



11th TC
Integrated Workshop

01

ESCAP/WMO
Typhoon Committee

Issue 33 • Year 2016
Typhoon Committee
Secretariat
Macao, China




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2nd newsletter

ESCAP/WMO Typhoon Committee Held its 11th Integrated Workshop



The ESCAP/WMO Typhoon Committee (TC) at its 48th Session decided to convene the 11th Integrated Workshop (11th IWS) in 2016. With the kind offer of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), the 11th IWS with the theme of “Improving Typhoon Impact-

based Forecasting and Warning” was held in Upper Lower Level, Waterfront Cebu City Hotel and Casino, Cebu, the Philippines on 24 to 27 October 2016. IWS is an annual event for TC Members to review TC activities and work progress through the Advisory Working Group (AWG) and the three TC Working Groups (WGs)

on Meteorology, Hydrology and Disaster Risk Reduction (DRR), and to make-work plans for the coming year. Totally around 110 participants joined the Workshop from 14 Members namely Cambodia; China; Hong Kong, China; DPR of Korea; Japan; Laos; Macao, China; Malaysia; Philippines; Republic of Korea; Singapore; Thailand; the United States of America (USA); and the Socialist Republic of Viet Nam. The representative from WORLD METEOROLOGICAL ORGANIZATION (WMO) and Asian Disaster Reduction Center (ADRC) attended the Workshop.

Six experts were invited to present keynote lectures on the first day of the 11th IWS, including:

- 1) "Typhoon Central Pressure Estimation using Doppler Radars" – Mr. Udai Shimada, Researcher, Second Laboratory, Typhoon Research Department, Japan;
- 2) "The seasonal forecastal on tropical cyclone in China" – Dr. Ying Ming, Vice-prof.; Shanghai Typhoon Institute, China;

3) "Community-based flood disaster management" – Dr. KOH Deuk koo, Vice President of Dongbu Engineering, Co. Ltd, Republic of Korea;

4) "Flood Forecasting and Warning System" – Mr. LEE Joon seok, CEO of Toconet (Corporation), Republic of Korea;

5) "Automatic discharge measurement technique" – Dr. CHA Jun ho, Chief of River Forecast team, Water Resources Information center (HRFCO), Republic of Korea

6) Discussion on TC Cross-cutting issues (SSOP-II) – Dr. Jinping LIU, Hydrologist of TCS.

Working Groups reviewed Members' Reports of 2016 and the implementation status of Annual Operation Plan (AOP) in 2016, discussed the implementation plan and success indicators of AOPs and budget request in 2017. The Participants discussed and commented the proposal of SSOP-II for 10th round of ECSAP Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries.



Opening Ceremony at TC 11th IWS



WGM Chair at the Parallel Session TC 11th IWS



Group Photo of WGH Parallel Session at TC 11th IWS



Group Photo of WGD RR Parallel Session at TC 11th IWS



Roving Seminar 2016

The Roving Seminar 2016 was held in Ha Noi, Viet Nam from 15 to 17 November 2016 with the strong support of National Hydro-Meteorological Service (NHMS) of Viet Nam. The topic this year was “Storm Surge” and there were 39 participants from Cambodia, China, Hong Kong, Lao PDR, Macao, Philippines, Republic of Korea, Singapore, Thailand and Viet Nam. Lecturers came from USA, Japan and Hong Kong delivered excellent lectures with hands-on experience sessions and the Seminar was highly appreciated by the participants.



The participants of the Roving Seminar taking a group photo with the Deputy Director General of National Hydro-Meteorological Service of Viet Nam, Mr. Tran Hong Thai (4th to the right, 1st row), Meteorologist of Typhoon Committee Secretariat, Mr. Fong Chi Kong (5th to the right, 1st row) and the lecturers.

Technical Visit to Ba Vi Meteorological Station



On the NEWS

TCS Received Media Interview

To increase the exposure of Typhoon Committee and public awareness on typhoons, TCS Meteorologist Mr. Clarence FONG was interviewed by Hong Kong Next Magazine in February 2017. Mr. FONG explained the missions of Typhoon Committee and shared the achievements in previous years. He also talked about early-warning strategies for high-impact weather such as typhoons and heavy rain.

Mr. FONG founded Weather Underground of Hong Kong in 1995 and he has profound experience in collaborating with weather stakeholders to promote public awareness on weather, especially for typhoons. He has also conducted lectures and published books for the public and he runs a leading Facebook page with 130,000 fans.



聯合國氣象專家方志剛

▲ 霧靄籠罩神州大地，香港亦難幸免。一月，香港空氣質素亦曾出現警報。

▲ 隨著時代進步，預測颱風路徑早已變得電腦化，但方志剛的辦公室內，仍有一張繪畫圖，圖上繪有一張透明膠，畫路徑解法度。

因為唔想返學

因父親工作的關係，方志剛在澳門長大。小學時期，他對氣象產生興趣，源於不想返學。他說：「有無打風，最影響你需唔需要返學，八號風球是不用返學，於是下次就會去望望。」不用返學，他會在家中收聽電台的風球消息。電話簿後面有熱帶氣旋途徑，當時就聽收音機同畫圖。由那時開始養成習慣，每逢打風落雨，他會半夜起床，聽最新風球消息，收集路徑數據，至今不變。數據不用多，把風球在不同經緯間的移動路徑連起，即可畫出預測颱風的路徑。每畫一幅就睡一張，你会有很多數據，你就開始見到規律。原來去到某些月份，風球會向上走。聽罷，明不明白，記者還是選擇返學聽書做功課算了。方志剛指其實不難，現在他與

拿八號喇 滿意啦？

聽日準時返工啊

▲ 打工仔最難放颱風假。
有網民諷刺背後有李漢強發功，造成李氏力場，令香港百「風」不便。

早

前突然有一股霧靄籠罩，究竟係乜？普通人一句，總之有毒，影響你健康。其實霧靄，即煙霞。霧是空氣中的水滴影響能見度。霧是空氣中的固體微粒影響能見度。當空氣中有大量污染物的懸浮粒子積聚，令能見度下降，加上相對濕度低，即成「霧」。自熱熱研究氣象的方志剛，樂於不在此社會問題解釋霧及霾之別。「前者係自然現象，後者係空氣污染。」北京每年冬天都會有霧，有指毒雨南下攻港，方志剛反指：「北方的污染物流來香港機會唔大，珠三角本身已是污染源頭，早前香港的污染是由珠三角吹過來。」不過港府似乎有半點醒覺，「空氣質素預報由環保署負責，但表現一向麻麻。」怕死的，只好戴口罩自保。

從來沒有李氏力場

方志剛



氣候大變，天氣不似預期。去年今日，超級寒襲港，大帽山結霜被封山；同一個香港，忽然「這個冬天不太冷」，今年新年溫度平均達二十度，葉劉那件皮草片肯定無用武之地。最慘之處，莫過於拜強國所賜，霧靄襲港，香港四周一片灰濛濛。官方咁講：霧靄是抵禦美國鎗射武器的侵襲；建議大家煮食多菜，不要BBQ。哦，你有你廢話連篇，香港人早已習慣權威、政府信不過。那地下組織呢？一切就是真理。要知霧靄有幾嚴重，颱風究竟打得成嗎？下一代，無人再開電視睇天氣報告。網上有個香港地下天文台，至今不知不覺已運作二十二個年頭，教埋你分析天氣。網友至愛，教天文台更權威。原主方志剛，無出鏡費，純粹一腔熱情。他是聯合國颱風委員會氣象專家，曾在天文台任學術主任。明知網友唔啱聽，他都要講：其實從來都無李氏力場。聽他一說，李氏王朝地位，再遜色了。

主修電腦、副修統計，不過方志剛最愛的，始終是睇天氣。「天氣變幻莫測，每分鐘都不同，很吸引。」

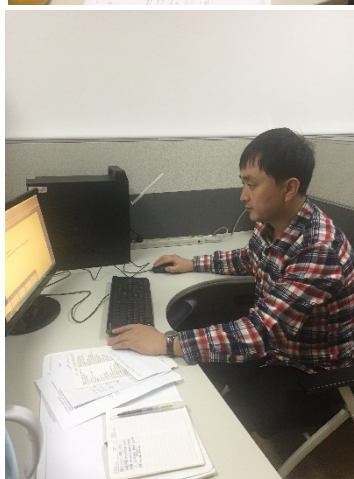
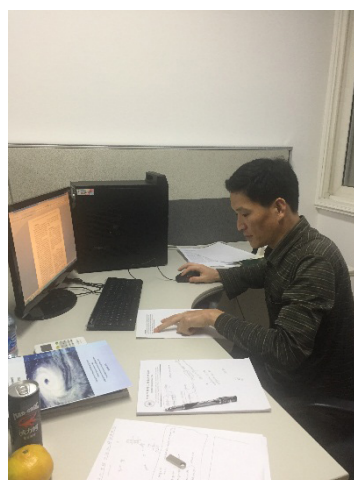
TC News from Members

China

● TC Research Fellowship

Under the 2016 Annual Operating Plan of the Working Group on Meteorology – Verification of Tropical Cyclone Operational Forecast in which it was proposed an offer of Research Fellowship as one of its actions. The research topic of the fellowship is “Verification of Tropical Cyclone Operational Forecast”. Mr. Pak Sang Il and Mr. Kim Kum Song from State Hydro-Meteorological Administration (SHMA) of DPRK worked in Shanghai Typhoon Institute (STI) from 23 October to 18 November 2016. They were nominated by their administration and selected by STI and Typhoon Committee Secretariat.

Mr. Kim Kum Song and Mr. Pak Sang Il are researchers of Typhoon and Numerical Weather Prediction Division, Central Meteorological Forecasting Institute, SHMA. They assisted in developing technique for tropical cyclone genesis forecast based on EPS and evaluating global models’ precipitation prediction ability before and after 1617 Super Typhoon Megi’s landfall. A paper “Verification of Extreme Rainfall in Tropical Cyclones with the Model Evaluation Tools (Met)” has been submitted to the journal of Tropical Cyclone Research and Review.

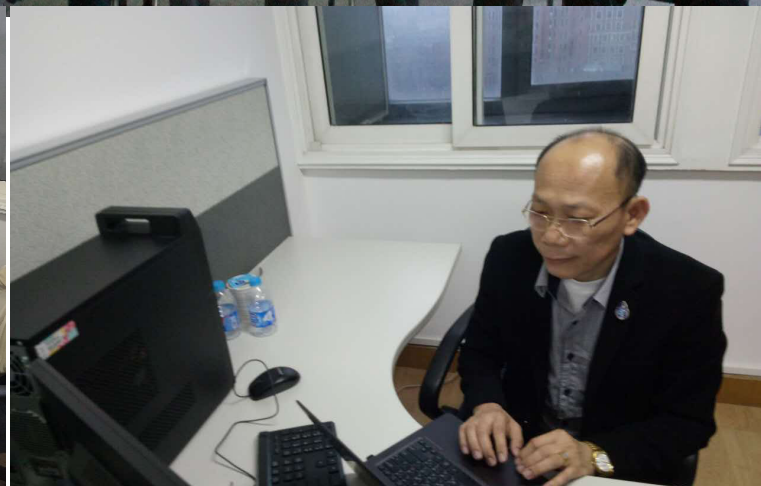
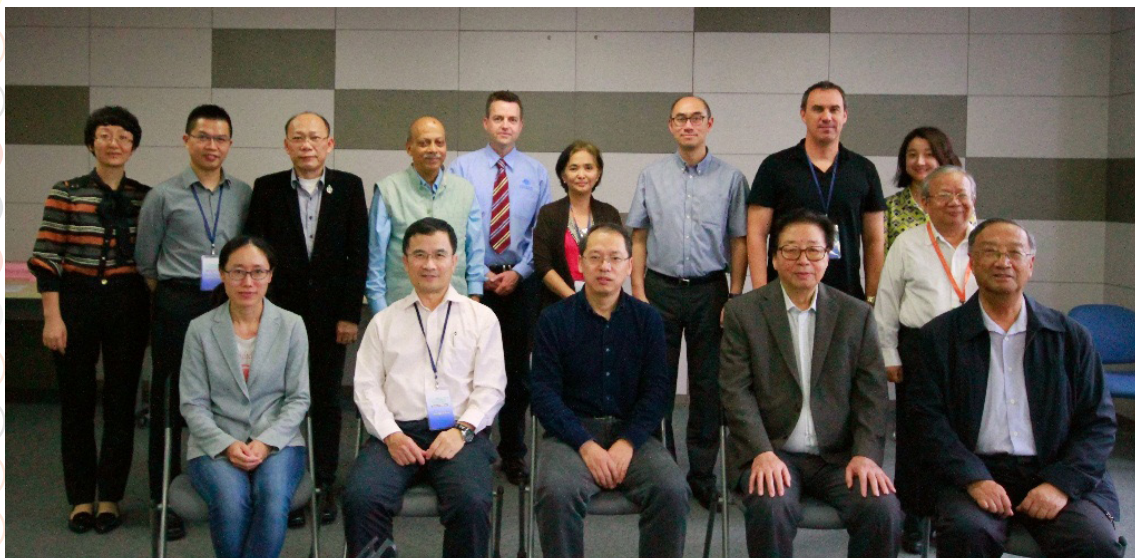


● The publication of Tropical Cyclone Research and Review

The 1st Editorial Board Meeting of Tropical Cyclone Research and Review was held in Shanghai, China on 21 October, 2016.

15 participants from United States, Australia, India, Hong Kong, Thailand and WMO attended the meeting. The report on TCRR progress and the Action Plan was delivered at the beginning, followed by discussion of TCRR Action Plan. Suggestions on how to encourage the forecasters to contribute articles, the way to increase the influence of TCRR and the incentives for authors were given. With the kind support of WMO, TCRR official website has been linked to the Tropical Meteorology Research Programme(https://www.wmo.int/pages/prog/arep/wwrp/new/tropical_meteorology.html).

Chen Yi-Leng from University of Hawaii and Mr. Kamol Promasakha na Sakolnakhon from Thailand Meteorological Department were invited to the Editorial Office located in Shanghai Typhoon Institute as the visiting editor from 17 to 21 October.



● **The 16th Annual Meeting of the Working Group on Tropical Meteorology Research & Joint Workshop/Progress Meetings of TCP & WWRP Projects (TLFDP and UPDRAFT) (Shanghai, China. 17-21 October, 2016)**

The 16th Annual Meeting of the Working Group on Tropical Meteorology Research & Joint Workshop/Progress Meetings of TCP & WWRP Projects (TLFDP and UPDRAFT) was held in Shanghai during 17-21 October, 2016. This meeting is sponsored by World Meteorological Organization(WMO)andChineseAcademy of Meteorological Sciences (CAMS), hosted by Shanghai Meteorological Service (SMS) and Shanghai Typhoon Institute of China Meteorological Administration (STI/CMA). Director General of SMS

delivered a welcome speech at the opening ceremony.

More than 40 participants from WMO, Naval Postgraduate School of USA, NOAA, PAGASA, Bureau of Meteorology of Australia, Hong Kong Observatory, National Institute of Meteorological Sciences of Korea Meteorological Administration, Indian Meteorological Society, City University of Hong Kong, Seoul National University, CAMS, Nanjing University, National Meteorological Center of CMA, STI attended the meeting.

This meeting promotes the mutual exchange of the latest progress in tropical cyclone research and also enhances international cooperation on tropical cyclone forecasting techniques.



● EXOTICCA

During the 16th Annual Meeting of the Working Group on Tropical Meteorology Research & Joint Workshop/Progress Meetings of TCP & WWRP Projects (TLFDP and UPDRAFT), EXOTICCA scientists introduced the typhoon field experiment in 2016 and showed some preliminary cooperation research results between STI and HKO.

● The Forecasting Competence of Tropical Cyclone over the Western North Pacific

Shanghai Typhoon Institute gave an annual report on “Performance of tropical cyclone forecast in western North Pacific in 2015” at 48th session in Honolulu Hawaii and submitted the final document to Typhoon Committee at the end of March, 2016. This report has briefly discussed the performance of typhoon forecast over western North Pacific in 2015. The verification results include TC genesis, track, and intensity for both deterministic and ensemble forecast guidance. The results show that stepped decreases in the values of each quantile of track errors were made at every lead time level from 2010 to 2015 for both deterministic and ensemble NWP guidance, however, intensity forecast skill for both global and regional models were almost stagnating for the last six years.

● The 3rd assessment report on the climate change impacts on tropical cyclones in the Typhoon Committee Region (TCAR3)

The Typhoon Committee now is planning the 3rd assessment report on the climate change impacts on tropical cyclones in the

Typhoon Committee Region (TCAR3). The expert team members come from CMA, HKO, JMA, KMA, and NOAA. They are now continuing to review peer-reviewed papers both in English and non-English (such as Chinese, Japanese, or Korean). In addition, a survey on tropical cyclone impacts is also proposed and will be conducted in next year. The outline of the assessment report was decided and the author for each chapter was identified. The expert team is planning a workshop in next year to finally discuss the draft of report.

● Benefit evaluation of typhoon disaster prevention and preparedness

This annual operational programme is conducted by Shanghai Typhoon Institute. The project analyzed the relationship between typhoon tracks, intensity forecast errors and direct economic losses of TCs making landfall on China mainland. The results show that adding track and intensity forecast errors into damage assessment model can reduce the model error notably. The results also show that if the 24h track forecast error reduces 1km, there will be 97 million yuan reduction of direct economic loss caused by a landfall TC. If the 24h intensity forecast error reduces 1m/s, there will be 380 million Yuan reduction of direct economic losses.

● Web-based typhoon forum

The on-line forum has been established and upgraded by sharing more real-time observation, forecast and warning information by Typhoon Committee Members. During the IWS it was discussed to ask TC Members to nominate staff as moderators of the forum. It is planned to post the information in TC Facebook page to attract more people to join.



valuable 3-dimensional tropical cyclone observation data since the US Air Force suspended reconnaissance flights over the South China Sea in 1987.

Meanwhile, low-level tropical cyclone reconnaissance by Hong Kong, China continued with a total of five missions in 2016, including: a tropical depression (26 May); Mirinae (25 July); Nida (1 August); a broad area of low pressure (15 August) where Dianmu later developed (18 August). In particular, the circulation centres of Nida (then of typhoon intensity) and Dianmu (then of tropical storm intensity) were traversed, providing valuable observation data for accurately locating the storms as well as determining their intensities.

1. First ever dropsonde mission

A dropsonde system on board the new Challenger fixed-wing aircraft of the Government Flying Service (GFS) of Hong Kong, China commenced trial operation in September 2016 (Figure 1). The Hong Kong Observatory conducted its first ever dropsonde mission on board the aircraft on 27 September during the approach of Megi (Figure 2). Three other missions were carried out for Megi and Aere providing



Figure 1 The meteorological profile measurement system (“dropsonde launcher”, left) inside the GFS Challenger aircraft, from which the dropsonde is launched during a ground test (right).

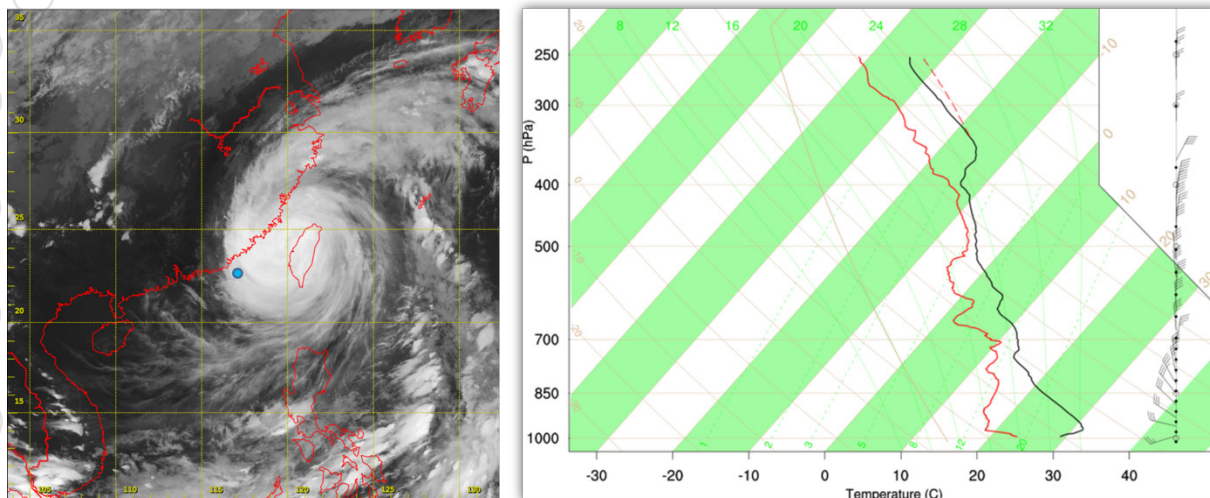


Figure 2 Vertical meteorological profile (right, including temperature, dew point and winds) sampled over the southwestern quadrant of Megi (left, drop location in blue) during the Observatory's first ever dropsonde mission on 27 September 2016.

2. Enhancement of meteorological observations over the South China Sea

Further to the trial deployment of a drifting buoy in the South China Sea west of Luzon in 2015, another five drifting buoys (Figure 3) were deployed into the data-sparse region of the South China Sea in August and September 2016 with the help of one of the Hong Kong Voluntary Observing Ships. Under the Barometer Upgrade Scheme of the Global Drifter Programme of the Data Buoy Cooperation Panel of WMO JCOMM, hourly observations of sea-level pressure and sea temperature are transmitted over the GTS in cooperation with US NOAA.

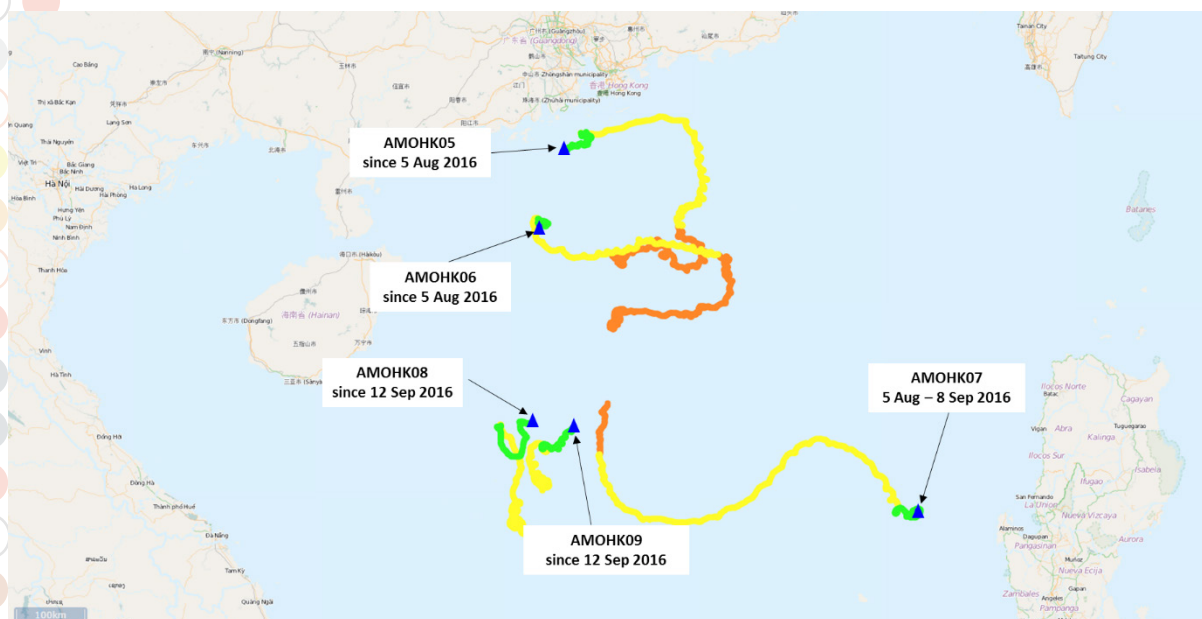


Figure 3 Tracks of the five drifting buoys since their deployment in the South China Sea. denotes their positions in early October (except AMOHK07 which lost communication since 8 September 2016); green portion of the tracks shows positions for past week; yellow portion for past month; and orange portion for positions more than a month-old.



3. New objective guidance for the probability of rapid intensification

The Hong Kong Observatory developed a new statistical-dynamical forecasting tool for assessing the probability of rapid intensification of tropical cyclones in the western North Pacific and incorporated the new tool into the Observatory's tropical cyclone intensity forecast model for trial operation in 2016. The new tool utilizes logistic regression and the naïve Bayes classifier techniques on various predictors, including: (a) NOAA tropical cyclone heat potential; (b) previous 12-hour intensity change and current intensity; and (c) different model forecast outputs of ECMWF to evaluate the chance of rapid intensification in the next 48 hours. Initial verification shows that the tool out-performs the intensity changes estimated from direct NWP model outputs.

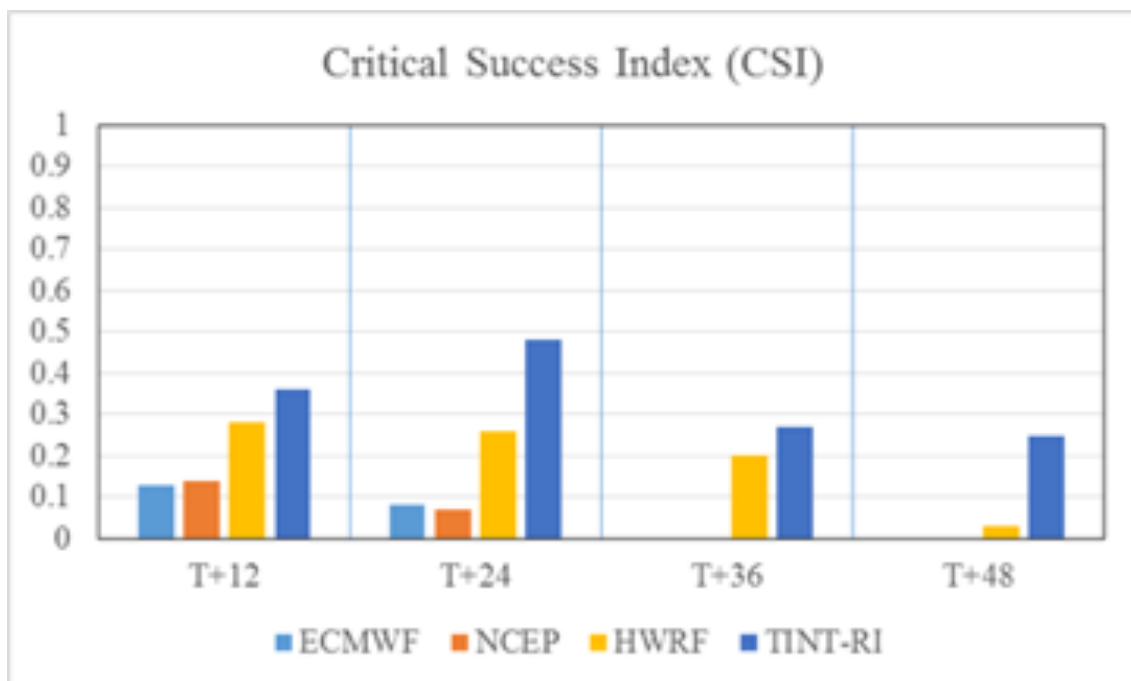


Figure 4 Critical success index of rapid intensification forecasts by the new forecasting tool (i.e. TINT-RI) in comparison to various NWP model outputs using 2013 test data.

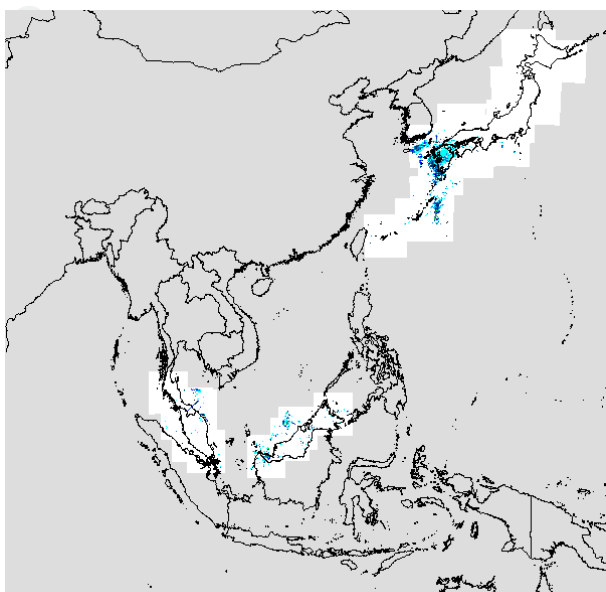


Japan

Development of a Southeast Asia Regional Radar Network

The ESCAP/WMO Typhoon Committee promotes the development of a regional radar network covering Southeast Asia.

Toward the development of a regional radar composite for the whole of Southeast Asia, the Thailand Meteorological Department (TMD), the Malaysian Meteorological Department (MMD) and the Japan Meteorological Agency (JMA) began an experimental test of radar data sharing in November 2016. The three organizations now share composite radar data from their respective countries on an hourly basis. JMA, TMD and MMD plan to build expertise and experience for the future development of whole-region composite.



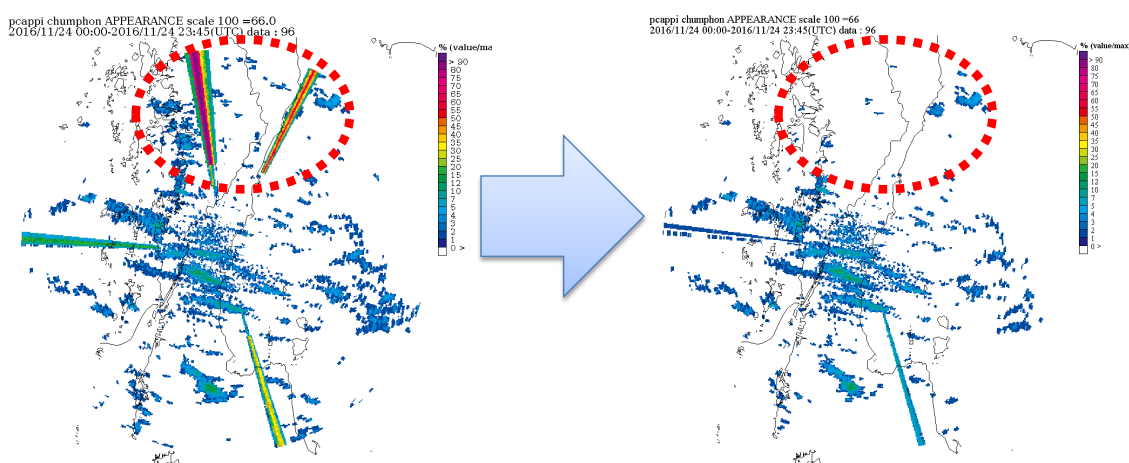
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Composite imagery shared among the three countries

To support the development of a regional radar network, JMA held a radar composite map technical meeting at its headquarters from 29 November to 2 December 2016 with the attendance of two TMD experts. TMD engages in ongoing efforts to improve radar observation quality in collaboration with JMA, and experts from the organization and JMA discussed current technical issues on quality control within TMD and possible solutions at the meeting. The attendees further discussed quality management for TMD radar data and meta data to improve the quality of quantitative precipitation estimation (QPE). To finish, the attendees also discussed future directions toward regional radar network development, ways to involve other regional members in the network, and specific activities for 2017. Consensus was reached on the importance of sharing experiences with regional members as the next step in the project and efforts for further improvement of related services. JMA also met with representatives from the MMD from 19 to 23 December 2016 at its headquarters to discuss technical issues on radar data quality management and utilization in Malaysia.



Discussions among TMD and JMA experts



Evidence of consequent improvement of radar data quality

16th Typhoon Committee Attachment Training at the RSMC Tokyo - Typhoon Center

The 16th ESCAP/WMO Typhoon Committee Attachment Training 2016 course was held at JMA Headquarters from 15 to 26 August 2016.

The RSMC Tokyo — Typhoon Center has organized ESCAP/WMO Typhoon Committee Attachment Training courses every year since 2001 with the support of the WMO Tropical Cyclone Programme (TCP) and the Typhoon Committee in order to advance the tropical cyclone fore-

casting capacity of Committee Members. Forecasters from the Panel on Tropical Cyclones (PTC) have also been invited since 2015 to enhance training collaboration between PTC and the Typhoon Committee. The 2016 attendees were Mr. Thatsana Chanvilay from Lao PDR, Ms. Shelly Jo Iguara Ignacio from the Philippines, Ms. Ton Thi Thao from Vietnam, Mr. Nasser Said Abdullah Al Ismaili from Oman, Mr. Habib Rehmat from Pakistan, and Mr. Ponna Handi Chaminda De Silva from Sri

Lanka.

The training focused on imparting practical knowledge and skills relating to operational tropical cyclone analysis and forecasting via lectures and exercises using the Satellite Analysis and Viewer Program (SATAID). The course covered a range of subjects including Dvorak analysis, interpretation of microwave data, quantitative precipitation estimation (QPE), quantitative precipitation forecasting (QPF) and storm surge forecasting. All attendees gave presentations to help JMA staff understand the current status of their meteorological and hydrological services.

In 2016, two days of presentations on warning coordination were newly introduced. The presentations focused on ways of determining warning thresholds using disaster statistics and meteorological datasets based on previous tropical cyclone-related disaster conditions in Japan.

Please use photos at following URLs:

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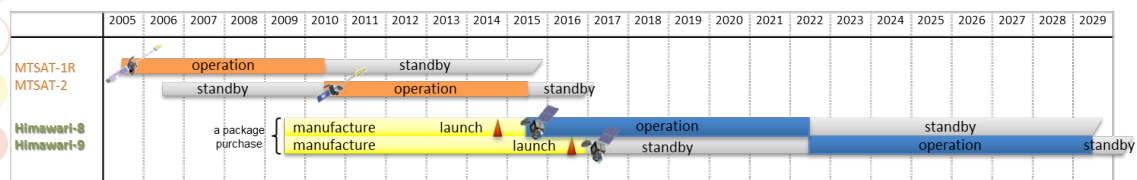
http://www.jma.go.jp/jma/en/photogallery/RSMC_training_201608/RSMC2016_2.JPG

Himawari-9 launched successfully

The Japan Meteorological Agency (JMA) launched its new Himawari-9 geosta-



tionary meteorological satellite on 2 November 2016 from the Japan Aerospace Exploration Agency's Tanegashima Space Center. The satellite entered geostationary orbit on 11 November 2016 as scheduled. In-orbit testing will be conducted until March 2017, and Himawari-9 will then act as backup to the currently operational Himawari-8 geostationary meteorological satellite. Himawari-8 and Himawari-9 are twin models with identical specifications. This combination of new-generation satellites will support JMA's stable provision of continuous satellite observation data for the Asia and Pacific regions until 2029.



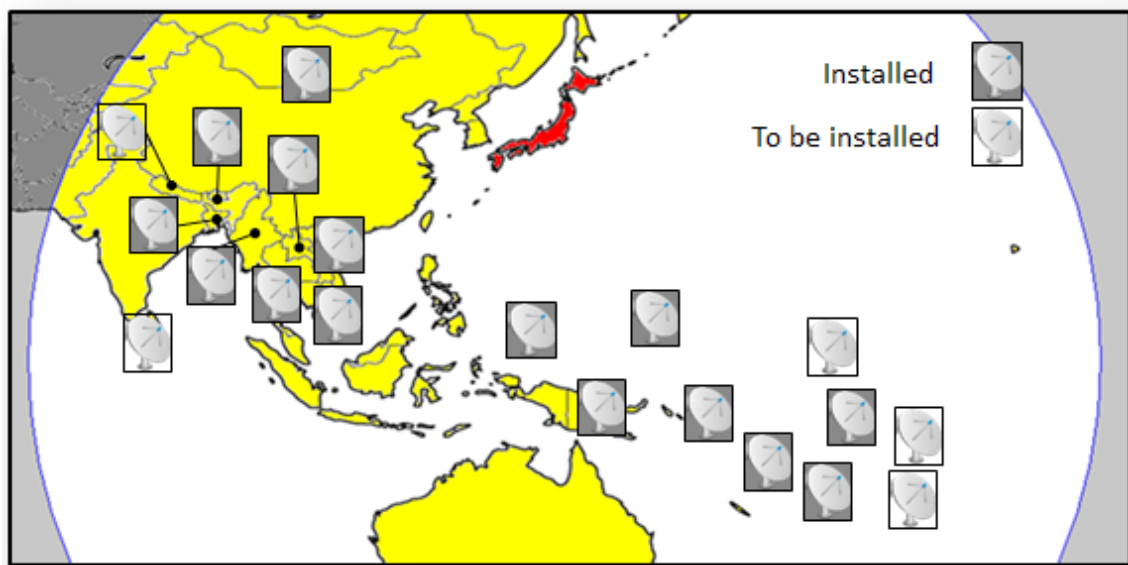
Himawari-8/-9 timeline



JMA provides the HimawariCloud and HimawariCast satellite data distribution services for National Meteorological and Hydrological Services (NMHSs) in the Asia and Pacific regions. The Agency will continue to provide these services after the switchover from Himawari-8 to Himawari-9, and users will not need to take any action to prepare for receipt of Himawari-9 data.

To facilitate the utilization of satellite data, WMO and the government of Japan have provided funding for the installation of HimawariCast receiving systems at more than 15 NMHSs. Some other NMHSs have also installed systems independently.

include basic interpretation of satellite imagery, monitoring of severe weather phenomena, utilization of JMA's SATAID satellite imagery analysis program, and the use of HimawariCast receiving equipment. Training covers the basics as well as current considerations such as the use of JMA's newly developed RGB imagery. JMA will continue to support NMHSs in their utilization of satellite data toward disaster risk mitigation in their regions.



NMHSs with HimawariCast receiving systems funded by WMO or the government of Japan (rather than installing systems independently) (as of 1 November 2016)

JMA has also provided training to more than 20 NMHSs since Himawari-8 began operating. These training programs provide opportunities for JMA experts to extensively discuss a range of matters with local NMHS users. Areas of focus

Start of week-range wave forecast service

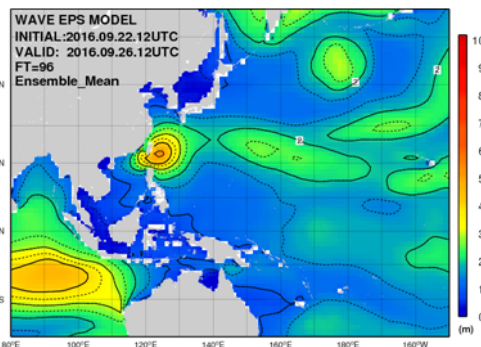
The Japan Meteorological Agency (JMA) began providing week-range wave forecasts to Typhoon Committee members on 27 August 2016. The new products are based on the output of a global Wave Ensemble System (WENS), which covers most of the globe and has a 1.25-degree grid resolution. It is run once a day at 12 UTC and predicts ocean wave conditions

up to 264 hours ahead with 27 members.

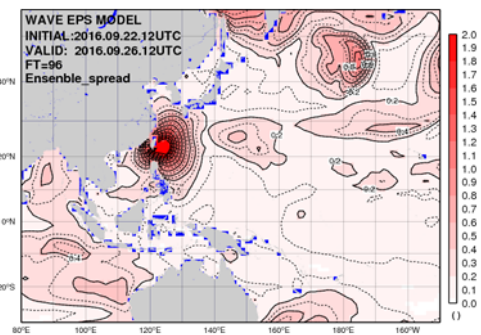
The products include information on ensemble mean/3rd quartile/maximum wave heights, probability of wave heights exceeding 2, 3, 4, 5 and 6 m, and ensemble spread. Boxplot data and information on the probability of wave heights exceeding the above values at specific stations are

also available. All products are uploaded to the new Surge/Wave section of JMA's Numerical Typhoon Prediction website.

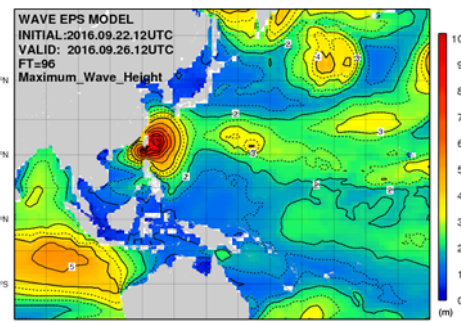
The information is expected to support evaluation to determine the possibility of high-wave events and the risk of wave-related coastal damage.



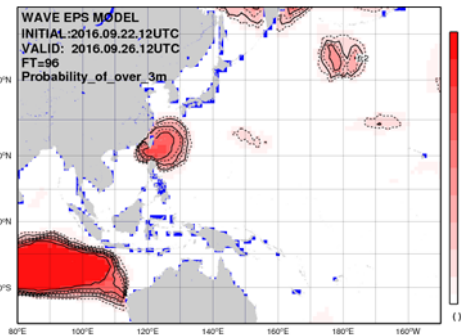
Ensemble mean wave heights



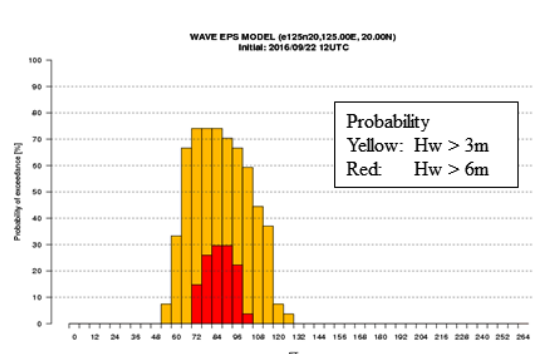
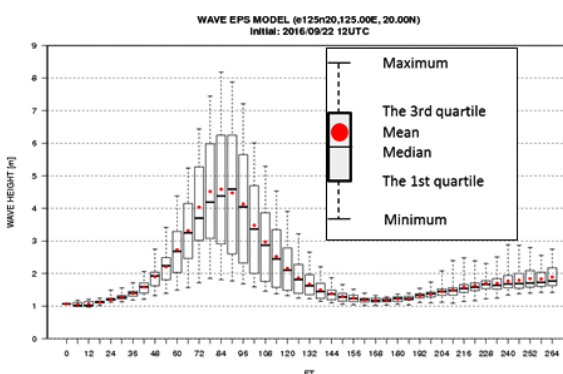
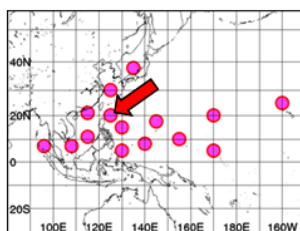
Ensemble spread



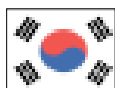
maximum wave heights among ensemble members



Probability of Hw_sig > 3m



Box plot (left) and Exceeding probability (right)



Rep. of Korea

1. Implementation of Typhoon Analysis and Prediction System (TAPS) in the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA)

The National Typhoon Center of the KMA (NTC/KMA) began sharing its Typhoon Analysis and Prediction System (TAPS)

with Typhoon Committee (TC) members in 2011. The technology transfer was a response to TC members' request for support in operational forecasting of tropical cyclones. With the web-based TAPS package, users can access remotely using the following web address: (<http://gtaps.kma.go.kr>).

The NTC sent two TAPS experts to train staff at the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) from 13 to 14 Oct, 2016. The transfer included three lectures and training sessions, familiarizing them with the TAPS [Fig. 1].

During their visit to the PAGASA, the experts introduced the TAPS itself and required programs for the system, and helped PAGASA members to install the TAPS on their operating systems and performed typhoon forecast demonstration using the program.

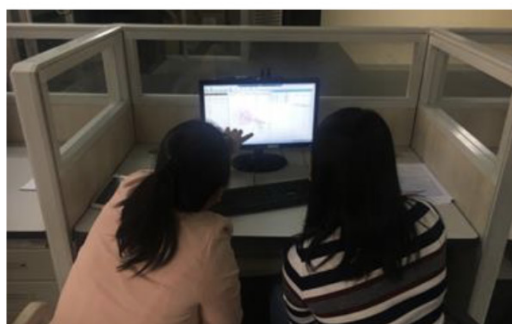


Figure 1. TAPS introduction and typhoon forecast training in PAGASA conducted by two experts (Seong-hee Won and Seul-gi Lee) from NTC/KMA.



Thailand

1. TMD sent one meteorologist to attend the CMA Typhoon Forecaster Training Programme 2016 at Beijing, China

Mr. Watchara Jaroonsak, Meteorologist, Southern Meteorological Center (East Coast) participated in the CMA Typhoon Forecaster Training Programme 2016 with the topic of “Typhoon Monitoring, Analysis and NWP”, which was hosted by CMA, Beijing, China from 10 to 19 October 2016.



Four trainees from DPR of Korea (2 persons from left), Viet Nam (the second from right), and Thailand (the third from right) attended the CMA Typhoon Forecaster Training Programme 2016 and they took a photo with Ms. XIANG Chunyi, Typhoon and Marine Weather Forecast Center, CMA and Mr. ZHOU Qingliang, Director for International Cooperation, National Meteorological Center (NMC).



All participants were briefed on the training objectives after the Opening Ceremony.



Participants from Thailand and DPR of Korea were listening to the using of software operations and products for typhoon monitoring.



All trainees took a picture with CMA meteorologists, Directors, and relevant officers after completing the course.



Trainees visited Beijing Climate Center and China Weather TV, Beijing, CMA.

2. TMD sent a staff to join in the Typhoon Committee Research Fellowship Scheme 2016: Visiting Editor for Tropical Cyclone Research and Review (TCRR)

Dr. Kamol Promasakha Na Sakolnakhon, Director of Meteorological Radar and Satellite Data Analysis Division, Weather Forecast Bureau participated in the Visiting Editor for Tropical Cyclone Research and Review (TCRR) Programme which was hosted by Shanghai Typhoon Institute (STI), China Meteorological

Administration (CMA) with full financial support from TCTF, during 17 –21 October 2016.

Besides, there were other two meetings held prior to the Editor team of TCRR:

1) WMO Typhoon Landfall Forecast Demonstration Project (WMO-TLFDP) 2) Understanding and Prediction of Rainfall Associated with land Falling Tropical Cyclones (UPDRAFT) Project. Mr. Kamol also attended both of them.



Participants of WMO-TLFDP and UPDRAFT meetings held before the meeting of TCRR Editor team.



Mr. Kamol, the middle person in the front row during the TCRR meeting.

3. TMD sent a staff to attend the Typhoon Committee Roving Seminar 2016

Mr. Pawat Siriyotha, Meteorologist, Marine Meteorological Center, Bureau of Meteorological Digital Services, Thai Meteorological Department participated in Typhoon Committee Roving Seminar 2016 with the theme of “Storm Surge Modeling and Applications for Decision Support” which was held in Ha Noi, Viet Nam from 15 to 17 November 2016.



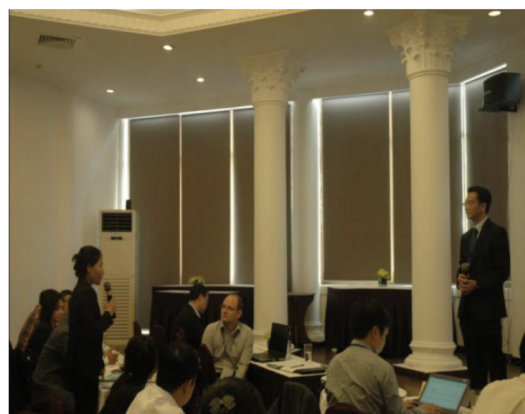
The Opening Ceremony and group photo of participants in the Typhoon Committee Roving Seminar 2016 with the theme of “Storm Surge Modeling and Applications for Decision Support”.



Mr. Pawat Siriyotha, the Thai participant was sharing the experience on storm surge during the seminar.



Q & A session



Participants were giving their opinions and comments on the seminar.



Certificates of achievement were presented to all participants after completing the course.



Study visit to National Hydro-Meteorological Service (NHMS), Viet Nam and participants were briefed on the daily weather forecast.



Study visit to Ba Vi Agrometeorological Station.

4. Two TMD's experts attended a technical meeting on Radar Composite Map Project, which was held at JMA Headquarters, Tokyo, Japan from 29 November – 2 December 2016.

Mr. Boonlert Archevarahuprok, Expert on Research and Development for Meteorology and Mr. Amorn Kaewmorakot, Director of Research and Development for Meteorological Information Division, two experts in working team for development of radar composite map at the Thai Meteorological Department (TMD) participated in the technical meeting on Radar Composite Map Project among

JMA radar experts which was held at JMA Headquarters, Tokyo, Japan from 29 November – 2 December 2016. The activity was a part of the implementation of Working Group on Meteorology's Annual Operating Plan 2016- item 4 (Development of Regional Radar Network) its objectives are to discuss on the quality management, algorithm for developing QPE product and utilization and sharing radar data.



Mr. Boonlert and Mr. Amorn (the fourth and third persons from right respectively) took a photo with JMA executives, Director of Observation Department, and experts.

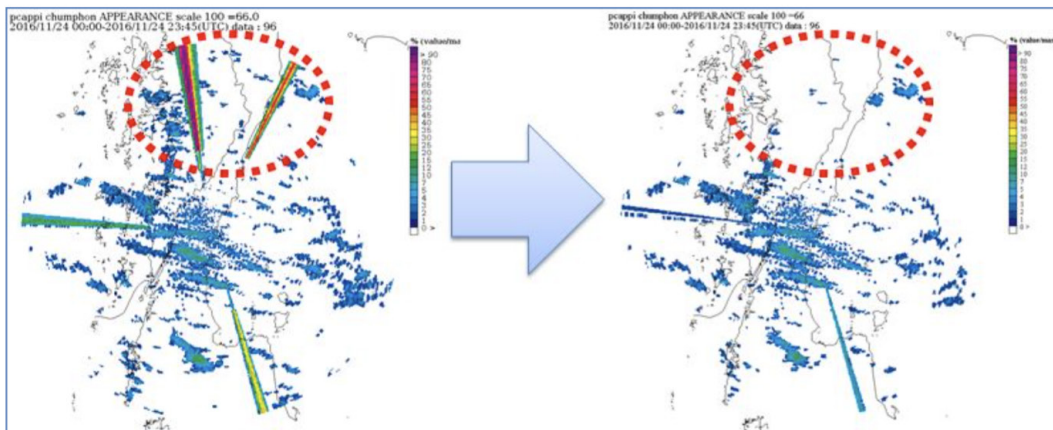


Mr. Boonlert reported on the progress in development of radar composite map and Quantitative Precipitation Estimation (QPE) and report on technical challenges for radar data utilization.

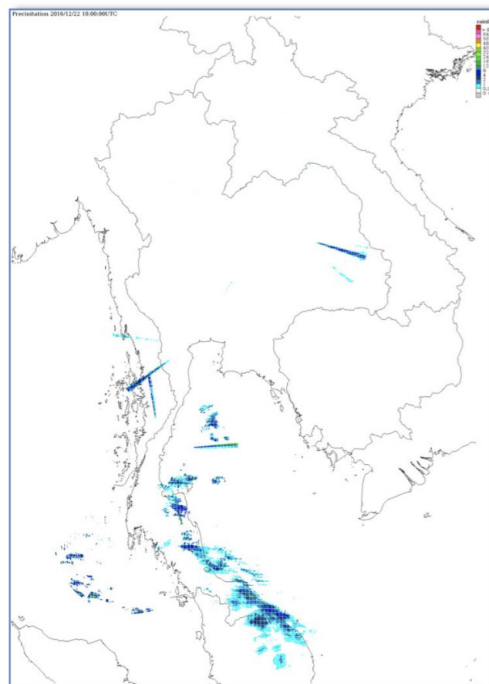


The meeting discussion between JMA and TMD experts.

Below figure is the accomplishments of the discussion on quality control for TMD weather radar data and evidence of consequent improvement of the quality of quantitative precipitation estimation (QPE)



Following is the successful result of nationwide Quantitative Precipitation Estimation (QPE) of the second calibration technique that JMA experts transferred to TMD for operational use in the future.



5. Representative of Department of Disaster Prevention and Mitigation (DDPM), Thailand attended the 11th Integrated Workshop(IWS),“Improving Typhoon Impact – based Forecasting and Warning”, 24 – 27 October 2016, Cebu, the Philippines

The delegate from Department of Disaster Prevention and Mitigation (DDPM), Thailand attended the Disaster Risk

Reduction Working Group of IWS. The delegate was present the impact of typhoon to Thailand in 2016 and the activities on Disaster Risk Reduction of Thailand such as National Disaster Risk Management Plan (2015) which is the strategies for an implementation of this National Plan comprise a focus on disaster risk reduction, an application of integrated emergency management system, strengthening and enhancing efficiency of sustainable

disaster recovery or building back better and safer, and promoting international cooperation on disaster risk reduction. These focused strategies will serve as guidelines to achieving objectives set forth in this National Plan and contributing to successful disaster risk reduction which is a foundation for sustainable development.



The meeting of Disaster Risk Reduction Working Group

Viet Nam



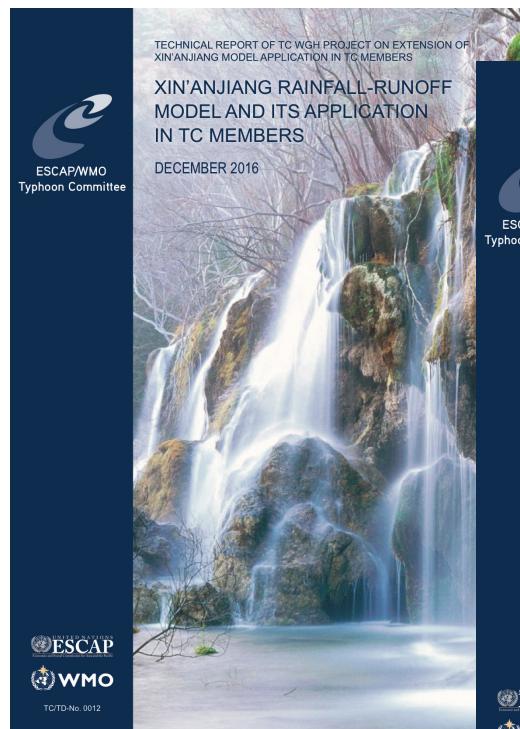
“Storm Surge” The Roving Seminar 2016

“With kind support from National Hydro-Meteorological Service of the Socialist Republic of Viet Nam, the Roving Seminar 2016 was held in Ha Noi, Viet Nam from 15-17 November 2016 with the topic “Storm Surge” The Roving Seminar 2016 was successful with active contribution of T CS, lecturers from Hong Kong, China, Japan, United States, Viet Nam and over 40 participants from Cambodia; China; Hong Kong, China; Macao, China; Laos PDR, Japan; Republic of Korea; Philippines; Singapore; Thailand, United States; Socialist Republic of Viet Nam. The Roving Seminar was highly appreciated by participants as well as Viet Nam’s mass media”





Typhoon Committee Publications



The ESCAP/WMO Typhoon Committee Newsletter

is published in English by the Typhoon Committee Secretariat

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