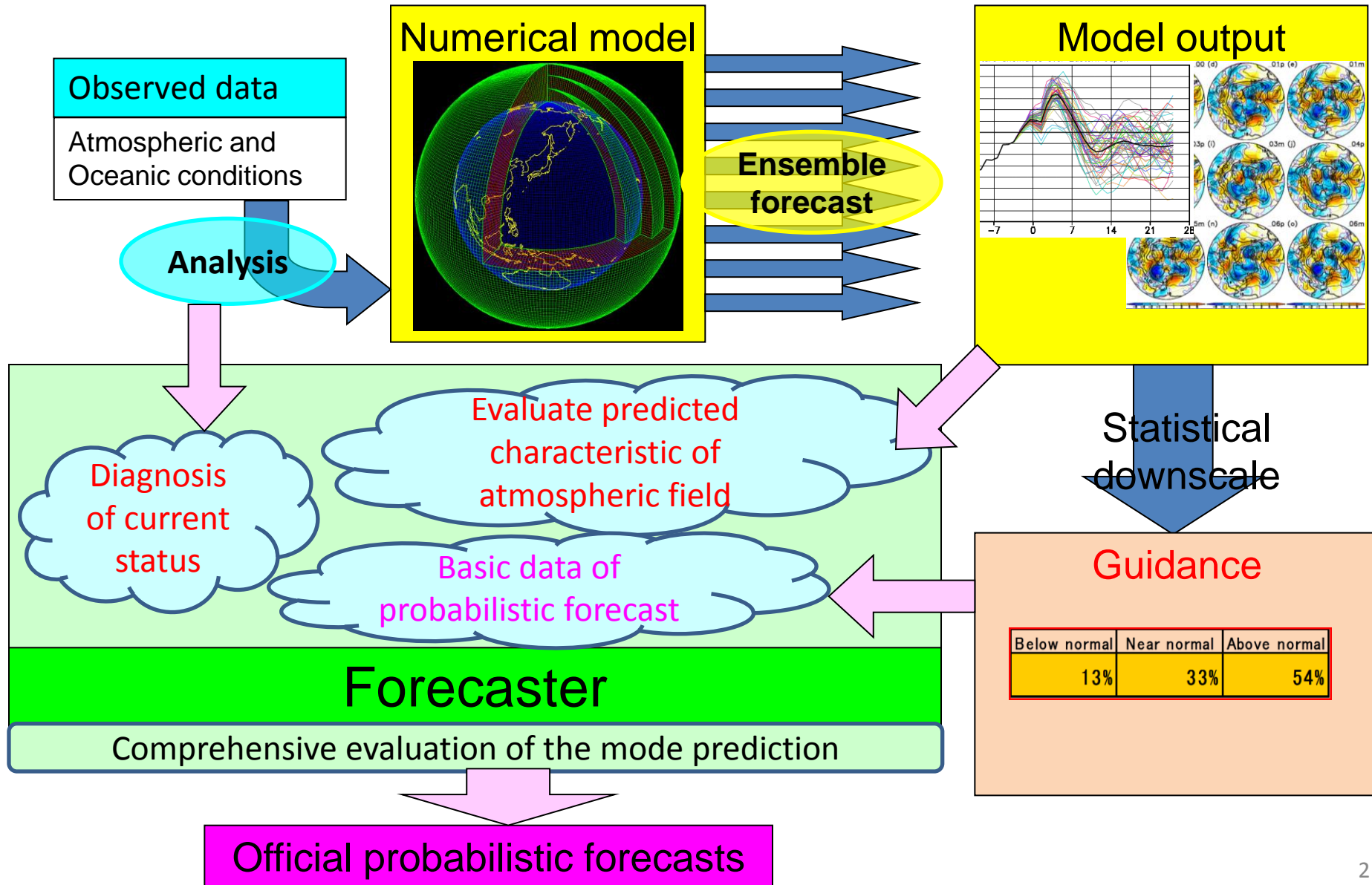


Introduction of products for Climate System Monitoring

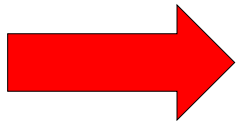
Typical flow of making one month forecast



Procedure of the one-month forecast (1)

(1) Understanding current status

- SST (ENSO, anomalies over the tropics)
- Atmosphere in the tropics
 - ISO (MJO, BSISO) active/inactive, phase
 - Convective activity over the tropics
 - Influence of the anomalous convection on the sub-tropical (mid-latitude) atmosphere
- Atmosphere in the mid-high latitudes
 - Position and meanderings of the sub-tropical jet or polar front jet
 - Rossby wave propagation along the jet streams
 - Subtropical High? Siberian High? Aleutian Low



Refer to the “Climate System Monitoring”

<http://ds.data.jma.go.jp/gmd/tcc/tcc/products/clisys/index.html>

Products for Climate System Monitoring on the TCC website

1. Animation Maps
2. Asian Monsoon Monitoring Indices
3. Time-Longitude Cross Section
4. Madden-Julian Oscillation (MJO) Phase and Amplitude monitor
5. Statistical analysis related to ENSO
6. Sea Surface Temperature

1. Animation Maps

The Animation Maps web pages provide various analysis charts and are useful to analyze the time evolution of atmospheric circulation and tropical convective activity. 1, 5, 7, 10 and 30-day average charts are available. Animation Maps are available for the period from 1958 to two days prior, and are updated every day.

To put the date backward/forward

Average period (1,5,7,10,30-day)

Date

To control animation

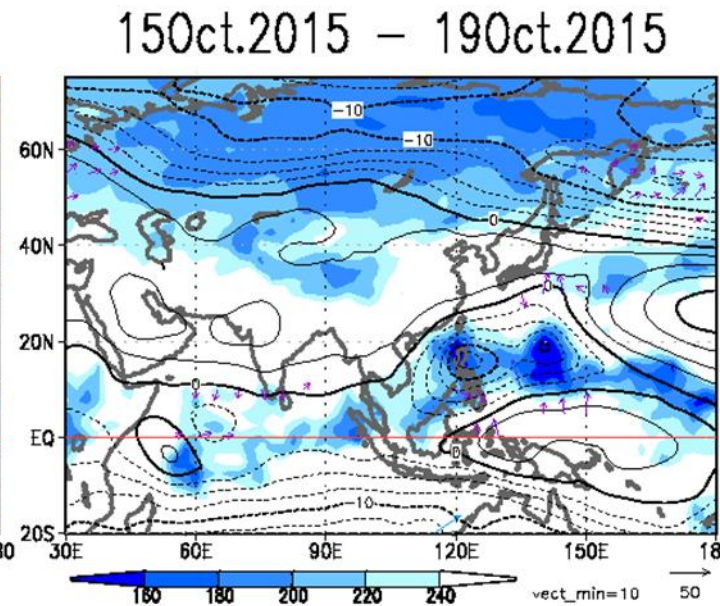
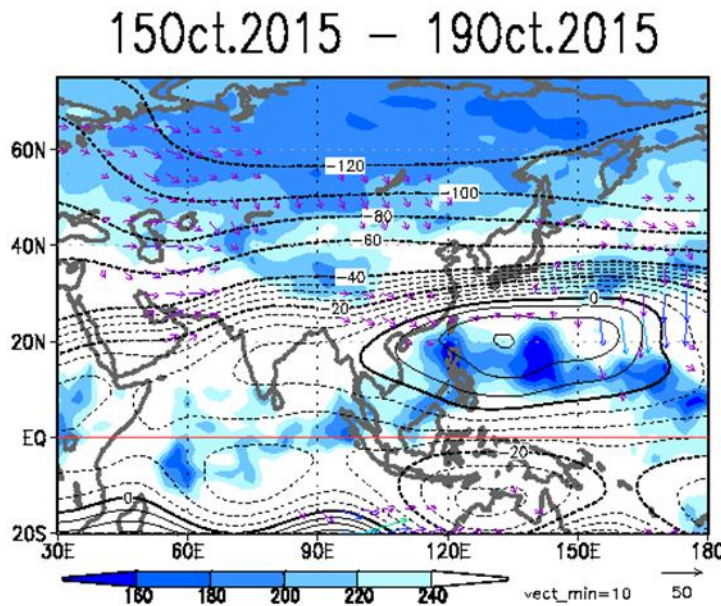
Animation Maps (Asian Region) **Explanation**

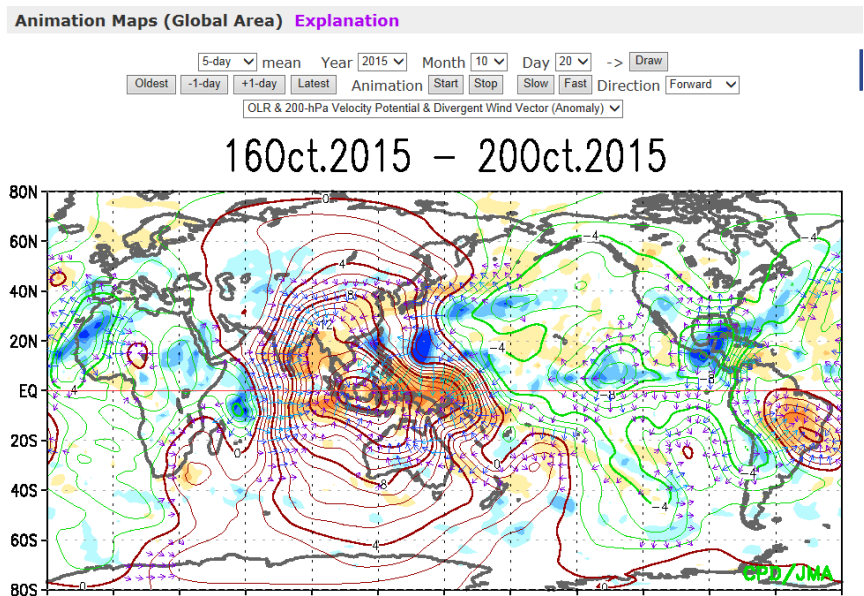
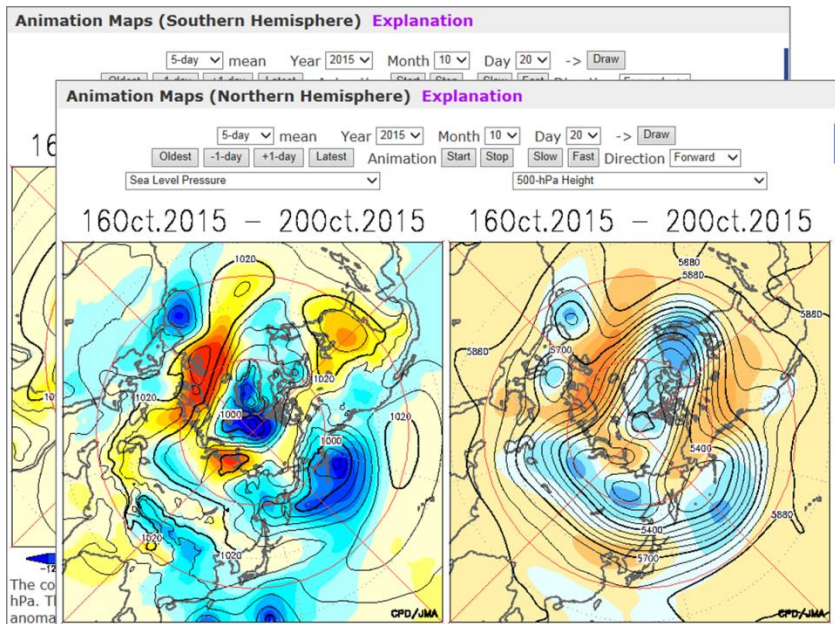
5-day mean Year 2015 Month 10 Day 19 -> Draw

Oldest -1-day +1-day Latest Animation Start Stop Slow Fast Direction Forward

OLR & 200-hPa Stream Function & Wave Activity Flux

OLR & 850-hPa Stream Function & Wave Activity Flux





Animation Maps cover four areas:
the Asian Region, the Northern and Southern Hemisphere and the Global Area.

Home | World Climate | **Climate System Monitoring** | El Nino Monitoring

HOME > Climate System Monitoring > Analysis Charts and Monitoring Indices

Analysis Charts and Monitoring Indices

Analysis Charts

- > Atmospheric Circulation (5-day, 10-day, month, 3-month)
- > Time Cross Section, Indices
- > Oceanic Figures and Tables
- > Animation Maps (Asian Region, Global Area, Northern Hemisphere, Southern Hemisphere)

Monitoring Indices

- > FNSO and Asian Monsoon Monitoring Indices

Animation Maps are available from Analysis Charts and Monitoring Indices page on the TCC website.

<http://ds.data.jma.go.jp/tcc/tcc/products/clisys/acmi.html>

2. Asian Monsoon Monitoring Indices

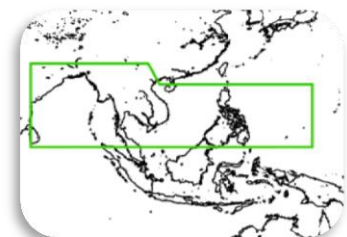
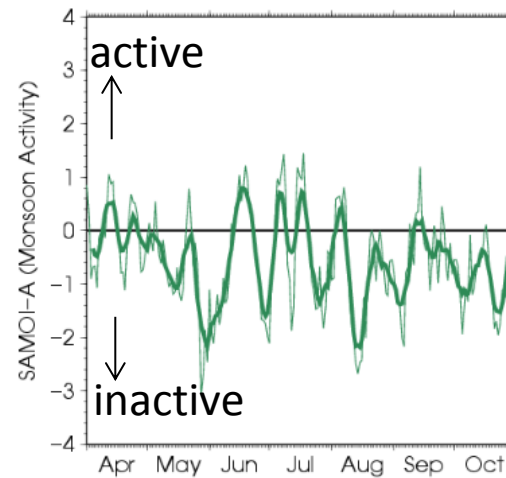
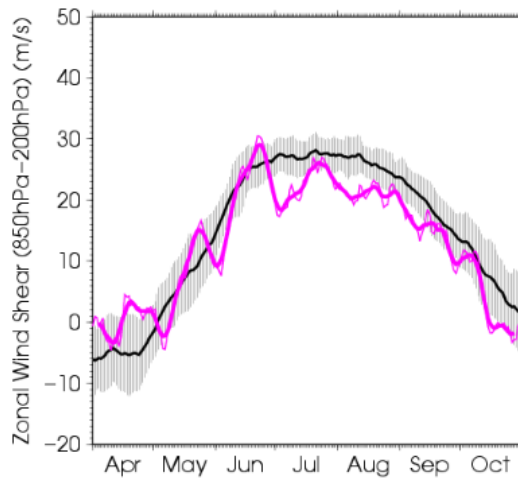
This web page provides the daily time series of Asian Monsoon Monitoring Indices. These indices are useful in monitoring the strength and expansion of the Asian summer monsoon, and are updated every day.

Asian Monsoon Monitoring Indices (daily timeseries)

Year: 2015

Element: Vertical zonal-wind shear (North Indian Ocean)

Element: SAMOI-A (Monsoon Activity)



The zonal wind shear index between the upper and lower troposphere over the North Indian Ocean and southern Asia.

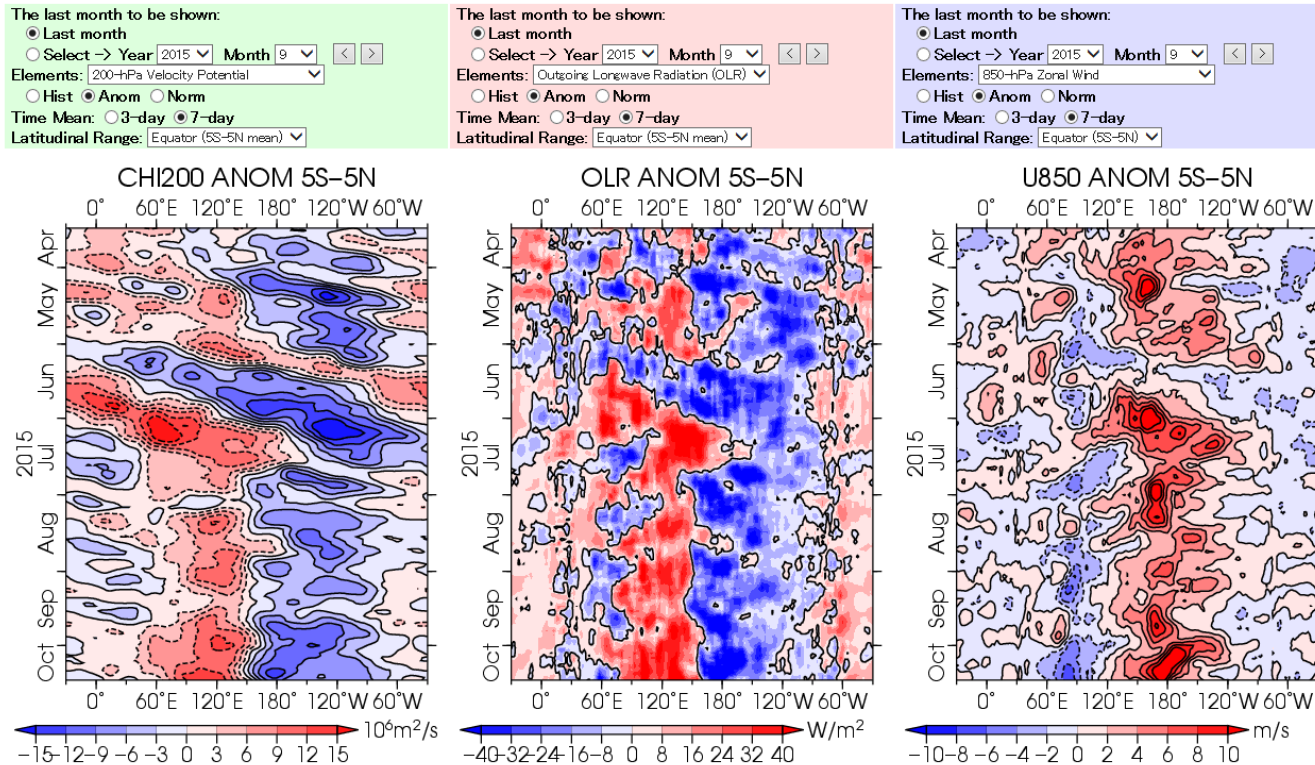
The Summer Asian Monsoon OLR Index (SAMOI-A) indicating the activity of the monsoon

3. Time-Longitude Cross Section

This web page provides time-longitude cross sections. These charts are useful in monitoring intraseasonal oscillations such as Madden-Julian Oscillation (MJO). This web page is available for the period since 1979, and is updated every day.

Time-Longitude cross section

Checking the right boxes will reflect selected options in the left section to all the other sections. ---> Time Elements Hist/Anom Time Mean Latitudinal Range
Clicking on the 'default' button will initialize your setting. --->



Elements:

OLR, velocity potential, zonal wind and sea surface temperature

Average period:

3-day and 7-day average

Latitude Range:

15-5S, 5S-5N(equator), 5-15N, 15-25N

4. MJO Phase and Amplitude monitor

MJO web page provides indices for MJO monitoring defined by Wheeler and Hendon (2004). MJO Phase and Amplitude monitor (last 40-day) is convenient for MJO monitoring.

Home | World Climate | **Climate System Monitoring** | El Niño Monitoring

HOME > Climate System Monitoring > Madden-Julian Oscillation (MJO)

Madden-Julian Oscillation (MJO)

- › Explanation

Time-Longitude Cross Section

- › OLR, Velocity Potential, Zonal Wind and SST

MJO Monitoring Indices

- › **Phase and Amplitude monitor (last 40-day)**
- › Time longitude cross section of phase and amplitude
- › Time series of RMM1 and RMM2

Principal components of EOF (1981-2010)

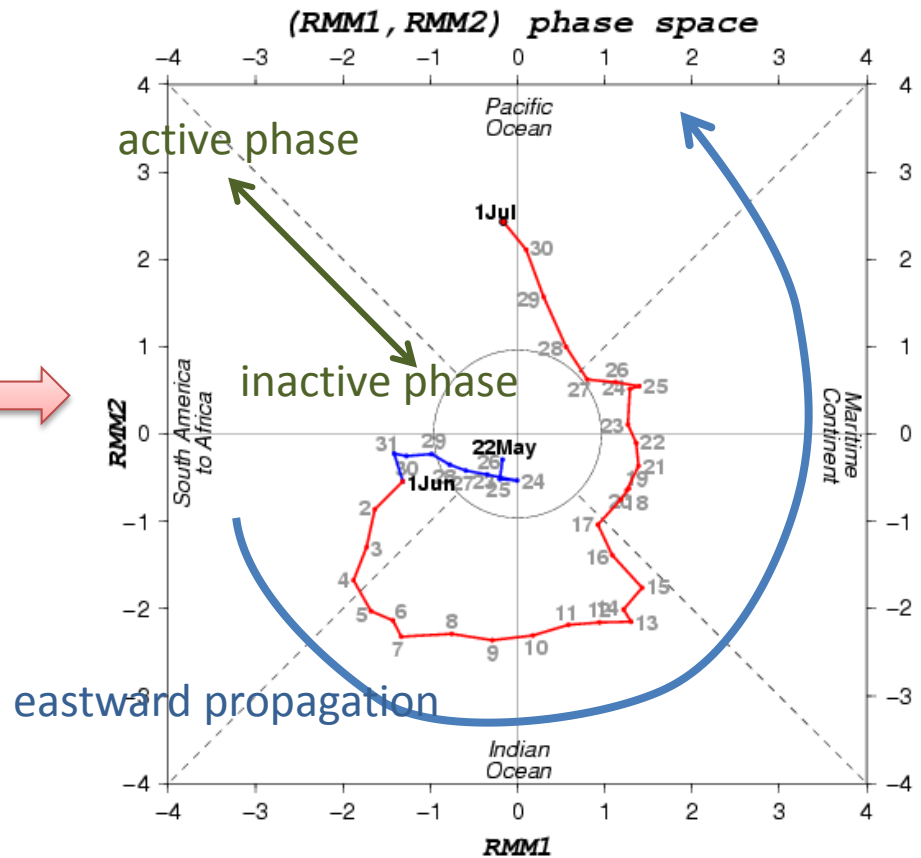
- › 1st (RMM1), 2nd (RMM2)

Composite map of anomalies

- › 8-phase (Apr. 1979 - Sep. 2012)

CSV file (1980-)

- › RMM1, RMM2, phase and amplitude (OLR+u850+u200)
- › RMM1, RMM2, phase and amplitude (chi200+u850+u200)



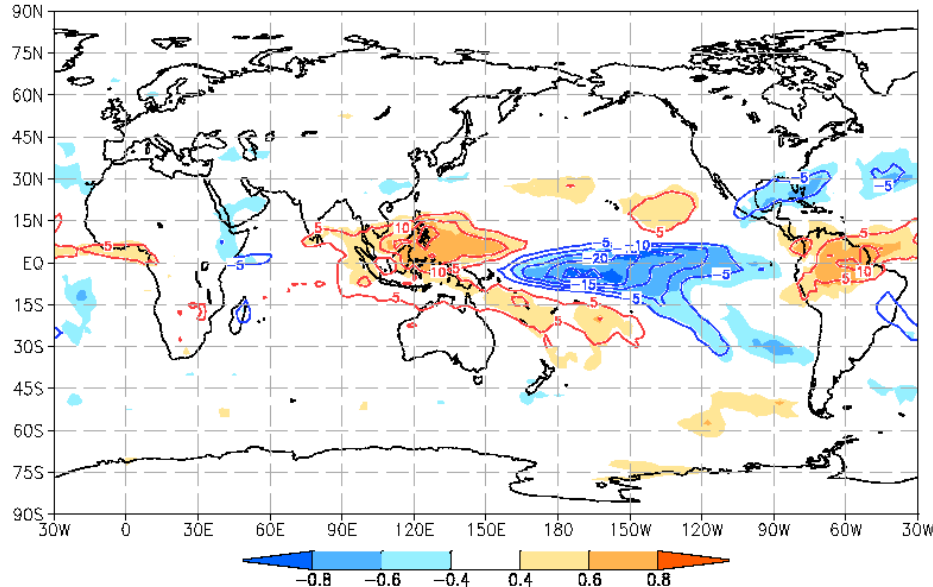
5. Statistical analysis related to ENSO

El Niño / Southern Oscillation (ENSO) events influence global atmospheric circulations and convective activities. This web page provides the statistical analysis on the relationship between ENSO monitoring indices (such as NINO.3, NINO.WEST and IOBW) and atmospheric circulation. The base period for the analysis is 1979 – 2008.

Atmosphere Circulation Regression and Correlation map

► [Explanation](#)

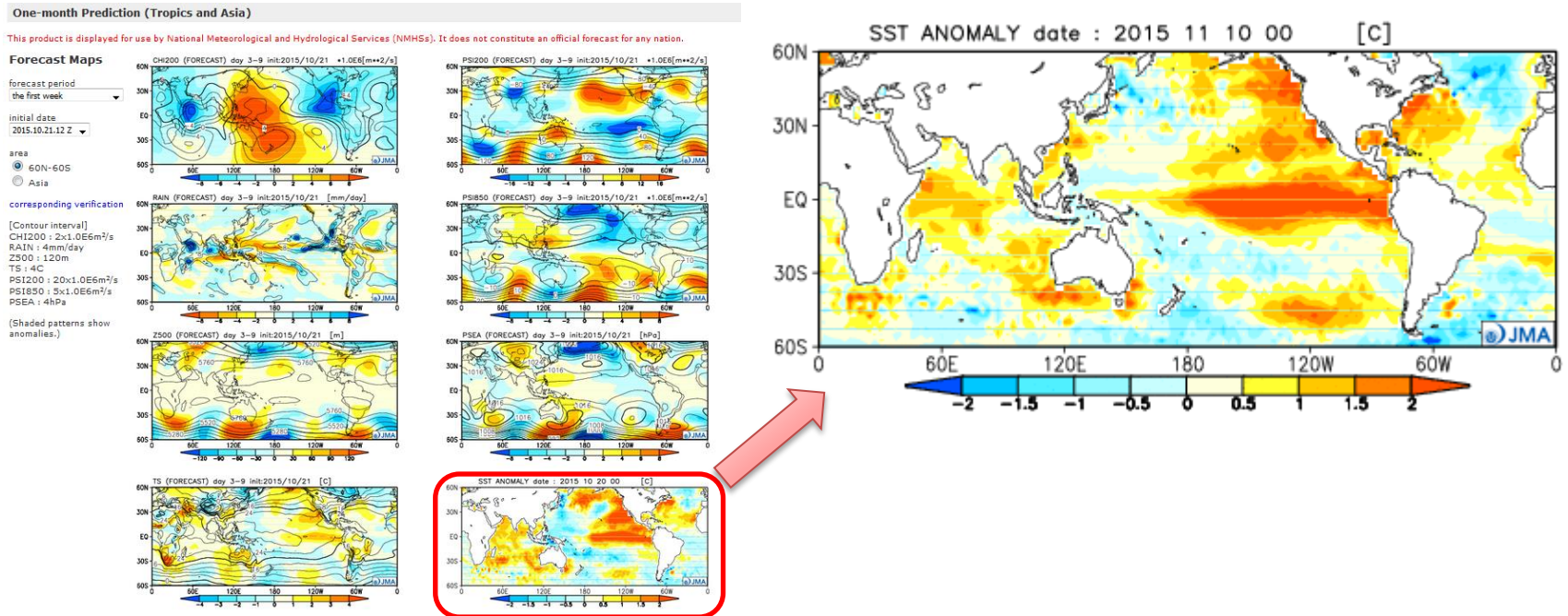
Index Elements monthly Lag



Now we are preparing to provide the renewed statistical analysis using the JRA-55 data (base period: 1958 – 2012).

6. Sea Surface Temperature (current condition)

Chart of current sea surface temperature anomaly is available in the Forecast Maps for One-month Prediction web page. The sea surface temperature anomaly displayed in this map is used as the lower boundary condition of ensemble prediction systems for the one-month prediction (the atmospheric general circulation model).

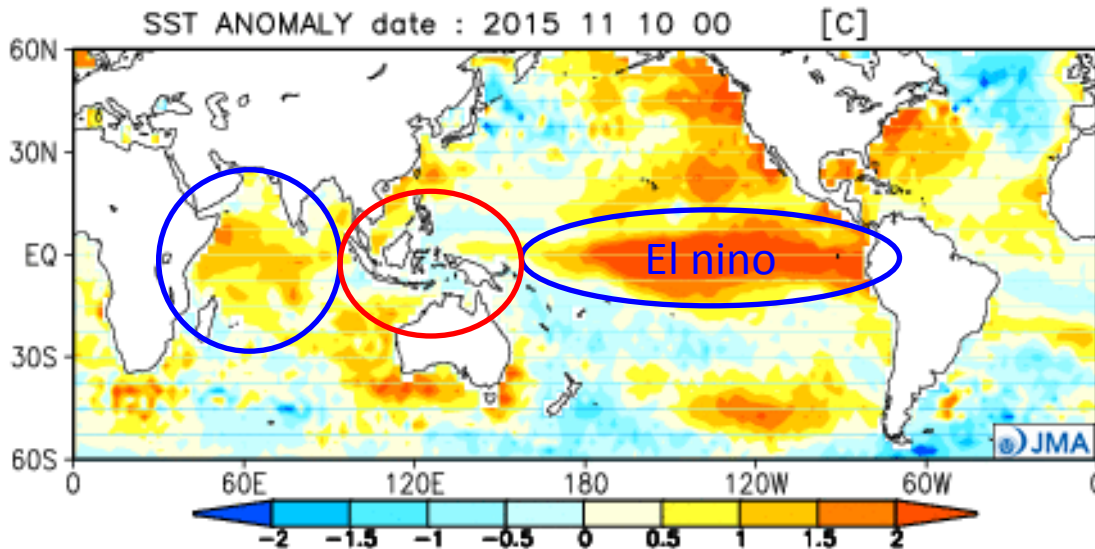


Forecast Maps for One-month Prediction (Tropics and Asia) page
(Bottom right: sea surface temperature anomaly)

Diagnosis of current Atmospheric and Oceanic conditions

Meeting for one-month forecast
on 11 November 2015

Sea surface temperature (SST)

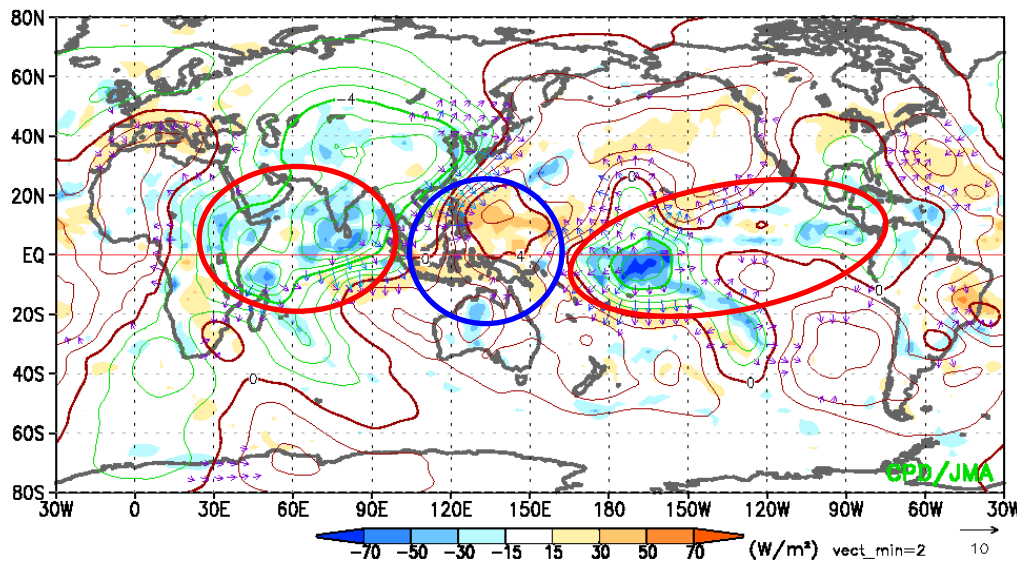


- Positive anomalies indicate warmer than normal.
- Negative anomalies indicate colder than normal.
- El Niño conditions continue in the equatorial Pacific.
- Positive SST anomalies were generally observed over the Indian Ocean.

<http://ds.data.jma.go.jp/tcc/tcc/products/model/map/1mE/map1/zpcmap.php>

OLR & 200-hPa Velocity Potential & Divergent Wind Vector (Anomaly)

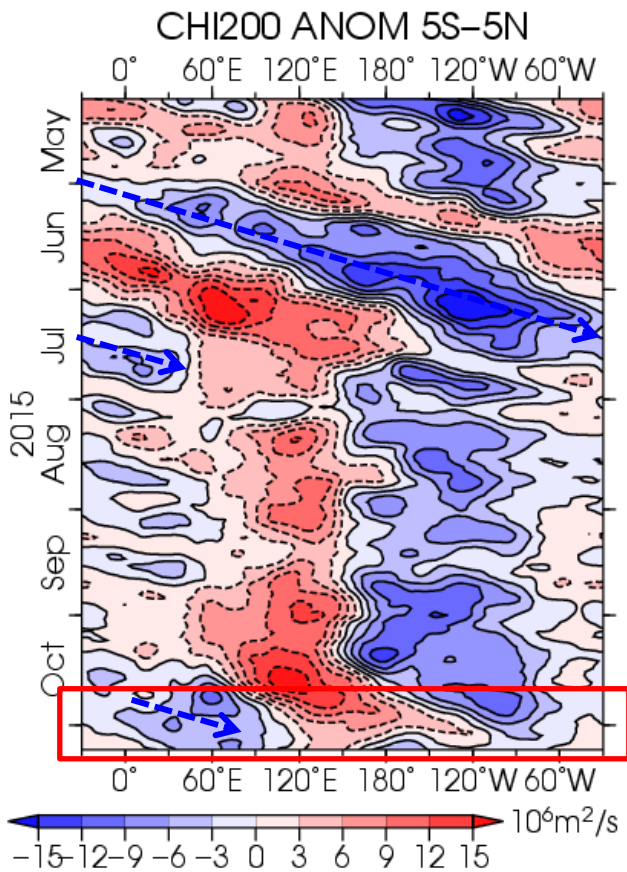
04Nov.2015 – 10Nov.2015



- Shading indicates OLR anomaly. Contours indicate large-scale divergence or convergence anomaly.
- Convective activity was enhanced and divergence anomalies were seen over Indian Ocean and central to eastern Pacific.
- Convective activity was suppressed and convergence anomalies were seen over the Maritime Continent.

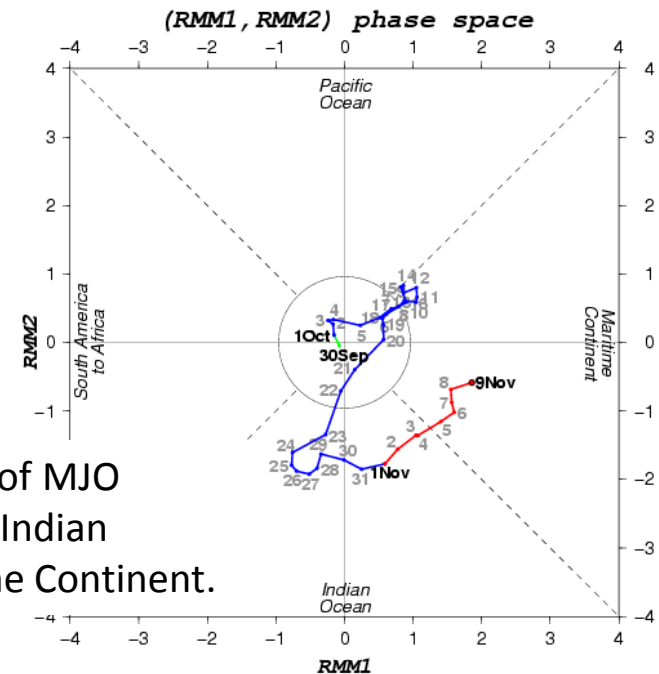
http://ds.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

Upper Velocity Potential (CHI200) anomaly along the equator



http://ds.data.jma.go.jp/tcc/tcc/products/clisys/ASIA_TCC/mjo_cross.html

- Negative value indicates large-scale divergence anomaly at 200-hPa.
- Positive value indicates large-scale convergence anomaly at 200-hPa.
- The active phase of the MJO was seen propagating eastward with enhanced amplitude around Indian Ocean from end of October.



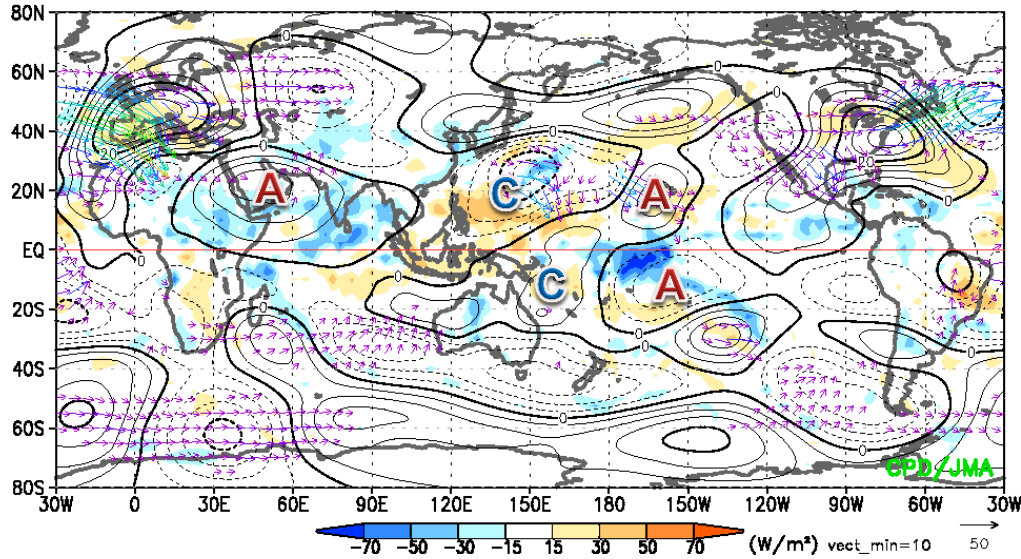
- The active phase of MJO propagated from Indian Ocean to Maritime Continent.

<http://ds.data.jma.go.jp/tcc/tcc/products/clisys/mjo/monitor.html>

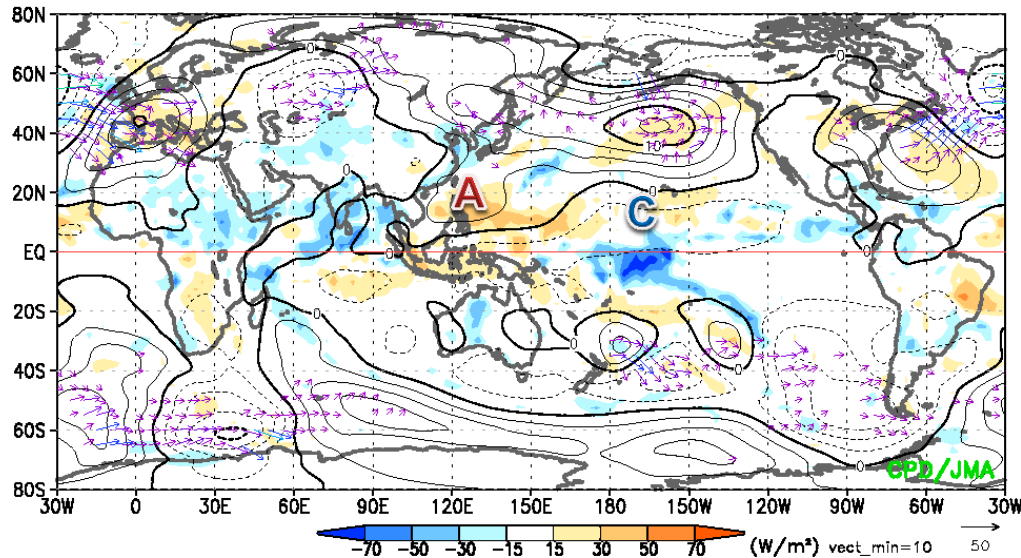
MJO Phase and Amplitude monitor (last 40-day)

OLR & Stream Function & Wave Activity Flux (Anomaly)

200-hPa 04Nov.2015 – 10Nov.2015



850-hPa 04Nov.2015 – 10Nov.2015



Stream Function

- Contours show stream function anomalies.
- Positive values (solid line) indicate anticyclone in Northern Hemisphere and cyclone in Southern Hemisphere
- Negative values (dash line) indicate cyclone in Northern Hemisphere and anticyclone in Southern Hemisphere

200-hPa

- Cyclonic circulation anomalies straddling the equator were seen over the western Pacific. Anticyclonic circulation anomalies straddling the equator were seen over the central Pacific.

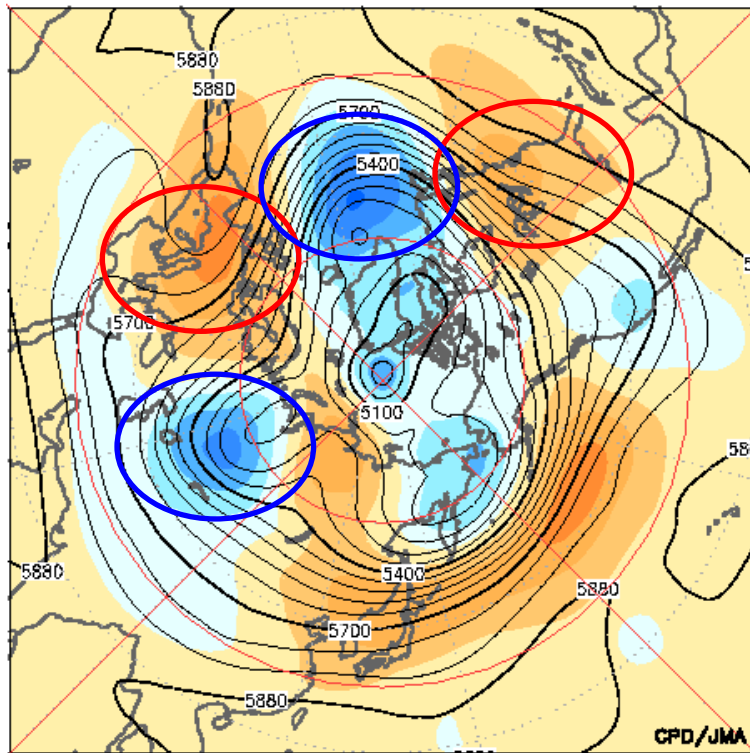
850-hPa

- Anticyclonic circulation anomalies were seen over North Western Pacific and cyclonic circulation anomalies were seen from the central to eastern equatorial Pacific in the Northern hemisphere.

http://ds.data.jma.go.jp/tcc/tcc/products/clisys/anim/anim_tp.html

500-hPa Geopotential Height

04Nov.2015 – 10Nov.2015

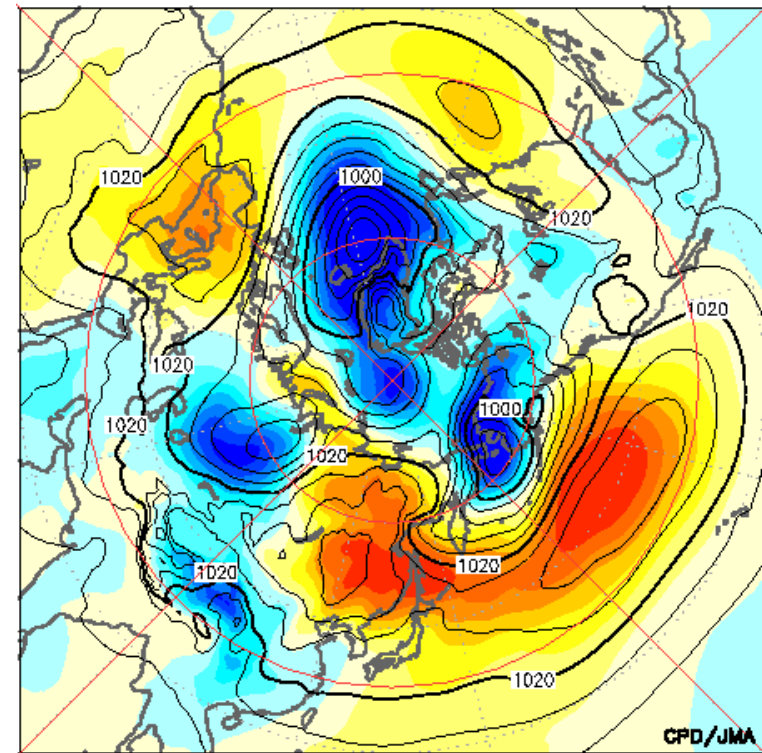


-300 -240 -180 -120 -60 0 60 120 180 240 300 (m)

- Contours indicate 500-hPa geopotential height.
- Shading indicates anomaly.
- Wave trains were seen over the area from eastern North America to western Siberia.

Sea Level Pressure

04Nov.2015 – 10Nov.2015

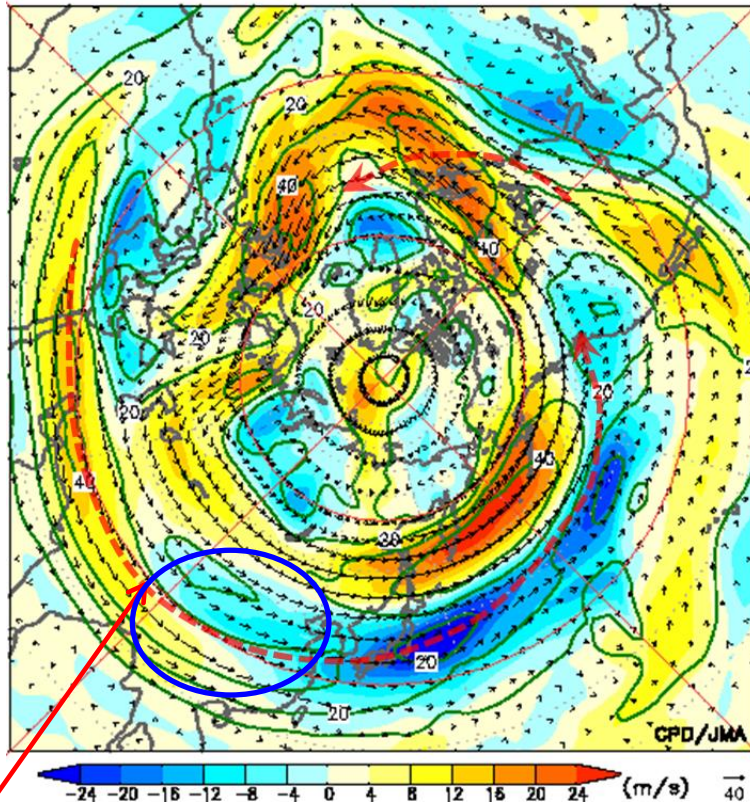


-12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 (hPa)

- Contours indicate sea level pressure.
- Shading indicates anomaly.
- Sea Surface Pressure is often used to know the strength of Pacific High, Siberian High, Aleutian Low and so on.

300-Pa Wind Speed & Wind Vector(Anomaly)

04Nov.2015 – 10Nov.2015

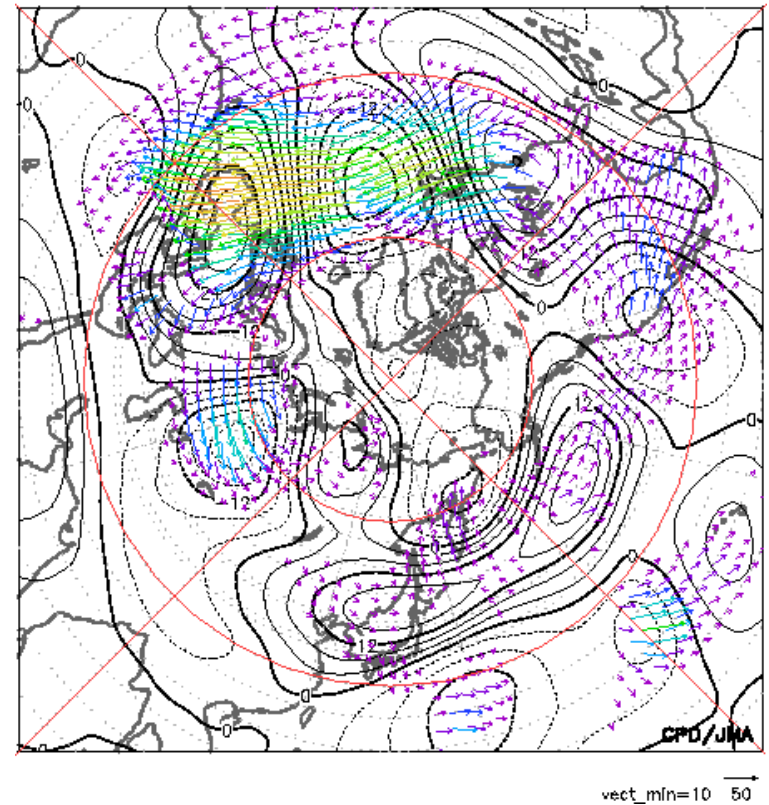


Climatological position

- Shading indicates wind speed anomaly.
- Vectors indicate wind vector anomaly.
- The jet stream shifted southward of its normal position around China. The polar front jet stream was clearly observed.

300-Pa Wave Activity Flux

04Nov.2015 – 10Nov.2015



- The vectors indicate wave activity flux.
- Contours indicate stream function anomalies.
- Quasi-stationary Rossby wave trains were seen from eastern North America to Western Siberia along the polar front jet stream.

Thank you!