

Implementation Plan of RCC Functions

Tokyo Climate Center / Japan Meteorological Agency

Overview of the past and planned activities of Tokyo Climate Center (TCC)

Since its establishment in April 2002, Tokyo Climate Center (TCC) of the Japan Meteorological Agency (JMA) has been assisting NMHSs in the Asia-Pacific region in implementing climate services through a variety of activities. These activities includes: 1) holding of the research meeting in December 2002 and the training workshop in November 2003 on climate system monitoring, analysis and prediction in the Asia-Pacific region; 2) disseminating various products on climate system monitoring, analysis and prediction, such as guidance materials for making climate forecasts and El Nino monitoring and outlook; and 3) providing training modules for the NMHSs' staff engaged in climate service through the TCC website (<http://cpd2.kishou.go.jp/tcc/>).

Besides implementing such activities, the “*Monthly Report on Climate System*” and the “*Report on El Nino Monitoring and Prediction*”, now available through the website, have been provided for more than ten years and are widely referred to not only by NMHSs but also by a wide range of diverse research institutes.

In the field of climate data management and its quality improvement, TCC has been working as the GCOS Surface Network (GSN) Monitoring Center and the CBS Lead Center for GSN. In order to support NMHSs' making probabilistic outlooks, TCC started providing tercile probabilistic prediction products of three-month temperature and precipitation for each grid over the globe in June 2005. For the purpose of improving the information on climate variability and change due to the global warming, TCC released “*Global Warming Projection Vol.6*” in July 2005 and “*Climate Change Monitoring Report 2004*” in November 2005 on the website.

Recently, TCC started developing the statistical downscaling techniques in order to produce guidance materials to assist NMHSs in the Asia-Pacific region in issuing climate advisory which is expected to contribute to the advanced applications in socio-economic activities such as agriculture, water resource management and energy. Also, TCC started the research for identifying possible fields in the application use of climate information in collaboration with some of the NMHSs in the region.

TCC will continue to advance and improve its climate products, for example, by using the Japanese long-term reanalysis data and long-term hindcast data. In addition, TCC plans to enhance the cooperation with the NMHSs aiming at advancing the application of climate information. TCC is developing a database of daily surface observations which is to be available to the NMHSs. Besides, TCC is considering organizing an international workshop or meeting for exchanging information among NMHSs, universities, research institutes, and climate-information users in various fields such as agriculture, water resource management, energy and health.

TCC's present status and future plans described in conformity with the criteria of the “Guidelines on the Eligibility of RCCs” can be referred to in the Annex II.

1. Operational function

(1) Provide interpretation and assessment of relevant output products from global prediction centres

Present status

TCC routinely provides brief interpretation and assessment of JMA's three-month and six-month forecast output products on trial.

Future plan

It is planned to provide detailed interpretation and assessment on an operational basis by early 2007.

(2) Generate and distribute tailored products to meet NMHS needs including seasonal outlooks etc.

(One-month Forecast)

Present status

TCC routinely generates and distributes a variety of charts, as referential materials, derived from JMA's one-month ensemble forecast model outputs, such as 500 hPa height forecast charts.

Future plan

It is planned to generate and distribute a prototype of the tercile probabilistic forecast for some major points in Southeast Asia by early 2007. The number of forecast points will be increased and the products will be provided on an operational basis by early 2008.

(Three-month Forecast)

Present status

TCC routinely generates and distributes a variety of charts as referential materials derived from JMA's three-month ensemble forecast model outputs, such as 500 hPa height forecast charts, and the tercile probabilistic forecast of mean temperature and total precipitation issued monthly for 2.5x2.5 degree grid points over the globe.

Future plan

It is planned to improve the accuracy of those products by early 2008.

(3) Undertake product verification, including hindcast verification of the tools, and the necessary exchange of basic data

(Verification results according to WMO LRF_SVS)

Present status

TCC provides the verification results of 18-year (1984-2001) hindcast of JMA's three-month ensemble forecast of mean temperature and total precipitation, in accordance with the WMO LRF_SVS.

Future plan

It is planned to provide by early 2007 the verification results of 21-year (1983-2003) hindcast of JMA's three-month ensemble forecast, in accordance with the WMO LRF_SVS.

(Provide the necessary data, including both hindcast and observation data for verification)

Present status

TCC has provided the data for verification in response to requests from WMO Members.

Future plan

It is planned to provide hindcast results and relevant objective analysis data for verification.

(4) Provide climate analysis, monitoring

(The analysis and monitoring products of maximum/mean/minimum temperature and precipitation in Asia)

Present status

TCC routinely provides the analysis and monitoring products of mean temperature and total precipitation amounts for a week and a month, issued weekly and monthly respectively.

Future plan

In addition to the mean temperature and total precipitation amounts, it is planned to routinely provide the analysis and monitoring products of maximum and minimum temperature.

(The special climate analysis and monitoring products focused on ENSO, Eurasian snow cover, Asian monsoon, drought, and other severe weather and climate events)

Present status

TCC routinely provides those specialized products in the reports “Monthly Report on Climate System Monitoring” and “El Nino Monitoring and Outlook”.

Future plan

It is planned to further improve the products and to provide those specialized products more frequently on a timely basis.

(5) Provide climate advisories in coordination with NMHS

Future plan

It is planned to strengthen cooperation and collaboration with the NMHSs in the Asia-Pacific region in 2006 toward provisions of climate advisories.

(6) Undertake climate Database Management

Present status

TCC routinely provides the public through the website with a part of monthly climate data including mean temperature and precipitation, and objective analysis data of the atmosphere.

Future plan

It is planned to derive historical daily surface climate database in Southeast Asia from some existing data sets and to make it open to the NMHSs; re-dissemination policy of each original data sets apply to the database. It is also planned to provide Japanese 25-year Reanalysis Project (JRA-25) data to the NMHS users in early 2006.

2. Coordination function

(1) Develop systems to facilitate harmonization and assistance in the use of Seasonal and Interannual (SI) Forecast products

Future plan

Under consideration.

(2) Assist coordination with end users, including the organization of workshops and other forums on users' needs (Regional Climate Outlook Forum)

Future plan

JMA is exploring the possibilities of convening an international workshop for promoting the application of climate information in Southeast Asia in 2008.

(3) Assist the introduction of climate information and predictions into early warning and disaster prevention systems

Future plan

JMA is exploring the possibilities of introduction of monitoring indices for climate assessment using earth observation satellites data for the purpose of early warning and disaster prevention.

3. Data services function

(1) Assist the rescue of climate data sets

Present status

JMA gave technical assistance in managing data quality and archiving data under the project of “ASEAN Compendium of Climate Statistics” conducted during January 2001 through March 2004.

Future plan

It is planned to conduct technical supports and consultations for the data rescue activity in the “Monsoon Asia Hydro-Atmosphere Science Research and prediction Initiative (MAHASRI)”.

(2) Provide climate database and archiving services

Present status

JMA, as a CBS Lead Center for GSN, routinely manages monthly surface climate data based on the CLIMAT reports. The climate data of monthly mean surface temperature, precipitation and air pressure etc. since 2000 are open to the public through the GSN Monitoring Center website.

Future plan

It is planned to provide the monthly surface climate data before 2000 as far before as possible.

(3) Provide advice on data quality management

Present status

JMA routinely conducts a consultation for the quality control management of the incoming CLIMAT reports as a CBS Lead Center for GSN.

Future plan

TCC is ready to give technical advice on quality management when required.

4. Training and capacity building function

(1) Train NMHS staff in SI forecasting methods and characteristics to assist NMHSs to strengthen of SI forecast products

(Have access to basic training facilities)

Present status

JMA in collaboration with the Japan International Cooperation Agency (JICA) has been providing group training courses in meteorology, including climatology, for more than 30 years.

Future plan

The group training course on meteorology will be continued.

(Train NMHS staff in SI forecasting methods and characteristics to assist NMHSs to strengthen their services)

Present status

In addition to the above-mentioned group training course for NMHSs’ staff, TCC organized the “Training Workshop on Climate System Monitoring, Diagnosis and Prediction in the Asia-Pacific Region” in 2003.

Future plan

In addition to the group training course, it is being considered to organize a training workshop on SI forecasting methods and their characteristics for NMHSs’ staff.

(2) Assist the training of end-users on the application and impact of SI Forecast products

Future plan

It is being considered to organize an international workshop for promoting the application of climate information in Southeast Asia in 2008.

(3) Assist the introduction of appropriate decision models for end-users, especially as related to probability forecasts

Future plan

It is planned to strengthen the relationship with both domestic and overseas researchers to develop decision-making models related to probabilistic forecasts.

(4) Assist technical capacity building on NMHS level

Future plan

It is planned to assist in technical capacity building through collaborative research activities.

5. Research and development function

(1) Study climate variability, predictability and impact in the Region

Present status

TCC is conducting the study on climate variability by using COBE-SST and JRA-25.

Future plan

It is planned to conduct the study on climate predictability by using long-term hindcast results in collaboration with universities and research institutes in the framework of the “Monsoon Asia Hydro-Atmosphere Science Research and prediction Initiative (MAHASRI)”.

(2) Develop tools for objective climate analysis and prediction

(Develop tools for objective climate analysis for Asia)

Present status

JMA developed Climate Data Assimilation System (JCDAS) with 3-D variational method and implemented the JRA-25.

Future plan

It is planned to provide JRA-25 data to the NMHS users in early 2006. It is also planned to develop new JCDAS with 4-D variational method.

(Develop climate modeling system for Asia)

Present status

JMA developed dynamical ensemble prediction systems for one-month, three-month and six-month forecasts which are routinely operated, and has been improving the systems in many aspects such as physical processes of related numerical models, especially for ENSO and Asian monsoon prediction.

Future plan

It is planned to develop the six-month ensemble prediction system with a high-resolution coupled ocean-atmosphere model to improve ENSO and Asian monsoon prediction.

(3) Develop and/or validate regional models and methods of downscaling of global output products

Present status

TCC has been developing and evaluating statistical downscaling techniques for one-month forecast.

Future plan

It is planned to initiate a collaborative research with universities and research institutes for developing and evaluating dynamical downscaling techniques with regional models.

(4) Undertake application research, and assist in the specification and development of sector specific products

Present status

TCC has started the development of application products for assisting in issuing early warning information on extreme climate for use in such areas as agriculture and energy industry.

Future plan

It is planned to develop tailored products which meet the needs of Members with different socio-economic and geographical backgrounds.

(5) Promote studies of the economic value of climate information

Future plan

Under consideration.