



ENSO Current Status and Outlook

SHAO Xie, LIU Y-J, ZHOU Bing, LIU C-Z, YANG M-Z

Beijing Climate Center, CMA
Nov 3, 2015



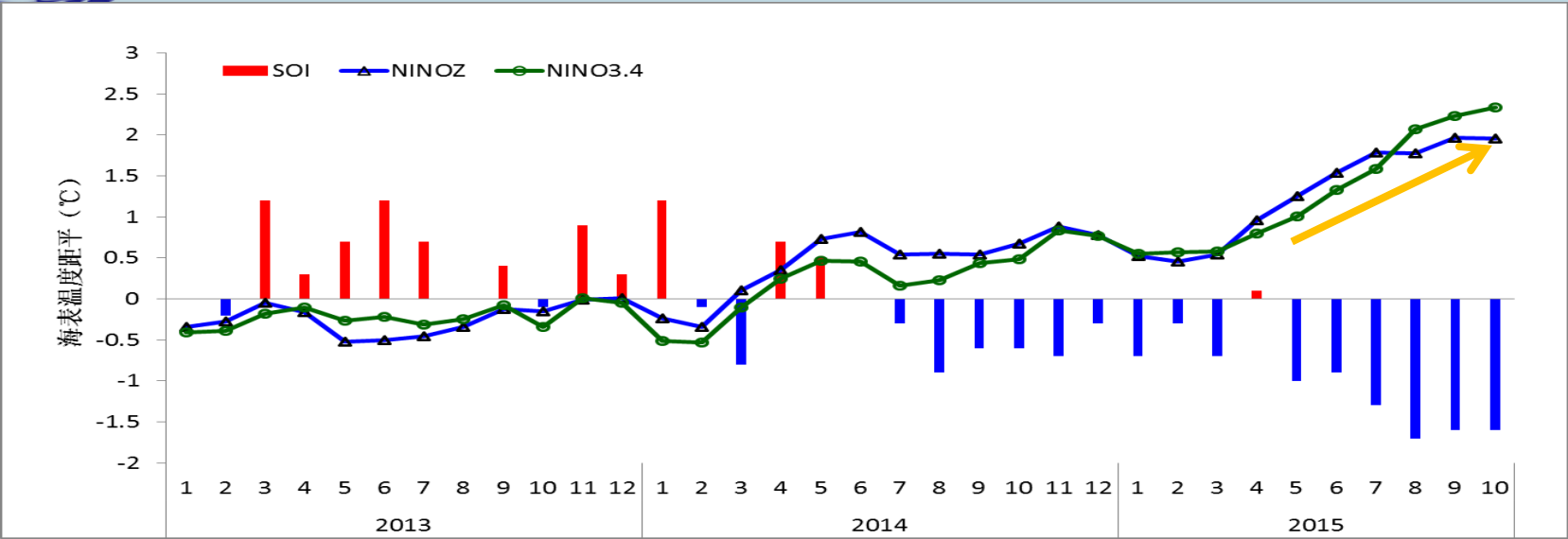


Outline

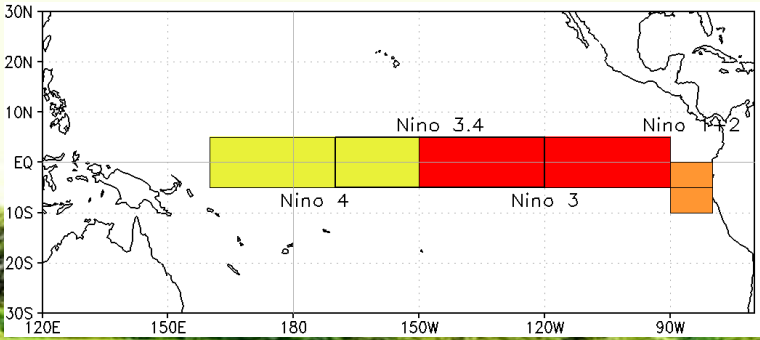
- 1. The current ENSO status and other related external forcing monitoring**
- 2. Response to the El Niño event**
- 3. The outlook about ENSO**
- 4. Conclusions**



An El Niño Event is Developing



During May-October 2014, the Nino Z indexes have reached or exceeded 0.5°C for 6 months. It is indicated that a new El Niño event has formed. Now, this event is still persisting.

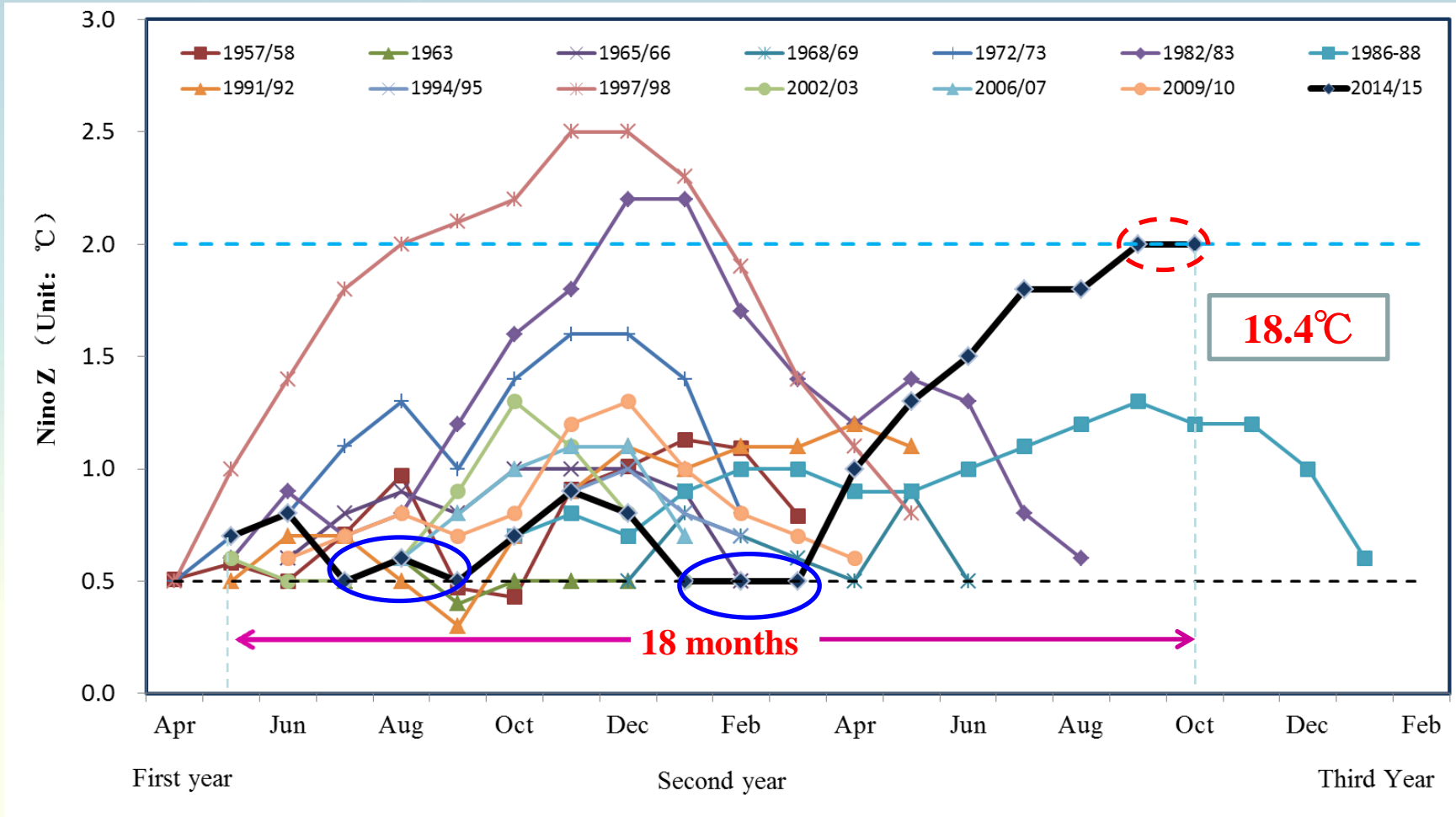


El Niño (La Niña) event: which is characterized by a positive(negative) sea-surface temperature departure from normal in NINO Z (weighted average of Nino 1+2, Nino3 and Nino 4) greater (less) than or equal to 0.5°C (-0.5°C) for at least 6 consecutive months (allowing below (above) 0.5°C (-0.5°C) for only one month) .



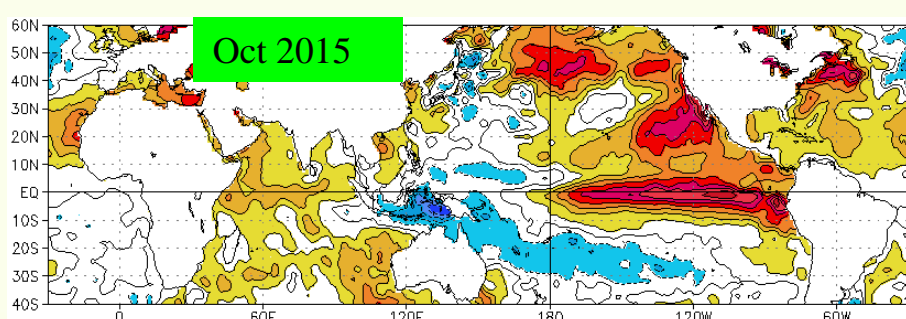
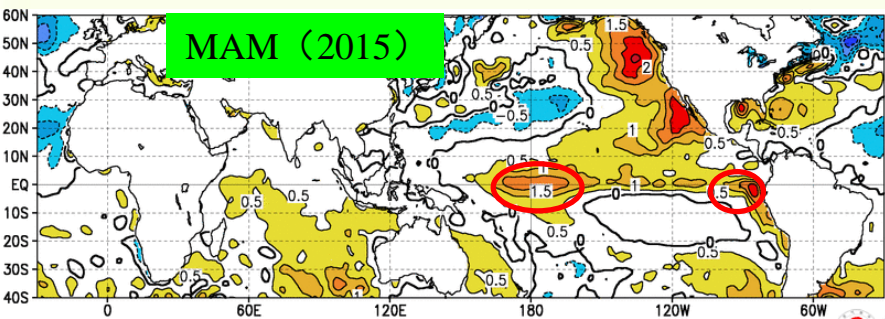
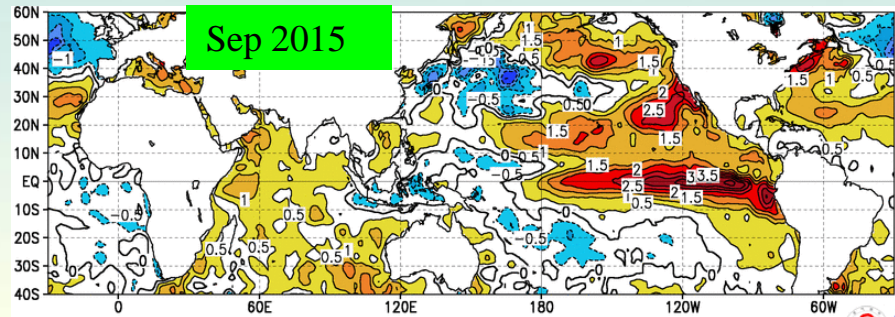
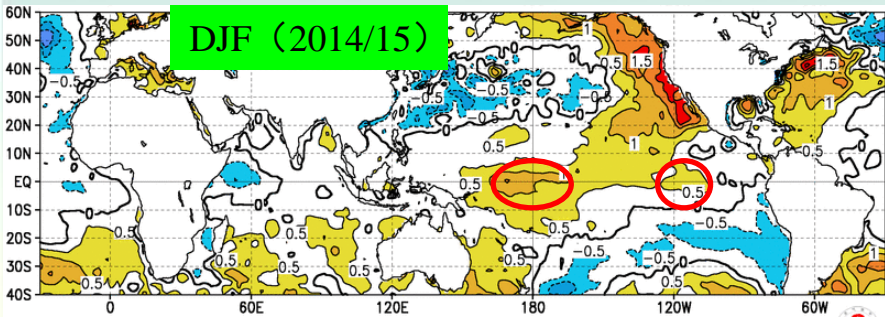
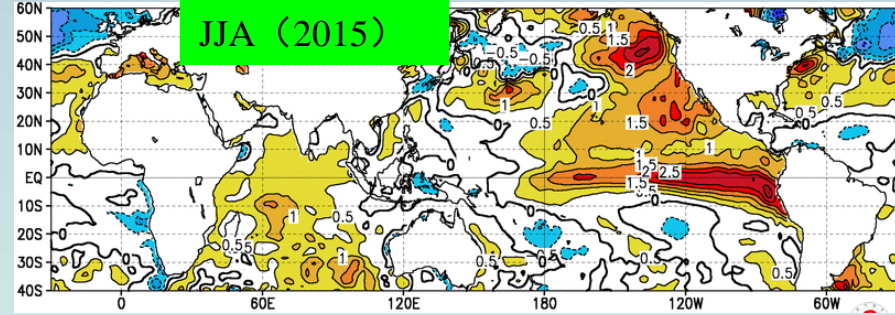
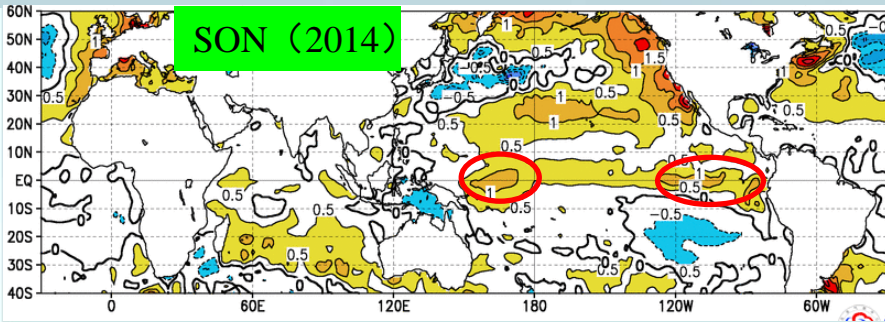


Historical El Niño Events Since 1951



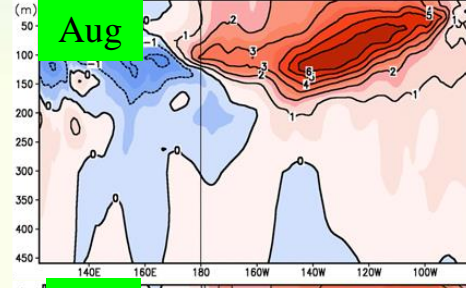
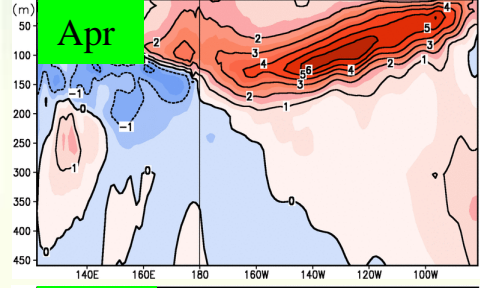
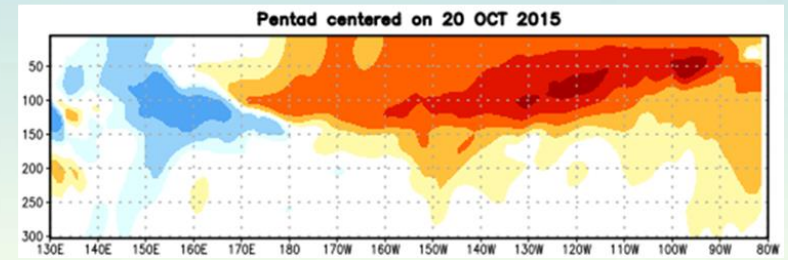
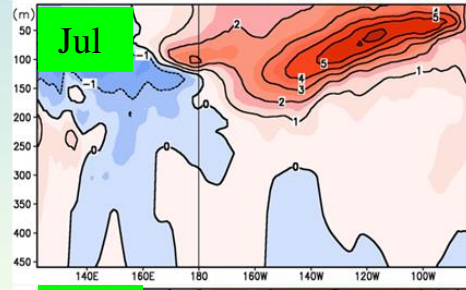
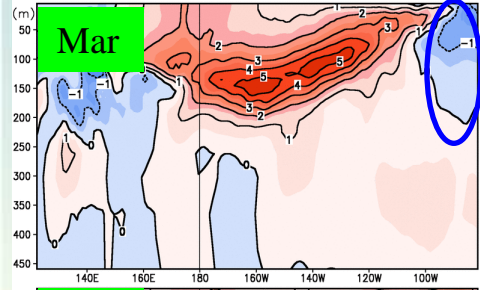
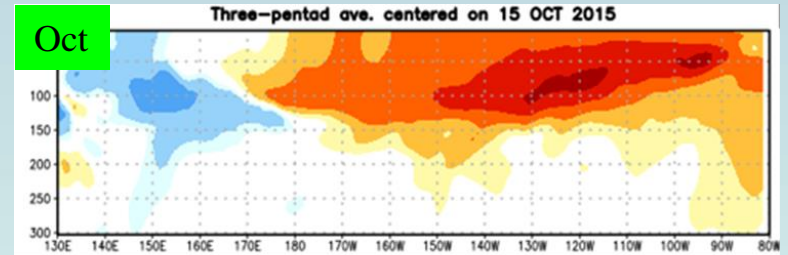
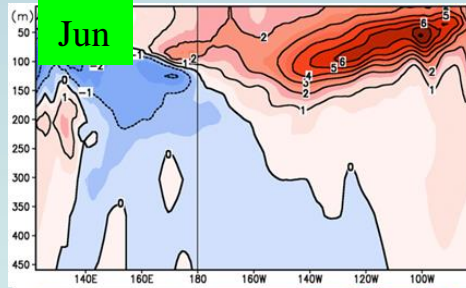
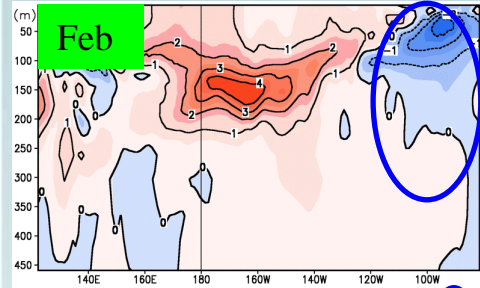


SSTA Evolution

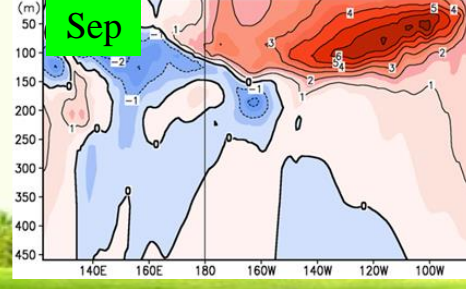
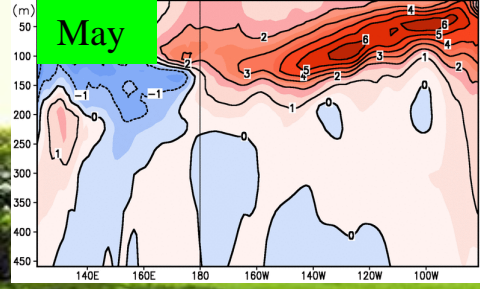




Sub-surface Temperature Evolution



(CPC)



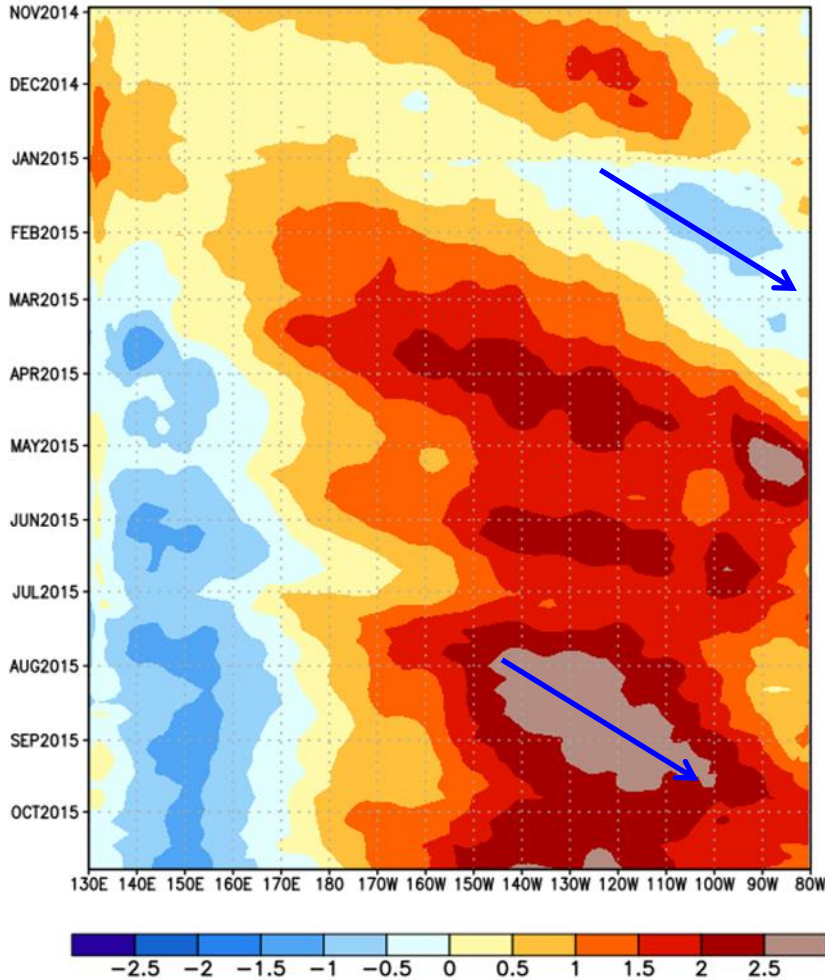
(BCC)



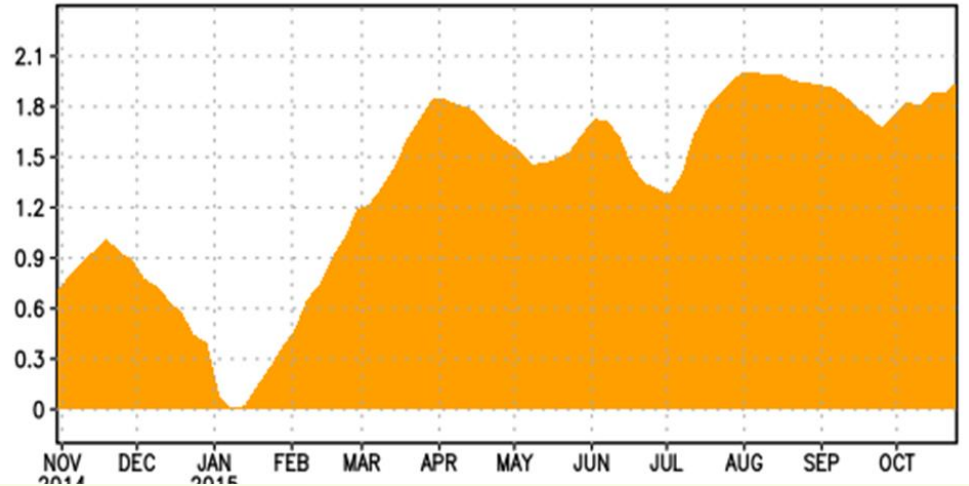


Sub-surface Temperature evolution

EQ. Upper-Ocean Heat Anoms. (deg C)



EQ. Upper-Ocean Heat Anoms. (deg C) for 180-100W



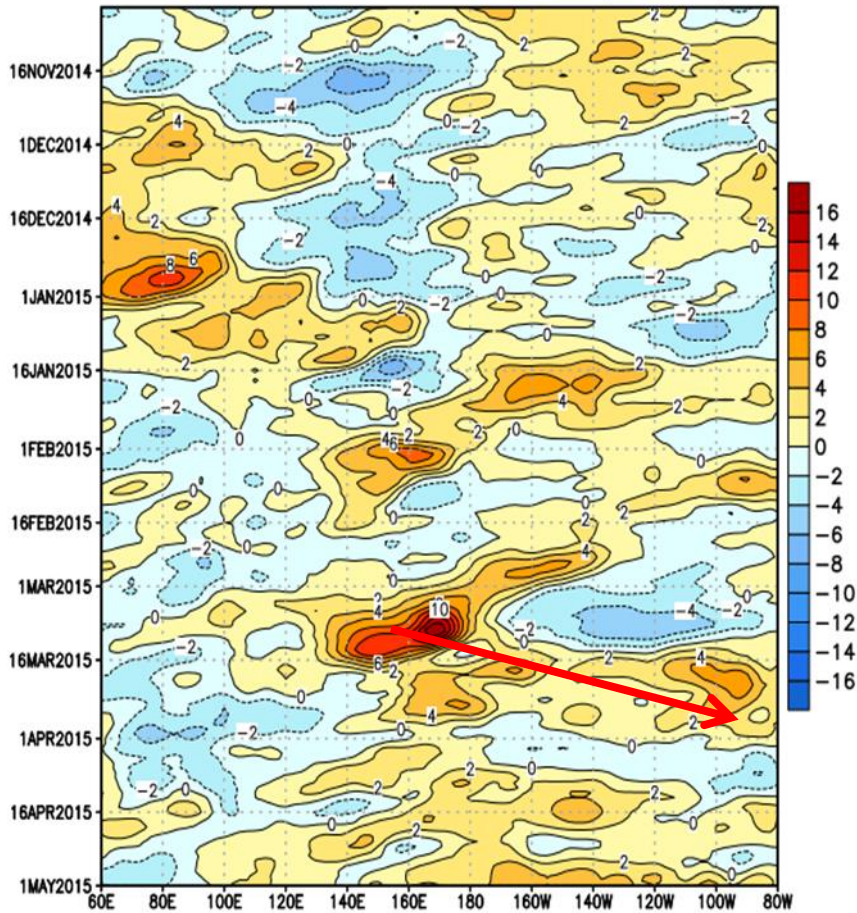
(CPC)



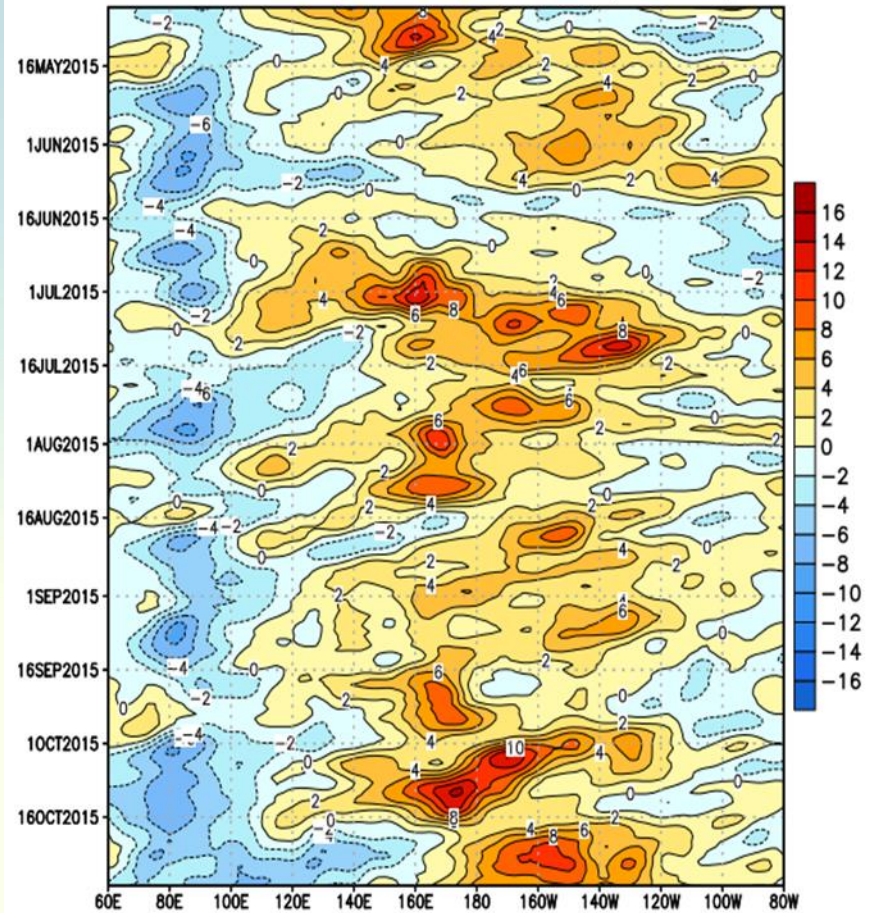


850hPa Zonal Wind Evolution

CDAS 850-hPa U Anoms. (5N-5S)



CDAS 850-hPa U Anoms. (5N-5S)

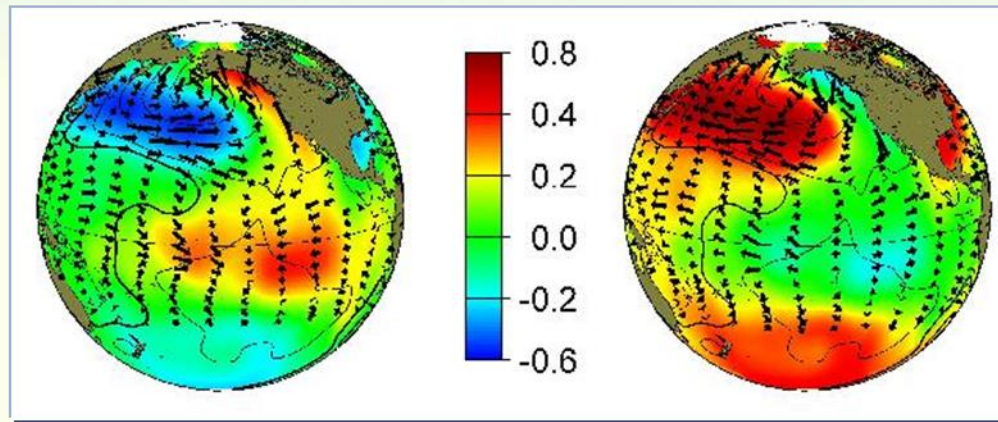
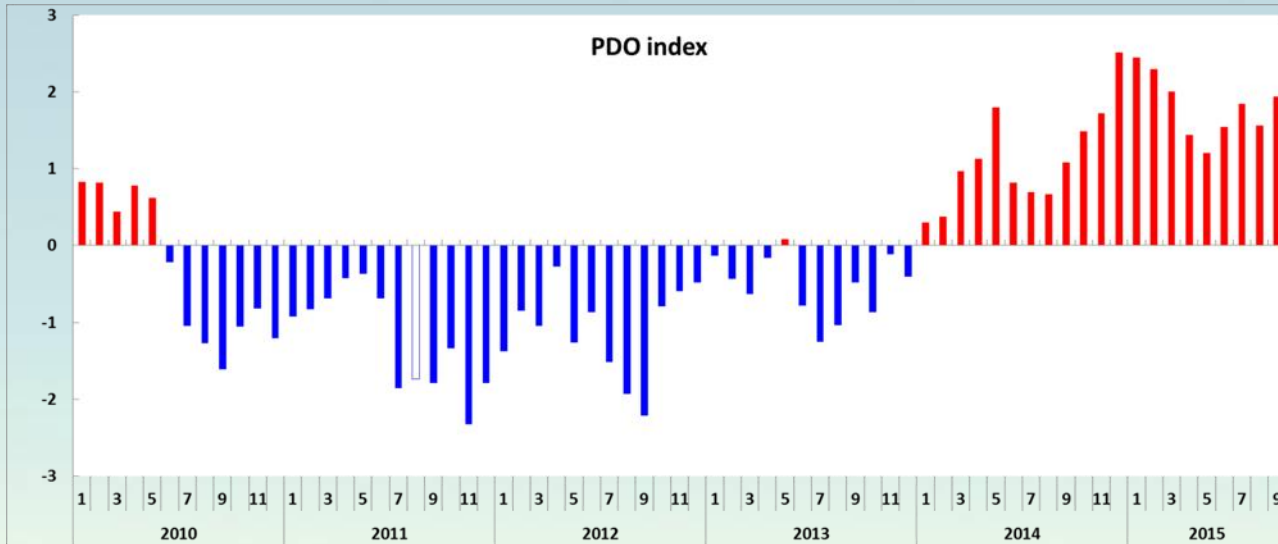


(CPC)





PDO Index Evolution



warm phase

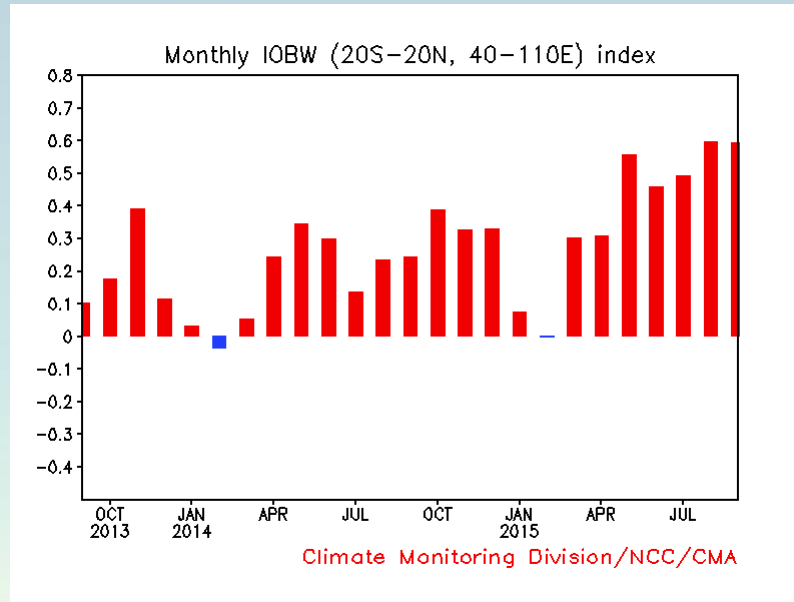
cool phase



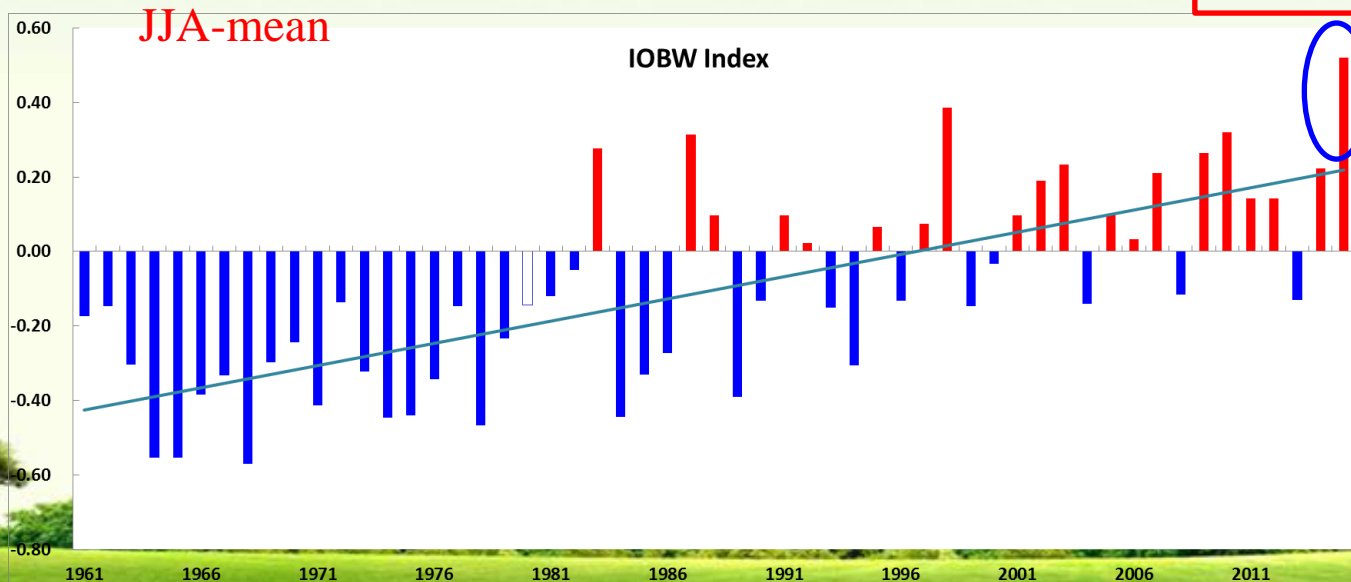


Indian Ocean SSTA monitoring

IOBW



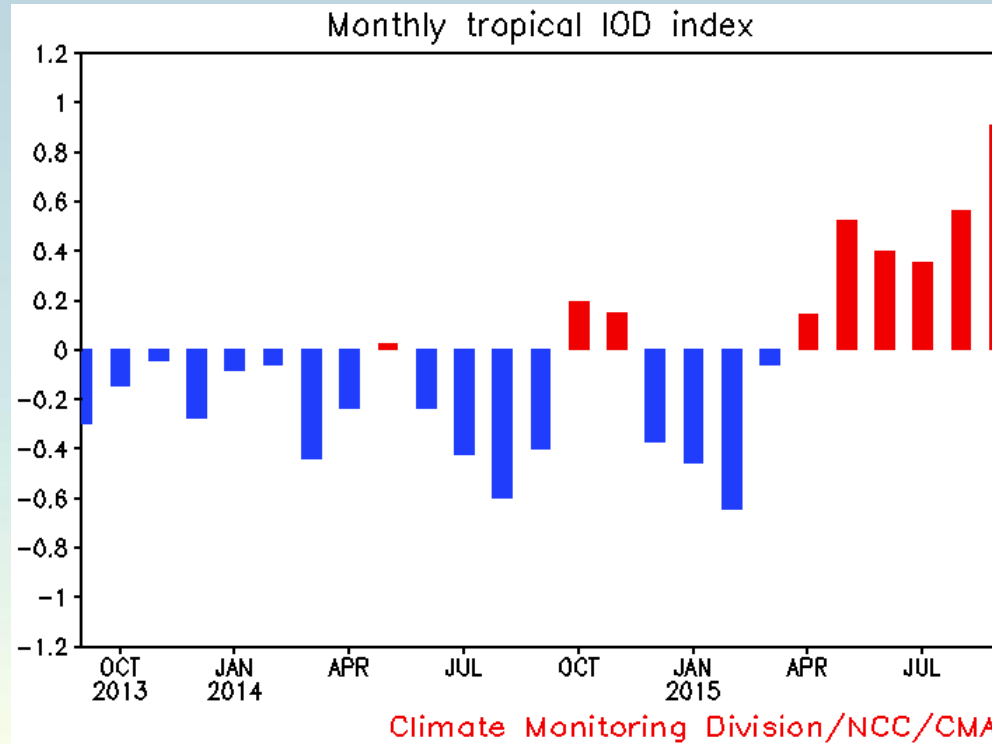
ENSO capacitor



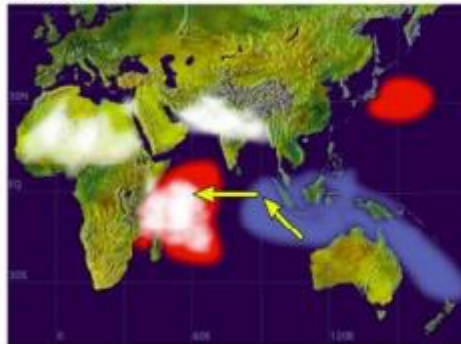


Indian Ocean SSTA monitoring

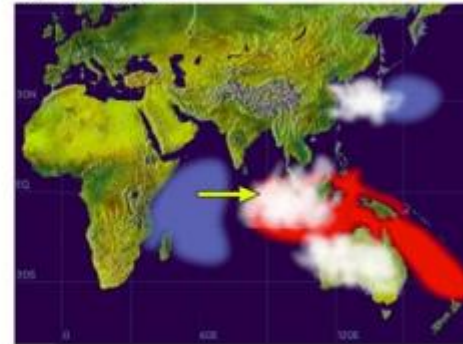
IOD



Positive Dipole Mode



Negative Dipole Mode



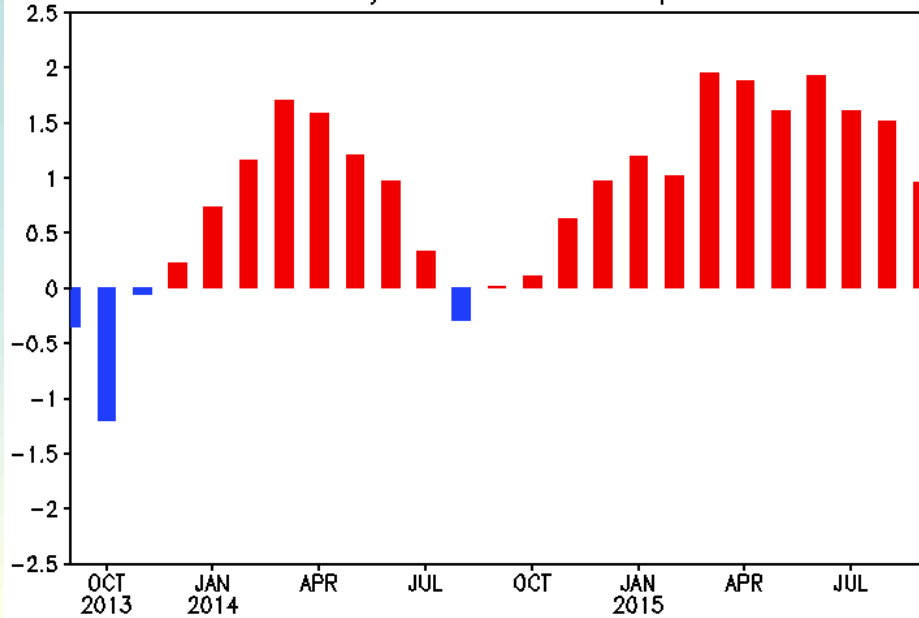
(引自 <http://www.jamstec.go.jp/frsgc/research/d1/iod/>)





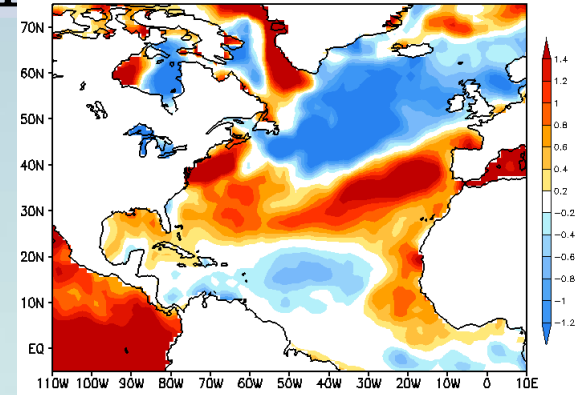
North Atlantic Tripole SSTA index evolution

Normalized Monthly North Atlantic Tripole SSTA index



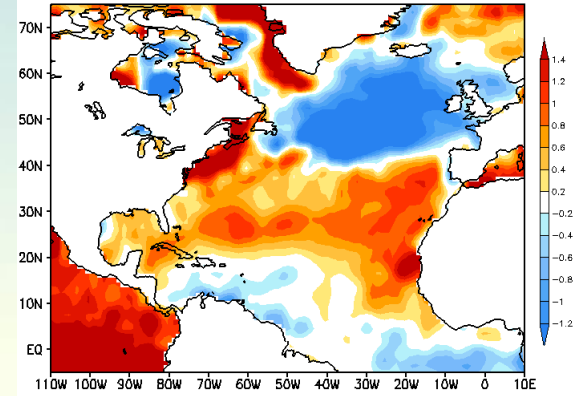
Climate Monitoring Division/NCC/CMA

SSTA over North Atlantic Ocean 2015-07



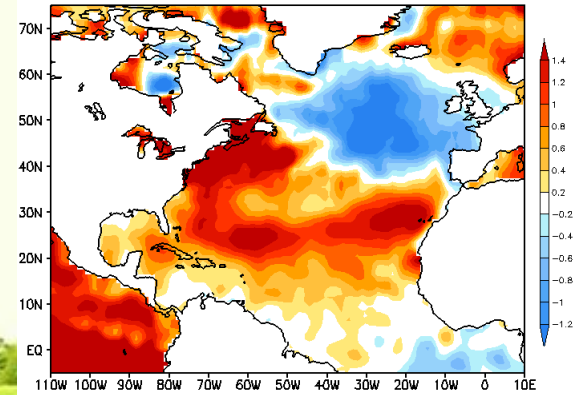
Climate Monitoring Division/NCC/CMA

SSTA over North Atlantic Ocean 2015-08



Climate Monitoring Division/NCC/CMA

SSTA over North Atlantic Ocean 2015-09



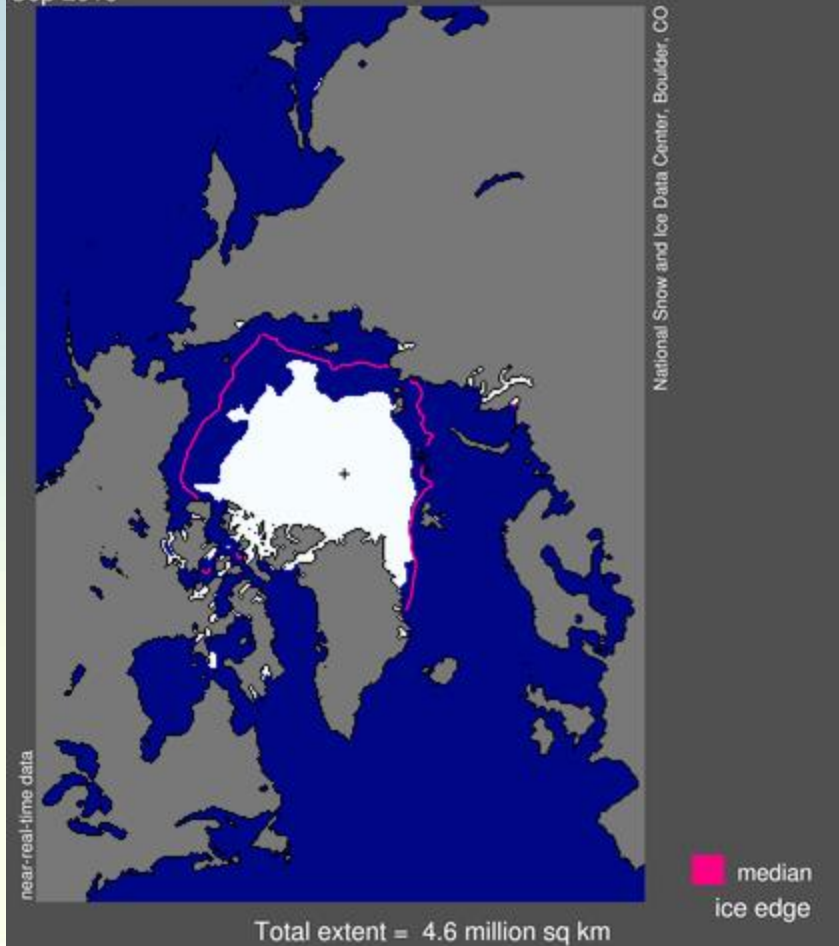
Climate Monitoring Division/NCC/CMA



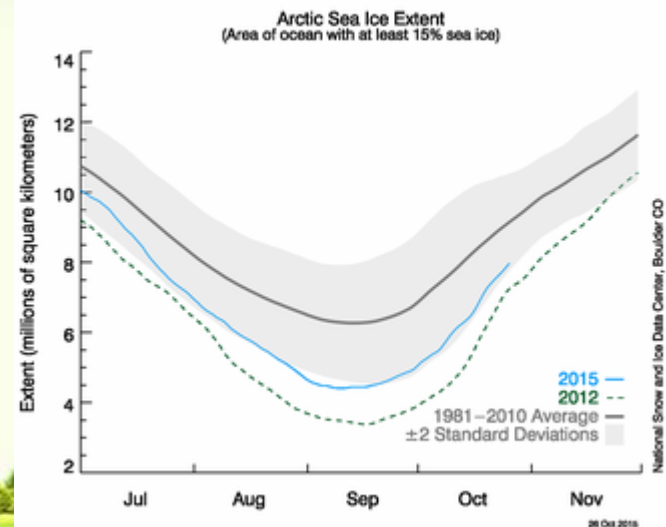
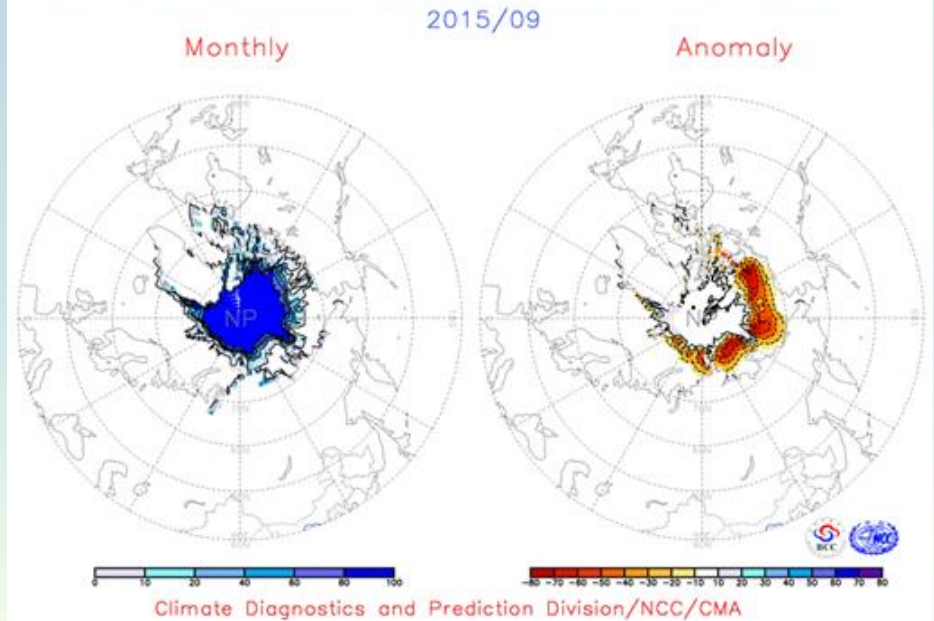


Arctic Sea Ice Monitoring

Sea Ice Extent
Sep 2015



Sea-Ice Concentration(%) in the Northern Hemisphere





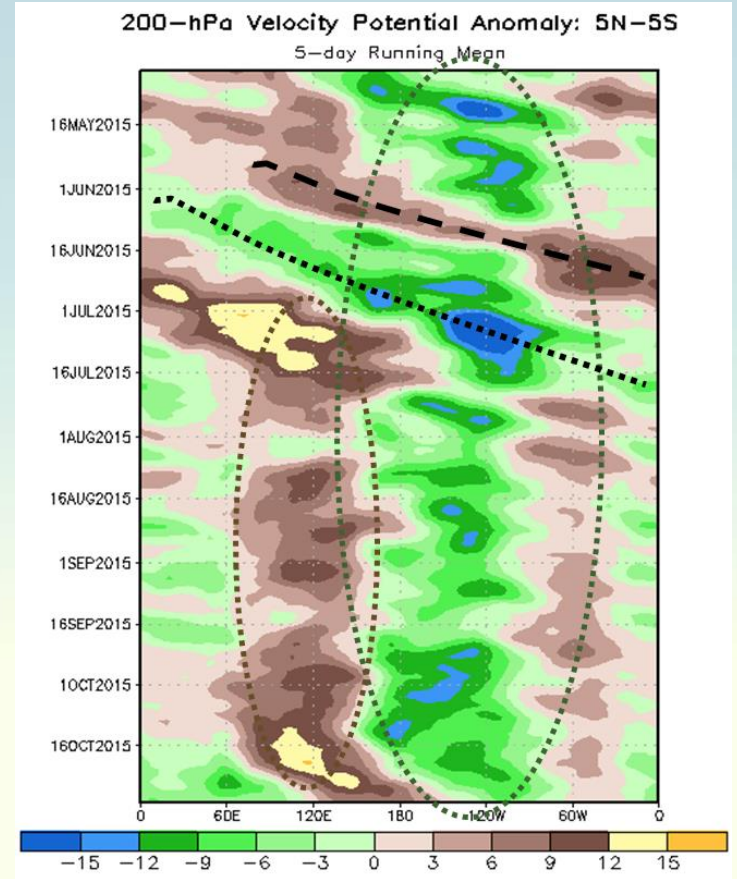
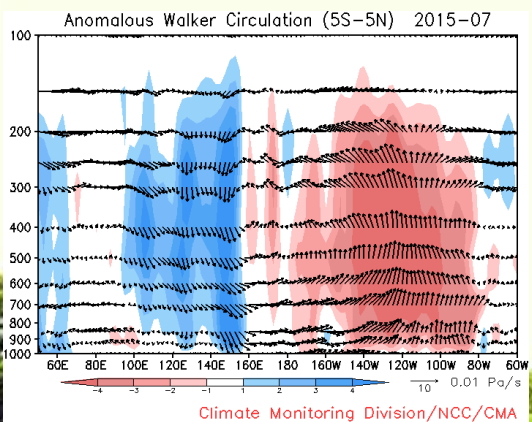
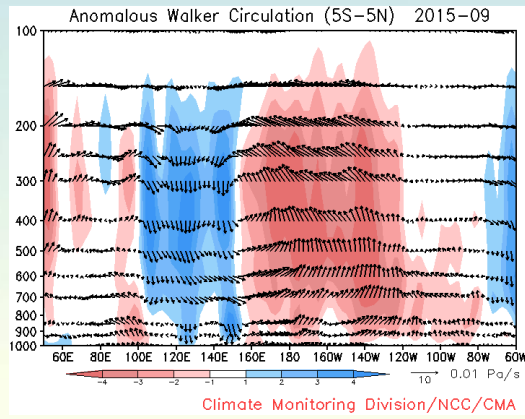
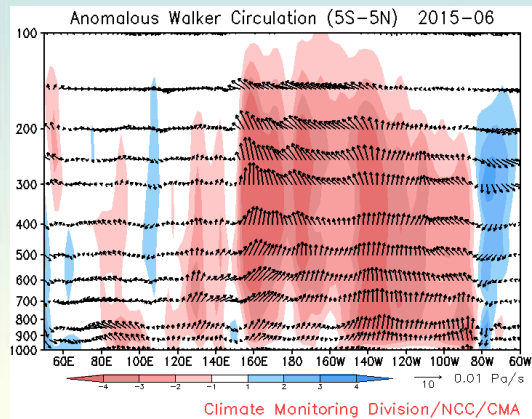
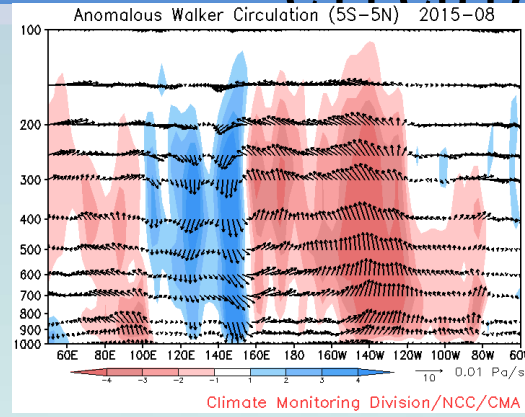
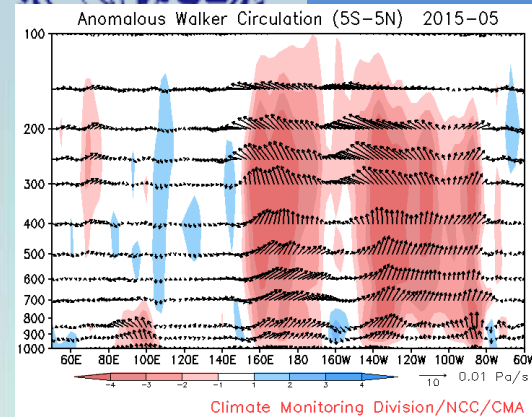
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Response To El Nino - vertical circulation

Upper



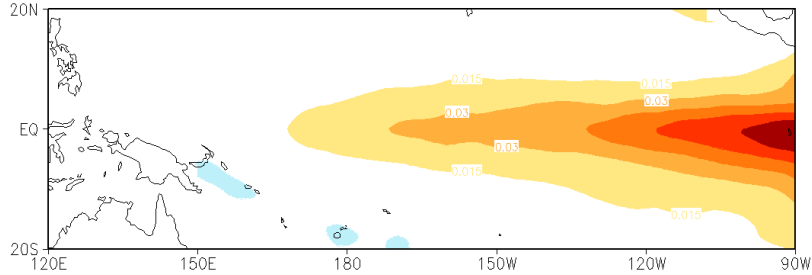
(CPC)



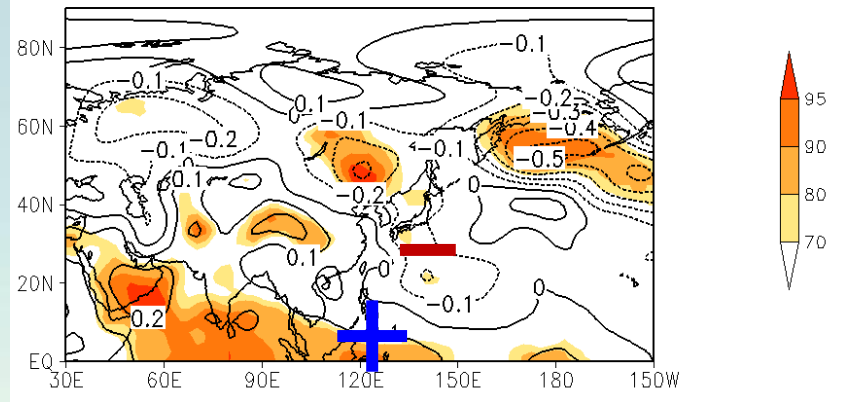


Response To El Nino - GEFA

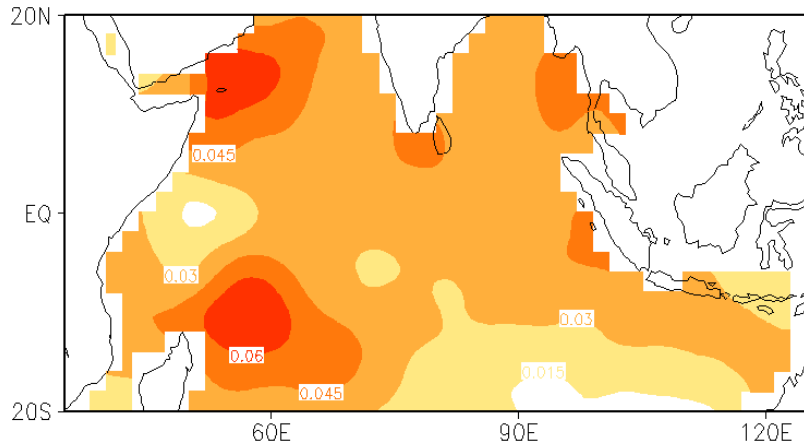
TP SST EOF1



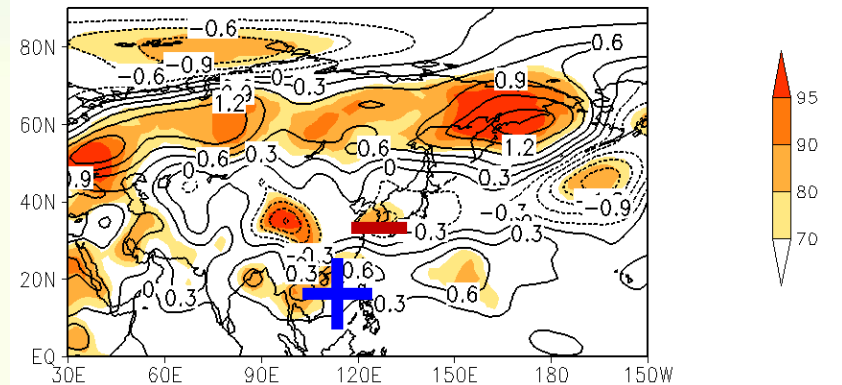
GEFA HGT 500hPa Rsp to TP SST EOF1



TI SST EOF1



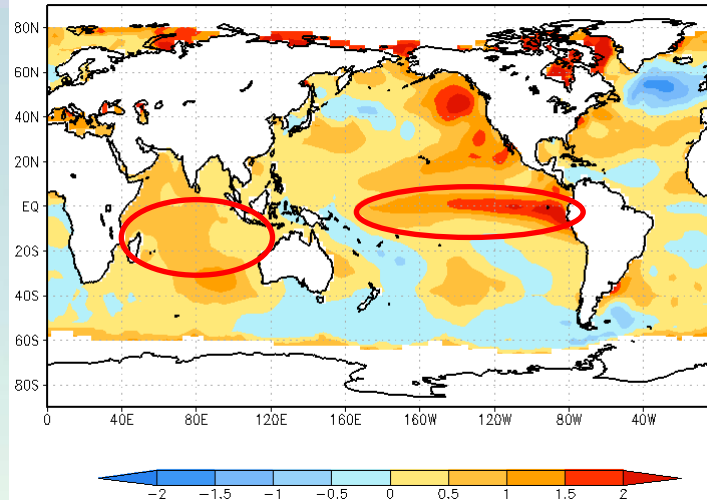
GEFA HGT 500hPa Rsp to TI SST EOF1



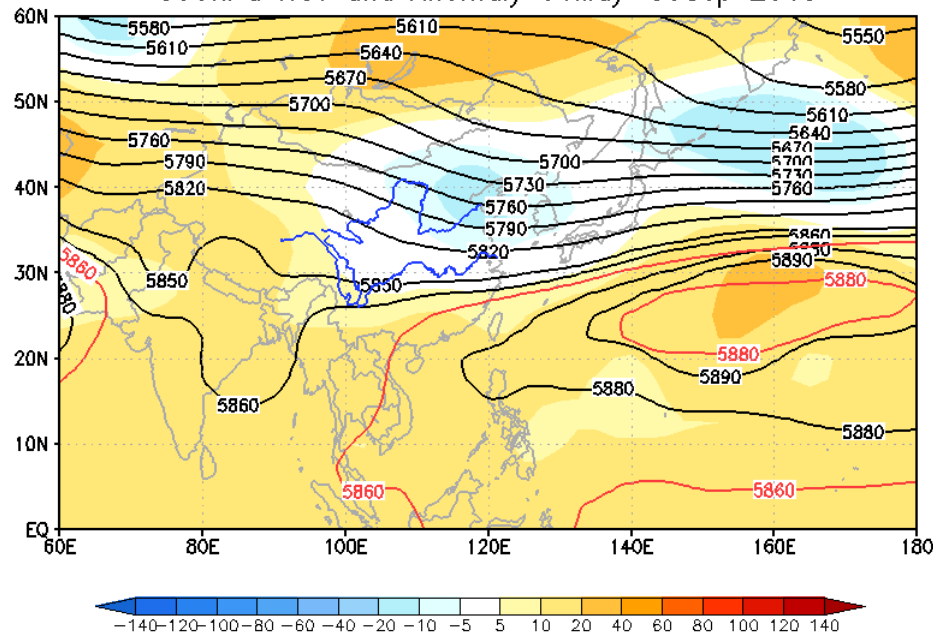


Response To El Nino - Circulation In East Asia Rainy Season

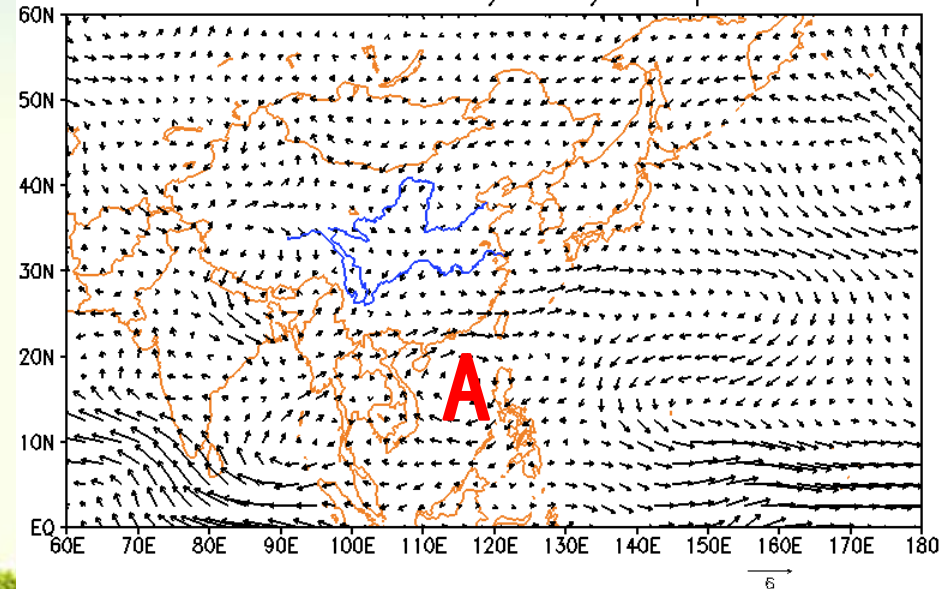
Sea Surface Temp. Anoma. 201505-201509



500hPa HGT and Anomaly 01May-30Sep 2015

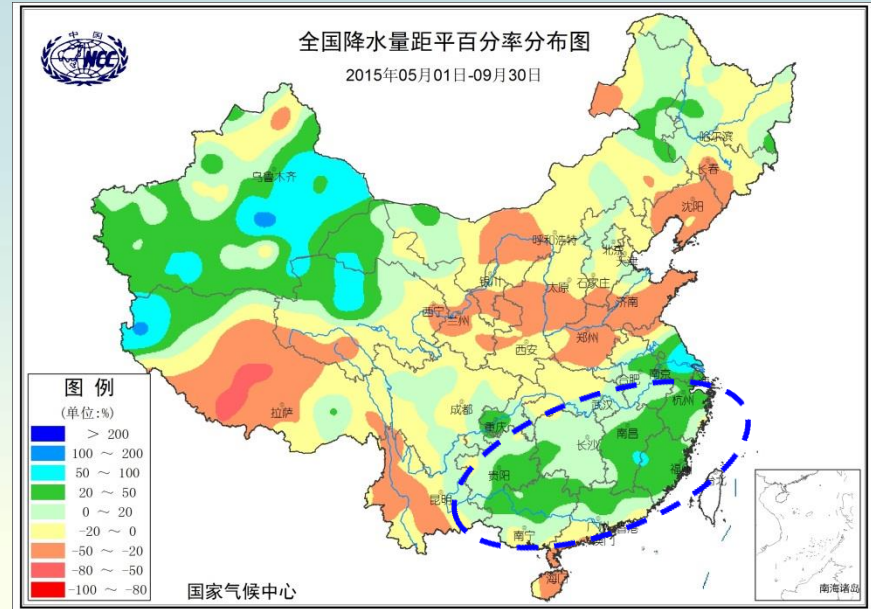
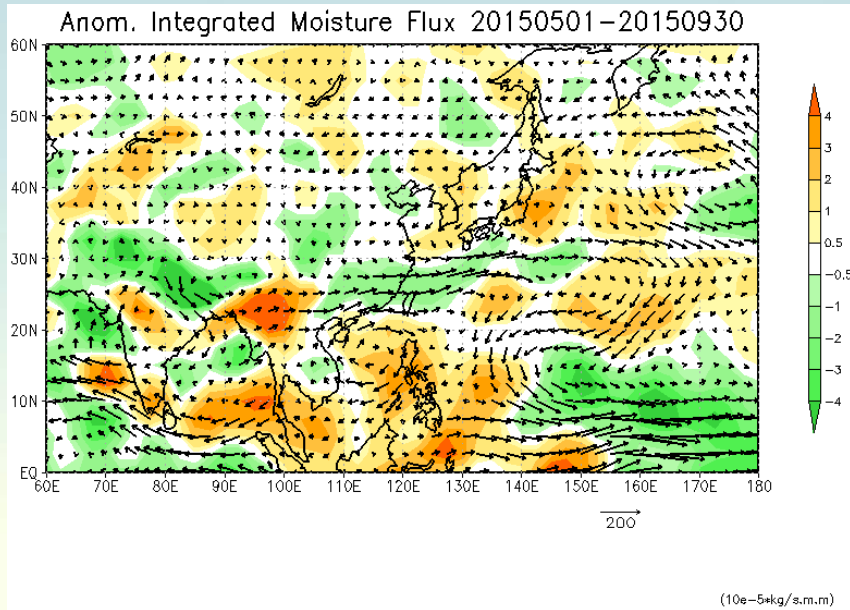


850hPa Wind Anomaly 01May-30Sep 2015





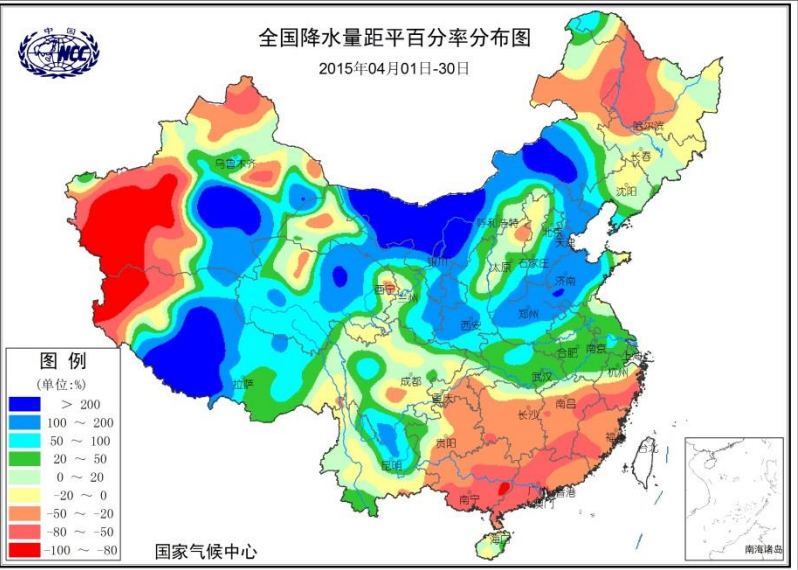
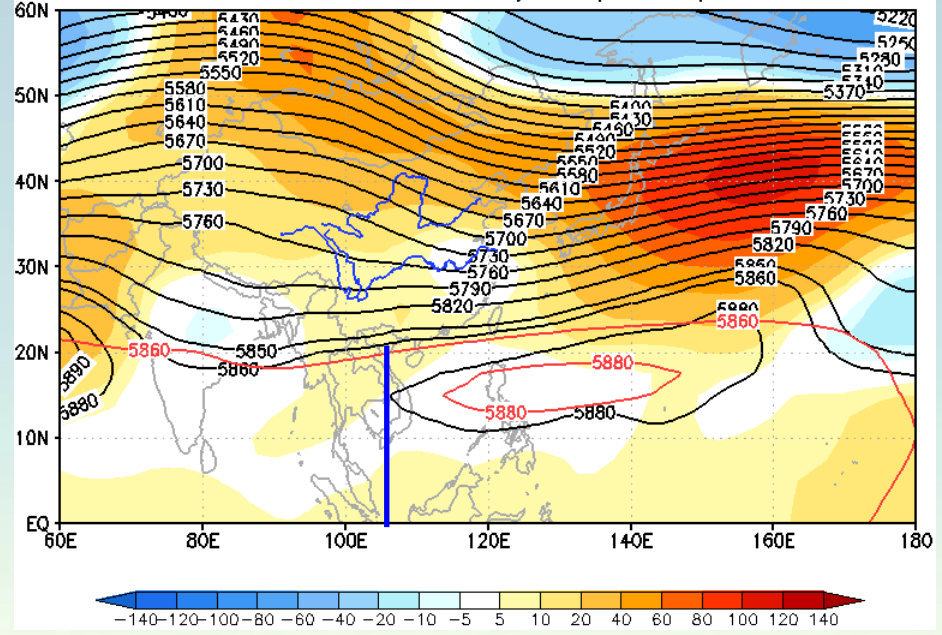
Response To El Nino - Precipitation In East Asia Rainy Season



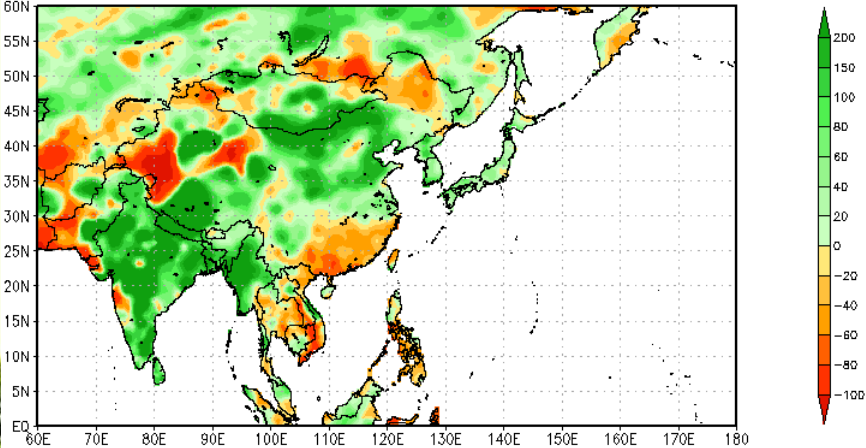


Response To El Nino - Delay of the onset of the rainy season in Southern China

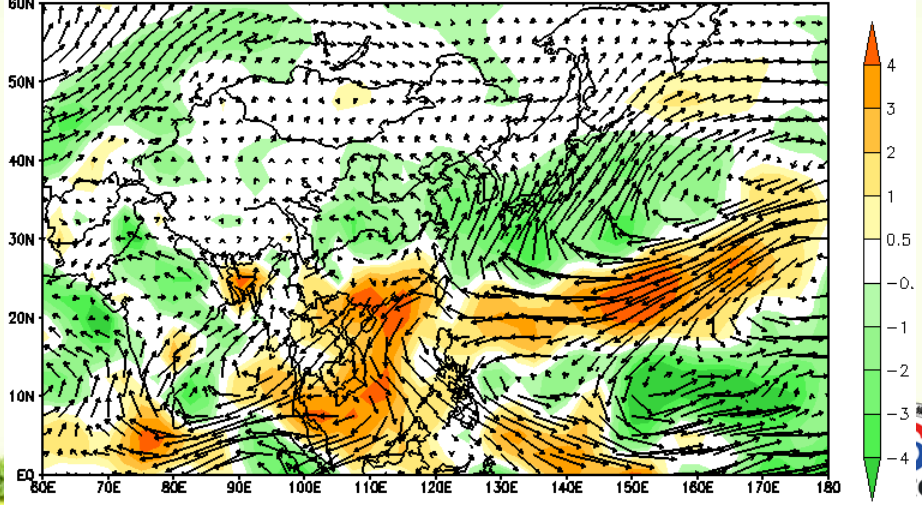
500hPa HGT and Anomaly 01Apr-30Apr 2015



Precip. anoma. (%) 20150401-20150430

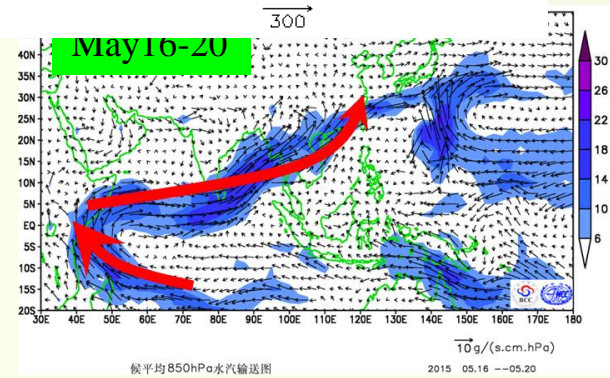
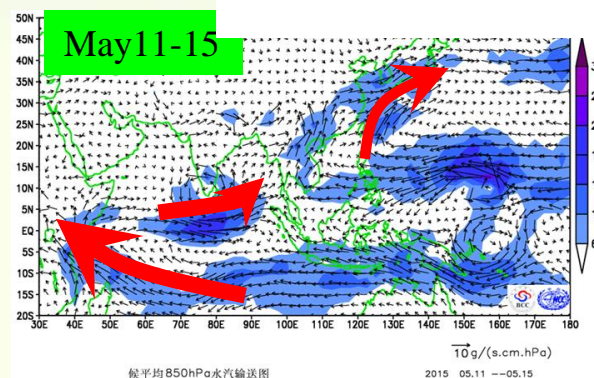
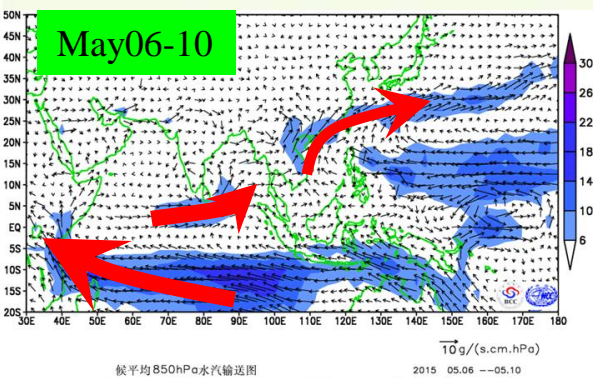
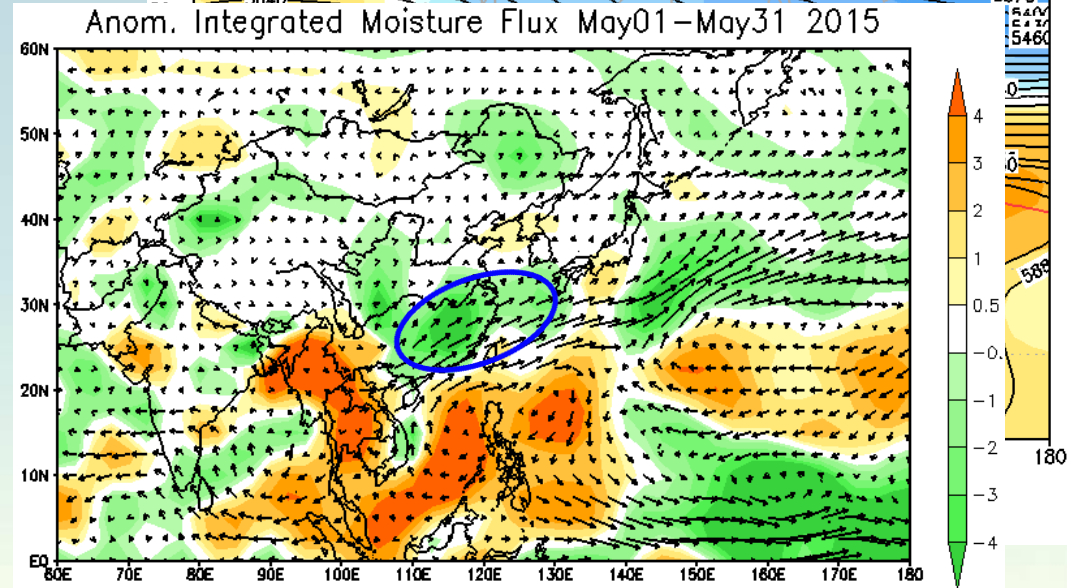
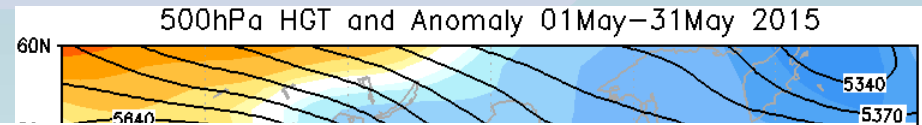
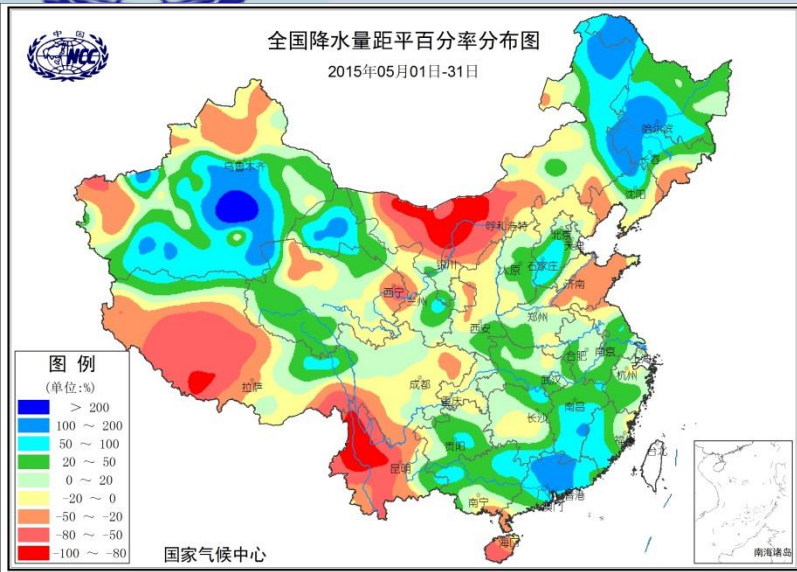


Anom. Integrated Moisture Flux Apr01-Apr30 2015



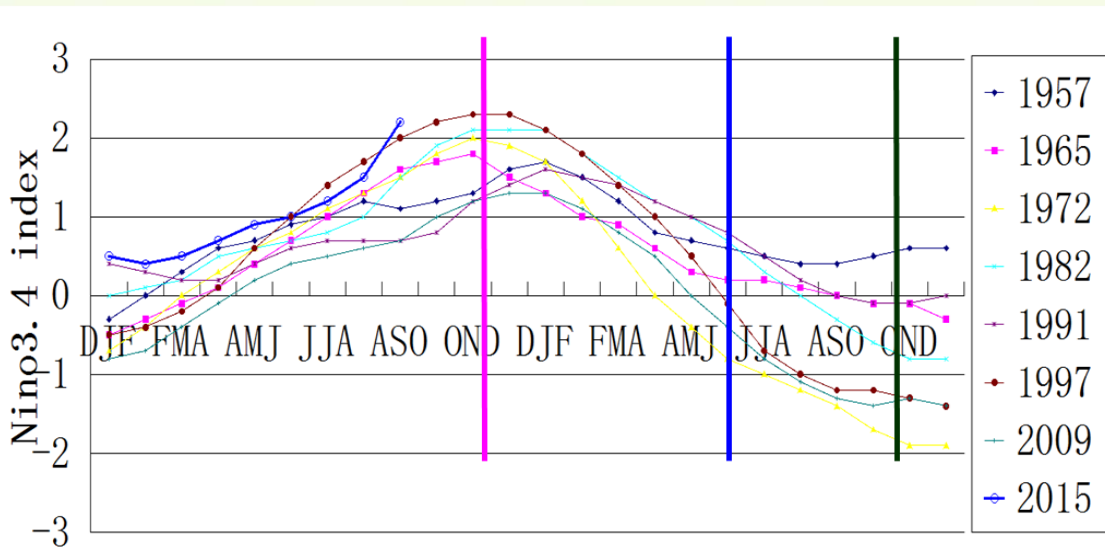
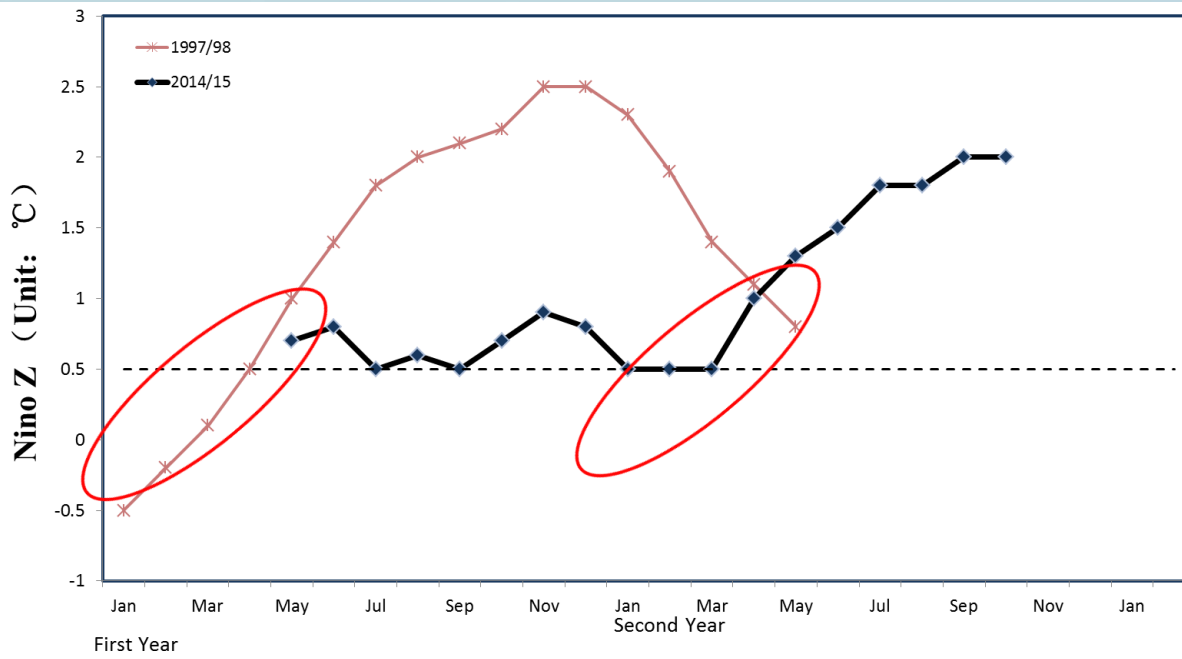


Response To El Nino - May





2015: The developing El Nino Year





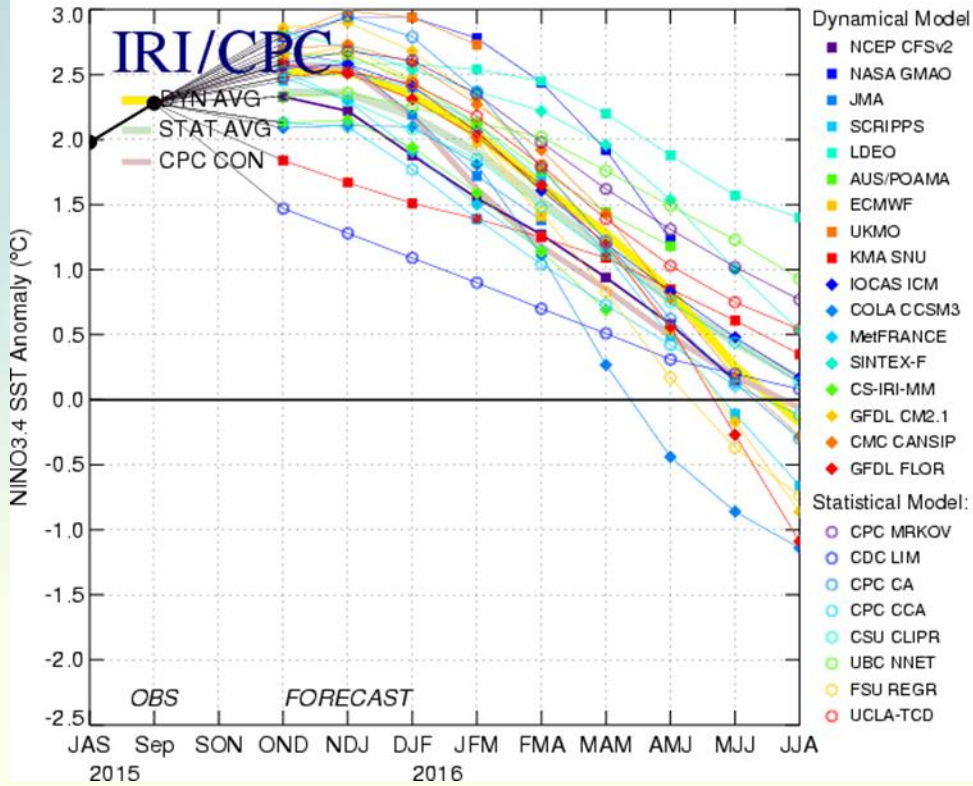
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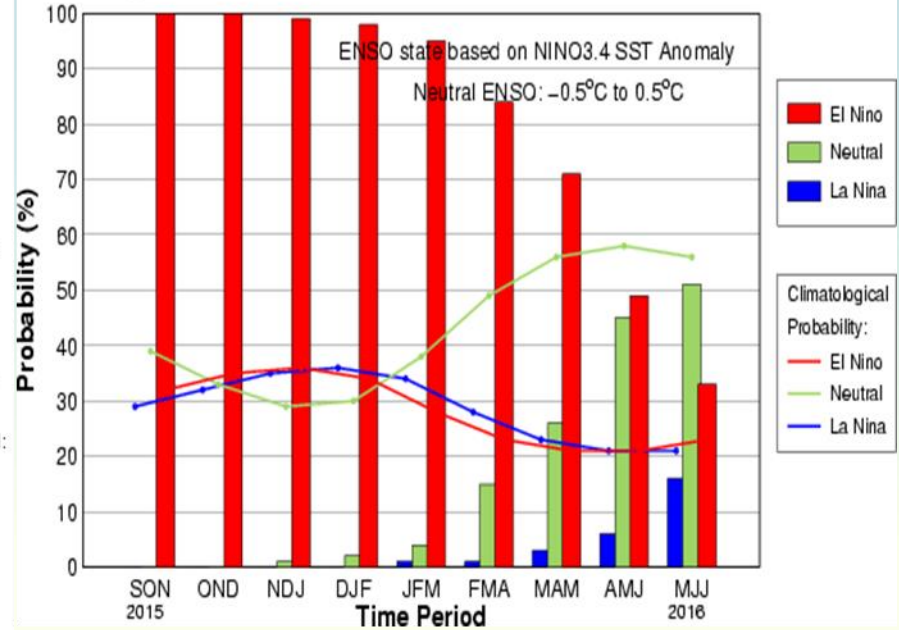


Model Predictions of ENSO

Mid-Oct 2015 Plume of Model ENSO Predictions



Early-Oct CPC/IRI Consensus Probabilistic ENSO Forecast



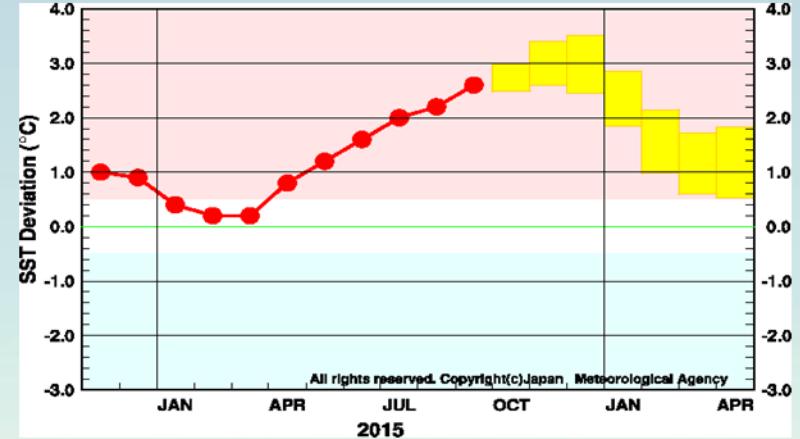
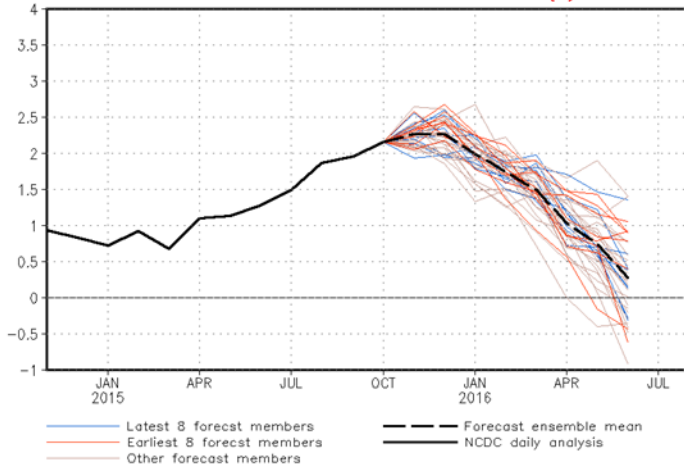


Model Predictions of ENSO

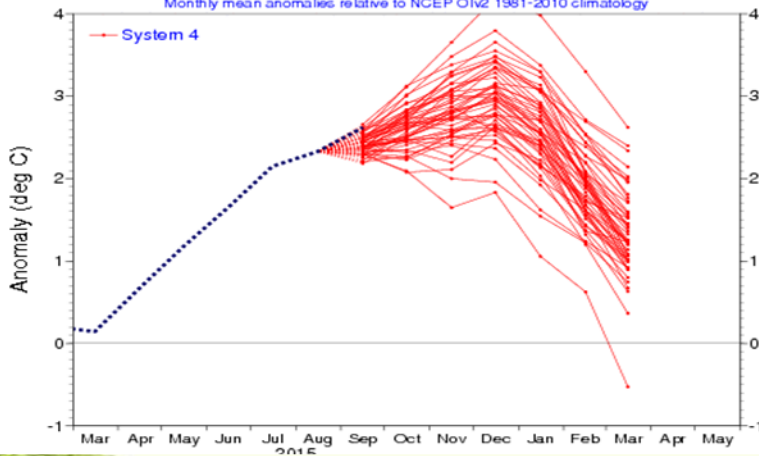
NWS/NCEP/CPC

Last update: Tue Oct 13 2015
Initial conditions: 12Sep2015-21Sep2015

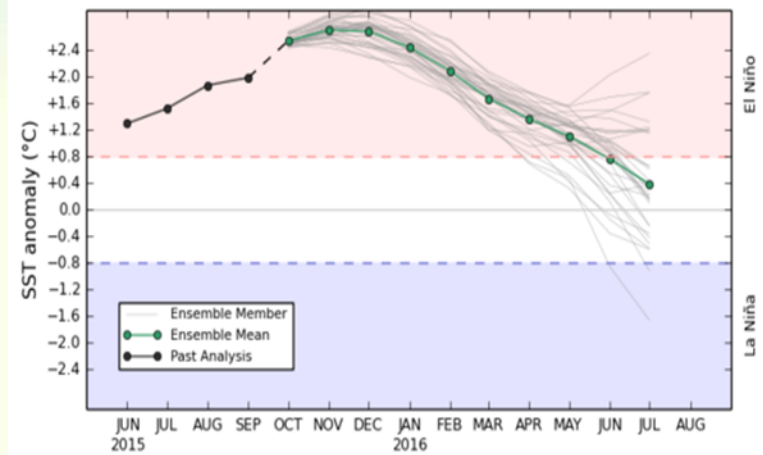
CFSv2 forecast Nino3.4 SST anomalies (K)



NINO3 SST anomaly plume ECMWF forecast from 1 Sep 2015 Monthly mean anomalies relative to NCEP OIv2 1981-2010 climatology



POAMA monthly mean NINO34 - Forecast Start: 11 OCT 2015



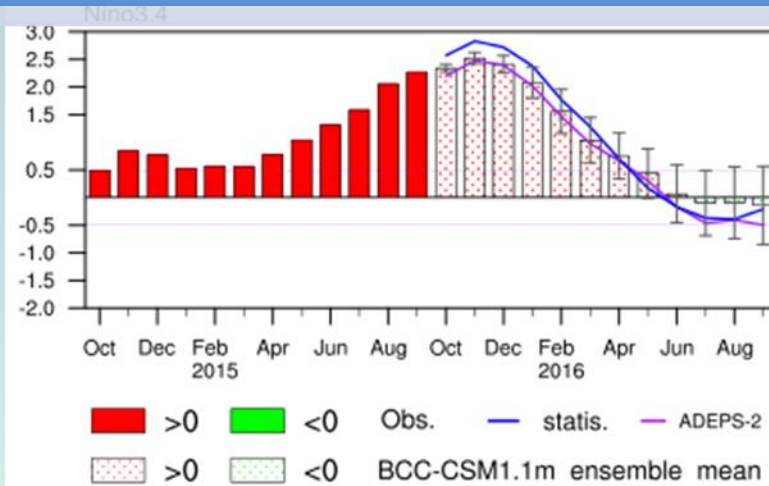
Copyright 2015 Australian Bureau of Meteorology

Base period 1981-2010



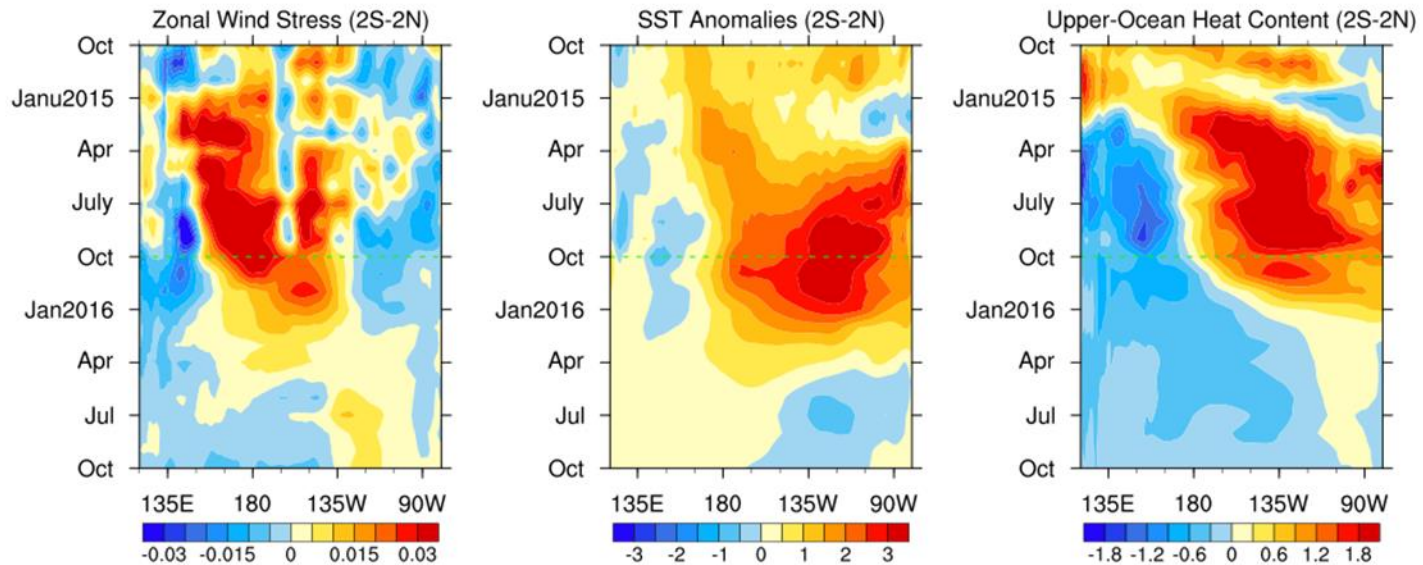


Model Predictions of ENSO – BCC



ENSO evolutions at Equator: BCC_CSM1.1m forecast

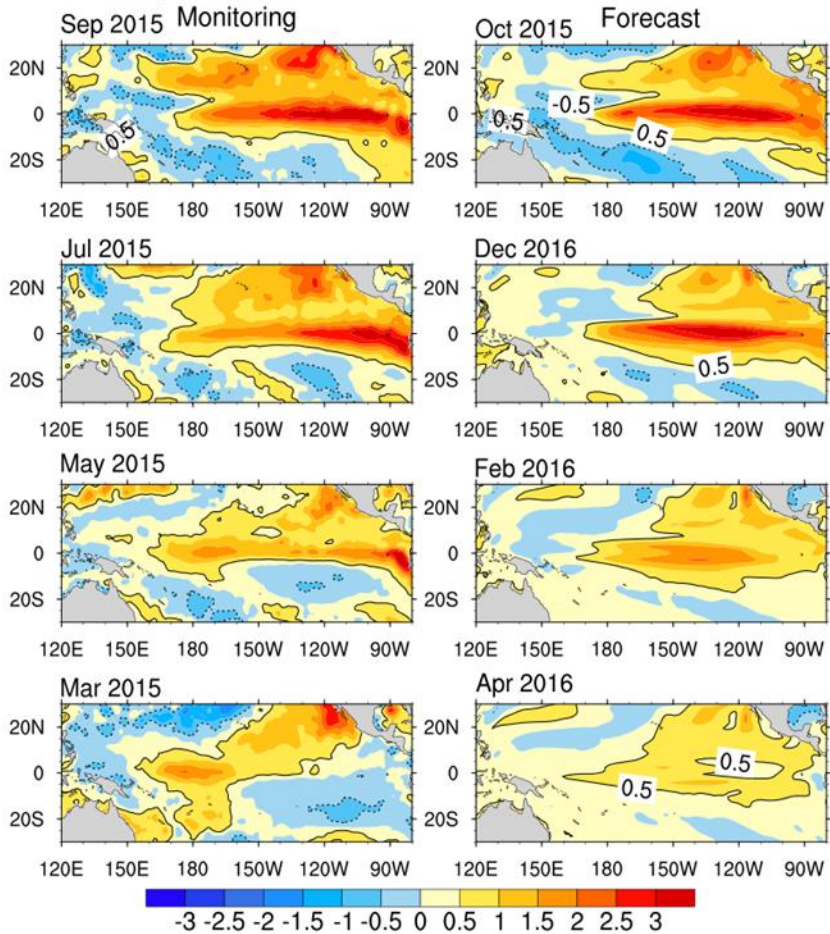
Monitor : 201410-201509; Forecast: 201510-201610



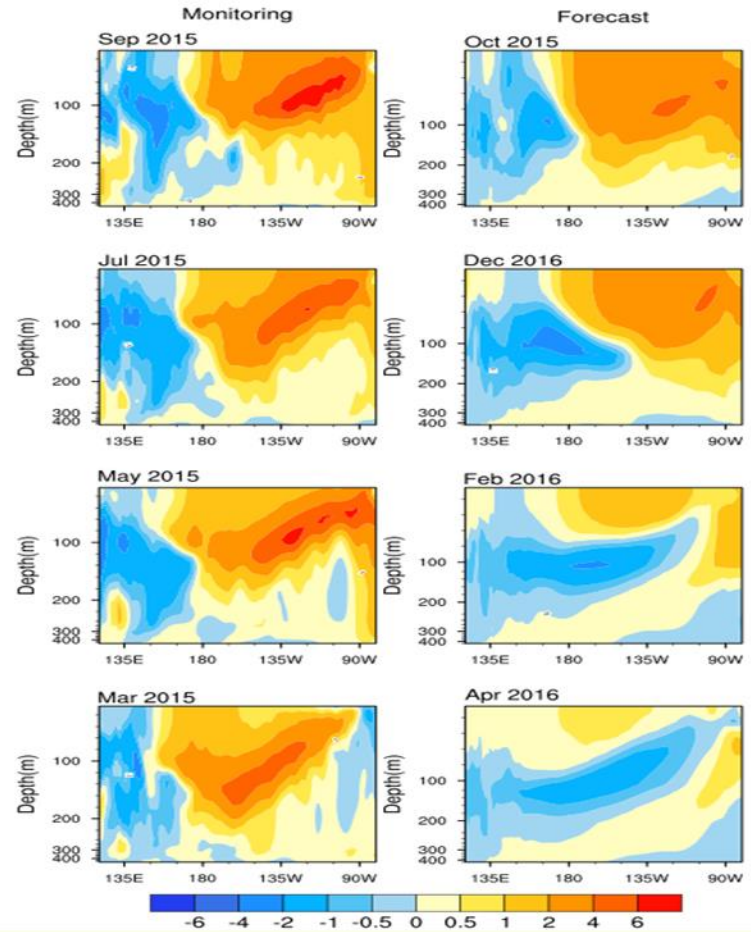


Model Predictions of ENSO – BCC

Tropical Pacific SSTA (K): BCC_CSM1.1m forecast
Monitor (OISST): 201503-201509; Forecast: 201510-201604



Subsurface temperature of tropical Pacific (2S-2N; K)
Monitor (GODAS): 201503-201509
Forecast (BCC_CSM1.1m): 201510-201604





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Conclusions

- 1 At present, the El Nino event is still developing. It has become the longest extreme strong event since 1951.
- 2 PDO, IOBW, IOD and NAT are all in the positive phase, and the sea ice in the artic is less than normal in September.
- 3 The anticyclonic circulation in the SCS and Philippine Sea and the anomalous southward WPSH resultin from the El Nino event leads to more rain in south of China in the rainy season, while the anomalous westward WPSH delay the start of the rainy season in Southern China.
- 4 The El Nino event will continue to the next spring, and it will reach the peak in the next winter.





Thank You!