

# Data Provider Node Report

March 8, 2017

Joint Project Team Meeting for Sentinel Asia STEP3 (JPTM2017)

Hani, Vietnam

Yuji Takada

Space Application and Operations Center

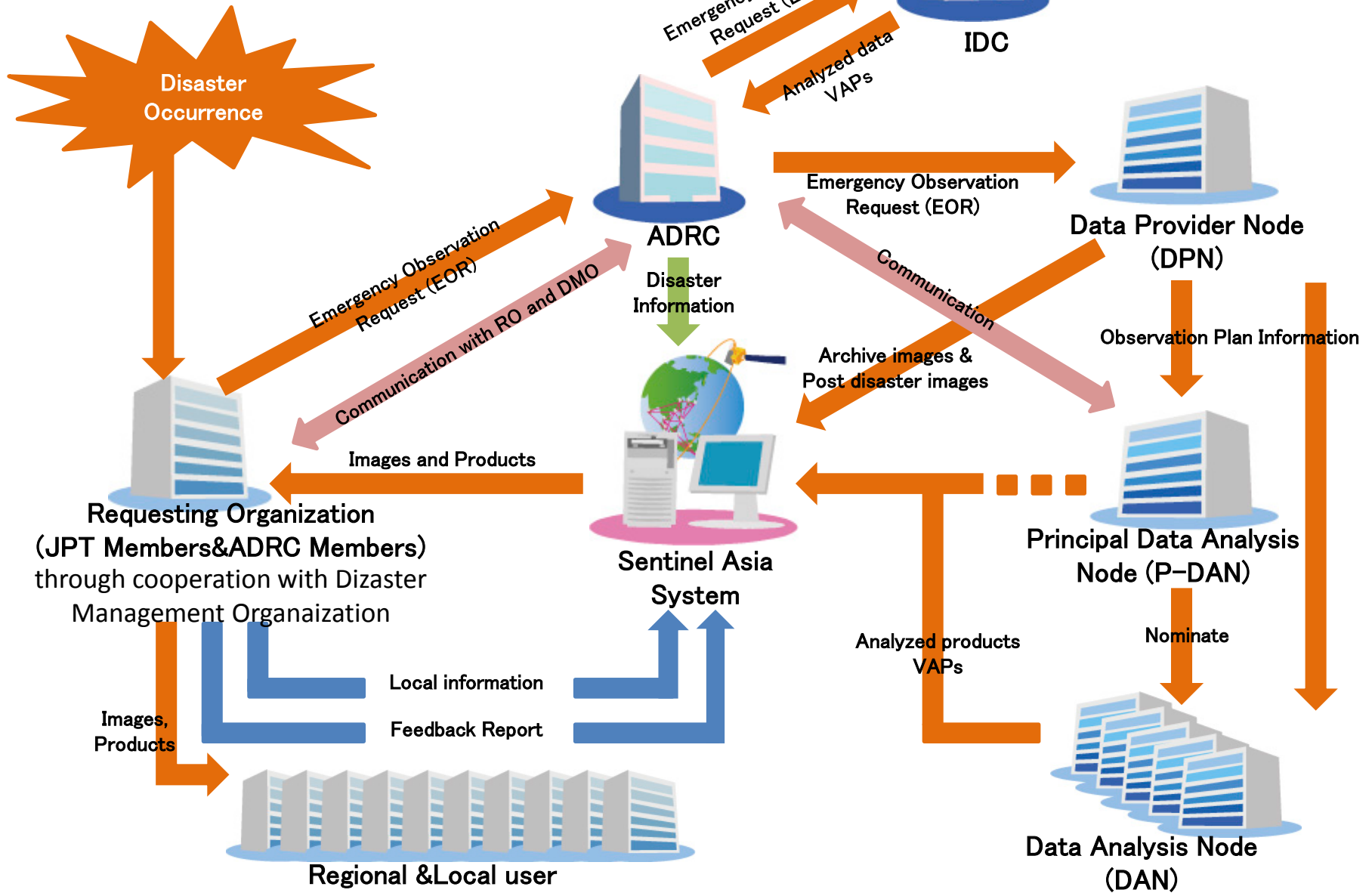
Japan Aerospace Exploration Agency

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# ALOS-2 Observation Plan by EOR

# Emergency Observation (EO) Flow



# ALOS-2 Observation Plan in accordance with EOR from DMO



When we make an observation plan, we consider mainly four points in order that **Disaster Management organization (DMO)** can use our observation data for their disaster response activities.

- Planned end-user of the observed information
- Purpose of the Request
- Disaster type and Damaged things
- Prioritized AOIs

Once ALOS-2 observation plan is decided, we inform DMO and DAN of the observed area scene data, archived one and these provision time for their activities.

# ALOS-2 Observation Plan in accordance with EOR from DMO



- Planned end-user of the observed information

Who will use the observation data and Value Added Products (VAPs)? DMO uses them internal only or share them with other relevant organization. Because we try to make an observation plan to meet DMO's role of the disaster response activities.

# ALOS-2 Observation Plan in accordance with EOR from DMO



## ● Purpose of the Request

What does DMO aim to use the observation data and VAPs? Because we can make an observation plan taking into the account of the emergency level.

### ● Emergency Response

e.g. Situation confirmation, Rescue activity, Evacuation activity

### ● Damage and Loss Assessment/Post Disaster Assessment

### ● Detection of hazard situation

### ● Recovery Planning

# ALOS-2 Observation Plan in accordance with EOR from DMO



- Disaster type and Damaged things

What is the disaster type and the damaged things by this disaster? According to the required damaged analysis, we make an observation plan with a suitable observation mode, e.g. for the damaged buildings the Ultra Fine mode is required, for wide area flood the ScanSAR mode is required and which polarizations are required and so on.

PALSAR-2/ALOS-2 Resolution

	Ultra Fine	High sensitive	Fine	ScanSAR
Resolution	3m	6m	10m	100m
Swath	50km	50km	70km	350km
Polarization	SP/DP	SP/DP/FP		SP/DP

SP : HH or VV or HV , DP : HH+HV or VV+VH , FP : HH+HV+VH+VV

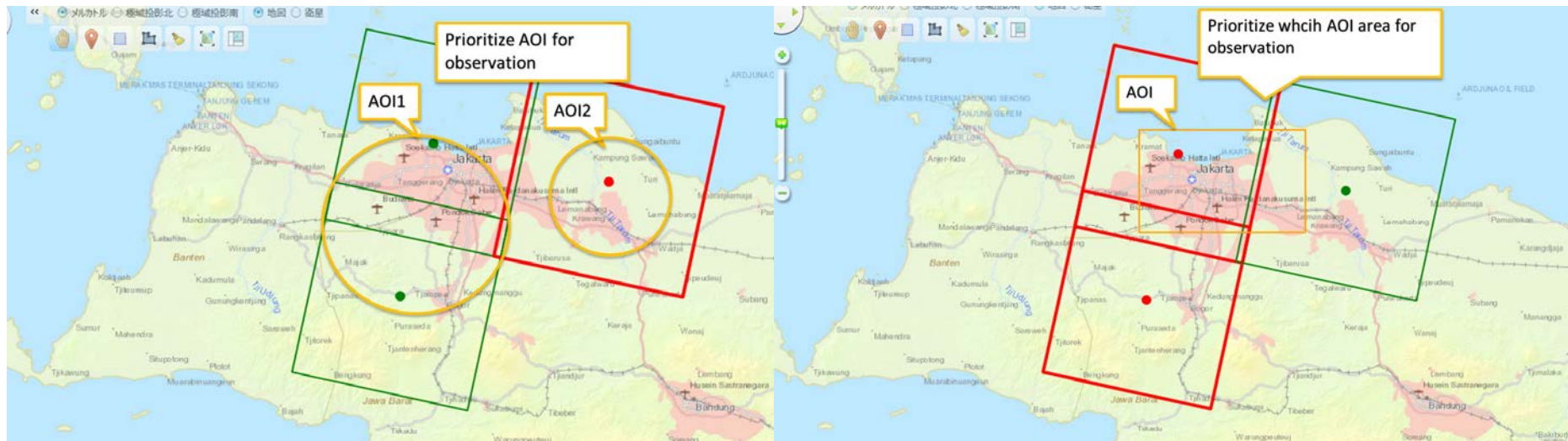


# ALOS-2 Observation Plan in accordance with EOR from DMO



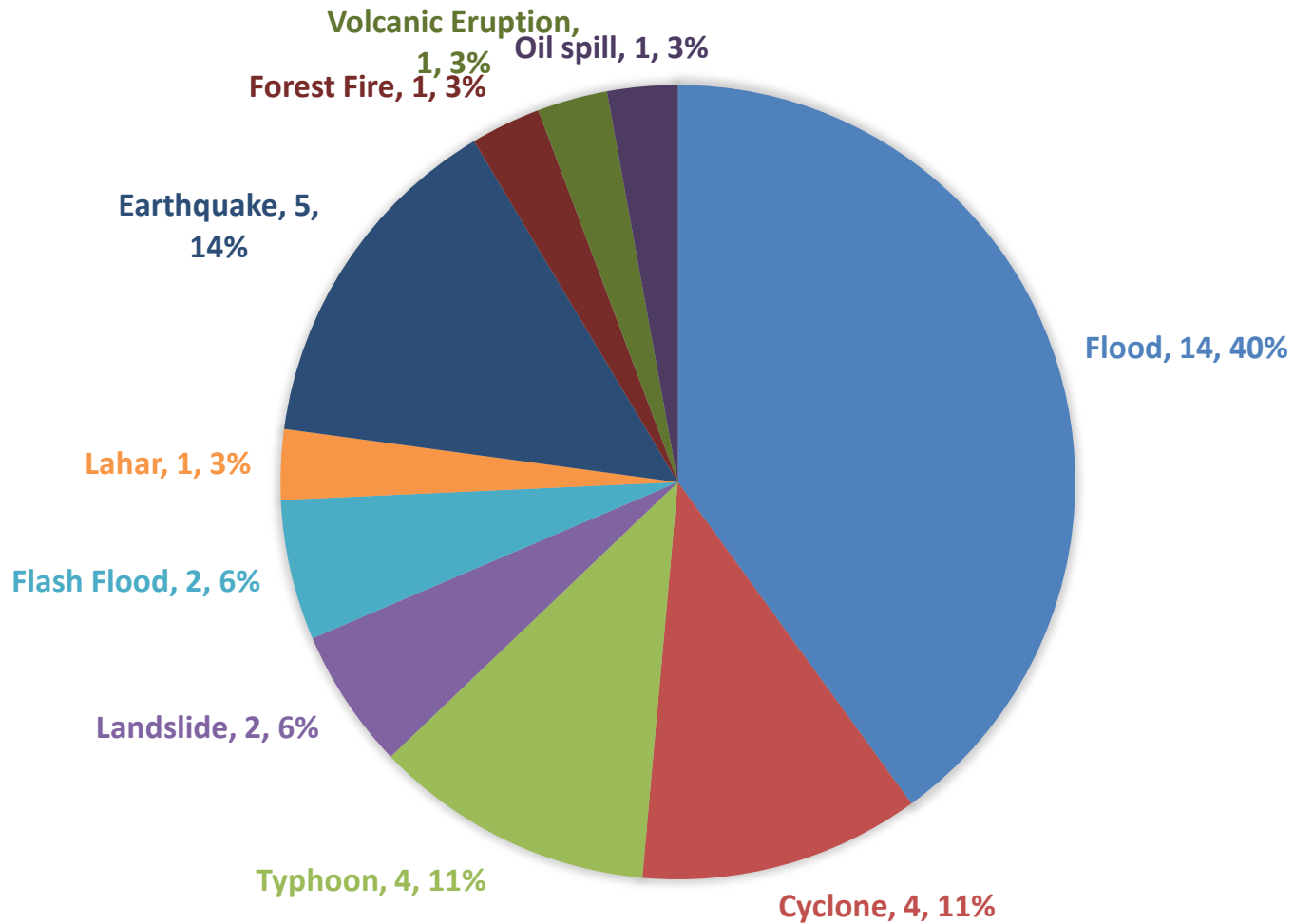
## ● Prioritized AOIs

Please prioritize AOIs for more than one AOI or AOI's area, because we do not know the damaged status and DMO's disaster response activities plan. We want to observe as many AOIs as possible, but ALOS-2 can not observe all required AOI at once.



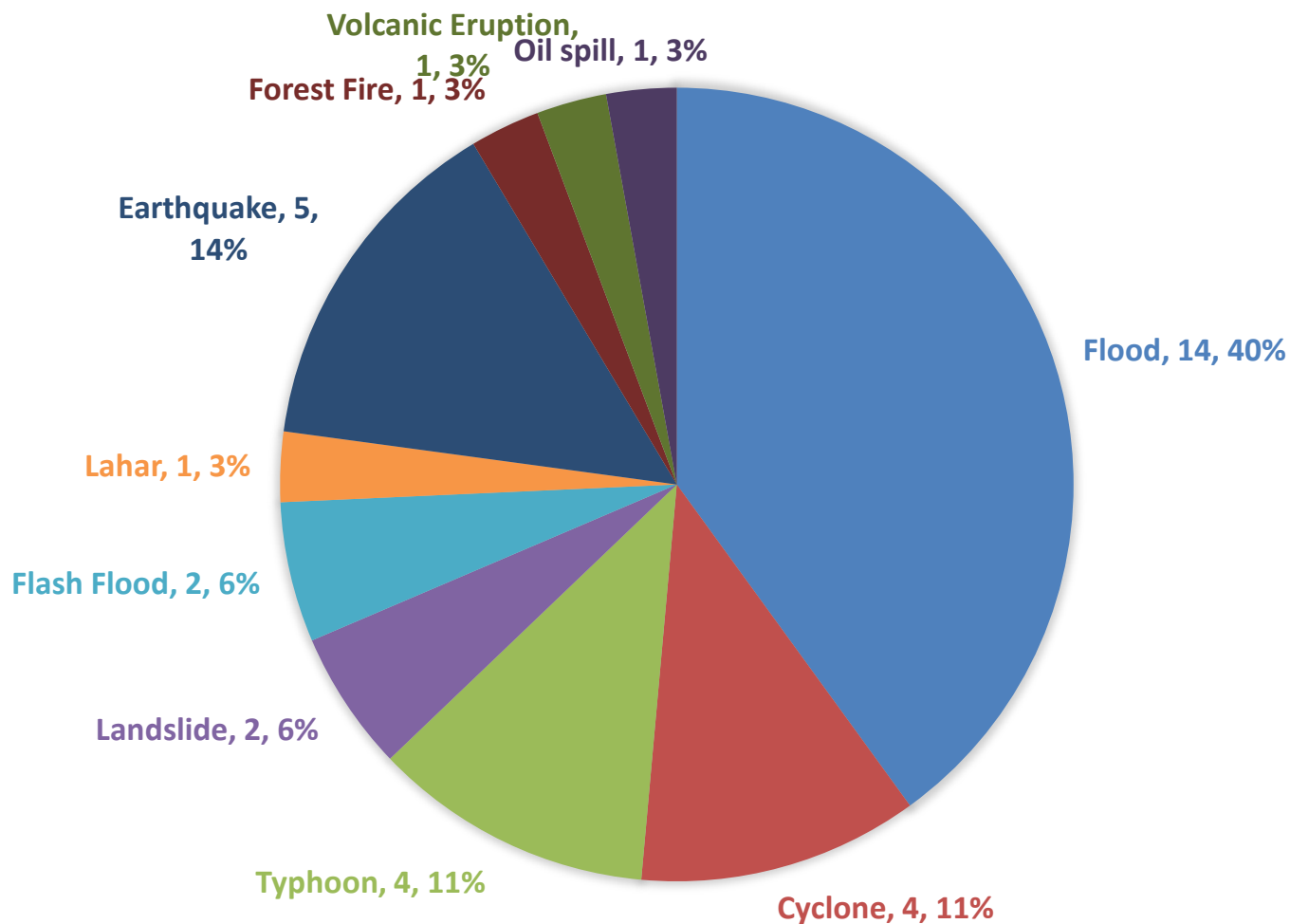
# Executed ALOS-2 Observation from 2016 to Feb., 2017

# 10 kinds of Occurred Disaster Types.

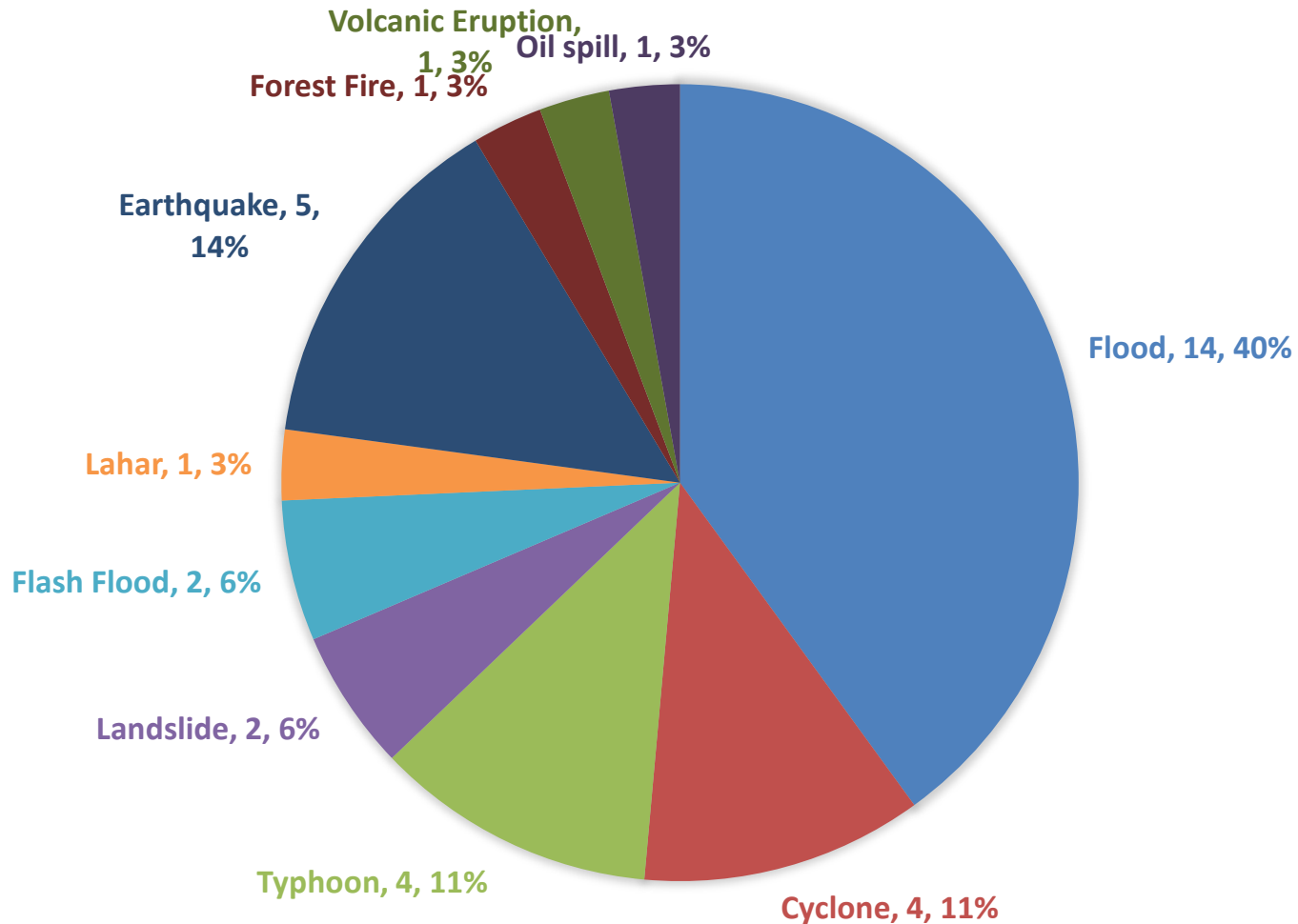


EOs were required **35** times.

ALOS-2 observation was **29** times.



# Water related disaster (Flood & Cyclone/Typhoon) occupied **62%** of total disaster.



# List of Emergency Observation & ALOS-2 Observation (1/5)

Country	Region	Disaster Type	Date			Quick Look Analysis on WEB-GIS (trial after July 2016 )
			Occurrence	Request	ALOS-2 Observation	
Taiwan	Southern Taiwan	Earthquake	2016/2/6	2016/2/6	2016/2/9	-
Myanmar	Notern part of Myanmar	Flood	2016/2/24	2016/2/24	2016/2/25	-
Fiji	Throughout Fiji	Cyclone	2016/2/20	2016/2/24	2016/2/24	-
Indonesia	West Java provinces	Flood	2016/2/29	2016/3/1	-	-
Indonesia	West Java provinces	Flood	2016/3/8	2016/3/14	2016/3/17	-
Taiwan	North coast of Taiwan	Oil spill	2016/3/12	2016/3/31	2016/4/5	-
Philippines	Mt.Apo, Mindanao	Forest Fire	2016/3/26	2016/3/31	2016/4/4	-

# List of Emergency Observation & ALOS-2 Observation (2/5)

Country	Region	Disaster Type	Date			Quick Look Analysis on WEB-GIS (trial after July 2016 )
			Occurrence	Request	ALOS-2 Observation	
Pakistan	Kohistan district, Khyber Pakhtunkhwa Province	Landslide	2016/4/4	2016/4/5	2016/4/6	-
Pakistan	Dana Kachili area of Muzaffarabad district	Landslide	2016/4/12	2016/4/15	-	-
Japan	Kumamoto prefecture, Kyushuu district	Earthquake	2016/4/16	2016/4/16	2016/4/16	-
Sri Lanka	The whole area of Sri Lanka	Flood	2016/5/14	2016/5/15	2016/5/17	-
Indonesia	Mt. Shinabung, Sumatera Island	Volcanic Eruption	2016/5/21	2016/5/23	2016/6/1	-
Bangladesh	Coastal area of Bangladesh	Cyclone	2016/5/21	2016/5/24	2016/5/28	-
Indonesia	Yogyakarta	Landslide, Flood	2016/6/19	2016/6/20	2016/6/20	-

# List of Emergency Observation & ALOS-2 Observation (3/5)

Country	Region	Disaster Type	Date			Quick Look Analysis on WEB-GIS (trial after July 2016 )
			Occurrence	Request	ALOS-2 Observation	
Nepal	Koshi river	Flood, etc.	2016/7/5	2016/7/6	2016/7/10	<a href="http://arcg.is/29tmvL5">http://arcg.is/29tmvL5</a>
Taiwan	Taitung city	Typhoon	2016/7/7	2016/7/7	2016/7/17	<a href="http://arcg.is/29QYaeG">http://arcg.is/29QYaeG</a>
Bangladesh	Northern part of Bangladesh	Flood	2016/7/31	2016/8/1	2016/8/4	<a href="http://arcg.is/2aAAc83">http://arcg.is/2aAAc83</a>
Bhutan	Southern part of Bhutan *Two AOI points	Flood	2016/7/30	2016/8/2	2016/8/11	<a href="http://arcg.is/2aFucP9">http://arcg.is/2aFucP9</a>
Myanmar	9 region along Ayeyarwady river	Flood	2016/8/3	2016/8/4	2016/8/7	<a href="http://arcg.is/2aX4dz8">http://arcg.is/2aX4dz8</a>
Laos	Luang Phabang	Flash Flood	2016/8/19	2016/8/25	2016/8/27	<a href="http://arcg.is/2bUDhkE">http://arcg.is/2bUDhkE</a>
India	Bihar and Uttar Pradesh	Flood	2016/8/25	2016/8/26	2016/8/26	<a href="http://arcg.is/2bM2ezK">http://arcg.is/2bM2ezK</a>



# List of Emergency Observation & ALOS-2 Observation (4/5)

Country	Region	Disaster Type	Date			Quick Look Analysis on WEB-GIS (trial after July 2016 )
			Occurrence	Request	ALOS-2 Observation	
Myanmar	Central Myanmar	Earthquake	2016/8/24	2016/8/26	-	-
Taiwan	southern part of Taiwan	Typhoon	2016/9/14	2016/9/14	-	-
Philippines	islands of northern Philippines	Tropical cyclone	2016/9/14	2016/9/15	2016/9/25	<a href="http://arcg.is/2cVkuO3">http://arcg.is/2cVkuO3</a>
Taiwan	Kaohsiung city	Typhoon	2016/9/28	2016/9/28	2016/9/30	<a href="http://arcg.is/2dzC2ff">http://arcg.is/2dzC2ff</a>
Vietnam	Quang Binh Province	Flood	2016/10/14	2016/10/16	2016/10/18	<a href="http://arcg.is/2exhF2E">http://arcg.is/2exhF2E</a>
Philippines	Cagayan Province	Typhoon	2016/10/19	2016/10/21	2016/10/28	No due to MTC analysis
Vietnam	Hà Tĩnh province and other	Flood	2016/10/28 to 2016/11/5	2016/11/1	2016/11/4	<a href="http://arcg.is/2g3ZzTs">http://arcg.is/2g3ZzTs</a>

# List of Emergency Observation & ALOS-2 Observation (5/5)

Country	Region	Disaster Type	Date			Quick Look Analysis on WEB-GIS (trial after July 2016 )
			Occurrence	Request	ALOS-2 Observation	
Indonesia	AcehProvince	Earthquake	2016/12/6	2016/12/7	-	-
India	Chennai	Cyclone	2016/12/12	2016/12/14	-	-
Nepal	Mountain area in northern part of Nepal	Flash Flood	2016/12/18	2016/12/21	2016/12/30	<a href="http://arcg.is/2iiW1gT">http://arcg.is/2iiW1gT</a>
Philippines	Around Mt. Mayon	Lahar	2016/12/26	2016/12/28	2017/1/5	<a href="http://arcg.is/2idf5MK">http://arcg.is/2idf5MK</a>
Thailand	Southern part of Thailand	Flood	2017/1/6	2017/1/11	2017/1/20	<a href="http://arcg.is/2iYGip0">http://arcg.is/2iYGip0</a>
Philippines	Mindanao, Ruzon	Flood	2017/1/16	2017/1/24	2017/1/25	No due to no archived data
Philippines	Mindanao, Surigao City	Earthquake	2017/2/10	2017/2/12	2017/2/20	No due to InSAR analysis

# Importance of Quick EOR Submission & JAXA's Two Improvement Approaches

# Time delay from Disaster Occurrence to EOR submission

It seemed that DMO took more than 1 day to submit EOR.

Country	Region	Type	Date		EOR received time after disaster occurrence
			Occurrence	Request	
Vietnam	Quang Binh Province	Flood	2016/10/14	2016/10/16	2 days
Vietnam	Hà Tĩnh province and other	Flood	2016/10/28 to 2016/11/5 (It might be 2016/10/31?)	2016/11/1	4 days (1 day?)
Philippines	Around Mt. Mayon	Lahar	2016/12/26	2016/12/28	5 days
Thailand	Southern part of Thailand	Flood	2017/1/6	2017/1/11	8 days
Philippines	Mindanao, Ruzon	Flood	2017/1/16	2017/1/24	8 days

# Time delay from Disaster Occurrence to EOR submission

If DMO submits EOR immediately after disaster occurred, you could get the observation data and VAPs by DAN sooner.

Country	Region	Type	Date		EOR received time after disaster occurrence
			Occurrence	Request	
Vietnam	Quang Binh Province	Flood	2016/10/14	2016/10/16	2 days-> <b>1 day could be</b>
Vietnam	Hà Tĩnh province and other	Flood	2016/10/28 to 2016/11/5 (It might be 2016/10/31?)	2016/11/1	4 days-> <b>1 day could be</b> (1 day?)
Philippines	Around Mt. Mayon	Lahar	2016/12/26	2016/12/28	5 days-> <b>1 day could be</b>
Thailand	Southern part of Thailand	Flood	2017/1/6	2017/1/11	8 days-> <b>1 day could be</b>
Philippines	Mindanao, Ruzon	Flood	2017/1/16	2017/1/24	8 days-> <b>1 day could be</b>

# Time delay from Disaster Occurrence to EOR submission (for other EOR cases)



Country	Region	Type	Date		EOR received time after disaster occurrence
			Occurrence	Request	
Myanmar	Notern part of Myanmar	Flood	2016/2/24	2016/2/24	0 day
Indonesia	West Java provinces	Flood	2016/2/29	2016/3/1	1 day
Indonesia	West Java provinces	Flood	2016/3/8	2016/3/14	6 days
Sri Lanka	The whole area of Sri Lanka	Flood	2016/5/14	2016/5/15	1 day
Indonesia	Yogyakarta	Landslide, Flood	2016/6/19	2016/6/20	1 day
Nepal	Koshi river	Flood, etc.	2016/7/5	2016/7/6	1 day
Bangladesh	Northern part of Bangladesh	Flood	2016/7/31	2016/8/1	1 day
Bhutan	Southern part of Bhutan *Two AOI points	Flood	2016/7/30	2016/8/2	3 days
Myanmar	9 region along Ayeyarwady river	Flood	2016/8/3	2016/8/4	1 day
India	Bihar and Uttar Pradesh	Flood	2016/8/25	2016/8/26	1 day

## JAXA's Improvement Approach 1

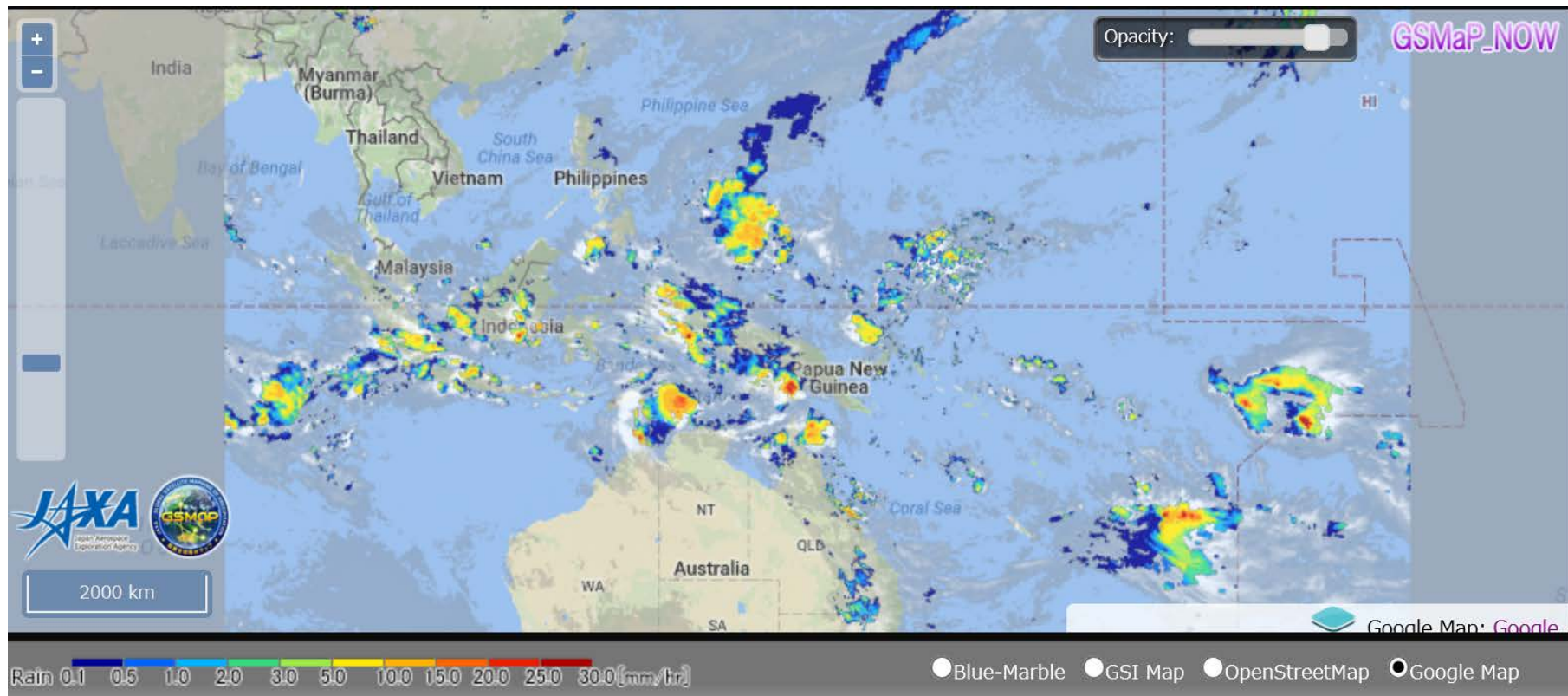
Water related disaster was **62%** of total disaster from 2016 to Feb., 2017.

It could be possible to minimize the damages by this water related disaster, if we get the information about the rainfall status.

DPN as JAXA monitors the rainfall status by using GSMaP\_NOW, to be able to take a prompt DPN action as much as possible.

# 72h Accumulative Rain by GSMaP\_NOW

(GSMaP\_NOW started this service on 29 Aug., 2016.)



GSMaP\_NOW produces rainfall map over the of geostationary satellite "Himawari" area ( $60^{\circ}$  N -  $60^{\circ}$  S,  $84.9^{\circ}$  E -  $155.1^{\circ}$  W), using passive microwave observations. 72-hour rainfall accumulation is available.

[http://sharaku.eorc.jaxa.jp/GSMaP\\_NOW/index.htm](http://sharaku.eorc.jaxa.jp/GSMaP_NOW/index.htm)



# GSMaP 72h Accumulative Rain

Date: 2016 / 10 / 14 till 23:59 JST Submit

Full Screen

« Prev Latest Next »



Relation between Occurred Flood&Lahar and 72h Accumulative Rain?



Blue-Marble GSI Map OpenStreetM

Cloud Rain MWR Coverage 24h rainfall accumulation 72h rainfall accumulation

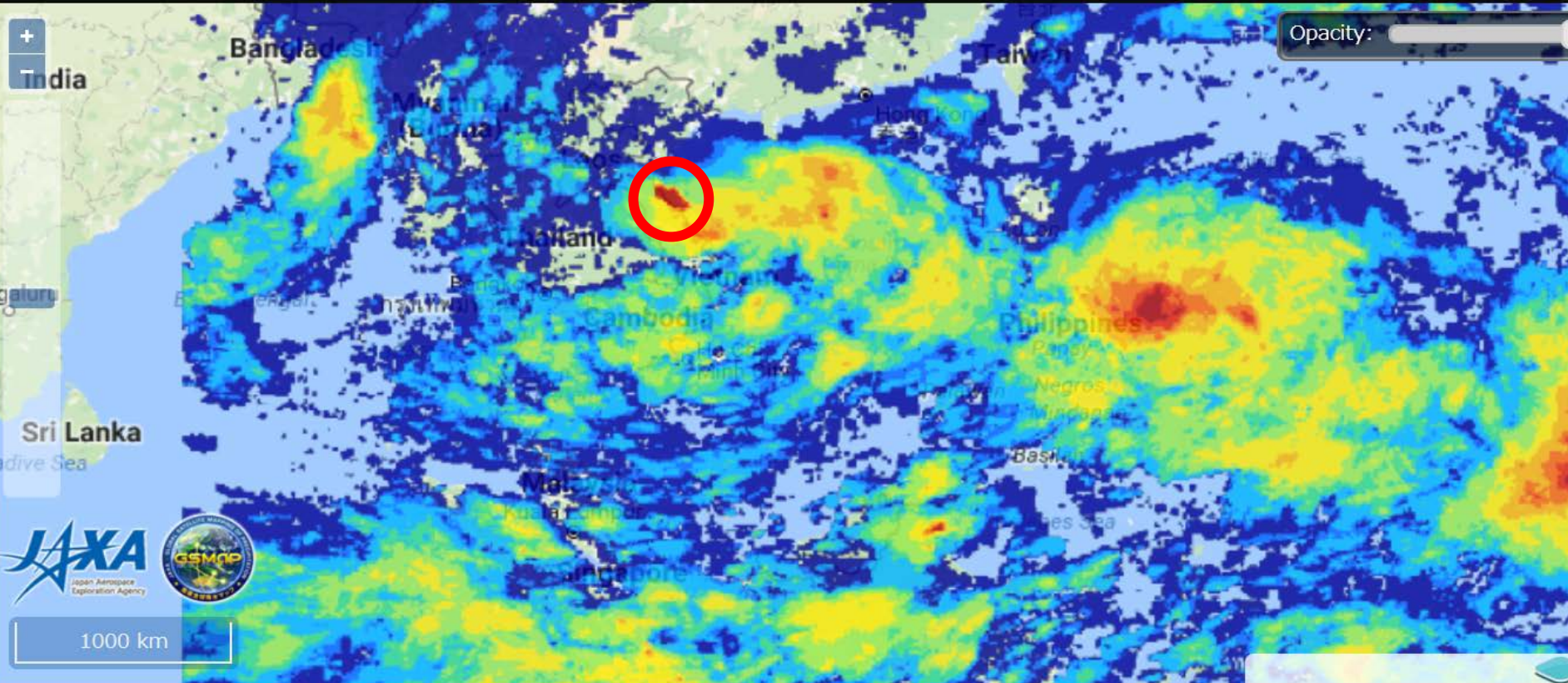
# GSMaP 72h (12 to 14 Oct.) Accumulative Rain

## Flood in Vietnam Quang Binh Province on 2016/10/14

Date: 2016 / 10 / 14 till 23:59 JST Submit

Full Screen

Prev Latest Next »



Accumulative Rain [mm]  
0 5 10 30 50 100 200 300 400 500

Blue-Marble GSI Map OpenStreetM

Cloud Rain MWR Coverage 24h rainfall accumulation 72h rainfall accumulation

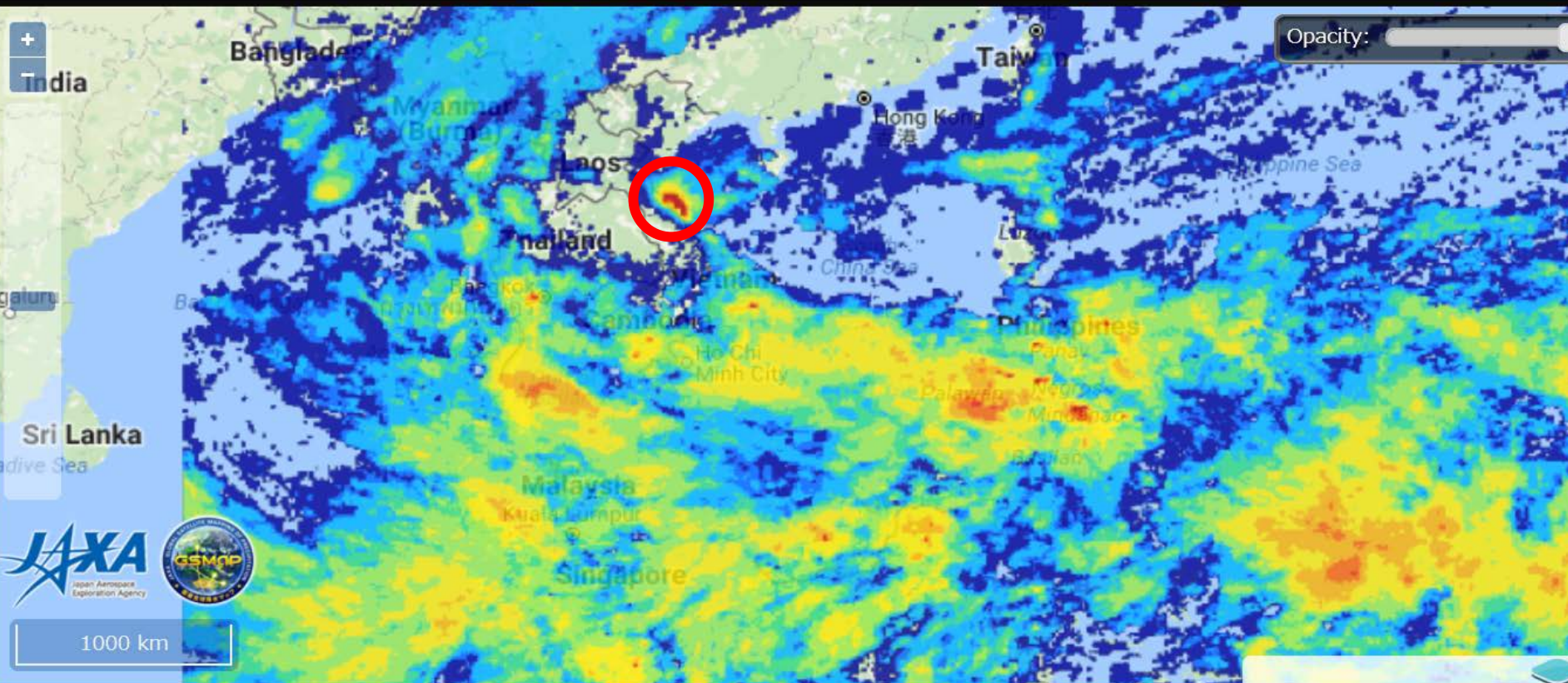
# GSMaP 72h (29 to 31 Oct.) Accumulative Rain

## Flood in Vietnam Hà Tĩnh province from 2016/10/28 to 2016/11/5

Date: 2016 / 10 / 31 till 23:59 JST Submit

Full Screen

Prev Latest Next



Blue-Marble GSI Map OpenStreetMap

Cloud Rain MWR Coverage 24h rainfall accumulation 72h rainfall accumulation

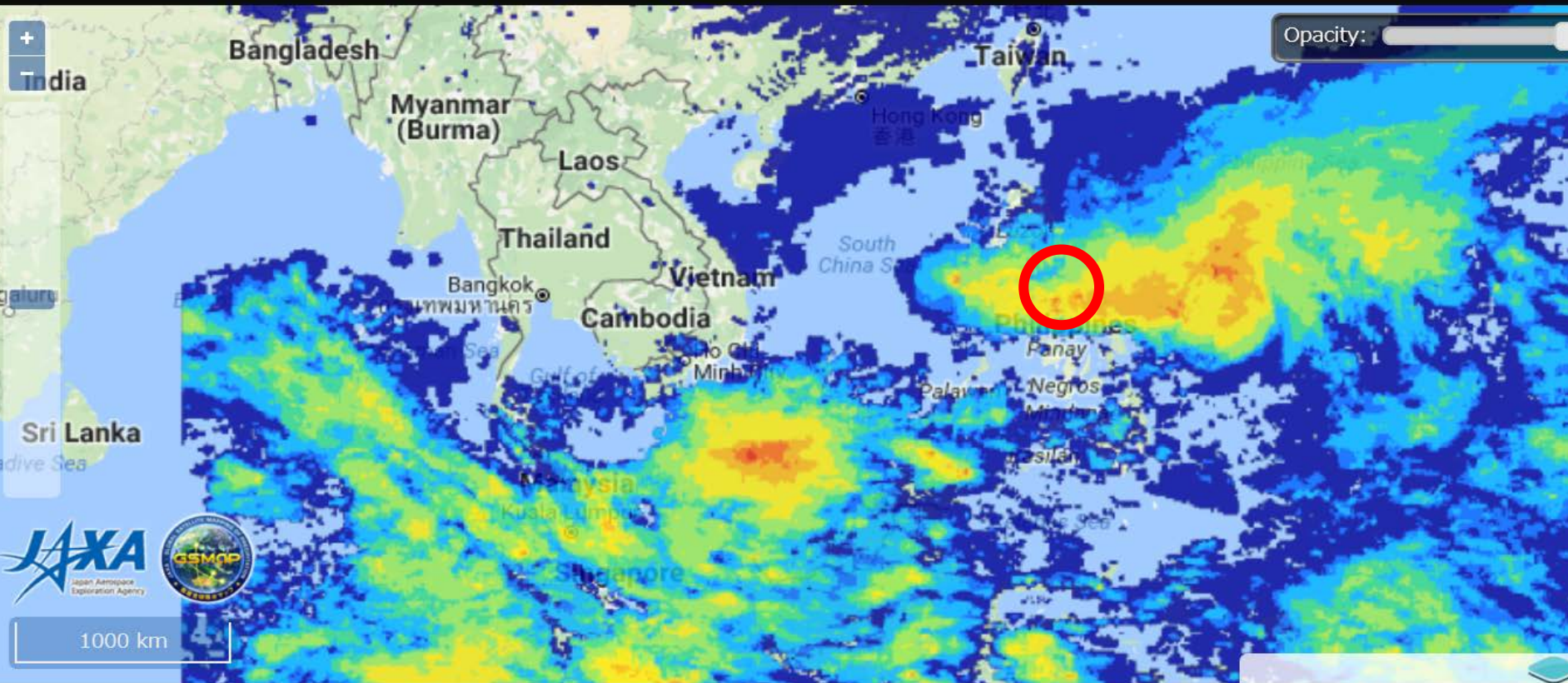
# GSMaP 72h (24 to 26 Dec.) Accumulative Rain

## Lahar Philippines around Mt. Mayon on 2016/12/26

Date: 2016 / 12 / 26 till 23:59 JST Submit

Full Screen

Prev Latest Next



Blue-Marble GSI Map OpenStreetM

Cloud Rain MWR Coverage 24h rainfall accumulation 72h rainfall accumulation

# GSMaP 72h (4 to 6 Jan.) Accumulative Rain

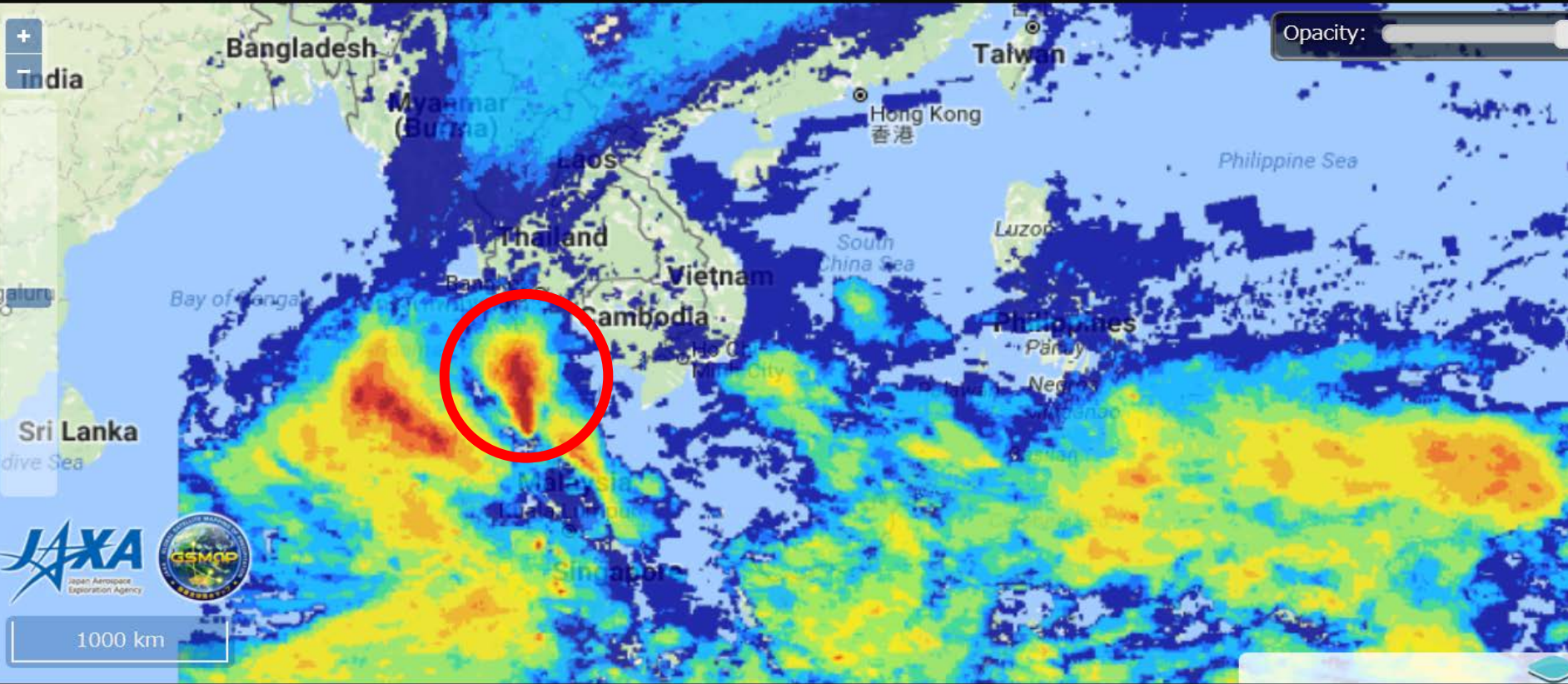


## Flood in Thailand Southern part on 2017/1/6

Date: 2017 / 1 / 6 till 23:59 JST Submit

« Prev Latest Next »

Full Screen



Blue-Marble GSI Map OpenStreetMap

Cloud Rain MWR Coverage 24h rainfall accumulation 72h rainfall accumulation

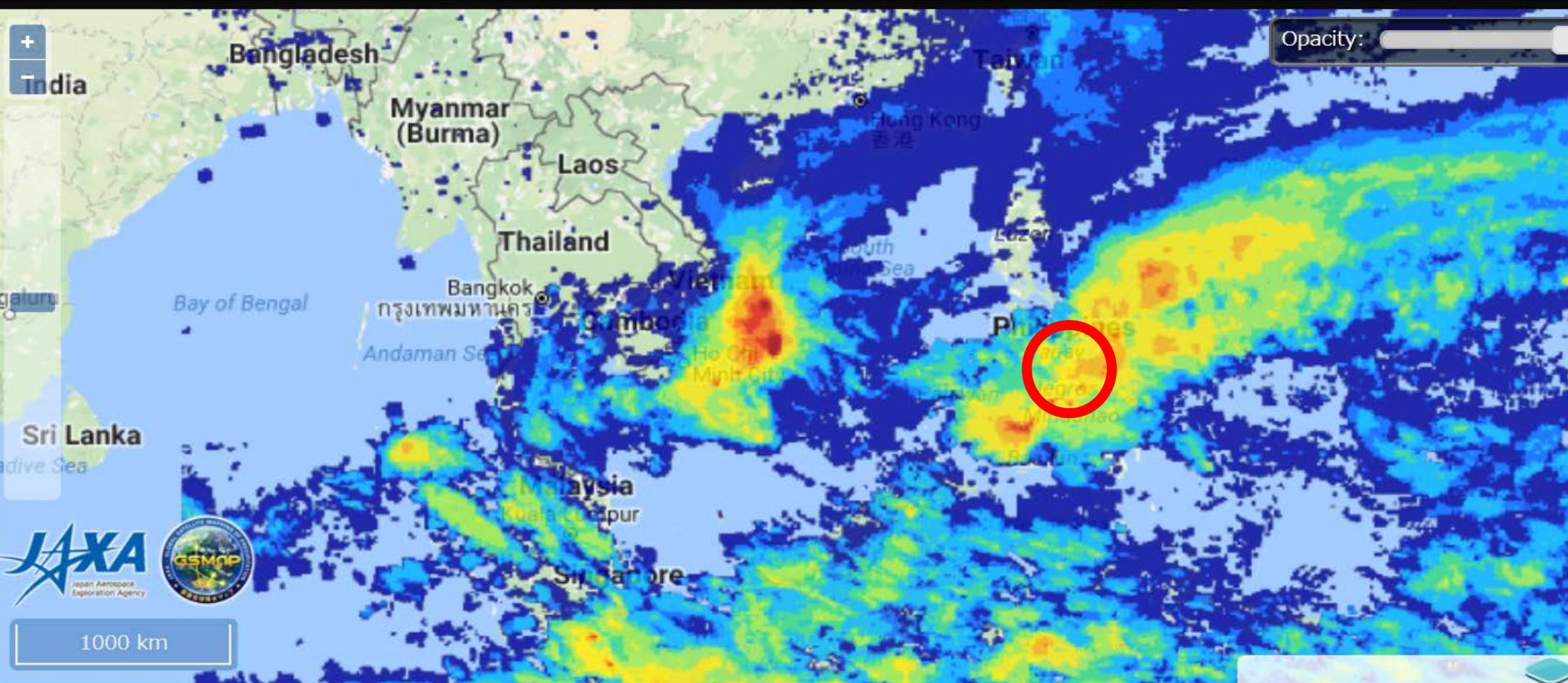
# GSMaP 72h (14 to 16 Jan.) Accumulative Rain

## Flood in Philippines Mindanao, Ruzon on 2017/1/16

Date: 2017 / 1 / 16 till 23:59 JST Submit

« Prev Latest Next »

Full Screen



Opacity:



Blue-Marble  GSI Map  OpenStreetM

Cloud Rain MWR Coverage 24h rainfall accumulation 72h rainfall accumulation

# GSMaP 72h Accumulative Rain

Date: 2016 / 10 / 14 till 23:59 JST Submit

Full Screen

« Prev Latest Next »



Opacity: [slider]



1000 km



Blue-Marble GSI Map OpenStreetMap

Cloud Rain MWR Coverage 24h rainfall accumulation 72h rainfall accumulation

## JAXA's Improvement Approach 2

Quick Look Analysis might be able to reduce the time required data provision, and be of DMO's help about SAR data looking.

Country	Region	Disaster Type	Date			Quick Look Analysis on WEB-GIS (trial after July 2016 )
			Occurrence	Request	ALOS-2 Observation	
Vietnam	Quang Binh Province	Flood	2016/10/14	2016/10/16	2016/10/18	<a href="http://arcg.is/2exhF2E">http://arcg.is/2exhF2E</a>
Vietnam	Hà Tĩnh province and other	Flood	2016/10/28 to 2016/11/5	2016/11/1	2016/11/4	<a href="http://arcg.is/2g3ZzTs">http://arcg.is/2g3ZzTs</a>



# Flood Quick Look Analysis (<http://arcg.is/2exhF2E>) Vietnam Quang Binh Province on 2016/10/14



https://jaxa-dmsso.maps.arcgis.com/apps/Viewer/index.html?webmap=2d51a1 Flood in Vietnam(2016-... 2016-10-17 17:00:00 - Fl... Flood in Vietnam(201... x

ファイル(F) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

**+ Flood in Vietnam(2016-039-WLD)** [Search]

[-] [Home] [Refresh] [Layers] [Full Screen] [Print] [Share] [Help]



POWERED BY esri Esri, HERE, Garmin, FAO, USGS

# Flood Quick Look Analysis (<http://arcg.is/2exhF2E>) Vietnam Quang Binh Province on 2016/10/14



Browser address bar: <https://jaxa-dmso.maps.arcgis.com/apps/Viewer/index.html?webmap=2d51a1>

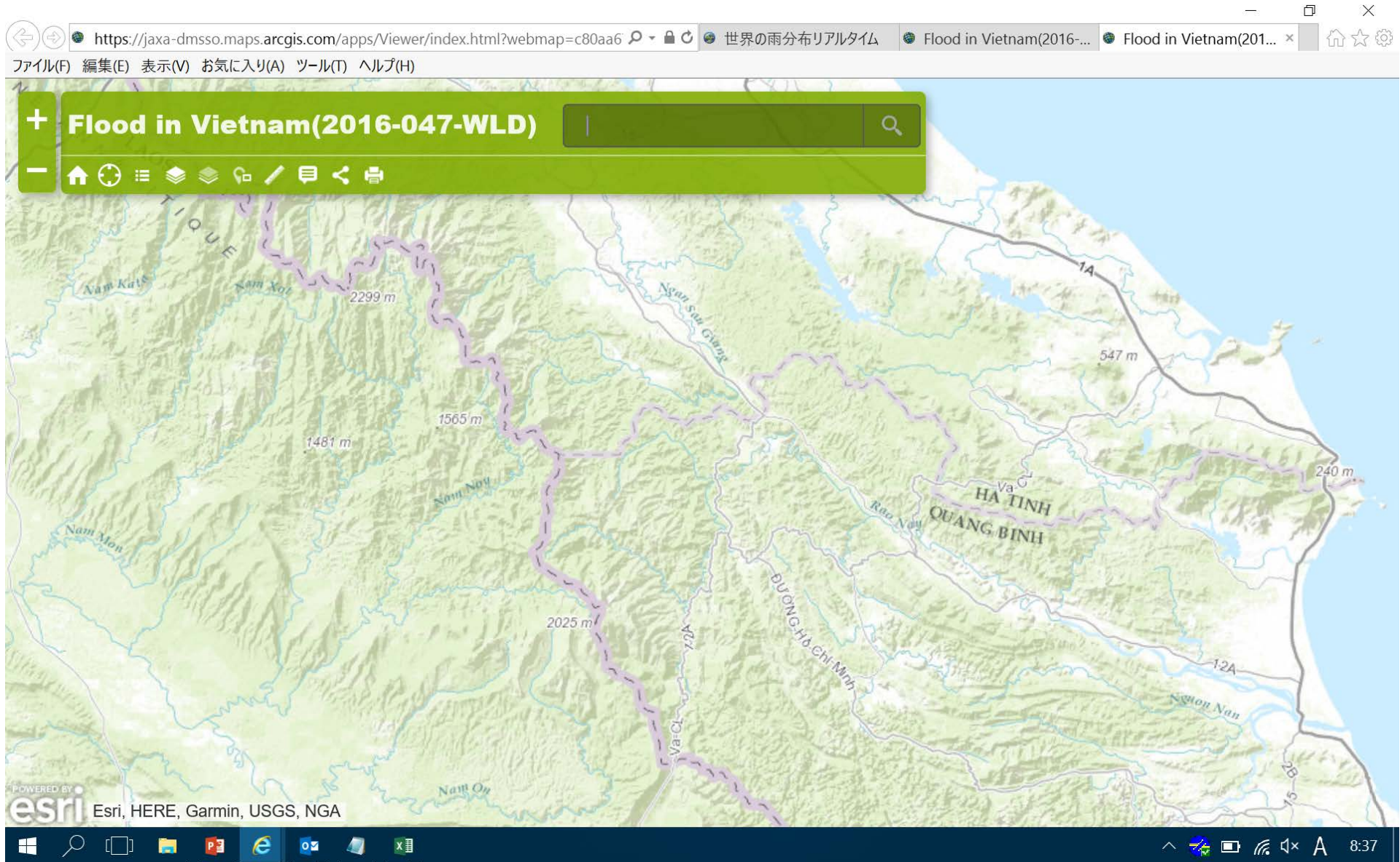
Browser tabs: Flood in Vietnam(2016-... | 2016-10-17 17:00:00 - Fl... | Flood in Vietnam(201...

Map title: Flood in Vietnam(2016-039-WLD)

Map description: RGB Color Composite Analysis using pre-disaster data and post-disaster one. Red area might be thought as flooded area.  
R:G:B=2016/06/26data:2016/10/16data:2016/10/16data

Map labels: lake, lake

# Flood Quick Look Analysis (<http://arcg.is/2g3ZzTs>) Vietnam Hà Tĩnh province from 2016/10/28 to 2016/11/5

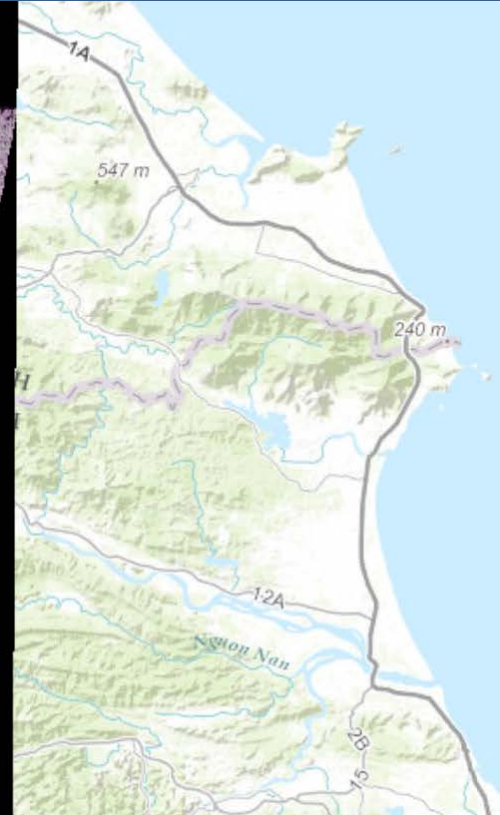
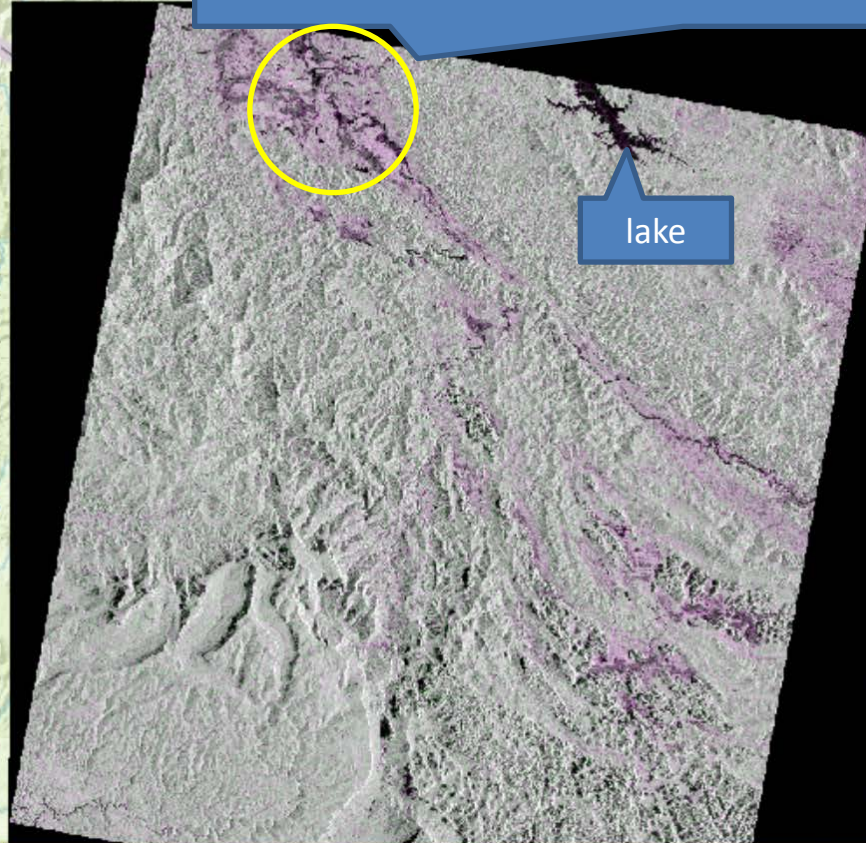
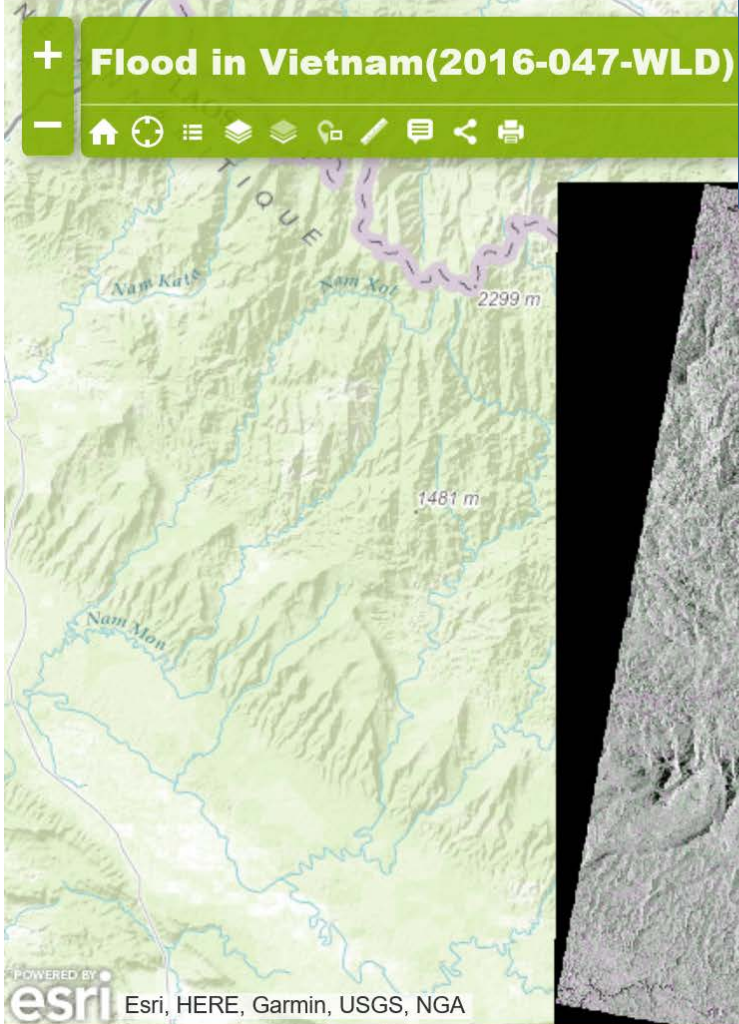


# Flood Quick Look Analysis (<http://arcg.is/2g3ZzTs>) Vietnam Hà Tĩnh province from 2016/10/28 to 2016/11/5



https://jaxa-dmsso.maps.arcgis.com/apps/Viewer/index.html?webp  
ファイル(F) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

Polarimetric Analysis using a phenomenon of backscatter value getting less on the water surface. Black area might be thought as flooded area.



# Summary

For DMO's disaster response activities;

- Exact EOR; DPN can consider the observation plan to meet DMO's aims.
- Quick EOR; DMO can capture opportunity to get the observation data and VAPs timely.

DMO's feedback for DPN & DAN activities and JAXA's two improvement approaches, makes DPN & DAN improve their activities and makes Sentinel Asia progress.

# Status of Reply for Feedback (1/3)



**JAXA asked 14 DMOs for feedback, 3 DMOs replied.  
JAXA has been waiting for your reply.**

Country	Region	Type	Reply to Feedback
Nepal	Koshi river	Flood, etc.	No reply
Taiwan	Taitung city	Typhoon	Replied
Bangladesh	Northern part of Bangladesh	Flood	No reply
Bhutan	Southern part of Bhutan *Two AOI points	Flood	Replied
Myanmar	9 region along Ayeyarwady river	Flood	Replied
Laos	Luang Phabang	Flash Flood	No reply
India	Bihar and Uttar Pradesh	Flood	No reply

# Feedback from RRD of Myanmar

VAPs were very useful to the **persons who have knowledge** how to interpret the map and definition of the colors mentioned in the map.

But the problem we occurred in the real situation was that the VAPs can **only** show **the extent of the water**, not the depth of the water and the end users for the products highlighted that **the water shown in map was not really flood.**

➡ The depth of the water **1 feet (ca.3cm)** was not a real flood.

- If SA can make a flood map eliminating less than 1 feet depth water, this VAP might be understandable for the end user and it meets the end user requirement.

# Status of Reply for Feedback (2/3)



Country	Region	Type	Reply to Feedback
Philippines	islands of northern Philippines	Tropical cyclone	Not ask for feedback
Taiwan	Kaohsiung city	Typhoon	No reply
Vietnam	Quang Binh Province	Flood	No reply
Philippines	Cagayan Province	Typhoon	No reply
Vietnam	Hà Tĩnh province and other	Flood	No reply



# Status of Reply for Feedback (3/3)



Country	Region	Type	Reply to Feedback
Nepal	Mountain area in northern part of Nepal	Flash Flood	No reply
Philippines	Around Mt. Mayon	Lahar	No reply
Thailand	Southern part of Thailand	Flood	No reply
Philippines	Mindanao, Ruzon	Flood	Not ask for feedback
Philippines	Mindanao, Surigao City	Earthquake	Not ask for feedback

# Feedback for the response of Sentinel Asia EO (Lahar 25 Dec 2016) (1/4)



From: 高田 裕司 [mailto:takada.yuji@jaxa.jp]  
Sent: Thursday, February 23, 2017 12:53 PM  
To: 'ocd\_opnsdiv@yahoo.com' <ocd\_opnsdiv@yahoo.com>;  
'focastrov@dswd.gov.ph' <focastrov@dswd.gov.ph>;  
'arturo.daag@phivolcs.dost.gov.ph' <arturo.daag@phivolcs.dost.gov.ph>;  
'asdaag@yahoo.com' <asdaag@yahoo.com>  
Cc: 'z-sentinel.asia@ml.jaxa.jp' <z-sentinel.asia@ml.jaxa.jp>  
Subject: [Z-SENTINEL.ASIA:00537] Feedback for the response of Sentinel Asia EO  
(Lahar 25 Dec 2016)

Dear Mr. Felino Castro (DSWD),  
Dear Sir and Madam (Office of Civil Defense),

Thank you for your contribution for Sentinel Asia (SA).

According your EOR (ERPHVS000018), SA observed the required AOI and provided the VAP (Value Added Products). SA wants to know that how the observation data and VAPs were used for your disaster response activities.

We would really appreciate it if you could provide answers to the following questions, in order to make our SA activities better and more helpful.

# Feedback for the response of Sentinel Asia EO (Lahar 25 Dec 2016) (2/4)



1) The provided VAPs of Product-AIT(\*) and Product-JPYU(\*) were easy to understand? If not, please tell us your requirements how VAP should be improved. These VAPs showed the flooded area, **they might not meet your required lahar analysis**, even though lahar analysis was described in “Disaster Situation” of SA web site. SA asks DAN to confirm what kind of damage analysis is required.

(\*) Provided VAPs: Product-AIT and Product-JPYU are on the url. It is in a single statement.

[https://sentinel.tksc.jaxa.jp/sentinel2/thumbnailEmob.jsp?emo\\_bRequestDetailAction.requestId=ERPHVS000018&subset\\_name=Emergency+Observation&submit.countryIdx=&submit.disasterTypeIdx=](https://sentinel.tksc.jaxa.jp/sentinel2/thumbnailEmob.jsp?emo_bRequestDetailAction.requestId=ERPHVS000018&subset_name=Emergency+Observation&submit.countryIdx=&submit.disasterTypeIdx=)

# Feedback for the response of Sentinel Asia EO (Lahar 25 Dec 2016) (3/4)



2) Is the WEB-GIS (<http://arcg.is/2idf5MK>) useful and helpful for your analysis or understanding? You can compare this **RGB Color composite analysis** (R:G:B=Pre-disaster:Post-disaster:Pre-disaster) of WEB-GIS with the **Lahar hazard maps of Mt. Mayon** that had been developed in SA Success Story Project. There seems to be some **colored point** (**long,lat=123.717794,13.187963**) on **Mt. Mayon stream(channel)** of this analysis. This point might be a lahar occurred place. Have you found out the lahar area by using another way, e.g. airplane and so on. If so, could you please compare this **RGB Color composite analysis with your lahar information**? Could you please tell us your results?

This WEB-GIS is still a trial implementation in Japanese. Please find the attached file to operate the WEB-GIS.

Feedback for the response of Sentinel Asia EO  
(Lahar 25 Dec 2016) (4/4)



3) For what kinds of your disaster response activities did you use VPAs and how helpful were they. We would really appreciate it if you could provide answers concretely giving some actual examples. When you could not use them, please tell us your honest reason or claims.

4) Your any comments please.

Regards,

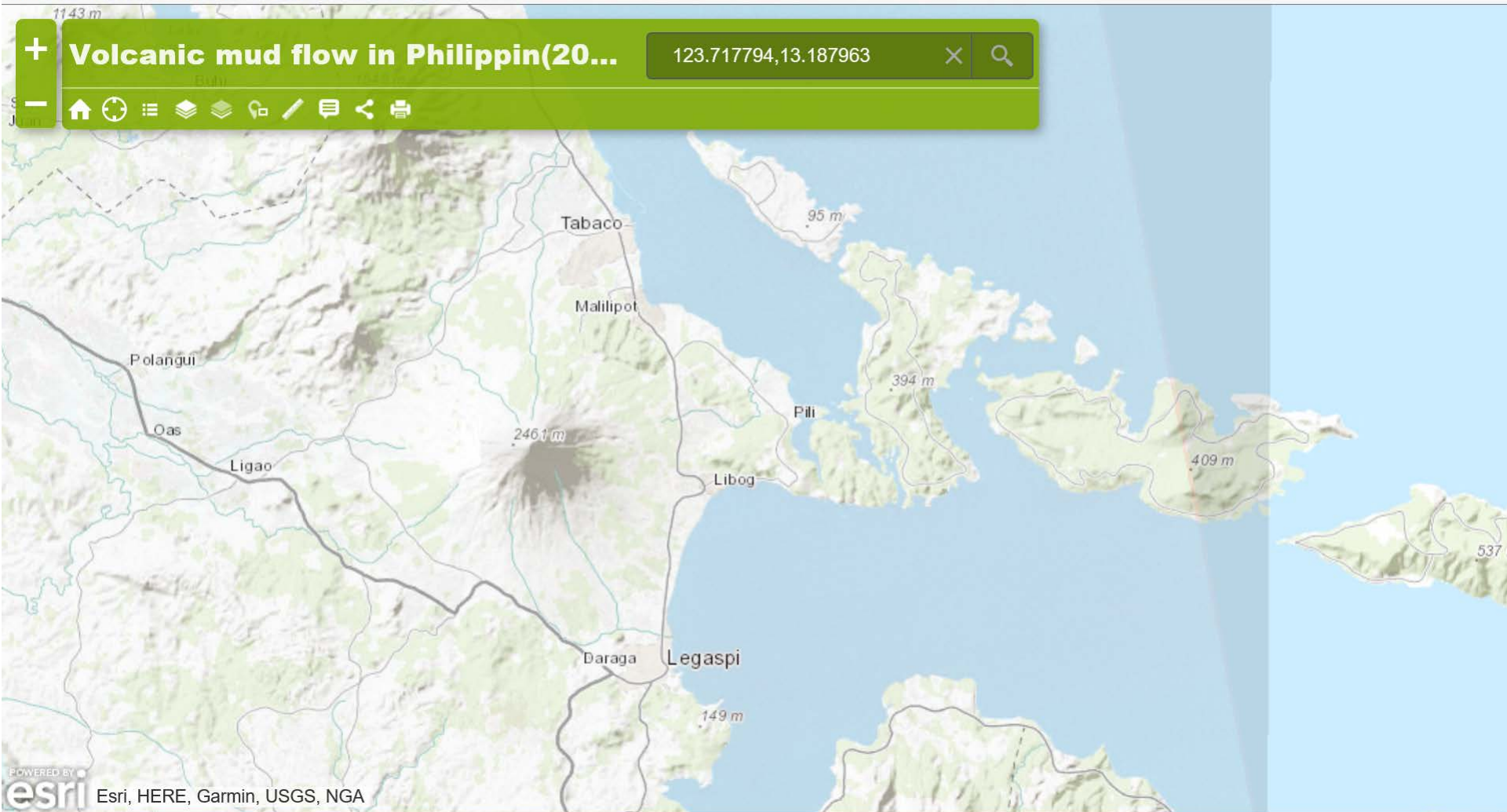
Takada/JAXA Sentinel Asia Secretariat

# Feedback for the response of Sentinel Asia EO (Lahar 25 Dec 2016) [<http://arcgis.com/2idf5MK>]



https://jaxa-dmso.maps.arcgis.com/apps/Viewer/index.html?webmap=1ec128 Volcanic mud flow in Philippi...

ファイル(F) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)



# Feedback for the response of Sentinel Asia EO (Lahar 25 Dec 2016) [<http://arcg.is/2idf5MK>]

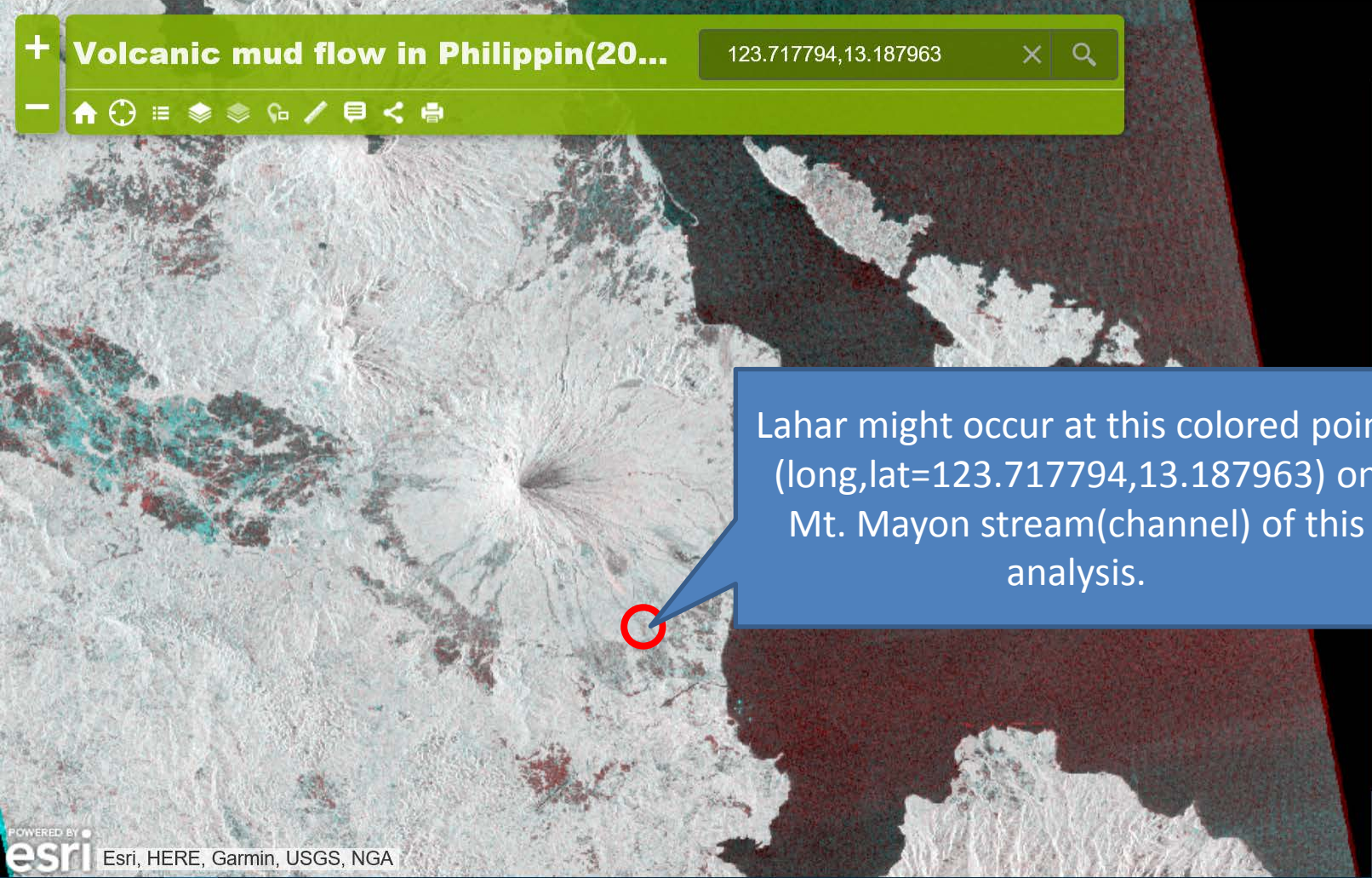


https://jaxa-dmso.maps.arcgis.com/apps/Viewer/index.html?webmap=1ec128 Volcanic mud flow in Philippi...

ファイル(F) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

**+** Volcanic mud flow in Philippin(20... 123.717794,13.187963 **x** **Q**

**-** Home Refresh Layers Map Tools Print



Lahar might occur at this colored point (long,lat=123.717794,13.187963) on Mt. Mayon stream(channel) of this analysis.

POWERED BY **esri** Esri, HERE, Garmin, USGS, NGA

# Feedback for the response of Sentinel Asia EO (Lahar 25 Dec 2016) [<http://arcgis.com/2idf5MK>]



https://jaxa-dmso.maps.arcgis.com/apps/Viewer/index.html?webmap=1ec128 Volcanic mud flow in Philippi...

ファイル(F) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

**Volcanic mud flow in Philippin(20...** 123.717794,13.187963

Home, Refresh, Layers, Legend, Full Screen, Print, Measure, Share, Back, Forward

Lahar might occur at this colored point (long,lat=123.717794,13.187963) on Mt. Mayon stream(channel) of this analysis.



POWERED BY **esri** Esri, HERE, Garmin, USGS, METI/NASA



# Compare Lahar Analysis using ALOS-2 observation data of 5 Jan. 2017 and Lahar hazard maps of Mt. Mayon



Figure 1. Lahar Analysis using ALOS-2 observation data of 5 Jan. 2017 and a compatible archived one of 26 May 2016

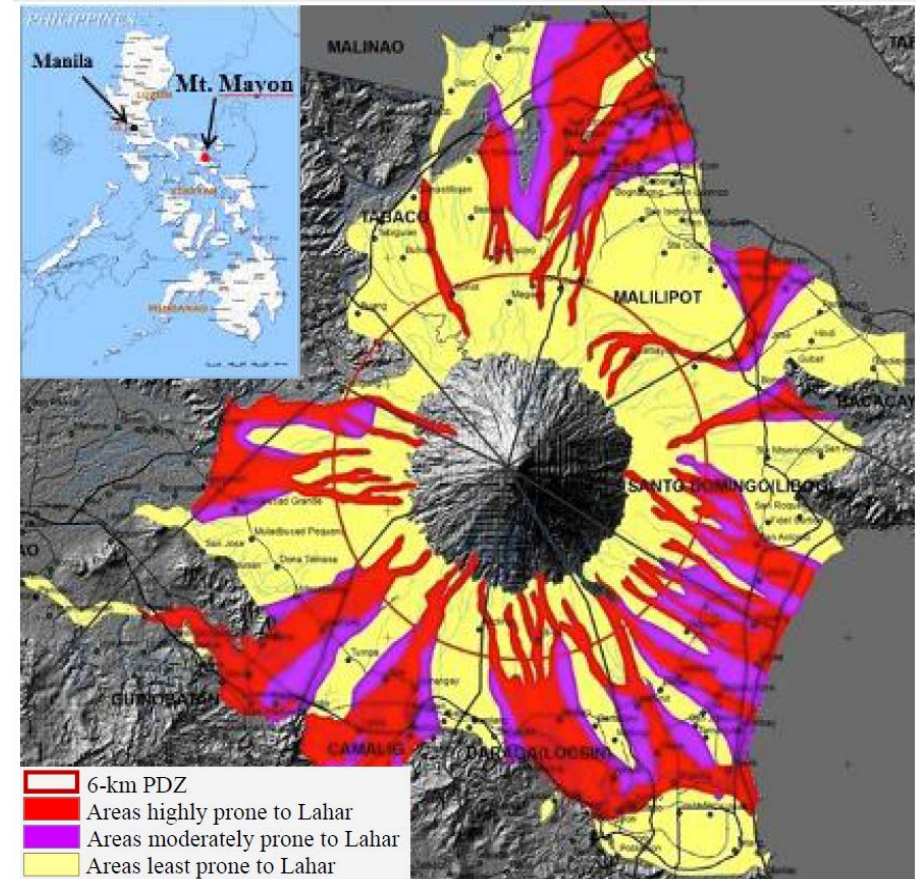


Figure 2. Lahar hazard maps of Mt. Mayon, Philippines

Reference: Feedback for the response of Sentinel Asia EO (Lahar 25 Dec 2016) [<http://arcg.is/2idf5MK>]

Reference: Page 8 Contribution of Space Technology for DRR -Sentinel Asia's 10th Anniversary- Good Practices