EASCOF 2016

The Fourth Session of East Asian winter Climate Outlook Forum

(EASCOF-IV)

8-9 November 2016, Ulaanbaatar, Mongolia

Program & Local Information

ABSTRACTS

Sponsors: National Agency of Meteorology and Environment Monitoring (NAMEM)

Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE)

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Program

The Fourth Session of East Asian winter Climate Outlook Forum (EASCOF-IV)

8-9 November 2016,
Ulaanbaatar, Mongolia

Tuesday 8 November

09:30-10:00 Registration

Opening Session:

Chair: Dr. P. Gomboluudev, IRIMHE

10:00-10:10 Welcoming Address
Mr. B. Battulga*, Deputy-Director, National Agency for Meteorology and Environment Monitoring*

10:10-10:20 Group Photo

10:20-10:40 Coffee break

Session I: Overview of Recent Climate over East Asia and Extreme Weather Events

Chair: Dr. LEE Hyunsoo, KMA

10:40-11:00 Analysis on Climate Anomalies and Causations in summer 2016
Dr.WANG Dongqian*, Beijing Climate Center, CMA, China*

11:00-11:20 Overview of 2016 Summer Climate over South Korea
Dr. YIM So-Young*, Climate Prediction Division, KMA, Korea*

11:20-11:40 Review of 2016 Summer Climate over Mongolia
Mr. A. Davaadorj*, IRIMHE, NAMEM, Mongolia*

11:40-12:00 Characteristics of 2016 summer monsoon in East Asia
Mr. FUJIWARA Hiroaki*, Climate Prediction Division, Global Environment and Marine Department, JMA, Japan*

12:00-14:00 Lunch

14:00-14:20 A Severe dust event over the Mongolian Gobi in 3-5 March, 2016
Dr. D. Jugder*, IRIMHE, NAMEM, Mongolia*

14:20-14:40 Summer extreme weather events in 2016 and winter severe condition – DZUD in Mongolia
Ms. B. Jargalan & Ms. Ch. Altantulga, *IRIMHE, NAMEM, Mongolia*

14:40-15:00 The Climate Condition - Yield of Agricultural Central Region in 2016
Dr. J. Oyun*, University of Agro-Ecology and Business, Darkhan-Uul aimag, Mongolia*

15:00-15:20 Zud: Early Warning in Mongolia
Ms. B. Barkhas, & Dr. B. Erdenetsetseg, *IRIMHE, NAMEM, Mongolia*

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Session II: Characteristics of ENSO and Long range forecast

Chair: Ms. NORIKO Yamashita, JMA

16:00-16:30 ENSO Current Status and Outlook
Dr. SUN Leng*, Beijing Climate Center, CMA, China*

16:30-17:00 What controls ENSO teleconnection to East Asia?
Ms. KIM Sunyong, *School of environmental science and engineering, POSTECH, Korea*

17:00-17:30 An introduction to the System of ENSO Monitoring, Analysis and Prediction (SEMAP2.1)
Dr. WANG Jianghua*, Beijing Climate Center, CMA, China*

18:00-20:00 Reception

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09:30-09:50 The recent activities of WMO LC-LRFMME
Ms. LEE Jihye*, Climate Prediction Division, KMA, Korea*

09:50-10:10 Introduction to NAMEM long-term prediction system based on PNU CGCM
Mr. G. Bayasgalan*, PNU, Korea*

Session Ⅲ Seasonal Prediction of the East Asian Winter Monsoon

Chair: Dr. SUN Leng, CMA

10:10-10:40 Seasonal Outlook for Winter 2016/2017 over Japan
Ms. NORIKO Yamashita, *Climate Prediction Division, Global Environment and Marine Department, JMA, Japan*

10:40-11:10 Coffee Break

11:10-11:40 Climate Outlook for Winter 2016 over Korea
Dr. LEE Hyunsoo*, Climate Prediction Division, KMA, Korea*

11:40-12:10 Seasonal Outlook for winter 2016/2017 over Mongolia
Ms. D. Odontungalag*, IRIMHE, NAMEM, Mongolia*

12:10-14:00 Lunch

14:00-14:30 Seasonal Outlook for Winter 2016/2017 over China
Dr. DING Ting, *Beijing Climate Center, CMA, China*

14:30-15:00 Outlook of 2016/2017 East Asian Winter Monsoon using PNU CGCM
Mr. G. Bayasgalan, *PNU, Korea*

Session IV: Discussion and Summary

Chair: Dr. L. Oyunjargal, NAMEM

15:00-15:30 Discussion & Summary

15:30-15:40 Closing address
Dr. G. Sarantuya, *Director, IRIMHE*

19:00-21:00 Dinner

Local Information

INFORMATION FOR THE PARTICIPANTS

Meeting Location

The Fourth Session of East Asian winter Climate Outlook Forum will be held at:

Date	Place
8 November 2016	3st Floor, Conference Hall, NAMEM
9 November, 2016	3st Floor, Conference Hall, NAMEM
Afternoon, 9 November, 2016	Visit to "Gobi" cashmere shop, http://www.gobi.mn/en/

NAMEM -National Agency for Meteorology and Environment Monitoring

Host organization: Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE) and NAMEM

Working language: English

Meals (Lunch and Dinner)

Date	Lunch	Dinner
8 November 2013	Prime Grille restaurant	Broadway restaurant
9 November 2013	Broadway restaurant	Puma restaurant

Time zone

In relation to Greenwich. Ulaanbaatar is +8 hours.

Airport-Hotel-Airport

We will pick up all participants in Chinggis Khaan International Airport and also take to airport from Hotel.

Electricity, internet and e-mail

The electrical voltage in Mongolia is 220V. Wireless is free in conference hall.

WiFi-name: **imh**

Password: **imhmn**

Hotel-NAMEM

It is 10-mins walk from the "Puma Imperial" hotel, you will go to NAMEM by yourself with staff of organizer.

Map of the venue and hotels:

Climate in Ulaanbaatar (Monthly average)

	November
Mean temperature	-10.9°C
Maximum temperature	5.9°C
Minimum temperature	-24.6°C
Days with precipitation	8.0mm

Weather forecast

	7th. Nov	8th. Nov	9th. Nov	10th. Nov
Minimum Temperature	-16°C	-10°C	-12°C	-15°C
Maximum Temperature	-5°C	2°C	-5°C	-7°C
Weather	cloudy	clear	cloudy	Scattered cloudy

Currency Exchange

Tugrik (₮) is the official currency of Mongolia. Foreign currency exchange is located at international airport and hotel reception as well. Also, there is foreign currency exchange center very close to NAMEM. Following table shows exchange rate in Khan Bank, 03 Nov 2016.

Currency	Currency name	Mongol Bank rates	Cash		non Cash	
			Buy	Sell	Buy	Sell
USD	United States Dollar	2388.45	2380.00	2398.00	2380.00	2394.00
EUR	EU Euro	2645.09	2614.00	2705.00	2614.00	2705.00
KRW	South Korean Won	2.08	1.98	2.14	2.01	2.14
JPY	Japanese Yen	23.04	22.83	23.62	22.83	23.62
CNY	Chinese Yuan	353.10	351.00	356.40	351.00	356.00

Following link shows exchange rate in Khan Bank.

https://www.khanbank.com/en/home/rates

Contact person of the meeting

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Abstracts

ANALYSIS ON CLIMATE ANOMALIES AND CAUSATIONS IN SUMMER 2016

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ABSTRACT

In the summer of 2016, the average temperature of China is 21.8 ℃, which is 0.9℃ higher than normal, while the average precipitation is 343.4 mm, 5.6% more than normal. During this summer, two rainfall belts were observed over eastern China, located over Yangtze River valley (YRV) and North China, respectively. From June to July, YRV is the main region of precipitation. However the distribution of precipitation reverses in August. Except for South China, precipitation was below normal in most part of eastern China.

The more intensified and more westward-extending west Pacific subtropical high (WPSH) acted as one of the most important circulation factors for the southern rainfall belt over the YRV in June and July. The associated anomalous low-level Philippine Sea anticyclone produces the convergence of water vapor over middle to downstream region of YRV. The persistent warming in the entire basin of the tropical Indian Ocean, which is generated by the decaying procedure of a strong El Nino event, is an important external forcing for the above tropical and subtropical circulation anomalies. In August, the WPSH divides, inducing an anticyclone anomaly circulation in the low level of troposphere over Northeast Pacific, followed by the divergence of water vapor over most of East China. This conditions lead to the hotter and less rainfall in YRV. Further analysis indicated that, the infrequent activity of Madden-Julian Oscillation (MJO) is the main reason for the inversion of tropical and subtropical circulation. The MJO in August is stronger and sustain over East Pacific for 25 days, which excited active tropical cyclone activities and thereby influenced the fracture of the WPSH in August 2016.

OVERVIEW OF 2016 SUMMER CLIMATE OVER SOUTH KOREA

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ABSTRACT

South Korea experienced above-normal temperature and below-normal rainfall in 2016 summer. The summer-mean temperature over South Korea was 24.8℃, which was +1.2℃ above than normal (1981~2010 average). In particular, the extreme events of daily maximum temperature above the 90th percentile (top 10 percent of all occurrences) were observed during the period from late-July through mid-August. The number of heat wave days* averaged over South Korea during August is 16.7, which reached a record high since 1973. This record-breaking heat wave was mainly caused by an inflow of hot air from the anomalous anticyclone formed over northeastern China while atmospheric flow was moving slowly due to a blocking high over Bering Sea.

The summer-mean rainfall (445.7mm) ratio to normal (723.2mm) over South Korea was 62%, which was recorded as the 5th lowest rainfall amount since 1973. The June, July, and August rainfall ratios were 41%, 105%, and 28%, respectively. It is interesting to note that the rainfall amount during July 1st through 6th was 222.6mm corresponding to almost 70% of July normal rainfall (289.7mm). 2016 Changma started on June 18 and ended on July 30 and its rainfall was slightly below normal (332.1mm, normal: 356.1mm). The rainfall in August was extremely less than normal due to the influence of long-lasted anomalous anticyclone over northeastern China. In addition, South Korea had no influence from typhoons in August. The information detailed will be presented.

*Number of heat wave days: days when the daily maximum temperature is greater than 33℃

REVIEW OF 2016 SUMMER CLIMATE OVER MONGOLIA

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ABSTRACT

Mongolia experienced above normal temperature and normal precipitation in 2016 summer. The summer mean temperature over Mongolia was 18.6°C, which was the above normal (1981-2010 average), especially western and eastern part of Mongolia. The June, July and August temperature anomalies were 0.0°C, 2.1°C and 1.7°C, respectively. Furthermore, the summer total precipitation was 144 mm, which was of near normal. The monthly precipitation ratio to normal were 159.9%, 108.5%, and 73.5% for the June, July and August, respectively. In the august obviously below normal precipitation.

In the June southern part of Mongolia was the above normal precipitation. Because omega blocking observed in Eurasian continental. Cyclonic circulation was sliding southern branch of blocking. Heatwaves occurred 2 times in the summer. That causes damage to eastern part of Mongolia.

CHARACTERISTICS OF 2016 SUMMER MONSOON IN EAST ASIA

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ABSTRACT

Temperatures in the East Asian monsoon region averaged from June to August 2016 were above normal in Japan, Korea, parts of China, and eastern Mongolia, and were below normal in parts of China. Precipitation amounts for the monsoon season were above normal in northern Japan, western China and southwestern Mongolia, and were below normal in Korea, northeastern China, and eastern Mongolia.

During August, a total of seven tropical cyclones (TC) appeared in the western North Pacific, six of them approached or made landfall on East Asian countries and five of them approached or made landfall on Japan's mainland (climatological normal number of landfall on Japan's mainland is 1.7). The monthly precipitation for August averaged over the Pacific side of northern Japan was the highest since 1946 at 231% of normal because four TC made landfall on northern Japan in the second half of August, which was also unusual. The causes of this extremely wet condition are summarized as follows:

・In the south of the Kamchatka Peninsula, a blocking high was persistent. To the east of this blocking high, the mid-Pacific trough remained deeper than normal. An upper tropospheric trough was sustained also over Japan.

・Around and to the east of the Philippines, positive SST anomalies let to the enhanced convective activities. These warm SST anomalies are considered to be partly because this summer was just after the strong El Niño condition since 2015 which had decayed in spring of this year. This is related to formation of some of the TC.

・An air mass with high potential vorticity repeatedly advected southwestward from the mid- Pacific trough and contributed to enhanced convective activity over the western North Pacific. The enhanced convection and a huge cyclonic circulation (monsoon gyre) contributed to activate TC genesis over the ocean south of Japan.

・In relation to the trough over Japan and the blocking high in the south of the Kamchatka Peninsula, the Pacific High was weaker than normal over its western part and stronger than in the far east of Japan.

・The weaker-than-normal Pacific High around Japan allowed TC to take unusual tracks into northern Japan.

[1] Hereinafter, a TC is defined as a tropical cyclone with a maximum sustained wind speed of 34 knots or more.

A SEVERE DUST EVENT OVER THE MONGOLIAN GOBI IN 3-5 MARCH, 2016

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ABSTRACT

A severe dust event occurred in Mongolia during 3-5 March 2016. Measured dust concentrations of PM10 and meteorological parameters, and weather situations during the dust event period were explained in this paper. A trough aloft arrived at the territory of Mongolia in 3-4 March 2016. A surface cyclone associating with the trough initiated in the lee side of the Khangai and Khuvusgul Mountains over the central territory of the country. Atmospheric cold front with the cyclonic circulation produced the severe dust event over the Gobi Deserts areas. Strong wind speeds varied from 15 to 32 m s^{-1} in those areas during the dust event period. Minimum visibilities were 300-500 m and measured dust concentrations of PM10 varied from 350 to 1789 μg m^{-3}. Duration of low visibilities less than 1.3 km was 3-30 hours at weather stations. Lidar observations during the dust event period showed that dust layer heights were 1.5 km and 2.5 km at Zamyn-Uud and Sainshand sites, respectively, those sites are in the Gobi Desert areas in south east of the country. A dust cloud over the areas appeared on the satellite images by MODIS data from Aqua/Terra. The dust storm caused missing of 44 herders looking after livestock and 88 people with 17 automobiles on the ways of inter-city transports.

SUMMER EXTREME EVENTS IN 2016 AND WINTER SEVERE CONDITION – DZUD IN MONGOLIA

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ABSTRACT

Mongolia has large area of territory, huge number of livestock and locates in the mid-latitude, which is sensitive area to the climate change. The global warming is the main fact to affect extreme weather events. Thus the numbers of disasters, especially convective related extreme events and their negative impacts have risen for last several years in Mongolia.

Therefore, the study was conducted on hydro-meteorological disasters occurring over Mongolia during last 26 years /1989-2015/, their trends as well as their losses. Even though convective related extreme events are dominating last years, the extreme weather events associated with cold front are still crucial issues.

The most extreme events in summer of 2016 include the severe thunderstorm with hazardous flash flood in Bayan-Ulgii province, which continued 20 minutes, results a huge losses of 2.259.565.000 tugrugs /two billion two hundred and fifty-nine million tugrugs which equal to 946216.5 USD/. In the beginning of September, 3 to 7 days continued heavy rain occurred over the eastern provinces of Mongolia, which caused by the 10th typhoon of 2016 LIONROCK from the Pacific Ocean over the east cost of Japanese island, that crossed through North East Asian continent and attacked to eastern part of Mongolia as a deep cyclone form.

Dzud, extreme condition in winter, is the most disastrous event for the livestock husbandry is unique to pastoral communities in Central Asia, and can be caused by a combination of summer drought, heavy snowfall, and high winds in concurrence with extremely low winter temperatures which combine to cause unsustainable conditions for animal survival.

The study shows that black dzud occurred in early monkey years and white dzud occurred in the last monkey years in winter and the summer condition was near and below normal since 1944. Even though, we have experienced some area with dzud condition in every year over certain degree of territory of the country, in winter monkey years, it caused great amount of livestock and economic loss. By Asian zodiac calendar, the 2016/2017 winter is the end of last experiences of Monkey years; suggest that the coming winter might be severe. However, last summer condition which is one of the main factors of the dzud was above normal over whole country, it is suggesting that winter condition could be better.

THE CLIMATE CONDITION - YIELD OF AGRICULTURAL CENTRAL REGION IN 2016

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ABSTRACT

Economic activity of Mongolia relies on herding and agriculture that depend on climatic conditions. Therefore, the production and yield are also directly dependent on how the weather was during the whole year.

When we compared the weather condition between 2015 and 2016 in the main agricultural region, the pasture plant yield had fallen five times, on average, due to drought in 2015. In contrast, the pasture plant grew well due to the conducive climate conditions of 2016. As a result, 13.0-17.6 center/ha was harvested field of agricultural central region; this is 4 times more than what was harvested in 2015.

The following research shows the distinctive nature of the weather patterns in 2016. In June of this year, the large rainfall increased pasture plant yield and plant sprouting. But in the beginning of July, the region experienced temperatures over 25°C for eight to nine days followed 48.3 mm of rainfall ten days afterward. August, again it saw hot conditions that lasted more than ten days followed once again by 12.8-30.2 mm precipitation. This cycling affected the growth of the yield. In other words, the crops survived on the verge of death due to timely rainfall conditions.

The 2016 agricultural season was very productive for both herders and farmers in the central agriculture region due to high crop yields.

ZUD: EARLY WARNING IN MONGOLIA

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ABSTRACT

Zud is a major natural disaster in Mongolia which can cause serious damage to the livestock sector, community well-being and the national economy.

IRIMHE have produced several data and information for drought, summer condition, zud and snow cover based on ground observation and remote sensing data.

Those data is developed by combining and produced risk maps and review on 20 Oct, 20 Nov and 31 Dec 2015. For this, we have selected about 20 data which includes summer condition map /visual check/, pasture carrying capacity, livestock number, ground observation biomass, precipitation and temperature anomalies, snow depth, snow density, snow cover days, drought map /MODIS/, NDVI /NOAA/, and monthly weather forecast.

First zud risk map we produced on 20 Oct, 2015 when no snow cover almost Mongolia then not includes snow cover data in this risk map. Areas with drought condition and pasture carrying capacity exceeded there was high risk for zud.

As of 20 Nov 80% of total territory covered by snow. Almost areas Uvs, Zavkhan, Tuv, and Sukhbaatar aimags, and some places of Bayan-Ulgii, Gobi-Altai, Bayankhongor, Khuvsgul, Arkhangai, Bulgan, Uvurkhangai, Selenge, Khentii, Dundgobi and Dornogobi aimags where was 7-12 cm snow depth with 0.02-0.27 g/cm3 density.

Zud risk map on 20 Nov shows 40% of total territory was under very high and high risk while some areas face white dzud conditions. Some aimags with very high risk such as entire Uvs aimag, almost area of Bulgan, northern part of Arkhangai, western half of Tuv, southern place Darkhan-Uul and Selenge aimags, and some soums of Zavkhan, Khuvsgul, Sukhbaatar, Dundgobi, and Dornogobi aimags.

Dzud risk map on Nov 20 presented to the Mongolian Government Meeting, Parliament Standing Committee meeting on Food and Agriculture, Special Committee meeting on Emergency Management, UNDP meeting in Mongolia, and Interview for MongolHD TV and radio.

This information became the basis of winter preparation works and dzud early warning management measures that have been implemented countrywide.

ENSO CURRENT STATUS AND OUTLOOK

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ABSTRACT

The strong 2015/16 El Niño event ended in May 2016. After that, sea surface temperatures (SSTs) decreased gradually across most of the central and eastern Pacific. Since mid-April 2016, near-to-below average SSTs had expanded westward toward the Date Line. In August 2016, the Nino 3.4 index was -0.53℃ which exceeded La Niña thresholds. However, the weak anomalous easterlies and westerlies alternated with each other in most of the central and eastern equatorial Pacific, which resulted in the slow development of negative SST anomalies (SSTAs). Below-average subsurface temperatures have decreased in fluctuation in most of the equatorial Pacific since late May 2016, while strengthened slightly near and east of the International Date Line since mid- September 2016. The oceanic and atmospheric monitoring data fluctuations bring uncertainty in speed and strength of La Niña development. At present, negative SSTAs controlled most of the central-eastern equatorial Pacific, while positive SSTAs persisted in the western and far eastern equatorial Pacific Ocean. Based on the current monitoring of the atmosphere-ocean condition, and the predictions of dynamical/statistical climate models, negative SSTAs will keep or further increase in the central equatorial Pacific, and a weak La Niña event is expected to possibly form during the winter 2016/17.

WHAT CONTROLS ENSO TELECONNECTION TO EAST ASIA?

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ABSTRACT

It is shown here that El Niño-Southern Oscillation (ENSO) teleconnections are contributed by two anomalous precipitation forcings in the equatorial central Pacific (CP) and western North Pacific (WNP). The positive CP precipitation anomalies (PRCPA) induce a prevailing cyclonic flow over the North Pacific, whereas the negative WNP precipitation forcing tends to induce anticyclonic anomalies over the Kuroshio extension region and North Pacific. It is demonstrated that the equatorial CP and WNP PRCPA play compensating roles in generating atmospheric teleconnections over the North Pacific. Therefore, the ENSO teleconnection can be determined by the competing responses to the CP and WNP PRCPA. The reconstructed teleconnection patterns based on only the two tropical forcings captures the majority of the subseasonal evolution of the ENSO teleconnection. In addition, the tropical forcings induce distinct teleconnections in East Asia, therefore, considering the two forcings gives significantly better representation of temperature and precipitation variations associated with ENSO in East Asia, compared to that of considering sole Niño3.4 SST. It is also found that the Coupled Model Intercomparison Project Phase 5 (CMIP5) models simulate well the relative roles of the WNP and equatorial CP precipitation impacts in East Asia, supporting observational argument.

Key words: ENSO, Teleconnection, Regional impacts, CMIP5

AN INTRODUCTION TO THE SYSTEM OF ENSO MONITORING, ANALYSIS AND PREDICTION (SEMAP2.1)

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ABSTRACT

A new generation of ENSO monitoring, analysis and prediction system (SEMAP2.1) has been developed by Beijing Climate Center in China Meteorological Administration (BCC/CMA) since 2012. The system comprises several modules including the real-time monitoring, dynamical diagnosis and attribution analysis, physics-based statistical prediction for the two types of ENSO, interpretation and application of ensemble forecasts in climate model, analogue-dynamical correction prediction, and the climate impacts of ENSO. The independent validation shows a relatively high-level prediction skill of ensemble-mean Nino3.4 index, whose temporal anomaly correlation could reach 0.8 with 6 months lead.

The system has given a reasonable prediction for the fluctuation of El Nino in the 2014 summer-autumn, and the type transition from the central-Pacific El Nino in the 2014/2015 winter to the eastern-Pacific El Nino during the 2015 summer. Also, the system predicted that the weak La Nina event started since the 2016 summer will last to next spring.

THE RECENT ACTIVITIES OF WMO LC-LRFMME

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ABSTRACT

The WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble (LC-LRFMME) has been operated by KMA and NOAA NCEP jointly. The goals of LC-LRFMME are to provide a conduit for sharing model data for long-term climate predictions and to develop a well-calibrated Multi-Model Ensemble (MME) system in order to maximize the benefits of favorable climate conditions.

The main roles of the LC-LRFMME are collecting and standardizing the model outputs provided by 12 WMO-designated Global Producing Centers (GPCs) for long-range forecasts, and generating and displaying the MME products through the website. In addition, the LC-LRFMME has supported publishing the trial version of Global Seasonal Climate Update (GSCU) obtained from relevant Regional Climate Centre (RCCs). Recently, the pilot system capable of collecting and processing sub-seasonal MME products has been developed, and the actual service will be opened after receiving the agreement from ET-OPSLS and GPCs.

The operational centers such as GPCs, RCCs, Regional Climate Outlook Forums (RCOFs) and National Meteorological and Hydrological Services (NMHSs) are able to access the digital and graphical products from the Website of the LC-LRFMME (www.wmolc.org).

In this presentation, the details about the MME products and verification, how to get/use data and the future plans will be introduced.

[1] ET- OPSLS: Joint Commission for Basic Systems (CBS) / Commission for Climatology (CCl) Expert Team on Operational Predictions for Sub-seasonal to Longer-time Scales

SEASONAL OUTLOOK FOR WINTER 2016/2017 OVER JAPAN

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ABSTRACT

Tropical oceanic conditions are the most important signal for the winter outlook in view of its predictability and effects on the variability of jet streams. JMA's CGCM predicts that the NINO.3 Sea Surface Temperature (SST) will be near or below normal and the area-averaged SST in the tropical western Pacific (NINO.WEST) will be above normal this winter. It is likely that the La Niña conditions will persist through the coming winter with a probability of 60%.

In association with these SST anomaly patterns, the model predicts that convective activity will be stronger than normal in the western tropical Pacific. In the upper circulation fields, anti-cyclonic anomalies from the southeastern part of the Asian Continent to the East China Sea and cyclonic anomalies in and around northern Japan are predicted in association with the active convections. Therefore the subtropical jet stream will meander southward from the Asian Continent to the sea east of Japan, suggesting the stronger-than-normal winter monsoon especially in western and southern Japan and large influences of the low pressure systems in northern Japan.

Furthermore, the tropospheric temperature is predicted to be above normal mainly due to the recent warming trend, which is likely to decrease probabilities of below normal temperatures.

As a result, in northern Japan, seasonal precipitation amounts and seasonal mean temperatures are expected to be above normal tendencies due to large influences by the low pressure systems and small influences of cold air advections from the higher latitudes. In western Japan and Okinawa/Amami, seasonal mean temperatures are

expected to be below normal tendencies due to large influences by the inflow of cold air from the continent. Seasonal snowfall amounts for the Sea of Japan side are expected to be above normal tendencies in western Japan.

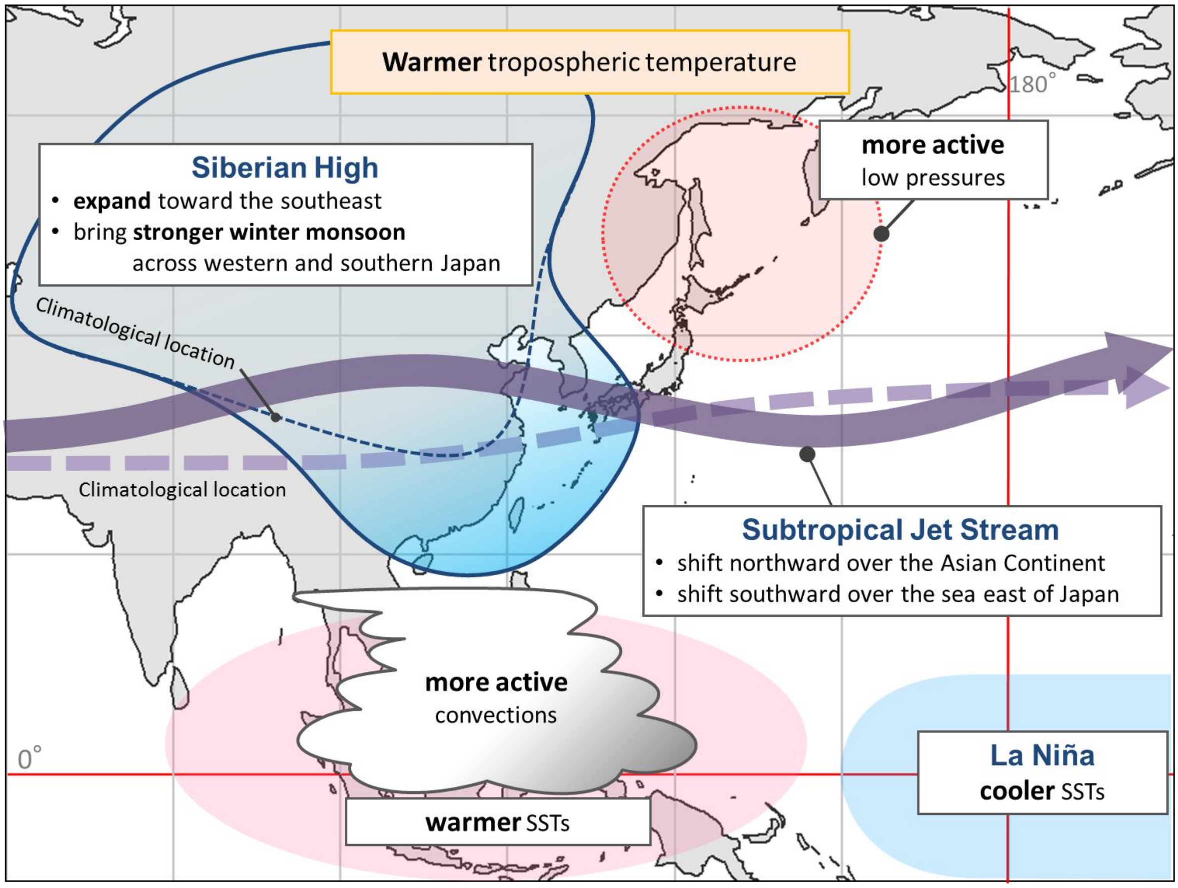

Figure: Conceptual diagram showing expected large-scale ocean/atmosphere characteristics for winter 2016/2017

CLIMATE OUTLOOK FOR WINTER 2016 OVER KOREA

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ABSTRACT

The Korea Meteorological Administration (KMA) usually releases official forecast for whole winter at 23 November. Prior to this, a tentative seasonal outlook for winter 2016 over Korea will be presented based on KMA's operational climate prediction model, GloSea5 (Global Seasonal Forecasting System ver.5) and results of the WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble (WMO LC-LRFMME). Some significant results by statistical models will also be added.

Currently, the Niño3.4 region of the tropical Pacific Ocean is likely to be in La Niña thresholds. However, it is only in recent weeks that a La Niña-like pattern in the atmosphere has become somewhat evident. The majority of international climate outlook models and expert opinion suggest that La Niña is approximately 50-60% likely during the remaining period of 2016, lasting into early 2017. The most likely strength of La Niña, if it prevails, is weak; however, moderate strength cannot be ruled out. In consideration for the recent SST condition, the overall characteristics for the La Niña developing years after strong El Niño years will be discussed.

Besides the ENSO, we are monitoring the snow-cover and Arctic sea-ice extent for wintertime forecast. More snow-cover over the Eurasian continent and its fast progress are significantly related to below-normal temperature for early winter. Severe winters across East Asia are associated with anomalous warmth in the Barents-Kara Sea region. Also, low sea-ice over the Laptev Sea for previous October is accompanied by the below-normal temperature for December over Korea.

SEASONAL OUTLOOK FOR WINTER 2016/2017 OVER MONGOLIA

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ABSTRACT

NAMEM has issued its outlook for the coming winter from December 2016 to February 2017 over Mongolia in September and updated it in October. The presentation will illustrate the new outlook updated in October 2016. Considering all statistic and global model output, 2016/2017 winter outlook is issued subjectively.

All in all, temperatures are expected to be above-normal in southwestern Mongolia in December and February, and to be below-normal range in northeastern Mongolia from January to February. Cold season precipitation amounts are expected to be above-normal over the northern Mongolia in December and over the southwestern Mongolia from January to February.

SEASONAL OUTLOOK FOR WINTER 2016/2017 OVER CHINA

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ABSTRACT

Based on statistical analyses and dynamical models, the seasonal outlook over China in 2016/2017 winter is illustrated. East Asian winter monsoon is expected to be stronger than normal, especially strong in January-February. Air temperature will be below normal in northern China, especially in northern Xinjiang and Northeast China. However, temperature will be near normal to warmer in southern part of China, especially warmer over Tibetan Plateau. Winter precipitation will be below normal over most parts of China, especially less in southwestern China. However, more precipitation tends to occur over most northern part of China, especially in Northeast China.

The SSTA in the Nino 3.4 region is below -0.5°C since August 2016, and a weak La Nina event is predicted in the tropical Pacific Ocean in the coming winter. The Sea Ice concentration (SIC) in Barents-Kara seas over the Arctic in September is less than normal after removing trend, and is close to the same extent with last year. Considering the two important factors, Siberia High will be stronger in winter. The La Nina event and strong negative tropical Indian Ocean (TIOD) will induce weak northwestern Pacific Subtropical High and weak India-Burma trough in winter, causing less moisture flux from the western Pacific and the Bay of Bengal to southern and southwestern China, respectively.

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Abr.:

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KMA	Korea Meteorological Administration
JMA	Japan Meteorological Agency
CMA	China Meteorological Administration
BCC	Beijing Climate Center
PNU	Pusan National University
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