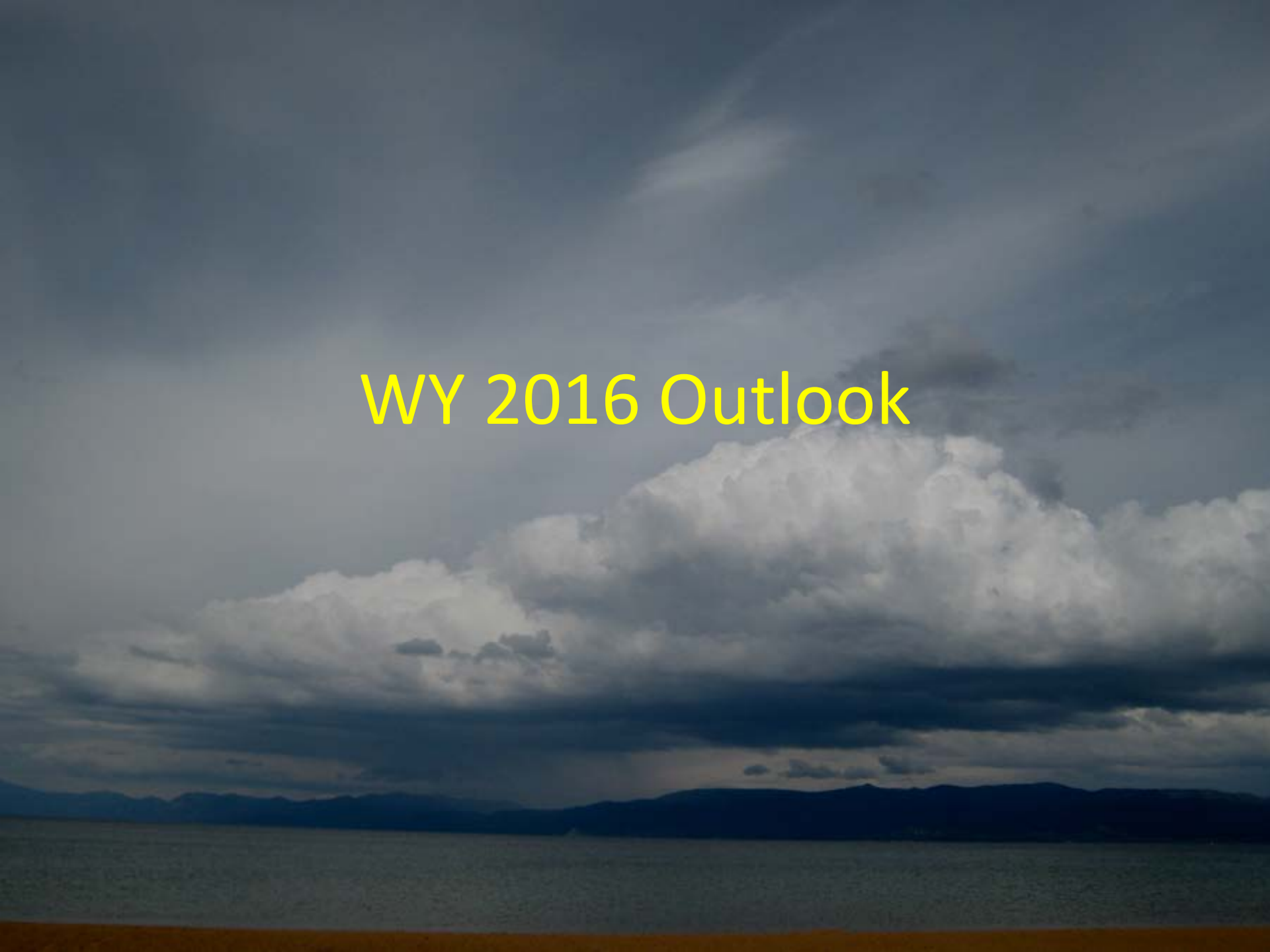
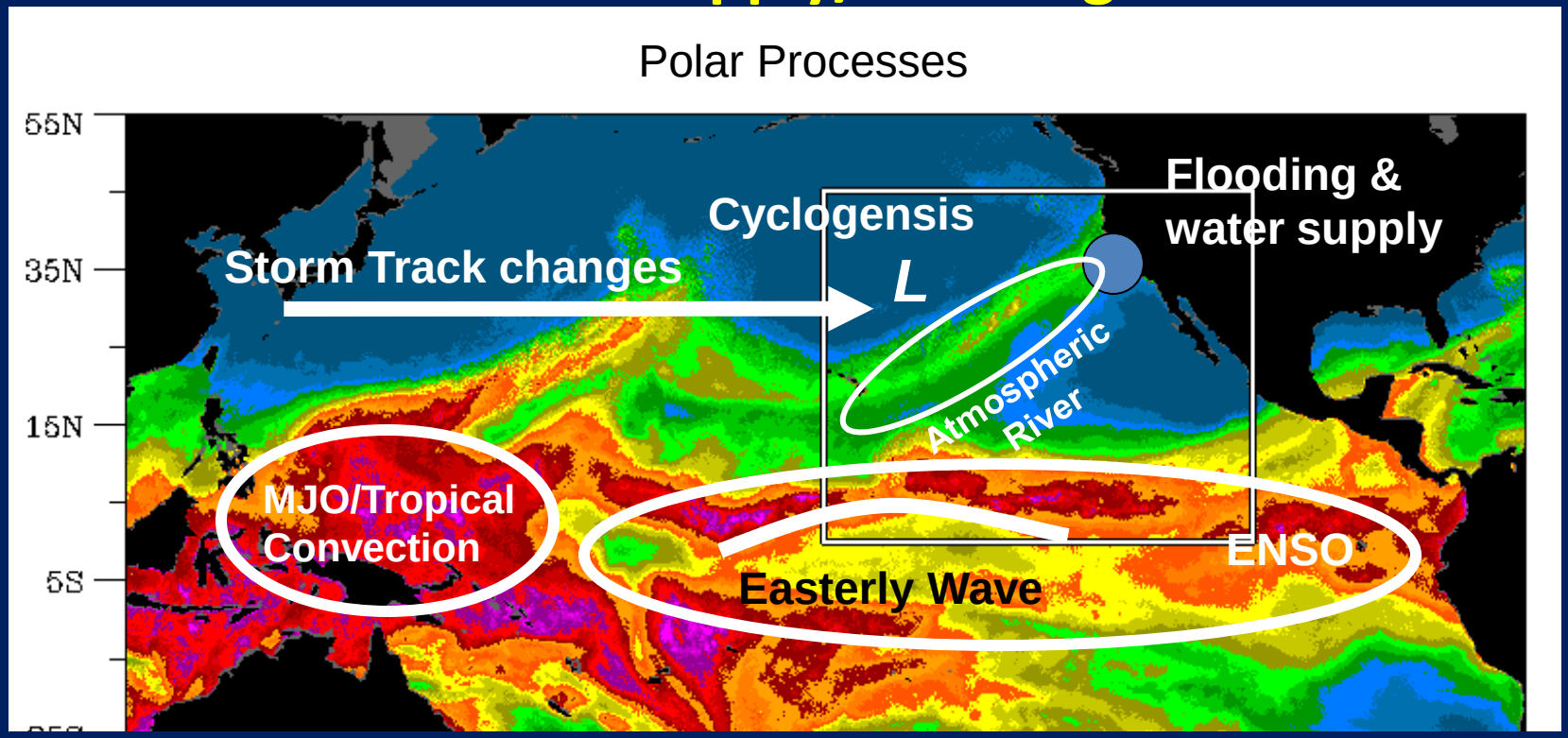


WY 2016 Outlook

Overview

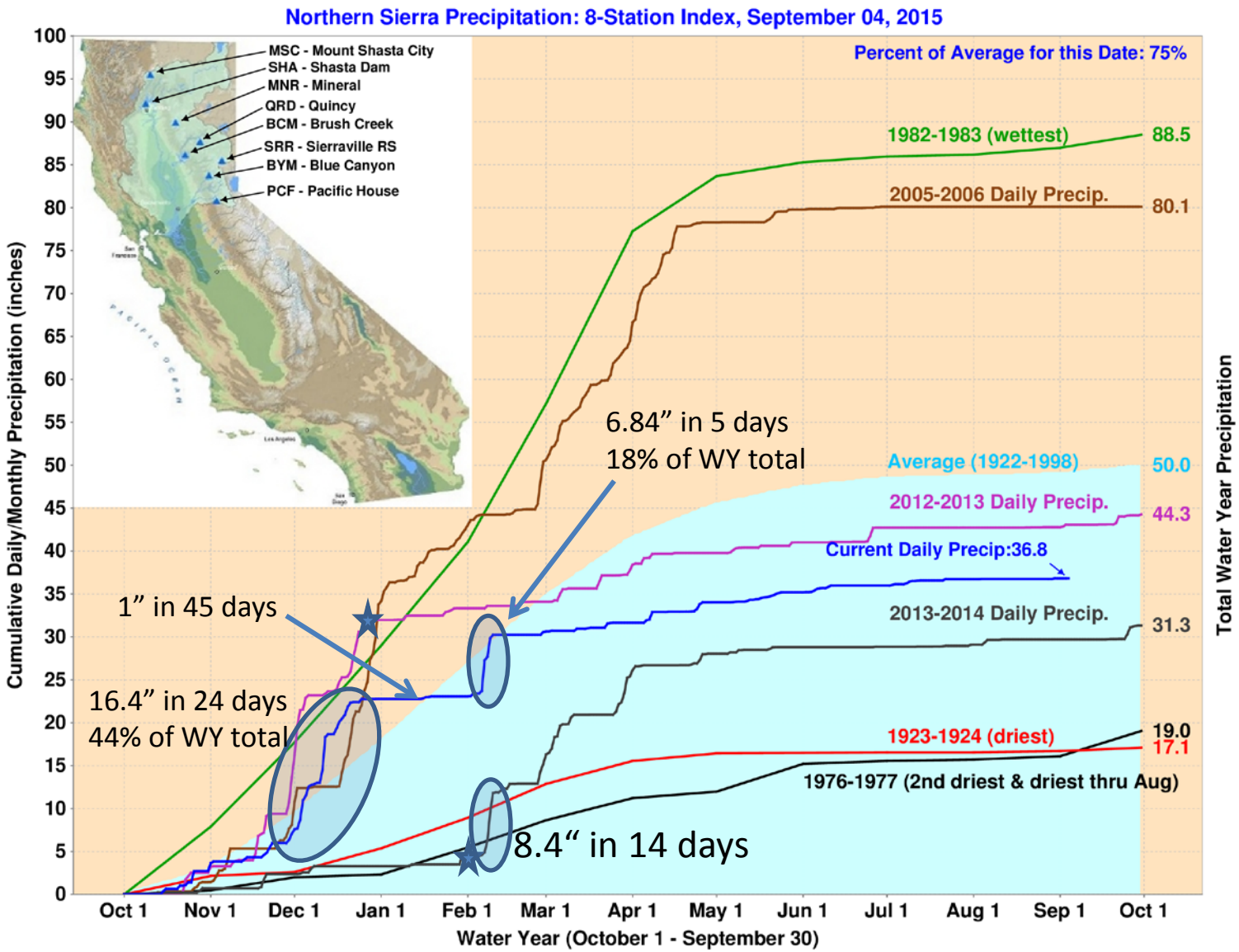
- WY2015 Perspective
- El Nino and California
- Expectations for WY2016

Key Phenomena Affecting California Water Supply/Flooding:



The size, number, and characteristics of atmospheric river events (ARs) result from the alignment of key processes

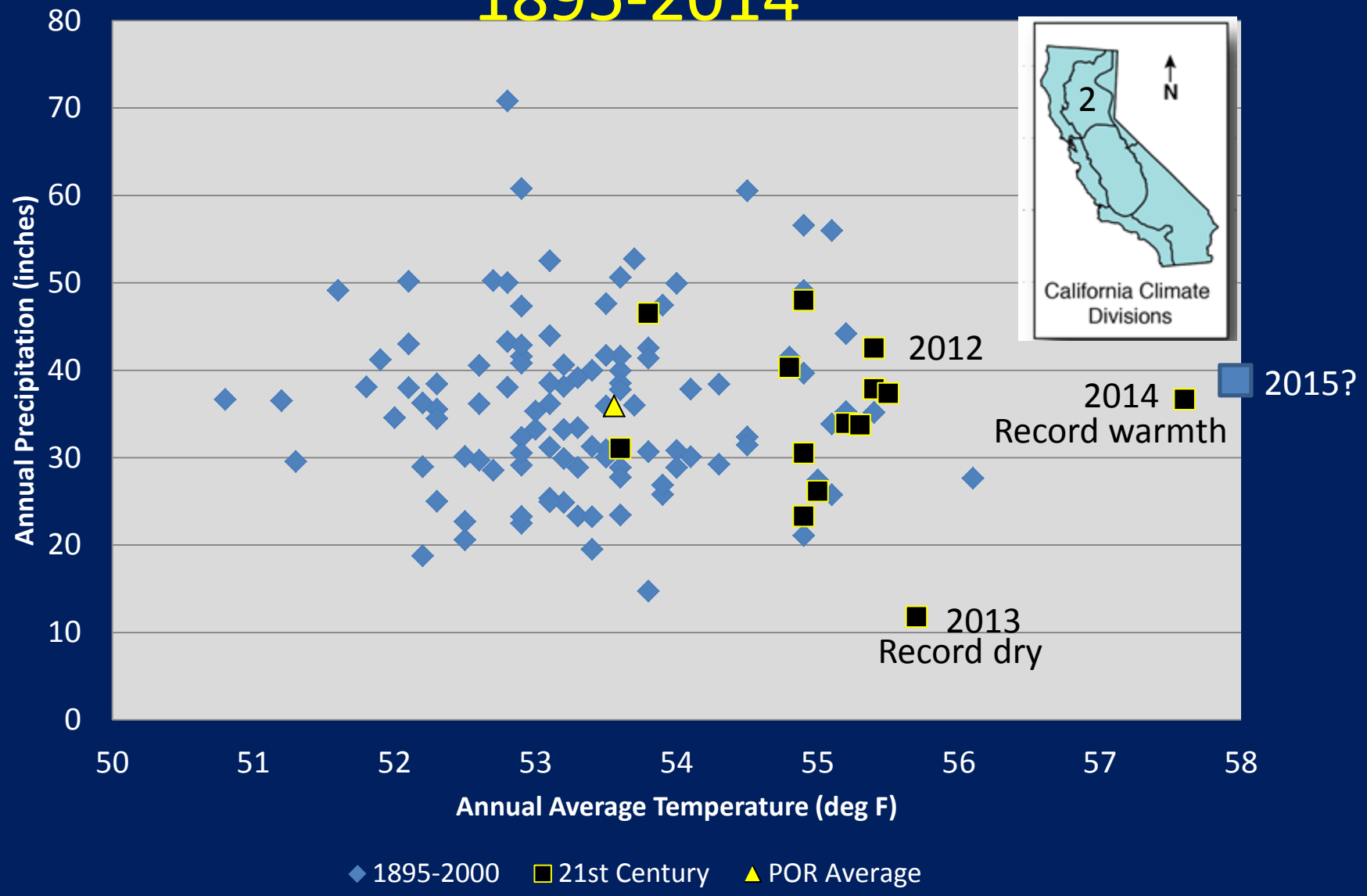
Atmospheric Rivers and Precipitation Accumulation



WY2015:
121 days
37.24"

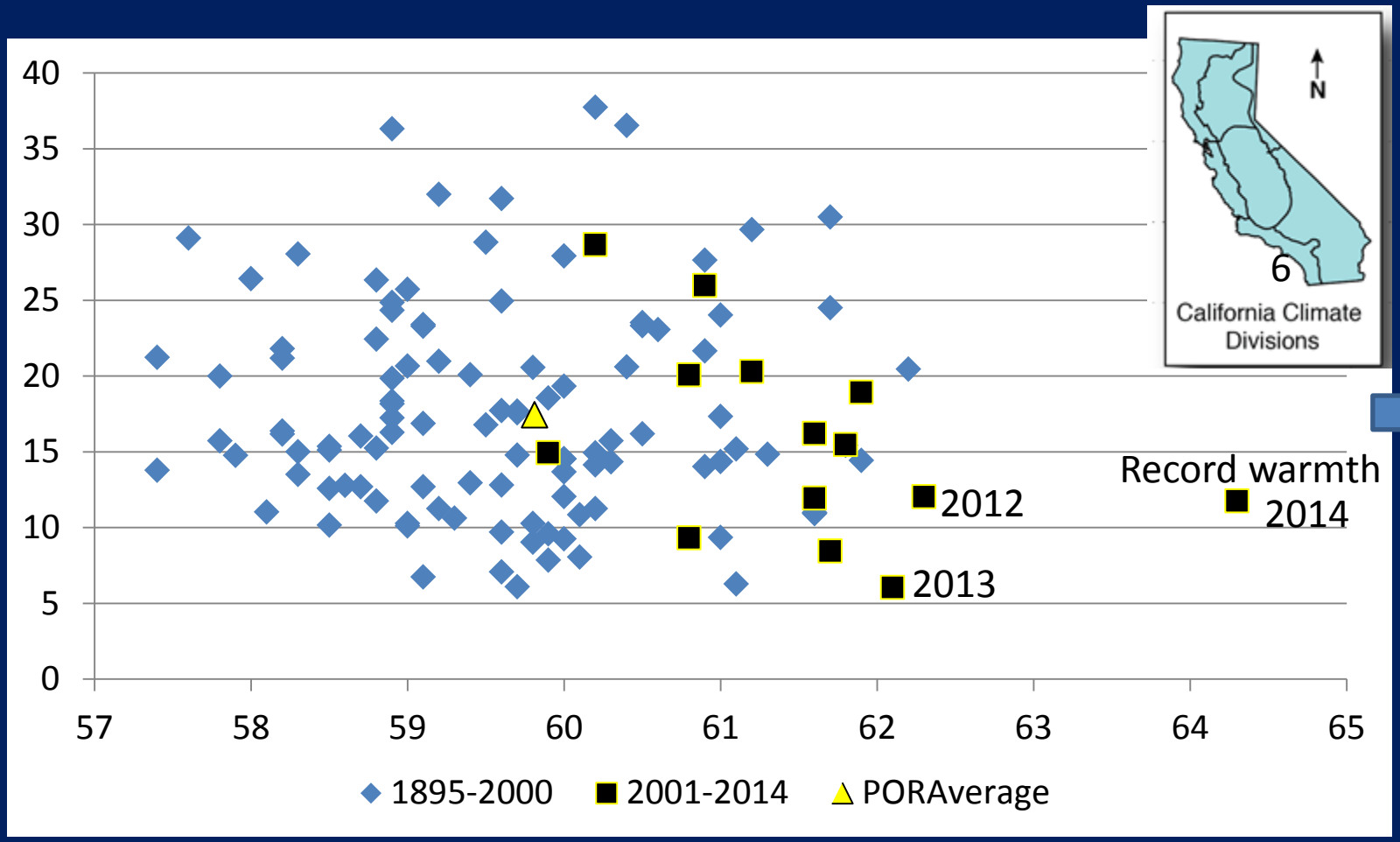
16.8"
404 Days

NOAA Climate Division 2 Calendar Year Data 1895-2014



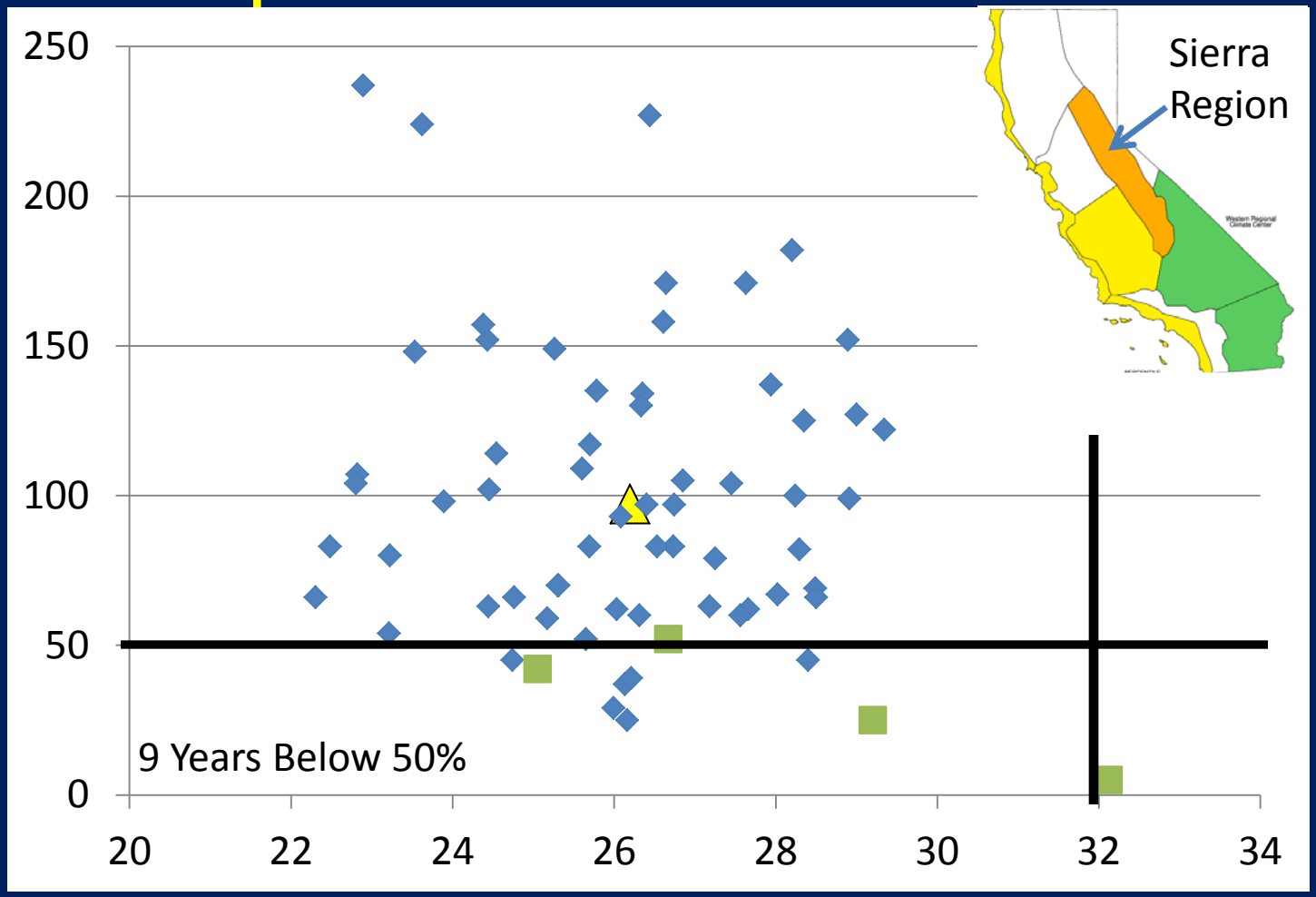
Source: NOAA Climate Division 2 Calendar Year Data

NOAA Climate Division 6 Calendar Year Data 1895-2014



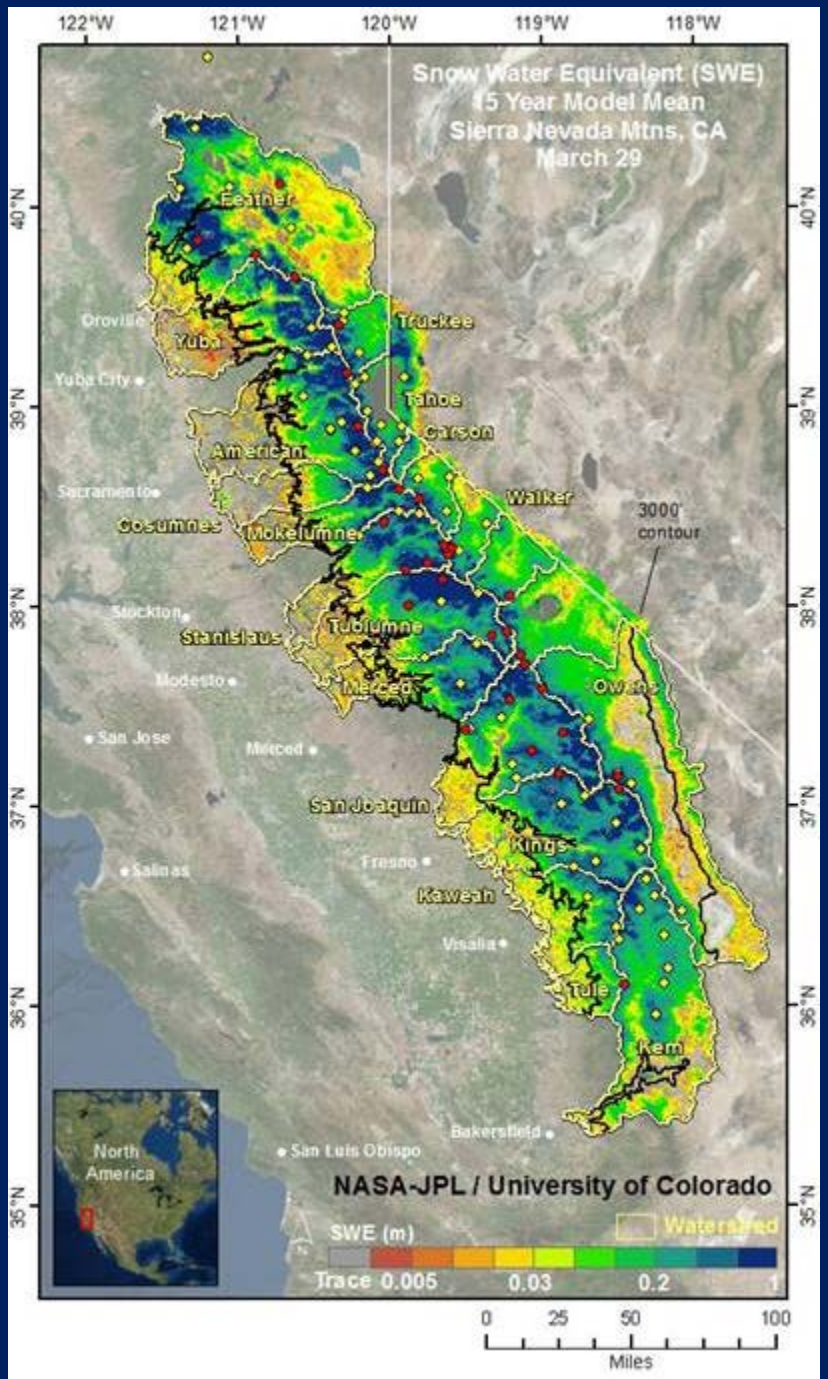
Source: NOAA Climate Division 2 Calendar Year Data

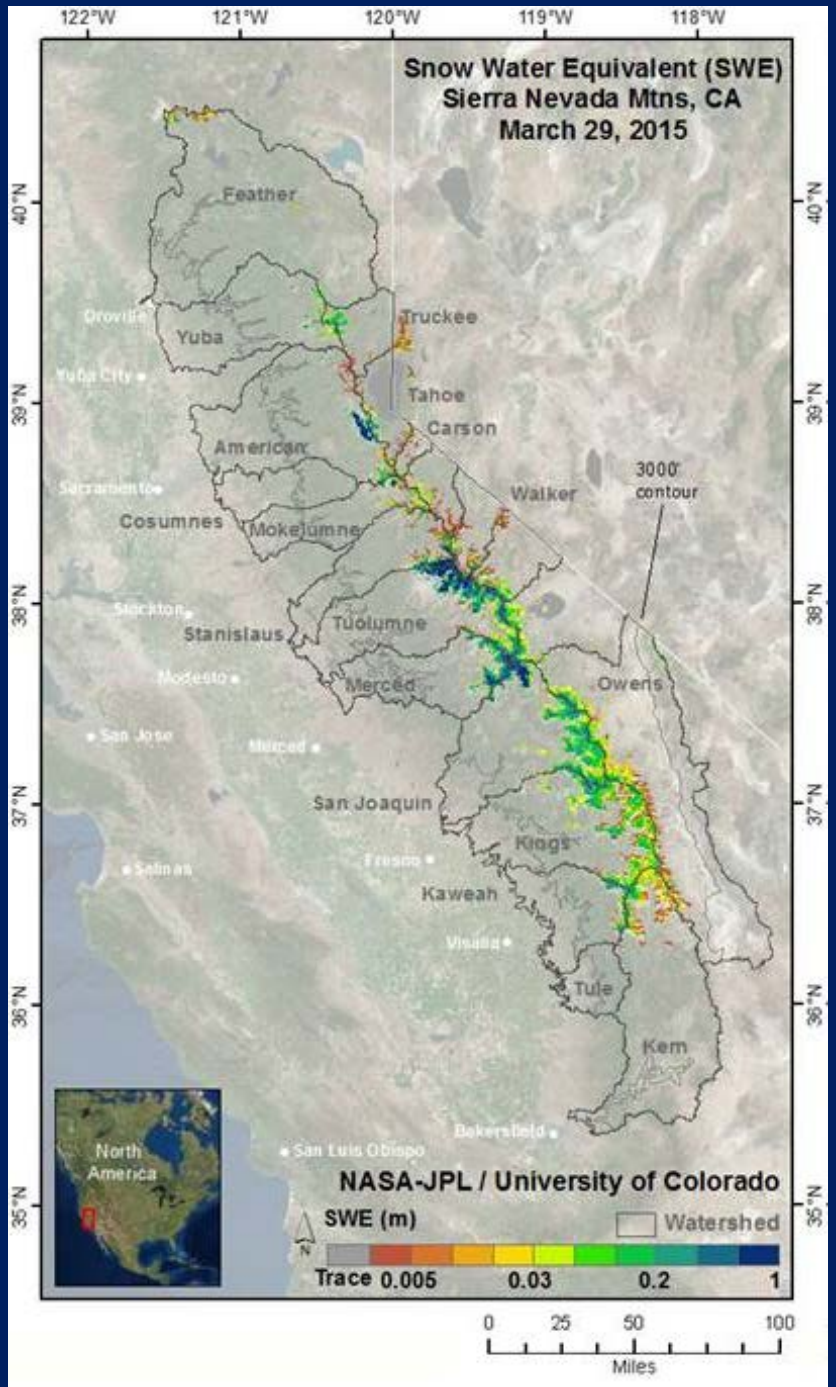
Sierra Snowpack vs Winter Temperature 1950-2015



Sierra Winter (DJF) Average Minimum Temperature (degrees Fahrenheit)

Temperature Data from California Climate Tracker, WRCC


Snow Water Equivalent (SWE)
15 Year Model Mean
Sierra Nevada Mtns, CA
March 29
122°W
121°W
120°W
119°W
118°W
40°N
39°N
38°N
37°N
36°N
35°N
Feather
Oroville
Yuba
Yuba City
Truckee
Tahoe
Carson
American
Sacramento
Walker
Cosumnes
Mokelumne
3000' contour
Stockton
Stanislaus
Tuolumne
Modesto
Merced
Owens
San Jose
Merced
San Joaquin
Kings
Fresno
Salinas
Kaweah
Visalia
Tule
Kern
Bakersfield
San Luis Obispo
North America
NASA-JPL / University of Colorado
SWE (m)
Watershed
Trace
0.005
0.03
0.2
1
0
25
50
100
Miles


Snow Water Equivalent (SWE)
Sierra Nevada Mtns, CA
March 29, 2015
122°W
121°W
120°W
119°W
118°W
40°N
39°N
38°N
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Feather
Oroville
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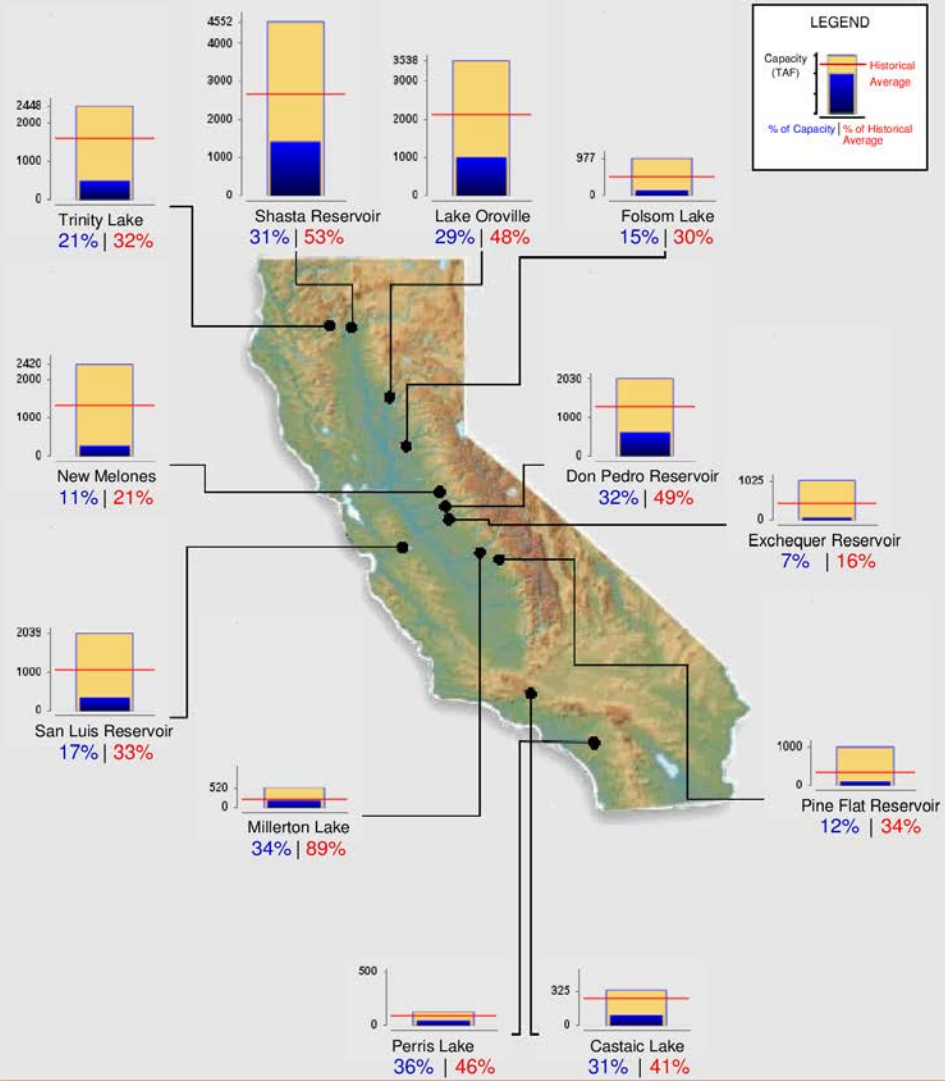
Fresno
Salinas
Kaweah
Visalia
Tule
Kern
Bakersfield
San Luis Obispo
North America
NASA-JPL / University of Colorado
SWE (m)
Watershed
Trace
0.005
0.03
0.2
1
0
25
50
100
Miles

Reservoir Conditions

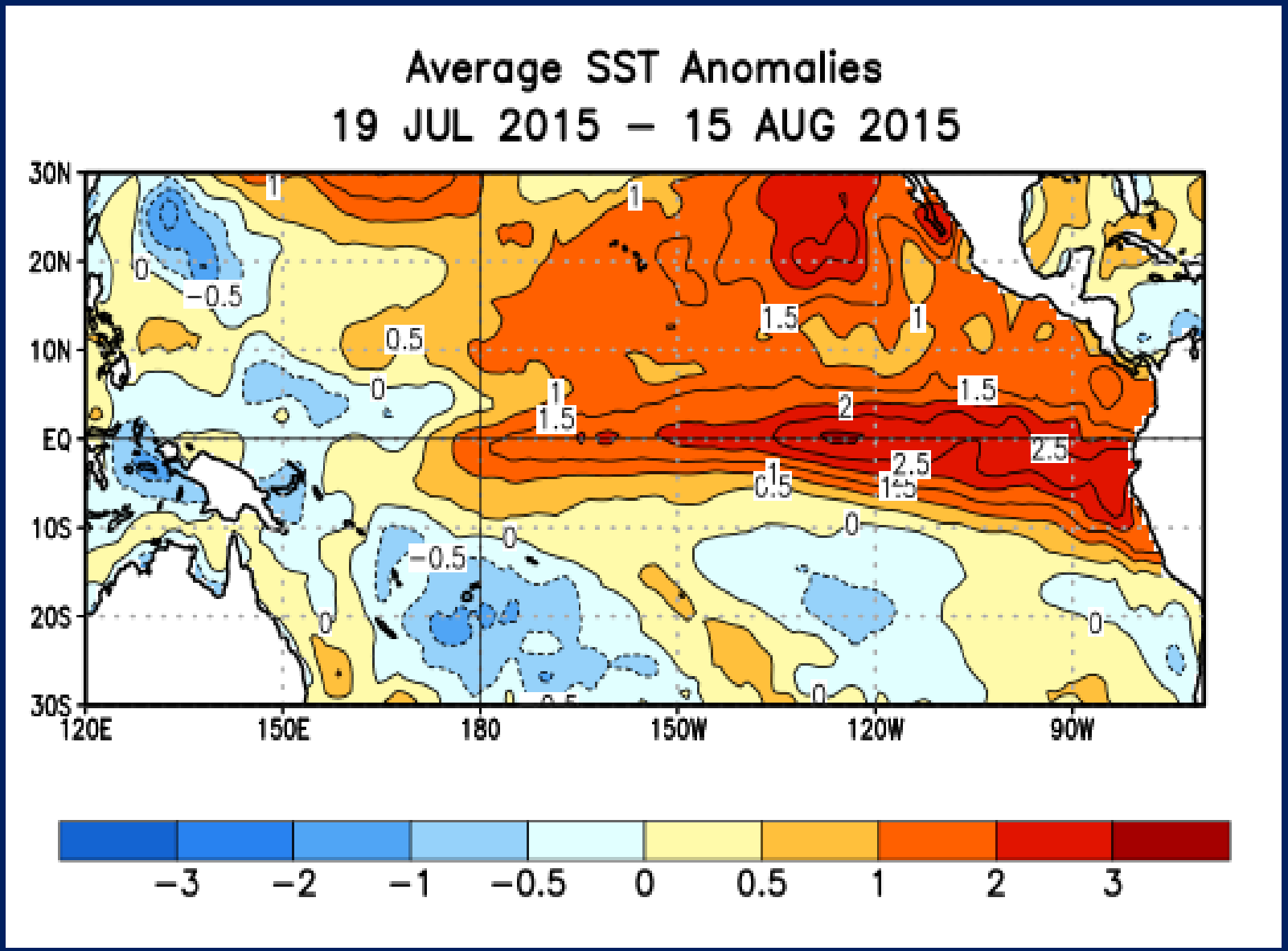
Ending At Midnight - October 28, 2015

CURRENT RESERVOIR CONDITIONS



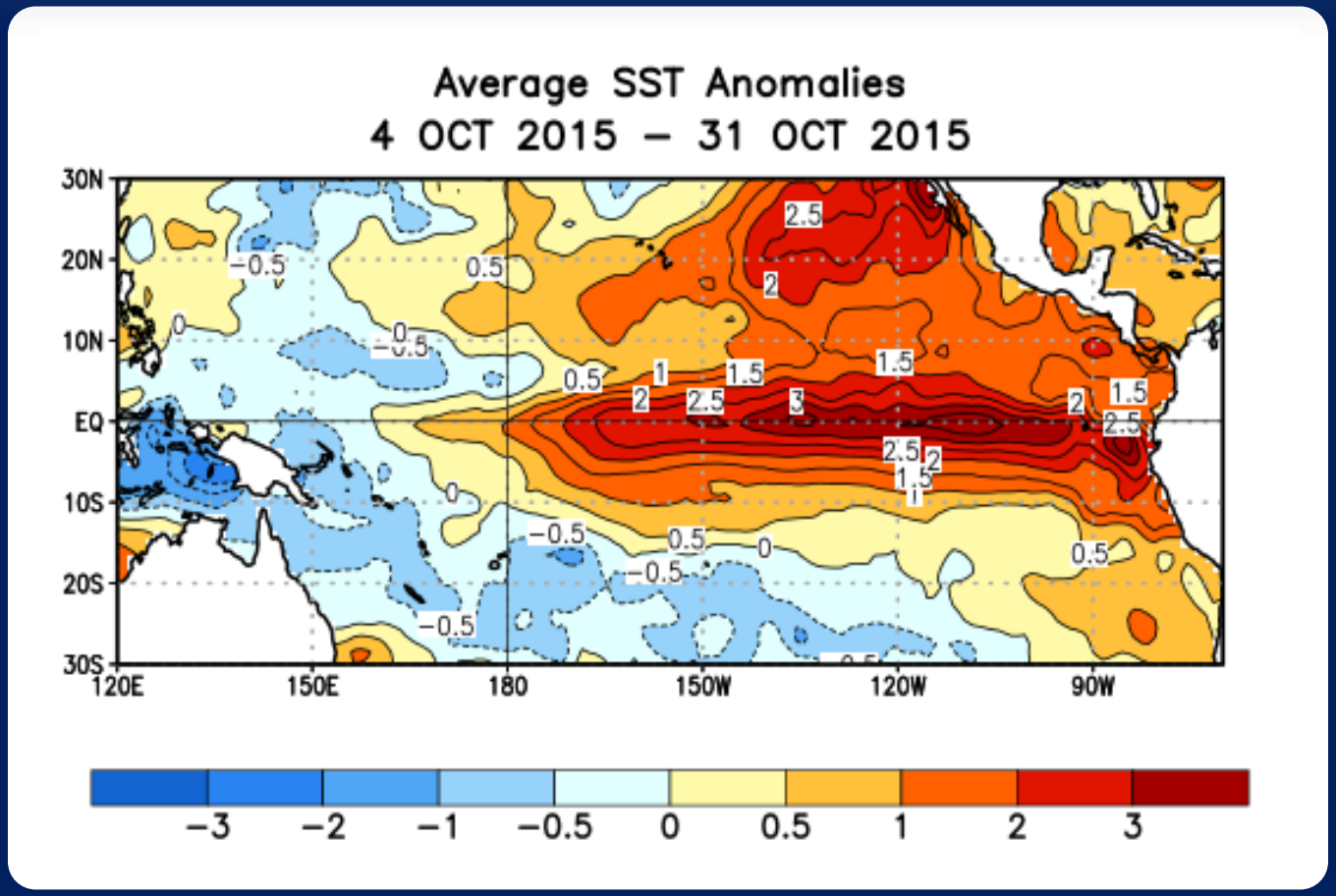
Graph Updated 10/29/2015 08:15 AM

What about El Niño?



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

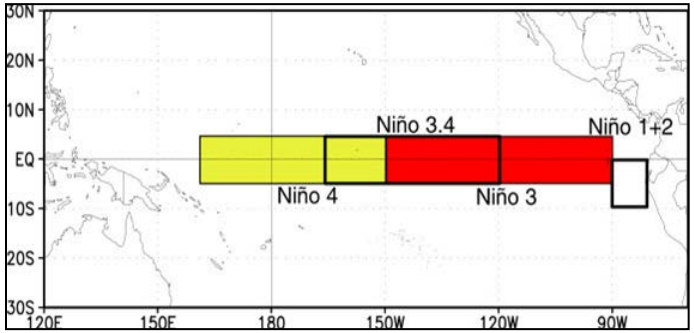
During the last four weeks, tropical SSTs were above average across the central and eastern Pacific, with the largest anomalies in the eastern Pacific.

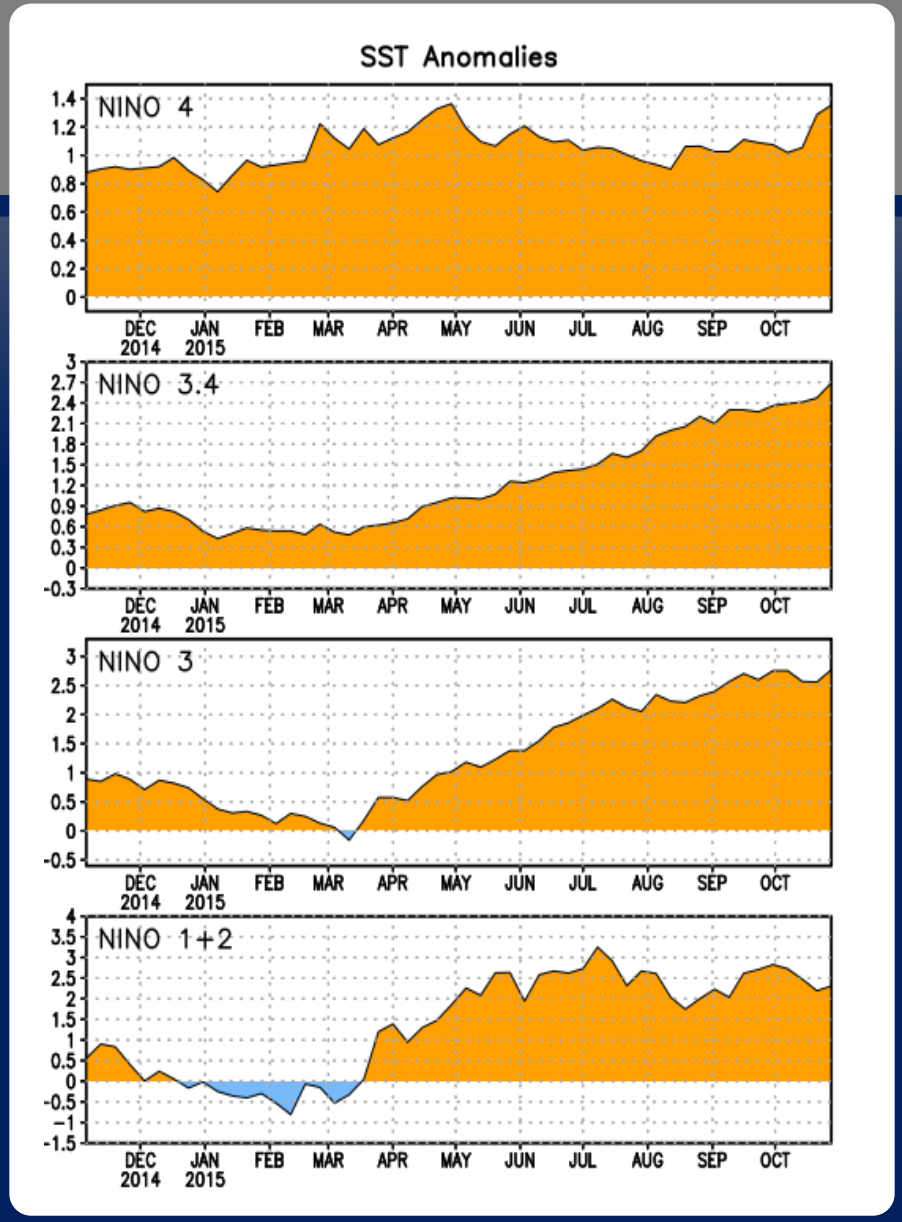


Niño Region SST Departures (ºC) Recent Evolution

The latest weekly SST departures are:

Niño 4	**1.4ºC**
Niño 3.4	**2.7ºC**
Niño 3	**2.8ºC**
Niño 1+2	**2.3ºC**

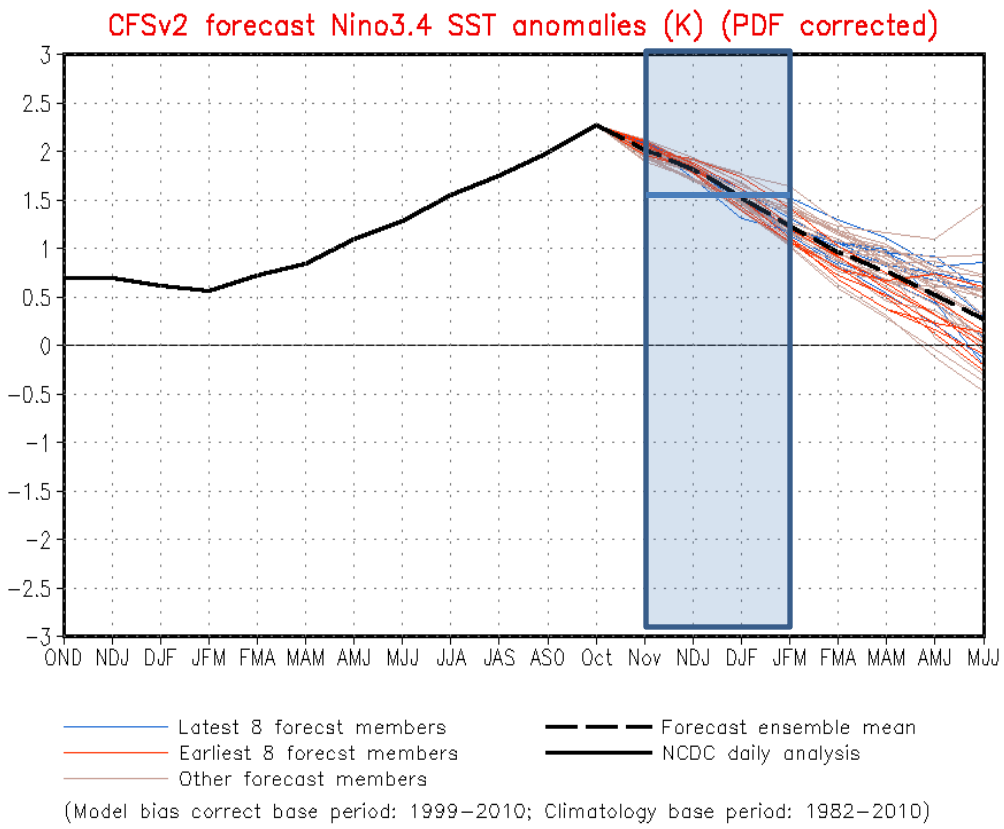


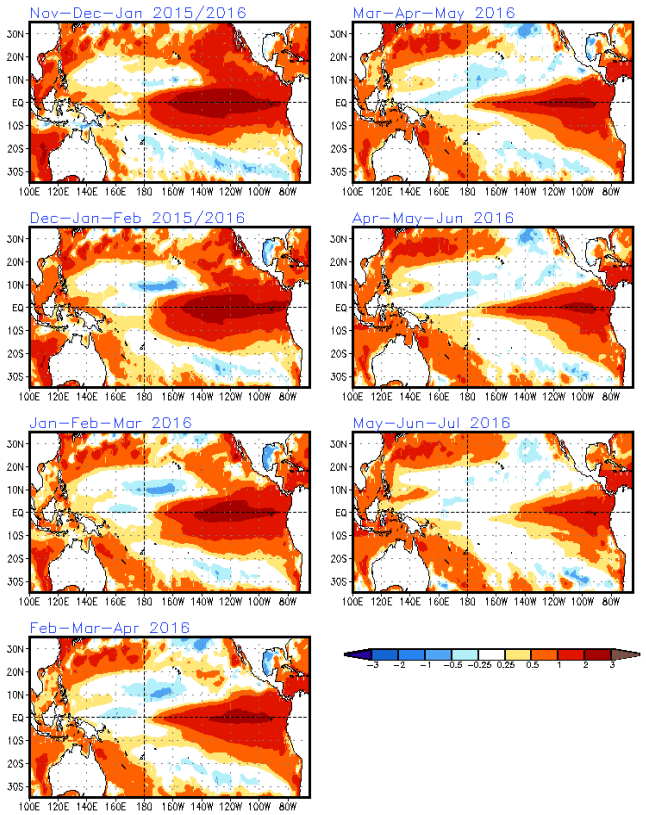


SST Outlook: NCEP CFS.v2 Forecast (PDF corrected)

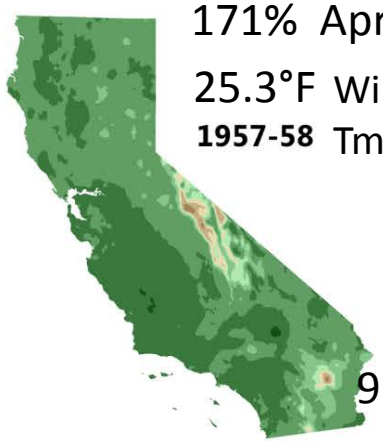
Issued: 26 October 2015

The CFS.v2 ensemble mean (black dashed line) predicts El Niño through MAM 2016.



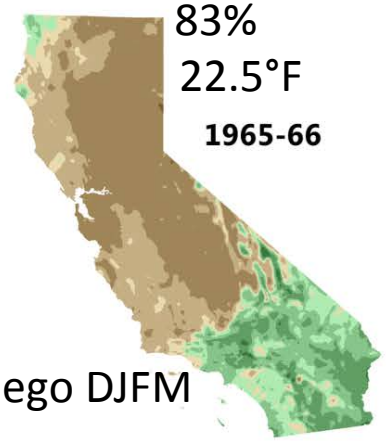


Historical Strong El Nino Outcomes



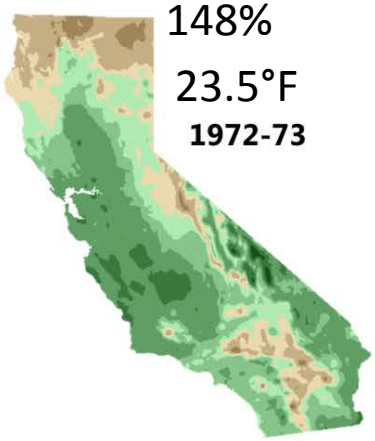
48.4” DJFM 8SI
171% April SWE
25.3°F Winter Sierra
1957-58 Tmin avg

9.13” San Diego DJFM



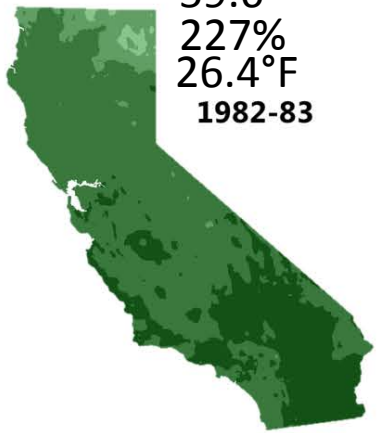
20.2”
83%
22.5°F
1965-66

8.92”



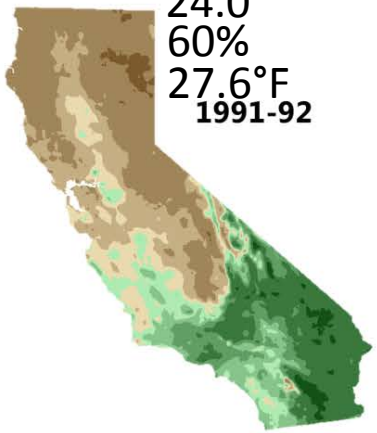
35.7”
148%
23.5°F
1972-73

7.18”



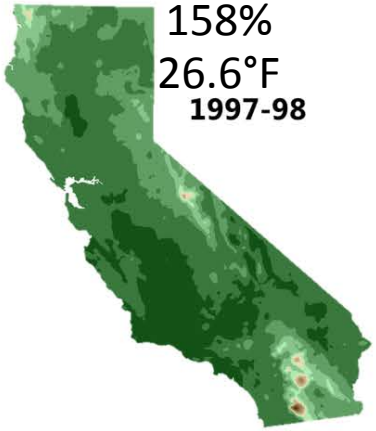
59.6”
227%
26.4°F
1982-83

13.98”



24.0”
60%
27.6°F
1991-92

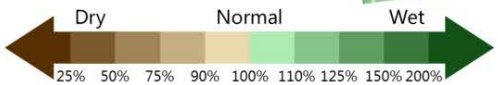
11.27”



53.5”
158%
26.6°F
1997-98

13.89”

2015
24.1”
5%
32.1°F



PRISM, Oregon State University

From NWS Sacramento

Water Year 1998 Precipitation Outcome by Month

8 Station Index

- Nov 9.45” (150%)
- Dec 4.79” (57%)
- Jan 18.82” (209%)
- Feb 21.22” (265%)
- Mar 8.63” (125%)
- Apr 7.47” (192%)

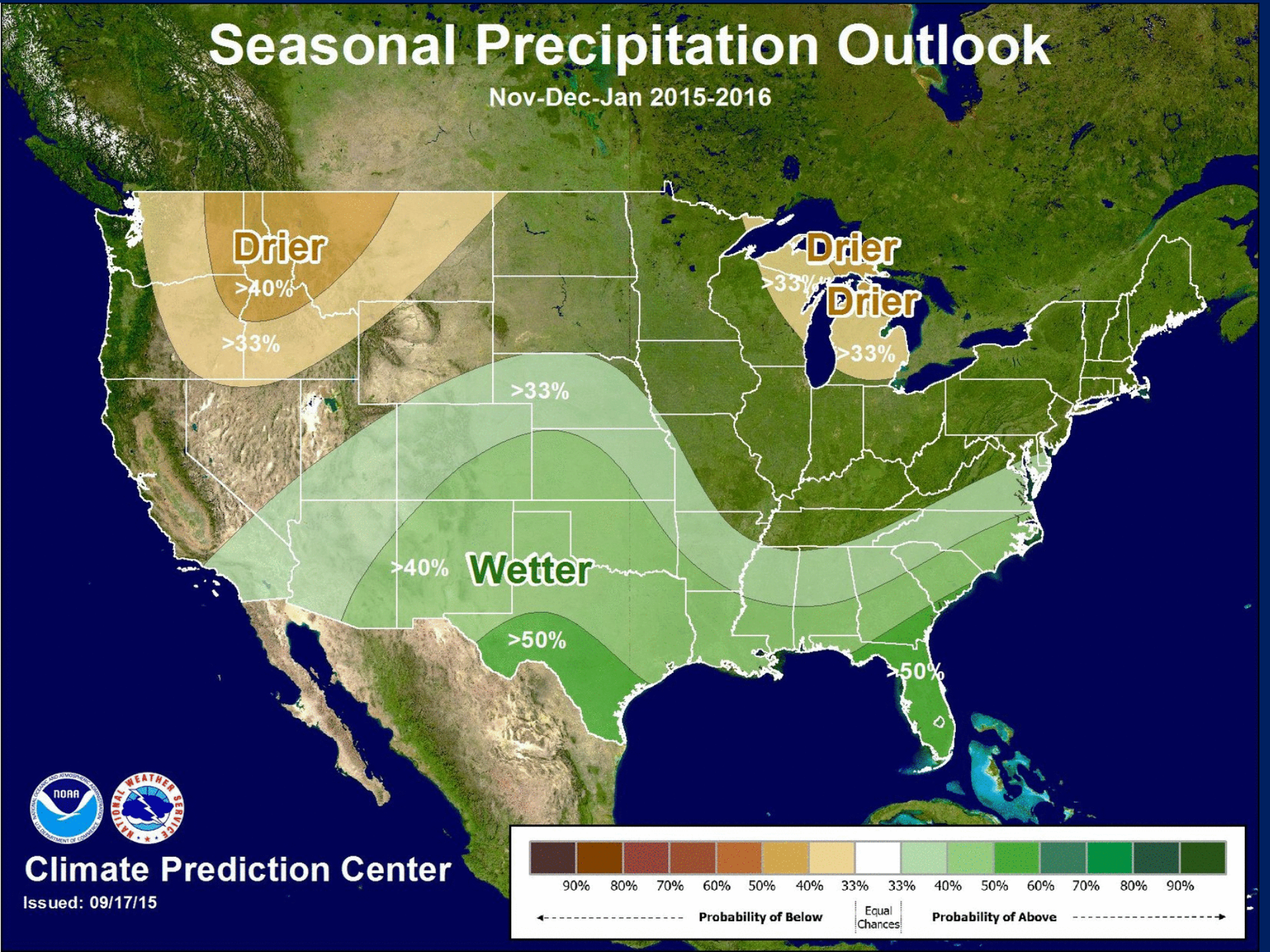
5 Station Index

- Nov 4.35” (92%)
- Dec 4.17” (67%)
- Jan 13.56” (180%)
- Feb 18.68” (270%)
- Mar 7.29” (120%)
- Apr 5.00” (139%)

California Statewide Average Snowpack				
	% of avg			
Water Year	1-Feb	1-Mar	1-Apr	1-May
1998	72	159	158	154

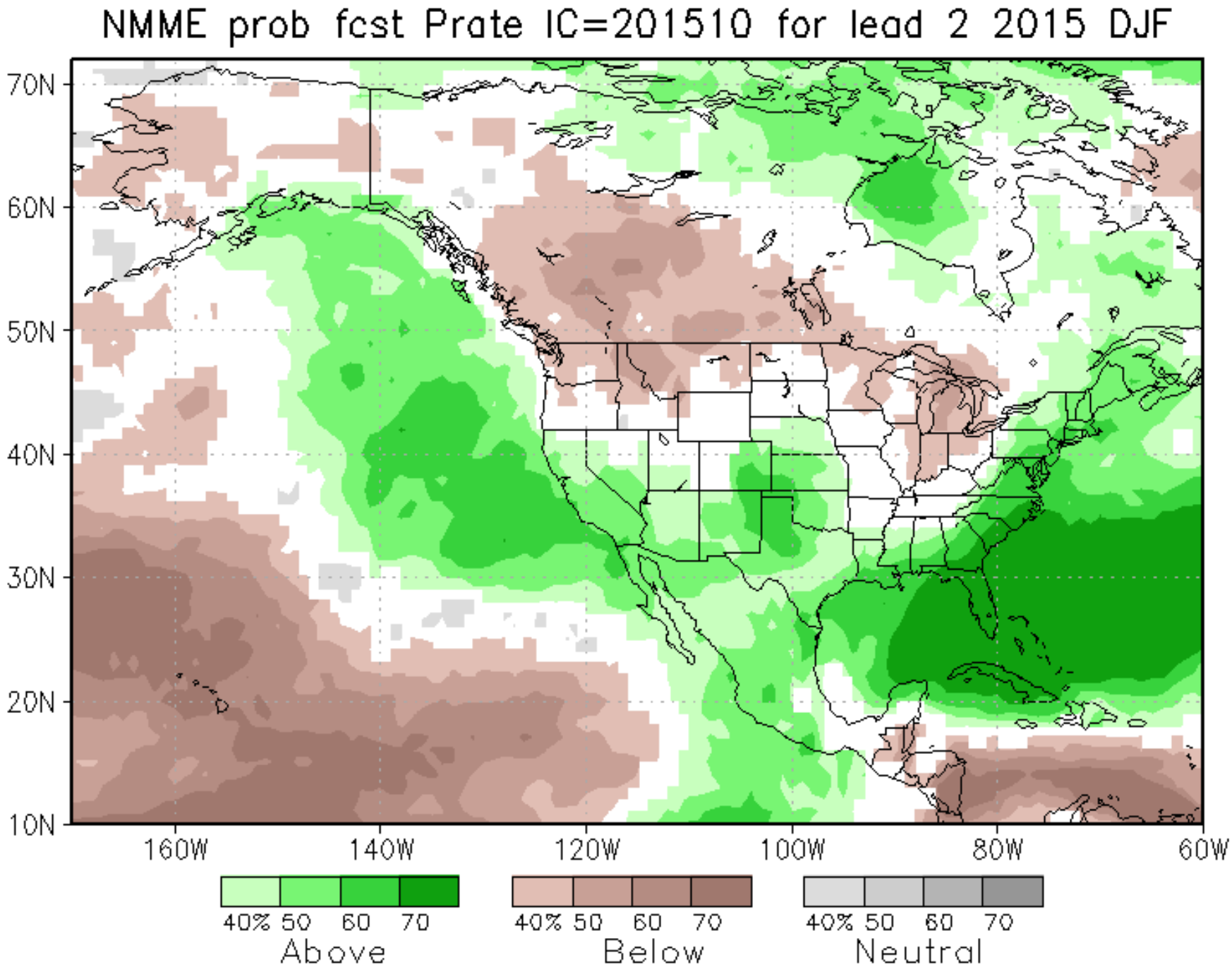
Seasonal Precipitation Outlook

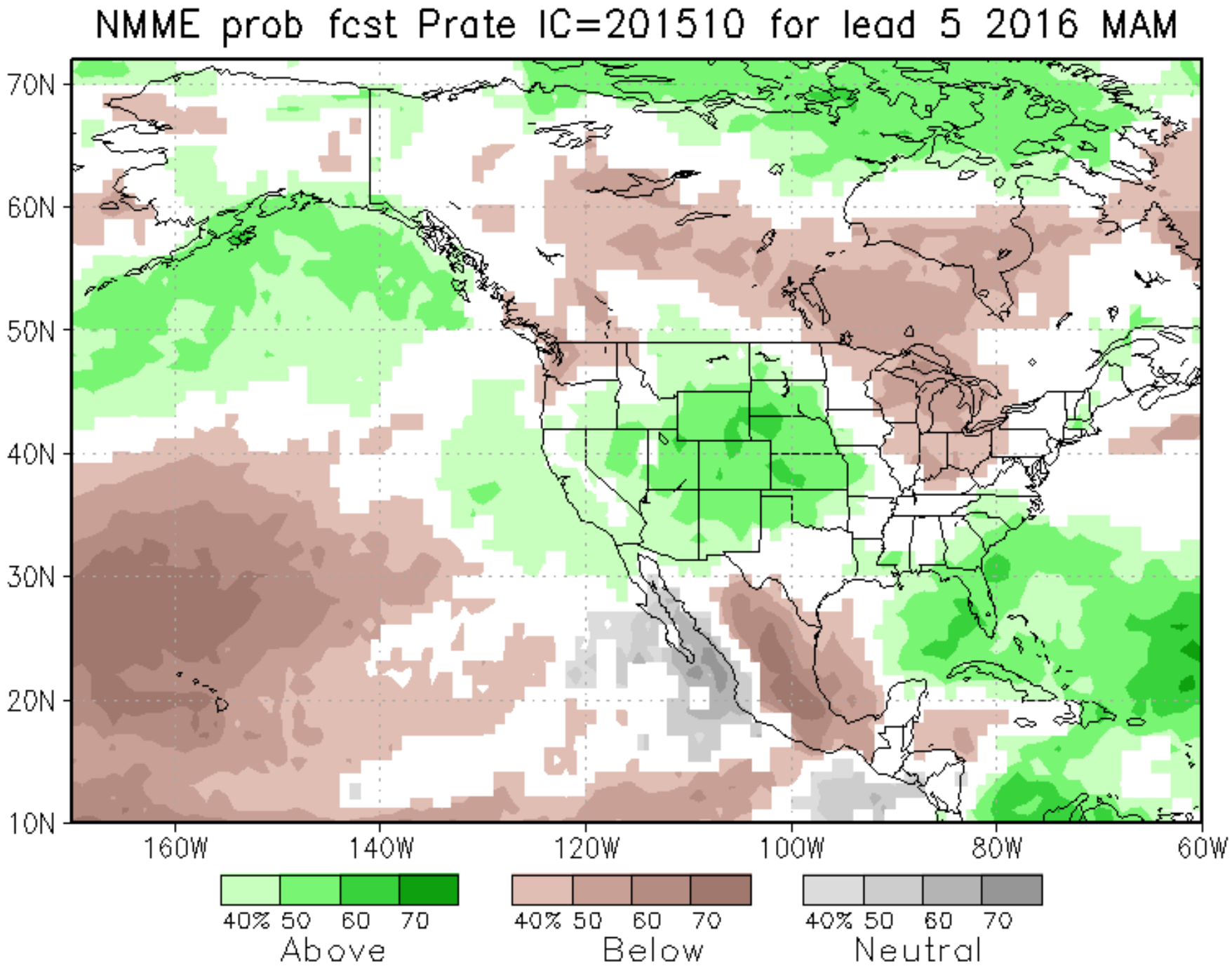
Nov-Dec-Jan 2015-2016



Climate Prediction Center

Issued: 09/17/15


NMME prob fcst Prate IC=201510 for lead 2 2015 DJF
70N
60N
50N
40N
30N
20N
10N
160W
140W
120W
100W
80W
60W
40% 50 60 70
Above
40% 50 60 70
Below
40% 50 60 70
Neutral


NMME prob fcst Prate IC=201510 for lead 5 2016 MAM
70N
60N
50N
40N
30N
20N
10N
160W
140W
120W
100W
80W
60W
40% 50 60 70
Above
40% 50 60 70
Below
40% 50 60 70
Neutral

Final Thoughts

- Timing, flux, duration, direction, freezing elevation and spatial extent of each storm important to water year evolution
- Current El Nino conditions among strongest on record for this time of year, but peak expected soon
- Above average precipitation expected for most of the State after the New Year with continued above normal temperatures
- Some surface water condition improvement expected including improved snowpack conditions

Questions?

Email: Michael.L.Anderson@water.ca.gov