4	1	3.1	1	3.1							4	12.5
Thailand	17	85.0	1	5.0											2	10.0		
Sri Lanka	12	75.0			1	6.3							2	12.5	1	6.3		
Taiwan	4	22.2	4	22.2	1	5.6	7	38.9							1	5.6	1	5.6
Myanmar	11	57.9	4	21.1	1	5.3	1	5.3					1	5.3			1	5.3
Pakistan	7	50.0	2	14.3	4	28.6											1	7.1
China	2	14.3	8	57.1	3	21.4			1	7.1								
Bangladesh	8	53.3			2	13.3	1	6.7					4	26.7				
Tajikistan	5	41.7	2	16.7	3	25.0											2	16.7
Kyrgyzstan	4	28.6	1	7.1	2	14.3											7	50.0
Bhutan	6	66.7							3	33.3								
Kazakhstan	4	50.0							3	37.5							1	12.5
Mongolia	2	33.3							3	50.0							1	16.7
Australia	3	60.0					1	20.0	1	20.0								
Brunei	4	80.0													1	20.0		
Turkey	1	20.0	3	60.0	1	20.0												
Cambodia	4	100.0																
Lao PDR	4	80.0															1	20.0
Afghanistan	1	33.3	2	66.7														
Solomon	1	33.3	1	33.3													1	33.3
Malaysia	2	66.7							1	33.3								
Korea			2	66.7					1	33.3								
Fiji	1	33.3					1	33.3					1	33.3				
Tonga											1	33.3	2	66.7				
PNG					1	50.0					1	50.0						
Vanuatu			1	33.3									2	66.7				
New Zealand			1	100.0														
Iran	1	100.0																
Lebanon																	1	100.0
United Arab Emirates	1	50.0											1	50.0				
Timor-Leste	1	100.0																
Turkmenistan	1	100.0																
Uzbekistan	1	50.0															1	50.0
Total	275	-	69	-	34	-	46	-	19	-	29	-	25	-	9	-	40	-

JPT member report “Sentinel Asia Activity in 2024”

1	ADRC	Participation in the 9th Joint Project Team Meeting (JPTM)
2	AHA Centre	Emergency Response Operation for Tropical Cyclone YAGI and Southwest Monsoon
3	BRIN	EOR activity in 2024
4	BWDB	EOR activity
5	CAIAG	✓ Participation in the 9th Joint Project Team Meeting (JPTM) ✓ Sentinel Asia Activity in Kyrgyzstan ✓ International Charter Project Manager Training
6	CEA	EOR activity
7	Chiba University	EMERGENCY RESPONSE OF THE 2024 JAPAN NOTO EARTHQUAKE
8	CRISP	Satellite data support of EORs
9	EOS	Rapid Response Efforts to Sentinel Asia EORs
10	GIC/AIT	✓ GISTDA continues to support Disaster Management ✓ Interaction with Disaster Management Organizations in Bhutan ✓ Training on Glacial Lake Outburst Flood (GLOF) Monitoring in Bhutan ✓ Field Survey to Disaster-affected Areas in Chiang Rai Province, Thailand
11	GISTDA	✓ GISTDA provides support on Disaster Management ✓ GISTDA as a Co-Chair of Sentinel Asia Steering Committee ✓ Lecture on Forest Fire Monitoring
12	ICIMOD	✓ Mapping floods in Bangladesh ✓ Mapping floods in Kathmandu ✓ Flood inundation mapping in the western Nepal ✓ GLOF in Solukhumbu, Nepal
13	ISRO	Support to Sentinel Asia
14	IWM	Participation in the 9th Joint Project Team Meeting (JPTM)
15	JMA	Meeting with Sentinel Asia secretary
16	MBRSC	MBRSC’s Support for Emergency Observation Requests during the Year 2024
17	MO	Presentation of Optimizing the Microsoft Planetary Computer for Emergency Observation and Mapping (EO/ M) at the JPTM2024
18	PhilSA	Emergency observation request

19	TASA	✓ Satellite Imagery Support to Sentinel Asia ✓ Sentinel Asia JPT-3 Cloud Services ✓ Satellite Imagery Aids Taiwan's Post-Quake Assessment ✓ Guide to Using Emergent Value-Added Products (EVAP) Module with QGIS for Disaster Response ✓ Sentinel Asia Steering Committee Meeting Held in Taiwan for the First Time
20	Yamaguchi University	Participation for the SC and Capacity Building on JPTM

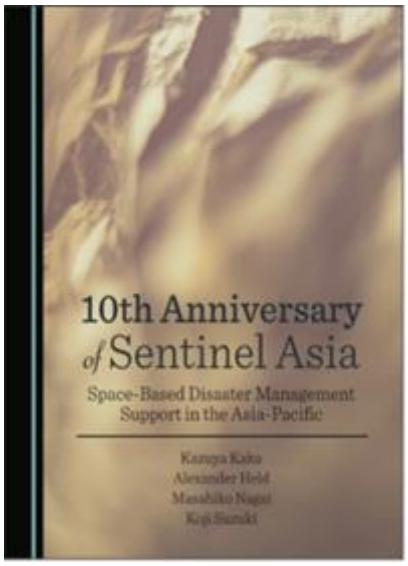
Organization	**Asian Disaster Reduction Center (ADRC)**
Title	**Participation in the 9th Joint Project Team Meeting (JPTM)**
Type of Activity	**conference**
Date	**November 2024**

The 9th Joint Project Team Meeting was held from 5 to 7 November 2024 in Quezon City, Philippines. It was co-organized by the Philippine Space Agency (PhilSA) and the Japan Aerospace Exploration Agency (JAXA).
ADRC participated in a training session held on 6 November, reporting on the status of Sentinel Asia fs emergency observation request (EOR) and end-user feedback on the various data provided. ADRC also introduced the Standard Operation Procedures (SOP) being developed in each Sentinel Asia member country and activities of the related workshops in each country. ADRC will continue to actively participate in activities related to the utilization of space technology in the field of disaster prevention.

Organization	**Asian Disaster Reduction Center (ADRC)**
Title	**10th Anniversary of Sentinel Asia: Space-Based Disaster Management Support in the Asia-Pacific**
Type of Activity	**Publication**
Date	**November 2024**

A book entitled "10th Anniversary of Sentinel Asia: Space-Based Disaster Management Support in the Asia-Pacific" was released by the Cambridge Scholars Publishing in November 2024. It was written by Dr KAKU Kazuya, Visiting Researcher of the ADRC, Mr SUZUKI Koji, Project Director of the ADRC, and others.

The book summarizes the activities of SA over the first decade from its conceptual inception in 2004, commemorating its 10th anniversary. It describes its history, framework, implementation approaches, how it operates, and its achievements, providing a good case study on how local partners have constructively collaborated to apply satellite remote sensing to support disasters management in the region. It will contribute to the further development of SA, and be a useful example for similar international collaborations for disaster response elsewhere.



Organization	**The ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre)**
Title	**Emergency Response Operation for Tropical Cyclone YAGI and Southwest Monsoon**
Type of Activity	**Utilisation of satellite products from Sentinel ASIA for disaster emergency operations**
Date	**September – October 2024**

On 1 September, tropical disturbance INVEST 92W, located east of Visayas, the Philippines, developed into Tropical Depression "Enteng" (PAGASA). It moved west-northwestward towards mainland Luzon, the Philippines, and continued to intensify with the international name YAGI. On 2 September, YAGI made landfall over Luzon, the Philippines. After exiting the Philippine Area of Responsibility, YAGI moved across West Philippine Sea–Viet Nam's East Sea, undergoing several stages of intensification as it moved towards mainland Southeast Asia. According to NCHMF, YAGI made landfall over Quang Ninh–Hai Phong Province, Viet Nam, on 7 September as a Super Typhoon, equivalent to a Category 4 hurricane on the Saffir–Simpson scale. YAGI not only brought direct impacts to ASEAN but also enhanced Southwest Monsoon conditions, further worsening the situation across ASEAN Member States.

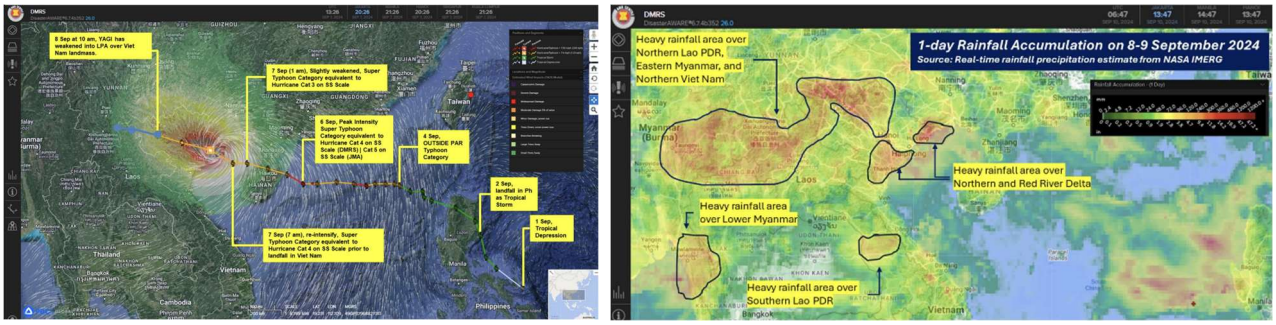


Figure 1. Tropical Cyclone YAGI track (left) and Accumulated Rainfall on 8 – 9 September 2024 (right) (Source: AHA Centre Situation Update for Tropical Cyclone YAGI and Southwest Monsoon.

During this period, the AHA Centre, for the first time, responded to disasters in 5 ASEAN Member States simultaneously. The AHA Centre provided support to NDMO Lao PDR, DDM Myanmar, NDRRMC–OCD the Philippines, DDPM Thailand, and VDDMA Viet Nam. Depending on the specific needs of each country, the AHA Centre delivered different types of assistance.

As a member of Sentinel Asia, the AHA Centre coordinated closely with the National Disaster Management Organisations (NDMOs) to determine whether a Sentinel Asia activation had already been requested. If an activation had been initiated by the NDMO or another organisation within the country, the AHA Centre provided support by sharing the Emergency Observation Request (EOR) satellite analysis produced by the Sentinel Asia Data Analysis Node (DAN). If no activation had been submitted, the AHA Centre proceeded to initiate an EOR request on behalf

of the NDMO. In these instances, the AHA Centre facilitating information to emergency satellite imagery and analysis. Information and analysis were shared from the AHA Centre Emergency Operations Centre (EOC) to the EOCs of ASEAN Member States, as well as through the AHA Centre's information products—specifically the Situation Updates for Tropical Cyclone YAGI and Southwest Monsoon #1, #2, #3, #4, #5, #6, #7, #8—to support emergency operations led by each respective NDMO.

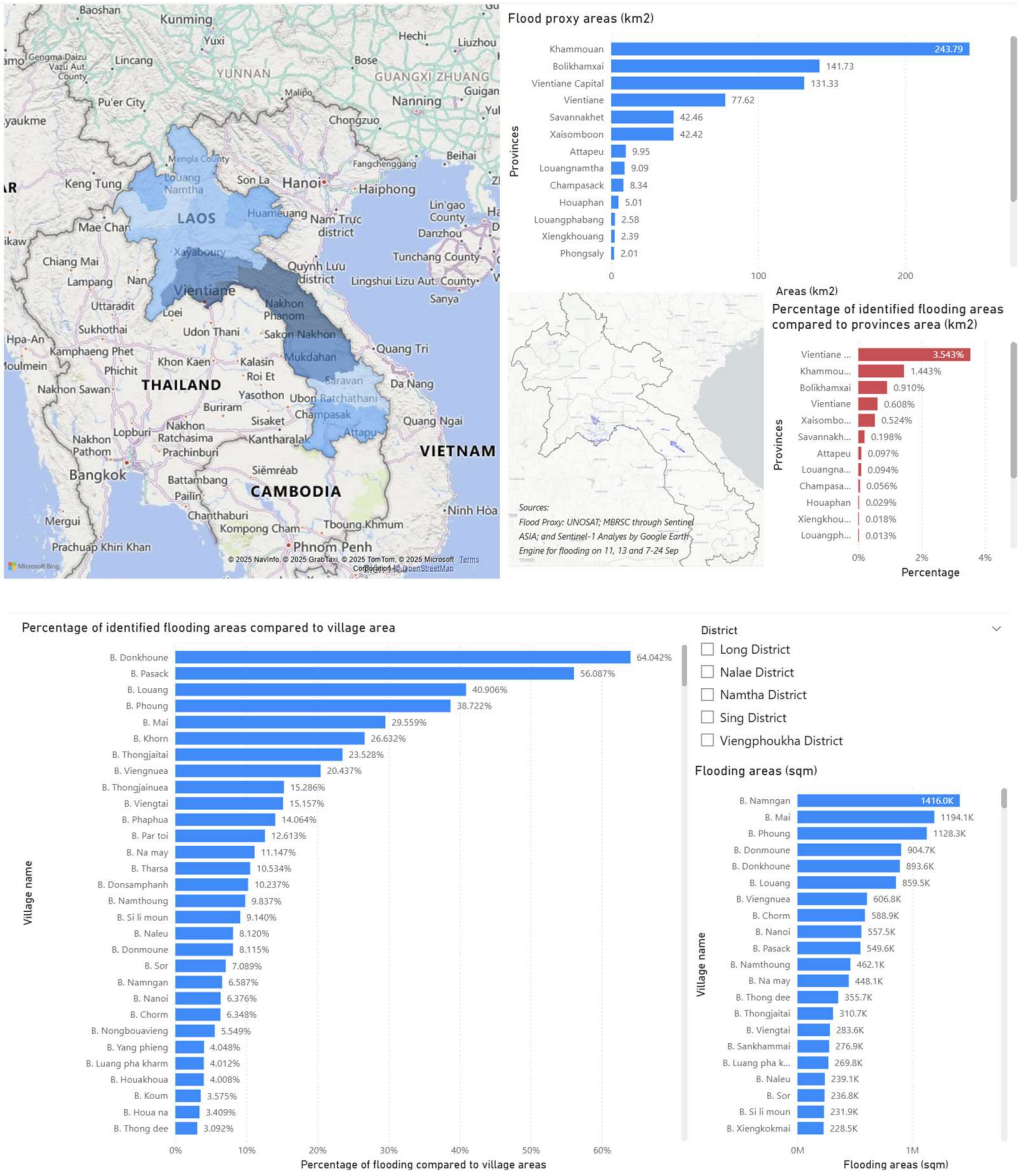


Figure 2. Calculation for flood proxy with total areas – dashboards using satellite imagery analysis including data from Sentinel Asia DAN.

As the needs of ASEAN Member States varied, NDMO Lao PDR also requested support for assessments. During the planning phase, the AHA Centre utilised satellite-based emergency information, including products from Sentinel Asia, to calculation of flood proxy maps for each affected area and compare them with total area. These information were shared with NDMO Lao PDR, as the lead agency for the joint assessment, and supported ASEAN-ERAT members on the ground.

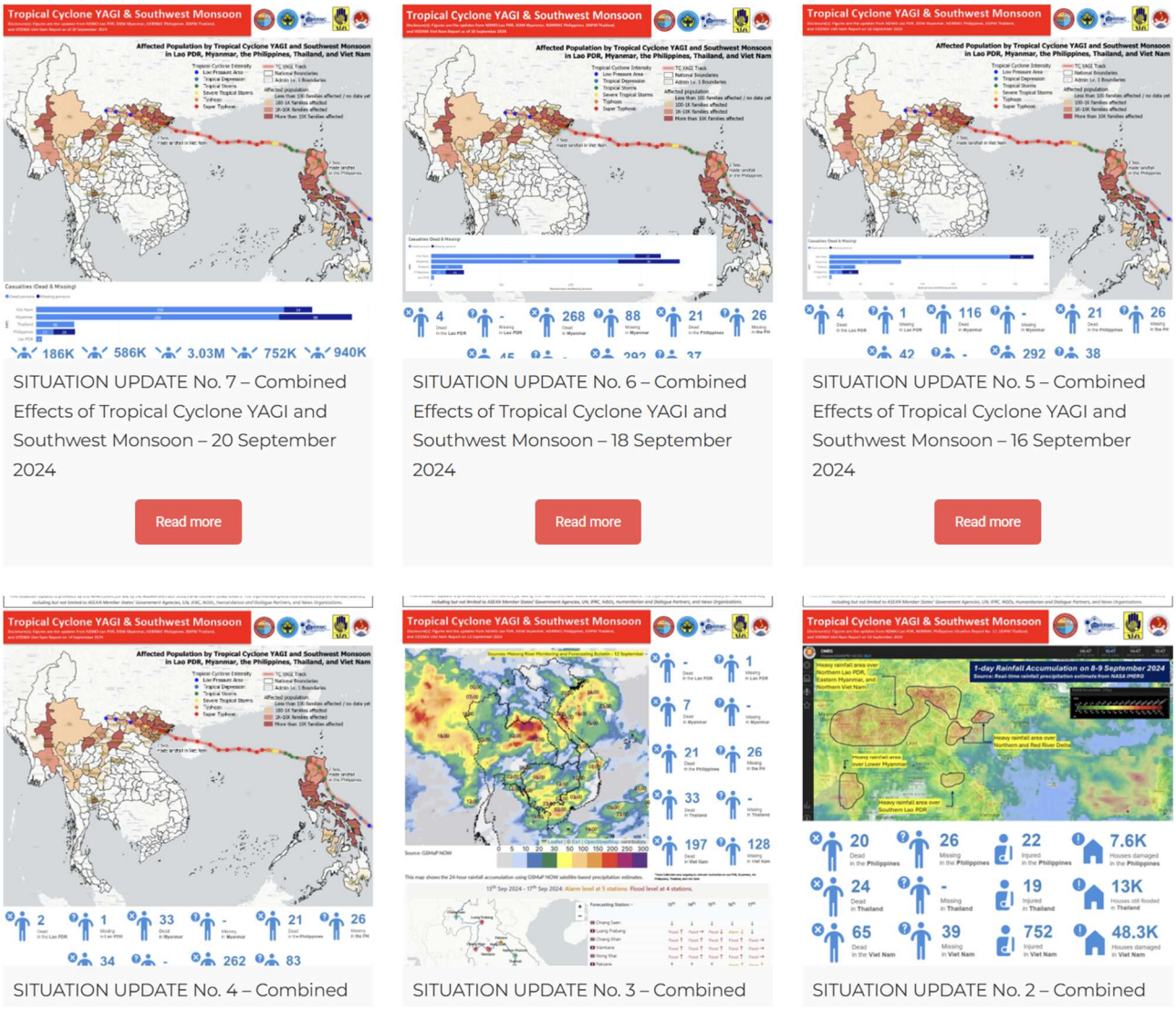


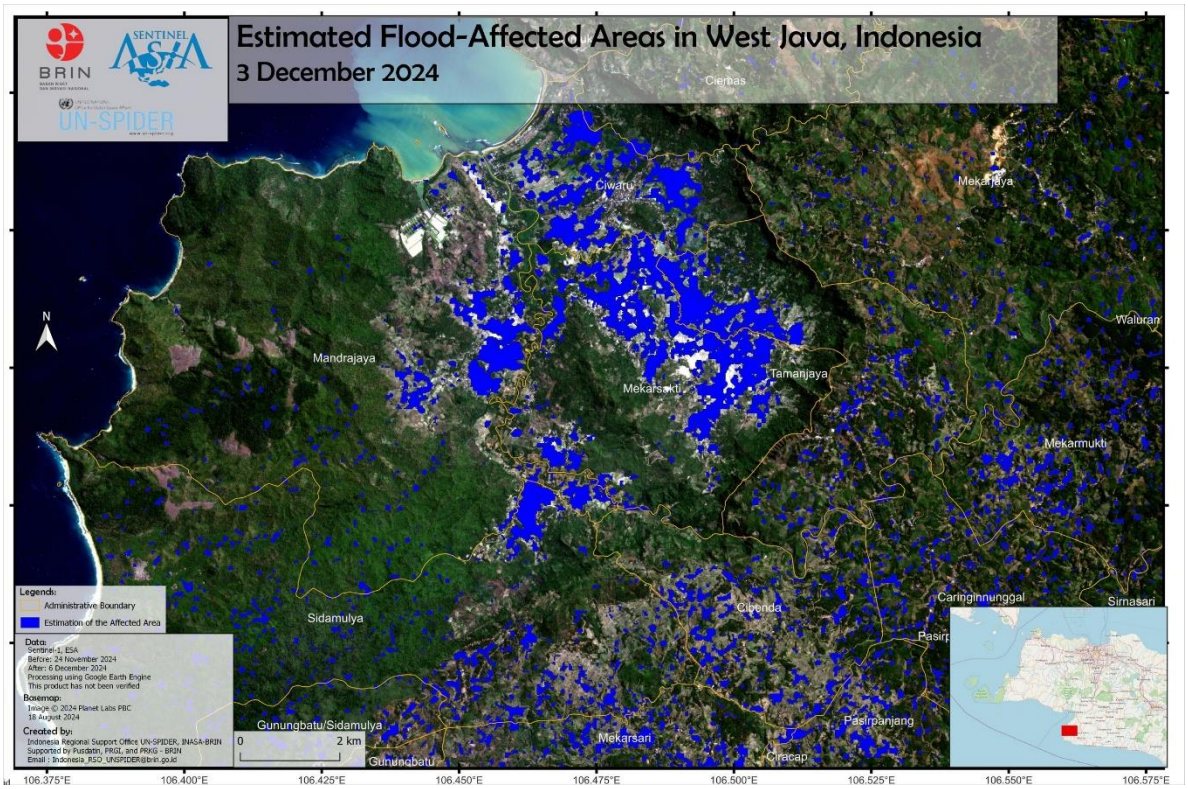
Figure 3. AHA Centre Situation Updates for Tropical Cyclone YAGI and Southwest Monsoon (https://ahacentre.org/situation-updates/)

Organization	**BRIN (Badan Riset dan Inovasi Nasional)**
Title	**EOR activity in 2024**
Type of Activity	**EOR activity in 2024**
Date	**2024**

BRIN (Badan Riset dan Inovasi Nasional) is Indonesia's national agency that unifies the country's research institutions and oversees all government-led research, technology, and innovation activities to enhance scientific development, promote innovation, and support national and international collaboration.

BRIN made 4 EORs in 2024 as follows.

- ✓ Flood in Central Java Island, Indonesia on 15 March, 2024
- ✓ Flood and Landslide in Indonesia on 02 May, 2024
- ✓ Flash Flood in West Sumatra, Indonesia on 11 May, 2024
- ✓ Flood and Landslide in West Java, Indonesia on 03 December, 2024



Analyzed map by BRIN

Organization	**Bangladesh Water Development Board (BWDB)**
Title	**EOR activity**
Type of Activity	**EOR activity**
Date	**2024**

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i. EOR for Flash Flood in Sylhet in June 2024

An EOR was submitted during the occurrence of Flash Flood in Sylhet division in June, 2024.

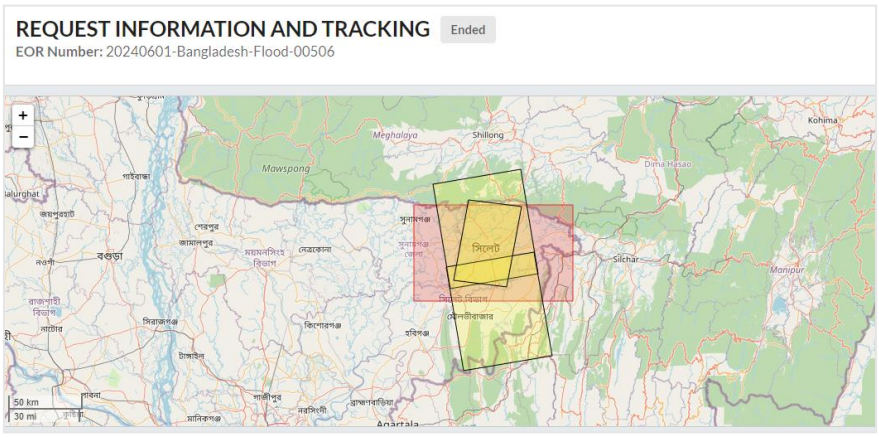
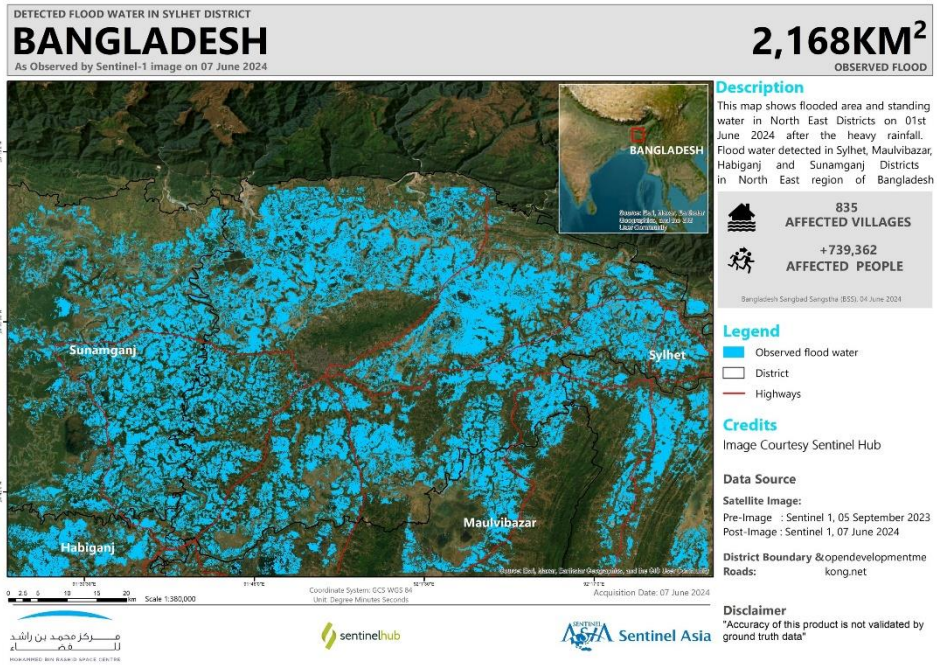
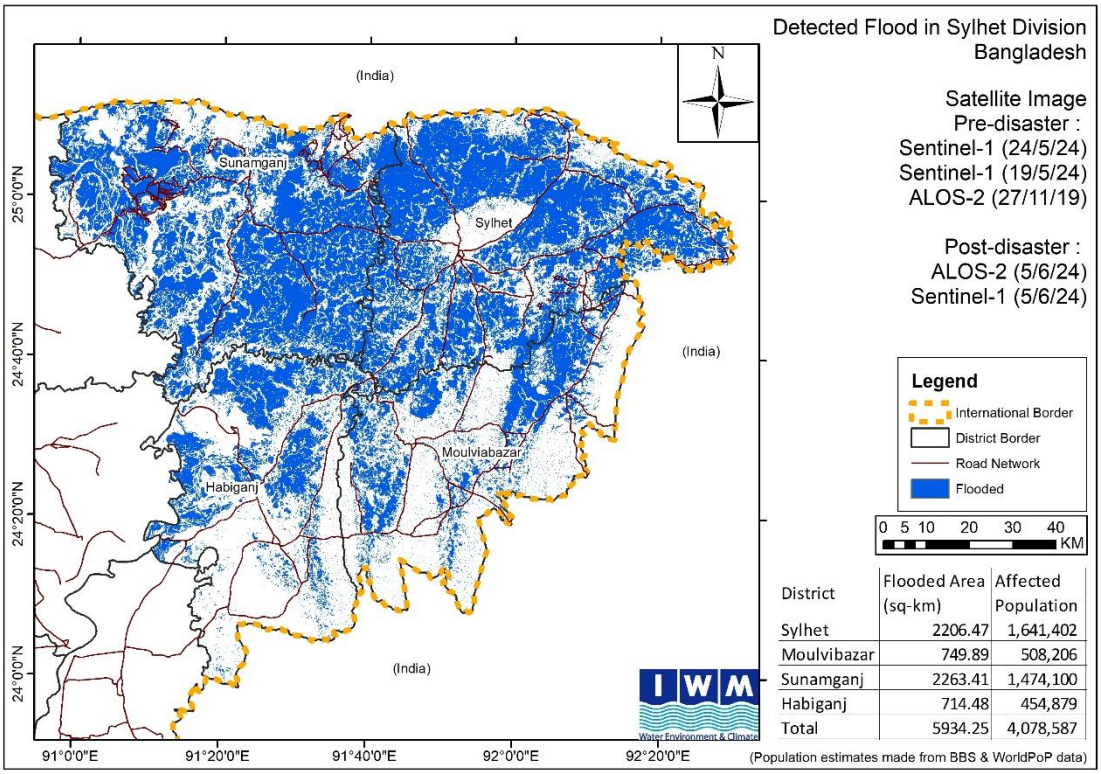


Figure 1: Flash Flood in Sylhet during June 2024

Value Added Products by DAN: Mohammed Bin Rashid Space Center

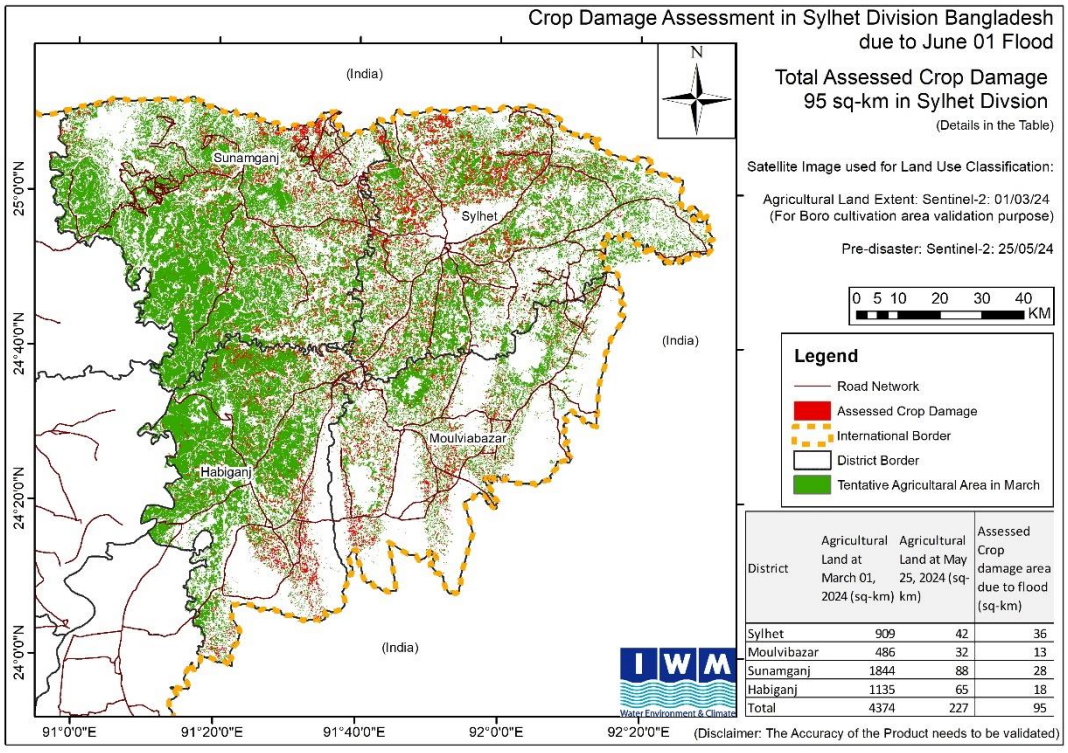


Value Added Products by DAN: IWM



District	Flooded Area (sq-km)	Affected Population
Sylhet	2206.47	1,641,402
Moulvibazar	749.89	508,206
Sunamganj	2263.41	1,474,100
Habiganj	714.48	454,879
Total	5934.25	4,078,587

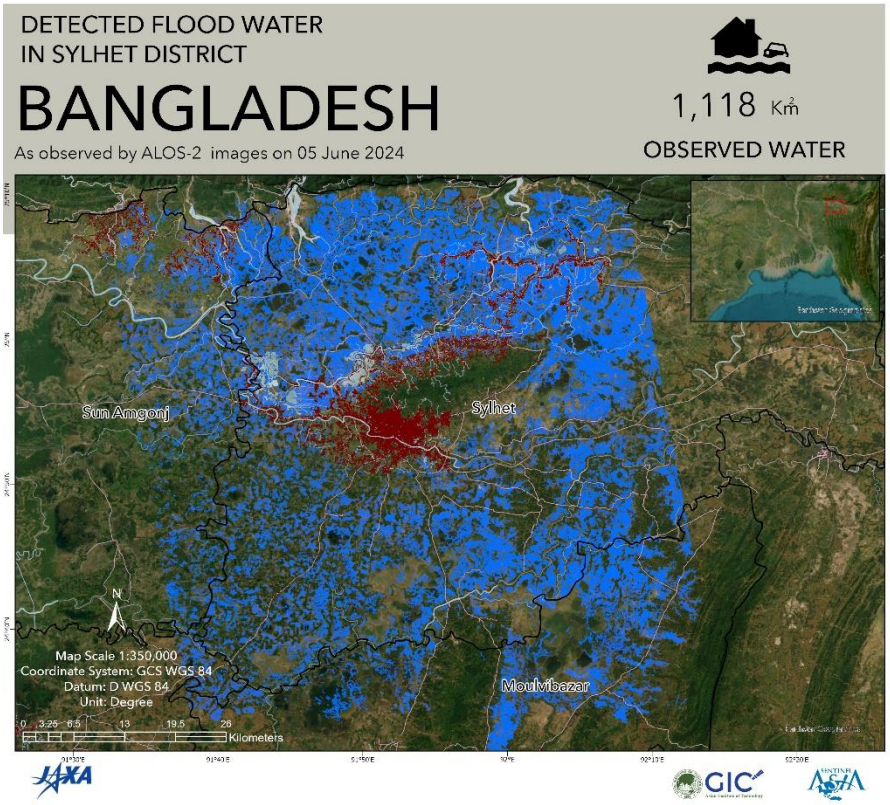
(Population estimates made from BBS & WorldPoP data)

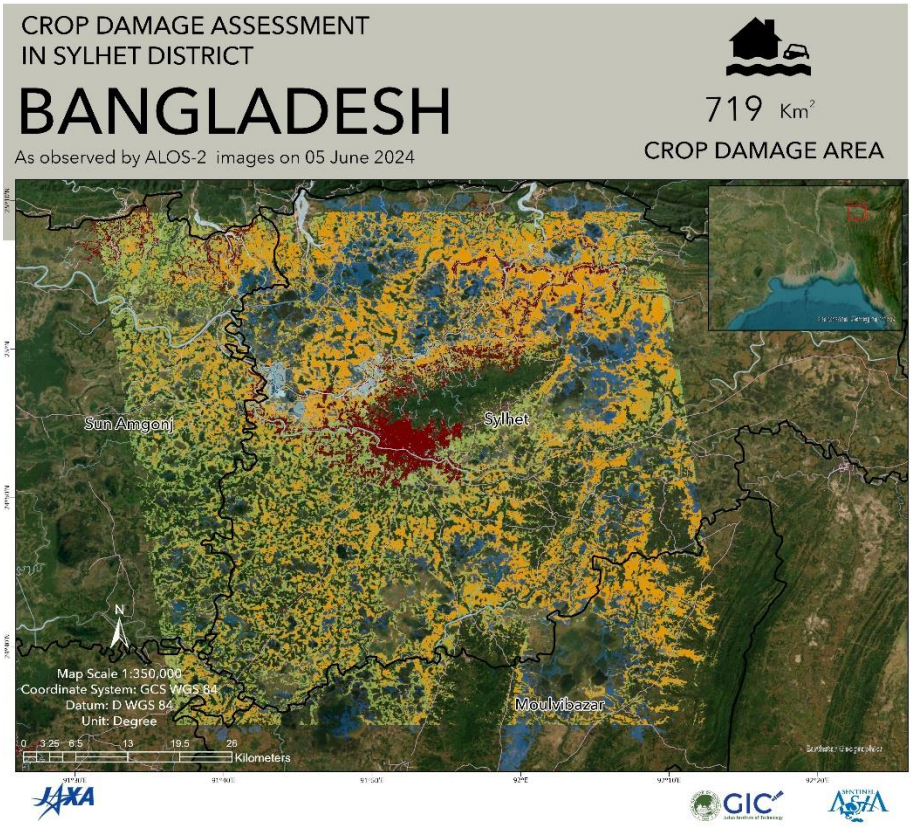


District	Agricultural Land at March 01, 2024 (sq-km)	Agricultural Land at May 25, 2024 (sq-km)	Assessed Crop damage area due to flood (sq-km)
Sylhet	909	42	36
Moulvibazar	486	32	13
Sunamganj	1844	88	28
Habiganj	1135	65	18
Total	4374	227	95

(Disclaimer: The Accuracy of the Product needs to be validated)

Value Added Product by PDAN: Asian Institute of Technology





Emergency Observation Request (EOR)

ii. Flash Flood in Chattogram and Sylhet Divisions in August 2024

In August 2024, severe flash flood occurred in several districts of Chattogram division such as Cumilla, Feni, Noakhali, Brahmanbaria, Chandpur as well as several districts of Sylhet division such as Moulvibazar, Habiganj due to intense monsoon rainfall.

Central GIS Directorate initiated a rapid response for assessing the impact of the flash flood by creating an Emergency Observation Request (EOR) through the Sentinel Asia platform using the Optemis system (https://optemis.sentinel-asia.org).

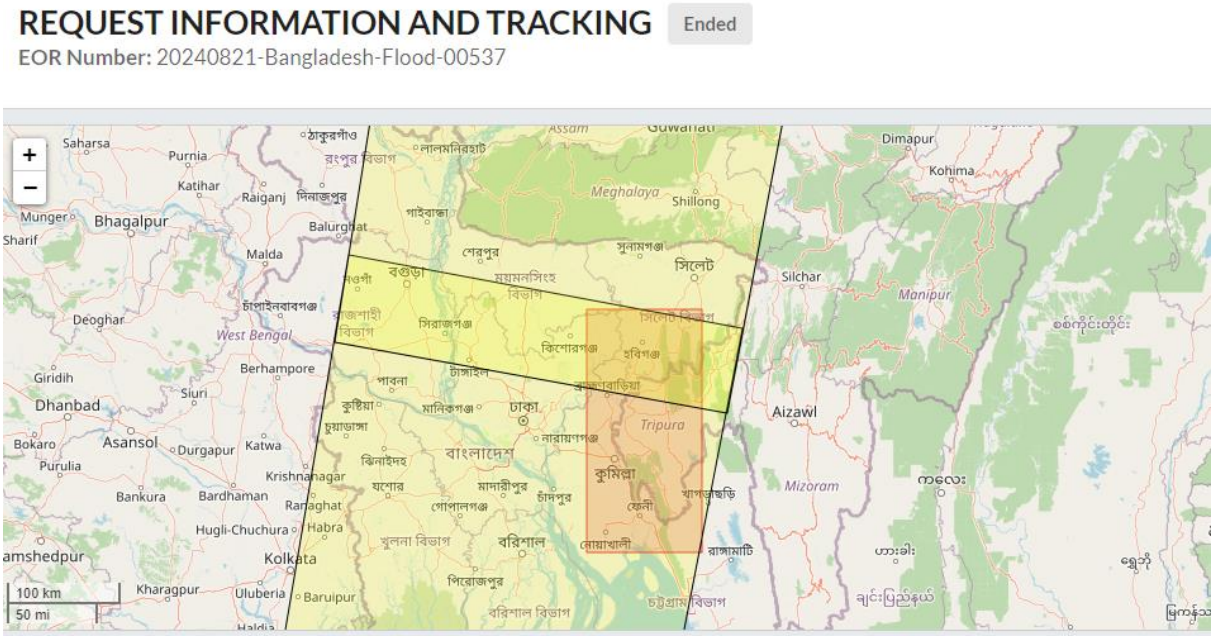


Figure 2: EOR for Flash Flood in Chattogram and Sylhet Divisions in August 2024

Following the submission of the EOR, satellite data was received from various Data Provider Nodes (DPNs) of Sentinel Asia. Besides, various Data Analysis Nodes (DANs) of Sentinel Asia provided some Value Added Products (VAPs) of analyzed imagery from SAR satellites.

Using the processed data from DANs, Central GIS Directorate was able to create flood extent map of the flooded regions. While ground truthing was not conducted during this flooding event, GIS Directorate plans to incorporate ground truthing in future events through the utilization of drone imagery and with the information provided by the BWDB's local offices of corresponding flood affected areas to enhance the accuracy of flood extent maps derived from SAR data.

The finalized flood extent map was published on the GIS portal of Central GIS Directorate (https://tinyurl.com/floodextent24082024) and also in International Disaster Charter

(https://disasterscharter.org/cos-api/api/file/public/article-image/28586113) which makes it accessible to stakeholders involved in disaster response.

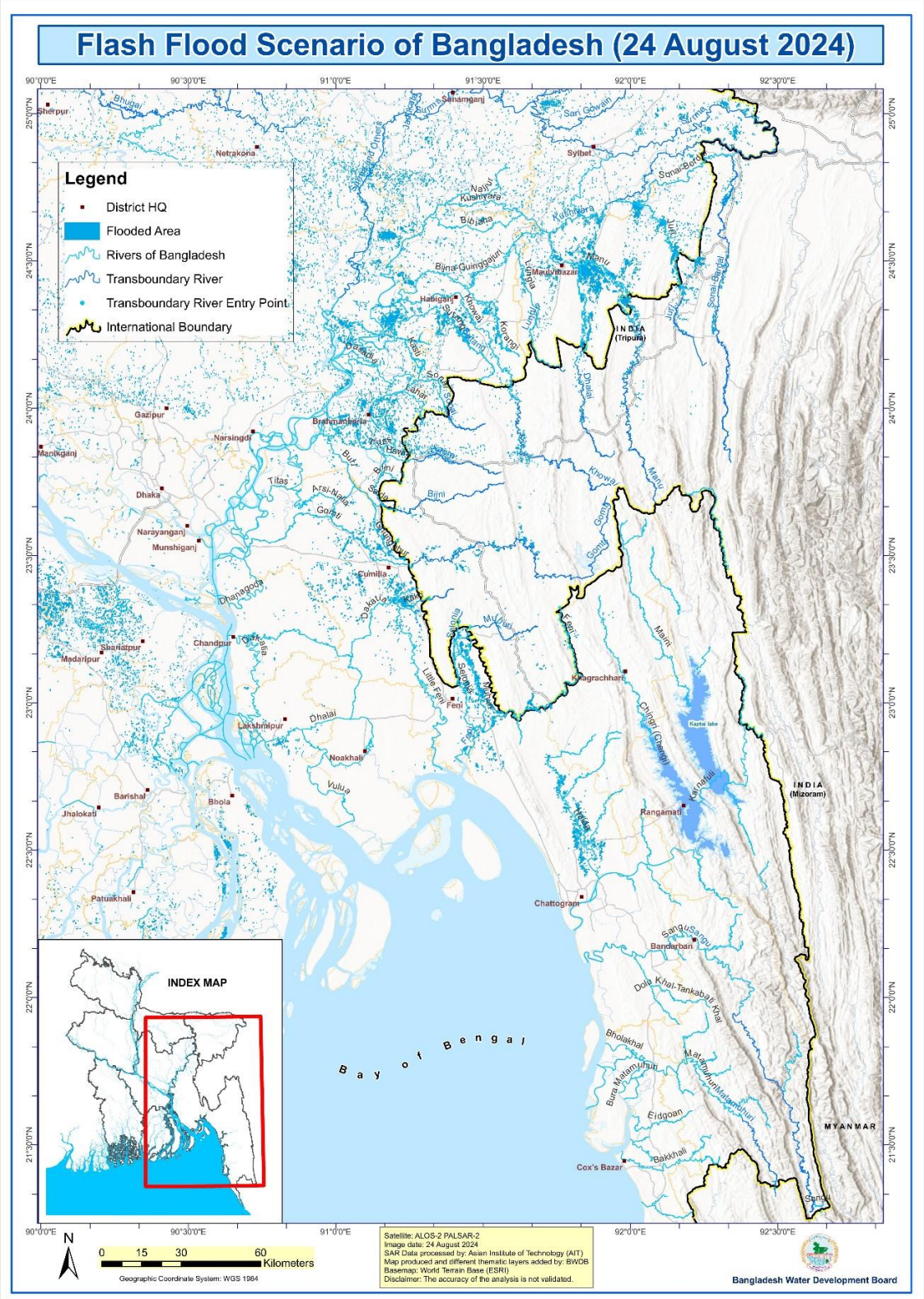
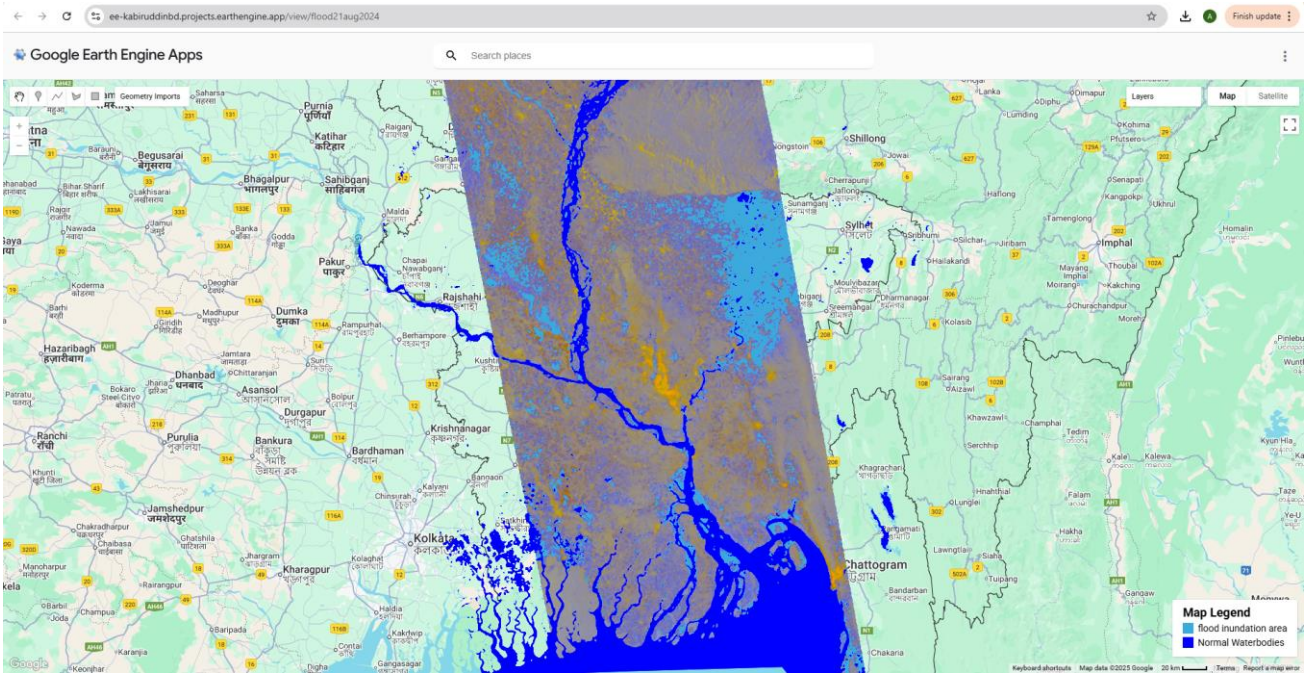


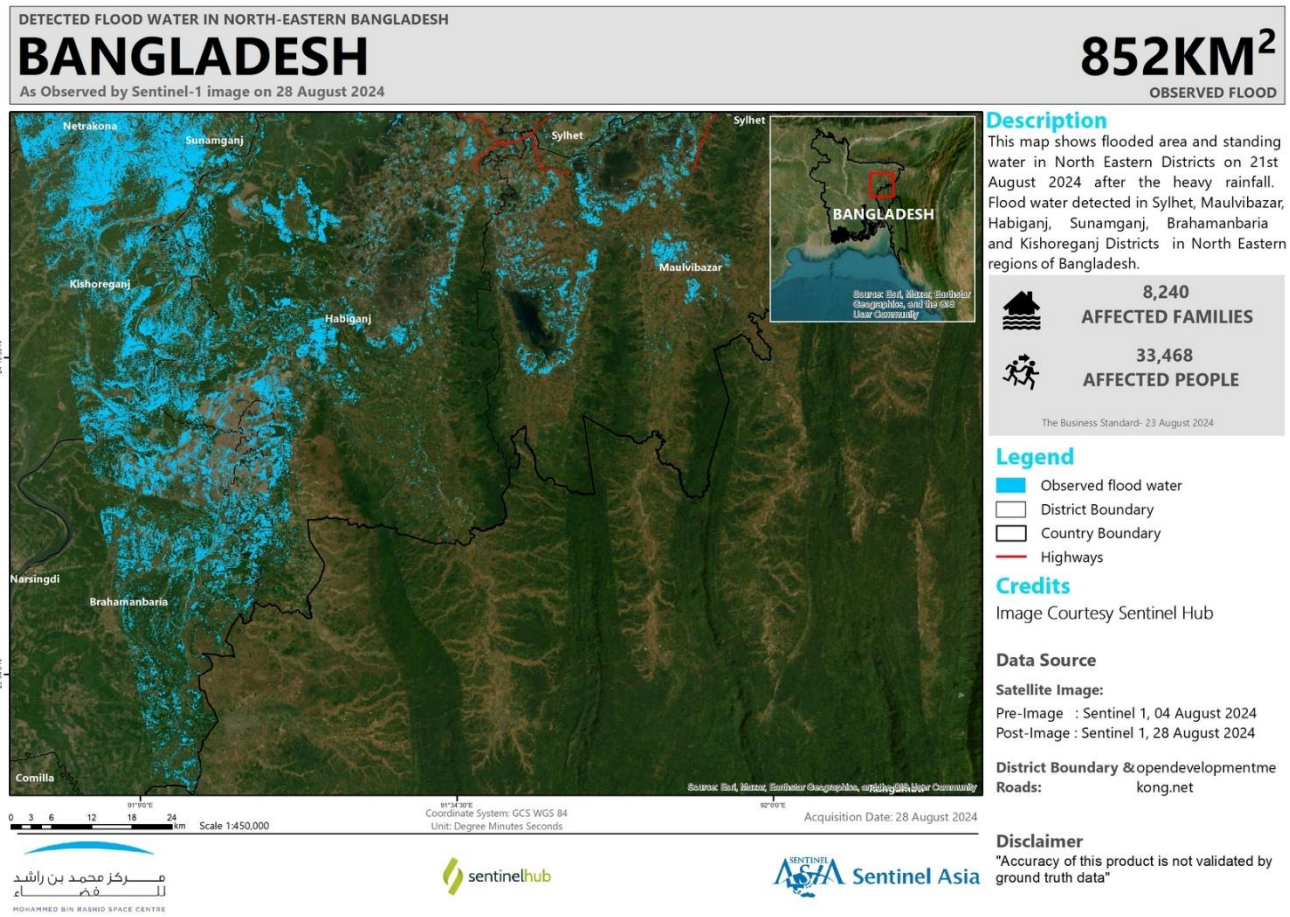
Figure 3: Flash Flood Scenario of Bangladesh during August, 2024.



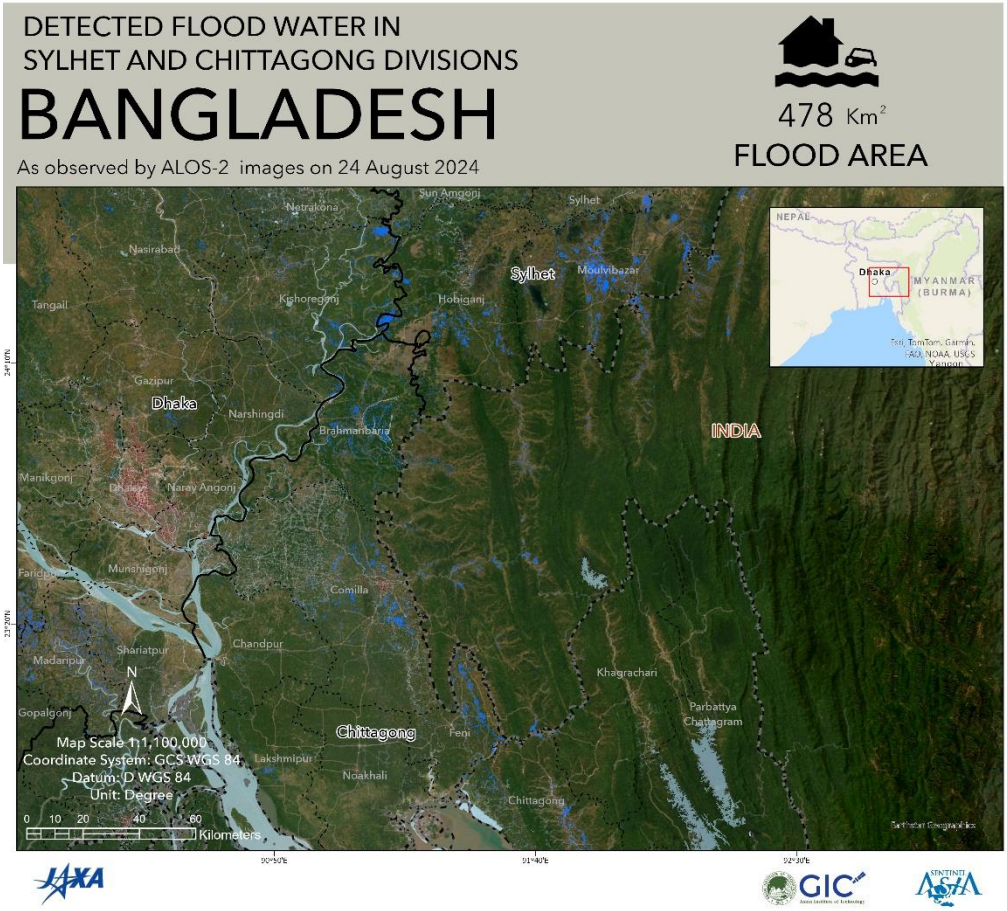
Value Added Product by Mr. Kabir Uddin: Flood Aug 2024

(https://ee-kabiruddinbd.projects.earthengine.app/view/flood21aug2024)

Value Added Product by DAN: Mohammed Bin Rashid Space Center



Value Added Product by PDAN: AIT



This map shows the detected flood water areas in Sylhet and Chittagong Divisions, Bangladesh, on August 21, 2024, due to downpours and swelling of many rivers.

15
NUMBER OF DEATHS

4,400,000
AFFECTED PEOPLE

Source: The Daily Star, 24/08/2024

- Detected Flood Water
- Building
- Country Boundary
- Division Boundary
- District Boundary
- Waterbody
- Waterway
- Road

Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 13 July 2024

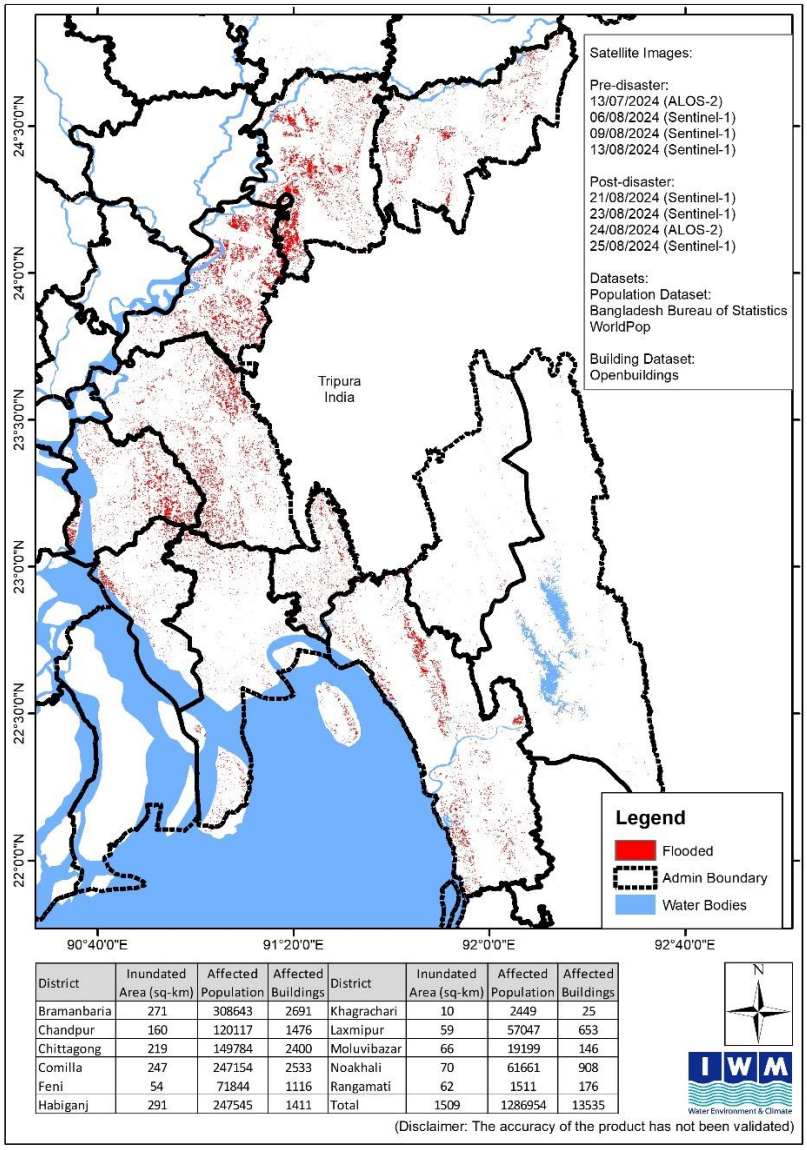
Post-disaster : ALOS-2 PALSAR-2, 24 August 2024

GIS Data:
Building and Road © OSM (2024)
Administrative Boundary © GADM (2024)

Map product made by GIC-AIT (v1.0).

Disclaimer: The accuracy of this product is not validated.

Value Added Product by DAN: IWM



District	Inundated Area (sq-km)	Affected Population	Affected Buildings	District	Inundated Area (sq-km)	Affected Population	Affected Buildings
Bramanbaria	271	308643	2691	Khagrachari	10	2449	25
Chandpur	160	120117	1476	Laxmipur	59	57047	653
Chittagong	219	149784	2400	Moluvibazar	66	19199	146
Comilla	247	247154	2533	Noakhali	70	61661	908
Feni	54	71844	1116	Rangamati	62	1511	176
Habiganj	291	247545	1411	Total	1509	1286954	13535

(Disclaimer: The accuracy of the product has not been validated)

3rd Coordination Meeting among the Sentinel Asia Members of Bangladesh

Date & Time :	11th June 2024 From 03:00 PM to 04:30 PM
Venue :	Meeting Room at JICA Bangladesh Office
Organized by :	JICA Advisor
Participants :	Mr. A M Mustofa Sorwar (Superintendent Engineer, BWDB), Mr. Mohammad Imrul Islam (Senior Research Officer, SPARRSO), Mr. S M Ahsan Habib (Senior Research Officer, SPARRSO), Mr. Mohammad Hafizur Rahman (Assistant Director GIS, DDM), Mr. Imran Khan (Associate Specialist, IWM), Mr. Morimasa Tsuda (JICA Advisor), Mr. Masudur Rashied (Program Officer).

The third coordination meeting among the Sentinel Asia members was held at the JICA Bangladesh office on June 11th. This meeting was attended by representatives from Bangladesh Water Development Board (BWDB), Department of Disaster Management (DDM), Space Research and Remote Sensing Organization (SPARRSO) and Institute of Water Modeling (IWM).

The main purpose of this meeting was to introduce IWM as a new member of Sentinel Asia, gather feedback from participating organizations and present the updated Standard Operating Procedure (SOP). The JICA Advisor distributed the SOP and gave a brief overview of the newly added portion, which involves inserting IWM as a Data Analysis Node (DAN).

Organization	**Central Asian Institute for Applied Geosciences (CAIAG)**
Title	**Participation in the 9th Joint Project Team Meeting (JPTM)**
Type of Activity	**The Conference "Harnessing Satellites and Collaboration for Regional Disaster Resilience"**
Date	**5-7/11/2024**

The 9th Joint Project Team Meeting was held from 5 to 7 November 2024 in Quezon City, Philippines. The event was co-organized by the Philippine Space Agency (PhilSA) and the Japan Aerospace Exploration Agency (JAXA).

The Central Asian Institute for Applied Geosciences (CAIAG) participated online in the session "Presentation on Good Practices of Sentinel Asia or Expectation of Sentinel Asia", held on 5 November, and presented the report "Events Occurred in Central Asia in 2024". The report highlighted that 11 Emergency Observation Requests (EORs) were activated in 2024 through the Sentinel Asia platform in the Central Asian region. Of these, six events occurred in the Kyrgyz Republic, two in Tajikistan, and one event each in Kazakhstan, Uzbekistan, and Turkmenistan. All events were classified as floods and landslides.

Organization	**Central Asian Institute for Applied Geosciences (CAIAG)**
Title	**Sentinel Asia Activity in Kyrgyzstan**
Type of Activity	**The Course on utilization of space technology for DRR -Sentinel Asia-**
Date	**10/10/2024**

The course was held on 10 October 2024 at CAIAG in Bishkek, Kyrgyz Republic. The event was co-organized by the Asian Disaster Reduction Center (ADRC) and the Japan Aerospace Exploration Agency (JAXA). The course on the use of space technology for disaster risk reduction (Sentinel Asia) was delivered by Dr. Ikeda, Mr. Kawakita, and Mr. Ueda.

The Sentinel Asia (SA) project aims to utilize space technology for disaster risk reduction (DRR) in Asian and Pacific countries. One of the major activities of SA is to provide satellite images and analytical maps in response to disasters, based on requests from SA member organizations. During the course, participants received a demonstration on submitting requests and discussed ways to improve activities in this field.

Participants included representatives and specialists from various institutions: the Deputy Head of the Geodesy and Geoinformatics Department from Razzakov Kyrgyz State Technical University, a Senior Lecturer from Kyrgyz State Technical University, an intern from the University of Heidelberg, Germany, a GIS specialist, and researchers from the Monitoring Systems and Data Management Department at CAIAG.

Figure 1 Participants of the course with ADRC and JAXA

Organization	**Central Asian Institute for Applied Geosciences (CAIAG)**
Title	**International Charter Project Manager Training**
Type of Activity	**Training on project management of the International Charter on Space and Major Disasters**
Date	**26-27/09/2024**

The training was held on 26–27 September 2024 at CAIAG in Bishkek, Kyrgyz Republic. The event was co-organized by the International Charter on Space and Major Disasters (the Charter) and conducted by the Charter's Executive Secretary, Dr. Shiraishi Takeshi (JAXA), along with online lecturers from the European Space Agency and the Geoinformatics Center at the Asian Institute of Technology (GIC-AIT).

During the training, participants were introduced to and demonstrated how to use the Charter's operational system COS-2 and the Charter Mapper program.

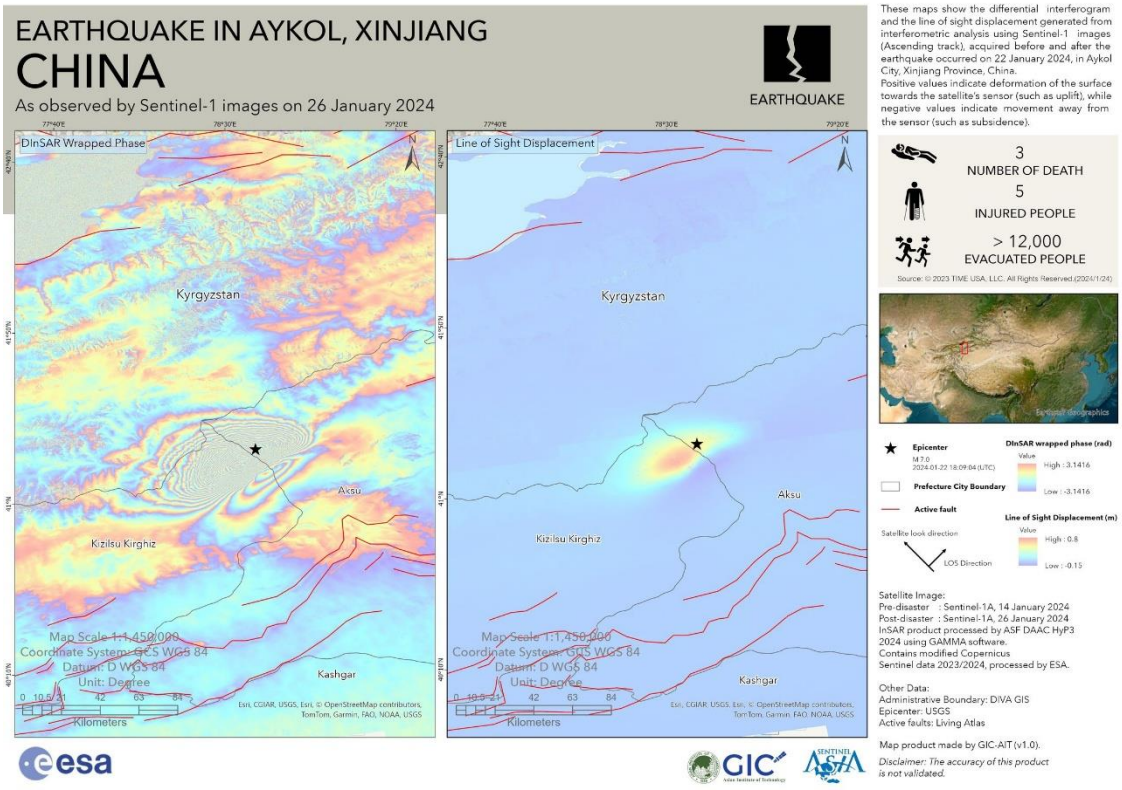
The training sessions included a general presentation on the Disasters Charter and Sentinel Asia (JAXA), an overview of the Charter's operational organization, Project Manager roles and procedures (JAXA), scenarios for different types of disasters covered by the Charter with examples from activations (JAXA), an online lecture on the Charter Mapper provided by ESA, and a practical demonstration on using the COS-2 system as a Project Manager during activations (JAXA). Participants also discussed experiences from Charter Project Managers (to be determined) and concluded with a group discussion and summary of key points.

Figure 2 Participants of the training with Charter's Executive secretary Dr. Shiraishi Takeshi

Organization	**China Earthquake Administration (CEA)**
Title	**Requested for Earthquake in western Xinjiang, China**
Type of Activity	**EOR activity**
Date	**January 2024**

The China Earthquake Administration (CEA) is a government agency responsible for earthquake management in China, as mandated by the Law of the People's Republic of China on Protecting Against and Mitigating Earthquake Disasters of PRC under the administration of State Council.

CEA made an EOR for the Earthquake in western Xinjiang, China. We received a several products and utilized for our DRR activities such as response on site.

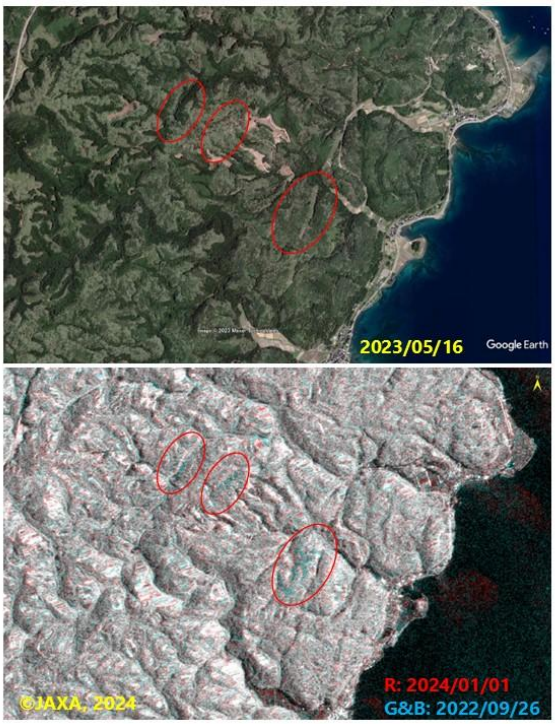


VAP (AIT/GIC)

Organization	**Chiba University, Japan**
Title	**EMERGENCY RESPONSE OF THE 2024 JAPAN NOTO EARTHQUAKE**
Type of Activity	**EOR** (e.g., Conference, Workshop, Meeting, Training, EOR, Providing satellite data or VAP)
Date	**15/10/2025**

A magnitude Mw 7.6 earthquake struck the Noto Peninsula in Ishikawa Prefecture, central Japan, on January 1, 2024. More than two hundred people were killed due to building collapses, landslides, tsunamis, and fires following the earthquake. The most severely affected municipalities were Wajima and Suzu cities, located on the northern and eastern edges of the peninsula.

In response to a request from the Japanese government, Sentinel Asia (SA) was activated on January 2 to support disaster response efforts. The authors produced color composites of pre- and post-event ALOS-2 intensity images around Anamizu Town and extracted possible landslides visually. In addition, possible damaged urban areas in Wajima and Suzu cities were identified through visual interpretation of pre- and post-event optical satellite images. These results were submitted to the International Disasters Charter.



The 2024 Noto earthquake, Japan

Sensors: ALOS-2 PALSAR-2
Comparison of the pre-event optical images (Google Earthquake) and the color composite of the ALOS-2 intensity images.
Cyan color represents the decrease of the backscatter intensity after the earthquake.
Three possible landslides were identified by visual interpretation.

ALOS-2 images were owned by JAXA (6.25m/pixel).

Organization	**Centre for Remote Imaging, Sensing and Processing (CRISP)**
Title	**Satellite data support of EORs**
Type of Activity	**Provision of satellite imagery for EORs**
Date	**2024**

In 2024, the Centre for Remote Imaging, Sensing and Processing (CRISP) at the National University of Singapore (NUS) continued its active participation in the Sentinel Asia JPTM and SA-SC meetings. As a Data Provider Node (DPN) of Sentinel Asia, CRISP also continued to provide satellite imagery in support of Emergency Observation Requests (EORs).

Satellite data support

For Sentinel Asia, CRISP provided imagery from the Singapore TeLEOS-1 optical earth observation satellite. The CRISP ground station team was activated on receiving the announcement of each new EOR, and tasked the satellite to capture images based on the location of the disaster as described in the EOR. Images sufficiently clear of clouds were uploaded to the OPTEMIS system for dissemination to Sentinel Asia members.

CRISP supplied a total of 17 TeLEOS-1 satellite images in 2024 to Sentinel Asia. These are listed below according to EOR:

	EOR name	No. and date of images provided
1	20240315-Indonesia-Flood-00493	5 images: 26 Mar, 27 Mar, 1 Apr (3)
2	20240701-Myanmar (Burma)-Flood-00511	1 image: 3 Jul
3	20240823-Vietnam-Flood-Landslide-Storm-00538	2 images: 28 Aug (2)
4	20240911-Myanmar (Burma)-Flood-Landslide-00546	1 image: 25 Sep
5	20240919-Vietnam-Flood-Landslide-Storm-00550	1 image: 30 Sep
6	20241024-Philippines-Flood-Landslide-00562	1 image: 4 Nov
7	20241103-Indonesia-Volcano-00563	4 images: 5 Nov (2), 15 Nov, 19 Nov
8	20241116-Philippines-Flood-Landslide-00565	2 images: 20 Nov, 21 Nov

Organization	**Earth Observatory of Singapore (EOS)**
Title	**Rapid Response Efforts to Sentinel Asia EORs**
Type of Activity	**Emergency Observation Requests (EORs)**
Date	**2024**

Contributions of the Earth Observatory of Singapore as a Data Analysis Node

The Earth Observatory of Singapore Remote Sensing Lab (EOS-RS) has been continually contributing to the ongoing humanitarian assistance and disaster relief (HADR) efforts of Sentinel Asia as a Data Analysis Node (DAN) in over 65 disaster events since 2019. EOS-RS primarily achieves this through the rapid generation of damage and flood proxy maps at low latencies using synthetic aperture radar (SAR) data. Prior to product delivery, these proxy maps from EOS-RS are rigorously validated with available ground-truth data to ensure high accuracy and product quality.

In 2024, EOS-RS responded to 26 calls for Emergency Observation Requests (EORs) from Sentinel Asia through the Optemis Dashboard, representing a significant 136% increase from the 11 EORs responded to in 2023. Notably, out of the 35 total disaster events that EOS-RS responded to in 2024, 26 (74%) were Sentinel Asia requests, demonstrating that the majority of our operational disaster response efforts are dedicated to supporting the Sentinel Asia framework. This substantial increase reflects both the growing trust in EOS-RS capabilities and the heightened disaster activity across the Asia-Pacific region in 2024.

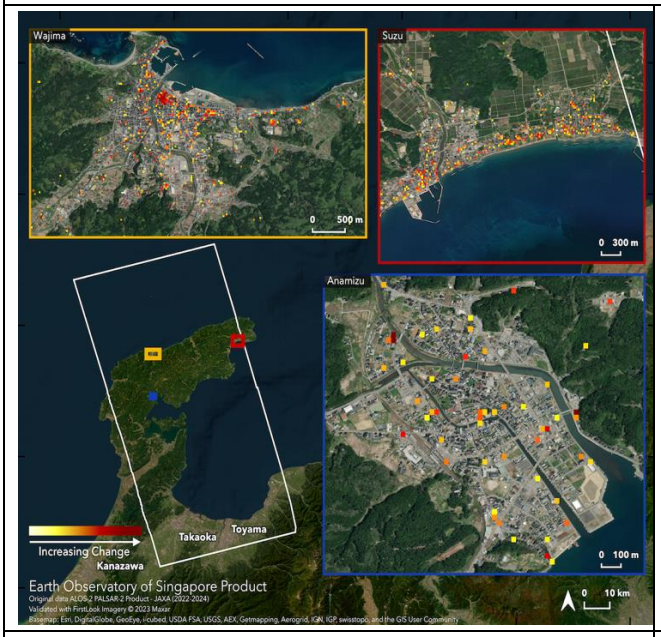
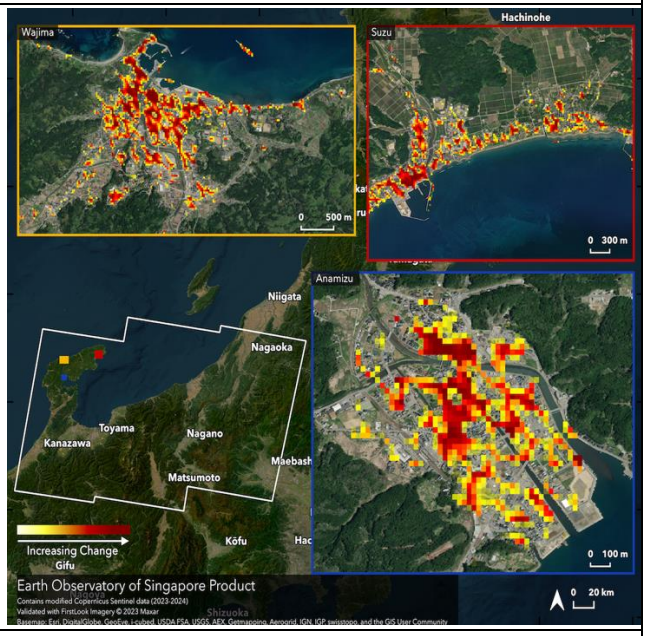
The nature of EORs that EOS-RS has responded to in 2024 are as follows:

- 13 Floods
- 4 Tropical Cyclones
- 3 Earthquakes
- 2 Volcanic Eruptions
- 2 Landslides
- 1 Glacial Lake Outburst Flood
- 1 Avalanche

Highlighted Events in 2024

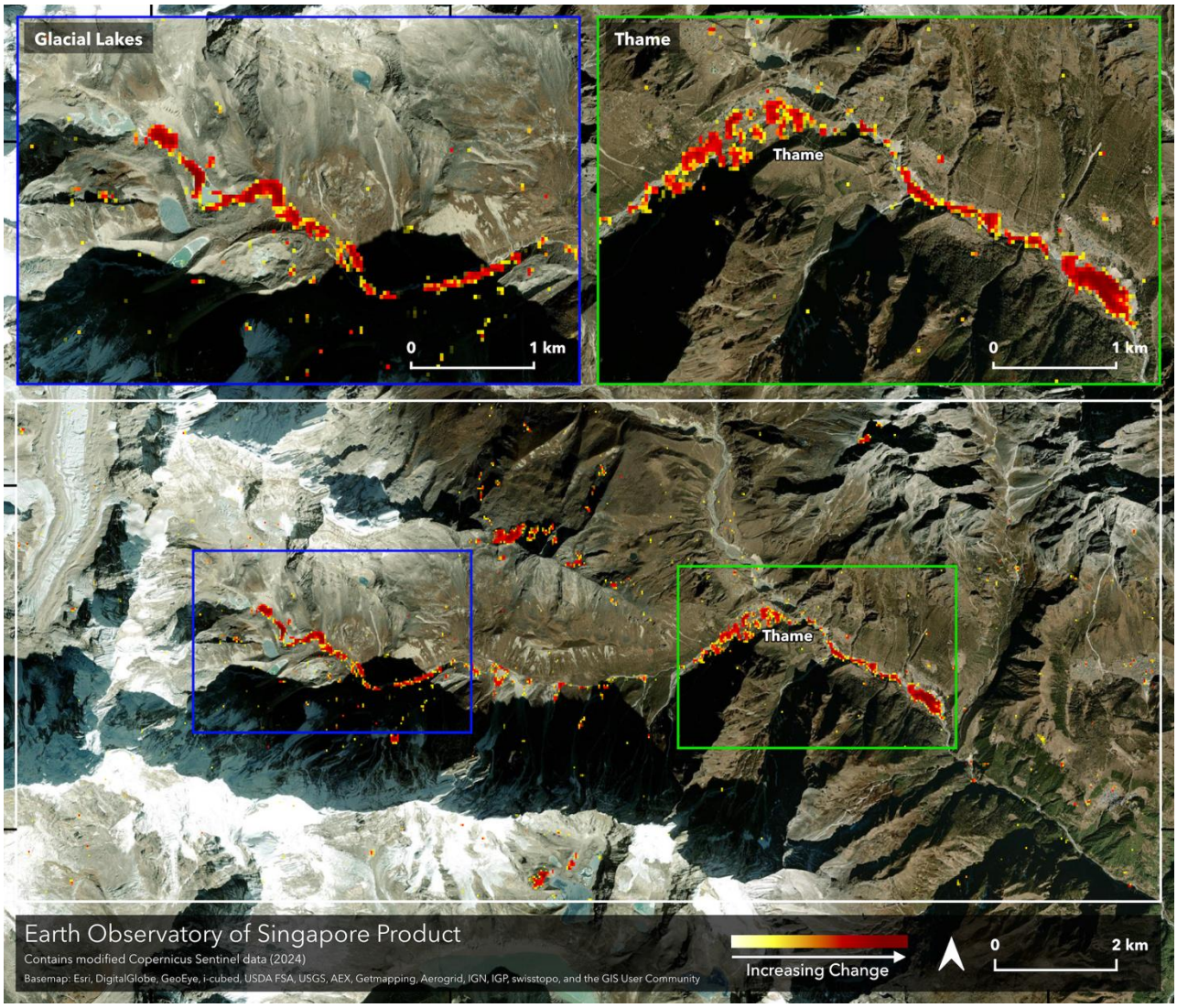
Throughout 2024, EOS-RS responded to several significant disasters across the Asia-Pacific region, showcasing our versatile mapping capabilities and multi-sensor approach:

Japan Noto Peninsula Earthquake (January 2024) - Following the devastating M7.6 earthquake on 1 January, EOS-RS rapidly deployed both ALOS-2 PALSAR-2 data (provided by JAXA) and Copernicus Sentinel-1 data to generate complementary damage proxy maps. This multi-sensor approach provided comprehensive damage assessment to support emergency response efforts.

Damage Proxy Maps: Japan, M7.6 Noto Peninsula Earthquake	
	
ALOS-2 PALSAR-2 data	Copernicus Sentinel-1 Data

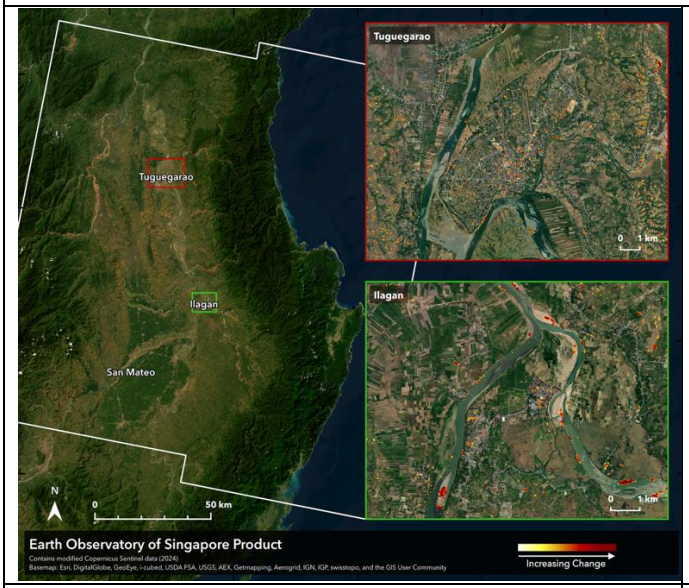
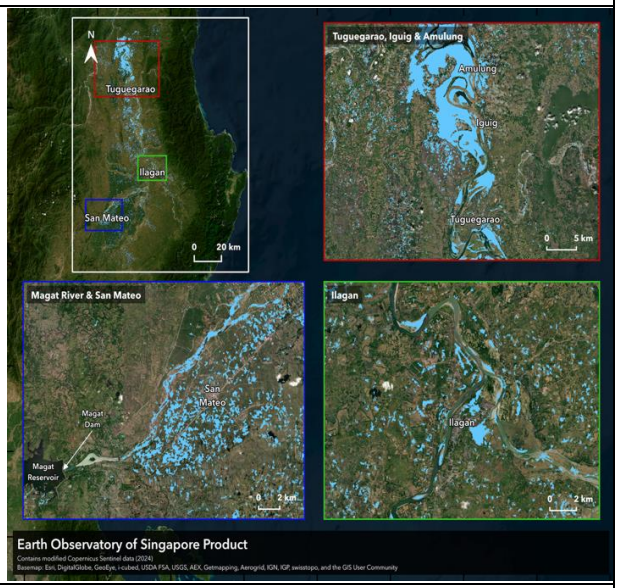
Nepal Thame Glacial Lake Outburst Flood (August 2024) - EOS-RS responded to this disaster, generating a damage proxy map for the areas affected by the glacial lake outburst flood near Thame, Solukhumbu on 16 August, demonstrating our capability to support responses to emerging climate-related hazards.

Damage Proxy Map: Nepal, Thame, Glacial Lake Outburst Flood



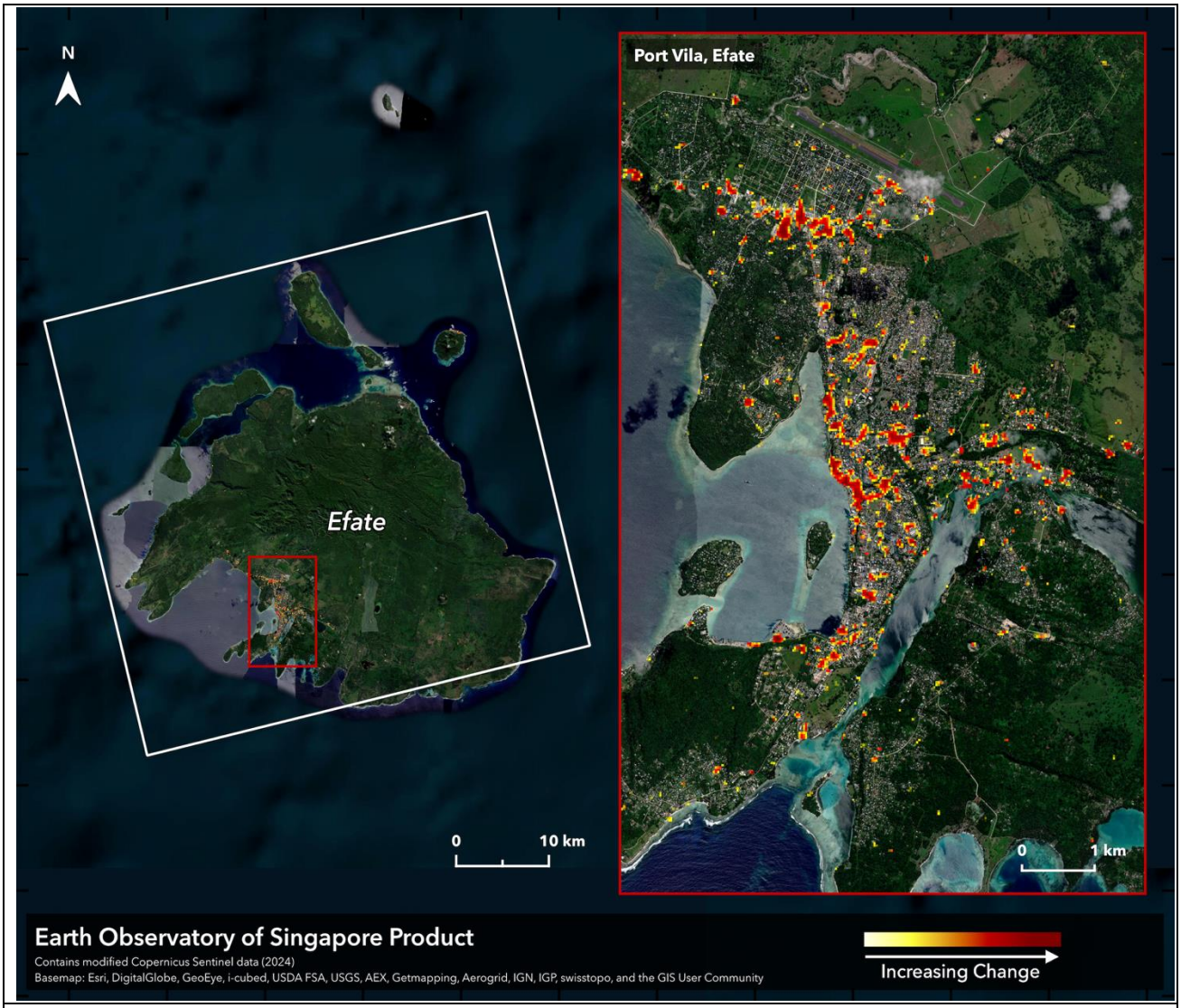
Copernicus Sentinel-1 Data

Philippines Multiple Typhoons (November 2024) - In an unprecedented disaster sequence, the Philippines was struck by six typhoons within one month. EOS-RS responded to Typhoons Toraji, Usagi, and Man-yi by generating both damage proxy maps and flood proxy maps for Isabela Province, demonstrating our dual-product capability to comprehensively assess both structural damage and flooding impacts.

Damage and Flood Proxy Maps: Philippines, Typhoons Toraji, Usagi, and Man-yi	
	
Damage Proxy Map (Copernicus Sentinel-1 Data)	Flood Proxy Map (Copernicus Sentinel-1 Data)

Vanuatu Efate Earthquake (December 2024) - EOS-RS concluded the year by responding to a powerful Mw7.3 earthquake and strong aftershocks in Efate, Vanuatu on 17 December, providing rapid damage assessment to support humanitarian response efforts.

Damage Proxy Map: Vanuatu, Efate, Earthquake



Copernicus Sentinel-1 Data

Organization	**Geoinformatics Center, Asian Institute of Technology**
Title	**Activities carried out as Principal Data Analysis Node (P-DAN) for Sentinel Asia.**
Type of Activity	**Value-Added Product Generation for Disaster Activations**
Date	**01/01/2024-31/12/2024**

1. Sentinel Asia

1.1 Activation and Value-Added Products Generation

As the Principal Data Analyses Node (P-DAN) of Sentinel Asia, the Geoinformatics Center of the Asian Institute of Technology (GIC-AIT) produces Value Added Products (VAP) right after disaster occurrences to support disaster response activities of the Sentinel Asia Community.

In 2024, there were 64 emergency observation requests from 21 countries. Most came from the Philippines (11 activations; 17.19%), followed by Vietnam (9 activations; 14.06%) and Nepal (8 activations; 12.50%). Kyrgyzstan and India each requested six activations (9.38%), while India also requested four activations (6.25%). Bangladesh, Myanmar (Burma), Taiwan, Tajikistan, and Thailand each requested two activations (3.13%). Other countries submitted one activation each (1.56%), including Bhutan, China, Japan, Kazakhstan, Laos, Pakistan, Turkmenistan, the United Arab Emirates, Uzbekistan, and Vanuatu.

Out of these activations, we have created 71 VAPs from 45 activations (*Table 1*) including 58 in Sentinel Asia and 13 VAPs in International Disaster Charter (IDC). Most products were created for the activation during floods, followed by mudflow, earthquake, flood and landslide, oil spill, landslide, storm, and volcano (*Figure 1*). Maps of the VAPs are provided in the *Appendix*.

Table 1: List of Sentinel Asia activations from 1st of January 2024 to 31st of December 2024, including the date of first created products and the number of VAPs for each of the activations.

No.	Activation ID	Occurrence Date	Activation Date	Country	Disaster Type	First Data Availability (SA)	First VAP Generation	No. of Product
1	491	1-Jan-24	2-Jan-24	Japan	Earthquake	22-Jan-24	26-Jan-24	1 (SA)
2	492	22-Jan-24	23-Jan-24	China	Earthquake	26-Jan-24	30-Jan-24	1 (SA)
3	493	15-Mar-24	20-Mar-24	Indonesia	Flood	21-Mar-24	21-Mar-24	5 (SA)
4	494	30-Mar-24	2-Apr-24	Kazakhstan	Flood	4-Apr-24	-	-
5	495	3-Apr-24	3-Apr-24	Taiwan	Earthquake	5-Apr-24	7-Apr-24	1 (SA)
6	496*	16-Apr-24	19-Apr-24	Indonesia	Volcano	19-Apr-24	1-May-24	-
7	497	14-Apr-24	19-Apr-24	Pakistan	Flood	19-Apr-24	22-Apr-24	2 (SA)
8	498	21-Apr-24	22-Apr-24	Nepal	Flood	5-May-24	-	-
9	499	20-Apr-24	22-Apr-24	Kyrgyzstan	Flood, Mudflow	23-Apr-24	-	-
10	501	2-May-24	1-May-24	United Arab Emirates	Flood	6-May-24	-	-
11	502*	2-May-24	12-May-24	Indonesia	Flood, Landslide	13-May-24	-	-
12	503*	11-May-24	13-May-24	Indonesia	Flood	15-May-24	17-May-24	1 (SA)
13	504	16-May-24	18-May-24	Turkmenistan	Flood	20-May-24	21-May-24	1 (SA)
14	505	27-May-24	29-May-24	India	Flood	2-Jun-24	4-Jun-24	1(SA)
15	506	1-Jun-24	3-Jun-24	Bangladesh	Flood	6-Jun-24	6-Jun-24	2 (SA)
16	507	9-Jun-24	10-Jun-24	Vietnam	Flood, Landslide	12-Jun-24	-	-
17	508**	24-Jun-24	26-Jun-24	Kyrgyzstan	Mudflow	27-Jun-24	28-Jun-24	4 (IDC)
18	509	26-Jun-24	28-Jun-24	Nepal	Flood	9-Jul-24	10-Jul-24	2 (SA)
19	510	28-Jun-24	1-Jul-24	Kyrgyzstan	Mudflow	4-Jul-24	4-Jul-24	-
20	511	1-Jul-24	1-Jul-24	Myanmar (Burma)	Flood	7-Jul-24	8-Jul-24	4 (SA)
21	512	3-Jul-24	3-Jul-24	Vietnam	Flood	6-Jul-24	9-Jul-24	1 (SA)
22	513	6-Jul-24	7-Jul-24	Nepal	Flood	10-Jul-24	11-Jul-24	1 (SA)
23	515*	7-Jul-24	8-Jul-24	Nepal	Flood, Landslide	11-Jul-24	12-Jul-24	2 (IDC)
24	516	10-Jul-24	11-Jul-24	India	Flood	12-Jul-24	17-Jul-24	3 (SA)
25	519	14-Jul-24	15-Jul-24	Vietnam	Flood	25-Jul-24	25-Jul-24	1 (SA)
26	520	13-Jul-24	15-Jul-24	Tajikistan	Mudflow	18-Jul-24	24-Jul-24	1 (SA)
27	521	14-Jul-24	15-Jul-24	Uzbekistan	Flood	18-Jul-24	-	-
28	522	14-Jul-24	15-Jul-24	Kyrgyzstan	Mudflow	19-Jul-24	19-Jul-24	-
29	523	15-Jul-24	15-Jul-24	Philippines	Flood	16-Jul-24	-	-
30	524	18-Jul-24	23-Jul-24	Philippines	Flood	31-Jul-24	31-Jul-24	1 (SA)
31	525	23-Jul-24	24-Jul-24	Vietnam	Flood	31-Jul-24	13-Aug-24	1 (SA)
32	526	23-Jul-24	24-Jul-24	Philippines	Flood	31-Jul-24	31-Jul-24	1 (SA)
33	527*	23-Jul-24	24-Jul-24	Kyrgyzstan	Mudflow	26-Jul-24	-	-
34	528*	25-Jul-24	25-Jul-24	Philippines	Oil Spill	27-Jul-24	7-Aug-24	1 (SA)
35	529	25-Jul-24	25-Jul-24	Taiwan	Flood	31-Jul-24	1-Aug-24	1 (SA)
36	530	30-Jul-24	5-Aug-24	Nepal	Flood	11-Aug-24	14-Aug-24	1 (SA)
37	531	6-Aug-24	6-Aug-24	Tajikistan	Flood	13-Aug-24	14-Aug-24	1 (SA)
38	533	10-Aug-24	10-Aug-24	Bhutan	Mudflow	15-Aug-24	26-Aug-24	1 (SA)
39	534*	16-Aug-24	16-Aug-24	Nepal	Flood	25-Aug-24	28-Aug-24	1 (SA)
40	535**	18-Aug-24	20-Aug-24	Kyrgyzstan	Mudflow	22-Aug-24	23-Aug-24	1 (IDC)
41	537	21-Aug-24	22-Aug-24	Bangladesh	Flood	24-Aug-24	27-Aug-24	1 (SA)
42	538	23-Aug-24	23-Aug-24	Vietnam	Flood	31-Aug-24	2-Sep-24	1 (SA)
43	540	23-Aug-24	24-Aug-24	Nepal	Landslide	30-Aug-24	-	-
44	541	24-Aug-24	27-Aug-24	Vietnam	Flood	30-Aug-24	3-Sep-24	1 (SA)
45	542	27-Aug-24	29-Aug-24	India	Flood	1-Sep-24	3-Sep-24	1 (SA)
46	543	1-Sep-24	2-Sep-24	Philippines	Flood	5-Sep-24	6-Sep-24	1 (SA)
47	544*	8-Sep-24	4-Sep-24	Vietnam	Flood	9-Sep-24	10-Sep-24	1 (SA), 4 (IDC)
48	546*	11-Sep-24	12-Sep-24	Myanmar (Burma)	Flood	15-Sep-24	17-Sep-24	1 (SA)
49	547*	10-Sep-24	12-Sep-24	Thailand	Flood	15-Sep-24	15-Sep-24	3 (SA), 2 (IDC)
50	548	12-Sep-24	13-Sep-24	Laos	Flood	19-Sep-24	23-Sep-24	1 (SA)
51	550	19-Sep-24	19-Sep-24	Vietnam	Flood	22-Sep-24	30-Sep-24	1 (SA)
52	551*	28-Sep-24	28-Sep-24	Nepal	Flood	2-Oct-24	4-Oct-24	1 (SA)
53	555	29-Sep-24	30-Sep-24	Philippines	Flood	3-Oct-24	-	-
54	557*	23-Oct-24	23-Oct-24	Philippines	Flood	26-Oct-24	28-Oct-24	1 (SA)
55	560	27-Oct-24	24-Oct-24	Vietnam	Flood, Landslide	30-Oct-24		-
56	561	25-Oct-24	24-Oct-24	India	Storm	26-Oct-24	29-Oct-24	1 (SA)
57	562	24-Oct-24	30-Oct-24	Philippines	Landslide	5-Nov-24	12-Nov-24	1 (SA)
58	563*	3-Nov-24	5-Nov-24	Indonesia	Volcano	7-Nov-24	14-Nov-24	1 (SA)
59	564	11-Nov-24	11-Nov-24	Philippines	Flood, Landslide	15-Nov-24	18-Nov-24	1 (SA)
60	565	16-Nov-24	16-Nov-24	Philippines	Flood, Landslide	20-Nov-24	-	-
61	566	26-Nov-24	29-Nov-24	Thailand	Flood	2-Dec-24	3-Dec-24	2 (SA)
62	567*	3-Dec-24	6-Dec-24	Indonesia	Flood, Landslide	4-Dec-24	-	-
63	568	9-Dec-24	9-Dec-24	Philippines	Volcano	24-Dec-24	-	-
64	569	17-Dec-24	17-Dec-24	Vanuatu	Earthquake	24-Dec-24	-	-

* Escalated to International Disaster Charter (IDC)

** Escalated to International Disaster Charter (IDC) and project management by GIC-AIT

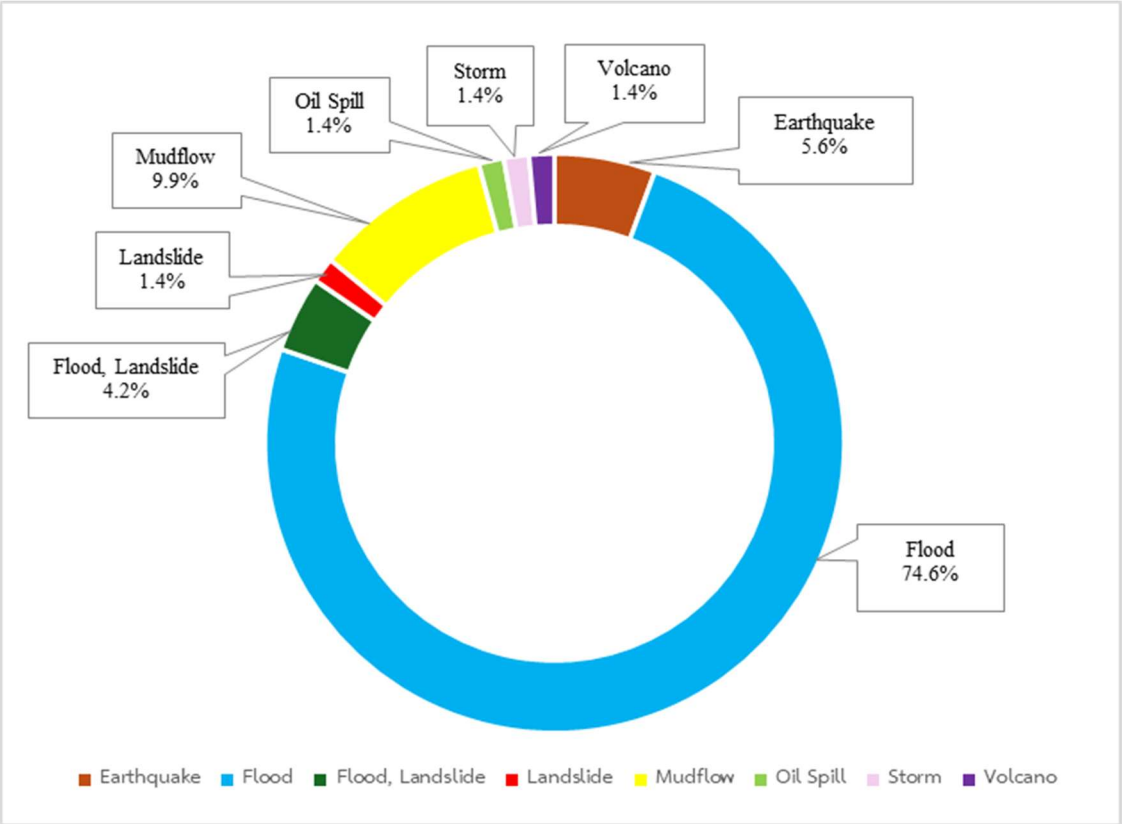


Figure 1: Disaster-wise VAPs created by GIC-AIT (2024/01/01-2024/12/31)

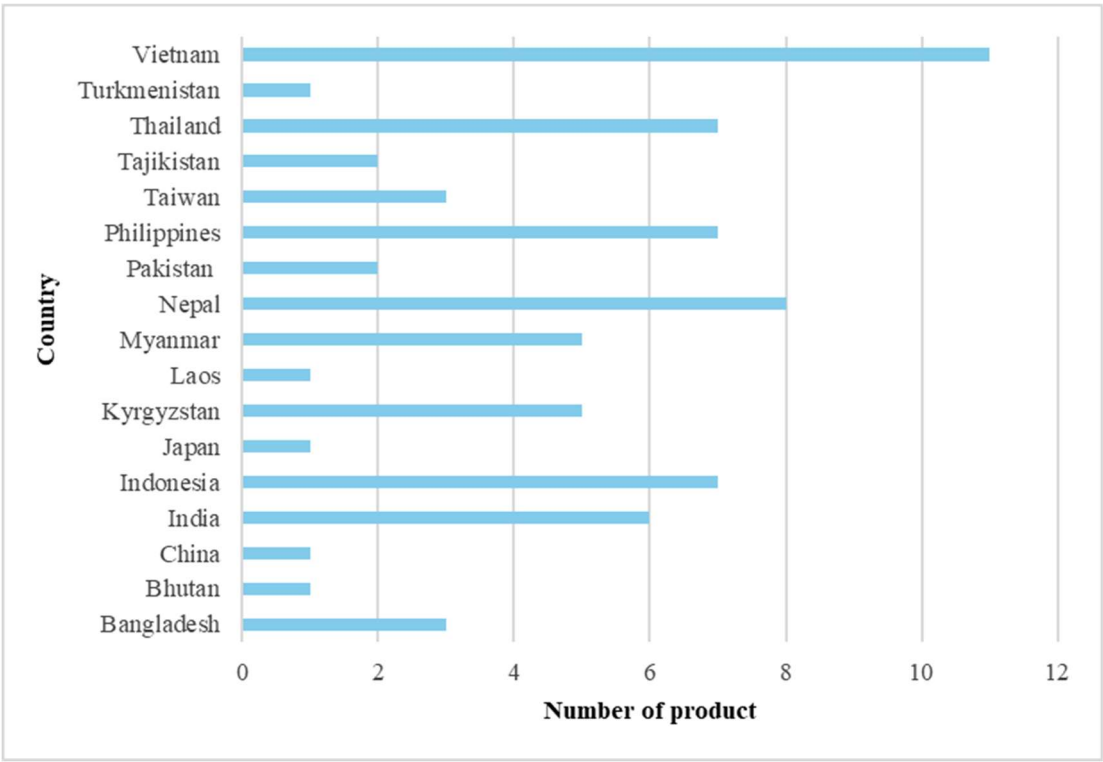


Figure 2: Country-wise VAPs created by GIC-AIT (2024/01/01-2024/12/31)

2. International Disaster Charter

2.1 Project Manager (PM)

When a major disaster occurs, the Sentinel Asia activation can be escalated to the International Disaster Charter. In 2024, we were nominated by JAXA as the Project Manager (PM) for two major disasters in Kyrgyzstan (Charter activations on June 25, 2024, and August 20, 2024). GIC-AIT also served as a Value Adder for three IDC activations: flood and landslide in Nepal (Charter activation on July 8, 2024), flood in Vietnam (Charter activation on September 10, 2024), and flood in Thailand (Charter activation on September 12, 2024). In total, GIC-AIT produced 13 VAPs for the IDC. Maps of the products created by are provided in the *Appendix*.

Organization	**Geoinformatics Center, Asian Institute of Technology**
Title	**Interaction with Disaster Management Organizations in Bhutan.**
Type of Activity	**Meetings**
Date	**19-23/08/2024**

Interaction with Disaster Management Organizations in Bhutan

From 19–23 August 2024, Sentinel Asia delegates, including Dr. Manzul Hazarika and Mr. Syams Nashrrullah from AIT, together with Mr. Takei Goro from JAXA/Sentinel Asia Secretariat, visited Bhutan to meet with several Disaster Management Organizations (DMOs) and conduct capacity-building activities. The mission included meetings with the National Center for Hydrology and Meteorology (NCHM), the Department of Local Governance and Disaster Management (DLGDM), the Department of Geology and Mines (DGM), and the Infrastructure Planning and Flood Adaptation Division. Field visits were also conducted in Thimphu District to observe areas recently affected by floods and landslides.

Figure 1: Meeting with the Department of Local Governance and Disaster Management (DLGDM).

Figure 2: Meeting with the Department of Geology and Mines (DGM).

Figure 3: Meeting with the Infrastructure Planning and Flood Adaptation Division.

Organization	**Geoinformatics Center, Asian Institute of Technology**
Title	**Training on Glacial Lake Outburst Flood (GLOF) Monitoring in Bhutan**
Type of Activity	**Training**
Date	**19-21/08/2024**

Training on Glacial Lake Outburst Flood (GLOF) Monitoring in Bhutan

From 19–21 August 2024, Sentinel Asia conducted a training on Glacial Lake Outburst Flood (GLOF) Monitoring at the National Center for Hydrology and Meteorology (NCHM), Bhutan. Nineteen participants from NCHM and other agencies, including DGM, DLGDM, the Department of Forests and Park Services, and the Department of Energy, joined the program.

The training combined lectures and hands-on sessions covering Sentinel Asia, remote sensing fundamentals, and practical exercises on glacial lake mapping, glacier velocity monitoring, and satellite data processing using Sentinel-1, Sentinel-2, QGIS, and SNAP. Expert input was also provided by Dr. Simhadri Rao from ISRO. The program strengthened Bhutan's capacity in disaster preparedness and response by enhancing skills in Earth observation data utilization for GLOF risk reduction.

Figure 1: Group photo of training in Bhutan

Organization	**Geoinformatics Center, Asian Institute of Technology**
Title	**Field Survey to Disaster-affected Areas in Chiang Rai Province, Thailand**
Type of Activity	**Field Survey**
Date	**24-25/09/2024**

Field Survey to Disaster-affected Areas in Chiang Rai Province, Thailand

On 12 September 2024, Sentinel Asia was activated at the request of the Geo-Informatics and Space Technology Development Agency (GISTDA) in response to flooding in Northern Thailand, recognized as a contingency case alongside international humanitarian assistance, including IDC activation and relief goods from UNICEF.

From 24–25 September 2024, GIC-AIT conducted a field survey in Chiang Rai Province, where two flood map products based on ALOS-2 data and one Sentinel-1 map from the Mohammed Bin Rashid Space Centre (MBRSC) were assessed through ground validation points collected across six districts including Muang Chiang Rai, Wiang Chiang Rung, Doi Luang, Chiang Saen, Mae Sai, and Mae Chan.

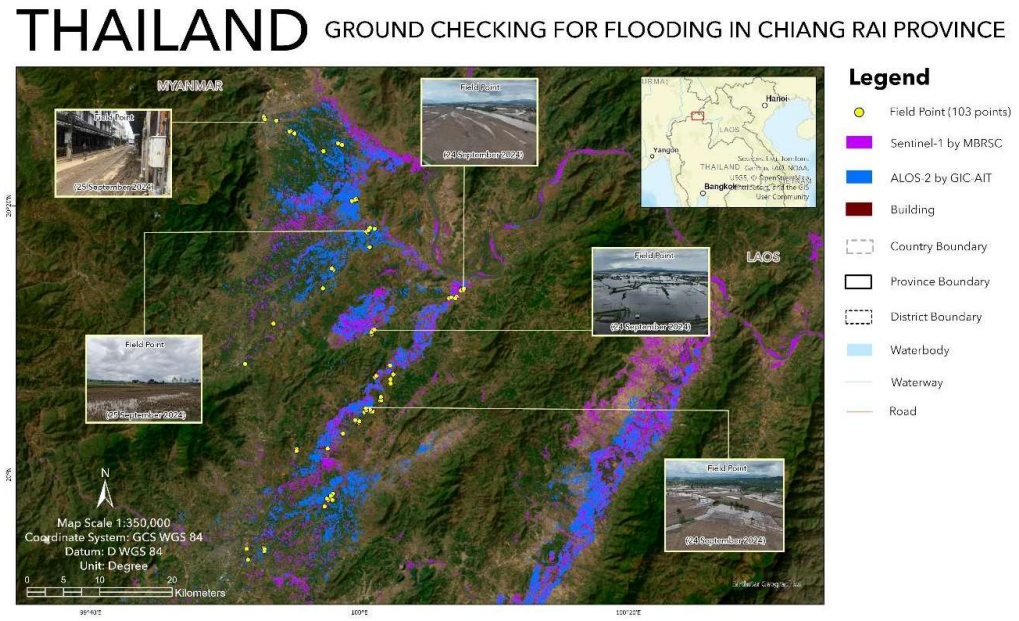
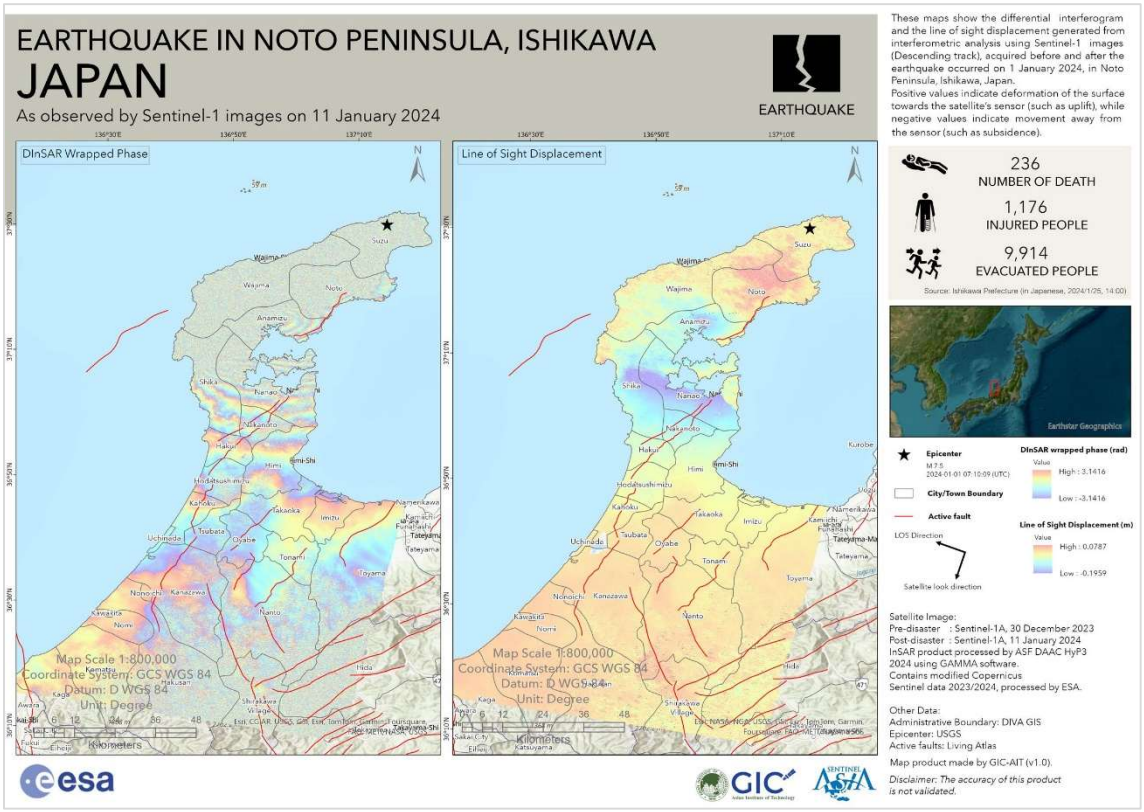


Figure 1: Ground validation points for flooding in Chiang Rai Province, Thailand

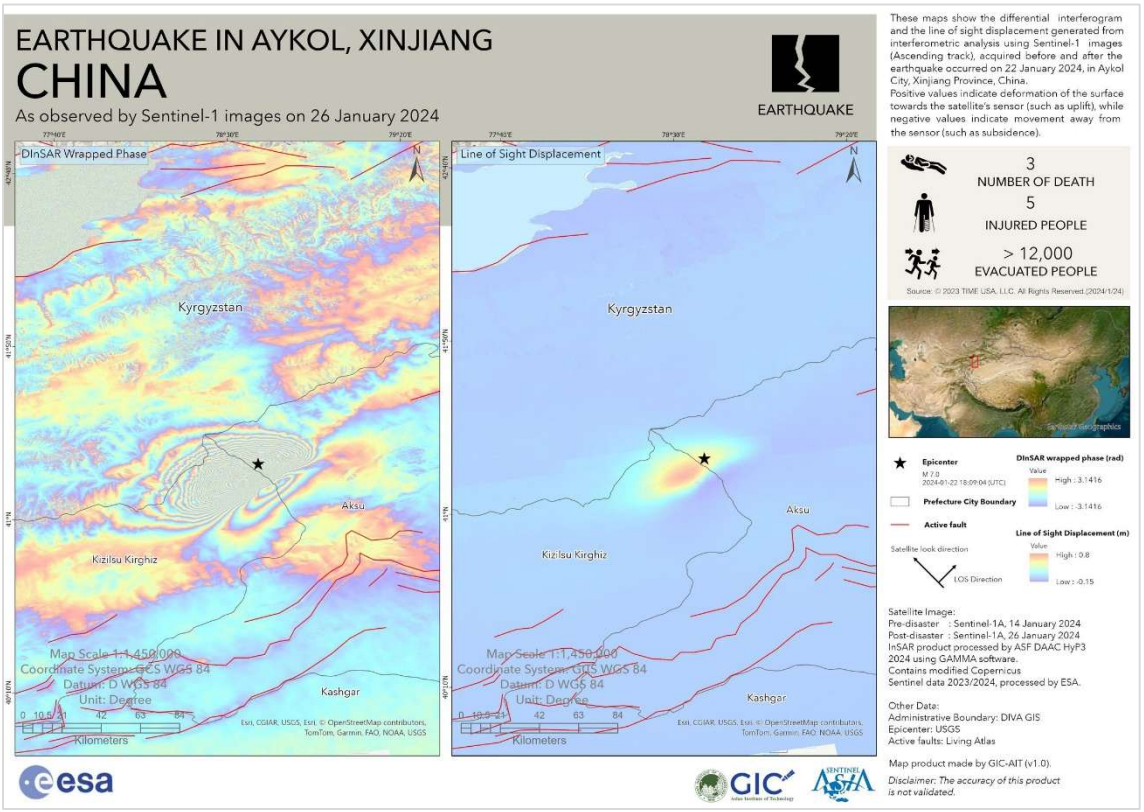
Figure 2: Field Survey to Disaster-affected Areas in Chiang Rai Province, Thailand

APPENDIX

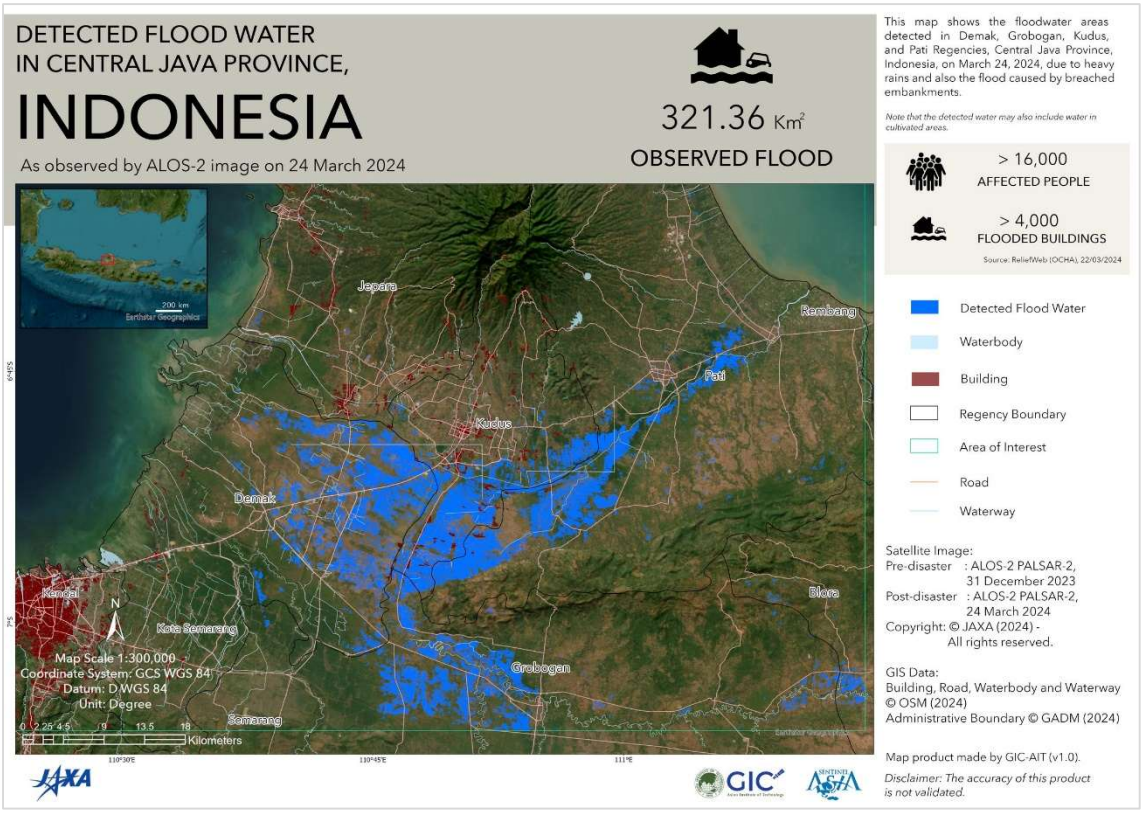
1. Earthquake in Japan on 1 January 2024



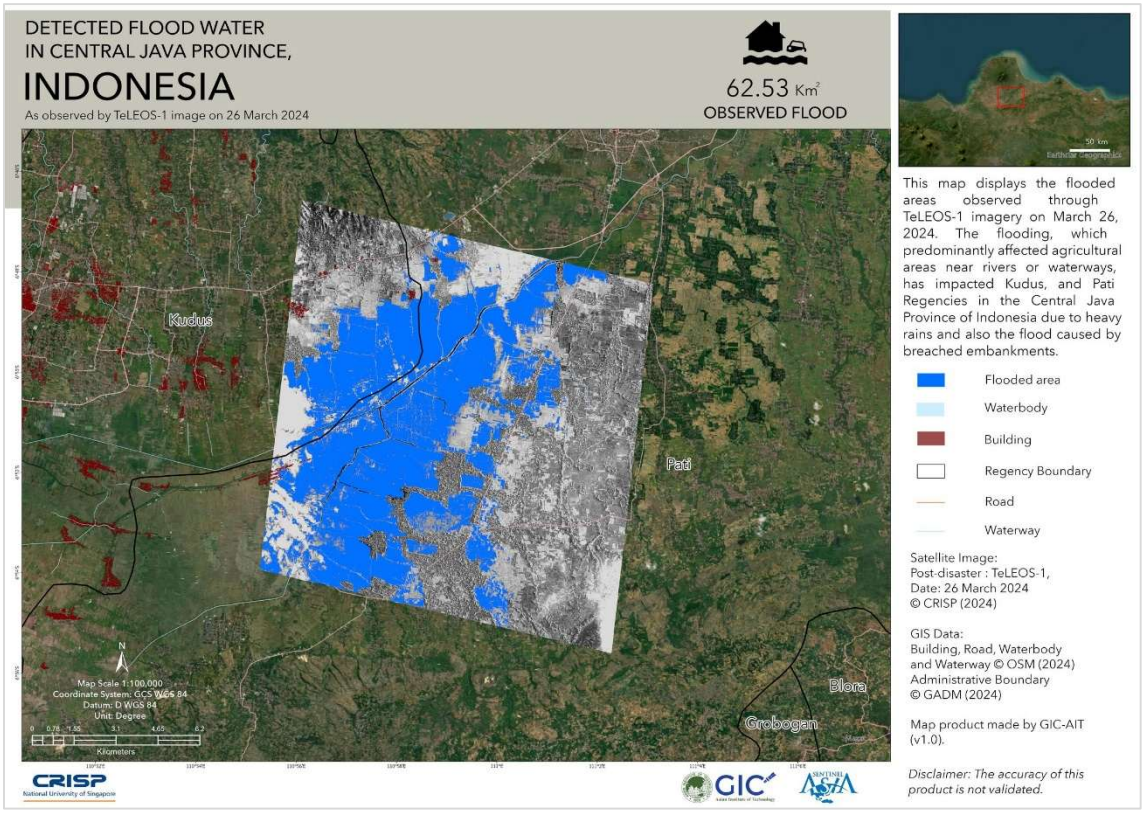
2. Earthquake in China on 22 January 2024



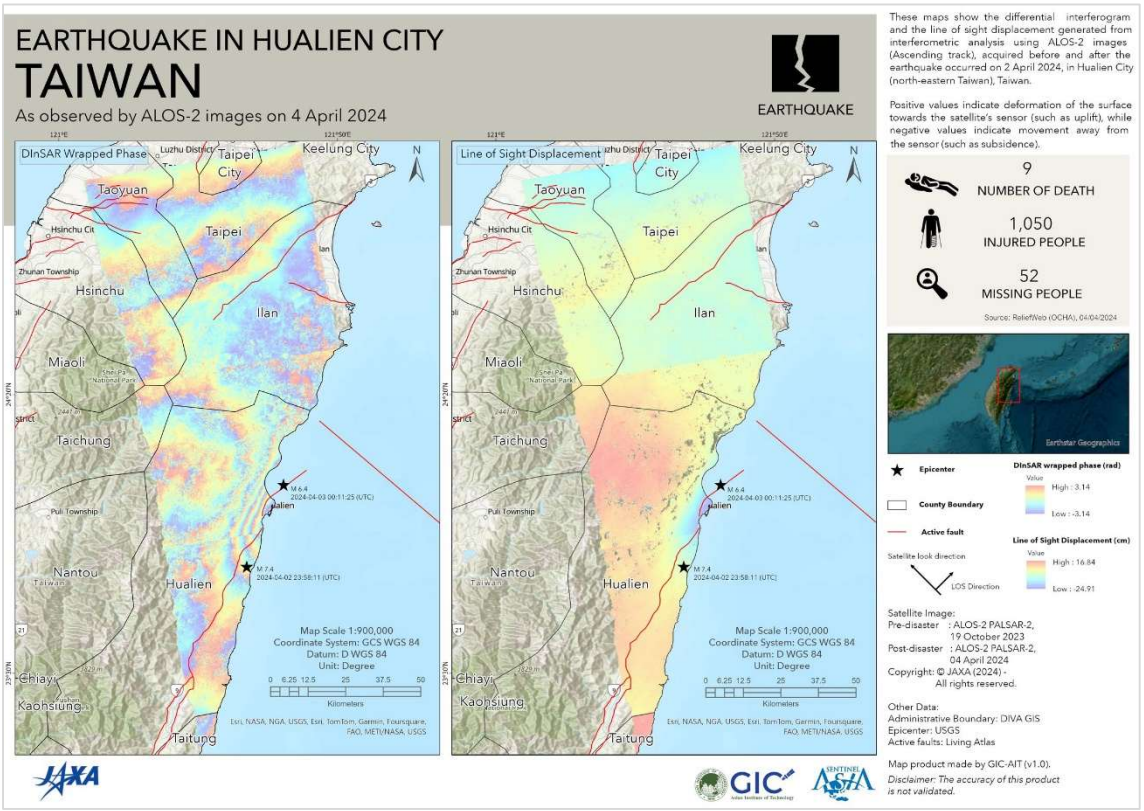
3. Flood in Indonesia on 15 March 2024


DETECTED FLOOD WATER
IN CENTRAL JAVA PROVINCE,
INDONESIA
As observed by ALOS-2 image on 24 March 2024
321.36 Km²
OBSERVED FLOOD
This map shows the floodwater areas detected in Demak, Grobogan, Kudus, and Pati Regencies, Central Java Province, Indonesia, on March 24, 2024, due to heavy rains and also the flood caused by breached embankments.
Note that the detected water may also include water in cultivated areas.
> 16,000
AFFECTED PEOPLE
> 4,000
FLOODED BUILDINGS
Source: ReliefWeb (OCHA), 22/03/2024
Jepara
Rembang
Pati
Kudus
Demak
Kendal
Kota Semarang
Blora
Grobogan
Semarang
Map Scale 1:300,000
Coordinate System: GCS WGS 84
Datum: D.WGS 84
Unit: Degree
Kilometers
Detected Flood Water
Waterbody
Building
Regency Boundary
Area of Interest
Road
Waterway
Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 31 December 2023
Post-disaster : ALOS-2 PALSAR-2, 24 March 2024
Copyright: © JAXA (2024) - All rights reserved.
GIS Data:
Building, Road, Waterbody and Waterway © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.

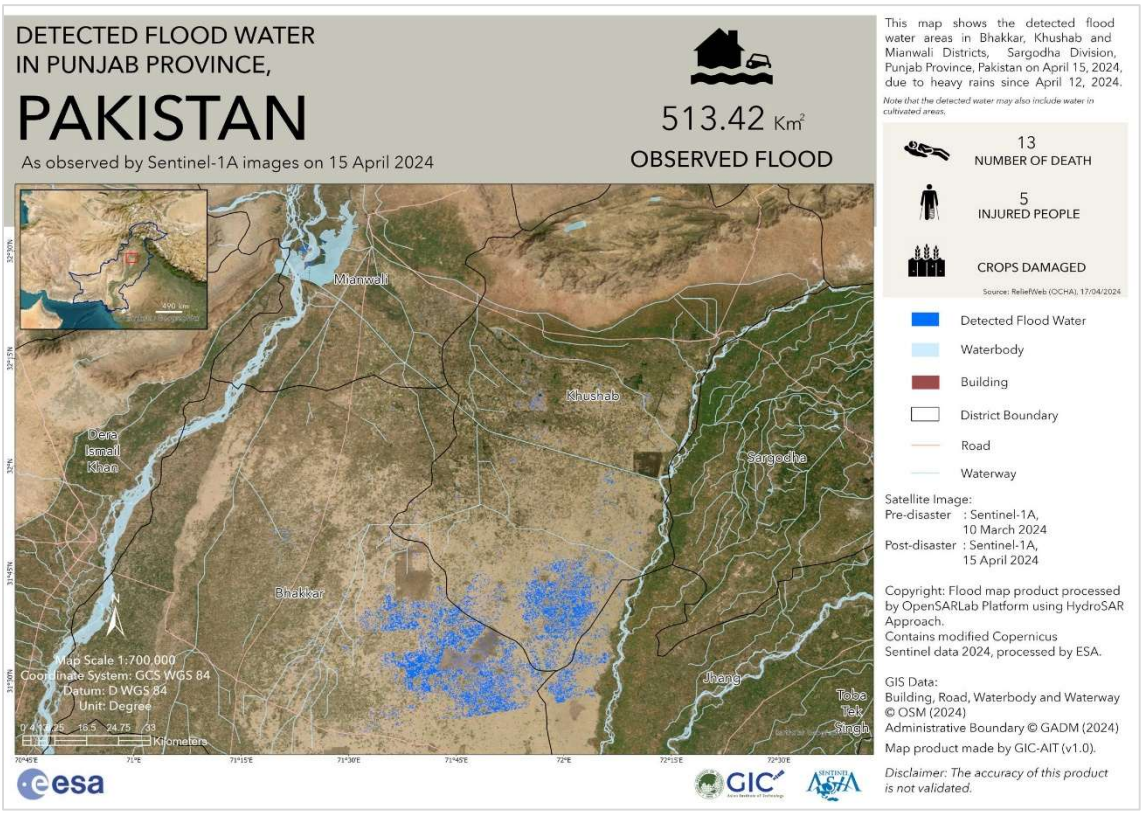

FLOODING IN CENTRAL JAVA PROVINCE,
INDONESIA
As observed by Resourcesat-2A image on 24 March 2024
280.87 Km²
OBSERVED FLOOD
This map displays the flooded areas observed through Resourcesat-2A imagery on March 24, 2024. The flooding, which predominantly affected agricultural areas near rivers or waterways, has impacted Demak, Grobogan, Kudus, and Pati Regencies in the Central Java Province of Indonesia due to heavy rains and also the flood caused by breached embankments.
Jepara
Pati
Kudus
Demak
Blora
Kota Semarang
Grobogan
Boyolali
Flooded area
Waterbody
Building
Regency Boundary
Area of Interest
Road
Waterway
Satellite Image:
Post-disaster : Resourcesat-2A, Date: 24 March 2024
© NRSC (2024)
GIS Data:
Building, Road, Waterbody and Waterway © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.

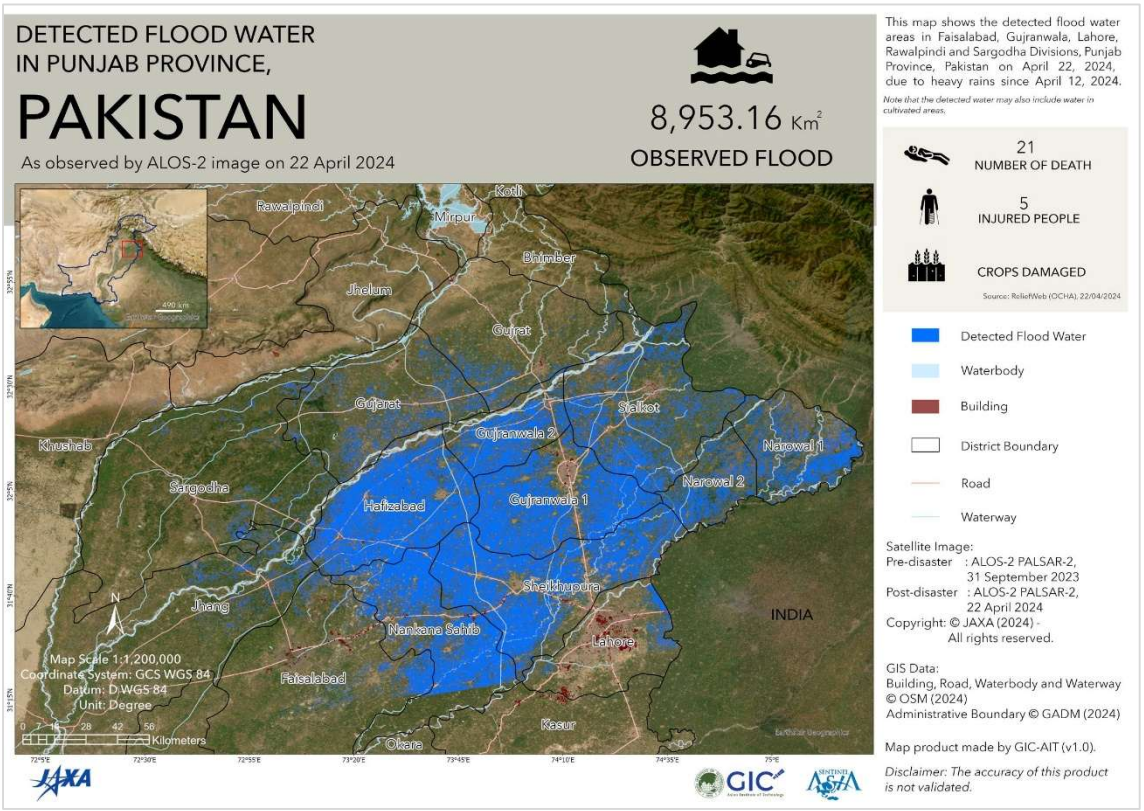


4. Earthquake in Taiwan on 3 April 2024



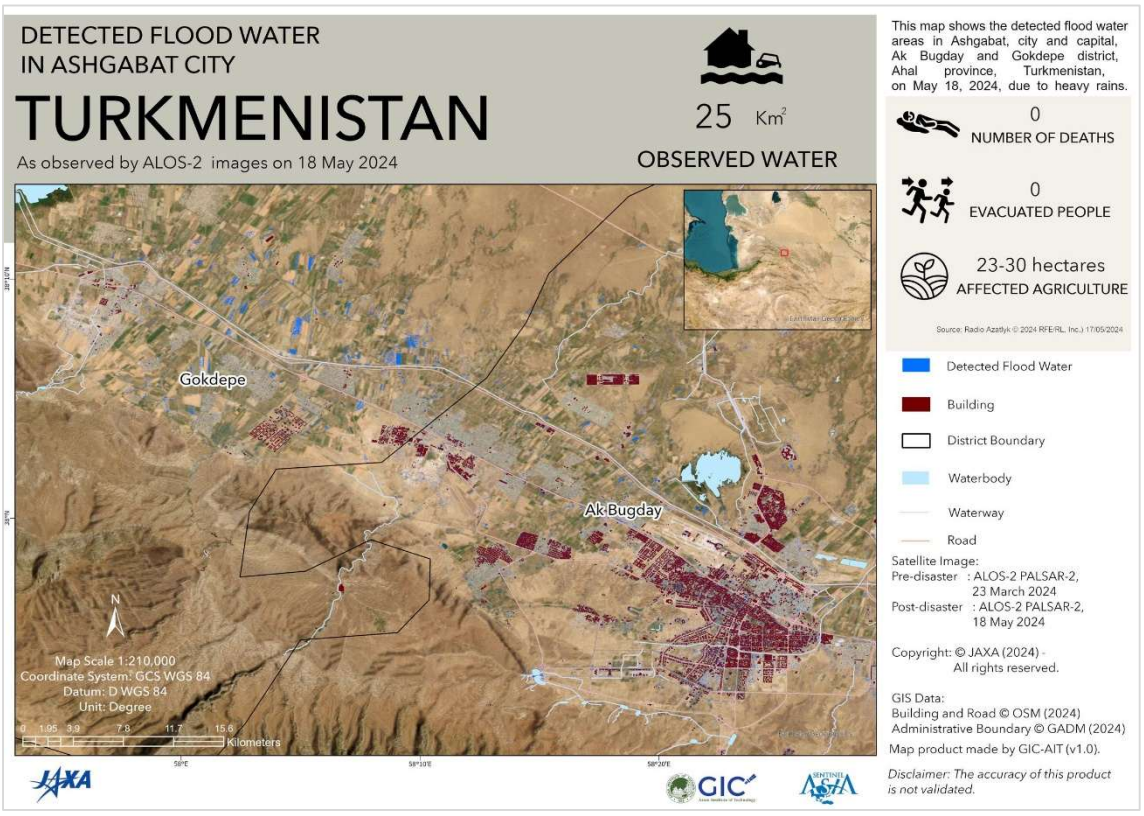
5. Flood in Pakistan on 14 April 2024



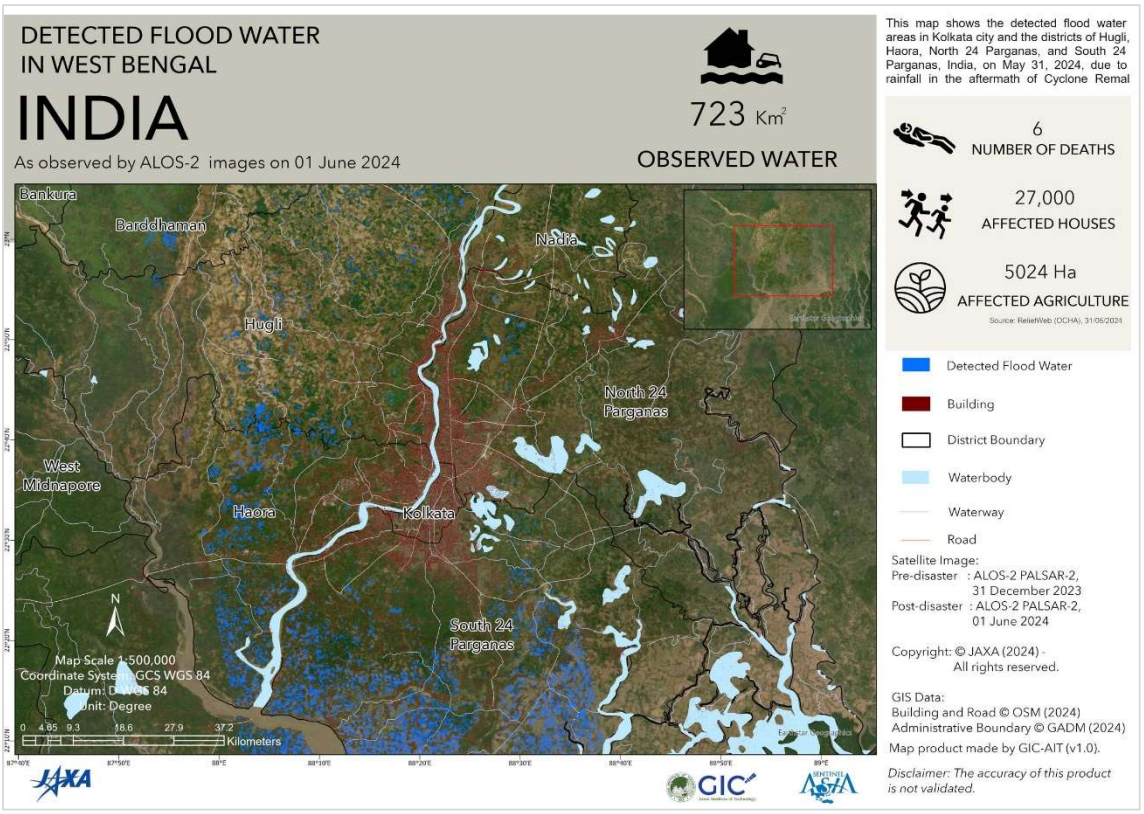


6. Flood in West Sumatra, Indonesia on 11 May 2024

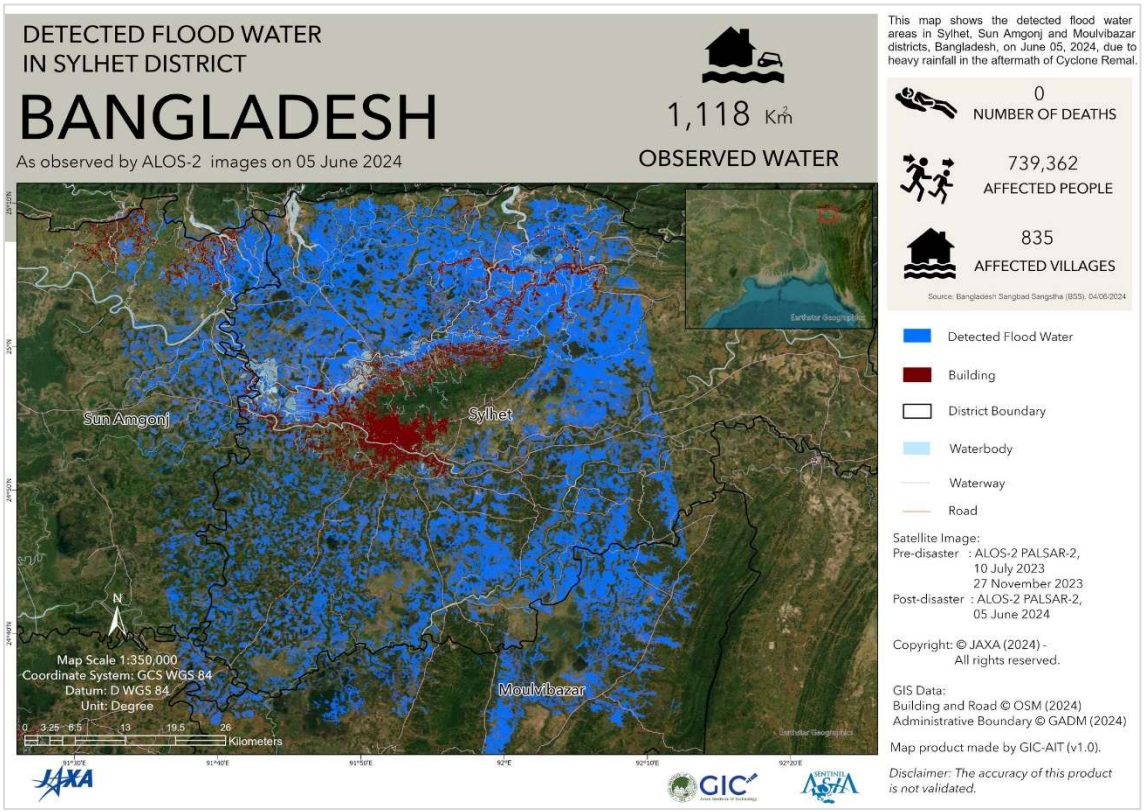
7. Flood in Turkmenistan on 16 May 2024

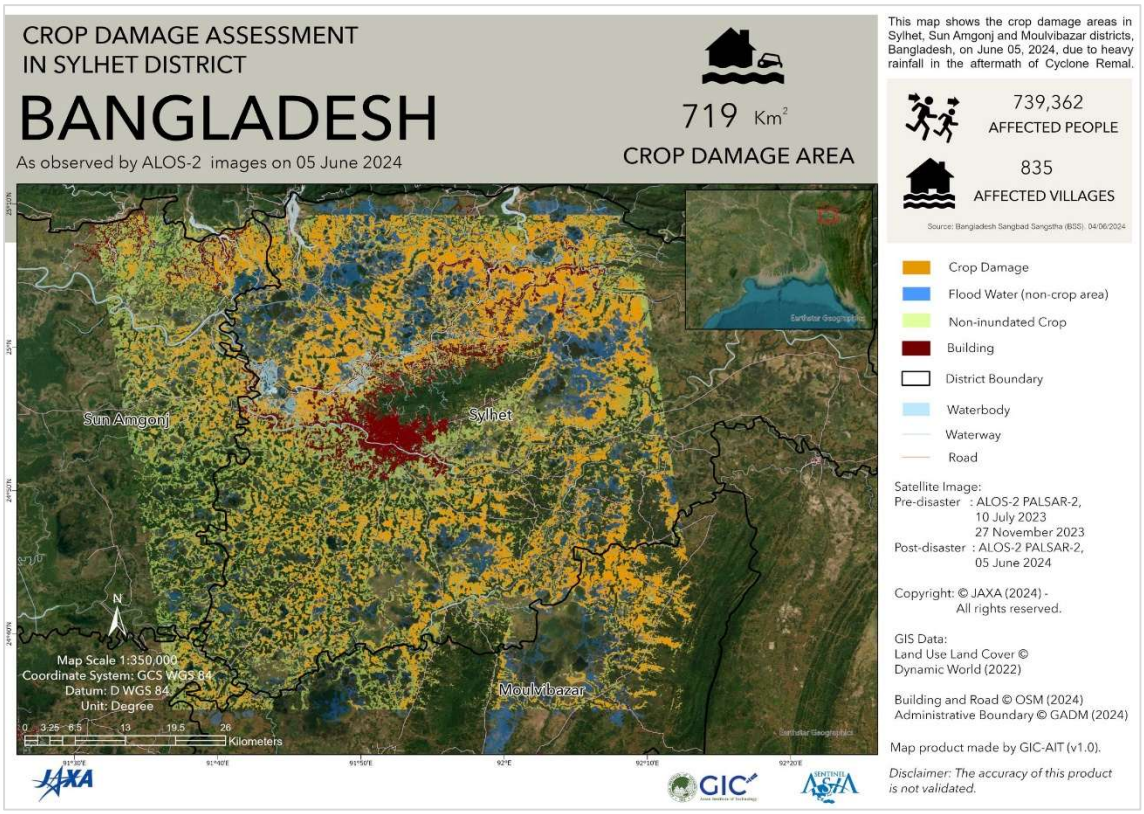


8. Flood in India on 27 May 2024

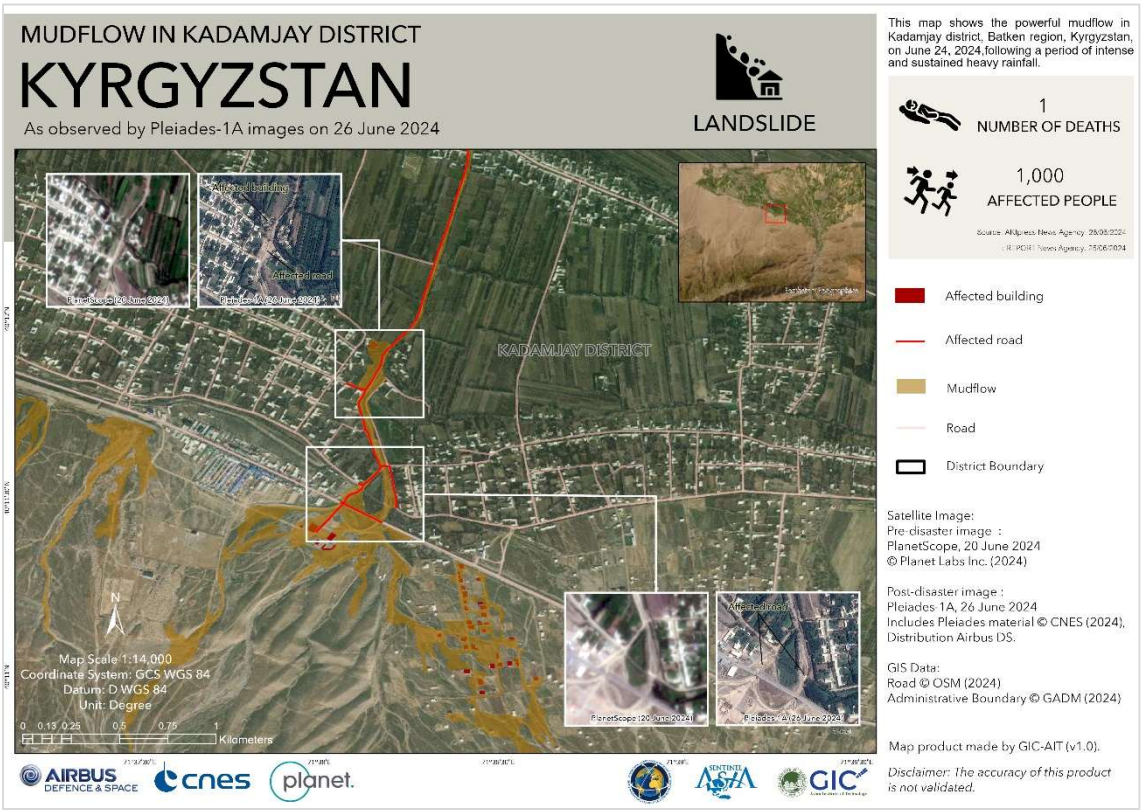


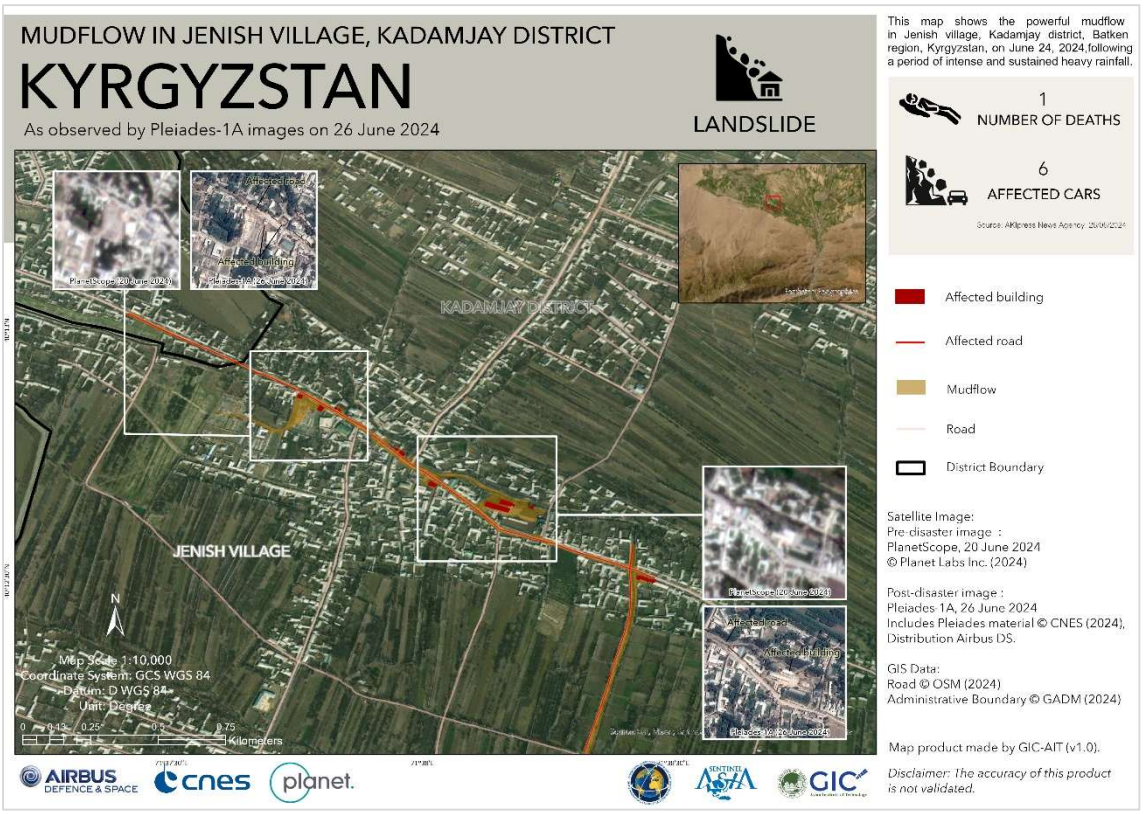
9. Flood in Bangladesh on 01 June 2024

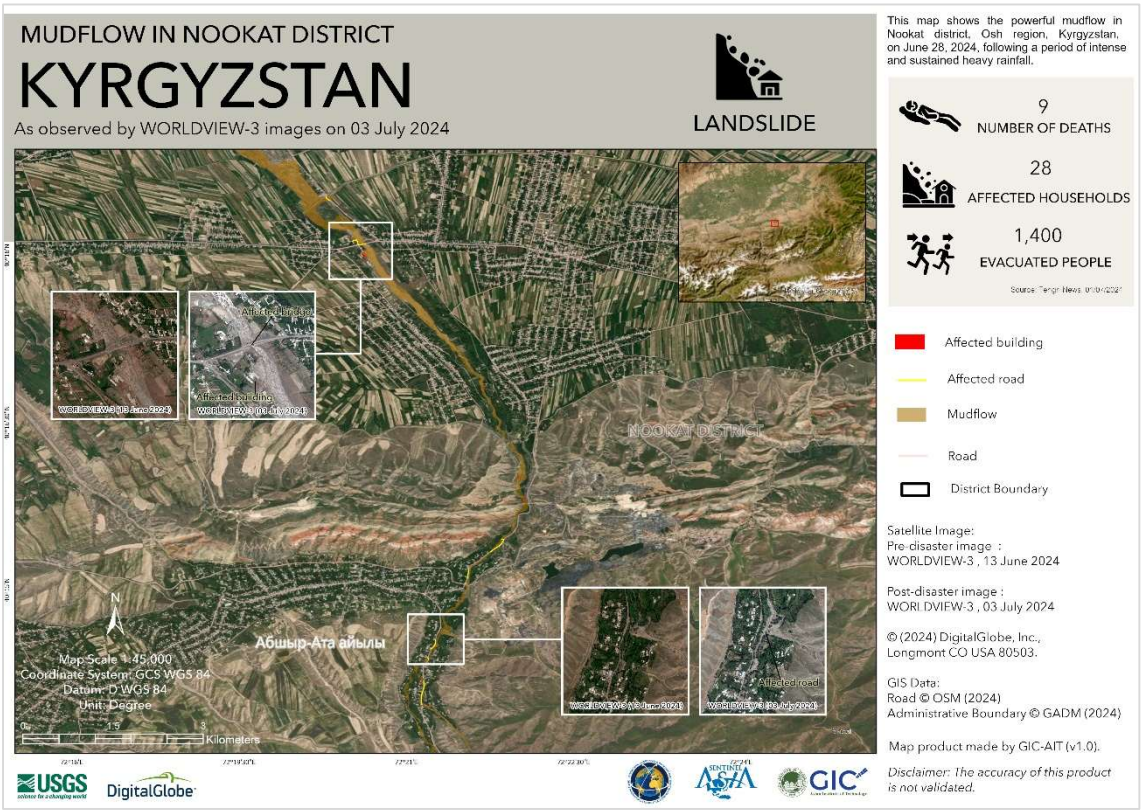


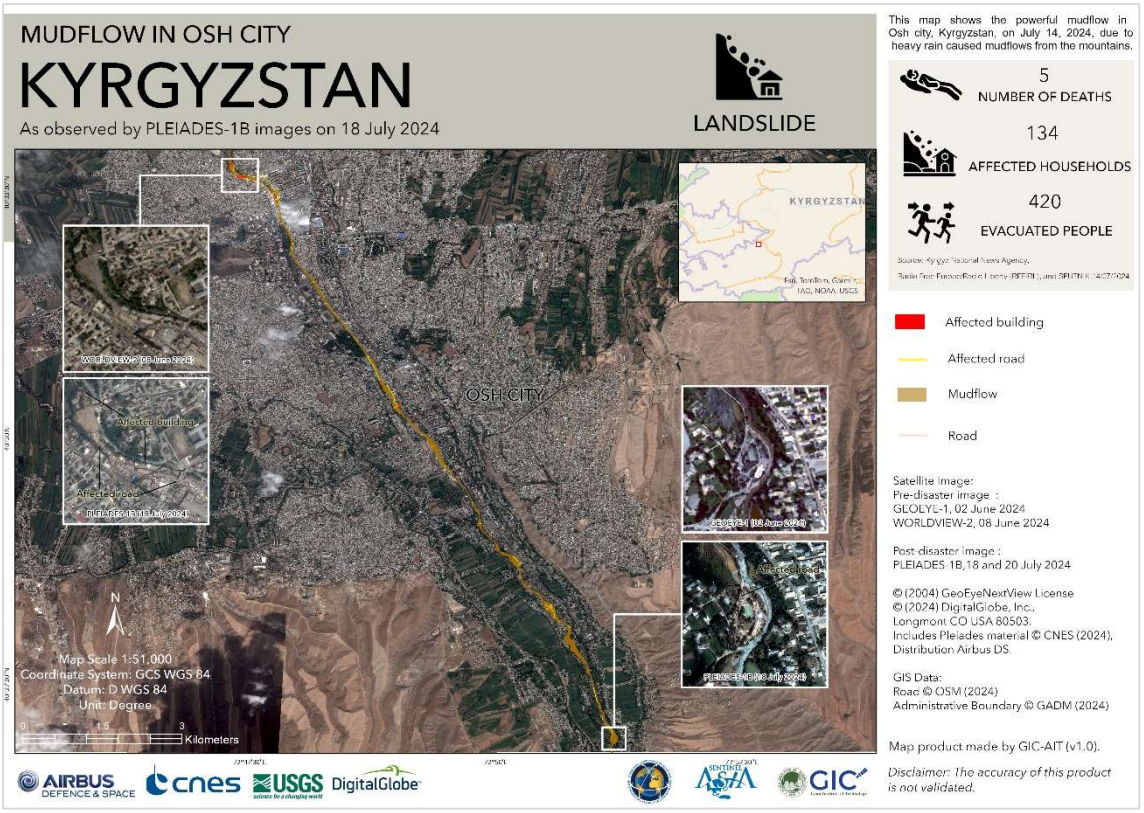


10. Mudflow in Kyrgyz on 24 June 2024 (SA was escalated to International Disaster Charter)

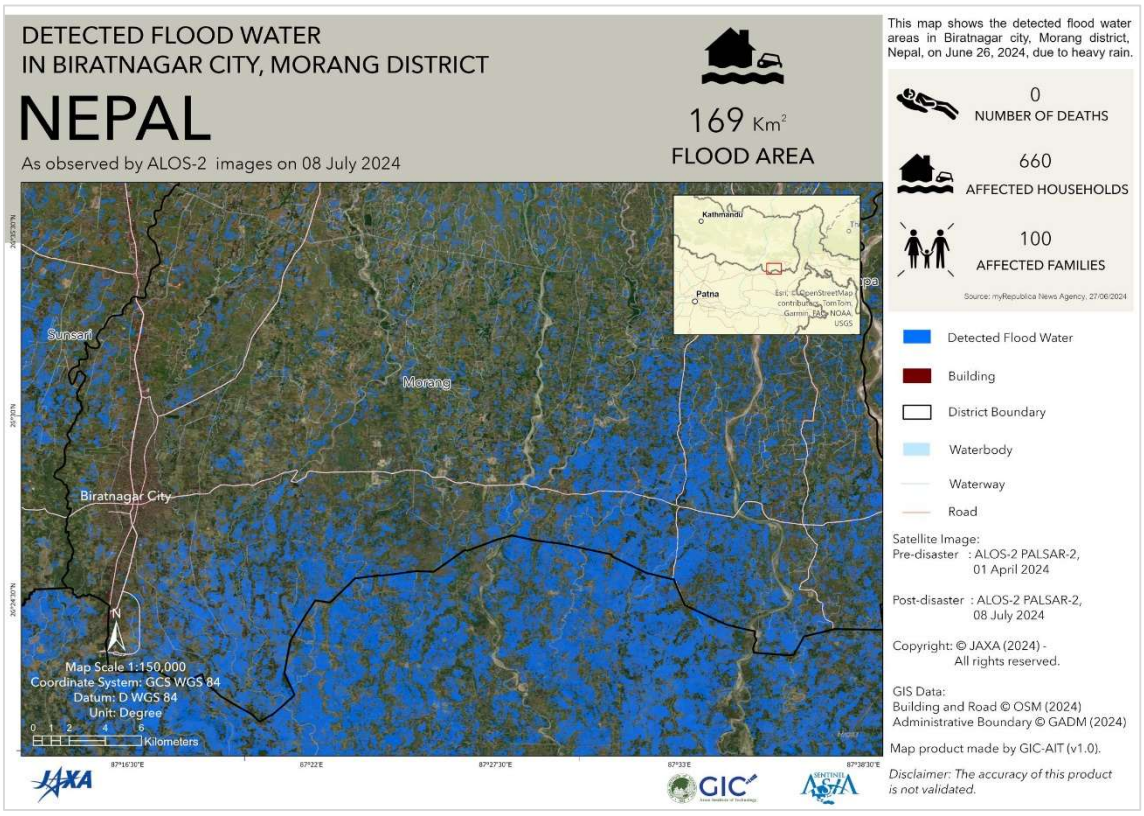


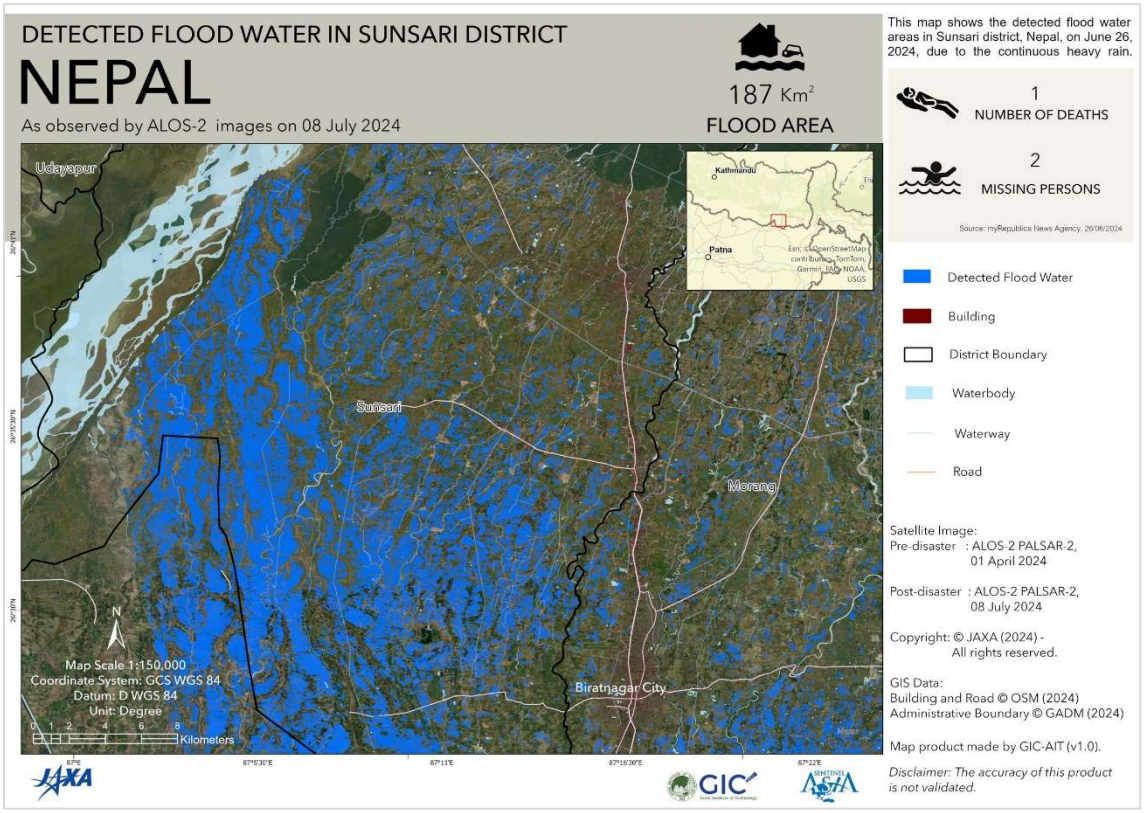

MUDFLOW IN JENISH VILLAGE, KADAMJAY DISTRICT
KYRGYZSTAN
As observed by Pleiades-1A images on 26 June 2024
LANDSLIDE
This map shows the powerful mudflow in Jenish village, Kadamjay district, Batken region, Kyrgyzstan, on June 24, 2024,following a period of intense and sustained heavy rainfall.
1
NUMBER OF DEATHS
6
AFFECTED CARS
Affected building
Affected road
Mudflow
Road
District Boundary
KADAMJAY DISTRICT
JENISH VILLAGE
Map Scale 1:10,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
Satellite Image:
Pre-disaster image :
PlanetScope, 20 June 2024
© Planet Labs Inc. (2024)
Post-disaster image :
Pleiades-1A, 26 June 2024
Includes Pleiades material © CNES (2024), Distribution Airbus DS.
GIS Data:
Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.
AIRBUS DEFENCE & SPACE
cnes
planet.


MUDFLOW IN NOOKAT DISTRICT
KYRGYZSTAN
As observed by WORLDVIEW-3 images on 03 July 2024
LANDSLIDE
This map shows the powerful mudflow in Nookat district, Osh region, Kyrgyzstan, on June 28, 2024, following a period of intense and sustained heavy rainfall.
9
NUMBER OF DEATHS
28
AFFECTED HOUSEHOLDS
1,400
EVACUATED PEOPLE
Affected building
Affected road
Mudflow
Road
District Boundary
NOOKAT DISTRICT
Абшыр-Ата айылы
Map Scale 1:45,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
Satellite Image:
Pre-disaster image :
WORLDVIEW-3 , 13 June 2024
Post-disaster image :
WORLDVIEW-3 , 03 July 2024
© (2024) DigitalGlobe, Inc., Longmont CO USA 80503.
GIS Data:
Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.
USGS
DigitalGlobe

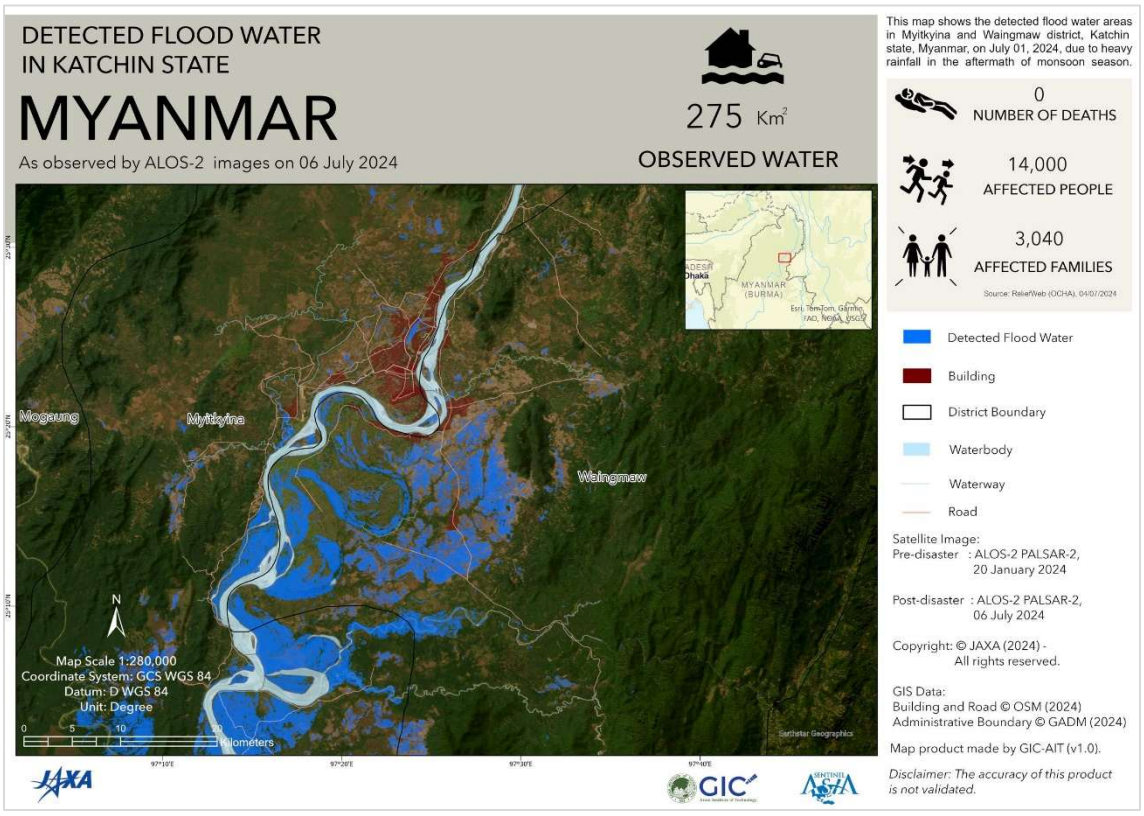


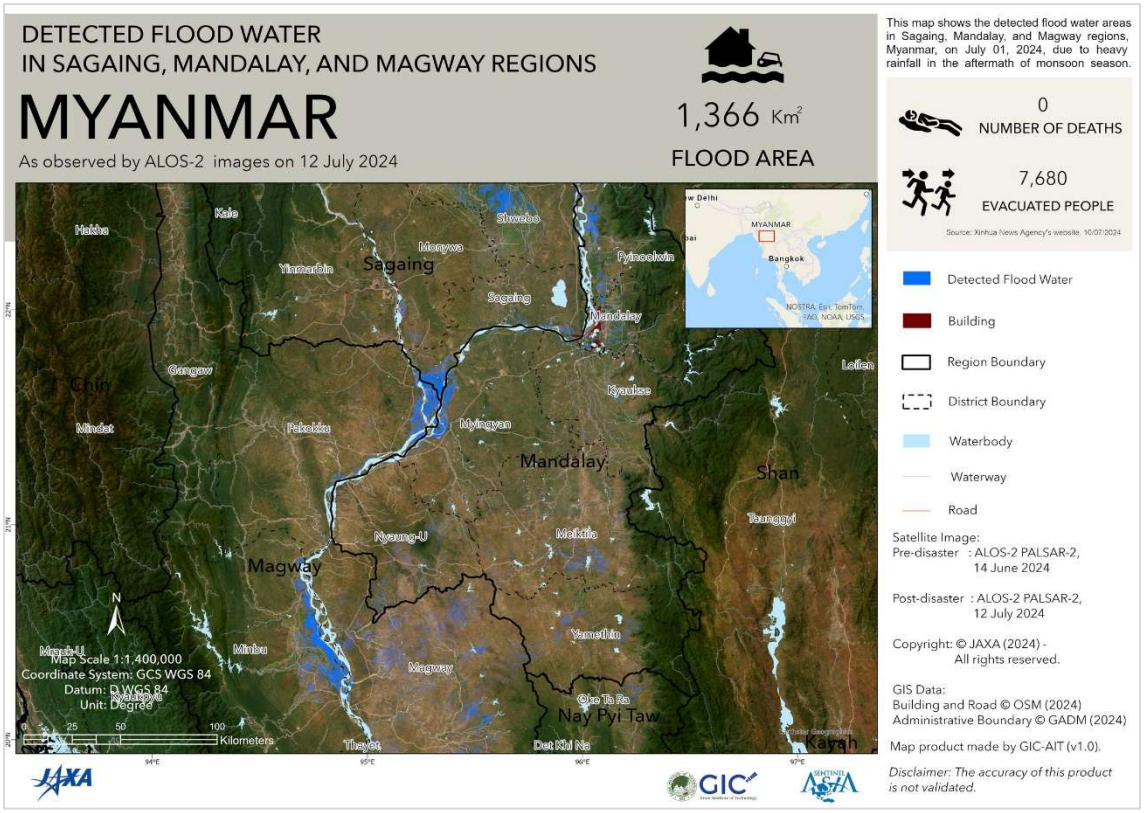
11. Flood in Nepal on 26 June 2024

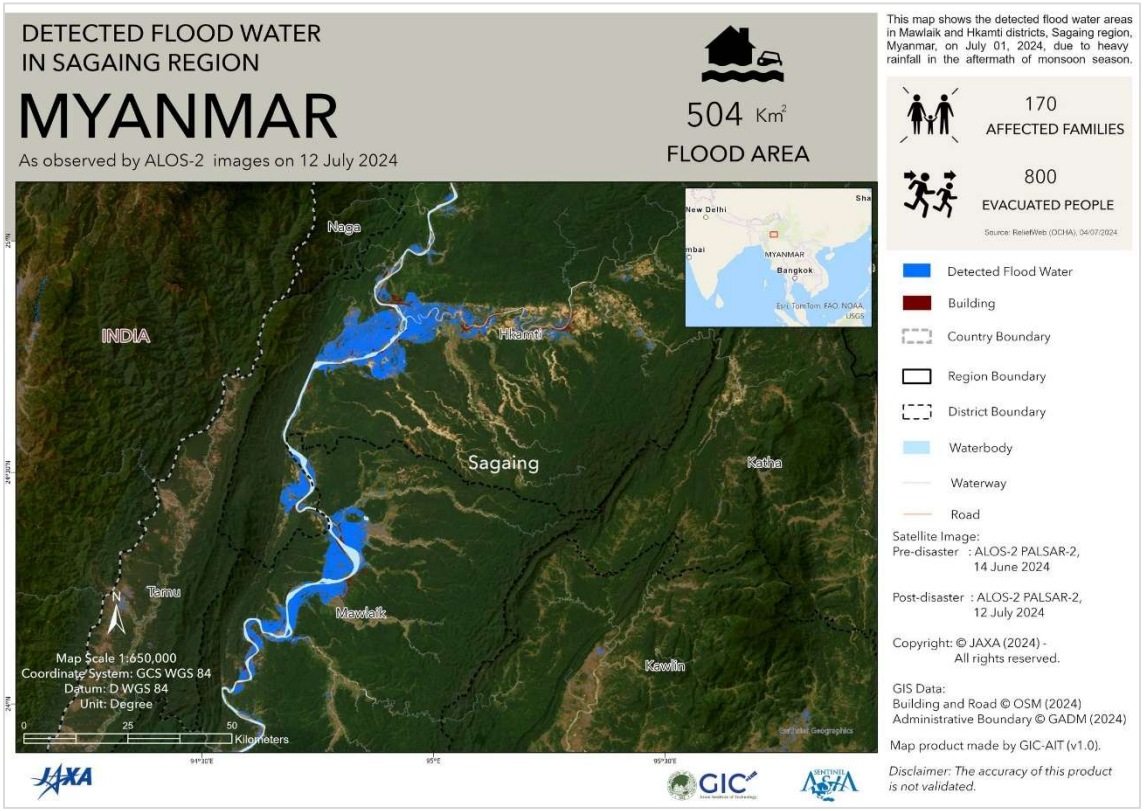


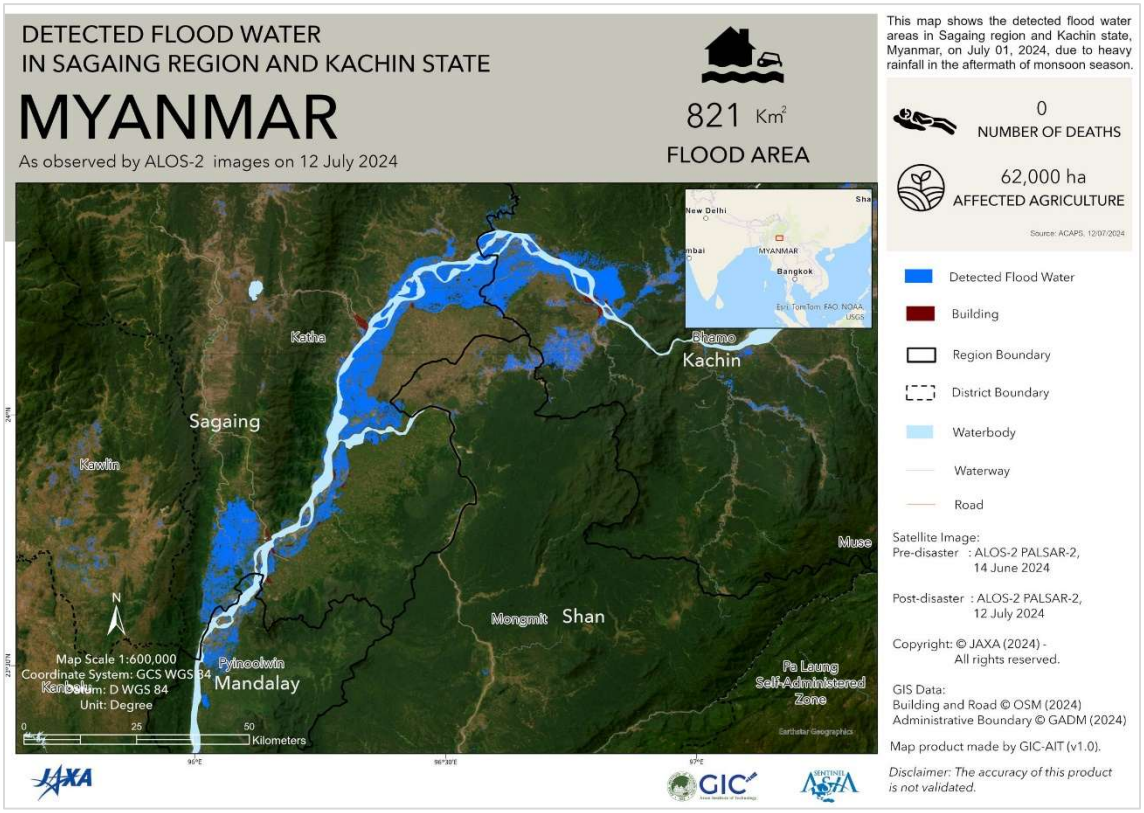


12. Flood in Myanmar on 01 July 2024

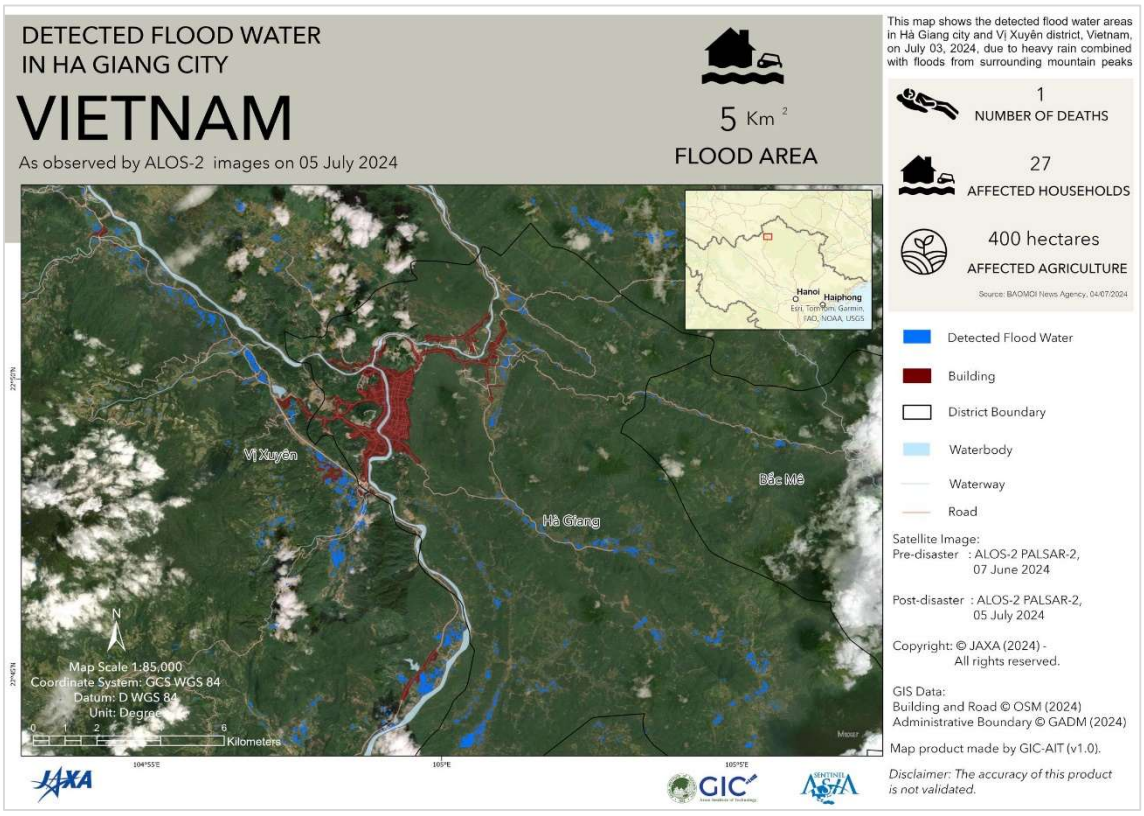



DETECTED FLOOD WATER
IN SAGAING, MANDALAY, AND MAGWAY REGIONS
MYANMAR
As observed by ALOS-2 images on 12 July 2024
1,366 Km²
FLOOD AREA
Kale
Hakha
Shwebo
Monywa
Sagaing
Yinmarbin
Pyinoolwin
Mandalay
Gangaw
Chin
Kyaukse
Mindat
Pakokku
Myingyan
Mandalay
Shan
Taunggyi
Nyaung-U
Meiktila
Magway
Yamethin
Minbu
Map Scale 1:1,400,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
Thayet
Det Khi Na
Nay Pyi Taw
Kayah
MYANMAR
Bangkok
This map shows the detected flood water areas in Sagaing, Mandalay, and Magway regions, Myanmar, on July 01, 2024, due to heavy rainfall in the aftermath of monsoon season.
0
NUMBER OF DEATHS
7,680
EVACUATED PEOPLE
Source: Xinhua News Agency's website, 10/07/2024
Detected Flood Water
Building
Region Boundary
District Boundary
Waterbody
Waterway
Road
Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 14 June 2024
Post-disaster : ALOS-2 PALSAR-2, 12 July 2024
Copyright: © JAXA (2024) - All rights reserved.
GIS Data:
Building and Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.

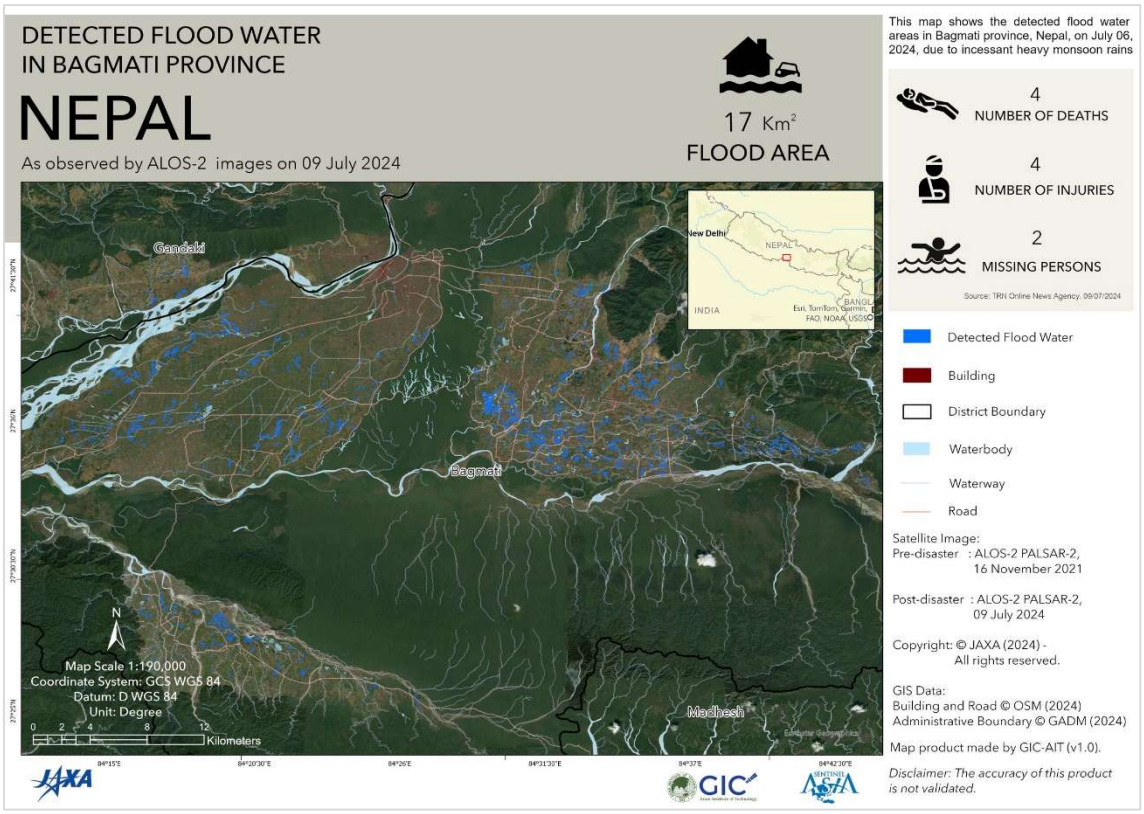

DETECTED FLOOD WATER
IN SAGAING REGION
MYANMAR
As observed by ALOS-2 images on 12 July 2024
504 Km²
FLOOD AREA
Naga
INDIA
Hkamti
Sagaing
Katha
Tamu
Mawlaik
Kawlin
Map Scale 1:650,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
MYANMAR
Bangkok
This map shows the detected flood water areas in Mawlaik and Hkamti districts, Sagaing region, Myanmar, on July 01, 2024, due to heavy rainfall in the aftermath of monsoon season.
170
AFFECTED FAMILIES
800
EVACUATED PEOPLE
Source: ReliefWeb (OCHA), 04/07/2024
Detected Flood Water
Building
Country Boundary
Region Boundary
District Boundary
Waterbody
Waterway
Road
Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 14 June 2024
Post-disaster : ALOS-2 PALSAR-2, 12 July 2024
Copyright: © JAXA (2024) - All rights reserved.
GIS Data:
Building and Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.



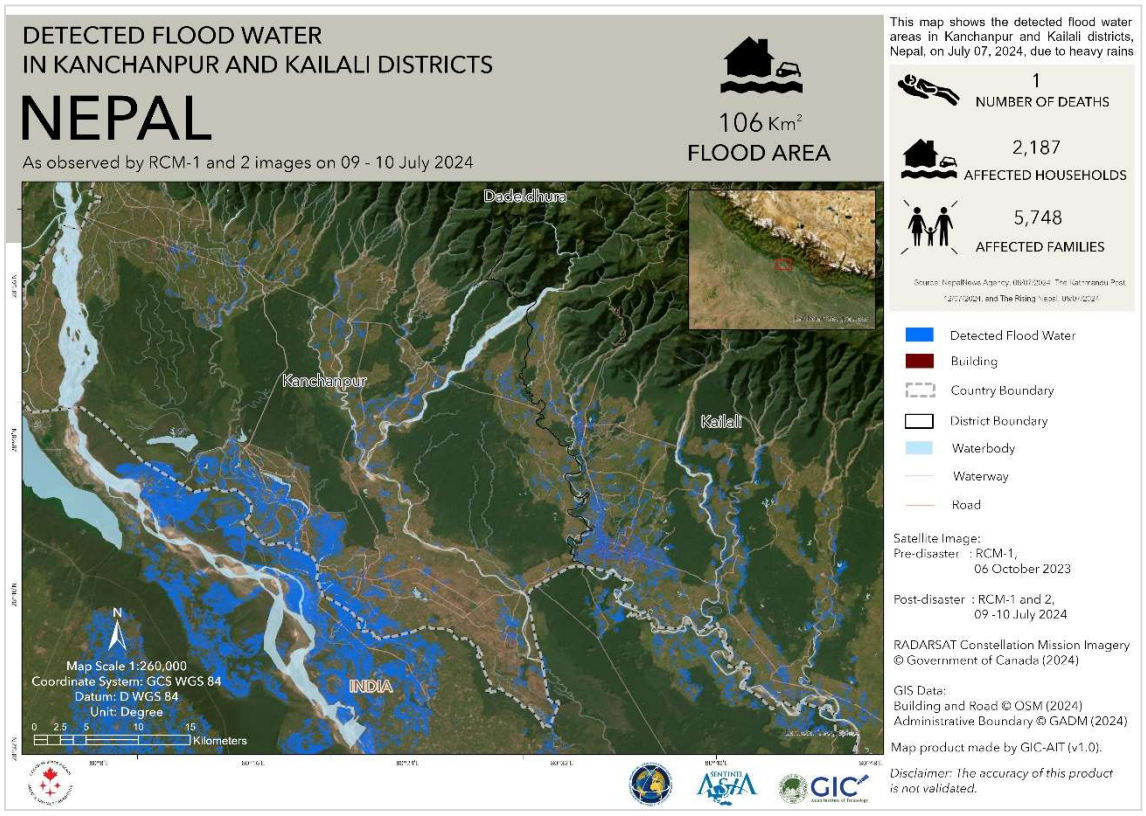
13. Flood in Northern Vietnam on 03 July 2024

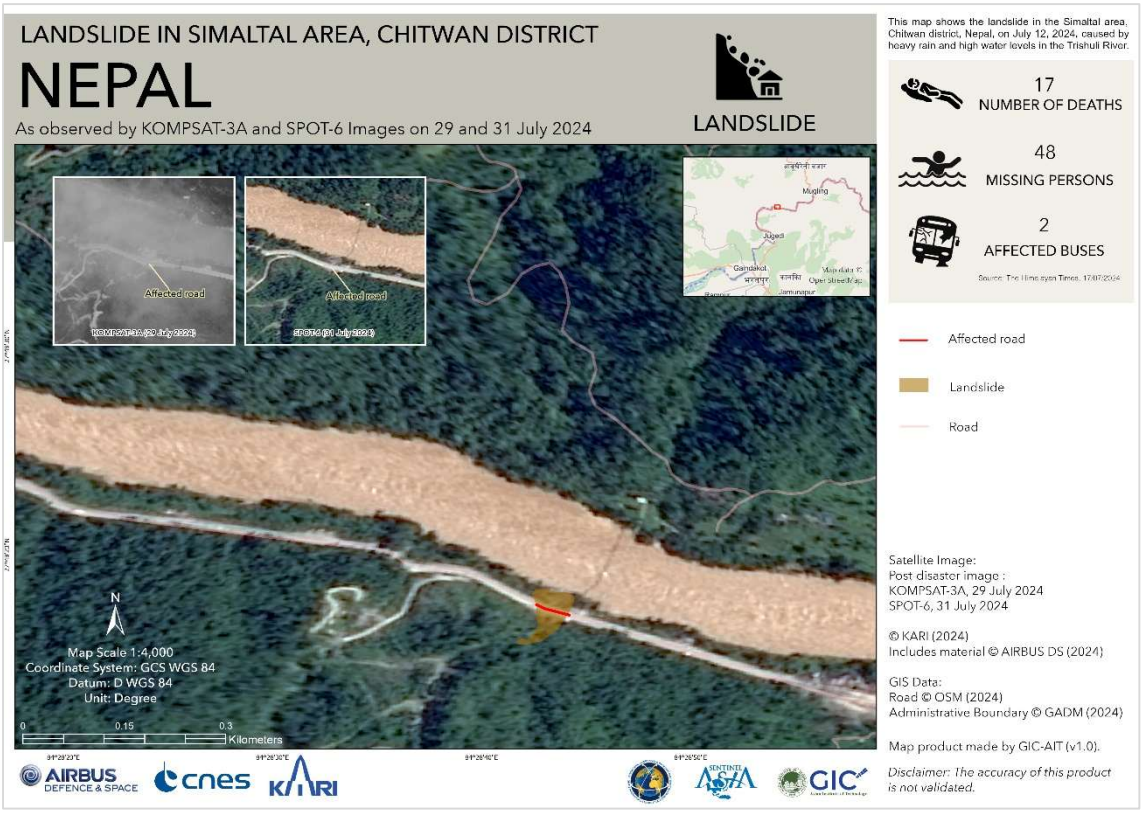


14. Flood in Nepal on 06 July 2024

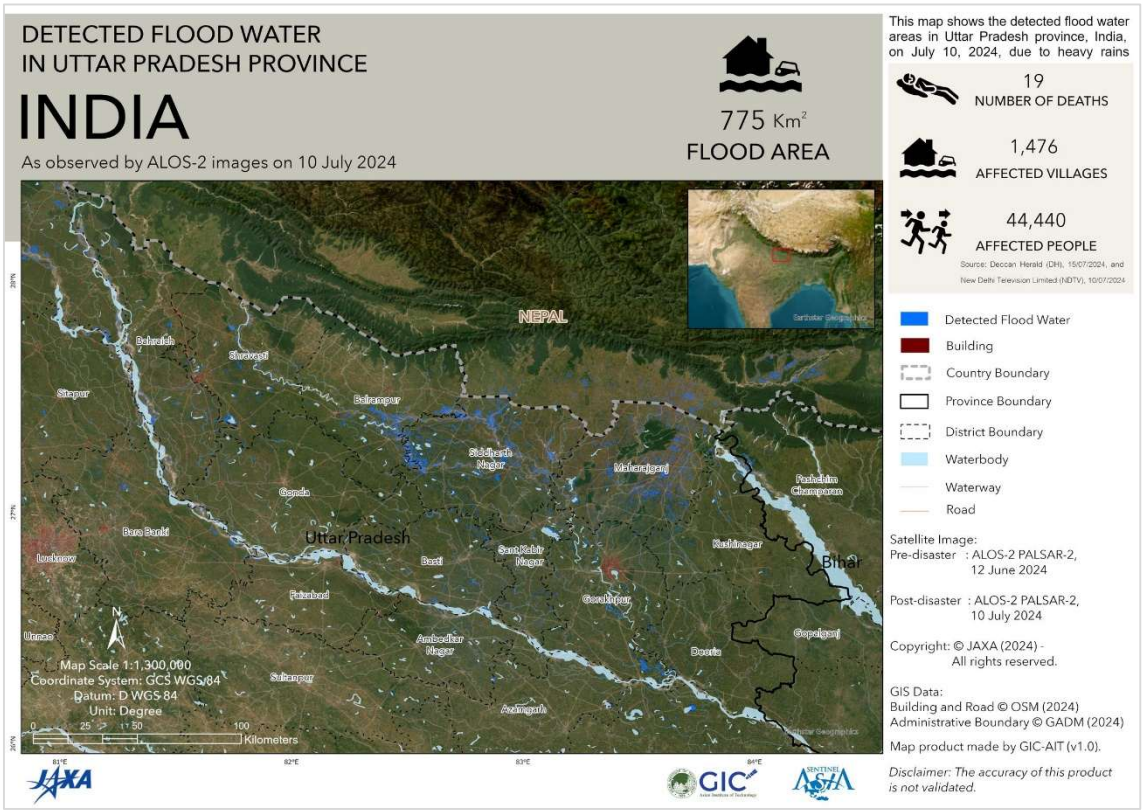


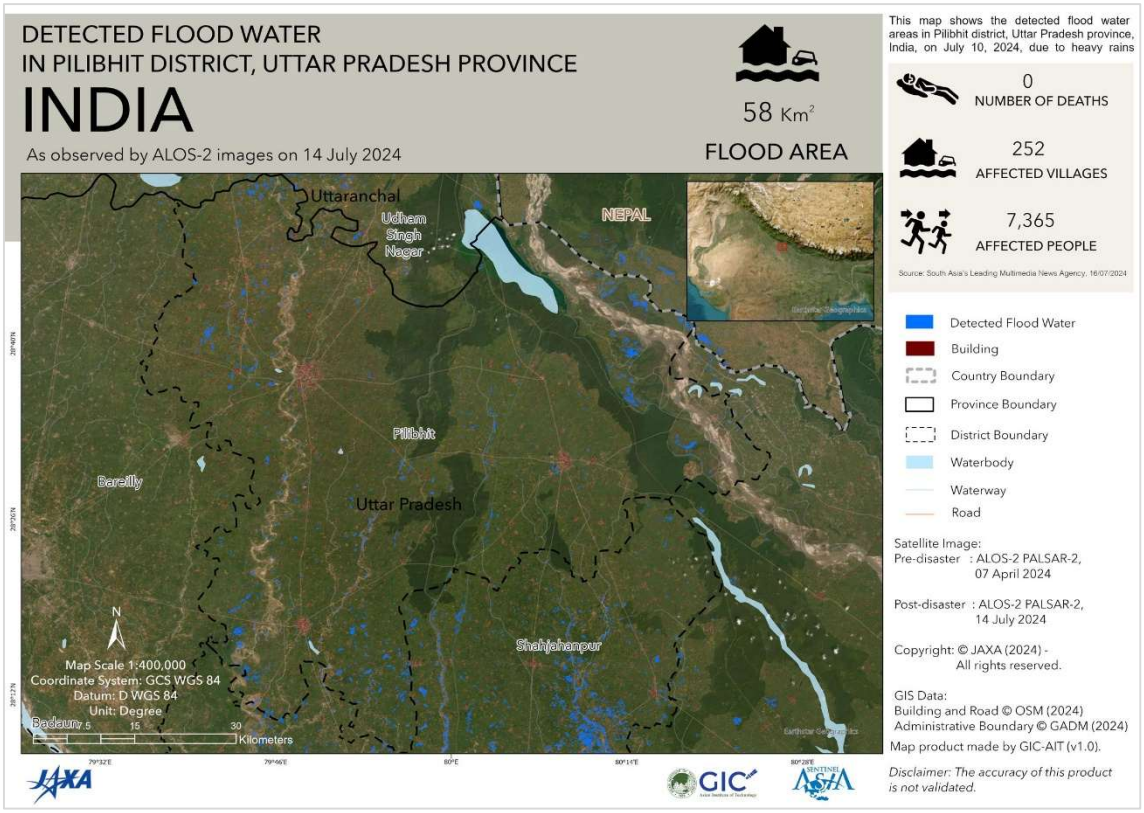
15. Flood and Landslide in Nepal on 07 July 2024 (SA was escalated to International Disaster Charter)

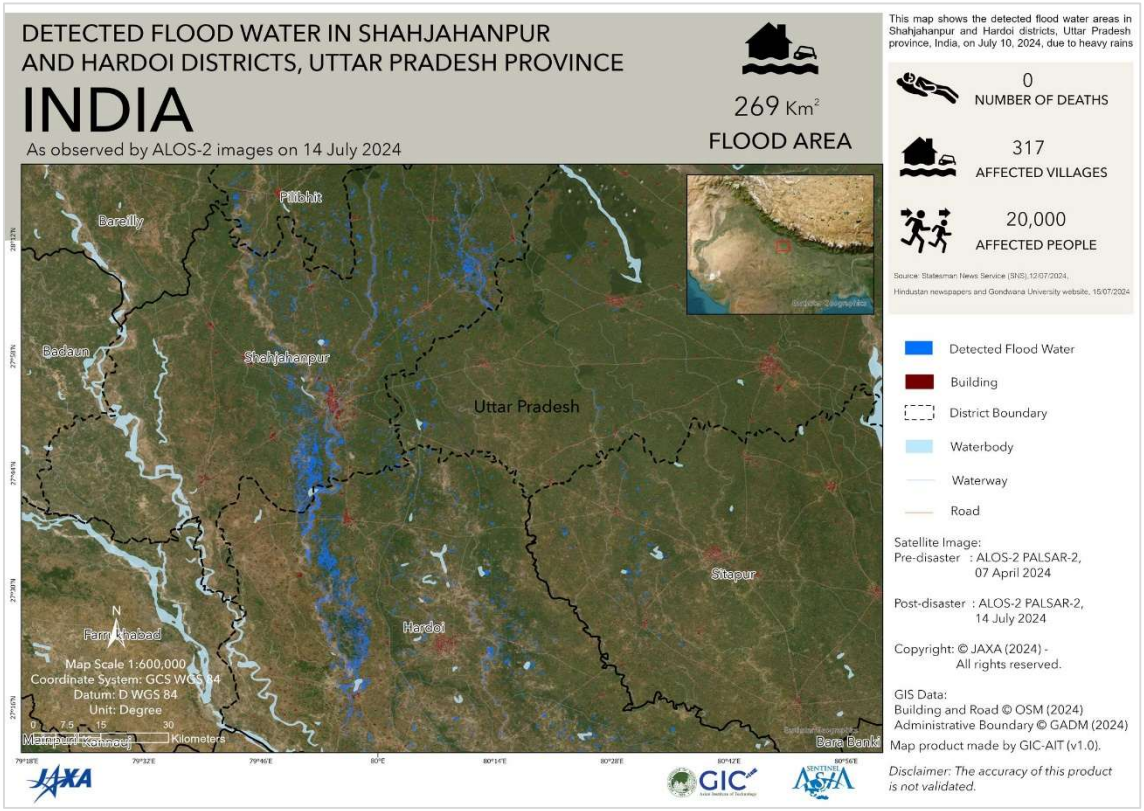




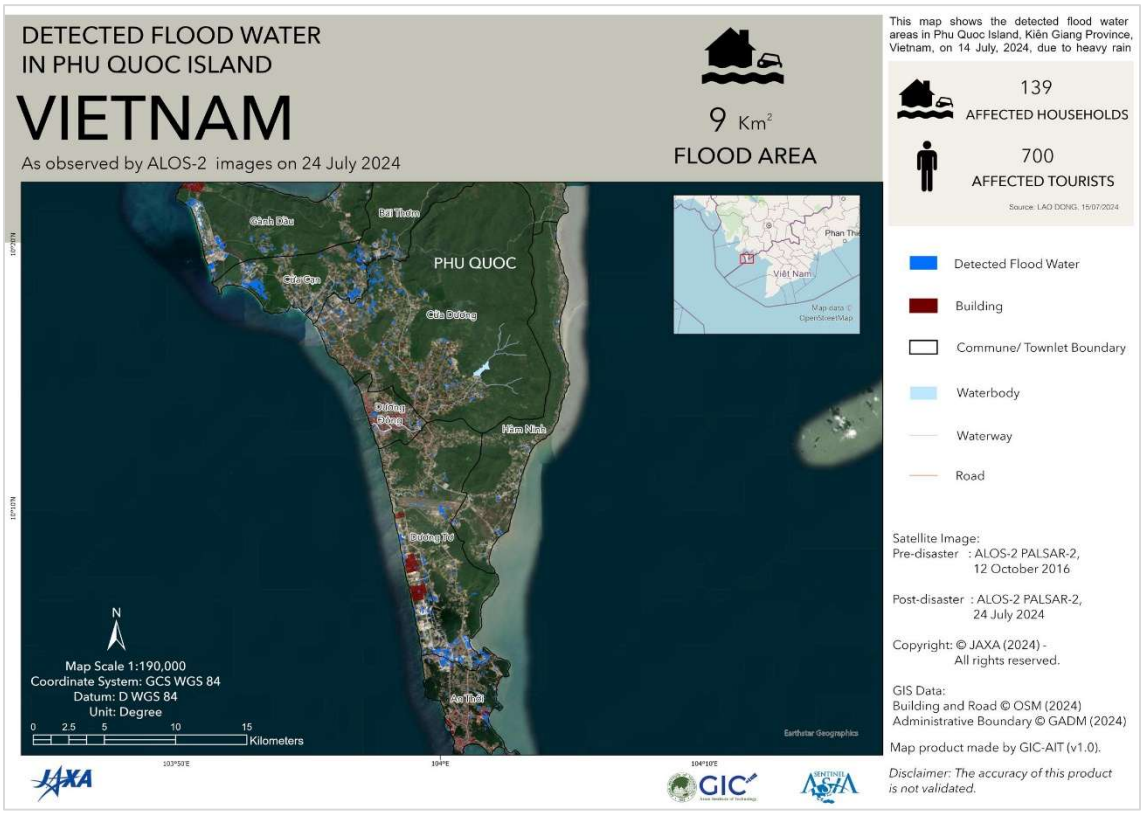
16. Flood in Uttar Pradesh of India on 10 July 2024



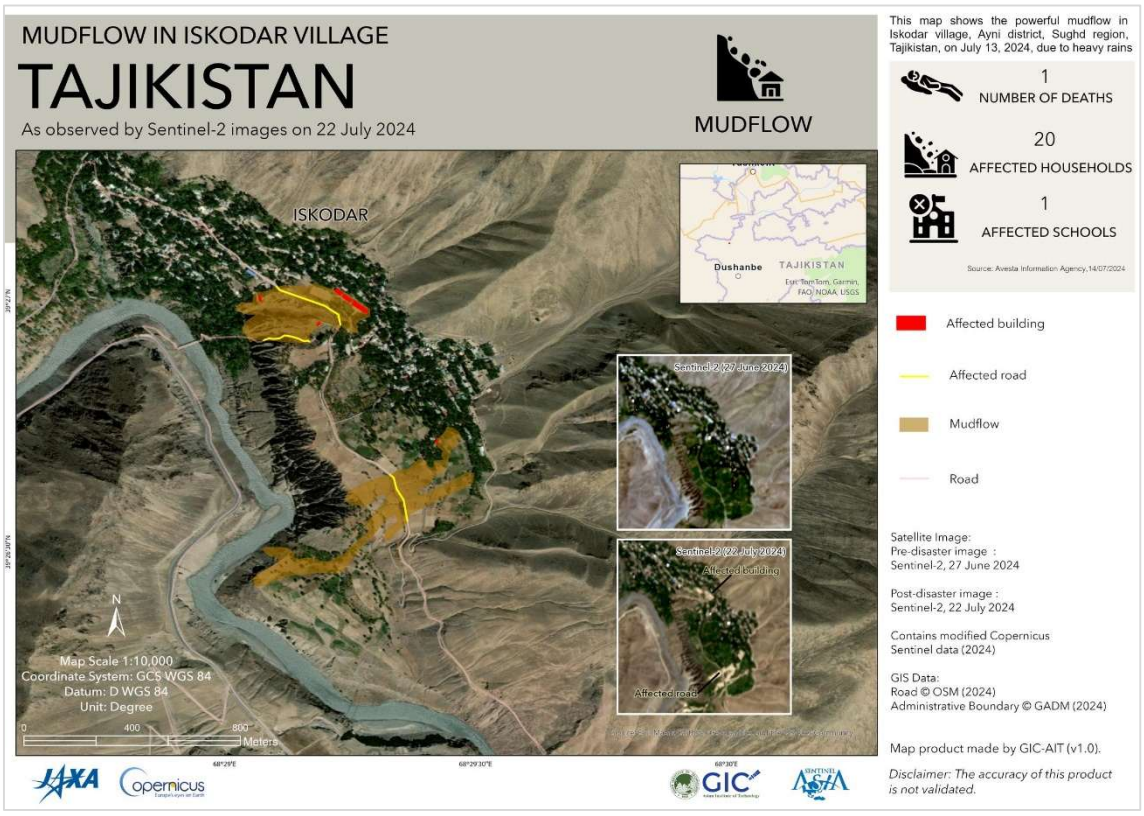

DETECTED FLOOD WATER
IN PILIBHIT DISTRICT, UTTAR PRADESH PROVINCE
INDIA
As observed by ALOS-2 images on 14 July 2024
58 Km²
FLOOD AREA
Uttaranchal
Udham Singh Nagar
NEPAL
Pilibhit
Bareilly
Uttar Pradesh
Shahjahanpur
Badaun
N
Map Scale 1:400,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
0 5 15 30
Kilometers
This map shows the detected flood water areas in Pilibhit district, Uttar Pradesh province, India, on July 10, 2024, due to heavy rains
0
NUMBER OF DEATHS
252
AFFECTED VILLAGES
7,365
AFFECTED PEOPLE
Source: South Asia's Leading Multimedia News Agency, 16/07/2024
Detected Flood Water
Building
Country Boundary
Province Boundary
District Boundary
Waterbody
Waterway
Road
Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 07 April 2024
Post-disaster : ALOS-2 PALSAR-2, 14 July 2024
Copyright: © JAXA (2024) - All rights reserved.
GIS Data:
Building and Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.


DETECTED FLOOD WATER IN SHAHJAHANPUR
AND HARDOI DISTRICTS, UTTAR PRADESH PROVINCE
INDIA
As observed by ALOS-2 images on 14 July 2024
269 Km²
FLOOD AREA
Pilibhit
Bareilly
Badaun
Shahjahanpur
Uttar Pradesh
Sitapur
Hardoi
Farrukhabad
Barabanki
N
Map Scale 1:600,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
0 7.5 15 30
Kilometers
This map shows the detected flood water areas in Shahjahanpur and Hardoi districts, Uttar Pradesh province, India, on July 10, 2024, due to heavy rains
0
NUMBER OF DEATHS
317
AFFECTED VILLAGES
20,000
AFFECTED PEOPLE
Source: Statesman News Service (SNS), 12/07/2024,
Hindustan newspapers and Gondwana University website, 15/07/2024
Detected Flood Water
Building
District Boundary
Waterbody
Waterway
Road
Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 07 April 2024
Post-disaster : ALOS-2 PALSAR-2, 14 July 2024
Copyright: © JAXA (2024) - All rights reserved.
GIS Data:
Building and Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.

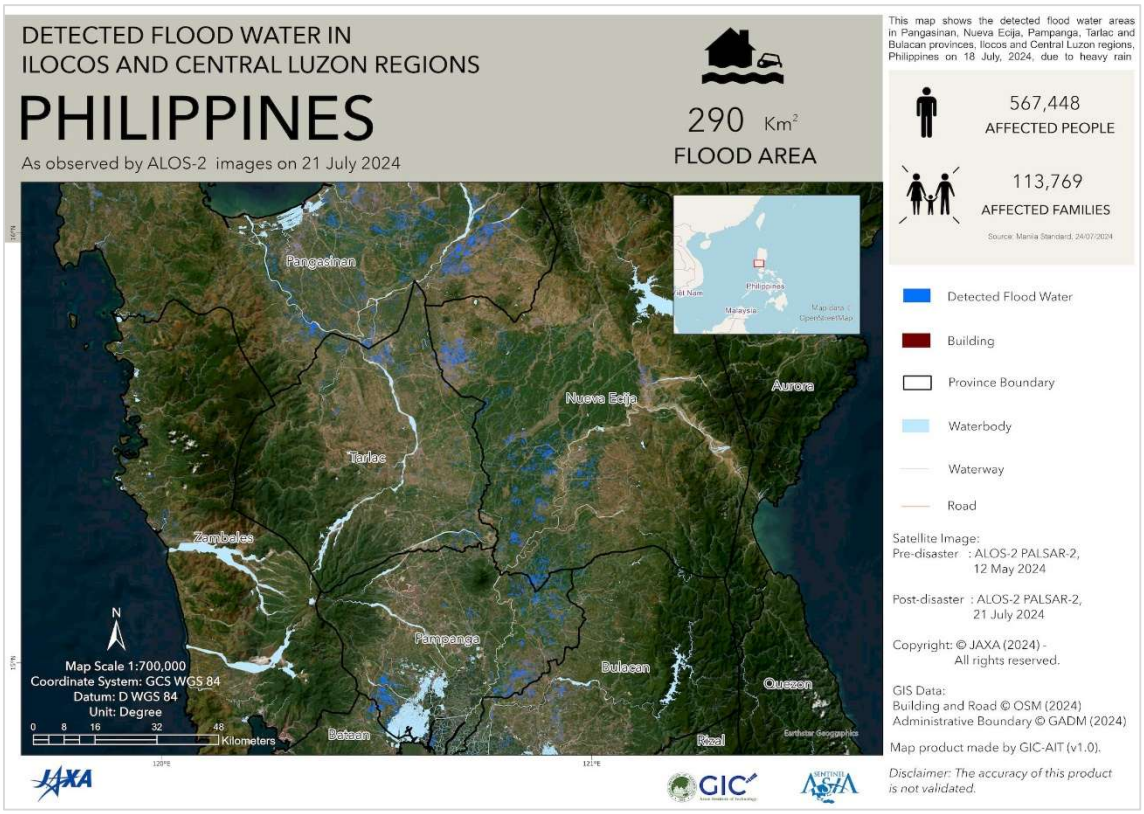
17. Flood in Vietnam on 14 July 2024



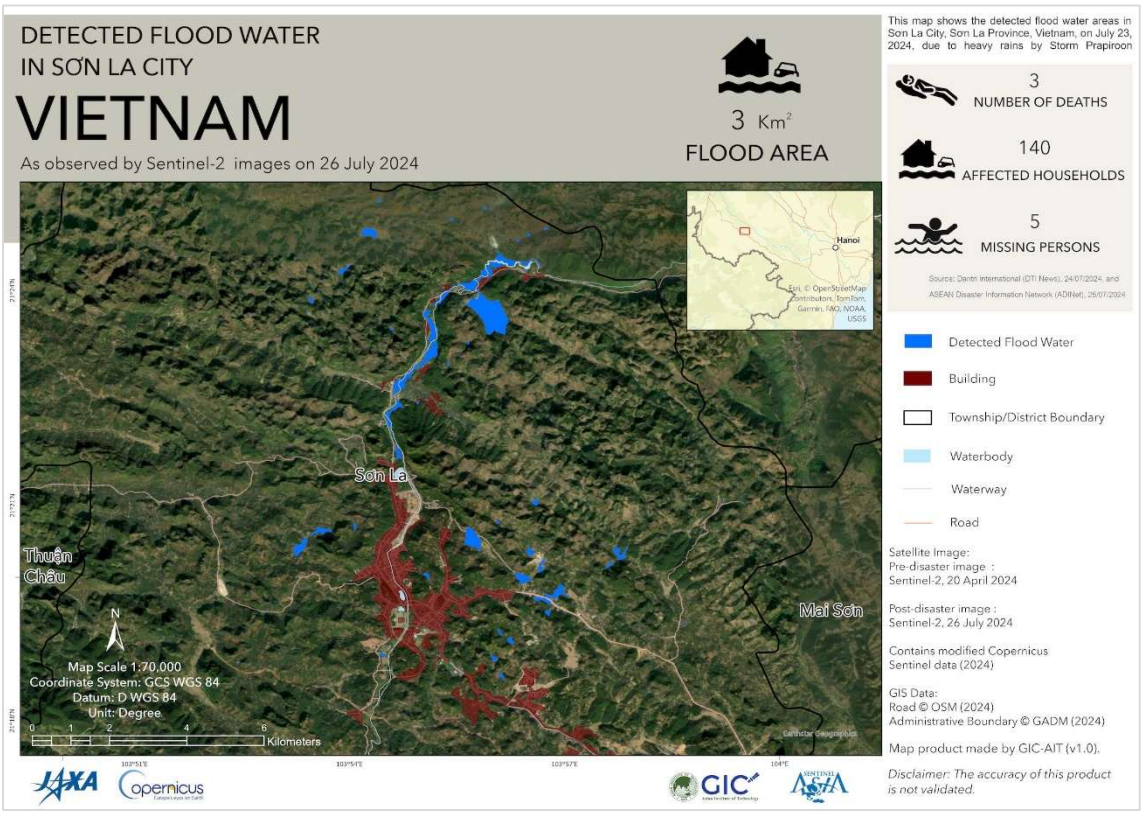
18. Mudflow in Tajikistan on 13 July 2024



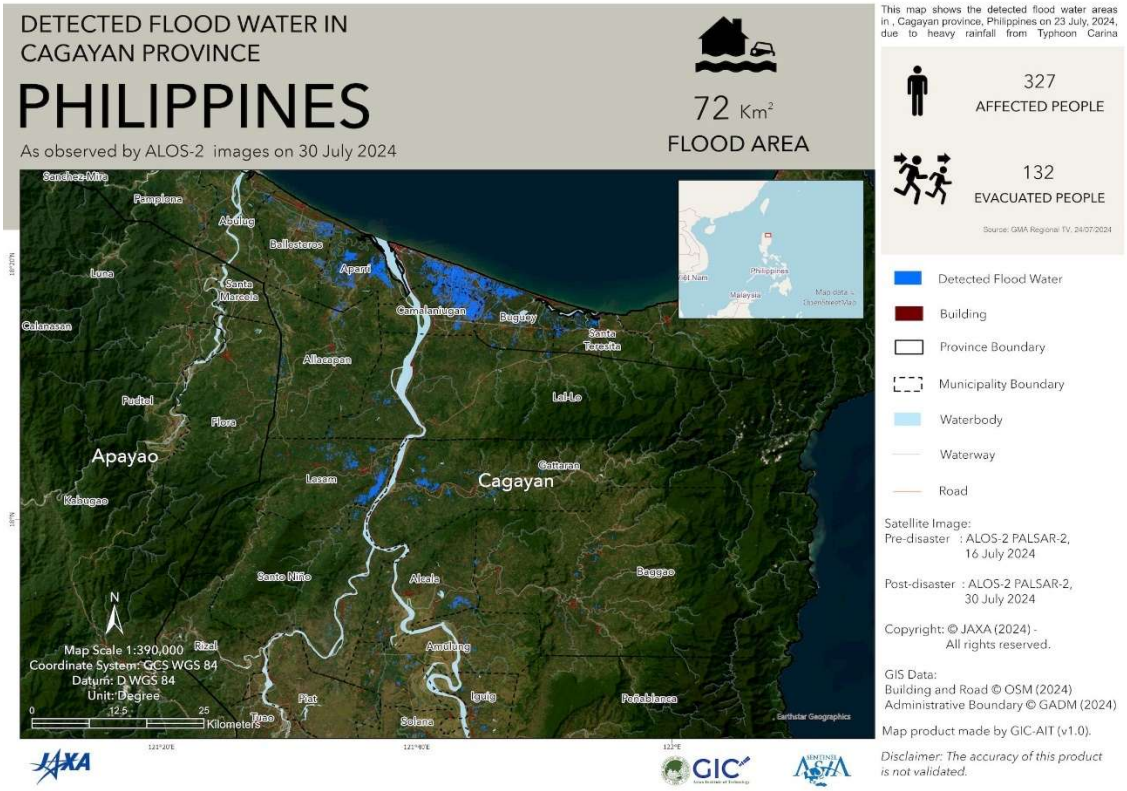
19. Flood in Philippines on 18 July 2024



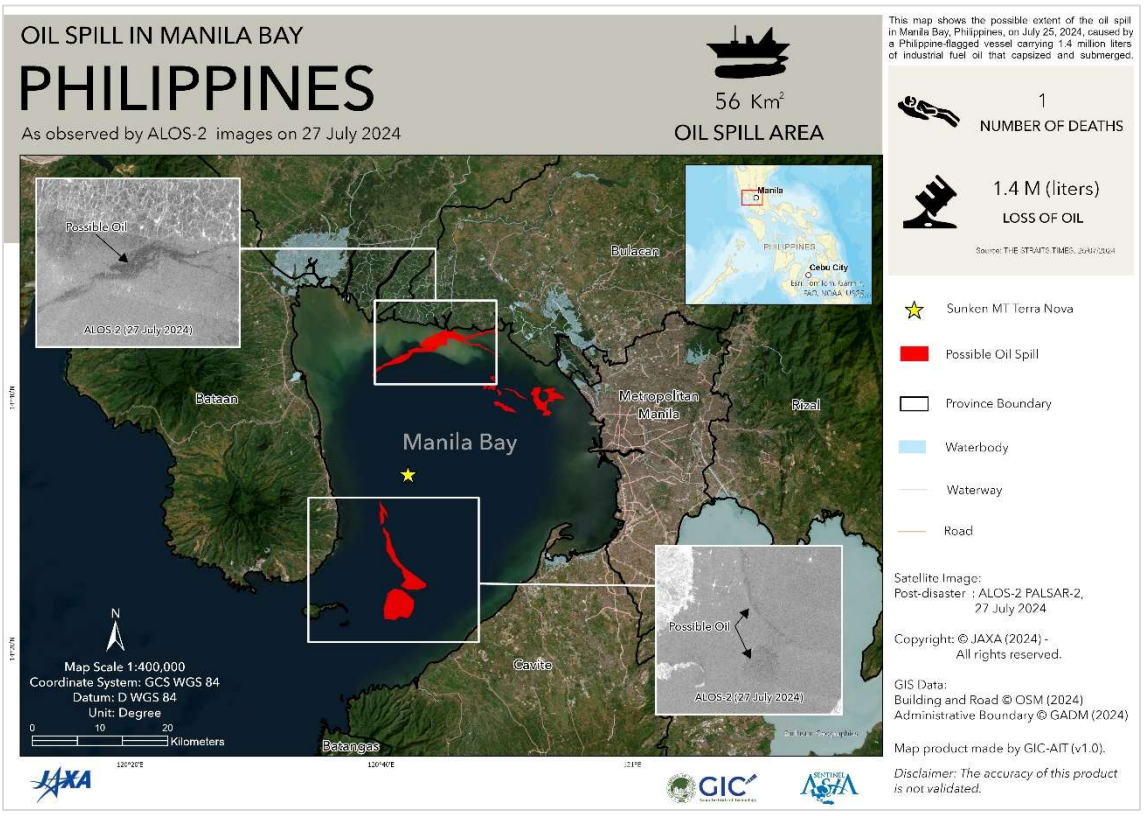
20. Flood in Son La City, Vietnam on 23 July 2024



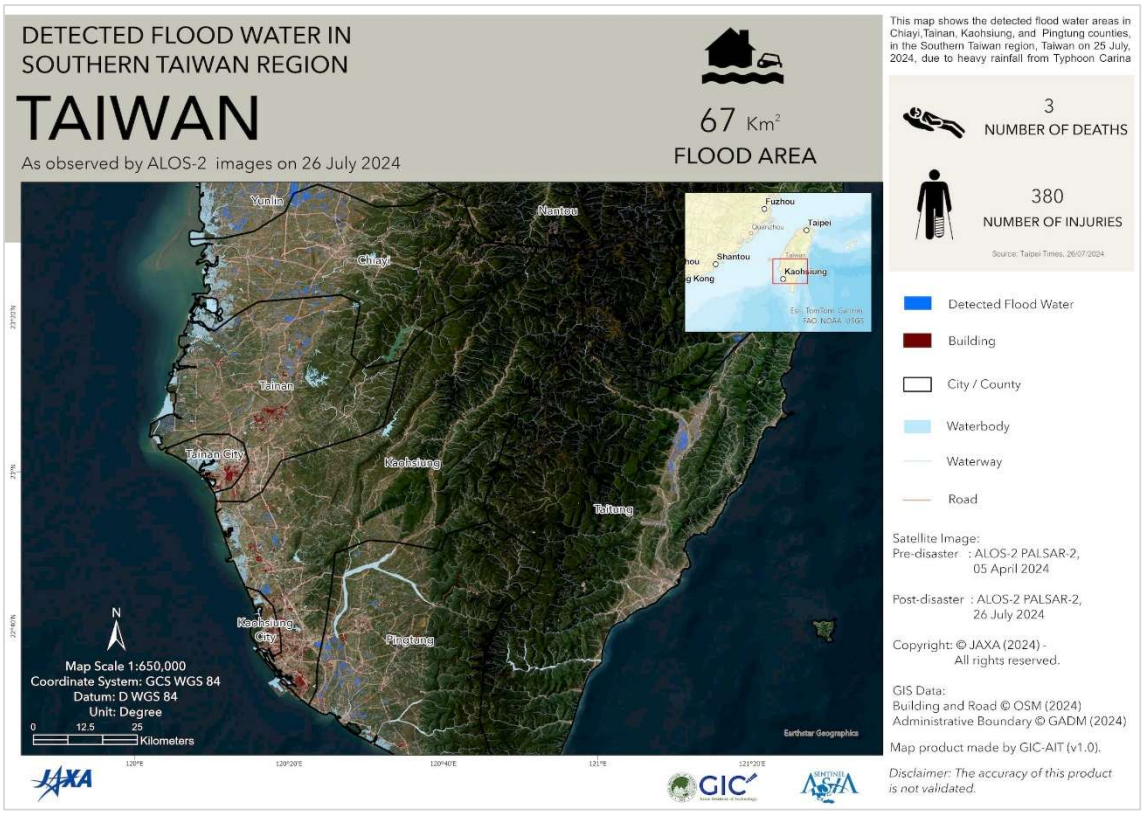
21. Flood in Philippines on 23 July 2024



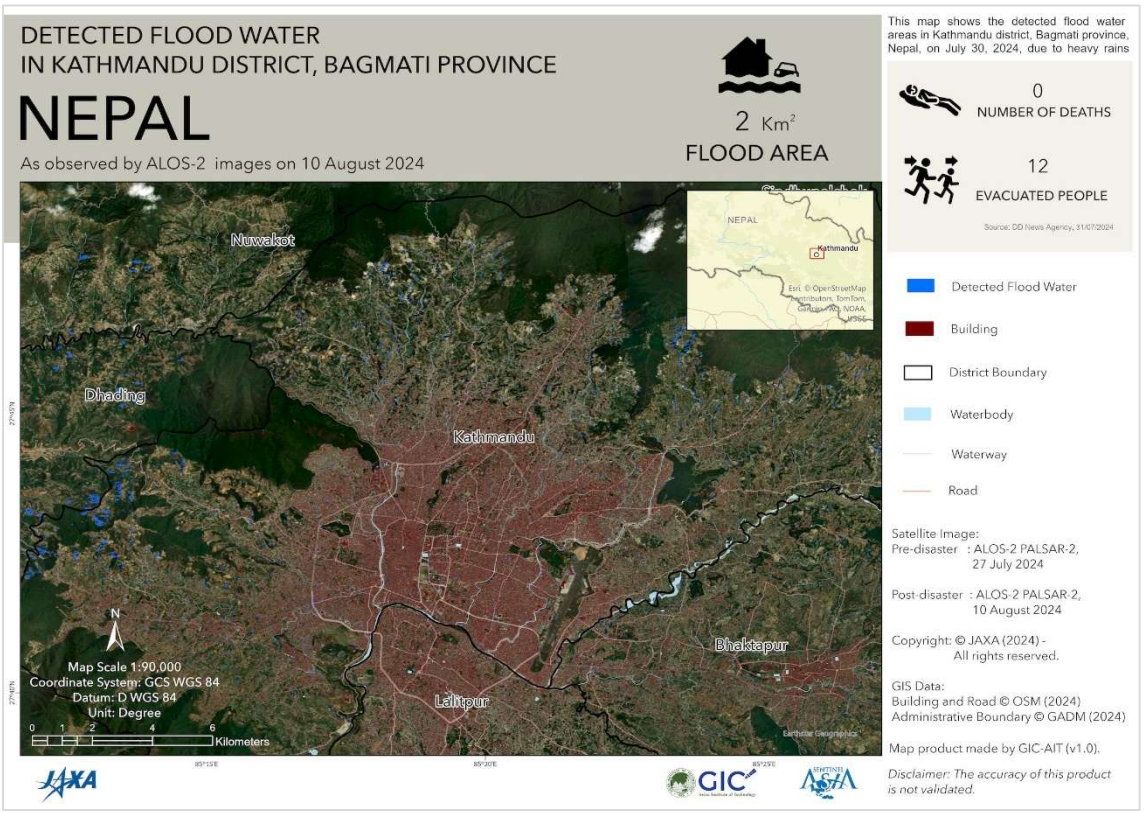
22. Oil Spill in Philippines on 25 July 2024



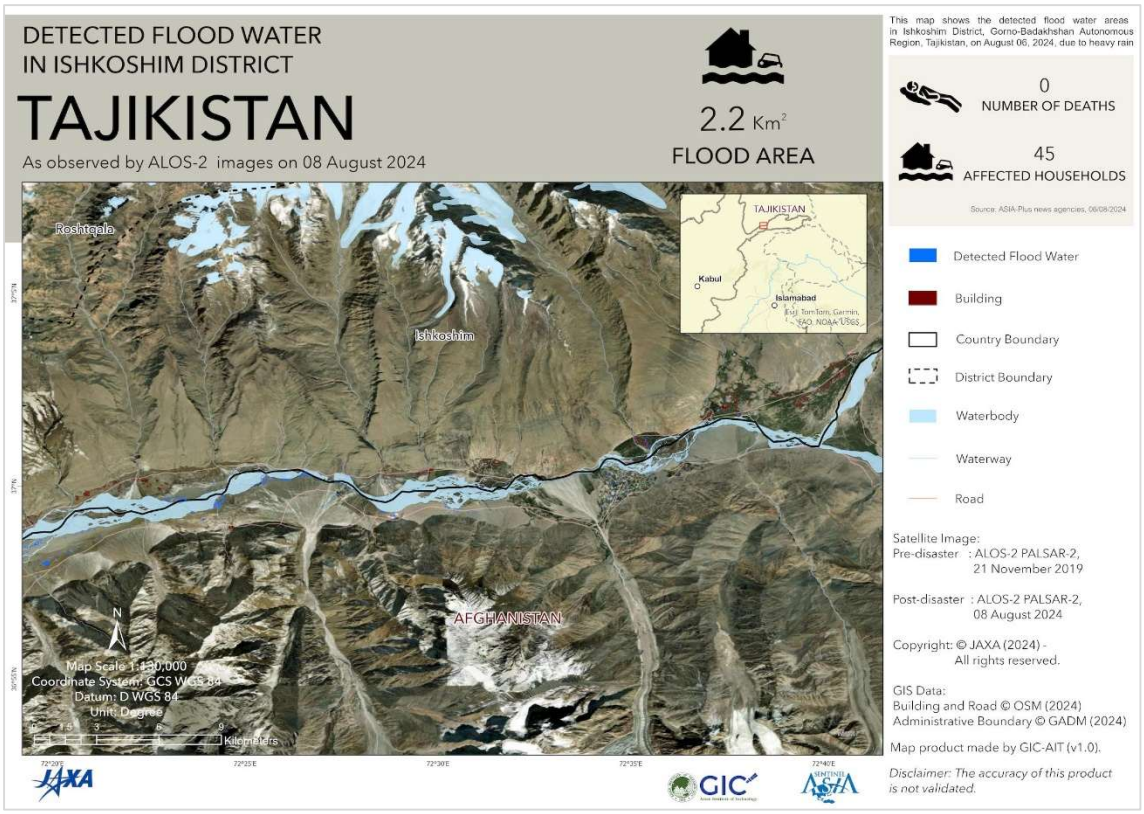
23. Flood in Taiwan on 25 July 2024



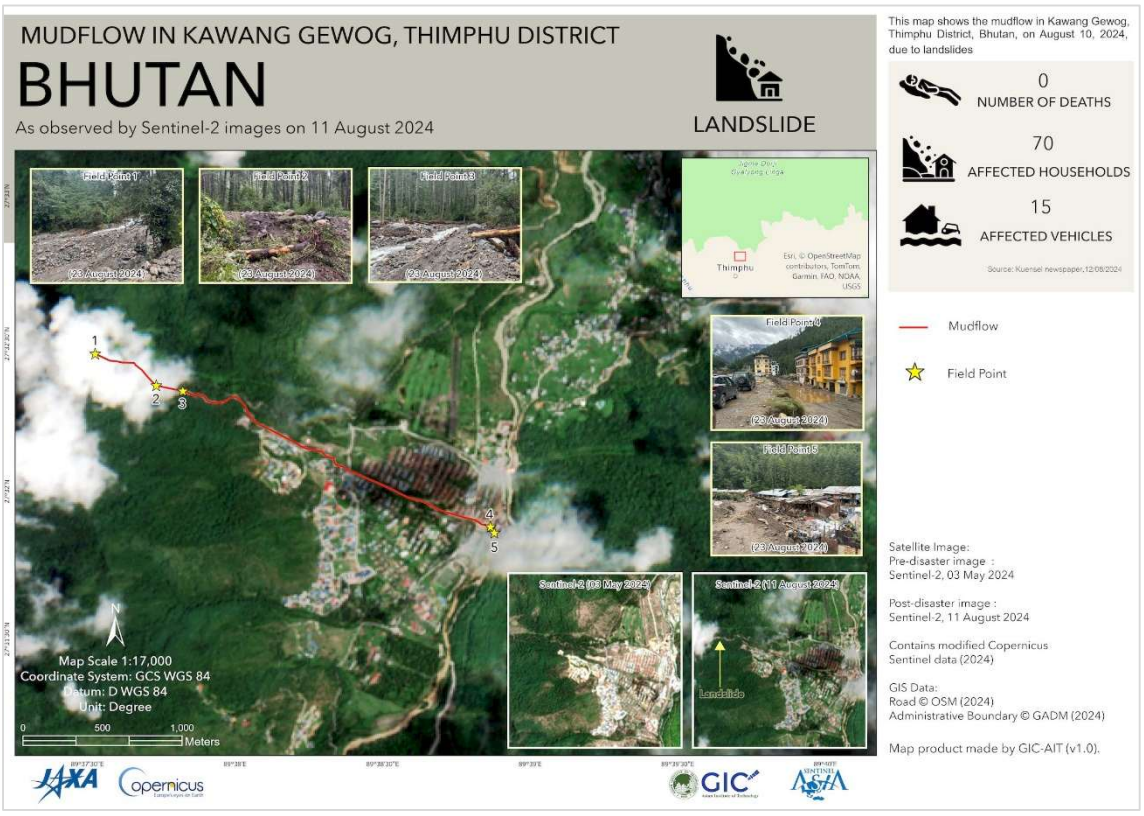
24. Flood in Nepal on 30 July 2024



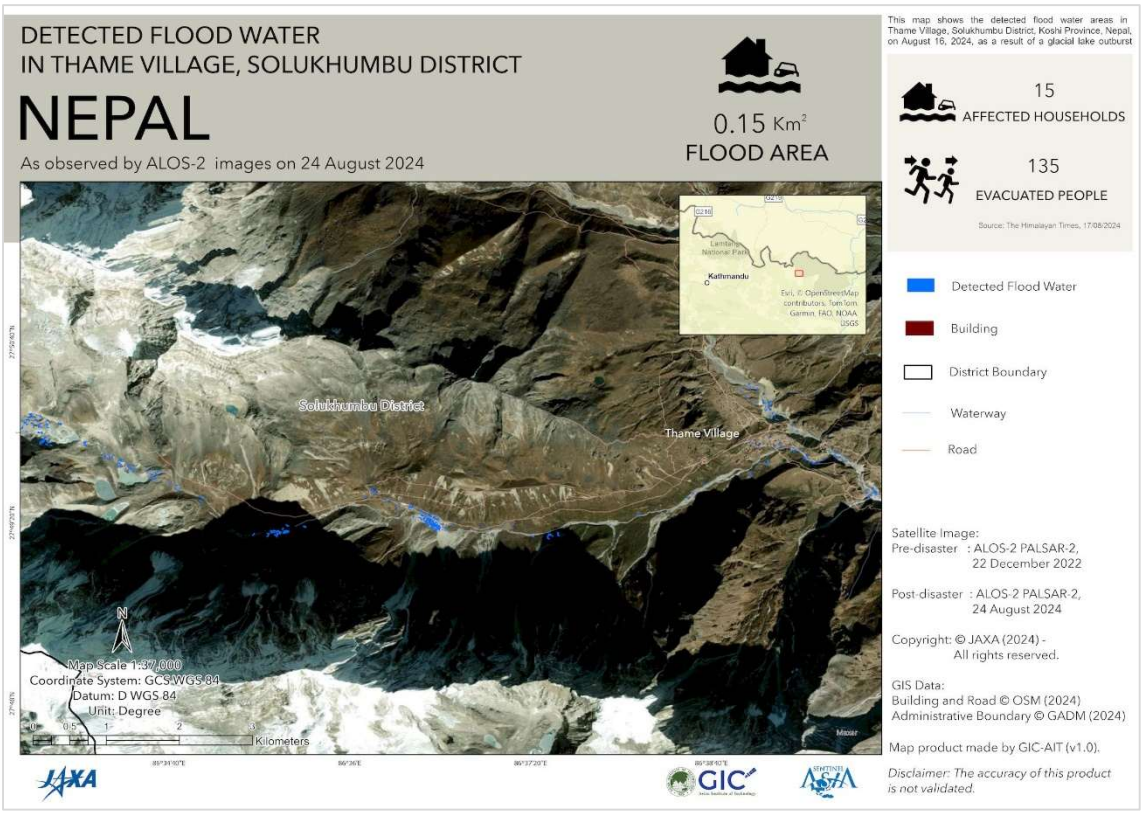
25. Flood in Tajikistan on 06 August 2024



26. Mudflow in Bhutan on 10 August 2024

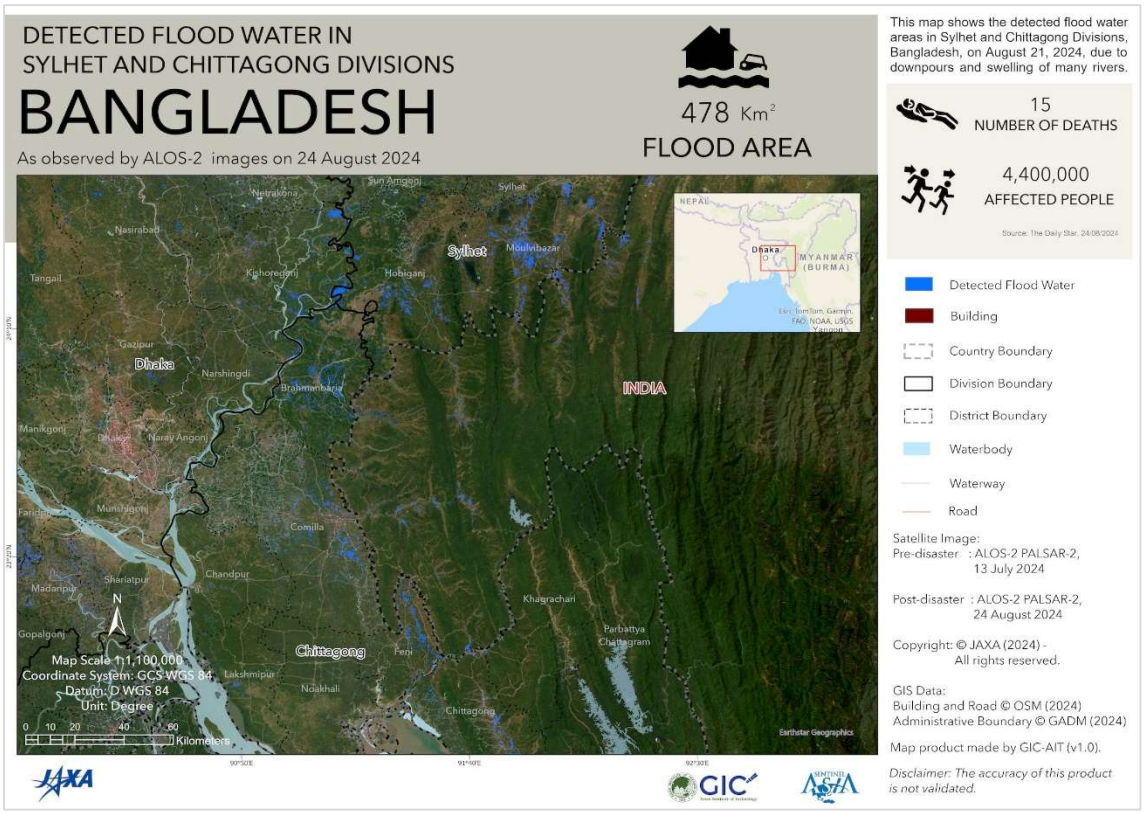


27. Flood in Solukhumbu, Nepal on 16 August 2024

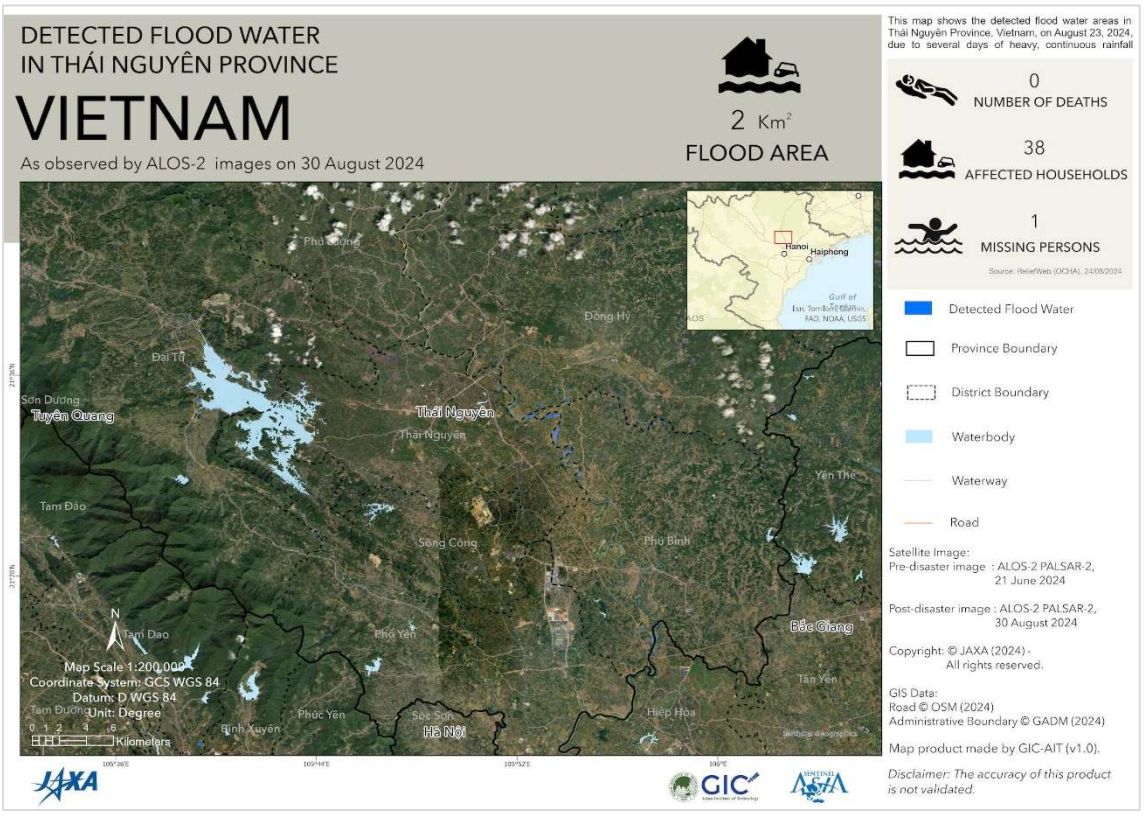


28. Mudflow in Kyrgyz on 18 August 2024 (SA was escalated to International Disaster Charter)

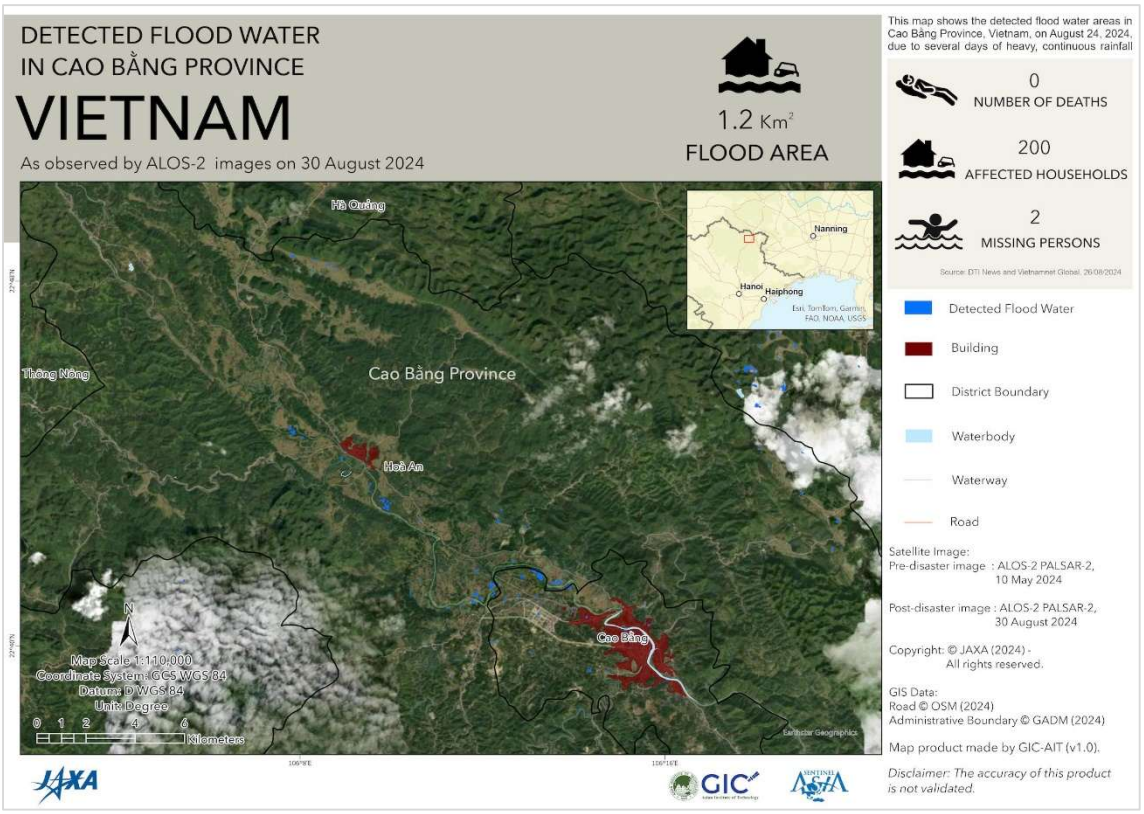
29. Flood in Bangladesh on 21 August 2024



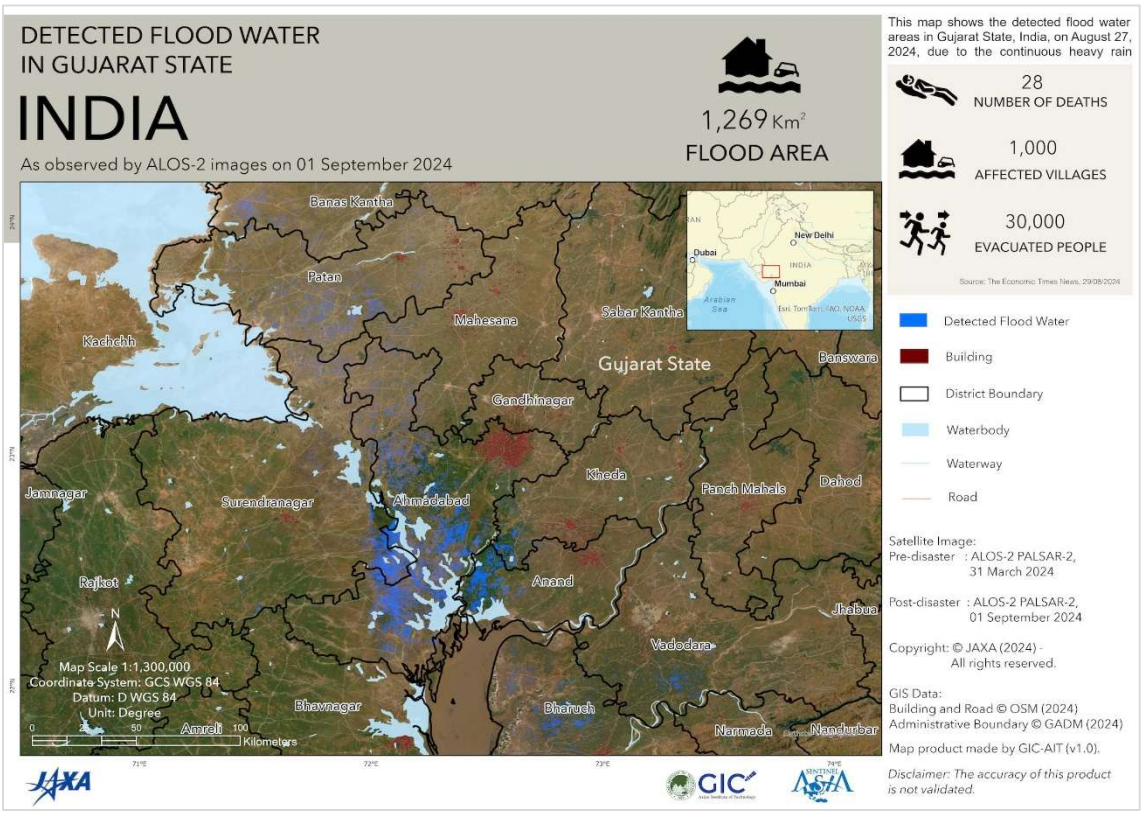
30. Flood in Thai Nguyen City, Vietnam on 23 August 2024



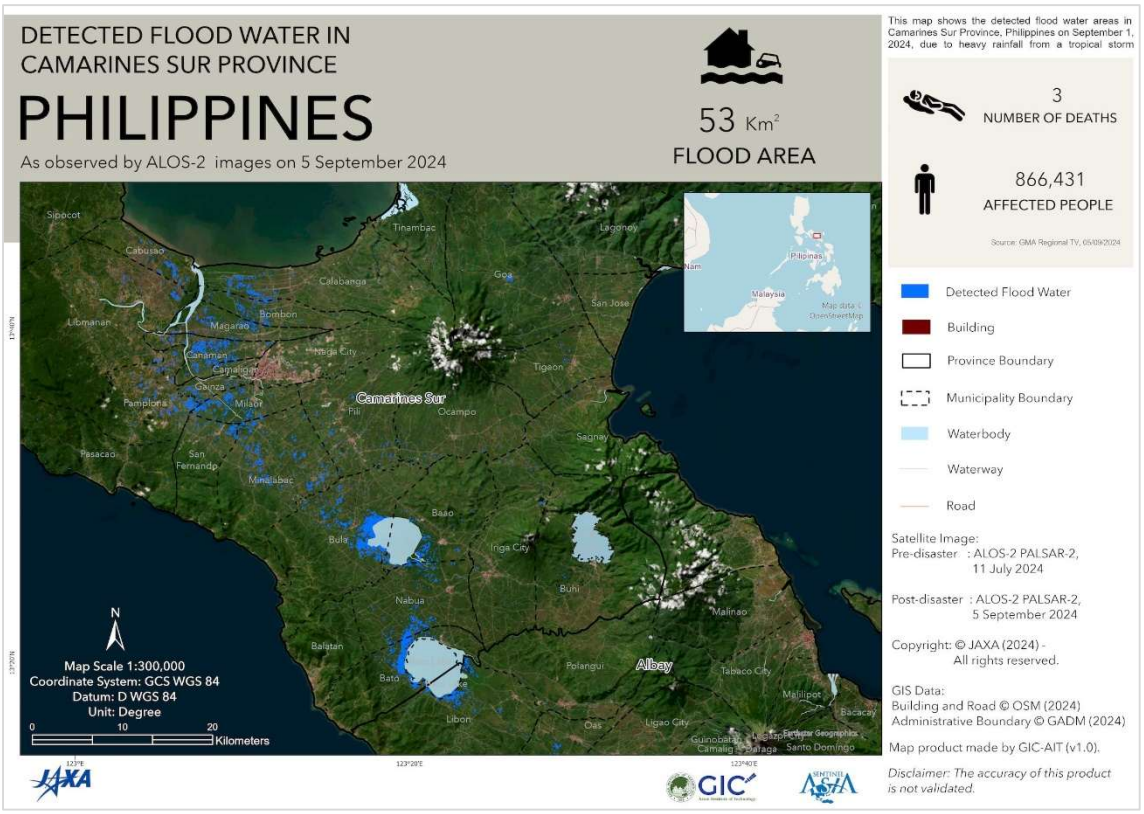
31. Flood in Cao Bang City, Vietnam on 24 August 2024



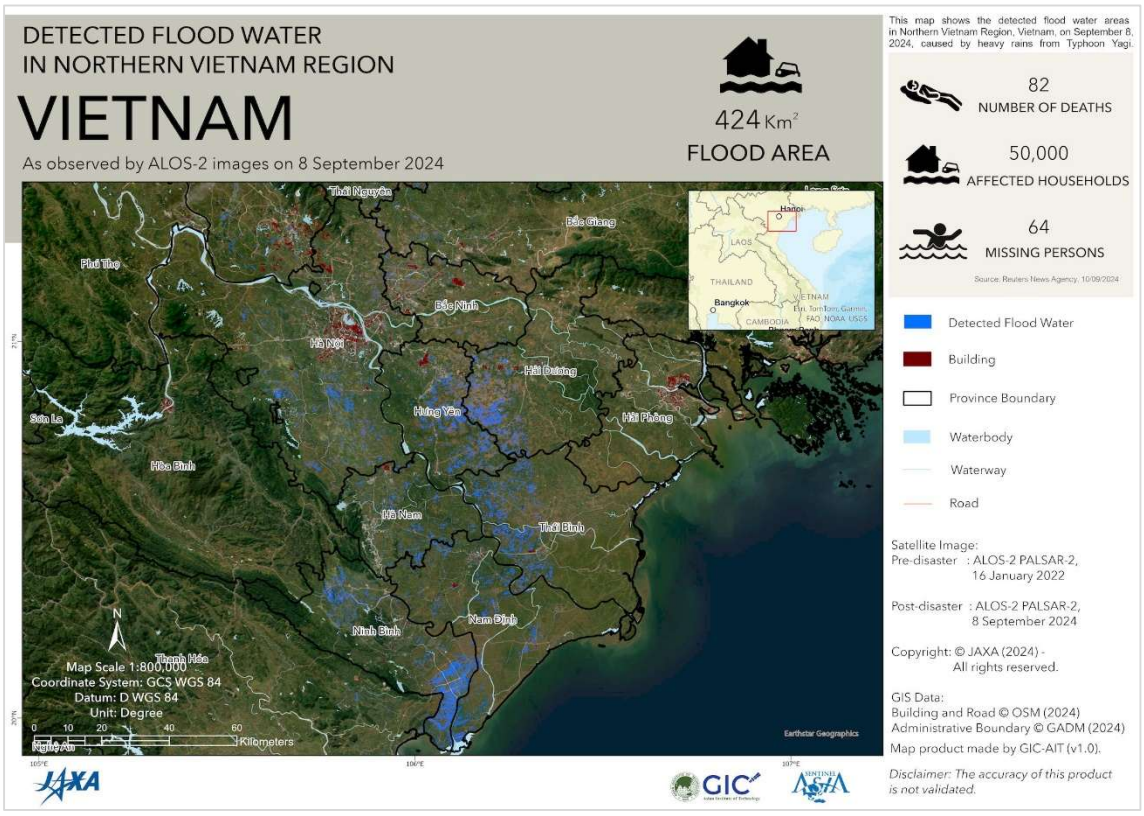
32. Flood in Gujarat State, India on 27 August 2024

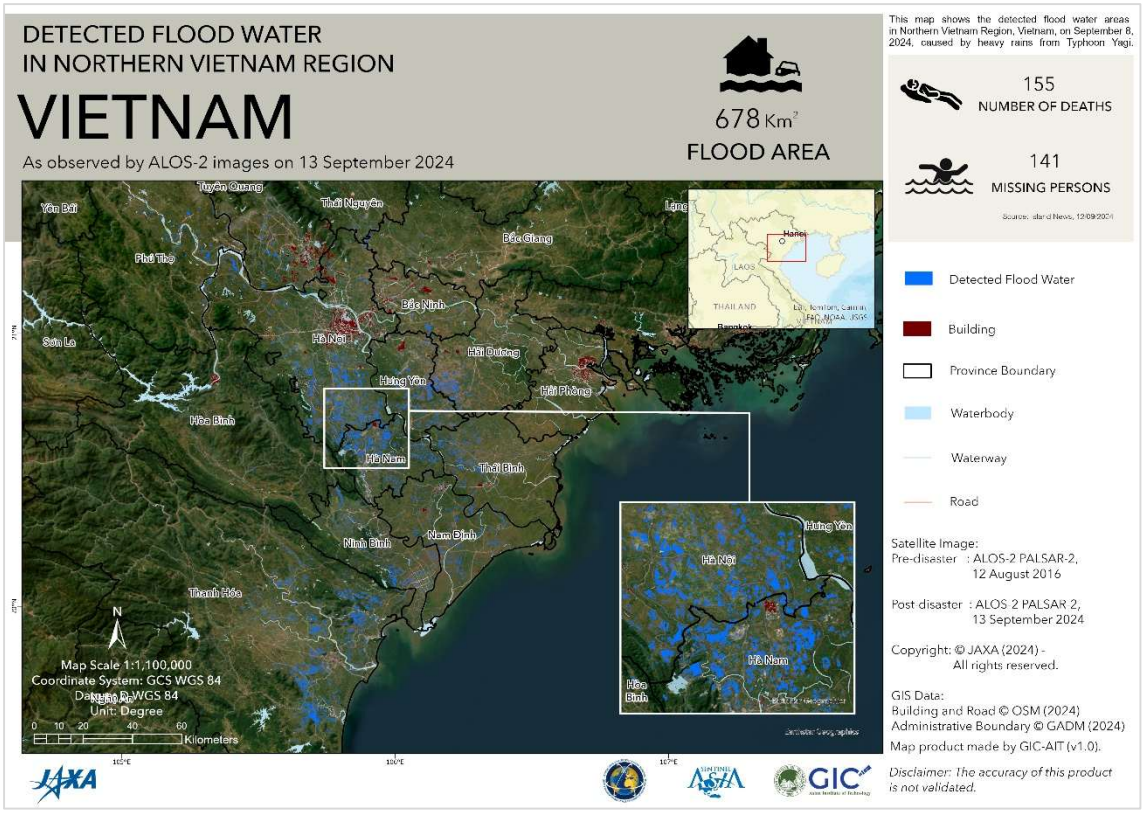


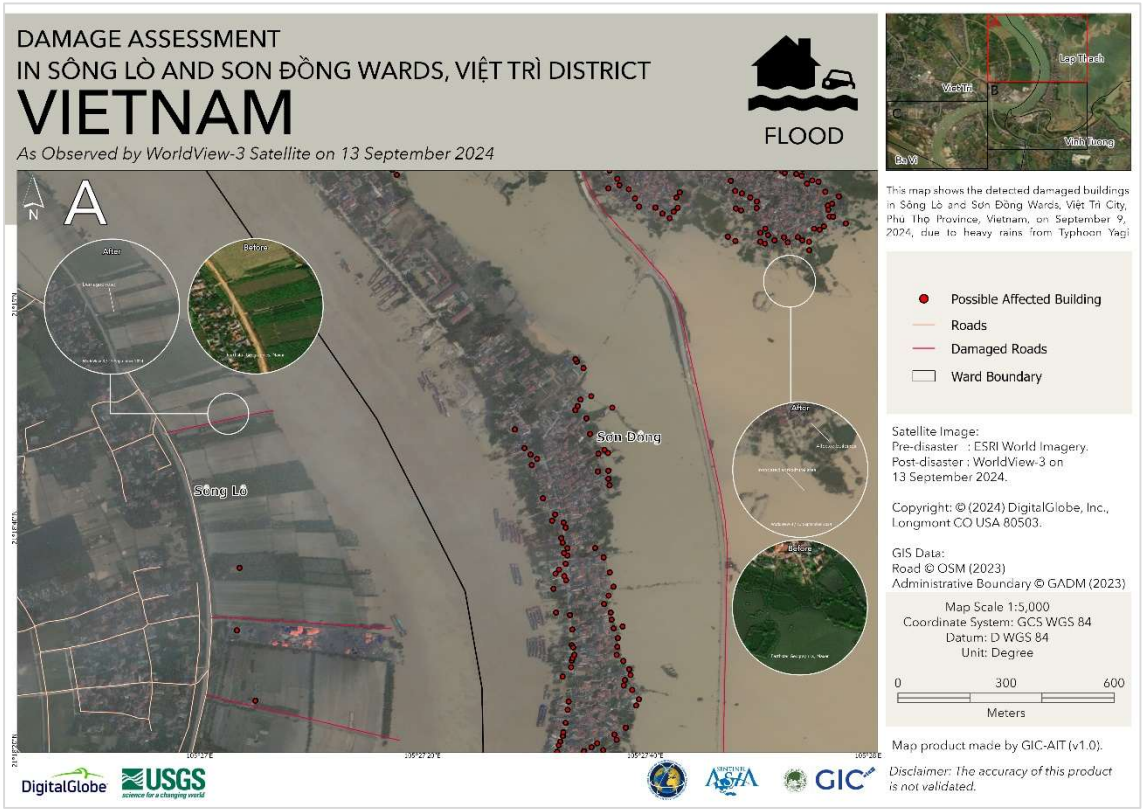
33. Flood in Philippines on 01 September 2024

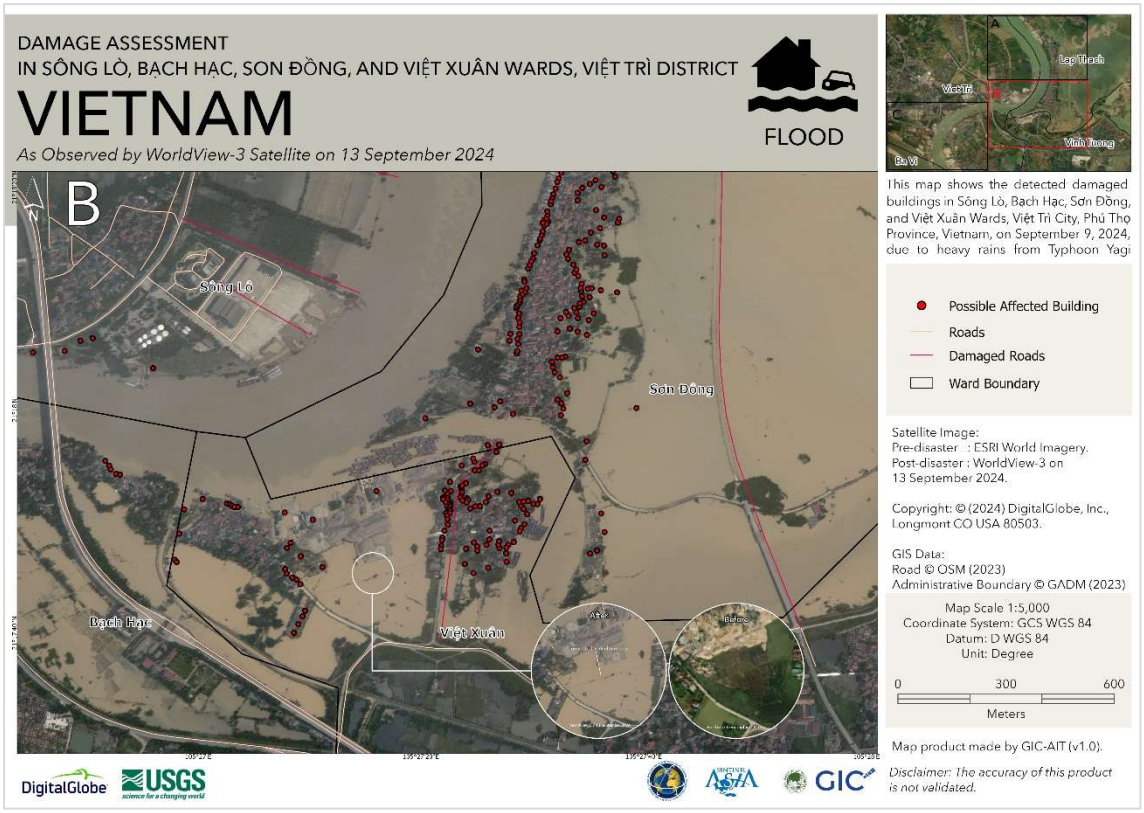


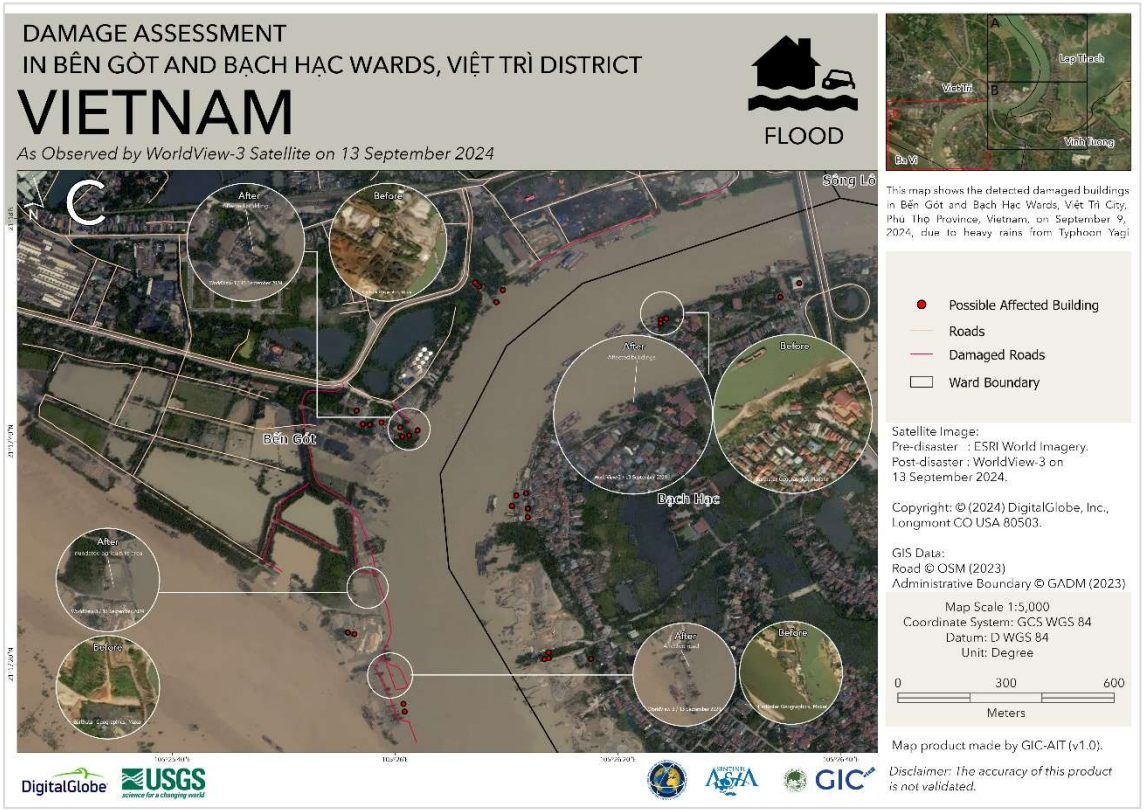
34. Typhoon Yagi in Vietnam on 8 September 2024 (SA was escalated to International Disaster Charter)



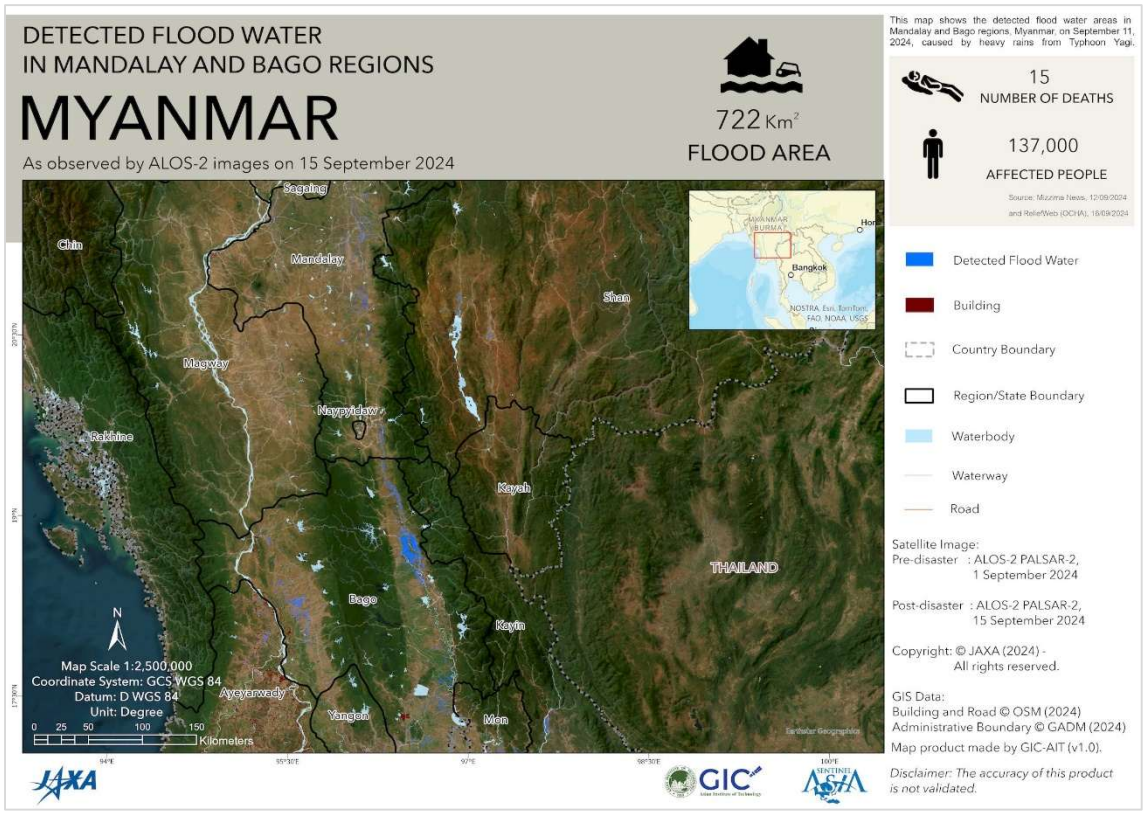

DETECTED FLOOD WATER
IN NORTHERN VIETNAM REGION
VIETNAM
As observed by ALOS-2 images on 13 September 2024
678 Km²
FLOOD AREA
This map shows the detected flood water areas in Northern Vietnam Region, Vietnam, on September 8, 2024, caused by heavy rains from Typhoon Yagi.
155
NUMBER OF DEATHS
141
MISSING PERSONS
Detected Flood Water
Building
Province Boundary
Waterbody
Waterway
Road
Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 12 August 2016
Post disaster : ALOS-2 PALSAR-2, 13 September 2024
Copyright: © JAXA (2024) - All rights reserved.
GIS Data:
Building and Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.
Map Scale 1:1,100,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
Yên Bái
Tuyên Quang
Thái Nguyên
Lạng
Bắc Giang
Phú Thọ
Bắc Ninh
Sơn La
Hà Nội
Hải Dương
Hưng Yên
Hải Phòng
Hòa Bình
Hà Nam
Thái Bình
Ninh Bình
Nam Định
Thanh Hóa
Laos
Thailand
Bangkok
Hanoi


DAMAGE ASSESSMENT
IN SÔNG LÒ AND SON ĐỒNG WARDS, VIỆT TRÌ DISTRICT
VIETNAM
As Observed by WorldView-3 Satellite on 13 September 2024
FLOOD
This map shows the detected damaged buildings in Sông Lô and Sơn Đồng Wards, Việt Trì City, Phú Thọ Province, Vietnam, on September 9, 2024, due to heavy rains from Typhoon Yagi
Possible Affected Building
Roads
Damaged Roads
Ward Boundary
Satellite Image:
Pre-disaster : ESRI World Imagery.
Post-disaster : WorldView-3 on 13 September 2024.
Copyright: © (2024) DigitalGlobe, Inc., Longmont CO USA 80503.
GIS Data:
Road © OSM (2023)
Administrative Boundary © GADM (2023)
Map Scale 1:5,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Meters
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.
A
Before
After
Sông Lô
Sơn Đồng
Việt Trì
Lập Thạch
Vĩnh Tường
Bạch Hạc

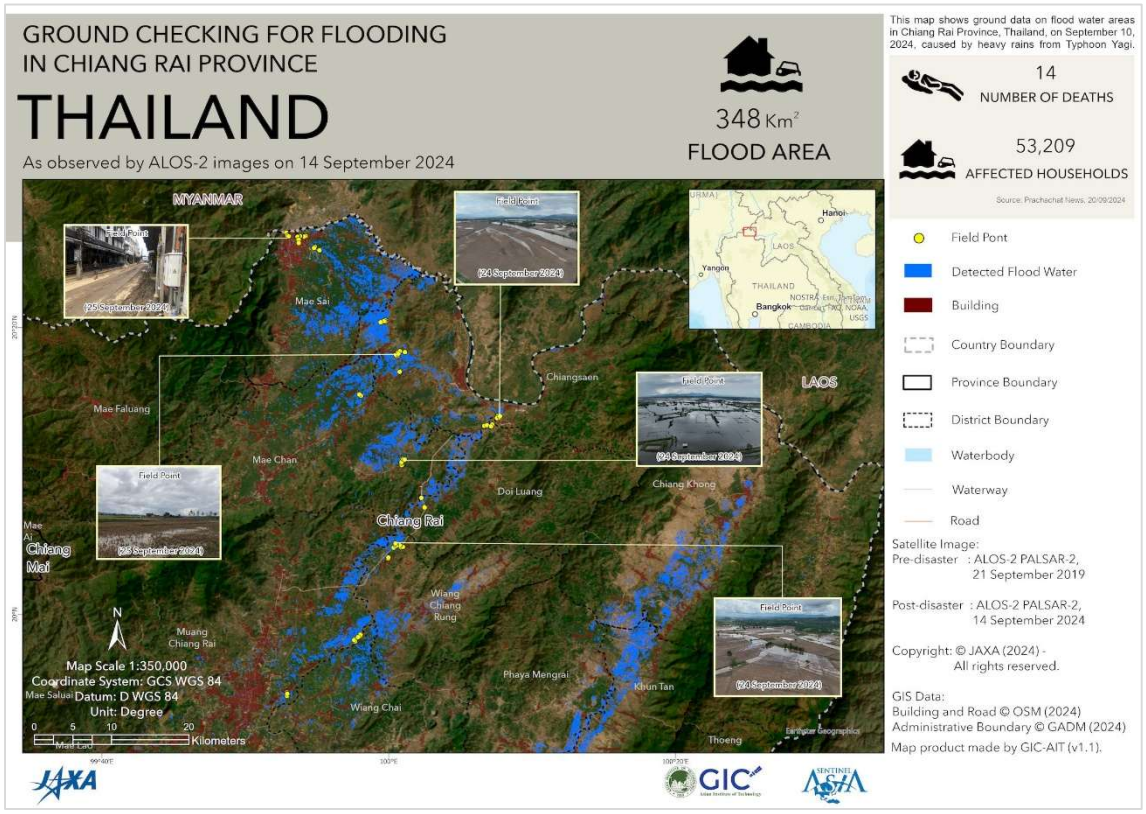

DAMAGE ASSESSMENT
IN SÔNG LÔ, BẠCH HẠC, SON ĐỒNG, AND VIỆT XUÂN WARDS, VIỆT TRÌ DISTRICT
VIETNAM
As Observed by WorldView-3 Satellite on 13 September 2024
FLOOD
B
Sông Lô
Sơn Đông
Bạch Hạc
Việt Xuân
After
Before
This map shows the detected damaged buildings in Sông Lô, Bạch Hạc, Sơn Đông, and Việt Xuân Wards, Việt Trì City, Phú Thọ Province, Vietnam, on September 9, 2024, due to heavy rains from Typhoon Yagi
Possible Affected Building
Roads
Damaged Roads
Ward Boundary
Satellite Image:
Pre-disaster : ESRI World Imagery.
Post-disaster : WorldView-3 on 13 September 2024.
Copyright: © (2024) DigitalGlobe, Inc., Longmont CO USA 80503.
GIS Data:
Road © OSM (2023)
Administrative Boundary © GADM (2023)
Map Scale 1:5,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
0
300
600
Meters
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.
DigitalGlobe
USGS
GIC

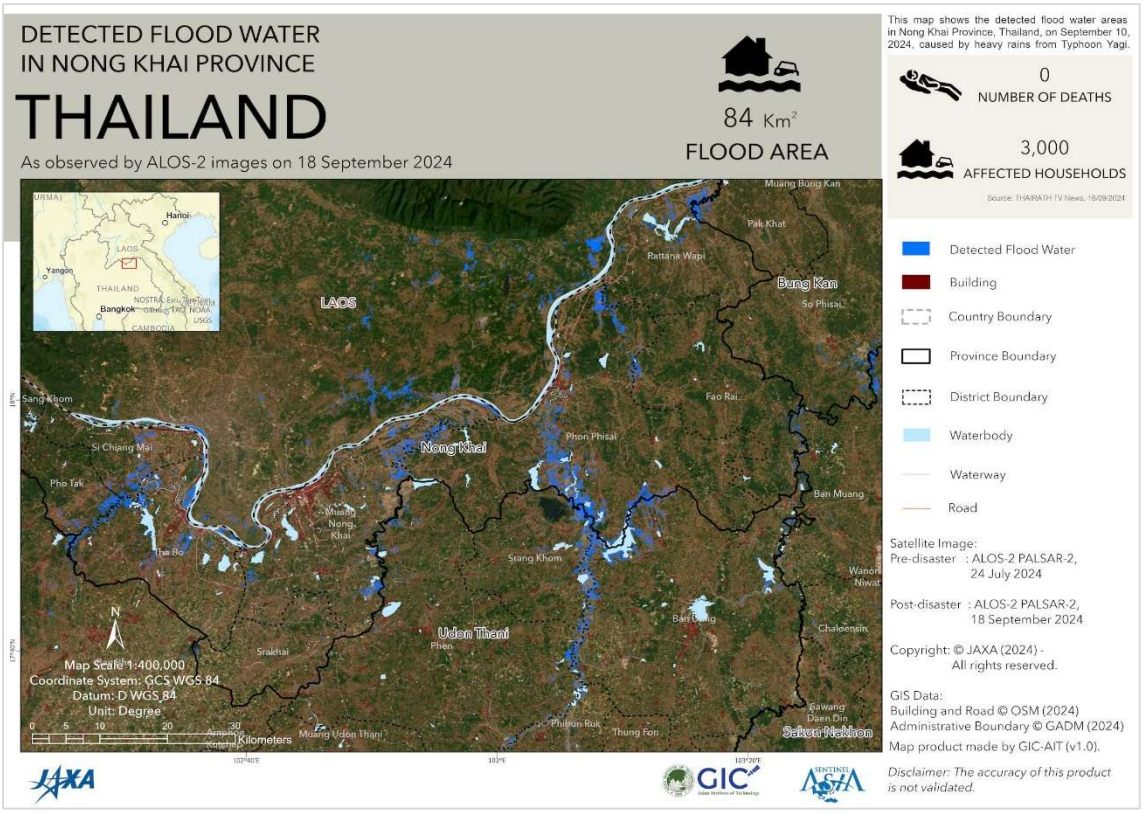

DAMAGE ASSESSMENT
IN BÊN GÒT AND BẠCH HẠC WARDS, VIỆT TRÌ DISTRICT
VIETNAM
As Observed by WorldView-3 Satellite on 13 September 2024
FLOOD
C
Sông Lô
Bến Gót
Bạch Hạc
After
Before
This map shows the detected damaged buildings in Bến Gót and Bạch Hạc Wards, Việt Trì City, Phú Thọ Province, Vietnam, on September 9, 2024, due to heavy rains from Typhoon Yagi
Possible Affected Building
Roads
Damaged Roads
Ward Boundary
Satellite Image:
Pre-disaster : ESRI World Imagery.
Post-disaster : WorldView-3 on 13 September 2024.
Copyright: © (2024) DigitalGlobe, Inc., Longmont CO USA 80503.
GIS Data:
Road © OSM (2023)
Administrative Boundary © GADM (2023)
Map Scale 1:5,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
0
300
600
Meters
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.
DigitalGlobe
USGS
GIC

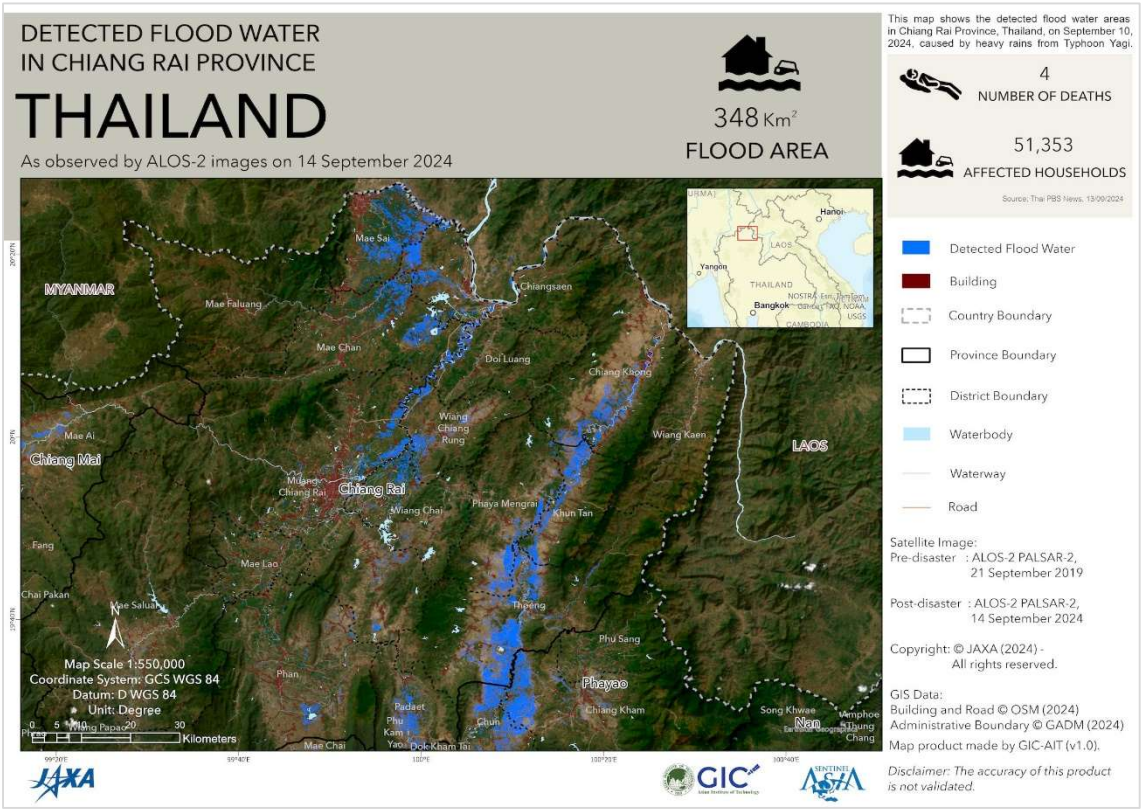
35. Typhoon Yagi in Myanmar on 11 September 2024

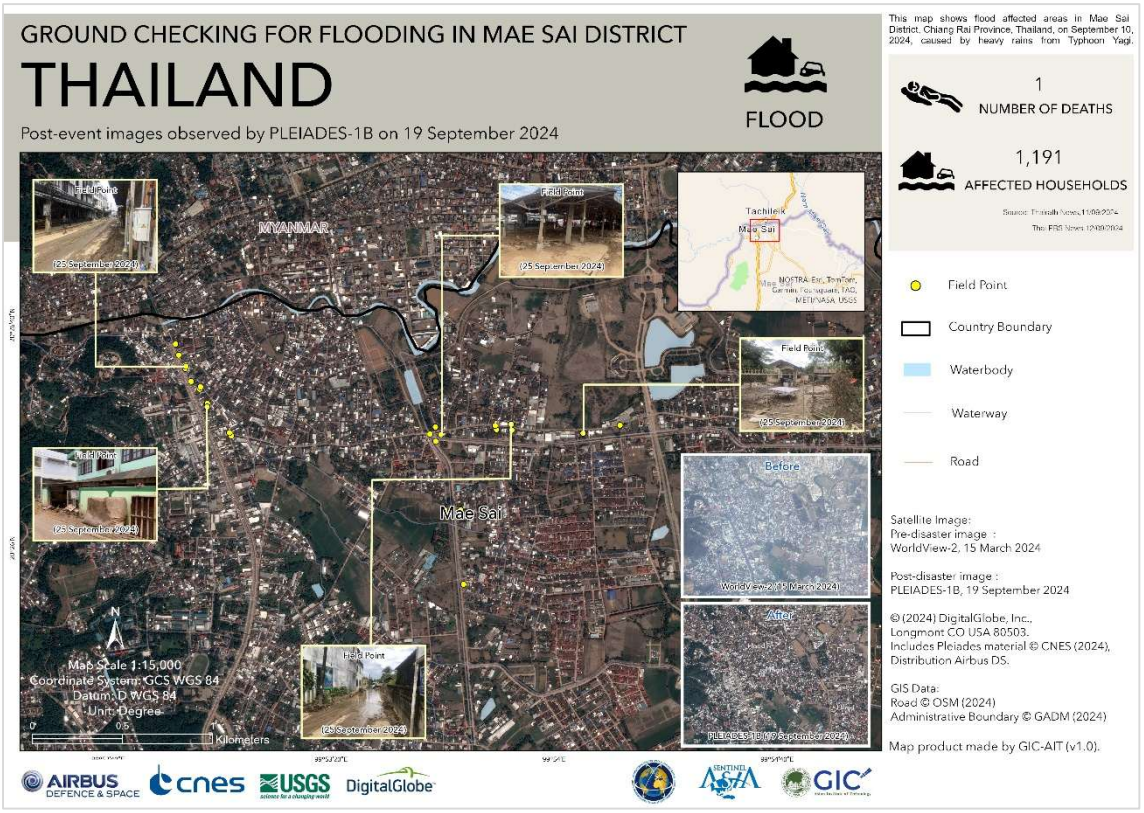


36. Typhoon Yagi in Thailand on 10 September 2024 (SA was escalated to International Disaster Charter)




DETECTED FLOOD WATER
IN NONG KHAI PROVINCE
THAILAND
As observed by ALOS-2 images on 18 September 2024
84 Km²
FLOOD AREA
This map shows the detected flood water areas in Nong Khai Province, Thailand, on September 10, 2024, caused by heavy rains from Typhoon Yagi.
0
NUMBER OF DEATHS
3,000
AFFECTED HOUSEHOLDS
Source: THAIRATH TV News, 16/09/2024
Detected Flood Water
Building
Country Boundary
Province Boundary
District Boundary
Waterbody
Waterway
Road
Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 24 July 2024
Post-disaster : ALOS-2 PALSAR-2, 18 September 2024
Copyright: © JAXA (2024) - All rights reserved.
GIS Data:
Building and Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.
LAOS
Nong Khai
Udon Thani
Bung Kan
Sakon Nakhon
Map Scale 1:400,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
JAXA
GIC
SENTINEL ASIA


DETECTED FLOOD WATER
IN CHIANG RAI PROVINCE
THAILAND
As observed by ALOS-2 images on 14 September 2024
348 Km²
FLOOD AREA
This map shows the detected flood water areas in Chiang Rai Province, Thailand, on September 10, 2024, caused by heavy rains from Typhoon Yagi.
4
NUMBER OF DEATHS
51,353
AFFECTED HOUSEHOLDS
Source: Thai PBS News, 13/09/2024
Detected Flood Water
Building
Country Boundary
Province Boundary
District Boundary
Waterbody
Waterway
Road
Satellite Image:
Pre-disaster : ALOS-2 PALSAR-2, 21 September 2019
Post-disaster : ALOS-2 PALSAR-2, 14 September 2024
Copyright: © JAXA (2024) - All rights reserved.
GIS Data:
Building and Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.
MYANMAR
LAOS
Chiang Rai
Chiang Mai
Phayao
Nan
Map Scale 1:550,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
JAXA
GIC
SENTINEL ASIA


GROUND CHECKING FOR FLOODING IN MAE SAI DISTRICT
THAILAND
Post-event images observed by PLEIADES-1B on 19 September 2024
FLOOD
This map shows flood affected areas in Mae Sai District, Chiang Rai Province, Thailand, on September 10, 2024, caused by heavy rains from Typhoon Yagi.
1
NUMBER OF DEATHS
1,191
AFFECTED HOUSEHOLDS
Field Point
Country Boundary
Waterbody
Waterway
Road
MYANMAR
Mae Sai
Tachileik
Before
After
Map Scale 1:15,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
Satellite Image:
Pre-disaster image :
WorldView-2, 15 March 2024
Post-disaster image :
PLEIADES-1B, 19 September 2024
© (2024) DigitalGlobe, Inc.,
Longmont CO USA 80503.
Includes Pleiades material © CNES (2024),
Distribution Airbus DS.
GIS Data:
Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
AIRBUS DEFENCE & SPACE
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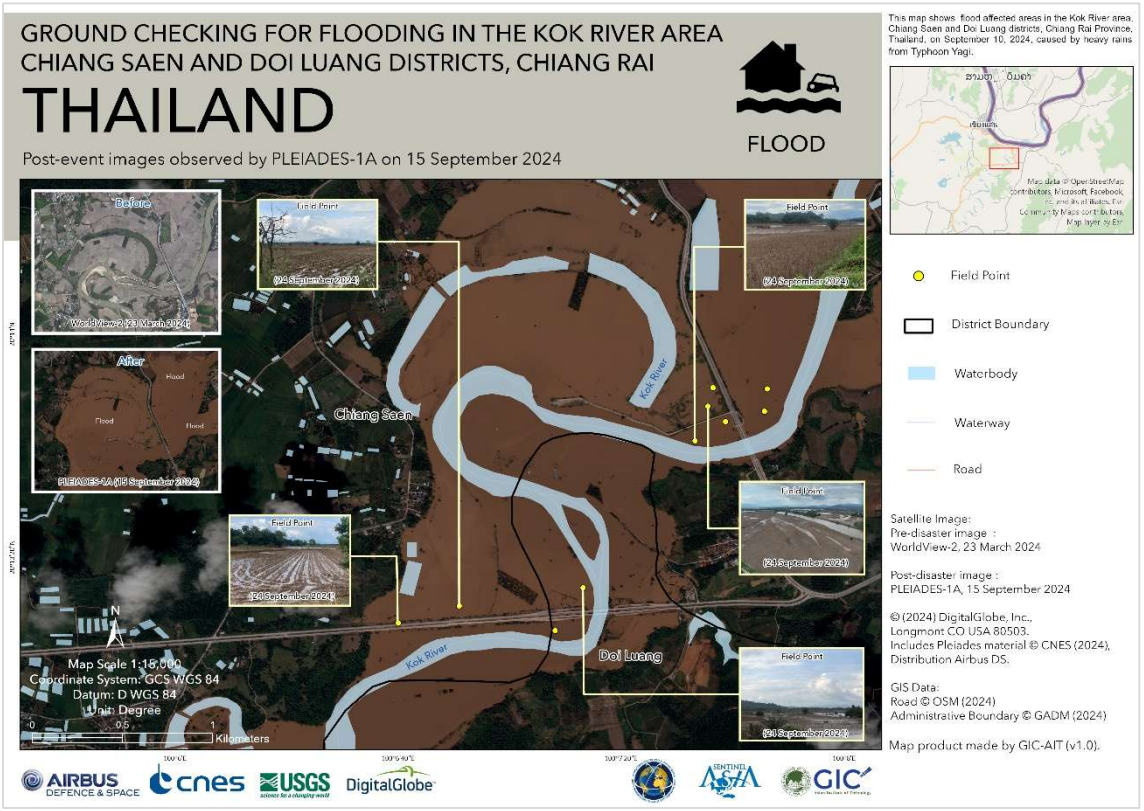
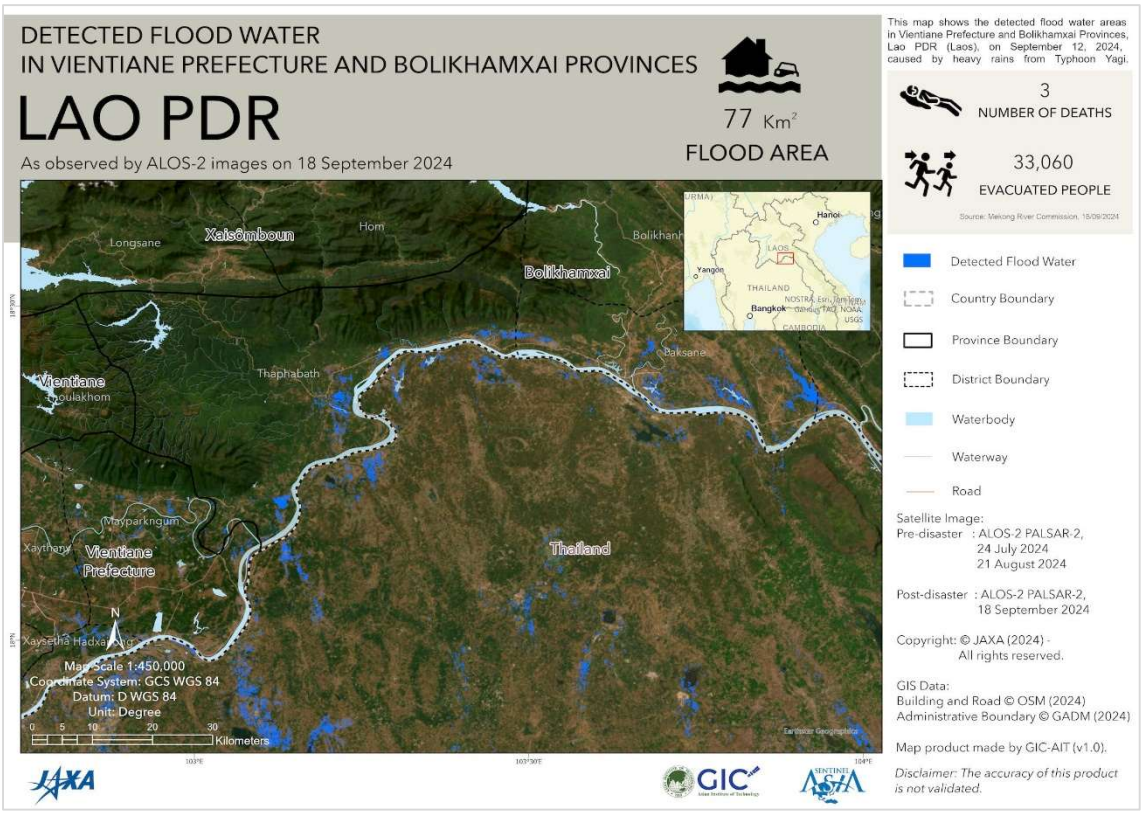
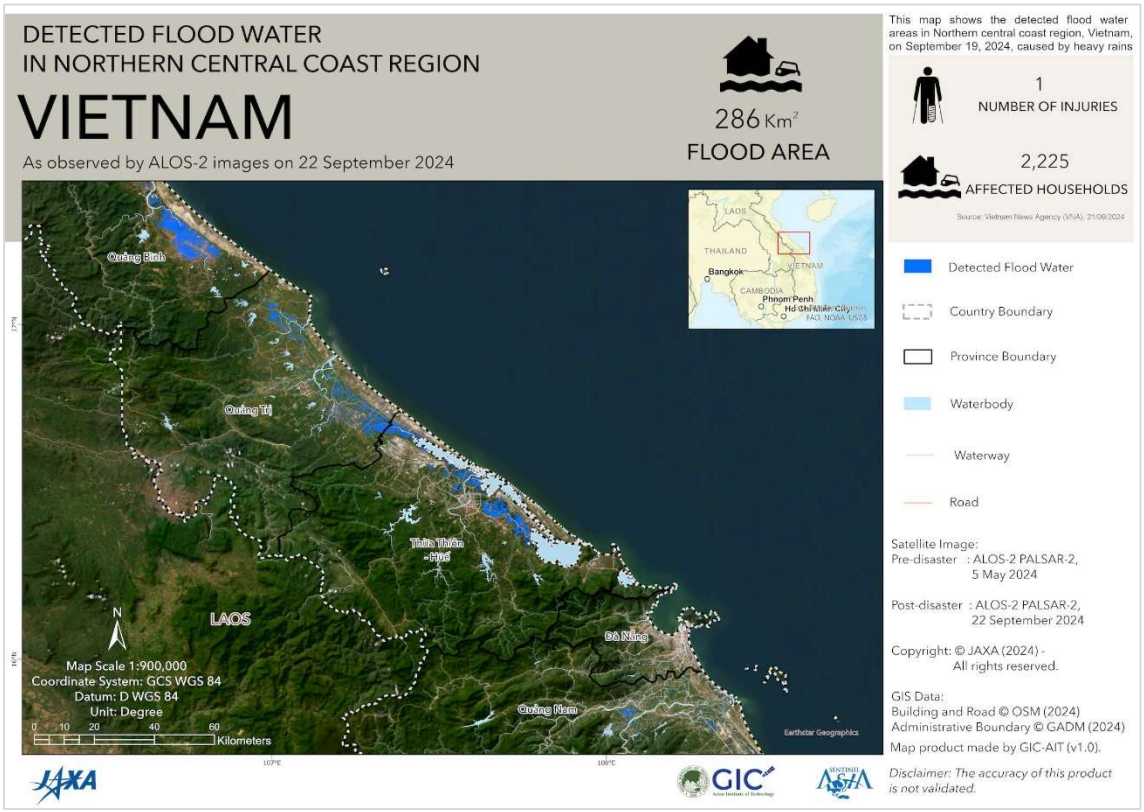
USGS
DigitalGlobe
SENTINEL ASIA
GIC


GROUND CHECKING FOR FLOODING IN THE KOK RIVER AREA
CHIANG SAEN AND DOI LUANG DISTRICTS, CHIANG RAI
THAILAND
Post-event images observed by PLEIADES-1A on 15 September 2024
FLOOD
This map shows flood affected areas in the Kok River area, Chiang Saen and Doi Luang districts, Chiang Rai Province, Thailand, on September 10, 2024, caused by heavy rains from Typhoon Yagi.
Field Point
District Boundary
Waterbody
Waterway
Road
Chiang Saen
Doi Luang
Kok River
Before
After
Flood
Map Scale 1:18,000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree
Kilometers
Satellite Image:
Pre-disaster image :
WorldView-2, 23 March 2024
Post-disaster image :
PLEIADES-1A, 15 September 2024
© (2024) DigitalGlobe, Inc.,
Longmont CO USA 80503.
Includes Pleiades material © CNES (2024),
Distribution Airbus DS.
GIS Data:
Road © OSM (2024)
Administrative Boundary © GADM (2024)
Map product made by GIC-AIT (v1.0).
AIRBUS DEFENCE & SPACE
cnes
USGS
DigitalGlobe
SENTINEL ASIA
GIC

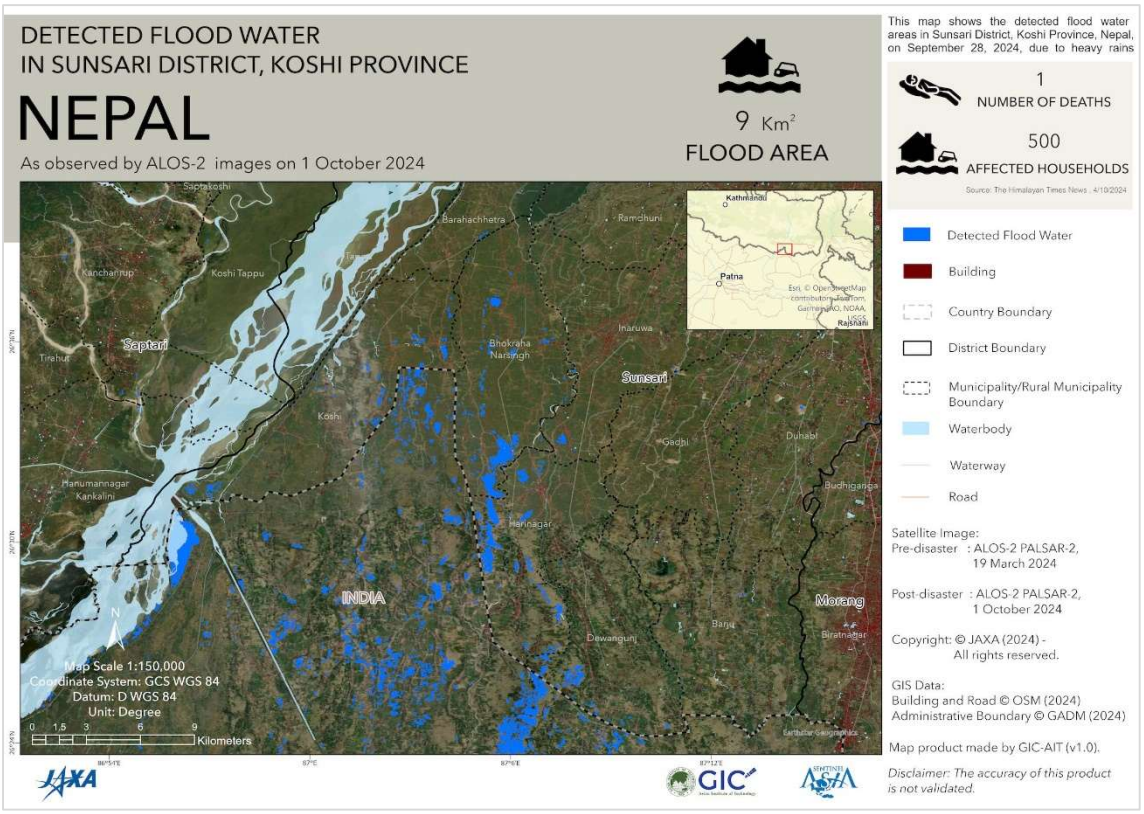
37. Typhoon Yagi in Lao PDR (Laos) on 12 September 2024



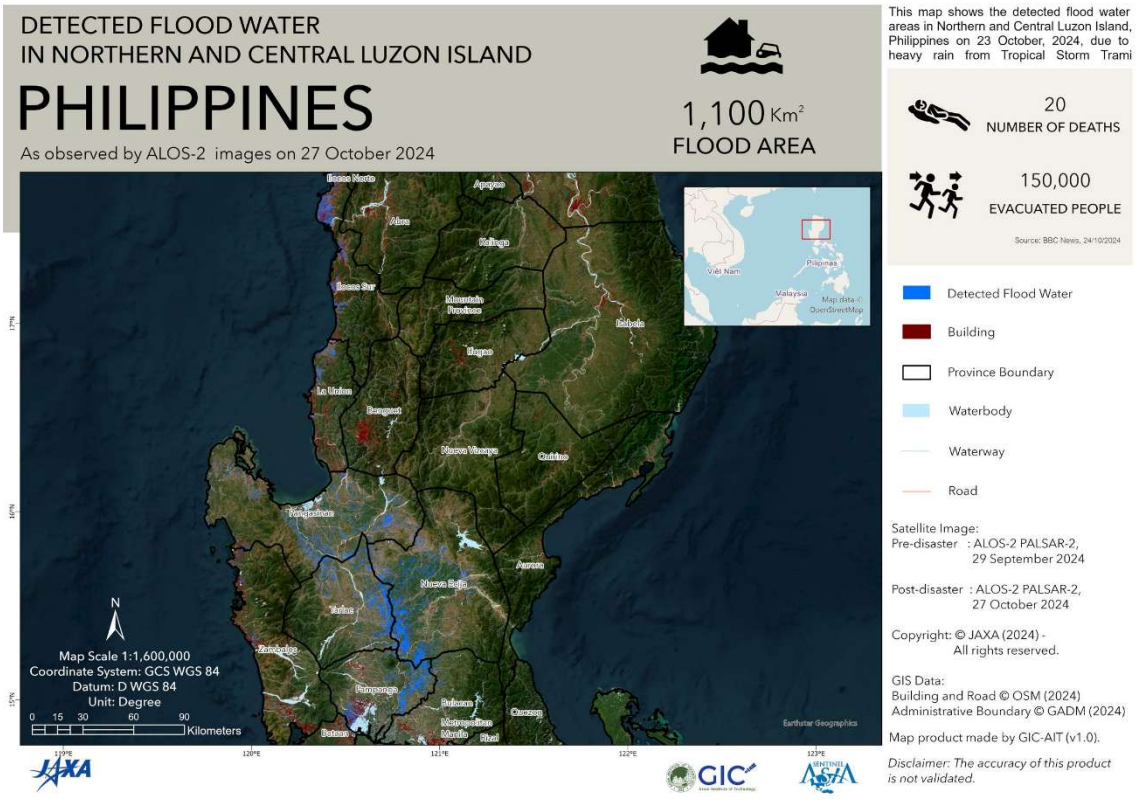
38. Floods in Vietnam on 19 September 2024



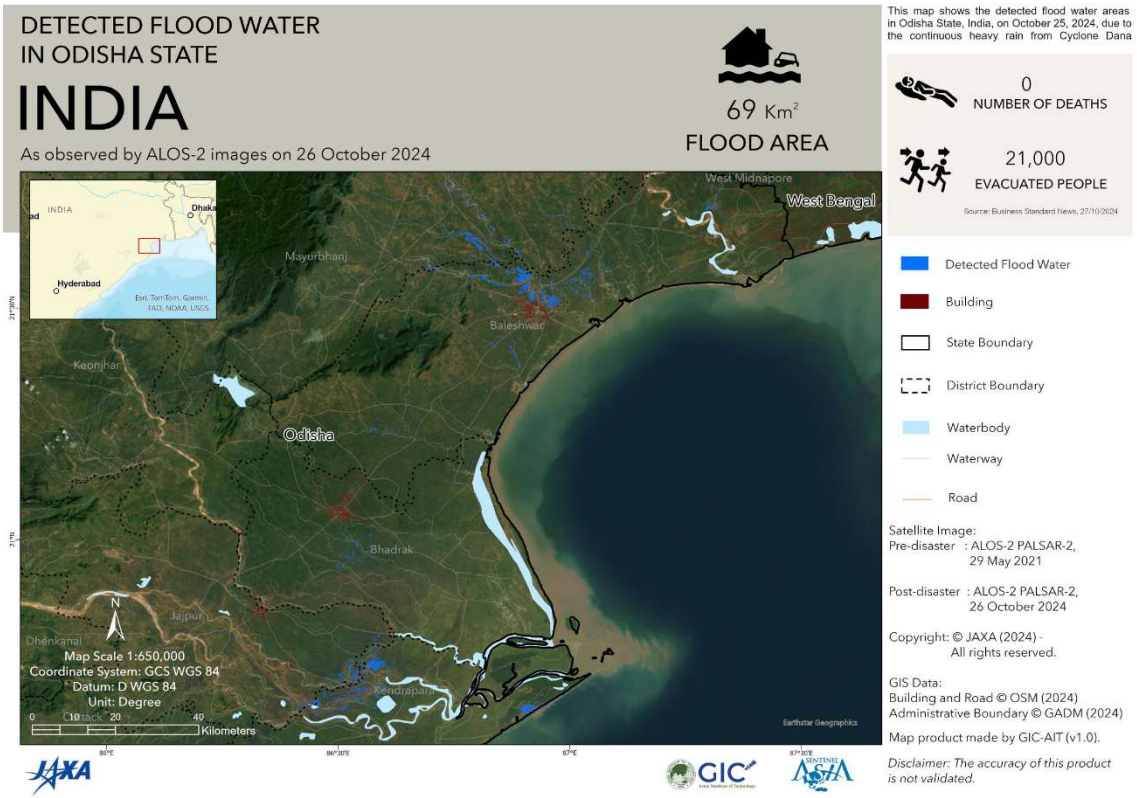
39. Floods in Nepal on 28 September 2024



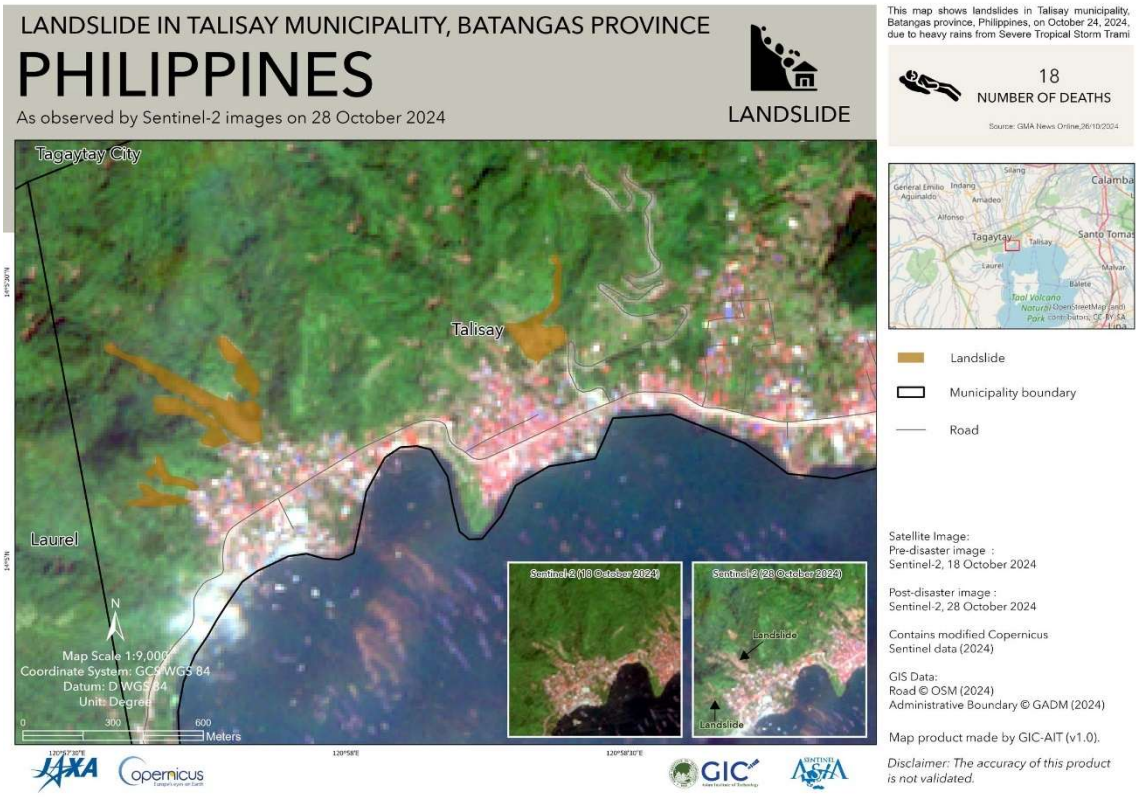
40. Flood in Philippines on 23 October 2024



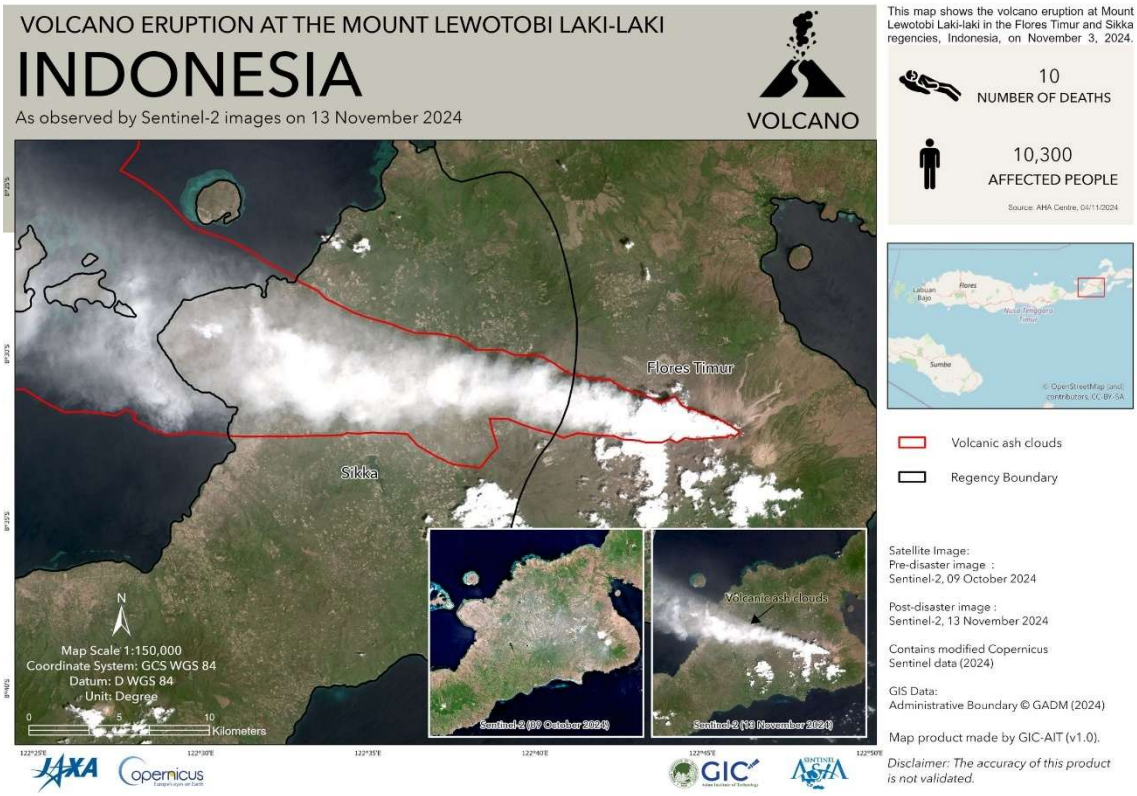
41. Flood in India on 25 October 2024



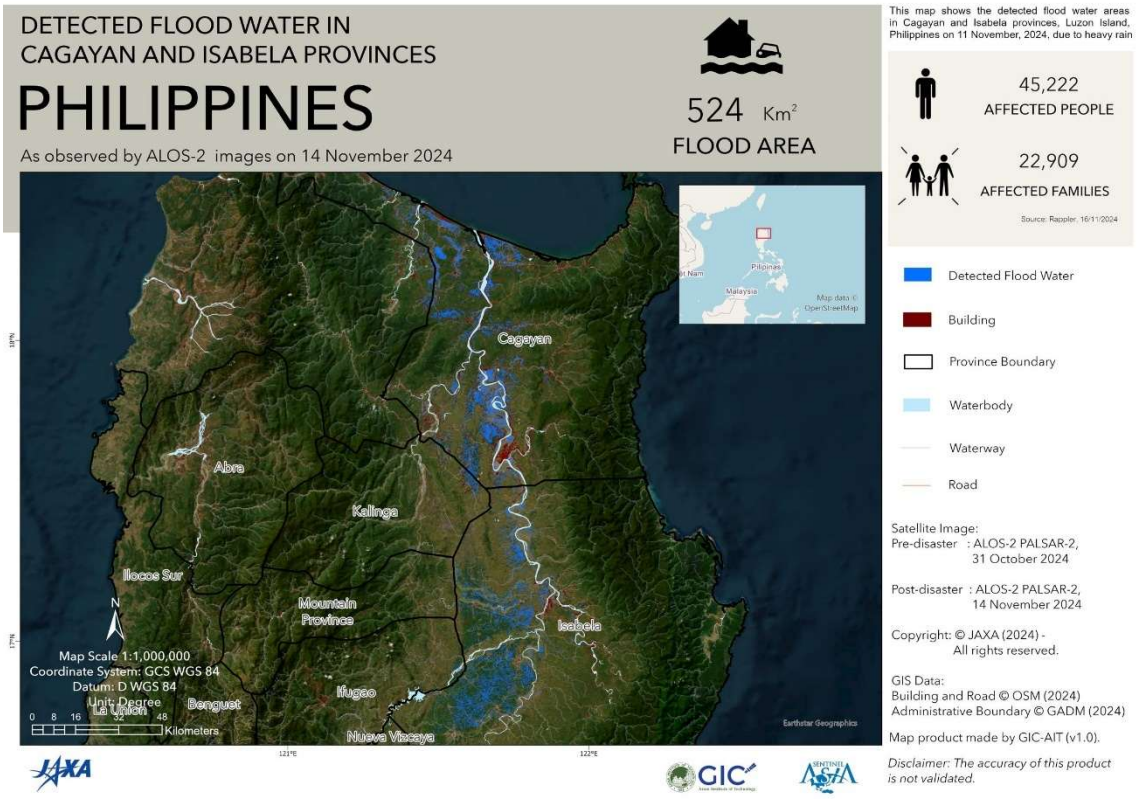
42. Landslide in Philippines on 24 October 2024



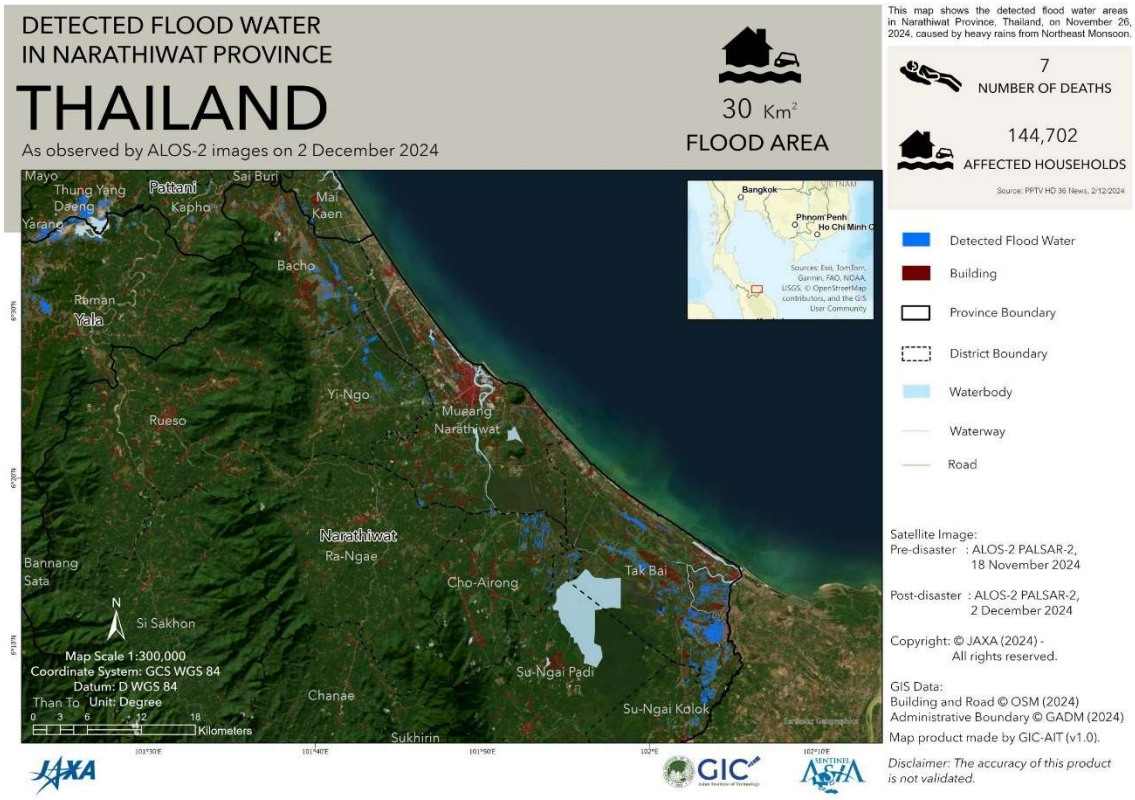
43. Lewotobi Laki-laki Volcano Eruption in Indonesia on 03 November 2024

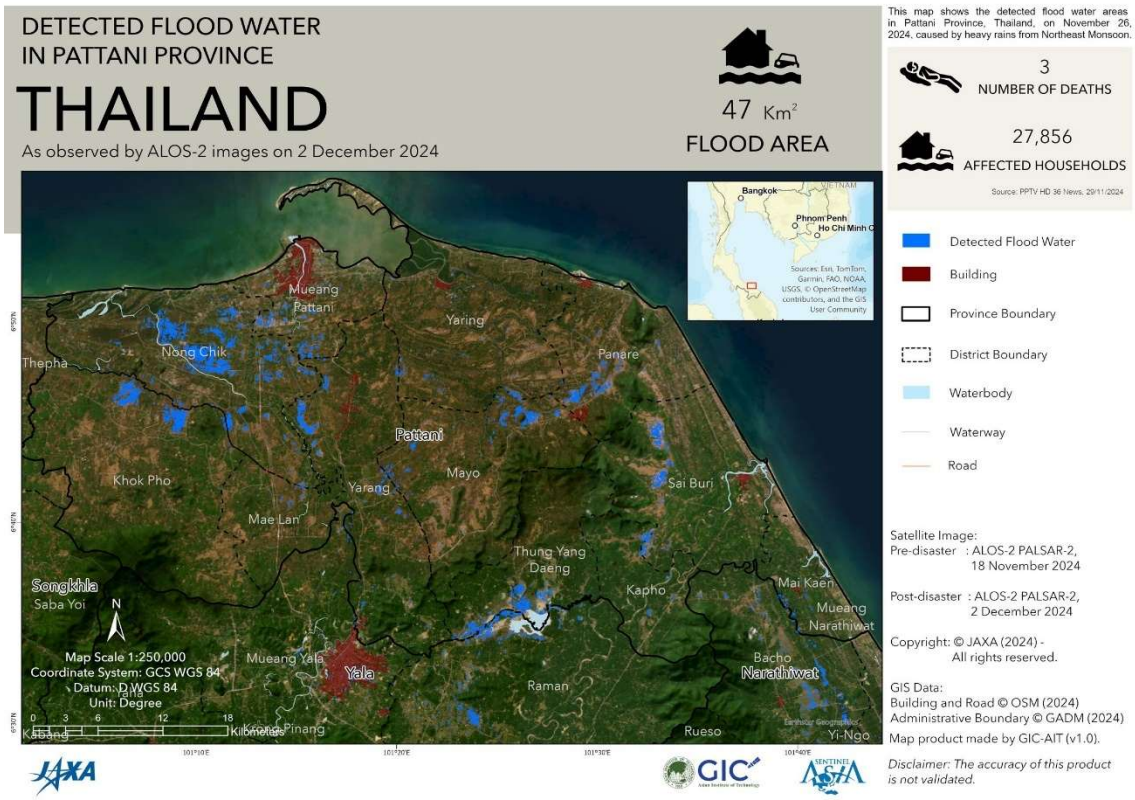


44. Flood in Philippines on 11 November 2024



45. Flood by Northeast Monsoon in Southern Thailand on 26 November 2024





Organization	**Geo-Informatics and Space Technology Development Agency (GISTDA)**
Title	**GISTDA provides support on Disaster Management**
Type of Activity	**Providing satellite data**
Date	**2024**

In 2024, GISTDA as a DPN has continuously supported many emergency observation requests for the disaster management activities by provide satellite images in total of 323 images (77 Multispectral images and 246 Panchromatic images) as shown in the Table below;

Summary of cooperation SA-GISTDA in contribution of Thaichote 1 Satellite

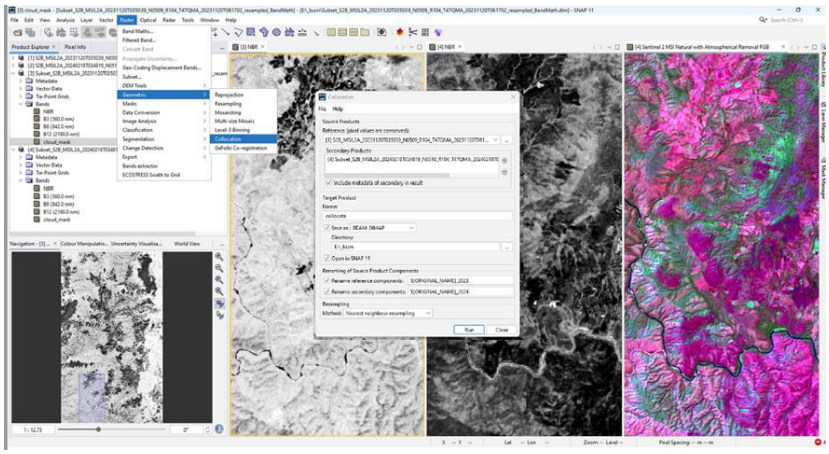
ACQ date	Country/Area	Disaster Type	MS	PAN	PS	Mosaic	Note	Number of Data provided
01/10/2023	Vietnam	Flood	2	5	0			7
02/10/2023	Vietnam	Flood	2	6	0			8
11/10/2023	Afghanistan	Earthquake	1	7	0			8
12/10/2023	Afghanistan	Earthquake	2	7	0			9
01/11/2023	Vietnam	Flood	2	4	0			6
06/11/2023	Nepal	Earthquake	2	5	0			7
18/11/2023	Vietnam	Flood	2	4	0			6
19/11/2023	Bangladesh	Storm	1	5	0			6
20/11/2023	Philippines	Earthquake	1	6	0			7
21/11/2023	Philippines	Earthquake	1	5	0			6
22/11/2023	Bangladesh	Storm	2	5	0			7
19/12/2023	China	Earthquake	1	5	0			6
07/01/2024	Japan	Earthquake	2	1	0			3
26/01/2024	China	Earthquake	1	4	0			5
27/01/2024	China	Earthquake	2	5	0			7
22/03/2024	Indonesia	Flood	2	6	0			8
23/03/2024	Indonesia	Flood	3	8	0			11
07/04/2024	Taiwan	Earthquake	2	7	0			9
20/04/2024	Indonesia	Vacano	1	5	0			6
29/06/2024	Kyrgyzstan	LandSlide	1	5	0			6
04/07/2024	Kyrgyzstan	Flood	1	5	0			6
11/07/2024	Nepal	Flood	2	4	0			6
12/07/2024	India	Flood	2	6	0			8
17/07/2024	Philippines	Flood	2	6	0			8
18/07/2024	Nepal	LandSlide	2	5	0			7
20/07/2024	Uzbekistan	Flood	1	5	0			6
20/07/2024	Kyrgyzstan	Flood	1	5	0			6
25/07/2024	Kyrgyzstan	Flood	1	5	0			6
26/07/2024	Kyrgyzstan	Flood	4	16	0			20
27/07/2024	Vietnam	Flood	2	9	0			11
28/08/2024	Vietnam	Flood	2	6	0			8
28/08/2024	Nepal	LandSlide	2	6	0			8
29/08/2024	Vietnam	Flood	2	6	0			8
29/08/2024	Vietnam	Flood	2	6	0			8
31/08/2024	India	Flood	2	5	0			7
06/09/2024	Philippines	Flood	3	12	0			15
07/09/2024	Philippines	Flood	4	7	0			11
17/09/2024	Thailand	Flood	4	12	0			16
30/09/2024	Nepal	Flood	2	5	0			7
03/10/2024	Nepal	Flood	3	10	0			13
			77	246	0		**Total**	**323**

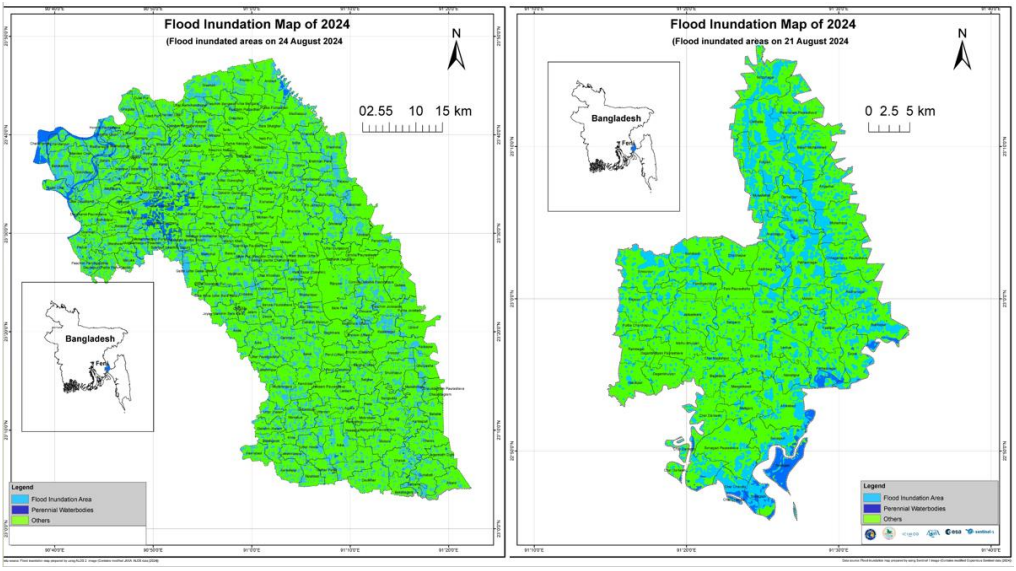
Organization	**Geo-Informatics and Space Technology Development Agency (GISTDA)**
Title	**GISTDA as a Co-Chair of Sentinel Asia Steering Committee**
Type of Activity	**Meeting**
Date	**12-13 December 2024**

GISTDA Deputy Executive Director served as a Co-Chair of the Steering Committee from 2022 to 2024 and successfully hand over the CO-Chair position to ISRO.
GISTDA continues to facilitate and link the cooperation between Sentinel Asia and UNESCAP, UNITAR/UNOSAT.

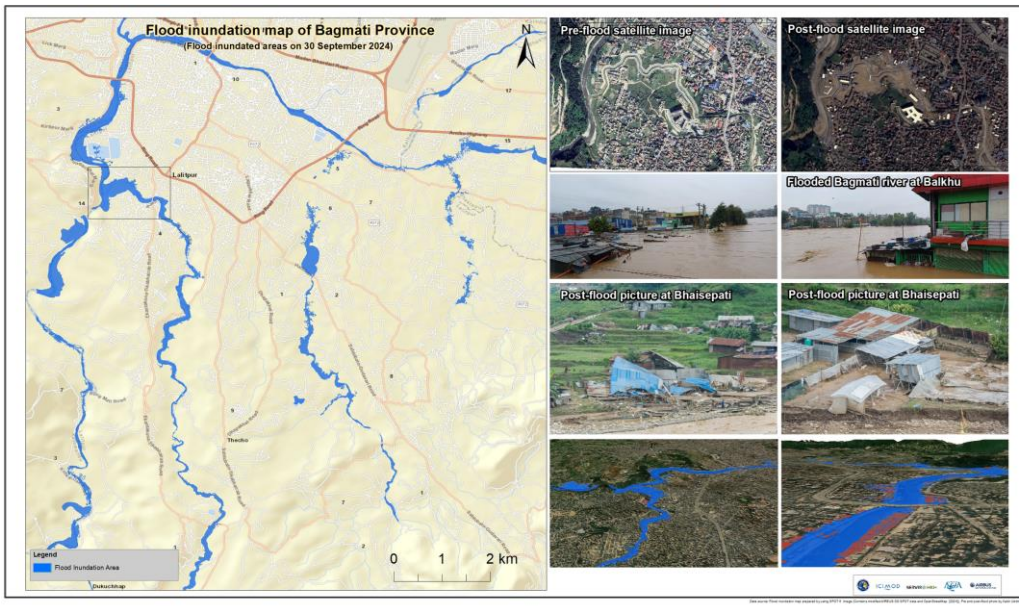
Organization	**Geo-Informatics and Space Technology Development Agency (GISTDA)**
Title	**Lecture on Forest Fire Monitoring**
Type of Activity	**Workshop**
Date	**5-7 November 2024**

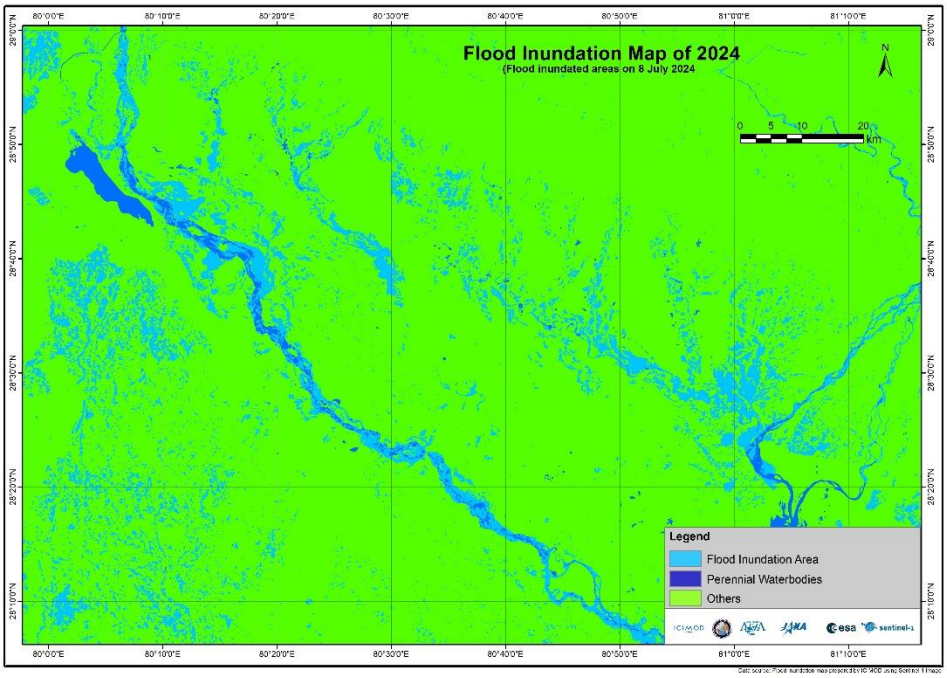
GISTDA gave a lecture and provide hands-on training on the Satellite-Based Burnt Area Detection Using Sentinel-2 Imagery at JPTM 2027 during 5-7 November 2024 at the Philippines. GISTDA conveyed the importance of monitoring forest fire that happens in the dry season in Thailand and demonstrated forest fire detection process using Sentinel-2 data with free software Python and SNAP, followed by lecturing about Normalized Difference Water Index (NDWI) analysis and Relativized version of burn severity analysis.



Organization	**International Centre for Integrated Mountain Development (ICIMOD)**
Title	**Mapping floods in Bangladesh**
Type of Activity	**Flood inundation mapping** https://onlinelibrary.wiley.com/doi/full/10.1111/jfr3.70087
Date	**24/08/2024**
	 Figure: Flood inundation map for the Cumilla and Feni district of Bangladesh

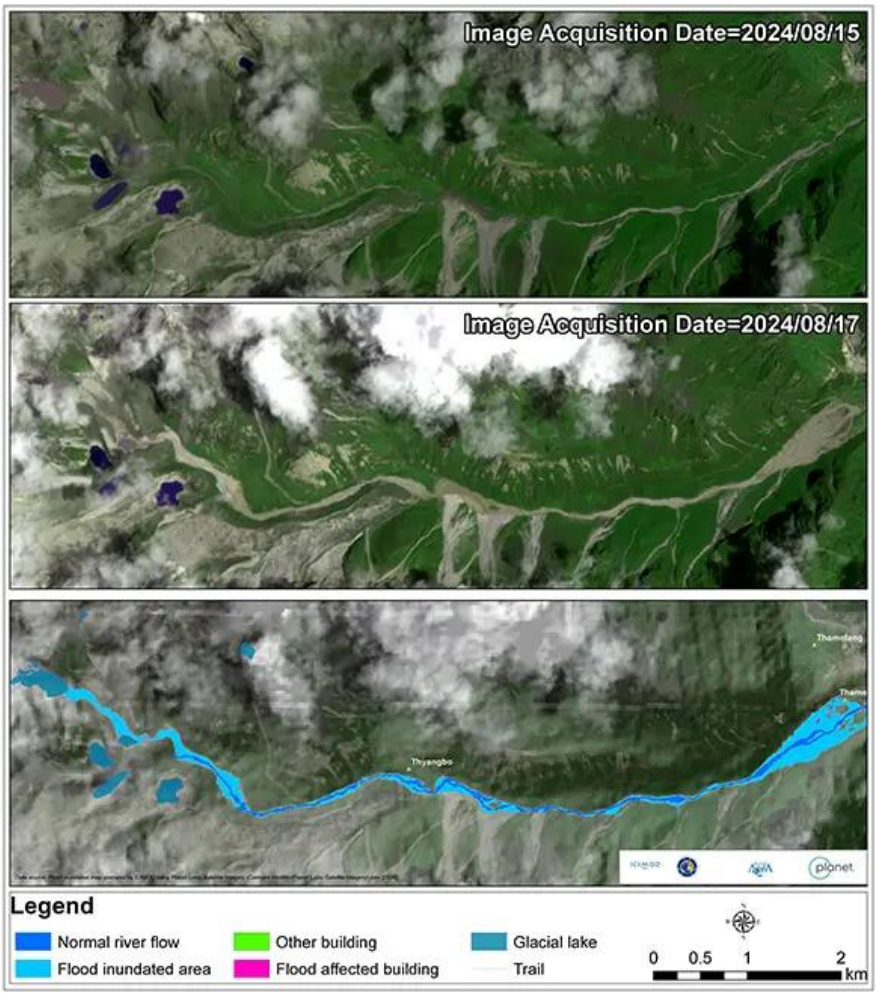
In August 2024, Feni District in Bangladesh was heavily inundated by floods, and Sentinel-Asia's Charted Activation was helpful in flood mapping for on-time support for flood management. The flood-inundation map of 21 August 2024 showed widespread water covering many upazilas, including Feni Paurashava, Sonagazi, Chhagalnaiya, Fulgazi, and others.

Organization	**International Centre for Integrated Mountain Development (ICIMOD)**
Title	**Mapping floods in Kathmandu**
Type of Activity	**Flood inundation mapping**
Date	**29/09/2024**
	 Figure: Flood inundation map for the Kathmandu

Organization	**International Centre for Integrated Mountain Development**
Title	**Flood inundation mapping in the western Nepal**
Type of Activity	**Providing satellite data (Flood inundation map)**
Date	**08/07/2024**
	 Figure**:** Flood Inundation Map: India and Nepal Inundated Areas

A cloudburst at Dodhara Chandani resulted in significant damage, with the highest recorded rainfall in Nepal's history at 624 mm within 24 hours at Dodhara, Kanchanpur. The disaster impacted 6,322 households and displaced 1,812 families. Continuous rainfall from July 3, 2024, led to widespread flooding, landslides, and thunderbolts, particularly in Sudurpaschim Province. Kailali and Kanchanpur districts faced severe flooding, with water levels remaining high for over 24 hours. In Kanchanpur, five deaths were reported, and numerous settlements experienced inundation and displacement. The East-West Highway was severely affected, with a culvert in Suda, Bedkot Municipality, being washed away, hindering travel. The Banbasa Bridge at Sharada Barrage was closed for three days due to a dangerous rise in the Mahakali River, which peaked at 255,000 cubic feet per second after the cloudburst. The heavy rainfall also caused the loss of 10 hectares of paddy fields in Dodhara Chandani, representing a significant financial setback for local farmers, further straining the community's economic resilience following the disaster.

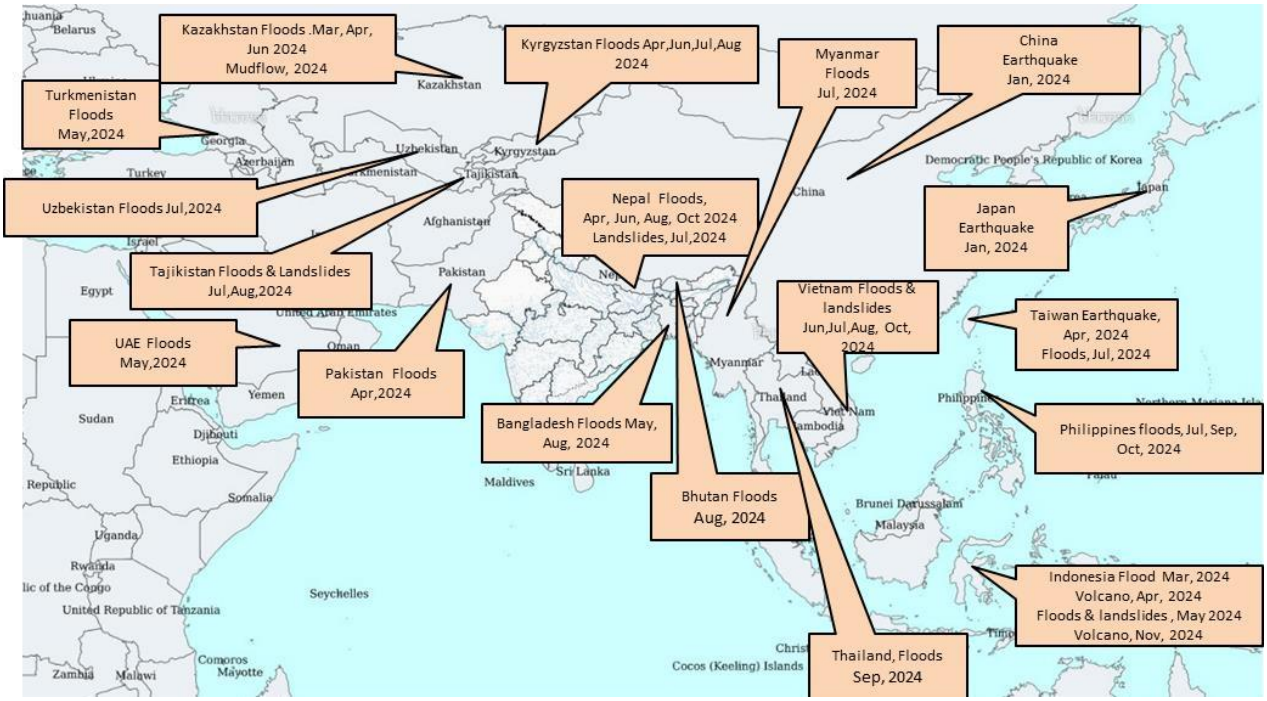
As part of the urgent satellite image acquisition during the disaster response, several space agencies extended their support by providing emergency imagery and generating value-added products to assist in the relief efforts. Notably, Thanaphol Boodchuang from the Asian Institute of Technology (AIT) contributed to developing value-added products through advanced geoinformation systems. Additionally, Alia Mohammad Al Mekhyat from the Mohammed Bin Rashid Space Centre, along with teams from UFRRJ and ICIMOD, Nepal, played crucial roles in creating and analyzing these products, ensuring that the data provided was accurate and actionable for the ongoing disaster management operations. Their collaborative efforts have been instrumental in enhancing the effectiveness of the response to the flooding in Nepal.

Organization	**International Centre for Integrated Mountain Development**
Title	**GLOF in Solukhumbu, Nepal**
Type of Activity	**Flood inundation mapping**
Date	**16/08/2024**
	 **Figure: Flood inundation map of Thame, Nepal**

On 16 August, a glacial lake outburst in Nepal triggered flash floods and mudslides along the Thame River in Solukhumbu district, causing severe destruction in the village of Thame. While no lives were lost, the disaster destroyed 20 houses, a school, and a health clinic as massive debris and boulders were carried downstream by the floodwaters. At least 135 people have been left homeless, and rescue operations are underway to provide emergency shelter and relief.

Organization	**INDIAN SPACE RESEARCH ORGANISATION (ISRO)**
Title	**Support to Sentinel Asia**
Type of Activity	**Providing Satellite data as Data Provider Node (DPN)** Providing Satellite data as DPN and attended all SA-SC meetings
Date	**31/12/2024**

During 2024, ISRO has supported 46 disaster events in 19 countries with the help of 104 IRS multi-sensor satellite datasets. ISRO has also activated Sentinel Asia during the floods of Bihar, Cyclone Dana, Uttar Pradesh floods and Andhra Pradesh floods. ISRO has regularly participated in Sentinel Asia Steering Committee meetings, Telecon meetings and has also participated in the Joint Project Team Meeting held at Manila, Philippines during Nov, 2024 and gave demonstration on NDEM Dashboard 5.0 services. NRSC has made a presentation (online) on Glacier lakes mapping, monitoring, and risk assessment using high resolution satellite data during the workshop organized by AIT, Bangkok in association with Sentinel Asia.



ISRO support to Emergency Observation Requests during 2024

ISRO Satellite data support to Indonesia Volcano-2024

ISRO’s Representation @ JPTM 2024 at Manila, Philippines

Organization	**Institute of Water Modelling (IWM)**
Title	**Participation in the 9th Joint Project Team Meeting (JPTM)**
Type of Activity	**Conference**
Date	**November 2024**

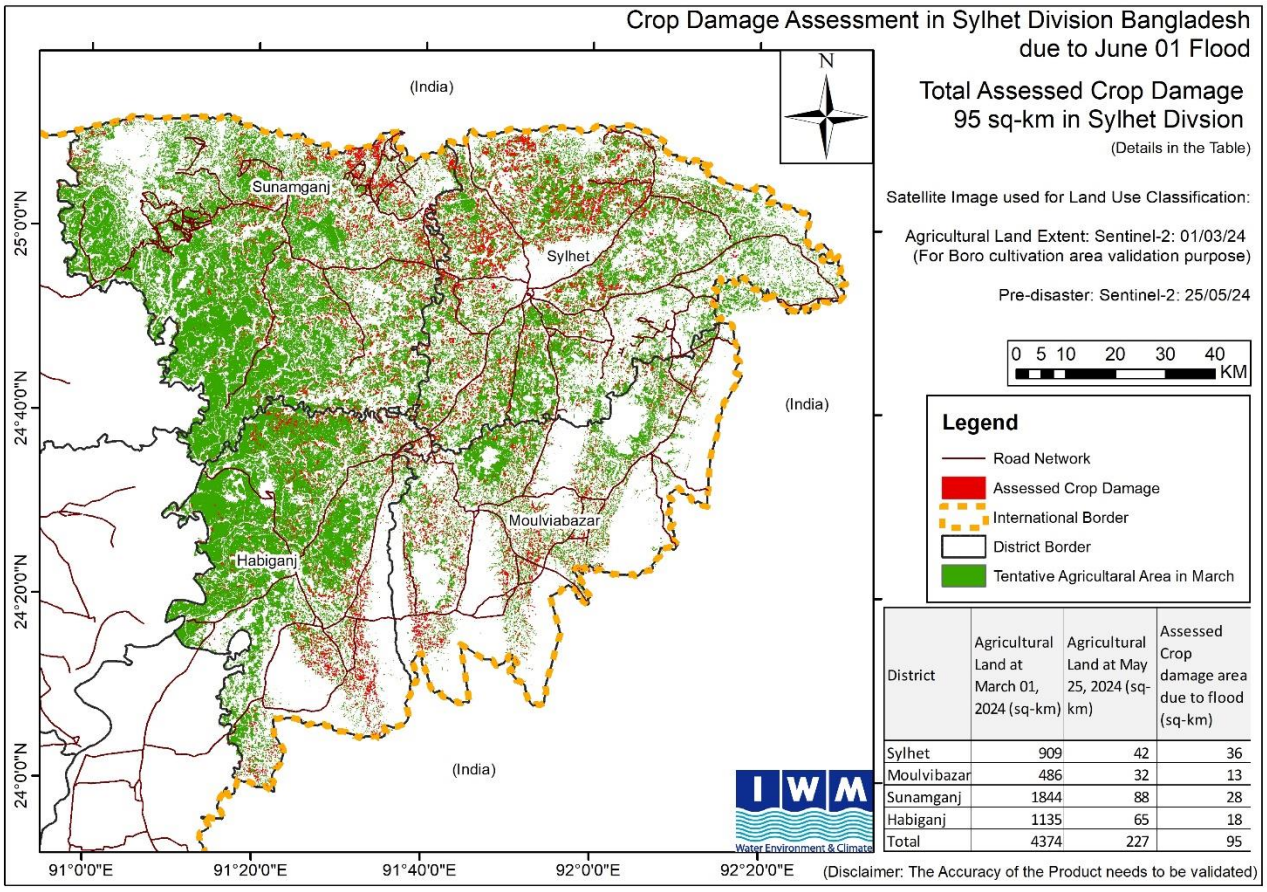
The Joint Project Team Meeting (JPTM) of Sentinel Asia was held from 5 to 7 November 2024 in Quezon City, Philippines. The meeting was co-organized by the Philippine Space Agency (PhilSA) and the Japan Aerospace Exploration Agency (JAXA). IWM participated in the meeting and expressed its appreciation to Sentinel Asia for the opportunity to take part. The event served as a valuable platform for knowledge exchange with space agencies and disaster management organizations across the region. The sessions emphasized the role of Earth observation in disaster management and included training on flood detection and earthquake building damage assessment using satellite data.

During Session 2: New Membership Session, chaired by JAXA, IWM presented its activities in the field of disaster management. The presentation highlighted IWM's experience in river erosion monitoring and flood management using satellite data, showcasing the severe impacts of flooding. It also stressed the need to shorten the process from user requests to evaluated products and underscored the importance of acquiring both pre- and post-disaster imagery for more effective analysis. These points were well received by the Sentinel Asia Secretariat. Overall, JPTM 2024 was highly productive for IWM, providing opportunities for learning, networking, and exploring future collaboration.

Organization	**Institute of Water Modelling (IWM)**
Title	**VAP for 20240601-Bangladesh-Flood-00506**
Type of Activity	**VAP**
Date	**June 2024**

A Value-Added Product (VAP) was generated for an Emergency Observation Request (EOR) submitted by the Bangladesh Water Development Board (BWDB). The analysis was based on satellite imagery from ALOS-2 and Sentinel-1. The VAP included estimates of flooded area and population affected, using Bangladesh Bureau of Statistics (BBS) and WorldPop data.

In response to the specific request of the EOR calling authority, an assessment of crop damage was also conducted. Optical image classification for March 2024 was used to map Boro rice cultivation areas in alignment with available BBS data. Subsequently, pre-disaster imagery immediately prior to the flood was analyzed to identify the remaining standing crops in the field before the disaster occurred.

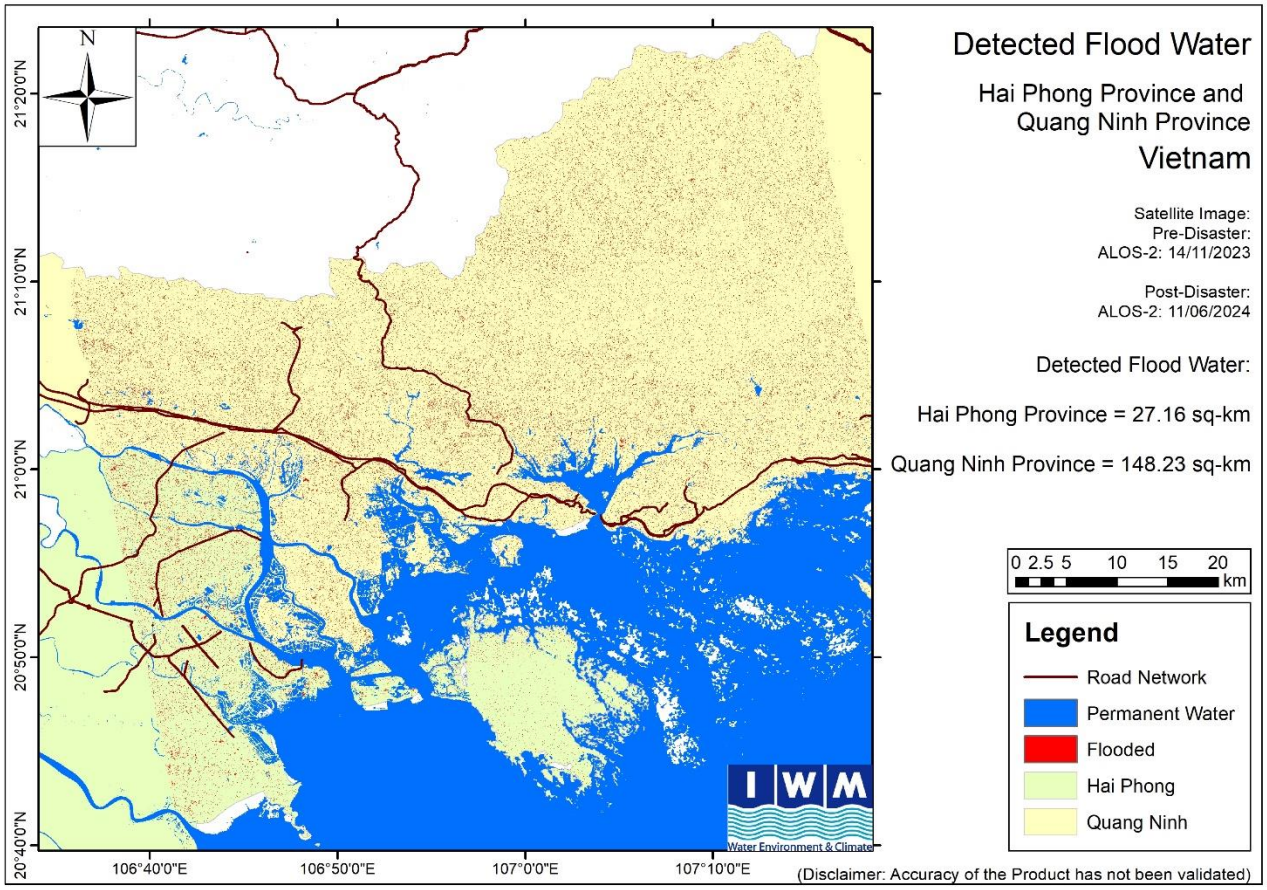


District	Agricultural Land at March 01, 2024 (sq-km)	Agricultural Land at May 25, 2024 (sq-km)	Assessed Crop damage area due to flood (sq-km)
Sylhet	909	42	36
Moulvibazar	486	32	13
Sunamganj	1844	88	28
Habiganj	1135	65	18
Total	4374	227	95

Organization	**Institute of Water Modelling (IWM)**
Title	**VAP for 20240609-Vietnam-Flood-Landslide-Storm-00507**
Type of Activity	**VAP**
Date	**June 2024**

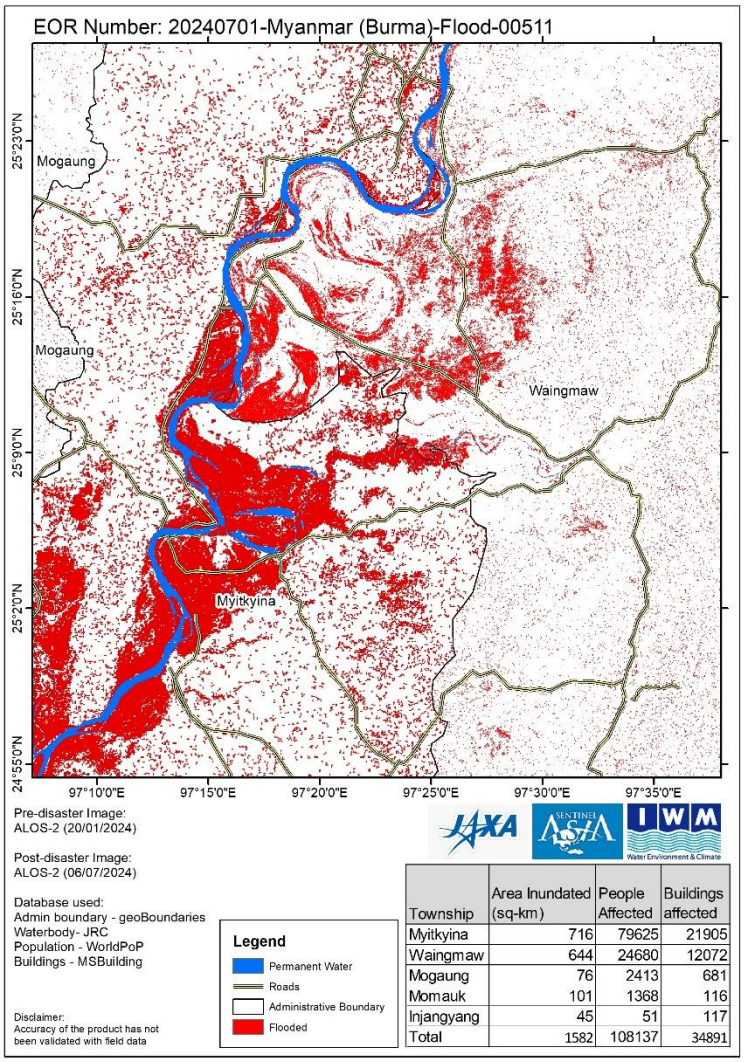
From the night of 8 June to the early morning of 9 June 2024, Quang Ninh Province and Hai Phong City experienced prolonged heavy rainfall, leading to widespread flooding and potential landslide risks. This was reported as the heaviest rainfall event in the past 10 years for the region.

An Emergency Observation Request (EOR) was submitted by the Asian Disaster Reduction Center (ADRC) on 9 June 2024. In response, a Value-Added Product (VAP) was generated using ALOS-2 imagery provided by JAXA. The VAP included the delineation of flood-affected areas derived from the processed satellite data.



Organization	**Institute of Water Modelling (IWM)**
Title	**VAP for 20240701-Myanmar (Burma)-Flood-00511**
Type of Activity	**VAP**
Date	**July 2024**

From late June 2024, severe flooding occurred in Kachin State, Myanmar, affecting Myitkyina and surrounding areas. Thousands of residents were reported in need of rescue, and flood warnings were issued for 18 townships across the state. An Emergency Observation Request (EOR) was submitted by the Myanmar Information Management Unit (MIMU) on 1 July 2025. In response, IWM generated a Value-Added Product (VAP) using ALOS-2 imagery. The VAP included estimates of flooded area, number of people affected (using WorldPop data), and the potential number of buildings impacted (based on MSBuilding data).

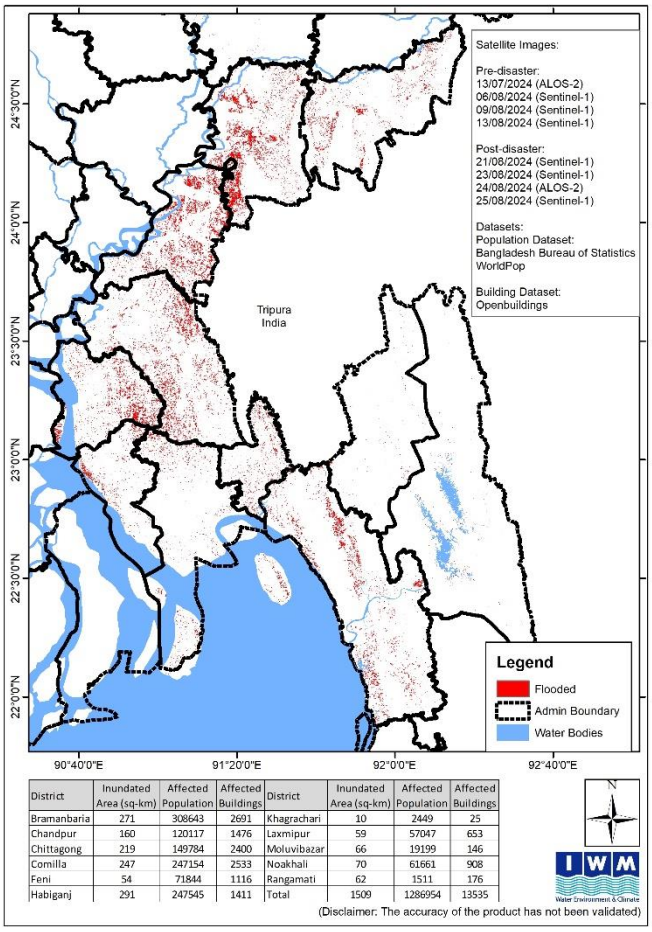


Township	Area Inundated (sq-km)	People Affected	Buildings affected
Myitkyina	716	79625	21905
Waingmaw	644	24680	12072
Mogaung	76	2413	681
Momauk	101	1368	116
Injangyang	45	51	117
Total	1582	108137	34891

Organization	**Institute of Water Modelling (IWM)**
Title	**VAP for 20240821-Bangladesh-Flood-00537**
Type of Activity	**VAP**
Date	**August 2024**

In August 2024, severe flooding affected eight districts in Bangladesh, leaving approximately 3.6 million people stranded. The affected areas included Feni, Noakhali, Cumilla, and Chattogram, where heavy rainfall and river overflow caused widespread inundation and infrastructure disruptions. The Bangladesh Water Development Board (BWDB) issued an Emergency Observation Request (EOR) to Sentinel Asia on 22 August 2024.

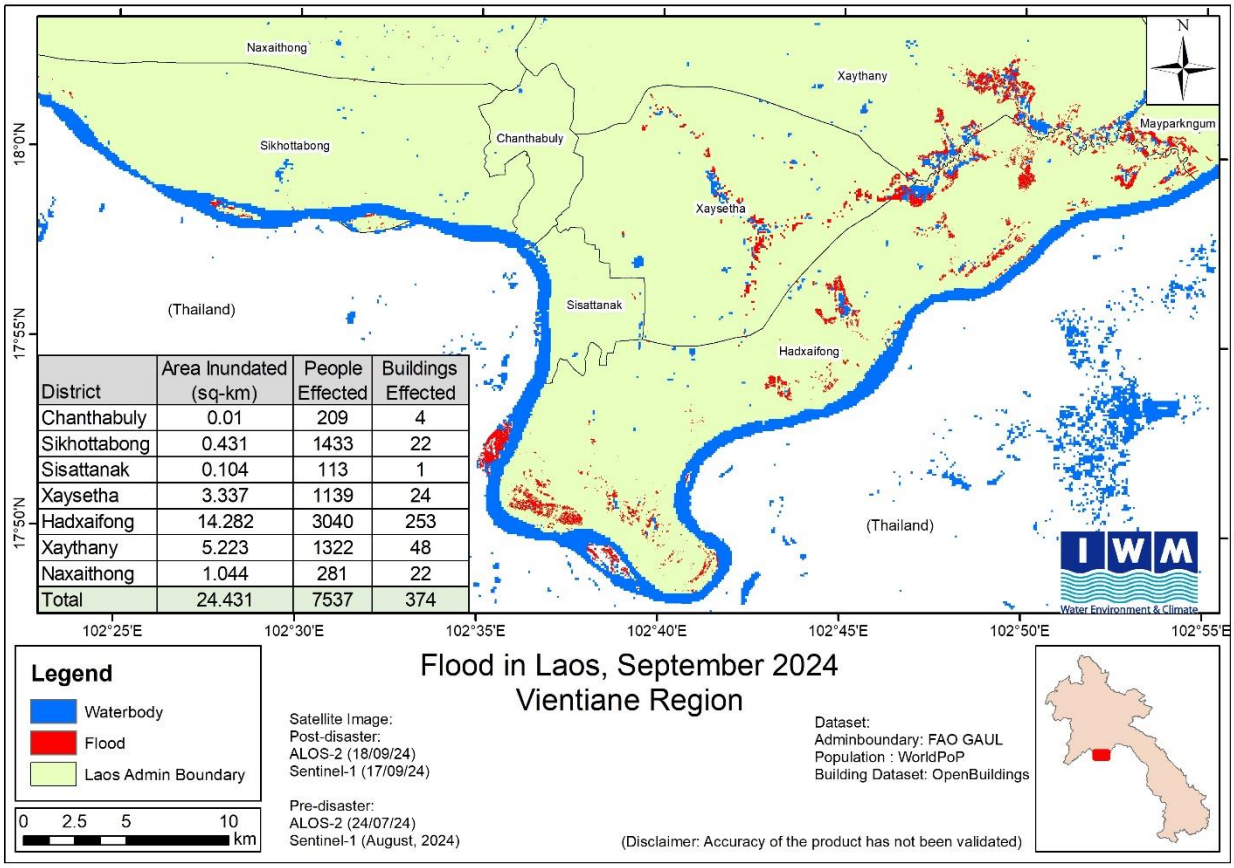
In response to the EOR, the Institute of Water Modelling (IWM) generated a Value-Added Product (VAP) utilizing satellite imagery from ALOS-2 and Sentinel-1. The VAP included: **Flood Extent Mapping (**Identification and delineation of flood-affected areas), **Population Impact Assessment (**Estimation of the number of people affected, derived from WorldPop data) and **Infrastructure Impact Assessment** (Estimation of the number of buildings affected, based on MSBuilding data). These analyses provided critical information to support disaster response and recovery efforts in the affected regions.



District	Inundated Area (sq-km)	Affected Population	Affected Buildings	District	Inundated Area (sq-km)	Affected Population	Affected Buildings
Bramanbaria	271	308643	2691	Khagrachari	10	2449	25
Chandpur	160	120117	1476	Laxmipur	59	57047	653
Chittagong	219	149784	2400	Moluvibazar	66	19199	146
Comilla	247	247154	2533	Noakhali	70	61661	908
Feni	54	71844	1116	Rangamati	62	1511	176
Habiganj	291	247545	1411	Total	1509	1286954	13535

Organization	**Institute of Water Modelling (IWM)**
Title	**VAP for 20240912-Laos-Flood-00548**
Type of Activity	**VAP**
Date	**September 2024**

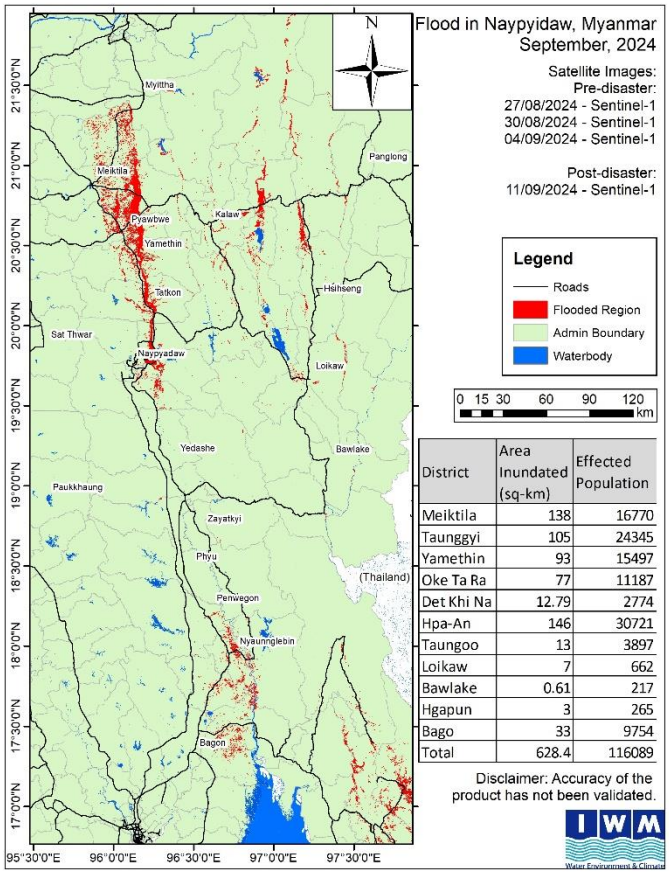
In early September 2024, severe flooding occurred in Laos, particularly affecting Luang Prabang and surrounding areas. The Mekong River's water levels reached critical thresholds, with forecasts predicting further increases, leading to widespread inundation and displacement of communities. An Emergency Observation Request (EOR) was submitted by the ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre) on 12 September 2024. In response to the EOR, the Institute of Water Modelling (IWM) generated a Value-Added Product (VAP) utilizing satellite imagery from ALOS-2 and Sentinel-1. The VAP included: **Flood Extent Mapping** (Identification and delineation of flood-affected areas), **Population Impact Assessment** (Estimation of the number of people affected, derived from WorldPop data) and **Infrastructure Impact Assessment** (Estimation of the number of buildings affected, based on OpenBuilding data). These analyses provided critical information to support disaster response and recovery efforts in the affected regions.



District	Area Inundated (sq-km)	People Effected	Buildings Effected
Chanthabuly	0.01	209	4
Sikhottabong	0.431	1433	22
Sisattanak	0.104	113	1
Xaysetha	3.337	1139	24
Hadxaifong	14.282	3040	253
Xaythany	5.223	1322	48
Naxaithong	1.044	281	22
Total	24.431	7537	374

Organization	**Institute of Water Modelling (IWM)**
Title	**VAP for 20240911-Myanmar (Burma)-Flood-Landslide-00546**
Type of Activity	**VAP**
Date	**September 2024**

In early September 2024, Myanmar experienced severe flooding due to the remnants of Typhoon Yagi, affecting regions including Naypyidaw, Mandalay, and Shan State. The disaster resulted in significant casualties, with at least 226 reported dead and over 77 missing. Approximately 320,000 individuals were displaced, and substantial damage occurred to infrastructure and agriculture. The Myanmar Information Management Unit (MIMU) issued an Emergency Observation Request (EOR) on 11 September 2024. In response, the Institute of Water Modelling (IWM) generated a Value-Added Product (VAP) utilizing Sentinel-1 imagery. The VAP included: Flood Extent Mapping (Identification and delineation of flood-affected areas), Population Impact Assessment (Estimation of the number of people affected, derived from WorldPop data) and Infrastructure Impact Assessment (Estimation of the number of buildings affected, based on OpenBuilding data). These analyses provided critical information to support disaster response and recovery efforts in the affected regions.



District	Area Inundated (sq-km)	Effected Population
Meiktila	138	16770
Taunggyi	105	24345
Yamethin	93	15497
Oke Ta Ra	77	11187
Det Khi Na	12.79	2774
Hpa-An	146	30721
Taungoo	13	3897
Loikaw	7	662
Bawlake	0.61	217
Hgapun	3	265
Bago	33	9754
Total	628.4	116089

Organization	**Japan Water Agency**
Title	**Meeting with Sentinel Asia secretary**
Type of Activity	**Meeting** (e.g., Conference, Workshop, Meeting, Training, EOR, Providing satellite data or VAP)
Date	**11/09/2024**

On September 11, 2024, JWA met with the secretary of Sentinel Asia at JWA HQ office. Possible area of cooperation between Sentinel Asia and JWA, as secretary of NARBO (Network of Asian River Basin Organizations), was discussed. After the discussion, JWA applied to JPTM on September 25, and it was approved on October 21.

Organization	Mohammed Bin Rashid Space Centre (MBRSC)
Title	MBRSC's Support for Emergency Observation Requests during the Year 2024
Type of Activity	Participating as DPN & DAN for Emergency Observation Requests
Date	2024

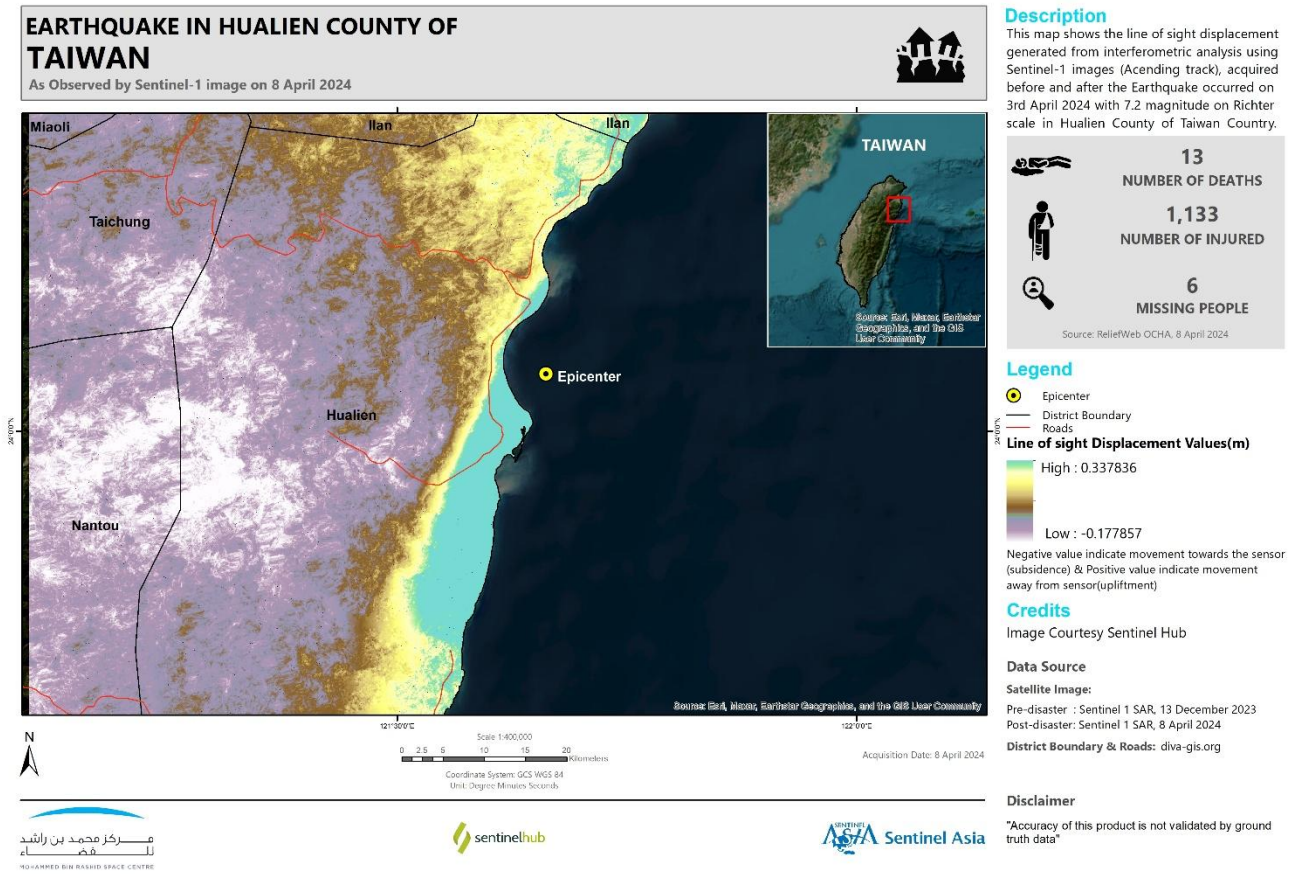
The Mohammed Bin Rashid Space Centre (MBRSC), a Dubai government organization, is a key contributor to the UAE National Space Programme, encompassing Earth observation satellite projects, the Emirates Mars Mission, the Emirates Lunar Mission, and the UAE Astronaut Programme. In October 2018, MBRSC launched KHALIFSAT, the UAE's first 100% locally designed and manufactured Earth observation satellite and one of the world's most technologically advanced remote sensing platforms. During the Year 2024, MBRSC provided Satellite Imagery as well as Value-Added Products (VAPs) in support of the following Emergency Observation Requests (EORs):

No.	Request ID.	Country	Type of Disaster
01	20240101-Japan-Earthquake-00491	Japan	Earthquake
02	20240122-China-Earthquake-00492	China	Earthquake
03	20240315-Indonesia-Flood-00493	Indonesia	Flood
04	20240330-Kazakhstan-Flood-00494	Kazakhstan	Flood
05	20240403-Taiwan-Earthquake-00495	Taiwan	Earthquake
06	20240416-Indonesia-Volcano-00496	Indonesia	Volcano
07	20240414-Pakistan-Flood-00497	Pakistan	Flood
08	20240421-Nepal-Flood-Other-00498	Nepal	Flood
09	20240420-Kyrgyzstan-Other-00499	Kyrgyzstan	Other
10	20240502-United Arab Emirates-Flood-Storm-00501	UAE	Flood-Storm
11	20240502-Indonesia-Flood-Landslide-00502	Indonesia	Flood-Landslide
12	20240511-Indonesia-Flood-Landslide-00503	Indonesia	Flood-Landslide
13	20240516-Turkmenistan-Flood-00504	Turkmenistan	Flood
14	20240527-India-Storm-00505	India	Storm
15	20240706-Nepal-Flood-00513	Nepal	Flood
16	20240601-Bangladesh-Flood-00506	Bangladesh	Flood
17	20240609-Vietnam-Flood-Landslide-Storm-00507	Vietnam	Flood-Landslide-Storm
18	20240624-Kyrgyzstan-Other-00508	Kyrgyzstan	Other
19	20240604-Nepal-Flood-00509	Nepal	Flood
20	20240628-Kyrgyzstan-Flood-Other-00510	Kyrgyzstan	Flood-Other
21	20240701-Myanmar (Burma)-Flood-00511	Myanmar (Burma)	Flood

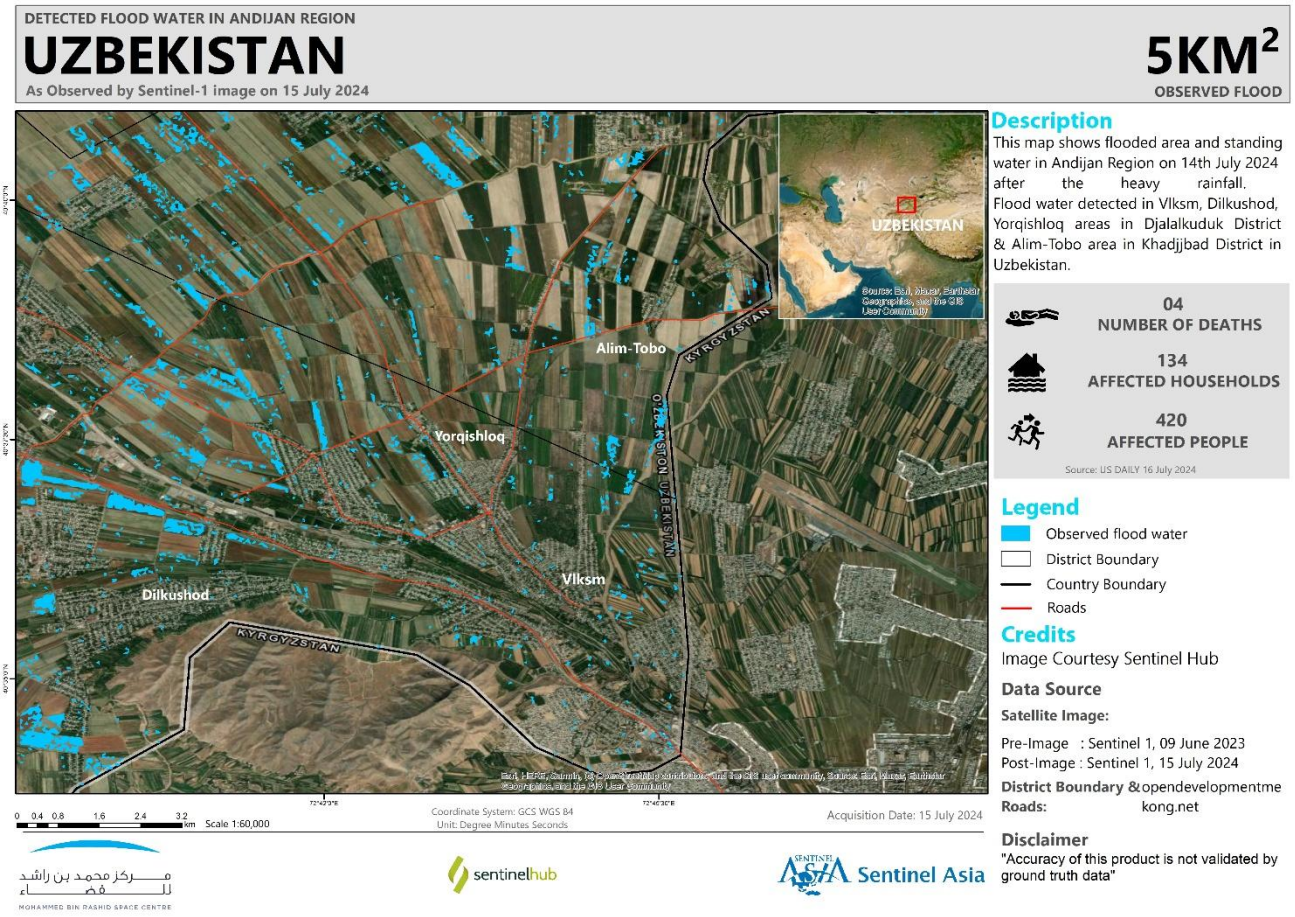
22	20240703-Vietnam-Flood-Landslide-Storm-00512	Vietnam	Flood-Landslide
23	20240707-Nepal-Flood-00515	Nepal	Flood
24	20240710-India-Flood-00516	India	Flood
25	20240714-Vietnam-Flood-Landslide-Storm-00519	Vietnam	Flood-Landslide-Storm
26	20240713-Tajikistan-Other-00520	Tajikistan	Other
27	20240714-Uzbekistan-Flood-00521	Uzbekistan	Flood
28	20240714-Kyrgyzstan-Flood-Other-00522	Kyrgyzstan	Flood-Other
29	20240115-Philippines-Flood-00523	Philippines	Flood
30	20240718-Philippines-Flood-Landslide-00524	Philippines	Flood-Landslide
31	20240723-Vietnam-Flood-Landslide-Storm-00525	Vietnam	Flood-Landslide-Storm
32	20240723-Philippines-Flood-00526	Philippines	Flood
33	20240723-Kyrgyzstan-Other-00527	Kyrgyzstan	Other
34	20240725-Philippines-Other-00528	Philippines	Other (Oil spill)
35	20240725-Taiwan-Flood-00529	Taiwan	Flood
36	20240730-Nepal-Flood-00530	Nepal	Flood
37	20240806-Tajikistan-Flood-Landslide-00531	Tajikistan	Flood-Landslide
38	20240810-Bhutan-Flood-Landslide-00533	Bhutan	Flood-Landslide
39	20240816-Nepal-Flood-Other-00534	Nepal	Flood-Other
40	20240818-Kyrgyzstan-Other-00535	Kyrgyzstan	Other
41	20240724-Philippines-Flood-00536	Philippines	Flood
42	20240821-Bangladesh-Flood-00537	Bangladesh	Flood
43	20240823-Vietnam-Flood-Landslide-Storm-00538	Vietnam	Flood-Landslide-Storm
44	20240823-Nepal-Landslide-00540	Nepal	Landslide
45	20240824-Vietnam-Flood-Landslide-Storm-00541	Vietnam	Flood-Landslide-Storm
46	20240827-India-Flood-00542	India	Flood
47	20240901-Philippines-Flood-Landslide-00543	Philippines	Flood-Landslide
48	20240908-Vietnam-Flood-Landslide-Storm-00544	Vietnam	Flood-Landslide-Storm
49	20240911-Myanmar (Burma)-Flood-Landslide-00546	Myanmar (Burma)	Flood-Landslide
50	20240910-Thailand-Flood-00547	Thailand	Flood
51	20240912-Laos-Flood-00548	Laos	Flood
52	20240919-Vietnam-Flood-Landslide-Storm-00550	Vietnam	Flood
53	20240928-Nepal-Flood-00551	Nepal	Flood
54	20240929-Philippines-Flood-Landslide-Storm-00555	Philippines	Flood-Landslide-Storm
55	20241023-Philippines-Flood-00557	Philippines	Flood
56	20241027-Vietnam-Flood-Landslide-Storm-00560	Vietnam	Vietnam
57	20241025-India-Storm-00561	India	Storm
58	20241024-Philippines-Flood-Landslide-00562	Philippines	Flood-Landslide

59	20241103-Indonesia-Volcano-00563	Indonesia	Volcano
60	20241111-Philippines-Flood-Landslide-00564	Philippines	Flood-Landslide
61	20241116-Philippines-Flood-Landslide-00565	Philippines	Flood-Landslide
62	20241126-Thailand-Flood-00566	Thailand	Flood
63	20241203-Indonesia-Flood-Landslide-00567	Indonesia	Flood-Landslide
64	20241209-Philippines-Volcano-00568	Philippines	Volcano
65	20241217-Vanuatu-Earthquake-00569	Vanuatu	Earthquake

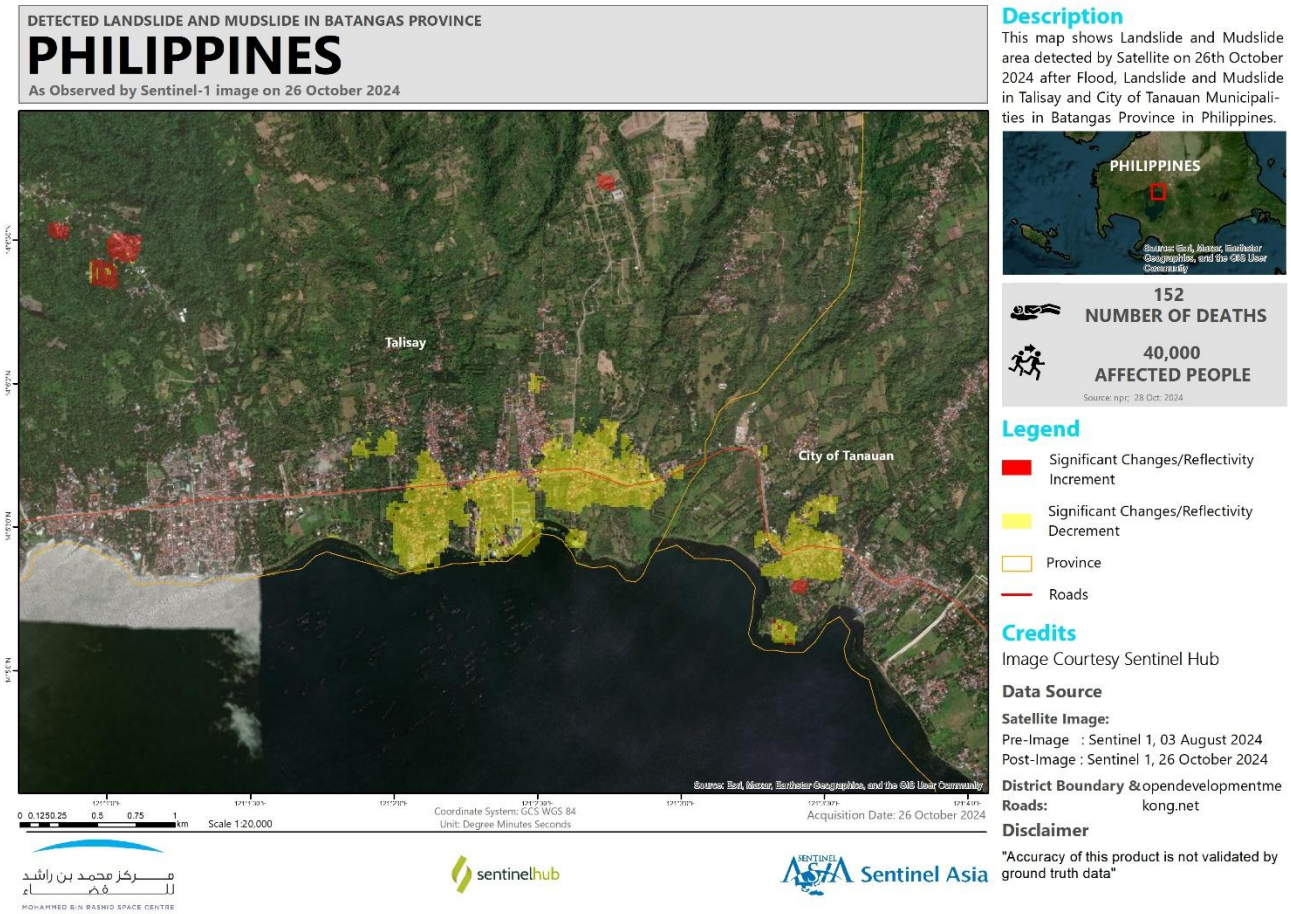
In addition, kindly you may find below examples of Value-Added Products shared during the Year 2024 as follows:



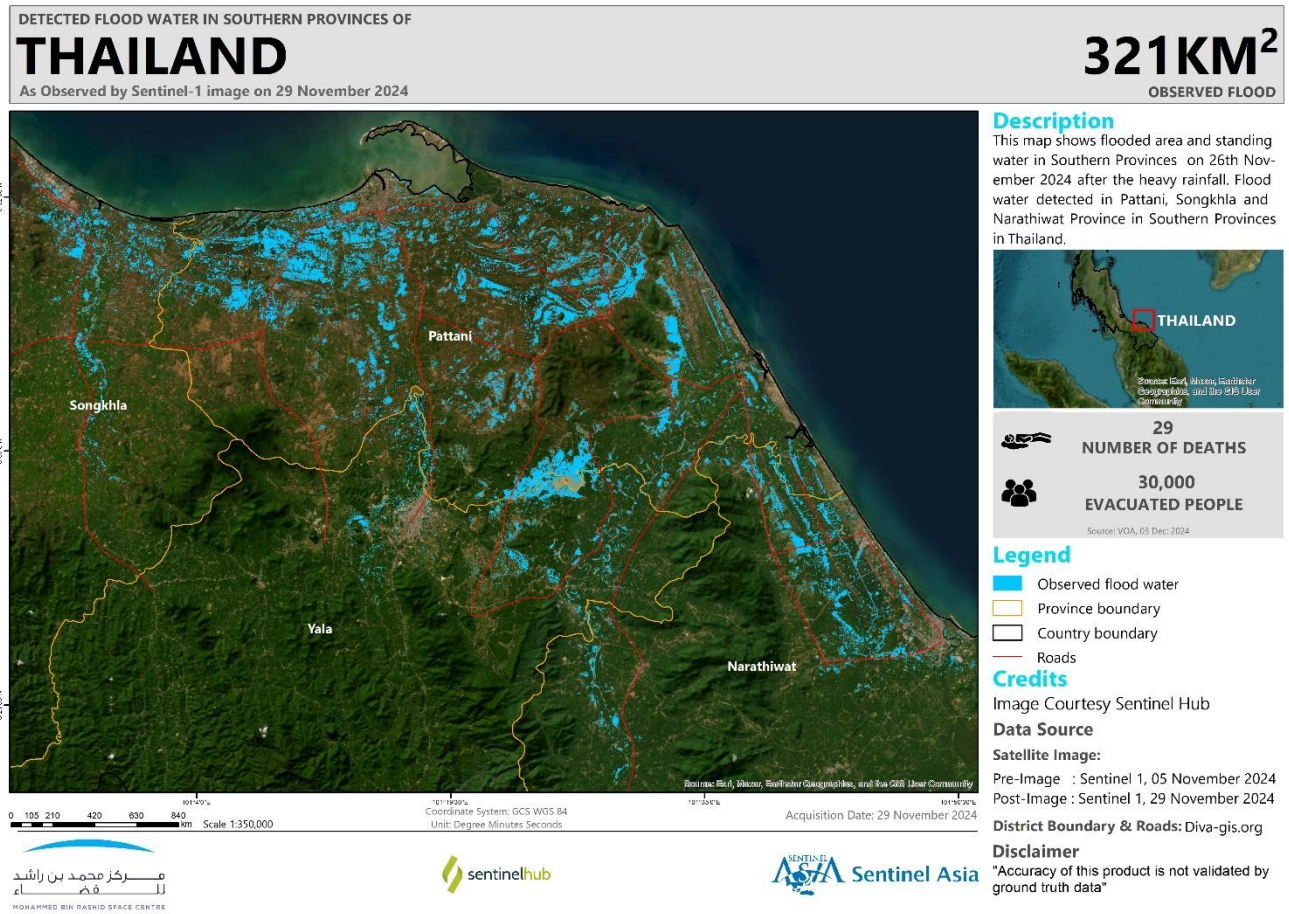
Example 1: Displacement Map for Earthquake in Taiwan on 8 April 2024.



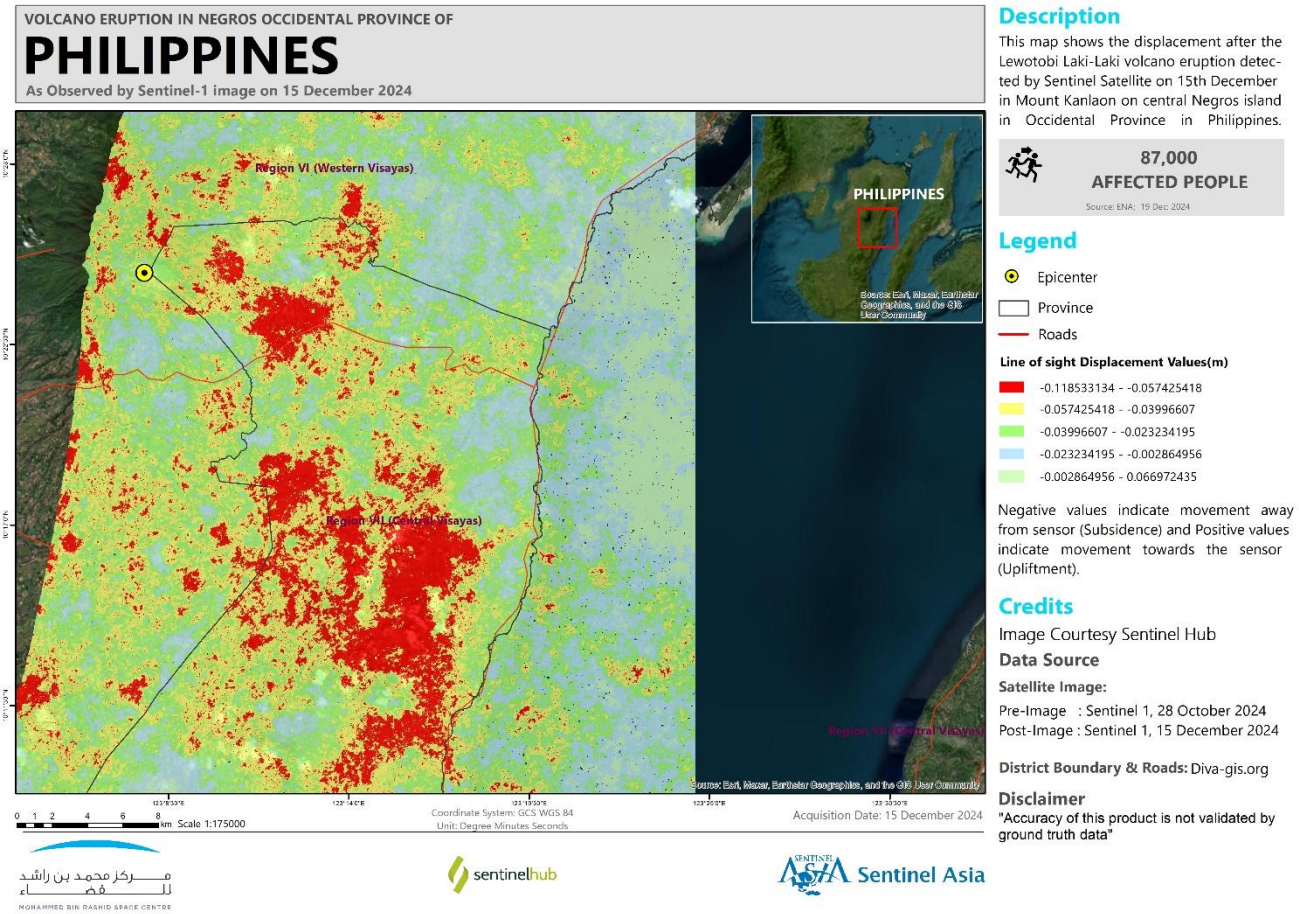
Example 2: Post-disaster Flood Assessment in Uzbekistan on 15 July 2024.



Example 3: Post-disaster Landslide and Mudflow Detection in the Philippines on 26 October 2024.



Example 4: Post-disaster Flood Assessment in Thailand on 29 November 2024.



Example 5: Displacement Map for Earthquake in the Philippines on 15 December 2024.

Organization	**Manila Observatory**
Title	**Presentation of Optimizing the Microsoft Planetary Computer for Emergency Observation and Mapping (EO/ M) at the JPTM2024**
Type of Activity	**Conference and Meeting** (e.g., Conference, Workshop, Meeting, Training, EOR, Providing satellite data or VAP)
Date	**March and November 2024**

A poster was presented at the 2nd WMO/WWRP Weather and Society Conference from February 12 to March 1, 2024. This conference was held online (https://www.weatherandsociety.de/program/index.html) with the theme that focused on the social science contribution to Early Warnings for All. The poster entitled “Emergency Observation and Mapping (EO/M) for the Risk-Informed Extreme Weather Bulletins (EWBs) in the Philippines” was presented in the Session 1: Risk knowledge and measurement (Figure 1). The goal of this research is to streamline and automate the services provided by Manila Observatory, in particular, the EWBs and EO/M. The poster showed that the datasets provided by Sentinel Asia for tropical cyclone Ulysses in November 2020 were used as a benchmark test case in automating the EO/M.

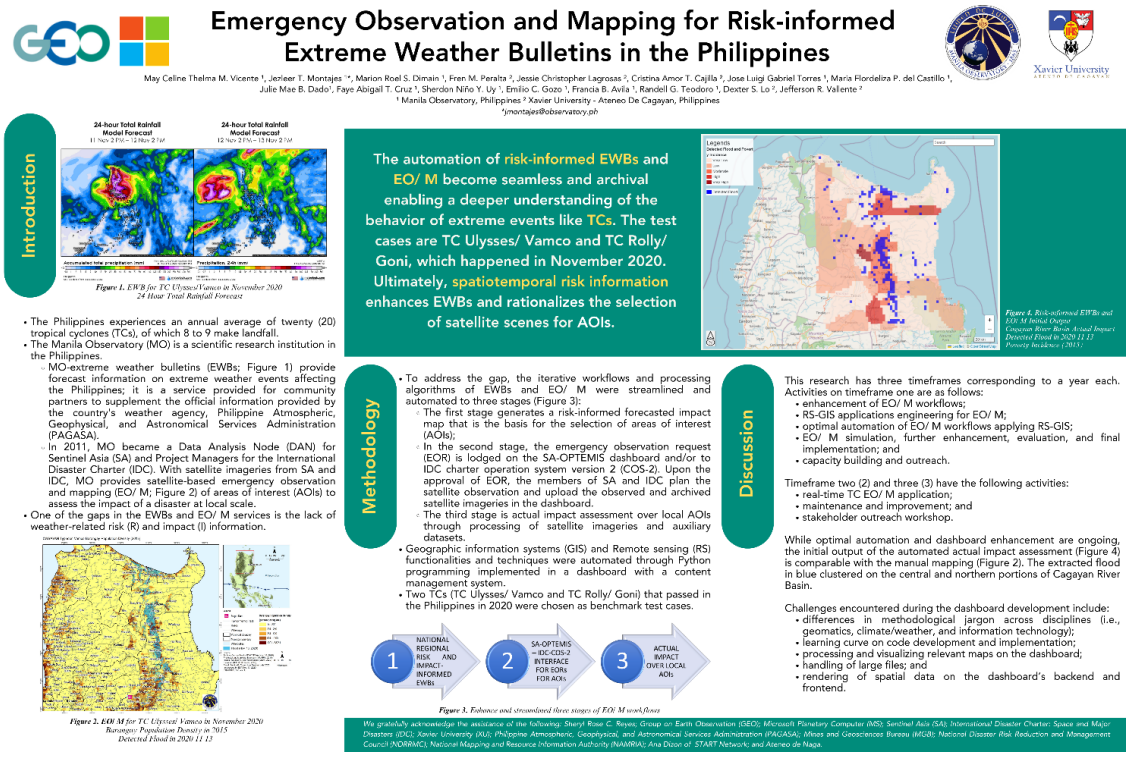


Figure 1. Poster presented at the 2nd WMO/WWRP Weather and Society Conference.

The same research was also presented at the 9th Joint Project Team Meeting (JPTM2024) at Novotel Manila Araneta City, Philippines on November 5 to 7, 2024. The presentation “Optimizing the Microsoft Planetary Computer for Emergency Observation and Mapping (EO/ M)” was part of Session 3 good practices of Sentinel Asia or expectations towards Sentinel Asia. The slides could be accessed here: https://sentinel-asia.org/meetings/SA3JPTM9/agenda/Day1/1130_MO_Montajes.pdf. The initial result, updated system architecture and ways forward were presented (Figure 2). Datasets from Sentinel Asia were used to generate the initial result of the research.

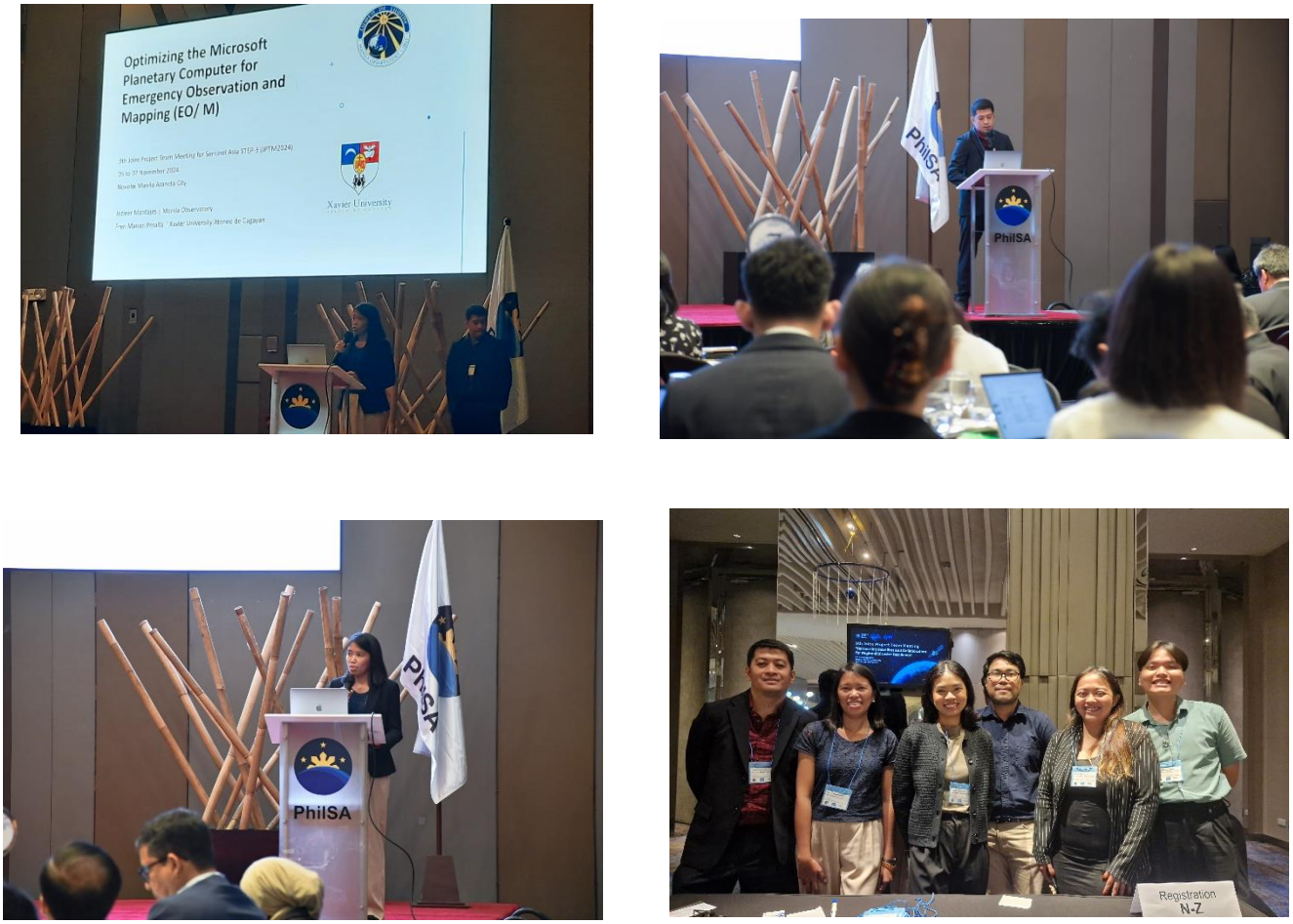
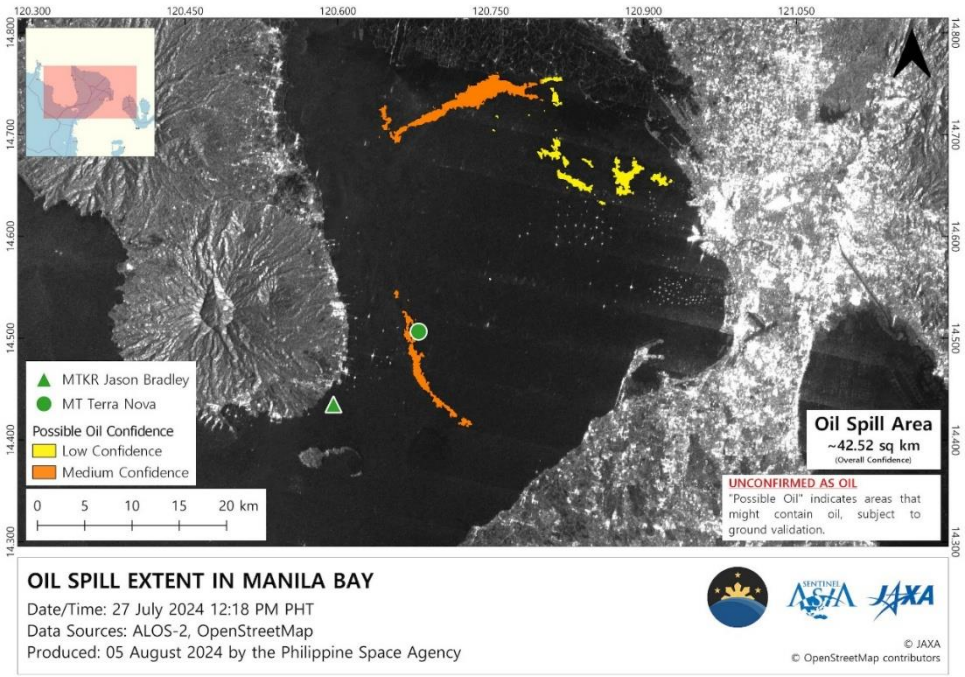


Figure 2. Presentation at the 9th Joint Project Team Meeting (JPTM2024).

Organization	**Philippine Space Agency (PhilSA)**
Title	**Emergency observation request**
Type of Activity	**Oil spill in Philippines (July 2024)**
Date	**2024**

On 25 July 2024, the Philippine tanker MT Terra Nova sank off Limay, Bataan during rough seas caused by the southwest monsoon and Typhoon Gaemi, spilling over 1.4 million liters of industrial fuel oil that spread across Manila Bay, severely affecting thousands of fisherfolk and coastal residents, prompting fishing bans and a state of calamity declaration, while the Philippine Coast Guard recovered 97.4 percent of the spill by mid-September, leaving experts warning of long-term ecological and economic impacts on the bay's marine environment and highlighting weaknesses in maritime safety and disaster response.

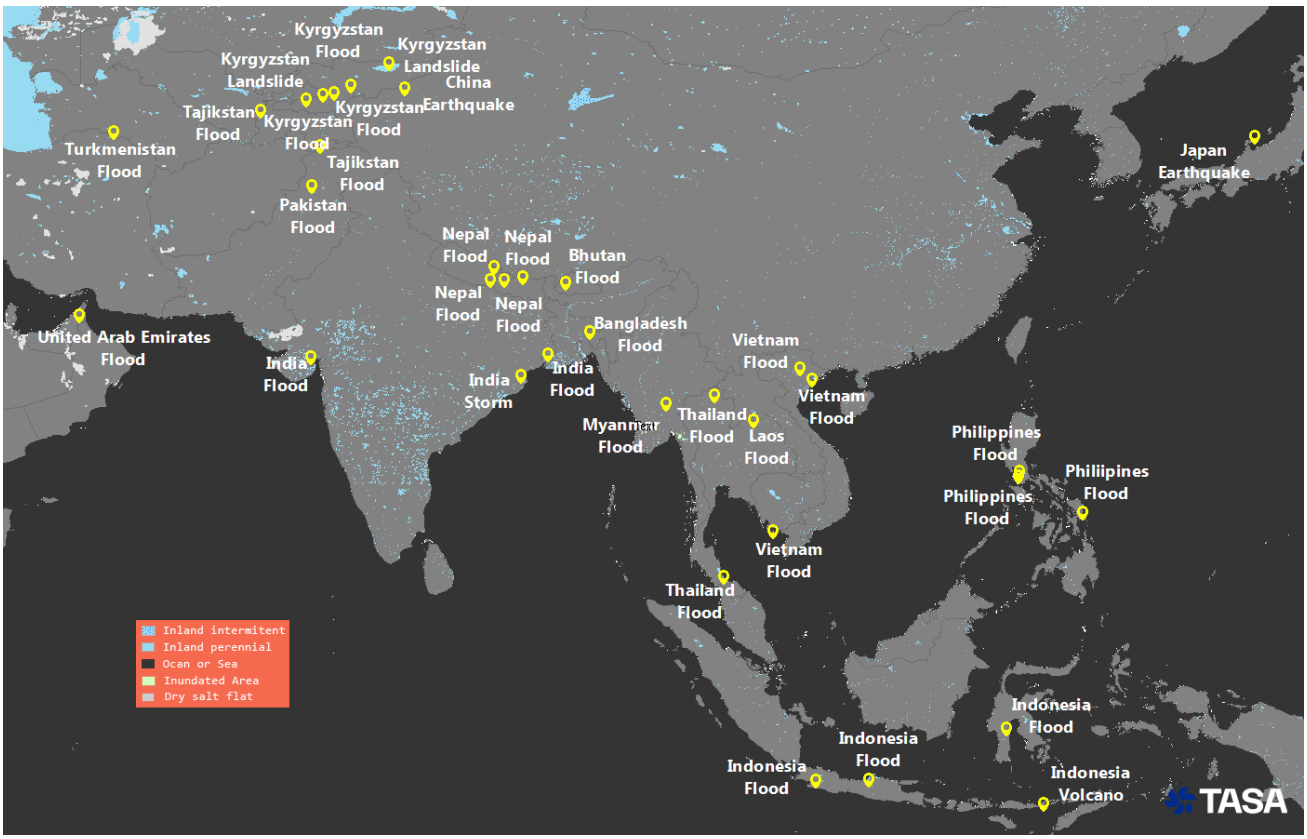
PhilSA made an EOR for this event and submitted a request to SA. We received several products. Also, we utilized satellite images from ALOS-2 and EOS-04 through Sentinel Asia, and satellite images from GeoEye-1, and RCM-2 through the International Disaster Charter (via Sentinel Asia) to produce oil spill extent maps. All of the produced maps were distributed to relevant agencies.



PhilSA prepared a VAP and shared to members

Organization	**Taiwan Space Agency (TASA)**
Title	**Satellite Imagery Support to Sentinel Asia**
Type of Activity	**Responses to EOR (Providing Satellite Data as Data Provider Node)**
Date	**Year of 2024**

During 2024, TASA has contributed to the Sentinel Asia activities as Data Provider Node. TASA has successfully responded to Emergency Observation Requests (EOR's) pertaining to 17 countries ranging from East Asia to South Asia in 36 events with FORMOSAT-5 satellite datasets comprising of pre- and post-disaster events. All these satellite image products were provided right after we acquired cloudless images. According to the statistics, FORMOSAT-5 satellite image products supported various types of applications such as flood and landslide relief. At the same time, it has also given disaster response assistance to Kyrgyzstan, Nepal and Philippines for more than one event. It's worth noting that TASA also provided Value-Added Products to assist stakeholders in the rescue, which enabled decision makers to understand the extent and scope of the disaster in intuitive manner.



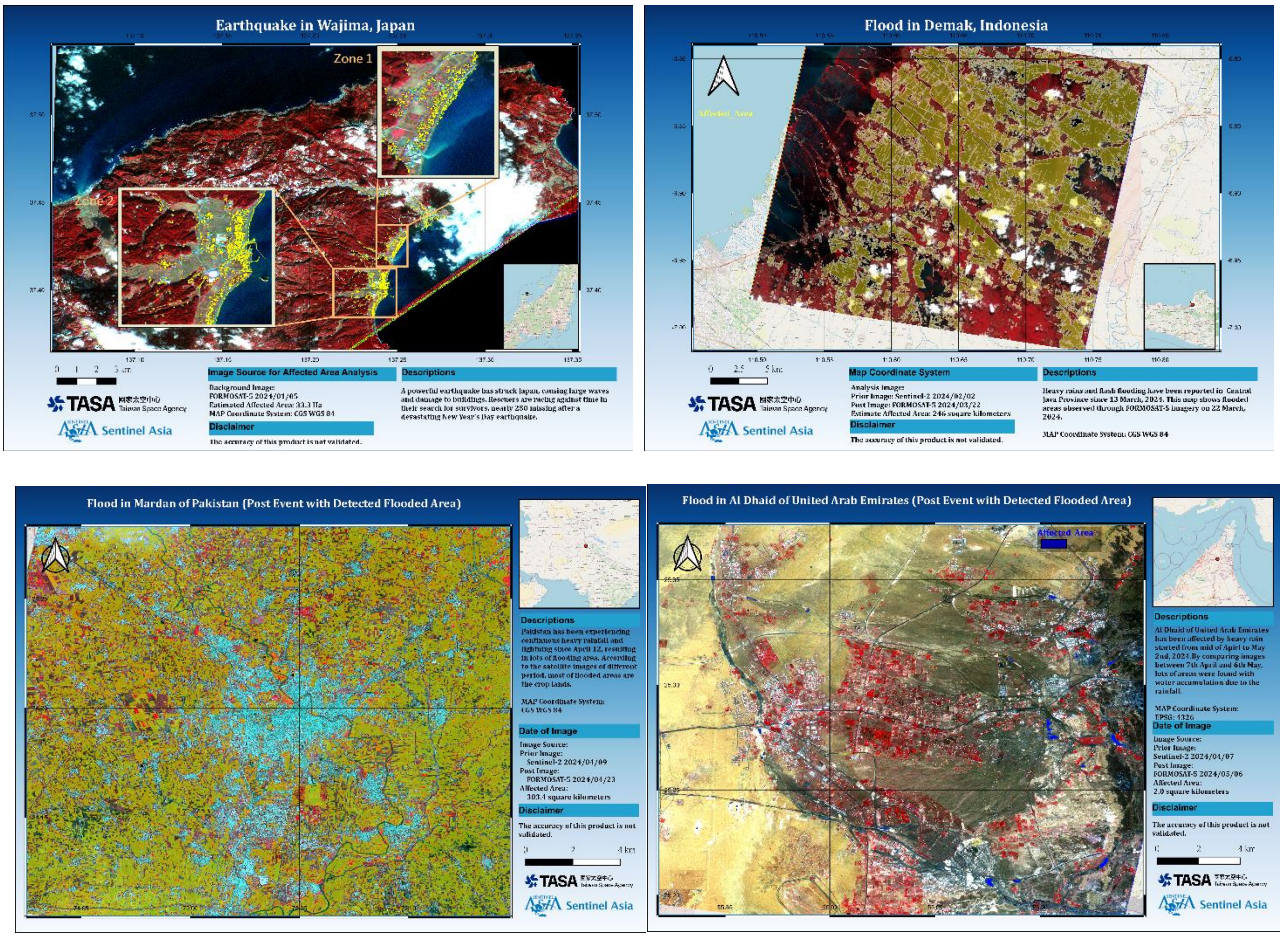


Fig 1 TASA Support to Sentinel Asia Emergency Observation Requests during 2024

Organization	**Academia Sinica Grid Computing Center (ASGC) and TASA**
Title	**Sentinel Asia JPT-3 Cloud Services**
Type of Activity	**Cloud Server Service**
Date	**Year of 2024**

The Sentinel Asia JPT-3 cloud system architecture is primarily established and maintained through collaboration between the Academia Sinica Grid Computing Center (ASGC), the Taiwan Space Agency (TASA), and Japan's JAXA. Since February 2020, it has played a core role in operational maintenance and system integration, providing a collaborative platform and services for satellite resource requests and sharing. As of whole year of 2024, the system has achieved an average stability of approximately 99.5% throughout the year, supporting 63 disaster cases across Asian countries, with a total of 0.21GB of data uploaded, 2,672GB downloaded, and over 3,736 data captures. On February 1, 2024, the Sentinel Asia Technology Conference was held at the ASGC, with participation from JAXA, TASA, and ASGC members. With system operations remaining stable, there were no urgent or special technical service issues requiring discussion. The meeting also noting the importance of ongoing collaboration and communication for international cooperation in Sentinel Asia.

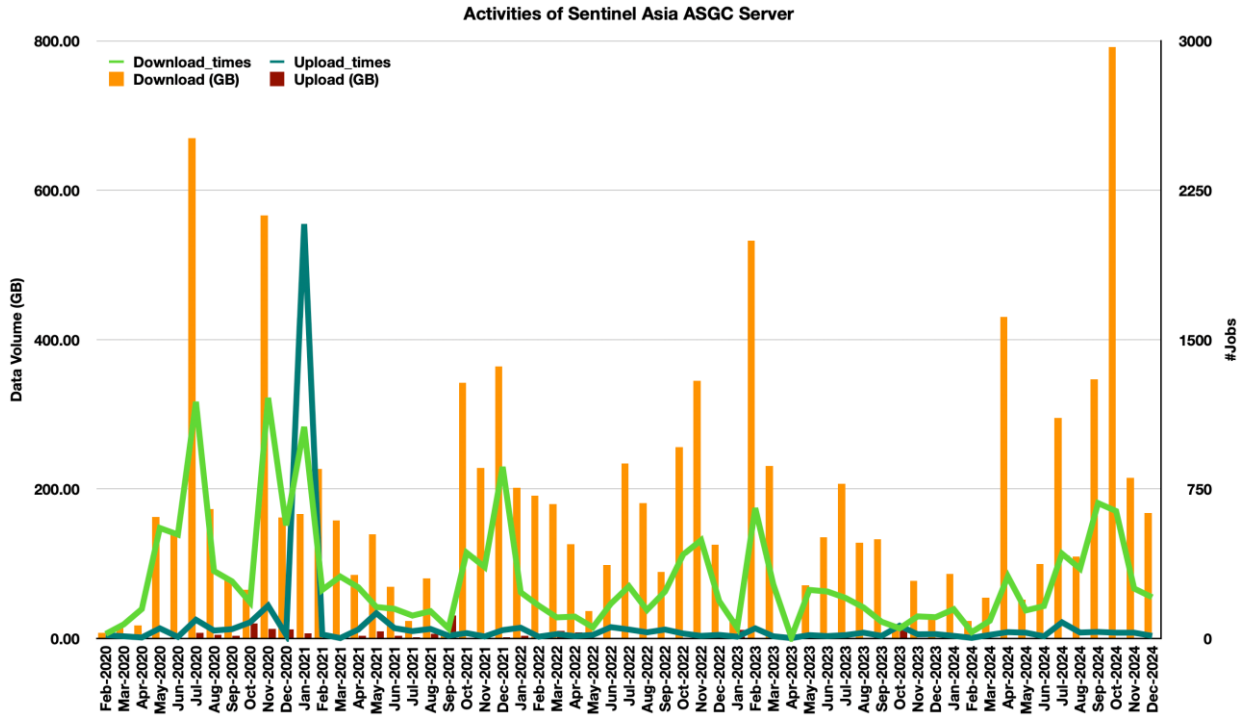


Fig 2 Summary of Sentinel Asia JPT-3 Cloud Services during the period of 2024.

Organization	**Taiwan Space Agency (TASA)**
Title	**Satellite Imagery Aids Taiwan's Post-Quake Assessment**
Type of Activity	**EOR**
Date	**03/04/2024**

On 3 April 2024, a strong earthquake with a magnitude of Mw 7.2 and a focal depth of 15.5 km struck Hualien, Taiwan. This was the largest earthquake recorded in Taiwan since the 1999 Chi-Chi earthquake, causing severe landslides, building collapses, and resulting in both casualties and property loss. The Taiwan Space Agency (TASA), as a member of Sentinel Asia serving as both a Data Provider Node (DPN) and a Data Analysis Node (DAN), submitted an emergency request immediately after the earthquake. Several other DPNs, including the Japan Aerospace Exploration Agency (JAXA), THEOS-1 of the Geo-Informatics and Space Technology Development Agency (GISTDA) of Thailand, and the Indian Space Research Organization (ISRO), provided satellite imagery. Optical satellite imagery and synthetic aperture radar (SAR) data supplied by the DPNs were utilized by TASA for disaster analysis, enabling the acquisition of more comprehensive information for disaster interpretation.

In addition, Sentinel Asia Data Analysis Nodes such as the Geo-Informatics Center at the Asian Institute of Technology (GIC-AIT) and the Remote Sensing Laboratory of the Earth Observatory of Singapore (EOS-RS) also contributed their disaster analyses. The satellite data provided by Sentinel Asia partners, along with the corresponding analysis reports, were submitted and shared with the Central Emergency Operation Center. Moving forward, TASA remains committed to contributing through Earth observation and the timely provision of satellite data and disaster analysis.

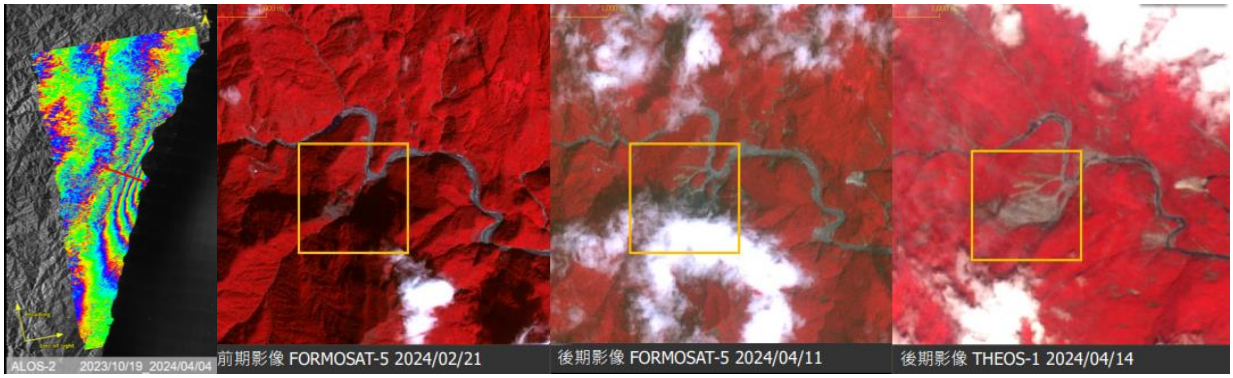


Fig 3 Satellite imagery analyses of the 3 April 2024 Hualien Mw 7.2 earthquake, produced by TASA under Sentinel Asia using ALOS-2, FORMOSAT-5, and THEOS-1 data.

Organization	**Taiwan Space Agency (TASA)**
Title	**Guide to Using Emergent Value-Added Products (EVAP) Module with QGIS for Disaster Response**
Type of Activity	**Training Toolkit**
Date	**01/09/2024**

The Taiwan Space Agency (TASA) has developed the Emergent Value-Added Products (EVAP) system. When a disaster occurs, it can provide disaster analysis more quickly and efficiently. The EVAP module is based on the QGIS platform and can be applied to analyze floods, wildfires, and droughts. The first step is to calculate the difference between pre-disaster and post-disaster images. By calculating spectral indices such as Normalized Difference Vegetation Index (NDVI), Normalized Difference Water Index (NDWI), and Change Vector Analysis (CVA), we can detect changes in every pixel. The second step is to apply the concept of a Gaussian model. If the change value of a pixel falls within a high-confidence region, it indicates a high probability of change. The third step is to vectorize the areas with significant changes. If there are cloud-covered areas in the images, we can correct them in the shapefile. Finally, we calculate the affected area of the disaster. The EVAP module provides a user-friendly interface and efficient analysis processing. Each step in the documentation is accompanied by a recorded video tutorial, making it easier for users to understand the procedures. It is available to the public, and we hope it can speed up disaster analysis and help mitigate disaster impacts.

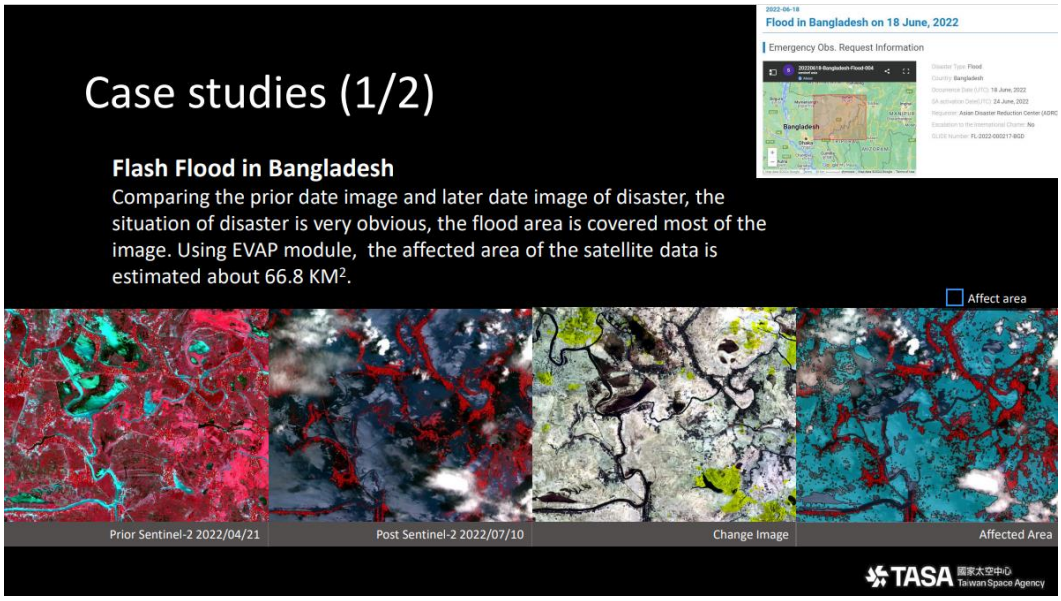


Fig 4 Flash Flood damage assessment in Bangladesh using Sentinel-2 with the EVAP module

Organization	**Taiwan Space Agency (TASA)**
Title	**Sentinel Asia Steering Committee Meeting Held in Taiwan for the First Time**
Type of Activity	**Meeting**
Date	**30/01/2024**

The Sentinel Asia Steering Committee Meeting, under the framework of the Asia-Pacific Regional Space Agency Forum (APRSAF), was held for the first time in Taiwan at the Taiwan Space Agency (TASA) headquarters in Hsinchu on January 30–31, 2024. Over 30 representatives from 14 Asia-Pacific countries and organizations, including Japan, the Philippines, Thailand, India, Vietnam, Singapore, and the UAE, attended the two-day meeting.

The National Science and Technology Council (NSTC) emphasized Taiwan's technological strength, openness, and commitment to international cooperation. Taiwan will continue to actively host international meetings, fostering collaboration between public and private sectors and promoting regional scientific innovation and sustainable development. TASA Director General Jong-Shinn Wu in his opening remarks noted that Taiwan joined Sentinel Asia in 2010 as a Data Provider Node (DPN), providing FORMOSAT-2 and FORMOSAT-5 imagery for emergency response, supporting an average of 29 disaster events annually. In 2022, TASA also became a Data Analysis Node (DAN) and, in 2023, contributed to 20 disaster analyses—ranking second only to JAXA.Wu added that with the upcoming FORMOSAT-8 optical constellation and FORMOSAT-9 SAR constellation, Taiwan will further enhance Sentinel Asia's disaster response capabilities and fulfill its global responsibility as an active member of the international community..

Fig 5 Group photo of the SC f2f meeting at TASA

Organization	**Center for Research and Application for Satellite Remote Sensing, Yamaguchi University**
Title	**Participation for the SC and Capacity Building on JPTM**
Type of Activity	**Participation for the SC and Capacity Building on JPTM**
Date	**2024**

- Participation for the Steering committees

  Yamaguchi University participated in the two Sentinel Asia Steering Committee Meetings, “22nd Steering Committee Meeting of Sentinel Asia (Taiwan)” and “24th Steering Committee Meeting of Sentinel Asia (Sri Lanka)” which were held in 2024. At each meeting, Yamaguchi University provided explanations about Value Added Products and progress reports on the Sentinel Asia.

- 9th Joint Project Team Meeting

  Yamaguchi University participated in the JPTM held in the Philippines in November 2024. During the meeting, Professor Nagai and Dr. Arnob conducted a hands-on training session for participants on data analysis using satellite images at the training workshop session.