

9th NARBO IWRM Training
Tagaytay City
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Response and Lesson Learned from Typhoon “YOLANDA” (HAIYAN)

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OUTLINE

1. Meteorological Informations
2. Impacts
3. Actions Undertaken
4. Problems and Lessons Learned



Brief Summary of Yolanda

Typhoon Yolanda was the 23rd tropical cyclone for the year 2013 and the 9th that made landfall. Yolanda was also one of the strongest and the most disastrous tropical cyclone in the Philippines. It was already a typhoon with maximum sustained winds of 195 kph near the center and gustiness of 230 kph when it entered the Philippine Area of Responsibility (PAR) at midnight of November 6. It was moving west northwest at an average speed of 35 kph. Yolanda made landfall in

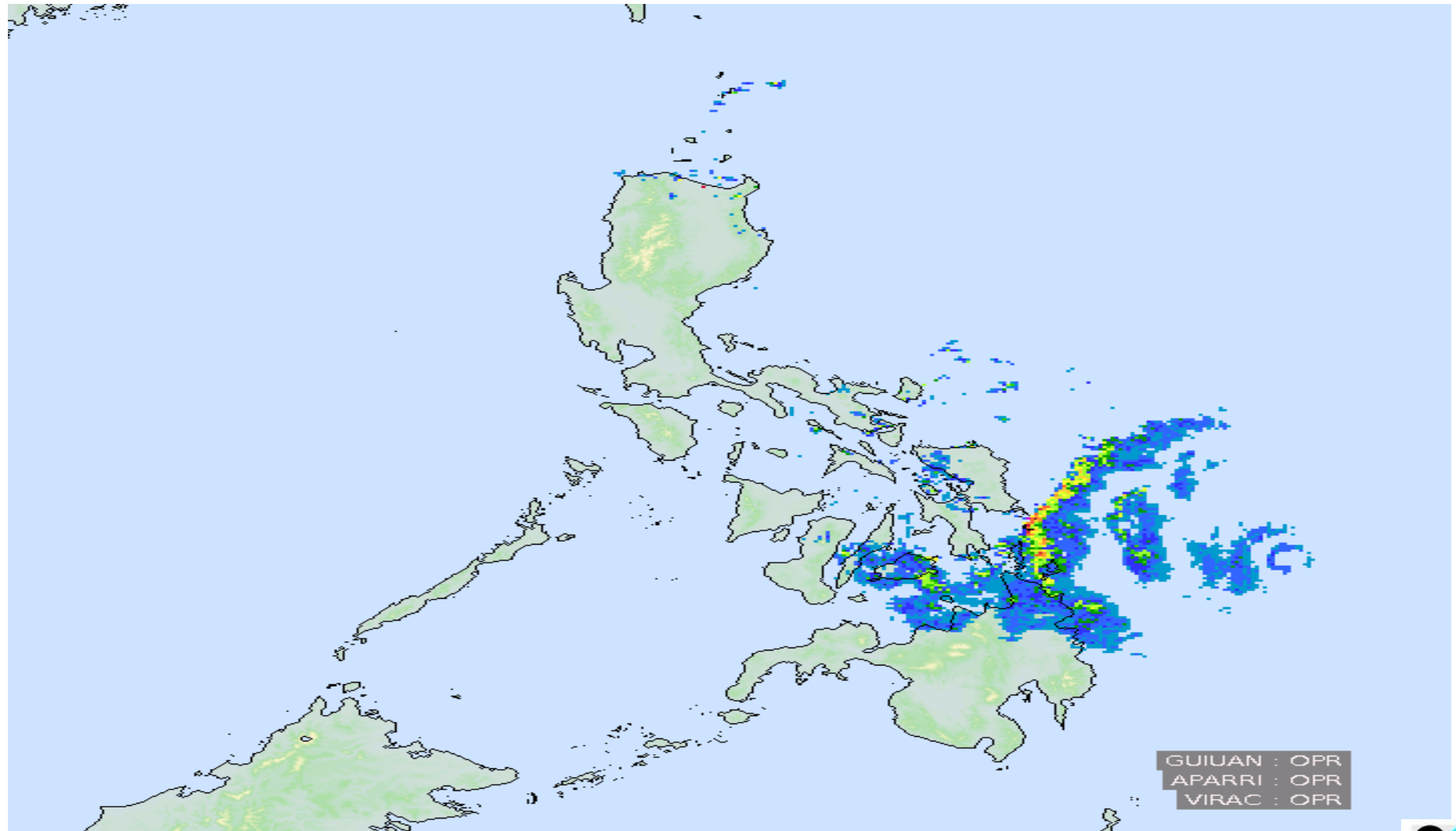


Brief Summary of Yolanda

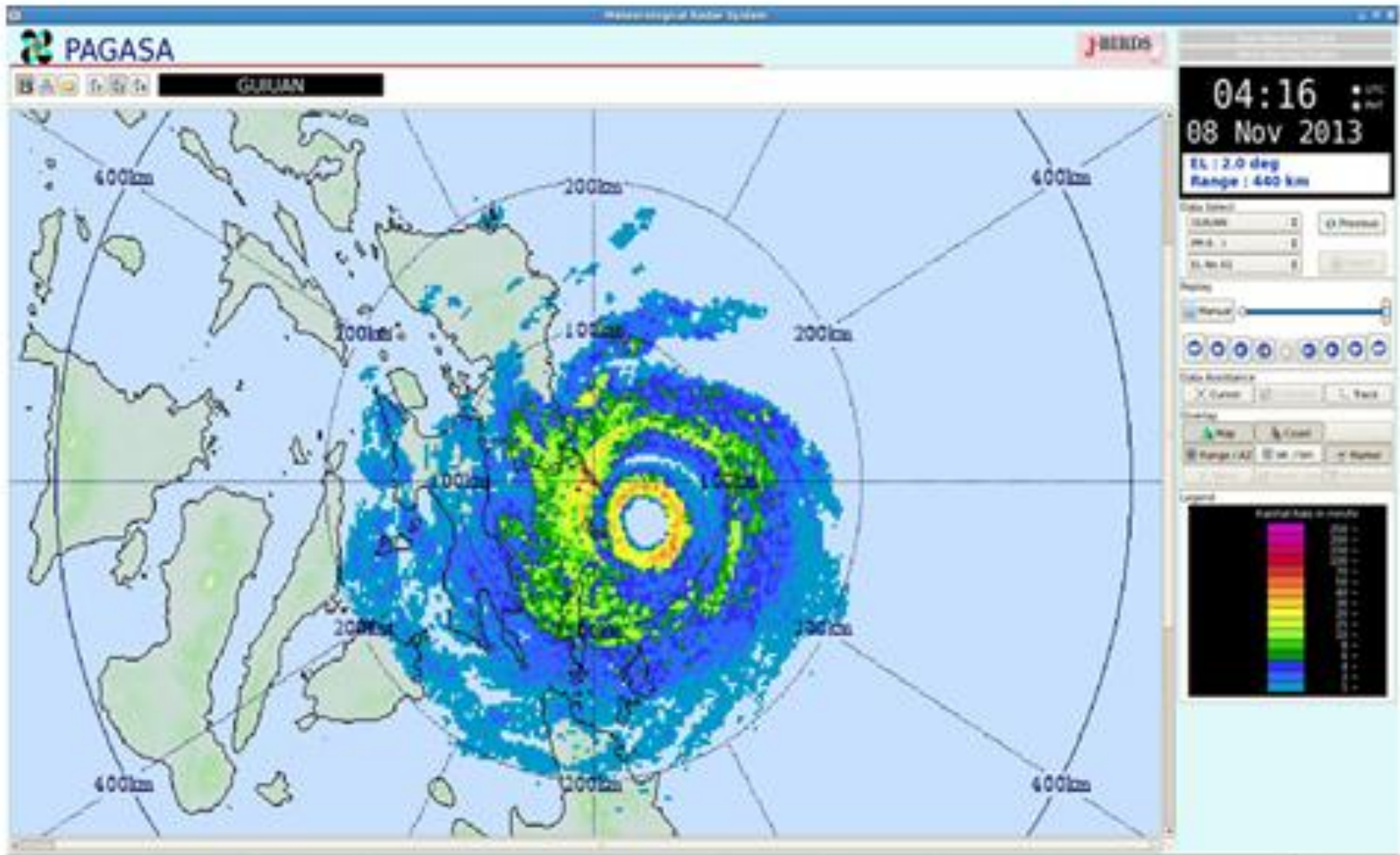
Guiuan, Eastern Samar in the early morning (4:40 Am) of November 8 with maximum sustained winds of 235 kph with gustiness of 275 kph near the center. It then crossed Northern Leyte (7:00Am), Northern Cebu (9:40 Am), Northern Panay (12:00 Nn) and Busuanga, Northern Palawan (8:00Pm). It exited PAR in the afternoon (1:40 Pm) of November 9.



Guiuan Radar Image

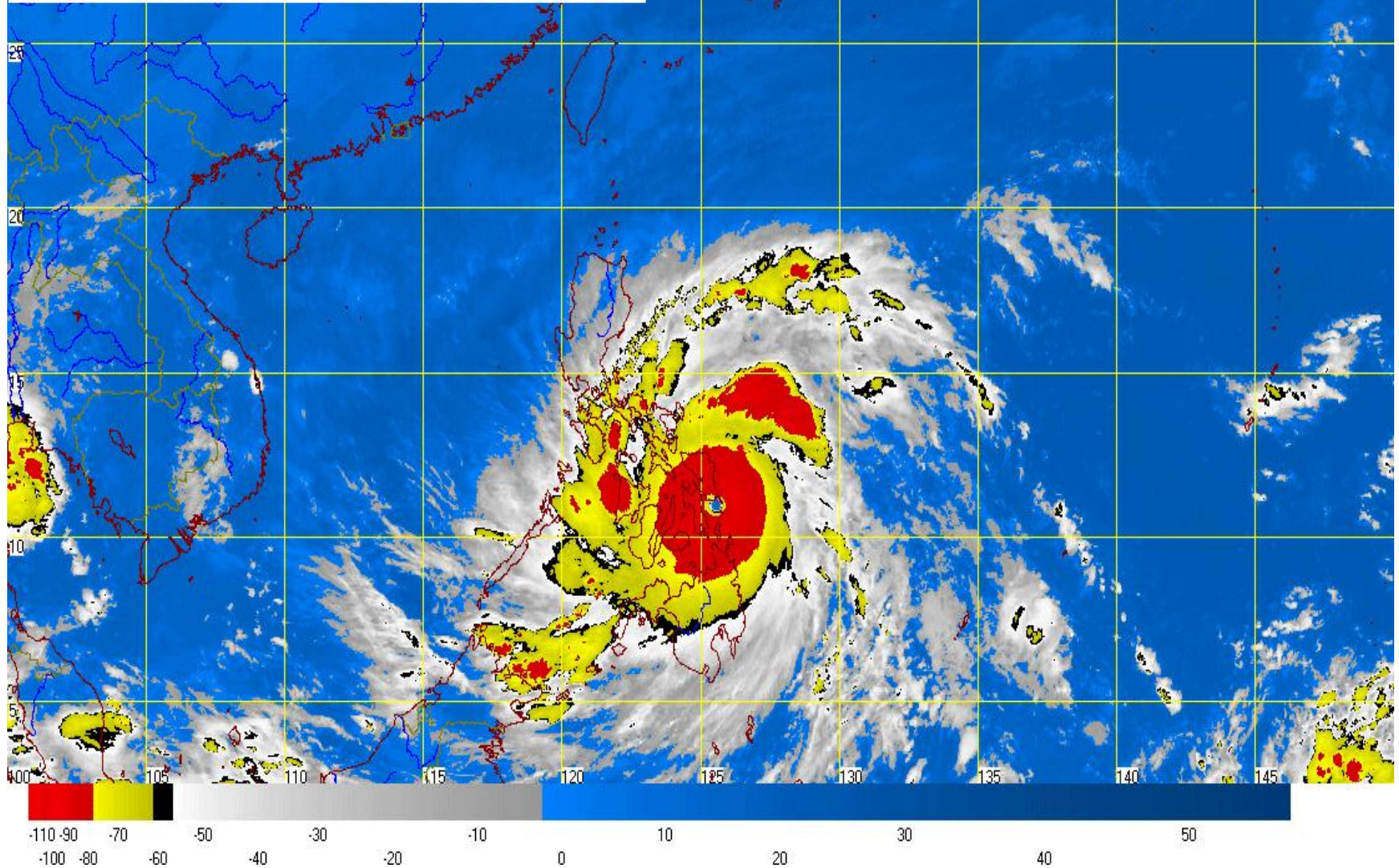


Last image of Guiuan Radar before landfall of TY Yolanda



MTSAT ANIMATION NOVEMBER 8-9, 2013

DOST PAGASA MTSAT IR1 21:30 UTC 07/11/2013

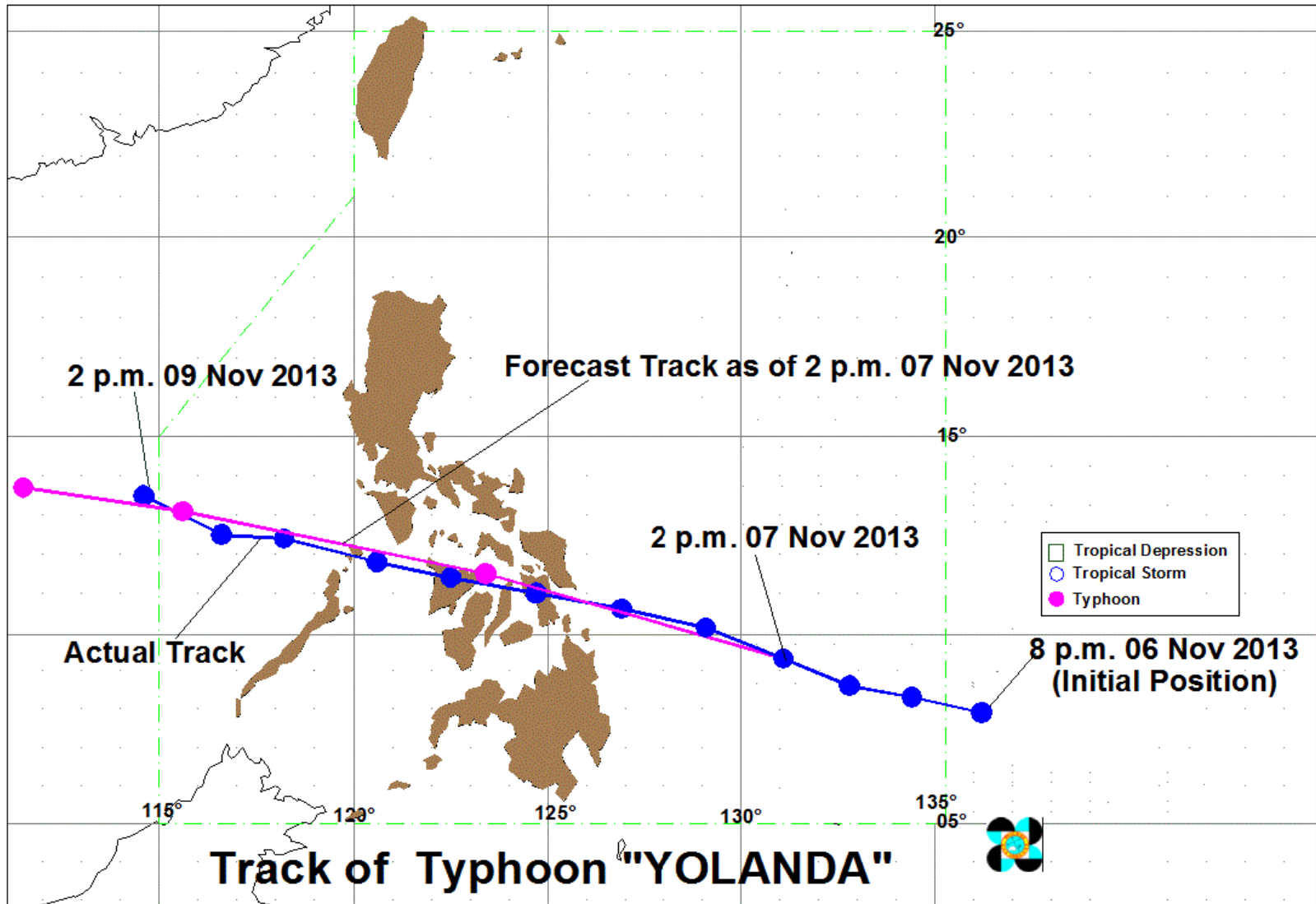


Meteorological Aspects:

- **Actual movement of Typ. Yolanda (Haiyan) was predicted accurately. Issued the following warnings:**
 - **Issued 2 Advisories (every 11 AM Nov. 5-6, 2013)**
 - **Issued initial Bulletin (Nov. 6/11Pm) even though it was still outside PAR**
 - **Issued 12 Severe Weather Bulletins**
 - **disseminated through OCD-NDRRMC**
 - **conduct press conferences, social network, including SMS, twitter and facebook**
- **Issued hourly location and intensity of the typhoon through PTV 4, PAGASA's website, twitter and facebook accounts and thru SMS.**



Forecast Track vs. Actual Track



● Actual track

● Forecast track



IMPACTS OF TYPHOON "YOLANDA" (HAIYAN)



Impacts of TY “Yolanda”(Haiyan)

Affected Population

Families	Persons	Baranggays	Municipalities	Provinces
3,434,593	16,078,181	12,139	591	44 Provinces

Casualties

Dead	Injured	Missing
6,245 identified	28,626	1,039

Damage (PhP)

TOTAL
PhP 39,821,497,852.17 (\$ 894,865,120.27)

Source: NDRRMC,
as of 06 March 2014
SitRep #106

Impacts: Damaged PAGASA Doppler Radar in Guiuan, Eastern Samar

GUIUAN



photo - credit: AFP Central Command from their Facebook page:



Impacts of Typhoon Haiyan



Impacts of Typhoon Yolanda

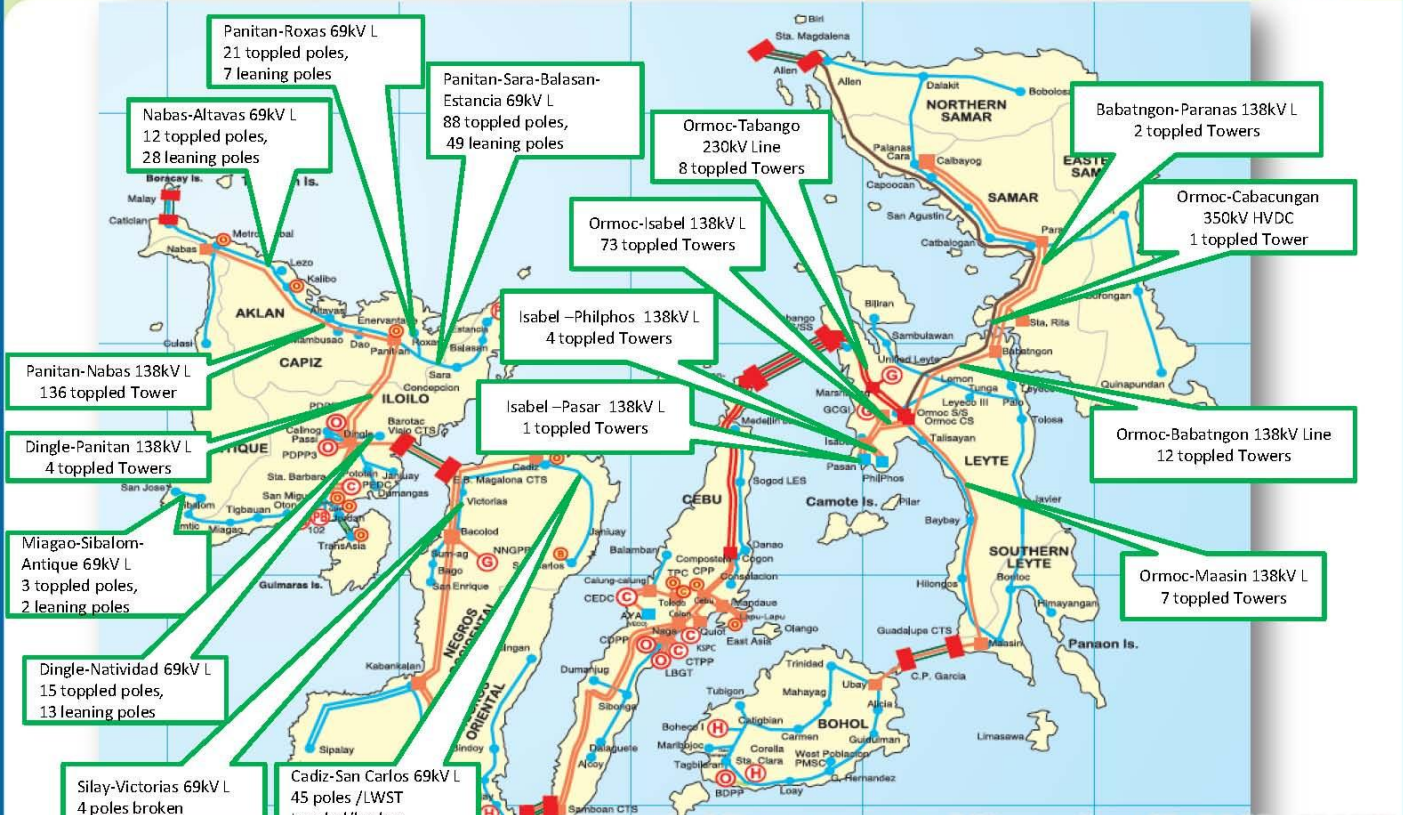


Tacloban Station



Impacts: Toppled Towers of National Grid Corporation of the PHILIPPINES

Report on Damages due to Typhoon Yolanda



Reported Damages as of November 10, 2013, 1800H

Toppled:

- 200 transmission towers
- 2000 poles

Estimated cost of damage:

- PhP5 billion (USD119 M)

Source: NGCP



Impacts of Typhoon Yolanda



Impacts of Typhoon Yolanda



Tacloban Airport



Impacts of Typhoon Yolanda



Malapascua Island, Northern Cebu



Impacts of Typhoon Yolanda



Tacloban City



Impacts of Typhoon Yolanda





BEFORE
Typhoon
Yolanda

Source: Digital Globe



AFTER
Typhoon
Yolanda

Source: Digital Globe

Several coastal barangays were
wiped out...

THE AFTERMATH

Damages incurred by
Typhoon Yolanda

THE AFTERMATH

Damages incurred by
Typhoon Yolanda



Wind, surge and wave damages
are enormous ...

THE AFTERMATH

Damages incurred by
Typhoon Yolanda

BEFORE Typhoon Yolanda



Source: Digital Globe

AFTER Typhoon Yolanda



Source: Digital Globe

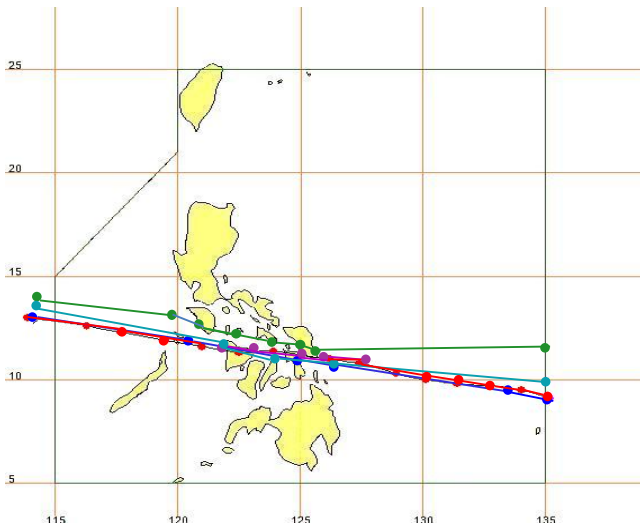
Economic activities were disrupted ,
and livelihoods were destroyed...

History of Typhoon Passages Near Tacloban, Leyte

From records dating **1897 to 2013**, many typhoons hit Visayas area, however **5** strong typhoons landed near Tacloban with notable damages/fatalities:

Date of Typhoon Occurrence	Fatalities	Station Pressure
12 October 1897	1,300	925.2 hPa
24 November 1912	52	924 hPa
27 October 1952	444	930 hPa
04 November 1984	1,167	925 hPa
08 November 2013	6,241 +	910 hPa

STORM SURGE
7.3 m (Hernani)
7 m (Sta. Rita)
No record
3.5 m (coastal areas of Leyte)
6-7 m (Leyte & Samar areas)



Dangerous Typhoons' Tracks

1897
1912
1952
1984
2013

Earlier events are recorded in the following documents:

- Philippine Weather Bureau Monthly Bulletins, 1901
- Hongkong Observatory, 1958, re-edited
- Shanghai Observatory, 1957, re-edited
- JMA Library, Japan

Typhoon Yolanda is just a repeat of what happened in the past except that the damage is highest because more people and infrastructure moved into harm's way.

**Actions Undertaken By PAGASA
During the Approach and Passage of
Typhoon “YOLANDA” (HAIYAN)**



- **Nov. 5 and 6 (11Am):** Issued Weather Advisories regarding the approaching Typhoon Yolanda (Haiyan)
- **Nov. 6 (11Pm):** Issued Regular Typhoon Bulletin even though it was still outside Philippine Area of Responsibility (PAR)
- **Nov. 6:** The Department of Science and Technology (DOST) as Vice-Chair of the National Disaster Risk Reduction and Management Council (NDRRMC), initiated NDRRMC members to convene and conducted press conference after the meeting, for the preparations and early evacuation in areas to be affected by TY Yolanda (Haiyan).



- **Nov. 6 - 9:** PAGASA Conducted Press Conferences and Press Briefings every 6 hours starting 5:00PM, Nov. 6
- Frequent briefing at Malacanang
- The President broadcasted in tri-media about the strong Typhoon Yolanda (Haiyan) 12 hours before landfall.



- Hourly updates on the location and intensity of the typhoon (Ptv 4, posted in the website, twitter, facebook and SMS).
- Detailed Meteorologists at the OCD(NDRRMC) Operation Center.
- Deployed a team of Storm Chasers to Sorsogon who proceeded to Samar and Leyte after the typhoon passage.



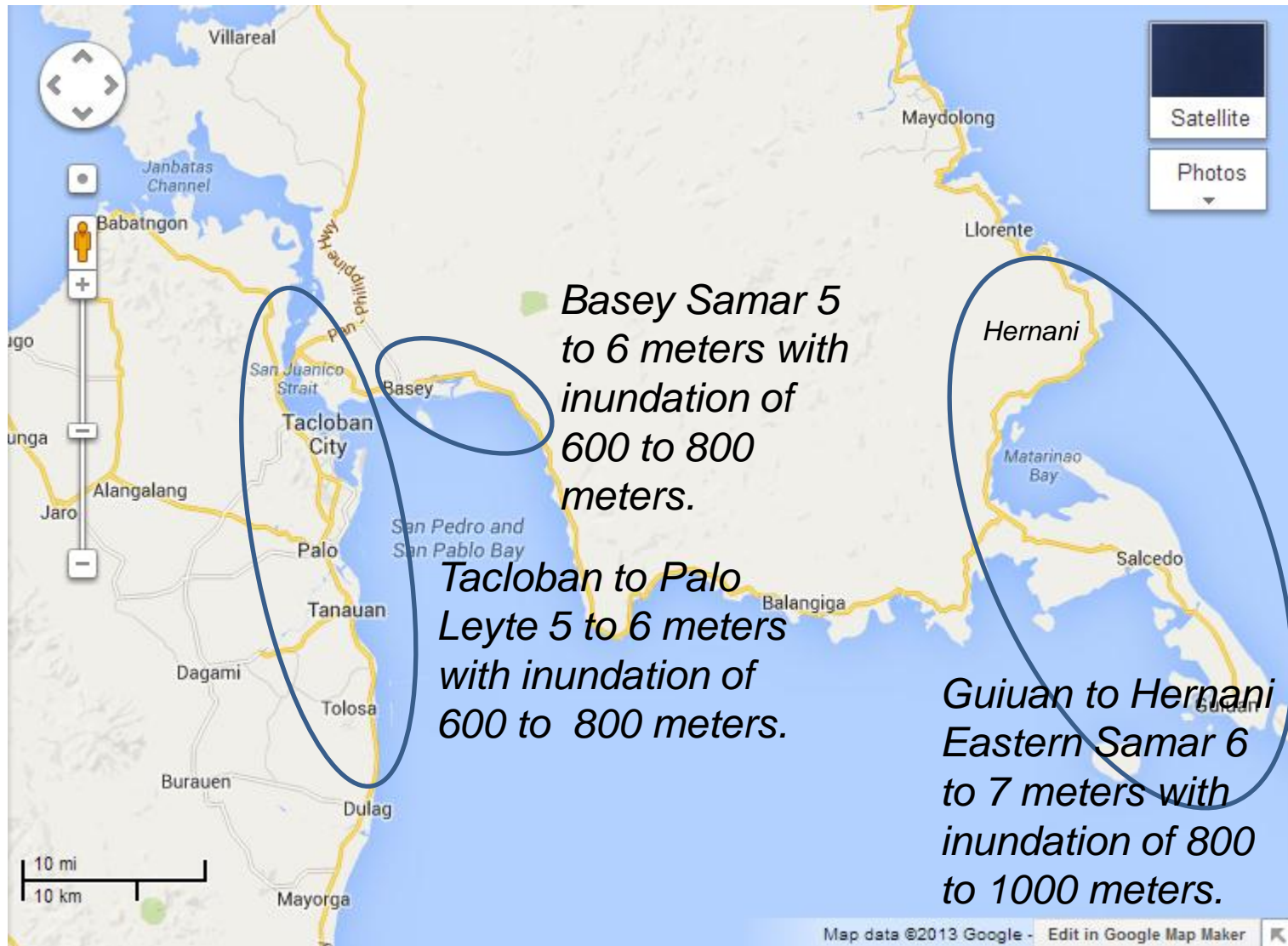
- Sent meteorologists from Central Office to Visayas PAGASA Regional Center and to Iloilo, Nov. 6-11, 2013 to assist the station in the dissemination of warnings and conduct assessment after the typhoon passage.
- Issued daily weather updates for the relief , rescue and rehabilitation of the affected areas.
- **Nov. 11:** Another Response Team composed of engineers, meteorologists and technicians were sent to Samar and Leyte. They also brought food and other emergency supplies for PAGASA personnel.



Activities of the Response Teams

- Temporary transfer of Tacloban synoptic station to DOST Region 8 Office in Palo, Leyte and installed basic weather instruments.
- Three (3) solar panels were put up for temporary lighting system and radio communication (SSB) at DOST R8 in Palo, Leyte, in Catbalogan and in Guiuan stations.
- Repaired water line at Guiuan station
- Repaired the generator sets of Tacloban, Catbalogan and Catarman stations.
- Re-installed all basic instruments in all affected PAGASA stations.

Survey storm surge heights (STORM CHASER Team)



- Checked/validated the reported height of the storm surge







BGY SAPAO, GUIUAN



**POSSIBLE FLOW
OF THE SURGE
(according to the
orientation of the
coconut trees)**



**INUNDATION REACHED ABOUT 2 KM AWAY FROM THE
SHORELINE (ACCORDING TO THE WITNESS)**







IEC for Teachers and LGUs in Tacloban and Palo, Leyte



Problems(Lessons Learned) During the Rescue and Relief Operations

- No communication available
- No power supply
- Heavy equipments and other vehicles were temporarily inoperational
- Impassable roads
- Relief goods stored in the provinces and regions were damaged and washaway



Problems(Lessons Learned) During the Rescue and Relief Operations

- Members of the Local Disaster Groups were also victims and cannot do their job
- Local officials were also affected (take charge)
- Airport in the area were temporary inoperational

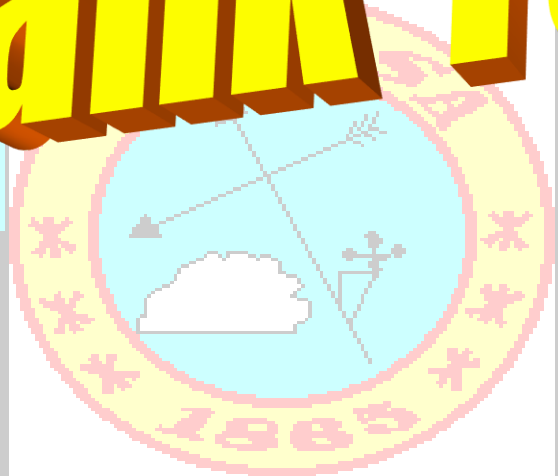


Lessons Learned (Problems)

- People were not aware of the destructive power of Storm Surge (video)
- Proper implementation of contingency plan for every hazard
- Availability of Hazard Maps (implementation)
- People do not heed to the advice of the Disaster Managers / LGUs



Thank You!



"tracking the sky . . . helping the country"

