TCC Activity Report for 2016

In 2016, the Tokyo Climate Center (TCC) continued to support the climate services of NMHSs in Asia-Pacific countries by providing and enhancing data and products, holding training seminars, dispatching experts and hosting visitors.

1. Enhancement of data/products/tools on the TCC website

1.1 Renewed statistical products regarding the impacts of tropical SST variability on the global climate system

Sea surface temperature (SST) variability in the tropics can significantly impact on the global climate through atmospheric circulation. El Niño/La Niña events, which are identified by SST fluctuations from the central to the eastern equatorial Pacific (NINO.3), are widely-known examples of this. In addition, SST variability in the western tropical Pacific (NINO.WEST) and the tropical Indian Ocean (IOBW) may also have significantly affect climate conditions around the world. In January 2016, TCC has updated a part of its web pages that host investigation results on impacts of tropical sea surface temperature (SST) variability on the global climate and atmospheric circulation. The renewed products show statistical relationships between warmer/cooler SST events in the areas of NINO.3, NINO.WEST (i.e., El Niño/La Niña events) and the tropical Indian Ocean (IOBW) and the global climate system. The analysis is based on surface observation data, the COBE-SST analysis dataset produced by JMA, JMA's latest reanalysis dataset (JRA-55) and satellite observation data for outgoing longwave radiation (OLR). The period of the analysis was from 1958 through 2012 (55 years). See the web page of "Global climate" and "Atmospheric Circulation" for more details on data and methodology.

1.2 Incorporation of ENSO Forecast Probabilities into the El Niño Outlook

Forecast probabilities for the onset, persistence and end of ENSO events (El Niño, La Niña and ENSO-neutral periods) were incorporated into the TCC El Niño Outlook in August 2016 for added clarity.

Specifically, information on ENSO event outlooks contained in the lead part and the main body now includes probability values regarding ENSO event onset and other considerations. By way of example, the second lead part of the El Niño Outlook in July (before the update) was as follows:

- La Niña conditions are less likely to develop during boreal summer than in the previous month's prediction; La Niña onset is more likely to occur in boreal autumn.

With the new forecast probability information, the lead would be:

- The likelihood of La Niña conditions developing during boreal summer is 40%, which is lower than in the previous month's prediction.
- Despite a 40% likelihood that ENSO-neutral conditions will persist until boreal autumn, it is more likely that a La Niña event will begin to develop in autumn (60%).

Using probability values in the ENSO outlook supports expression of the likelihood of the onset, persistence and end of ENSO events with greater precision than simple expressions and users are also provided with information on probability changes or tendencies compared to the previous month's outlook.

These probabilities are based on output from the JMA's ENSO prediction model (JMA/MRI-CGCM2), which is also used for three-month prediction and warm-/cold-season prediction.

The model is operated as a 51-member ensemble prediction system, and probabilities are essentially calculated as ratios of variables used to predict each event (El Niño, La Niña or ENSO-neutral conditions) before being calibrated using data from the 30-year (1981 – 2010) re-forecast experiment.

1.3 Revamp of TCC website

In March 2016, the Center revamped its website to improve user accessibility and operability. Users can now more easily access periodically updated products via the new Latest Update section on the left of the page. Positioning the mouse pointer over a window shows a key figure of each product and a related link. This upgrade provides users with convenient access to monthly, seasonally and annually updated products.

The update also provides brief introductions and links to major recommended products including iTacs (Interactive Tool for Analysis of the Climate System), long-range fore-cast products from the Global Producing Center (GPC Tokyo), Monthly Discussion on Seasonal Climate Outlook, El Niño Outlook, ClimatView (a worldwide CLIMAT viewer), and TCC News. TCC updates such as product launches and TCC News releases are also provided on the upper right of the screen.

2. Capacity development

TCC holds annual training seminars as part of capacity-development activities related to its role as an RCC in RA II. In addition to running annual training seminars, it also arranges expert visits to and hosts visitors from NMHSs to support exchanges of views on climate services and the effective transfer of technology.

2.1 Training seminar

TCC hold a training seminar in its each fiscal year from April to March. In 2016, TCC held a seminar in November, with primary mode of global climate variability and regional climate as the subject. Details of the event are reported in TCC News No. 46.

2.2 Expert visits and other follow-up activities

TCC experts visited the National Center of Hydro-Meteorological Forecasting (NCHMF) of Viet Nam in April and the Department of Meteorology (DOM) of Cambodia in August, to hold a follow-up seminar on one-month forecasts using the statistical downscaling technique and in the basic operation of TCC's Interactive Tool for Analysis of the Climate System (iTacs). The visits were planned as follow-up to the TCC training seminar held in November 2015, and also provided an opportunity for NCHMF and DOM to discuss future cooperation with TCC (TCC News No. 44 and TCC News No. 45).

Other follow-up to previous TCC training seminars included hosting visiting experts at TCC and conducting teleconferences to provide technical support.

3. International meetings

3.1 Regional Climate Outlook Forums

RCCs are expected to actively contribute to discussions in Regional Climate Outlook Forums (RCOFs). In 2016, TCC experts participated in the following RCOFs in Asia:

- Twelfth session of the Forum on Regional Climate Monitoring, Assessment and Prediction for Regional Association II (FOCRA II) held in Guangzhou, China, from 7 to 9 April

- Eighth session of the South Asian Climate Outlook Forum (SASCOF-8) held in Colombo, Sri Lanka, from 25 to 26 April
- Ninth session of the South Asian Climate Outlook Forum (SASCOF-9) held in Nay Pyi Taw, Myanmar, from 27 to 28 September
- Fourth session of the East Asia winter Climate Outlook Forum (EASCOF) held in Ulaanbaatar, Mongolia, from 8 to 9 November

TCC attendees gave presentations on seasonal predictions based on JMA's numerical model and participated in discussions toward the formulation of a consensus statement on regional forecasts.

3.2 Other meetings

In 2016, TCC head Mr Kiyotoshi Takahashi and TCC expert Mr Atsushi Goto attended the fourth session of the Management Committee of the Intergovernmental Board on Climate Services held in Darmstadt, Germany, to contribute to the implementation and management of GFCS. Mr Goto also took part in the Developers' Meeting on GFCS-Relevant Climate Data, Products, and Tools held in Geneva, Switzerland, in December.

4. Publications

TCC has published its newsletter (TCC News) on a quarterly basis since 2005. The publication is intended to enhance communication and provide information to NMHSs and related communities about recent TCC developments, events and activities as well as details of the Center's reports on the state of the climate, monitoring results and outlooks. In 2016, TCC News Nos. 43 – 47 were issued and made available on the TCC website.

Other English-language publications related to the climate, such as Climate Change Monitoring Report 2015 and Annual Report on the Climate System 2015, were also published on the TCC website.

5. Staff changes

Dr Kazutoshi Onogi, who served as the head of TCC in 2015, transferred to the Planning Division of the Japan Meteorological Agency on 1st April to work as Senior Coordinator for Research and Development. He was succeeded by Mr Kiyotoshi Takahashi, who previously worked on the development of JMA's long-term reanalysis data and long-range forecast models.

6. Plans for 2017

- Contribution to the Global Framework for Climate Services (GFCS)

RCCs are expected to play a major role in the implementation of the GFCS. TCC plans to further strengthen its activities and lead RA II's contribution to the Framework. Such activities include the provision of further assistance to NMHSs for better climate services, as well as maintenance and updating of the portal site for the Pilot Project on Information Sharing on Climate Services.

- New/upgraded data, products and tool development

TCC plans to implement a major upgrade of its Seasonal Ensemble Prediction System for operational one-month forecasting by spring 2017.

To leverage the JRA-55 long-term reanalysis dataset, investigation on teleconnection indices (e.g., the Arctic Oscillation Index) is being conducted to enhance monitoring of atmospheric circulation.

TCC plans to publish the investigation results and the indices on its website in 2017. In addition to its work on the above-listed products and tool, TCC is making efforts to develop information/products based on the Standard Precipitation Index (SPI) toward better monitoring of droughts worldwide.

- Capacity development

In the last quarter of the year, TCC will hold its annual training seminar with a dozen invited experts as attendees. The Center will also continue to dispatch experts to NMHSs as necessary and host visitors from NMHSs upon request.

- Hosting of EASCOF

In autumn, TCC will host the fifth session of the East Asia Winter Climate Outlook Forum (EASCOF) with the participation of experts engaged in climate services at NMHSs and researchers from China, Japan, Mongolia and the Republic of Korea. At the event, the climate conditions of the previous season will be reviewed, and the current status of the climate system as well as the seasonal Asian winter monsoon forecast for winter 2017/2018 will be discussed.