

Summary

- Currently La Nina conditions continue to weaken [slides 3].
- The subsurface equatorial Pacific has been warming rather quickly.
 - consistent with the surface weakening [slide7]. 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 10].
- If La Nina conditions persist into and through the April-June climate window chances for below normal rainfall increase for this climate window (slide 14).
- PDO is still in a moderate to strong conditions. This tends to impede El Nino development and favors La Nina development. (Slide 11)
- The sea surface temperature anomalies in the North Atlantic and the Atlantic Hurricane Main Development regions sea surface are lower than last tropical season although still above normal. 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]
- September-November rainfall has sharply decreased since 2005 (Slide 24).

U.S. Drought Monitor

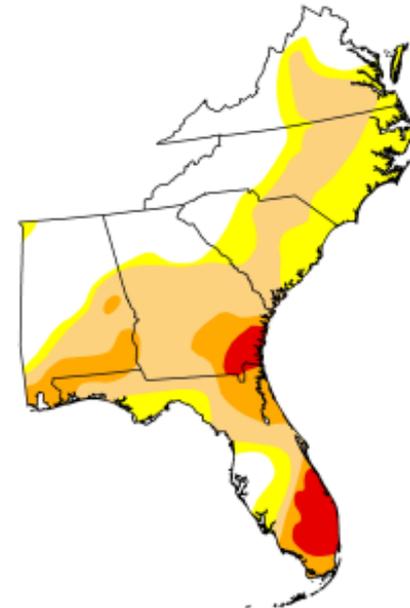
Southeast

April 12, 2011

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	30.65	69.35	48.75	15.15	4.60	0.00
Last Week (04/05/2011 map)	28.48	71.52	49.77	14.63	4.44	0.00
3 Months Ago (01/11/2011 map)	15.08	84.92	57.90	25.36	6.86	0.00
Start of Calendar Year (12/28/2010 map)	23.01	76.99	51.84	23.55	5.63	0.00
Start of Water Year (09/28/2010 map)	18.18	81.82	38.04	10.32	0.90	0.00
One Year Ago (04/06/2010 map)	94.61	5.39	0.00	0.00	0.00	0.00



Intensity:



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 14, 2011
Anthony Artusa, NOAA/NWS/NCEP/CPC

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

Niño Region SST Departures (°C) Recent Evolution

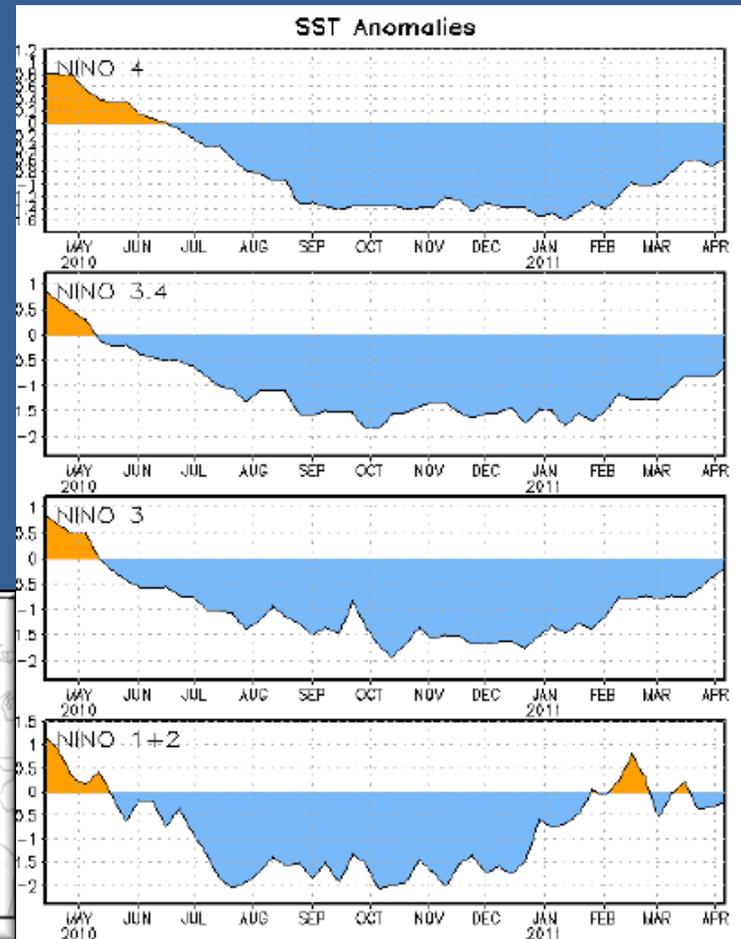
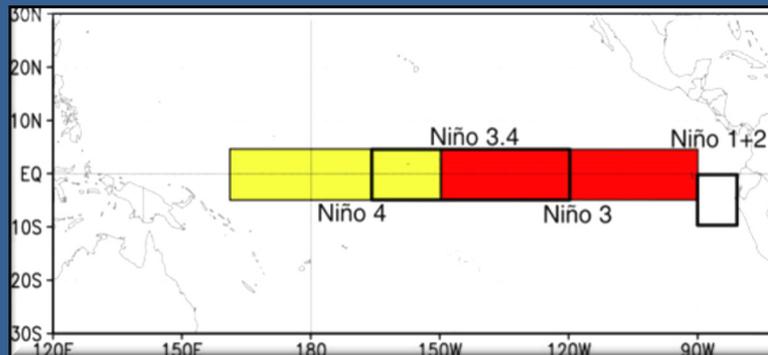
The latest weekly SST departures are:

Niño 4 **-0.5°C**

Niño 3.4 **-0.6°C**

Niño 3 **-0.1°C**

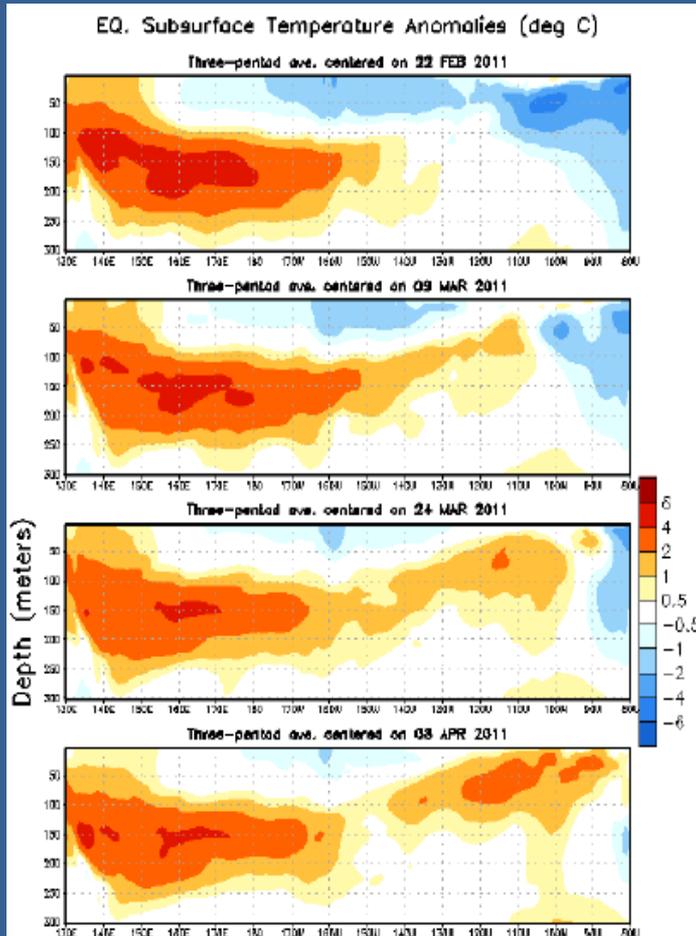
Niño 1+2 **0.4 °C**



Niño 3.4 is used to compute the official index.

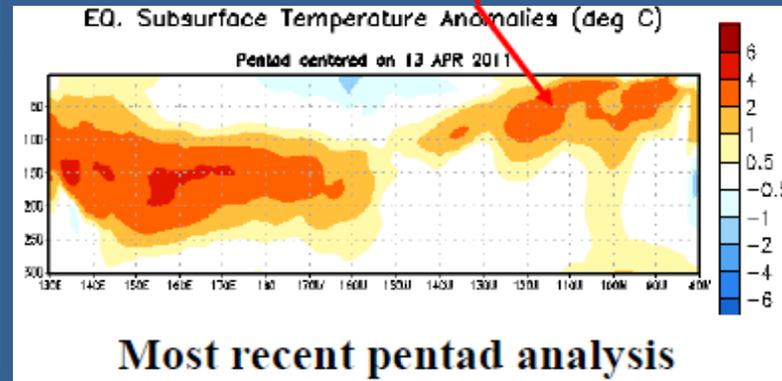
Equatorial Pacific Sub Surface Temperature Anomaly

Time



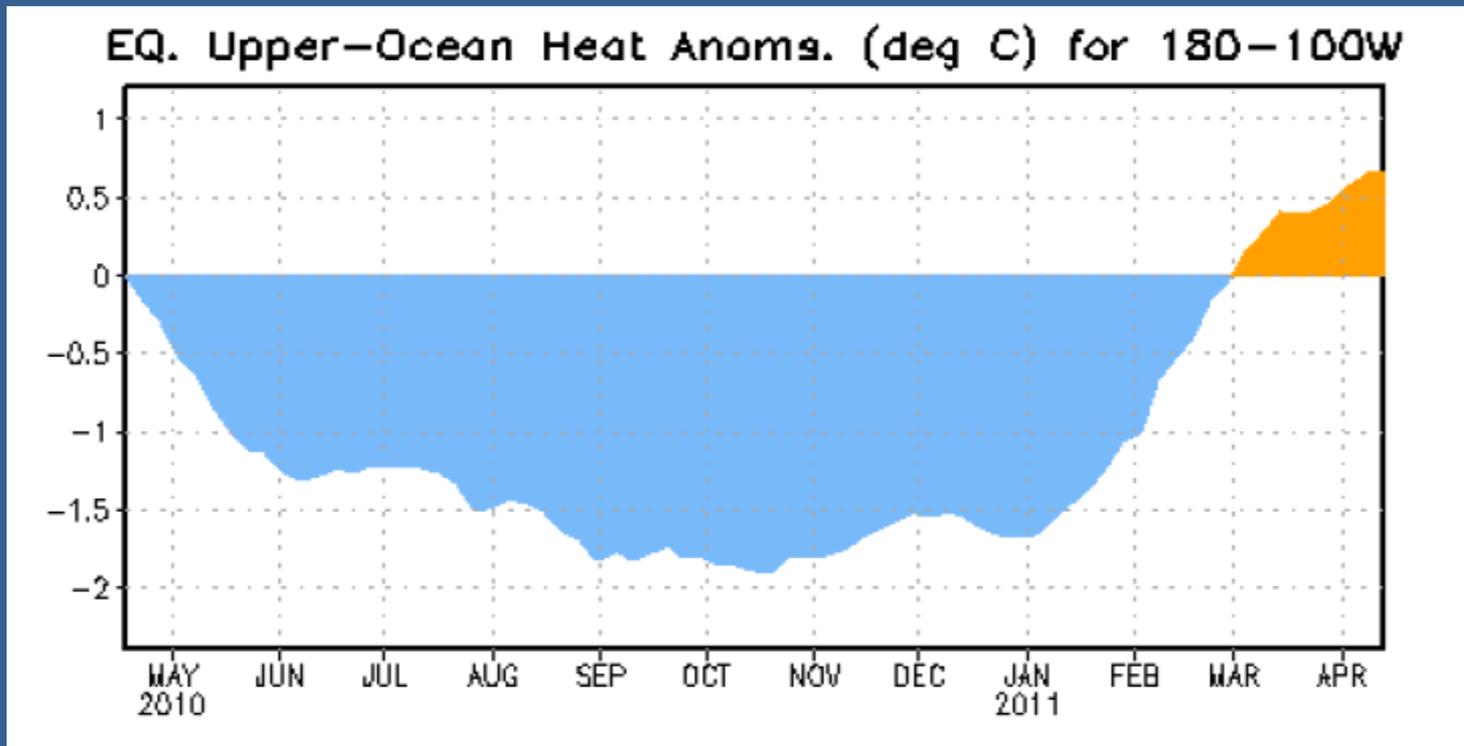
Longitude

- Since late December 2010, positive subsurface temperature anomalies have expanded eastward at depth (100-300m), with anomalies in the central and eastern Pacific switching to positive.
- Positive anomalies in the eastern Pacific have continued to increase in the most recent period.



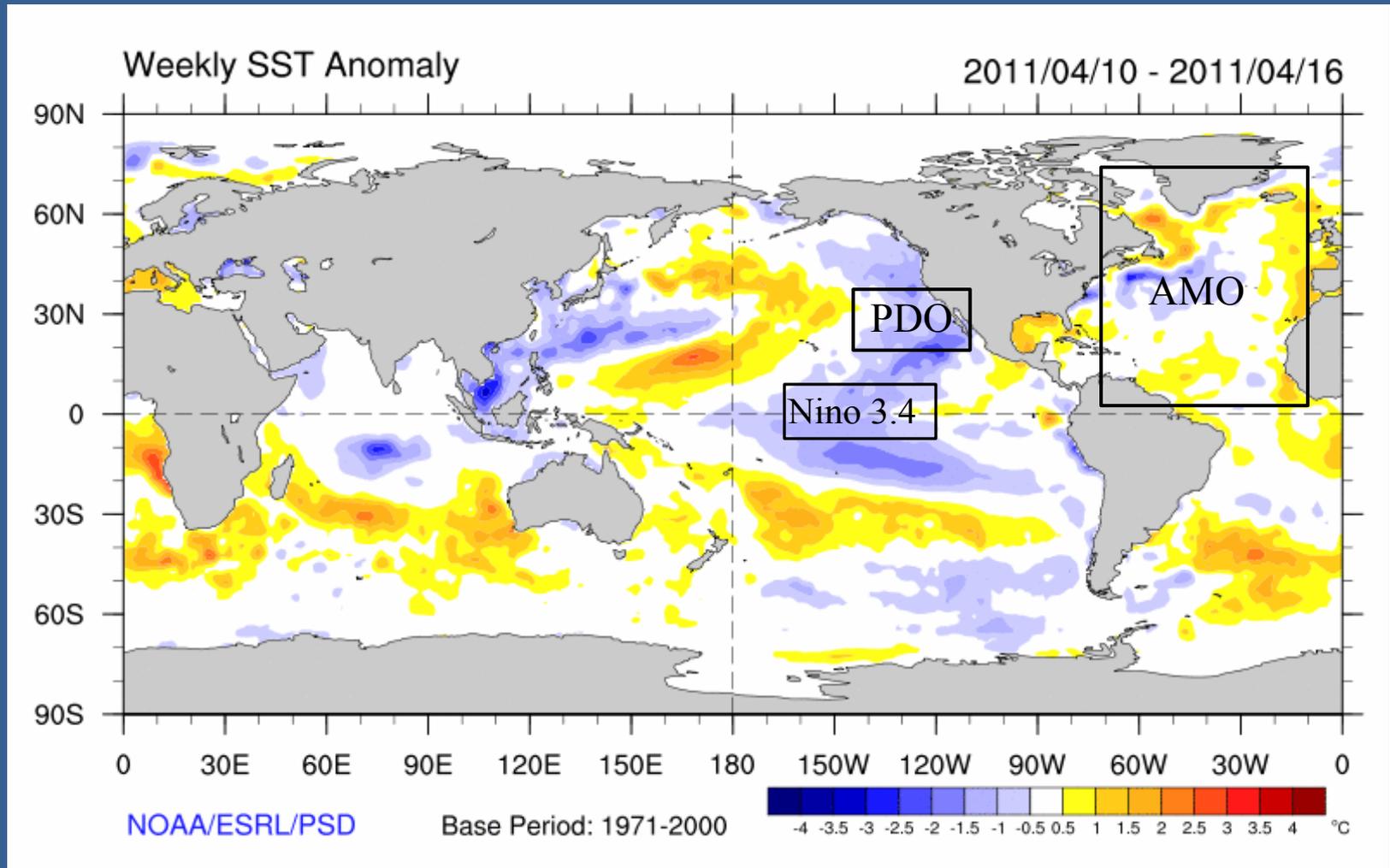
Most recent pentad analysis

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



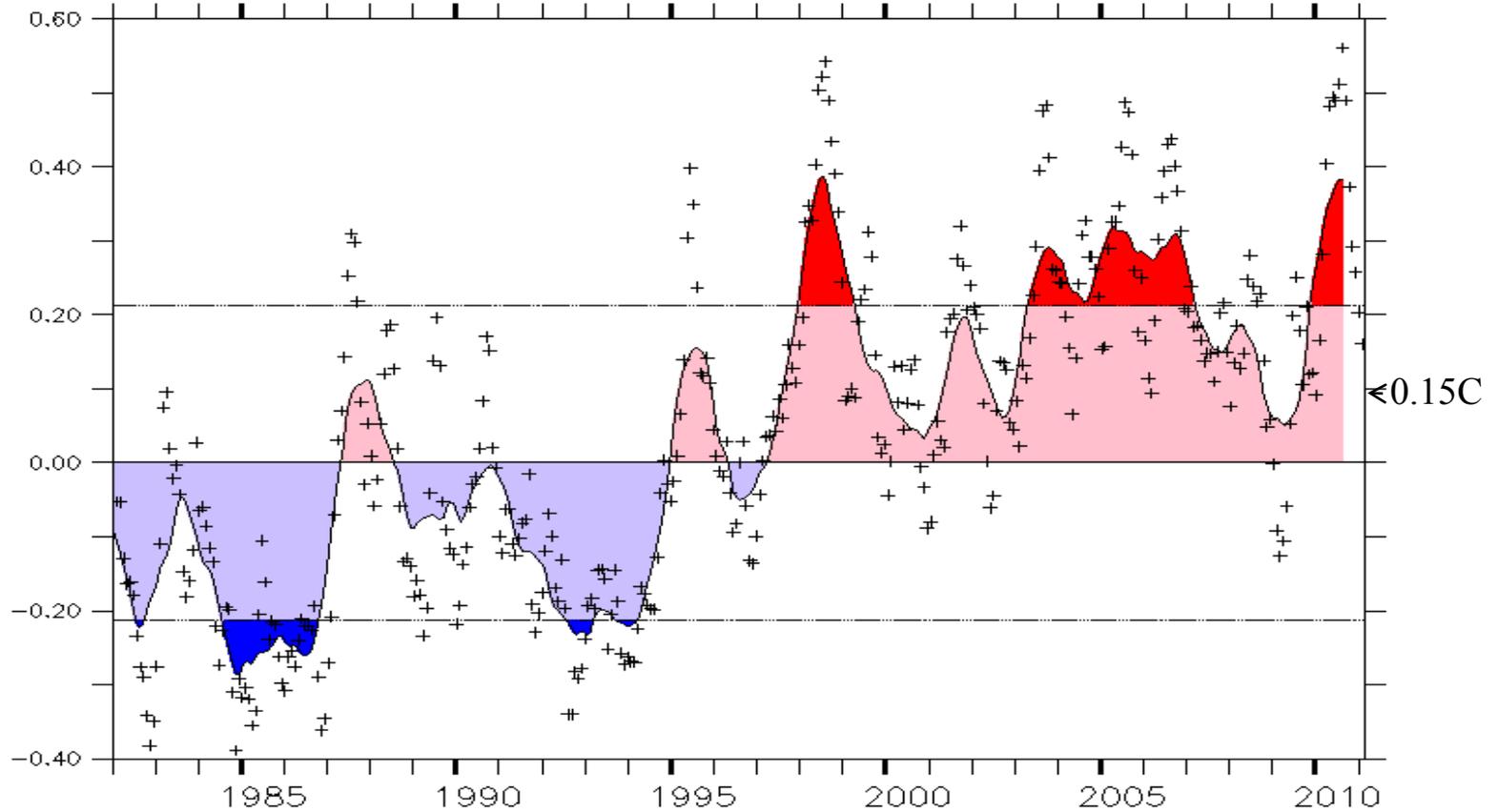
Large positive anomalies associated with El Niño decreased beginning in late February 2010, becoming negative in late April. The negative anomalies since June 2010 are consistent with La Niña. In January 2011 negative anomalies began to decrease in magnitude, with anomalies becoming positive in March.

Weekly Sea Surface Temperature Anomaly



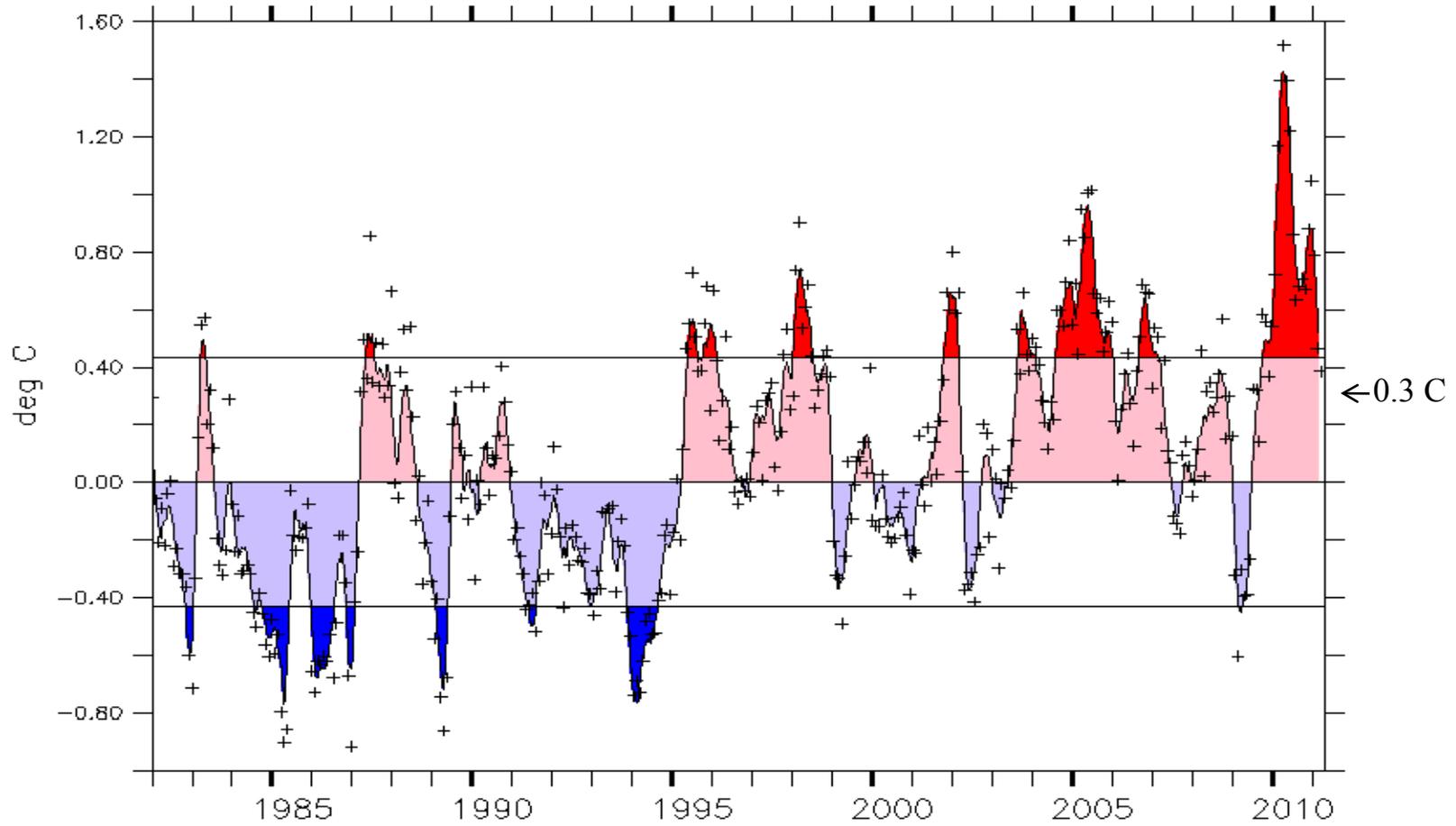
PDO is in cold Phase. ENSO cold but warming. AMO warm but cooling

Atlantic Multidecadal Oscillation



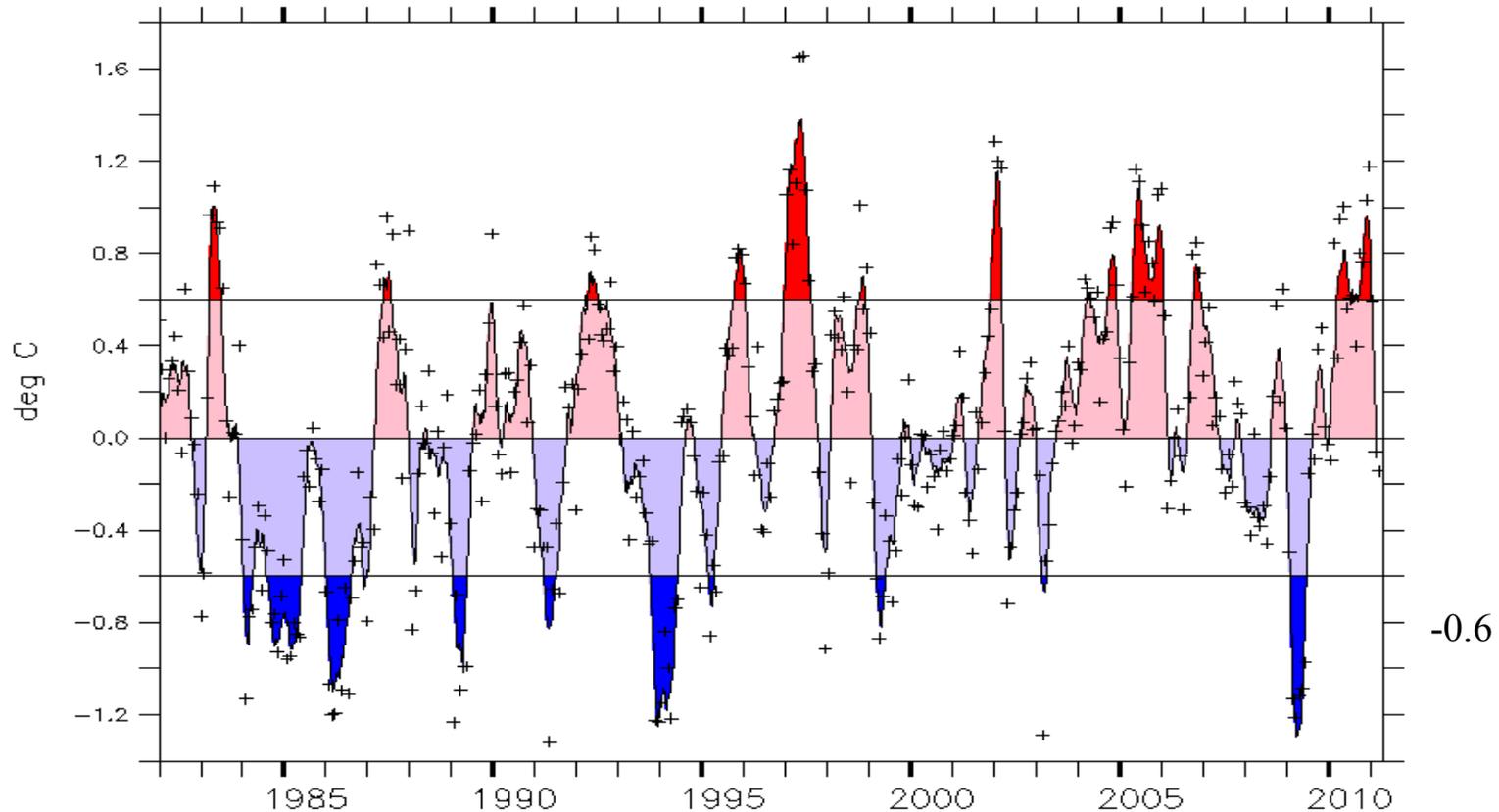
Ocean Observations Panel for Climate (OOPC) <http://ioc-goos-oopc.org/>

Tropical Northern Atlantic Index (TNA)



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

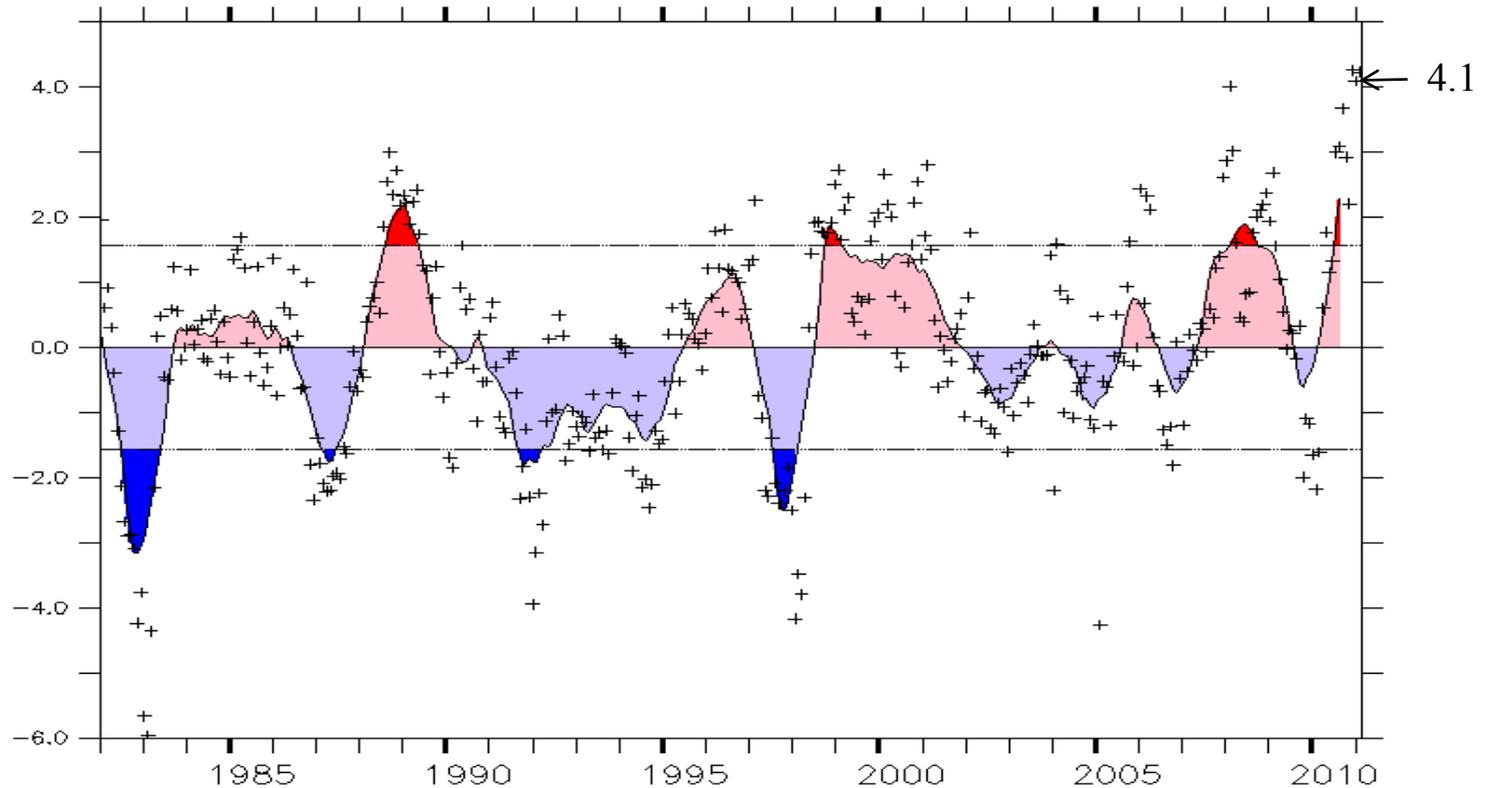
Tropical Atlantic (TASI) SST index



➤ 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/>

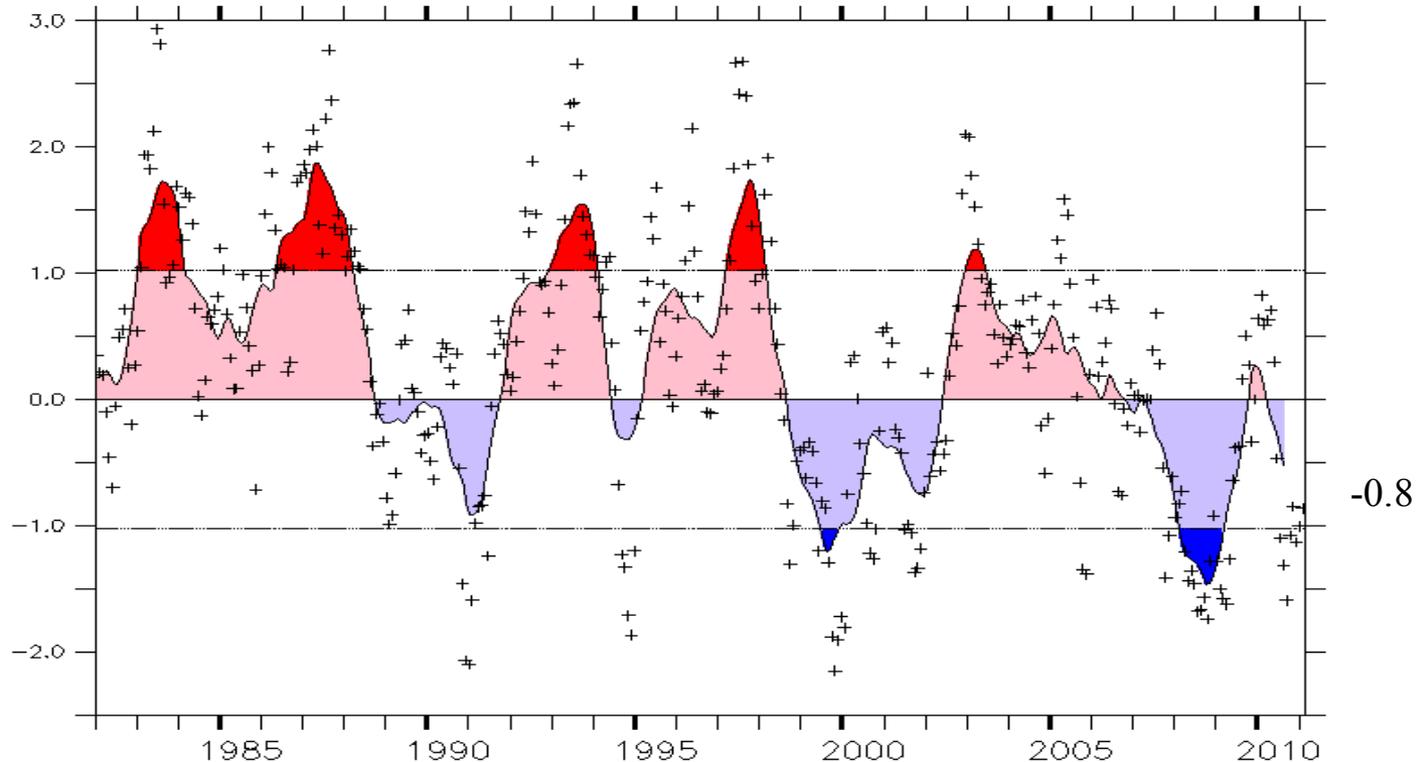
Southern Oscillation Index



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.

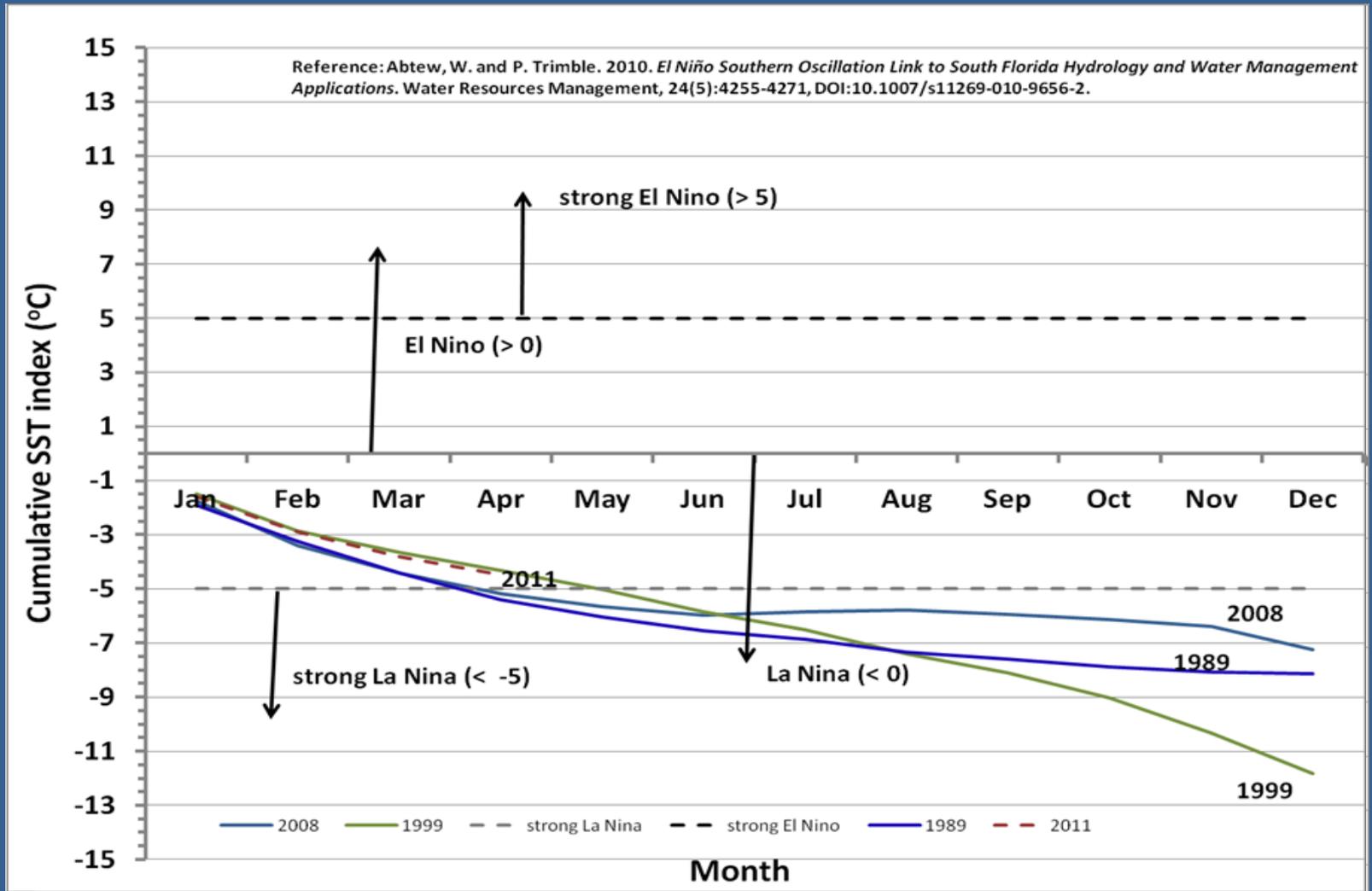
Pacific Decadal Oscillation



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).

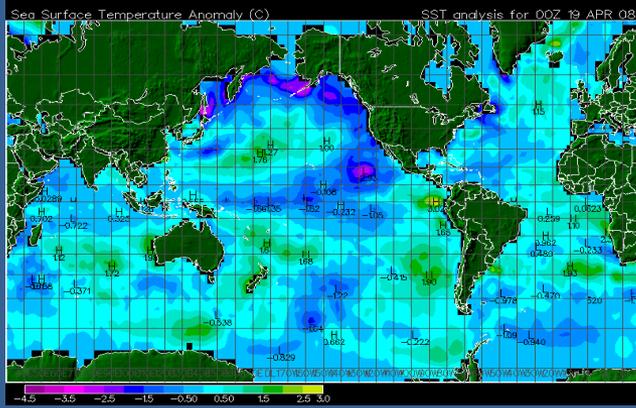
The PDO has been trending downward since 2004

Cumulative Nino Index (CNI)

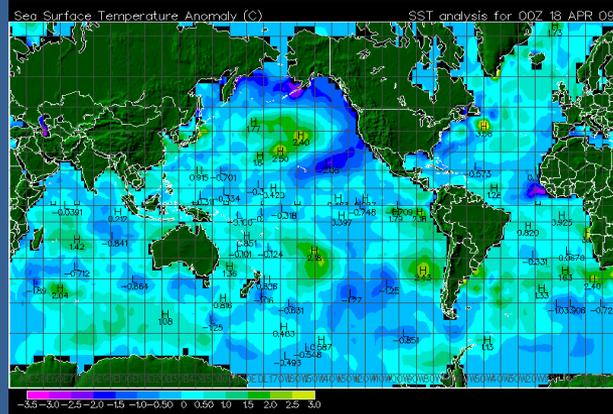


CNI has been decreasing. This is expected to slow during the summer.

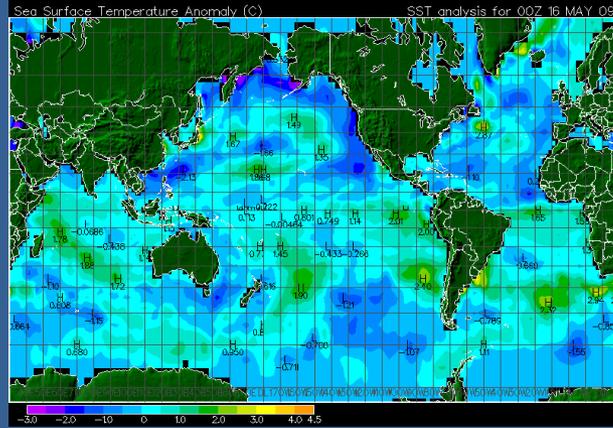
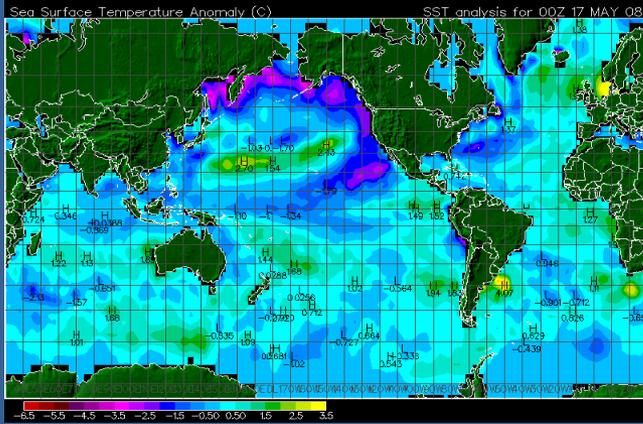
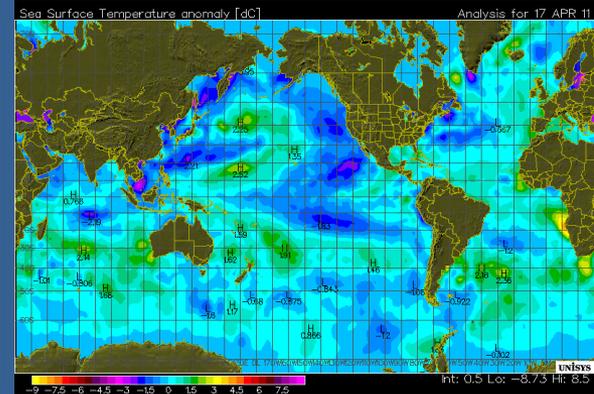
2008



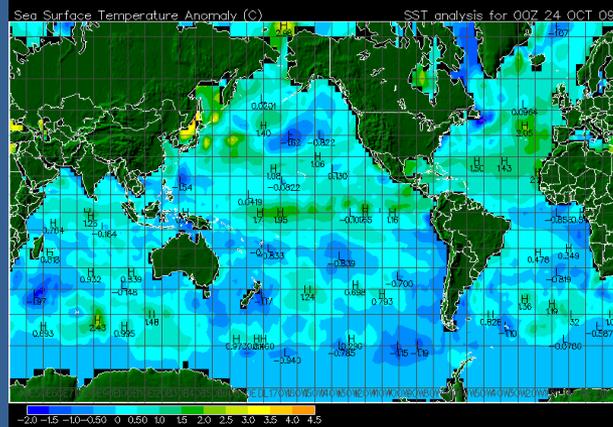
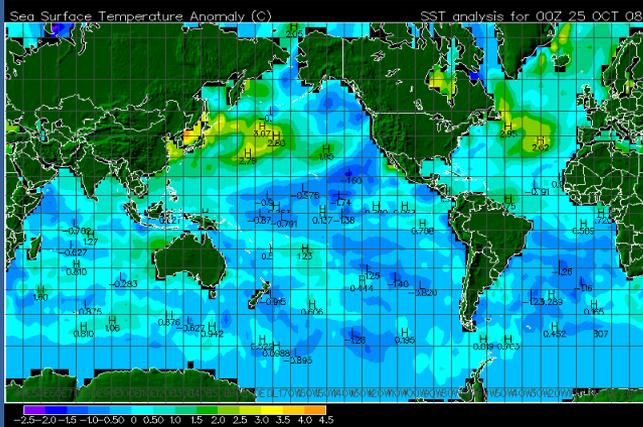
2009



2011



?



?



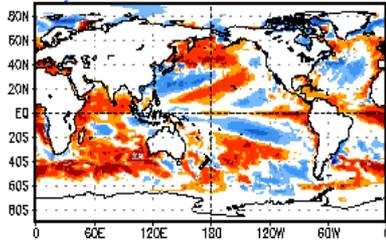
NWS/NCEP/CPC

Initial conditions: 8Apr2011-17Apr2011

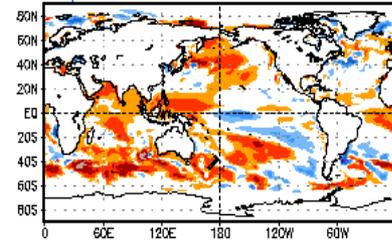
Last update: Tue Apr 19 2011

CFSv2 seasonal SST (K)

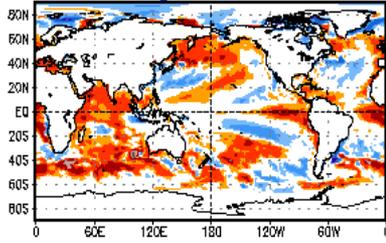
May-Jun-Jul 2011



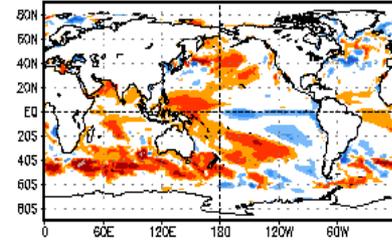
Sep-Oct-Nov 2011



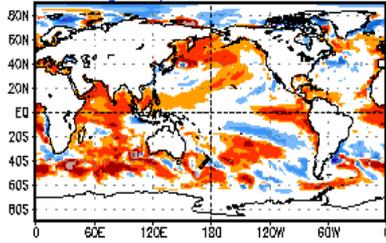
Jun-Jul-Aug 2011



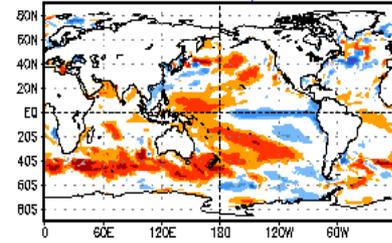
Oct-Nov-Dec 2011



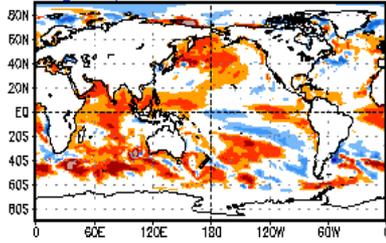
Jul-Aug-Sep 2011



Nov-Dec-Jan 2011/2012



Aug-Sep-Oct 2011

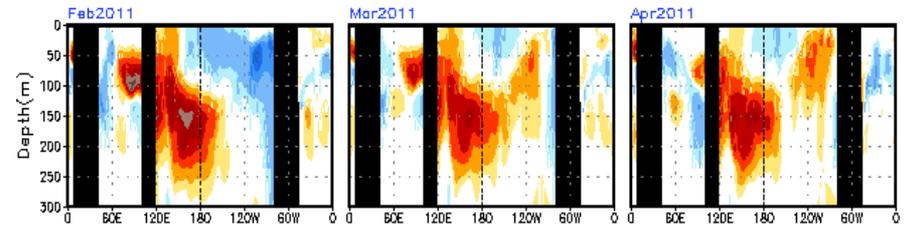


NWS/NCEP/CPC

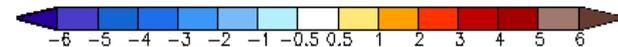
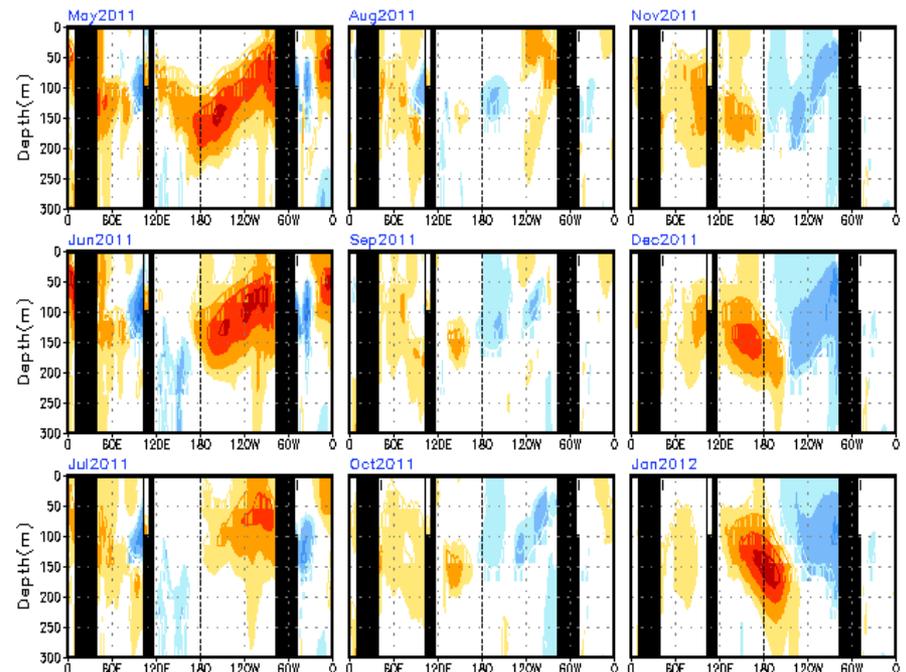
Initial conditions: 8Apr2011-17Apr2011

Last update: Tue Apr 19 2011

GODAS equatorial temperature(K)



CFSv2 equatorial temperature(K)



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

CFS New

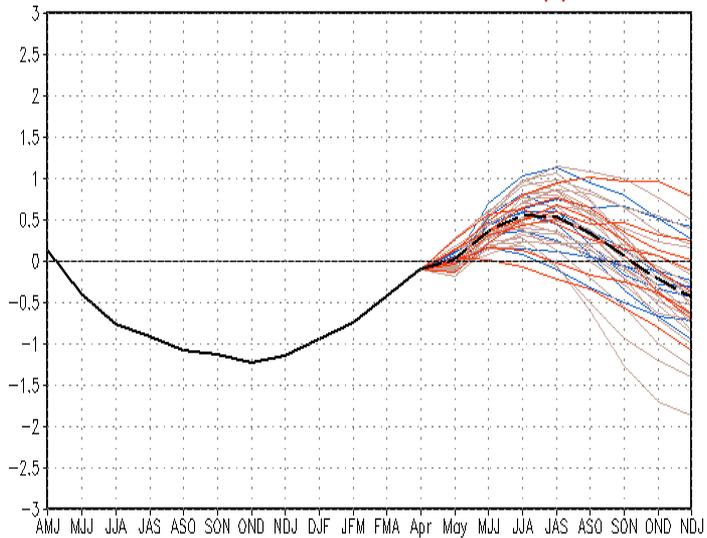
CFS Old



NWS/NCEP/CPC

Last update: Tue Apr 19 2011
Initial conditions: 8Apr2011-17Apr2011

CFSv2 forecast Nino3 SST anomalies (K)



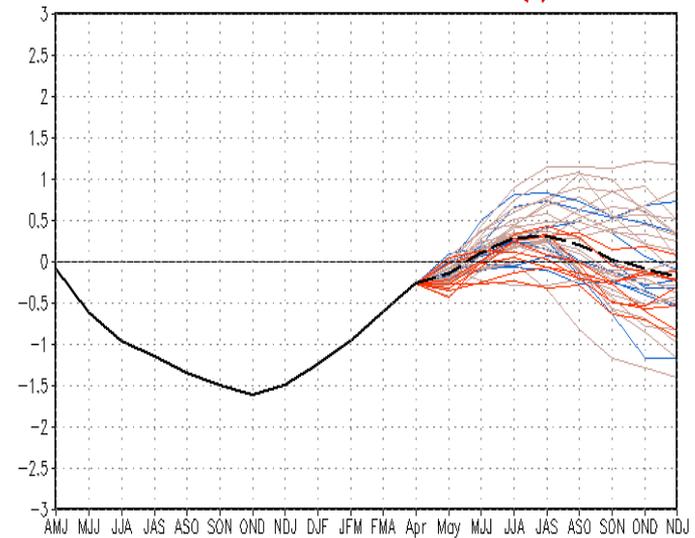
— Latest 8 forecast members
— Earliest 8 forecast members
— Other forecast members
- - - Forecast ensemble mean
— NCDC daily analysis



NWS/NCEP/CPC

Last update: Tue Apr 19 2011
Initial conditions: 8Apr2011-17Apr2011

CFS forecast Nino3 SST anomalies (K)

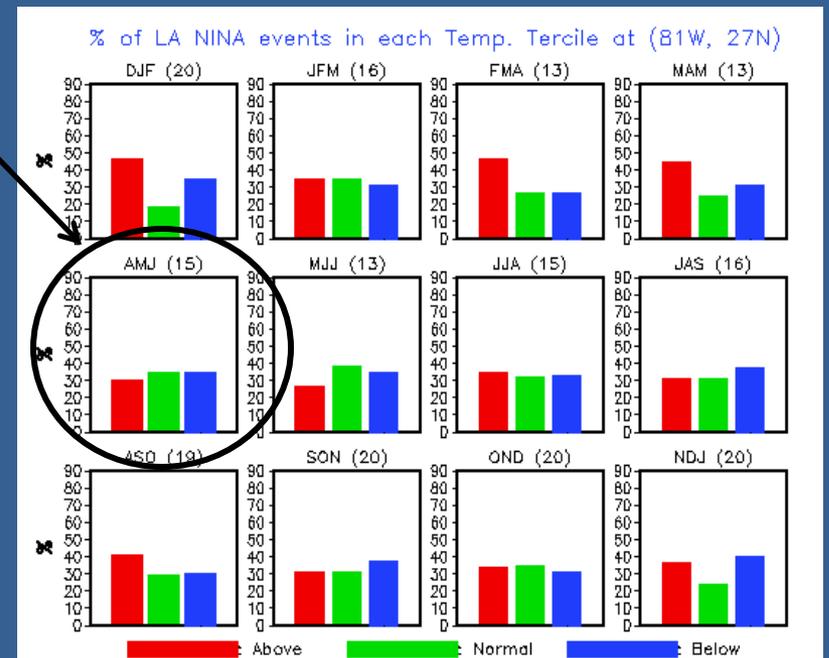
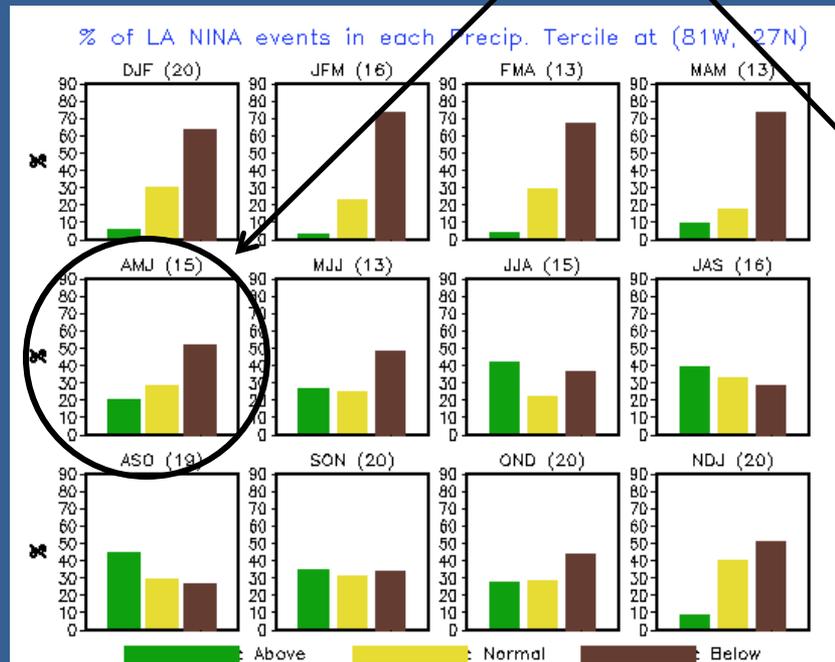
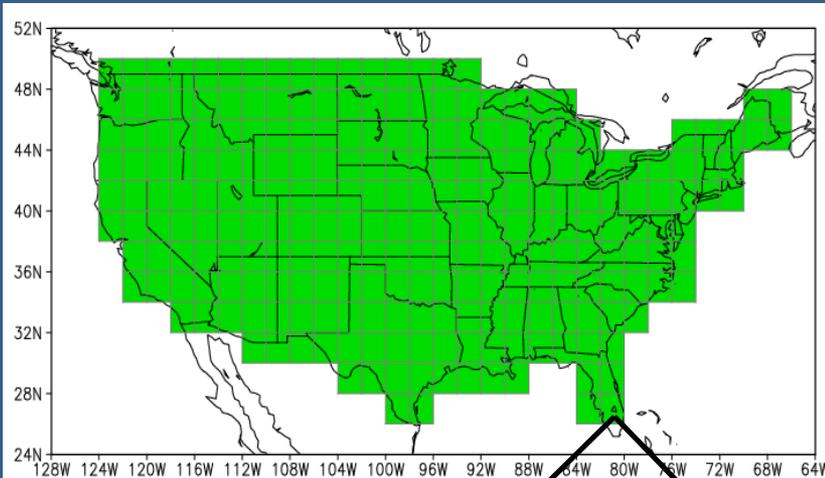


— Latest 8 forecast members
— Earliest 8 forecast members
— Other forecast members
- - - Forecast ensemble mean
— NCEP Olv2 weekly analysis

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

(Probability of events in upper middle and lower tercile)

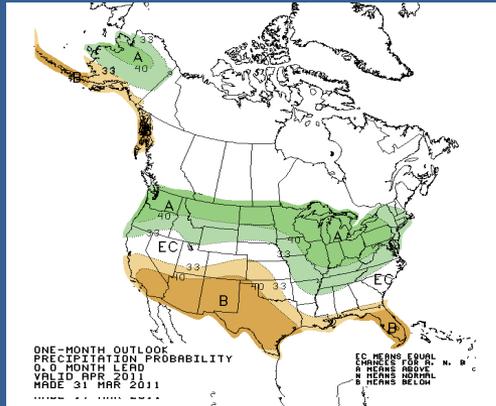
http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/ens_o_page_text.htm



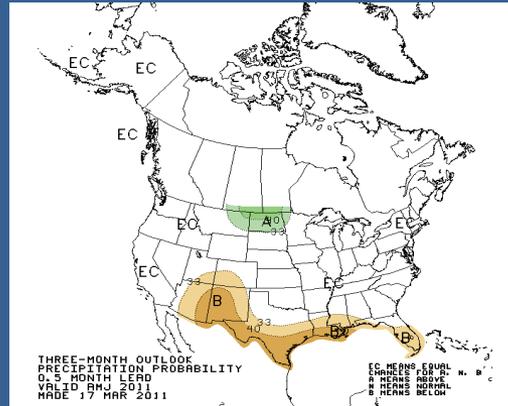
Official Three Month Overlapping Seasonal Outlooks

Climate Prediction Center

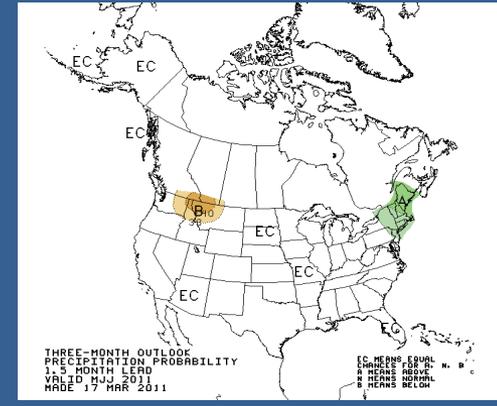
April



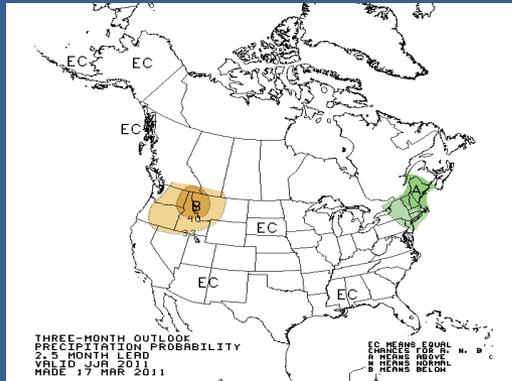
AMJ



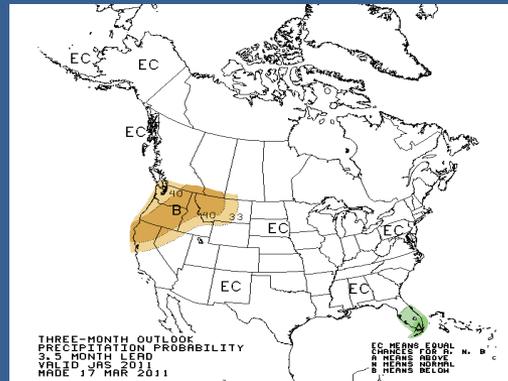
MJJ



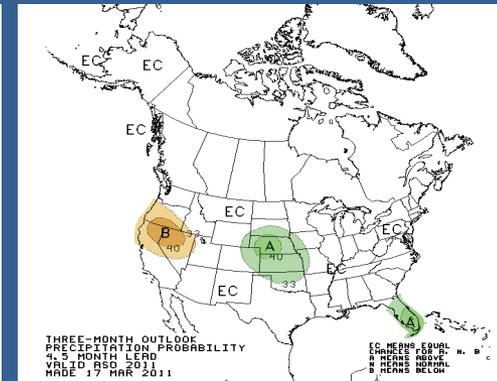
JJA



JAS

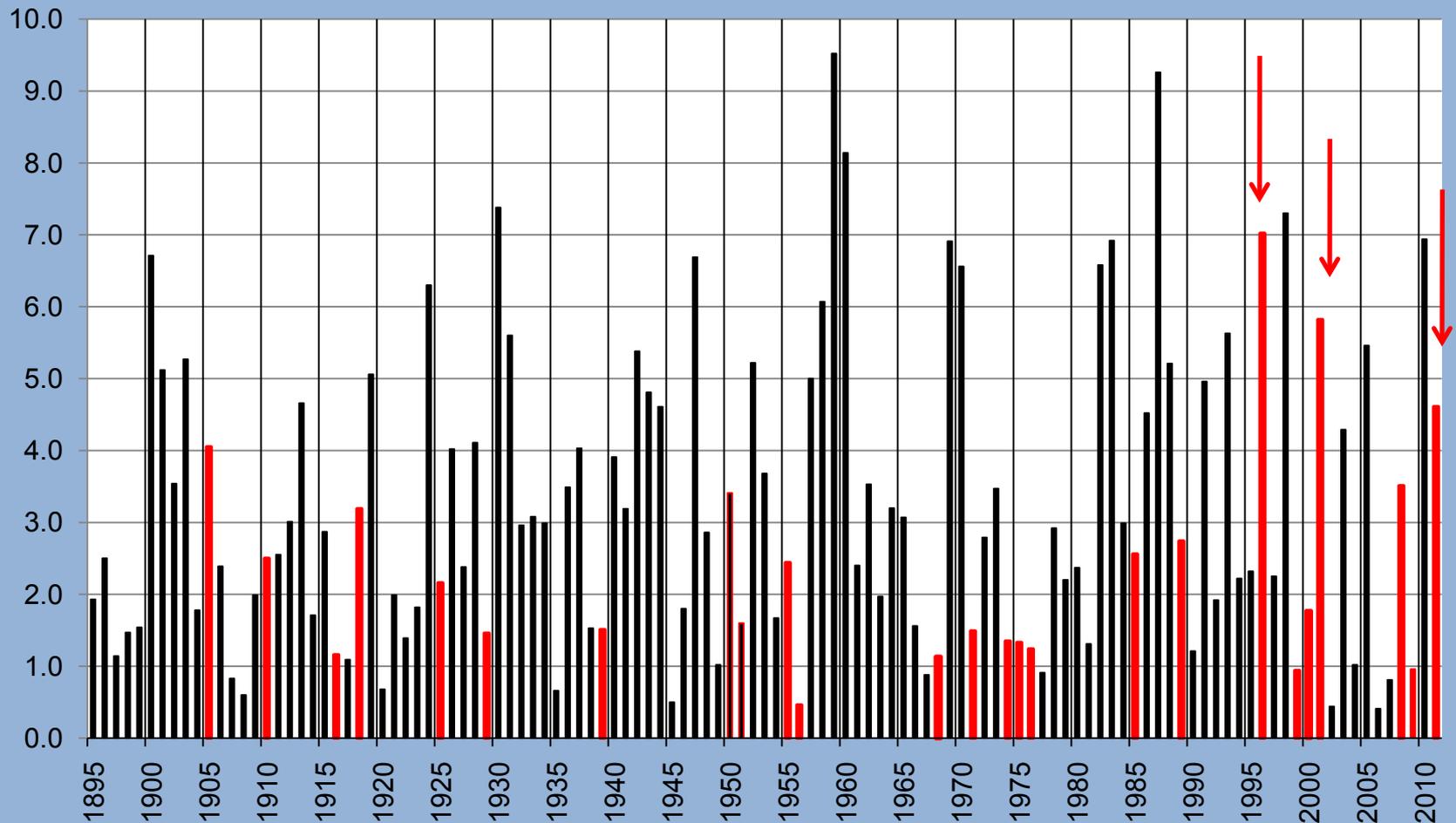


ASO



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



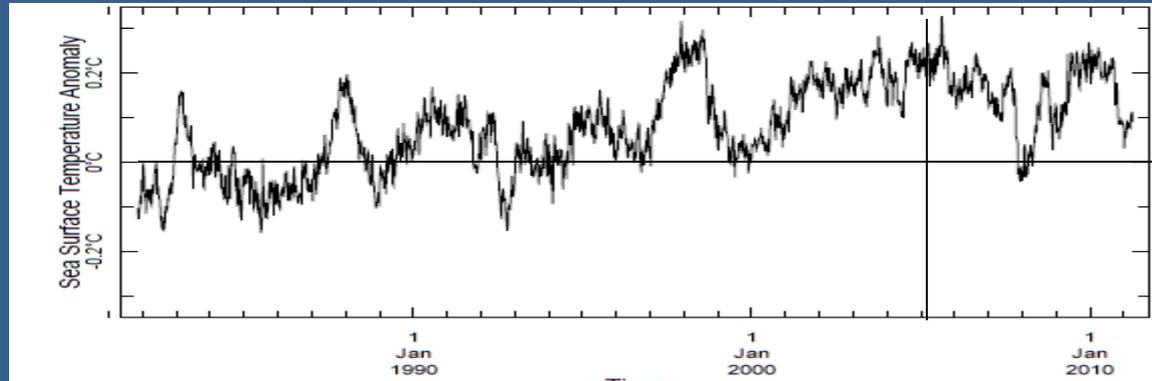
Red Bars indicate the La Nina events. Since 1995 there has been an increase in above normal rainfall in March during La Nina Events. The possible causes for this increased March rainfall is under investigation.

Weekly Sea Surface Temperature Anomaly (SSTA)

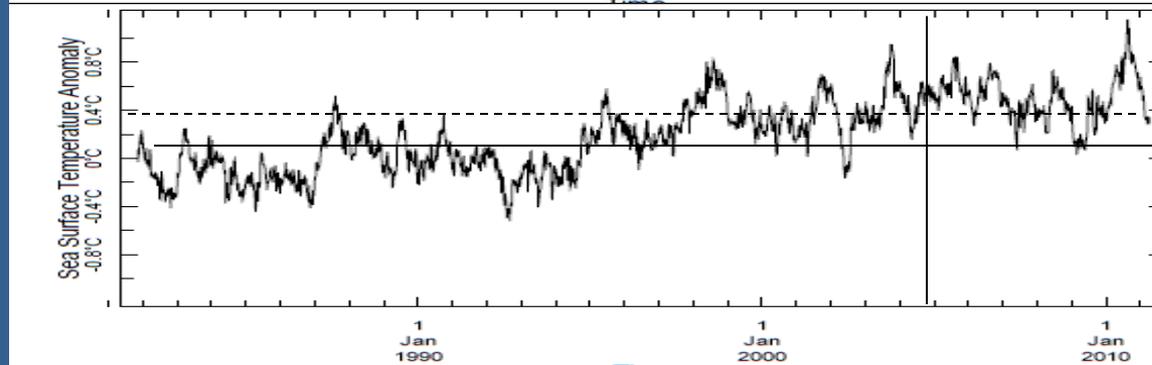
Smith and Reynolds (1998)

1981-2000 Climatology

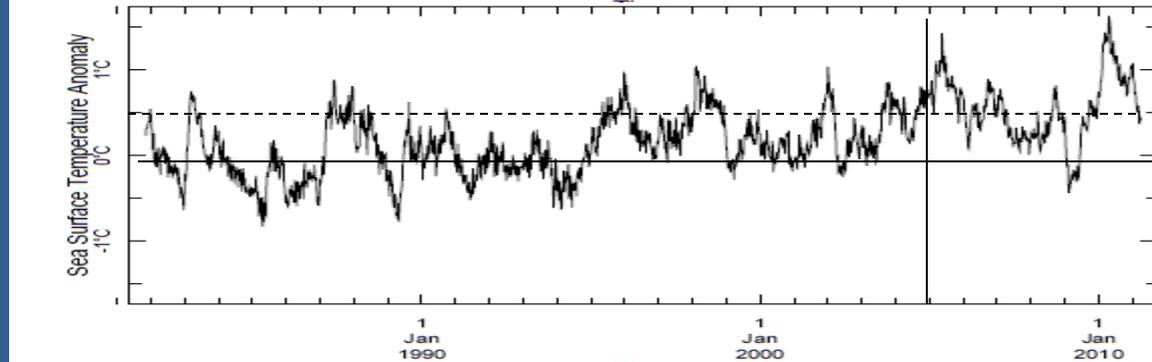
Global
Sea Surface
Temperature
Anomaly
(SSTA)



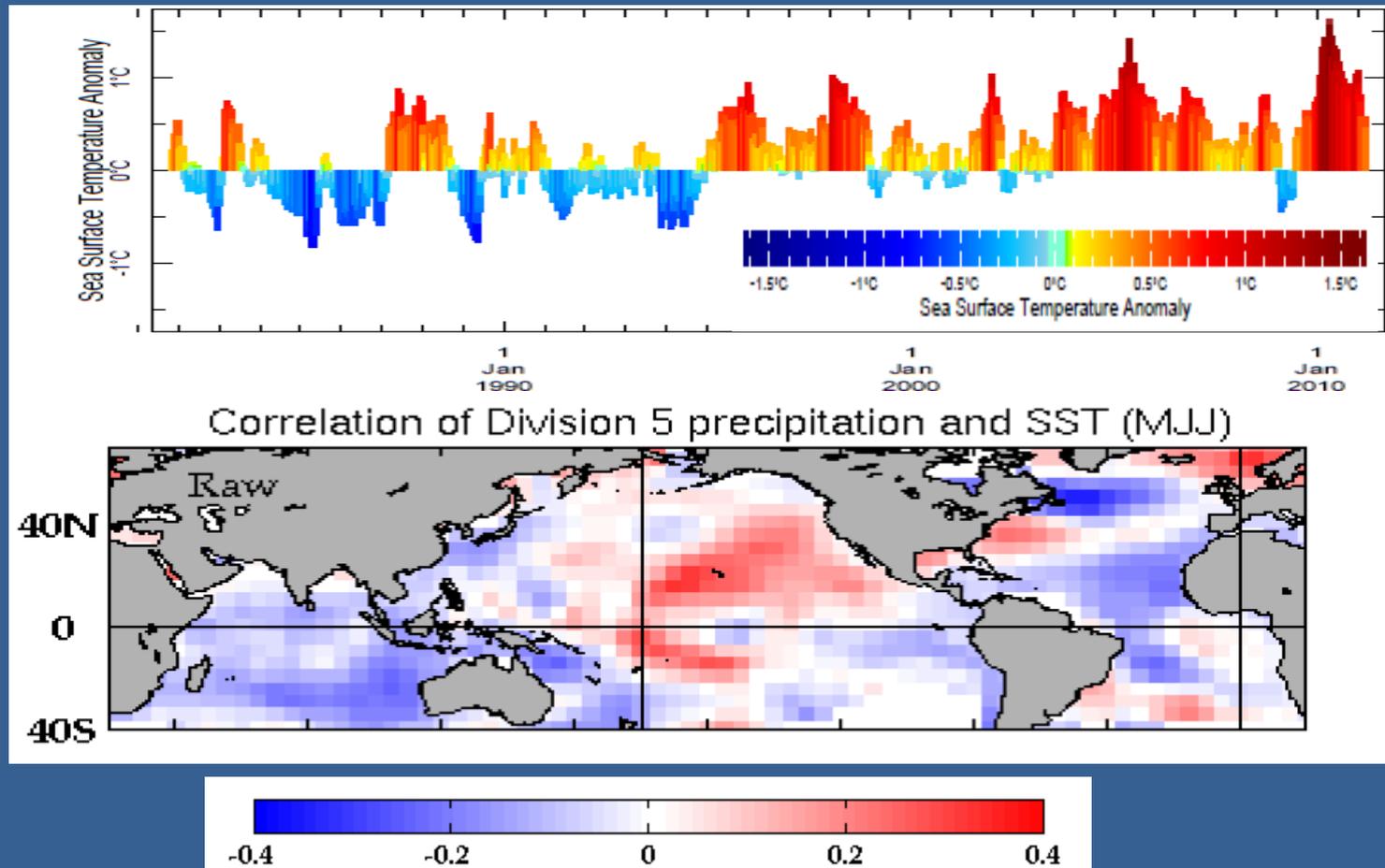
North Atlantic
SSTA



North
Tropical Atlantic
SSTA



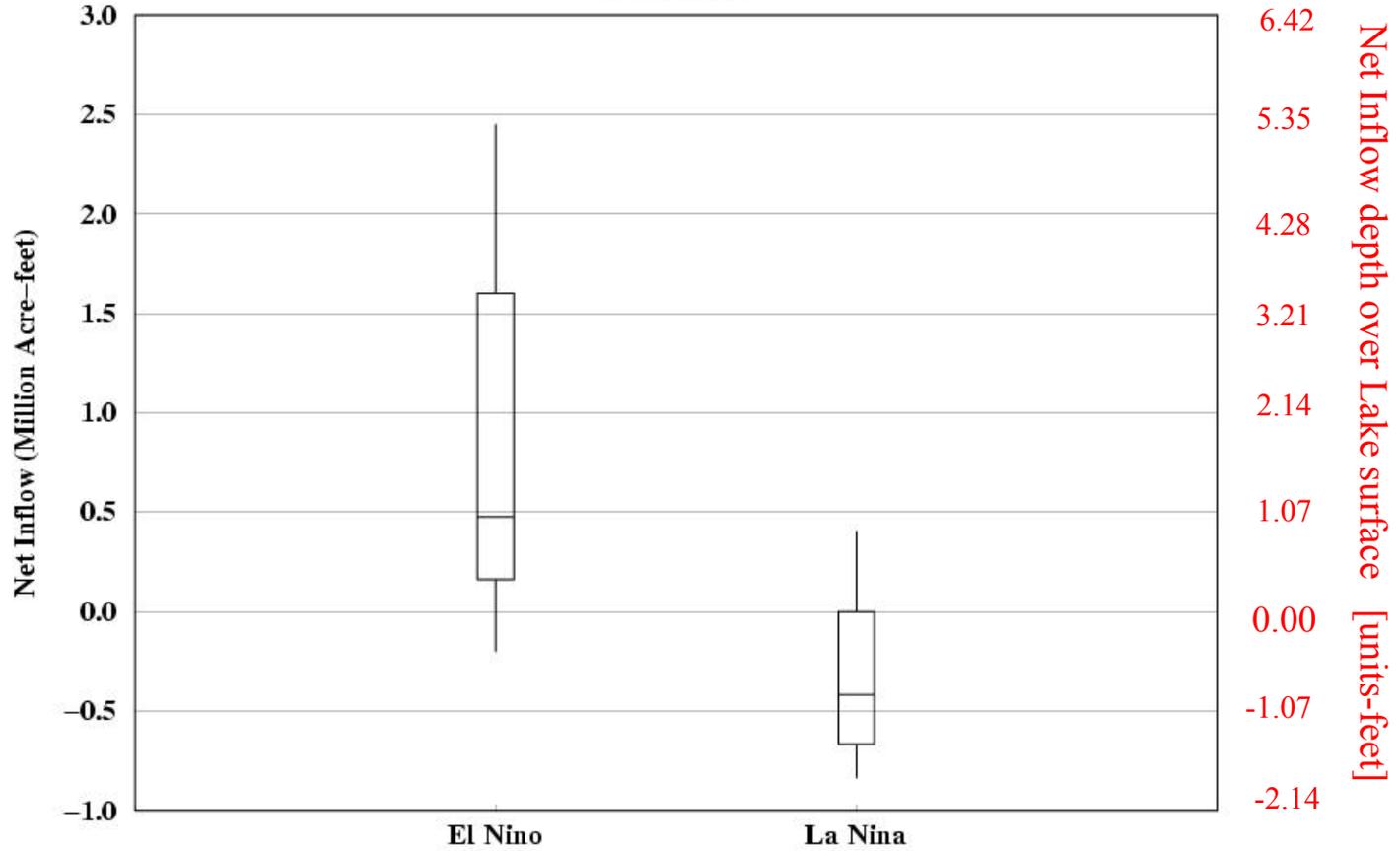
North Tropical Atlantic Sea Surface Temperature Anomalies favor less rainfall for the May-June-July Climate Window



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.

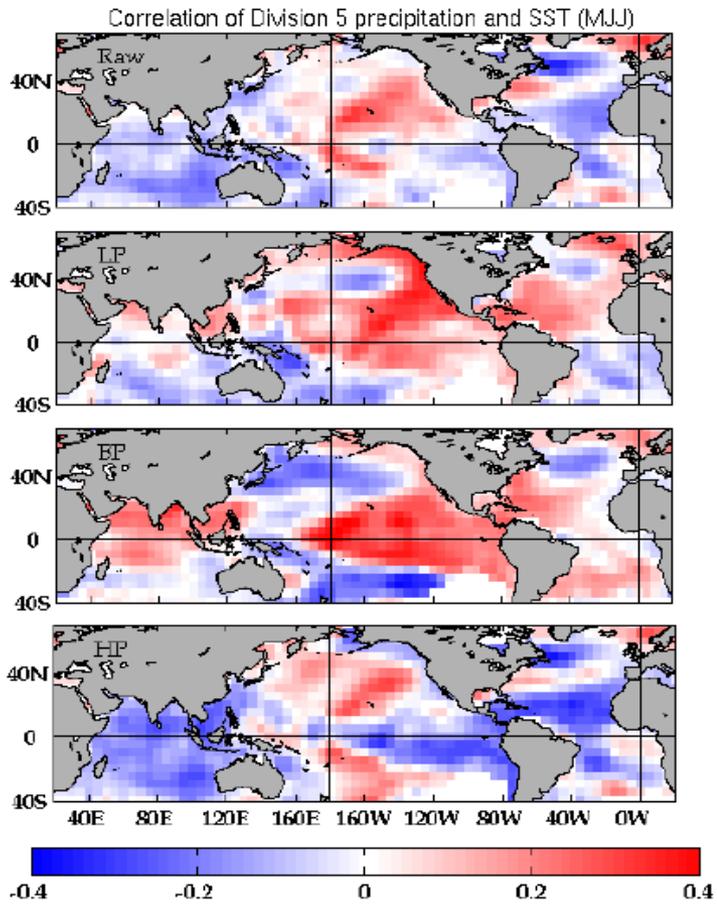
Lake Okeechobee Inflow

Dry Season



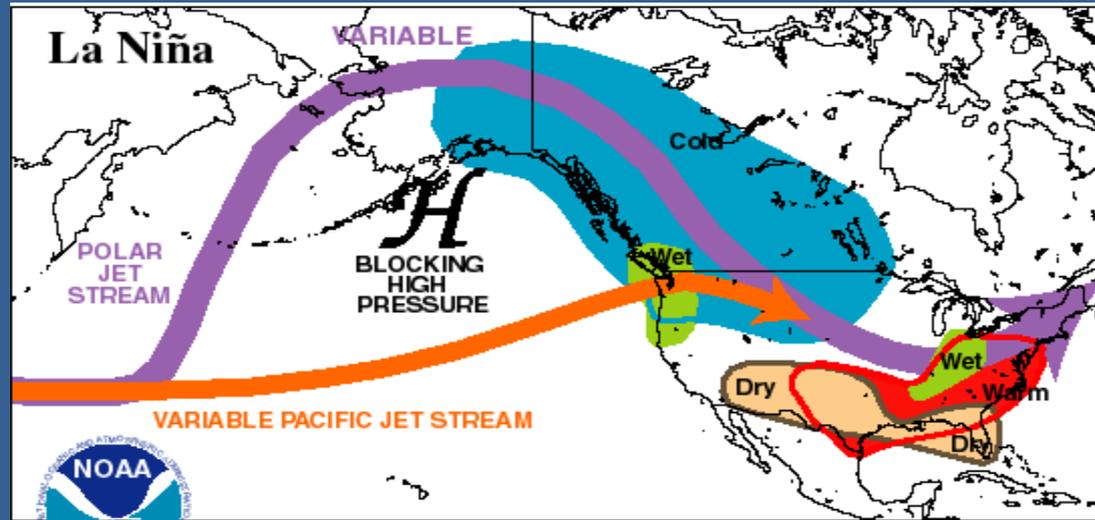
ENSO as defined by Center for Ocean-Atmospheric Prediction.

Everglades Rainfall correlated to sea surface temperature anomalies

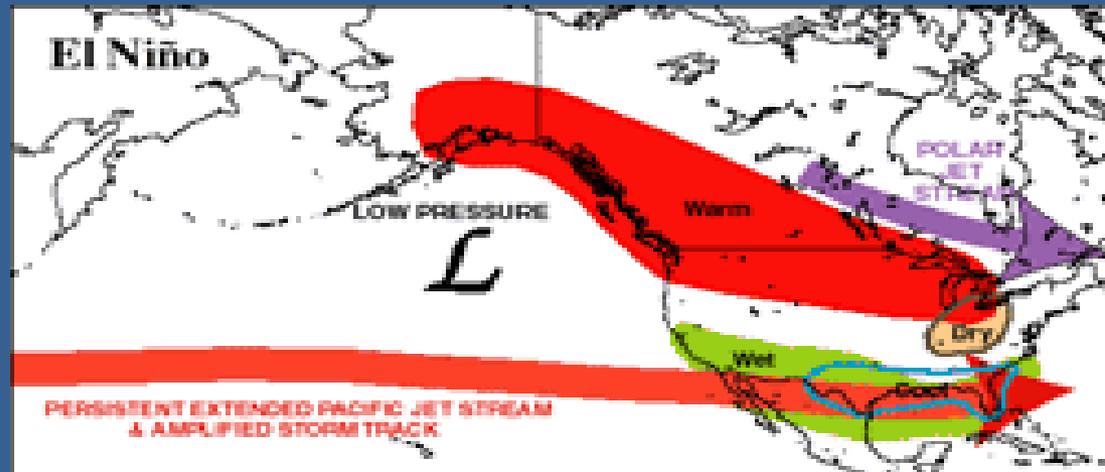


Florida Normally has drier conditions during La Nina

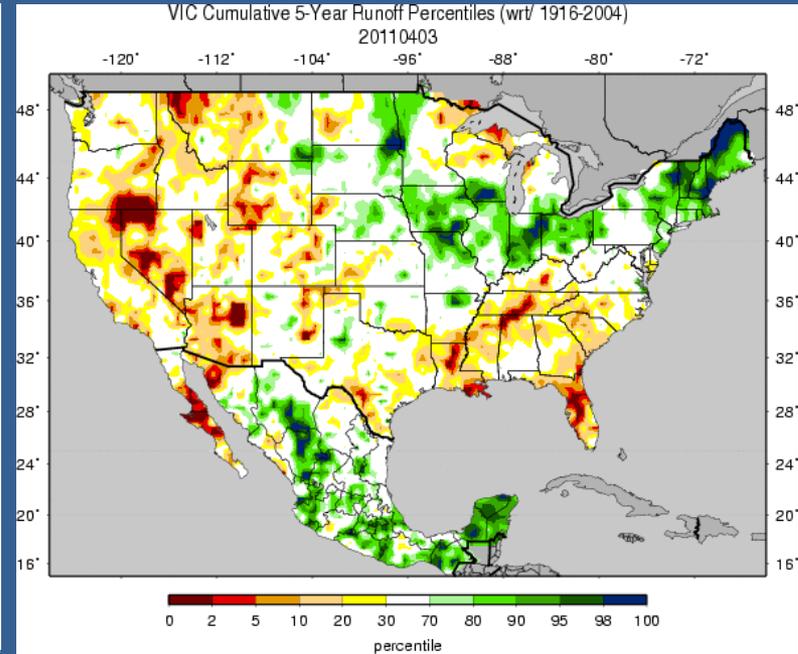
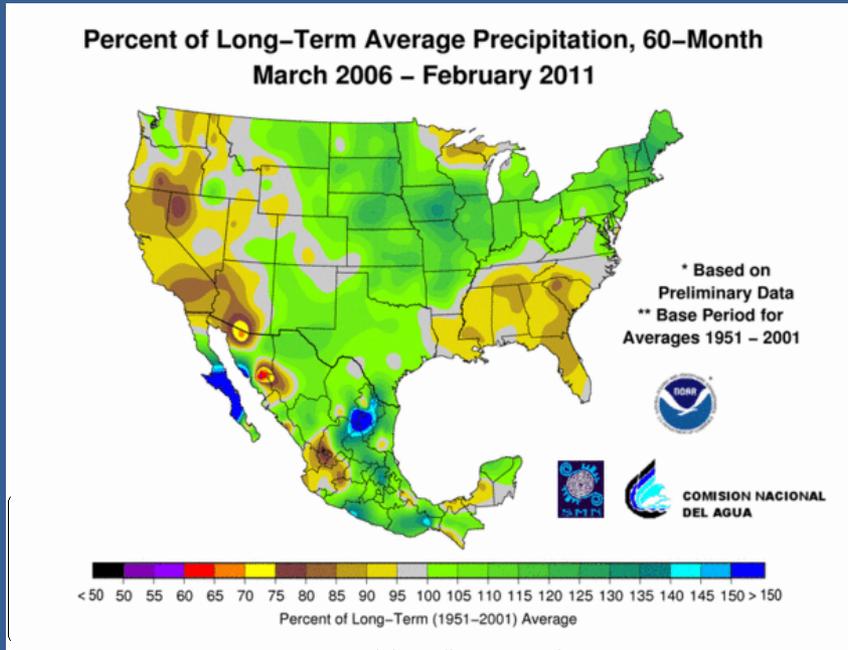
During La Nina conditions the Pacific jet stream and storm track tend to flow north of Florida producing drier conditions within south Florida.



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



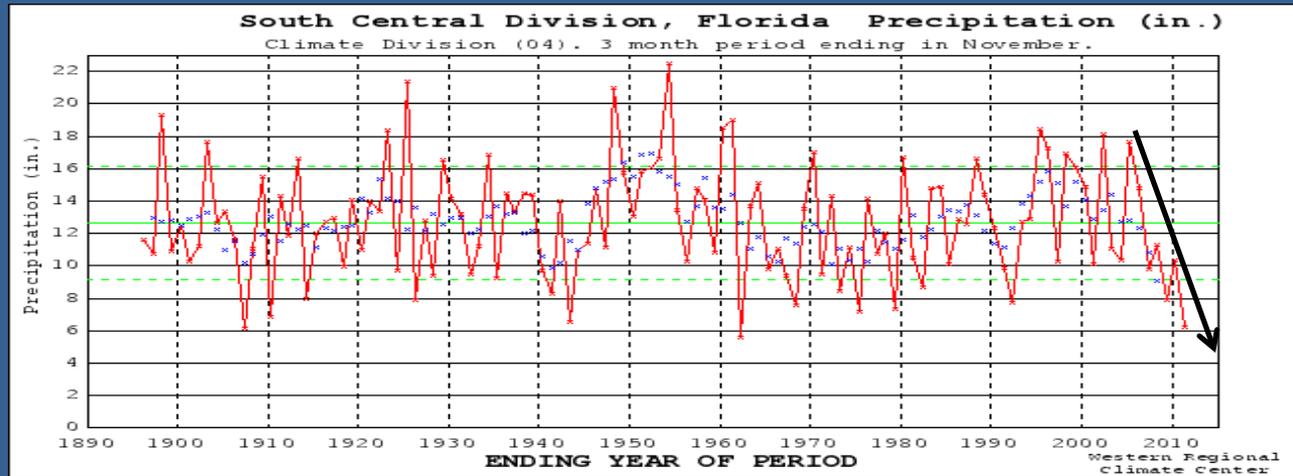
Rainfall the last 60- months over a large portion of the District has been at 5 to 10% less of normal



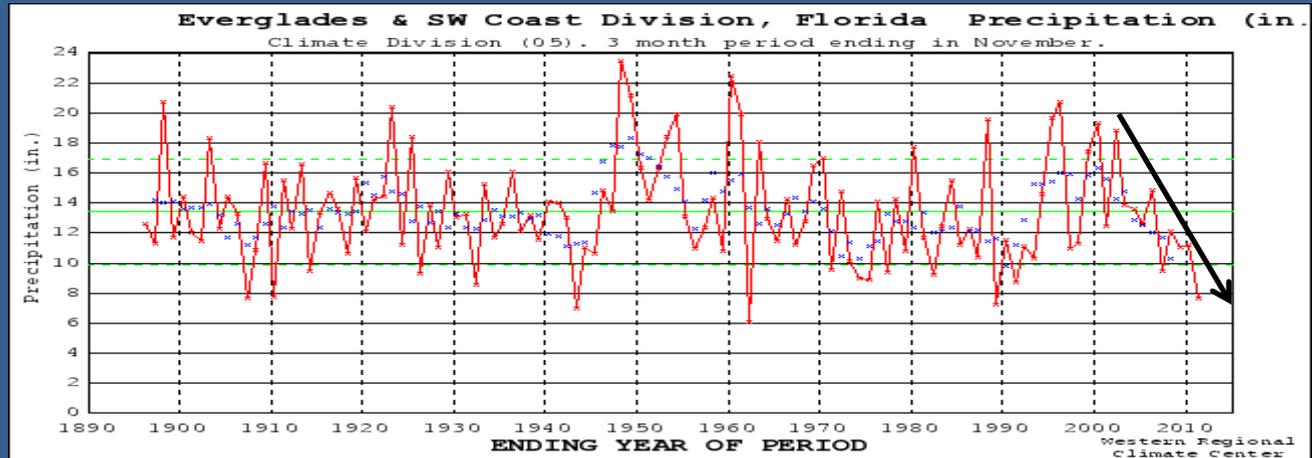
Areal view of the 5- year decline in rainfall and runoff.

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.