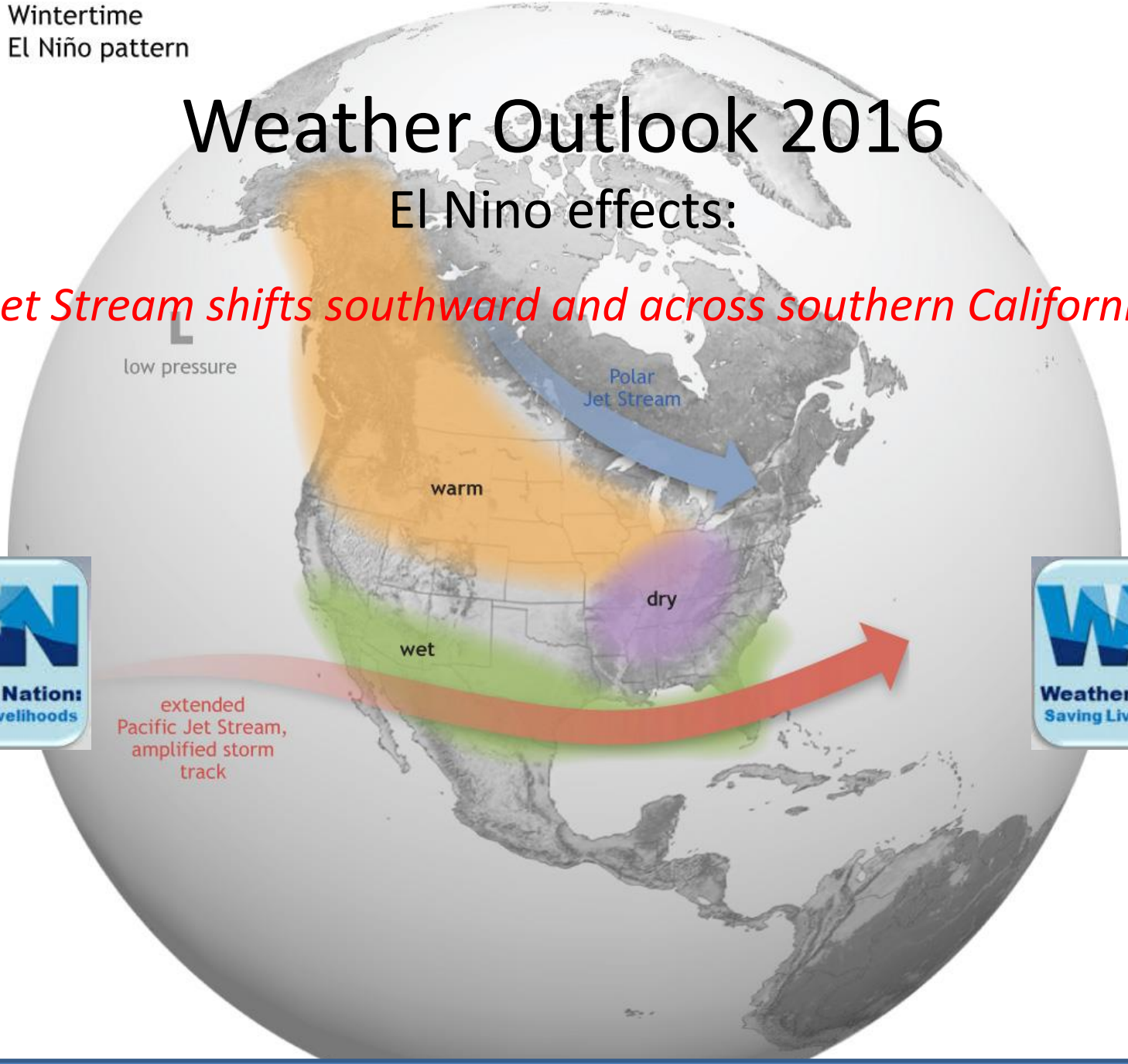
Weather Outlook 2016

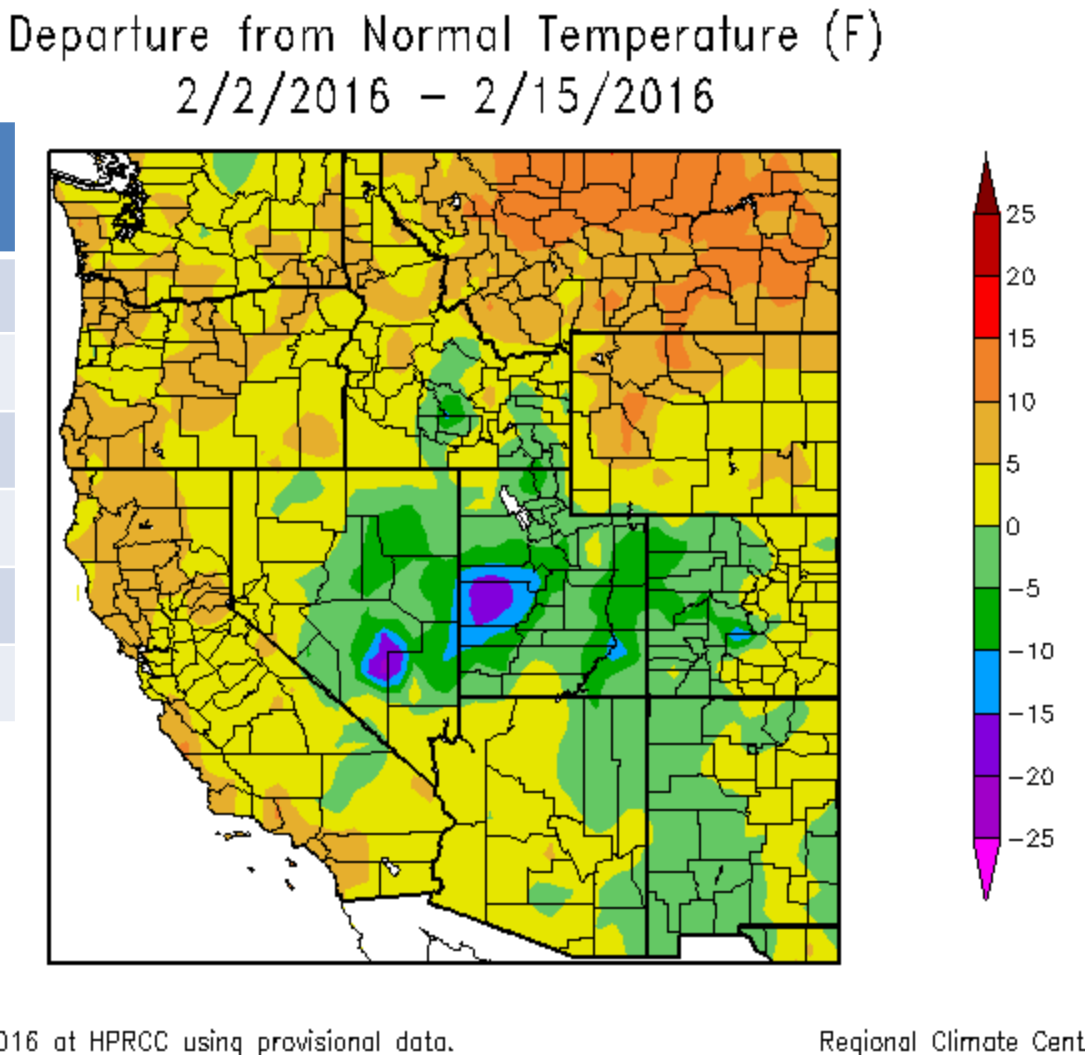
El Nino effects:

Jet Stream shifts southward and across southern California

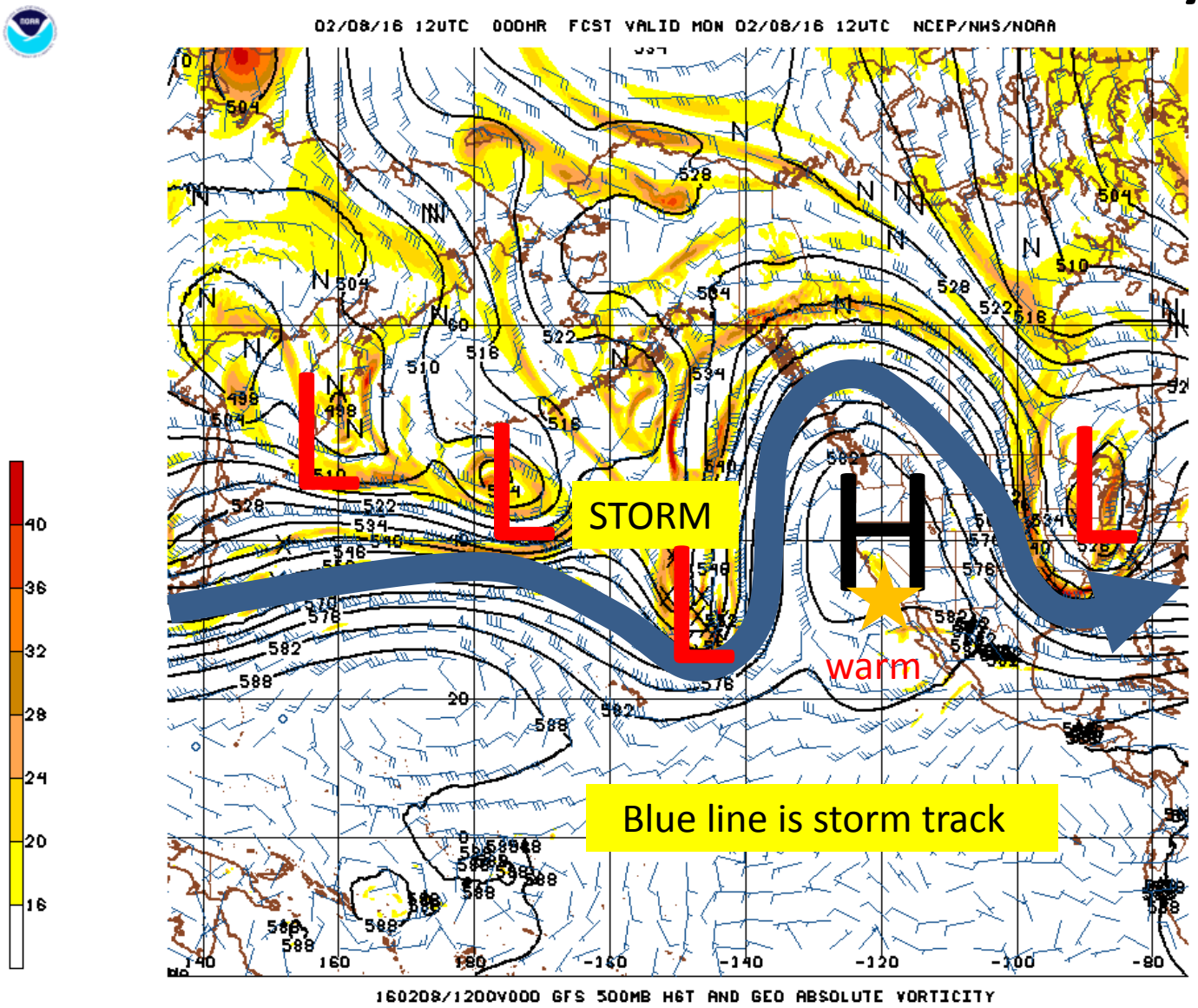


Warm Temperatures in February

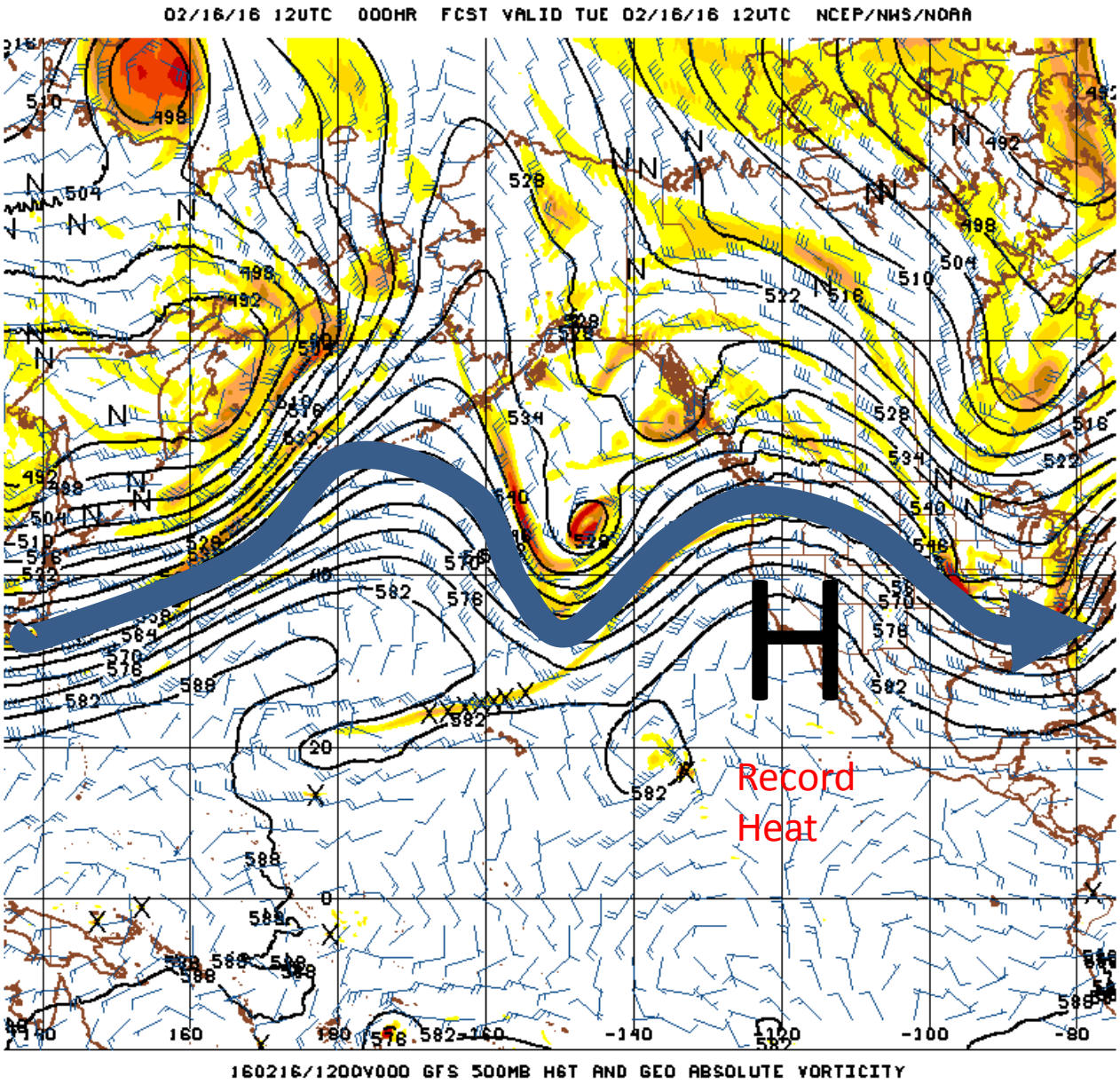
Location	Hottest in February
San Diego	90 in 1995
Riverside	94 in 1921
Santa Ana	95 in 1995, 2016
Big Bear	72 in 1986
Palomar Mtn	77 in 1972
Palm Springs	99 in 1986



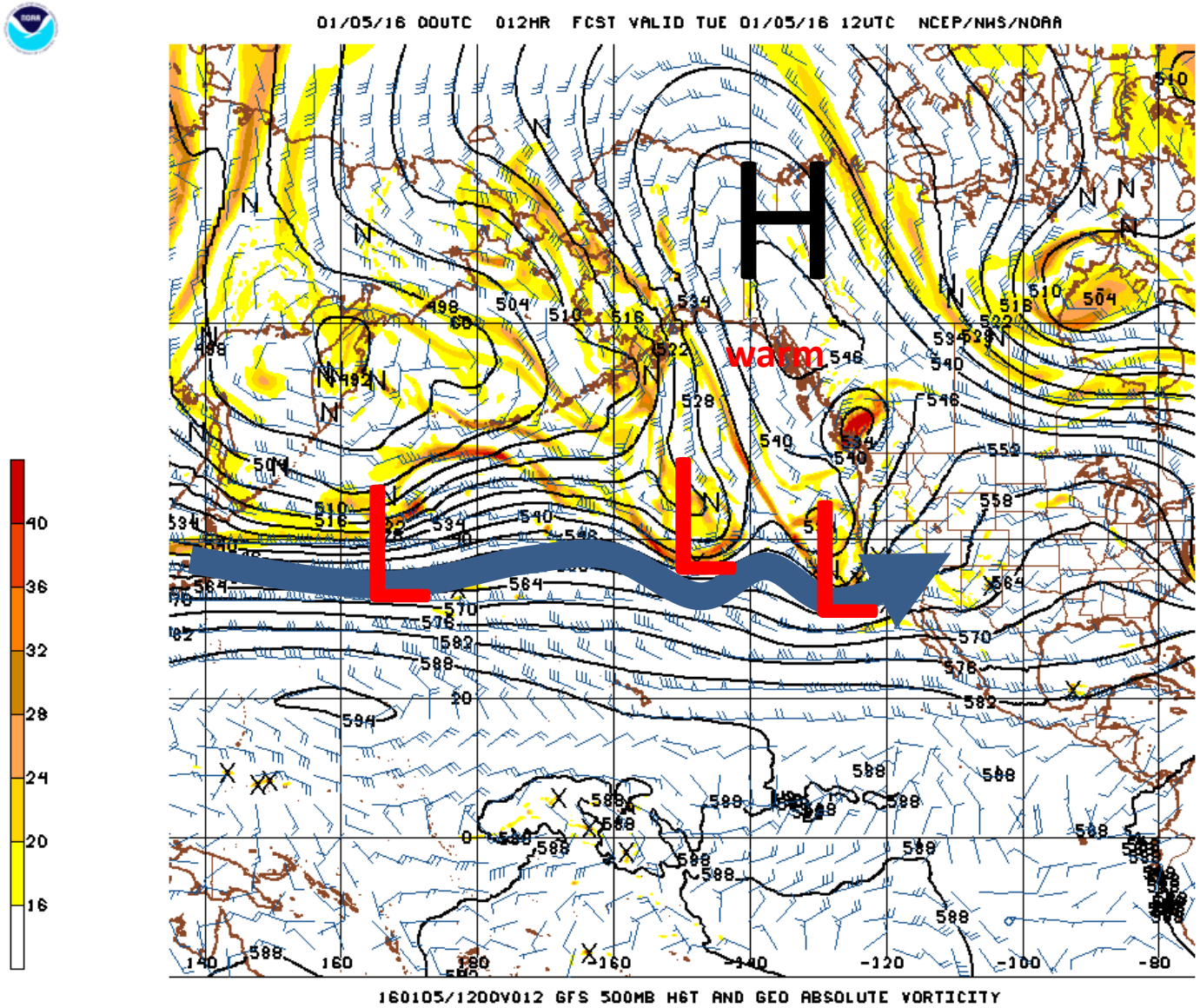
The Weather Pattern February 8th



February 16, 2016

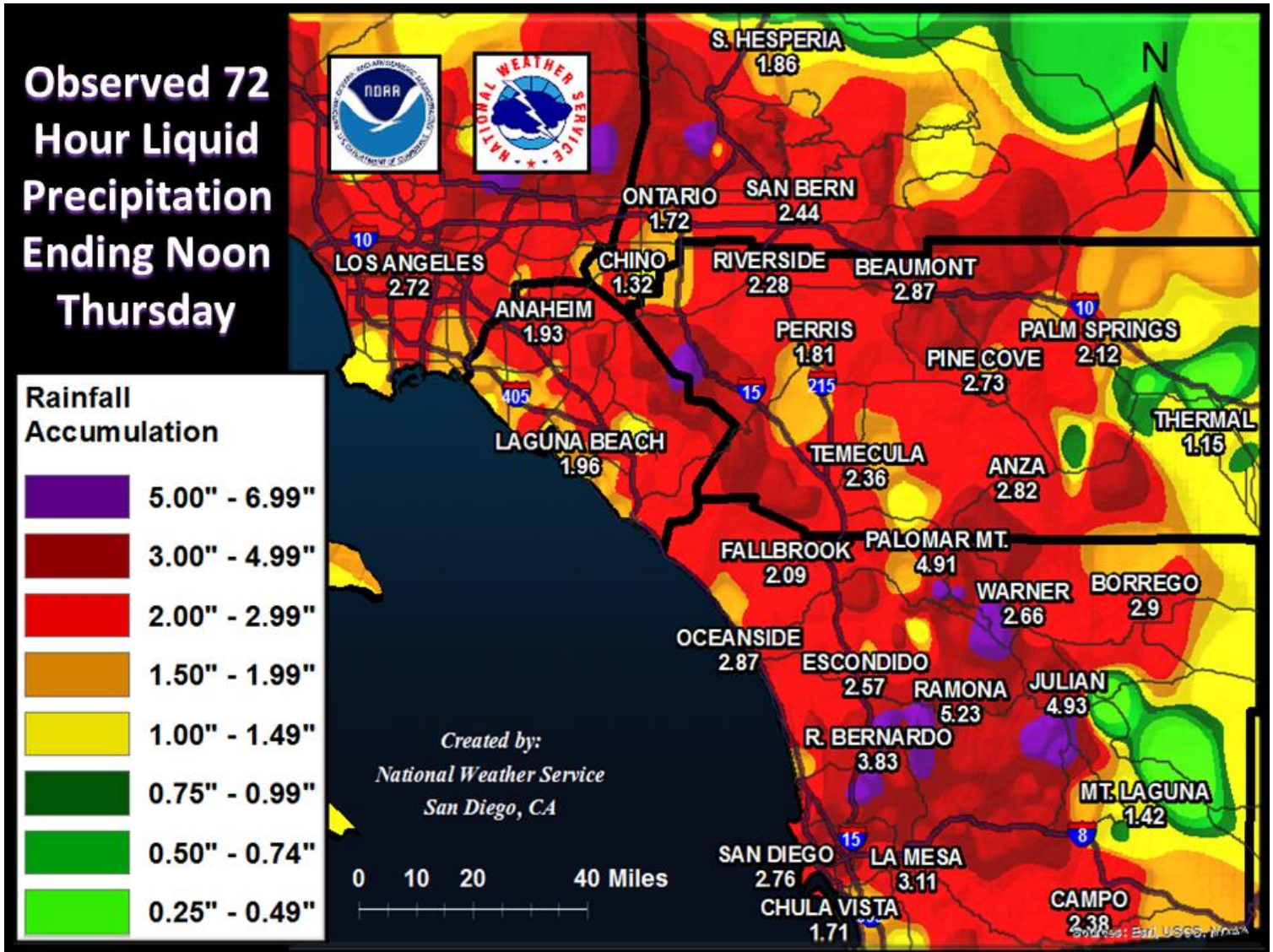


The Weather Pattern in early January



Series of Pacific storms January 4-8, 2016

bring high impact – first Socal "El Nino pattern"



Sabre Springs Poway Road damage

Tuesday

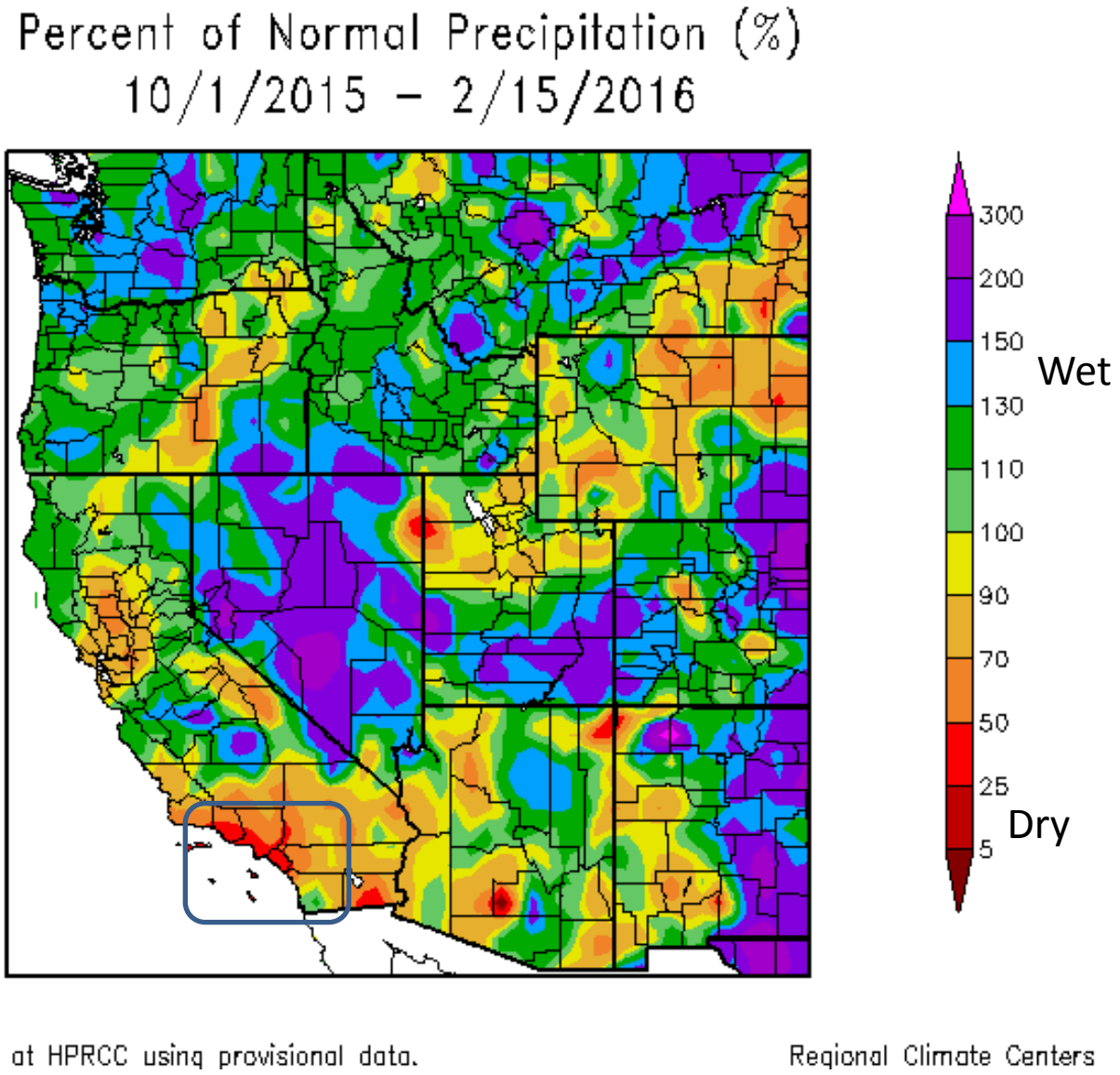
PLAY
LOTS OF RAIN IN SMALL AMOUNT OF TIME LEADS TO FLOODING
NEWS
10:01

LOTS OF RAIN IN SMALL AMOUNT OF TIME LEADS TO FLOODING

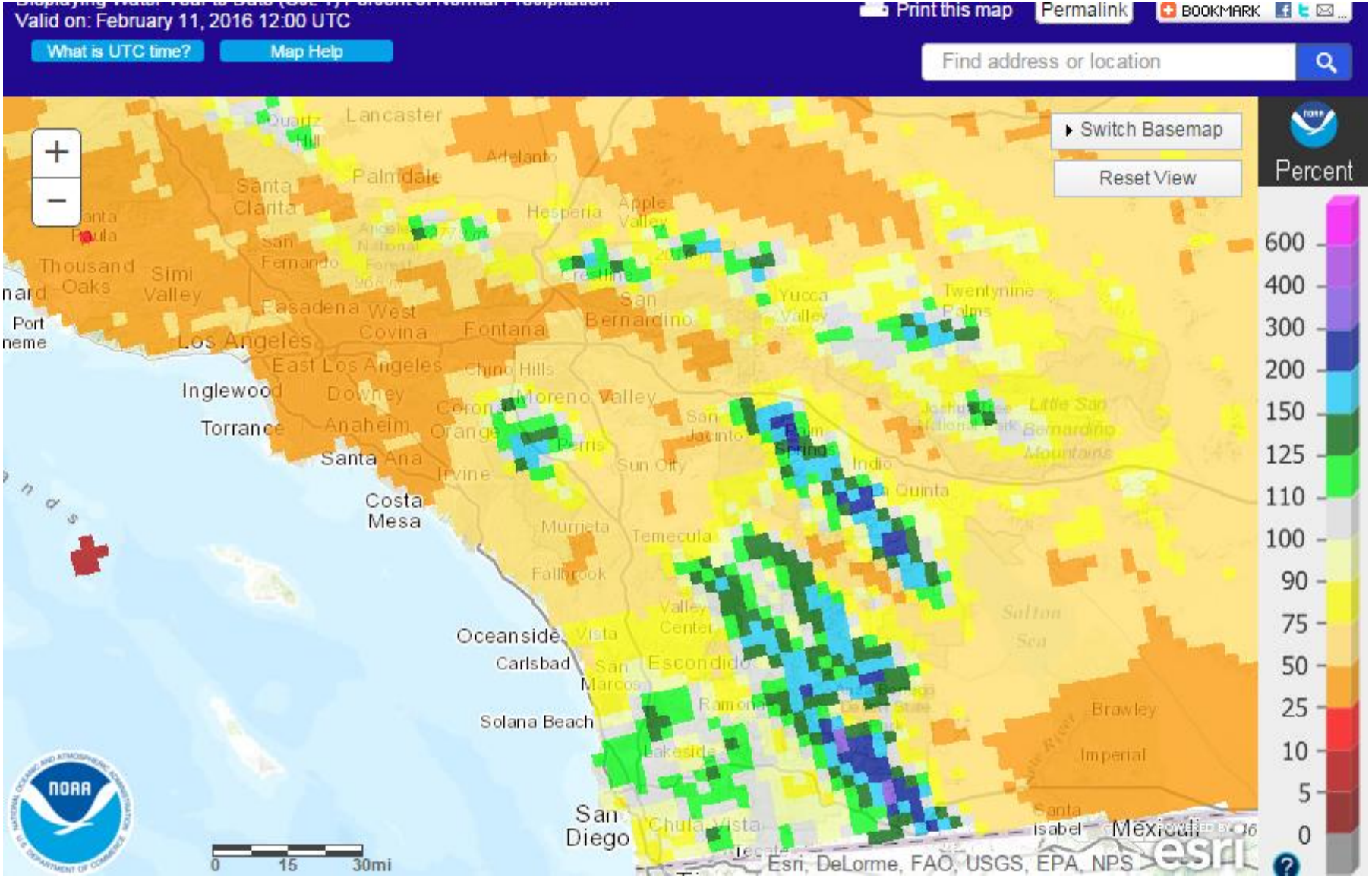
LOTS OF RAIN IN SMALL AMOUNT OF TIME LEADS TO FLOODING
NEWS
10:02
DOZENS OF RESCUES ACROSS COUNTY THIS AFTERNOON/EVENING
Dream Shop

DEVELOPING STORY
WEST COAST SUPER SOAKER
FLOODING TRIGGERS DANGEROUS MUDSLIDES IN CA
125 NORTH BOUND AT 125 NB CONNECTOR - 5 MPH
125 NORTH BOUND
7:06 | 54°

Percent of Normal Precip (water year)



Local View (since October 1)
Percent of Normal Precipitation



Precipitation in 1982-83 and 1997-98
2 strong El Nino winters

Month	San Diego 82/83, 97/98	Santa Ana 82/83, 97/98	Riverside 82/83, 97/98
November	2.10, 1.17	3.76, 1.70	2.57, 1.14
December	1.43, 1.35	1.01, 5.35	0.52, 3.12
January	2.10, 2.68	4.06, 2.19	2.58, 2.66
Rainfall To Date	5.63, 5.20 2015-16 – 6.06	8.83, 9.24 2015-16 – 3.17	5.67, 6.92 2015-16 – 3.84
February	3.88, 7.65	3.88, 13.99	3.25, 10.08
March	6.57, 2.21	8.32, 2.95	6.01, 1.94
April	1.74, 1.11	2.74, 0.94	2.44, 0.82
May	0.01, 0.64	0.26, 2.48	0.17, 1.53

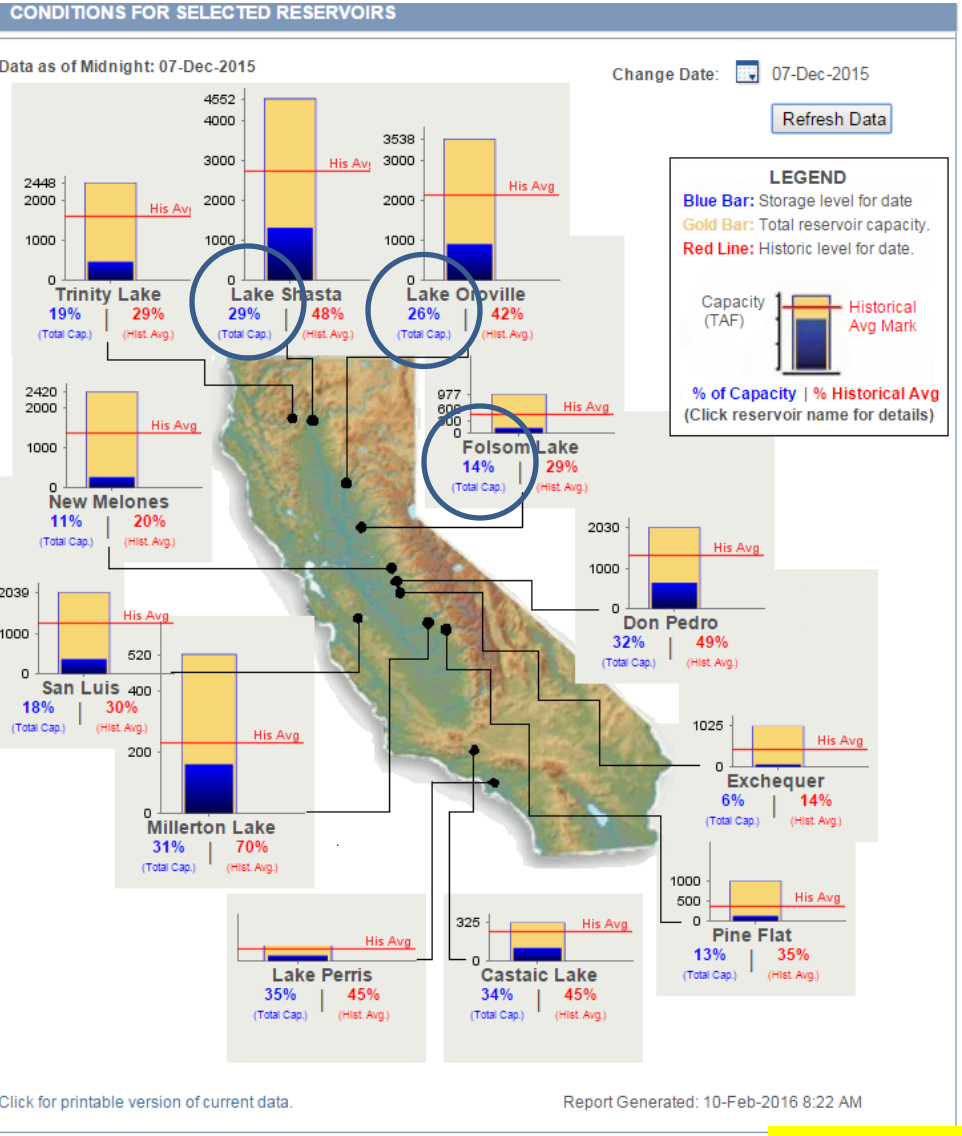
Rainfall is INCHES

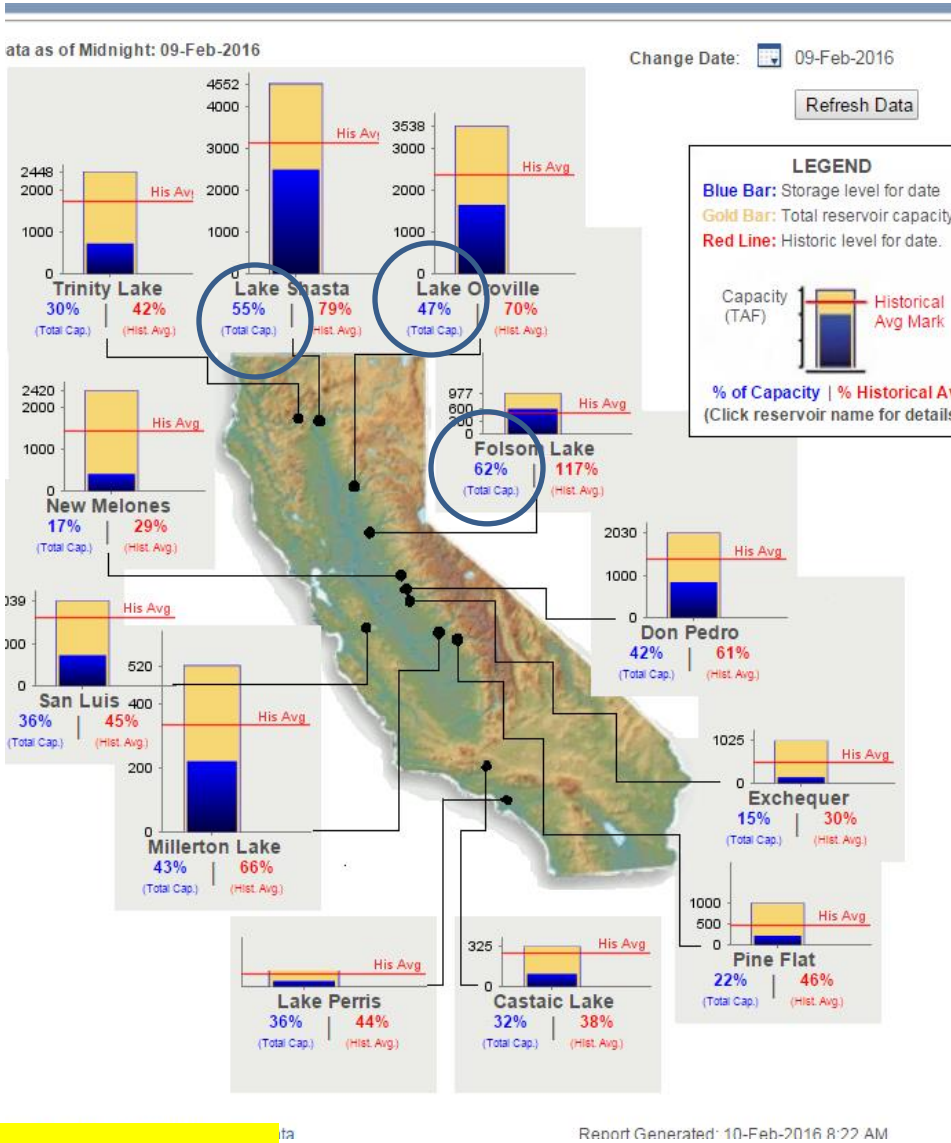
Mountain and Desert Precipitation

Location	2015 to 2016 to date	Normal October to February 1	February to May 82/83 and 97/98
Idyllwild	15.25	12.33	27.75/ M
Big Bear	10.80	9.89	14.30/ M
Palomar Mountain	9.24	14.56	25.99/34.09
Palm Springs	2.31	2.85	4.43/3.86

State Water Supply

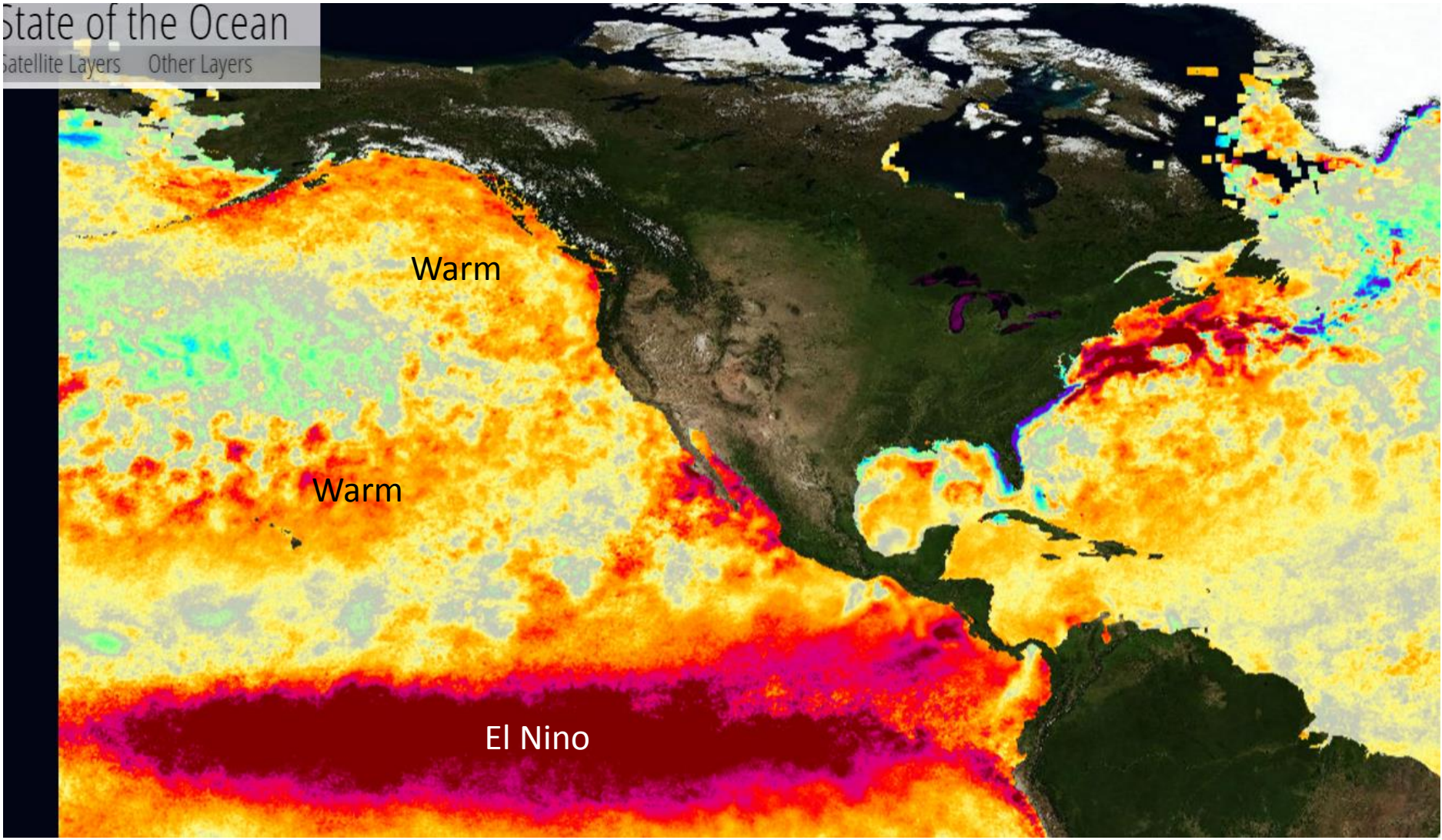
December 7, 2015 to February 9, 2016





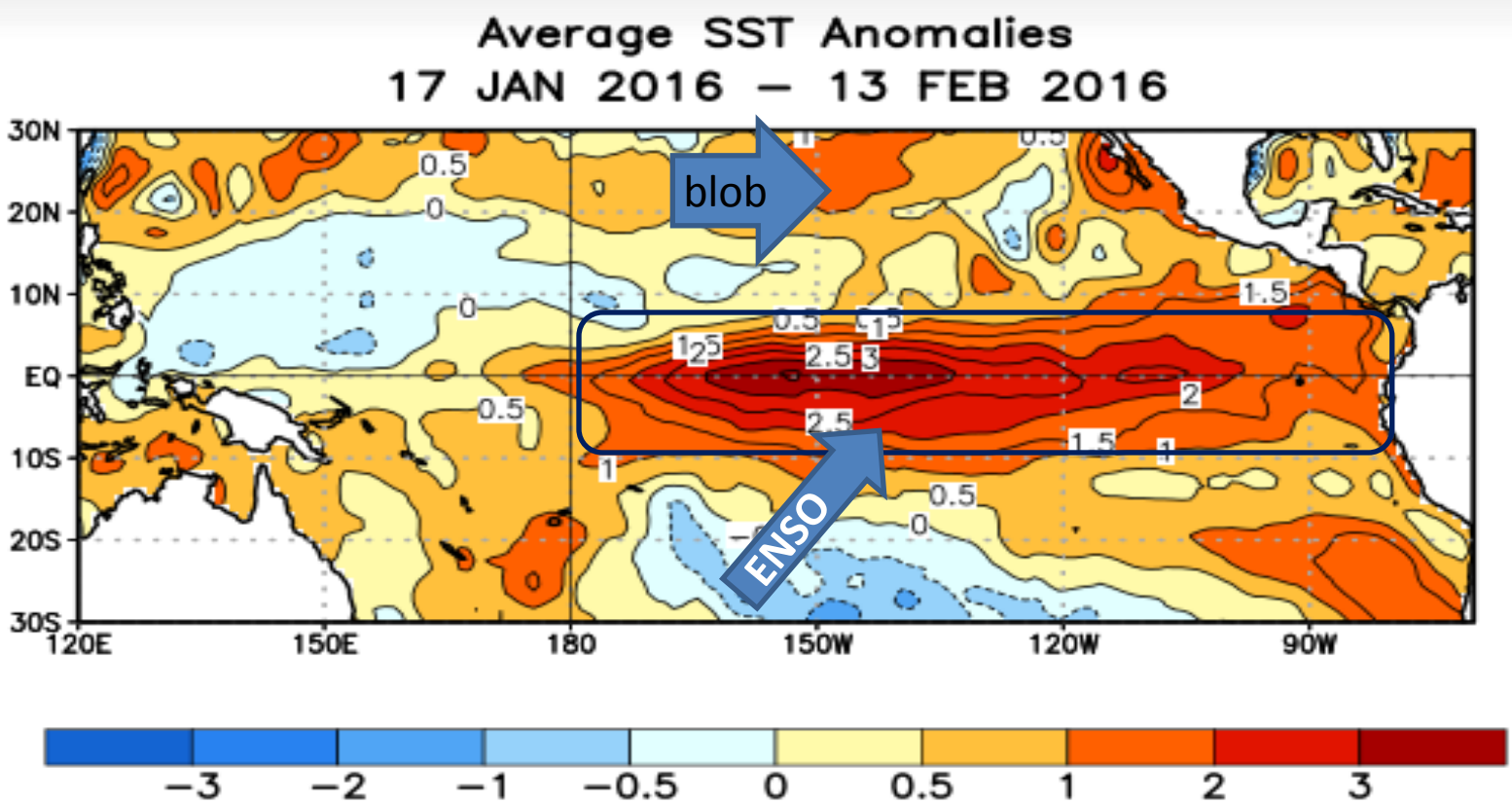
15 to 25% to 45-60 %

Pacific Ocean
Sea Surface Temperature (anomaly)



SST Departures (ºC) in the Tropical Pacific During the Last Four Weeks mid January to mid February

During the last four weeks, equatorial SSTs were above average across the central and eastern Pacific, with the largest anomalies off the coast of S. America.



Niño Region SST Departures (°C) Recent Evolution

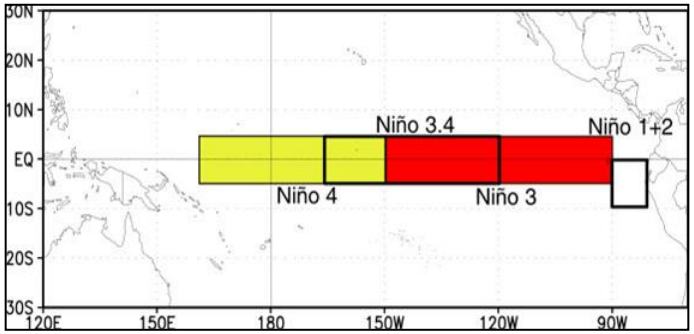
The latest weekly SST departures are:

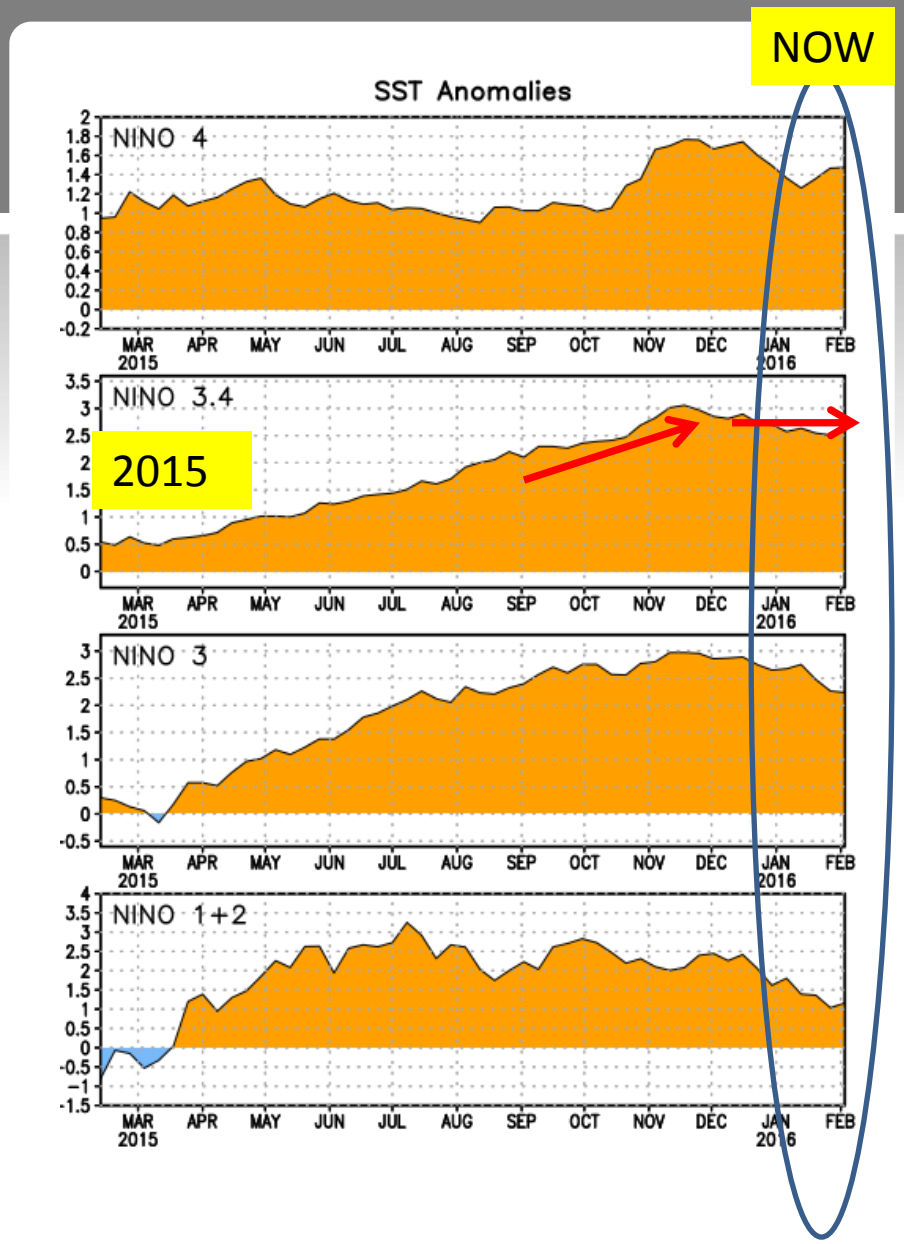
1.5°C

2.5°C *

2.0°C

0.7°C

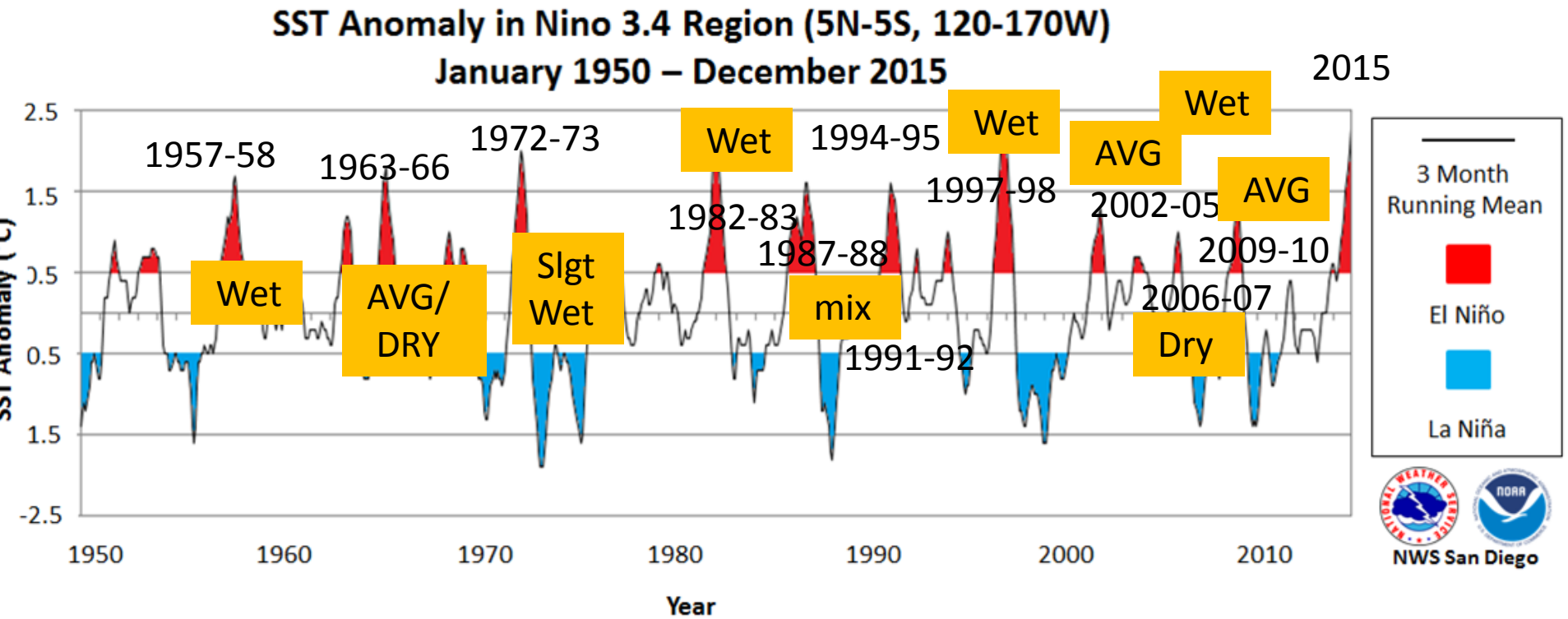




* Record High Weekly Average Value

Historical ENSO periods

El Nino warm = red blue=cool phase



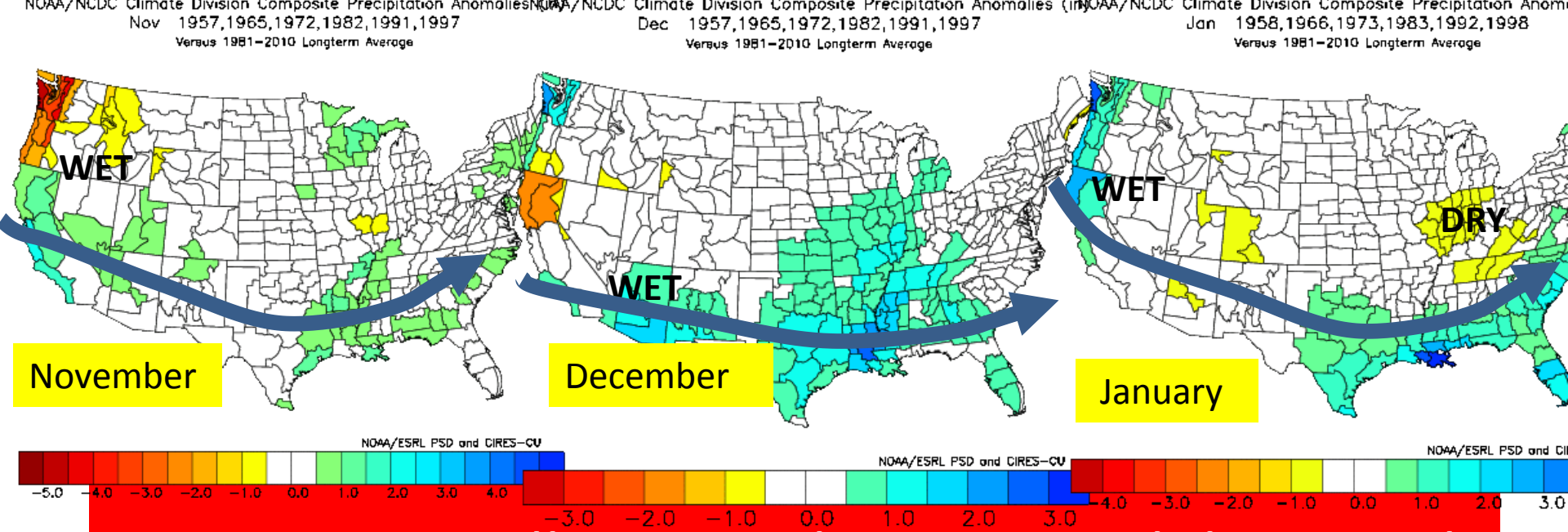
2010-11 Wet

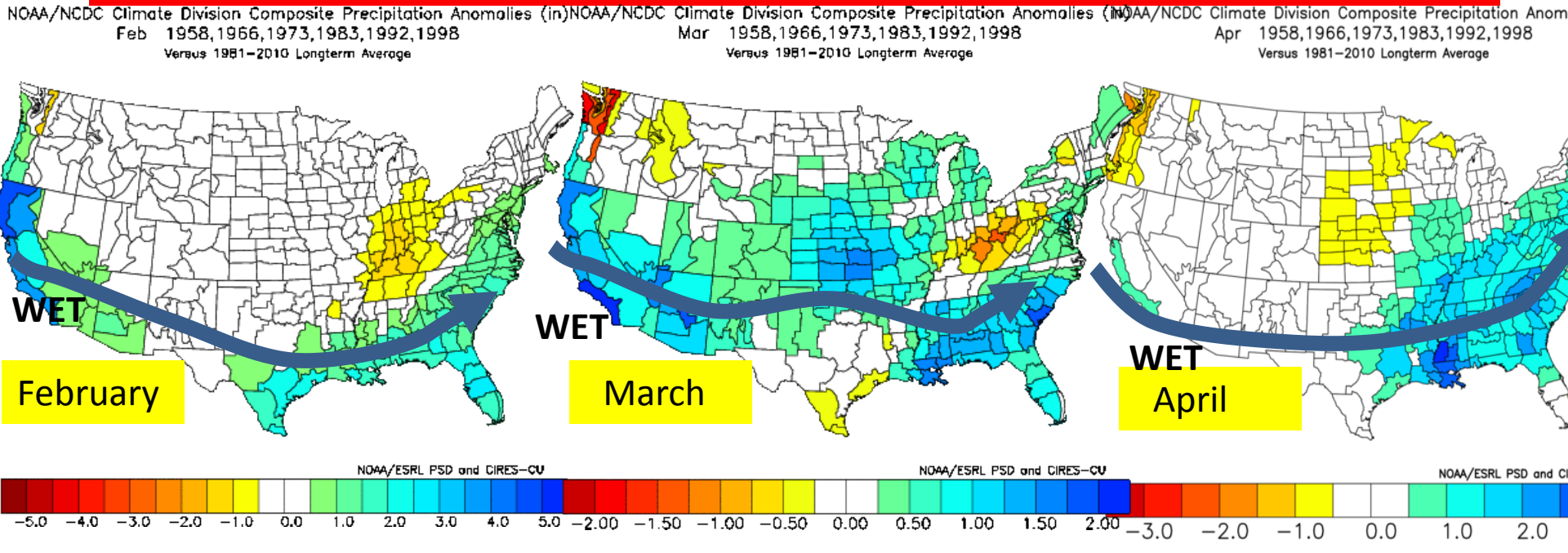
San Diego Big Monthly Rainfall

Winter October to April

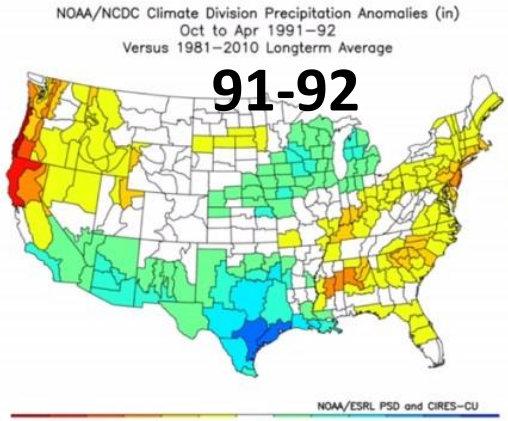
Month Year	Total Precipitation	October-April	ENSO ONI
January 1993	9.09	17.81	0.2 (neutral)
January 1995	8.06	16.63	1.3
February 1998	7.65	16.19	2.5
March 1991	6.96	11.77	0.4 (neutral)
March 1983	6.57	17.87	2.3
December 1965	6.60	14.74	1.5
January 1978 Drought Buster Year	5.95	16.54	0.7
February 2005	5.83	22.35	0.7
January 1979	5.82	14.03	-0.1 (neutral)
November 1965	5.82	14.74	1.5
January 1980	5.58	14.96	0.5
December 2010	5.00	12.18	-1.4
			2010-11

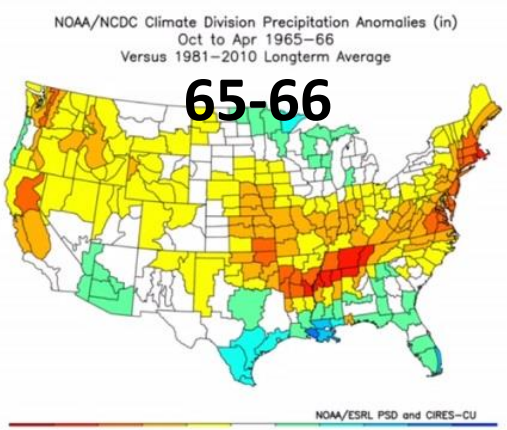
Precipitation All Strong El Nino Month by Month

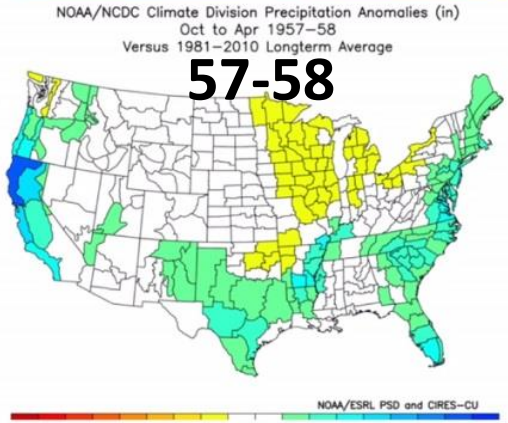


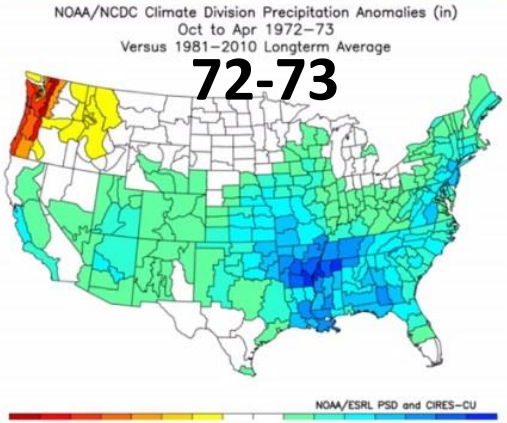


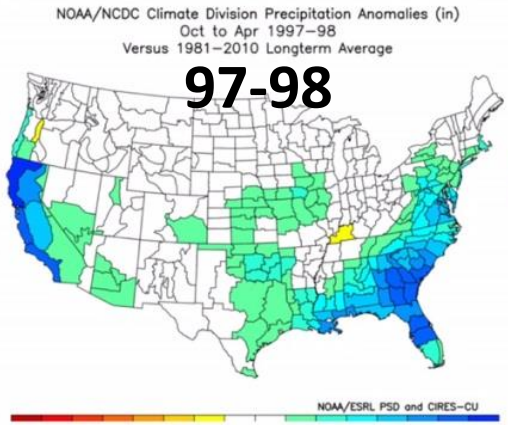
Past Strong El Nino

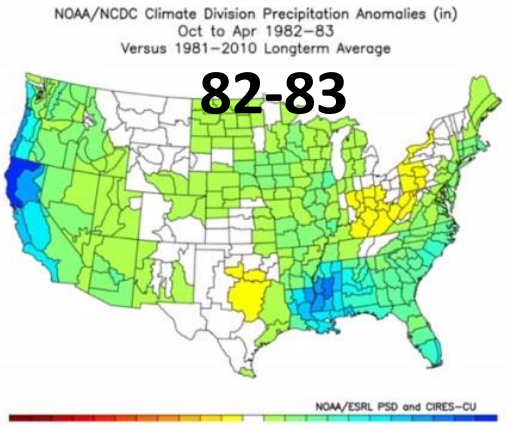






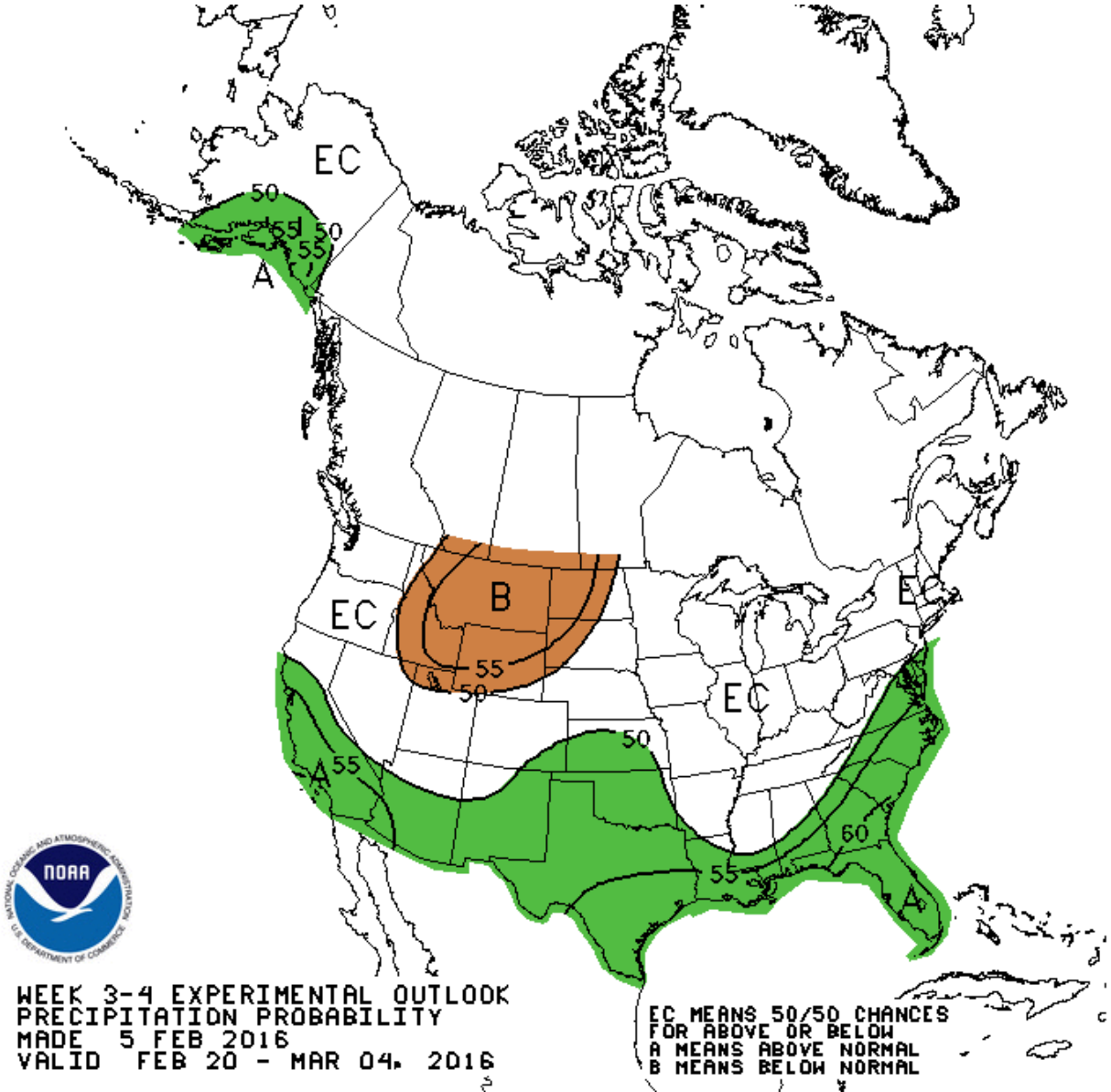






Outlook for Precipitation

February 20 to March 4, 2016

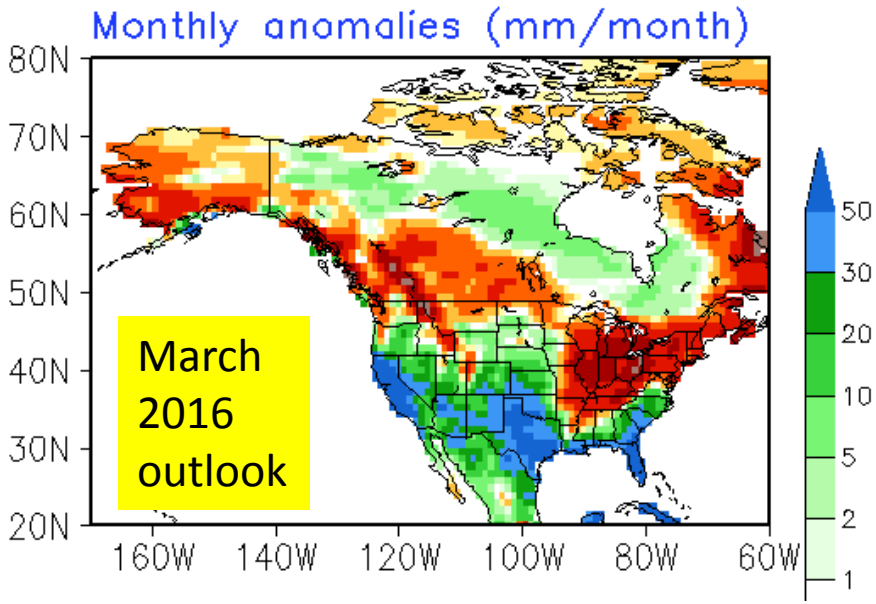


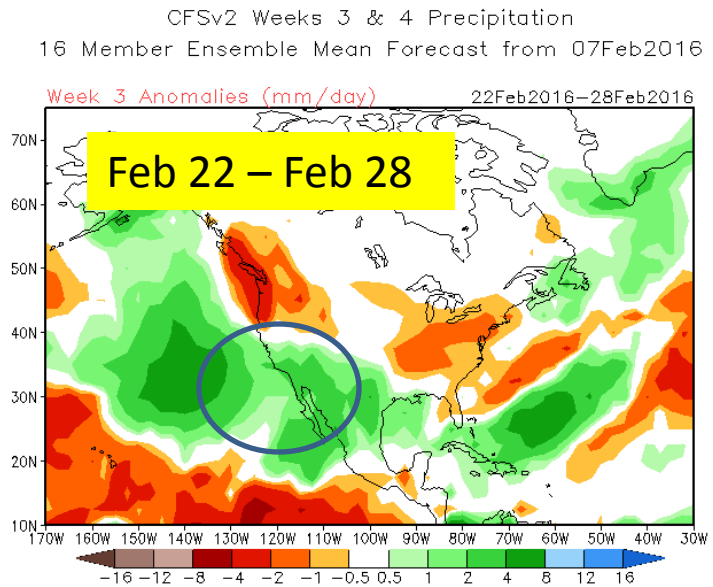
Climate Forecast Model

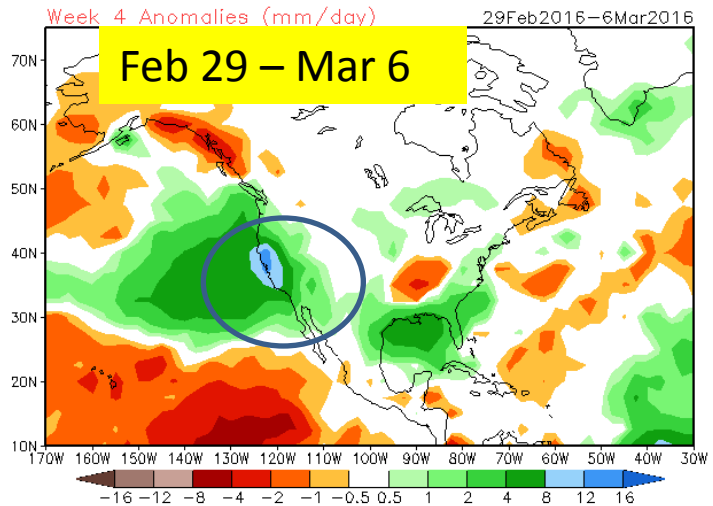
NWS/NCEP/CPC

Initial conditions: 06Z05Feb2016–00Z08Feb2016(21 members)

CFSv2 monthly Prec forecast for Mar2016

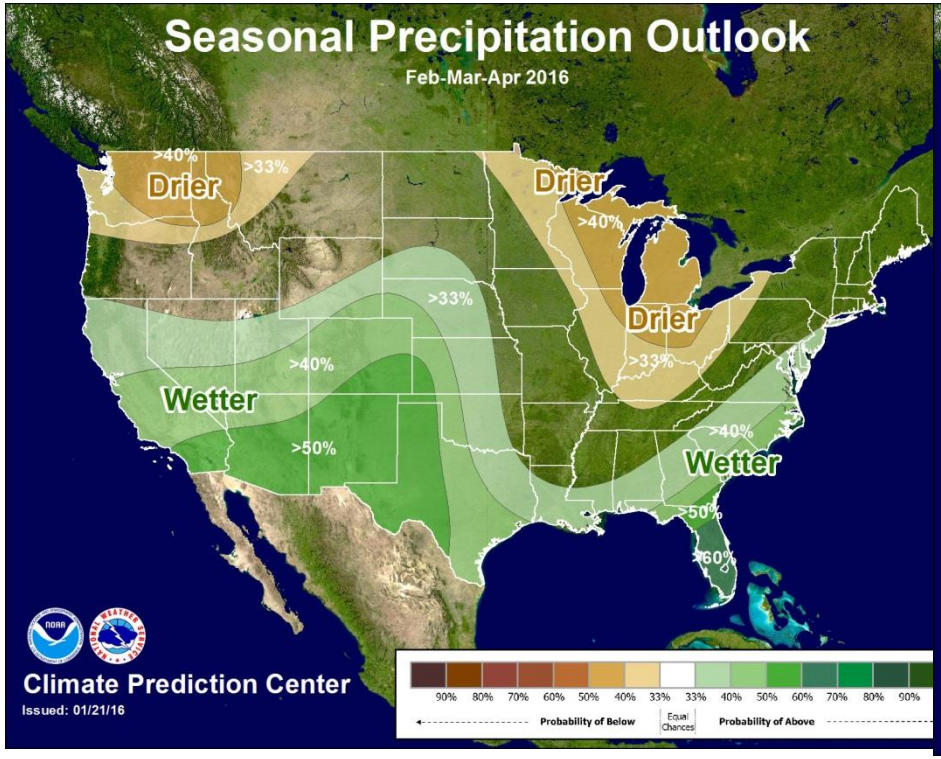


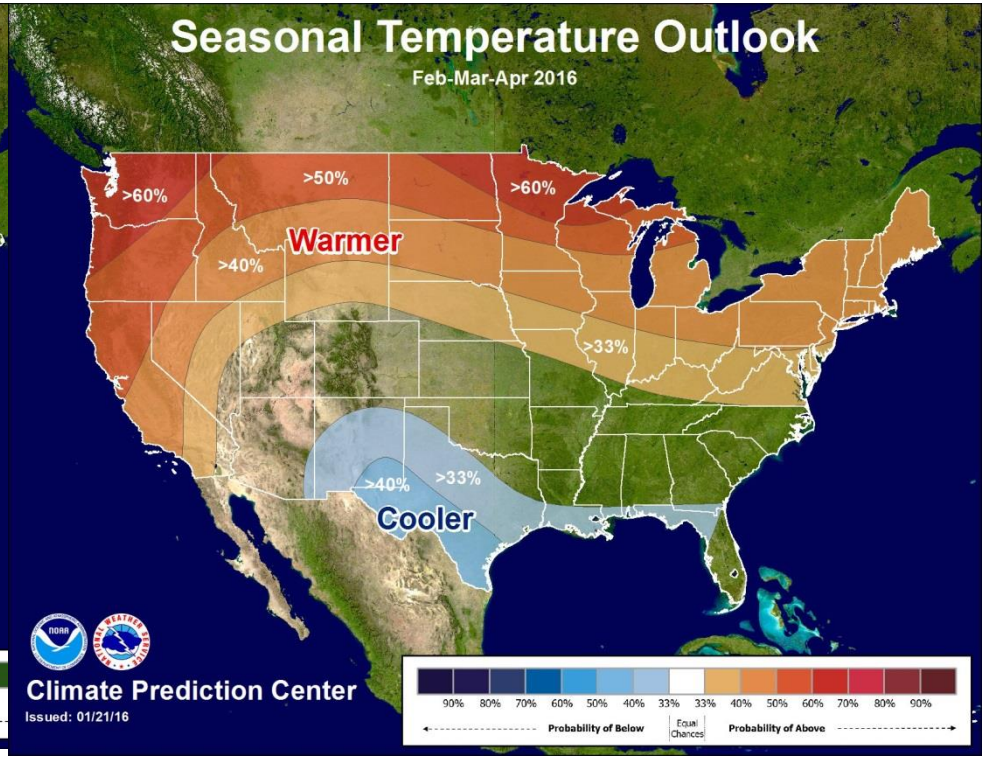




Winter Outlook 2015-16

issued January 21





Summary of El Nino

- El Nino conditions are the unusual warming of the Sea Surface Temperatures in the Pacific Ocean along the equator (occurs every 3 to 7 years) after trade winds are weakened
- An El Nino can take the normal Jet Stream from Oregon and bring it south across Southern California for much of the winter and spring months
- El Nino can result in a pattern that brings a series of stormy periods in the winter and spring months, but not a particular storm
- Strong (2.3 °C running mean, same as 97-98) El Nino is present and strengthening slowly through Fall
- El Nino at the strong phase correlates to above normal precipitation in southern California but not necessarily the whole state
- Currently it is the strongest El Nino on record (2.5 °C in the center)
- Above normal precipitation and frequent storms are expected for southern California with the best chance from December through March
- Santa Ana winds still occur in El Nino years (Santa Ana's peak in December)
- Moderate snow levels (not the tropical high snow events and not the artic air mass)
- The "blob" warm waters can enhance rainfall rates (more unstable)
- El Nino can impact the jet stream to bring more frequent storms during the wet season but not necessarily stronger storms (not just the Pineapple Express or Atmospheric River)
- Some of the wettest months have been El Nino years but individual large precipitation events have occurred in non- El Nino and La Nina years (such as January 1993 and December 2010)
- El Nino does not guarantee above normal precipitation and there have been several dry or average years in California during El Nino
- Drought will continue since 4-year deficits are 1 to 2 seasons missed and the entire state will need much above normal precipitation and above normal snowpack