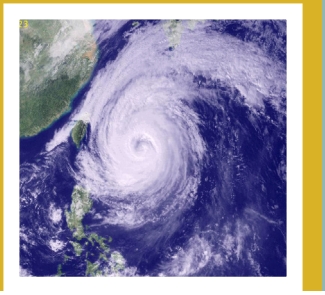

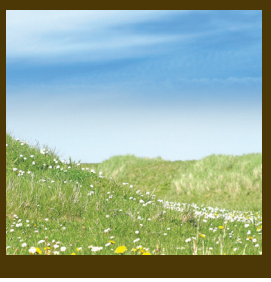

UNESCAP/WMO Typhoon Committee

Newsletter

UNITED NATIONS Economic and Social Commission for Asia and the Pacific

World Meteorological Organization

ESCAP/WMO Typhoon Committee

Brought to you by Typhoon Committee Secretariat • Macao, China

Issue 21 · Year 2009

News from the Editor

In August 2009 we had very sad news. The Typhoon Committee Secretariat was informed by the Chief of the WMO Tropical Cyclone Programme, Mr. Koji Kuroiwa, that the former chairman of Typhoon Committee, Dr. Chow Kok Kee, had passed away. TCS immediately has taken the required measures to inform all Members and express, on behalf of TC, its deepest regrets to his family.

Dr. Chow Kok Kee

During his career Dr. Chow Kok Kee was strongly linked to the activities of the Typhoon Committee, either as director of the Malaysian Meteorological Department, or as chairman of TC elected at the thirty-sixth annual session (December 2003), or as Chairman of the Advisory Working Group for the period between the 37th and 38th Sessions (2005). He was also Chairman of the Drafting Committee in several annual sessions. In this Newsletter, in another section, we shall pay tribute to him in greater detail (see page 5).

With regard to the realization of the TC annual sessions, usually held in November or December, and following the suggestions from some participants in previous sessions, the 41st Session was held in January

THE FORTY-FIRST SESSION OF THE TYPHOON COMMITTEE

The Government of Thailand, in cooperation with ESCAP and WMO hosted the forty-first Session of the Typhoon Committee, which was held in Phumrapee Room, Phucome Hotel, Chiang Mai, Thailand, from 19 to 24 January 2009.

The Session was attended by 100 participants from 12 out of 14 Members of the Typhoon Committee, namely: Cambodia; China; Hong Kong, China; Japan; Macao, China; Malaysia; Philippines; Republic of Korea; Singapore; Thailand; the Socialist Republic of Viet Nam; and the United States of America (USA).

The Session was also attended by 6 observers from the United Nations International Strategy for Disaster Reduction Secretariat (UN/ISDR), the Federal Service for Hydrometeorology and Environmental Monitoring (ROSHYDROMET) of the Russian Federation, the United Nations Development Programme (UNDP), the Commission of Atmospheric Sciences of WMO (CAS/WMO), the Joint Typhoon Warning Center of USA and the International Civil Aviation Organization (ICAO). Representatives from the Economic and Social Commission for Asia and the Pacific (ESCAP), the World Meteorological Organization (WMO) and Typhoon Committee Secretariat (TCS) also attended the session.

The Session was declared open by her Excellency, Sub Lt. Ranongruk Suwanchwee, Minister of the Ministry of Information and Communication Technology, at 10:45 am on Monday, 19 January 2009, in the presence of the Chiang Mai Vice-Governor and Members' representatives.

At the opening ceremony statements were delivered by Mr.

EDITORIAL

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2009. This procedure is expected to be adopted in future, given that this way of proceeding will allow the Members to present in each session their activities corresponding to an entire calendar year, since January to December. This change of the previous practice will also allow the Member's representatives the possibility of reporting all the tropical cyclones corresponding to an entire typhoon season.

The TC activities in 2009 covered a wide range of issues and significant improvements were achieved in the three main components of the TC: Meteorology, Hydrology and Disaster Prevention and Preparedness (DPP).

For the forth time an integrated workshop was held, involving meteorologists, hydrologists and DPP experts. Professionals of these three areas had once more the opportunity to discuss matters of common interest. The workshop was held in Cebu, Philippines, under the theme "Building Sustainability and Resilience in High Risk Areas of the Typhoon Committee: Assessment and Action", and was a great opportunity to

exchange information, to review progress in the implementation of the Annual Operating Plan for 2009 and to identify priority and strategic needs of the TC Members for 2010 and beyond.

In the field of meteorology special attention was given, amongst others issues, to the assessment of change of frequency and intensity of tropical cyclones, the progress of information and processing systems, early warning systems, storm surge models in use by Members and Web-based forum on discussions and exchanging information of tropical cyclone among forecasters.

In what refers the hydrological component, progress has been made in the seven ongoing projects, such as those related to the establishment of flood disaster preparedness indices, hazard mapping, debris and landslides warning systems, urban flood risk management, socio-economic impacts of water-related disasters and training. In respect to disaster prevention and preparedness component, the main progress has been made regarding the WEB GIS based Typhoon Committee Disaster Information System (WGTCDIS), which is intended to be a system for sharing disaster related information to reduce damage from tropical cyclones and typhoons.

Two main events were realized by the Training and Research

Thosakdi Vanichkajorn, Acting Director-General of Thai Meteorological Department (TMD); Mr Pairoj Sangphuwong, Vice-Governor of Chiang Mai Province, Thailand; Mr. Olavo Rasquinho, Secretary of Typhoon Committee in representation of the Chairman of Typhoon Committee; Dr. Tokiyoshi Toya, representative of the WMO Secretariat; Dr. Xuan Zengpei, representative of ESCAP Secretariat and Her Excellency Sub Lt. Ranongruk Suwanchwee, Minister of Information and Communication Technology.

Dr. Roman L. Kintanar Award for Typhoon related Disaster Mitigation was presented to the Southern Meteorological Center of TMD and the Regional Specialized Meteorological Center (RSMC) Tokyo - Typhoon Center.

Mr. Thosakdi Vanichkajorn, Acting Director General of TMD was elected Chairperson and Ms. Wong Chin Ling, Head (Operational Services Department), Meteorological Services Division, National Environment Agency of Singapore, was elected Vice-Chairperson of the TC. Mr. Jeffrey LaDouce, Director of National Weather Service, NOAA-Pacific Region of USA was elected Chairperson of the Drafting Committee.

Prior to the plenary session for the Committee, parallel sessions of the three Working Groups on Meteorology, Hydrology and Disaster Prevention and Preparedness (DPP)were convened on the morning of 19 January 2009 in three separate meeting areas to review progress of work during the past year, identify priorities for cooperation and recommend points to the Committee for consideration. The major outcomes of the parallel sessions of the three Working Groups were reported to the plenary session.

The Typhoon Committee discussed in detail the activities carried out by its members, including important achievements, major issues and future directions by each member related to the Meteorological, Hydrological, and Disaster Prevention and Preparedness components. It also reviewed the activities undertaken on Training and Research component.

The Committee also discussed the information provided by the members and the findings of the

CONTINUED FROM PAGE 2

Coordinating Group (TRCG), the Roving Seminar and the first TRCG Technical Forum. The former was held in Nanjing with the collaboration of the Working Group on Meteorology, WMO and the China Meteorological Administration through the Regional Meteorological Training Center of Nanjing. The latter was held in Jeju, Republic of Korea, focused mainly the exchange of experience on information and processing systems and in lectures on ensemble prediction system (EPS). WMO, WGM and the Korean Meteorological Administration (KMA) have given a precious collaboration to the organization of this forum.

In accordance with the TC policy of giving more visibility to Typhoon Committee, and following invitations from various international institutions, staff of the TC Secretariat had the opportunity to give presentations in some international meetings, namely "First Meeting of the Committee on Disaster Risk Reduction-DRR" (Bangkok, 25-27 March 2009); "Expert Group Meeting on Innovative Strategies towards Flood Resilient Cities in Asia-Pacific" (Bangkok, Thailand, 21-23 July 2009); "AOGS 6th Annual Meeting" (Singapore, 11-15 August, 2009); "Second WMO International Workshop on Tropical Cyclone Landfall Processes - IWTCLP-II" (Shanghai, China, 19-23 October 2009); "First International Conference on Policy and Research for Global Disaster Management" (Seoul, Republic of Korea, 11-13 November 2009).

The 2009 typhoon season was characterized by some very active tropical storms and typhoons that have deeply affected some Members, where floods, landslides and mudslides were frequent, causing a significant death toll. In the Philippines the tropical storm Ketsana has unleashed the heaviest rains in more than four decades on Manila and surrounding areas, inducing the declaration of state of calamity that has encompassed most of Luzon. In Taiwan, the typhoon Morakot has become nearly stationary for several days over the island, causing torrential rain never recorded before in that region, associated to severe mudslides with catastrophic consequences.

I would not end this editorial without paying tribute to the eighteen-year-old Filipino citizen, Muelmar Magallanes, who died rescuing more than thirty people from the floods caused by the tropical storm Ketsana.

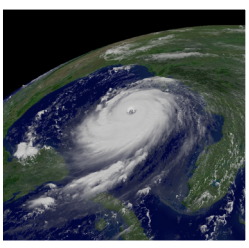
parallel sessions of the Working Group on Meteorology (WGM), Working Group on Hydrology (WGH) and Working Group on Disaster Prevention and Preparedness (WGDPP). The Committee re-established the WGM, WGH, WGDPP and the Advisory Working Group (AWG).

The major outcomes of the parallel sessions of the three Working Groups were reported to the plenary session and are described in detail in the Report of the Forty-first Session of Typhoon Committee.

MAIN ACTIVITIES OF TC MEMBERS IN 2009

Meteorological Component

The WGM activities in 2009 focused mainly in the assessment report on the change of frequency and intensity of tropical cyclones, Typhoon Information and Processing System, survey on the present status of Members in using storm surge, upgrade of the communication system, and web-based forum on discussions and exchanging the latest information of tropical cyclone among forecasters. The WGM also had an active collaboration in the organization of the Eighth Roving Seminar on warning information dissemination and media skill, together with the Training and Research Coordination Group (TRCG), WMO and the Regional Training Center of Nanjing at the Nanjing University of Information Science & Technology in Nanjing, China. Also with the collaboration of WGM, together with TRCG, WMO and KMA was organized the first TRCG Technical Forum, in Jeju, Republic of Korea.



Hydrological Component

The WGH activities in 2009 focused mainly in the seven ongoing projects, namely, Flood Hazard Maps (FHMs), Debris Flow and Landslides Warning System, led by Japan, On-the-Job Training on Flood Forecasting between TC members, led by Malaysia, Urban Flood Risk Management in TC region, led by China, Assessment System of Socio-economic Impacts of Water-related Disasters for Infrastructure, led by Republic of Korea, Hazard Mapping for Sediment disasters, led by Japan, Establishment of Flood Disaster Preparedness Indices, led by ICHARM-Japan.

Disaster Prevention and Preparedness Component (DPP)

The WGDPP activities in 2009 were mainly focused in promoting the WEB GIS based Typhoon Committee Disaster Information System (WGTCDIS) to TC Members; enhancing WGTCDIS and establishing methodology to assess the socio-economic impacts of disasters; maintaining hardware, software of WGTCDIS and upgrading disaster information and other contents by inputs from Members; reviewing progress of WGTCDIS project and enhancing the Typhoon Committee's effectiveness and efficiency; maintaining and enhancing WGTCDIS. The working group has also organized the 4th WGDPP, held in Seoul, in which it was focused an approach to reduce typhoon-related disaster risk based on sound disaster statistics in the region, and also efforts to identify joint activities with the other TC working groups, such as activities related to urban disaster risk reduction and early warning systems. Collaboration with UN organizations was also focused.

Training and Research Coordinating Group-TRCG

The activities of TRCG were mainly focused in the organization of the Eighth Roving Seminar and the First TRCG Technical Forum. The former was held in Nanjing with the collaboration of the Working Group on Meteorology, WMO and the China Meteorological Administration through the Regional Meteorological Training Center of Nanjing. The latter was held in Jeju, Republic of Korea, focused mainly the exchange of experience on information and processing systems and in lectures on ensemble prediction system (EPS). WMO, WGM and the Korean Meteorological Administration (KMA) have given a precious collaboration to the organization of this forum.

Regular Publications

The Typhoon Committee Secretariat published in 2009, besides this Newsletter, the Typhoon Committee Annual Review 2008.

TRIBUTE TO DR. CHOW KOK KEE


1948-2009

Dr. Chow Kok Kee, former Director-General of the Malaysian Meteorological Department (MMD) and Permanent Representative of Malaysia with World Meteorological Organization, was born on the 17th of December 1948. He started his career as a Meteorological Officer in 1 July 1972, was appointed as Deputy Director-General of MMD on 3 May 1996 and Director-General on 28 January 2001. After serving the MMD diligently for 33 years, he retired on the 17th December 2005. Despite his retirement, he continued to give his best leadership, advice and comments especially to various officials at various stages of the climate negotiations. His vast knowledge and outstanding contributions to the meteorological sector especially in the field of Climate Change made him a prominent figure in the numerous international meetings he attended. He was most known for his leadership in the United Nations Framework Convention on Climate Change (UNFCCC) and as active chairman of the Subsidiary Body for Scientific and Technological Advice (SBSTA) from 1997 to 1999.

Dr. Chow Kok Kee was member of the Clean Development Mechanism (CDM) Executive Board for the period 2003 to 2004 and member of the Expert Group on Technology Transfer of UNFCCC for 2006 to 2008. He also had a very active participation as the lead negotiator for the Group of 77 (G77) and China in the development and transfer of technology since the early days of the UNFCCC. He has been popularly known as Chairman Chow in the climate circles. He is also known for his contributions for setting up a regional tsunami early warning system.

His most recent contribution to the Typhoon Committee was given at the "Integrated Workshop on Coping with Climate Change in the Typhoon Committee Area", Beijing, China, 22-26 September 2008, where he made the presentation "Technology Transfer Development, Transfer and Diffusion of Environment Friendly Technology".

Dr. Chow Kok Kee, a man well-loved by family members, friends, colleagues, workers, co-workers and respected by all, passed away very peacefully on the 9th August, 2009.

The Typhoon Committee Secretariat, on behalf of Typhoon Committee, has presented in due time to his wife and daughter, respectively Jocelyn and Xiang Yee, its deepest condolences.

Left to right: Jonathan Pershing, International Energy Agency; Brian Flannery, ExxonMobil; and Kok Kee Chow, Malaysia. at the"The role of companies in the Kyoto mechanisms" at UNFCCC SB-16, June 2002

SBI Chair John Ashe and Mechanisms Chair Kok Kee Chow during a session break @ Sixth Conference of the Parties to the UN Framework Convention on Climate Change, November 2000

Chow Kok Kee @ Integrated Workshop on Coping with Climate Change in the Typhoon Committee Area", Beijing, China, September 2008

MAIN ACTIVITIES OF THE TYPHOON COMMITTEE SECRETARIAT IN 2009

Participation of TCS in International Activities

Since the 41st Session of TC the Typhoon Committee Secretariat was represented at the the following international events:

- 2009 Annual Workshop of the Working Group on Typhoon and Marine Meteorology of CMA - Guangzhou, China, 23-25 February 2009;
- 5th IFNet General Meeting Istanbul, Turkey, 19 March 2009;
- First meeting of the Committee on Disaster Risk Reduction (DRR) – Bangkok, 25-27 March 2009;
- China National Hydrological Information and Forecasting Conference - Guangzhou, China ,1-2 April 2009;
- Forth Typhoon Committee Working Group on DPP Meeting - Seoul, Republic of Korea - 28-29 April 2009;
- First Training and Research Coordination Group Technical Forum - Jeju, Republic of Korea, 12 - 15 May 2009;

- Expert Group Meeting on Innovative Strategies towards Flood Resilient Cities in Asia-Pacific - Bangkok, Thailand, 21-23 July 2009;
- Support to Macao bid for hosting AOGS 2011 Annual Meeting - Singapore, 15 August 2009;
- Workshop on Climate Change and Action – Macao, China, 24 September 2009;
- ESCAP/WMO Typhoon Committee Integrated Workshop "Building Sustainability and Resilience in High Risk Areas of the Typhoon Committee: Assessment and Action" - Cebu, Philippines, 14-18 September 2009;
- Vietnam National Forum on Disaster Risk Reduction and Climate Change Adaptation, Hanoi, Vietnam, 7 October 2009;
- Visit to the NHMS of Vietnam;

- Second WMO International Workshop on Tropical Cyclone Landfall Processes (IWTCLP-II) - Shanghai, China, 19-23 October 2009;
- First International Conference on Policy and Research for Global Disaster Management - Seoul, Republic of Korea, 11-13 November 2009;
- Seminar "Circulation in Pearl River Estuary and its Linkages with Adjacent Coastal Waters: Modeling Study" – Macao, China – 16 November 2009;
- Roving Seminar – Nanjing, China, 16-19 November 2009;
- Experts Meeting on the Assessment of Change of Intensity and Frequency of Tropical Cyclones – Macao, 14-15 December 2009
- Meeting of Advisory Working Group – Macao, 16-17 December 2009.

Visit of the TC Secretary to NHMS of Viet Nam

Following the participation at the Vietnam National Forum on Disaster Risk Reduction and Climate Change Adaptation, the TC Secretary visited the National Hydro-Meteorological Service of Viet Nam, on 8 October 2009, were he had the opportunity to talk to the Director-General, heads of departments and staff.

Dr. Bui Van Duc, Director-General of National Hydro-Meteorological Service of Viet Nam, and Mr. Olavo Rasquinho during the visit of the TC Secretary to the NHMS of Viet Nam – 8 October, 2009)

TV and Newspaper Interviews of TCS Staff

During 2009 there were several articles and TV programmes in which activities of Typhoon Committee were mentioned, such as in the Macao Portuguese newspaper "Tribuna de Macau" that has interviewed the Secretary of TC; the Portuguese Channel of Macao Television has also interviewed the Secretary and the TCS hydrologist, Mr Jinping Liu, for different emissions of "Asia Global". The China Central Television (CCTV) has also made a reportage at the TCS headquarters and interviewed the Secretary for an emission on the ten years of Macao integration in the People's Republic of China.


JORNAL TRIBUNA de Macau 澳門論壇日報

OLAVO RASQUINHO EM ENTREVISTA AO JTM

OLAVO RASQUINHO ACREDITA QUE GOVERNO E POPULAÇÃO ESTÃO MAIS SENSIBILIZADOS

Macau tem poder financeiro para investir na indústria da protecção ambiental

A aposta na diversificação da economia pode passar pelo ambiente. A sugestão foi feita pelo secretário do Comité dos Tufões, Olavo Rasquinho, que em entrevista ao JTM, defendeu que o território deverá investir numa indústria ligada à protecção ambiental

-No geral, considera que Macau está preparada para os tufões?

-Macau tem zonas baixas que serão sempre susceptíveis de serem afectadas em situações de maré de tempestade, mas, em termos técnicos podemos dizer que os Serviços Meteorológicos e Geofísicos de Macau estão apetrechados. Agora, vai ser instalada em breve uma rede de mediação da altura das marés que poderá ajudar também à previsão e monitorização da elevação do nível do mar. Provavelmente vai haver projectos comuns a alguns dos 14 membros exactamente sobre mudanças climáticas e os efeitos das marés de tempestade e, eventualmente, Macau poderá participar.

-E como se posiciona a RAEM em relação a outros membros? Está bem apetrechada?

-Macau é um membro muito activo e temos de fazer justiça aos Serviços Meteorológicos. Evidentemente, é sempre possível melhorar, ter radares de maior qualidade que permitam a monitorização de tornados, tempestades, tufões, mas Macau está a avançar em termos meteorológicos e em proporção às suas dimensões num continente tão vasto. Há uma maior consciencialização dos Governos sobre o que são as mudanças climáticas e para o financiamento de projectos neste sentido, estão mais abertos e sensibilizados para uma acção conjunta.


The Secretary talking to journalists

TC Publications

TCS elaborated a proposal for the publication of technical documents. Considering that the already issued technical documents were published following the numbering and graphical aspect of WMO, TCS based its proposal on the WMO guidelines.

Memorandum of Understanding between WMO and TCS

WMO and TCS, with contributions from AWG, prepared a draft of the "Memorandum of Understanding between the World Meteorological Organization (WMO) and the ESCAP/WMO Typhoon Committee Secretariat (TCS) Regarding Typhoon Committee Trust Fund (TCTF) Budget Arrangement". This MoU is supposed to be submitted to the appreciation of TC at its 42nd Annual Session.

Auditing procedure

TCS made available all documents to the international firm KPMG, which prepared the "Independent auditor's report to the management of Typhoon Committee Secretariat", which includes the annual financial statements showing income, expenditures, assets and liabilities as of 31 December 2008, related to the Endowment Fund provided by Macao SAR Government. In the report it is stated: "In our opinion, the financial statements give a true and fair view of the financial position of the Secretariat as of 31 December, and of its financial performance and its cash flows for the year then ended in accordance with International Financial Report Standards". TCS sent one original of the Report to the Government of Macao and copies ESCAP, WMO and to Mr. Thosakdi Vanichkajorn, Chairman of TC.

Visits to TCS Headquarters

TCS headquarters was visited by some personnel from other institutions with similar activities to the ones undertaken by the TC, namely Mr. ZHENG Yunjie, former meteorologist of CMA, advisor to the Management Board Member of the Academic Supervision and Arbitration Committee of Macao Polytechnic Institute; Prof. Wen CHEN, Director of Center for Monsoon System Research under the Institute of Atmospheric Physics (IAP) of Chinese Academy of Sciences (CAS); Dr. Gang HUANG, professor of Key Laboratory of Regional-Environment Research for Temperate East Asia (RCE-TEA) under IAP of CAS; Prof. Jianping Gan, from the Department of Mathematics & Atmospheric Marine and Coastal Environment (AMCE) program, Hong Kong University of Science and Technology.

More recently the TCS staff had the pleasure to talk to Mr. Xuan Zengpei and Mr. Ono, respectively Director of Information and Communications Technology and Disaster Risk Reduction Division and Chief of Disaster Risk Reduction Section of the Information and Communications Technologies and Disaster Risk Reduction Division of ESCAP during their visit to TCS headquaters on 17 December 2009.

The staff of the TC Secretariat had the opportunity to exchange views with these distinguished visitors in areas of common interest.

TC NEWS FROM MEMBERS

Cambodia

Cambodia's news are related to the disaster that occur in the country in 2009. (pictures only).

China

1. A 10-day training course on TC analysis and forecast was held at the National Meteorological Centre (NMC) of CMA in 13-24 April, chief forecasters reviewed and discussed the successes and failures of the operational TC forecasting cases over the past 5 years for improving TC forecasting skills.

2. CMA initiated a 3-year research project on "Typhoon Forecast and Warning System" in 2009, Its 8 sub-systems include: 1) TIPS; 2) Typhoon track and intensity forecast; 3) Typhoon wind and rainfall forecast; 4) Typhoon forecast and warning products generation and dissemination; 5) Typhoon disaster analysis and pre-assessment; 6) Global TC monitoring; 7) Typhoon-related climate prediction; 8) Typhoon-targeted NWP.

3. The Typhoon Committee Research Fellowships offered by CMA in 2009 have been awarded to a forecaster of the Thai Meteorological Department to conduct a study on Typhoon Vortex Initialization Scheme in NWP model, and a forecaster of NHMS of Viet Nam. The research will focus on Typhoon Vortex Initialization Scheme and Typhoon Ensemble Forecast Techniques.

4. WMO 2nd International Workshop on Tropical Cyclone Landfall Processes was held in Shanghai in 19-23 October 2009. The workshop was hosted by CMA, and it was co-sponsored by the Chinese Academy of Meteorological Sciences and the Shanghai Meteorological Bureau. Over 30 experts worldwide attended the event.

The workshop shared latest developments in research and operational forecasts of landing typhoons in the past 4 years, and transferred proven research findings

into operational applications. The topics covered major advances in both scientific research and operational forecasts of landing typhoons, including off-shore unusual typhoon behavior, like sudden changes in motion, structure and intensity, and main research outcomes on the mechanism of high-impact events induced by landing typhoons, outfield scientific experiments, such as CBLAST, T-PARC and TCS08, etc., as well as the early warning systems for landing typhoons.

5. The Typhoon Committee roving seminar 2009, co-sponsored by WMO, and CMA, was held at the WMO Nanjing Regional Training Center in the campus of the Nanjing University of Information Science & Technology in 16-19 November 2009. Mr. Samuel Muchemi, representative of WMO, Mr. Chip Guard from NOAA, United States and Mr. S. T. Chan from Hong Kong Observatory, Hong Kong, China gave lectures to the 14 participants from 9 countries and regions respectively. Professor Zhi Xiefei, Deputy Director of the RTC, and all the lecturers and participants attended the closing ceremony and conferred certificate to the participants.

The tropical cyclone experts presented important weather influence on tropical cyclones, analysis of tropical meteorology and how to produce and edit the warning information of tropical cyclones. After 3-day discussions and exchanges, every participant did some practices, gaining experience on tropical cyclone forecasts and warnings. The lecturers and participants also visited the Observatory and the Audio/Video Center of the Jiangsu Meteorological Bureau and exchanged experience on typhoon forecasting and warning with the staff of the Jiangsu Meteorological Bureau.

6. Typhoon Forum

In order to provide a real-time communication platform for forecasters and researchers in Asia and Pacific region, to improve TC forecasters' ability, and to reduce the TC risks, the Shanghai Typhoon Institute, CMA served as the coordinator for the project. In July 2009, the web-based typhoon forum was set up and opened to nominated members of the Typhoon Committee. Three sections have been set up, i.e. "TC real-time information and forecasts", "Historical cases" and "Forecast verification" respectively. So far, it has 38 registered users of the platform from 11 Members of the Typhoon Committee.

Hong Kong, China

1. Storm surge alert system

A localized alert system on storm surge flooding was implemented for a small village community on Lantau Island in Hong Kong, under the collaboration of key government departments and emergency response units. The village was severely flooded during the passage of Typhoon Hagupit in 2008. In 2009, the Hong Kong Observatory started issuing early alerts a few hours ahead to key operational personnel as well as to the community leaders using the Short Message Service (SMS). Such early alert system proved very effective

and favourable feedback was received from users and residents.

A large-scale drill exercise on the alert system on storm surge flooding was conducted in 2009 in collaboration with other key government departments and emergency response units.

2. New Tropical Cyclone Intensity Classification

In Hong Kong, typhoons are classified into three intensity categories, namely: typhoon, severe typhoon and super typhoon starting from 2009. The new intensity classification is shown in the table below.
The purpose is to enhance public awareness on the potential threats of intense typhoons, as well as document and analyze the long-term trend in tropical cyclone intensity in the face of climate change.

Classification of Tropical Cyclones	**Maximum sustained wind speed near the centre** (km/h)
Tropical Depression	41 - 62
Tropical Storm	63 – 87
Severe Tropical Storm	88 – 117
Typhoon	118 – 149
Severe Typhoon*	150 – 184
Super Typhoon*	185 or above

* New categories since 2009

3. Enhancing Warning Dissemination with Severe Weather Information System (SWIC)

The Severe Weather Information Centre (SWIC) website, operated by Hong Kong, China for WMO, continues to serve as a major and authoritative channel for dissemination of real-time tropical cyclone warnings and information worldwide. The total page view continued to grow and exceeded 13 million in the 12-month period from October 2008 to September 2009.

The Hong Kong Observatory (HKO) launched a "weather wizard" electronic gadget in 2008 to enable the local public to retrieve automatically the latest weather warnings from the HKO website and display them on the user PC. A pilot project under ESCAP/Typhoon Committee has been launched in 2009 to adapt this gadget for warning dissemination in the region through the SWIC platform, utilizing warning information from Typhoon Committee Members.

4. 1st TRCG Technical Forum (Jeju, Republic of Korea, 12 – 15 May 2009)

The Typhoon Committee, in organizing TRCG's first meeting for the planning of training and research activities in the coming cycle, decided to hold a parallel technical forum on the themes of "Consensus Forecast, EPS and TIPS" (TIPS stands for Tropical Cyclone Information Processing System). Apart from a series of lectures on the relevant topics, the forum has also been purposely designed with practical and discussion sessions on TIPS as well as other forecasting techniques to actively encourage interaction and exchanges among participants. Through such interaction, the ultimate aim is to transfer sustainable technology to the developing countries for operational adaptation to improve their forecasting and warning services.

Benefiting from the generous hospitality of the Korea Meteorological Administration, the event was held at the Seogwipo KAL Hotel in Jeju, with the added attraction of an enlightening visit and live TAPS (KMA version of TIPS) tutorial session at the National Typhoon Center on the island. For the first time in many years, TRCG had the opportunity to actually meet and make strategic plans for future training and research development. Out of 14 Members, 11 were represented in the meeting and a work programme for the coming 4-year cycle was formulated.

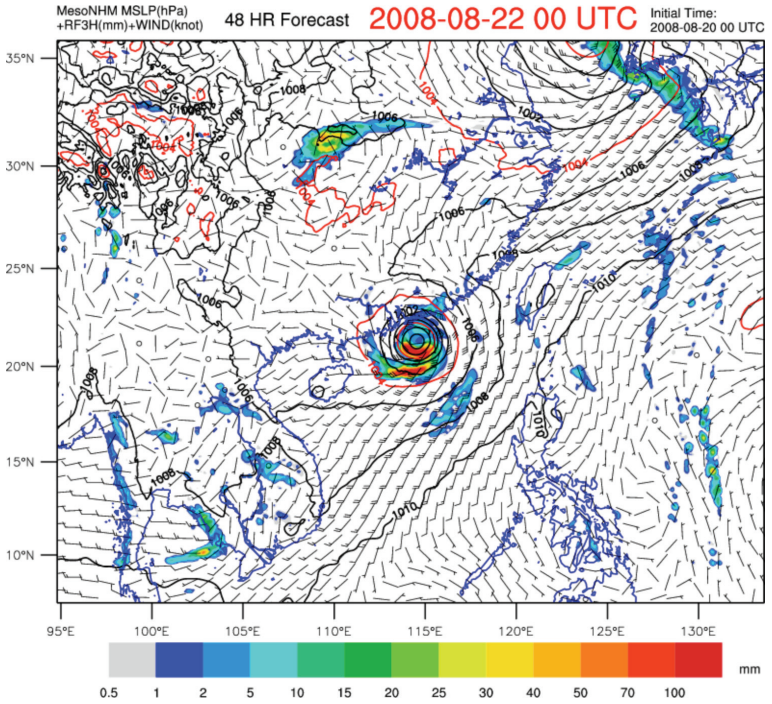
In parallel to the TRCG planning meeting, two invited experts, namely Professor Russell Elsberry from the Naval Postgraduate School and Mr. Takuya Komori from the Japan Meteorological Agency, delivered lectures on topics relating to consensus forecasts, EPS and TIPS. About 20 participants from 12 Members attended the lectures and TIPS sessions. Participants generally appreciated the objectives of the technical contents and considered the presentations useful for future adaptation and implementation. Two-thirds of the respondents felt that the derived operational benefits could be felt within the next couple of years.

Visit to the Korea National Typhoon Center in Jeju on 13 May 2009 during the 1st TRCG Technical Forum.

Participants working with KMA instructor during a demonstration session at the Korea National Typhoon Center in Jeju.

5. A New High-resolution Mesoscale Numerical Weather Prediction System to Support Tropical Cyclone Prediction at the Hong Kong Observatory (HKO)

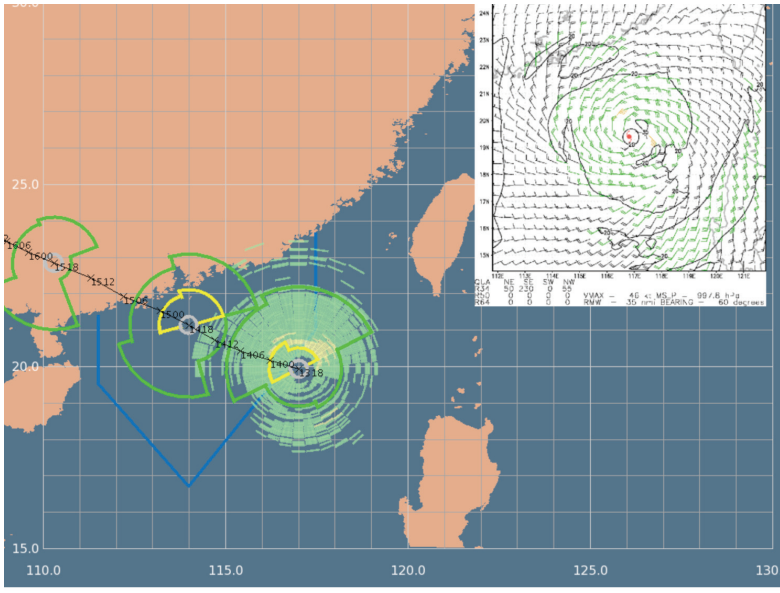
The HKO is experimenting with a 10-km resolution NHM adapted from the Japan Meteorological Agency. It has been used to predict the movement of selected tropical cyclones over the South China Sea in 2008 and 2009. Compared with the existing mesoscale modelling system, the new system is found to have smaller position error in the forecast track. Moreover, with the higher spatial resolution and improved model physics, the new system is able to resolve the structures of tropical cyclones better in respect of the distribution of precipitation and wind near them. Such model data would be useful in the evaluation of the impact of high wind and significant precipitation associated with the tropical cyclones along the coast of southern China. The system is expected to become operational in early 2010.



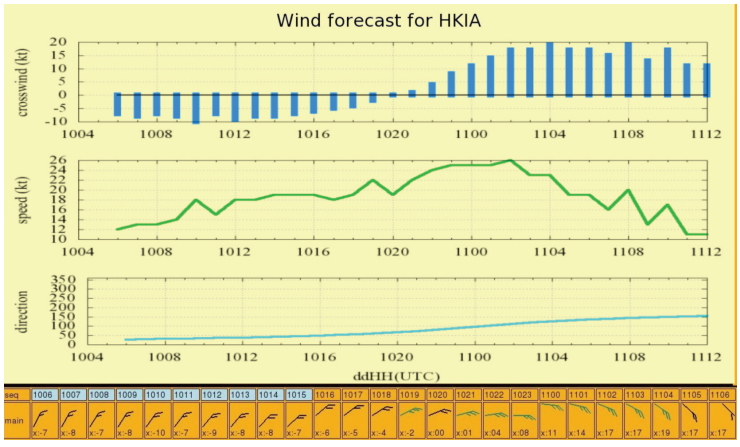
48-hour forecast of mean sea level pressure, wind and 3-hour accumulated rainfall based on the NHM run at 00 UTC, 20 August 2008 for the case Typhoon Nuri (0812) approaching Hong Kong and south China coastal areas.

6. Use of multi-platform satellite surface wind analysis in tropical cyclone monitoring and forecasting at the Hong Kong International Airport

A multiple regression model was developed involving the use of the multi-platform satellite surface wind analysis data generated by the National Oceanic and Atmospheric Administrations. The tropical cyclone wind structure parameters (including strong/ gale/storm/hurricane wind radii in different quadrants) from the latter was correlated with the tropical cyclone intensity, latitudinal position, 6-hour speed of movement and the radius of maximum wind from the Hong Kong Observatory best track data. The training dataset covered tropical cyclones over the western North Pacific and the South China Sea during 2006-2008. Coupled with the tropical cyclone forecast track and intensity as well as local topographical information, the model is capable of generating wind forecasts at specific locations during the passage of the tropical cyclone. Its performance in forecasting surface wind at the Hong Kong International Airport was evaluated using tropical cyclone datasets in 2008 and 2009. Verification results showed that the mean RMS error for 24-hour forecast was about 7 knots. This tool would be put into operational trial in 2010.



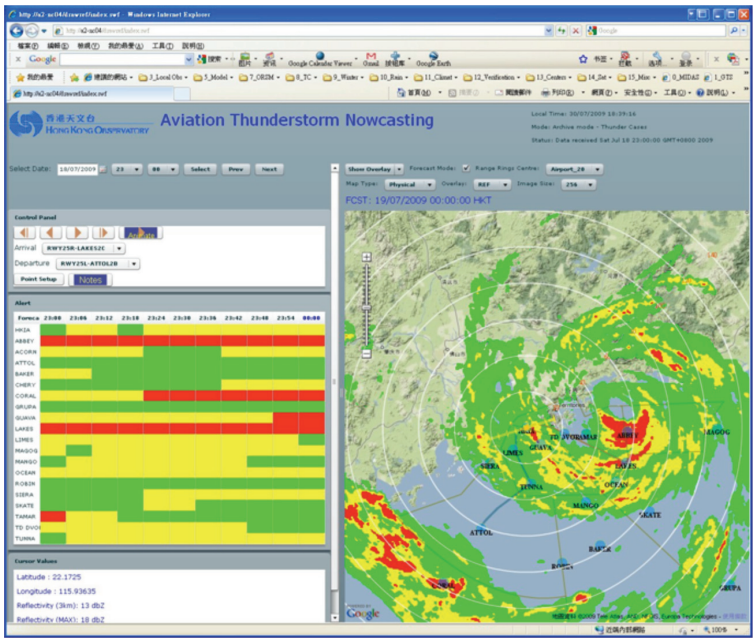
Estimated high wind radii (gales in yellow; strong winds in green) of a tropical cyclone in different quadrants at various instances along the forecast track (black line) based on the multi-platform satellite surface wind analysis (upper right-hand corner).



Display of surface wind and crosswind forecasts for HKIA generated by the regression model coupled with surface characteristics adjustments during the passage of a tropical cyclone.

7. Aviation Thunderstorm Nowcasting System for alerting hazardous convective weather associated with tropical cyclone

The convective weather associated with a tropical cyclone may have adverse effects on flight operations, with implications on both aviation safety and efficiency. In support of air traffic management (ATM), an aviation thunderstorm nowcasting system (ATNS) has been developed for the Hong Kong International Airport. The nowcasting products are based on SWIRLS (Short-range Warnings of Intense Rainstorm in Localized System) of the Hong Kong Observatory for automatically tracking and predicting the future movement of thunderstorms and rainbands using Doppler weather radar data and artificial intelligent methods. The arrival and departure routes as well as other significant locations for ATM, such as way-points and holding points are overlaid onto the forecasts. Geographical information system (GIS) technology has been employed in the graphical user interface. Verification results indicated that ATNS performed reasonably well during the passage of Typhoon Molave.



Product of ATNS showing the distribution of the forecast rainbands associated with Typhoon Molave on 18 July 2009 on the right and the time-series of the predicted intensity of the rain over the various way-points on the left. (Red, yellow and green correspond to reflectivity levels of >41, 33-41 and 20-33 dBZ respectively.

8. Hong Kong Observatory continued to organize training programmes for overseas meteorologists

The Hong Kong Observatory organized a WMO Voluntary Co-operation Programme (VCP) training course on "Use and Interpretation of City-specific NWP Products" late last year to help participants make better use of NWP products for predicting weather in their home countries. Of the eight participants attending the course, two meteorologists were from Typhoon Committee Members.

A group photo of WMO VCP course participants and Hong Kong Observatory staff taken at the opening ceremony of the course.

Between mid September and early October 2008, two forecasters from the Malaysian Meteorological Department and another three from National Hydro-Meteorological Service of Viet Nam were attached to the Observatory to exchange experience of forecasting of typhoon and severe weather. The attachment programme was considered by participants to be an effective way to build capacity and enhance collaboration between Typhoon Committee Members.

Forecasters of Malaysian Meteorological Department and National Hydro-Meteorological Service of Viet Nam pictured with Observatory staff

As part of the continuous contribution to international cooperation towards disaster reduction, the Observatory has scheduled a course on "Basic operation of weather radar and use of radar products" between 30 November and 4 December 2009. This will be the 12th professional course conducted by the Observatory under the WMO VCP.

Japan

TC Changes: Mr. Kunio Sakurai Appointed as New Director-General of JMA

Mr. Kunio Sakurai succeeded Dr. Tetsu Hiraki as the new Director-General of the Japan Meteorological Agency (JMA) in April 2009. Before his appointment to the post, he served as Director-General of the Forecast Department (2006 – 2009) and Director-General of the Seismological and Volcanological Department (2004 – 2006).

Mr. Sakurai holds a B.Sc. (1972) from Kyoto University, and since joining JMA in 1972 he has worked extensively in operational meteorological services, particularly in the introduction of new services such as the El Niño Outlook and Tornado Watch. He has also played an important role in seismological services by promoting development and preparatory work for the Early Earthquake Warning System – a new advance earthquake alert provided by JMA – as well as by introducing interim provision of Tsunami Watch Information for Indian Ocean countries.

Mainly within the framework of WMO, Mr. Sakurai has actively participated in international activities. He was a member of the Commission for Basic Systems (CBS) and the Commission for Atmospheric Sciences (CAS) of WMO in 2006 – 2009, and is an acting member of the WMO Executive Council having been elected at its 61st session in 2009. He has also made contributions to the ESCAP/WMO Typhoon Committee, particularly through his participation in its 39th and 40th sessions.

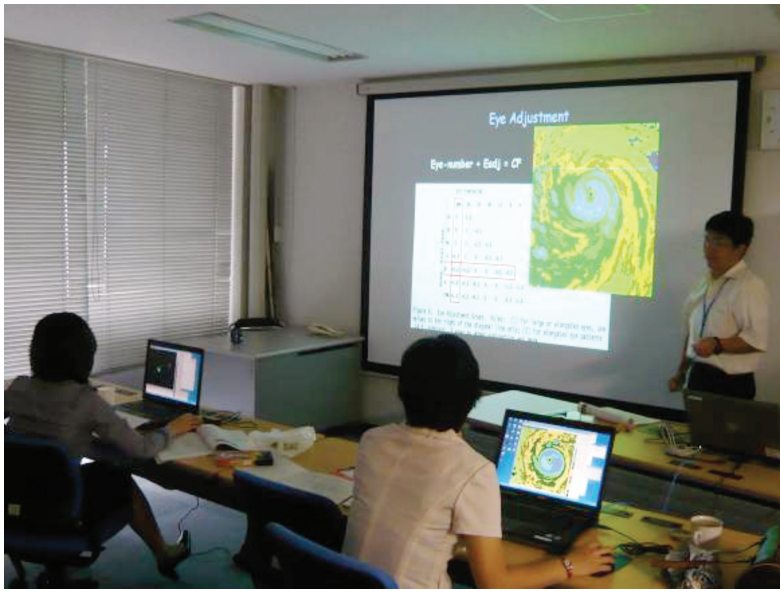
Ninth Typhoon Committee Training Seminar at the RSMC Tokyo - Typhoon Center

The RSMC Tokyo - Typhoon Center assumes the responsibility of assisting members of the ESCAP/WMO Typhoon Committee with typhoon forecasting services.

One of the activities of the Center is to hold on-the-job training on typhoon operations for forecasters in the region to improve analysis and forecast skills by exchanging views and sharing experiences in the field.

This year, two forecasters – Ms. Huang Bin from China (China Meteorological Administration) and Ms. Marcella James J. from Malaysia (Malaysia Meteorological Department) – visited the Japan Meteorological Agency (JMA) from 22 to 31 July 2009 to participate in the ninth Typhoon Committee Training Seminar at the RSMC Tokyo - Typhoon Center. Through the course, the two forecasters learned about tropical cyclone analysis and forecasting, and in particular about analysis using SATAID software (a satellite viewer program).

Figure ** Ninth Typhoon Committee Training Seminar



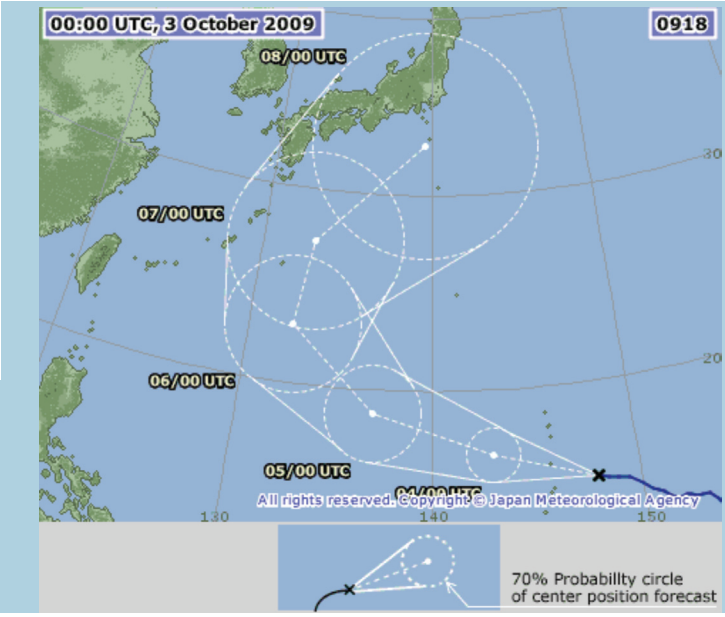
JMA's Five-day Track Forecasts

As of 22 April 2009, the RSMC Tokyo - Typhoon Center of the Japan Meteorological Agency (JMA) started issuing five-day track forecasts every six hours in addition to the existing three-day track and intensity forecasts. The new reports include center positions and radii of probability circles* for the fourth and fifth forecast days, which contribute to improving early warning activities against

tropical cyclones (TCs). These five-day track forecasts have been realized mainly as a result of recent improvements in numerical weather prediction, including the development of the Typhoon Ensemble Prediction System (TEPS).

* Probability circle: a circular range in which a TC is expected to be located with a probability of 70% at each forecast time, indicating the uncertainty of the forecast

Example of a five-day track forecast, tropical cyclone Melor (0918)



Weather Radar Observation Interval Shortened

Extensive damage caused by a series of localized heavy rain events in many parts of Japan during the summer of 2008 led JMA to shorten the interval between weather radar observations from 10 to 5 minutes in July 2009 with the aim of early detection for developing precipitation cells that may bring localized heavy rainfall. This shortening was made possible by reorganizing the scan sequence for each of the 20 countrywide weather radars. As a result, it is now possible to produce nationwide radar-echo composite maps every five minutes. These maps are used on a real-time basis by JMA for issuing weather warnings, and are also provided to the general public through the Agency's website.

Five Conventional Radars Replaced with Doppler Units by JMA

JMA operates 20 weather radars designed to collectively cover the whole of Japan and the surrounding area for 3D observation of precipitation system development, and in 2006 began to replace its conventional radars with new Doppler units. By April 2010, 5 conventional radars (at Sapporo, Fukui, Osaka, Hiroshima and Ishigakijima) will be replaced with the Doppler type in addition to the existing 11 Doppler units already in operation. After April 2010, this network of 16 Doppler radars will contribute to disaster prevention by providing detailed meteorological information on strong winds and incorporating the data into NWP to enable the output of products featuring a higher level of accuracy.

Reanalysis Project for Typhoon Vera (1959): ReVera

1. Introduction

Fifty years ago, Typhoon Vera (1959) made landfall on Japan's Kii Peninsula at around 1800 JST(0900 UTC) on 26 September, 1959. It brought tremendous damage to the country's islands – especially around the Ise Bay area – and was the most tragic meteorological disaster in post-war Japan with a casualty toll exceeding 5,000. The massive damage it caused to society means that Vera is well remembered in Japan, and people recall it as the Isewan (Ise Bay) Typhoon. At the time, the one-day track forecast for Vera was accurate, but the forecast for its speed of movement suggested that it would be much slower than it actually was. In addition, the forecast of storm surge around Ise Bay was 100 to 150 cm at most – much lower than the actually recorded value of 389 cm.

Recent advances in objective numerical reanalysis systems have enabled us to obtain long-term reanalysis data. JMA has started the JRA-55 project (a long-term reanalysis initiative targeting the period from 1958 to 2012), which is the successor of the JRA-25 project for the period from 1979 to 2004. Using the reanalysis dataset and sophisticated numerical models, we can simulate past remarkable meteorological phenomena such as typhoons. Accordingly, we performed numerical prediction experiments for Vera to validate its predictability using the latest forecast techniques together with the primary outcome from JRA-55 as initial conditions for track, intensity and storm surge predictions.

2. Track forecast experiment

We performed track predictions using the global model with a horizontal grid spacing of 60 km and different initial conditions every 12 hours starting from 4 days before Vera made landfall. In all the simulated cases, Vera was predicted to make landfall in Japan. Among the forecasts, the one with an initial time of 0900 JST on 24 September 1959 showed the outcome closest to the best track. Then, ensemble forecasts with 11 members were performed by perturbing the initial conditions using the same time. The results (Figure 1) indicate that all the members predicted realistic tracks making landfall in Japan, with the locations of landfall widely distributed across southern coastal areas of the country. However, the tracks were less varied and stayed close to the best track until Vera passed the 30°N point.

3. Intensity and storm surge experiment

To predict the intensity of Vera and the associated storm surge more accurately, a high-resolution mesoscale model was needed to make the initial conditions as realistic as possible. For this purpose, JNoVA (JMA's Non-hydrostatic model Variational data Assimilation system) was used to implement mesoscale analysis for a period of 24 hours from 0900 JST on 25 September 1959 with a 3-hour assimilation window. We also assimilated dropsonde data for Vera obtained through US military aircraft reconnaissance and archived at JMA. We performed 36-hour forecast experiments using the results of this analysis and the non-hydrostatic model with a grid spacing of 5 km from 0900 JST on 26 September, 1959 (9 hour before the landfall). Figure 2 shows the results of the numerical experiment; it indicates that Vera makes landfall on the Kii Peninsula, and the amount of precipitation was successfully simulated. In addition, the time difference of landfall between the simulation and the analysis based on the best track is less than an hour. Figure 3 shows a pseudo-satellite image artificially produced from the output of the numerical simulation. Such realistic imagery was not available 50 years ago because the first geostationary meteorological satellite (GMS) over the western Pacific was launched in 1977.

After the numerical simulation using the mesoscale model, storm surge predictions were performed using the Princeton Ocean Model and the output from the numerical simulation as atmospheric forcing. The predicted sea-level height at the port of Nagoya was very close to the observed value (Figure 4).

4. Summary

From these experiments, it is deemed possible to obtain highly accurate predictions for Vera using the latest forecast techniques. An important consideration of this outcome is that the numerical model used in the present experiments is based on the operational version at JMA, suggesting high potential to predict the tracks and intensity of large typhoons such as Vera using the current operational prediction system.

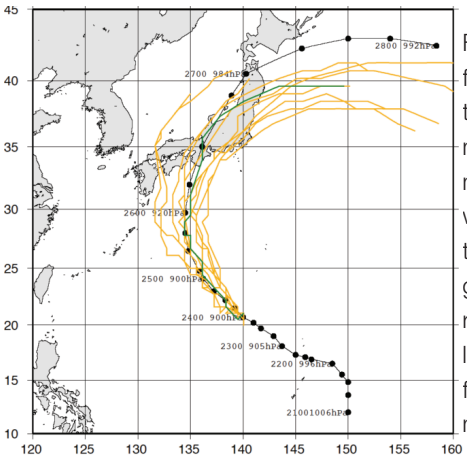


Figure 1 Track forecast results from the global ensemble model with 11 members. The line with the dots shows the best track. The green line is a control run, and the yellow lines are derived from the ensemble members.

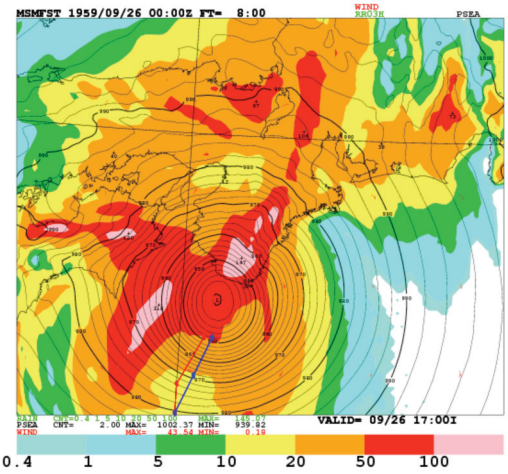


Figure 2 Intensity forecast for Vera created using JMA's non-hydrostatic model at 17 JST on 26 Sep., 1959. The colors represent three-hourly cumulative rainfall values, and the contours indicate surface pressure.

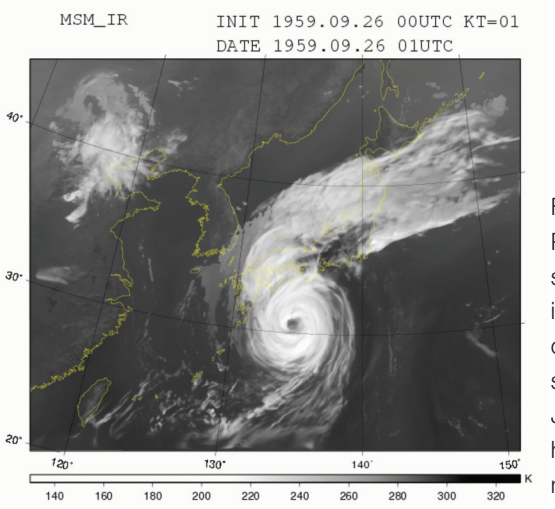


Figure 3 Pseudo-satellite image of Vera simulated by JMA's non-hydrostatic model

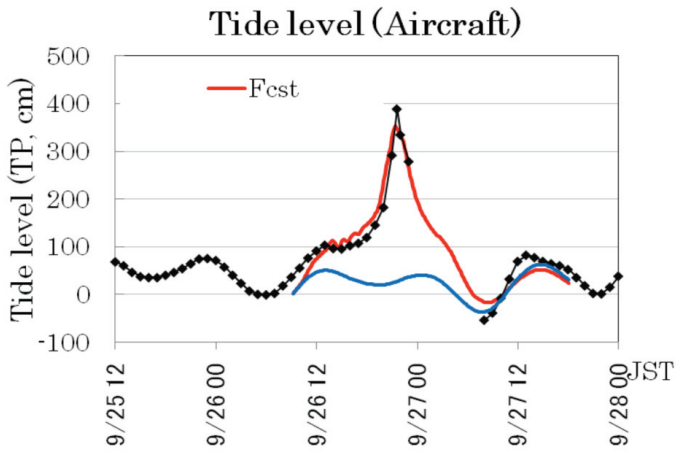


Figure 4 Storm surge observation and forecast for the port of Nagoya. The red line shows the forecast results, the blue line indicates the astronomical tide level, and black line with dots plots the observed values.

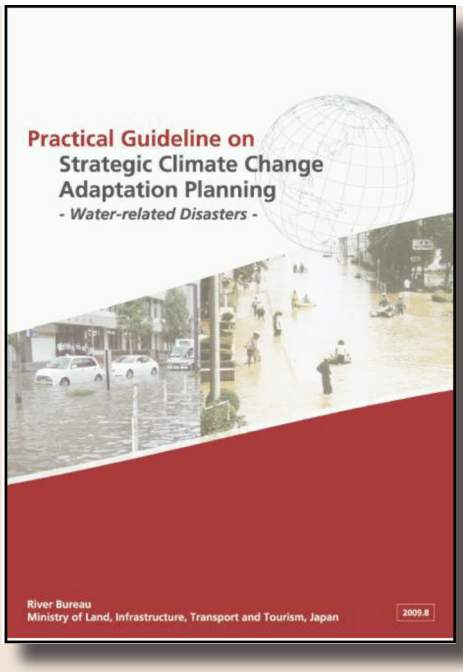
Publication of "Practical Guideline on Strategic Climate Change Adaptation Planning – Water-related Disasters –"

Severer floods due to climate change occur on a global scale and are common issues facing the international community, although the degree of impact varies by region. Located in the Asian Monsoon region, some Asia-Pacific countries have climatic and geological conditions similar to those of Japan, and their areas of production and inhabitation are based mostly on alluvial plains.

The guideline prepared by experts in the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) describes a framework for procedures to develop adaptation measures against severer flood disasters due to climate change based on experiences, strategies and technologies accumulated in Japan. The publication mainly targets countries facing conditions such as: 1) expected socio-economic development and urbanization due to population growth; 2) a basis of living and production situated on alluvial plains; and 3) underdeveloped flood control measures (e.g., countries in the Asia-Pacific region and others).

Compared with existing guidelines on flood management, the importance of estimating future meteorological external forces such as precipitation is higher in the development of climate change adaptation measures. Accordingly, the publication contains a full account outlining the setting of meteorological external forces.

In order to make an international contribution by implementing technical support to concrete climate change adaptation planning in the Asia-Pacific region, MLIT established "Advisory board on promotion of international contribution regarding climate change adaptation measures", which consists of academic experts (chaired by Prof. Toshio KOIKE of Tokyo University) in June 2009.Based on suggestions from the advisory board, the guideline will be further improved. MLIT hopes to contribute to the promotion of effective adaptation measures in the Asia-Pacific region by utilizing the guideline through various activities such as Climate Change and Adaptation Knowledge Hubs in Asia Pacific Water Forum (APWF), bilateral cooperation by JICA, and so on.
(http://www.mlit.go.jp/river/basic_info/english/climate.html)



Promotion of Countermeasures for Localized Heavy Rainfall and Extremely Intensified Rainfall – Introduction of X-band MP Radars

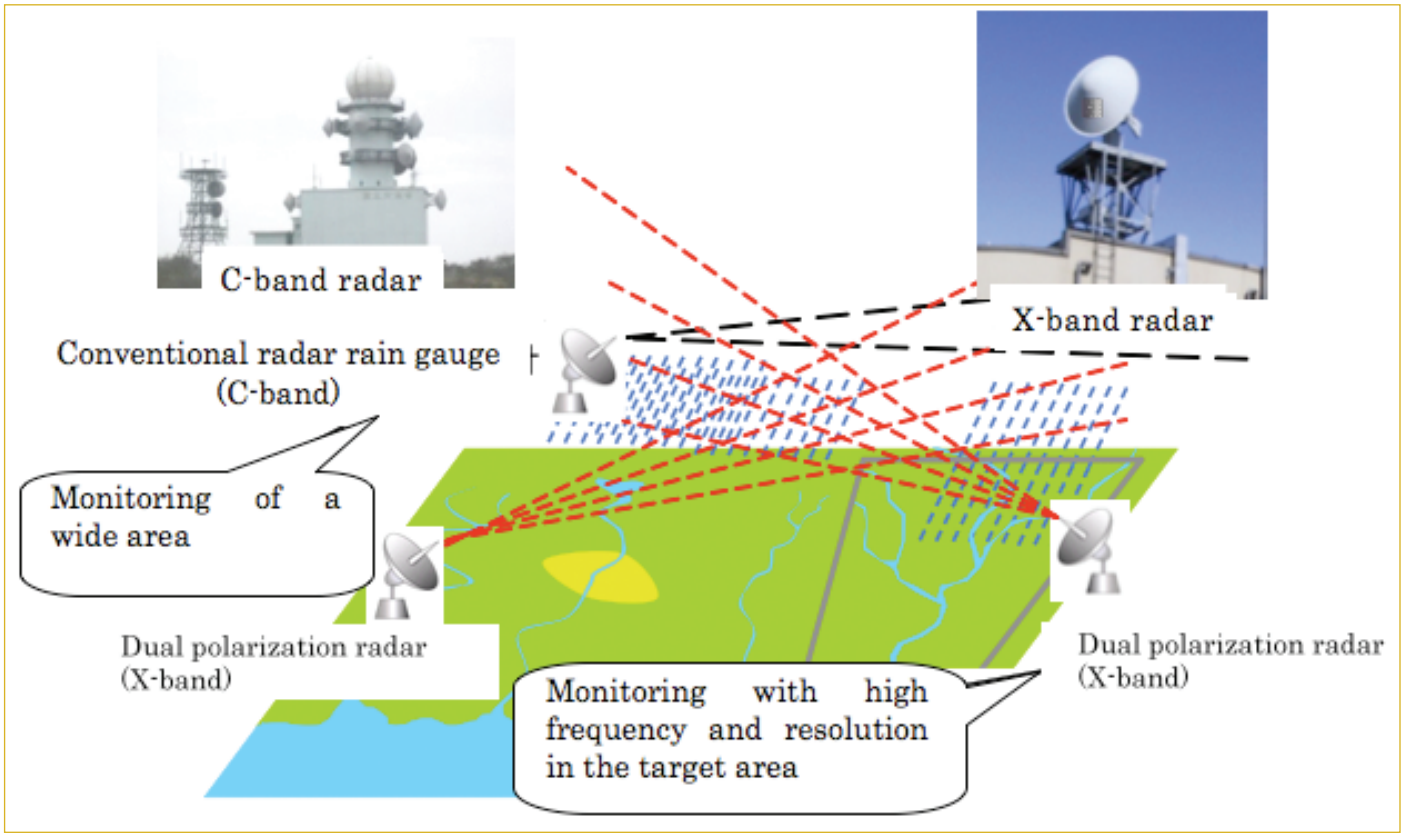
In recent years, serious disasters caused by localized heavy rainfall and extremely intensified rainfall have become increasingly frequent throughout Japan.

To strengthen real-time monitoring of these types of rainfall, the Ministry of Land, Infrastructure, Transport and Tourism has started a project to implement more detailed, frequent monitoring by introducing X-band MP (multi-parameter) radars. This new type is capable of observing rainfall with higher frequency, finer resolution and improved accuracy, and can also observe 3D distribution of rainfall and wind. The radars are expected to improve accuracy in observation and forecasting of localized heavy rainfall, which is often found difficult to observe with traditional C-band radars.

X-band MP radars enable observation of wind and even the shape of raindrops. This sophisticated capability leads to technological research and development for observation

and forecasting of thundercloud development and rainfall-area movement as well as for improved flood forecasting and simulation. With these technological improvements, more accurate and timely information can be provided to the relevant municipalities and local residents, which will contribute to the reduction of damage caused by localized heavy rainfall or extremely intensified rainfall.

Under the current plan, a total of 11 X-band radar stations will be implemented in three metropolitan areas and other regions (Kanto, Chubu, Kinki and Hokuriku) by the end of fiscal 2009, and in the regions of Chugoku and Kyushu in the near future. Test operation is scheduled to start in fiscal 2010 before full operation in 2013.



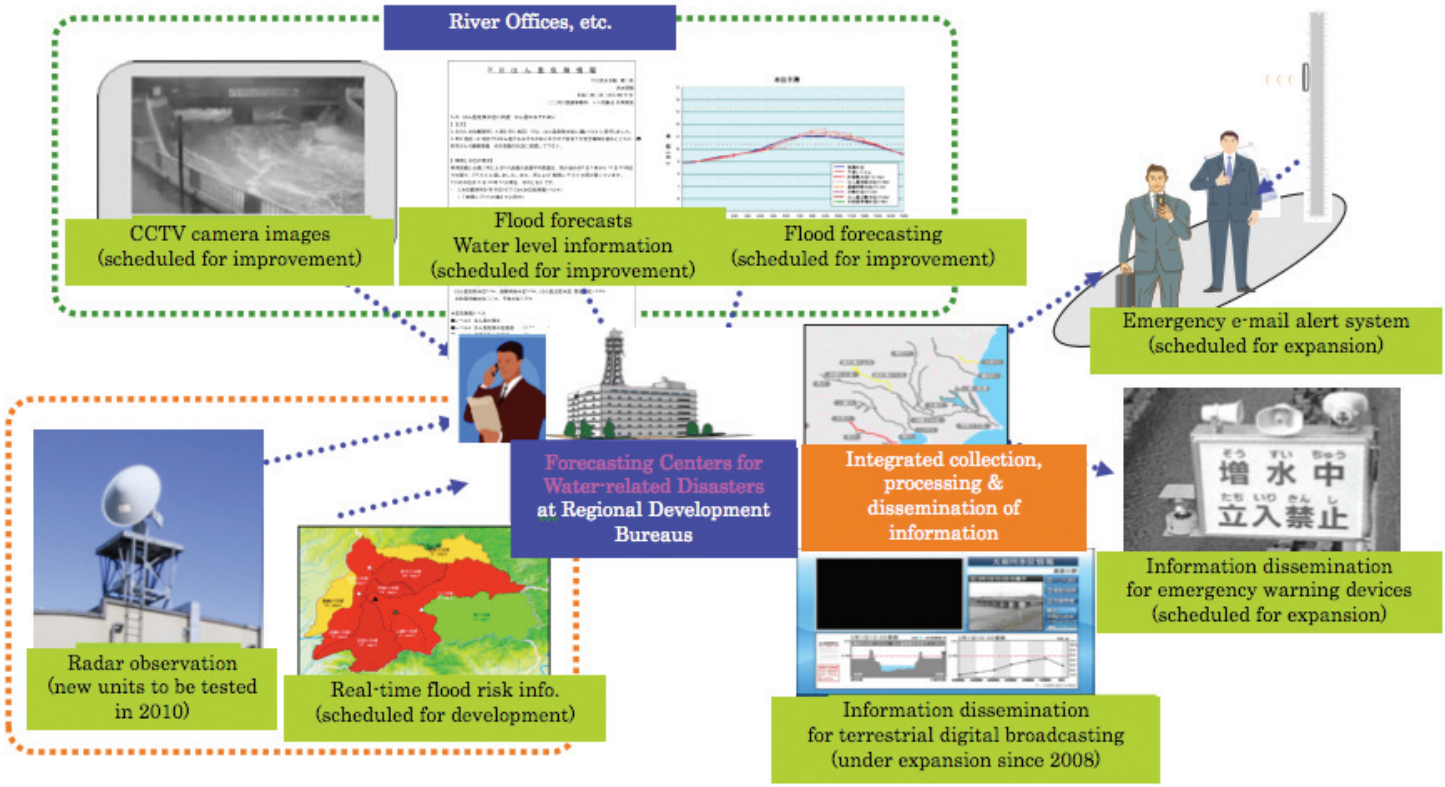
Radar type	C-band radar (conventional type)	X-band MP radar (new type)
Frequency band, wavelength	4 – 8 GHz, 5 cm	8 – 12 GHz, 3 cm
Observational purpose	Real-time rainfall monitoring for river management (over a wide area)	- Real-time rainfall monitoring for river management (over a limited area for detailed data) - Observation of rainfall area development and movement
Observational period	5 minutes	1 minute (target duration)
Time-lag to information release	5 – 10 minutes	1 – 2 minutes (target time-lag)
Resolution of data	1 km	250 – 500 m
Doppler observation (wind observation)	Partially conducted	Fully conducted
Scanning method	2D scanning	3D scanning (observation of raindrop formation process)
Dual polarization (observation of raindrop shape)	Partially conducted	Fully conducted

Establishment of "Forecasting Centers for Water-related Disasters"

In recent years, water-related disasters have become more frequent, including storm surge and flooding events caused by record heavy rainfall and localized intensive deluges. This situation requires river administrators and municipal offices to provide faster and more precise disaster response. Efforts should also be made to achieve the goal of ensuring zero disaster victims by analyzing, assessing and appropriately incorporating the impacts of external forces intensified by climate change due to global warming into structural and non-structural measures.

Accordingly, "Forecasting Centers for Water-related Disasters" were established in April 2009, and have since been in operation at the eight MLIT Regional Development Bureaus across Japan. The Centers provide the following services:

1. Monitoring and forecasting of water-related disasters and improvement of these functions
2. Collection and dissemination of information on monitoring, forecasting, forecasts and warnings, and water levels
3. Analysis and assessment of the impacts of climate change on water-related disasters
4. Assistance for prefectural river administrators and flood-fighting administrators



Macao, China

Workshop on Climate Change and Climate Prediction in the Pearl River Delta Region

The "Workshop on Climate Change and Climate Prediction in the Pearl River Delta Region", the first of its kind in the region, was jointly organized by the Hong Kong Observatory (HKO), the Guangdong Meteorological Bureau (GMB) and the Macao Meteorological and Geophysical Bureau (SMG) on 15 and 16 December 2008 at the Hong Kong Observatory Headquarters. During the workshop, experts from the Observatory, GMB and SMG, local universities as well as the business sector gave presentations on topics related to climate change, trends of extreme weather, climate prediction and climate change outreaching initiatives in the Pearl River Delta Region.

Thereafter on 24 September 2009, SMG held a seminar namely “Climate is changing, let’s take action now” at the STDM Hall of the International Library at the University of Macao. The seminar was a continuation of the workshop on climate change and climate prediction in the Pearl River Delta Region, during which the prizewinning photos of the photo competition in August 2009 “Our climate” were displayed together with the exhibition boards on climate change.

WORLD METEOROLOGICAL DAY – 23 MARCH 2009

This year the theme of the World Meteorological Day is “Weather, climate and the air we breathe”. A series of events were held by the Macao Meteorological and Geophysical Bureau (SMG) on celebrating the World Meteorological Day:

The dissemination of Macao Weather RSS enables the public including other organizations to receive weather information directly on-line, and to avoid any delay due to network congestion on telephone and fax;
The official announcement of SMG new warning: “Storm Surge warning”;
A gala dinner was held to give honor to the current and retired professionals in the fields of meteorology, as well as to those units closely worked with SMG. The dinner aimed to show friendship to our working partners and commendation awards were presented to those personnel working over 20, 25 and 30 years.

The new "Storm Surge Warning" mechanism helps to reduce flooding damage

Last year the passage of Typhoon Hagupit brought extensive flooding to many areas in Macao, leading a vast economic loss. In order to strengthen the forecasting of any flooding due to water intrusion and heavy rains, starting from April 2009, the Meteorological and Geophysical Bureau (SMG), jointly worked with other government departments, established a new warning system namely "Storm Surge Warning", aiming to remind the public as soon as possible to prevent and minimize the damage caused by flooding.

The main mechanism is constituted by 9 land stations, 2 tide stations and 1 wave station, which are used to monitor the height of the water level, the tide level and the wave respectively. Data from these stations will be transmitted to other departments for taking necessary precaution measures.

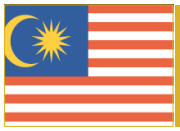
Conclusion of the Study Project of Air Quality in Macao with Mobile Laboratory for Air Monitoring in Real-Time

With funding from the Science and Technology Development Fund, the University of Macau, the Meteorological and Geophysical Bureau and the Environment Protection Bureau jointly carried out a research project namely the "Project Study of Air Quality in Macao with Mobile Laboratory for Monitoring the Situation of Air in Real-Time". Air qualities were recorded in different areas of Macao during 18 to 24 February 2009. Upon completion of the research project, a ceremony for the research achievement was held at the Science and Technology Development Fund at 3 pm on 4th November 2009, followed by a workshop in which trainings were provided to the research participants. The project aimed to demonstrate to the public the different strategies planned in regard of the Macao air quality in the near future. In addition, the research project matches the theme of the World Meteorological Day "weather, climate and the air we breathe". The project on one hand monitored the air quality in different regions of Macau, and on the other hand it enabled local students to learn using the most updated equipment to conduct scientific project. In conclusion, the results indicated that during the monitoring period, the air quality of Macao is within the necessary qualification of a national heritage city.

X-Band dual-polarization radar

The multi-Doppler radar in the Macao Meteorological and Geophysical Bureau (SMG) has been damaged for a long time. Taking into consideration that Macao is a small region and the need of the Macao International Airport, as well as the use of dual-polarized radar is the future direction of many countries, SMG decided to buy a X-band dual-polarization radar (model: DWSR-2001X) from the Enterprise Electronics Corporation in the United States.

Most of the weather radars only give out level of polarized radar pulses, however, the dual-polarized radar is able to give out both horizontal and vertical polarized radio wave at the same time. The radar is able to distinguish raindrops between round and flat, and to calculate the number of raindrops with their shape changed, so as to estimate accurately the rainfalls. Moreover the radar is able to classify the patterns of the raindrops, such as rain shape, ice shape, snow shape, hailstone and cold water, which help to improve the accuracy of precipitation forecasts and is useful to weather forecasts. The radar was installed in November this year and is scheduled for testing and use in mid-December.



Malaysia

Upgrading of the Malaysian Meteorological Department (MMD) Numerical Weather (NWP) Systems: Implementation of the Typhoon Bogussing Scheme

MMD had acquired two SGI high performance computer systems in 2008 to run the MM5 and WRF (Weather Research Forecasting) numerical weather prediction models respectively with high resolutions of up to 4 kilometres over Peninsular Malaysia, Sabah and Sarawak. The models are run twice a day at 00UTC and 12UTC for up to 72 hours forecasts over Malaysia (4km and 12km resolution) and Southeast Asia (36km resolution) regions.

In 2009, two experts from the Shanghai Typhoon Institute (STI), China Meteorological Administration (CMA) were invited to help MMD in the implementation of Typhoon bogussing scheme on the MM5 NWP model and to train MMD staff to run the models to forecast typhoon track over the South China Sea region on operational basis during the occurrence of typhoons. During the absence of typhoon events, the MM5 model will be initialised without the typhoon bogussing scheme.

A tropical cyclones initialization scheme based on the NCAR-AFWA (Air Force Weather Agency) tropical cyclone bogussing scheme (N-A bogus scheme) and STI Bogus Data Assimilation (BDA) based on the MM5-4Dvar system was installed on the SGI high performance computer at MMD. Both the bogussing schemes were integrated into the operational MM5 NWP model. Currently, the BDA scheme is used operationally at MMD. A selected case study of Tropical Cyclone Fengshen (TC 0806) was conducted using the two different bogussing schemes, the N-A bogus scheme and the BDA bogus scheme. A control experiment was also conducted by using the MM5 NWP model without any bogussing scheme. Results (Figure 1 and 2) of the test case show that these schemes modify the initial structure of typhoon reasonably well and may help in improving the performance of tropical cyclones forecast in terms of location, intensity and structure of tropical cyclone (TC).

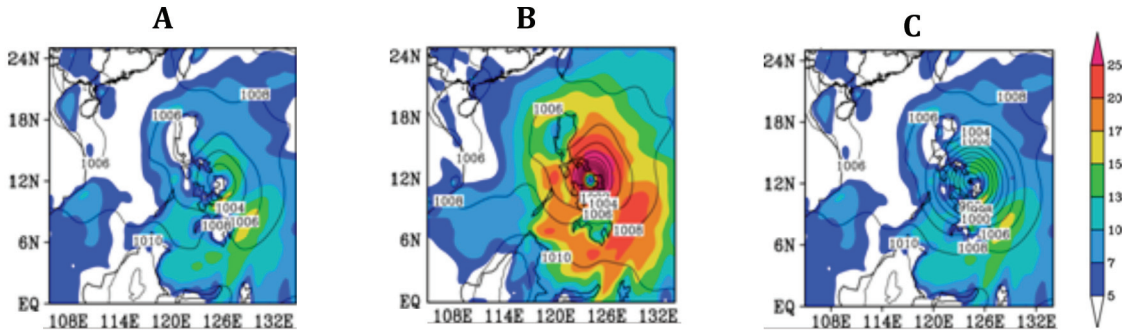


Figure 1 The distributions of the Sea Level Pressure (SLP) (hPa) and wind speed (m/s) for the (**A**) control experiment, (**B**) MM5 with the NCAR - ARWA scheme (default scheme), and (**C**) MM5 with the BDA scheme at 1200 UTC 20 Jun 2008. Figure 1 (c) shows that the presence of the BDA bogussing scheme significantly improves the wind speed and central pressure of the storm in the model forecast.

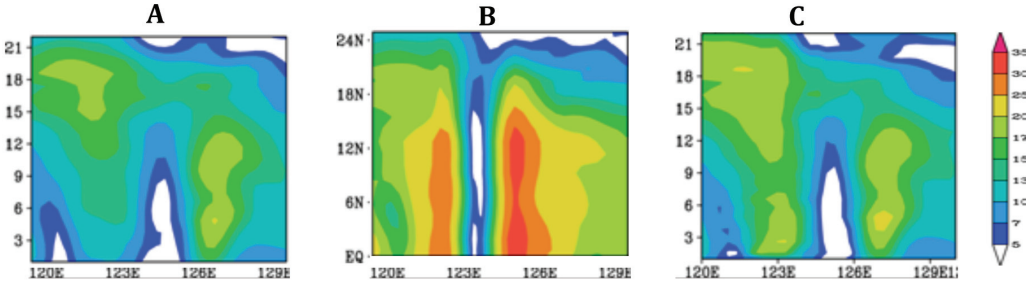


Figure 2 Vertical cross sections through the centre of the TC in terms of wind speed (m/s) for the (**A**) control experiment, (**B**) MM5 with the NCAR - ARWA scheme (default scheme), and (**C**) MM5 with the BDA scheme at 1200 UTC 20 Jun 2008. Figure 2 (c) shows that the presence of the BDA bogussing scheme resembles the core of the control experiment.

Philippines

The Northwest Pacific basin has been very active in year 2009 as compared to the relatively silent Atlantic basin. As of the end of November 2009, 21 tropical cyclones (TCs) have traversed the Philippine Area of Responsibility (PAR) with 8 cyclones crossing land and 15 developed within the PAR. Apart from these TCs, other weather causing phenomena such as the monsoons, the intertropical convergence zone (ITCZ), etc. have also affected the country. Singly or in combination, these weather disturbances have produced record breaking rainfall resulting to unprecedented flooding, particularly in the monitored major river basins and reservoirs.

The flashflood in Metro Manila on 26 September 2009 is a classic example of the level of vulnerability that a mega city like Metro Manila could expect in an extreme rainfall event. The flash flood was caused by a 24-hour rainfall of 540 millimeters from an average Tropical Storm (Ketsana) while the extent of devastation was due to factors of anthropogenic origins. The enhanced rainfall over Metro

Manila was the result of the interaction between Ketsana and the seasonal southwest monsoon. Storm Ketsana's cyclonic circulation and the southwesterlies resulted to intense wind convergence south of the storm's center which led to torrential rains. The maximum hourly rainfall recorded was 92 millimeters in Quezon City while an hourly average of 64 millimeters persisted for a period of 6 hours (9AM to 3PM, 26 September). The 24-hour rainfall is equivalent to more than a month's average rainfall (392 millimeters is the average for the month of September) in Metro Manila. The estimated return period of the flood is 180 years (University of the Philippines, National Hydraulic Research Center (UP-NHRC, 2009) while the drainage structures which were constructed in 1975 were designed to withstand 10 year floods (JICA, 1990). Bankoff (2003) has correctly stated that the nature of flooding in Metro Manila must be gauged through a perspective that considers changes in topography, demographic growth, and urban development over time.

The event is a clear manifestation of the issues and concerns that were raised in the Fourth Assessment Report of the IPCC that the most vulnerable areas to the impacts of hydrometeorological extremes are cities or urban areas along the coasts. The proof came too soon for the Philippines when it was just a couple of months ago

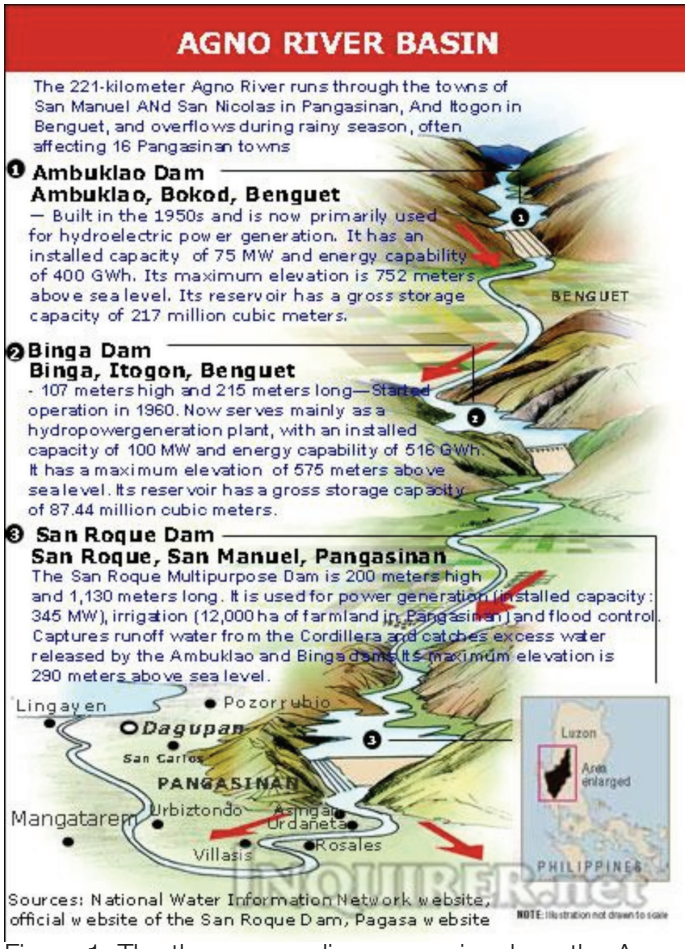


Figure 1. The three cascading reservoirs along the Agno river

that these issues were seriously considered during the Global Platform for Disaster Risk Reduction conference in June 2009, the Expert Group Meeting on Innovative Strategies for Flood Resilient Cities in July 2009, the 3rd World Climate Conference, and the Integrated Workshop of the Typhoon Committee in September 2009.

The Philippine government was still reeling from the devastation of Tropical Storm Ketsana when Typhoon Parma entered PAR and crossed Northern Luzon three (3) times (Table 1). Parma dumped a total rainfall amount of 1815 millimeters in Baguio City which is located near the upper reach of the Agno river basin where 3 major reservoirs were constructed along the Agno river (Figure 2). The amount rainfall for an average tropical cyclone passing the island of Luzon is within the range of 350 to 450 millimeters.

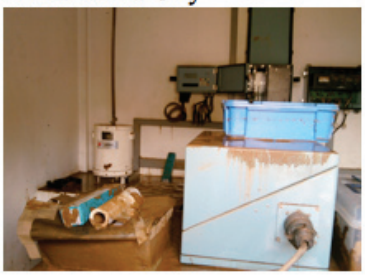
During the occurrence of Typhoon Parma in Luzon, the maximum inflow to San Roque dam was 5,547 cubic meters per second (cms) and this occurred when the reservoir was barely 1 meter below its top of gate elevation. This critical situation warranted for an "inflow equals outflow" spillway operation. The impact of the cascading flood waters from the dam caused the breaching of dikes at 3 points along the Agno river and consequently led to widespread flooding. Again, similar to the Metro Manila flooding, there was a mismatch between the flood and the flood control structures that were in place. The observed flood has a return period of 50 years while the dikes and levees were built for a 10-year flood.

Table 1. Daily inflow of San Roque dam during the passage of Ty Parma

Date	Inflow (MCM)	REMARKS
30 September 2009	18.00	Typhoon Parma entered PAR.
01 October 2009	19.30	
02 October 2009	20.10	
03 October 2009	27.60	@ 4PM, Parma made 1st landfall.
04 October 2009	91.30	
05 October 2009	46.30	
06 October 2009	38.98	@ 10PM, Parma made 2nd landfall.
07 October 2009	74.30	
08 October 2009	196.14	@ 10AM, Parma made 3rd landfall.
09 October 2009	248.00	
10 October 2009	95.00	@ 10PM, PAGASA issued the Final Bulletin for Parma.



Provident Village in Marikina City



The Nangka rainfall & water level station in San Mateo, Rizal was totally submerged.

Quite a number of lessons were learned after the series of flooding which focused on policy issues, particularly on flood control structures, flood risk management and also facilitated the signing into law of the Philippine Climate change Act of 2009 on 30 October 2009 the House of Representatives vowed for the speedy passage of the Philippine Disaster Risk Reduction, Management and Recovery Act of 2009, which was already passes on third and final reading in the Senate. Meanwhile, Executive Order 838 issued on 22 October 2009 created the special National Public Reconstruction Commission to undertake a study of the causes, costs and actions to be taken in the wake of typhoon Ondoy, Pepeng, Ramil and Frank, to seek fresh aids to fund reconstruction and to enter into a partnership with the private sector for the foregoing purposes.

For the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), the series of events paved the way for a number of opportunities such as more projects in the enhancement of its network of monitoring facilities for early warning systems for tropical cyclones and floods.

Republic of Korea

1. The 1st TRCG Technical Forum, May 12-15, 2009, Jeju, Korea

The Korea Meteorological Administration (KMA) hosted the first Technical Forum of Training and Research Coordination Group (TRCG) / Typhoon Committee (TC) which was held on May 12-15, 2009, Jeju, Korea. Participants from 13 countries participated in this event, benefited from WMO, TC and KMA. Dr. Byung-Seong Chun, KMA administrator, Dr. Prisco D. Nilo, PAGASA administrator, Mr. Kuroiwa Koji, TCP/WMO chief and Mr. Olavo Rasquinho, secretary of TC, gave the opening and welcome messages. There were also two invited experts, Professor Russel Elseberry from the Naval Postgraduate School, USA, and Mr. Takuya Komori from the Japan Meteorological Agency, Japan, delivering the special lectures: the TC deterministic consensus forecasts and TC Ensemble Prediction System, respectively. In addition, Mr. Roger Edson gave an extra lecture about the use of microwave and scatterometer data in TC. One of important things was tutorial session of the typhoon forecasting system from each country, and KMA offered a live session of the Typhoon Analysis and Prediction System at the National Typhoon Center.

Frame 1. Participant photo of the 1st Technical Forum of TRCG/TC, May 12-15, 2009, Seogwipo city, Jeju, Korea.

2. The International Workshop on Tropical Cyclone-Ocean Interaction in the Northwest Pacific (TCOI 2009), April 27-29, 2009, Jeju, Korea

The International Workshop on Tropical Cyclone-Ocean Interaction in the Northwest Pacific (TCOI 2009) was held on April 27-29, 2009, at Seogwipo city, Jeju, Korea, which was hosted by the Korea Meteorological Administration (KMA), Korea Ocean Research and Development Institute (KORDI), Cheju National University, University of Rode Island (USA) and WetherPredict Consulting Inc. Over 50 experts in the typhoon research and forecast and physical oceanography from USA, Japan, China, Australia, Taiwan, and Korea were participated in this workshop, and discussed their research results such as the typhoon-ocean interaction phenomena, observation data utilization method, numerical model-based forecasting, etc. And especially they exchanged the information about the typhoon forecast skill and typhoon-ocean coupling modeling scheme for the future cooperation. In the last day most participants also visited the National Typhoon Center of KMA.

Frame 1. Participant photo of the Internatinal Workshop on Tropical Cyclone-Ocean Interaction in the Northwest Pacific, April 27-29, 2009, Seogwipo city, Jeju, Korea

3. Workshop on the Economic and Social Effects of Typhoon, August 21-22, 2009, Jeju, Korea

Frame 3. Participant photo of the Workshop on the Economic and Social Effects of Typhoon, August 21-22, 2009, Seogwipo city, Jeju, Korea

National Typhoon Center (NTC) and National Institute of Meteorological Research (NIMR) of Korea Meteorological Administration hosted the workshop and panel discussion about the two sides of typhoon, held on August 21-22, 2009, in Jeju, Korea. The main theme was “typhoon is always bad?” Experts from several fields such as economic and social sciences, engineering parts, journalism, and meteorology and oceanography were participated in presenting their research results about the typhoon-related phenomena and disasters, social and economic effects including the negative and positive effects to the human life. The typhoon-induced disasters like flooding, strong wind, inundation were mainly discussed in the negative side, however several issues like cleaning the air in the big city, strong mixing in the coastal area, and water supply for the winter season area were also suggested for the positive side. They also suggested on how much of money could be lost or gain from a special typhoon event such as typhoon Rusa(0215) and Maemi(0314).

A Commemorative Photograph

The 4th WGDPP Annual Meeting

The Working Group on Disaster Prevention and Preparedness (WGDPP) conducted 4th annual meeting during 28-29 April 2009 on Seoul Garden Hotel, Korea to reinforce partnership and cooperation in the field of typhoon related disaster prevention and preparedness. There are 30 from 9 Members (i.e. Hong Kong, China; Lao PDR; Macao, China; Malaysia; Philippines; Republic of Korea; Thailand; USA and Viet Nam) and TCS, UNESCAP, UNISDR, ADRC attending the WGDPP Parallel Sessions.

The principle objectives of WGDPP Annual Meeting were to foster collaboration and discussion between disaster related researchers spanning TC working groups (meteorology, hydrology) and colleagues in the disaster preparedness and risk management communities.

During WGDPP Annual Meeting, activities of the WGDPP on 2008 regarding on i) 3rd WGDPP Annual Meeting, ii) Expert Mission results on 2008 and 2009, iii) enhanced Web GIS based TCDIS (WGTCDIS), iv) four WMO reports, v) Integrated Workshop on 2008, and vi) the 41th TC Session were reported. In general, the following points were identified by the Members as additional WGDPP activities, while supporting the upgrading of the WGTCDIS activities: i) agreed on a more focused approach to reduce typhoon-related disaster risk based on sound disaster statistics in the region; ii) agreed to make efforts to identify joint activities with other TC WGs; iii) agreed to identify activities related with urban disaster risk reduction and early warning; and iv) proposed the TCS to consider conducting a public event on the occasion of the annual TC session. Feasibility study on the real-time transmission of severe weather warning serviced by the Severe Weather Information Centre (SWIC), Hong Kong, China was also discussed and also Members agreed that Hong Kong, China will lead the pilot project of community weather stations to raise public awareness.

For the future works, the following points were identified by the Members as additional WGDPP activities; i) For extending WGTCDIS as ongoing project, Thailand; Lao PDR; Philippines and Hong Kong, China will prepare 5yrs typhoon related damages information for developing WGTCDIS; ii) TC Members will prepare one or two typhoon related information to put into DiMap of WGTCDIS.


WGDPP Meetings

Members were also discussed future works regarding on i) preparing for Integrated Workshop on Philippines and 42nd TC Session; ii) election new vice-chairman of WGDPP; iii) Expert Mission to give information of WGTCDIS and application of system. After meeting Members visited on Han River Flood Control Office and Paldang Office of Korea Hydro & Nuclear Power Co., LTD.

Day 1	Tuesday, 28 April 2009	
Time	Items	Etc
08:30-09:00	Registration	
09:00-09:40	Opening Ceremony	
09:40-10:00	Coffee break	
10:00-12:00	Keynote lectures or presentations	
12:00-13:30	Lunch	
13:30-14:20	Review of activities of TC WGDPP	
14:20-15:20	Discussion on Web GIS based TCDIS	
15:20-15:40	Coffee break	
15:40-16:30	Discuss on Case Study	
16:30-17:30	Discussion on Expert Mission of WGDPP	
18:00-20:00	Welcome dinner	
Day 2	Tuesday, 29 April 2009	
Time	Items	Etc
09:00-10:20	Discussion on co-research plan for application of Web GIS based TCDIS	
10:20-11:30	Discussion on future plan of WGDPP	
11:30-12:00	Closing Ceremony	
12:00-13:30	Lunch	
14:00-18:00	Field trip - Han River Flood Control Office - Paldang Office of Korea Hydro & Nuclear Power Co., LTD	
18:00-20:00	Farewell Dinner	

Expert Mission

The National Institute for Disaster Prevention (NIDP) as a member of the Working Group for Disaster Prevention and Preparedness (WGDPP) developed the WEB GIS based TCDIS (WGTCDIS) for the second project. The WGTCDIS was greatly enhanced in visual following the WMO web style and on function to estimate similar typhoon trajectory and damages from determined typhoon was also upgraded with Viet Nam's data. The data for the WGTCDIS such as the GIS, the meteorological, the weather station, and typhoon related damages were collocated from the Expert Mission performed on 2008. Based on the information collected from the Viet Nam, the WGTCDIS was developed for the Viet Nam's own system.

To introduce new system and teach usage of WGTCDIS and method to put data into the WGTCDIS, the Expert Mission for the Viet Nam was decided in the 41st TC Session in Chiang Mai. Through the Expert Mission, expert team will help to assist members in data collection to promote the WGTCDIS which WGTCDIS can help the members for in time and efficient disaster response of typhoon related disasters. WGTCDIS can also be used as a platform for information exchanges to reduce the damages from typhoon related disasters. The WGTCDIS as an information exchange system can be utilized to provide essential typhoon-disaster related information for decision-makers.

The main objectives of the Expert Mission were to i) promote the usages and benefits of the WGTCDIS to the governments of Viet Nam; ii) identify needs and gaps of participating members in relation to the implementation of the WGTCDIS as an early warning systems (EWS) and acquisition of the necessary information to the WG TCDIS, and; iii) explore whether there is a need for public out-reach projects in relation to EWS and disaster prevention and preparedness in the participating members.

An expert team was organized which three experts were joined from Republic of Korea to promote usages of the WGTCDIS and identify needs and gaps of participating members in relation to the implementation of the EWS and the Disaster Information System. The Expert Mission were performed during 2-7 March 2009 on the three main cities in Viet Nam such as Ha Noi, Da Nang and Hochi Minh. The three expert members were Dr. Yi (Chair of WGDPP), Dr. Tae Sung Cheong (NIDP), Dr. Eun-Mi Chang (KSIC).

Country	Date	Contents	Presentation
Ha Noi, Viet Nam	3.2 (Mon)	· *Fly to the Hanoi from the In Chun* · 15:00-15:30 *Briefing on Expert Mission* · 15:30-16:20 *Briefing on WEB-GIS based TCDIS* · 16:30-19:00 *Practice and discussion*	 Chair (Dr. Yi) Dr. Chang Dr. Cheong
Da Nang, Viet Nam	3.3 (Tue)	· *Fly to the Da Nang from the Hanoi* · 14:00-14:30 *Opening Ceremony* · 14:30-15:30 *Briefing on Expert Mission* · 16:00-18:00 *Briefing on WEB-GIS based TCDIS*	 Host Chair (Dr. Yi) Dr. Chang
Da Nang, Viet Nam	3.4 (Wed)	· 09:00-10:00 *Briefing and Discussion on Disaster Map* · 11:00-18:00 *Practice and discussion (TCDIS, dMap)*	Dr. Cheong All
Da Nang, Viet Nam	3.5 (Thu)	· 09:00-10:30 *Decision Support System to reduce* inundation damages · 10:30-12:00 *Disaster Management System of Viet Nam* · *Fly to the Ho Chi Min from the Da Nang*	Dr. Cheong Nguyen Viet Tien
Hochi Minh, Viet Nam	3.6 (Fri)	· 09:00-09:30 *Opening Ceremony* · 09:30-10:00 *Briefing on Expert Mission* · 10:20-12:00 *Briefing on WEB-GIS based TCDIS* · 14:00-15:40 *Briefing and Discussion on Disaster Map* · 16:00-18:00 *Practice and discussion (TCDIS, dMap)*	Host Chair (Dr. Yi) Dr. Chang Dr. Cheong All
Hochi Minh, Viet Nam	3.7 (Sat)	· 09:00-12:00 *Practice and discussion (TCDIS, dMap)* · *Fly to the In Chun from the Hanoi*	All

At the Ha Noi, Viet Nam

At Da Nang, Viet Nam

At Ho Chi Minh, Viet Nam

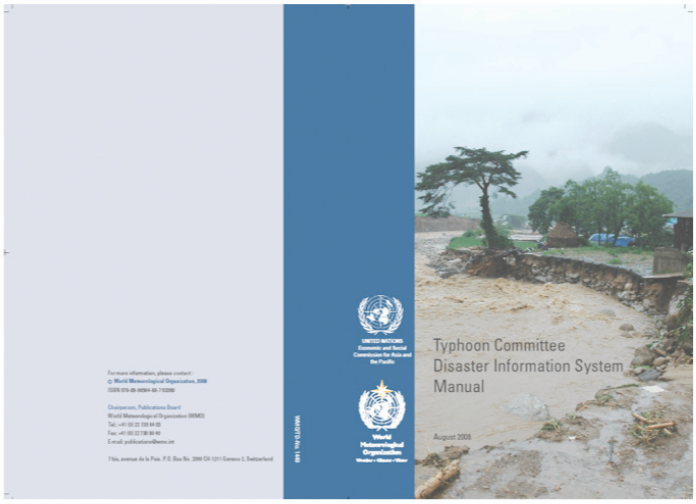
Expert team explained usage of WGTCDIS and method to put data into the WGTCDIS to the governments of Viet Nam. Viet Nam and NIDP agreed to work together when new typhoon come to Viet Nam to calibrate the new Viet Nam's WGTCDIS. Through the expert mission, we identified needs and gaps of technologies and disaster information and agreed to make collaborations for reducing gaps between Members.

WGTCDIS Manual

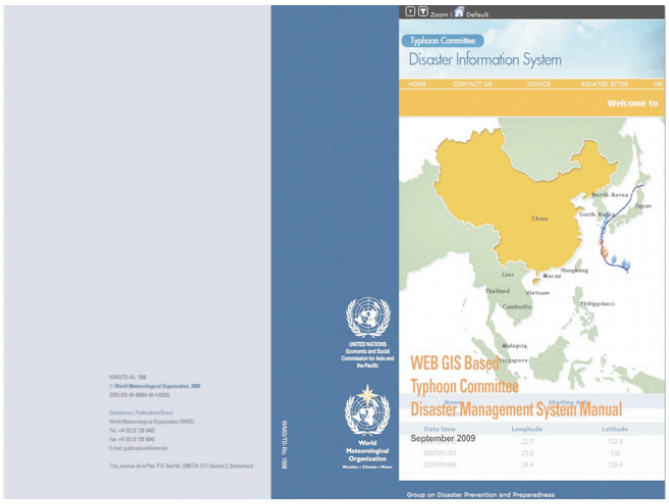
The Working Group on Disaster Prevention and Preparedness (WGDPP) developed the WEB GIS Based Typhoon Committee Disaster Information System (WGTCDIS) to share disaster related information, manage disaster and reduce damages from tropical cyclones or typhoons of 14 committee member countries in Asia and Pacific area, namely, Cambodia; China; Hong Kong, China; Japan; Lao People's Democratic Republic; Macao, China; Malaysia; People's Democratic Republic of Korea; Philippines; Republic of Korea; Singapore; Thailand; USA; Viet Nam, a practical information providing project had been suggested.

The WGDPP implemented first project in 2006 and established a website (www.tcdis.org) called the "Typhoon Committee Disaster Information System (TCDIS)". The TCDIS contributes to tropical cyclone related disaster risk reduction in the region though promoting a timely and efficient way of tropical cyclone related disaster information communication via its website. The WGTCDIS is upgrade version of TCDIS which can also be used as a platform for members to share disaster data, knowledge and experiences, good practices, and other information related to tropical cyclone disaster risk reduction.

One of main WGDPP projects is to support Typhoon Committee (TC)



TCDIS Manual



WGTCDIS Manual

Members and to identify and implement high priority activities for typhoon risk mitigation and commissioning of technical assistance and studies to sustain these initiatives. The WGTCDIS built now for Korea, Viet Nam and Hong Kong, China and will be extended as an early warning or disaster assessment system of other TC Members. The WGTCDIS manual will be used for understanding technical background of the WGTCDIS and help committee members to expand the WGTCDIS for their own system.

The main part of this manual is composed of two chapters and four Appendixes. From chapter one to four of Appendix, the procedures of installation of basic software are explained for running the WGTCDIS. It is not necessary for all the general users to learn these parts, but understanding technical background of the WGTCDIS. I am also confident that this publication will be useful for implementation of not only other tropical cyclone committee /hurricane committee but also for other WMO Members, in particular to their decision-makers, financial experts and emergency response managers. This manual will help all the TC members upload all the disaster related data and information and find similar typhoon trajectory and estimate typhoon related damage for disaster assessment.

Integrate Workshop on September in Cebu, Philippines

Thailand

The Latest Director General of the TMD

On 1st September this year, Mr. Angsumal Sunalai was appointed as the latest TMD's Director General.

Mr. Angsumal Sunalai holds the Bachelor of Science Degree in Mechanical Engineering from the Cebu Institute of Technology, the Philippines. Afterward, he started his career as a civil servant at the National Statistical Office of Thailand. Before taking charge of the TMD's Director General, Mr. Angsumal Sunalai had taken the post of Deputy Permanent Secretary at the Office of Permanent Secretary, Ministry of Information and Communication Technology. Besides the prosperity in his career, he also received the highest Badge of Honour "Knight Grand Cordon (Special Class) of the Most Noble Order of the Crown of Thailand" on 5th December, 2008.

Figure 1. The group photo at the opening ceremony of the 41st Session of ESCAP/WMO Typhoon Committee in Chiang Mai, Thailand

TMD hosted the 41st Session of Typhoon Committee

The Thai Meteorological Department held the 41st Session of ESCAP/WMO Typhoon Committee in Chiang Mai, Thailand during 19th – 24th January 2009. The Session was attended by 100 participants from 12 out of 14 Members of the Typhoon Committee as well as 6 observers from the United Nations International Strategy for Disaster Reduction Secretariat (UN/ISDR), the Federal Service for Hydrometeorology and Environmental Monitoring (ROSHYDROMET) of the Russian Federation, the United Nations Development Programme (UNDP), the Commission of Atmospheric Sciences of WMO (CAS/WMO), the Joint Typhoon Warning Center of USA, and the International Civil Aviation Organization (ICAO). Additionally, the representatives from the Economic and Social Commission for Asia and the Pacific (ESCAP), the World Meteorological Organization (WMO), and Typhoon Committee Secretariat (TCS) also attended the session.

This year, Dr. Roman L. Kintanar Award for Typhoon related Disaster Mitigation was presented to the Southern Meteorological Center of TMD and the Regional Specialized Meteorological Center (RSMC) Tokyo - Typhoon Center.

Figure 2. The representatives of the Southern Meteorological Center, TMD and the Regional Specialized Meteorological Center (RSMC) Tokyo - Typhoon Center received Dr. Roman L. Kintanar Award at the 41st Session of ESCAP/WMO Typhoon Committee.

briefs news

SUMMARY OF TYPHOON COMMITTEE ROVING SEMINAR 2009

(Nanjing, China, 16 - 19 November 2009)

Organization

The Eighth Roving Seminar of the Typhoon Committee was held at the Nanjing University of Information Science & Technology (NUIST) in Nanjing, China on 16 - 19 November 2009. It was organized with the generous support of WMO Public Weather Services Programme and Tropical Cyclone Programme and the support of Typhoon Committee Trust Fund.
It was attended by a total of 14 participants, which included 2 from DPR Korea, Philippines, Republic of Korea, Thailand and Viet Nam; 1 from Hong Kong, Macau, Malaysia, Singapore.

Seminar Programme

Mr. S.T. Chan of HKO presented Topic A on "Analysis and forecasting of high-impact weather associated with tropical cyclones".

Mr. Chip Guard of NOAA presented Topic B on "Formulation and compilation of tropical cyclone warning messages".

Mr. Sam Muchemi of WMO presented Topic C on "Communication and broadcasting of tropical cyclone warning messages through the mass media", including studio sessions for on-camera presentation skills.

Proposals and Recommendations

The participants gave a warm appreciation to the three Resource Persons for their outstanding presentations, which provided the participants with new insight on the topics discussed.

Closure of the Roving Seminar

The Resource Persons and participants expressed their gratitude and appreciation to the China Meteorological Administration and NUIST for the successful hosting of the Roving Seminar and for their warm hospitality.

The closing remarks were given by Prof. Xiefei Zhi, Deputy Director of RTC Nanjing, followed by the presentation of Attendance Certificates to the participants.

The Roving Seminar was closed on 19 November 2009.

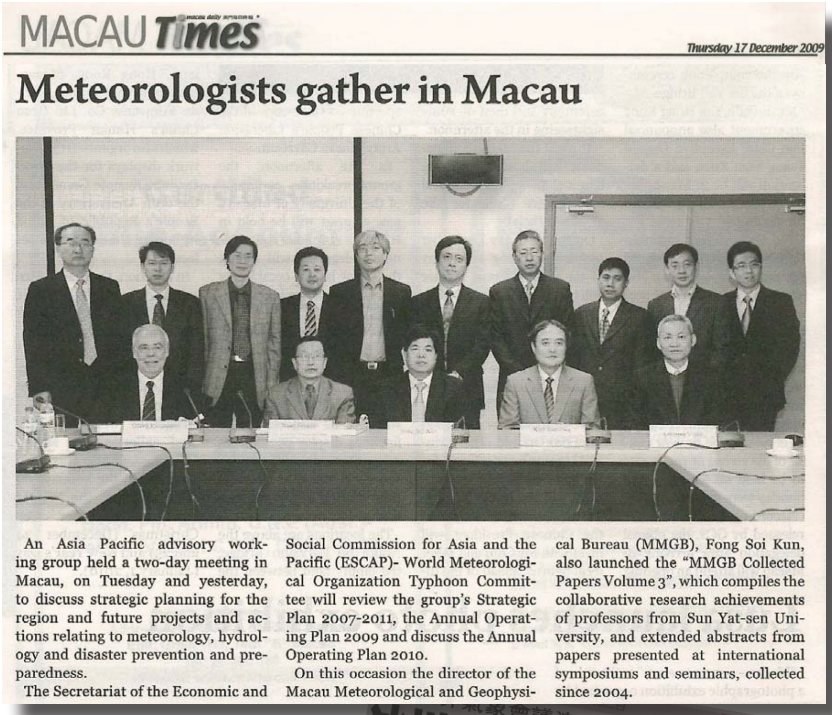
The Resource Persons and participants @ Roving Seminar in Nanjing 2009

AWG Meeting in Macao, China

ESCAP/WMO Typhoon Committee Advisory Working Group Meeting and the Launching Ceremony of the MMGB Collected Papers (Vol.3)

The Secretariat of the Economic and Social Commission for Asia and the Pacific (ESCAP) / World Meteorological Organization (WMO) Typhoon Committee (TC) is organizing a meeting of the Advisory Working Group of this Committee in Macao during 16-17 December 2009. The purpose of the meeting is to review its Strategic Plan 2007-2011, the Annual Operating Plan 2009 and to discuss the Annual Operating Plan 2010 and future projects and actions related to the TC main components: Meteorology, Hydrology and Disaster Prevention and Preparedness.
The meeting was scheduled held on 16 December at the conference room of the Conselho Consultivo para o Reordenamento dos Bairros Antigos de Macau. The meeting will be attended by the chairpersons of the Working Groups and high representatives of the ESCAP and WMO.

At the commencement of the meeting, a launching ceremony for the "MMGB Collected Papers Volume 3" hosted by the Director of the Macao Meteorological and Geophysical Bureau (MMGB) Dr. Fong Soi Kun.



MACAU Times

Thursday 17 December 2009

Meteorologists gather in Macau

An Asia Pacific advisory working group held a two-day meeting in Macau, on Tuesday and yesterday, to discuss strategic planning for the region and future projects and actions relating to meteorology, hydrology and disaster prevention and preparedness.

The Secretariat of the Economic and Social Commission for Asia and the Pacific (ESCAP)- World Meteorological Organization Typhoon Committee will review the group's Strategic Plan 2007-2011, the Annual Operating Plan 2009 and discuss the Annual Operating Plan 2010.

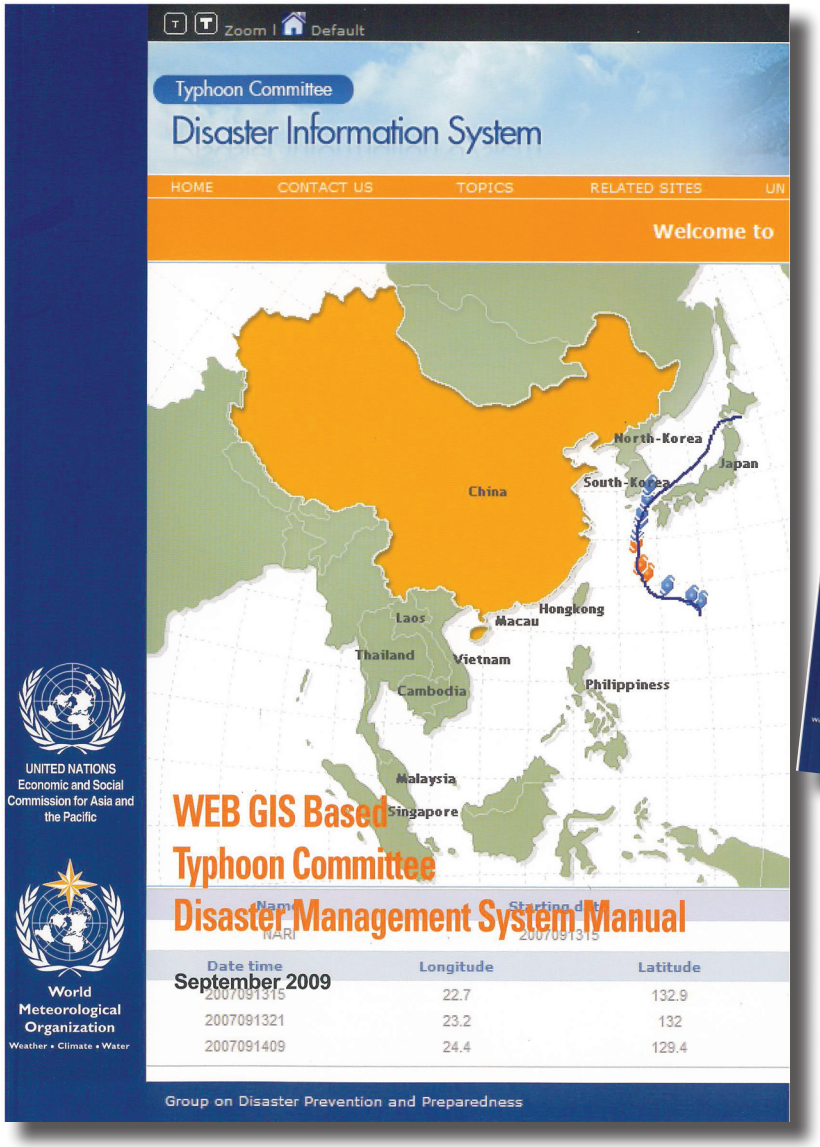
On this occasion the director of the Macau Meteorological and Geophysical Bureau (MMGB), Fong Soi Kun, also launched the "MMGB Collected Papers Volume 3", which compiles the collaborative research achievements of professors from Sun Yat-sen University, and extended abstracts from papers presented at international symposiums and seminars, collected since 2004.

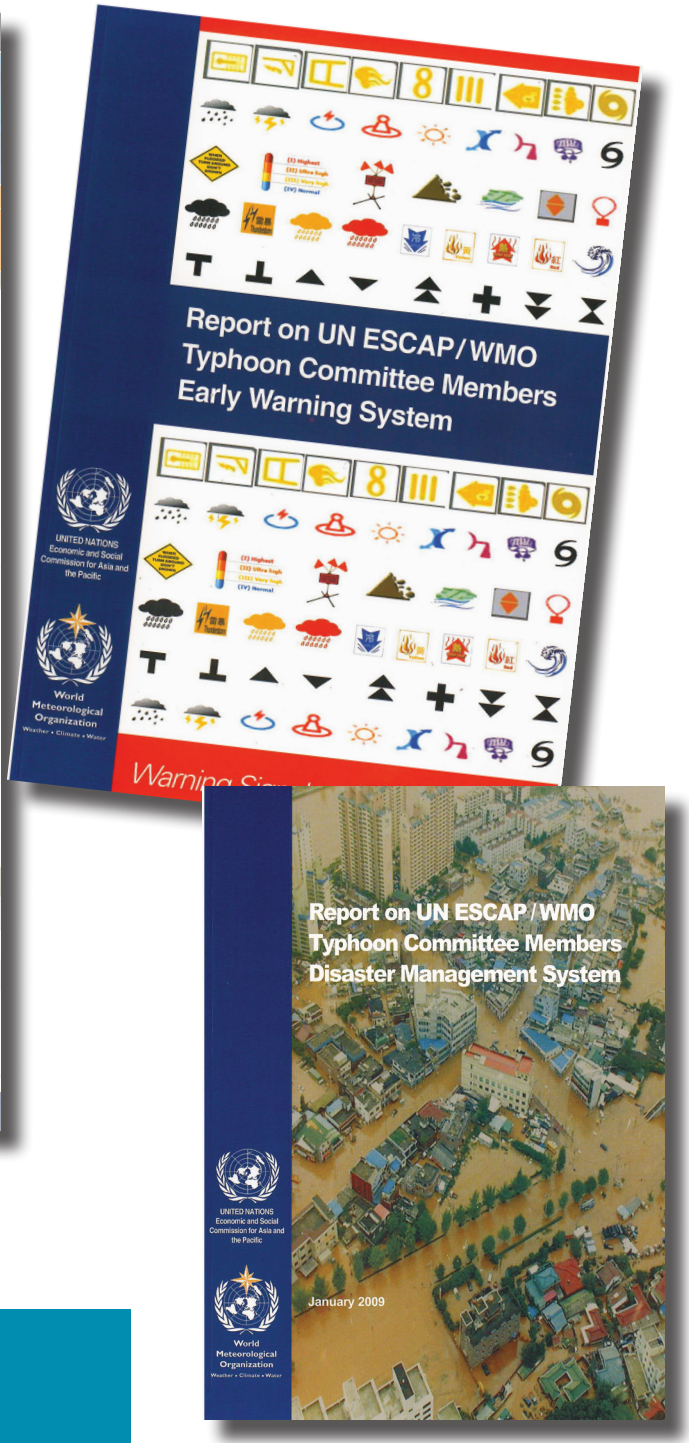
News from the local media related to the TC AWG Meeting held in Macao, China

Since Year 2004, MMGB started to compile the collaboration research achievements with the professors from the Sun Yat-sen University, extended abstracts for papers presented at the international symposia or seminars, as well as the regional professional cooperation workshops by the colleagues in MMGB for publication of the collected papers. This year the publication is the 3rd volume of the collected papers.

In celebrating of the Tenth Anniversary of the Macao Special Administrative Region, MMGB issued the 3rd Volume of the Collected Papers this year. MMGB will continue to keep abreast of the times and to work hard on researching on meteorological and climate change, aiming to use their expertise to the improvement of livelihood.

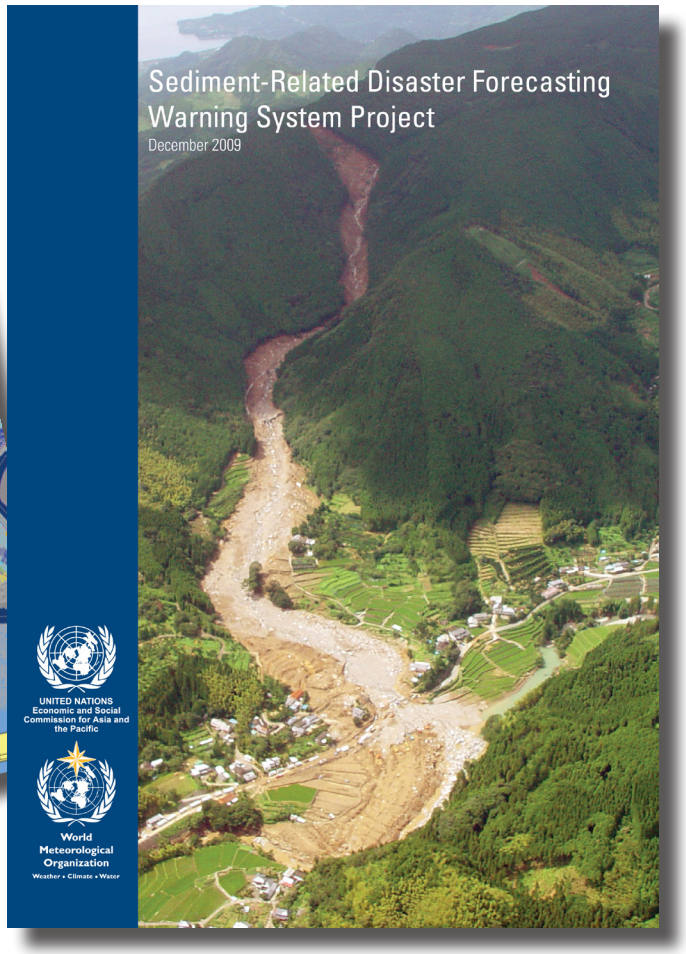
Publications of Typhoon Committee





TC Publications from WGDPP

TC Publications from WGH



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Humour Corner