

Item 4.4

SWFDP in Southeast Asia

SWFDP-SeA

Yuki Honda, JMA,

*RA II Theme Leader on NWP Systems
and Products*

Review the Events since Feb 2010



Organization of RSMT

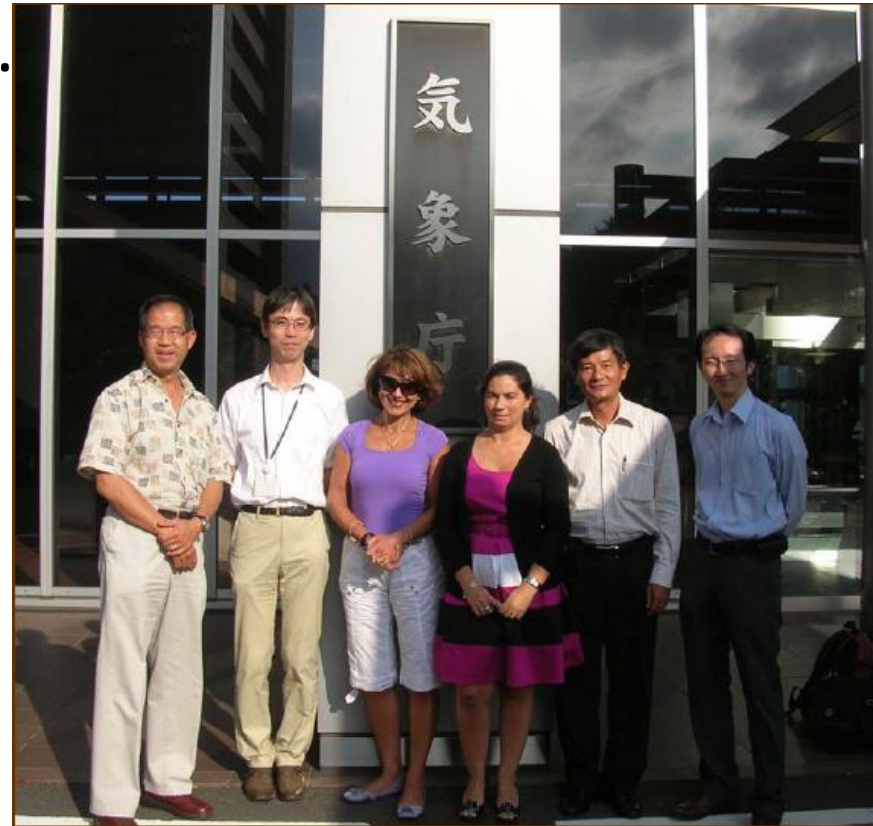
- After 3rd session of SWFDP-SeA, WMO Secretariat sent the official letters to the PRs of relevant countries
 - To invite them to join the SWFDP-SeA and
 - To appoint someone as members of the RSMT.
- NMHSs:
 - Ms Bin Chann MONY, Department of Meteorology, Cambodia,
 - Ms Souvanny PHONEVILAY, Department of Meteorology and Hydrology, Laos, P.D.R.,
 - Ms Sugunyanee YAVINCHAN, Thai Meteorological Department, Bangkok;
- Regional Centres:
 - **Mr Nguyen Dai KHANH**, National Hydro-Meteorological Service of Viet Nam; also as **Chair** (not confirmed officially.)
 - **Mr LEE Lap-Shun**, Hong Kong Observatory: also as **PWS Representative**
 - Mr Masashi KUNITSUGU, RSMC-Tokyo,
 - Dr M. Mohaptra, RSMC-New Delhi;
- Global Centres:
 - Ms ZHANG Xiaoling, China Meteorological Administration, Beijing,
 - **Mr Yuki HONDA**, Japan Meteorological Agency, Tokyo; also as **RA II Rep. to SG-SWFDP**
 - Mr Hyun-Cheol SHIN, Korea Meteorological Administration, Seoul,
 - Mr Detlev MAJEWSKI, Deutscher Wetterdienst, Offenbach;

Project Development Team and drafting RSIP

- The Coordinator of WGDRS, Mr. Lai (HKO), formulated a small Project Development Team whose members are Mr. Edwin S. T. Lai, Mr. Nguyen Dai Khanh (Rep. of RFSC Ha Noi, Viet Nam) and Mr. Yuki Honda (Theme Leader of NWP Systems and Products in RA II).
- The Team started drafting RSIP using SWFDP Overall Project Plan (2010), SWFDP Guidebook for Planning Regional Subprojects (2010) and RSIP of on-going subprojects.

Meeting of Project Dev. Team (Tokyo, Japan, Sep 2010)

- A Meeting to Develop a Strategy for Preparing an Implementation Plan for an SWFDP in Southeast Asia was held to discuss GDPFS and PWS components of the subproject and refine the RSIP.
- The RSIP as the outcome of this meeting was proposed to the first RSMT meeting.



1st RSMT Meeting

(Hanoi, Viet Nam, Oct 2011)

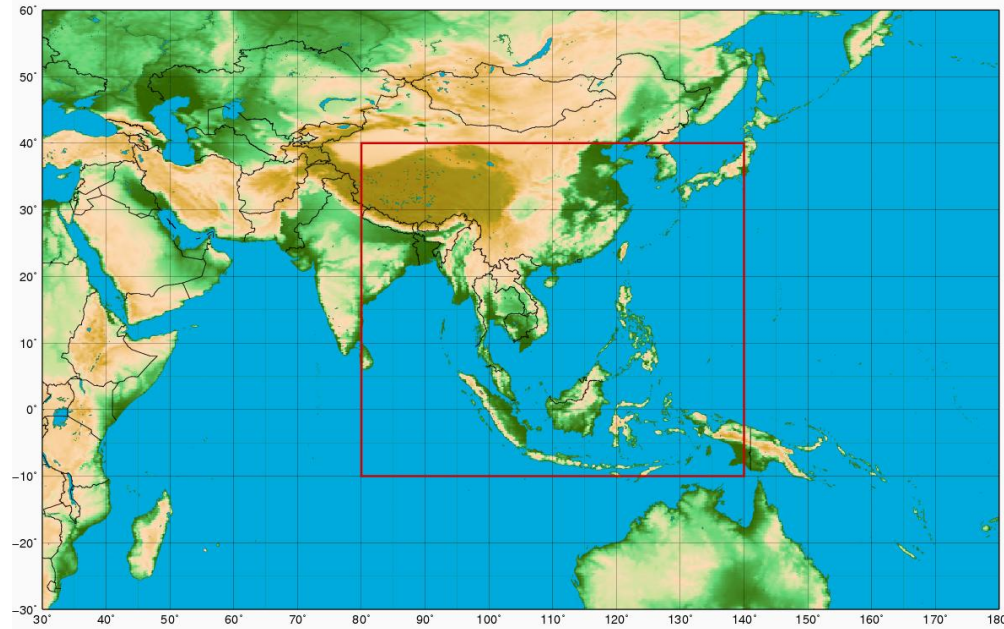
- The meeting was held at HQ. of Viet Nam Hydro-Met Service from 10 to 13 Oct 2011.
- The meeting reviewed the status of the preparation in participating countries and discussed the framework and the schedule of the SWFDP-SeA. The RSIP was updated according to the outcomes of the meeting. The final draft version of RSIP is referred as Annex. The framework of the SWFDP-SeA is described in detail in the following section.



Framework of SWFDP-SeA

Basic Framework

- Domain: 10°S, 40°N, 80°E and 140°E
- Global Centres:
 - **CMA**, **JMA** and **KMA**
(NWP guidance material, satellite products)
 - **DWD** (regional NWP technical support)
- Regional Centres:
 - **NCHMF / VHMS** (Regional Forecast Support)
 - **RSMC Tokyo** and **RSMC New Delhi** (TC forecasting support)
 - **HKO** (training and technical support)
- NMCs:
 - **Cambodia**, **Lao PDR**, **Thailand** and **Viet Nam**



Targeting Severe Weather Events

Recognizing that the following hazardous weather conditions and associated impacts (such as flooding, landslides, high waves and swell) are the most relevant in the region:

- (i) **tropical cyclone** (both from the South China Sea and from the Bay of Bengal) track, intensity, structure changes and landfall process (wind and gust, rainfall and storm surge);
- (ii) **heavy rain** triggered by tropical cyclones, SW and NE monsoon, troughs and ITCZ migration, and orography;
- (iii) thunderstorms and hail associated with severe convection;
- (iv) cold conditions and frost; and
- (v) extreme hot and dry conditions associated with föhn effect.

The sub-project, in its pilot/demonstration phases, is addressing heavy rain and strong winds, and may consider other hazardous weather conditions and weather-related hazards in future phases.

Establishment of Regional Forecasting Function

- There is no RSMC in the target domain.
- It is required to establish a centre for supporting regional forecasting whose main functions are:
 - (1) to maintain the project webpage; and
 - (2) to issue Daily Severe Weather Forecasting Guidance.
- The centre is named as Regional Forecasting Support Centre (RFSC).
- National Centre for Hydro-Meteorological Forecasting (NCHMF) of Viet Nam Hydro-Met. Service is assigned as RFSC.

RFSC Website

<http://swfdp-sea.com.vn/index>



World Meteorological Organization

Regional Specialised Meteorological Center (RSMC) Ha Noi



NCHMF

National Center for Hydro
Meteorological Forecasting

06:25:53

Logout

Guidance Products

Satellite-based 0-24 Hour Products

Global NWP Products

Global EPS Products

Regional NWP Products

Regional EPS Products

LEPS_0.2x0.2

SREPS_0.15x0.15

Tropical Cyclone Products

Training Website

RSMC Guidance Archive

SeA-NWS webpage

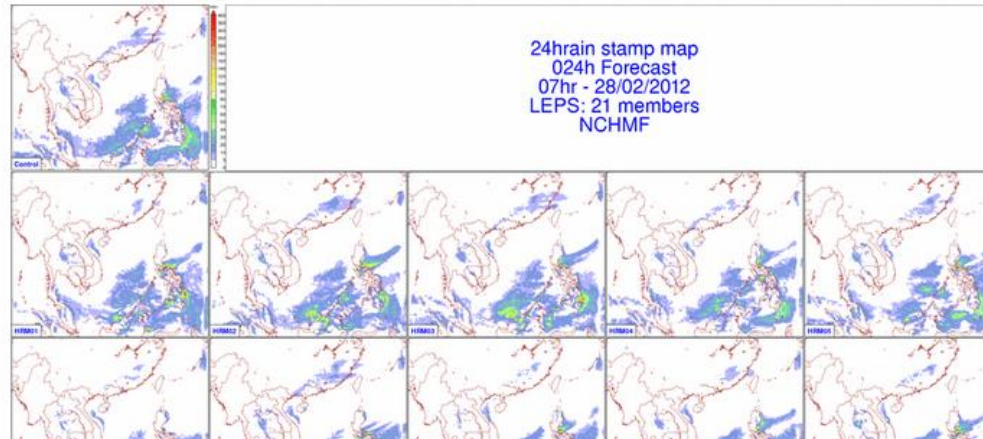
Regional and International Centers

Initial Date:

Select product category

Select weather chart

Forecasting meteorological fields



Contents of RFSC website

Products	Contents	Status
Guidance Products	Short-range (1-3 days) Medium-range (4-5 days)	Test
Satellite-based 0-24 Hour Products	Satellite Image: MTSAT-2 Satellite-Based Rainfall Convective Thunderstorm Forecasts Storm Tracks	Test
Global NWP Products	GSM (JMA), GFS (NCEP), NOGAPS, GEM (CMC), GME (DWD), UM(KMA)	Real-time
Global EPS Products	NAEFS	Real-time
Regional NWP Products	HRM, WRFARW	Real-time
Regional EPS Products	LEPS, SREPS	Real-time
Tropical Cyclone Products	Guidance Track and Intensity forecast Strike Probabilistic	Not yet
RSMC Guidance Archive		Not yet

Blue products are what we are using in Vietnam

RFSC Daily SW Forecasting Guidance

- RFSC Guidance is adjusted as follows, considering the operational forecasting procedure at NCHMF:
 - the RFSC Guidance is issued **once per day at 08UTC**; and
 - **the short-range is defined as up to 72 hours** and the medium range is up to 5 days.
- The RFSC Guidance, **including risk-table**, contains:
 - Synopsis of weather (analysis and forecast);
 - the interpretation of deterministic and ensemble NWP products from the Global and Regional Centres; and
 - severe weather predictions (risk or probability estimates) including tropical cyclone information.

RFSC Daily SW Forecasting Guidance

- The threshold values are determined as follows:
 - heavy rain: 50 and 100mm
(the risk over 200mm/24h should be described in discussion)
 - wind speed: 30knot over the land and 30 and 50knot over the sea.
- The threshold values of EPS products are determined as follows:
 - 6-hour accumulated precipitation: 25,50,100mm
 - 24-hour accumulated precipitation: 50,100mm
 - 10-meter wind speed: 20kt and 30kt
 - significant wave height: 2 m, 4 m and 6 m
 - significant wave period: 10 s and 15 s
 - Thumbnails of probability of precipitation in excess of threshold of 25, 50mm/6h at 6 hours intervals

RFSC Daily SW Forecasting Guidance



1st Map 2nd Map Risk Tables Discussion

RSMC-HANOI
SWFDP GUIDANCE PRODUCTS
RISK TABLES
SHORT-RANGE (DAY 1 AND DAY 2)

Issue Date: 15th April 2011

In order to provide more information about the geographical location of the severe event the following convention is adopted when filling in the cells: X for the whole country, N for the northern part, S for the southern part, W for the western part and E for the eastern part.

Day 1 Saturday 16th April 2011

RISK1	No risk	Low risk	Medium risk	High risk	No risk	Low risk	Medium risk	High risk
	Heavy Rain				Strong Winds			
Viet Nam	✗	SW & W coast			✗	SW & W coast		
Lao PDR			N	E			N	E
Cambodia								
Thailand								

Day 2 Sunday 17th April 2011

RISK1	No risk	Low risk	Medium risk	High risk	No risk	Low risk	Medium risk	High risk
	Heavy Rain				Strong Winds			
Viet Nam	✗				✗			
Lao PDR	✗				✗			
Cambodia	✗				✗			
Thailand	✗				✗			

Associated project proposals/activities

- Formulated a project “**Building a center for supporting regional forecasting**” to be submitted to the Government for funding:
 - ✓ High Performance Computing (HPC) system;
 - ✓ Hosted web and data servers
 - ✓ High resolution regional models for natural hazards for Southeast Asia: non-hydrostatic models and data assimilation systems (3DVAR, both traditional and non-traditional observations)
 - ✓ Applying ensemble forecast systems (for short and middle range)
 - ✓ Establishing website and related software (for displaying & analyzing)
- Workplaces and all necessary facilities
- Human resource developments:
 - ✓ In forecasting disasters from natural hazards
 - ✓ Experts on numerical weather prediction

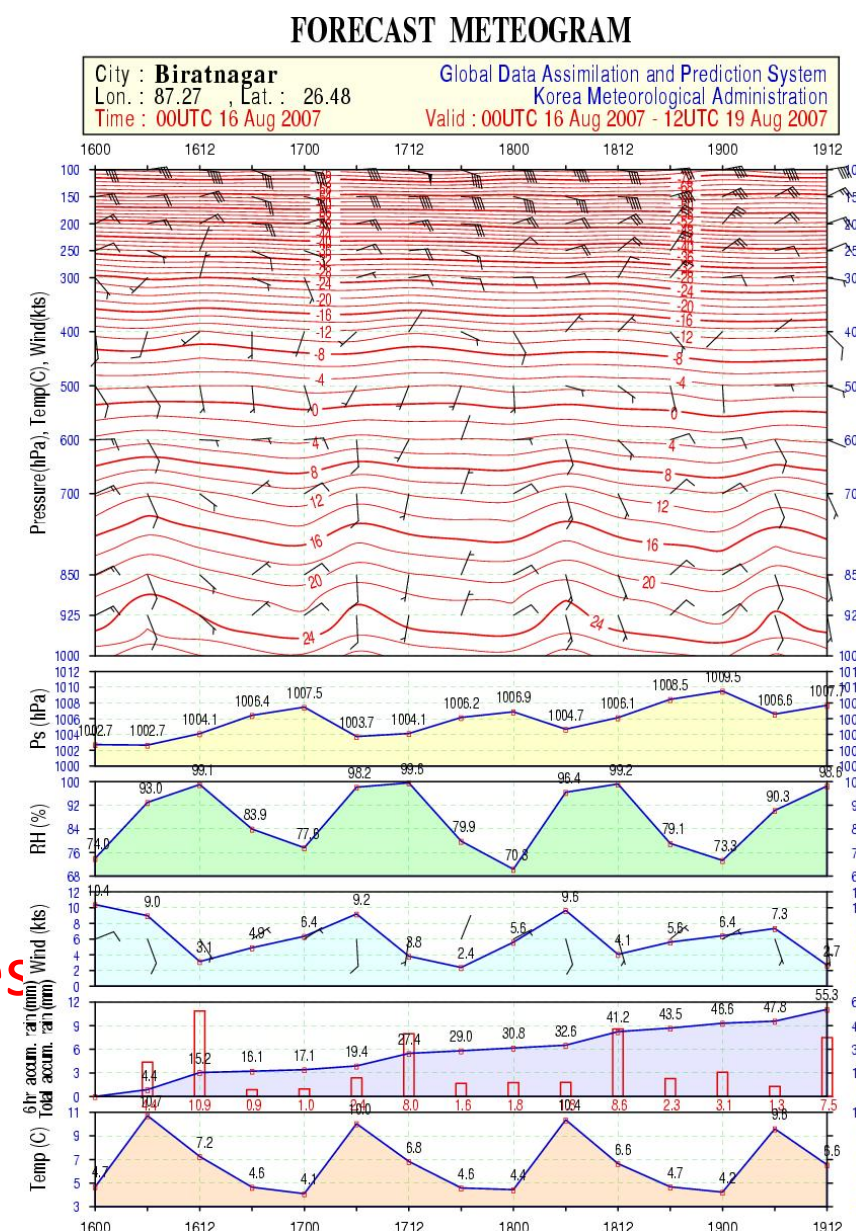
Projects in Synergy with SWFDP-SeA

- RA-II Project on the Provision of City-Specific NWP products
- JMA Pilot Project on EPS products
- GIFS-Forecast Demonstration Project (FDP) (THORPEX/TIGGE/GIFS)
 - North Western Pacific Tropical Cyclone (Track) Ensemble Forecast Research Project (WWRP Research Development Project)
- Landfall Typhoon Forecast Demonstration Project (WMO-Project, ESCAP/WMOTC)
- Flash Flood Guidance System (FFGS) in Mekong River Basin (WMO Regional Hydrology)
- NOAA/NCEP Indo-Asia Monsoon Desk.
- Mekong River Commission: rainfall estimation using satellite data.
- UNESCAP/WMO Typhoon Committee
 - Collaboration on Sharing of Weather Radar Data.
 - Urban Flood Risk Management Pilot Project.
- RAI Pilot Project to Develop Support for NMHSs in Satellite Data, Products and

RA II Project on City-specific NWP forecasts

- 13th Session of RA II
 - to enable developing countries of RA II access NWP products;
- Hong Kong, China, Japan and the Republic of Korea provide city-specific forecast time series products
 - JMA is now providing products for **about 300 cities of 18 countries.**

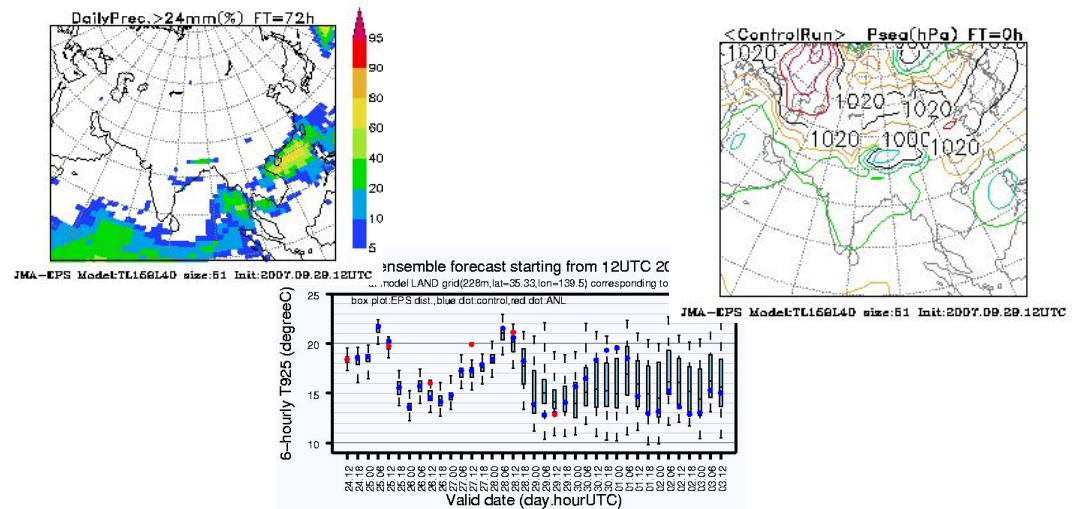
From KMA →



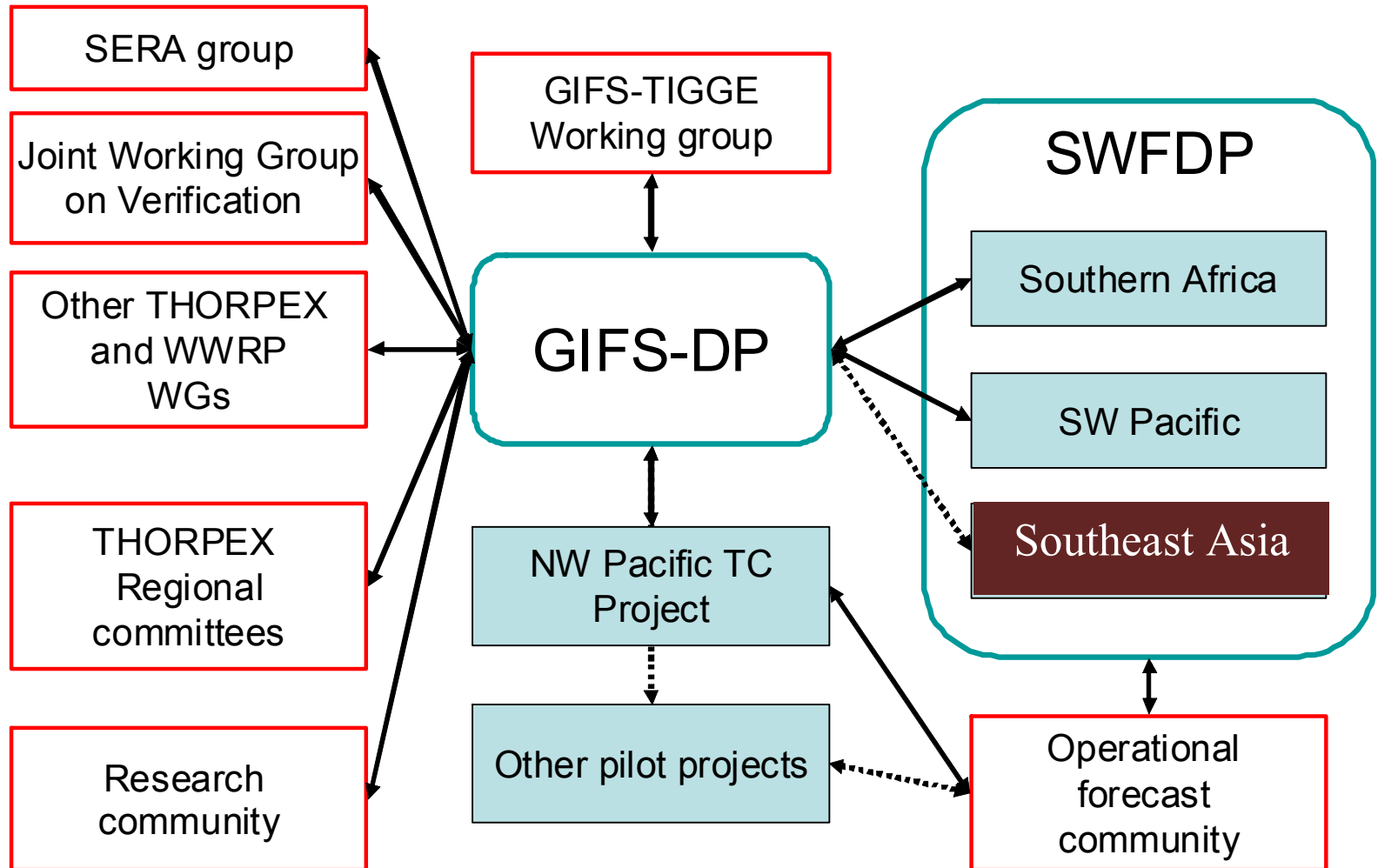
JMA EPS-WEB

The products in JMA EPS-WEB are recommended by Manual on the GDPFS (WMO No.485).

- In addition to the web-site for public users, JMA provides a web-site for meteorologists and forecasters in foreign countries.
- The special forecast products derived from EPS are disseminated on the website, “JMA EPS-WEB”, supporting the activity of National Meteorological and Hydrological Services (NMHSs) in Asia.
- The data in this website is available for operational weather forecasting in your countries.



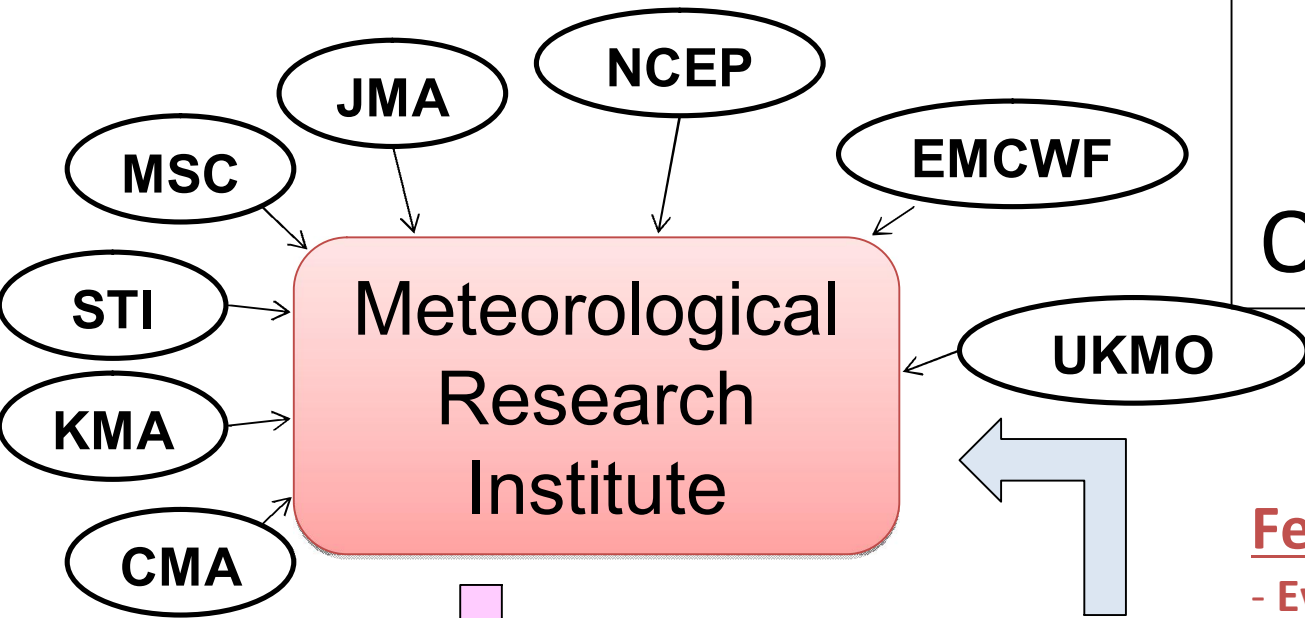
GIFS development project interactions



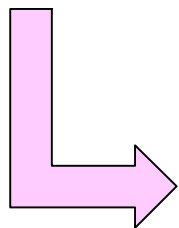
Synergy with TIGGE/GIFS in RA II

- CMA
 - Archive Centre of the THORPEX/TIGGE project
 - Store EPS products from 10 NWP centres every day.
- MRI
 - North Western Pacific Tropical Cyclone (TC) Track Ensemble Forecast (NWP-TCTEF) Project
 - Severe weather potential

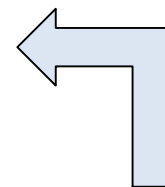
Testify GIFS
Products for
Operational Use



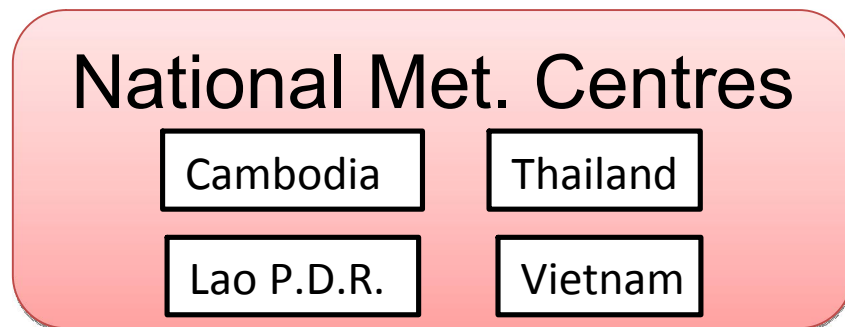
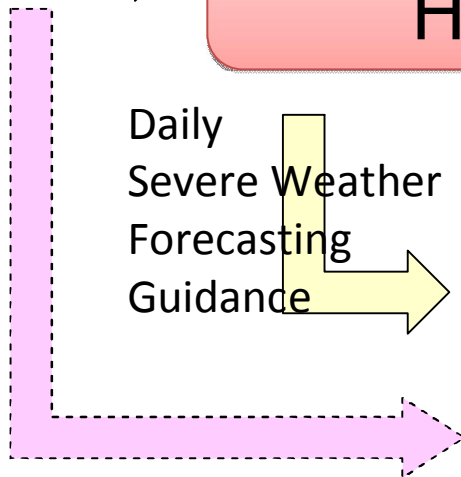
**Multi-Centres
Grand Ensemble
GIFS Products**



Feedback
- Evaluation of usefulness
in forecasting operation



Daily
Severe Weather
Forecasting
Guidance

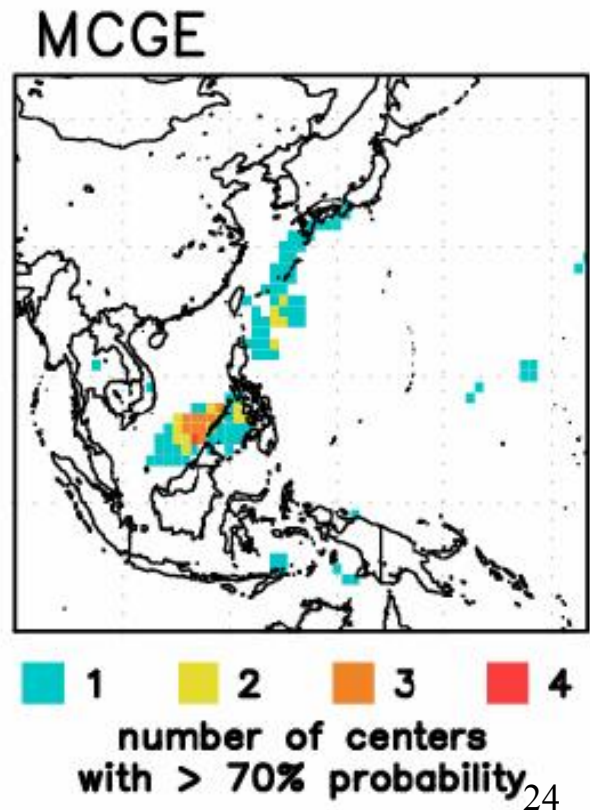
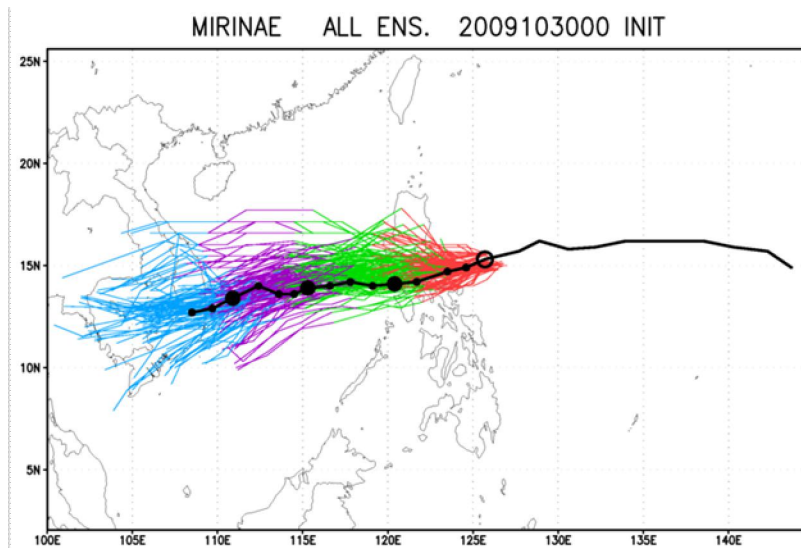


GIFS-TIGGE Products at MRI/JMA

MRI/JMA will provide **two** types of GIFS-TIGGE products for Severe Weather Forecast Demonstration Project in Southeast Asia.

1. Tropical cyclone track in the western North Pacific

2. Severe weather potential such as heavy precipitation



How to Use GIFS-TIGGE products

1. Tropical cyclone track in the western North Pacific

- is available in near-real time and
- offers a product with better performance.

*We would like to ask you to test this product **in real time operation.***

2. Severe weather potential such as heavy precipitation

- corrects the statistical bias and downscales information.

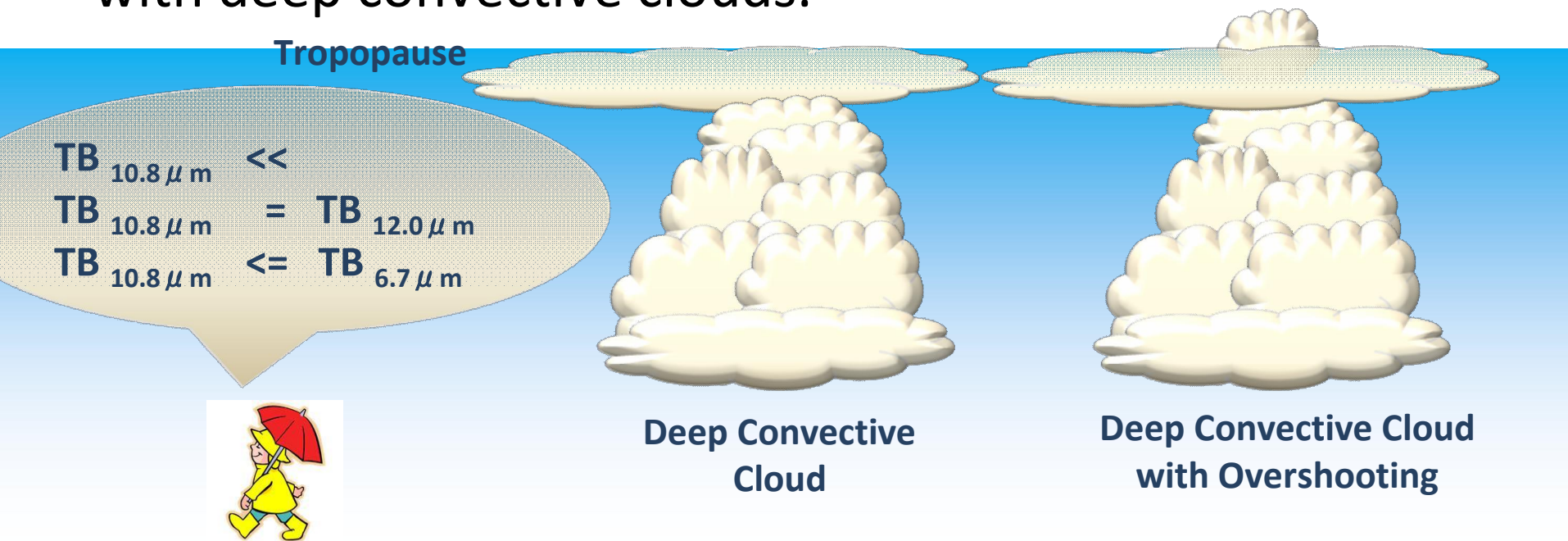
But

- needs more verification; and
- is only available with 48hour delay.

*We would like to ask you to test this product **in the post evaluation.***

Satellite-based Nowcasting Product

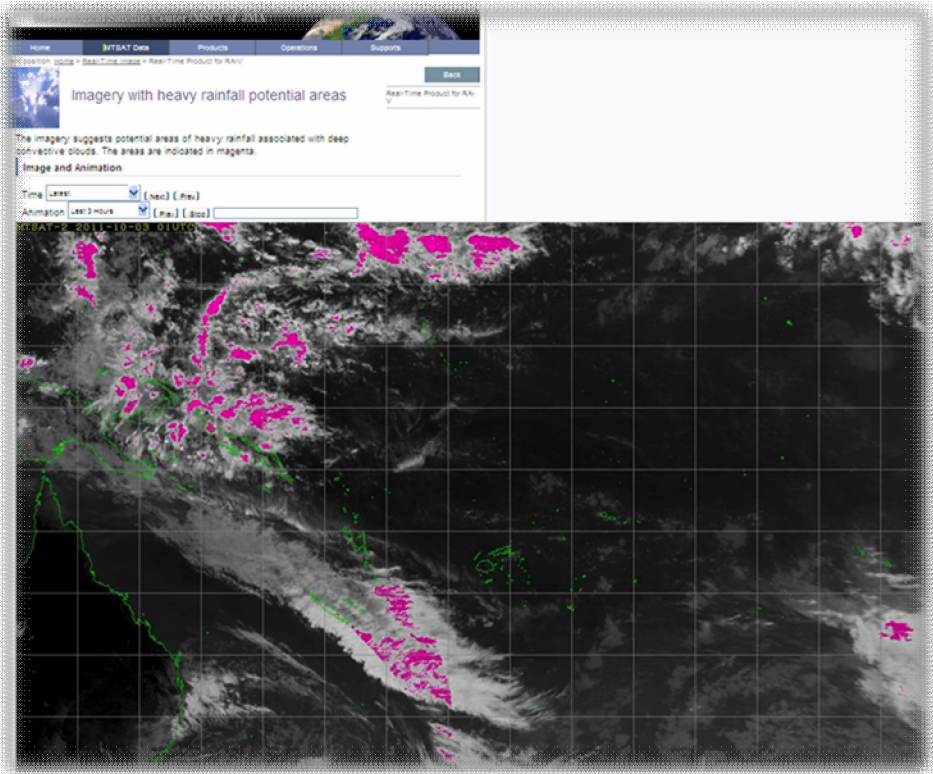
- Meteorological Satellite Center of JMA provides the nowcasting product to support severe weather monitoring in the absence of weather radar, by indicating probable or potential areas of heavy rainfall associated with deep convective clouds.



Product for South Pacific

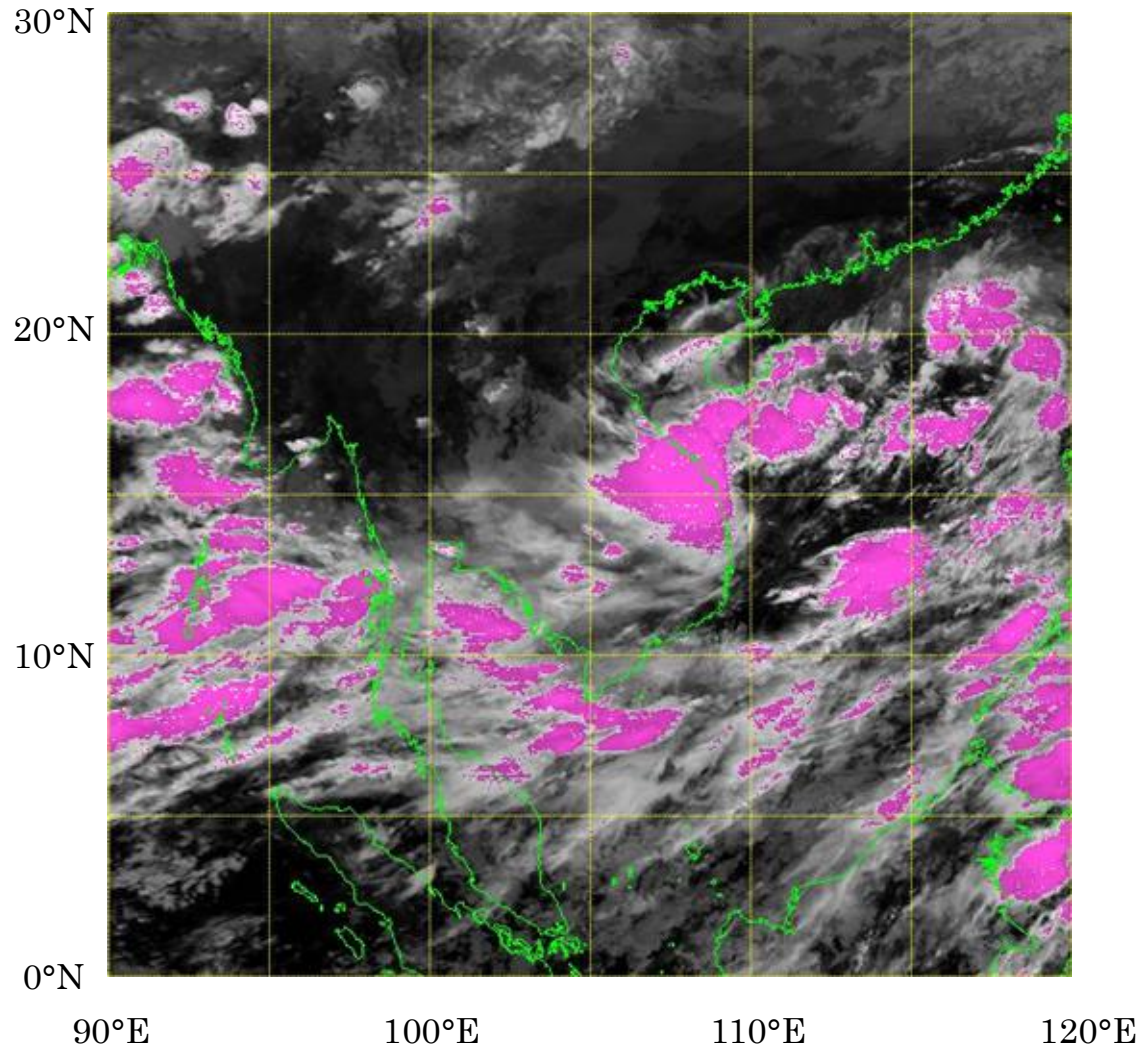


(80 E, 32 N - 92 E, 24 N)			
High-Resolution Asia 3 (84 E, 27 N - 95 E, 18 E)			
Imagery with heavy rainfall potential area			



http://mscweb.kishou.go.jp/RA-V/sat_img.htm

Product for Southeast Asia (sample)



PWS component of SWFDP-SeA

- Focus on three user groups: the general public, the media and the disaster management organizations.
- Implementation Plan to improve the warnings and forecasts services in NMHSs
 - Is expected to be developed in advance using PWS Guidance on Developing Service Delivery Mechanisms in NMHSs
 - Will be tested during the field phase and be evaluated to verify its usefulness and
 - NMHSs will identify the area of improvement after the field phase.
- At 1st RSMT meeting, the steps agreed by NMHSs are created and included in RSIP.

Preparatory Training Workshop

- The first two-week preparatory training workshop on GDPFS and PWS for SWFDP-SeA was organized in Hong Kong from 4 to 15 July 2011.

1st week : GDPFS

Role	Name
Organizer	Peter Chen, WMO Secretariat
Lecturer	Rick Jones, WMO expert consultant
Lecturer	Anders Persson, WMO expert consultant
Lecturer	Masakazu Higaki, JMA
Lecturer	Chen Yun, CMA
Lecturer	Vo Van Hoa, Vietnam
Lecturer	ST Chan, YS Li, WK Wong, HY Yeung and LS Lee from HKO
Trainee	Hoang Phuc Lam, Vietnam
Trainee	Souvanny Phonevilay, Lao PDR
Trainee	Charoon Laohalertchai, Thailand
Trainee	Bin Chann Mony, Cambodia
Trainee	Juanito S. Salang, Philippines

2nd week : PWS

Role	Name
Organizer	Haleh Kootval, WMO
Lecturer	Alex Awiti
Lecturer	Gilbert Ouma
Lecturer	KL Lee, YC Cheng, WL Ginn and ST Lai from HKO, MY Ha from RTHK
Trainee	Nguyen Dieu Huyen, Vietnam
Trainee	Vilayphong Sisomvang, Lao PDR
Trainee	Sarawut Phansangworn, Thailand
Trainee	Hoang Phuc Lam, Vietnam
Trainee	Souvanny Phonevilay, Lao PDR
Trainee	Charoon Laohalertchai, Thailand
Trainee	Bin Chann Mony, Cambodia
Trainee	Juanito S. Salang, Philippines



2nd Preparatory Training Workshop

- It is tentatively planned to hold the 2nd workshop in July 2012 for two weeks.
 - Possible Venue : Thailand
 - Joint Training Workshop with SWFDP in Bay of Bengal

Discussion at 1st RSMT meeting:

- More input from the RSMT about suitable candidates for training
- More specific training on how to use contingency tables for verifying warnings and severe weather events
- Request the training on new products such as satellite-based nowcasting product.
- The use of advanced IT tools for knowledge sharing would be an option to assist the workshop participants to pass what they learned to the others in their own NMHSs.

Future Plan

When	What / Task	Who / RSMT Member
Oct 2011	SWFDP-SeA RSMT meeting to review the RSIP	All
Nov. 2011	Start a pilot phase	All
Apr. 2012	Start a demonstration phase	All
July 2012	Second preparatory training workshop (GDPFS/PWS)	P.Chen and H. Kootval, WMO L.-S. LEE, HKO
August 2012	First quarterly report (Apr. 2012 – July 2012)	NMHSs: Cambodia, Lao P.D.R., Thailand, Viet Nam.
Dec. 2012	Second quarterly report (Aug. 2012 – Nov. 2012)	NMHSs: Cambodia, Lao P.D.R., Thailand, Viet Nam.
Dec 2012 (or later)	Mid-term meeting (adjust and discuss the expand phase)	All
April 2013	Third progress report (Dec. 2012 – March 2013)	NMHSs: Cambodia, Lao P.D.R., Thailand, Viet Nam.

Severe Weather Event Evaluation Form

Severe Weather Event Evaluation Form

NMC: / PERIOD: MM/YYYY to MM/YYYY

Event No.	Event type	Region	OBS start time (to nearest h in UTC)	OBS end time (to nearest h)	Observations (list all reports in region)	Severe weather observed? (Yes=1, No=0)	Warning Issued? (Yes=1, No=0)	FCST start time (to nearest h)	FCST end time (to nearest h)	Lead time of warning (0=time of observed start)	Impact of event	Impact of the warning					
1	Please fill out this table for each event, either forecast or observed or both, for each region of the country where an event occurred and/or an event was forecast. For "false alarms" only columns F to J and M need to be filled. For missed events, only columns A to H and L need to be filled in; but please also evaluate the guidance in those cases.																
													Guidance:	RFSC Guidance (o=checked, x=not)	Evaluation: 1 to 4 (1=Poor, 4=Excellent)	Other Products (o=checked, x=not)	Evaluation: 1 to 4 (1=Poor, 4=Excellent)
														DAY 1 Map		CMA: Global	
														DAY 2 Map		CMA: Ensemble	
														DAY 3 Map		JMA: Global	
														Risk Table		JMA: Ensemble	
														Discussion		KMA: Global	
														Medium-range		KMA: Ensemble	
																NCHMF: Regional	
																NCHMF: Ensemble	
		TIGGE: TC Track															
		TIGGE: SW Potential															
		IMTSAT: Heavy Rain															