

Tokyo Climate Center

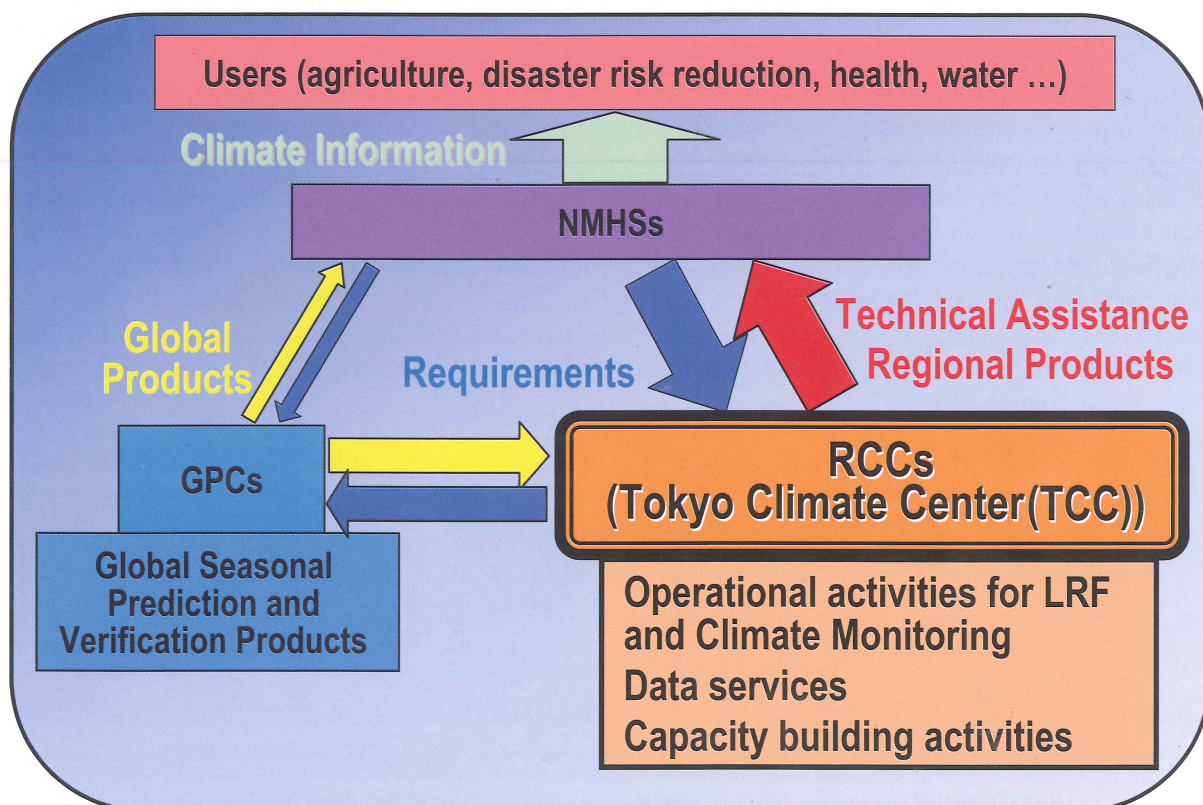
WMO Regional Climate Center in RA II

Introduction

Extreme climate events have recently caused a variety of serious disasters such as droughts and floods around the world, creating a significant social and economic impact. To mitigate the effects of such disasters, National Meteorological and Hydrological Services (NMHSs) play an important role in providing the general public and decision-makers with monitoring results and timely predictions of climate variability. The Japan Meteorological Agency (JMA) established the Tokyo Climate Center (TCC) to meet the requirements of NMHSs in this area and to contribute to the climate services they provide. TCC's two major activities involve providing basic climate data and products to NMHSs through its website and assisting with capacity building at NMHSs in the region.

To promote climate services for the benefit of individuals and countries around the world, WMO has established an international collaborative framework composed of Global Producing Centers (GPCs) for Long-range Forecasts (LRF), Regional Climate Centers (RCCs) and NMHSs to facilitate climate services. RCCs provide information to members within their respective regions and assist them in delivering appropriate climate services and products, including regional long-range climate forecasts for a wide variety of user groups. They also perform mandatory functions covering the domains of long-range forecasting, climate monitoring, data services and training. TCC was designated as one of the first WMO RCCs in Regional Association II (Asia) in 2009 along with the China Meteorological Administration's Beijing Climate Center. It also supports Regional Climate Outlook Forums (RCOFs) in Asia where climate experts in the region discuss the outlook for the coming season.

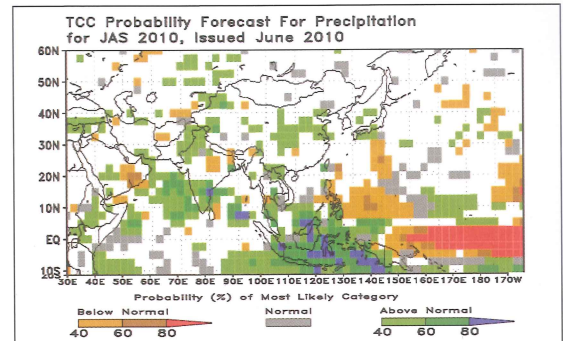
This leaflet introduces TCC's main activities in relation to mandatory RCC functions.



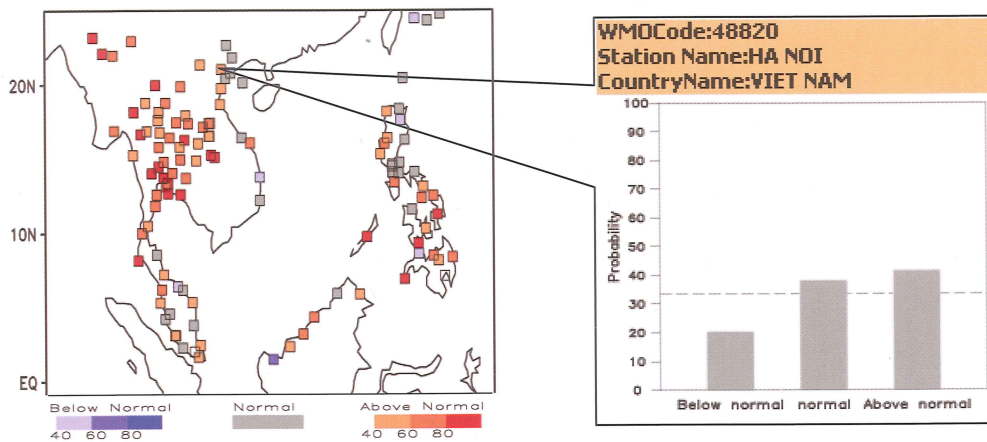
Operational activities for LRF

In its role as a GPC, JMA operates a numerical prediction system for one-month, three-month and summer/winter season forecasts.

TCC provides ensemble prediction maps and verification charts for one-month, three-month and summer/winter season predictions through its website, and registered NMHS users can also access grid point values (GPVs) of ensemble products. TCC also provides one-month probabilistic forecasts for Southeast Asia using JMA's LRF model data (statistical downscaling).



Probabilistic forecast for three-month precipitation (by 2.5° x 2.5° grid)

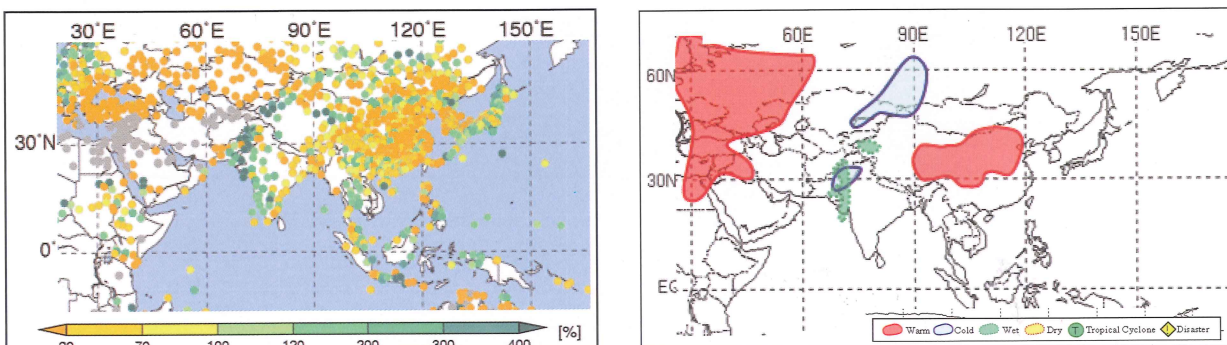


One-month probabilistic forecasts of surface temperature in Southeast Asia (by station)

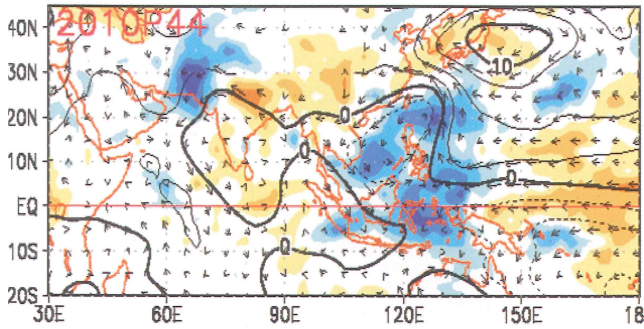
Operational activities for climate monitoring

TCC monitors global climate data through WMO's Global Telecommunication System (GTS). It assembles quality-checked data on temperature and precipitation for the assessment of extreme climate events, and publishes monitoring reports on such phenomena with brief descriptions of the resulting disaster conditions. The Center also monitors the present state of the global climate system, including the Asian Monsoon. Monthly Highlights on Climate System – a report detailing climatic features, atmospheric circulation and oceanographic conditions for the relevant month –, is made available on the TCC Website.

These monitoring results are useful in efforts to understand the present climate, including Climate Watch for extreme events and long-term trends, and in carrying out long-range forecasts and scientific research.



Weekly precipitation ratios (left) and weekly report on extreme climate events (right) (issued in the event of Pakistan floods in August 2010)



Monitoring of Asian Monsoon
(Five-day average of stream function, wind, OLR and their anomalies at 850 hPa in the event of Pakistan floods in August 2010)

Monthly Highlights on Climate System (December 2010)

- Highlights in December 2010
- In late December, a strong cold surge brought heavy snowfall on the Sea of Japan side.
 - Monthly mean temperatures were extremely low in Europe and the southeastern USA. Monthly precipitation amounts were extremely heavy in eastern Australia.
 - The negative Arctic Oscillation was pronounced. Blocking highs developed around eastern Siberia and Greenland.
 - Convective activities were enhanced across the eastern Indian Ocean and the Maritime Continent.
 - Negative SST anomalies were dominant in the equatorial Pacific.

Climate in Japan (Fig. 1):

Due to the northward shift of the Asia jet stream to the east of Japan, monthly mean temperatures were significantly above normal in Northern and Eastern Japan. Since cyclones occasionally developed near Japan, monthly precipitation amounts were significantly above normal in Northern, Eastern, and Western Japan. In late December, a strong cold surge brought heavy snowfall on the Sea of Japan side.

the jet stream was stronger than normal around Japan. The jet stream split into two branches over the central Pacific and the Atlantic, corresponding to the blocking highs.

Tropics (Figs. 6, 7 and 8):

Convective activities were enhanced across the eastern Indian Ocean to the Maritime Continent, especially from the Bay of Bengal to the South China Sea, around Indonesia, over the Caribbean Sea and northern South Africa. Meanwhile, they were suppressed across the

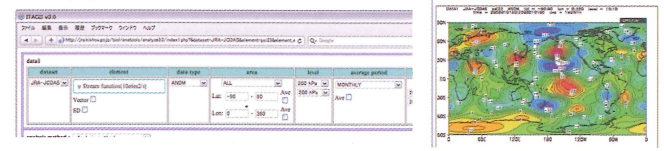
Monthly Highlights on Climate System

TCC has developed a useful web-based climate diagnosis tool called ITACS (Interactive Tool for Analysis of the Climate System) that enables users not only to monitor the current status of the climate but also to analyze the characteristics and factors that lie behind climatic conditions and extreme climatic events. ITACS is available on the TCC website, which is intended for the use of NMHSs and related research institutes.

ITACS : Interactive Tool for Analysis of the Climate System

The ITACS is a web-based application for climatological analysis. The Japan Meteorological Agency (JMA) has developed the ITACS to assist National Meteorological and Hydrological Services (NMHSs) in analyzing the causes of extreme climate events. The ITACS will enable users not only to monitor current climate conditions but also to analyze the characteristics and factors that lie behind such conditions and extreme climatic events. Those who are, basically at NMHSs, interested in using the ITACS are required to submit application to JMA in order to receive permission of the use ([Application for using the ITACS page](#)).

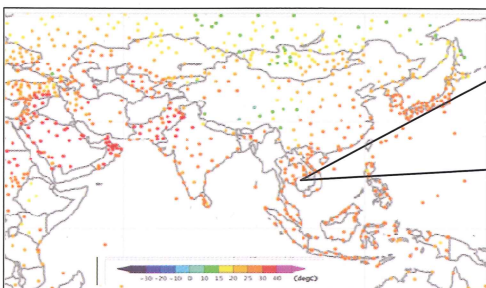
For using the ITACS, users are required only to access the Internet through major web browsers, but not necessary to set up any programs and download any data sets.



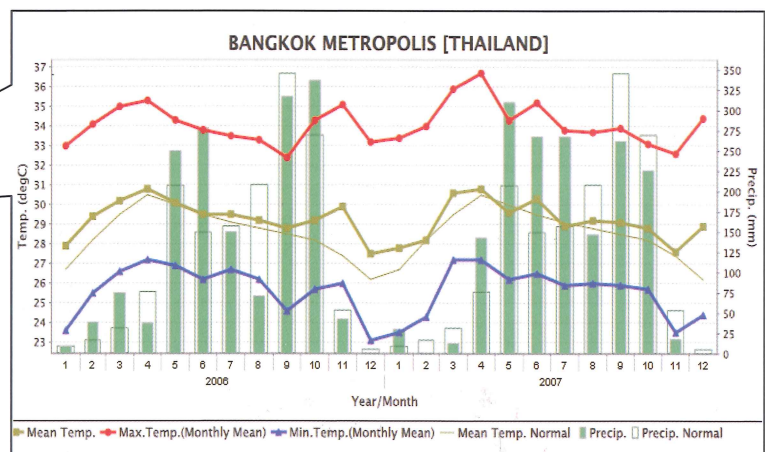
Top page of ITACS

Operational data services, to support operational LRF and climate monitoring

TCC provides a variety of climate datasets that are useful in LRF, climate monitoring and research. Among these, ClimatView is a web-based interactive tool designed to provide monthly climate data from around the world, enabling users to view or download monthly mean temperature and monthly total precipitation data derived from CLIMAT reports. Monthly means of daily maximum/minimum temperatures are also available.

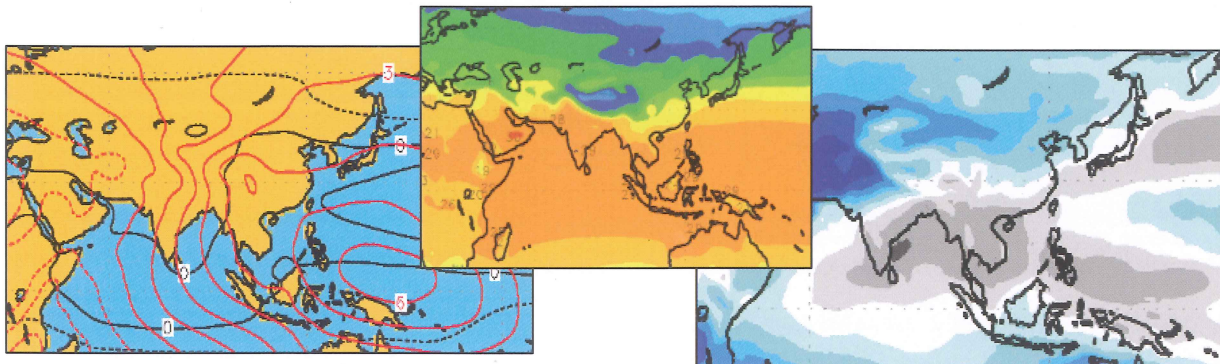


Monthly global mean temperature data derived from CLIMAT reports (ClimatView)



Time-series of monthly temperature and precipitation (ClimatView)

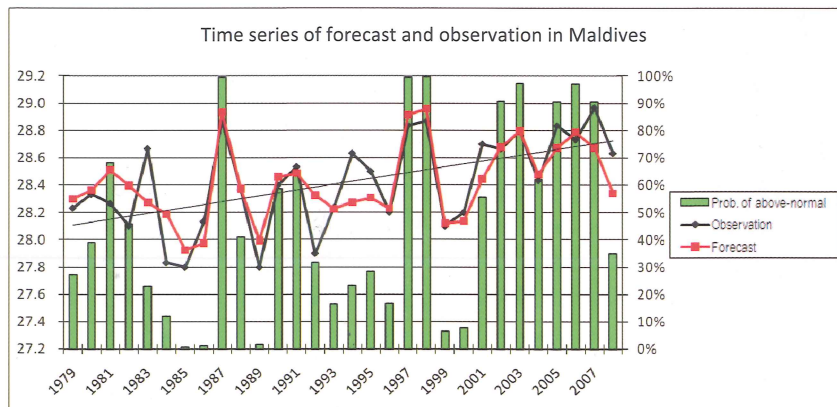
The Japanese Reanalysis Project (JRA-25) and a subsequent real-time climatic assimilation system (the JMA Climate Data Assimilation System (JCDAS)) provide long-term and homogeneous global analysis data for the period from 1979. In addition, maps showing annual, seasonal and monthly averaged climate fields for various meteorological variables from the JRA-25 products are available in the JRA-25 Atlas.



JRA-25 Atlas

Training in the use of operational RCC products and services

To assist NMHSs with their operational climate services, TCC runs annual training seminars on the application of its climate monitoring and prediction products for young NMHS officials engaged in operational climate services in the Asia-Pacific region. Each seminar deals with a different theme depending on TCC's progress in climate prediction and analysis capabilities, such as the introduction of upgraded climate models. The training materials used in seminars are also made available on the TCC website.



Example of exercise outcome at the TCC Training Seminar on Application of Seasonal Forecast GPV Data to Seasonal Forecast Products held at JMA Headquarters (18 – 21 January 2011)

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