

Cat Resource Center Post-Event Report

2024 WESTERN NORTH PACIFIC TYPHOON 11 YAGI

Report Date: 18 September 2024

Super Typhoon Yagi

Landfalls on 6-7 September 2024



Landfall Locations:

Wenchang, Hainan CHN (16:20 CST)
Xuwen, Guangdong, CHN (22:20 CST)
Quang Ninh, VNM (13:00 ICT 7 Sep)



Extent of hurricane force winds: 100km

Extent of TS force winds: 275km



Max sustained: 230km/h

Peak gust: 280km/h

Category: 4



Minimum central
pressure: 915hPa



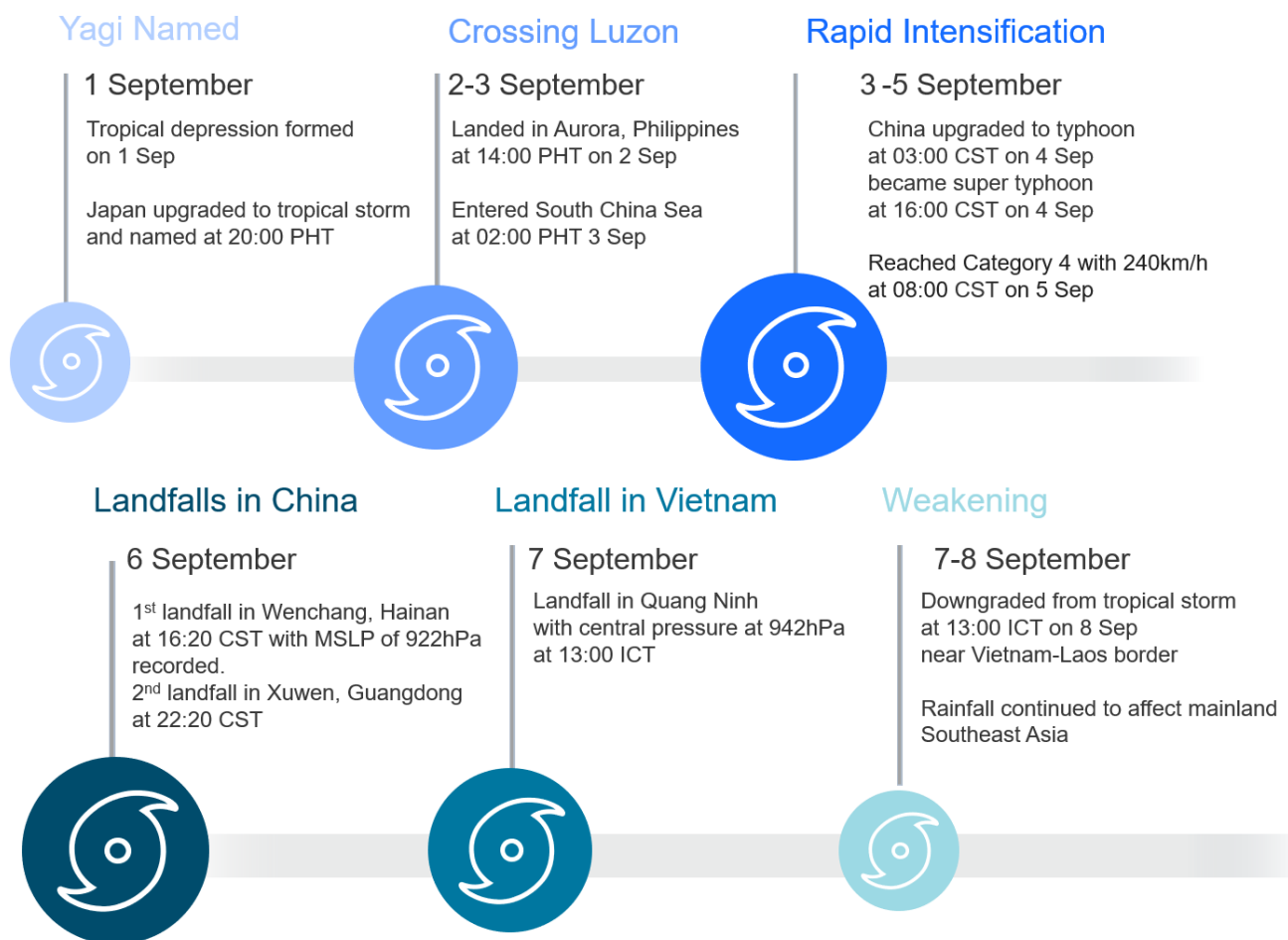
Forward speed:
WNW at 18km/h

- Super Typhoon Yagi is the second strongest typhoon since 1949 to hit Haikou, Hainan Province of China.
- Yagi is also the strongest typhoon on record landing in Vietnam, striking populated cities of Hanoi and Haiphong.
- Substantial wind and flood damages widely reported in northern Vietnam and Hainan.
- Heavy rainfalls associated with the typhoon further affected the Philippines, Laos, Thailand, and Myanmar.

This post-event report comprises the following sections:

- [Physical Discussion of Meteorological Conditions](#)
- [Flooding in Southeast Asia](#)
- [Damage Impacts](#)
- [Comparison with Recent Typhoons](#)

Physical Discussion of Meteorological Conditions



Super Typhoon Yagi (“Enteng” in the Philippines) is the eleventh named tropical cyclone of the Western North Pacific in 2024. Yagi is a top-end Category 4 typhoon with estimated maximum wind speed of 240km/h at its peak. It is also the strongest typhoon on record to hit Vietnam, and the second strongest to make landfall in China.

Yagi originated from a low-pressure system east of the Philippines first reported by Japan Meteorological Agency on 30 August. The system became a tropical storm and was named on the night of 1 September when it was 60km offshore from Luzon Island. The system moved northwestward the next day and made landfall at the Province of Aurora, then turned westward at the northern end of Luzon. Yagi’s strength was limited by the mountainous island, but the southwest monsoon the storm induced triggered heavy rainfalls over Luzon.

On the morning of 3 September, Yagi entered the South China Sea as a tropical storm and slowly tracked westward. Warm sea waters exceeding 30°C and weak vertical shear fueled rapid intensification of the storm. Yagi reached its peak intensity of 240km/h, a top-end Category 4 (Saffir–Simpson scale) or Super Typhoon (China classification), on the morning of 5 September when it was about 400km south of Hong

Kong. Yagi continued tracking westward towards Hainan and underwent an eyewall replacement cycle, pausing further strengthening.

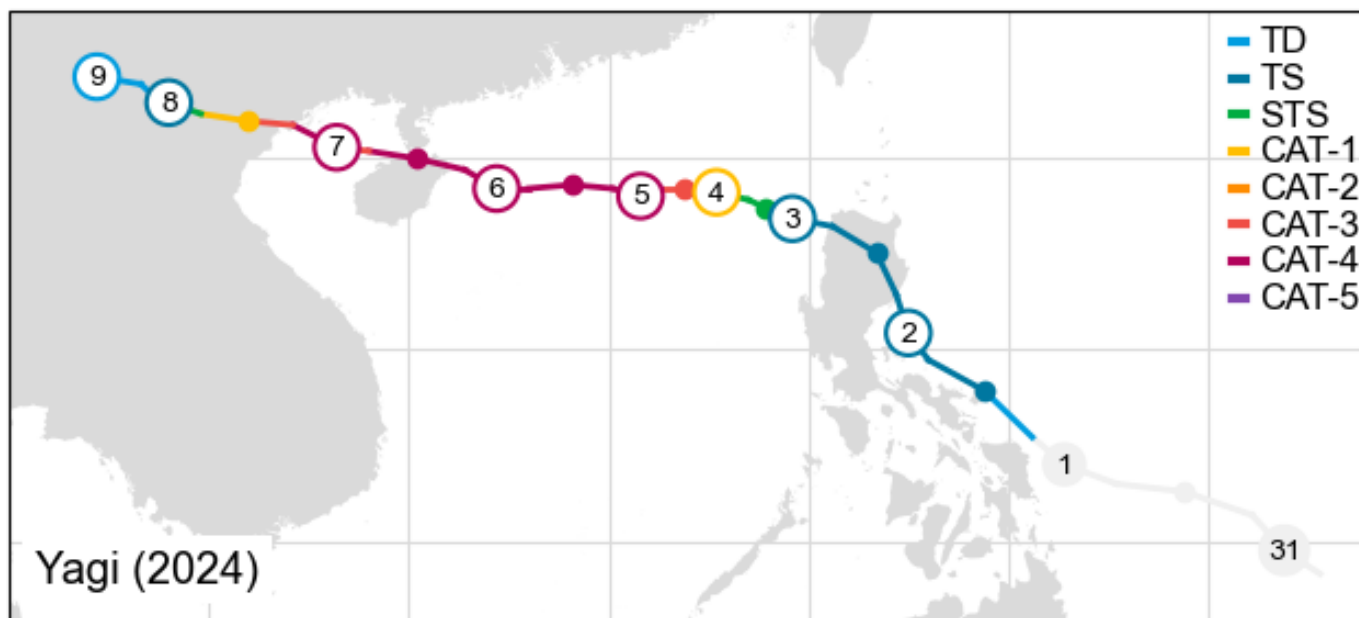
At 16:20 China Standard Time on 6 September, Yagi landed near Wenchang, Hainan at full strength. A local weather station recorded China's new lowest mean sea level pressure of 921.7hPa, surpassing the previous record set by Typhoon Rammasun in 2014. Strong gusts exceeding 60m/s were widely observed in the northern Hainan and Leizhou Peninsula. Coastal cities across Guangdong, Guangxi and Hainan provinces received heavy rainfall of more than 250mm over 3 days.

As Yagi went through Hainan Island and Leizhou Peninsula, it weakened into Category 3. However, the typhoon quickly reintensified to Category 4 with estimated wind speed of 210km/h in the Gulf of Tonkin on 7 September. Yagi made its final landfall that afternoon near Quang Ninh, Vietnam, and struck through Haiphong and Hanoi, causing substantial wind and flood damages to northern Vietnam.

Yagi quickly weakened as it moved into the mainland of Southeast Asia, but its remnant continued generating substantial rainfalls in the region. Heavy rainfall and flooding associated with Yagi has been reported in Laos, Thailand and Myanmar as well.

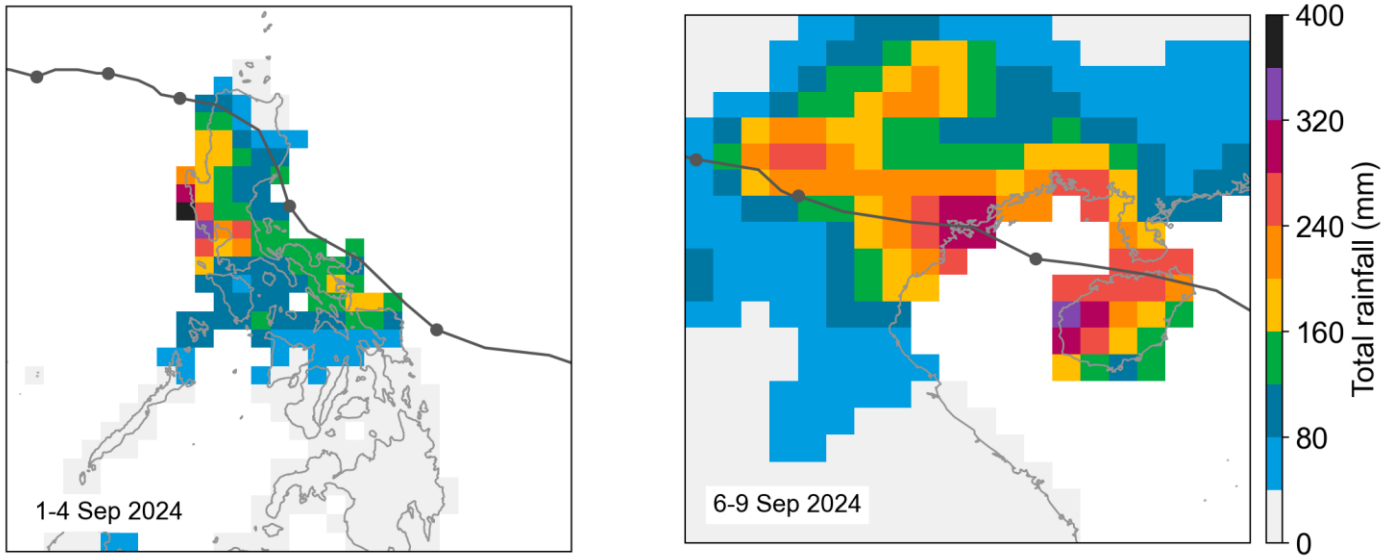
It is worth noting that Yagi's remnant regenerated in the Bay of Bengal on 13 September and was classified as a "deep depression", equivalent to a tropical depression in the Pacific, by the India Meteorological Department. It finally dissipated on 17 September in India.

Figure 1: Track of Typhoon Yagi. Circled numbers indicate its position at 08:00 CST on the day.



Source: JTWC, Graphics: Guy Carpenter

Figure 2: 4-day rainfall associated with Typhoon Yagi in the Philippines (left), China and Vietnam (right).



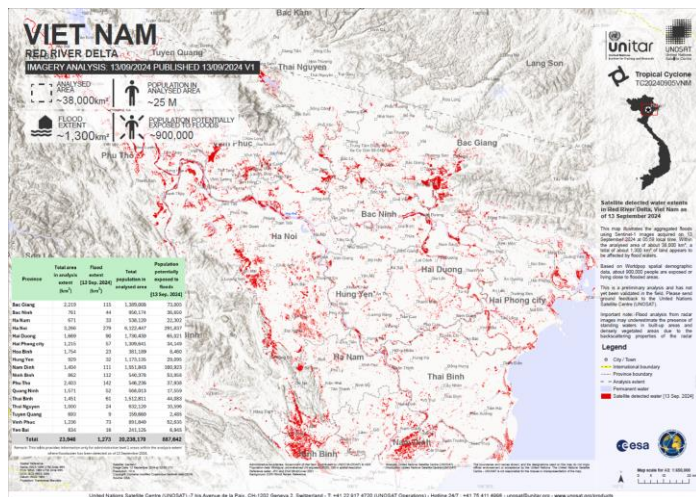
Source: NOAA, Graphics: Guy Carpenter

Flooding in Southeast Asia

Typhoon Yagi made landfall on Saturday, 7 September, setting off heavy rains that triggered flash floods in many locations and landslides in Vietnam, Laos, Thailand and Myanmar.

In Hanoi, thousands of people living near the swollen Red River were evacuated as its waters rose to a 20-year high, flooding streets days after Yagi battered the country's north. Vietnam's mountainous north was severely affected by flash flood and landslides, and an entire hamlet was wiped away. Roads to Lang Nu were badly damaged, making it impossible to bring in heavy equipment to aid in the rescue effort. Figure 3 shows the satellite detected flood extents in Red River Delta as of 13 September.

Figure 3: Flooded areas in Vietnam.



Source: Int'l Charter, UNOSAT

In Myanmar, torrential rains severely impacted Nay Pyi Taw (Nayphydaw), Mandalay, Magway, Bago Regions, Shan, Mon, Kayah and Kayin States¹. People were rescued with ropes as floodwaters 4 meters (15 feet) high surged through the hill town of Kalaw in Shan state on 10 September².

In Thailand's northernmost province of Chiang Rai, flood water entered the city and inundated key roads and urban areas. 9 out of 10 flights from Chiang Rai's airport on 12 September were cancelled³. The airport itself was not flooded, but rising waters made roads to the facility impassable, said head of Chiang Rai's Office of Disaster Prevention and Mitigation. It was reported that the northern part of Thailand saw the worst flooding in 80 years⁴.

The Mekong River rose due to prolonged heavy rains with flooding in Nong Khai province, northeastern Thailand and Vientiane, the capital of Laos. Thousands of people had their homes submerged in water. Authorities implemented emergency measures including evacuating residents and building protective barriers.

Damage Impacts

China

As of 10 September, according to Department of Emergency Management of Hainan Province, 4 areas were severely damaged in Hainan Province (Wenchang City, Haikou City, Chengmai County and Lingao County), suffering a total direct economic loss of nearly CNY 80 billion (USD 11 billion). China Banking and Insurance News reported that, as of 16 September, the insurance industry had received a total of 92,000 reported cases due to Typhoon Yagi, with an estimated insured loss of about CNY 3.5 billion, of which CNY 1.48 billion had been paid.

Based on the report on 7 September by the Department of Emergency Management of Hainan Province, about 526,100 people in the province were affected by Typhoon Yagi, of which 312,600 people were relocated. 4 people were killed and 95 were injured.

In Wenchang City, where Typhoon Yagi made landfall, the direct economic loss was approximately CNY 32.7 billion. More than 25,000 houses in Wenchang were damaged, and nearly a third of roads were blocked by fallen trees. 792 communication base stations were damaged, causing an 82.3% power outage rate in Wenchang. 8 water plants were forced to cease operation due to power shortage. About 270,000 acres of crops were affected, of which 160,000 acres were destroyed. Additionally, 48,100 hectares of forests were affected, representing 46% of total forested areas in Wenchang.

Haikou City was also seriously damaged with a direct economic loss of about CNY 26.324 billion. There were 105,500 people relocated and 209,800 people in need of assistance. 32,424 houses were damaged, of which 401 houses collapsed. 56,742 hectares of crops were affected, and over 167,800 trees were downed.

Vietnam

As of Monday, 16 September, Vietnam's Minister of Planning and Investment reported that Yagi caused VND 40 trillion (USD 1.62 billion) damage in northern Vietnam. The losses could reduce 2024's GDP by 0.15 percentage points where 7% expansion was previously targeted. GDP growth in the third and fourth quarters could decrease by 0.35% and 0.22% respectively. According to Planning and Investment Minister

¹ <https://reliefweb.int/report/viet-nam/philippines-viet-nam-lao-pdr-thailand-myanmar-tropical-cyclone-yagi-and-southwest-monsoon-update-dg-echo-partners-governments-echo-daily-flash-15-september-2024>

² <https://www.france24.com/en/live-news/20240915-storm-flooding-death-toll-in-myanmar-jumps-to-74>

³ <https://www.channelnewsasia.com/asia/flooding-thailand-maroons-thousands-northern-province-4603641>

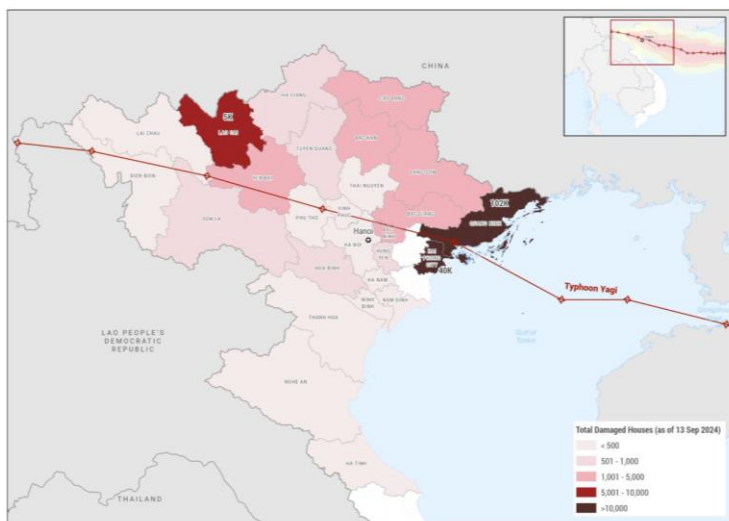
⁴ <https://www.dw.com/en/typhoon-yagi-batters-thailand-myanmar-as-vietnam-cleans-up/a-70215185>

Nguyen Chi Dung, Haiphong City, home to several industrial parks, recorded about VND 11 trillion (USD 450 million) of losses and damage from the typhoon.

In northern Vietnam, 232,000 houses were damaged and 190,000 hectares of rice, 48,000 hectares of other crops and 31,000 hectares of fruit trees were flooded and damaged^{5,6}. At least 292 people were killed and more than 38 were missing⁷.

Flash floods and landslides severely affected Vietnam's mountainous northern region, including wiping away an entire hamlet. Roads to Lang Nu were badly damaged, making it impossible to bring in heavy equipment to aid in the rescue effort. A steel bridge over the Red River in Phu Tho province collapsed, sending 10 cars and trucks along with 2 motorbikes into the river. The bus carrying 20 people was swept into a flooded stream by a landslide in mountainous Cao Bang province⁸.

Figure 4: Most affected provinces in terms of damaged houses as of 13 September 2024.



Source: Government of Viet Nam Loss and Damage Report⁹

Other Southeast Asia Countries

The Mekong River's rise due to prolonged heavy rain affected Myanmar, with the government announcing that more than 230,000 people were left homeless¹⁰. As of 18 September, 226 people were killed and 77 were missing in flooding and mudslides caused by Yagi¹¹. The floods had destroyed more than 160,000 houses and 5 dams¹²

In Thailand, at least 45 people have been killed and 24 were injured due to flooding and landslides. 4 were killed and at least 440 families were evacuated in Laos due to vast impacted areas of flooded paddy fields across 8 provinces. The Philippines also reported at least 21 casualties and 26 people were missing.^{13,14}

⁵ <https://www.businesstimes.com.sg/international/asean/vietnam-sees-40-trillion-dong-yagi-damage-may-cut-growth>

⁶ <https://www.channelnewsasia.com/business/typhoon-yagi-costs-vietnam-16-billion-may-lower-growth-planning-ministry-estimates-4609781>

⁷ <https://www.channelnewsasia.com/business/typhoon-yagi-costs-vietnam-16-billion-may-lower-growth-planning-ministry-estimates-4609781>

⁸ <https://en.nhandan.vn/typhoon-yagi-claims-74-lives-in-myanmar-causes-flooding-in-thailand-laos-post139266.html>

⁹ <https://vietnam.un.org/en/278680-viet-nam-typhoon-yagi-office-resident-coordinator-situation-update-no-3>

¹⁰ <https://kpl.gov.la/En/detail.aspx?id=85826>

¹¹ <https://www.abc.net.au/news/2024-09-18/myanmar-thailand-laos-vietnam-typhoon-yagi-deaths-top-500/104363402>

¹² <https://www.theguardian.com/world/2024/sep/16/typhoon-yagi-scores-dead-from-flooding-in-myanmar>

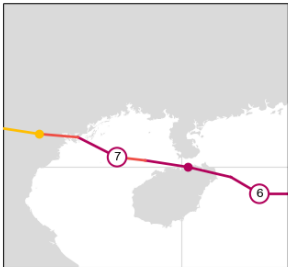
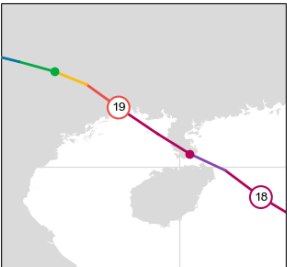

¹³ <https://www.aljazeera.com/gallery/2024/9/18/hundreds-killed-in-floods-as-typhoon-yagi-wreaks-havoc-in-myanmar>

¹⁴ <https://www.tnnthailand.com/news/earth/176490/>

Comparison with Recent Typhoons

Table 1 compares Typhoon Yagi with recent significant historical events impacting similar regions; Typhoon Rammasun in 2014 and Typhoon Doksuri in 2017.

Table 1: Recent significant typhoons affecting Hainan and Vietnam.

Typhoon	Yagi (2024)	Rammasun (2014)	Doksuri (2017)
Tracks Near Hainan and Northern Vietnam			
Landfall Locations	PHL: Aurora CHN: Wenchang, Xuwen VNM: Quang Ninh	PHL: Legazpi City CHN: Wenchang, Xuwen, Fangchenggang	VNM: Quang Binh
Maximum Wind at Landfalls per JTWC (km/h)	PHL: 85 (T.S.) CHN: 240 (Cat. 4) VNM: 205 (Cat. 3)	PHL: 210 (Cat. 4) CHN: 260 (Cat. 5)	VNM: 175 (Cat. 2)
Reported Economic Loss (mil USD)	CHN: >11,000 (est.) VNM: > 1,620 (est.)	CHN: 5,233 PHL: 1,014 VNM: 6 - 8	VNM: 578 - 726

Source: JTWC, EM-DAT, AXCO

Yagi's central pressure estimation of 915hPa at landfall in China is the second lowest since 1949, only trailing behind Typhoon Rammasun (2014). While both Yagi and Rammasun made landfall at similar places in China, Yagi tracked more westward than Rammasun and posed greater impact on Vietnam.

Yagi is the strongest typhoon to hit Vietnam on record. In 2017, Typhoon Doksuri caused large loss when it struck central Vietnam. Given the long duration and intensity of Yagi, current estimated economic loss is significantly greater than the 2 previous typhoons.

Sources: ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management, China Meteorological Administration, Department of Emergency Management of Hainan Province, European Civil Protection and Humanitarian Aid Operations, Indian Meteorological Department, Japan Meteorological Agency, Lao News Agency, United Nation, United States National Oceanic and Atmospheric Administration, United States Joint Typhoon Warning Center, Australia Broadcasting Corporation, Al Jazeera, Business Times, Channel News Asia, China Banking and Insurance News, Deutsche Welle, EM-DAT, AXCO, France24, The Guardian, Nhan Dan, Thai News Network, Thai News Network, VnExpress.

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