Tokyo Climate Center, Japan Meteorological Agency

TCC News

No.2 October 2005

Contents

JMA's Cold Season Outlook for 2005/2006 winter in Japan

For 2005/2006 winter in Japan, winter mean temperature would be above/near normal in its eastern and western parts, above normal in its southwestern part, and normal in its northern part. The outlook is mainly based on the reasons that during this winter it is unlikely for El Niño or La Niña to develop, likely for above-normal tropospheric air temperature in the mid-latitudes to persist, and likely for the Arctic Oscillation (AO) to be negative according to its decadal oscillation.

1. Outline of the outlook

JMA issued the Cold Season Outlook for 2005/2006 winter in Japan on 22 September 2005.

In the Northern Japan, winter weather is likely to be normal, featuring that the winter monsoon cold surges occur periodically and snowy days are dominant in its Japan Sea side. In the other regions, cold surges are not expected to occur so much as in a normal year and warm days are expected more frequently than normal. Wetter-than-normal weather is expected in Western Japan and the Pacific side of Eastern Japan due to frequent cyclone passage.

Probabilistic forecasts of winter mean temperatures, winter precipitation amounts, and snowfall amounts for the primary forecast regions of Japan are available at the following URL.

Cold Season Outlook in Japan:
http://okdk.kishou.go.jp/outlooks/outlook3c.html

2. Reasons for the outlook

The climatic trends in recent 10 years show that the winter mean temperatures in Japan are almost above/near normal, especially in Nansei Islands, southwestern Japan, where they clearly tend to be warmer than normal. However, in the northern part of Japan, large fluctuations of temperature were observed during last 5 years. The snowfall amounts in recent 10 years were near or below normal all over Japan.

The thickness temperature between 300hPa and 850hPa averaged over the mid-latitudes (30°N-50°N) is positively correlated with the temperatures in Japan. It generally continues to be above normal since 2003, and the situation is likely to persist during this winter. The winter mean AO index (when it's positive, the 500hPa height anomalies are below normal in the arctic area and above normal in the mid-latitudes) tends to be negative since the latter half of 1990's. This suggests the polar air mass is likely to flow out over the North Pacific, which might occasionally cause cold winters in the northern part of Japan.

The sea surface temperatures (SSTs) in the equatorial Pacific were generally above normal in August 2005. However, the SST anomaly in NINO.3 region became smaller in the last ten days of August and is likely to be near normal in this autumn. It is unlikely that El Nino or La Niña will develop during this winter. So, the effect of El Niño or La Niña is not taken into account.

As for the ensemble prediction, please refer to "JMA's Seasonal Numerical Ensemble Prediction for 2005/2006 winter" in this News.

(Shunji Takahashi, Climate Prediction Division)

El Niño Outlook (October 2005 - April 2006)

The Region B (Niño 3) SST is likely to be near normal during this autumn and winter. Also, it is unlikely that El Niño or La Niña will develop during the prediction period.

In September 2005, negative SST anomalies developed in the eastern equatorial Pacific, while positive SST anomalies persisted in the central part (Figure 1a). The SST deviation from the 1961-1990 mean for Region B decreased from +0.5°C for August to -0.2°C for September. Also, in the subsurface ocean, negative temperature anomalies dominated in the eastern equatorial Pacific (Figure 1b).

These oceanic changes during September are considered to be due to the enhancement of the Trade Winds over the equatorial Pacific in the first half of September (Figure 1c).

The easterly wind anomalies, however, were replaced by weak westerly wind anomalies in the second half of the month. In the subsurface ocean, eastward propagation of both positive temperature anomalies in the west and negative ones in the east is recognized. However, it is considered that the magnitudes of these anomalies are not large enough to result in significant change of the Region B SST deviation in the next few months. Current atmospheric and oceanic conditions in the equatorial Pacific are almost near normal, and there is no indication toward El Niño or La Niña at present.

The JMA's El Niño forecast model predicts that the Region B SST will be near normal during this autumn and winter (Figure 2).

Judging from all the above, the Region B SST is likely to be near normal during this autumn and winter. At present, it is unlikely that El Niño or La Niña will develop during the prediction period.

(Takafumi Umeda, Climate Prediction Division)

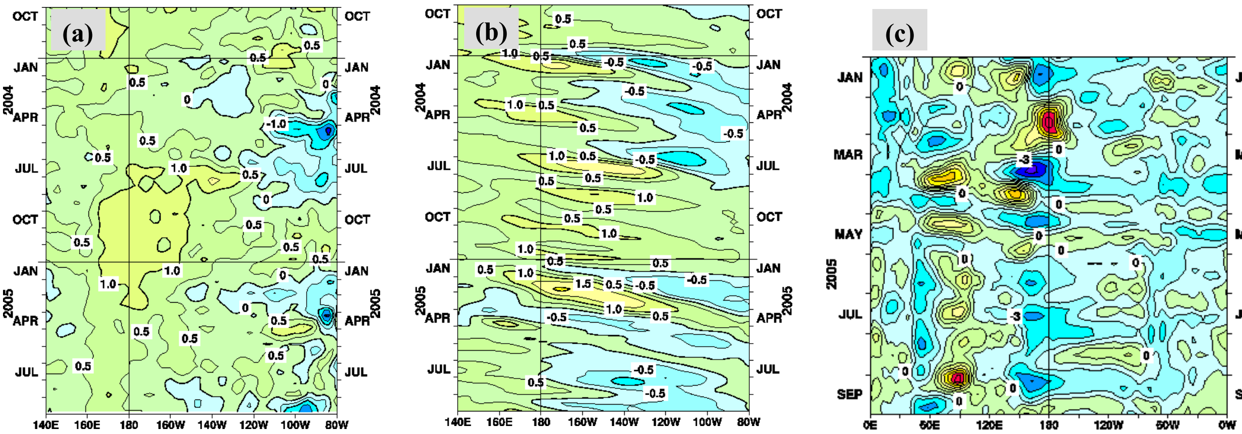

Figure 1 Time-longitude cross sections along the equator in the Pacific Ocean
(a) SST anomalies,
(b) Ocean Heat Content (OHC; vertically averaged temperature in the top 260 m) anomalies, and
(c) zonal wind anomalies at 850 hPa.
Warm-color (cold-color) shading indicates positive (negative) anomalies.

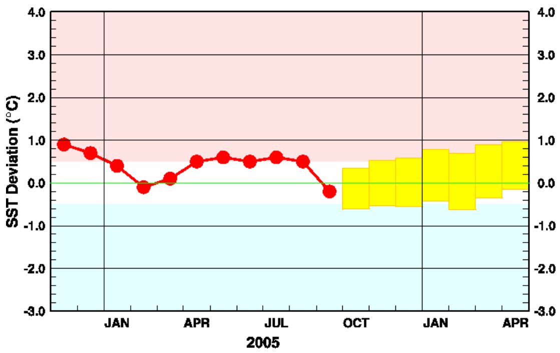

Figure 2 Outlook of the SST deviation for Region B (Niño.3) by the El Niño forecast model
This figure indicates a time series of the monthly sea surface temperature (SST) deviation for Region B (4°N-4°S, 150°W-90°W). Thick line with closed circles shows the observed SST deviations and boxes show the predicted one for the next seven months by the El Niño forecast model. Each box denotes the range where the SST deviation is expected with the probability of 70%.

JMA's Seasonal Numerical Ensemble Prediction for 2005/2006 winter

The JMA's seasonal numerical ensemble prediction shows that 500hPa height anomalies would be above normal over most of the Northern Hemisphere, except some below-normal regions such as around the Aleutian where the probability of below-normal category is not so high. The AO index would be around normal with considerable spread.

1. Introduction

JMA utilizes the seasonal numerical ensemble prediction system for one of the prognostic tools for the operational cold season outlook since 2003. It consists of 31 ensemble members and employs the two-tier method for SST: a combination of persisted anomalies, climatology and prediction with the JMA's El Niño prediction model (CGCM). More detailed information on the prediction system are available at http://okdk.kishou.go.jp/products/model/outline/longrange.html. The verification results based on the 18-year hindcasts are available at http://okdk.kishou.go.jp/products/model/hindcast/7mE/svs/index.html.

This report shows the main results of the ensemble prediction, whose initial date is 11th September 2005, for the three-month mean from December 2005 to February 2006. First, the predicted global SST anomalies are presented in section 2. Then, the predicted circulation fields in the tropics and sub-tropics associated with those SST anomalies are described in section 3. Finally, the predicted circulation fields in the middle and high latitudes in the Northern Hemisphere are explained in section 4.

2. SST anomalies (Figure 3)

During 2005/06 winter, the SST anomalies are predicted to be slightly above normal, except in the following three regions: the tropical eastern Pacific, the southern Indian Ocean, and the Antarctic, where they are predicted to be slightly below normal. Although no significant anomalies are found, the overall anomaly pattern resembles that of the linear trend in the period from 1979 to 2004 (not shown). Accordingly, it is expected that the atmospheric response to the SST anomalies resembles the linear trend pattern of the atmosphere, though the amplitude of the response may not be so large.

3. Circulation fields in the tropics and sub-tropics (Figure 4)

In the tropics, no significant anomalies are predicted in both the convection and the circulation fields as inferred from the predicted small SST anomalies. Though positive rainfall anomalies are predicted over the maritime continent and over the northern Indian Ocean, the hindcasts indicate that the forecasting skills for the rainfall are generally so low in those areas that the results should be interpreted with caution.

In the upper troposphere, a train of wave-like stream function anomalies is found along the Asian jet stream; anti-cyclonic circulation anomalies are located over the Middle East and over the East China Sea. Since a wave-like train pattern similar to the predicted one is also found in the linear trend of stream function in the upper troposphere (not shown), it is suggested that the predicted anomalies are forced by the SST anomalies resembling the linear trend.

4. Circulation fields in middle and high latitudes (Figure 5, Figure 6)

The ensemble mean anomaly indicates that the winter mean 500hPa height anomalies will be above normal over most parts of the Northern Hemisphere, except in the following three areas: the eastern part of Russia, around the Aleutian Islands and the northern part of the Atlantic. But, the probabilities of below-normal category are not so high in these areas (Figure 5). These predictions suggest that the temperatures will be above normal over eastern Asia, though cold surges may affect the northern parts of the region.

The AO is the leading mode of the low frequency variability of the atmosphere in the Northern Hemisphere. The AO index of the ensemble mean prediction is near normal with considerable spread among the ensemble members (Figure 6). This means that the seasonal predictions have large uncertainty in the areas where the climate is strongly affected by the AO, such as the northern part of Japan.

(Shuhei Maeda, Climate Prediction Division)

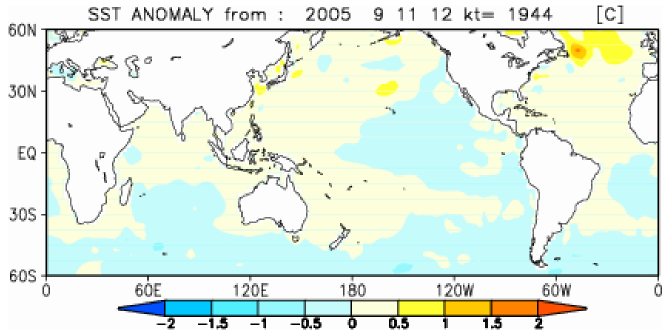

Figure 3 Predicted SST anomalies for 2005/2006 DJF

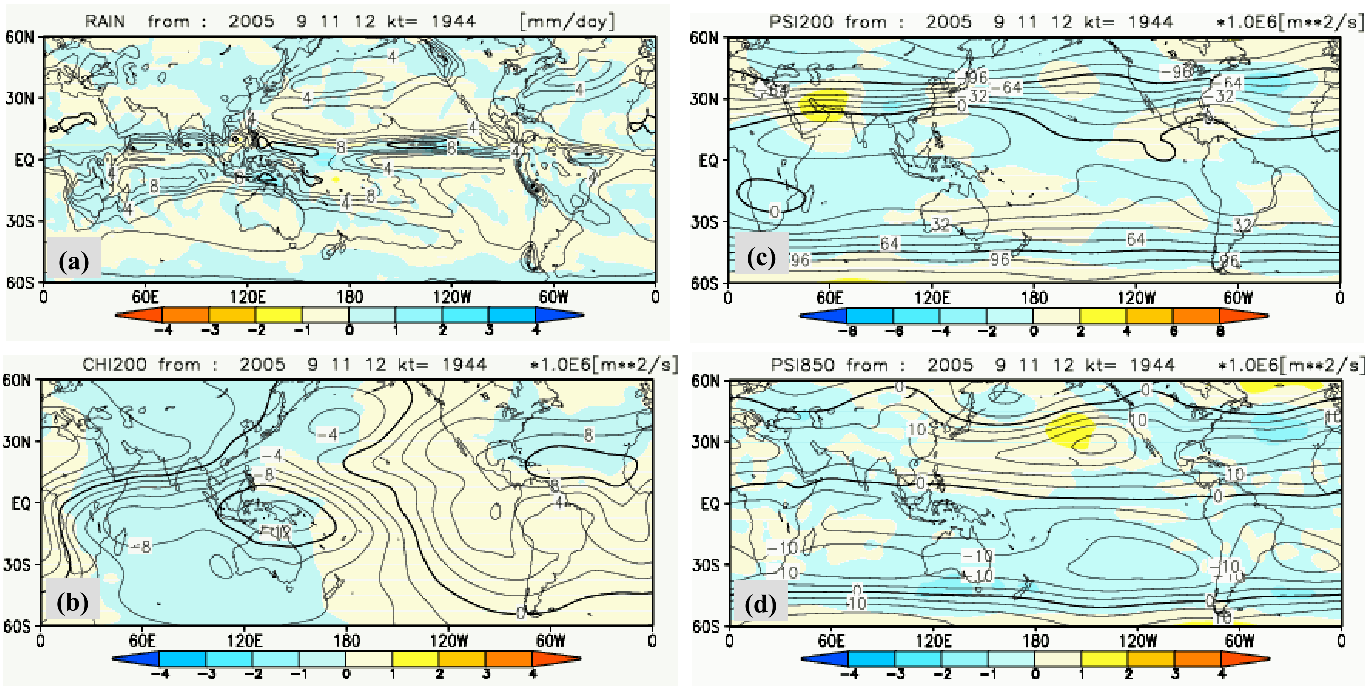

Figure 4 Predicted atmospheric fields for 2005/06 DJF (Ensemble mean of 31 members)
(a) Precipitation (contour) and anomaly (shading). Contour interval is 2mm/day,
(b) Velocity potential at 200hPa (contour) and anomaly (shading). Contour interval is $2\times10^6 m^2/s$,
(c) Stream function at 200hPa (contour) and anomaly (shading). Contour interval is $16\times10^6 m^2/s$,
(d) Stream function at 850hPa (contour) and anomaly (shading). Contour interval is $5\times10^6 m^2/s$.

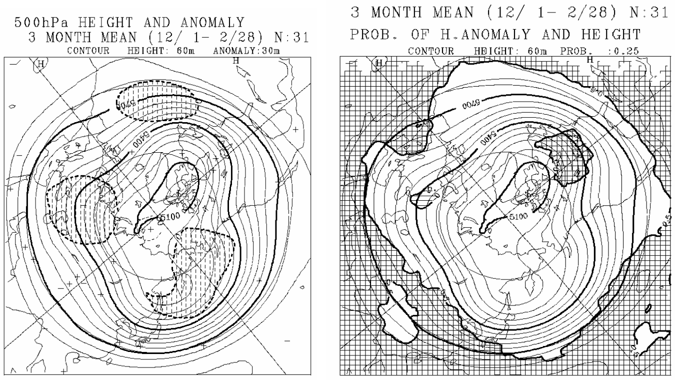

Figure 5 Predicted 500hPa height in the Northern Hemisphere for 2005/2006 DJF
(a) Ensemble mean (solid contours; interval is 60m) and anomaly (dashed contours; interval is 30m). Negative anomalies are shaded.
(b) Ensemble mean (solid contours; interval is 60m) and the probabilities of anomalies predicted to be above {+0.42×standard deviation} or below {–0.42×standard deviation}. Areas where probabilities exceed 50% are hatched. Areas above {+0.42×standard deviation} are cross hatched, and areas below {-0.42×standard deviation} are single hatched.

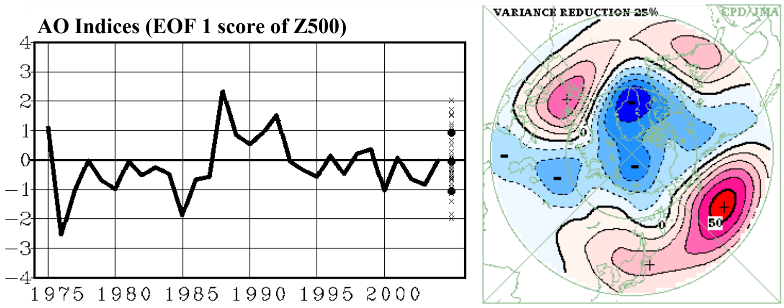

Figure 6 Observed (1975/76-2004/2005 DJF) and predicted (2005/2006 DJF) AO index (left) defined by the first EOF of 500hPa height anomalies in the Northern Hemisphere (right).
In the left panel, thick line shows time series of observed AO indices. Black circles are ensemble mean and ensemble mean ± spread. Cross shows each member.

The status of Japanese 25-year reanalysis project and usage of the products

An ongoing long-term global atmospheric reanalysis covering 26 years from 1979 to 2004 is scheduled to be completed by March 2006. JMA has already started the web-based distribution of the products. These Japanese 25-year reanalysis (JRA-25) products have advantages in the accuracy of tropical rainfall and the reproducibility of tropical cyclones in comparison with other reanalyses.

1. Outline

In the framework of operational weather and climate services, there are serious needs for a consistent basic dataset that covers over recent decades. In 2000, JMA and Central Research Institute of Electric Power Industry (CRIEPI) made decision to conduct a cooperative research project for a new reanalysis that covers 26 years from 1979 to 2004. JMA's state-of-the-art operational global numerical weather prediction and data assimilation system have been used in JRA-25 after some modifications. The main operation started in April 2004 using the CRIEPI's Fujitsu VPP5000/32PE supercomputer. By September 2005, over 90 % of the calculation for the target period had been completed. The products are uploaded to our web server after some post processing. The latest information of the project status can be found in the official web site (http://www.jreap.org/indexe.html). After the completion of the production in March 2006, this JRA-25 system will be followed by the Japanese Climate Data Assimilation System (JCDAS), which will generate quasi-real-time products.

2. Product and usage

The JRA-25 system is composed of a forecast model and an assimilation module attached with land and snow analysis. The forecast model is the JMA global spectral model (GSM); its assimilation scheme is based on a JMA operational 3-dimensional variational scheme. Forecast and assimilation cycles are repeated at 6-hour intervals. The original JRA-25 products are a huge amount of grid point values (GPVs) with the total amount of around 10 terabytes. They include atmospheric pressure, temperature, wind, humidity including the stratosphere, precipitation, ground soil wetness, sea surface temperature, sea ice coverage, accumulated snow, and so on. Due to limited telecommunication resources, original spatial resolution: T106 Gaussian (320 x 160, about 125km horizontal grid intervals), vertical 40 levels with top at 0.4 hPa are reduced to publicly-supplied version: basically in 2.5-degree lat-lon grid (144 x 73, about 280km intervals) with vertical 23 pressure levels. The binary format of the JRA-25 products is GRIB and can be easily handled with GrADS graphical routine freely distributed from COLA and any other GRIB decorder. JMA is willing to supply the reanalysis products to any operational meteorological organizations and climate research communities. The download procedure is briefly shown in Table 1.

Table 1 JRA-25 download procedure

Read web document
'How to use data?'
(http://www.jreap.org/download/howto-e.html),
and 'Reanalysis Evaluation Group'
(http://www.jreap.org/organization/evaluation-e.html).
Sign up JRA-25 evaluation membership
Simply fill out your 'Name', 'Organization', 'E-mail address' and 'Purpose of use'.
Download Data
(http://www.jreap.org/download/download-e.html)
Now three-dimensional analysis and first guess data at 23 layers of pressure levels, two-dimensional atmospheric monitor output, land surface and snow analysis data are available.

3. Advantages of JRA-25

Reanalysis products are comprehensive and consistent resources not only for operational climate system monitoring but also for various climate and meteorological studies. Preliminary evaluation shows JRA-25 data have advantages in the accuracy of tropical rainfall (Figure 7) and the reproducibility of tropical cyclones (Figure 8). From March 2006 onward, JMA will start quasi-real-time JCDAS. We hope the products of JCDAS as well as JRA-25 will give much benefit in climate-system monitoring services and climate analysis studies.

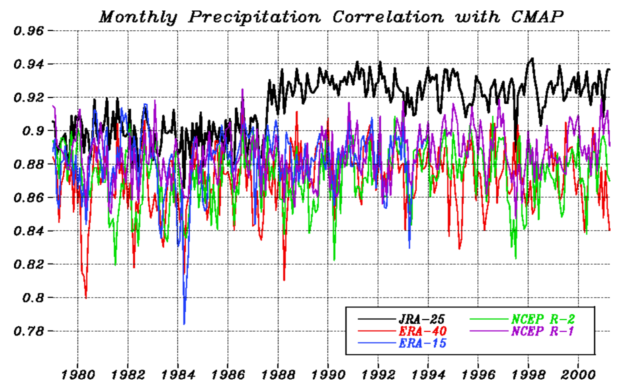

Figure 7 Time series of correlation coefficient between monthly averaged global precipitation generated by reanalyses, and CMAP satellite observation
Correlation of JRA-25 is the best among reanalyses since middle of 1987 when SSM/I precipitable water retrieval introduced in the 3DVAR assimilation.

References

JRA-25 working group, 2001: Japanese 25-year reanalysis plan, available from http://www.jreap.org/indexe.html

(Hiroshi Koide, Climate Prediction Division)

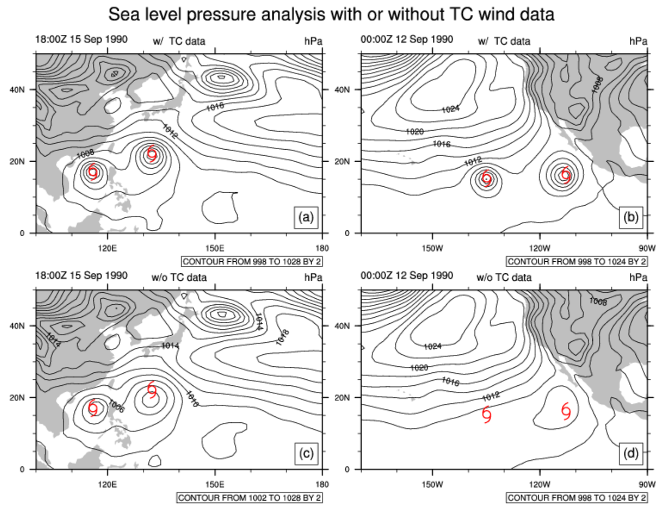

Figure 8 Tropical cyclones (TCs) in JRA-25 Reanalysis with (Upper) and without (Lower) the impact of Dr. Mike Fiorino's TC wind retrieval (TCWR) data
In data sparse region, the impact of TCWR is significant. JRA-25 is the first case adopting this kind of data to a long-term reanalysis (These figures are provided by CRIEPI).

Summary of Asian Summer Monsoon 2005

The South Asian monsoon rainfall was near normal during June to September 2005. In East Asia, precipitation was above normal in southern China, the Republic of Korea, and southwestern Japan, while below normal over central and northern China, and western Japan.

1. Monsoon activities

Asian summer monsoon activities, inferred from the seasonal mean OLR (Outgoing Longwave Radiation) over Southeast Asia and India during the period from June to September 2005 (hereafter called "the monsoon period"), were near normal (Figure 9). The most active convection area of the Asian monsoon was located in the east of its normal position.

According to India Meteorological Department (IMD), the southwest monsoon rainfall during the monsoon season, over India as a whole was 99% of its long period average. The onset of monsoon was late over the Indian Peninsula and eastern parts of India, but early advance over its northwestern parts. The withdrawal was delayed over most parts of India.

The rainfall during Baiu season over Japan was below normal in its western parts and significantly above normal in the southwestern parts. The beginning of Baiu season was delayed in most of Japan except its southwestern parts. The end of Baiu season was near normal or earlier than normal in most of Japan except its southwestern and northern divisions.

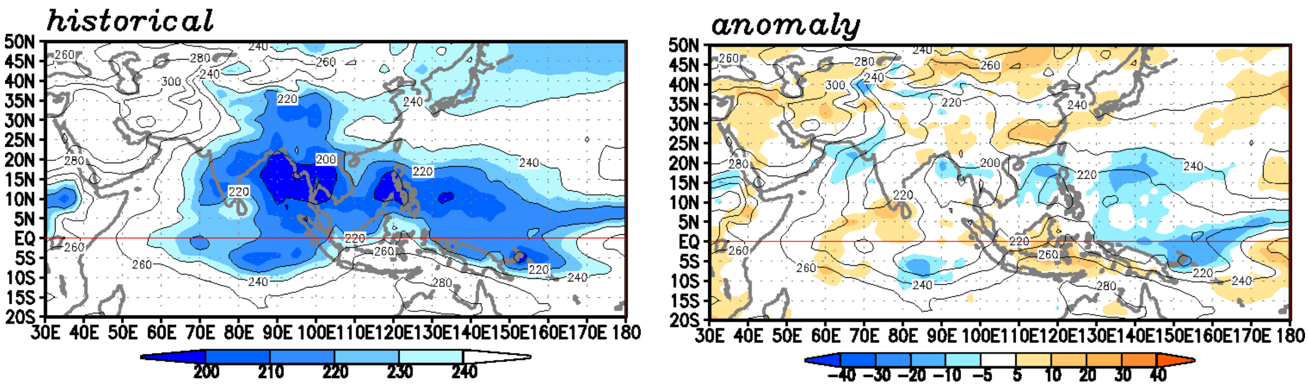

Figure 9 Four-month mean OLR (Outgoing Longwave Radiation) and anomalies (June-September 2005)
Solid lines indicate OLR (W/m^2) with a contour interval of 30W/m^2.

2. Precipitation and temperature

The four-month total precipitation, based on CLIMAT reports, during the monsoon season was above normal in western India, the central Indochina Peninsula, from the southern coast of China to southwestern Japan, in Shandong province in China and in the Republic of Korean, while below normal from eastern Mongolia to northern China (Figure 10). In June, significantly heavy precipitation was observed in western India and southwestern parts of Japan. In July, precipitation was significantly heavy in central India. In August, significantly light precipitation was observed in northwestern India. In September, precipitation was significantly heavy in the eastern and western coasts and northwestern parts of India, and over the Indochina Peninsula.

The four-month mean temperature during the same period was higher than normal over most of Asia, except western India and northern Thailand, and significantly high in Malaysia and over eastern Mongolia to northern China (Figure 11). In June, significantly high temperature was observed across eastern India through China to Japan and over Malaysia to the Kalimantan Island. In July, temperature was significantly high in southern China and over Mongolia to northern China. In August, significantly high temperature was observed in southern India, over the Malay Peninsula to the Kalimantan Island, and in eastern Mongolia. In September, temperature was significantly high across northern India through southern China to western Japan.

3. Tropical cyclones

During the monsoon season, 15 tropical cyclones occurred over the western North Pacific, and the number of the occurrence is near normal, compared to the 1971-2000 average of 16.4 (Figure 10). There were eight tropical cyclones causing damage to East Asia or the Indochina Peninsula (Table 2). The typhoon “Talim”, which crossed southeastern China from 31 August to 2 September, and the typhoon “Damrey”, which migrated westward across the northern South China Sea and made landfall on northern Vietnam on 27 September, led to more than 100 fatalities, respectively. In early September, the typhoon “Nabi” hit Japan and caused severe damage such as 26 deaths and three missing people.

4. Noticeable weather-related disasters other than tropical cyclones

Major weather-related disasters in Asia, except those related to tropical cyclones, during the monsoon season are as the following. In June, heat waves occurred in eastern India, Bangladesh, and Pakistan, causing above 300 fatalities. In southern China, more than 230 deaths due to heavy

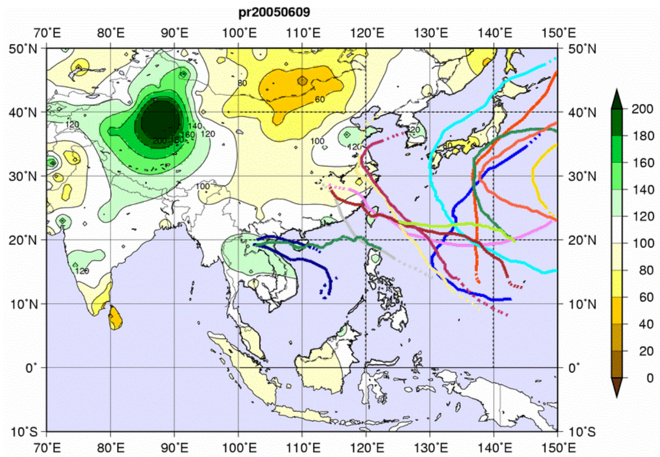

Figure 10 Four-month precipitation ratio (%) and tropical cyclone tracks during June to September 2005

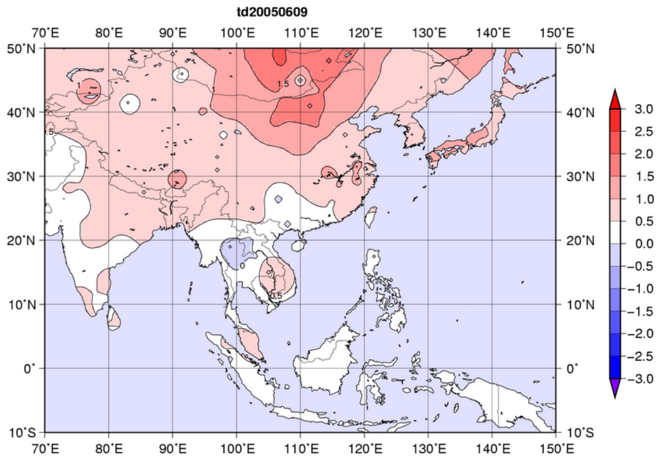

Figure 11 Four-month mean temperature anomaly (℃) during June to September 2005

Table 2 Tropical cyclones which caused damage to East Asia and the Indochina Peninsula during June to September 2005

Number	Name	Date (UTC)	Category[1)]	Min Pressure[2)] (hPa)	Max Winds[3)] (knots)	Fatalities[4)]	Affected Countries
T0505	Haitang	7/13 - 7/20	TY	920	105	15	China
T0507	Banyan	7/21 - 7/28	STS	975	55	0	Japan
T0509	Matsa	7/31 - 8/ 7	TY	950	80	13	China
T0511	Mawar	8/19 - 8/28	TY	930	95	0	Japan
T0513	Talim	8/27 - 9/ 2	TY	925	95	over 100	China
T0514	Nabi	8/29 - 9/ 8	TY	925	95	26	Japan
T0515	Khanun	9/ 7 - 9/13	TY	945	85	14	China
T0518	Damrey	9/21 - 9/27	TY	955	80	over 120	the Philippines, China, Vietnam, Thailand, Lao P.D.R

1) Abbreviations of tropical cyclone categories
TS: Tropical Storm, STS: Severe Tropical Storm, TY: Typhoon
2) Estimated minimum central pressure
3) Estimated maximum 10-minute mean winds
4) The number of fatalities is based on media reports, except on reports from Japan Fire and Disaster Management Agency for cases in Japan.

rain were reported. On 27 July, a record-breaking rainfall of 944 mm was observed at Mumbai, India, which caused devastating damage such as over 1000 deaths. In early August, heavy rain caused by active Baiu front in the Republic of Korea led to 11 fatalities. In August, heavy rain, floods, and landslides occurred in Liaoning and Hubei provinces in China, resulting in over 50 deaths. In middle September, a cyclonic storm, which formed over the northern Bay of Bengal and made landfall on the central Bay-side of India, caused more than 50 fatalities.

5. The abrupt Atmospheric Circulation Change in East Asia around the End of Meiyu/Baiu Season

In the former half of mid-July (the 39th pentad of the year), Meiyu/Baiu front was stagnant from central China to the main islands of Japan. In the latter half of mid-July (the 40th pentad), it abruptly weakened, which brought the end of Meiyu/Baiu season in most of East Asia except northern parts of Japan. What is the possible mechanism of this abrupt change? After the 38th pentad, the propagation of the Rossby wave along the Asian jet was observed, and strengthened anti-cyclonic circulation over northeastern China in the 40th pentad (Figure 12). In addition, the typhoon "Haitang" moved slowly westward over the western North Pacific (Figure 13), and simultaneously the strengthening of anti-cyclonic circulation was observed in the lower troposphere over the Yellow Sea and the western part of Japan. It is supposed that the formation of those anti-cyclonic circulations, which seem to be related to both the wave propagation and the typhoon, caused the dramatic change of water vapor flow in East Asia (Figure 14) and weakened the Meiyu/Baiu front.

(1: Chiaki Kobayashi, 2-4: Shotaro Tanaka, and 5: Yayoi Harada, Climate Prediction Division)

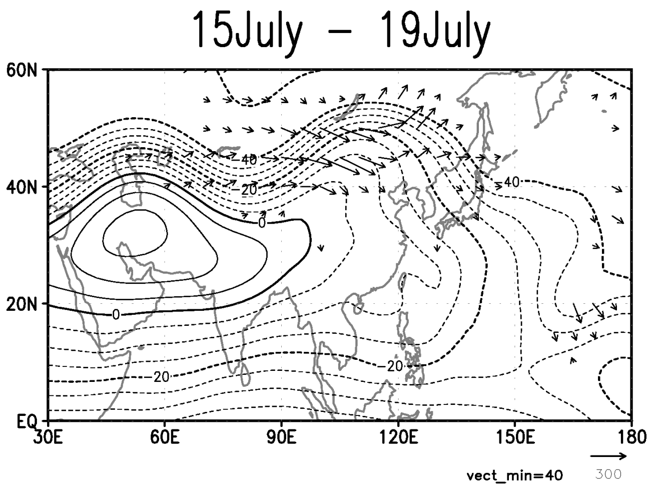

Figure 12 Five-day Mean 200hPa Stream Function and Wave Activity Flux

Contours show stream function ($\times 10^6 m^2/s$). Vectors show wave activity flux ($\times 10^6 m^2/s^2$) after Takaya and Nakamura (2001, JAS, 58, 608-627).

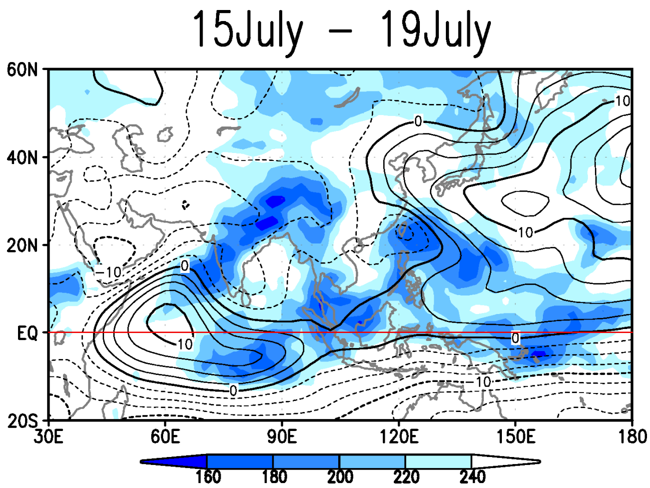

Figure 13 Five-day Mean 850hPa Stream Function and OLR

Contours show stream function ($\times 10^6 m^2/s$). Shading shows OLR (W/m^2).

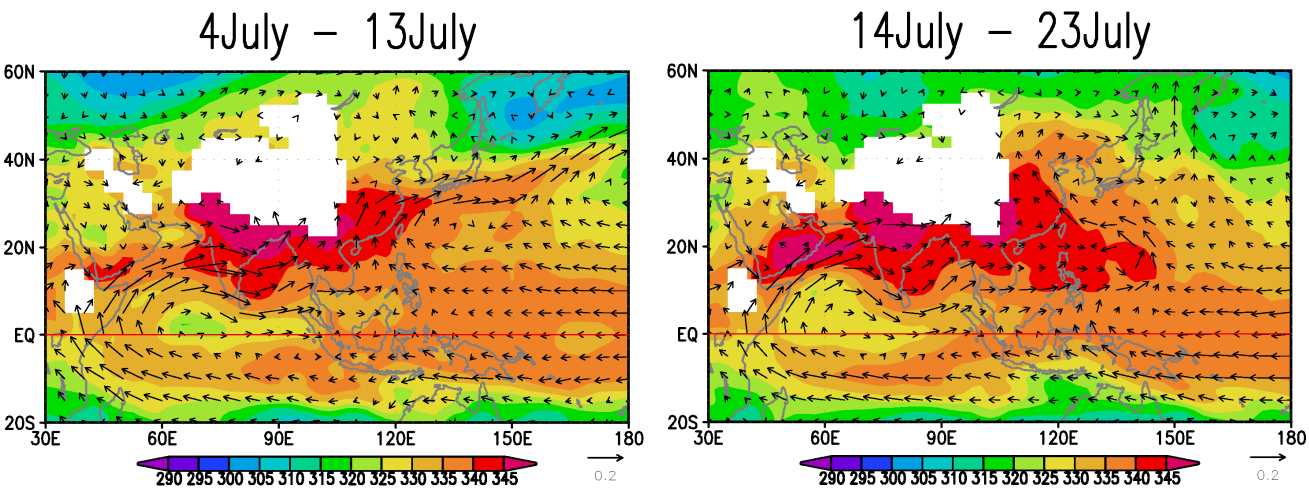

Figure 14 10-day Mean Equivalent Potential Temperature and Water Vapor Flux before and after the weakening of the Meiyu/Baiu front

Shading shows equivalent potential temperature (K) at 850hPa. Vectors show water vapor flux (g/kg*m/s) at 850hPa.

Projected change of Asian summer monsoon: a report on a global warming experiment by an AGCM with a 20-km grid

The global warming projection, conducted by using a very high horizontal resolution atmospheric general circulation model with a 20-km grid produced by MRI/JMA, implys that the subtropical high south of Japan would be intensified and lead to the increase of water vapour conveyance from the tropics to the East China Sea during Asian summer monsoon season.

The evaluation of the impact of the global warming on the change of Asian summer monsoon season are selected as one of the main targets of this study, because the activity of Asian summer monsoon greatly affects the life and society of people living in the region. So far various global climate models in the world have not given reliable simulations and projections due to their insufficient resolutions.

Figure 15a shows the observed distribution of climatological precipitation and 850-hPa wind vector for July. Figure 15b shows simulated July climatology by the model under the present-day climate condition. The model reproduces Baiu rain band reasonably well over Japan, Korea, China, although the model overestimates precipitation over Korea. Also the model well reproduces precipitation over Indian subcontinent, although the model overestimates precipitation over oceans. As for 850-hPa wind field, the model well reproduces clockwise circulation over the subtropical high, north-eastward flow from Indochina to Japan, and Somali jet.

Figure 15c shows the change of precipitation and 850-hPa wind field projected by the model for July. Precipitation increases over the Yangtze River Basin, the East China Sea and the ocean to the south of Japan. Clockwise circulation change of 850-hPa wind over the subtropical high means the intensification of subtropical high. Strengthening of clockwise circulation together with increase of water vapour amount due to the warming of atmosphere leads to the increase of water vapour transport from the tropics to the East China Sea. In contrast, precipitation decreases over Korea and Northern Japan. In spite of the weakening of Somali jet, precipitation over Indian subcontinent increases. This is because the water vapour transport decrease due to the weakening of Somali jet is compensated by the increases of water vapour amount due to the warming of atmosphere.

Acknowledgements

This study was conducted under the framework of the Research Revolution 2002 (RR2002) project "Development of Super-High-Resolution Global and Regional Climate Models" funded by Ministry of Education, Culture, Sports, Science and Technology (MEXT). This project is called "Kyosei-4 project". The Earth Simulator was used for the 20-km model calculation

Reference

Kusunoki, S. et al, 2005: Global warming projection by a 20-km mesh super high resolution atmospheric general circulation model. In proceedings of "*International Workshop on Variability and Predictability of the Earth Climate System*". 26-27 January 2005, The University of Tokyo, 292-317.

(Shoji Kusunoki, Meteorological Research Institute)

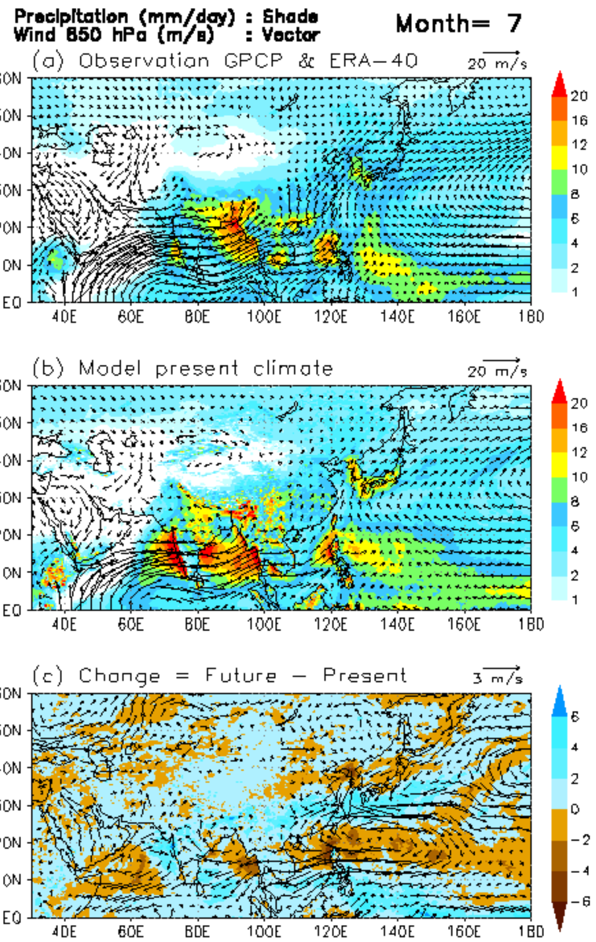

Figure 15 Distribution of climatological precipitation (colour, mm/day) and 850-hPa wind vector (arrow, m/s) for July

(a) Observed precipitation by the GPCP one-degree daily data (Huffman et al. 2001) for 7 years from 1997 to 2003. Observed wind by the ERA-40 data (Simmons and Gibson 2000) for 30 years from 1971 to 2000, (b) Model's present-day climate 10-year simulation forced by observed climatological (1982-1993) sea surface temperature (SST) by Reynolds and Smith (1994), (c) Change as future minus present-day simulation. In a future 10-year simulation around year2090, IPCC SRES A1B emission scenario (IPCC 2000) is assumed. Future SST change is taken from projection by Atmosphere-Ocean Coupled model (MRI-CGCM2.3) and added to observed SST used in the present-day simulation.

Any comments or inquiries on this newsletter and/or the TCC website would be much appreciated. Please e-mail to the following address:
tcc@climar.kishou.go.jp
(Chief Editor: Shingo Yamada)

Tokyo Climate Center (TCC), Climate Prediction Division, JMA
Address: 1-3-4 Otemachi, Chiyoda-ku, Tokyo 100-8122, Japan
TCC website: http://okdk.kishou.go.jp/index.html