TCC Training Seminar on Climate Analysis Information

- Introduction -

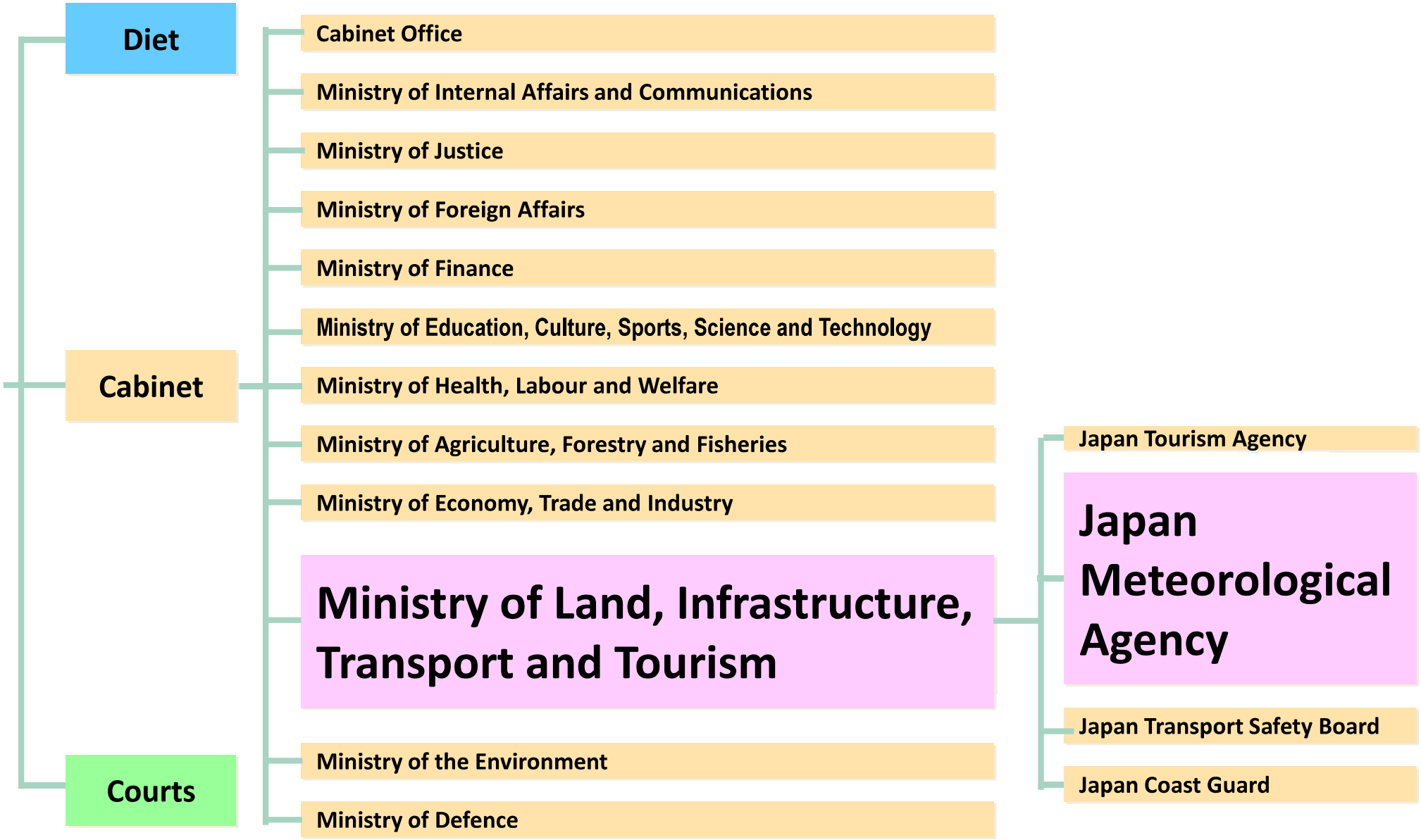
Tokyo Climate Center (TCC)
Japan Meteorological Agency (JMA)
E-mail: tcc@met.kishou.go.jp

Topics in this session

- Introduction
  - Introduction of JMA, TCC and TCC's activities including capacity development
  - Schedule of the seminar

- Products on the TCC website
  - Schedule of provision of climate information

Organization of the Government of Japan



Organization of JMA

Director-General

Dr. Mitsuhiko Hatori

Deputy Director-General

Headquarters

- Administration Department
  - Councellor
- Forecast Department
- Observations Department
- Seismological and Volcanological Department

Local Offices

- District Meteorological Observatory
  - Okinawa Meteorological Observatory
- Local Meteorological Observatory
  - Aviation Weather Service Center
- Weather Station
- Marine Observatory

Auxiliary Organs

- Meteorological Research Institute — Tsukuba, IBARAKI
- Meteorological Satellite Center — Kiyose, TOKYO
- Aerological Observatory — Tsukuba, IBARAKI
- Magnetic Observatory — Ishioka, IBARAKI
- Meteorological College — Kashiwa, CHIBA

Global Environment and Marine Dept.

- Climate Prediction Division
- Tokyo Climate Center

About the Tokyo Climate Center

- The Japan Meteorological Agency (JMA) has been monitoring extreme climate events and the global climate system for two decades. In addition, the Agency operates numerical prediction models for long-rage forecasts and El Niño outlooks.
- JMA established the Tokyo Climate Center (TCC) in 2002 to meet the requirements of NMHSs and contribute to the climate services they provide in the Asia-Pacific region.
- The Center was designated as a Regional Climate Center in Region II of the World Meteorological Organization as of 1 July 2009.

Provision of Climate Information

Types of Climate Information and Services

- Global Climate Monitoring & Analysis
- Long-range Forecast
- El Niño Monitoring and Outlook
- Numerical Climate Prediction and Re-analysis
- Climate Change Monitoring and Projection
- Climate Application Services

Domestic Users In Japan

Tokyo Climate Center (TCC)
<RCC Tokyo>

NMHSs in Asia and the Pacific region

Capacity Development

TCC conducts capacity-building activities in its role as RCC.

Annual Training Seminar

Expert visit to NMHSs

Expert visit from NMHSs

TCC Annual Training Seminar

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.

	Theme
Nov. 2008	Climate Information and Forecasting
Dec. 2009	Climate Analysis using Reanalysis Data
Jan. 2011	Application of Seasonal Forecast Gridded Data to Seasonal Forecast Products
Nov. 2011	One month Forecast Products
Nov. 2012	**Climate Analysis Information** NOW

TCC Annual Training Seminar

Materials and presentations of past training seminars are available on the TCC website.

Expert visit to NMHSs

Participation of TCC Experts in RCOFs and Expert Visits to NMHSs in Southeast Asia

WMO Regional Climate Outlook Forums (RCOFs) bring together national, regional and international climate experts on an operational basis to produce regional climate outlooks based on input from participating NMHSs, regional institutions, Regional Climate Centres and global producers of climate predictions. By providing a platform for countries with similar climatological characteristics to discuss related matters, these forums ensure consistency in terms of access to and interpretation of climate information.

In 2012, TCC experts participated in two RCOFs. These were the eighth session of the Forum on Regional Climate Monitoring, Assessment and Prediction for Regional Association II (FOCRAII) held in Beijing, China, from 6 to 8 April, and the third session of the South Asian Climate Outlook Forum (SASCOF-3) held in Pune, India, from 19 to 20 April. At both the events, the TCC attendees gave presentations on seasonal predictions based on JMA's numerical model and participated in discussions to produce consensus forecasts.

TCC experts also visited NMHSs in the Philippines, Viet Nam and Lao PDR in March 2012 to provide follow-up for the TCC Training Seminar on one-month forecast held in November 2011, including practical exercises with the Interactive Tool for Analysis of the Climate System (ITACS) and the installation of a module for site-specific probabilistic guidance for one-month forecasting. The experts also discussed and exchanged views with attendees on improving climate services and engaging in possible future cooperation.

Presentation at FOCRA II, Beijing, China

Discussion at Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Philippines

Exercise at National Center for Hydro-Meteorological Forecasting (NCHMF), Viet Nam

Lecture at Department of Meteorology and Hydrology (DMH), Lao PDR

(TCC news No. 28 (Spring 2012)

http://ds.data.jma.go.jp/tcc/tcc/news/index.html

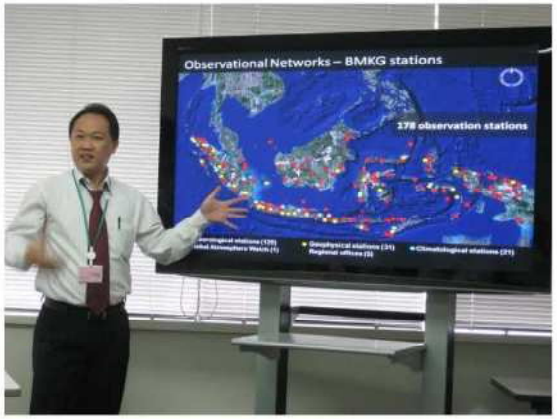
Expert visit from NMHSs

BMKG expert visit to TCC

One of TCC's main tasks is to assist NMHSs in improving their climate services. In addition to running annual training seminars and arranging expert visits, TCC also receives visitors from NMHSs upon request.

Indonesia's Meteorological, Climatological and Geophysical Agency (BMKG) is currently developing its Climate Early Warning System (BMKG CEWS), which is scheduled to enter operation in 2013. In a related development, JMA commenced operational provision of Early Warning Information on Extreme Weather (EWIEW)* in March 2008 with the aim of contributing to meteorological risk management in climate-sensitive sectors in Japan. To support the effective development of BMKG CEWS, four experts from BMKG visited TCC in July 2012.

During the visit, the BMKG representatives gave informative presentations on their climate services, including those tailored to agriculture in Indonesia. TCC experts then led discussions on a number of relevant issues such as work procedures for the operational climate warning system in Japan and JMA's Ensemble Prediction System (EPS) for seasonal forecasting. Attendees from both organizations engaged in interesting and fruitful discussions on customized climate services and various other issues. The BMKG experts then had exercises on the application of TCC products including gridded EPS data. TCC hopes the visit will contribute to the efficient and effective development of BMKG's planned Climate Warning System.



Presentation by a BMKG expert

Presentation by a TCC expert

Exercises on the application of TCC products

BMKG experts and TCC staff members

(TCC news No. 29 (Summer 2012)

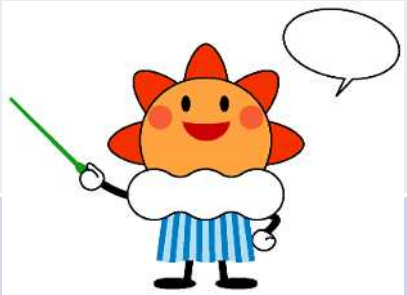
http://ds.data.jma.go.jp/tcc/tcc/news/index.html

Schedule of this seminar

Date	Presentations and exercises
Mon., 26	Opening - Welcome address, self introduction, etc.
	Introduction of products on the TCC website
	Introduction to Climatology
Tue., 27	Use of ClimatView and Statistical analysis
	Monitoring and prediction of El Nino and La Nina
	Climate System Monitoring - Introduction of TCC products on the TCC website focusing on Asian monsoon
	Exercise – Part I - Introduction of ITACS, Basic operation of ITACS

Schedule of this seminar (cont.)

Date	Presentations and exercises
Wed., 28	Exercise – Part I (Cont.) - Introduction of ITACS, Basic operation of ITACS
	Climate System Monitoring - Example analysis of past phenomena
	Exercise – Part II - Production of climate analysis information
Thu., 29	Exercise – Part II (Cont.)
	Presentation by participants
Fri., 30	Presentation by participants (cont.)
	Wrap up and Closing
	Technical Tour

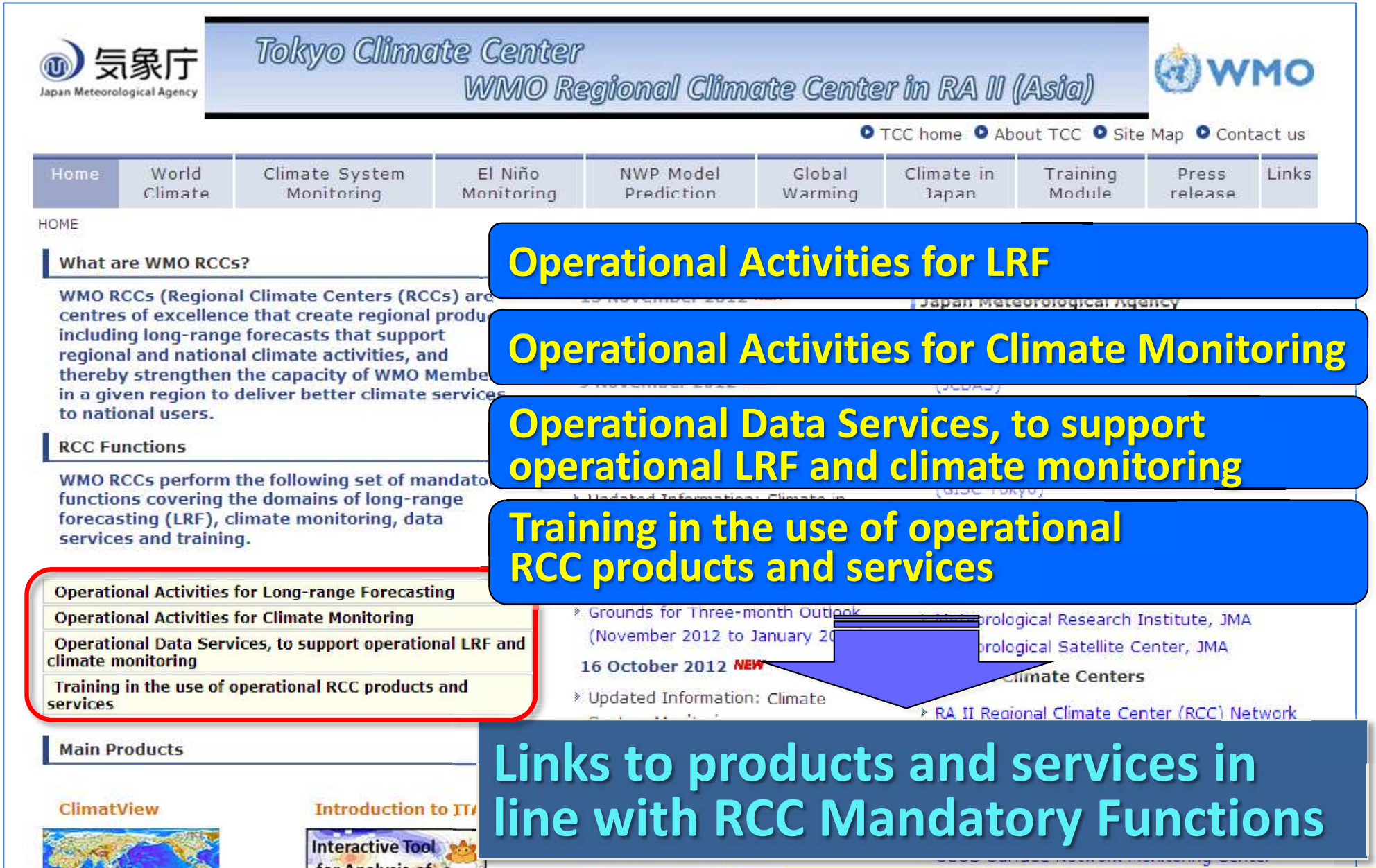


Introduction of products on the TCC website

Tokyo Climate Center (TCC)
Japan Meteorological Agency (JMA)

E-mail: tcc@met.kishou.go.jp

Provision of Data and Products via the TCC website

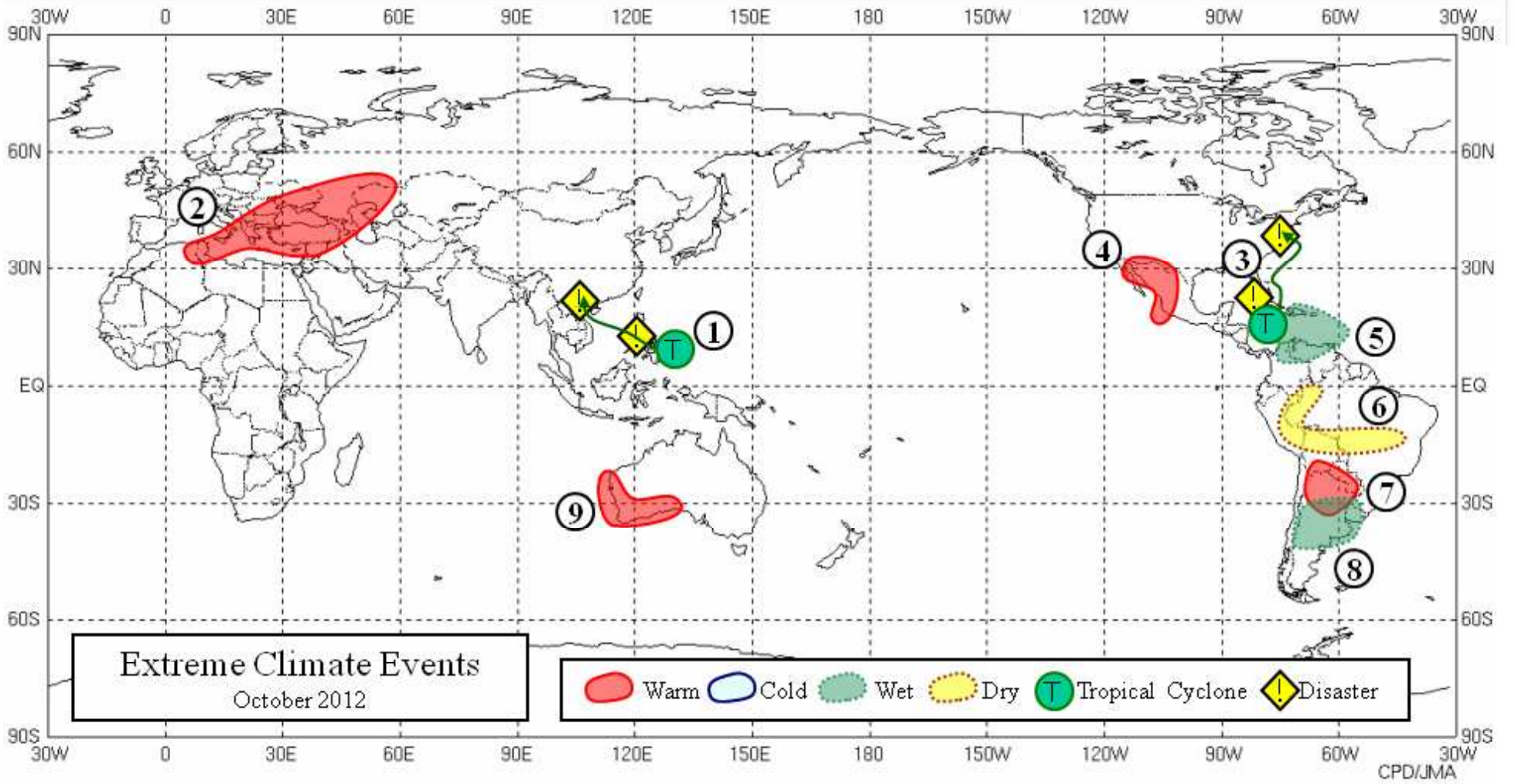


http://ds.data.jma.go.jp/tcc/tcc/index.html

Climate Monitoring
&
Climate Analysis

Monitoring Extreme Climate Events

Weekly, Monthly, Seasonal and Annual Temperature/Precipitation
Hazardous Climatic Events (Flood/Drought/Tropical Cyclone)
Using CLIMAT and SYNOP reports



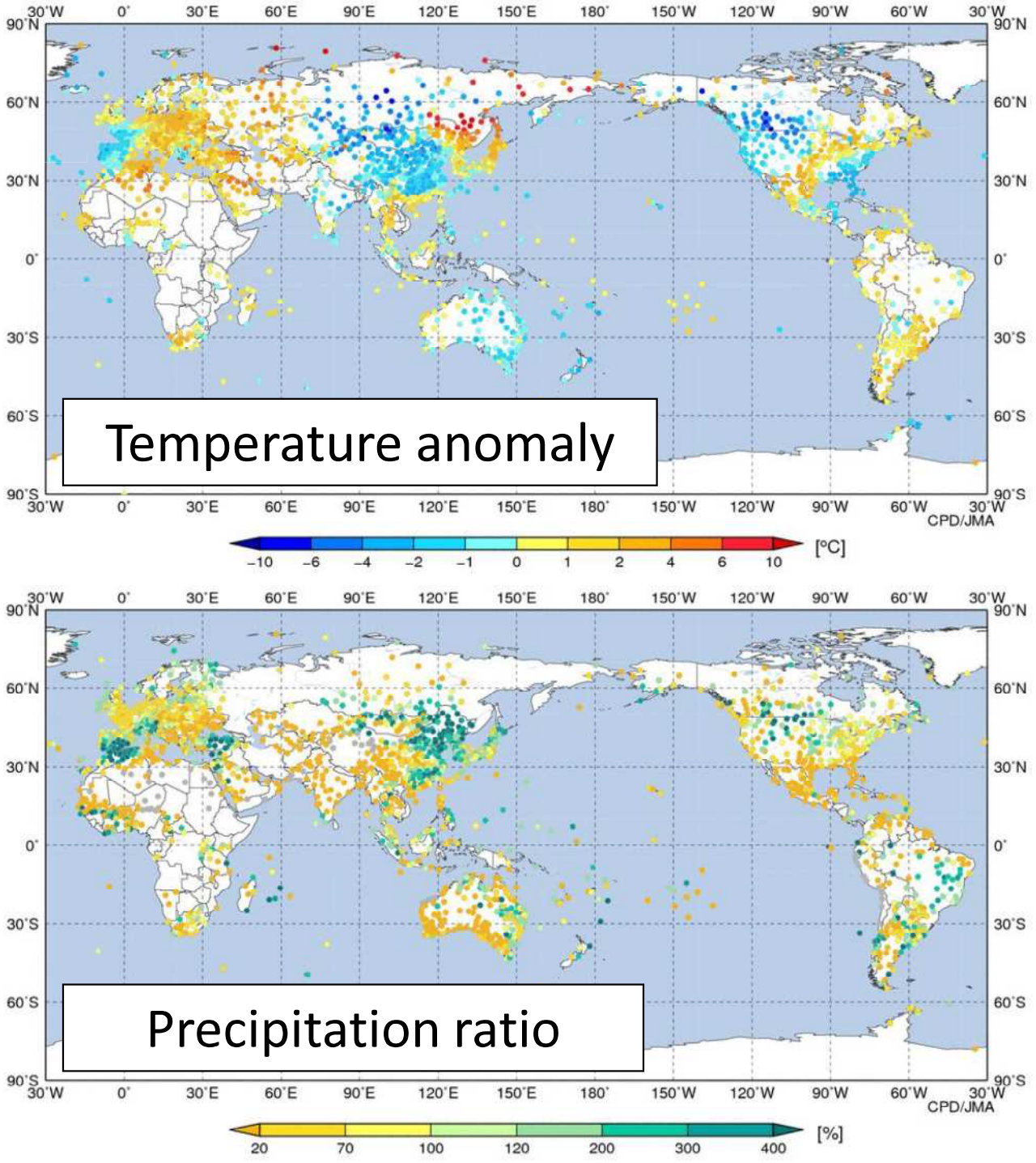
Distribution of Monthly Extreme Climate Events (October 2012)

http://ds.data.jma.go.jp/tcc/tcc/products/climate/index.html

Monitoring Extreme Climate Events

Weekly Temperature anomaly (top) and Precipitation ratio (bottom)

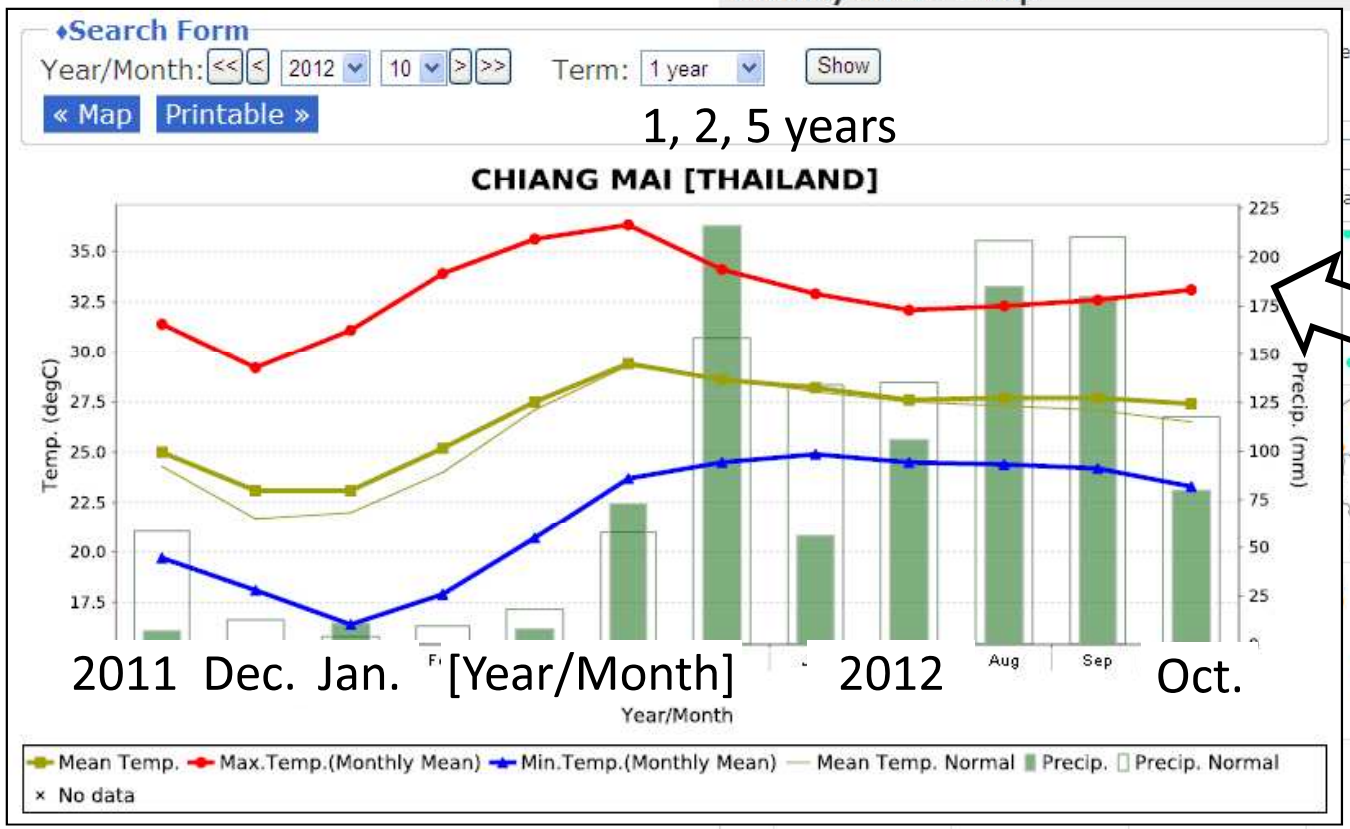
(7 – 13 November, 2012)

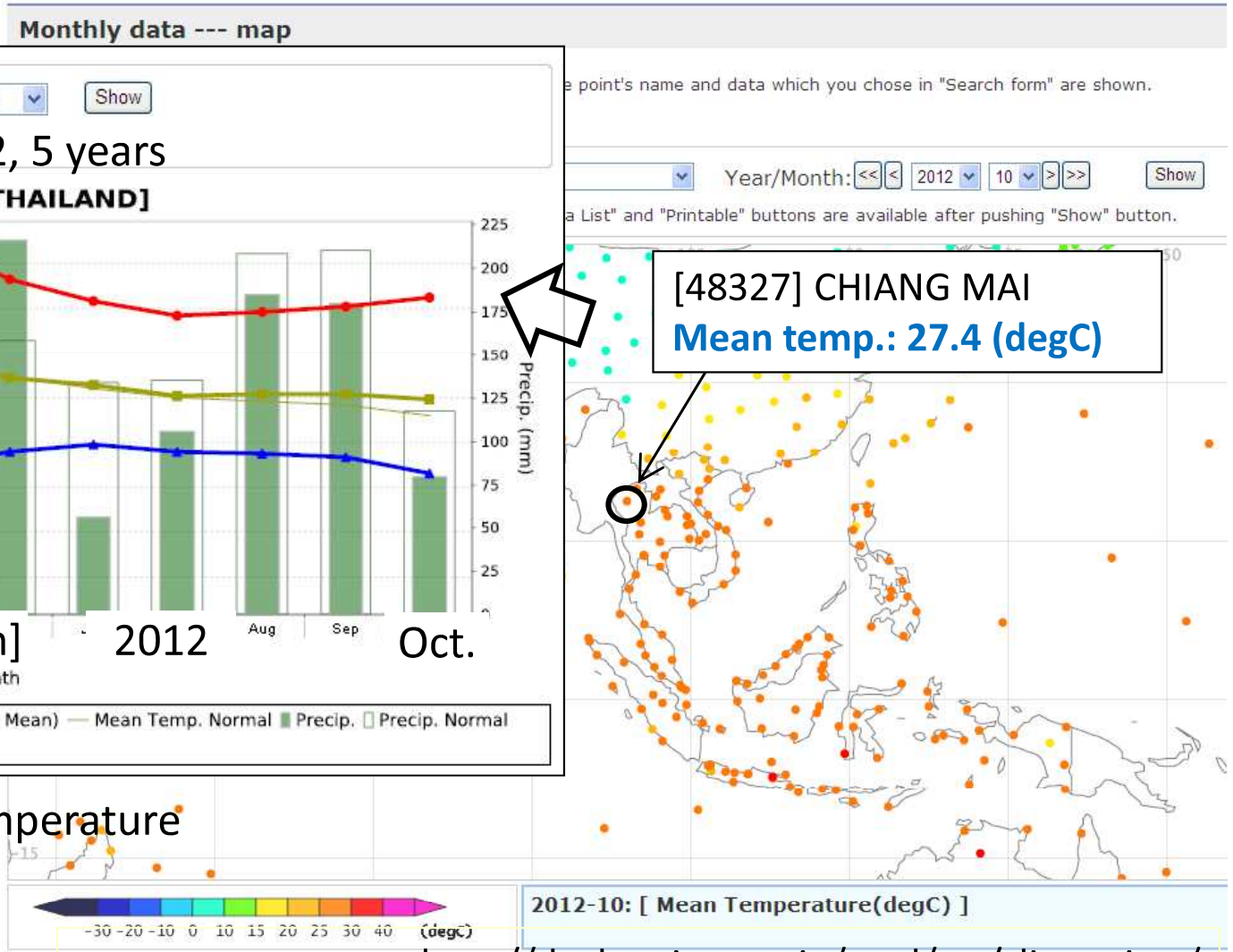


http://ds.data.jma.go.jp/tcc/tcc/products/climate/synop.html

ClimatView: Web-based Interactive Tool

ClimatView is a tool overviewing and downloading monthly world climate data. It allows the user to see and obtain monthly mean temperatures, monthly total precipitation amounts and its anomaly or ratio at all available stations.



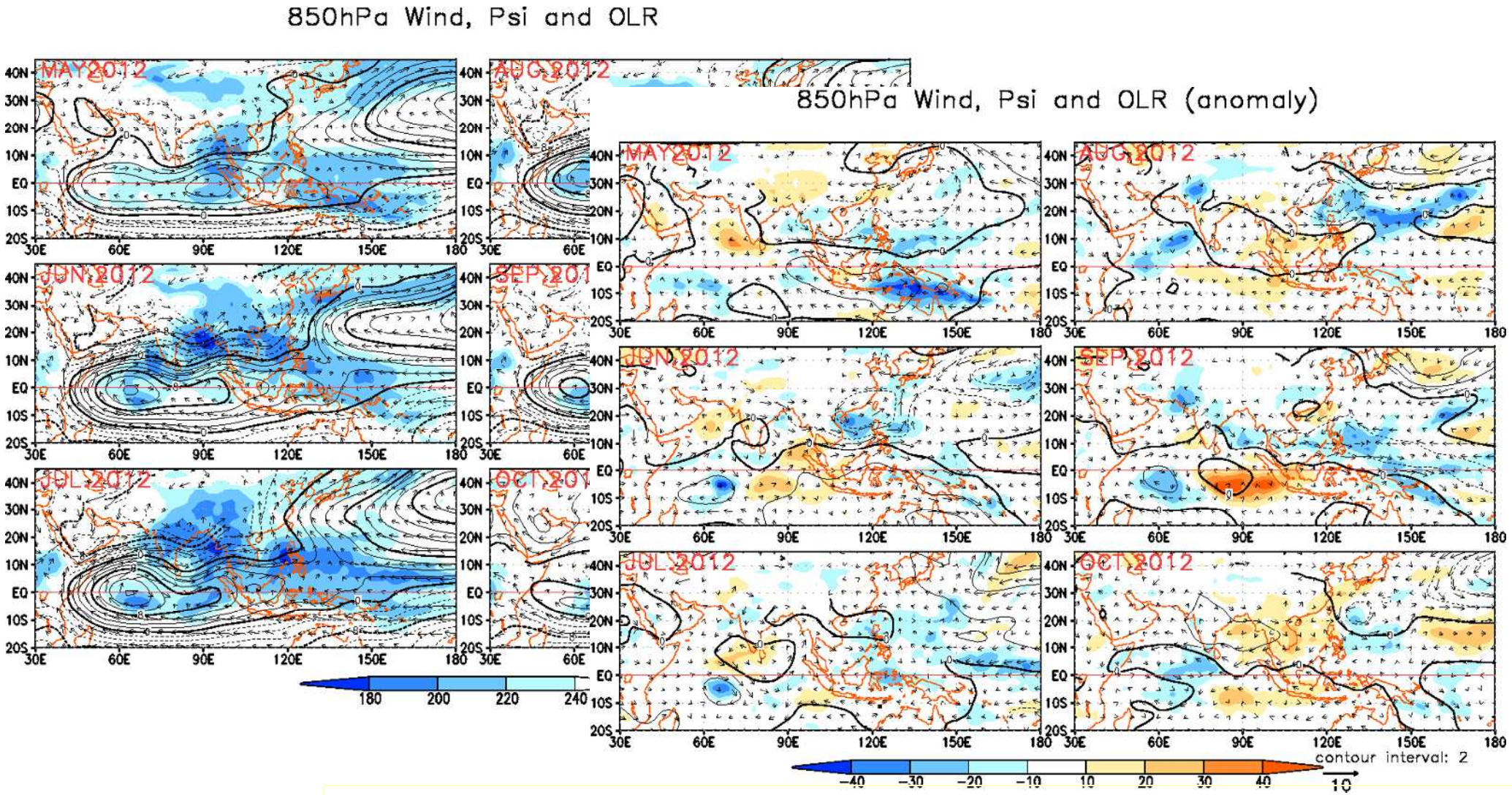


Monthly high, mean and low temperature and monthly precipitation from Nov., 2011 to Oct., 2012 in Chang Mai, Thailand

http://ds.data.jma.go.jp/gmd/tcc/climatview/

Climate Monitoring: Asian Monsoon

For monitoring Asian Monsoon, TCC provides monthly mean and anomaly of Stream Function, Wind and OLR in the 850hPa height field.

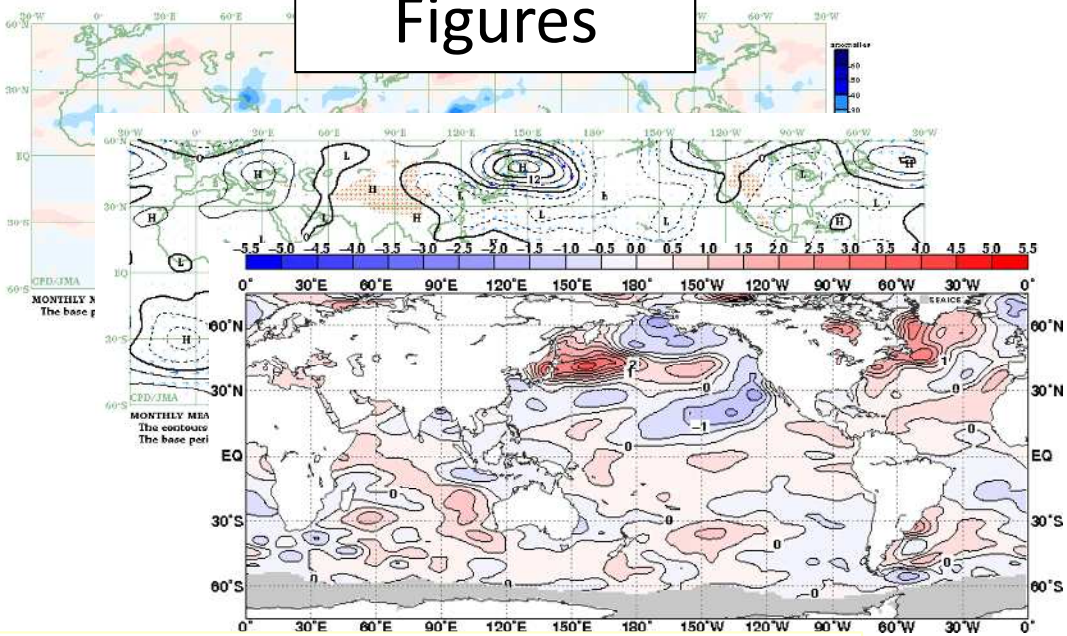


http://ds.data.jma.go.jp/tcc/tcc/products/clisys/ASIA_TCC/map1_mon.html

Monthly Highlights on the Climate System

'Monthly Highlights on the Climate System' has been issued as a monthly bulletin focusing on the monthly highlights of the monitoring results.

Figures



Text

15 November 2012 *Japan Meteorological Agency*

Monthly Highlights on the Climate System (October 2012)

Highlights in October 2012
- El Niño conditions transitioned to ENSO neutral conditions in the equatorial Pacific (see El Niño Outlook updated on 9 November 2012).
- Monthly mean temperature was significantly above normal in northern Japan, while it was below normal in Okinawa/Amami.
- Monthly mean temperatures were extremely high from western Kazakhstan to Tunisia.
- The negative phase of the Arctic Oscillation was pronounced.
- Convective activity was enhanced and suppressed over the western and eastern Indian Ocean, respectively.
- Positive and negative SST anomalies were seen in the western and eastern equatorial Pacific, respectively.

Climate in Japan:

Monthly mean temperature was significantly above normal in northern Japan where warm air covered mainly in the first ten days. On the other hand, it was below normal in Okinawa/Amami, due to cold air outbreaks. Monthly sunshine durations were above normal in eastern and western Japan, where fine weather prevailed in the first and second ten days.

World Climate:

The monthly anomaly of the global average surface temperature in October 2012 (i.e., the combined average of the near-surface air temperature over land and the SST) was +0.19 °C (4th warmest since 1891) (Fig. 2). On a longer time scale, global average surface temperatures have risen at a rate of about 0.61°C per century. Extreme climate events were as follows (Fig. 3).
- Monthly mean temperatures were extremely high from western Kazakhstan to Tunisia.
- Monthly precipitation amounts were extremely heavy in central Argentina.
- It was reported that Hurricane "SANDY" caused more than 100 fatalities in the eastern USA (FEMA). It was also reported that Hurricane "SANDY" caused more than 60 fatalities in Haiti and Cuba (OCHA and the Government of Cuba).

Extratropics:

In the 500-hPa height field (Fig. 4), positive and negative anomalies were generally seen in the high- and mid-latitudes, respectively, exhibiting the negative phase of the Arctic Oscillation. Blocking anticyclones were developed around the Bering Sea and over the northern North Atlantic. The jet stream from the Eurasia to the Pacific shifted southward of its normal position, and zonal flow (small meandering) prevailed around Japan (Fig. 5).

Tropics:

Philippines, across the Intertropical Convergence Zone from the Caribbean Sea to western Africa, and was suppressed from the eastern Indian Ocean to the Maritime Continent, west of the dateline in the tropical North Pacific (Fig. 6). The active phase of the Madden-Julian Oscillation propagated eastward from the western Pacific to the Atlantic in early and mid-October and reached the western Indian Ocean in late October (Fig. 7). In the lower troposphere, easterly and westerly wind anomalies were seen over the western and central – eastern equatorial Pacific, respectively (Fig. 7). In the upper troposphere, cyclonic circulation anomalies were observed over southern Eurasia (Fig. 8). The Southern Oscillation Index value was +0.5 (Fig. 10).

Oceanographic Conditions:

In October, positive and negative SST anomalies were seen in the western and eastern equatorial Pacific, respectively (Fig. 9). The monthly mean SST anomaly were -0.1°C and the SST deviation from the latest sliding 30-year mean in the NINO.3 region were +0.0°C (Fig. 10). In the North Pacific, remarkably positive SST anomalies were seen around 40°N, 145°W and from near 35°N, 170°E to near Japan. Remarkably negative SST anomalies were seen near the Bering Sea, near Aleutian Islands, from around the west of Mexico to the central tropical Pacific except its equatorial area, and from around the Philippines to south of Japan.

In the Indian Ocean, remarkably positive SST anomalies were seen from around the western coast of Australia to the central and western tropical regions, and southeast of Madagascar. In the Atlantic, remarkably positive SST anomalies were seen from near the eastern coast of the USA to around Greenland and from Gulf of Mexico to around the western coast of North Africa. Remarkably negative SST anomalies were seen around 35°N, 35°W and from around the eastern coast of Brazil to around the

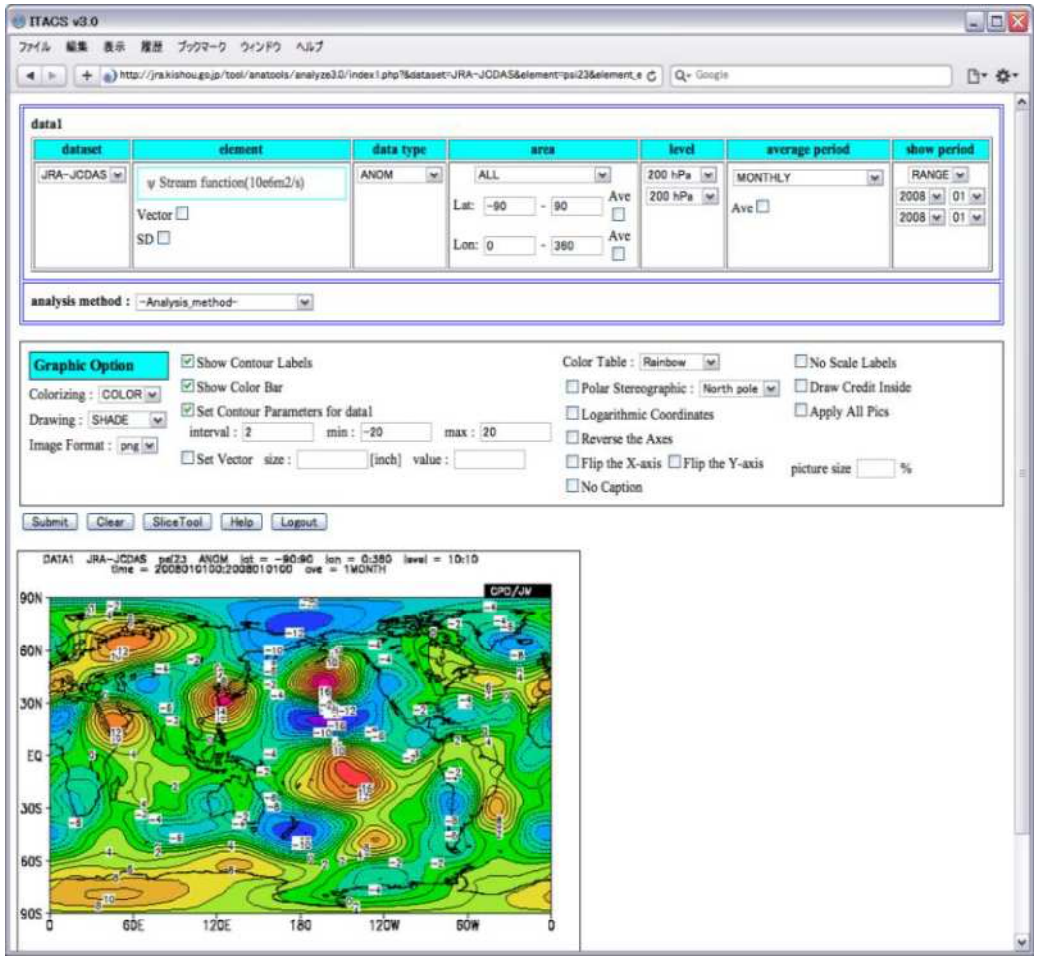
Data: JRA-25/JCDAS, OLR, COBE-SST, CLIMAT reports, etc.

http://ds.data.jma.go.jp/tcc/tcc/products/clisys/highlights/index.html

ITACS: Web-based Interactive Tool

ITACS (Interactive Tool for Analysis of the Climate System) is a web-based application software for climate analysis.

A new version (Version 4) has been developed, enabling 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.

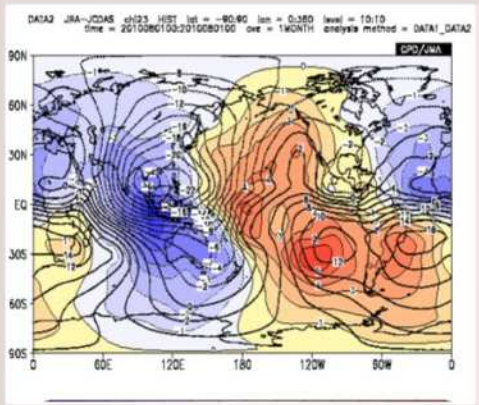


Data

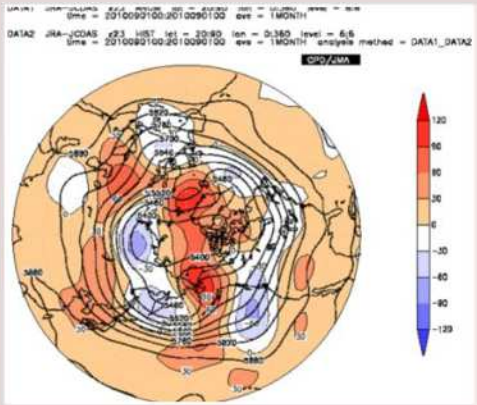
- Japanese 25-year ReAnalysis (JRA-25) （1979-2004）
- JMA Climate Data Assimilation System (JCDAS） （2004 - Present)
- Daily Sea Surface Analysis for Climate Monitoring (COBE-SST) and Predictions
- OLR, CLIMAT

http://extreme.kishou.go.jp/tool/itacs-tcc2011/

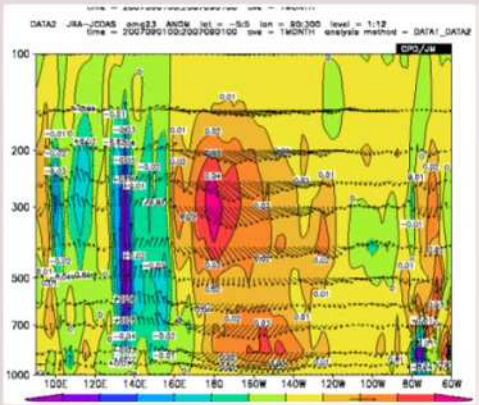
ITACS: Web-based Interactive Tool



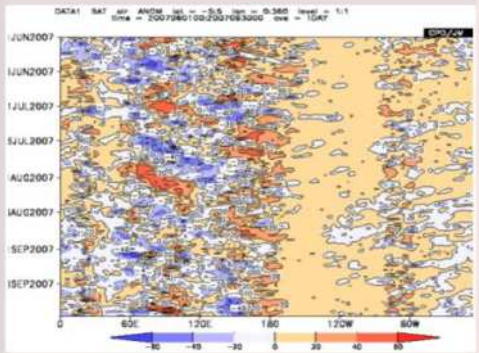
Latitude-Longitude Map



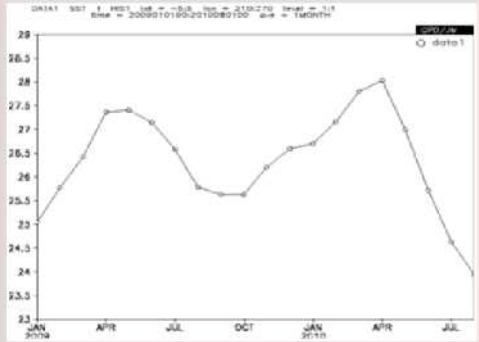
Polar Stereographic Map



Vertical Cross Section



Time-Longitude Cross Section



Time-Series Graph

http://extreme.kishou.go.jp/tool/itacs-tcc2011/

El Niño Monitoring & Outlook

El Niño Monitoring & Outlook

JMA operates the Ocean Data Assimilation System and the El Niño Prediction System (an ocean-atmosphere coupled model) for monitoring and prediction of El Niño-Southern Oscillation (ENSO).

Monthly diagnosis reports, ENSO monitoring products, ENSO indices and El Niño outlooks are available on TCC website.

El Niño Outlook

(November 2012 - May 2013)

Last Updated: **9 November 2012**

- **El Niño conditions transitioned to ENSO neutral conditions in the equatorial Pacific.**
- **It is likely that ENSO neutral conditions will continue until the northern hemisphere spring.**

[El Niño / La Niña]

In October 2012, the NINO.3 SST deviation was 0.0°C (Table and Fig.1). SSTs in the equatorial Pacific were above normal in the western part and below normal in the eastern part (Fig.2 and Fig.4). Subsurface temperatures were above normal from the western to the central parts and below normal in the eastern part (Fig.3 and Fig.5). In the atmosphere, the convective activities were near normal in the equatorial Pacific (Fig.6). Easterly winds in the lower troposphere were also near normal in the

http://ds.data.jma.go.jp/tcc/tcc/products/elnino/index.html

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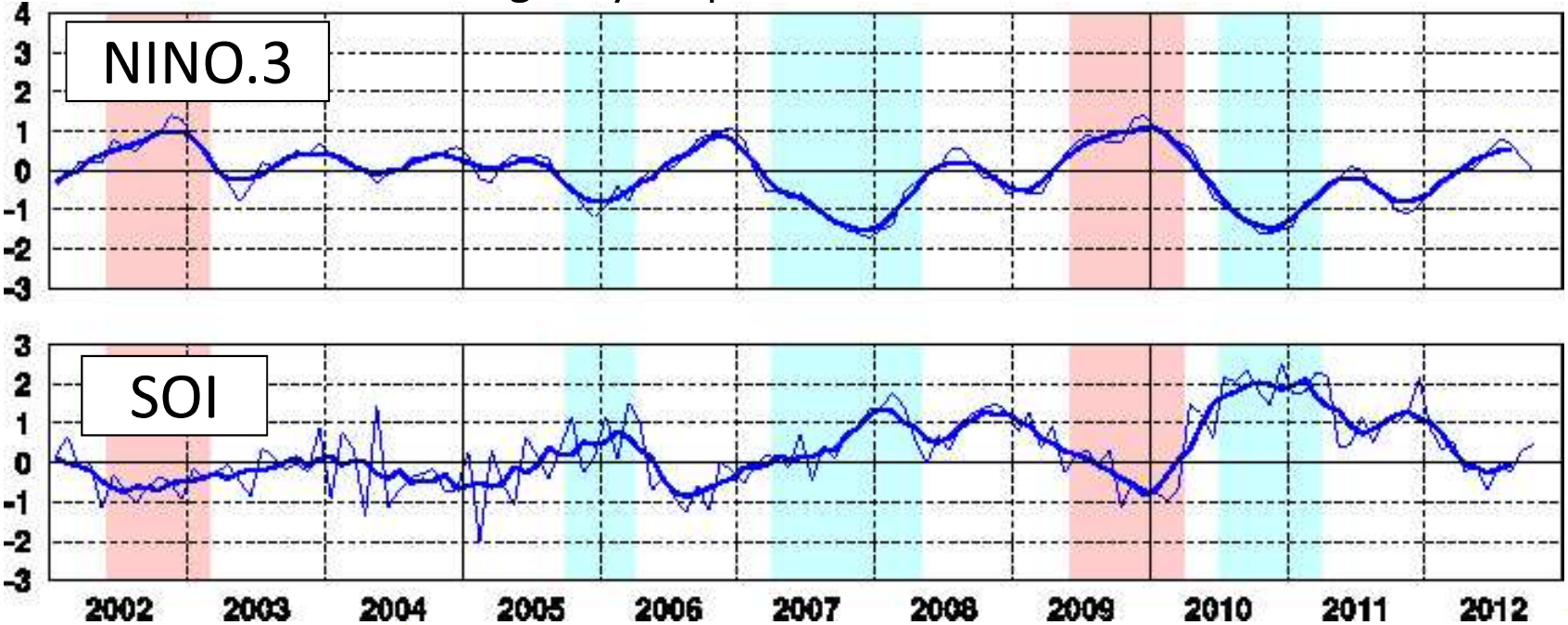
JMA's El Niño Monitoring Areas

Time series of sea surface temperature deviations from the climatological mean based on a sliding 30-year period for NINO.3 and SOI



(Area)
<NINO.3>
[5N-5S, 150W-90W]
<NINO.WEST>
[15N-EQ, 130E-150E]
<IOBW>
[20N-20S, 40E-100E]

http://ds.data.jma.go.jp/tcc/tcc/products/elnino/index.html

El Niño Monitoring & Outlook

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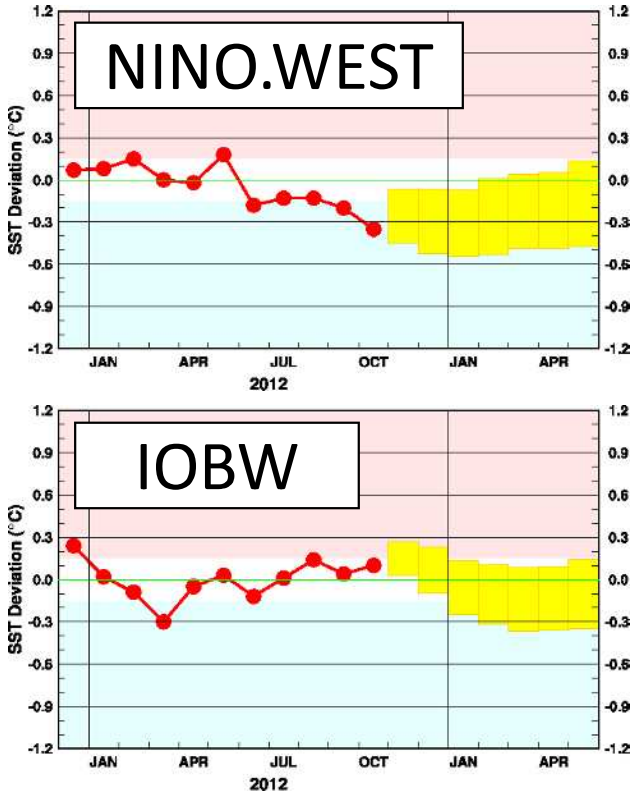
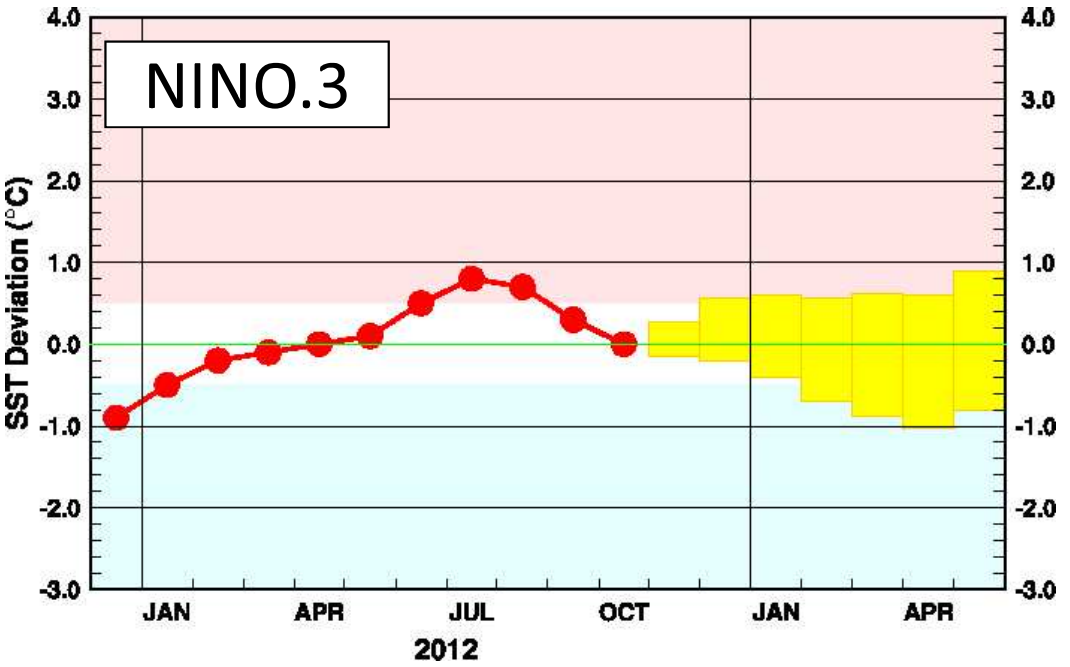


(IOBW: Indian Ocean basin-wide)



(Area)
<NINO.3>
[5N-5S, 150W-90W]
<NINO.WEST>
[15N-EQ, 130E-150E]
<IOBW>
[20N-20S, 40E-100E]

Outlook of the SST deviation for JMA's El Niño Monitoring Areas by the El Niño prediction model.

http://ds.data.jma.go.jp/tcc/tcc/products/elnino/index.html

Long-range Forecast Products

One-month, Three-month, & Warm/Cold season

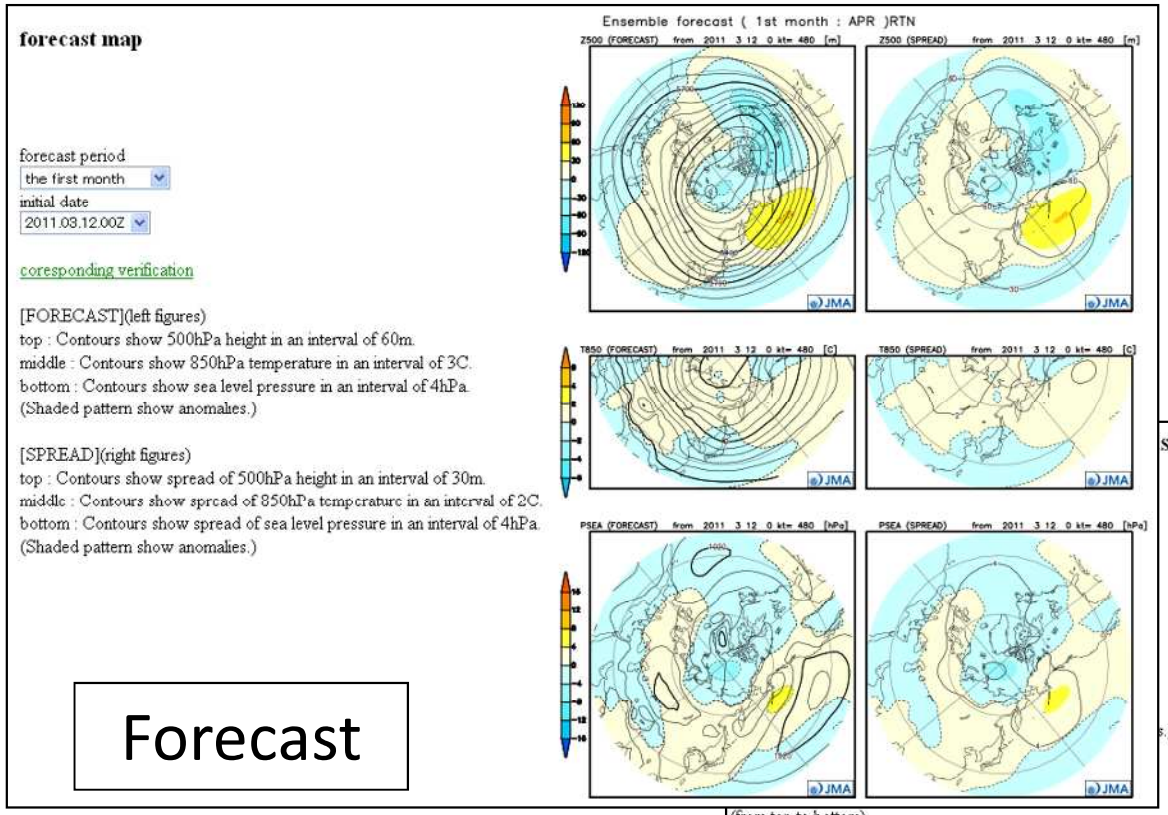
JMA NWP systems for Extended-range forecast

Model	JMA AGCM
Horizontal res.	TL159 (about 1.125º Gaussian grid ~110km)
Vertical Layers	60 (Top Layer Pressure:0.1hPa)
Time integration	One-month forecast: 34 days Early Warning Information: 17 days
Ensemble size	50 members
Perturbation method	Breeding Growing Mode (BGM) & Lagged Average Forecast (LAF) method
SST	Persisted anomaly
Land surface Initial conditions	Initial conditions of land parameters are provided by a land surface analysis system. Observation of snow depth reported in SYNOP is assimilated.

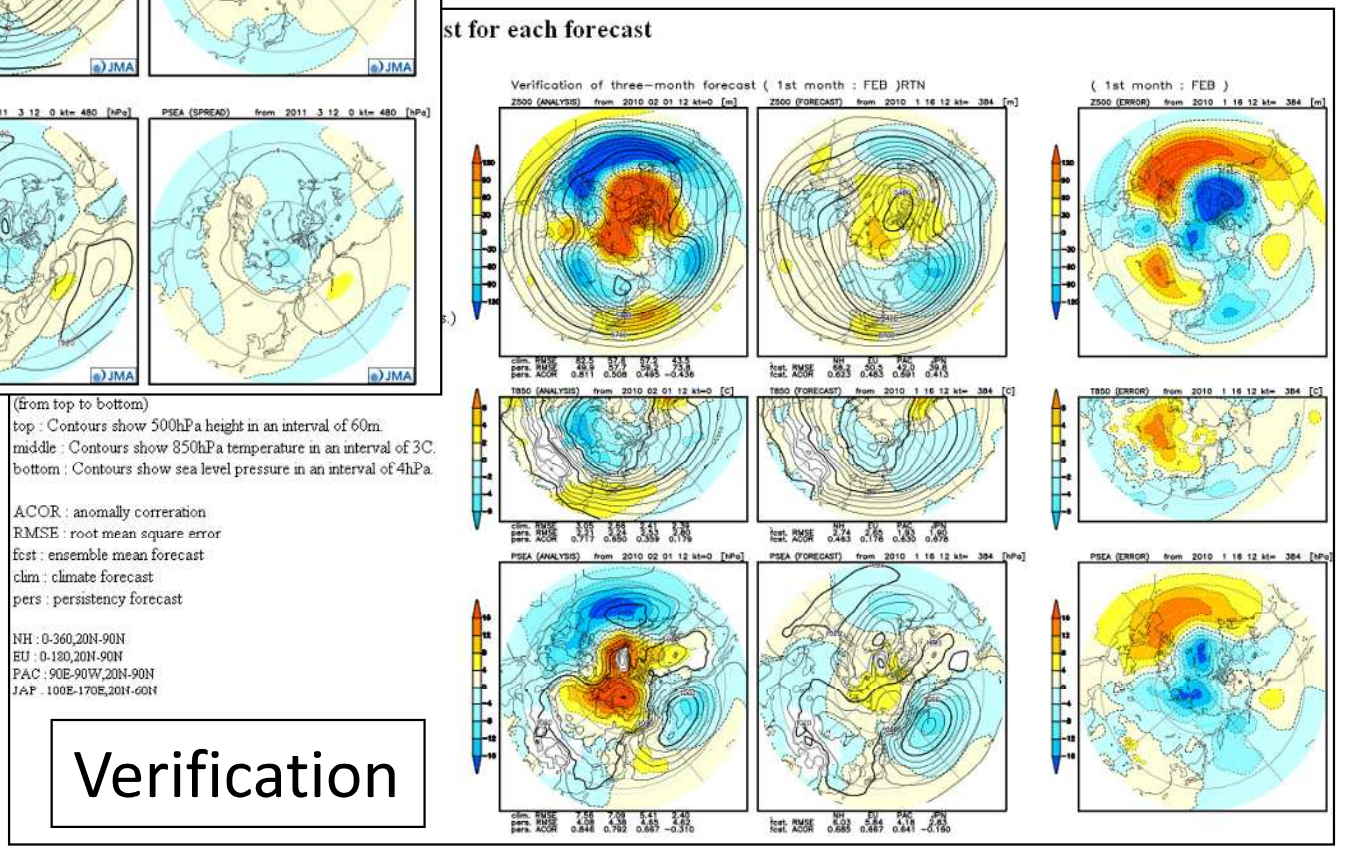
JMA NWP systems for Long-range forecast

Model	JMA/MRI-CGCM
Horizontal resolution	AGCM: TL95 (about 1.875º Gaussian grid ~180km) OGCM: 1.0deg in lon. X 0.3-1.0 deg in lat.
Vertical Layers	AGCM: 40 (Top Layer Pressure:0.4hPa) OGCM: 50
Time integration	7 months
Executing freq.	Every five days (9 members for each initial date)
Ensemble size	51 members from six different initial dates
Perturbation method	Breeding Growing Mode (BGM) and Lagged Average Forecast (LAF) method
SST	One-tiered method (=predicted)
Land surf. initial	Climatology

Forecast and Verification maps



Forecast and verification maps for one-month, three-month and warm/cold season forecasts are available.



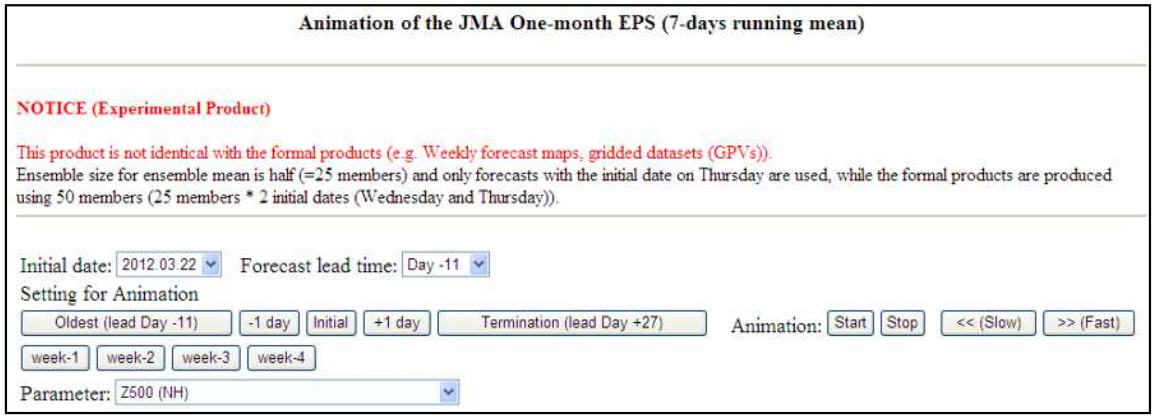
Update interval

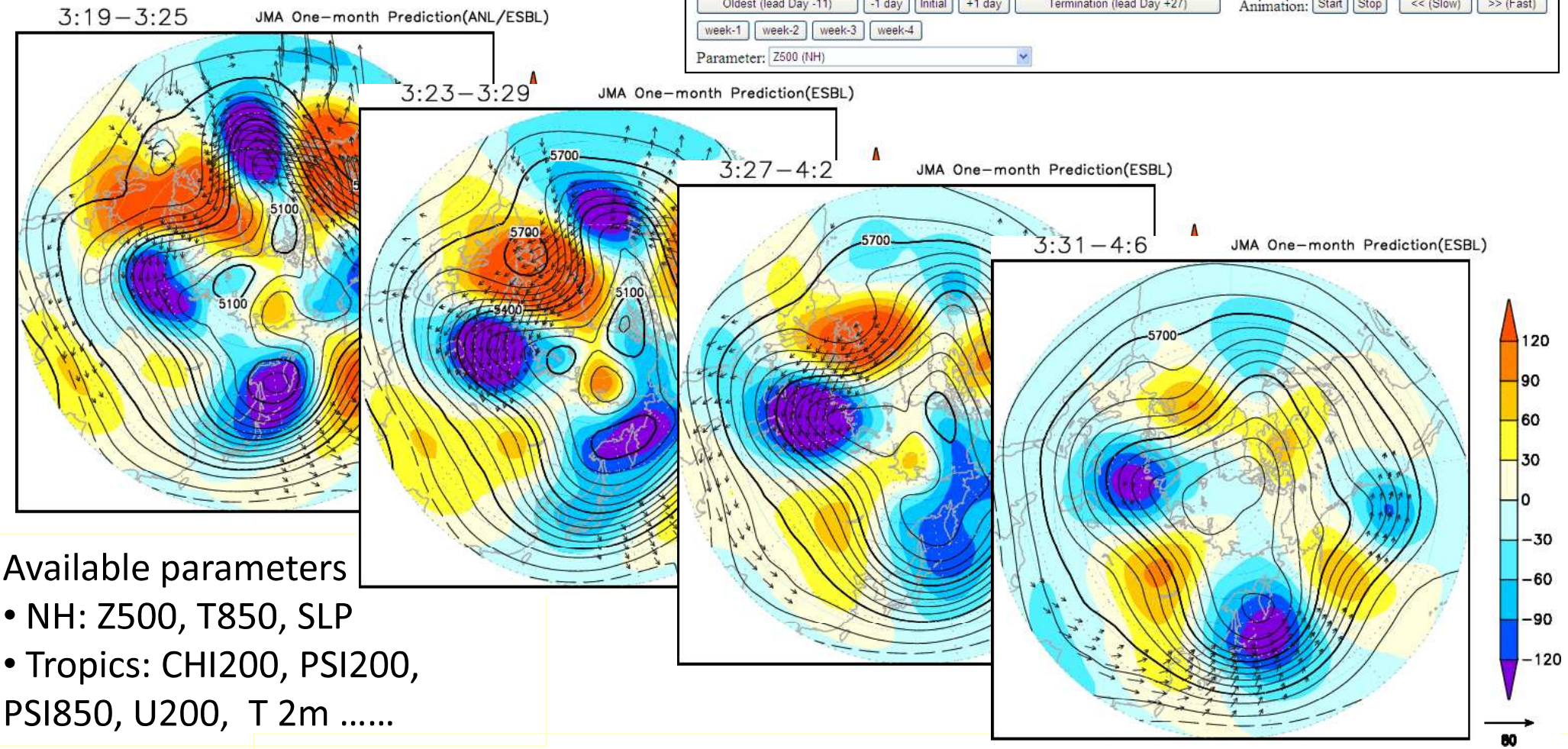
- One-month Forecast: Every Friday
- Three-month Forecast: Every month
- Warm season Forecast: Feb., Mar. and Apr.
- Cold season Forecast: Sep. and Oct.

http://ds.data.jma.go.jp/tcc/tcc/products/model/index.html

Animation of one-month prediction

TCC provides **animation of JMA one-month prediction** on an experimental basis.





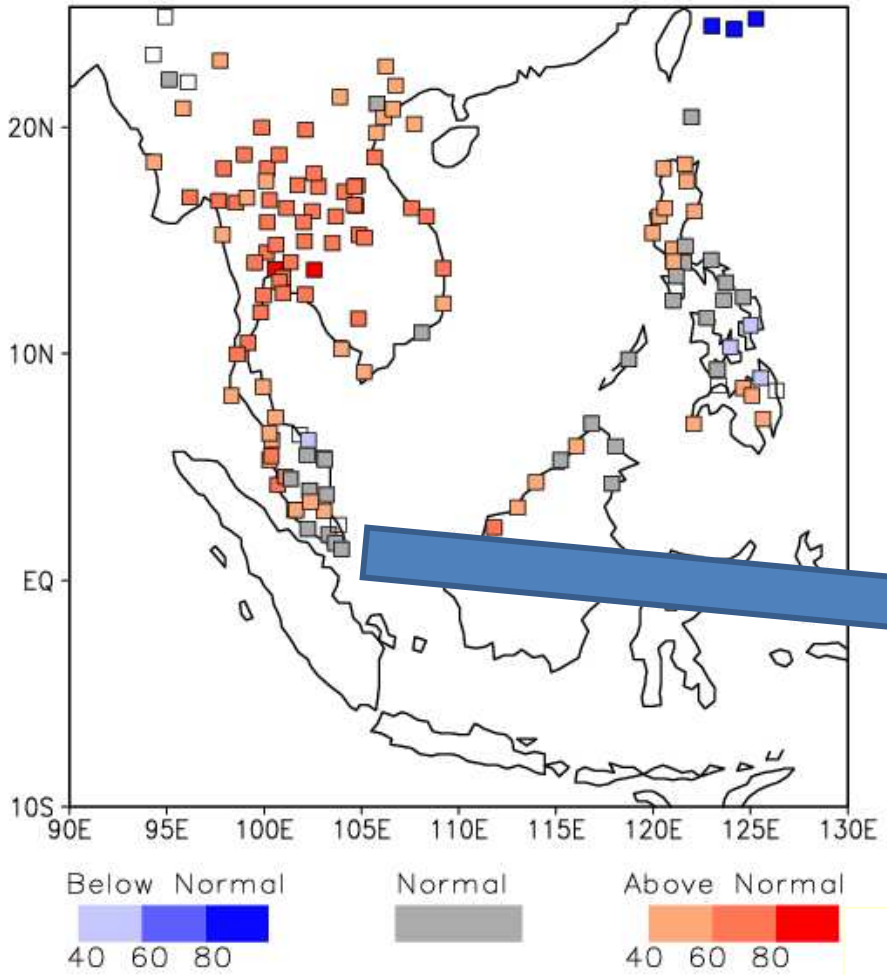
Available parameters

- NH: Z500, T850, SLP
- Tropics: CHI200, PSI200, PSI850, U200, T 2m ……

http://ds.data.jma.go.jp/tcc/tcc/gpv/model/Anime.1mE.experiment/anime.e.php

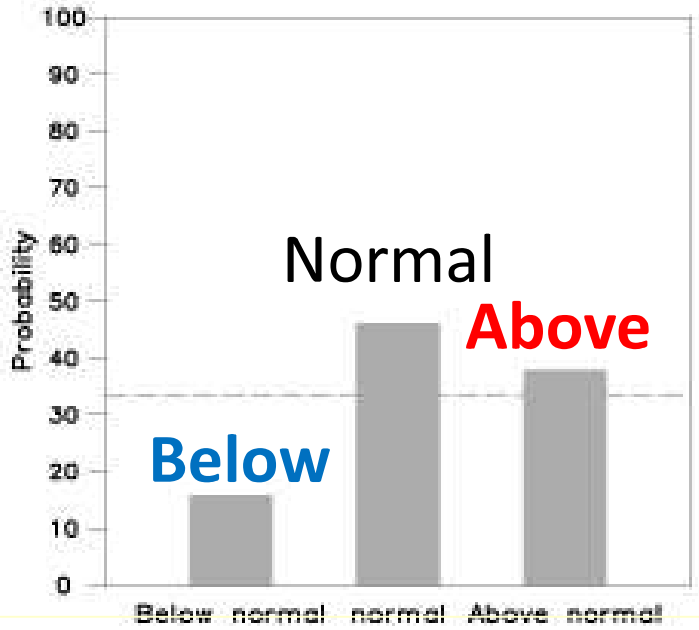
One-month Probabilistic Forecast for Southeast Asia

TCC provides **three-level (tercile) probabilistic forecasts of 2m temperature and total precipitation** at a number of major stations in Southeast Asia, based on the needs of regional and sub-regional scale forecasts from NMHSs.



Initial Forecast Time: 8 Nov., 2012
Lead time: 2-8 day Element: Temperature

WMOCode:48647
Station Name:KUALA LUMPUR/SUBANG
CountryName:MALAYSIA (PENINSULAR MALAYSIA)



http://ds.data.jma.go.jp/tcc/tcc/products/guidancetst/

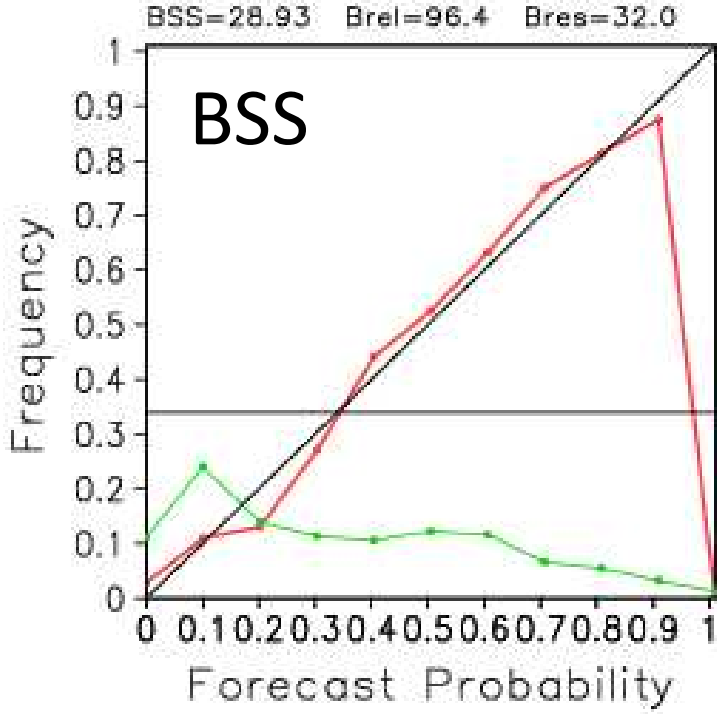
One-month Probabilistic Forecast for Southeast Asia

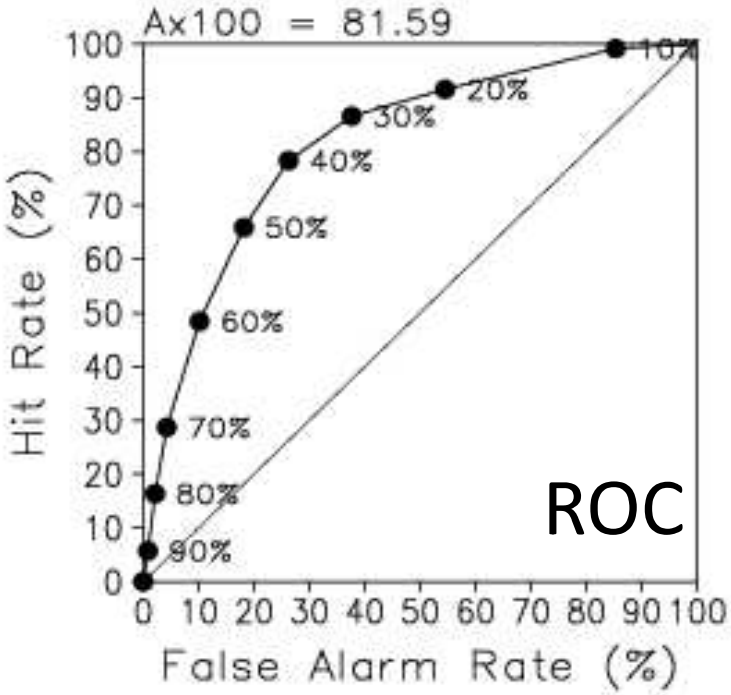
TCC provides **three-level (tercile) probabilistic forecasts of 2m temperature and total precipitation** at a number of major stations in Southeast Asia **and their verification**, based on the needs of regional and sub-regional scale forecasts from NMHSs.

♦Selected point

WMOCode: 48647 **Country:** MALAYSIA (PENINSULAR MALAYSIA)

Station Name: KUALA LUMPUR/SUBANG **Season:** Post monsoon season



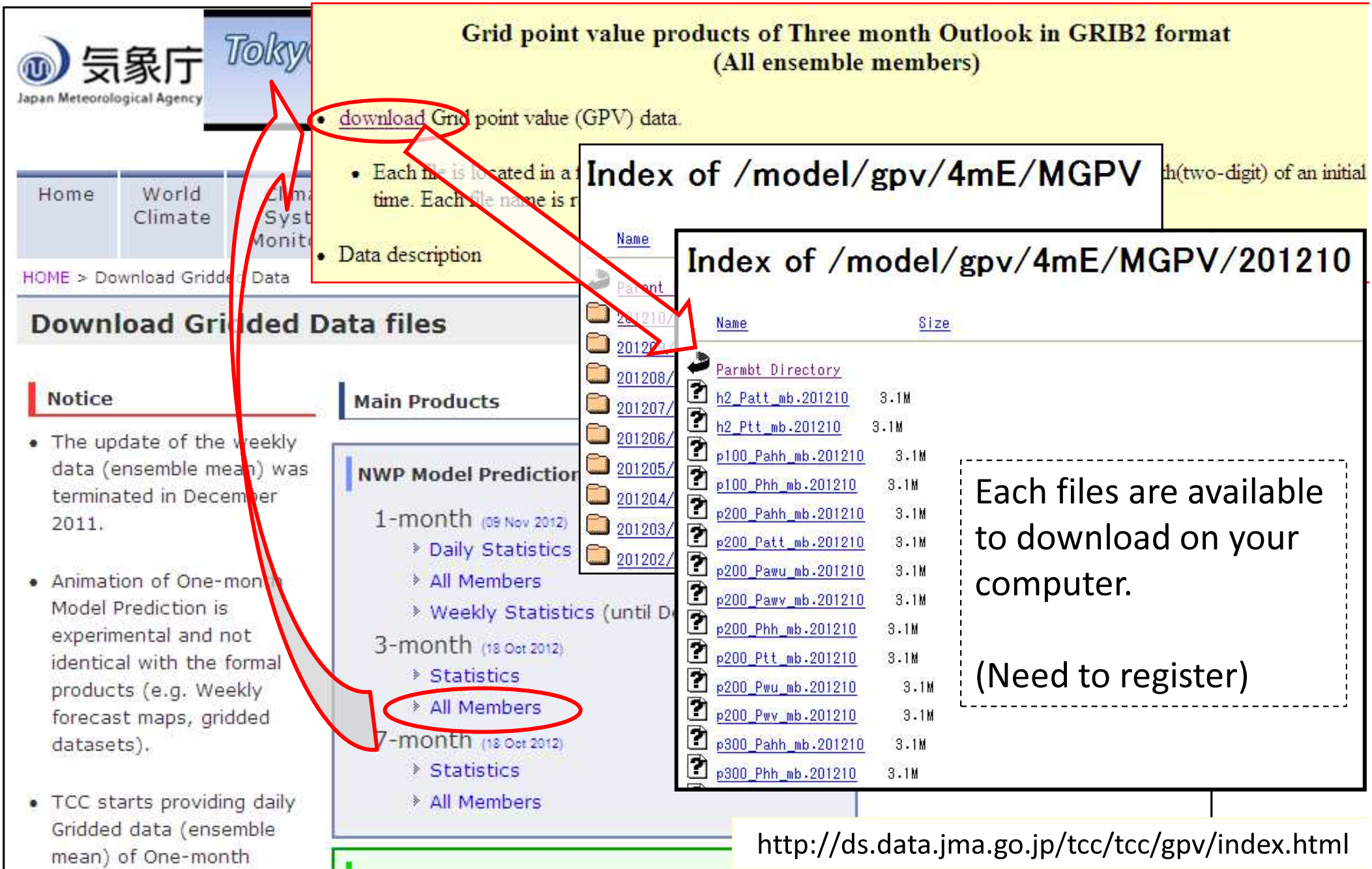


[definition of season for this verification]
- Winter Dry: Jan.-Mar.
- Pre Monsoon: Apr.-May
- Summer Monsoon: Jun.-Sep.
- Post Monsoon: Oct.-Dec.

http://ds.data.jma.go.jp/tcc/tcc/products/guidancetst/

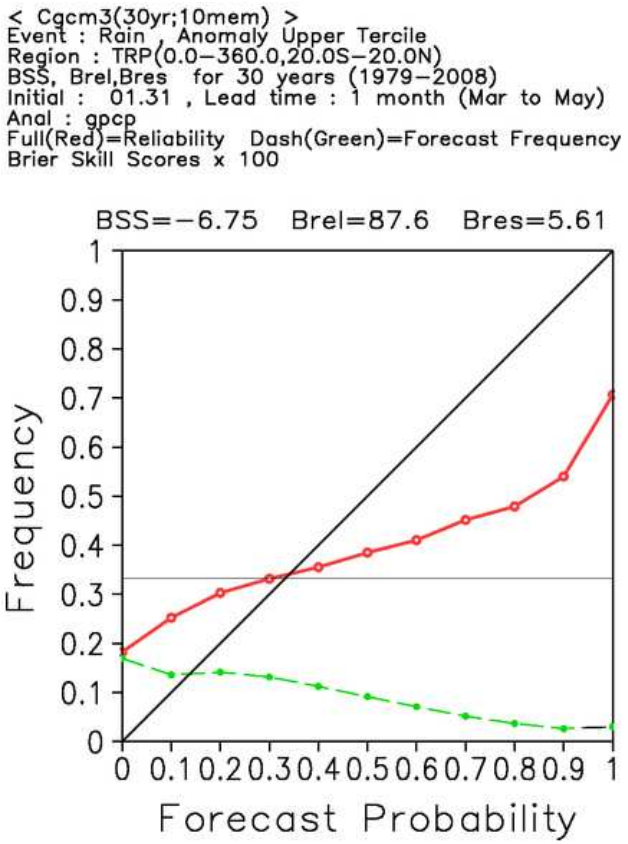
Binary gridded data (GPV)

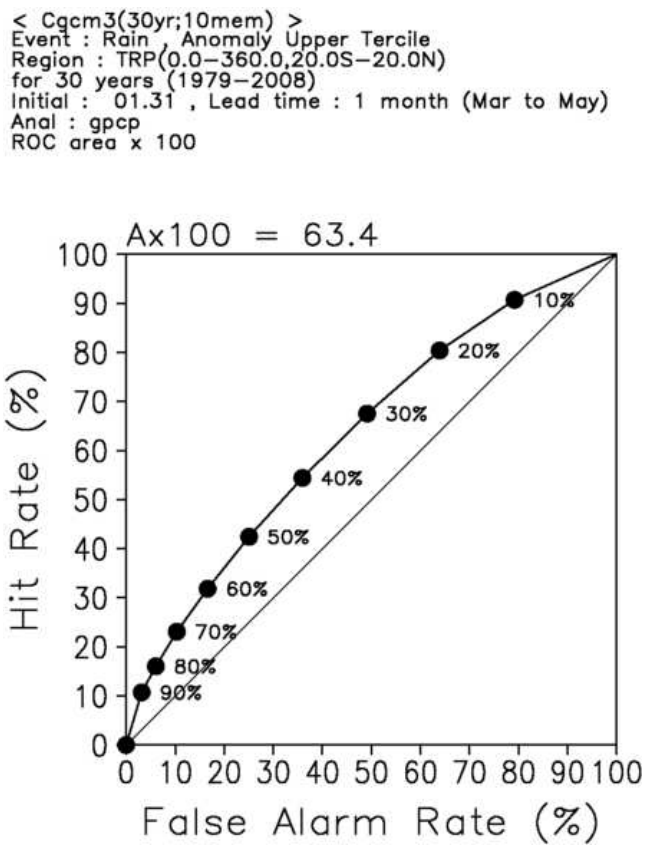
(GPV: Grid Point Value)



Verification of Long-range Forecast Products

TCC provides **verification results** (e.g., SVS LRF scores, Brier Skill Scores, ROC, Hit Rate Skill Score) and **hindcast data** for several elements including 2-m temperature and total precipitation. Whenever an LRF system is updated, a set of hindcasts is implemented and verification datasets are distributed.





Verification results (Brier Skill Score (left) and ROC (right)) for precipitation for 1-3 months

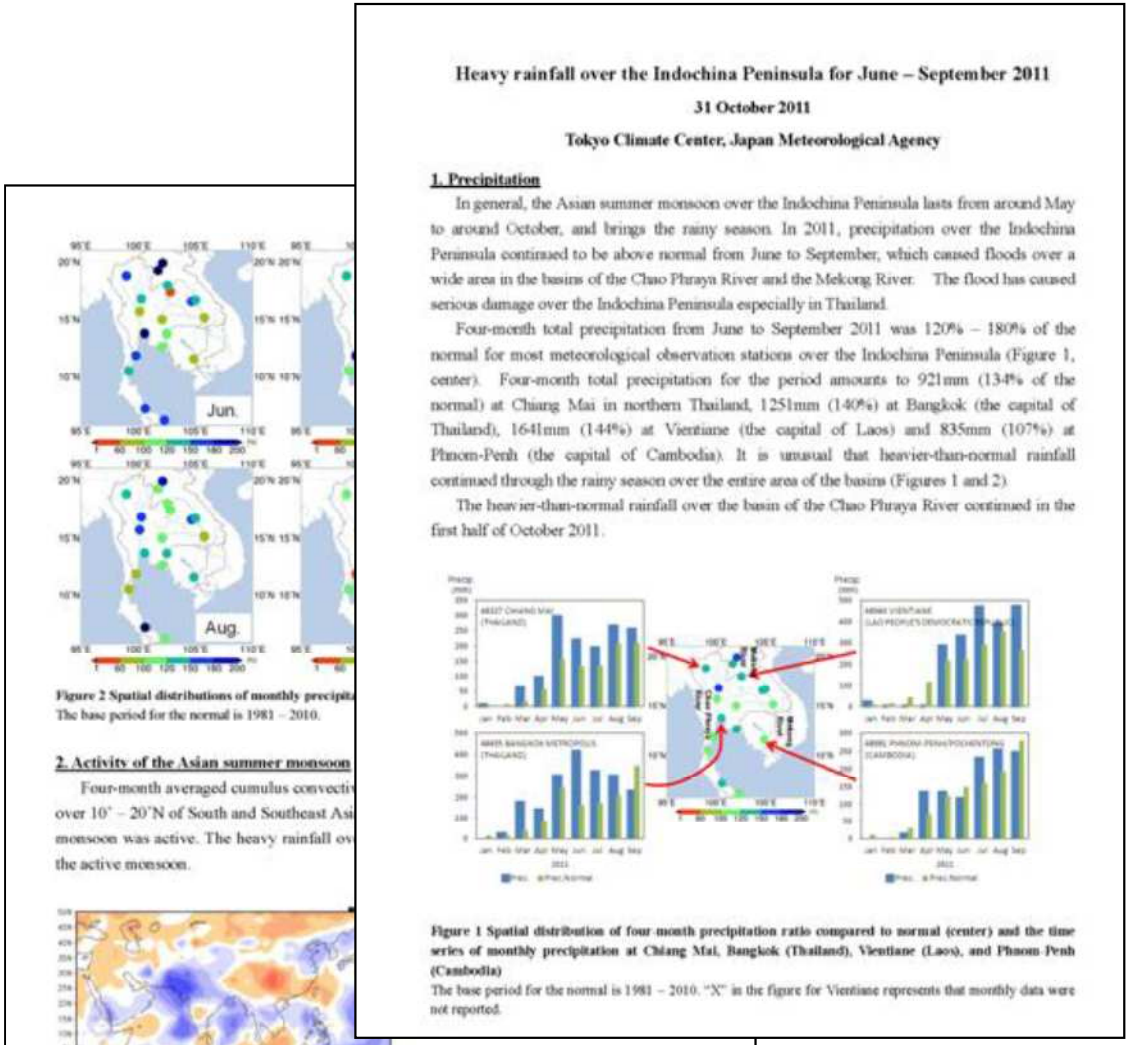
Special report on the extreme climate event & its analysis

Report on the extreme climate event (1)

NMHSs are expected to actively contribute to climate risk management, and must issue appropriate information in a timely manner when extreme events occur. Against this background, **TCC is committed to assisting NMHSs in fulfilling their roles.**

In summer 2011, precipitation over the Indochina Peninsula continued to be above normal from June to September, which caused floods over a wide area in the basins of the Chao Phraya River and the Mekong River. The flood has caused serious damage over the Indochina Peninsula especially in Thailand.

On 31 October, 2011, TCC issued a report entitled "Heavy rainfall over the Indochina Peninsula for June – September 2011" on its website.



Heavy rainfall over the Indochina Peninsula for June – September 2011

31 October 2011

Tokyo Climate Center, Japan Meteorological Agency

1. Precipitation

In general, the Asian summer monsoon over the Indochina Peninsula lasts from around May to around October, and brings the rainy season. In 2011, precipitation over the Indochina Peninsula continued to be above normal from June to September, which caused floods over a wide area in the basins of the Chao Phraya River and the Mekong River. The flood has caused serious damage over the Indochina Peninsula especially in Thailand.

Four-month total precipitation from June to September 2011 was 120% – 180% of the normal for most meteorological observation stations over the Indochina Peninsula (Figure 1, center). Four-month total precipitation for the period amounts to 921mm (134% of the normal) at Chiang Mai in northern Thailand, 1251mm (140%) at Bangkok (the capital of Thailand), 1641mm (144%) at Vientiane (the capital of Laos) and 835mm (107%) at Phnom-Penh (the capital of Cambodia). It is unusual that heavier-than-normal rainfall continued through the rainy season over the entire area of the basins (Figures 1 and 2).

The heavier-than-normal rainfall over the basin of the Chao Phraya River continued in the first half of October 2011.

Figure 1 Spatial distribution of four-month precipitation ratio compared to normal (center) and the time series of monthly precipitation at Chiang Mai, Bangkok (Thailand), Vientiane (Laos), and Phnom Penh (Cambodia)

The base period for the normal is 1981 – 2010. "X" in the figure for Vientiane represents that monthly data were not reported.

Figure 2 Spatial distributions of monthly precipita

The base period for the normal is 1981 – 2010.

2. Activity of the Asian summer monsoon

Four-month averaged cumulus convecti
over 10° – 20°N of South and Southeast Asi
monsoon was active. The heavy rainfall ov
the active monsoon.

Figure 3 Cumulus convective activity (June – September 2011)

The shading indicates four-month averaged outgoing longwave radiation (OLR) anomaly (W/m^2) for June – September 2011. It can be inferred that negative OLR anomalies (blue-color) show enhanced cumulus convection compared to the normal. The base period for the normal is 1981 – 2010. Original data provided by NOAA.

Report on the extreme climate event (2)

In winter 2012, the Eurasian continent, especially in the mid-latitudes, experienced significantly lower-than-normal temperatures due to strong cold-air inflow.

Temperatures were extremely low from the northern part of East Asia to Central Asia (in and around Mongolia and Kazakhstan) from mid- to late January. The influence of cold air extended to all over Central Asia, such as Uzbekistan and Tajikistan from the beginning of February.

TCC issued a report "Cold Wave over the Eurasian Continent" on 6 February 2012 on its website.

The Center also provided NMHSs in the affected areas with supplementary commentary on the situation as well as information on how to prepare the figures using web-based tools such as ITACS available on the TCC website.

Cold Wave over the Eurasian Continent

6 February 2012
Tokyo Climate Center, Japan Meteorological Agency

1. Overview

Since mid-January 2012, the Eurasian continent, especially in the mid-latitudes, has experienced significantly lower-than-normal temperatures due to strong cold-air inflow (Figure 1). As a result, temperatures have been extremely low from the northern part of East Asia to Central Asia (in and around Mongolia and Kazakhstan) since mid-January, and in Eastern Europe (in and around Ukraine) since the end of January. The influence of cold air has extended to Central to Western Europe as well as to all over Central Asia, such as Uzbekistan and Tajikistan, since the beginning of February.

2. Climatic conditions

Table 1 summarizes weekly extreme climate events from mid-January. Figure 1 shows weekly temperature anomalies from mid-January in the Northern Hemisphere. Figure 2 shows daily temperatures at some meteorological stations in affected countries.

Table 1 Weekly extreme climate events and impacts

Period	Areas	Extreme Climatic Events and impacts
15 – 21 January	In and around Eastern Kazakhstan	Extremely low temperatures - It was reported that more than 40 people were killed in an avalanche/cold wave. (Source: UN Office for the Coordination of Humanitarian Affairs, as of 23 January)
22 – 28 January	From Mongolia to Eastern Kazakhstan	Extremely low temperatures
29 Jan. – 4 Feb.	From Mongolia to Eastern Kazakhstan	Extremely low temperatures
	Eastern Europe	Extremely low temperatures - It was reported that more than 130, 50 and 30 people were killed in Ukraine, Poland and Romania, respectively due to cold wave. (Source: National Governments, as of 5 February)

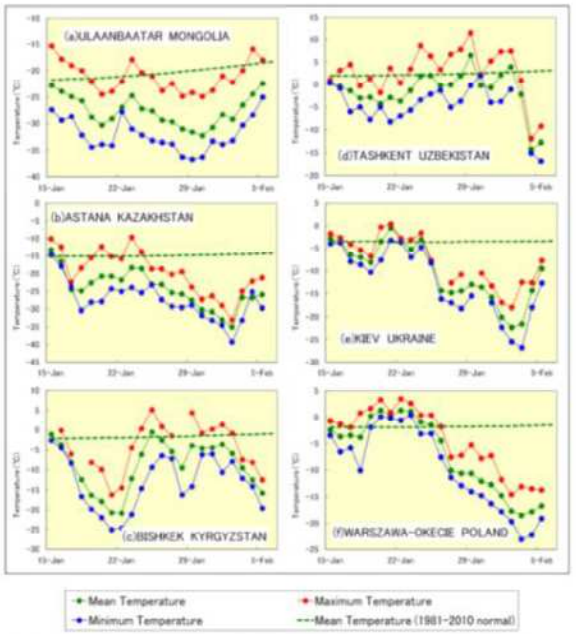


Figure 2 Daily maximum, mean and minimum temperatures (°C) at six stations from 15 January to 5 February 2012 (Based on SYNOP reports)

3. Characteristics of atmospheric circulations

In the middle of January, a high pressure system was enhanced over western Siberia, in association with the large meander of the upper-level westerly jet stream, and significantly cold air mass over central and eastern Siberia flowed into Mongolia and Kazakhstan along the periphery of the high pressure. After that, the high pressure system further developed and expanded over northwestern Russia and northern Europe. In accordance with the westward expansion of the high pressure system, cold air mass around Kazakhstan flowed westward over the southern side of the high pressure and reached eastern and central Europe in early February.

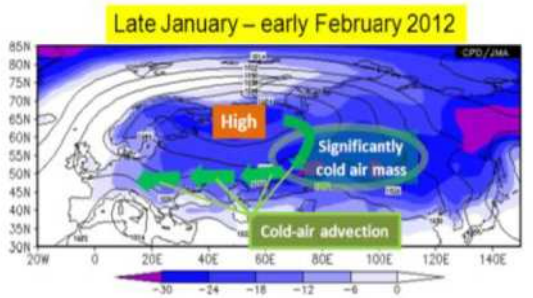


Figure 3 Sea level pressure and surface air temperature (29 January – 4 February)
The contours indicate sea level pressure (hPa), and the cold shading denotes 2 m temperature (°C).

Information on specific events

In addition to issuing reports as the press release, TCC also provides information, such as summary of the Asian summer monsoon and reports on specific events.

気象庁 Japan Meteorological Agency

Tokyo Climate Center
WMO Regional Climate Center in RA

TCC home

Home | World Climate | Climate System Monitoring | El Niño Monitoring | NWP Model Prediction | Global Warming | Climate Japan

HOME > Climate System Monitoring > Asian Monsoon Monitoring

Asian Monsoon Monitoring

Reports on specific events

10 May 2012 NEW
- Asian Winter Monsoon Summary for 2011/2012

6 February 2012
- Cold wave over the Eurasian continent

28 November 2011
- Summary of the 2011 Asian summer monsoon

31 October 2011
- Heavy rainfall over the Indochina Peninsula for June - September 201

Asian Winter Monsoon Summary for 2011/2012

Many parts of East and Central Asia experienced significantly below-normal temperatures throughout winter (December – February) 2011/2012. This report summarizes the related surface climate characteristics, atmospheric circulation and primary factors contributing to the cold conditions observed. The relevant factors were clarified based on investigation by JMA's Advisory Panel on Extreme Climate Events.

Note: JRA/JCDAS (Onogi et al. 2007) atmospheric circulation data and COBE-SST (JMA 2006) sea

s investigation. The outgoing

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s experienced significantly
e northern part of Siberia and
igure 1.1).
ber 2011 to February 2012. In
Mongolia and southern Central
al Siberia to northern Western

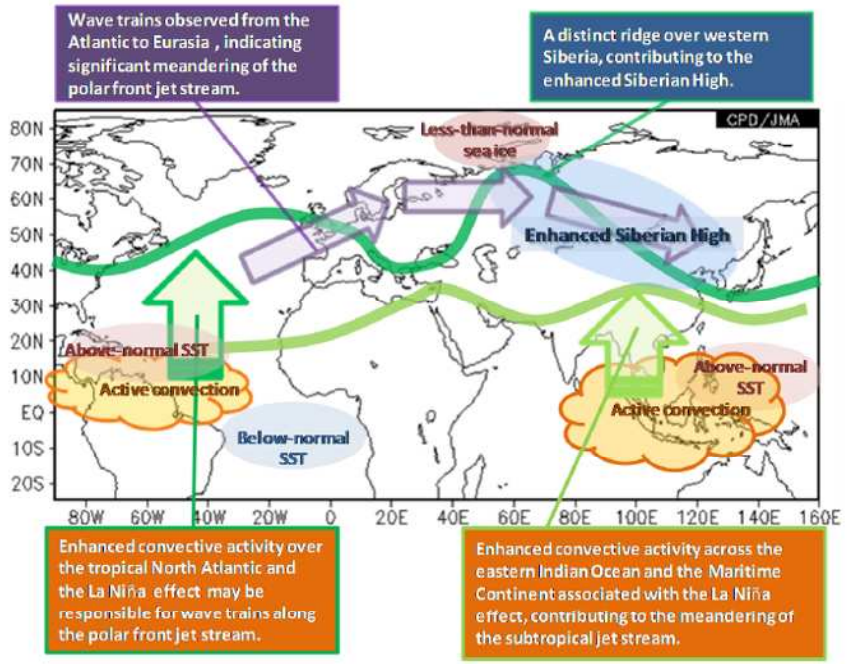
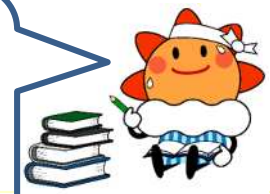


Figure 4.1 Primary factors contributing to the cold winter conditions of 2011/2012 in Central and East Asia

We will exercise how to make information like this in this seminar!

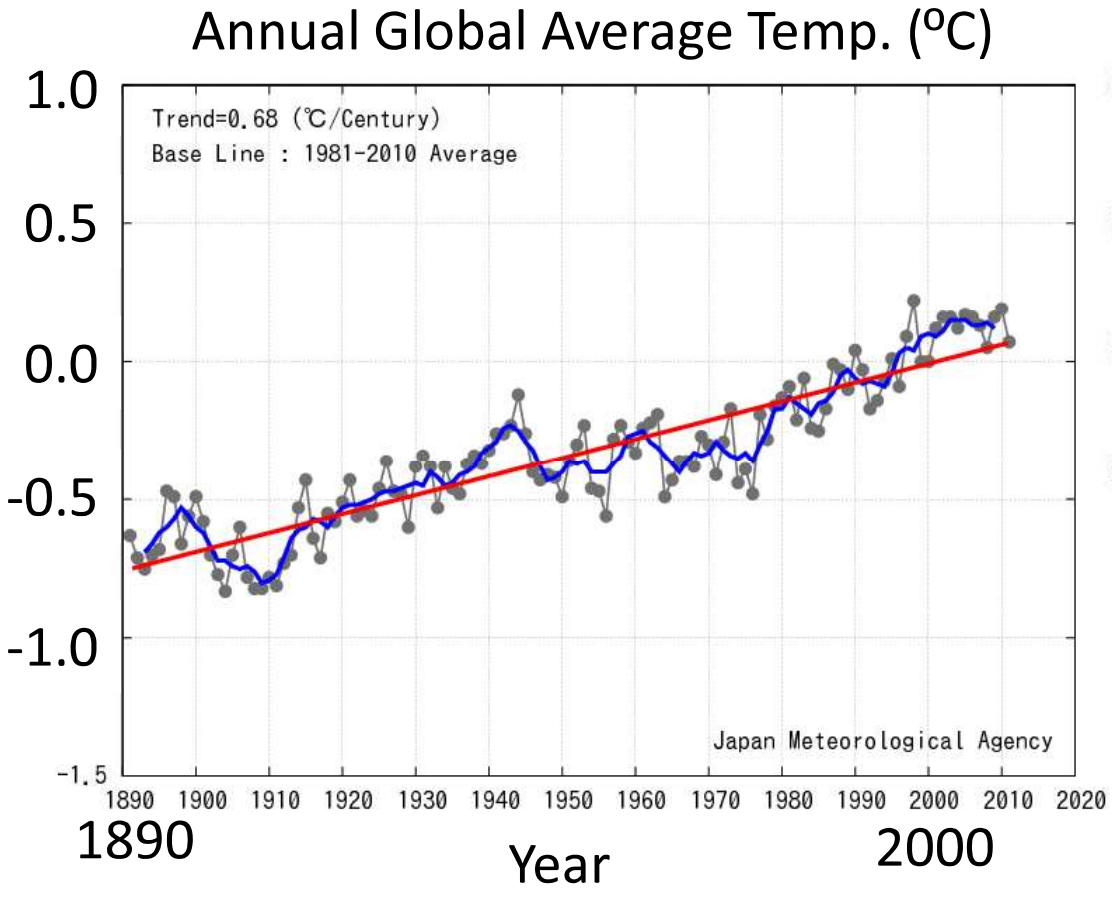


http://ds.data.jma.go.jp/tcc/tcc/products/clisys/ASIA_TCC/index.html

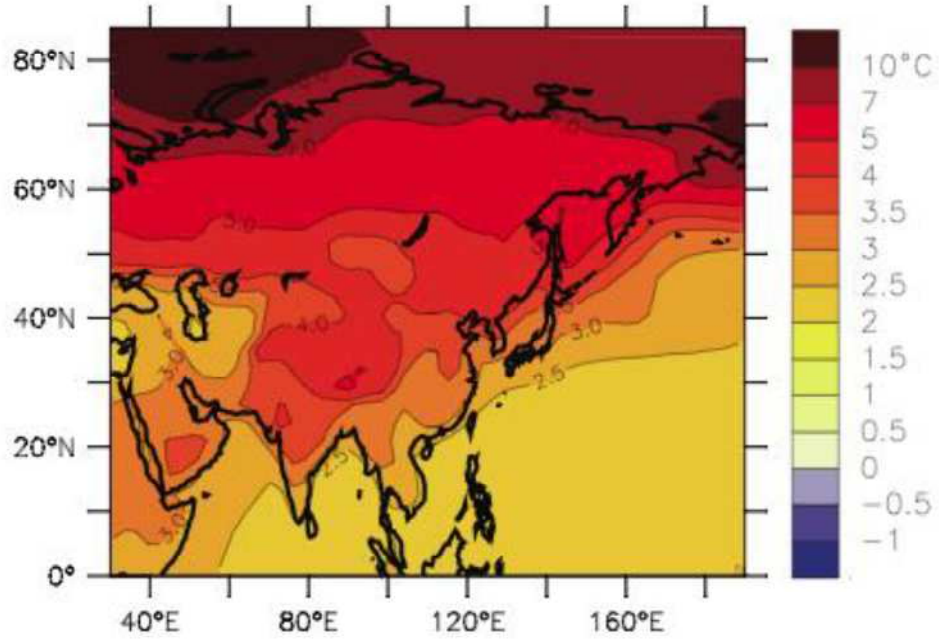
Climate Change Monitoring & Projection

Climate Change Monitoring and Projection

JMA monitors long-term changes in global average surface temperature anomalies for the purpose of monitoring global warming. The TCC website make it available to **see long-term changes in annual and monthly anomalies of the global average surface temperature**.



Annual anomalies of surface temperature averaged over the globe
(Base period for the normal: 1981- 2010)



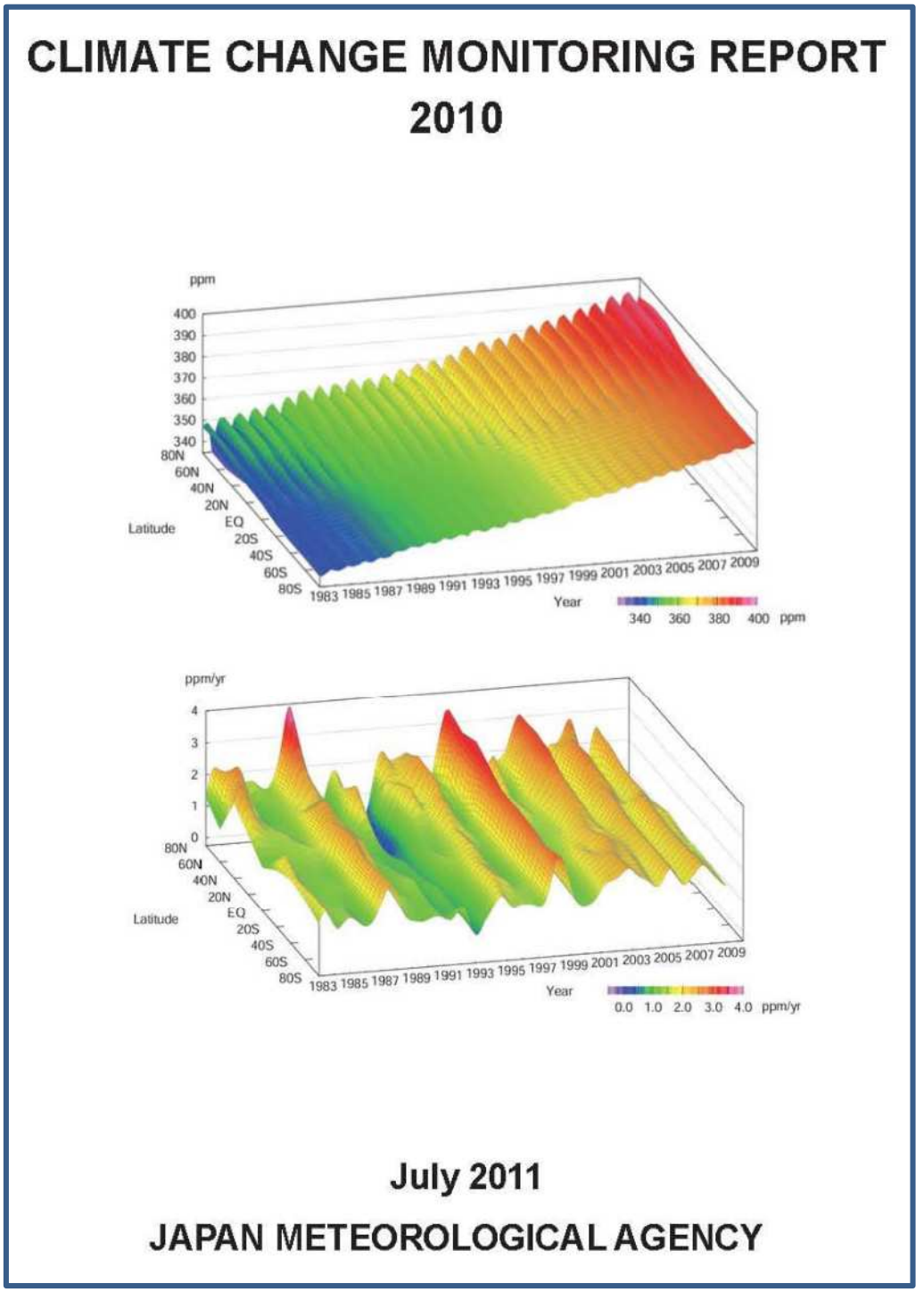
Projection of warming in winter (December-February) for scenario A1B for the period 2080 - 2099 relative to the period 1980 - 1999 conducted using 21 climate models (used the report of working group I to the IPCC Fourth Assessment Report)

http://ds.data.jma.go.jp/tcc/tcc/products/gwp/gwp.html

Climate Change Monitoring Report

JMA has issued **"Climate Change Monitoring Report"** every year informing the latest status of climate change in Japan and the world, greenhouse gases and the ozone layer.

These reports are expected to help readers such as policy makers and researchers to obtain better understanding of the latest status of the climate and further to take measures against the global warming and for protection of the global environment.



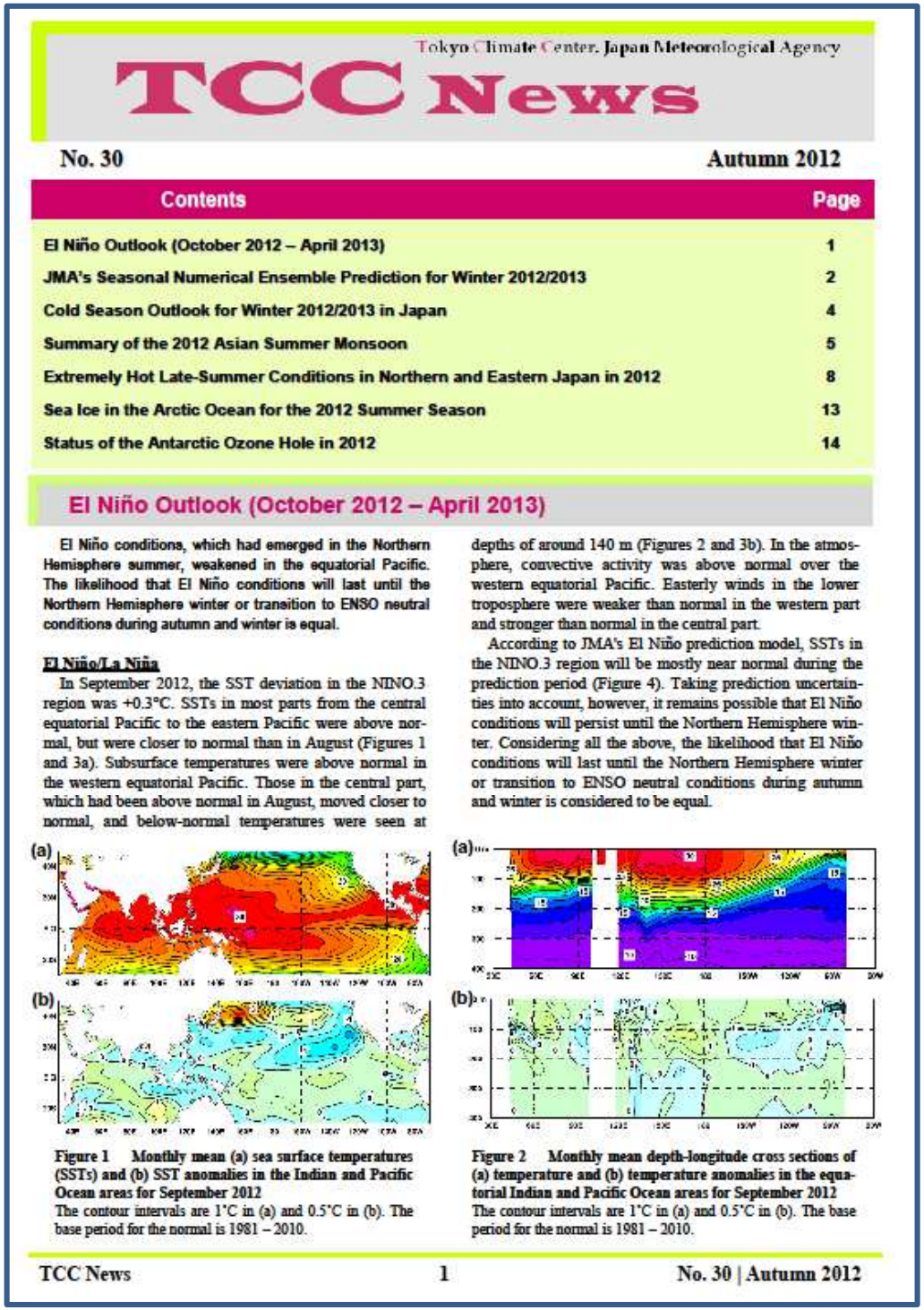
http://www.jma.go.jp/jma/en/NMHS/indexe_ccmr.html

TCC news

TCC news

TCC news is a quarterly newsletter issued in February, May, August and November containing articles on the latest climate information (significant climate events, seasonal outlook, etc.), introduction of TCC's new products and relevant activity.

The latest issue (No. 30) is now available.



Tokyo Climate Center, Japan Meteorological Agency

TCC News

No. 30 Autumn 2012

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El Niño Outlook (October 2012 – April 2013)

El Niño conditions, which had emerged in the Northern Hemisphere summer, weakened in the equatorial Pacific. The likelihood that El Niño conditions will last until the Northern Hemisphere winter or transition to ENSO neutral conditions during autumn and winter is equal.

El Niño/La Niña

In September 2012, the SST deviation in the NINO.3 region was +0.3°C. SSTs in most parts from the central equatorial Pacific to the eastern Pacific were above normal, but were closer to normal than in August (Figures 1 and 3a). Subsurface temperatures were above normal in the western equatorial Pacific. Those in the central part, which had been above normal in August, moved closer to normal, and below-normal temperatures were seen at depths of around 140 m (Figures 2 and 3b). In the atmosphere, convective activity was above normal over the western equatorial Pacific. Easterly winds in the lower troposphere were weaker than normal in the western part and stronger than normal in the central part.

According to JMA's El Niño prediction model, SSTs in the NINO.3 region will be mostly near normal during the prediction period (Figure 4). Taking prediction uncertainties into account, however, it remains possible that El Niño conditions will persist until the Northern Hemisphere winter. Considering all the above, the likelihood that El Niño conditions will last until the Northern Hemisphere winter or transition to ENSO neutral conditions during autumn and winter is considered to be equal.

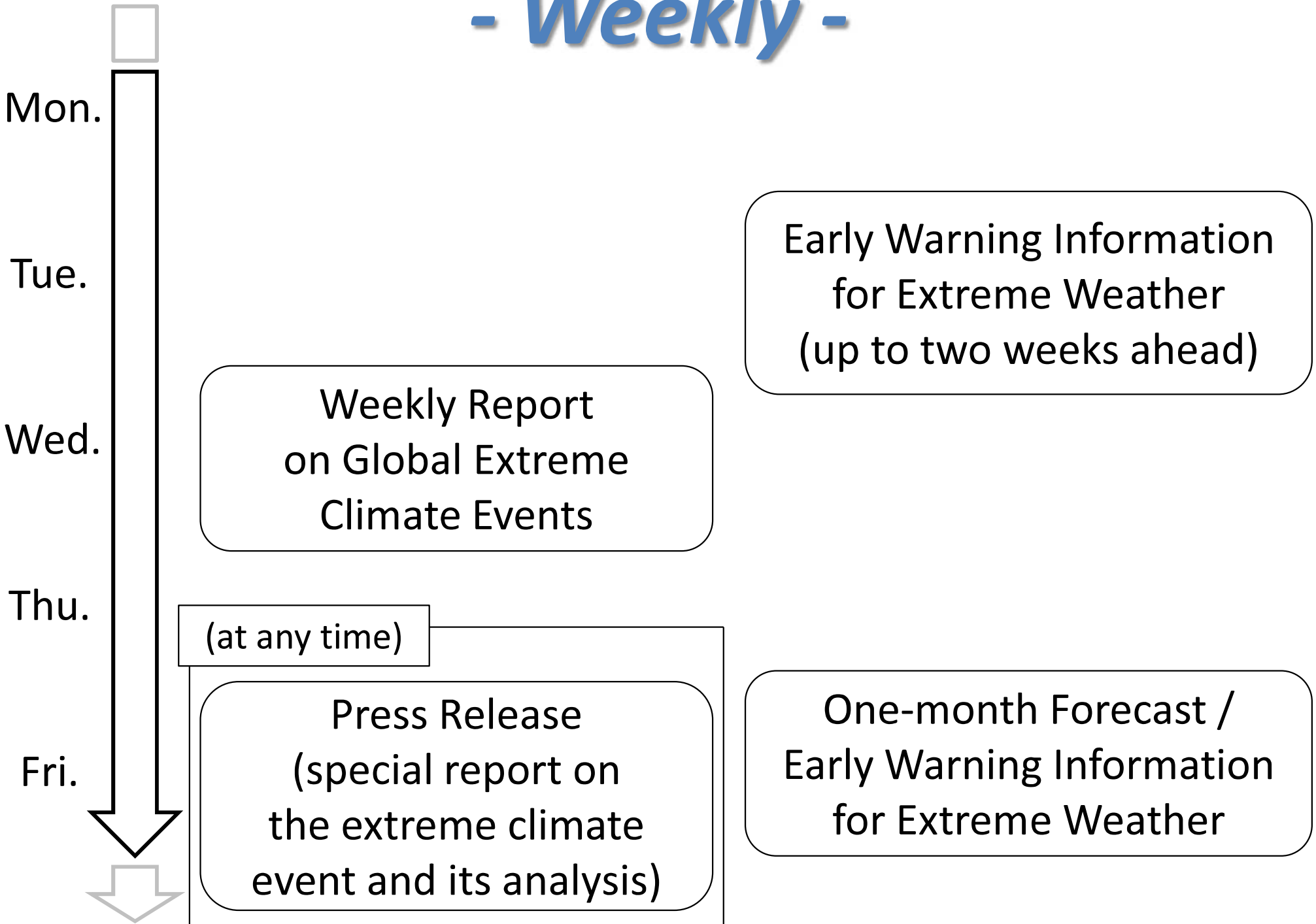
Figure 1 Monthly mean (a) sea surface temperatures (SSTs) and (b) SST anomalies in the Indian and Pacific Ocean areas for September 2012
The contour intervals are 1°C in (a) and 0.5°C in (b). The base period for the normal is 1981 – 2010.

Figure 2 Monthly mean depth-longitude cross sections of (a) temperature and (b) temperature anomalies in the equatorial Indian and Pacific Ocean areas for September 2012
The contour intervals are 1°C in (a) and 0.5°C in (b). The base period for the normal is 1981 – 2010.

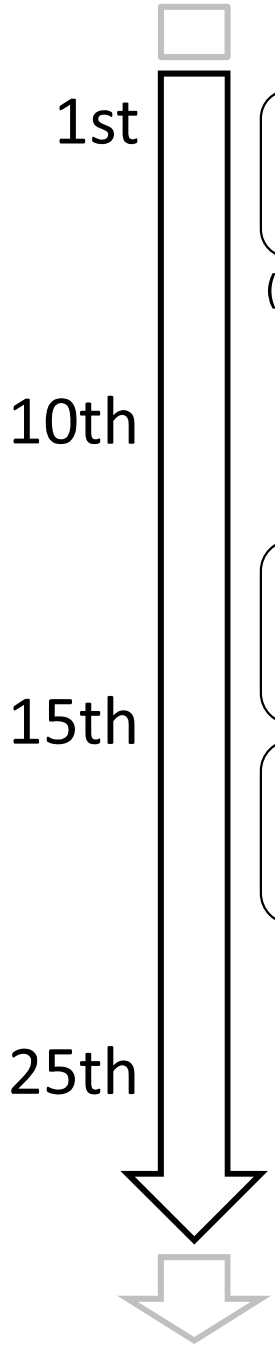
http://ds.data.jma.go.jp/tcc/tcc/news/index.html

Schedule of provision of climate information

Schedule of provision of climate information
- Weekly -



Schedule of provision of climate information
- Monthly -



Monthly Climate Report over Japan

(1st(domestic), 10th(international))

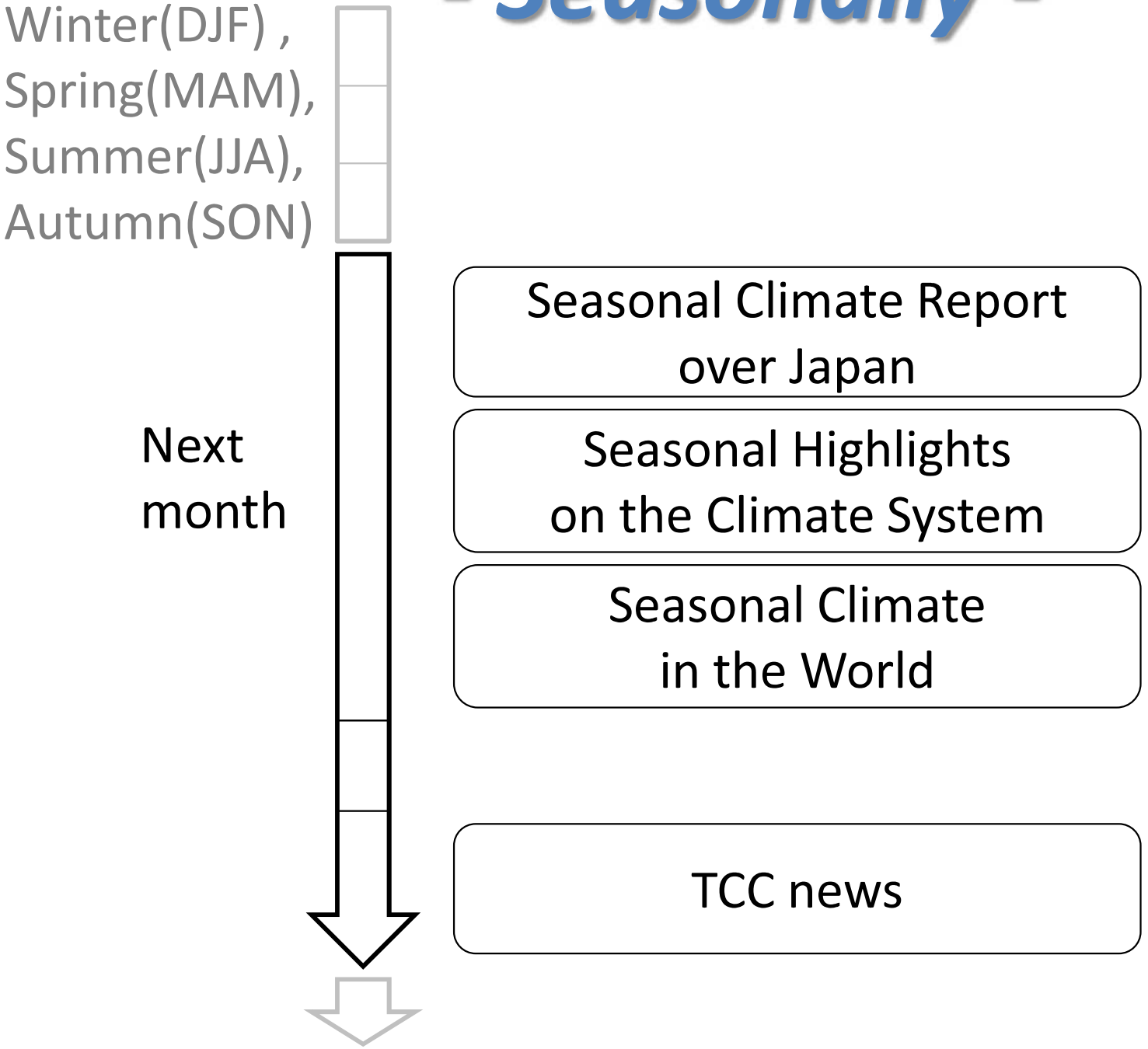
El Niño Outlook (including monitoring report)

Monthly Highlights on the Climate System

Monthly Climate in the World

Seasonal Forecast (Three-months, Warm/Cold seasons)

Schedule of provision of climate information
- Seasonally -



Schedule of provision of climate information
- Annually (& more) -