



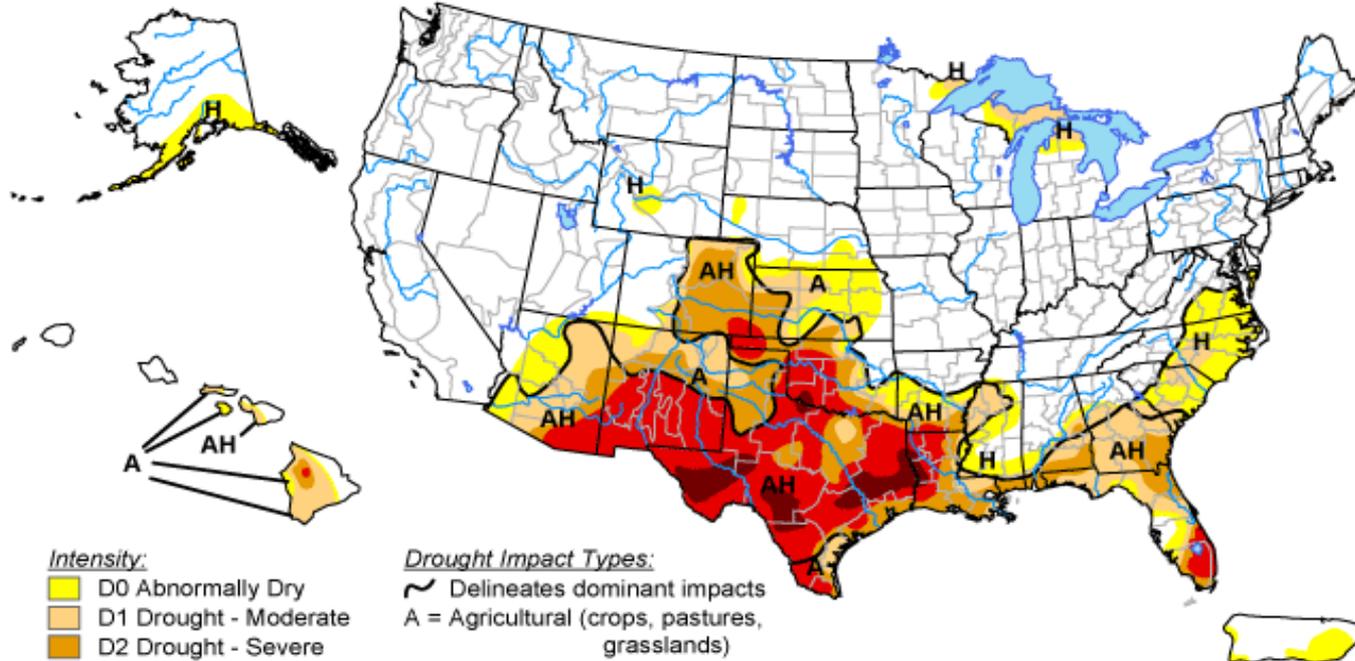
## Summary

- Currently La Nina is weak and confined to the central equatorial Pacific [slides 2 and 3].
- The subsurface equatorial Pacific continues to warm [slide 5&6]. Part of this warming is caused by an oceanic Kelvin wave.
- Many of the atmospheric La Nina indicators including the Southern Oscillation Index remain in strong La Nina conditions [slide 11].
- If La Nina conditions persist into and through the April-June climate window chances for below normal rainfall increase for this climate window (slide 15).
- PDO is still in the moderate cold phase. This tends to impede El Nino development and favors La Nina development. (Slide 12)
- The sea surface temperature anomalies in the North Atlantic and the Atlantic Hurricane Main Development regions sea surface are less than last tropical season although still above normal. The upcoming tropical season should be closer to normal compared to last years very active season. As always tropical storm outlooks depend on the evolution of ENSO. If A Traditional El Nino (not El Nino Modoki) develops this may also help suppress tropical activity [slides 7,8,9,10]

# U.S. Drought Monitor

April 26, 2011

Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

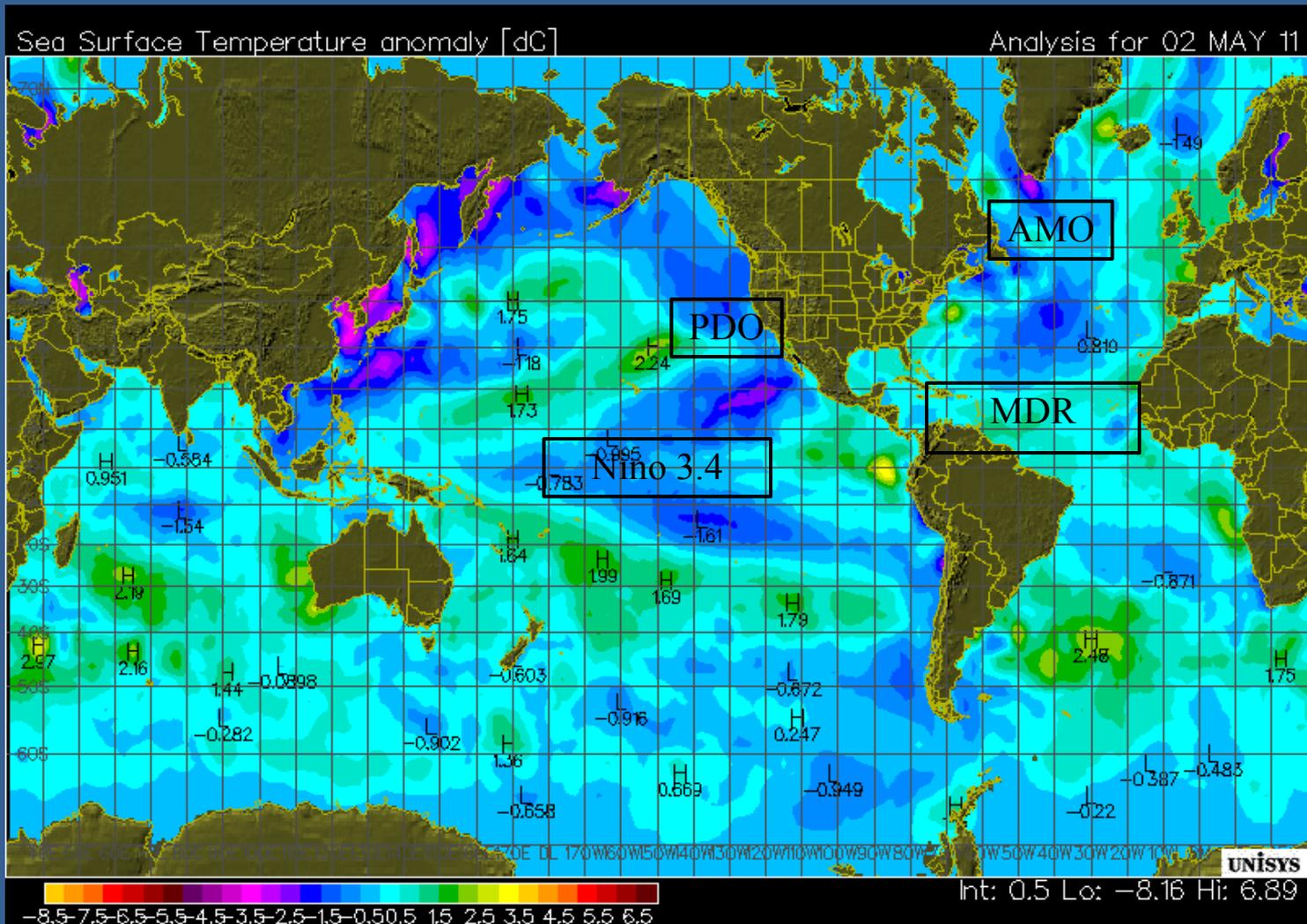


Released Thursday, April 28, 2011

Author: Michael Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC

Much of Central Florida has received a reprieve from drought March rains.

# Weekly Sea Surface Temperature Anomaly



PDO is in cold Phase. ENSO cold but warming. AMO warm but cooling

# Niño Region SST Departures (° C) Recent Evolution

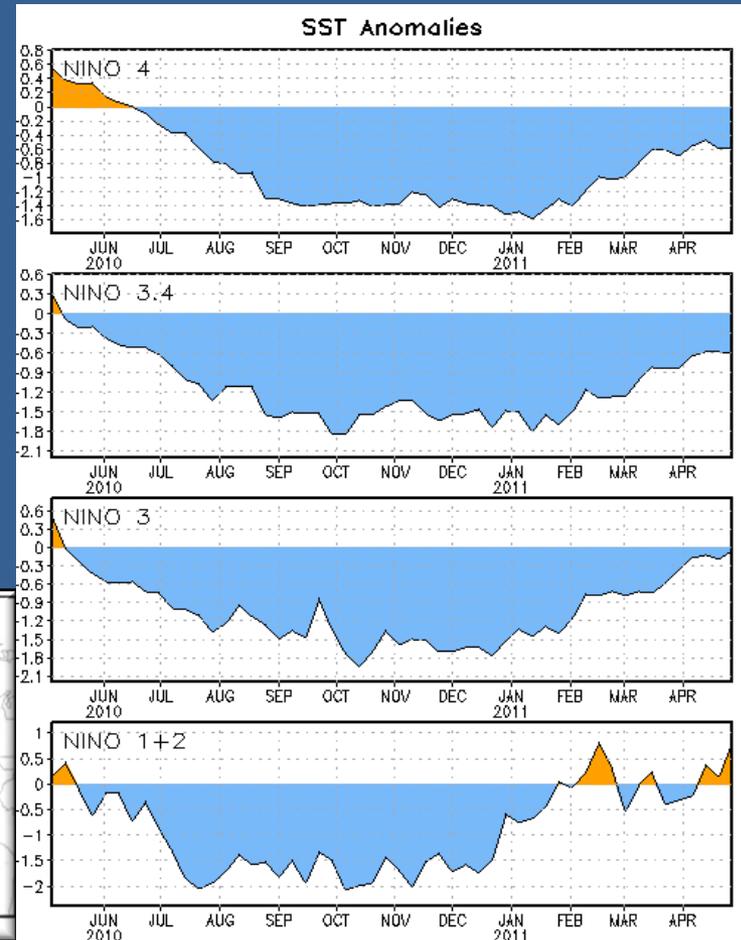
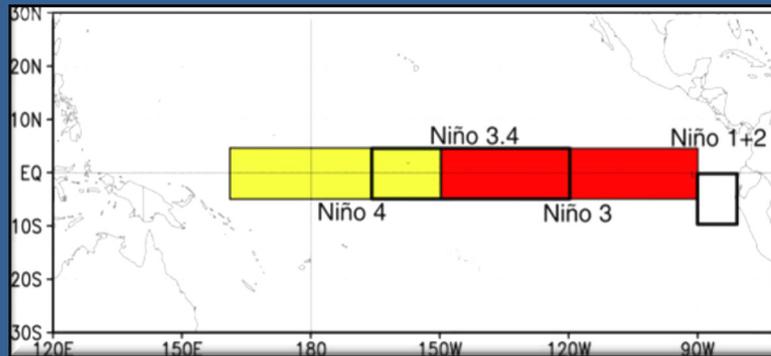
The latest weekly SST departures are:

**Niño 4** **-0.6°C**

**Niño 3.4** **-0.6°C**

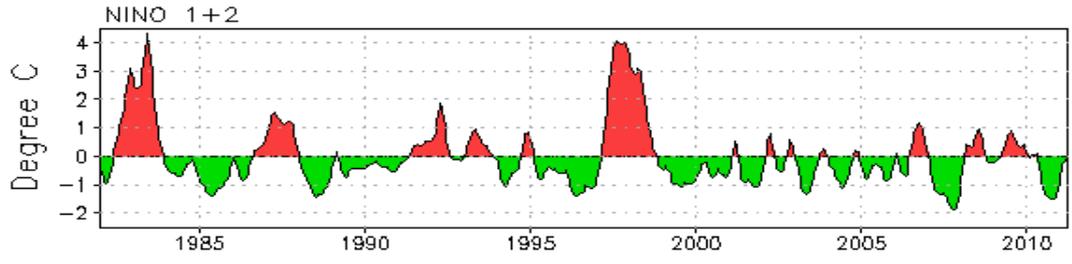
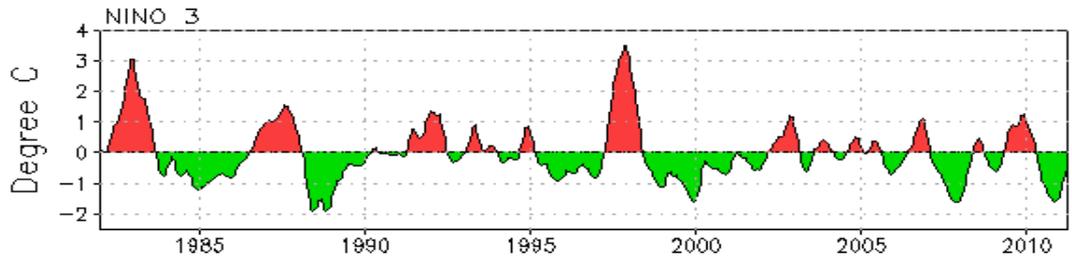
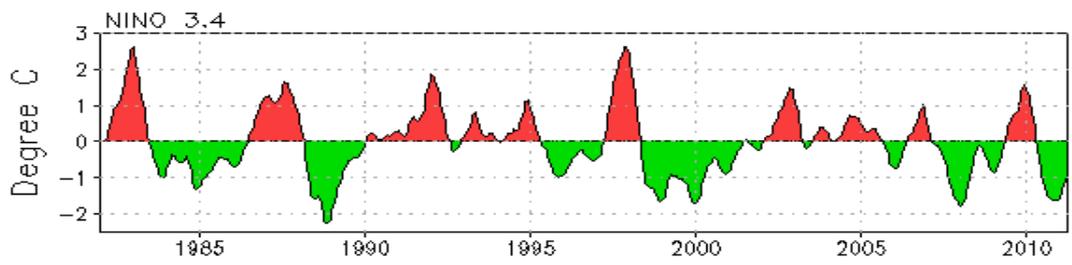
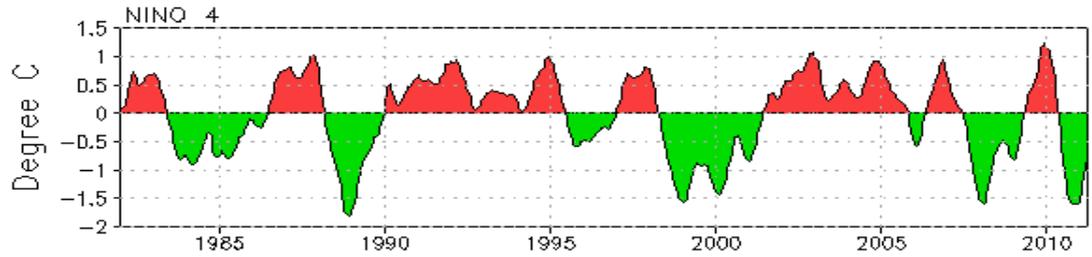
**Niño 3** **-0.1°C**

**Niño 1+2** **0.8 °C**



Niño 3.4 is used to compute the official index.

### Tropical Pacific SST Anomaly (3 Month-Running-Mean)



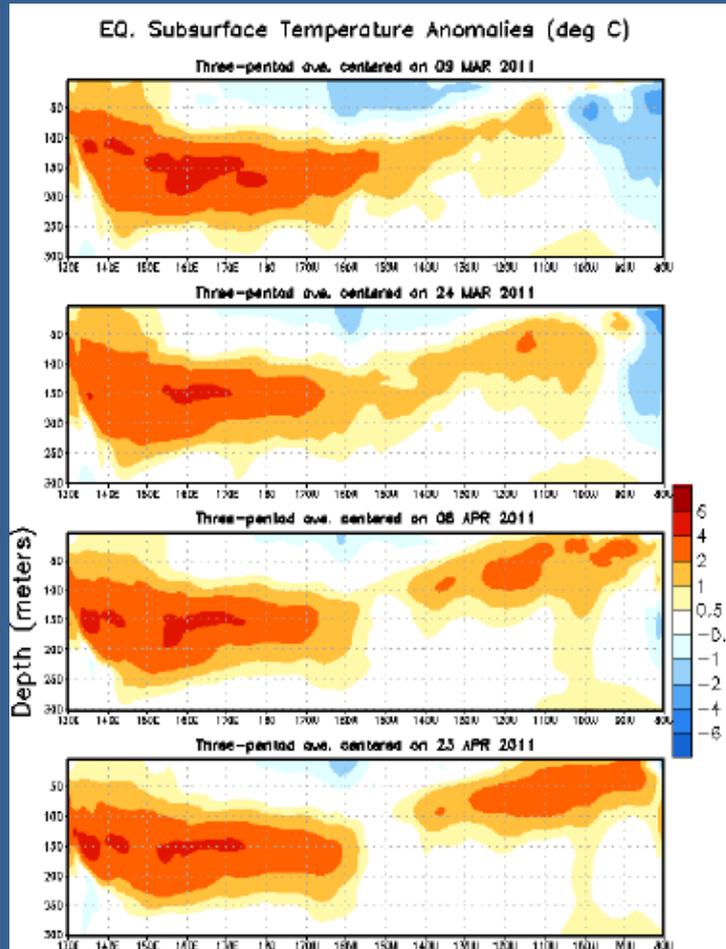
# Equatorial Pacific Sub Surface Temperature Anomaly

Mar  
09<sup>th</sup>

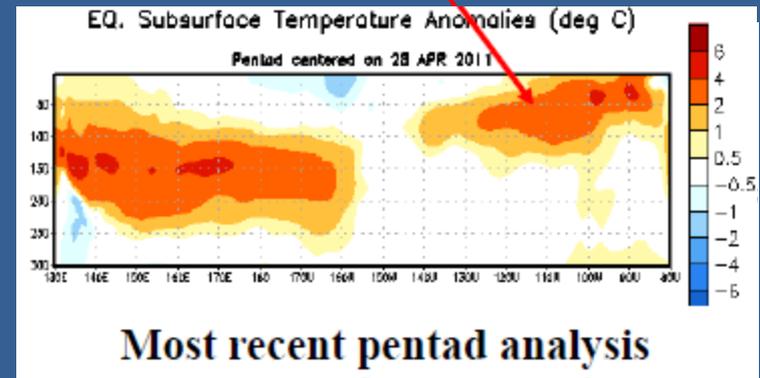
Mar  
24<sup>th</sup>

Apr  
08<sup>th</sup>

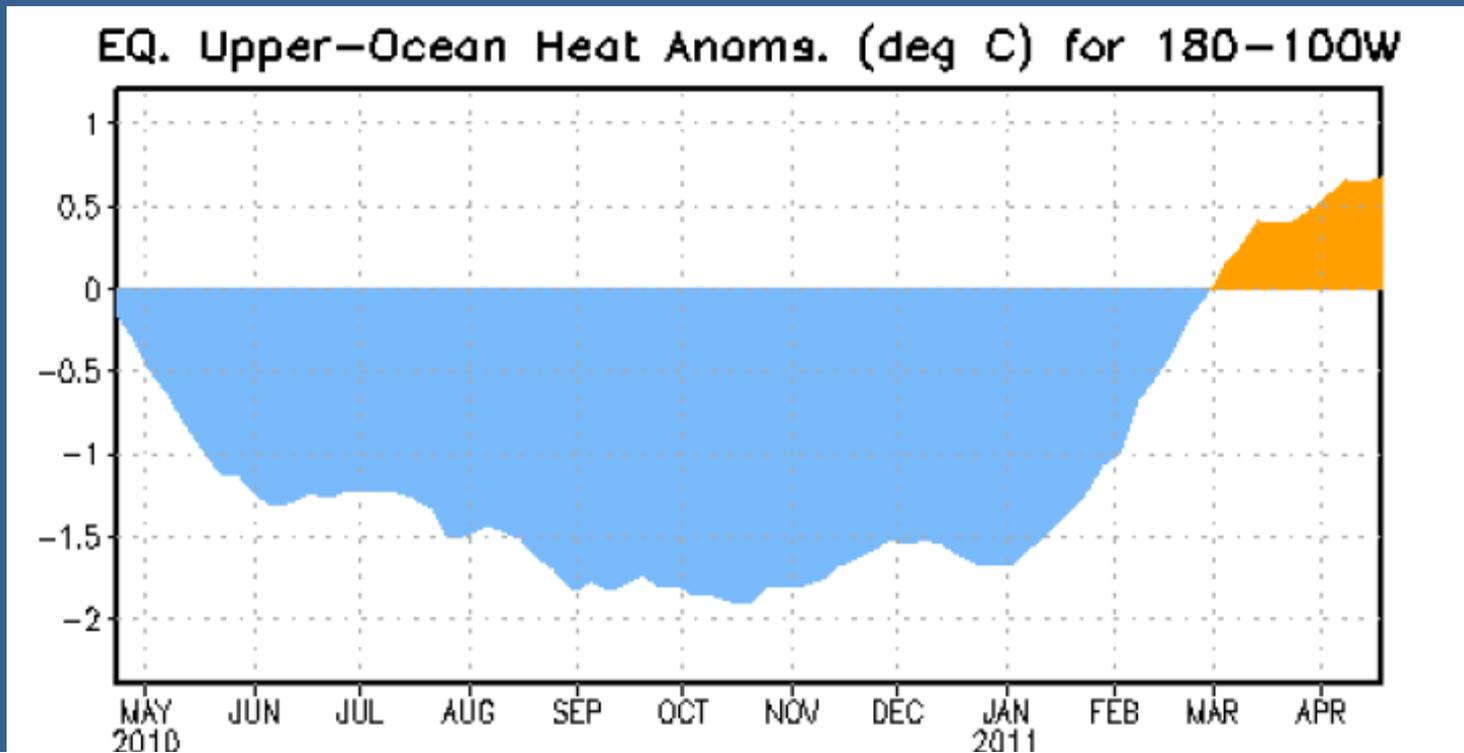
Apr  
23<sup>rd</sup>



- Since late December 2010, positive subsurface temperature anomalies have expanded eastward at depth (100-300m), with anomalies in the eastern Pacific switching to positive. Also, negative near surface anomalies in the central Pacific have been weakening.
- Positive anomalies in the eastern Pacific have persisted in the most recent period.

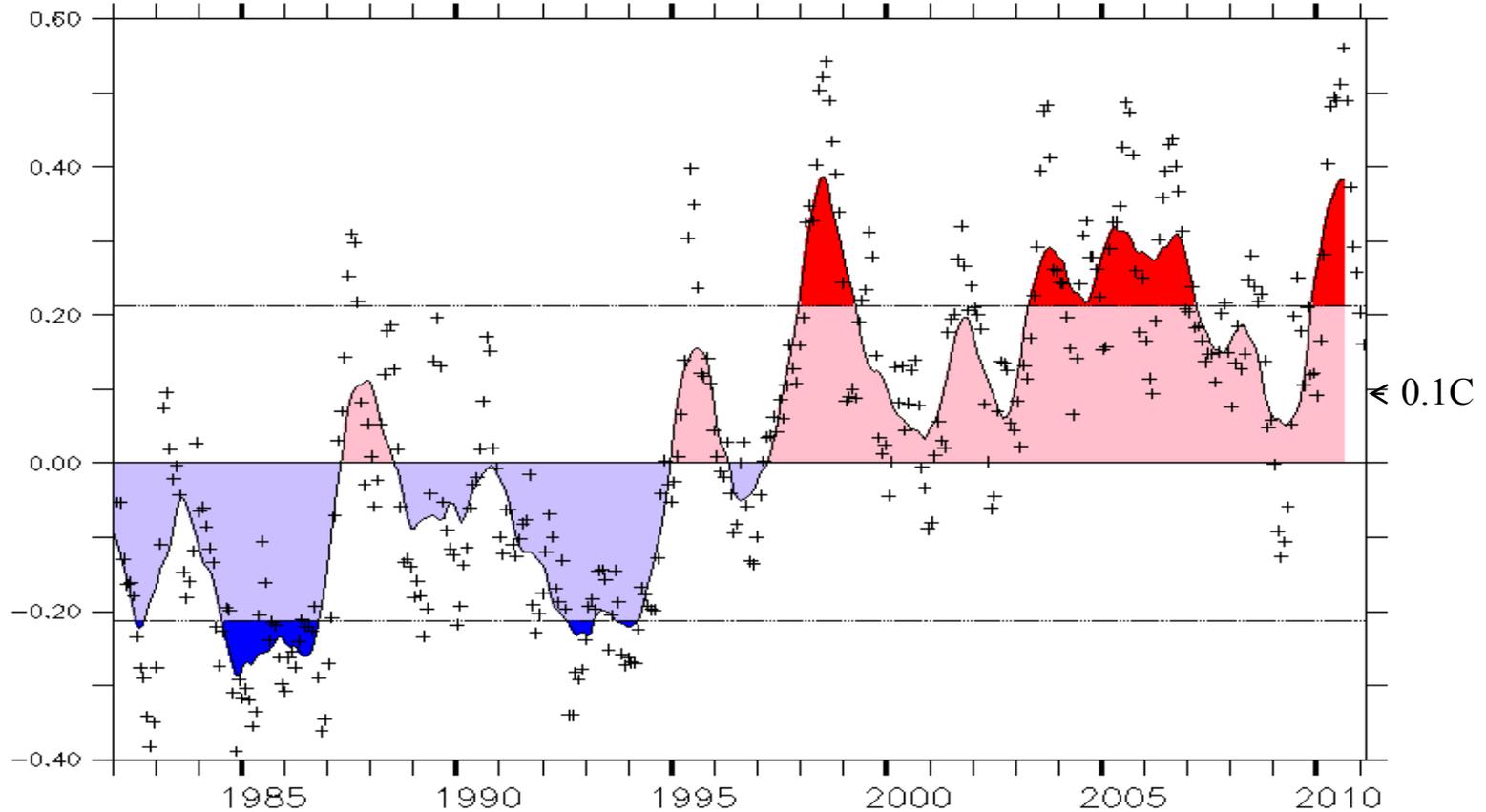


## Weekly Equatorial Pacific Upper Ocean (0-300 m) Average Temperature Anomaly



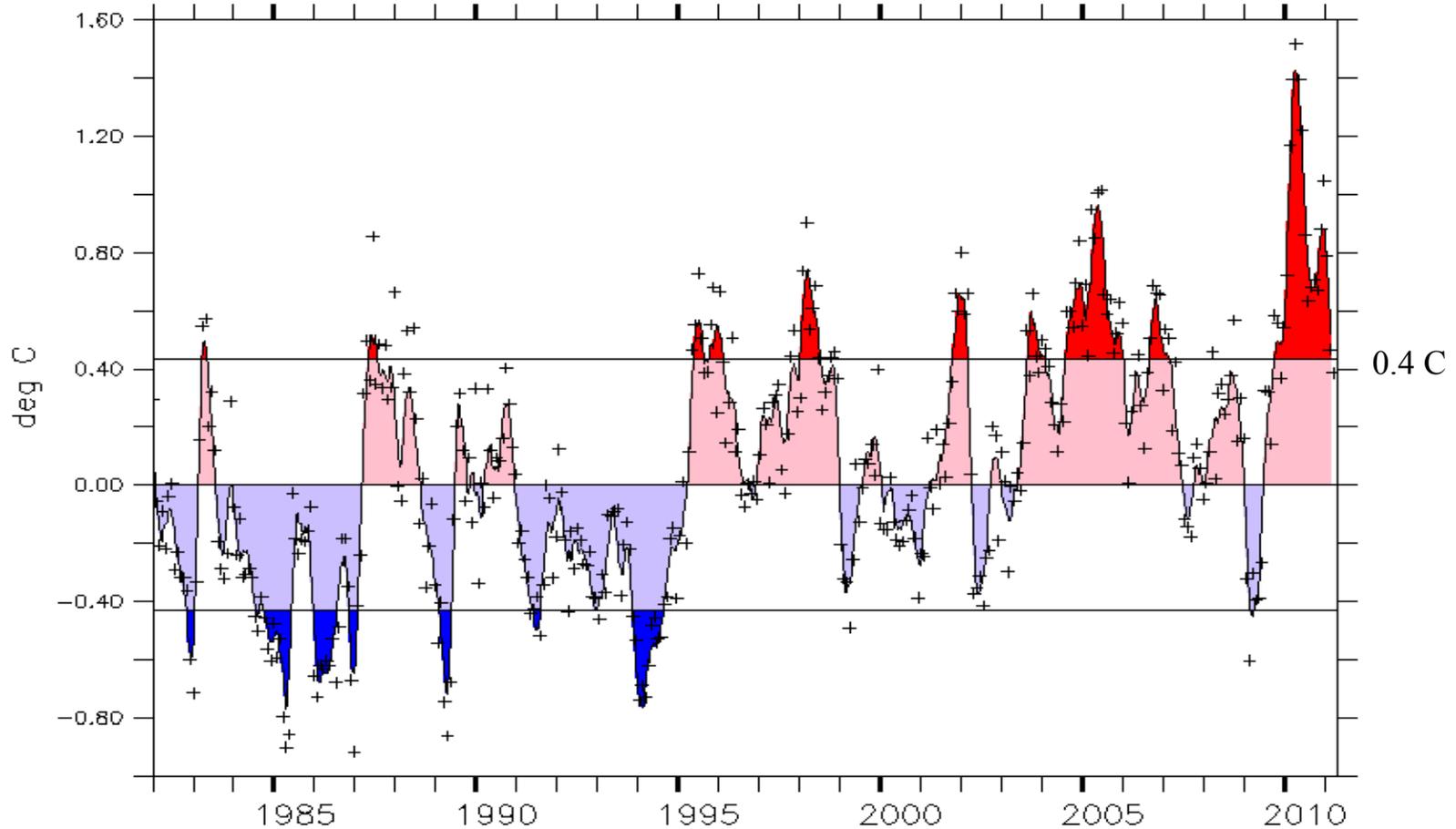
**The negative anomalies since June 2010 are consistent with La Niña. In January 2011 negative anomalies began to decrease in magnitude, with anomalies becoming positive in March.**

# Atlantic Multidecadal Oscillation



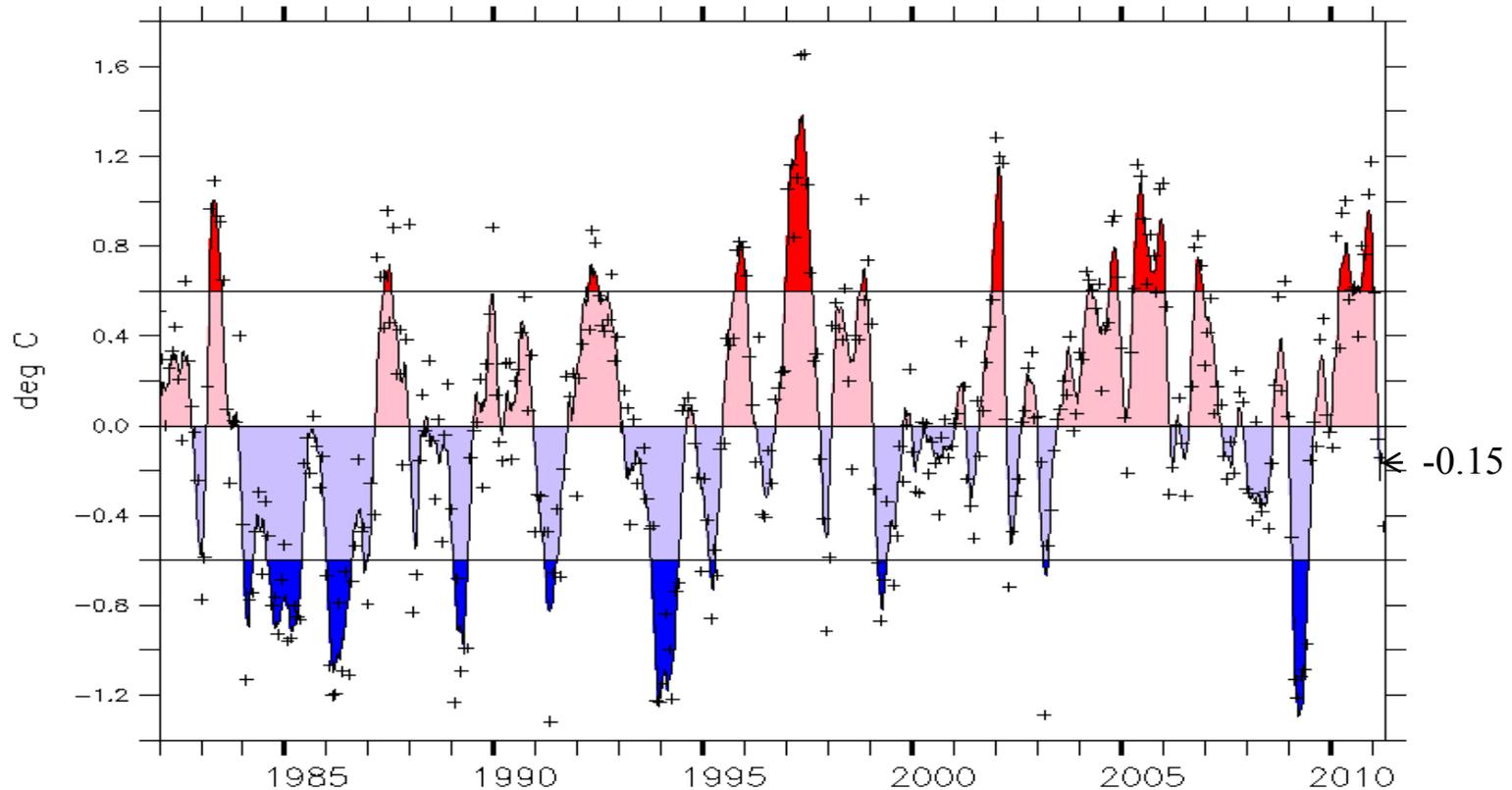
Ocean Observations Panel for Climate (OOPC) <http://ioc-goos-oopc.org/>

# Tropical Northern Atlantic Index (TNA)



Ocean Observations Panel for Climate (OOPC) <http://ioc-goos-oopc.org/>

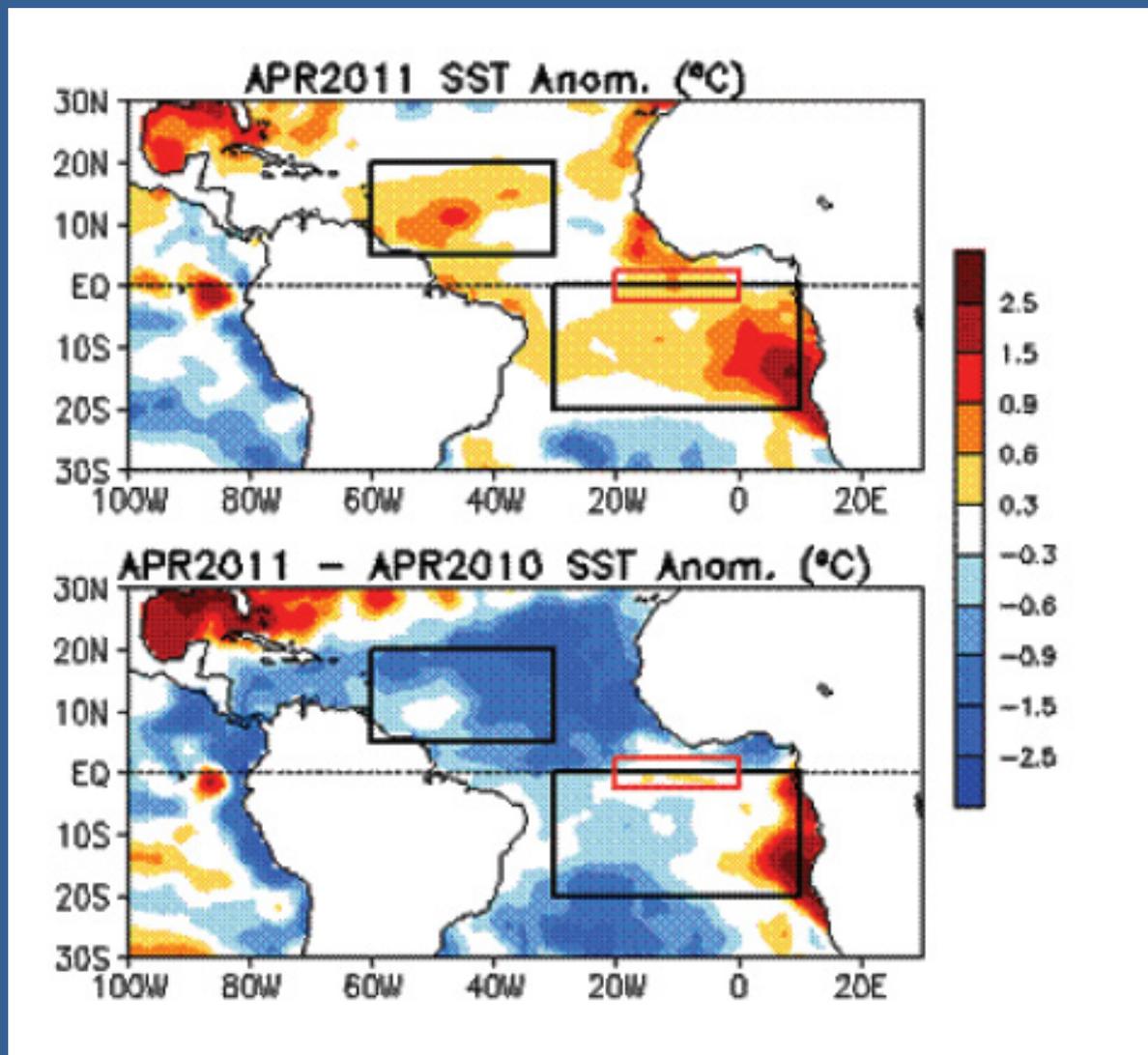
## Tropical Atlantic (TASI) SST index



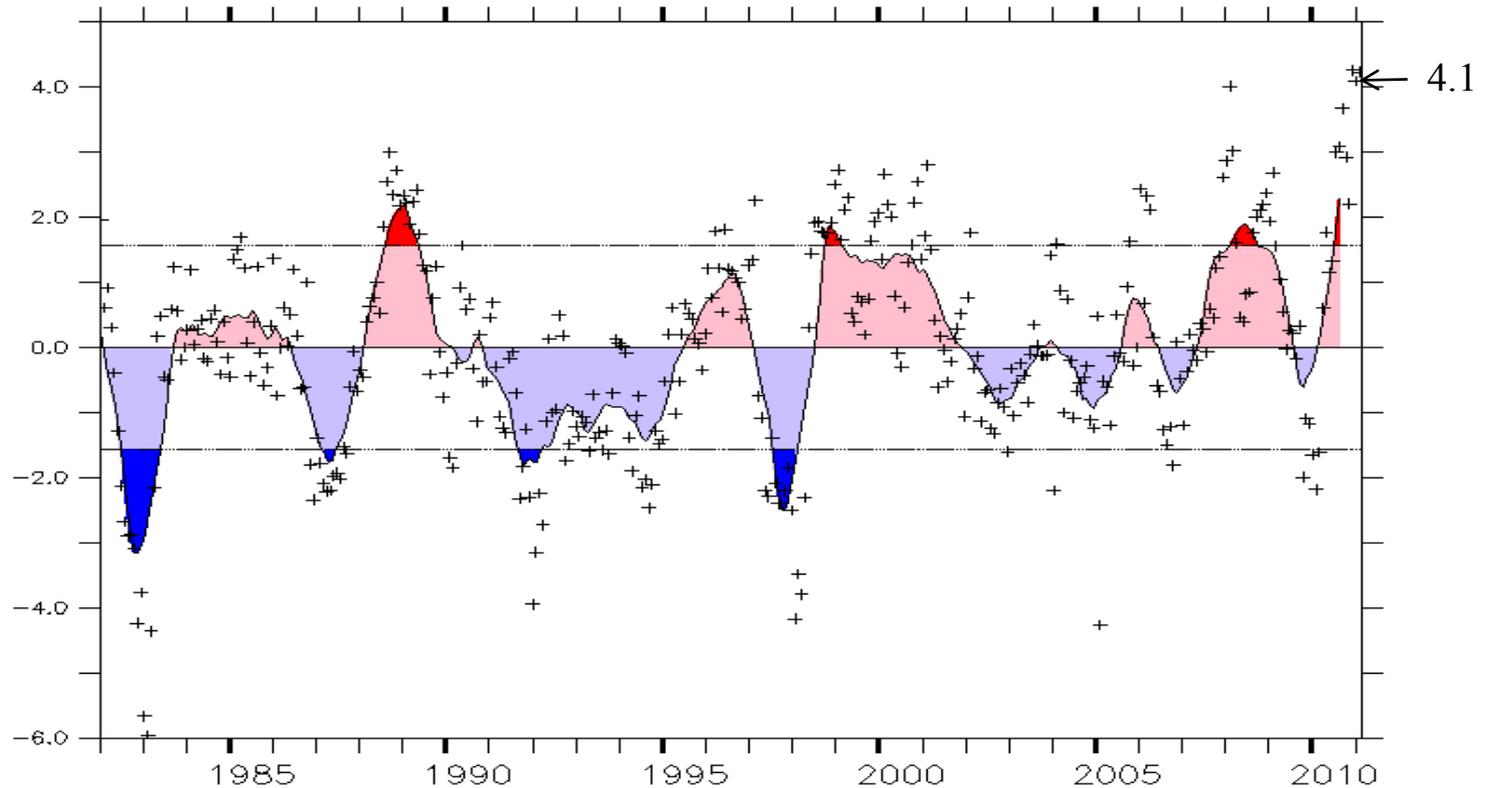
The TASI SST anomaly index is an indicator of the Meridional surface temperature gradient in the tropical Atlantic Ocean. It is calculated as the difference of the NAT and SAT indices.

**Ocean Observations Panel for Climate (OOPC)** <http://ioc-goos-oopc.org/>

Sea Surface Temperatures in the Hurricane main Development Region are above normal but much cooler than last year.



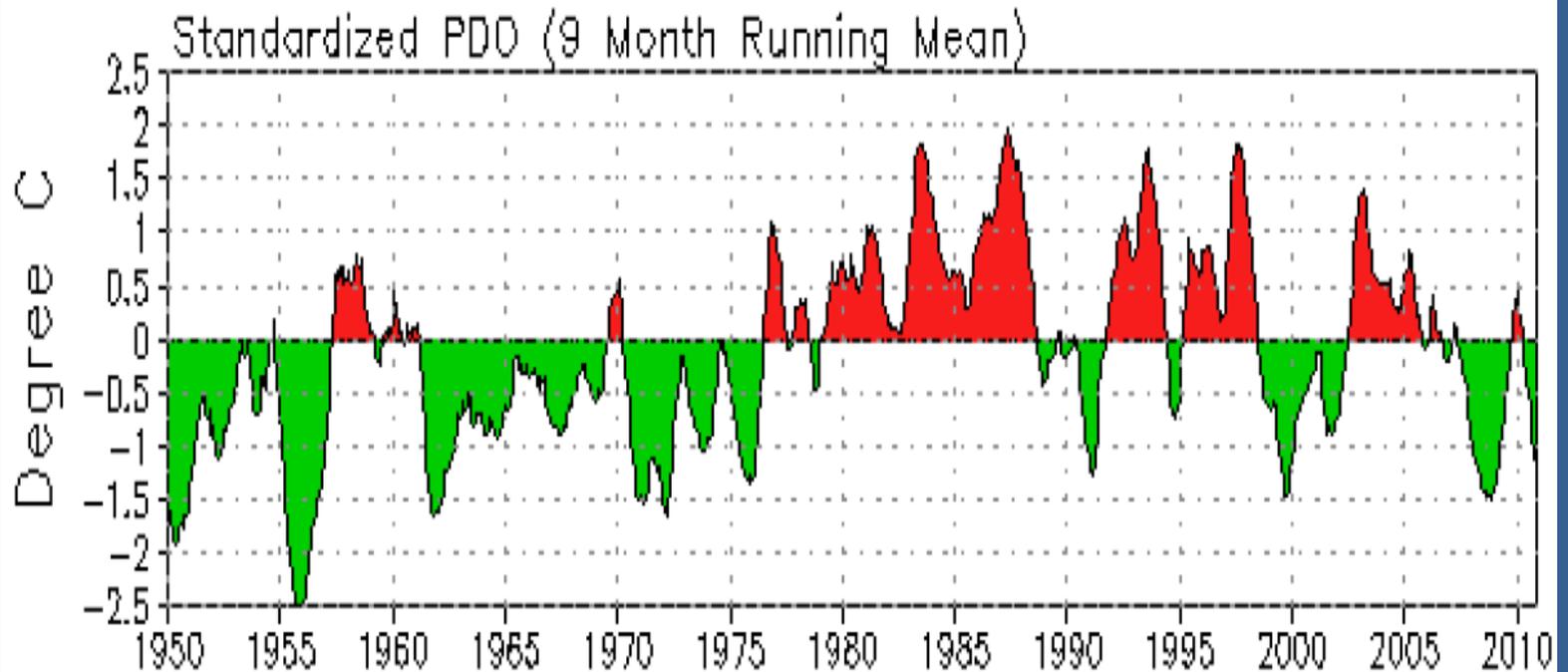
## Southern Oscillation Index



The SOI index is the normalized difference in pressure between Darwin, Australia and Tahiti

Southern Oscillation index have been at record high levels in 2011.  
Positive SOI are associated with La Nina conditions.

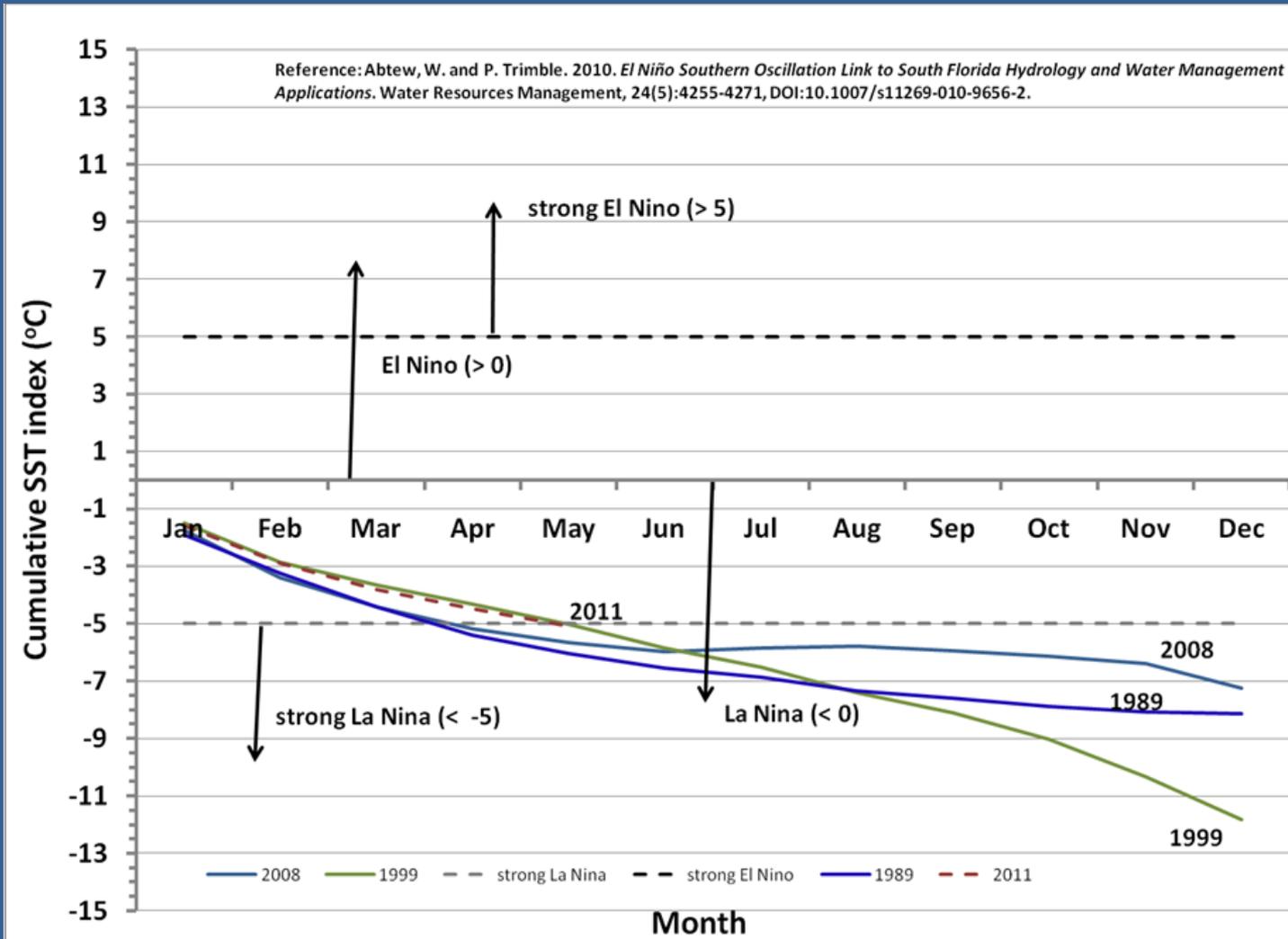
## Pacific Decadal Oscillation



The Pacific Decadal Oscillation (PDO) Index is defined as the leading principal component of North Pacific monthly sea surface temperature variability (poleward of 20N for the 1900-93 period).

The PDO has been trending downward since 2004

# Cumulative Nino Index (CNI)



CNI has been decreasing. This is expected to slow during the summer.

# New Climate Forecast System model indicating a possible return to La Nina next dry season

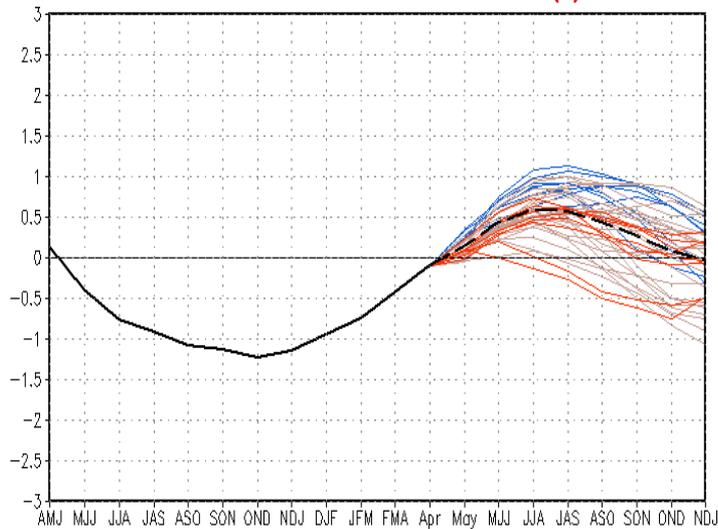
## Nino 3



NWS/NCEP/CPC

Last update: Mon May 2 2011  
Initial conditions: 22Apr2011-1May2011

CFSv2 forecast Nino3 SST anomalies (K)



— Latest 8 forecast members      - - - Forecast ensemble mean  
— Earliest 8 forecast members      — NCDC daily analysis  
— Other forecast members

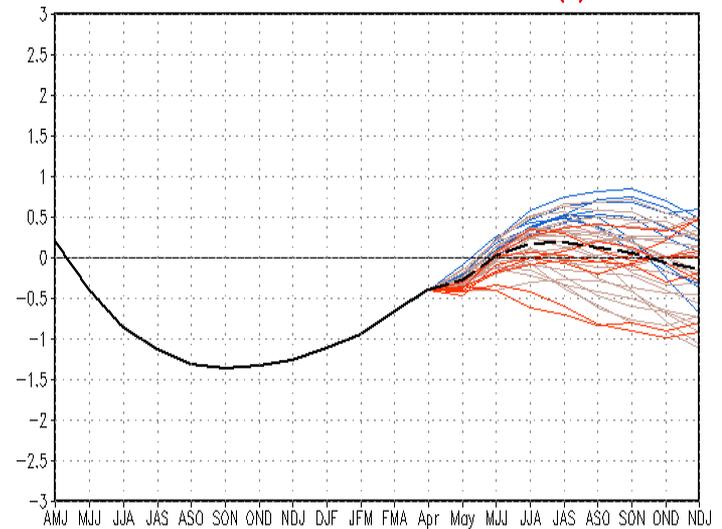
## Nino 3.4



NWS/NCEP/CPC

Last update: Mon May 2 2011  
Initial conditions: 22Apr2011-1May2011

CFSv2 forecast Nino3.4 SST anomalies (K)

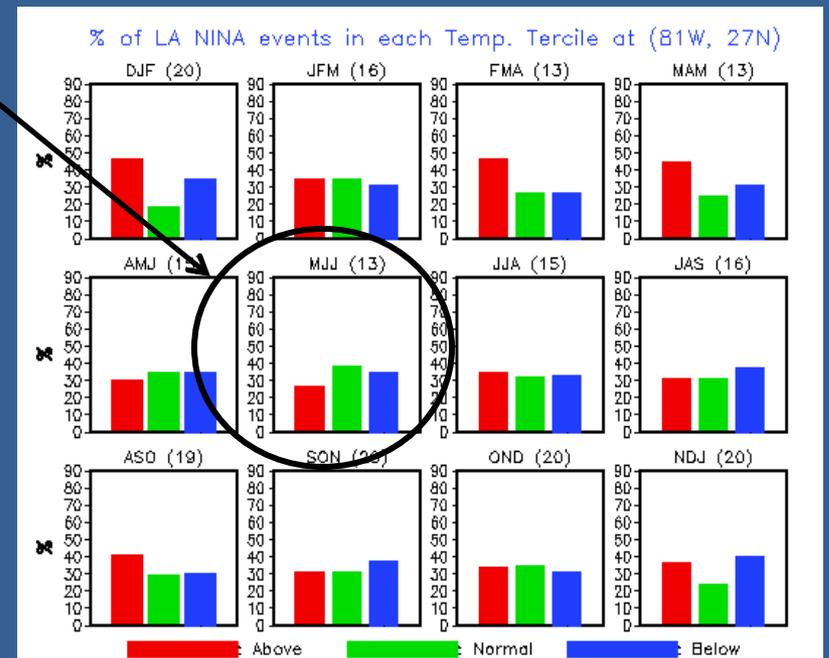
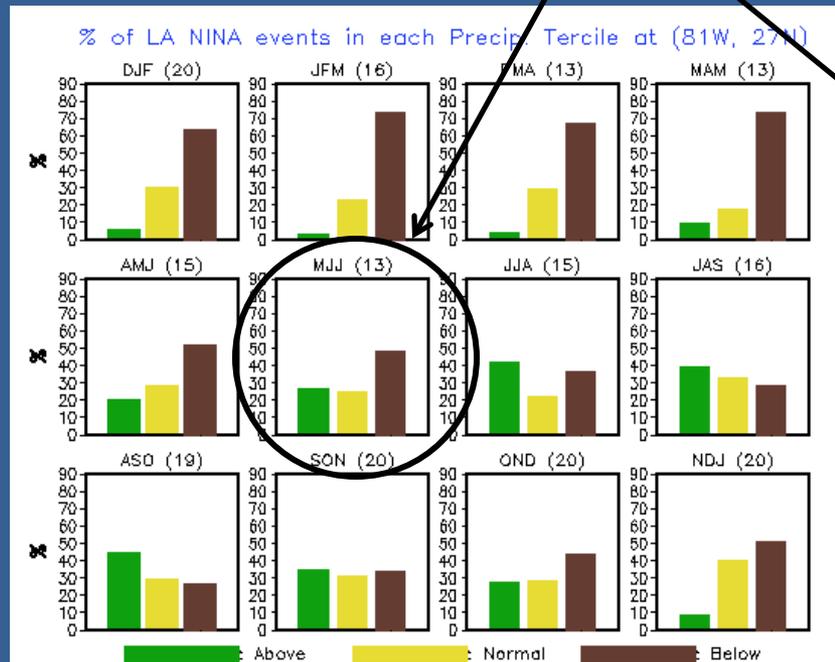
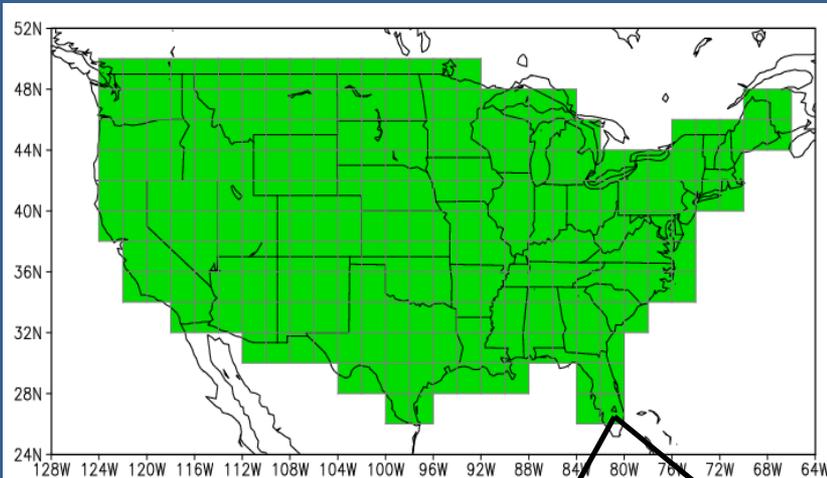


— Latest 8 forecast members      - - - Forecast ensemble mean  
— Earliest 8 forecast members      — NCDC daily analysis  
— Other forecast members

# Rainfall and Temperature Probability Shifts in south Florida during La Nina Events (CPC)

(Probability of events in upper middle and lower tercile)

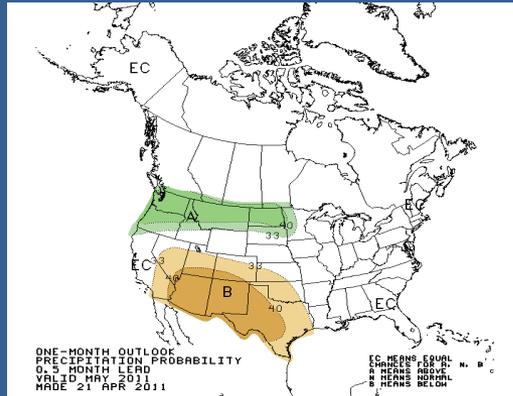
[http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/ens\\_o\\_page.text.htm](http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/ens_o_page.text.htm)



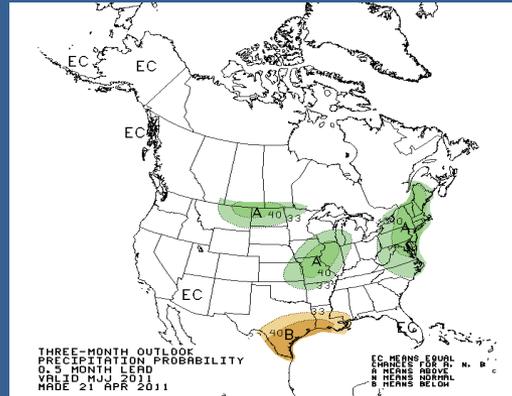
# Official Three Month Overlapping Seasonal Outlooks

## Climate Prediction Center

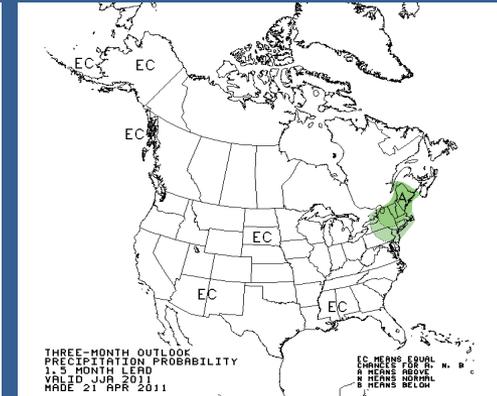
May



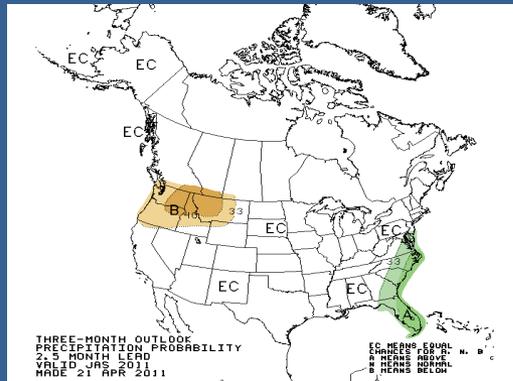
MJJ



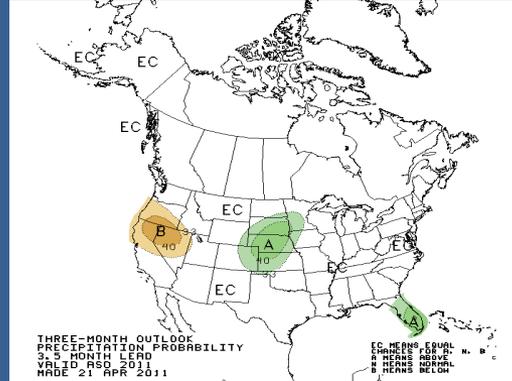
JJA



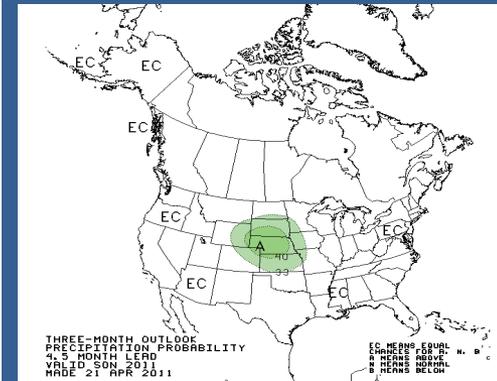
JAS



ASO



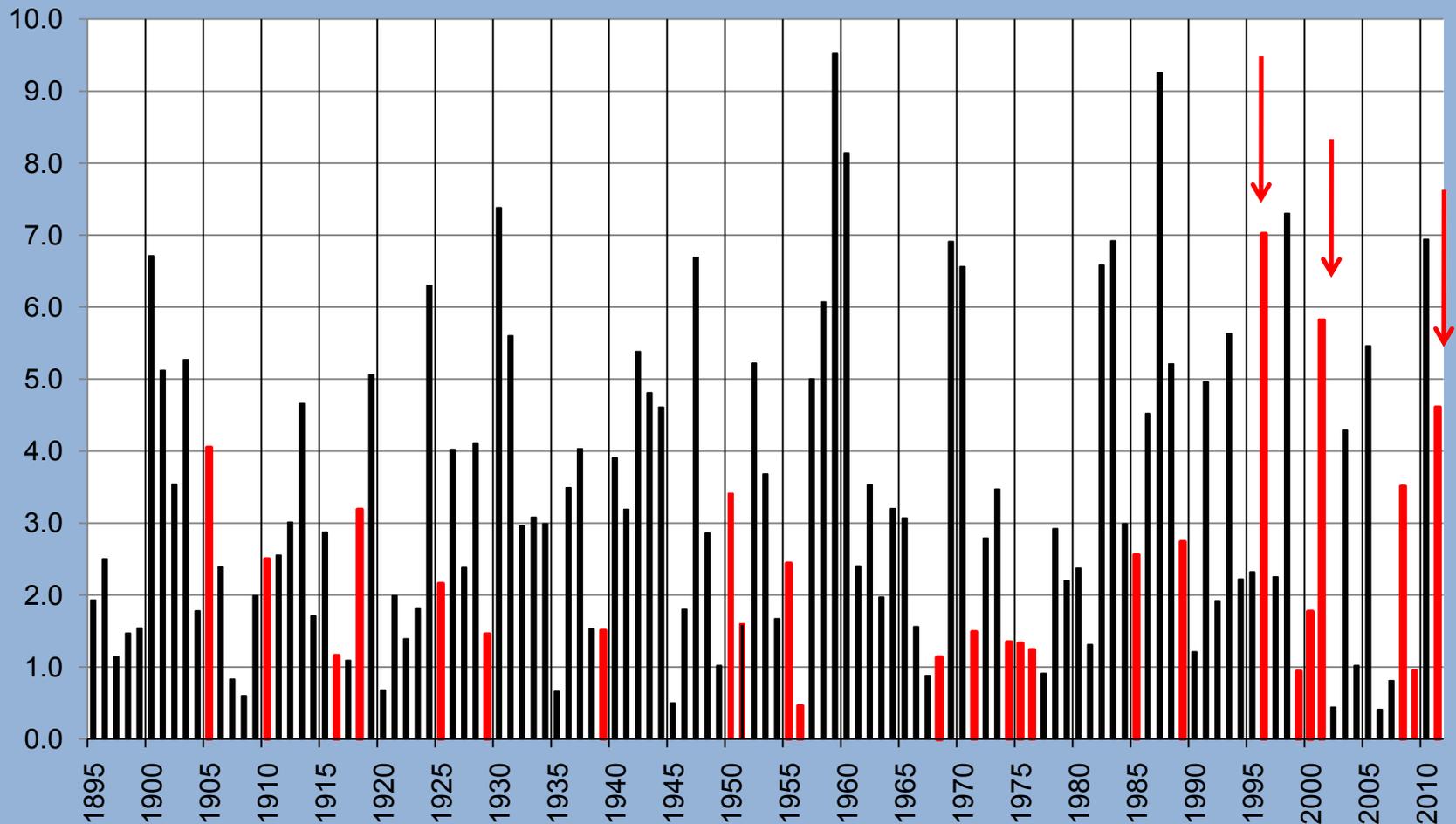
SON



The warm tropical Atlantic and La Nina conditions may be indicators of a possible late start of the wet season in south Florida not indicated in the CPC outlook.

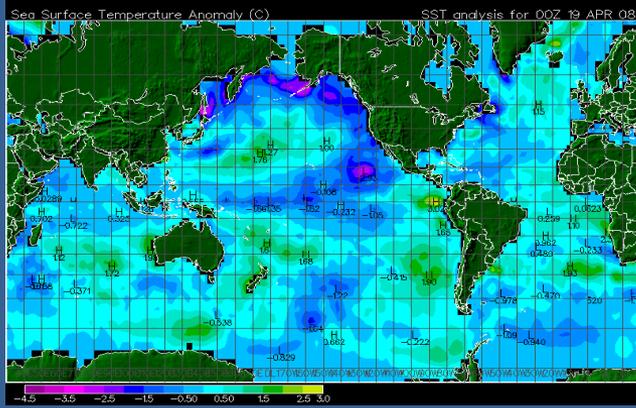


## March Rainfall Climate Division 4

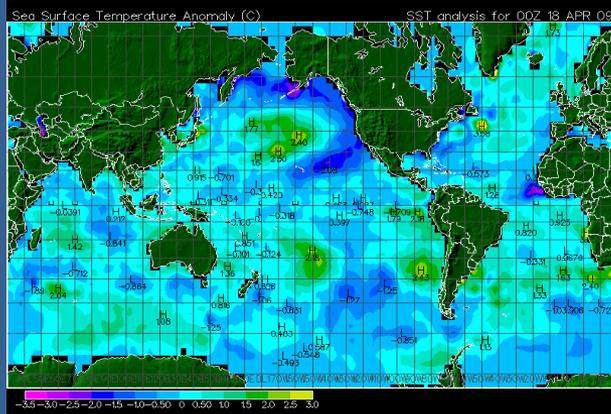


Red Bars indicate the La Nina events. Since 1995 there has been an increase in above normal rainfall in March during La Nina Events. The possible causes for this increased March rainfall is under investigation.

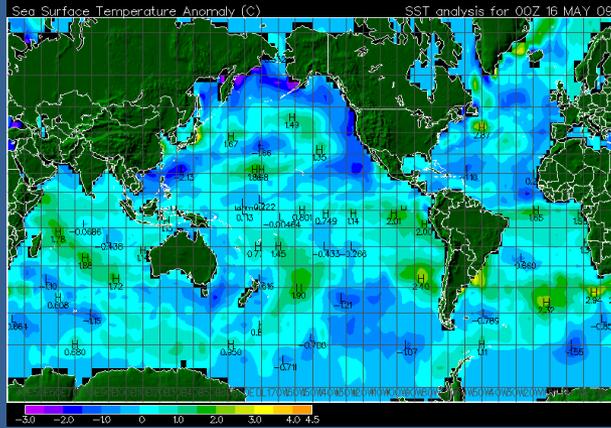
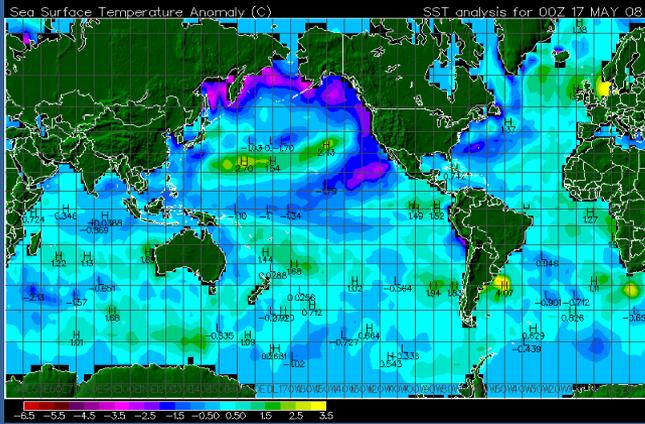
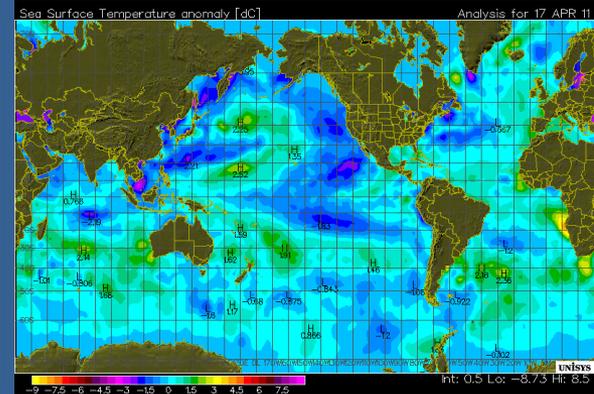
2008



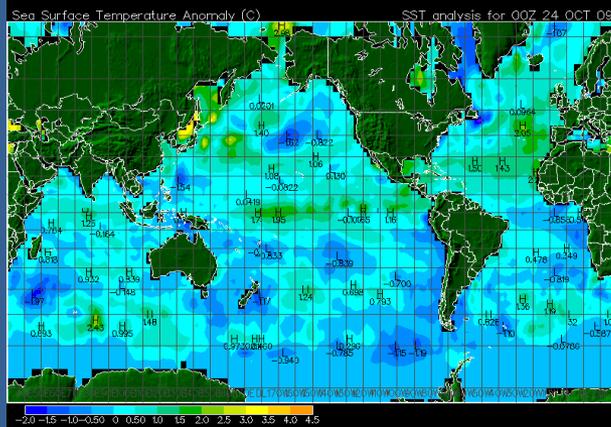
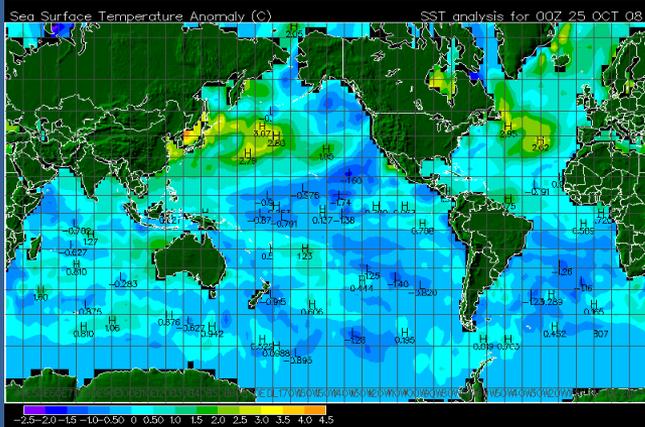
2009



2011



?



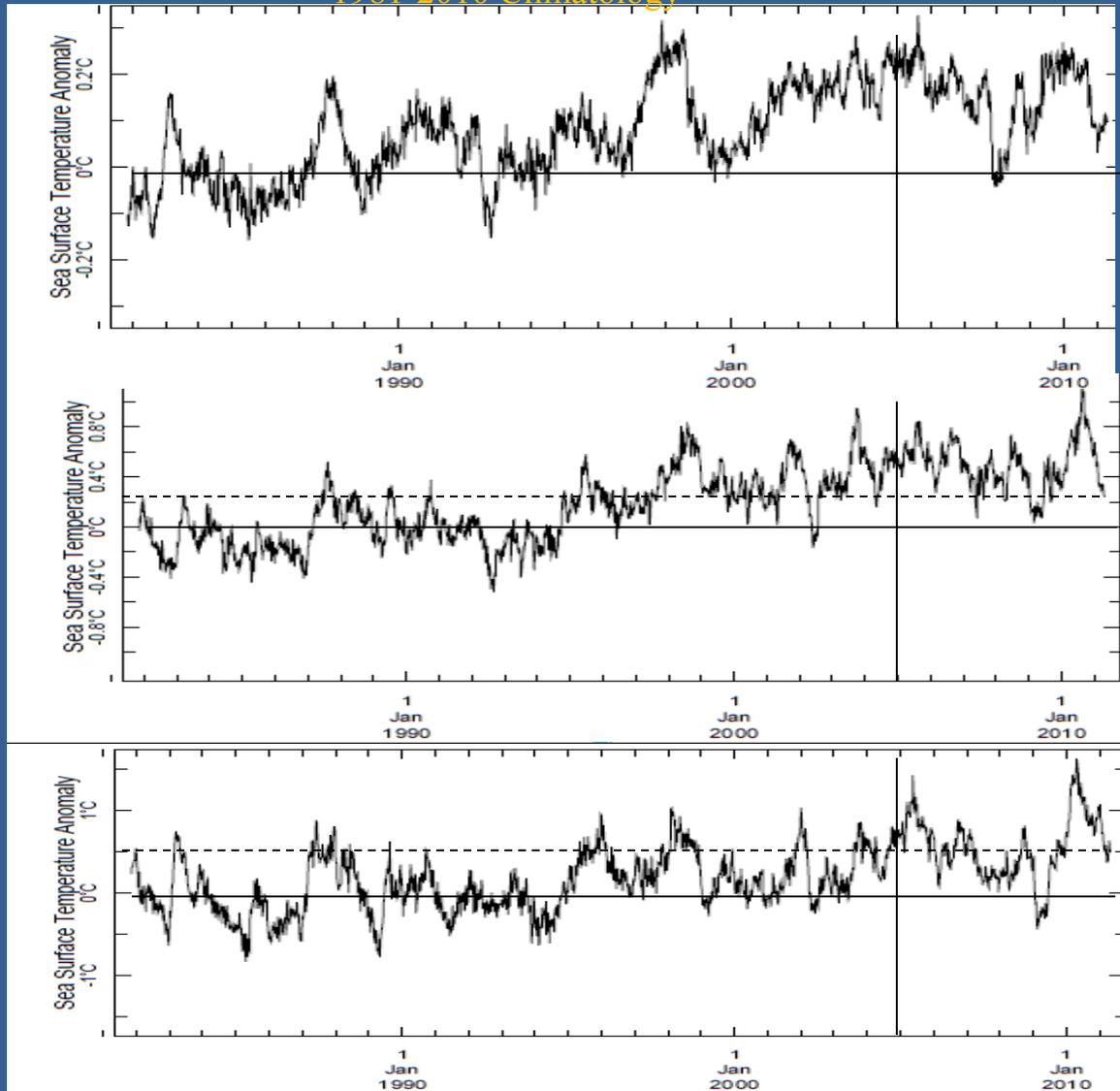
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# Weekly Sea Surface Temperature Anomaly (SSTA)

Smith and Reynolds (1998)

1981-2010 Climatology

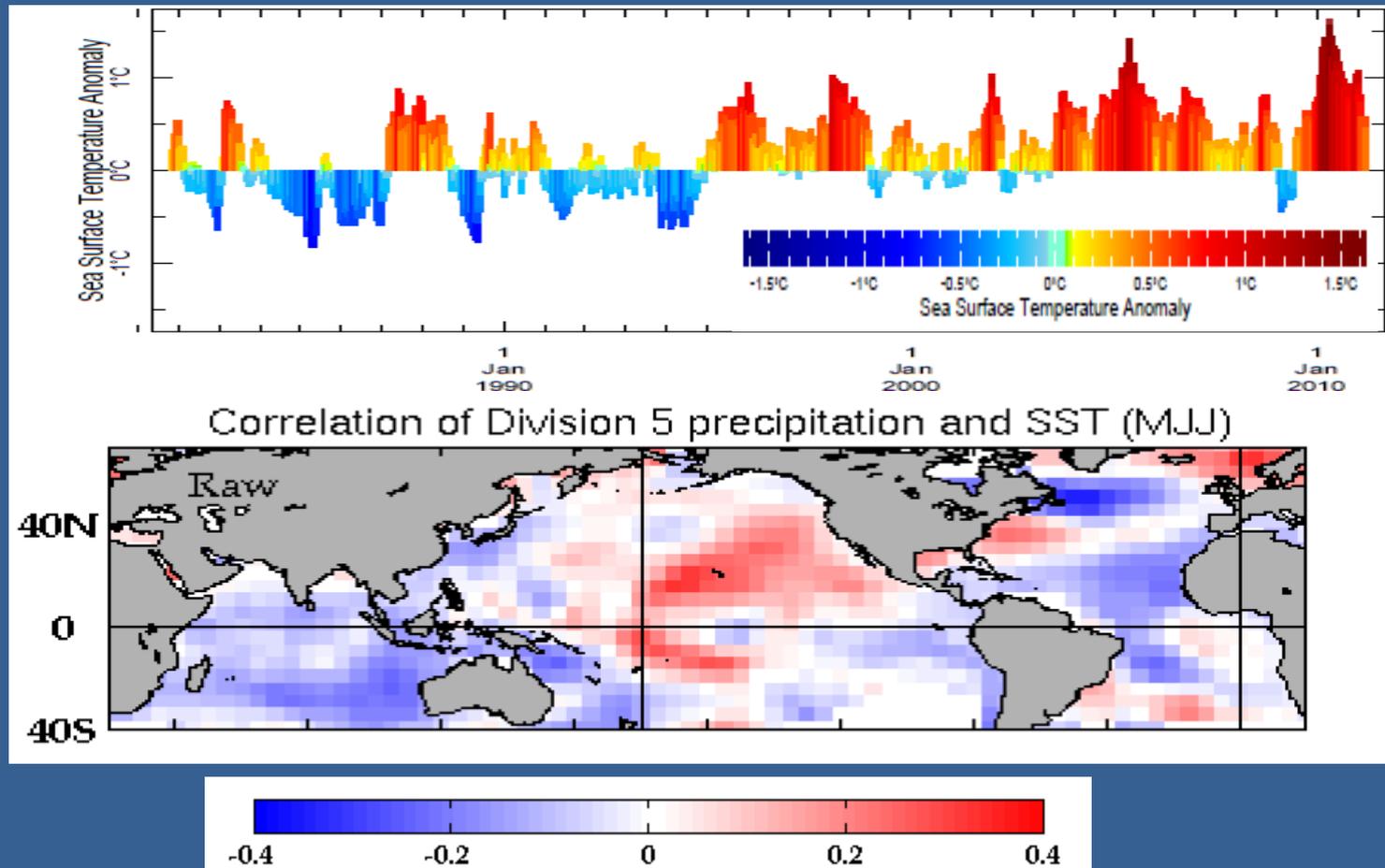
Global  
Sea Surface  
Temperature  
Anomaly  
(SSTA)



North Atlantic  
SSTA

North  
Tropical Atlantic  
SSTA

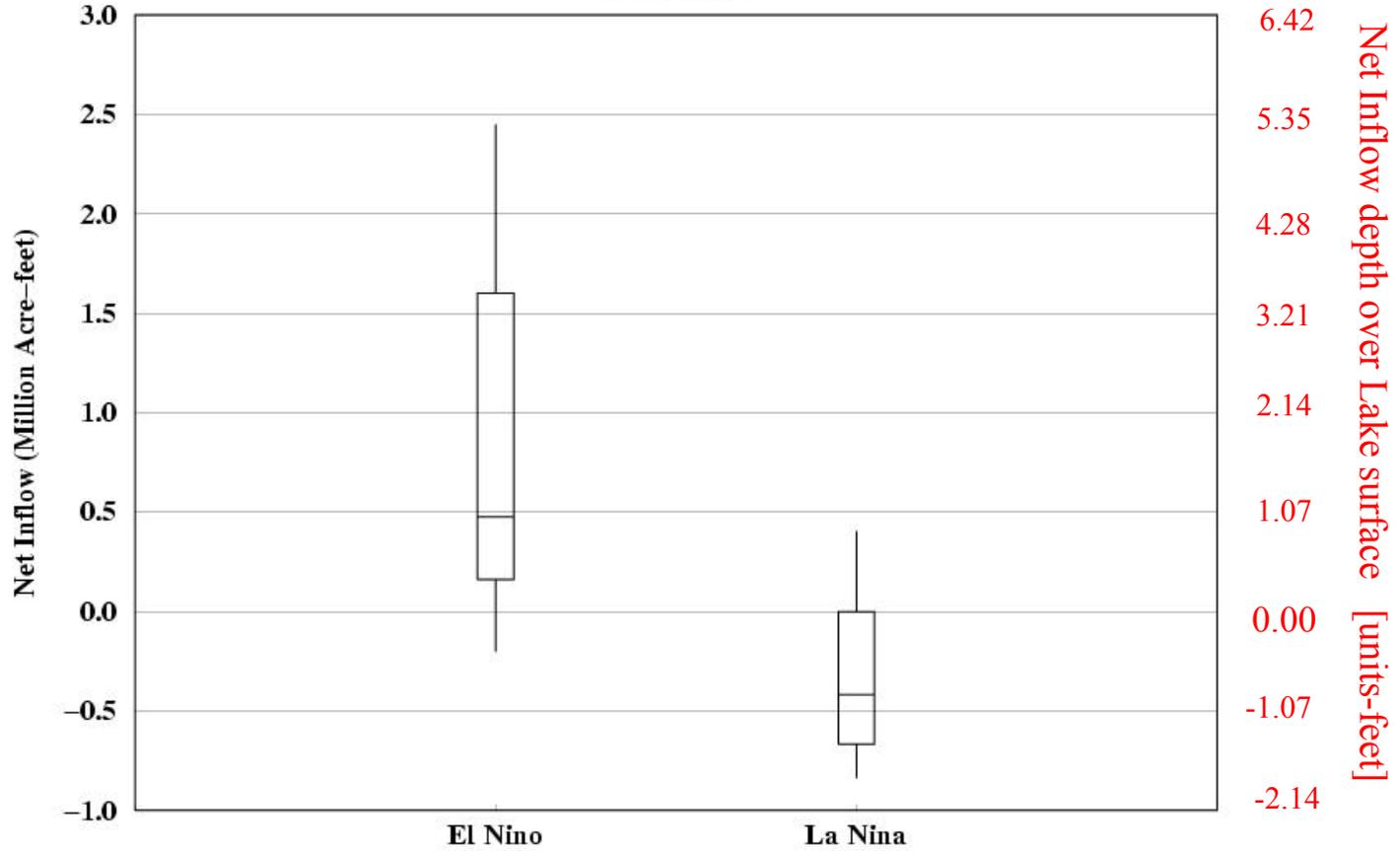
## North Tropical Atlantic Sea Surface Temperature Anomalies favor less rainfall for the May-June-July Climate Window



Map of correlation coefficient of sea surface temperature Everglades rainfall. The North tropical Atlantic and eastern equatorial Pacific STTA is negatively correlated to Everglades rainfall. Thus the warm SSTA in the Atlantic favor a below average rainfall.

# Lake Okeechobee Inflow

Dry Season

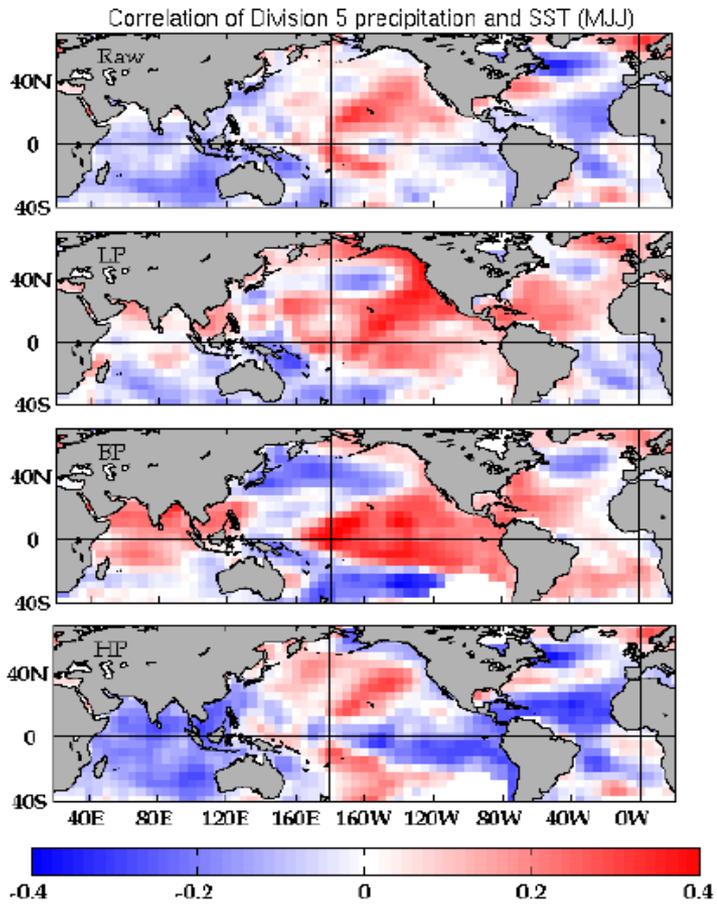


Net Inflow depth over Lake surface [units-feet]

ENSO Phase	Min	Q1	Median	Q3	Max
El Nino	6.42	5.35	4.28	3.21	2.14
La Nina	1.07	0.00	-1.07	-2.14	-3.21

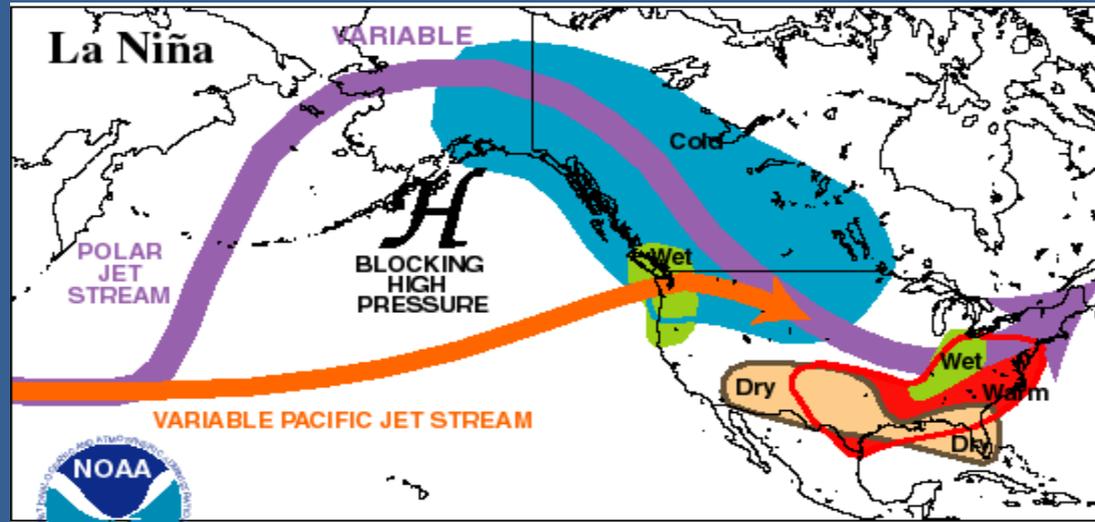
ENSO as defined by Center for Ocean-Atmospheric Prediction.

# Everglades Rainfall correlated to sea surface temperature anomalies

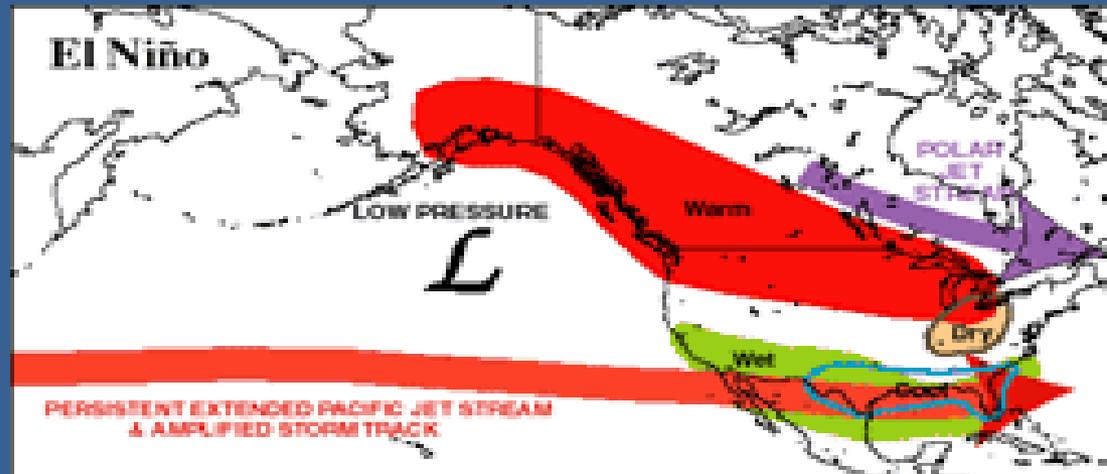


# Florida Normally has drier conditions during La Nina

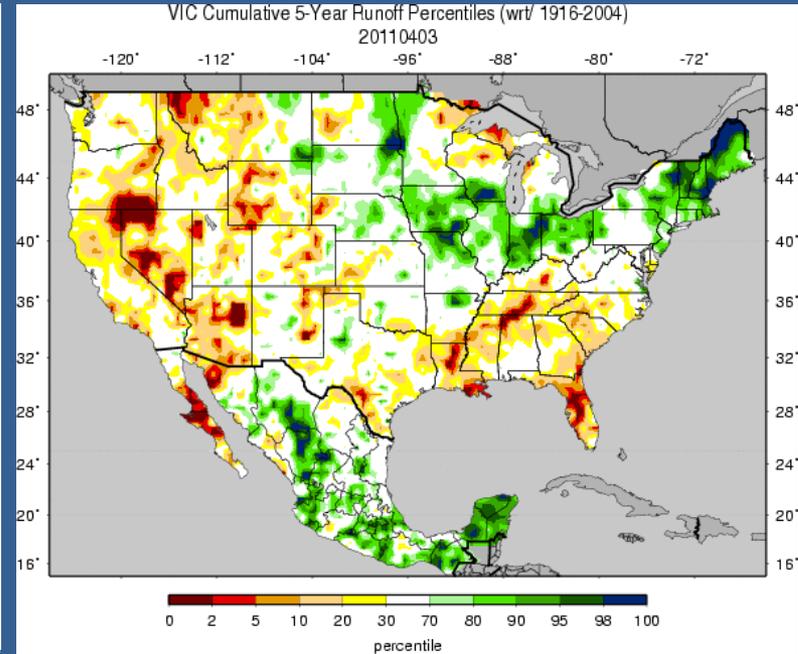
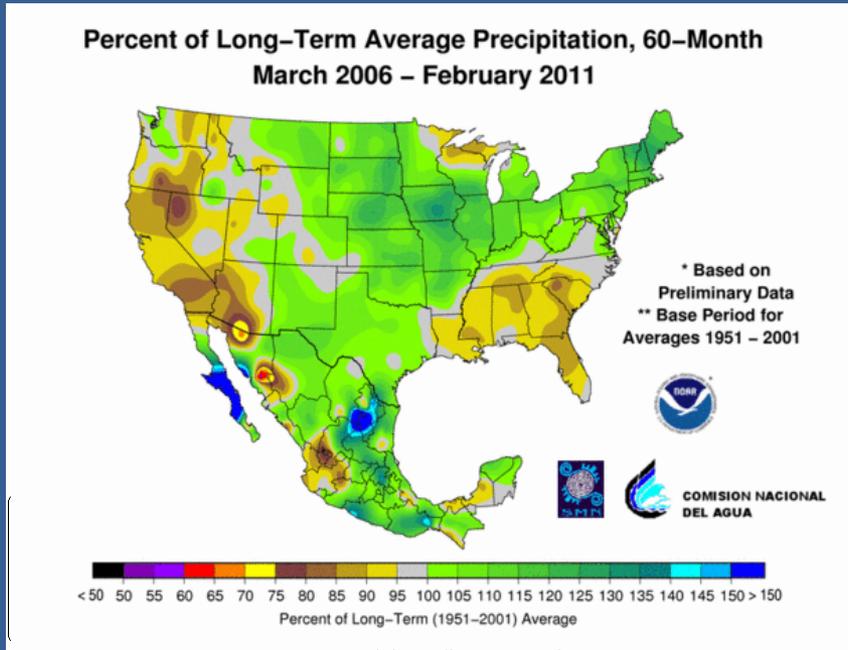
During La Nina conditions the Pacific jet stream and storm track tend to flow north of Florida producing drier conditions within south Florida.



During El Niño conditions the Pacific jet stream and storm track tend to flow across Florida producing wetter conditions within the state.



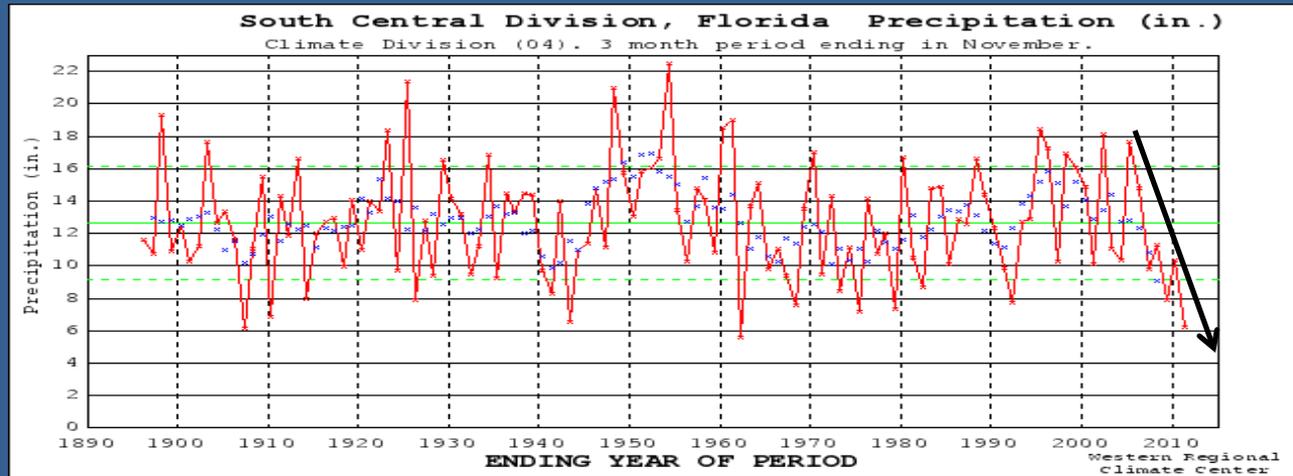
Rainfall the last 60- months over a large portion of the District has been at 5 to 10% less of normal



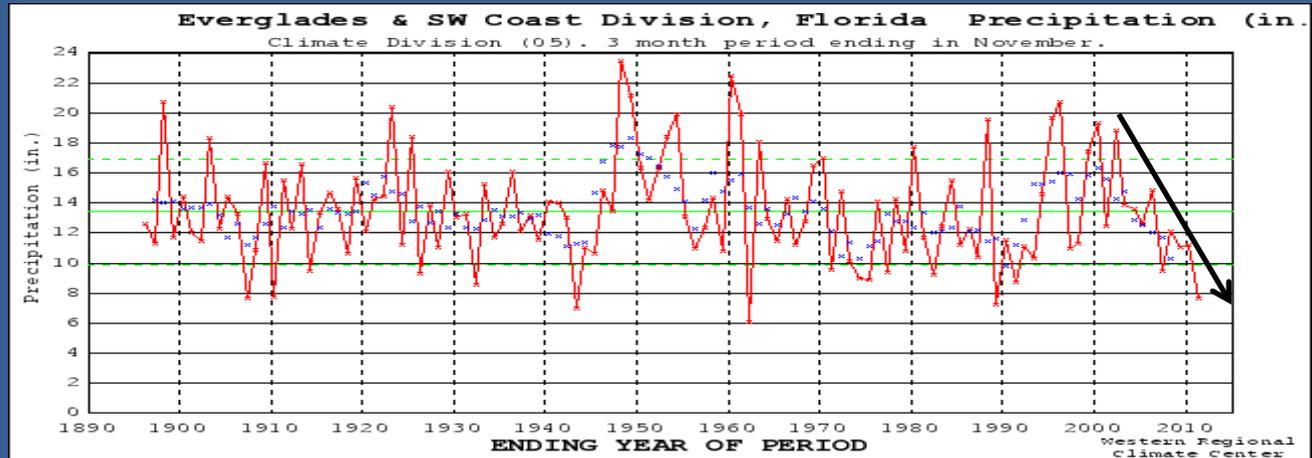
Areal view of the 5- year decline in rainfall and runoff.

# Late tropical season rainfall declines since 2005

Climate Division 4



Climate Division 5



In recent years there has been a marked declines in the late tropical season rainfall has been present.

# End of April Palmer Drought Severity Index (PDSI)

