Seasonal Outlook of the East Asian Winter Monsoon 2013/14

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Structure of this presentation

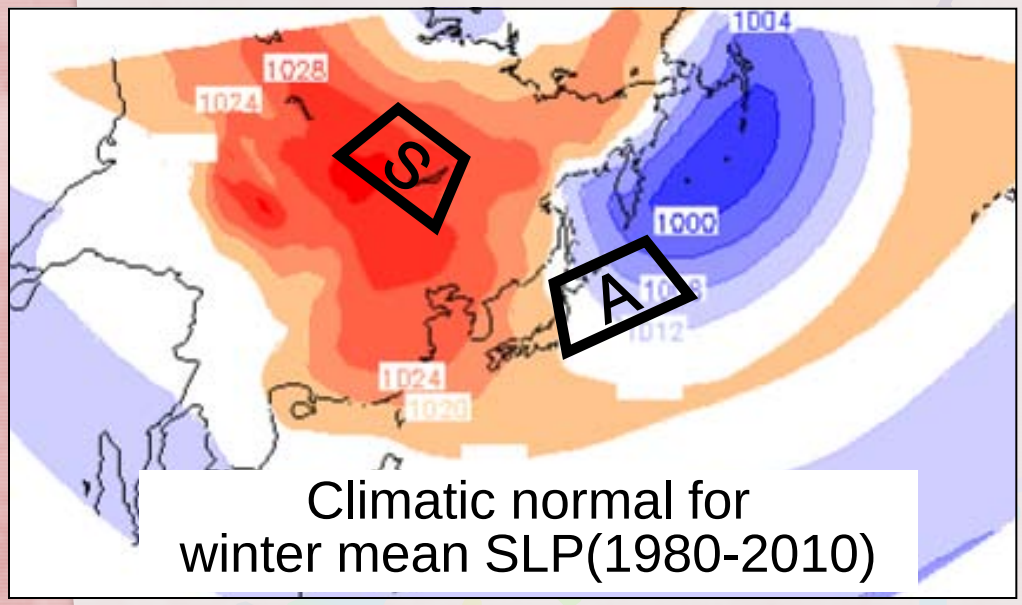
Part I Interannual variability of East Asian Winter Monsoon (EAWM - index)

Part II Current condition

Part III Numerical prediction

Part I Interannual variability of East Asian Winter Monsoon (EAWM)

Interannual variability of EAWM



Climatic normal for
winter mean SLP(1980-2010)

Conveniently we define EAWM-Index as follows,

EAWM-Index =

SLP(S) – SLP(A)

where

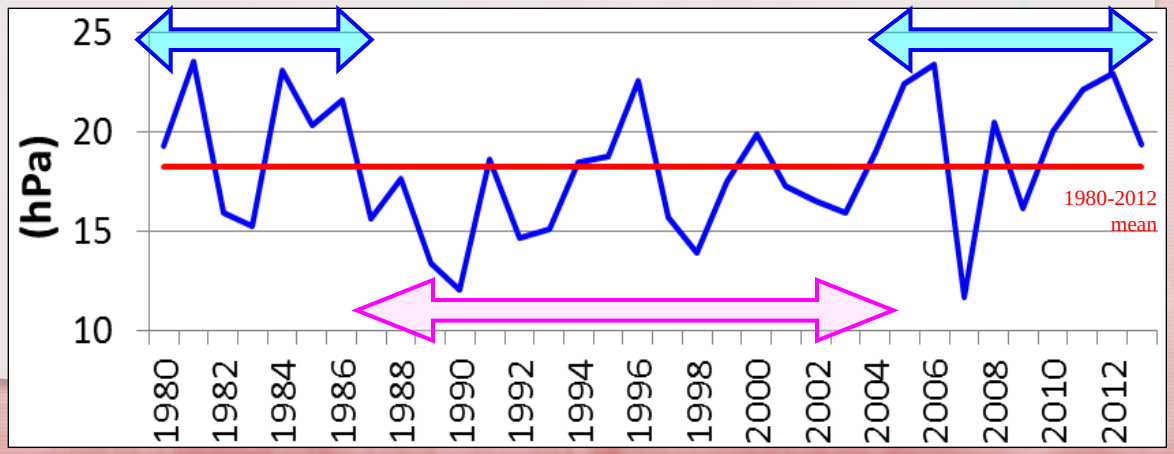
area S : 50-60N, 90-110E

area A : 35-45N, 140-160E

term

Dec.-Feb. mean

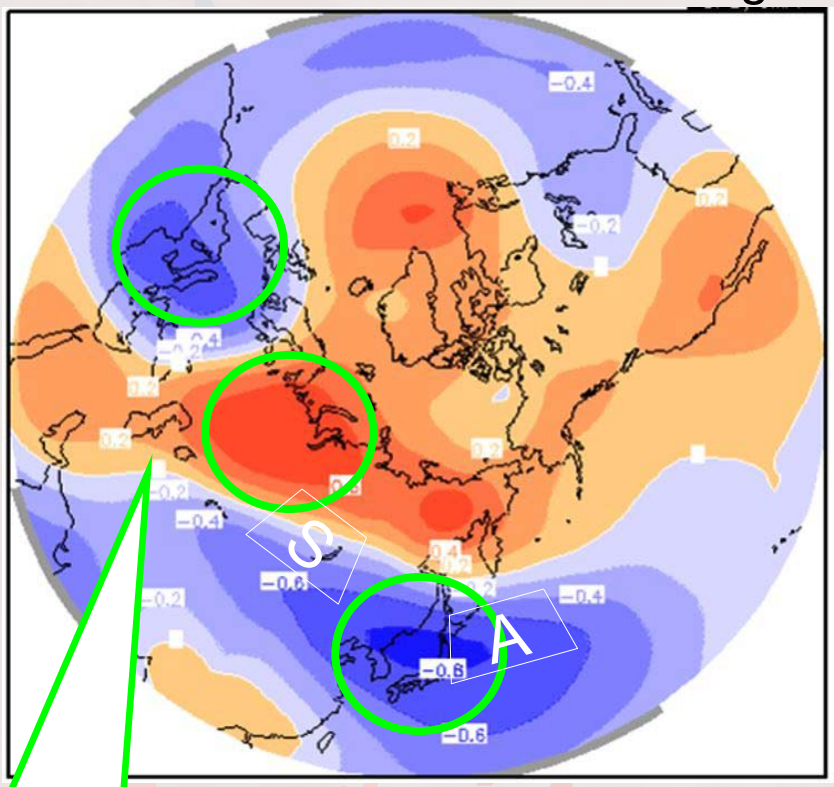
Interannual variation of EAWM-Index



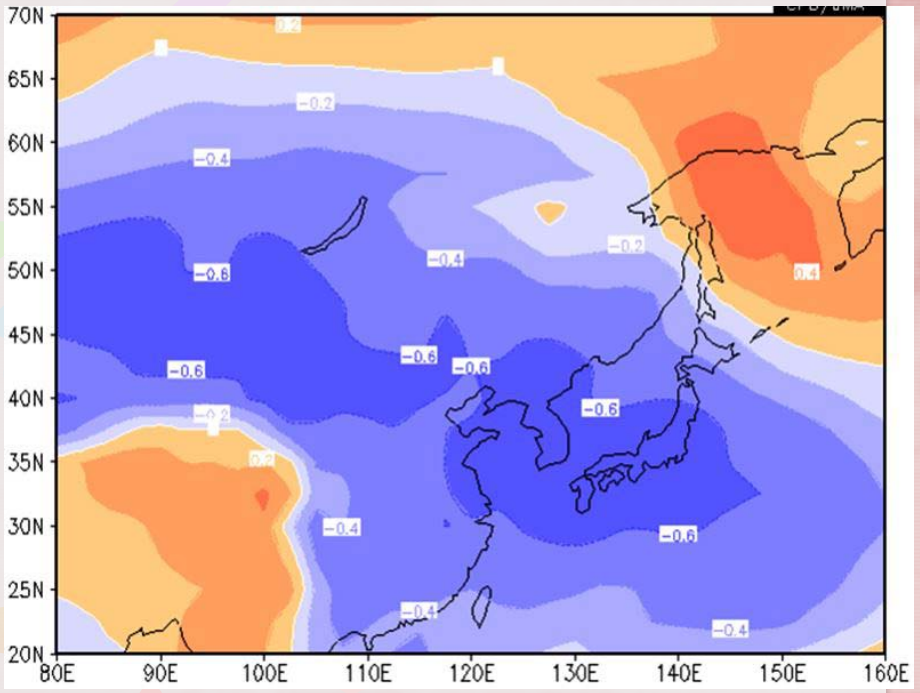
Relationship between EAWM and EU-pattern

correlation coefficients between …

EAWM-Index and 500hPa height



EAWM-Index and
850hPa temperature



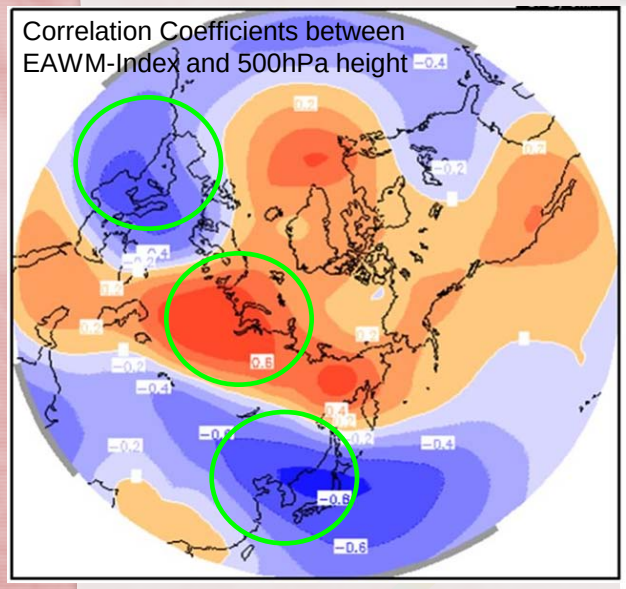
EU teleconnection pattern

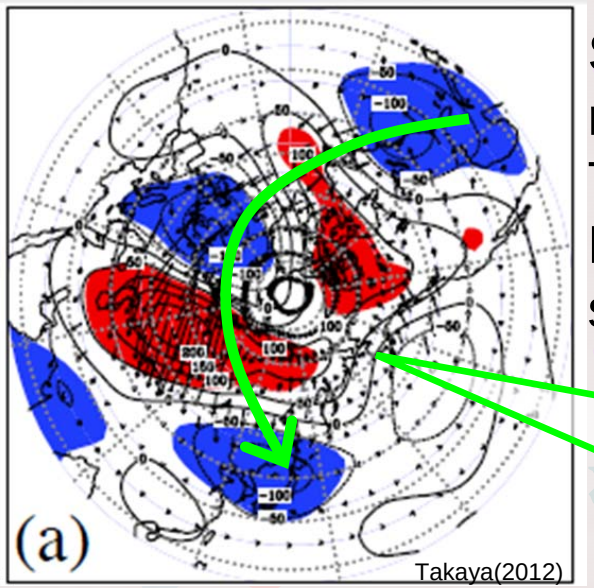
95% significant

95% significant

Period:1979-2012

Relationship between EAWM and tropics

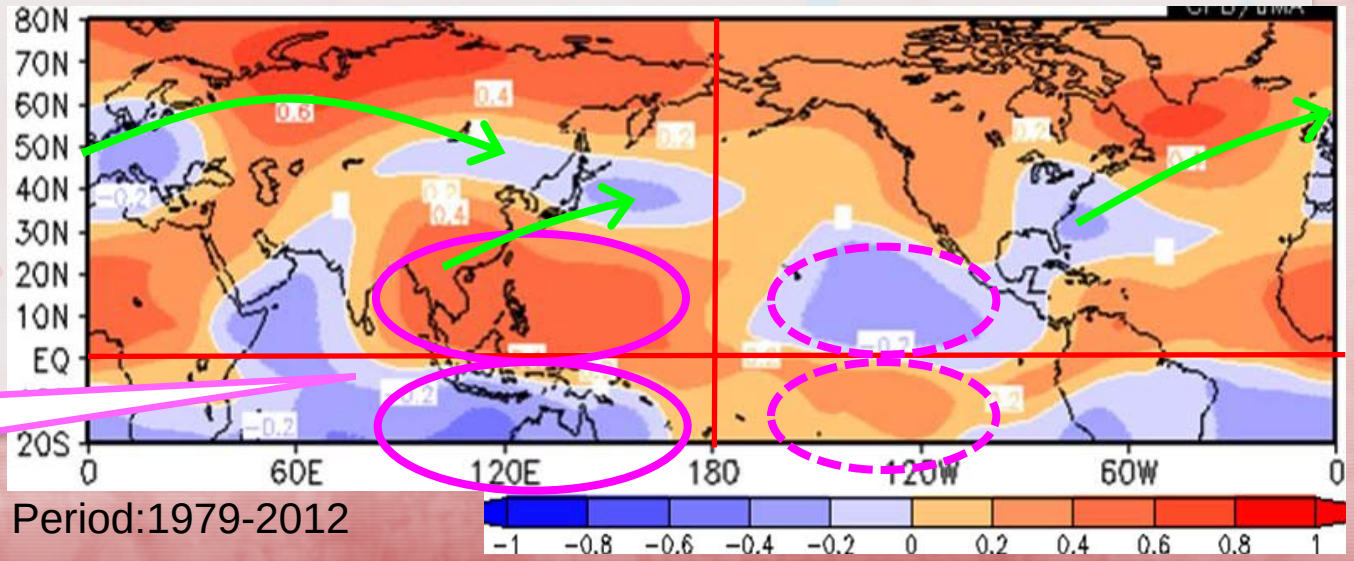




Similar result to the research by Takaya(2012). The source of wave train to EU pattern is located at southeastern North America

Propagation of stationary Rossby wave

correlation coefficients between EAWM-Index and 200hPa stream function



Matsuno-Gill Pattern

Period:1979-2012

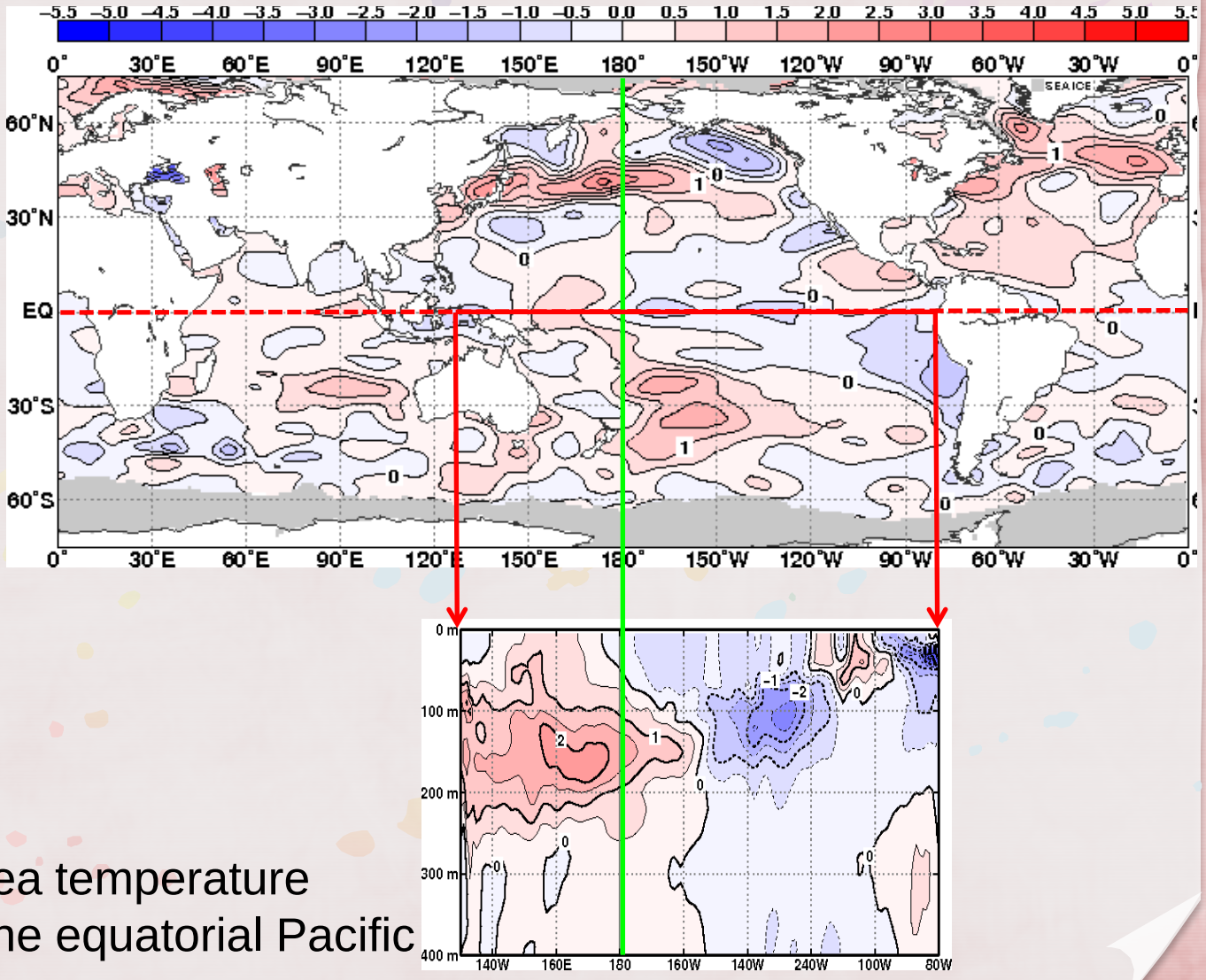
Summary of interannual variability of EAWM

- There seems to be a decadal variation in interannual variability of East Asian Winter Monsoon.
- For recent years, the phase of decadal variation shows a strong EAWM.
- The interannual variability of EAWM relates to EU teleconnection pattern.
- The EU pattern is basically considered as an internal mode of atmosphere, but it is possible that the sub-tropical convection is concerned with the exciting of Rossy wave source.

Part II Current conditions

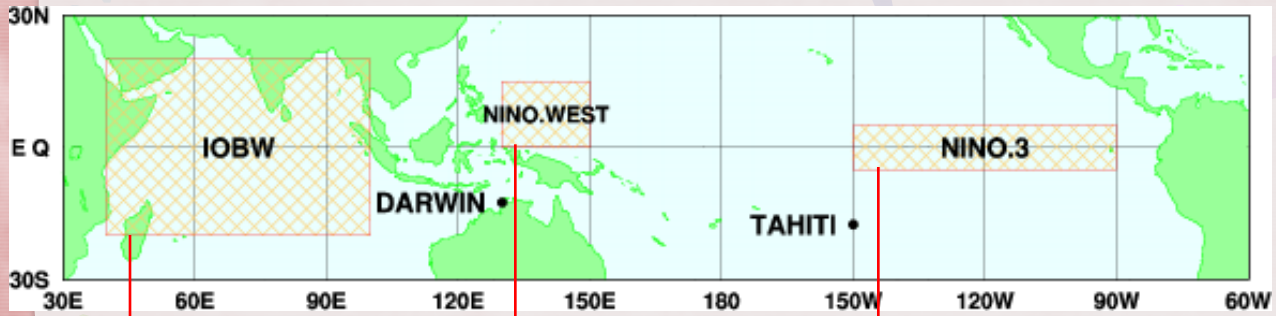
Oceanic conditions in Mid-October

SST anomalies

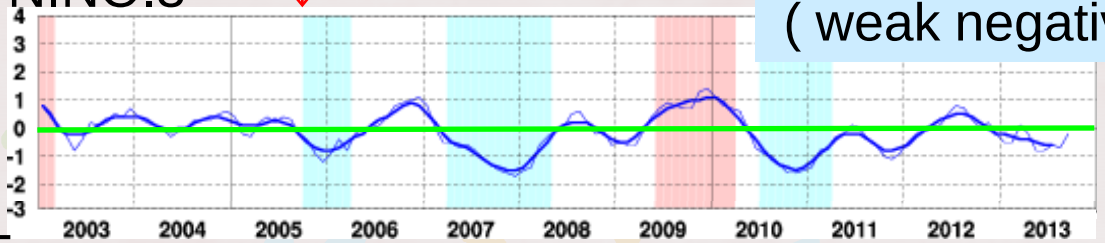


Sub-surface sea temperature anomalies in the equatorial Pacific

Time series of El-nino/La-nina Monitoring Indices

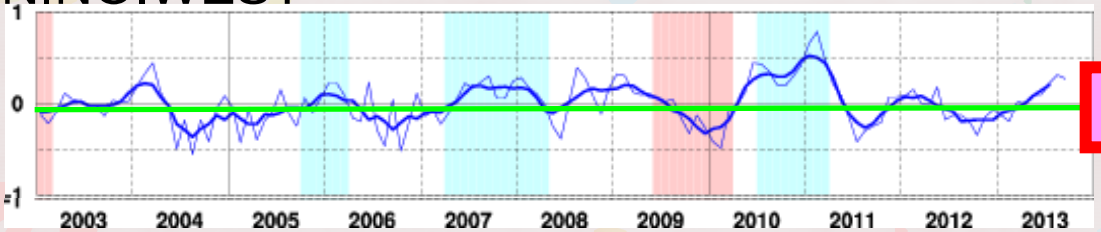


NINO.3



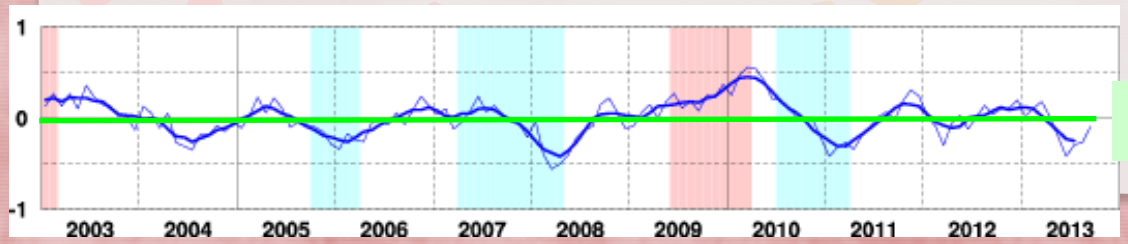
Near normal
(weak negative)

NINO.WEST



Positive anomaly

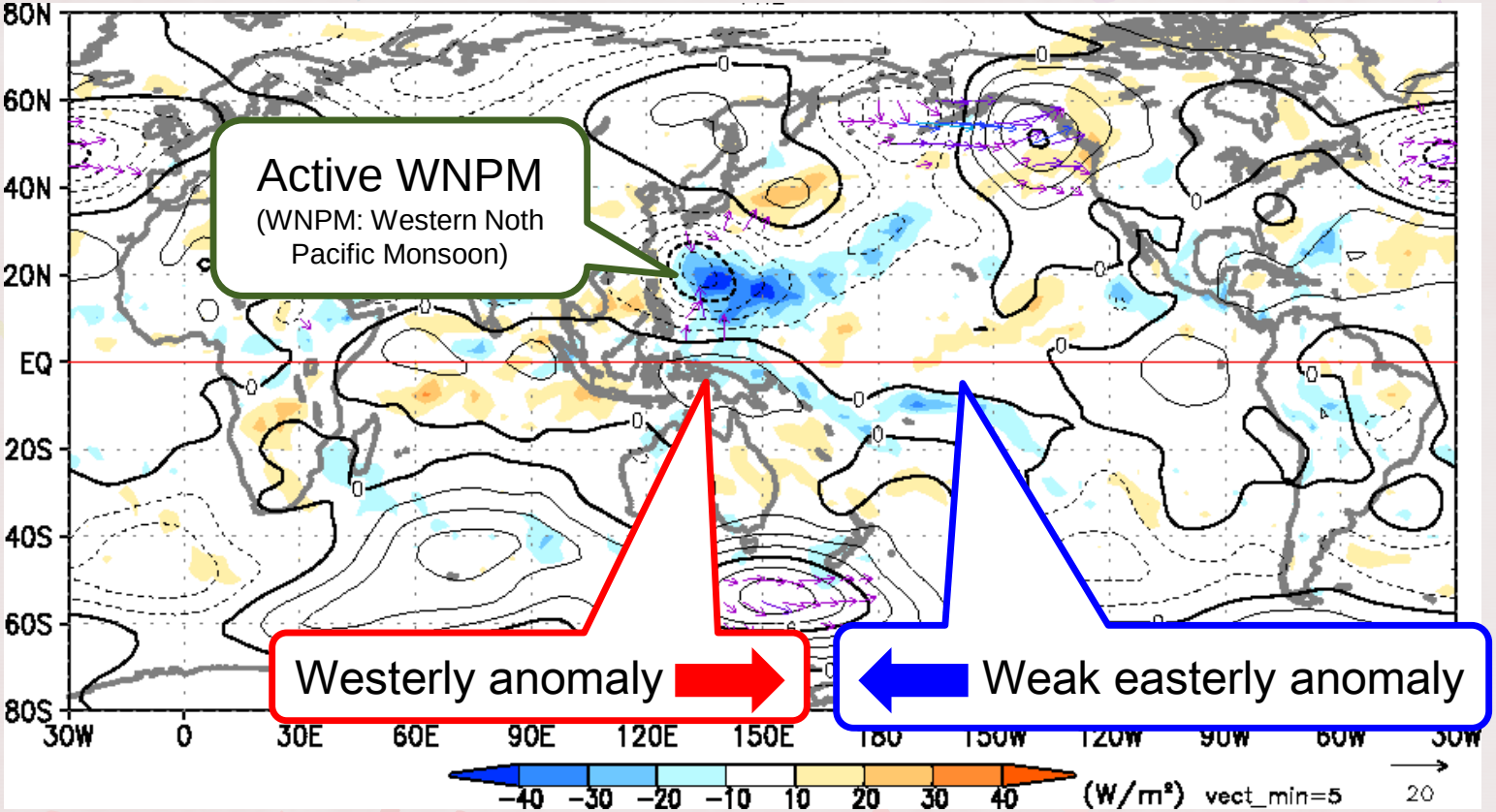
IOBW :Indian Ocean basin-wide



Near normal

Atmospheric conditions in October

Color shade : OLR anomalies
Contour : 850hPa stream function anomalies



Summary of current conditions

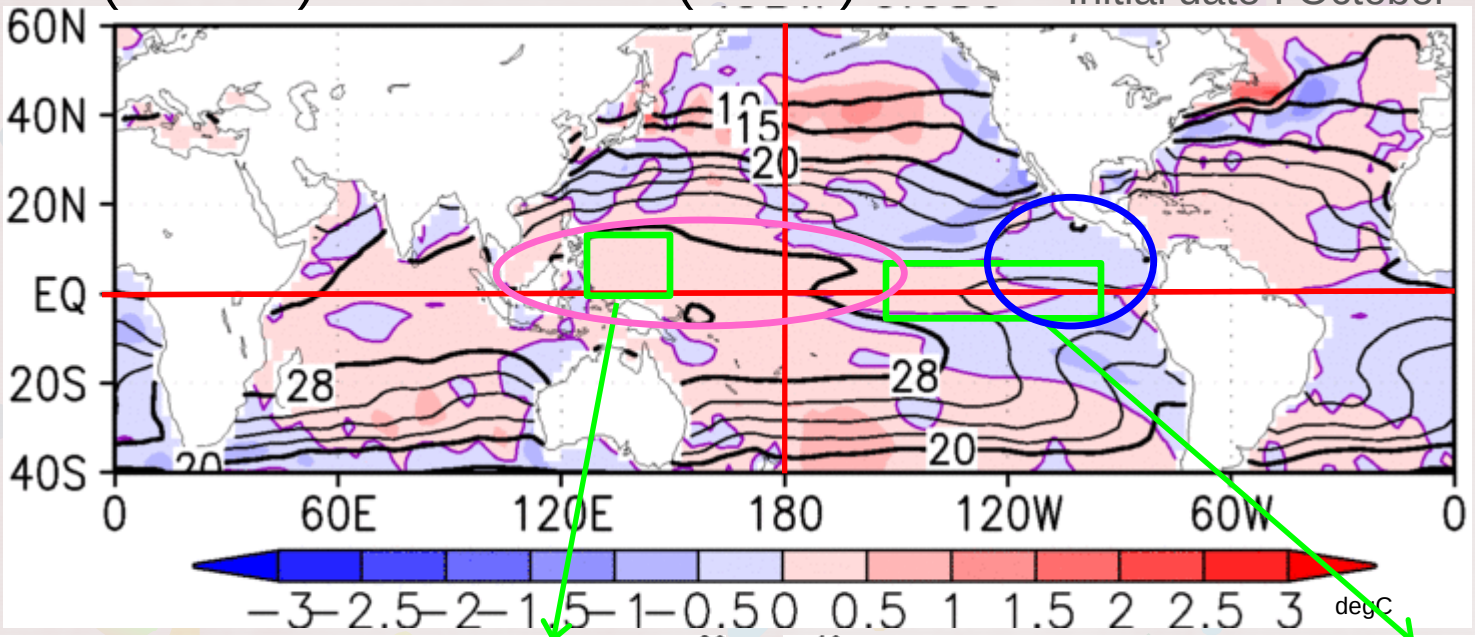
- SST and sub-surface sea temperature anomalies along the equator are positive in the western Pacific, and weak negative in the eastern Pacific.
- WNPM is active. Westerly anomalies are observed in the maritime continent, weak easterly anomalies are observed in the central Pacific.
- In conclusion, the ENSO-neutral continues.
- Meanwhile, NINO.WEST positive anomaly in the western Pacific is a remarkable point.

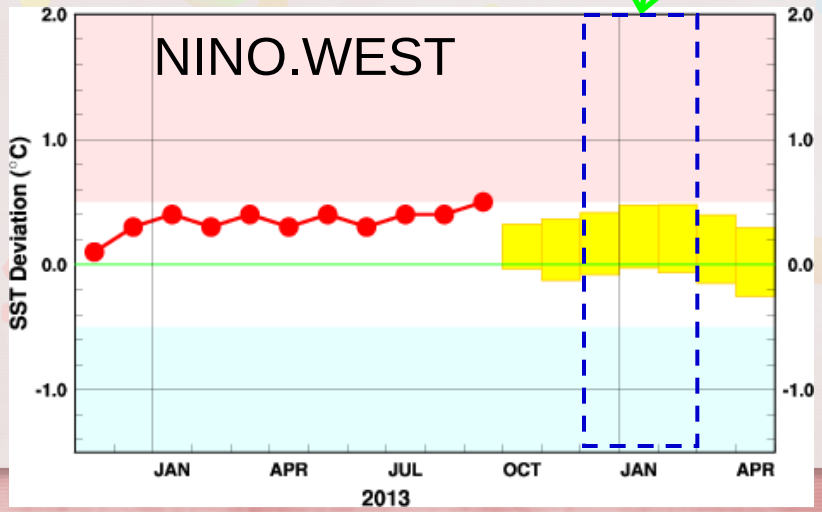
Part III Numerical prediction

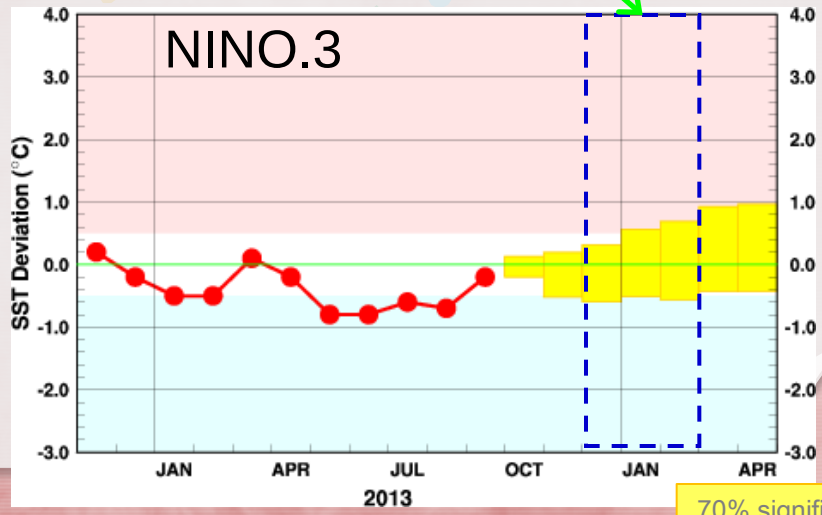
DJF Prediction --oceanic conditions--

SST(contour) and anomalies(shade)

Initial date : October



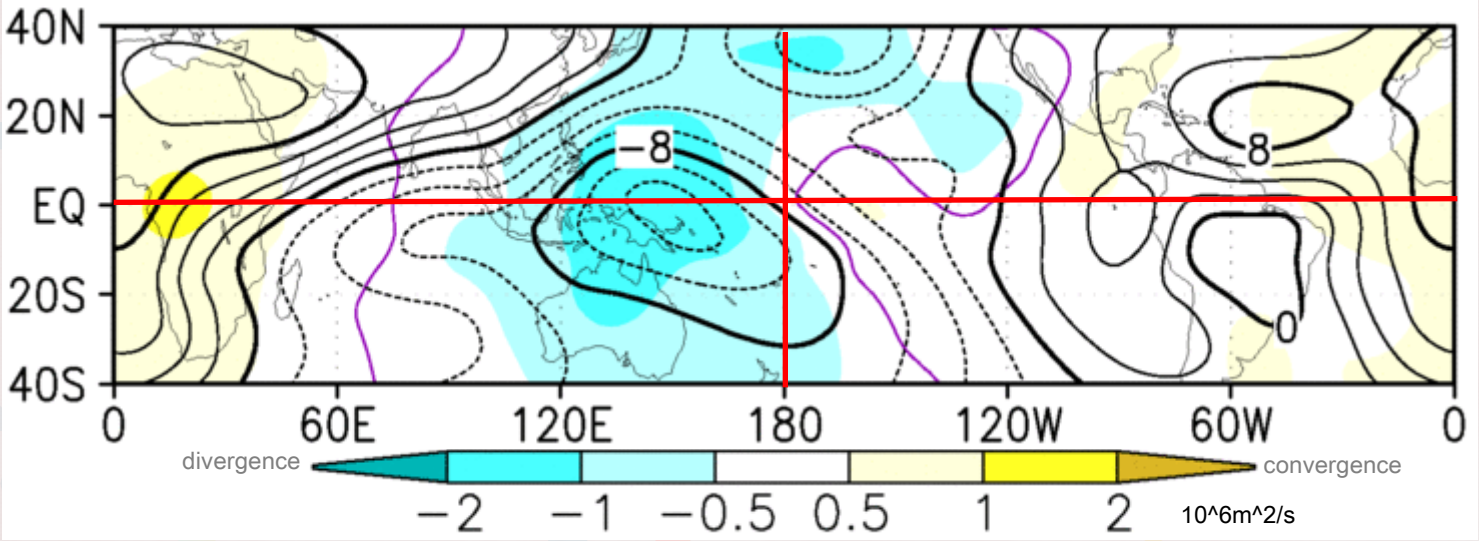




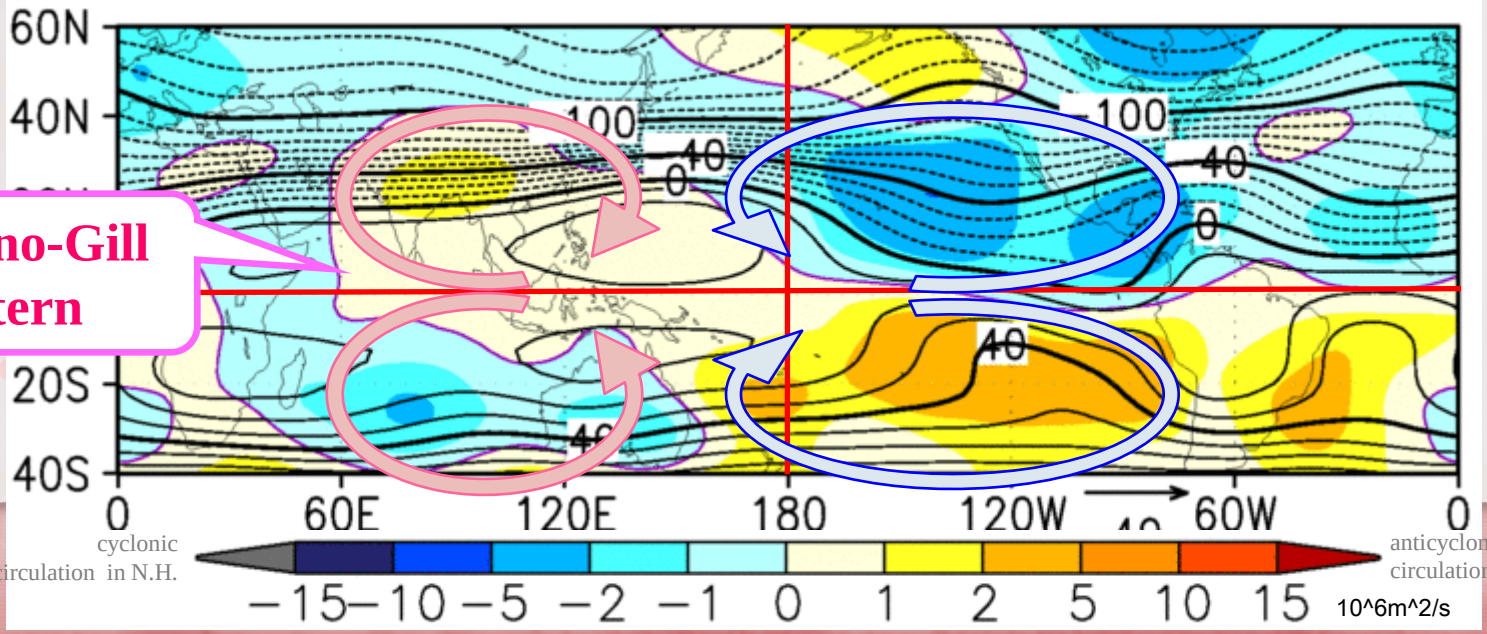
70% significant

DJF Prediction --sub-tropical circulation(1)--

200hPa velocity potential and anomalies

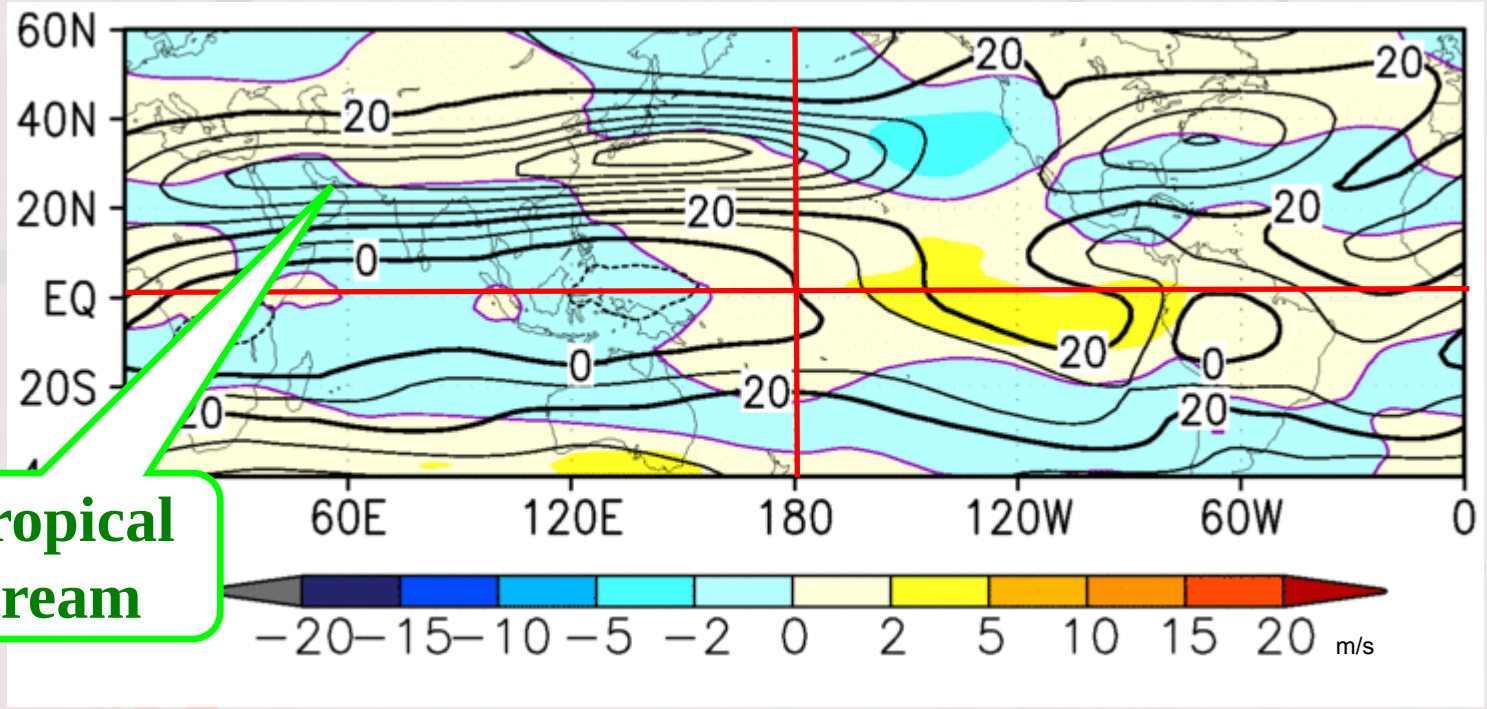


200hPa stream function and anomalies



DJF Prediction --sub-tropical circulation(2)--

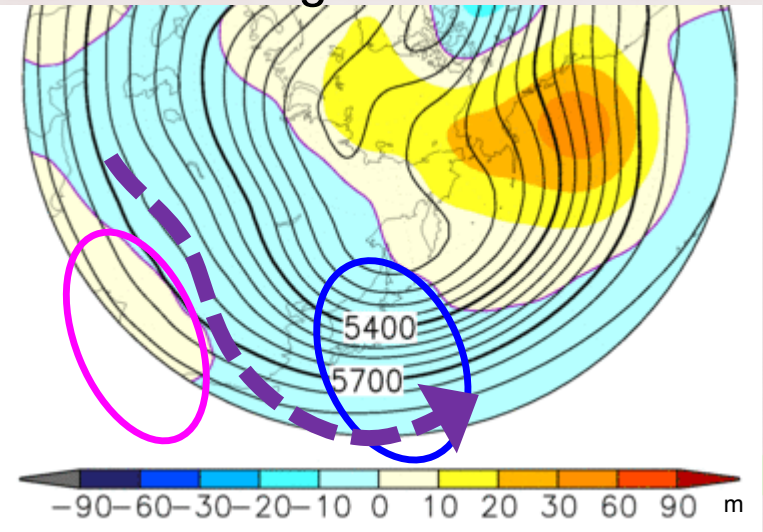
200hPa U and anomalies



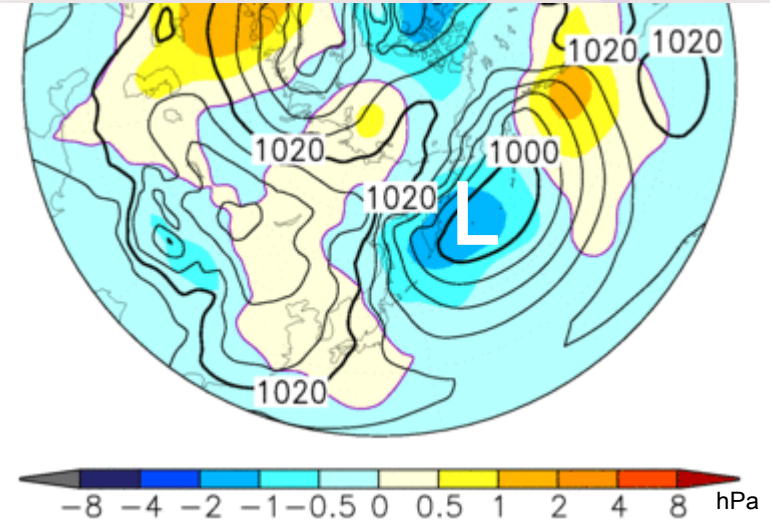
Sub-tropical jet stream

DJF Prediction --East Asian circulation --

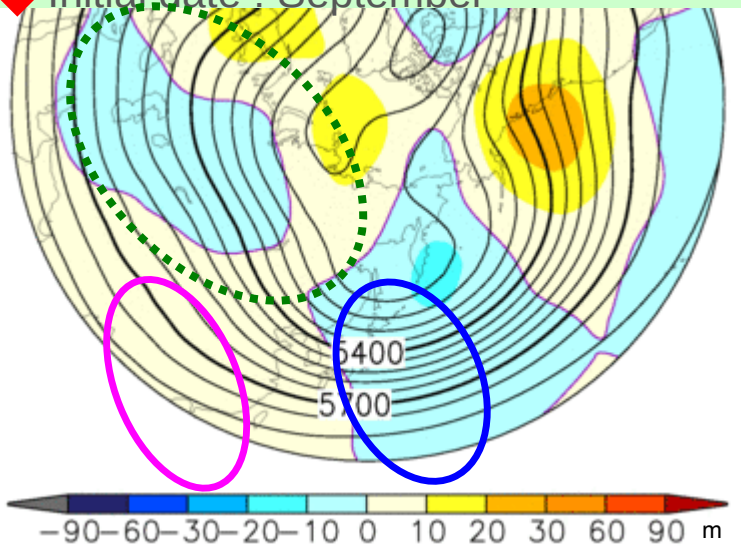
500hPa height and anomalies



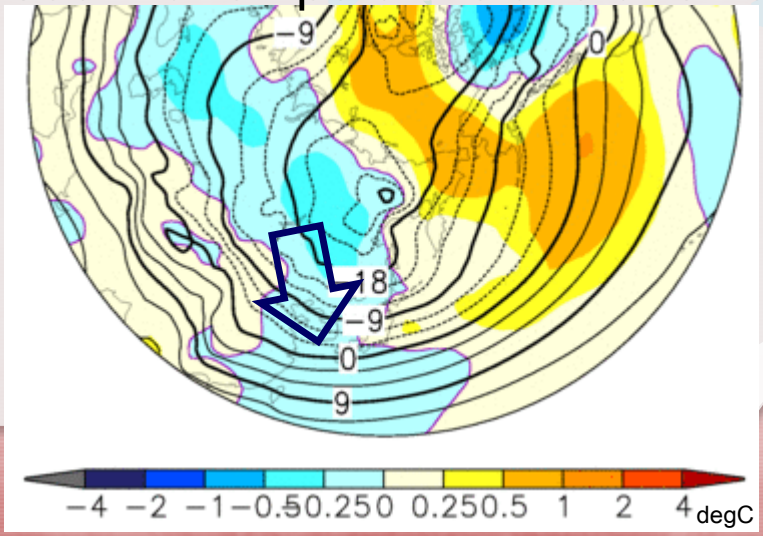
SLP and anomalies



Initial date : September



850hPa temperature and anomalies

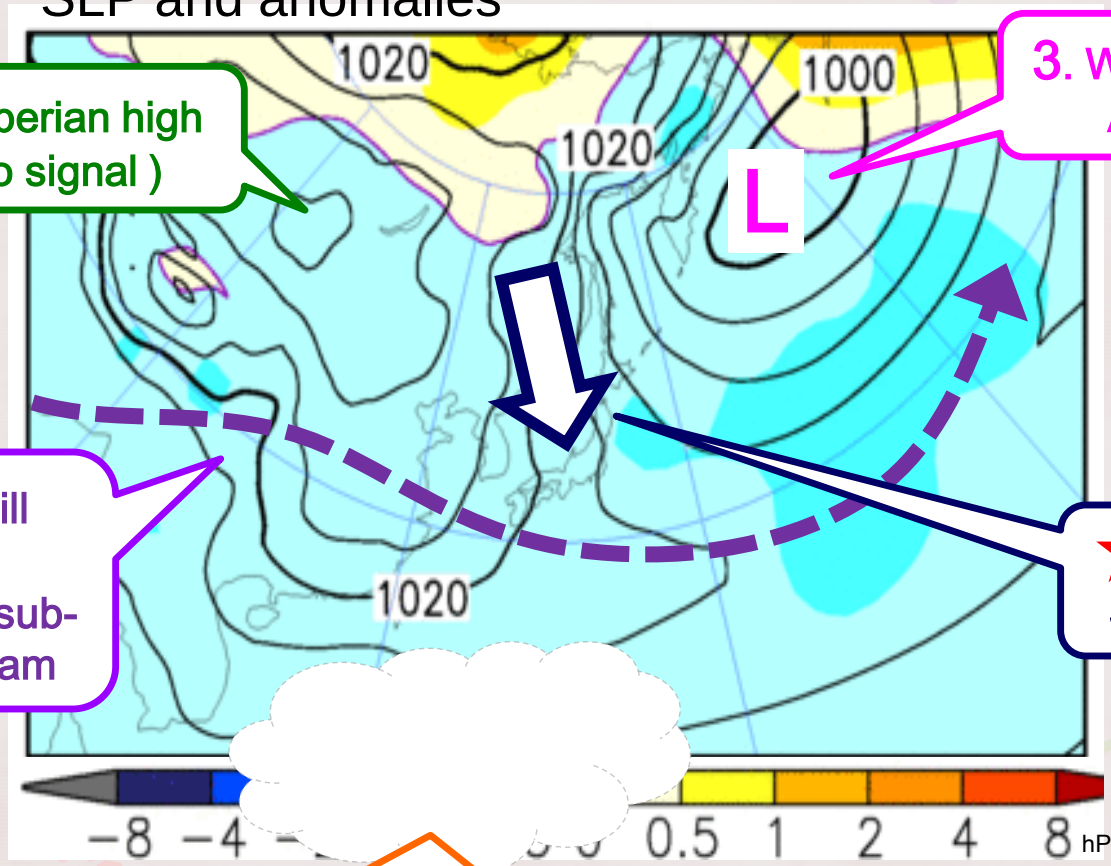


Summary of numerical prediction and its interpretation

- ENSO neutral condition will continue during this winter.
- The key point is the warmer SST in western tropical Pacific.
- The meandering sub-tropical jet will shift the Aleutian low westward.
- There is no apparent signal in terms of the Siberian high.
- As a result, East Asian Winter Monsoon is expected to be stronger than normal or near normal.

Schematic chart of East Asian circulation in DJF

SLP and anomalies



4. Siberian high (no signal)

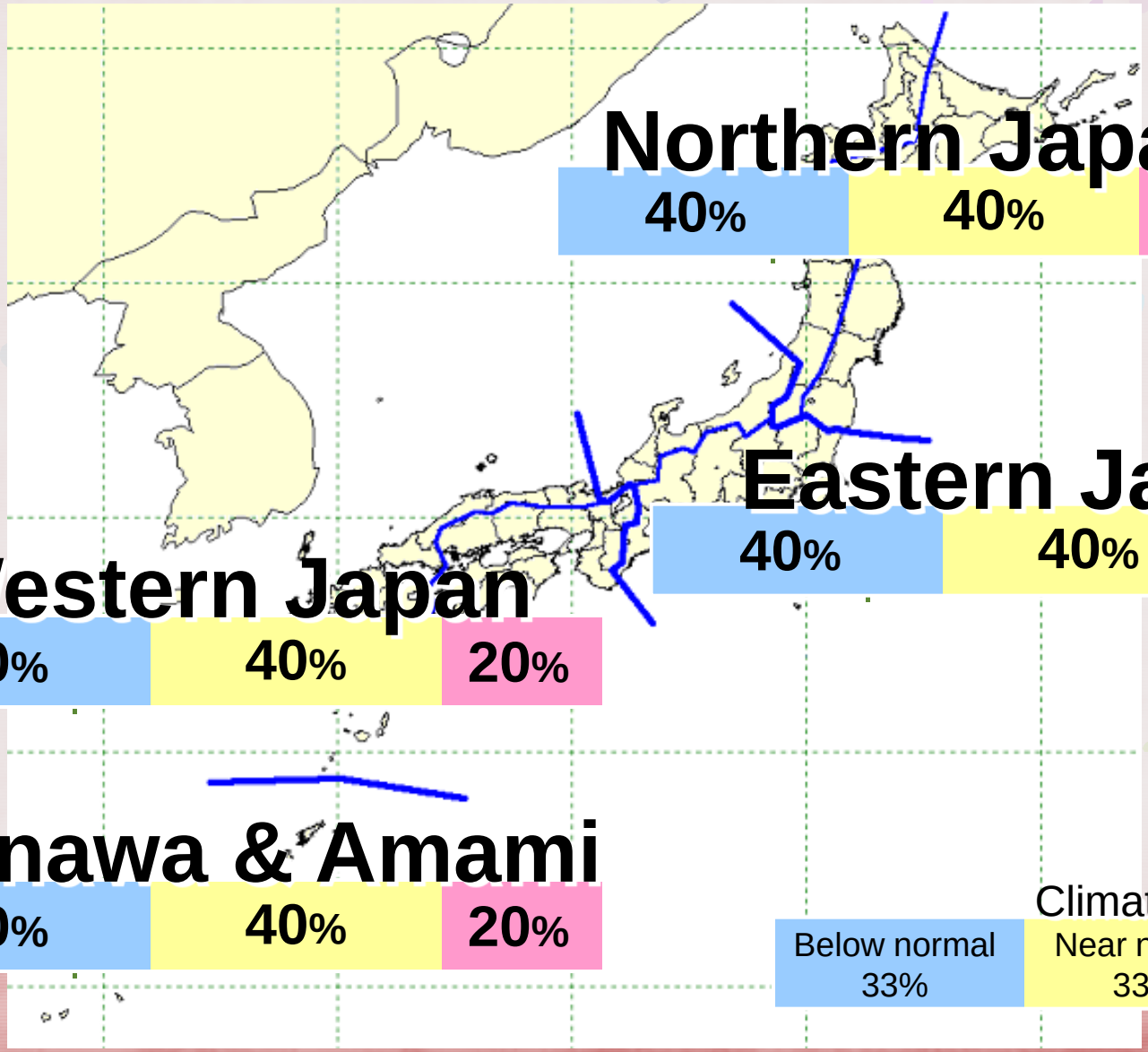
3. Westward shift of Aleutian low

2. Mastuno-Gill Pattern and meandering of sub-tropical jet stream

★ 5. EAWM Strong or normal

1. Warmer SST in western tropical Pacific and active convection

Probability forecast of temperature for winter 2013/2014 in Japan



Northern Japan

40%	40%	20%

Eastern Japan

40%	40%	20%

Western Japan

40%	40%	20%

Okinawa & Amami

40%	40%	20%

Climatology

Below normal 33%	Near normal 33%	Above normal 33%

감사합니다　謝謝　Баярлалаа

Thank you

ありがとうございました