IASCLiP FORECAST FORUM (IFF)
(Issued June 9, 2011)

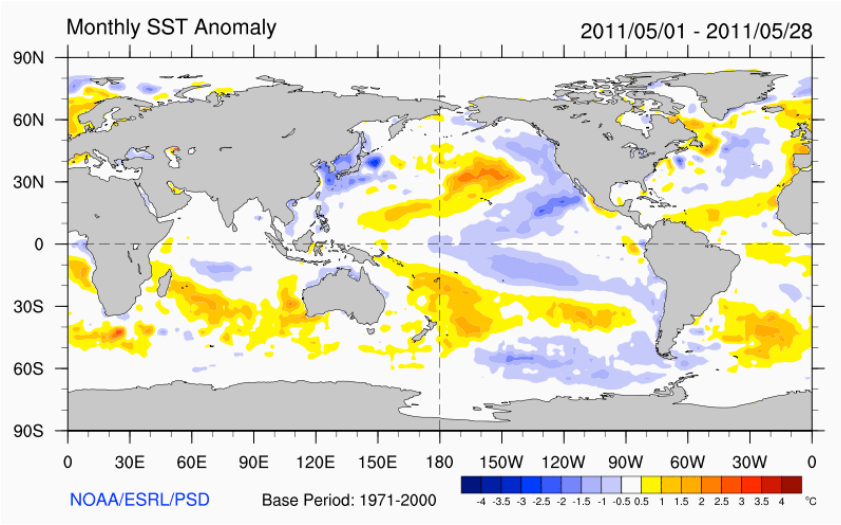
June-July-August 2011

Disclaimer: The forecast and the discussions in this forum in no way reflect the opinion of the contributing personnel's institutions and organizations. These forecasts are experimental with voluntary contributions from ECPC/SIO, NASA/GMAO, RSMAS/UM, APCC/KOREA, COAPS/FSU, IRI, and NCEP-CFS forecasts downloaded from their website.

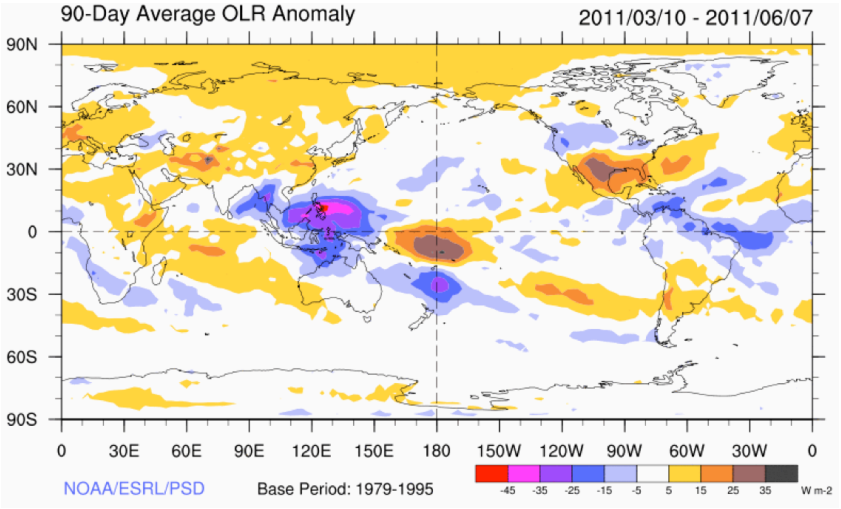
Process: The forecast forum comprises of a coalition of climate scientists working on IASCLiP including the modeling working group of the IASCLiP. We hold discussions analyzing the model forecast and current conditions to come with a "consensus" forecast. We expect to update this analysis forecasts for the forthcoming seasons of August-September-October in late July 2011.

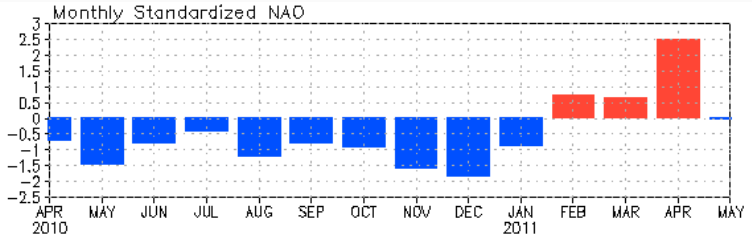
Acknowledgements: APCC, COAPS-FSU, ECPC-SCRIPPS, IRI, NASA/GMAO, NCEP, RSMAS-UM

Special Thanks: Adam Frumkin and Steven DiNapoli (COAPS)



http://www.esrl.noaa.gov/psd/map/images/sst/sst.anom.month.gif





http://www.cpc.ncep.noaa.gov/products/GODAS/ocean_briefing_new/mnth_nao.gif

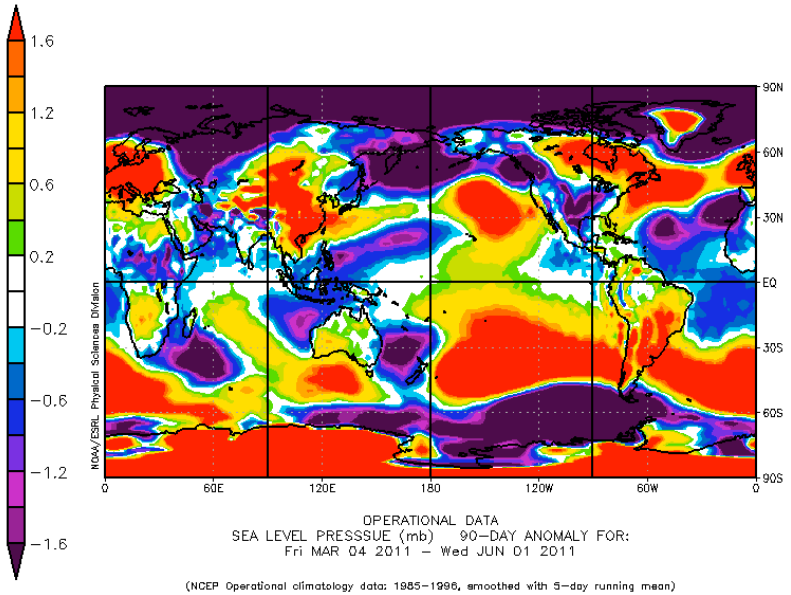
Observations

The observations in the past month continue to suggest that the strong La Nina in the boreal winter is in the wane. However, the positive anomalies of SST in the Caribbean Sea and in the northwestern Atlantic would call for a growing Atlantic warm Pool.

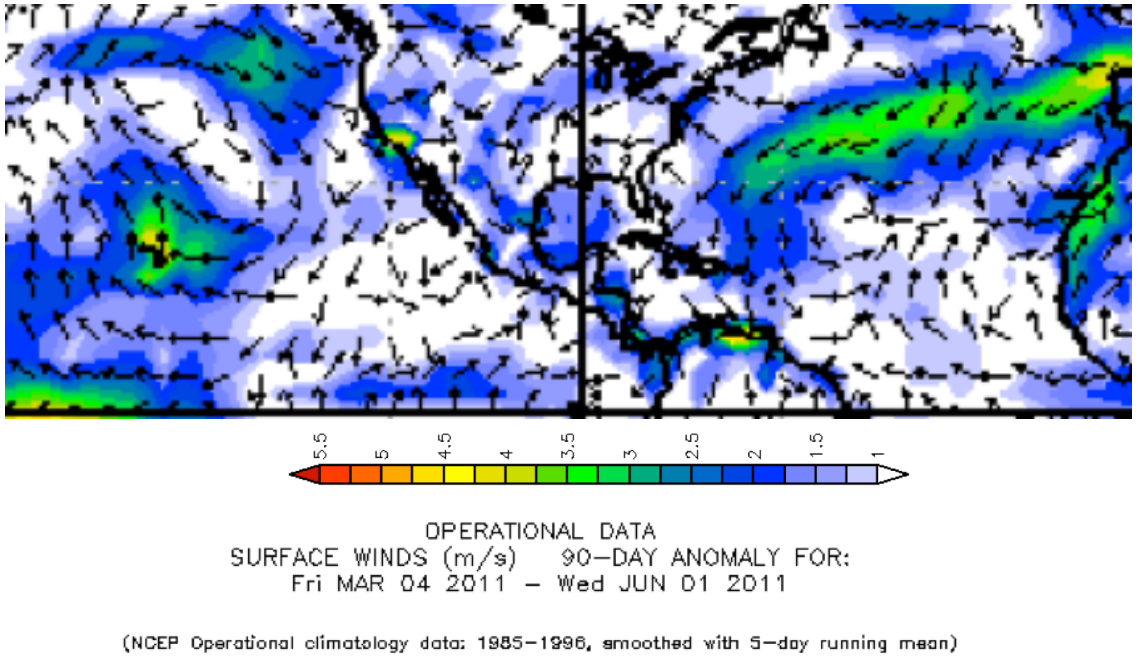
The convection in northern South America has been strong in the last 3 months which entails a stronger subsidence over NASH, strengthening it slightly, which would cause more evaporation and therefore cooling of the SST in the AWP region.

The NAO continues to remain positive for the past 3 months.

Observations



Courtesy: http://www.esrl.noaa.gov/psd/map/images/fnl/slp_90a.fnl.html



Courtesy: http://www.esrl.noaa.gov/psd/map/images/fnl/sfcwnd_90a.fnl.html

The SLP anomalies in the AWP region (left top) last 90 days is consistent with the development of westerly wind anomaly (left bottom), which would entail reduction in the wind driven evaporation and an increase in SST. This may be a result of the forcing of La Nina and positive NAO.

In fact the observed SST anomaly tendency in the AWP region from Mar 2011 to Apr 2011 increased by ~1^0C (http://www.cpc.ncep.noaa.gov/products/GODAS/).

JJA 2011 forecast based on current conditions

- In Feb2011 when we made the forecast for AWP we suggested a near normal or below normal AWP year.
- With the development of westerly wind anomalies in the tropical western Atlantic, continued weakening of La Nina and persisting with the current SST anomalies will call for a slightly above normal (or slightly large) AWP year.
- The other competing influences that are trying to cool AWP are the the strong convection across northern South America and the lingering influence of La Nina that has persisted through Spring.
- On balance, from examining current conditions only, one would lean towards **slightly** above normal (or **slightly large**) AWP year.

Models

Model	Reference	No. of Ensemble members	Coupled to ocean?
NCEP CFS v1	A	10	Yes
CCSM3.0	B	6	Yes
NASA GMAO	C	6	Yes
ECHAM-MOM	D		Yes
POAMA	E	10	Yes
ECPC	F	12	No . Prescribed (persisted SST & IRI forecasted SST)
CWB	G	10	Yes

Index	Reference
A	http://cfs.ncep.noaa.gov/menu/doc/
B	http://journals.ametsoc.org/doi/abs/10.1175/2009MWR2672.1
C	http://gmao.gsfc.nasa.gov/research/modeling/cgcm/
D	http://poama.bom.gov.au/
E	http://iri.columbia.edu/climate/ENSO/currentinfo/models/ECHAM_MOM.html
F	http://ecpc.ucsd.edu/projects/GSM_model.html
G	http://www.cwb.gov.tw/V6/climate/other-subject/WPGM_CWB2tier_CFS.pdf

How have we faired?

So far we have attempted forecasting for Aug-Sep-Oct 2010 in late July 2010, AWP 2011 in early Feb 2011, and so this is our third such effort to forecast June-July-Aug 2011.

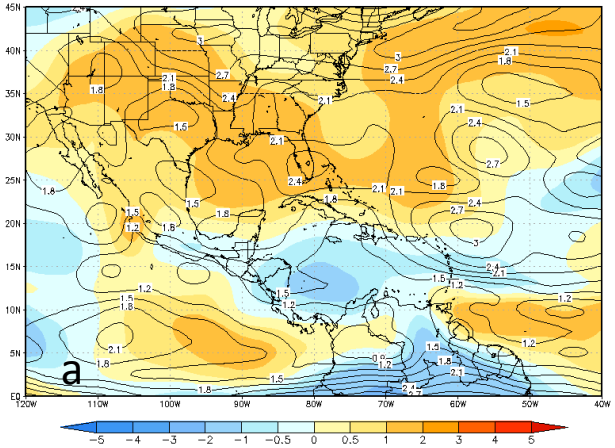
By the poor quality of the majority of models to even define AWP in its climatology, our forecast efforts in this forum has been unusually hard and have to rely on heuristic models, persistence of current conditions and over reliance on models that have AWP in its climatology. Moreover ocean observations in the AWP region are as sparse as that of the polar oceans. Therefore our understanding of the current ocean conditions especially below the surface is very limited and dependent largely on available ocean analyses.

We have done okay at times and have been wrong equally (see next slide). This forum engages experts of the field who are involved with research over the AWP region and its teleconnections. So we put forth in this forum our best possible estimates of what can unfold in the ensuing season, with the caveat that nature indeed can behave contrary to our expectations and make us feel humble.

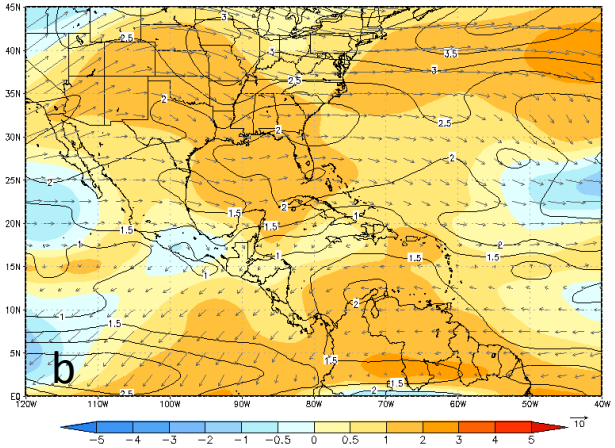
Forecasted feature	Forecast Anomaly	Forecast season	When forecast was made	Observed verification
Size of AWP	Large	ASO 2010	Late Jul 2010	Yes, large AWP
Strength of NASH	Weak	ASO 2010	Late Jul 2010	Yes, weak
Shear in MDR	Weak	ASO 2010	Late Jul 2010	Yes, Weak
Rainfall over Southern Mexico	Dry	ASO 2010	Late Jul 2010	No, Wet
Mid-west	Dry	ASO 2010	Late Jul 2010	No, Wet
Size of AWP	Near normal or small	JJA 2011	Early Feb 2011	Remains to be verified
Low level easterlies	Normal or slightly stronger	JJA 2011	Early Feb 2011	Remains to be verified

NCEP CFS v1

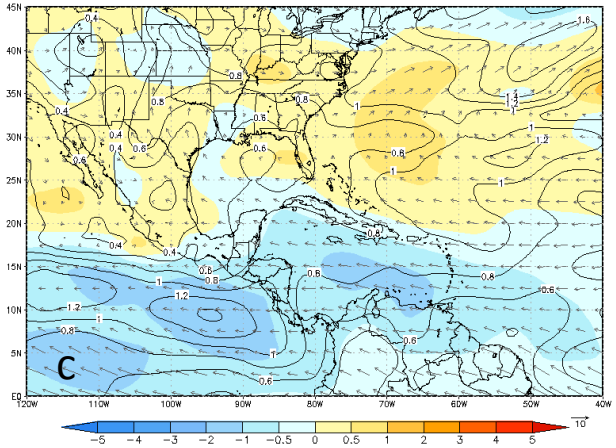
Vertical wind shear (200-850hPa winds, in ms^{-1})



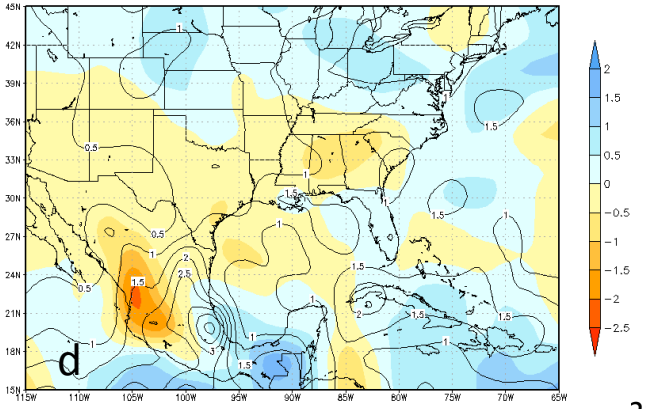
200hPa winds (ms^{-1})



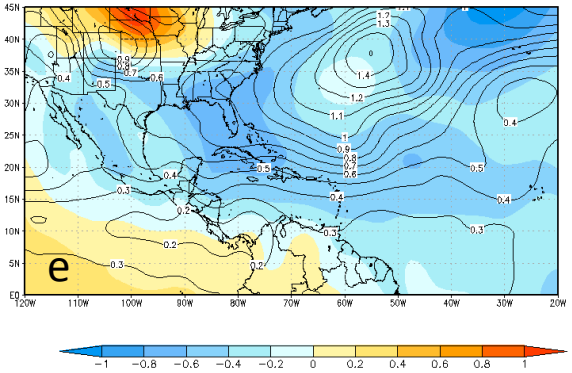
850hPa winds (ms^{-1})



Precipitation rate (mm day^{-1})

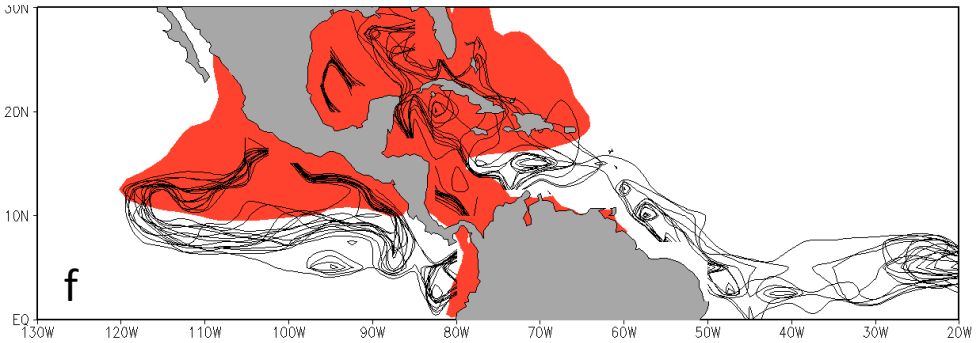


MSLP anomalies (hPa)



Contours are intra-ensemble spread and shading is anomaly of the ensemble mean in a, b, c, d, and e. In f model climatology of the 28.5^{0}C isotherm is shaded in red and the 28.5^{0}C isotherm from the individual ensemble forecasts are contoured.

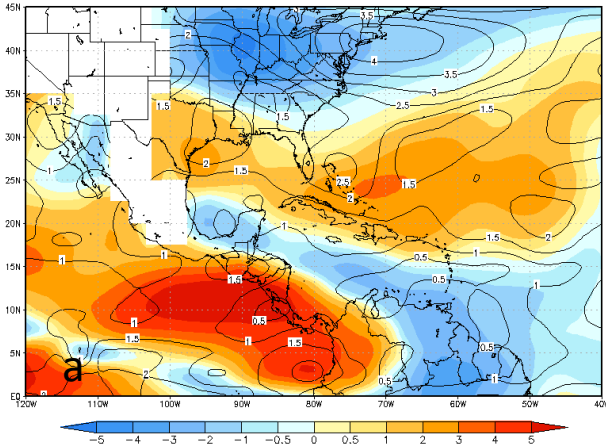
28.5^{0}C isotherm of SST



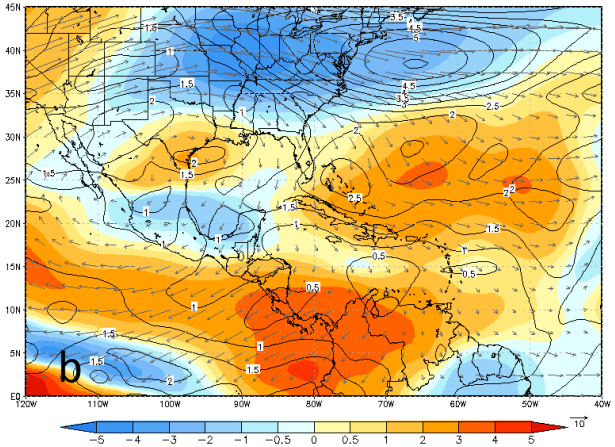
MDR anomalous zonal shear value of ensemble mean=-0.2148m/s; suggests weak (&easterly shear)

NASA GMAO

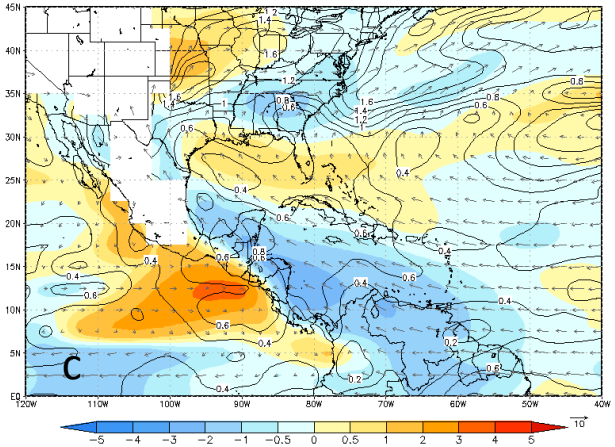
Vertical wind shear (200-850hPa winds, in ms^{-1})



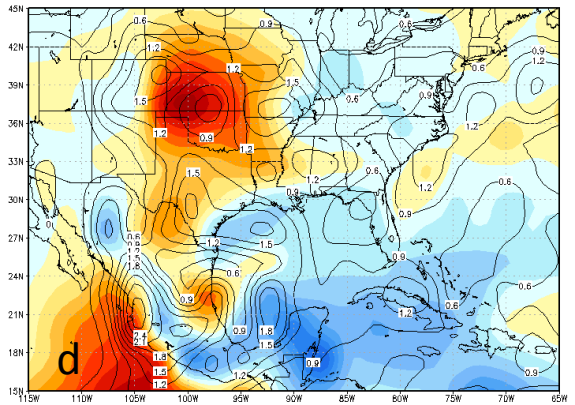
200hPa winds (ms^{-1})



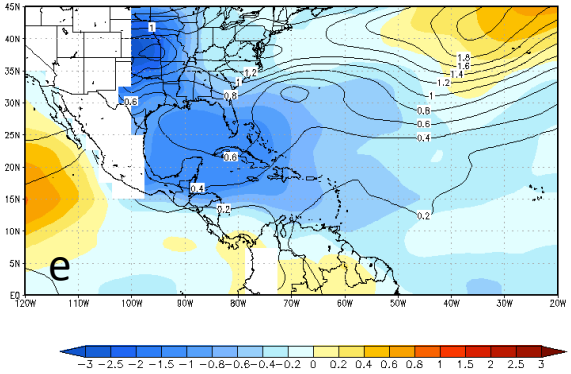
850hPa winds (ms^{-1})



Precipitation rate (mm day^{-1})

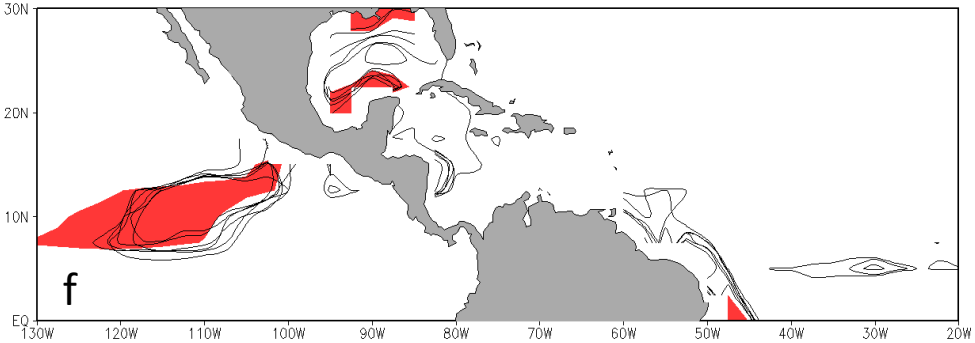


MSLP anomalies (hPa)



Contours are intra-ensemble spread and shading is anomaly of the ensemble mean in a, b, c, d, and e. In f model climatology of the 28.5^{0}C isotherm is shaded in red and the 28.5^{0}C isotherm from the individual ensemble forecasts are contoured.

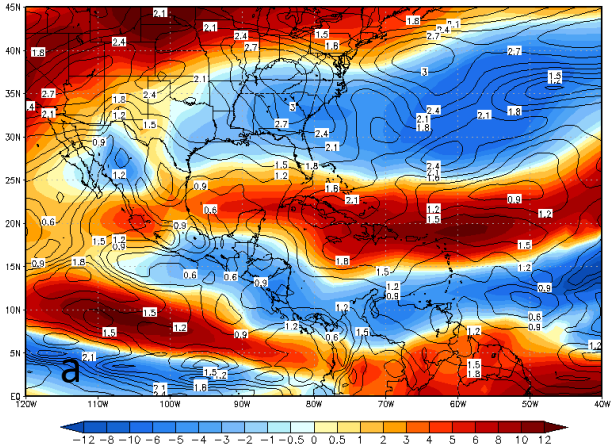
28.5^{0}C isotherm of SST



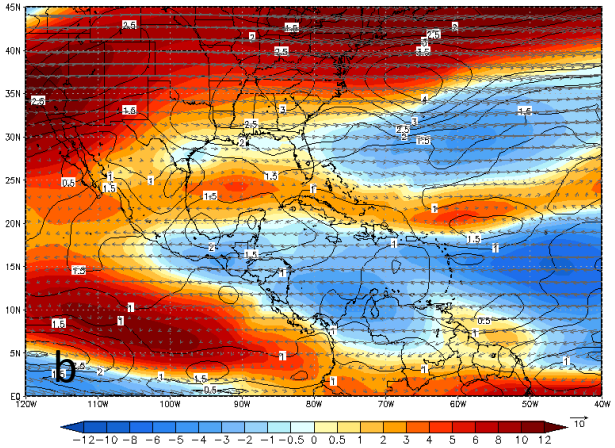
MDR anomalous zonal shear value of ensemble mean=-0.3065m/s; suggests weak (&easterly shear)

CCSM3

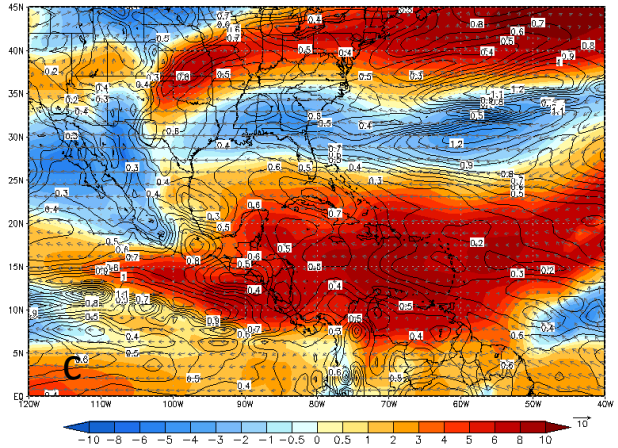
Vertical wind shear (200-850hPa winds, in ms^{-1})



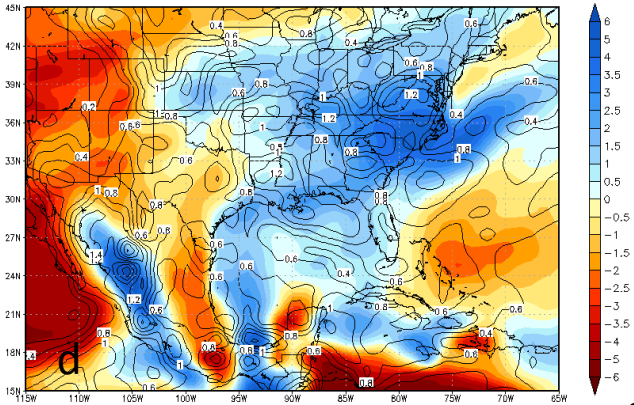
200hPa winds (ms^{-1})



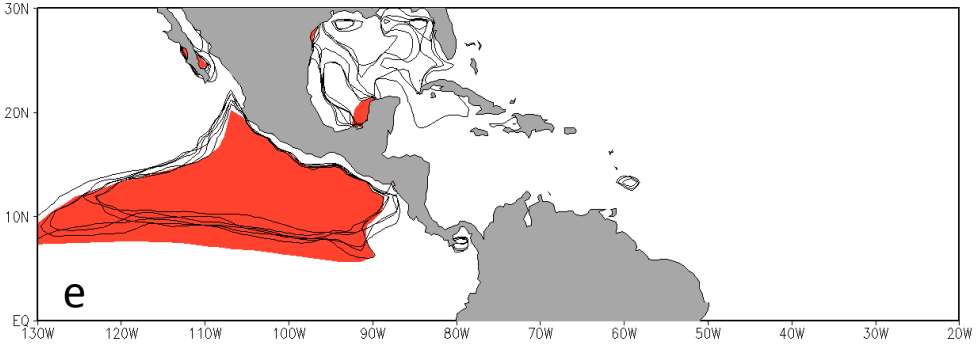
850hPa winds (ms^{-1})



Precipitation rate (mm day^{-1})



28.5^{0}C isotherm of SST

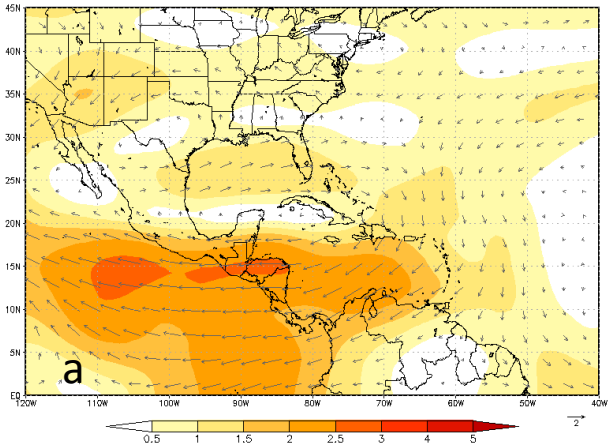


Contours are intra-ensemble spread and shading is anomaly of the ensemble mean in a, b, c, and d. In e model climatology of the 28.5^{0}C isotherm is shaded in red and the 28.5^{0}C isotherm from the individual ensemble forecasts are contoured.

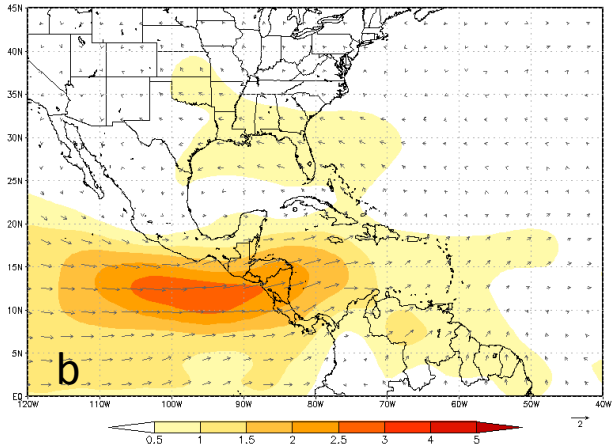
MDR anomalous zonal shear value of ensemble mean= 0.0022m/s; suggests near normal shear

ECHAM-MOM

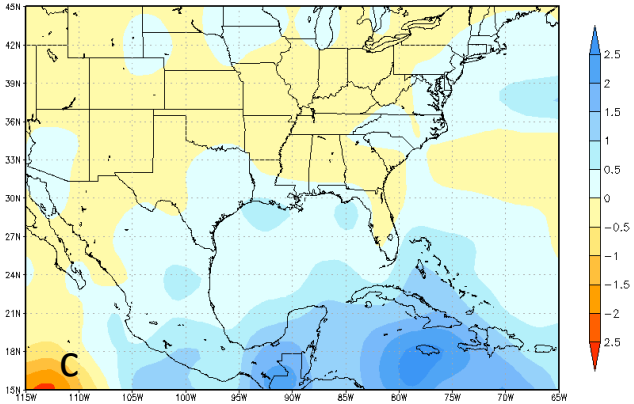
200hPa wind anomalies (ms^{-1})



850hPa wind anomalies (ms^{-1})



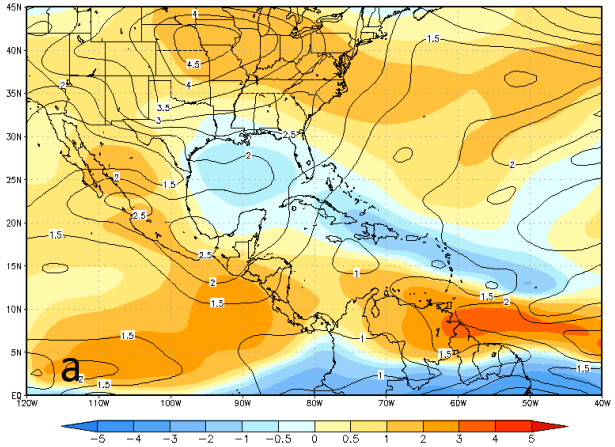
Precipitation rate (mm day^{-1})



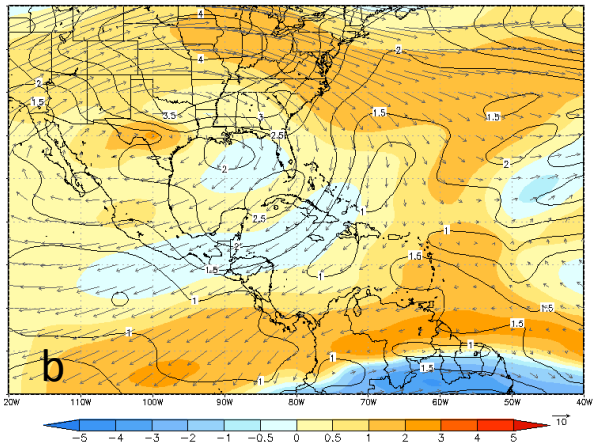
Shading is precipitation anomaly in c, and magnitude of wind anomaly in a and b. Vectors in a and b show direction of wind anomalies.

CWB

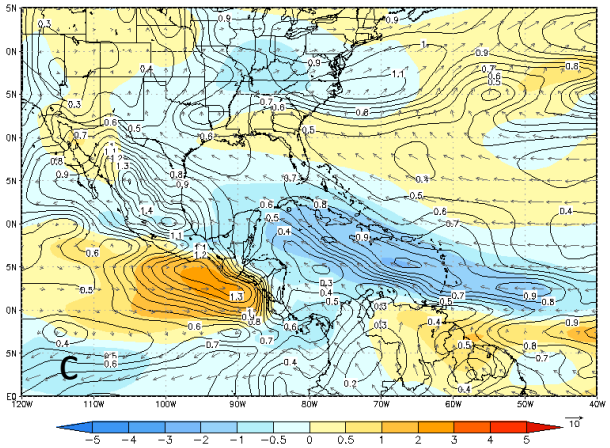
Vertical wind shear (200-850hPa winds, in ms^{-1})



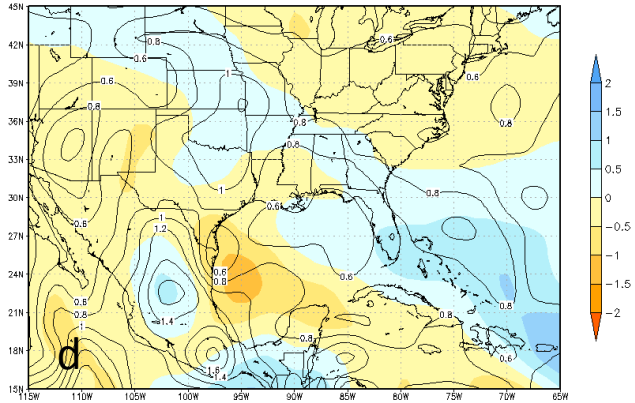
200hPa winds (ms^{-1})



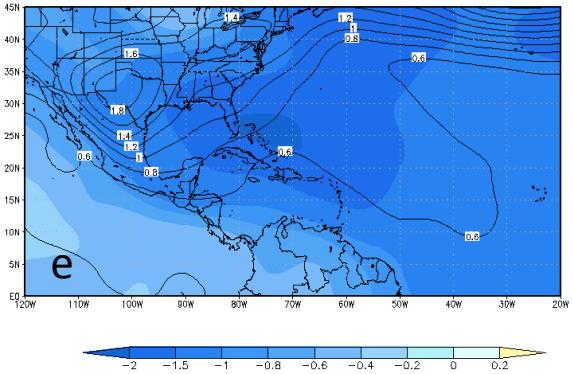
850hPa winds (ms^{-1})



Precipitation rate (mm day^{-1})



MSLP anomalies (hPa)

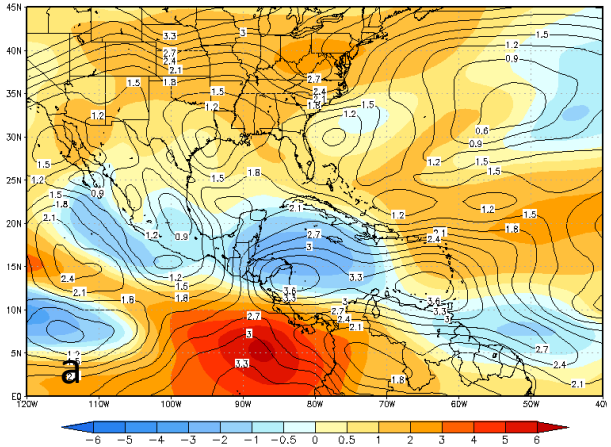


Contours are intra-ensemble spread and shading is ensemble mean in a, b, c, d, and e.

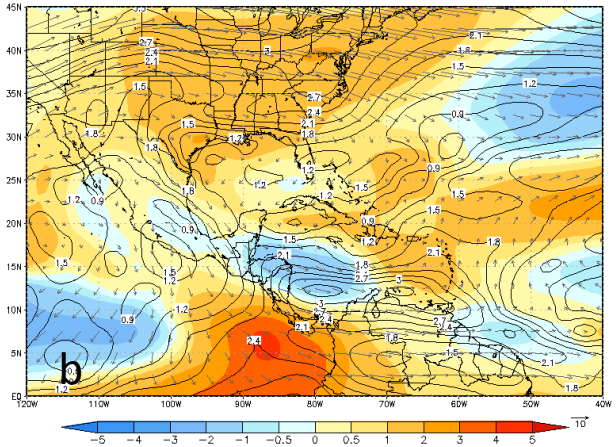
MDR anomalous zonal shear value of ensemble mean= 0.1462m/s; suggests slightly strong (&westerly shear)

POAMA

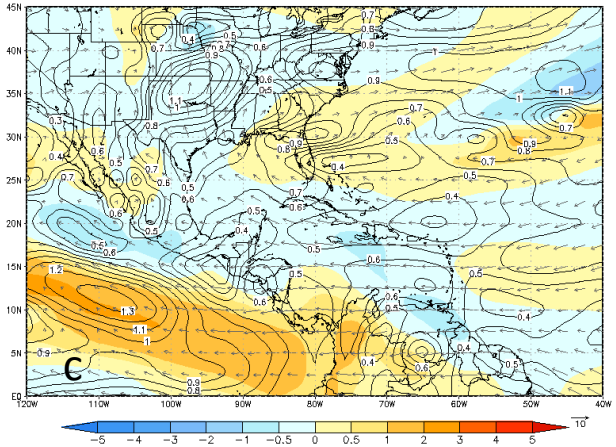
Vertical wind shear (200-850hPa winds, in ms^{-1})



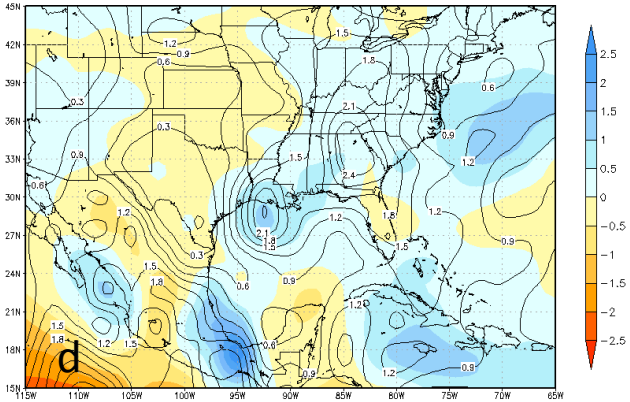
200hPa winds (ms^{-1})



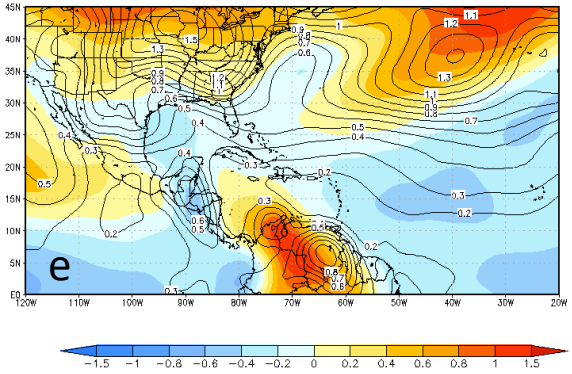
850hPa winds (ms^{-1})



Precipitation rate (mm day^{-1})

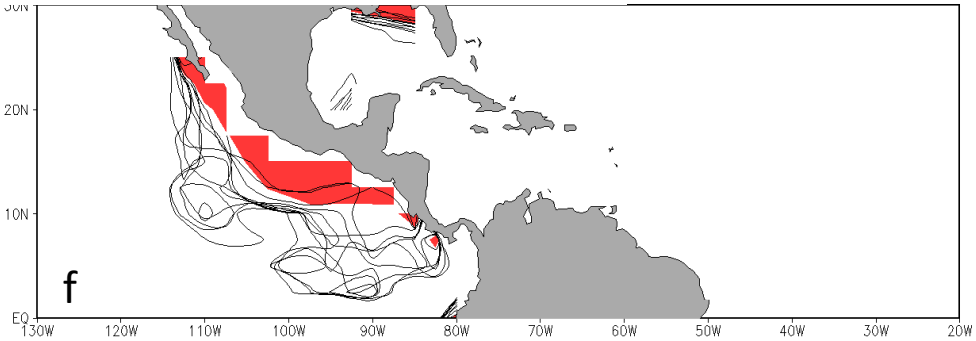


MSLP anomalies (hPa)



Contours are intra-ensemble spread and shading is ensemble mean in a, b, c, d, and e. In f model climatology of the 28.5^{0}C isotherm is shaded in red and the 28.5^{0}C isotherm from the individual ensemble forecasts.

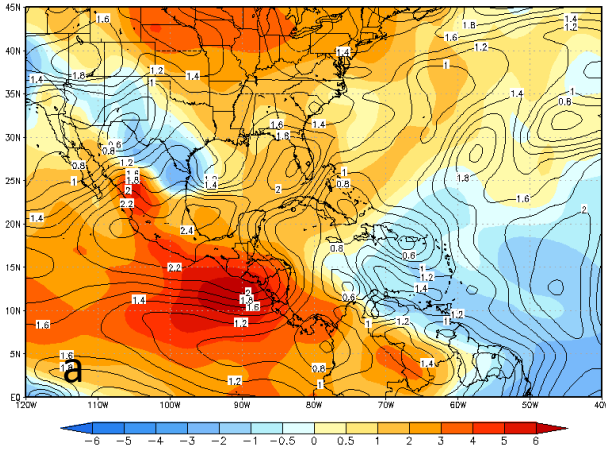
28.5^{0}C isotherm of SST



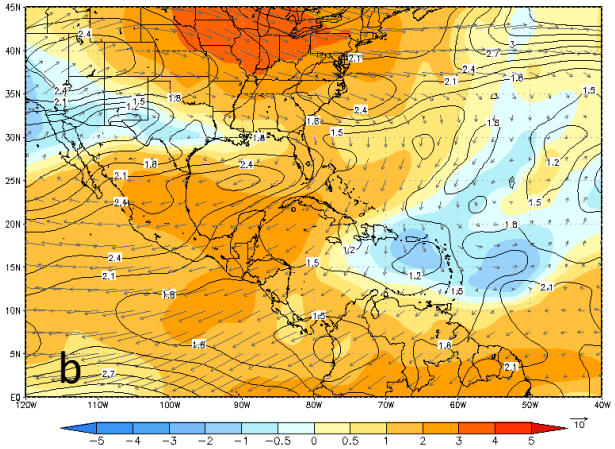
MDR anomalous shear value of ensemble mean=0.5159m/s; suggests strong (&westerly shear)

ECPC-COAPS

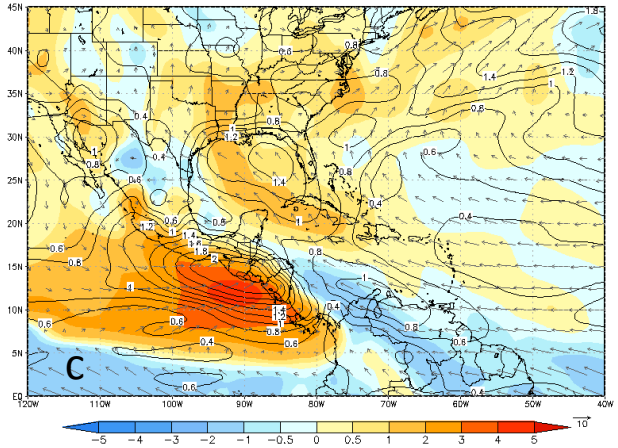
Vertical wind shear (200-850hPa winds, in ms^{-1})



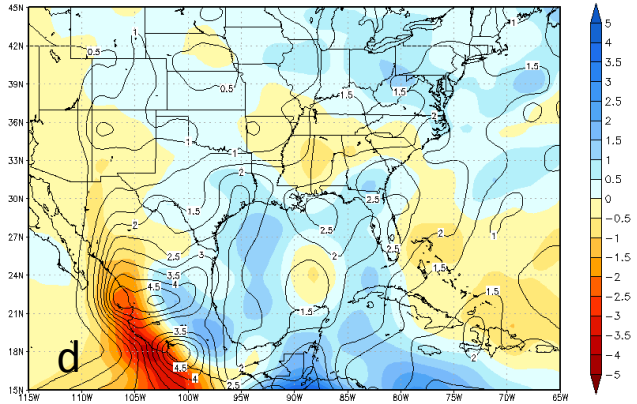
200hPa winds (ms^{-1})



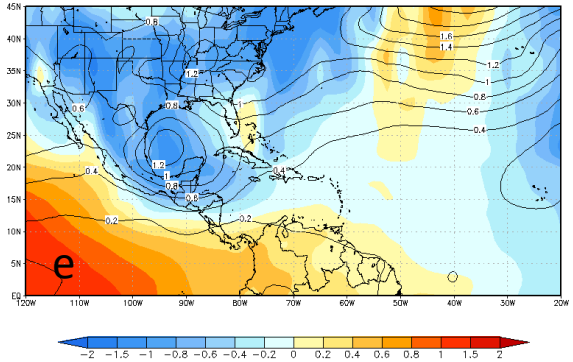
850hPa winds (ms^{-1})



Precipitation rate (mm day^{-1})



MSLP anomalies (hPa)



Contours are intra-ensemble spread and shading is ensemble mean in a, b, c, d, and e.

MDR anomalous shear value of ensemble mean=-0.6928m/s; suggests weak (&easterly shear)

Summary of Model Forecasts

Feature	NCEP CFS v1	NASA GMAO	CCSM3	ECHAM -MOM	CWB	POAMA	ECPC-COAPS	Model's CONSEN.
AWP area anomaly	Large	Large[1]	Large[1]	Not Avail.	Not Avail.	No AWP	N/A	Large
Vertical shear anomaly in MDR	Weak (Easterly)	Weak	Near Normal	Not Avail.	Westerly	Westerly	Weak (Easterly)	Weak (Easterly)
Strength of NASH or Bermuda high[2]	Weak	Weak	Not Avail.	Not Avail.	Weak	Weak	Weak	Weak
Mid-west rain anomaly[3]								
Southern Mexican rain anomaly[3]								

1: Appearance of 28.50C isotherm in ensembles over AWP is considered large anomaly despite climatology of the model not showing AWP.
2: Based on the MSLP anomalies. 925hPa winds would have been better than 850hPa winds.
3: Unworthy of interpreting summer seasonal rainfall anomaly from these models

Heuristic model forecasts

If we interpret the model forecasts and the current conditions then we anticipate the **likelihood** of the following to happen in JJA 2011 based on our understanding (and research) of the AWP impacts on remote and local climate:

a) A slightly larger than normal AWP to occur
b) A slightly weaker than normal Bermuda/North Atlantic subtropical high
c) A weaker than normal (easterly) vertical shear from the lingering effects of rapidly weakening La Nina and appearance of weak warm ocean anomalies in the eastern equatorial Pacific and the slight weakening of NASH.

Based on a), b) and c) above we anticipate from our past research work the **likelihood** of the following to happen in JJA 2011:

i) Slightly below normal rainfall over mid-west US
ii) Slightly above normal rainfall over southern Mexico
iii) Slightly below normal summer rainfall activity along the northern US Gulf coast
iv) Slightly above normal hurricane activity based on 1950-2010 climatology

We have a **stronger** consensus that this year is not going to be a very large anomalous AWP year. However in a relative sense, the forecasting of small anomaly years are much more difficult to verify.