

## 17th Online Integrated Workshop



he ESCAP/WMO Typhoon Committee (TC) at its 54th Online Session decided to convene the 17th Integrated Workshop (17th IWS) in 2022 in conjunction with the 4th Training & Research Coordination Group (TRCG) Forum in ESCAP facility in Bangkok, Thailand, in Q4 of 2022. However, it recently came to our notice that there is nil vacancy available in the venue of ESCAP from November to mid-December 2022. For the 4th TRCG Forum, if a face-toface 17th IWS could not be arranged, TRCG has reviewed the situation and recommended to further postpone the event to conduct back-to-back with the 18th IWS in 2023. Moreover, following the request in TC54, TCS has consulted China regarding the hosting of the 18th IWS and 19th IWS. China prefers to host the 19th IWS in 2024 as planned instead of the 18th IWS in 2023.









\$

## **TC News from Members**

**%** 

Newsletter

2nd Semester 2022

## The 7th International Distance Training Course On Tropical Cyclone Monitoring And Forecasting

The 7th International Distance Training Course on Tropical Cyclone Monitoring and Forecasting was held by WMO Regional Training Centre-Beijing (RTC-BJ/CMATC) from 24 October to 4 November 2022 via the CMATC MOOC website, with supports from World Meteorological Centre-Beijing (WMC-BJ). ESCAP/WMO Typhoon Committee and WMO Education and Training office supported and distributed the course information. 172 participants, including 21 from the ESCAP/WMO Typhoon Committee and WMO/ESCAP Panel on Tropical Cyclones (PTC) Members, enrolled in the course.

The course aims to offer knowledge and skills of typhoon monitoring and forecasting, and enhance the trainees' understanding of the application of meteorological satellite products and ensemble forecast products in supporting typhoon monitoring and forecasting operations.

The course includes an overview of the recent progress on typhoon monitoring, forecasting and warning; the application of meteorological satellite products in typhoon forecasting operations, the intensity analysis of Typhoon, the probabilistic forecast of typhoon genesis, the application of ensemble prediction product based forecasting of landing typhoon associated precipitation and typhoon tracks, and tropical cyclone disaster prevention and mitigation.

The instructors include senior experts from China Meteorological Administration (CMA), National Meteorological Centre (NMC), Beijing Climate Centre (BCC) of CMA, National Satellite Meteorological Center (NSMC), CMA Earth System Modeling and Prediction Centre, CMA Training Centre, National Marine Environmental Forecasting Centre, Shanghai Typhoon Institute of China Meteorological Administration, Guangzhou Institute of Tropical and Marine Meteorology of CMA, Hong Kong Observatory, Fudan University, University of Hawaii etc.

The training course Das conducted in English and was delivered via recorded lectures, live lectures, and online discussions. Participants are also invited to give presentations concerning good practices, case analysis, and policy and actions on improving tropical cyclone forecast or disaster prevention and mitigation on the Participants' Forum. A special section on Public-Private Engagement was also conducted.

#### COMMENTS FROM THE 7TH INTERNATIONAL DISTANCE TRAINING COURSE ON TROPICAL CYCLONE MONITORING AND FORECASTING





My name is Pamornwan Pootta. I'm from Thailand. I gained in the course many technics for forecasting typhoons and how to observe and analyze wind in tropical cyclones. The Typhoon course I like the most is Tropical Cyclone Size and Size Change because Lecturer can present so clearly and easily to understand. And I don't have suggestions about this because it is so easy to learn online and I can learn everywhere.

 $\Omega_0$ 

♡2

🖌 添加评论

副 服名 13天 Thank you CMATC M Mohamer Ch. Sadak. Thank you for your efforts in making this course a success. My name is Mohammed Shandao. I am from Yemen. I worked as an assistant weather forecaster in the meteorological office at Sana'a International Airport, I learned and gained a lot of new information in this course. although the time was short. But it was an important course for me. I hope that such training courses will continue on a larger scale because of their positive impact on meteorologists. And I have a suggestion. Include a PDF file with the content of each lecture for those who wish to download it. And also enable the feature to download the recorded videos of the lectures for those who wish to download them to their device. As for the other courses that we need. 1.Early warning. 2. Numerical predictions. 3. Satellike. 4. The importance of meteorology for air traffic. Finally,I reiterate my thanks and appreciation for your efforts and your good treatment in making this session a success. I wish you and the People's Republic of China further progress, prosperity and success. 00 法定律论



### Newsletter 2nd Semester 2022

#### 曼 匿名 ◎天 Thanks CMATC



Hello, My name is Bushra Al Saadi and I'm from Sultanate of Oman. This course was really a good experience for me and I gain too much informations about different ways of monitoring and forecasting tropical cyclone. "Operational use of multiple satellite data in typhoon forecasting (1&2)" lessons helped me in my daily work because it explain the TC intensity analysis based on Dvorak technique, which relate the satellite cloud image features and the TC intensity. In this course some of the professional recording lectures, participants' forums, Visual tour and ice-breaking activities that I liked the most. My suggestion for this course to reduce the length of the live lectures and case studies that done by the lecturers. I think if there is any possibility to prepare a course about "marine forecast" that will help me a lot in my daily work. Thank you for everything.

٣	2	00
-	添加评论	



#### Hello everyone ..

My name is Kharendra Muiz. I am working as a weather forecaster at Agency of Meteorology Climatology and Geophysics (BMKG). This course is so important for me to improve my knowledge and skill to forecasting. I acquired many techniques for forecasting hurricanes and how to observe and analyze winds in tropical cyclones.

I really appreciate the CMATC team who made this course happen. I Hope CMATC can make more online training like this. Thank You

♥1 ● 添加评论 D٥

臺 圈名 11天 Thank you CMATC for the opportunity given to me.



#### Hello,

-My name is Maswi Christine from Kenya. I work as a daily weather forecaster at the Kenya Meteorological Department headquarters located in Nairobi, thank you to all the instructors and the organizers of this training for a job well done. All the lectures were very good and informative and I give an applaud to those who settled on this topics.

-The TC course was very helpful to me as an individual and as well as the department, because all the topics covered were very educative. I enjoyed mostly the live lecture on nowcasting techniques by Prof Wang Yuging especially on thunderstorm and severe convection. My country is prone to lightning and thunderstorms development that leads to loss of life and destruction of properties and gaining more knowledge on mitigation could help a lot.

-secondly the recorded lecture on NWP system related to TC prediction and products in CEMC by Dr. Ma Suhong, Back in My department, Am part of NWP team and we run WRF model where we produce various weather products like rainfall, temperature, cloud cover and other parameters that go hand in hand in giving warnings to the public incase of severe weather, I was able to relate well with the various components of GRAPES. My suggestion was to request you to kindly avail the training materials to the participants who would wish to access them even after the training and to include PDF files for downloads as well. During the live lecture. the participants do engage in doing some work like the one asked on severe convective warnings to the public incase of severe weather, I was able to relate well with the various components of GRAPES. My suggestion was to request you to kindly avail the training materials to the participants who would wish to access them even after the training and to include PDF files for downloads as well. During the live lecture, the participants do engage in doing some work like the one asked on severe convective weather in our various countries, could it be possible next time for those who were not able to attend the live lecture to do so directly when watching the recorded live lecture so as to have that feeling of participation in the lecture?

-Kindly, more training on NWP and satellite imagery interpretations could do much better for me. Thank you



**BR** 

# topan

Hello, my name is Audia Azizah Azani from Indonesia. I gained so much knowledge from this course, especially about cyclones around Northwest Pacific, which my forecasting area got impacted by that. Also, the lecture about forecasting the surge helps me a lot to understand how the surge will impact the coastal area when TC happens. What I really like about this course is the meteoculture course because I can learn how the meteorological conditions affected Chinese culture and it's really interesting to watch. I also love the participant forum where I can share the condition of my forecasting area with other participants even though I was a little bit nervous but it was really memorable achievement for me :D

Fyi, I am working on my master's thesis right now, specifically about the study of surge characteristics during TC. I hope all the presentation materials in this course will be shared with us. And the suggestion for the next course is about marine weather observation, prediction, and analysis.

See you next time!

Love, Audia

P.S. I will be very glad if anyone wants to share their publication about the surge and TC :) feel free to contact me: audia.azani@bmkg.go.id

**9**5

#### ፪名 □天 From the Philippines!



Typhoon

Thank you for the course!

Typhoon in the Philippines is called BAGYO.

I am Mariecar Robles of the DOST Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA). I am interested int his course and I enjoyed learning new things. I really appreciate the recorded videos since I can review it again.

Thank you for the opportunity to continue learning.

00

To more courses to attend!

♥2 ● 添加评论



Thank you CMAT for this great opportunity.



I'm Octavio Arturo Farias Nunez from Mexico City of Mexico, I actually work in the National Weather Service.

This course it's more that I was expecting this course goes beyond of my expectations because you cover all the topics related to the TC Monitoring and Forecasting.

My favorite part of the course it was when all the participants were in the live lectures and also that human sense that characterized all and special the staff.

I have two suggestions, maybe, consider the possibility to have two different hours of the live session because it was a little late here in Mexico, and second if it's possible could be useful attach subtites on the records or even put a transcript of the video, because in some cases we have different intonation of the English language and it's kind of difficult to understand some words. I need (if it's possible) a course related more with the numerical models, like a workshop of numerical models on forecasting TC and other Meteorological an Climate events, also if it's possible a course related with Climate Forecast, and subseasonal forecast (I'd made all this suggestions and request because I like so much your way that you teach and you plan the courses).

I wish some day I would visit you at CMAT and take a presence course, in my case it's difficult to afford the course my own if you know a process or application form I'll appreciated your information for apply and be there with you sharing knowledge.

The instructors where so kind and professionals and sure I will take more courses with you (even if you conserve the live sessions hours "lo!").

Thanks so much for this opportunity and sure I will stay with you taking and if it possible giving more courses.

♀ 4
○ 0
● 添加评论





from Solomon Islands. From this training I indeed learned alot of new things. Thus at the end of this course I am able to atleast; -understand the conditions or favourable environment for the formation of tropical cyclone -identify tropical cyclone image from satellite paintings to understand what it likes around the eye of the cyclone. the condition required for the sizes of the tropical cyclone -the conditions needed by tropical cyclone in her life span. -the ways in which tropical cyclone message or informations should be diseminated for general public -the impact and the effects of tropical cyclones if poor preparation or un reliable information is given to the public.

accurately tropical cyclone prediction is still a major problem for Tropical Dyclone Forecasting Centres In this course the part I like the most is Participants Forums This is because I am able to know about other countries cultures, foods (Mexican food), and new each country handle tropical cyclone warnings and awaress, effects and impacts of tropical cyclones from other countries. Nearly the same as my country. Chinese writing of Typhoon too is so interesting, 1 ard word Typheon during high school days but didn! know exactly how this word typi is extracted or originated from My suggestion for the course is , this course is very in sportant and the time frame of the course is very shert. Grateful, if time can increase to easily run through the presentations and rded videos. My country has inconsistent power supply. poor internet coverage and peed. Some of the lectures forums and presentations I really came behind the schedule. A face to face training will be nice.

Once again thank you CMATC.

With many thanks.

John Naneu feel free to email mer nanauhitr@gmail.com

#### minatami 12天

#### Thank you CMAT for informative and interesting lectures

Natalia Mishchenko, Ukraine

I can consider my success the fact that I learned a lot about this topic. It is guite new for me. I just started studying this topic, so all the lessons became a kind of discovery for me. I really liked the way the teachers taught their lessons and their visualization. All presentations were sufficiently meaningful and understandable. Therefore, I liked the lecture recordings and online broadcasts the most.

I hope to attend classes on similar topics in the future. In general, I am very interested in the latest methods of forecasting convective phenomena, the use of satellite information in the work of forecasters. I would also like to learn more about the possibilities of obtaining various model data and their processing methods.

C 2

 $O_0$ 

添加评论



Mondher Mrabti from Tunisia here, it is always nice to learn something new, the content of the course was well presented. Thank you for the informative course 🛢 🛢 🛢

00

02 😧 添加评论



mocco and I w



From 27 June to 8 July, 2022, *International Training Course on Tropical Cyclone Forecasts* was hosted by Nanjing University of Information Science and Technology (NUIST) for almost 90 trainees from 21 countries. This event saw experts from NUIST and China Meteorological Administration deliver lectures on dynamics, genesis, track, intensity change, and extra-tropical transition of TC, and share operational experiences in TC detection, monitoring and forecast, such as satellite image recognition, radar data application and data assimilation. Through the training course, trainees from developing countries, related TC members in particular, enriched ad hoc knowledge, shared and exchanged working experiences on operational topics of common interest. Designated as the training centre of Typhoon Committee in 2012, NUIST has organized about 10 training events on tropical cyclone forecast and made its contribution to the working capacity enhancement of TC-related operations with the meteorological services represented

## Carrying out "the Belt and Road" meteorological technology exchanges and promoting the research and development of CMA-TRAMS typhoon model

At the invitation of the ESCAP/WMO Typhoon Committee, Chen Zitong and Wu Kaixin from the Guangzhou Institute of Tropical and Marine Meteorology of the China Meteorological Administration participated in the 5th Annual Meeting of TC Working Group on Meteorology and the ESCAP/WMO TYPHOON COMMITTEE 17th Integrated Workshop on October 13, 2022 and November 29-30, 2022 online. Wu Kaixin made an oral report entitled "Progress of AOP-2 of WGM in 2022" at the meeting which mainly introduces the research and development progress of CMA-TRAMS model in 2022 and future plans. Through academic exchanges, we have a deeper understanding of the international typhoon disaster prevention and mitigation, typhoon numerical model, typhoon forecast and inspection.





Figure 1 The 5th Annual Meeting of TC Working Group on Meteorology

## Developing CMA-TRAMS typhoon model products to widely serve the "the Belt and Road"

The Guangzhou Institute of Tropical and Marine Meteorology of the China Meteorological Administration has carried out in-depth research on the CMA-TRAMS typhoon model, and has built the CMA-TRAMS typhoon model with independent intellectual property rights. The horizontal resolution of the CMA-TRAMS model is 9km, and it can provide weather forecasts for the next 7 days, including typhoon path, typhoon intensity, precipitation, and other conventional meteorological elements. Real-time forecast products are provided on the website of the Guangdong-Hong Kong-Macao Greater Bay Area branch of the World Meteorological Center (Beijing) and the WMO Typhoon Committee. According to the assessment of the Typhoon and Marine Meteorology Expert Working Group of the China Meteorological Administration, the 24-hour and 48-hour typhoon path errors of CMA-TRAMS in 2021 were 67.6km and 132.6km respectively, second only to the ECMWF. At present, CMA-TRAMS typhoon model has realized Real-time mode forecast product sharing service in the Guangdong-Hong Kong,-Macao, Greater Bay Area branch of the World Meteorological Center (Beijing), which can provide numerical model forecasts for the next 7 days in "the Belt and Road" region.



Figure 2 Real-time forecast product of 10m wind from CMA-TRAMS



## 📸 🛛 Hong Kong, China

#### **Tropical Cyclone Reconnaissance Flight**

The Hong Kong Observatory (HKO) had been collaborating with the Government Flying Service (GFS) on tropical cyclone reconnaissance flights using dropsondes since 2016.

In 2022, a total of 12 dropsonde missions were conducted for tropical cyclones Chaba (30 June and 1 July), Mulan (8, 9 and 10 August), the tropical depression over the South China Sea (16 August), Ma-on (24 August), Noru (26 September), Nesat (17 and 18 October) and Nalgae (1 and 2 November, Figure 1).

The data processing method had been re-engineered for operational implementation in September 2022 to enable a timelier dissemination of dropsonde data with additional vertical levels. A set of data containing weather elements at 16 pressure levels in BUFR format would now be disseminated to GTS immediately after the launch of each sonde unit, where-as previously, the whole set of data was sent in one batch only after the operation was completed and with weather elements at just 10 pressure levels. Together with real-time data relay via satellite and automated data quality checking, the revamped workflow had expedited the data dissemination process to facilitate timely subjective analysis by forecasters and data assimilation into NWP models.



Figure 1 - Dropsonde data (winds below 50 m) of tropical cyclone Nalgae overlaid on false-colour satellite imagery at around 0200 UTC on 2 November 2022. Although Nalgae appeared to be rather weak on the satellite image, southeasterly wind of 50 knots at a height of 10 m was recorded near the storm centre by a sonde, indicating that Nalgae remained a severe tropical storm on that morning.

#### Typhoon Committee Research Fellowship

In view of the latest COVID-19 epidemic situation, HKO continued to offer a Typhoon Committee Research Fellowship remotely in 2023. Ms XIANG Chunyi from China Meteorological Administration commenced the 2<sup>nd</sup> phase of the fellowship research project titled "Study on the characteristics and model forecast performance of rapid intensification of near-landfall tropical cyclones" in January 2023. She will further review and consolidate the initial findings in the first phase of the project and evaluate the performance of subjective forecast, global NWP deterministic models and EPSs to capture Rapid Intensification (RI) of near-landfall tropical cyclones in Q1 2023.



Figure 2 - Ms XIANG Chunyi (Top right) discussing with HKO colleagues through online meeting.



#### Contribution of Tropical Cyclone-related Educational Videos to WGDRR

HKO continued to contribute tropical cyclone-related educational videos to the Working Group on Disaster Risk Reduction (WGDRR). In 2022, a video on the potential threats brought by a relatively distant tropical cyclone had been translated into English version with subtitle and voice over. The video was shared with the WGDRR members and uploaded to the Typhoon Committee website to raise public awareness on tropical cyclones.



Figure 3 - WGDRR educational video about the potential threats brought by a relatively distant tropical cyclone. (<u>https://www.typhooncommittee.org/2018/06/07/drr-educational-vid-eos/</u>)

#### Online Video Course on Tropical Cyclone

The HKO launched an "<u>Online Video Course on Tropical Cyclone</u>" on its website in 2022 to introduce the basic scientific knowledge on tropical cyclones to members of the public and to raise their awareness of disaster preparedness and response. The online course comprises six short videos which explain the formation, structure and movement of tropical cyclones, methods of observing and forecasting the storms, as well as the local effects and hazards including high winds, heavy rain, storm surge and swells. The online course was well received with number of views exceeding 50,000 on <u>YouTube channel</u> within 2022. English version of the course will be available in 2023.



Figure 4 - Online video course on tropical cyclone.





#### 1. Technical Developments

#### 1.1 Upgrade of the storm surge watch scheme (SSWS) model and related products

Following the endorsement of the ESCAP/WMO Typhoon Committee (41st session, January 2009), the RSMC Tokyo – Typhoon Center has provided storm surge prediction products on its Numerical Typhoon Prediction website (https://tynwp-web.kishou.go.jp/) since 2011. The service operates within the framework of the Storm Surge Watch Scheme (SSWS), with the aim of strengthening the storm surge warning capabilities of National Meteorological and Hydrological Services in the region. Products include storm surge forecast distribution maps, time-series charts for selected stations, multi-scenario storm surge predictions, and week-range wave forecasts based on the JMA Wave Ensemble system (WENS).

RSMC Tokyo upgraded its storm surge forecast products on 4 August 2022 in line with enhancement of the storm surge prediction model. The changes included:

- Incorporation of the finite volume method (FVM) with an unstructured grid
- Increased resolution in coastal regions from 2 minutes to 1.5 km
- Expansion of the model domain to cover most of the Center's area of responsibility
- Extension of the forecast range from 72 to 132 hours
- More multi-scenario predictions using whole members of the Global Ensemble Prediction System (GEPS)

The upgrades enable visualization of additional probabilistic forecast maps for variables such as ensemble mean, ensemble max, ensemble spread, 1-, 2- and 3-meter exceeding probabilities and third-quartile height, in addition to deterministic storm surge forecasts. New time-series charts with boxplots and exceeding probability bar graphs are also available. Brief commentary is provided on the SSWS website, and a technical review paper will be updated accordingly.

These new forecast products are intended to support storm surge disaster risk reduction among Typhoon Committee Members.



#### Time series chart of SSWS forecast

obability o surge (bol >1m >2m

12



The Japan Meteorological Agency switched operation from its Himawari-8 satellite to its Himawari-9 unit on 13th December 2022. Himawari-9 carries the same Advanced Himawari Imager (AHI) sensor equipment as Himawari-8, and conducts observations from the same orbital position (140.7°E) with the same observation sequence. Slight differences of observation quality are found due to individual sensor characteristics between Himawari-8 and Himawari-9. Results of comparison are provided on the Meteorological Satellite Center website at <a href="https://www.data.jma.go.jp/mscweb/en/oper/switchover.html">https://www.data.jma.go.jp/mscweb/en/oper/switchover.html</a>

#### (1) For HimawariCloud users

HimawariCloud users can access Himawari-9 data in a similar way to Himawari-8 data, with the same HimawariCloud account used for Himawari-8 remaining valid. No additional procedures are needed for users to receive Himawari-9 data.

#### (2) For HimawariCast users

HimawariCast users don't need to modify receiver system settings (data format/quality or antenna orientation) in relation to the switch.

The Japan Meteorological Agency will continue to provide stable distribution of Himawari observation data, which is essential for typhoon monitoring in the Asia-Pacific region.

CONTRACTOR OF A REAL PROVIDENCE OF A REAL PROVIDENC							_															
FY Satellite	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	6202	
Himawari-8				La	auno	ch 🛔			O	pera	tior	nal			1	in-o	rbit	star	ndbr	y		
		Mai	nufa	ctu	ring								4						_			
Himawari-9	Launch									In-orbit standby						Operational						

Himawari satellites schedule

#### 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. 13 inquiries relating to more than 10 tropical cyclones had been submitted via the platform in 2022, 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 2021

The Annual Report on the Activities of the RSMC Tokyo – Typhoon Center 2021 outlines major activities conducted in 2021, summarizes the 2021 typhoon season and presents verification of operational forecasts, numerical models and other products. Content includes information on Typhoon Committee attachment training, commencement of five-day storm wind probability maps for tropical depression (TD) expected to reach TS intensity within 24 hours. 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.



#### 4 Capacity Development Activities

## 4.1 22nd Typhoon Committee Attachment Training course at the RSMC Tokyo – Typhoon Center

The 22nd ESCAP/WMO Typhoon Committee Attachment Training course was held online from 11 to 13 January 2023. Due to COVID-19, the course was held virtually (as in the previous two years) with 51 attendees from eight Typhoon Committee Members including China; Hong Kong, China; Macao, China; Malaysia; the Philippines; the Republic of Korea; Thailand; and the United States of America.

At the opening session, Mr. Nomura Ryoichi (Director-General of JMA's Atmosphere and Ocean Department) spoke about 2022 typhoon season where several tropical cyclones posed multiple hazards affecting public activity. The importance of understanding and using cutting-edge technology (such as meteorological satellites and numerical weather prediction), sharpening TC forecasting skills, and promoting the application of such abilities obtained from the training course to reduce TC-related damage in the Asia-Pacific region, was reaffirmed.

The course was enriched with hands-on training materials for self-study and interactive exercises on satellite analysis techniques and Dvorak analysis. Associate Prof. Ito Kosuke from the University of the Ryukyus presented on recent progress in understanding tropical cyclone motion in his role as an expert in the field. The course contents were renewed from last year to further fit with recent needs. This year, to enhance understanding of coastal hazards associated with tropical cyclones, a lecture on storm surges and high waves was held by an expert of JMA. This lecture also contributes to the activity of the WMO Regional Association II (RA II) Expert Team on Marine Services (ET-MS) under the Working Group on Weather, Climate, Water and Related Environmental Services and Applications (WG Services).

The event generated productive discussions, with Member representatives making wide-ranging presentations on tropical cyclone information (including case studies on TCs affecting their areas and pubic weather services) on the third day. The interaction provided valuable opportunities to share information on experiences and expertise in TC forecasting and warning operations, and their attempts to further enhance public awareness.

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, 2023)

#### 5 Meetings

#### 5.1 The 11th Meeting of the TC Working Group on Hydrology

The 11th Meeting of the TC Working Group on Hydrology was held in Tokyo with both online and in-person attendance from 18 to 19 October 2022. The organizers were pleased to host TC Members in person for the first time since the 8th Meeting was held in Seoul in 2019 before the onset of COVID-19.

On the theme of "Effective Use of Science and Technology towards Building a Resilient Society", attendees discussed views and achievements in the fields of hydrology and flood prevention. Representatives from Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT) outlined the Kumamoto Initiative for Water announced by Japanese Prime Minister Fumio Kishida at the 4th Asia-Pacific Water Summit and underlined the Ministry's intention to proceed with projects relating to the initiative in cooperation with TC Member countries.



A field trip the day after the meeting incorporated the Meteorological Science Museum, the Minamisuna Stormwater Reservoir for flood control and Tsurumi River multipurpose retarding basin to highlight Japan's philosophy and activities toward a resilient and sustainable society via the development of high-quality infrastructure. JMA remains committed to ongoing cooperation with TC Members in these areas.





#### 5.2 Working Group of Hydrology (WGH) visit to JMA Headquarters

As a part of a technical excursion during the annual meeting of the Working Group on Hydrology, JMA hosted WGH experts at its headquarters on 18 October 2022. The Agency provided a comprehensive overview of its weather observation and forecasting systems with focus on cutting-edge flood warnings and prediction. Another presentation featured the new weather operation room by showing a video on JMA's flood warning operation in close communication with river management authorities. The visit helped attendees understand how meteorological agencies conduct weather operation related to hydrological events.



Presentation on JMA flood warnings and forecasts

## 5.3 Contribution to Severe Weather Forecasting Programme-Southeast Asia (SWFP-SeA)

JMA supports the implementation of the Severe Weather Forecasting Programme in Southeast Asia (SWFP-SeA) as a participating organization. Contributions involve World Meteorological Center Tokyo and RSMC Tokyo – Typhoon Center activities and geostationary meteorological satellite operations. Provision of forecasting/observation materials and capacity development opportunities are central pillars for assisting participating National Meteorological Centres (NMCs) in operational forecasting.

The Regional Sub-programme Management Team (RSMT) meeting for Southeast Asia was held online from 1 to 2 December 2022 to review progress made by SWFP-Southeast Asia since the 2019 meeting and discuss needs for related advancement. Two JMA focal point persons highlighted the Agency's cutting-edge technical advancement on Numerical Weather Prediction (NWP) and tropical cyclone analysis/forecasting. The event helped to clarify the status and outcomes of SWFP-SeA implementation. JMA remains committed to its efforts for further contribution to SWFP-SeA activities.





#### Providing AI-based 24-hour Day and Night RGB Imagery from GK2A for Specific Typhoon Areas

The National Meteorological Satellite Center (NMSC) of KMA has developed an artificial intelligence (AI) model that simulates visible images at night. 24-hour day/night RGB images have been used to monitor high-impact weather during night time since March 2021. Previously, these images were only available for the Korea and East Asian area, as depicted in the pink box in Figure 1 on the left.

The NMSC has modified its AI model to adjust "the typhoon area," as depicted in the blue box in the day/night RGB in Figure 1 on the left. New images for the typhoon area allow forecasters to more clearly interpret lower cloud circulations of the low pressure systems in the early stages of tropical depressions. For example, while the cloud lower circulations of Typhoon Hinnamnor in 2022 are not clearly identified in the conventional day/night RGB (upper right), the AI-based day/night RGB (lower right) provides a vivid red color, making it easier to interpret.



[Fig. 1] An AI-based day/night RGB imagery for the East Asian area indicated by a pink box and the typhoon area indicated by a blue box (left), a conventional day/night RGB imagery of Typhoon Hinnamnor (upper right), and an AI-based day/night RGB imagery of Typhoon Hinnamnor (lower right).

#### Invitational Training on Capacity Building for Typhoon Monitoring and Forecasting Platform

KMA has conducted the project "Establishment of Integrated Platform for Typhoon Monitoring and Forecasting in Laos" in collaboration with DMH. As part of the project, KMA provided working-level training on the utilization of Typhoon Operation System (TOS) and the analysis of GK2A satellite data for DMH staff from November 14 to December 2, 2022 at the National Typhoon Center (NTC) and the National Meteorological Satellite Center (NMSC) of KMA. During that period, two invited forecasters from the DMH of Lao PDR participated in the TOS training at the NTC/KMA from November 14 to 18. The training consisted of hands-on practices in typhoon forecasting using TOS and lectures on guidance for typhoon forecasting based on numerical weather prediction models. The NTC staff also introduced the typhoon re-analysis process and the seasonal prediction system to the participants. In particular, the participants simulated typhoon information using the TOS's analysis and forecast modules. It was a meaningful opportunity for DMH's forecasters and KMA's typhoon forecasters to share forecasting technology and related issues.



[Fig. 2] Introduction to TOS and typhoon forecast practice with two participants from DMH.





#### 1. TMD participants attended the Workshop on Typhoon Forecasting Techniques and WGM Project Progress Review (face-to-face and online) hosted by the Malaysian Meteorological Department (MMD)

Miss Pornsiri Rucksunchart, Meteorologist, Weather Forecast Division from the Thai Meteorological Department (TMD) attended the Workshop on Typhoon Forecasting Techniques and WGM Project Progress Review face-to-face in Malaysia. The workshop was hosted by the Malaysian Meteorological Department (MMD) from 11 to 13 October 2022.

With the fully financial supported by the Typhoon Committee Trust Fund (TCTF) and Malaysian Meteorological Department (MET) as the local host, Miss Pornsiri Rucksunchart could have a good opportunity to meet with many experts and all meteorologists learning and discussing about typhoon forecast techniques. Also, there were three TMD's meteorologists attending the workshop virtually as Mr. Surajit Jitarerat, Ms. Paweena Yupajan, and Mr. Chanupong Photchanakrai. All TMD's participants gained new knowledge and research that they could apply to forecast the severity and direction of tropical storms that affect Thailand. Additionally, they learned about the impact based forecast and how to issue warning to the public with the most effective methods.







## 2. TMD sent our staff to attend the Tenth WMO International Workshop on Tropical Cyclones (IWTC-10), Bali, Indonesia, 5 – 9 December 2022

Mr. Somprat Srithagon, Meteorologist, Weather Forecast Division, Thai Meteorological Department (TMD) was received the full financial support from the World Meteorological Organization (WMO) to attend the Tenth WMO International Workshop on Tropical Cyclones (IWTC-10) physically in Bali, Indonesia from 5 to 9 December 2022.

Besides, a couple of TMD meteorologists, Mr. Kukiat Soonrach, Meteorologist, Upper Northeastern Meteorological Center and Acting Sub Lt. Phatcharee Pratead, Meteorologist, Southern-East Coast Meteorological Center had got the opportunity to join the meeting online. The participants could gain knowledge about the problem and the impact of typhoon including the way to cope it and the communication with the public. The methods of studying typhoon through research in various aspects were also presented at the IWTC-10.





\*\*\*\*\*\*

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

Avenida 5 de Outubro, Coloane, Macau-China Phone: +853 88010531 Fax: +853 88010530 Email: info@typhooncommittee.org

The newsletter is available on request to the Editor at the above address

Editor: YU Jixin, Secretary of TC

Staff Members: Clarence FONG • Meterologist LIU Jinping • Hydrologist Michal FU • DRR expert Denise LAU • Senior Secretary KOU Meng Kit, Lisa • Finance Assistant