Tokyo Climate Center, Japan Meteorological Agency

TCC News

No. 57 Summer 2019

Contents

Commencement of Two-week Temperature Forecast Provision

TCC began providing online two-week maximum and minimum temperature forecasts for various stations in Japan in June 2019. The TCC website shows temperatures recorded over the past week along with forecasts, thereby providing a clear three-week overview of temperature variations. Issued at 14:30 JST every day, the Two-week Temperature Forecast is intended to provide adequate time for measures against extreme temperatures.

Figure 1-1 shows the top page of the online Two-week Temperature Forecast issued on 9 August 2019. Individual colors on the map indicate categorized five-day average temperatures from eight days ahead. Red, orange, white, light blue and blue correspond to very high, high, near-normal, low and very low values, respectively. Appearance ratios for high/very high, normal and low/very low temperatures are 33% in the relevant climatology. The terms "very high" and "very low" refer to values with climatology appearance ratios of 10%.

Click the map or select a prefecture from the pull-down menu to display detailed temperature forecasts for individual stations. Figure 1-2 shows an example for Tokyo, with the values and colors shown in "A" indicating daily maximum and minimum temperatures for the past week and related categories. Next week's daily temperature forecast and related categories are shown in "B," and the forecasts for the second week ahead in "C" are averaged over the five-day periods marked in parentheses. Temperature variability is also shown in the time-series graphs displayed in middle and bottom panels.

Select "Japan (list)" from the pull-down menu to view nationwide temperature categories simultaneously (Figure 1-3).

If very high/low temperatures or very heavy snowfall are expected 6 – 14 days ahead with a probability of 30% or more, Early Warning Information on Extreme Weather is issued on the relevant Mondays and Thursdays.

Two-week Temperature Forecast:
https://www.data.jma.go.jp/gmd/cpd/twoweek/en/
Early Warning Information on Extreme Weather:
https://www.data.jma.go.jp/gmd/cpd/souten/en/

(Hiroshi Ohno, Tokyo Climate Center)

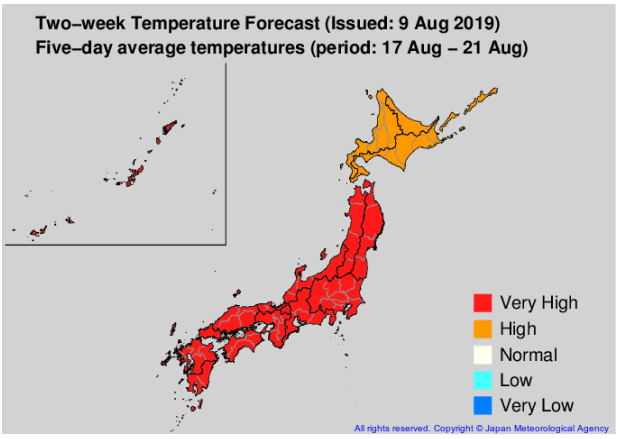

Figure 1-1 Top page of the Two-week Temperature Forecast issued on 9 August 2019
Colors represent temperature categories (see text for details). Click the map to display detailed temperature forecasts for individual stations.

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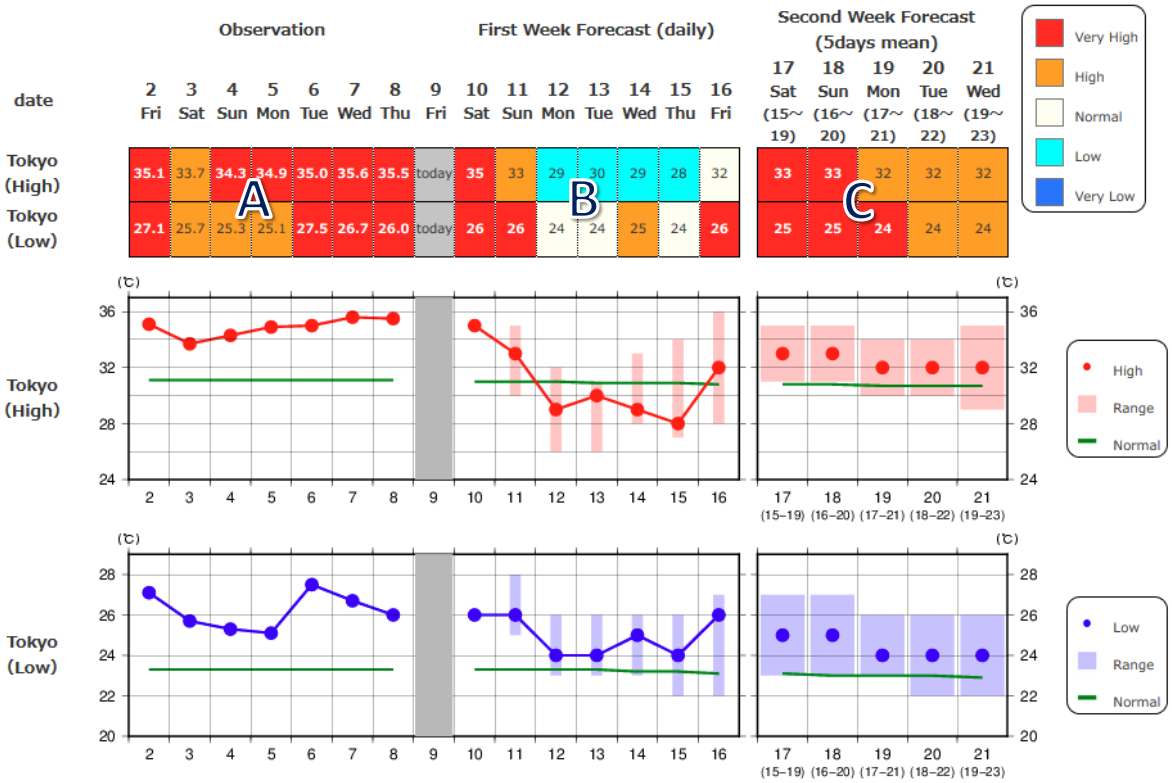

Figure 1-2 Two-week Temperature Forecast for Tokyo issued on 9 August 2019
"A" indicates observed daily maximum and minimum temperatures for the past week. "B" and "C" indicate first-week (daily) and second-week (5-day mean) temperature forecasts. The middle and bottom panels show time-series representations of maximum and minimum temperatures. Individual colors correspond to temperature categories (see text for details).

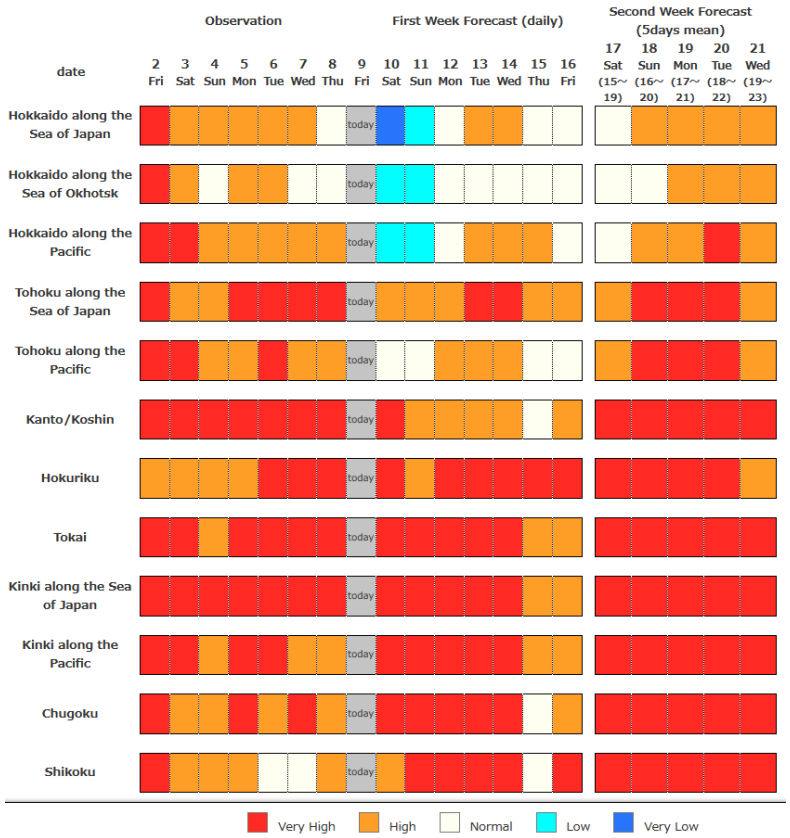

Figure 1-3 Two-week Temperature Forecast for all regions of Japan issued on 9 August 2019
Rows are time-series representations of observed temperatures for the past week and forecasts for the next two weeks in each region. Individual colors correspond to the temperature category (see text for details).

Sea Ice in the Sea of Okhotsk in the 2018/2019 Winter Season

The maximum sea ice extent in the Sea of Okhotsk for winter 2018/2019 was near the normal.

The sea ice extent in the Sea of Okhotsk for winter 2018/2019 was lower than the normal from December to early February and in April and May (Figure 2-1). The seasonal maximum of 1.197 x 10^6 km^2 was reached on 10 March (Figures 2-1 and 2-2) and was near the normal of 1.169 x 10^6 km^2 (based on the 30-year average from 1980/1981 to 2009/2010). Figure 2-3 shows the overall trend of maximum sea ice extent from 1971 to 2019. Although values for the Sea of Okhotsk show large interannual variations, there is a long-term downward trend of 0.062 [0.031 – 0.093] x 10^6 km^2 per decade (the numbers in square brackets indicate the two-sided 95% confidence interval), which equates to a loss of 3.9 [2.0 – 5.9]% of the total sea area per decade.

(Ryohei Okada, Office of Marine Prediction)

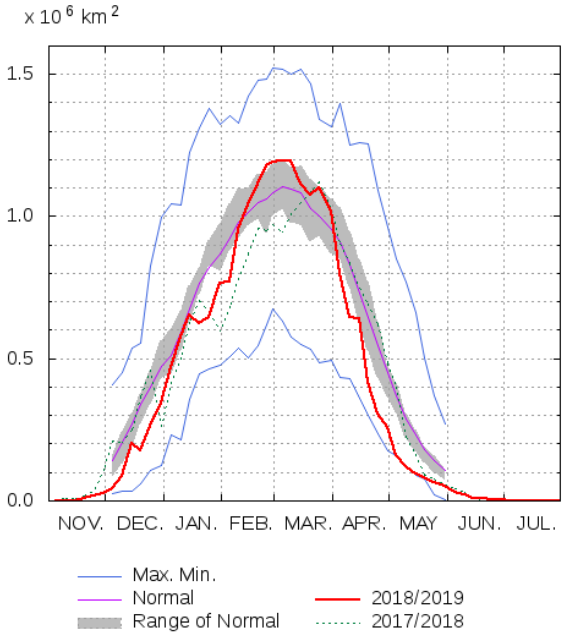

Figure 2-1 Seasonal variation of sea ice extent at five-day intervals in the Sea of Okhotsk from November 2018 to July 2019
The normal is the 30-year average from 1980/1981 to 2009/2010.

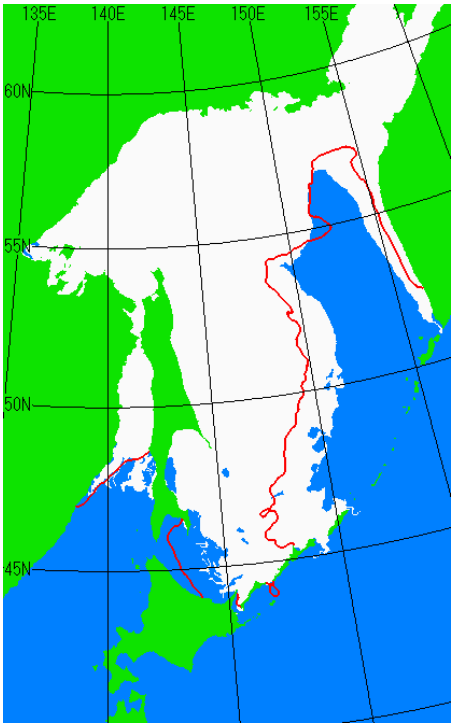

Figure 2-2 Sea ice situation on 10 March 2019
The white area shows the observed sea ice extent, and the red line indicates the extent of normal coverage (the 30-year average from 1980/1981 to 2009/2010).

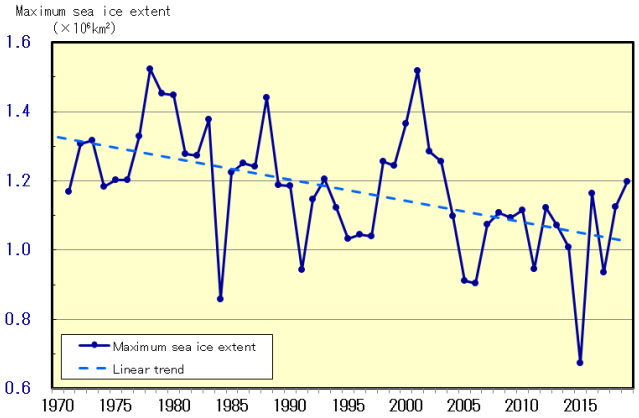

Figure 2-3 Interannual variation of maximum sea ice extent in the Sea of Okhotsk from 1971 to 2019
Maximum sea ice extent: the greatest amount of sea ice extent observed during the year

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Kosa (Aeolian Dust) Events over Japan in January–June 2019

Kosa (Aeolian dust) was observed in Japan on 10 days between January and June 2019, which is close to the average frequency for the last decade.

Kosa is an atmospheric phenomenon in which visibility is reduced when fine sand and dust are blown up from arid and semi-arid areas of the Asian continent, and often appears over Japan. Observation to detect the presence of Kosa is conducted visually at 50 manned JMA meteorological stations. The monthly normal frequency (i.e., the 1981 – 2010 average) of Kosa events in Japan peaks from March to April, and more than 95% of such events are observed from January to June.

During the first half of 2019, Kosa events were observed on 10 days at one or more meteorological stations in Japan (Figure 3-1). This was well below the 30-year average (22.9 days/6 months) but relatively close to the average for the previous decade (13.7 days/6 months). Identification of any statistically significant trend in the frequency of Kosa events is hindered by interannual variability (Figure 3-1).

Significant Kosa event in early April as viewed in satellite imagery

Kosa was extensively observed at stations in Japan during the period from 5 to 7 April 2019 (Figure 3-2) in association with air masses relating to two low-pressure systems moving eastward at 30 and 43 degrees north (Figure 3-3).

One of the dust masses was blown up into the atmosphere over the Gobi Desert area around 3 April, and reached northern Japan on 5 April. This can be seen in magenta over northern China in Dust RGB imagery from the Himawari-8 geostationary meteorological satellite (Figure 3-4). The other was blown up around 5 April in the same area, and reached western Japan on 6 – 7 April. Its extensive spread can be seen over the Sea of Japan in Himawari-8 True Color Reproduction imagery (Figure 3-5).

Satellite imagery is highly effective in Kosa monitoring, as it enables real-time detection and tracking of heavy-dust areas. Details of Dust RGB and True Color Reproduction imagery are provided in TCC News No. 45 and No. 53.

(Jun Ohtake, Atmospheric Environment Division)

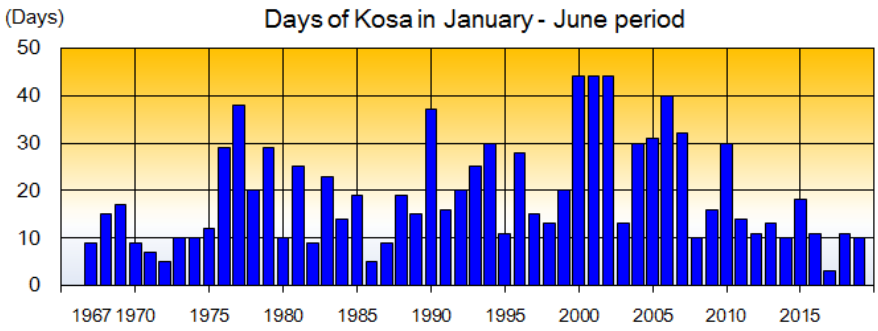

Figure 3-1 Annual numbers of days on which Kosa was observed at any of JMA's 50 manned meteorological stations from January to June of the relevant year

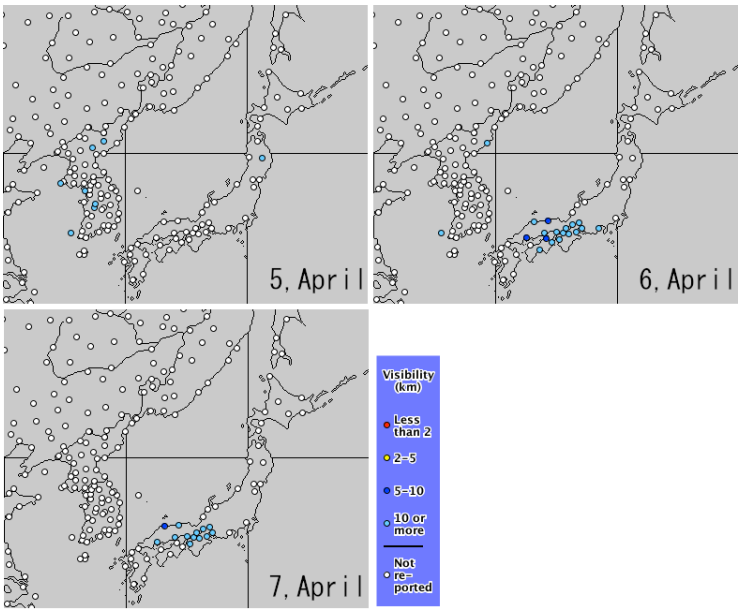

Figure 3-2 Meteorological stations reporting dust or sand for present weather and visibility from 5 to 7 April 2019
Visibility is denoted by color plots.

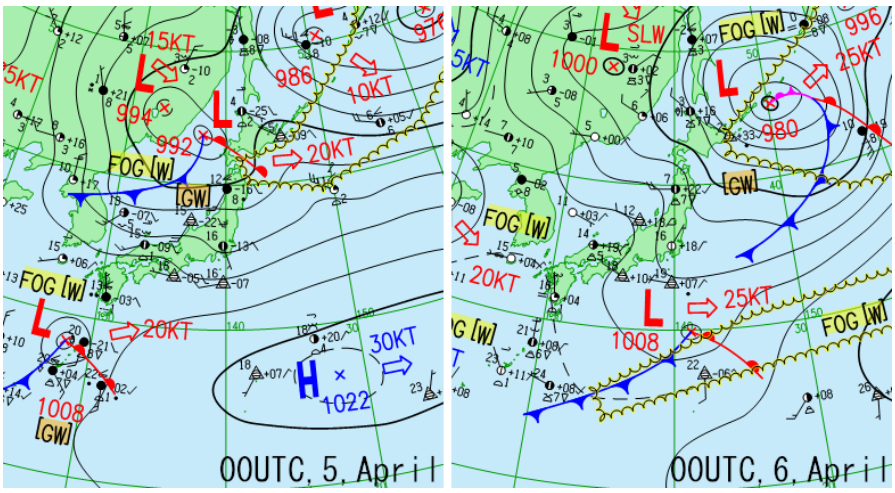

Figure 3-3 Synoptic charts for 00 UTC on 5 and 6 April 2019

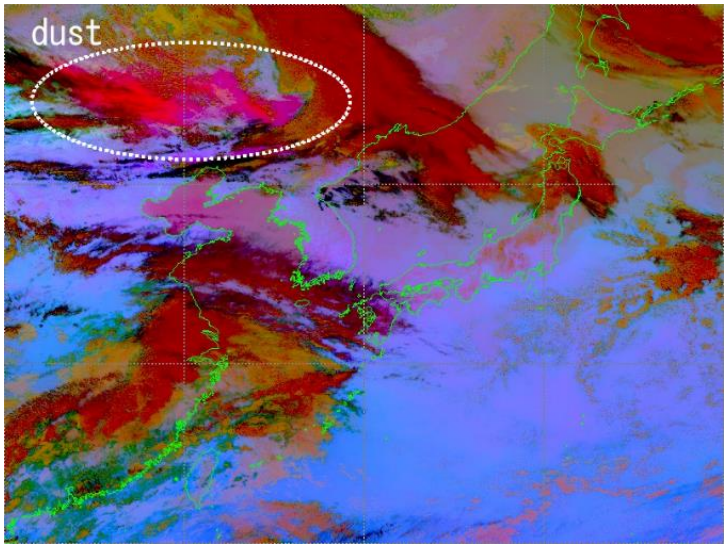

Figure 3-4 Dust RGB imagery from the Himawari-8 for 08 UTC on 4 April 2019
Dust is shown in magenta.

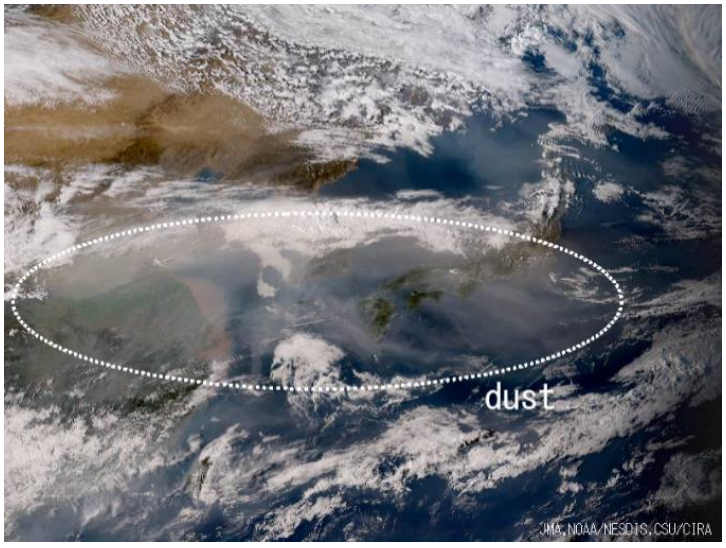

Figure 3-5 True Color Reproduction imagery from the Himawari-8 for 08 UTC on 6 April 2019

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TCC Experts Visit Mongolia

TCC arranges expert visits to National Meteorological and Hydrological Services (NMHSs) to support capacity building for climate services and facilitate the effective transfer of technical expertise on TCC products and tools.

As part of such efforts, two TCC experts visited the National Agency for Meteorology and Environmental Monitoring of Mongolia (NAMEM) from 9 to 11 July 2019 to provide training regarding the generation of one-month forecasts. The training was also intended to promote the effective use of TCC's Interactive Tool for Analysis of the Climate System (iTacs; a web-based application). The visit was conducted as follow-up to the 2018 TCC Training Seminar (see TCC News No. 54 and the TCC website for details).

With the attendance of 13 staff from NAMEM headquarters, the TCC trainers began with a practice session for basic iTacs operation. On the second day, presentations were given on expertise and techniques necessary to generate one-month probabilistic forecast products using the new TCC web-based statistical downscaling tool. The trainers also outlined verification of probabilistic forecasts and related interpretation in terms of climatological and meteorological dynamics. Using this background expertise and the handy TCC guidance tool, attendees produced one-month forecasts for four station points in Mongolia and gave presentations on their achievements.

The visit also provided valuable opportunities for TCC in terms of awareness regarding the latest status of NAMEM climate services, and staff from both organizations enjoyed fruitful discussions on future collaboration. TCC will continue to arrange expert visits to NMHSs in East Asia, Southeast Asia and elsewhere as necessary to assist with operational climate services.

(Hiroshi Ohno and Yasushi Mochizuki, Tokyo Climate Center)

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Visit to TCC by staff from the Meteorological, Climatological and Geophysical Agency of Indonesia (BMKG)

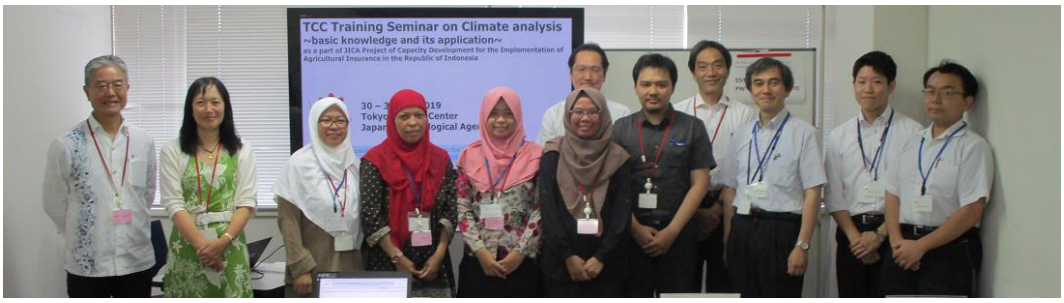
In its role as a World Meteorological Organization (WMO) Regional Climate Centre (RCC), TCC performs a variety of capacity development activities based on 1) annual training in Tokyo and 2) dispatch of experts to National Meteorological and Hydrological Services (NMHSs) to organize local training courses. TCC also hosts NMHS climate experts upon request.

From July to August 2019, five BMKG climate experts were hosted in Japan under a Japan International Cooperation Agency (JICA) project for capacity development in the implementation of in-country agricultural insurance. The initiative was designed highlight Japan's advanced approaches to such insurance, related tailored climate products and associated activities. Attendees underwent training at TCC on 30 and 31 July to reinforce capacity in the development of fit-for-purpose climate information based on essential expertise in climate analysis and related application.

The course included presentations on seasonal forecasting, ensemble prediction systems, interannual/decadal variability in tropical ocean conditions (e.g., El Niño-Southern Oscillation (ENSO)) and practical exercises in the operation of the handy TCC interactive tool for analysis of the climate system (iTacs). In addition to TCC presentations, three BMKG experts highlighted the current status of their climate services, approaches to their ENSO forecasting, and development of their climate projection modeling.

Despite its brevity, the course provided valuable opportunities for the BMKG attendees to learn more about climatology and TCC tool utilization, helped to highlight how BMKG provides climate services, and clarified associated needs in relation to TCC services. The initiative is expected to contribute to the efficient and effective development of climate services and the production of tailored agricultural information.

(Yasushi Mochizuki, Tokyo Climate Center)



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You can also find the latest newsletter from Japan International Cooperation Agency (JICA).
JICA's World (July 2019)
https://www.jica.go.jp/english/publications/j-world/1907.html
JICA's World is the quarterly magazine published by JICA. It introduces various cooperation projects and partners along with the featured theme. The latest issue features "Innovating a New Future".

Any comments or inquiry on this newsletter and/or the TCC website would be much appreciated. Please e-mail to tcc@met.kishou.go.jp.
(Editors: Yasushi Takatsuki, Yasushi Mochizuki and Kazuaki Tsuji)

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