Monthly Discussion on Seasonal Climate Outlooks (No. 129)

(19 November 2024)

Tokyo Climate Center (TCC)
Japan Meteorological Agency (JMA)

Outline

Notes:

- The present monthly discussion is intended to assist National Meteorological and Hydrological Services (NMHSs) in WMO RA II (Asia) in interpreting WMC Tokyo's seasonal prediction products. It does not constitute an official forecast for any nation. Seasonal outlooks for individual countries should be obtained from the relevant NMHS.
- Seasonal predictions are based on a JMA's Seasonal Ensemble Prediction System (EPS), which is based on the coupled atmosphere-ocean general circulation model (CGCM).
- JMA provides three-month prediction products around the 20th of every month with warm-season (Jun. – Aug.) prediction products in February, March and April, and with cold-season (Dec. – Feb.) prediction products in September and October.
- Unless otherwise noted, the base period for the normal is 1991 – 2020.

1. Summary and Discussion

ENSO

- ENSO-neutral conditions persisted in October. Overall conditions in the atmosphere and ocean, however, indicate that common features of past La Niña events were becoming clear.
- The characteristics of La Niña conditions will become clearer towards and during winter, but will not last until spring. Thus, it is more likely that ENSO-neutral conditions will continue (60%) than the definition of a La Niña event will be met (40%).

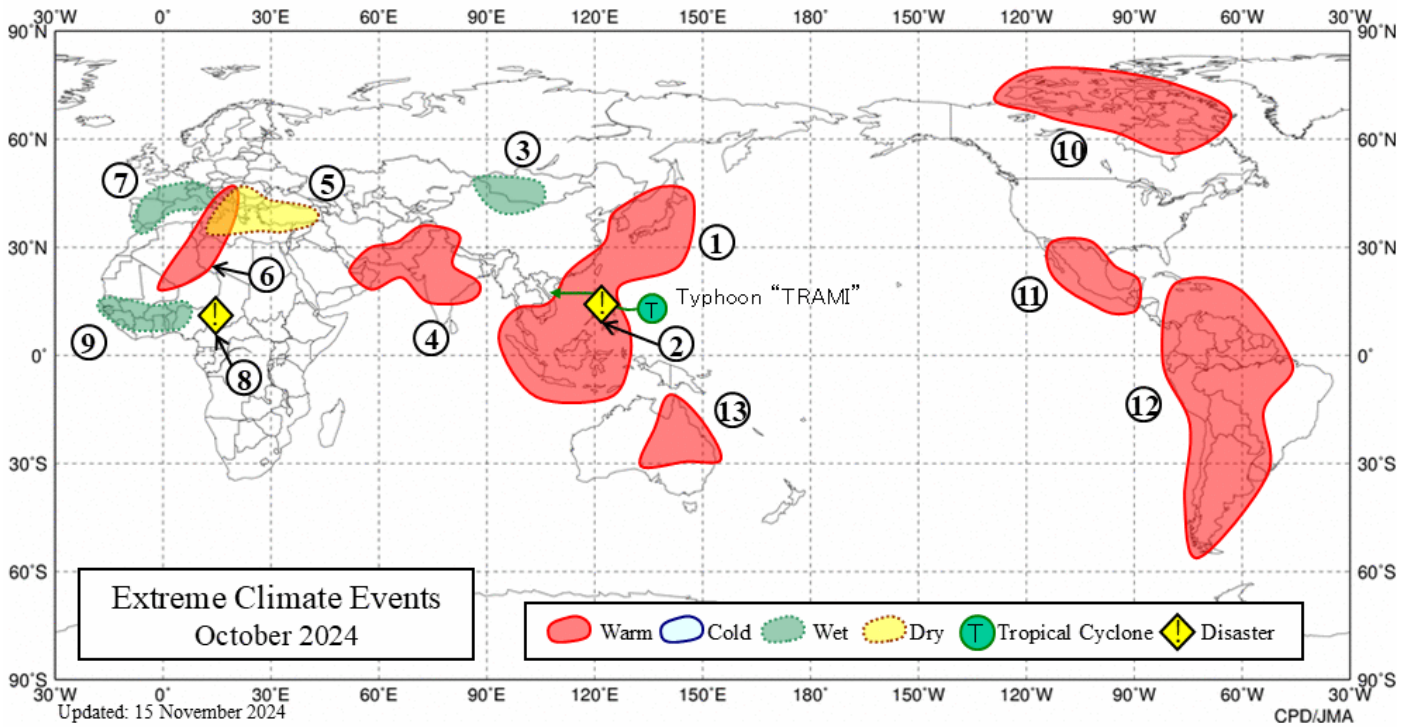
Prediction for December 2024-January-February 2025 (DJF 2024-25)

- In the 200-hPa velocity potential field, large-scale divergence anomalies are predicted from the eastern Indian Ocean to the Maritime Continent, while large-scale convergence anomalies are predicted from Africa to the western Indian Ocean and from the western to central Pacific.
- In the 850-hPa stream function field, cyclonic (anti-cyclonic) circulation anomalies straddling the equator are predicted from the Indian Ocean to the Maritime Continent (over the tropical Pacific), in association with tropical precipitation described below.
- A high probability of above-normal precipitation is predicted from the eastern Indian Ocean to near Southeast Asia. A high probability of below-normal precipitation is predicted over the western equatorial Indian Ocean, from the western to central equatorial Pacific, and from the Middle East to southern East Asia.
- A high probability of above-normal temperatures is predicted over a wide area from the Indian Ocean to the western Pacific, over South Asia, and over southern East Asia. A high probability of below-normal temperatures is predicted to the north of 50°N over Eurasia.

2. Latest State of the Climate System

October 2024

<October 2024> Extreme Climate Events



	Type	Area
1	Warm	From Japan to Indonesia
2	Typhoon	Southern China, the Philippines, Viet Nam
3	Wet	In and around western Mongolia

	Type	Area
4	Warm	From India to the eastern Arabian Peninsula
5	Dry	From Turkey to southeastern Europe
6	Warm	From Italy to southern Algeria
7	Wet	From northern Italy to Spain

	Type	Area
8	Heavy Rain	Northern Cameroon
9	Wet	Southern Western Africa
10	Warm	Northern Canada
11	Warm	Mexico
12	Warm	From Caribbean countries to South America

	Type	Area
13	Warm	Northeastern Australia

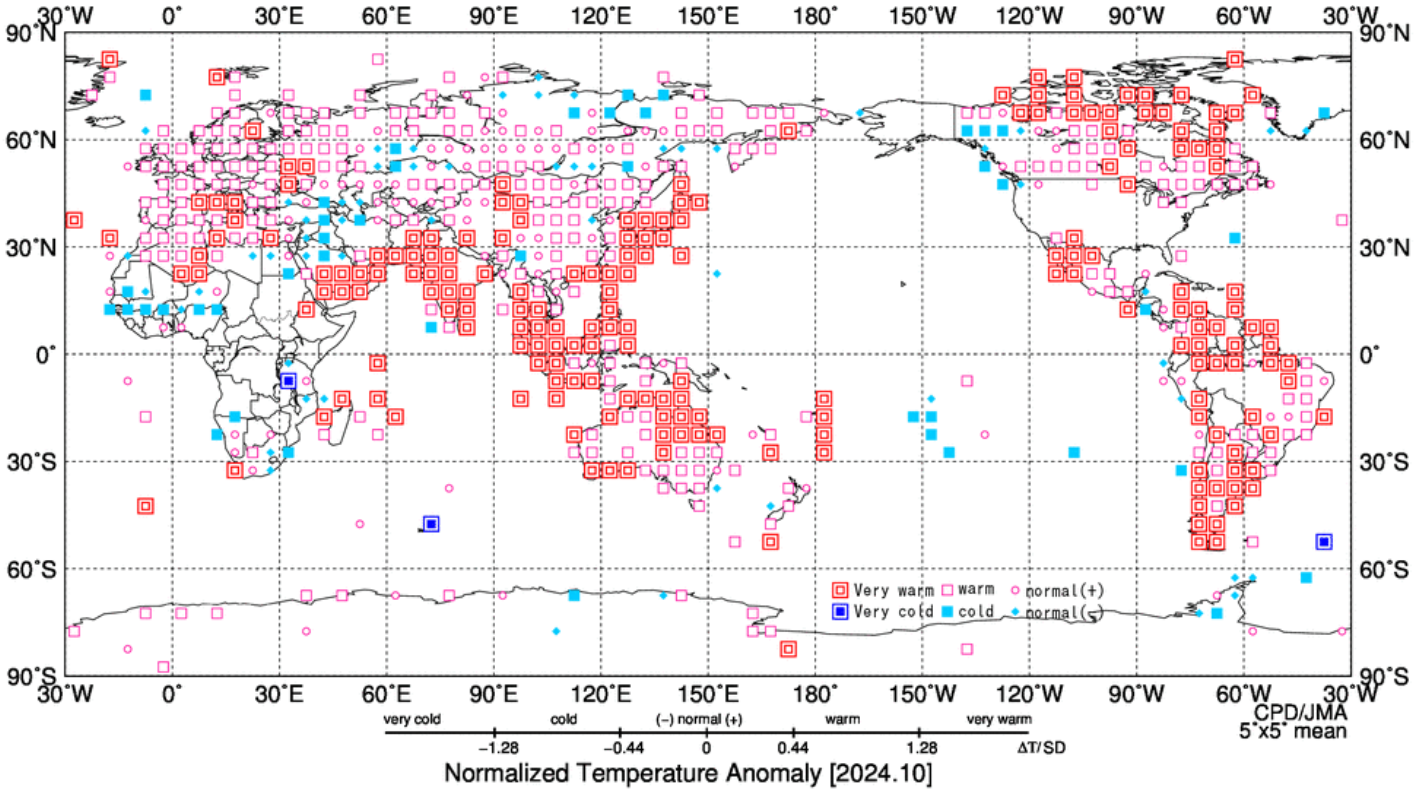
<Monthly Report on Global Extreme Climate Events>

https://www.data.jma.go.jp/tcc/tcc/products/climate/monthly/index.html

<October 2024> Temperature

- Monthly mean temperatures were extremely high from Japan to Indonesia, from India to the eastern Arabian Peninsula, from Italy to southern Algeria, in northern Canada, in Mexico, from Caribbean countries to South America and in northeastern Australia.

Normalized anomaly of monthly mean temperature

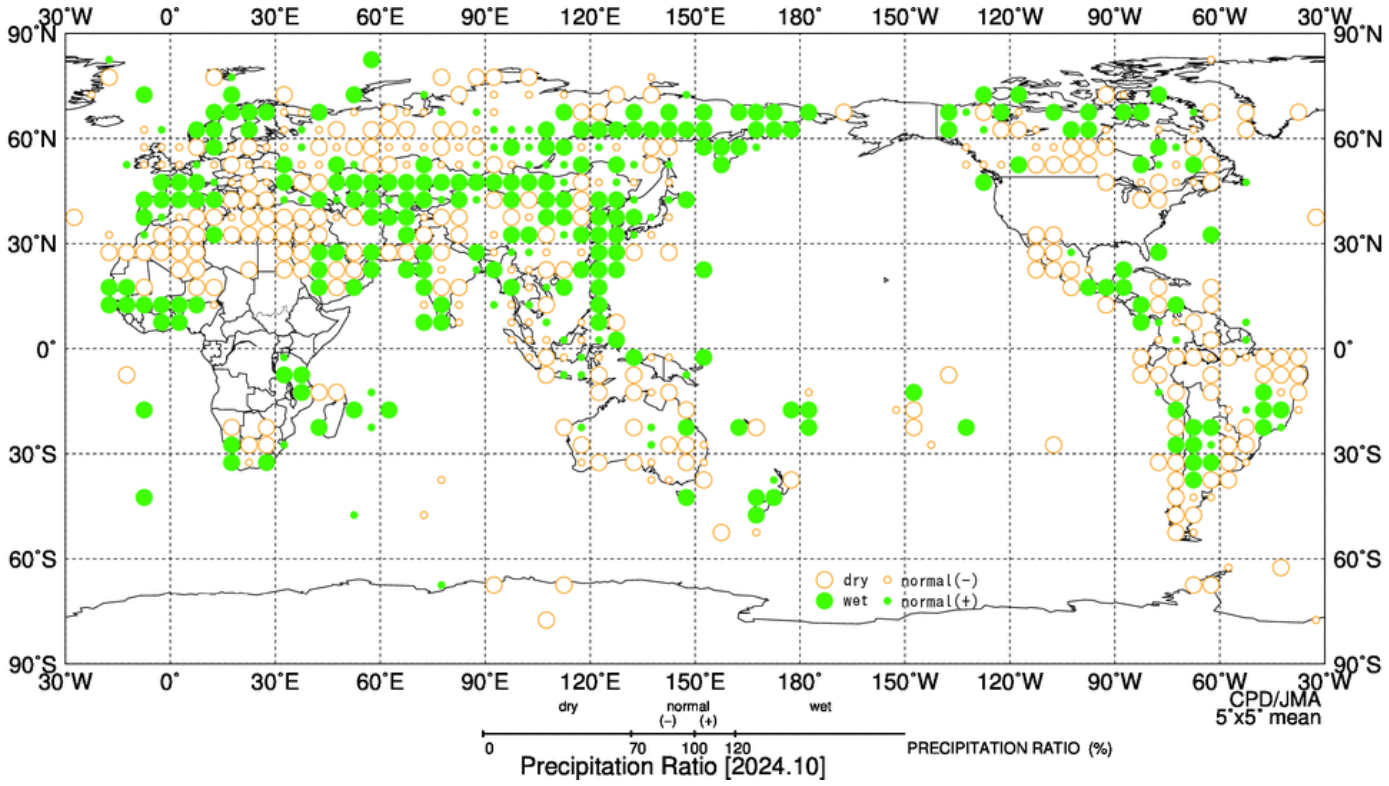


<World Climate Chart (Monthly)> https://www.data.jma.go.jp/tcc/tcc/products/climate/climfig/?tm=monthly

<October 2024> Precipitation

- Monthly precipitation amounts were extremely high in and around western Mongolia, from northern Italy to Spain and in southern Western Africa.
- Monthly precipitation amounts were extremely low from Turkey to southeastern Europe.

Monthly precipitation ratio

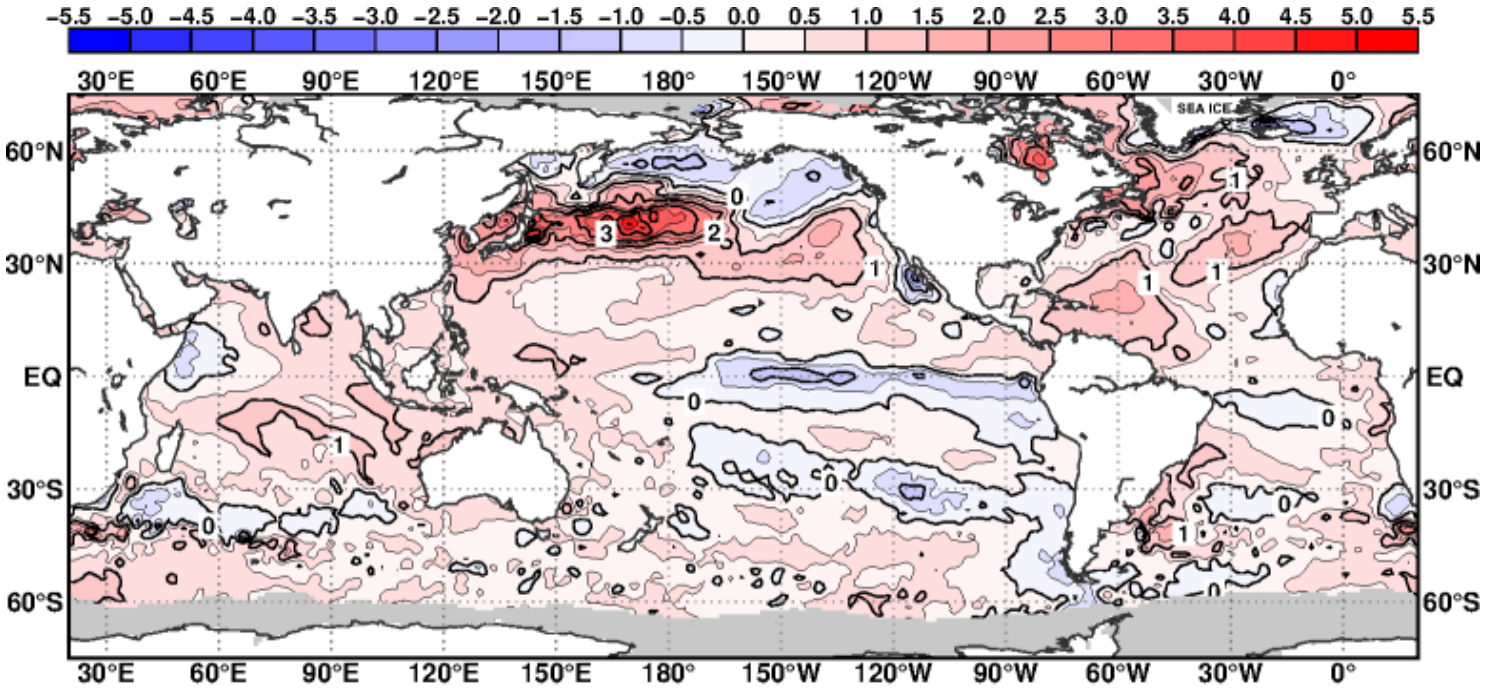


<World Climate Chart (Monthly)> https://www.data.jma.go.jp/tcc/tcc/products/climate/climfig/?tm=monthly

<October 2024> Sea Surface Temperature (SST)

- In the equatorial Pacific, remarkably positive SST anomalies were observed in the western part and negative anomalies were observed from the central to eastern parts.
- In the North Pacific, remarkably positive SST anomalies were observed from the western part of the tropics to a wide area of the mid-latitudes.
- In the Indian Ocean, remarkably positive SST anomalies were observed in a wide area except off Somalia and to the south of Madagascar.
- In the North Atlantic, remarkably positive SST anomalies were observed from the tropics to the mid-latitudes.

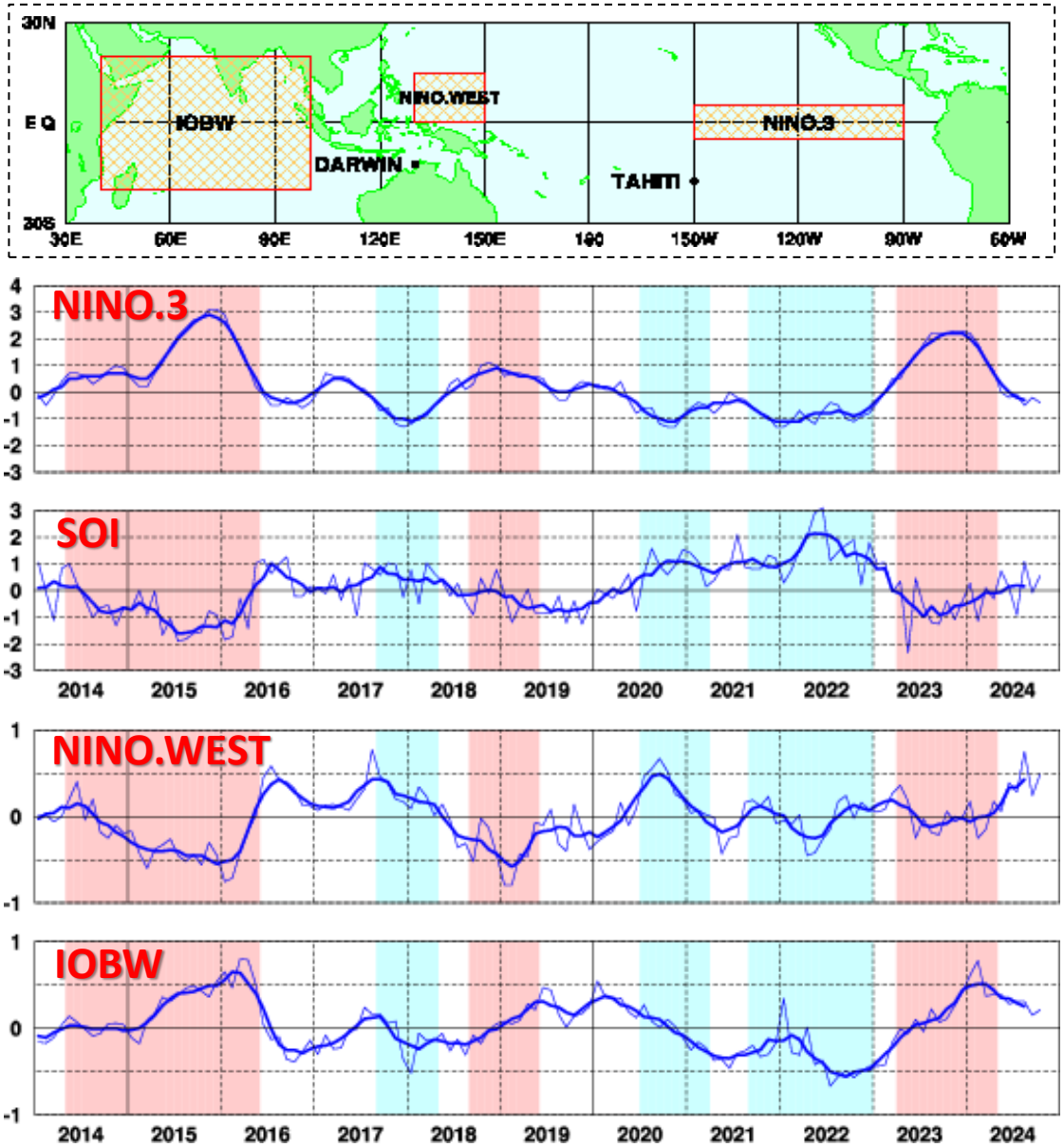
Monthly mean SST anomaly (˚C)



<Monthly mean SST anomalies (Global)> https://www.data.jma.go.jp/tcc/tcc/products/elnino/ocean/sst-ano-global_tcc.html

<October 2024> ENSO Monitoring Indices

- ENSO-neutral conditions persisted in October. Overall conditions in the atmosphere and ocean, however, indicate that common features of past La Niña events were becoming clear.
- The NINO.3 SST was near normal with a deviation of -0.4ºC in October 2024.
- The Southern Oscillation Index (SOI) value was +0.6.
- The area-averaged SST in the tropical western Pacific (NINO.WEST) region was above normal.
- The area-averaged SST in the tropical Indian Ocean (IOBW) region was above normal.



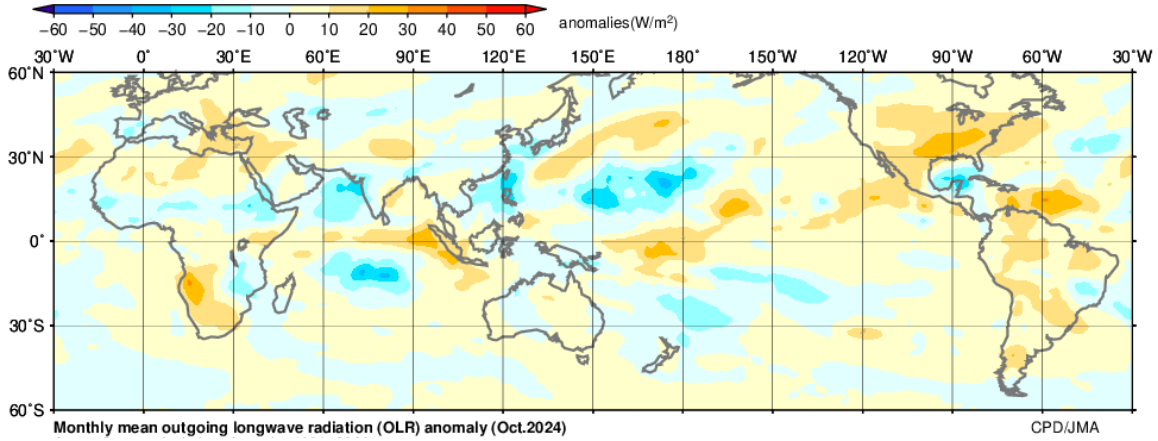
Monthly values (thin lines) and five-month running means (thick lines). The shading indicates El Niño (red) and La Niña (blue) events.

< El Niño Monitoring and Outlook> https://www.data.jma.go.jp/tcc/tcc/products/elnino/elmonout.html

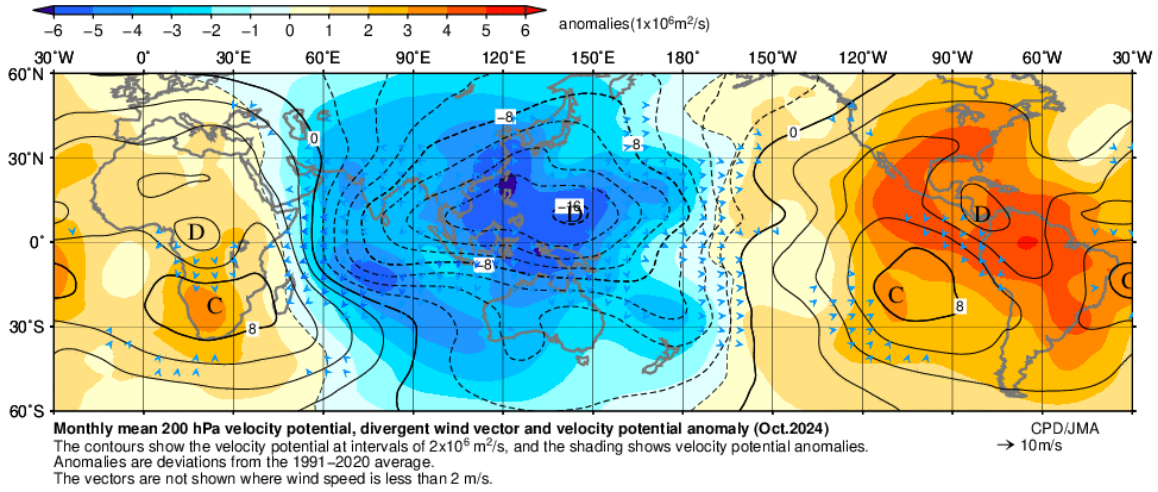
<October 2024> Convective activity in the Tropics

- Convective activity was enhanced near the Gulf of Mexico, from the latitude band of 10°N in Africa to the Arabian Sea, the central part of the southern tropical Indian Ocean, from near the Philippines to the subtropical western North Pacific, and suppressed over the equatorial Indian Ocean, from the central tropical Pacific to South America.

Monthly mean
OLR anomalies
Shading: OLR anomalies (W/m^2)



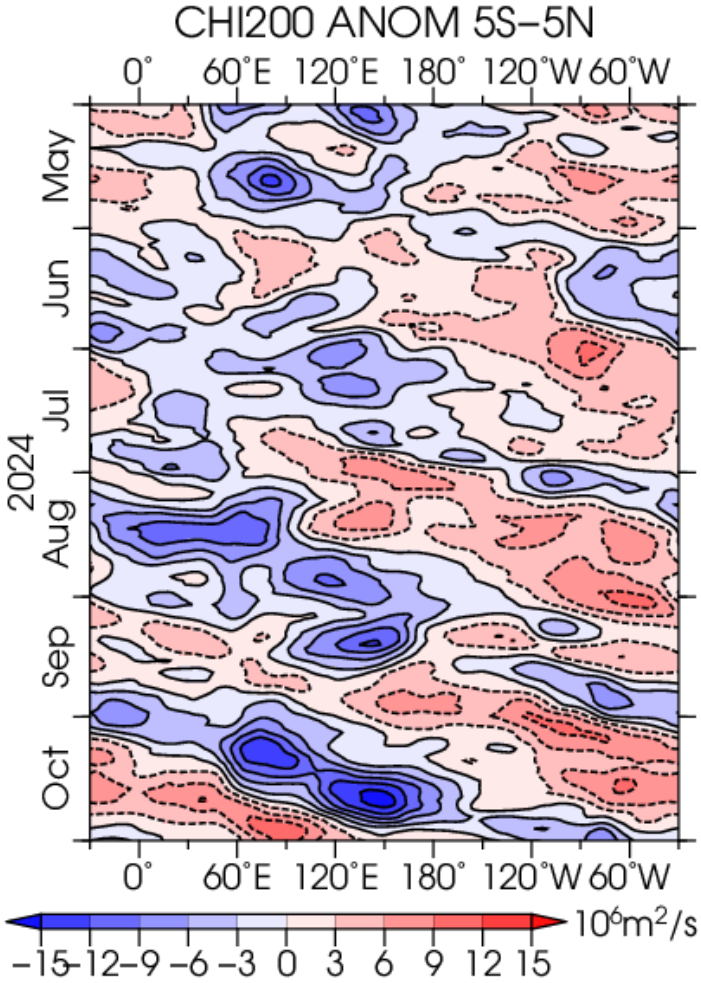
Monthly mean
Velocity potential,
Divergent wind vector, and
Velocity potential anomalies
at 200-hPa
Contour: velocity potential ($10^6 m^2/s$)
Vector: divergent wind vector (m/s)
Shading: velocity potential anomalies ($10^6 m^2/s$)
"D" and "C" indicate the centers of large-scale divergence and convergence anomalies, respectively.



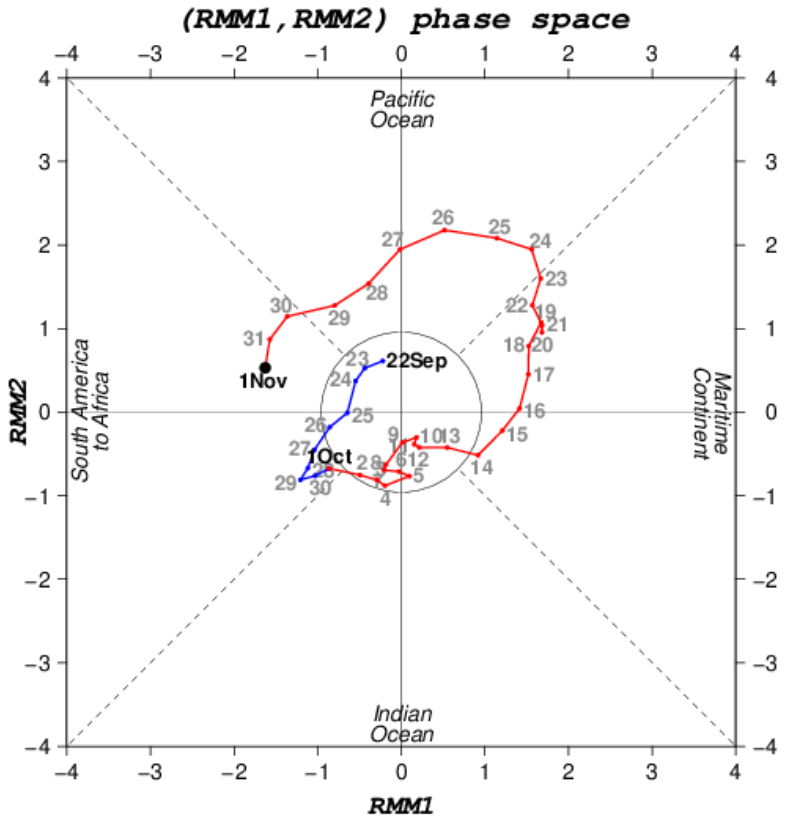
<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<October 2024> Equatorial Intraseasonal Oscillation

- The active phase of equatorial intraseasonal oscillation propagated eastward from Africa to South America through Indonesia.



Time-longitude cross section of seven-day running mean velocity potential anomalies at 200-hPa (5˚S – 5˚N)



MJO diagram

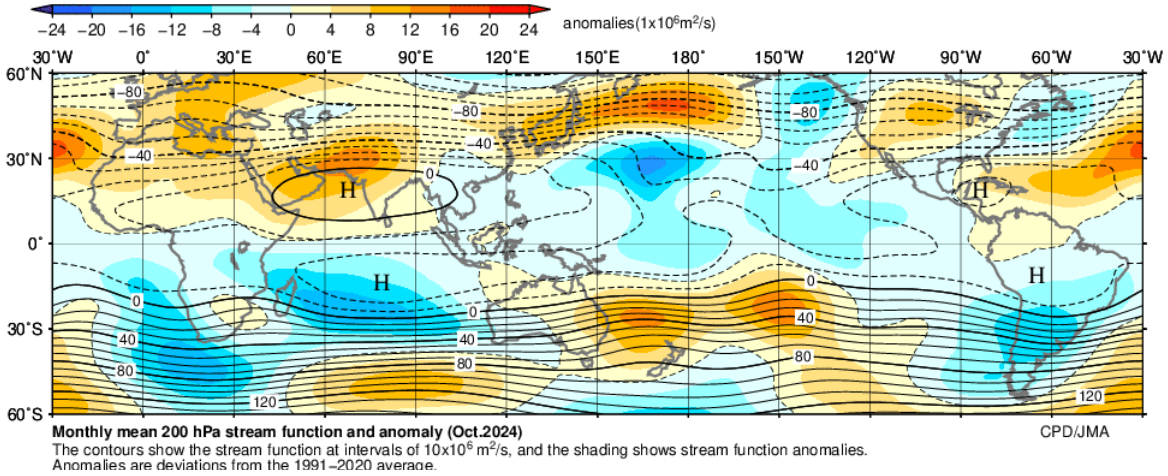
<MJO> https://www.data.jma.go.jp/tcc/tcc/products/clisys/mjo/moni_mjo.html

<October 2024> Upper-level Circulation

- In the upper troposphere, cyclonic circulation anomalies straddling the equator were seen over the central tropical Pacific, and anti-cyclonic circulation anomalies straddling the equator were seen from Africa to the tropical Indian Ocean. Anti-cyclonic circulation anomalies were widely seen over the Northern Hemisphere mid-latitudes.

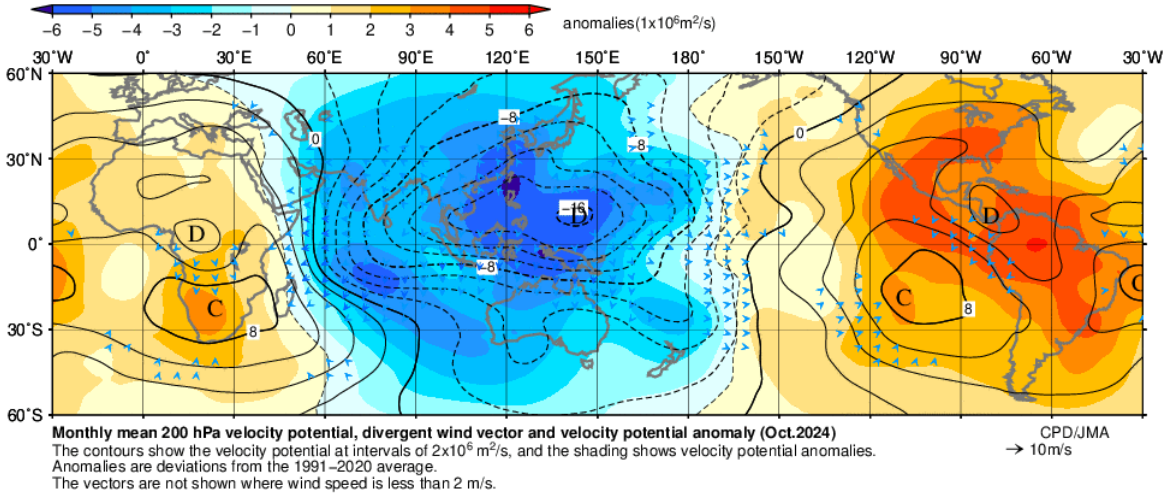
Monthly mean Stream function and its anomalies at 200-hPa

Contour: stream function ($10^6 m^2/s$)
Shading: stream function anomalies ($10^6 m^2/s$)
"H" and "L" indicate the centers of anti-cyclonic and cyclonic circulations, respectively.



Monthly mean Velocity potential, Divergent wind vector and Velocity potential anomalies at 200-hPa

Contour: velocity potential ($10^6 m^2/s$)
Vector: divergent wind vector (m/s)
Shading: velocity potential anomalies ($10^6 m^2/s$)
"D" and "C" indicate the centers of large-scale divergence and convergence anomalies, respectively.



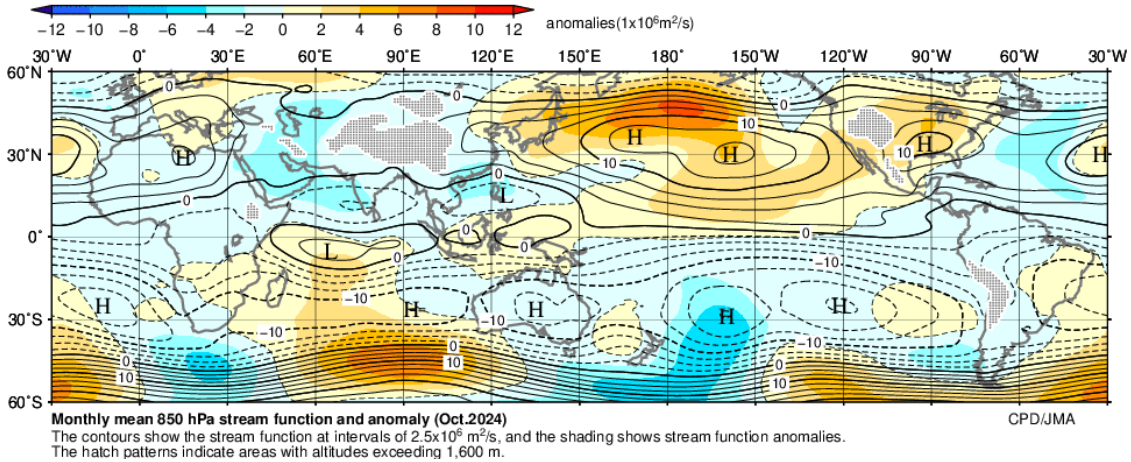
<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<October 2024> Low-level Circulation

- In the lower troposphere, anti-cyclonic circulation anomalies were widely seen over the North Pacific and extended to Japan. Cyclonic circulation anomalies were widely seen near the Arabian Sea and the Philippines.
- In the sea level pressure field, positive anomalies were seen from the central tropical Pacific to the tropical Atlantic. Negative anomalies were seen from the Indian Ocean to near Indonesia.

Monthly mean Stream function and its anomalies at 850-hPa

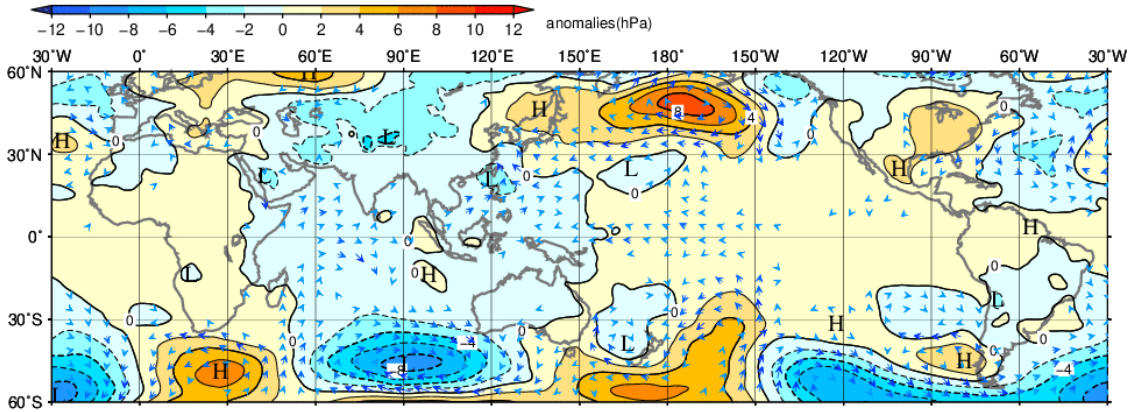
Contour: stream function ($10^6 m^2/s$)
Shading: stream function anomalies ($10^6 m^2/s$)
"H" and "L" indicate the centers of anti-cyclonic and cyclonic circulations, respectively.



Monthly mean 850 hPa stream function and anomaly (Oct.2024)
The contours show the stream function at intervals of 2.5×10^6 m^2/s, and the shading shows stream function anomalies.
The hatch patterns indicate areas with altitudes exceeding 1,600 m.

Monthly mean Sea level pressure anomalies and Surface wind vector anomalies

Contour&shading: sea level pressure anomalies (hPa)
Vector: surface wind vector anomalies (m/s)
"H" and "L" indicate the centers of anti-cyclonic and cyclonic anomalies, respectively.

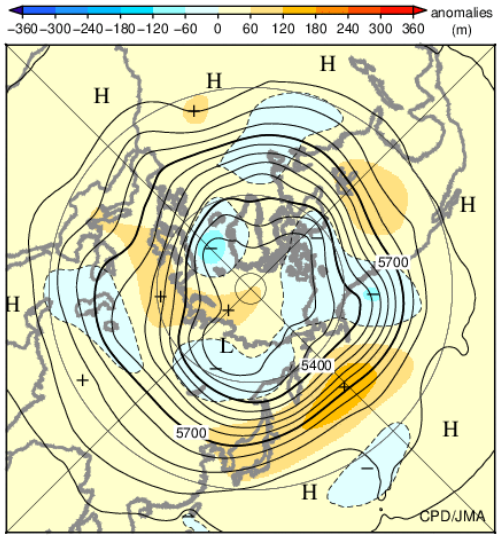


Monthly mean sea level pressure anomaly and surface wind vector anomaly (Oct.2024)
The contours show sea level pressure anomalies at intervals of 2 hPa.
Anomalies are deviations from the 1991–2020 average.
The vectors are not shown where wind speed is less than 1 m/s.

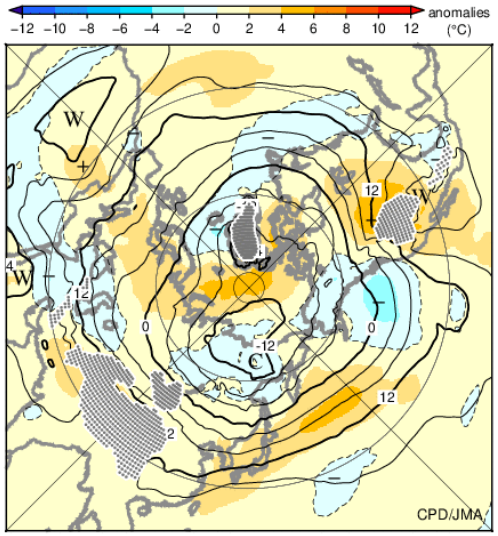
<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<October 2024> Northern Hemisphere Circulation

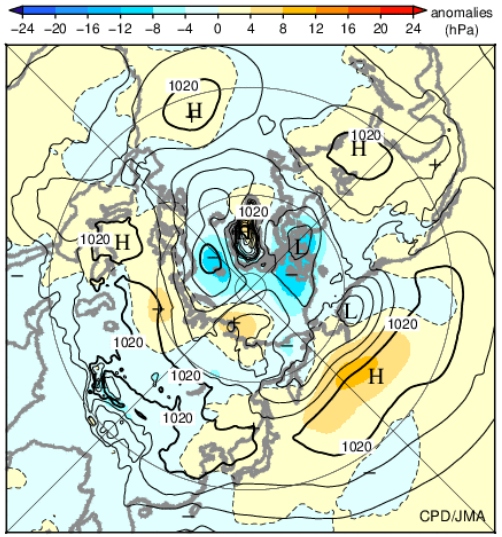
- In the 500-hPa height field, a wavy anomaly pattern was seen from Greenland to near Japan via Siberia. Significantly positive anomalies were seen from near Japan to the south of the Aleutian Islands.
- Temperatures at 850-hPa were significantly above normal near the North Pole, from near Japan to the south of the Aleutian Islands, and in the USA.
- In the sea level pressure field, significant positive anomalies were seen from the sea east of Japan to the south of the Aleutian Islands with the strong North Pacific High.



Monthly mean 500 hPa height and anomaly in the Northern Hemisphere (Oct.2024)
The contours show height at intervals of 60 m.
The shading indicates height anomalies.
Anomalies are deviations from the 1991–2020 average.



Monthly mean 850 hPa temperature and anomaly in the Northern Hemisphere (Oct.2024)
The contours show temperature at intervals of 4°C.
The shading indicates temperature anomalies.
The hatch patterns indicate areas with altitudes exceeding 1,600 m.
Anomalies are deviations from the 1991–2020 average.



Monthly mean sea level pressure and anomaly in the Northern Hemisphere (Oct.2024)
The contours show sea level pressure at intervals of 4 hPa.
The shading indicates sea level pressure anomalies.
Anomalies are deviations from the 1991–2020 average.

Monthly mean geopotential height and its anomalies at 500-hPa

Contour: geopotential height (m)
Shading: geopotential height anomalies (m)

Monthly mean temperature and its anomalies at 850-hPa

Contour: temperature (˚C)
Shading: temperature anomalies (˚C)

Monthly mean sea level pressure and its anomalies

Contour: sea level pressure (hPa)
Shading: sea level pressure anomalies (hPa)

<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html

3. Three-month Predictions

December 2024 – January – February 2025 (DJF 2024-25)

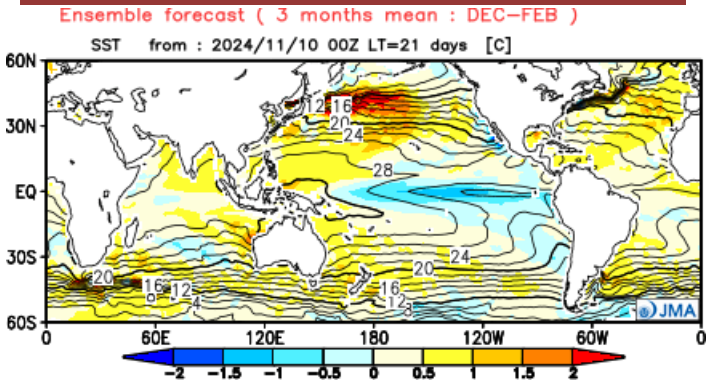
(Initial date for the Seasonal EPS: 10 November 2024)

<DJF 2024-25> Sea Surface Temperature (SST)

- The characteristics of La Niña conditions will become clearer towards and during winter, but will not last until spring. Thus, it is more likely that ENSO-neutral conditions will continue (60%) than the definition of a La Niña event will be met (40%).
- The NINO.WEST SST is likely to be above or near normal until boreal spring. The IOBW SST will approach the normal towards the coming winter and be near or below normal in boreal spring.

Three month mean Sea surface temperature (SST)

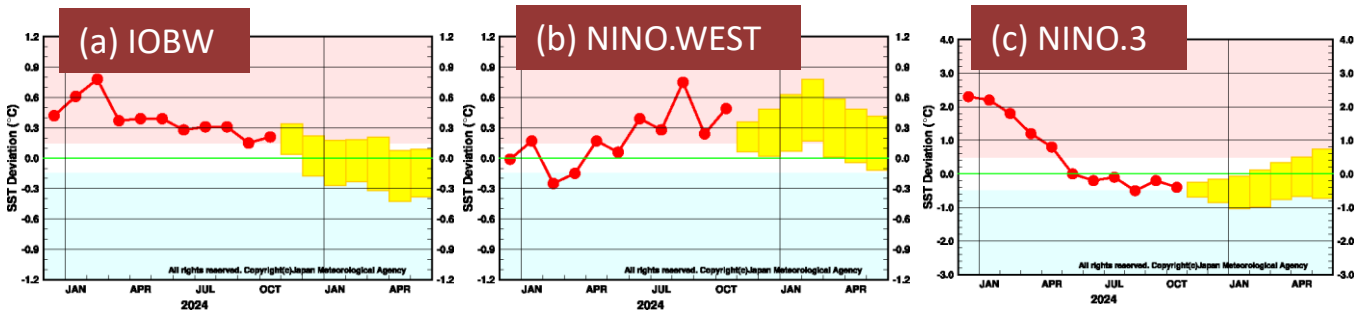
Contour: SST (˚C); Shading: SST anomalies.

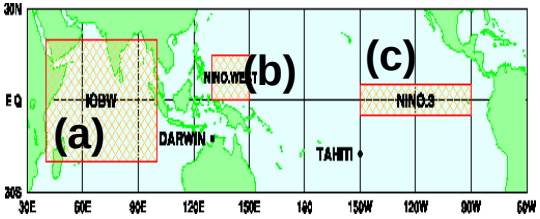


ENSO forecast probabilities

YEAR	MONTH	mean period	El Niño	ENSO neutral	La Niña
2024	SEP	JUL2024–NOV2024		100	
	OCT	AUG2024–DEC2024		50	50
	NOV	SEP2024–JAN2025		40	60
	DEC	OCT2024–FEB2025		40	60
2025	JAN	NOV2024–MAR2025		40	60
	FEB	DEC2024–APR2025		50	50
	MAR	JAN2025–MAY2025		60	40

Outlook of the SST deviation





Verification based on hindcast

https://www.data.jma.go.jp/tcc/tcc/products/model/hindcast/CPS3/index.html

https://www.data.jma.go.jp/tcc/tcc/products/model/hindcast/CPS3/shisu/shisu.html

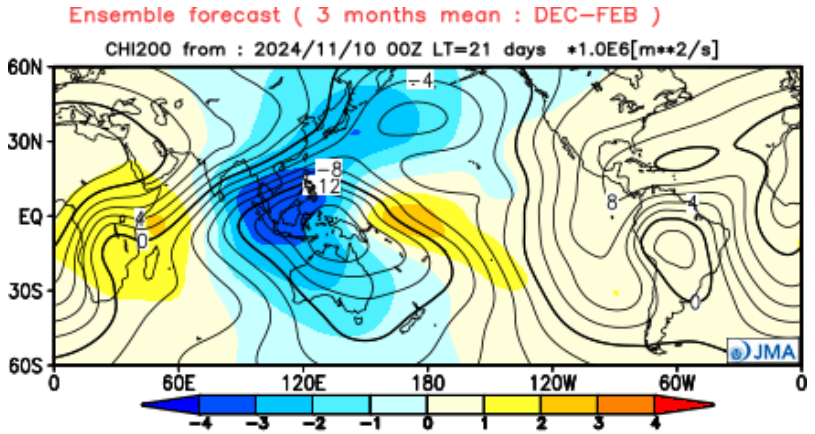
(See "Explanatory Notes (2)" for the definition of the SST indices.)

<DJF 2024-25> Global Circulation

- In the 200-hPa velocity potential field, negative (large-scale divergence) anomalies are predicted from the eastern Indian Ocean to the Maritime Continent, while positive (large-scale convergence) anomalies are predicted from Africa to the western Indian Ocean and from the western to central Pacific, indicating the stronger-than-normal and westward-shifted Walker circulation in association with La Niña-like zonal contrast of SST anomalies.
- In the 200-hPa stream function field, anti-cyclonic (cyclonic) circulation anomalies straddling the equator are predicted from the Indian Ocean to the Maritime Continent (over the central tropical Pacific). These anomaly patterns are associated with the large-scale anomalous divergence. A wavy anomaly pattern from the anti-cyclonic circulation anomalies over southern Eurasia toward northeast is accompanied by the enhanced trough to near Japan.

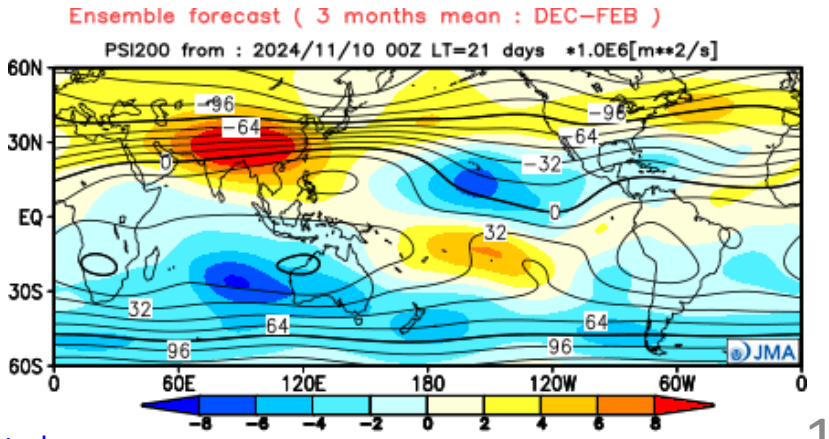
Three month mean 200-hPa velocity potential

Contour: 200-hPa velocity potential (10^6 m^2/s)
Shading: 200-hPa velocity potential anomalies (10^6 m^2/s)



Three month mean 200-hPa stream function

Contour: 200-hPa stream function (10^6 m^2/s)
Shading: 200-hPa stream function anomalies (10^6 m^2/s)



Verification based on hindcast
https://www.data.jma.go.jp/tcc/tcc/products/model/hindcast/CPS3/index.html

<DJF 2024-25> Asian Circulation

- In the 850-hPa stream function field, cyclonic (anti-cyclonic) circulation anomalies straddling the equator are predicted from the Indian Ocean to the Maritime Continent (over the tropical Pacific), in association with tropical precipitation described below.
- In the sea level pressure field, negative anomalies are predicted from the Indian Ocean to the Maritime Continent.
- Above-normal precipitation is predicted from the eastern Indian Ocean to the Maritime Continent, and below-normal precipitation is predicted over the western equatorial Indian Ocean and the western equatorial Pacific.

Three month mean

(a) 850-hPa stream function anomalies and wind vector anomalies

Contour&Shading: 850-hPa stream function anomalies (10^6 m^2/s)

Vector: wind vector anomalies (m/s)

(b) sea level pressure and its anomalies

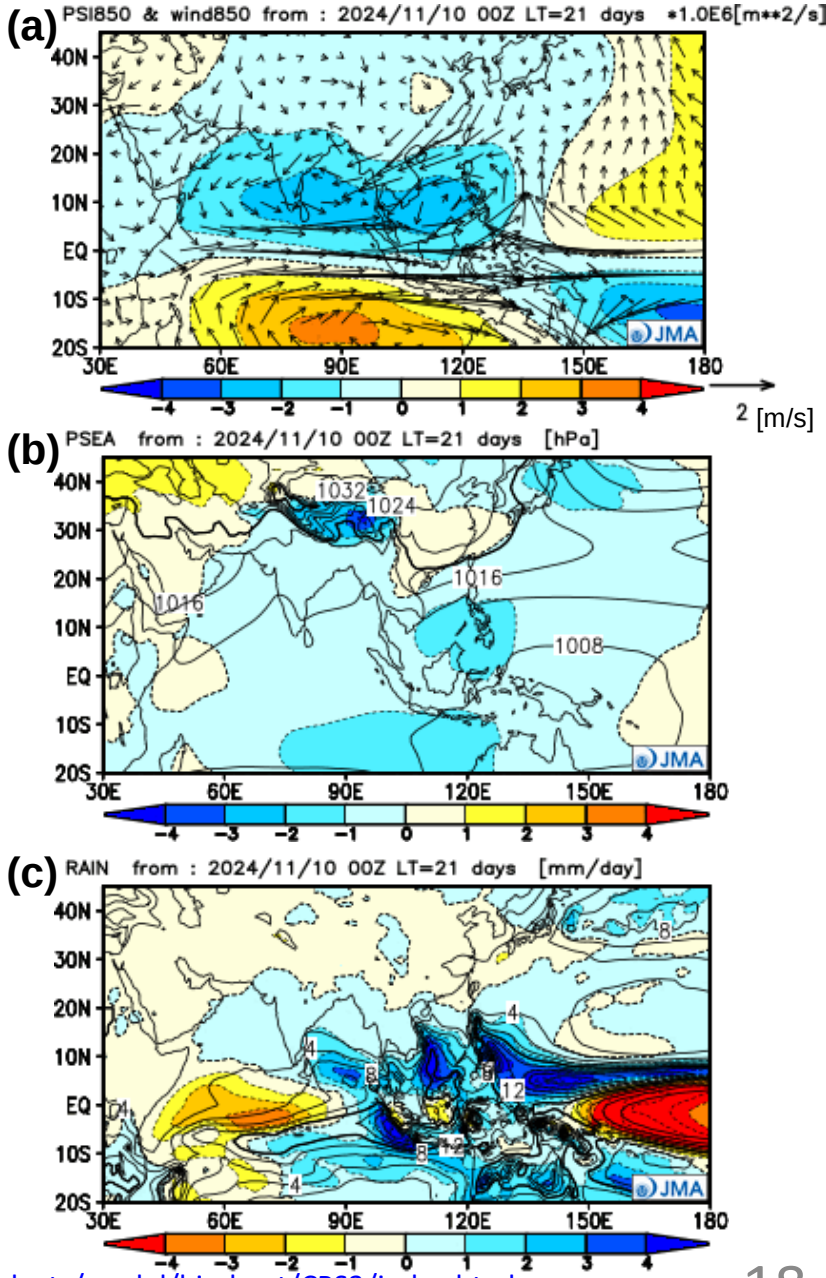
Contour: sea level pressure (hPa)

Shading: sea level pressure anomalies (hPa)

(c) precipitation and its anomalies

Coutour: precipitation (mm/day)

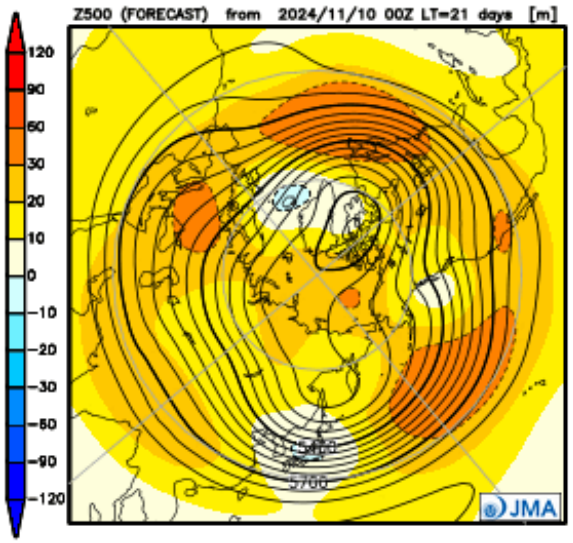
Shading: precipitation anomalies (mm/day)



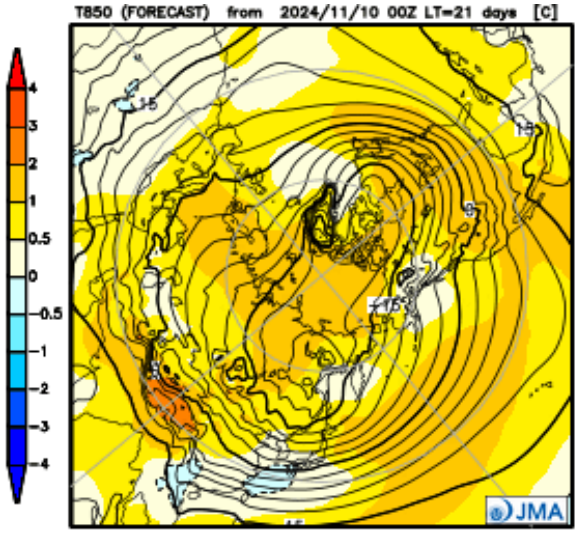
Verification based on hindcast https://www.data.jma.go.jp/tcc/tcc/products/model/hindcast/CPS3/index.html

<DJF 2024-25> Northern Hemisphere circulation

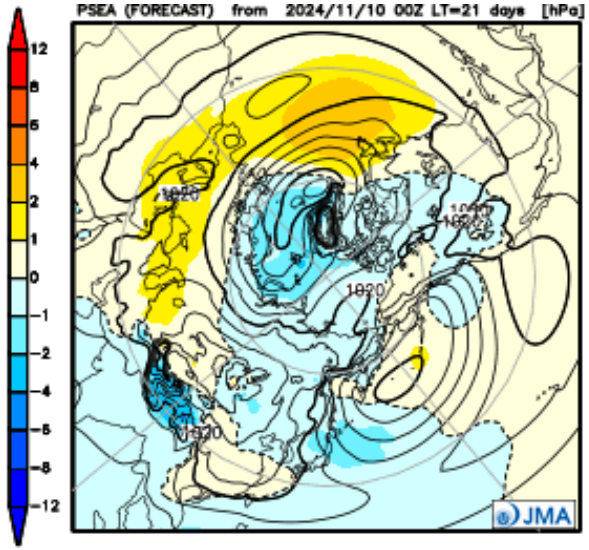
- In the 500-hPa height field, positive anomalies are predicted over a wide area of the Northern Hemisphere with the significantly positive anomalies from the central to eastern Pacific in the mid-latitude, from eastern North America to mid-latitude North Atlantic and over Europe, except over parts of the northern North Atlantic and near Japan.
- In the 850-hPa temperature field, positive anomalies are predicted over a wide area of the Northern Hemisphere except over a part of southern East Asia.
- In the sea level pressure field, the Iceland Low is predicted to be stronger than normal from the central to eastern part. The Aleutian Low is predicted to be stronger (weaker) than normal in the western (eastern) part.



Three month mean
geopotential height
and its anomalies at 500-hPa
Contour: geopotential height (m)
Shading: geopotential height anomalies (m)



Three month mean
temperature
and its anomalies at 850-hPa
Contour: temperature (˚C)
Shading: temperature anomalies (˚C)

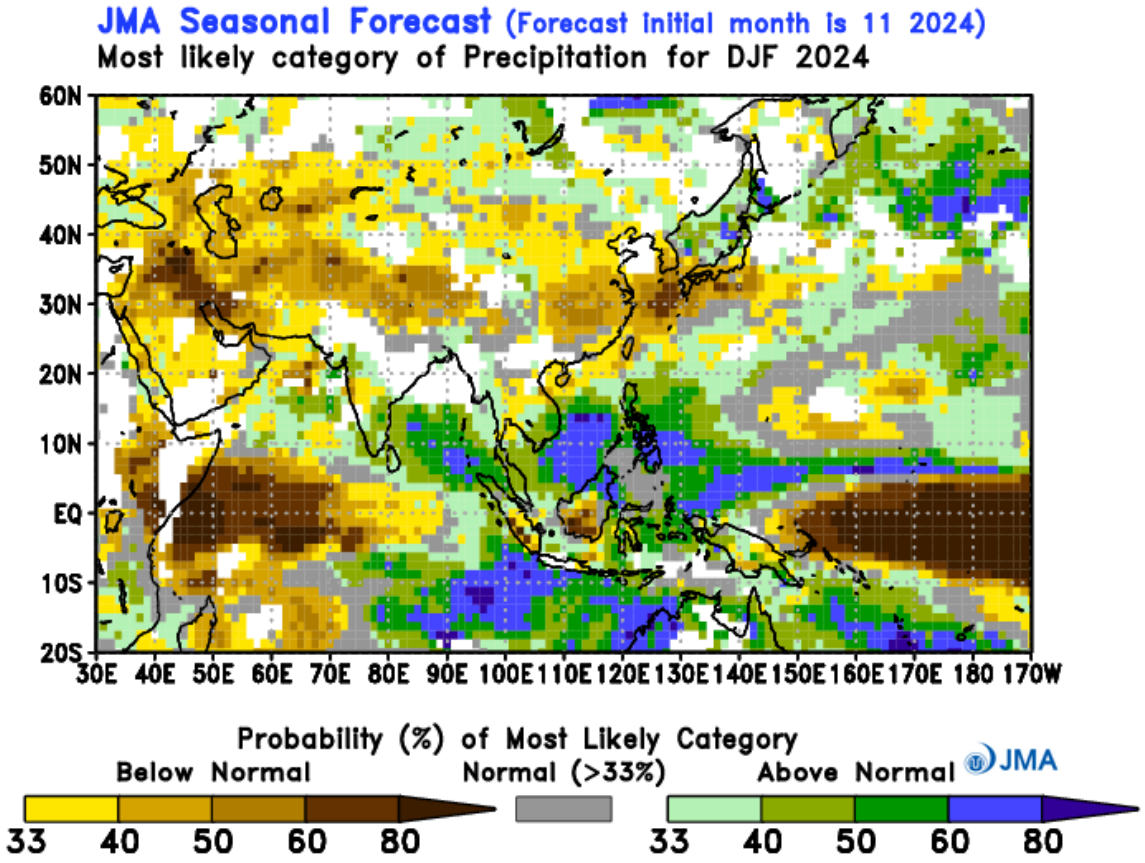


Three month mean
sea level pressure (SLP)
and its anomalies
Contour: sea level pressure (hPa)
Shading: sea level pressure anomalies (hPa)

Verification based on hindcast https://www.data.jma.go.jp/tcc/tcc/products/model/hindcast/CPS3/index.html

<DJF 2024-25> Probability Forecasts (precipitation)

- A high probability of above-normal precipitation is predicted from the eastern Indian Ocean to near Southeast Asia.
- A high probability of below-normal precipitation is predicted over the western equatorial Indian Ocean, from the western to central equatorial Pacific, and from the Middle East to southern East Asia.

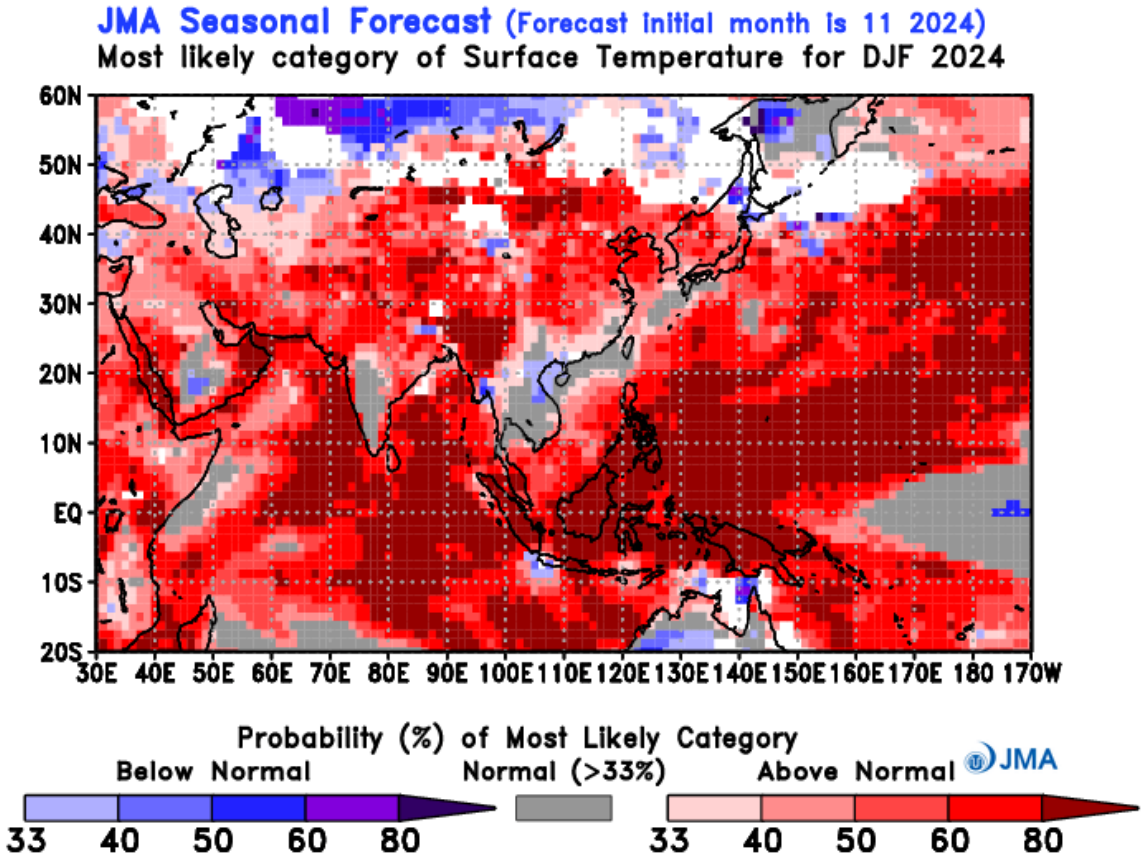


Verification based on hindcast

https://www.data.jma.go.jp/tcc/tcc/products/model/probfcst/3-mon/hind/html/skill_score_reg.html
https://www.data.jma.go.jp/tcc/tcc/products/model/probfcst/3-mon/hind/html/skill_2d_3-mon.html

<DJF 2024-25> Probability Forecasts (temperature)

- A high probability of above-normal temperatures is predicted over a wide area from the Indian Ocean to the western Pacific, over South Asia, and over southern East Asia.
- A high probability of below-normal temperatures is predicted to the north of 50°N over Eurasia.



Verification based on hindcast

https://www.data.jma.go.jp/tcc/tcc/products/model/probfcst/3-mon/hind/html/skill_score_reg.html
https://www.data.jma.go.jp/tcc/tcc/products/model/probfcst/3-mon/hind/html/skill_2d_3-mon.html

Explanatory Notes (1)

Latest state of the climate system

- Extreme climate events and surface climate conditions are based on CLIMAT messages.
  For details, see https://www.data.jma.go.jp/tcc/tcc/products/climate/index.html
- SST products are based on MGDSST and COBE-SST2 data.
  For details, see
  MGDSST https://www.data.jma.go.jp/goos/data/rrtdb/jma-pro/mgd_sst_glb_D.html
  COBE-SST2 https://www.data.jma.go.jp/tcc/tcc/products/elnino/cobesst2_doc.html
- Atmospheric circulation products are based on JRA-3Q data:

  https://jra.kishou.go.jp/JRA-3Q/index_en.html

  For details, see https://www.data.jma.go.jp/tcc/tcc/products/clisys/index.html
- The base period for the normal is 1991 – 2020.

Three-month predictions and warm/cold season predictions

- Products are generated using JMA's seasonal EPS which is based on the CGCM.
  For details, see https://www.data.jma.go.jp/tcc/tcc/products/model/index.html
- Unless otherwise noted, atmospheric circulation prediction products are based on the ensemble mean, and anomalies are deviations from the 1991 – 2020 average for hindcasts.

Contact: tcc@met.kishou.go.jp

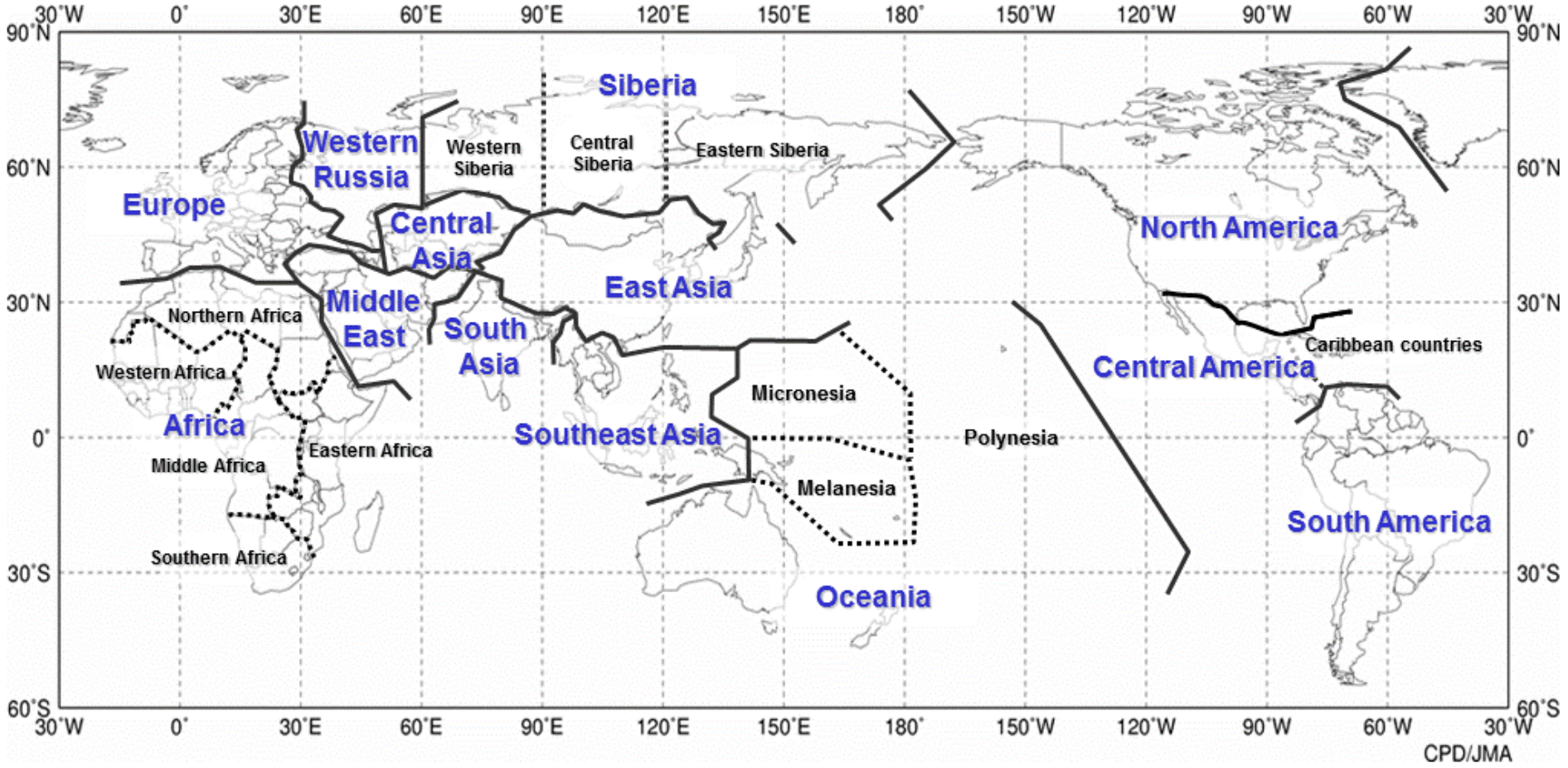
Explanatory Notes (2)

SST monitoring indices (NINO.3, NINO.WEST and IOBW)

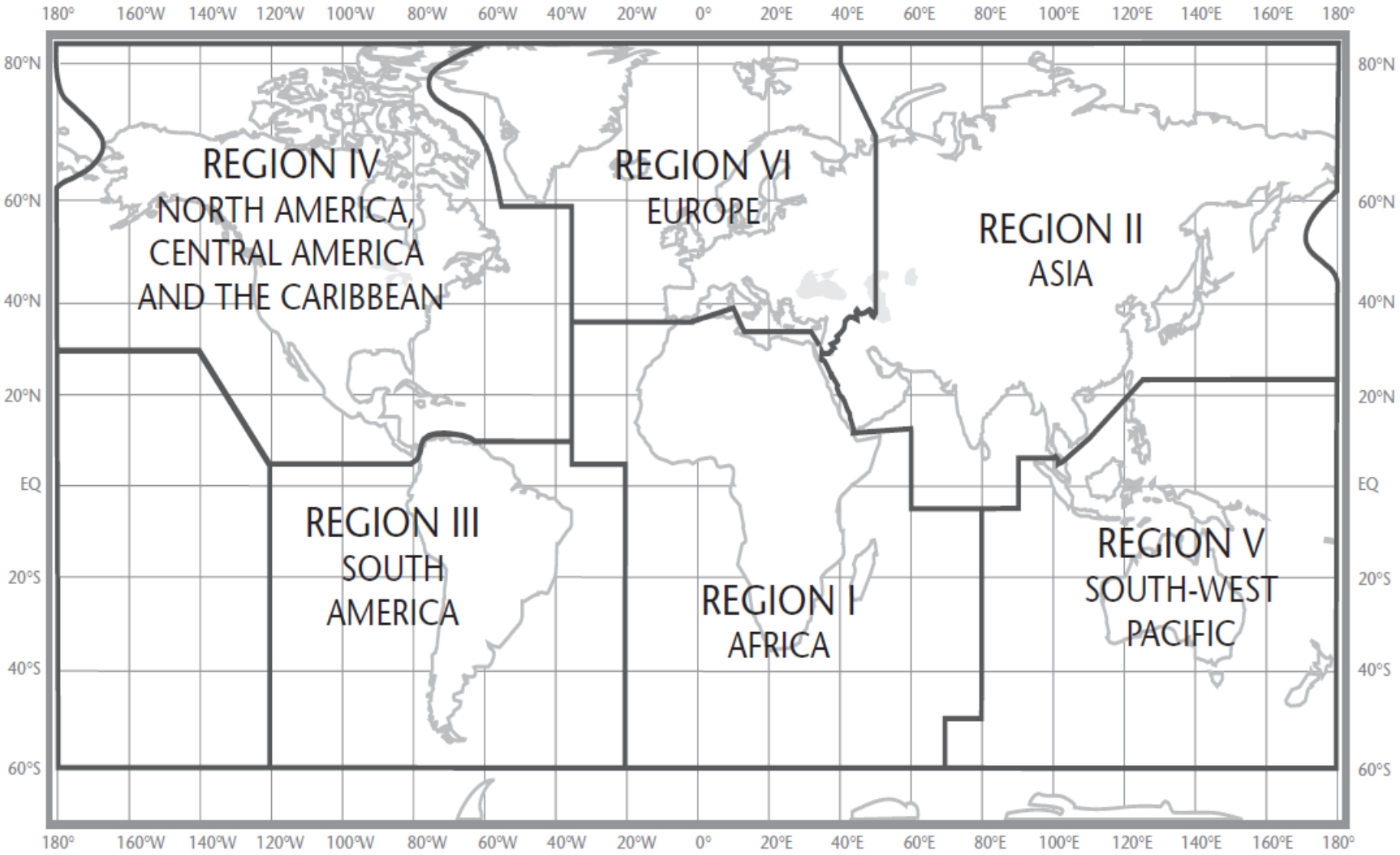
- The SST baseline for NINO.3 region (5˚S – 5˚N, 150˚W – 90˚W) is defined as a monthly average over a sliding 30-year period (e.g., 1994 – 2023 for 2024). The thresholds of above the baseline, near the baseline, and below the baseline categories are +0.5 and -0.5.
- The SST baselines for the NINO.WEST region (Eq. – 15˚N, 130˚E – 150˚E) and the IOBW region (20˚S – 20˚N, 40˚E – 100˚E) are defined as linear extrapolations with respect to a sliding 30-year period in order to remove the effects of significant long-term warming trends observed in these regions. The thresholds of above the baseline, near the baseline, and below the baseline categories are +0.15 and -0.15.
- These SST indices are derived from MGDSST datasets after June 2015 and those of COBE-SST2 before this.

Contact: tcc@met.kishou.go.jp

Names of world regions



WMO Regional Association regions



Reference: WMO General Regulations

TCC website

気象庁 Japan Meteorological Agency

Tokyo Climate Center
WMO Regional Climate Center in RA II (Asia)

WMO

TCC home | About TCC | Site Map | Contact us

Home | World Climate | Climate System Monitoring | El Niño Monitoring | NWP Model Prediction | Global Warming | Climate in Japan | Training Module | Press release | Links

HOME

What are WMO RCCs

WMO RCCs are centres of excellence...

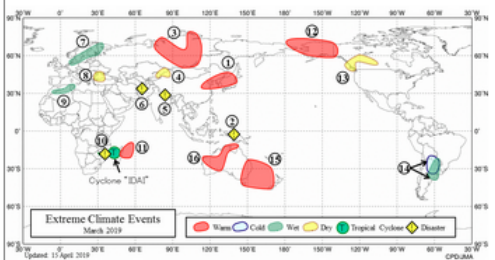
RCC Functions

- **Operational Activities for Long-range Forecasting (LRF)**
- **Operational Activities for Climate Monitoring**
- **Operational Data Services, to support operational LRF and climate monitoring**
- **Training in the use of operational RCC products and services**

Latest Updates

World Climate Updated: 15 April 2019

The latest monthly report is issued on 15 April 2019.



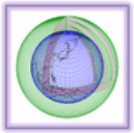
Distribution of Extreme Climate Event (March 2019)

Climate System Monitoring	Updated 15 April 2019
El Niño Monitoring	Updated: 10 April 2019
Monthly Discussion	Updated: 25 March 2019
Global Warming	Updated: 15 April 2019
Climate in Japan	Updated: 10 April 2019
STRATALERT TOKYO	

Main Products

iTacs

iTacs, Interactive Tool for Analysis of the Climate System, is a web-based application to assist NMHSs to analyses extreme climate events and to monitor climate status.

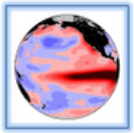


WMC Tokyo

Products of long-range forecast from World Meteorological Centre (WMC) Tokyo are available. These products are based on JMA's ensemble prediction system.

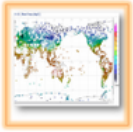
Monthly Discussion on Seasonal Climate Outlook

This is intended to assist NMHSs in the Asia-Pacific region in interpreting WMC Tokyo's three-month prediction and warm/cold season prediction products.



El Niño Monitoring

"El Niño Outlook" consists of a diagnosis of current condition and prediction of El Niño/Southern Oscillation. This is issued every month around 10th.



ClimatView

The ClimatView tool enables viewing and downloading of monthly world climate data, including monthly temperature/precipitation statistics and 30-year climate normals.

TCC News

TCC News, a quarterly newsletter from Tokyo Climate Center, acquaints with significant climate disasters and events, forecaster's commentaries on seasonal outlooks, besides topics on the renewal and the usage of TCC products.

What's New RSS

19 March 2019 W NE

- Announcement: Incorpotation of Standardized Precipitation Index (SPI) into the ClimatView tool.

14 March 2019 W NE

- Announcement: New JMA's One-month Guidance Tool (password required) is launched. Please refer to the commentary for details.

1 March 2019 W NE

- TCC News No. 55 (Winter 2019: PDF)
  - Global surface temperature for 2018 the fourth highest since 1891
  - Highlights of the Global Climate in 2018
  - Summary of Japan's Climatic Characteristics for 2018
  - TCC Activity Report for 2018
  - TCC contribution to WMO International Workshop on RCC Operations

21 December 2018 W NE

- Press release: Global temperature for 2018 to be the 4th highest since 1891 (Preliminary)

» Previous news

» Press release

Links

Regional Climate Centers

- RA II Regional Climate Center (RCC) Network Homepage
- Beijing Climate Center
- National Climate Centre, Pune W NE
- North Eurasian Climate Center (NEACC)
- WMO RA VI RCC-Network

Regional Climate Outlook Forum (RCOF)

- Forum on Regional Climate Monitoring-Assessment-Prediction for Asia (FOCRAII)
- East Asia winter Climate Outlook Forum (EASCOF)
- South Asian Climate Outlook Forum (SASCOF)
- ASEAN Climate Outlook Forum (ASEANCOF)

WMO RA II Climate Services

https://www.data.jma.go.jp/tcc/tcc/index.html