COUNTRY REPORT

ESCAP/WMO Typhoon Committee

44th Session

6 - 11 February 2012

China

JAPAN

CONTENTS

I. Overview of tropical cyclones which have affected/impacted Member's area since the last Typhoon Committee Session

1. Meteorological Assessment (highlighting forecasting issues/impacts)

In 2011, nine tropical cyclones (TCs) of tropical storm (TS) intensity or higher had come within 300 km of the Japanese islands. Seven of these affected Japan, with three making landfall. The details of these seven are described below, and their tracks are shown in Figure 1.

(1) TS Aere (1101)

Aere was upgraded to tropical storm (TS) intensity at 12 UTC on 7 May and reached its peak intensity with maximum sustained winds of 40 kt and a central pressure of 992 hPa east of Luzon Island 24 hours later. After moving along the northeastern coast of Luzon Island, it turned northeastward and moved along the Okinawa Islands before weakening to tropical depression (TD) intensity south of Kyushu Island at 18 UTC on 11 May. Cancellations of flights and ship departures were reported in Okinawa Prefecture.

(2) TY Songda (1102)

Songda was upgraded to tropical storm (TS) intensity just south of Yap Island at 12 UTC on 21 May. Soon after being upgraded to typhoon (TY) intensity east of the Philippines at 18 UTC on 24 May, it turned northwestward and reached its peak intensity with maximum sustained winds of 105 kt and a central pressure of 920 hPa east of Luzon Island at 06 UTC on 26 May. Gradually turning northeastward, it moved along the Okinawa Islands before transforming into an extratropical cyclone at 06 UTC on 29 May south of Shikoku Island. A peak gust of 55.3 m/s was recorded at Naha (47936), and a 24-hour precipitation total of 457.5 mm was recorded at Yakushima (47836). Damage to houses and farm products, power outages and cancellations of flights and ship departures were reported in areas from Kinki to Okinawa.

(3) STS Meari (1105)

Meari was upgraded to tropical storm (TS) intensity over the sea east of Samar Island in the Philippines at 00 UTC on 22 June. Moving north-northwestward, it was further upgraded to severe tropical storm (STS) intensity east of Luzon Island 24 hours later. Keeping its north-northwestward track and gradually accelerating, Meari reached its peak intensity with maximum sustained winds of 60 kt and a central pressure of 975 hPa south of the Sakishima Islands at 09 UTC on 24 June. After moving northward over the East China Sea, it turned sharply to the northeast near the Shandong Peninsula and was downgraded to TS intensity over the Yellow Sea at 00 UTC on 27 June. It transformed into an extratropical cyclone off the northwestern coast of the Korean Peninsula at 06 UTC on 27 June and dissipated six hours later. A peak gust of 33.6 m/s was recorded at Naha (47936), and one person was injured due to strong winds in Okinawa Prefecture. Damage to farm products, power outages and cancellations of flights and ship departures were also reported in Okinawa Prefecture.

(4) TY Ma-on (1106)

Ma-on was upgraded to tropical storm (TS) intensity at 00 UTC on 12 July before being further upgraded to typhoon (TY) intensity northeast of the Mariana Islands at 00 UTC on 14 July. Soon after turning northwestward, it reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 935 hPa northeast of Okinotorishima Island at 12 UTC on 16 July. It turned northward late on 17 July and made landfall on Shikoku Island with TY intensity at around 14 UTC on 19 July. A few hours later, Ma-on moved eastward and passed around Shionomisaki with severe tropical storm (STS) intensity before 01 UTC the next day. It moved southeastward until early on 22 July before turning north-northeastward and transforming into an extratropical cyclone east of Hokkaido at 12 UTC on 24 July. A peak gust of 46.6 m/s was recorded at Murotomisaki (47899), and a 24-hour precipitation total of 532.5 mm was observed at Owase (47663). Two people died after being swept away in swollen rivers. Damage to houses and farm products, power outages and transport disruption were reported across a wide area stretching from Tohoku to Okinawa.

(5) TY Muifa (1109)

Muifa was upgraded to tropical storm (TS) intensity at 06 UTC on 28 July as it followed a constant westward track. After turning northward on 28 July, it was upgraded to typhoon (TY) intensity east of the Philippines at 00 UTC the next day. It developed rapidly and reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 930 hPa southwest of Okinotorishima Island at 18 UTC on 30 August. Muifa turned gradually westward on 2 August and maintained a westward track for around two days. Turning northward on 5 August, it passed around Kumejima Island with TY intensity at around 13 UTC before gradually weakening while moving northward over the East China Sea and the Yellow Sea. It hit the northern Korean Peninsula on 8 August and weakened to TD intensity in northeastern China at 00 UTC the next day. A peak gust of 47.3 m/s and a 24-hour precipitation total of 459.0 mm were recorded at Nago (47940). Damage to houses and farm products, power outages and cancellations of flights and ship departures were reported in Okinawa Prefecture.

(6) STS Talas (1112)

Talas was upgraded to tropical storm (TS) intensity at 00 UTC on 25 August. Decelerating as it moved northward, it was upgraded to severe tropical storm (STS) intensity at 12 UTC on 27 August and reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 970 hPa southwest of Iwoto Island two days later. Turning westward then northwestward, it made landfall on Shikoku Island with STS intensity at around 01 UTC on 3 September. After crossing the island northward, Talas made landfall again in the Chugoku region of western Japan just after 09 UTC the same day. After moving over the Sea of Japan, it accelerated northward and transformed into an extratropical cyclone at 06 UTC on 5 September. A 24-hour precipitation total of 684.0 mm was observed at Owase (47663), and a 72-hour total of 1,652.5 mm (the highest ever recorded in Japan) was recorded at an AWS station in Nara Prefecture. A total of 78 people were killed due to flooding and landslides in eastern and western Japan, mainly in the prefectures of Wakayama, Nara and Mie (Figure 2). Damage to houses and farm products, power outages and transport disruption were also reported across a wide area stretching from Hokkaido to Shikoku.

(7) TY Roke (1115)

Roke was upgraded to tropical storm (TS) intensity over the sea northeast of Okinotorishima Island at 06 UTC on 13 September. It moved west-northwestward and turned in a counterclockwise direction to circle near the Daito Islands before being upgraded to typhoon (TY) intensity near Kikaijima Island at 12 UTC on 19 September. It reached its peak intensity with maximum sustained winds of 85 kt and a central pressure of 940 hPa 24 hours later. Moving northeastward, Roke made landfall around Hamamatsu City in Shizuoka Prefecture with TY intensity at around 05 UTC on 21 September. Keeping its northeastward track, it transformed into an extratropical cyclone east of Hokkaido at 06 UTC on 22 September. A peak gust of 45.5 m/s was recorded at Minamidaitojima (47945), and a 24-hour precipitation total of 489.0 mm was observed at Tokushima (47895). A total of 17 people were killed due to landslides, flooding and strong winds across an area stretching from Tohoku to Kyushu. Damage to houses and farm products, power outages and transport disruption were also reported across wide areas of Japan.

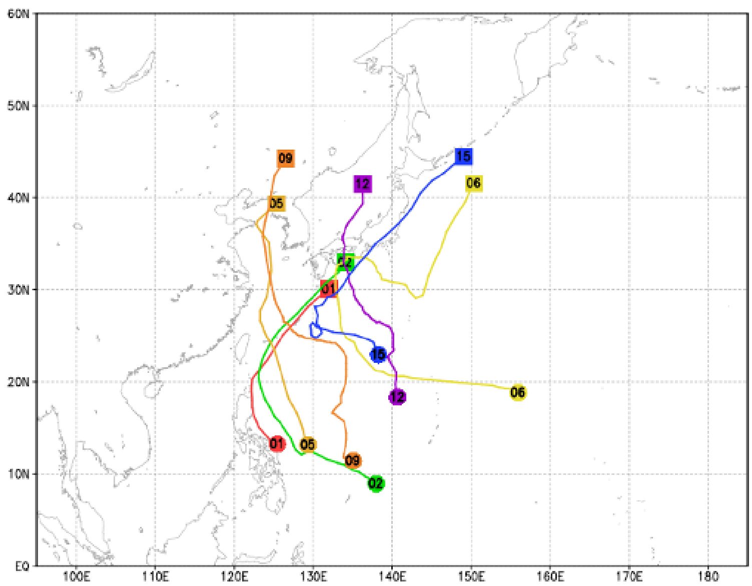

Figure 1. Tracks of the seven named TCs affecting Japan in 2011

The numbered circles represent the genesis point of each named TC, while the squares show the dissipation point. The numbers indicate the last two digits of the identification number for each named TC.

Figure 2. Effects of STS Talas (1112). Left: the Kumano River flowing over Kumano Bridge (photo: Kinan Office of River and National Highway). Right: landslide-dammed lake in Nara Prefecture (photo: JMA)

2. Hydrological Assessment (highlighting water-related issues/impact)
3. Socio-Economic Assessment (highlighting socio-economic and DPP issues/impacts)
4. Regional Cooperation Assessment (highlighting regional cooperation successes and challenges)

II. Summary of progress in Key Result Areas

1. Progress on Key Result Area 1: Reduced Loss of Life from Typhoon-related Disasters.

a. Meteorological Achievements/Results

a-1. Provision of Storm Surge Distribution Maps for Typhoon Committee Members

To establish a regional storm surge watch scheme suitable for the Typhoon Committee region, the ESCAP/WMO Typhoon Committee adopted the Annual Operating Plan for 2010 at its 42nd session (Singapore, January 2010). In response, JMA has collected bathymetric and tidal data from Typhoon Committee Members since 2010, and has developed and begun operation of a numerical storm surge model covering most of the Typhoon Committee region.

Based on this preliminary work, JMA started issuing storm surge distribution maps for Typhoon Committee Members through its Numerical Typhoon Prediction website (https://tynwp-web.kishou.go.jp/) on June 1, 2011.

Registered users can download normal-image (covering the whole calculation area) and enlarged-image (covering areas around the typhoon of interest) storm surge distribution maps and select any 3-hourly forecast maps up to 72 hours from the initial time. JMA also plans to issue storm surge time series charts for selected stations starting in 2012.

(KRA 7)

b. Hydrological Achievements/Results

b-1. SABO workshop on project for “Hazard Mapping for Sediment-related Disaster”

The SABO Dept. of MLIT, NILIM and SABO technical center, Japan, have been conducting projects “Sediment-related disaster forecasting warning system project” (2002-2008), “Hazard Mapping for Sediment-related disaster” (2009 - On going). For effective and efficient evacuation, establishing the system to connect “Forecasting” and “Hazard map” for warning and evacuation is essential. Therefore prior to 6th TCIWS, On November 6, SABO Workshop was held in Nha Trang, Viet Num, successfully. In SABO Workshop, a lecture and field training, regarding how to establish the warning and evacuation system against sediment-related disaster, was held to explain the system used in Japan and how the meteorological agency, local disaster prevention section, municipality office and local residents act to operate warning and evacuation systems effectively for 20 participants from six TC members (China, Japan, Korea, Lao PDR, Thailand, Viet Num) and local engineers.

Figure 3. Lecture (left) and Field training (right)

In the 6th TCIWS, the progress of the Project was reported that participants of the project had already selected model sites, and will set hazardous area at their model sites by referring the methodology of Japan in 2011. In 2012, the guideline of the project including Japanese technique of “How to identify hazardous area”, “How to make hazard map” and participants’ examples will be published as final report.

(KRA2, 4, 5, 6, 7)

c. Disaster Prevention and Preparedness Achievements/Results

c-1. Major Disaster and Response Measures since January 2011

In 2011, Japan was affected by significant flooding and torrential rain, with serious damage being caused by two typhoons in particular. Typhoon Talas disrupted the western part of Japan from 3 to 5 September, bringing heavy rainfall of up to 130 millimeters per hour in Wakayama Prefecture and causing in 52 fatalities as well as the complete or partial destruction of more than 2,000 houses. Throughout the country, 94 people were killed or reported missing and 109 were injured, and inundation above floor level affected as many as 5,664 houses. These torrential rains caused a number of landslides in mountain areas, while built-up sediment blocked rivers and major secondary disaster conditions resulted from the collapse of dammed lakes. In response, the Major Disaster Management Headquarters began related operations on 4 September. The Prime Minister visited affected sites in the prefectures of Mie, Nara and Wakayama, and the Minister of State for Disaster Management and other related ministers visited the affected areas to investigate the damage first-hand.

Typhoon Roke also hit Japan in September, bringing over 1,000 millimeters of precipitation to Kyushu and parts of Shikoku between 10 and 22 September (more than double the average for the whole month). This rainfall resulted in 18 fatalities, caused inundation above floor level in 2,145 houses and damaged about 9,400 other houses. In response, the national government called a series of inter-ministerial meetings to collect information and support the coordination of emergency response operations.

d. Research, Training, and Other Achievements/Results

e. Regional Cooperation Achievements/Results

f. Identified Opportunities/Challenges for Future Achievements/Results

2. Progress on Key Result Area 2: Minimized Typhoon-related Social and Economic Impacts.

a. Meteorological Achievements/Results

b. Hydrological Achievements/Results

c. Disaster Prevention and Preparedness Achievements/Results

d. Research, Training, and Other Achievements/Results

e. Regional Cooperation Achievements/Results

f. Identified Opportunities/Challenges for Future Achievements/Results

3. Progress on Key Result Area 3: Enhanced Beneficial Typhoon-related Effects for the Betterment of Quality of life.

a. Meteorological Achievements/Results

b. Hydrological Achievements/Results

c. Disaster Prevention and Preparedness Achievements/Results

d. Research, Training, and Other Achievements/Results

e. Regional Cooperation Achievements/Results

f. Identified Opportunities/Challenges for Future Achievements/Results

4. Progress on Key Result Area 4: Improved Typhoon-related Disaster Risk Management in Various Sectors.

a. Meteorological Achievements/Results

a-1. JMA's Climate Change Monitoring Report

JMA describes inter-annual variability and long-term trends regarding typhoon activity in its Climate Change Monitoring Report every year. This is distributed to the Japanese public as well as to NHMSs via the Tokyo Climate Center's website (http://ds.data.jma.go.jp/gmd/tcc/tcc/products/gwp/gwp.html).

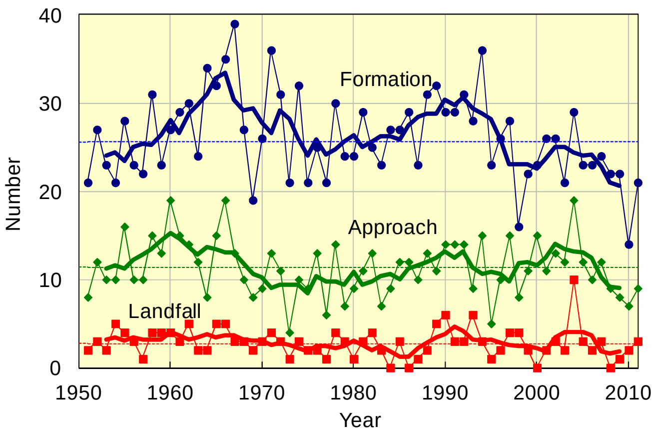

Figure 4. The number of tropical cyclones (TS intensity or higher) forming in the western North Pacific (top), those that approached Japan (middle) and those that hit Japan (bottom). The thin, solid and dashed lines represent annual/five-year running means and normal values (1981 – 2010 averages), respectively.

(KRA1, 2, 5, 6)

b. Hydrological Achievements/Results

b-1. Measures to Protect People from the Effects of Large-scale Sediment Disasters

Amendment to the Sediment-related Disaster Prevention Act

The partially amended Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Areas was enforced on May 1, 2011. The act was amended for the purposes of further protecting people from the effects of sediment disasters and providing support for municipal mayors in making appropriate judgments on the issuance of evacuation orders to residents based on the Basic Act on Disaster Control Measures. If river blockages (natural dams) or volcanic eruptions are likely to cause debris flow and present an imminent danger, the central government will conduct emergency investigations. If a high likelihood of landslides presents an imminent danger, prefectural governments will conduct such investigations. The results are used to dispatch information on disaster-prone areas and estimated times of disaster occurrence (collectively known as emergency information on sediment disasters) to the relevant municipalities and to the public at large.

Eruption of Mt. Shinmoedake

Mt. Shinmoedake in the Kirishima volcano group started erupting on January 26, 2011, and more than a centimeter of volcanic ash has so far accumulated at ground level in local areas as a result. An emergency investigation in the area was conducted before the enforcement of the act, and emergency information was provided to the relevant municipalities, which in turn issued evacuation orders based on this information and on data showing predicted rainfall in the area.

Disaster conditions caused by Typhoon Talas

Typhoon Talas hit the eastern part of Kochi Prefecture, Shikoku Island, on September 3, 2011, bringing record rainfall across a wide area stretching from western to northern Japan. On the Kii Peninsula in particular, the total precipitation was over 1,800 millimeters.

This torrential rainfall caused deep rapid landslides, river blockages and the formation of natural dams. As a result, emergency investigations were conducted in five areas where river blockages remained after the rainfall, and emergency information was provided to the relevant municipalities, which initially issued evacuation orders based on the information. However, as Typhoon Roke was also approaching, more mandatory emergency evacuation areas were designated, and a thorough program of resident evacuation was implemented.

To address the high risk of river blockages (natural dams) overflowing or giving way, thereby worsening sediment disaster conditions, emergency drainage work was started using temporary drainage channels and pumps on September 16. As the natural dams were located deep in mountainous areas and roads were closed after the disaster, emergency construction work was implemented with equipment being transported by helicopter – an advanced technological approach based on past experience. Once the water level of the natural dams was lowered using temporary drainage channels and drainage pumps, planning for the construction of sabo dams and channels was started to prevent another disaster in the future.

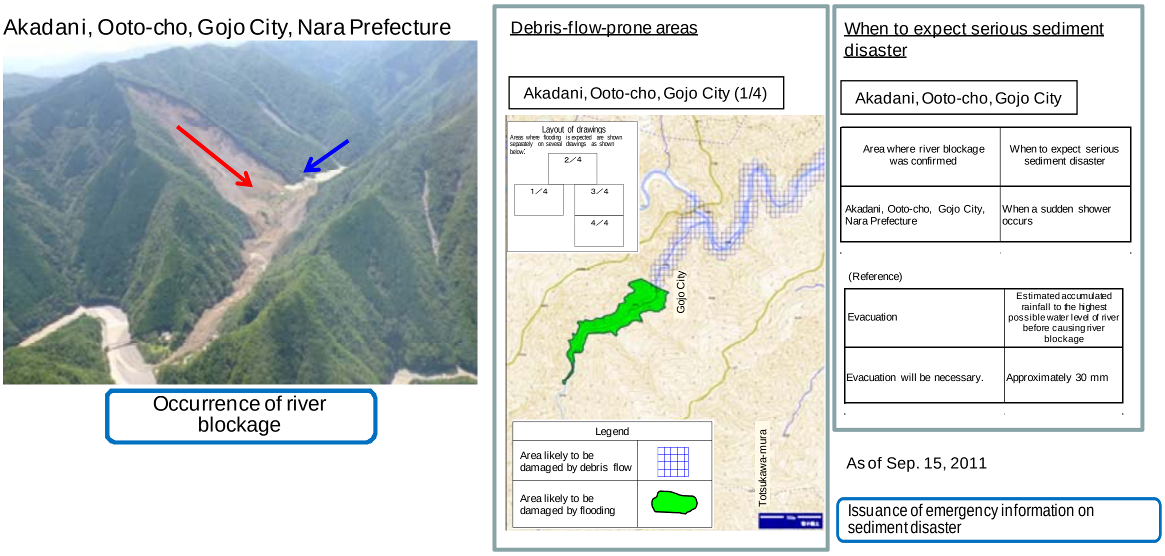

Figure 5.

Development of a large-collapse monitoring and warning system

The deep rapid landslides caused by Typhoon Talas resulted in tremendous damage. As a countermeasure, it is now considered an urgent priority to establish methods of monitor and guard at-risk sites and determine the potential extent of such disasters. Accordingly, plans are underway for the development of a large-collapse monitoring and warning system based on advanced technology and facilities in areas where deep rapid landslides may occur. Specifically, these plans involve:

- Investigation of conditions leading to deep rapid landslide occurrence
- Analysis of the mechanism by which Typhoon Talas caused deep rapid landslides
- Monitoring the rainfall of wide area using radar
- Early detection of large collapse through a network of deep rapid landslide sensors
- Urgent determination of sites and potential extents of deep rapid landslides based on satellite image analysis

To support timely evacuation of local residents, the large-collapse monitoring and warning system will be developed with a combination of monitoring and observation equipment and information will be provided to local autonomous bodies.

c. Disaster Prevention and Preparedness Achievements/Results

c-1. Visiting Researchers from ADRC Member Countries

Major Disaster and Response Measures Implemented since January 2011

The Asian Disaster Reduction Center (ADRC) has hosted visiting researchers (VRs) from member countries since 1999, with 63 officials having taken part in the program to date. VRs learn about Japan's advanced expertise and technology in the field of disaster risk reduction (DRR). Researchers finishing the program are expected to be able not only to contribute to strengthening DRR capacity in their home nations but also to further promote cooperation between their countries and the ADRC. In 2011, the ADRC hosted eight visiting researchers from the member countries listed below.

FY	Name	Country
2011	Emin Nazarov	Azerbaijan
	Surina Binti Othman	Malaysia
	Anna-Lisa Dumaguing Orallo	Philippines
	Sisira Wanninayake	Sri Lanka
	Md Munir Chowdhury	Bangladesh
	Bazarragchaa Sodnom	Mongolia
	Dangal Rameshwor	Nepal
	Phatsita Rerngnirunsathit	Thailand

Figure 6. Visiting Researchers

d. Research, Training, and Other Achievements/Results

e. Regional Cooperation Achievements/Results

f. Identified Opportunities/Challenges for Future Achievements/Results

5. Progress on Key Result Area 5: Strengthened Resilience of Communities to Typhoon-related Disasters.

a. Meteorological Achievements/Results

b. Hydrological Achievements/Results

c. Disaster Prevention and Preparedness Achievements/Results

d. Research, Training, and Other Achievements/Results

e. Regional Cooperation Achievements/Results

f. Identified Opportunities/Challenges for Future Achievements/Results

6. Progress on Key Result Area 6: Improved Capacity to Generate and Provide Accurate, Timely, and understandable Information on Typhoon-related Threats.

a. Meteorological Achievements/Results

a-1. JMA Starts Centres of WMO Information System (WIS)

As designated at the Sixteenth WMO Congress in June 2011, the Japan Meteorological Agency (JMA) began providing services for the Global Information System Centre (GISC) and eight Data Collection or Production Centres (DCPCs) on August 1, 2011.

The WIS is a new framework for the collection and sharing of information in support of all WMO and related international programs. The Global Telecommunication System (GTS) continues to serve time- and operation-critical information as an important part of the WIS, while Internet-based information services are being streamlined under a comprehensive catalogue for Data Discovery, Access and Retrieval (DAR).

Existing Internet data services offered by JMA will be provided through the new servers of

GISC Tokyo. Such services include the RSMC Data Serving System (RSMC DSS), the JMA WIS Prototype Service (MTSAT imagery and NWP products for SATAID software), and JMA High-resolution GSM Data. For more details, please visit the GISC Tokyo portal site at http://www.wis-jma.go.jp/.

a-2. Improvement of the Global Telecommunication System

In accordance with the TCP/IP strategic plan approved by CBS (Ext. 1998), the Japan Meteorological Agency (JMA) started the migration of its telecommunication protocol from X.25 to the TCP socket procedure in 1999 based on the procedures prescribed in Manual on the GTS. JMA also upgraded its GTS message switching system to additionally support WMO's FTP procedure in response to the increasing number of NMHSs adopting the procedure in recent years. In December 2011, the procedure was successfully applied to the main telecommunication network circuit between RTHs in Beijing and Tokyo in place of the socket procedure that had been used since 2001.

In addition, as Global Information System Centres (GISCs) of the WMO Information System (WIS) have started or are scheduled to start operation, new connections will be established between these centers, and data synchronization for the WIS is expected in the next few years. This will produce a significant increase in the amount of traffic using the Regional Meteorological Data Communication Network (RMDCN), which plays an important role as a core network of the WIS. In order to cope with these changes, JMA upgraded the IP bandwidth for the RMDCN from 3 Mbps to 10 Mbps in September 2011.

a-3. Introduction of a Stochastic Physics Scheme for Representation of Model Uncertainties to JMA's Typhoon Ensemble Prediction System

Since February 2008, the Japan Meteorological Agency (JMA) has operated the typhoon ensemble prediction system (TEPS), which is designed to improve track forecast targeting for tropical cyclones (TCs) in the Regional Specialized Meteorological Centre (RSMC) Tokyo - Typhoon Center's area of responsibility within the framework of the World Meteorological Organization. The forecast model employed in TEPS is a low-resolution version (TL319L60) of JMA's Global Spectral Model (GSM) at TL959L60. TEPS adopts a singular vector (SV) method to generate its initial perturbations and calculates dry SVs targeting the mid-latitude area in the center's area of responsibility. It also calculates moist SVs targeting TC surroundings where moist processes are critical.

A stochastic physics scheme was introduced into TEPS in December 2010 after a related numerical experiment. The scheme, which is based on Buizza et al. (1999), stochastically perturbs tendencies of parameterized physical processes. As a result of this introduction, TEPS started representing model uncertainties in addition to initial data uncertainties. The experimental results show that the introduction makes the ensemble spread more appropriate in terms of the spread-skill relationship and improves forecast skill, especially over the tropics. On the other hand, the results of experiments regarding the TC track forecast show that the introduction has a neutral impact on reducing the size of forecast errors for the ensemble mean TC track and improving the spread-skill relationship (as shown in Figure 7).

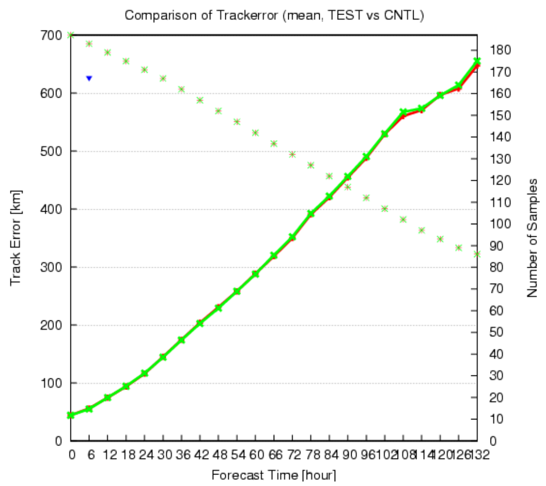

Figure 7. Mean position error of the ensemble mean TC track from TEPS. The horizontal axis shows the forecast range up to 132 hours ahead, and the green and red lines represent the results of verification for the current and previous systems, respectively. The crosses indicate the numbers of verified samples based on the vertical scale on the right.

(KRA1, 2, 4, 5, 7)

a-4. Upgrade of the Resolution of the Inner Model Used in JMA's Global Analysis System

A four-dimensional variational (4D-Var) data assimilation method has been employed for atmospheric analysis with JMA's Global Spectral Model (GSM) since February 2005. In 4D-Var, analysis increments are calculated using an inner model with a resolution lower than that of the GSM due to the limitations of available computational resources. The resolution of the inner model was originally configured as T63L40, and was upgraded to T106L40 in March 2006, then to T159L60 in November 2007. Speed-up of 4D-Var was required in order to allow a further upgrade of the inner model's resolution from T159L60, which was still insufficient in light of the GSM's TL959L60 resolution. As the inner model used an Eulerian advection scheme and a standard Gaussian grid, a semi-Lagrangian advection scheme and an adaptive (or reduced) Gaussian grid were introduced to speed up 4D-Var, and both have been used in the GSM since August 2008. With the introduction of these modifications, the resolution of the inner model was successfully upgraded to TL319L60 in October 2011 without the need for large amounts of additional computational power. At the same time, the background and observational error statistics used in 4D-Var were recalculated.

In order to evaluate the performance of the new system, forecast-analysis cycle experiments were performed for the one-month periods of January and August 2010. Nine-day forecasts were made once a day based on 12 UTC initial conditions throughout the experiment periods. Positive impacts on 500-hPa geopotential height forecasts were seen in comparison to the previous system, mainly in the Northern Hemisphere. Figure 8 shows the track forecast errors for typhoons T1004 – T1010. The values for the new system are almost the same as those of the previous one, although in some cases the new system better represented the atmospheric structure around typhoons. Figure 9 shows the case of T1004.

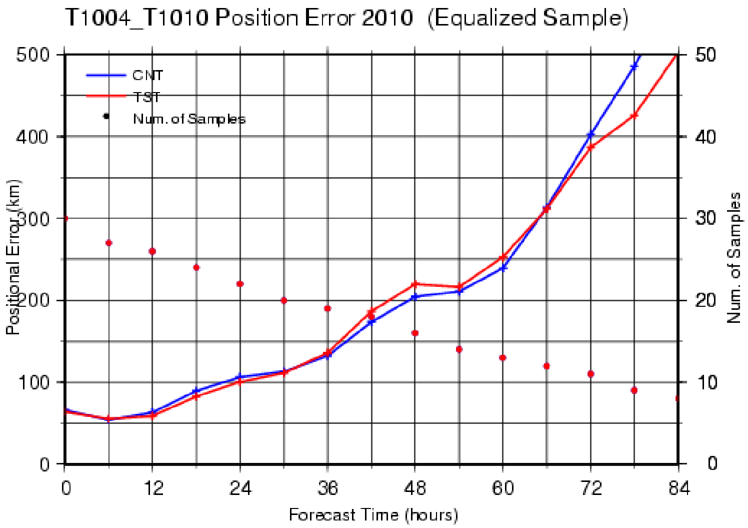

Figure 8. Typhoon track forecast errors of TCs T1004 – T1010 for the period from 01 August, 2010, to 09 September, 2010. The red line represents the new system, and the blue one represents the previous system.

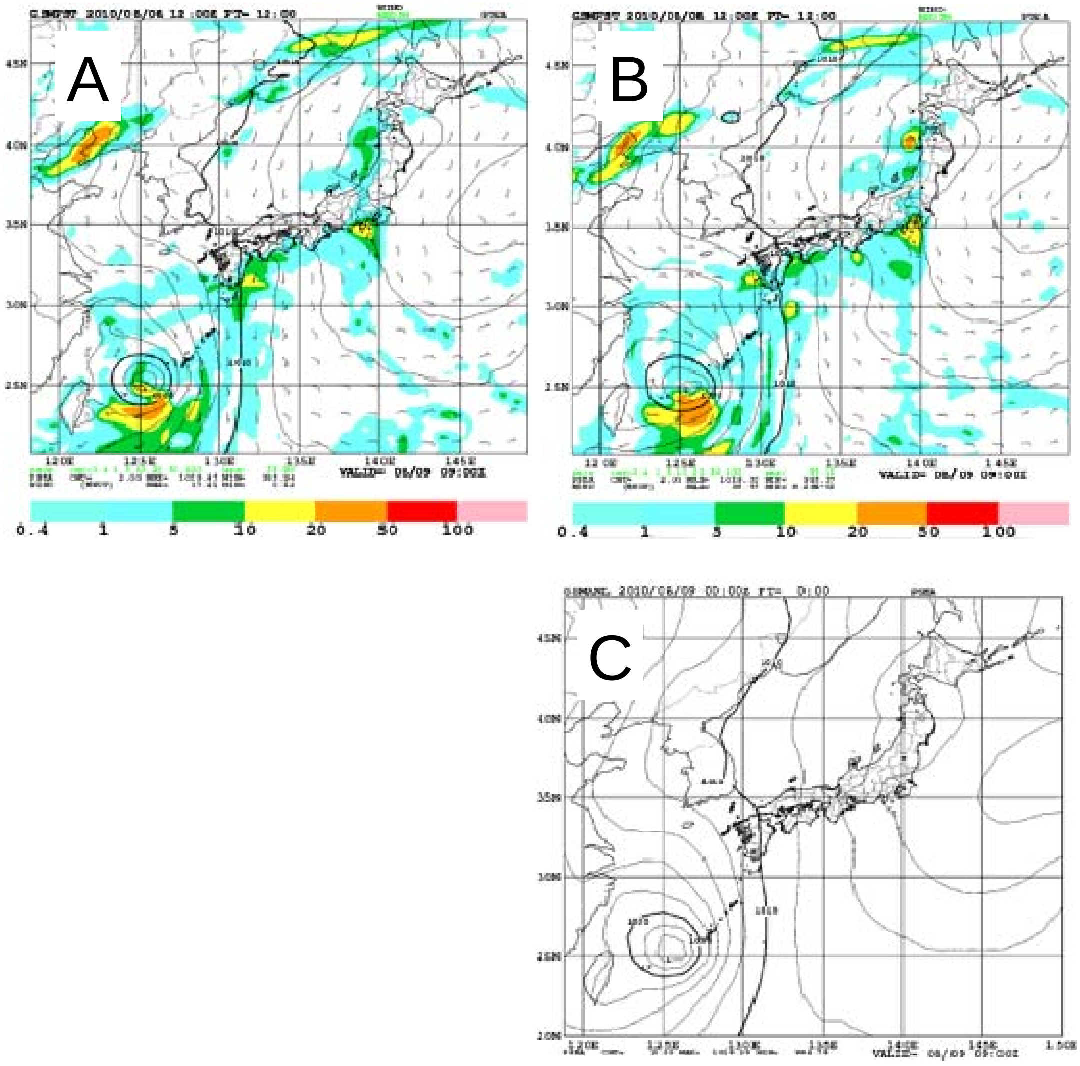

Figure 9. Mean sea level pressure (contours) [hPa] and precipitation (shading) [mm/3 h]. (A) 12-hour forecast of the previous system (B) 12-hour forecast of the new system (C) Analysis

(KRA1, 2, 4, 5, 7)

a-5. Weekly report on extreme climate events

JMA issues weekly reports on extreme climate events around the world, including extremely heavy precipitation and/or weather-related disasters caused by tropical cyclones. These reports are distributed to NMHSs via the TCC website in near-real time (http://ds.data.jma.go.jp/gmd/tcc/tcc/products/climate/).

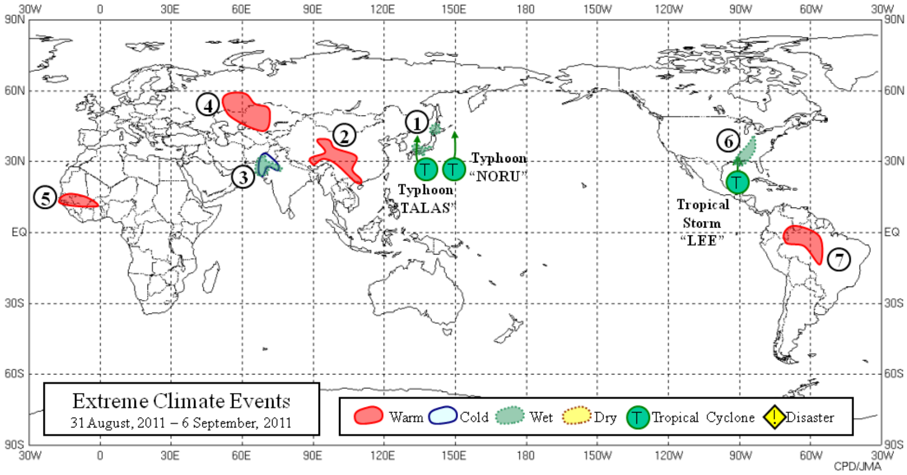

Figure 10. Distribution of global extreme climate events (31 Aug., 2011 – 6 Sep., 2011) The figure highlights areas where extreme climate events were identified from SYNOP messages, and also shows the tracks of tropical cyclones based on preliminary data from tropical cyclone centers worldwide

s(KRA 1, 2, 4, 5, 7)

b. Hydrological Achievements/Results

c. Disaster Prevention and Preparedness Achievements/Results

d. Research, Training, and Other Achievements/Results

e. Regional Cooperation Achievements/Results

f. Identified Opportunities/Challenges for Future Achievements/Results

7. Progress on Key Result Area 7: Enhanced Typhoon Committee's Effectiveness and International Collaboration.

a. Meteorological Achievements/Results

a-1. TCC News

Tokyo Climate Centre (TCC) issues a quarterly newsletter called TCC News, which is available on the TCC website. It covers various climate-related topics including the El Niño outlook, JMA's seasonal numerical prediction for the coming summer/winter, summaries of Asian summer/winter monsoons, reports on extreme climate events around the world, and introductions to new TCC services. The latest issue, TCC News No. 26, covers the near-normal frequency seen in the formation of tropical cyclones of tropical storm (TS) intensity or higher over the western North Pacific in 2011, and discusses two severe tropical storms and two typhoons that caused fatalities in the Philippines and Japan (http://ds.data.jma.go.jp/tcc/tcc/news/tccnews26.pdf).

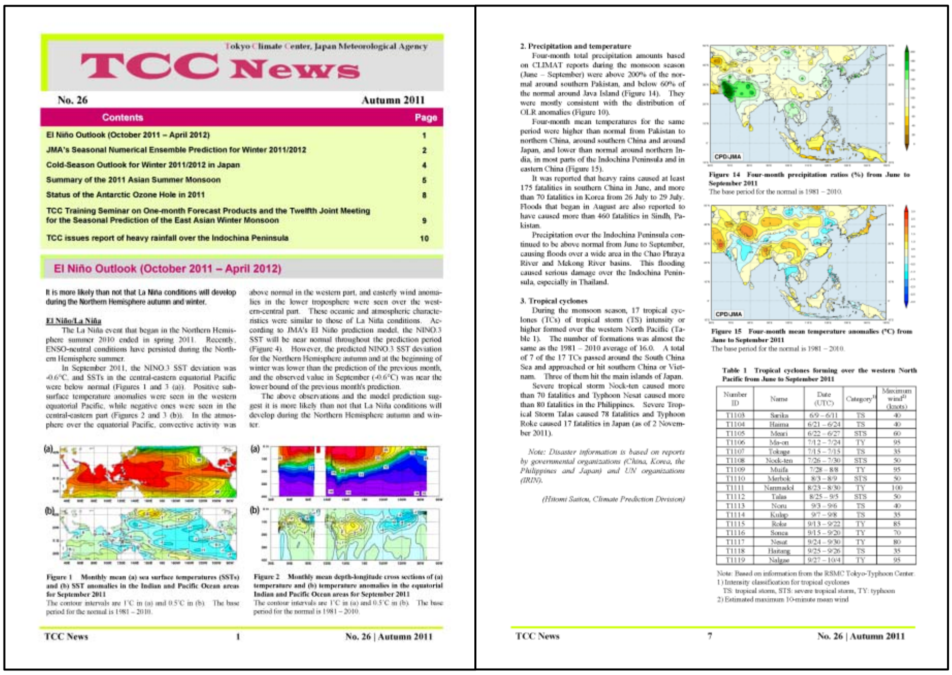

Figure 11. TCC News 2011

(KRA1, 2, 4, 5）

b. Hydrological Achievements/Results

<u>b-1. 5th International Conference on Flood Management (ICFM5) September 27 – 29, 2011, Tokyo, Japan</u>

ICFM5 Secretariat, in the International Centre for Water Hazard and Risk Management (ICHARM) organized the 5th International Conference on Flood Management held in Tokyo from September 27 to 29, 2011. More than 450 participants from 41 nations attended the event. ICHARM was established as part of the Public Works Research Institute of Japan in March 2006 under the auspices of UNESCO.

The call for abstracts and online registration was met with a hugely positive response, with the ICFM5 Secretariat receiving 417 abstracts covering all the topic areas announced. More than 250 participants traveled to Tokyo from overseas for the conference in addition to approximately 200 attendees from across Japan. The International Scientific Committee reviewed all submitted abstracts for relevance to the ICFM5 objectives, and a total of 256 presentations were made during the three-day conference at various gatherings including plenary sessions, special sessions, oral parallel sessions and poster/exhibition sessions.

ICFM5 kicked off on September 27 at the United Nations University (UNU) in Tokyo with a welcome address and opening remarks by ICHARM Director Prof. Kuniyoshi Takeuchi. Mr. Michel Jarraud (WMO Secretary General), Prof. Soon-tak Lee (UNESCO-IHP Chair), Prof. Kazuhiko Takeuchi (UNU Vice-Rector) and Prof. Slobodan Simonovic (ICFM Ad-hoc Committee Chair) also spoke at the opening ceremony.

A number of high-level experts were also invited to make presentations at the International Forum on Mega-Water Disasters on the first day of ICFM5. The forum was held by MLIT and other governmental organizations in conjunction with ICFM5 with the main objective of incorporating recent experiences and lessons learned from the Great East Japan Earthquake and tsunami into ICFM5. Sessions involving high-level experts and decision makers were convened at the event, and their discussions were reflected during the conference. His Imperial Highness the Crown Prince of Japan and other high-ranking officials, including Mr. Mir Changez Khan Jamali, Pakistan's Minister for Science and Technology, and Mr. Rogelio Singson, Secretary of the Philippine Department of Public Works and Highways (DPHW), also took part in the event.

The second and third days of ICFM5 were dedicated to special, parallel and poster/exhibition sessions. All participants received a book of abstract proceedings containing more than 300 accepted abstracts in both hard copy and digital form. A copy of the first ICHARM book series on large-scale flood reports was also distributed to all participants as a contribution to the International Flood Initiative. The conference ended on September 29 after a reading of the draft ICFM5 declaration and the announcement of Brazil as the host of ICFM6.

For more information, please visit the ICFM5 website at http://www.ifi-home.info/icfm-icharm/icfm5.html.

Figure 12

(KRA1, 2, 4, 5,6)

<u>b-2. Assistance Relating to the Widespread Flooding in Thailand</u>

A variety of assistance efforts relating to the widespread flooding in Thailand has implemented.

1. Estimation of precipitation in the Chao Phraya River basin

Mean precipitation values for the Chao Phraya River basin for a three-month period (July – September) in each of the last four years (2008 – 2011) were estimated using satellite monitoring data from GSMaP_MVK for 2008 and from GSMaP_NRT for 2009 – 2011 acquired from the website (*1) of the Japan Aerospace Exploration Agency (JAXA). In the estimation, hourly mesh precipitation data (0.1° x 0.1°) for the whole of the basin were accumulated, and the mean precipitation was calculated. The results indicated that precipitation levels for July, August and September 2011 were higher than those of the average for the previous three years (2008 – 2010) by as much as 40%, 27% and 68%, respectively. The total precipitation during the three-month period in 2011 was estimated at 710 mm, which was 45% more than the average for the previous three years (490 mm). This is considered to be the reason for the widespread inundation seen across the whole of the Chao Phraya River basin.

*1 ftp://rainmap:amechi-zu@hokusai.eorc.jaxa.jp/

2. Computer simulation of flooding in the Chao Phraya River basin

The International Centre for Water Hazard and Risk Management (ICHARM) conducted computer simulation on the unprecedented flooding seen in Thailand's Chao Phraya River basin. The simulation was based on a rainfall-runoff-inundation (RRI) model with satellite-based topographic and precipitation data. Prior to the official release of the results, it was confirmed that the simulated flood inundation area was largely in agreement with a satellite-based inundation image taken on 13 October. In mid-October, when the flooding was just approaching its peak, the first simulation results were released to facilitate emergency response efforts. The simulation suggested the likelihood that the area from Ayutthaya to northern Bangkok would still be inundated until late November. The results were also shown on several TV news programs including those of NHK. The information has also been helpful for other purposes, and was highly appreciated in work such as the development of restoration plans for submerged industrial estate complexes and resident preparation. ICHARM also conducted field investigations together with UNESCAP to collect necessary field information for the improvement of the model's performance so that it can also be used to review future flood risk management in the Chao Phraya River basin.

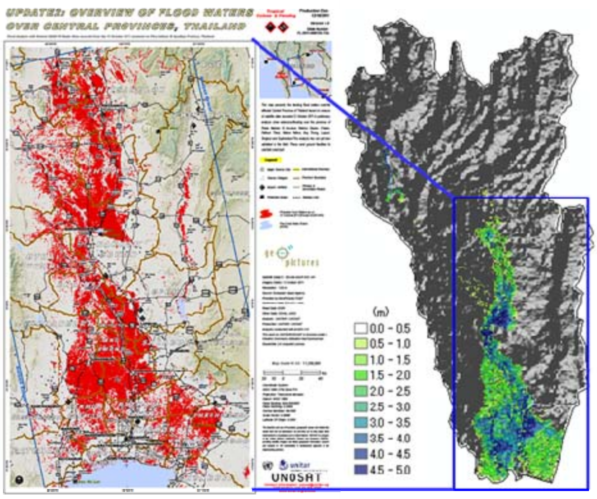

Figure 13

3. Dispatch of experts and drainage vehicles

MLIT dispatched seven experts at the beginning of the period of flooding.

Expert on flooding countermeasures: October 19 to November 2.

Experts on drainage (two people) support measures (two people): October 29 to November 18.

Experts on airports (two people): October 27 to November 1 (one person) and 2 (another person)

Experts on railways (two people): October 26 to November 2

In order to support Thailand's drainage efforts, 10 pump drainage vehicles (belonging to MLIT's Chubu Regional Development Bureau) and 51 (880 man-days) experts which were composed of members from MLIT (fourteen people), Ministry of Foreign Affairs (MOFA) (two people), Japan International Cooperation Agency (JICA) (nineteen people), Japan Water Agency (one people), Advanced Construction Technology Center (one people) and private enterprises (fourteen people) had been dispatched. Drainage activities have been conducted from November 19th to December 20th to support the Thai Government's efforts in the affected areas and around 8,100,000 m3 of water was drained.

Figure 14

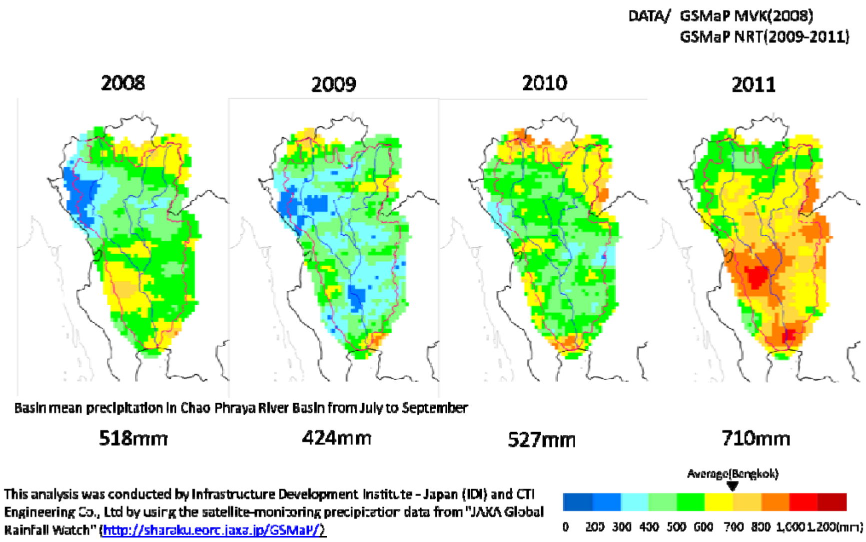

Figure 15

(KRA1, 2, 4, 6)

c. Disaster Prevention and Preparedness Achievements/Results

c-1. Asian Conference on Disaster Reduction 2011

The Asian Conference on Disaster Reduction (ACDR) 2011 was held from 13 to 15 June, 2011, in Colombo, Sri Lanka. The event was jointly organized by the governments of Sri Lanka and Japan, the United Nations Secretariat of the International Strategy for Disaster Reduction (UNISDR) and the Asian Disaster Reduction Center (ADRC). More than 120 people attended, including high-level government officials from 27 countries and representatives of 26 international and regional organizations, the academic community, the private sector and civil society organizations.

ACDR 2011 provided valuable opportunities for policymakers and practitioners from ADRC member countries and international/regional organizations to come together and share their experiences as well as the lessons they had learned to date.

Following a number of presentations by government and organization representatives on their reports and current situations, participants discussed needs and problems relating to the three areas of preparedness, response and recovery. As a result, the following series of recommendations was formulated:

- Develop a comprehensive climate-related data collection system
- Systematize early warnings
- Develop tools that are both highly reliable and convenient
- Strengthen relationships and networks in member countries
- Raise public awareness and promote disaster education
- Promote linkages with multiple stakeholders, especially with local communities
- Strengthen existing communication and coordination mechanisms
- Adopt an inclusive participatory process to enhance self-ownership

Figure 31. Group photo of participants

c-2. Urban Search-and-Rescue Training in Singapore as an ADRC activity for disaster reduction

The Singaporean Government runs a training course every year for search and rescue officers.

The course has hosted trainees from outside Singapore for the past nine years to promote the search-and-rescue expertise required in urban disaster situations. The training facility complex of the Civil Defense Academy (CDA) run by the Singapore Civil Defense Force (SCDF) is one of the highest-level facilities of its kind in Asia. In an effort to utilize the academy's expertise and facilities, the ADRC has been inviting related officers from member countries to attend the training course since 2001. Individuals from Mongolia, Bhutan and the Maldives took the course from 18 to 29 October, 2010, and officers from Bangladesh and Russia participated from 26 September to 7 October, 2011.


Figure 16. Urban search-and-rescue training in Singapore

d. Research, Training, and Other Achievements/Results

d-1. 11th Typhoon Committee Attachment Training at the RSMC Tokyo - Typhoon Center

JMA's RSMC Tokyo - Typhoon Center provides assistance to members of the ESCAP/WMO Typhoon Committee in typhoon analysis and forecasting services. One of the Center's activities involves holding on-the-job training on typhoon operations for forecasters in the region to improve analysis and forecasting skills through the exchange of views and the sharing of experience in the field.

This year, two forecasters – Ms. Sinthaly Chanthana (from Lao P.D.R.) and Ms. Lai Un Man (from Macao, China) – visited JMA Headquarters from 20 to 29 July, 2011, to participate in the 11th Typhoon Committee Attachment Training. The information covered included the following areas:

1. The Satellite Analysis and Viewer Program (SATAID)
2. Tropical cyclone analysis (Dvorak)
3. Tropical cyclone forecasting
4. Storm surge
5. Quantitative precipitation estimation (QPE) and quantitative precipitation forecast (QPF)

Figure 17. A courtesy visit to JMA Director-General Dr. Mitsuhiko Hatori. Dr. Hatori between Ms. Lai Un Man (right) and Ms. Sinthaly Chanthana (left) with National Typhoon Center staff (20 July, 2011, Director-General's office)

During the training, Typhoon Ma-on approached Japan and two tropical cyclones (Nock-ten and Muifa) were generated. As a result, the two trainees gained hands-on experience of TC analysis and forecasting using real-time examples.

Figure 18. Discussion in the operation room (JMA’s Forecast Division)(left). Lecture and training in JMA’s seminar room (right).

(KRA1, 2, 4, 5, 6）

<u>d-2. *The Reinforcement of Meteorological Services* group training course</u>

JMA conducted the Reinforcement of Meteorological Services group training course as one of the Training and Dialogue Programmes of the Japan International Cooperation Agency (JICA) from 20 September to 15 December 2011. The session was one of a series of JICA group training courses in meteorology that have been provided since 1973 to support capacity building among National Meteorological Services. On the course, eight participants from eight countries (including Lao PDR, and Myanmar from among the TC members) acquired skills in the utilization of satellite data including tropical-cyclone analysis, and learned about the application of numerical weather prediction products and radar data. The course also included technical tours to research institutes, private weather companies, airlines, meteorological instrument manufacturers, and mass media in charge of disaster prevention/mitigation and risk management to highlight state-of-the-art application and communication of meteorological information.

(KRA1, 2, 4, 5, 6）

e. Regional Cooperation Achievements/Results

e-1. Expert services of the Japan Meteorological Agency (JMA)

- A JMA expert provided training at the TCP/JCOMM Workshop on Storm Surge and Wave Forecasting held in Macao, China, in October 2011.
- A JMA expert visited Vietnam to give a lecture on QPE/QPF techniques at a workshop in November 2011.
- A JMA expert visited Thailand in September 2011 to provide technical assistance on the development of radar composite maps.
- A JMA expert visited Cambodia to gather information on operational weather forecasting at the Department of Meteorology (DOM) in October 2011 on a WMO mission relating to the Severe Weather Forecasting Demonstration Project for Southeast Asia.

e-2. Technical visits to JMA

- A delegation from the China Meteorological Administration visited JMA for technical exchange on emergency response in November 2011.
- Experts from the Korea Meteorological Administration visited JMA for technical exchange on long-range forecasting, radar systems, wind shear detection and monitoring/forecasting of volcanic activities in 2011.

f. Identified Opportunities/Challenges for Future Achievements/Results

III. Resource Mobilization Activities

1. Basic design study for a radar system upgrade project in the Philippines

The government of Japan has exchanged letters of agreement with the government of the Philippines on the Improvement of the Meteorological Radar System in the Philippines project. The initiative is sponsored by Japan's Grant Aid program, and is being run by the Japan International Cooperation Agency (JICA) to support upgrading of the radar observation system run by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). Under this project, three Doppler radars and a VSAT system will be installed.

2. Improvement of Capabilities to Cope with Natural Disasters Caused by Climate Change in Vietnam

The government of Japan has exchanged letters of agreement with the government of Vietnam on the Improvement of Capabilities to Cope with Natural Disasters Caused by Climate Change project. The project is sponsored by Japan's Grant Aid program, and is being run by the Japan International Cooperation Agency (JICA) to support installation of two Doppler radars and other meteorological equipment in the northern part of the country. The aim is to enhance flood forecasting skills and thus to strengthen disaster prevention measures implemented by the government of Vietnam.

IV. Update of Member’s Working Groups Representatives

1.Working Group on Meteorology

2. Working Group on Hydrology

3. Working Group on Disaster Prevention and Preparedness

4. Training and Research Coordinating Group

5. Resource Mobilization Group