

# Review on RFSC Hanoi's current and future activities

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Viet Nam

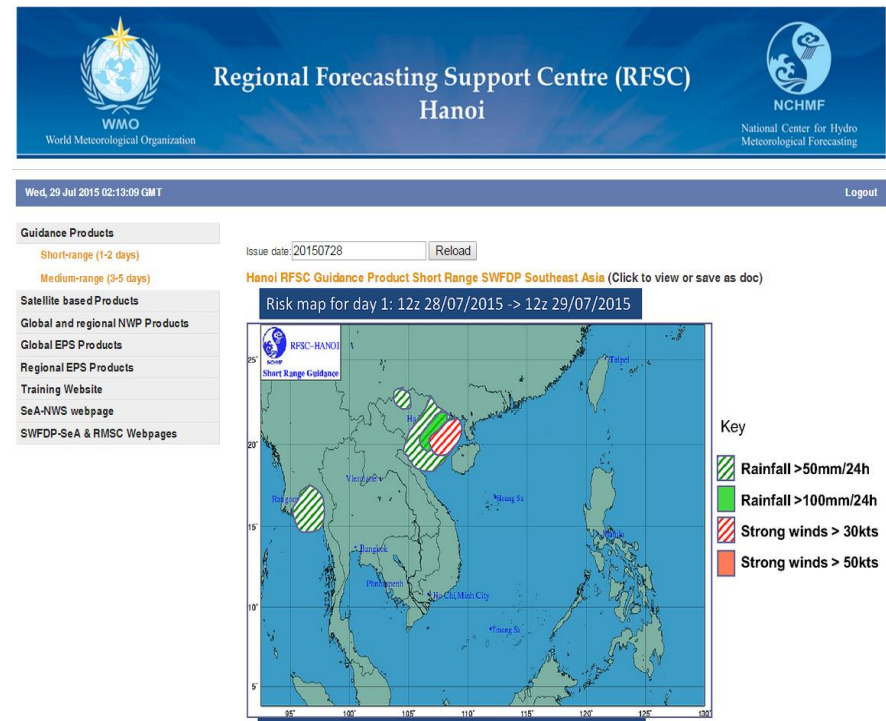
National Center for Hydro-Meteorological Forecasting

# Contents

- Brief overview of SWFDP-SeA RFSC Hanoi
- Updating of SWFDP-SeA in 2015
  - NWP and satellite products
  - Guidance products
- Future activities

# Brief overview of SWFDP-SeA RFSC Hanoi

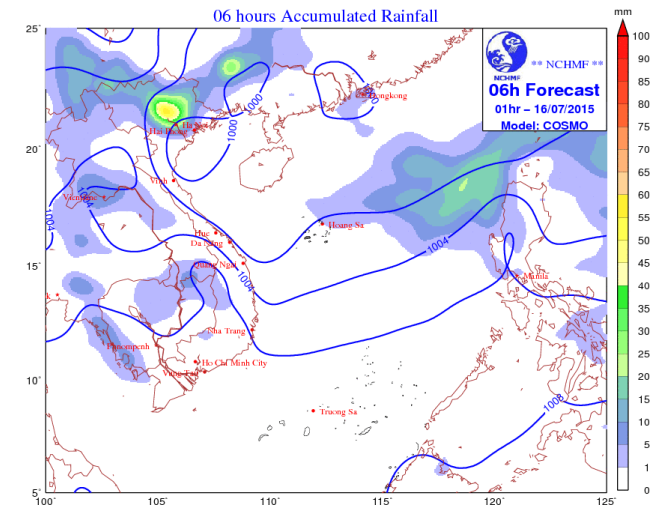
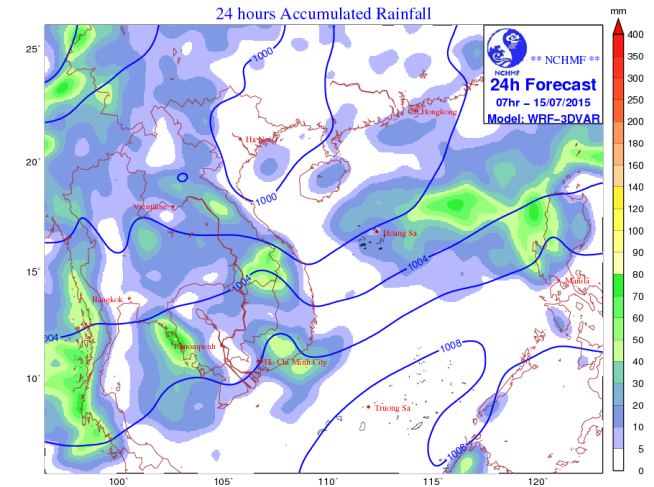
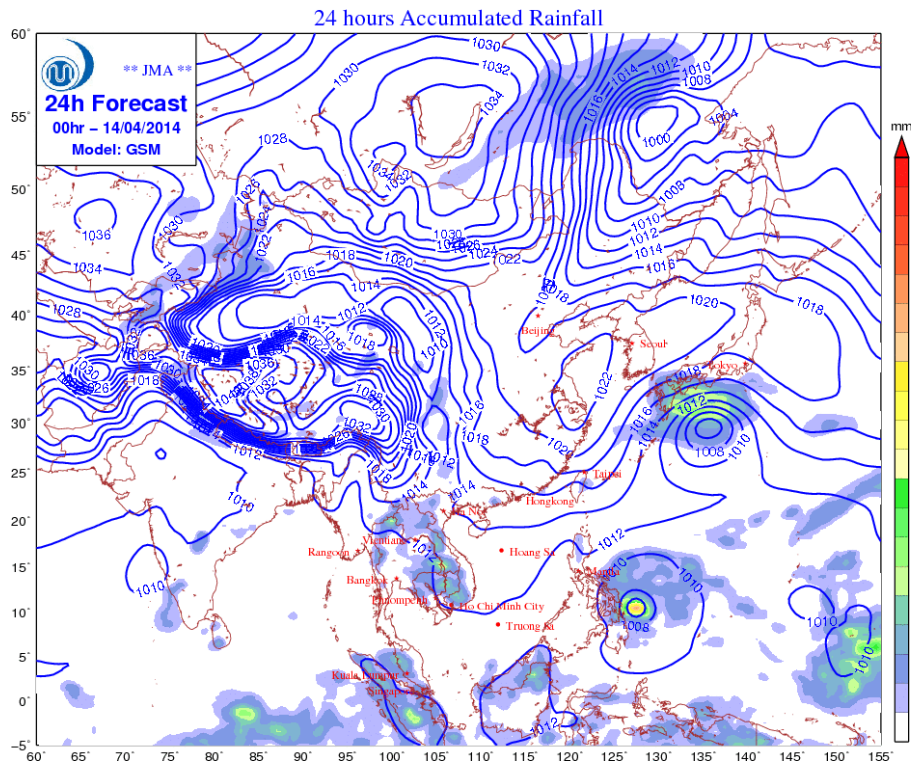
- Sharing at password protected [www.swfdp-sea.com.vn](http://www.swfdp-sea.com.vn) website
- Sharing global and regional forecast products (including both deterministic and ensemble)
- Sharing observations over the Southeast Asia domain: satellite data, satellite based products
- Issuing 1-5 days guidance for heavy rainfall and strong wind areas based on NWP products



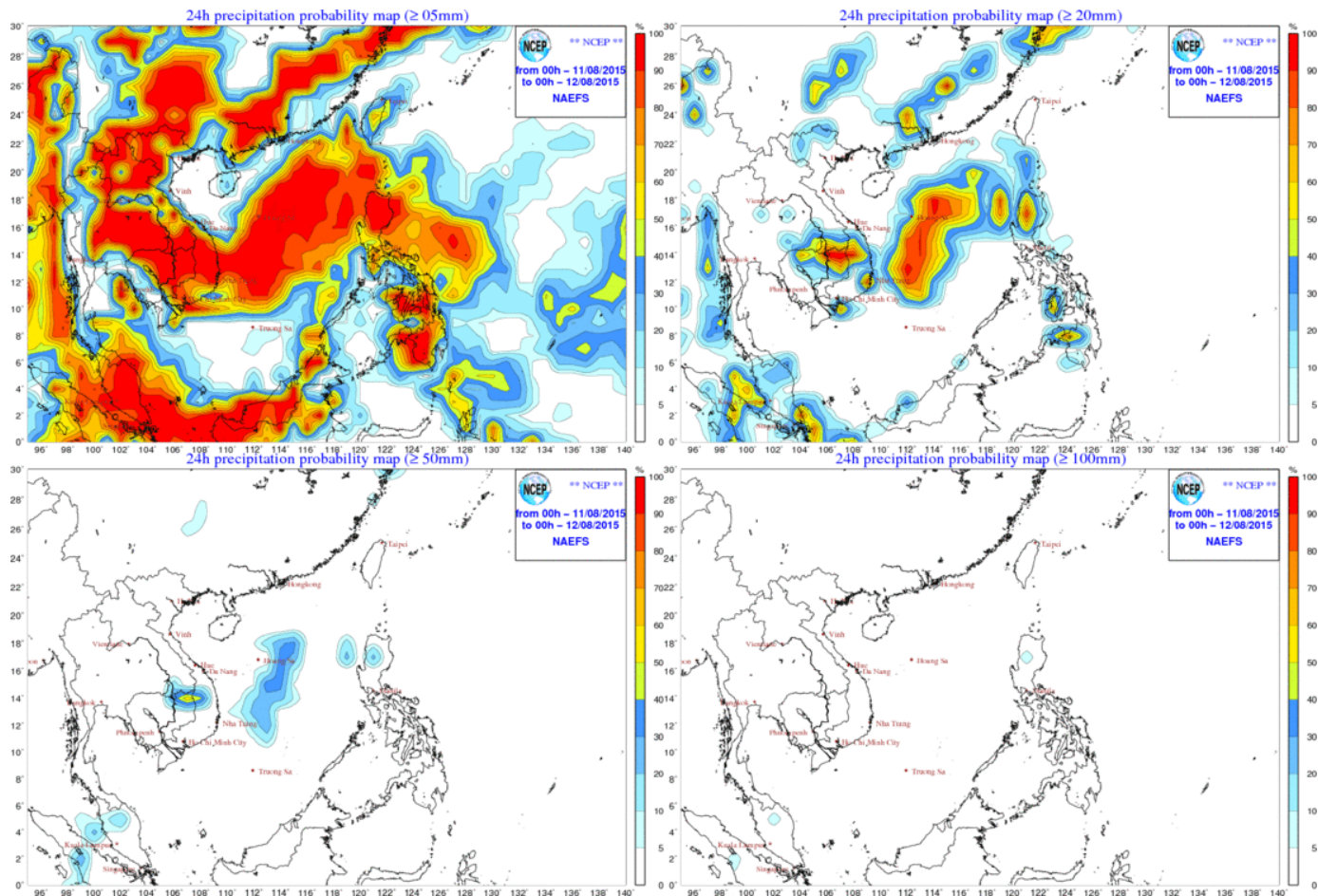
# Global and regional forecast products

- Global forecast products:
  - Deterministic: GSM (JMA); GME (DWD); NAVGEM (US Navy); GEM (CMC); GFS (NCEP)
  - Ensemble: NAEFS (21 members of GEFS)
- Regional forecast products:
  - Ensemble:
    - SREPS: Short range EPS (1-3 days) based on running HRM, WRF-ARW, and WRF-NMM models with 5 difference global models for boundary conditions (GME, GEM, GFS, GSM, NAVGEM), 15kmx15km
    - LEPS: Limited area EPS (3-5 days) based on running HRM model with boundary conditions from 21 members of GEFS, 22kmx22km

# Examples of deterministic products



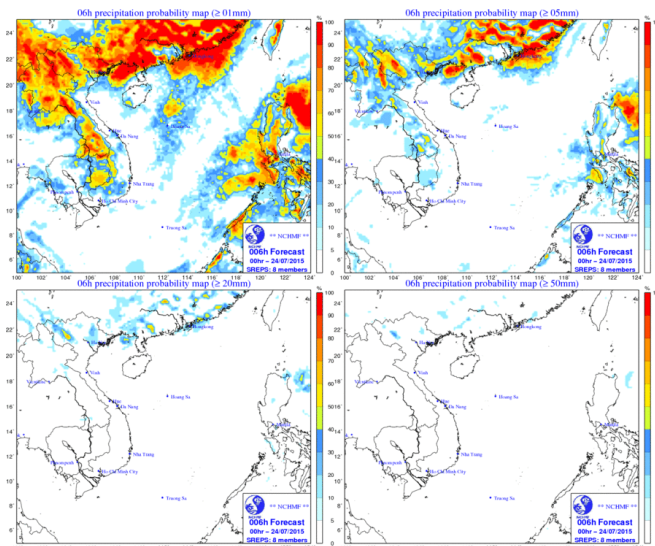
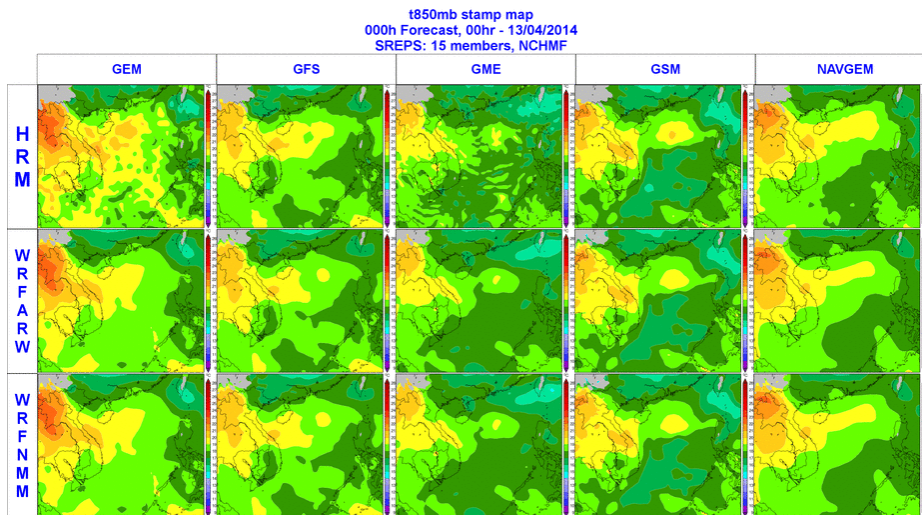
# Example of global ensemble forecasts: GEFS/NCEP (21 members)



24h precipitation probability maps at different thresholds

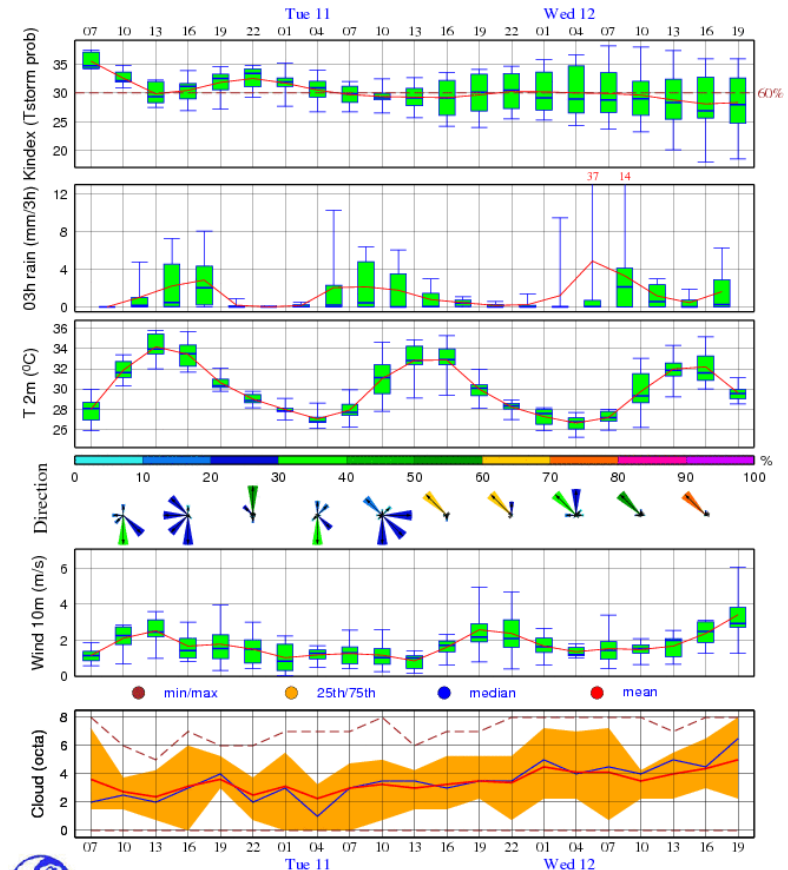


# Example of regional ensemble forecasts: SREPS



Probability maps

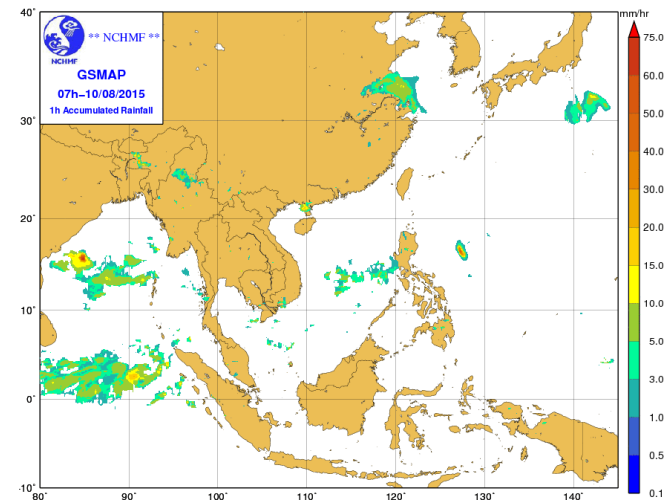
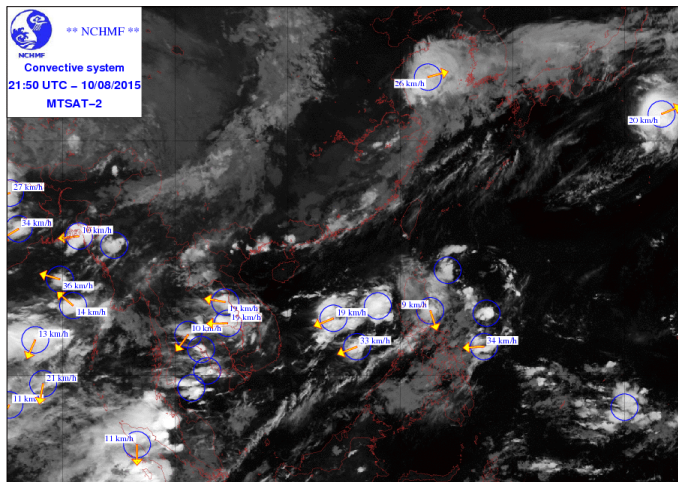
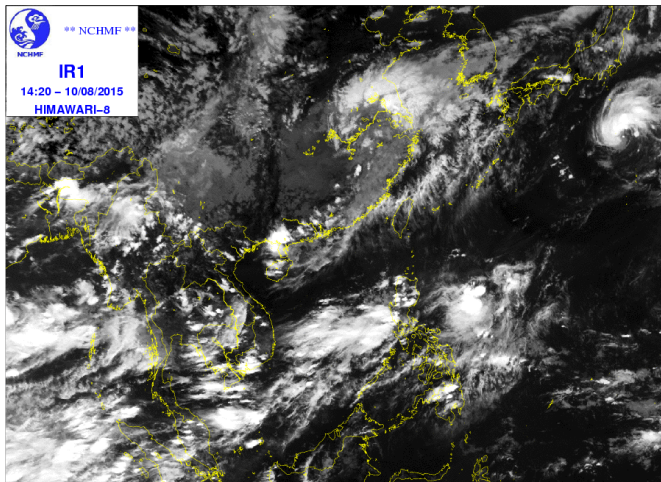
EPSgram for Ha Noi (105.8°E, 21.0°N, 6.0m Above mean sea level)



SREPS 8 members  
Valid from 07h-10/08/2015 to 19h-12/08/2015  
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EPSgram for specific locations

# Satellite products





# Updating of SWFDP-SeA in 2015

- **NWP and other products**
  - Updating GME (DWD) to ICON system
  - Adding regional products: WRF-ARW and COSMO
  - MTSAT to Himawari-8
  - Sharing some useful products: satellite-based precipitation estimation from SCOPE project, RMSC Tokyo/New Delhi
- **Guidance products**
  - Started providing short range guidance since April-2015
  - Started providing medium range guidance since August-2015
  - Issuing every 0800UTC-0900UTC from Monday to Friday

# Guidance products

- Two kind of guidance products:
  - The short range guidance: from 1 to 2 days
  - The medium range guidance: from 3 to 5 days
- Criteria are used:
  - Heavy precipitation:  $> 50\text{mm}/24\text{h}$  &  $> 100\text{mm}/24\text{h}$
  - Strong Winds:  $> 30$  Knots (over land and Sea)  $> 50$  Knots (over Sea)

# Guidance products

- Main contents of the guidance:
  - Current synoptic situations (1-2 days, supplementing with current satellite images and surface analysis maps of NCHMF) and longer expectations (3-5 days, analyzing the large scale trends from global model systems (GFS, GSM and ECMWF))
  - The risk situations for strong wind and heavy rainfall with above criteria for each day.
  - The comments about the degree of confidence for risk areas (high, medium and low)
  - The risk maps and risk table for each day

# Guidance products

- ***The synoptic situations*** are focused on the following items:
  - The activities of sub tropical high system, the western heat low system, the Inter Tropical Convergence Zone (ICTZ) and South west monsoon
  - Enhanced monsoon flow across the NE Sea.
  - Equatorial Rossby Wave.
  - An extending upper trough enhancing the cold surge.
- ***The degree of confidence:***
  - Based on agreements of the different models and agreements of the latest and other previous running cycles
  - The low confidence related to the high variable weather situation
  - The high confidence related to the high probability in forecasting for the heavy rain or strong wind phenomena

# Example of short range guidance for SWFDP-SeA

## Annex - C: Example of short range guidance for SWFDP-SEA



### RFSC Guidance Product for SWFDP-Southeast Asia

#### SHORT-RANGE (DAY 1 and DAY 2)

**Issue time:** 0800Z Tue 28<sup>th</sup> July, 2015

**Valid time:** DAY1: 1200Z Tue 28<sup>th</sup> to 1200Z Wed 29<sup>th</sup> July 2015

DAY2: 1200Z Wed 29<sup>th</sup> to 1200Z Thu 30<sup>th</sup> July 2015

#### Preamble

RFSC Guidance Products are based on a skillful evaluation of both Global and Regional model outputs for the domain area, satellite imagery at the hour of the issue and, expert interpretation that takes into consideration interactions with the local features. For generating the guidance products, the following criteria are used:

- Heavy precipitation: > 50mm/24h & > 100mm/24h (the risk over 200mm/24 shall be described in discussion text)
- Strong Winds: > 30 Knots (over land and Sea) > 50 Knots (over Sea)

#### Assessment Scale for the Degree of Confidence of Forecast:

Confidence Level >75% (High), Confidence Level 50-75% (Medium), and Confidence Level <50% (Low)

#### Synoptic Situation BOTH DAYS:

Over the Southeast Asia domain:

- A trough having axis along 21°N – 23°N is across the north of Vietnam with a low pressure area during next 24 and 48 hours.
- The southwest monsoon prevails over the Andaman Sea and Thailand Gulf.

#### Risk over Southeast Asia domain next 24h and 48h

- The risk of heavy rain is expected over:
  - The northeast of Vietnam and Tonkin Gulf in DAY 1 and DAY 2.
- The risk of strong wind is expected over:
  - The Tonkin Gulf of Vietnam in DAY 1 and DAY2.

#### Degree of Confidence for DAY ONE:

- The northeast of Vietnam area and the Tonkin Gulf area are high heavy rain confidence coming from all the models with threshold 50 – 160mm/24h.
- The Tonkin Gulf area is medium strong wind confidence coming from 50% models with threshold >30kts.

#### Degree of Confidence for DAY TWO:

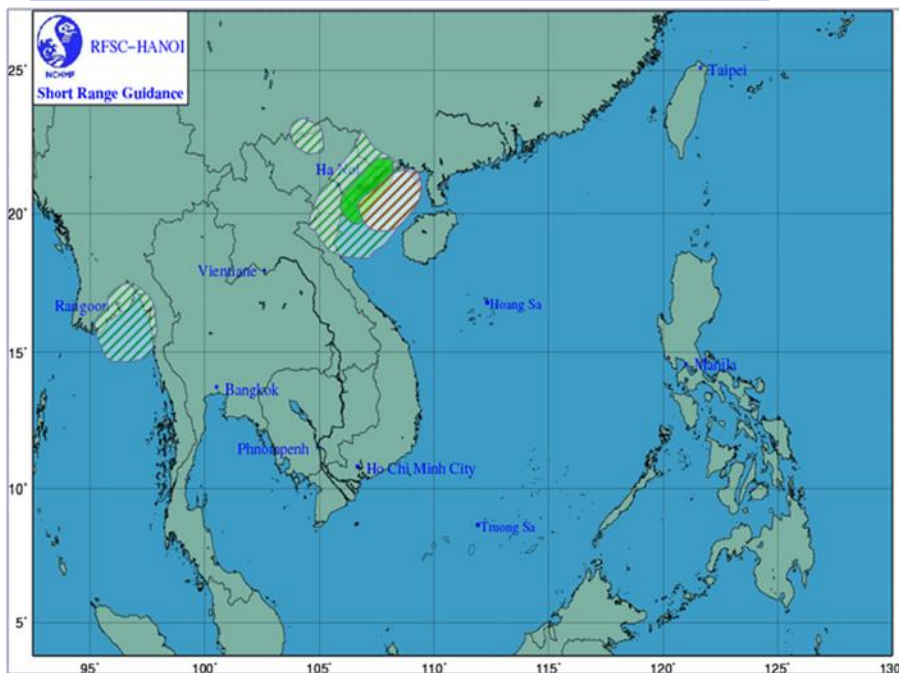
- The northeast of Vietnam area and the Tonkin Gulf area are high heavy rain confidence coming from all the models with threshold 50 – 160mm/24h.
- The Tonkin Gulf area is medium strong wind confidence coming from 50% models with threshold >30kts

#### Surface analysis maps:



# Example of risk map and risk table for day 1 of the short range guidance

Risk map for day 1: 12z 28/07/2015 -> 12z 29/07/2015



**DAY 1: Risk Probability Table**

Country	Rain > 50mm/24h Risk				Rain > 100mm/24h Risk				Wind > 15m/s (30kts) Risk				Wind > 25m/s (50kts) Risk			
	No	Low	Med	High	No	Low	Med	High	No	Low	Med	High	No	Low	Med	High
Cambodia	X				X				X				X			
PDR Laos	X				X				X				X			
Philippines	X				X				X				X			
Vietnam				N				N	X				X			
Thailand	X				X				X				X			

# Example of the medium range guidance

## Medium synoptic situation expectations:

Over the Southeast Asia domain:

- A trough having axis along  $21^{\circ}\text{N} - 23^{\circ}\text{N}$  is across the north of Vietnam with a low pressure area. The activity of this trough is expected to be stronger next few days.
- The southwest monsoon prevails over the Andaman Sea and Thailand Gulf

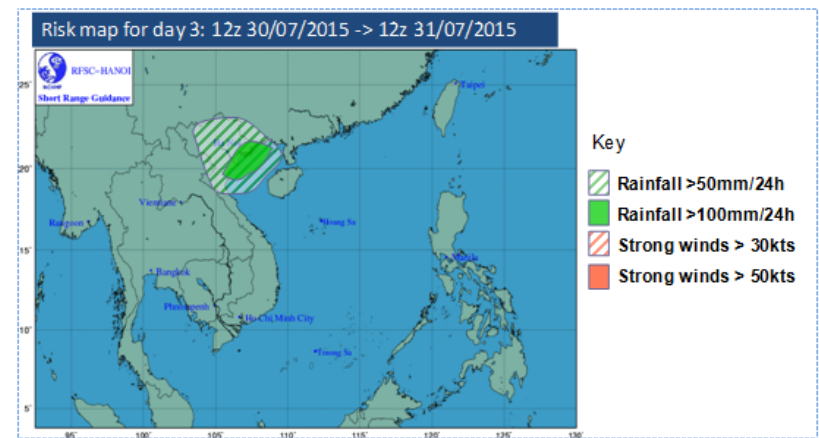
## Risk over Southeast Asia domain next 72h, 96h and 120h

- The risk of heavy rain is expected over the northeast of Vietnam and Tonkin Gulf (northeast of Vietnam) in DAY 3, DAY 4 and DAY 5.

## Degree of Confidence:

- The northeast of Vietnam and the Tonkin Gulf area are medium heavy rain confidence coming from 50% forecast models with threshold 50 – 120mm/24h in DAY 3.
- The north of Vietnam and the Tonkin Gulf area are medium heavy rain confidence coming from 50% forecast models with threshold 40 – 100mm/24h in DAY 4 and DAY 5.

## Risk maps:



# Future activities

- For guidance products:
  - Collaborating with RMSC Tokyo (Mr. Koide) to release the guidance in case of having tropical cyclone over the Southeast Asia domain
  - Collaborating with experts from NHMS in SeA to enhance the knowledge of forecast experiences over different countries
  - Verification for the guidance to enhance the skill of the forecasters in SWFPD-SeA RFSC Hanoi team

# Future activities

- Fully updating Himawari-8 images
- Updating storm-tracking products based on:  
i)new satellite products and testing the very short range warning capabilities of this product and ii) improving convective detection with JMA's algorithms
- Providing rainfall estimation from Himawari data with JMA's algorithms (Kurino's method)
- Collaborating with JAXA for updating GSMap and the nowcasting of GSMap upto 3h (contact point: Dr. Le Duc)

# Future activities

- For the regional NWP:
  - Extending regional model running domain covering the east sea of Philippine
  - Replacing the SREPS and LEPS systems by 1 system for 5 days ensemble regional forecast with data assimilation (WRF/COSMO/NHM-JMA with ensemble assimilation methods (Kalman Filter))
  - *These activities depend on our submission for the new computing next year*



Thank for your attention