

**WORKING GROUP  
WATER-RELATED DISASTERS & EOR ACTIVITIES**

**FLOODS & LANDSLIDES**

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Philippine Institute of Volcanology  
and Seismology

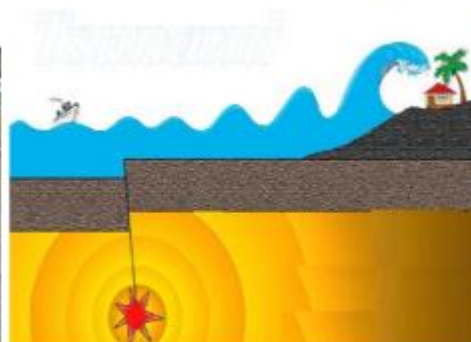
MARCH 9, 2017  
Hanoi, Vietnam

# Natural Hazards in the Philippines

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



*Earthquake*



*Tsunami*



*Volcanic eruption*



*Typhoon*



*Storm surge*



*Flood*



*Landslide*



# 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

Comparison of number EOR in top 3 countries (2007-2016)

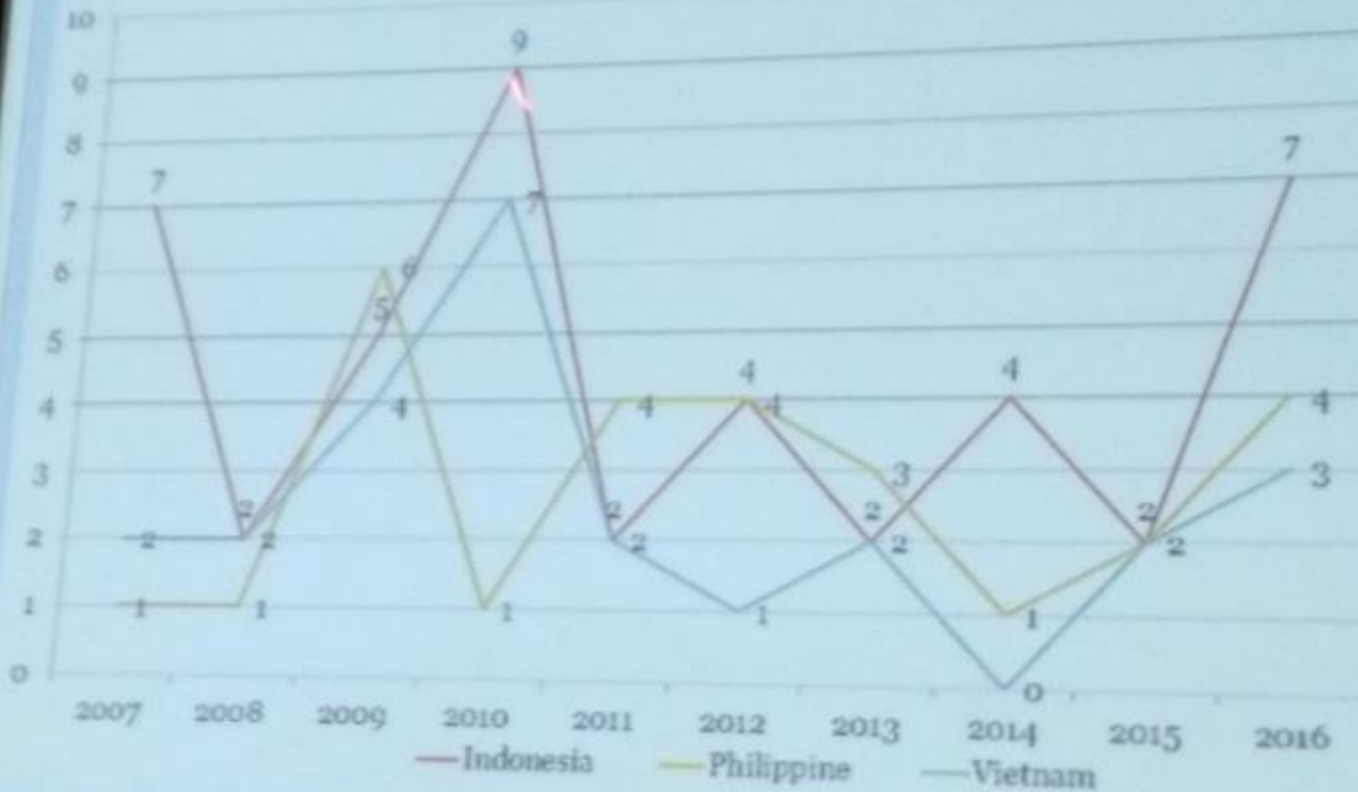








Figure From ADPC

### Emergency Obs. Request List



Country:  Disaster Type:

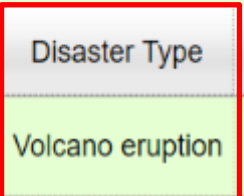
| Emergency Obs. ID | Occurrence Date | Country     | Disaster Type | Product   | WEB-GIS   | Detail               | Disaster Inf.        | Status |
|-------------------|-----------------|-------------|---------------|---|---|----------------------|----------------------|--------|
| ERPHDC000002      | 10/Feb/2017     | Philippines | Earthquake    |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERSECR000166      | 15/Oct/2013     | Philippines | Earthquake    |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERPHMO000005      | 06/Feb/2012     | Philippines | Earthquake    |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |



### Emergency Obs. Request List



















Country:  Disaster Type:

| Emergency Obs. ID | Occurrence Date | Country     | Disaster Type    | Product   | WEB-GIS   | Detail               | Disaster Inf.        | Status |
|-------------------|-----------------|-------------|------------------|---|---|----------------------|----------------------|--------|
| ERPHVS000005      | 25/Dec/2009     | Philippines | Volcano eruption |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |





Emergency Obs. Request List

Country: Philippines Disaster Type: Typhoon Search

| Emergency Obs. ID | Occurrence Date | Country     | Disaster Type | Product   | WEB-GIS   | Detail               | Disaster Inf.        | Status |
|-------------------|-----------------|-------------|---------------|---|---|----------------------|----------------------|--------|
| ERPHAG000006      | 20/Oct/2016     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERADRC000041      | 14/Dec/2015     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERADRC000038      | 18/Oct/2015     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERADRC000022      | 06/Dec/2014     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERSECR000174      | 08/Nov/2013     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERSECR000151      | 27/Dec/2012     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERSECR000149      | 04/Dec/2012     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERPHVS000002      | 08/Aug/2009     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Finish |
| ERPHVS000001      | 21/Jun/2008     | Philippines | Typhoon       |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Finish |

Emergency Obs. Request List

Country: Philippines Disaster Type: Tropical cyclone Search

| Emergency Obs. ID | Occurrence Date | Country     | Disaster Type    | Product   | WEB-GIS   | Detail               | Disaster Inf.        | Status |
|-------------------|-----------------|-------------|------------------|---|---|----------------------|----------------------|--------|
| ERPHVS000017      | 14/Sep/2016     | Philippines | Tropical cyclone |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Active |



October 20, 2016  
(Typhoon)

**Emergency Obs. Request Information**

Emergency Obs. ID: FRPH05000107  
 Disaster Type: Tropical cyclone Country: Philippines  
 Occurrence Date (UTC): 2016/10/20 Time: 00:00 GLIDE Number: 2016/20010  
 ADRG URL: [https://www.astris.gov.ph/adr/obs\\_request.php?obs\\_request\\_id=201610200107](https://www.astris.gov.ph/adr/obs_request.php?obs_request_id=201610200107)

**Escalation to the Charter, Space and Major Disasters**

Request to escalate this EO to the Charter

**Disaster Situation**

Typhoon HANU (locally named LAW) landed in the Province of Cebu and in the part of the Philippines on October 20 and affected 7 people.

**Products (RGS) (png)**

ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15

**Products (RGS) (pdf)**

ALOS-2 PALSAR-2 2016/10/15 16:15

**Products (RGS) (tif)**

ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15

**Emergency Obs. Request Information**

Emergency Obs. ID: FRPH05000107  
 Disaster Type: Tropical Country: Philippines  
 Occurrence Date (UTC): 2016/10/20 Time: 00:00 GLIDE Number: 2016/20010  
 ADRG URL: [https://www.astris.gov.ph/adr/obs\\_request.php?obs\\_request\\_id=201610200107](https://www.astris.gov.ph/adr/obs_request.php?obs_request_id=201610200107)

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**Products (RGS) (png)**

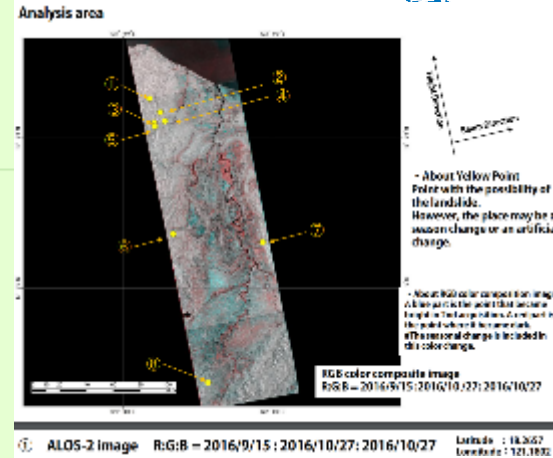
ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15

**Products (RGS) (pdf)**

ALOS-2 PALSAR-2 2016/10/15 16:15

**Products (RGS) (tif)**

ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15  
 ALOS-2 PALSAR-2 2016/10/15 16:15



**Emergency Obs. Request Information**

Emergency Obs. ID: FRPH05000107  
 Disaster Type: Tropical cyclone Country: Philippines  
 Occurrence Date (UTC): 2016/09/14 Time: 00:00 GLIDE Number: 2016/09010  
 ADRG URL: [https://www.astris.gov.ph/adr/obs\\_request.php?obs\\_request\\_id=201609140107](https://www.astris.gov.ph/adr/obs_request.php?obs_request_id=201609140107)

**Escalation to the Charter, Space and Major Disasters**

Request to escalate this EO to the Charter

**Disaster Situation**

Very strong wind due to typhoon FORTK (locally named LINDA) hit these islands and trying to assess the extent of damages.

**Ramoths Images(Before Disaster)**

**ALOS-2(png)**

ALOS-2 PALSAR-2 2016/09/14 03:49  
 ALOS-2 PALSAR-2 2016/09/14 03:49  
 ALOS-2 PALSAR-2 2016/09/14 03:49

**Ramoths Images(After Disaster)**

**ALOS-2(png)**

ALOS-2 PALSAR-2 2016/09/14 03:49  
 ALOS-2 PALSAR-2 2016/09/14 03:49  
 ALOS-2 PALSAR-2 2016/09/14 03:49

September 14, 2016  
(Tropical Cyclone)



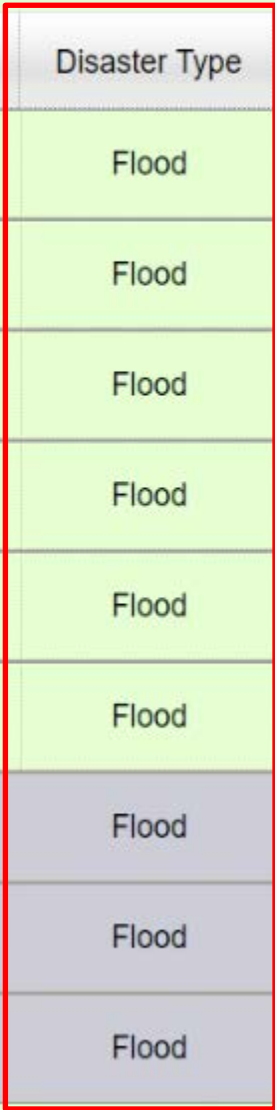
### Emergency Obs. Request List

Country:

Disaster Type:

**Search**

| Emergency Obs. ID | Occurrence Date | Country     | Disaster Type | Product   | WEB-GIS   | Detail               | Disaster Inf.        | Status |
|-------------------|-----------------|-------------|---------------|---|---|----------------------|----------------------|--------|
| ERPHAG000008      | 16/Jan/2017     | Philippines | Flood         |    |    | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERSECR000163      | 19/Aug/2013     | Philippines | Flood         |    |    | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERPHMO000006      | 07/Aug/2012     | Philippines | Flood         |    |    | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERPHMO000004      | 17/Dec/2011     | Philippines | Flood         |    |    | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERPHMO000002      | 27/Sep/2011     | Philippines | Flood         |    |    | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERPHVS000009      | 03/Feb/2011     | Philippines | Flood         |   |   | <a href="#">link</a> | <a href="#">ADRC</a> | Active |
| ERPHVS000004      | 04/Oct/2009     | Philippines | Flood         |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Finish |
| ERPHVS000003      | 26/Sep/2009     | Philippines | Flood         |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | Finish |
| ERPHMG000001      | 22/Jan/2009     | Philippines | Flood         |  |  | <a href="#">link</a> | <a href="#">ADRC</a> | 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

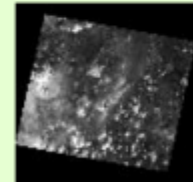
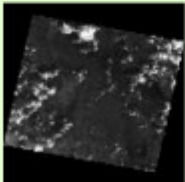
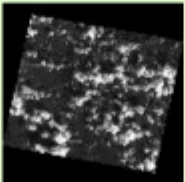
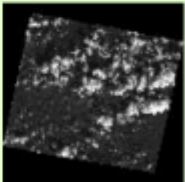
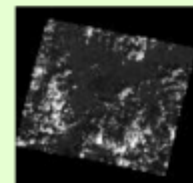
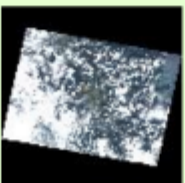
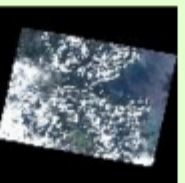
PAGASA has 4 "AOI" as follow

- 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...<br>24/Jan/2017 16:00  | ALOS-2 PALSAR-2...<br>24/Jan/2017 16:00   | ALOS-2 PALSAR-2...<br>24/Jan/2017 16:00   | ALOS-2 PALSAR-2...<br>24/Jan/2017 16:00  | ALOS-2 PALSAR-2...<br>24/Jan/2017 16:00   |

### THEOS(Jpeg)

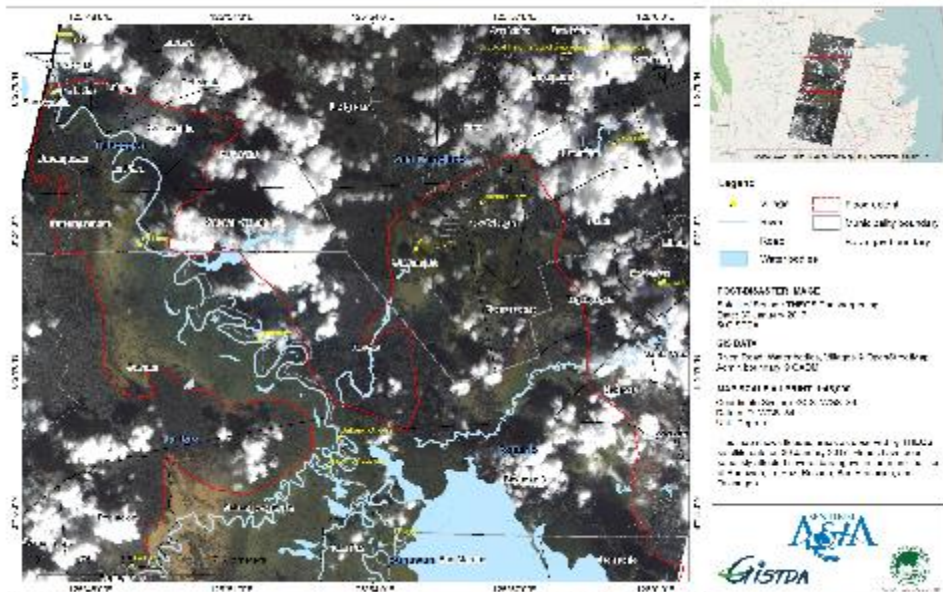
|  |   |   |   |
|--|---|---|---|
|   |   |   |  |
| THEOS PAN SCENE...<br>30/Jan/2017 01:52  | THEOS PAN SCENE...<br>30/Jan/2017 01:52   | THEOS PAN SCENE...<br>30/Jan/2017 01:52   | THEOS PAN SCENE...<br>30/Jan/2017 01:52   |
|  |  |  |   |

Images received from DPN

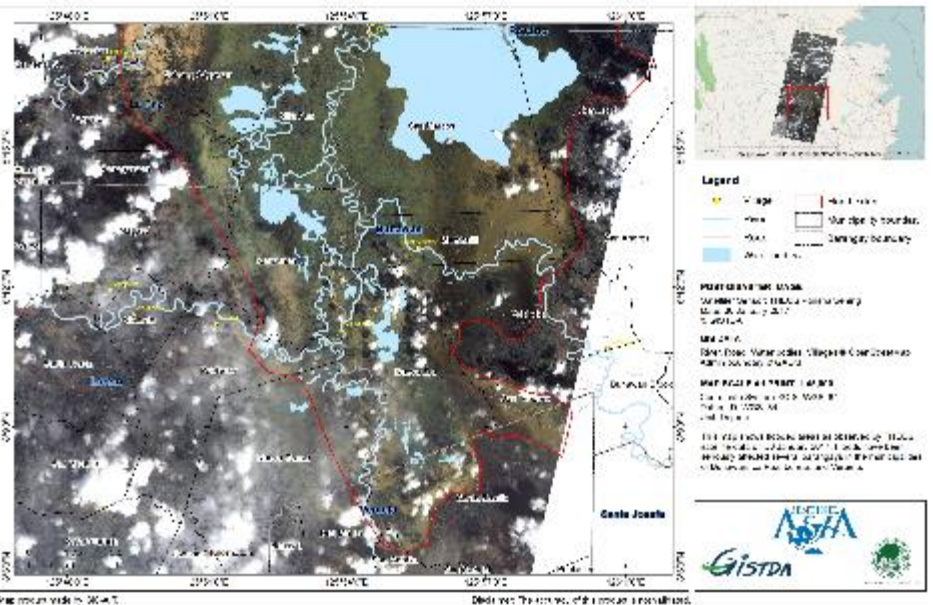
FLOODING IN MUNICIPALITY OF BUNAWAN, AGUSAN DEL SUR PROVINCE IN THE PHILIPPINES



FLOODING IN AGUSAN DEL SUR PROVINCE IN THE PHILIPPINES



FLOODING IN AGUSAN DEL SUR PROVINCE IN THE PHILIPPINES




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

**NDRRM UPDATE**

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

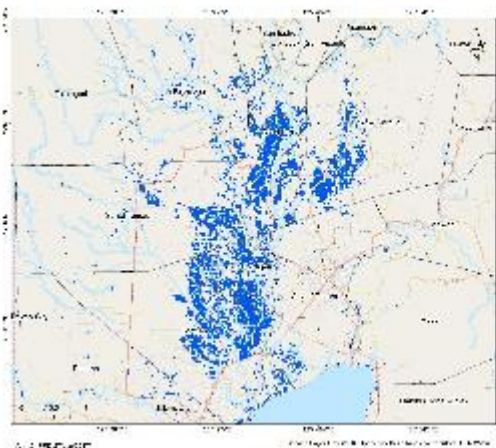
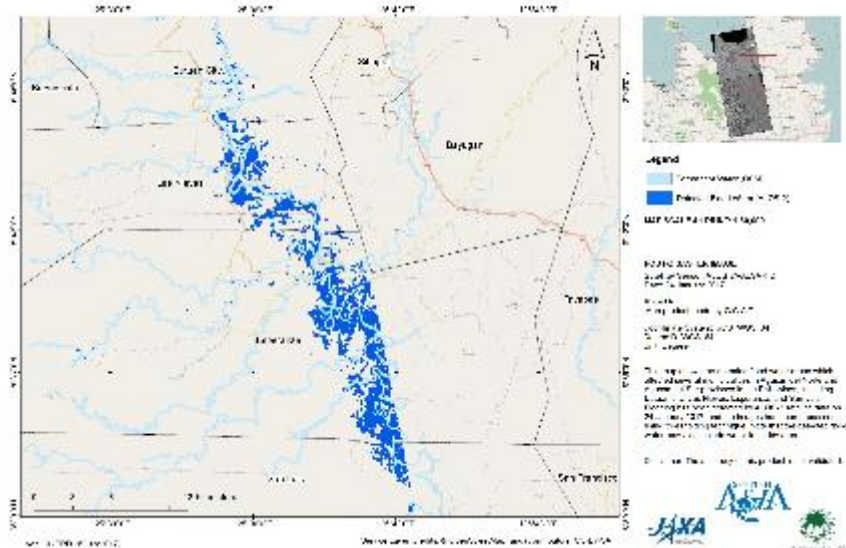
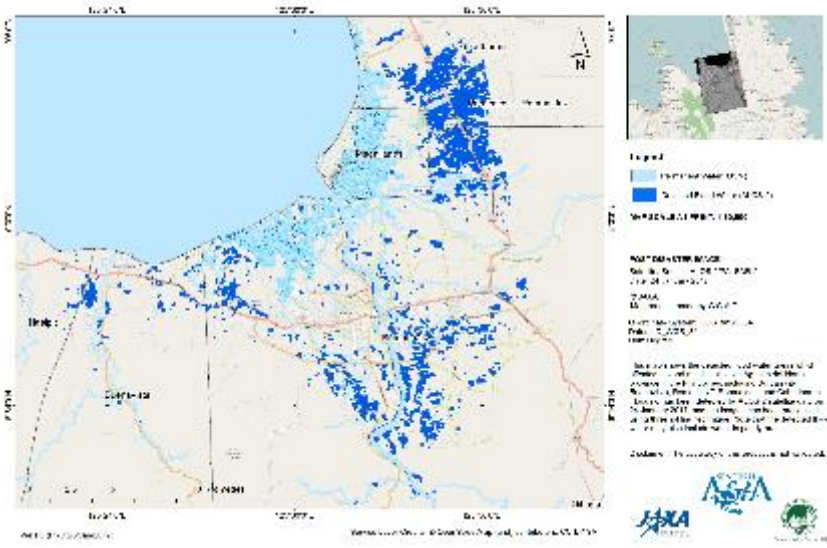
Releasing Officer:  
  
**USEC. RICARDO B. JALAD**  
 Executive Director, NDRRM and Administrator, OCD

**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>



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.

**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 Capital 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 to 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.

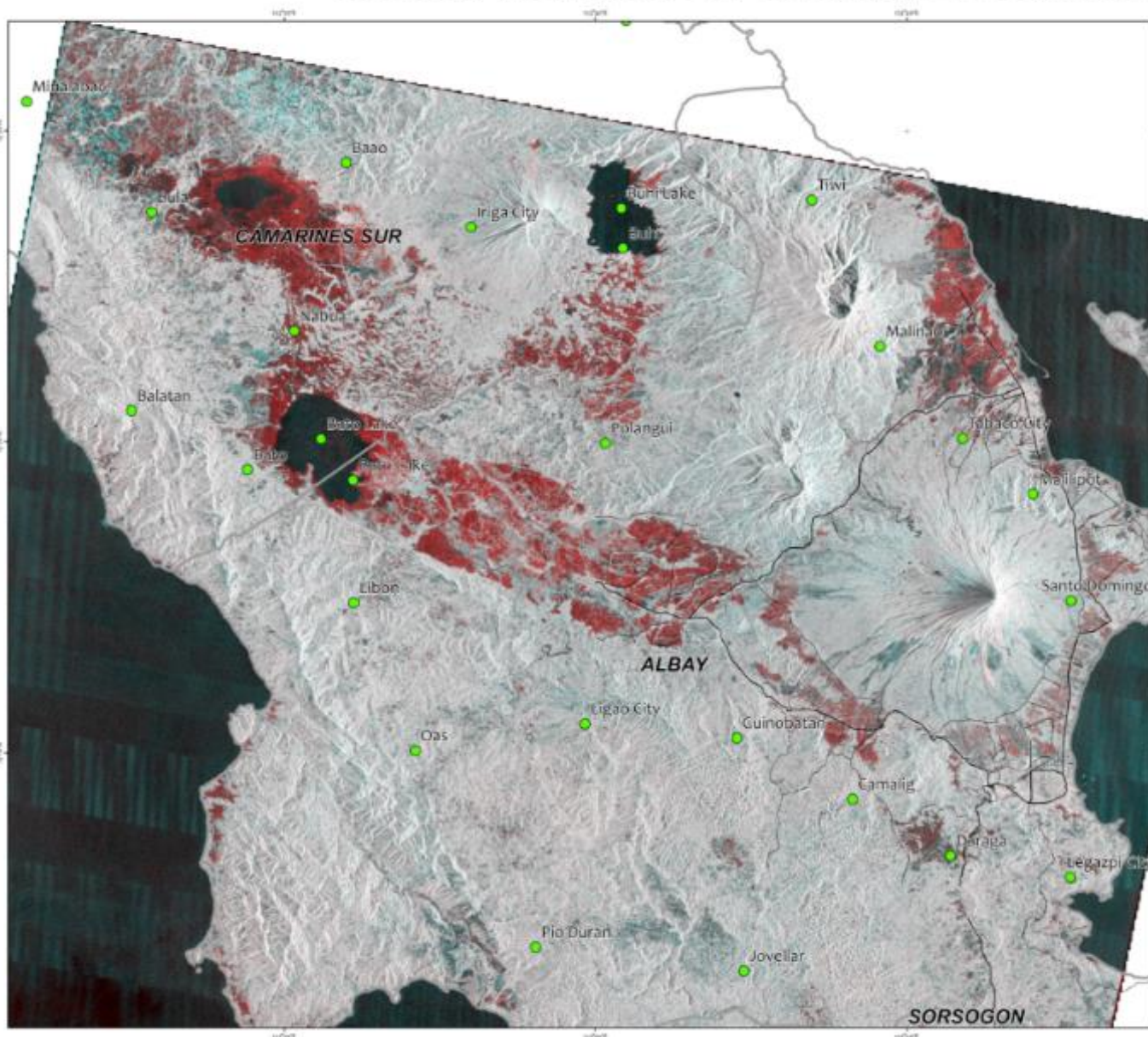
**I. Status of Ports**

- 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.

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



Geographic Coordinate System: WGS 1984  
Datum: NAD 83  
Unit: Degree

## 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

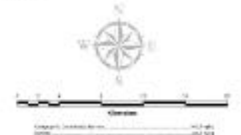
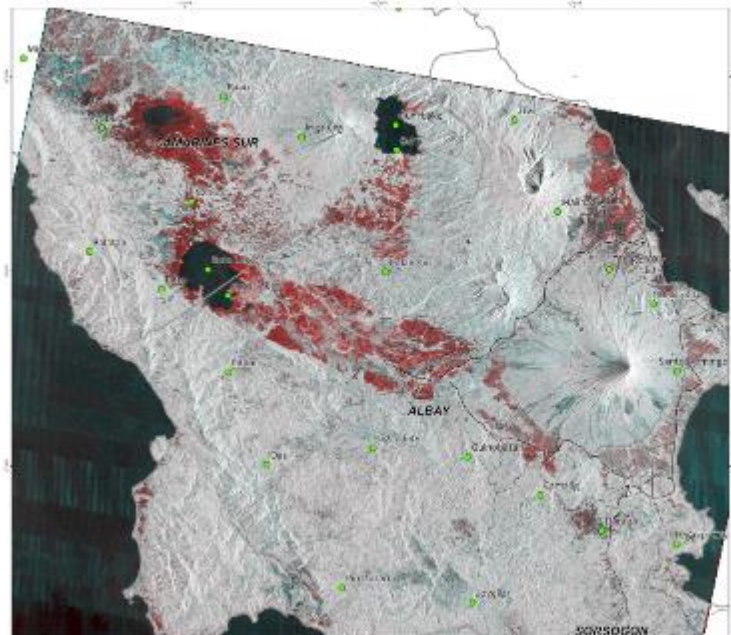
This map shows flooding in the Provinces of Camarines Sur and Albay caused by Typhoon Nina (Nock-Ten) last 25 December 2016.

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 Area  
 □ Provincial boundaries  
 ● Main Road  
 — 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

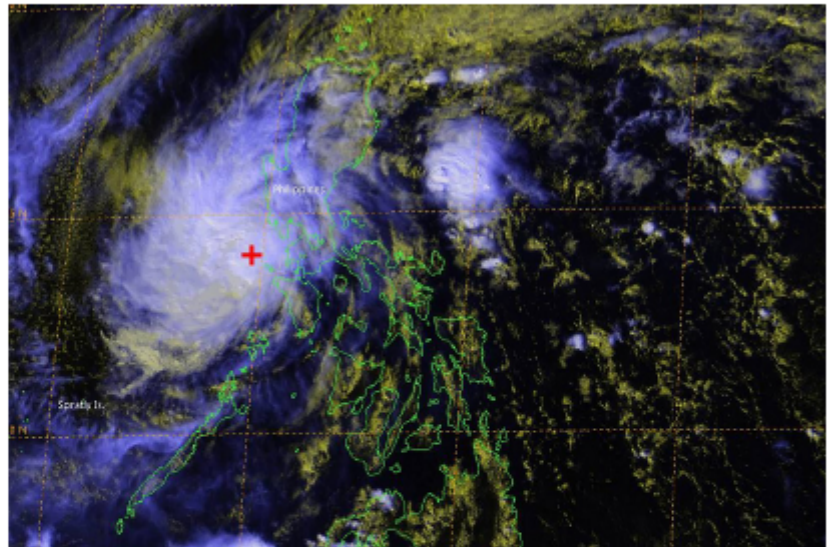
This map shows flooding in the Provinces of Camarines Sur and Albay caused by Typhoon Nina (Nock-Ten) last 25 December 2016.

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

Administrative boundaries: PhGIS, Inc.

Typhoon Nina weakens, leaves 4 dead  
 (philstar.com) | Updated December 26, 2016 - 5:27pm

Twitter 4 | Share 8 | googleplus 2 | Email 0 | Like 238



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

Track of Typhoon "NINA" {NOCK-TEN}



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.



Typhoon Nina: President Rodrigo Duterte...  
 Duterte: 'Nina' was a 'bored' head brought by heavy rain and...  
 Duterte: 'Nina' was a 'bored' head brought by heavy rain and...  
 Duterte: 'Nina' was a 'bored' head brought by heavy rain and...

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                  | Country:      | Philippines        |
| Disaster Type:         | Earthquake                    | GLIDE Number: | EQ-2017-000016-PHL |
| Occurrence Date (UTC): | Date: 10/Feb/2017 Time: 22:00 |               |                    |
| 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

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

## 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

10 FEBRUARY 2017 MAGNITUDE 6.7 SURIGAO DEL NORTE EARTHQUAKE

On 10 February 2017 at 10:00 PM Philippine Standard Time (PST), a magnitude (M<sub>w</sub>) 6.7 earthquake struck the Province of Surigao del Norte in northeastern Mindanao. Using the data from the Philippine Seismic Network (PSN) of the Philippine Institute of Volcanology and Seismology - Department of Science and Technology (PHIVOLCS-DOST), the epicenter was located in Surigao Strait at 9.80P° N and 125.26° E or 16 km offshore northwest of Surigao City at a shallow depth of 10 km. The earthquake was generated by the movement of the Philippine Fault - Surigao segment. The ground shaking was felt in PHIVOLCS Earthquake Intensity Scale (PEIS) VII in Surigao City and San Francisco. The rest of the municipalities in Surigao del Norte experienced PEIS VI to IV. Small magnitude earthquakes followed afterwards. As of 22 February 2017 8:00 AM, 230 aftershocks were recorded by the PSN, 106 of which were shallow and 26 were reportedly felt. The largest aftershock was recorded on 14 February 2017 at 4:03 AM with a magnitude of M<sub>w</sub> 3.0 and was felt in Surigao City at PEIS V.

This earthquake generated a 4.3 km surface-rupture that was mapped in Brgys. Ipi in Surigao City and Brgys. Polonara, Honrado and Macopa in the Municipality of San Francisco, Surigao del Norte. These barangays were estimated to experience strong ground shaking at PEIS-VIII.

Liquefaction and earthquake-induced landslides were encountered as well as the collapsed Anderson Bridge, damages to buildings, ports, roads, other bridges.



| Intensity (PEIS) | Location          | Damage/Remarks  |
|------------------|-------------------|---|
| VIII             | Surigao del Norte | Strong to violent ground shaking was felt in Surigao City and San Francisco. Damages to buildings, ports, roads, other bridges. |
| VII              | Surigao del Norte | Violent ground shaking was felt in Surigao City and San Francisco.  |
| VI               | Surigao del Norte | Strong ground shaking was felt in Surigao City and San Francisco.   |
| V                | Surigao del Norte | Ground shaking was felt in Surigao City and San Francisco.  |
| IV               | Surigao del Norte | Light to moderate ground shaking was felt in Surigao City and San Francisco.  |
| III              | Surigao del Norte | Weak to light ground shaking was felt in Surigao City and San Francisco.  |
| II               | Surigao del Norte | Very weak to light ground shaking was felt in Surigao City and San Francisco.   |
| I                | Surigao del Norte | Not felt.   |

SURFACE RUPTURE OF THE PHILIPPINE FAULT - SURIGAO SEGMENT



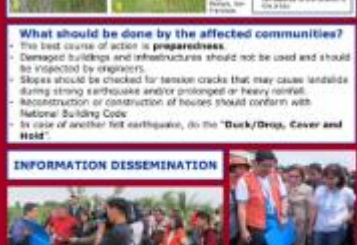
LANDSLIDE



LIQUEFACTION



GROUND SHAKING



INFORMATION DISSEMINATION



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 February 2017 PHIVOLCS QUICK RESPONSE TEAM

Drone survey of the effects of the SDN Earthquake



[https://www.youtube.com/watch?v=Q-48gBn\\_XDY](https://www.youtube.com/watch?v=Q-48gBn_XDY)

Impacts of the 10 February 2017 M6.7 Surigao Earthquake



30,426 views

PRIMER ON THE 10 FEBRUARY 2017 MAGNITUDE 6.7 EARTHQUAKE AT SURIGAO DEL NORTE  
 Saturday, 11 February 2017 12:22

**What is happening at Surigao del Norte?**  
 At 10:00 PM on 10 February 2017, Friday, a strong earthquake of magnitude 6.7 struck the island of Mindanao. The epicenter is located 16 km offshore northwest of Surigao City, Surigao del Norte. The earthquake was generated by the movement of the Surigao segment of the Philippine Fault. Small magnitude aftershocks followed afterwards, and as of 10:30 PM on 11 February 2017, 102 aftershocks have been recorded by the PHIVOLCS seismic monitoring network.



Based on preliminary Ministry reports, the strongest ground shaking was felt at PHIVOLCS Earthquake Intensity Scale (PEIS) VII (Detached) in Surigao City. Furthermore, the municipalities of Ipi (in Surigao City) and Honrado and Macopa in Surigao del Norte experienced the ground shaking at PEIS VI to III in the municipalities of Ipi, Honrado and Macopa in Surigao del Norte. Large and San Juan in Davao del Norte, San Roque, Zamboanga and San Francisco in Southern Leyte and Narayan City fell the shaking at PEIS V (Strong). This is due to the low ARI (PEIS) for 10 km radius (300 km away) (Basilan City, Ormoc City, Tacloban City, Cebu City, Cagayan City, Surigao City, Zamboanga City and Tagbilaran City) from the epicentral area. The strong ground shaking near the epicentral area

Primer about the Earthquake



# Maraming Salamat!

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