

Emergency Observations at the Manila Observatory

Manila Observatory
Sentinel Asia Joint Project Team Meeting
1 – 2 November 2018
Awaji, Hyogo, Japan

MO Weather Reports / Bulletins

Where did the TC happen and where will it go

- TC Track
- Areas to be affected
- Exposure, Vulnerability, land use
- Physical geography description – Topography, lecz, etc

What are the potential hazards, risk and Impacts

- Wind
- Rain, flooding+lecz
- Storm surge
- Land slides
- Hotspots
- Actual impact reports

How does it compare with previous TCs

- History of other TCs and impacts (showing track of current TC)

Regional Climate Systems – meteorology, wind, rain, tc tracks, historical events

Geomatics for Environment and Development – physical geography, exposure, vulnerability

Instrumentation and Technology Development – observation data from AWS

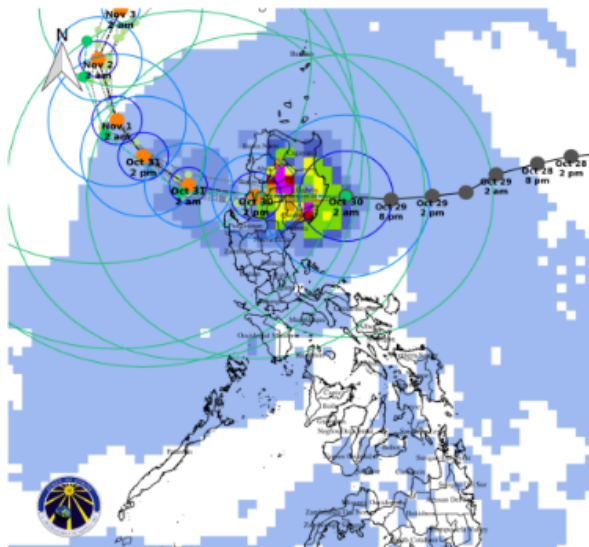
Report update: 9:00AM, 3:00PM, 9:00PM

Potential Rainfall associated with Typhoon Yutu

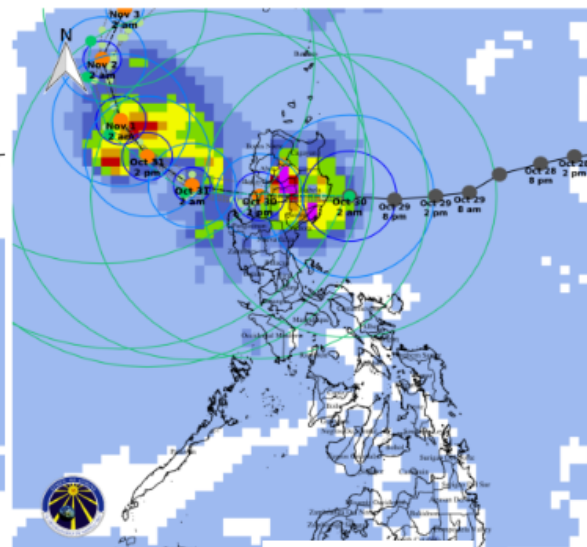


Potential high rainfall expected over Northern and Central Luzon within next 24 hours as TC Yutu exits PH (2AM 30 Oct to 2AM 31 Oct).

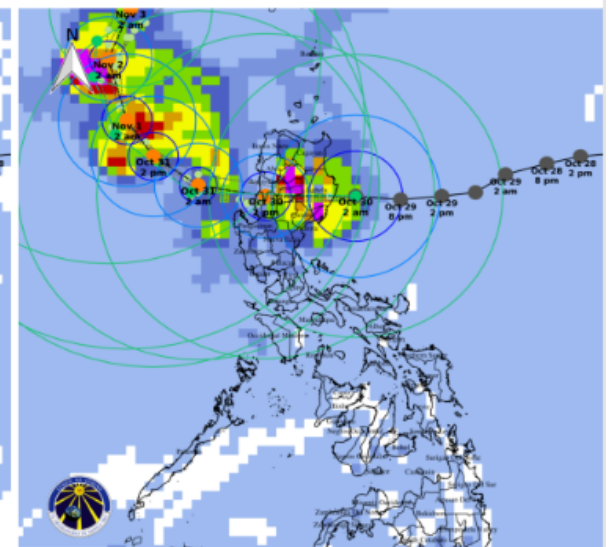
**24-hour Total Rainfall
Model Forecast**
30 Oct 2 AM – 31 Oct 2 AM



**48-hour Total Rainfall
Model Forecast**
30 Oct 2 AM – 1 Nov 2 AM

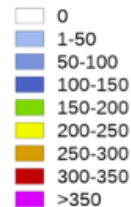


**72-hour Total Rainfall
Model Forecast**
30 Oct 2 AM – 2 Nov 2 AM



Legend

Total Rainfall (mm)



Forecast Track



Radius of Max Wind



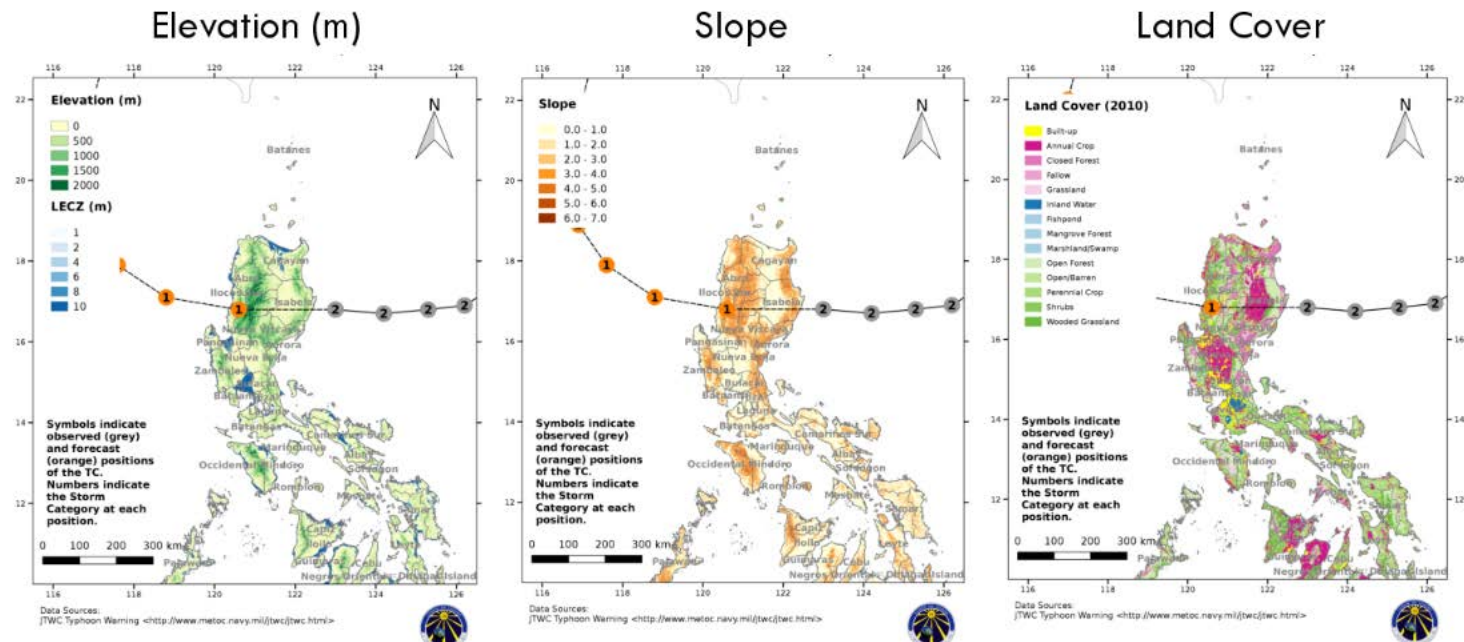
Sources:

NOAA Global Forecast System

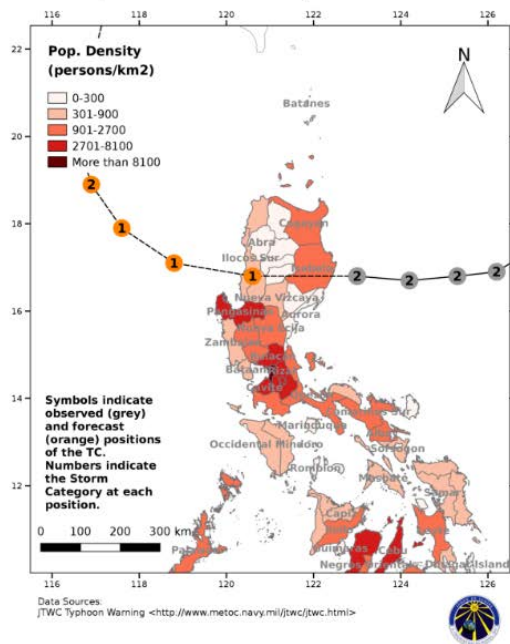
Typhoon2000 (<http://www.typhoon2000.ph>)

JTWC (<http://www.metoc.navy.mil/jtwc/jtwc.html>)

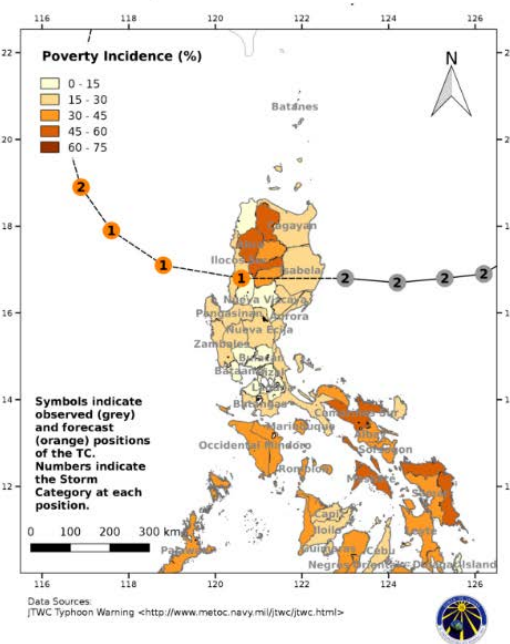
Forecast tracks as of 30 Oct, 2 AM



Population Density (as of 2015)



Poverty Incidence (as of 2015)





IMPACTS OF DESTRUCTIVE TYPHOONS (IN OCTOBER) WITH SIMILAR TRACKS TO HAIMA 2016

Oct 21 2 am

Oct 20 2 pm

Oct 20 2 am

Megi was CAT5 at landfall on October 18, 2010 in Palanan, Isabela. 2 million persons affected \$255.1 million in damages

- Haima Forecast Track (JTWC)
- Haima Past Track (JTWC)
- TC Megi (Juan) 2010
- TC Sarika (Karen) 2016
- TC Zeb (Iliang) 1998

Oct 19 2 pm

Oct 19 8 am

Oct 18 2 pm

Oct 18 8 am

Oct 18 2 a

Sarika was CAT4 at landfall on October 16, 2016 in Baler, Aurora. 80,458 persons affected \$41.7million in damages

Zeb was CAT5 at landfall on October 14, 1998 in Palanan, Isabela. 925,000 persons affected \$576million in damages



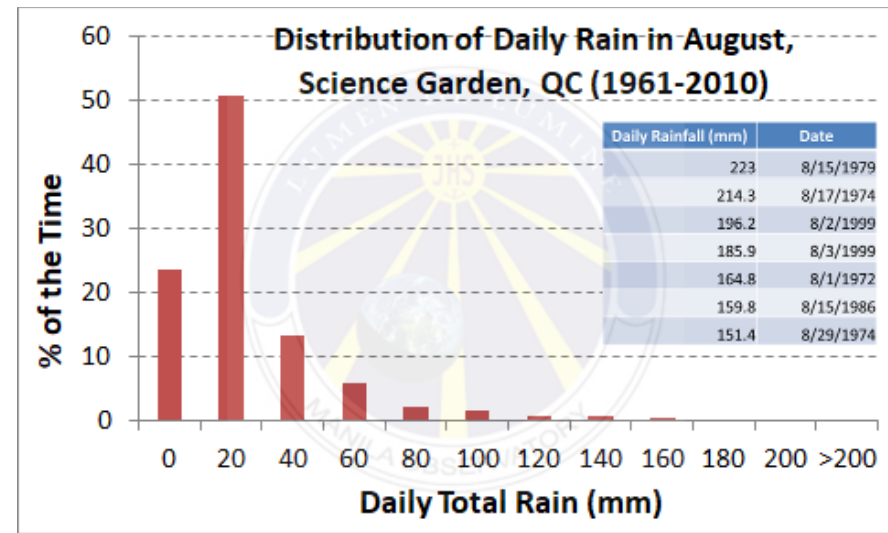
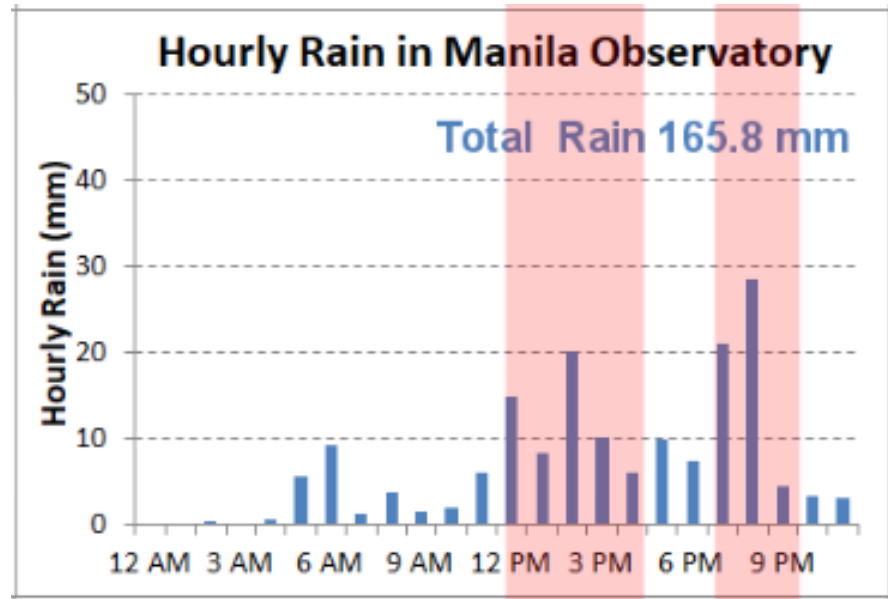
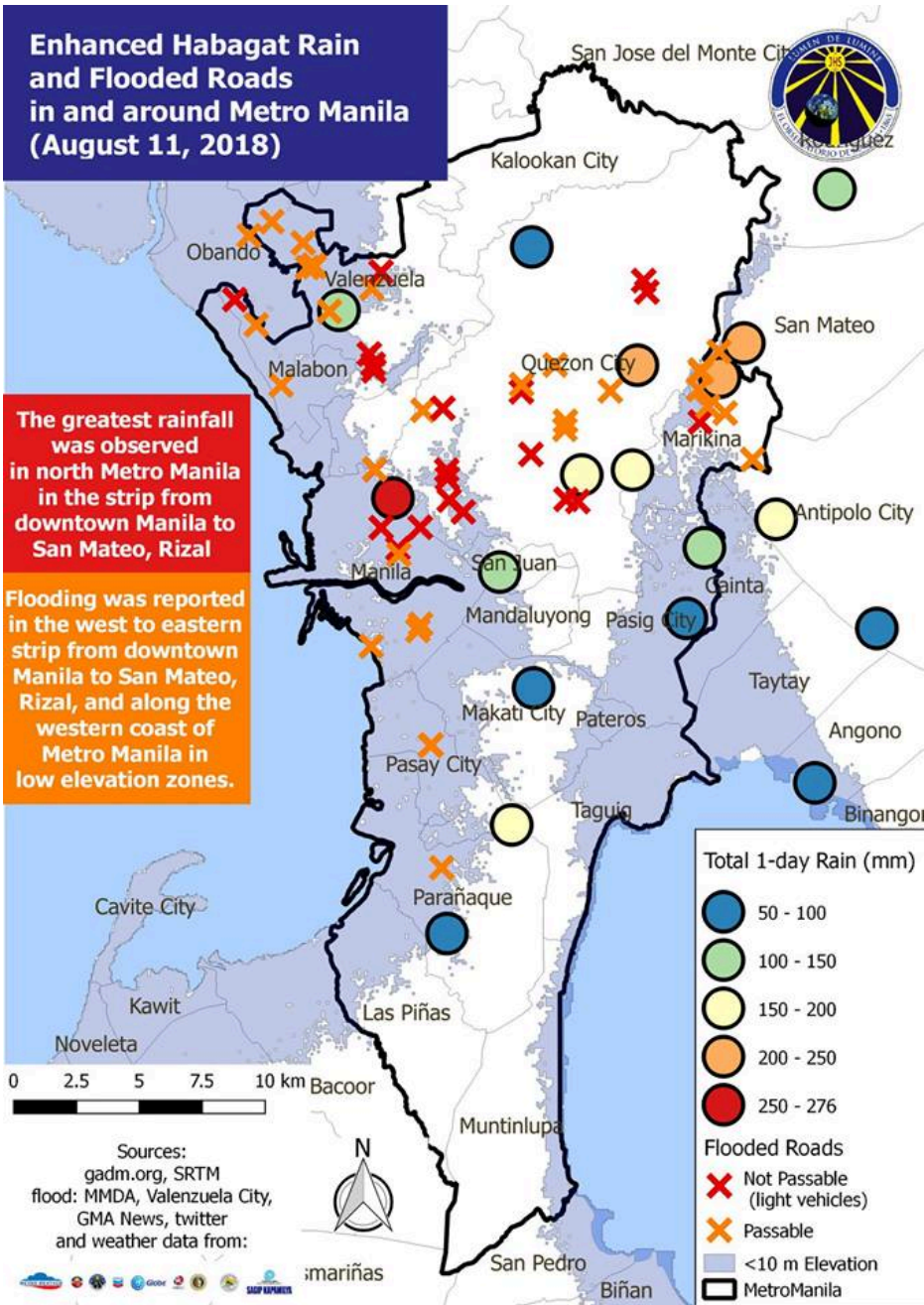
0 100 200 300 400 km

SOURCES:
PhilGIS
JTWC
NDRRMC

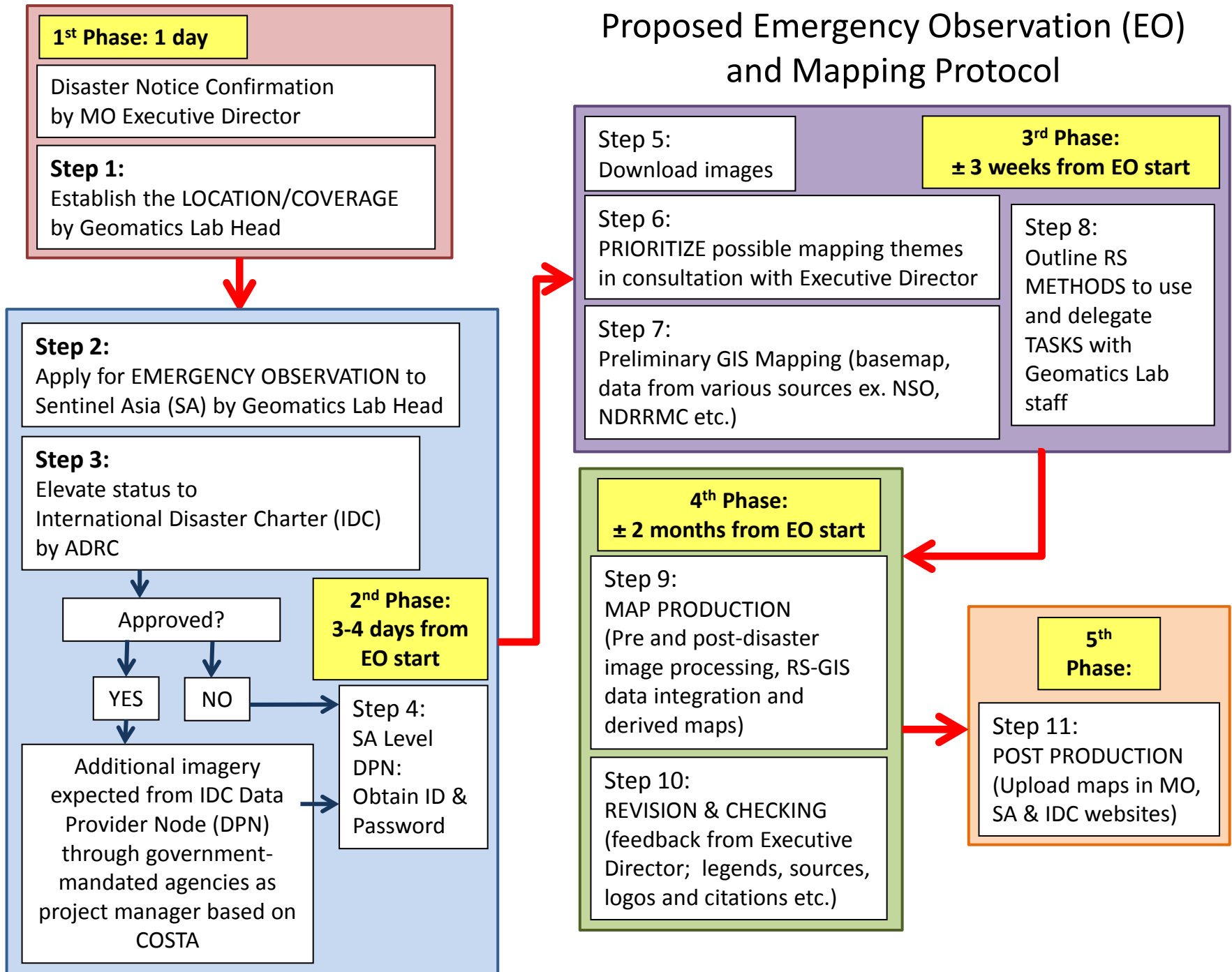
Enhanced Habagat Rain and Flooded Roads in and around Metro Manila (August 11, 2018)

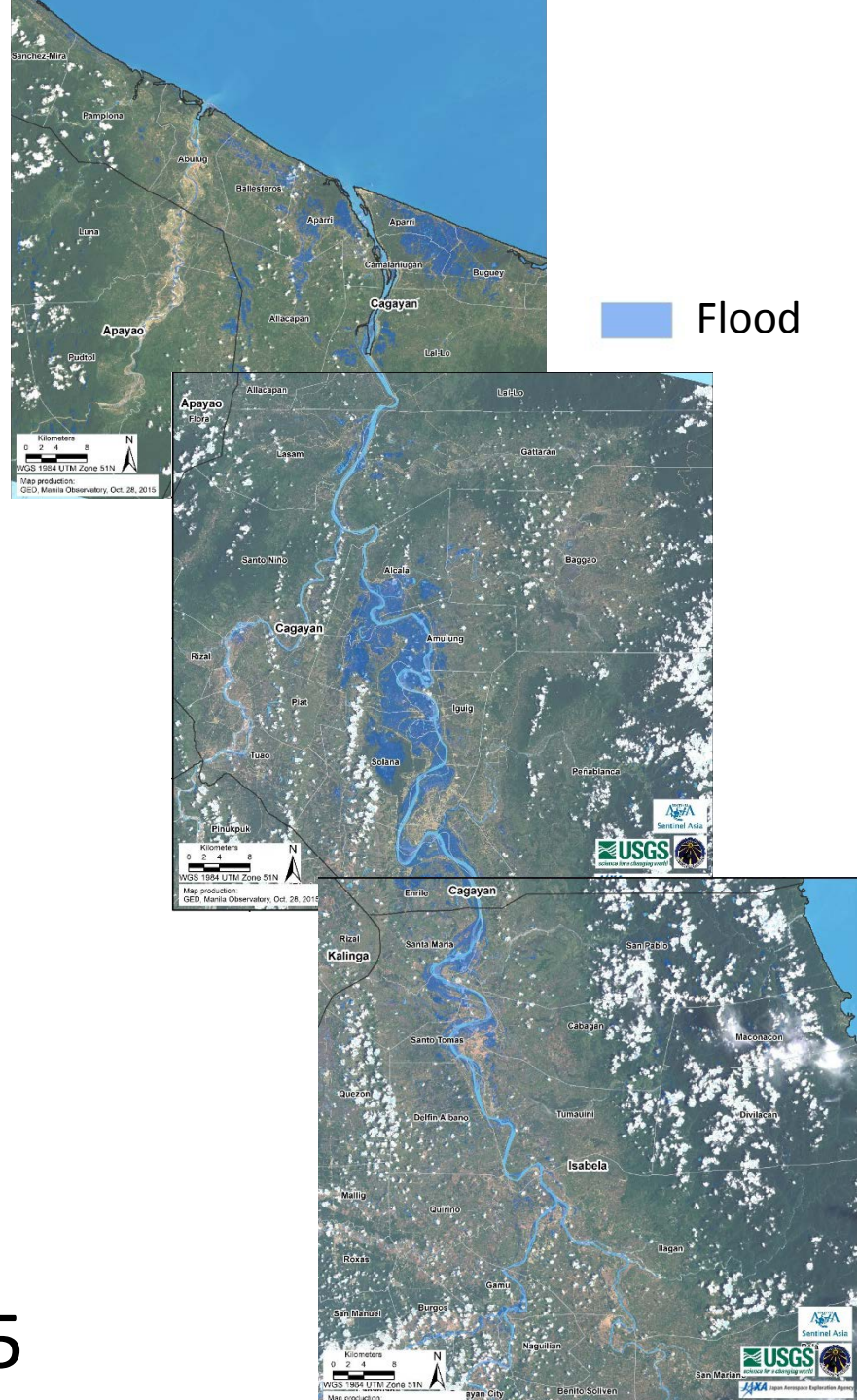
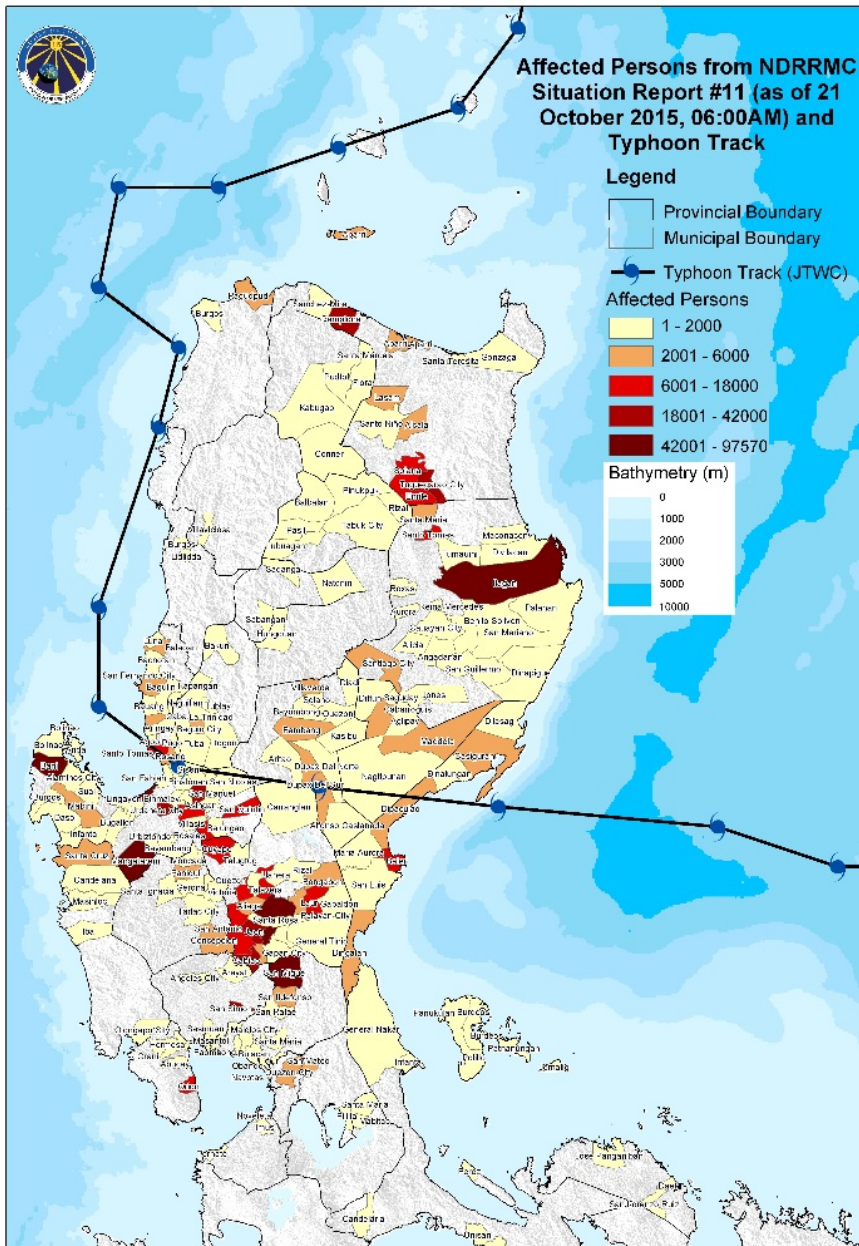
The greatest rainfall was observed in north Metro Manila in the strip from downtown Manila to San Mateo, Rizal

Flooding was reported in the west to eastern strip from downtown Manila to San Mateo, Rizal, and along the western coast of Metro Manila in low elevation zones.



Proposed Emergency Observation (EO) and Mapping Protocol



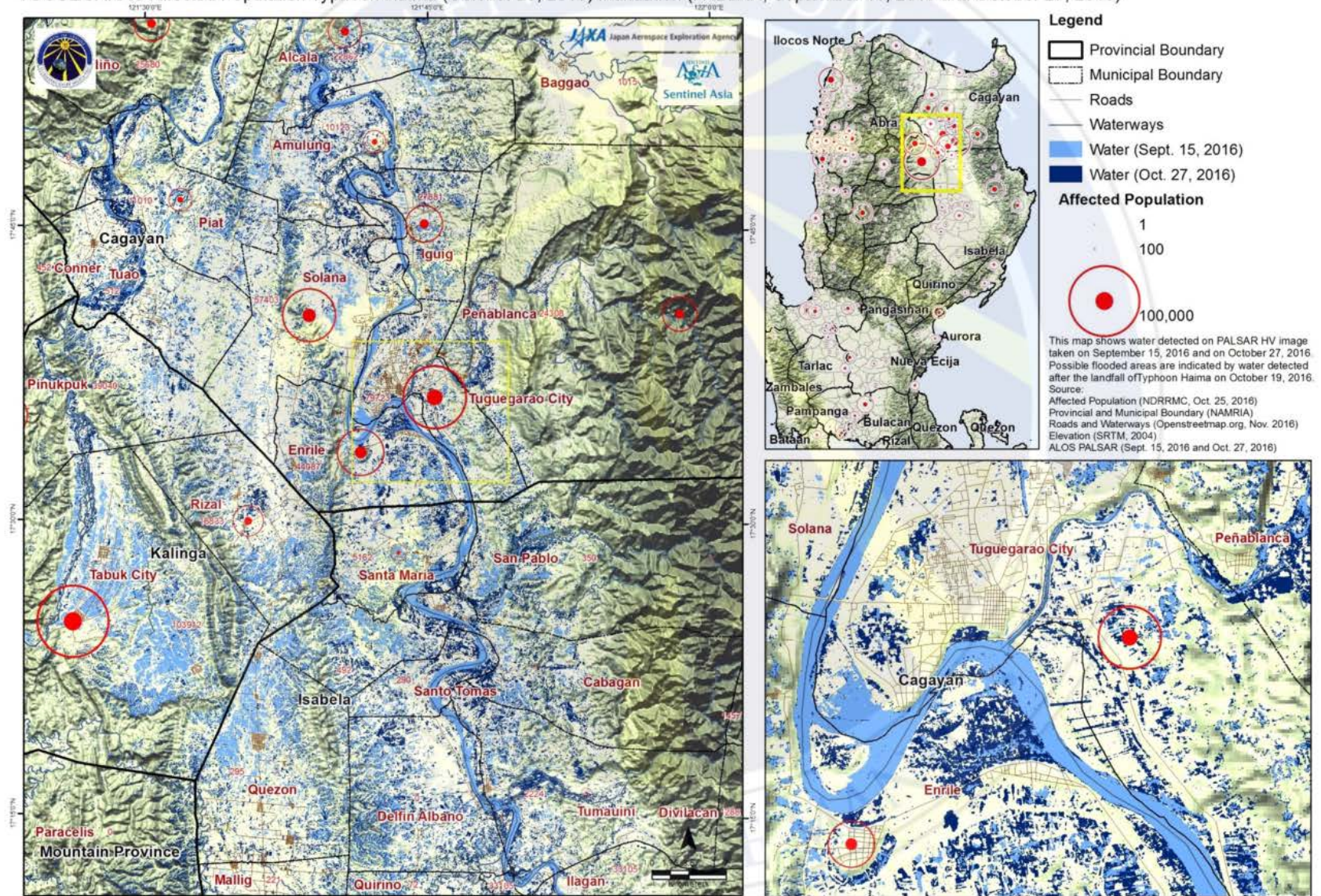


TC Koppu, October 2015

TC HAIMA IMPACTS

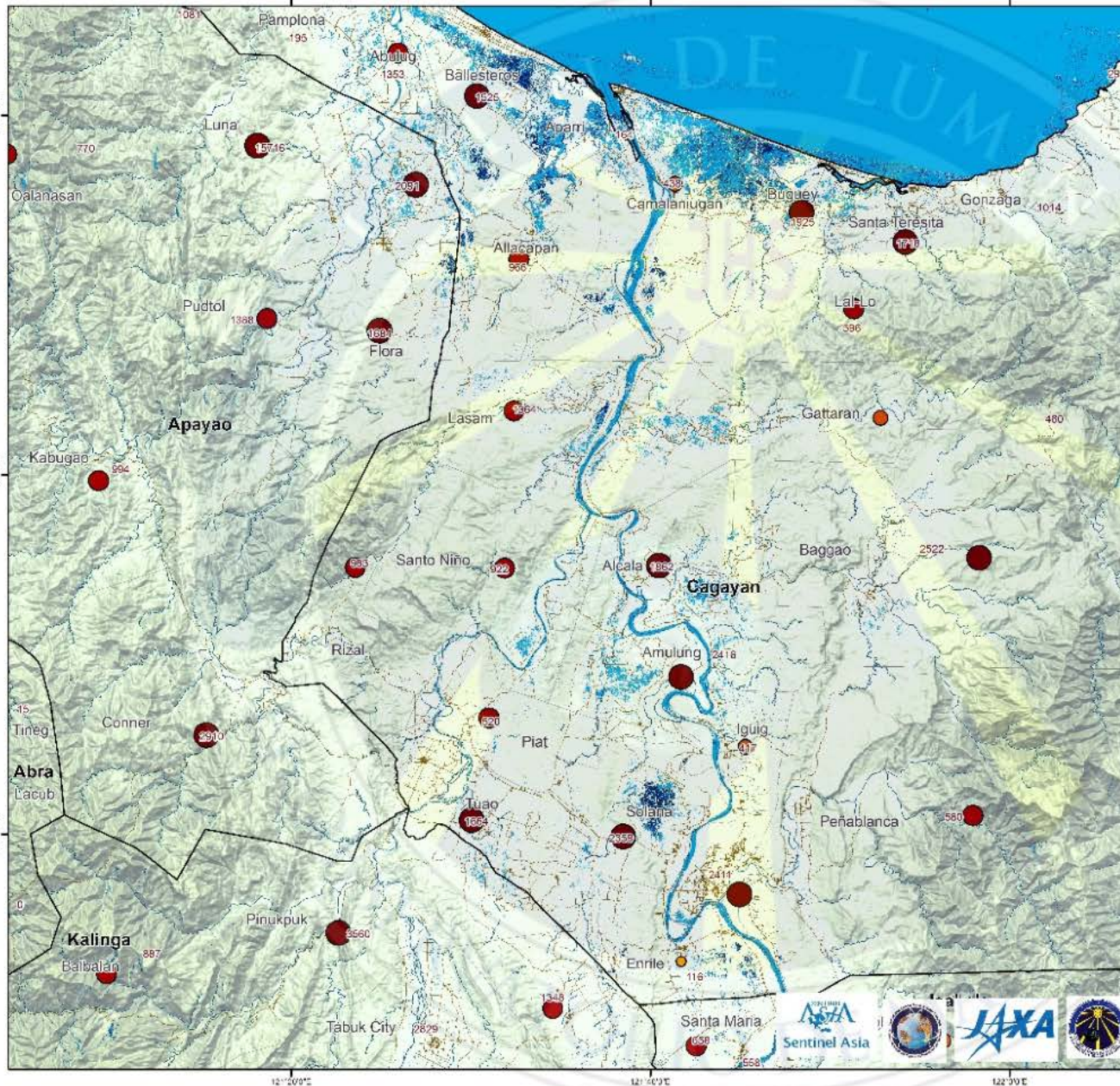
(Flood footprint and affected population)

TUGUEGARAO Affected Population Typhoon Haima (October 25, 2016) Inundation (PALSAR, September 15, 2016 and October 27, 2016)

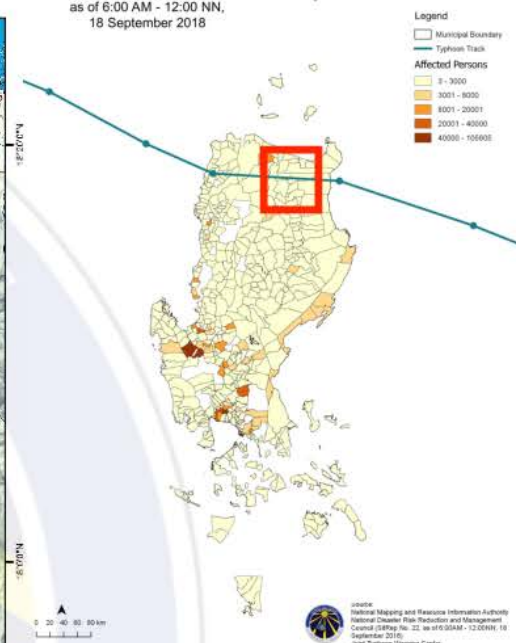


TC Mangkhut, September 2018

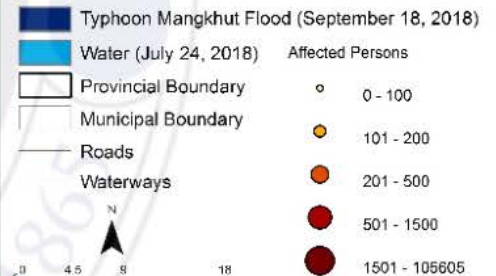
CAGAYAN Typhoon Mangkhut Flood (September 18, 2018) and Affected Persons (September 18, 2018)



TC MANGKHUT IMPACTS
as of 6:00 AM - 12:00 NN,
18 September 2018



Legend



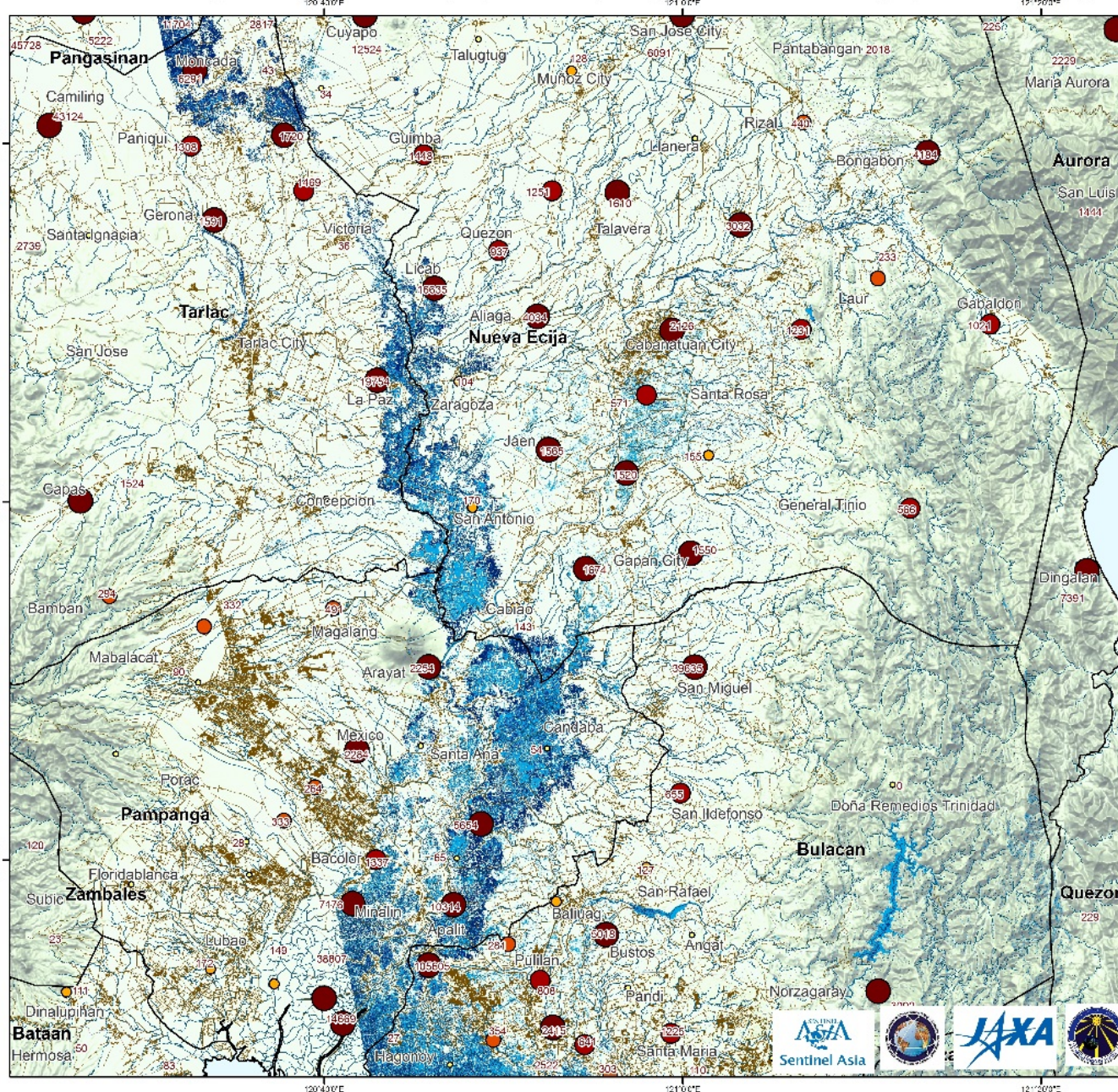
Map Description:

This map shows the inundated areas after Typhoon Mangkhut on September 18, 2018 in Cagayan Province. The image was taken two days after the typhoon's landfall. Note that flooding was also experienced when the pre-flooding image was taken in July 24, 2018.

Source:

Provincial and Municipal Boundary (NAMRIA)
Elevation (SRTM, 2000)
Water (ALOS 2 PALSAR, July 24, 2018)
Flood (ALOS 2 PALSAR, September 18, 2018)
Roads and waterways - Openstreetmap.org
Affected Persons (NDRRMC, September 18, 2018)

CENTRAL LUZON Typhoon Mangkhut Flood (September 18, 2018) and Affected Persons (September 18, 2018)



Legend

- Typhoon Mangkhut Flood (September 18, 2018)
- Water (September 4, 2018)
- Provincial Boundary
- Municipal Boundary
- Roads
- Waterways

Affected Persons

- 0 - 100
- 101 - 200
- 201 - 500
- 501 - 1500
- 1501 - 105605

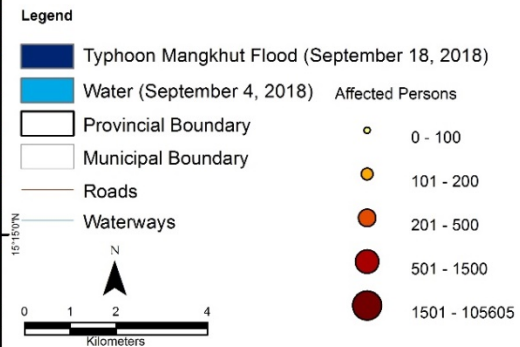
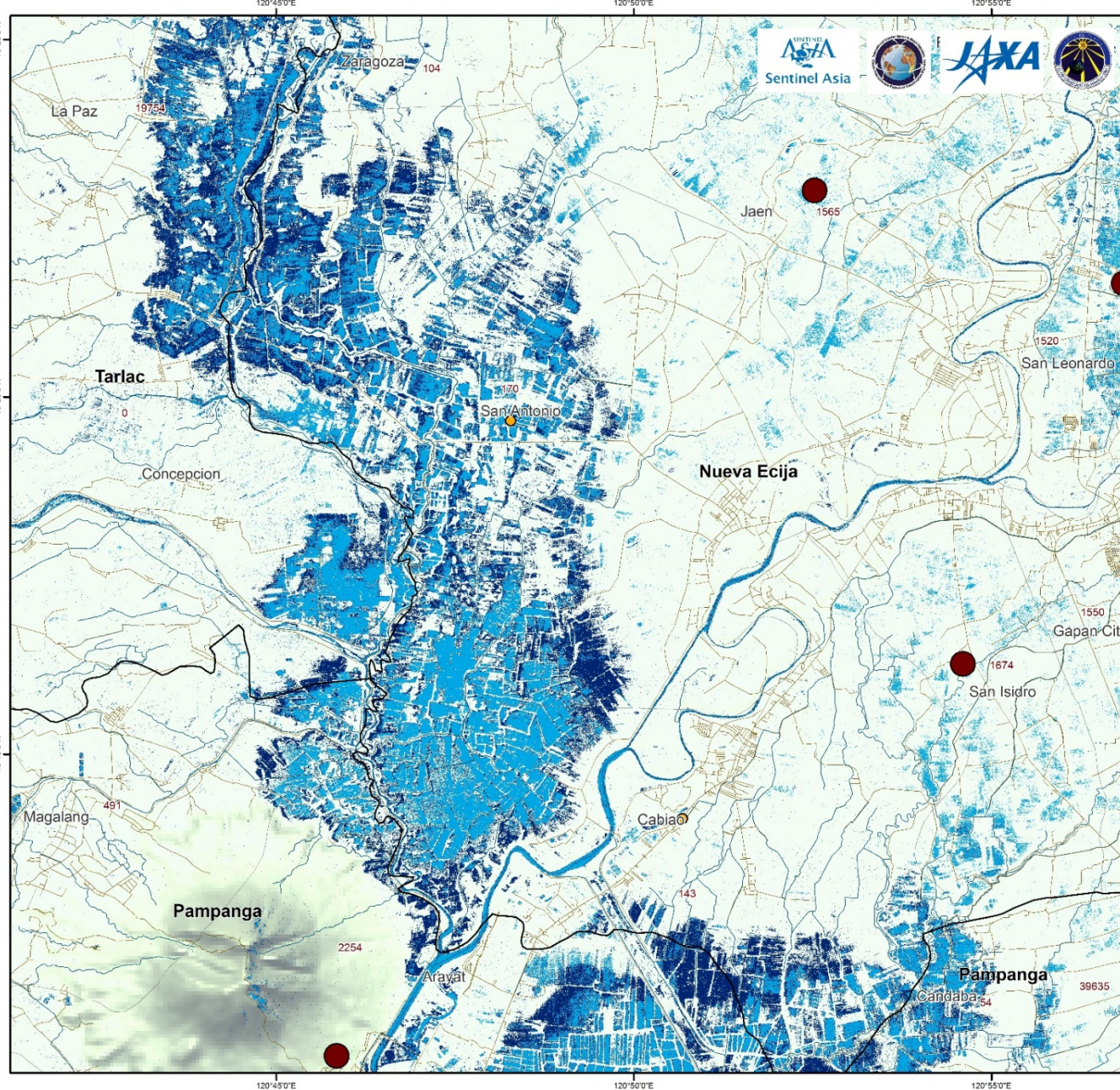
0 4.5 9 18
Kilometers

Map Description:
This map shows the inundated areas after Typhoon Mangkhut on September 18, 2018 in Central Luzon. The image was taken two days after the typhoon's landfall.

Source:
 Provincial and Municipal Boundary (NAMRIA)
 Elevation (SRTM, 2000)
 Water (ALOS PALSAR, September 4, 2018)
 Flood (ALOS 2 PALSAR, September 18, 2018)
 Roads and waterways - Openstreetmap.org
 Affected Persons (NDRRMC, September 18, 2018)



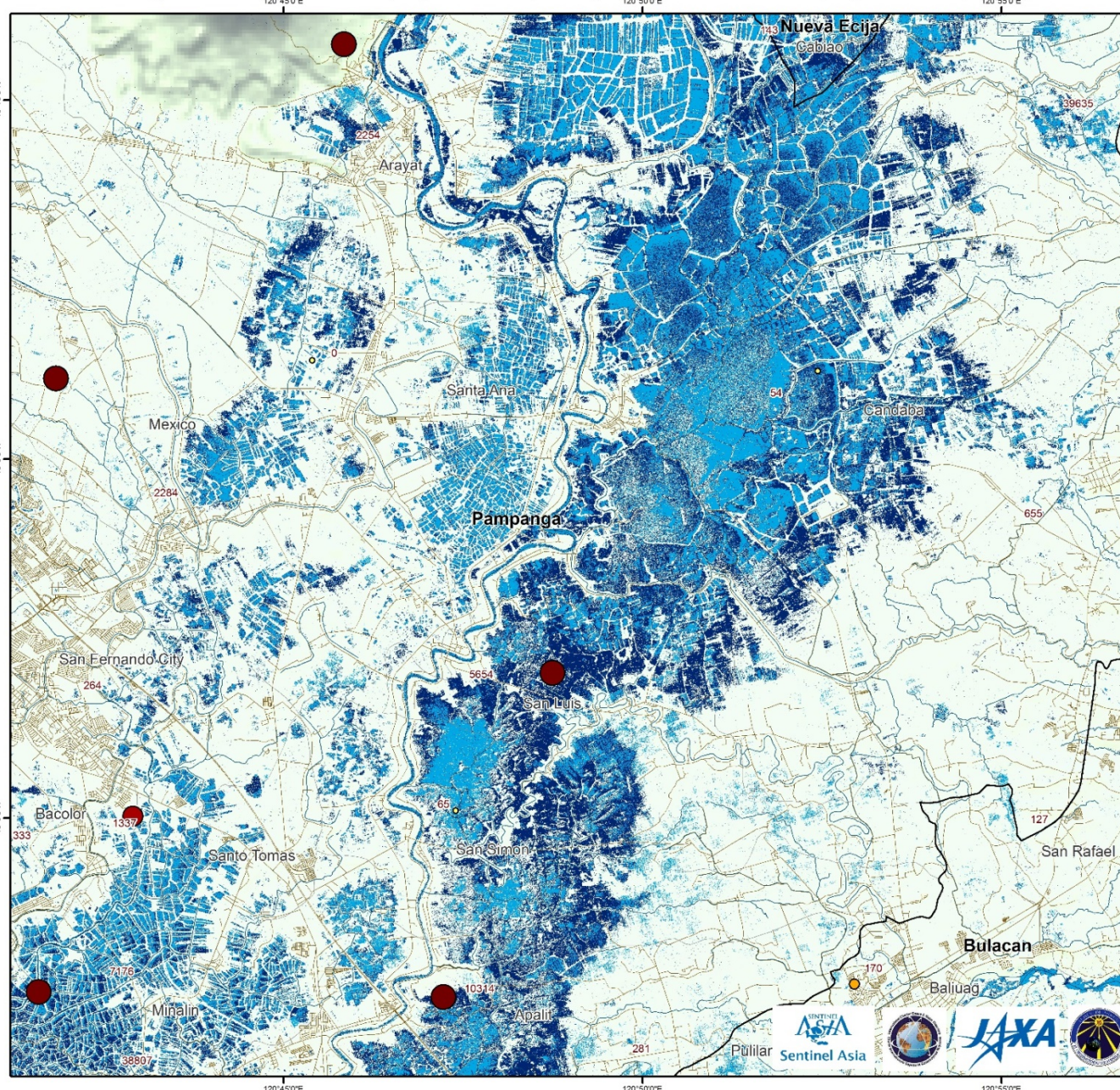
NUEVA ECIJA Typhoon Mangkhut Flood (September 18, 2018) and Affected Persons (September 18, 2018)



Map Description:
This map shows the inundated areas after Typhoon Mangkhut on September 18, 2018 in Nueva Ecija. The image was taken two days after the typhoon's landfall.

Source:
 Provincial and Municipal Boundary (NAMRIA)
 Elevation (SRTM, 2000)
 Water (ALOS PALSAR, September 4, 2018)
 Flood (ALOS 2 PALSAR, September 18, 2018)
 Roads and waterways - Openstreetmap.org
 Affected Persons (NDRRMC, September 18, 2018)

PAMPANGA Typhoon Mangkhut Flood (September 18, 2018) and Affected Persons (September 18, 2018)



Legend

- Typhoon Mangkhut Flood (September 18, 2018)
- Water (September 4, 2018)
- Provincial Boundary
- Municipal Boundary
- Roads
- Waterways

Affected Persons

- 0 - 100
- 101 - 200
- 201 - 500
- 501 - 1500
- 1501 - 105605

N

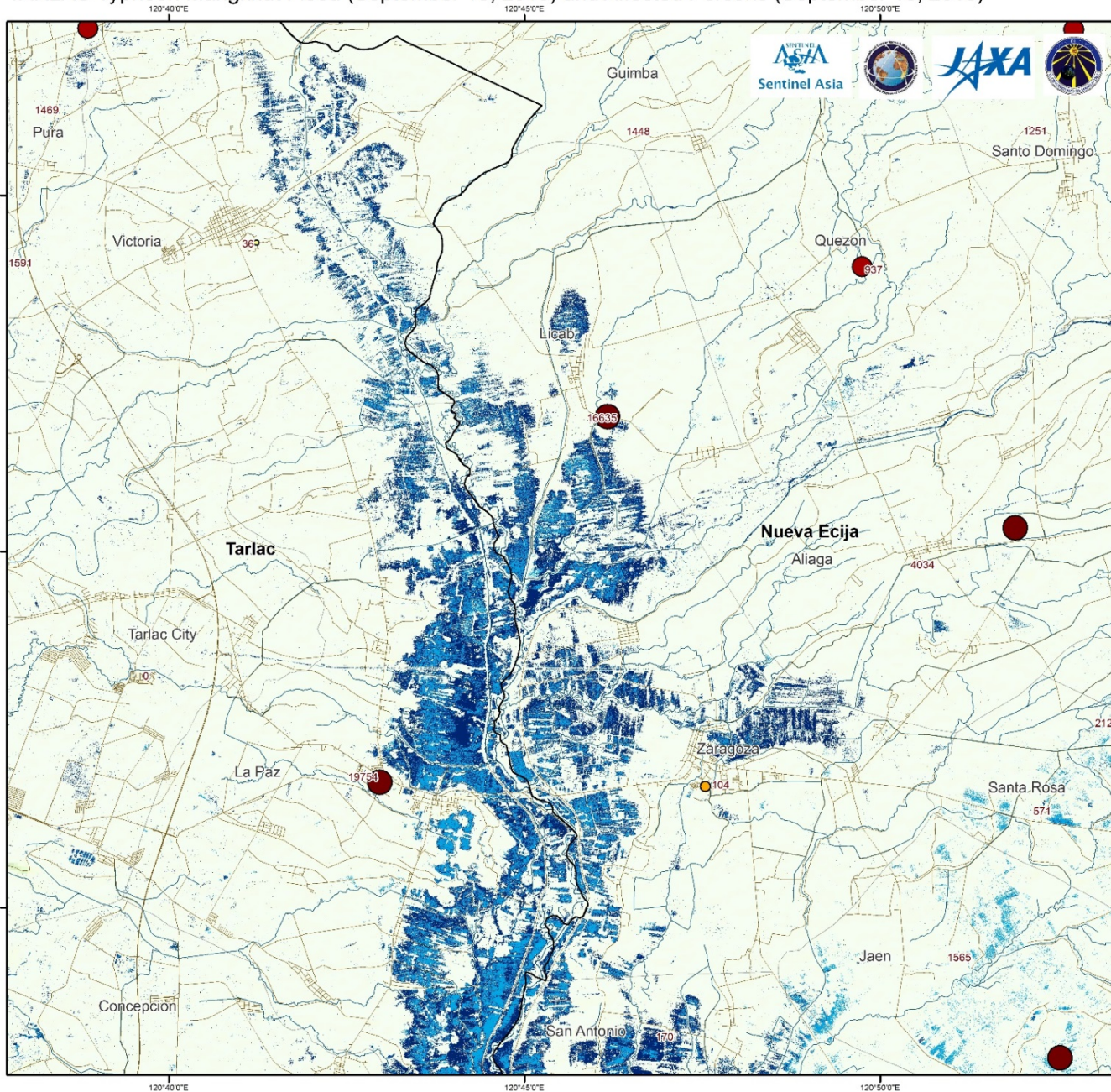
1
2
4

 Kilometers

Map Description:
 This map shows the inundated areas after Typhoon Mangkhut on September 18, 2018 in Pampanga. The image was taken two days after the typhoon's landfall.

Source:
 Provincial and Municipal Boundary (NAMRIA)
 Elevation (SRTM, 2000)
 Water (ALOS PALSAR, September 4, 2018)
 Flood (ALOS 2 PALSAR, September 18, 2018)
 Roads and waterways - Openstreetmap.org
 Affected Persons (NDRRMC, September 18, 2018)

TARLAC Typhoon Mangkhut Flood (September 18, 2018) and Affected Persons (September 18, 2018)



Legend

- Typhoon Mangkhut Flood (September 18, 2018)
- Water (September 4, 2018)
- Provincial Boundary
- Municipal Boundary
- Roads
- Waterways

Affected Persons

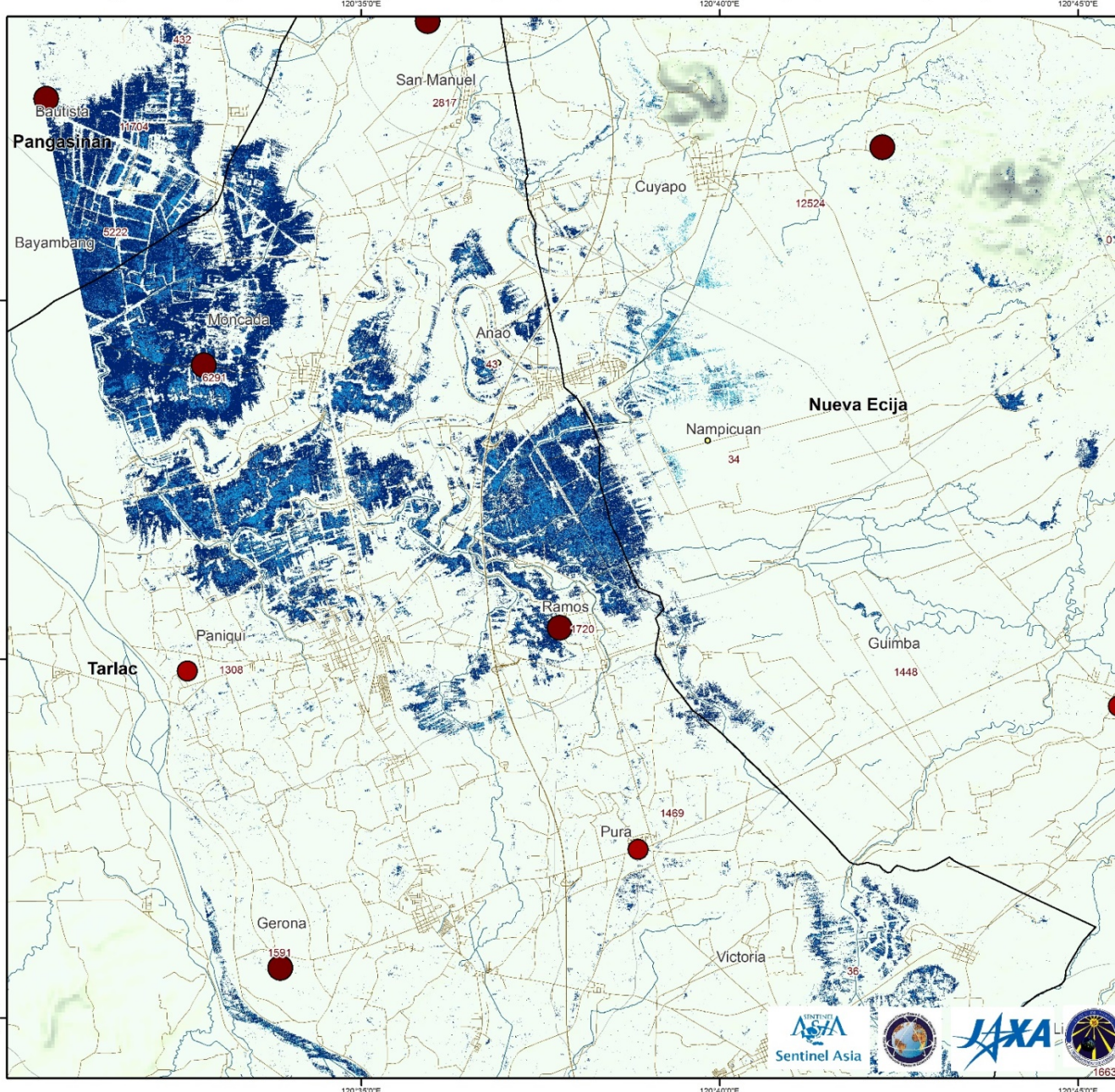
- 0 - 100
- 101 - 200
- 201 - 500
- 501 - 1500
- 1501 - 105605

0 1 2 4
Kilometers

Map Description:
This map shows the inundated areas after Typhoon Mangkhut on September 18, 2018 in Tarlac. The image was taken two days after the typhoon's landfall.

Source:
 Provincial and Municipal Boundary (NAMRIA)
 Elevation (SRTM, 2000)
 Water (ALOS PALSAR, September 4, 2018)
 Flood (ALOS 2 PALSAR, September 18, 2018)
 Roads and waterways - Openstreetmap.org
 Affected Persons (NDRRMC, September 18, 2018)

TARLAC Typhoon Mangkhut Flood (September 18, 2018) and Affected Persons (September 18, 2018)



Legend

- Typhoon Mangkhut Flood (September 18, 2018)
- Water (September 4, 2018)
- Provincial Boundary
- Municipal Boundary
- Roads
- Waterways

Affected Persons

- 0 - 100
- 101 - 200
- 201 - 500
- 501 - 1500
- 1501 - 105605

0 1 2 4
Kilometers

Map Description:
This map shows the inundated areas after Typhoon Mangkhut on September 18, 2018 in Tarlac. The image was taken two days after the typhoon's landfall.

Source:
 Provincial and Municipal Boundary (NAMRIA)
 Elevation (SRTM, 2000)
 Water (ALOS PALSAR, September 4, 2018)
 Flood (ALOS 2 PALSAR, September 18, 2018)
 Roads and waterways - Openstreetmap.org
 Affected Persons (NDRRMC, September 18, 2018)



Final Reports

- Discussion and Summary of previous bulletins
- Assessment of:
 - Forecast skill
 - Tools
 - Operations
 - Impact on target users (partners)
- Recommendations

Future Plans

- Obtaining archival impacts data of at least 30 years from NDRRMC
- Upload EO maps in the MO Geoportal