

# Steering Committee on Global Flash Flood Guidance

29 November 2016, Inter-Continental Hotel, Phnom Penh



# Activities and Responsibilities of Research and Flood Forecasting Office

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- 1- Hydro-meteorology Observation Network .
  - 2-Multi- Numerical Weather Predictions Model (MWP)
  - 2- Flash Flood/Flood forecast and river monitoring.
  - 3- Hydrological Study (Modeling).
  - 4- Hydrological research in River Basin.
  - 5- Collect and forecast water level in Pilot Flood Plant Areas.
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# Weather Observation

-35 Automatic Weather Stations(AWS)

-Manual Weather Station

-Automatic/Manual rain gauge station



# Computer Sever System

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- The computer server system is using for Synergie linked with the Meteo- France International(MFI).
  - We got various meteorological data/information in the region and our areas
  - Various NWP model sources has been used from those sever.
  - Extreme weather event and critical weather phenomena such as Storm, Earthquake, Surnami received via this sever too.
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# Synergies and Mateo-Factory



# Computer Severe System



# Telecommunication and Dissemination System

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-We got the various meteorological data /information as well as early warning for any extreme event that occurred in the region via the regional Global Telecommunication System(GTS) that linked from Bang Kok.

-We also delivered all data/information user such as MRC Aviation via the domestic GTS.

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# Global Telecommunication System(GTS)

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# Technical Training on GTS/WIS



# Meteorology Service

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-Climate Data and Information

-Now casting

-Three days forecast

-One week

-Seasonal Forecast

-Weather Early Warning

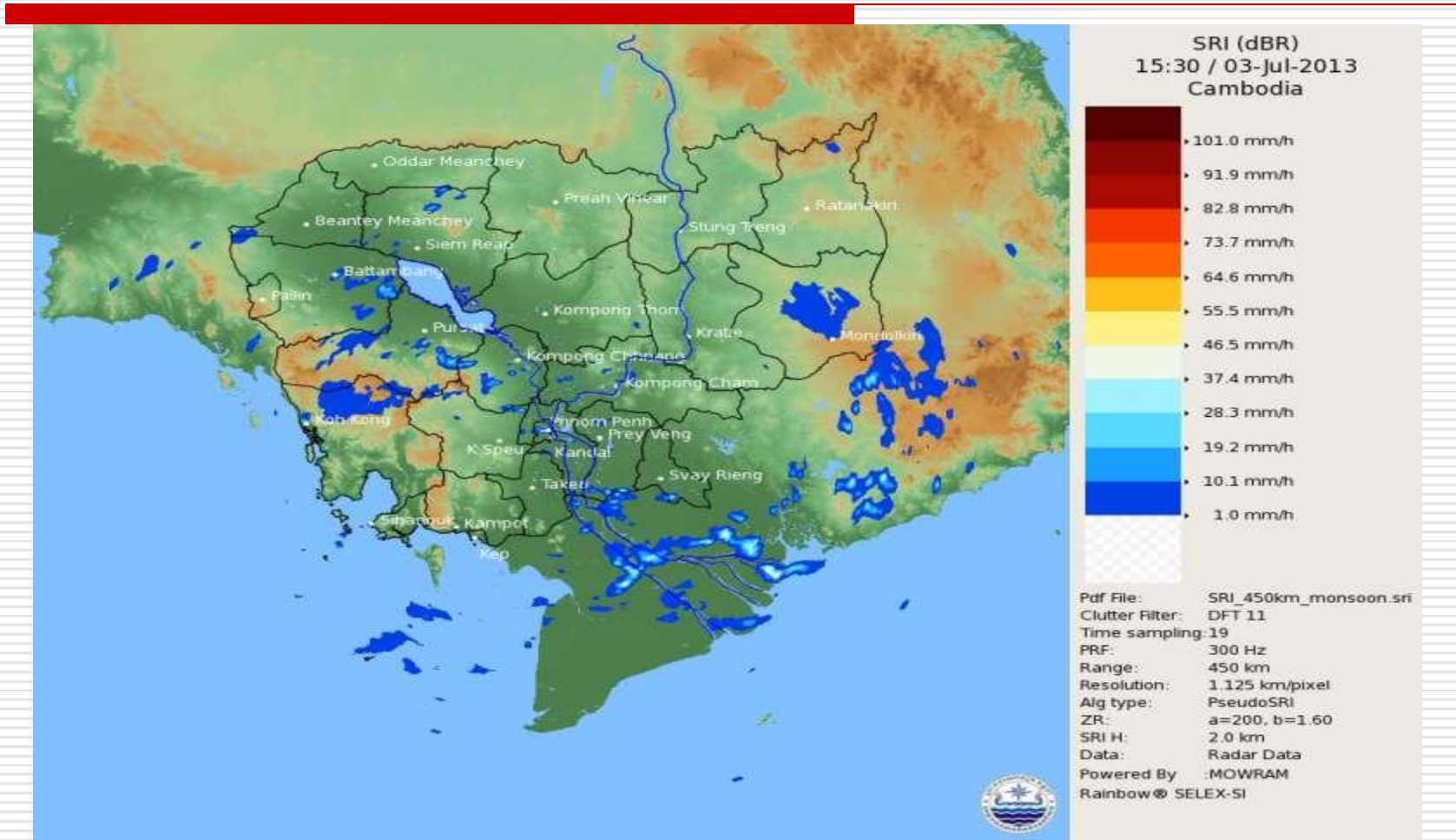
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## 3-Meteorological Phenomena

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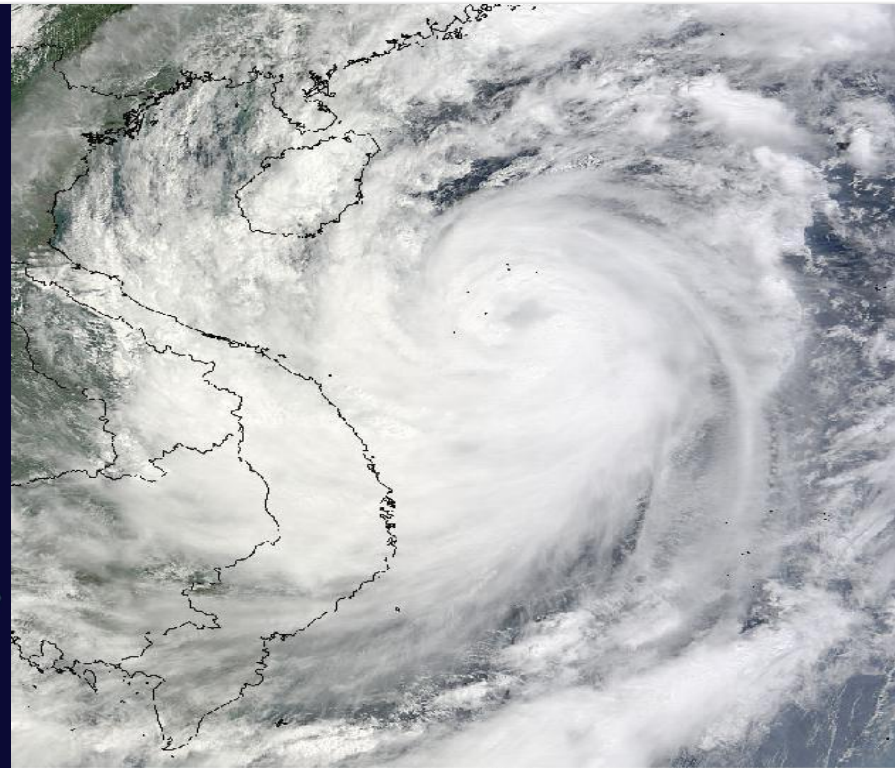
- Cambodia face on various natural disasters , mainly weather disaster related to the extreme weather event such as very heavy rainfall ,wild storms, thunderstorm, that cause to flood, flash flood ...
  - With the record in the last 3-4 year, the extreme events raised and more intensify for example in year 2012 in Pacific Ocean, the number of Tropical Cyclone 27 and 15 of them are Typhoons and Super typhoons.
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# Rainfall Intensity Monitoring by Weather Radar



# Cambodia and Typhoon Ketsana Experience

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Typhoon Ketsana on 28th September, 2009 at 10:30 am Local Time  
(Source of NASA's Terra Satellite)

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## Weather/Flood Information & Early Warning Processing



# Weather Warning

**ដែនសមុទ្រ**

▶ ព្យាករណ៍ដែនសមុទ្រ

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**ភ្ជាប់ទៅគេហទំព័រផ្សេង**

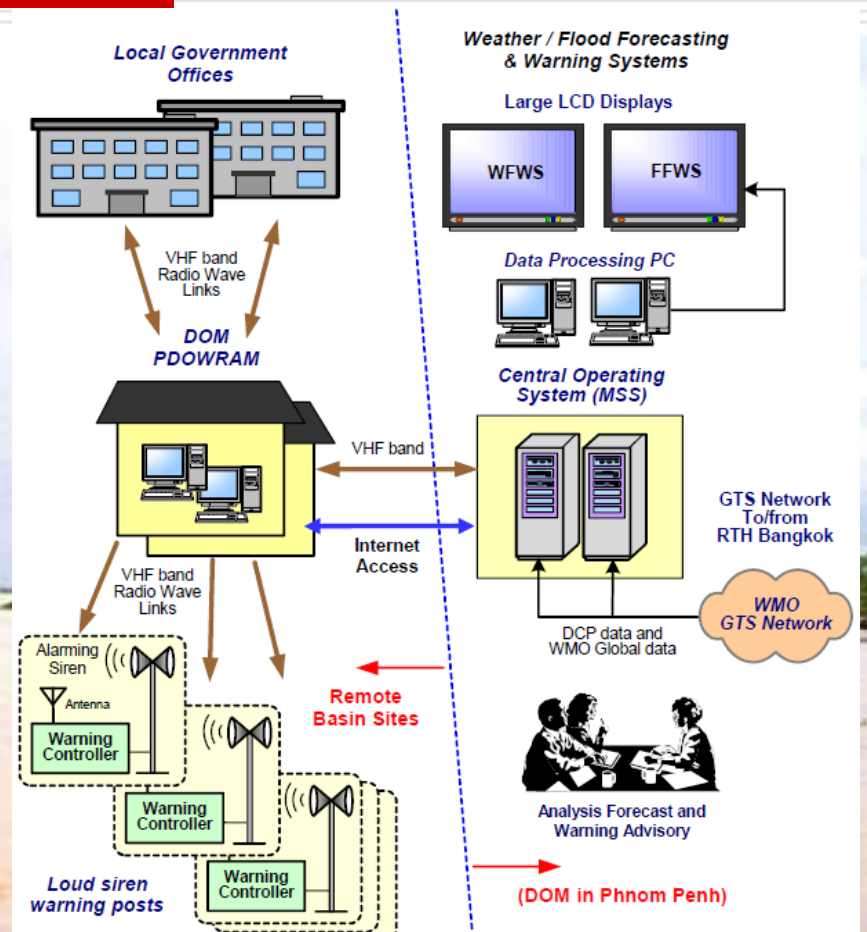
- ▶ ក្រសួងធនធានទឹក និងខនុ និងយម
- ▶ អាជ្ញាធរទន្លេសាប
- ▶ ក្រសួងសាធារណៈ និងដឹកជញ្ជូន
- ▶ ក្រសួងទេសចរណ៍

Visitors  
**6043426**

Warnings			
3 days outlook	Tuesday	Wednesday	Thursday
	<p><b>Tuesday 15 September 2015</b></p> <p>ភ្លៀងខ្លាំងនិងខ្យល់កម្រាស់ រីឯភើតមានឡើងទៅតាមពេល និងទឹកខ្ពង់ក្នុងតំបន់ដែលមានពណ៌ ។                      ច្យល់បក់ ភ្លៀងនៅលើផ្ទៃសមុទ្រ ។ លេកសមុទ្រអាចមានកំពស់ចាប់ពី ១.៥០ ម៉ែត ទៅ ២.០០ម៉ែត។</p> <p>សូមប្រុងប្រយ័ត្នខ្ពស់ ជាមួយជំនន់ទឹកភ្លៀង ដែលអាចភើតមានឡើងជាយថាហេតុ</p>	<p><b>Wednesday 16 September 2015</b></p> <p>រំពឹងថា ភ្លៀងខ្លាំងនិងខ្យល់កម្រាស់ រីឯភើតមានឡើងទៅតាមពេល និងទឹកខ្ពង់ក្នុងតំបន់ដែលមានពណ៌ ។                      ច្យល់បក់ ភ្លៀងនៅលើផ្ទៃសមុទ្រ ។ លេកសមុទ្រអាចមានកំពស់ចាប់ពី ១.៥០ ម៉ែត ទៅ ២.០០ម៉ែត។</p> <p>សូមប្រុងប្រយ័ត្នខ្ពស់ ជាមួយជំនន់ទឹកភ្លៀង ដែលអាចភើតមានឡើងជាយថាហេតុ</p>	<p><b>Thursday 17 September 2015</b></p> <p>រំពឹងថា ភ្លៀងខ្លាំងនិងខ្យល់កម្រាស់ រីឯភើតមានឡើងទៅតាមពេល និងទឹកខ្ពង់ក្នុងតំបន់ដែលមានពណ៌ ។                      ច្យល់បក់ ភ្លៀងនៅលើផ្ទៃសមុទ្រ ។ លេកសមុទ្រអាចមានកំពស់ចាប់ពី ១.៥០ ម៉ែត ទៅ ២.០០ម៉ែត។</p> <p>សូមប្រុងប្រយ័ត្នខ្ពស់ ជាមួយជំនន់ទឹកភ្លៀង ដែលអាចភើតមានឡើងជាយថាហេតុ</p>



# Flooding along Mekong River Area



# FLOOD EARLY WARNING SYSTEM

## Flood Alarm States



## "Flood Billboard"



## **Inundated school in Stung Sen district**



## **Flooding over the major district road to Sraeung commune**

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# MRC HYDROMETEOROLOGICAL NETWORK

## Basin-wide Real time Data Collection Network

Data Transmission every 15'.

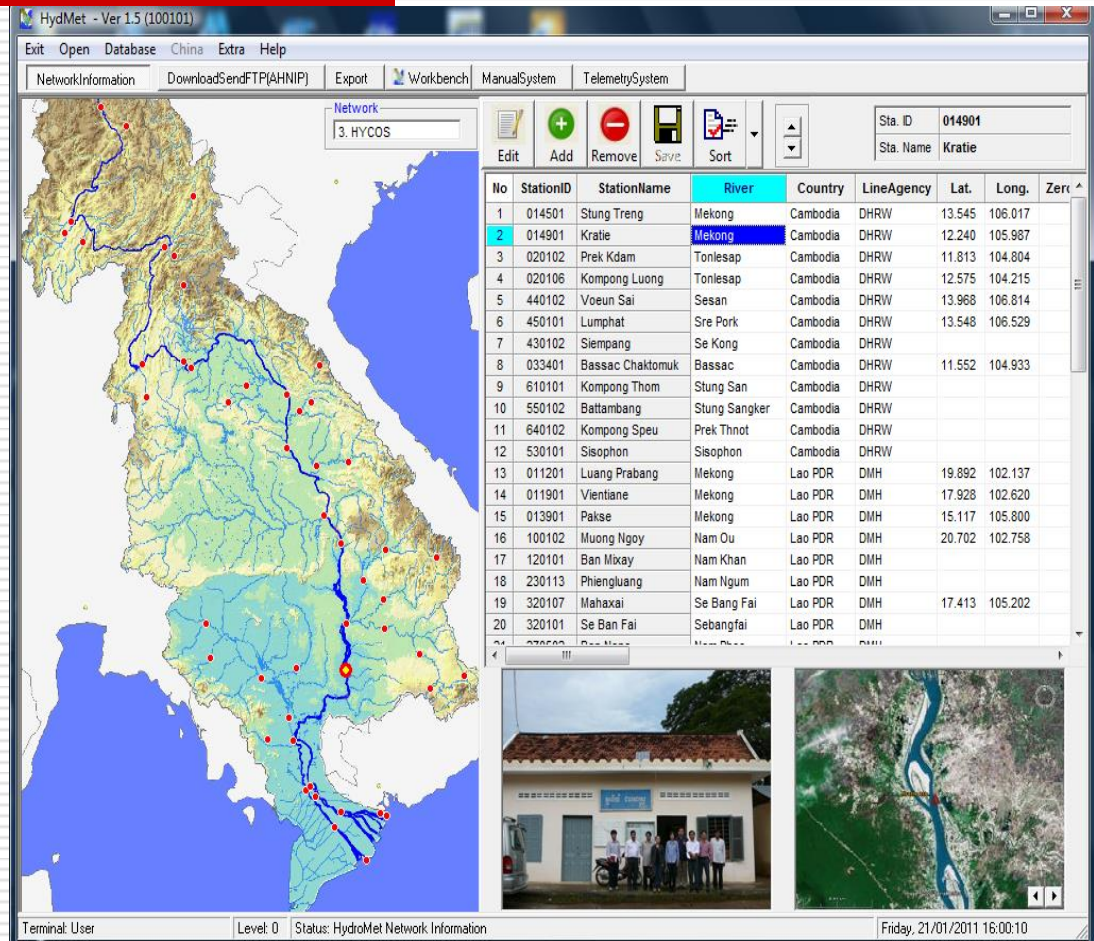
### AHNIP:

- 4 stations in Cambodia among 17 stations of the MRC network

### Mekong-HYCOS:

- 8 stations in Cambodia among 32 station of MRC Network

- ***Real time data above are very important for flood forecasting and warning.***



The screenshot displays the HydMet software interface (Ver 1.5 (100101)). The main window shows a topographic map of the Mekong basin with a network of stations marked by red dots. A table on the right lists the stations, with the 'Kratie' station (StationID 014901) highlighted in blue. The table includes columns for StationID, StationName, River, Country, LineAgency, Lat., Long., and Zeri. Below the table, there are two small images: a photograph of a station building and a satellite view of the river area.

No	StationID	StationName	River	Country	LineAgency	Lat.	Long.	Zeri
1	014501	Stung Treng	Mekong	Cambodia	DHRW	13.545	106.017	
2	014901	Kratie	Mekong	Cambodia	DHRW	12.240	105.987	
3	020102	Prek Kdam	Tonlesap	Cambodia	DHRW	11.813	104.804	
4	020106	Kompong Luong	Tonlesap	Cambodia	DHRW	12.575	104.215	
5	440102	Voeun Sai	Sesan	Cambodia	DHRW	13.968	106.814	
6	450101	Lumphat	Sre Pork	Cambodia	DHRW	13.548	106.529	
7	430102	Siempang	Se Kong	Cambodia	DHRW			
8	033401	Bassac Chaktomuk	Bassac	Cambodia	DHRW	11.552	104.933	
9	610101	Kompong Thom	Stung San	Cambodia	DHRW			
10	550102	Battambang	Stung Sangker	Cambodia	DHRW			
11	640102	Kompong Speu	Prek Thnot	Cambodia	DHRW			
12	530101	Sisophon	Sisophon	Cambodia	DHRW			
13	011201	Luang Prabang	Mekong	Lao PDR	DMH	19.892	102.137	
14	011901	Vientiane	Mekong	Lao PDR	DMH	17.928	102.620	
15	013901	Pakse	Mekong	Lao PDR	DMH	15.117	105.800	
16	100102	Muong Ngoy	Nam Ou	Lao PDR	DMH	20.702	102.758	
17	120101	Ban Mxay	Nam Khan	Lao PDR	DMH			
18	230113	Phiengluang	Nam Ngum	Lao PDR	DMH			
19	320107	Mahaxai	Se Bang Fai	Lao PDR	DMH	17.413	105.202	
20	320101	Se Ban Fai	Sebangfai	Lao PDR	DMH			

# Flood Forecasting and Warning

## Type of flood in Cambodia

Based on Annual Maximum Water Level at <b>Bassac-Chaktomuk station</b>	<b>Small Flood</b>	<b>Medium Flood</b>	<b>Big Flood</b>	<b>Biggest Flood</b>
	Lower <9.00m	Between >9.00m to <10.00m	Between 10.00m to <11.00m	Higher > 11.00 m

## Flow speed in flood season

Station	Flow Duration arrive at Phnom Penh_Chaktomuk
Stung Treng	3 days
Kratie	2 days
KgCham	1 day

## Flood caused by:

- Big discharge is over the flow capacity of the rivers and its tributaries.
- Heavy rainfall in the region caused of the over bank flow
- Limitation of capacity drainage system
- Siltation or sedimentation deposit in the river cause to river shallow
- Sea level rise, ...etc.

## 2 main factors of Flood Phenomena:

- Nature factor
- Human factor

# Conclusion

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- Strength:
    - Human Resources and Capacity in DHRW/DOM are improved;
    - Cooperation with many sector such as Government, Other Committee related to Water, Universities/Institutes at National and Abroad, NGO's,...
  - Weakness:
    - Human Resources and Capacity in Provincial Staff are limited;
    - Continuous data collection;
    - Network is need to be improved;...
  - Need:
    - Human Resources: training in short-medium-long time and education;
    - Capacity Building: for DHRW/DOM and Provincial Staff;
    - Equipment support;
    - Improving Hydro-meteorological Observation System
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