The Eighth Session of the East Asia Winter Climate Outlook Forum (EASCOF-8)
Tokyo, Japan (online)
5 November 2020

Executive summary

The Eighth Session of the East Asia Winter Climate Outlook Forum (EASCOF-8) was held on 5 November 2020 as a virtual meeting of member state headquarters. The event was hosted by the Japan Meteorological Agency (JMA) and remotely attended by long-range forecasters and climate experts from the China Meteorological Administration (CMA), JMA, the Korea Meteorological Administration (KMA) and Mongolia's National Agency for Meteorology and Environmental Monitoring (NAMEM), with a special contribution from experts at the North Eurasia Climate Centre (NEACC). Attendees engaged in active discussions, sharing expertise to work toward a consensus on the seasonal outlook for winter 2020/2021.

Taking into account the ensemble predictions produced by global coupled models and the effect of the La Niña and sea ice condition, experts reached a consensus summary that the coming East Asian Winter Monsoon (EAWM) is likely to be near normal or stronger than normal overall, give or take a fluctuation on a sub-seasonal time scale.

1. Introduction

In line with an agreement made at the Thirteenth Session of the Joint Meeting for Seasonal Prediction of the EAWM, EASCOF was established as a WMO sub-regional Climate Outlook Forum in 2013 with alternate hosting by NAMEM, JMA and KMA.

EASCOF-8 was hosted online by JMA on 5 November 2020 with 30+ experts from National Meteorological and Hydrological Services (NMHSs) in China, Japan, Korea, Mongolia and Russia sharing cutting-edge information on phenomena related to EAWM , leading to a consensus on the outlook for the coming winter.

In Session 1, attendees reviewed recent East Asian climatic characteristics. In Session 2, Mr. TAKAYA Yuhei from JMA's Meteorological Research Institute (MRI) presented results from studies on how the Indian Ocean affects the East Asian monsoon. Member countries then presented their seasonal outlooks for winter 2020/2021 for discussion. With input from NEACC on seasonal prediction for the Asian part of Russia, a consensus outlook for the upcoming winter was reached. In the closing session, WMO Regional Climate Prediction Services Division head Dr. Wilfran Moufouma-Okia talked about the latest developments in the organization's strategy for implementation of objective seasonal predictions. This was followed by a presentation from Mr.

Sung Eun Kim of ESCAP's ICT and Disaster Risk Reduction Division on international activities related to impact-based forecasting for key sectors in consideration of seasonal climate predictions. At the end of the session, a cordial proposal from KMA to host the ninth EASCOF session in 2021 was warmly welcomed by all member countries.

2. Review of recent East Asian climatic characteristics

CMA: The annual average temperature over China in the first nine months of 2020 is 12.5°C, 0.9°C higher than the normal of 1981-2010 (11.6°C), ranking third since 1961. In the first nine months, the national average temperature of each month remained on high level, among which the mean temperature in March and May was the fourth highest for these months respectively since 1961.

The Average precipitation over China in the first nine months of 2020 is 641.87 mm, 13.6% more than the normal (564.8 mm), making this year the second wettest since 1961(only lower than that in 1998). Except in April and May when the average precipitation was below normal, the precipitation in other months was above normal, among which the precipitation in August and September was the highest since 1961.

JMA: In July 2020, areas from western to northeastern Japan experienced record-heavy rainfall and record-low sunshine durations. A remarkable series of heavy rainfall events from western to eastern parts of the country was observed from the 3rd to the 31st of the month. In some areas, monthly precipitation totals exceeded 2 to 2.4 times the climatological normal, making the period the wettest since records began in 1946. These climate extremes may be attributable to higher-than-normal sea surface temperatures in the Indian Ocean. In stark contrast to July, temperatures were extremely high in August across the country, particularly from western to eastern parts, where monthly average temperatures were the highest on record since 1946. The maximum temperature of 41.1°C recorded at Hamamatsu on 17 August matched the historical national maximum.

KMA: In June the highest surface mean temperature was recorded since national records began in 1973. This was followed by the exceptionally low surface mean temperature in July (44th highest temperature recorded). In fact, quite in reverse to the climatological seasonal march, the average temperature in July was cooler than in June, in relation to remote influences from the Indian Ocean and a negative phase of Arctic Oscillation. But in August the country experienced prolonged heatwaves and tropical nights (overnight lows are at 25°C or higher) primarily due to the Western North Pacific subtropical highs and the Tibetan High being enhanced (6th highest temperature).

The precipitation total 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.

NAMEM: Generally, both of air temperature and precipitation anomaly was near normal in the last summer (JJA). However, it doesn't mean whole summer was near normal for the both. Therefore, it was divided into 2 different periods which are the early and the late summer.

The early summer weather is characterized by warm temperature with more than 20 days of above-average temperatures, exacerbating heatwave conditions throughout the region that lasted into mid-June. The average temperature of May and June was 14.9ºC, which means above normal (+1.1°C) temperature was prevailed in the early summer.

As to late summer, the precipitation average of July and August was 65.5mm, which is expressing the above normal (123.4%) precipitation occurred in the late summer over most of the country, except the south western part (the front side of the high Altai mountains). During this period, daily precipitation amount record was broken at 14 stations over the northern part due to the upper-level trough located over Mongolia.

3. Current status and outlook for ENSO

At present, La Niña conditions are seen in the equatorial Pacific.

It is likely that La Niña conditions will continue until the winter 2020/2021.

4. Outlook for winter 2020/21

Summary: The East Asian Winter Monsoon is likely to be near normal or stronger than normal.

CMA: A strong or normal EAWM is predicted in the coming winter. Air Temperatures will be lower than normal for the northwestern, central and southern parts of China, while higher than normal in central and eastern parts of Tibet and the eastern to northeastern part of the country. Precipitation is likely to be above normal for the northern part of China and normal or below normal for the southwestern and southeastern parts

JMA: In northern Japan, seasonal mean temperatures are expected to be above normal. Seasonal snowfall amounts on the Sea of Japan side in the northern Japan are expected to be below normal due to weaker-than-normal continental cold-air inflow and above normal in the western Japan due to stronger-than-normal continental cold-air inflow.

KMA: The Dynamical model shows that the East Asia winter monsoon is near or slightly weaker than normal. Temperature is above normal, and precipitation is likely to be near or below normal during the coming winter. However, the tendency of overestimating temperature of the model and anomalous eddies along the mid-latitude at 500hPa indicate that Siberian High occasionally extends toward the Korean Peninsula and impacts on cold air outbreak during the early winter.

La Niña is likely to be maintained for the winter. Statistically, Korea has experienced near or below-normal conditions for winter temperature at La Niña years. Also, The Arctic sea ice extent over the Barents-Kara Sea, Laptev Sea and Bering Sea is abnormally less than normal. This sea ice extent anomaly is likely to lead to the Ural blocking pattern, which has impact on a stronger-than-normal Siberian High and below-normal temperatures in early winter. Later in the winter, influences for the sea ice anomaly are expected to diminish. Overall, temperature over South Korea is expected to be near-normal (slightly below normal for early winter), and precipitation is near or below-normal for the following winter season with strong intra-seasonal variation.

NAMEM: According to results of Dynamical models, Siberian high (SH) is expected to be likely stronger in early winter. A statistical research indicates that a diminished Arctic sea ice extent is associated with a stronger-than-normal Siberian high.

Given that the current sea ice extent is record-low in the artic which influences warm sea surface temperature (SST) in Barents-Kara Sea and less sea ice extent (SIE) in Chukchi Sea. The SST and SIE may lead SH and Eurasian pattern are likely to be stronger. Thus, air temperature is likely to be below-normal over the western and some part of central Mongolia and near normal over the rest of the country. Precipitation is likely to be near normal except for the western part where above-normal is expected.

NEACC: The record-low extent of the Arctic sea ice is likely to weaken the polar vortex, induce atmospheric instability and lead to enhanced cyclonic activity in the polar latitudes of the Asian part of Russia. The Siberian High is predicted to be displaced from its normal position and likely to be near or below normal in the Asian part of Russia. The winter season is expected to be warmer than normal over most of the Asian part of Russia. The temperature will be close to normal or slightly below normal in the southern part of Western and Eastern Siberia. Excessive precipitation is predicted over the northern regions of the Asian part of Russia, most likely in Taimyr Peninsula, Yakutia, Chukotka and Kamchatka Peninsula. Deficit precipitation or precipitation near normal is likely in the southern part of Western Siberia.

Summarized outlooks are shown in Figure 4.1. The designations given in this report do not imply the expression of any opinion whatsoever concerning the legal status of any country, territory, city or area, or of related authorities or opinions concerning the delimitation of frontiers or boundaries.

a) Temperature

b) Precipitation

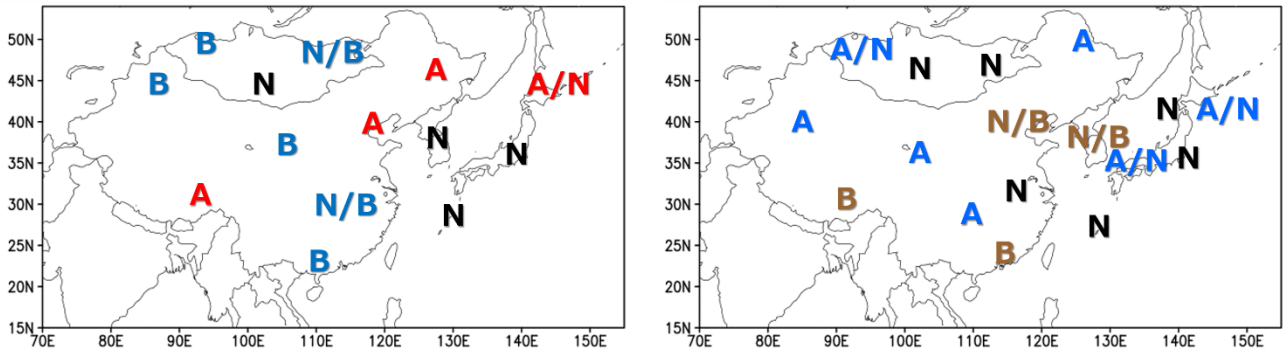

Figure 4.1 Outlooks of (a)temperature and (b)precipitation for winter 2020/2021 (December 2020 – February 2021)

A: probability of above-normal category is 50% or more (e.g., above-normal: 50%; normal: 30%; below-normal: 20%), or most likely category is above normal (deterministic forecast)

A/N: probabilities of above-normal and normal categories are both 40% (i.e., above-normal: 40%; normal: 40%; below-normal: 20%), or most likely category is above-normal or normal (deterministic forecast)

N: probability of normal category is 40% or more and above those of the other categories (e.g., above-normal: 30%; normal: 40%; below-normal: 30%), or most likely category is normal (deterministic forecast)

N/B: probabilities of below-normal and normal categories are both 40% (i.e., above-normal: 20%; normal: 40%; below-normal: 40%), or most likely category is below-normal or normal (deterministic forecast).

B: probability of below-normal category is 50% or less (e.g., above-normal: 20%; normal: 30%; below-normal: 50%), or most likely category is below normal (deterministic forecast)

5. Exchange of knowledge and experiences among NMHSs in East Asia

5.1. Climate variations associated with the East Asian monsoon

Cutting-edge scientific expertise on climate variations associated with the East Asian monsoon is essential in assessing current conditions and interpreting numerical model predictions. Against this background, EASCOF provides an ideal platform for operational forecasters and climate researchers from various communities to learn from one another.

A presentation given by Mr. TAKAYA Yuhei of JMA's Meteorological Research Institute on the roles of the Indian Ocean in anomalous Asian climate patterns at the event suggested that the positive Indian Ocean Dipole phenomenon of 2019 and the subsequent basin-wide Indian Ocean warmth had triggered a remote influence on the East Asian climate, including the warm conditions observed over the area in winter 2019/2020 and the enhanced Meiyu-Baiu rainfall of early summer 2020. The presentation also highlighted conditional seasonal predictability in East Asia in the winter

of 2019/2020 and early summer of 2019 originating from Indian Ocean conditions.

Attendees welcomed the presentation as an addition to the collective expertise of EASCOF-8 and a springboard for related discussions on current conditions and predictions.

6. Other matters

- The EASCOF-8 presentations/attendee list and a summary of the discussions are available online.
- EASCOF-8 activities in the WMO sub-regional COF role will be reported to WMO by JMA once approved by all attendees.
- The details of KMA's proposal to host EASCOF-9 (likely in November 2021) will be announced once confirmed.