Monthly Discussion on Seasonal Climate Outlooks (No. 121)

(19 March 2024)

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

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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

- Oceanic indicators suggest that ongoing El Niño conditions in the equatorial Pacific have already peaked and are now gradually weakening.
- El Niño conditions are likely to transition to ENSO-neutral conditions during boreal spring (80%).
- During boreal summer, it is more likely that ENSO-neutral conditions will continue (60%) than La Niña conditions will develop (40%).

Prediction for April-May-June 2024 (AMJ 2024)

- In the upper troposphere, large-scale divergence anomalies are predicted over the Indian Ocean and from South America to the Atlantic, while large-scale convergence anomalies are predicted over a wide area in the Pacific.
- A high probability of above-normal precipitation is predicted from the tropical Indian Ocean to the Maritime Continent. A high probability of below-normal precipitation is predicted from the Indochina Peninsula to the subtropical western North Pacific.
- A high probability of above-normal temperatures is predicted over a wide area of Asia, particularly in the tropics from the Indian Ocean to the western Pacific, implying a significantly hot pre-monsoon period in South Asia and the Indochina Peninsula. A high probability of below-normal temperatures is predicted over the Sea of Okhotsk.

1. Summary and Discussion (cont.)

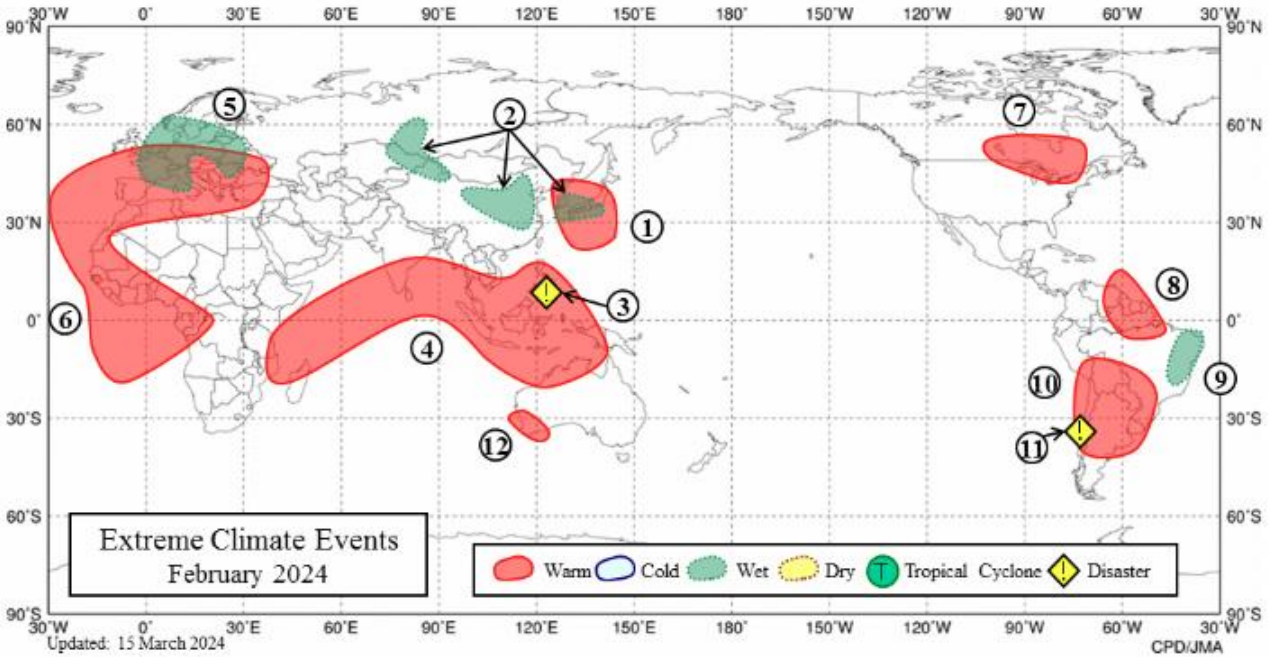
Prediction for June-July-August 2024 (JJA 2024)

- In the upper troposphere, large-scale divergence anomalies are predicted over the Indian Ocean and over the Atlantic, while large-scale convergence anomalies are predicted over a wide area in the Pacific.
- A high probability of above-normal precipitation is predicted around the Maritime Continent. A high probability of below-normal precipitation is predicted over the tropical western Pacific.
- A high probability of above-normal temperatures is predicted from the Middle East to the tropical western Pacific through the northern Indian Ocean. A high probability of below-normal temperatures is predicted over the Sea of Okhotsk.

2. Latest State of the Climate System

February 2024

<February 2024> Extreme Climate Events



	Type	Area
1	Warm	From Honshu region of Japan to the Korean Peninsula
2	Wet	From eastern Japan to southern Western Siberia
3	Heavy Rain	The southern Philippines
4	Warm	From Southeast Asia to the southwestern Indian Ocean
5	Wet	From eastern to western Europe

	Type	Area
6	Warm	From southeastern Europe to the eastern South Atlantic
7	Warm	Southeastern Canada
8	Warm	Northeastern South America
9	Wet	Eastern Brazil

	Type	Area
10	Warm	From central to southern South America
11	Wildfire	Chile
12	Warm	Southwestern Australia

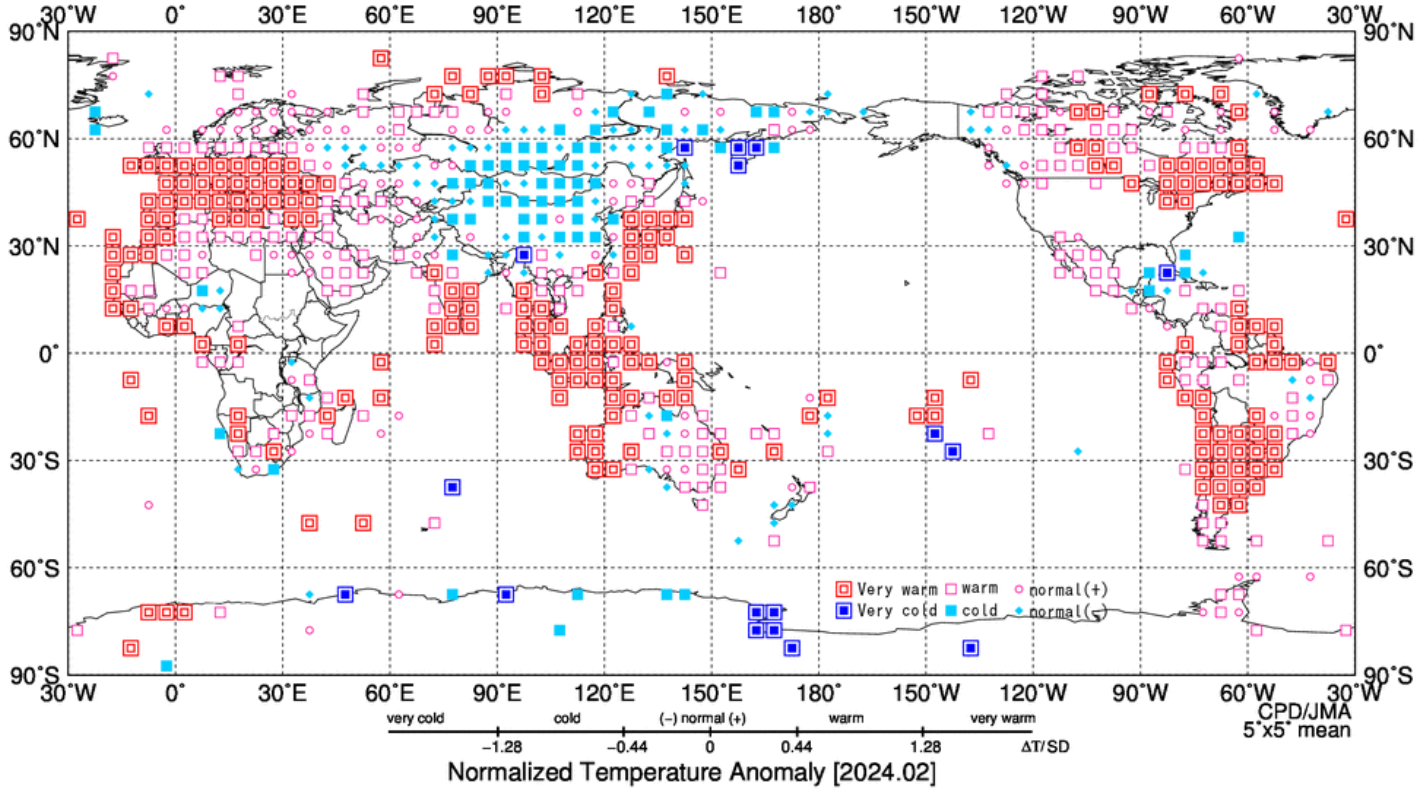
<Monthly Report on Global Extreme Climate Events>

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

<February 2024> Temperature

- Monthly mean temperatures were extremely high from Honshu region of Japan to the Korean Peninsula, from Southeast Asia to the southwestern Indian Ocean, from southeastern Europe to the eastern South Atlantic, in southeastern Canada, in northeastern South America, from central to southern South America, and in southwestern Australia.

Normalized anomaly of monthly mean temperature

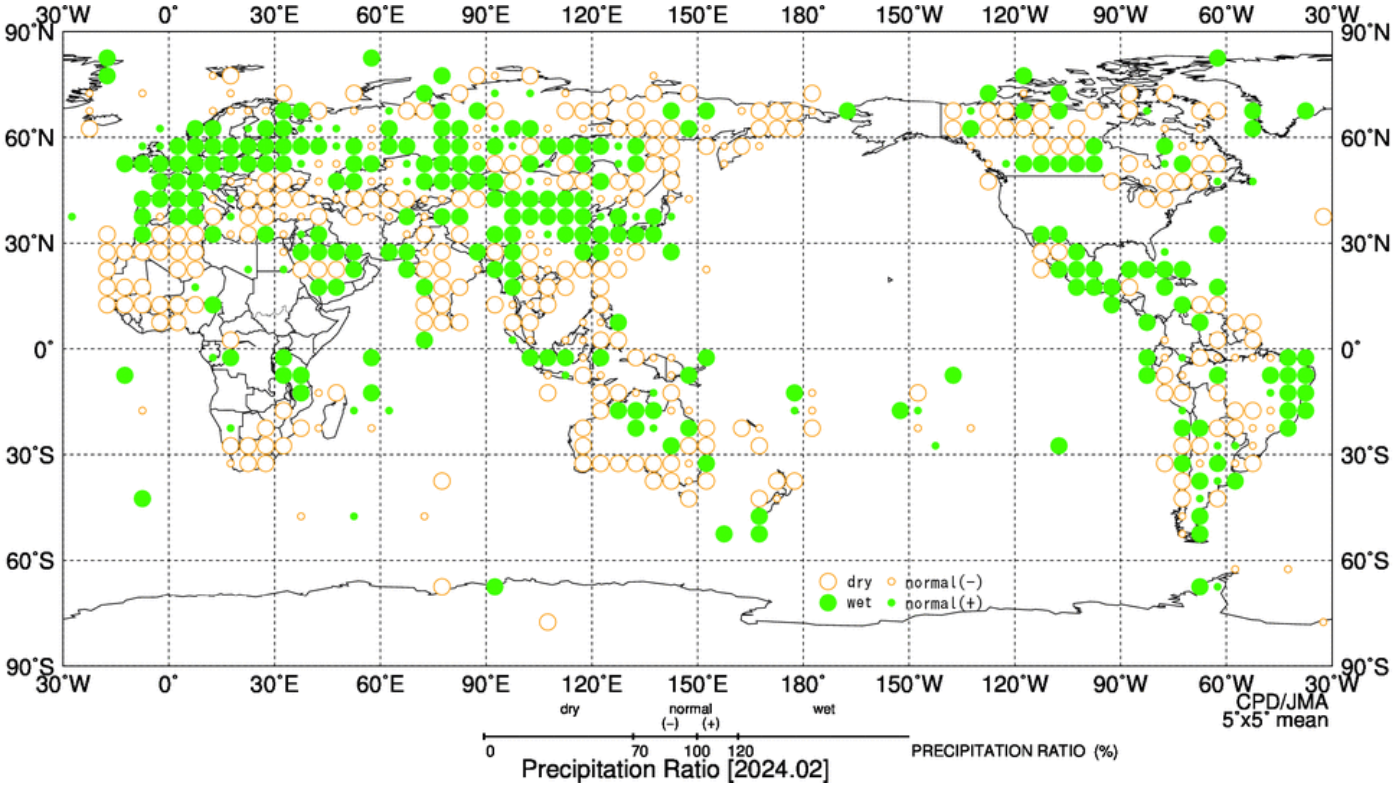


<World Climate Chart (Monthly)> https://www.data.jma.go.jp/tcc/tcc/products/climate/climfig/?tm=monthly

<February 2024> Precipitation

- Monthly precipitation amounts were extremely high from eastern Japan to southern Western Siberia, from eastern to western Europe, and in eastern Brazil.

Monthly precipitation ratio

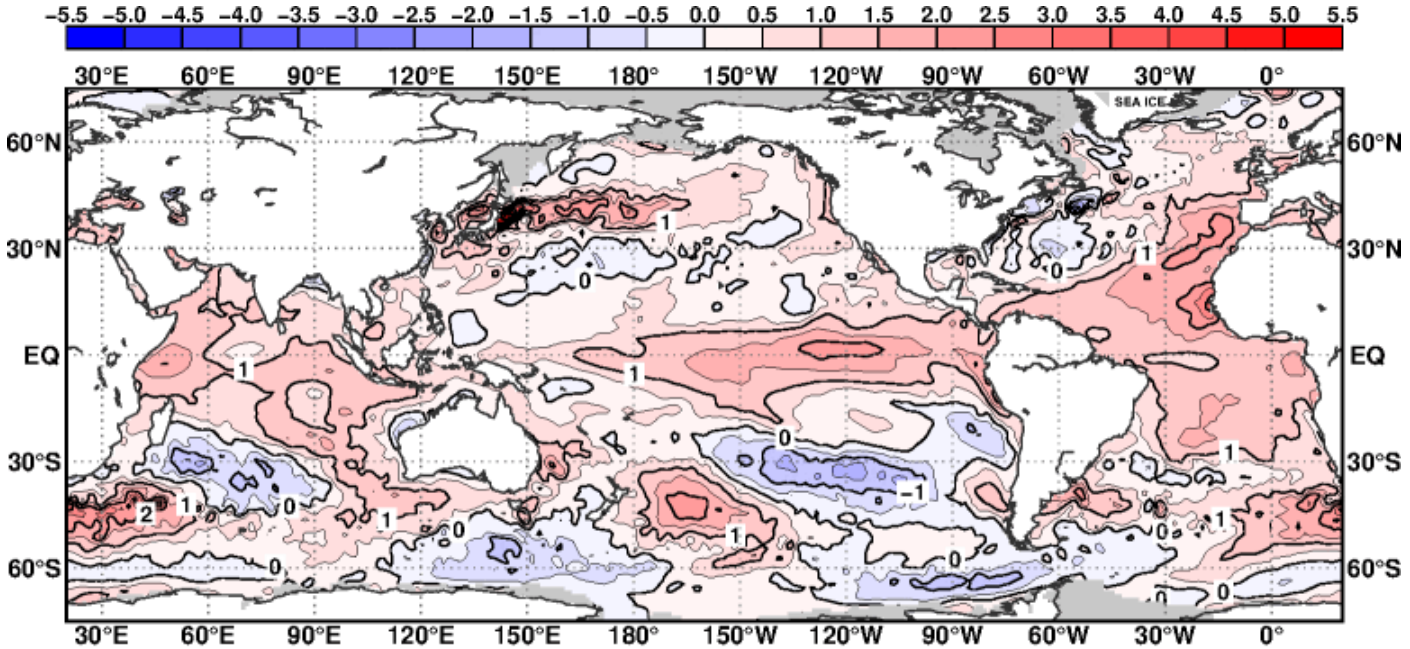


<World Climate Chart (Monthly)> https://www.data.jma.go.jp/tcc/tcc/products/climate/climfig/?tm=monthly

<February 2024> Sea Surface Temperature (SST)

- In the equatorial Pacific, remarkably positive SST anomalies were observed particularly from the central to eastern parts.
- In the North Pacific, remarkably positive anomalies were observed from the western to central mid-latitudes.
- In the Indian Ocean, remarkably positive anomalies were observed in the tropics.

Monthly mean SST anomaly (˚C)



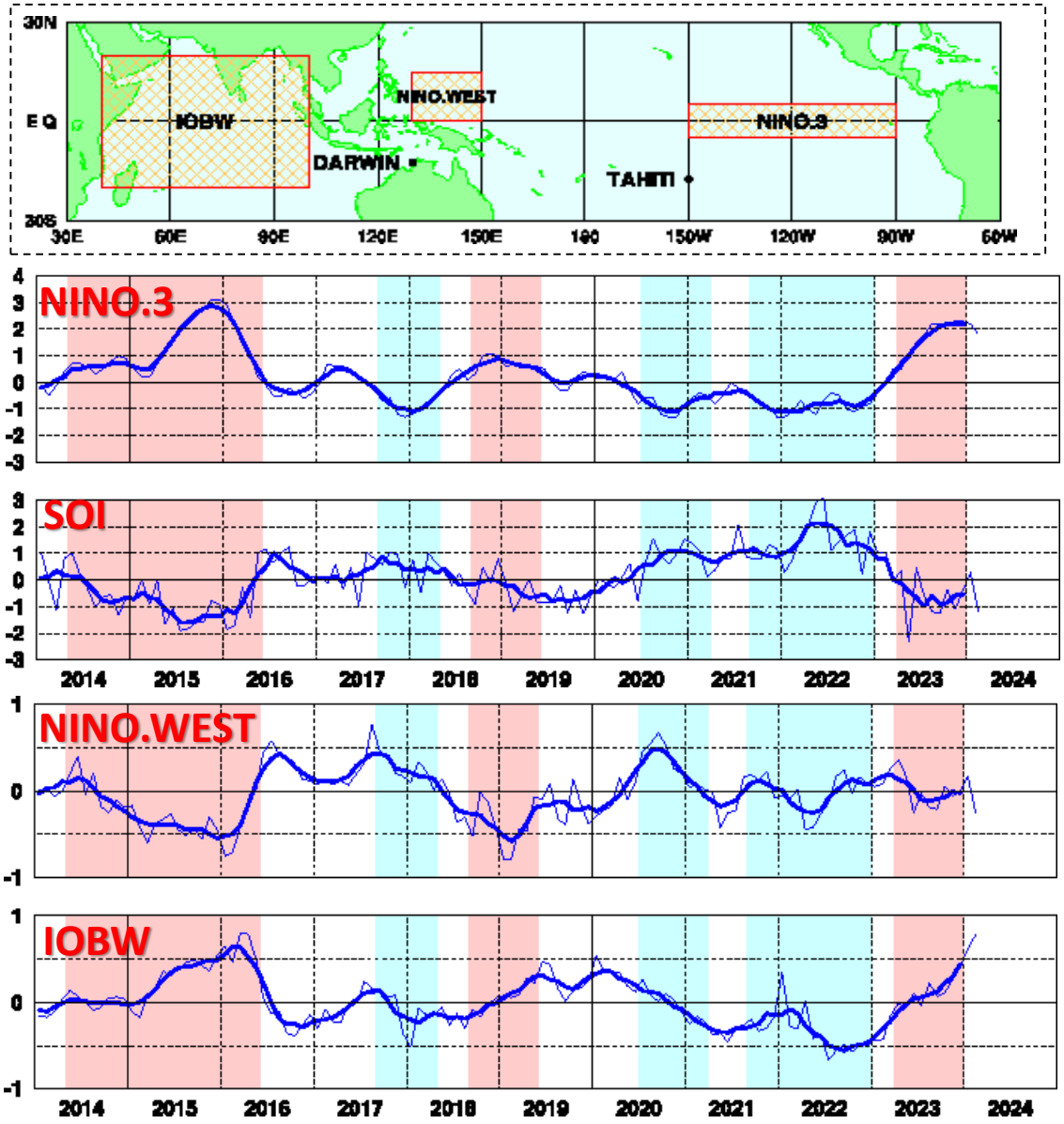
Monthly mean sea surface temperature anomalies based on COBE-SST2 and MGDSST* (Feb. 2024)
The contours and shading show sea surface temperature anomalies at intervals of 0.5°C.
The gray shading indicates maximum coverage of sea ice.
The baseline period for climatological normal is from 1991 to 2020.
(*) COBE-SST2: until 31 May 1985, MGDSST: after that date

CPD/JMA

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

<February 2024> ENSO Monitoring Indices

- Oceanic indicators suggest that ongoing El Niño conditions in the equatorial Pacific have already peaked and are now gradually weakening.
- The NINO.3 SST was above normal with a deviation of +1.8ºC in February 2024.
- The Southern Oscillation Index (SOI) value was +1.1.
- The area-averaged SST in the tropical western Pacific (NINO.WEST) region was below normal.
- The area-averaged SST in the tropical Indian Ocean (IOBW) region was above normal.



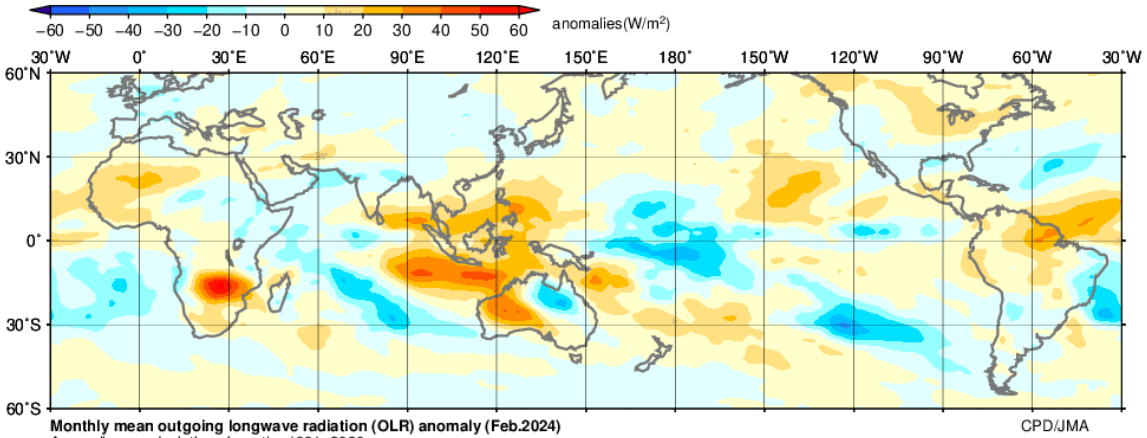
Monthly values (thin lines) and five-month running means (thick lines). The shading indicates El Niño (red) and La Niña (blue) events.

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

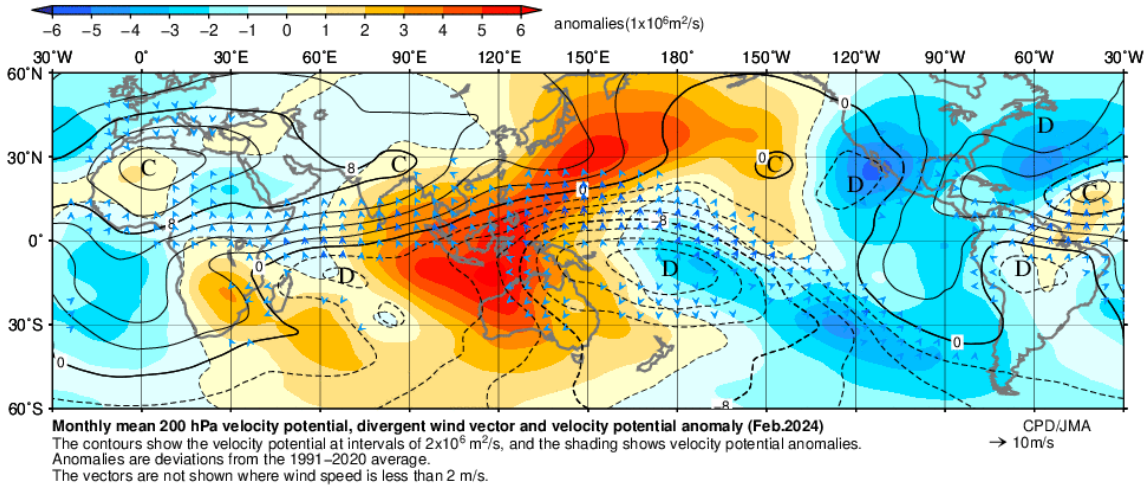
<February 2024> Convective activity in the Tropics

- Convective activity was enhanced over the tropical central Pacific and the western to central parts of the Indian Ocean, and suppressed from the eastern Indian Ocean to Indonesia, and from the tropical South America to the western Africa.

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



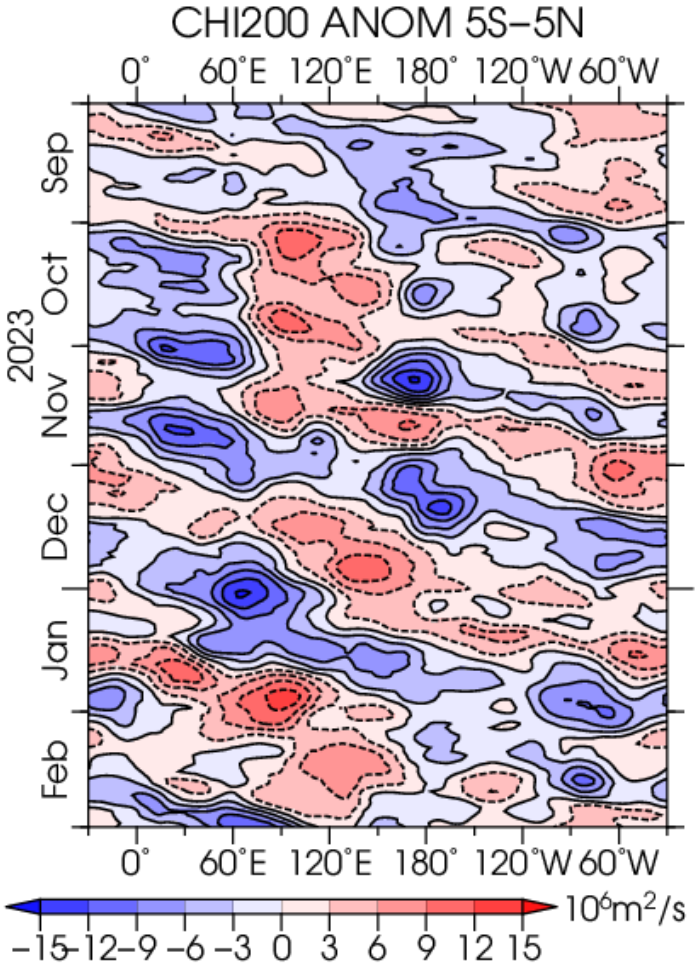
Monthly mean
Velocity potential,
Divergent wind vector, and
Velocity potential anomalies
at 200-hPa
Contour: velocity potential ($10^6 m^2/s$)
Vector: divergent wind vector (m/s)
Shading: velocity potential anomalies ($10^6 m^2/s$)
"D" and "C" indicate the centers of large-scale divergence and convergence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

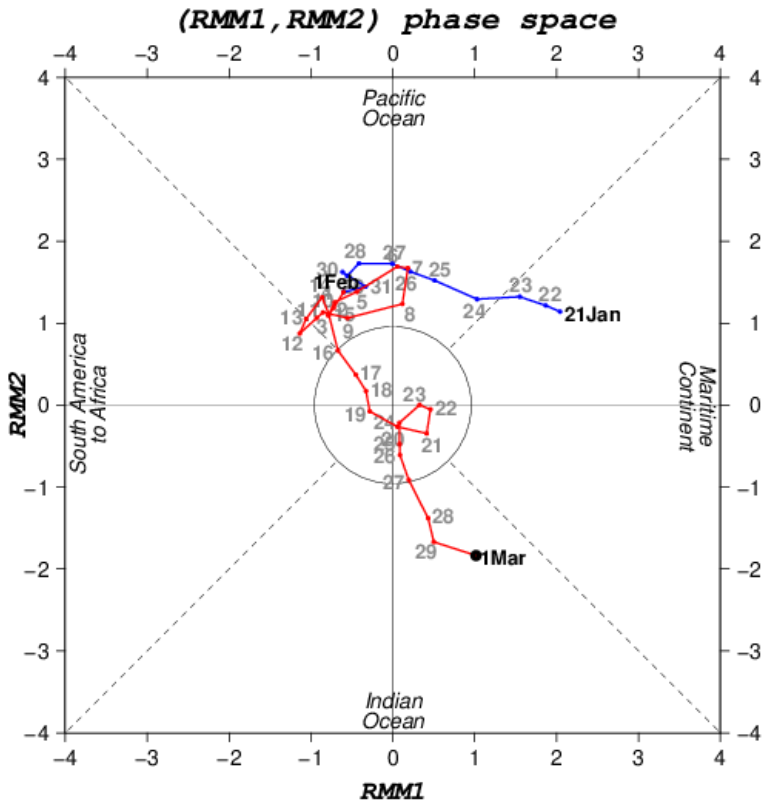


<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<February 2024> Equatorial Intraseasonal Oscillation

- Eastward propagation of the active phase of equatorial intraseasonal oscillation was unclear.





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

MJO diagram

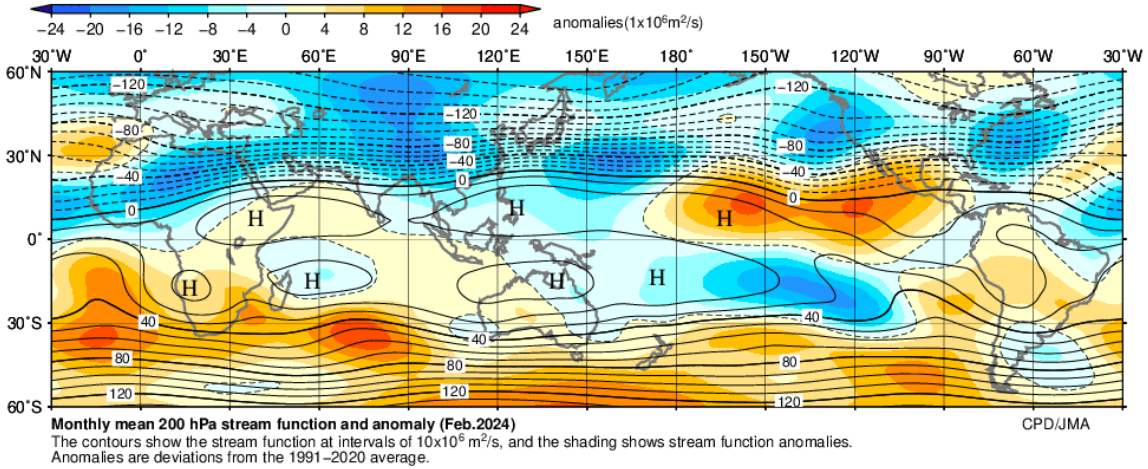
<MJO> https://www.data.jma.go.jp/tcc/tcc/products/clisys/mjo/moni_mjo.html

<February 2024> Upper-level Circulation

- In the upper troposphere, anti-cyclonic circulation anomalies straddling the equator were seen over the central to eastern Pacific. A wavy anomaly pattern was seen over the subtropical region in the Northern Hemisphere.

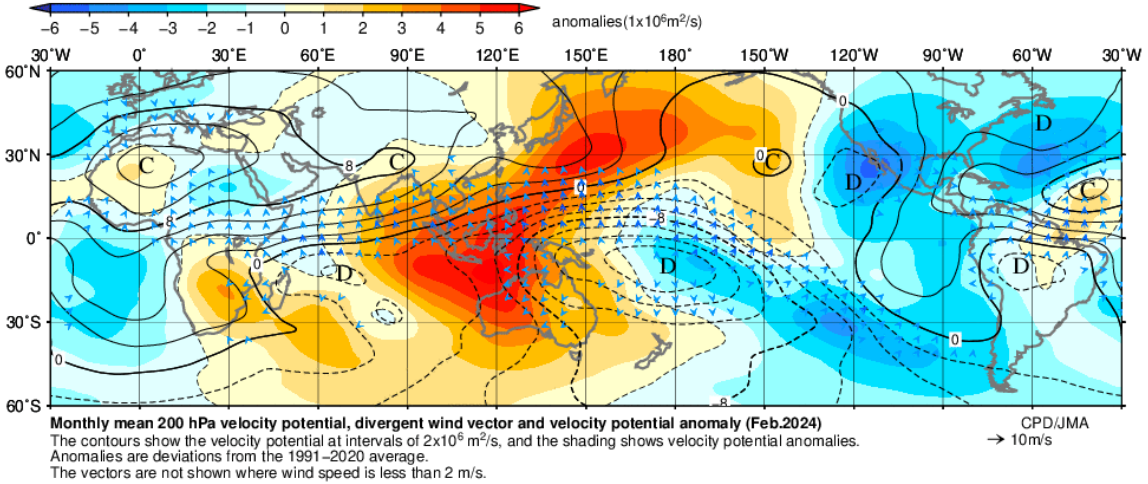
Monthly mean Stream function and its anomalies at 200-hPa

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.



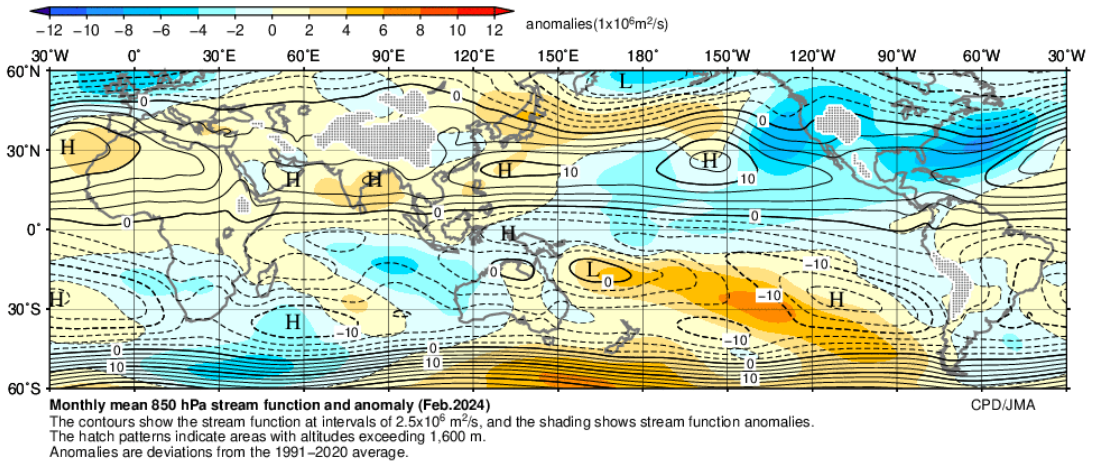
<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<February 2024> Low-level Circulation

- In the lower troposphere, cyclonic circulation anomalies straddling the equator were seen over the central Pacific, and anti-cyclonic circulation anomalies straddling the equator were also seen from the eastern Indian Ocean to the Maritime Continent.
- In the sea level pressure field along the equator, positive anomalies were seen over the tropical region, and negative anomalies were seen over the subtropical region of the central South Pacific.

Monthly mean Stream function and its anomalies at 850-hPa

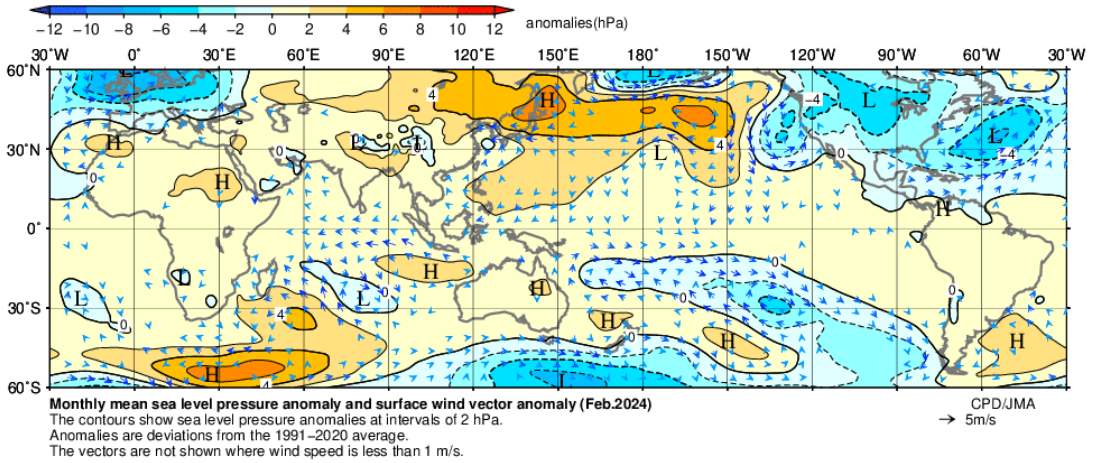
Contour: stream function ($10^6 m^2/s$)
Shading: stream function anomalies ($10^6 m^2/s$)
"H" and "L" indicate the centers of anti-cyclonic and cyclonic circulations, respectively.



Monthly mean 850 hPa stream function and anomaly (Feb.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.
Anomalies are deviations from the 1991–2020 average.

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.

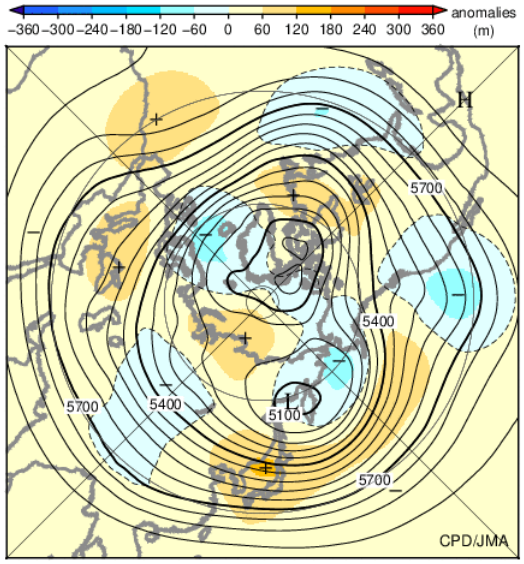


Monthly mean sea level pressure anomaly and surface wind vector anomaly (Feb.2024)
The contours show sea level pressure anomalies at intervals of 2 hPa.
Anomalies are deviations from the 1991–2020 average.
The vectors are not shown where wind speed is less than 1 m/s.

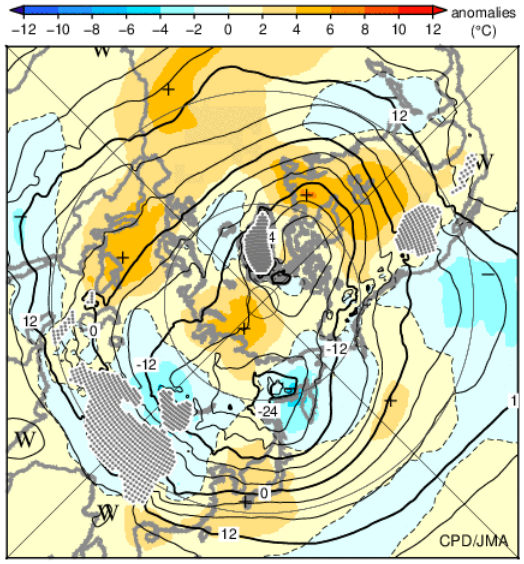
<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<February 2024> Northern Hemisphere Circulation

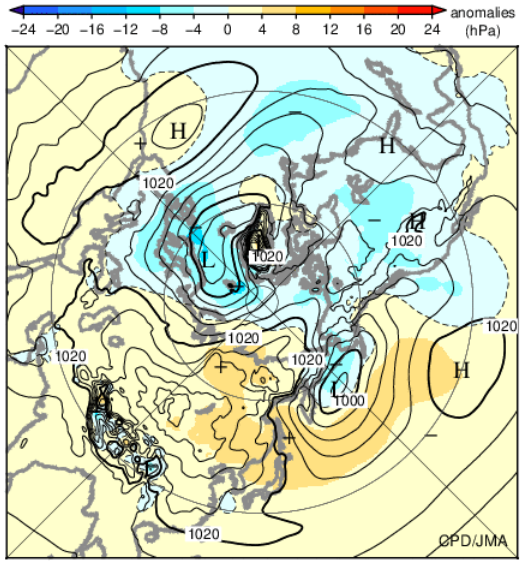
- In the 500-hPa height field, the polar vortex in the Northern Hemisphere split with positive anomalies from Western to Central Siberia and negative anomalies to the northwest of Europe and over the eastern part of Eastern Siberia. Wave trains were dominant over the Northern Hemisphere mid-latitudes with positive anomalies over northeastern North America, from northwestern Northern Africa to southern Europe, from Japan to the east, and negative anomalies to the west of the USA and over southern Western Siberia.
- Temperatures at 850-hPa were above normal over North America, from the southern North Atlantic to southern Europe and over Japan, and negative anomalies to the southwest of the USA, over southern Western Siberia, and over Eastern Siberia.
- In the sea level pressure field, positive anomalies were seen over a wide area from Central Siberia to the mid-latitude North Pacific through Japan, and negative anomalies were seen over a wide area from North America to western Europe. The Aleutian Low was generally weaker than normal except over its northern part.



Monthly mean 500 hPa height and anomaly in the Northern Hemisphere (Feb.2024)



Monthly mean 850 hPa temperature and anomaly in the Northern Hemisphere (Feb.2024)



Monthly mean sea level pressure and anomaly in the Northern Hemisphere (Feb.2024)

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)

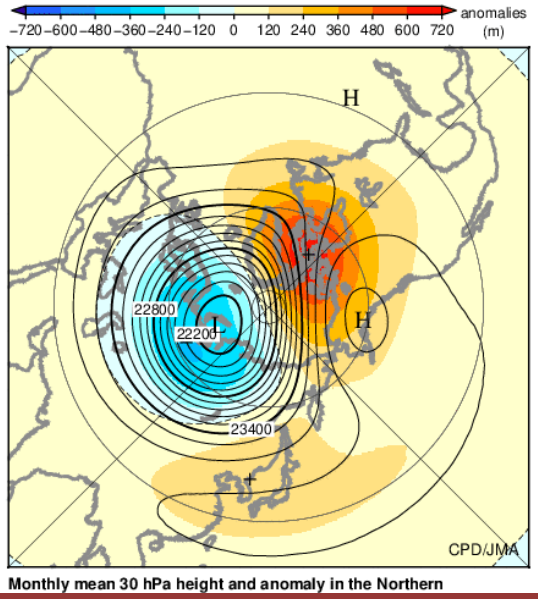
Monthly mean sea level pressure and its anomalies

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

<February 2024> Stratospheric Circulation

- In the 30-hPa height field, the polar vortex was displaced toward Western Russia in association with positive anomalies over a wide area of the Arctic region. The major stratospheric sudden warming occurred in middle February.
- The negative height anomalies over Western Russia and positive height anomalies over the Arctic region (i.e., the northward extension of the Aleutian High) in the stratosphere possibly affected the anomalous circulation in the troposphere through processes of the downward propagation of planetary waves and the thermal wind balance.

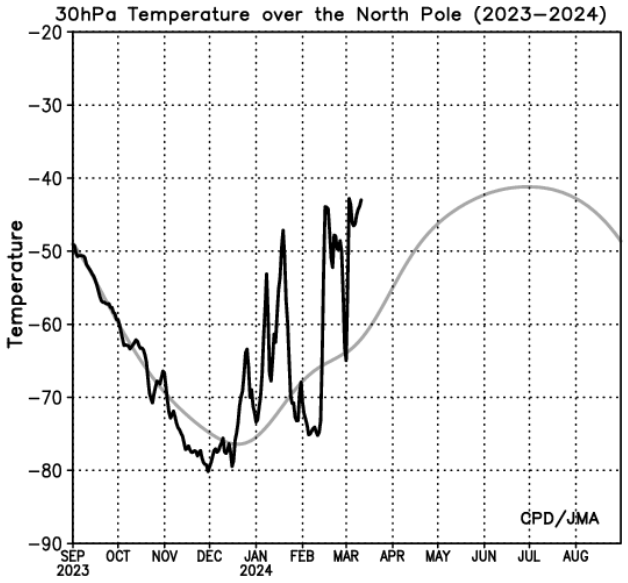


Monthly mean 30 hPa height and anomaly in the Northern

Monthly mean geopotential height and its anomalies at 30-hPa

Contour: geopotential height (m)

Shading: geopotential height anomalies (m)



Time-series representation of temperatures at 30-hPa over the North Pole

Black line: daily temperatures (°C)

Gray line: normal (°C)

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

<Stratospheric Circulation> https://www.data.jma.go.jp/tcc/tcc/products/clisys/STRAT/index.html

3. Three-month Predictions

April – May - June 2024
(AMJ 2024)

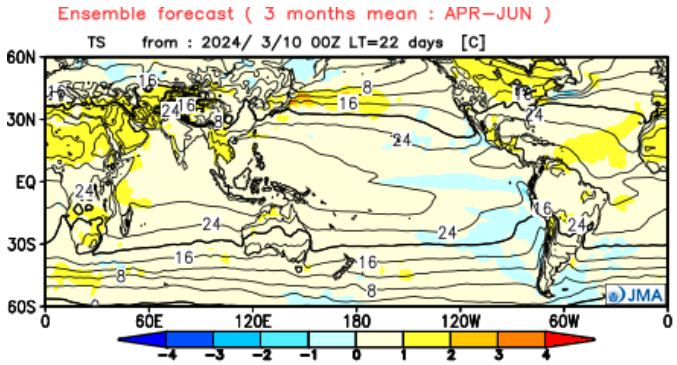
(Initial date for the Seasonal EPS: 10 March 2024)

<AMJ 2024> Sea Surface Temperature (SST)

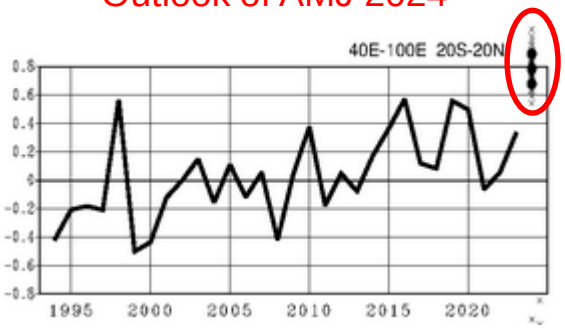
- El Niño conditions are likely to transition to ENSO-neutral conditions during boreal spring (80%). During boreal summer, it is more likely that ENSO-neutral conditions will continue (60%) than La Niña conditions will develop (40%).
- The NINO.WEST SST is likely to be near or below normal during boreal spring, and almost near normal during boreal summer.
- The IOBW SST is likely to be above normal until boreal summer. Note that the significantly above-normal IOBW SST anomaly is predicted in boreal spring.

Three month mean Sea surface temperature (SST)

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



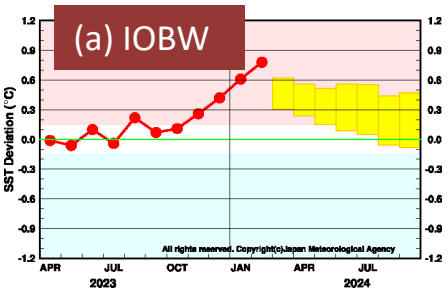
Inter-annual variability of IOBW SST anomaly

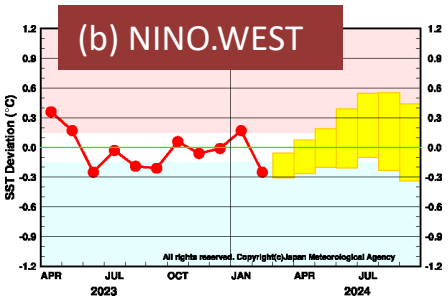


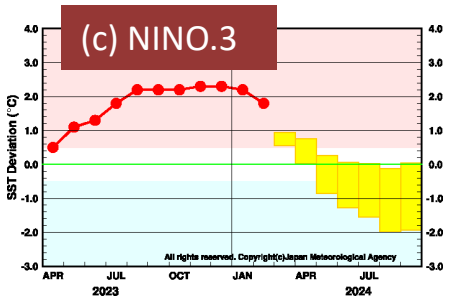
ENSO forecast probabilities

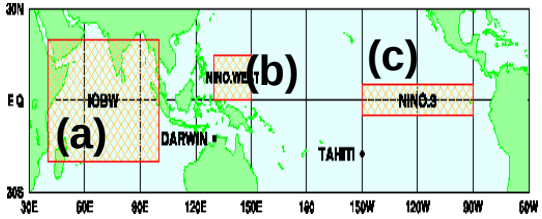
YEAR	MONTH	mean period	El Niño	ENSO neutral	La Niña
2024	JAN	NOV2023–MAR2024	100		
	FEB	DEC2023–APR2024	100		
	MAR	JAN2024–MAY2024	100		
	APR	FEB2024–JUN2024	40	60	
	MAY	MAR2024–JUL2024	20	80	
	JUN	APR2024–AUG2024	10	70	20
	JUL	MAY2024–SEP2024		60	40

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

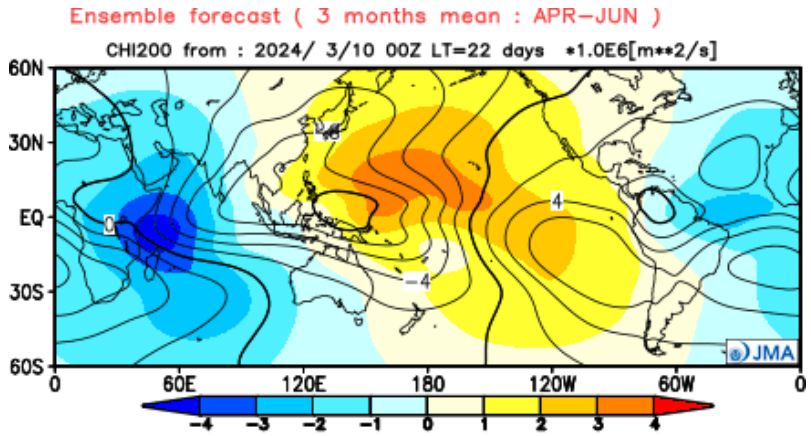
(See "Explanatory Notes (2)" for the definition of the SST indices.)

<AMJ 2024> Global Circulation

- In the 200-hPa velocity potential field, negative (large-scale divergence) anomalies are predicted over the Indian Ocean and from South America to the Atlantic, while positive (large-scale convergence) anomalies are predicted over a wide area in the Pacific.
- In the 200-hPa stream function field, anti-cyclonic circulation anomalies straddling the equator are predicted from the eastern tropical Pacific to the Atlantic. Cyclonic circulation anomalies straddling the equator are predicted from the eastern Indian Ocean to the Maritime Continent, particularly over East Asia, corresponding to the southward shift of the subtropical jet over Eurasia.

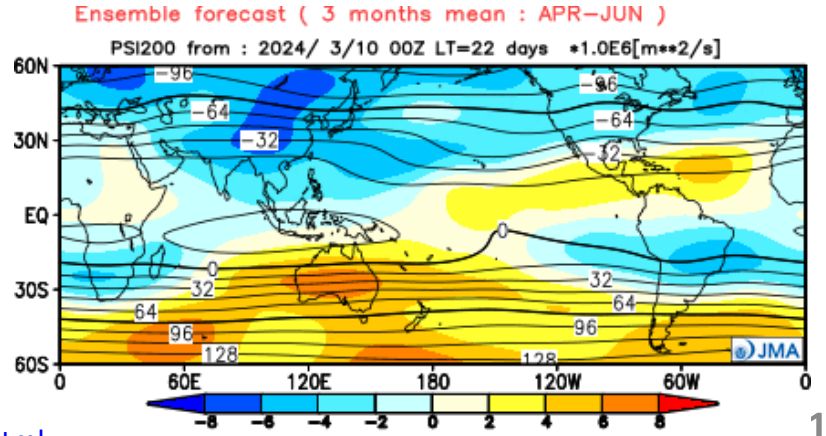
Three month mean 200-hPa velocity potential

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

<AMJ 2024> Asian Circulation

- In the 850-hPa stream function field, anti-cyclonic circulation anomalies are predicted from the Bay of Bengal to the subtropical western North Pacific, which are possibly associated with the positive IOBW-related above-normal precipitation over the equatorial Indian Ocean and the below-normal precipitation over the latitude band of 10°N in the western North Pacific through the process of Kelvin-wave induced Ekman divergence.
- In the sea level pressure field, positive and negative anomalies are predicted over the subtropical western North Pacific and the equatorial Indian Ocean, respectively.
- Above-normal precipitation is predicted over 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

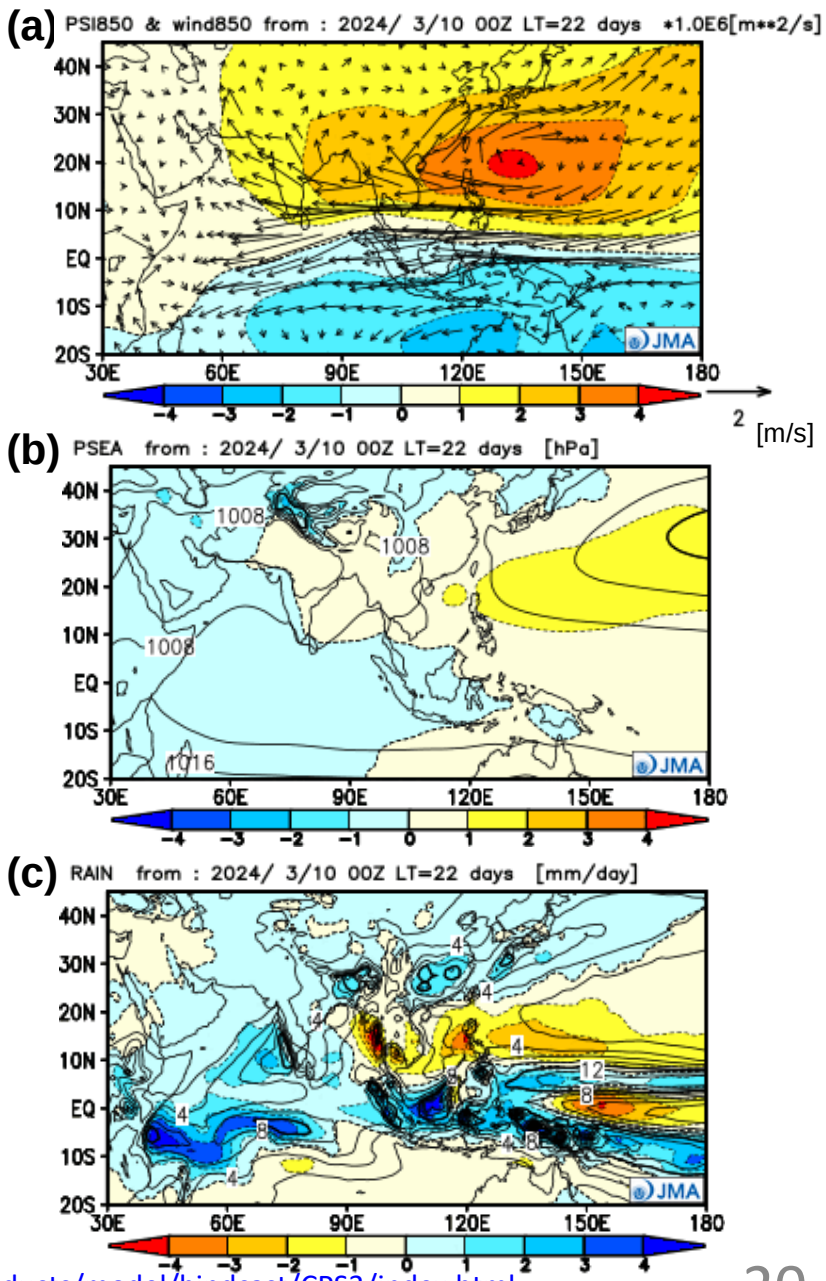
Contour: sea level pressure (hPa)

Shading: sea level pressure anomalies (hPa)

(c) precipitation and its anomalies

Contour: precipitation (mm/day)

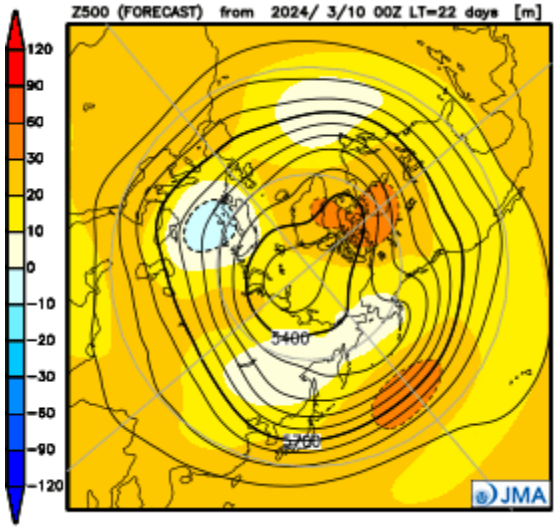
Shading: precipitation anomalies (mm/day)



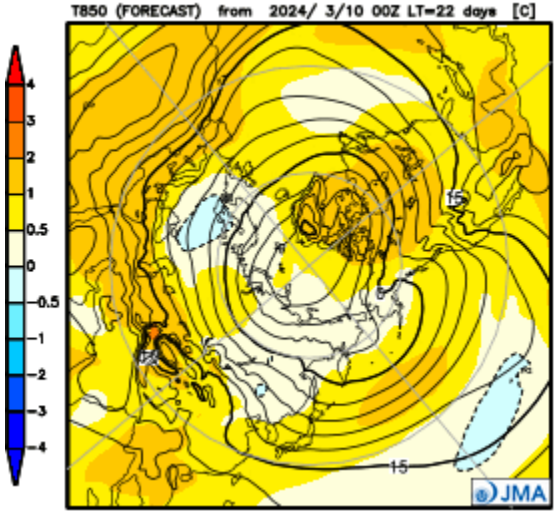
Verification based on hindcast https://www.data.jma.go.jp/tcc/tcc/products/model/hindcast/CPS3/index.html

<AMJ 2024> Northern Hemisphere circulation

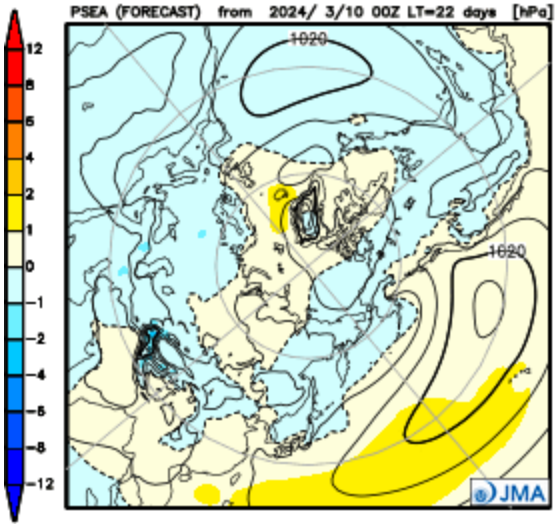
- In the 500-hPa height field, positive anomalies are predicted over a wide area of the Northern Hemisphere mid- and high-latitudes, except over northern Europe.
- In the 850-hPa temperature field, positive anomalies are predicted over a wide area of the Northern Hemisphere, particularly from Northern Africa to South Asia and over northern North America and the mid-latitude North Pacific.
- In the sea level pressure field, the stronger-than-normal westward extensions of the subtropical highs over the North Pacific are predicted.



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)

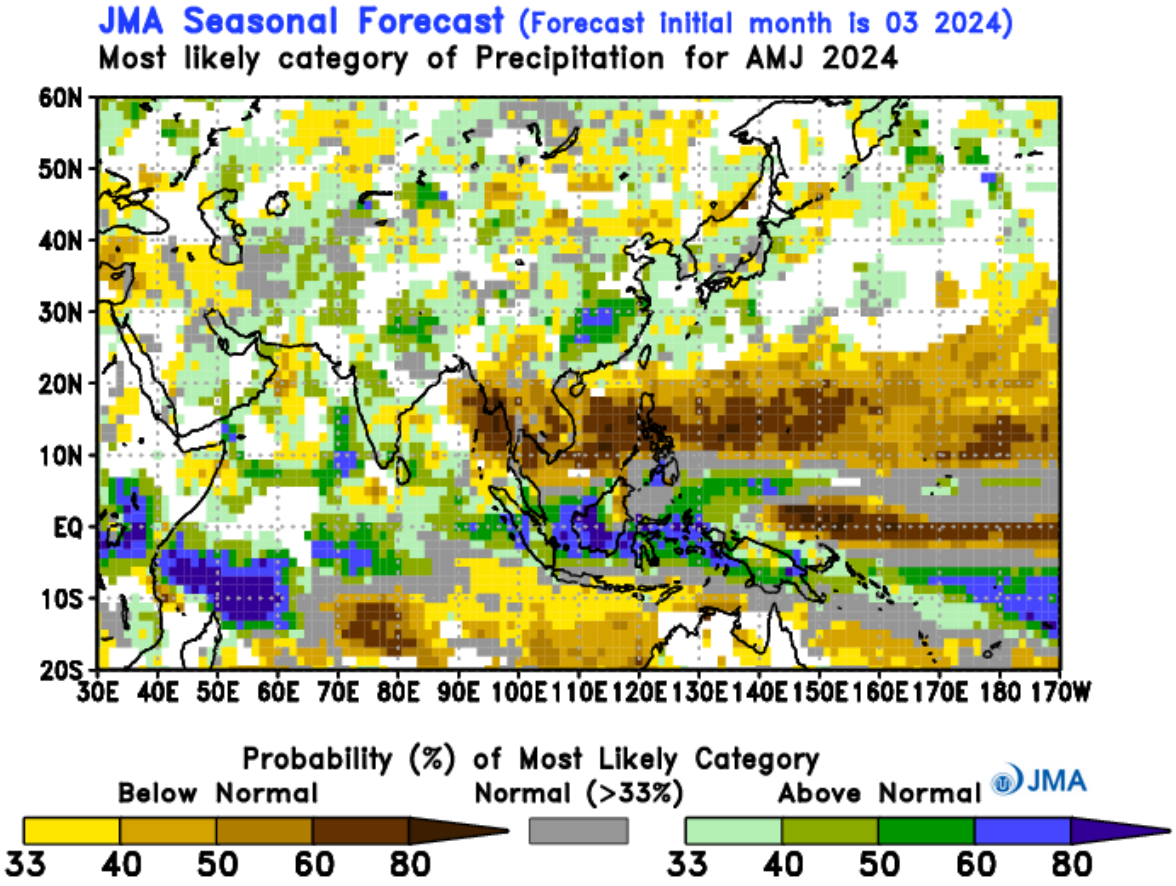


Three month mean
sea level pressure (SLP)
and its anomalies
Contour: sea level pressure (hPa)
Shading: sea level pressure anomalies (hPa)

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

<AMJ 2024> Probability Forecasts (precipitation)

- A high probability of above-normal precipitation is predicted from the tropical Indian Ocean to the Maritime Continent.
- A high probability of below-normal precipitation is predicted from the Indochina Peninsula to the subtropical western North Pacific.

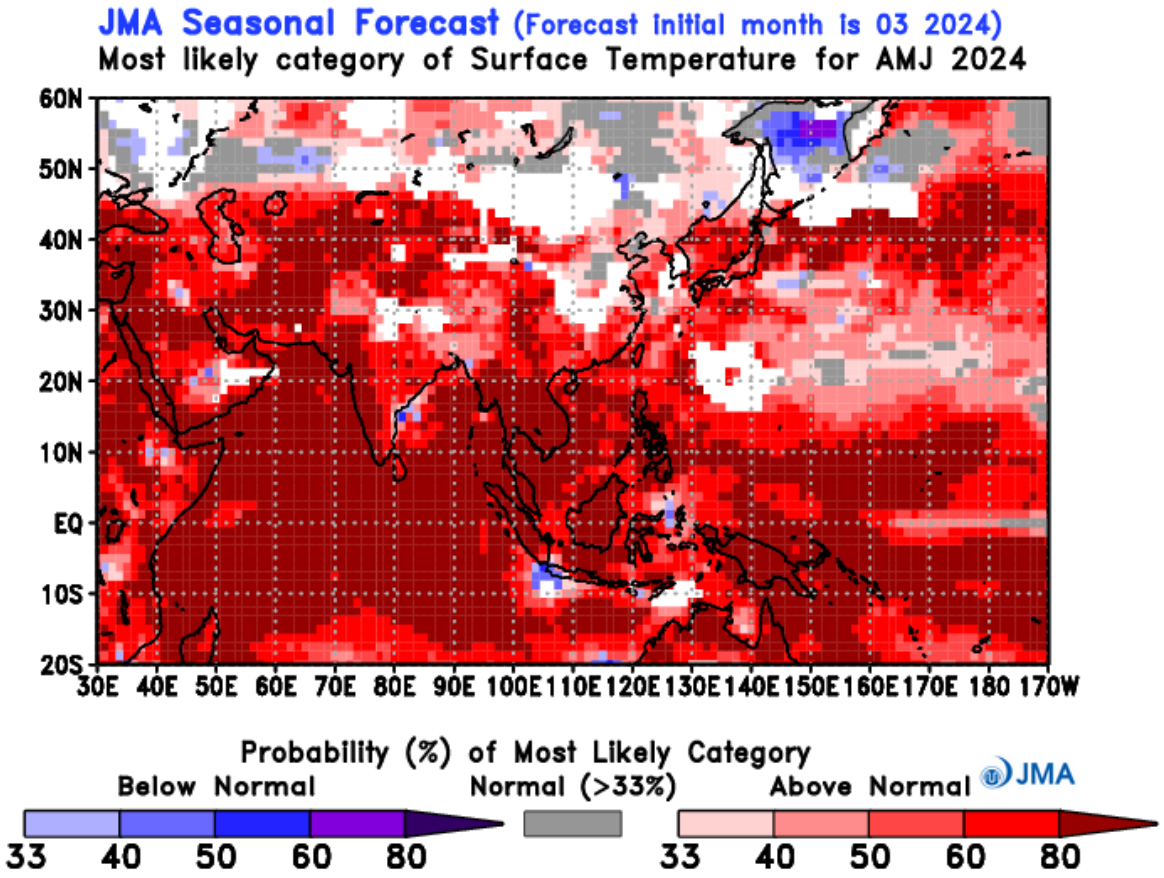


Verification based on hindcast

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

<AMJ 2024> Probability Forecasts (temperature)

- A high probability of above-normal temperatures is predicted over a wide area of Asia, particularly in the tropics from the Indian Ocean to the western Pacific, implying a significantly hot pre-monsoon period in South Asia and the Indochina Peninsula.
- A high probability of below-normal temperatures is predicted over the Sea of Okhotsk.



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

4. Warm Season Predictions

June – July – August 2024
(JJA 2024)

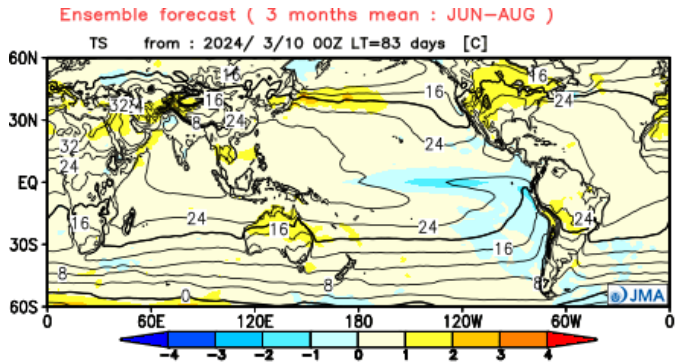
(Initial date for the Seasonal EPS: 10 March 2024)

<JJA 2024> Sea Surface Temperature (SST)

- During boreal summer, it is more likely that ENSO-neutral conditions will continue (60%) than La Niña conditions will develop (40%).
- The NINO.WEST SST is likely to be almost near normal during boreal summer.
- The IOBW SST is likely to be above normal until boreal summer.

Three month mean Sea surface temperature (SST)

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

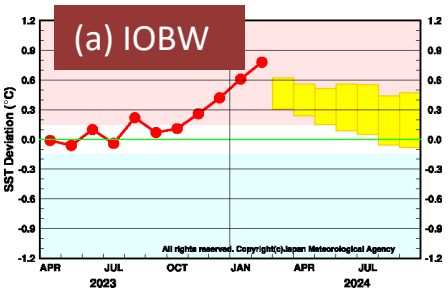


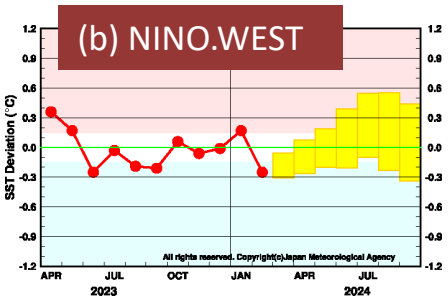
ENSO forecast probabilities

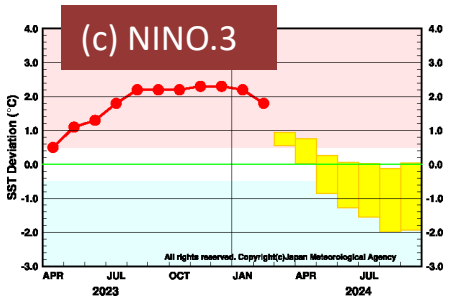
YEAR	MONTH	mean period	
2024	JAN	NOV2023–MAR2024	100
	FEB	DEC2023–APR2024	100
	MAR	JAN2024–MAY2024	100
	APR	FEB2024–JUN2024	40 / 60
	MAY	MAR2024–JUL2024	20 / 80
	JUN	APR2024–AUG2024	10 / 70 / 20
	JUL	MAY2024–SEP2024	60 / 40

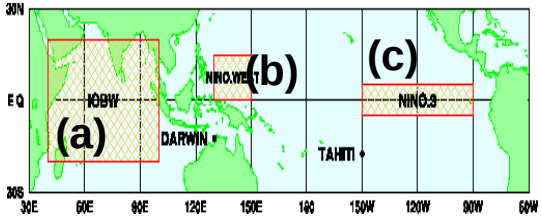
El Niño ENSO neutral La Niña

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

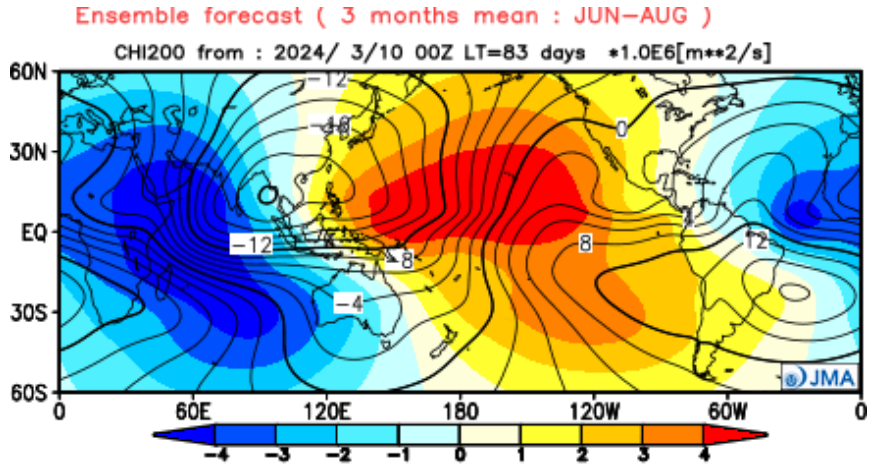
(See "Explanatory Notes (2)" for the definition of the SST indices.)

<JJA 2024> Global Circulation

- In the 200-hPa velocity potential field, negative (large-scale divergence) anomalies are predicted over the Indian Ocean and over the Atlantic, while positive (large-scale convergence) anomalies are predicted over a wide area in the Pacific.
- In the 200-hPa stream function field, anti-cyclonic circulation anomalies straddling the equator are predicted from the tropical eastern Pacific to Africa, and cyclonic circulation anomalies straddling the equator are predicted from the Southeast Asia to the western Pacific.

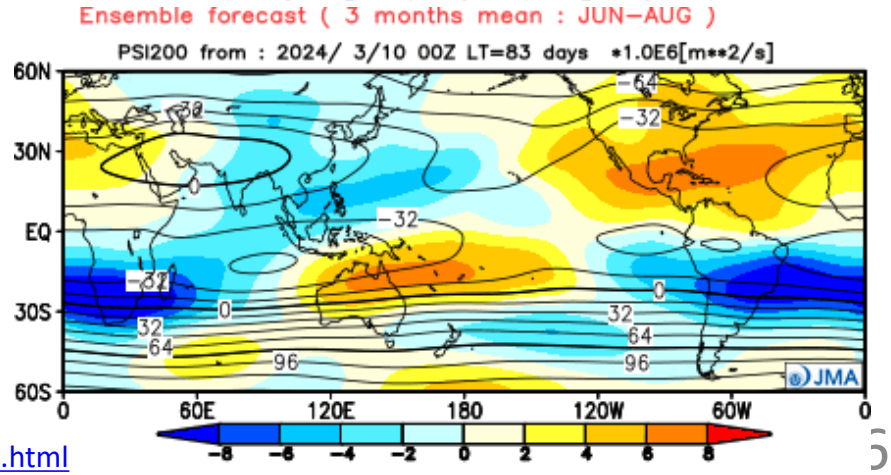
Three month mean
200-hPa velocity potential

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

<JJA 2024> Asian Circulation

- In the 850-hPa stream function field, anti-cyclonic circulation anomalies straddling the equator are predicted over Southeast Asia in association with the below-normal precipitation near the tropical western Pacific and possibly the positive IOBW-related above-normal precipitation over the Indian Ocean through the process of Kelvin-wave induced Ekman divergence.
- In the sea level pressure field, positive and negative anomalies are predicted over the subtropical western North Pacific and the Indian Ocean, respectively.

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

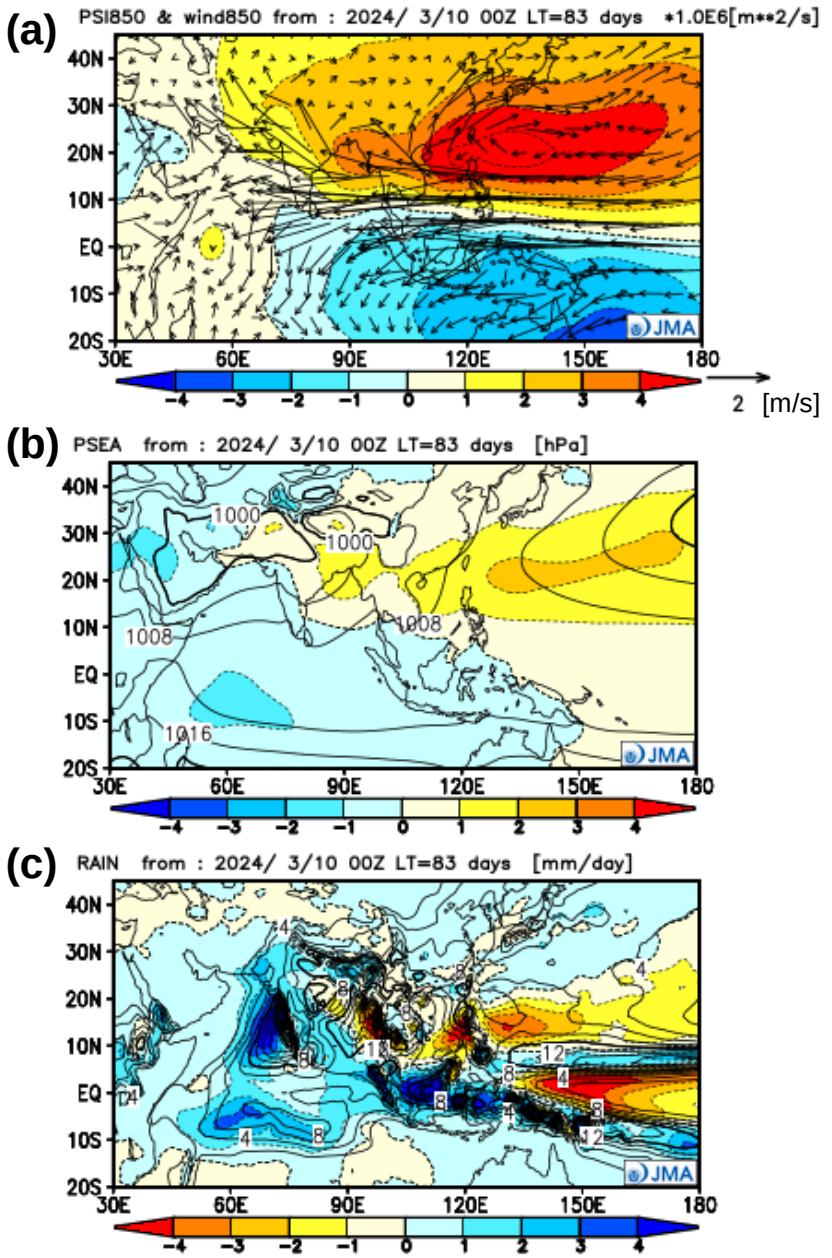
Contour: sea level pressure (hPa)

Shading: sea level pressure anomalies (hPa)

(c) precipitation and its anomalies

Contour: precipitation (mm/day)

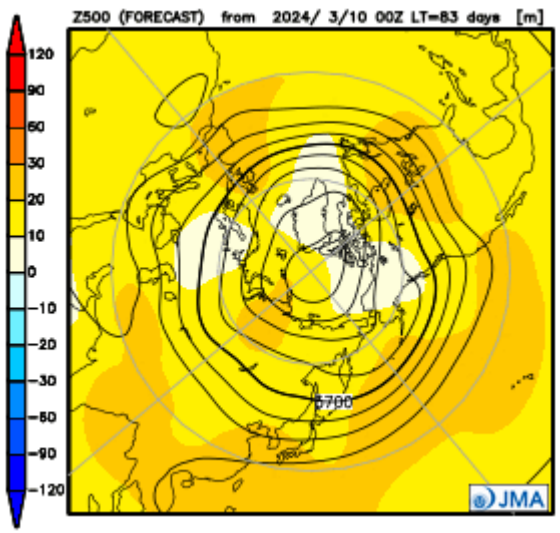
Shading: precipitation anomalies (mm/day)



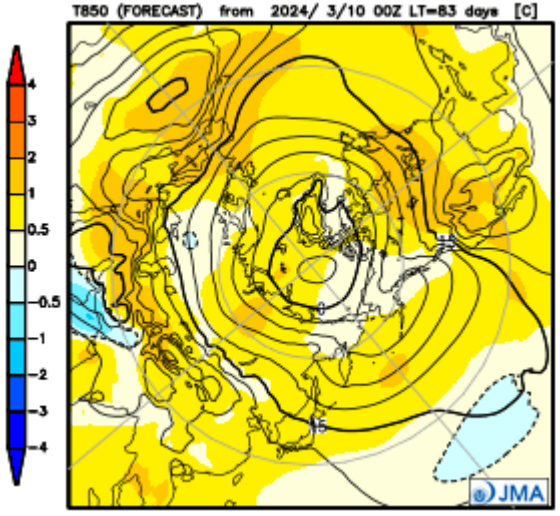
Verification based on hindcast https://www.data.jma.go.jp/tcc/tcc/products/model/hindcast/CPS3/index.html

<JJA 2024> Northern Hemisphere circulation

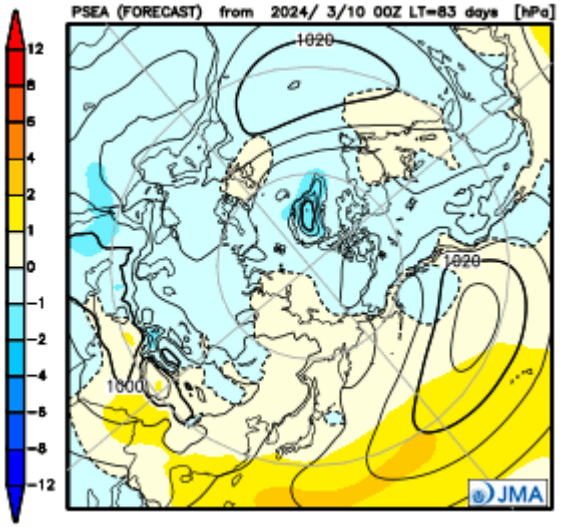
- In the 500-hPa height field, positive anomalies are predicted over a wide area of the Northern Hemisphere.
- In the 850-hPa temperature field, positive anomalies are predicted over a wide area of the Northern Hemisphere.
- In the sea level pressure field, positive anomalies are predicted over the subtropical western North Pacific, indicating the westward extension of the North Pacific subtropical high.



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)

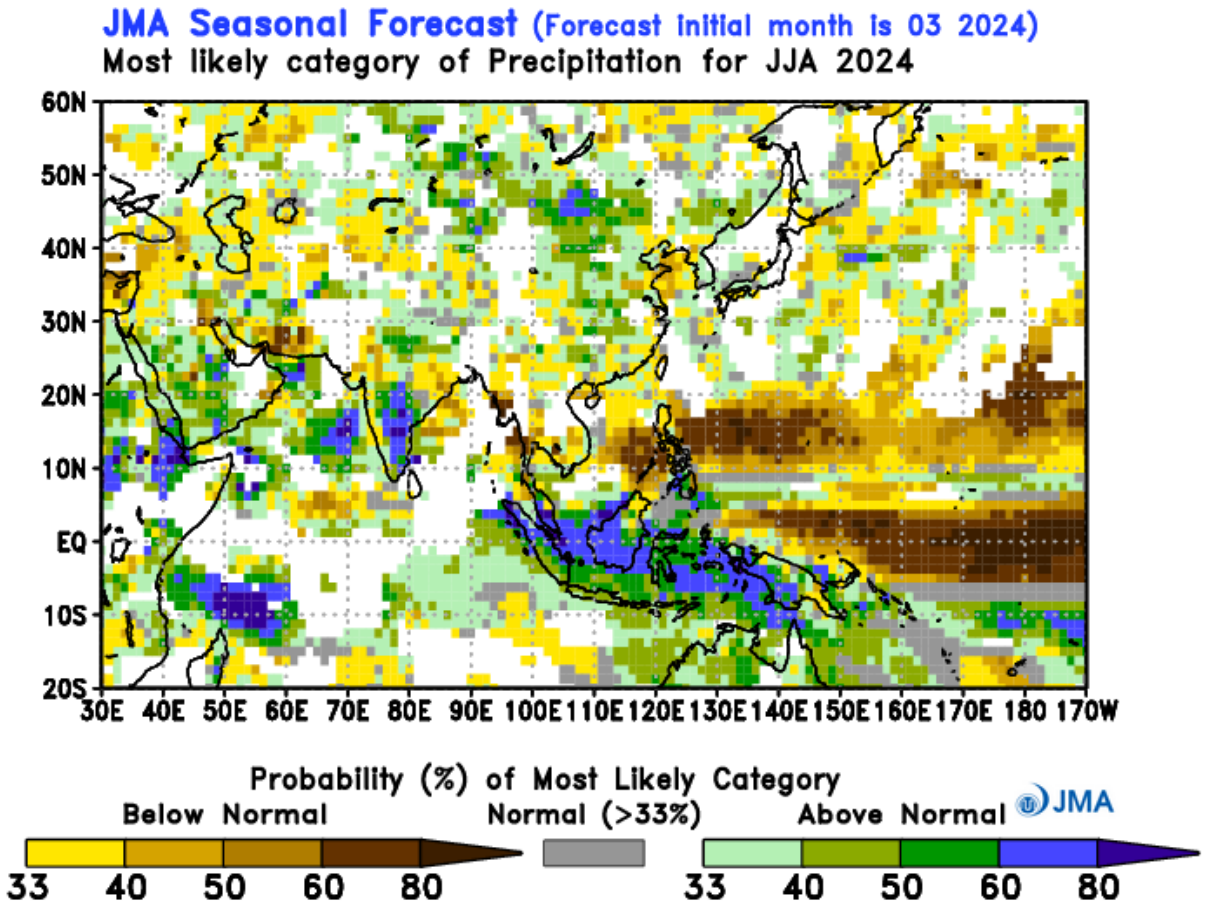


Three month mean
sea level pressure (SLP)
and its anomalies
Contour: sea level pressure (hPa)
Shading: sea level pressure anomalies (hPa)

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

<JJA 2024> Probability Forecasts (precipitation)

- A high probability of above-normal precipitation is predicted around the Maritime Continent.
- A high probability of below-normal precipitation is predicted over the tropical western Pacific.

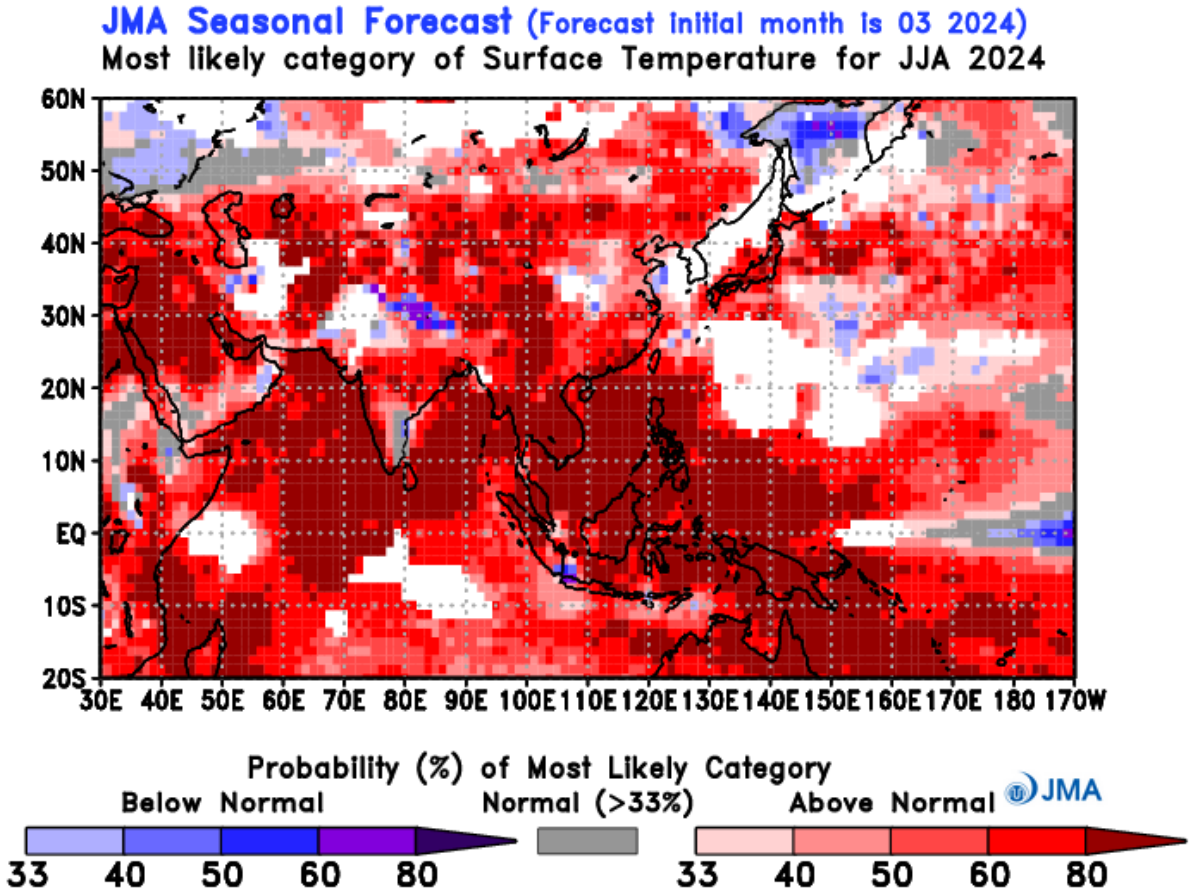


Verification based on hindcast

https://www.data.jma.go.jp/tcc/tcc/products/model/probfcst/warm_cold_season/hind/html/skill_score_reg.html
https://www.data.jma.go.jp/tcc/tcc/products/model/probfcst/warm_cold_season/hind/html/skill_2d_warm_cold_season.html

<JJA 2024> Probability Forecasts (temperature)

- A high probability of above-normal temperatures is predicted from the Middle East to the tropical western Pacific through the northern Indian Ocean.
- A high probability of below-normal temperatures is predicted over the Sea of Okhotsk.



Verification based on hindcast

https://www.data.jma.go.jp/tcc/tcc/products/model/probfcst/warm_cold_season/hind/html/skill_score_reg.html
https://www.data.jma.go.jp/tcc/tcc/products/model/probfcst/warm_cold_season/hind/html/skill_2d_warm_cold_season.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

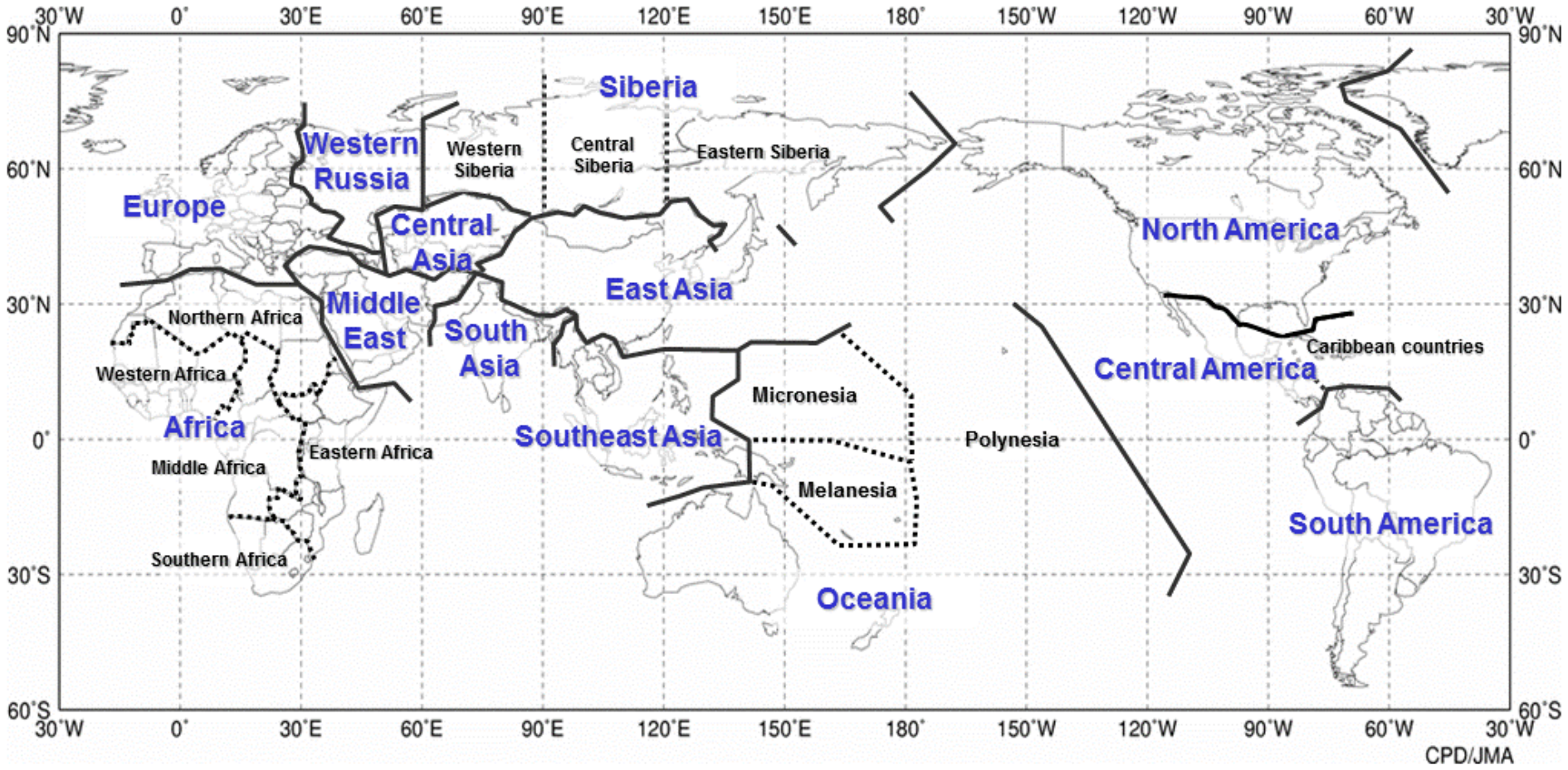
Explanatory Notes (2)

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

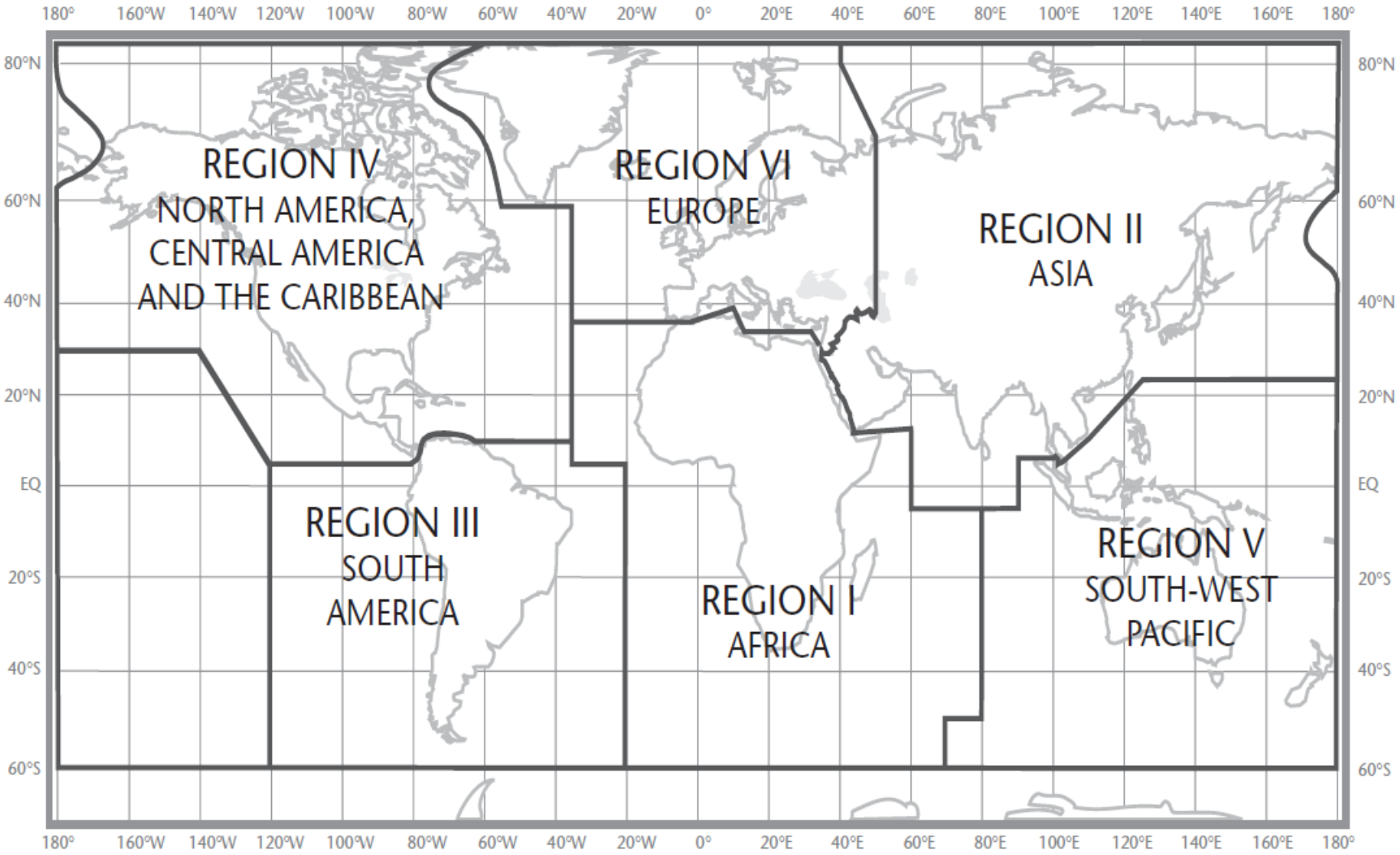
- The SST baseline for NINO.3 region (5˚S – 5˚N, 150˚W – 90˚W) is defined as a monthly average over a sliding 30-year period (e.g., 1994 – 2023 for 2024). The thresholds of above the baseline, near the baseline, and below the baseline categories are +0.5 and -0.5.
- The SST baselines for the NINO.WEST 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...

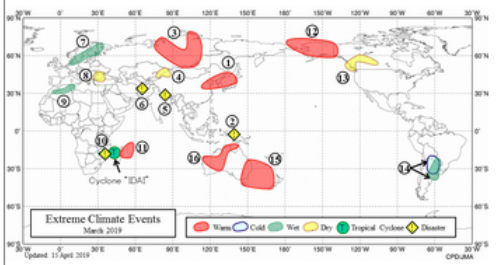
RCC Functions

- **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.



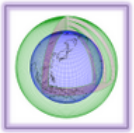
Distribution of Extreme Climate Event (March 2019)

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.

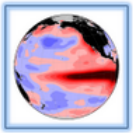


WMC Tokyo

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

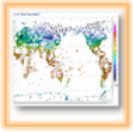
Monthly Discussion on Seasonal Climate Outlook

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