

Seasonal Highlights on the Climate System (December 2017 – February 2018)

Highlights (December 2017 – February 2018)

- It is considered that La Niña conditions continue in the equatorial Pacific (see [El Niño Outlook](#) updated on 9 March 2018).
- Seasonal mean temperatures were below normal all over Japan and seasonal precipitation amounts were significantly above normal on the Sea of Japan side of eastern Japan.
- Seasonal mean temperatures were extremely high from western Alaska to the central part of Eastern Siberia and from the northeastern part of Western Siberia to northeastern Greenland.
- Convective activity was enhanced from the Indochina Peninsula to the seas east of the Philippines.
- In the upper troposphere, anti-cyclonic circulation anomalies were seen from eastern India to southern China. The subtropical jet stream in the Northern Hemisphere displaced northward from its normal position in general while meandering northward over China and southward over Japan, respectively.
- In the 500-hPa height field, the polar vortex in the Northern Hemisphere split into the East Siberian part and the North American part associated with positive height anomalies in and around the North Pole.

Climate in Japan (Fig. S1):

- Seasonal mean temperatures were below normal all over the country.
- Seasonal precipitation amounts were significantly above normal on the Sea of Japan side of eastern Japan.
- Seasonal sunshine durations were significantly above normal on the Pacific side of eastern Japan.

World Climate (Fig. S2):

- Seasonal mean temperatures were extremely high from western Alaska to the central part of Eastern Siberia, from the northeastern part of Western Siberia to northeastern Greenland, in New Zealand, and from northeastern to southeastern Australia.
- Seasonal mean precipitation amount were extremely high in and around the southern part of Western Russia, and from central to southern Europe.

Oceanographic Conditions (Fig. S3):

- In the equatorial Pacific, remarkably positive SST anomalies were observed in the western part and negative SST anomalies were observed from the central part to the eastern part.
- In the North Pacific, remarkably positive SST anomalies were observed from the western tropical region to south of the Aleutian Islands, and from the area near 10°N, 160°W to the western coast of Central America.
- In the South Pacific, remarkably positive SST anomalies were observed around New Zealand, and from the area near 35°S, 125°W to the area near 40°S, 85°W, and remarkably negative SST anomalies were observed from the eastern tropical region to the western coast of Chile.
- In the Indian Ocean, remarkably positive SST anomalies were observed from the area near 20°S, 60°E to the area near 45°S, 100°E, and remarkably negative SST anomalies were observed south of Madagascar.
- In the North Atlantic, remarkably positive SST anomalies were observed in the Gulf of Mexico, and from the area off the eastern coast of North America to the area off the western coast of Europe.

Tropics:

- Convective activity was enhanced from the Indochina Peninsula to the seas east of the Philippines and from the North Atlantic to Northern Africa, and was suppressed over the equatorial Indian Ocean and from the west of the dateline to the central equatorial Pacific (Fig. S4).
- In the upper troposphere, a wave train was seen from Northern Africa to the northern part of East Asia with anti-cyclonic circulation anomalies from eastern India to southern China (Fig. S5).
- In the lower troposphere, cyclonic circulation anomalies straddling the equator were seen from the Indian Ocean to the Maritime Continent.
- In the sea level pressure field, negative anomalies were seen from the Indian Ocean to the western Pacific and positive anomalies were seen over the central to eastern equatorial Pacific.

Extratropics:

- In the 500-hPa height field (Fig. S6), the polar vortex in the Northern Hemisphere split into the East Siberian part and the North American part associated with positive height anomalies in and around the North Pole. Negative anomalies were also seen over Europe. Wave trains were clearly observed over southern and northern Eurasia.
- The subtropical jet stream in the Northern Hemisphere displaced northward from its normal position in general while meandering northward over China and southward over Japan, respectively (Fig. S7).
- In the sea level pressure field (Fig. S8), the Siberian High was stronger than normal in general and extended northwestward. The Aleutian Low shifted westward and was stronger than normal on and around the Kamchatka Peninsula.
- Temperatures at 850-hPa were widely above normal over the Arctic Ocean, and below normal over East Asia, the northern part of North America and Europe (Fig. S9).

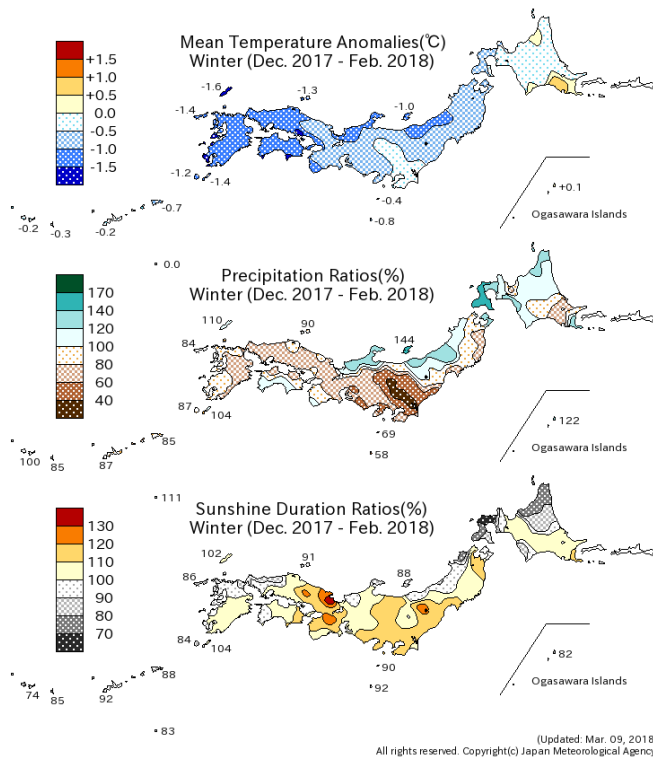


Fig. S1 Seasonal climate anomaly/ratio over Japan (December 2017 - February 2018)
 Top: temperature anomalies (degree C)
 Middle: precipitation ratio (%)
 Bottom: sunshine duration ratio (%)

The base period for the normal is 1981-2010.

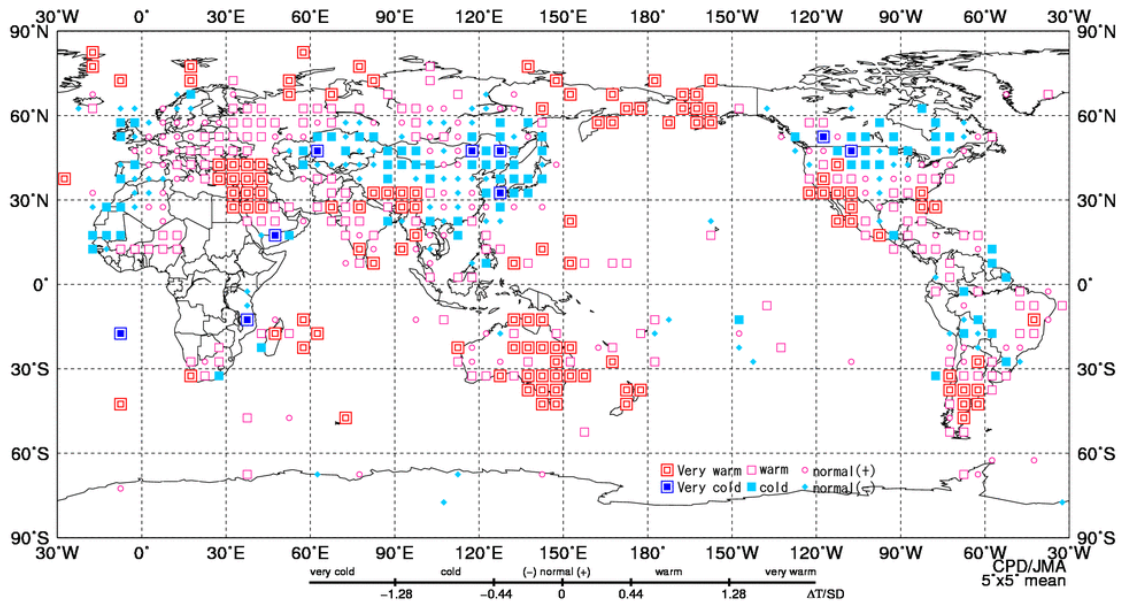


Fig. S2 Three-month mean temperature anomaly (normalized) category (December 2017 - February 2018)

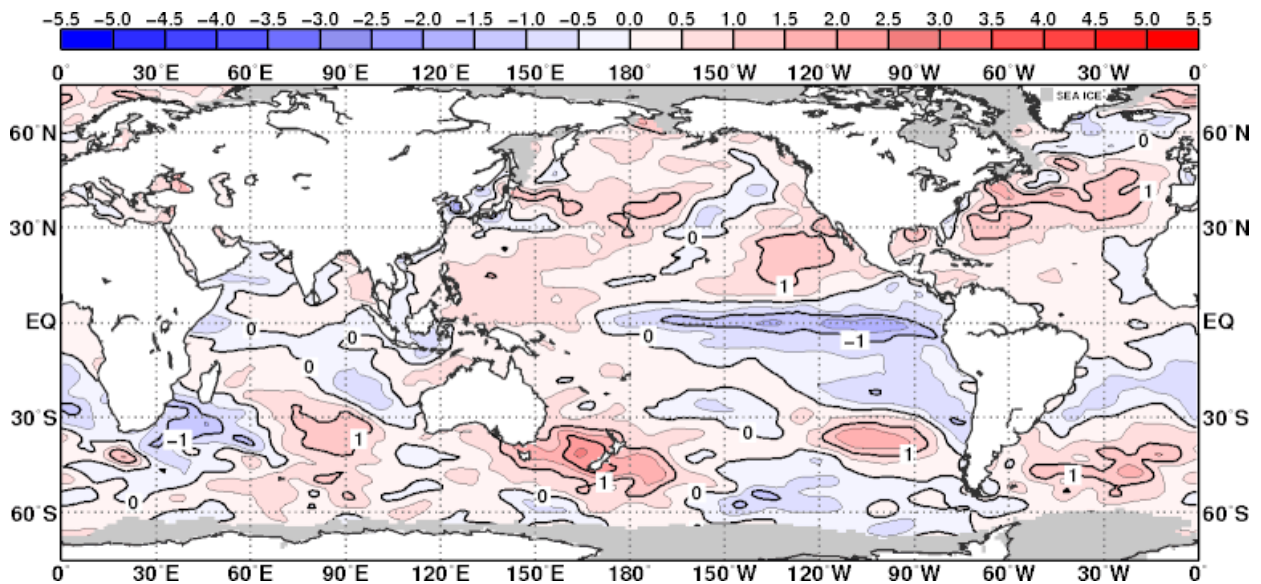


Fig. S3 Three-month mean sea surface temperature anomaly (December 2017 - February 2018)
 The contour interval is 0.5 degree C. The base period for the normal is 1981-2010. Maximum coverage with sea ice is shaded in gray.

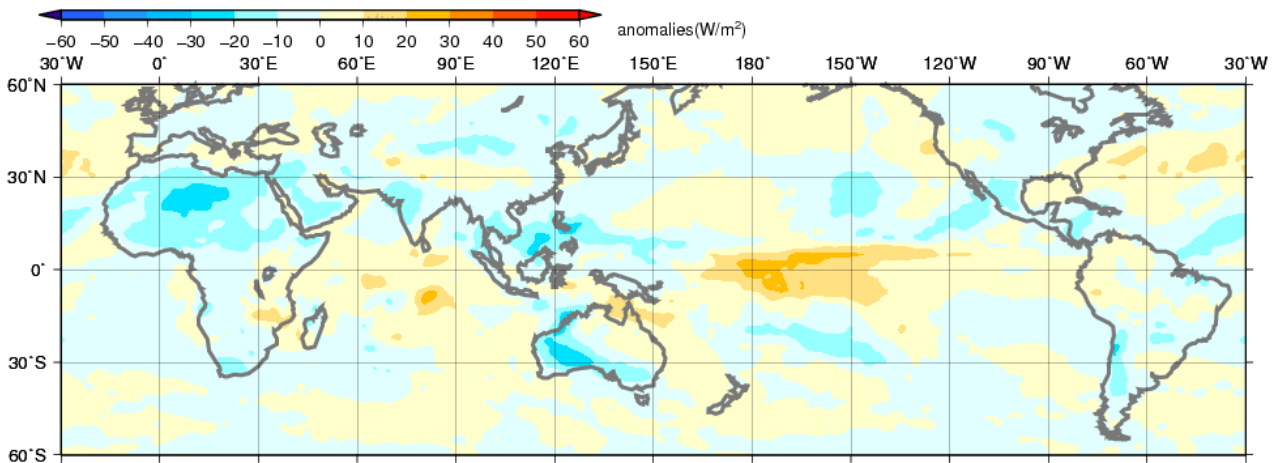


Fig. S4 Three-monthly mean Outgoing Longwave Radiation (OLR) anomaly (December 2017 - February 2018)
 The contour interval is 10 W/m². The base period for the normal is 1981-2010. Original data provided by NOAA.

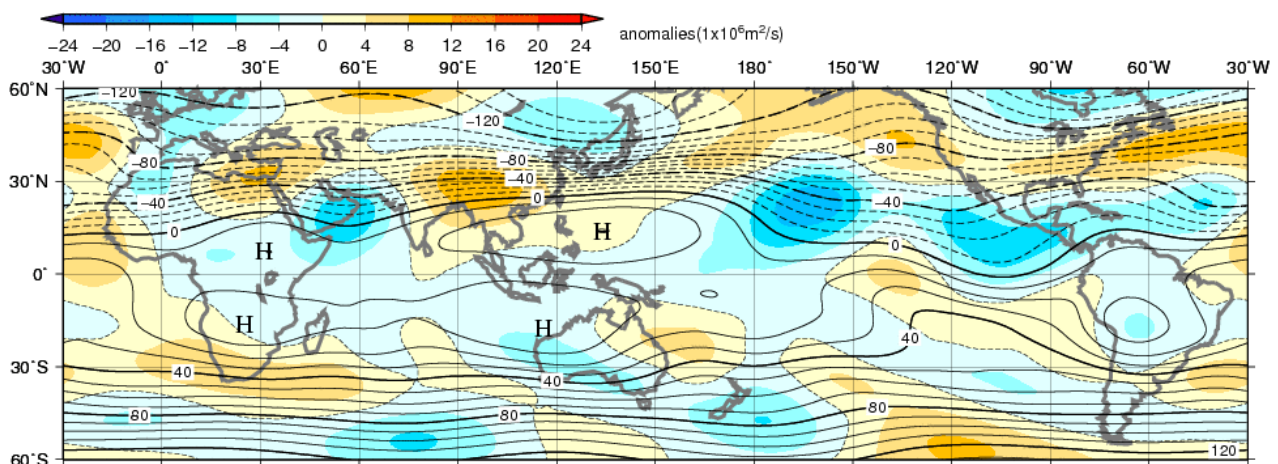


Fig. S5 Three-month mean 200-hPa stream function and anomaly (December 2017 - February 2018)
 The contour interval is 10x10⁶ m²/s. The base period for the normal is 1981-2010.

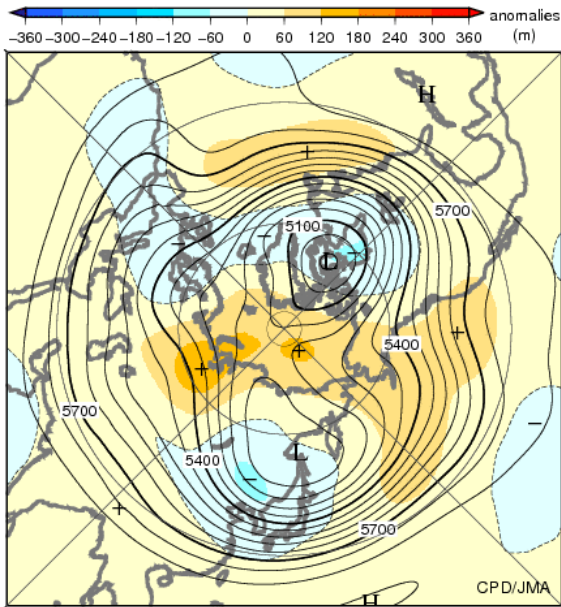


Fig. S6 Three-month mean 500-hPa height and anomaly in the Northern Hemisphere (December 2017 - February 2018)

The contours show 500-hPa height at intervals of 60 m. The shading indicates its anomalies. The base period for the normal is 1981-2010.

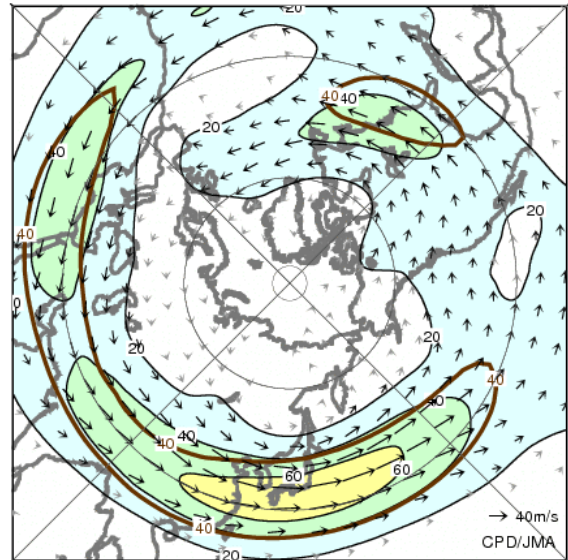


Fig. S7 Three-month mean 200-hPa wind speed and vectors in the Northern Hemisphere (December 2017 - February 2018)

The black lines show wind speed at intervals of 20 m/s. The brown lines show its normal at intervals of 40 m/s. The base period for the normal is 1981-2010.

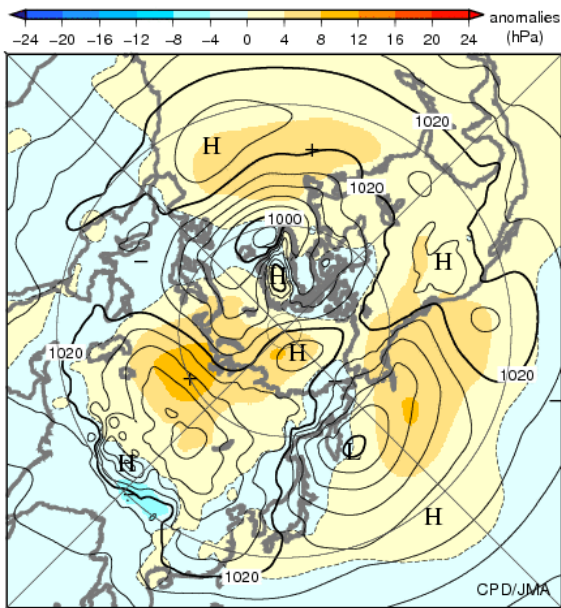


Fig. S8 Three-month mean sea level pressure and anomaly in the Northern Hemisphere (December 2017 - February 2018)

The contours show sea level pressure at intervals of 4 hPa. The shading indicates its anomalies. The base period for the normal is 1981-2010.

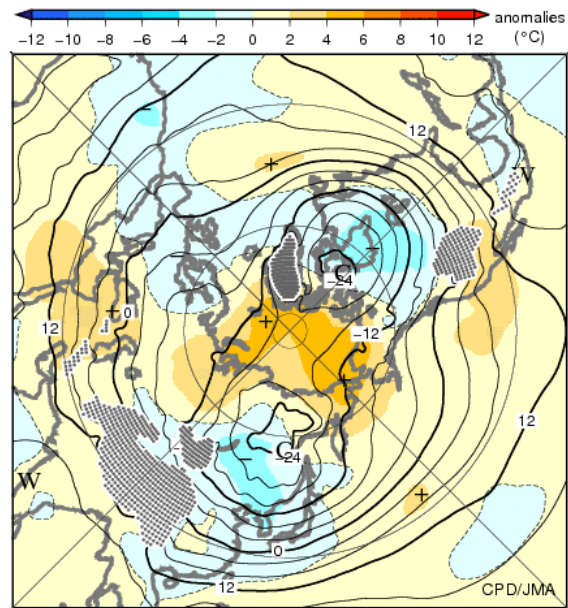


Fig. S9 Three-month mean 850-hPa temperature and anomaly in the Northern Hemisphere (December 2017 - February 2018)

The contours show 850-hPa temperature at intervals of 4 degree C. The shading indicates its anomalies. The base period for the normal is 1981-2010.

Detailed information on the climate system is available on the Tokyo Climate Center's website.
<http://ds.data.jma.go.jp/tcc/tcc/index.html>
 This report is prepared by the Tokyo Climate Center, Climate Prediction Division, Global Environment and Marine Department, Japan Meteorological Agency.