The Eighth Session of East Asia Winter Climate Outlook Forum (EASCOF - 8)

5 November 2020, Tokyo, Japan (Online)

Agenda, List of participants & Abstracts

Hosted by Tokyo Climate Center (TCC),
Japan Meteorological Agency (JMA)

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Agenda

AM (10:00-12:00 JST), 5 November, 2020

Chaired by OIKAWA Yoshinori, TCC, JMA

Opening session		
10:00-10:05	Opening remarks from JMA	OBAYASHI, Masanori, DG for Atmosphere and Ocean Dept., JMA
10:05-10:10	Remarks from WMO	Ben Churchill, Head of the Regional Office for Asia and South-West Pacific, WMO
Session 1 Latest climate services and review of recent East Asian climatic features		
10:10-10:30	Climate Events and Impacts over China in 2020	ZHOU Xingyan, BCC, CMA
10:30-10:50	Characteristics of 2020 summer climate conditions in Japan	SATO Hirotaka, JMA
10:50-11:10	Brief Post-Analysis of South Korea Summer 2020	GyoSoon IM, KMA
11:10-11:30	Review of 2020 summer climate over Mongolia	Tergel Shijirtuya, NAMEM
Session 2 Climate variations associated with the East Asian monsoon		
11:30-12:00	Roles of the Indian Ocean on warm conditions over East Asia in winter 2019/2020, and enhanced Meiyu-Baiu rainfall in 2020	TAKAYA Yuhei, MRI, JMA

PM (14:00-16:05, JST)

Chaired by OKUBO Tadayuki, TCC, JMA

Session 3 Seasonal outlook for winter 2020/21		
14:00-14:10	ENSO Outlook	SUGIMOTO Hiroyuki, JMA
14:10-14:25	Climate Outlook for Winter 2020 over Korea	YeiSook LEE, KMA
14:25-14:40	Seasonal outlook for winter 2020/21 over Mongolia	Akhmyetali Khamshybai, NAMEM
14:40-14:55	Seasonal climate outlook for winter 2020/21 over China	HAN Rongqing, BCC, CMA
14:55-15:10	Seasonal outlook for winter 2020/21 over Japan	NAKAGAWA Ken-ichi, JMA
15:10-15:25	Seasonal outlook over Asian part of North Eurasia for upcoming winter 2020-21 from NEACC	Ekaterina Kaverina, NEACC
Session 4 Discussion and summary of the outlook for winter 2020/21		
15:25-15:45	Discussion and summary of the outlook for winter 2020/21	OKUBO Tadayuki, JMA
Closing Session		
15:45-16:00	Presentation and remarks from WMO	Wilfran Moufouma-Okia, WMO
16:00-16:20	Riskscape (land scape of disaster risk) of the East Asia and methodological framework of ‘Seasonal Outlook (EASCOF) to Socio-economic Impact Forecasting’	Sanjay Srivastava and SungEn Kim, ESCAP
16:20-16:25	Closing remarks from JMA	FUJIKAWA, Norihisa, Head of Tokyo Climate Center

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Climate Events and Impacts over China in 2020

Xingyan Zhou
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Abstract

Since the beginning of this year, the average temperature in China has been 12.5℃, 0.9℃ higher than the normal of 1981-2010 (11.6℃). In the first nine months, the national average temperature of each month remained on the high level, among which the mean temperature in March and May was the fourth highest in the same period since 1961. The average precipitation in China was 666.4 mm, 12.9% more than the normal (590.0 mm), ranking the second most since 1961(only lower than that in 1998). Except the national precipitation in April and May was below normal, the precipitation in other months was above normal, among which the precipitation in August and September was the most since 1961.

There have been 36 heavy rainfall events in China since the beginning of this year. In this summer, the Yangtze River Basin experienced persistent torrential rainfalls with great intensity and high overlap, and hence suffered serious flood disaster. Since this year (up to 20st October), 17 tropical cyclones have generated in the western North Pacific and the South China Sea, which was 4.3 less than the same period of the normal year (21.3). Five tropical cyclones made landfall over China, 1.8 less than the normal (6.8), which tend to suddenly strengthen in the coastal areas and land with their peak intensities. The mean high temperature days in China was 13.6 days, which was the lowest since 2016 although 3.2 days more than the normal (10.4 days). The meteorological drought was relatively less with regional and periodic characteristics. The severe convection weather processes were anomalously frequent and brought serious loss in several regions.

Characteristics of 2020 summer climate conditions in Japan

SATO Hirotaka
Scientific Officer, Tokyo Climate Center, Japan Meteorological Agency

Abstract

2020 summer climate condition in Japan is characterized as record-wet and record-cloudy July and record-hot August.

In July 2020, western to northeastern Japan experienced record-heavy rain and record-low sunshine durations.

The month was characterized by a remarkable series of heavy rainfall events from western to eastern Japan from 3rd to 31st July. In some areas, monthly precipitation totals exceeded 2 to 2.4 times the climatological normal, making the period the wettest since 1946 when records began.

These phenomena are attributed to a continued tendency for large amounts of water vapor to concentrate around western and eastern Japan from two major flows – one from the west along the Meiyu-Baiu front, which stagnated along mainland Japan due to delayed northward migration of the subtropical jet stream, and the other from the south along the periphery of the North Pacific Subtropical High (NPSH), which extended southwestward of its climatological extent.

A persistent upper-level trough over the Yellow Sea also caused an intensification of Meiyu-Baiu front activity with enhanced vertical upward flow over western and eastern Japan, resulting in prolonged heavy rain.

The delayed northward migration of the subtropical jet stream and the southwestward extension of the NPSH may be attributable to higher-than-normal sea surface temperatures in the Indian Ocean and related inactivity of the Asian summer monsoon.

In addition to the record-wet and record-cloudy July in Japan, the climatic characteristics after the month such as record-hot August and this autumn so far also will be dealt with in the presentation.

Brief Post-Analysis of South Korea Summer 2020

IM Gyosoon, CHOI Jeonghee, KIM Miju and KIM Jeongsik
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Abstract

- June recorded the highest surface mean temperature since national records began in 1973.

- The surface mean temperature in July (44th highest temperature recorded) was lower than in June as cold air mass was located over the Korean Peninsula, and the country had many cloudy and rainy days because of the delayed northward expansion of the West North Pacific Subtropical Highs (WNPSH).

- August experienced heatwaves and tropical nights as the WNPSH and Tibetan high pressure expanded (6th highest temperature).

- During the early summer, with the continued flow of water vapor along the edge of the WNPSH, a stationary front affected the southern part of South Korea. In the second half of the summer, as the WNPSH expanded to the north, the stationary front moved up and down the central part of South Korea, forming a frequent strong rain band.

- As a result, the precipitation in summer 2020 stood at 1007.0 mm, the 3rd highest precipitation amount, which is higher than climate norms. The number of precipitation days was 46, the 4th highest number of precipitation days recorded.

- The precipitation during the summer monsoon season was 689.9 mm. The central part of South Korea had 54 summer monsoon days, and Jeju had 49 days, a record long monsoon days. In August South Korea was affected by three typhoons in a row.

- The unusually high temperature in Siberia in June reduced the extent of the Arctic sea ice in July, causing blocking of air masses around the peninsula. This resulted in frequent inflows of cold air from the north.

- In July, the high sea surface temperature and the active convection in the western Indian Ocean strengthened the convection suppression from the east Indian Ocean to the Philippine Sea, facilitating a great expansion of the Northwest Pacific Ocean from the south to the west.

- This delayed the northern expansion of the WNPSH and made the stationary front stay more active around the peninsula, leading to a longer summer monsoon season and lower temperatures in July.

Review of 2020 summer climate over Mongolia

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Research Division of General Circulation and Long-Range Prediction,
Information and Research Institute of Meteorology, Hydrology and Environment

Abstract

In Mongolia, the weather condition of last summer can be divided into two parts.

For early summer, above the average temperatures and dry conditions observed across Mongolia were associated with a relatively persistent ridge of high pressure over central Asia throughout the mid of July, while during the second half of summer received above-average precipitation, ranked 2nd rainy August on record for last 40 years.

The early summer weather is characterized by warm temperature and record for more than 20 days with temperatures at above average, exacerbating heatwave conditions throughout the region during mid-June. Whereas, the second half of (from the end of July) last summer was above-average precipitation over most of country, except the south western part of Mongolia (front side of high Altai mountain). During this period, daily precipitation amount was broken at 14 stations over the northern part due to the upper-level trough was located over middle Asia and Mongolia.

Roles of the Indian Ocean on warm conditions over East Asia in winter 2019/2020, and enhanced Meiyu-Baiu rainfall in 2020

Yuhei Takaya[1*], Ichiro Ishikawa[1], Chiaki Kobayashi[1], Hirokazu Endo[1] and Tomoaki Ose[1]

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Abstract

In 2019, a strong positive phase of the Indian Ocean Dipole (IOD) was observed. The positive IOD is characterized by a dipole SST pattern with anomalously lower SST east of Sumatra and higher SST in the western equatorial Indian Ocean (IO). The profoundly strong 2019 IOD emerged without a concurrent El Niño and this event raised a question regarding why this happened. Recent studies suggested a couple of atmosphere-ocean coupled mechanisms in the IO and western Pacific for the occurrence of the strong IOD. The IOD also triggered subsequent IO variability, in particular, the warm basin-wide IO warmth in early summer 2020. We suggest that the 2019 IOD and subsequent IO warmth triggered remote influence in East Asia, including the warm conditions over East Asia in winter 2019/2020, and enhanced Meiyu-Baiu rainfall in early summer 2020. We investigated underlying processes and seasonal predictability using a climate prediction system (JMA-MRI-CPS2), real-time atmosphere analysis (JRA-55) and ocean analysis (MOVE/MRI.COM-G2). In winter 2019/2020, the tripole pattern of the atomospheric convection generated the wave trains (stationary Rossy wave) over the subtropical jet and this teleconnection led to the warm condition in East Asia. In early summer 2020, the subtropical high extended westward and transported more moisture to the Meiyu-Baiu region, causing devastating floods in China and Japan. In this talk, we will explain how the anomalous convective activity over the IO resulted from the tropical IO and western Pacific, with more detailed analysis on the time-evolution of the IO variability. We will also present that the model predicted these events reasonably. Our results highlight the conditional seasonal predictability in East Asia in last winter and early summer, originated from the IO conditions.

ENSO Outlook

SUGIMOTO Hiroyuki
Tokyo Climate Center, Japan Meteorological Agency

Abstract

The Japan Meteorological Agency provides an ENSO monitoring and outlook on a monthly basis. By referring to the October issue, in this presentation the latest ENSO conditions and outlook will be presented.

In September 2020, the NINO.3 SST was below normal with a deviation of -1.1°C. SSTs in the equatorial Pacific were above normal in the western part and below normal in the central and eastern parts. Subsurface temperatures were above normal in the western part and below normal in the central and eastern parts. Atmospheric convective activity near the date line over the equatorial Pacific was below normal, and easterly winds in the lower troposphere (i.e., trade winds) over the central equatorial Pacific were stronger than normal. These oceanic and atmospheric conditions indicate common features of past La Niña events. It is considered that La Niña conditions are present in the equatorial Pacific.

The subsurface cold waters, observed in the central and eastern equatorial Pacific in September, are expected to maintain colder-than-normal SST conditions in the eastern part. JMA's El Niño prediction model suggests that the NINO.3 SST will be below normal until boreal winter. In conclusion, La Niña conditions are likely (90%) to continue until boreal winter.

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Climate Outlook for Winter 2020 over Korea

LEE Yeisook, KIM Samyoung, KIM Hyeonjeong, JANG Junho
and LEE Hyunsoo
Climate Prediction Division, Korea Meteorological Administration

Abstract

Korea Meteorological Administration (KMA) officially releases seasonal outlook for the coming winter season on 23rd November. The seasonal outlook for winter 2020 over Korea will be presented based on the KMA's operational climate prediction system, GloSea5 (Global Seasonal Forecasting System ver.5) and MME results from the WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble (WMO LC-LRFMME), as well as impacts of essential climate elements/indices. The preliminary results of GloSea5 using October initial condition show normal temperature and below-normal precipitation over Korea for the coming winter season.

In September, the SST anomalies in Niño3.4 region is 0.9℃ cooler than normal and it is expected to last through the winter. The Arctic sea ice over Barents-Kara Sea, Laptev Sea and Bering Sea is less than normal, it is the lowest-ever. Therefore, it is predicted that temperature for the coming winter season is variable over Korea.

Possible impact of various climate variables such as SST, continental snow cover, and Arctic sea ice on the winter climate of Korean peninsula will be considered along with statistical analysis results to produce final seasonal outlook for the winter. Overall, detailed analysis results of numerical and statistical models will be presented.

SEASONAL OUTLOOK FOR WINTER 2020/2021 OVER MONGOLIA

Kh. Akhmyet-Ali, B. Jargalan and G. Bayasgalan
Information and Research Institute of Meteorology, Hydrology and Environment,
National Agency for Meteorology and Environmental Monitoring

Abstract

For coming winter outlook, results of dynamical models in Tokyo Climate Center (TCC), European Centre for Medium-Range Weather Forecasts (ECMWF), United Kingdom Meteorological Office (UKMO), The Euro-Mediterranean Center on Climate Change (CMCC), METEO–France (METEO) and German *Meteorological* Service (DWD) were used. Also, outputs of a coupled general circulation model at NAMEM was performed with initial condition of Sep, 2020 for coming winter outlook.

Based on the model results and statistical models operates at NAMEM, air temperature over northern part of Mongolia would be below-normal and rest of territory would be near normal. Precipitation is likely to be near normal.

SEASONAL CLIMATE OUTLOOK FOR WINTER 2020/2021

Han Rongqing and Yuan yuan
Beijing Climate Center, China Meteorological Administration

Abstract

Dynamical models and statistical analyses will be discussed focusing on East Asian Winter Monsoon (EAWM), seasonal temperature and precipitation outlook for 2020/2021 winter over China.

Based on dynamical models and statistical analyses, we predict a strong-normal EAWM in the coming winter. Air temperatures will be lower than normal over North China (north of Yangtze River), and higher than normal in central and east parts of Tibet, and close to normal in most regions of South China (south of Yangtze River). Less precipitation tends are probably to occur over most China, in which there is especially less precipitation over Huanan region of China. However, more precipitation tends are probably to occur over the northwest China and the middle and lower reaches of the Yangtze River valley.

Less Arctic sea ice removed the linear trend over Barents Sea in September and the occurring La Nina event both are the most important external-forcing factors for the climate prediction in this winter. They will induce a stronger winter monsoon. Most of dynamical and statistical models predict that there’s about an 85% chance for La Niña conditions continuing through the coming Northern Hemisphere winter.

Seasonal Outlook for winter 2020/2021 over Japan

Ken-ichi Nakagawa
Tokyo Climate Center, Japan Meteorological Agency

Abstract

The Japan Meteorological Agency (JMA) issued its outlook for the coming winter (December 2020 – February 2021) over Japan in September 2020 and updated it this October. In this talk, the latest outlook will be presented.

La Niña conditions are considered to be present in the equatorial Pacific and are likely to continue until boreal winter. The Sea surface temperature (SST) is expected to continue to be below-normal over central and eastern equatorial Pacific. Corresponding to the expected SST anomalies in the tropics, the convective activities will be enhanced over Maritime continent and suppressed over central and eastern equatorial Pacific. As a result, the subtropical jet stream is expected to shift northward over southern Eurasia and meander southward in and around Japan, suggesting the slightly stronger-than-normal winter monsoon in eastern, western and southern Japan. On the other hand, the extratropical cyclone activity is expected to be higher than normal around northern Japan, and intensity of Siberian High is predicted to be weaker than normal in the northeast of its climatological extent, suggesting the weaker-than-normal winter monsoon in northern Japan.

Furthermore, the mid-latitude tropospheric temperature is predicted to be above-normal mainly due to the recent warming trend, which is likely to increase probabilities of above-normal temperatures.

In conclusion, in northern Japan, seasonal mean temperatures are expected to be above-normal tendencies, seasonal snowfall amounts for the Sea of Japan side are expected to be below-normal tendencies due to weaker-than-normal the cold air inflow from the continent. In western Japan, seasonal snowfall amounts for the Sea of Japan side are expected to be above-normal tendencies due to large influences by the cold air inflow from the continent.

Seasonal outlook over Asian part of North Eurasia for upcoming winter 2020-21 from NEACC

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Abstract

North Eurasian Climate Centre is among of RCCs WMO that provides for RAII operational climate services, generating relevant regional and sub-regional products, and consensus statements on climate outlook.

In this presentation, the climate outlook for forthcoming winter over Asian part of the North EurAsia produced by NEACC has been presented. The state of atmospheric circulation conditions as an important factor in the formation of the temperature and precipitation anomalies on seasonal time intervals is discussed. Atmospheric circulation patterns are analyzed by means of the monitoring and forecast information from 500 hPa height, mean sea level pressure, T850 fields. The current state of sea surface temperature is also reviewed with focus on the sea surface anomalies in the Atlantic and Pacific oceans. The current situation of sea ice extent changes in Arctic region in connection with polar weather conditions has been considered. To identify the leading modes of atmospheric variability in the upcoming season and teleconnection patterns, climate indices such as EA, WA, EU, WP and PNA were calculated from SL-AV model ensemble forecasts. Air temperature and precipitation forecasts over North Eurasia from different GPCs are compared and assessed. The special attention has been given to analysis of seasonal forecast for winter 2020-21 in North-East Asia from NEACC based on SL-AV and MGO models. In conclusion, brief summary for the up-coming winter 2020-21 from NEACC has been provided.

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