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### Launch of TCC's Three-month Guidance Tool

The interactive TCC's Three-month Guidance Tool has been released as an extension of its one-month version (TCC's one-month Guidance Tool; TCC News No. 56), simplifying calculation of statistical guidance for any given station point and supporting operational seasonal forecasts. This handy resource can be accessed at

- <https://ds.data.jma.go.jp/tcc/tcc/products/model/index.html> (lower part; three-month prediction section)
- [https://extreme.kishou.go.jp/cgi-bin/simple\\_guidance/index\\_3mon.cgi](https://extreme.kishou.go.jp/cgi-bin/simple_guidance/index_3mon.cgi) (see below for password info)

Users are simply required to input their own past observation data for station points where temperature or precipitation guidance is to be calculated, in the same format as for TCC's One-month Guidance Tool. Real-time forecast and re-forecast gridded data from the TCC operational seasonal ensemble prediction system (CPS) are stored on the app side. After the setting of interactive parameters (initial day, forecast periods and predictor elements (Figure 1-1)), the following figures and results for the selected forecast period are displayed (Figure 1-2):

- Tercile probability map
- Tercile probability (colored bars) at stations
- Inter-annual time-series representation of tercile probability
- Reliability/forecast frequency

For more information, see

[https://extreme.kishou.go.jp/tool/simple\\_guidance/help/](https://extreme.kishou.go.jp/tool/simple_guidance/help/)

Forecast datasets are updated on the 3<sup>rd</sup> and middle of every month, and every Monday.

The tool is provided exclusively to support seasonal forecasts by National Meteorological and Hydrological Services (NMHSs). IDs and passwords are as per the TCC's One-month Guidance Tool. To request an ID/PW, refer to the instructions via the above link. The tool is currently operated on an experimental basis, and may be suspended without notice in the event of malfunction or other issues.

The tool is intended for consideration of seasonal forecasts. All NMHS feedback is welcomed toward future improvement.

*(YAMADA Ken, Tokyo Climate Center)*

```

#station=,,, TOKYO, NIIGATA, SENDAI, NAGOYA, OSAKA, SAPPORO, HIROSHIMA, TAKAMATSU, FUKUOKA, NAHA
#lon=,,, 139.75, 139.02, 140.90, 136.97, 135.52, 141.33, 132.46, 134.05, 130.38, 127.69
#lat=,,, 35.69, 37.89, 38.26, 35.17, 34.68, 43.06, 34.40, 34.32, 33.58, 26.21
1981, 1, 1, 4.0, 1.8, 1.8, 3.4, 4.6, -3.3, 3.1, 2.8, 5.3, 15.6
1981, 1, 2, 3.6, 3.8, 2.9, 3.5, 5.0, -2.2, 3.3, 4.6, 2.7, 13.4
1981, 1, 3, 4.1, 3.8, 1.1, 2.2, 3.0, -0.3, 1.6, 2.8, 2.2, 13.3
1981, 1, 4, 3.4, 4.2, 1.9, 1.7, 2.9, -2.4, 2.2, 2.8, 2.1, 14.2
1981, 1, 5, 3.2, 1.4, 0.0, 1.8, 2.7, -6.7, 2.4, 2.7, 3.4, 14.9

```

Detailed Options

Submit

Figure 1-1 Parameter settings

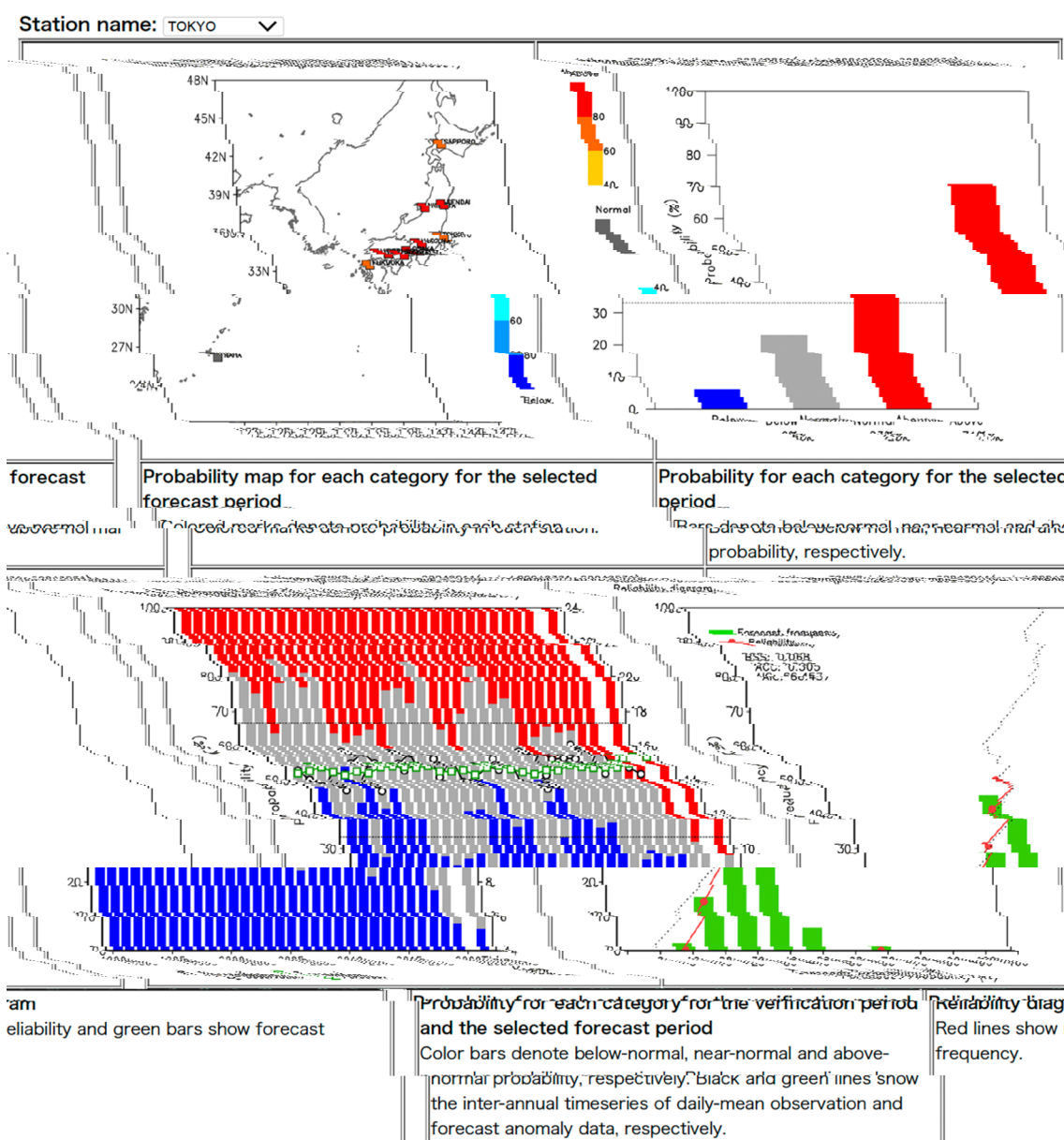


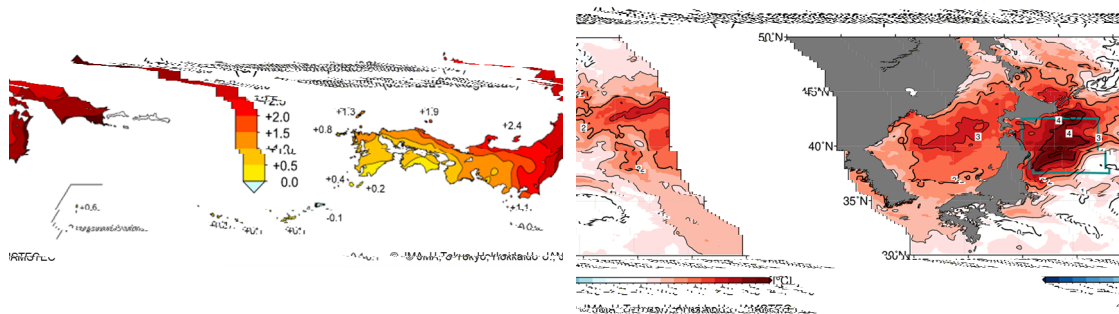
Figure 1-2 Guidance-tool output

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## Contribution of an Unprecedented Marine Heatwave to Extremely Hot Summer Conditions over Northern Japan in 2023

TCC issued a press release regarding contribution of an unprecedented marine heatwave (MHW; unusually high ocean temperature) to extremely hot summer conditions over northern Japan in 2023. A summary and a link to the full article are provided below.

Northern Japan experienced the hottest summer in 2023 (Figure 2-1a). The Japan Meteorological Agency (JMA) Advisory Panel on Extreme Climatic Events (comprised of prominent climate science academics and researchers) identified MHWs around northern Japan (Figure 2-1b) in association with prominent poleward meandering of the Kuroshio Extension as a potential contributor to northern Japan's unprecedentedly hot summer in 2023 (Tokyo Climate Center, 2023; Takemura et al. 2024).



**Figure 2-1 Summer-mean surface air temperature anomalies over Japan in 2023. (b) As in (a), but for sea surface temperature anomalies.** From Sato et al. (2024 Scientific Reports).

Further analysis by a joint research team (comprising TCC/JMA and advisory panel members Prof. Hisashi Nakamura from the Research Center for Advanced Science and Technology (RCAST) at the University of Tokyo, Prof. Youichi Tanimoto from Hokkaido University and Dr. Masami Nonaka from the Japan Agency for Marine-Earth Science and Technology (JAMSTEC)) indicated that the marine conditions contributed to reduced amounts of low-level cloud and increased insolation, atmospheric heating due to the warm ocean, and anomalous evaporation and an enhanced greenhouse effect (Figure 2-2).

The results of this survey were published online in Scientific Reports on 19 July 2024.

### Paper:

Authors: Hirotaka Sato, Kazuto Takemura, Akira Ito, Takafumi Umeda, Shuhei Maeda, Youichi Tanimoto, Masami Nonaka & Hisashi Nakamura

Title : Impact of an unprecedented marine heatwave on extremely hot summer over northern Japan in 2023

Journal : Scientific Reports

DOI : [10.1038/s41598-024-65291-y](https://doi.org/10.1038/s41598-024-65291-y)

Press Release by TCC/JMA: [https://ds.data.jma.go.jp/tcc/data/news/press\\_20240815.pdf](https://ds.data.jma.go.jp/tcc/data/news/press_20240815.pdf)

Related article by RCAST at The University of Tokyo:

[https://www.rcast.u-tokyo.ac.jp/en/news/report/page\\_00338.html](https://www.rcast.u-tokyo.ac.jp/en/news/report/page_00338.html)

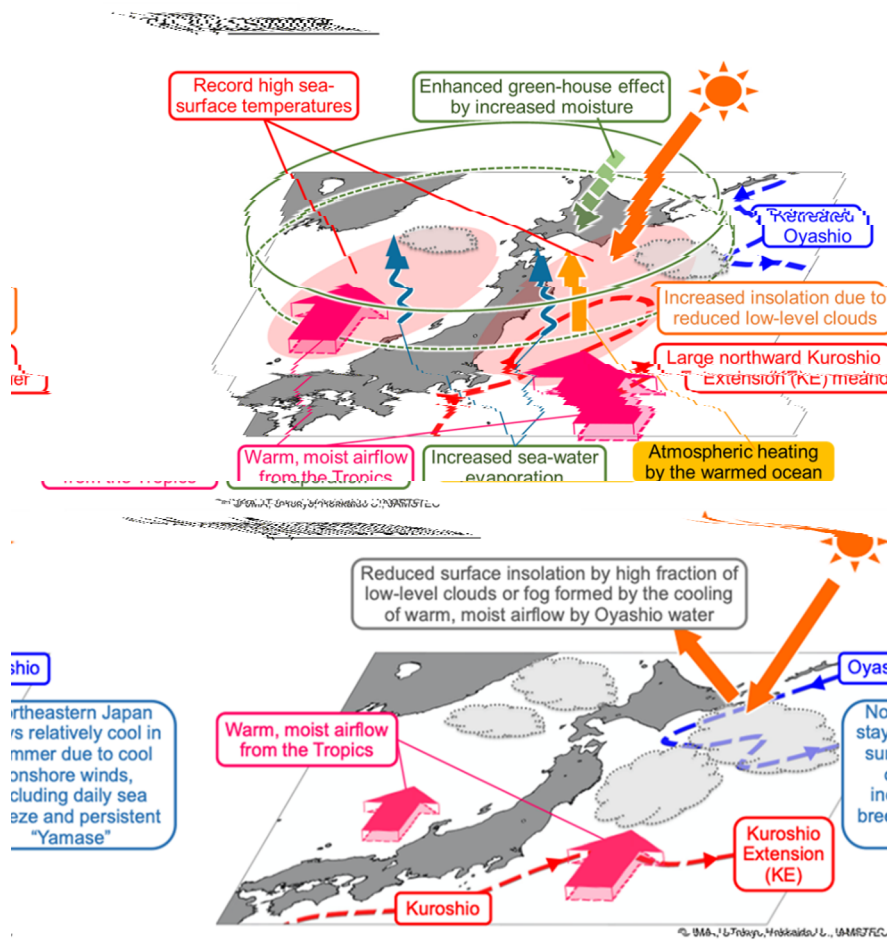


Figure 2-2 (a) Schematic of processes involved in the impact of an unprecedented marine heatwave (MHW) on record-breaking hot summer in 2023 over northern Japan. (b) As in (a), but for atmospheric and oceanic processes that characterize climatological summertime situation around northern Japan. Based on Sato et al. (2024 Scientific Reports).

(SATO Hirotaka, Tokyo Climate Center)

## References

- Sato, H., K. Takemura, A. Ito, T. Umeda, S. Maeda, Y. Tanimoto, M. Nonaka and H. Nakamura, 2024: Impact of an unprecedented marine heatwave on extremely hot summer over Northern Japan in 2023. *Sci. Rep.*, **14**, 16100. <https://doi.org/10.1038/s41598-024-65291-y>
- Takemura, K, H. Sato, A. Ito, T. Umeda, S. Maeda, M. Hirai, Y. Tamaki, H. Murai, H. Nakamigawa, Y. N. Takayabu, H. Ueda, R. Kawamura, Y. Tanimoto, H. Naoe, M. Nonaka, T. Hirooka, H. Mukougawa, M. Watanabe and H. Nakamura, 2024: Preliminary Diagnosis of Primary Factors for an Unprecedented Heatwave over Japan in 2023 Summer. *SOLA*, **20**, 69-78. <https://doi.org/10.2151/sola.2024-010>
- Tokyo Climate Center, 2023: Climate characteristics and factors behind heavy rainfall during the Baiu season in 2023 and extremely high temperatures from mid-July onward (press release) [https://ds.data.jma.go.jp/tcc/data/news/press\\_20230928.pdf](https://ds.data.jma.go.jp/tcc/data/news/press_20230928.pdf)

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## TCC Expert visit to Bhutan

As part of the Project for Capacity Enhancement of Meteorological Observation, Forecasting and Flood Warning for Disaster Preparedness and Response in Thimphu and Paro River Basins in Bhutan by the Japan International Cooperation Agency (JICA) and related capacity development by TCC in its WMO Regional Climate Center function, TCC experts visited the National Center for Hydrology and Meteorology (NCHM) of Bhutan from 6 to 8 August 2024. Content encompassed training on medium-to-long range forecasts and the effective use of TCC resources, including the online Interactive Tool for Analysis of the Climate System (iTacs) and TCC's Three-month Guidance Tool launched in July 2024.

With the attendance of seven staff from the NCHM Weather Service Division, the course began with a presentation on inter-annual and intra-seasonal climate system variability relating to seasonal forecasts in Bhutan. Attendees learned about iTacs usage and climate system analysis associated with observation data in Bhutan, and also assimilated the expertise and techniques necessary to create long-range forecasts using TCC products (e.g., TCC's Three-month Guidance Tool), and produced forecasts for their own regions for the August – October 2024 period. At the end of the seminar, attendees were divided into two groups for presentations on:

- large-scale atmospheric and oceanic variability relevant to Bhutan's climate
- seasonal forecasting for Aug.-Oct. 2024 in Bhutan.

The training was considered a success, with Bhutan attendees clearly learning via excellent presentations to inspire further improvement in medium-to-long range forecasting.

TCC seminars characteristically involve such exercises and presentations to promote understanding of climatological dynamics, seasonal forecasting and usage of TCC tools. TCC remains dedicated to its program of expert visits to NMHSs in Southeast Asia and elsewhere as necessary to assist with operational climate services.

Thanks are due to the relevant NCHM staff for their kind hospitality and to JICA for providing this outstanding opportunity.

*(YAMADA Ken, MAEDA Shuhei, Tokyo Climate Center)*



Practical exercises



Group Photo

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## Introduction of WMO RA II Information Sharing for Climate Services on the TCC Website

Climate services today play increasingly important roles in helping various socio-economic sectors to reduce related negative impacts and adapt to climate change and global warming. Against such a background, National Meteorological and Hydrological Services (NMHSs) need to provide high-quality, high-precision climate information in consideration of accessibility and user needs, and engage in various activities related to the Global Frameworks for Climate Services (GFCS) WMO initiative to promote utilization of climate information in user sectors.

Enhanced climate services and GFCS implementation require sharing of information on such services, good practices and lessons learned in climate-related activities, especially among NMHSs in climatologically similar regions.

To address these issues in WMO Regional Association II (RA II), TCC operates <https://ds.data.jma.go.jp/tcc/RaiiInfoshare/> (TCC News Nos. 36, 50, 67) in response to related decisions taken at the 15th and 16th RA II sessions based on questionnaire feedback. TCC remains committed to supporting the improvement of RA II climate services via its online content.

*(TAKAHASHI Kiyotoshi, Tokyo Climate Center)*

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You can find the latest newsletter from the 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 situations 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](mailto:tcc@met.kishou.go.jp).

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