ENSO Cycle: Recent Evolution, Current Status and Predictions

Update prepared by
Climate Prediction Center / NCEP
17 March 2008

Outline

- Overview
- Recent Evolution and Current Conditions
- Oceanic Niño Index (ONI) – "Revised November 2007"
- Pacific SST Outlook
- U.S. Seasonal Precipitation and Temperature Outlooks
- Summary
- Temperature and precipitation La Niña composites

Overview

• Moderate La Niña conditions are present across the tropical Pacific Ocean.

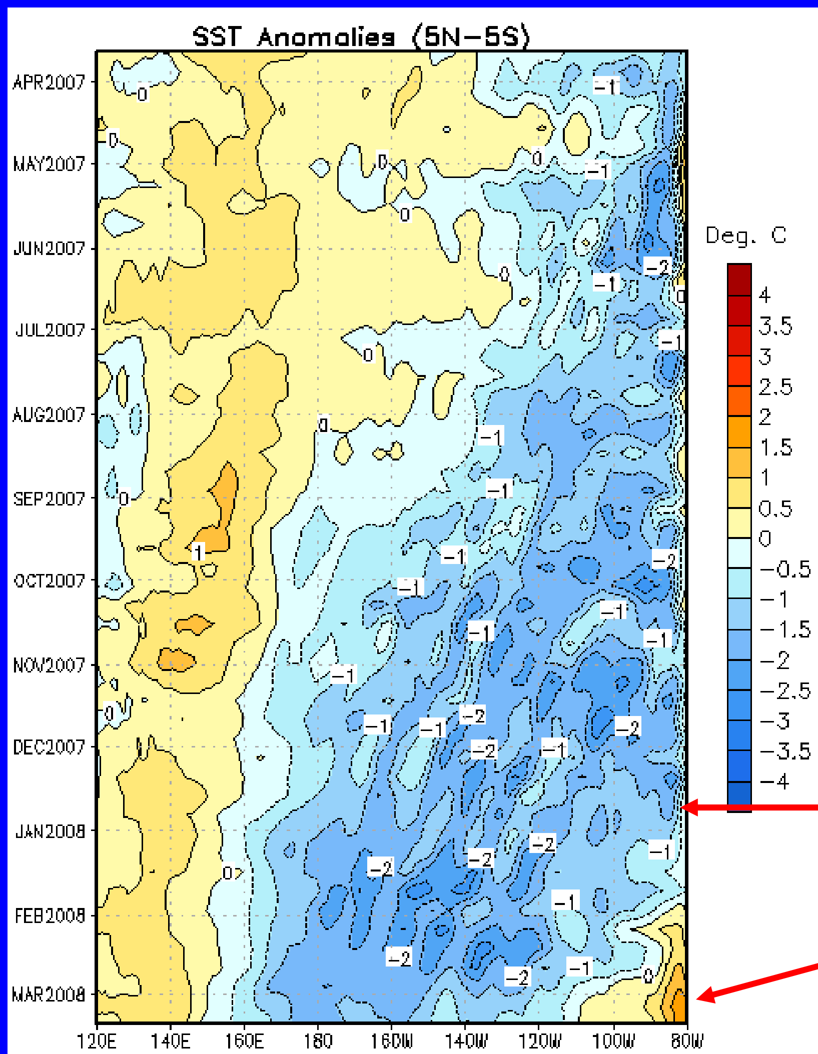
• Equatorial SSTs in the Pacific Ocean remain below average from west of the Date Line eastward to 110ºW, but departures have decreased in magnitude over the past several weeks.

• Recent equatorial Pacific SST trends and model forecasts indicate La Niña will continue through the Northern Hemisphere Spring 2008.

• Thereafter, there is considerable spread in the models, with approximately one-half indicating La Niña could continue well into the Northern Hemisphere summer.

Recent Evolution of Equatorial Pacific SST Departures (ºC)

Time



Longitude

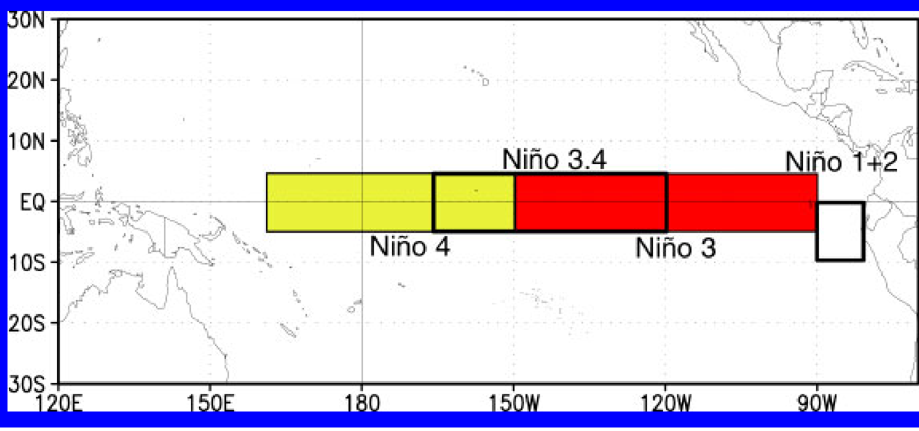
Over the past year, below average SSTs have expanded westward. Negative anomalies now cover most of the equatorial Pacific Ocean.

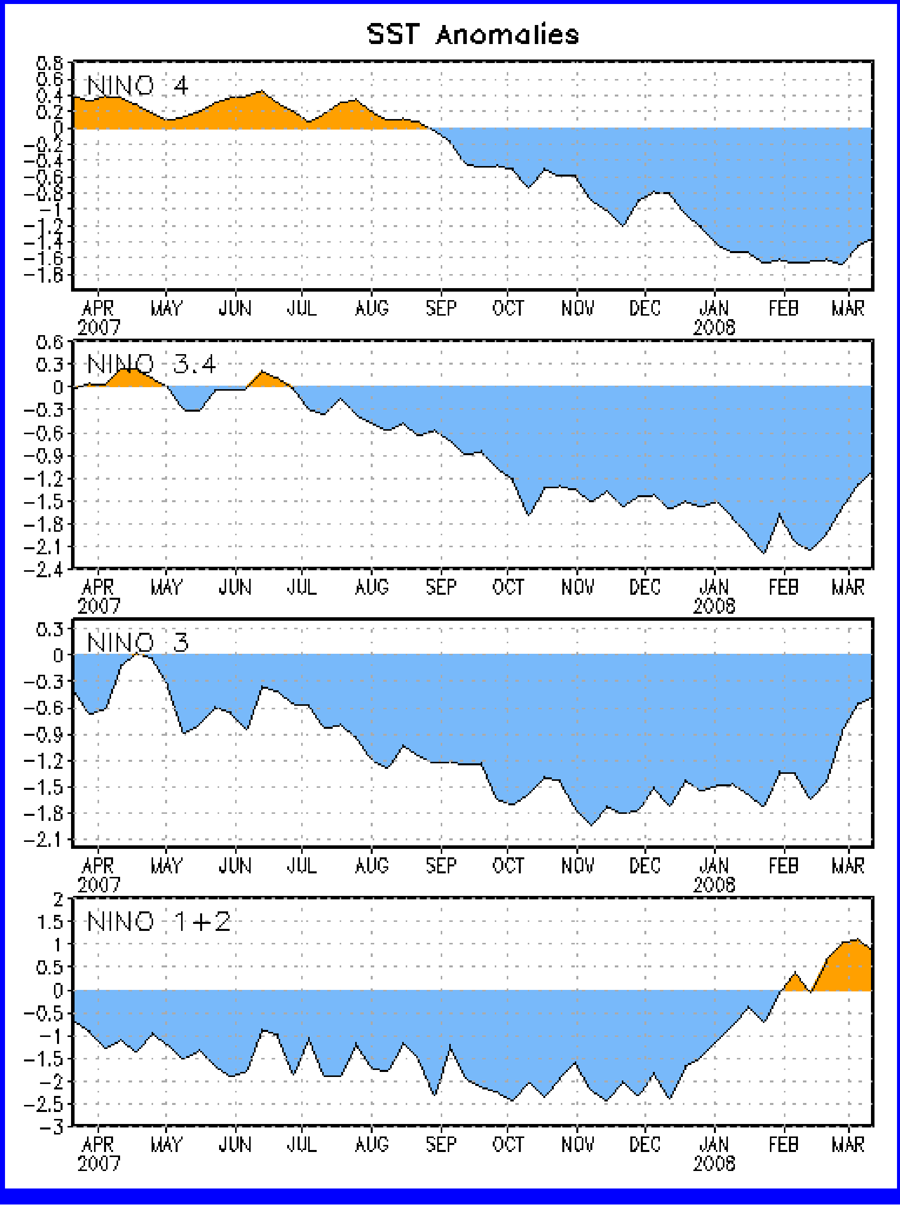
During February 2008, negative anomalies weakened and positive anomalies developed near the west coast of South America.

Niño Region SST Departures (ºC) Recent Evolution

The latest weekly SST departures are:

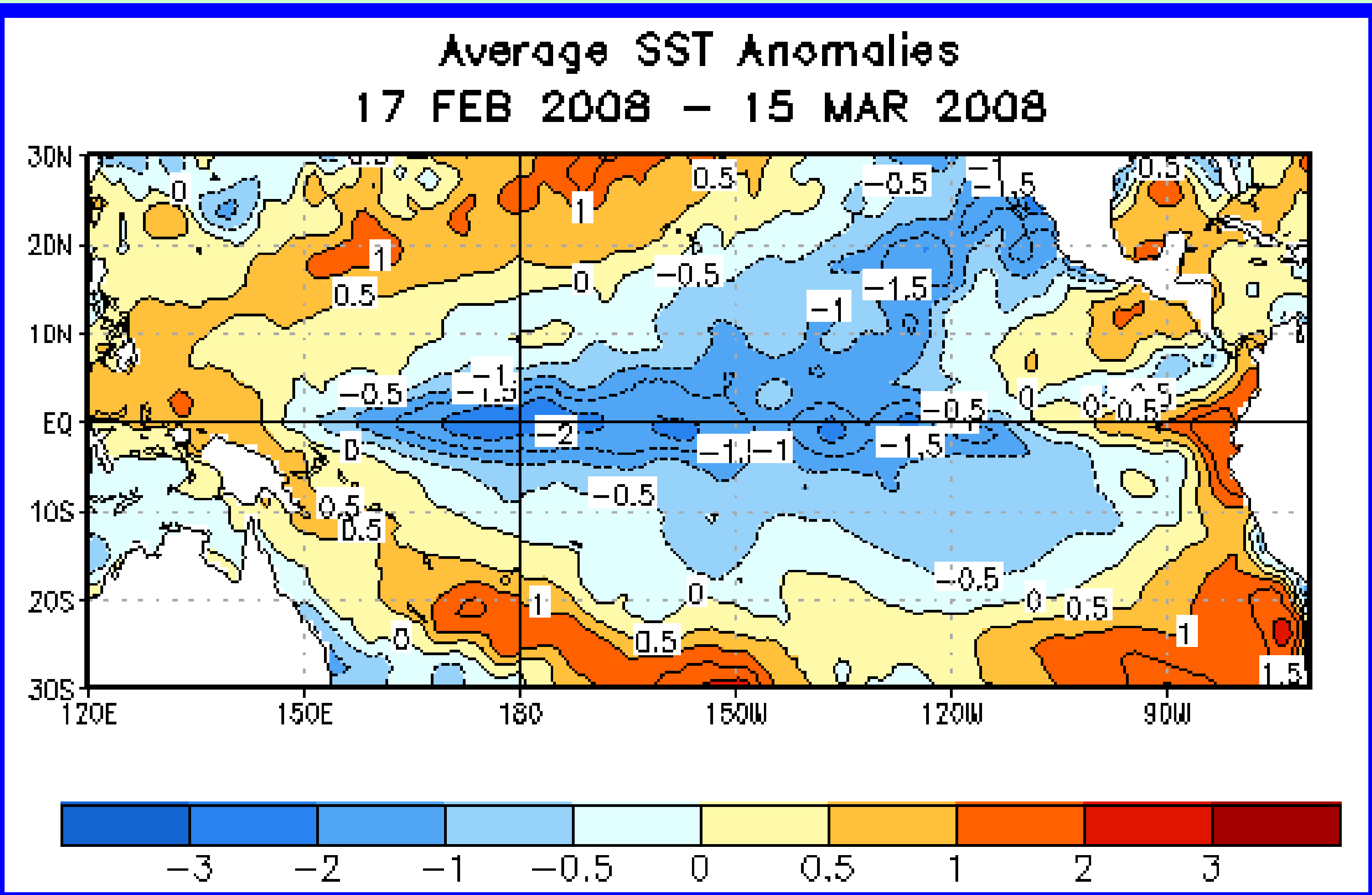
Niño 4	**-1.3ºC**
Niño 3.4	**-1.1ºC**
Niño 3	**-0.5ºC**
Niño 1+2	**+0.8ºC**



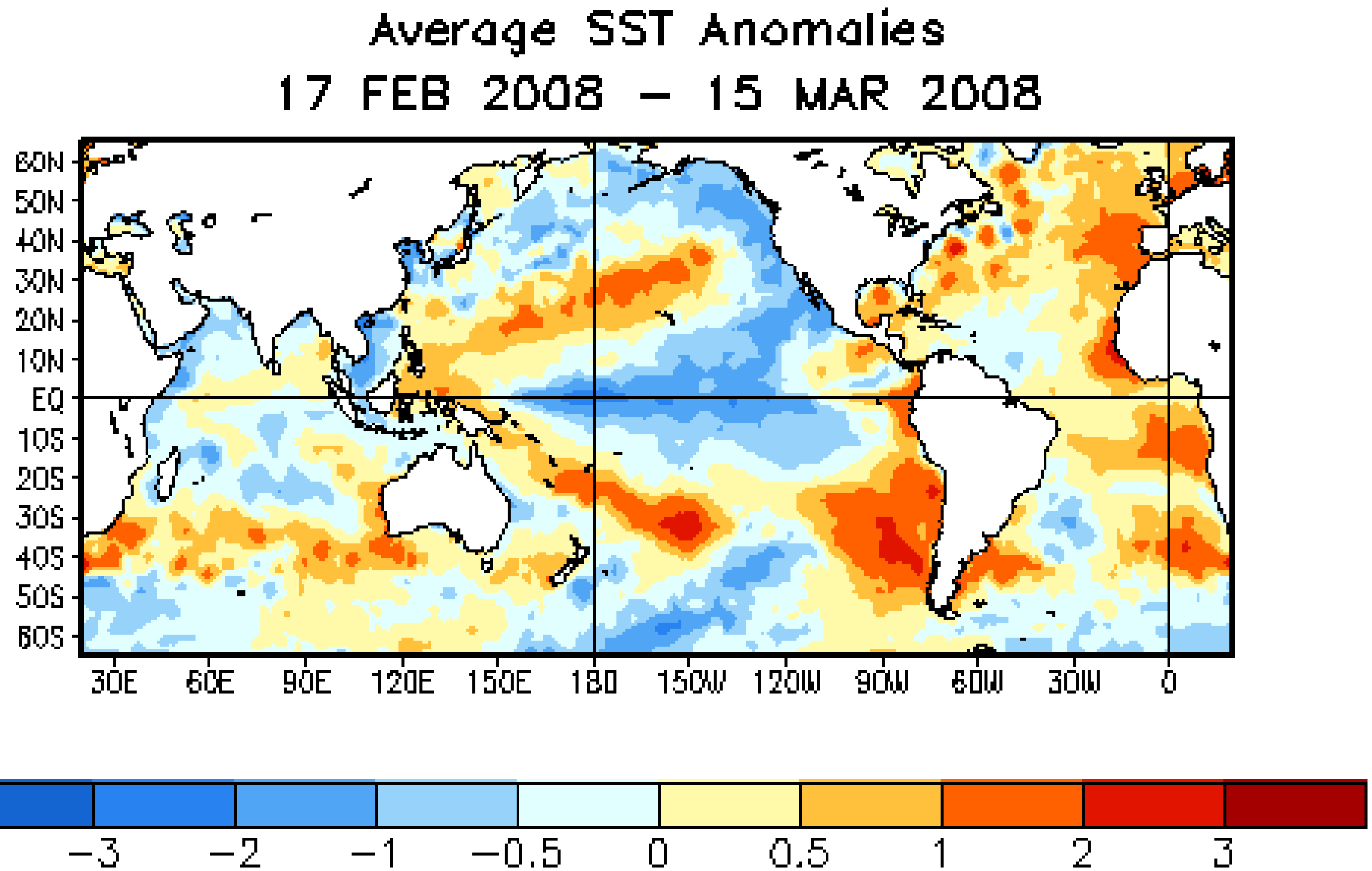


SST Departures (ºC) in the Tropical Pacific During the Last 4 Weeks

During the last month, equatorial Pacific SSTs were more than 1ºC below average between 160ºE and 110ºW. Equatorial SSTs were more than 1ºC above average between the South American coast and 90ºW.

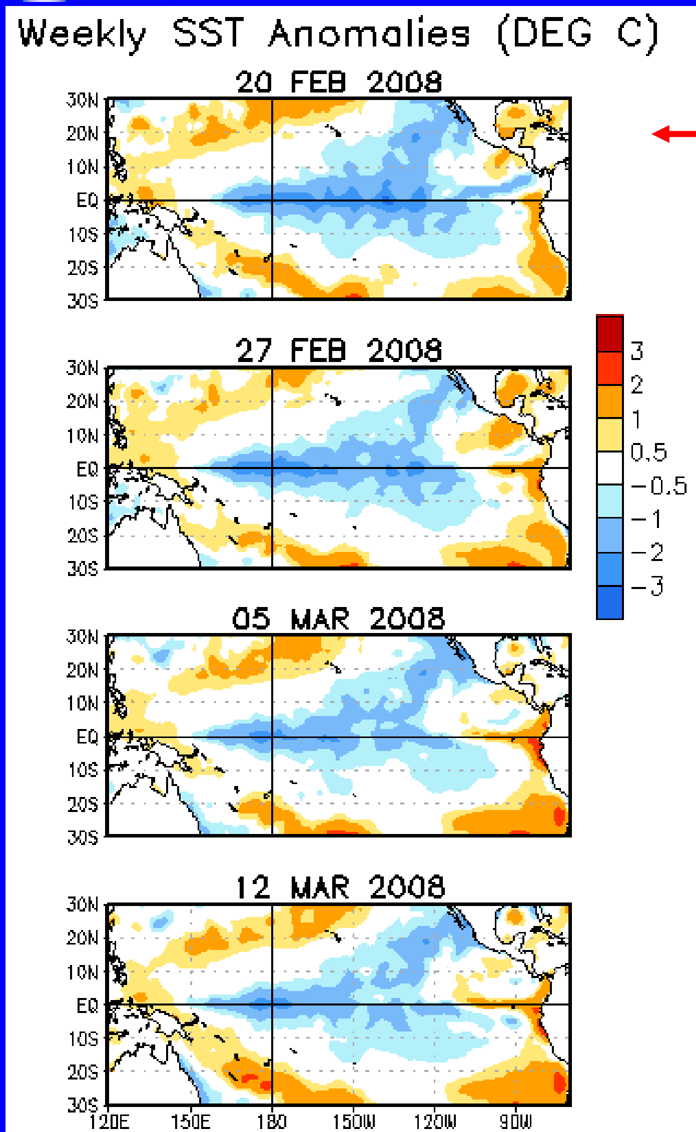


Global SST Departures (ºC)



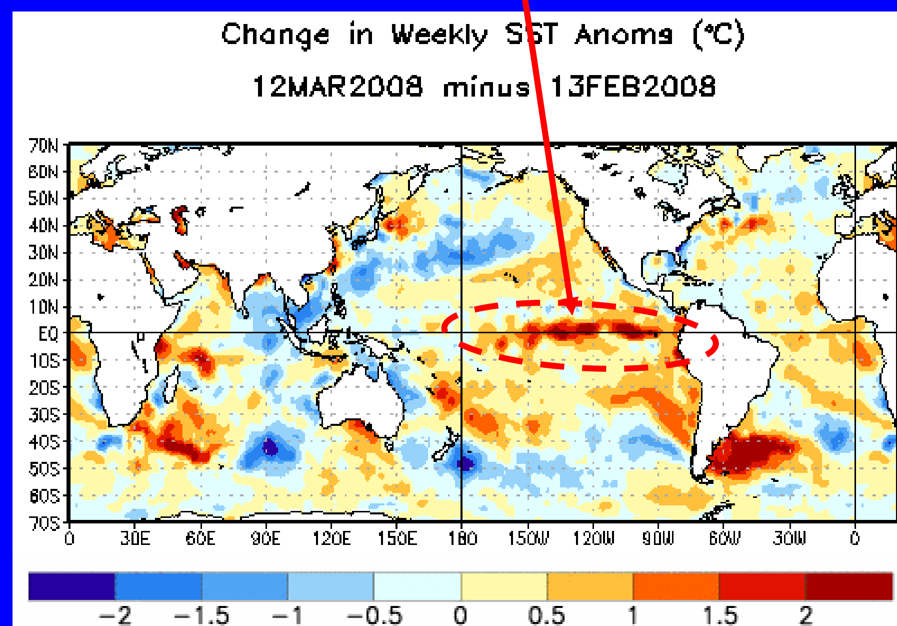
Equatorial SST anomalies remained negative across the central and east-central Pacific Ocean, and positive in the far eastern and western Pacific Ocean, and the Atlantic Ocean. A horseshoe-shaped pattern of positive anomalies spanned the Pacific Ocean of both hemispheres. Positive anomalies covered much of the North Atlantic Ocean, while negative anomalies extended along the west coast of North America into the Gulf of Alaska.

Weekly SST Departures (ºC) for the Last Four Weeks



- During mid February- mid March 2008 negative SST departures remained over the central equatorial Pacific and east-central equatorial Pacific. SSTs were near-to-above normal over the eastern equatorial Pacific.

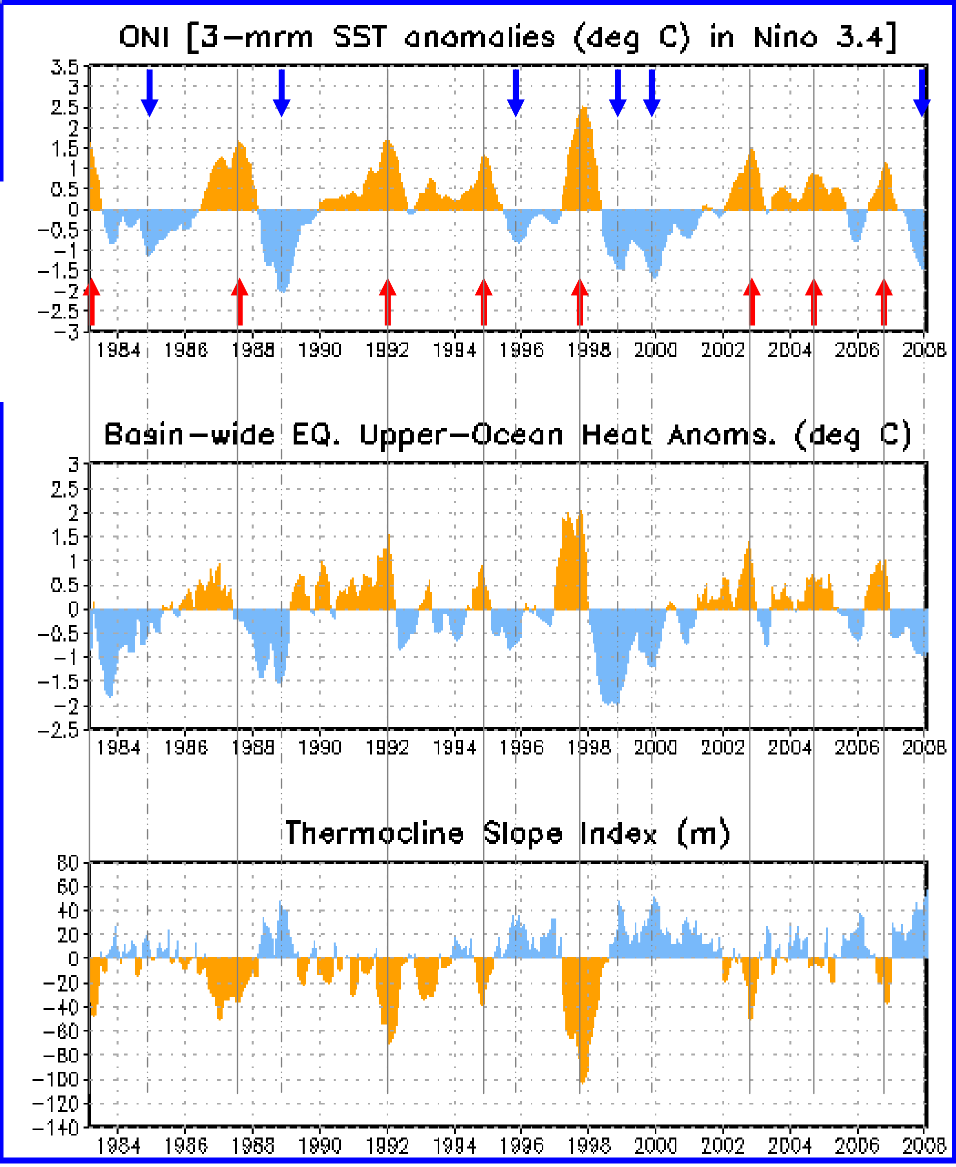
- Over this 4-week period, the negative anomalies weakened in the central and east-central Pacific, and positive anomalies strengthened along the west coast of South America.



Upper-Ocean Conditions in the Eq. Pacific

Cold Episodes

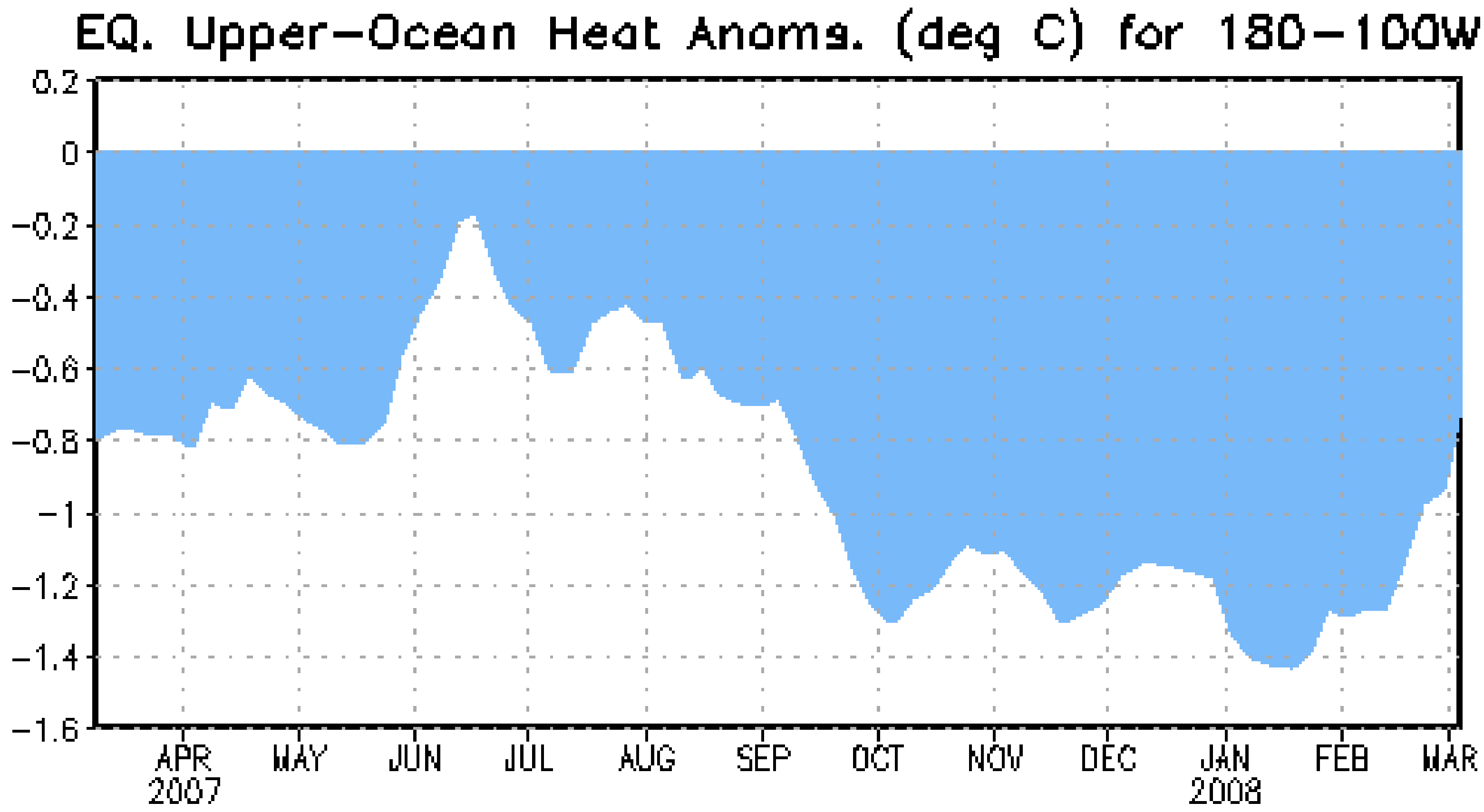
Warm Episodes



- **The basin-wide equatorial upper ocean (0-300 m) heat content is greatest prior to and during the early stages of a Pacific warm (El Niño) episode (compare top 2 panels) and least prior to and during the early stages of a cold (La Niña) episode.**
- **The slope of the oceanic thermocline is least (greatest) during warm (cold) episodes.**
- **Current values of the upper-ocean heat anomalies (negative) and the thermocline slope index (positive) indicate La Niña.**

The monthly thermocline slope index represents the difference in anomalous depth of the 20ºC isotherm between the western Pacific (160ºE-150ºW) and the eastern Pacific (90º-140ºW).

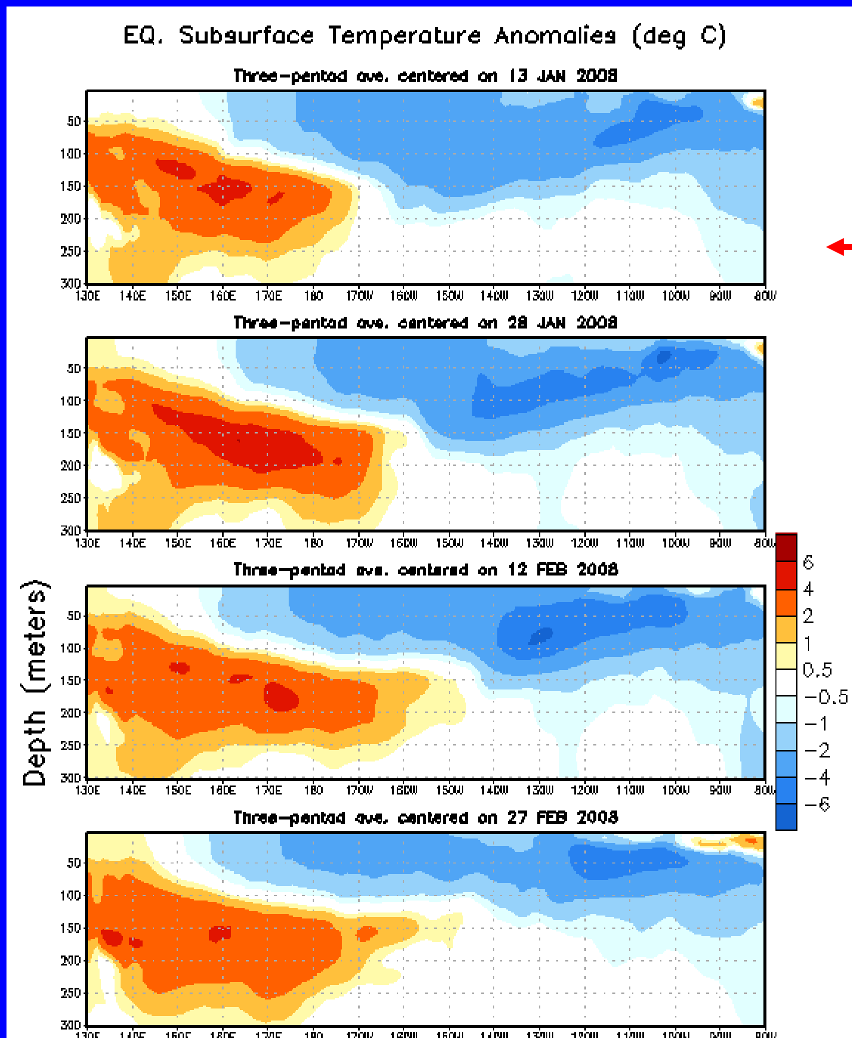
Central & Eastern Pacific Upper-Ocean (0-300 m) Weekly Heat Content Anomalies



The upper ocean heat content has been below average across the eastern half of the equatorial Pacific Ocean since January 2007, with the largest departures occurring during October 2007 - January 2008. Since February 2008 the negative heat content anomalies weakened. Below average heat content favors the continuation of La Niña.

Sub-Surface Temperature Departures (ºC) in the Equatorial Pacific

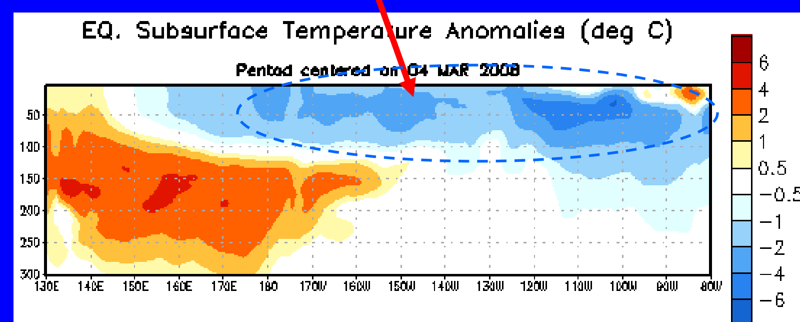
Time ↓



Longitude

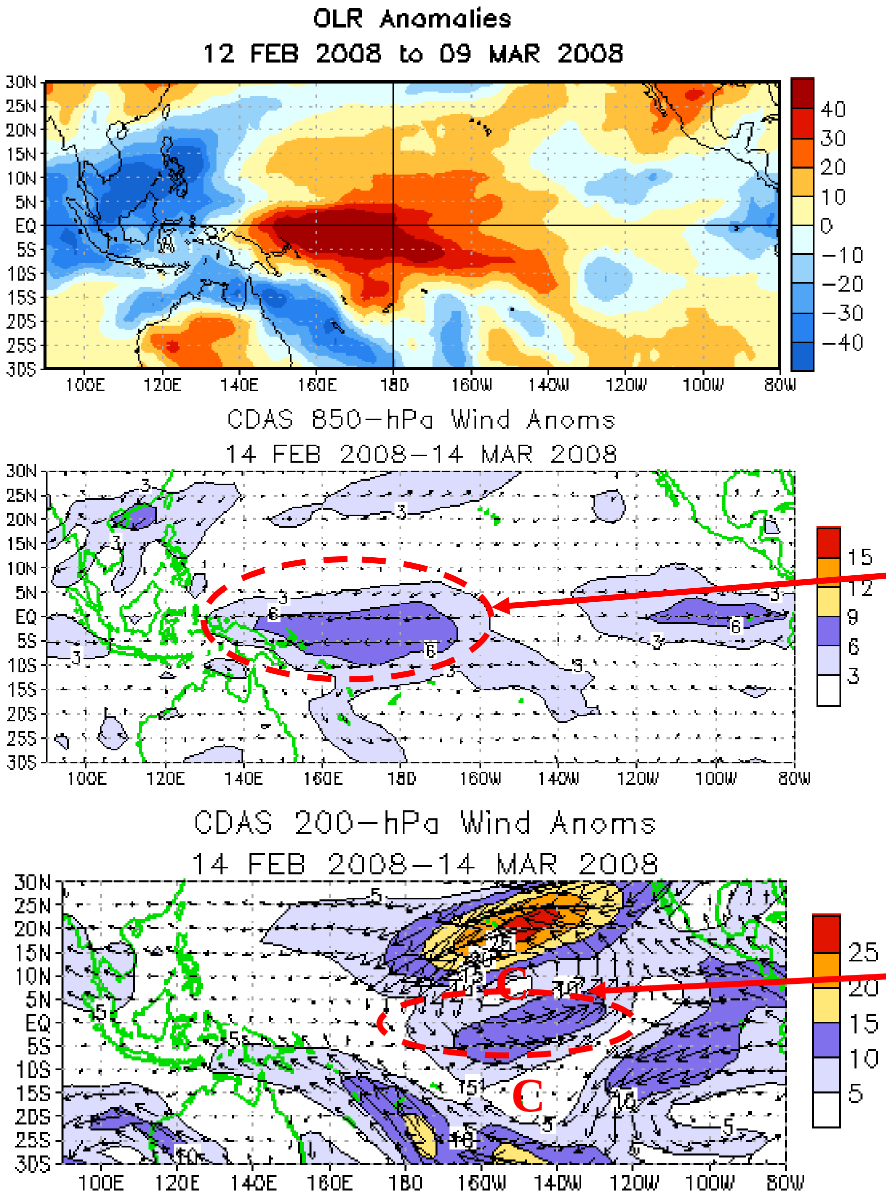
- During January –February 2008, the depth of the negative sub-surface temperatures became shallower in the central and east-central Pacific, while positive anomalies remained in the western Pacific.

- The most recent period (below) shows weaker negative temperature anomalies between the surface and 100m depth in the central and east-central Pacific.



Most recent pentad analysis

Tropical OLR and Wind Anomalies During the Last 30 Days



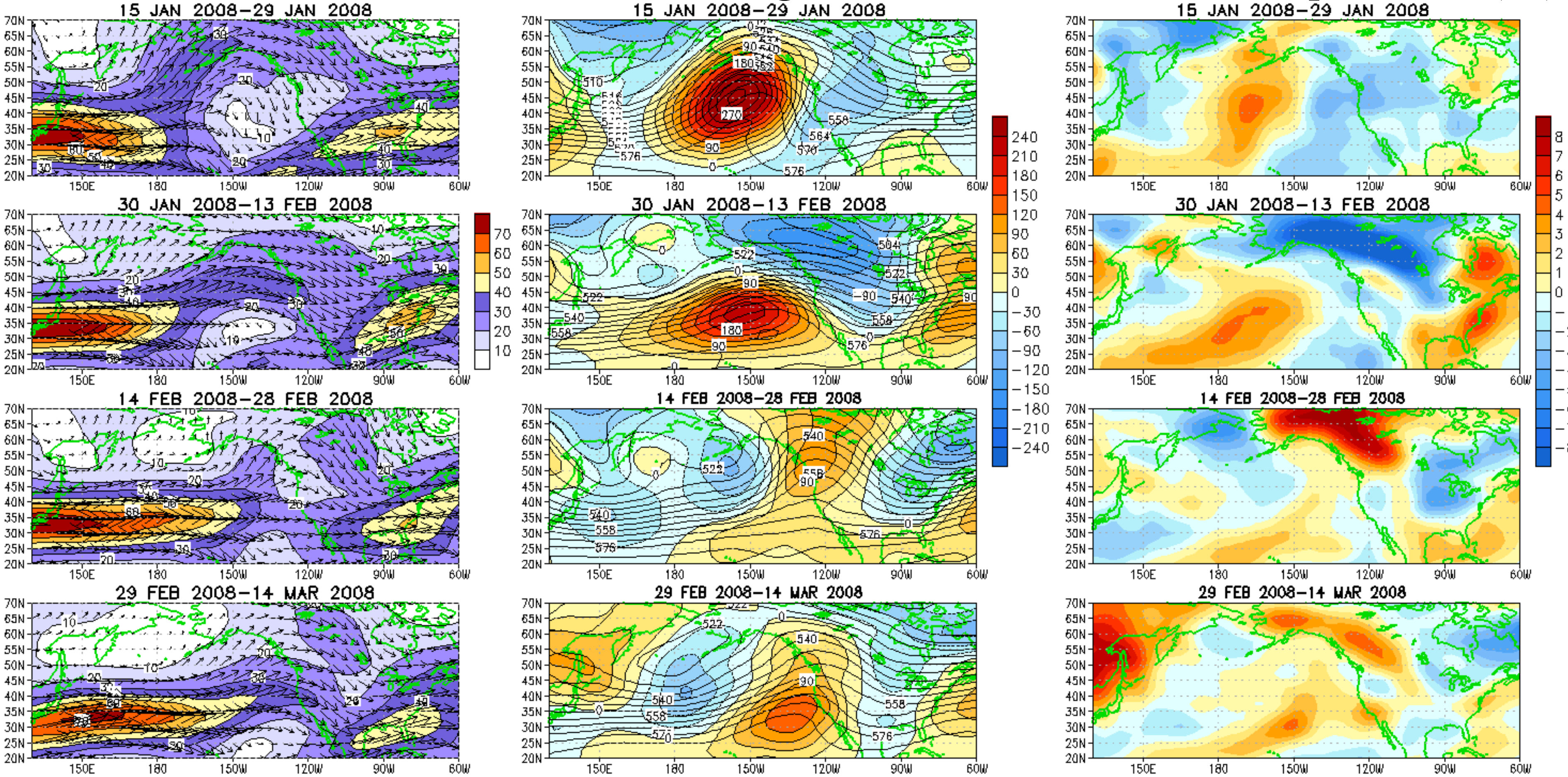
Positive OLR anomalies (suppressed convection and precipitation, red shading) were observed across most of the tropical Pacific between 140ºE and 100ºW. Negative OLR anomalies (enhanced convection and precipitation, blue shading) were present over Southeast Asia, the Philippines, Malaysia, Indonesia, and north and east of Australia.

Low-level (850-hPa) easterly wind anomalies were present over the central and western equatorial Pacific Ocean between 130ºE and 160ºW.

At 200-hPa, La Niña is reflected in the pattern of westerly wind anomalies over the central equatorial Pacific, and cyclonic anomalies in the subtropics of both hemispheres.

Atmospheric Circulation over the North Pacific & North America During the Last 60 Days

200-hPa Wind | **500-hPa Height & Anoms.** | **925-hPa Temp. Anoms. (°C)**

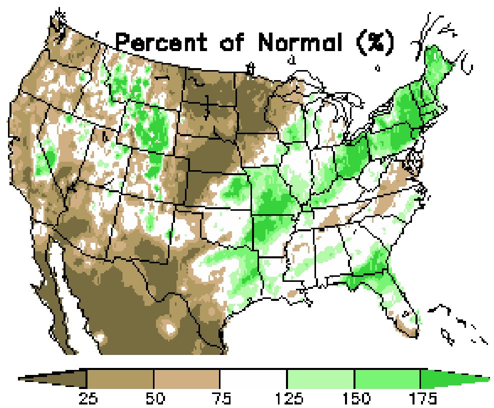


During January and early February, the core of the east Asian jet was retracted westward leading to a strong anomalous ridge over the central N. Pacific. A downstream anomalous trough led to below-average temperatures over Alaska and western N. America, while an anomalous ridge contributed to above-average temperatures over eastern N. America. During late February and early March, the east Asian jet extended into the central N. Pacific, which served to weaken and shift the anomalous Pacific ridge towards western N. America. A downstream anomalous trough over eastern N. America contributed to below-average temperatures in that region.

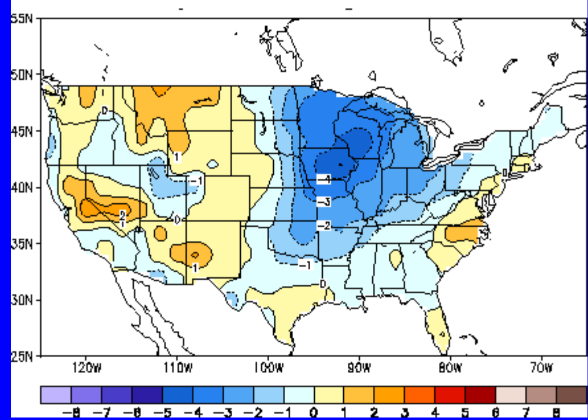
U.S. Temperature and Precipitation Departures During the Last 30 and 90 Days

Last 30 Days

30-day (ending 16 Mar 2008) % of average precipitation

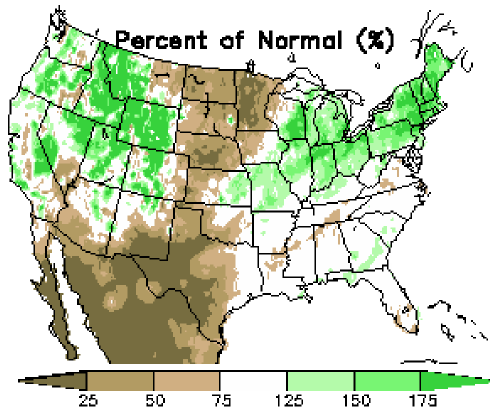


30-day (ending 15 Mar 2008) temperature departures (degree C)

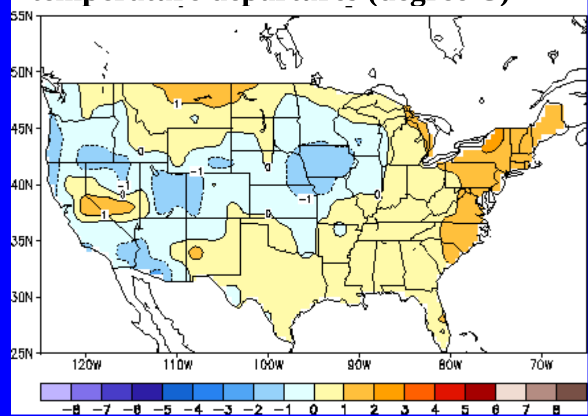


Last 90 Days

90-day (ending 16 Mar 2008) % of average precipitation



90-day (ending 15 Mar 2008) temperature departures (degree C)



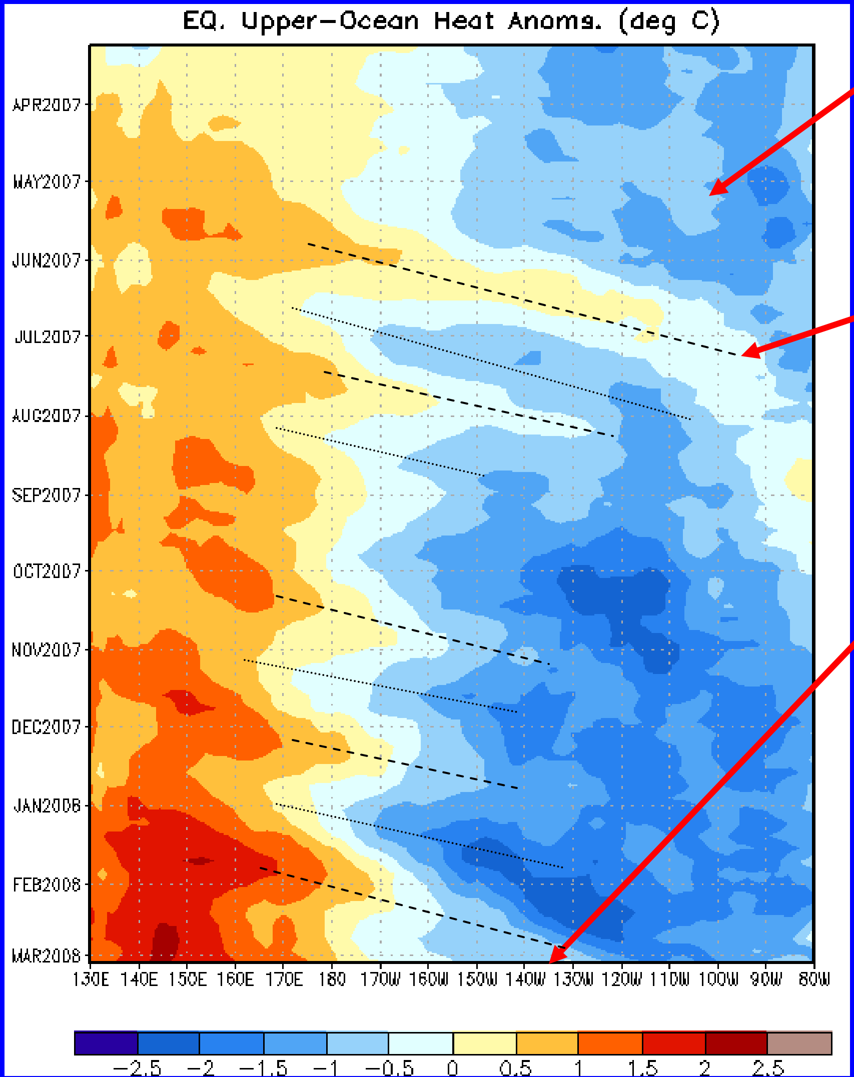
Intraseasonal Variability

- **Intraseasonal variability in the atmosphere (wind and pressure), which is often related to the Madden-Julian Oscillation (MJO), can significantly impact surface and subsurface conditions across the Pacific Ocean.**

- **Related to this activity**
  - **significant weakening of the low-level easterly winds usually initiates an eastward-propagating oceanic Kelvin wave.**
  - **Several Kelvin waves have occurred during the last year (see next slide).**

Weekly Heat Content Evolution in the Equatorial Pacific

Time



Longitude

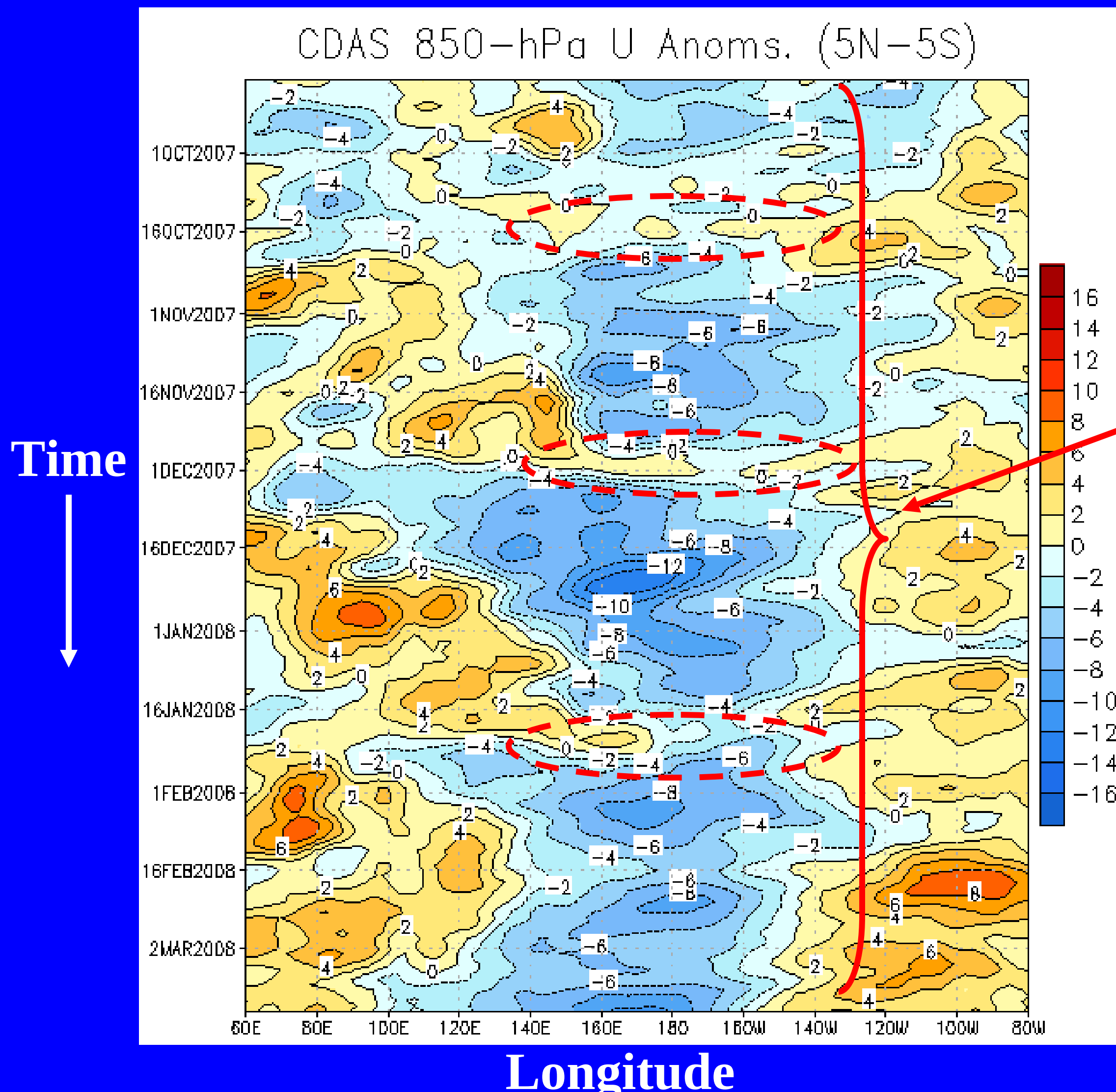
During February-May 2007, the heat content was anomalously low (blue) in the eastern equatorial Pacific.

- During May-August 2007, the subsurface temperature anomalies and heat content were affected by weak oceanic Kelvin wave activity.

- Recently, the heat content anomalies have weakened across the central and east-central equatorial Pacific.

•Oceanic Kelvin waves have alternating warm and cold phases. The warm phase is indicated by dashed lines and the cold phase is indicated by dotted lines. Down-welling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.

Low-level (850-hPa) Zonal (east-west) Wind Anomalies (m s^{-1})



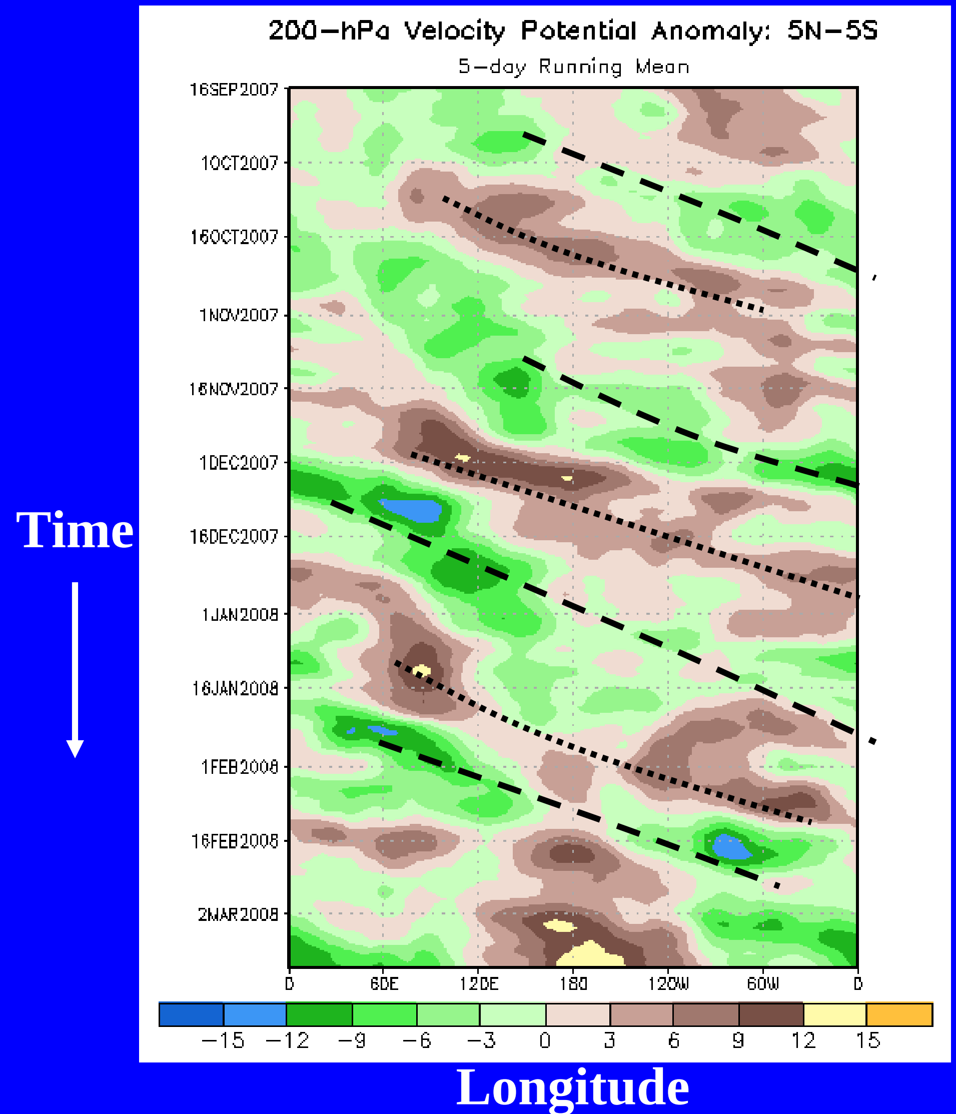
Westerly wind anomalies (orange/red shading).

Easterly wind anomalies (blue shading).

Low-level (850-hPa) easterly wind anomalies have persisted since January 2007 over the equatorial Pacific in areas between 150ºE and 150ºW.

From mid-October through February, intraseasonal (MJO) activity occasionally acted to weaken the easterly anomalies across the central equatorial Pacific (dashed ovals in figure).

200-hPa Velocity Potential Anomalies (5ºN-5ºS)

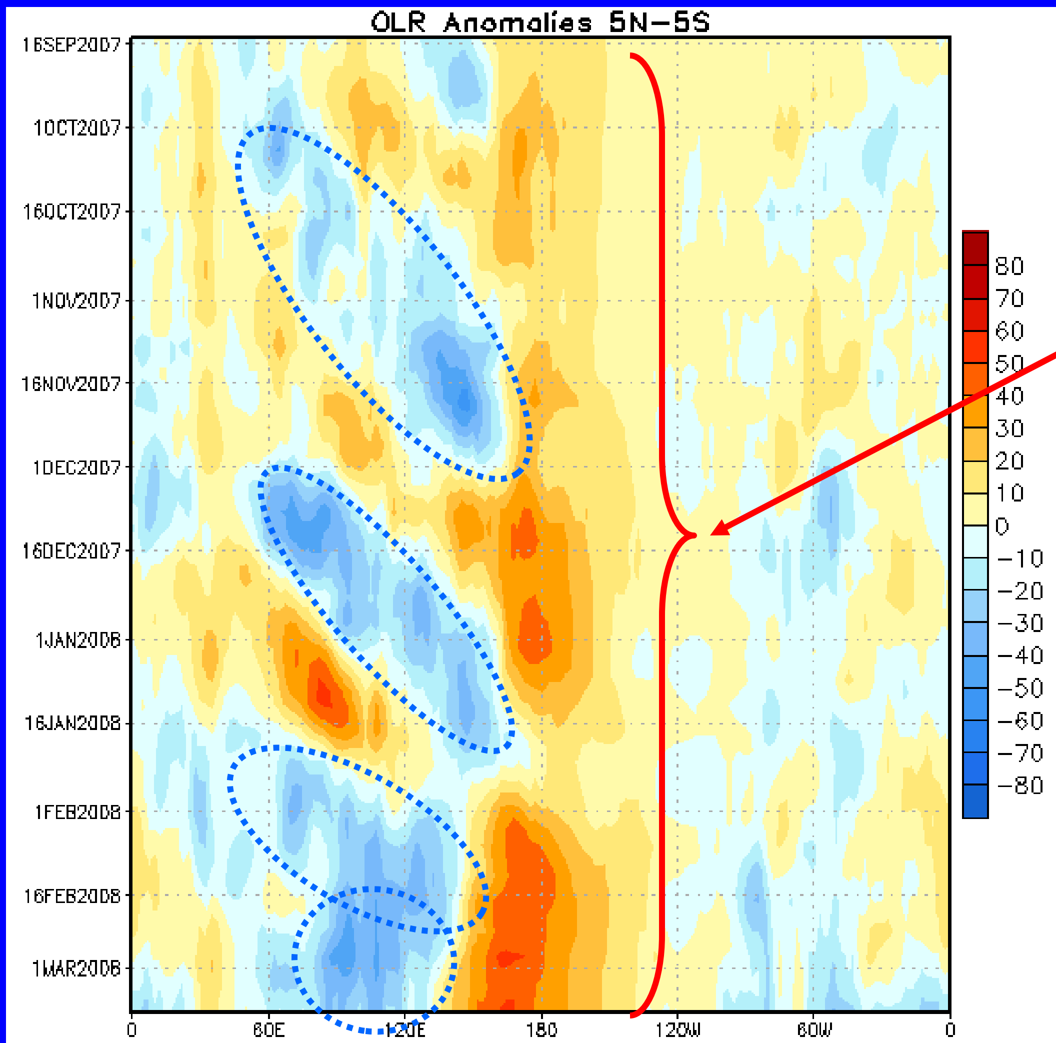


Positive anomalies (brown shading) indicate unfavorable conditions for precipitation.

Negative anomalies (green shading) indicate favorable conditions for precipitation.

MJO activity was observed during October 2007 – February 2008, but has since weakened. Recently, the velocity potential anomalies have become nearly stationary.

Outgoing Longwave Radiation (OLR) Anomalies



Time

Longitude

Drier-than-average conditions (orange/red shading)

Wetter-than-average conditions (blue shading)

Since February 2007, convection has been suppressed across the central equatorial Pacific Ocean.

Convection has occasionally been enhanced over the western equatorial Pacific and central Indian Ocean.

Oceanic Niño Index (ONI)

- The ONI is based on SST departures from average in the Niño 3.4 region, and is a principal measure for monitoring, assessing, and predicting ENSO.
- Defined as the three-month running-mean SST departures in the Niño 3.4 region. Departures are based on a set of improved homogeneous historical SST analyses (Extended Reconstructed SST – ERSST.v3). The SST reconstruction methodology is described in Smith et al., 2007, *J. Climate, in press*.
- Used to place current events into a historical perspective
- NOAA's operational definitions of El Niño and La Niña are keyed to the ONI index.

NOAA Operational Definitions for El Niño and La Niña

El Niño: characterized by a ***positive*** ONI greater than or equal to +0.5°C.

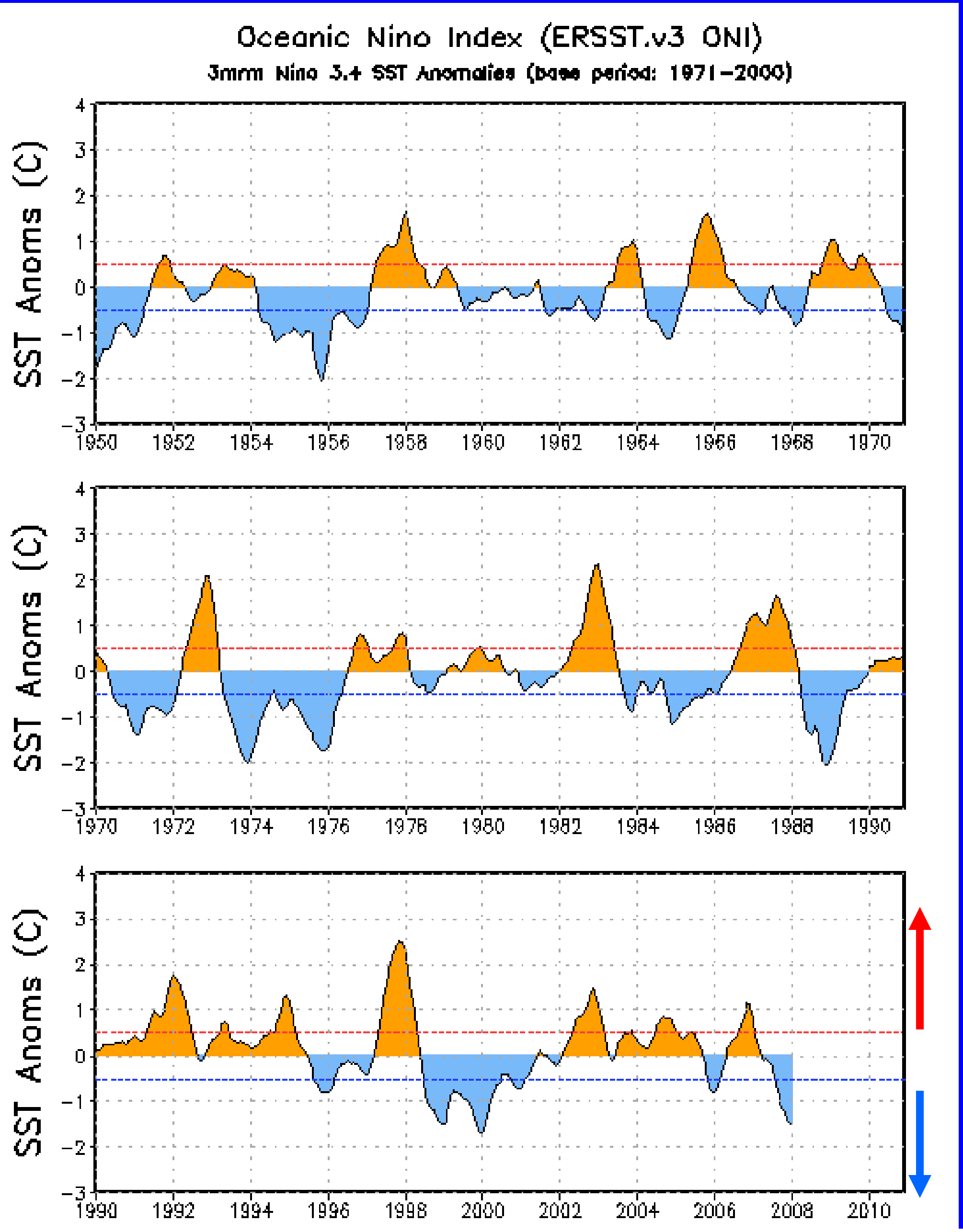
La Niña: characterized by a ***negative*** ONI less than or equal to -0.5°C.

By historical standards, to be classified as a full-fledged El Niño or La Niña episode, these thresholds must be exceeded for a period of at least 5 consecutive overlapping 3-month seasons.

CPC considers El Niño or La Niña conditions to occur when the monthly Niño3.4 SST departures meet or exceed +/- 0.5°C along with consistent atmospheric features.

ONI (ºC): Evolution since 1950

The most recent ONI value (December 2007 – February 2008) is -1.5ºC.



El Niño

neutral

La Niña

Historical El Niño and La Niña Episodes

Based on the ONI computed using ERSST.v3

NOTE:

After upgrading the ocean analysis to ERSST.v3, the following weak ENSO episodes no longer meet the NOAA criteria for an ENSO episode:

El Nino:

FMA 1993-JJA 1993

La Nina:

ASO 1961-MAM 1962

ASO 1983- DJF 1983/84

El Niño	Highest ONI Value
JAS 1951 - NDJ 1951/52	0.7
MAM 1957 – MJJ 1958	1.6
JJA 1963 – DJF 1963/64	1.0
MJJ 1965 – MAM 1966	1.6
OND 1968 – MJJ 1969	1.0
ASO 1969 – DJF 1969/70	0.7
AMJ 1972 – FMA 1973	2.1
ASO 1976 – JFM 1977	0.8
ASO 1977 - JFM 1978	0.8
AMJ 1982 – MJJ 1983	2.3
ASO 1986 – JFM 1988	1.7
AMJ 1991 – JJA 1992	1.8
JJA 1994 – FMA 1995	1.3
AMJ 1997 – MAM 1998	2.5
AMJ 2002 – FMA 2003	1.5
JJA 2004 – JFM 2005	0.9
JAS 2006 - DJF 2006/07	1.2

La Nina	Lowest ONI Value
ASO 1949 – FMA 1951	-1.8
MAM 1954 – DJF 1956/57	-2.0
MAM 1964 – JFM 1965	-1.1
NDJ 1967/68 – MAM 1968	-0.9
JJA 1970 – DJF 1971/72	-1.4
AMJ 1973 – JJA 1974	-2.0
ASO 1974 – AMJ 1976	-1.8
SON 1984 – ASO 1985	-1.1
AMJ 1988 – AMJ 1989	-2.0
ASO 1995 – FMA 1996	-0.8
JJA 1998 – MJJ 2000	-1.7
SON 2000 – JFM 2001	-0.7

Historical Pacific warm (red) and cold (blue) episodes based on a threshold of +/- 0.5 ºC for the Oceanic Nino Index (ONI) [3 month running mean of ERSST.v3 SST anomalies in the Nino 3.4 region (5N-5S, 120-170W)], calculated with respect to the 1971-2000 base period. For historical purposes El Niño and La Niña episodes are defined when the threshold is met for a minimum of 5 consecutive over-lapping seasons.

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
1950	**-1.7**	**-1.5**	**-1.4**	**-1.4**	**-1.3**	**-1.2**	**-0.9**	**-0.8**	**-0.8**	**-0.8**	**-0.9**	**-1.0**
1951	**-1.1**	**-0.9**	**-0.7**	-0.4	-0.2	0.1	0.3	**0.5**	**0.6**	**0.7**	**0.7**	**0.6**
1952	0.3	0.2	0.1	0.1	0.0	-0.2	-0.3	-0.3	-0.1	-0.2	-0.2	-0.1
1953	0.1	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.2
1954	0.3	0.2	-0.2	**-0.6**	**-0.8**	**-0.8**	**-0.8**	**-1.1**	**-1.2**	**-1.1**	**-1.1**	**-1.0**
1955	**-1.0**	**-0.9**	**-0.9**	**-1.0**	**-1.1**	**-1.0**	**-1.0**	**-1.0**	**-1.4**	**-1.8**	**-2.0**	**-1.7**
1956	**-1.2**	**-0.7**	**-0.6**	**-0.6**	**-0.5**	**-0.5**	**-0.6**	**-0.8**	**-0.8**	**-0.9**	**-0.8**	**-0.7**
1957	**-0.5**	-0.1	0.3	**0.6**	**0.7**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**1.2**	**1.5**
1958	**1.7**	**1.5**	**1.1**	**0.7**	**0.5**	**0.5**	0.4	0.2	0.0	0.0	0.2	0.4
1959	0.4	0.5	0.4	0.2	0.1	-0.2	-0.4	-0.5	-0.4	-0.3	-0.2	-0.3
1960	-0.3	-0.3	-0.3	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.2	-0.2	-0.2
1961	-0.1	-0.2	-0.2	-0.1	0.1	0.2	0.1	-0.3	-0.6	-0.6	-0.5	-0.4
1962	-0.5	-0.5	-0.4	-0.5	-0.4	-0.3	-0.2	-0.3	-0.4	-0.6	-0.7	-0.7
1963	-0.6	-0.3	0.0	0.1	0.1	0.3	**0.7**	**0.9**	**0.9**	**0.9**	**1.0**	**1.0**
1964	**0.9**	0.4	0.0	**-0.5**	**-0.7**	**-0.7**	**-0.7**	**-0.8**	**-1.0**	**-1.1**	**-1.1**	**-1.0**
1965	**-0.8**	**-0.5**	-0.2	0.0	0.3	**0.7**	**1.0**	**1.3**	**1.5**	**1.6**	**1.6**	**1.5**
1966	**1.2**	**1.1**	**0.8**	**0.5**	0.3	0.2	0.2	0.0	-0.2	-0.2	-0.3	-0.3
1967	-0.4	-0.5	-0.6	-0.5	-0.2	0.0	0.0	-0.2	-0.4	-0.5	-0.4	**-0.5**
1968	**-0.7**	**-0.8**	**-0.8**	**-0.7**	-0.4	0.0	0.3	0.3	0.3	0.4	**0.7**	**0.9**
1969	**1.0**	**1.0**	**0.9**	**0.8**	**0.6**	**0.5**	0.4	0.4	**0.6**	**0.7**	**0.7**	**0.6**
1970	**0.5**	0.3	0.2	0.1	0.0	-0.3	**-0.6**	**-0.7**	**-0.7**	**-0.7**	**-0.8**	**-1.1**
1971	**-1.3**	**-1.4**	**-1.2**	**-0.9**	**-0.8**	**-0.8**	**-0.8**	**-0.8**	**-0.8**	**-0.9**	**-1.0**	**-0.9**
1972	**-0.7**	-0.3	0.0	0.3	**0.6**	**0.8**	**1.1**	**1.4**	**1.6**	**1.8**	**2.1**	**2.1**
1973	**1.8**	**1.2**	**0.5**	0.0	**-0.5**	**-0.8**	**-1.0**	**-1.2**	**-1.4**	**-1.7**	**-1.9**	**-2.0**
1974	**-1.8**	**-1.6**	**-1.2**	**-1.1**	**-0.9**	**-0.7**	**-0.5**	-0.4	**-0.5**	**-0.7**	**-0.8**	**-0.7**
1975	**-0.6**	**-0.6**	**-0.7**	**-0.8**	**-0.9**	**-1.1**	**-1.3**	**-1.3**	**-1.5**	**-1.6**	**-1.7**	**-1.7**

Historical Pacific warm (red) and cold (blue) episodes based on a threshold of +/- 0.5 °C for the Oceanic Nino Index (ONI) [3 month running mean of ERSST.v3 SST anomalies in the Nino 3.4 region (5N-5S, 120-170W)], calculated with respect to the 1971-2000 base period. For historical purposes El Niño and La Niña episodes are defined when the threshold is met for a minimum of 5 consecutive over-lapping seasons.

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
1976	**-1.6**	**-1.2**	**-0.9**	**-0.6**	**-0.5**	-0.2	0.1	0.3	**0.6**	**0.8**	**0.8**	**0.8**
1977	**0.6**	**0.5**	0.3	0.2	0.2	0.4	0.4	0.4	**0.5**	**0.7**	**0.8**	**0.8**
1978	**0.8**	**0.5**	0.0	-0.3	-0.4	-0.3	-0.3	-0.4	-0.4	-0.3	-0.2	-0.1
1979	-0.1	0.0	0.1	0.2	0.1	0.0	0.1	0.2	0.3	0.5	0.5	0.6
1980	0.5	0.4	0.3	0.2	0.3	0.3	0.2	0.0	-0.1	0.0	0.0	0.0
1981	-0.2	-0.4	-0.4	-0.3	-0.2	-0.3	-0.3	-0.3	-0.2	-0.1	-0.1	0.0
1982	0.0	0.1	0.2	0.4	**0.7**	**0.7**	**0.8**	**1.0**	**1.5**	**1.9**	**2.2**	**2.3**
1983	**2.3**	**2.1**	**1.6**	**1.3**	**1.0**	**0.7**	0.3	-0.1	-0.5	-0.7	-0.9	-0.7
1984	-0.4	-0.2	-0.2	-0.3	-0.4	-0.4	-0.3	-0.2	-0.2	**-0.6**	**-0.9**	**-1.1**
1985	**-1.0**	**-0.9**	**-0.8**	**-0.8**	**-0.8**	**-0.6**	**-0.6**	**-0.5**	**-0.6**	-0.4	-0.4	-0.4
1986	-0.5	-0.5	-0.3	-0.2	-0.1	0.0	0.2	0.4	**0.6**	**0.9**	**1.0**	**1.2**
1987	**1.2**	**1.3**	**1.2**	**1.1**	**1.0**	**1.2**	**1.5**	**1.7**	**1.6**	**1.5**	**1.2**	**1.1**
1988	**0.7**	**0.5**	0.1	-0.3	**-0.9**	**-1.3**	**-1.4**	**-1.2**	**-1.3**	**-1.6**	**-2.0**	**-2.0**
1989	**-1.8**	**-1.6**	**-1.2**	**-0.9**	**-0.7**	-0.4	-0.4	-0.4	-0.4	-0.3	-0.2	-0.1
1990	0.1	0.1	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4
1991	0.4	0.4	0.3	0.3	**0.6**	**0.8**	**1.0**	**0.9**	**0.9**	**0.9**	**1.3**	**1.6**
1992	**1.8**	**1.7**	**1.5**	**1.4**	**1.2**	**0.9**	**0.5**	0.2	-0.1	-0.1	0.1	0.3
1993	0.4	0.4	0.5	0.7	0.7	0.7	0.4	0.3	0.3	0.3	0.3	0.3
1994	0.2	0.2	0.2	0.3	0.4	0.4	**0.5**	**0.5**	**0.7**	**0.9**	**1.3**	**1.3**
1995	**1.2**	**0.9**	**0.6**	0.3	0.2	0.1	-0.1	-0.2	**-0.5**	**-0.6**	**-0.8**	**-0.8**
1996	**-0.8**	**-0.7**	**-0.5**	-0.3	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.3	-0.4
1997	-0.4	-0.3	-0.1	0.3	**0.8**	**1.3**	**1.7**	**2.0**	**2.2**	**2.4**	**2.5**	**2.5**
1998	**2.3**	**2.0**	**1.4**	**1.1**	0.4	-0.1	**-0.7**	**-1.0**	**-1.1**	**-1.2**	**-1.4**	**-1.5**
1999	**-1.5**	**-1.2**	**-0.9**	**-0.8**	**-0.8**	**-0.8**	**-0.9**	**-1.0**	**-1.0**	**-1.2**	**-1.4**	**-1.7**
2000	**-1.7**	**-1.4**	**-1.0**	**-0.8**	**-0.6**	**-0.6**	-0.4	-0.4	-0.4	**-0.5**	**-0.7**	**-0.7**
2001	**-0.7**	**-0.5**	-0.4	-0.3	-0.1	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.2

Historical Pacific warm (red) and cold (blue) episodes based on a threshold of +/- 0.5 ºC for the Oceanic Nino Index (ONI) [3 month running mean of ERSST.v3 SST anomalies in the Nino 3.4 region (5N-5S, 120-170W)], calculated with respect to the 1971-2000 base period. For historical purposes El Niño and La Niña episodes are defined when the threshold is met for a minimum of 5 consecutive over-lapping seasons.

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2002	-0.1	0.1	0.2	0.4	**0.6**	**0.8**	**0.9**	**0.9**	**1.1**	**1.3**	**1.5**	**1.4**
2003	**1.2**	**0.9**	**0.5**	0.1	-0.1	0.0	0.3	0.4	0.5	0.5	0.6	0.4
2004	0.4	0.2	0.2	0.2	0.3	0.4	**0.7**	**0.8**	**0.9**	**0.8**	**0.8**	**0.8**
2005	**0.6**	**0.5**	0.4	0.5	0.5	0.5	0.5	0.3	0.2	-0.1	-0.4	-0.8
2006	-0.8	-0.6	-0.3	-0.1	0.2	0.3	0.4	**0.5**	**0.7**	**0.9**	**1.2**	**1.1**
2007	**0.8**	0.4	0.1	-0.1	0.0	-0.1	-0.2	**-0.5**	**-0.8**	**-1.1**	**-1.2**	**-1.4**
2008	**-1.5**											
2009												
2010												
2011												
2012												
2013												
2014												
2015												
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												
2026												
2027												

Pacific Niño 3.4 SST Outlook

Most ENSO models predict at least a moderate La Niña through FMA, with the likelihood of La Niña continuing through AMJ. Thereafter, there is considerable spread in the models, with approximately one-half indicating that La Niña (-0.5°C in the Niño 3.4 region) could continue well into the Northern Hemisphere summer.

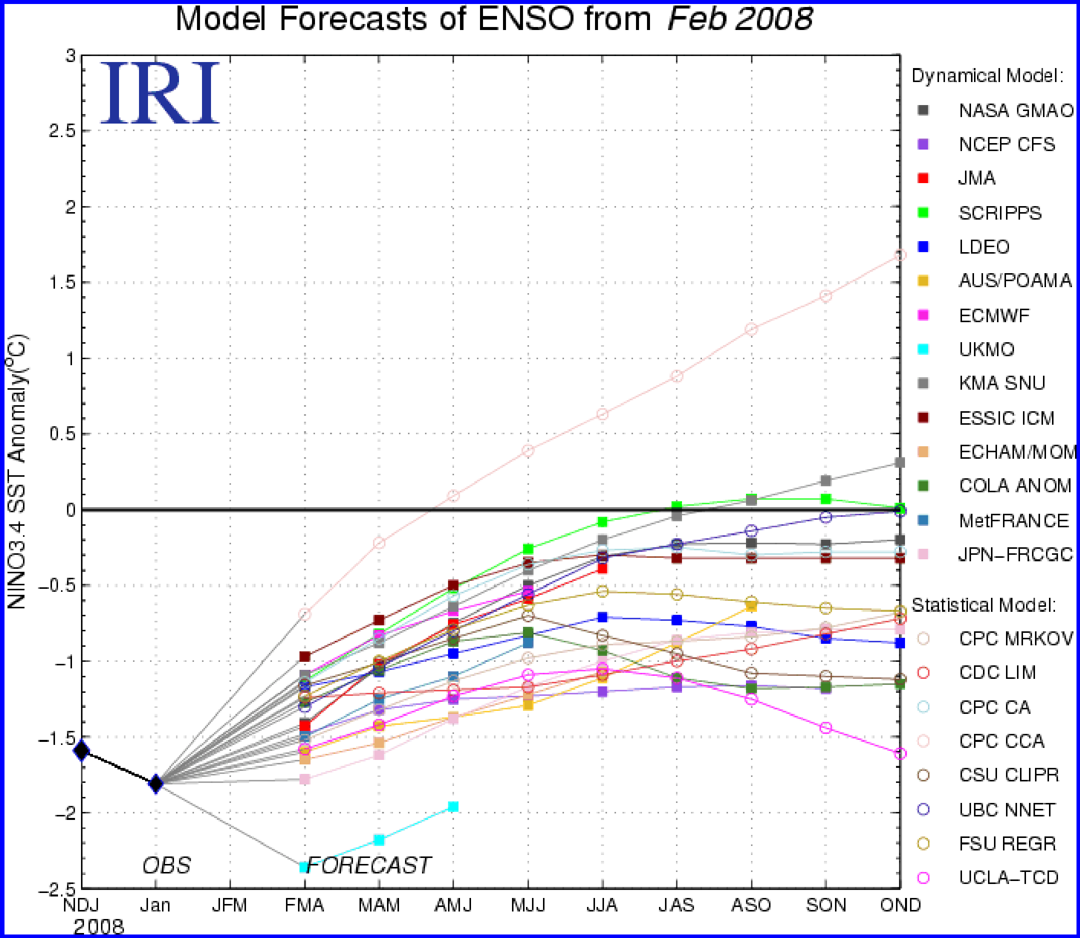
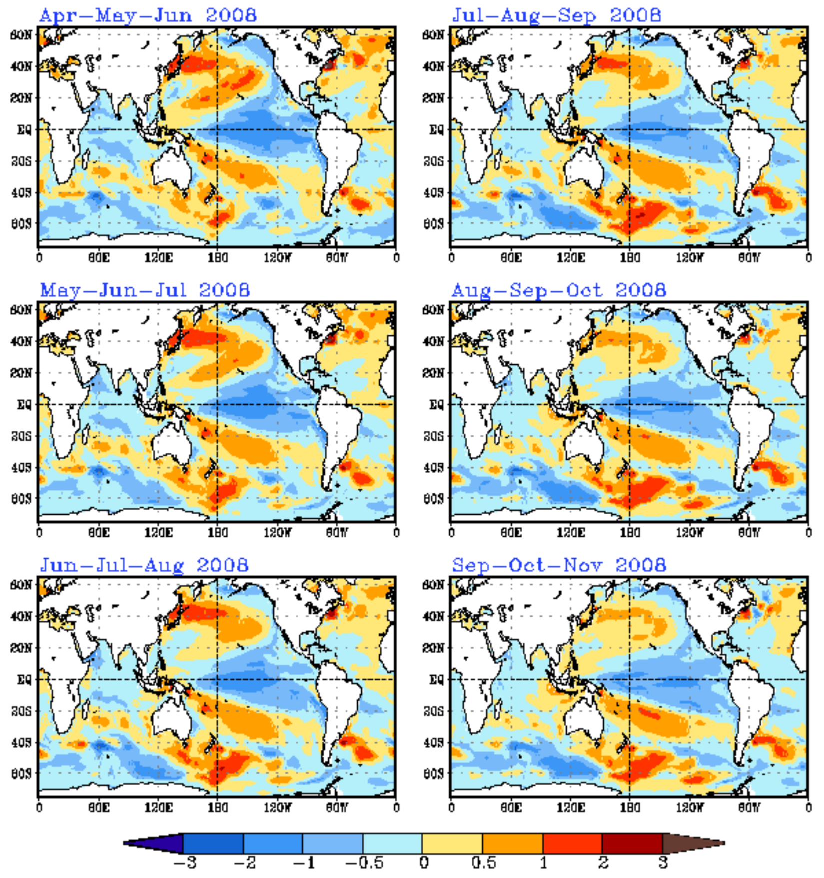
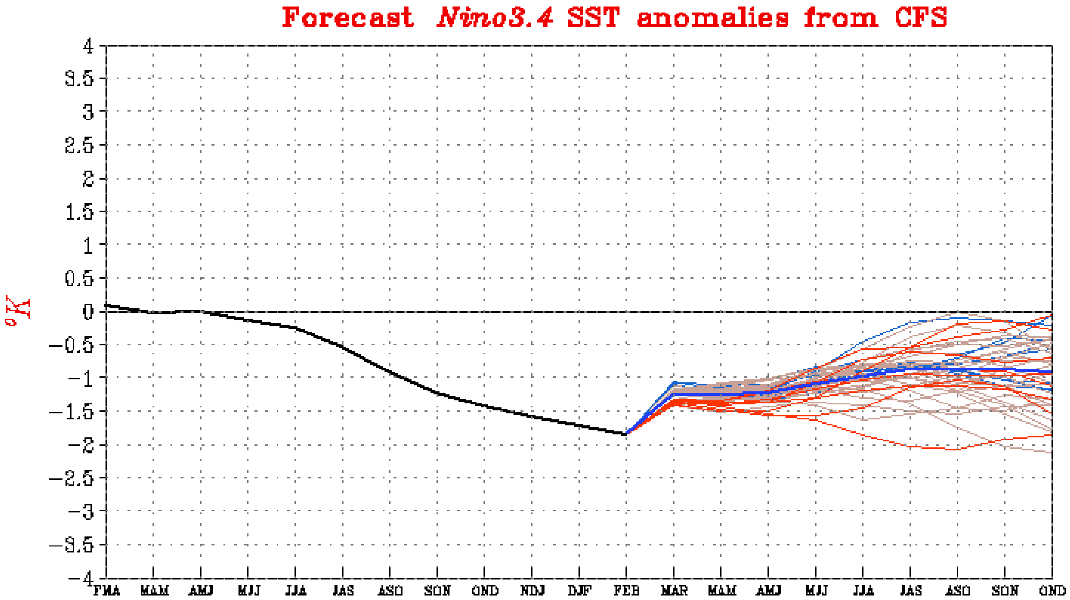


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 20 February 2008).

SST Outlook: NCEP CFS Forecast
Issued 17 March 2008

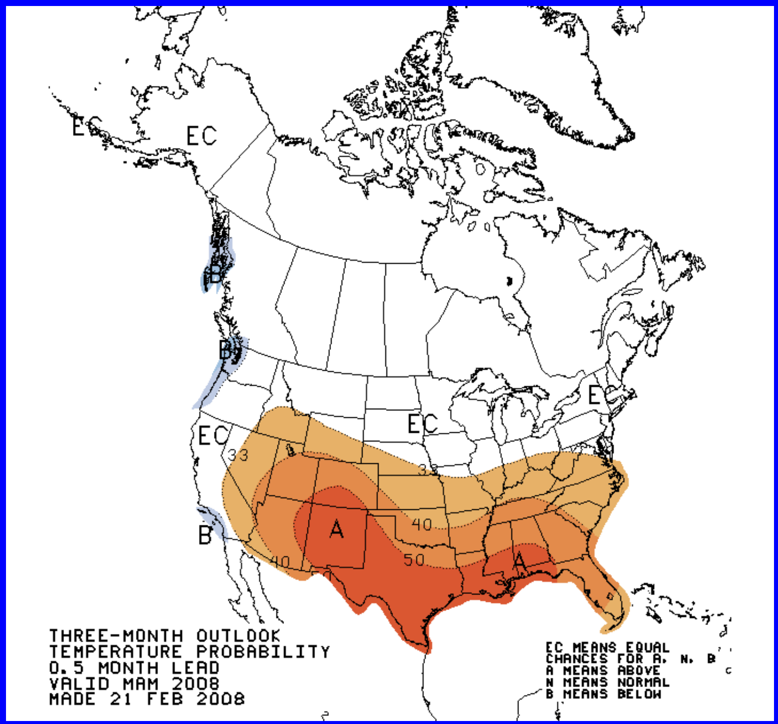


The CFS ensemble mean (heavy blue line) predicts La Niña will continue through Fall 2008.

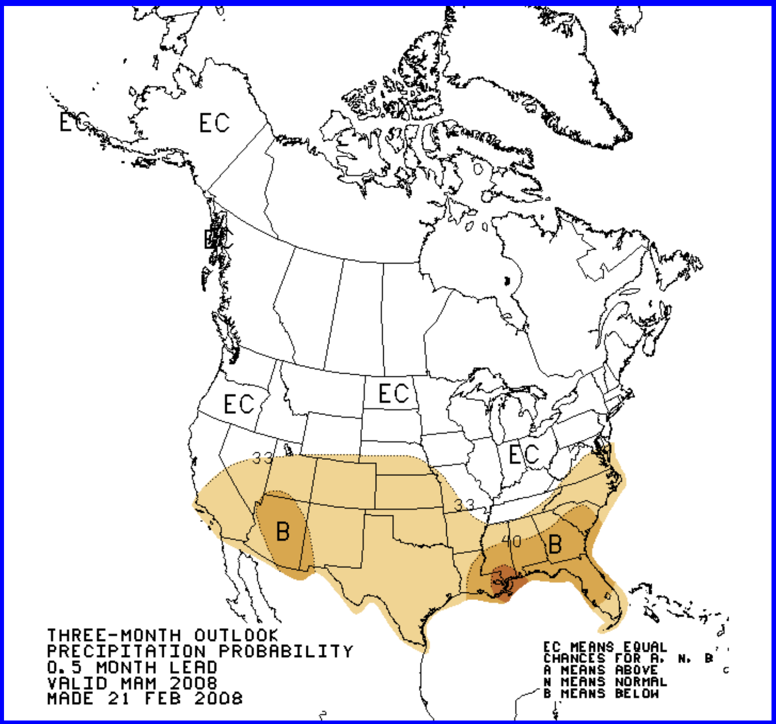


U. S. Seasonal Outlooks
March- May 2008

Temperature



Precipitation



These seasonal outlooks combine typical La Niña impacts and long-term trends.

Summary

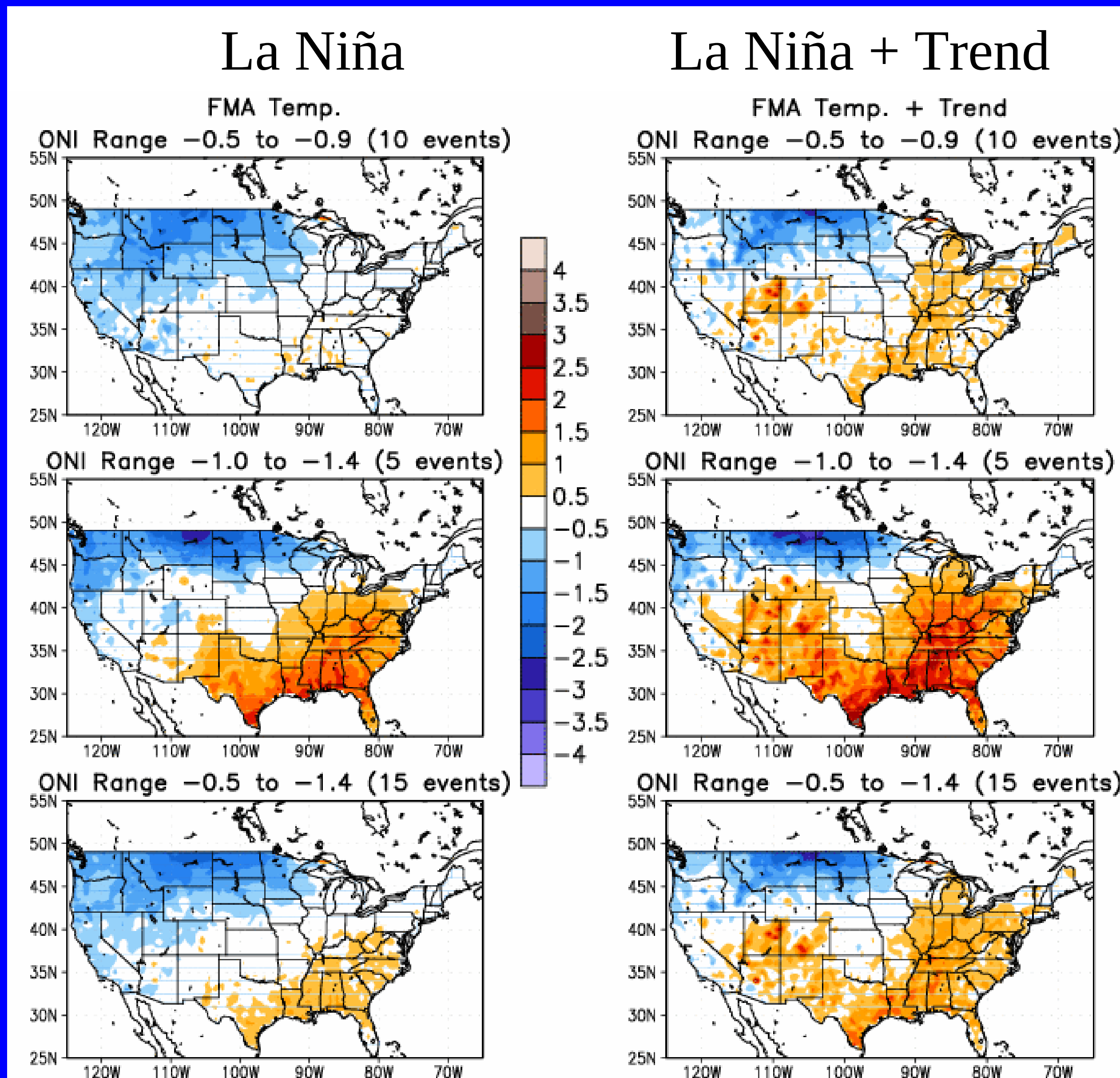
- Moderate La Niña conditions are present across the tropical Pacific Ocean.
- Equatorial SSTs in the Pacific Ocean remain below average from west of the Date Line eastward to 110ºW, but departures have decreased in magnitude over the past several weeks.
- Recent equatorial Pacific SST trends and model forecasts indicate La Niña will continue through the Northern Hemisphere Spring 2008.
- Thereafter, there is considerable spread in the models, with approximately one-half indicating La Niña could continue well into the Northern Hemisphere summer.

Temperature Departures (ºC) for Ranges of the ONI during February-April

Weak

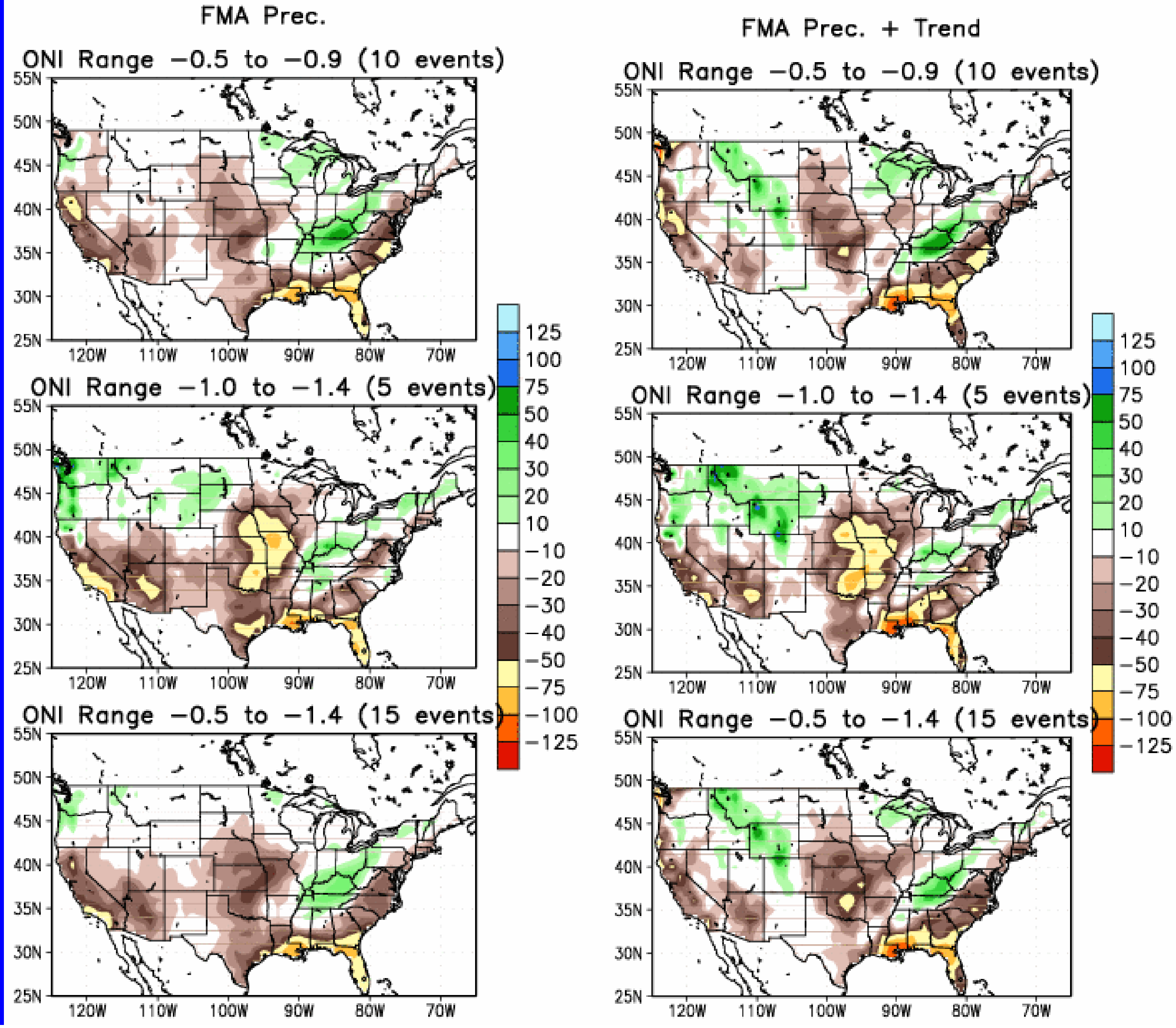
Moderate/ Strong

All episodes



Precipitation Departures (mm) for Ranges of the ONI during February-April

	La Niña	La Niña + Trend
Weak		
Moderate/ Strong		
All episodes		



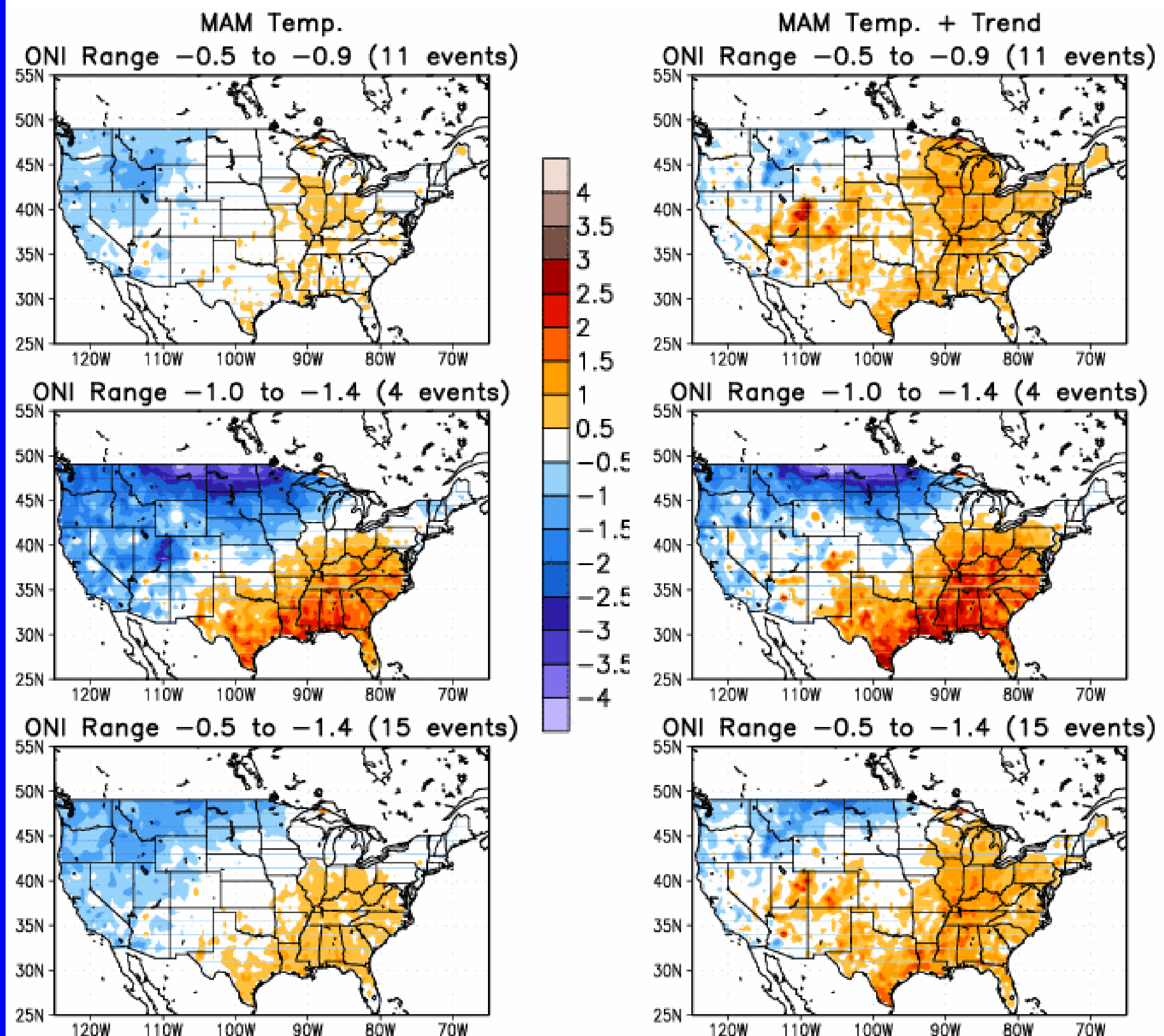
Temperature Departures (ºC) for Ranges of the ONI during March- May

La Niña | La Niña + Trend

Weak

Moderate/ Strong

All episodes

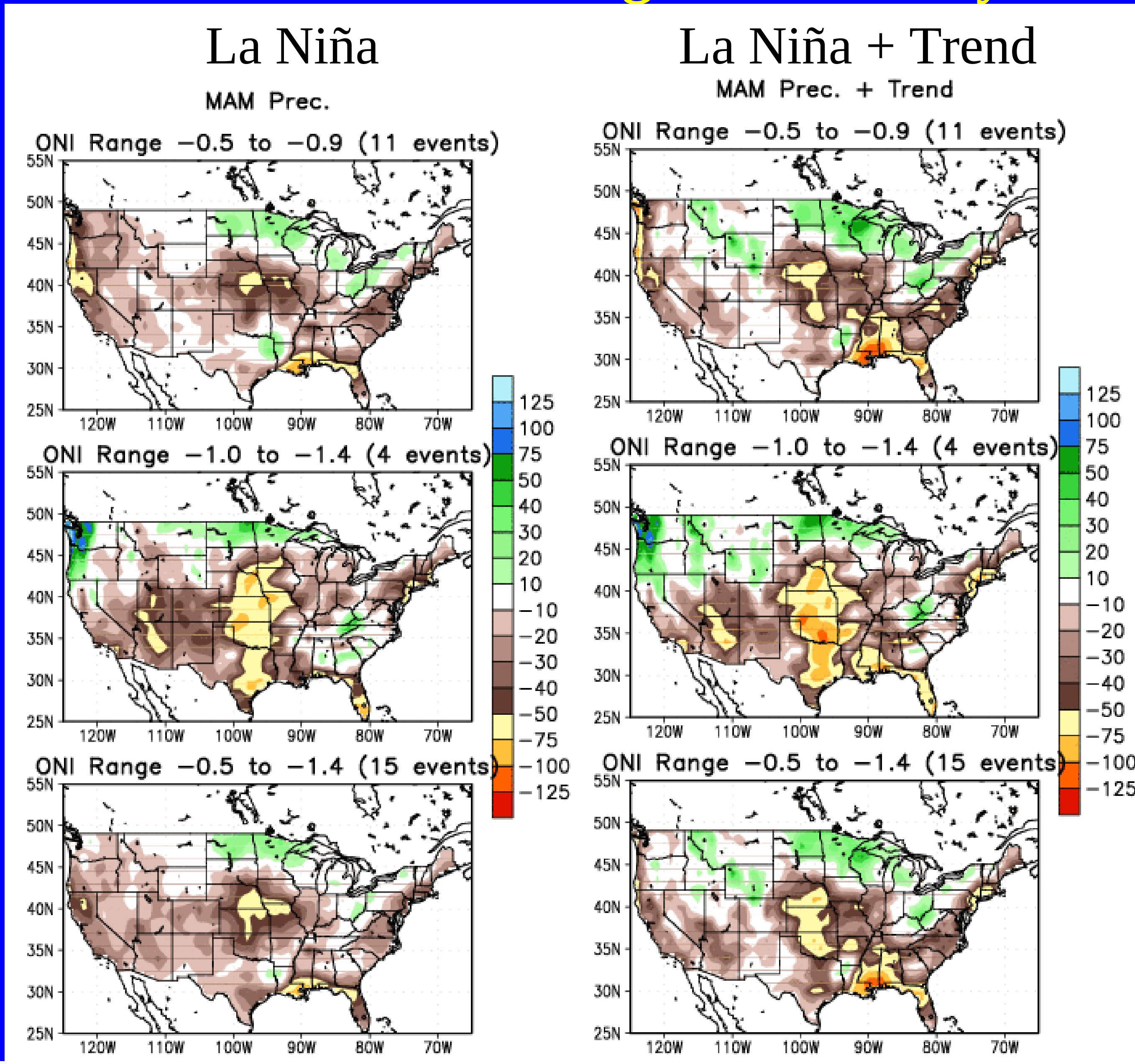


Precipitation Departures (mm) for Ranges of the ONI during March- May

Weak

Moderate/ Strong

All episodes

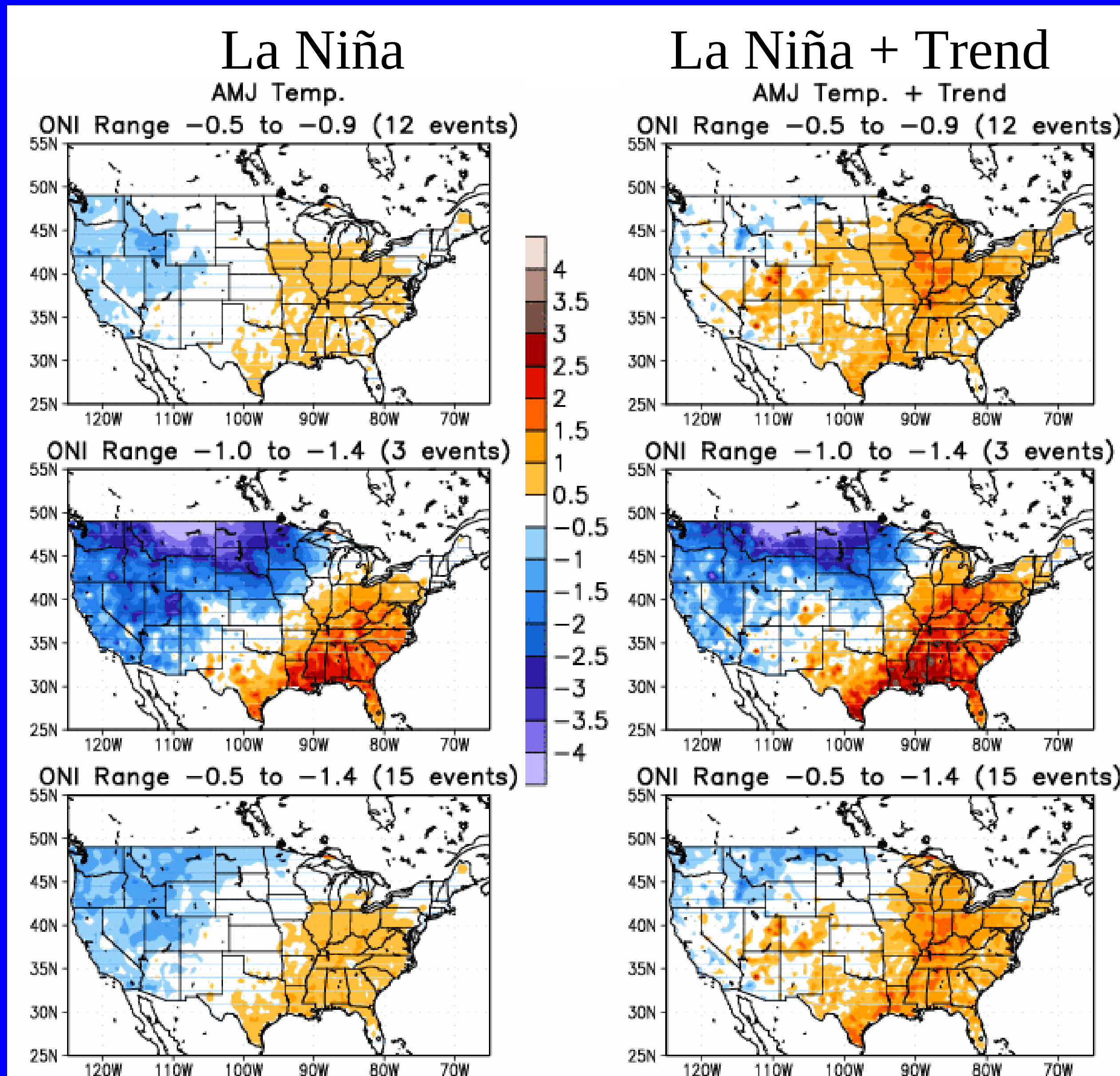


Temperature Departures (ºC) for Ranges of the ONI during April - June

Weak

Moderate/ Strong

All episodes



Precipitation Departures (mm) for Ranges of the ONI during April - June

Weak

Moderate/ Strong

All episodes