

Monthly Highlights on the Climate System (November 2014)

Highlights in November 2014

- El Niño conditions are present in the equatorial Pacific (see [El Niño Outlook](#) updated on 10 December 2014).
- Monthly mean temperatures were above normal all over Japan.
- Monthly mean temperatures were extremely low from the Midwest of the USA to northeastern Mexico.
- In the 500-hPa height field, positive anomalies were seen over the area from northern Europe to western Russia, around Japan and Alaska, and negative anomalies were seen over western and central Siberia and eastern North America.
- Convective activity was enhanced over the Indian Ocean, northern part of the Philippine Sea and the area to the southwest of Mexico, and was suppressed around Indonesia.
- Positive SST anomalies were observed in almost the entire equatorial Pacific.

Climate in Japan:

East Asian winter monsoon was weaker than normal. Though a severe cold surge came into Japan temporarily in the middle of the month, warm southerly wind brought significantly warm days to the whole of Japan in the end of the month. Therefore, monthly mean temperatures were above normal all over Japan. Besides, monthly sunshine durations were significantly above normal and monthly precipitation amounts were significantly below normal on the Sea of Japan side of northern Japan.

World Climate:

The monthly anomaly of the global average surface temperature in November 2014 (i.e., the combined average of the near-surface air temperature over land and the SST) was +0.23 °C (the 7th warmest since 1891) (preliminary value) (Fig. 2). On a longer time scale, global average surface temperatures have risen at a rate of about 0.69°C per century in November (preliminary value).

Extreme climate events were as follows (Fig. 3).

- Monthly mean temperatures were extremely high from central Europe to northern Algeria.
- Monthly precipitation amounts were extremely heavy from southwestern Europe to Morocco.
- Monthly mean temperatures were extremely low from the Midwest of the USA to northeastern Mexico.

Extratropics:

In the 500-hPa height field (Fig. 4), positive anomalies were seen over the area from northern Europe to western Russia, around Japan and Alaska, and negative anomalies were observed over western and central Siberia and the eastern part of North America. The subtropical jet stream was weaker than normal from eastern China to Japan, and meandered northward to the east of Japan (Fig. 5). Zonal mean temperatures were generally above normal in the troposphere. The Aleutian Low was stronger than normal, and the Siberian High was weaker than normal.

Tropics:

Convective activity was enhanced over the Indian Ocean, northern part of the Philippine Sea and the area to the southwest of Mexico, and was suppressed around Indonesia (Fig. 6). The active phase of the Madden-Julian Oscillation (MJO) propagated eastward from the Pacific to the Atlantic in the first half of November, and that of the amplified MJO propagated eastward over the Indian Ocean in the second half of November (Fig. 7). In the equatorial lower troposphere, westerly wind anomalies were seen over the Indian Ocean and the central and eastern Pacific (Fig. 7). In the upper troposphere, wave trains were observed along the subtropical jet stream, and anticyclonic circulation anomalies were seen over South Asia (Fig. 8). The Southern Oscillation Index value was -0.8 (Fig. 10).

Oceanographic Conditions:

Positive SST anomalies were observed in almost the entire region of the equatorial Pacific. The monthly mean SST anomaly in the NINO.3 region was +0.9 °C and the SST deviation from the latest sliding 30-year mean was +1.0 °C. In the North Pacific, remarkably positive SST anomalies were observed from the Bering Sea to south of Alaska and from the coast of North America to near 15°N, 150°E, and negative SST anomalies were observed from south of Japan to near 40°N, 150°W. In the South Pacific, remarkably positive SST anomalies were observed from near 35°S, 155°W to near 45°S, 110°W and remarkably negative SST anomalies were observed from near 25°S, 135°W to near 20°S, 95°W. In the Indian Ocean, remarkably positive SST anomalies were observed in the western part of equatorial area and from near Madagascar to the west of Australia, and remarkably negative SST anomalies were observed from near the southeastern coast of Africa to near 35°S, 75°E. In the Atlantic, remarkably positive SST anomalies were observed from near the eastern coast of North America to near 35°N, 35°W and remarkably negative SST anomalies were observed from near 45°N, 40°W to near 50°N, 15°W.

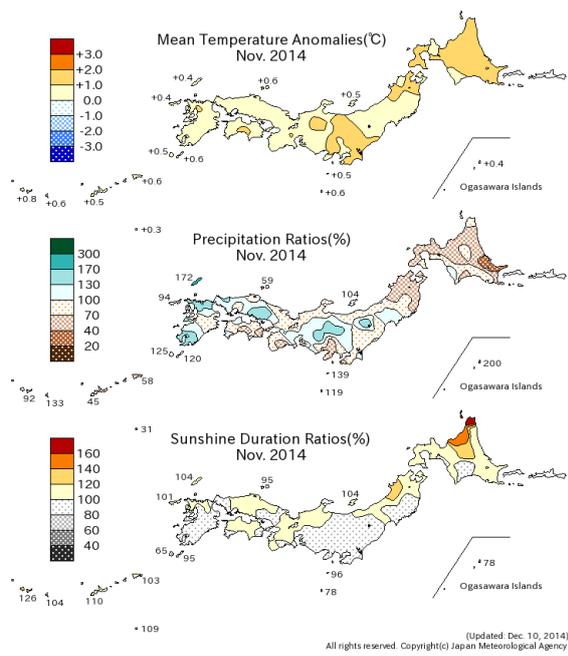


Fig. 1 Monthly climate anomaly / ratio over Japan (November 2014)
 Top: temperature anomalies (degree C)
 Middle: precipitation ratio (%)
 Bottom: sunshine duration ratio (%)
 Anomalies are defined as the deviations from the normal (1981-2010 average).

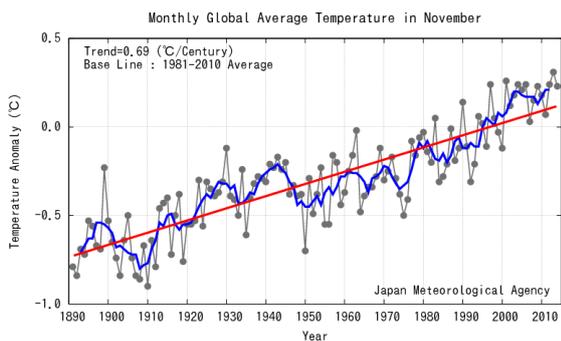


Fig. 2 Long-term change in monthly anomalies of global average surface temperature in November
 The thin black line indicates anomalies of the surface temperature in each year. The blue line indicates five-year running mean, and the red line indicates a long-term linear trend. Anomalies are deviations from the 1981-2010 average.

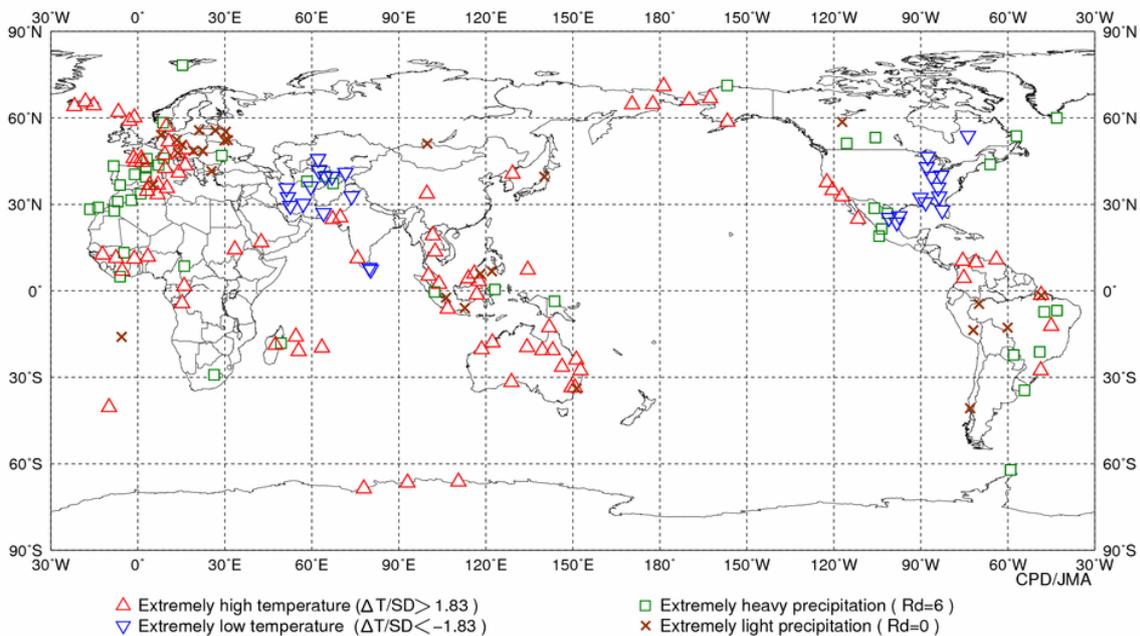


Fig. 3 Distribution of extreme climate events (November 2014)

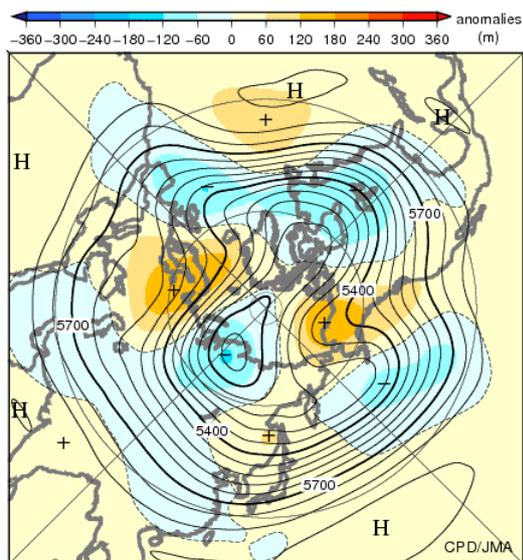


Fig. 4 Monthly mean 500-hPa height and anomaly in the Northern Hemisphere (November 2014)
The contours show heights at intervals of 60 m. The shading indicates height anomalies. The base period for the normal is 1981-2010.

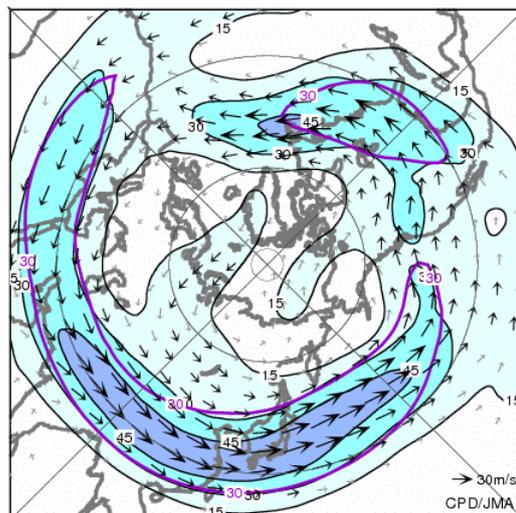


Fig. 5 Monthly mean 200-hPa wind speed and vectors in the Northern Hemisphere (November 2014)
The black lines show wind speeds at intervals of 15 m/s. The darkest blue shading shows values greater than 45 m/s. The purple lines show normal wind speeds at intervals of 30 m/s. The base period for the normal is 1981-2010.

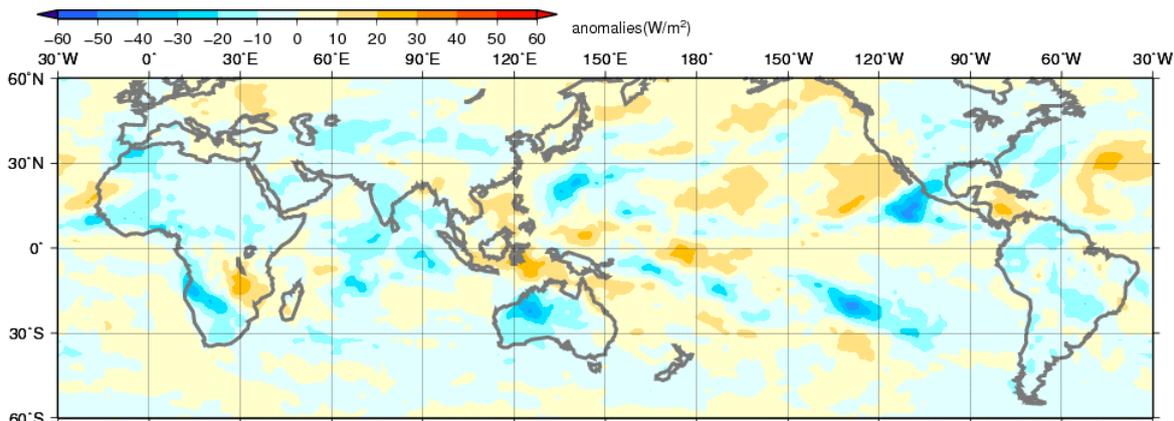


Fig. 6 Monthly mean Outgoing Longwave Radiation (OLR) anomaly (November 2014)
The contour interval is 10 W/m². The base period for the normal is 1981-2010. Original data provided by NOAA.

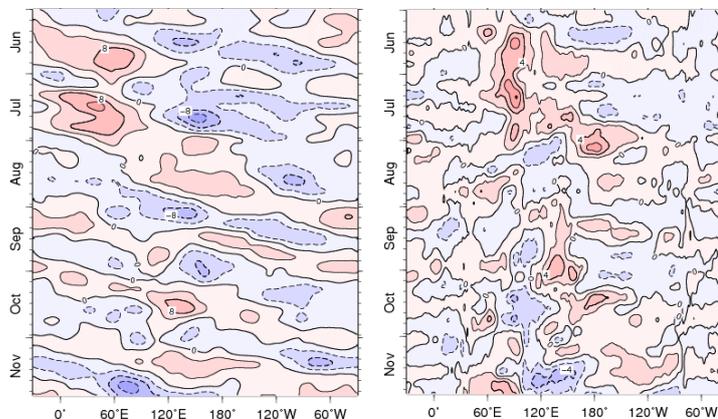


Fig. 7 Time-Longitude cross section (5°N-5°S) of five-day running mean 200-hPa velocity potential anomaly (left) and 850-hPa zonal wind anomaly (right) (June 2014 - November 2014)
The contour intervals are 4x10⁶ m²/s (left) and 2 m/s (right). The base period for the normal is 1981-2010.

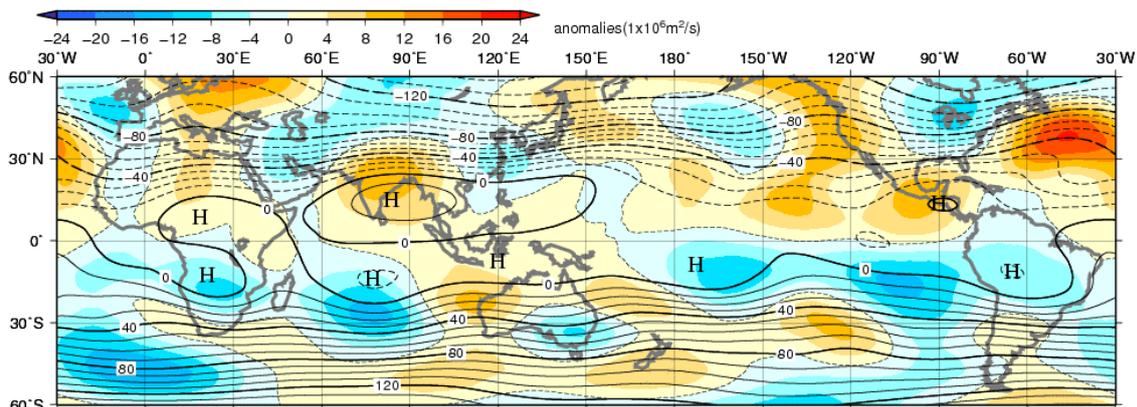


Fig. 8 Monthly mean 200-hPa stream function and anomaly (November 2014)
 The contour interval is $10 \times 10^6 \text{ m}^2/\text{s}$. The base period for the normal is 1981-2010.

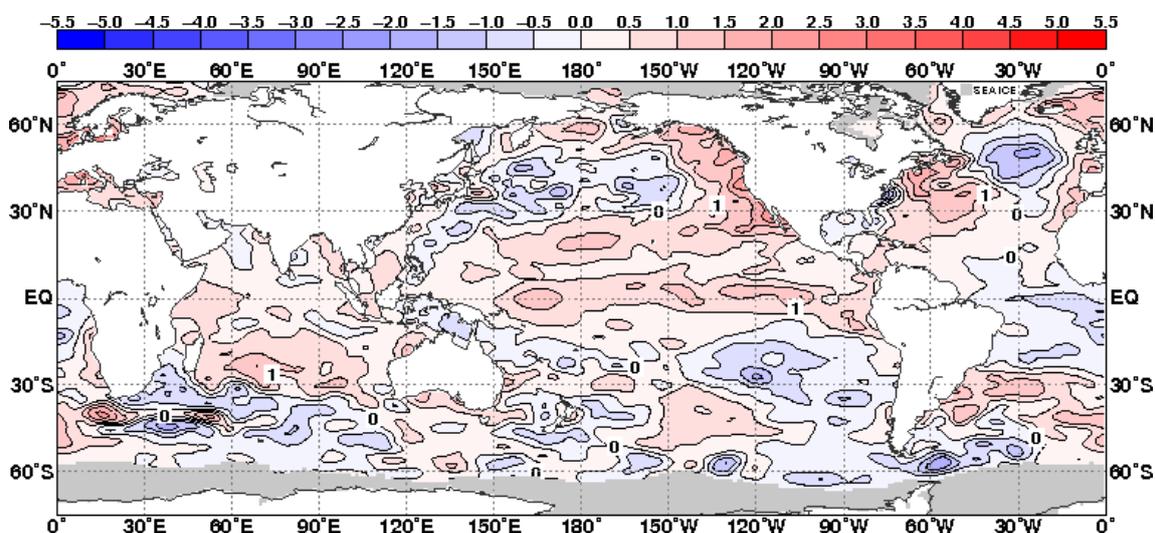


Fig. 9 Monthly mean sea surface temperature anomaly (November 2014)
 The contour interval is 0.5 degree C. The base period for the normal is 1981-2010. Maximum coverage with sea ice is shaded in gray.

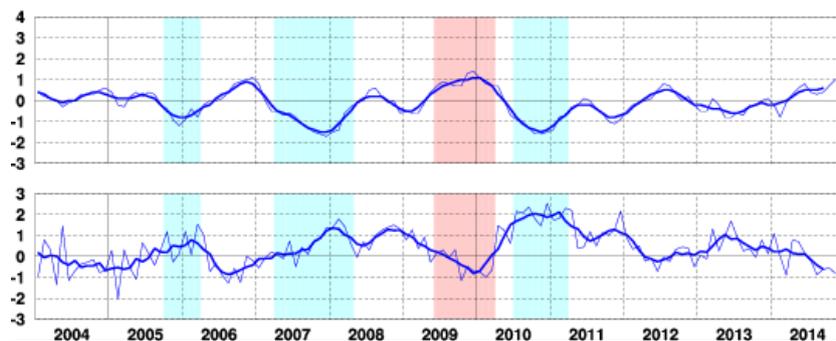


Fig. 10 Time series of monthly mean SST departure (degree C) from the reference value defined as the immediate past 30-year mean SST averaged over the NINO.3 region (upper). Time series of the Southern Oscillation Index with respect to the 1981-2010 base period (lower). Thin blue lines represent monthly means and thick blue lines five-month running means. Periods of El Niño and La Niña events are shown as red-colored and blue-colored boxes, respectively.

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 Climate Prediction Division, Global Environment and Marine Department, Japan Meteorological Agency.

Seasonal Highlights (September 2014 – November 2014)

- Seasonal sunshine durations were significantly above normal in northern Japan and on the Sea of Japan side of eastern Japan, and that for the latter area was the largest for autumn (September-October-November) since 1946.
- Seasonal mean temperatures were extremely high around western Europe.
- The jet stream flowed southward of its normal position over the eastern Pacific.
- Convective activity was enhanced over the Indian Ocean and the Inter-tropical Convergence Zone of the North Pacific, and was suppressed over the Maritime Continent.
- In the equatorial Pacific, remarkably positive SST anomalies were observed in almost the entire equatorial Pacific.

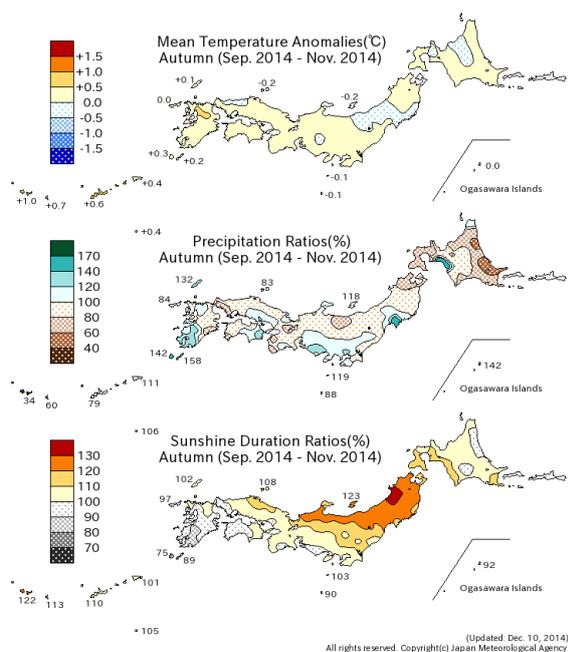


Fig. S1 Seasonal climate anomaly / ratio over Japan (September 2014 - November 2014)
 Top: Temperature anomalies (degree C)
 Middle: Precipitation ratio (%)
 Bottom: Sunshine duration ratio (%)
 Anomalies are defined as the deviations from the normal (1981-2010 average).

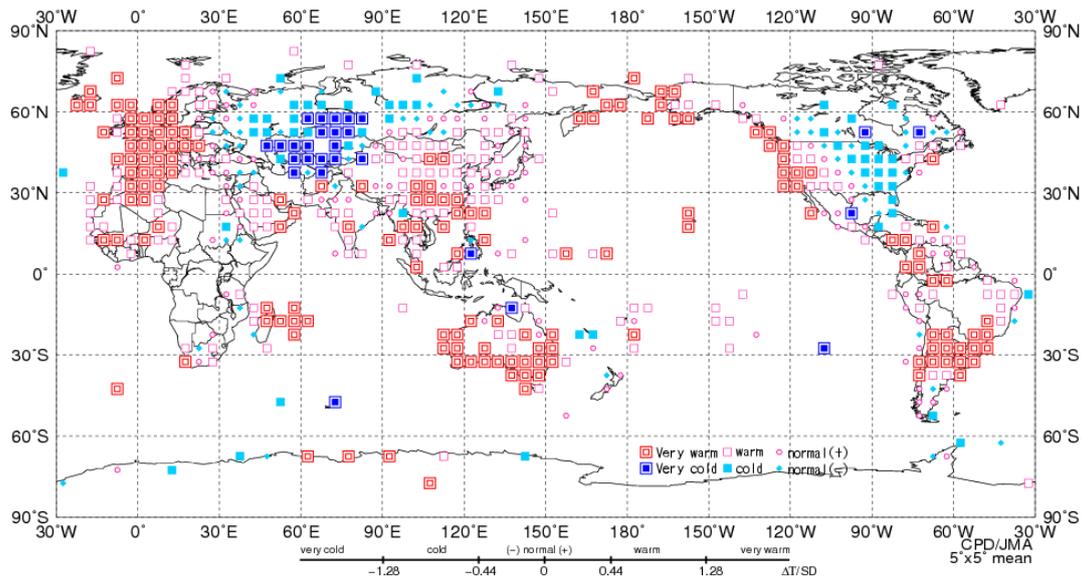


Fig. S2 Three-month mean temperature anomaly (normalized) category (September 2014 - November 2014)

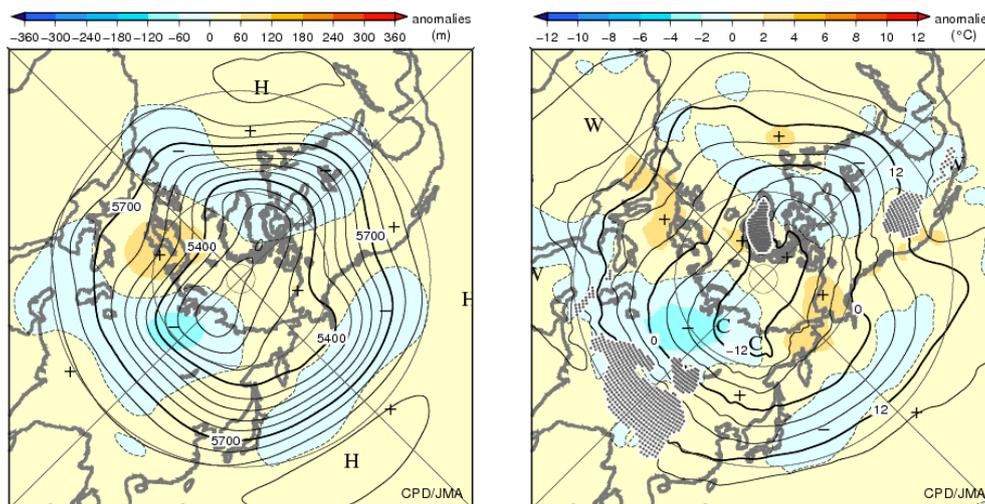


Fig. S3 Three-month mean 500-hPa height and anomaly (left) and 850-hPa temperature and anomaly (right) in the Northern Hemisphere (September 2014 - November 2014)

The contour intervals are 60 m (left) and 4 degree C (right). The shading shows anomalies. The base period for the normal is 1981-2010.

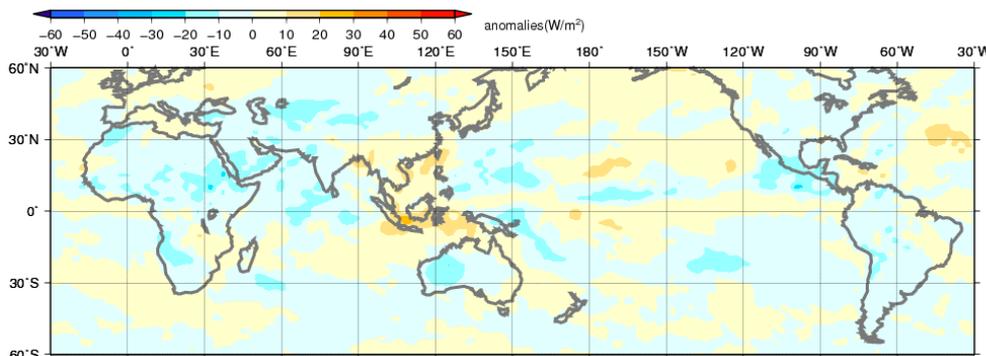


Fig. S4 Three-month mean Outgoing Longwave Radiation (OLR) anomaly (September 2014 - November 2014) The contour interval is 10 W/m². The base period for the normal is 1981-2010. Original data provided by NOAA.

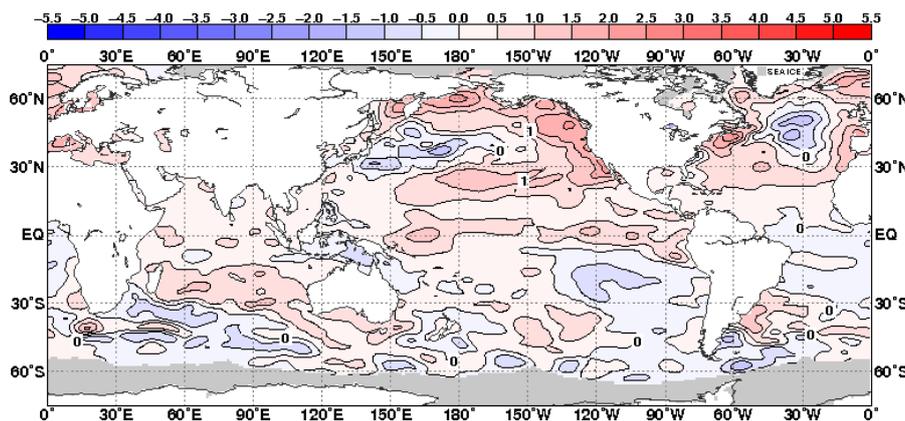


Fig. S5 Three-month mean sea surface temperature anomaly (September 2014 - November 2014) The contour interval is 0.5 degree C. The base period for the normal is 1981-2010.

Detailed seasonal 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 Climate Prediction Division, Global Environment and Marine Department, Japan Meteorological Agency.