

# Mapping the Impacts of Typhoon Kalmaegi (Tino) in Leyte

Geomatics for Environment and Development (GED) Laboratory

MANILA OBSERVATORY

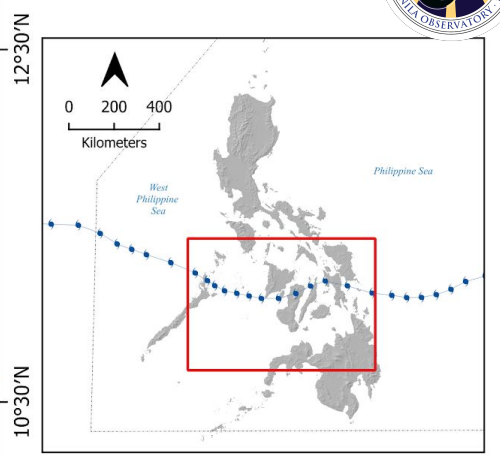
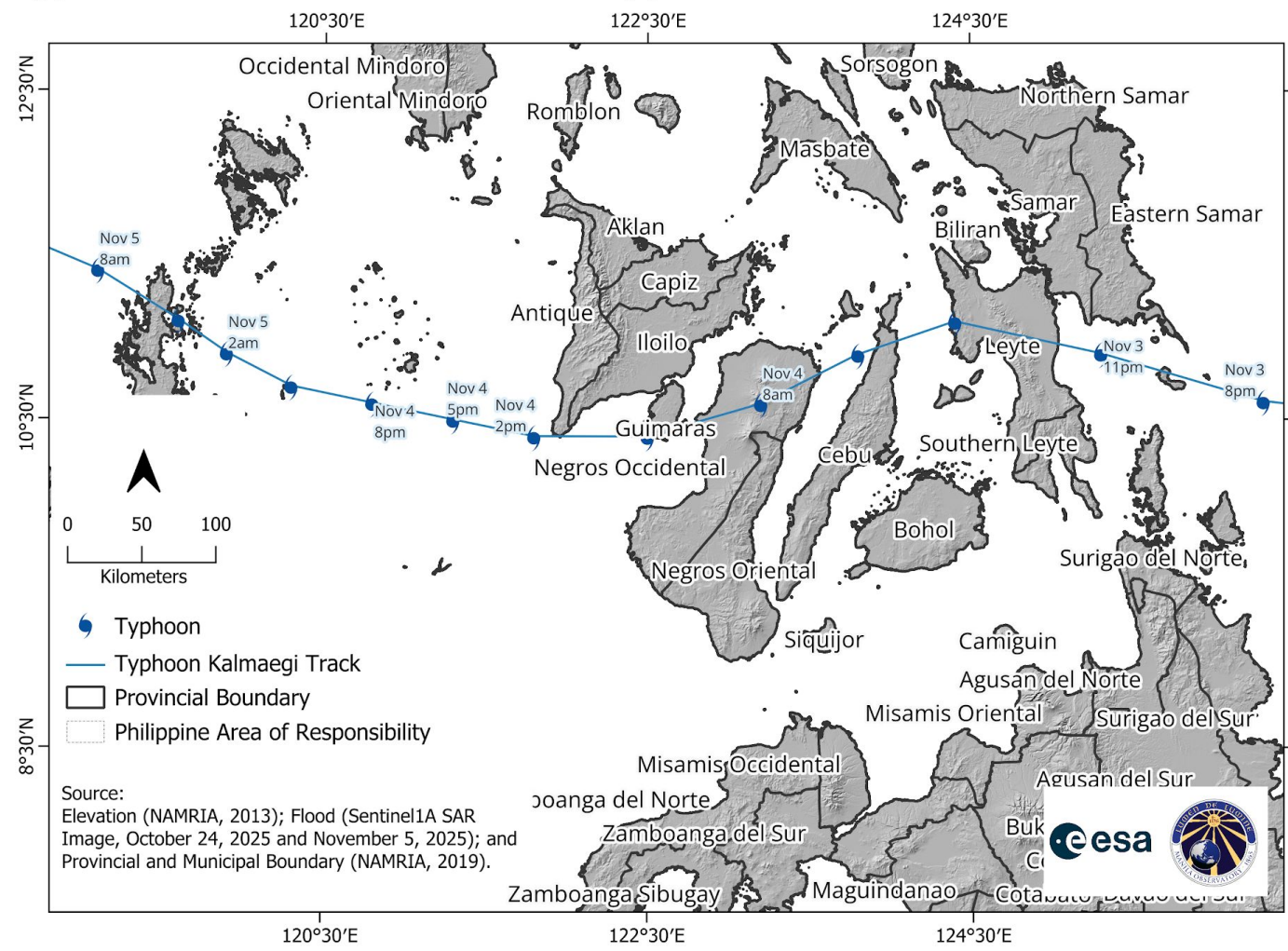
March 9, 2026

# Summary

- Several areas in Visayas experienced accumulated 24-hour rainfall exceeding 200 mm during onslaught of Typhoon Kalmaegi (Tino) on November 3 to 4, 2025
- Multi-temporal Synthetic Aperture Radar images detected flooding in the Provinces of Leyte, Cebu, Negros Occidental, Capiz, and Iloilo.
- Generated map shows population density overlaid with detected flood caused by Typhoon Tino, affected population, loss and damage to agriculture, and flooded road.



# Typhoon 'Tino' Track over the Philippines



Kalmaegi or 'Tino' entered the Philippine Area of responsibility (PAR) at 11:00 am Nov. 2, 2025 as Tropical Storm. It made landfall on Nov. 4, 2025 over the Province of Leyte.

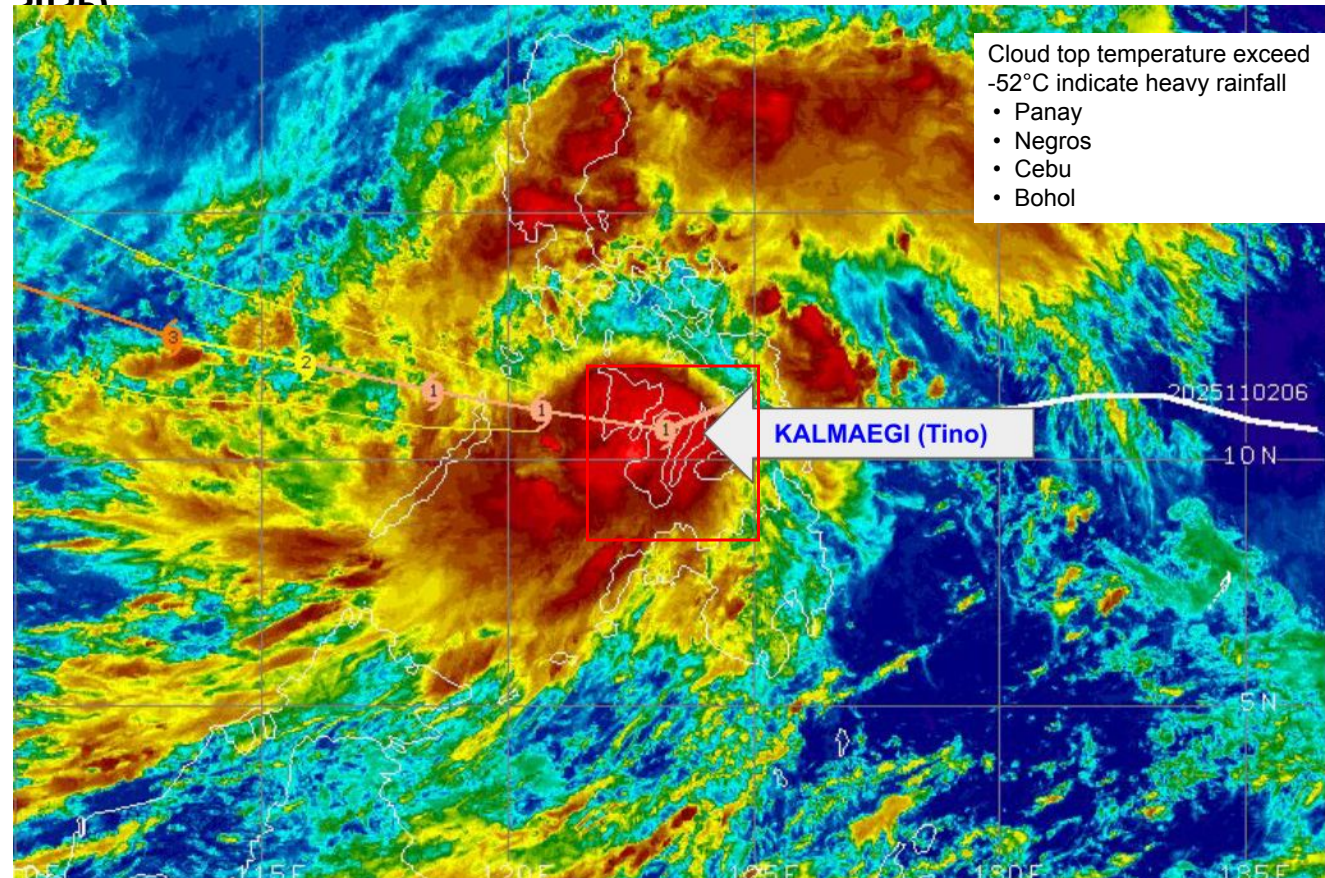
Typhoon 'Tino' (NDRRMC Situation Report No. 30)

- It made multiple landfall over Leyte, Cebu, Negros Occidental, Guimaras, Iloilo, and Palawan
- Tino exited PAR on Nov. 6, 2025, it moved past Kalayaan Islands to Vietnam.

Source: Elevation (NAMRIA, 2013); Flood (Sentinel1A SAR Image, October 24, 2025 and November 5, 2025); and Provincial and Municipal Boundary (NAMRIA, 2019).



# Typhoon Tino Rainfall over Visayas (November 4, 2025)



Cloud top temperature exceed  $-52^{\circ}\text{C}$  indicate heavy rainfall

- Panay
- Negros
- Cebu
- Bohol



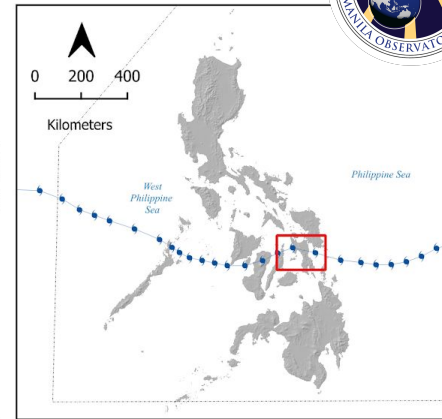
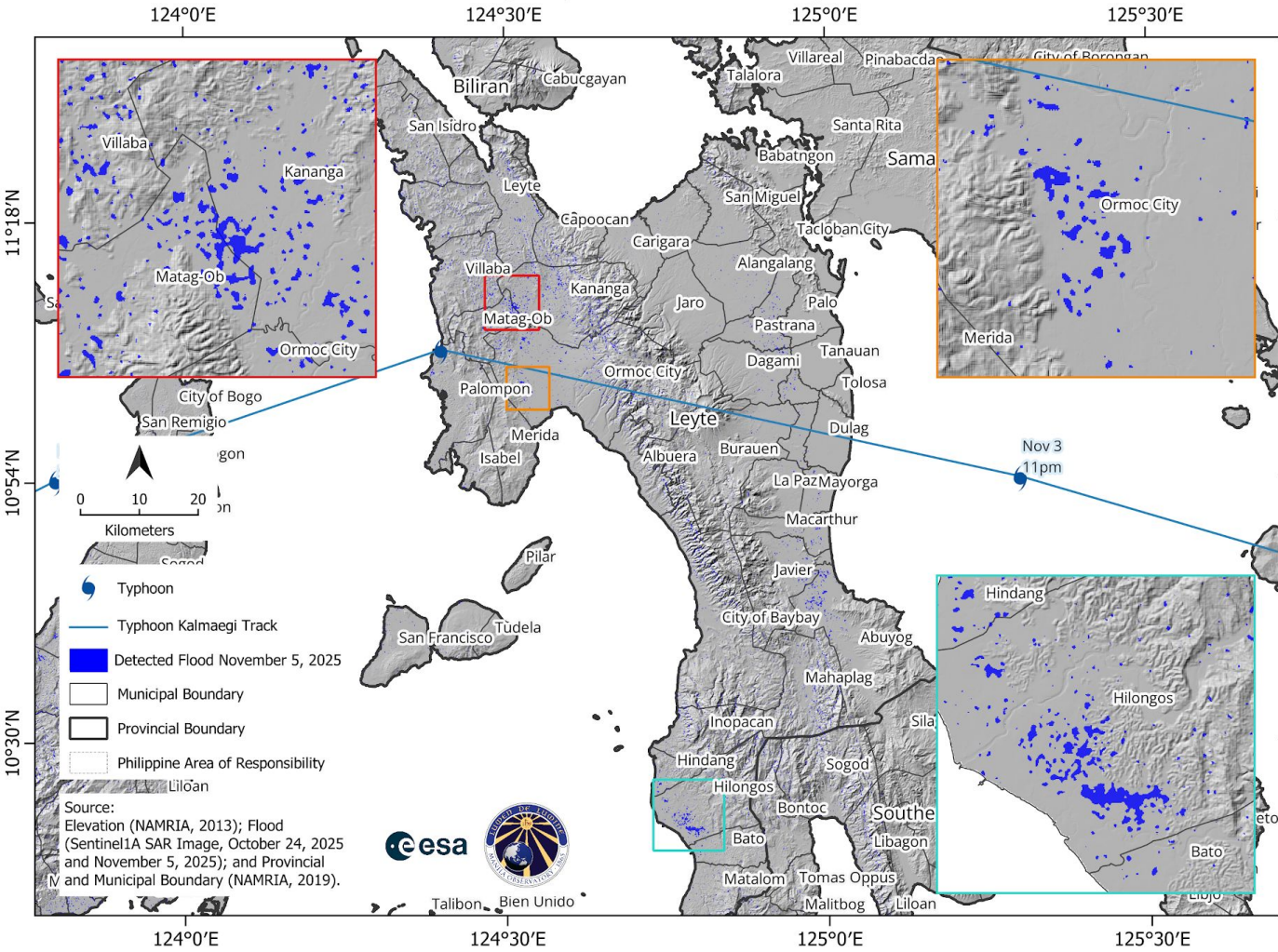
**Affected Major River Basin:**

- Panay
- Jalaur
- Iloilo-Batiano
- Ilog-Hilabangan
- Central Cebu



## INFRARED SATELLITE IMAGE

# Detected Flood in Province of Leyte (Sentinel 1A Images, October 24, 2025 and November 5, 2025)



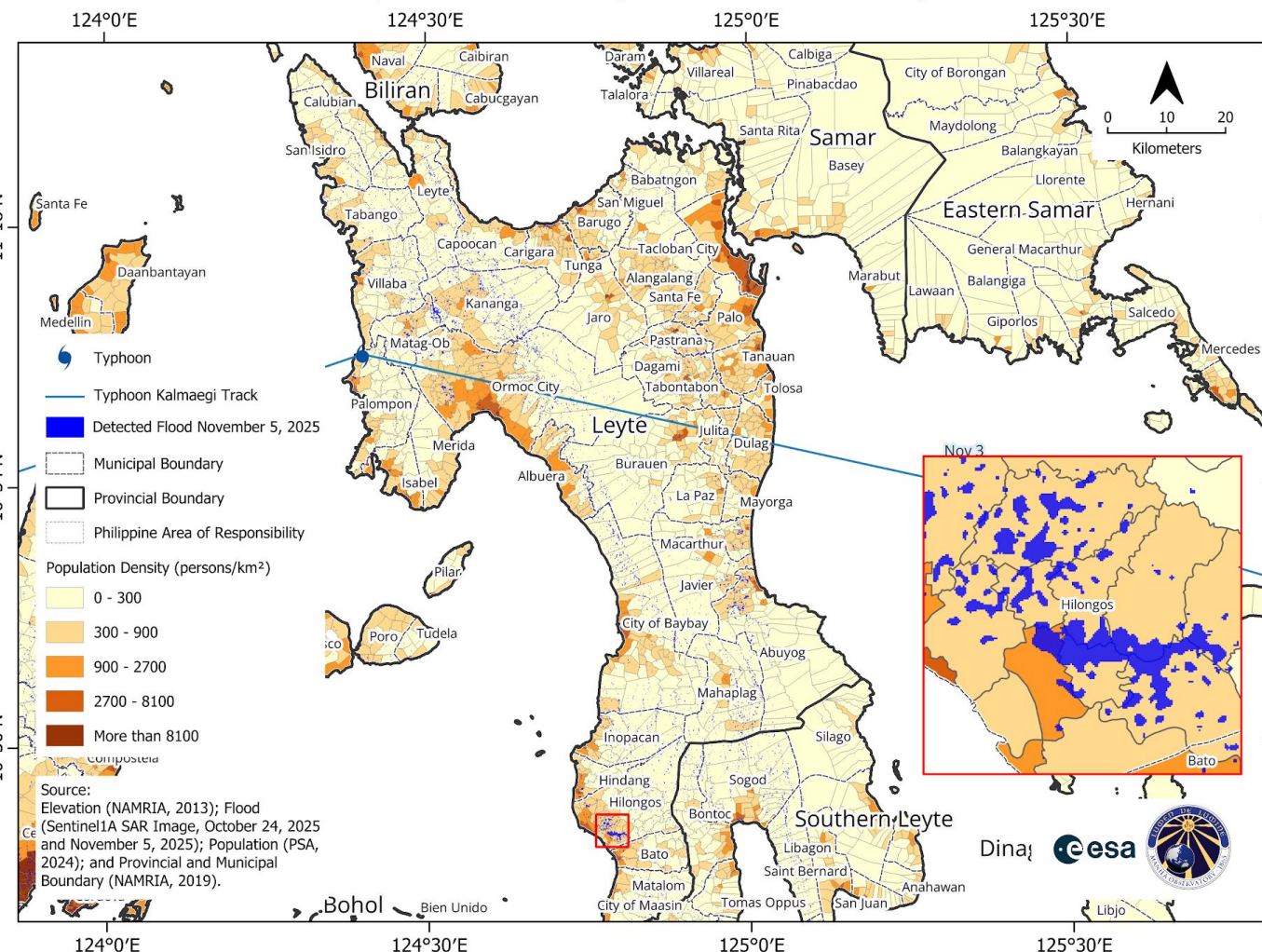
Highlighted in blue are the observed flooded areas in Leyte Island after >200 mm of rain due to Typhoon 'Tino' on Nov 3, 2025.

- Flood extent was detected by thresholding the difference of pixel values of Sentinel-1 SAR image taken on Oct 24, 2025 and Nov 5, 2025.
- Please note that flood extent could be underestimated in urban areas due to complex backscattering over built surface.
- Note also that **no ground validation** was done for this map.

**Flooded municipalities in Leyte**

- Kananga
- Matag-Ob
- Ormoc City
- Abuyog
- Hindang
- Hilongos

# Detected Flood and Population Density in Province of Leyte



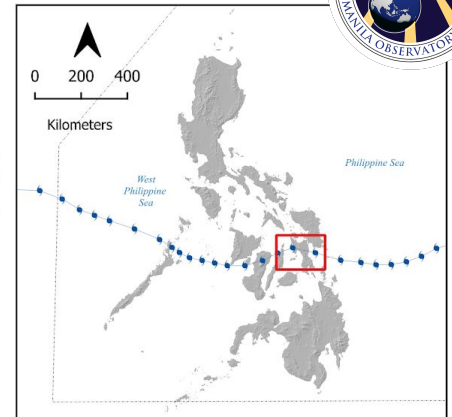
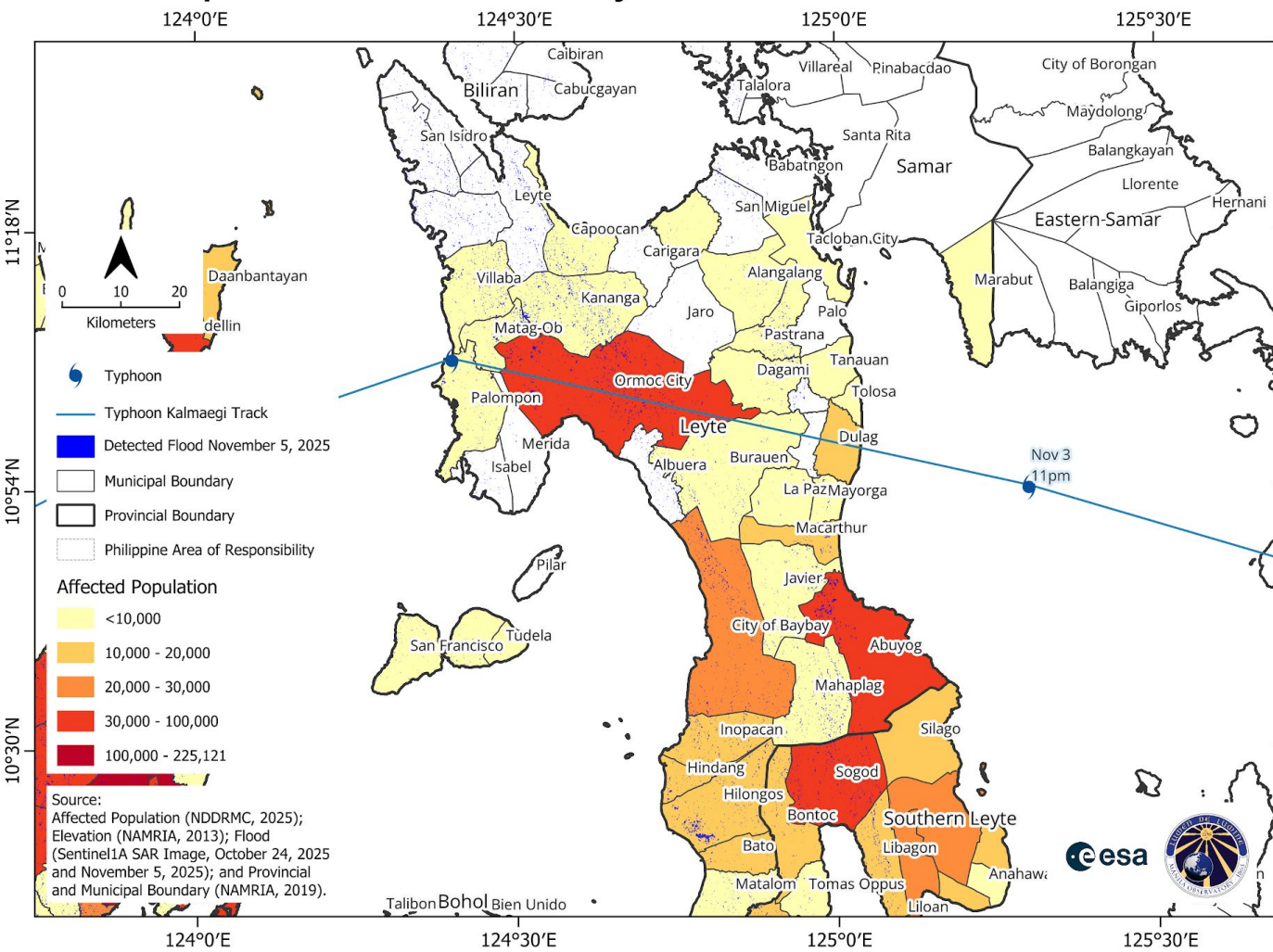
**Flooded Municipalities and Cities with Densely Populated Barangays (More than 8100 persons/km<sup>2</sup>)**

- Ormoc
- Carigara
- Palompon
- City of Baybay
- Bato
- Burauen
- Hilongos
- Isabel
- Abuyog
- Calubian

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# Affected Population in Province of Leyte

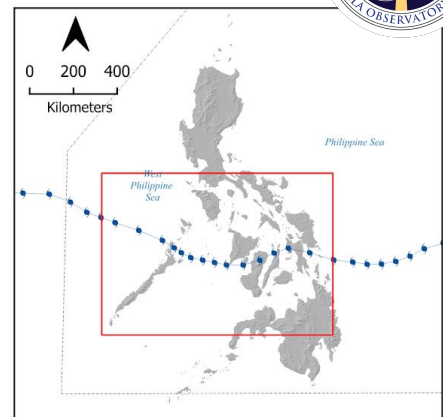
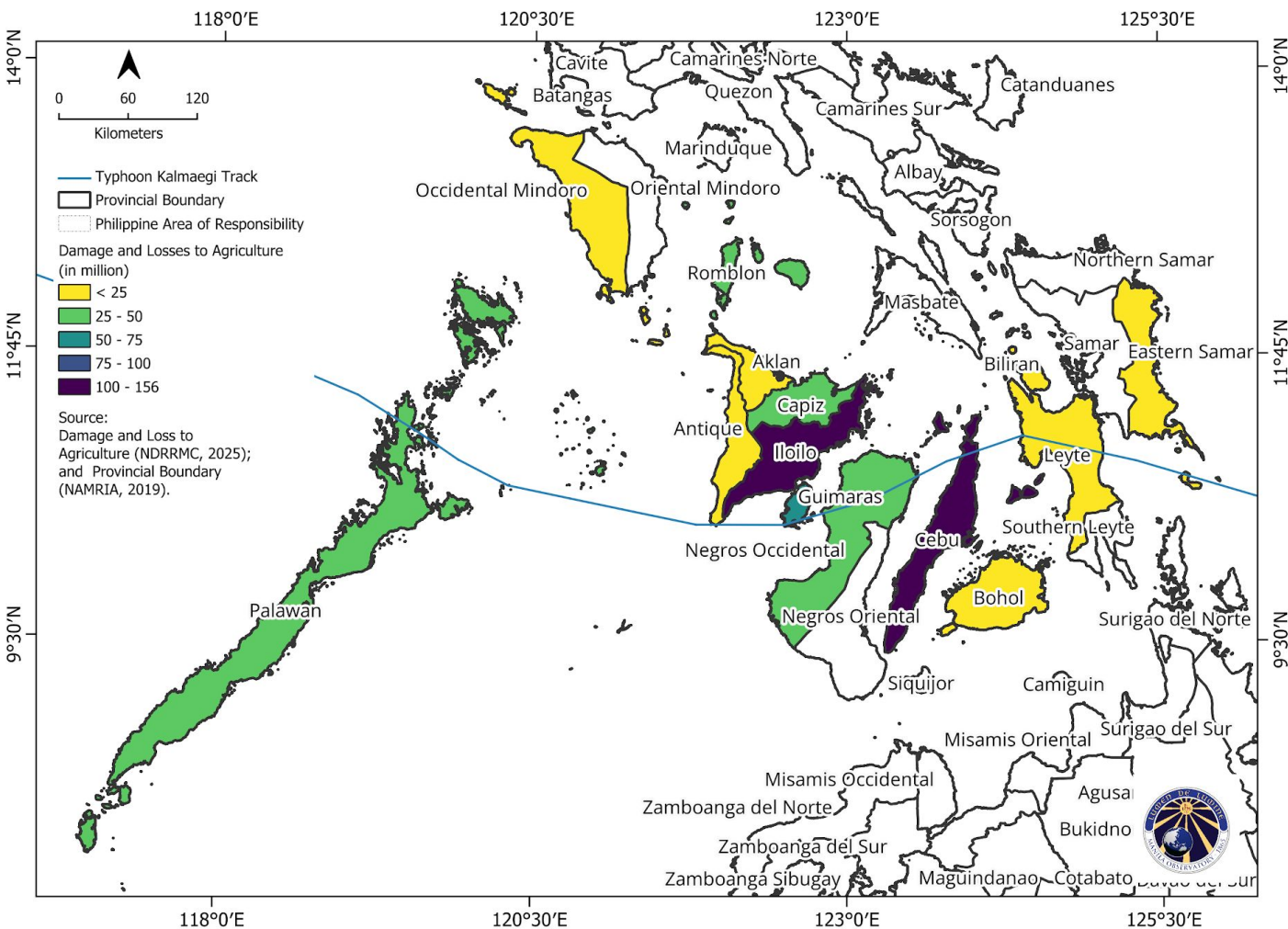


- Affected Population by City/Municipality (More than 10,000 person)**
- Abuyog
  - Ormoc City
  - City of Baybay
  - Macarthur
  - Inopacan
  - Burauen
  - Dulag
  - Bato
  - Hilongos
  - Hindang

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# Damage and Loss to Agriculture

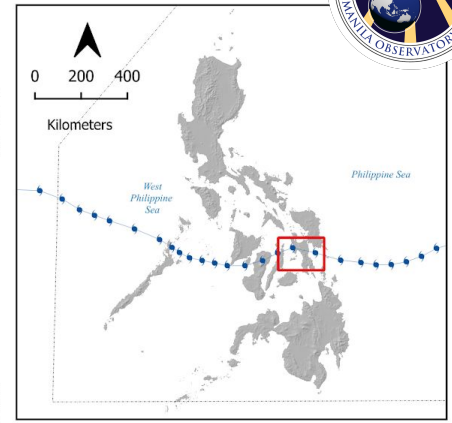
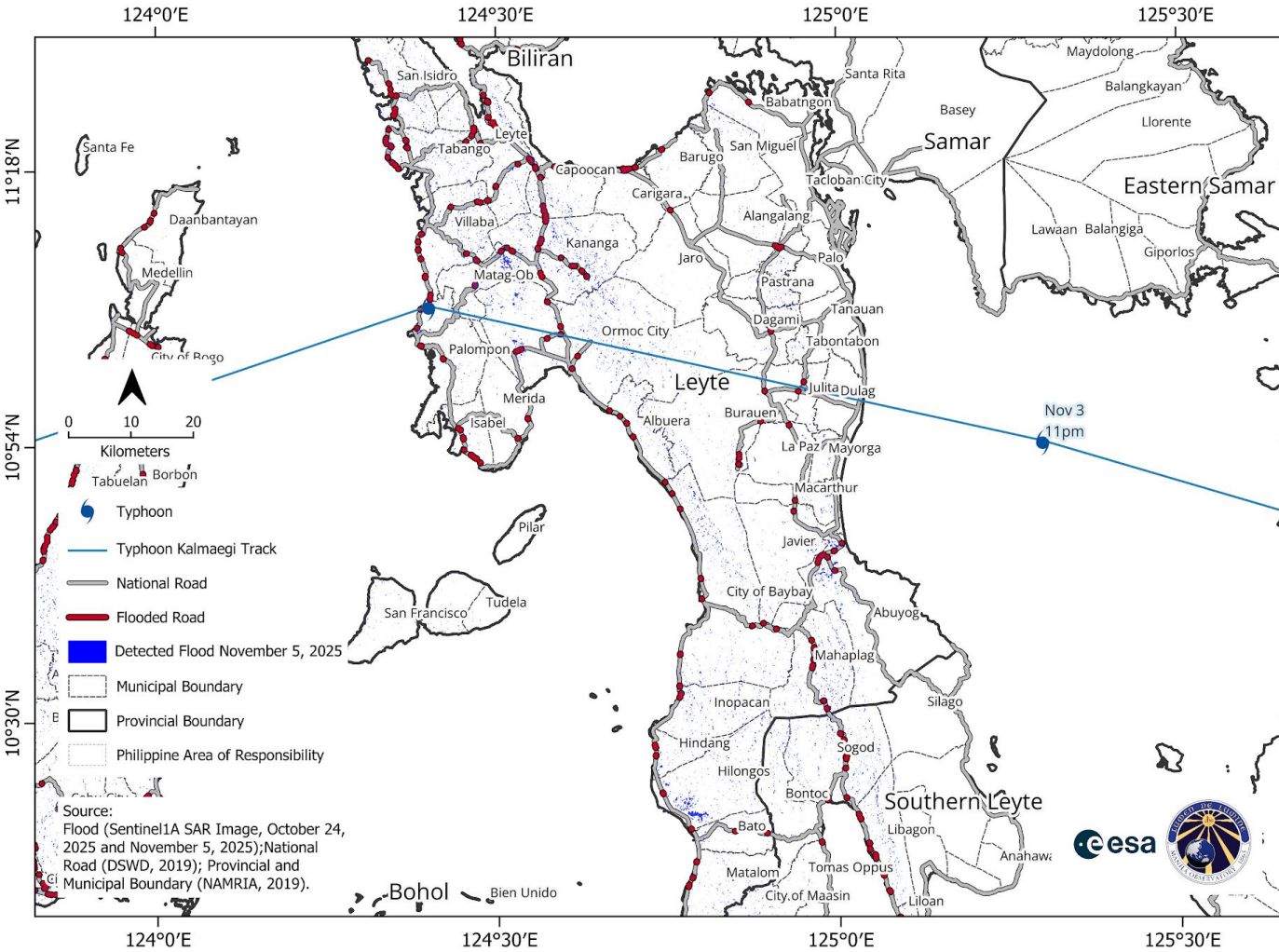


**Province with Damage and Loss in Agriculture (More than 25 million)**

- Cebu
- Iloilo
- Guimaras
- Romblon
- Negros Occidental
- Capiz
- Palawan



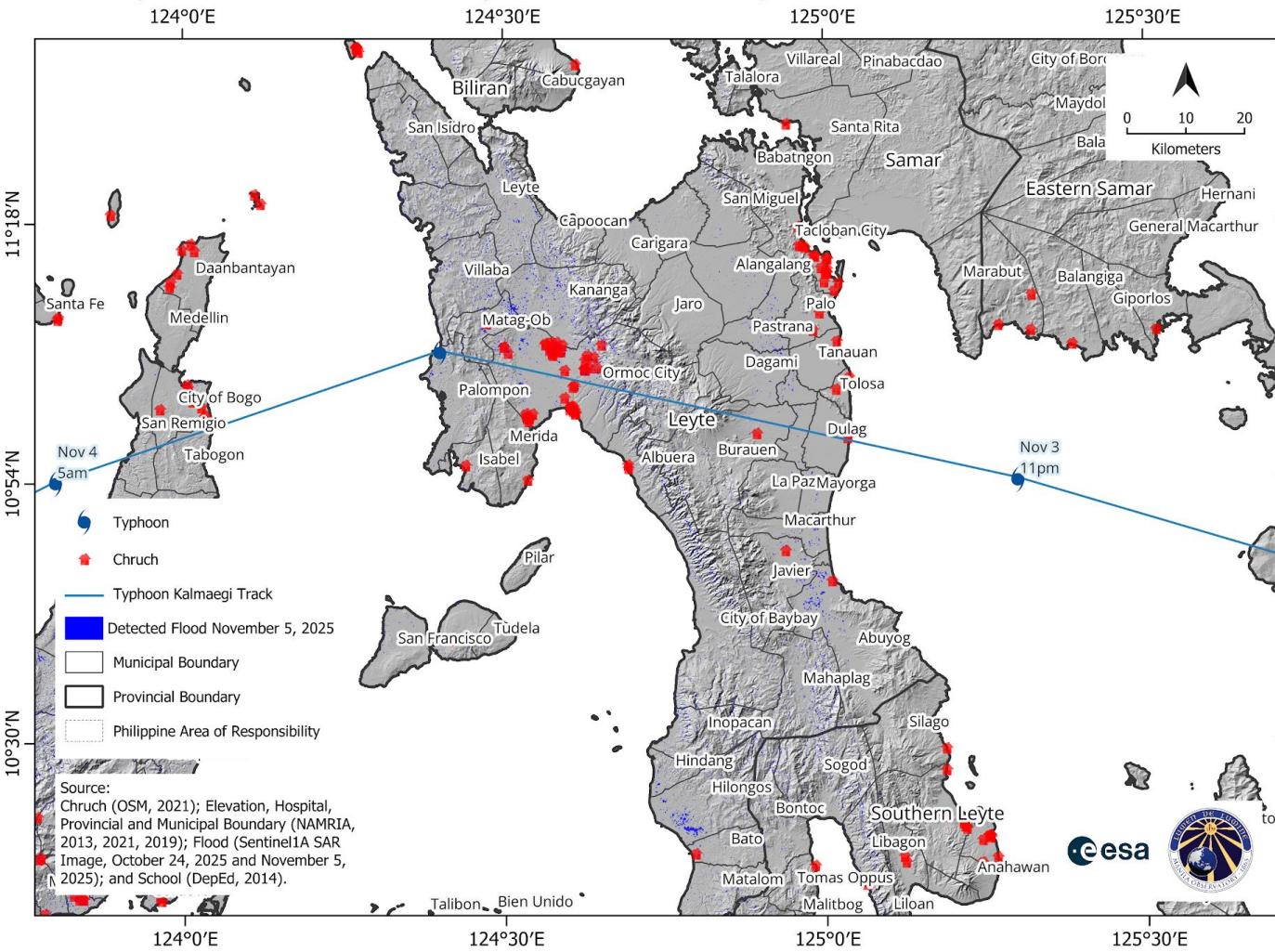
# Flooded Road in Province of Leyte



- Municipalities and Cities With Flooded National Road (More than 1 km)**
- Tabango
  - Kananga
  - Ormoc City
  - Villaba
  - City of Baybay
  - Capoocan
  - Abuyog
  - San Isidro
  - Mahaplag
  - Hindang
  - Hilongos
  - Matalom
  - Inopacan
  - City of Baybay
  - Palompon
  - Leyte
  - Isabel

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# ChruCh (Critical Infrastructure) in Province of Leyte



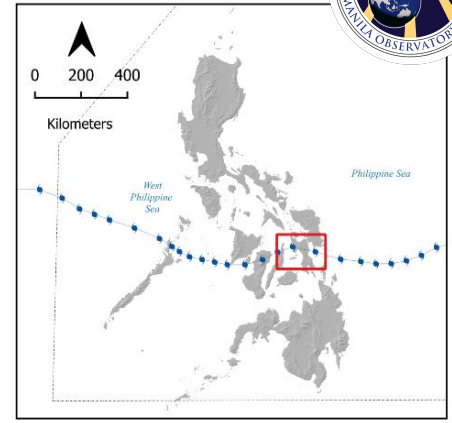
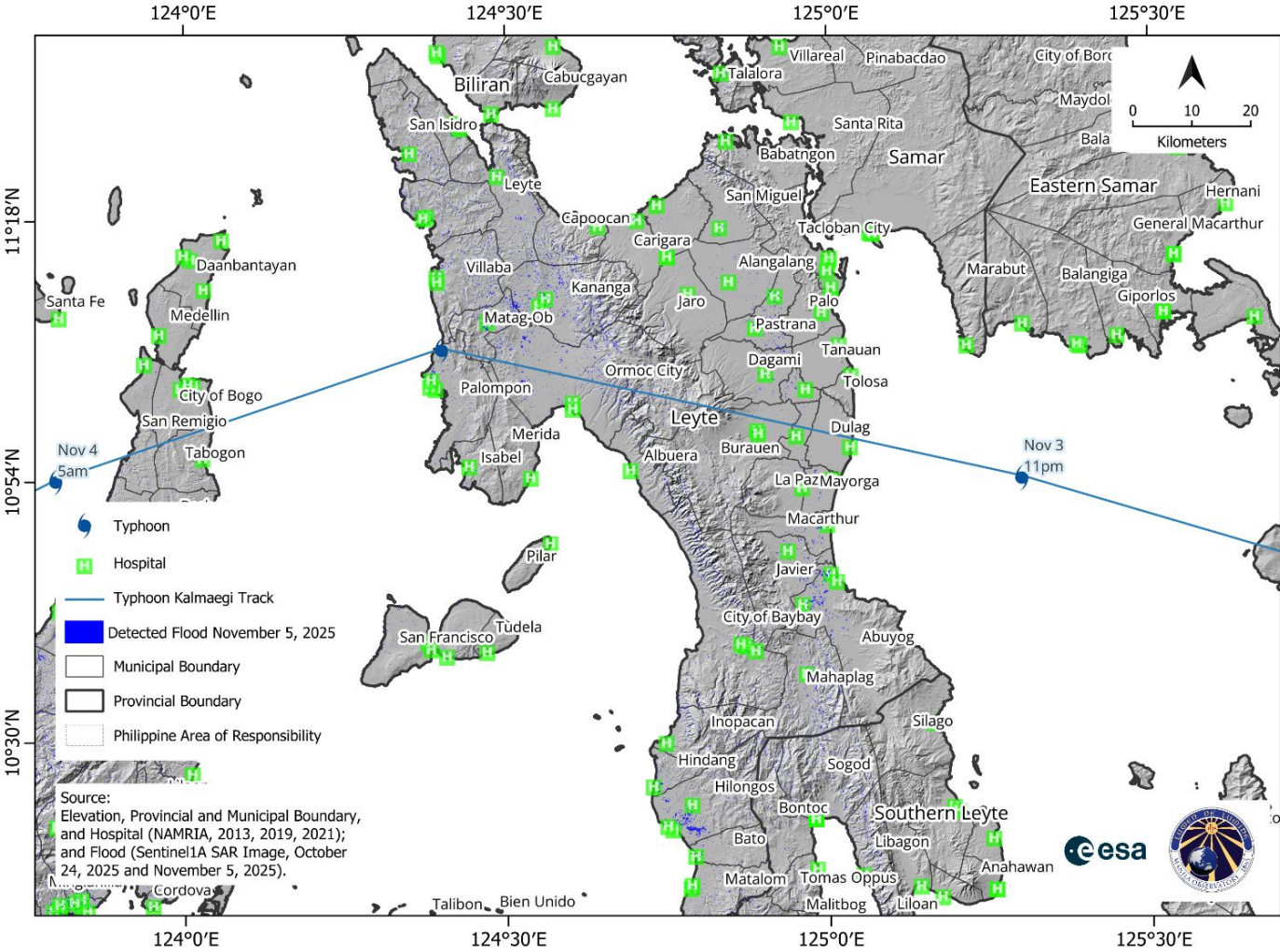
- Typhoon
- ChruCh
- Typhoon Kalmaegi Track
- Detected Flood November 5, 2025
- Municipal Boundary
- Provincial Boundary
- Philippine Area of Responsibility

Source:  
 ChruCh (OSM, 2021); Elevation, Hospital,  
 Provincial and Municipal Boundary (NAMRIA,  
 2013, 2021, 2019); Flood (Sentinel1A SAR  
 Image, October 24, 2025 and November 5,  
 2025); and School (DepEd, 2014).



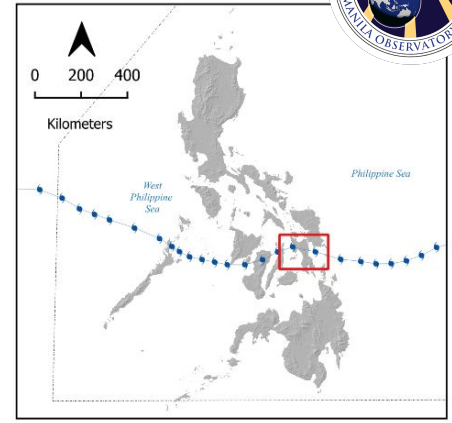
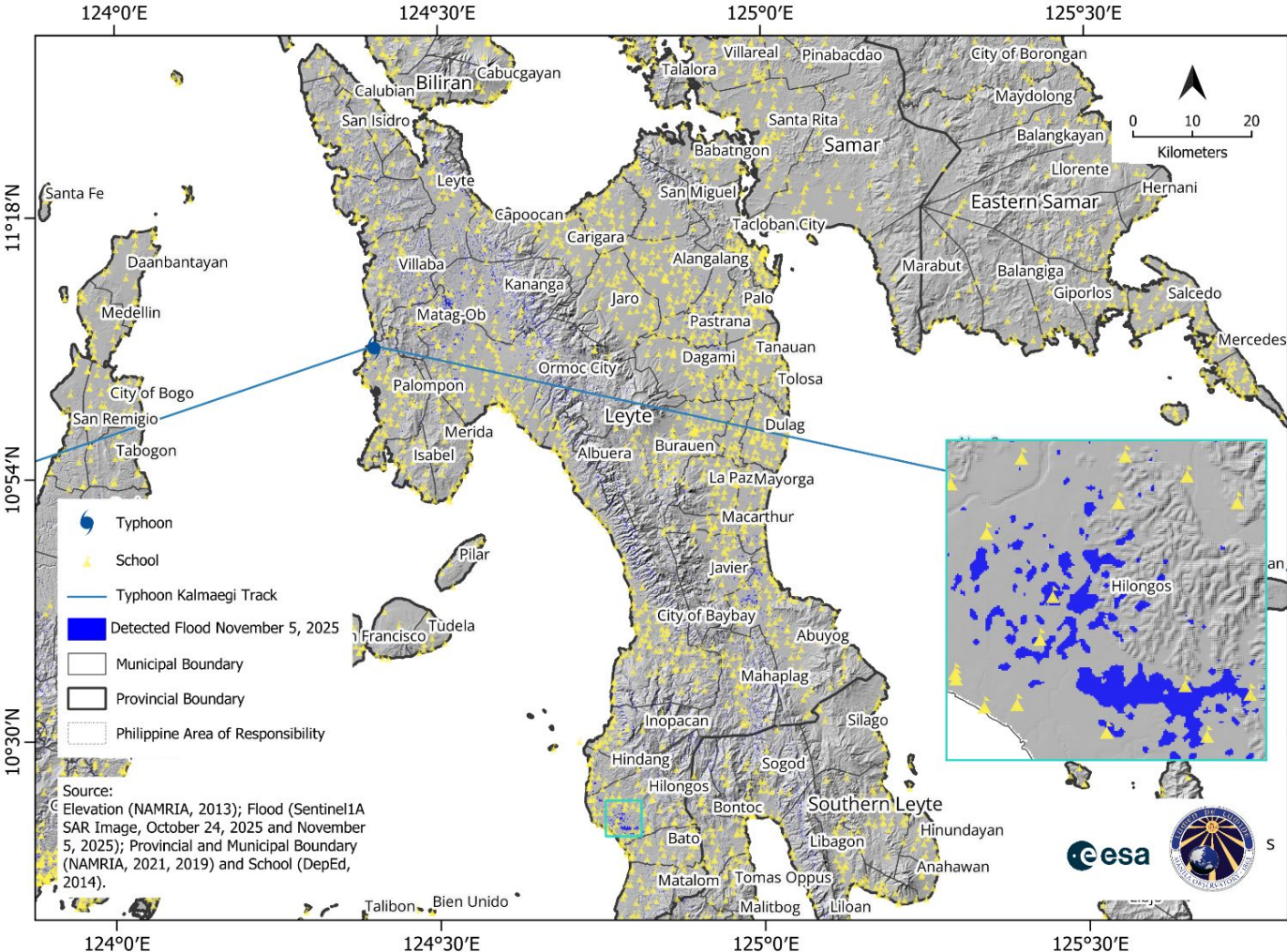
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# Hospital (Critical Infrastructure) in Province of Leyte



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# School (Critical Infrastructure) in Province of Leyte



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For queries, request, comments, suggestions, please email  
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