TECHNICAL PRESENTATIONS TC49

Item 5 of TC49 Agenda

No.	Time	TITLE	ABSTRACT
1	11:40 – 12:00	**Regional component of IN-MHEWS (International Network for Multi-hazard Early Warning System)** *Mr. Sanjay Srivstava, ESCAP*	*The Asia Regional Plan for Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, adopted at the 7th Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR) in November 2016, emphasized enhancing regional cooperation for coherent implementation of the Sendai Framework and the 2030 Agenda for Sustainable Development. It further called for innovative partnerships; and North-South, South-South and Triangular Cooperation in all areas related to disaster risk reduction, particularly in multi-hazard early warning systems for transboundary disasters, recognizing the critical role of the Asia-Pacific Regional Coordination Mechanism convened by ESCAP for implementing and monitoring the Sendai Framework, in line with the Sustainable Development Goals. In this regard, the presentation will overview ESCAP's mandated work on regional cooperation for building resilience to transboundary disasters. On further harnessing regional cooperation, it will outline specific ESCAP's strategies to address the unmet needs of multi-hazard early warning systems for tropical cyclones, tsunamis, drought, floods, glacial lake outburst floods (GLOFs), landslides, and sand and dust storms, in order to create mechanisms for coherent implementation, as highlighted in the Asia Regional Plan.*
2	12:00 – 12:20	**Reflecting the targets and indicators of the Sendai Framework for Disaster Risk Reduction to the new strategic plan of the Typhoon Committee** *Dr. Yuichi Ono, Professor, International Research Institute of Disaster Science, Tohoku University*	*The four priority of actions and seven global targets of the Sendia Framework for Disaster Risk Reduction will be monitored based on the agreed indicators and terminology. Tropical cyclone-related disasters have been causing significant damages in the Typhoon Committee region. They might be more severe in coming years due to climate change according to the recent IPCC report. The Sendai Framework for Disaster Risk Reduction, a comprehensive prescription for disaster risk reduction, is effective for reducing typhoon-related disaster risks. This presentation will provide important elements to be considered for integrating the Sendai Framework into the new strategic plan of the Typhoon Committee.*
	12:20 - 13:50	*Lunch*	
3	13:50 – 14:05	**How to issue evacuation orders for citizens in face of typhoon, based on the lessons we learnt from the Typhoon in 2016.** *Ms. Setsuko Saya, Director, International Cooperation Division, Disaster Management Bureau, Cabinet Office*	*Due to the impact of climate change, there is a growing concern that disasters might be more intensified and cause the unprecedented levels of heavy rains in many places of the world. In the context of unprecedented disasters, supports by pubic (governments) are not always sufficient for all affected people. It is indispensable to be prepared by individual citizens and to support mutually in communities. The importance of enhancing resilience at the community level was recognized based on the lessons from the Great East Japan Earthquake in 2011. The Community DRR Plan system was established in Japan recently to provide citizens'*

			platform for dialogue so that they can discuss local risks and plan their own actions. This planning system is able to accommodate local knowledge and needs according to the choice of the citizens. For example, Community DRR Plan can take into account where vulnerability exists in the neighborhood, such as where senior citizens and disabled people live. Such information will be useful to understand local hazards and propose actions for evacuation.
4	14:05 – 14:20	**Brief Introduction to China Emergency Early Warning Release Platform** - *CHENG Zhengquan, Guangdong Meteorological service, CMA*	*The presentation gives a brief introduction of general situation of China Emergency Early Warning Release Platform, focusing on the background, implementation steps, working platform, release channels of Guangdong Emergency Early Warning Release Center and its effect in emergencies in the past several years.*
5	14:20- 14:35	**Multi-hazard Risk-based Warning in Japan** *Mr. Yasuo Sekita, Director-General of Forecast Department, JMA*	*This talk will review recent improvements in JMA's multi-hazard risk-based warning services. JMA develops new graphical products indicating risks of landslide, inland water, and river flood disasters including related technical developments in order to help users to visually understand seriousness of risks of these disasters at their locations. Another product to be highlighted is to Probability of Warning-class Phenomenon that provides five-day probability of severe weather phenomena potential to have impacts on society. It will help users to prepare for risks of severe weather well in advance. The talk will also mention the importance of collaborative efforts with DRR related agencies, including local governments, for such warning products to be fully utilized for emergency responses.*
6	14:35 - 14:50	**Utilization of radar composite for severe weather watches, warnings, and advisories** *Mr. Boonlert Archevarahuprok Expert on Research & Development for Meteorology Thai Meteorological Department*	*Presently, various advances of weather radar technology including dual polarization Doppler are implement in NHMSs operation. With the Limitation of local observation range maximum hundred kilometers for S-band, C-band and X- band. Then it is impossible to observe server phenomena that will occur and effect to resilient areas for alerting , early warning, and preparedness in advance. The weather radar composite or mosaic is one of the application that gives more information in both of temporal and spatial resolution. The example of them is to identify the development of server tropical cyclone genesis and clarify especially position and movement. These results will be more useful for advisories to the decision maker on disaster warning and preparedness in each situation.*
7	14:50 – 15:20	**Model Simulation and Observational Studies in Japan** *Dr. Munehiko Yamaguchi, Senior Researcher, MRI/JMA Dr. Hironori Fudeyasu, Associate Professor, Yokohama National University Dr. Hiroyuki Yamada, Associate Professor, University of the Ryukyus*	***Introduction:*** *We will introduce tropical cyclone (TC) research in Japan, focusing mainly on model simulation and observational studies. First, the current status and future challenges regarding TC analysis and forecasting are briefly reviewed based on the recommendations at the 8th WMO International Workshop on Tropical Cyclones (IWTC-8) in 2014. In the following two presentations, recent research and development activities in Japan to better understand TC dynamics as well as to further improve TC analysis and forecast are presented.*

			Model Simulation Studies: Recent advances in computer power have made it possible to conduct super-high-resolution TC simulations with the state-of-the-art numerical models. The outstanding researches include a sub-kilometer global simulation without cumulus parameterizations on the Japan's powerful supercomputer, K computer, one of the fastest supercomputers worldwide. The detailed structure of TCs including the eye, circular clouds around the eye, and the spiral rainbands is realistically simulated with such a fine resolution. The huge amount of outputs from the simulations gives us an opportunity to analyze the detailed structure of TCs, which leads to better understanding of TC dynamics and thermodynamics related to the genesis, intensification, and evolution.
			Observational Studies: In recent years, remarkable advances have been made in TC observations including enhanced geostationary and microwave satellite observations and the increasing number of ground-based Doppler radars in Asian countries. These data are valuable to estimate TC intensity such as the minimum sea level pressure more accurately. For example, an objective method for estimating TC intensity with multiple satellite data has been developed to improve the conventional Dvorak Technique-based analysis. Another example is direct measurement of wind speed over coastal regions using a Doppler radar. In addition, dropsonde TC observation will be carried out in the Okinawa region since 2017. These observational studies will contribute to our understanding of physical mechanisms governing TC intensification.
	15:20 – 15:45	*Coffee Break*	
8	15:45- 16:00	**Recent and Future Advances in Tropical Cyclone Modeling at NOAA's National Weather Service National Center for Environmental Prediction (NWS/NCEP)** *Dr. Avichal Mehra, NOAA, USA*	*Regional Tropical Cyclone modeling systems implemented at NWS/NCEP operations are now used for forecasting guidance in all ocean basins of the world. Lately, Hurricane Weather Research and Forecast (HWRF) modeling system has made significant improvements to the state of the art in numerical forecast guidance. These improvements come from advances in various components of the modeling system that are incorporated into the model in yearly cycles. In this talk, we discuss model improvements in the 2015-2017 yearly upgrade cycles along with future plans for Tropical Cyclone modeling at NCEP including development of new forecast systems.*
9	16:00 – 16:15	**Activities of Numerical Weather Prediction for Typhoon forecast at Japan Meteorological Agency** *Mr. Junichi Ishida, Group Leader of NWP Group, JMA*	*JMA operates Global Spectral Model (GSM) and Global Ensemble Prediction System (GEPS) for Typhoon forecast. JMA has been developing 1) forecast model, 2) data assimilation method, 3) usage of observation data to reduce the Typhoon track forecast error and intensity forecast error. JMA has lead the inter-comparison study project of Typhoon track forecast verification at the WGNE (Working Group for Numerical Experiences) of WMO (World Meteorological Organization), in which many operational Numerical Weather Prediction (NWP) Centres participate. The knowledge from the project fosters the development of the NWP systems at each centre. The presentation focuses on the recent development of JMA GSM and GEPS and the project.*

10	16:15-16:30	**The recent progresses in tropical cyclone forecasting service at the National Hydro-Meteorological Service of Socialist Republic of Viet Nam** *Mr. Vo Van Hoa, Director Red River Delta Regional Hydro-Meteorological Center, NHMS*	*The difficulties and challenges in operational tropical cyclone forecasting at NHMS of Viet Nam will be reported. In order to fill the gaps, the high-resolution NWP system and track ensemble prediction system has been researched in took into operation. In addition, the tropical cyclone forecasting activities has been defined in Law of Natural Disaster Prevention and Control and Law of Meteorology and Hydrology. These legal documents provide very useful legal framework for tropical cyclone forecasting activities at NHMS of Viet Nam. Finally, the new severe weather warning bulletin disseminating system based on cloud computing technology has been established and applied for most smart phones to ensure the warning information sent to the public on time and effectively*
11	16:30 – 16:45	**2016 CMA Typhoon Forecast Performance and Challenges** *Mr. Qian Chuanhai, National Meteorological Center, CMA*	*The characteristics of 2016 typhoons over the western North Pacific and South China Sea were analyzed and the CMA official forecasts were verified by using the CMA operational data and ECMWF NWP products etc. 2016 typhoon activities have very close relations with the transition of El Nino to La Nina over the eastern equatorial Pacific. Even though we have gotten much improvement in track forecasts in recent years, the increasingly track forecast scores could not cover up our difficulties or weakness, we still face many challenges in operations, and in some cases, very big track forecast errors still occur for the long lead-time (day 4 to day 5) track forecasts. For typhoon quantitative precipitation forecasts, false and miss are still common; For typhoon intensity forecasts, we still have no effectively methods to get the same improvement as we did in typhoon track forecasts, especially for rapid intensification cases happening over coastal waters; We still have to make great effort to further develop our capabilities to provide more accurate typhoon forecasts and achieve more effective public and decision-making services.*
12	16:45 – 17:00	**Development of objective forecast guidance on rapid intensification of tropical cyclones over the western North Pacific** *Mr. TC Lee, Hong Kong Observatory*	*Despite the advance of numerical weather prediction (NWP) models in recent decades, forecasting rapid intensification of tropical cyclones remains a major challenge in tropical cyclone forecasting. The Hong Kong Observatory has developed a new statistical-dynamical forecasting tool for assessing the probability of rapid intensification of tropical cyclones over the western North Pacific and incorporated this 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's tropical cyclone heat potential; (b) previous 12-hour intensity change and current intensity; and (c) different model forecast output of ECMWF, to evaluate the chance of rapid intensification in the next 48 hours. Initial verification shows that the new guidance tool out-performs the intensity change estimates derived from direct NWP model output.*

13	17:00 – 17:15	**Introduction of Himawari-8/9 for Typhoon Monitoring** *Mr. Kazumi Kamide, Meteorological Satellite Center, JMA*	*Himawari-8, the world's first new-generation satellite, has significantly improved observational capacity in monitoring and forecasting severe weathers in the Typhoon Committee region. This presentation will introduce Himawari-8 related services, such as HimawariCast and HimawariCloud, its products useful for tropical cyclone analysis and forecasting, and training activities to support Members to utilize the Himawari-8 data/products for the operational Services.*
14	17:15 – 17:30	**Climate Mechanism for Stronger Typhoon in a Warmer World.** *Dr. Nam-Young KANG, The National Typhoon Center/KMA*	*Violent typhoons continue to have catastrophic impacts on economies and welfare, but how they are responding to global warming has yet to be fully understood. Here, an empirical framework is used to explain physically why observations support a tight connection between increasing ocean warmth and the increasing intensity of supertyphoons in the western North Pacific. It is shown that the energy needed for deep convection is on the rise with greater heat and moisture in the lower tropical troposphere but that this energy remains untapped when air pressure is high. Accordingly, tropical cyclone formation is becoming less common, but those that do form are likely to reach extreme intensities from the discharge of stored energy. These thermodynamic changes to the environment most significantly influence the upper portion of extreme typhoon intensities, indicating that supertyphoons are likely to be stronger at the expense of overall tropical cyclone occurrences in the western North Pacific.*
15	17:30-17:45	**Flash Flood Risk Information for Local Resilience** *Dr. Toshio Koike, Director, Intentional Water Hazard and Risk Management, Public Works Research Institutes, Japan*	*Explain Japanese initiatives to Integrate governance, monitoring and advanced science technology on flood and flash flood risk information, and the International flood Initiative (IFI) which could contribute to typhoon committee's activities*