Monthly Discussion on Seasonal Climate Outlooks (No. 123)

(21 May 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

- El Niño conditions are gradually weakening.
- El Niño conditions are likely to transition to ENSO-neutral conditions during this boreal spring (90%).
- It is more likely that La Niña conditions will develop by boreal autumn (60%) than ENSO-neutral conditions will continue (40%).

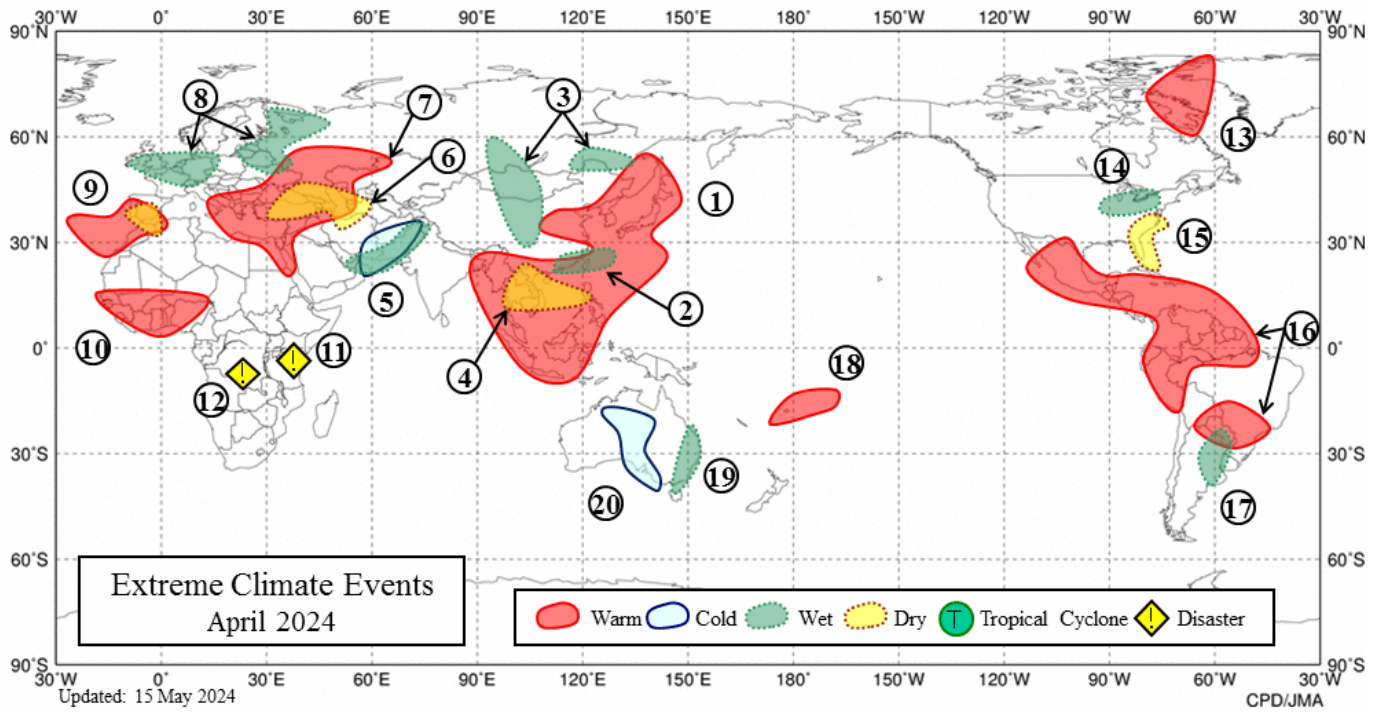
Prediction for June-July-August 2024 (JJA 2024)

- In the upper troposphere, large-scale divergence anomalies are predicted from the Atlantic to the central Indian Ocean, while large-scale convergence anomalies are predicted over the Pacific.
- In the lower troposphere, anti-cyclonic circulation anomalies straddling the equator are predicted from the eastern Indian Ocean to the western Pacific.
- A high probability of above-normal precipitation is predicted over parts of the western Indian Ocean and the Maritime Continent. A high probability of below-normal precipitation is predicted over the equatorial eastern Indian Ocean, over the subtropical western North Pacific, and over the equatorial western Pacific.
- A high probability of above-normal temperatures is predicted over a wide area from South to Southeast Asia. A high probability of below-normal temperatures is predicted over the equatorial eastern Indian Ocean and over a part of northern South Asia.

2. Latest State of the Climate System

April 2024

<April 2024> Extreme Climate Events



	Type	Area
1	Warm	From southern Eastern Siberia to Southeast Asia
2	Wet	In and around southeastern China

	Type	Area
3	Wet	From the southern parts of Central and Eastern Siberia to central China
4	Dry	Northern Southeast Asia
5	Cold · Wet	In and around Pakistan
6	Dry	From western Central Asia to Turkey
7	Warm	From southwestern Russia to the area around the eastern Mediterranean Sea

	Type	Area
8	Wet	In and around Western Russia, from central to western Europe
9	Warm · Dry	From Spain to western Northern Africa
10	Warm	Southern Western Africa
11	Heavy Rain	From Kenya to Rwanda
12	Heavy Rain	Democratic Republic of the Congo
13	Warm	Northeastern Canada

	Type	Area
14	Wet	In and around the Midwest of the USA
15	Dry	In and around the southeastern USA
16	Warm	From Central America to northern South America, central South America
17	Wet	In and around northern Argentina
18	Warm	In and around Fiji
19	Wet	Eastern Australia
20	Cold	Central Australia

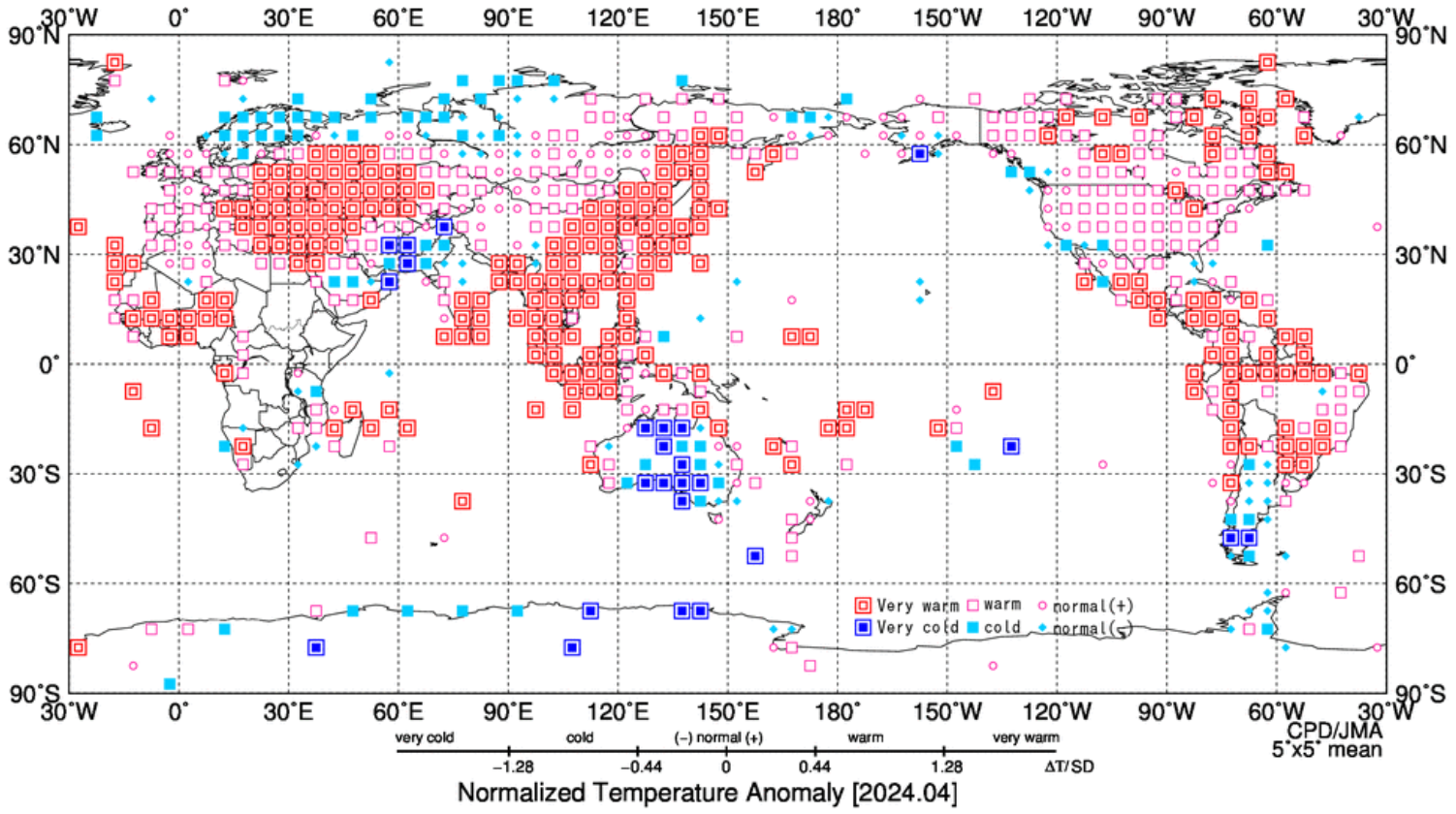
<Monthly Report on Global Extreme Climate Events>

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

<April 2024> Temperature

- Monthly mean temperatures were extremely high from southern Eastern Siberia to Southeast Asia, from southwestern Russia to the area around the eastern Mediterranean Sea, from Spain to western Northern Africa, in southern Western Africa, in northeastern Canada, from Central America to northern South America, in central South America and in and around Fiji.
- Monthly mean temperatures were extremely low in and around Pakistan and in central Australia.

Normalized anomaly of monthly mean temperature

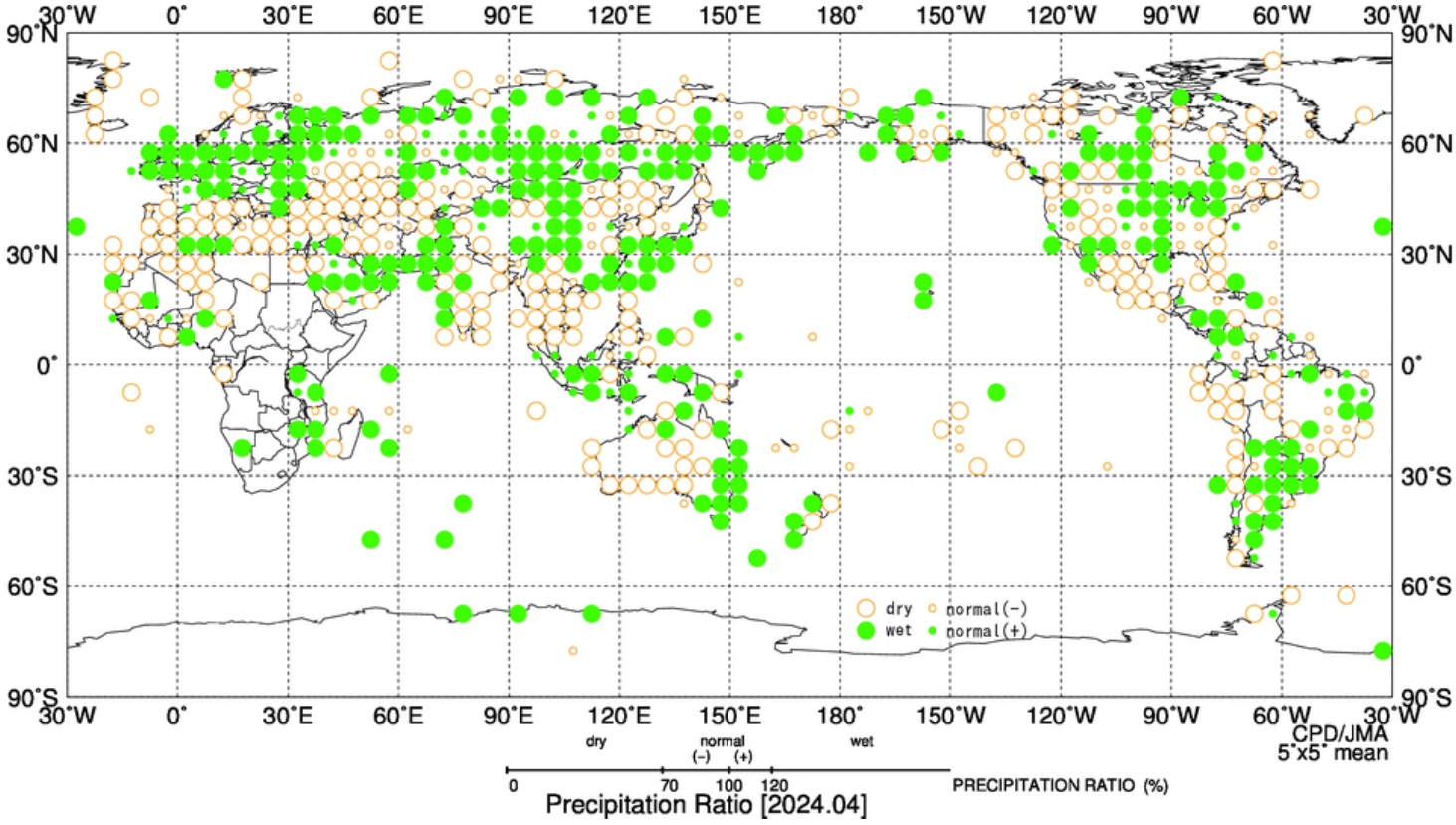


<World Climate Chart (Monthly)> https://www.data.jma.go.jp/tcc/tcc/products/climate/climfig/?tm=monthly

<April 2024> Precipitation

- Monthly precipitation amounts were extremely high in and around southeastern China, from the southern part of Central and Eastern Siberia to central China, in and around Pakistan, in and around Western Russia, from central to western Europe, in and around the Midwest of the USA, in and around northern Argentina and in eastern Australia.
- Monthly precipitation amounts were extremely low in northern Southeast Asia, from western Central Asia to Turkey, from Spain to western Northern Africa and in and around the southeastern USA.

Monthly precipitation ratio

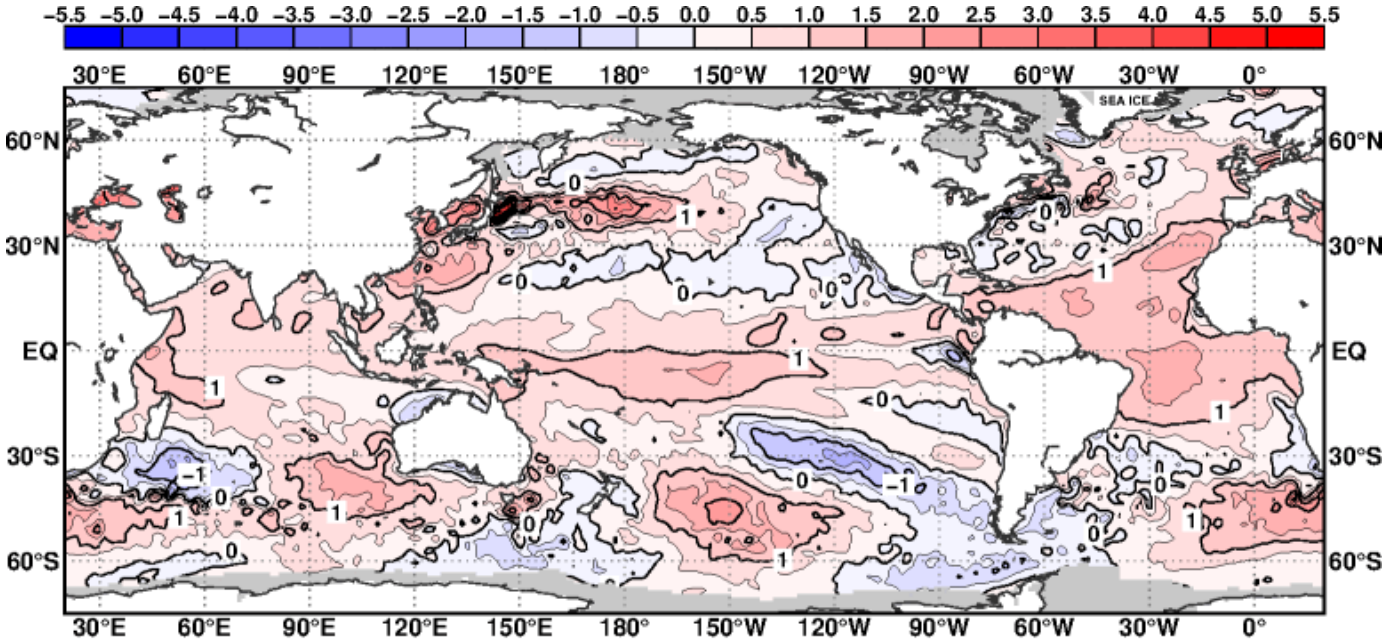


<World Climate Chart (Monthly)> https://www.data.jma.go.jp/tcc/tcc/products/climate/climfig/?tm=monthly

<April 2024> Sea Surface Temperature (SST)

- In the equatorial Pacific, remarkably positive SST anomalies were observed from the western to central part.
- In the North Pacific, remarkably positive SST anomalies were observed from the western to central mid-latitudes.
- In the Indian Ocean, remarkably positive SST anomalies were observed from the western part of the tropics to the Bay of Bengal.

Monthly mean SST anomaly (˚C)



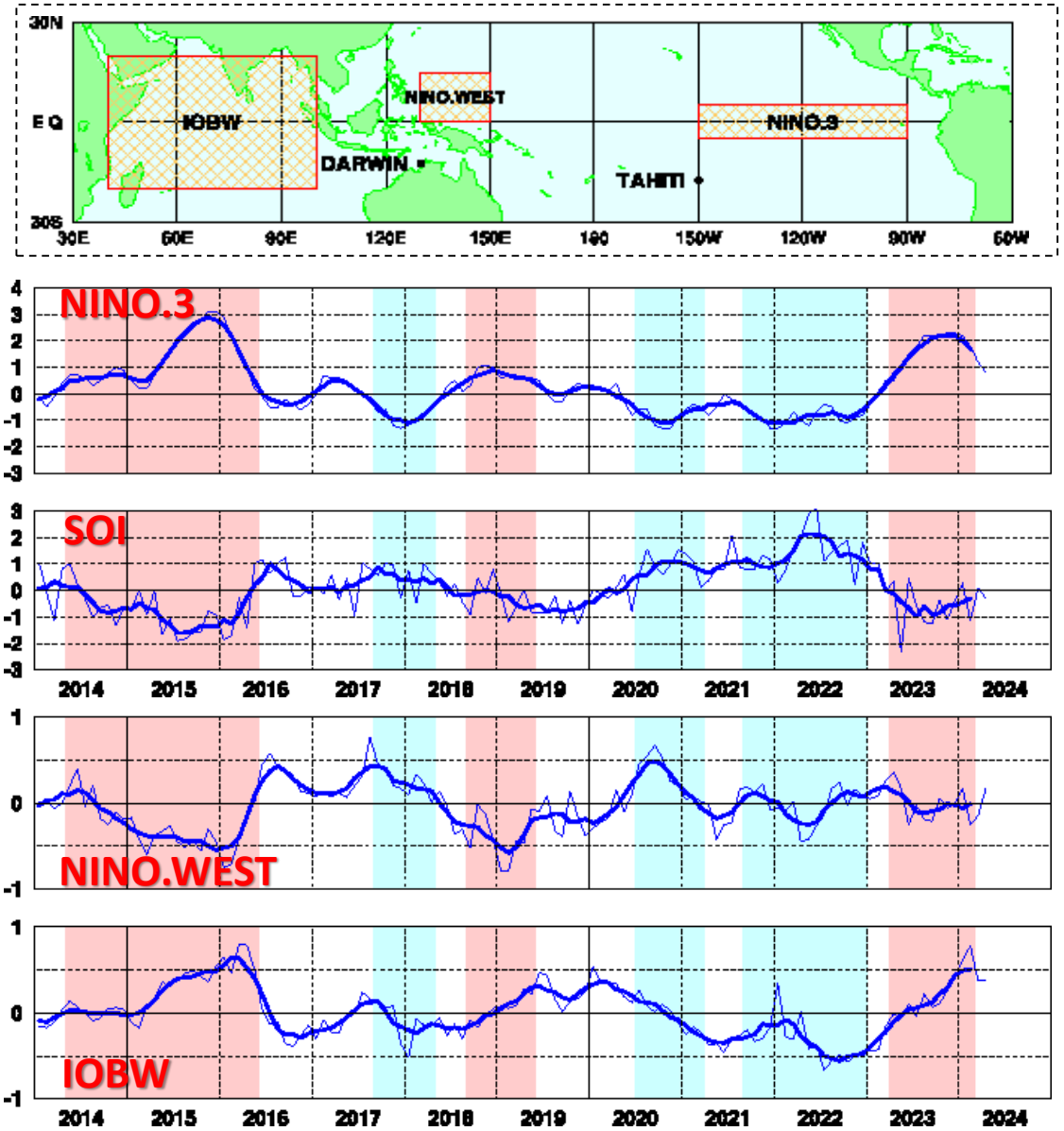
Monthly mean sea surface temperature anomalies based on COBE-SST2 and MGDSST* (Apr. 2024)
The contours and shading show sea surface temperature anomalies at intervals of 0.5°C.
The gray shading indicates maximum coverage of sea ice.
The baseline period for climatological normal is from 1991 to 2020.
(*) 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

<April 2024> ENSO Monitoring Indices

- El Niño conditions are gradually weakening.
- The NINO.3 SST was above normal with a deviation of +0.8ºC in April.
- The Southern Oscillation Index (SOI) value was -0.3.
- 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.

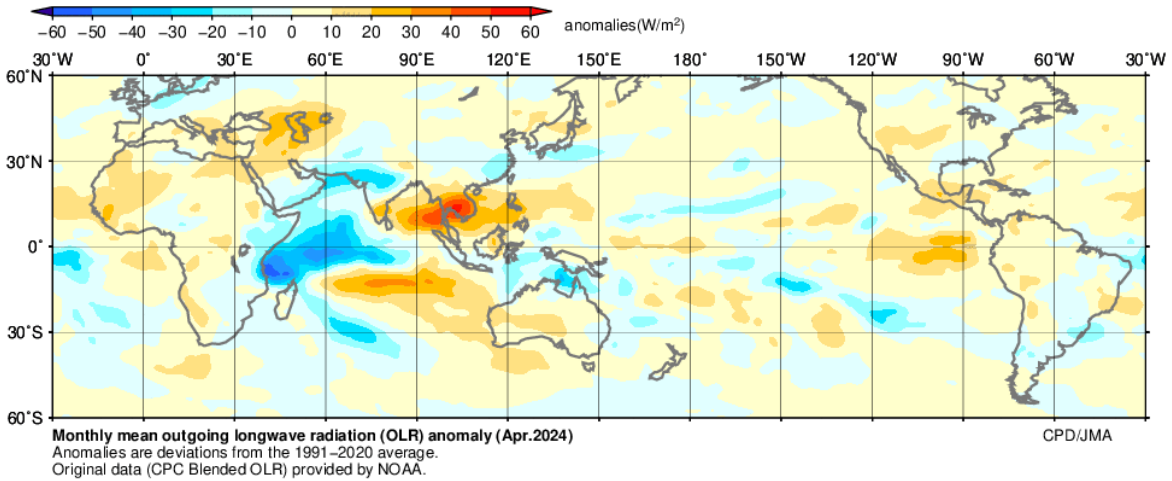
< El Niño Monitoring and Outlook> https://www.data.jma.go.jp/tcc/tcc/products/elnino/elmonout.html

<April 2024> Convective activity in the Tropics

- Convective activity was enhanced in the western Indian Ocean, and suppressed from the Bay of Bengal to the Philippines and in the southeastern Indian Ocean.

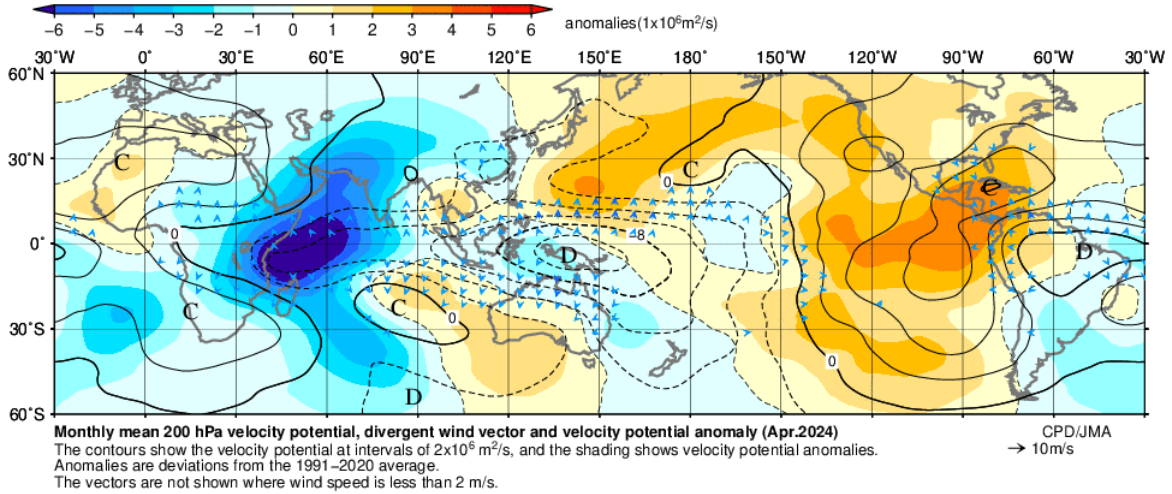
Monthly mean OLR anomalies

Shading: OLR anomalies (W/m^2)



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

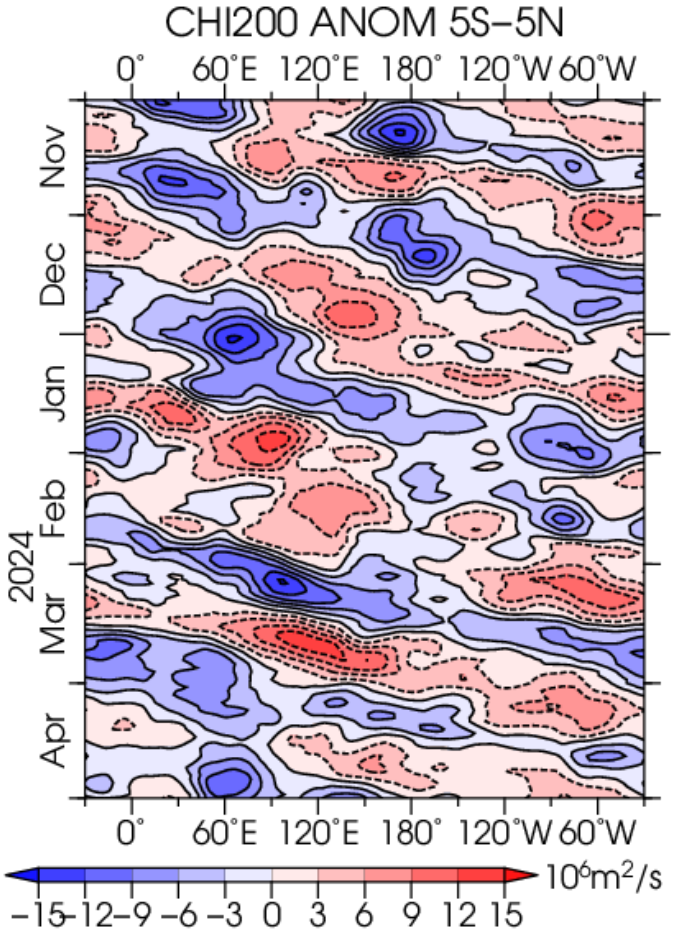
Contour: velocity potential (10^6m^2/s)
Vector: divergent wind vector (m/s)
Shading: velocity potential anomalies (10^6m^2/s)
"D" and "C" indicate the centers of large-scale divergence and convergence anomalies, respectively.



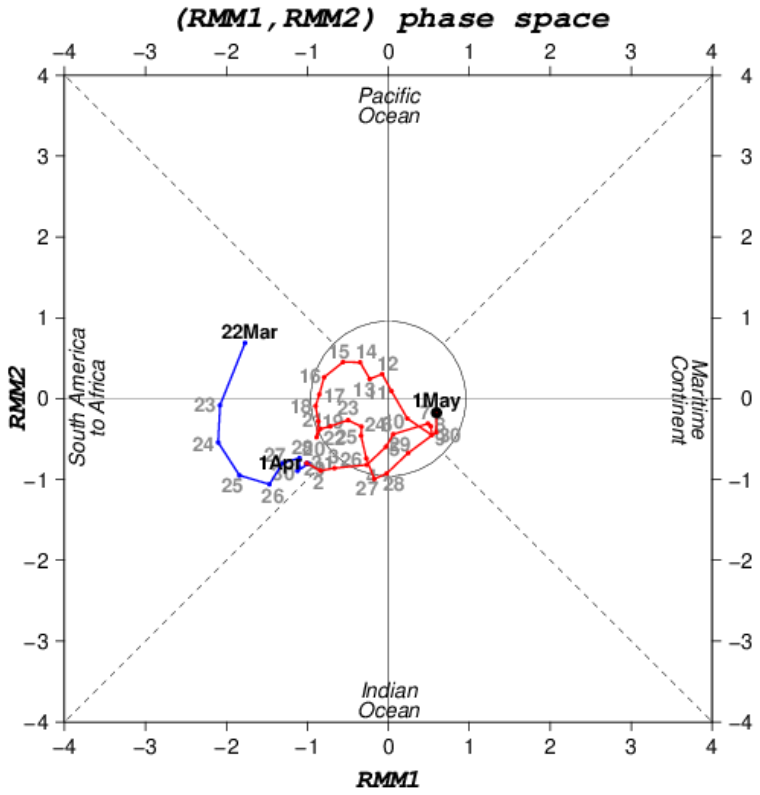
<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<April 2024> Equatorial Intraseasonal Oscillation

- The active phase of equatorial intraseasonal oscillation with the small amplitude propagated eastward from the western Indian Ocean to go around the equator.



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



MJO diagram

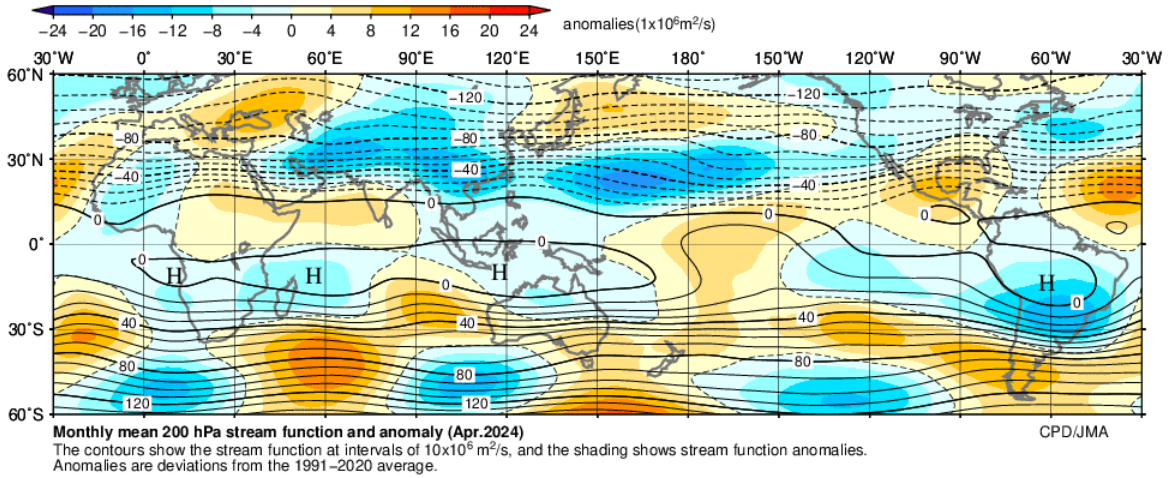
<MJO> https://www.data.jma.go.jp/tcc/tcc/products/clisys/mjo/moni_mjo.html

<April 2024> Upper-level Circulation

- In the upper troposphere, anti-cyclonic circulation anomalies straddling the equator were seen in the western Indian Ocean. Cyclonic circulation anomalies were seen in a wide area from southern Eurasia to the central subtropical North Pacific.

Monthly mean Stream function and its anomalies at 200-hPa

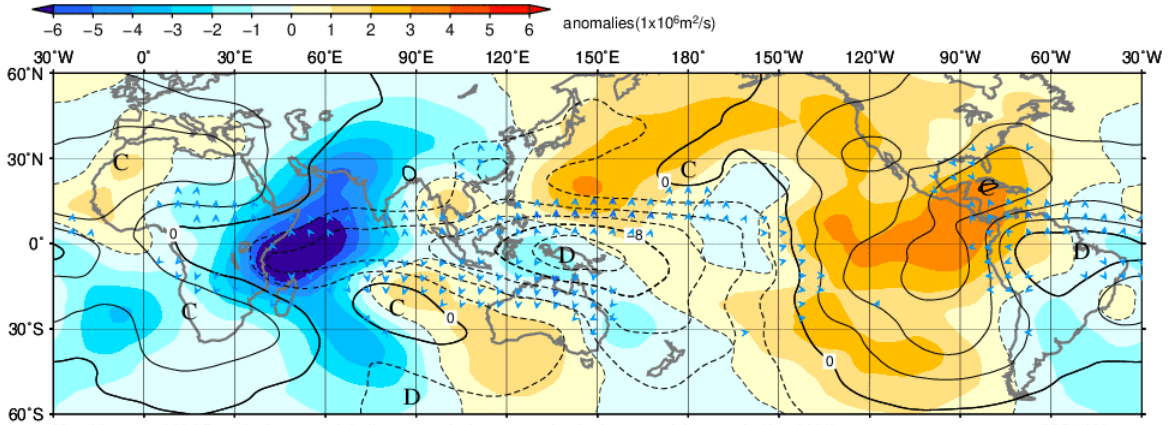
Contour: stream function ($10^6 m^2/s$)
Shading: stream function anomalies ($10^6 m^2/s$)
"H" and "L" indicate the centers of anti-cyclonic and cyclonic circulations, respectively.



Monthly mean 200 hPa stream function and anomaly (Apr.2024)
The contours show the stream function at intervals of $10x10^6$ m^2/s, and the shading shows stream function anomalies.
Anomalies are deviations from the 1991–2020 average.

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 200 hPa velocity potential, divergent wind vector and velocity potential anomaly (Apr.2024)
The contours show the velocity potential at intervals of $2x10^6$ m^2/s, and the shading shows velocity potential anomalies.
Anomalies are deviations from the 1991–2020 average.
The vectors are not shown where wind speed is less than 2 m/s.

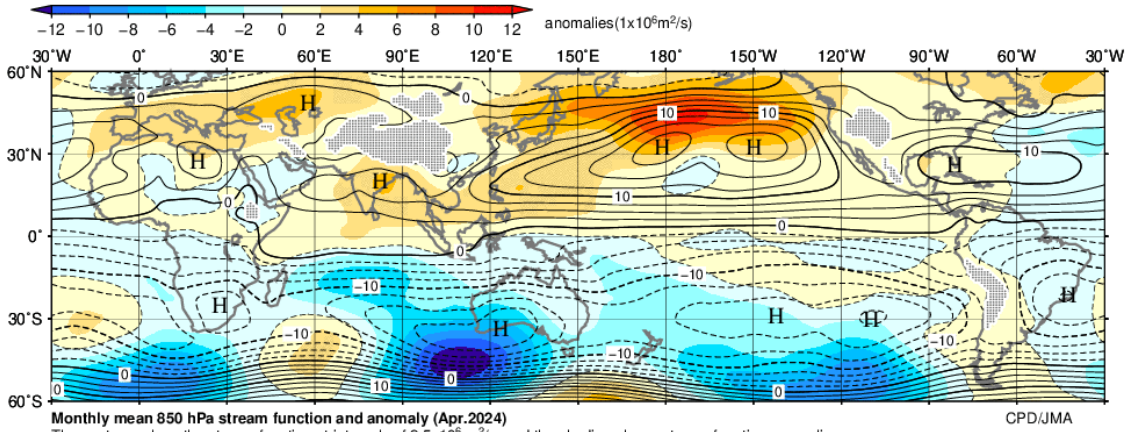
<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<April 2024> Low-level Circulation

- In the lower troposphere, anti-cyclonic circulation anomalies straddling the equator were seen in the eastern Indian Ocean. Anti-cyclonic circulation anomalies were also seen from the Philippines to the south of Japan.
- In the sea level pressure field, negative anomalies were seen in a wide area of the tropics, with remarkable anomalies from the tropical western Indian Ocean to the Maritime Continent.

Monthly mean Stream function and its anomalies at 850-hPa

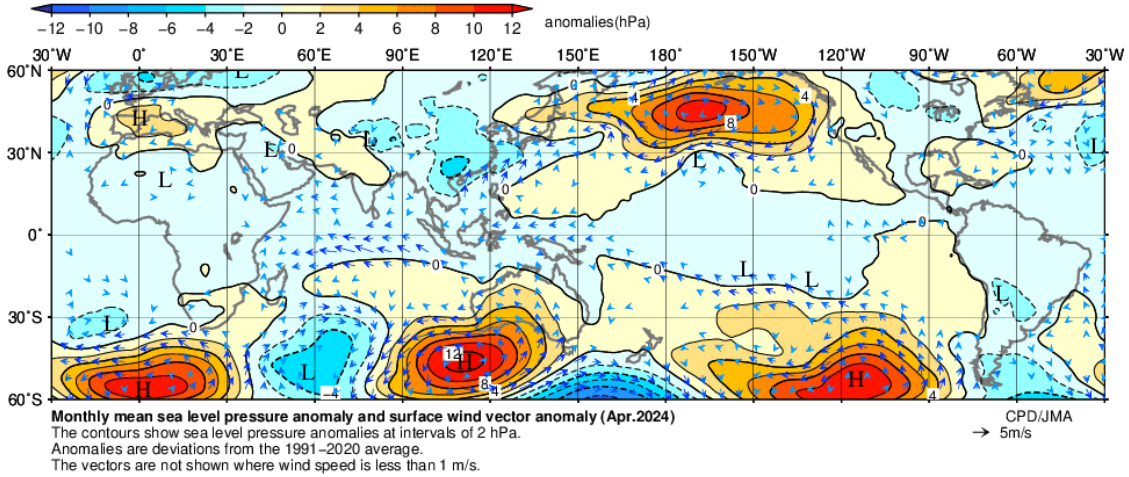
Contour: stream function ($10^6 m^2/s$)
Shading: stream function anomalies ($10^6 m^2/s$)
"H" and "L" indicate the centers of anti-cyclonic and cyclonic circulations, respectively.



Monthly mean 850 hPa stream function and anomaly (Apr.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.

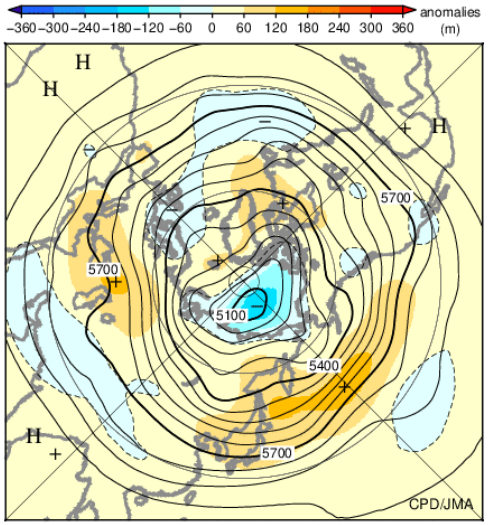


Monthly mean sea level pressure anomaly and surface wind vector anomaly (Apr.2024)
The contours show sea level pressure anomalies at intervals of 2 hPa.
Anomalies are deviations from the 1991–2020 average.
The vectors are not shown where wind speed is less than 1 m/s.

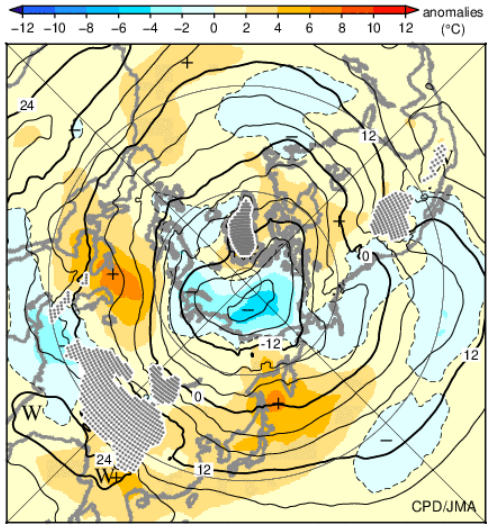
<Monthly Mean Figures> https://www.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html
<Animation Maps (Global Area)> https://www.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

<April 2024> Northern Hemisphere Circulation

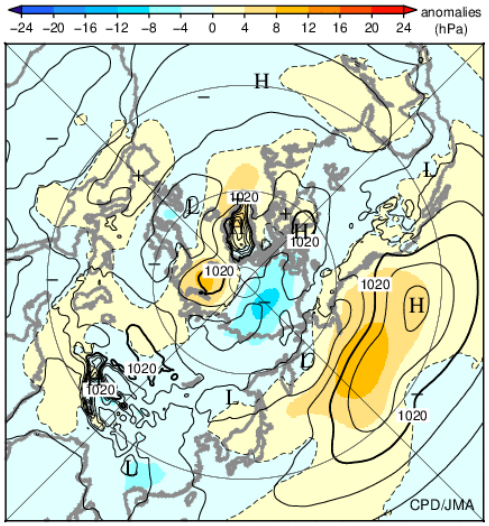
- In the 500-hPa height field, the polar vortex was stronger than normal. Positive anomalies were seen near eastern Canada, from southeastern Europe to Western Russia, and from Japan to the mid-latitude North Pacific.
- Temperatures at 850-hPa were above normal from southeastern Europe to Western Russia, from the Indochina Peninsula to Japan, and over Canada, and below normal over the Arctic region and western South Asia.
- In the sea level pressure field, positive anomalies were seen from Japan to the mid-latitude North Pacific, and negative anomalies were seen from the East Siberian Sea to the Beaufort Sea and over southern China.



Monthly mean 500 hPa height and anomaly in the Northern Hemisphere (Apr.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 (Apr.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 (Apr.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

June – July – August 2024
(JJA 2024)

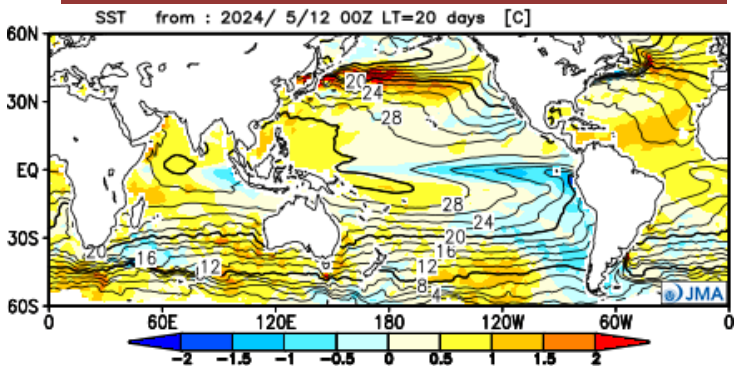
(Initial date for the Seasonal EPS: 12 May 2024)

<JJA 2024> Sea Surface Temperature (SST)

- El Niño conditions are gradually weakening.
- El Niño conditions are likely to transition to ENSO-neutral conditions during this boreal spring (90%).
- It is more likely that La Niña conditions will develop by boreal autumn (60%) than ENSO-neutral conditions will continue (40%).

Three month mean Sea surface temperature (SST)

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

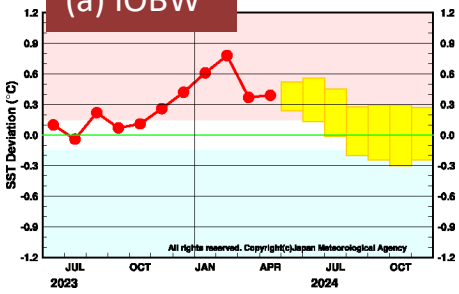


ENSO forecast probabilities

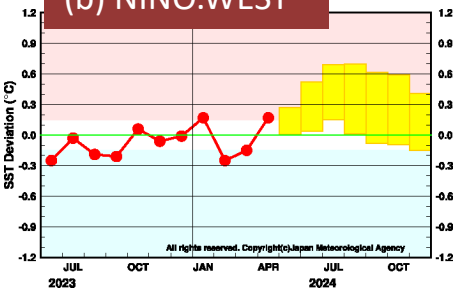
YEAR	MONTH	mean period	El Niño	ENSO neutral	La Niña
2024	MAR	JAN2024–MAY2024	100		
	APR	FEB2024–JUN2024	90		10
	MAY	MAR2024–JUL2024	10	90	
	JUN	APR2024–AUG2024		90	10
	JUL	MAY2024–SEP2024		60	40
	AUG	JUN2024–OCT2024		50	50
	SEP	JUL2024–NOV2024		40	60

Outlook of the SST deviation

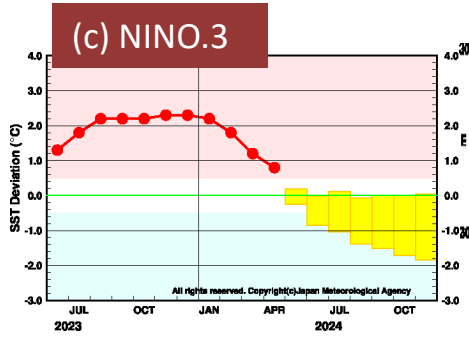
(a) IOBW

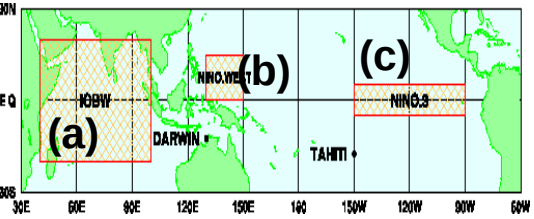


(b) NINO.WEST



(c) NINO.3





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

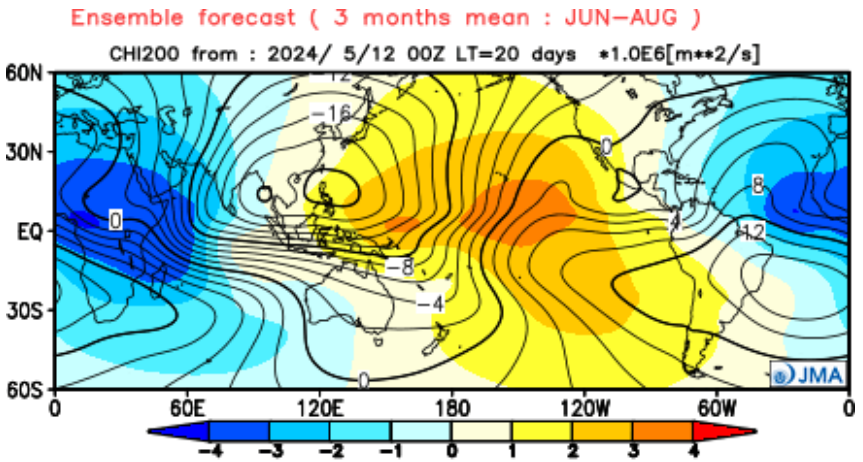
(See "Explanatory Notes (2)" for the definition of the SST indices.)

<JJA 2024> Global Circulation

- In the 200-hPa velocity potential field, large-scale divergence anomalies are predicted from the Atlantic to the central Indian Ocean, while large-scale convergence anomalies are predicted over the Pacific.
- In the 200-hPa stream function field, anti-cyclonic circulation anomalies straddling the equator are predicted from the eastern Pacific to the Atlantic in association with the above-mentioned divergence anomalies. Cyclonic circulation anomalies are predicted over Eurasia, implying the southward shift of the subtropical jet stream (STJ).

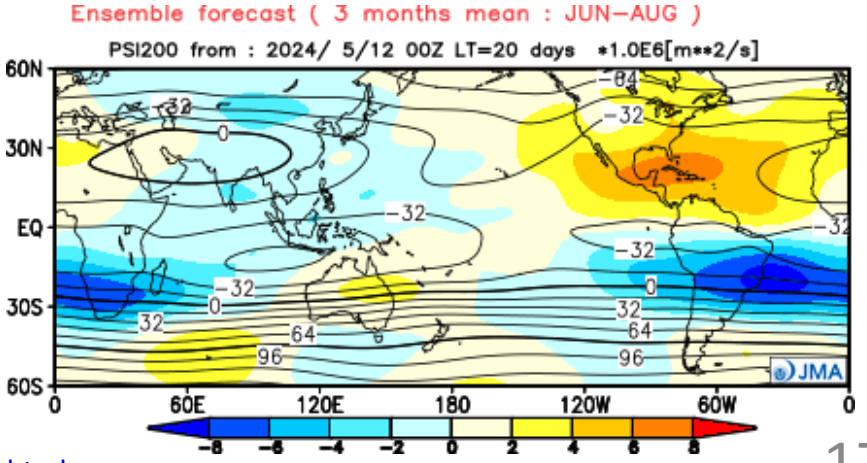
Three month mean 200-hPa velocity potential

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 from the eastern Indian Ocean to the western Pacific, possibly associated with the below-normal precipitation over the eastern equatorial Indian Ocean and in a part of the western tropical Pacific.
- In the sea level pressure field, negative anomalies are predicted over the western Indian Ocean, and positive anomalies are predicted over the subtropical western North Pacific.
- Above-normal precipitation is predicted from the western Indian Ocean to the Bay of Bengal and near the Maritime Continent.

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

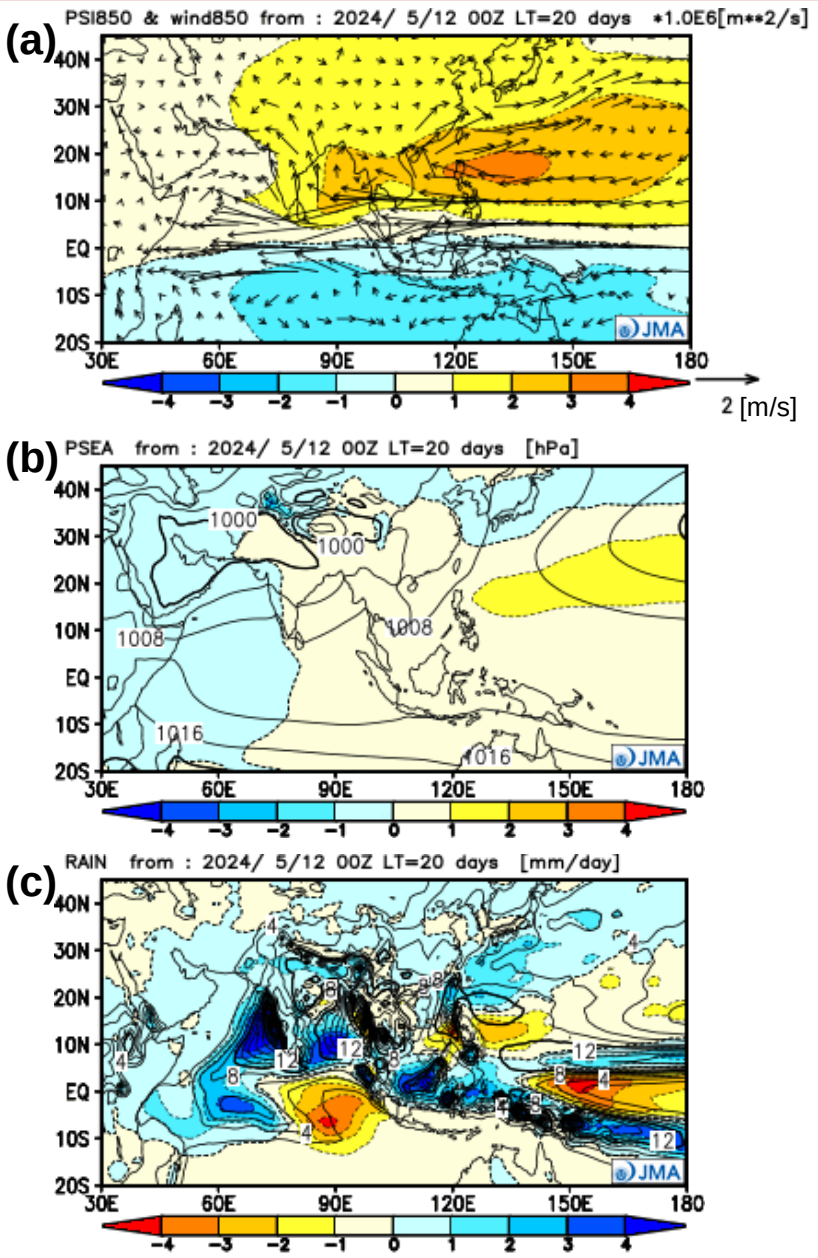
Contour: sea level pressure (hPa)

Shading: sea level pressure anomalies (hPa)

(c) precipitation and its anomalies

Coutour: precipitation (mm/day)

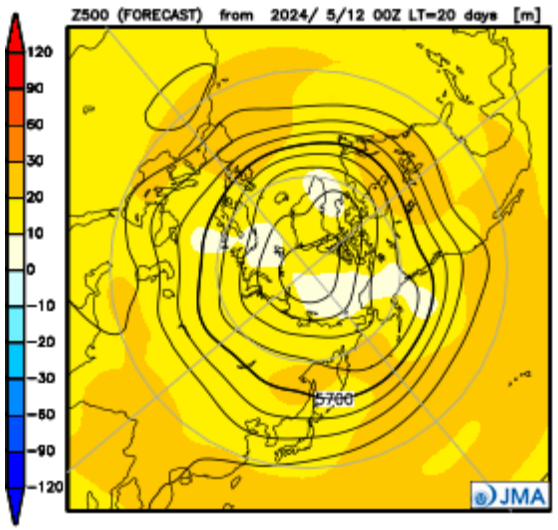
Shading: precipitation anomalies (mm/day)



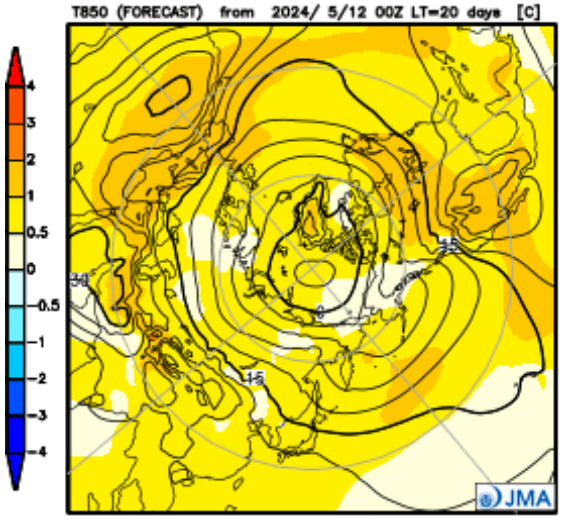
Verification based on hindcast https://www.data.jma.go.jp/tcc/tcc/products/model/hindcast/CPS3/index.html

<JJA 2024> Northern Hemisphere circulation

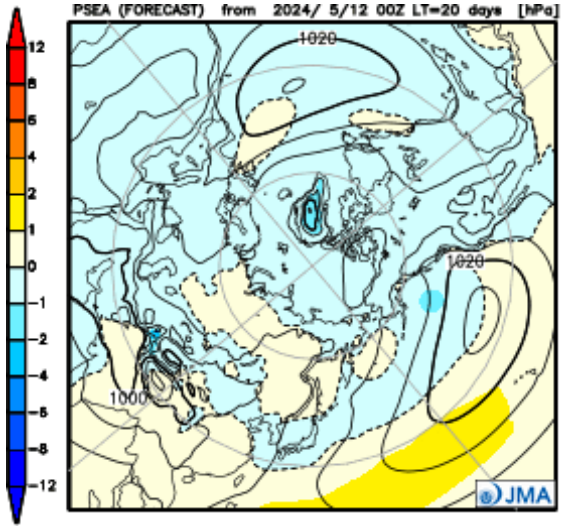
- In the 500-hPa height field in the Northern Hemisphere (NH), positive anomalies are predicted over a wide area, while the anomalies are relatively small over mid-latitude Eurasia, consistent with the southward shift of the STJ.
- In the 850-hPa temperature field, positive anomalies are predicted over a wide area in the NH.
- In the sea level pressure field, positive anomalies are predicted over the subtropical western North Pacific, corresponding to the westward extension of the North Pacific Subtropical High. Negative anomalies are predicted over the mid-latitudes from East Asia to the North Pacific.



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)

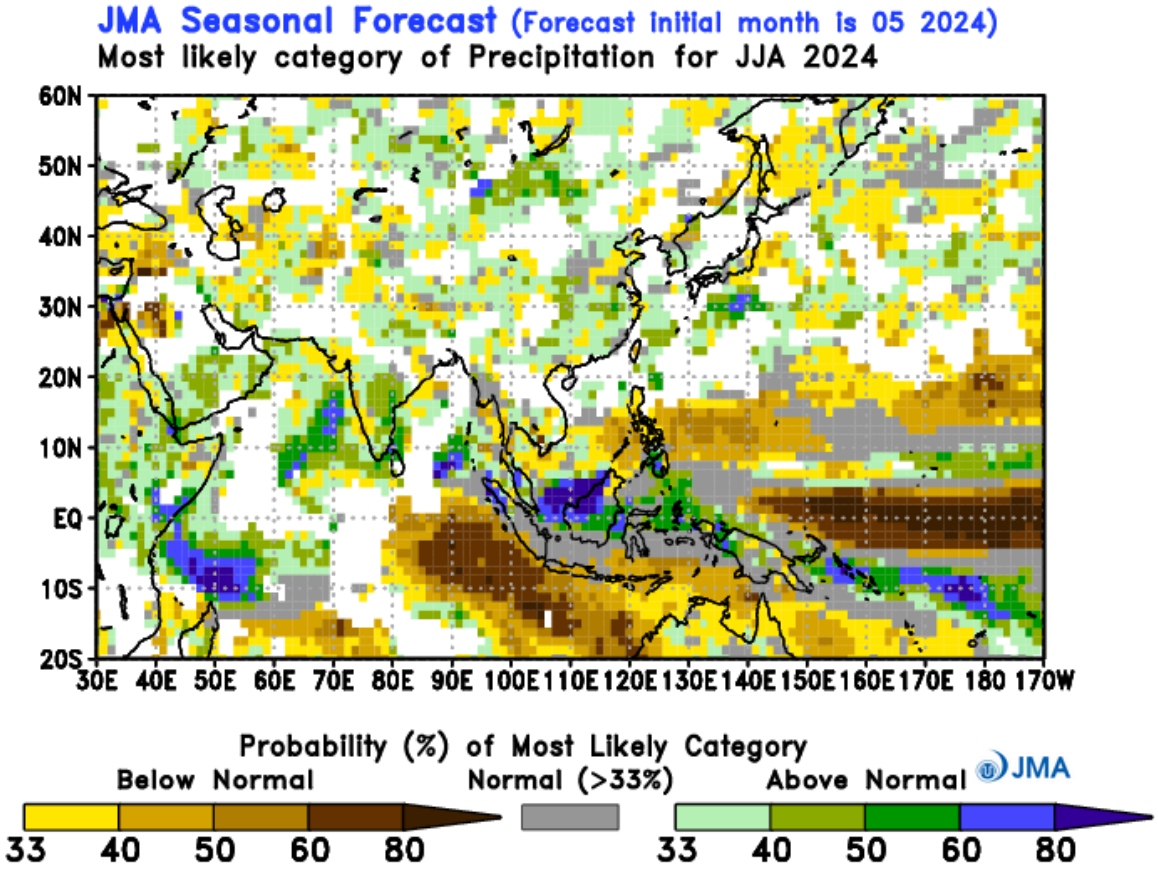


Three month mean
sea level pressure (SLP)
and its anomalies
Contour: sea level pressure (hPa)
Shading: sea level pressure anomalies (hPa)

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 over parts of the western Indian Ocean and the Maritime Continent.
- A high probability of below-normal precipitation is predicted over the equatorial eastern Indian Ocean, over the subtropical western North Pacific, and over the equatorial western Pacific.

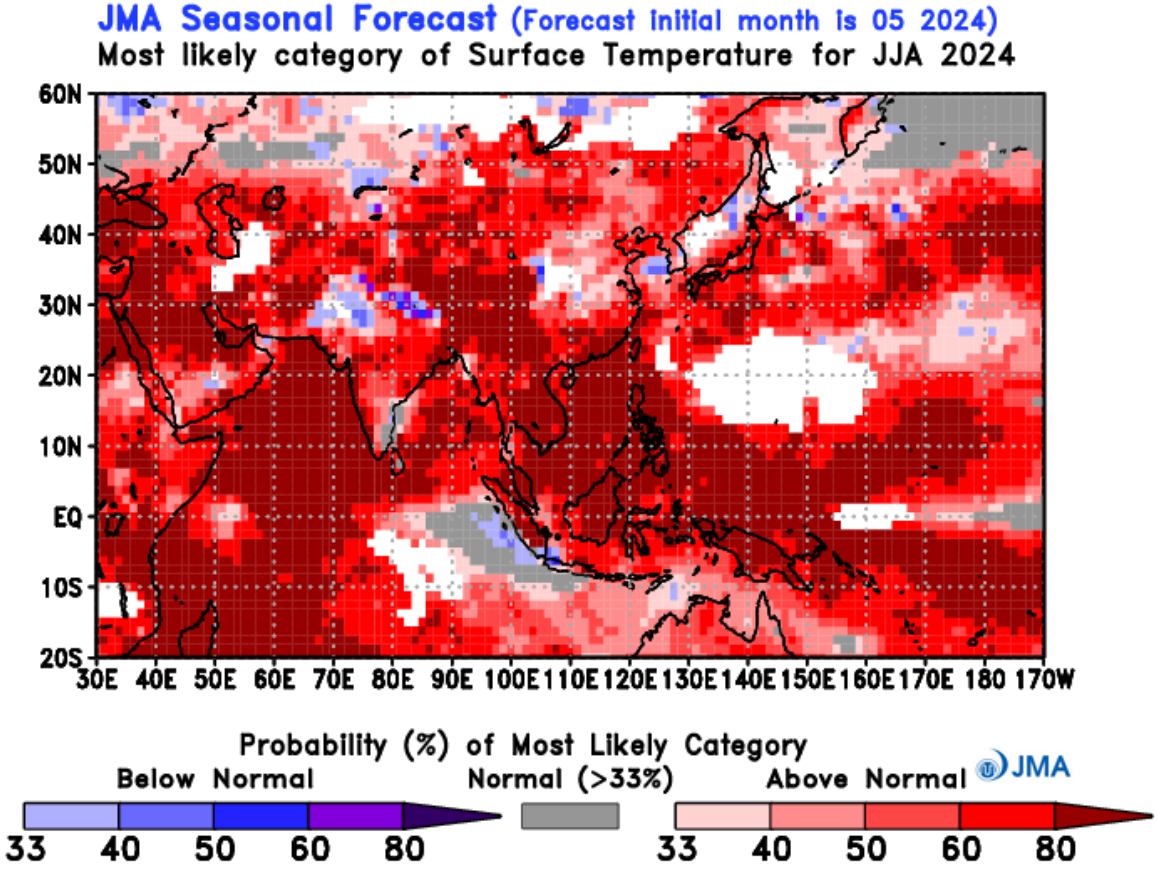


Verification based on hindcast

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

<JJA 2024> Probability Forecasts (temperature)

- A high probability of above-normal temperatures is predicted over a wide area from South to Southeast Asia.
- A high probability of below-normal temperatures is predicted over the equatorial eastern Indian Ocean and over parts of northern South 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

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

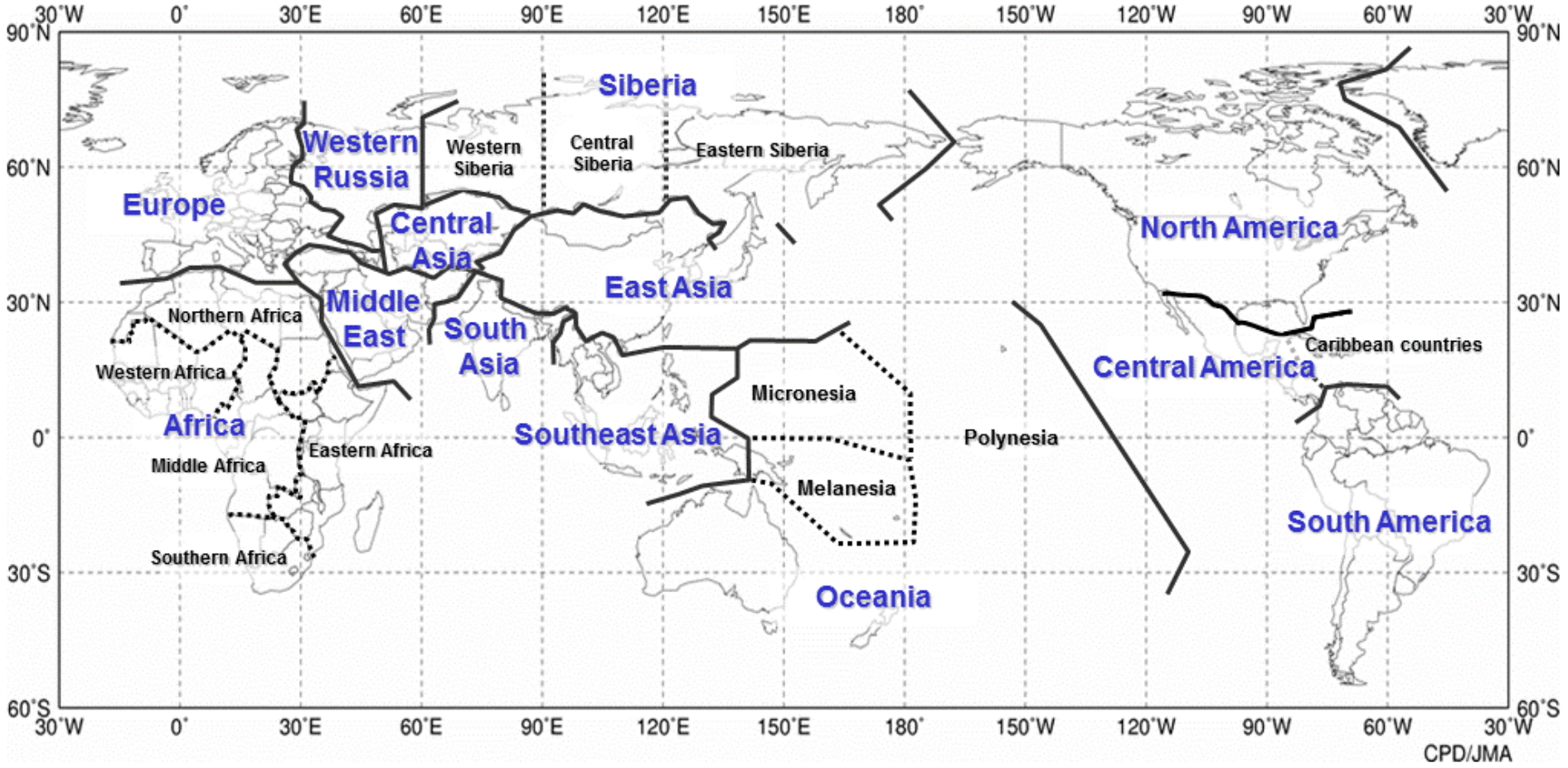
Explanatory Notes (2)

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

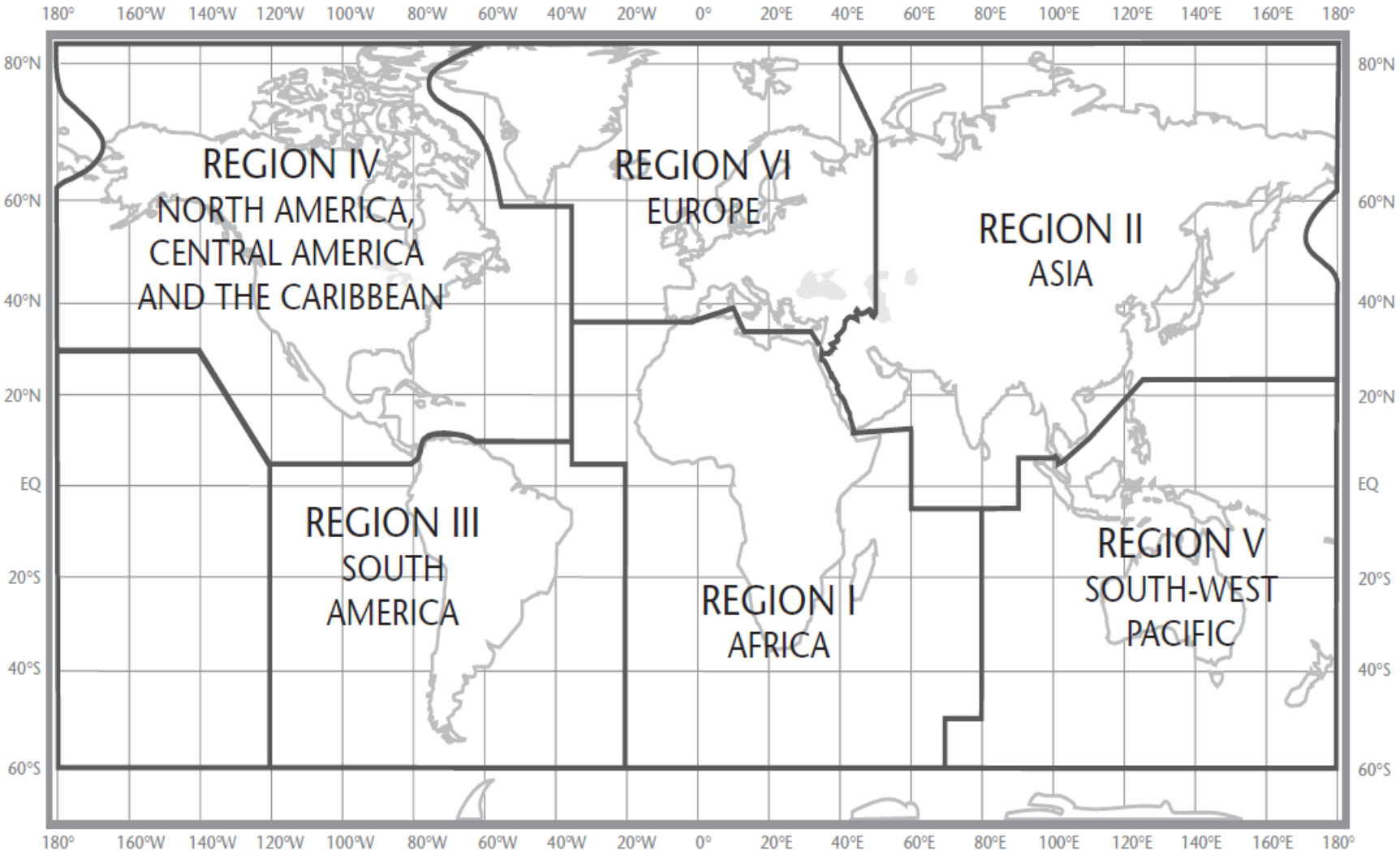
- The SST baseline for NINO.3 region (5˚S – 5˚N, 150˚W – 90˚W) is defined as a monthly average over a sliding 30-year period (e.g., 1994 – 2023 for 2024). The thresholds of above the baseline, near the baseline, and below the baseline categories are +0.5 and -0.5.
- The SST baselines for the NINO.WEST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

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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...

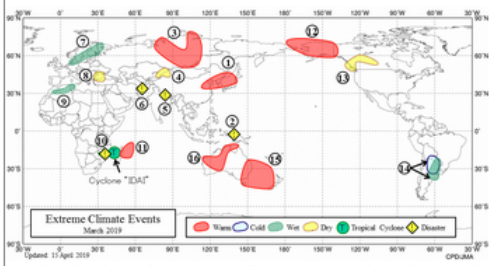
RCC Functions

- **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.



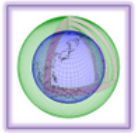
Distribution of Extreme Climate Event (March 2019)

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.

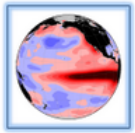


WMC Tokyo

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

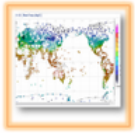
Monthly Discussion on Seasonal Climate Outlook

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