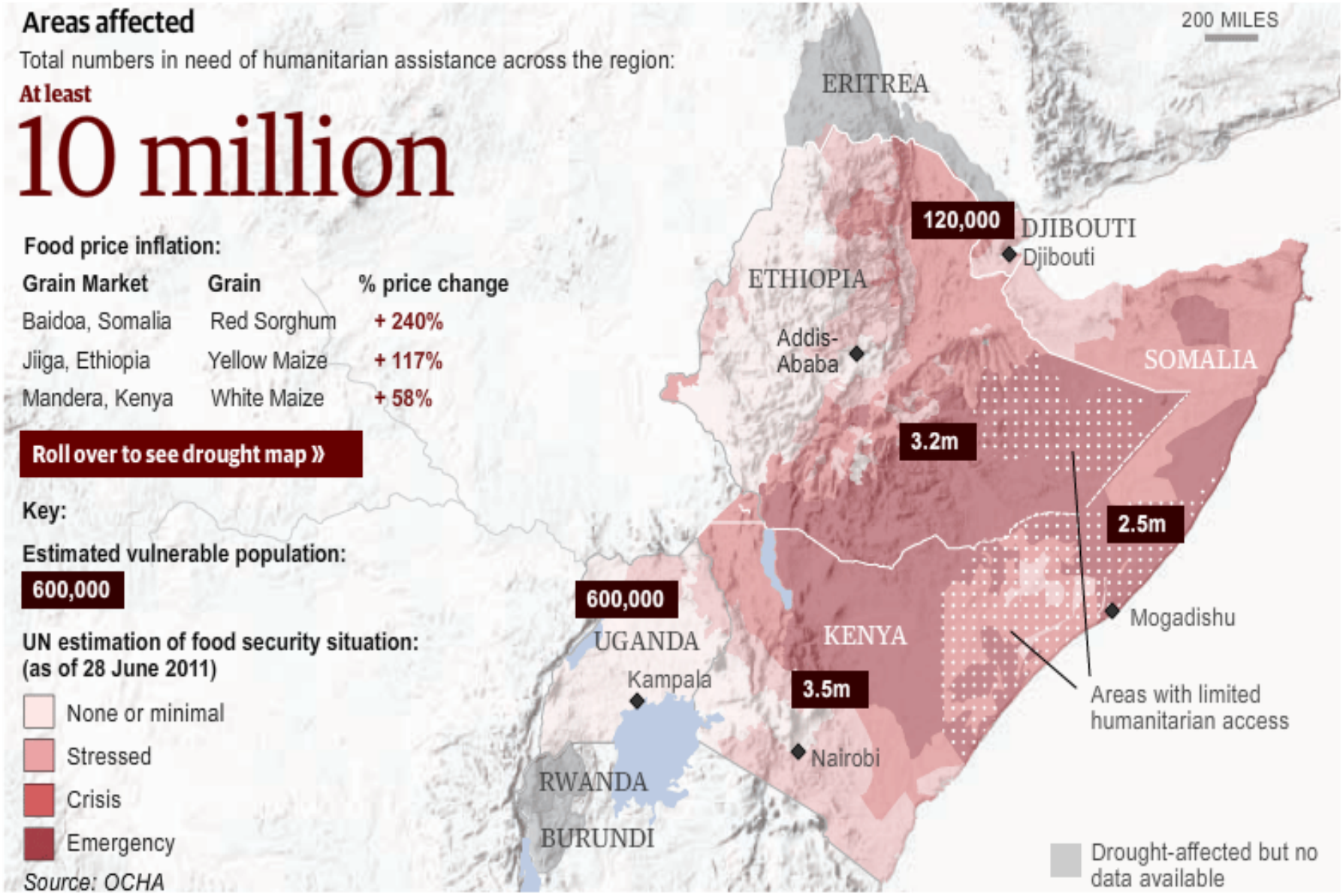
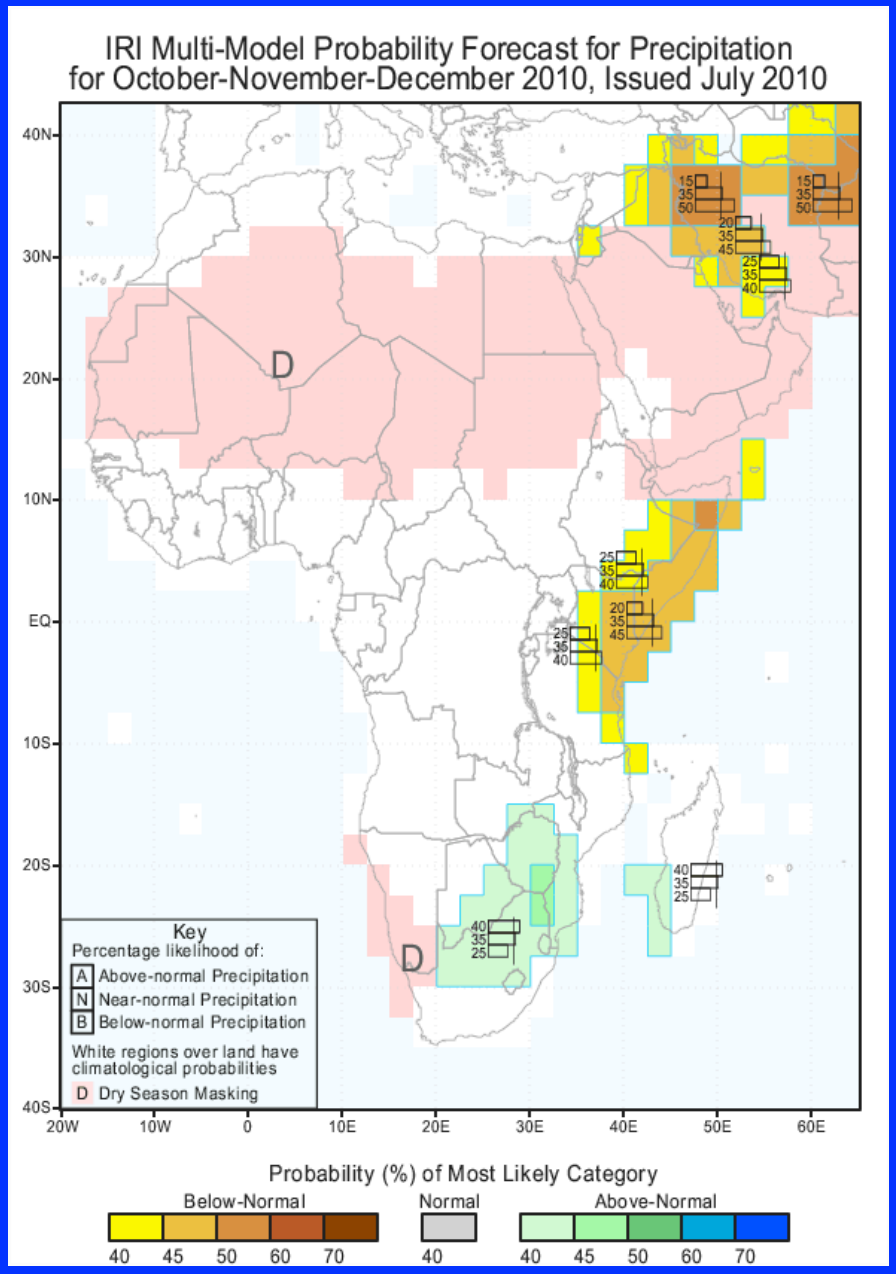
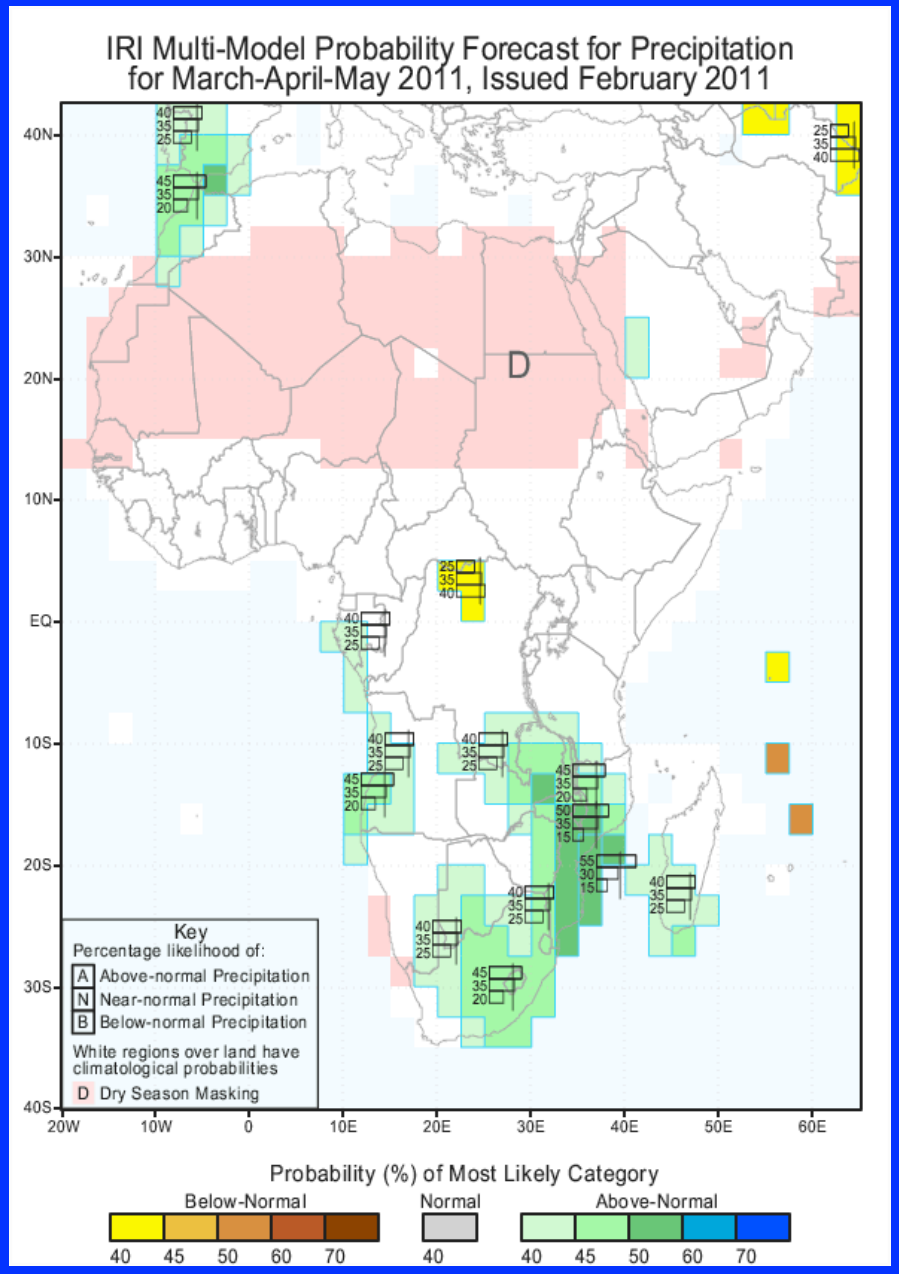
OCHA and Paddy Allen
guardian.co.uk, Monday 4 July 2011 12.07 BST




IRI Multi-Model Probability Forecast for Precipitation
for October-November-December 2010, Issued July 2010
Key
Percentage likelihood of:
A Above-normal Precipitation
N Near-normal Precipitation
B Below-normal Precipitation
White regions over land have climatological probabilities
D Dry Season Masking
Probability (%) of Most Likely Category
Below-Normal
Normal
Above-Normal
40 45 50 60 70
40
40 45 50 60 70


IRI Multi-Model Probability Forecast for Precipitation
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40 45 50 60 70
40
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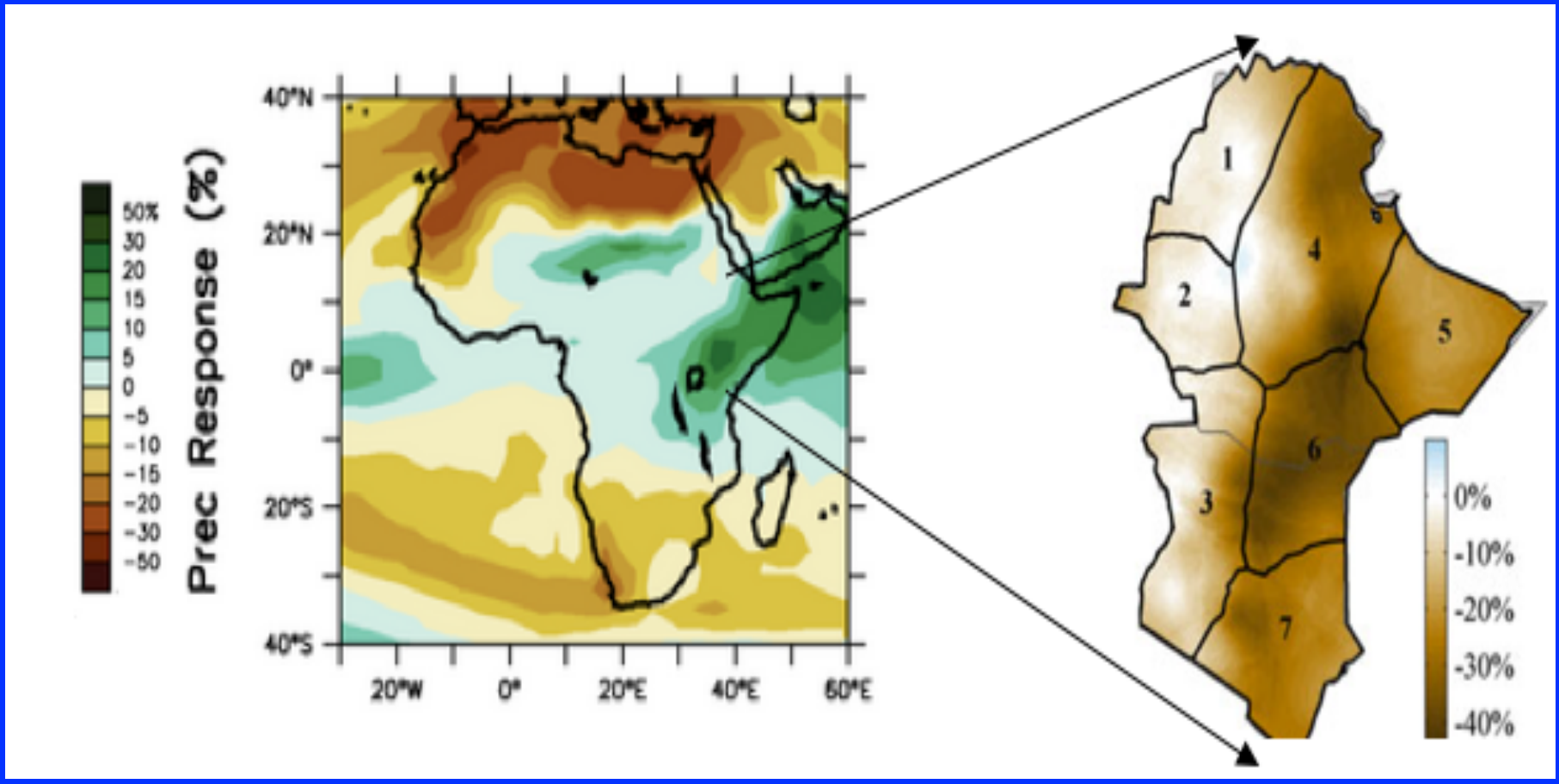
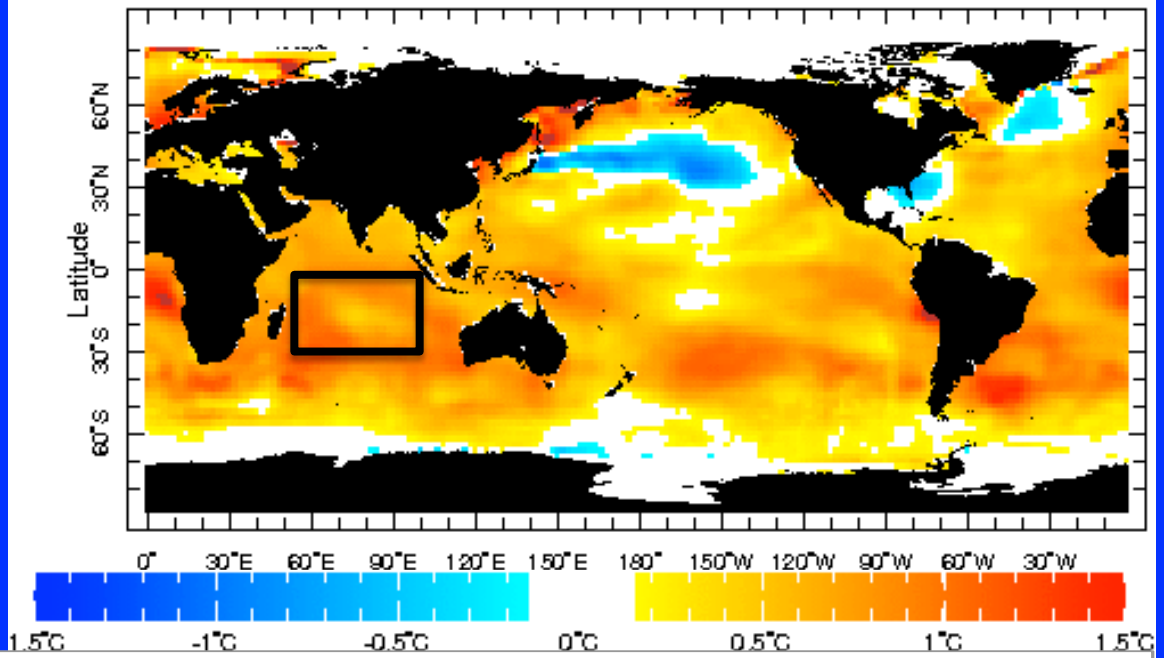


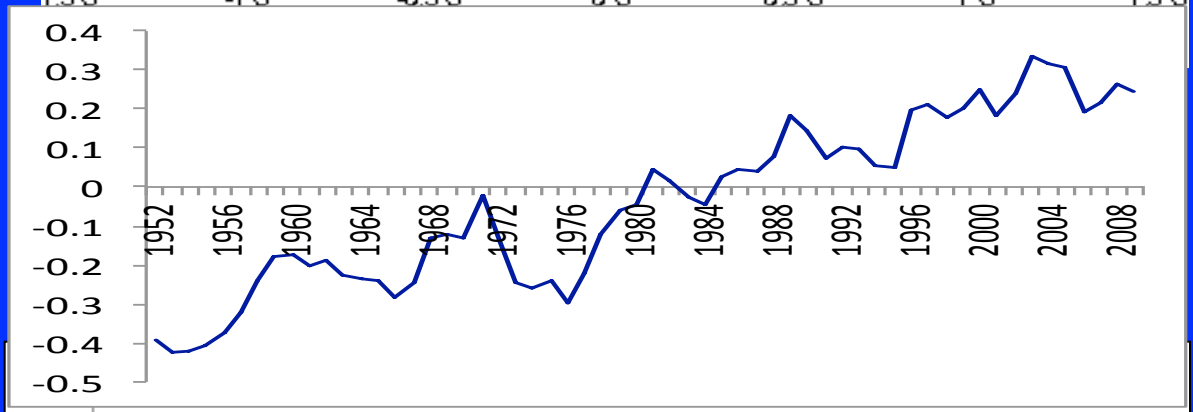
(Left) Projected change in annual precipitation 2080-2099 relative to the observed climate 1980-1999. From IPCC Fourth Assessment Report Working Group I Figure 11.2.

(Right) Observed percent change in long rains precipitation (March to June) in the Greater Horn 1979-2009 relative to 1950-1979. From Williams and Funk (2011).

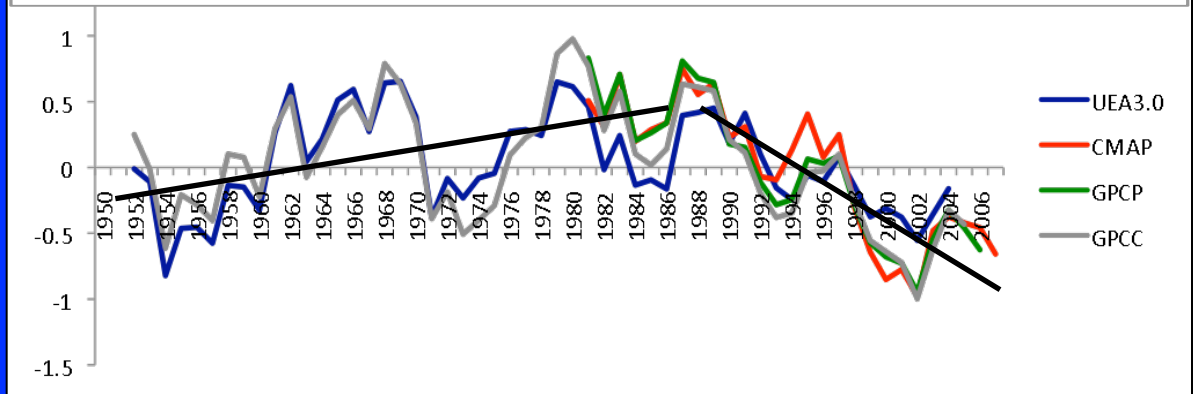
SST Trend
(deg. C/60yr)



Indian Ocean
SST anomaly



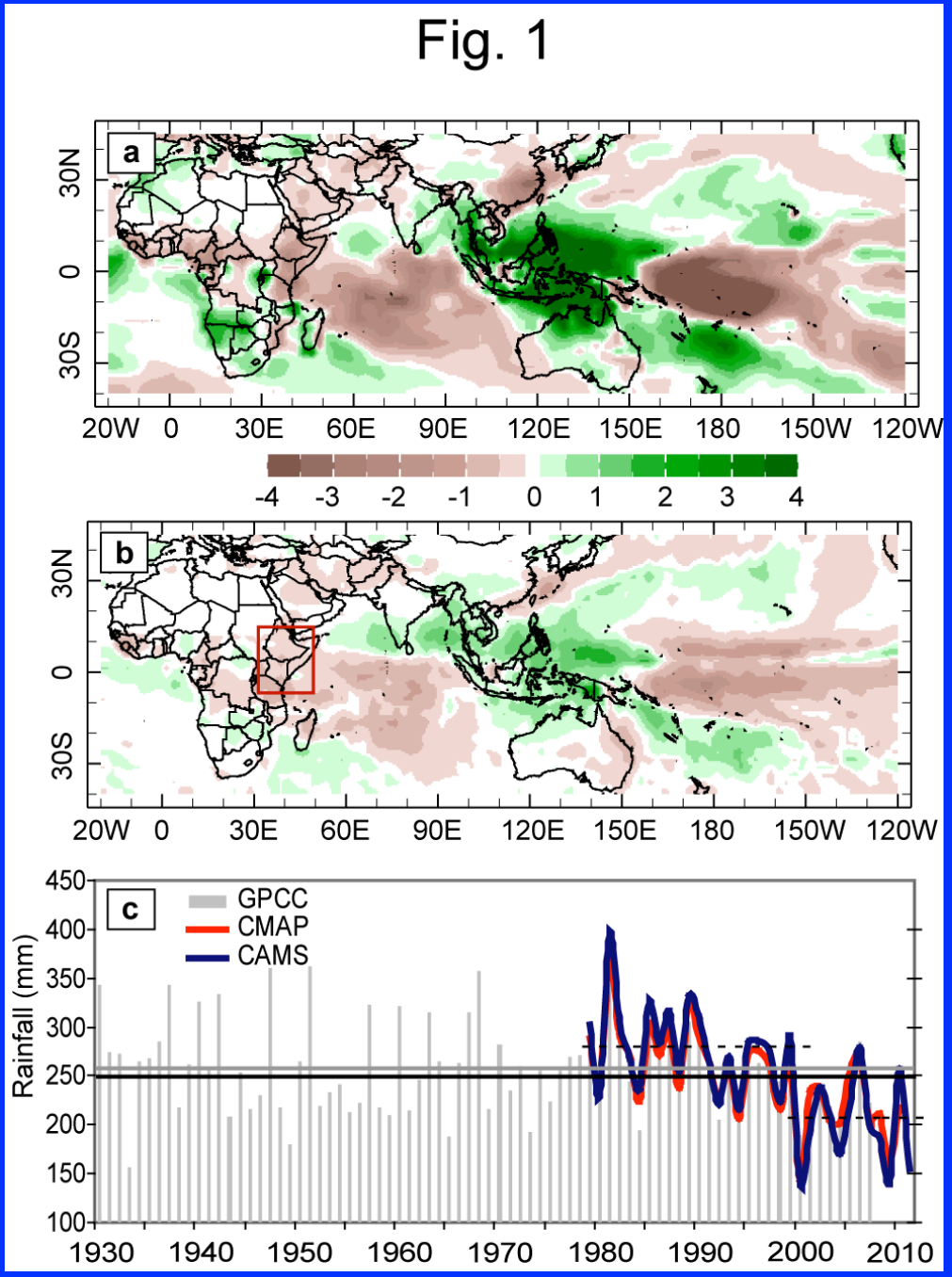
East Africa
PRCP anomaly



PRCP Anomaly
MAM 2011

Avg. PRCP Anomaly
MAM (1999-2010)

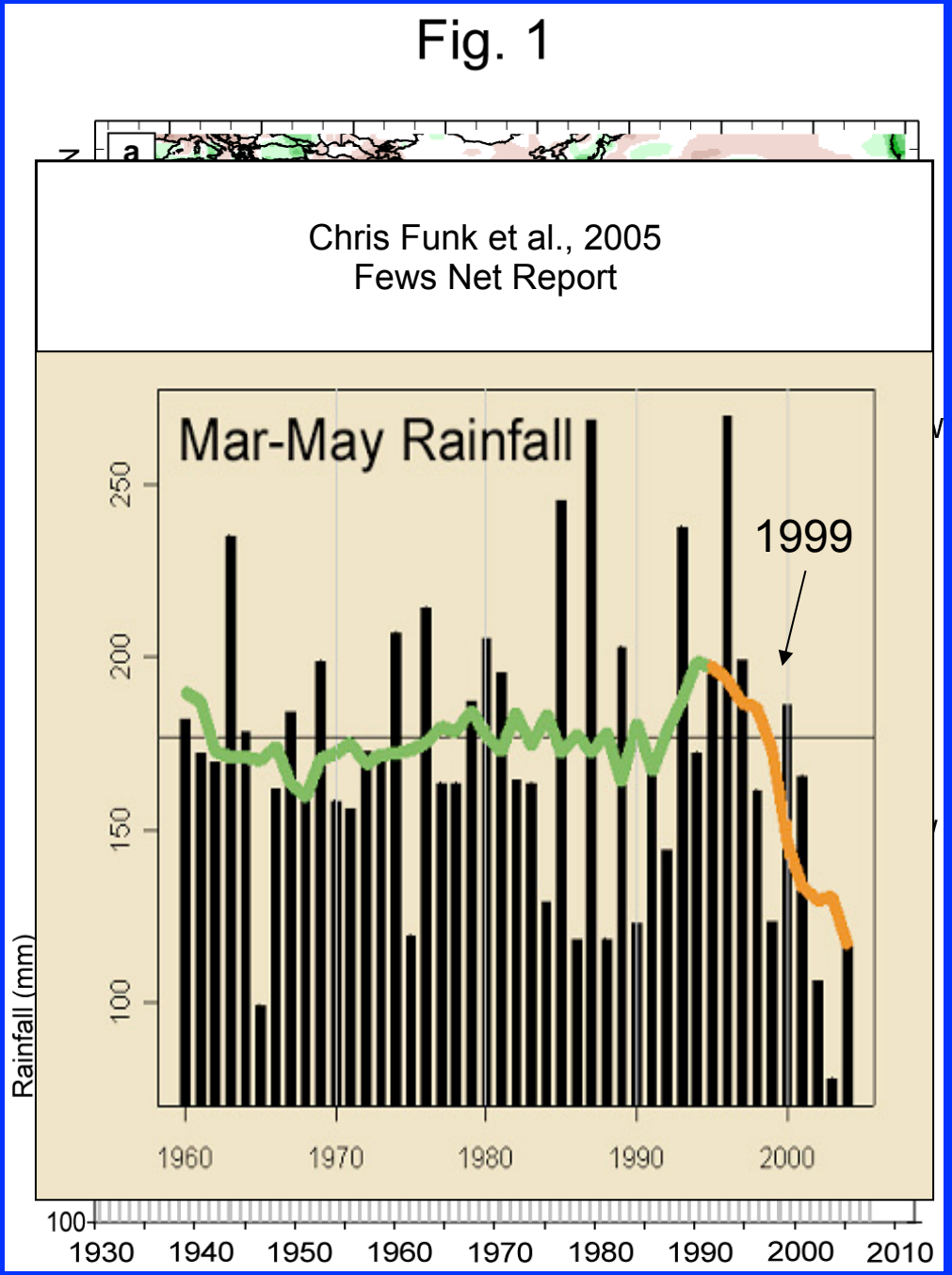
Fig. 1



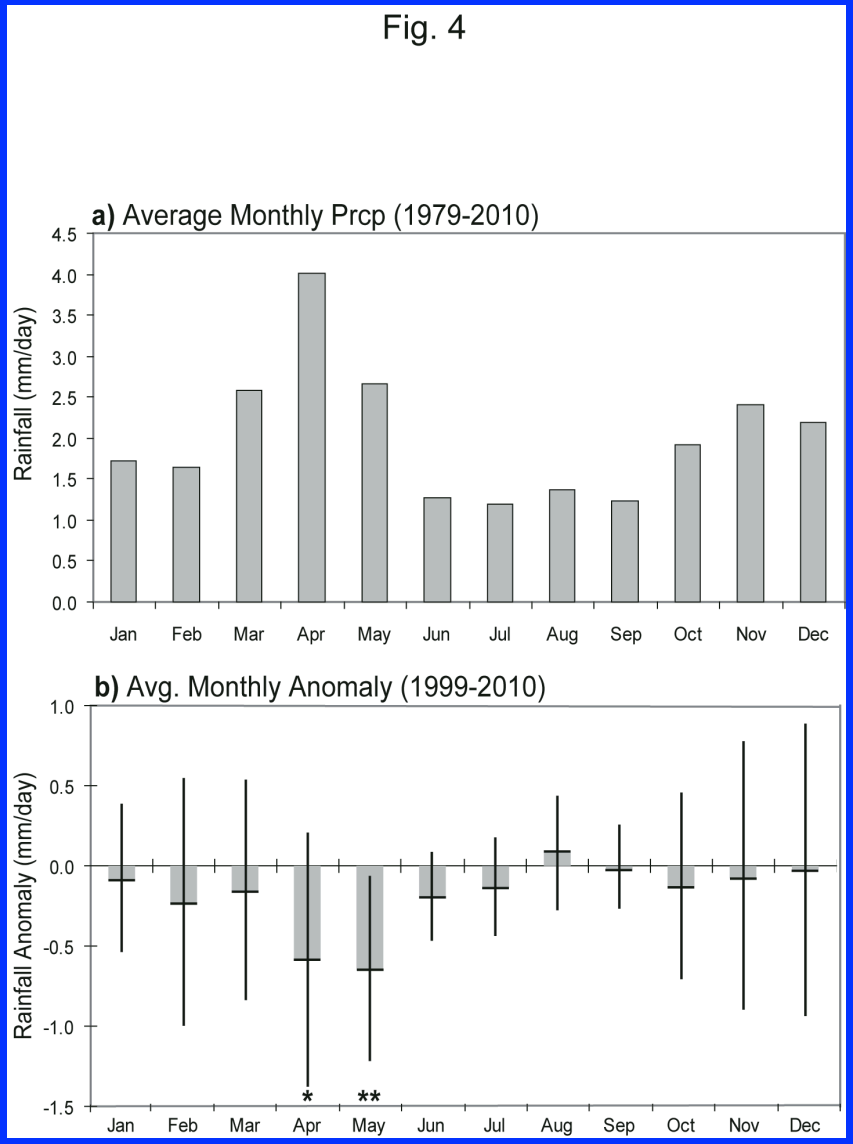
PRCP Anomaly MAM 2011

Avg. PRCP Anomaly MAM (1999-2010)

Fig. 1

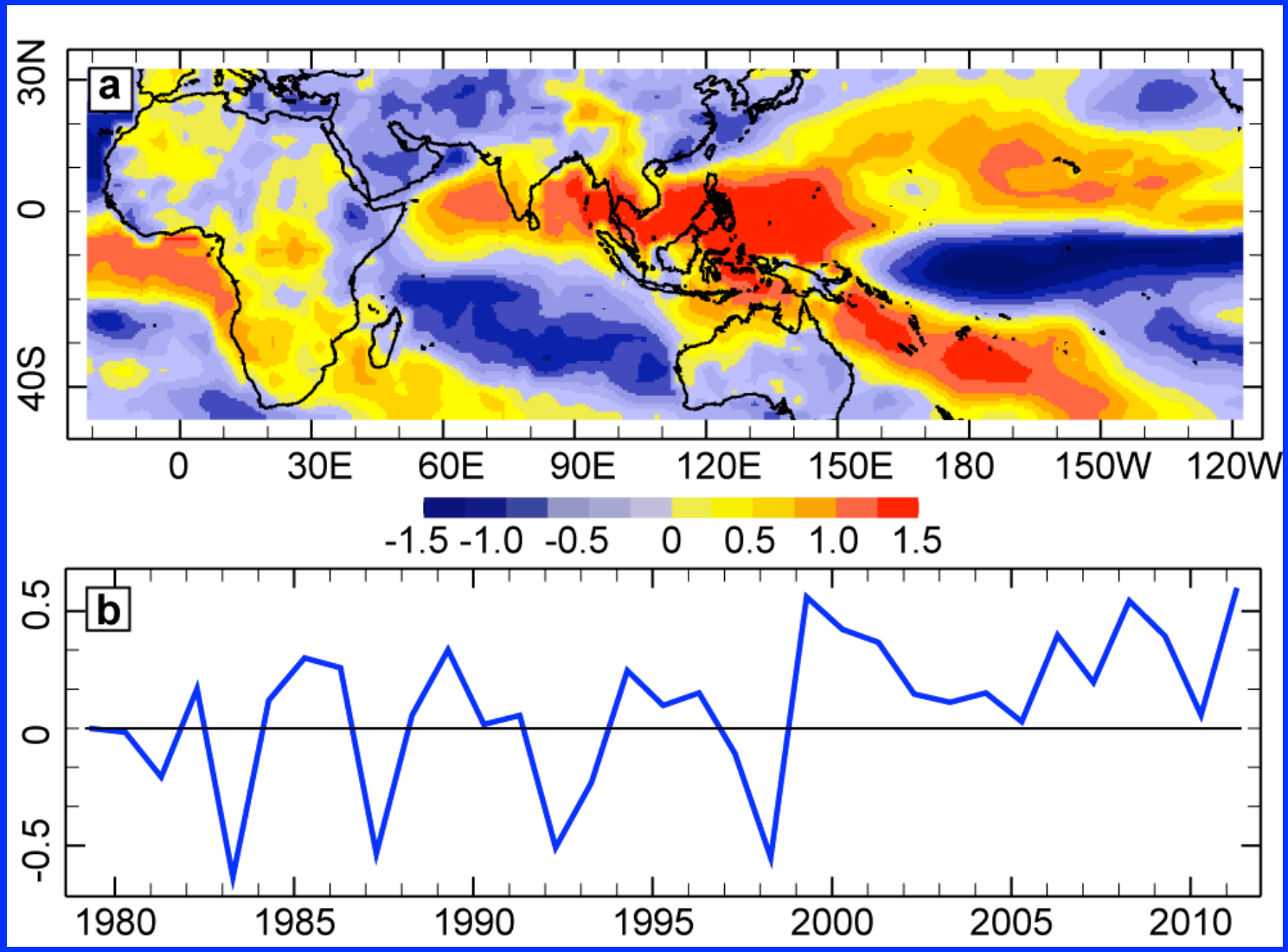


East Africa Rainfall (CMAP)



- Recent decline dominated by the months of Apr-May

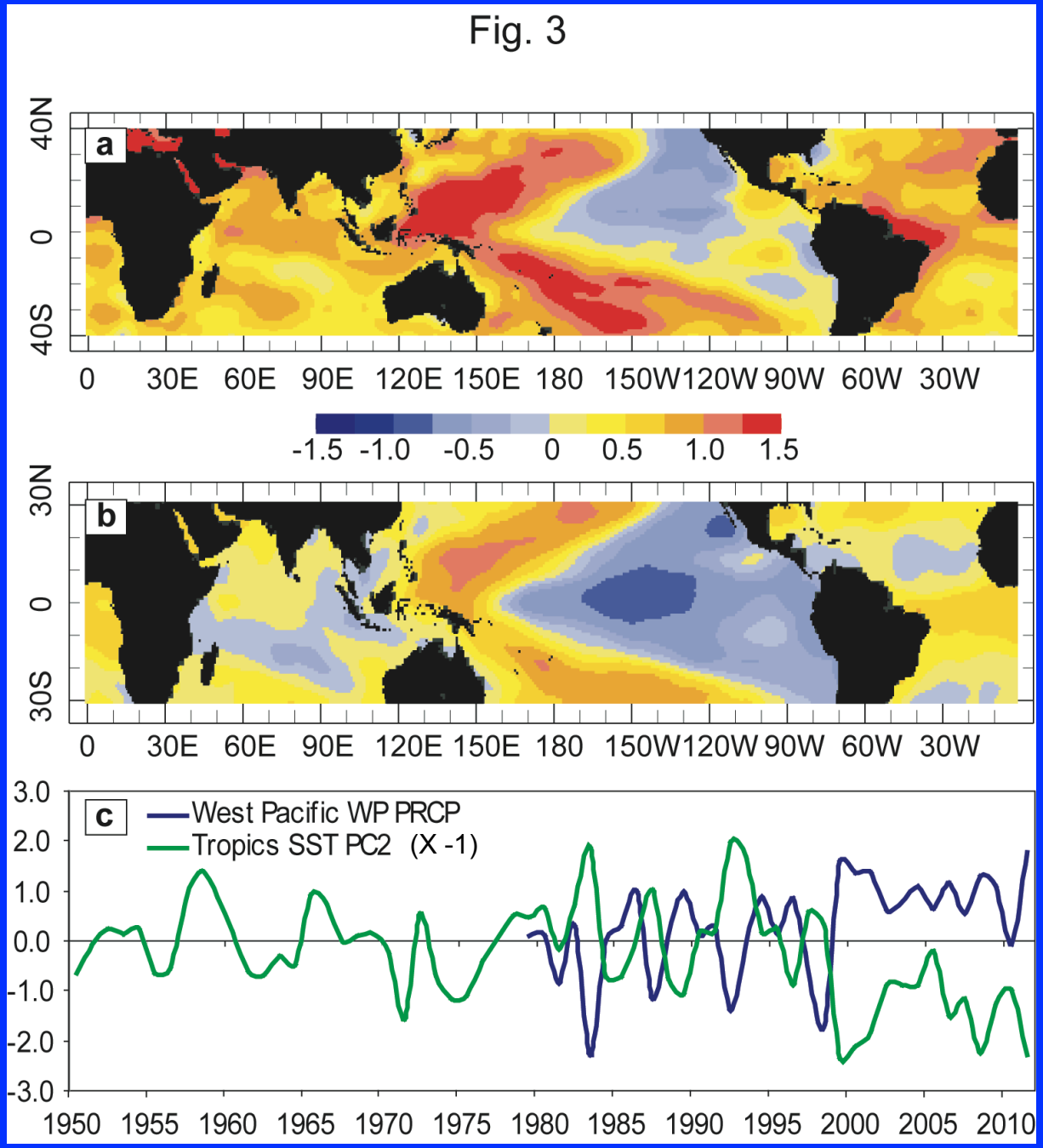
MAM CMAP PRCP Leading EOF and PC Time Series



STD. MAM SSTa (1999-2011)

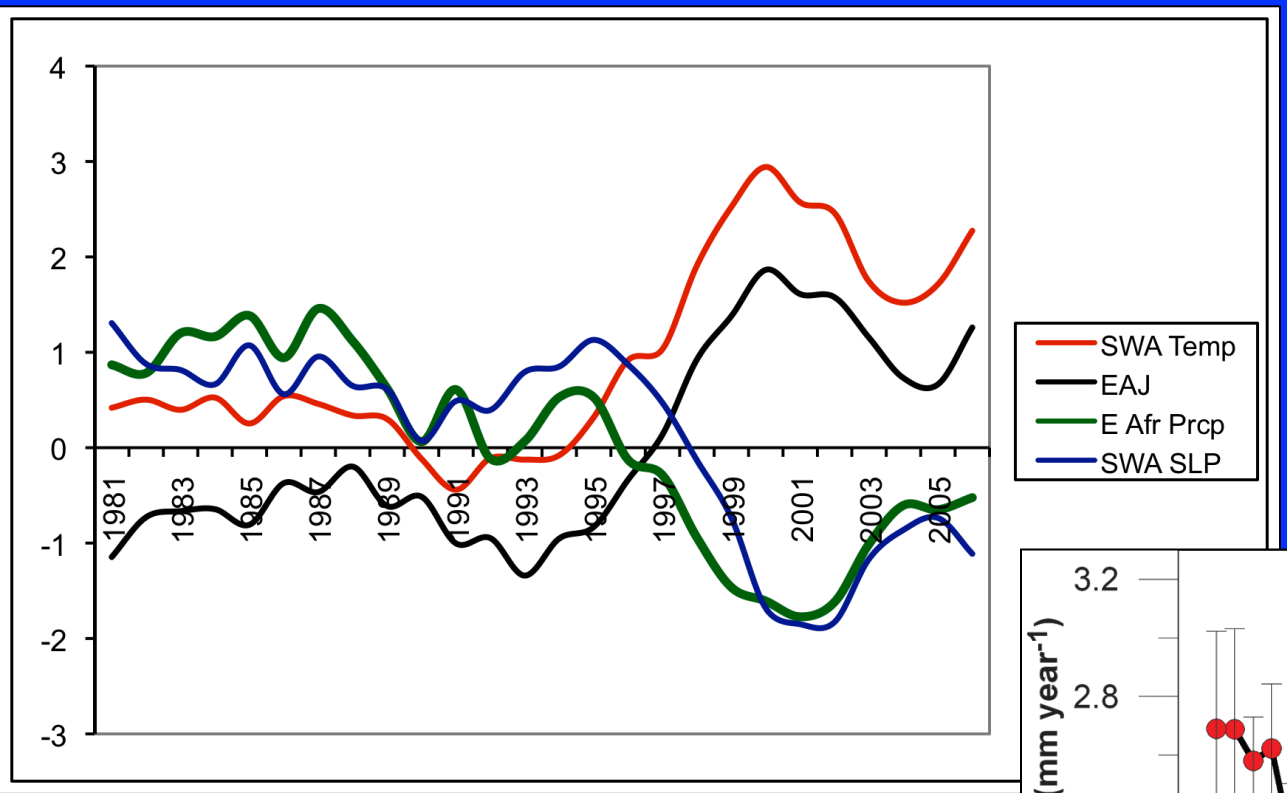
Loadings SSTa EOF2
(leading mode → trend)

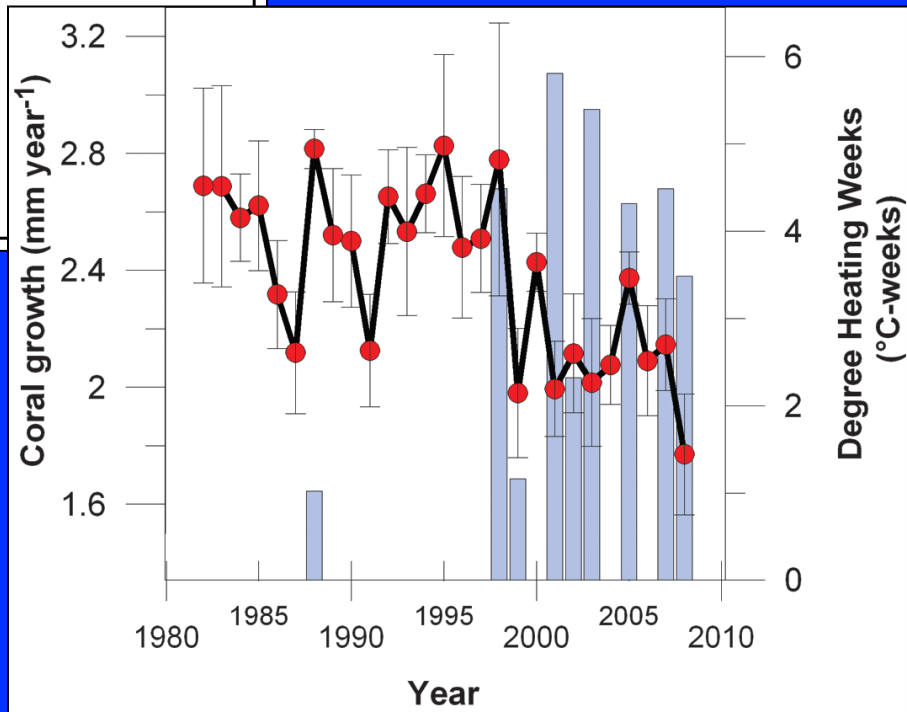
PC Time Series EOF2 and Pac. Warm Pool PRCP



Additional Variables

5-yr Moving Average





Right: From Cantin et al., Science 2010

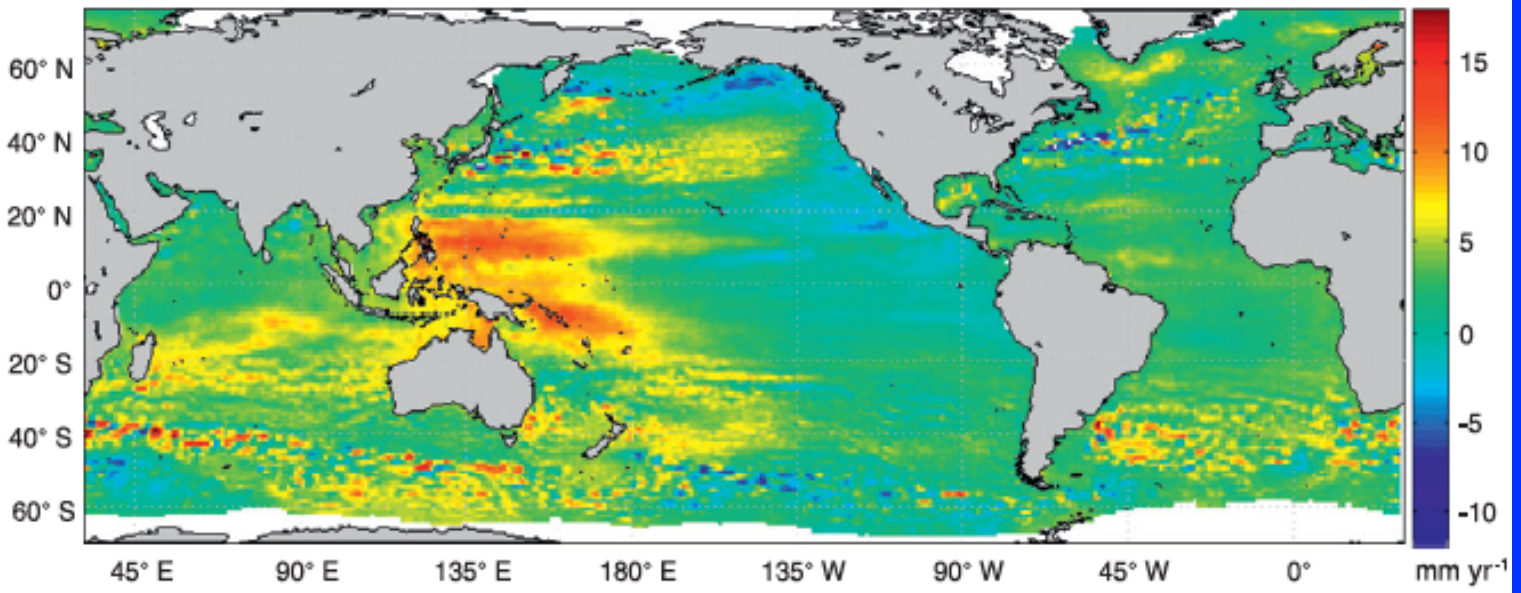


FIG. 1. The linear trend in satellite altimetry SSH for the period 1993–2009 based on the Aviso multimission altimeter data product.

1 AUGUST 2011

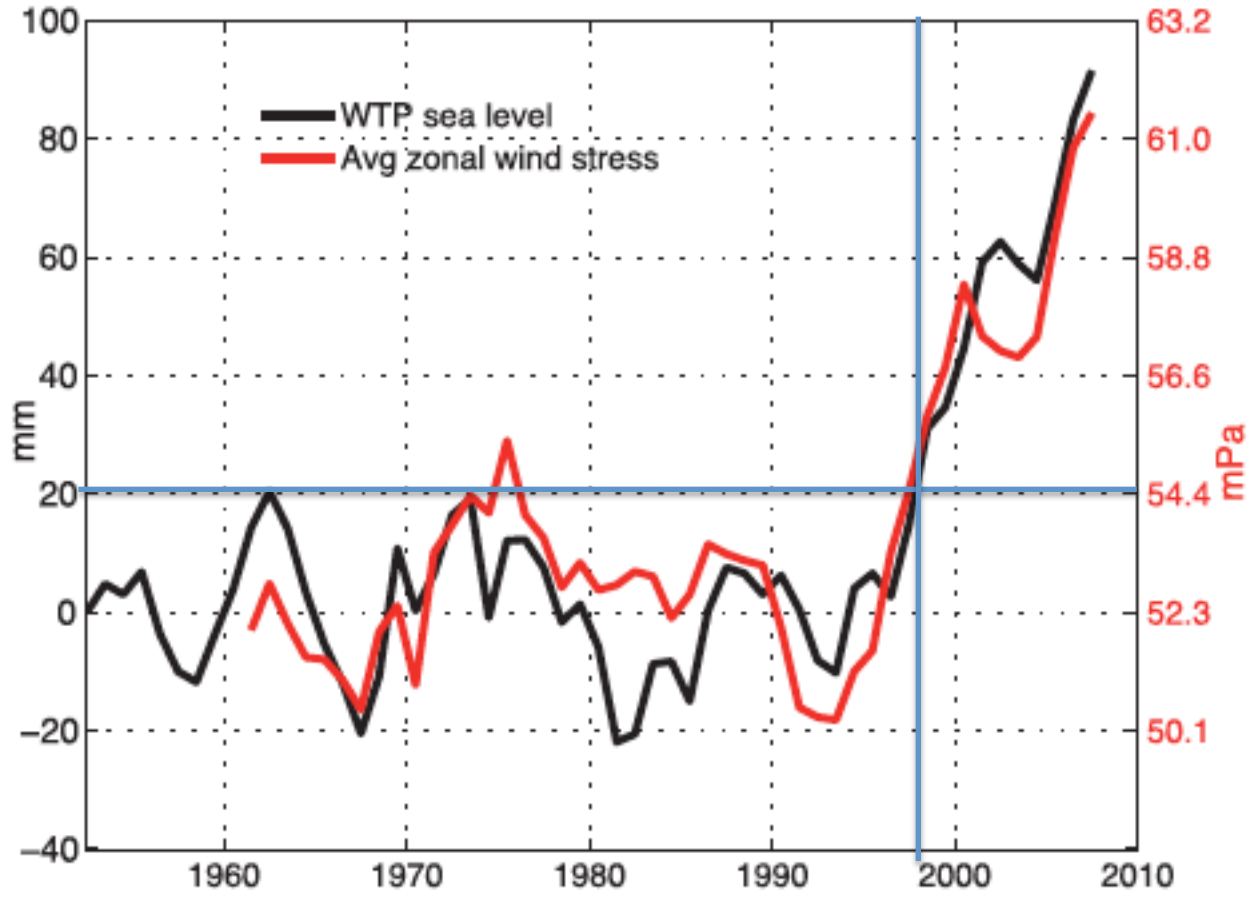
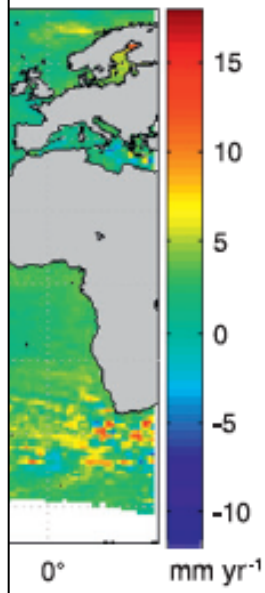


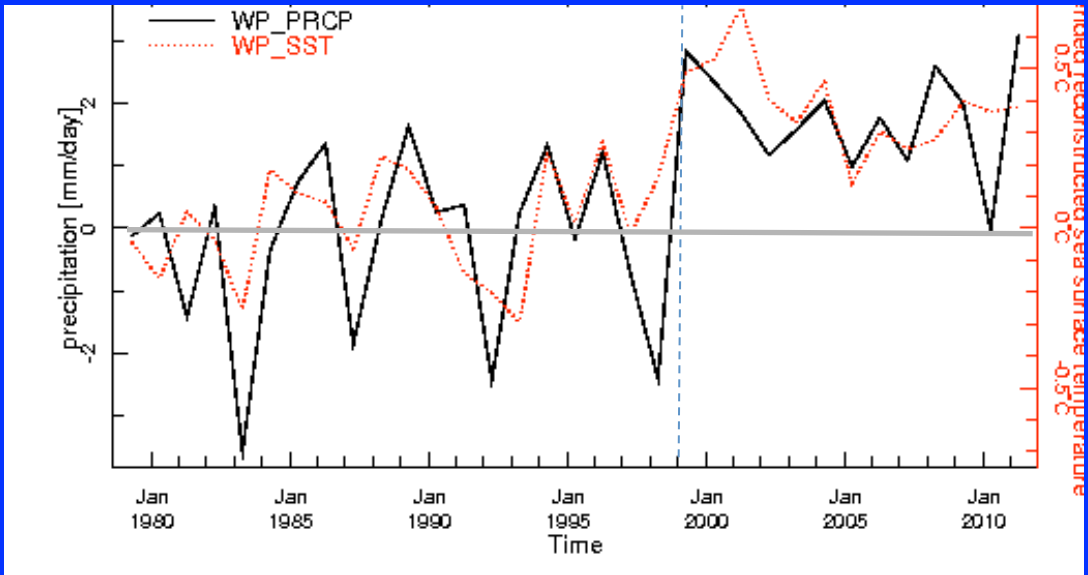
FIG. 9. Comparison of average WTP sea level and the amplitude of zonal wind stress averaged across the Pacific between 20°S and 20°N and from 150°E to the eastern boundary.



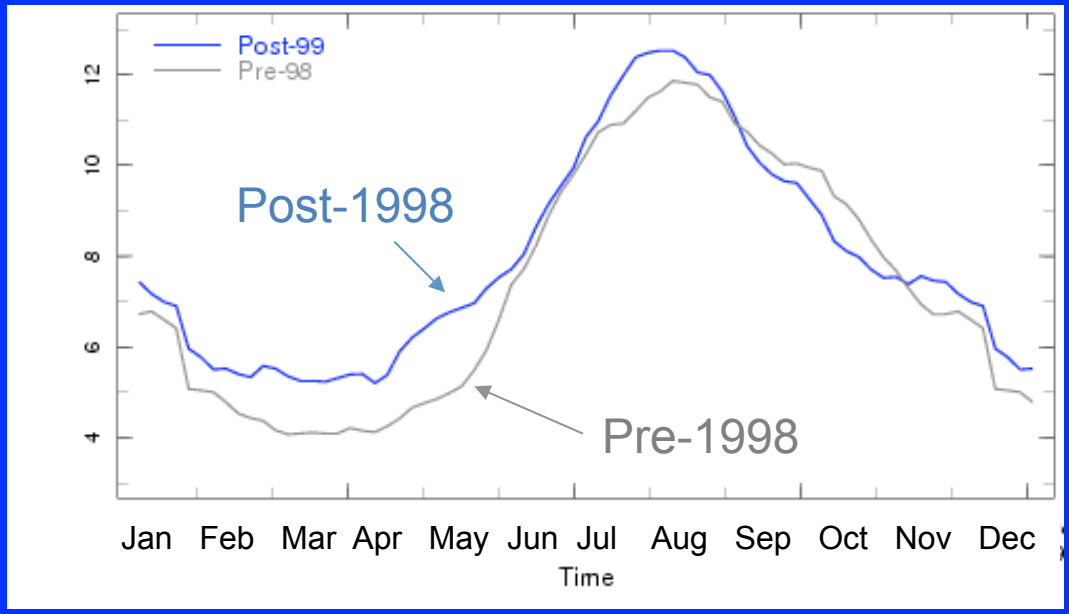
ed on the Aviso

Warm Pool SST and PRCP 1979-2009

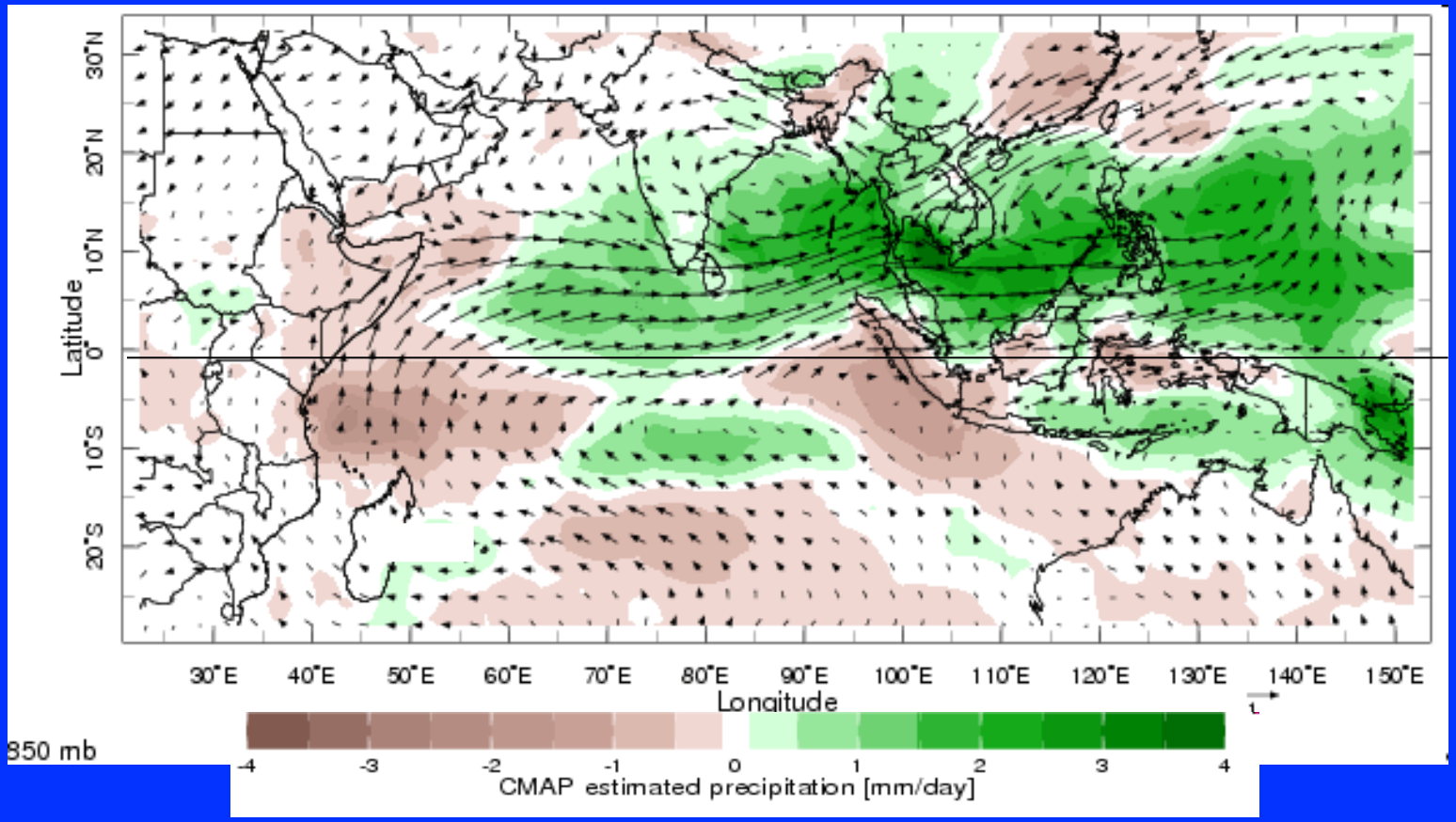
MAM SST and PRCP Anomalies



Pentad PRCP Annual Cycle

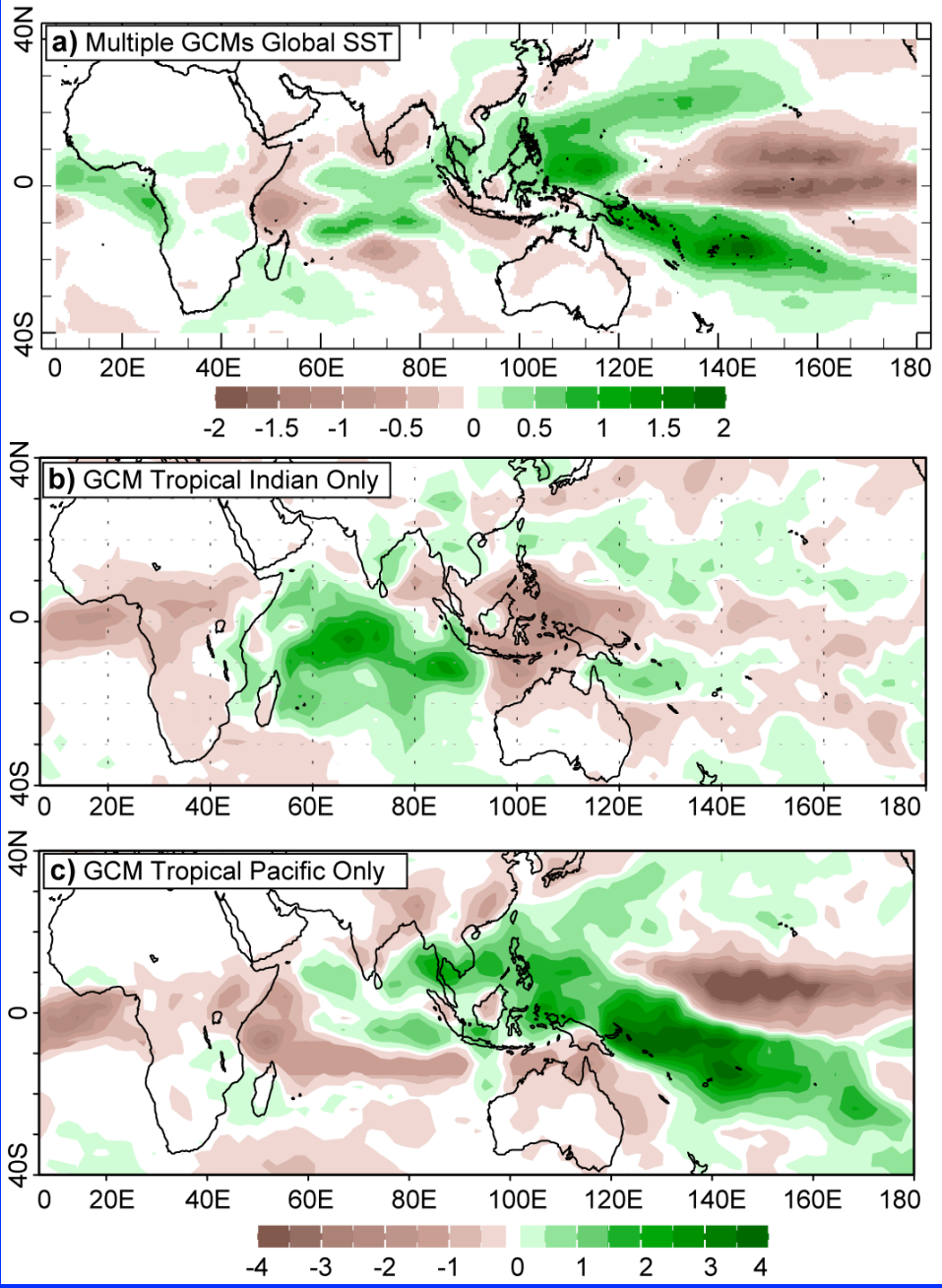


ECHAM5 T85 Model Simulations
Apr-May Anomalies
850 hPa Wind & PRCP



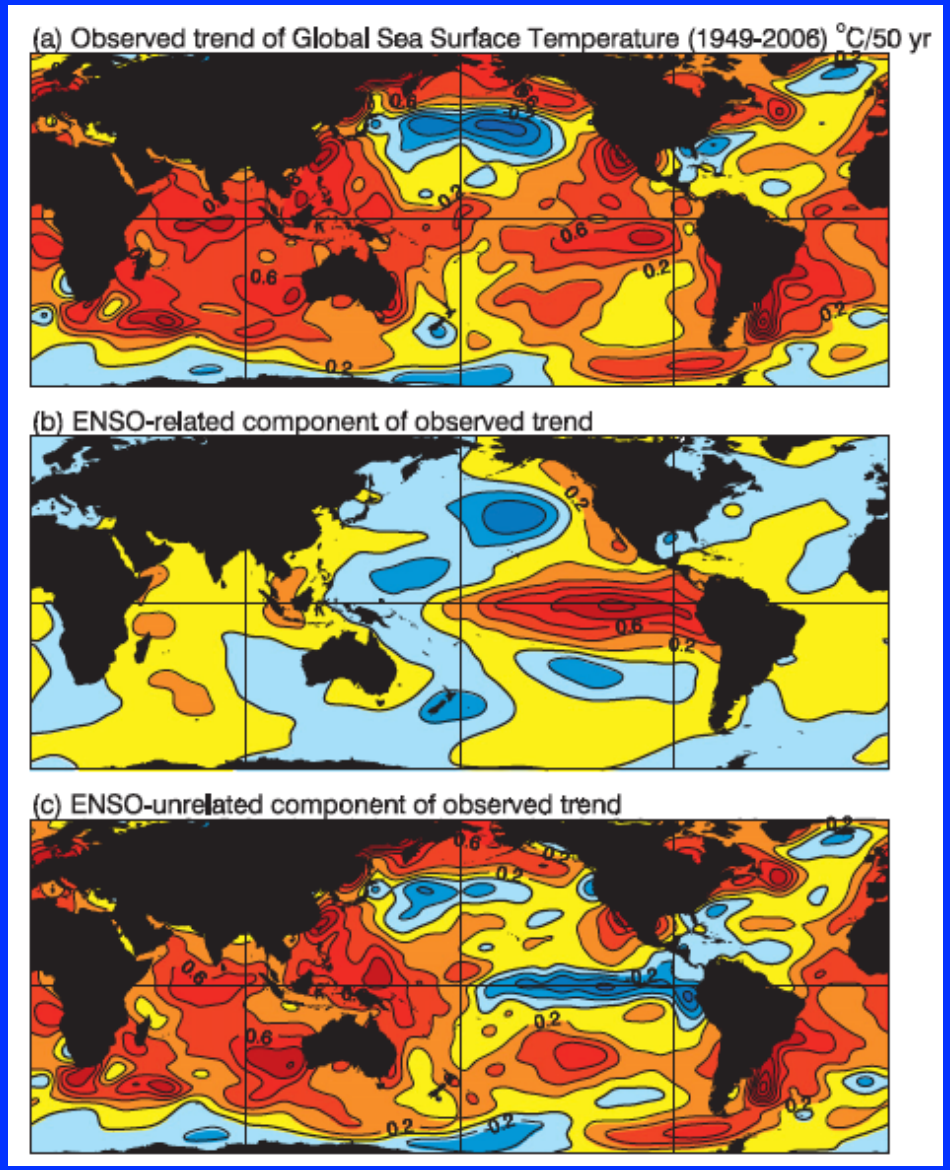
Lyon et al. (in prep)

Fig. 4

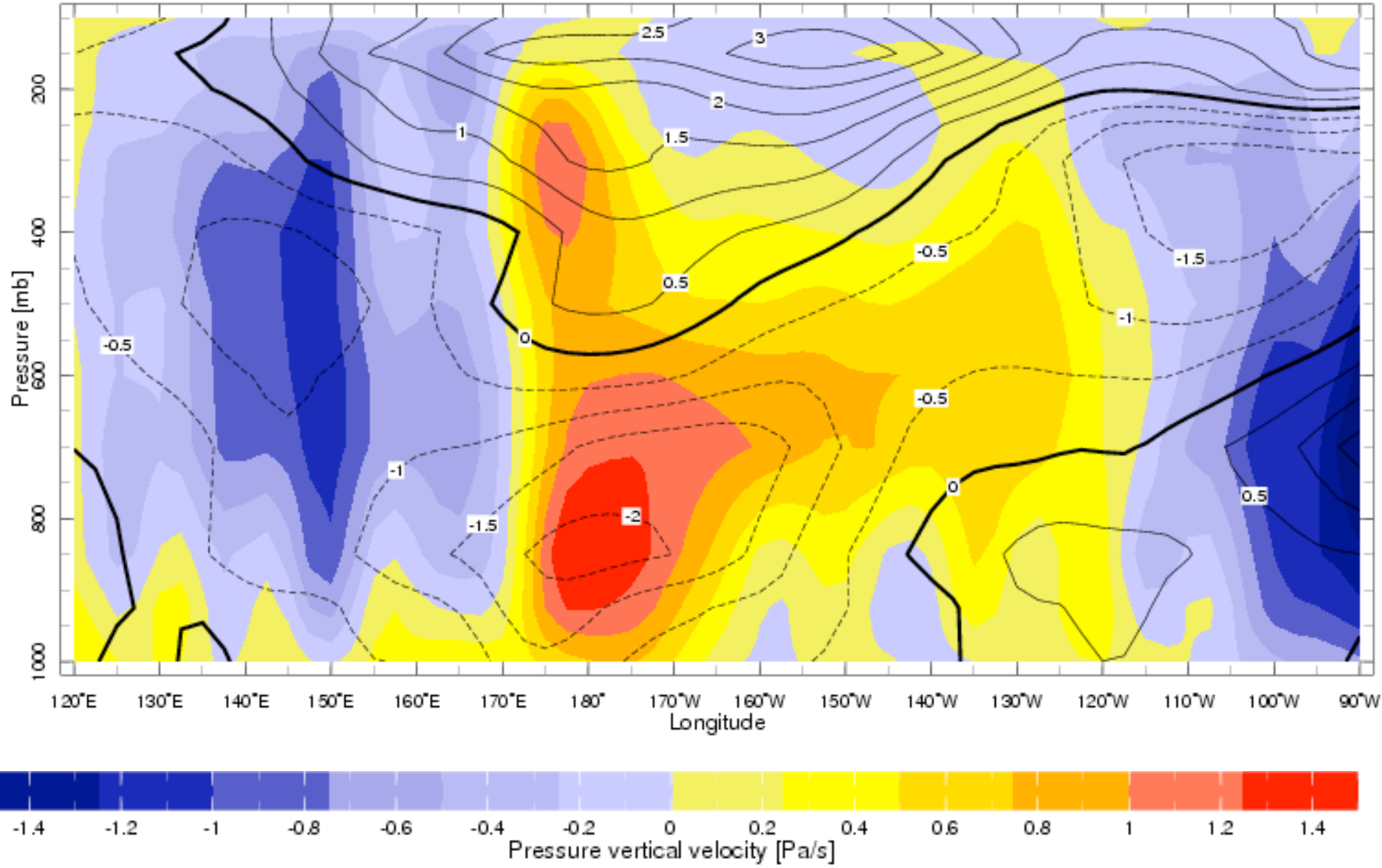

a) Multiple GCMs Global SST
b) GCM Tropical Indian Only
c) GCM Tropical Pacific Only
40N
0
40S
0
20E
40E
60E
80E
100E
120E
140E
160E
180
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
-4
-3
-2
-1
0
1
2
3
4

Removing ENSO-Related Variations from the SST Climate Record

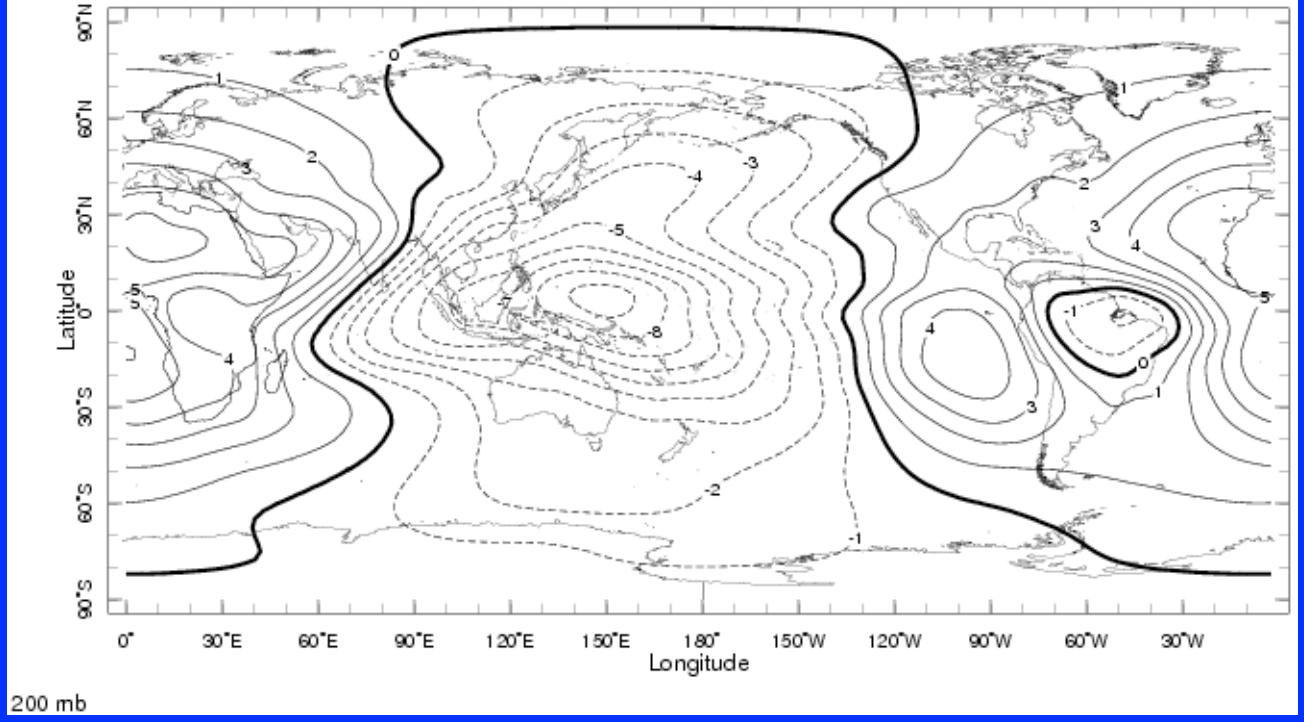
Compo and Sardeshmukh (J. Climate, 2010)



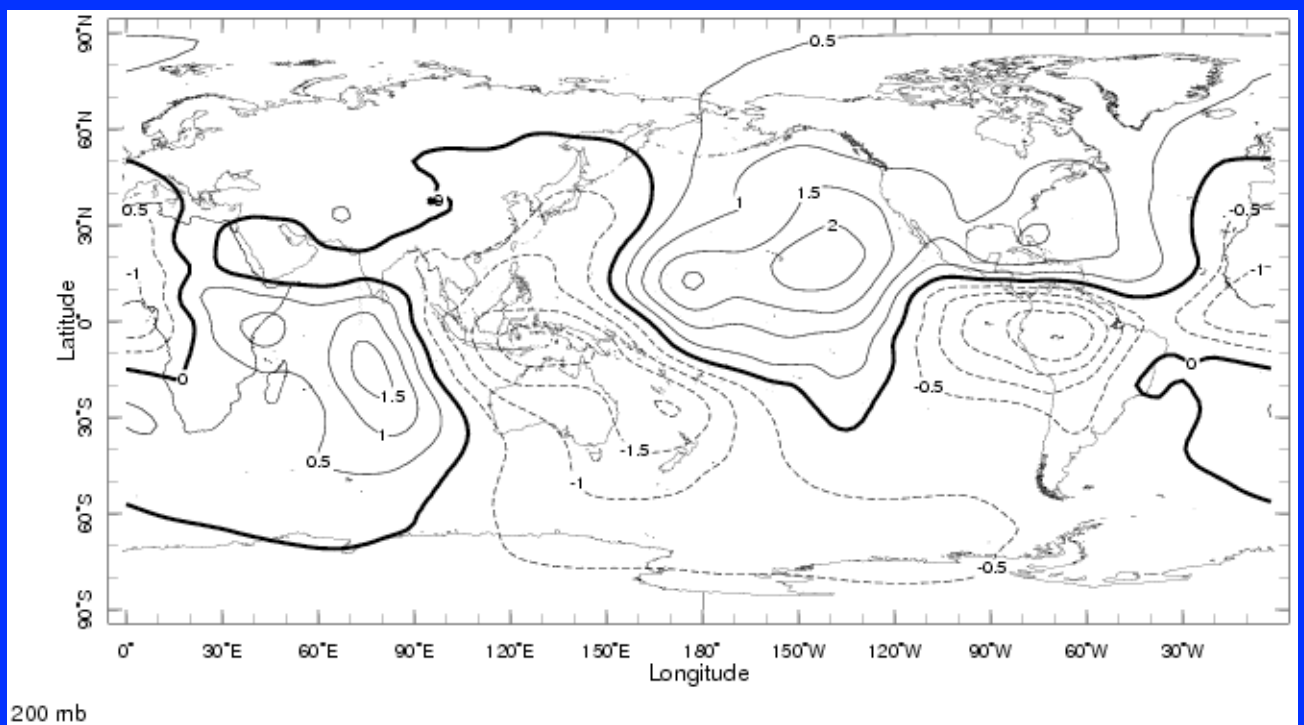
Reanalysis omega and u-wind MAM (1999-2011) – climo.

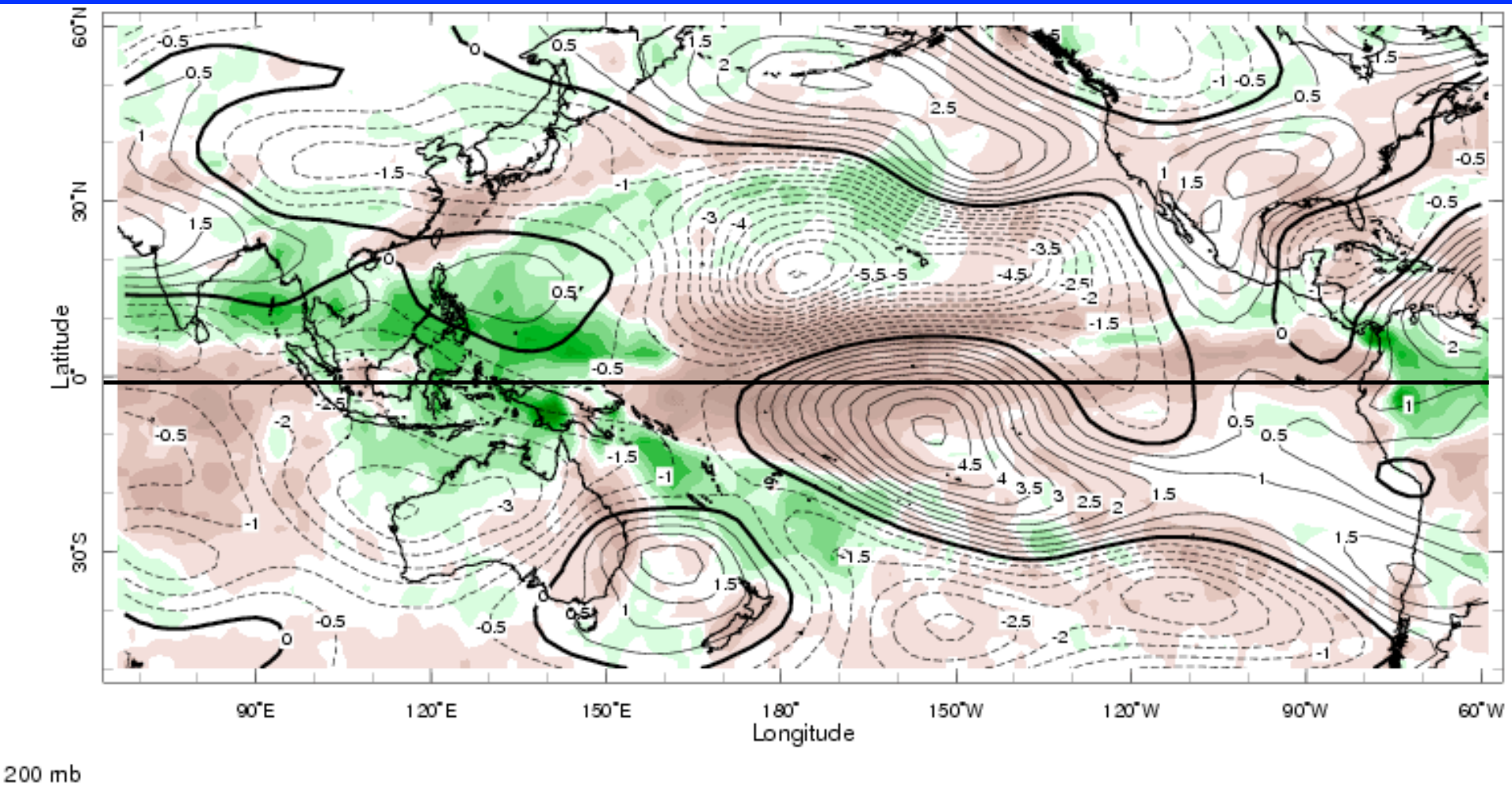


NCEP Reanalysis
Velocity Potential
MAM Climo. (‘79-’96)



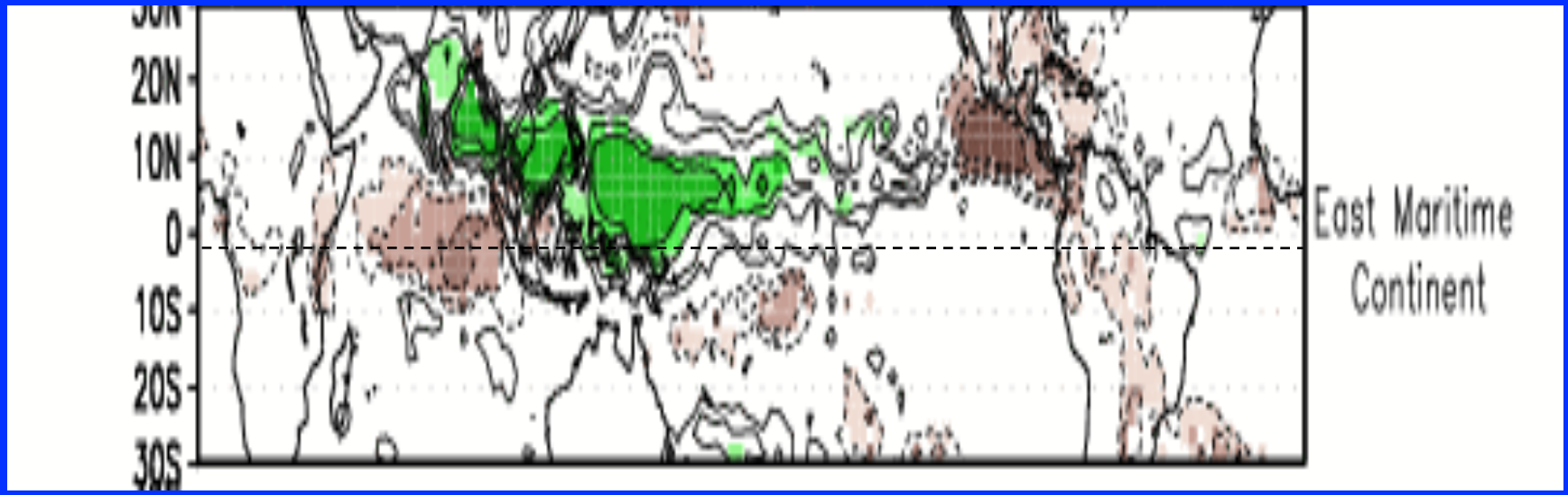
MAM
(1999-2011) – Climo

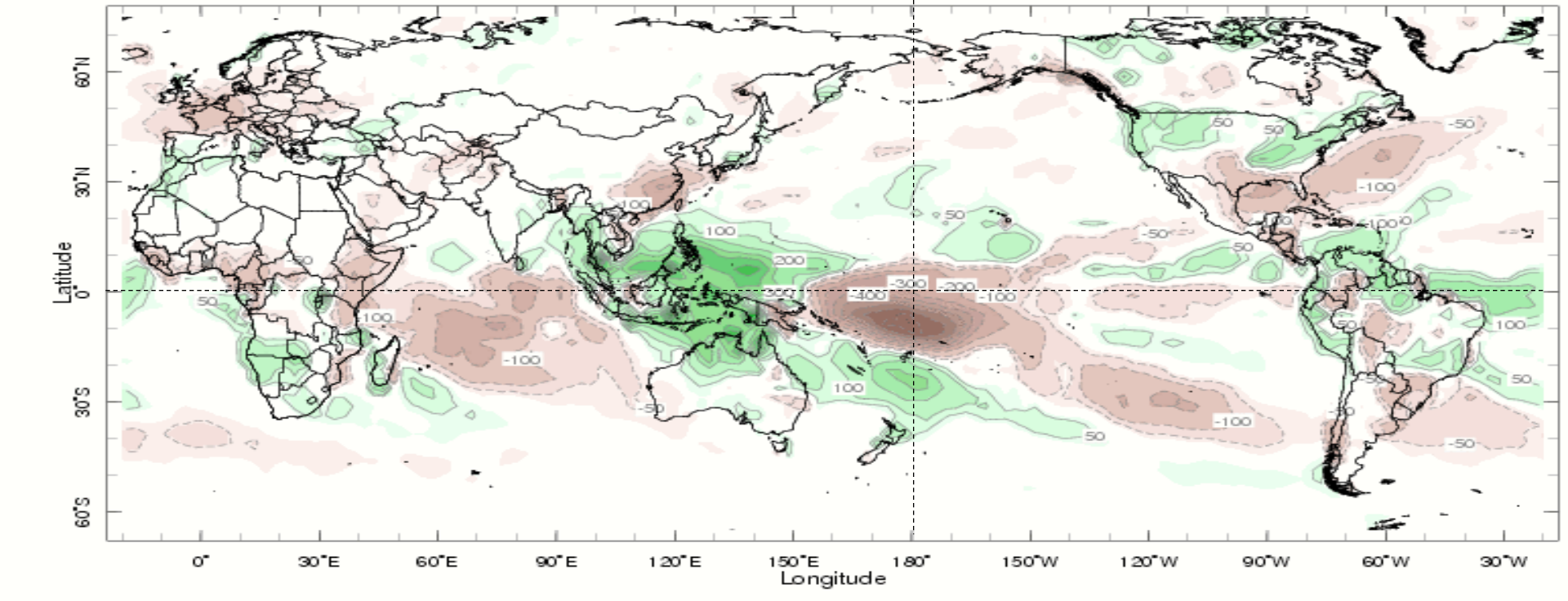



60°N
30°N
0°
30°S
Latitude
90°E
120°E
150°E
180°
150°W
120°W
90°W
60°W
Longitude
200 mb
-4
-3
-2
-1
0
1
2
3
4
CMAP estimated precipitation [mm/day]

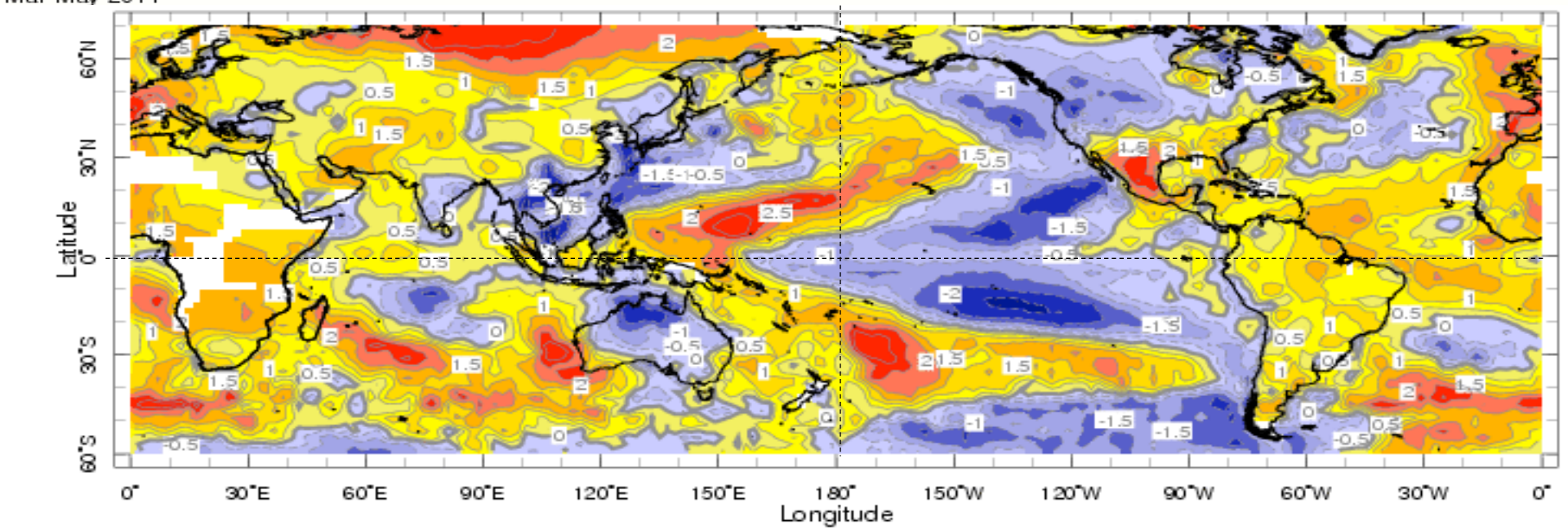
~ *finis* ~

MJO PRCP Response May-Sep
(from CPC)





Mar-May 2011



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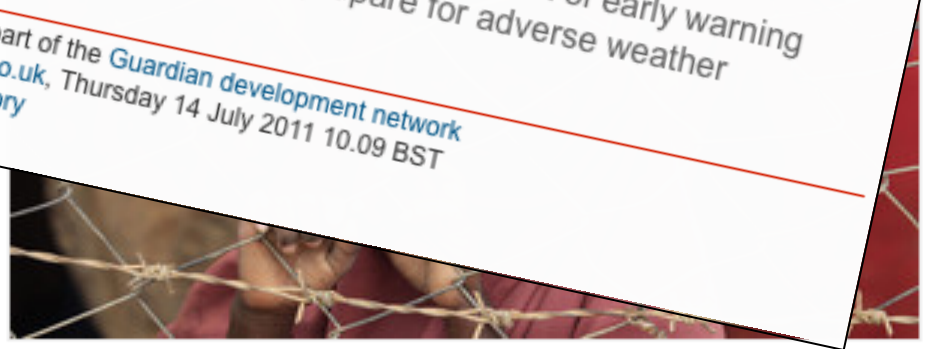
Predicting Drought

Severe drought in the horn of Africa has
to crop failures and food shortages. Ten
million people are at risk of starvation.
can science help to better predict thes
events and help mitigate these disasters? Dr
Bradfield Lyon is a research scientist at the
International Research Institute for Climate
and Society based at Columbia University in
the United States. He explained the east



Drought in east Africa the result of climate change and conflict

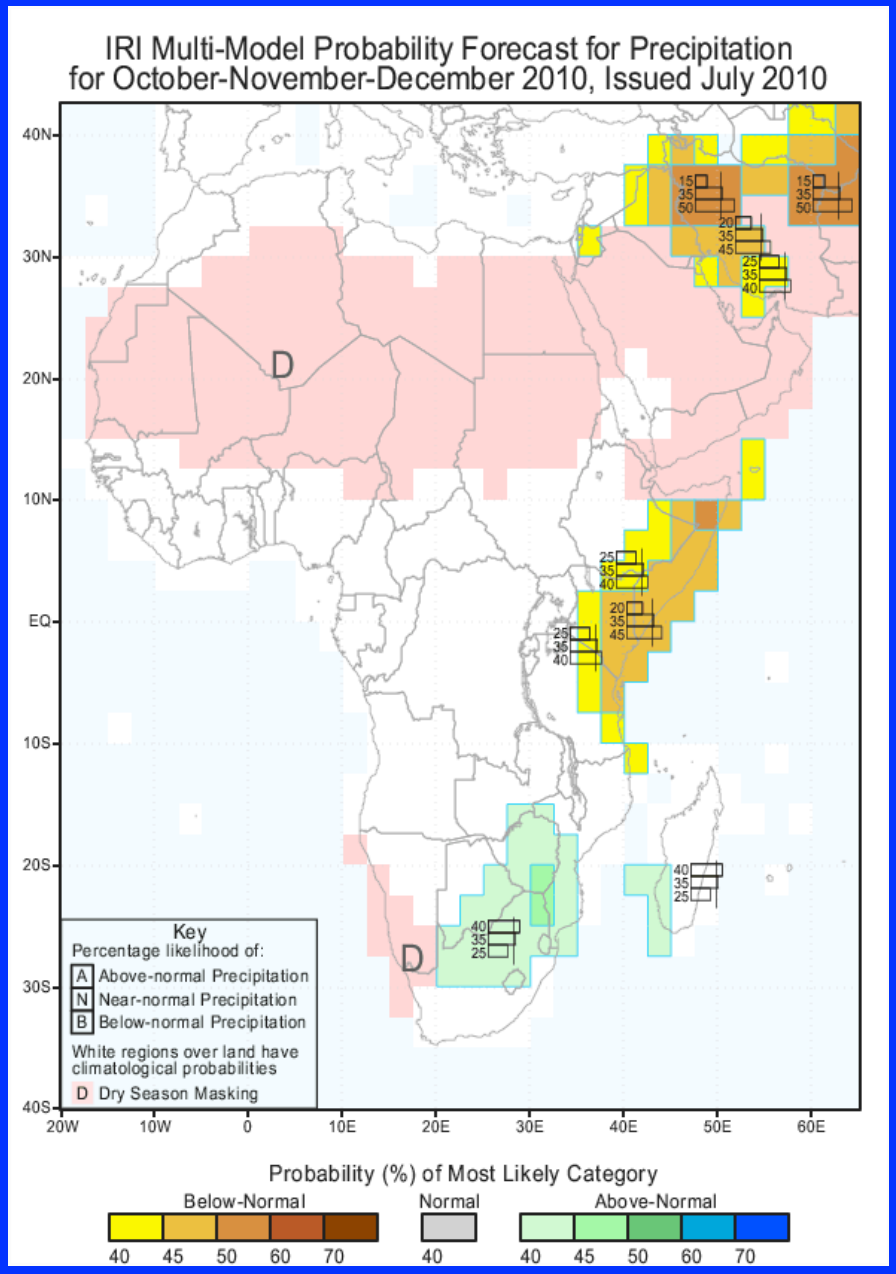
Aid agencies say that weather in the region has become more erratic and years of war leave populations especially vulnerable

Felicity Lawrence
guardian.co.uk, Monday 4 July 2011 18.50 BST
Article history

La Niña blamed for east African drought

Environmentalists call for the development of early warning systems to help countries prepare for adverse weather

By IRIN, part of the Guardian development network
guardian.co.uk, Thursday 14 July 2011 10.09 BST
Article history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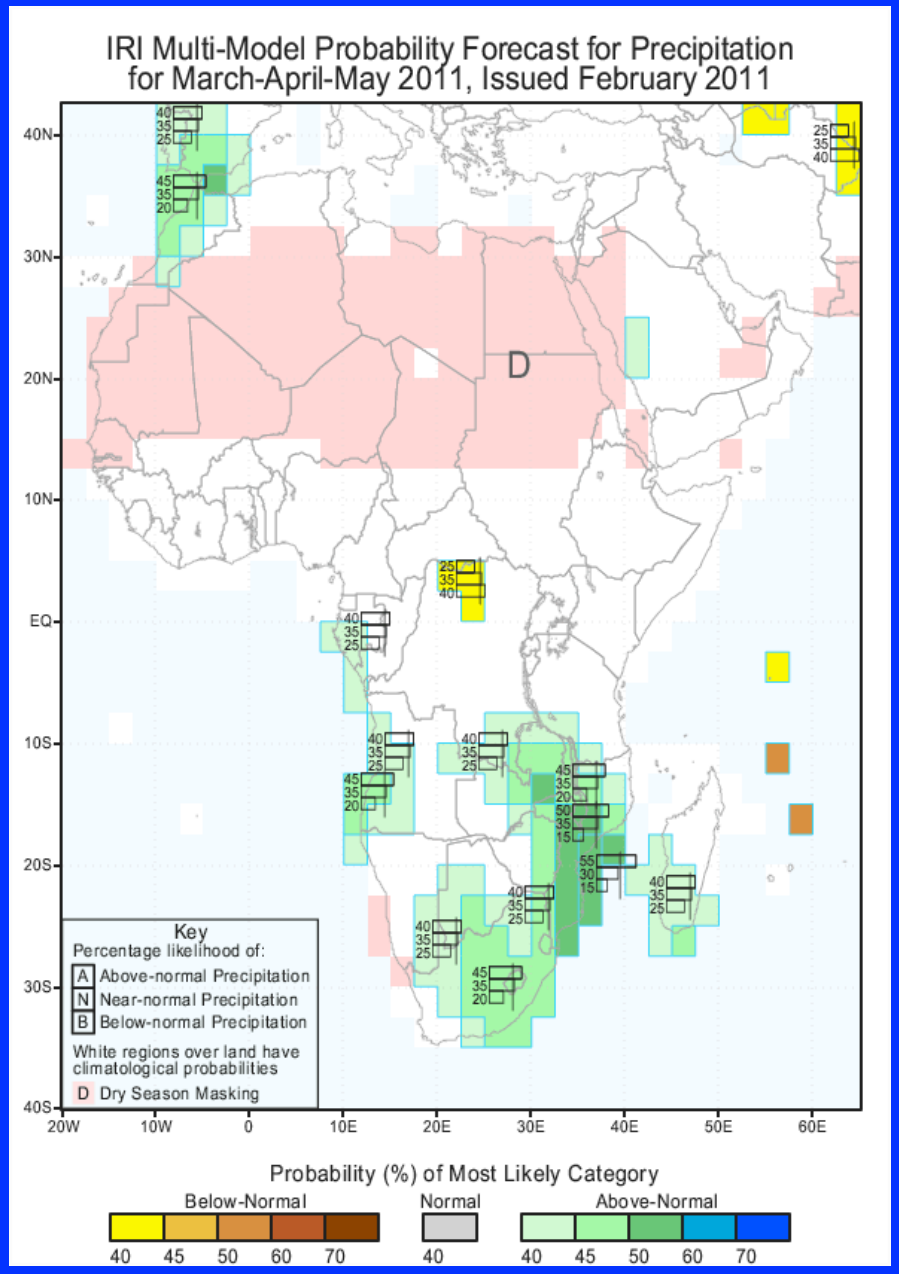
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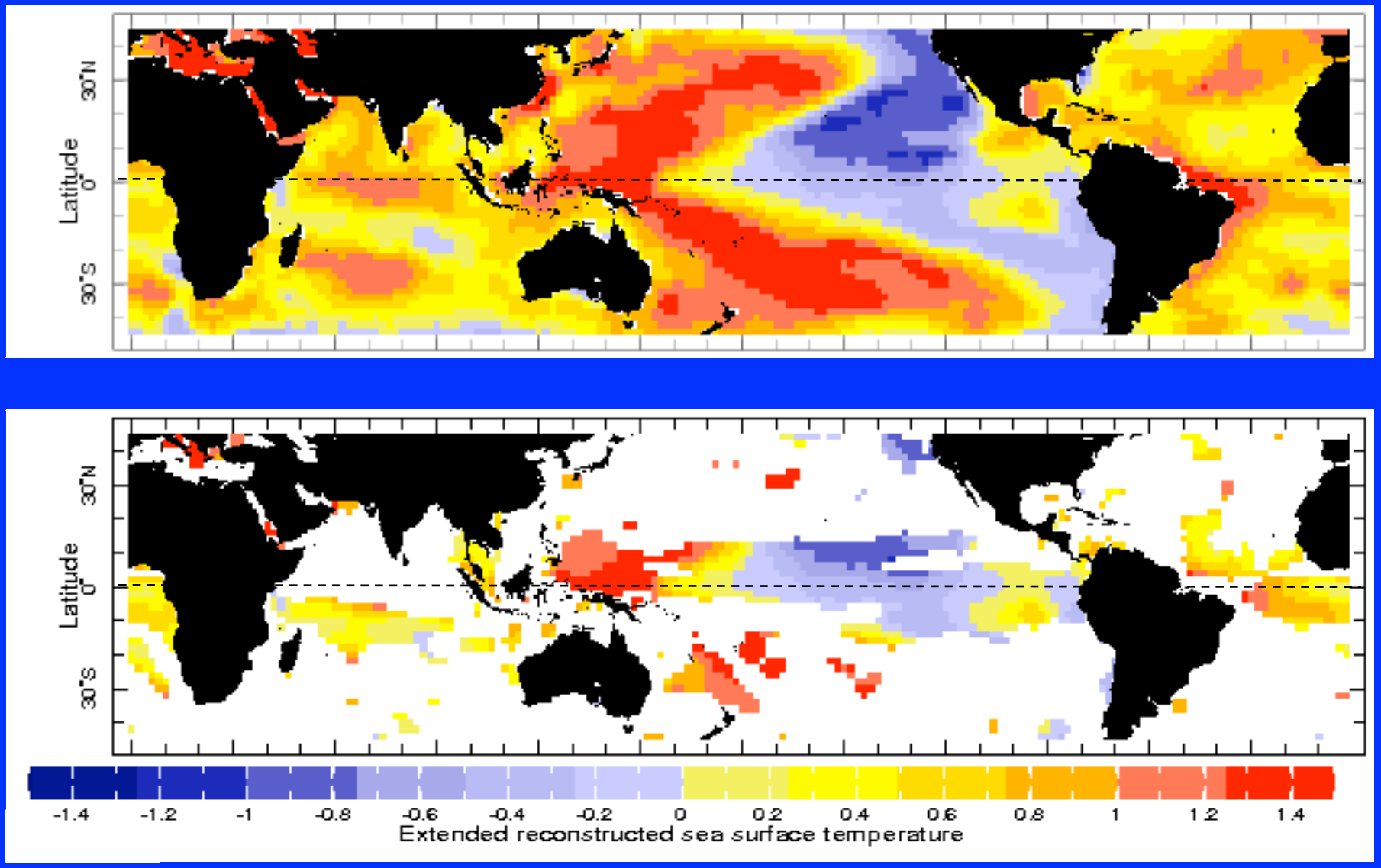
Probability (%) of Most Likely Category
Below-Normal
Normal
Above-Normal
40 45 50 60 70
40
40 45 50 60 70

SST Anomaly Apr-May (1999-2010) Expressed as Std Anomaly

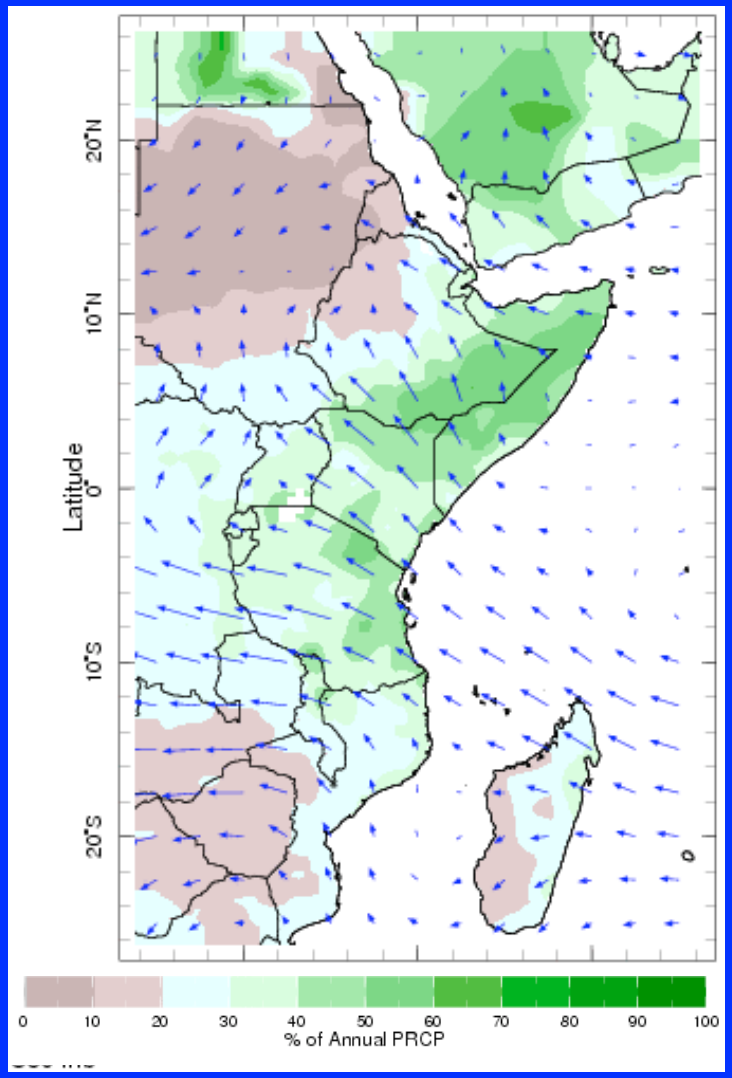
and, bottom

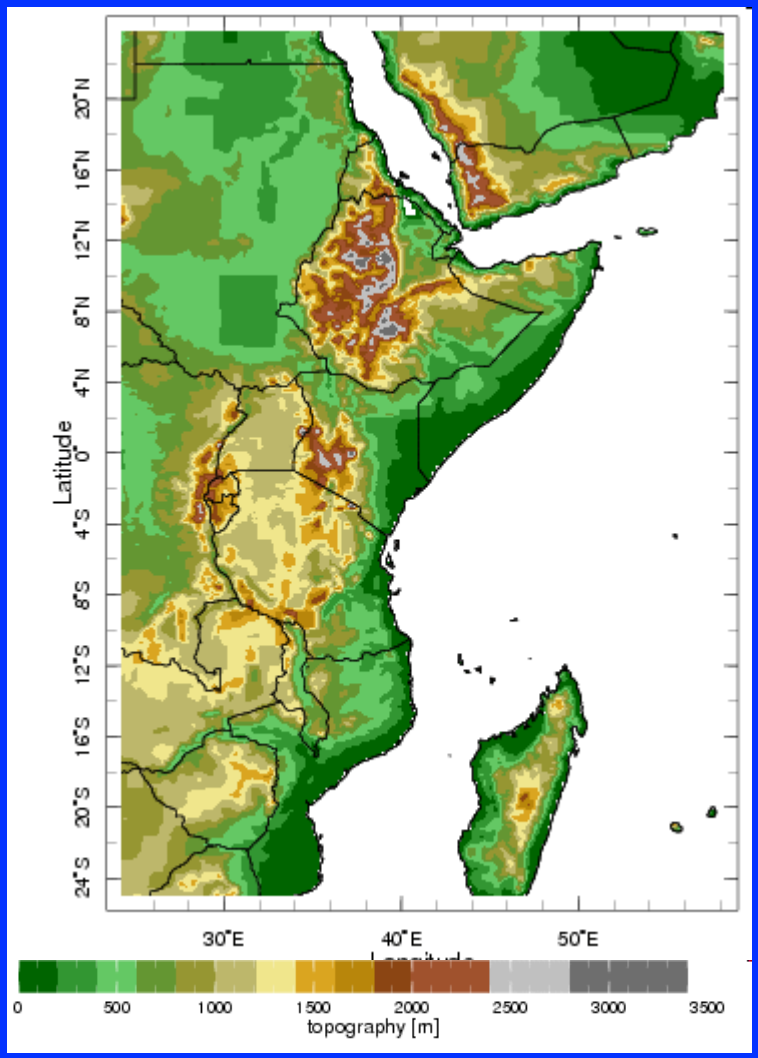
Where Significant Correlation Exists Between SST and (local) PRCP



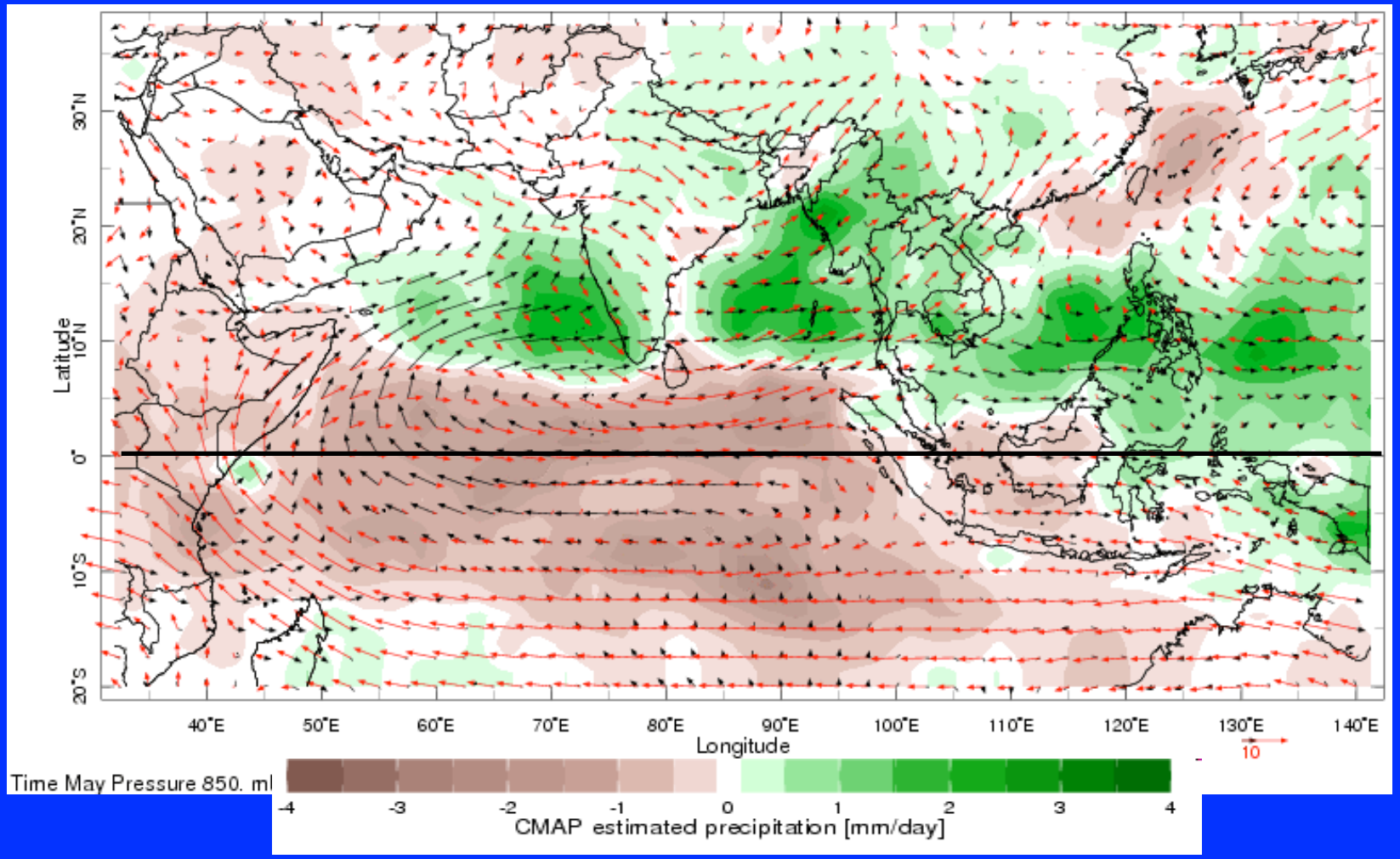
Mar-Apr-May “Long Rains” (Kenya), “Belg” (Ethiopia)

Fraction of Annual PRCP & 850 hPa Wind, Topography





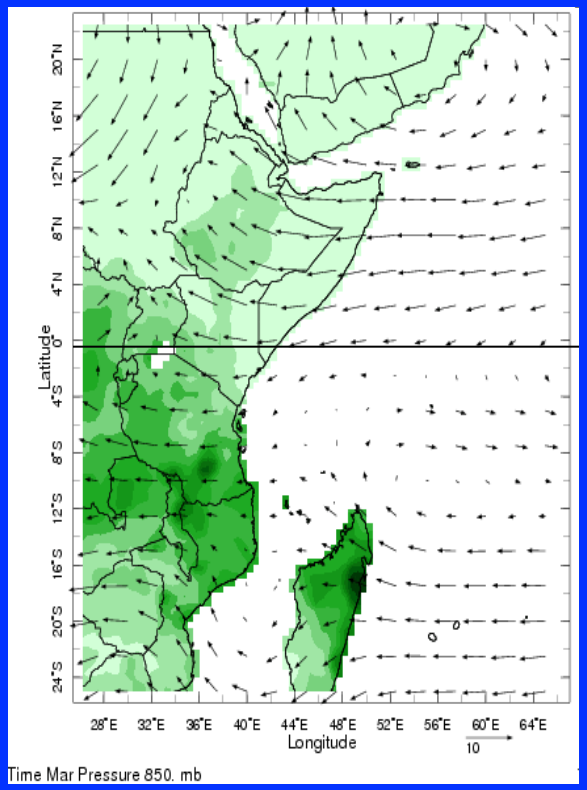
May PRCP and 850 mb Wind Anomaly (1999-2011 average)



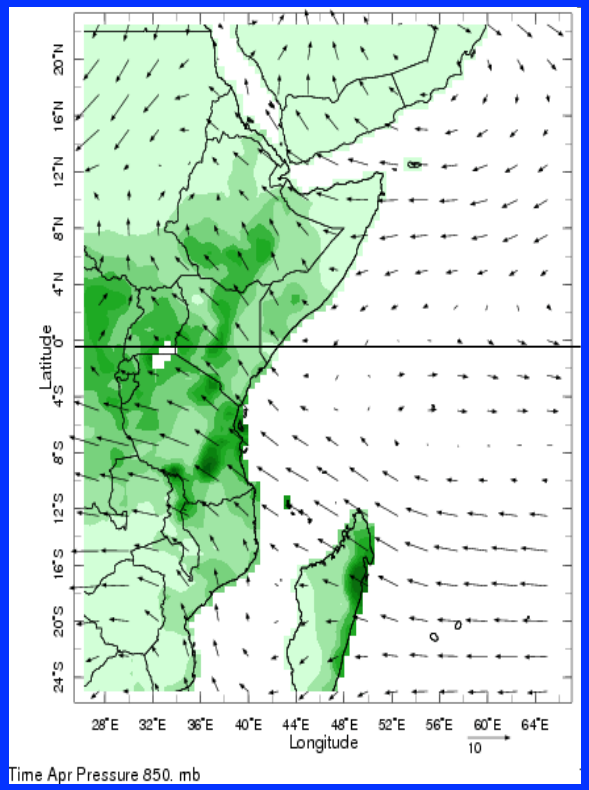
Climatological 850 hPa Winds, PRCP

Reanalysis and GPCC (1971-2000)

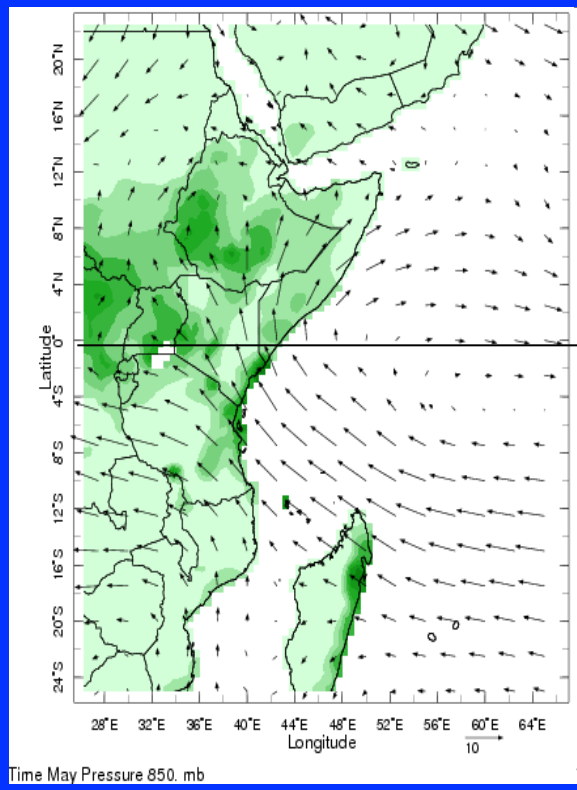
March



April

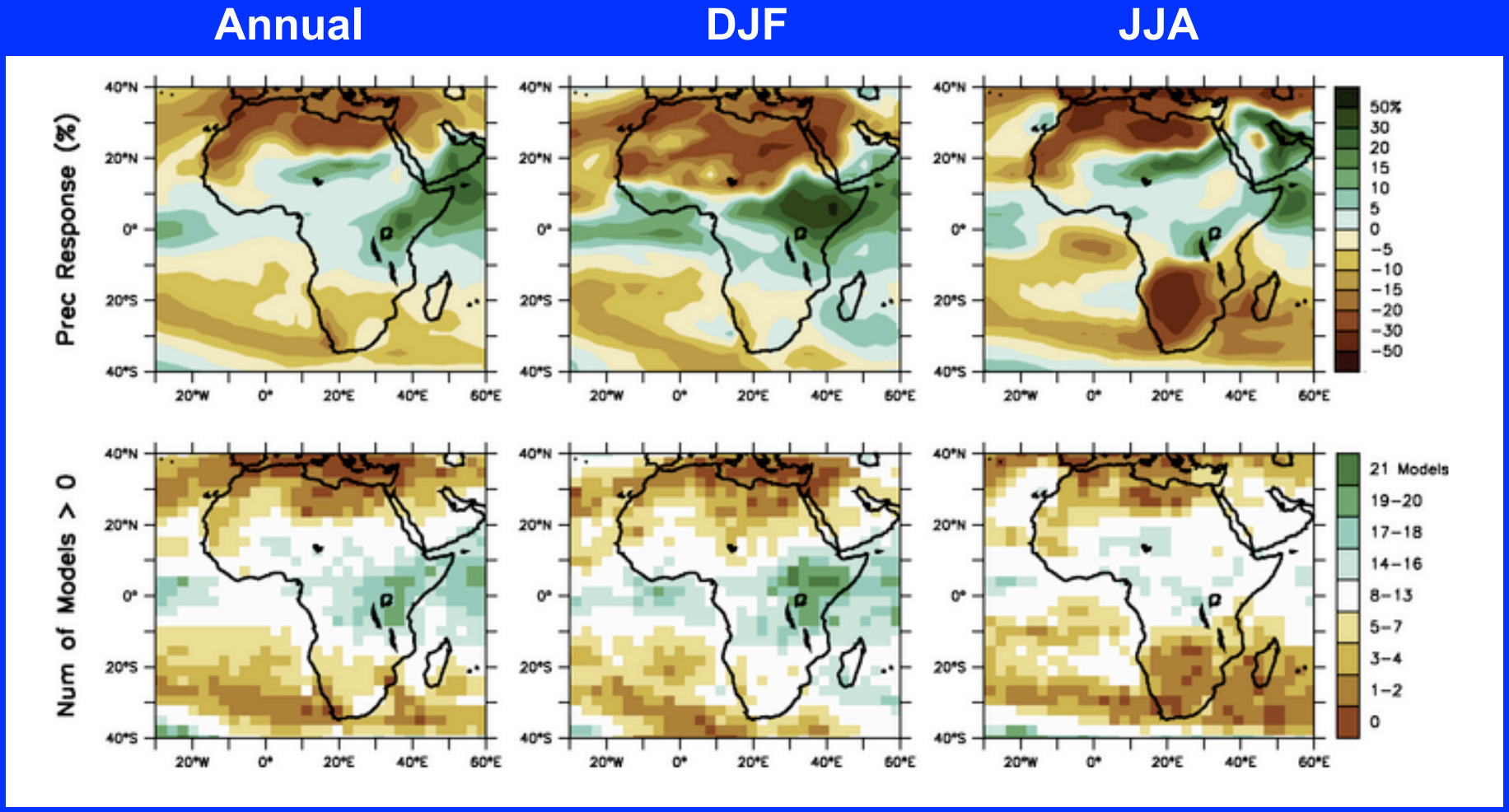


May



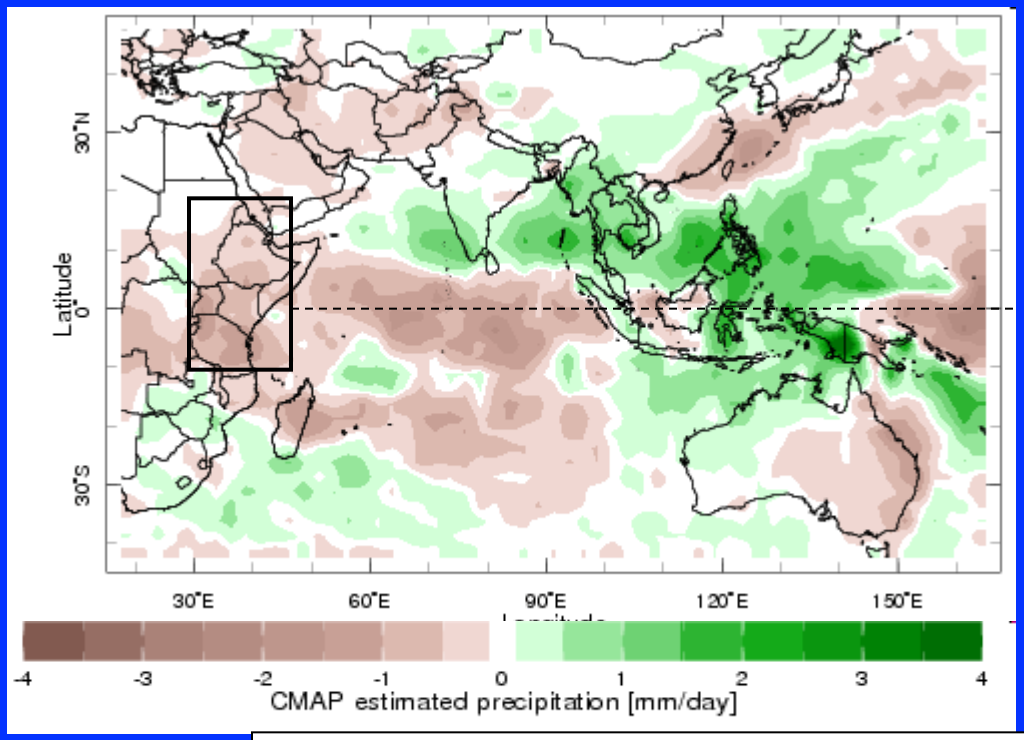
Model Projections: A Wetter East Africa

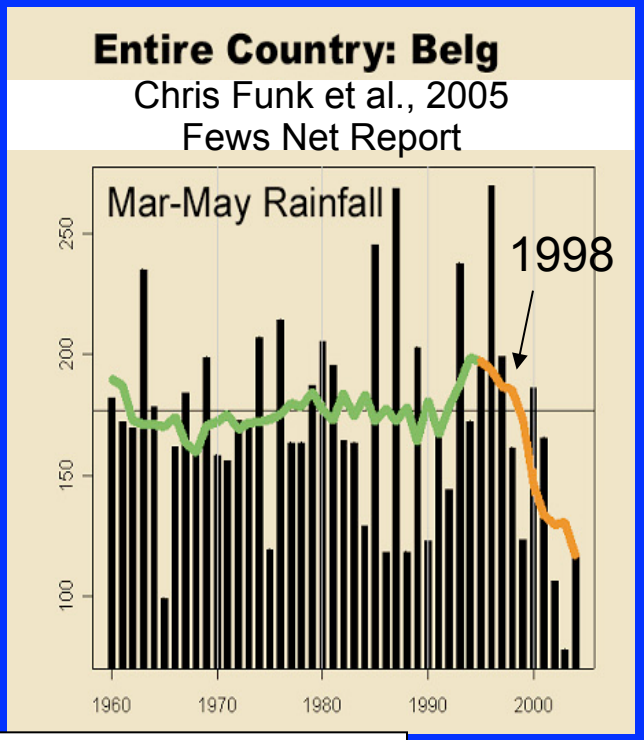
Average PRCP for 2080-2099 Relative to 1980-1999 Mean

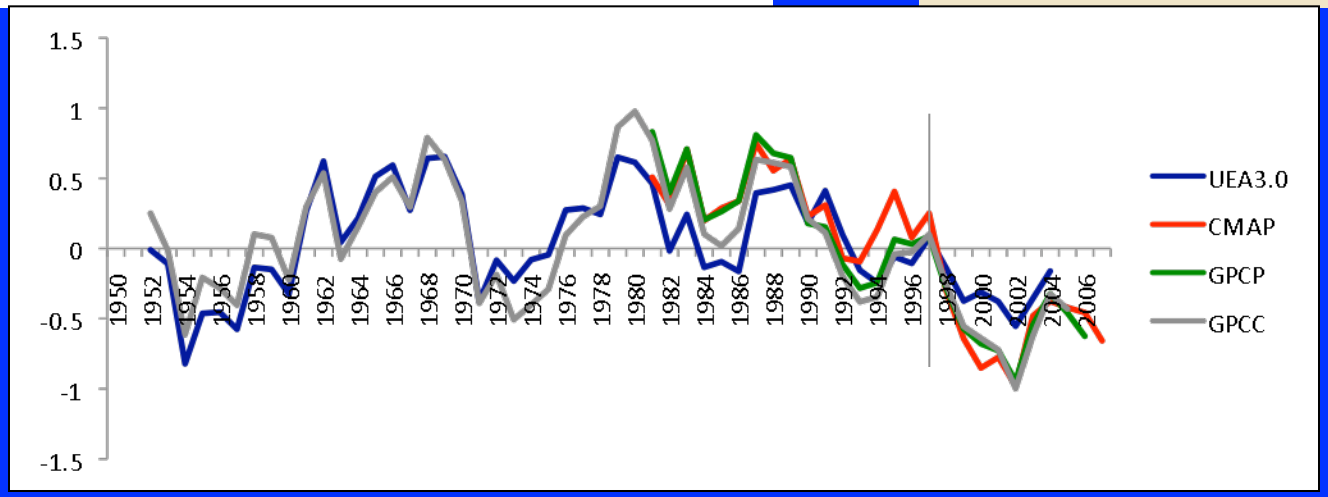


IPCC WGI Fig. 11.2

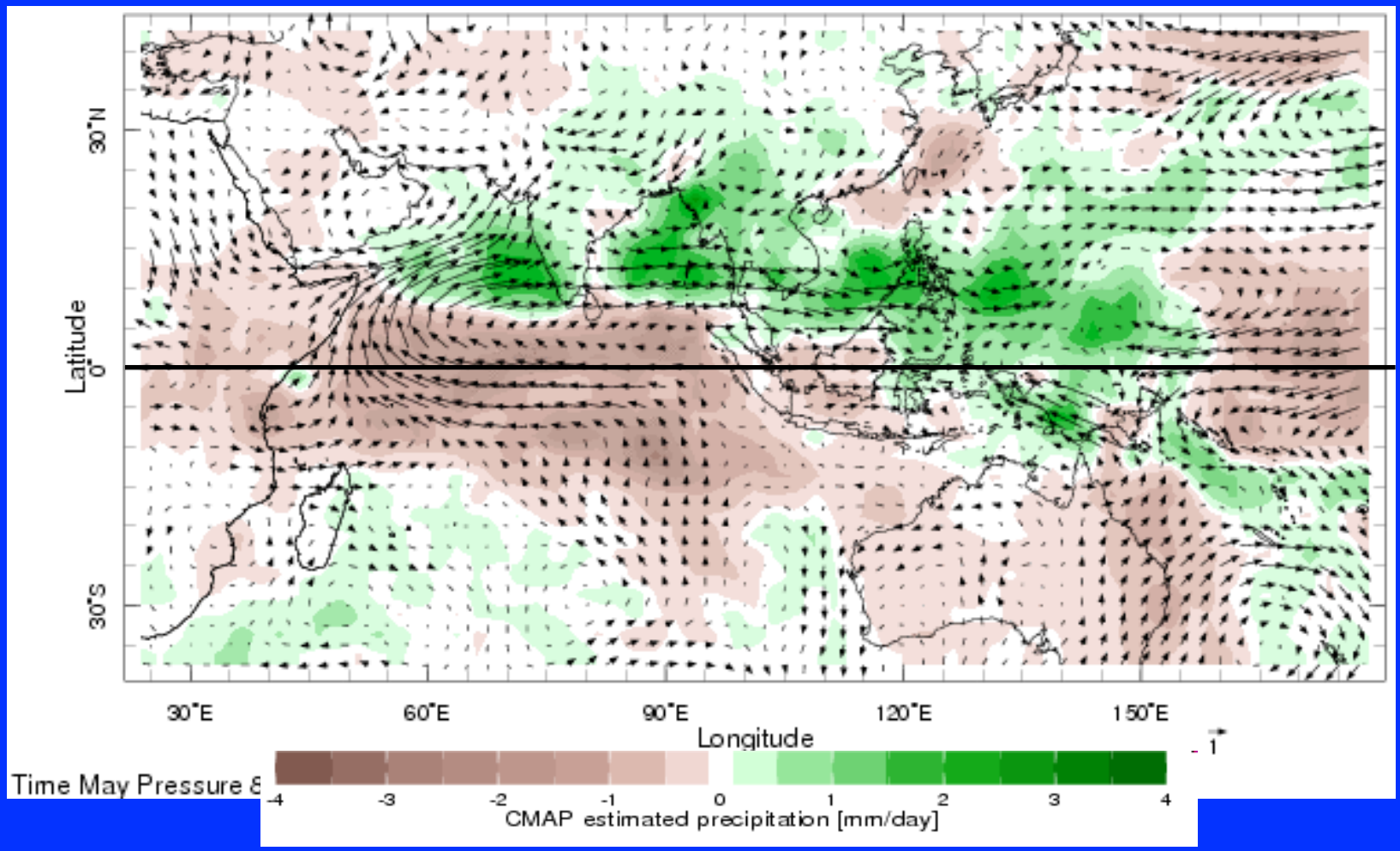
Obs MAM PRCP ANOMALY 1999-2010 (CMAP)



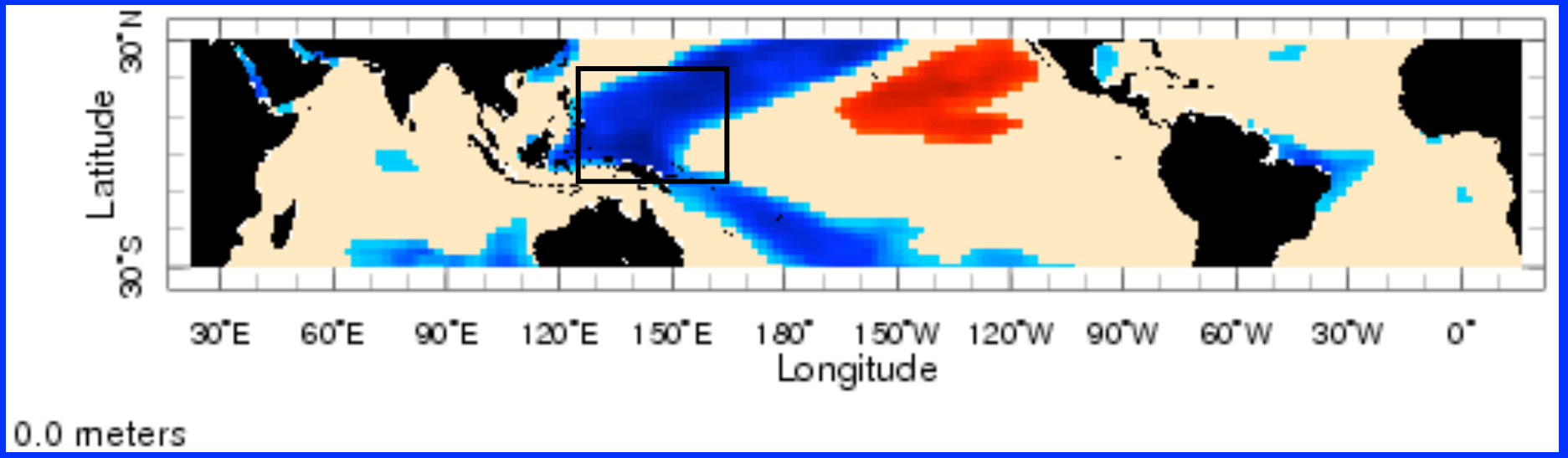


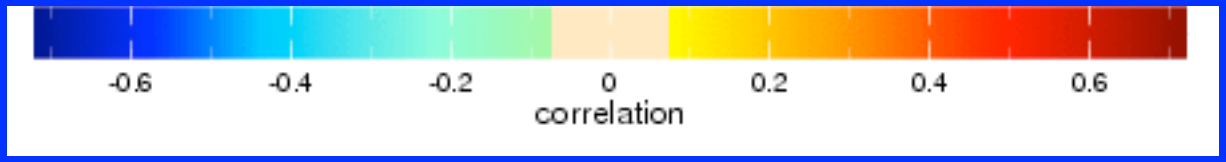


May PRCP and 850 mb Wind Anomaly (1999-2011 average)



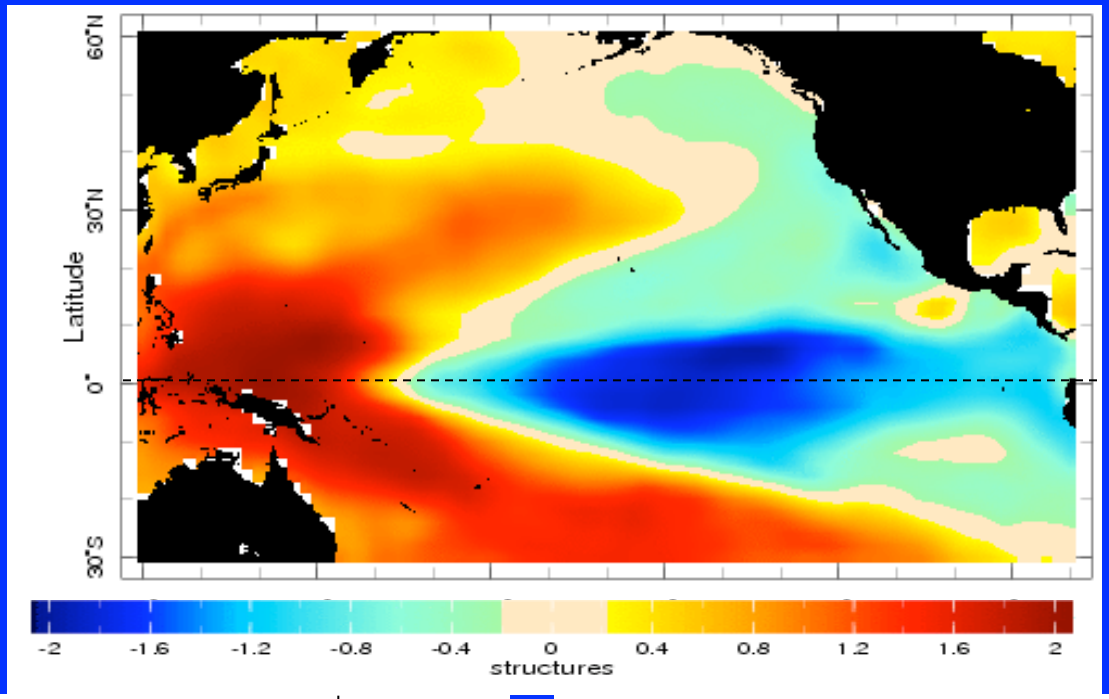
East Africa April-May Rainfall Index and Tropical SST Correlation (1979-2010)

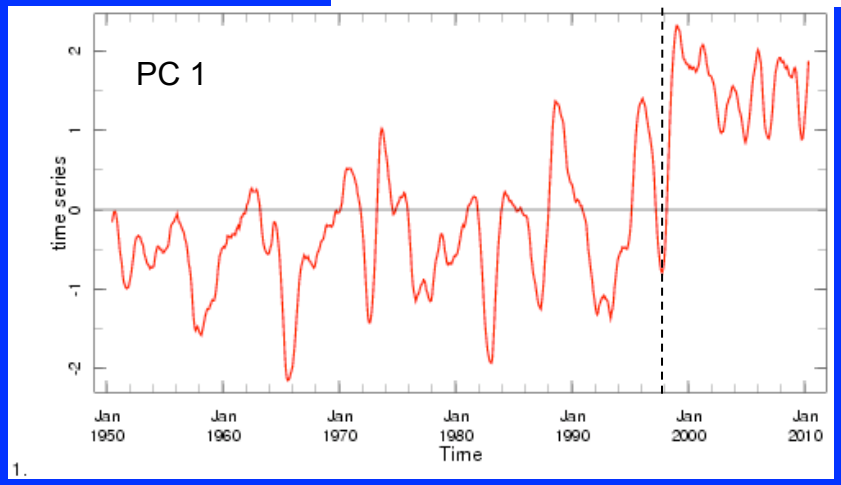


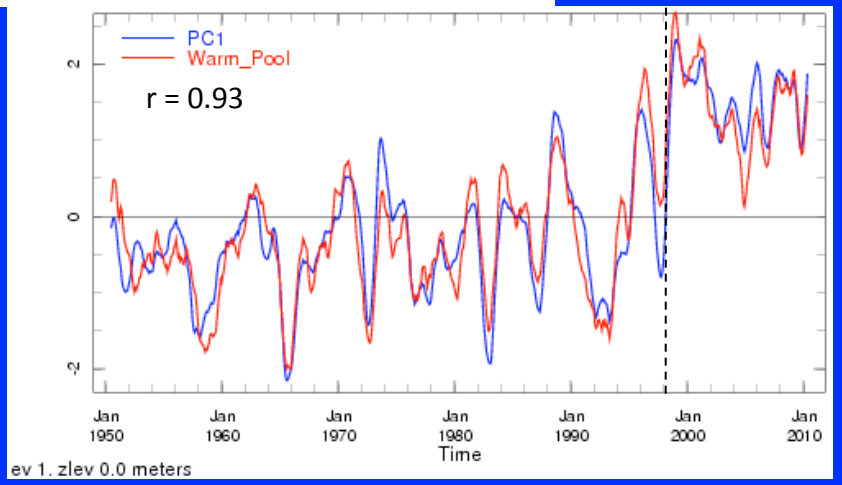


ERSST 1950-2010 1st EOF after "Removing" ENSO

(includes trend)

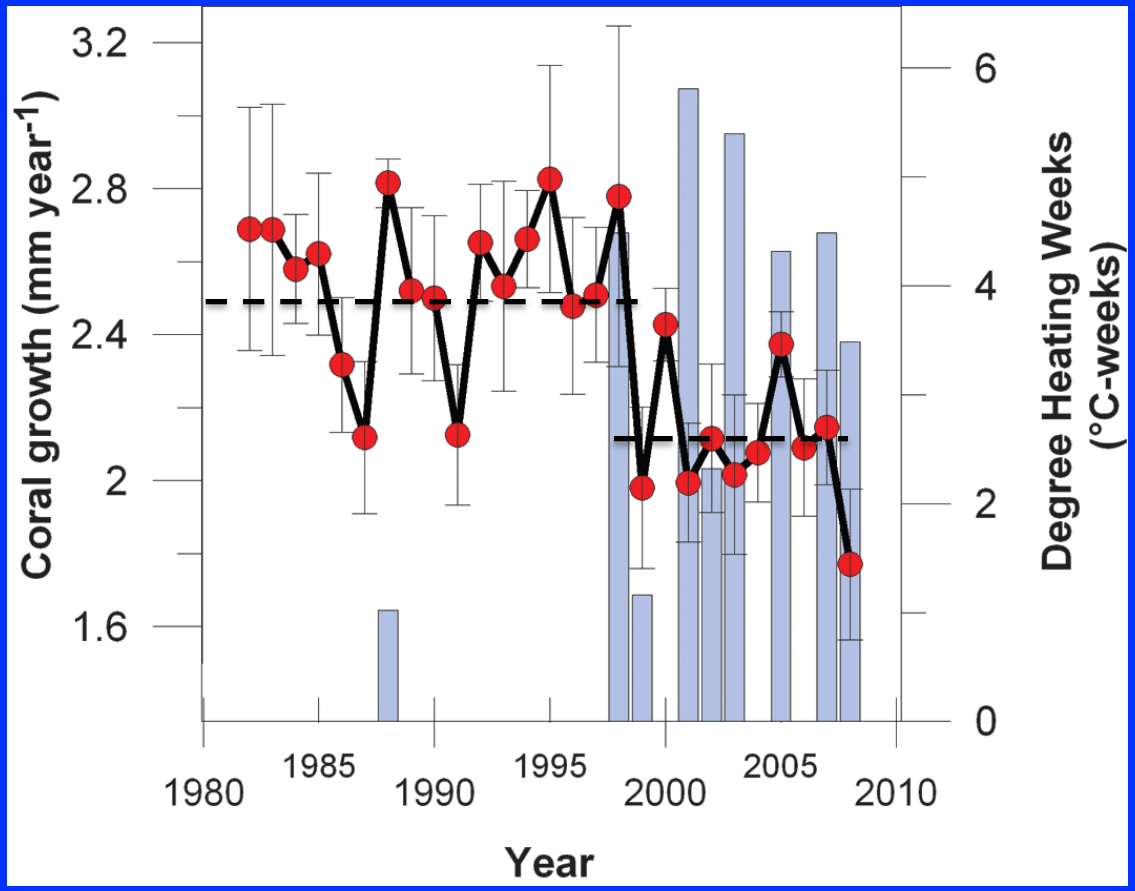


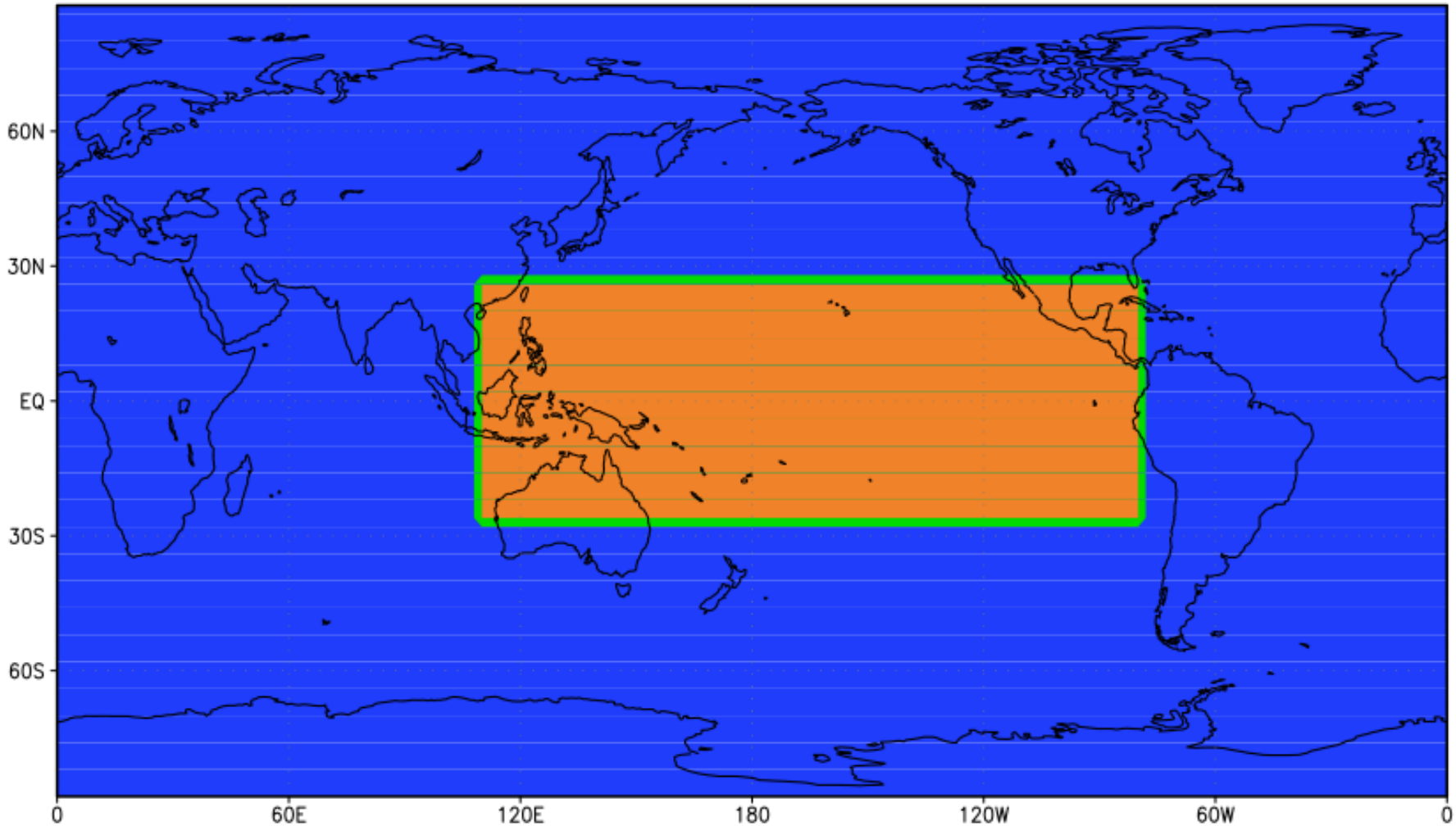




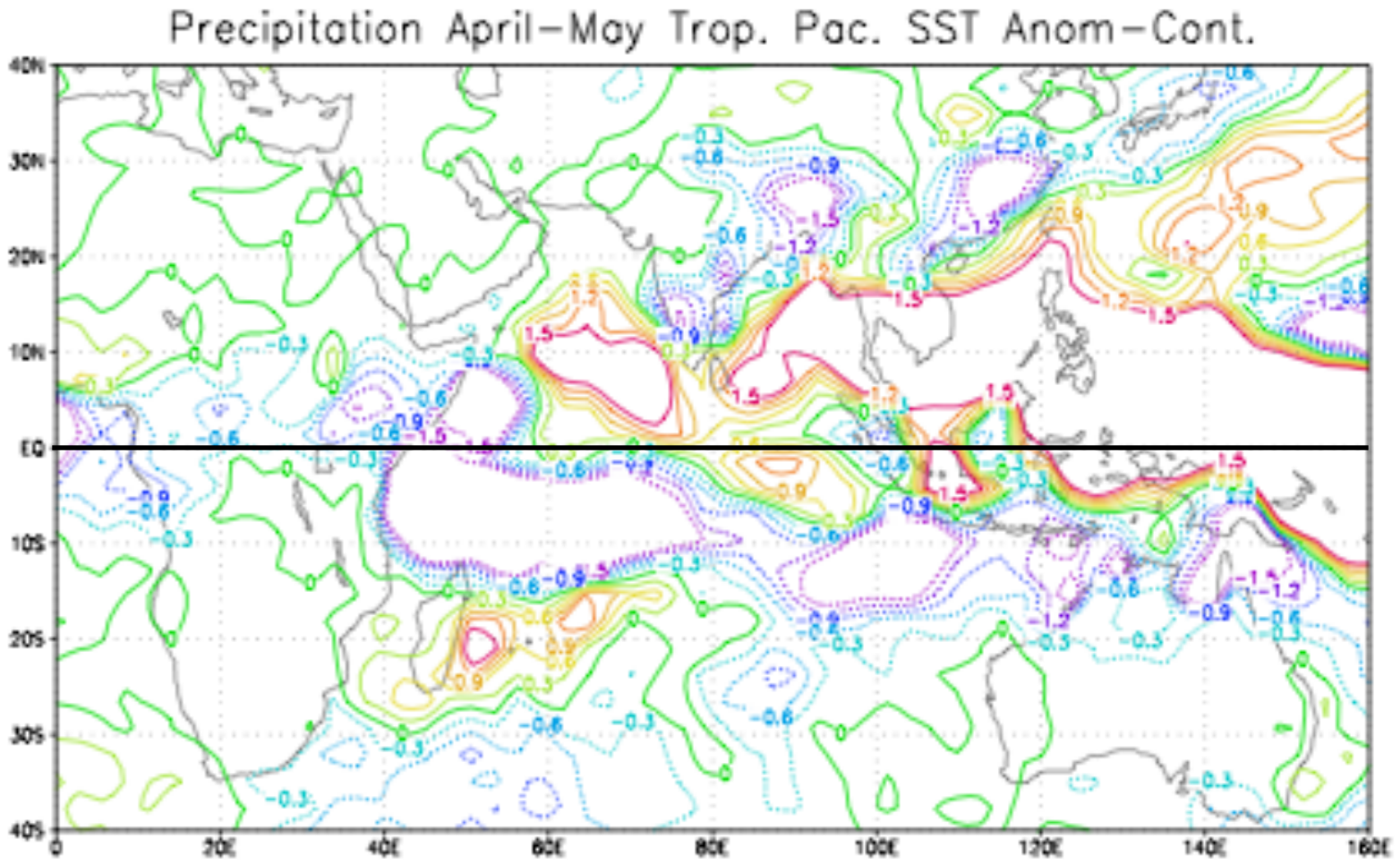
Ocean Warming Slows Coral Growth in the Central Red Sea

Neal E. Cantin,* Anne L. Cohen,* Kristopher B. Karnauskas, Ann M. Tarrant, Daniel C. McCorkle (*Science*, 16 July 2010)

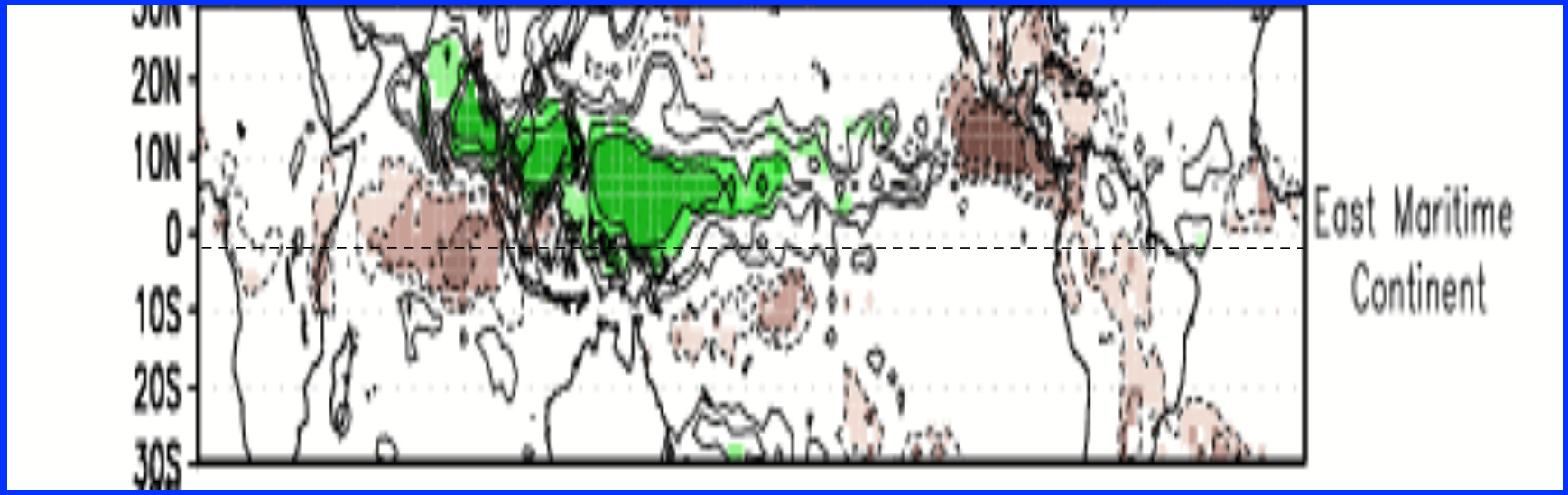



60N
30N
EQ
30S
60S
0
60E
120E
180
120W
60W
0

ECHAM5 24-Member Ensemble Mean PRCP - Control

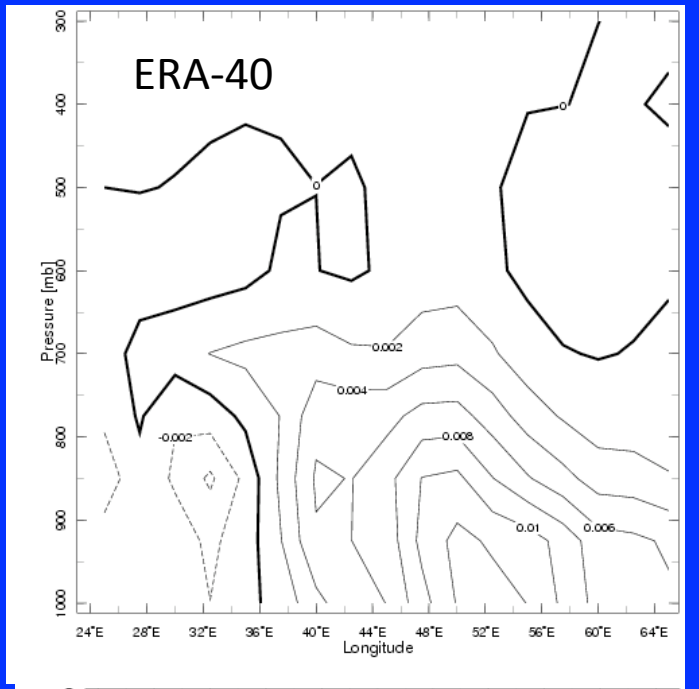


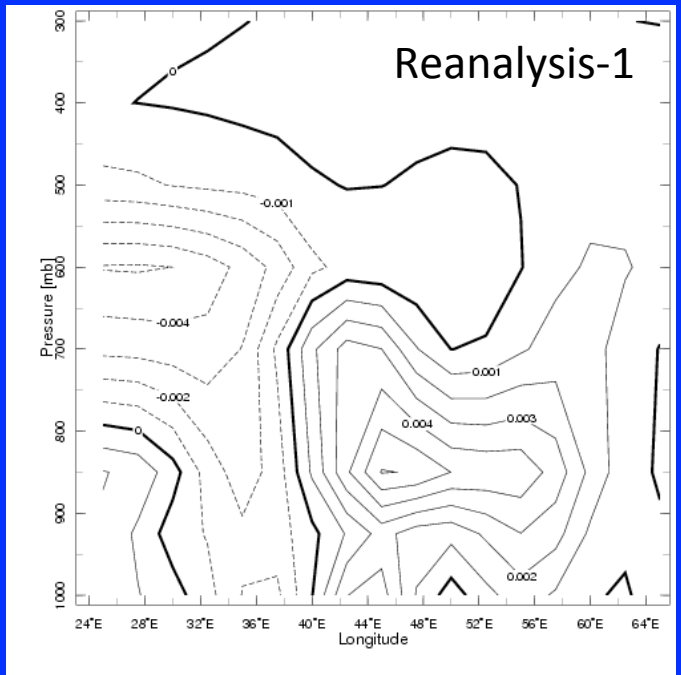
MJO PRCP Response May-Sep
(from CPC)

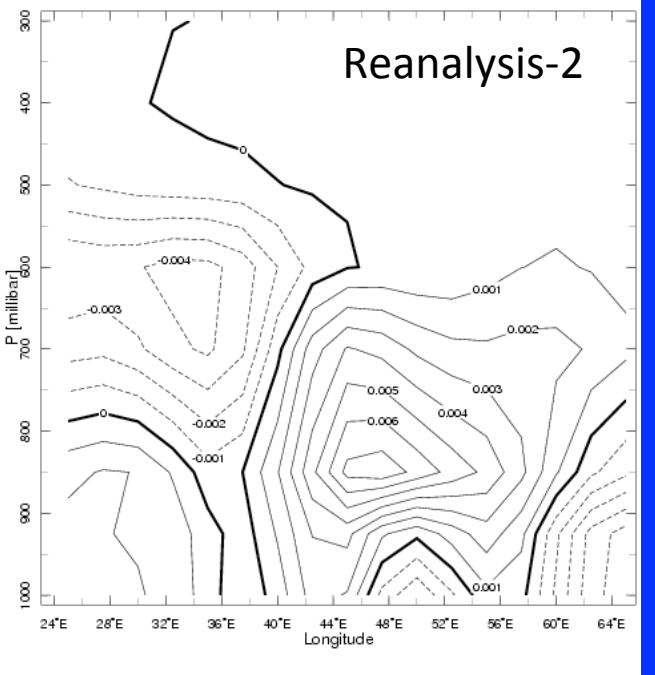


Supplemental Slides

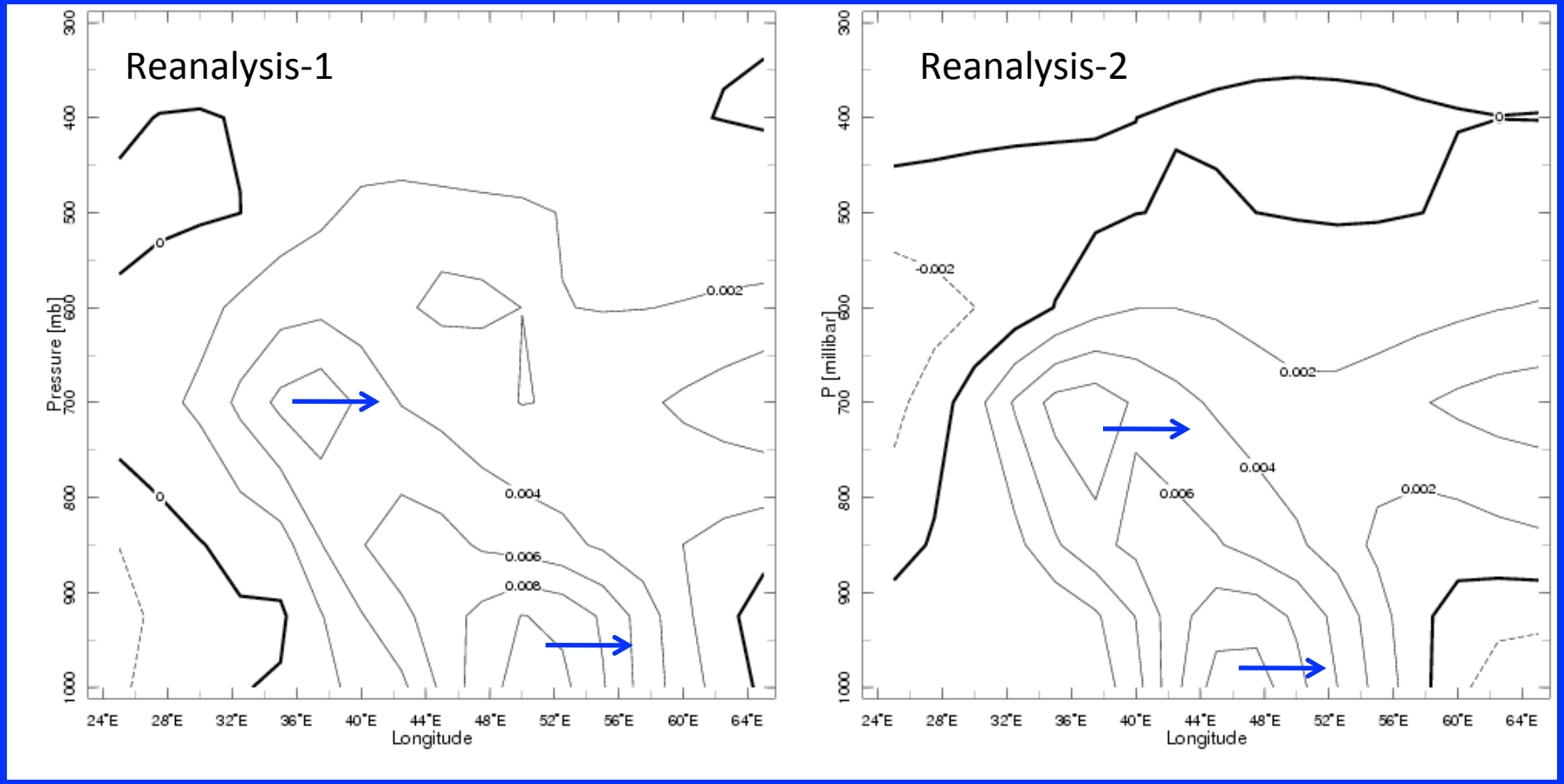
qv (1999-2009) – (1979-1997)
Apr-May
Note: ERA40 is 1999-2002







qu (1999-2009) – (1979-1997)
Apr-May

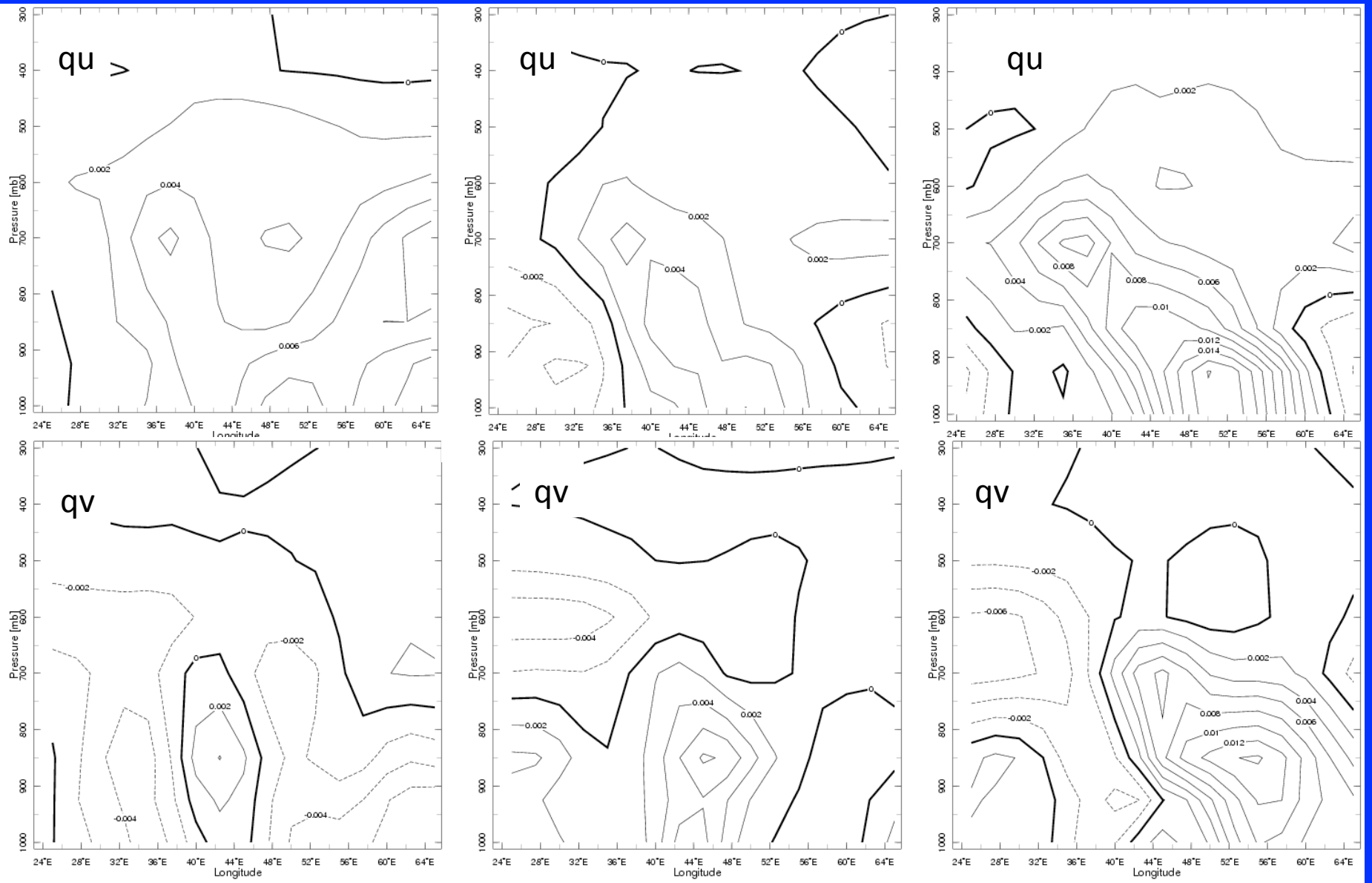


Reanalysis-1 (1998-2009) – (1979-1997)

March

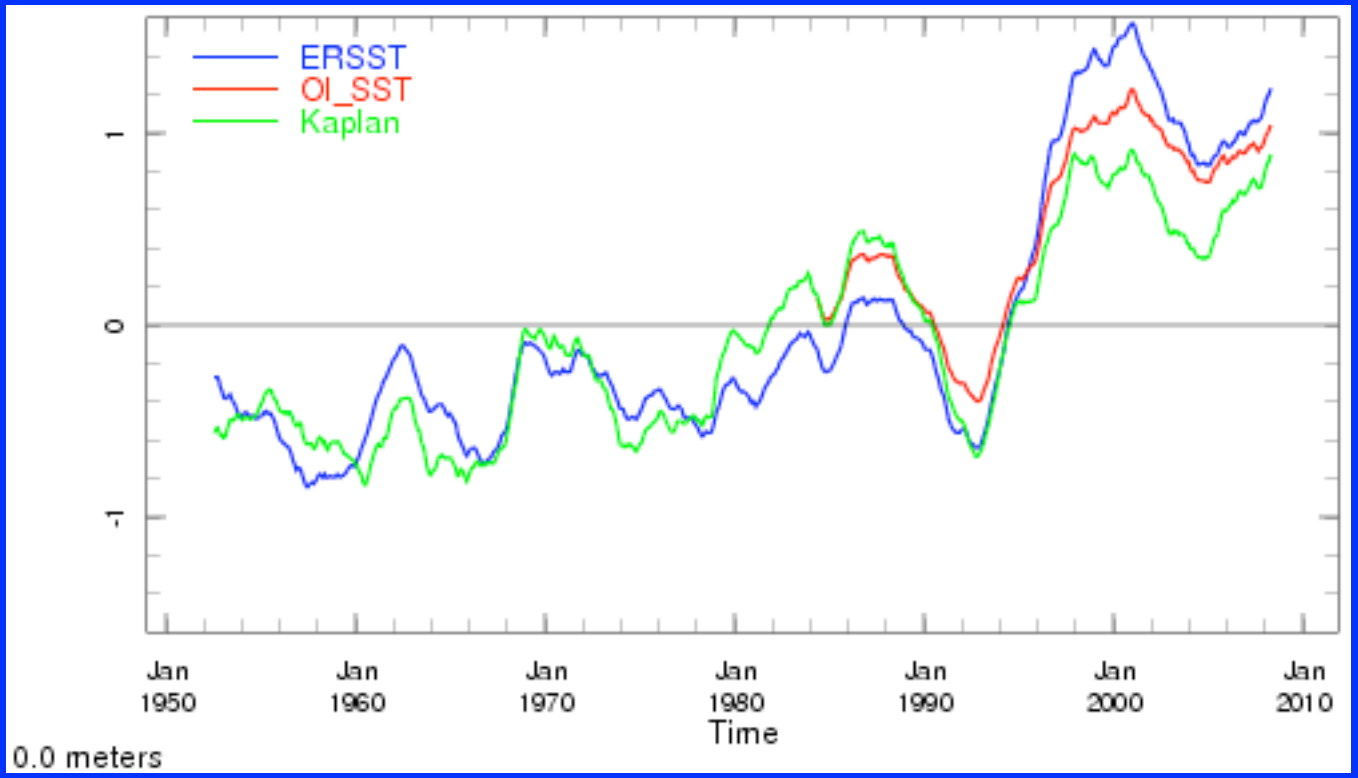
April

May



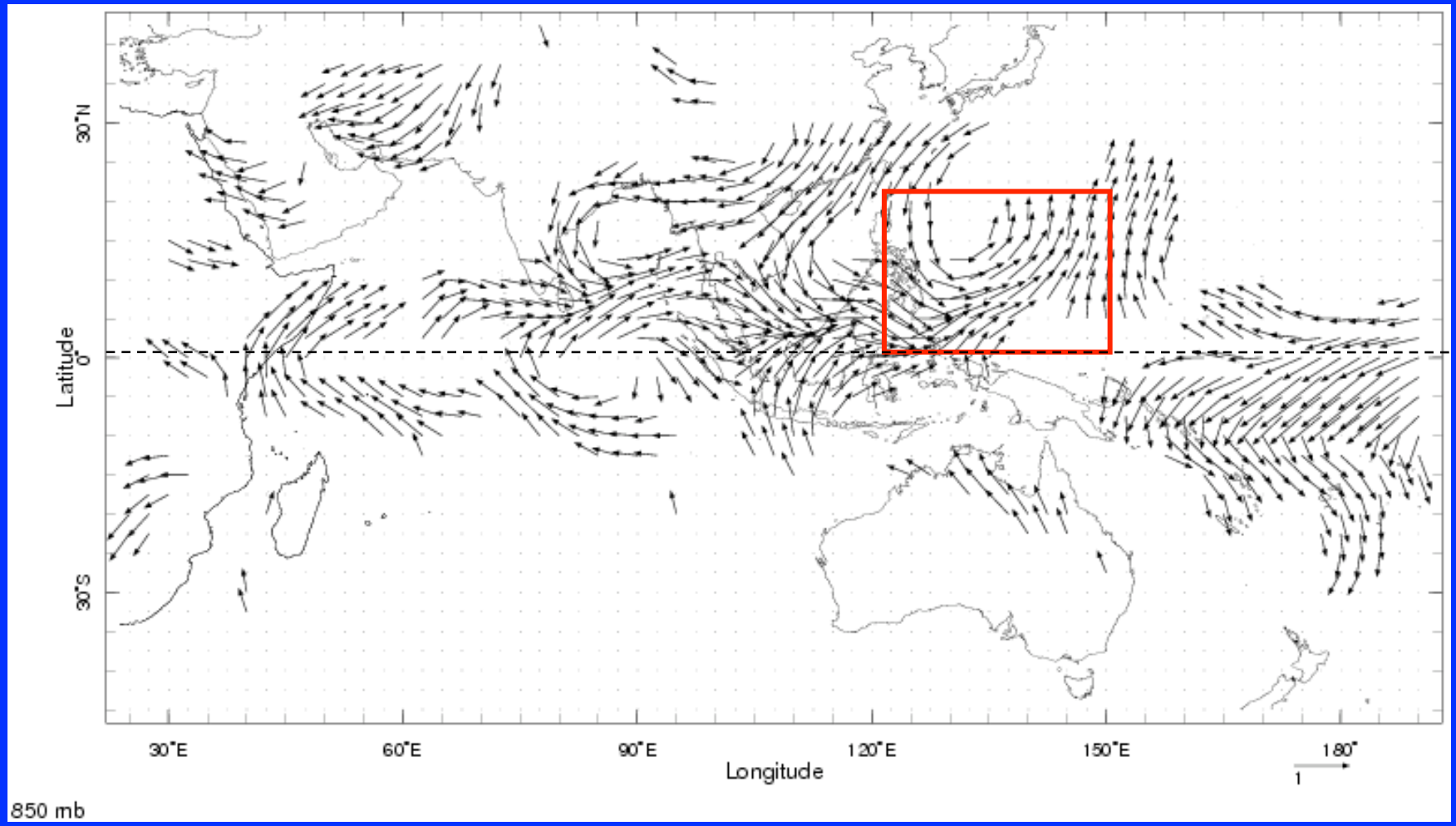
Pacific Warm Pool SST Std Anomaly

61-month Moving Average

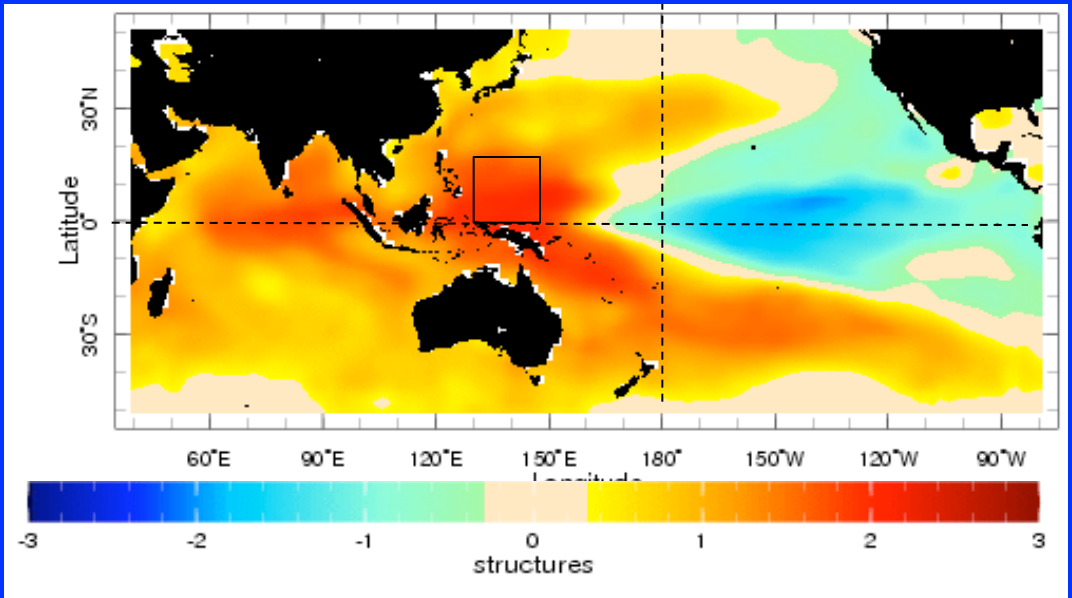


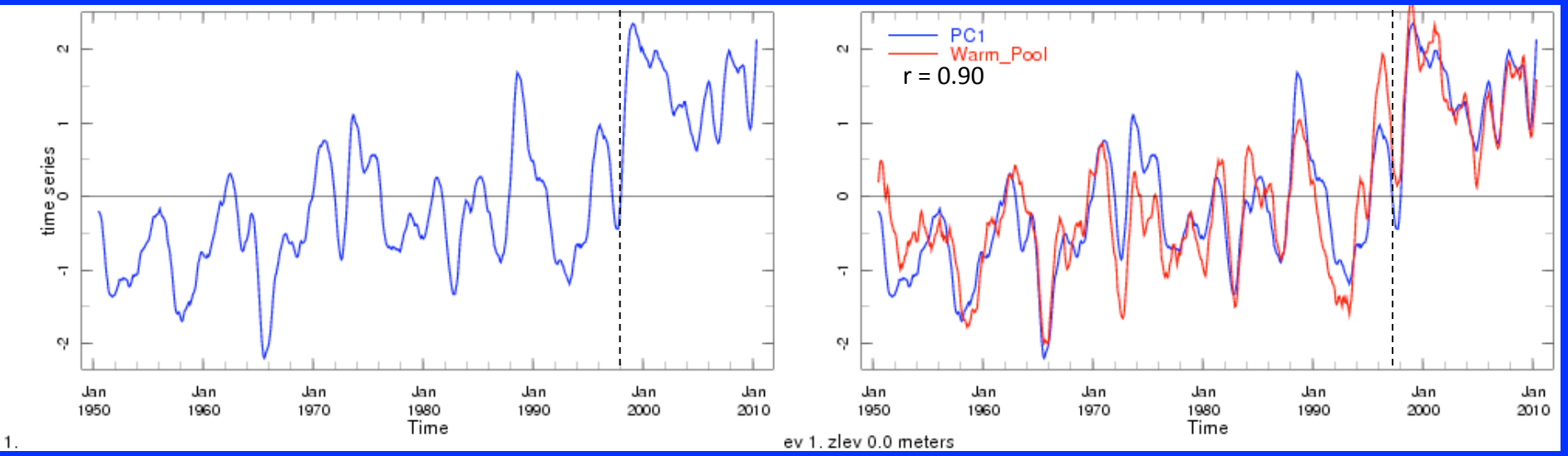
Correlation Apr-May SSTa in Box and (u, v) 850mb
Plotted only for >95% significance

Reanalysis (1979-2010)



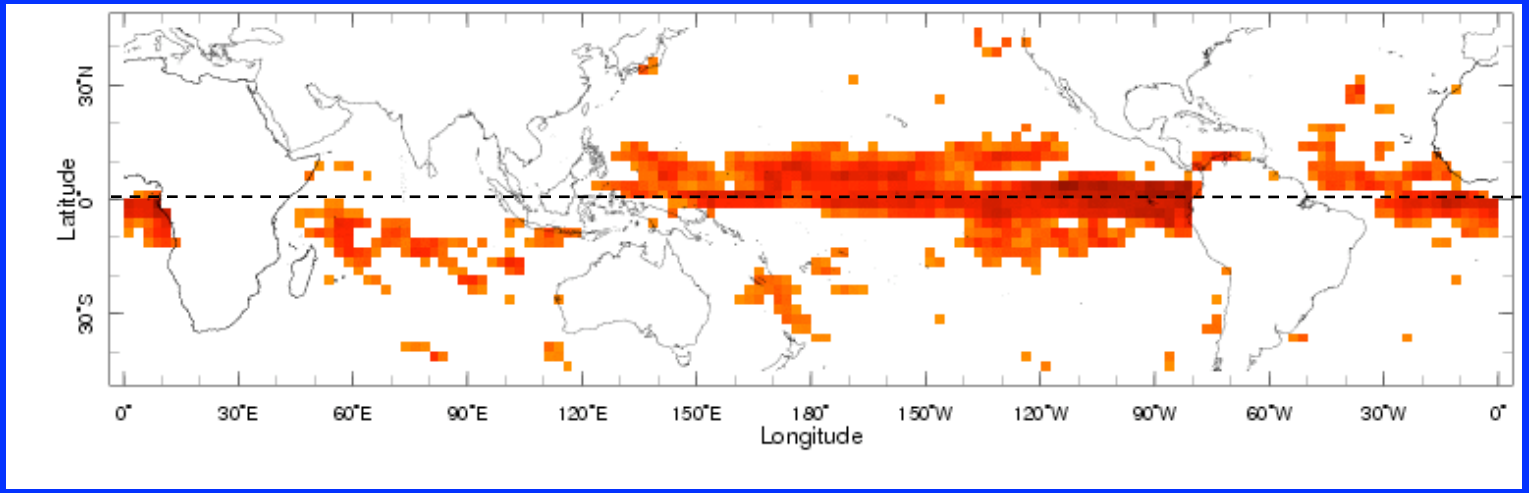
ERSST 1950-2010 1st EOF after subtracting ENSO
(includes trend)



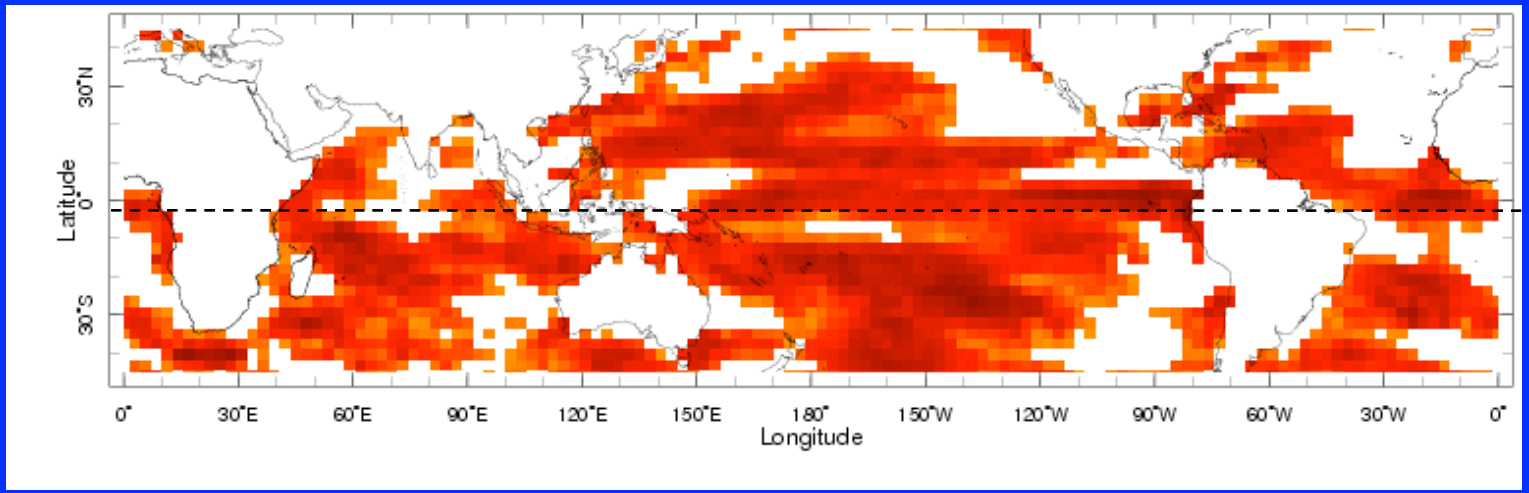


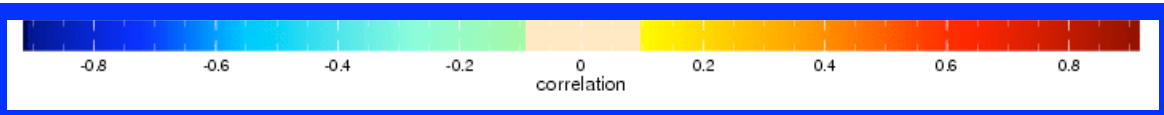
Apr-May correlation (SST, PRCP), 1982 to 2008
OI SST, GPCP PRCP

OBS

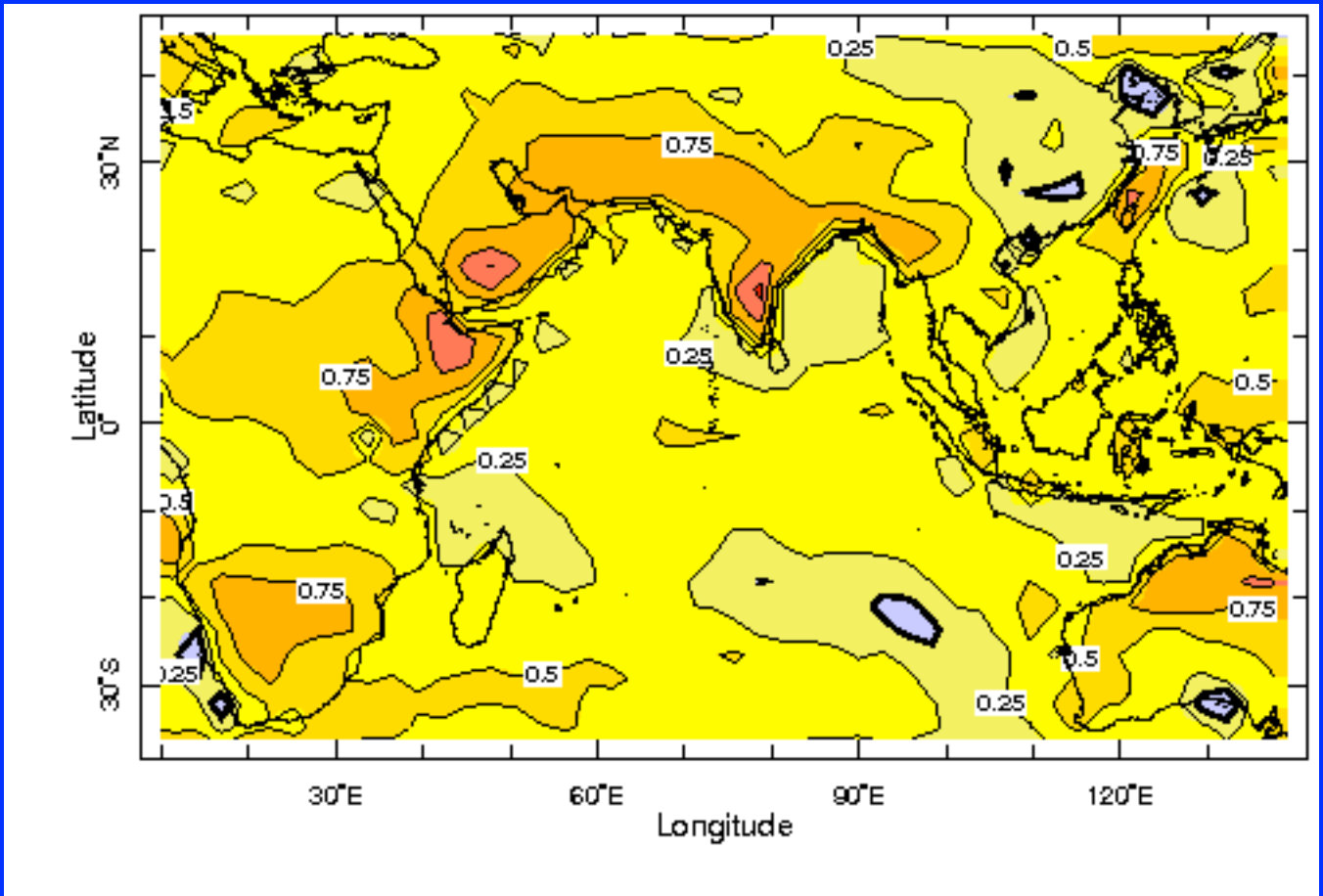


ECHAM4.5





ECHAM4.5 Avg Tsfc Anomaly MAM 1999-2008 (1971-2000 base period)



Apr-May PRCP (1998-2008) – (1979-1996)

CMAP
NOAA

GPCP
NASA