

Sentinel Asia

**-space-based collaborative disaster management platform
in the Asia-Pacific region-**

**Asian Conference on Disaster Reduction (ACDR) 2019
Ankara, Republic of Turkey
25 November 2019**

**Takanori Miyoshi
Administrator
Satellite Applications and Operations Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)**

Radar images from radar satellites

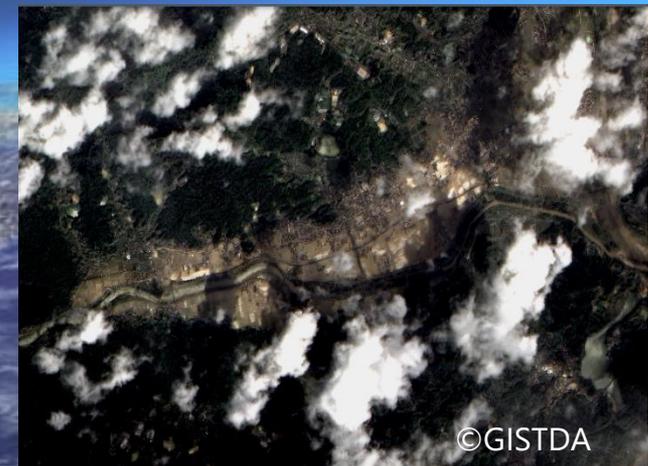
- 24-hour availability (including nighttime)
- Not affected by weather conditions



- Wide Coverage
- Borderless
- Not affected by disasters per se

Photo images from optical satellites

- Clarity



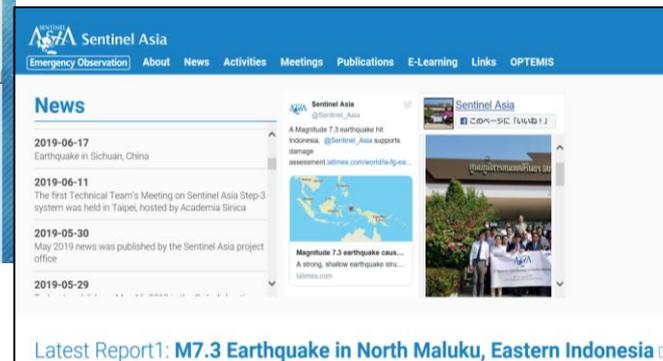
APRSAF-12

REPORT

October 11-13, 2008
Kitakyushu, Japan




The screenshot shows the APRSAF website interface. At the top, there is a navigation bar with the APRSAF logo, a banner for the 21st APRSAF meeting in Japan (December 2-5, 2014), and a 'Subscribe' button. Below the navigation bar are tabs for 'About APRSAF', 'Annual Meetings', 'Participants', 'Working Groups', 'Initiatives', 'Capacity Building', 'Interviews & Features', and 'Event Calendar'. The main content area features a 'HOME' section with a large 'About APRSAF' article, a 'News & Updates' section with a list of recent news items, and an 'Initiatives' section with logos for Sentinel Asia, SAFE, ClimateR3, and KIBO-ABC.



The screenshot shows the Sentinel Asia website. The top navigation bar includes 'Emergency Observation', 'About', 'News', 'Activities', 'Meetings', 'Publications', 'E-Learning', 'Links', and 'OPTEMIS'. The main content area features a 'News' section with a list of recent news items, including 'Earthquake in Sichuan, China', 'A Magnitude 7.3 earthquake hit Indonesia', and 'The first Technical Team's Meeting on Sentinel Asia Step-3 system was held in Taipei, hosted by Academia Sinica'. There is also a 'Latest Report1: M7.3 Earthquake in North Maluku, Eastern Indonesia' link.

Sentinel Asia

- Initiative under the Asia-Pacific Regional Space Agency Forum (APRSAF)
- Established in accordance with the recommendation at APRSAF in Kitakyushu, Japan, co-hosted by MEXT/JAXA

(As of 20 November 2019)

Space Community

APRSAF

Satellite Image

Promotion of Utilization

Capacity Building

SENTINEL ASIA

94 organizations from **28** countries & regions and **16** international organizations
In total: **110** organizations

Disaster Reduction Community

ADRC
Member Countries
(31 member countries)

Disaster Information

Utilization (User)

Joint Project Team (JPT)

International Community

UNESCAP, UNOOSA
ASEAN, AIT and
International Disaster Charter
etc.

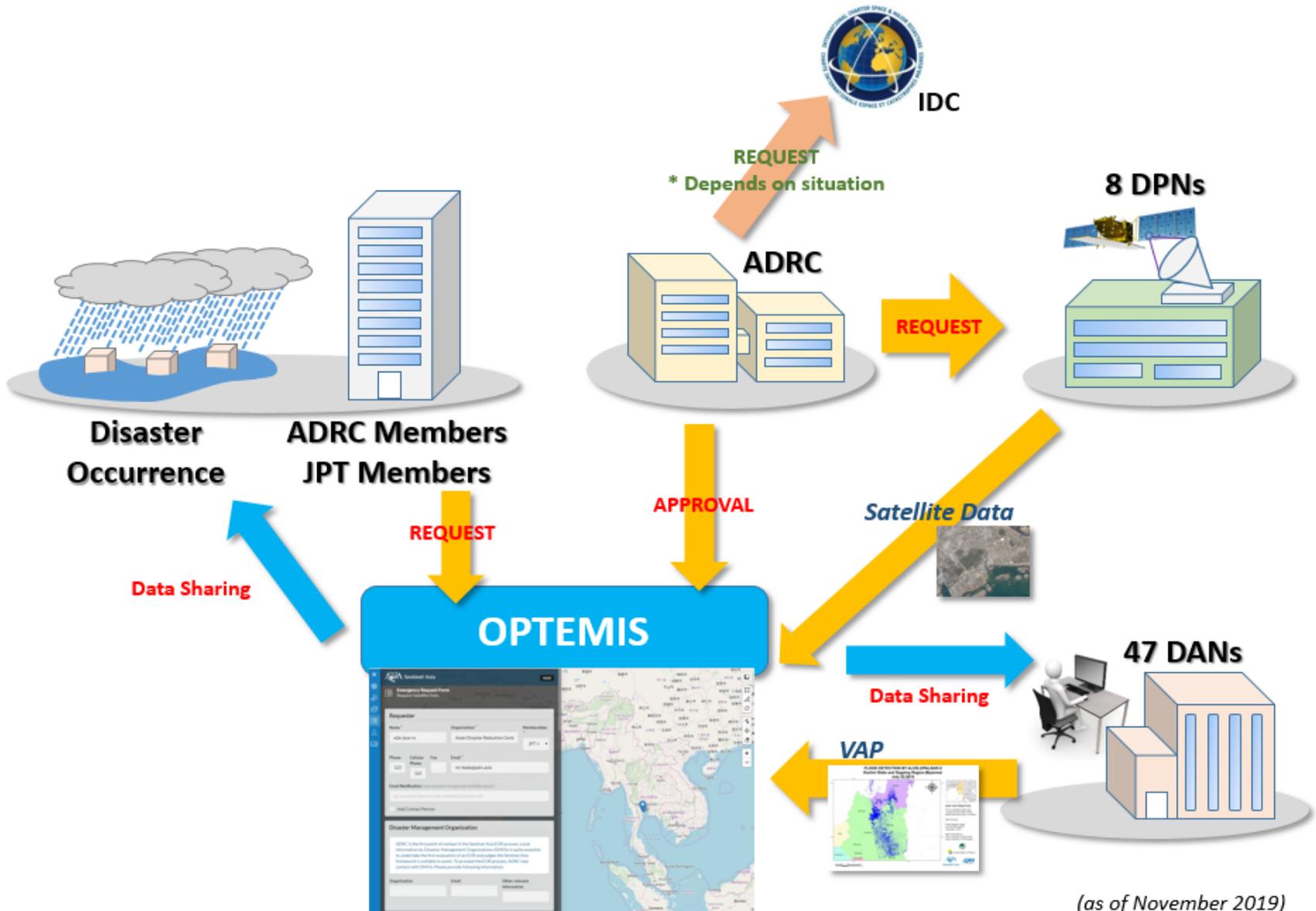
International Cooperation



JPT Meeting in Awaji, Japan in 2018
Co-organized by ADRC and JAXA
(back-to-back with ACDR in Awaji)

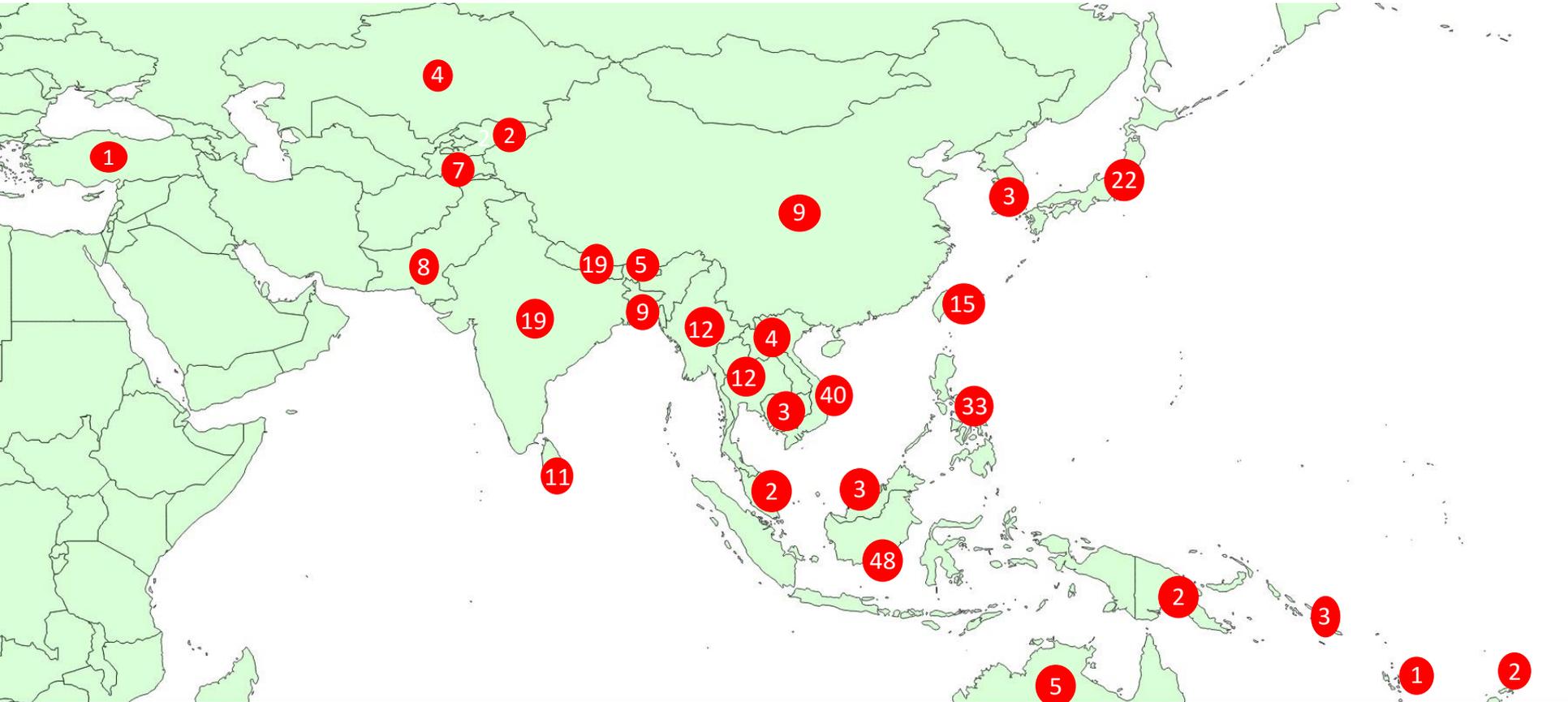






(as of November 2019)

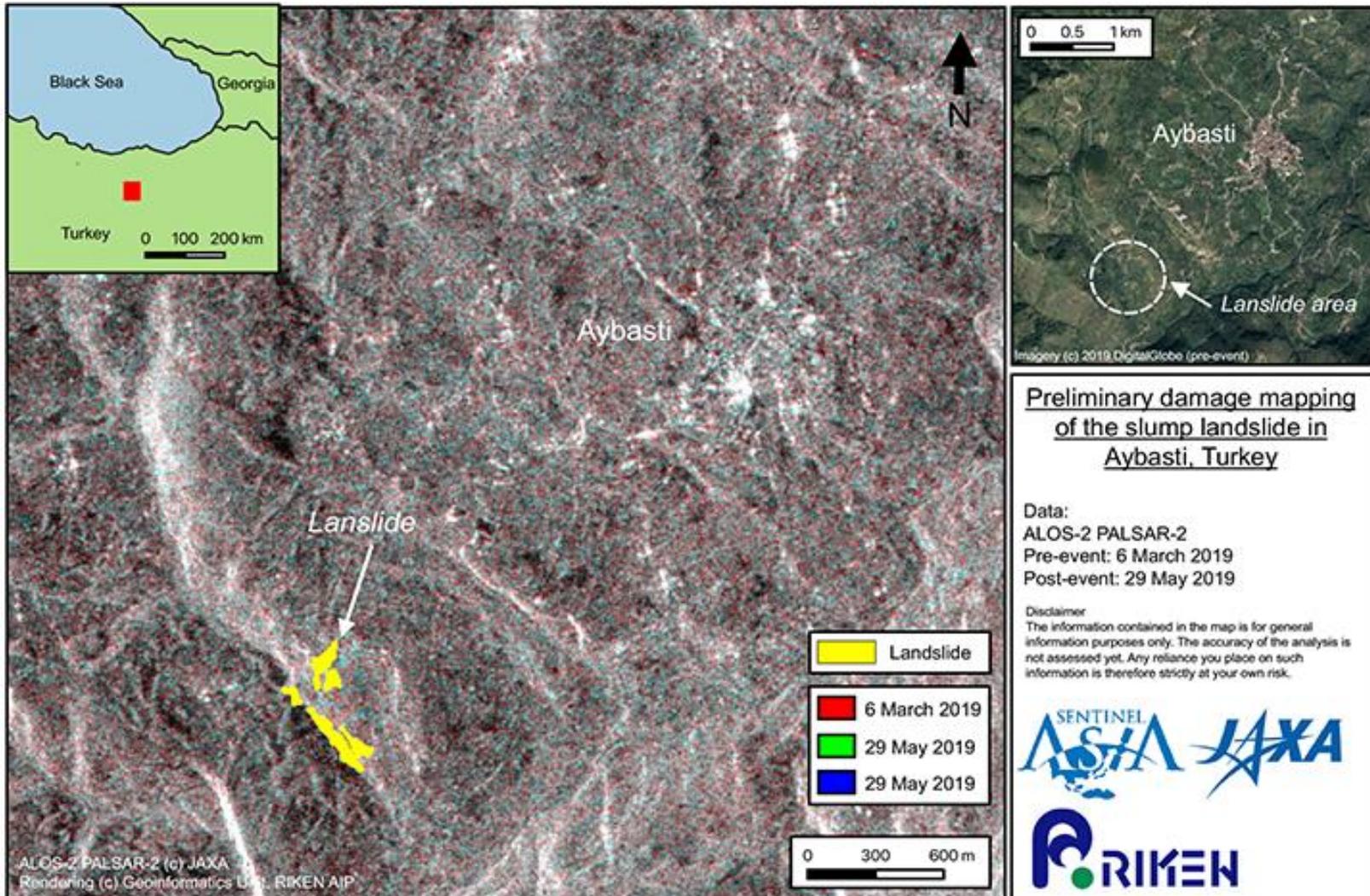
EOR Review, Responded Disasters by Geographical Distribution



30 countries/regions
307 disasters

February 2007 - 31 October 2019

- Landslide in Aybasti, Turkey in May 2019
- The first EOR from Turkey to Sentinel Asia
- Requested by AFAD as an ADRC member organization, facilitated by ADRC



Web GIS-based information

Landslide in Turkey, May 2019

Sentinel Asia



ALOS2_RGB_30May2019

Landslide analyzed by RIKEN

THEOS_04jun2019

Resourcesat2A_01Jun2019

Sentinel Asia Data site

Sentinel Asia Portal site

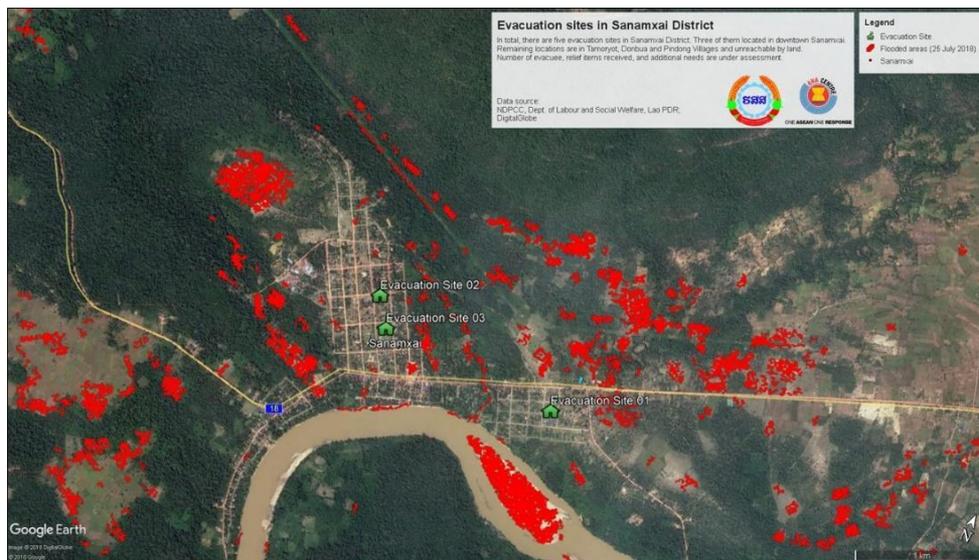


Landslide analyzed by RIKEN

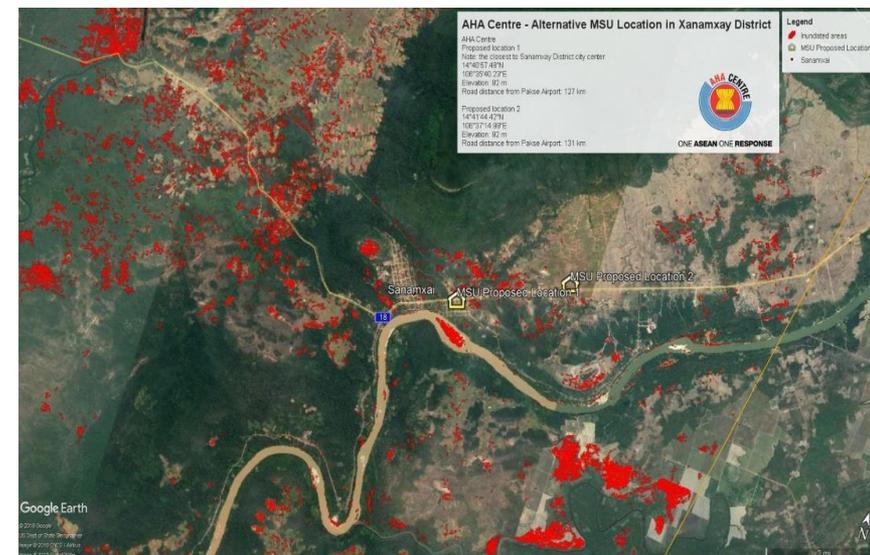
with Web AppBuilder for ArcGIS



~Use of information provided by Sentinel Asia~ Emergency Response, Relief and Rescue activities supported by the AHA Centre



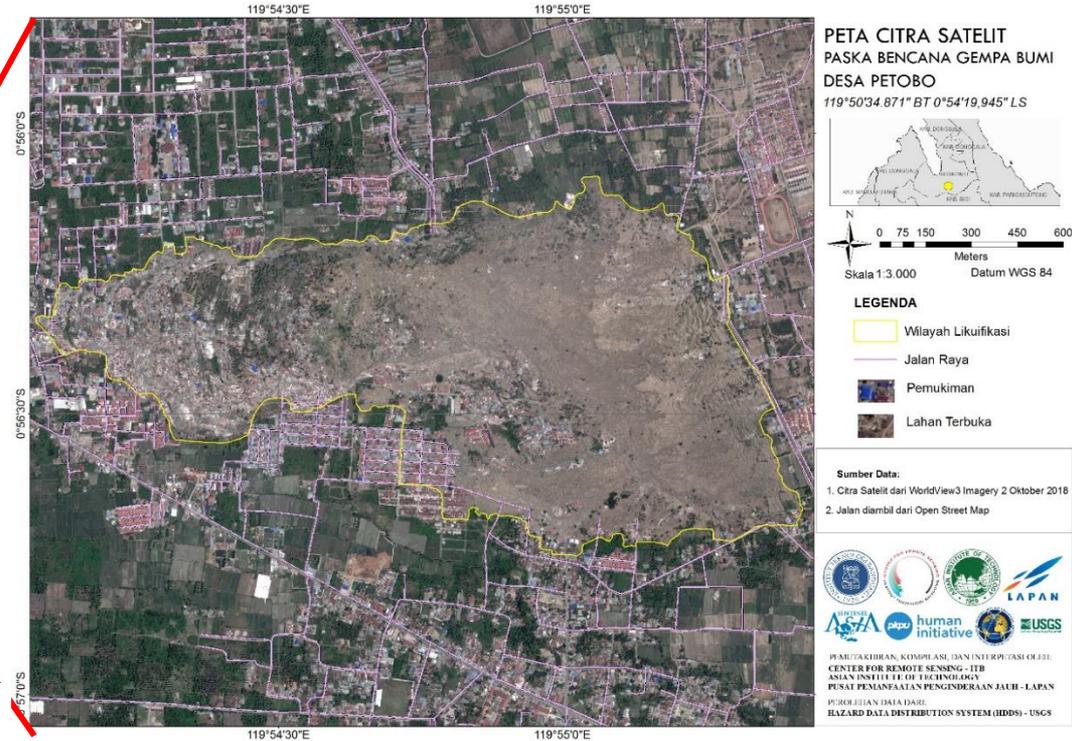
**Overlay of Inundation Areas and
Evacuation Sites in Sanamxai District**



**Overlay of Inundation Areas for
determining location of
Mobile Storage Unit**



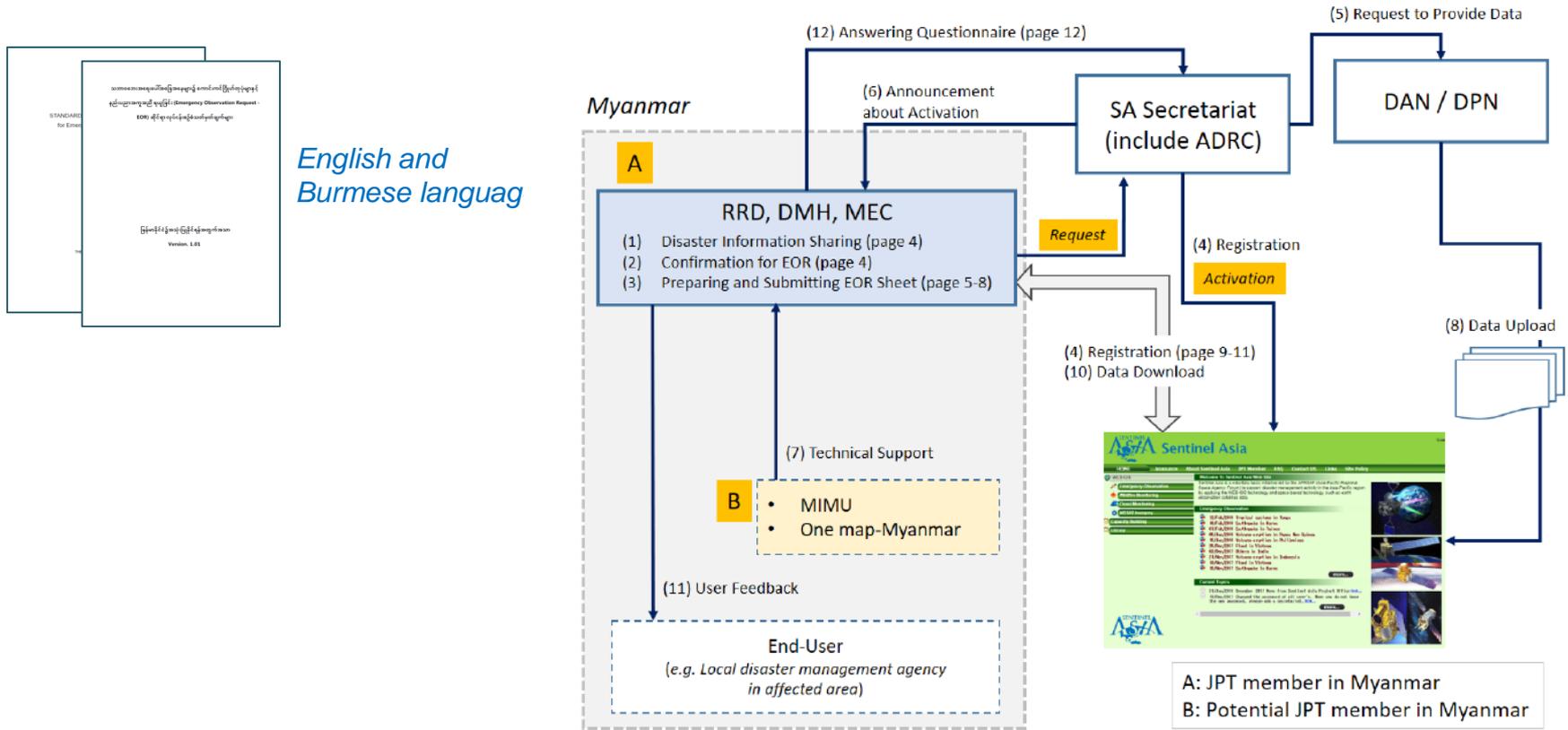
Army Central Command Station in Sigi.



The damage Map generated from satellite images was used for evacuation.

Pre-established Standard Operating Procedure (SOP) for Sentinel Asia

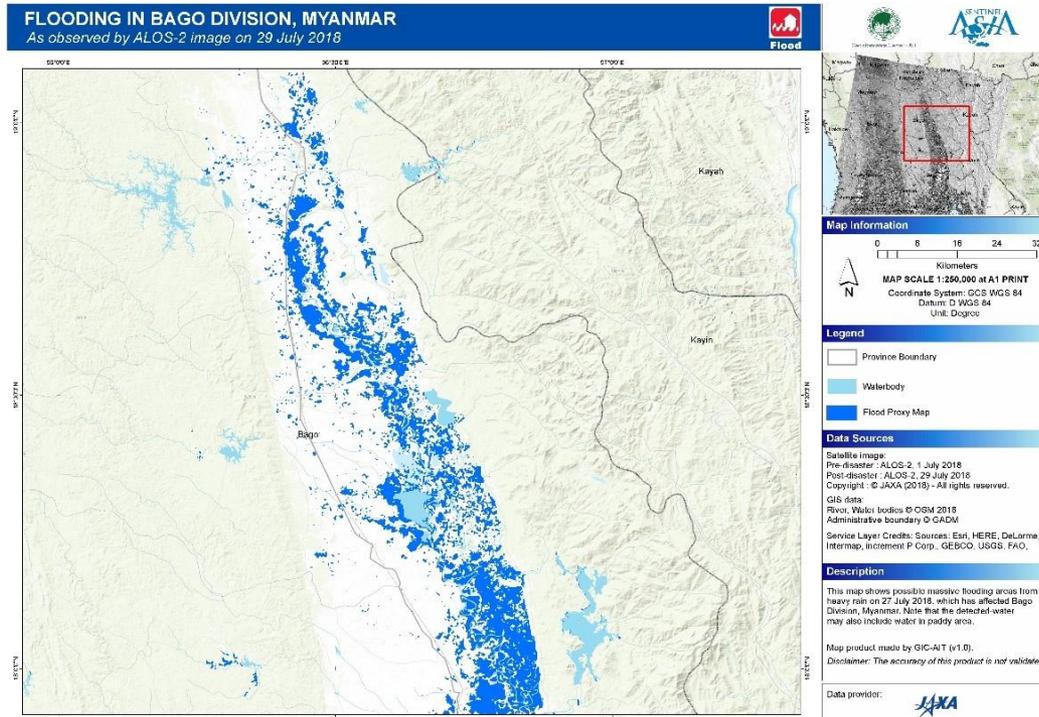
Established by disaster management authorities in Myanmar, supported by ADRC and JAXA



(Example) Myanmar Version

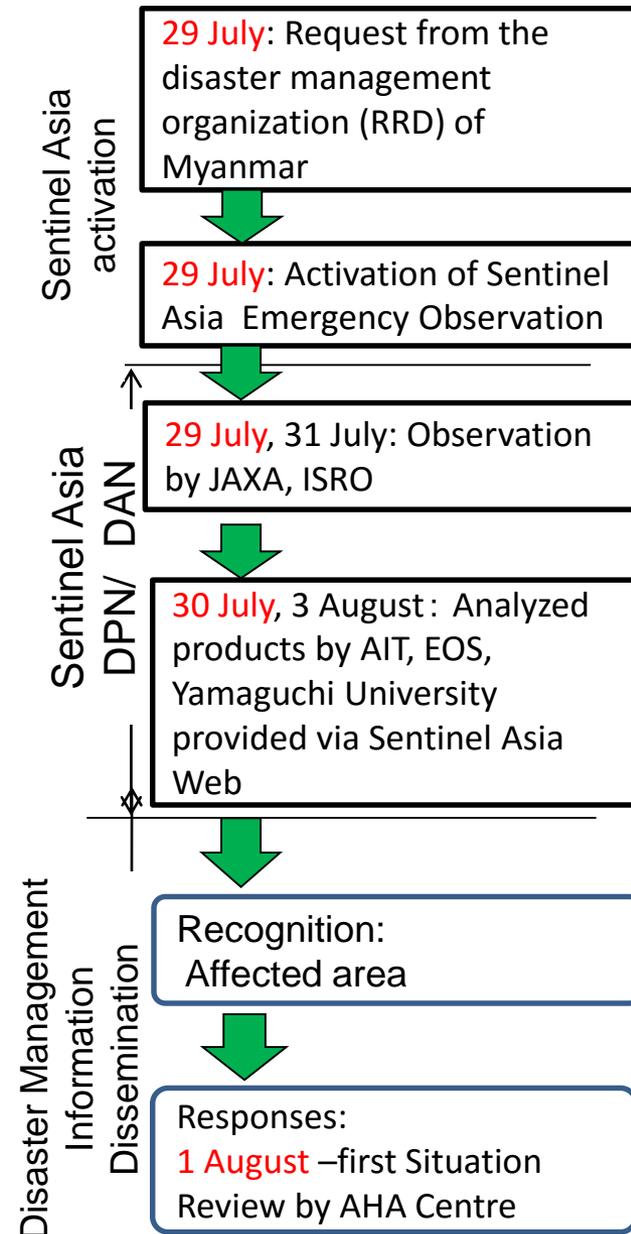
Floods in Myanmar, July 2018

Taninthayi Township, Myeik District in Taninthayi Region, was flooded as monsoon rains led the water level of the local river rise above the danger level, affecting many homes, lakes and wells in the villages and towns. Reportedly more than 100,000 were affected and more than 16,000 people were displaced.



The first analyzed product provided by AIT on 30 July

Courtesy: AIT



The first “Situation Update” published by AHA Centre on 1 August 2018

- Detailed assessment of damages
- Dissemination on the estimated needs for humanitarian support
- Supports from the international community were made available

1. HIGHLIGHTS

- a. Due to heavy torrential rains as a result of Southwest Monsoon since 4 June 2018, 9 provinces were affected thus far with widespread flooding and landslides reported. Currently there are 4 provinces which are most affected. These provinces are Kayin, Mon, Tanintharyi and Bago. The AHA Center has provided two Flash Update on the situation, which available [here](#) and [here](#).
- b. The AHA Centre sent In-Country Liaison Team and activated in-country ASEAN Emergency Response and Assessment Team (ERAT) to support coordination on emergency response operations with Government of Myanmar and preparation for local procurement of relief items. An Incident page in ASEAN WebEOC opened for potential ASEAN collective response.
- c. In view of current number of evacuees, evacuation sites and ratio of people within evacuation site, humanitarian partners may wish to reconsider add the number and space of evacuation site, particularly in the State of Bago.

2. SUMMARY OF EVENTS & FORECAST

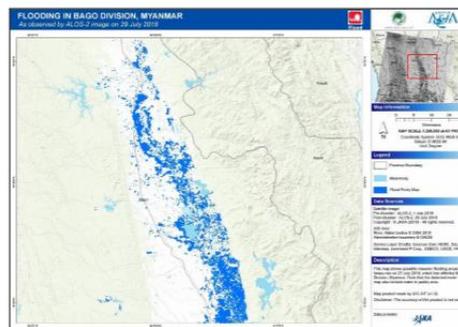
- a. On 31 July, the Department of Meteorology and Hydrology (DMH) issued an update on the Sittoung River at Madauk Station, Bago Region, indicating that the water level may drop but remains at its danger level. Also, the water level of the Shwekyin River at Shwekyin station may decline but will remain at its danger level. For the Thanlin river in Kayin State may decline and may remain at its danger level.

- b. Monsoon is strong to vigorous over the Andaman Sea and Bay of Bengal. Rain or thundershowers will be scattered in Lower Sagaing, Mandalay and Magway Regions, fairly widespread in Southern Shan State and widespread in the remaining Regions and States with regionally heavy falls in Tanintharyi Region, Rakhine, Kayin and Mon States and isolated heavy falls in Upper Sagaing Region and Kachin State.
- c. As the region is experiencing effect of Southwest Monsoon marked by heavy rainfall and strong winds between early June and late September/early October. Risk of exposure to flash floods with likelihood of localised landslides increases. Please refer to Potential Landslide Exposure in northern ASEAN Region (PDC).



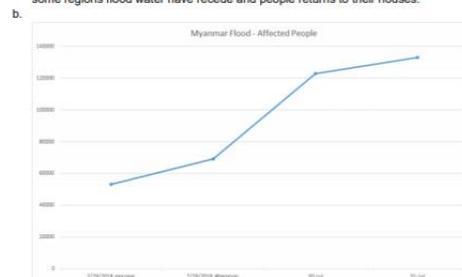
1

SITUATION UPDATE



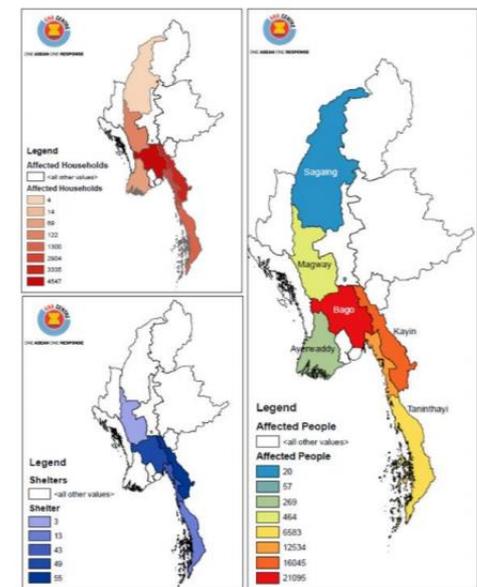
3. ASSESSMENT OF DAMAGE, IMPACT, AND HUMANITARIAN NEEDS

- a. According to the DDM in Nay Pi Taw, as of 31 July, in three regions and two states that are affected by floods, there are a total of 299 Camps where 132,972 people (28,481 households). The number raised from the initial date (29 July), although in some regions flood water have recede and people returns to their houses.



3

SITUATION UPDATE



4. ACTIONS TAKEN AND RESOURCES MOBILISED

Response by Government of Myanmar

- a. Government of Myanmar provided [Flood Warning](#) have been issued by Department of Meteorology and Hydrology (DMH), for Thabaung Township, and the availability of Myanmar [Disaster Alert Notification](#) enable sufficient evacuation by the people.
- b. Department of Disaster Management, Ministry of Social Welfare, Relief and Resettlement, is carrying out initial assessment of the situation in order to estimate the impact and damage due to the flooding.



5

SITUATION UPDATE

Four specific priorities for action;

Priority Action-1(PA-1); Understanding disaster risk

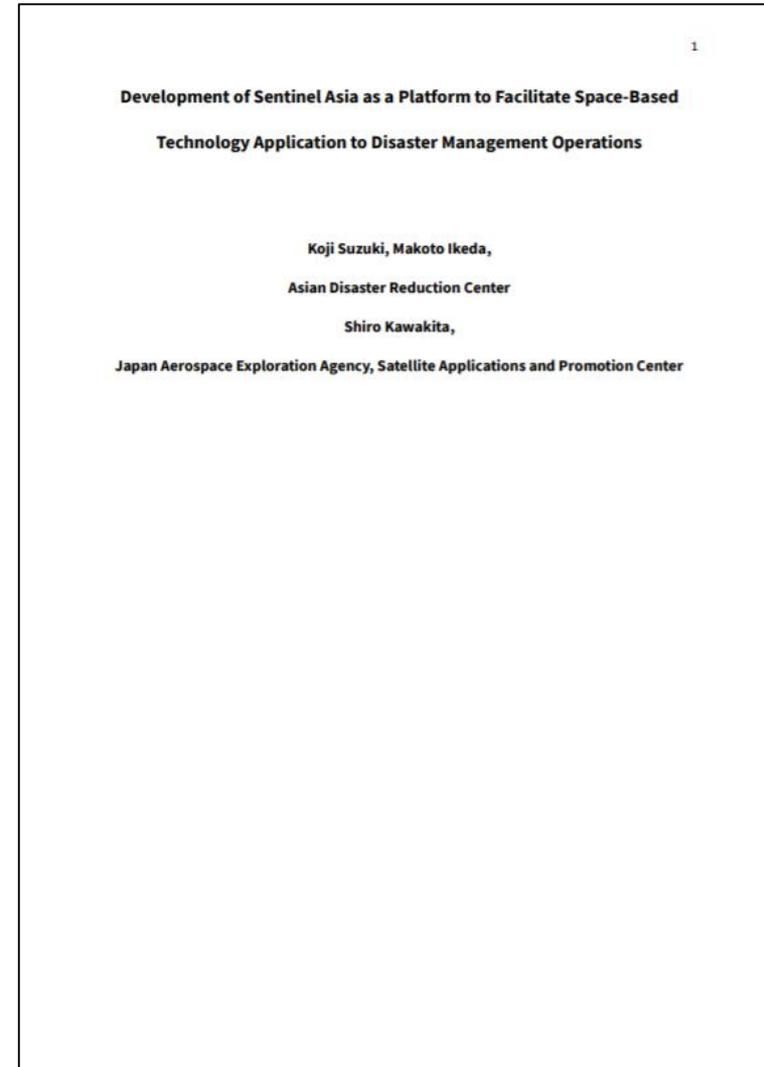
Priority Action-2(PA-2); Strengthening disaster risk governance to manage disaster risk

Priority Action-3(PA-3); Investing in disaster risk reduction

Priority Action-4(PA-4); Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.



- Sentinel Asia's paper "Development of Sentinel Asia as a Platform to Facilitate Space-Based Technology Application to Disaster Management Operations"
- Co-authored by ADRC and JAXA
- Accepted and published as part of Global Assessment Report (GAR) by UNDRR

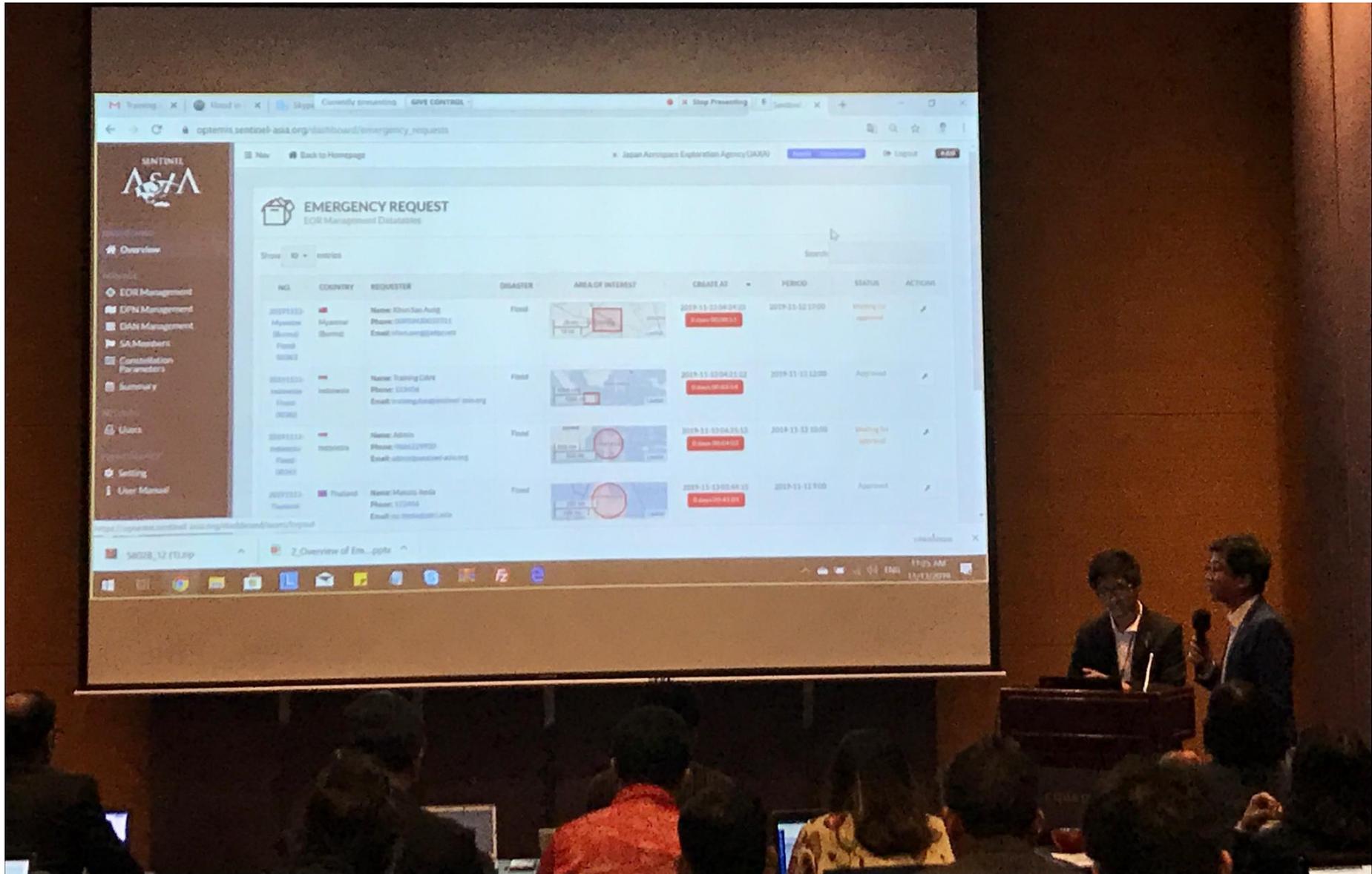




	ADRC members	JPT members
Emergency observation requests	✓	✓
Participation in JPT meetings		✓
Training/capacity-building opportunities		✓

- Co-organized by the Asian Disaster Preparedness Centre (ADPC) and JAXA
- Hosted by ADPC in Bangkok, from 12 to 14 November 2019





optemis.sentinel-asa.org/dashboard/emergency_requests

Japan Aerospace Exploration Agency (JAXA)

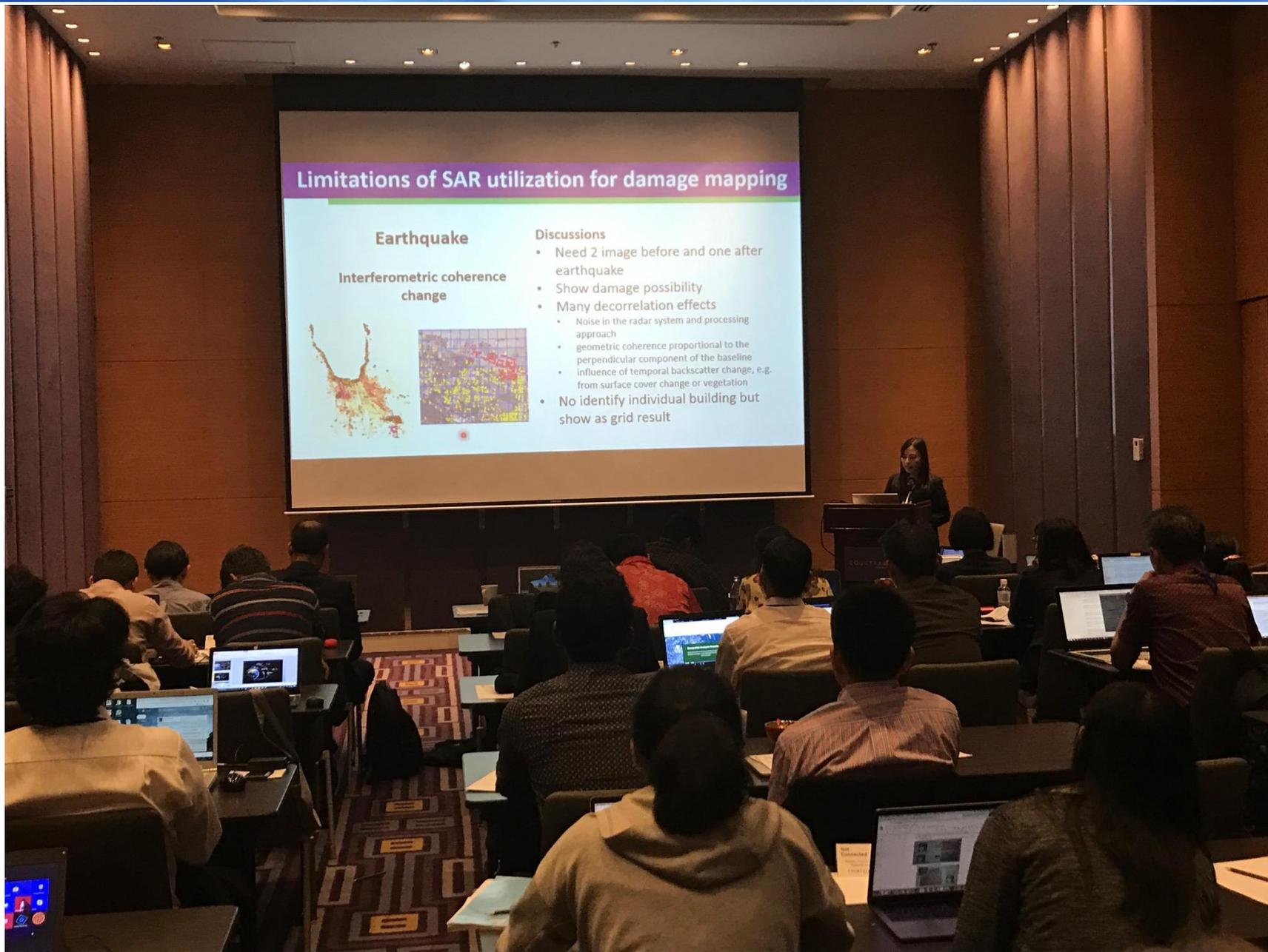
EMERGENCY REQUEST

EMERGENCY REQUEST Management Database

Show 4 entries

ID	COUNTRY	REQUESTER	DISASTER	AREA OF INTEREST	CREATE AT	PERIOD	STATUS	ACTION
20191101	Indonesia	Name: Ebin San Aung Phone: 0812345678901 Email: ebin.san@optemis.com	Flood		2019-11-01 04:24:00 View Details	2019-11-02 17:00	Working for approval	
20191101	Indonesia	Name: Training Data Phone: 123456 Email: training@optemis.com	Flood		2019-11-01 04:21:02 View Details	2019-11-01 12:00	Approved	
20191101	Indonesia	Name: Admin Phone: 0812345678901 Email: admin@optemis.com	Flood		2019-11-01 04:20:15 View Details	2019-11-02 00:00	Working for approval	
20191101	Thailand	Name: Marisa Suda Phone: 123456 Email: msuda@optemis.com	Flood		2019-11-01 00:00:00 View Details	2019-11-12 0:00	Approved	

11:25 AM 11/13/2019



Limitations of SAR utilization for damage mapping

Earthquake

Interferometric coherence change



Discussions

- Need 2 image before and one after earthquake
- Show damage possibility
- Many decorrelation effects
 - Noise in the radar system and processing approach
 - geometric coherence proportional to the perpendicular component of the baseline
 - influence of temporal backscatter change, e.g. from surface cover change or vegetation
- No identify individual building but show as grid result

If you would like to collaborate more closely
with Sentinel Asia,
please contact the Executive Secretariat
(JAXA) at sa-secretariat@restec.or.jp to be
a JPT member as well!