

RESPONSE TO TYPHOON HAIYAN IN VIET NAM

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ESCAP/WMO typhoon Committee 8th IWS/2nd TRCG Forum
Ma Cau, 02-06 December 2013



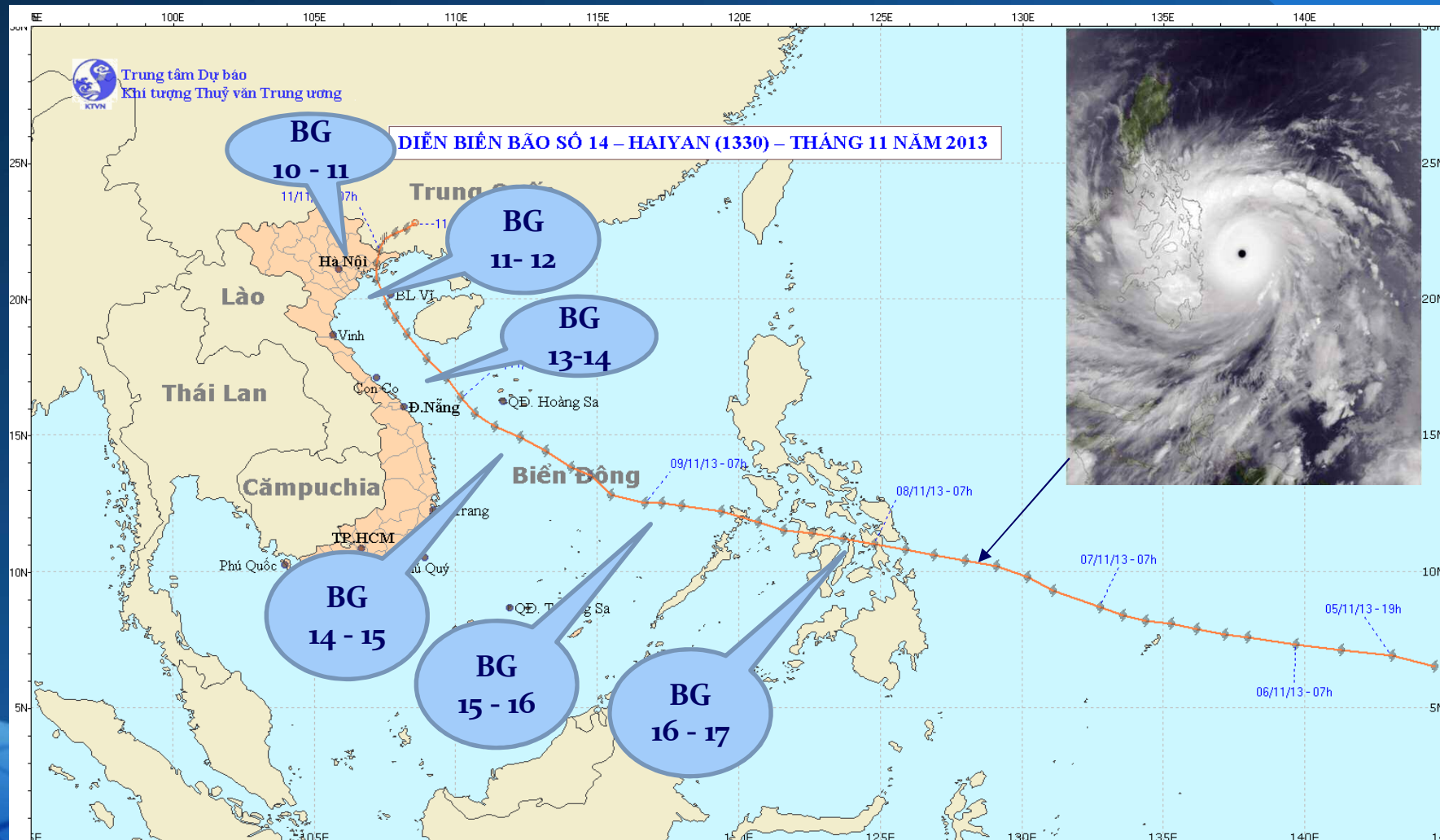
Introduction

TY Haiyan-1330

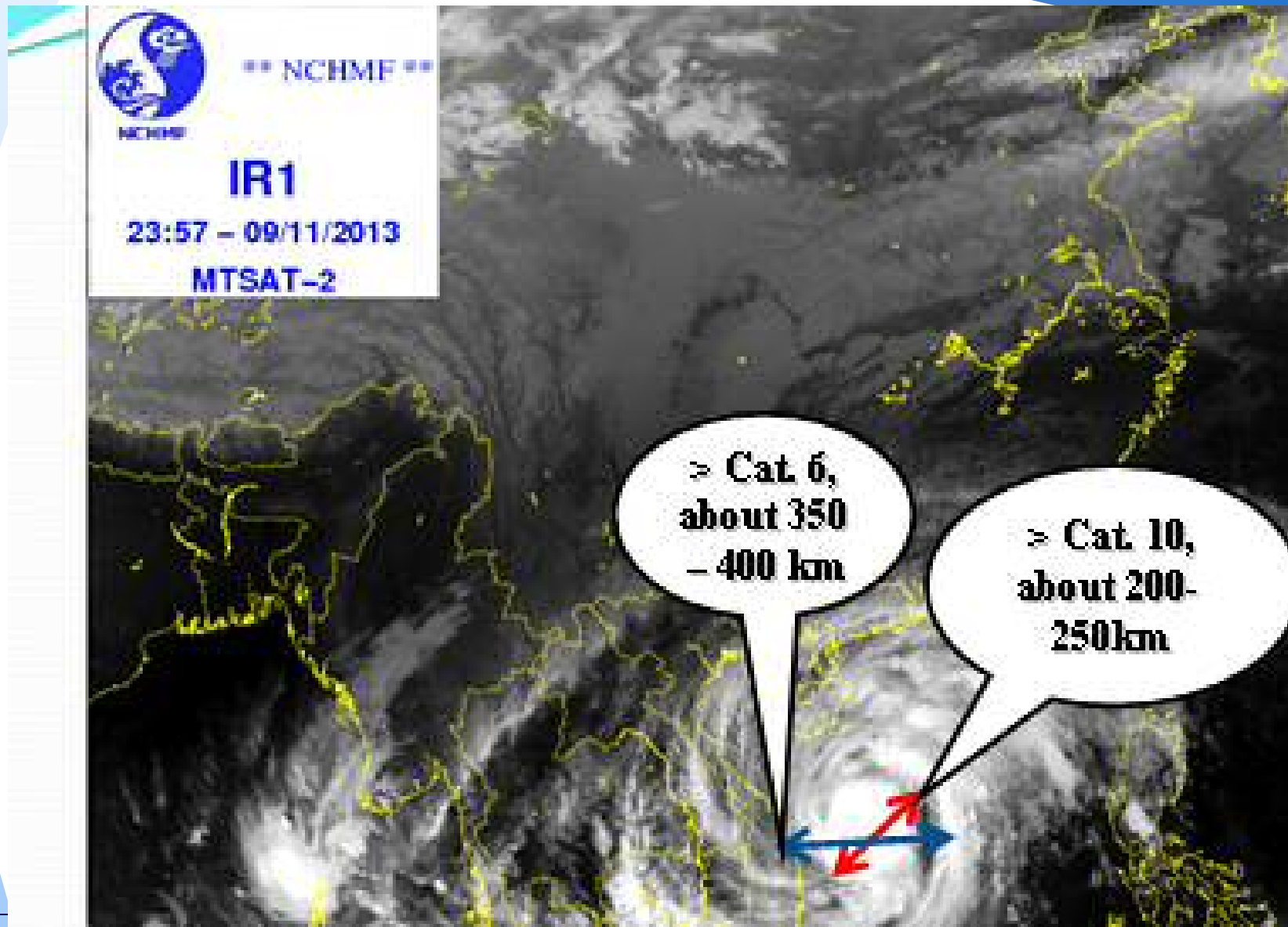
- ❖ **In the morning 04/11, a TD in the SE far from the Philippines strengthened into TS and became the 30th TS in the Northwest Pacific with the name of HAIYAN. After formation the Haiyan moved very fast to the direction between West and West-North-West with gradually strengthening intensity from 12, 13 then 16, 17 Beaufort grade.**
 - ❖ **In the early morning 08/11, The super typhoon Haiyan hit the Philippines.**
 - ❖ **in the evening of 08/11, the Super Typhoon Haiyan entered the Viet Nam East Sea and became the TS No14. After that Haiyan moved almost west-northwestward about 30 - 35 km/h with the weakened intensity of 15-16 Beaufort grade.**
 - ❖ **At noon 09/11, Haiyan turned to moved northwestward then continued changing its movement to north-northwestward almost parallel with the coast of Central Viet Nam**
 - ❖ **In the early morning of 11/11, HaiYan finally made landfall in Quangninh Province. A peak gust of 41 m/s was recorded at Coto Island (48/834), and accumulated precipitation total was 461mm which was recorded at Mauson (48/86). A central pressure value of 973.8 mb was also recorded at 1830Z in BachLongvi (48839).**
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Super Typhoon Haiyan (1330) life cycle characteristics

Track and Intensity



Wind speed estimated by satellite image



Observed maximum sustained wind speed and gust wind at some stations during TS Haiyan landing

TT	Station	Maximum wind speed	Time/date	Gust
1	Móng Cái (Quảng Ninh)	17 m/s (BG 7)	01h47 ['] /11/11	26 m/s (BG 10)
2	Sơn Động (Bắc Giang)	20 m/s (BG 8)	04h10 ['] /11/11	28 m/s (BG 10)
5	Uông Bí (Quảng Ninh)	16 m/s (BG 7)	02h35 ['] /11/11	28 m/s (BG 10)
6	Cô Tô (Quảng Ninh)	27 m/s (BG 10)	00h30 ['] /11/11	41 m/s (BG 13)
7	Bãi Cháy (Quảng Ninh)	30 m/s (BG 11)	01h31 ['] /11/11	37 m/s (BG 13)
8	Bạch Long Vĩ (Hải Phòng)	30 m/s (BG 11)	23h28 ['] /10/11	39 m/s (BG 13)
9	Phù Lĩn (Hải Phòng)	20 m/s (BG 8)	02h11 ['] /11/11	32 m/s (BG 11)
10	Hòn Dấu (Hải Phòng)	14 m/s (BG 7)	02h51 ['] /11/11	24 m/s (BG 9)
13	Thái Bình	20 m/s (BG 8)	01h01 ['] /11/11	25 m/s (BG 10)
17	Văn Lý (Nam Định)	17 m/s (BG 7)	00h26 ['] /11/11	26 m/s (BG 10)
29	Huế	6 m/s (BG 4)	08h32 ['] /10/11	13 m/s (BG 6)
30	Đà Nẵng	7 m/s (BG 4)	02h25/10/11	14 m/s (BG 7)
33	Lý Sơn (Quảng Ngãi)	21 m/s (BG 9)	07h00 ['] /10/11	28 m/s (BG 10)

**Observed minimum pressure at some stations
during TS Haiyan landing**

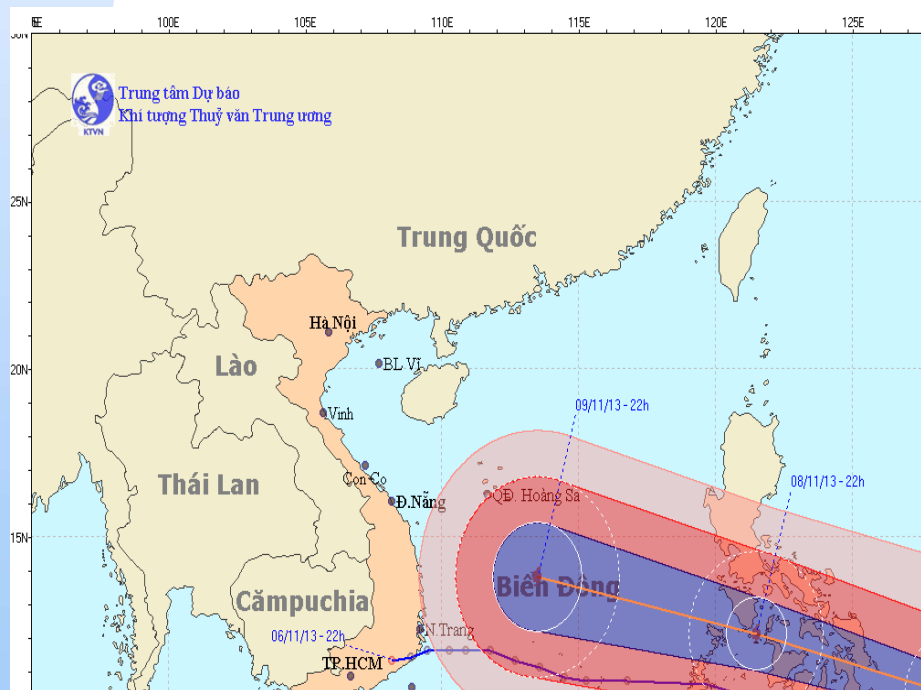
TT	Station/Province	P Min	Time
1	Móng Cái (Quảng Ninh)	998,8mb	02h30 ³ /11/11
2	Bắc Giang	995,9mb	04h35 ³ /11/11
3	Cô Tô (Quảng Ninh)	987,2mb	01h30 ³ /11/11
4	Bãi Cháy (Quảng Ninh)	981,2mb	03h30 ³ /11/11
5	Phù Liên (Hải Phòng)	989,4mb	02h30 ³ /11/11
6	Hòn Dấu (Hải Phòng)	986,1mb	02h25 ³ /11/11
7	Thái Bình	995,6mb	02h48 ³ /11/11
8	Bạch Long Vĩ (Hải Phòng)	973,8mb	23h14 ³ /10/11
9	Nam Định	997,0mb	03h00 ³ /11/11
10	Văn Lý (Nam Định)	996,9mb	01h35 ³ /11/11

Rainfall distribution

- ❖ The total 3 days (9-11 Nov) accumulated rainfall in North Central provinces was normally 20 – 40mm, somewhere was 60 – 80mm and greater than 100mm such as in Sầm Sơn 103mm and Tĩnh Gia (Thanh Hóa) 128mm, Quỳnh Lưu 125mm and Hòn Ngư (Nghệ An) 200mm, Hương Sơn 132mm and Hà Tĩnh 109mm
 - ❖ The rainfall at coastal area from Quảng Bình – Phú Yên normally was 40 – 80mm, somewhere was 100 - 150mm and more such as in Nam Đông: 317mm and Huế city: 151mm, Tam Kỳ: 189mm and Trà Bồng (Quảng Ngãi): 157mm
 - ❖ The rainfall at Red river delta normally was 40 – 80mm, somewhere was 90 – 120mm and more such as in Sơn Động (Bắc Giang province): 164mm, Thái Bình: 123mm and Văn Lý (Nam Định province): 150mm
 - ❖ The rainfall at Lạng Sơn, Hải Phòng and Quảng Ninh province where directly affected by Haiyan typhoon normally was 100 – 300mm, in some places there was extreme rainfall recorded as in Đình Lập: 303mm, Mẫu Sơn: 461mm, Bãi Cháy: 364mm, Cửa Ông: 309mm and Tiên Yên: 388mm.
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RESPONSE IN VIET NAM

- ❖ **4 Nov.:** Early warning of TD
- ❖ **Morning 5 Nov.:** Early warning of TS than STS, TY, super Typhoon
- ❖ **Night 6 Nov.:** Issue “TS near East Sea” and warning the Haiyan could enter East Sea in the coming 48 – 60h. High relevant officials including PM were constantly and dully informed of the behaviors of Haiyan. **Issue 4 bulletins/day.**
=> Strict order to fishermen to go back to nearest safe shelter ports

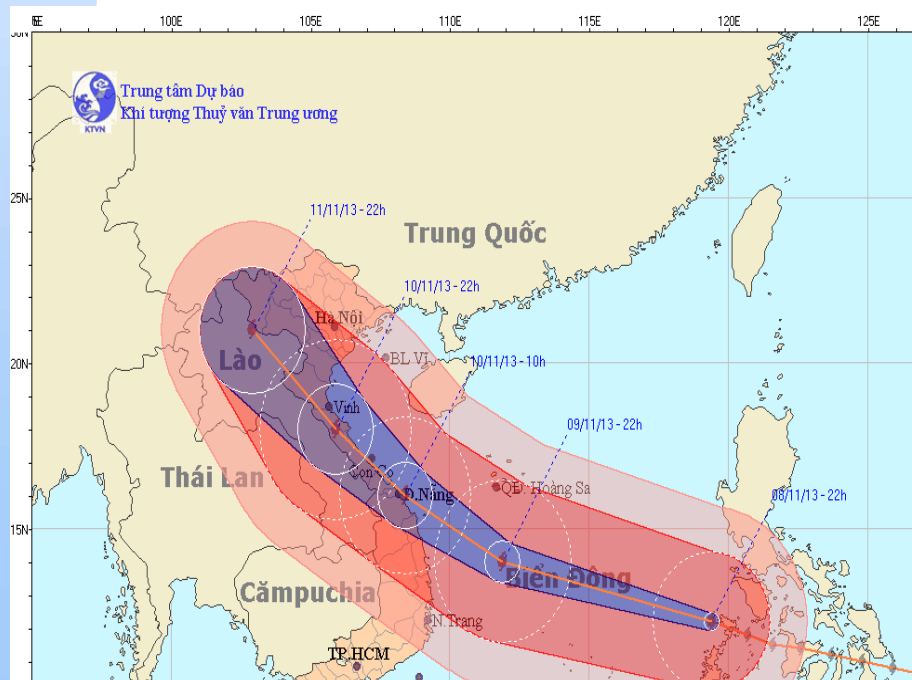


**Track Forecast by NHMS
valid at 4Z 06 Nov 2013**



RESPONSE IN VIET NAM

- ❖ **Morning 8 Nov.:** Tele-conference among NHMS forecasting offices headed by Vice Minister of MONRE.
- ❖ **Afternoon 8 Nov.:** Letter of request was sent to WMO, Typhoon Committee, regional forecasting centers for assistance
- ❖ **Evening 8 Nov.:** Issue "TS in the East Sea" (since this time, **issue 8 bulletins/day**). MONRE Vice Minister and some NHMS staff also made an immediate mission to give on-site direction and assist Mid-Central RHMC.



RESPONSE IN VIET NAM

❖ Evening 8 Nov.:

PM Nguyen Tan Dung chaired the CCFSC teleconference; Prime Minister has called on the ministries and agencies concerned to do all they can to minimize human and material losses. He said: "**Preventing typhoon Haiyan is the task of the political system, party committees, governments, the army, police and the relevant agencies of all levels. We must mobilize all available resources to minimize human and property losses**".



RESPONSE IN VIET NAM

❖ Evening 8 Nov.: ...

2 Vice PMs: Deputy Prime Ministers Nguyen Xuan Phuc and Hoang Trung Hai left for central provinces to inspect preparations for the super typhoon Haiyan. They ordered the evacuation should be completed before 7:00 p.m. 9 Nov.

MARD minister cum Chairman of CCFSC - Mr. Cao Duc Phat went to the central provinces to give on-site instruction of preparation for Haiyan. 6 task forces was sent to central provinces to inspect and protect dykes, dams and other irrigation works.

The Foreign Ministry has sent a diplomatic note to the Embassies of China, the Philippines, Indonesia and Malaysia in Vietnam and the Vietnamese Embassies abroad, asking for all possible support in case of emergency....



RESPONSE IN VIET NAM...

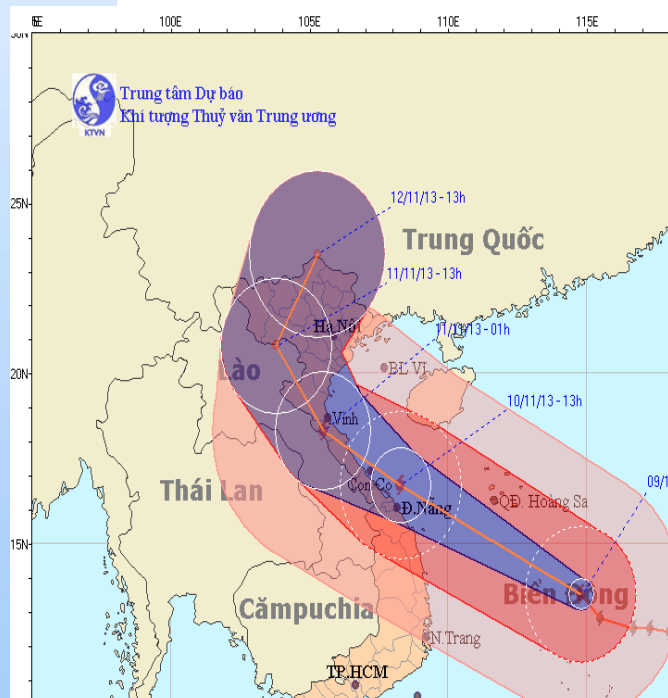


RESPONSE IN VIET NAM...



RESPONSE IN VIET NAM...

- ❖ **Noon 09/11:** When TY Haiyam passed 112E, NHMS issued “Near shore typhoon” and warned of the TY movement speed, possible change of direction, affected area, etc.. More than 600,000 people in Mid-central provinces were evacuated. Nearly 200,000 people in the North-Central provinces were ready for evacuation.



**Track Forecast of NHMS
valid at 06Z 09 Nov 2013**



People leaving their homes



Evacuees gathering at schools and healthcare centres

RESPONSE IN VIET NAM...

- ❖ **Noon 10 Nov.:** When the TY center was about 190km East of Thua Thien-Hue province, issue "Urgent TS" and give warning for coming 12h of TY speed (about 30-35km/h), direction (along coast from Thua Thien-Hue to Nghe An), then it may change direction to NWN-N with slowed down speed of 15km/h and land coastal provinces in the North Viet Nam. **Hourly bulletins were issued.** Evacuated people in central provinces went back home in order



Track Forecast by NHMS valid at 09Z 10 Nov 2013

RESPONSE IN VIET NAM...

- ❖ **Early morning 11 Nov.:** Haiyan landed Hai Phong-Quang Ninh provinces
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RESPONSE IN VIET NAM...

Working with Mass Media to deliver information:

- ❖ 07/11: work closely with VTV1
 - ❖ 09/11: provide information to VTV1, News Agency TV, HTV9, VTC14, VOV and 12 newspaper agencies.
 - ❖ 10/11: provide information to VTV1, News Agency TV, HTV9, VTC14, VOV, QPTV, ANTV, VTC1 and 23 newspaper agencies.
 - ❖ From 15h30 p.m, 09/11 to 04h00 a.m., 11/11, collaborate with VTV1 in setting up a live TV bridge with provinces to provide continuous updated forecasts and warnings to serve prevention and preparedness activities.
 - ❖ 10/11: Provide information of Haiyan to CCTV.
 - ❖ During Haiyan, some private SMS providers voluntarily sent messages of typhoon Haiyan information to the users in the possibly affected area.
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RESPONSE IN VIET NAM...

International co-operation:

- ❖ 08/11: Send letter to WMO, TCS, TC Members, Regional forecasting centers, ADPC
- ❖ 09/11-11/11: Receive prompt and valuable responses from WMO, TCS and some developed forecasting centers (JMA, CMA, HKO, NWS) providing advises, recommendations, information of:
 - Forecast products (TC track; storm surges)
 - Disaster management measures and Public weather services focusing in:
 - *To secure communication channel with the high-level decision-making authority*
 - *To send clear message from the highest authority to the public about the potential threats and necessary response*
 - *To take joint actions with DRR agencies for evacuation of people in the areas at risk*
 - *To keep close contact with media for dissemination of updated warnings and advisories.*

Mr. Michel Jarraud, WMO Secretary General: "It is excellent illustration of WMO spirit and effectiveness"

Damage caused by Typhoon Haiyan

In life: No one was killed when Haiyan made landfall, **4** missing and **84** others were injured.

In property: **75** collapsed and **2526** damaged and drifted houses; **316** hectares of rice were damaged; **49096** hectares of industrial crops and fruit fields were damaged; **1089** m³ of soil, stone and roads tumbled down



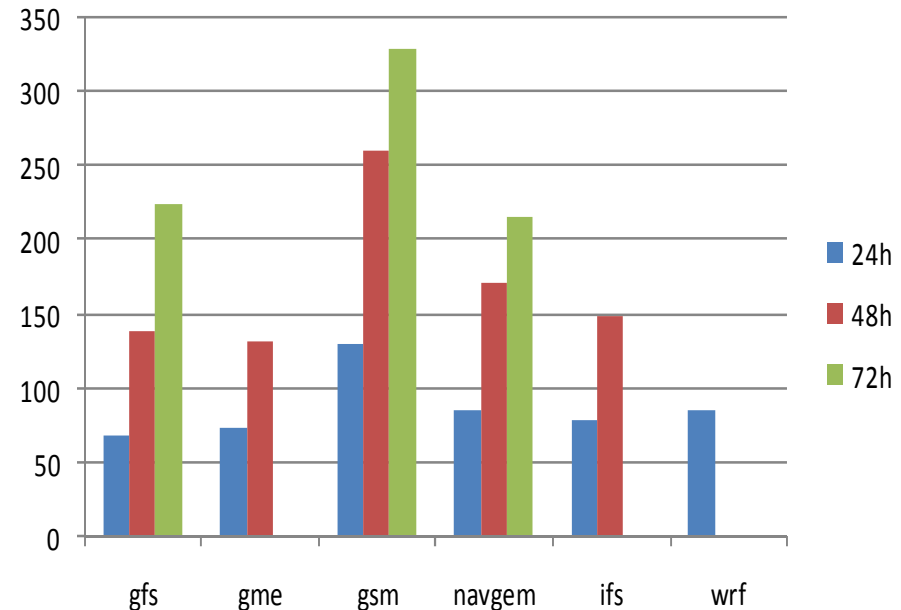
Damage caused by Haiyan...



Preliminary evaluation of Forecasting quality of NWP models and International warning centers

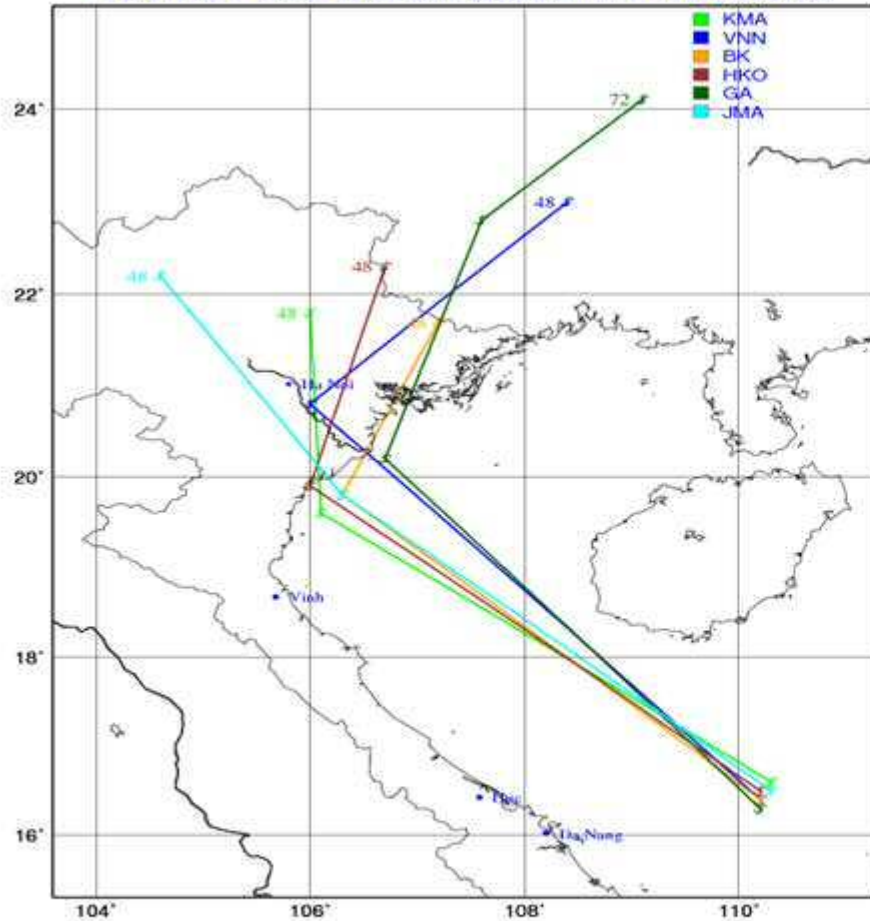


Direct position error of international warning centers (BK: Beijing; GA: Guam; VNN: NCHMF) is calculated up to 00Z 10 Nov 2013

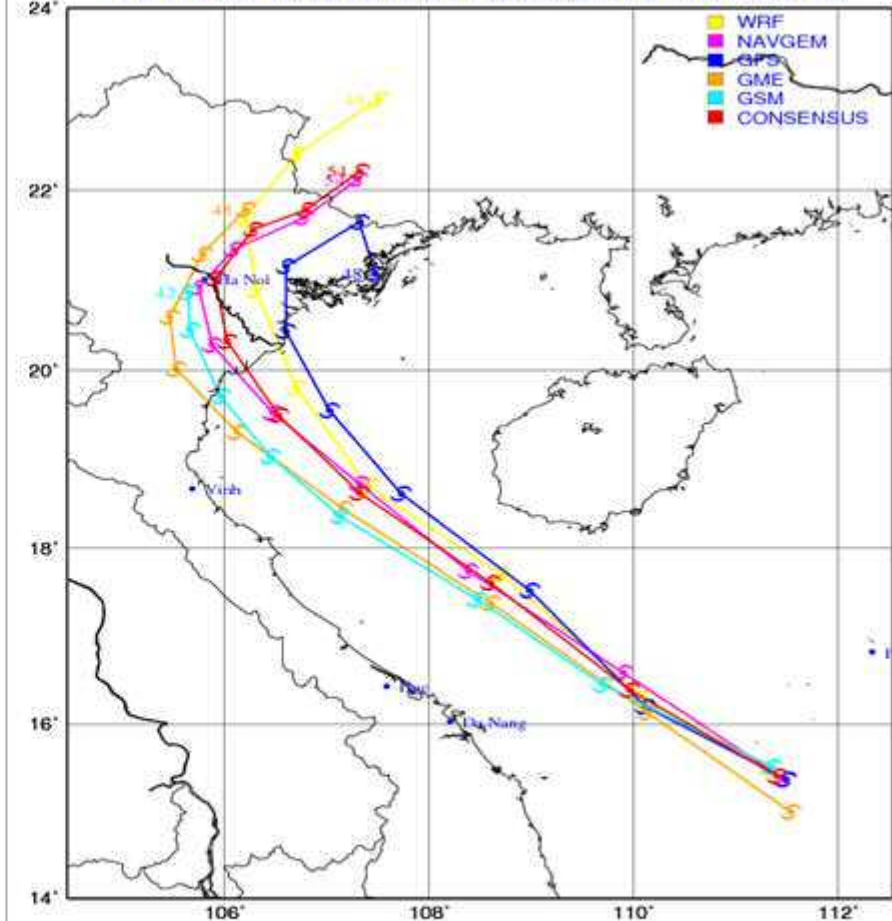


Direct position error of global and regional NWP models (GSM-JMA; GME-DWD; GFS-NCEP; NAVGEM- US Navy; IFS-ECMWF; WRF-NCHMF) is calculated up to 00Z 10 Nov 2013

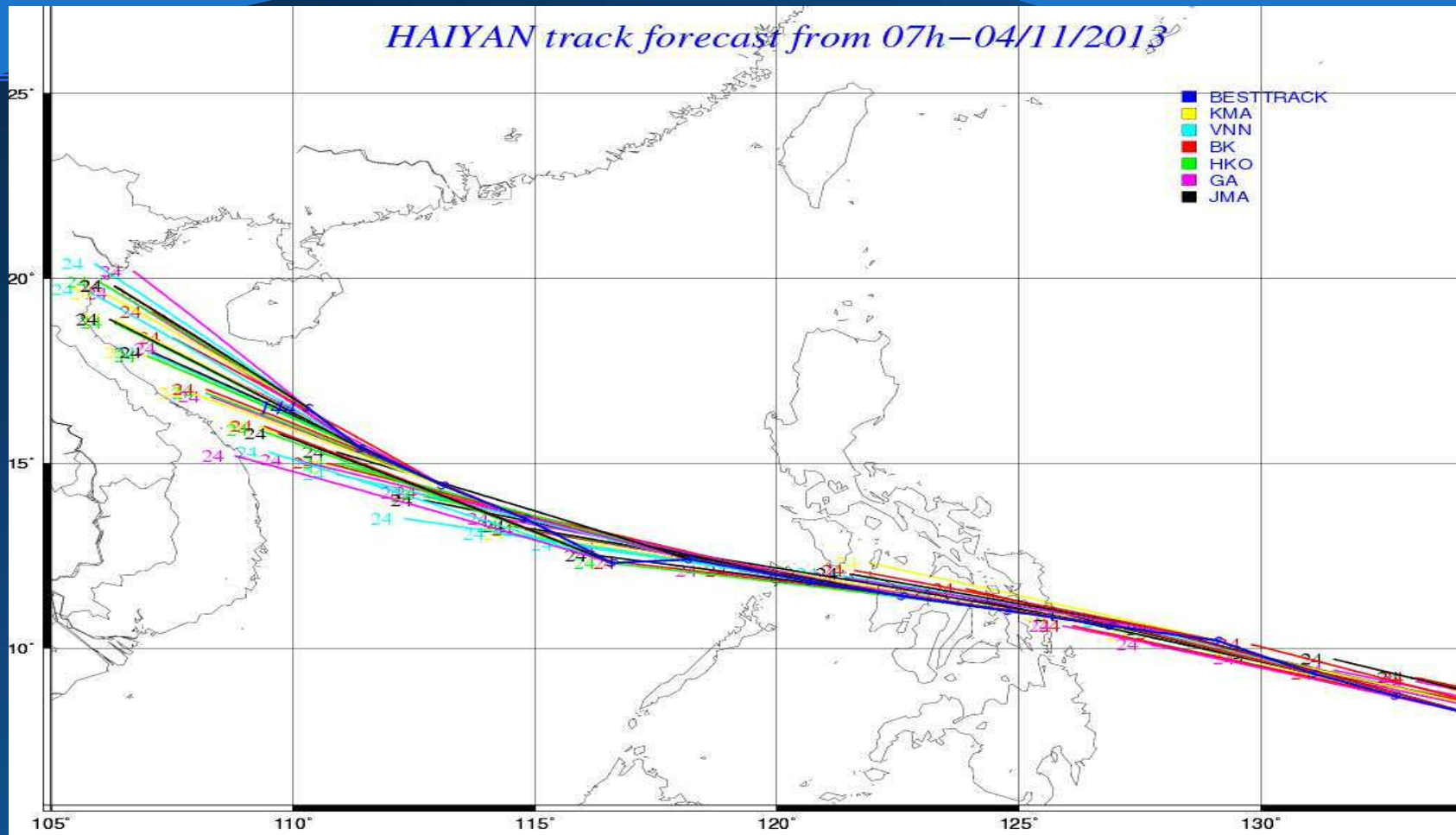
HAIYAN track forecast issued at 07h-10/11/2013



HAIYAN track forecast issued at 01h-10/11/2013

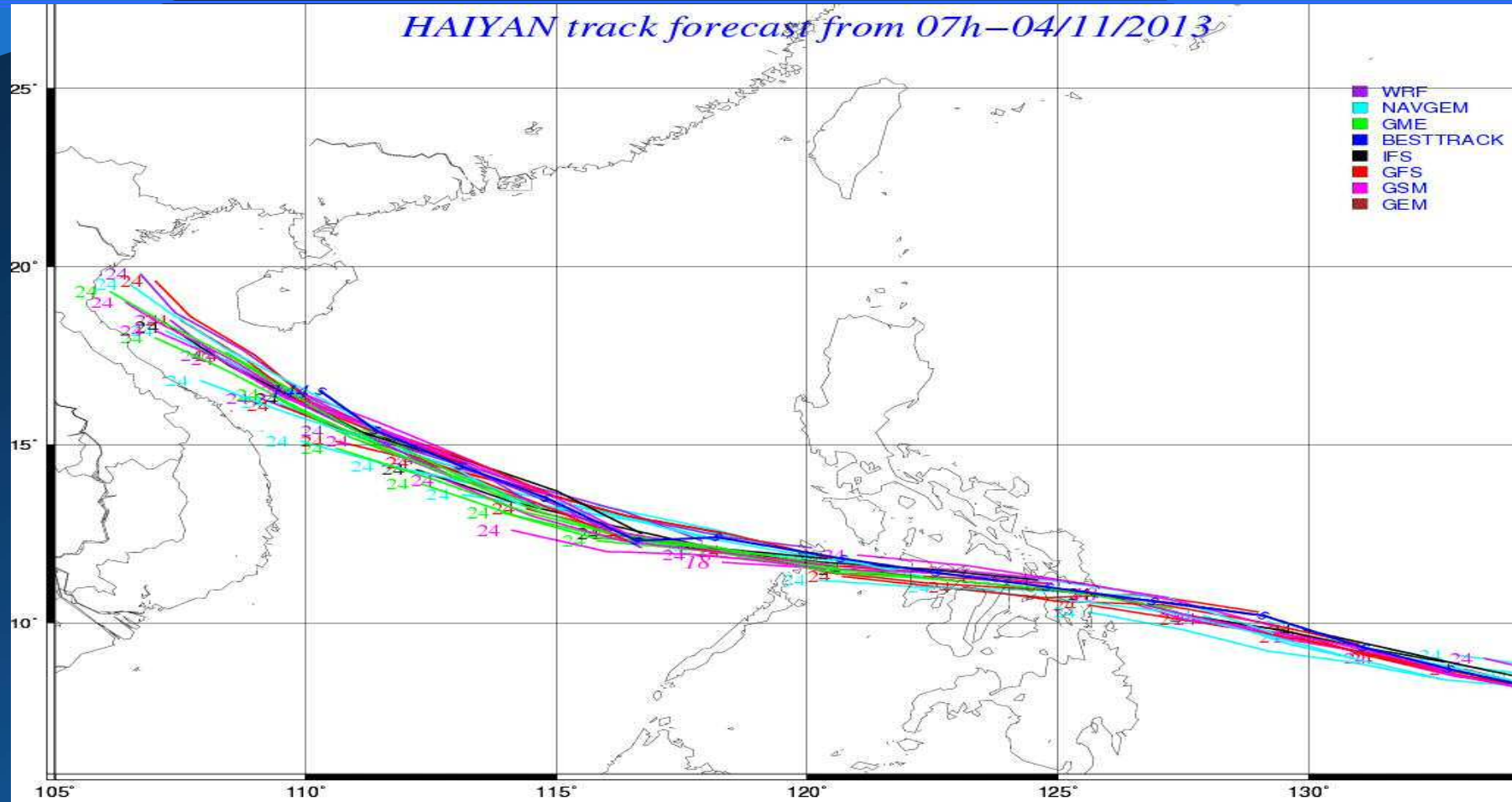


Track forecasts of international warning centers (left) and global NWP models (right)
valid at 00UTC 10 Nov 2013



**The +24hrs track forecasts of international warning centers from 00Z 4 to 00Z 9
Nov 2013**

HAIYAN track forecast from 07h-04/11/2013



The +24hrs track forecasts of global NWP models from 00Z 4 to 00Z 9 Nov 2013

LESSON LEARNED

- ❖ The early warning is very important: NHMS has changed the standard operational forecasting procedure when recognized that Haiyan would possibly make landfall in Viet Nam
 - ❖ In case of Haiyan, all socio-political system from the national (prime minister directly controlled all activities related to Haiyan) to local levels joined the prevention, response and mitigation activities
 - ❖ The public weather services: All mass media facilities (television, newspaper, internet, social networks, etc.) were used to disseminate and update the latest information of the typhoon Haiyan
 - ❖ Final decision should be updated according to the latest forecast bulletin: the evacuation decision was changing respectively according to the change of TC track and predicted area of landfall of Haiyan
 - ❖ International cooperation in sharing forecast products and DRR experience is very important
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Acknowledgement

- ❖ WMO
 - ❖ Typhoon Committee
 - ❖ JMA (RSMC-Typhoon Center-Tokyo);
 - ❖ CMA
 - ❖ Hong Kong Observatory
 - ❖ NWS
 - ❖ All TC Members
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THANK YOU!

