

**Seventh Session of the Forum on Regional Climate  
Monitoring, Assessment and Prediction for Asia (FOCRAII)  
6 – 8 April 2011, Beijing, China**

# **TCC's capacity-building activity and recent development**

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(Annual Training Seminars)**
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# TCC's Capacity-building Activities

## □ Annual Training Seminars

As part of TCC's capacity-building activity in its role as RCC, TCC holds annual training seminars on the application of its climate monitoring and prediction products. Each seminar deals with a different theme depending on TCC's progress in climate and analysis capabilities, such as the introduction of upgraded climate models.



# TCC's Capacity-building Activities

## □ Annual Training Seminars

- Nov. 2008**      **Use of data and products for long-range forecast**
- Dec. 2009**      **Climate analysis using re-analysis data**
- Jan. 2011**      **Application of seasonal forecast GPV data to seasonal forecast products**



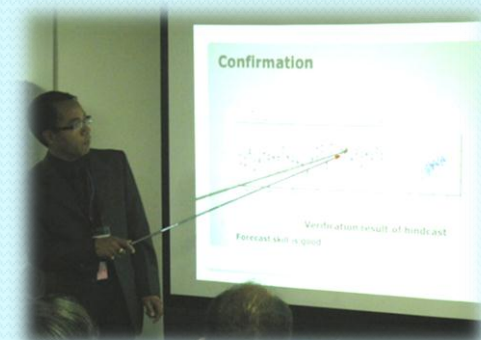
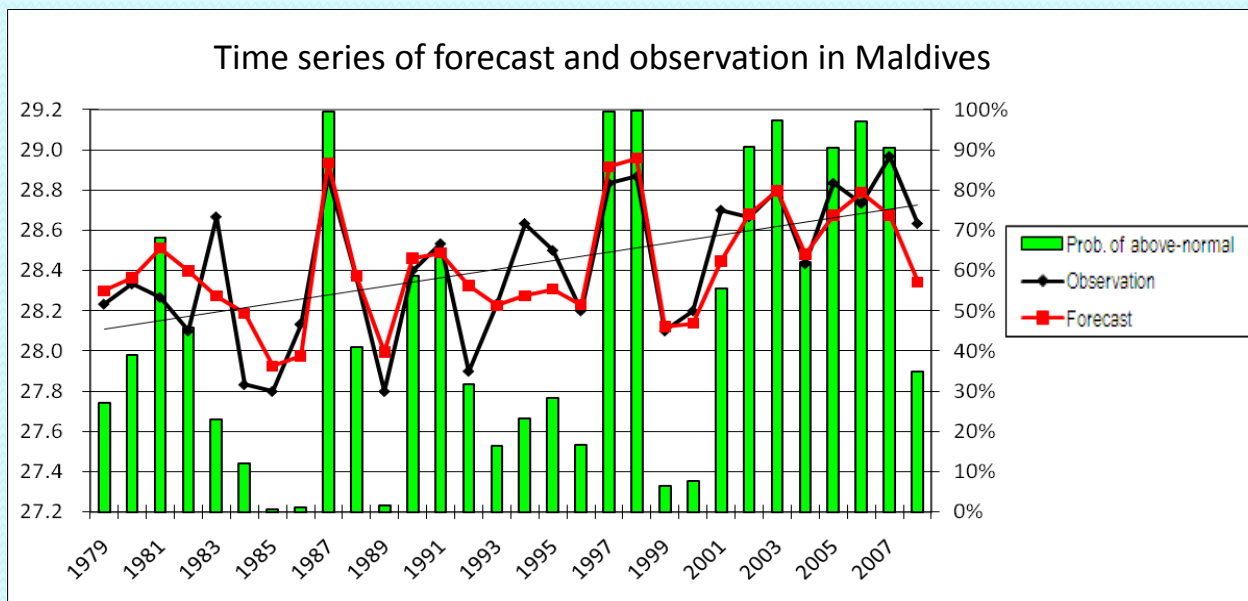
**Next seminar will be held in autumn this year, followed by the Twelfth Joint Meeting for the Seasonal Prediction of the East Asian Winter Monsoon.**

## From the last training seminar

In January 2011, Training Seminar on Application of GPV data to Seasonal Forecast was held with 19 participants from 18 countries and territory.

In the seminar, participants learned about the seasonal forecast GPV data available on the TCC website as well as their application to seasonal forecast products such as probabilistic seasonal forecasts.

After a series of lectures and exercises, individual participants gave presentations on the exercise results of statistical guidance for seasonal forecasting in each country.

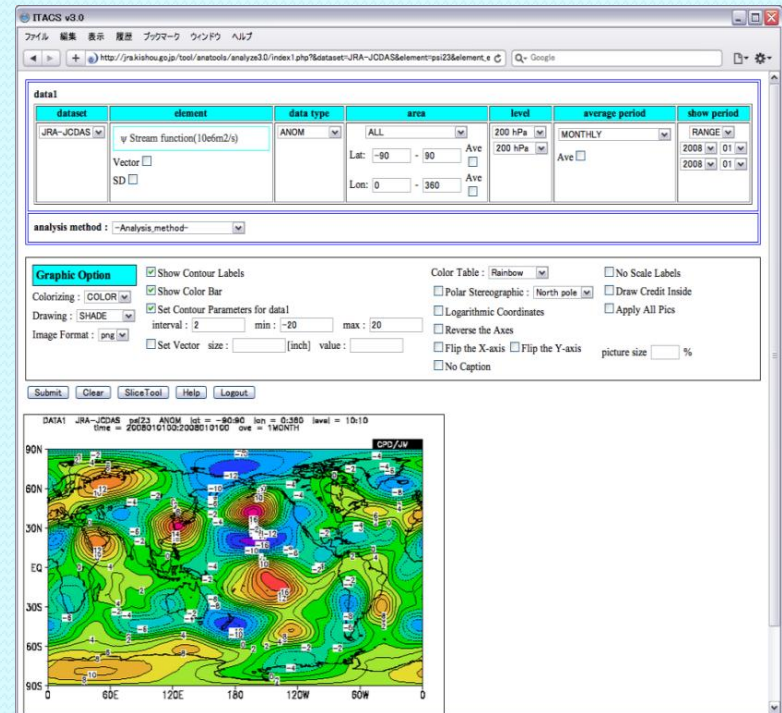


Good example of exercise outcome at the seminar

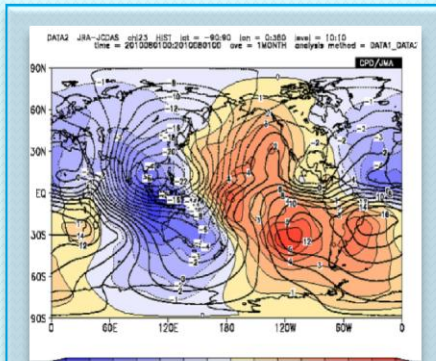
# ITACS : Interactive Tool for Analysis of the Climate System

## What is the ITACS?

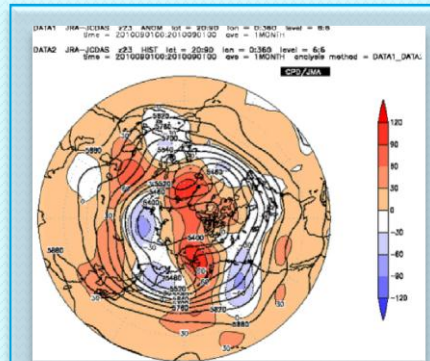
- A web-based application software for climatological analysis
- User is restricted to NMHSs.
- Version 3 is currently released.



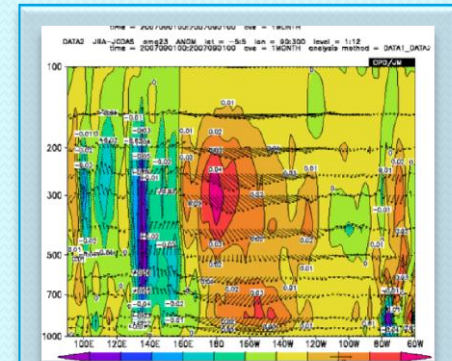
# Examples of Chart



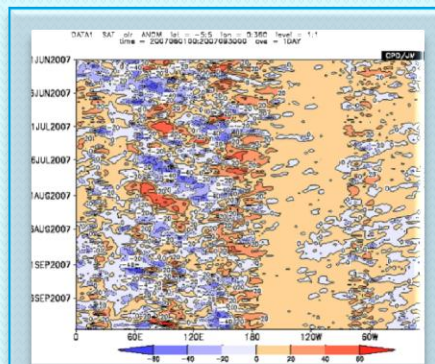
Latitude-Longitude  
Map



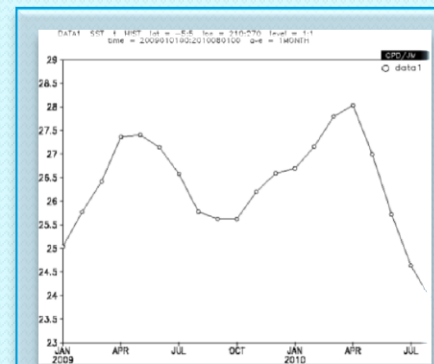
Polar  
Stereographic Map



Vertical Cross  
Section



Time-Longitude  
Cross Section

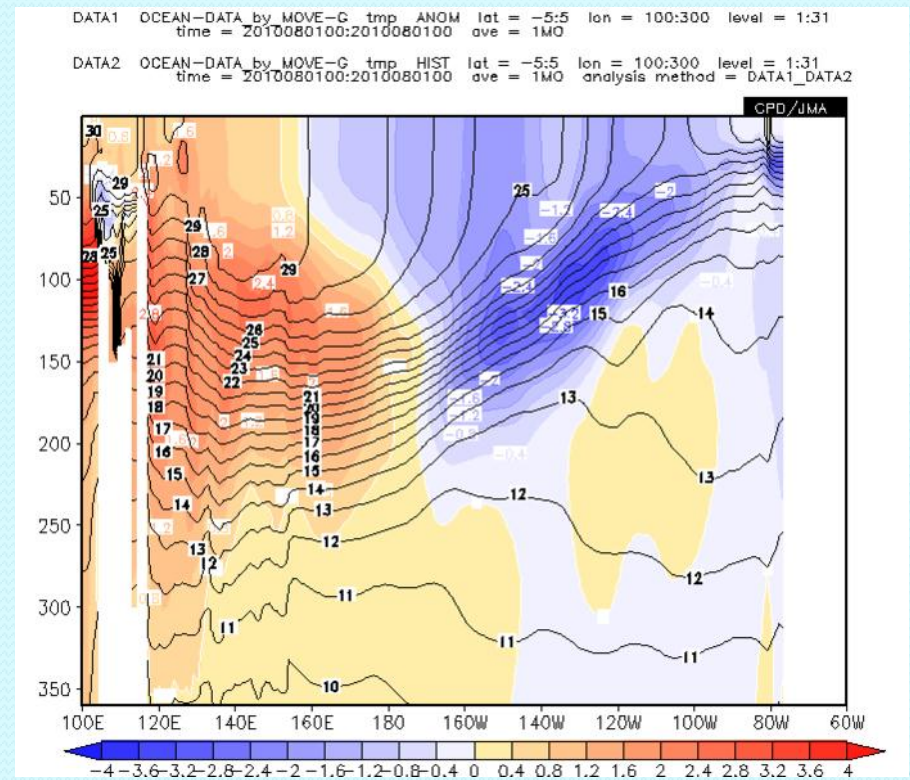


Time-Series Graph

# New Features of ITACS Ver. 4

New version (Version 4) is now being developed. The new version will enable users to (1) use the JMA's current operational ocean analysis data, (2) set the detailed graphics setting, and (3) download data in binary format, which is compatible to GrADS.

Vertical Cross Section of Sea Water Temperature and Anomaly along the Equator in the Pacific in Aug. 2010





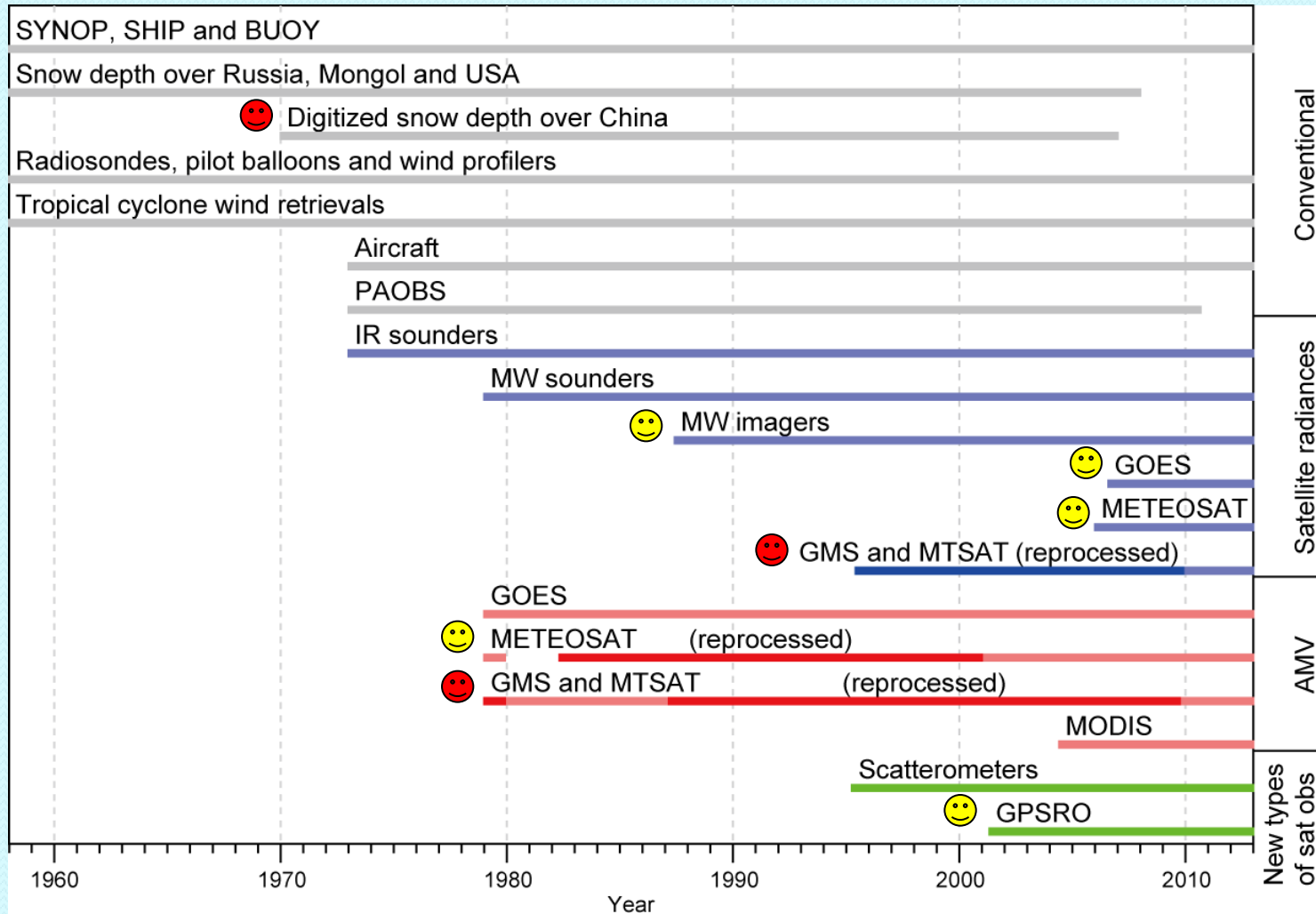
# Status of reanalysis activities at JMA

- **JRA-25/JCDAS (1979 onward; current)**
  - Jointly produced by JMA and Central Research Institute of Electric Power Industry (CRIEPI)
  - Continued in near real time as the JMA Climate Data Assimilation System (JCDAS)
  - Freely available for research purposes
    - [http://jra.kishou.go.jp/JRA-25/index\\_en.html](http://jra.kishou.go.jp/JRA-25/index_en.html)
- **JRA-55 (1958~2012; ongoing)**
  - Extending the period back to 1958 when global radiosonde observing system was established
  - Based on the latest JMA NWP system as of December 2009
  - Aiming at producing a data set that can be used for analysis of low frequency variability in the climate system

# Data assimilation and forecast system

	JRA-25/JCDAS	JRA-55
Resolution	T106L40 (top layer at 0.4hPa)	TL319L60 (top layer at 0.1hPa)
Time integration	Eularian	Semi-Lagrangian
Long-wave radiation	<i>Line absorption</i> Statistical band model <i>Water vapor continuum</i> e-type	<i>Line absorption</i> Table lookup + K distribution <i>Water vapor continuum</i> e-type + p-type
Green house gases	CO <sub>2</sub> (constant at 375ppmv)	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, CFC-11, CFC-12, HCFC-22 (daily interpolation of annual values)
Assimilation scheme	3D-Var	4D-Var (with T106 inner model)
B matrix	constant	Simple inflation factor (x 1.8) applied for pre-satellite era (~1972)
Bias correction for satellite radiances	offline	Variational bias correction

# Observations used for JRA-55

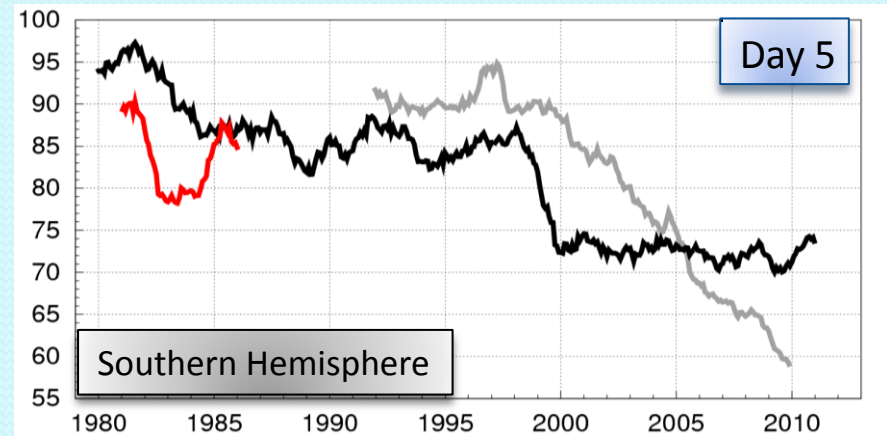
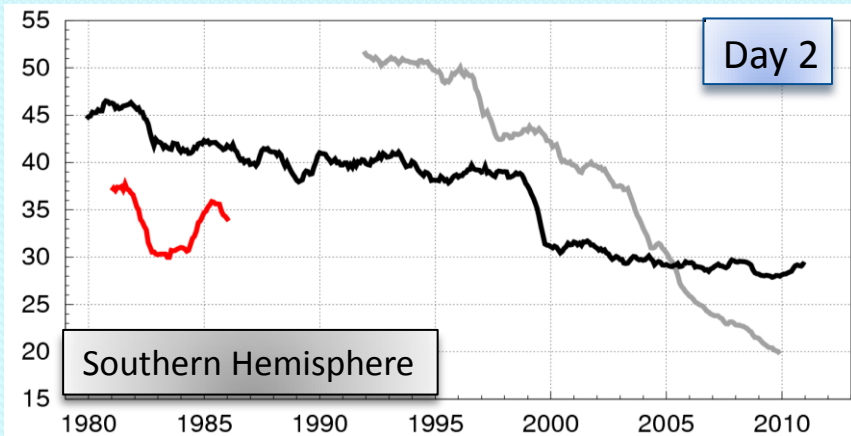
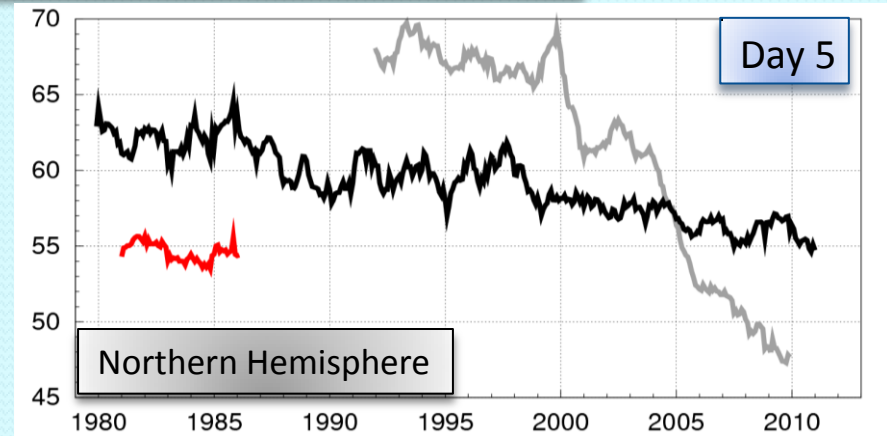
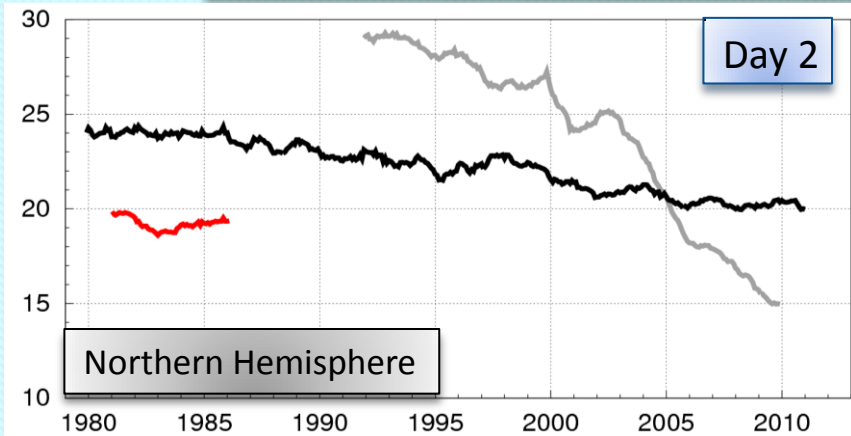


First time for reanalyses

Improved from or added to JRA-25

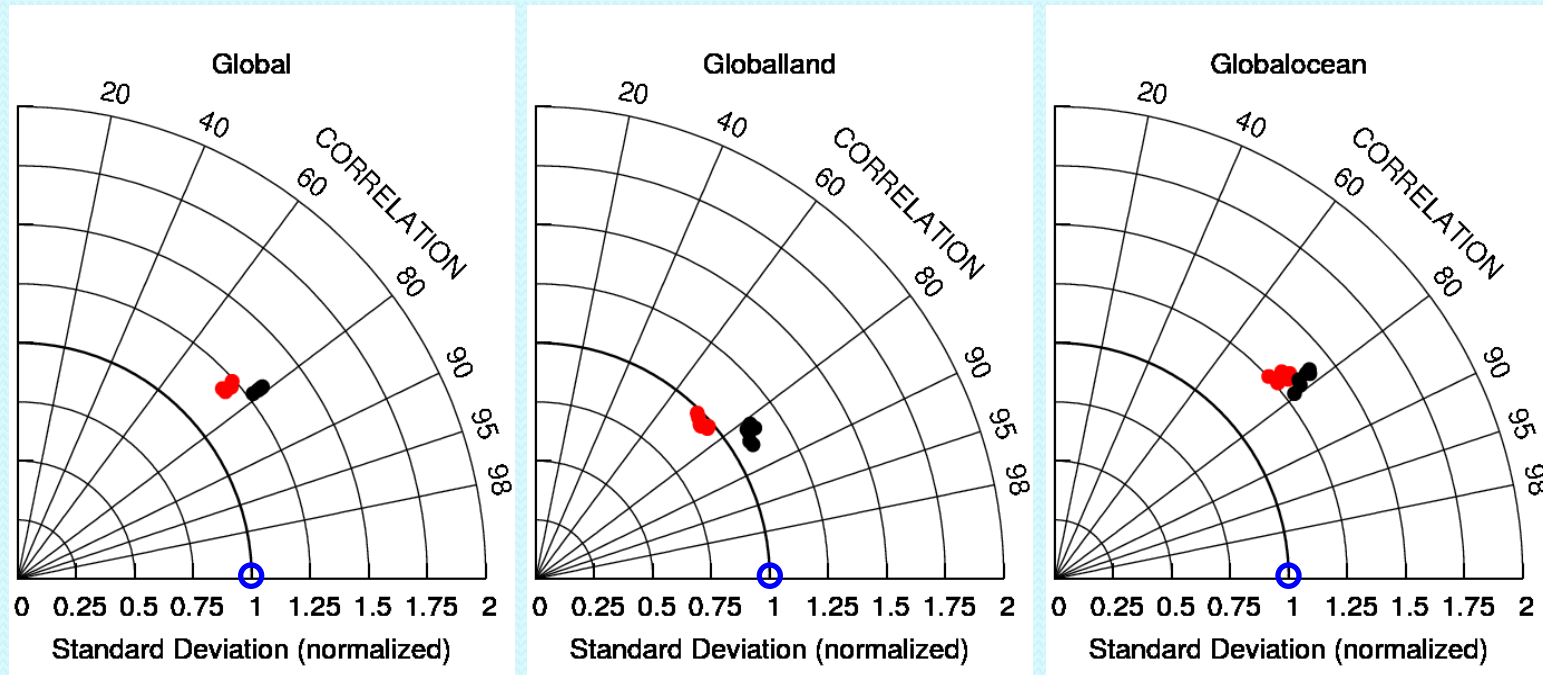
# Performance of extended forecasts

RMSE of 500hPa geopotential height (gpm) (12-month running mean is applied)



JRA-55      JRA-25      Operational

# Evaluation of spatial distribution of precipitation



Taylor diagrams for the annual mean correlations and normalized standard deviations with respect to the GPCP monthly precipitation for the period from 1980 to 1985. The point (1, 1) (indicated by a blue circle) is identical to GPCP and the linear distance of a point to (1, 1) indicates the RMSE from GPCP.

# Production schedule

Aug. 2010

- Stream B started

Dec. 2010

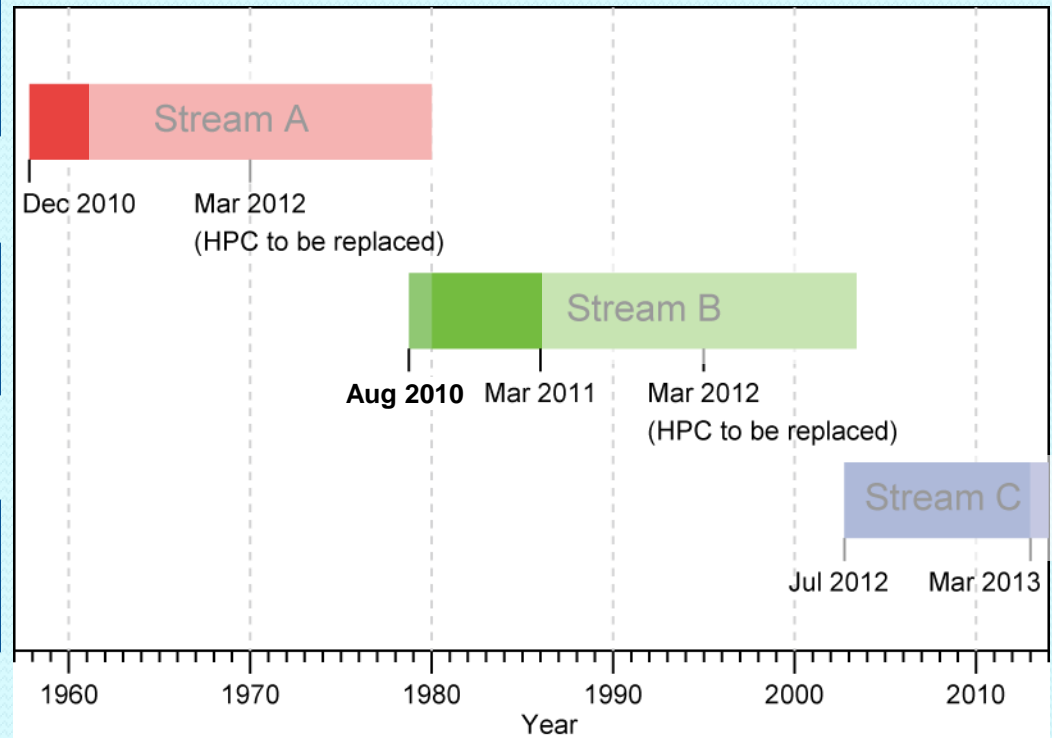
- Stream A started

Early 2013

- Complete production

Mid 2013

- Product release
- JRA-55 will be continued as new JCDAS.



# Please visit the TCC web.

# <http://ds.data.jma.go.jp/tcc/tcc/index.html>

The screenshot shows the Tokyo Climate Center (TCC) website homepage. At the top left is the logo of the Japan Meteorological Agency (気象庁). The main header reads "Welcome to Tokyo Climate Center". A navigation bar includes links for "TCC home", "About TCC", "Site Map", and "Contact us". Below this is a secondary navigation menu with categories: "Home", "World Climate", "Climate System Monitoring", "El Niño Monitoring", "NWP Model Prediction", "Global Warming", "Climate in Japan", "Training Module", and "News Archive".

The main content area is divided into three columns:

- Main Products:** A list of product categories including World Climate, Climate System Monitoring, El Niño Monitoring, NWP Model Prediction, Global Warming, and Climate and Outlook in Japan. Below this is a "ClimatView" section with a world map and "GPC Long-range forecast (LRF) Products" section with a GPC LRF products logo.
- What's New:** A list of recent updates and reports, including "24 December 2010 NEW", "21 December 2010 NEW", "17 December 2010 NEW", "14 December 2010 NEW", "13 December 2010 NEW", "10 December 2010 NEW", "10 November 2010 NEW", "30 September 2010", and "16 September 2010".
- Links:** A list of external links to various climate-related organizations and centers, such as "RA II Regional Climate Center (RCC) Network Homepage", "WMO DDB", "JRA-25 Atlas", "World Data Center for Greenhouse Gases (WDCGG)", "RSMC Tokyo - Typhoon Center", "World Meteorological Organization (WMO)", "GCOS Surface Network Monitoring Center (GSNMC)", "APEC Climate Center", and "Asian Disaster Reduction Center".

At the bottom left, there is a section for "TCC News (latest issue)" and "Introduction to ITACS" with a corresponding logo.

***Thank you for your attention.***