



Sentinel Asia

Recent Activities of Sentinel Asia Since 2020

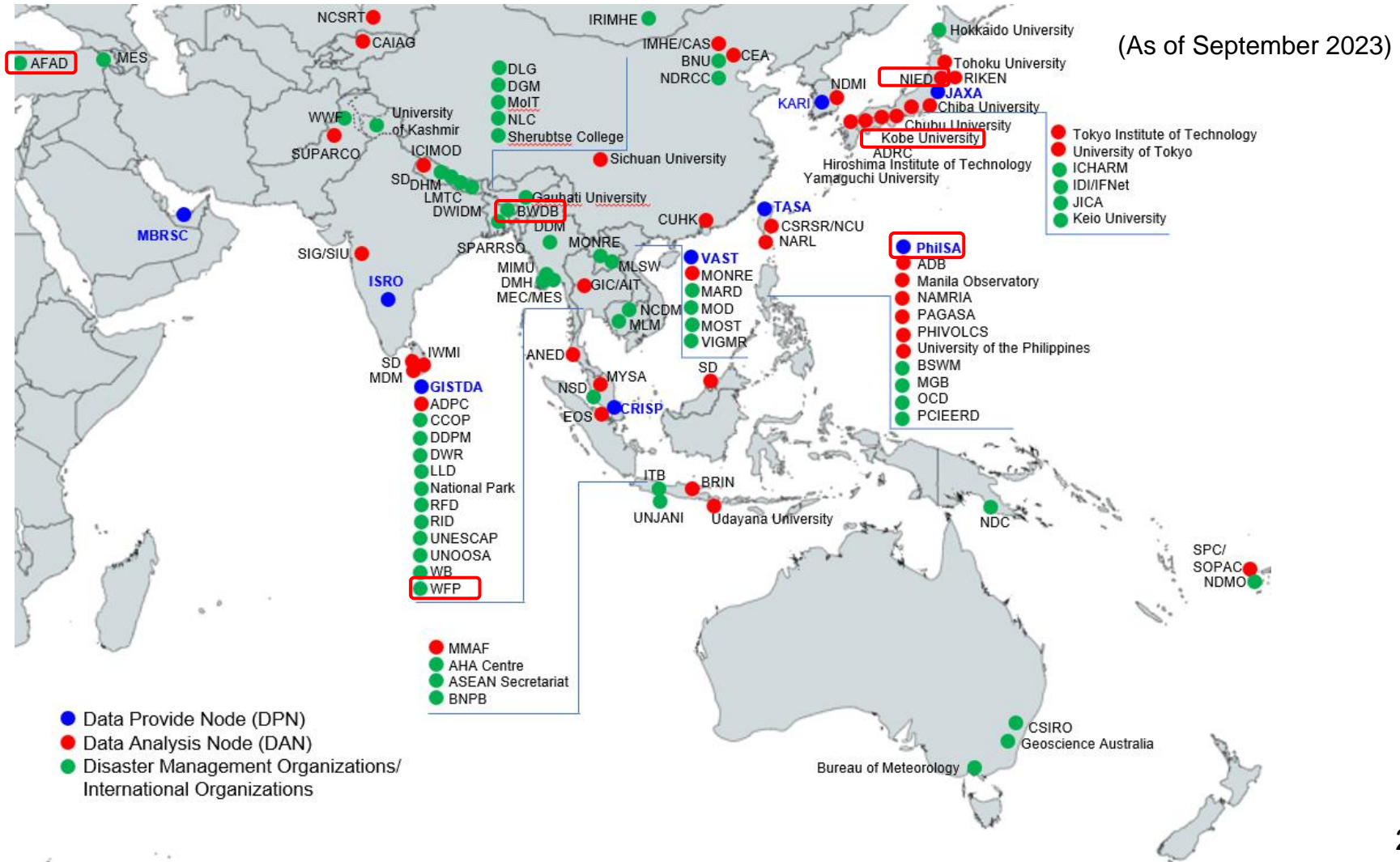
8th Joint Project Team Meeting
September 17, 2023

Deputy Executive Secretariat of Sentinel Asia
Goro Takei

1. Membership Status of Sentinel Asia

In total: **114** organizations. **6** organizations newly joined as below:

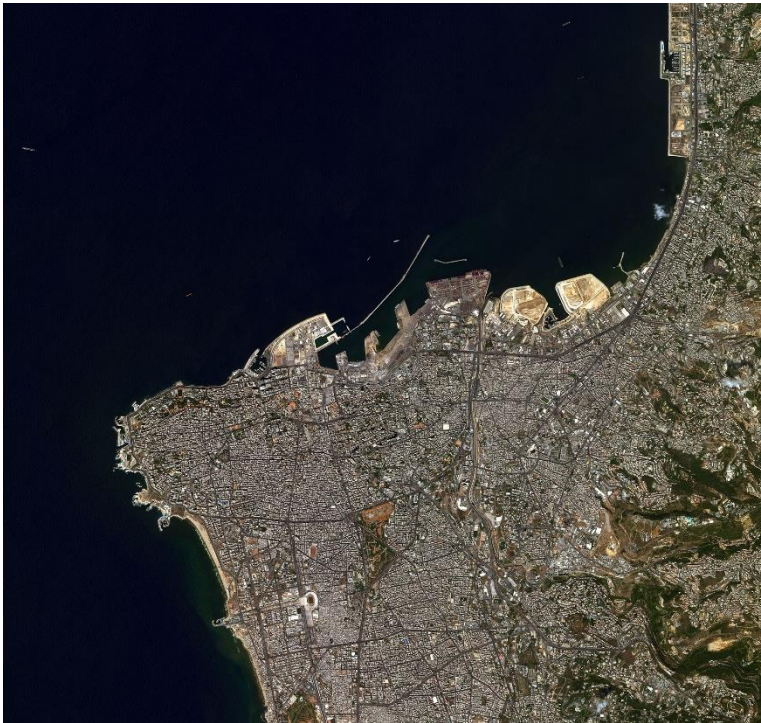
- United Nations World Food Programme (**UNWFP**) in September 2020
- **Kobe University**, Japan in April 2021
- National Research Institute for Earth Science and Disaster Resilience(**NIED**) of Japan in May 2021
- Disaster and Emergency Management Presidency (**AFAD**), Turkey in July 2022
- Philippine Space Agency (**PhilSA**) in January 2023
- Bangladesh Water Development Board (**BWDB**) in May 2023



2. New Satellites Contributions to Sentinel Asia

- ✓ MBRSC and CRISP newly registered their satellites, respectively “KhalifaSat” and “TeLEOS-1” as contributing satellites since 2020

KhalifaSat image



Explosion in Lebanon
Acquired on 5 August 2020
©MBRSC

TeLEOS-1 image



Tropical storm Viet Nam
Acquired on 23 September 2020
©CRISP

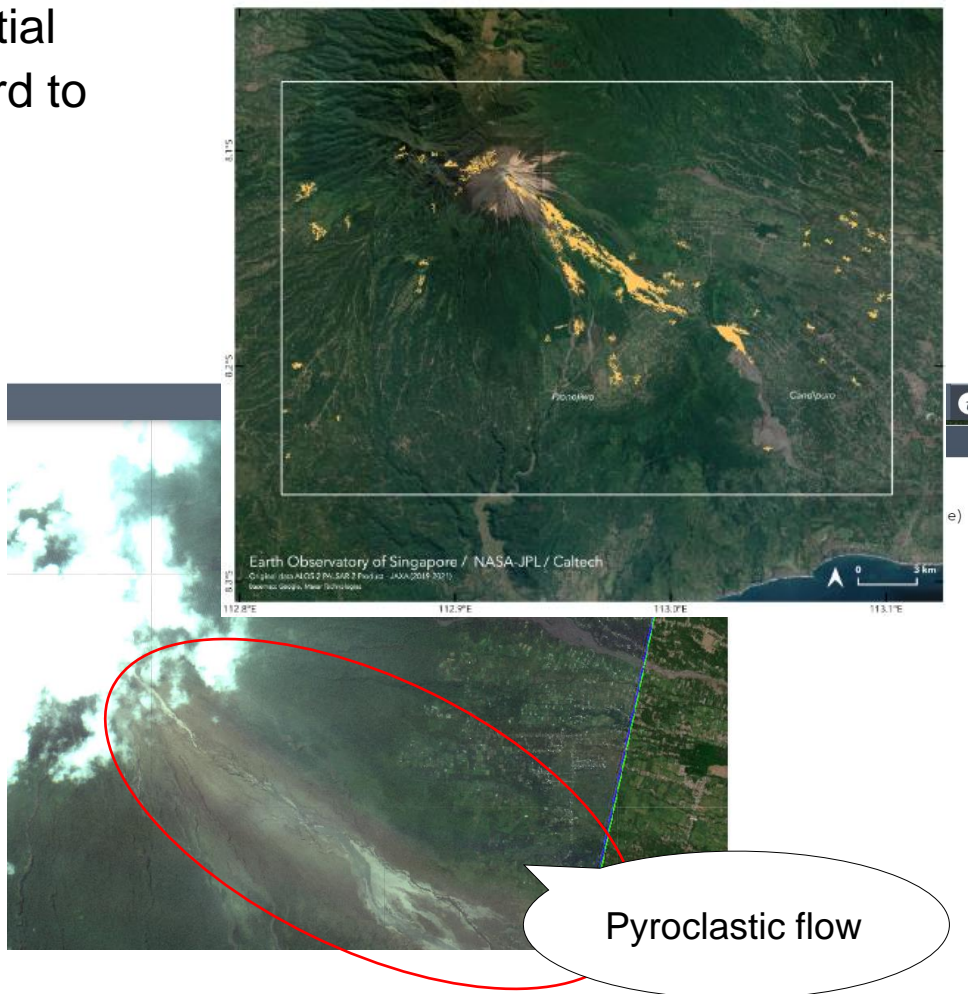
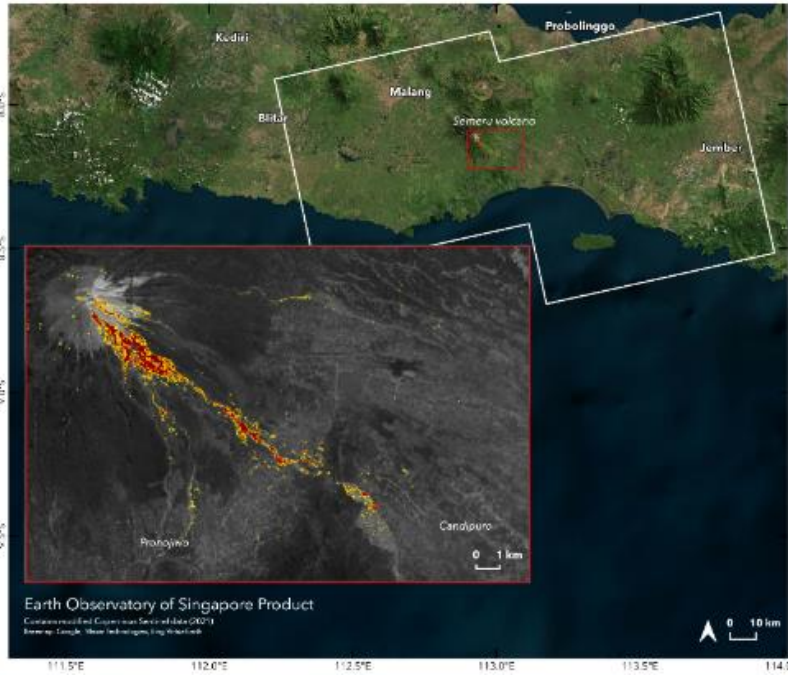
3. Emergency Observation Request by Geographical Distribution



Number of activations
36 countries/regions
422 disasters
 Feb. 2007 - Sep. 2023

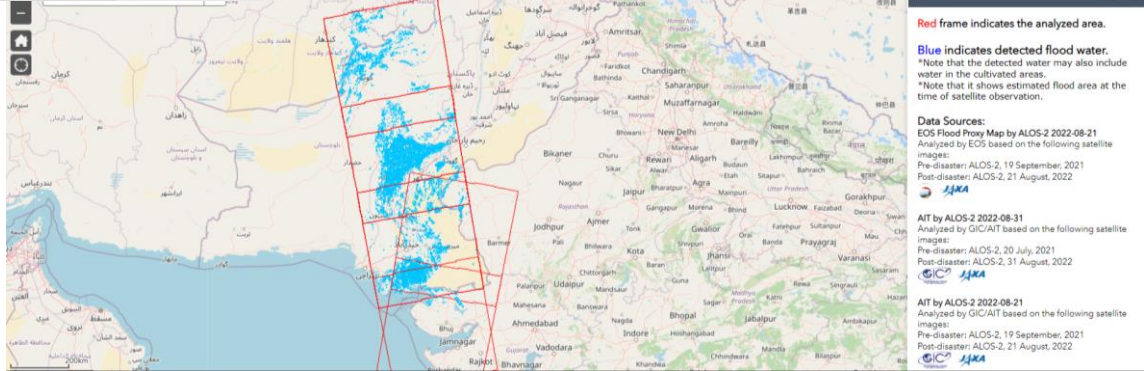
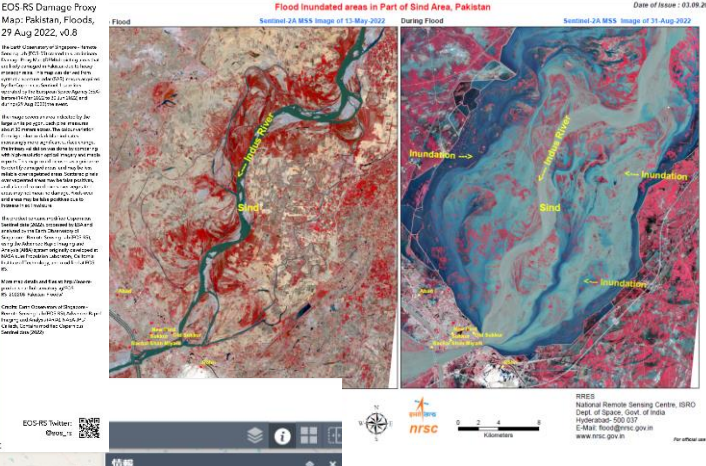
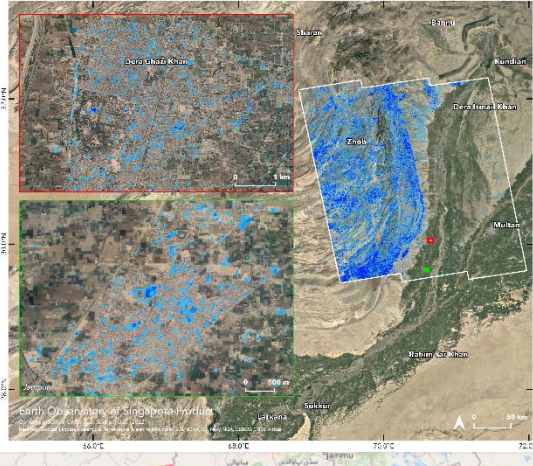
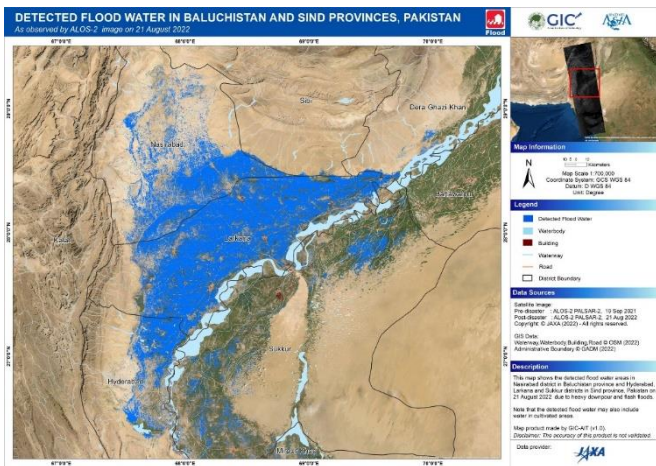
3.1 Volcano Eruption in Indonesia in December 2021

- ✓ JICA requested emergency observation on Volcano Eruption of Mt. Semeru
- ✓ Thanks to disaster information provided by Earth Observatory of Singapore (EOS), Nanyang Technological University and optical satellite data from FORMOSAT-5 TASA on Web-GIS, JICA found potential landslide risk information that was hard to acquire from the field survey



3.2 Flood in Pakistan in August 2022

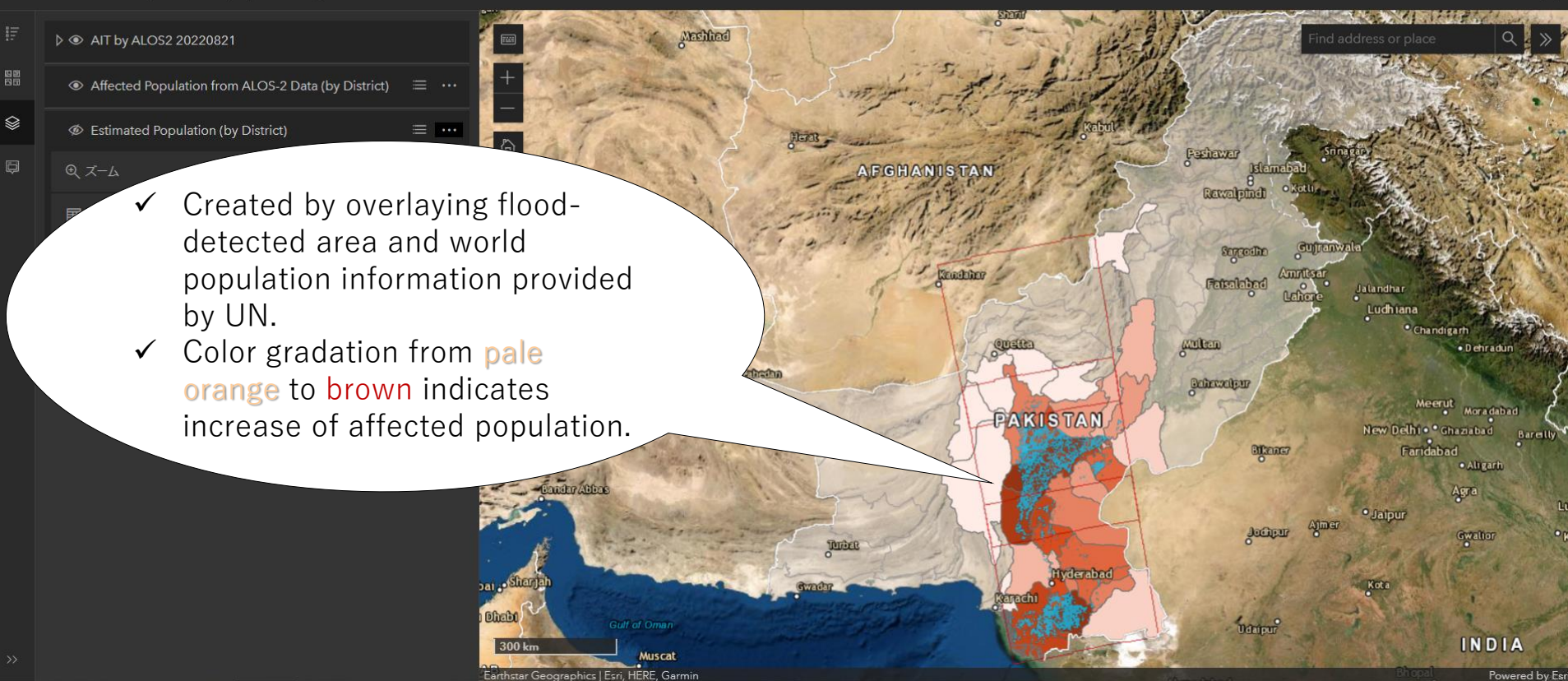
- ✓ Provincial Disaster Management Authority (PDMA) of Pakistan requested emergency observation through Asia Institute of Technology (AIT) and Asia Disaster Reduction Center (ADRC) activated
- ✓ Japan International Cooperation Agency (JICA), United Nations World Food Program (UNWFP), a Consultant of a World Bank project, and a disaster response NGO asked for their access to the Web-GIS to monitor the impact of flood in Pakistan



3.2 Flood in Pakistan : Statistic information

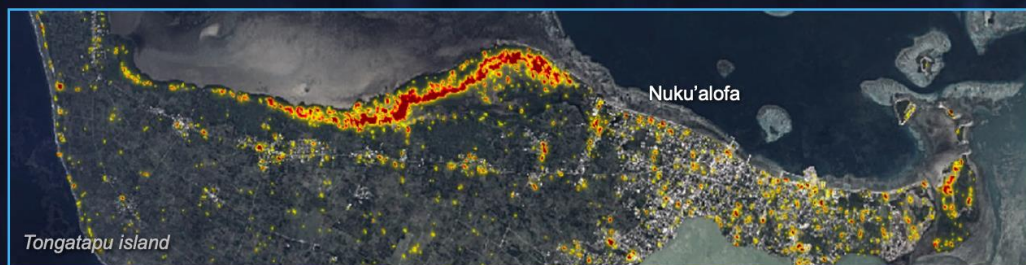
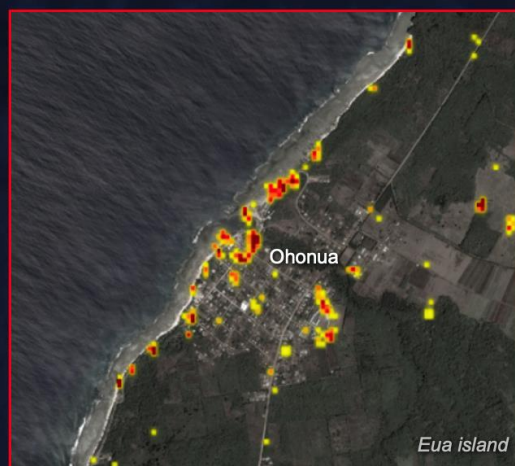
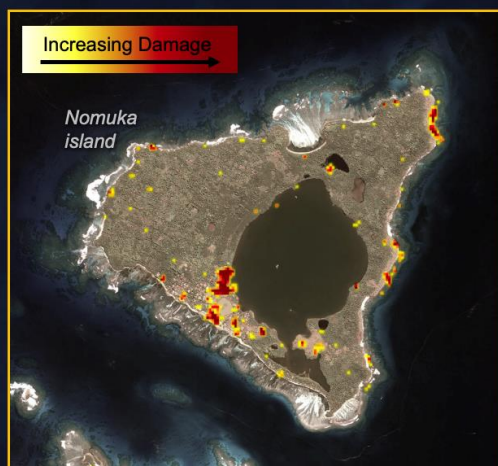
- ✓ JICA expected the statistic information such as affected population to understand the scale of the food impact
- ✓ In this regard, JAXA created below affected population information as sample and introduced it to JICA

Flood in Pakistan (Affected population) Data: ALOS-2 2022/08/21



3.3 Volcano Eruption in Tonga in January 2022

- ✓ ADRC requested emergency observation on Volcano Eruption in Tonga
- ✓ JICA HQ shared the disaster information provided by Sentinel Asia to JICA Fiji Office, that oversees surrounding islands including Tonga



EOS-RS Damage Proxy Map: Tonga, Hunga Tonga-Hunga Ha'apai volcano, 22 Jan 2022, 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 Tongatapu and southern Ha'apai islands of Tonga due to the eruption of Hunga Tonga-Hunga Ha'apai volcano on 15 Jan 2022. This map was derived from synthetic aperture radar (SAR) images acquired by ALOS-2 satellites operated by the Japan Aerospace Exploration Agency (JAXA) before (9 Mar 2019, 7 Mar 2020) and after (22 Jan 2022) the event.

The image covers an area indicated by the large white polygon. Each pixel measures about 30 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. This damage proxy map should be used as a guide 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 coloured pixels over vegetated areas may not mean no damage.

The Earth Observatory of Singapore (EOS) coordinated with Sentinel Asia to timely task the ALOS-2 satellite. Data was analyzed by the Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS).

More map details and files at: http://eos-rs-products.earthobservatory.sg/EOS-RS_202201_Tonga_HungaTonga_Volcano

EOS-RS Twitter:
@eos_rs

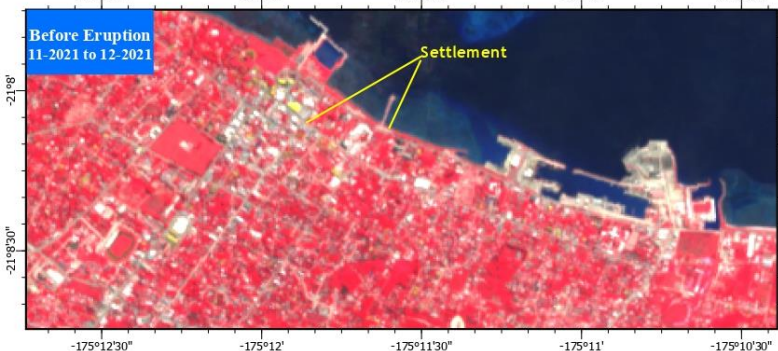
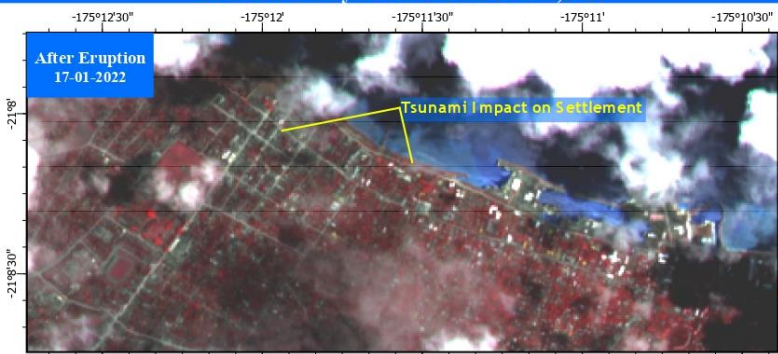


3.3 Volcano Eruption in Tonga in January 2022

- ✓ JICA appreciated the disaster information provided by Mohammed Bin Rashid Space Centre (MBRSC), which indicates the potential impact of the Tsunami and Ash since there was no information from Tonga due to the communication issues

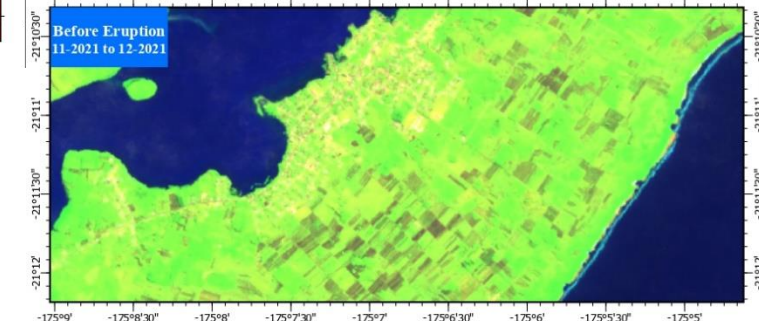
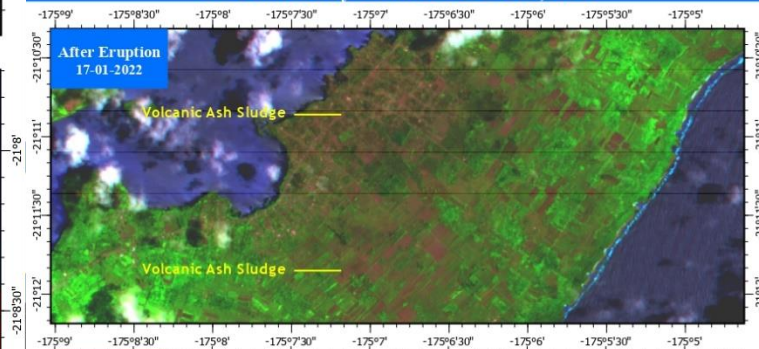
Ha'apai Volcanic eruption, Tsunami impact on Tonga

As Observed by Sentinel 2 on 17 Jan, 2022



Ha'apai Volcanic eruption, Volcanic Ash impact on Tonga

As Observed by Sentinel 2 on 17 Jan, 2022



Description

- This Map shows impact of Ha'apai Volcanic Eruption occurred on 15 Jan, 2022 on Tonga Archipelago.
- Volcanic Ash have impact all over the Tonga island causing air, land and water pollution and major damaged to Urban, Clean water and Agriculture areas.
- Volcanic Ash Sludge is formed by mixing ash into rain water converted into cement like material. Cause contamination of clean water, decrease in temperature and damaged to vegetation and urban areas.
- Accuracy of this product is not validated

Map Information

- Coordinate System: GCS WGS 1984 DD
- Unit Degree
- 0 0.36 0.73 1.46 2.19 2.92
- Km

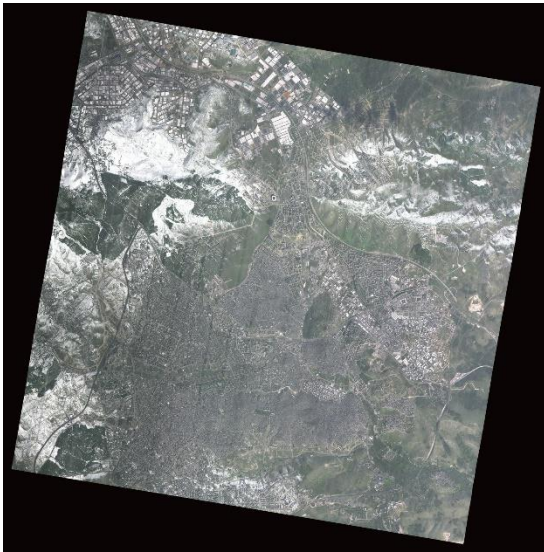
Data Source

- Copernicus Open Access Hub ESA
- Satellite Product: Sentinel 2
- Observation Range: 2022-01-17

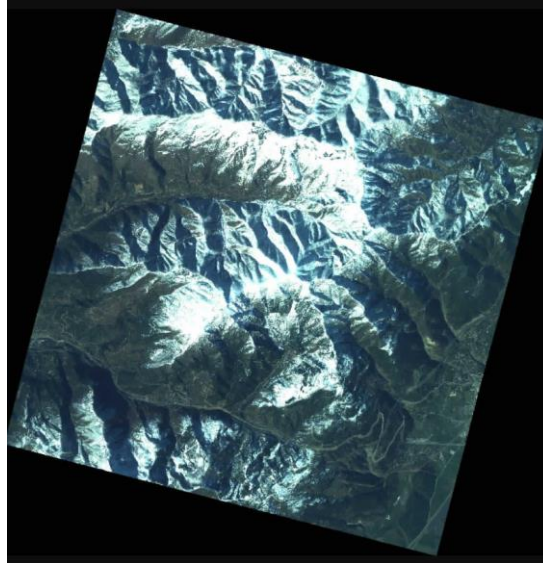
Disaster information provided by MBRSC

3.4 Earthquake in Turkey in February 2023

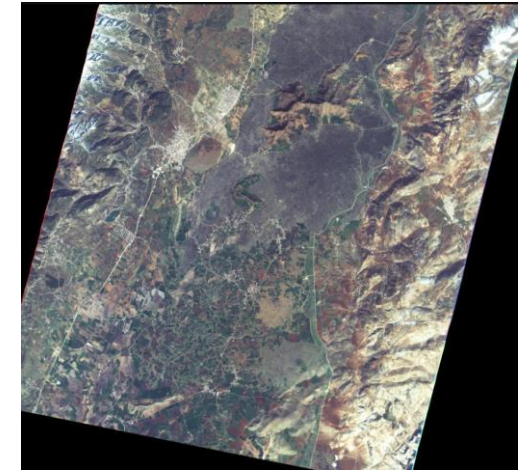
- ✓ Disaster and Emergency Management Presidency of Turkey (AFAD) requested emergency observation
- ✓ AFAD, disaster relief team and UNWFP used disaster assessment map to monitor the impact of the earthquake
- ✓ 5 organizations provided satellite data and 8 organizations provided analyzed disaster assessment maps



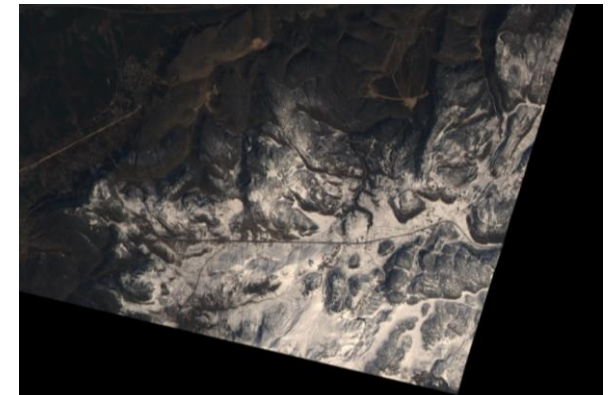
Cartosat-3



KhalifaSat

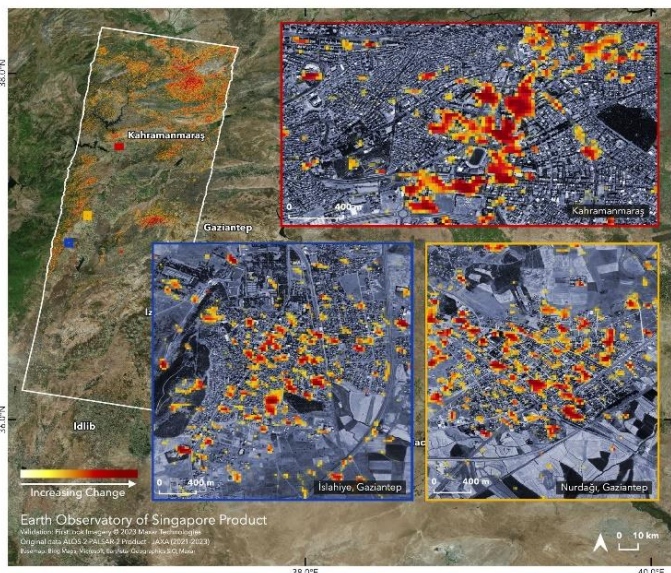


FORMOSAT-5



THEOS1

3.4 Earthquake in Turkey in February 2023

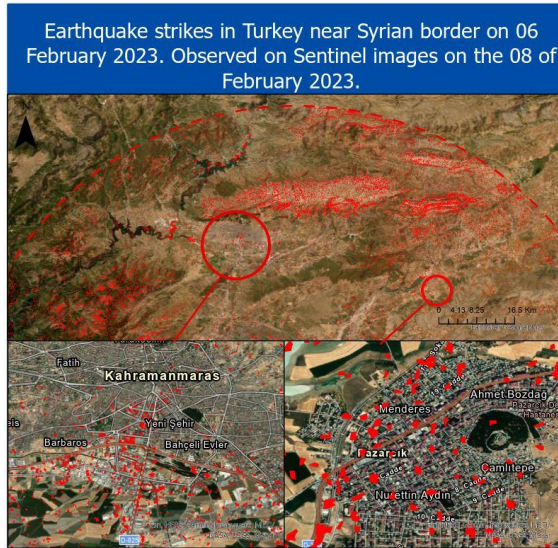


EOS-RS Damage Proxy Map: Türkiye (Turkey) and Syria. Earthquake, 8 Feb 2023, v1.2

The Earth Observatory of Singapore (EOS) Remote Sensing Lab (EOS-RS) created this preliminary Damage Proxy Map (DPM) based on satellite data collected from Sentinel-1 (S1) and Sentinel-2 (S2) on 08 Feb 2023. The map was derived from the S1 SAR and S2 optical images acquired on 08 Feb 2023. The map was derived from the S1 SAR and S2 optical images acquired on 08 Feb 2023.

The map was derived from the S1 SAR and S2 optical images acquired on 08 Feb 2023. The map was derived from the S1 SAR and S2 optical images acquired on 08 Feb 2023. The map was derived from the S1 SAR and S2 optical images acquired on 08 Feb 2023.

EOS-RS Twitter: @eos_rs

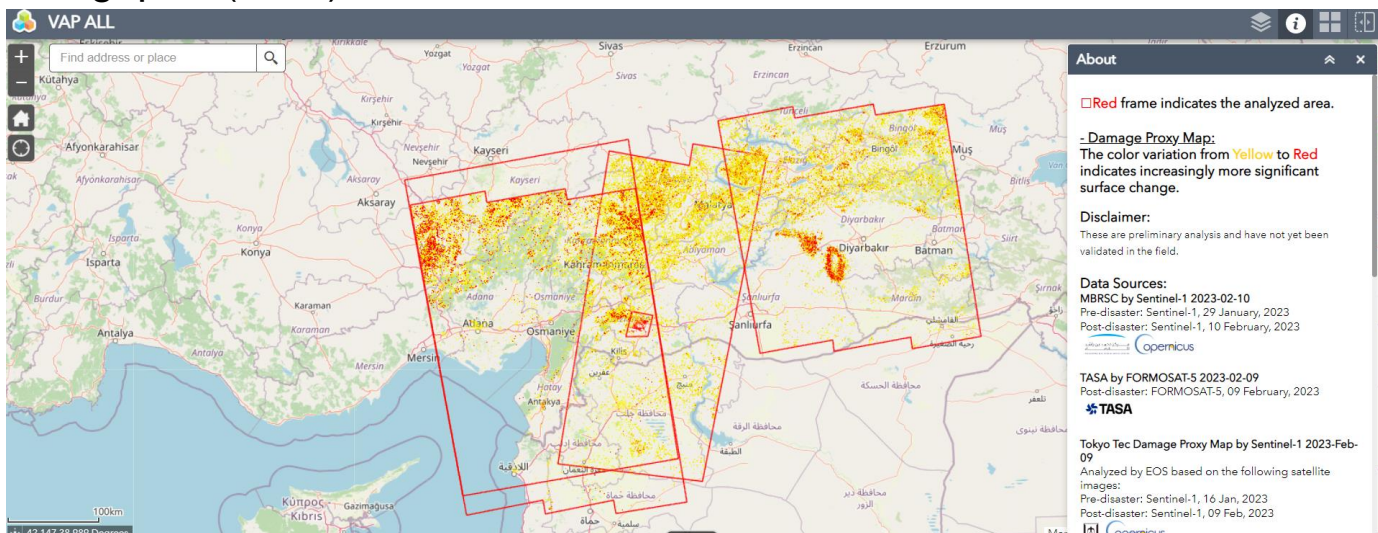


Location	
Legend	
Description	
<p>Strong 7.8 magnitude earthquake strikes in Turkey near Syrian border. Massive quake hits near southern city of Kahramanmaraş and is felt in Syria and Lebanon, with fears of widespread destruction and casualties.</p>	
Data Source	
<p>Pre-disaster image: Sentinel1A_IW_SLC_1SDW, acquired on 29 January, 2023 at T:03:35:19. Post-disaster image: Sentinel1A_IW_SLC_1SDW, acquired on 10 February, 2023 at T:03:34:54 Note: The resulted outputs had not been verified with any ground truth observation.</p>	

Significant damage map by MBRSC

Damage Proxy Map by Earth Observatory of Singapore(EOS)

Web-GIS overlaying potentially damaged areas and maps

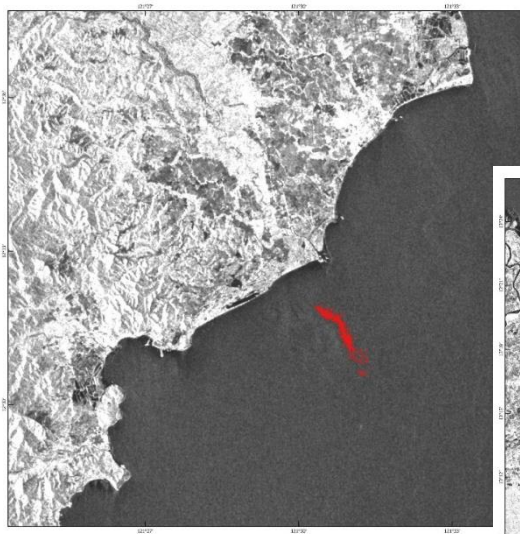
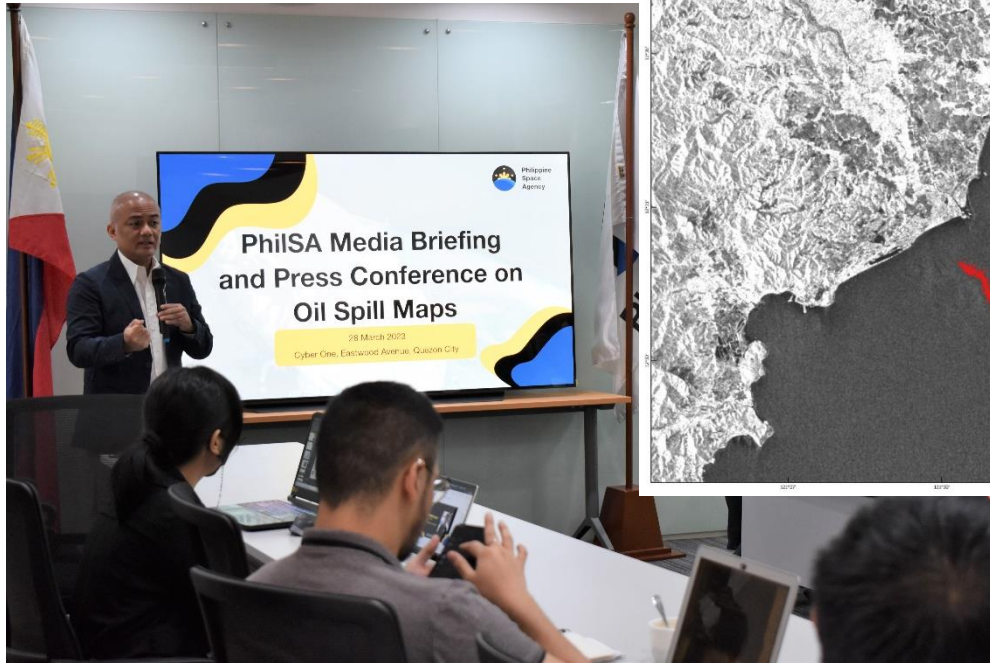


<https://storymaps.arcgis.com/collections/3933d7b09edf4187a2e969e39558aa7f?item=1>

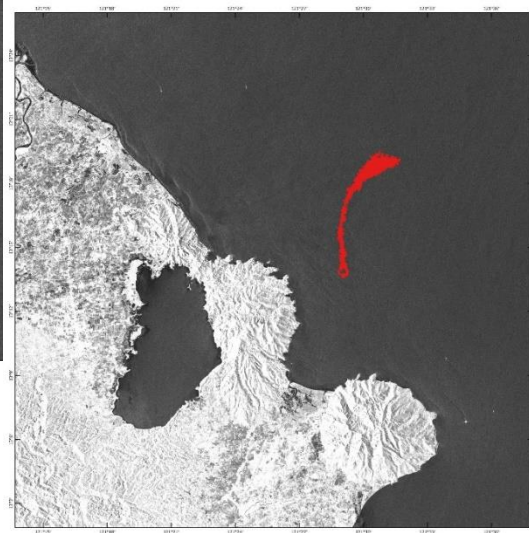
3.5 Oil Spill in the Philippines in March 2023

PhilSA requested emergency observation on oil spill, and held media briefing/press conference with estimated extent of oil spill maps provided by Sentinel Asia

- ✓ In response to this incident, the Japan Disaster Relief (JDR) Expert Team was dispatched for gathering information on the oil spill situation, checking oil removal and control activities and technical advisory
- ✓ JDR Expert Team used estimated extent of oil spill maps provided by Sentinel Asia
- ✓ 4 organizations provided satellite data and 2 organizations provided estimated extent of oil spill maps



Marine Pollution Due to Oil Spillage
 Oriental Mindoro, Philippines
 15 March 2023, 12:02 AM



Marine Pollution Due to Oil Spillage
 Oriental Mindoro, Philippines
 15 March 2023, 12:02 AM

Legend
 Possible Oil Spill Data Coverage

Map Information
 This view shows possible oil spill extent in the coast of Oriental Mindoro, an observed view. All AIS-2 SAR image captured on March 15, 2023.
 The detection of spill covers approx. 9 square kilometers. Water font is not validated.

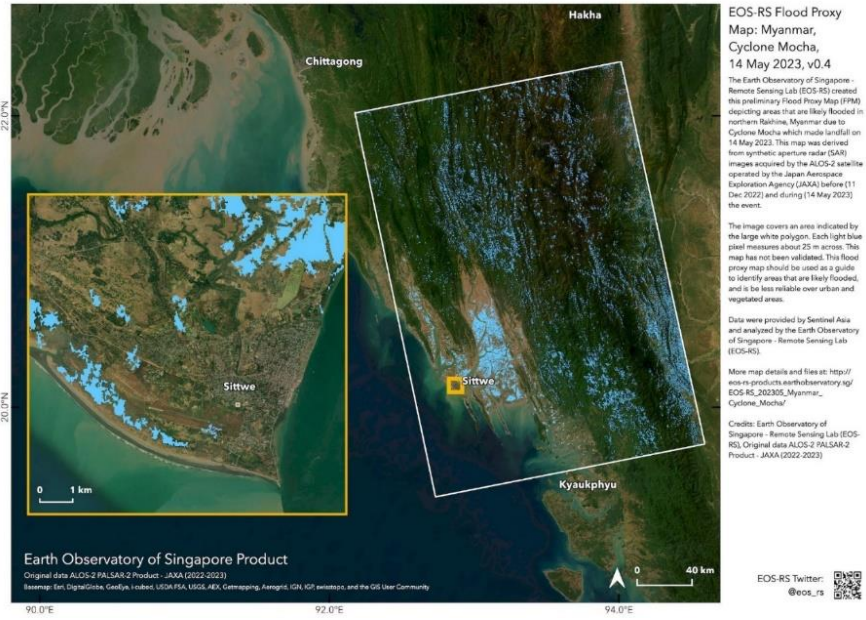
Data Sources
 AIS-2 SAR image captured on March 15, 2023, at approximately 12:02 AM Philippine Standard Time, received from JAXA, Intellectual Property Rights for the AIS-2, and AIS-2 archive data belong to JAXA.
 AIS-2 © JAXA
 Remotely by Sentinel Asia

PhilSA showed journalists extent of Mindoro oil spill as captured by satellite images

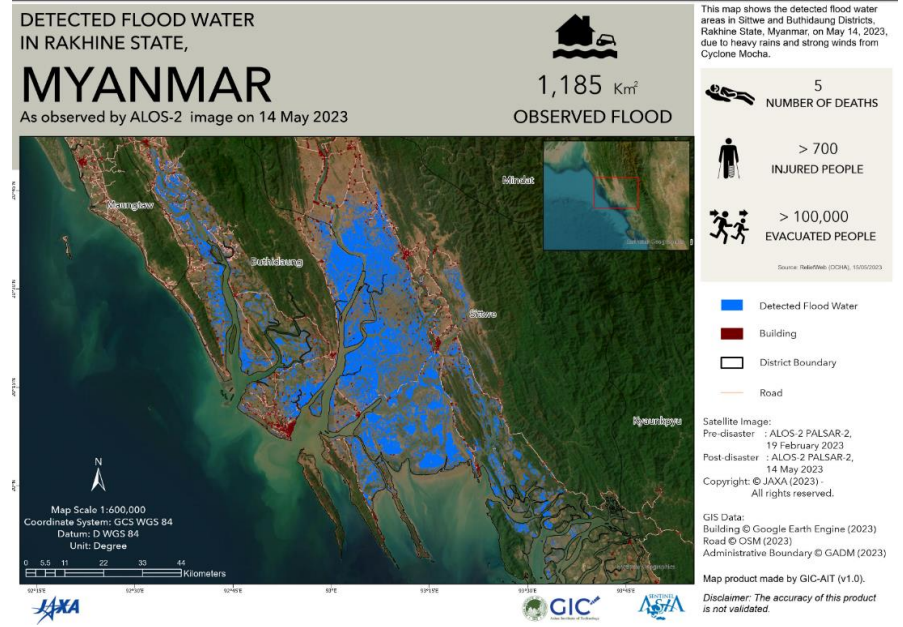
PhilSA showed journalists extent of Mindoro oil spill as captured by satellite images

3.6 Cyclone MOCHA in Myanmar in May 2023

- ✓ AHA Centre requested emergency observation on Cyclone MOCHA in Myanmar in May 2023
- ✓ Thanks to disaster information provided by Earth Observatory of Singapore (EOS), Nanyang Technological University, Asian Institute of Technology (AIT) and MBRSC, AHA Centre could monitor the impact of the cyclone
- ✓ The flood proxy map provided by EOS was introduced on the report of AHA Centre



Flood Proxy Map by Earth Observatory of Singapore(EOS)




Detected water area map by Asian Institute of Technology (AIT)

AHA Centre Situation Report : https://ahacentre.org/wp-content/uploads/2023/05/AHA-Situation_Report-3-TC-MOCHA-Myanmar.pdf

3.6 Cyclone MOCHA in Myanmar in May 2023

✓ AIT and EOS VAP along with WebGIS was used in the TV News Program in JAPAN
 The VAPs were recognized that the area of the flood is easy to grasp to the viewers of the TV program.

洪水範囲の解析(推定)
シットウェ 14日撮影

サイクロン“直撃”400人超死亡が
ミャンマー西部 難民キャンプ被害

Sittwe

Sentinel Asia (防災における国際協力仲組みセンチネルアジア)
 解析機関: Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS),
 Asian Institute of Technology (AIT)
 衛星画像提供 JAXA 陸域観測技術衛星2号「だいち2号」(ALOS-2)
 表示ソフト: ESRI

Flooded area map by MBRSC

Japanese TV program, “TV Asahi Hodo Station”

4.1 Webinar co-organized by ISRO and IWMI

- ✓ The first Sentinel Asia Webinar titled “Space Technology for Drought Risk Management” was held in July 2021
- ✓ 50 experts and practitioners from the Sentinel Asia community participated and acknowledged the new technologies to minimize economic losses by drought

DROUGHT WEBINAR SERIES

LIVE
WEBINAR ▶

ASIA PACIFIC REGIONAL
WEBINAR

SPACE TECHNOLOGY
FOR DROUGHT RISK
MANAGEMENT

Jointly organized by National Remote Sensing Centre (NRSC),
Indian Space Research Organization (ISRO),
International Water Management Institute (IWMI) and Sentinel Asia
19 – 20 July 2021

4.2 Webinar co-organized by ISRO and IWMI

- ✓ The second Sentinel Asia Webinar titled “Space Technology for Flood Forecast Modelling” was held in October 2021
- ✓ Engineers and researchers were participated in this webinar



LIVE
Webinar Series

ASIA PACIFIC REGIONAL
WEBINAR

“Space Technology for
Flood Forecast Modelling”

Jointly Organised by
National Remote Sensing Centre (NRSC)
Indian Space Research Organisation (ISRO),
International Water Management Institute (IWMI)
under Sentinel Asia
27 – 28 October, 2021

5.1 Establishment of the Standard Operating Procedures (SOPs)

- ✓ In 2021, SOPs for making Emergency Observation Requests(EORs) to Sentinel Asia were established in below countries and regions:
 - Cambodia and Laos
 - Central Asia and Caucasus
 - Pacific Islands
- ✓ For prompt EORs to Sentinel Asia including escalation to the Charter, the below organizations are to play hub roles in making EORs through close communication with local DMOs:
 - **AHA Centre**: ASEAN countries including Cambodia and Laos
 - **Central Asian Institute of Applied Geosciences (CAIAG)**: Central Asian/Caucasus countries
 - **Pacific Community (SPC)** : the Pacific Islands

Ex. CAIAG made EOR for Tajikistan Earthquake in July 2021

Emergency Obs. Request Information

Disaster Type: Earthquake

Country: Tajikistan

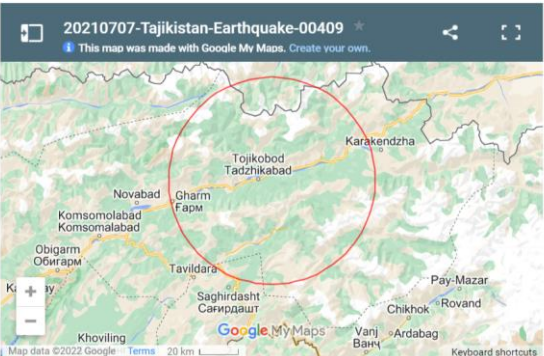
Occurrence Date (UTC): 7 July, 2021

SA activation Date(UTC): 14 July, 2021

Requester: Central Asian Institute of Applied Geosciences (CAIAG)

Escalation to the International Charter: No

GLIDE Number:

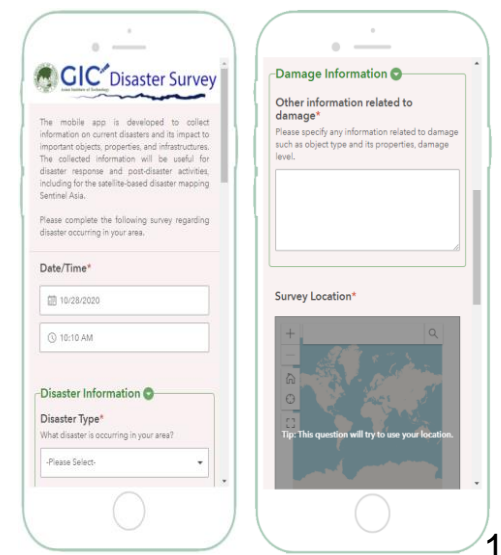
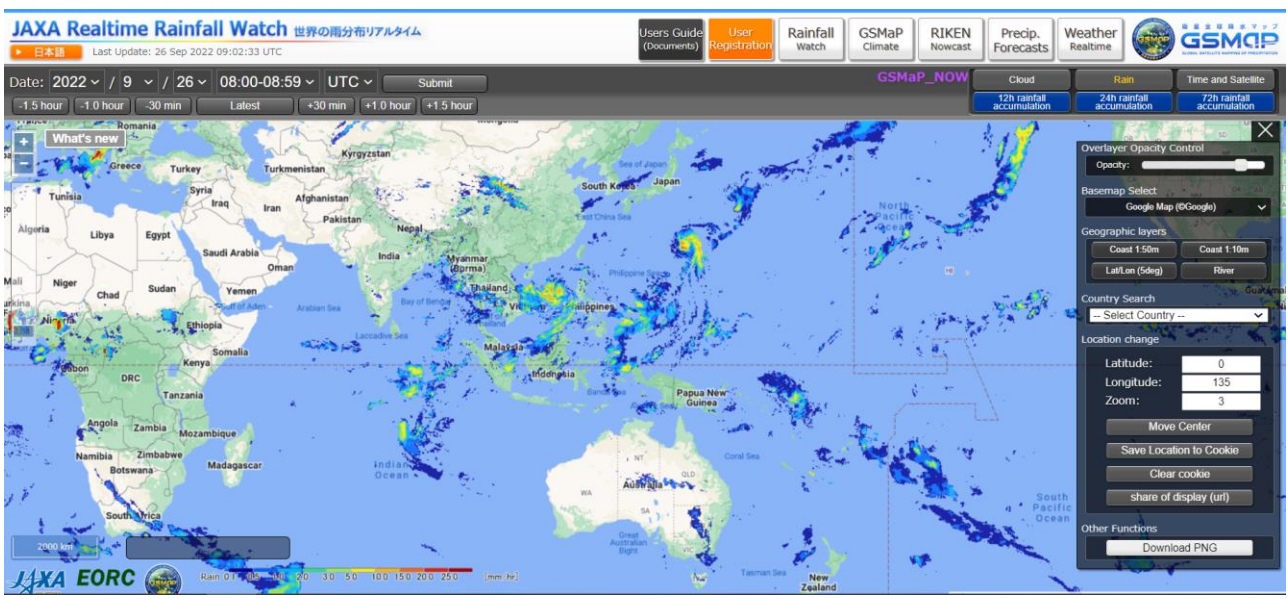


5.2 Establishment of the Standard Operating Procedures (SOPs)

- ✓ Institutionalized use of Global Satellite Mapping of Precipitation (GSMaP) as reference information for making EORs
- ✓ Easy and real-time provision of local information on the disaster via web-based mobile application developed by AIT to calibrate accuracy of disaster information provided by Sentinel Asia

Mobile application developed by AIT

- Web link: <https://arcg.is/1HWGWX0>
- QR Code:



6. AHA Centre Executive Programme (ACE Programme)

- ✓ Special session titled “Sentinel Asia for the ASEAN Region” was held in November 2021 during the “Japan Disaster Risk Reduction Online Course” hosted by the AHA Centre and Kobe University
- ✓ At the session, experts from ADRC, the University of Tokyo, and the JAXA/Sentinel Asia Secretariat gave lectures and hands-on training courses
- ✓ More than 30 future young leaders from 24 NDMOs as well as AHA Centre staff members attended the session



Joint Session with Sentinel Asia
 “Sentinel Asia for the ASEAN region”
 17 November 2021

Time (JST)	Agenda Item	Speaker/Moderator
16.00- 16.05	Opening	Prof. BISRI (Kobe University)
16.05- 16.20	Keynote Presentation	Mr. MIYOSHI (Sentinel Asia Secretariat)
16.20- 16.40	Hands-on Session: “Sentinel Asia Web-GIS”	Ms. TAKAKURA (JAXA)
16.40- 16.50	How to make an Emergency Observation Request (EOR) to Sentinel Asia	Dr. IKEDA (ADRC)
16.50- 17.20	Extraction of building footprints from satellite data -theory and hands-on experience-	Prof. MIYAZAKI (University of Tokyo)
17.20-17.25	-Questions & Answers -Discussion	Prof. BISRI (Kobe University)
17.25- 17.30	Closing	Mr. MIYOSHI (Sentinel Asia Secretariat) Prof. BISRI (Kobe University)

7. JICA's Online Training Course

- ✓ Introduced Sentinel Asia activities in November 2021 during JICA's online training course titled "Comprehensive Disaster Risk Reduction in Small Island"
- ✓ At the course, experts from ADRC, AIT, and Sentinel Asia Secretariat gave lectures
- ✓ Officials responsible for disaster risk reduction in the central or local governments of Fiji, Marshall Islands, Samoa, Tonga, and Vanuatu watched the lecture and acknowledged the importance of space technology in disaster risk reduction



Sentinel Asia Step 3 for Asia and the Pacific

Introducing Satellite- based Early Warning Platform

Mapping of Earthquake and Tsunami (2018)
Palu City, Central Sulawesi, Indonesia



Project Director, Asian Disaster Reduction Center(ADRC)
Senior Advisor, Oriental Consultants Global (OCG)
Visiting Professor, Kobe University

Koji Suzuki

Manzul Hazarika, Ph.D.
Director, Geoinformatics Center
Asian Institute of Technology
E-mail: manzul@ait.asia



8. Sentinel Asia's Voluntary Commitments to the Sendai Framework

VOLUNTARY COMMITMENTS

SENDAI FRAMEWORK


FOR DISASTER RISK REDUCTION 2015-2030

Home

Commitments

Highlights

About

Commitment    

CONTACT FOCAL POINT

REPORT AN ISSUE

COMMITMENT	ID	DURATION	LAST UPDATED	VERSION	STATUS
Sentinel Asia	20210621_001	Jan 2013 – Dec 2030	19 Aug 2021	1.1	Progress not updated



The Sentinel Asia initiative is an international collaboration among space agencies, disaster management agencies, and international agencies for applying remote sensing and Web-GIS technologies to support disaster management in the Asia-Pacific region.

MAIN FOCAL POINT

shiro kawakita

IMPLEMENTERS

Asia-Pacific Regional Space Agency Forum 

SCOPE

Regional - Asia, Oceania

THEMES AND ISSUES

Capacity Development, Community-based DRR, Complex Emergency, Disaster Risk Management, Early Warning, GIS and Mapping, Information Management, Recovery, Risk Identification and Assessment, Science and Technology, Space and Aerial Technology

HAZARDS

-  Cyclone
-  Drought
-  Earthquake
-  Flood
-  Land Slide
-  Tornado
-  Tsunami
-  Volcano
-  Wild Fire

SENDAI PRIORITIES FOR ACTION

- Priority 1** Understanding disaster risk
- Priority 4** Enhancing disaster preparedness for effective response, and to «Build Back Better»

SELECTED SENDAI INDICATORS

- E-1 (Compound)** National average score for the adoption and implementation of national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030
- F-5** Number of international, regional and bilateral programmes and initiatives for the transfer and exchange of science, technology and innovation in disaster risk reduction for developing countries
- F-6** Total official international support (ODA plus other official flows) for disaster risk reduction capacity-building
- F-7** Number of international, regional and bilateral programmes and initiatives for disaster risk reduction-related capacity-building in developing countries

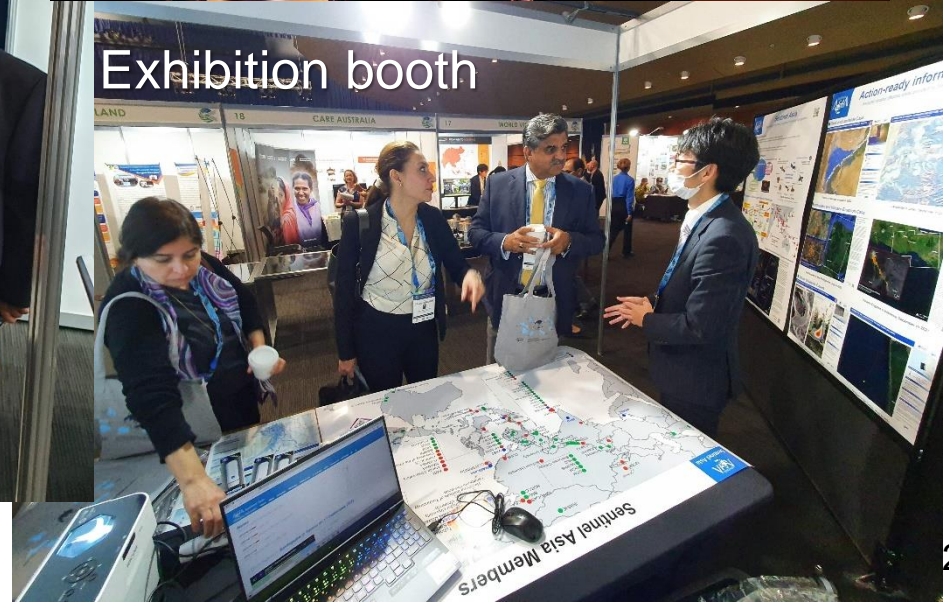
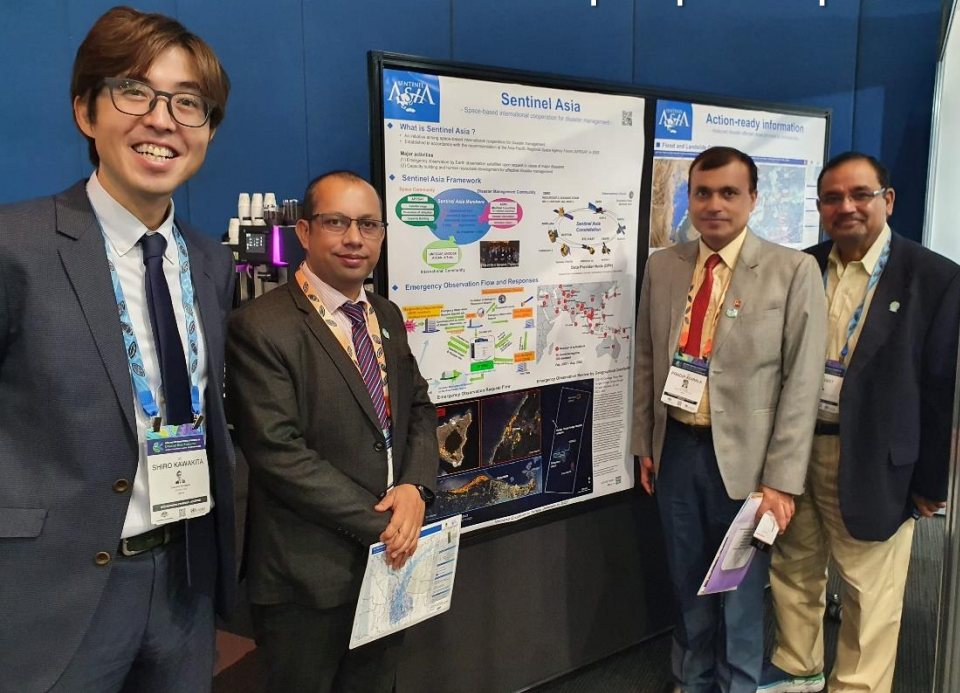
9. Asia-Pacific Ministerial Conference On Disaster Risk Reduction

- ✓ Promoted Sentinel Asia's activities at the exhibition 19 to 22 September 2022 in Brisbane, Australia
- ✓ More than 100 participants visited Sentinel Asia booth per day



Opening Ceremony

Exhibition booth with Nepal participants



Exhibition booth

10. Sentinel Asia Interview articles

✓ 20 interview articles were released since 2020



Mr. Sadhu Zukhruf Janottama
Disaster Monitoring and Analysis Officer
AHA Centre



Mr. Keith Paolo Landicho
Disaster Monitoring and Analysis Officer
AHA Centre



Mr. Mohammad Fadli
Pacific Disaster Center
AHA Centre Liaison



Dr. Manzul Kumar Hazarika
Director, Geoinformatics Center



Mr. Syams Nashrullah
Program Officer/Team Leader



Mr. Chathumal Madhuranga
Research Associate



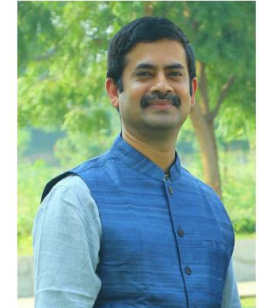
Mr. Hans Guttman,
Executive Director of
the Asian Disaster Preparedness Center (ADPC)



Mr. KWOH Leong Keong
Centre for Remote Imaging, Sensing and
Processing (CRISP)



Dr. Raj Kumar
Outstanding Scientist
Director, National Remote Sensing Centre (NRSC)
Indian Space Research Organisation (ISRO)



Dr. Giriraj Amarnath
Research Group Leader
Water Risks to Development and Resilience



Dr. Hitoshi Taguchi,
National Research Institute for Earth
Science and Disaster Resilience (NIED)



Alia Mohammad Almekhyat
- Officer -
Business Development Section,
Remote Sensing Department



Shaikha Ahmed Albeshir
- Engineer -
Remote Sensing Applications
Unit, Remote Sensing
Department



Dr. Kuang-Chong Wu
President of National Applied Research Laboratories



Dr. Jong-Shinn Wu
Director General of National Space Organization (NSPO)

<https://sentinel-asia.org/interview/interview.html>



10. Sentinel Asia Interview articles

✓ 20 interview articles were released since 2020



Prof. Dr. Erna Sri Adiningsih,
Executive Director of Indonesian Space Agency,
National Research and Innovation Agency (INASA-BRIN)



Prof. Dr. M. Rokhis Khomarudin
Research Professor of the Remote Sensing Research Center
Research Organization of Aeronautics and Space (ORPA),
National Research and Innovation Agency (BRIN), Indonesia



Mr. Tatiya Chuentragun,
Geo-Informatics and Space Technology Development Agency (GISTDA)



Mr. Hans Guttman,
Executive Director of
the Asian Disaster Preparedness Center (ADPC)



Mr. Koji Suzuki,
Asian Disaster Reduction Center (ADRC)



Dr. Arturo Daag,
Philippine Institute of Volcanology and Seismology (PHIVOLCS)



Dr. Sang-Ho Yun
Earth Observatory of Singapore (EOS)



Dr. Lal Samarakoon
Former Director of AIT



Mr. Hideaki Matsumoto,
Japan International Cooperation Agency (JICA)



11. Published Sentinel Asia Annual Report

Published annual report in 2019, 2020, and 2021

SENTINEL ASIA

ANNUAL REPORT 2021

Sentinel Asia Activity Report in 2020

Organization	Geo-Informatics and Space Technology Development Agency (GISTDA)
Title	GISTDA continue in supporting Disaster Management
Type of Activity	Provide Satellite data and images
Date	2021

Sentinel Asia Activity Report in 2020

The University of Tokyo
R&D on applications of large-scale building mapping and night-time light observation for socioeconomic monitoring
Research and development for data preparedness (e.g., Conference, Workshop, Meeting, Training, EOR, Providing satellite data or VAP)
Through the year in 2020

Organization	Center for Research and Application for Satellite Remote Sensing, Yamaguchi University
Title	Contribution VAPs for EOR activities
Type of Activity	EOR activities
Date	August 2020

Yamaguchi University, Center for Research and Application of Satellite Remote Sensing, was established in February 2017. There are 4 missions at this center: (1) to promote world-class research in satellite remote sensing, (2) to cultivate human resources capable of promoting a wide range of research in satellite remote sensing and space technology, (3) to contribute to disaster information analysis and improve public safety and security, and (4) to promote local industry and create new industry/business for space utilization technology. Yamaguchi university provided VAPs for following EORs in 2020.

- India: Cyclone, May 2020
- Cambodia: Flood, October 2020
- Philippines: Typhoon GONI, November 2020

GISTDA supported the disaster management activities by

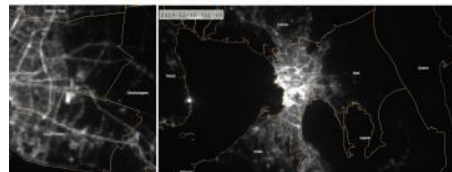
1. Provide satellite images in total of 596 images consisting of 171 Multispectral images, 422 Panchromatic images and 3 Pan sharpened images as followed;

No	ACQ date	Country	Disaster Type	MS	PAN	PS	Mosaic	No. of images
2001/2021	Indonesia	Earthquake	2	4				6
2401/2021	Indonesia	Earthquake	2	3				5
2401/2021	Indonesia	Earthquake	2	4				6
8/02/2021	India	Flood (glacier)	6	10				16
10/02/2021	India	Flood (glacier)	2	7				9
11/02/2021	India	Flood (glacier)	3	6				9
8/04/2021	Indonesia	Flood	4	7				11
9/04/2021	Indonesia	Flood	4	8				12
10/04/2021	Indonesia	Flood	2	6				8
11/04/2021	Timor	Flood	2	4				6
13/04/2021	Timor	Flood	8	15				23
20/05/2021	India	Flood	12	31				43
24/05/2021	India	Flood	3	9				12
25/05/2021	India	Flood	3	7				10
11/06/2021	Sri Lanka	Oil spill	2	6				8
14/06/2021	Sri Lanka	Oil spill	2	6				8
21/06/2021	Nepal	Flood	4	4				8
22/06/2021	Nepal	Flood	5	8				13
26/07/2021	Uzbekistan	Flood	2	6				8
26/07/2021	Kyrgyzstan	Landslide	2	5				7
28/07/2021	Philippines	Flood	2	3	1			6
30/07/2021	Philippines	Flood	4	11				15
31/07/2021	Philippines	Flood	15	32				47
14/08/2021	Japan	Flood	2	7				9
14/08/2021	Turkey	Flood	2	5				7
16/08/2021	Japan	Flood	4	10	1			15
17/08/2021	Japan	Flood	4	10				14
18/08/2021	Japan	Flood	4	10				14
09/09/2021	Philippines	Flood	2	7	1			10
10/09/2021	Philippines	Flood	2	7				9
11/09/2021	Philippines	Flood	1	2				3
EX-266								
08/10/2021	Vietnam	Flood	4	11				15
09/10/2021	Vietnam	Flood	4	13				17
12/10/2021	Vietnam	Flood	3	9				12
17/10/2021	Philippines	Flood and Landslide	6	17				23
18/10/2021	Philippines	Flood and Landslide	3	10				13
20/10/2021	India	Flood	5	12				17
22/10/2021	Japan	Volcanic	2	5				7
23/10/2021	India	Flood	4	8				11
23/10/2021	Japan	Volcanic	2	6				8
24/10/2021	India	Flood	2	6				8
24/10/2021	Japan	Volcanic	2	6				8

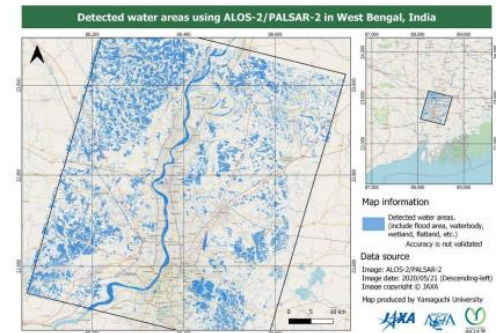
proceeded on research and development of 1) large-scale building mapping from satellite ing, and 2) socioeconomic monitoring using night-time light observations. The building maps are gthening disaster preparedness of public agencies and, if the data is openly available, also of munities. We developed a pilot system of on-demand automated building mapping from high- es of web map services by deep learning techniques. The system demonstrated large-scale me cities, such Sri Lanka, Bangkok, and Maputo. We also demonstrated socioeconomic ime light observation during the COVID-19 crisis, focusing the impact of state of emergency. The ed to collaborations with JPT members for applications in practice.



Examples of automated building mapping (left: Bangkok; right: Maputo)



Examples of night-time light observation (left: Bangkok; right: Metro Manila)



India: Cyclone, May 2020

Courtesy of Yamaguchi University

Courtesy of GISTDA

Courtesy of the University of Tokyo

<https://sentinel-asia.org/reports/Reports.html>



Please click and read them!