

Typhoon Committee Secretariat Macao, China St Develop of the Typhoon Committee

The Fifty-Forth Session of theTyphoon Committee Online • Laos PDR, 23 to 25 February 2022



The Fifty-forth Session of the Typhoon Committee held online from 23 to 25 February 2022. The Session is being convened by the Typhoon Committee, under the auspices of the Economic and Social Commission for Asia and the Pacific (ESCAP) and the World Meteorological Organization (WMO), and hosted online by Department of Meteorology and Hydrology (DMH) of Lao People's Democratic Republic. Due to the ongoing COVID-19 situation around the world and after approval by TC53 Chair and Vice-Chairperson, at this special online 54th Annual Session of the Typhoon Committee, the Committee reviewed the progress made in its programme of work in 2021 and plan for activities



to be undertaken in 2022 and beyond, together with the support required to implement them. The Session also the cover strategic and development issues such as the implementation of the Strategic Plan for 2022-2026.

The Session was attended by 120 online participants from 13 out of 14 Members of the Typhoon Committee, namely: China; Democratic Republic of Korea (DPRK), Hong Kong, China; Japan; Laos People's Democratic Republic (Laos PDR); Macao, China; Malaysia; the Philippines; Republic of Korea; Singapore; Thailand; United States of America (USA); and the Socialist Republic of Viet Nam. Representatives of United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), World Meteorological Organization (WMO) and Typhoon Committee Secretariat (TCS).



WGDRR Online Seminar for TC Crowd-sourcing High Density Non-Conventional Weather Data

As one of the initiatives in the Annual Operating Plan of the Working Group on Disaster Risk and Reduction (WGDRR), the Hong Kong Observatory (HKO) hosted an online seminar on "TC Crowdsourcing High Density Non-conventional Weather Data" for Typhoon Committee members on 5 July 2022. The seminar aimed to share the experience on the concept and methodology of obtaining crowdsourced weather data for impact analysis and microclimate study, particularly for near-realtime monitoring of the impacts of tropical cyclones. In the seminar, experts of the HKO delivered two talks, each followed by a Q&A session, on the Pilot Crowd Sourcing Scheme and on the establishment of microclimate station network in Hong Kong.



Figure 1 Participants of the WGDRR online seminar

Typhoon Committee Research Fellowship

Amid the COVID-19 pandemic, the HKO continued to offer a Typhoon Committee Research Fellowship remotely in 2022. Mr Nawin Sermsook from Thai Meteorological Department commenced the Fellowship research project titled "Study on the characteristics and model forecast performance of rapid intensification of near-landfall tropical cyclones" in January 2022. The project aimed to find out spatial, monthly and long-term variations in Rapid Intensification (RI) of near landfall tropical cyclones over the western North Pacific and the South China Sea. The fellowship project was conducted smoothly through online meetings and email communication, and the study report was being prepared for future reference.





2.

Mr Nawin Sermsook (bottom) discussed with HKO colleagues through online

3. Deployment of drifting buoys in the South China Sea and western North Pacific for tropical cyclone monitoring

The HKO deployed the first drifting buoy in the South China Sea in 2015 for enhancing meteorological observations over the seas and monitoring of tropical cyclone activities over the region. Since then, more drifting buoys were deployed in the South China Sea and the western North Pacific in typhoon season every year. There was a total of five drifting buoys deployed during June and July 2021. The deployment was arranged under the Barometer Upgrade Scheme of the Global Drifter Programme (GDP) of WMO-IOC Data Buoy Cooperation Panel (DBCP). In 2022, two drifting buoys were deployed in the South China Sea with the assistance of the Hong Kong Voluntary Observing Ship (VOS) in July 2022. Hourly observations of sea level pressure and sea surface temperature would be transmitted to the Observatory via satellites for analysis and disseminated on the GTS as well. The valuable meteorological data collected by the drifting buoys over the data sparse areas are useful for weather monitoring and forecasting especially during tropical cyclone situations, contributing to navigation safety in the region.



Figure 3 Ship crew of Hong Kong Voluntary Observing Ship deployed a drifting buoy into the South China Sea. (Photo courtesy of Orient Overseas Container Line Ltd.)

With a view to promoting the knowledge on tropical cyclones and raising the awareness of wider audience to disaster preparedness and response, the HKO launched the English version of "A Tour of Tropical Cyclones" e-book for children in late 2021.

Contents of the e-book include the classification and naming of tropical cyclones, information on local historical typhoons, meaning of warning signals, storm structure, methods of monitoring and forecasting tropical cyclones, as well as the associated hazards and precautionary measures. In addition to multimedia information, the e-book contains vivid infographics and provides hyperlinks to relevant online educational resources of the HKO. While the e-book's main target audiences are children, its contents are also suitable for other readers. The English version of the e-book was well received with around 10,000 views since its launch.

"A Tour of Tropical Cyclones" e-book can be browsed at https://kids.weather.gov.hk/ eBook/ebook_TC/tablet_en.html.



Figure 4 "A Tour of Tropical Cyclones" e-book for children featuring infographics to introduce precautions for high winds and floods.

4.

5. Innovation on Hydrometric Information System

The Drainage Services Department (DSD) has deployed various devices to monitor data of rainfall, tide and water levels in real time, also with monitoring devices from the HKO, through mobile phones and computer systems in order to identify flood risks location as early as possible for the purpose of implementing appropriate flood prevention measures. The DSD has established the Hydrometric Information System (HIS) that uses real-time hydrometric data to analyse the situation of flooding timely so that the DSD can coordinate with relevant departments to prepare for rescue and evacuation when necessary.

Recent innovative development on HIS is its automatic detection of potential flooding cases by setting logic in terms of weather condition and real-time water levels in DSD's drainage facilities, especially at flood prone locations. This innovation enables automatic arrangement of immediate drainage inspection and just-in-time clearance and helps not only optimize manpower resources deployment in handling potential flooding cases at night time, but also minimize the flooding risks at different locations in a systematic manner.

With this innovation on HIS, the reliability and robustness of our drainage system and flood control strategy in Hong Kong to deal with upcoming challenges such as climate change and extreme weather events could be reinforced.

The DSD also participated at International Exhibition of Inventions of Geneva for the first time earlier in 2022 and achieved a silver medal with the above innovation on HIS.



Figure 5 Real-time information display in HIS

Figure 6DSD achieved a silver medal inInternational Exhibition of Inventions of Genevawith their innovation on HIS.

SALON SALON INTERNATIONAL DES INVENTIONS GENÈVE			
	Après examen, le	a Jury a décidé	
de remettre à:	Drainage Services Departme Republic of China	nt of the Government of Hong Kong SAR of the People's	
pour l'invention:	Innovative Hydrometric Info and Preventive Flood Cont	ormation System for Smart Drainage Management trol in Hong Kong	
80	MÉDALLE D'ARCIENT SIVER MEDAL SUBERMEDALLE	Genéve, le 28 mars 2022	
	Jan		
Le Président du Jury: Dov	ed Top	Le Président du Salam Jean-Luc Vincent	

The severe convectively induced turbulence in the vicinity of the eye wall and inner rain bands of a tropical cyclone may also pose a threat to commercial aircrafts that fly at around 30,000 to 40,000 feet above ground. The Meteorological Watch Offices (MWOs) are responsible for issuing warnings, namely, the Significant Meteorological Information, or abbreviated "SIGMET", when meteorological hazards (in this case WC SIGMET for information related to tropical cyclones with a maximum sustained wind speed reaching 34 knots) are forecast or present in their area of responsibility or flight information region (FIR).



Figure 7 A WC SIGMET (purple polygons) issued by Hong Kong FIR for Tropical Cyclone Chaba in June 2022.

As tropical cyclones very often affect more than one FIR throughout its life cycle, cross-border coordination is essential for the provision of harmonised SIGMET across FIRs. The HKO has since developed a web platform, named the HKO Regional SIGMET Coordination Platform, which is open for use by both local aviation forecasters as well as forecasters from other FIRs to coordinate SIGMET issuance.



Figure 8 Ad-hoc tropical cyclone briefing for Tropical Cyclone Chaba in June 2022 with neighbouring MWOs, including Guangzhou, Hanoi, Ho Chi Minh, Hong Kong, Manila and Sanya.

When a tropical cyclone is posing a threat to the South China Sea, HKO would also take the initiative to organize ad-hoc tropical cyclone briefings, providing an opportunity for neighbouring MWOs to discuss and exchange information in advance, e.g. the forecast track and intensity change of the tropical cyclones. This would allow the forecasters in different FIRs to have better situational awareness and be able to work towards providing seamless hazardous weather information for the benefit of aviation users.





1. Technical Developments

1.1 Commencement of five-day storm wind probability maps for tropical depression (TD) expected to reach TS intensity within 24 hours

In response to the September 2020 commencement of five-day track and intensity forecast provision for TDs expected to reach TS intensity within 24 hours, five-day storm wind probability maps were updated in December 2021. These are provided when named TCs or TDs expected to reach TS intensity or higher are present.



1.2 Upgrade in Tropical Cyclone Heat Potential (TCHP) product

The TCHP product on the NTP website has been upgraded in March 2022. As background information, Japan Meteorological Agency has improved its ocean data assimilation system in October 2020. Improvements such as its resolution, adoption of four-dimensional variational data assimilation (4D-Var) system were made in the new system, namely, MOVE/MRI.COM-JPN.

Accordingly, the TCHP product now has a high resolution of approximately 0.1 degree, and detailed structure of TCHP will sure to be revealed.



2 Enhanced Communication

The RSMC Tokyo – Typhoon Center's TC communication platform (developed and maintained by the Center since July 2019) supports enhanced communication between operational forecasters and the Center, as well as sharing of advance-notice updates. 17 inquiries relating to seven tropical cyclones had been submitted via the platform in 2021, with related discussions helping to clarify TC status and forecasts.

3 RSMC Tokyo – Typhoon Center Publications

3.1 Annual Report on the Activities of the RSMC Tokyo – Typhoon Center 2020

The Annual Report on the Activities of the RSMC Tokyo – Typhoon Center 2020 outlines major activities conducted in 2020, summarizes the 2020 typhoon season and presents verification of operational forecasts, numerical models and other products. Content includes information on Typhoon Committee attachment training, five-day tropical cyclone forecasts for TDs expected to reach TS intensity within 24 hours, and notification of enhanced communication for the 2021 move from trial to full-scale operation. The report also presents verification of timing in relation to initial operational forecasts for individual named TCs and best-track data for 2020 tropical cyclones in table and chart form. The publication is available on the RSMC Tokyo – Typhoon Center website at

https://www.jma.go.jp/jma/jma-eng/jma-center/rsmc-hp-pub-eg/annualreport.html.

3.2 RSMC Technical Review No. 24

RSMC Technical Review No. 24, published in April 2022, describes JMA's WAVE Ensemble System and its related developments. This publication is available on the RSMC Tokyo - Typhoon Center website at https://www.jma.go.jp/jma/jma-eng/jma-center/rsmc-hp-pub-eg/techrev.htm

4 Capacity Development Activities

4.1 21st Typhoon Committee Attachment Training course at the RSMC Tokyo – Typhoon Center The 21st ESCAP/WMO Typhoon Committee Attachment Training course was held online from 11 to 13 January 2022. Due to COVID-19, the 2022 course was held virtually (as in 2021) with 55 attendees from eight Typhoon Committee Members including China; Hong Kong, China; Macao, China, Malaysia; the Republic of Korea; Thailand; the United States of America; and Viet Nam.

At the opening session, Mr. Obayashi Masanori (Director-General of JMA's Atmosphere and Ocean Department) commented on the importance of understanding and using cutting-edge technology (such as meteorological satellites and numerical weather prediction), sharpening TC forecasting skills via the training course, and promoting the application of such abilities to reduce TC-related damage in the Asia-Pacific region.

The 2022 training course programme was enriched with hands-on training materials for selfstudy, and interactive exercises on satellite analysis techniques and Dvorak analysis. RSMC-Tokyo highlighted the purposes of the course that it has been set out under Category 2 Unit of the Tropical Cyclone Forecast Competency given in the Typhoon Committee Region specifications in the Typhoon Committee Operational Manual (TOM).

The event aroused a wide variety of questions, comments, and active discussions among the attendees and lecturers. On the third day, nine Member attendees made wide-ranging presentations on tropical cyclone information, including case studies on TCs affecting their areas, providing a valuable platform for sharing of their experience and expertise in TC forecast and warning operations.

RSMC-Tokyo remains committed to its vital roles for capacity building in the Asia-Pacific region to mitigate the impacts of hazardous tropical cyclone conditions.



Attendees and Tokyo Typhoon Center staffs (13 January, 2022)

4.2 Contribution to the e-learning workshop held by IFI secreteriat ICHARM

JMA contributed to International Flood Initiative (IFI) e-learning workshop for Indonesia in October 2021. IFI is a platform established via collaboration among various international and national governmental organizations. Experts from various disciplines and public-sector operators (e.g., government bodies, public organizations and media) were hosted at the "Effective Hazard Information and Public Awareness" presentation on JMA's latest disaster risk reduction efforts.

5 Technical Meetings

5.1 Technical Meeting on Regional Weather Radar Network for Southeast Asia 2021

JMA held a technical meeting online on a regional weather radar network for Southeast Asia from 11 to 12 November 2021. This was the latest activity in the ESCAP/WMO Typhoon Committee's long-term Development of Regional Radar Network project (AOP3), and representatives from National Meteorological and Hydrological Services (NMHSs) in Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam attended the meeting.

Attendees reviewed project achievements and highlighted their current situations along with challenges in weather radar. The discussions underlined the significance of data exchange within the regional radar network and engagement in technical collaboration. The end of the meeting featured a discussion on the direction of the project and yielded an agreement to proceed with data exchange support for NMHSs. https://www.jma.go.jp/jma/en/photogallery/Technicalmeeting_202111.html

5.2 Technical Meeting on Himawari-8/9 Rapidly Developing Cumulus Area (RDCA) Products

JMA held a technical meeting online on Himawari-8/9 Rapidly Developing Cumulus Area (RDCA) products on 18 February 2022, a part of activities conducted under the ESCAP/WMO Typhoon Committee's Enhancing Utilization of Himawari 8/9 Products project (AOP7). Representatives from NMHSs in Malaysia, Singapore, Thailand and Viet Nam attended the meeting.

The project is intended to enhance NMHS utilization of observation data from the Himawari-8/9 geostationary meteorological satellites via the development of RDCA detection techniques based on such data. Meeting attendees learned about such techniques and discussed progress for this year as well as possible efforts in future years.

https://www.jma.go.jp/jma/en/photogallery/RDCAmeeting_202202.html

6 The 4th Asia-Pacific Water Summit in Kumamoto, Japan

The 4th Asia-Pacific Water Summit was held in Kumamoto City from 23 to 24 April, 2022. Under the theme of "Water for Sustainable Development -Best Practices and the Next Generation-", high-level delegates including heads of states in the Asia-Pacific region and representatives from international organizations discussed various water-related issues.

At the Summit, Japanese Prime Minister Kishida announced the "Kumamoto Initiative for Water" which the Government of Japan expresses its contribution to solving water issues and sustainable economic growth in the Asia-Pacific region, and the "Kumamoto Declaration" was adopted by the participating state leaders.

In order to answer the questions received from the leaders in the Kumamoto Declaration, 9 thematic sessions were held during the Summit. The outcomes of these sessions were summarized as the "Chairman's Summary" which outlines a clear path toward quality growth in the Asia-Pacific region. https://apwf.org/summit/kumamoto-2022/



The 4th Asia-Pacific Water Summit

[4th Asia-Pacific Water Summit] Kumamoto Initiative for Water (Outline)

- Proactive Contribution to the Development of "Quality Infrastructure" based on a "New Form of Capitalism" -

Japan will proactively contribute to the solution of water-related social issues faced by the Asia-Pacific region by developing "Quality Infrastructure" capitalizing on Japan's advanced technologies, and based on a "New Form of Capitalism", which means promoting public-private partnerships and fostering digitization and innovation to solve social issues as a growth engine for sustainable development and the formation of a resilient society and economy.

1. Promoting both clin

Use of observation

Evaluation of waterelated disaster risks

Planning and

operation of

facilities

River basin sustainability and resilience against water-related disaster risks

Flooding of rivers Inland flooding Flooding in rural areas

Creation of clean energy

Promoting energy

gas emissio

uring access to safe water

sanitary

Mair

nance of

Development of "Quality Infrastructure" by the use of hubrid technology to implement both

Effective use of existing dams

Sewerage systems

Irrigation and drainage facilities

ople's basic living environment

Capacity building for the operation and management of the facilities

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supply

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Sanitatio

1. Promoting both climate change adaptation and mitigation measures (1) Promoting the development of "Quality Infrastructure"

- Promoting the development of "Quality Infrastructure"
 Develop and provide hybrid technology to develop dams, sewerage systems and agricultural facilities to reduce the damage caused by flooding for river basin sustainability and resilience against water-related disaster risks for climate change adaptation and also to reduce greenhouse gas emissions for climate change mitigation (Improve and renew existing dams to bring about the effects more speedily)
- (Improve and renew existing dams to bring about the effects more speedily)
 Propose the introduction of "Quality Infrastructure" through public-private partnership
 (2) Contribution to fill gaps of observation data
 Provide satellite data obtained from the meteorological satellite "Himawari"
- Provide satellite data obtained from the meteorological satellite "Himawari" and Advanced Land Observing Satellite-2 (ALOS-2) "Daichi-2" as well as from the core satellite of the Global Precipitation Measurement (GPM) mission
 Contribution to generating (automa buman recourses and conscibuted)
- (3) Contribution to governance (systems, human resources and capacity) - Sophisticate the evaluation of water-related disaster risks by the use of Al/IoT-based forecast and analysis technologies - Support human resource development through the Asia-Pacific Climate
- Support human resource development through the Asia-Pacific Climate Change Adaptation Information Platform (AP-PLAT) and the Data Integration and Analysis System (DIAS)
 Utilization and evenemic of the Isint Craditing Machanism (ICM)
- (4) Utilization and expansion of the Joint Crediting Mechanism (JCM)

2. Promoting measures to improve people's basic living environment (1) Promoting the development of "Quality Water Supply Systems"

- Introduce advanced technologies, including IoT technologies for the development of water supply facilities
- (2) Promoting the development of "Quality Sanitation Facilities"
 Develop sewerage systems and on-site treatment facilities and enhance abilities to operate comprehensive treatment facilities

Providing financial assistance worth approximately 500 billion yen over the next five years

Kumamoto Initiative for Water (Outline)

https://www.mlit.go.jp/mizukokudo/mizsei/content/001479358.pdf



Dr. YOO Hee-dong Appointed as New KMA Administrator



YOO Hee-Dong, Administrator of the Korea Meteorological Administration Dr. YOO Hee-Dong has been appointed as new Administrator of the Korea Meteorological Administration (Fig. 3). He graduated from Korea's Yonsei University in 1988 with an M.S. degree in Astrometeorology and obtained a Ph.D. in Meteorology from the University of Oklahoma in 2003. Before being appointed as the new head of Korea's state weather agency, Dr. YOO has built a long career in the field of science and technology for weather and climate forecasting and relevant services. Working at the Forecast Bureau, he made an especially huge contribution to enhancing high-impact weather forecasting system including typhoon forecasts. From 2007 to 2011, he worked as the director of the NWP Model Development Division and the director of the Forecast Policy Division under the Forecast Bureau at KMA. From 2014 to 2021, he served as the director-general of the Climate Science Bureau, director-general of the Forecast Bureau, and director-general of the Planning and Coordination Bureau. In 2021, he was promoted to Vice Administrator of KMA and appointed as new KMA Administrator in 2022. Dr. YOO also contributed to establishing the National Typhoon Center at KMA and developing the typhoon forecasting system TAPS to improve KMA's typhoon forecasting. Moreover, he has actively participated in typhoon committee activities.

Improvement in the Algorithm for Typhoon Summer Prediction

To improve its ability to predict TCs' genesis, the Korea Meteorological Administration/National Typhoon Center (KMA/NTC) has developed a brand new statistical model for predicting the frequency of TCs over the western North Pacific (WNP) in the summer season (June-July-August). The model — ordinary least square regression model using predictors such as WNP trade wind (April), Pacific Meridional Mode (March), Canadian Sea Ice (March), St. Lawrence Sea Ice (March), and others — produces the predicted TC frequency for the two respective domains of the WNP. The WNP is divided by the 145°E longitude line since the predictors show differences of the spatio-temporal correlation with TC frequency (Fig. 1). The predicted value for the WNP is produced by the sum of two values for the two domains. The model's prediction skill for TC frequency predicted the frequency over the WNP is 0.72 for the period of 1984–2021, and during the summer season in 2022 the value of predicted TC frequency over domain 1 is 6.1 and 5.2 for domain 2. The final prediction value for the WNP is 11.3 based on the sum of values for the two domains. The final value indicates near-normal compared with the climate normals of 11.



Fig. 1 Distribution of TCs' genesis over the western North Pacific in summer season (1984-2020).

Blue (Red) dots indicate the TCs' genesis in the domain 145°E westward (145°E eastward plus genesis points on the dividing line).

KMA/NTC's Improved Typhoon Forecast Services

The Korea Meteorological Administration/National Typhoon Center (KMA/NTC) has enhanced its typhoon forecast services by improving GIS-based typhoon information for users' better understanding. Users can find various typhoon information on the website (https://www.weather.go.kr/w/typhoon/ko /weather/typhoon_02.jsp) such as when a typhoon gets closest to land, areas most at risk for typhoons, as well as a typhoon forecast track overlapped by satellite images (Fig. 2). In addition, it has improved the graphical depiction of the track so that users can easily recognize changes in the intensity at the typhoon center with different icons showing different categories. The fax-type notification for the public institutions was converted into GIS-based detailed information. These services will be available on the KMA's website starting from July 2022.





Fig. 2 Sample of KMA/NTC's detailed typhoon forecast information

Working Group on Disaster Risk and Reduction (AOP7) Online Seminar for TC Crowd-sourcing High Density Non-Conventional Weather Data Date: 5 July (Tue), 2022 Hosted by the Hong Kong Observatory, Hong Kong, China

With reference to the AOP7 of the Working Group on Disaster Risk and Reduction 2022, an online seminar regarding the TC Crowd Sourcing High Density Non -Conventional Weather data was arranged. Thanks to the meeting host, Hong Kong Observatory, we had around 20 members coming from 8 member countries participated in this meeting.

During the meeting, Dr. Jong Seol LEE, Chairman of WGDRR and Mr. Pak-wai CHAN, Assistant Director, HKO made the opening remarks and the two speakers from Hong Kong Observatory Mr Armstrong CHENG and Ms Olivia Shuk-ming LEE, shared to us their experience on the Pilot Crowd Sourcing Scheme in Hong Kong and illustrated to us the establishment of a Network of Microclimate Stations in Hong Kong.

Participants interacted actively with the speakers and members of WGDRR would like to express their greatest appreciation to Hong Kong Observatory for arranging such successful and informative meeting to the TC members.



Thailand

Appointment of new Director-General of Thai Meteorological Department (TMD)



Dr. Chomparee Chompurat was designated as the present Director-General of the Thai Meteorological Department (TMD) on 23 February 2022 onwards. She was born in 1970, holder of Doctoral Degree from Mahidol University, Thailand.

She served as the Deputy Secretary, Office of the National Digital Economy and Society Commission in 2020 and the Assistant Permanent Secretary from November 2020 – December 2021. Later, she was promoted as the Inspector, Ministry of Digital Economy and Society for a short period and currently was the Director-General of TMD under the Ministry of Digital Economy and Society.

Dr. Chomparee Chompurat General (23 February 2022 – present)

Dr. Chomparee has experienced from various trainings such as Budgeting for Executives Program, Public Finance for Executives Present TMD's Director-Program, the Civil Service Executive Development Program: Visionary and Moral Leadership, etc. She intends to avail herself for the full cooperation on meteorology and hydrology for the benefit of the international community.

One TMD's meteorologist participating in the Typhoon Committee Research Fellowship Scheme 2021 online, from 1 January to 31 March 2022



Mr. Nawin Sermsook, a Meteorologist, Weather Forecast Division had been awarded to

participate in the Typhoon Committee Research Fellowship Scheme 2021 online which was hosted by the Hong Kong Observatory from 1 January to 31 March 2022. The project was named "Study on the characteristics and model forecast performance of rapid intensification of near-landfall tropical cyclones"

TMD staff attending online training course on Tropical Cyclone Forecast, 27 June – 8 July 2022, hosted by RTC-Nanjing

Though, the COVID-19 pandemic has prevented us from activities in face-to-face mode, the Thai Meteorological Department (TMD) is still keeping to enhance our staff capacity building with many online courses that come to us regularly. One of an importance courses is the training course on Tropical Cyclone Forecast in which TMD had nominated 16 meteorologist for attending the course. It was hosted by RTC-Nanjing and held successfully online from 27 June to 8 July 2022.









The ESCAP/WMO Typhoon Committee Newsletter is published in English by the Typhoon Committee Secretariat

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