

[Table of Contents: TCC News No. 73](#)

TCC and GPC Tokyo representatives' visit to MSS..... 1

TCC contributions to the Report on the States of the Climate in Asia 2022..... 2

Climate characteristics and factors behind heavy rainfall during the Baiu season in 2023 and extremely high temperatures from mid-July onward..... 2

Record global mean surface temperature based on JRA-3Q reanalysis..... 4

TCC and GPC Tokyo representatives' visit to MSS

On 16th June 2023, the Tokyo Climate Center (TCC) and Global Producing Centre (GPC) Tokyo representatives paid a visit to Meteorological Service Singapore (MSS) / Centre for Climate Research Singapore (CCRS) to enhance collaboration with JMA and share progress since last visit on 25th November 2019.

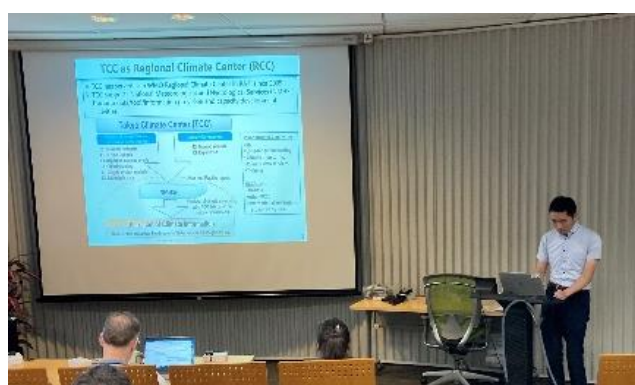
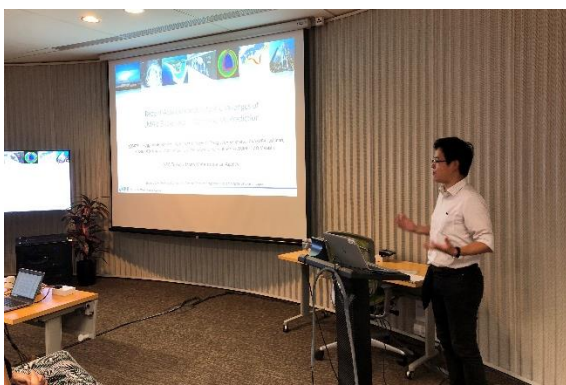
They provided two seminars on current status and future challenges of sub-seasonal to seasonal model development at GPC Tokyo and recent TCC activities with advertisement of new climate system monitoring products using new reanalysis dataset.

MSS also shared recent progress and activities in the area of sub-seasonal and seasonal forecasting, and global warming projection.

After that, collaboration agreements were discussed and updated including evaluation of model performance with focus on precipitation over the Maritime Continent under the influence of the Madden Julian Oscillation (MJO), wind fields over Southeast Asia, and the Indian Ocean Dipole (IOD).

Such collaboration will be beneficial for further improvement of activities in both at MSS and JMA.

(KOMORI Takuya (Global Producing Centre Tokyo) and TAKEMURA Kazuto (Tokyo Climate Center))





[<<Table of contents](#) [<Top of this article](#)

TCC contributions to the Report on the States of the Climate in Asia 2022

[WMO's State of the Climate in Asia 2022 report](#) was published 27th July 2023 as the third in the series, summarizing climatic conditions and extreme weather events observed in 2022 and associated socioeconomic impacts in the Asian region (RA II). The report is intended for widespread reference in various fields relating to climate change.

The contributions of National Meteorological and Hydrological Services (NMHSs) and WMO Regional Climate Centers (RCCs) in the region were essential in compiling this report. TCC again made a significant contribution with its drafting of input on Global Temperature, Extreme Events and Tropical Cyclones. Ongoing collaboration among Members and RCCs in RA II will support future reporting in this field for the Asian region.

URL: <https://library.wmo.int/records/item/66314-state-of-the-climate-in-asia-2022?offset=1>

(NEMOTO Noboru and TAKAHASHI Kiyotoshi, Tokyo Climate Center)

[<<Table of contents](#) [<Top of this article](#)

Climate characteristics and factors behind heavy rainfall during the Baiu season in 2023 and extremely high temperatures from mid-July onward

TCC issued a press release regarding climate characteristics and factors behind heavy rainfall during the Baiu season in 2023 and extremely high temperatures from mid-July onward. An abstract of the press release and the download link for the full article are as follows.

- Heavy rainfall from June to mid-July 2023
 - The Baiu front stagnated near Japan's main island of Honshu in early June, and a series of stationary linear mesoscale convective systems (SLMCSs) hit the Pacific side of eastern and western Japan. Such conditions brought unprecedented 24-hour June rainfall at 167 stations. Enhanced frontal activity over brought heavy rain over a wide area from western to northern parts of the country from late June to mid-July, accompanying SLMCSs in western Japan and elsewhere.
 - The widespread heavy rain observed during the Baiu season is associated with large amounts of warm moist

air flowing over Japan and increased frontal activity. The inflow of large amounts of water vapor was associated with Typhoon Mawar, which moved eastward over the sea to the south of Japan in early June, and with a strengthened Pacific High to the south of Japan from late June onward. The heavy rainfall observed may also have been associated with an increasing volume of water vapor caused by long-term global warming.

- Extremely high temperatures from mid-July 2023 onward
 - Record-high temperatures were observed in northern/eastern Japan and elsewhere from mid-July onward. The average temperature for northern Japan in late July was the highest for the region since records began in 1946, and that for eastern Japan was the second highest for the region. The average temperature for the Sea of Japan side of eastern and western Japan in early August was also the highest ever. From July 16 to August 23, 106 of 915 observation stations in Japan saw record-high maximum temperatures. The national average surface temperature over summer was the highest since records began in 1898.
 - The significantly high temperatures observed in the second half of July are attributed to active cumulus convection and typhoons near the Philippines, which caused the upper-level subtropical jet stream (STJ) to shift northward and a warm anticyclone to cover Japan, and the extension of the low-level Pacific High toward Japan strengthened to a record level. The conditions near the Philippines may have been due to weaker-than-normal cumulus convective activity over the tropical Indian Ocean due to the La Niña event that ended in winter 2022/2023. The northward shift of the STJ near Japan may also have been associated with the meandering of the jet stream over Europe and the Mediterranean. In addition to the pronounced northward shift of the STJ, Typhoons Khanun and Lan continued bringing warm, moist air from the south to Japan in the first half of August, and the influence of Foehn phenomena added to the record high temperatures on the Sea of Japan side. The remarkably high temperatures observed during summer are attributed to a worldwide summer tendency associated with persistent global warming. The record-high temperatures in northern Japan may also have been influenced by significantly higher temperatures in surrounding seas.

URL: https://www.data.jma.go.jp/tcc/tcc/news/press_20230928.pdf

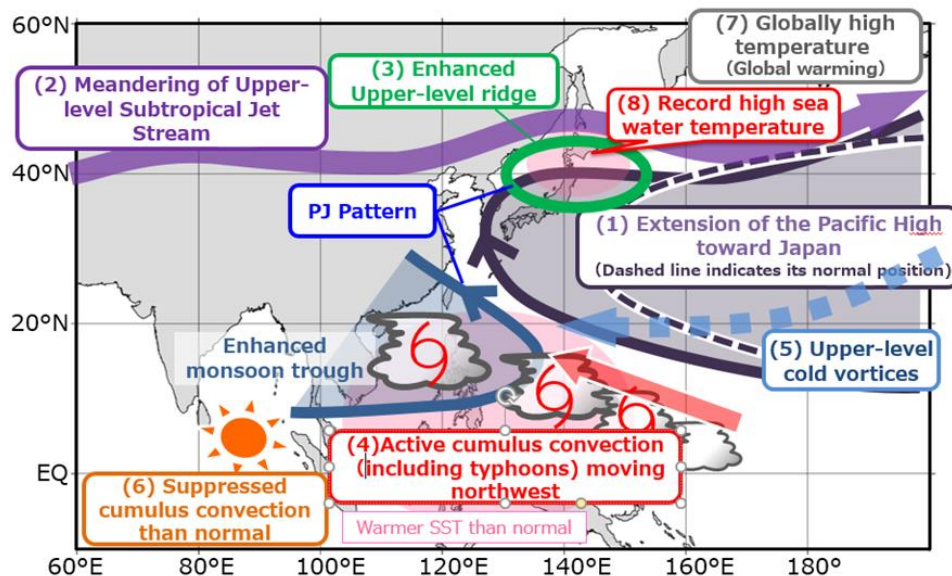


Figure 3-1. Characteristics of large-scale atmospheric circulation bringing extremely high temperatures

(TAKAHASHI Kiyotoshi, Tokyo Climate Center)

[<<Table of contents](#) [<Top of this article](#)

Record global mean surface temperature based on JRA-3Q reanalysis

The up-to-date Japanese Reanalysis of Three Quarters of a Century ([JRA-3Q](#)) dataset indicates the highest-ever global mean surface temperature for summer 2023.

On 10 July, WMO posted this news online ([Preliminary data shows hottest week on record. Unprecedented sea surface temperatures and Antarctic sea ice loss](#)) based on preliminary global mean temperatures from JRA-3Q. Figure 1 here indicates JMA/TCC revised version of global mean temperatures. These values were calculated from analysis fields over land areas and 6-hour forecast fields over ocean areas, as analysis fields over ocean areas were most likely to be affected by biases of observations of air temperature from ships.

As per [the TCC Web page \(30 May\)](#), all online diagnostic products and online-tool iTacs have been updated using JRA-3Q data. To learn more, see:

- JRA-3Q: https://jra.kishou.go.jp/JRA-3Q/index_en.html
- TCC Web page: https://www.data.jma.go.jp/tcc/data/news/announce_20230530_jra3q.pdf

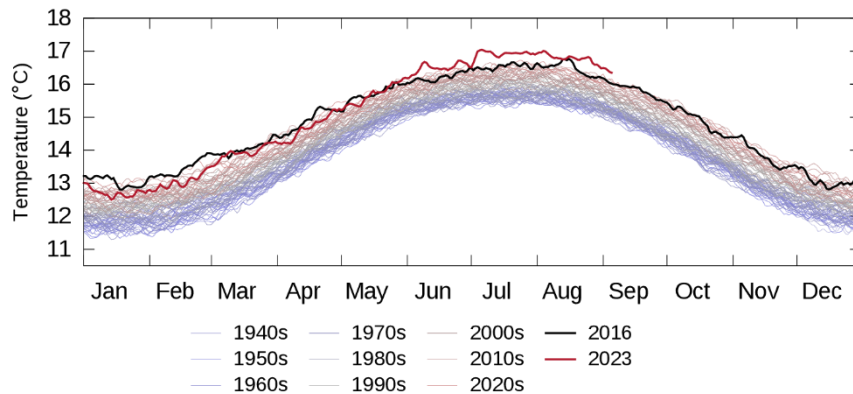


Figure 4-1 Global mean surface temperatures based on JRA-3Q

(TAKAHASHI Kiyotoshi, Tokyo Climate Center; KOBAYASHI Shinya, Numerical Prediction Development Center)

[<<Table of contents](#) [<Top of this article](#)

You can also find the latest newsletter from Japan International Cooperation Agency (JICA).

JICA Magazine

<https://jicamagazine.jica.go.jp/en/>

"JICA Magazine" is a public relations magazine published by JICA. It introduces the current situation of developing countries around the world, the people who are active in the field, and the content of their activities.

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: NEMOTO Noboru, TAKAHASHI Kiyotoshi)

Tokyo Climate Center, Japan Meteorological Agency
3-6-9 Toranomom, Minato City, Tokyo 105-8431, Japan

TCC Website:

<https://www.data.jma.go.jp/tcc/tcc/index.html>

[<Top of this article](#)