WORKING GROUP
WATER-RELATED DISASTERS & EOR ACTIVITIES

FLOODS & LANDSLIDES

Mabelline T. Cahulogan

Philippine Institute of Volcanology and Seismology

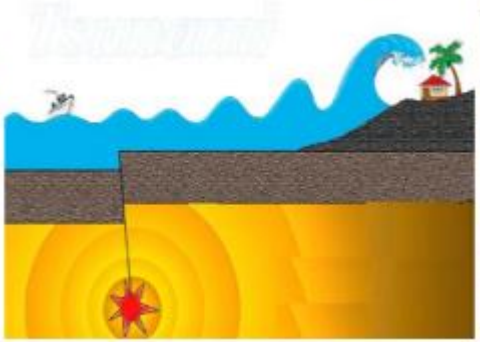
MARCH 9, 2017

Hanoi, Vietnam

Natural Hazards in the Philippines

The Philippines is 3rd in the world most exposed and at risk to natural hazards (World Risk Report, 2013)

Earthquake



Tsunami

Volcanic eruption

Typhoon

Storm surge

Flood

Landslide

DOST PHIVOLCS

2016 Sentinel Asia success story in the Philippines

The Need to Reduce Disaster Risks

Disaster risks must be reduced to save lives and develop resilient cities and communities, through:

- Hazard Assessment, Exposure Database Development and Risk assessment
- Monitoring and Forecasting
- Warning
- Awareness and Preparedness
- Rapid Response and Recovery
- Appropriate Land Use
- Mitigation Measures

EFFORTS THAT ARE BEING UNDERTAKEN TO REDUCE RISKS TO HAZARDS

- Capacity building
- Image Processing
- Hazards Assessment
- Monitoring and Warning
- Disaster Response through Emergency Operation Request
- Sharing results to concerned organizations and local governments

PHILIPPINES

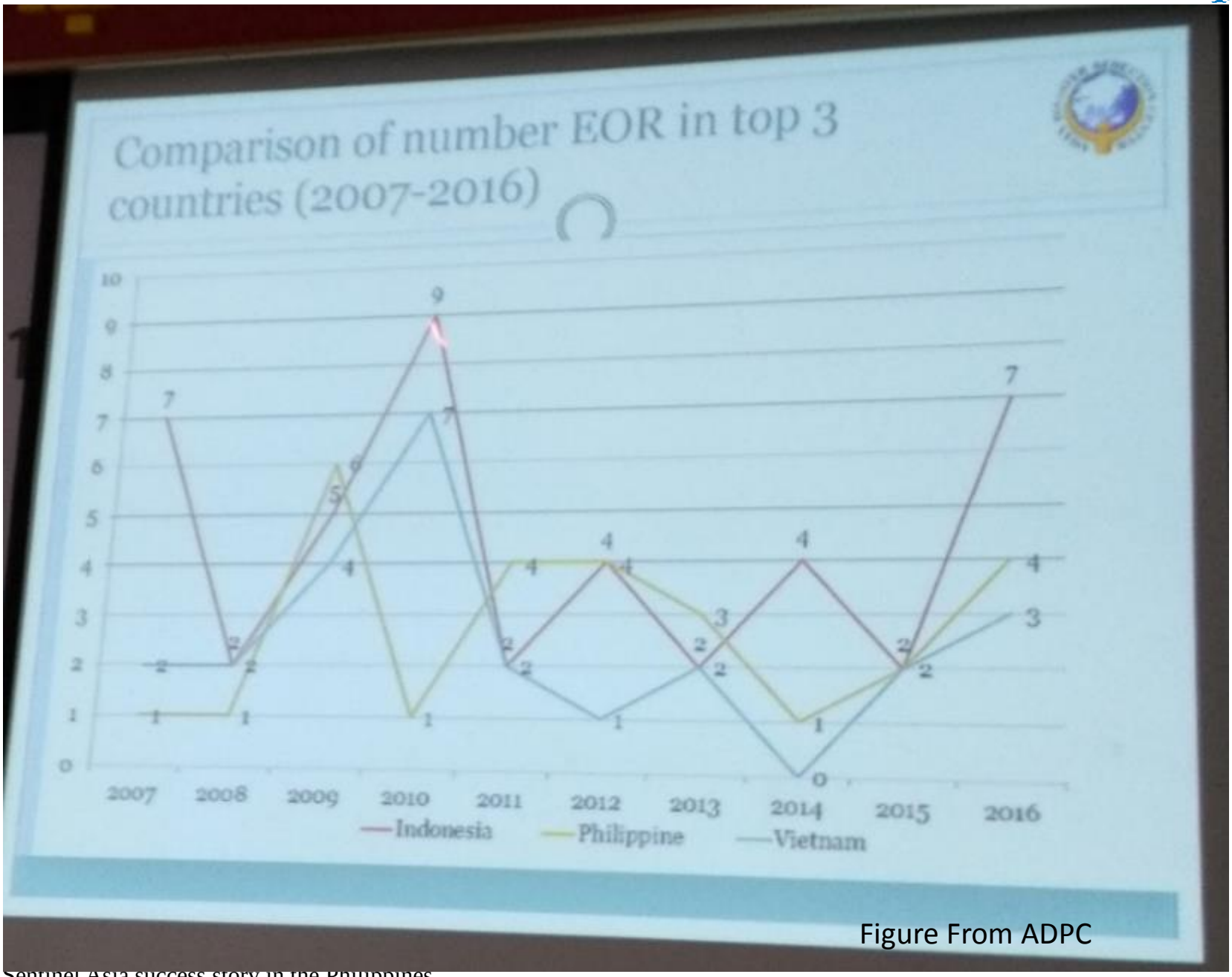


Figure From ADPC


Sentinel Asia
JPT Member
FAQ
Contact US
Links
Site Policy
Emergency Obs. Request List
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Disaster Type: Earthquake
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Emergency Obs. ID
Occurrence Date
Country
Disaster Type
Product
WEB-GIS
Detail
Disaster Inf.
Status
ERPHDC000002
10/Feb/2017
Philippines
Earthquake
link
ADRC
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ERSECR000166
15/Oct/2013
Philippines
Earthquake
link
ADRC
Active
ERPHMO000005
06/Feb/2012
Philippines
Earthquake
link
ADRC
Active


Sentinel Asia
JPT Member
FAQ
Contact US
Links
Site Policy
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Occurrence Date
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Volcano eruption
link
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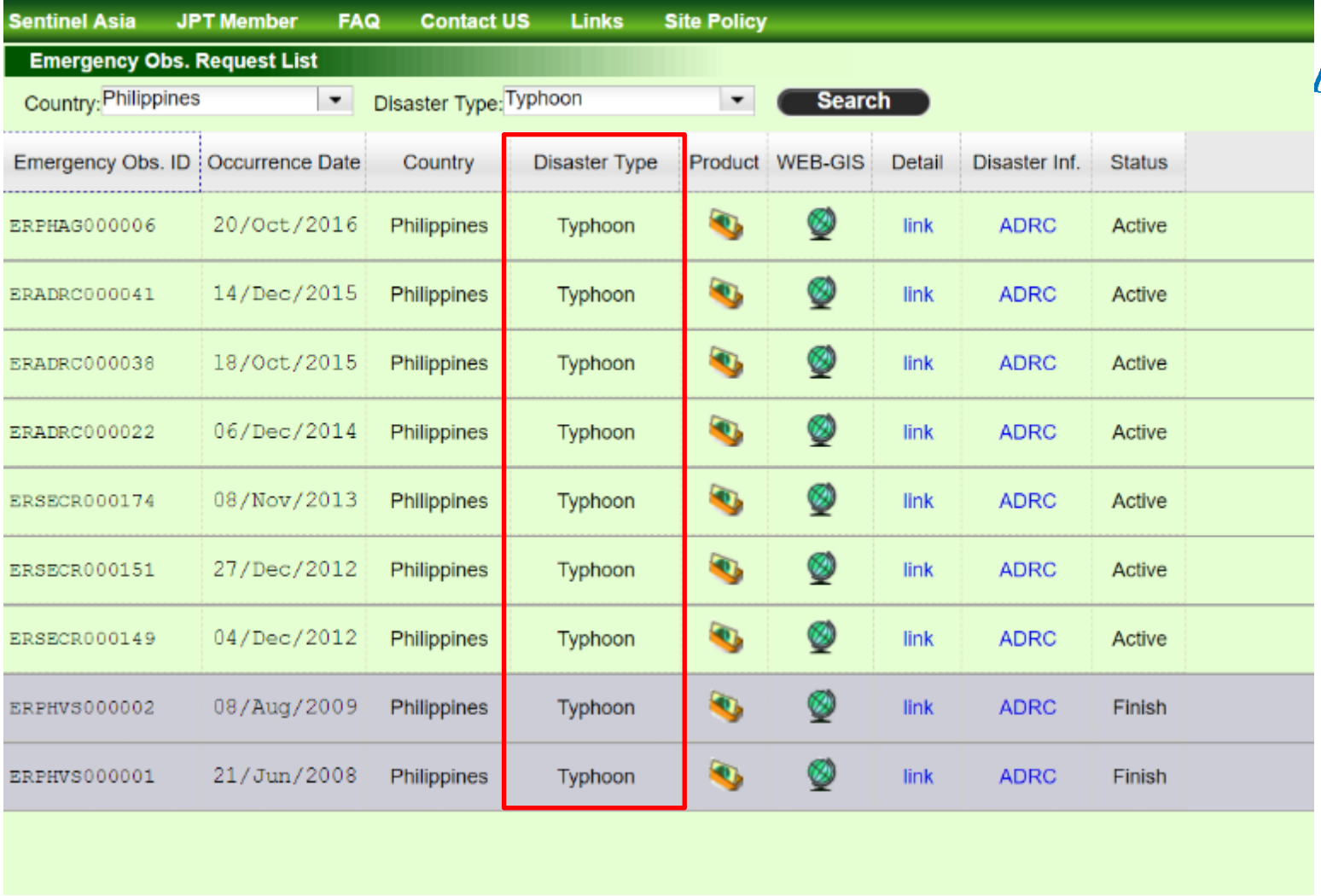
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Emergency Obs. ID
Occurrence Date
Country
Disaster Type
Product
WEB-GIS
Detail
Disaster Inf.
Status
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ERADRC000041 14/Dec/2015 Philippines Typhoon link ADRC Active
ERADRC000038 18/Oct/2015 Philippines Typhoon link ADRC Active
ERADRC000022 06/Dec/2014 Philippines Typhoon link ADRC Active
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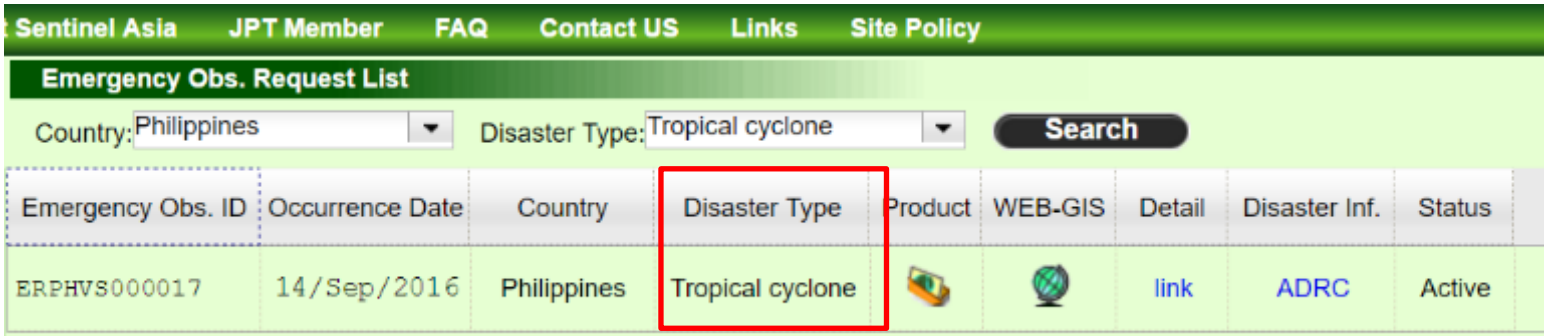
ERSECR000151 27/Dec/2012 Philippines Typhoon link ADRC Active
ERSECR000149 04/Dec/2012 Philippines Typhoon link ADRC Active
ERPHVS000002 08/Aug/2009 Philippines Typhoon link ADRC Finish
ERPHVS000001 21/Jun/2008 Philippines Typhoon link ADRC Finish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Contact US
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Occurrence Date
Country
Disaster Type
Product
WEB-GIS
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Disaster Inf.
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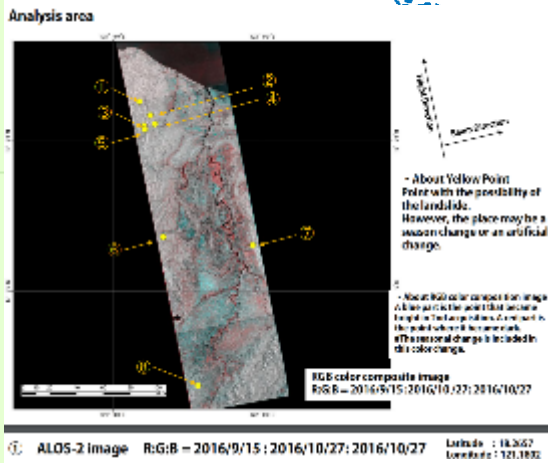
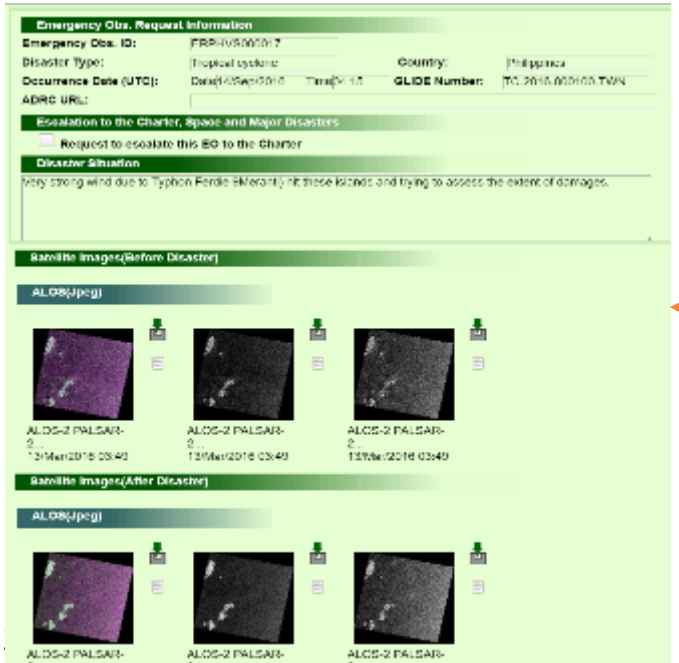
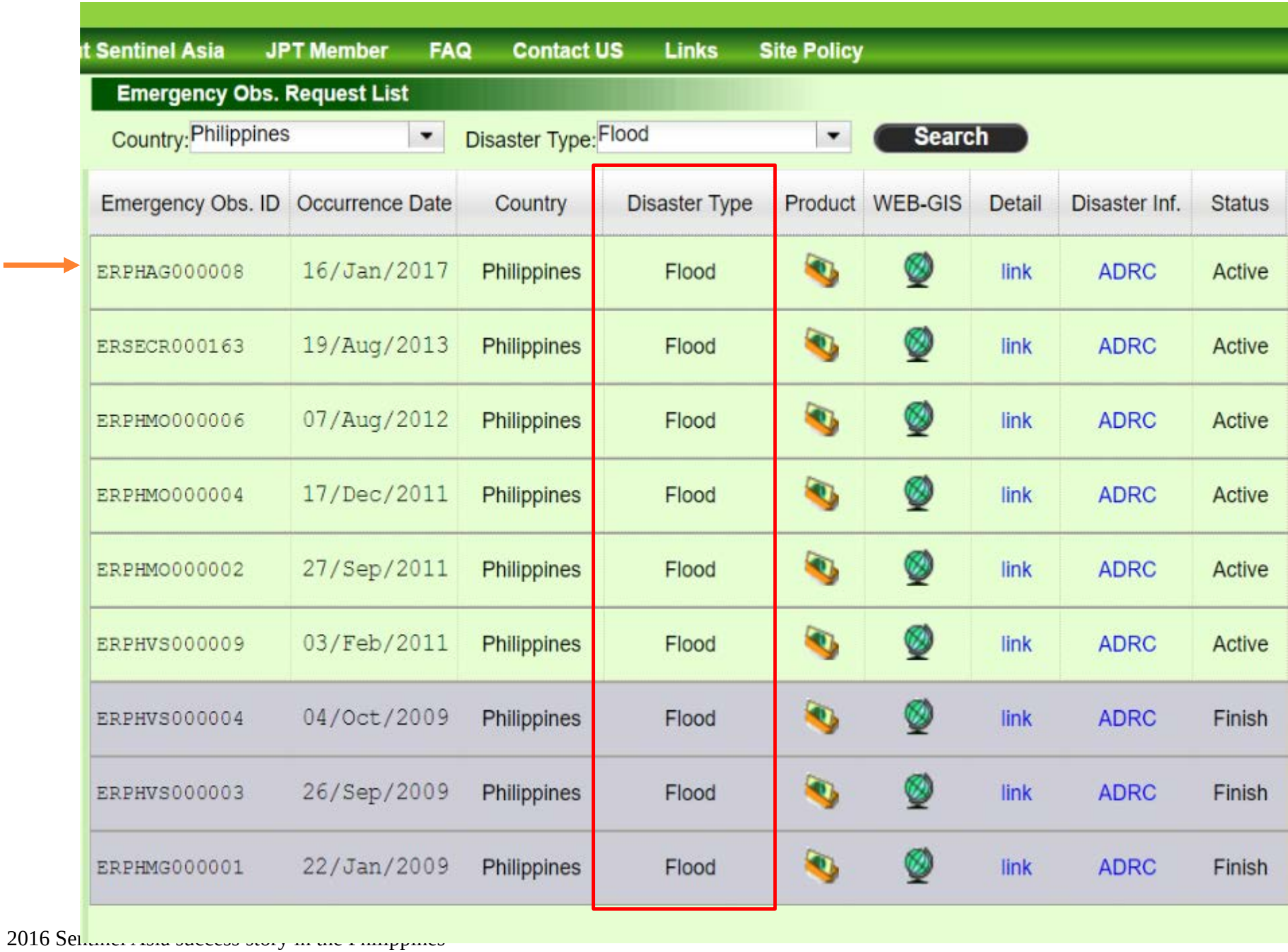
October 20, 2016
(Typhoon)





September 14, 2016
(Tropical Cyclone)


t Sentinel Asia
JPT Member
FAQ
Contact US
Links
Site Policy
Emergency Obs. Request List
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Disaster Type: Flood
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Emergency Obs. ID
Occurrence Date
Country
Disaster Type
Product
WEB-GIS
Detail
Disaster Inf.
Status
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ERSECR000163 19/Aug/2013 Philippines Flood link ADRC Active
ERPHMO000006 07/Aug/2012 Philippines Flood link ADRC Active
ERPHMO000004 17/Dec/2011 Philippines Flood link ADRC Active
ERPHMO000002 27/Sep/2011 Philippines Flood link ADRC Active
ERPHVS000009 03/Feb/2011 Philippines Flood link ADRC Active
ERPHVS000004 04/Oct/2009 Philippines Flood link ADRC Finish
ERPHVS000003 26/Sep/2009 Philippines Flood link ADRC Finish
ERPHMG000001 22/Jan/2009 Philippines Flood link ADRC Finish

Emergency Obs. Request Information

Emergency Obs. ID:	ERPHAG000008		
Disaster Type:	Flood	**Country:**	Philippines
Occurrence Date (UTC):	Date 16/Jan/2017 Time 00:00	**GLIDE Number:**	
ADRC URL:			

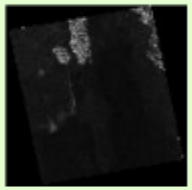
Escalation to the Charter, Space and Major Disasters

☐ **Request to escalate this EO to the Charter**

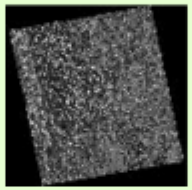
Disaster Situation

PAGASA has 4 "AOI" as follow
1) 8d 26m 29.09's N, 125d 49m 35.99's E, Radius=30 km
2) 7d 18m 23.87's N, 125d 40m 51.29's E, Radius=30 km
3) 7d 12m 50.66's N, 124d 14m 57.28's E, Radius=30 km

ALOS(Jpeg)


ALOS-2 PALSAR-2...
24/Jan/2017 16:00


ALOS-2 PALSAR-2...
24/Jan/2017 16:00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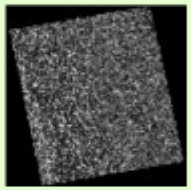
24/Jan/2017 16:00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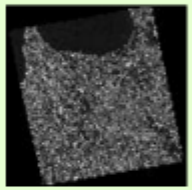
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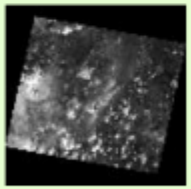
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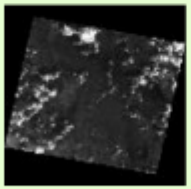
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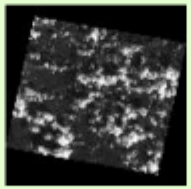
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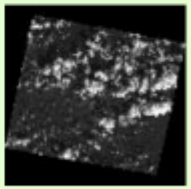
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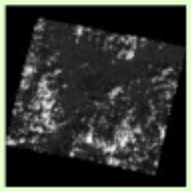
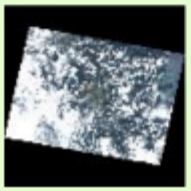
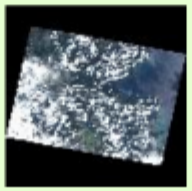
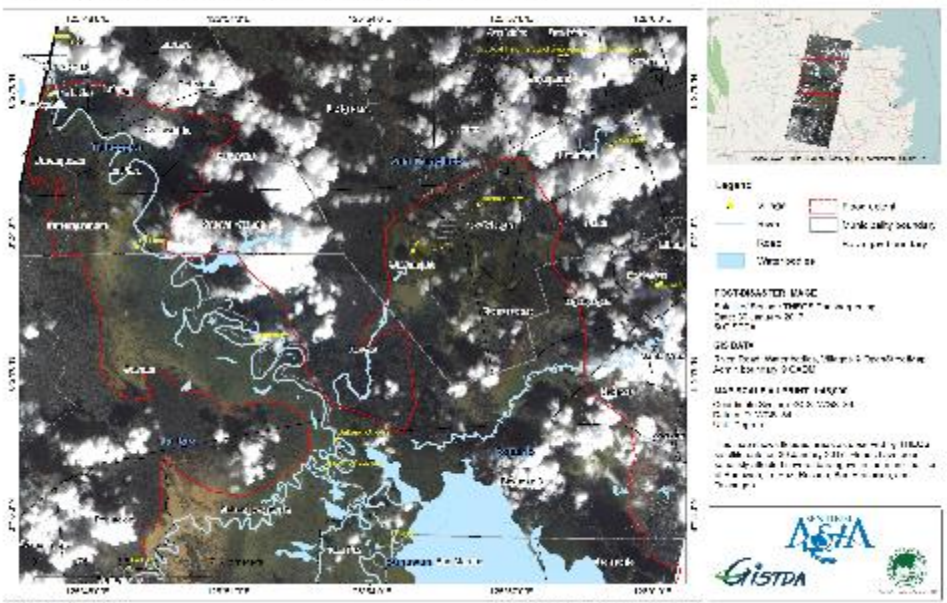
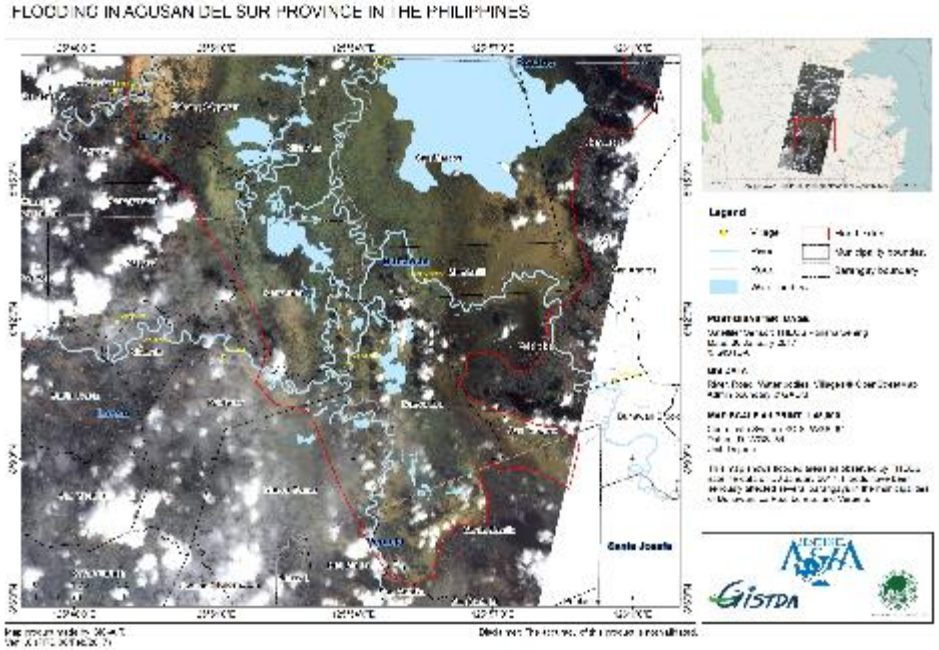






Images received from DPN





REPUBLIC OF THE PHILIPPINES
NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL
National Disaster Risk Reduction and Management Center, Camp Aguinaldo, Quezon City, Philippines

NDRRMC UPDATE

Sitrep No. 10 re Effects of Tail-End of a Cold Front and Low Pressure Area (LPA)

Releasing Officer:

USEC. RICARDO B. JALAD
Executive Director, NDRRMC and
Administrator, OCD

DATE : 25 January 2017, 8:00 AM

I. SITUATION OVERVIEW:

16 January 2017

At 10:00 AM, the Low Pressure Area (LPA) was estimated at 130 km West of Cotabato City, Maguindanao. This weather system along with the Tail-End of a Cold Front brought cloudy skies with moderate to occasionally heavy rains and thunderstorms over Palawan, Visayas, Zamboanga Peninsula, and Northern Mindanao.

17 January 2017

At 11:00 AM, the Low Pressure Area (LPA) East Northeast of Zamboanga City has dissipated. Meanwhile, the Tail-End of a Cold Front continued to bring cloudy skies with moderate to occasionally heavy rains and thunderstorms over Visayas and the Regions of Northern Mindanao and CARAGA.

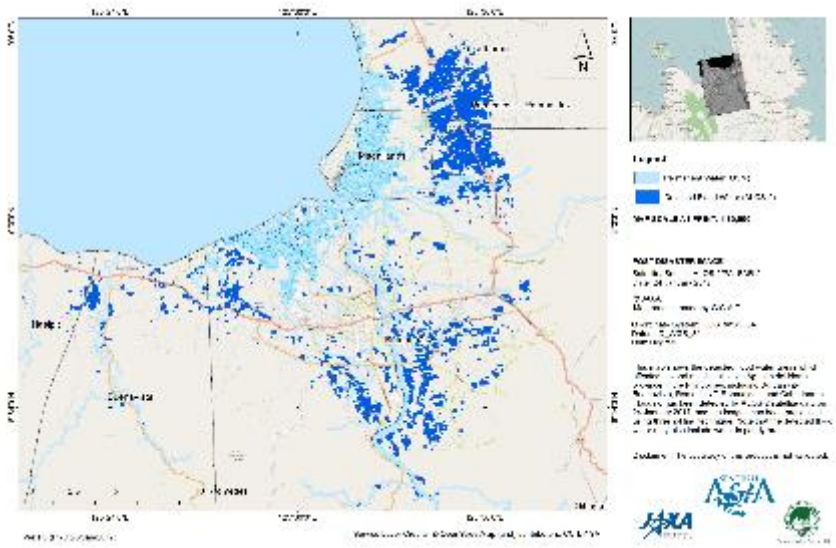
18 January 2017

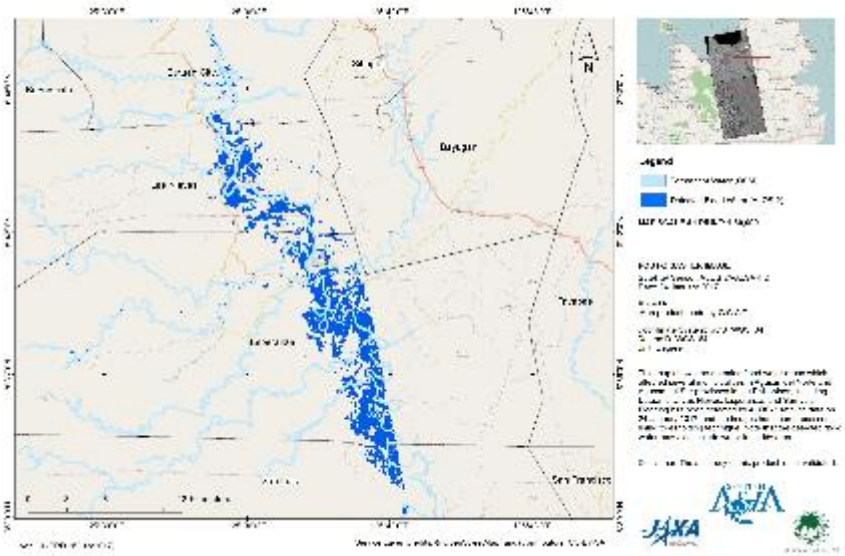
At 11:00 AM, the effect of Tail-End of a Cold Front over Visayas and Mindanao has weakened. However, cloudy skies with light to moderate rains and isolated thunderstorms continued to prevail over Visayas, Mindanao, and the province of Palawan.

19 January 2017

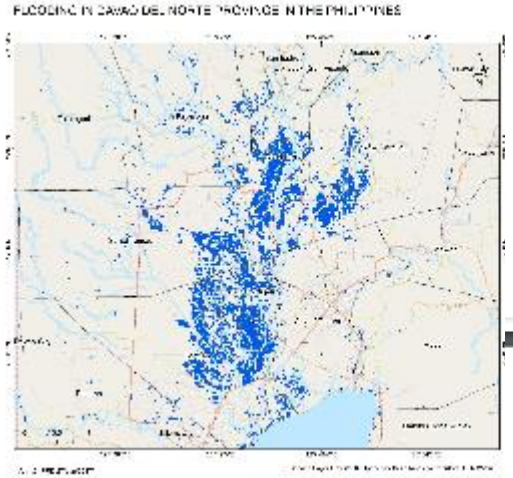
https://goo.gl/P7CaKq

2016 Sentinel Asia success story in the Philippines





Report source: https://goo.gl/q5YvD4



II. EFFECTS:

A. Pre-emptive Evacuation (TAB A)

1. A total of **17,366 families / 90,697 persons** were pre-emptively evacuated in Regions VI, VII, IX, X, XI, CARAGA, and NIR.

B. Affected Population (TAB B)

1. A total of **136,320 families / 654,149 persons** were affected in a total of **834 barangays** in Regions VI, VII, VIII, IX, X, **XI**, XII, CARAGA, and ARMM due to the said weather disturbances.

2

2. Of which, **8,155 families / 38,046 persons** are served inside **135 Evacuation Centers (ECs)** and **3,879 families / 18,090 persons** are still served outside ECs.

C. Casualties (TAB C)

1. **Nine (9) dead, ten (10) injured, and two (2) missing persons** were reported in Regions VIII, IX, X, and CARAGA.

D. Flooded Areas (TAB D)

1. A total of **445 areas** were reported flooded in Regions VI, VII, VIII, IX, X, XII, CARAGA, ARMM, and NIR. Of which, flood waters in **194 areas** has already subsided.

E. Incidents Monitored

1. **Ten (10) incidents** were monitored in Regions VIII, X, ARMM, and NIR due to Tail end of a Cold front and Low Pressure Area;

G. Suspension of Classes and Work (TAB F)

1. Classes in some areas in Regions VI, VII, VIII, X, NIR, CARAGA and **ARMM** were suspended due to continuous rains and flooding.
2. Work in the Provincial Capitol of Cebu was suspended on 16 January 2017 except those offices which provides emergency response services.
3. Work in government offices in the Municipality of La Libertad, Negros Oriental was cancelled.
4. A total of fifty four (54) cities/municipalities declared suspension of classes, thirteen (13) of which had already resumed.

H. Status of Lifelines

1. **Power**
   a. Power supply in the City of Cagayan de Oro was shut down as precautionary measure. Power was restored as of 17 January 2017, 12:50 AM.
   b. The municipality of Esperanza, Sultan Kudarat experienced power interruption from 7:00 PM until 9:00 PM on 18 January 2017 due the bad weather.
   c. Brgy. Casoon Monkayo, Compostela Valley still had no electricity as of 19 January 2017, 9:00 PM.
   d. As of 21 January 2017, the power supply in Brgy. Casoon Monkayo, Compostela Valley has been restored
2. **Roads and Bridges (TAB G)**
   a. A total of **53 road sections** (34 national and 19 local), **5 bridges (national), and one (1) spillway** were rendered impassable due to flooding and slides.
   b. To date, **8 road sections (3 national and 5 local) and one (1) spillway** are still not passable in Regions X, XI and CARAGA.

I. Status of Ports

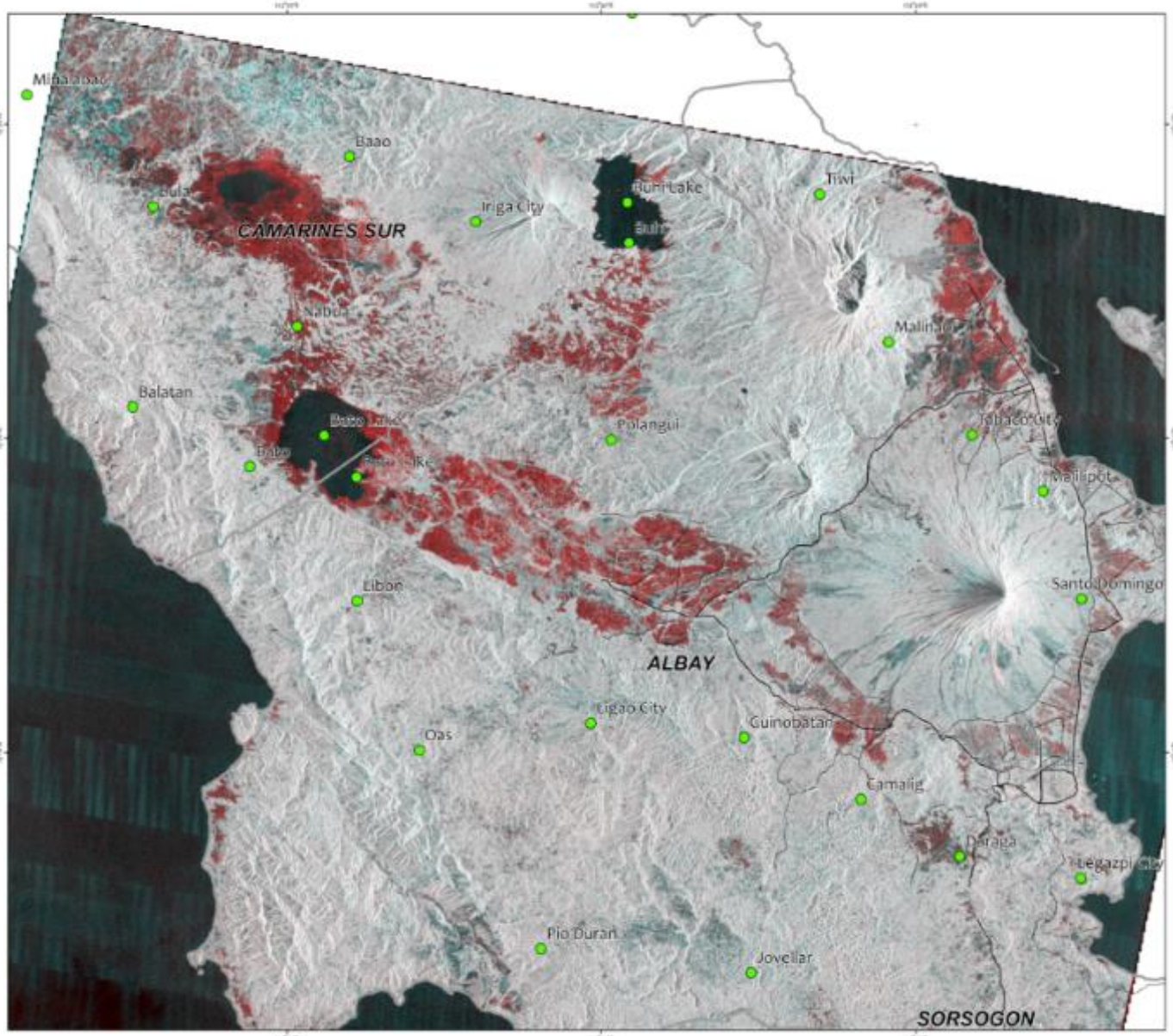
1. **SEAPORTS**
   a. All trips of sea vessels in San Carlos Port, San Carlos City, and Negros Occidental were cancelled on 18 January 2017 and resumed on 19 January 2017.
   b. Trips of less than 250 gross tonnage sea crafts from Bredco Port, Bacolod City, Negros Occidental were cancelled. Resumed on 19 January 2017.
2. **AIRPORTS (TAB H)**
   a. **Eighteen (18) domestic flights were cancelled** on 16, 18, 19, 20, 21, and 22, and 23 January 2017 due to the bad weather.

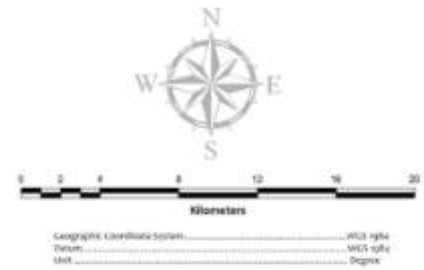
J. Declaration of State of Calamity

1. **Thirteen (13) municipalities** in the Provinces of Lanao del Sur, Maguindanao, Davao Oriental, Agusan del Sur, and Agusan del Norte were declared under the State of Calamity:

2016 Sentinel Asia success story in the

FLOODING DUE TO TYPHOON NINA
IN THE PROVINCES OF CAMARINES SUR AND ALBAY





Legend

- Detected Flooded Areas
- Provincial Boundaries
- Municipalities
- Main Roads
- Secondary Roads

Pre-Disaster Image
Satellite/ Sensor: ALOS-2/ PALSAR-2
Date: 26 May 2016

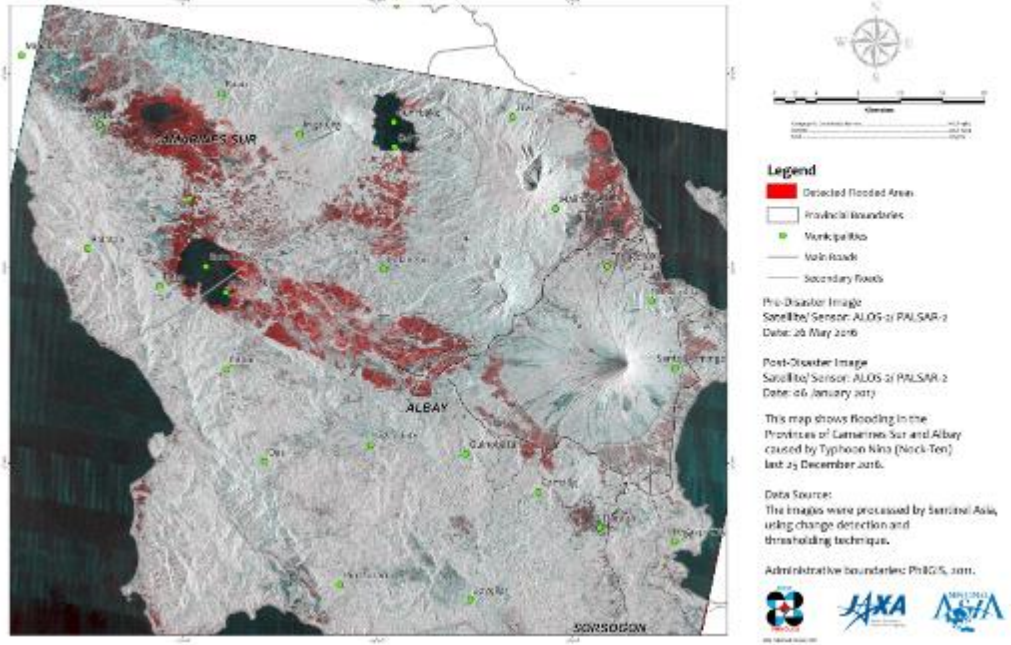
Post-Disaster Image
Satellite/ Sensor: ALOS-2/ PALSAR-2
Date: 06 January 2017

This map shows flooding in the Provinces of Camarines Sur and Albay caused by Typhoon Nina (Nock-Ten) last 25 December 2016.

Data Source:
The images were processed by Sentinel Asia, using change detection and thresholding technique.

Administrative boundaries: PhilGIS, 2011.

FLOODING DUE TO TYPHOON NINA
IN THE PROVINCES OF CAMARINES SUR AND ALBAY



Legend
Detected Flooded Areas
Provincial Boundaries
Municipalities
Main Roads
Secondary Roads

Pre-Disaster Image
Satellite/ Sensor: ALOS-2/ PALSAR-2
Date: 26 May 2016

Post-Disaster Image
Satellite/ Sensor: ALOS-2/ PALSAR-2
Date: 06 January 2017

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Data Source:
The images were processed by Sentinel Asia, using change detection and thresholding techniques.

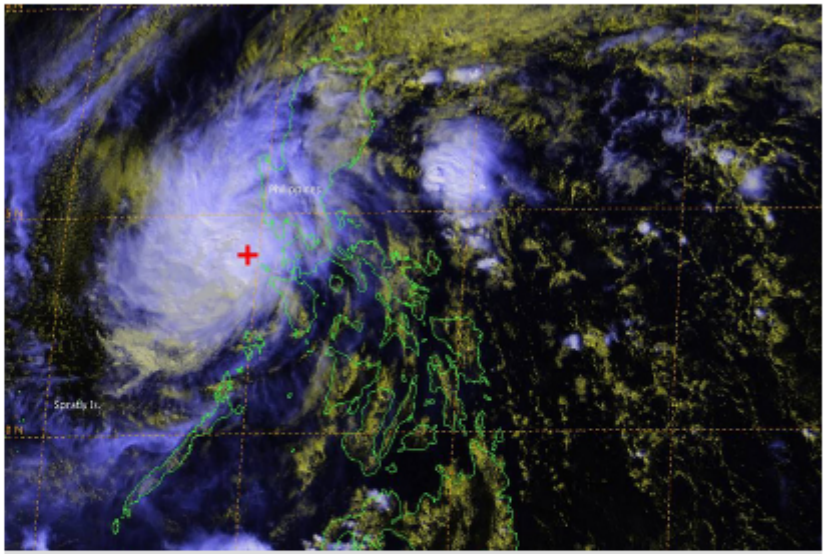
Administrative boundaries: PhilGIS.org.

:om/headlines/2016/12/26/1656921/typhoon-nina-weakens-leaves-4-dead

Typhoon Nina weakens, leaves 4 dead

(philstar.com) | Updated December 26, 2016 - 5:27pm

Tweet 4 Share 8 googleplus 2 Email 0 Like 236



Satellite image from the US Navy's Joint Typhoon Warning Center shows Typhoon Nina (international name Nock-Ten) barreling across the Philippines at 5 p.m. on Monday, Dec. 26, 2016. **JTWC**

MANILA, Philippines **(5th update; First published 7:45 a.m.)** — State weather bureau PAGASA lifted cyclone warning signals from most areas previously alerted over the onslaught of Typhoon Nina, which roared over Bicol region and spoiled Christmas Day.

Track of Typhoon "NINA" {NOCK-TEN}

Philippine Atmospheric Geophysical and Astronomical Services Administration

ADDITIONAL:
STATUS AND UPDATE ON
REQUEST FOR IMAGERIES FOR SURIGAO DEL NORTE EARTHQUAKE

IMAGE REQUEST FOR SURIGAO DEL NORTE EARTHQUAKE

Emergency Obs. Request Information

Emergency Obs. ID:	ERPHDC000002		
Disaster Type:	Earthquake	**Country:**	Philippines
Occurrence Date (UTC):	Date 10/Feb/2017 Time 22:00	**GLIDE Number:**	EQ-2017-000016-PHL
ADRC URL:			

Escalation to the Charter, Space and Major Disasters

☑ **Request to escalate this EO to the Charter**

Disaster Situation

At 10:03 PM on 10 February 2017, Friday, a strong earthquake of magnitude 6.7 shook the island of Mindanao. The epicenter is located 16 km offshore northwest of Surigao City, Surigao Strait at a depth of 10 km. The earthquake was generated by the movement of Surigao segment of the Philippine Fault. Small-magnitude earthquakes followed afterwards, and as of 4:00 PM of 11 February 2017, 101 aftershocks have been recorded by the PHIVOLCS seismic monitoring network.

Satellite Images(Before Disaster)

Satellite Images(After Disaster)

Product

IMAGE REQUEST STATUS

Emergency Obs. Request Information

Emergency Obs. ID:	ERPHDC000002		
Disaster Type:	Earthquake	**Country:**	Philippines
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ADRC URL:			

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Satellite Images(Before Disaster)

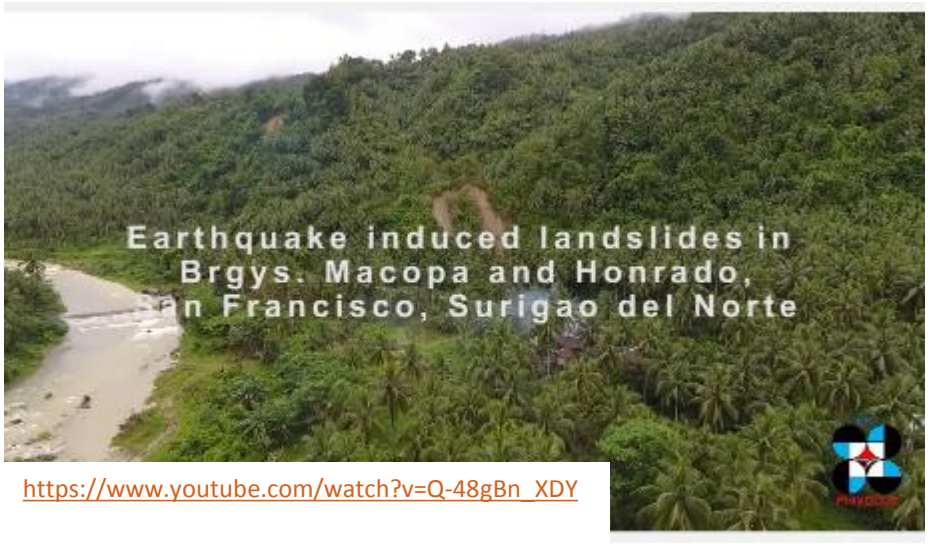
Satellite Images(After Disaster)

Product

POSTER AND VIDEO OF THE 10 FEBRUARY 2017 MAGNITUDE 6.7 EARTHQUAKE AT SURIGAO DEL NORTE

Friday, 24 February 2017 07:59

Drone survey of the effects of the SDN Earthquake



https://www.youtube.com/watch?v=Q-48gBn_XDY

Impacts of the 10 February 2017 M6 7 Surigao Earthquake

PHIVOLCS DOST

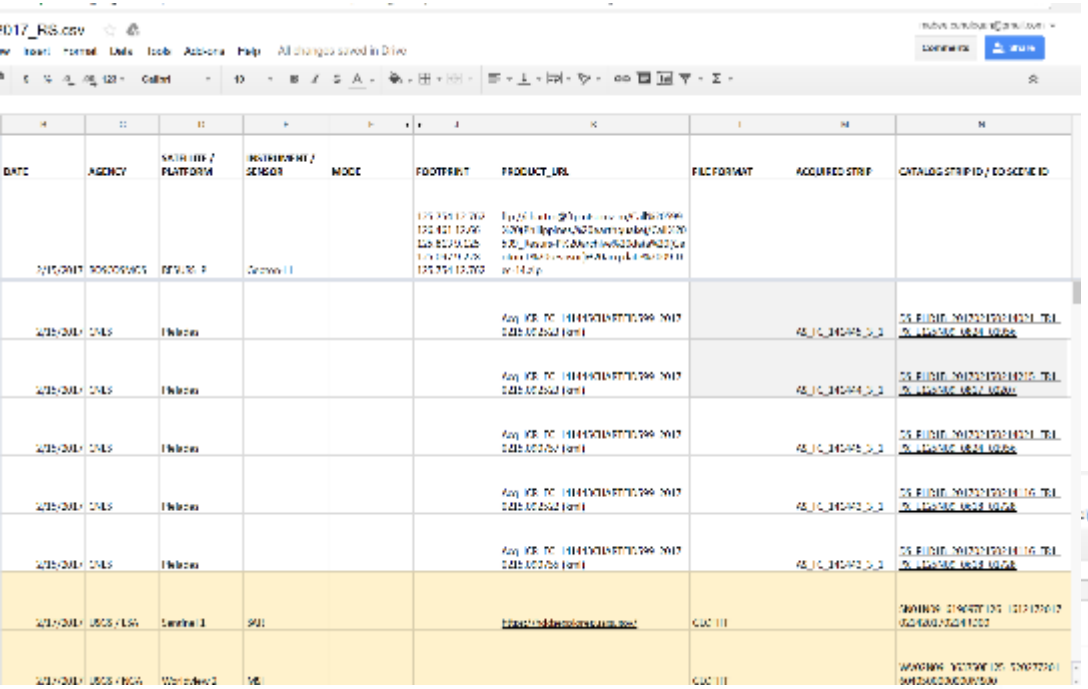
Subscribe 57

30,426 views

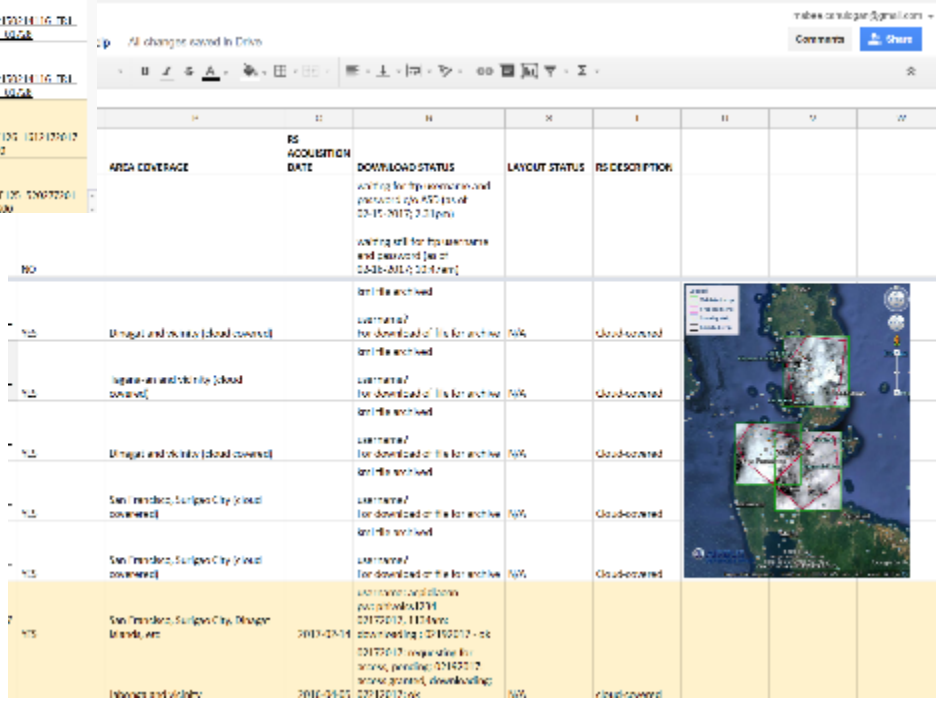
Primer about the Earthquake

Status of Request for Imageries

https://goo.gl/HS2KTk



Images derived from international charter, as well as from Sentinel Asia are deemed not useful for interpretation so far, as most are cloud-covered.



PHIVOLCS continues to look into imageries still being received from the Charter for possible interpretation of imageries.

Maraming Salamat!

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