MEMBER REPORT
Japan

ESCAP/WMO Typhoon Committee
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CONTENTS

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

1. Meteorological Assessment (highlighting forecasting issues/impacts).
2. Hydrological Assessment (highlighting water-related issues/impact)
3. Socio-Economic Assessment (highlighting socio-economic and DRR issues/impacts)

II. Summary of Progress in Priorities supporting Key Result Areas

1. Extension of Forecast Range and Commencement of 5-Day Tropical Cyclone Intensity Forecasts in March 2019
2. Establishment of the JETT Disaster Support System for Municipalities
3. Upgrade of Products on the RSMC Tokyo-Typhoon Center's Numerical Typhoon Prediction Website
4. HimawariRequest: JMA's rapid scan satellite service for WMO RA II and RA V
5. TCC products and publications related to tropical cyclones
6. Attachment Training in 2018
7. Urban Search-and-Rescue Training in Singapore as an ADRC activity for disaster reduction
8. Asian Conference on Disaster Reduction (ACDR) 2018
9. Visiting Researchers from ADRC Member Countries

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

1. Meteorological Assessment (highlighting forecasting issues/impacts)

In 2018, 15 tropical cyclones (TCs) of tropical storm (TS) intensity or higher had come within 300 km of the Japanese islands as of 9 October. Japan was affected by 8 of these, with 5 making landfall. These 8 TCs are described below, and their tracks are shown in Figure 1.

(1) TY Prapiroon (1807)
Prapiroon was upgraded to tropical storm (TS) intensity around the sea south-southeast of Okinawa Island at 00 UTC on 29 June 2018 and moved northwestward. Gradually turning northeastward, it was upgraded to typhoon (TY) intensity around Okinawa Island at 00 UTC on 2 July and reached peak intensity with maximum sustained winds of 65 kt and a central pressure of 960 hPa 18 hours later. Keeping its northeastward track, Prapiroon gradually weakened and transformed into an extratropical cyclone over the Sea of Japan at 06 UTC on 4 July. A peak gust of 38.0 m/s was observed at Fukue (47843) and a 24-hour precipitation total of 231.0 mm was observed at Kumejima (47929).

(2) TY Jongdari (1812)
Jongdari was upgraded to tropical storm (TS) intensity east of the Philippines at 12 UTC on 24 July 2018. After gradually turning northeastward, it was upgraded to typhoon (TY) intensity south of the Ogasawara Islands at 18 UTC on 26 July. It reached peak intensity with maximum sustained winds of 75 kt and a central pressure of 960 hPa over the same waters six hours later. After gradually turning counterclockwise, it made landfall on the city of Ise in Mie Prefecture with TY intensity around 16 UTC on 28 July. Jongdari moved westward over western Japan and made landfall again on the city of Buzen in Fukuoka Prefecture with TS intensity before 09 UTC on 29 July. After gradually turning southward and passing around the Shimabara Peninsula with TS intensity around 14 UTC on 29 July, it moved over the East China Sea and assumed a counterclockwise arcing track near Yakushima Island with TD intensity. After taking a counterclockwise track over the East China Sea, it moved westward and hit central China before weakening to TD intensity at 00 UTC on 3 August. A peak gust of 42.9 m/s was observed at Irozaki (47666), and a 24-hour precipitation total of 245.5 mm was observed at Nikko (47690).

(3) TY Shanshan (1813)
Shanshan was upgraded to tropical storm (TS) intensity around the sea east of the Mariana Islands at 00 UTC on 3 August 2018, and was upgraded to typhoon (TY) intensity over the same waters at 06 UTC the next day. It reached peak intensity with maximum sustained winds of 70 kt and a central pressure of 970 hPa around Minamitorishima Island at 18 UTC on 4 August. Shanshan gradually turned northward around the sea east of Japan on 8 August and weakened to severe tropical cyclone (STS) intensity off the eastern coast of Ibaraki Prefecture at 00 UTC on 9 August. After accelerating northeastward, it transformed into an extratropical cyclone at 06 UTC on 10 August. A peak gust of 27.5 m/s was observed at Choshi (47648) and a 24-hour precipitation total of 268.5 mm was observed at Shinjo (47520).

Shanshan left six people injured in the Kanto region.

(4) STS Leepi (1815)
Leepi was upgraded to tropical storm (TS) intensity over the sea west of the Mariana Islands at 12 UTC on 11 August 2018. Keeping its northwestward track, it was upgraded to severe tropical storm

(STS) intensity and reached peak intensity with maximum sustained winds of 50 kt and a central pressure of 994 hPa over the sea west of the Ogasawara Islands at 06 UTC on 13 August. It made landfall on Hyuga City, Miyazaki Prefecture, with TS intensity around 1730 UTC on 14 August before weakening to TD intensity around the Tsushima Strait at 00 UTC on 15 August.

(5) TY Cimaron (1820)

Cimaron was upgraded to tropical storm (TS) intensity over the sea north of the Chuuk Islands at 12 UTC on 18 August 2018. Gradually turning northwestward, it was upgraded to typhoon (TY) intensity south of the Ogasawara Islands at 00 UTC on 21 August and reached peak intensity with maximum sustained winds of 85 kt and a central pressure of 950 hPa over the sea west of the Ogasawara Islands at 06 UTC the next day. After turning northward, Cimaron made landfall on southern Tokushima Prefecture with TY intensity around 12 UTC on 23 August and again on Himeji City, Hyogo Prefecture, with TY intensity around 1430 UTC the same day. Turning north-northeastward, it weakened and transformed into an extratropical cyclone over the Sea of Japan at 12 UTC on 24 August. A peak gust of 45.2 m/s was recorded at Murotomisaki (47899) and a 24-hour precipitation total of 285.5 mm was observed at Owase (47663).

Cimaron left 33 people injured. Residential and agricultural damage, power and water outages, communication downtime and transport disruption were reported in western, eastern and other parts of Japan.

(6) TY Jebi (1821)

Jebi was upgraded to tropical storm (TS) intensity around the Marshall Islands at 18 UTC on 27 August 2018 and gradually turned westward. It was upgraded to typhoon (TY) intensity around the sea east of the Mariana Islands at 06 UTC on 29 August. Jebi developed rapidly and reached peak intensity with maximum sustained winds of 105 kt and a central pressure of 915 hPa around the sea west of the Mariana Islands at 00 UTC on 31 August. After turning northwestward and maintaining peak intensity for 30 hours, it gradually weakened and turned north-northeastward. Maintaining very strong TY intensity, Jebi made landfall on Muroto City, Kochi Prefecture, around 0130 UTC on 4 September and again on Kobe City, Hyogo Prefecture, around 05 UTC the same day. After crossing Honshu Island, it was downgraded to severe tropical storm (STS) intensity over the Sea of Japan at 15 UTC on 4 September. Jebi turned north-northwestward and transformed into an extra-tropical cyclone over the same waters at 00 UTC on 5 September. After crossing the coast of Russia early on 5 September, it meandered northward and crossed latitude 60 degrees north at 06 UTC on 7 September. A peak gust of 57.4 m/s was recorded at Wakayama (47777) and a 24-hour precipitation total of 161.0 mm was observed at Owase (47663). Record-breaking storm surges were observed in Osaka, Kobe and other areas.

Jebi left 14 people dead and more than 900 injured. Serious residential and agricultural damage, power and water outages, communication downtime and transport disruption were reported in western, eastern and northern Japan. Kansai International Airport and port facilities were seriously damaged by storm surge waves.

(7) TY Trami (1824)

Trami was upgraded to tropical storm (TS) intensity around the Mariana Islands at 12 UTC on 21 September. Maintaining its west-northwestward track, it was upgraded to typhoon (TY) intensity east of the Philippines at 18 UTC on 22 September and reached peak intensity with maximum sustained winds of 105 kt and a central pressure of 915 hPa over the same waters at 15 UTC on 24 September. Trami decelerated while maintaining peak intensity before turning sharply northward and weakening south of Okinawa Island. After turning northwestward and moving over the East

China Sea on 29 September, it turned northeastward before moving off the southern coasts of Kyushu and Shikoku and making landfall on Tanabe City, Wakayama Prefecture, with very strong TY intensity around 11 UTC on 30 September. After moving northeastward over eastern and northern Japan, it transformed into an extra-tropical cyclone near Hokkaido Island at 03 UTC on 1 October. A peak gust of 53.1 m/s was recorded at Naha (47936) and a 24-hour precipitation total of 277.0 mm was observed at Miyakonojo (47829).

Trami left 3 people dead and more than 200 injured. Serious residential and agricultural damage, power and water outages, communication downtime and transport disruption were reported nationwide.

(8) TY Kong-rey (1825)

Kong-rey was upgraded to tropical storm (TS) intensity around the Mariana Islands at 06 UTC on 29 September. It turned northwestward and was upgraded to typhoon (TY) intensity east of the Philippines at 03 UTC on 30 September before reaching peak intensity with maximum sustained winds of 105 kt and a central pressure of 915 hPa over the same waters at 18 UTC the next day. It gradually turned north-northwestward and moved over the East China Sea on 4 September. After turning gradually northeastward, it was downgraded to severe tropical cyclone (STS) intensity around the Tsushima Strait at 00 UTC on 6 October before transforming into an extra-tropical cyclone over the Sea of Japan at 18 UTC on the same day.

Kong-rey left 31 people injured in northern and western Japan and Okinawa.

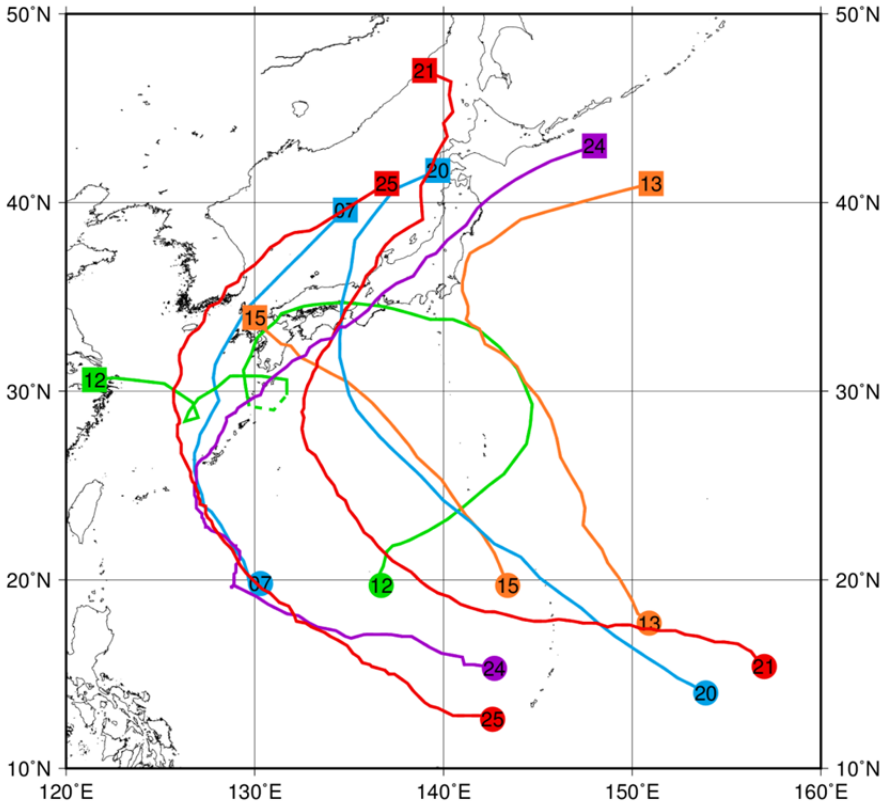

Figure 1 Tracks of the eight named TCs affecting Japan in 2018

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

2. Hydrological Assessment (highlighting water-related issues/impact)

In Japan, two major water-related disasters have occurred in 2018.

(1) Heavy rain in western Japan in July

Rainfall with unprecedented intensity in western Japan and elsewhere from June 28th through July 8th caused flooding and landslides in eight prefectures of western Japan. The rainfall was characterized by simultaneous occurrence over wide areas, resulting in 221 fatalities, 9 people missing for and 29,092 houses inundated.

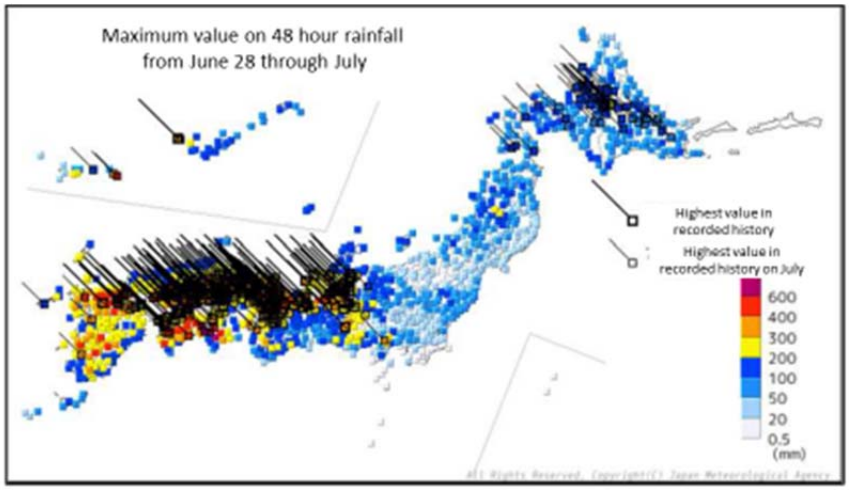

Figure 2 Maximum 48-hour rainfall values

Figure 3 Levee breach (Oda River, Okayama Prefecture)

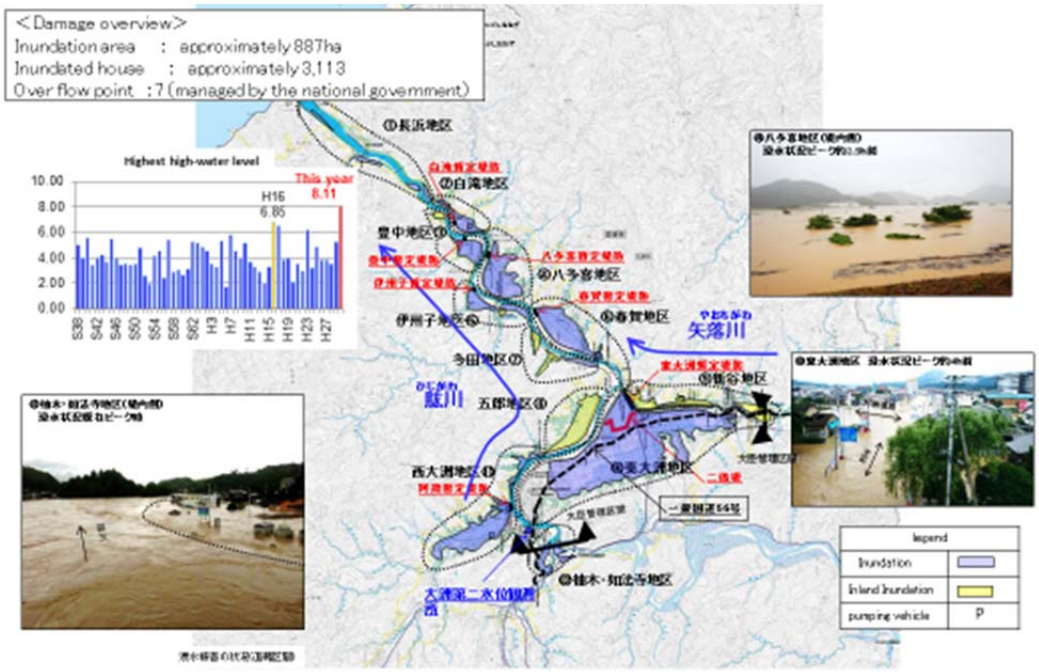

Figure 4 Overtopping (Hiji River, Ehime Prefecture)

(2) Typhoon Jebi in September

Typhoon Jebi seriously affected the Kansai area on September 3rd and 4th, causing unprecedented tide levels in Osaka Bay. The maximum wind speed exceeded previous records in many places. Kansai Airport was shut down for several days due to runway submergence, prompting MLIT to dispatch its TEC-FORCE officials with pumping vehicles to drain the water. As a result, airport operation was partially recovered within three days.

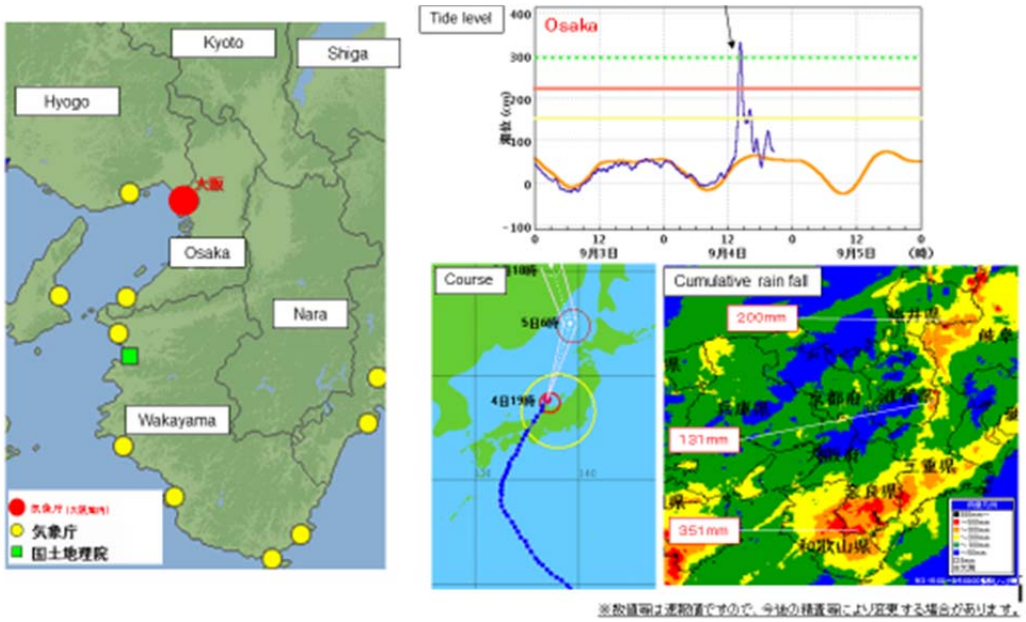

Figure 5 Typhoon Jebi's track and related tidal surges

Figure 6 Submergence of Kansai Airport

3. Socio-Economic Assessment (highlighting socio-economic and DRR issues/impacts)

Damage from major typhoons in 2018 (as of 25 September 2018)

As of 25 September 2018, 24 typhoons had formed in the western North Pacific basin, with 13 approaching the country and 4 (nos. 12, 15, 20 and 21) making landfall.

Various parts of Japan experienced significant rainfall during the Heavy Rain Event of July 2018 (28th June – 8th July), with unprecedented precipitation being recorded at some JMA Automated Meteorological Data Acquisition System (AMeDAS) stations. Primary synoptic/meso-scale atmospheric circulation-related factors considered to have contributed to the heavy rainfall event include:

(A) Ongoing concentration of two massively moist air streams over western Japan
(B) Persistence of upward flow associated with activation of the stationary Baiu front
(C) Characteristics of linear precipitation systems

(A) and (B) were the dominant factors behind the event as a whole, while (C) played a significant role in certain areas and TY Prapiroon partially contributed to factor (A).

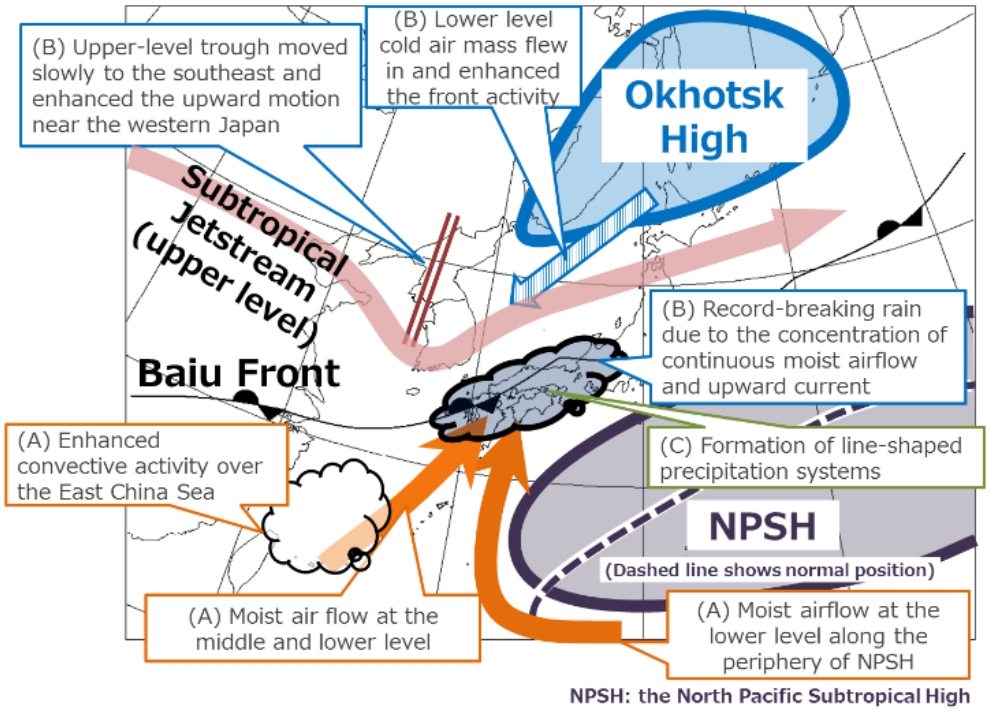

Figure 7 Primary synoptic -scale motion factors behind record rainfall from western Japan to the Tokai region from 5 to 8 July 2018

River flooding and sediment disasters occurred in several places, and by September 10 reports included 231 people killed or missing and 91 seriously injured, as well as 6,321 residences destroyed and over 21,000 flooded above floor level.

The event also caused significant damage to the electricity and water supply infrastructure, with as many as 263,593 residences being left without water in 80 municipalities across 18 prefectures nationwide. Services were quickly restored except in areas where residences and roads had been significantly damaged by landslides caused by the torrential rain, and plans were made to restore and improve the water supply in the affected areas along with reconstruction. Damage related to

agriculture, forestry and fisheries amounted to 277.51 billion yen (2.5 billion US dollars) over a wide area stretching from Hokkaido to Okinawa.

TY Jebi (1821) made landfall on Tokushima Prefecture at 12 p.m. on September 4 with very strong force and crossed the Kinki area with increasing speed. It then headed northward over the Sea of Japan and took on extratropical cyclone status over the Mamiya Strait at 9 a.m. on September 5. Very strong winds and heavy rain accompanying the typhoon's approach and passage from western to northern Japan were reported. In particular, the Shikoku and Kinki areas experienced unusually strong wind and torrential rain, with some locations reporting record storm surges.

The typhoon had caused significant damage by September 14 (13 fatalities, 38 seriously injured and 857 injured). A total of 9 residences were destroyed, 46 were seriously damaged, 21,920 were damaged, 28 were flooded above floor level and 191 were flooded below floor level across a wide area from Hokkaido Prefecture to Kochi Prefecture.

In the Kansai area, up to 1,700,000 residences experienced power outages and up to 16,490 were left without water in 56 municipalities of 11 prefectures nationwide.

At Kansai International Airport, runway and terminal buildings were flooded by storm surge waves. Road and railway access to the airport was cut off when a tanker driven by strong winds collided with a bridge connecting to the airport.

II. Summary of Progress in Priorities supporting Key Result Areas

1. Extension of Forecast Range and Commencement of 5-Day Tropical Cyclone Intensity Forecasts in March 2019

Main text:

The Japan Meteorological Agency (JMA) began the operation of its new supercomputer system on 5 June 2018. The system has an effective peak performance 10 times faster than its predecessor and is capable of processing larger amounts of data with higher efficiency. JMA uses this power for a variety of numerical calculations in monitoring and prediction of weather and climate conditions over periods ranging from the short term to several months ahead, and utilizes the results to support the output of meteorological information for use in disaster prevention, daily life, socio-economic activity and a variety of other areas. The Agency plans to utilize the new supercomputer for precise early prediction of tropical cyclones and localized torrential rain and for improvements in various types of information, including ensemble prediction on scales ranging from weeks to months.

In the area of tropical cyclone forecasts, the range of JMA's global spectral model (GSM) was extended on 5 June 2018 to cover periods up to 132 hours ahead for initial times of 00, 06 and 18 UTC in association with the supercomputer system upgrade. Leveraging this extension, RSMC Tokyo began providing track forecasts from a deterministic GSM with a header of FXPQ20-25 RJTD at 00 UTC on 1 August 2018 using the extended forecast range. Track forecasts based on data from JMA's global ensemble prediction system (GEPS), which were previously issued with the FXPQ20-25 header, are now provided with a header of FXPQ30-35 RJTD.

RSMC Tokyo will also begin providing five-day tropical cyclone intensity forecasts in the first quarter of 2019 based on a statistical intensity prediction scheme leveraging forecast guidance developed by JMA based on the Statistical Hurricane Intensity Prediction Scheme (SHIPS). The new scheme is known as TIFS (**T**yphoon **I**ntensity **F**orecasting scheme based on **S**HIPS), and the information produced will be added to existing RSMC Tropical Cyclone Advisories for five-day forecasts with GTS headings of WTPQ 50-55 RJTD.

Identified opportunities/challenges, if any, for further development or collaboration:

Ongoing focus will be placed on improving forecast accuracy.

Priority Areas Addressed:

Enhance the capacity to monitor and forecast typhoon activities particularly in genesis, intensity and structure change.

Develop and enhance typhoon analysis and forecast technique from short- to long-term.

Promote communication among typhoon operational forecast and research communities in Typhoon Committee region.

Contact Information:

Member: Japan
Name of contact for this item: Hisaki Eito
Telephone: +81-3-3211-8303
Email: rsmc-tokyo@met.kishou.go.jp

2. Establishment of the JETT Disaster Support System for Municipalities

Main text:

The JMA Emergency Task Team (JETT) was established on 1 May 2018 to support municipal government response to actual or expected disasters. With this framework, JMA dispatches this team of experts from its local meteorological offices in affected areas to municipal governments or disaster management headquarters to provide detailed information and guidance on weather conditions and other phenomena based on needs/situations or and local government activities. The service is provided for tropical cyclones and other phenomena such as non-TC heavy rain, major earthquakes and volcanic eruptions.

As of 19 October 2018, JETT forecasters had been dispatched to local governments for the heavy rain event that affected Hokkaido in July, the heavy rain that affected western and other parts of Japan in July (known officially as the Heavy Rain Event of July 2018), TY Cimaron (1820), TY Jebi (1821), TY Trami (1824) and TY Kong-rey (1825).

Effective response in emergency situations requires full comprehension of protocols for disaster management by local governments and clarification of the support offered by JMA on a daily basis. This is a good example of how JMA values daily communication and collaboration with related organizations.

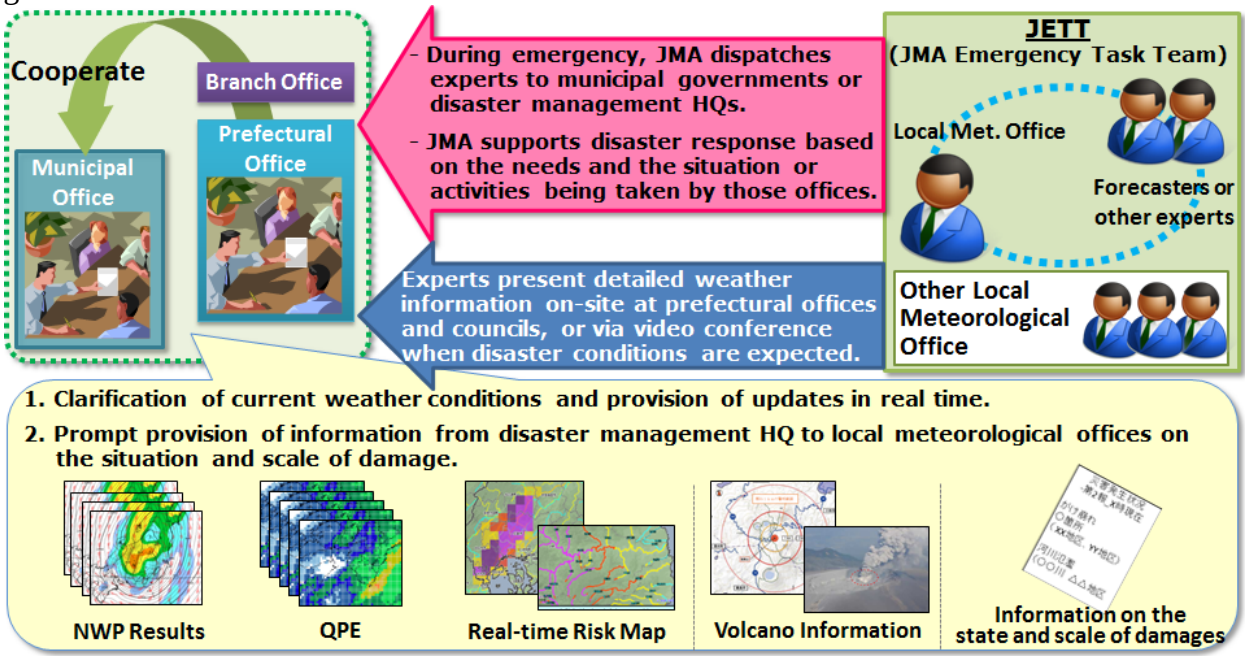

Figure 8 JETT structure and roles

Identified opportunities/challenges, if any, for further development or collaboration:

Ongoing focus will be placed on meeting local government needs as well as enhancing JMA's information provision and related commentary.

Priority Areas Addressed:

Share experience/know-how of DRR activities including legal and policy framework, community-based DRR activities, methodology to collect disaster-related information.

Contact Information:

Member: Japan
Name of contact for this item: Hisaki Eito
Telephone: +81-3-3211-8303
Email: rsmc-tokyo@met.kishou.go.jp

3. Upgrade of Products on the RSMC Tokyo-Typhoon Center's Numerical Typhoon Prediction Website

Main text:
RSMC Tokyo now provides advance notice to registered Committee Members via email and its Numerical Typhoon Prediction (NTP) website when TC status changes are likely. This is supplementary information to RSMC tropical cyclone advisories, and is provided in the event of:

1. an upgrade from a tropical depression (TD) to a tropical storm (TS)
2. a downgrade from a TS to a TD or extratropical transition
3. a TC crossing a border between RSMCs

Advance notice is provided in principle from around an hour before to half an hour after the reference time of an official RSMC advisory (e.g., from 11 p.m. to 12:30 a.m. for an RSMC advisory with a 00 UTC reference time). It should be noted that such notice may not be provided in certain situations, and even when provided should not be considered an official RSMC advisory and/or a replacement therefor.

Several parts of the NTP website have also been upgraded as announced via circular letters in May and July 2018. By way of example, prognostic reasoning (upgraded from last year's version in frequency and content) is now available both via GTS and on the NTP website for user convenience. A curvature vorticity and streamline map for the 850-hPa level is now provided in place of the previous total vorticity map. For some maps, color tone has been improved to highlight areas requiring heightened attention and the drawing range has been extended. As described in Chapter II, Section 1, the forecast ranges of track forecasts have been extended in line with the increased capacity of the new supercomputer system. Text-format track forecasts from the deterministic GSM (FXPQ20-25) and GEPS (FXPQ30-35) are now provided via the NTP website and via GTS.

The latest upgrade involves TC activity prediction maps, with ensemble prediction results from NCEP being added on 1 October 2018. With this enhancement, ensemble predictions from four centers (ECMWF, UKMO, JMA and NCEP) constitute the Multi-Center Grand Ensemble.

Identified opportunities/challenges, if any, for further development or collaboration:
Ongoing improvement of the NTP website is considered beneficial to Members. Accordingly, Member feedback should be solicited for site enhancement and development.

Priority Areas Addressed:
Enhance the capacity to monitor and forecast typhoon activities particularly in genesis, intensity and structure change.
Enhance and provide typhoon forecast guidance based on NWP including ensembles and weather radar related products, such as QPE/QPF.
Enhance RSMC capacity to provide regional guidance including storm surge, responding to Member's needs.

Contact Information:
Member: Japan
Name of contact for this item: Hisaki Eito
Telephone: +81-3-3211-8303
Email: rsmc-tokyo@met.kishou.go.jp

4. HimawariRequest: JMA's rapid scan satellite service for WMO RA II and RA V

Main text:
JMA launched the HimawariRequest service in January 2018, allowing National Meteorological and Hydrological Services (NMHSs) in WMO RA II and RA V to request Target Area (TA) observation conducted by Himawari-8/9 every 2.5 minutes.

The Advanced Himawari Imager (AHI) on board Himawari-8/9 is capable of frequent and flexible observation, providing full-disk images of the earth every 10 minutes and regional images with even shorter periodicity. In regional monitoring, TA observation provides imagery covering an area of approximately 1,000 km x 1,000 km every 2.5 minutes with flexibility for location changes. This rapid observation provides superior insight for extreme events such as tropical cyclones and volcanic eruptions. JMA utilizes TA observation in the provision of its services, including typhoon monitoring within the area of responsibility of the Regional Specialized Meteorological Center (RSMC) Tokyo – Typhoon Center.

The HimawariRequest service enables registered NMHS users to specify the area and period of their requested TA observation using JMA's simple web tool, which also allows the submission of request emails in a fixed format (Fig. 1). A list of planned TA observations and related graphical expressions are provided via the web tool, by which users can check on the status of their requests (Fig. 2). The tool is provided to users at the post-registration stage.

As of September 2018, JMA had taken registrations from twelve NMHSs in RA II and RA V (the Solomon Islands, Myanmar, Australia, Hong Kong, Bangladesh, New Zealand, Malaysia, Samoa, Nepal, Thailand, Fiji and Russia), and opened the service to the nine (the Solomon Islands, Hong Kong, New Zealand, Nepal, Australia, Malaysia, Fiji, Thailand and Russia) whose preparations for request submission were complete.

Further information on HimawariRequest, including a service description and registration form, is available on the JMA website at http://www.jma.go.jp/jma/jma-eng/satellite/HimawariRequest.html.

Identified opportunities/challenges, if any, for further development or collaboration:
JMA expects the HimawariRequest service to support disaster risk reduction activities in WMO RA II and RA V based on the monitoring of extreme events such as tropical cyclones and volcanic eruptions.

Priority Areas Addressed:
Enhance collaborative activities with other regional/international frameworks/organizations, including TC and PTC cooperation mechanism.

Contact Information:
Member: Japan
Name of contact for this item: Ryo Yoshida
Telephone: +81-3-3201-8677
Email: metsat@met.kishou.go.jp

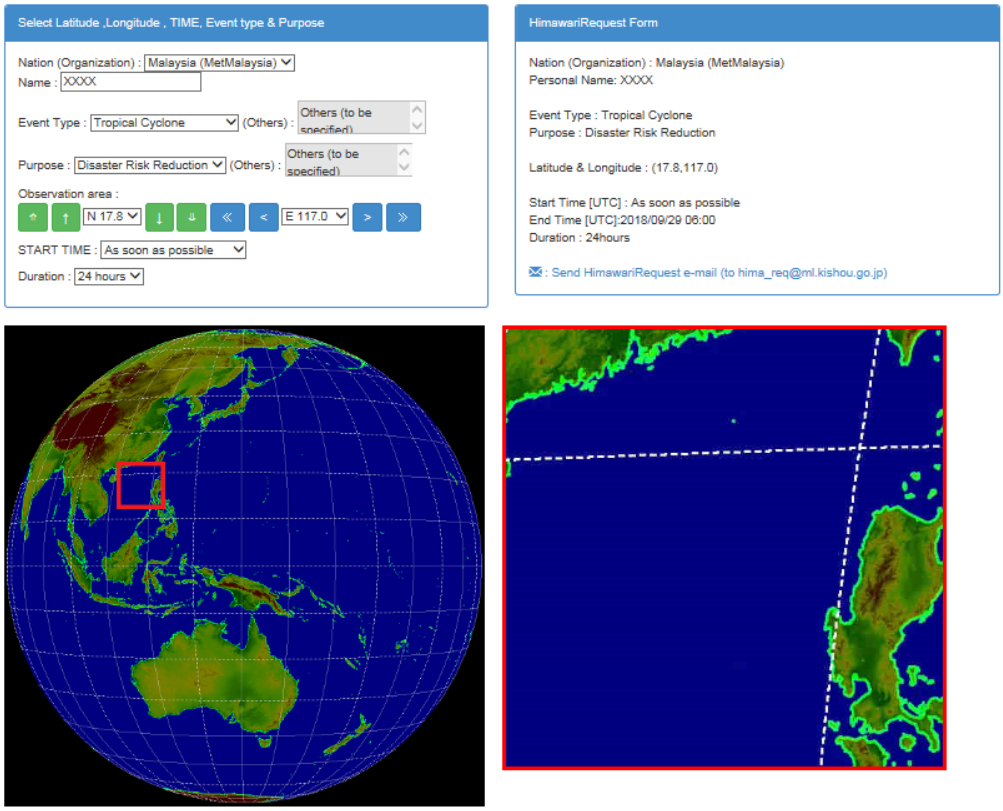

Figure 9 Web tool enabling HimawariRequest users to submit Target Area observation requests
The red square shows the observation Target Area.

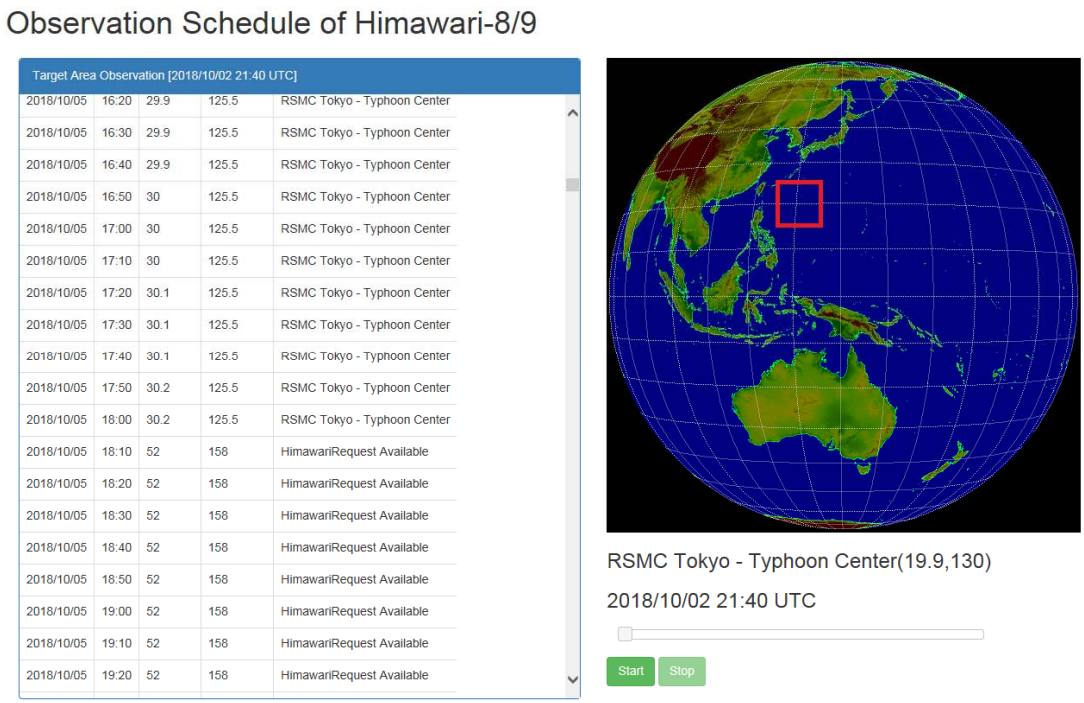

Figure 10 Sample Target Area observation schedule
List of planned observations (left) and equivalent graphical expression (right)

5. TCC products and publications related to tropical cyclones

Main text:

The Tokyo Climate Center (TCC) issues weekly reports on extreme climate events around the world, including extremely heavy precipitation and/or weather-related disasters caused by tropical cyclones (http://ds.data.jma.go.jp/gmd/tcc/tcc/products/climate/).

The Center also issues a quarterly newsletter called TCC News, which is available on the TCC website. The publication includes a variety of climate-related content 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 details of new TCC services. The next issue, TCC News No. 54 (to be published in December), will include a summary of the 2018 typhoon season in the western North Pacific (http://ds.data.jma.go.jp/tcc/tcc/news/).

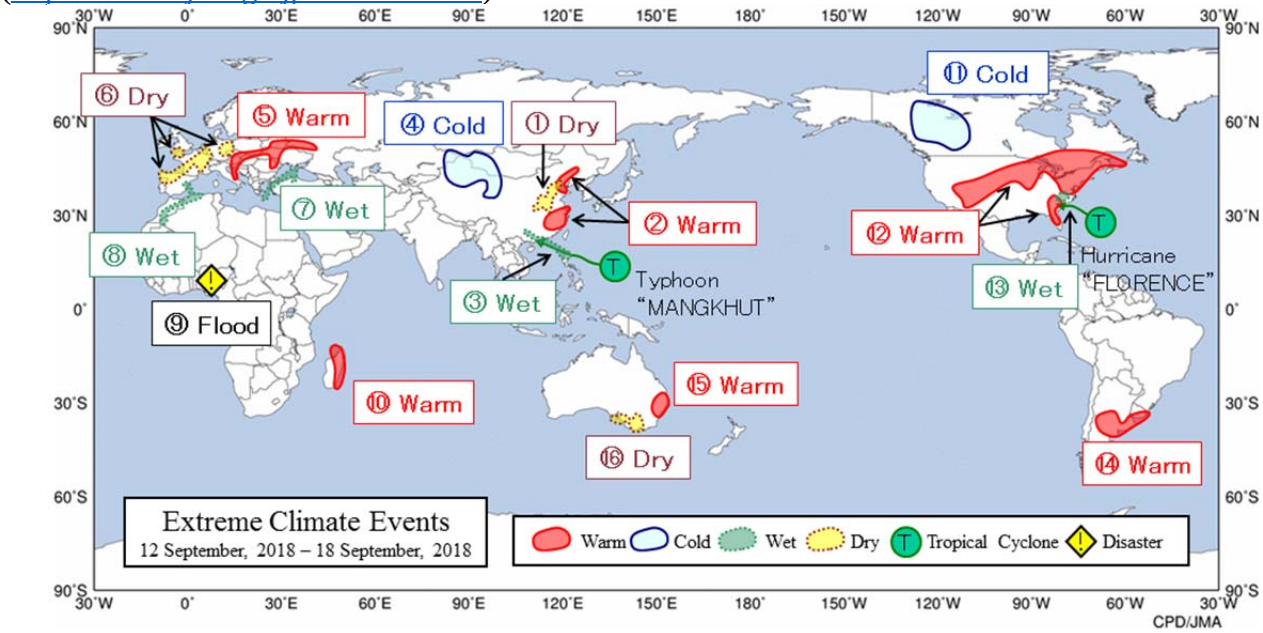

Figure 11 Distribution of global extreme climate events (12 – 18 September 2018)

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.

Identified opportunities/challenges, if any, for further development or collaboration:

Priority Areas Addressed:

Enhance collaborative activities with other regional/international frameworks/organizations, including TC and PTC cooperation mechanism.

Enhance the capacity to monitor and forecast typhoon activities particularly in genesis, intensity and structure change.

Contact Information:

Member: Japan
Name of contact for this item: Kenji Kamiguchi
Telephone: +81-3-3212-8341 (Ext. 3157)
Email: climatemonitor@met.kishou.go.jp

6. Attachment Training in 2018

Main text:
RSMC Tokyo conducted its 18th Attachment Training course from 15 to 26 October 2018 for three forecasters from Macao (China), Malaysia and the Philippines. In accordance with a decision taken by the third joint session of the Panel on Tropical Cyclones (PTC) and the Typhoon Committee, RSMC Tokyo invited two forecasters from PTC Members Oman and Sri Lanka.

The course included training on analysis, forecasting and public weather services. The analysis section covered satellite and tropical cyclone analysis (Dvorak method) using JMA's SATAID program, interpretation of microwave imagery, and new techniques such as the utilization of Doppler weather radar data and sea surface atmospheric motion vectors (AMVs) estimated from Himawari-8 low-level AMVs. The forecast section covered tropical cyclone forecasting and storm surge forecasting. Presentations and exercises on tropical cyclone forecasting were expanded in consideration of the importance of TC forecast competency this year. Public weather service content covered in the training since 2016 has included the setting of warning criteria, evaluation of forecast skill and enhancement of capacity in developing and implementing effective warning systems in collaboration with disaster risk reduction partners.

Figure 12 Courtesy visit to JMA Director-General Dr. Toshihiko Hashida with RSMC Tokyo – Typhoon Center staff

Identified opportunities/challenges, if any, for further development or collaboration:
Ongoing focus will be placed on enhancing the quality of the training course.

Priority Areas Addressed:
Enhance collaborative activities with other regional/international frameworks/organizations, including TC and PTC cooperation mechanism.
Enhance the capacity to monitor and forecast typhoon activities particularly in genesis, intensity and structure change.
Develop and enhance typhoon analysis and forecast technique from short- to long-term.
Enhance and provide typhoon forecast guidance based on NWP including ensembles and weather radar related products, such as QPE/QPF.
Enhance, in cooperation with TRCG, training activities in accordance with Typhoon Committee forecast competency, knowledge sharing, and exchange of latest development and new techniques.

Contact Information:

Member: Japan
Name of contact for this item: Hisaki Eito
Telephone: +81-3-3211-8303
Email: rsmc-tokyo@met.kishou.go.jp

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

Main text:
The Singaporean Government holds a training course every year for search and rescue officers. The course has hosted trainees from outside Singapore for the past ten years and provided training on 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 its expertise and facilities, the ADRC has been welcoming relevant officers from member countries to the training course since 2001. As of March 2018, 55 people had undergone the training.

Attendees over the past 5 years
FY2012 (2): Mongolia, Thailand
FY2014 (2): Bhutan, Maldives *
FY2015 (1): Azerbaijan
FY2016 (1): Mongolia
FY2017 (1): Cambodia

* The achievement of FY2014 originally was it of FY2013 which has recruited the participants by the former fiscal year. It was carried out in April 2014 because couldn't determine the participants during that fiscal year.

Figure 13 Urban Search-and-Rescue Training in Singapore (2017)

8. Asian Conference on Disaster Reduction (ACDR) 2018

Main text:
The Asian Disaster Reduction Center (ADRC) annual international conference is attended by disaster risk management officials from member countries and disaster experts from international organizations to promote sharing of information and ideas, and to enhance partnerships among participating countries and organizations.

The Asian Conference on Disaster Reduction (ACDR) 2018 will be held in Awaji-island, Hyogo, Japan, on 30 October and 1 November 2018. The event will be organized jointly by the Government of Japan and ADRC, and will be attended by participants including high-level government officials from ADRC member countries, as well as representatives of international and regional organizations, the academic community and the private sector.
The key areas addressed at ACDR 2018 are:

1. Regional cooperation against the Cross-border Disasters
2. Enhancement of global disaster data
3. Capacity Development Programs including ADRC Visiting Researchers for further collaboration
4. Space-based technology and Affordable solutions facilitating DRR

ACDR2017 will begin with opening remarks opening remarks by Dr. Masanori Hamada (ADRC Chairman), which will be followed by a High-level Session, which highlights 20-year contribution of ADRC. Dr. Tadashi Yamada, professor of Chuo University, will present the special report on the Trend of Climate Changing and Related Disasters.

Figure 14 Participants of ACDR 2017

9. Visiting Researchers from ADRC Member Countries

Main text:
The Asian Disaster Reduction Center (ADRC) has hosted Visiting Researchers (VRs) from member countries since 1999. To date, 102 officials from 26 member countries have taken part in this program.

The Visiting Researcher Program is intended to strengthen VRs' capacity for disaster risk reduction (DRR) in their countries and to further promote collaboration between these countries and ADRC. After finishing the program, attendees are expected to help develop and improve disaster reduction capacity in their home nations.

During the program, VRs learn about DRR and related technology from Japan and member countries through exchanges with DRR experts and the use of facilities.

FY	Organization	Country
2018	Assam State Disaster Management Authority	India
	Malaysian Meteorological Department	Malaysia
	National Disaster Management Centre	Maldives
	Department of Disaster Management,	Myanmar
	Office of Civil Defense	Philippines
	Department of Disaster Prevention and Mitigation	Thailand