



Sentinel Asia

# Recent Activities of Sentinel Asia Since 2023

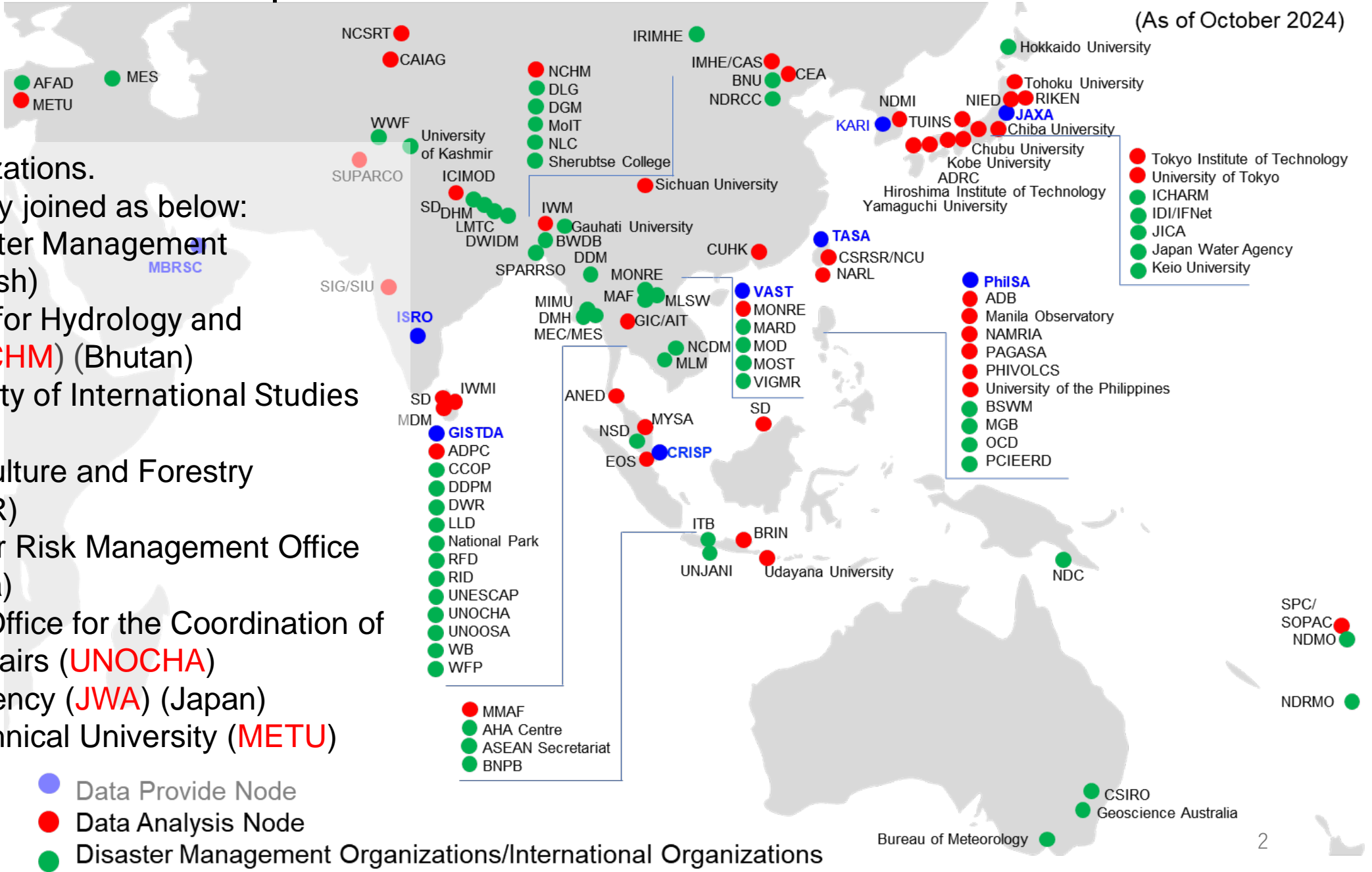
9th Joint Project Team Meeting  
November 5, 2024

Deputy Executive Secretariat of Sentinel Asia  
Goro Takei



# 1. Membership Status of Sentinel Asia

(As of October 2024)



In total: **122** organizations.

**8** organization newly joined as below:

- International Water Management (IWM)(Bangladesh)
- National Center for Hydrology and Meteorology (NCHM) (Bhutan)
- Toyama University of International Studies (TUINS)(Japan)
- Ministry of Agriculture and Forestry (MAF)(Laos PDR)
- National Disaster Risk Management Office (NDRMO)(Tonga)
- United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA)
- Japan Water Agency (JWA) (Japan)
- Middle East Technical University (METU) (Türkiye)

- Data Provide Node
- Data Analysis Node
- Disaster Management Organizations/International Organizations

## 2. Emergency Observation Request by Geographical Distribution



### 3.1 Earthquake in Noto Peninsula, Japan January 1<sup>st</sup>, 2024

On January 1st, 2024 at 16:10 (Japan Standard Time), a **magnitude 7.6 earthquake** struck the **Noto Peninsula** in Ishikawa Prefecture, Japan. **4m tsunami** damaged at approximately 160 hectares in Suzu City and Noto City. The local government confirmed at least **241 deaths, 1,296 people were injured. More than 60,614 houses** are reported to be collapsed/damaged.

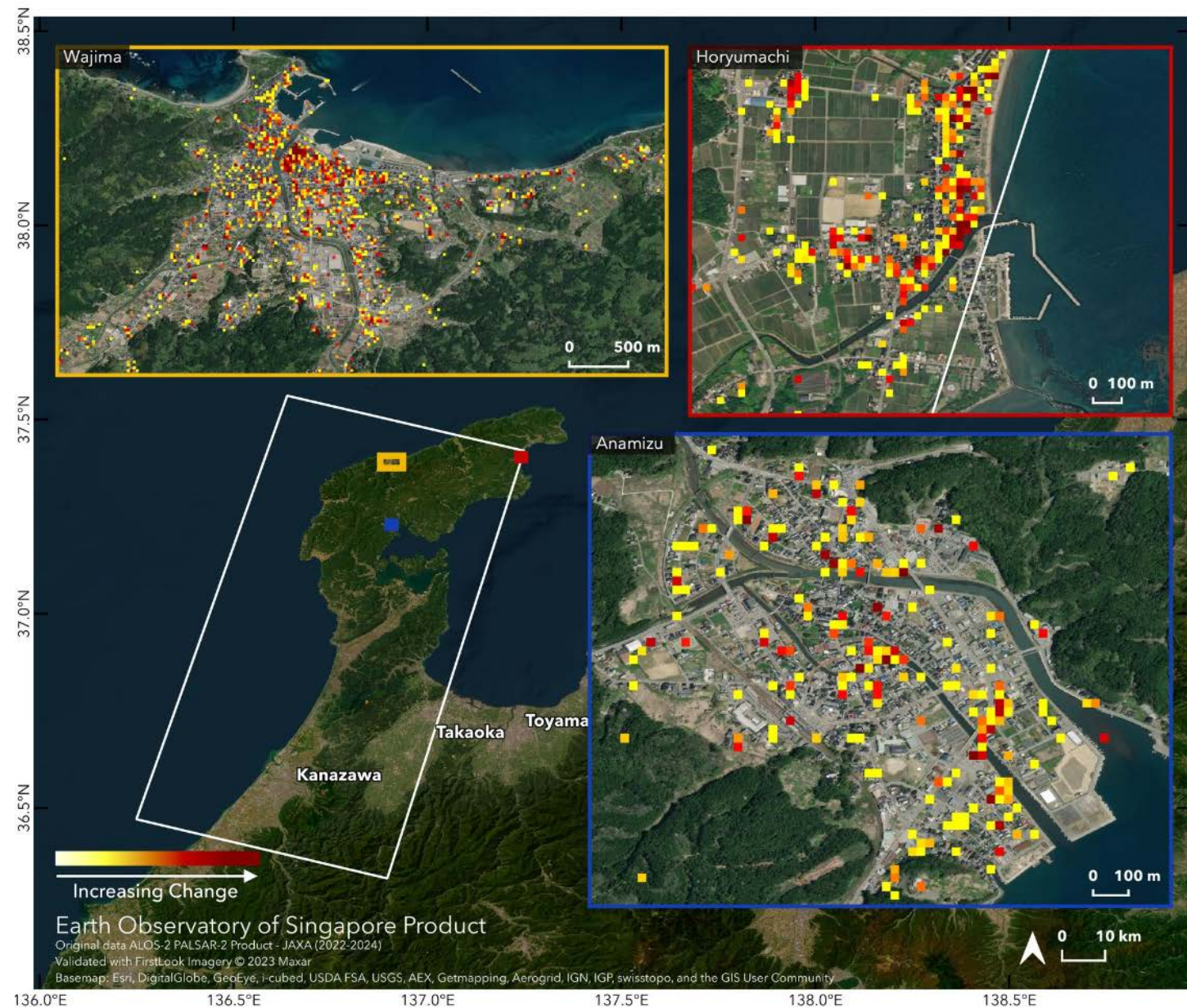
Satellite images were provided by ISRO, JAXA, MBRSC, and TASA  
VAPs were provided from AIT, EOS, MBRSC, and TASA



# 3.1 Earthquake in Noto Peninsula, Japan January 1<sup>st</sup>, 2024

EOS provided Damage Proxy Maps on January 6th to 8th analyzing ALOS2 images taken on January 2nd.

EOS has extraordinary techniques to extract damaged buildings from SAR images.



EOS-RS Damage Proxy Map: Japan, Earthquake, 2 Jan 2024, v0.5

The Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS) created this preliminary Damage Proxy Map (DPM) depicting areas that are likely damaged in Noto, Japan due to the M7.6 earthquake that occurred on 1 Jan 2024. This map was derived from synthetic aperture radar (SAR) images acquired by the ALOS-2 satellite operated by the Japan Aerospace Exploration Agency (JAXA) before (22 Nov 2022 and 6 Jun 2023) and after (2 Jan 2024) the event.

The map covers an area indicated by white polygon. Each pixel measures about 25m meters across. The colour variation from yellow to red indicates increasingly more significant surface change. Preliminary validation was done by comparing with high-resolution optical imagery and media reports. This map could be used as a guidance to identify damaged areas, and may be less reliable over vegetated areas. Scattered pixels over vegetated areas may be false positives, and a lack of colored pixels over vegetated areas may not mean no damage.

Data were provided by Sentinel Asia and analyzed by the Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS).

More map details and files at: [https://eos-rs-products.earthobservatory.sg/EOS-RS\\_202401\\_Japan\\_Earthquake/](https://eos-rs-products.earthobservatory.sg/EOS-RS_202401_Japan_Earthquake/)

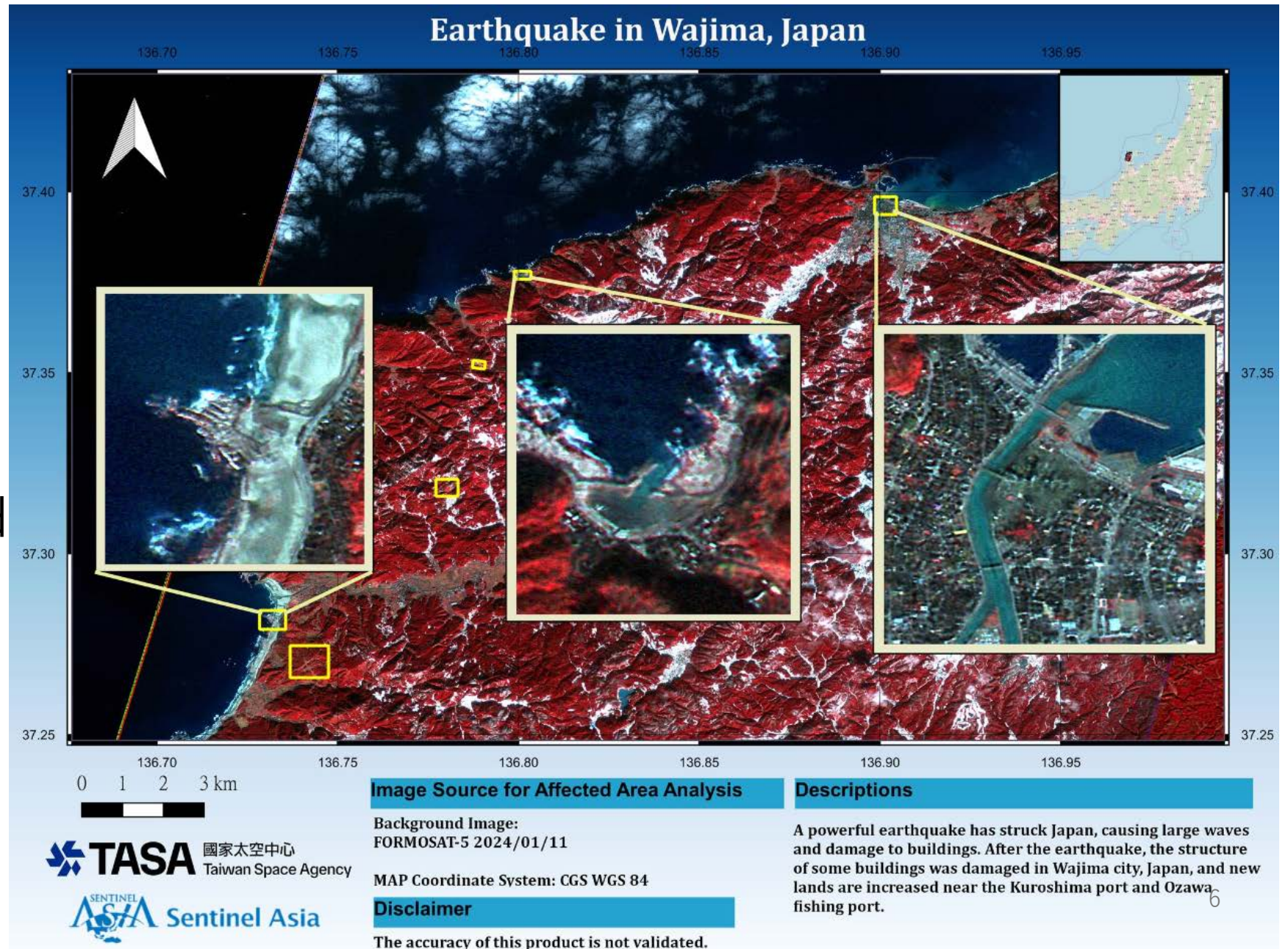
Credits: Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS), Original data ALOS-2 PALSAR-2 Product - JAXA (2022-2024), Validated with FirstLook Imagery © 2024 Maxar



### 3.1 Earthquake in Noto Peninsula, Japan January 1<sup>st</sup>, 2024

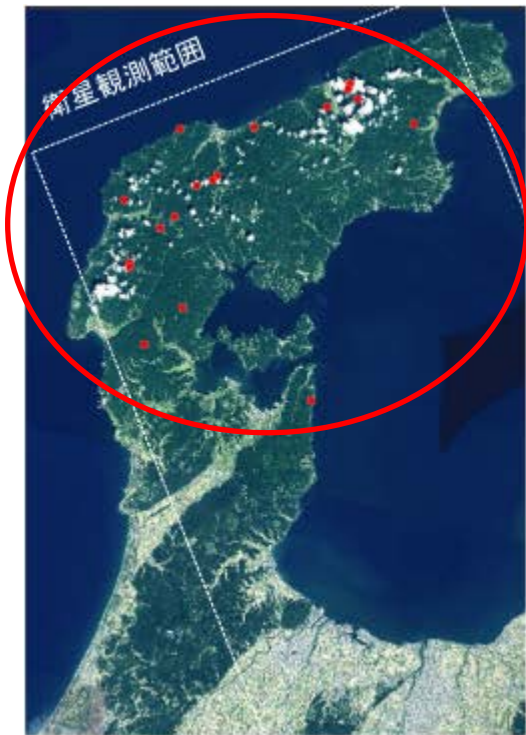
TASA provided satellite image of January 11th and provided VAPs.

The VAP shows the burnt area of the farmer's market and area damaged by tsunami around the coast

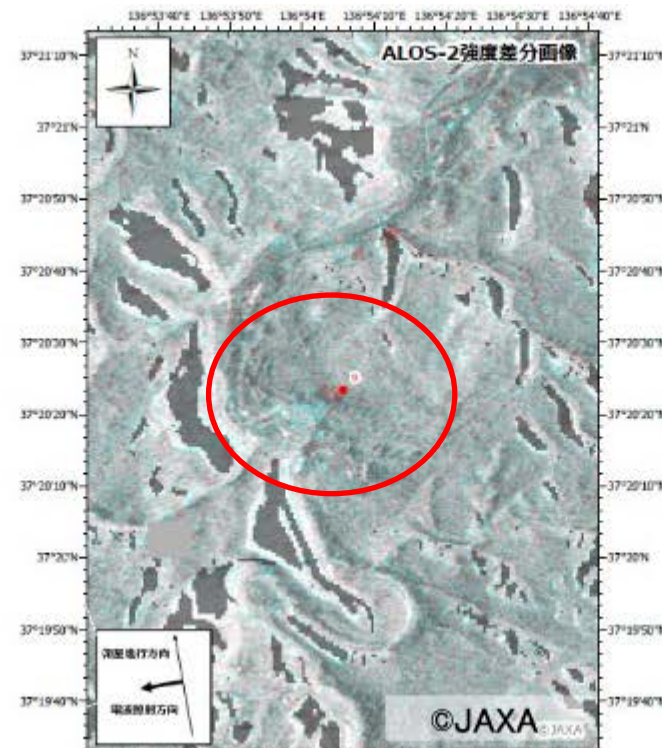


### 3.1 Earthquake in Noto Peninsula, Japan January 1<sup>st</sup>, 2024

In Japan, JAXA took ALOS2 SAR Images on the night of January 1st, and they were used to identify possible landslides and utilized for investigation by helicopters on January 2nd.



Landslide Map



ALOS2 Image



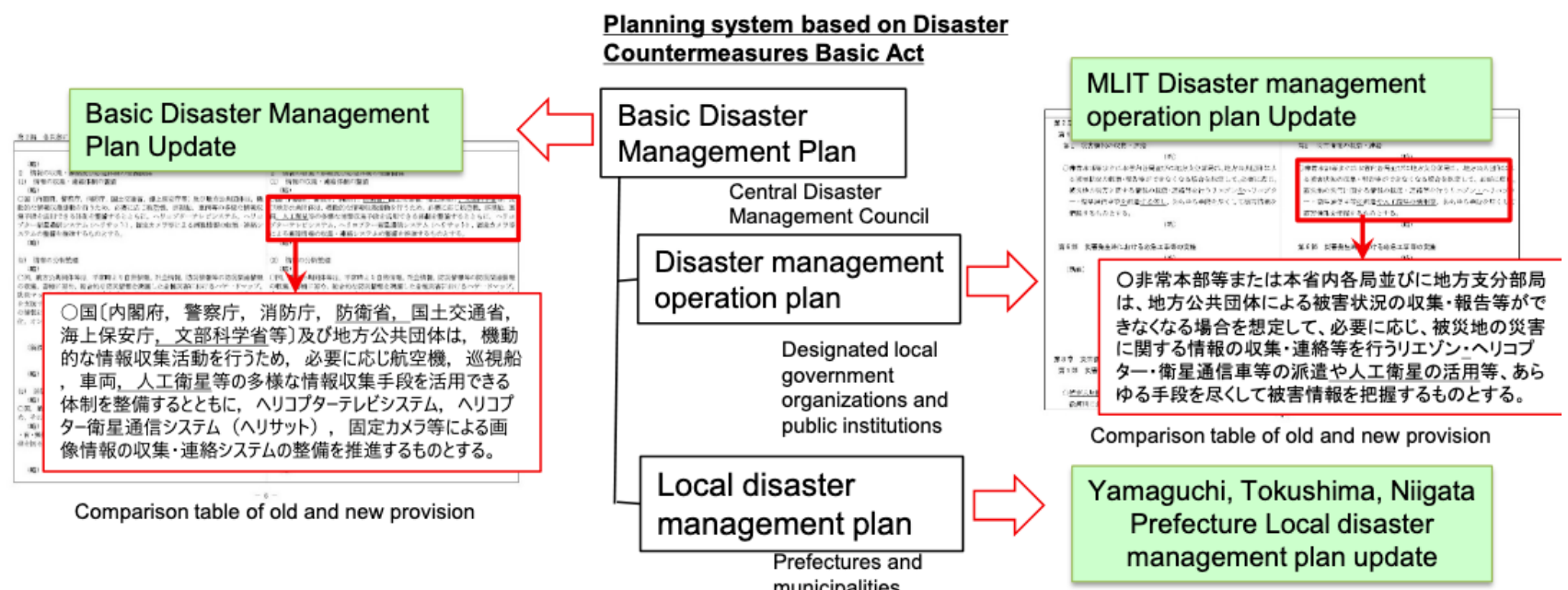
Helicopter Photo

Red Dot indicates the suspected Landslide spots

# 3.1 Earthquake in Noto Peninsula, Japan January 1<sup>st</sup>, 2024

## “Utilization of Satellite Images including SAR” is explicitly written in Disaster Management Basic Plan of Japanese Government (Updated on June, 2024)

1. Disaster Management Basic Plan has been updated to include satellite as one of the method for disaster information collection. (approved by the Central Disaster Management Council on Apr. 11, 2017)
2. Local disaster management plan of some prefecture has been updated to include satellite as one of the method for disaster information collection. (Yamaguchi: May, 2017 Tokushima: Oct. 2017 Niigata: Mar. 2018)
3. Disaster management operation plan of Ministry of Land,Infrastructure,Transport and Tourism (MLIT) has been updated to include satellite as one of the method for disaster information collection.(Sep. 2018) The plan indicates that satellite can be used for all type of disaster in addition to anticipated large-scale earthquake such as Nankai Trough earthquake.

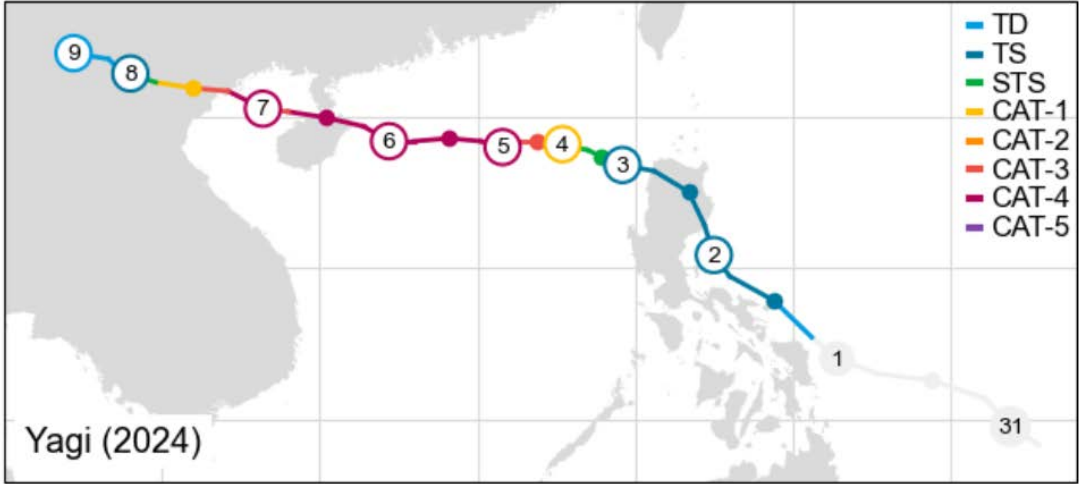




### 3.2 Super-Typhoon Yagi(Entag)

In the **Philippines**, 21 people were killed while 26 others were reported missing. In **Vietnam**, over 329,000 structures were affected and 325 people died, with 24 more missing; a majority of the casualties were caused by landslides. The remnants of Yagi caused catastrophic flooding and landslides in **Myanmar**, where 433 deaths and 79 missing were confirmed. These remnants also caused extensive flooding and deaths in **Laos** and **Thailand**. In total, the typhoon caused at least 844 deaths, 2,279 injuries, and left 129 people missing. Yagi also damaged, flooded or destroyed over 741,800 structures, resulting in US\$16.6 billion in damage across eight countries and territories.

Figure 1: Track of Typhoon Yagi. Circled numbers indicate its position at 08:00 CST on the day.

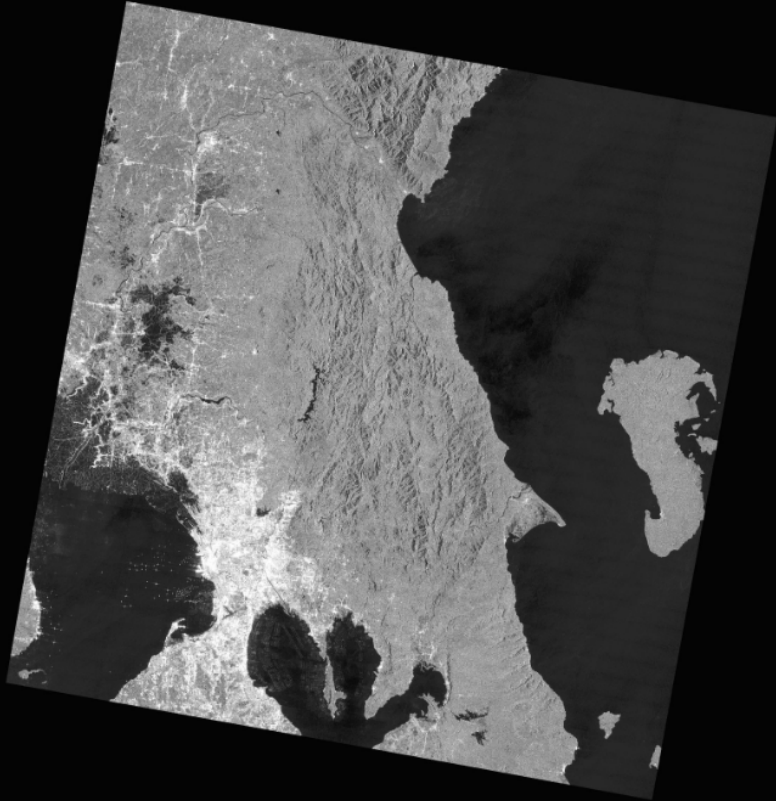


Source: JTWC, Graphics: Guy Carpenter

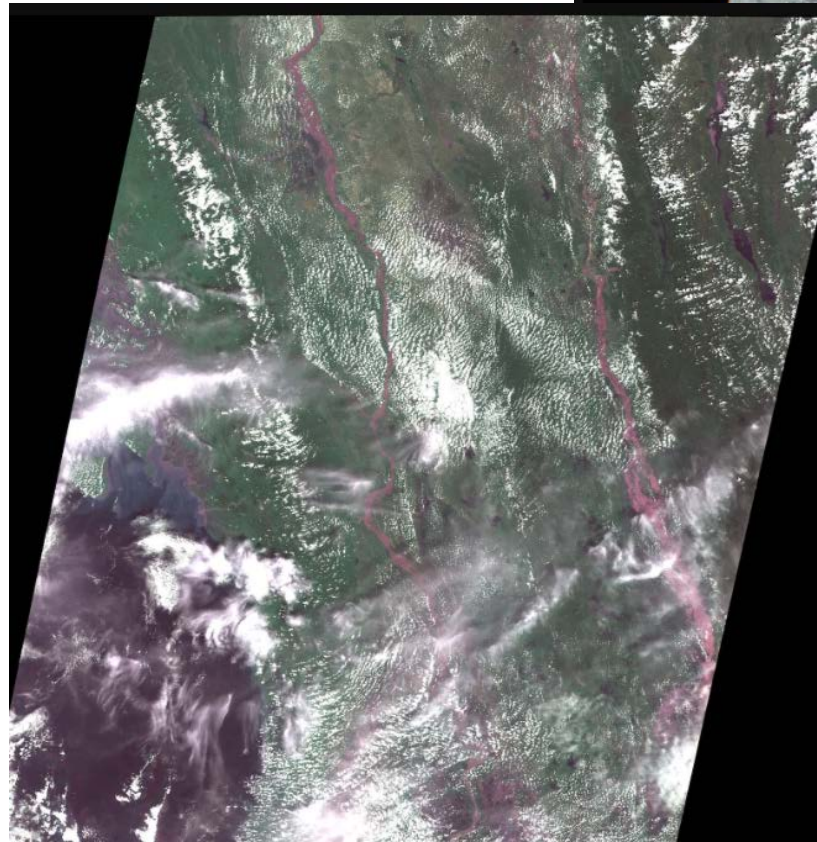
	Date of Acceptance	Requester	Provider of Satellite Images	Provider of Value Added Products
Philippines	9/2	PhilSA	ISRO, JAXA, TASA,	AIT, MBRSC
Vietnam	9/8	MONRE	JAXA	AIT, EOS, MBRSC, JAXA
Laos PDR	9/12	AHA Centre	JAXA, TASA	AIT, IWM, MBRSC
Thailand	9/10	GISTDA	ISRO, JAXA, MBRSC, TASA,	AIT, MBRSC
Myanmar	9/11	UNDP MIMU	CRISP, ISRO, JAXA, TASA	AIT, IWM, MBRSC, UNWFP

## 3.2 Super-Typhoon Yagi(Entag)

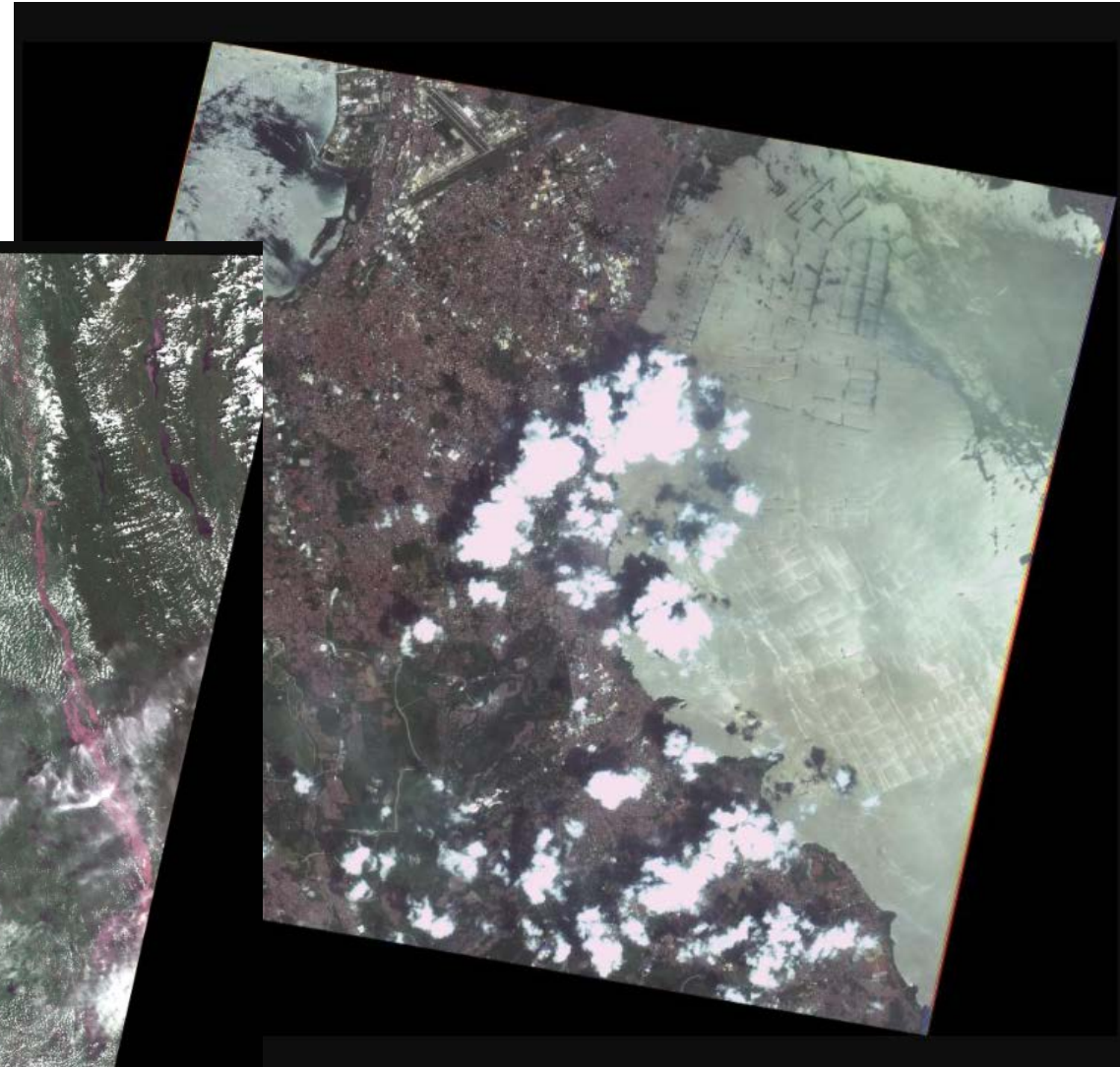
ISRO provided SAR images and  
Optical Images



ISRO Provided EOS-04 SAR images  
For Philippines

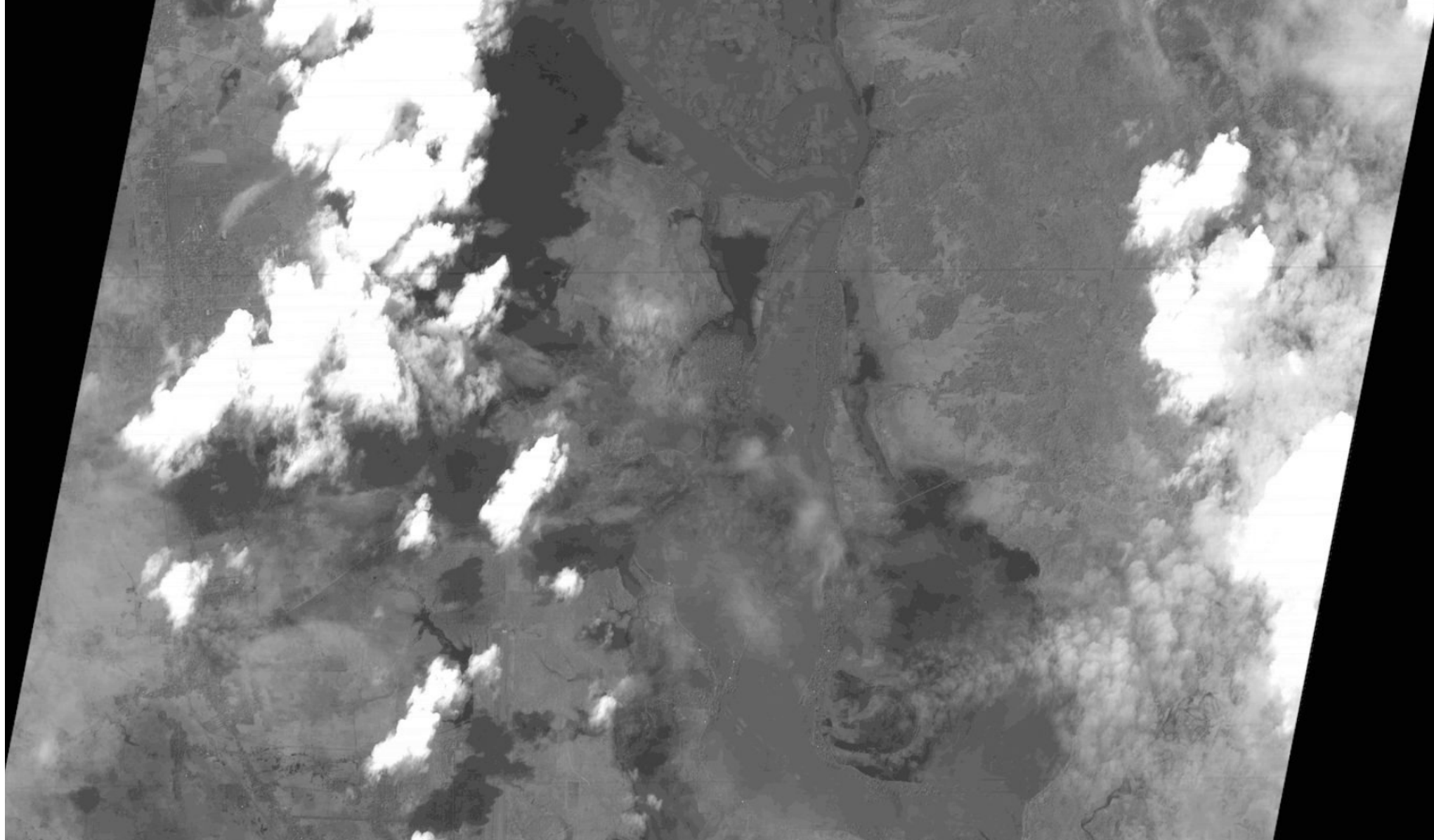


ISRO Provided Resourcesat2  
for Myanmar



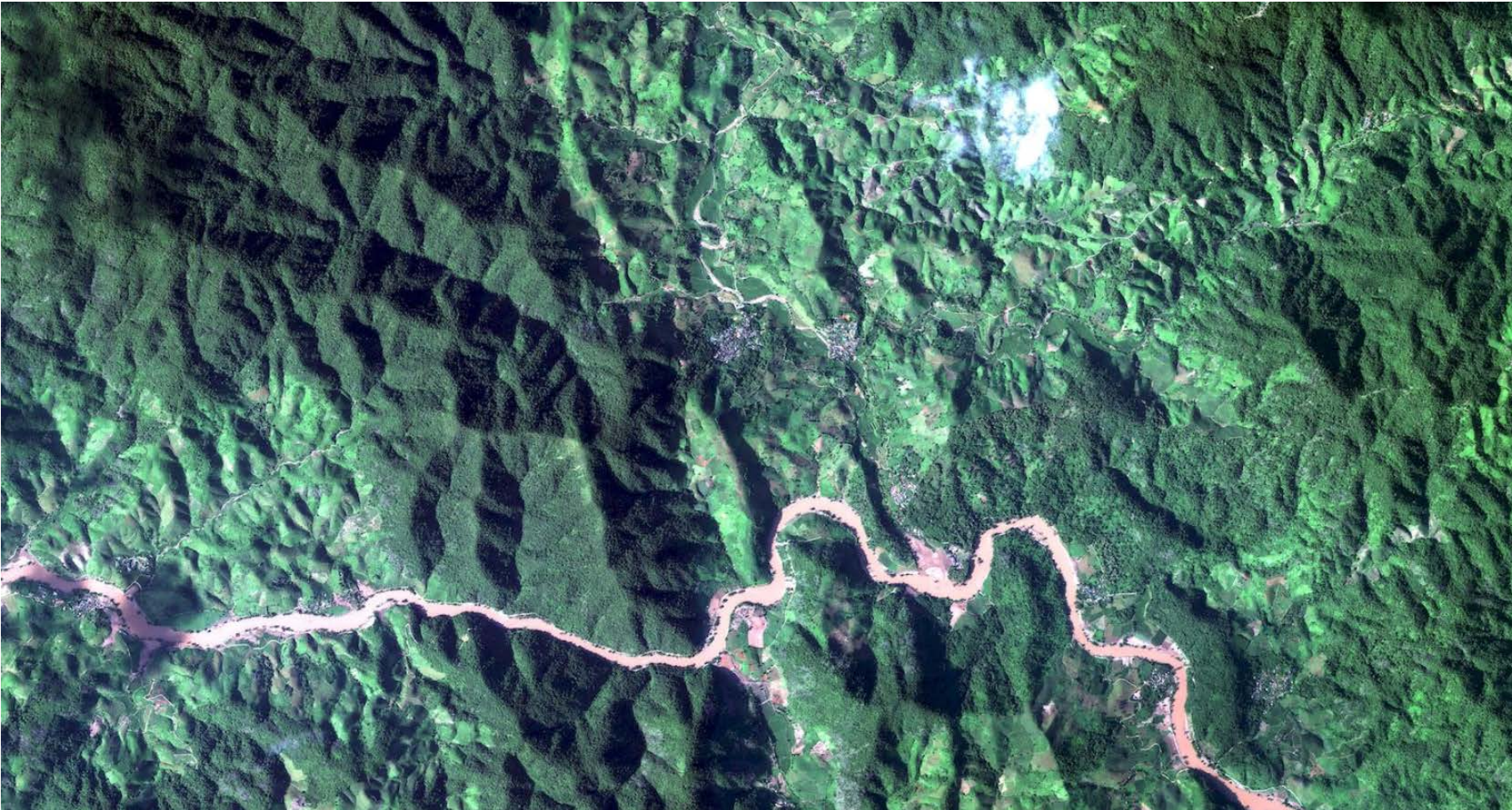
## 3.2 Super-Typhoon Yagi(Entag)

CRISP  
provided  
TELEOS-1  
images for  
Myanmar



## 3.2 Super-Typhoon Yagi(Entag)

MBRSC provided KalifaSat for Thailand  
Mud Flow can be visualized



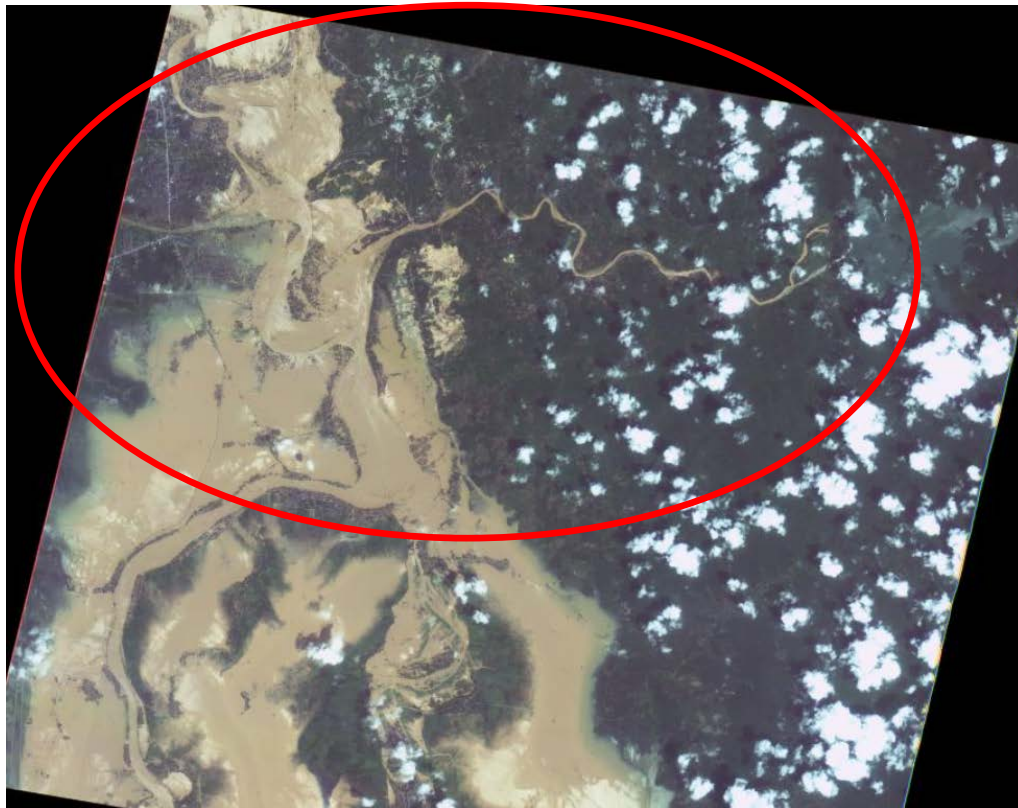
### 3.2 Super-Typhoon Yagi(Entag)

TASA Provided Formosat-5 images for Myanmar

9/16 and 9/20

Showing multi temporal images

The change in inundated area is shown



Formosat-5 Images 9/16



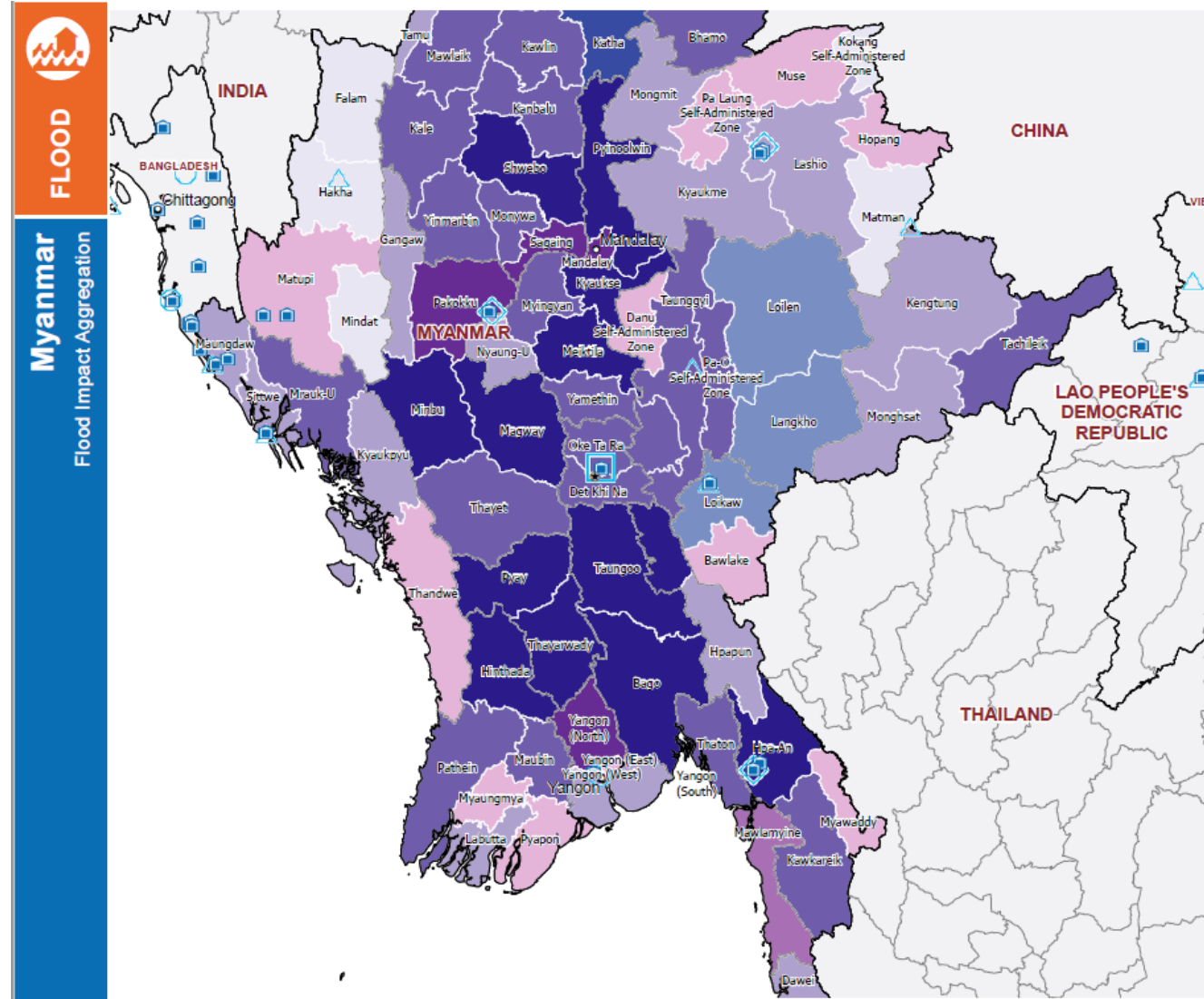
Formosat-5 Images 9/20

### 3.2 Super-Typhoon Yagi(Entag)

UNWFP provided Damage Assessment VAP for Myanmar.

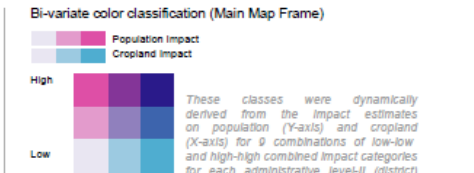
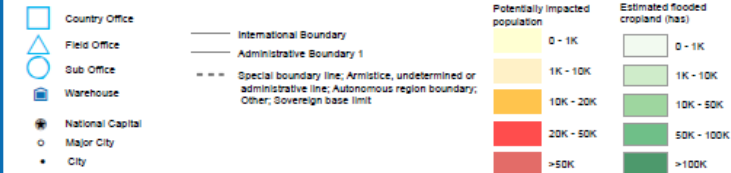
Darker area has more impact toward population and cropland.

VAP is used for estimating the volume of Humanitarian Aid



**FLOOD**

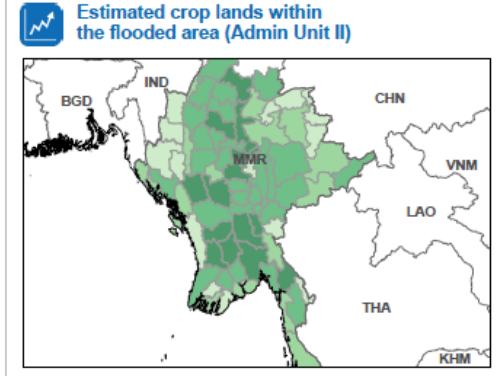
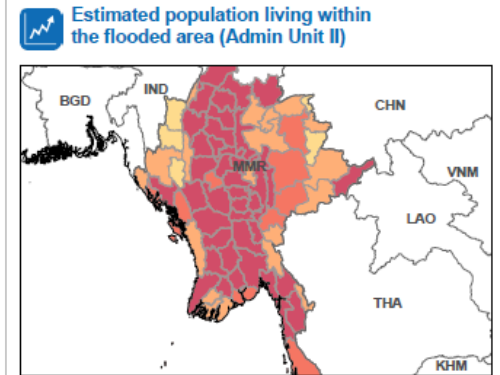
**Myanmar**  
Flood Impact Aggregation



**Flood Impact Data Aggregation**

Derived data are summarized by administrative unit II (admin2). For any boundary related concerns, please write to wfp.adam@wfp.org. This aggregated information is indicative and for planning purposes only.

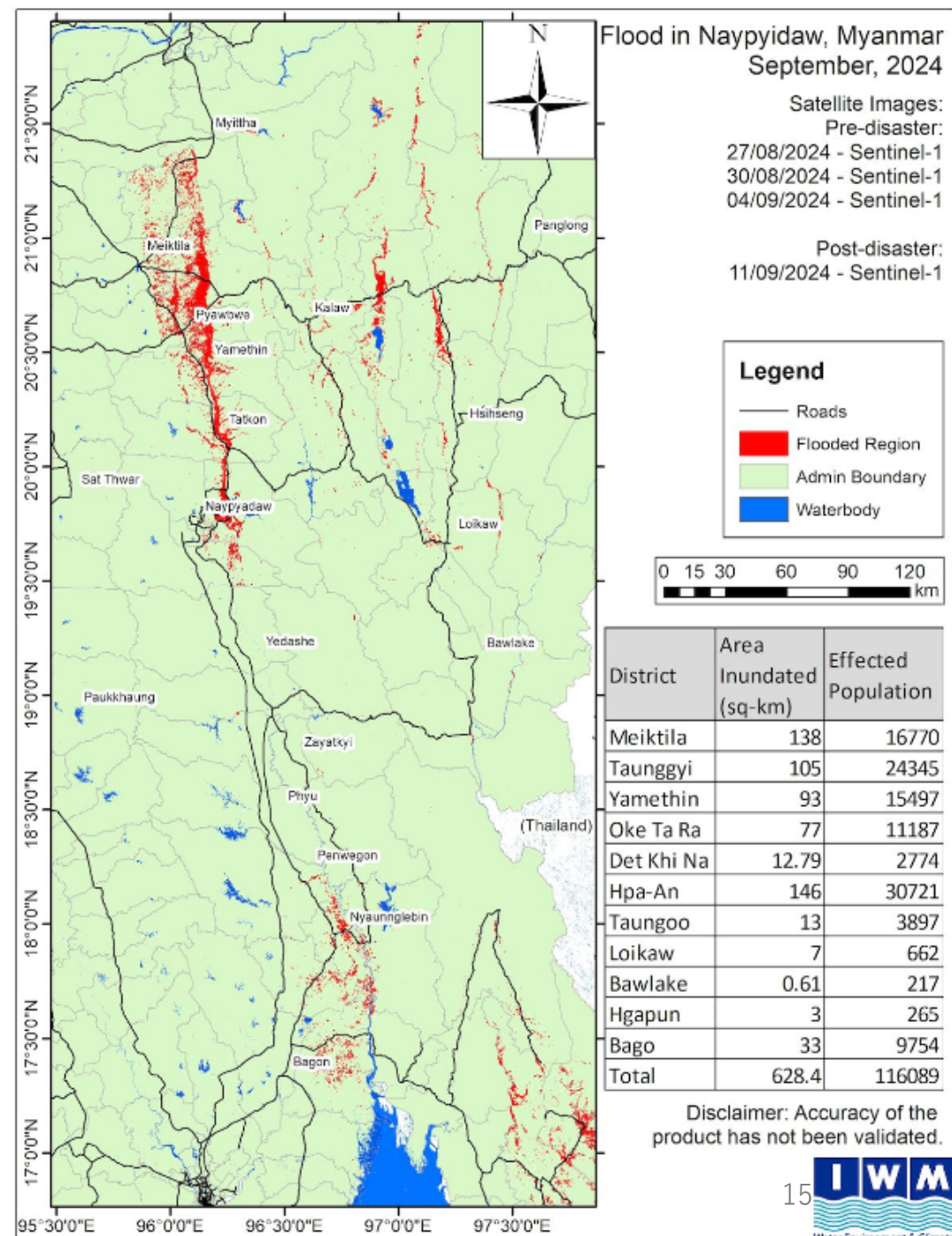
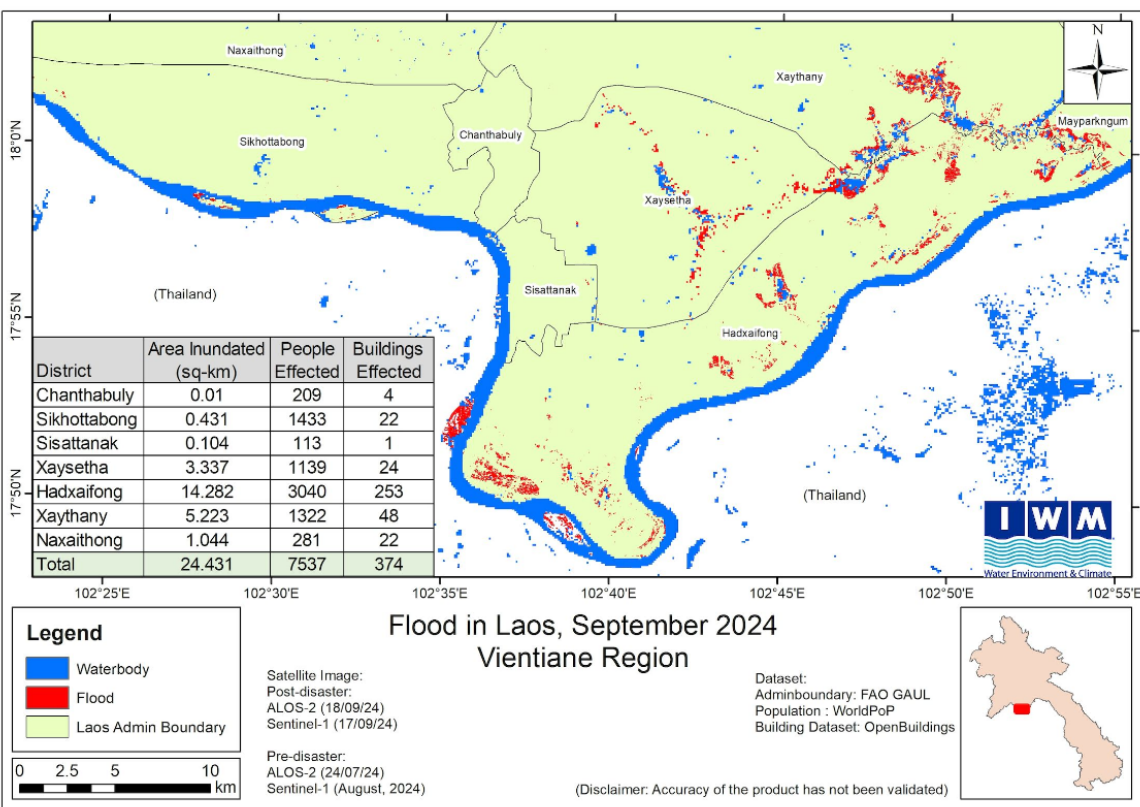
Global Data Sources:  
Population - WorldPop 2022  
Cropland Areas - NASA GFSAD30



**ADAM**  
Advanced Disaster Analysis and Mapping

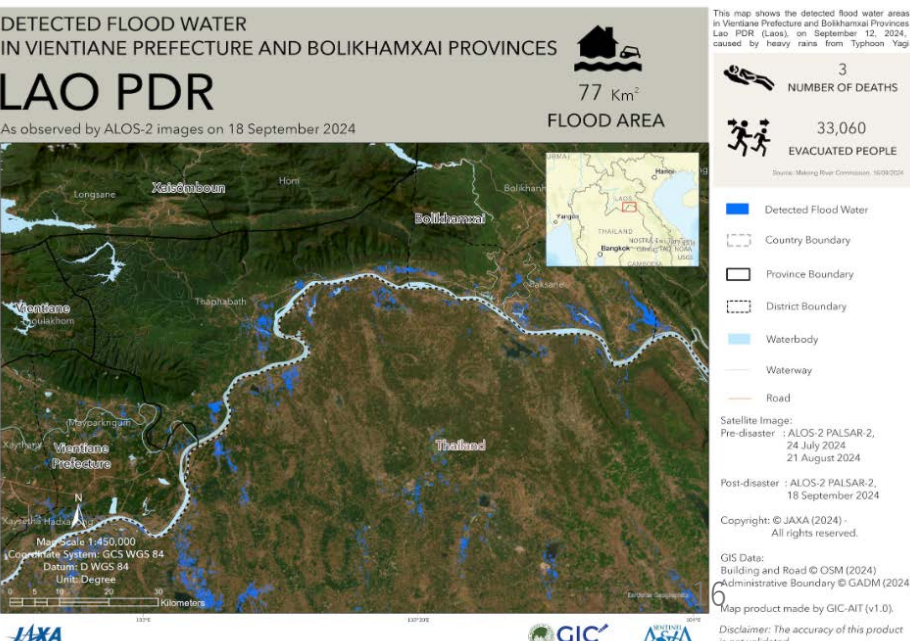
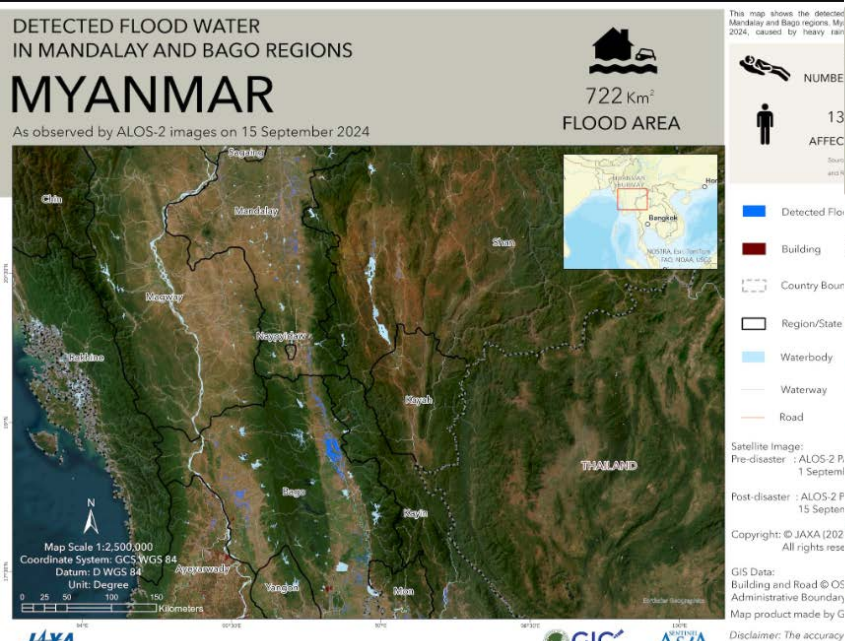
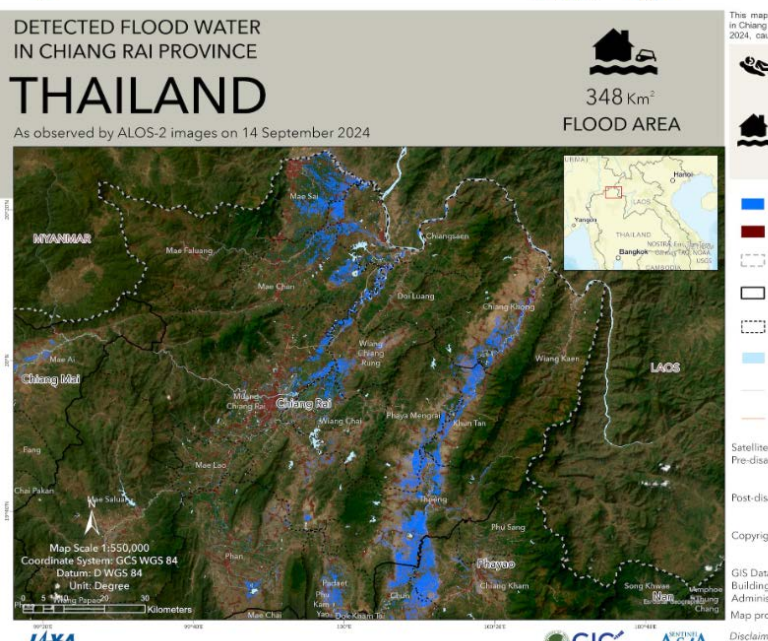
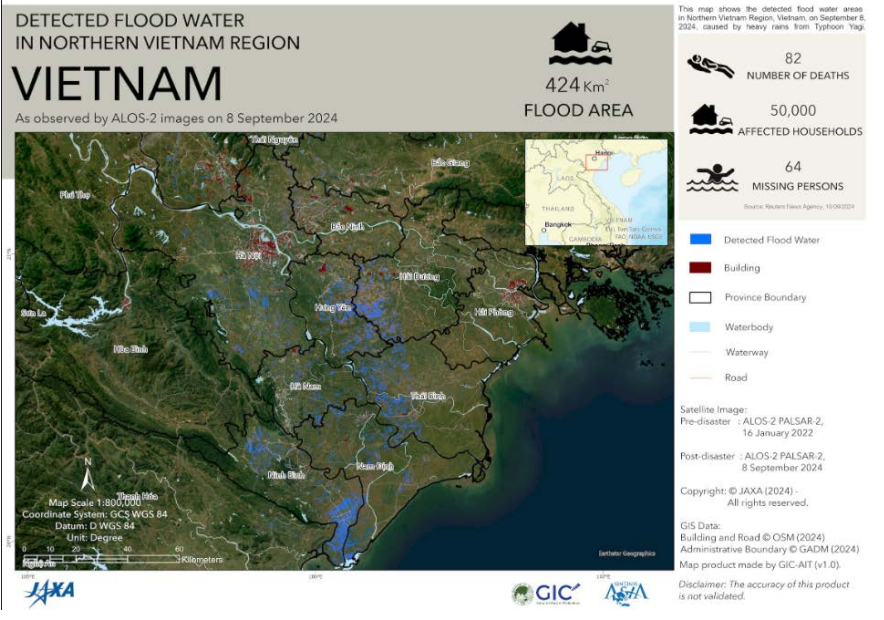
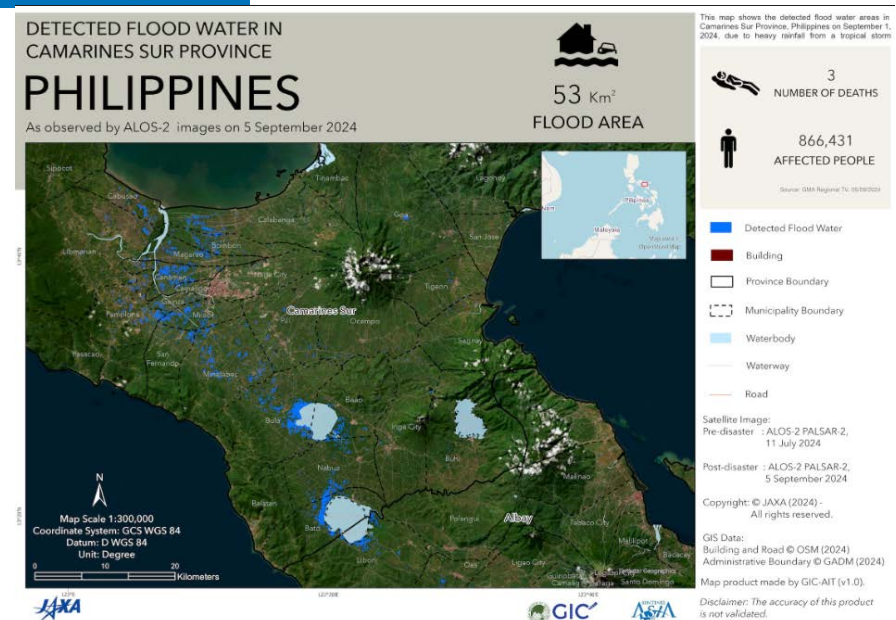
# 3.2 Super-Typhoon Yagi(Entag)

IWM, one of the new members of Sentinel Asia, provided VAPs for Laos and Myanmar, showing inundated area in red.



# 3.2 Super-Typhoon Yagi(Entag)

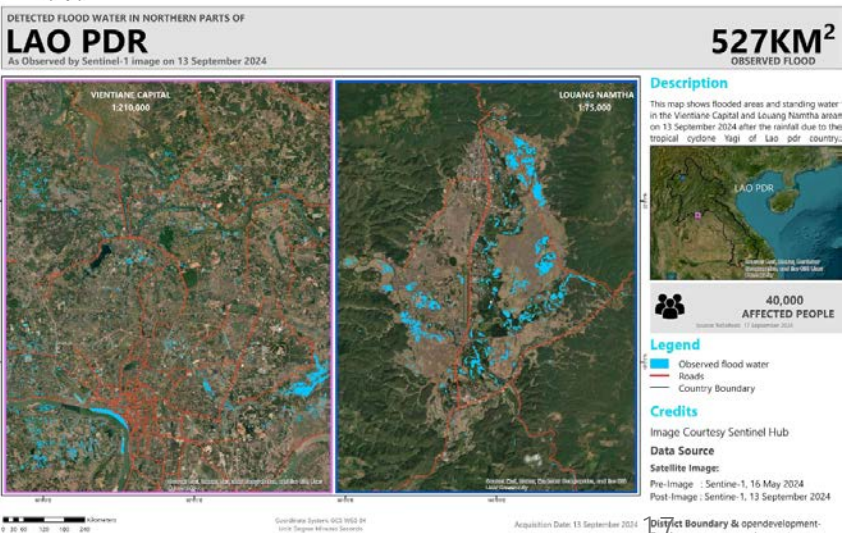
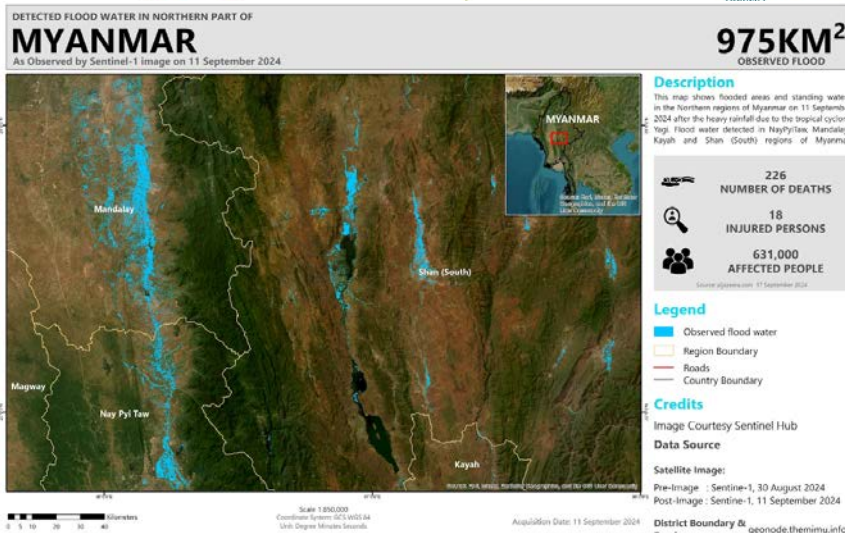
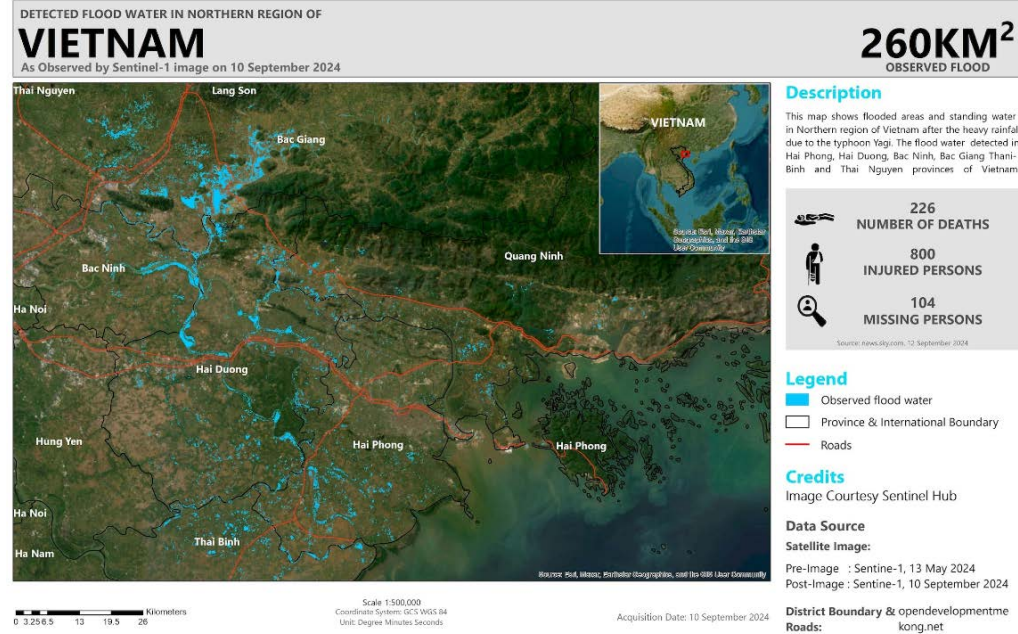
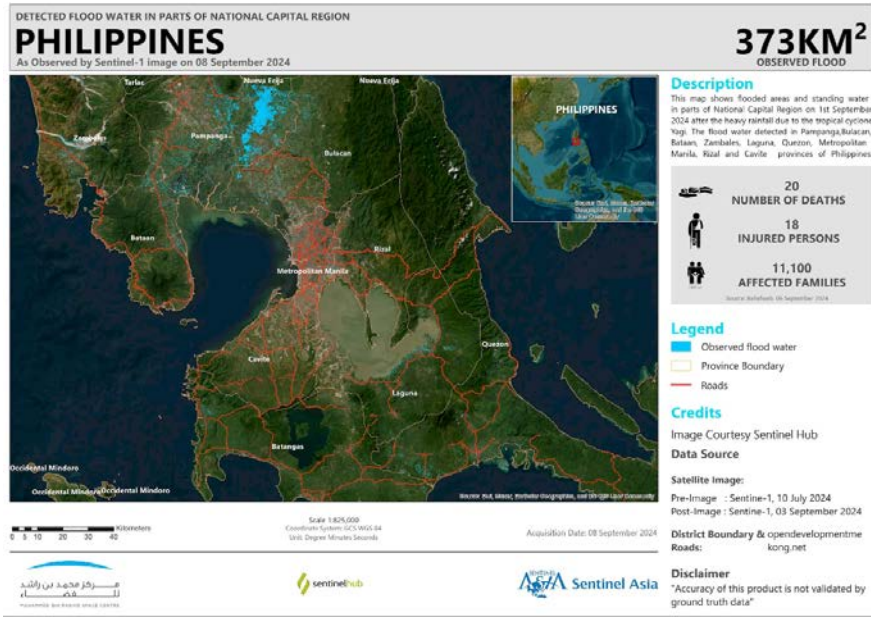
AIT provided VAPs for all countries using JAXA's ALOS2 images  
 Strong collaborative effort within Sentinel Asia





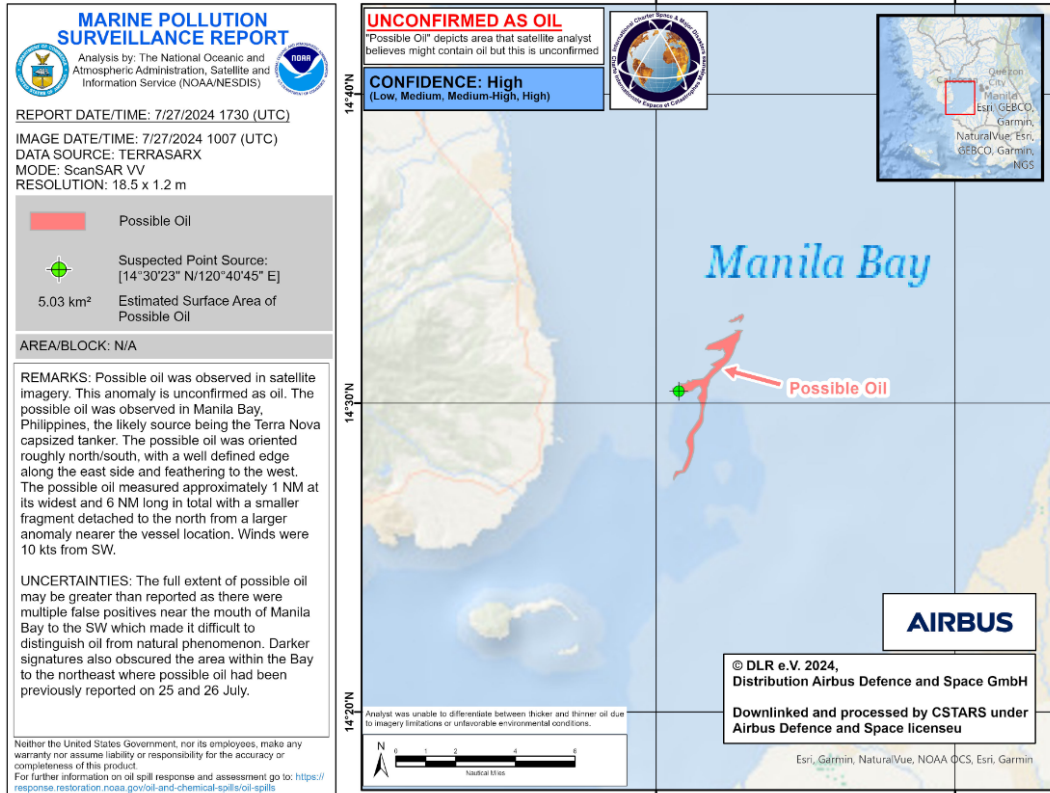
# 3.2 Super-Typhoon Yagi(Entag)

MBRSC provided VAPs for all countries using Sentinel 1 Images

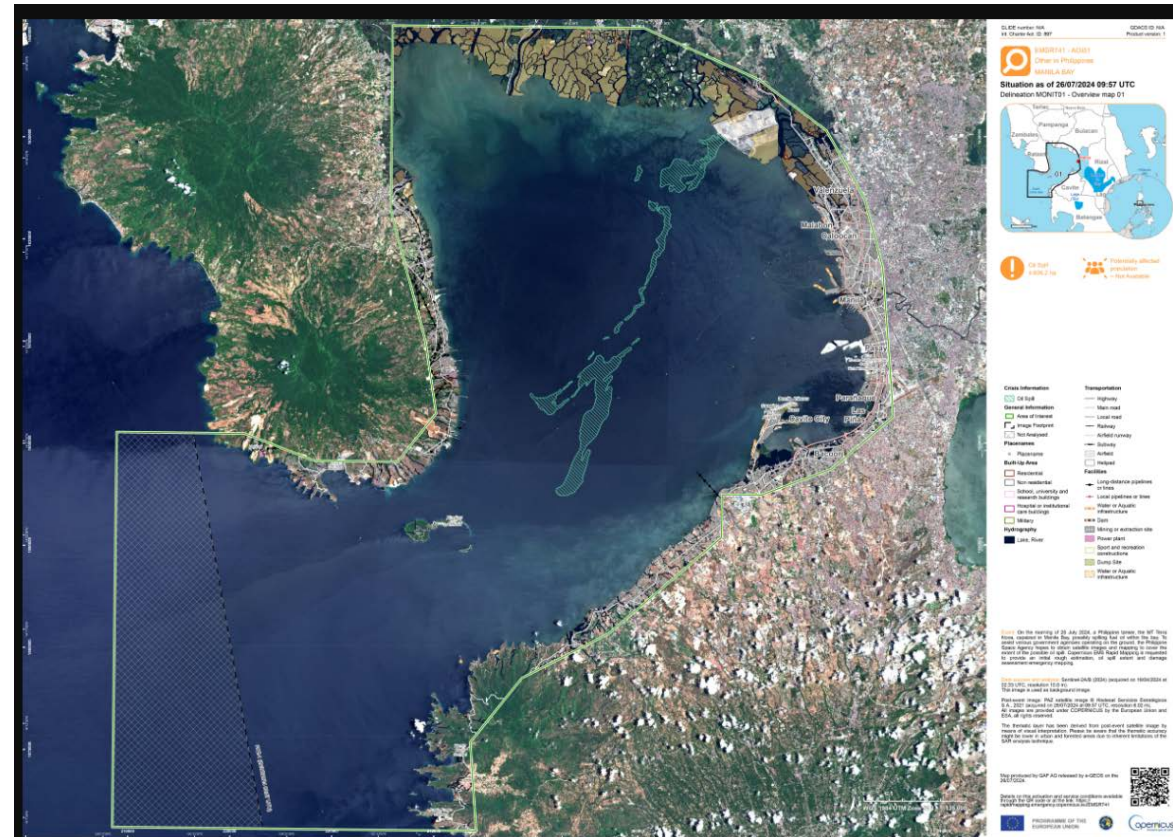


# 3.3 Sentinel Asia Escalation to International Disaster Charter Oil Spill in Philippines, Manila Bay July 25

- ✓ PhilSA requested emergency observation to Sentinel Asia on the Oil Spill in Manila Bay, Philippines and it was escalated to the Charter by request.
- ✓ 192 images were provided from CSA, ROSCOSMOS, ESA, CONAE, CNSA, DLR, ABAE, USGS(Blacksky), KARI.
- ✓ ESA, NOAA, PhilSA and UNITAR/UNOSAT created 14VAPs



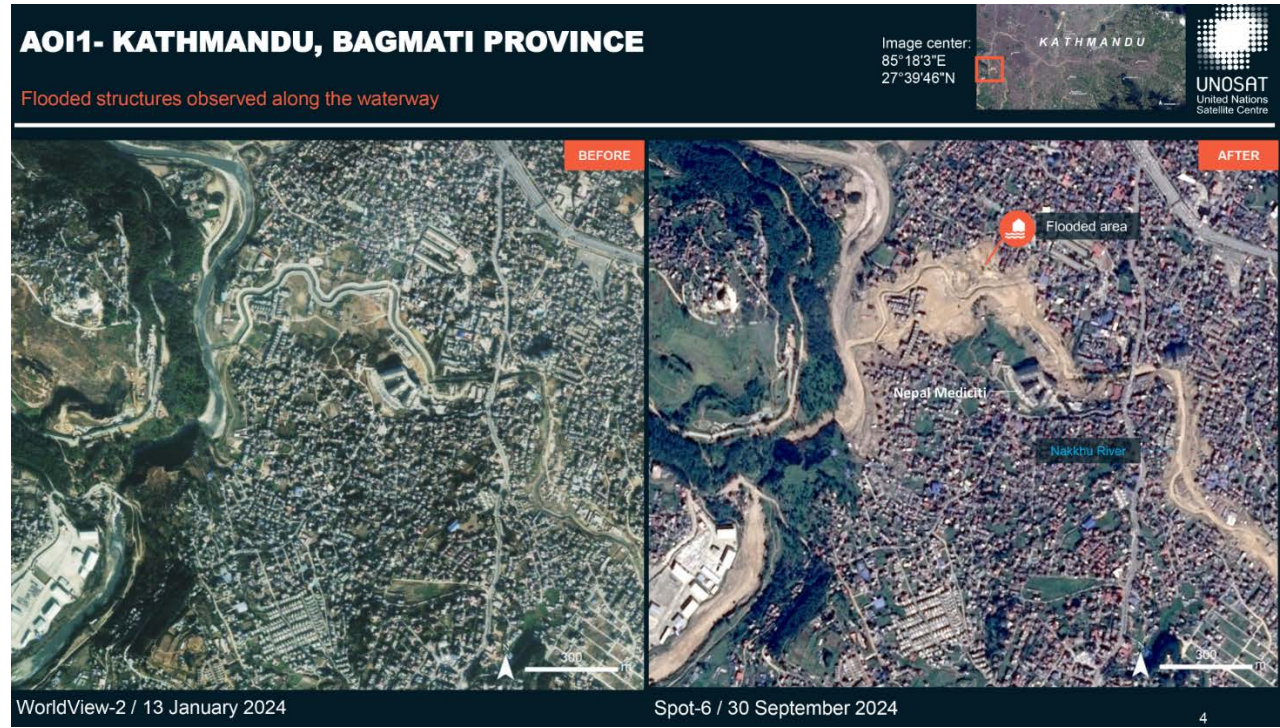
Source: TerraSARX acquired July 27, 2024 Copyright: DLR  
 Map produced by NOAA



Source: PAZ satellite Acquired: July 26, 2024 Copyright: Copernicus/ESA  
 Map produced by GAF AG by e-GEOS Copernicus/ESA

# 3.4 Sentinel Asia Escalation to International Disaster Charter Flood in Nepal September 29

- ✓ DHM requested emergency observation to Sentinel Asia on Flood in Nepal
- ✓ 29 images were provided from CSA, ROSCOSMOS, ESA, ISRO, CNSA, DLR
- ✓ ICIMOD and UNITAR/UNOSAT created 2 VAPs



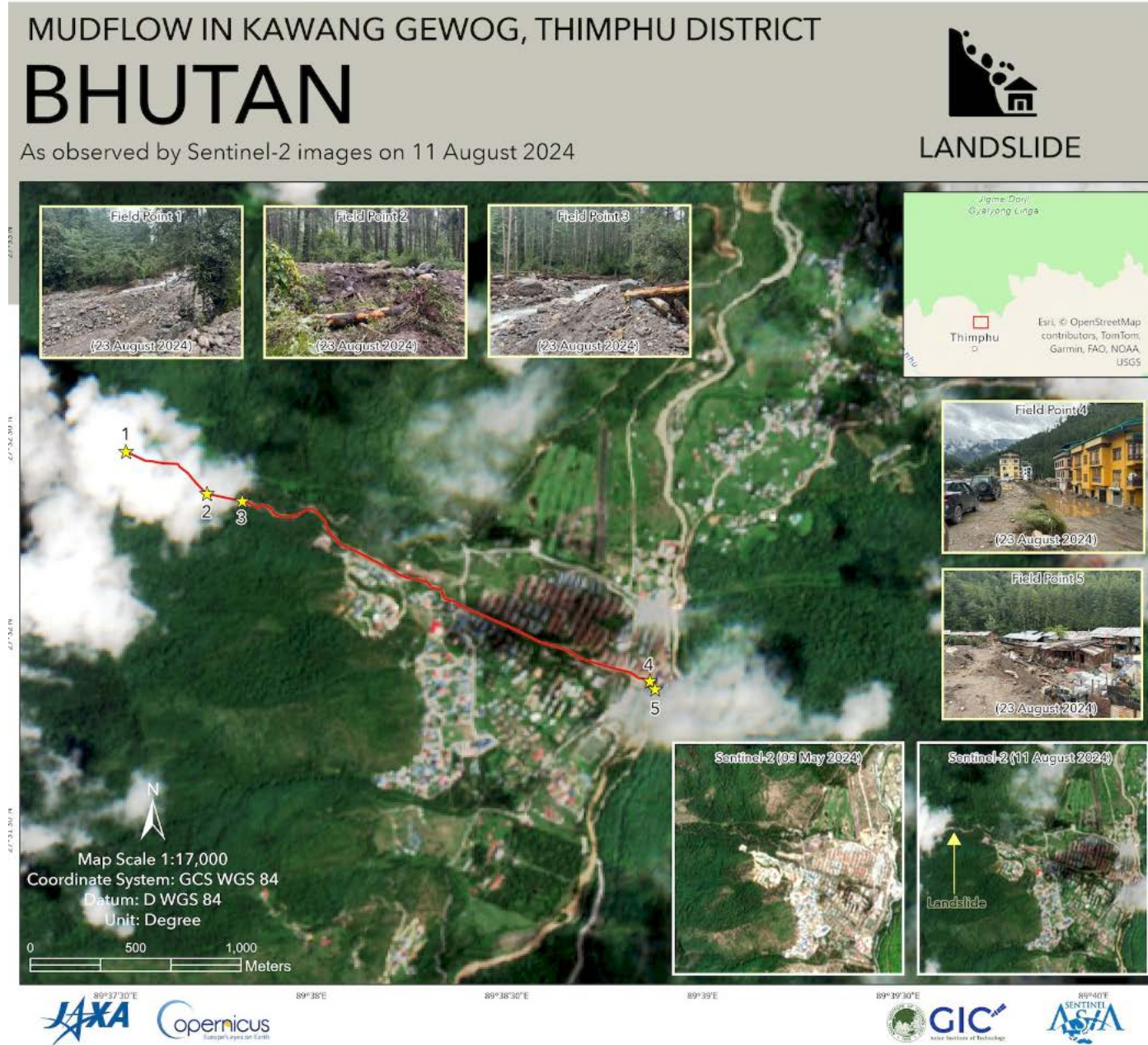
Source: Spot-6 Acquired: September 30, 2024 Copyright: ESA  
Map produced by UNITAR/UNOSAT

Source: Spot-6 Acquired: September 30, 2024 Copyright: ESA  
Map produced by ICIMOD

# 3.5 Flood and Landslide in Bhutan on August 10, 2024

There was a flash flood at north of Thimphu, Bhutan.

AIT and JAXA performed field survey to collect Ground Truth Data at the timing of GLOF Training



This map shows the mudflow in Kawang Gewog, Thimphu District, Bhutan, on August 10, 2024, due to landslides

	0	NUMBER OF DEATHS
	70	AFFECTED HOUSEHOLDS
	15	AFFECTED VEHICLES

Source: Kuensel newspaper, 12/08/2024

Satellite Image:  
Pre-disaster image : Sentinel-2, 03 May 2024  
Post-disaster image : Sentinel-2, 11 August 2024

Contains modified Copernicus Sentinel data (2024)

GIS Data:  
Road © OSM (2024)  
Administrative Boundary © GADM (2024)

Map product made by GIC-AIT (v1.0).

## 4.1 GLOF Training in Bhutan by AIT and JAXA August 2024

AIT, ISRO and JAXA provided 3day training for Capacity Building regarding Glacier Lake Outbreak Flood(GLOF) in Bhutan.

14 GIS experts attended the training, learning

- 1) Obtaining satellite data
- 2) Glacier Lake Detection and Mapping
- 3) Multi Temporal Analysis
- 4) Velocity Mapping of Glacier Lakes



## 4.2 Workshop in Nepal (November 2023) ADRC and JAXA



Interview at DHM, ICIMOD,  
and NDRRMA (before WS)



## 4.3 Workshop in Türkiye (December 2023) ADRC and JAXA



### Interview at AFAD and METU (before WS)





Sentinel Asia

## 4.4 Visit to Kyrgys by ADRC and JAXA (October 2024)

ADRC and JAXA participated in CAIAG's 20th year Anniversary event



ADRC presented Sentinel Asia activities.

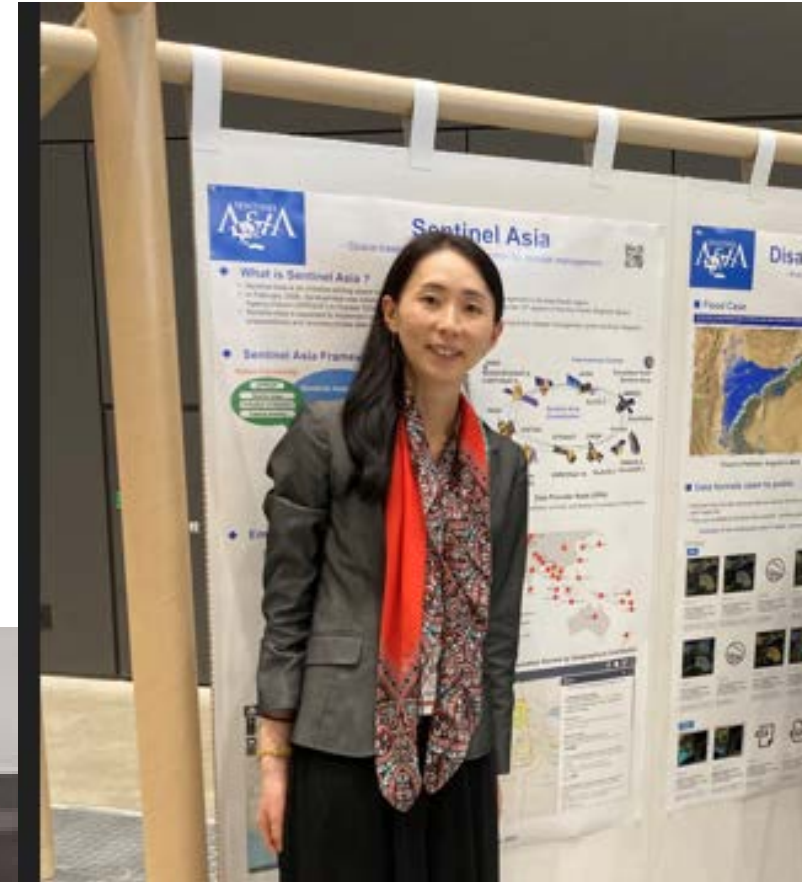




## 5.1 Understanding Risk Global Forum 2024 by World Bank @ Japan

- ✓ Understanding Risk Global Forum 2024 was held from June 16-21, 2024
- ✓ More than **1,700 participants from 135 countries**
- ✓ **JAXA ran an exhibition booth** for Sentinel Asia.

**JAXA presented at panel discussion** of “Space in Disaster Risk Reduction “ among NASA, ESA, ADB, and World Bank experts, expressing Sentinel Asia’s contribution towards utilization of satellite images for disaster response.



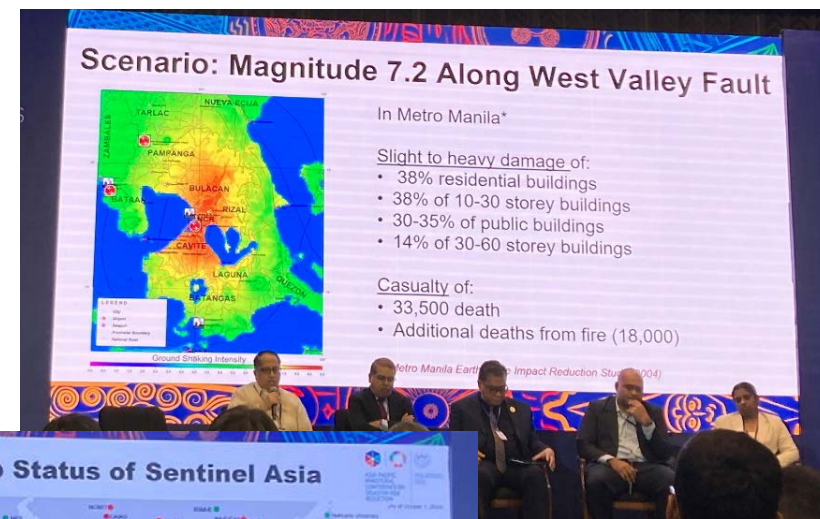
## 5.2 Asia-Pacific Ministerial Conference On Disaster Risk Reduction @ Philippine

- ✓ The Asia-Pacific Ministerial Conference on Disaster Risk Reduction 2024 (APMCDRR2024) was held from October 14 to 18, 2024
- ✓ More than 4,000 participants from 60 countries
- ✓ JAXA ran an exhibition booth for Sentinel Asia.



# 5.2 Asia-Pacific Ministerial Conference On Disaster Risk Reduction @ Philippine

**ADRC, PhilSA, PHIVOLCS, and JAXA made their presentation** at the 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**” coordinated by JICA



Thank you for your Attention