

ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre)



**ONE ASEAN
ONE RESPONSE**

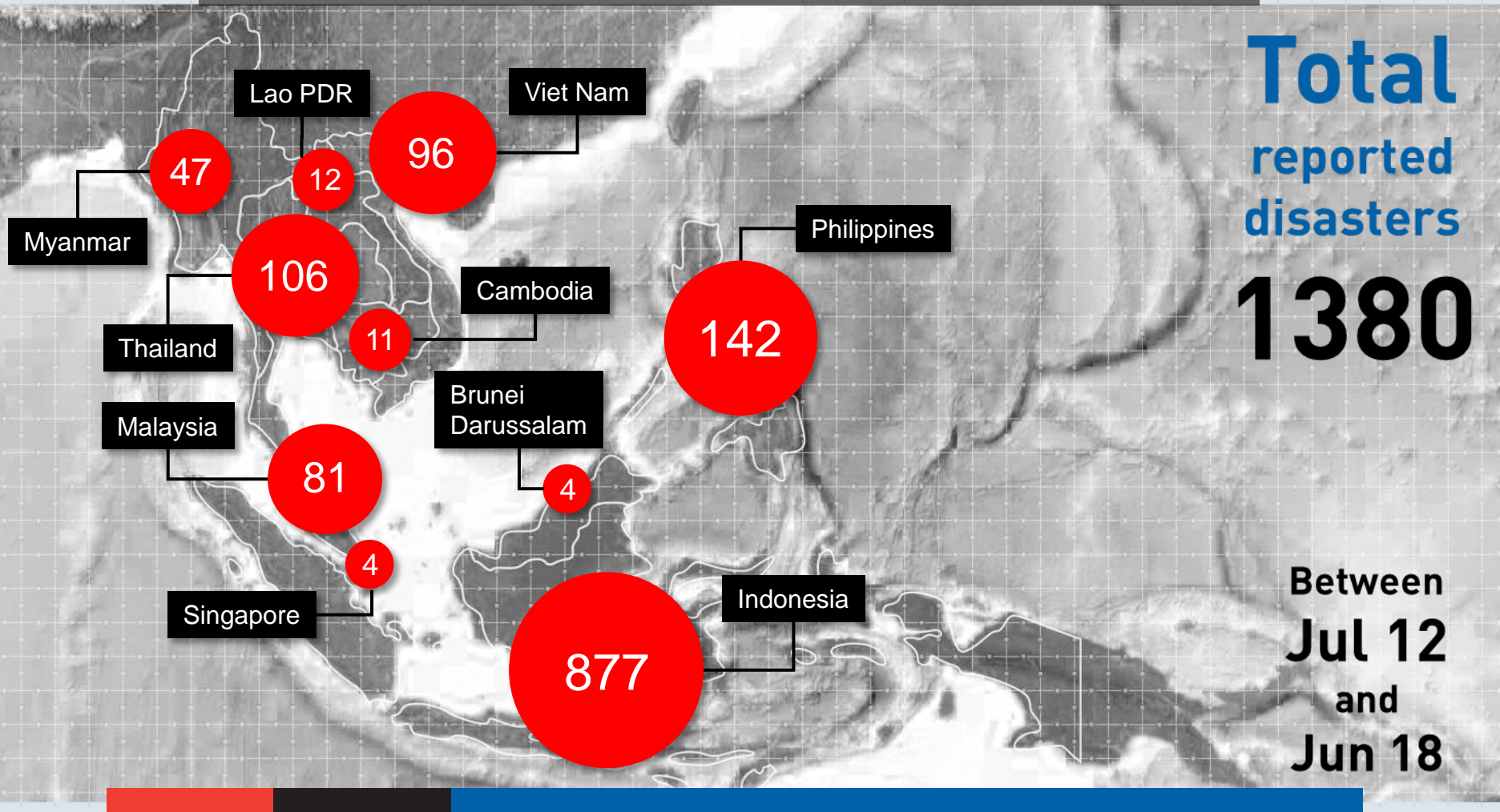
1 Nov 2018

Total reported disasters within ASEAN

(Between Jul 12 and Jun 18)



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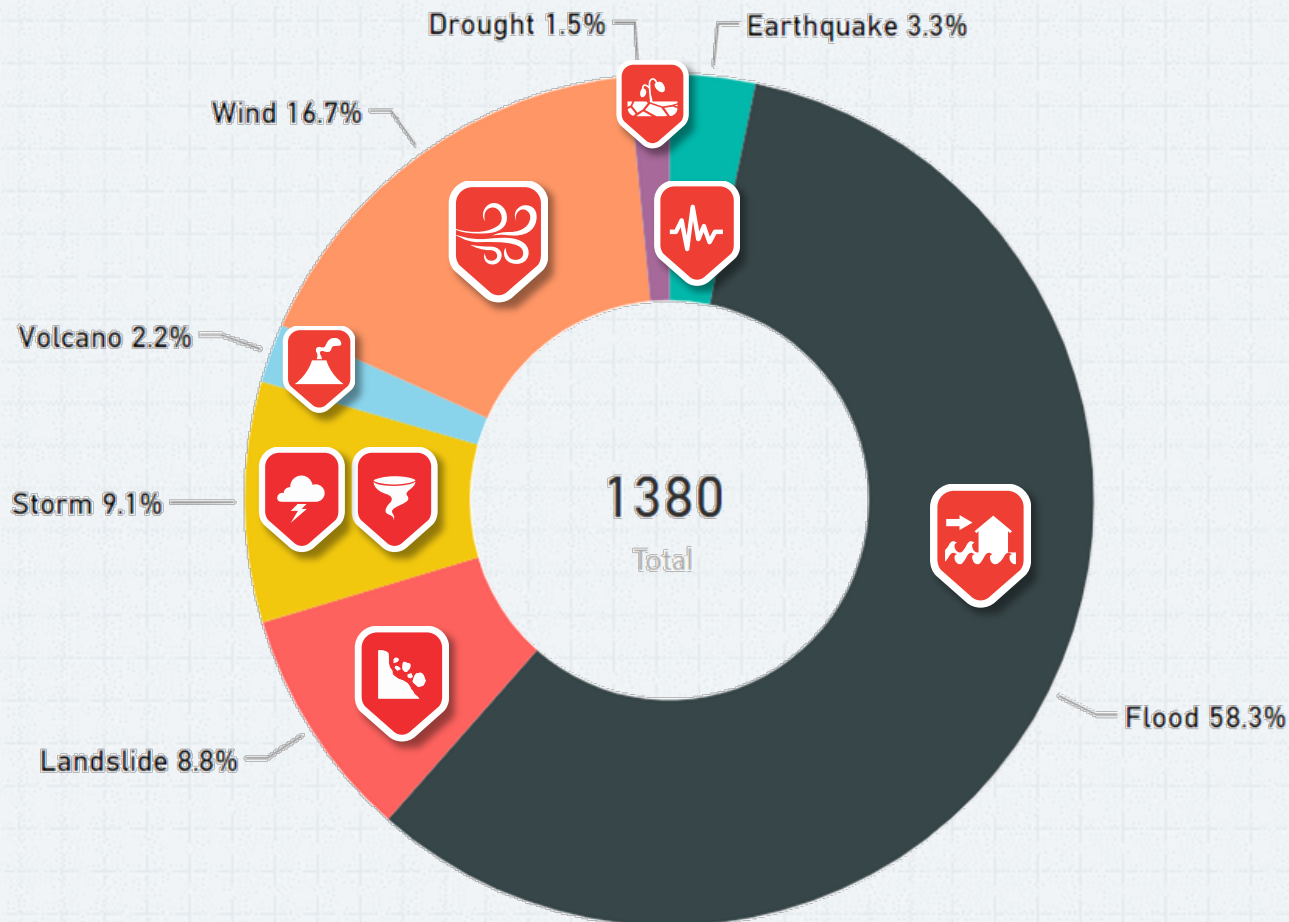


Total reported disasters breakdown by hazard

(Between Jul 12 and Jun 18)



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hydro-met

85.6%



14.4%

geophysical



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LIST OF AHA CENTRE RESPONSES

The AHA Centre has responded to a total of 23 incidents in 7 countries across the region, and conducted preparedness and assessment mission in another 5 occasions.



- | | | | |
|---|---|--|---|
| 1 2012 MYANMAR, NOV
THABAITKKYIN EARTHQUAKE | 8 2013 THE PHILIPPINES, OCT
BOHOL EARTHQUAKE | 15 2015 MYANMAR, AUG
MYANMAR FLOOD | 22 2017 VIET NAM, AUG
FLASH FLOOD & LANDSLIDE |
| 2 2012 THE PHILIPPINES, DEC
TROPICAL STORM BOPHA | 9 2013 CAMBODIA, OCT
FLOOD | 16 2015 THE PHILIPPINES, OCT
TYPHOON KOPPU | 23 2017 MYANMAR, OCT
IDP IN RAKHINE STATE |
| 3 2013 INDONESIA, JAN
JAKARTA FLOOD | 10 2013 THE PHILIPPINES, DEC
TYPHOON HAIYAN | 17 2016 THE PHILIPPINES, OCT
TYPHOON HAIMA | 24 2017 VIET NAM, NOV
TYPHOON DAMREY |
| 4 2013 MYANMAR, MAY
TROPICAL CYCLONE MAHASEN | 11 2014 THE PHILIPPINES, JUL
TYPHOON RAMMASUN | 18 2016 INDONESIA, DEC
ACEH EARTHQUAKE | 25 2018 MYANMAR, APR
LANDFILL FIRE, YANGON |
| 5 2013 INDONESIA, JUL
ACEH EARTHQUAKE | 12 2014 VIET NAM, JUL
TYPHOON RAMMASUN | 19 2016 PHILIPPINES, DEC
TYPHOON MELOR | 26 2018 LAO PDR, JUL
FLOOD |
| 6 2013 LAO PDR, AUG
FLOOD | 13 2014 THE PHILIPPINES, DEC
TYPHOON HAGUPIT | 20 2016 THE PHILIPPINES, DEC
TYPHOON NOCK-TEN | 27 2018 MYANMAR, AUG
FLOOD |
| 7 2013 THE PHILIPPINES, AUG
TROPICAL STORM MARING | 14 2015 MALAYSIA, JAN
FLOOD | 21 2017 THE PHILIPPINES, JUL
INTERNALLY-DISPLACED PEOPLE IN MARAWI (IDP) | 28 2018 INDONESIA, AUG
LOMBOK EARTHQUAKE |

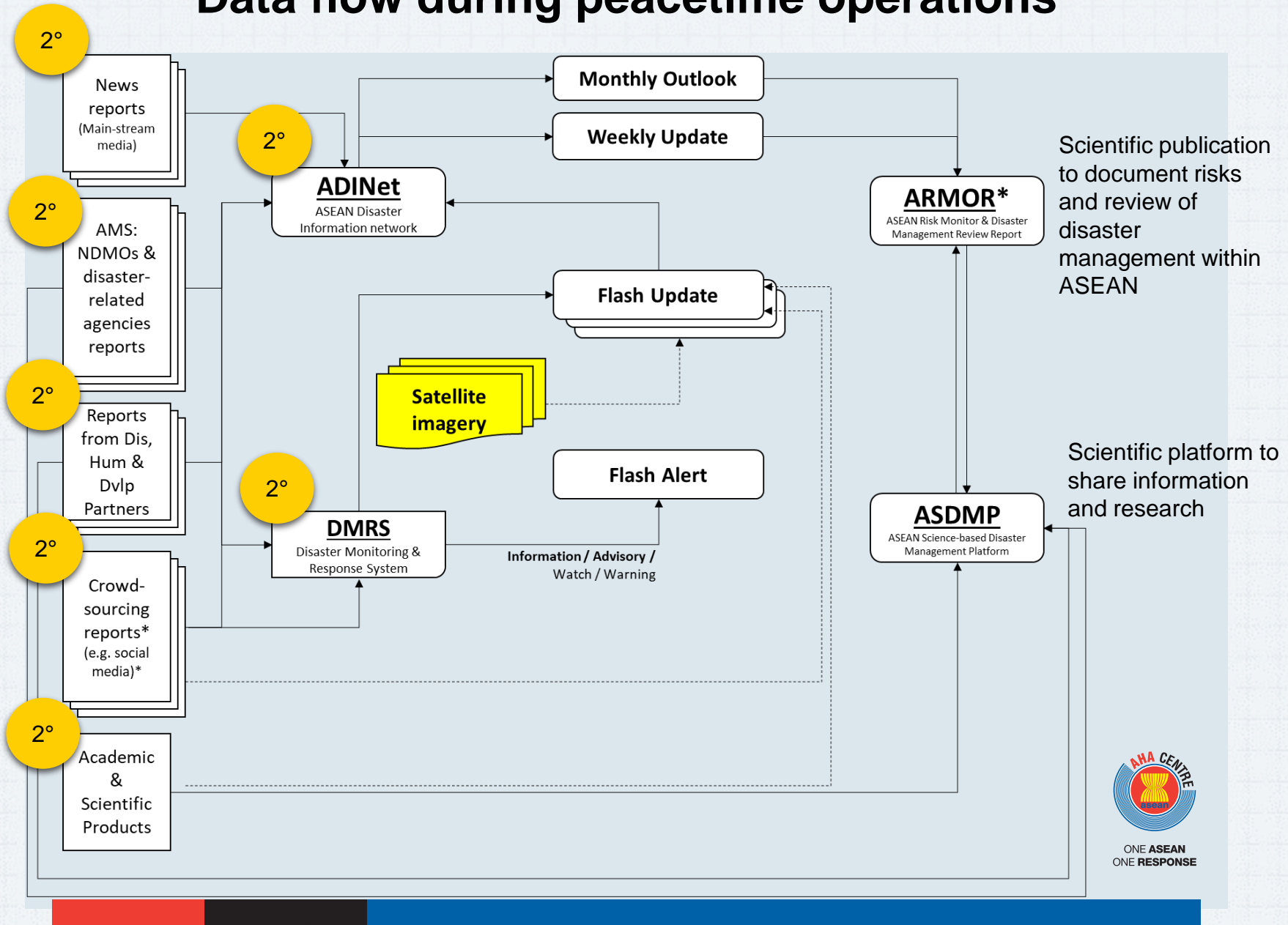
AHA Centre responses

Till 20 October, AHA Centre has responded to **25 incidents** with preparedness and assessment missions for 5 occasions.

The latest responses were:

- Super Typhoon Mangkhut (Ompong)
- Central Sulawesi Earthquake

Data flow during peacetime operations

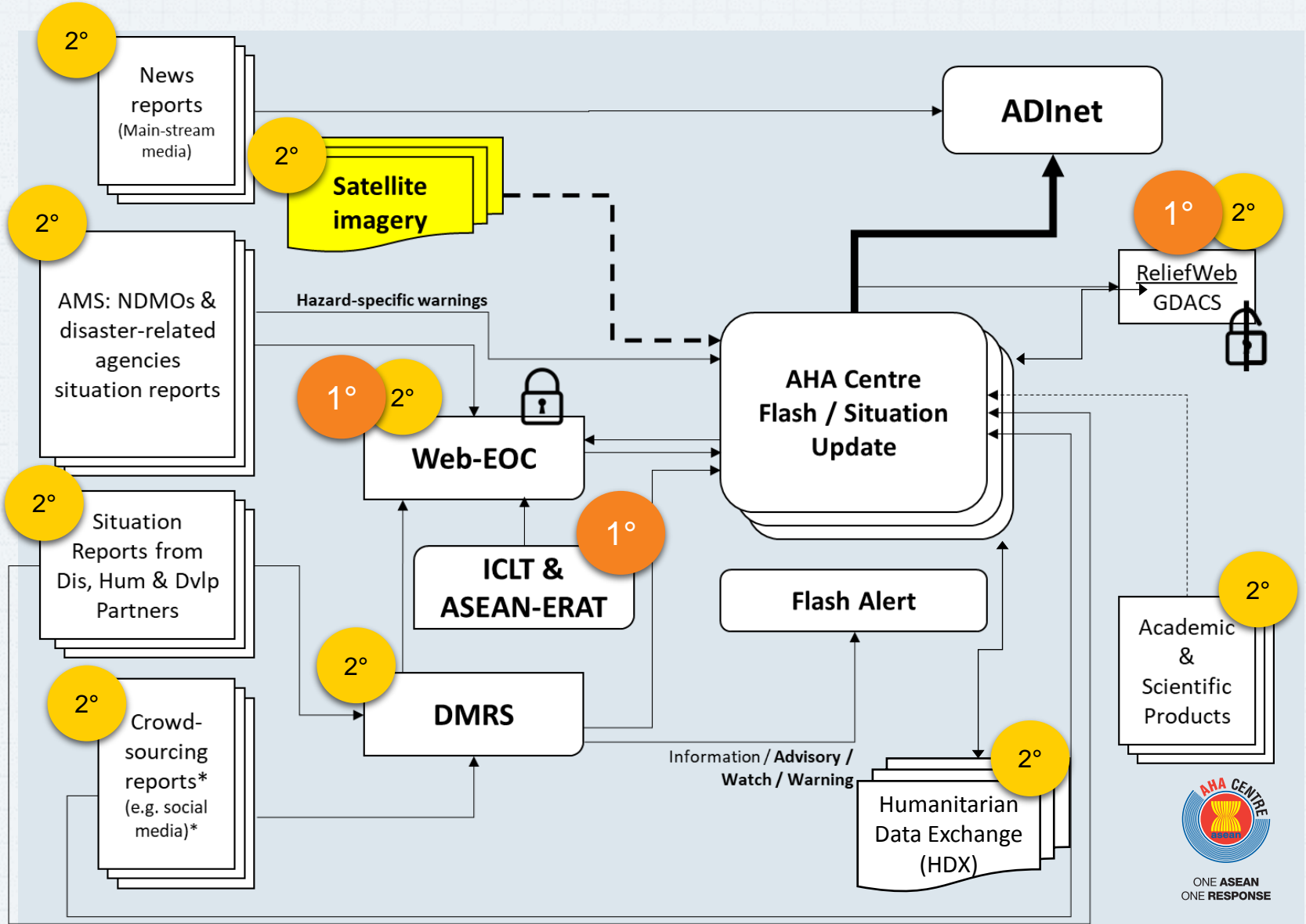


1° Primary data

2° Secondary data



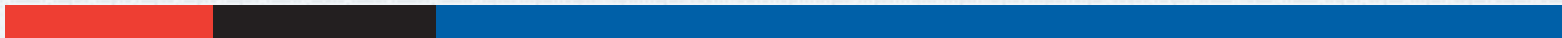
Data flow during emergency operations



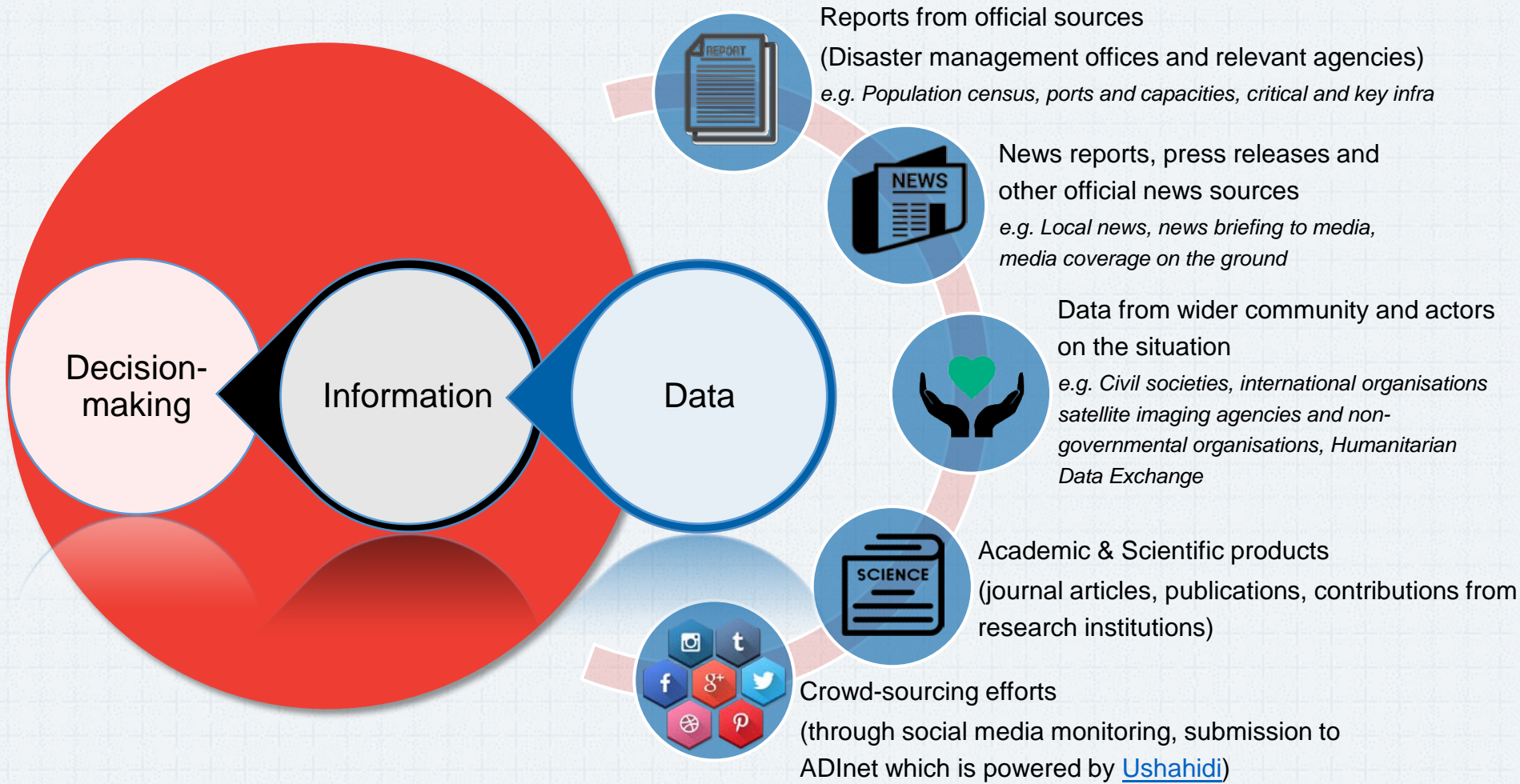
Use and value of satellite data in disasters



- Using **remotely sensed data to decipher trends** and also provide a good understanding of where potential hydro-met disaster could occur in the region.
 - Proxy to areas where weather stations are unavailable or not readily accessible
 - Provides better understanding to inform decisions on resource mobilization across seasons (Southwest or Northeast monsoon) or annually
- Provide **bird's eye view on the areas which had suffered damages**, tracking it across time – For both **assessment and recovery planning**
- Provides the science behind the event and how it occurred.
- Provides a **better sense on where the IDP settlements should be placed** and how **satellite imagery can help to select locations which are away from potential risks and dangers**
- Adds an **additional dimension to analysis for damage assessment** should there be widespread destruction, areas which have been hampered by access.



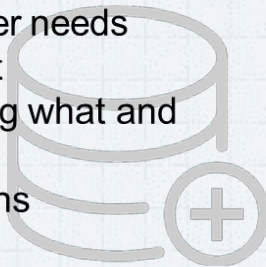
Data to decision making



From data to decisions

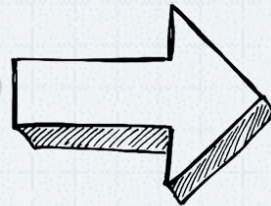
Data input

- Pre-disaster data
- Post-disaster needs assessment
- Who is doing what and where
- Consultations
- Interviews



Consider the following factors

- Magnitude
- Humanitarian Impact
- Capability and resources
 - Manpower
 - Equipment
 - Relief items
- Short, mid and long term needs



- What are we prioritising?
- What is lacking and in need?
- Who to coordinate with?

- Who is offering what?
- What should be offered?
- Addressing the request of assistance



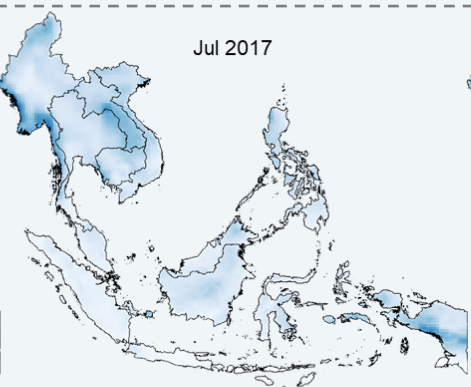
Use of remote sensing data for deciphering trends



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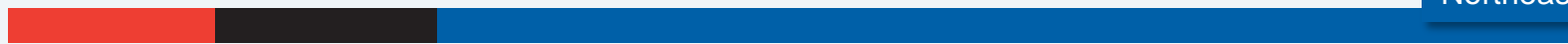
Northeast Monsoon



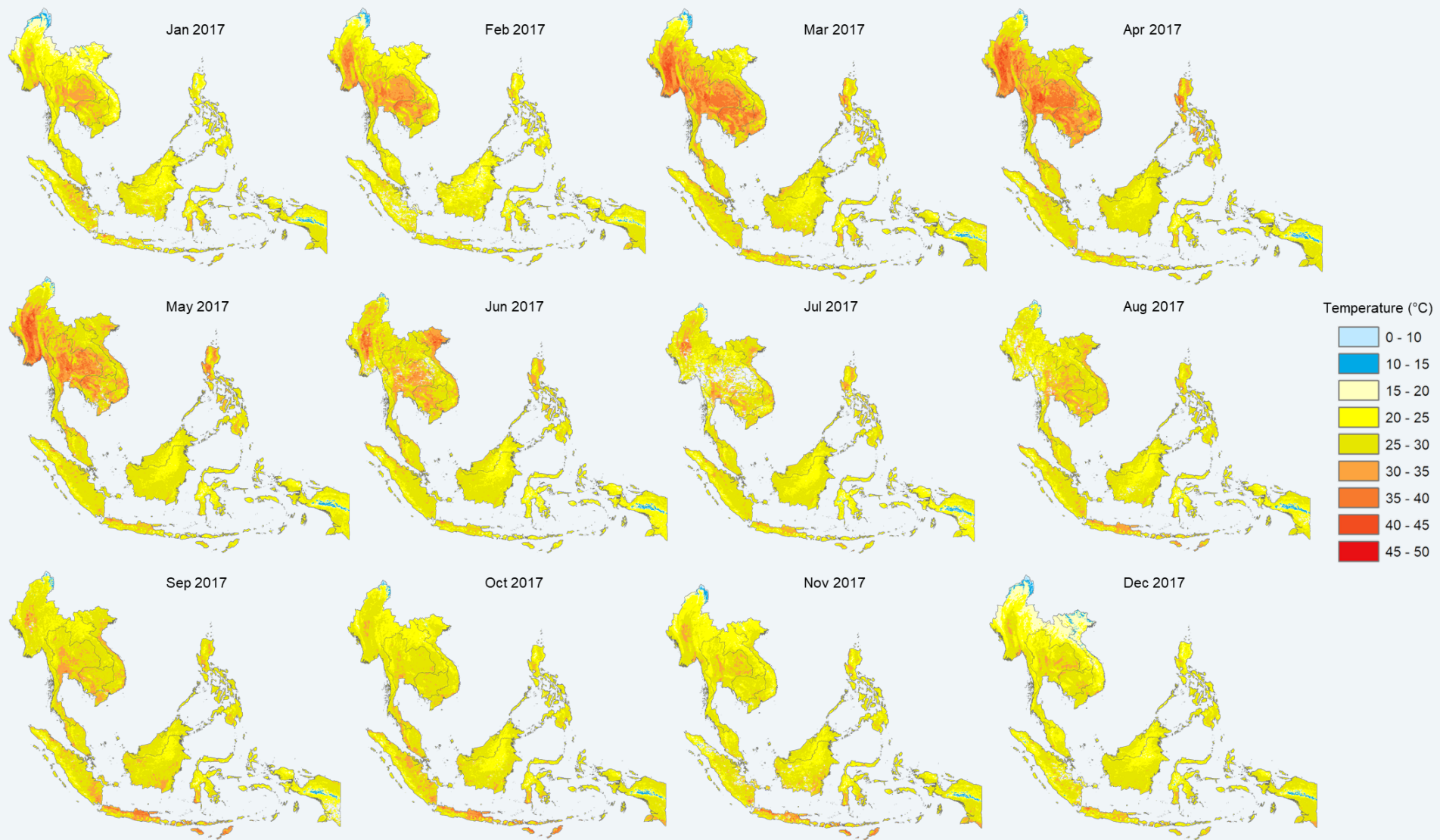
Southwest Monsoon



Northeast Monsoon



Data source: NASA Precipitation Measurement Missions, TRMM 3A26 Surface Rain Total



Data Source: MODIS MOD11C3 Land Surface Temperature/Emissivity Monthly



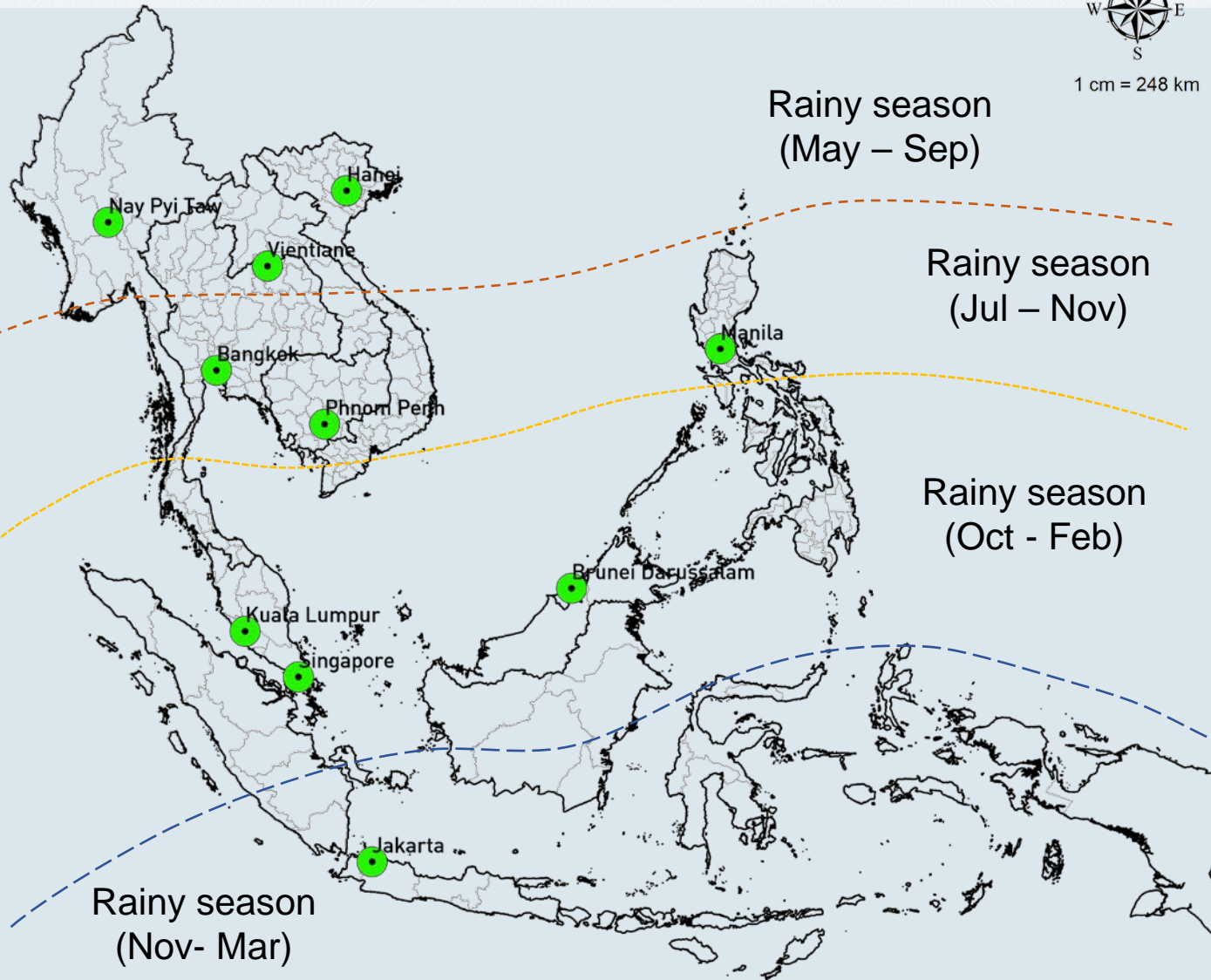
1 cm = 248 km

Rainy season
(May – Sep)

Rainy season
(Jul – Nov)

Rainy season
(Oct - Feb)

Rainy season
(Nov- Mar)



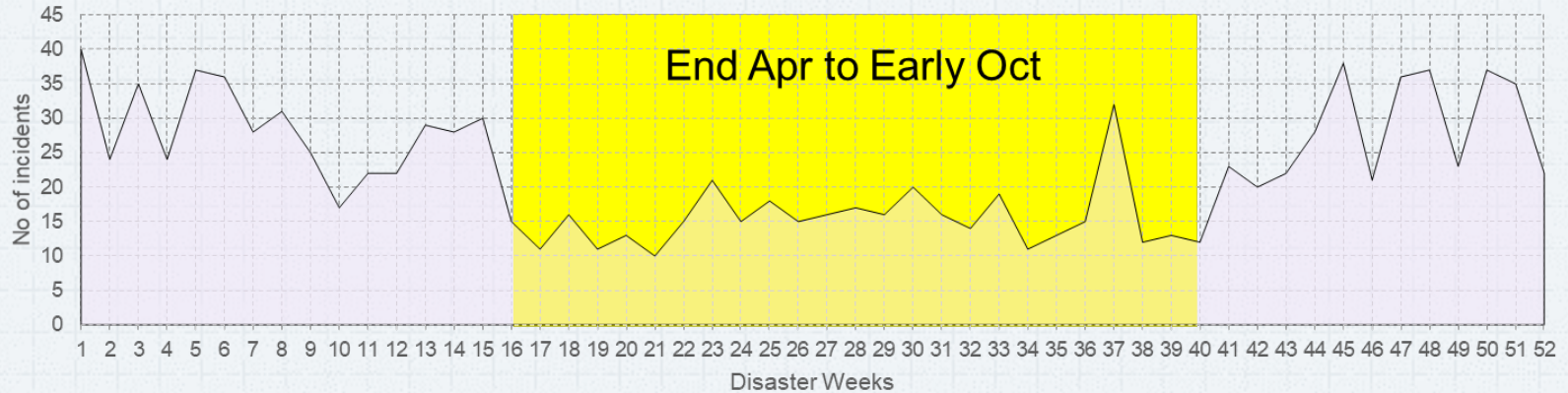
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Weekly Disaster Trends (Jul 12 to Dec 17)

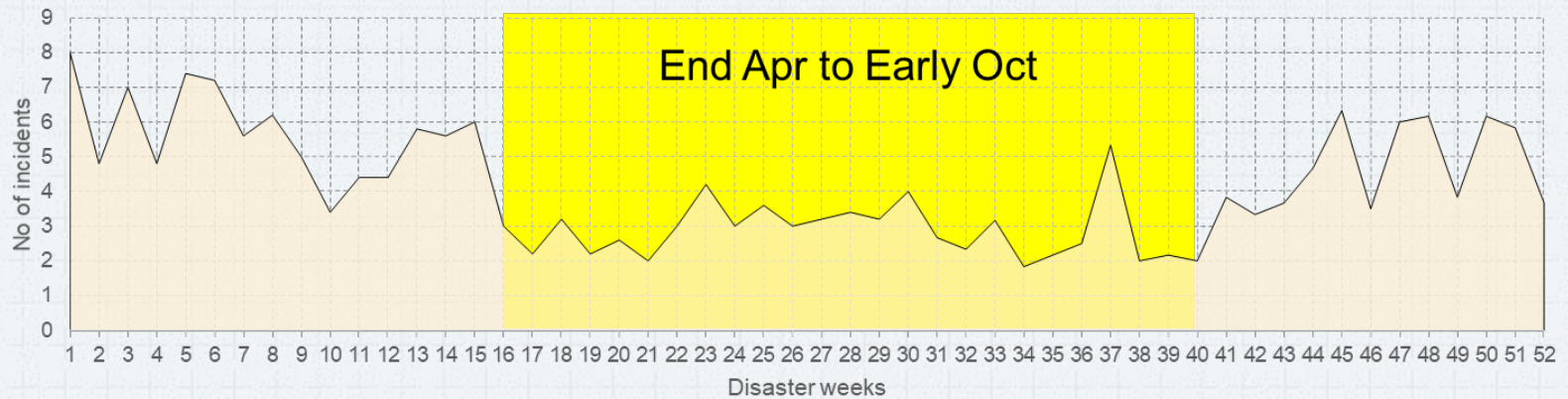


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Frequency of total disasters (Jul 2012 to Dec 2017)

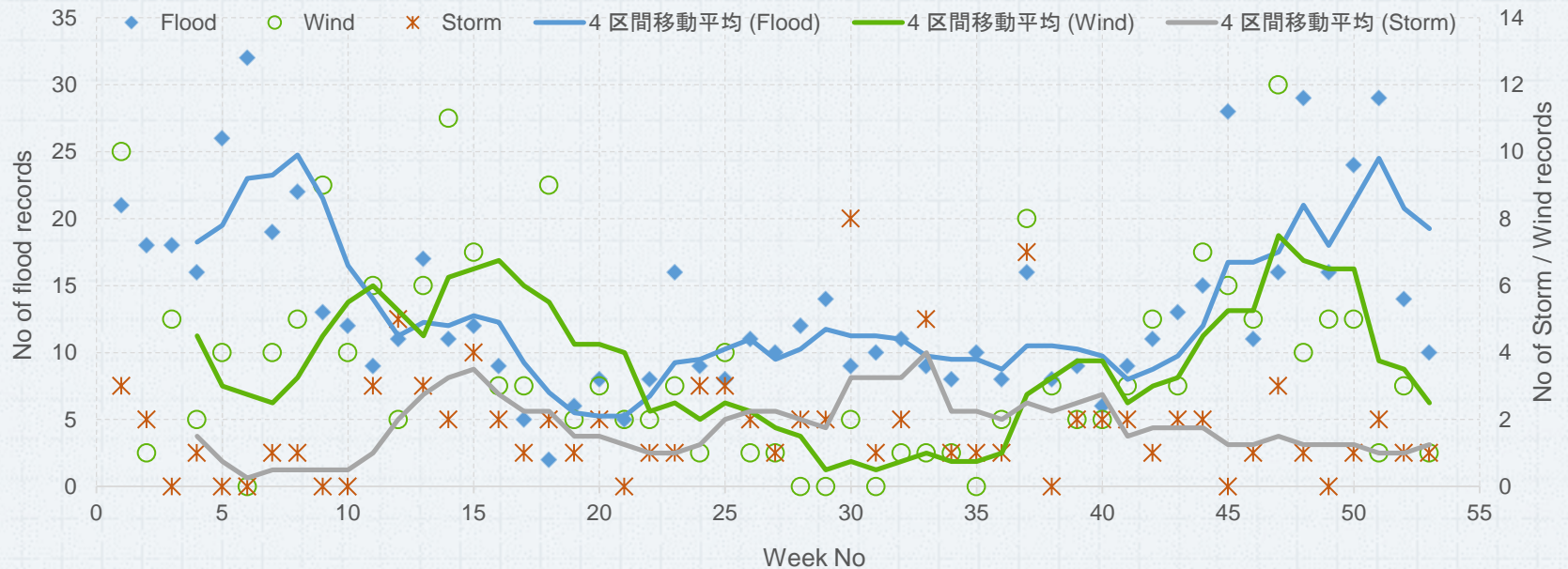


Frequency of average disasters (Jul 2012 to Dec 2017)



Moving Average (4 weeks) trend lines

4 week moving average for recorded disasters between 2012 and 2017 by week

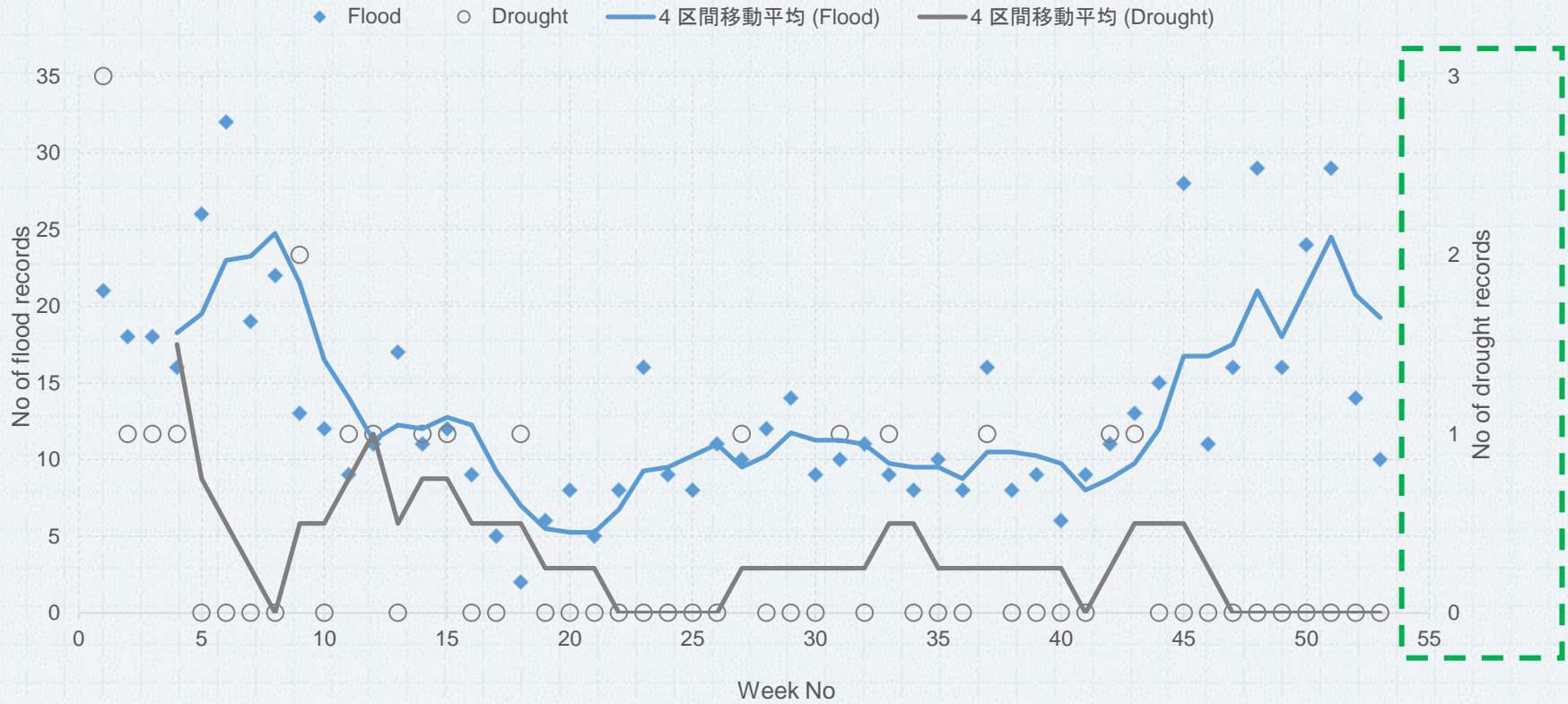


- Data is consistent with the fact that storms and strong winds bring about heavy rainfall leading to floods.
- How about hazards of opposing nature?

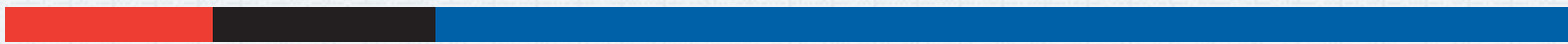
Statistical correlation was not conducted at this point as the data would not have significant power and there is under-reporting of disasters across certain countries.

Moving Average (4 weeks) trend lines

4 week moving average for recorded disasters between 2012 and 2017 by week



- Data seems to suggest that drought has an opposing trend to Floods.
- However, data on droughts is under-reported and it is at best inconclusive on the trend line comparison.



How was satellite imagery data used in disaster response?



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Satellite observation data utilised in emergencies within ASEAN in 2018

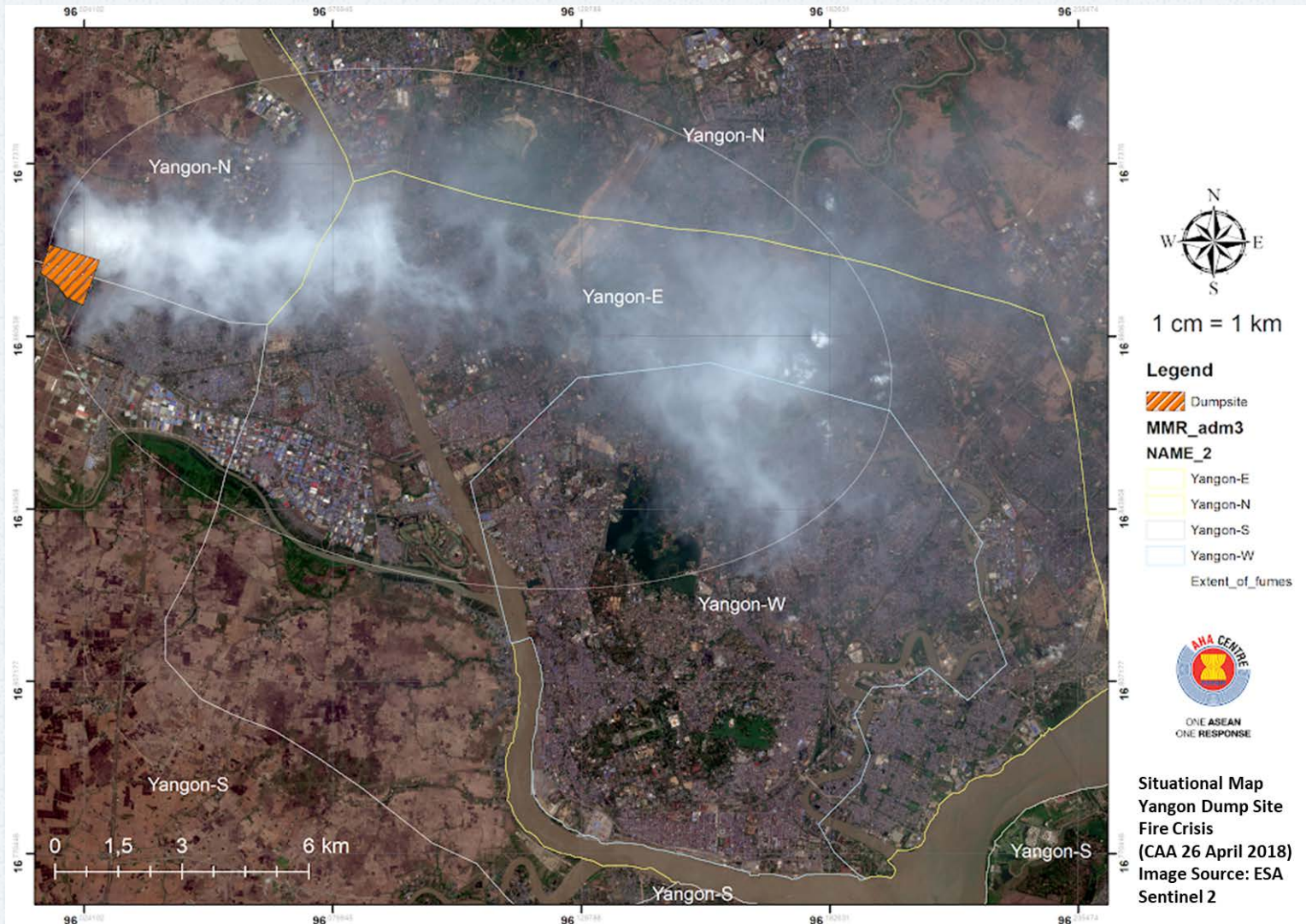


1. Yangon dumpsite fire (May 2018)
2. Attapeu, Laos flood response (July 2018)
3. Myanmar flood response (August 2018)
4. Lombok earthquake response (August 2018)
5. Super Typhoon Mangkhut [Ompong] response (September 2018)
6. Central Sulawesi Earthquake response (September – October 2018)

Yangon dumpsite fire (May 2018)

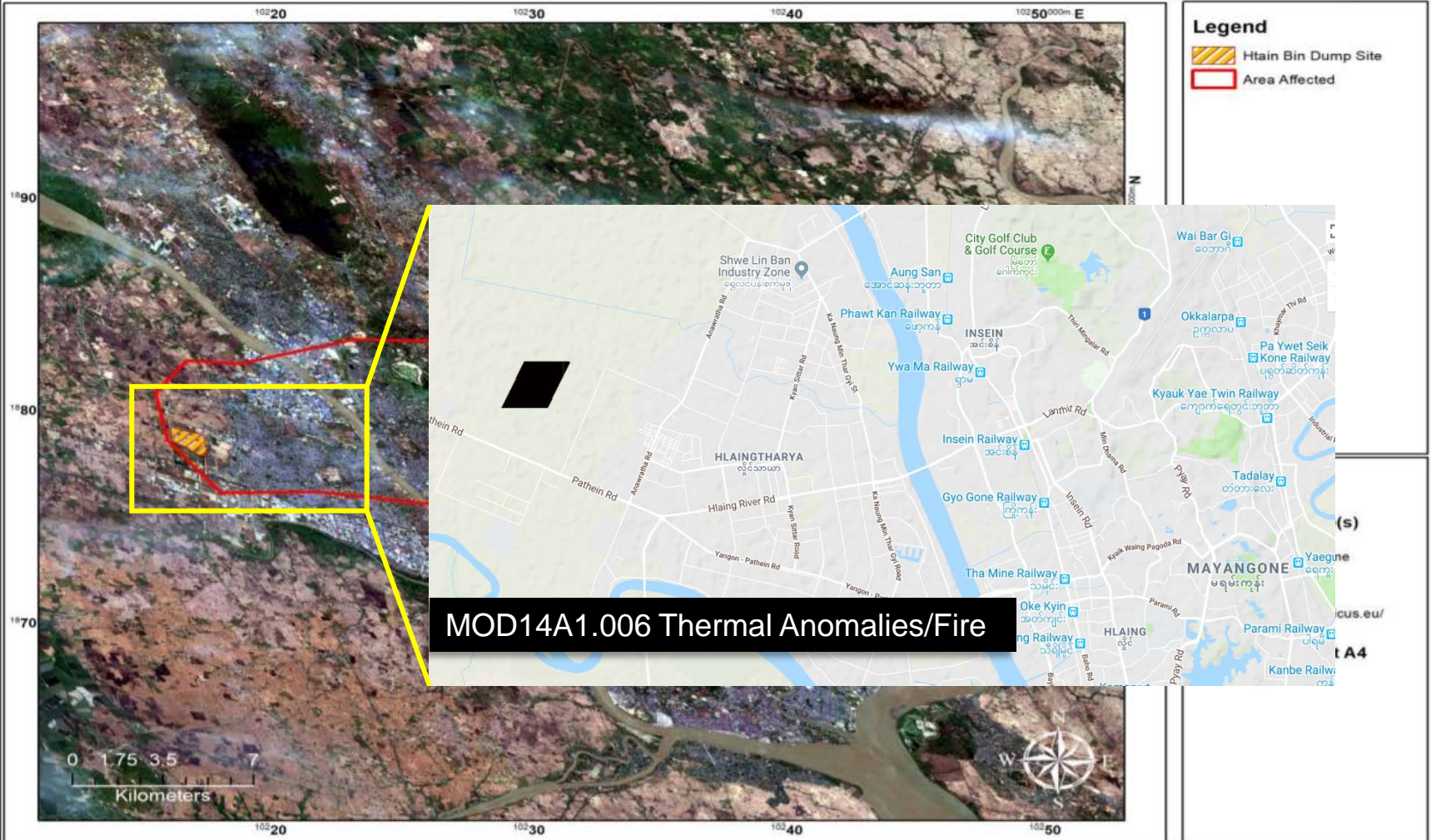


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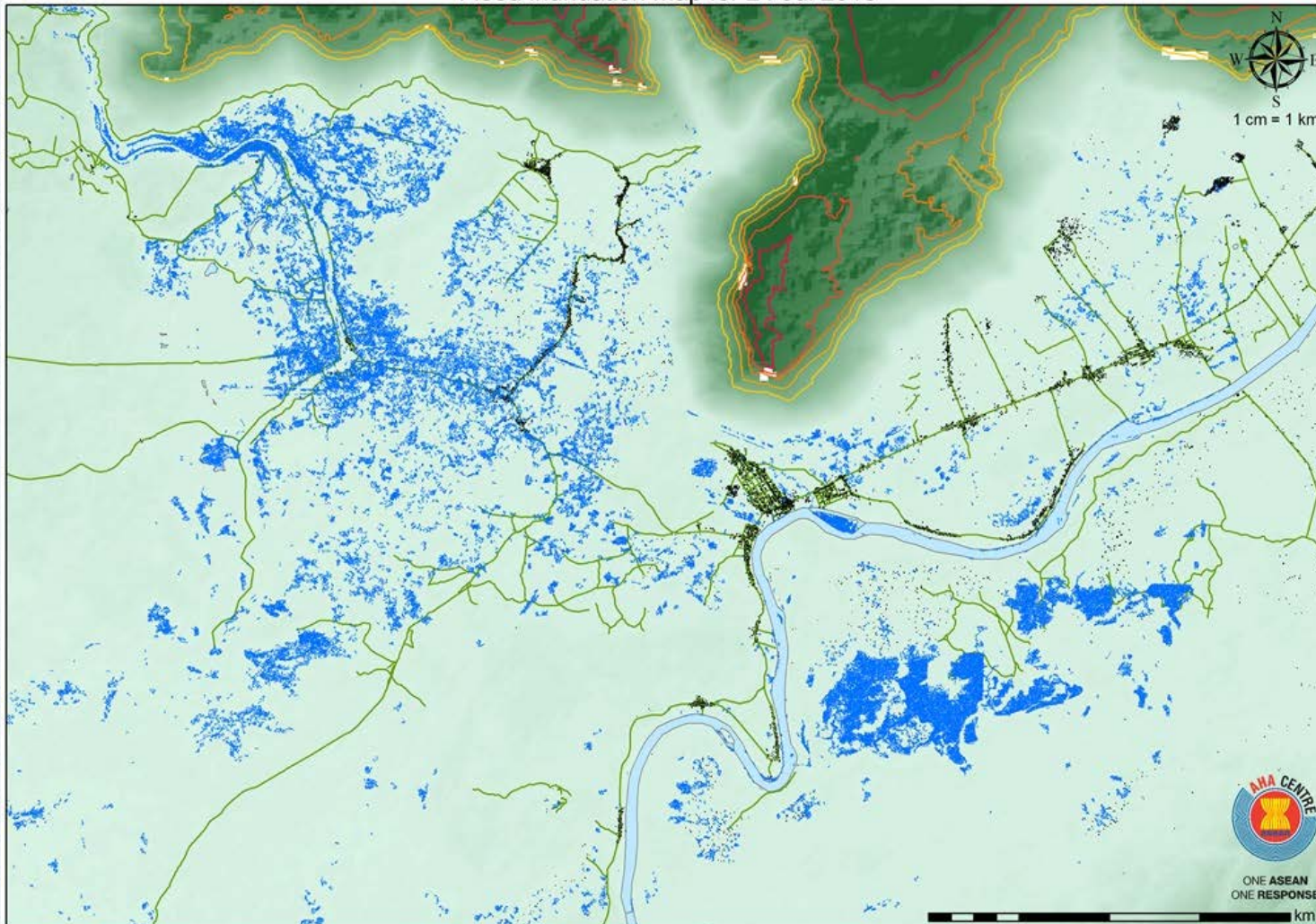
Yangon dumpsite fire (May 2018)

Satellite Imagery Prior to Major Fire in Htain Bin Dump Site, Yangon



Attapeu, Laos Flood response (July 2018)

Flood inundation map for 24 Jul 2018



KML file from Sentinel Asia network used in determining extent of flood and comparing it with imagery analysis from a week after

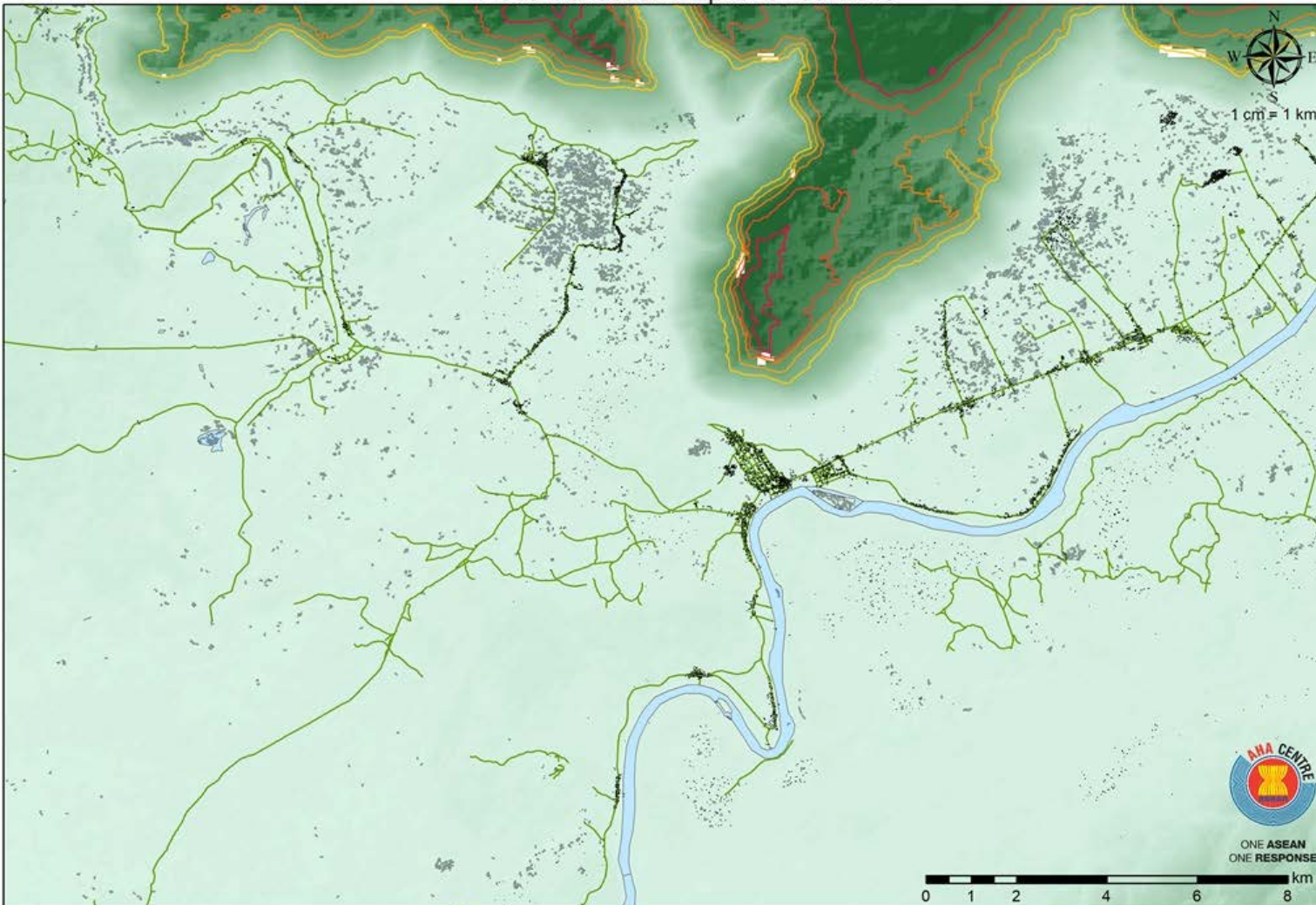
Comparison between 24 and 31 July 2018

Attapeu, Laos Flood response (July 2018)



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Flood inundation map for 31 Jul 2018



KML file from Sentinel Asia network used in determining extent of flood and comparing it with imagery analysis from a week after


Comparison between 24 and 31 July 2018

Time series of pre and post dam break



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Pre and Post dam break scenario in Attapeu province (Lao PDR) using Sentinel-1 Satellite Data (17, 25 and 29 July 2018)



Laos dam collapse
According to the Lao News Agency KPL, the Xe Pian-Xe Nam Noy hydropower dam in the Southern Laos collapsed at 8 p.m. night local time (1 p.m. GMT) on 23 July 2018, triggering the catastrophic release of 0.5 billion m3 of water. The disaster is so far known to have affected at least six villages in the Sanamxay district of Attapeu province including Yai Thae, Hinlad, Mai, Thasengchan, Tha Hin, and Samong. Hinlad and Mai villages were the worst-affected. As on 30 July 2018, around 30 people were killed and about 20 hospitalised, approx. 123 people are missing and more than 1,300 families (6,600 people) are rendered homeless. A report by the Vientiane Times stated that 3,000 were in need of rescue as of Wednesday afternoon (25 July 2018), taking shelter in trees and on rooftops.


IWMI conducted a geospatial analysis with Sentinel-1 Satellite Data available on 17, 25 and 29 July 2018 to understand the changes in inundation pattern over the time. The total flooded area was approximately estimated to be 41.14 sq.km (17 July), 67.25 sq. km (25 July) and 42.36 sq.km (29 July) for those 3 days. Agriculture damage was 27.21 sq. km (17 July), 38.65 sq.km (25 July) and 28.16 (29 July). Land-use data from <http://www.globallandcover.com/GLC30Download/index.aspx>

Legend

Satellite Image : Sentinel-1
Pre - 17 July 2018
Post - 25 July 2018
Post - 29 July 2018

- Cities/Town
- Road
- River
- Flood 17 July 2018
- Flood 25 July 2018
- Flood 29 July 2018


Map Prepared by



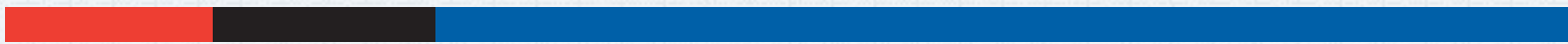
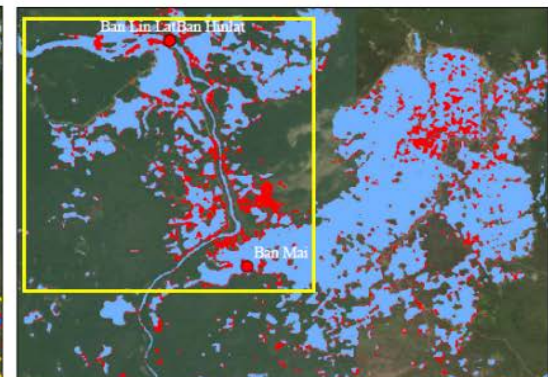
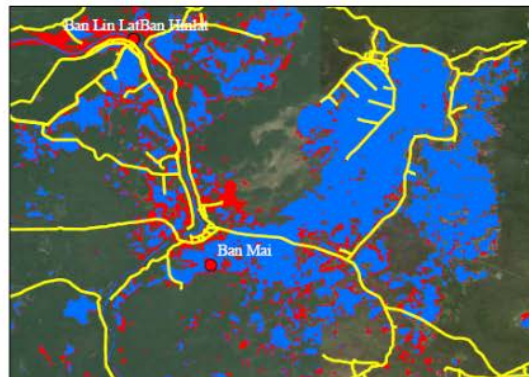
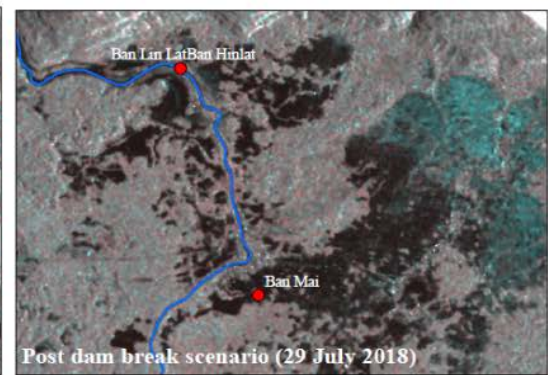
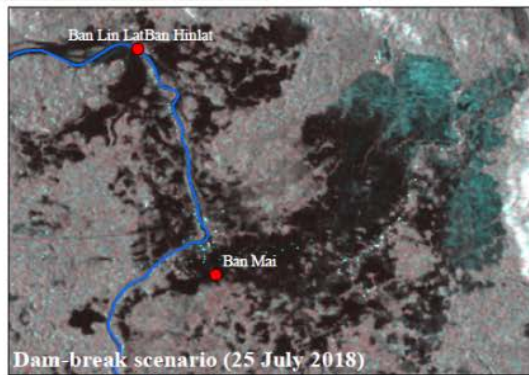
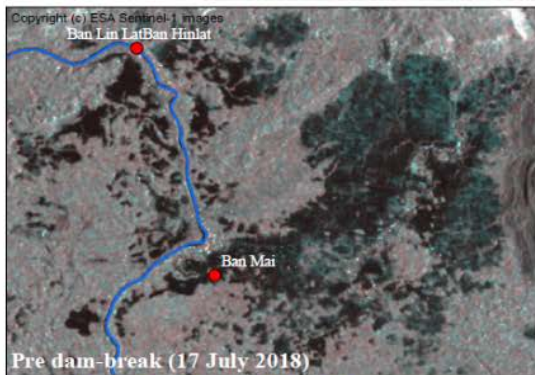
30 July 2018 | FL-2018-0011-LAO | Version 1

The analysis excluded permanent water bodies including reservoir, tanks and ponds and this reflects only the inundation extent. Please note the surface water extent mapped has not yet been validated in the field.

The depiction and use of boundaries, geographic names and related data shown in these maps are based on the sources they have been drawn from and quoted. These are neither error-free nor do they imply official endorsement or the position of IWMI.

Data Provider 

0 1.75 3.5 7 Km



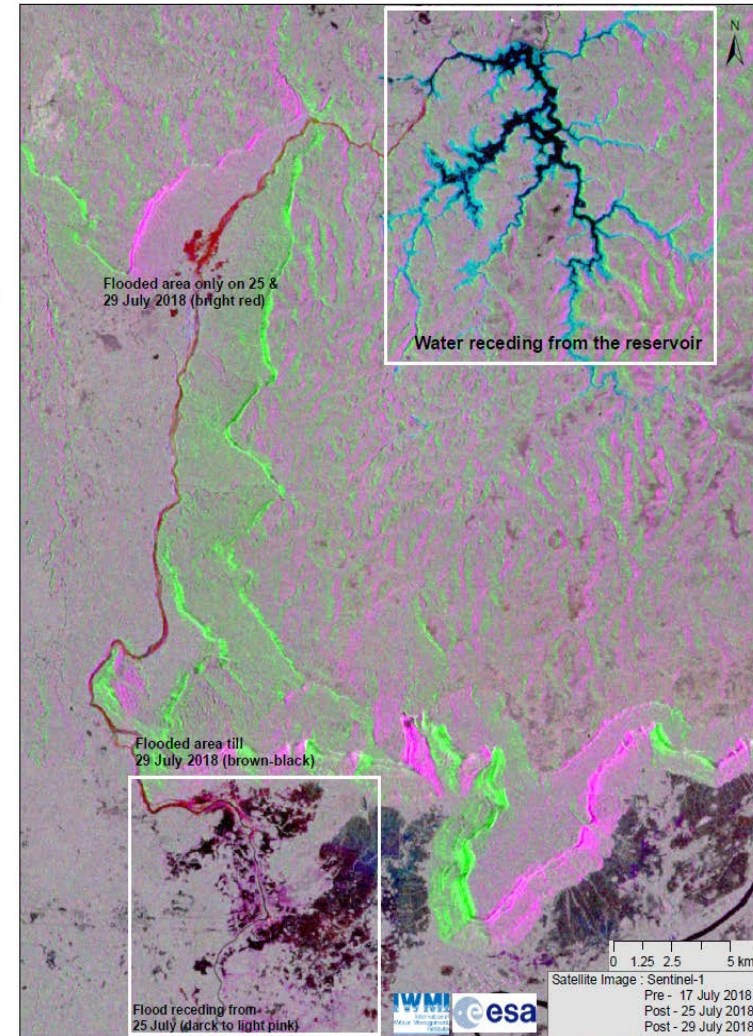
Attapeu, Laos Flood response (July 2018)



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- Provided analysis of inundated agricultural areas which allowed authorities to better understand the extent of damage
- Provides an estimation of agricultural needs in the planning for recovery
- Provides authorities with clear idea of where to set up temporary settlements

Date	17 July	25 July	27 July	29 July
Parameter				
Inundation area (sqkm)	41.14	67.25	48.78	42.36
Inundated agriculture area (sqkm)	27.21	38.65	32.53	28.16
Number of villages inundated in Sanamxai District	Chomphoy, Done, Donesoug, Kamphor, Kung, MOUNG, Somphoy, Tamoryose, Thabok, Thasangchan (10)	Gvilay, Chomphoy, Done, Donesoug, Hinlath, Kamphor, Kung, Mai, MOUNG, Namkong, Samongtay, Sivilay, Somphoy, Tamoryose, Thabok, Thahintay, Thasangchan (17)	Chomphoy, Kung, Samongtay, Tamoryose, Thabok, Thahintay, Thasangchan (7)	



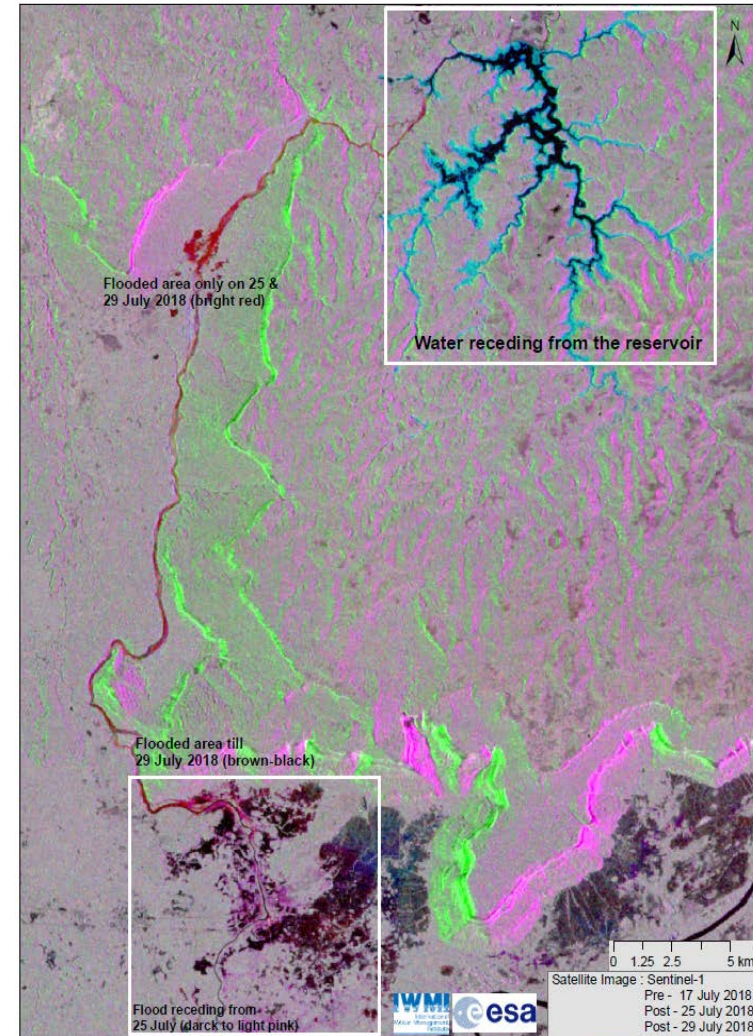
Attapeu, Laos Flood response (July 2018)



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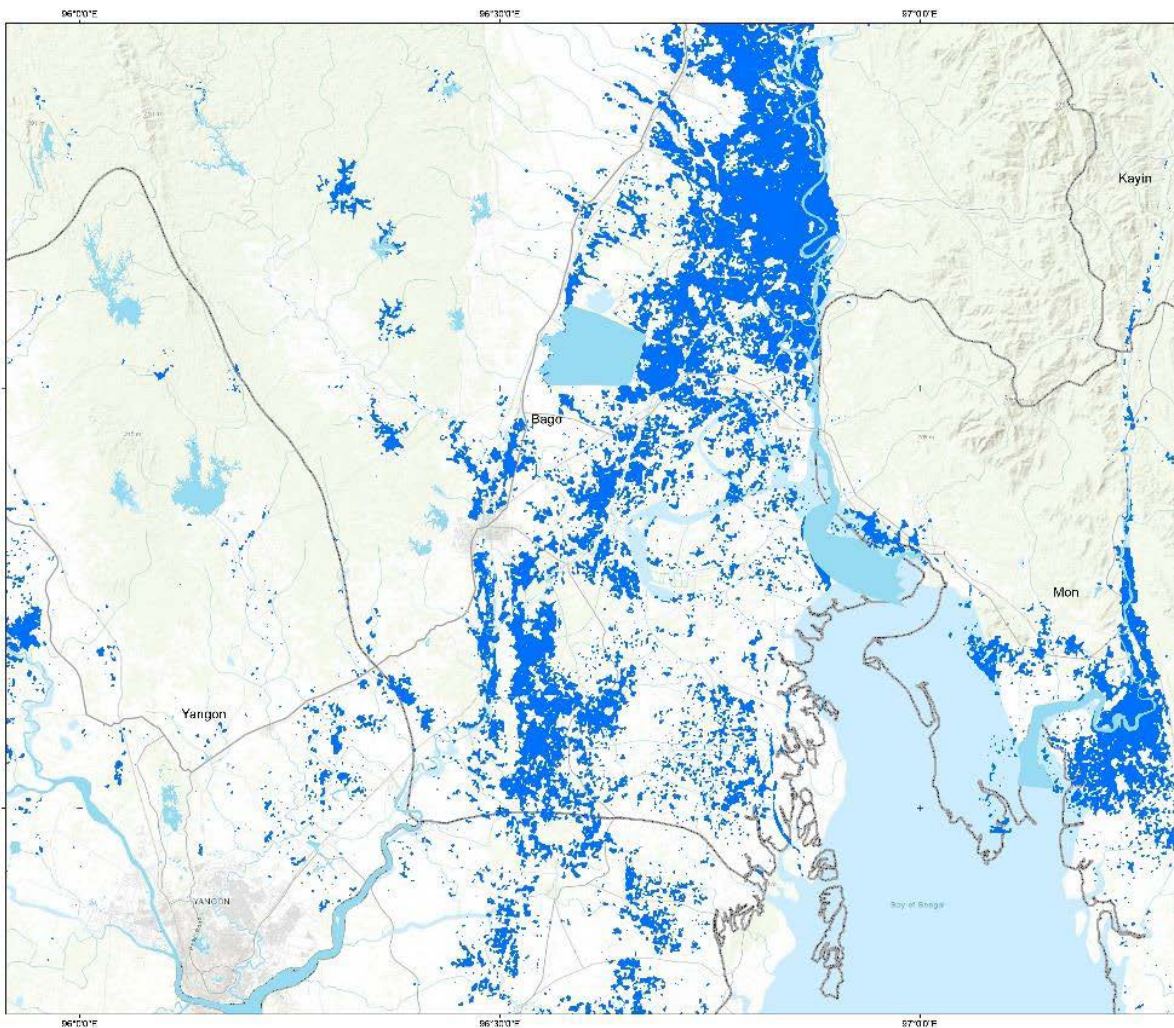
Myanmar Floods (4 provinces) (August 2018)



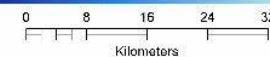
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FLOODING IN BAGO AND MON DIVISION, MYANMAR

As observed by ALOS-2 image on 29 July 2018



Map Information



MAP SCALE 1:250,000 at A1 PRINT
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree

Legend

- Province Boundary
- Waterbody
- Flood Proxy Map

Data Sources

Satellite image:
Pre-disaster : ALOS-2, 1 July 2018
Post-disaster : ALOS-2, 29 July 2018
Copyright : © JAXA (2018) - All rights reserved.

GIS data:
R/W: Water bodies © OSM 2018
Administrative boundary © GADM

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO,

Description

This map shows possible massive flooding areas from heavy rain on 27 July 2018, which has affected Bago and Mon Division, Myanmar. Note that the detected-water may also include water in paddy area.

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

Disclaimer: The accuracy of this product is not validated.

Data provider:



Myanmar Floods (4 provinces) (August 2018)



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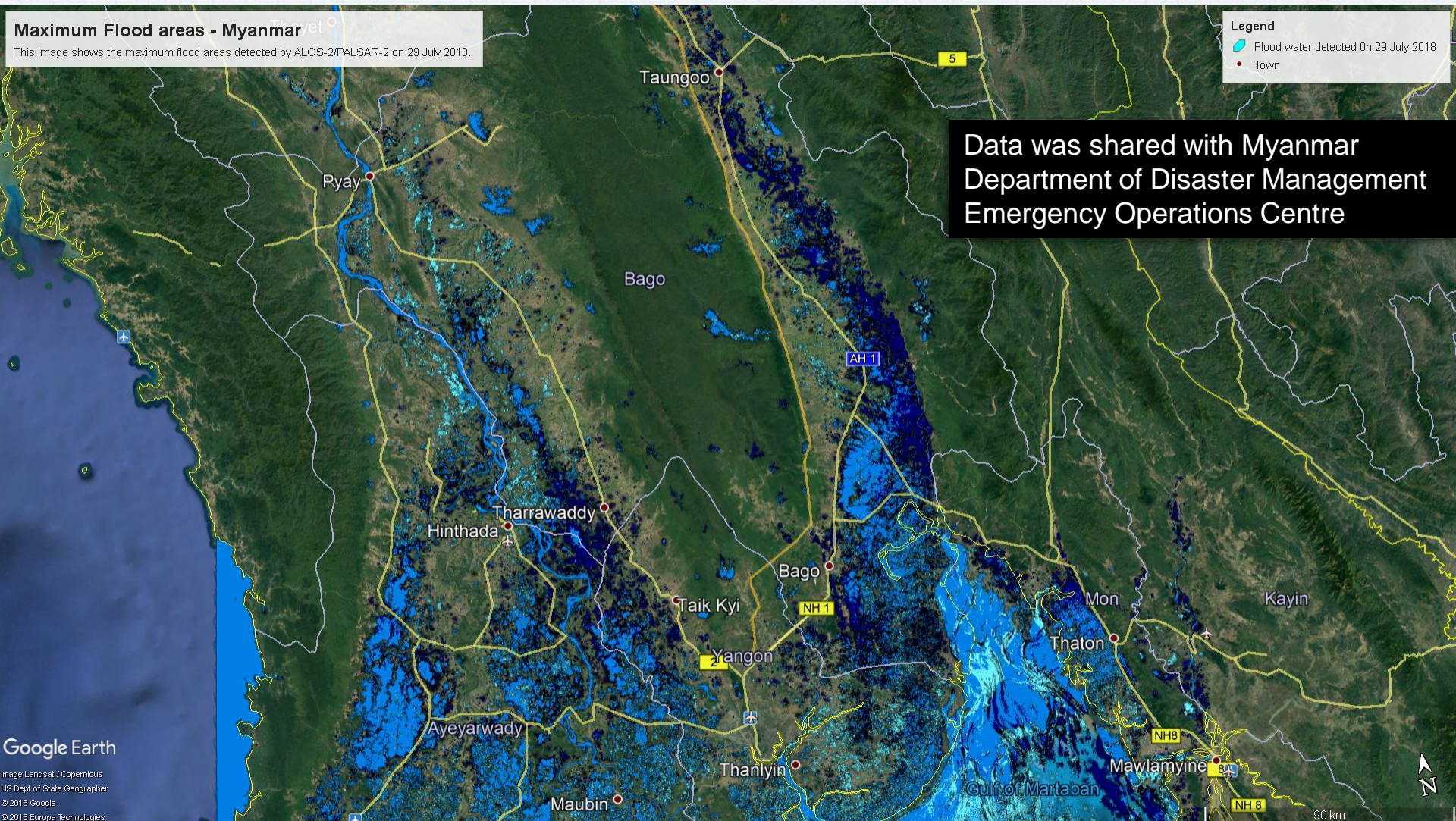
Maximum Flood areas - Myanmar

This image shows the maximum flood areas detected by ALOS-2/PALSAR-2 on 29 July 2018.

Legend

- Flood water detected On 29 July 2018
- Town

Data was shared with Myanmar
Department of Disaster Management
Emergency Operations Centre



Google Earth

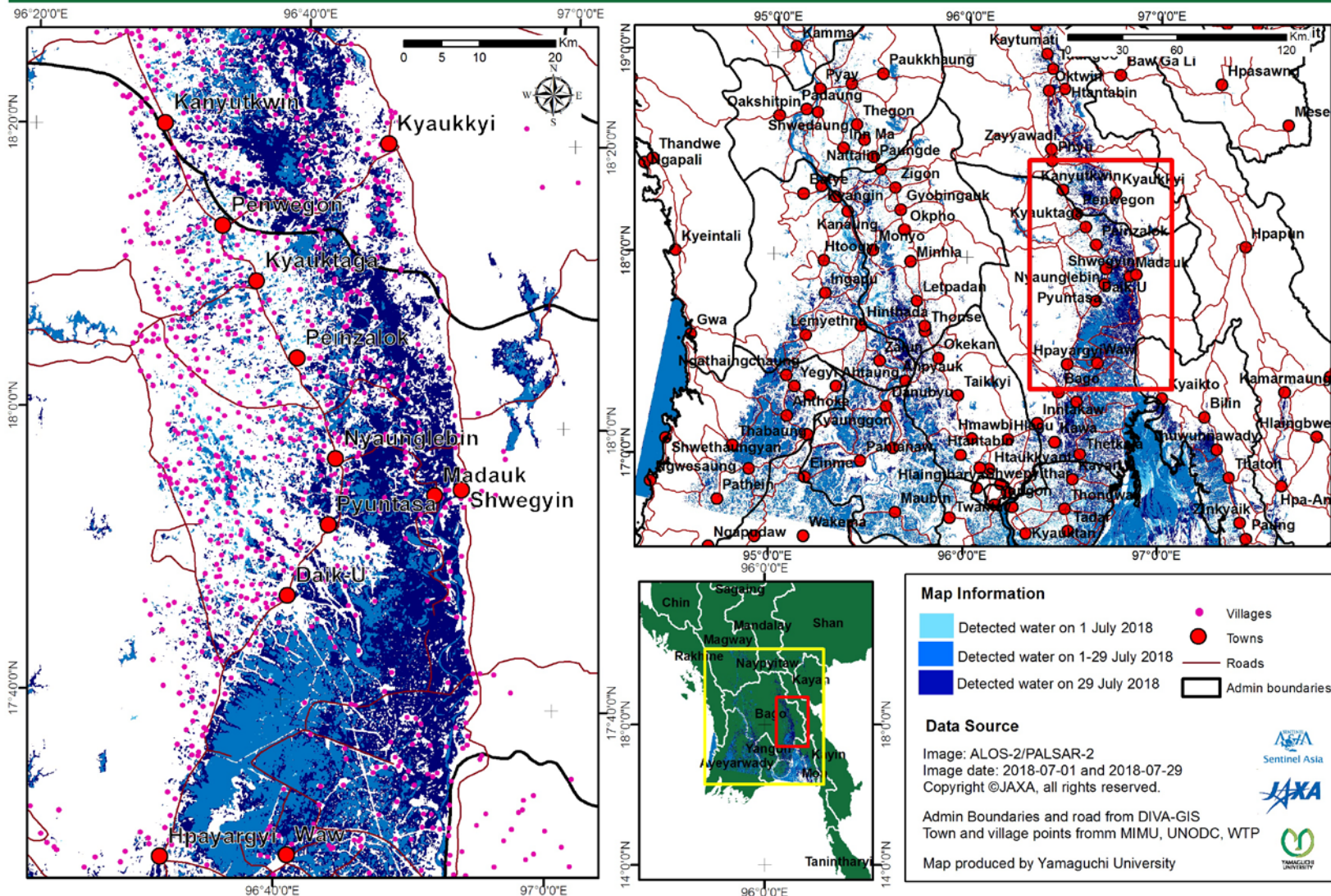
Image Landsat / Copernicus
US Dept of State Geographer
© 2018 Google
© 2018 Europa Technologies

Myanmar Floods (4 provinces) (August 2018)



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Area under water detection by ALOS-2 images, Myanmar



Lombok Earthquake (August 2018)



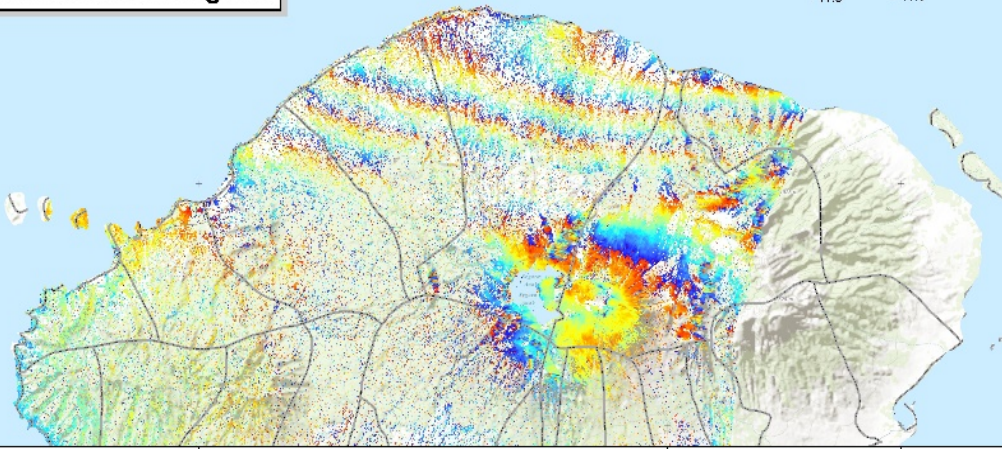
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ALOS-2 InSAR Analyses of Lombok Earthquake, Indonesia



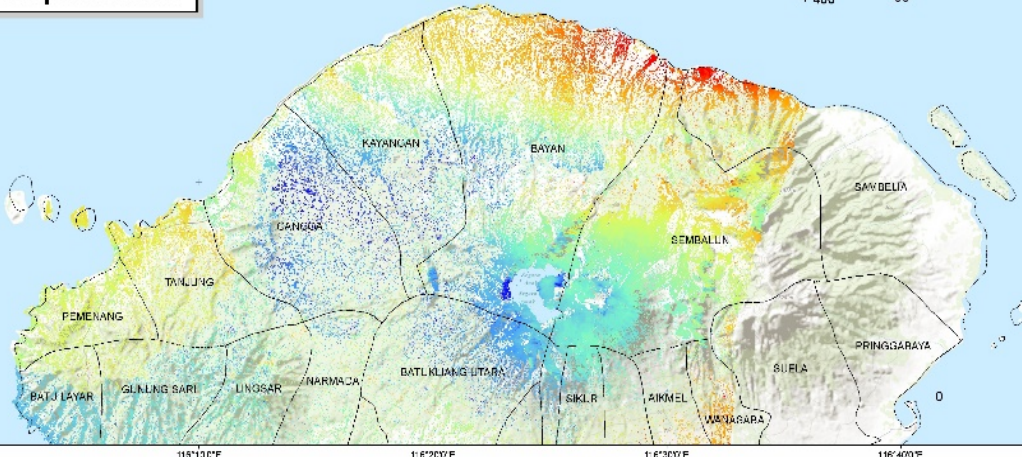
Co-seismic interferogram

Wavelength (cm.)
- 11.9 + 11.9



LOS Displacement

Displacement (mm.)
+ 400 -80



Map Information

0 4.5 9 13.5 18
Kilometers
MAP SCALE 1:150,000 at A1 PRINT
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree

Legend

District Boundary

Data Sources

Satellite images:

Pre-earthquake: ALOS-2, 29 Dec 2015
Post-eruption: ALOS-2, 7 August 2018
Copyright: © JAXA (2018) - All rights reserved.

GIS data:

Administrative boundary © BIG, 2017
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO.

Description

The upper map shows the information on the co-seismic deformation pattern following a 6.9 magnitude earthquake strike on 5 August 2018 at 19:46 GMT+8, in North Lombok, Indonesia.
The lower map shows the information on the possible surface displacement after the earthquake.
The results were processed using GMTSSAR

Disclaimer:

Map product made by GIC - AIT, it is provided "as is", without any verification on the field.

Data provider:



Lombok Earthquake (August 2018)



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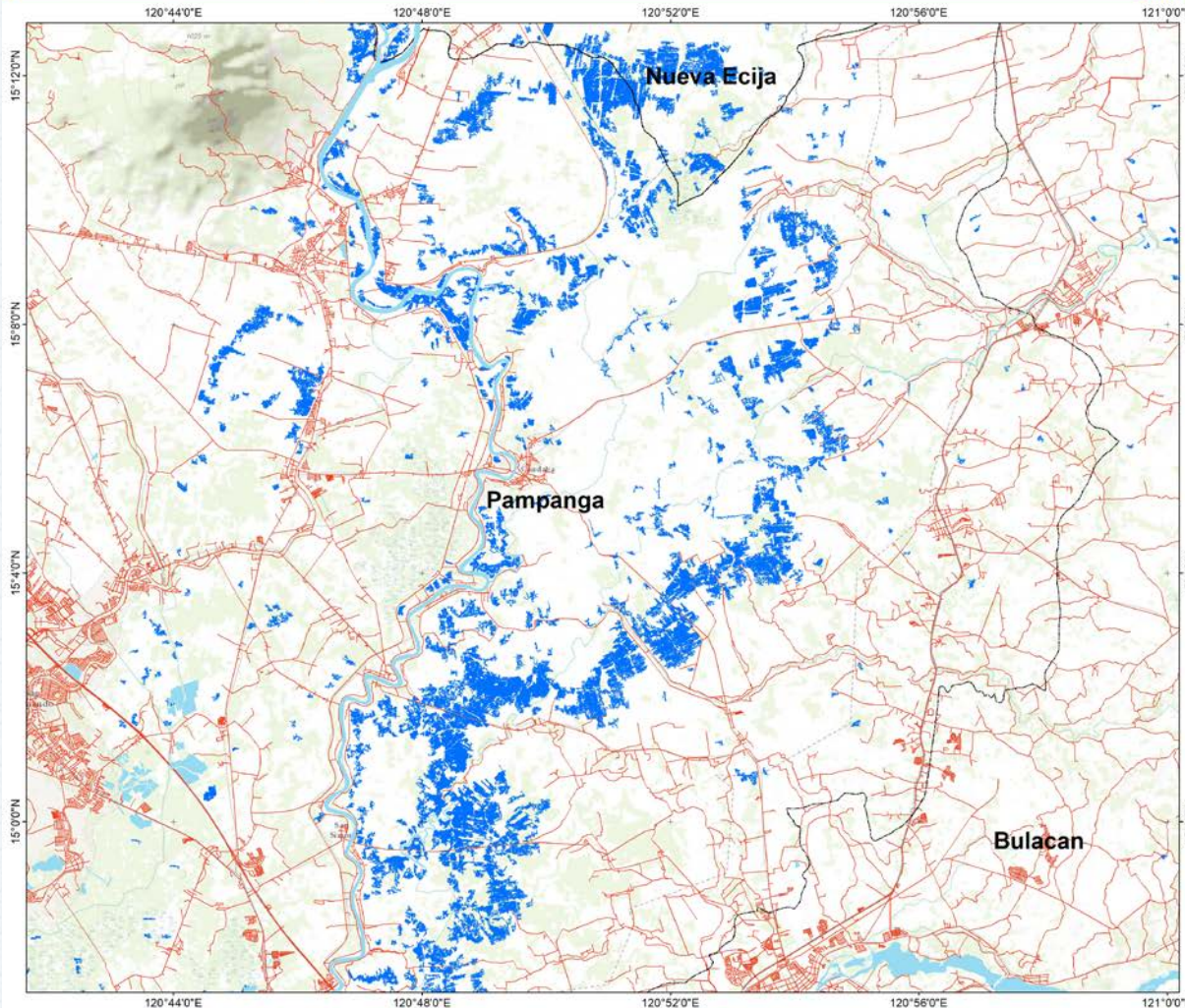
Super Typhoon Mangkhut (Ompong) (October 2018)



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FLOODING IN PAMPANGA PROVINCE, PHILIPPINES

As observed by ALOS-2 image on 18 September 2018



Map Information

0 1.5 3 4.5 6
Kilometers
MAP SCALE 1:55,000 at A1 PRINT
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree

Legend

- Roads
- Province boundary
- Water bodies
- Detected flood area

Data Sources

Satellite image:
Pre-disaster : ALOS-2, 4 September 2018
Post-disaster : ALOS-2, 18 September 2018
Copyright : © JAXA (2018) - All rights reserved.
GIS data:
River, Water bodies © OSM 2018
Administrative boundary © GADM
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO,

Description

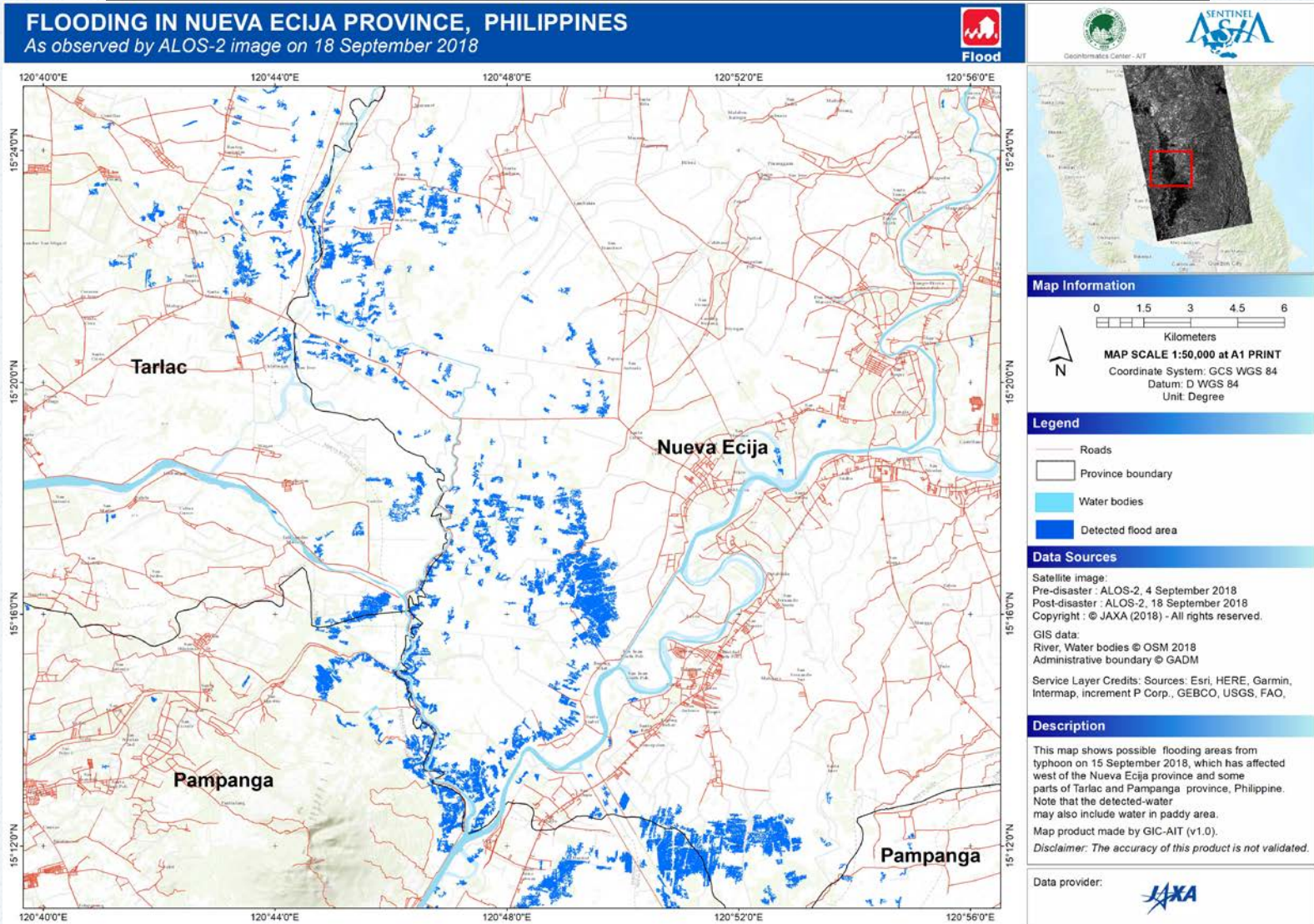
This map shows possible flooding areas from typhoon on 15 September 2018, which has affected east of the Pampanga province and some part of Nueva Ecija province, Philippine. Note that the detected-water may also include water in paddy area. Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.

Data provider:

Super Typhoon Mangkhut (Ompong) (October 2018)



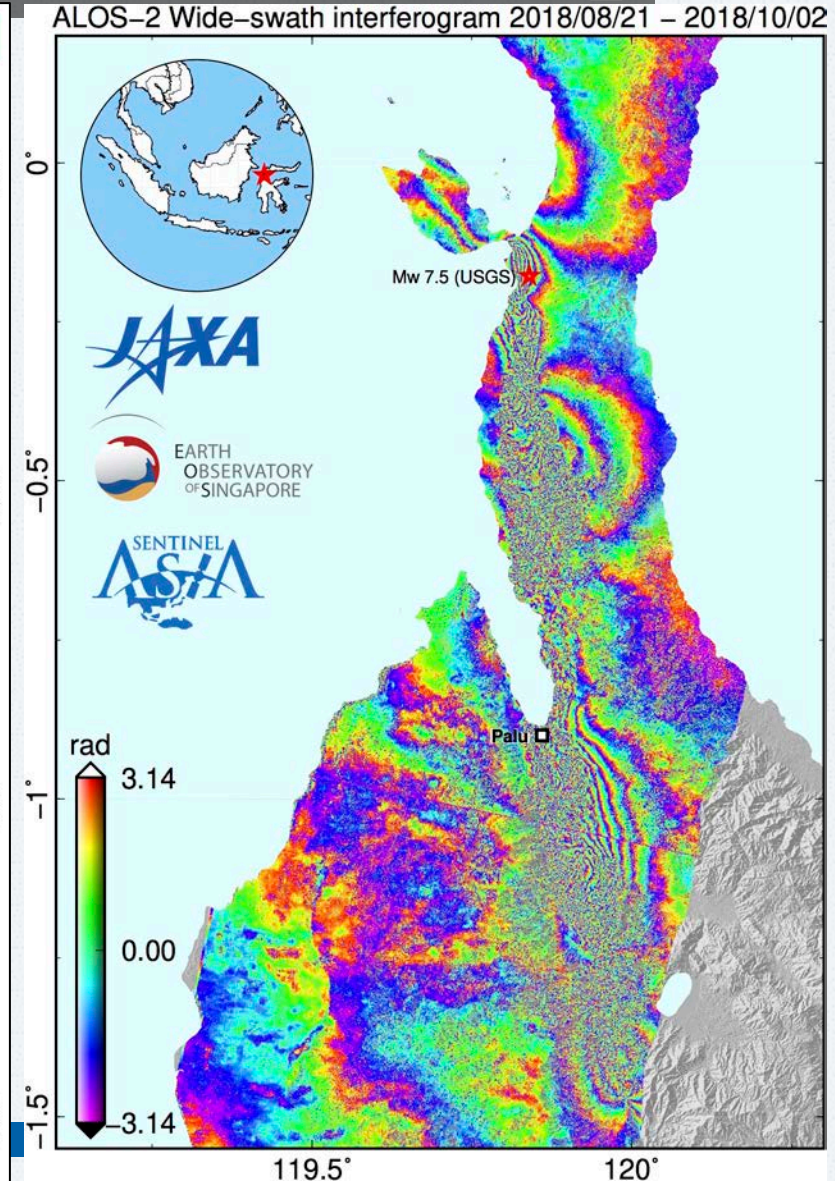
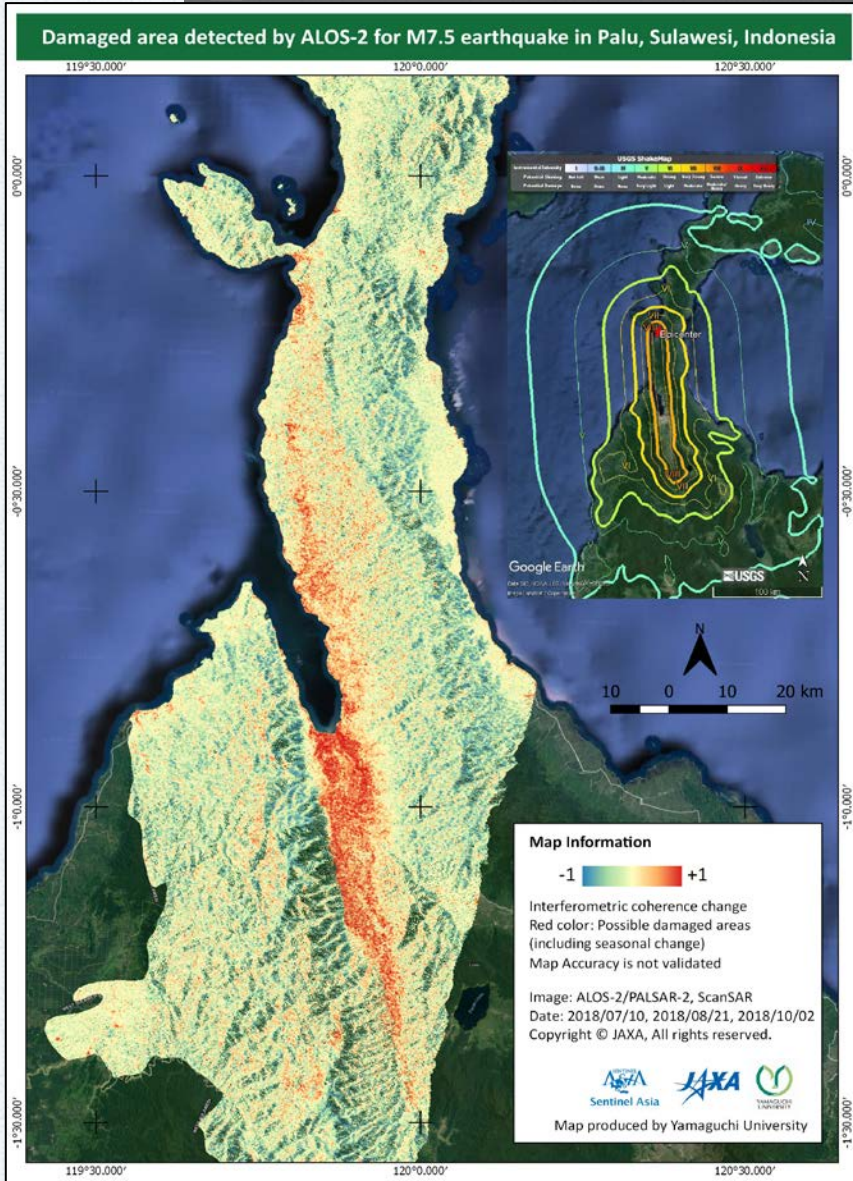
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Central Sulawesi Earthquake & Tsunami (October 2018)



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Central Sulawesi Earthquake & Tsunami (October 2018)

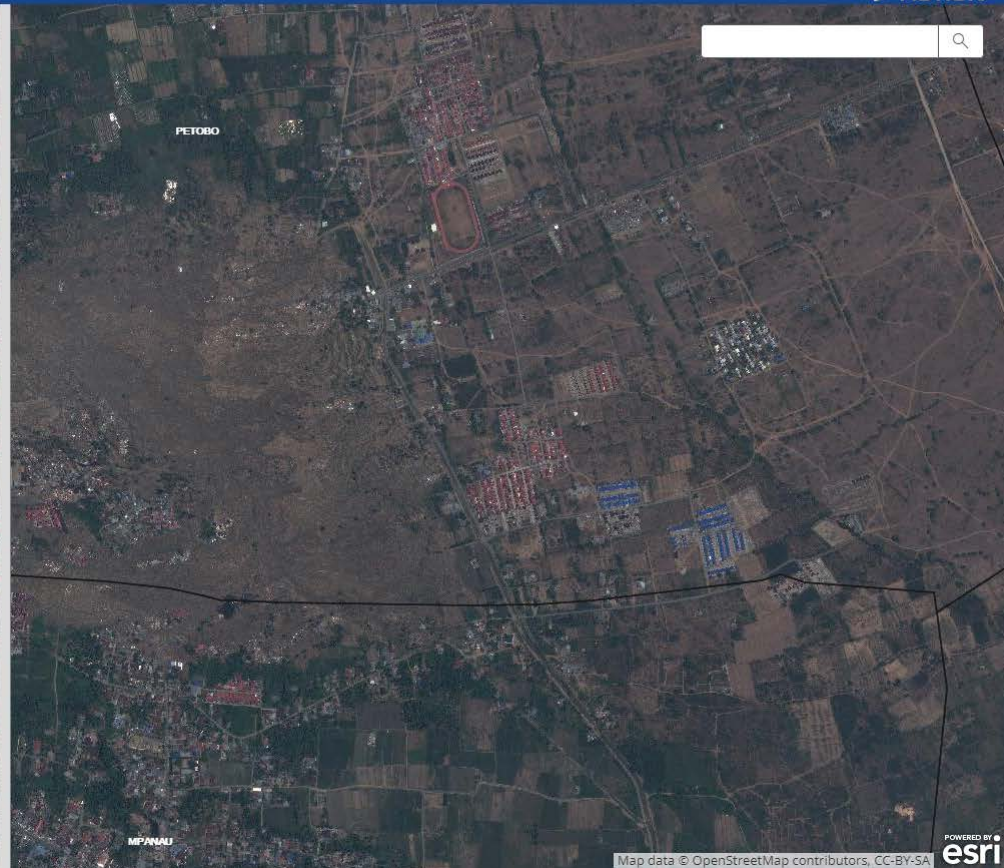
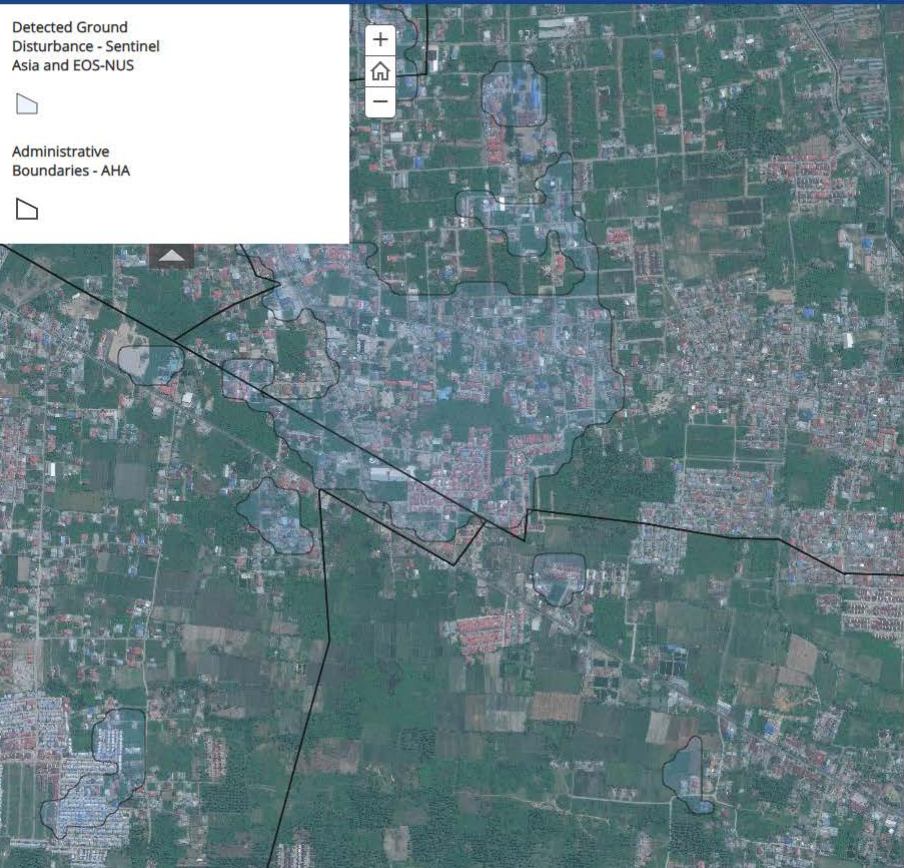


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Indonesia: Palu - Before (17/08/2018) and After (02/10/2018)

Application created by MapAction as part of the efforts in Palu - Indonesia after 28 September 2018. Imagery: ©2018 DigitalGlobe - Disturbance Areas: ©Sentinel Asia and EOS-NUS

Palu - Indonesia [f](#) [t](#) [e](#)



Map data © OpenStreetMap contributors, CC-BY-SA

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ASEAN Science Based Disaster Management Platform



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Disaster | Documents & Publications | DM Community | Discussion



Disasters

Malaysia, Flood in Sabah

National Disaster Management Agency (NADMA) of Malaysia reported flood in Penampang, Sabah, on 1 June 2018 0800 hrs (UTC+8) due to heavy rainfall, which

Fri, 01 Jun 2018 01:05:00 GMT

Indonesia, Flood in Asahan Regency

Health Crisis Center of Ministry of Health reported flooding in Asahan Regency, on 31 May 2018, 2030hrs local time (UTC +7). Heavy rainfall caused the local river

Thu, 31 May 2018 13:38:00 GMT

Indonesia, Storm in Southeast Minahasa Regency

Health Crisis Center of Ministry of Health reported major storm in the coast of Southeast Minahasa Regency on 31 May 2018, 0500hrs local time (UTC+8). The

Wed, 30 May 2018 22:00:00 GMT

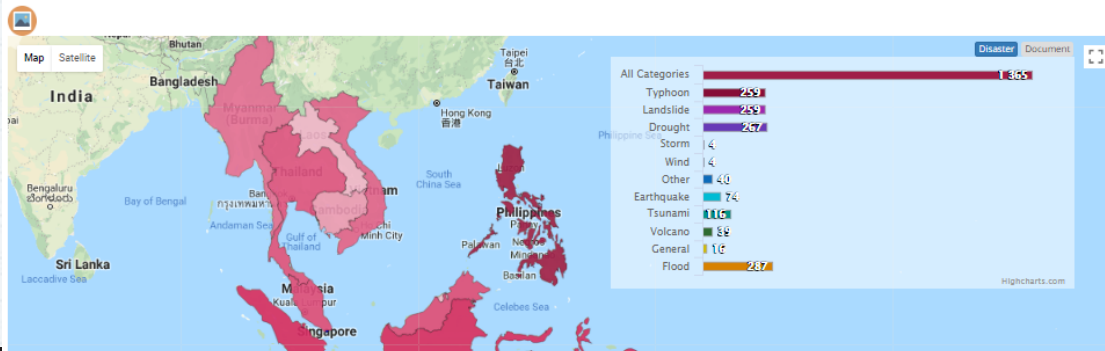
Indonesia, Flood in Musi Rawas Regency, South Sumatra

Health Crisis of Ministry of Health reported flooding on Musi Rawas Regency on 30 May 2018, 1300 hrs local time (UTC + 7). Heavy rainfall has caused

Wed, 30 May 2018 06:16:00 GMT

[more disaster](#)

Documents & Publications



Potential considerations for satellite data



1. Pre-schedule the satellite observations before the storm and potential flooding events
2. Providing a short narrative on the processed data for the users to ensure that they are able to understand
 1. Limitations of the processed data
 2. How to utilise the processed data properly (optional)
3. Processed data to be available on openly available platforms for all humanitarian actors such as
 1. ReliefWeb,
 2. HumanitarianResponse.info
 3. Humanitarian data exchange
4. Finalised data to be available in predominantly PDF and JPEG format as compressed sizes are better received on the field due to 1) limited internet connectivity, and 2) data can be very expensive

How pivotal is satellite data?

