Tokyo Climate Center, Japan Meteorological Agency

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Contents

El Niño Outlook (October 2007 - April 2008)

The NINO.3 SST is likely to be below normal during the forecast period. It is likely that La Niña conditions will continue until spring 2008.

In September 2007, the SST deviation from a sliding 30-year mean SST averaged over the NINO.3 region was -1.3˚C. The five-month running mean of the NINO.3 SST deviation was -0.9˚C for July 2007. SSTs were below normal throughout the central and eastern equatorial Pacific and above normal in the western part in September (Figure 1a).

Subsurface negative temperature anomalies through the central and eastern parts and positive temperature anomalies in the western part were prominent (Figure 2). Convective activities were below normal around the date line (Figure 1b). In the central equatorial Pacific, westerly wind anomalies at the upper troposphere and easterly wind anomalies at the lower troposphere were prominent. These features are consistent with the oceanic and atmospheric conditions seen during La Niña events and indicate more typical La Niña conditions than in August 2007.

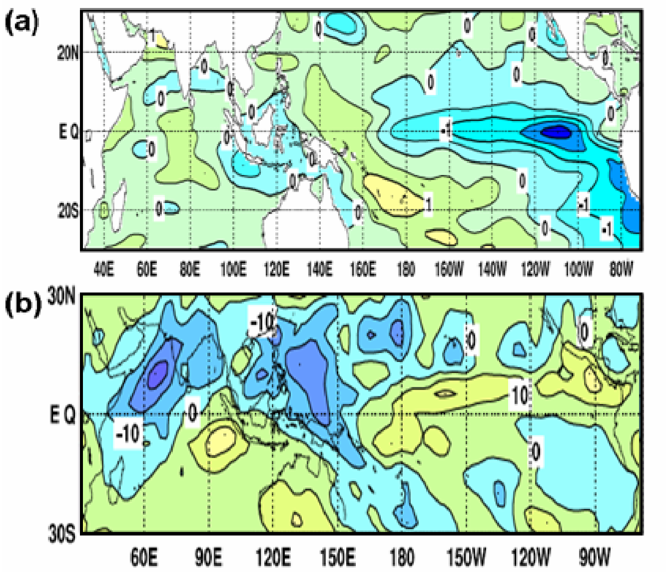


Figure 1 Monthly mean conditions of the Pacific and Indian Ocean sectors in September 2007 for (a) sea surface temperature (SST) anomalies and (b) outgoing long wave radiation (OLR) anomalies
Contour intervals are 0.5˚C in (a) and 10W/m^2 in (b). Base periods for normal are 1971-2000 in (a) and 1979-2004 in (b).

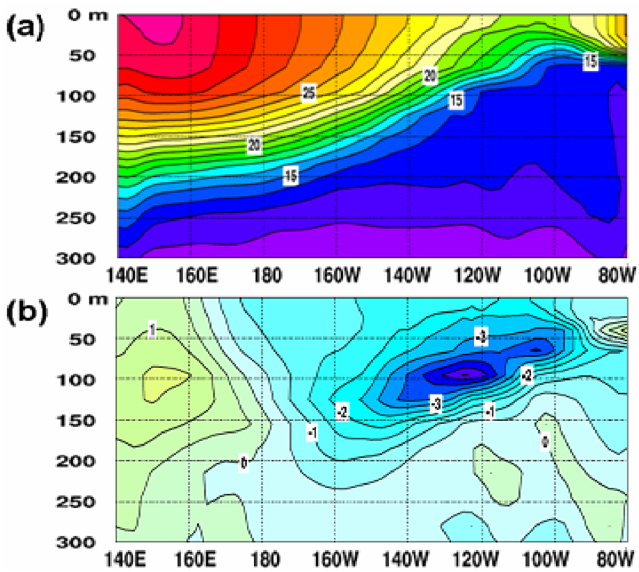


Figure 2 Monthly mean depth-longitude cross sections of (a) temperature and (b) temperature anomalies in the equatorial Pacific for September 2007
Contour intervals are 1˚C in (a) and 0.5˚C in (b). Base period for normal is 1987-2006.

Under the La Niña conditions mentioned above, the negative SST anomalies in the eastern equatorial Pacific tend to be maintained by the ocean-atmosphere interaction.

The JMA's El Niño forecast model predicts that the NINO.3 SST will be below normal during the forecast period (Figure 3).

Considering all the above, the NINO.3 SST is likely to be below normal during the forecast period. It is likely that La Niña conditions will continue until spring.

For details, please refer to El Niño Monitoring Page of the TCC's website: http://ds.data.jma.go.jp/tcc/tcc/products/elnino/index.html

(Ikuo Yoshikawa, Climate Prediction Division)

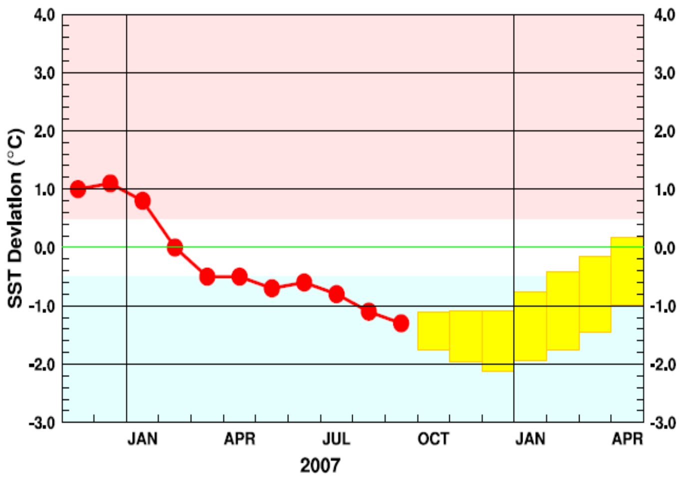


Figure 3 Outlook of the SST deviation for NINO.3 by the El Niño forecast model
This figure indicates a time series of the monthly SST deviation for NINO.3 (5°N-5°S, 150°W-90°W). Thick line with closed circle shows the observed SST deviation and boxes show the predicted one for the next six months by the El Niño forecast model. Each box denotes the range where the SST deviation will be included with the probability of 70%.

JMA's Seasonal Numerical Ensemble Prediction for 2007/2008 winter

In 2007/2008 winter, an anomaly pattern in the central and eastern Pacific in the upper troposphere, which seems to be related to the La Niña event, is predicted by JMA's seasonal numerical ensemble prediction system, while typical anomaly pattern during La Niña events is not predicted in the western Pacific. It might be related to the positive SST anomalies in the Indian Ocean. It is noted that the skill of the SSTs and precipitation in the Indian Ocean is not so high that the results should be interpreted with caution.

1. Introduction

In this report, JMA's seasonal numerical ensemble prediction for 2007/2008 winter (DJF), which is used for one of the prognostic tools for the JMA's operational cold season outlook issued on 25 October 2007, is introduced. The prediction consists of 51 ensemble members whose initial dates are 18 October 2007, and employs the two –tier method: first, global SSTs are predicted using a combination of persisted anomalies, climatology and prediction with the JMA's El Niño prediction model (atmosphere-ocean coupled model; CGCM), and then the specific SSTs are fed in an atmospheric model (AGCM). Details on the prediction system and verification maps based on 22-year hindcast experiments are available at http://ds.data.jma.go.jp/tcc/tcc/products/model/index.html. This report is organized as follows. In section 2, the predicted global SST anomalies are presented. Then, the predicted circulation fields in the tropics and sub-tropics associated with those SST anomalies are described. Finally, the predicted circulation fields in the middle and high latitudes in the Northern Hemisphere are explained.

2. SST anomalies (Figure 4)

During 2007/2008 winter, the SSTs in the equatorial Pacific are predicted to be slightly above normal in the western part and negative anomalies exceeding -0.5°C in the central and eastern parts. Positive anomalies are also seen in the South Pacific Convergence Zone (SPCZ). This anomaly pattern is similar to the one typically observed during La Niña events. In the Indian Ocean, the SSTs are predicted slightly above normal, except for the Bay of Bengal, where relatively negative anomalies are seen. Positive SST anomalies are predicted in the Atlantic.

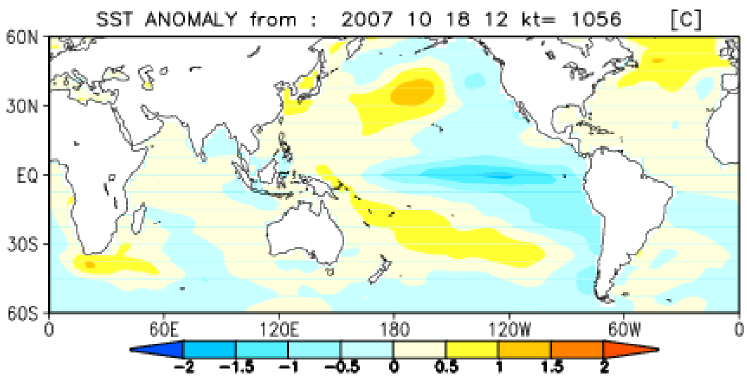


Figure 4 Predicted SST anomalies for 2007/2008 DJF

3. Circulation fields in the tropics and sub-tropics (Figure 5)

As expected from the predicted SST anomalies, below normal precipitation is predicted in the equatorial central and eastern Pacific. On the other hand, above normal precipitation is predicted in the western Pacific, SPCZ and the Atlantic. Though above normal precipitation is also seen in the Indian Ocean, the hindcast indicates that the forecasting skills for the rainfall are generally so low in this area that the results should be interpreted with caution.

Consistent with the precipitation pattern, the upper tropospheric velocity potential anomalies are negative (more divergent) over the Indian Ocean. Positive (more convergent) anomalies are predicted over the tropical western Pacific. It should be noted that the results of negative anomalies over the Indian Ocean should be interpreted with caution since the skills for the upper tropospheric velocity potential from the hindcast are low like those for the rainfall.

In the upper troposphere, cyclonic circulation anomalies are located on north and south sides of the central and eastern Pacific and anti-cyclonic circulation anomalies are located poleward of each cyclonic anomaly, which is often seen during La Niña events. In the lower troposphere, that kind of typical pattern during La Niña events is obscure, though it is seen in the upper troposphere. The anti-cyclonic pattern in the northern central and eastern Pacific in extratropics is also seen in the lower troposphere. On the other hand, in the western Pacific, typical anomaly pattern is not seen in both upper and lower troposphere. It might be related to the positive SST anomalies in the Indian Ocean.

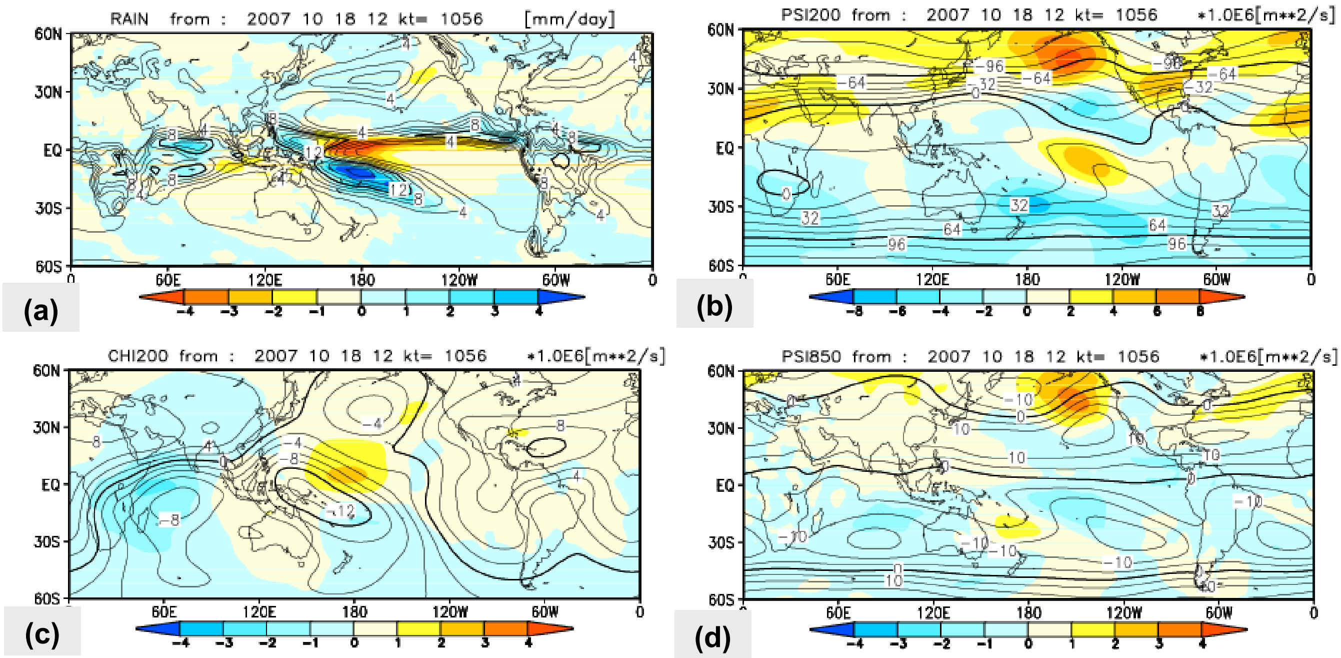


Figure 5 Predicted atmospheric fields of 2007/2008 DJF (Ensemble mean of 51 members)
(a) Precipitation (contour) and anomaly (shading). Contour interval is 2 mm/day.
(b) Velocity potential at 200 hPa (contour) and anomaly (shading). Contour interval is $2x10^6 m^2/s$.
(c) Stream function at 200 hPa (contour) and anomaly (shading). Contour interval is $16x10^6 m^2/s$.
(d) Stream function at 200 hPa (contour) and anomaly (shading). Contour interval is $5x10^6$m2/s.

4. Circulation fields in the middle and high latitudes in the Northern Hemisphere (Figures 6 and 7)

The ensemble prediction says that the winter mean 500-hPa height anomalies will be above normal over most parts of the Northern Hemisphere, except for the high latitudes such as northern part of North America and Europe. Relatively large positive anomaly is seen over the northeastern Pacific, which is often seen during La Niña events. The probabilistic distribution of EOF1 score of the 500hPa height anomalies in DJF predicted by each member is positively biased, while that of EOF2 is near normal. EOF1 score is used as the AO index and the AO is the leading mode of the low frequency variability of the atmosphere in the Northern Hemisphere. The EOF1 scores biased positively in this case, however, we need more consideration to conclude that the probability of positive AO situation would be seen, since EOF1 scores look affected by the positive anomalies in the northeastern Pacific, while the center of variability for EOF1 derived from analysis is in the north Atlantic.

(Akihiko Shimpo, Climate Prediction Division)

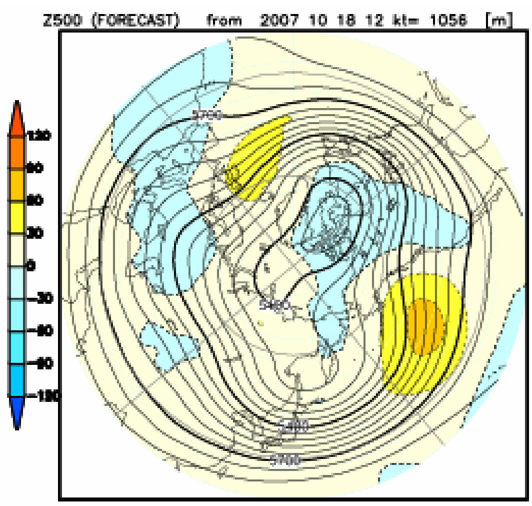


Figure 6 Predicted 500hPa height in the Northern Hemisphere for 2007/2008 DJF (Ensemble mean of 51 members)
Contour interval is 60 m. Anomalies are shaded.

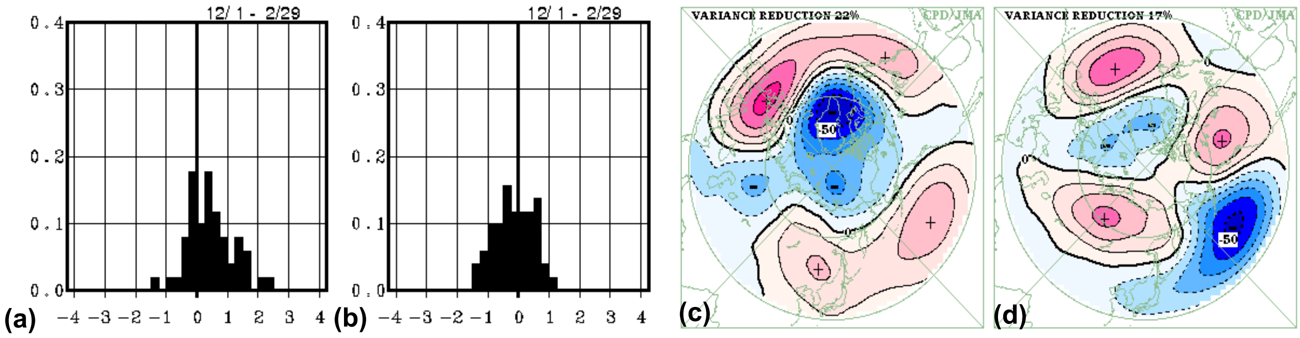


Figure 7 Histogram of predicted (2007/2008 DJF) (a) EOF1 and (b) EOF2 scores defined by the (c) first and (d) second EOFs of 500hPa height anomalies in the Northern Hemisphere

Cold Season Outlook for 2007/2008 winter in Japan

For winter mean temperatures, near-normal temperatures are expected with a 40% probability and both above-normal and below-normal with 30% probabilities for Northern, Eastern and Western Japan. Both near-normal and warmer-than-normal temperatures with 40% probabilities are predicted for Okinawa and Amami. Snowfall amounts are predicted to be near-normal with 40% probabilities on the Sea of Japan side. However, we have not yet had enough signals for the coming winter climate in Japan, so it is necessary to keep watching the precursor signal carefully such as the significant shift of the Arctic Oscillation phase.

1. Long-term trends

The 11-month running mean temperatures over Japan have been almost above normal since 1980's. They have fluctuated with a period of 3 or 4 years in the positive anomaly base and they are currently at one of the highest peaks. Recently, winter mean temperatures have not been below normal except for Northern Japan. The appearance ratios (below normal: normal: above normal) for winter mean temperatures in recent 10 years are 1:3:6 for Eastern Japan, 1:5:4 for Western Japan, and 0:2:8 for Okinawa and Amami. The tropospheric thickness temperature averaged over the mid-latitudes of the Northern Hemisphere (30-50° N) also tends to be above normal since 1998 and it is likely to be above normal in this winter. From these points of view, it is considered that there is a signal of warm or normal winter for Eastern Japan, Western Japan, and Okinawa and Amami, and no signal for Northern Japan.

2. Oceanic condition

The La Niña event which occurred in last spring has developed to a mature phase in this autumn and it is predicted to continue during the coming winter. According to our statistical studies, anti-cyclonic and cyclonic circulation anomalies tend to be dominant over the southern part of China and around Japan, respectively, during La Niña events. This feature is explained by the theory of Rossby wave enhanced by the active convection around the Maritime Continent and the eastward propagation of quasi-stationary Rossby wave packet. Our statistical study also shows that cold or normal winters tend to be observed in most parts of Japan during La Niña events. From these points of view, it is considered that there is a signal of cold or normal winter for Northern, Eastern and Western Japan.

3. Ensemble Prediction System (EPS)

The Sea Surface Temperature Anomalies (SSTA) fed to the atmospheric global model are positive in the tropical western Pacific, slightly positive in the Indian Ocean and significantly negative along the equator in the central and eastern Pacific. Reflecting this SSTA distribution, precipitation anomalies are generally positive over the tropical western Pacific and the Indian Ocean, especially to the north of New Guinea. This feature is almost the same as the statistical feature which tends to appear during La Niña event and the pattern of 500hPa height anomalies from the eastern Pacific to North America is also consistent with it. Meanwhile, the EPS seems to have no signal of the Eurasian teleconnection pattern and the Arctic Oscillation (AO) pattern. As the result, the pattern of 500hPa anomalies around Japan is dissimilar to the statistical feature which is often observed during La Niña events and there is only a signal of warming trend of tropospheric temperatures. From these points of view, it is considered that there is a weak signal of normal or slightly warm winter for Northern and Eastern Japan.

Conclusion

Considering the above points, a signal of warm winter and a signal of cold winter cancel each other, so the base of winter mean temperature is predicted to be near normal and the winter monsoon which brings heavy snow on the Sea of Japan side is also predicted to be near normal. More to the point, the warm effect by the long-term trends and the cold effect by the La Niña event are balanced. Taking into account that the AO which is closely connected with winter climate in Japan is not predicted as a significant signal, probability of warm or cold winter is expected to be small. Nonetheless, we should carefully keep monitoring the situation of the Arctic Oscillation because the active convection around the Maritime Continent affected by the La Niña event will work synergistically in increasing the possibility of major cold waves if the Arctic Oscillation becomes a certain level of negative phase.

(Norihisa Fujikawa, Climate Prediction Division)

Summary of Asian Summer Monsoon 2007

1. Monsoon activities (Figure 8)

Asian summer monsoon activities inferred from the seasonal mean OLR (Outgoing Longwave Radiation) over Southeast Asia and India from June to September (hereafter called "the monsoon period") were enhanced in the Arabian Sea and near Indonesia, and suppressed near Japan. The most active convection area of the Asian monsoon shifted westward from its normal position. In June, convective activities in the Arabian Sea were extremely enhanced, whereas they were suppressed in the Bay of Bengal. In June and July, convective activities were suppressed in Southeast Asia except in Indonesia. In September, convective activities in the Asian monsoon region were extremely enhanced.

According to the India Meteorological Department (IMD), the southwest monsoon precipitation over India during the monsoon period was more than its normal. The onsets of the monsoon were later than normal in southeast India and earlier than normal in northwest India, respectively.

The total precipitation during the Bai-u season 2007 was more than normal in the Pacific side of Western and Eastern Japan especially in July, while less than normal in Northern Japan. Both the beginnings and the ends of the Bai-u season were later than normal in most districts in Japan.

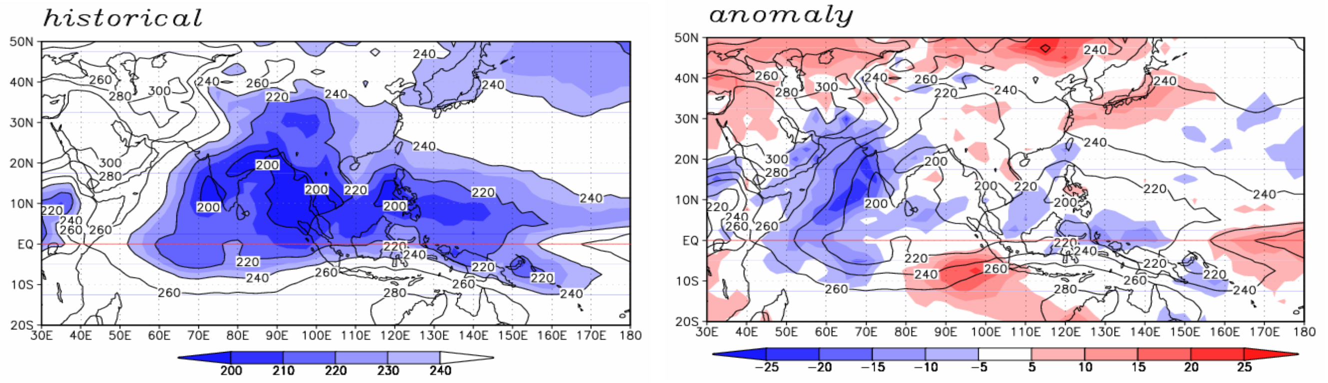


Figure 8 Four-month mean OLR (Outgoing Longwave Radiation) (left) and its anomalies (right) (June-September 2007)
Solid lines indicate OLR (W/m^2) with a contour interval of 20W/m^2, and color shadings indicate OLR anomalies (right).

2. Precipitation and temperature

During the monsoon season (June-September), the four-month total precipitation amounts, based on CLIMAT reports, were above normal from southern India to Pakistan, Kalimantan Island to western New Guinea, around the Yellow Sea, while below normal in northern India, Mongolia to northern China (Figure 9). In June, precipitation amounts were extremely heavy from Pakistan to western India corresponding to enhanced convective activities in the Arabian Sea. In July, extremely heavy precipitation amounts were observed in central Southeastern Asia, while extremely light precipitation amounts were observed around southern China. In August, precipitation amounts were extremely heavy around the Yellow Sea and the Eastern China Sea due to warm/wet flow and tropical storms. From July to September, precipitation amounts were extremely light around Mongolia. During the same period, the four-month mean temperatures were higher than normal over most of Asia especially from Mongolia to northern China, while they were slightly lower in some parts of southern China (Figure 10). In June, temperatures were extremely high from Northern Japan to northern China. In July, extremely high temperatures were observed around southern China. In August, temperatures were extremely high from southwestern China to northern India. In September, temperatures were extremely high in Japan. From July to September, extremely high temperatures were observed around Mongolia.

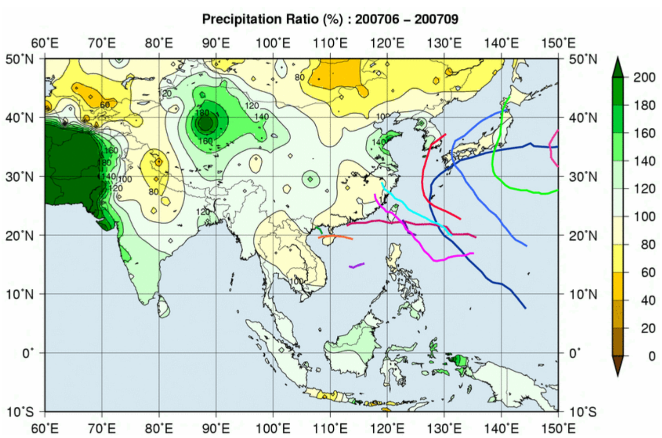


Figure 9 Four-month precipitation ratio (%), and tropical cyclone tracks in the northwestern Pacific, from June to September 2007

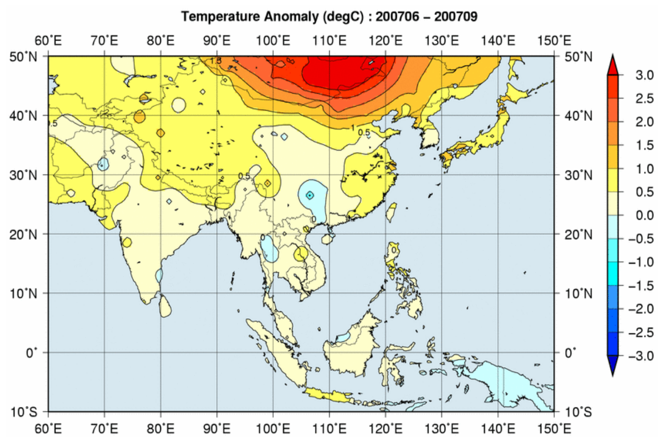


Figure 10 Four-month mean temperature anomaly (℃) from June to September 2007

3. Tropical Cyclones

During the monsoon season, 12 tropical cyclones of tropical storm (TS) intensity or higher formed over the western North Pacific, and the number of the occurrence was lower than the 1971-2000 average of 16.4 (Figure 9). There were 11 tropical cyclones which approached or made landfall on East and Southeast Asia (Table 1). The typhoon "Man-Yi" which hit Japan in the middle of July led to five deaths (Japan Fire and Disaster Management Agency). In the beginning of August, the typhoon "Pabuk" and the tropical storm "Wutip" caused 12 fatalities in the Philippines. After being downgraded to a tropical depression, the "Pabuk" caused damage in the Korean Peninsula. In the middle of August, the typhoon "Sepat" caused more than 50 deaths in China and the Philippines. In the middle of September, the typhoon "Wipha" caused 7 fatalities in China (Ministry of Civil Affairs of the People's Republic of China).

Cyclone "Yemyin" hit Pakistan in the end of June and caused more than 200 deaths.

The number of fatalities is based on the Emergency Disasters Database (EM-DAT) except for specified one.

4. Noticeable weather-related disasters other than tropical cyclones

Major weather disasters in Asia, except for those related to tropical cyclones during the monsoon season are the following.

In India, floods caused over 1300 fatalities in total. Also floods occurred in the end of July or beginning of August in Pakistan, Bangladesh, and Nepal, which led to more than 200, 800, 170 deaths, respectively.

In addition, floods led to more than 700 fatalities in China in total. Around Sulawesi Island in Indonesia, over 100 were killed due to floods in the beginning of August. In August and September, drought conditions were reported in northern China (Beijing Climate Center).

Table 1 Tropical cyclones which approached/made landfall on East and Southeast Asia from June to September 2007
Information is issued by RSMC Tokyo-Typhoon Center, except for "Affected Countries".

ID Number	Name	Date (UTC)	Category[1)]	Minimum Pressure[2)] (hPa)	Maximum Winds[3)] (Knots)	Affected Countries
T0703	Toraji	7/5	TS	996	35	China
T0704	Man-Yi	7/8 - 7/16	TY	930	95	Japan
T0705	Usagi	7/29 - 8/4	TY	945	90	Japan
T0706	Pabuk	8/5 - 8/9	TY	975	65	China
T0707	Wutip	8/8 - 8/9	TS	990	40	China
T0708	Sepat	8/12 - 8/19	TY	910	110	China
T0709	Fitow	8/29 - 9/8	TY	965	65	Japan
T0711	Nari	9/13 - 9/16	TY	940	100	Japan, Korea
T0712	Wipha	9/16 - 9/19	TY	930	100	China
T0713	Francisco	9/23 - 9/25	TS	990	45	China
T0714	Lekima	9/30 - 10/4	STS	975	60	Vietnam

1) Intensity classification of tropical cyclones
TS: Tropical Storm, STS: Severe Tropical Storm, TY: Typhoon
2) Estimated minimum central pressure
3) Estimated maximum 10-minute mean winds

5. Atmospheric circulation and convection (Figure 11)

In June, convective activities in the Arabian Sea were extremely enhanced coincident with the arrival of the active phase of the Madden Julian Oscillation (MJO), and they were suppressed in the Bay of Bengal and Southeast Asia except in Indonesia. Associated with these convective anomalies, the Tibetan High in the upper troposphere shifted westward from its normal position. In the lower troposphere, the southwest monsoon in the Bay of Bengal and Southeast Asia were weaker than normal. Meanwhile, in the western India and Pakistan, enhanced northward water vapor flux and its convergence were observed and these areas had extremely heavy precipitation.

The eastward propagation of the active phase of MJO was observed clearly in June and July. In early August, the active convection area moved northward from near Indonesia to the north of the Philippines. In the lower troposphere, cyclonic circulation anomalies in South China and anti-cyclonic circulation anomalies near Japan were observed. The circulation anomaly pattern like this is called Pacific-Japan pattern (PJ pattern, Nitta 1987).

Asian summer monsoon was still very active in September. Convective activities were remarkably enhanced in the Asian monsoon region as a whole. The southwest monsoon precipitation in India was heavier than normal coincident with the enhancement of the monsoon circulation in early and late September.

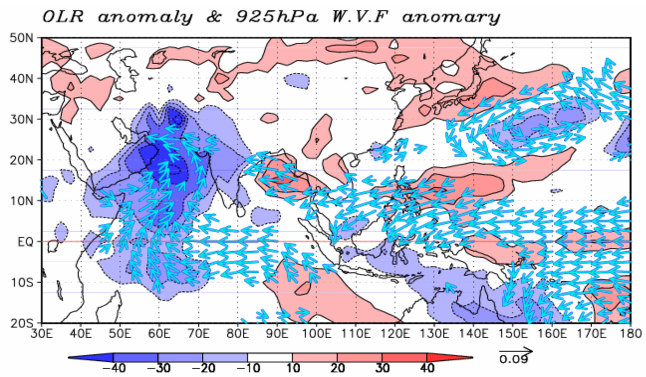


Figure 11 OLR anomalies and water vapor flux anomalies in June 2007

Color shadings indicate OLR anomalies (W/m^2) with a contour interval of $10 W/m^2$, and vectors indicate water vapor flux anomalies at the 925-hPa level.

(1 and 5 Atsushi Goto, 2 – 4 Yoshikazu Fukuda, Climate Prediction Division)

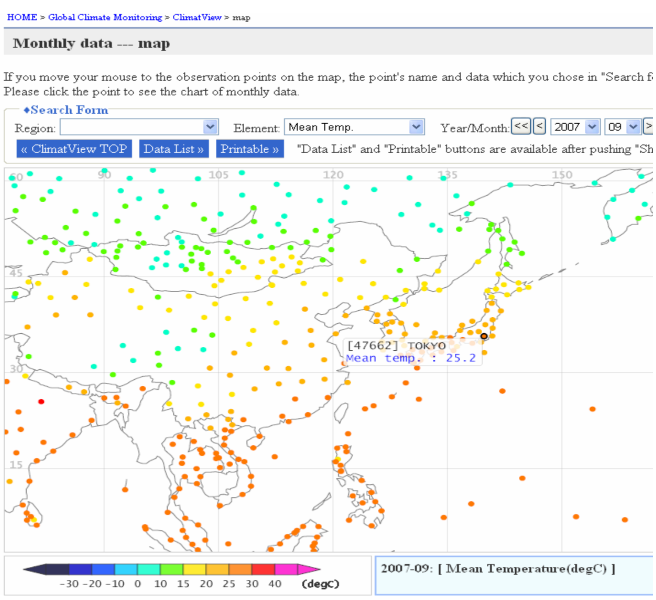
Reference:

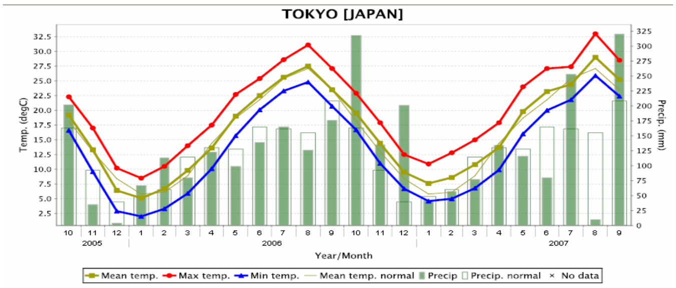
Nitta, T., 1987: Convective activities in the tropical western Pacific and their impact on the Northern Hemisphere summer circulation. *J. Meteor. Soc. Japan.* **65,** 373-390.

"ClimatView": Online Web-based Interactive Climate Database launched

JMA/TCC launched a web-based interactive climate database "ClimatView", a new service that provides monthly climate data of the world, at http://ds.data.jma.go.jp/gmd/tcc/climatview/. ClimatView enables users to view or download monthly mean temperature and monthly total precipitation derived from CLIMAT reports which have been received and monitored by two GCOS Surface Network Monitoring Centers, JMA and the Deutscher Wetterdienst (DWD), since 1982 and 1999, respectively.

By using "ClimatView", users can see and get monthly mean temperature, monthly total precipitation and its anomaly or ratio at all available stations. Monthly means of daily maximum/minimum temperatures are also available. These data are derived from CLIMAT messages via the GTS line from the WMO Members in the world. This website is expected to help not only all NMHSs but also other institutions and individuals in monitoring and analysis of surface climate and its variations for specific observation stations as well as the globe.





TOKYO - JAPAN
Lon.: 139.77°E / Lat.: 35.68°N Height: 6(m)

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Year/Month	Observation				Normal	
	Mean temp. degC	Max temp. degC	Min temp. degC	Precip. mm	Mean temp. degC	Precip. mm
2005-10	19.2	22.3	16.6	202.0	18.2	163.1
2005-11	13.3	17.0	9.6	35.0	13.0	92.5
2005-12	6.4	10.2	2.9	4.0	8.4	39.6
2006-1	5.1	8.5	2.0	67.0	5.8	48.6
2006-2	6.7	10.5	3.3	113.0	6.1	60.2
2006-3	9.8	14.0	5.9	80.0	8.9	114.5
2006-4	13.6	17.5	10.1	123.0	14.4	130.3
2006-5	19.0	22.7	15.7	99.0	18.7	128.0
2006-6	22.5	25.4	20.1	139.0	21.8	164.9
2006-7	25.6	28.6	23.3	165.0	25.4	161.5
2006-8	27.5	31.1	24.8	126.0	27.1	155.1
2006-9	23.5	27.1	20.7	176.0	23.5	208.5
2006-10	19.5	22.9	16.7	318.0	18.2	163.1
2006-11	14.4	17.9	11.0	135.0	13.0	92.5
2006-12	9.5	12.5	6.7	201.0	8.4	39.6
2007-1	7.6	10.9	4.6	42.0	5.8	48.6
2007-2	8.6	12.8	5.0	57.0	6.1	60.2
2007-3	10.8	15.0	6.8	77.0	8.9	114.5
2007-4	13.7	17.9	9.9	134.0	14.4	130.3

Sample images of ClimatView

TCC staff members attend a Training Course in Malaysia

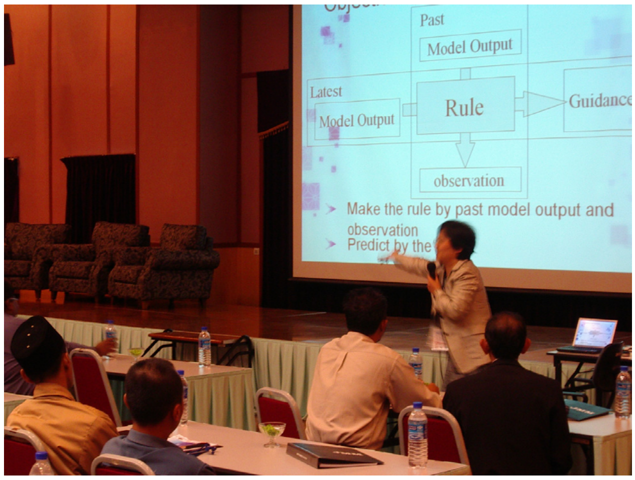
A Training Course on Interpretation of Climate Products and Climate Downscaling, organized by the Malaysian Meteorological Department (MMD) and the Ministry of Science, Technology and Innovation Malaysia (MOSTI), was held at the Headquarters of MMD at Petaling Jaya, Malaysia, from 22 to 26 October 2007. The Training Course was attended by about 35 staff members of MMD including those from regional offices. At the kind invitation of MMD, Ms. Kumi Hayashi, Head of the Tokyo Climate Center (TCC), and Mr. Ryuji Yamada, Scientific Officer of TCC, attended the Training Course as trainers.

In the five-day Training Course, the trainers made lectures on the following topics:

- JMA's Numerical/Seasonal Prediction Models
- Ensemble Prediction System and Making Guidance
- Statistical Downscaling (lectured by Mr. Okura, Fujitsu FIP Corporation)
- Access to GPV data and its application using R Language
- Re-analysis data (JRA-25) and its application
- Usage of Analysis/Forecast Products ….

TCC hopes that this Training Course will help MMD further improve its seasonal forecasting services.

(Ryuji Yamada, Climate Prediction Division)



Summary of UV Radiation for 2007 Summer Season in Japan

JMA has been conducting UV radiation observation at three domestic stations, i.e. at Tsukuba (36º03´N, 140º08´E, 31.0m) since 1990, Sapporo (43º04´N, 141º20´E, 26.3m) and Naha (26º12´N, 127º41´E, 27.5m) since 1991 within the framework of WMO/GAW Programme. Figure 12 shows the monthly mean values of erythemal UV*[1] daily accumulation at the stations in 2007. At Sapporo, the highest monthly mean values were observed in two consecutive months of June and July for these months. At Tsukuba, the values for June and August were the second highest, while at Naha, the value for August was the second lowest.

Figure 13 shows the monthly mean anomalies of daily maximum estimated UV Index*[2] for August 2007. The values more than 110% of the 1997-2006 average were dominant in the Pacific side of Hokkaido to Kanto region. On the other hand, the values less than 90% of the average were dominant in the Nansei Islands. We can see a contrastive pattern especially between Kanto region and the Nansei Islands. This contrast is mainly the reflection of the contrast of sunshine duration between the above two regions, i.e. much sunshine duration in Kanto region where the subtropical high prevailed and less sunshine duration in the Nansei Islands where tropical cyclones/depressions often passed. Additionally, large ozone amount over the Nansei Islands (second highest total ozone in record for August at Naha) is thought to be another reason for the lower UV Index there.

*1 Erythemal UV is widely used as a scale of UV radiation that shows the degree of effect on the human body, calculated by considering different levels of influence depending on the wavelength.

*2 UV Index is a standardized index of erythemal UV, and in Japan, the value observed usually ranges from 0 to 12. JMA's UV Index daily forecast can be referred to at the following website: http://www.jma.go.jp/en/uv/.

(Hiroshi Ishihara, Ozone Layer Monitoring Office)

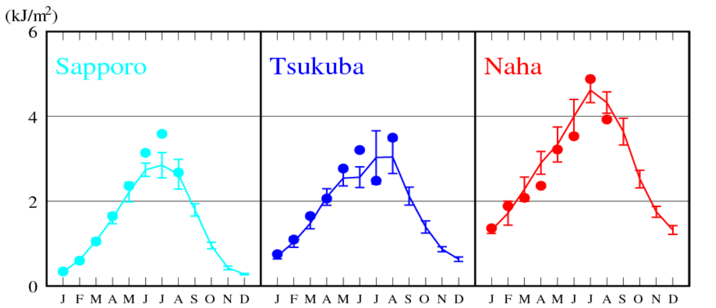


Figure 12 Monthly mean values of erythemal UV daily accumulation at Sapporo, Tsukuba and Naha
Closed circles indicate monthly mean values. The solid lines represent the normal (i.e. the average over 1990-2006 for Tsukuba and 1991-2006 for the other stations) with bars of standard deviation.

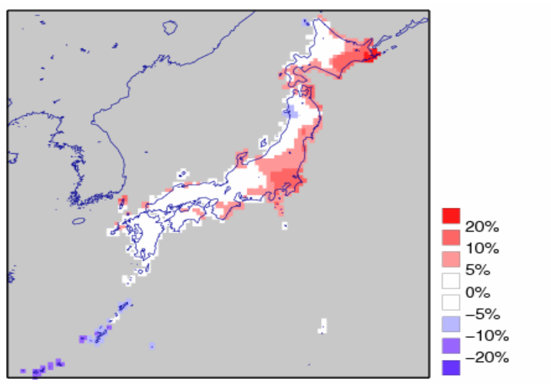


Figure 13 Monthly mean anomalies of daily maximum estimated UV Index for August 2007

Any comments or inquiries on this newsletter and/or the TCC website would be much appreciated. Please e-mail to: tcc@climar.kishou.go.jp
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