Center for Disaster Management and Risk Reduction Technology

CEDIM Forensic Disaster Analysis Group (FDA)

TYPHOON 22W "Hagupit" – Short Summary

09 December 2014 – Report No. 1 – 12:00 GMT

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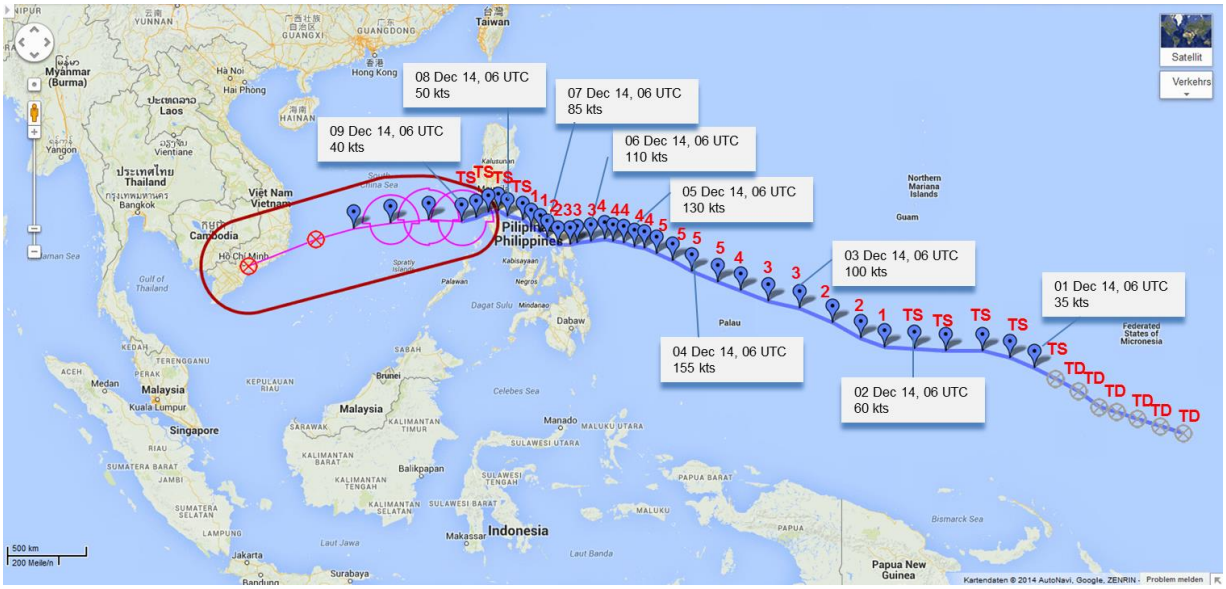
SUMMARY

Official Disaster Name	Date	Landfall UTC	Local	Duration (PH)
Typhoon 22W Hagupit (Ruby)	**06-09 Dec 2014**	**06 DEC, 13:15 UTC**	**+8**	**72 hours**

Location Information:

Country	ISO	Provinces/Regions	Most Impact
Philippines	**PH**	**Metro Manila, Region III (Central Luzon), Region IV-A (Calabarzon), Region IV-B (Mimaropa), Region V (Bicol), Region VIII (Eastern Visayas)**	**Samar, Masbate, Luzon, Mindoro**
Fed. States of Micronesia	**FM**	**Yap**	
Republic of Palau	**PW**		
Vietnam	**VN**	**Southern, central**	

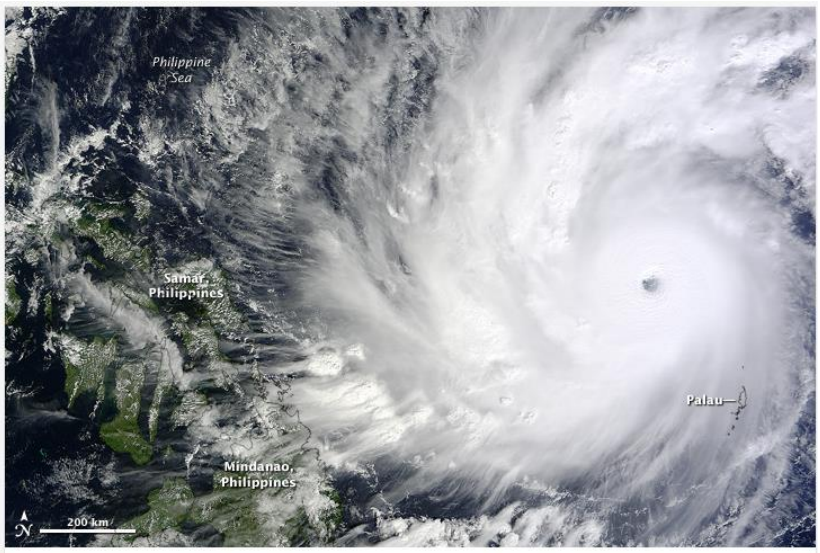


Track of Super-Typhoon HAGUPIT, 6 hourly timestep (Analysis 29 Nov - 09 Dec and forecast 09 - 12 Dec 2014). Red numbers represent the storm's category (Cat 1 – Cat 5) according to the Saffir-Simpson Hurricane scale (TD – Tropical Depression, TS – Tropical Storm). Data source: Joint Typhoon Warning Center

Hazard Description (Wind speed etc.) Hagupit was the 4th Supertyphoon in 2014 in the Western Pacific

On 30 Nov-02 Dec 2014

- Hagupit developed from a low pressure area that was identified at 4N 154E in the area of the Federated States of Micronesia. Warm ocean water and favourable atmospheric conditions fed thunderstorm clusters that became organized and formed a Tropical Storm on 1 Dec.
- Hagupit became a Cat 1 typhoon as of 2 Dec 14, 15 UTC, with sustained winds of 70 kt and a propagation speed of 17 kt to the west
- Tropical storm and typhoon warnings were issued for parts of Micronesia (Woleai, Yap)



Satellite image on 04 Dec 2014, 02:10 UTC; Hagupit and its well pronounced eye some hundred km east of the Philippines. Image credit: NASA

On 03-04 Dec 2014

- Hagupit made its way through Micronesia and headed from near Palau towards central Philippines. On 03 Dec, 15 UTC, sustained winds were 100 kts.
- Hagupit showed maximum intensity on 04 Dec between 00 and 15 UTC with sustained winds of 155 kt. At 15 UTC the storm center was 500 km southeast of Samar (PH) at 11N 131E.
- Tropical storm warnings were in effect for parts of the Republic of Palau (Kayangel, Koror)
- Public storm warnings were in effect for parts of the Philippines

On 05-06 Dec 2014

- Hagupit lost intensity but still made its way through Micronesia and headed from near Palau towards central parts of the Philippines. On 05 Dec, 15 UTC, sustained winds were 130 kts, CAT 4. The position of the eye was at 12N 128E, 300 km east of Samar.
- Many warnings were in effect throughout the Philippines
- While approaching Samar, Hagupit showed further decreasing. On 06 Dec, 12 UTC, sustained winds were at 110 kt, CAT 3. The typhoon was 100 km east of Samar, travelling west at 8 kt.

On 06-09 Dec 2014

- Landfall of Hagupit according to all available data was on 06 Dec 2014, 13-14 UTC, near Dolores on Eastern Samar. According to JTWC the typhoon had sustained winds of 110 kt, CAT 3. Central pressure was 935 hPa (JMA).
- While propagating through the Philippines with a speed of 10-15 kph, the typhoon gradually decreased and finally lost typhoon status around 00 UTC on 08 Dec. Hagupit made several landfalls before the storm center entered the South China Sea on 09 Dec, 00 UTC
- Many warnings due to wind, precipitation and storm surge were in effect throughout the Philippines

Outlook (+48 - +96h)

- Hagupit is expected to move across the South China Sea towards southern Vietnam and could make landfall as Tropical Depression or Tropical Storm on 11 Dec 2014.
- Intense rainfall and flooding is possible in southern and central Vietnam. Rain amounts may exceed 100 mm /24 hours.

Due to a relatively slow shift along its track, Hagupit was responsible for intense rain which caused landslides, flooding and falling debris.

72h-Rain amounts (06 Dec 00 UTC, - 09 Dec 00 UTC, data source: DWD Java Map)
Legaspi / Luzon: 268 mm
Catbalogan / Samar: 433 mm
Borongan / Samar: 406 mm
Masbate City / Masbate: 420 mm
Tayabas / Luzon: 292 mm
Calapan / Dolores: 211 mm
Alabat / Alabat Island: 234 mm
Manila Int. Airport: 44 mm

What have been the largest comparable damaging events (in the Philippines) in the past?

Date - Name	Impact Size (1 min sustained)	Location	fatalities	Economic Loss in Philippines
2013 Haiyan	Typhoon (315 kph)	Leyte, Samar, Tacloban	6340 (confirmed)	$9-17b UDS (CEDIM estimate)
2012 Bopha	Typhoon (280 kph)	Southern PH	1146, 834 missing	$1.04b USD (42b PHP)
1990 Mike	Typhoon (280 kph)	Central PH	748	$879m USD (2013 adj.)
1995 Angela	Typhoon (150-170 kph)	Manila	936	$315m USD 1995 unadj

Disaster Preparedness:

Evacuation:

- On December 3rd, three days prior to the first landfall, the NDRRMC "advised local DRRMCs to initiate pre-emptive evacuation of families in low-lying and mountainous areas if situation warrants" (Weather Bulletin No.1, http://www.ndrrmc.gov.ph/).
- Two days before landfall the Department of Education was readying evacuation centers, various MDRRMCs were preparing for or already conducting pre-emptive evacuation, and a few areas discussed forced evacuations (SitRep No.2, http://www.ndrrmc.gov.ph/). Tacloban City for example "activated evacuation center facilities and conducted pre-emptive evacuation" two days before landfall. (SitRep No.2, http://www.ndrrmc.gov.ph/)
- Prior to the first landfall, 716,639 people had been pre-emptively evacuated (SitRep No.7, http://www.ndrrmc.gov.ph/

Warnings:

- From December 4th – 8th the NDRRMC issued an average of 4 Weather Bulletins per day, or one every six hours.
- On December 3rd, three days before the first landfall, the NDRRMC issued Weather Bulletin No. 1, describing the location, strength, movement, and forecast positions. It identified seaboards which would have rough to very rough sea conditions, and advised fisherfolks not to travel in those areas. Each subsequent bulletin updated these areas.
- Weather Bulletin No.2 issued on December 4th at 11:00pm (2.5 days before landfall) began identifying which areas had a Public Storm Warning Signal (PSWS) in effect, and each subsequent bulletin updated the locations of each PSWS (ranging from PSWS #1 - #3).
- Weather Bulletin No. 3 issued on December 4th at 5:00pm (2 days before landfall) first discussed the potential for storm surges at coastal areas.
- Severe Weather Bulletin No.6 (issued December 5th, 11:00am) described the expected landfall over the Eastern Samar – Northern Samar area to bring strong winds, a 4-5 meter storm surge and heavy-intense rainfall. Subsequent bulletins updated the locations, depths of storm surge and amount of estimated rainfall.

Emphasis on "Storm Surge":

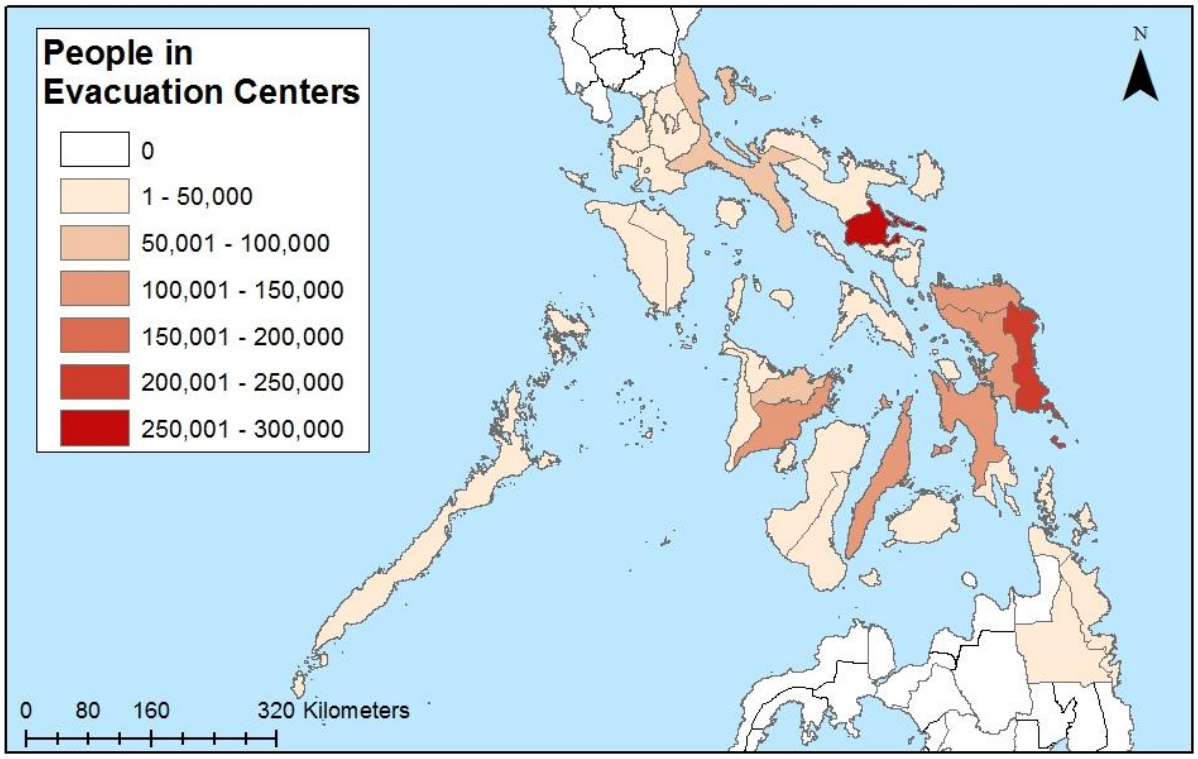
- Situation Report No.8 issued December 7th at 6:00pm marked a change in the NDRRMC Situation Report formatting, which now appears to place a greater emphasis on the risk of storm surge. The risk to storm surge was included in the PSWS section of the update, with each PSWS number associated with a level of storm surge. This was also the first time that the risk of storm surge made it to the first page of an NDRRMC situation report for both Typhoon Hagupit and Typhoon Haiyan. The wording was also changed from previous reports. The report stated that "those living along the coast are warned of the occurrence of big waves associated with **storm surge which may reach up to 3 meters.**" (SitRep No.8, http://www.ndrrmc.gov.ph/). The term "big waves" was not used during Typhoon Haiyan.
- The media coverage on Typhoon Hagupit also emphasized the risk to storm surge much more than during Typhoon Haiyan. The risk to storm surge was appearing on headlines, with the following being examples:
  - "How to know if storm surge threatens your area" (4 Dec 2014, http://www.rappler.com/move-ph/issues/disasters/76974-project-noah-storm-surge-hazard-maps)
  - "Typhoon Hagupit: More than half a million Philippines residents flee storm surge (6 Dec 2014, http://www.theguardian.com/world/2014/dec/05/phillipines-residents-evacuated-typhoon-hagupit)
  - "LIST: Areas under threat of storm surge, according to Project NOAH" (6 Dec 2014, http://www.gmanetwork.com/news/story/391342/weather/list-areas-under-threat-of-storm-surge-according-to-project-noah)
- Populations themselves may have also placed a higher degree of importance on the risk to storm surge and overall risk to typhoons, because of the destruction and loss of life they witnessed only a year ago from Typhoon Haiyan in which the majority of deaths were caused by storm surge.

Social Impacts

Typhoon Hagupit has affected over 2 million people and as of December 9th, 2014, 03:00 pm (local time), according to the NDRMC there are 8 fatalities and 151 injured people. According to the Philippine National Red Cross, 21 fatalities have been reported in Eastern Samar (http://www.reuters.com/article/2014/12/08/us-philippines-typhoon-toll-idUSKBN0JM0J520141208).

The evacuation focused on the eastern coast of the Philippines although evacuations occurred throughout the affected area. Twenty six thousand people evacuated from Leyte province alone, which was also devastated by super typhoon Haiyan in November last year (NDRRMC SitRep 8). About 25,000 people in Eastern Samar and Leyte still live in tents, shelters and bunkhouses more than a year after Haiyan. Haiyan killed over 7000 and displaced more than 4 million people. The large evacuation before Hagupit has been credited to improved preparedness as a consequence of learning from Tyhoon Haiyan (IOM SitRep 2). One year ago, the much stronger Typhoon Haiyan led to a pre-emptive evacuation of 792,018 people (NDRRMC Yolanda SitRep 8) compared to the 716,639 people evacuated for Typhoon Hagupit (NDRRMC SitRep 7).

The NDRRMC reports that 1,823,176 people are currently housed in evacuation centers (NDRRMC SitRep 12). Eastern Visayas and Bicol regions together accounted for 60% of the people in evacuation centers (NDRRMC SitRep 12). The map shows the number of people in evacuation centers in each of the affected provinces.



Impacts on Transportation System and Lifelines

Typhoon Hagupit had some minor impacts on the transportation system.

Maritime transport:

- As of 7 December 2014, 06:00 pm (local time), a total of 2,225 passengers, 90 vessels, 786 rolling cargoes, and 4 motorbancas have been stranded due to bad weather conditions.
- As of 9 December 2014, 03:00 pm (local time), a total of 984 passengers, 20 vessels, and 274 rolling cargoes are still stranded due to bad weather conditions.

Air transport:

- On 7 December 2014, airports have been closed in Naga City (Camarines Sur), Legazpi (Albay), Masbate City (Leyte), Tacloban (Leyte), and Calbayog (Samar) for one day. However, the airport of Tacloban was open for military and general aviation flights for relief operations.
- On 8 December 2014, the airport of Borongan (Eastern Samar) was closed.
- As of 9 December 2014, 03:00 pm (local time), all airports are operational.
- Between 7 and 9 December 2014, a total of 245 domestic and 33 international flights were cancelled due to bad weather conditions.

Road transport:

- On 7 and 8 December 2014, a total of ten national road sections were closed to traffic due to flooding, landslides and fallen trees in Regions V and VIII. A total of four national road sections are not passable to light vehicles in Leyte due to flooding. A total of eight national road sections are hardly passable to traffic in Regions V and VIII due to flooding, landslides, uprooted trees and toppled electric posts. Furthermore, one local road in Quezon (Region IV-A) and six roads in Samar (Region VIII) were reported not passable.
- As of 9 December 2014, 06:00 am (local time), all roads have been cleared and are open for traffic except two national road sections in Regions IV-A and VIII. However, Buenavista Bridge in BRGY Lilukin (Buenavista, Quezon) and another bridge in Camarines Sur are not passable due to high water level.

Typhoon Hagupit caused minor damage to lifelines.

Power:

- Since 6 December 2014, power interruptions were experienced in 20 provinces in six regions (IV-A, IV-B, V, VI, VIII). Most power outages occurred in the provinces of Samar and Leyte.
- As of 8 December 2014, 06:00 pm (local time), power was restored in affected areas in provinces of Romblon and Camarines Sur.

Telecommunications:

- As of 7 December 2014, 06:00 pm (local time), global and smart networks were down in some parts of the provinces of Leyte and Eastern Samar.
- As of 9 December 2014, 03:00 pm (local time), 91.275 % of cellsites in the affected areas in the Regions IV-A, IV-B, VI, VII and VIII have been restored. The global network has been restored up to 44 % in the affected areas.

This summary report was produced with information from wettergefahren-fruehwarnung.de, NDRRMC, JTWC data, NASA, wunderground.com, weather.unisys.com, noah.dost.gov.ph