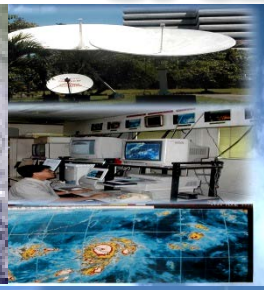
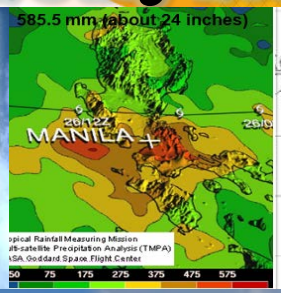
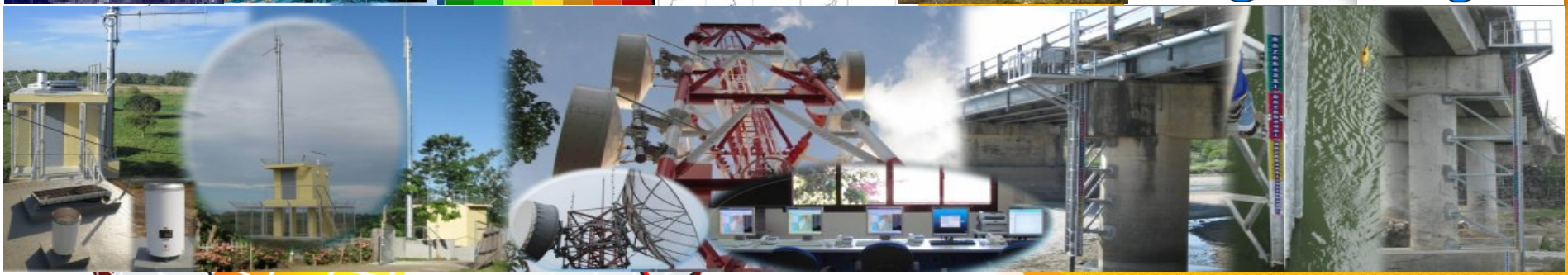
Department of Science and Technology

Philippine Atmospheric, Geophysical and Astronomical Services Administration

FIRST STEERING COMMITTEE MEETING (SCM1)
Southeastern Asia-Oceania Flash Flood Guidance (SAOFFG) Project
10-12 July 2017- Jakarta, Indonesia

By : Renito Paciente, WD
Maximo F. Peraltab, ETSD

PAGASA

Outline of Presentation:

1. Local capacity for the provision of flash flood early warnings

2. Availability of historical local hydrometeorological data

1. Local capacity for the provision of flash flood early warnings

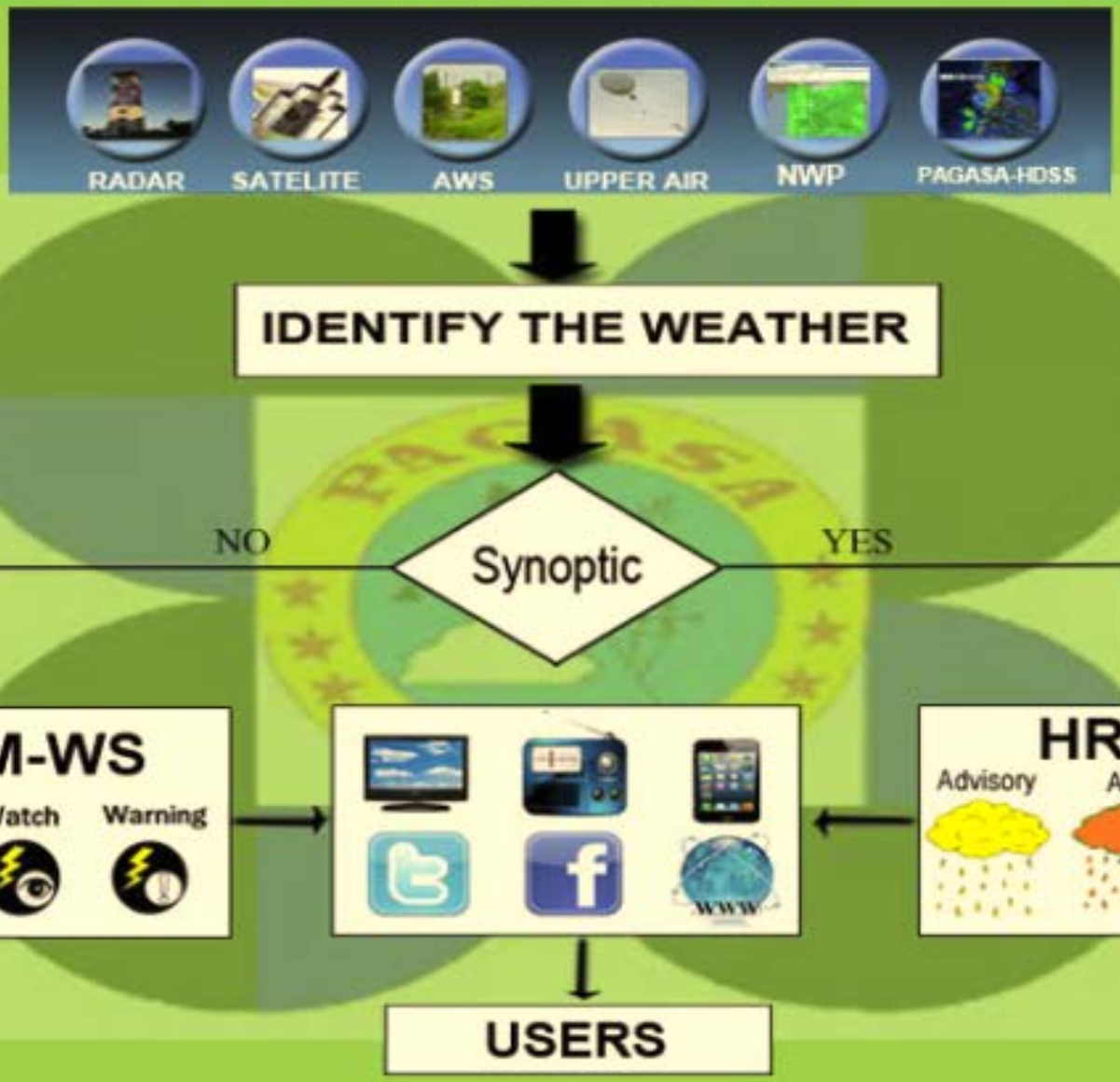
Philippine Atmospheric, Geophysical and Astronomical Services Administration

- **RAINFALL WARNING SYSTEM**

-is an end to end rainfall warning decision support tool developed for PAGASA's operation in providing timely and accurate warnings to alert the concerned communities and decision-makers about the occurrence of heavy rainfall event caused by local convective and synoptic weather systems

Phase 1: THUNDERSTORM ADVISORY

RWS TOOLS, EQUIPMENT, COMPONENT AND WORKFLOW



Philippine Atmospheric, Geophysical and Astronomical Services Administration

Thunderstorm Warning Levels:

WARNING LEVEL	MEANING	DISSEMINATION
 Information	Thunderstorm is **LESS** likely to develop within the next twelve (12) hours.	This will be disseminated thru Website, Twitter and Facebook
 Watch	Thunderstorm is **MORE** likely to develop within the next twelve (12) hours.	This will be disseminated thru Website, Twitter and Facebook
 Advisory	Thunderstorm threatens or expected to affect a specific area(s) within the next two (2) hours	This will be disseminated thru SMS, Website, Twitter and Facebook

rRevised: June 2013

Model Output and Sounding Indices

Date: May 2017		Day: 2 Hour: 10 PM		Day: 3 Hour: 10 AM	
Assigned Personnel:		Forecaster:		Forecaster:	
PARAMETERS		*VALUES*	*ASSESMENT*	*VALUES*	*ASSESMENT*
A. Initial Numerical Model Output					
A-1 WAFS RH value of at least 80% at 950 or 850mb?			NO		NO
A-1.2 WAFS RH value of at least 70% at 700mb?			NO		NO
A-2 LEADS RH value of at least 80% at 950 or 850mb?		64	NO	83	YES
A-2.1 LEADS RH value of at least 70% at 700mb?		81	YES	54	NO
B. Sounding Indices					
B-1 SkewT-LogP Diagram Are the dew point & temperature lines close to each other from surface to upper level?			NO		NO
B-1 Showalter Index Is below zero?		0.2	NO	-0.5	YES
B-3 Lifted Index Is below zero?		-4	YES	-3	YES
B-4 SWEAT Index (TSTM Potential) ≥170		180.4	YES	203.6	YES
B-5 K-Index (TSTM Probability) >26		36.6	YES	29.8	YES
B-6 Total Totals Index >40		44	YES	44.1	YES
B-7 CAPE Index >1000		2035	YES	1384	YES
B-8 PWAT >41		44.1	YES	38.8	NO
C. Wind Profiler (Surface up to 700mb)					
C-1 Vertical Wind Profile Is there presence of turbulence or any perturbations in the wind flow?			NO		NO
Number of field with "YES"		7	ISSUE TSTM WATCH	7	ISSUE TSTM WATCH
Number of field with entry		9		9	

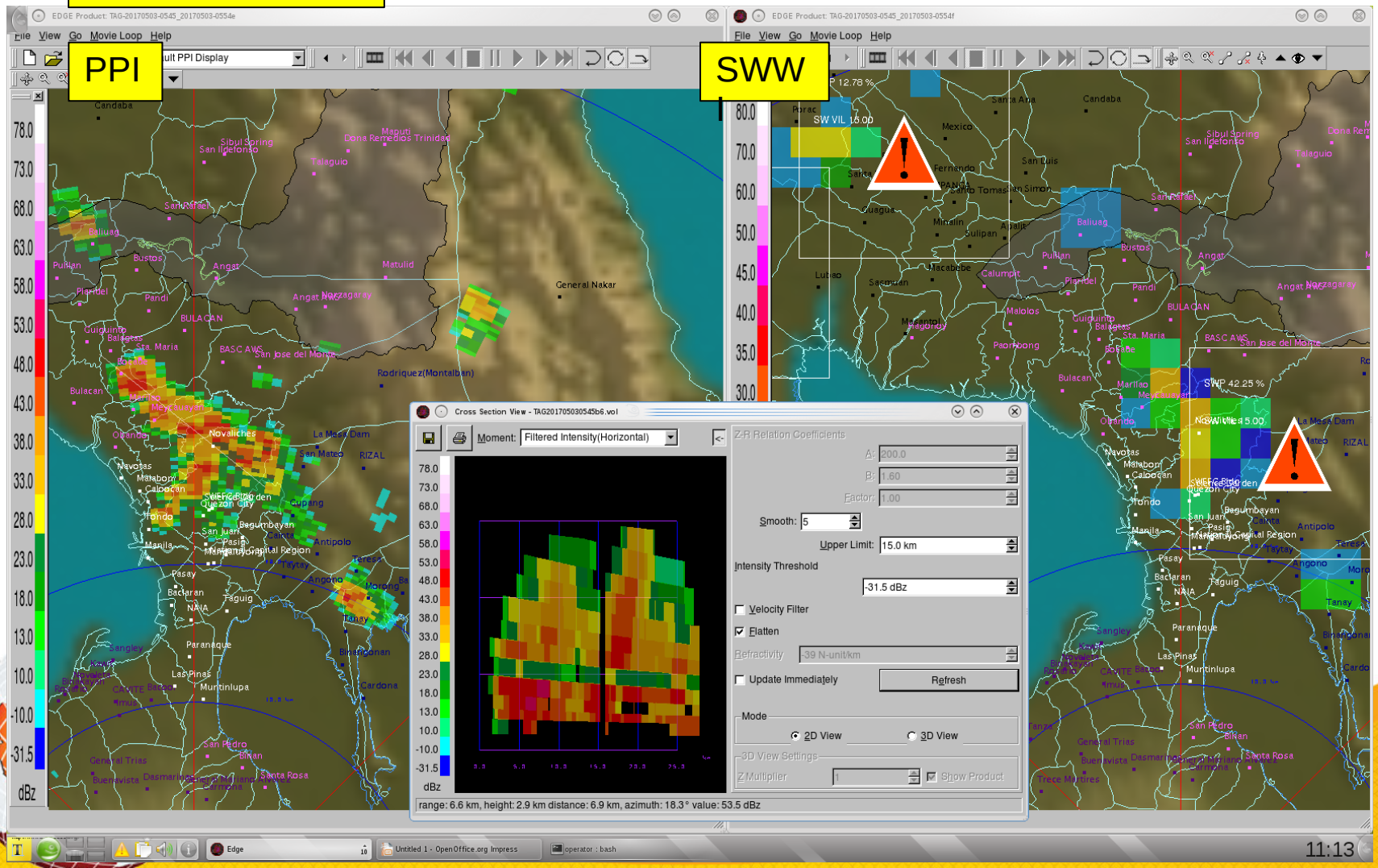
Thunderstorm Advisory

- **Thunderstorm Adv 2 (1:30PM** 3May17)
- Thunderstorm is affecting Rizal (SanMateo, Antipolo), Bulacan(Marilao,Meycauayan) and portion of Zambales & Batangas w/c may persist w/in 2hrs. **Xpect thunderstorm ovr MetroManila,** Cavite,Bataan,Pampanga & other areas of Rizal, Bulacan w/in d nxt 2hrs. Minwyl, lyt-mod rains affecting MetroManila(portions of QC & Marikina, Mandaluyong,Manila) w/c may persist for 2hrs.NCR_PAGASA

Sample TSTM Advisory from PAGASA SMS

1:45 PM

TAGAYTAY Radar



Flashflood in Quezon City

The heavy downpour has submerged within minutes several low-lying areas in Metro Manila

Published: 15:42 June 8, 2015
By Gilbert P. Felongco, Correspondent

GULF NEWS

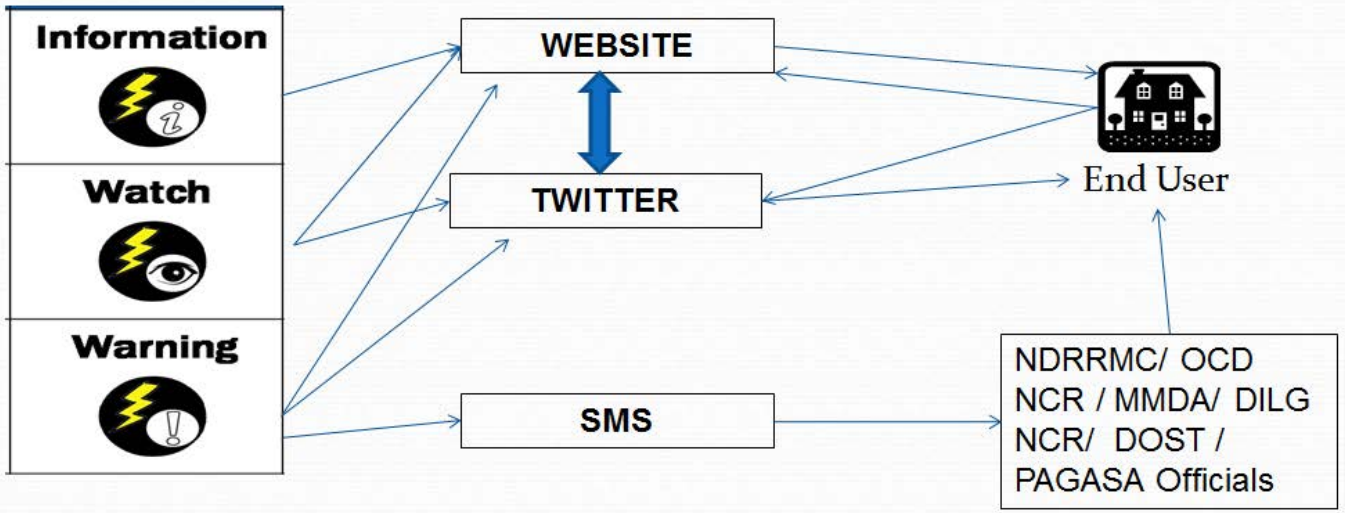
Heavy rain started to fall at round 3.30pm on Monday leaving roads in Metro Manila's biggest suburb, Quezon City, as well as the city of Manila, submerged in at least 30 centimetres to a metre deep of water.

The rain lasted for at least an hour and according to the Metro Manila

Development Authority (MMDA), the floodwaters had subsided by 4.30pm

Philippine Atmospheric, Geophysical and Astronomical Services Administration

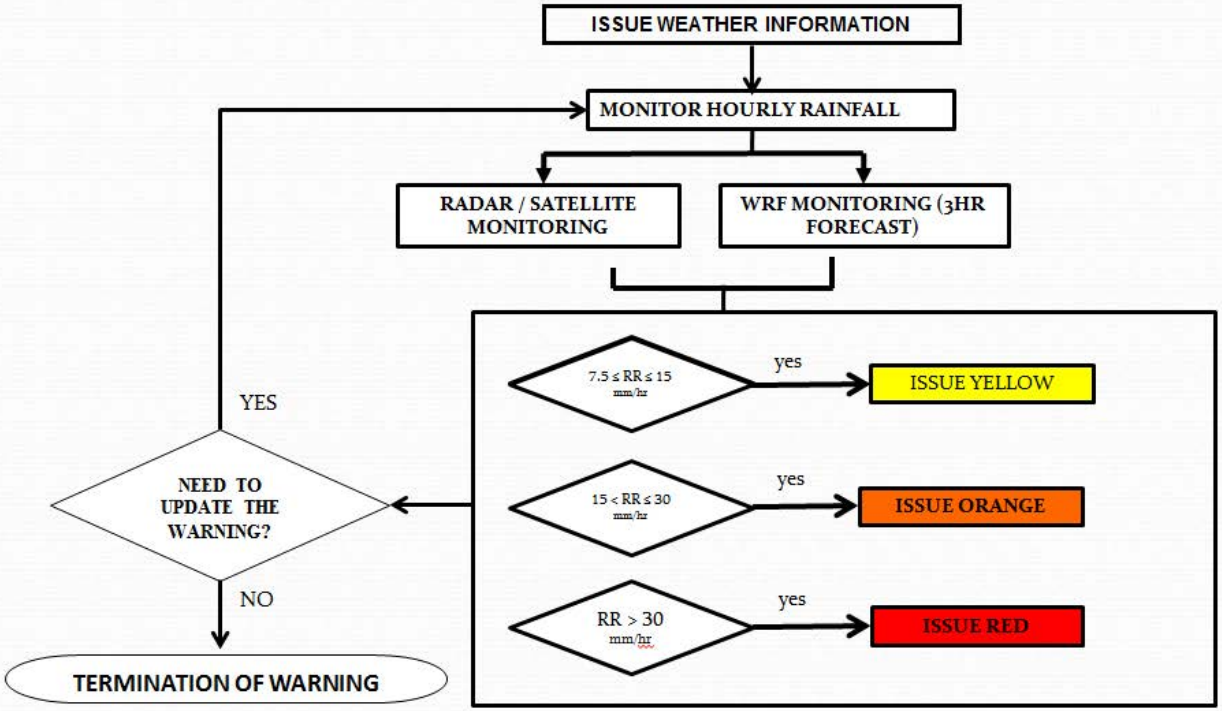
Dissemination Protocol
Thunderstorm Warning System



Phase 2: HEAVY RAINFALL (HR-WS)

Philippine Atmospheric, Geophysical and Astronomical Services Administration

Heavy Rainfall Warning System (HR-WS) Workflow



RAINFALL ADVISORIES, CLASSIFICATION AND MEASUREMENT

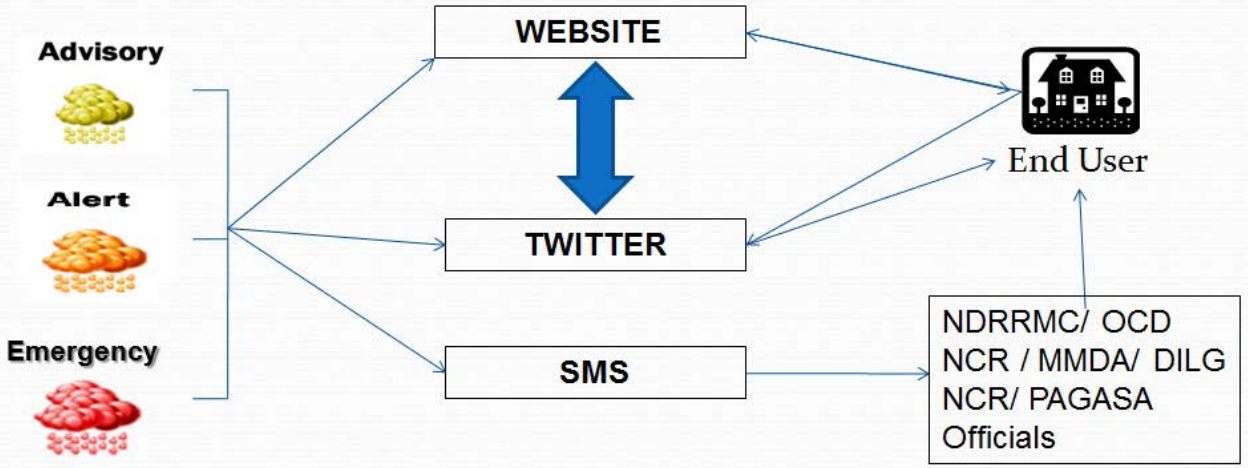
COLOR-CODED RAINFALL ADVISORIES AND CLASSIFICATION	RAIN MEASUREMENT		FLOOD POSSIBILITY	RESPONSE
RED TORRENTIAL	MORE THAN 30mm RAIN observed in 1 hour and expected to continue in the next 3 hours.	= 8 gallons per square meter/hour	Serious Flooding expected	EVACUATION
ORANGE INTENSE	15–30mm RAIN observed in 1 hour and expected to continue in the next 3 hours.	= 4 to 8 gallons per square meter/hour	Flooding is threatening	ALERT for possible evacuation
YELLOW HEAVY	7.5–15mm RAIN observed in 1 hour and expected to continue in the next 3 hours.	= 2 gallons per square meter/hour	Flooding is possible	MONITOR
MODERATE	2.5–7.5mm RAIN observed in 1 hour and expected to continue in the next 3 hours.	= 2.5 liters per square meter/hour to 7.5 liters per square meter/hour	(Flooding still possible in certain areas)	
LIGHT	LESS THAN 2.5mm RAIN observed in 1 hour and expected to continue in the next 3 hours	= 2.5 liters per square meter/hour		

Guidelines on issuance:

- The initial warning can be issued anytime of the day or when need arises.
- The next warning will be issued after 3 hours
- The updates will be issued as frequent as possible
  - Updates are defined as the amount of rainfall observed in the areas under warn.

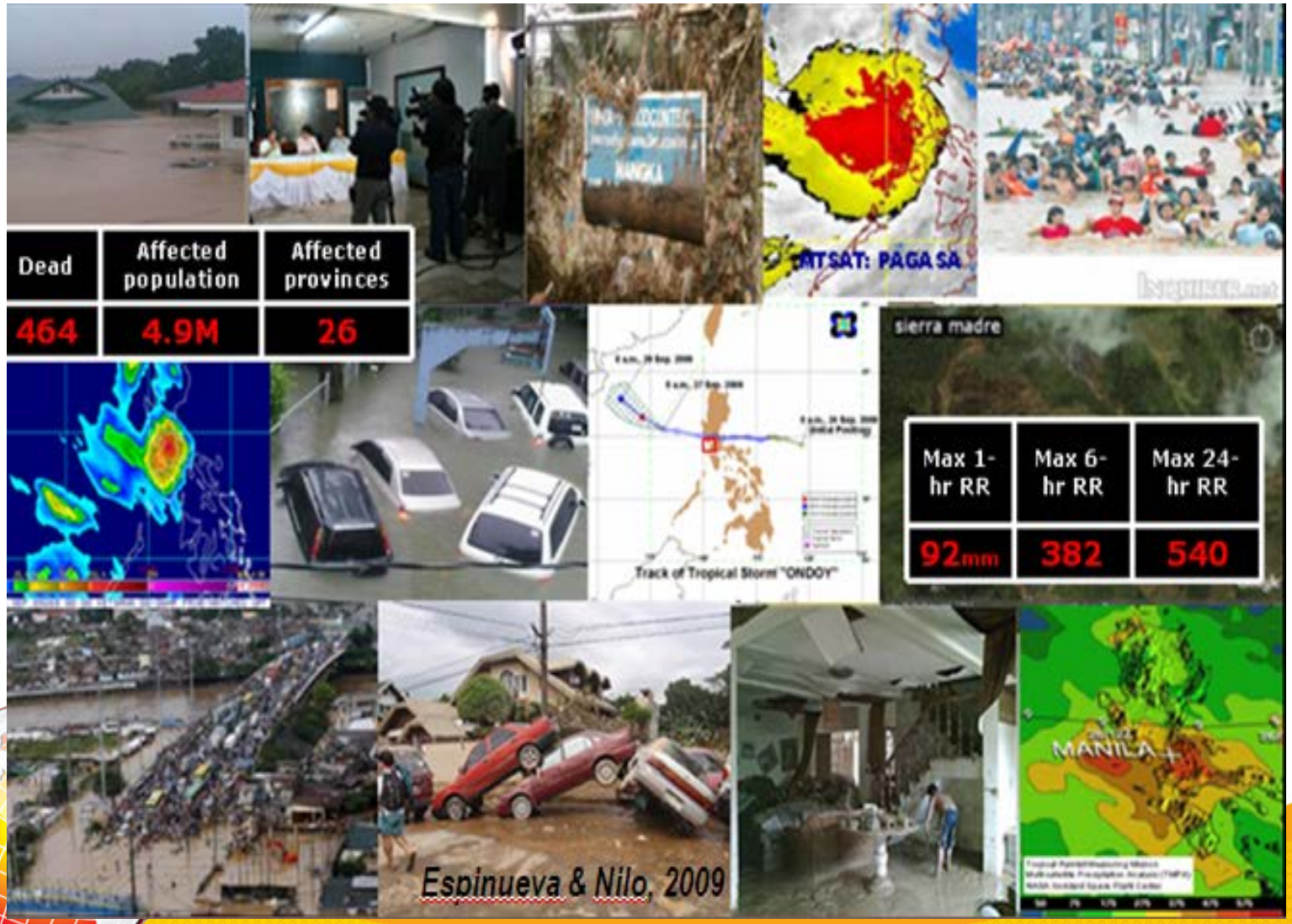
Philippine Atmospheric, Geophysical and Astronomical Services Administration

Dissemination Protocol
Heavy Rainfall Warning System



Extreme flood events in the PH

Impacts of flooding due to passage of TS Ondoy (Sep 26, 2009)



For any early warning system to succeed, several components are necessary:

- Technology to detect and monitor the hazard;
- Communication systems to alert the public;
- Local leaders trained to make the right decisions;
- A public that is educated to react appropriately to warnings; and
- Response protocols — such as evacuation plans — prepared
- and rehearsed well in advance of the threat.

All these elements must work well, both individually and in harmony.

Failure in any one of these elements can mean failure of the whole early warning system.

3. Availability of historical local hydrometeorological data

Pasig Marikina River FFWS Monitoring Equipment 1/2

Available historical local hydrometeorological data 1

Pasig Marikina River FFWS Monitoring Equipment 2/2

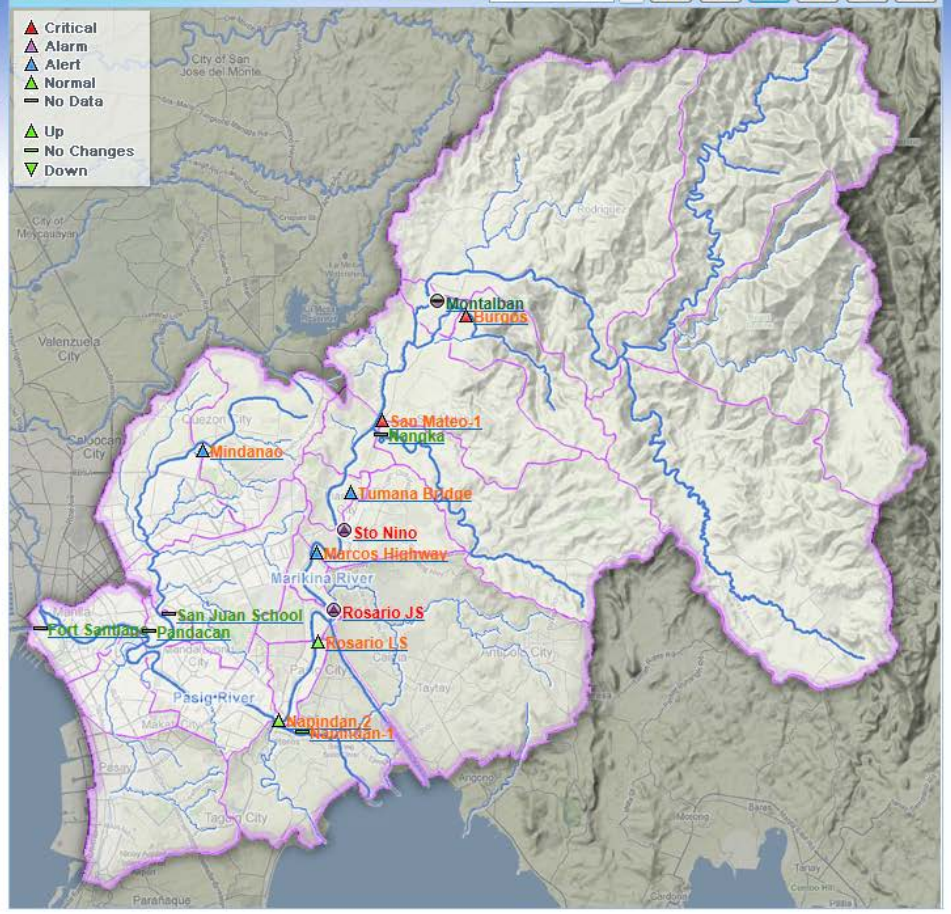
STATUS OF WATERLEVEL of PMRB
as of 5:40 AM September 19, 2014

PAGASA
Philippine Atmospheric, Geophysical and Astronomical Services Administration

KOICA WORLD FRIENDS KOREA

MENU
- Bulletin
  - Real-time Bulletin
  - Major WL Station
  - Major Sub-basin rainfall
- Water Level
  - Map
  - Table
- Rainfall
  - Map
  - Table
  - Areal Mean Rainfall
- AWS
  - Map
  - Table

Water Level Map — Search Time 2014/09/19 05:40 [-60] [-30] [-10] [+10] [+30] [+60]



Time : 2014/09/19 05:40

Station	WL [El.m]	Alert [El.m]	Alarm [El.m]	Critical [El.m]
Montalban	-	22.40	23.00	23.60
Burgos	28.95	27.40	27.90	28.40
San Mateo-1	20.39	18.00	19.00	20.00
Nangka	-	16.50	17.10	17.70
Mindanao	33.93	33.00	34.00	35.00
Tumana Bridge	17.91	17.26	18.26	19.26
Sto Nino	16.83	15.00	16.00	17.00
Marcos Highway	15.33	14.50	15.50	16.50
Rosario JS	14.02	13.50	14.00	15.00
San Juan School	-	11.00	11.50	12.00
Fort Santiago	-	11.00	11.50	12.00
Pandacan	-	11.00	11.50	12.00
Rosario LS	12.86	13.00	13.50	14.00
Napindan-2	12.00	14.00	14.50	15.00
Napindan-1	11.65	13.50	14.00	14.50

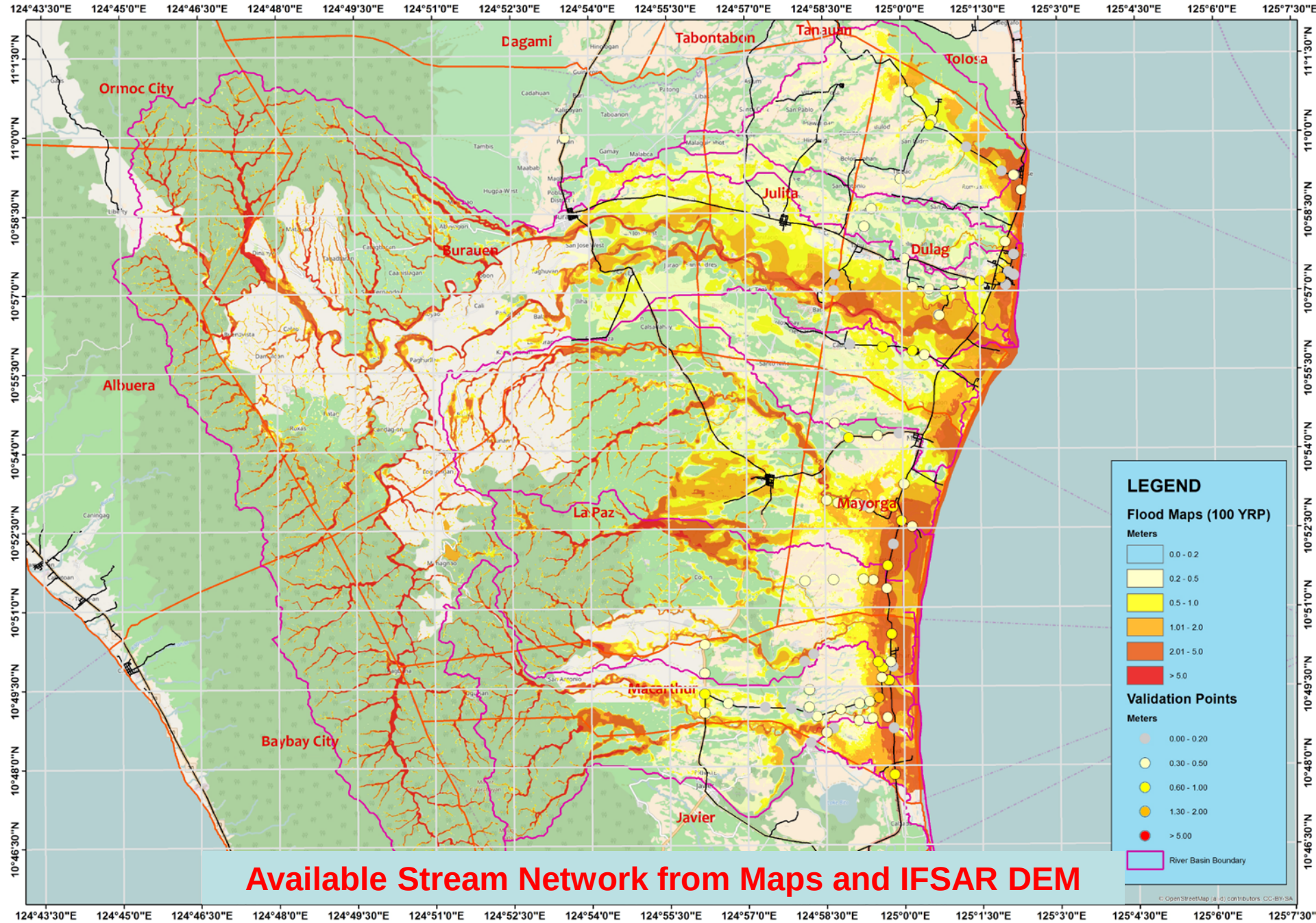
Station Color

PAGASA Major Station	MMDA Major Station
PAGASA Station	MMDA Station
PAGASA-UNDP Station	

Available historical local hydrometeorological data 2

Land Cover Map from RAPID NRA

Available Land Cover Map for the entire Philippines



Available Stream Network from Maps and IFSAR DEM

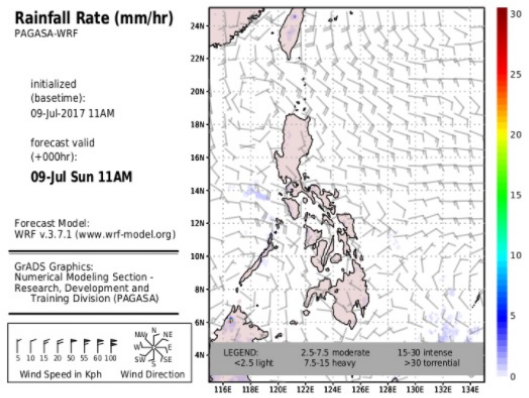
PAGASA CITIZEN'S CHARTER

PAGASA MODERNIZATION ROAD MAP TOWARDS A WORLD CLASS ATMOSPHERIC/METEOROLOGICAL-HYDROLOGICAL AGENCY

- WEATHER Advisories
- RAINFALL and THUNDERSTORM Warning
- FLOOD Info/Warnings
- CLIMATE Advisories
- ASTRONOMY Info
- *Products and Services*
  - 4-Hour Rainfall Forecast (Climate X)
  - Weather Forecasts from Numerical Prediction Model
  - Flood Monitoring for Metro Manila
  - Risk Map
  - Flood Hazard Map
- Related *Linkages*

PRINT

Weather Research and Forecasting | Wave | Global Spectral Model



Precipitation/Wind

Analysis

Like 5 | Tweet | G+1 0 | Share 2

PHILIPPINE STANDARD TIME
03:40:40 PM
09 July 2017 Sunday

Tweets by @dost_pagasa

PAGASA-DOST @dost_pagasa
#VIS_PRSD-Quezon Palawan Radar @ 3:25 PM 09 Jul 2017
Light to moderate rains affecting over #Palawan(Quezon,... fb.me/1v8sNMHaL
9m

PAGASA-DOST @dost_pagasa
#NCR_PRSD 9 July 2017, 2:55PM
Light to moderate #rains affecting #Quezon (Macalelon, GenLuna), #Laguna (Calauan,... fb.me/7kZRyGpVL

Embed View on Twitter

PAGASA's Event

Today July 2017 Print Week

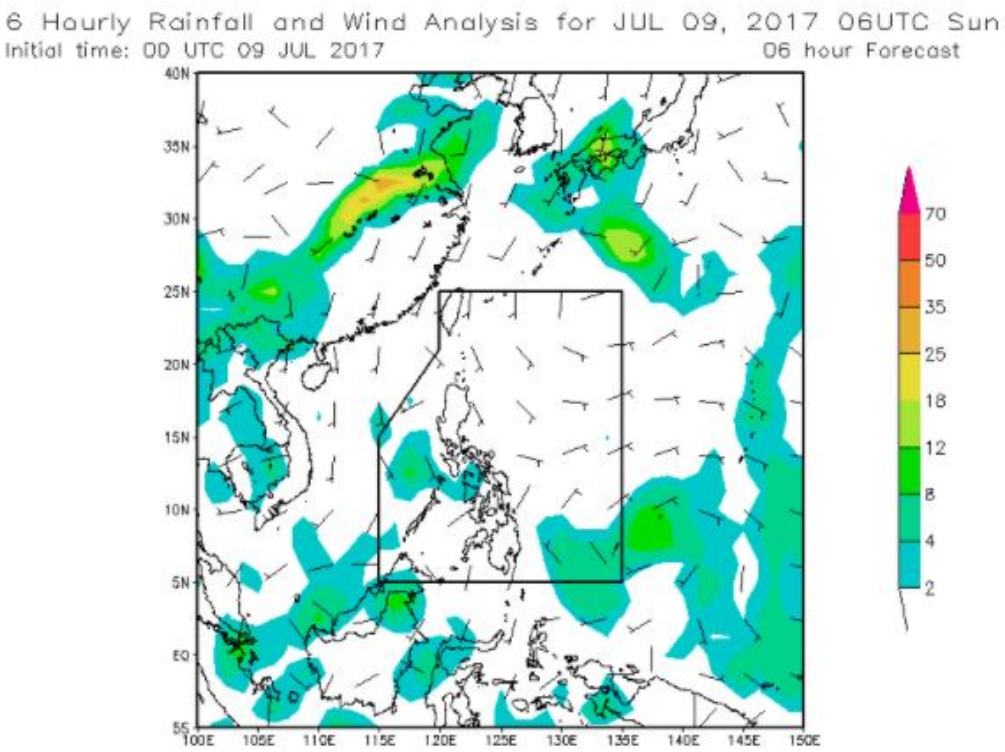
Sun	Mon	Tue	Wed	Thu	Fri	Sat
25	26	27	28	29	30	1 Jul
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1 Aug	2	3	4	5

Events shown in time zone: Manila
Google Calendar

ENG INTL 3:42 PM 09/07/2017

Available mesoscale NWP Model (WRF- 4km X 4 km and 12km X 12 km)

Weather Research and Forecasting | Wave | Global Spectral Model

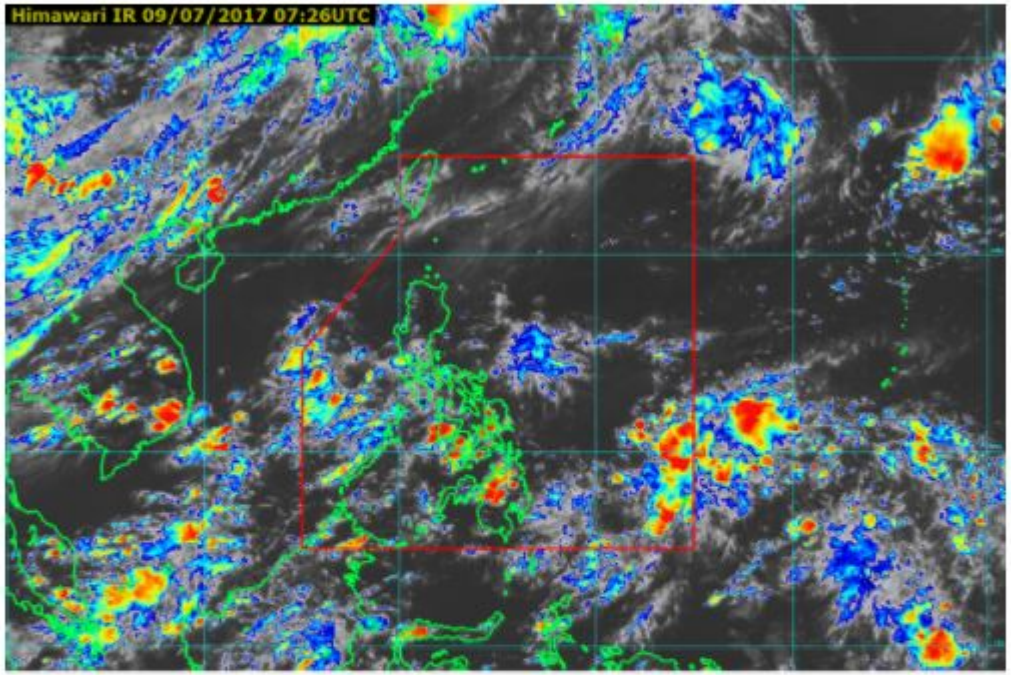


Accumulated Rainfall

06 Hours Forecast

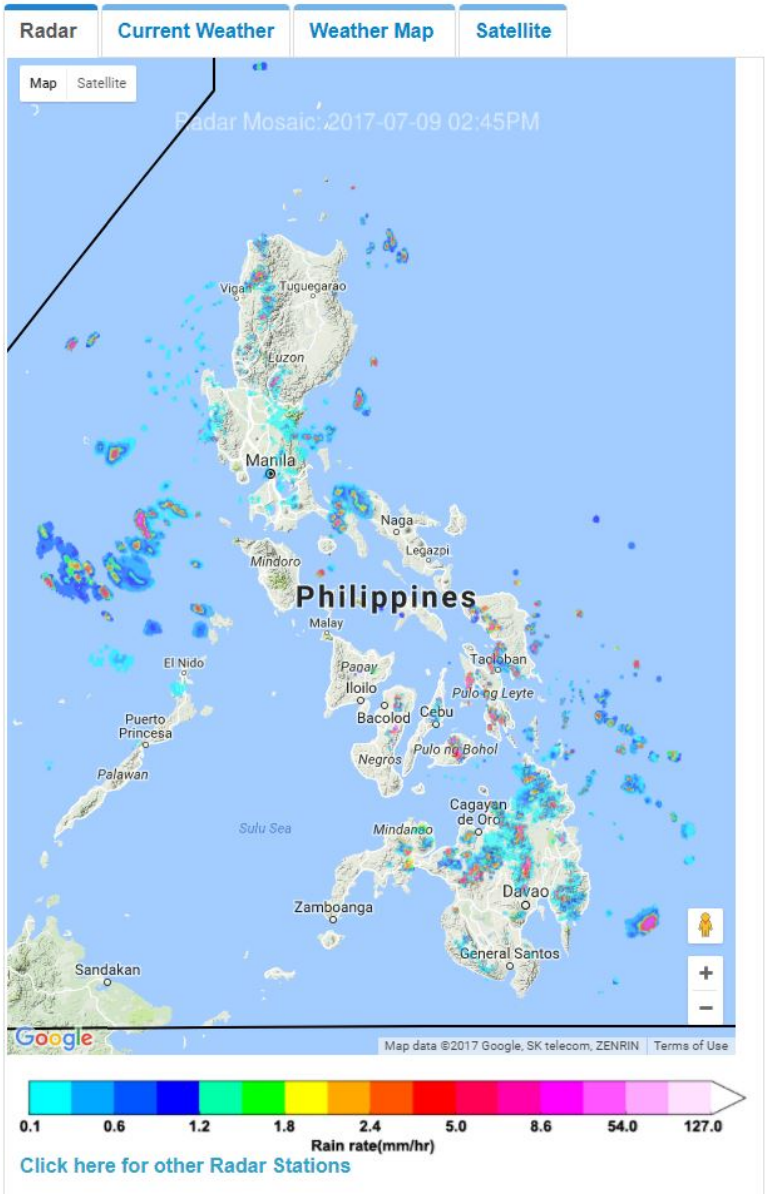
Available mesoscale NWP Model (GSM- 25 km X 25 km)

Radar | Current Weather | Weather Map | Satellite

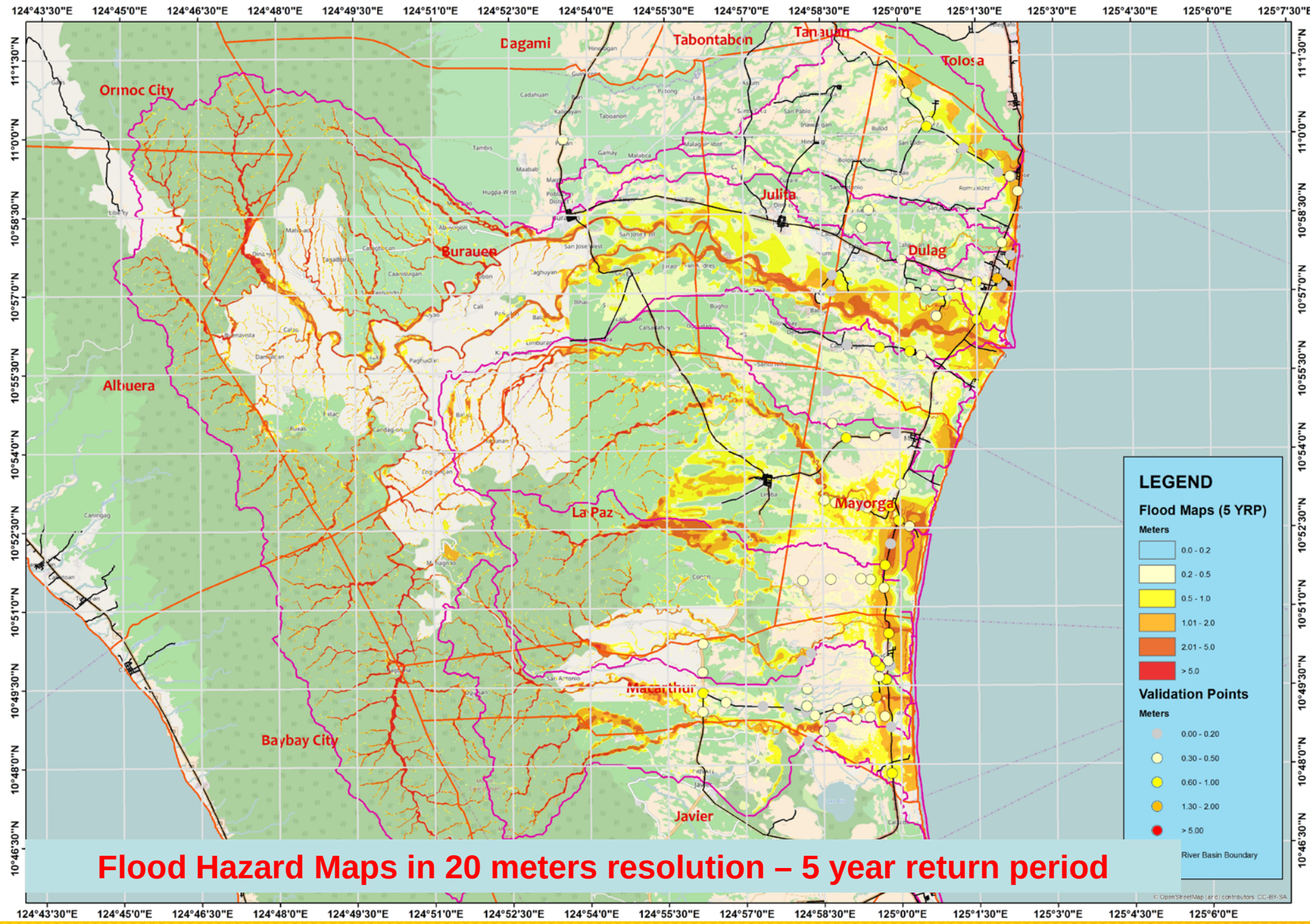


HIMAWARI-8 |COMS-RI | FY2E

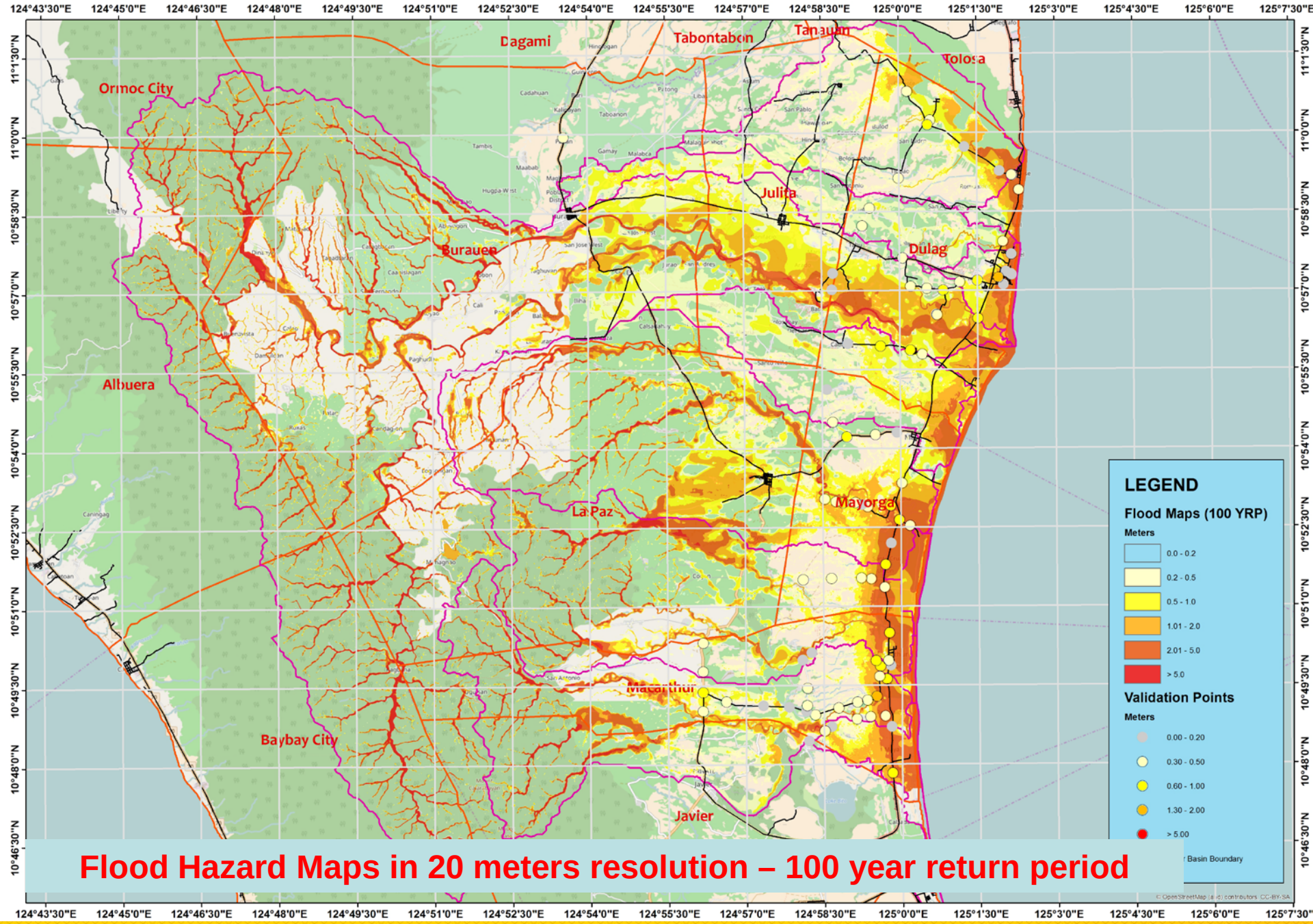
Available satellite data (Himawari, COMS, FY2E-Sat, NOAA)



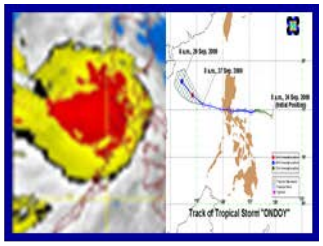
Available composite radar data (14 Radars)



Flood Hazard Maps in 20 meters resolution – 5 year return period



Flood Hazard Maps in 20 meters resolution – 100 year return period



Thank you for your attention!

www.pagasa.dost.gov.

BIR Road, Diliman, Quezon City

Like us on facebook, follow us on twitter