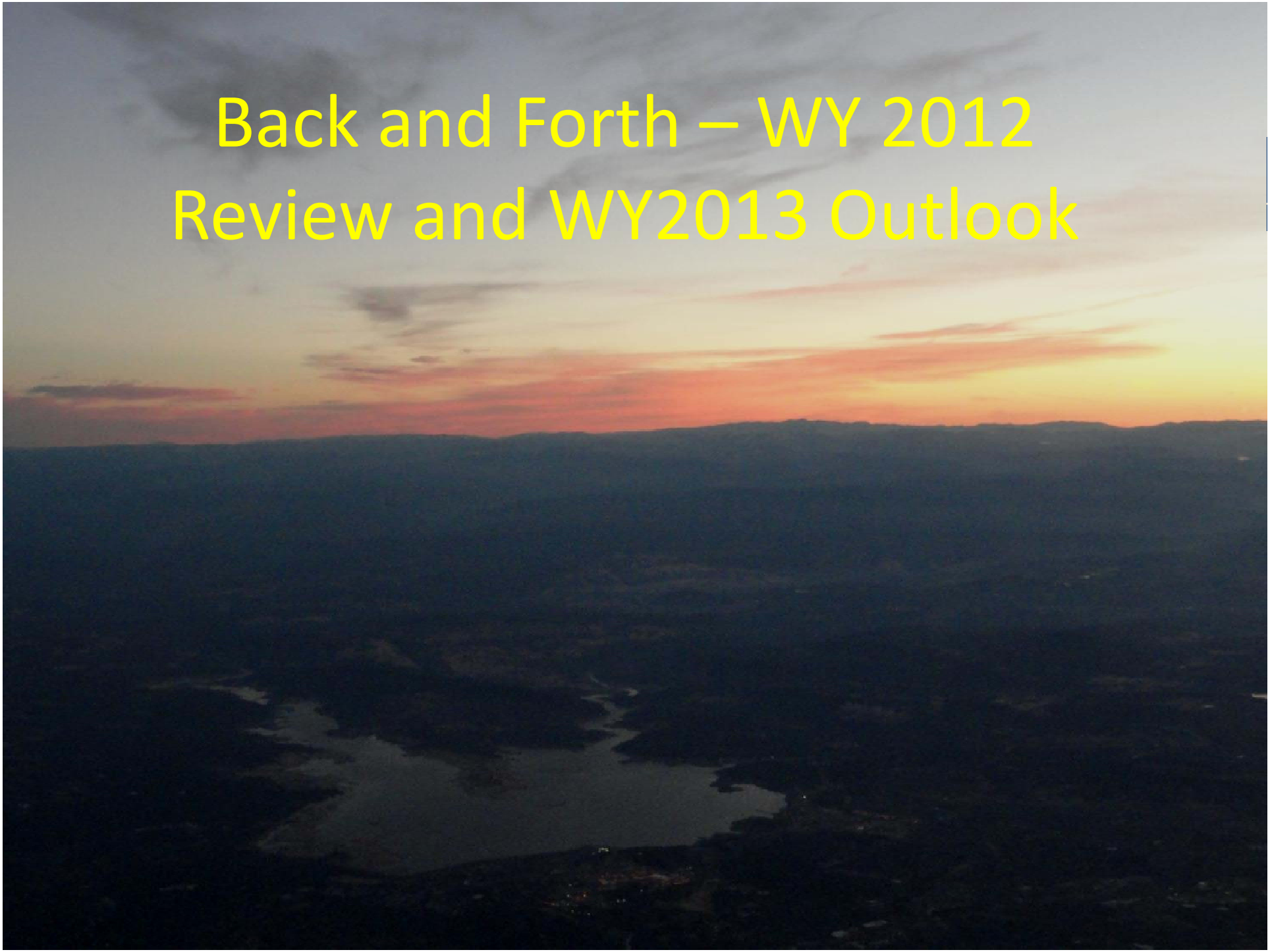
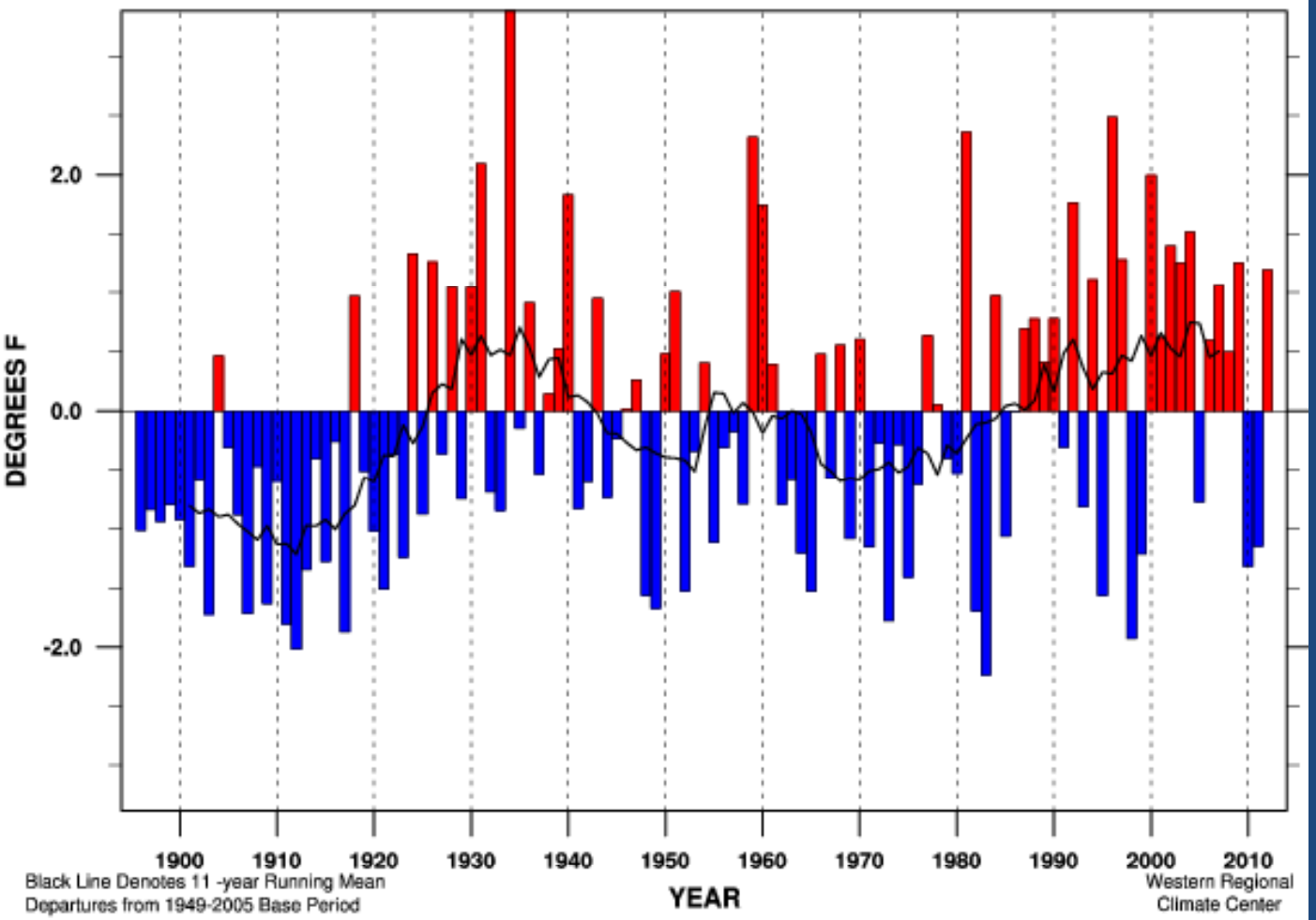
Back and Forth – WY 2012 Review and WY2013 Outlook



Overview

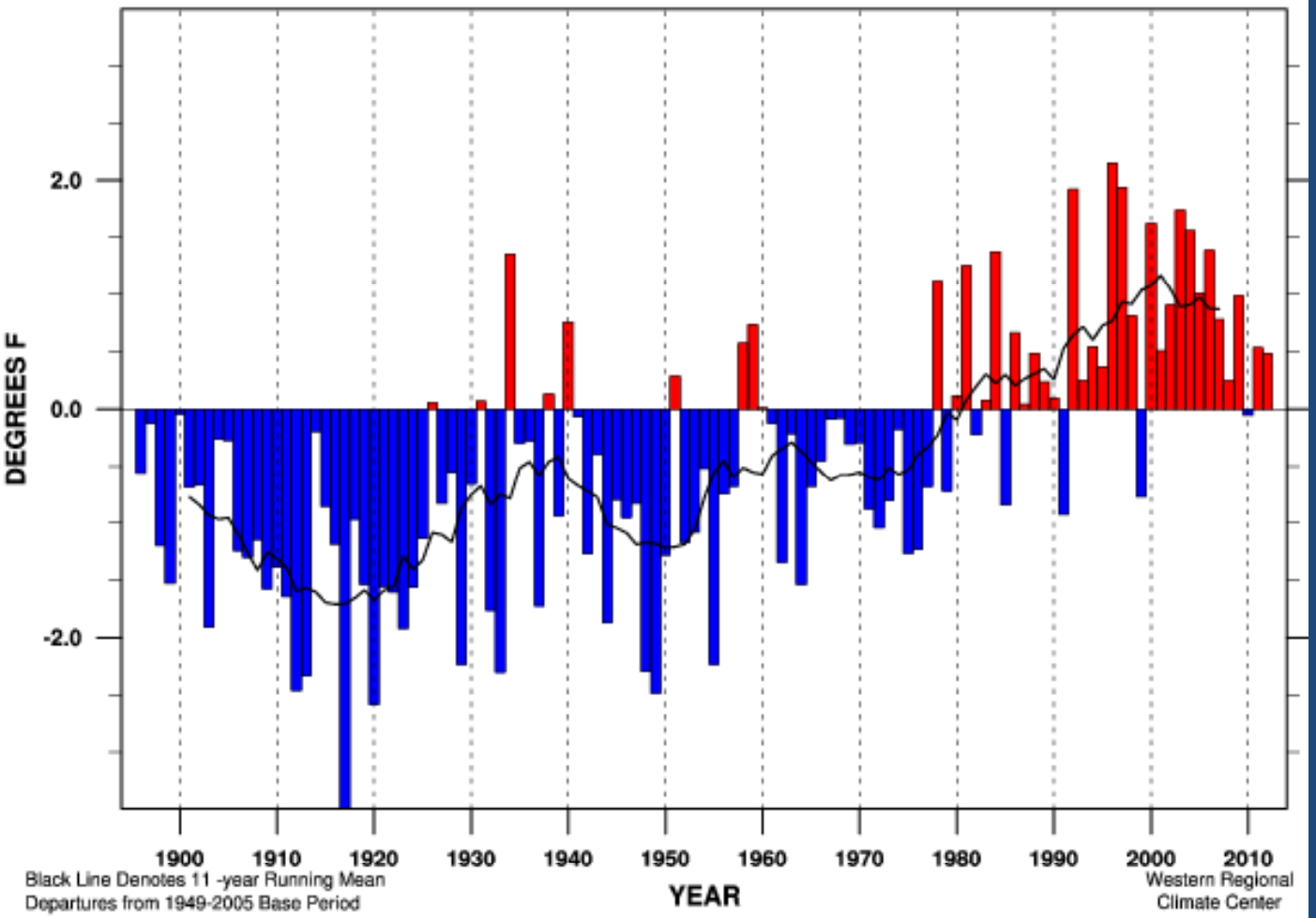
- WY2012 and Current Conditions
- WY2013 Outlook
- Reasons for Optimism and Pessimism

California Statewide
Maximum Temperature Departure Oct-Sep



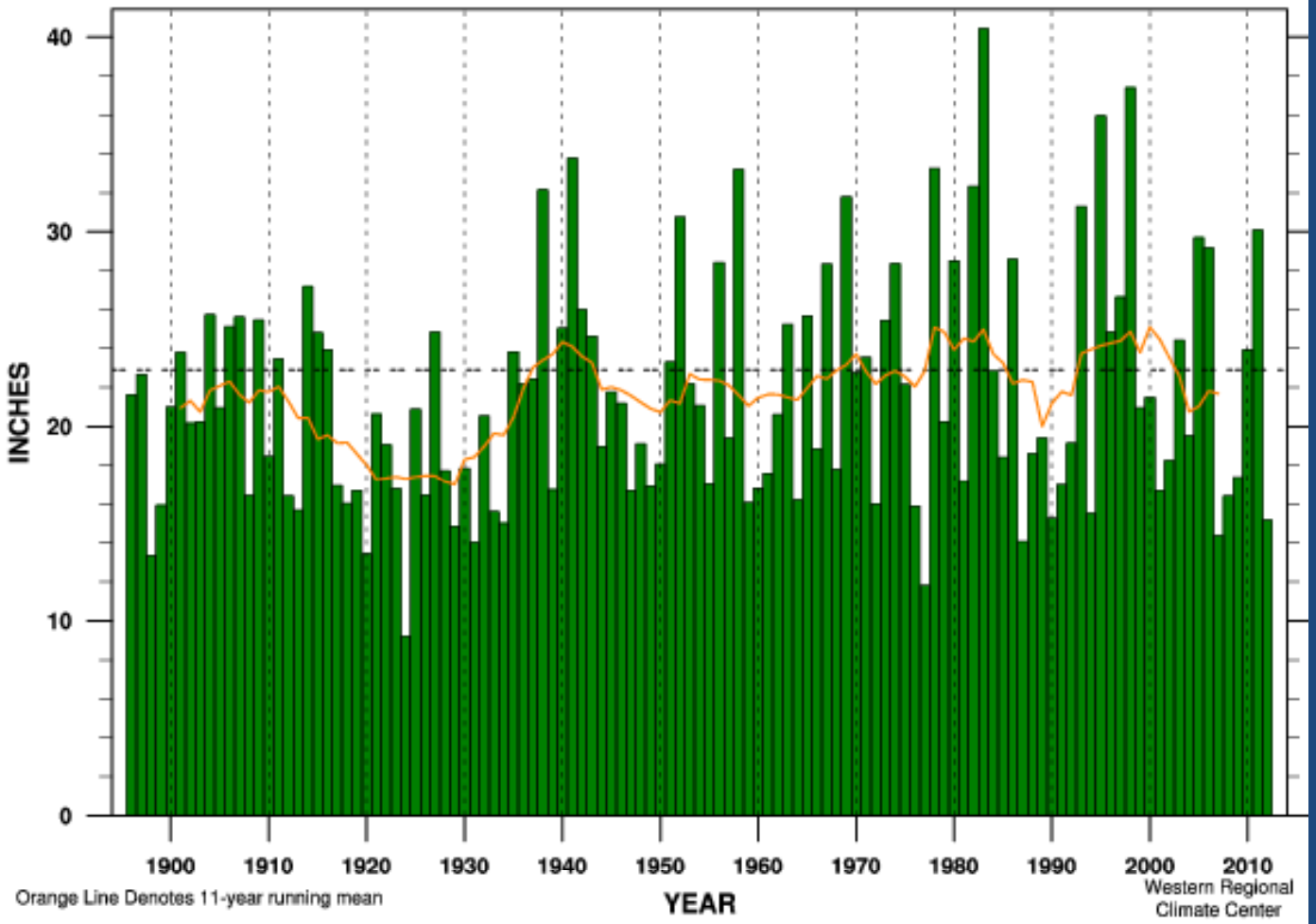
Linear Trend 1895-present	+ 0.98 ± 0.60 °F/100yr		
Linear Trend 1949-present	+ 1.27 ± 1.61°F/100yr		
Linear Trend 1975-present	+ 1.83 ± 3.87 °F/100yr		
Warmest Year	72.4 °F (+ 3.4 °F) in 1934	MEAN	69.0 °F
Coldest Year	66.8 °F (- 2.2 °F) in 1983	STDEV	1.18 °F
Oct-Sep 2012	70.2 °F (+ 1.2 °F)	RANK	101 of 117

California Statewide
Miniumum Temperature Departure Oct-Sep



Linear Trend 1895-present		+ 2.00 ± 0.47 °F/100yr		
Linear Trend 1949-present		+ 3.23 ± 1.06 °F/100yr		
Linear Trend 1975-present		+ 3.02 ± 2.54 °F/100yr		
Warmest Year		45.3 °F (+ 2.2 °F) in 1996	MEAN	43.1 °F
Coldest Year		39.7 °F (- 3.5 °F) in 1917	STDEV	1.00 °F
Oct-Sep	2012	43.6 °F (+ 0.5 °F)	RANK	93 of 117

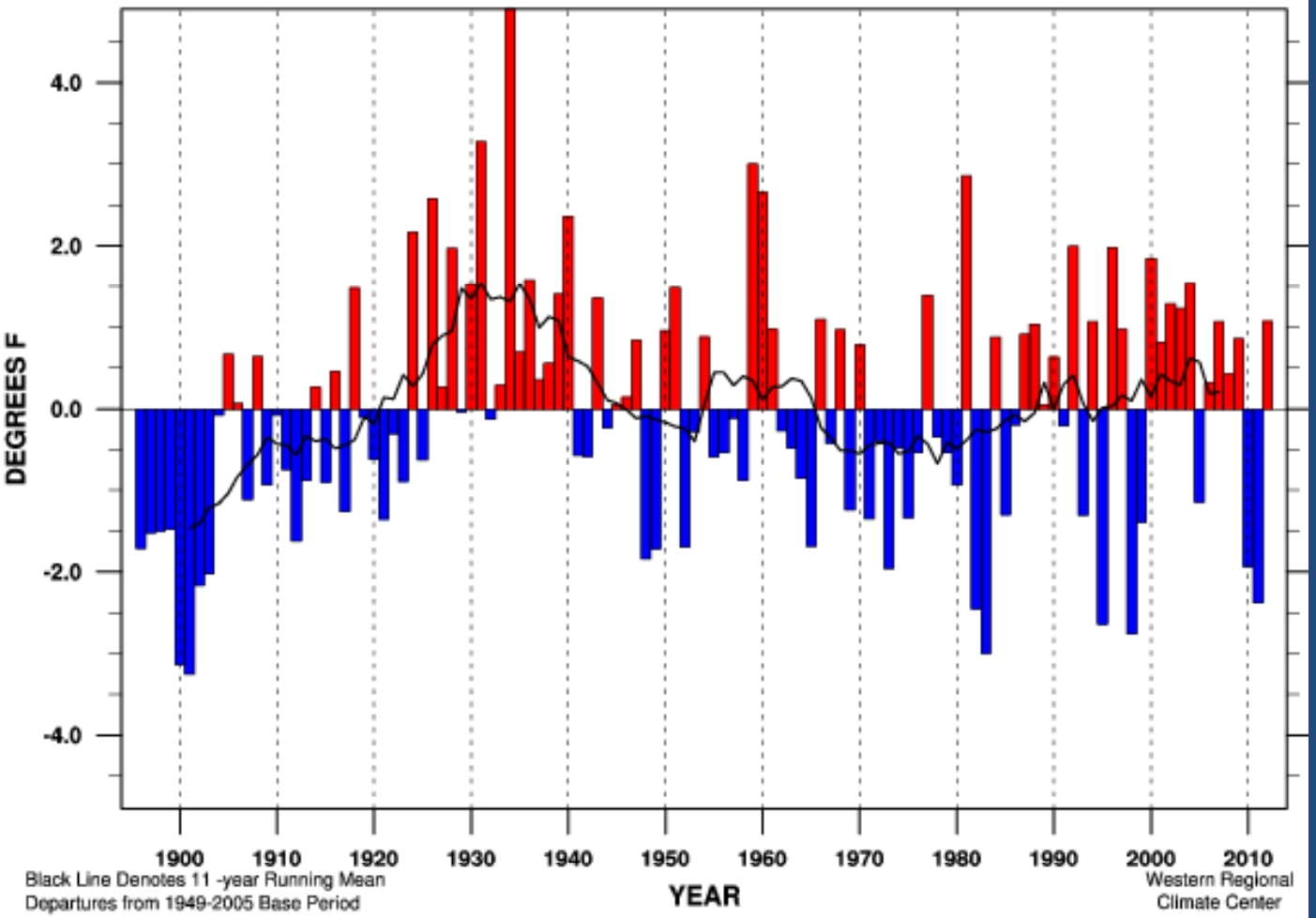
California Statewide
Precipitation Oct-Sep



Linear Trend 1895-present	+ 3.19 ± 3.14 in.	(+ 13 ± 13%) per 100 yr	
Linear Trend 1949-present	+ 0.16 ± 9.11 in.	(+ 0 ± 39%) per 100 yr	
Linear Trend 1975-present	- 3.35 ± 23.33 in.	(- 14 ± 101%) per 100 yr	
Wettest Year	40.44 in. (176%)	in 1983	MEAN 22.90 in.
Driest Year	9.23 in. (40%)	in 1924	STDEV 6.53 in.
Oct-Sep 2012	15.17 in. (66%)		RANK 10 of 117

Sierra Region

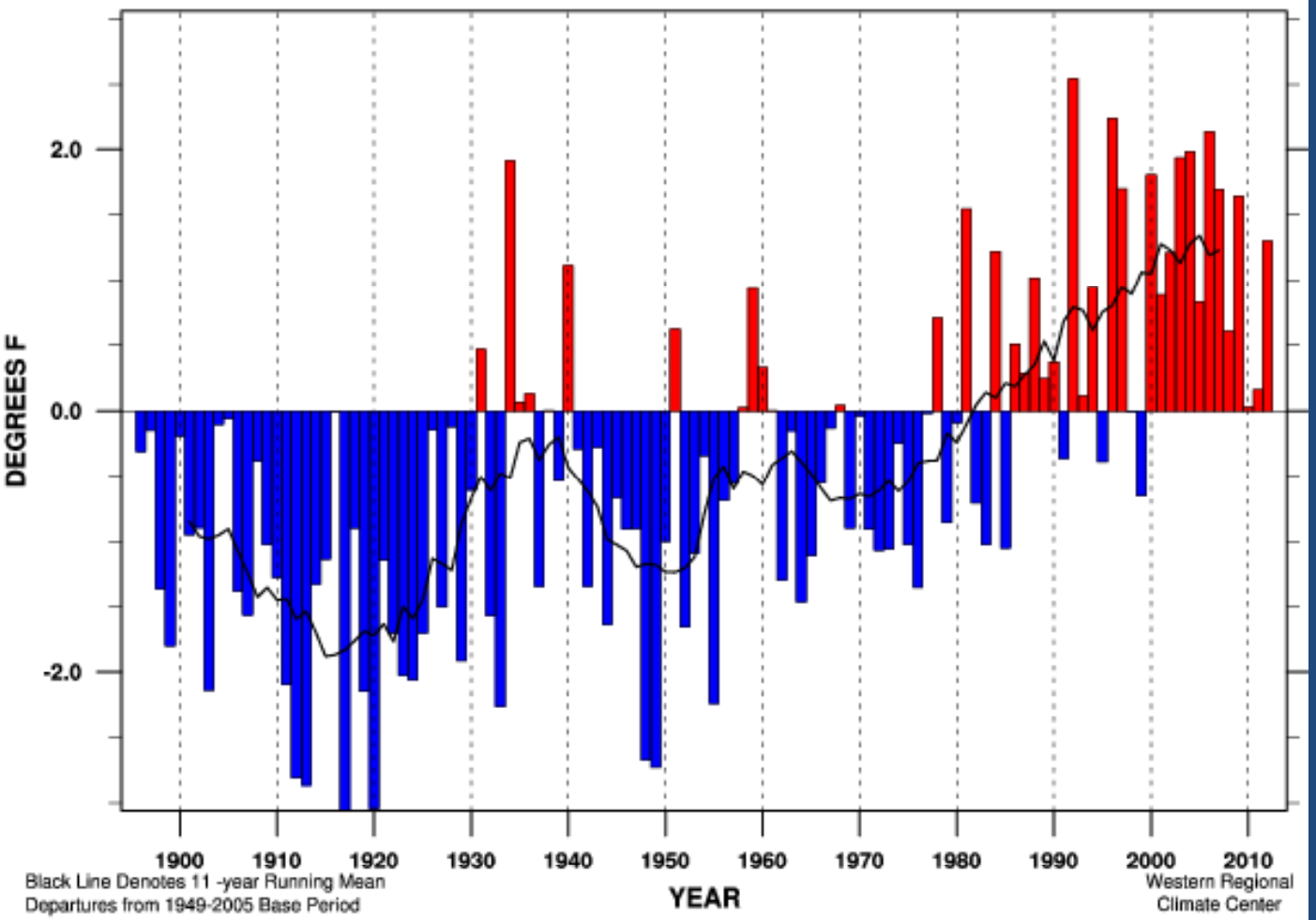
Maximum Temperature Departure Oct-Sep



Linear Trend 1895-present	+ 0.51 ± 0.79 °F/100yr		
Linear Trend 1949-present	+ 0.01 ± 1.97 °F/100yr		
Linear Trend 1975-present	+ 0.85 ± 4.80 °F/100yr		
Warmest Year	66.4 °F (+ 4.9 °F) in 1934	MEAN	61.5 °F
Coldest Year	58.2 °F (- 3.3 °F) in 1901	STDEV	1.41 °F
Oct-Sep 2012	62.6 °F (+ 1.1 °F)	RANK	94 of 117

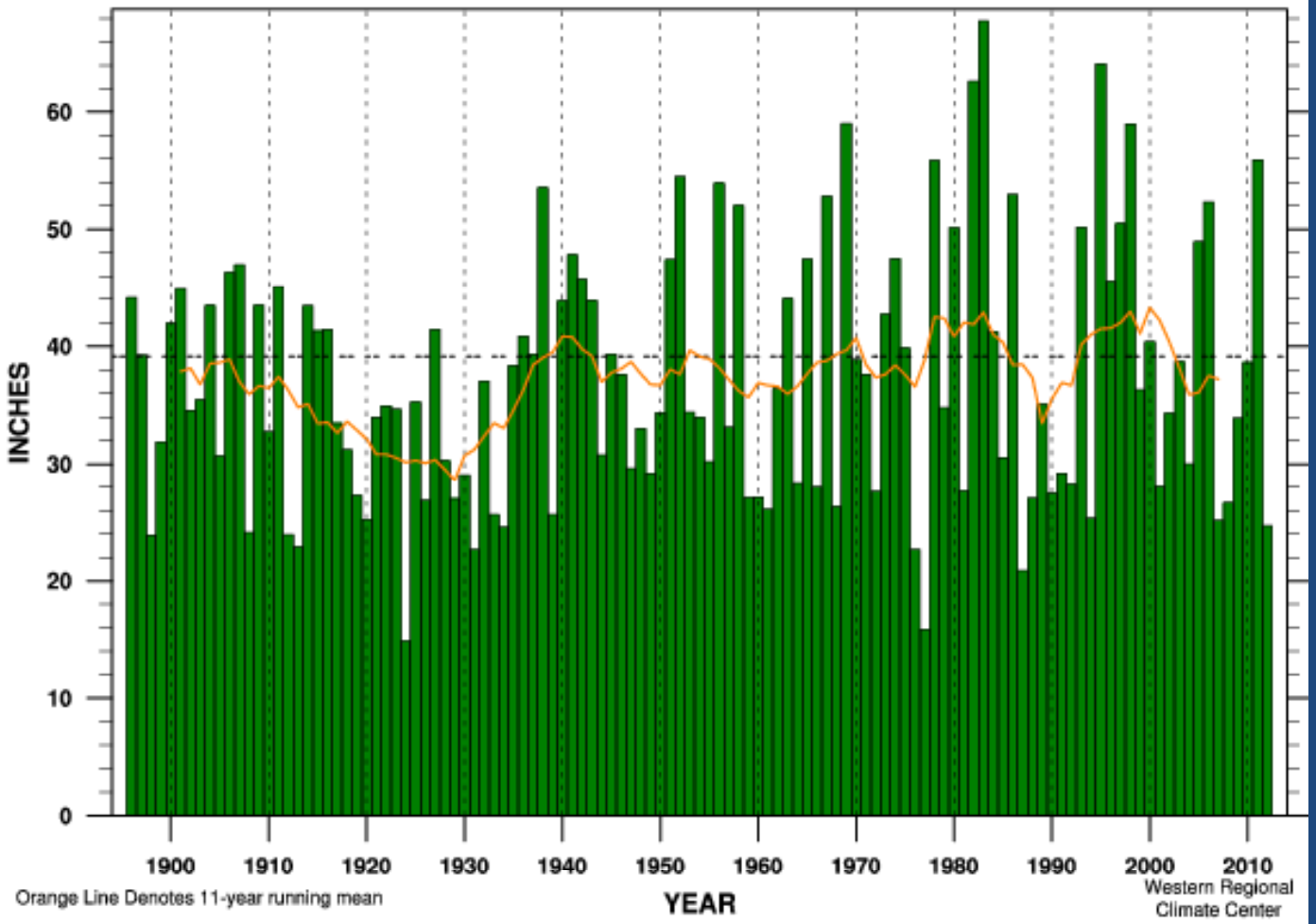
Sierra Region

Miniumum Temperature Departure Oct-Sep



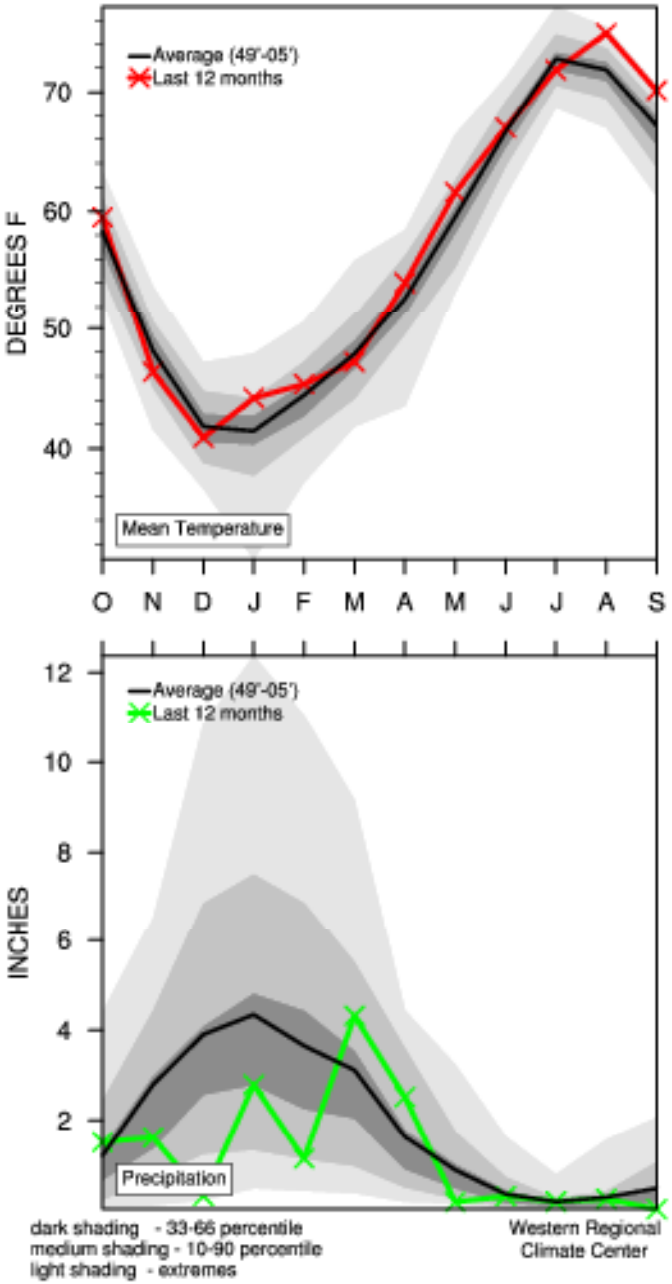
Linear Trend 1895-present	+ 2.19 ± 0.53 °F/100yr		
Linear Trend 1949-present	+ 3.74 ± 1.20 °F/100yr		
Linear Trend 1975-present	+ 4.54 ± 2.89 °F/100yr		
Warmest Year	39.1 °F (+ 2.5 °F) in 1992	MEAN	36.6 °F
Coldest Year	33.5 °F (- 3.1 °F) in 1917	STDEV	1.12 °F
Oct-Sep 2012	37.9 °F (+ 1.3 °F)	RANK	106 of 117

Sierra Region
Precipitation Oct-Sep

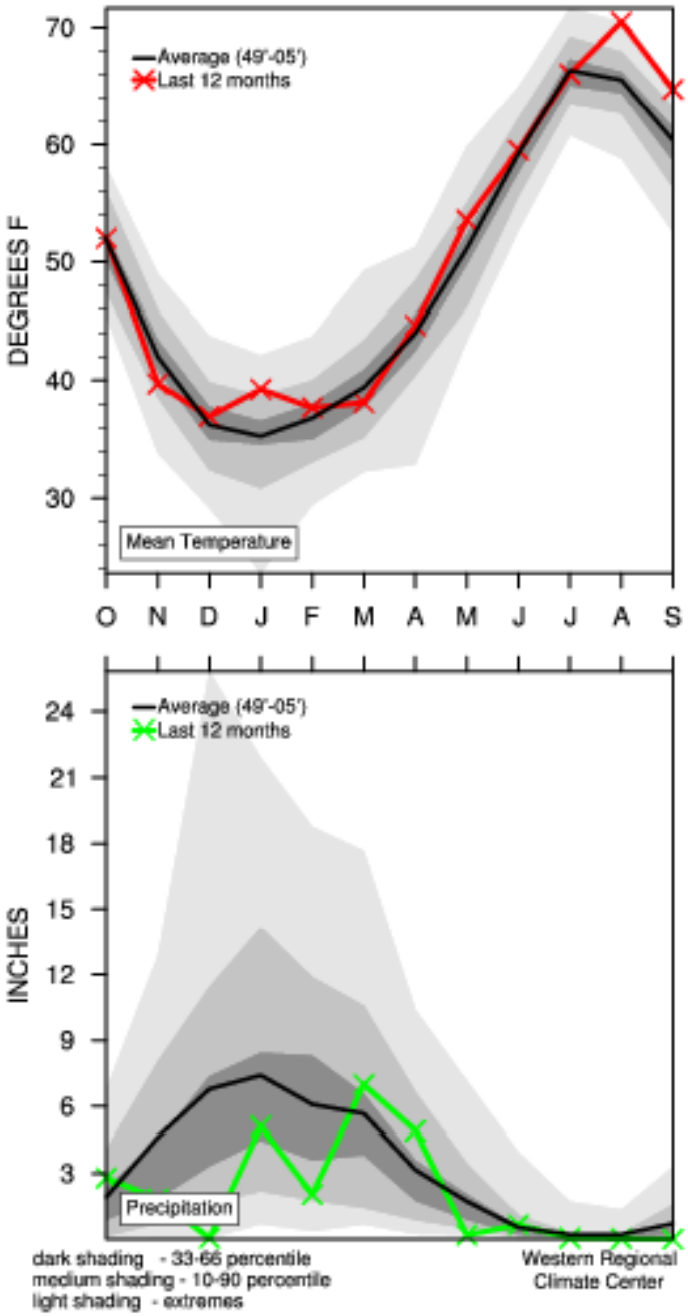


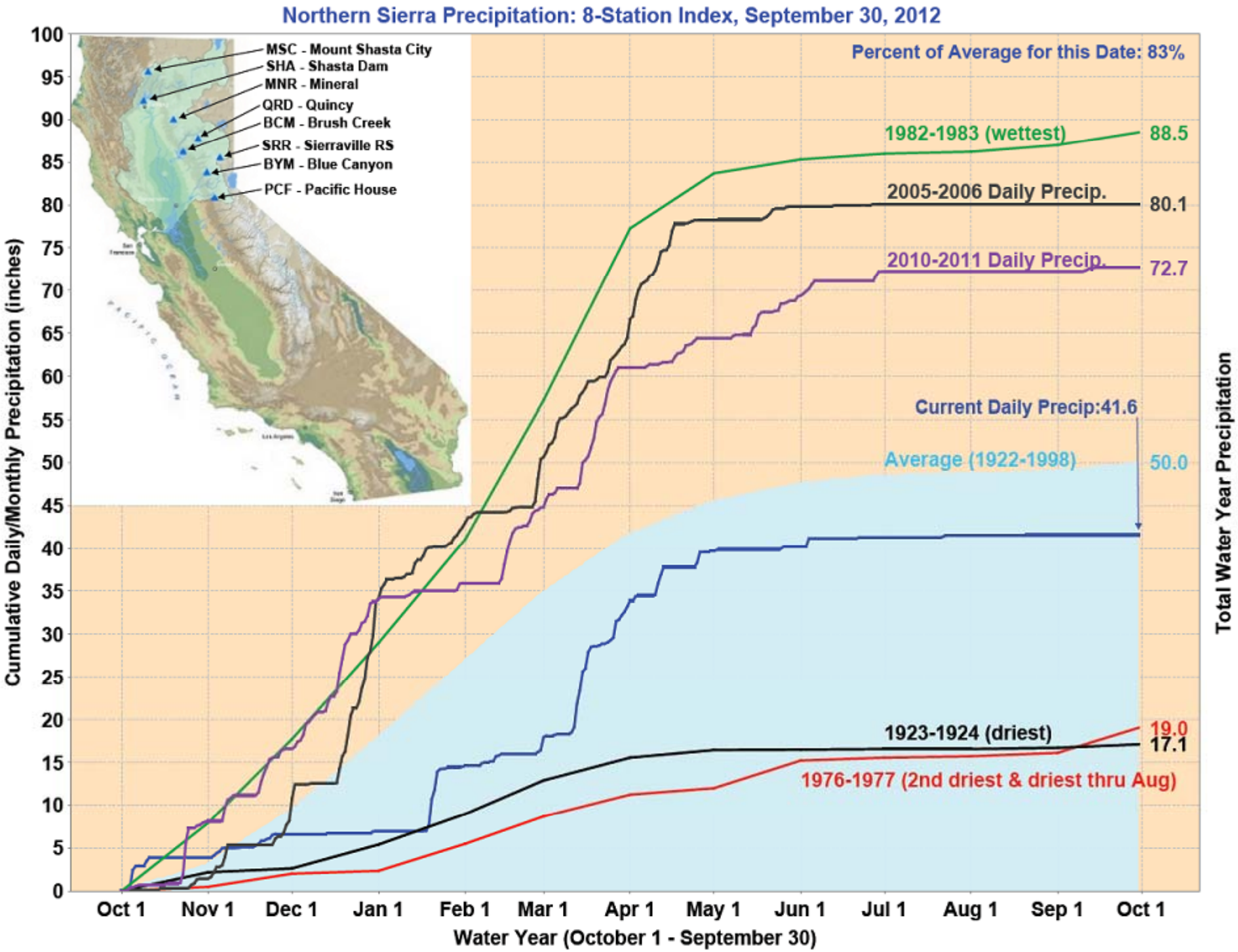
Linear Trend 1895-present	+ 4.51 ± 5.80 in.	(+ 11 ± 14%) per 100 yr			
Linear Trend 1949-present	- 0.17 ± 17.16 in.	(- 0 ± 43%) per 100 yr			
Linear Trend 1975-present	- 1.81 ± 43.27 in.	(- 4 ± 110%) per 100 yr			
Wettest Year	67.79 in. (173%)	in 1983		MEAN	39.15 in.
Driest Year	14.89 in. (38%)	in 1924		STDEV	12.33 in.
Oct-Sep 2012	24.70 in. (63%)			RANK	11 of 117

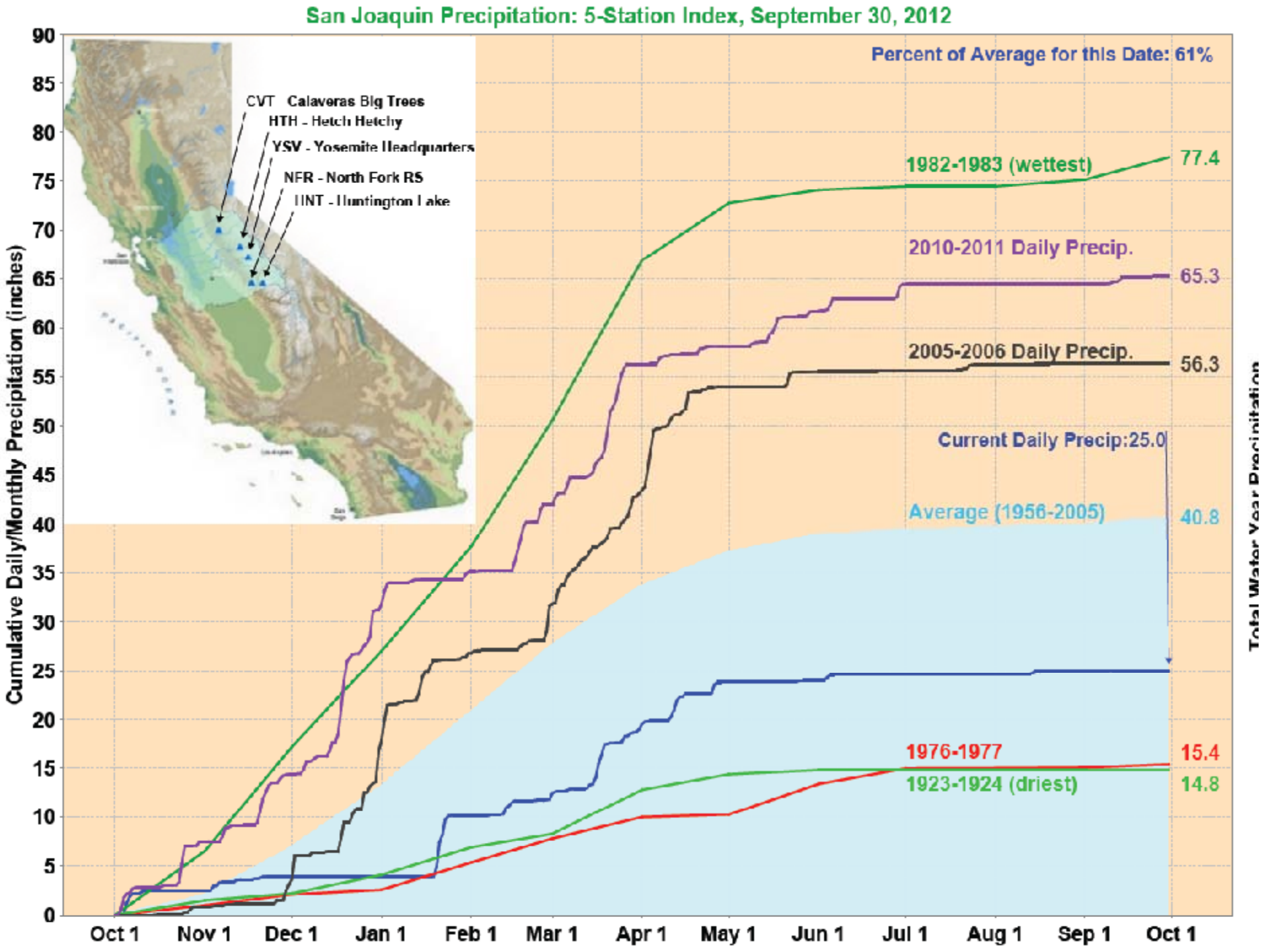
California Statewide Last 12 Months



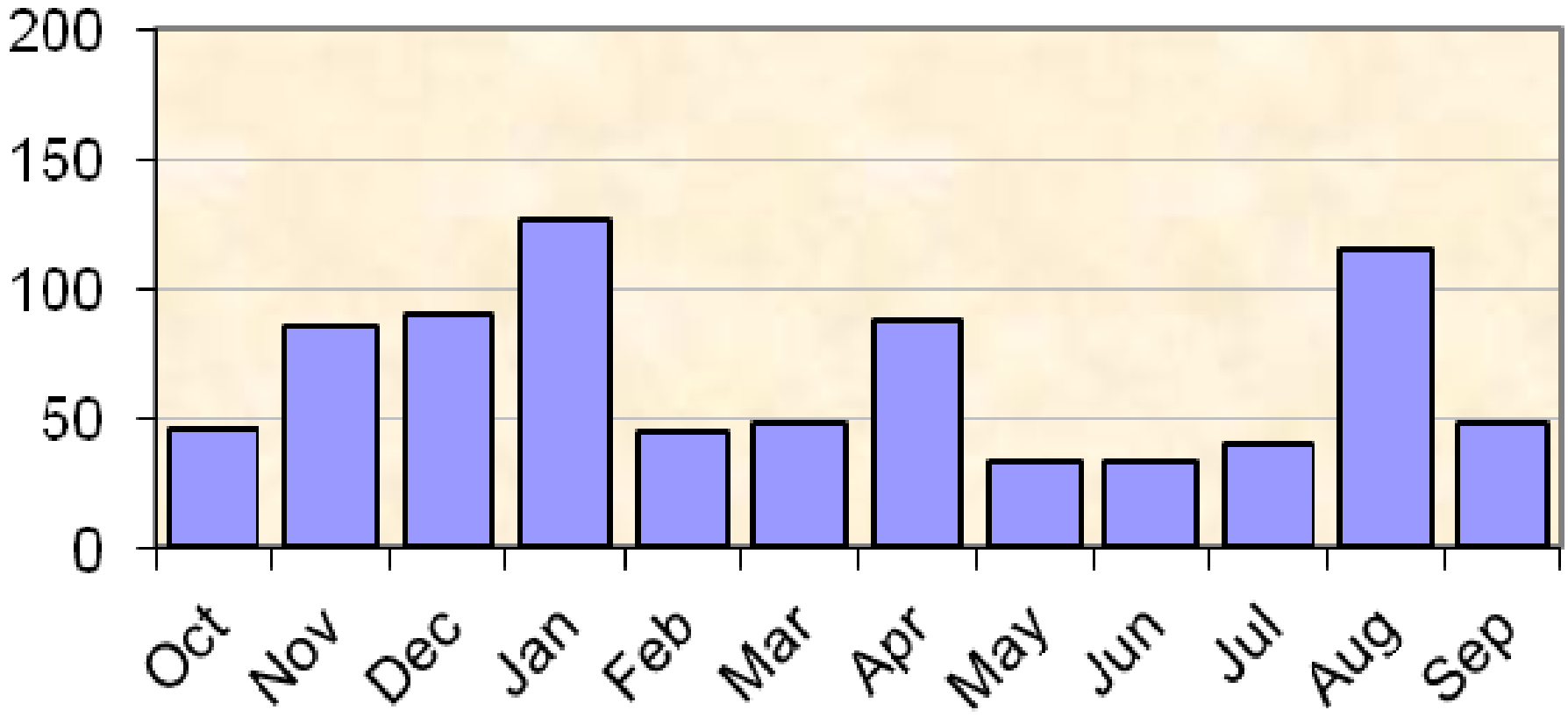
Sierra Region Last 12 Months



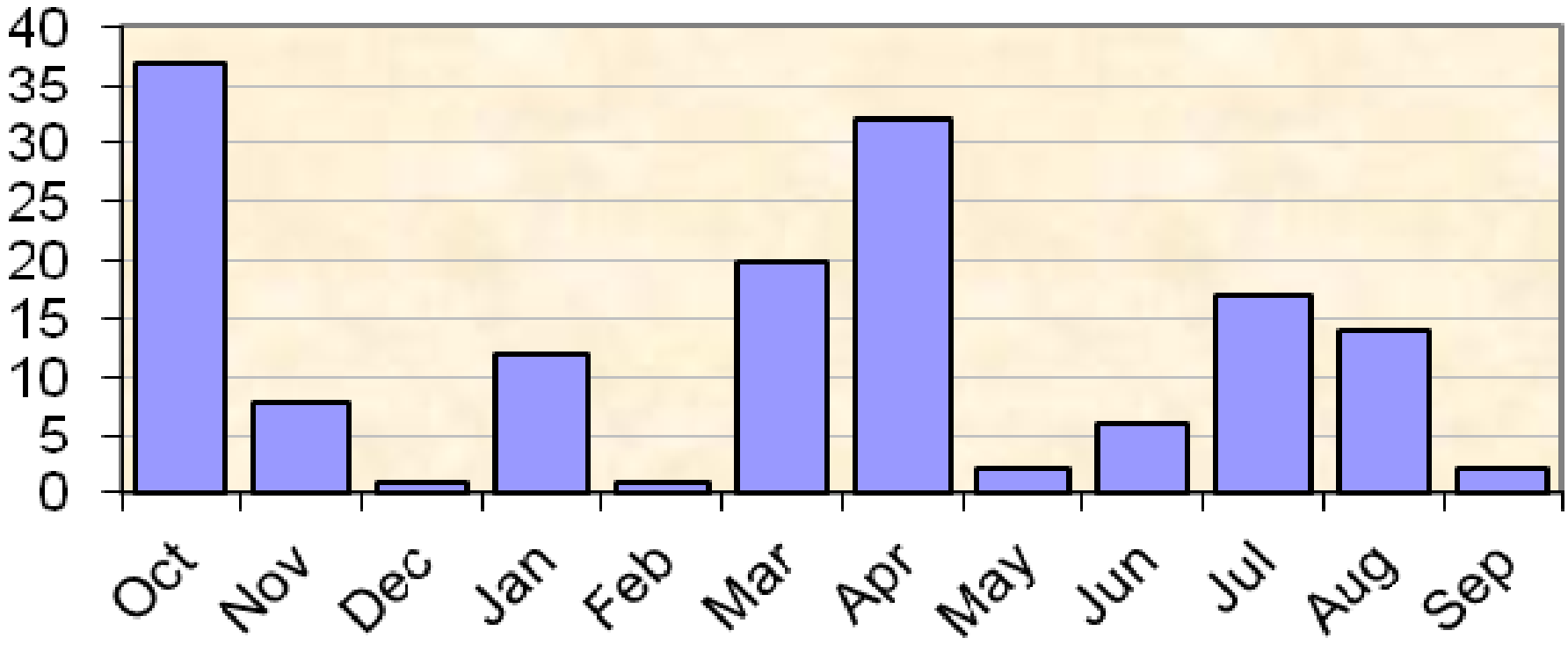

Northern Sierra Precipitation: 8-Station Index, September 30, 2012
MSC - Mount Shasta City
SHA - Shasta Dam
MNR - Mineral
QRD - Quincy
BCM - Brush Creek
SRR - Sierraville RS
BYM - Blue Canyon
PCF - Pacific House
Percent of Average for this Date: 83%
1982-1983 (wettest)
88.5
2005-2006 Daily Precip.
80.1
2010-2011 Daily Precip.
72.7
Current Daily Precip:41.6
Average (1922-1998)
50.0
1923-1924 (driest)
17.1
19.0
1976-1977 (2nd driest & driest thru Aug)
Cumulative Daily/Monthly Precipitation (inches)
Total Water Year Precipitation
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1
Water Year (October 1 - September 30)


San Joaquin Precipitation: 5-Station Index, September 30, 2012
Percent of Average for this Date: 61%
CVT Calaveras Big Trees
HTH - Hetch Hetchy
YSV - Yosemite Headquarters
NFR - North Fork R5
HNT - Huntington Lake
1982-1983 (wettest)
77.4
2010-2011 Daily Precip.
65.3
2005-2006 Daily Precip.
56.3
Current Daily Precip:25.0
Average (1956-2005)
40.8
1976-1977
15.4
1923-1924 (driest)
14.8
Cumulative Daily/Monthly Precipitation (inches)
Total Water Year Precipitation
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1

Temperature Records by Month for Water Year 2012



Precipitation Records by Month for Water Year 2012



Climate Conditions WY2012

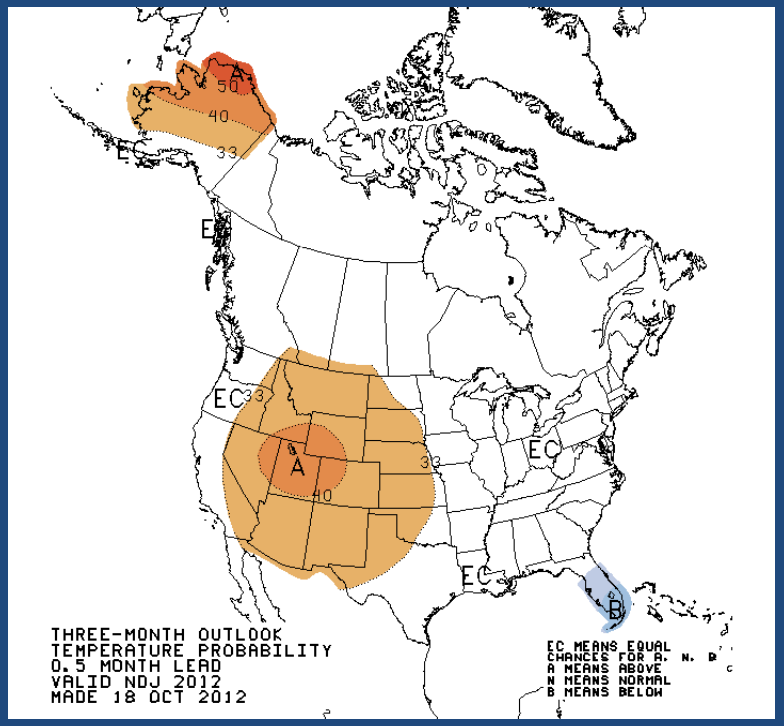
- PDO Cold Phase
- Second Year La Nina with La Nina transitioning to Neutral conditions in spring 2012
- AO positive 8 of 12 months
- Stronger than average North American Monsoon with westward displacement

WY 2013 Outlook

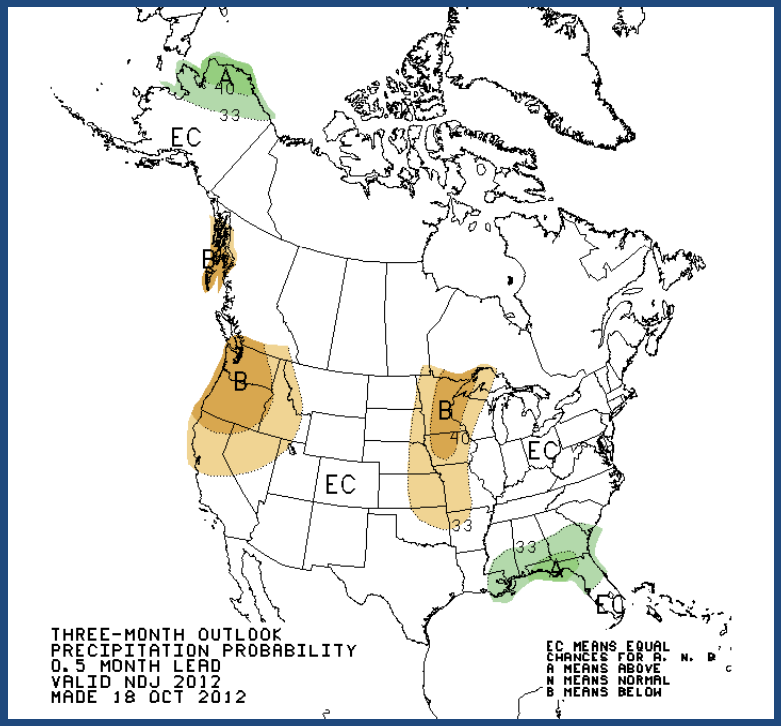
- CPC forecasts weak El Nino beginning Fall 2012 (Still Cold PDO, MJO Active)
- Possible dry fall with change in circulation possible in January
- Smaller chance of arctic air intrusions
- Forecast models split on CA winter precipitation

U. S. Seasonal Outlooks
November 2012– January 2013

Temperature



Precipitation

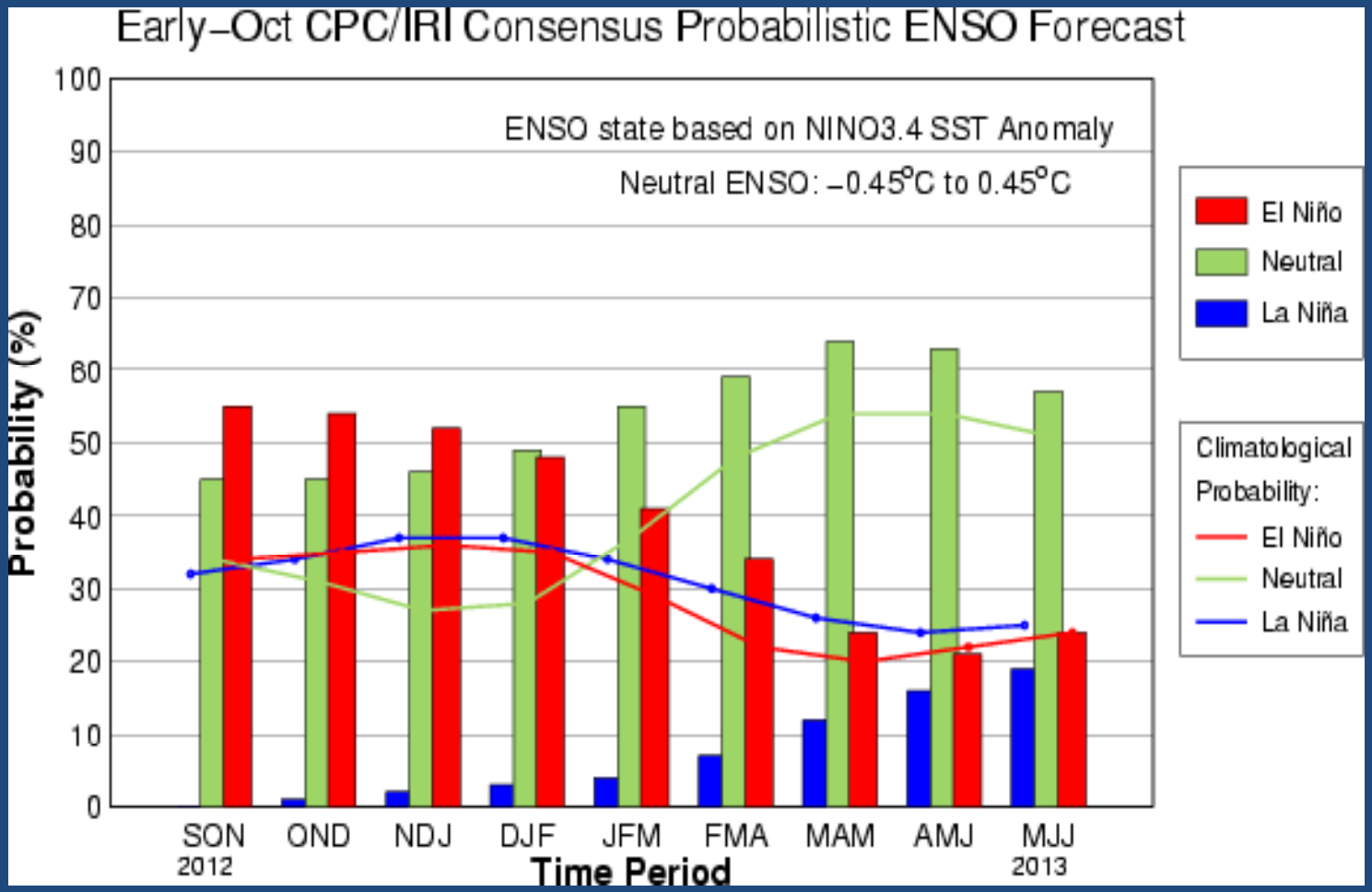


The seasonal outlooks combine the effects of long-term trends, soil moisture, and, when appropriate, ENSO.

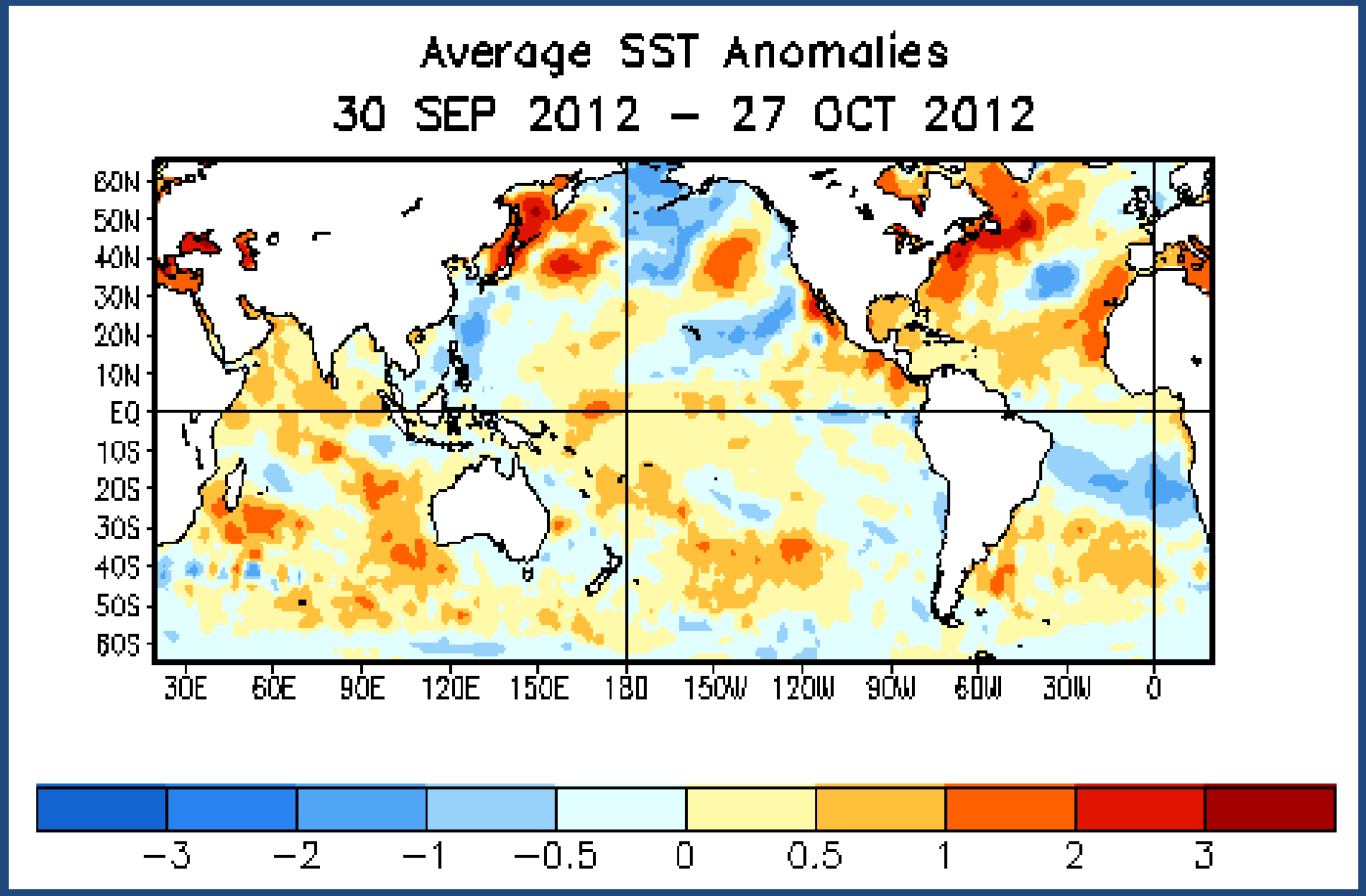
CPC/IRI Probabilistic ENSO Outlook

(updated 4 Oct 2012)

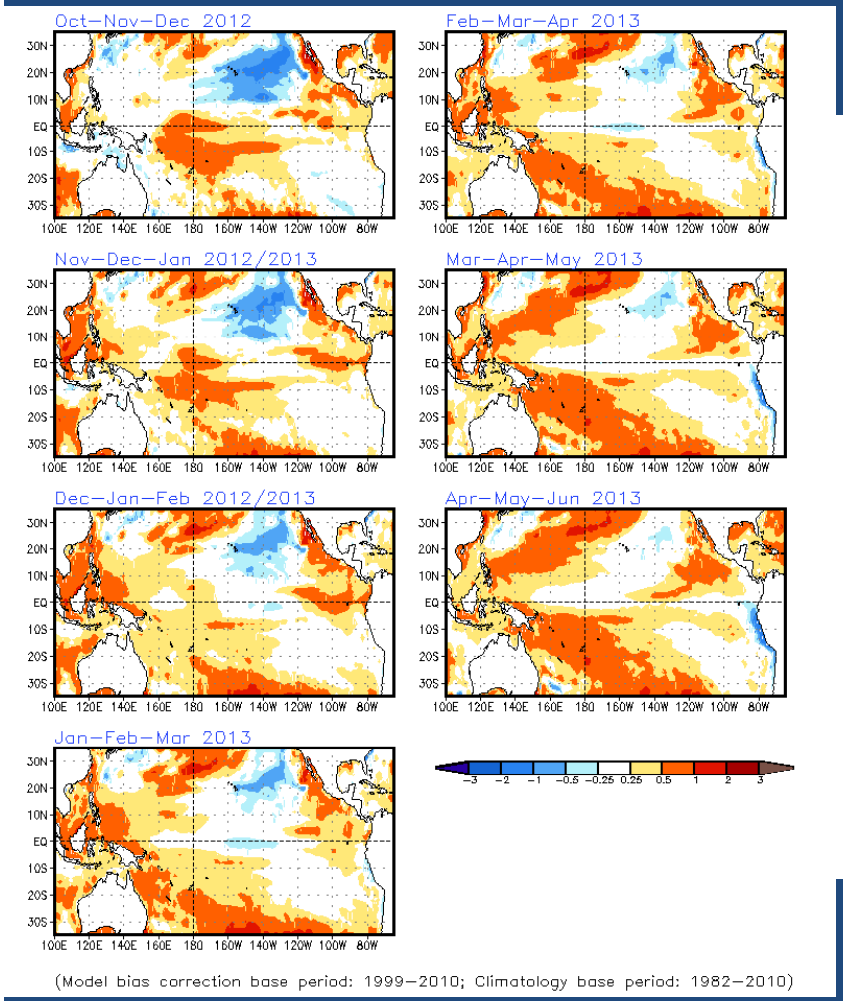
El Niño is favored beginning in September-November (SON) 2012 and persisting through November-January (NDJ) 2012-13.



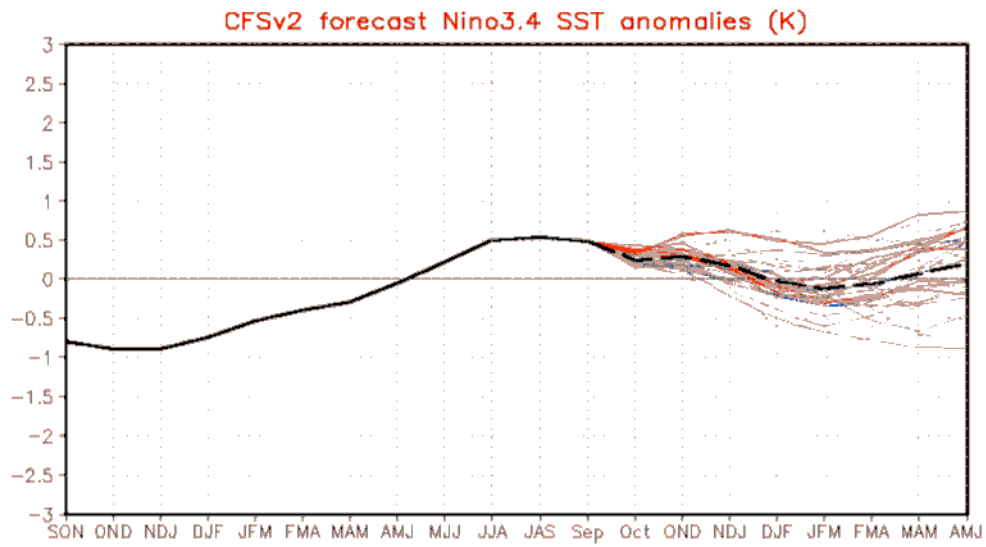
Global SST Departures (°C)



SST Outlook: NCEP CFS.v2 Forecast Issued 9 October 2012

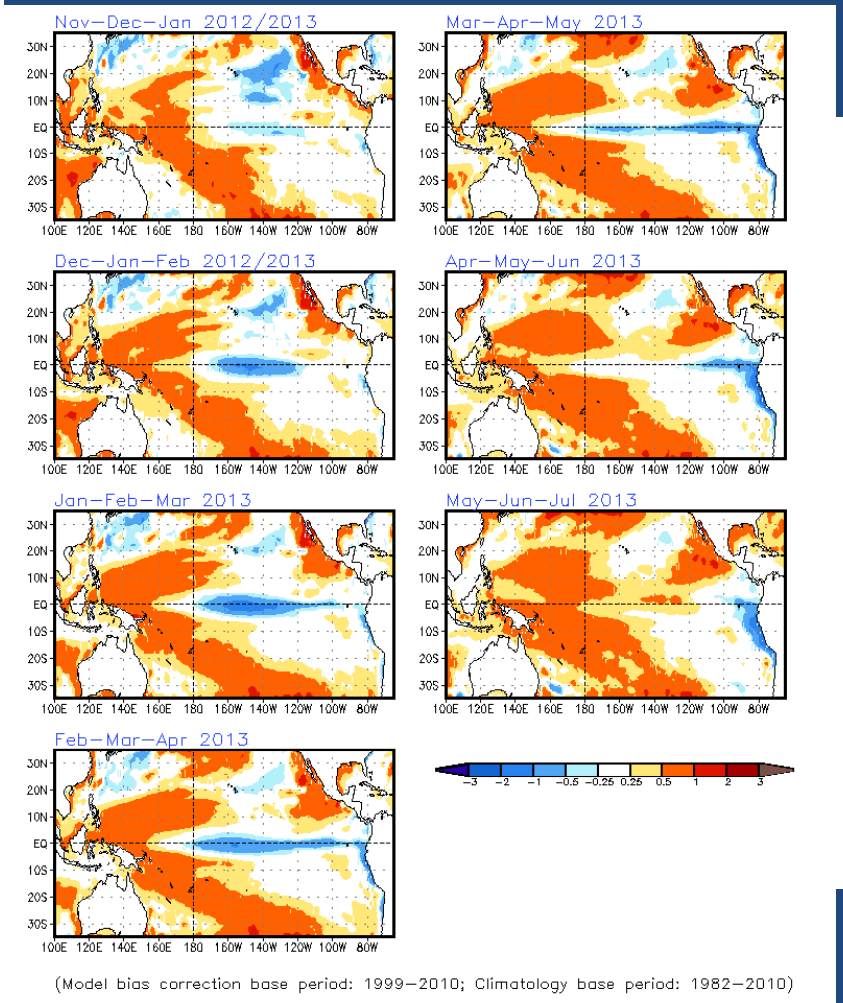


The CFS.v2 ensemble mean (black dashed line) predicts ENSO-neutral conditions for the next several months.

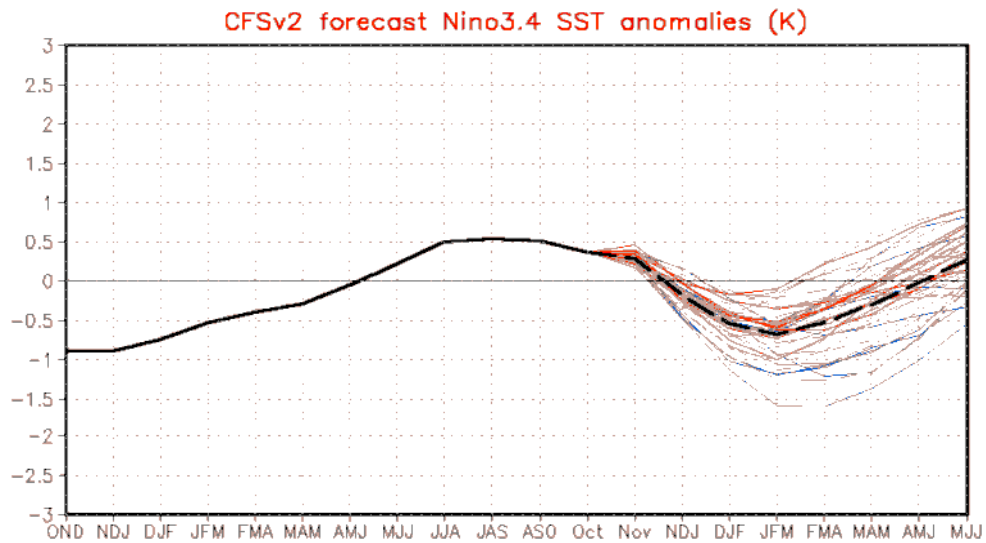


CFS.v1 has been discontinued.

SST Outlook: NCEP CFS.v2 Forecast Issued 28 October 2012



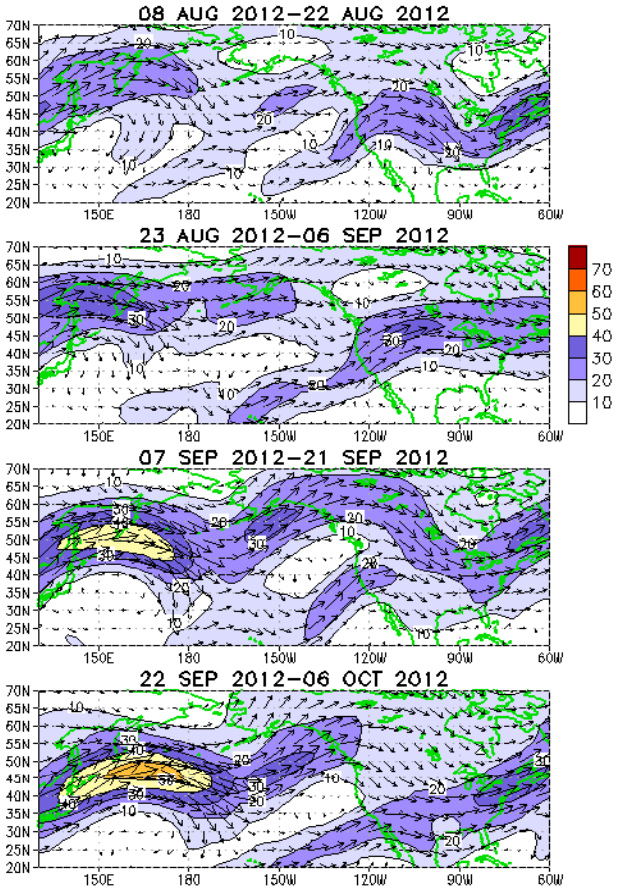
The CFS.v2 ensemble mean (black dashed line) predicts below-average SSTs during N. Hemisphere winter 2012-13.



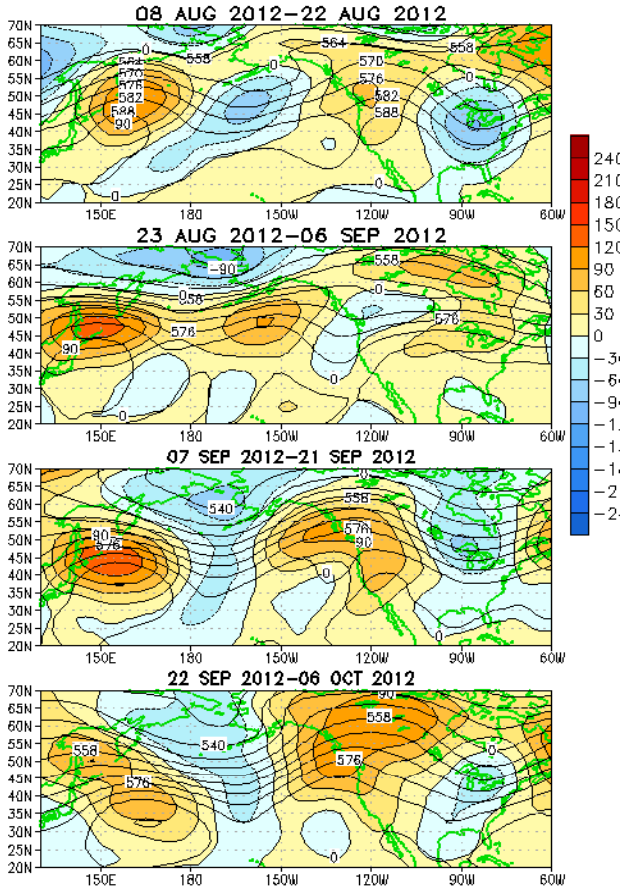
CFS.v1 has been discontinued.

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

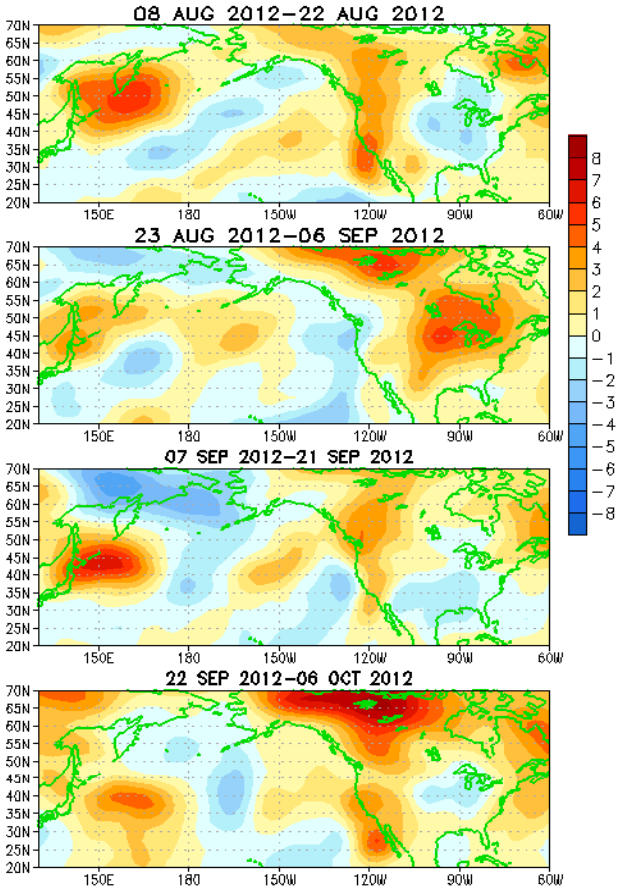
200-hPa Wind



500-hPa Height & Anoms.



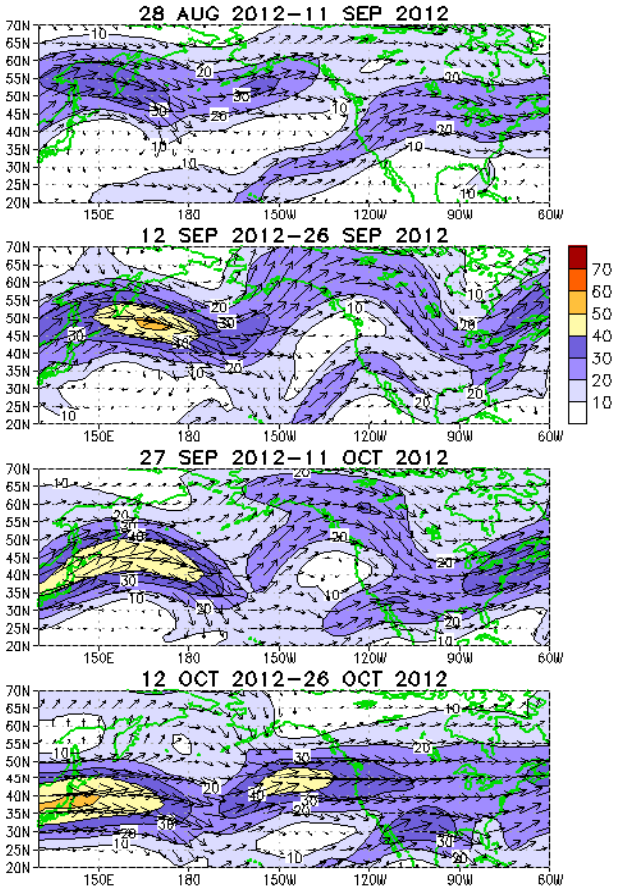
925-hPa Temp. Anoms. (°C)



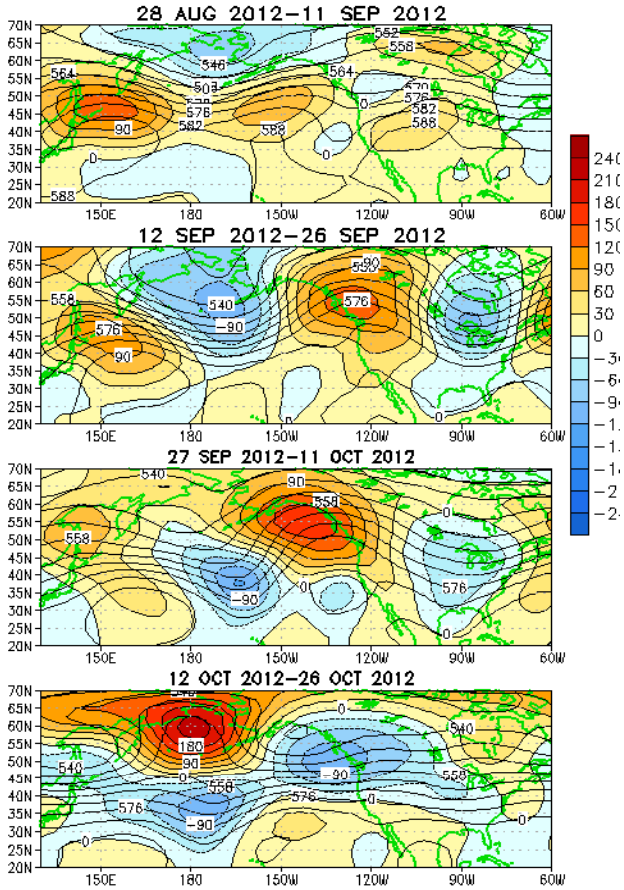
During mid August and most of September, below-average heights were evident across the eastern U.S., accompanied by near- or below-average temperatures in many areas of the central and eastern U.S. During late August/early September, the 500-hPa heights and temperatures were above-average across much of the contiguous U.S.

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

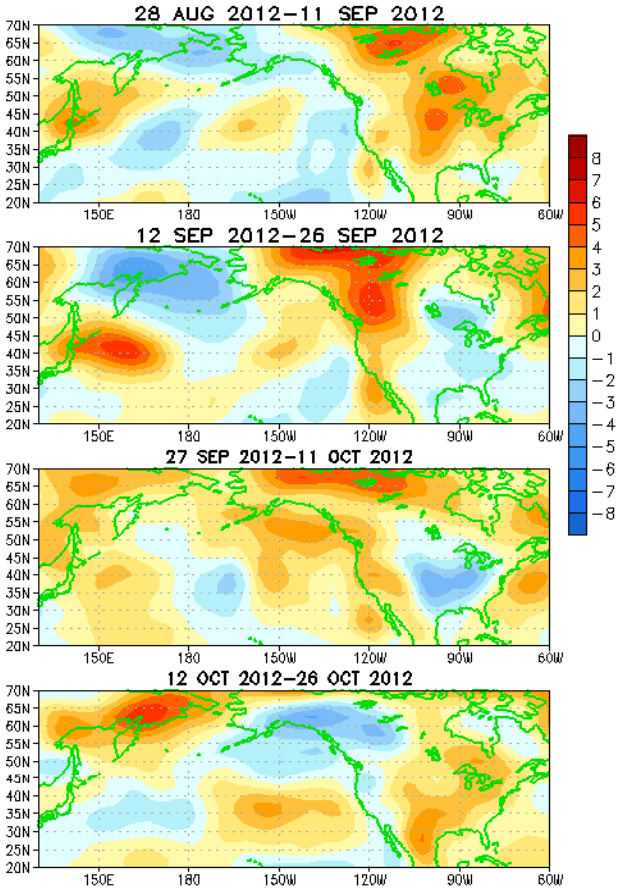
200-hPa Wind



500-hPa Height & Anoms.

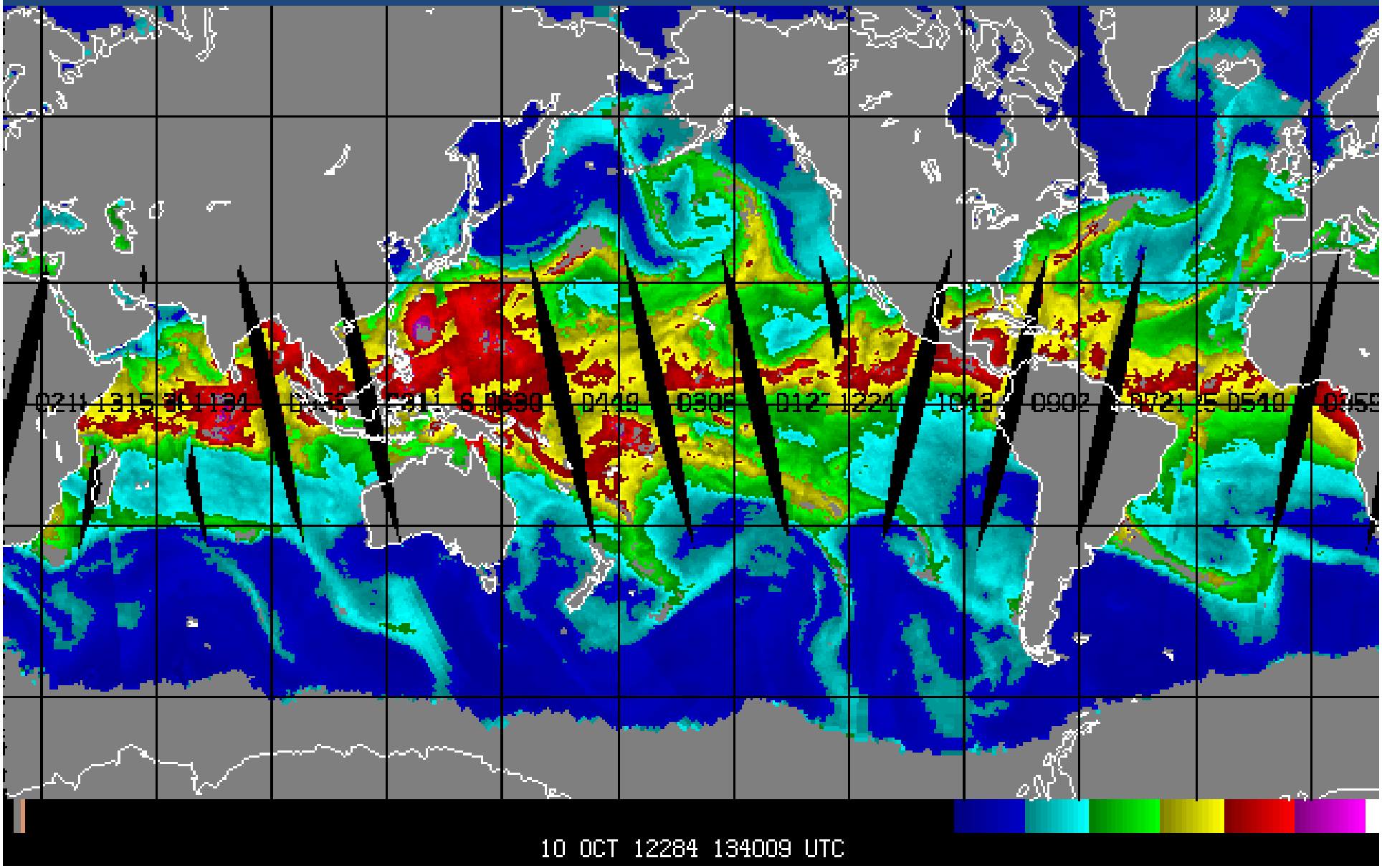


925-hPa Temp. Anoms. (°C)



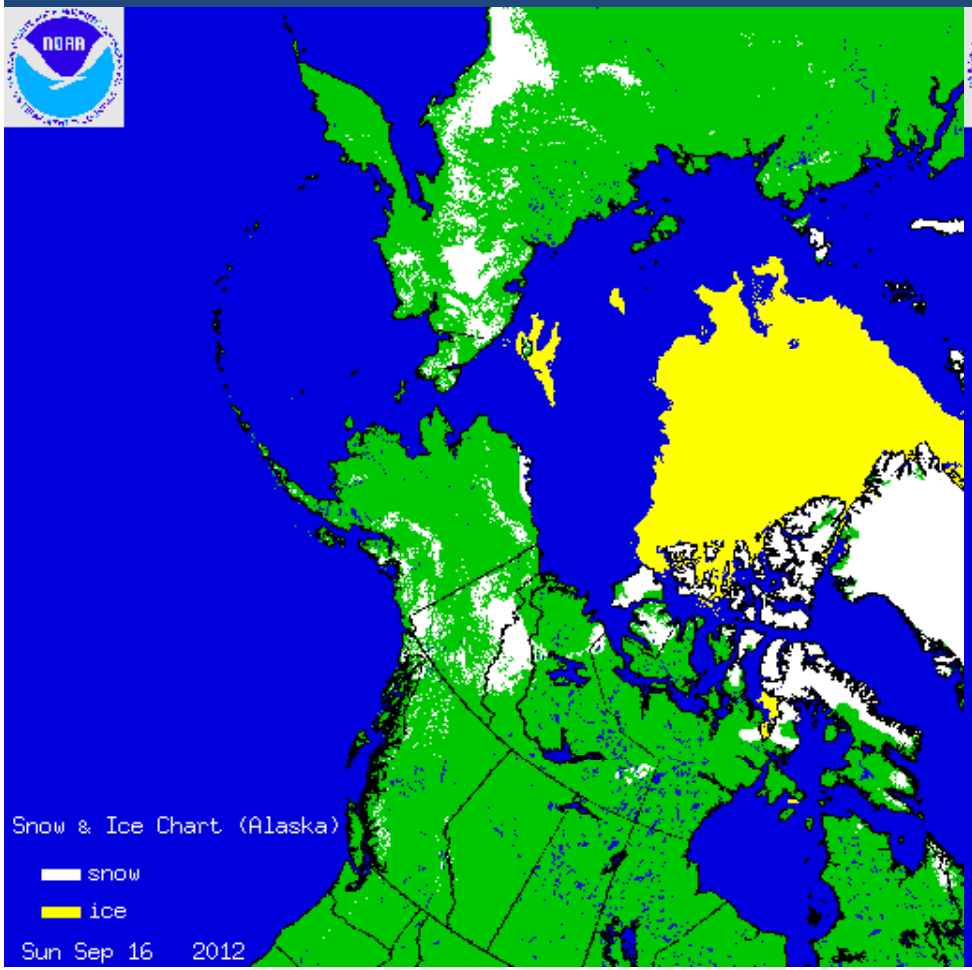
During late September through mid-October, below-average 500-hPa heights were evident across the eastern U.S., accompanied by near- or below-average surface temperatures in many areas of the central and eastern U.S. During this same period, above-average heights and temperatures were observed over the western U.S. Recently, above-average temperatures were evident across much of the U.S. except along the West Coast and in Alaska.

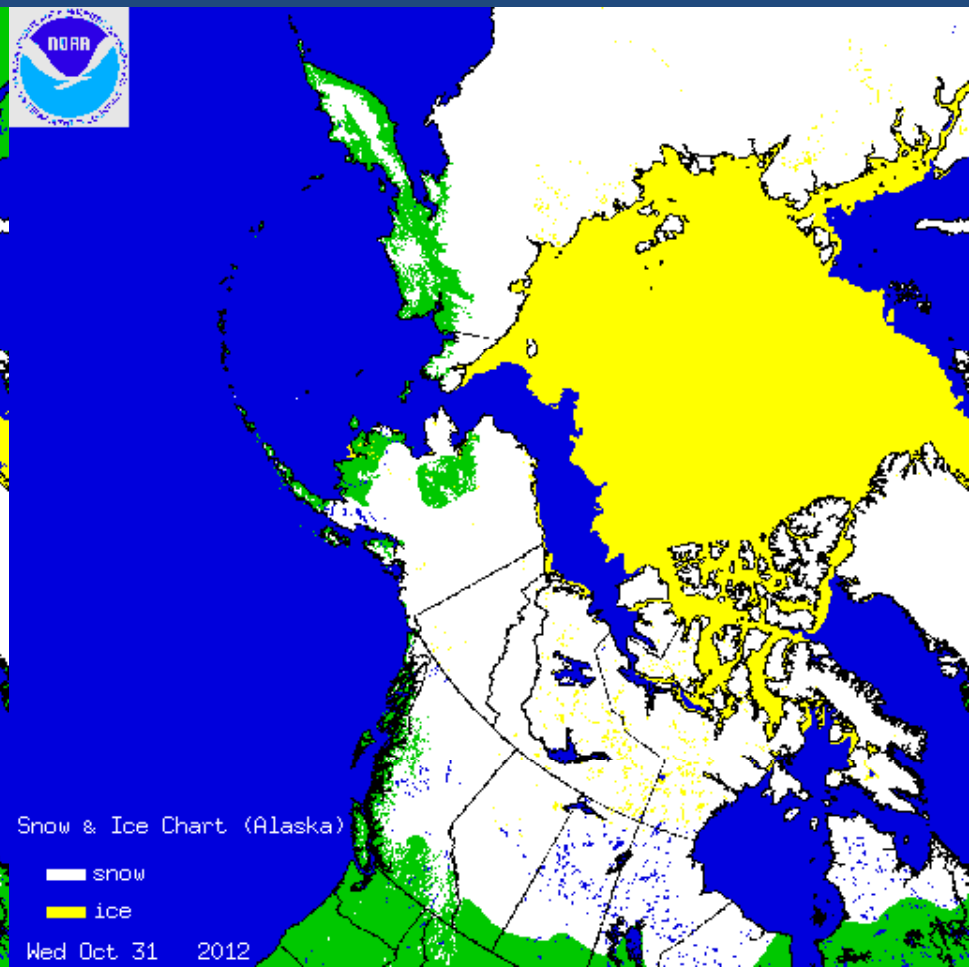
10/10/2012 Water Vapor Image



11/1/2012 Water Vapor Image

North Pole Sea Ice Extent





WY 2013 – Reasons for Optimism

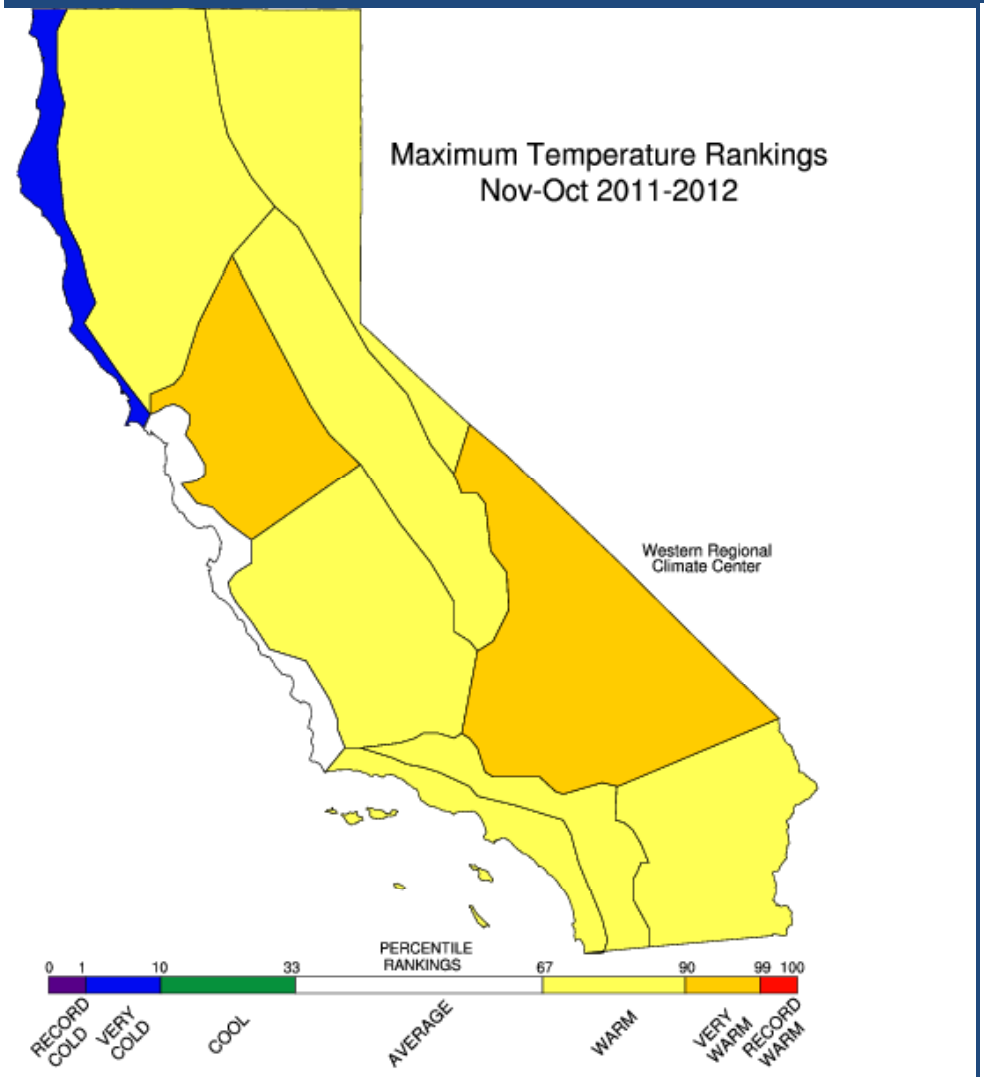
- International forecast models hint at above normal winter precipitation for CA
- Composite + Trend statistical model forecasts for El Niño show above normal winter precipitation for CA
- Cranes migrated to Delta early

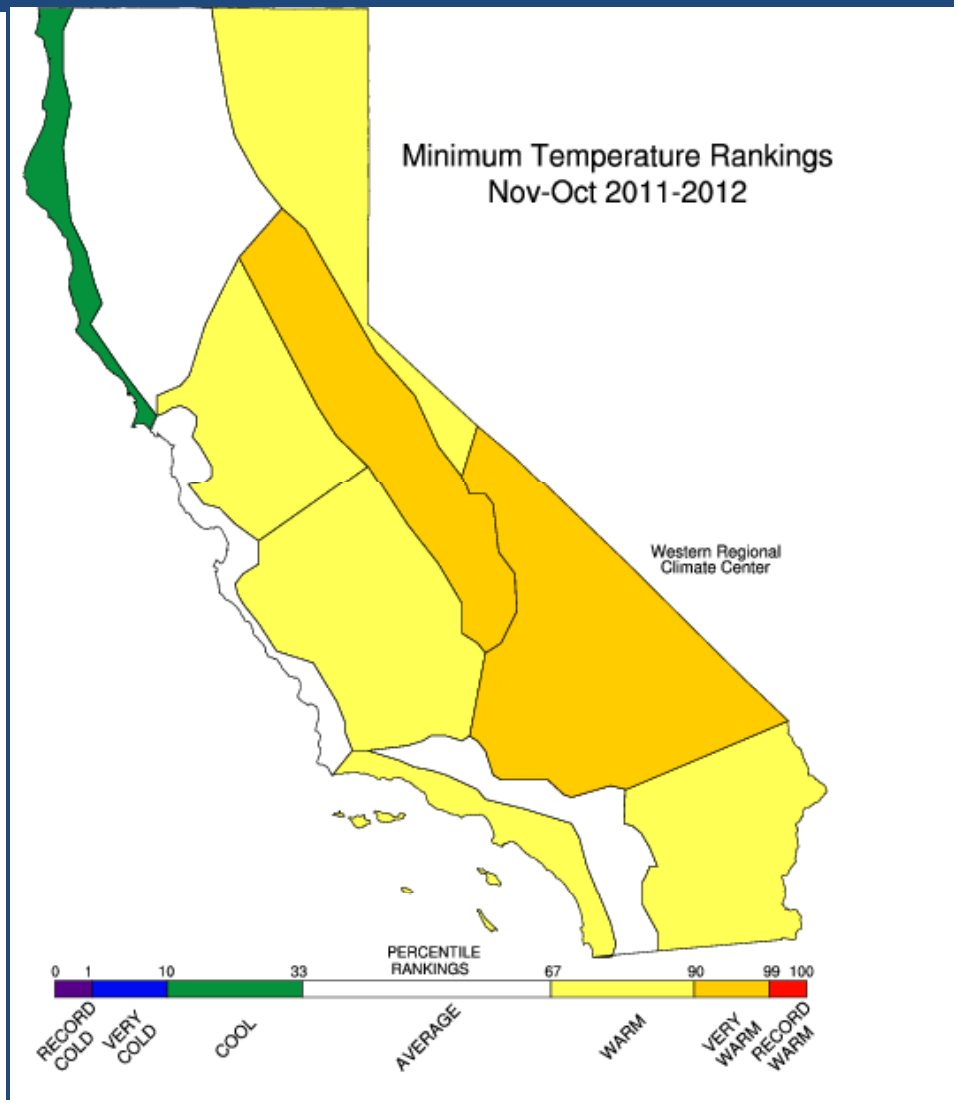
WY 2013 – Reasons for Pessimism

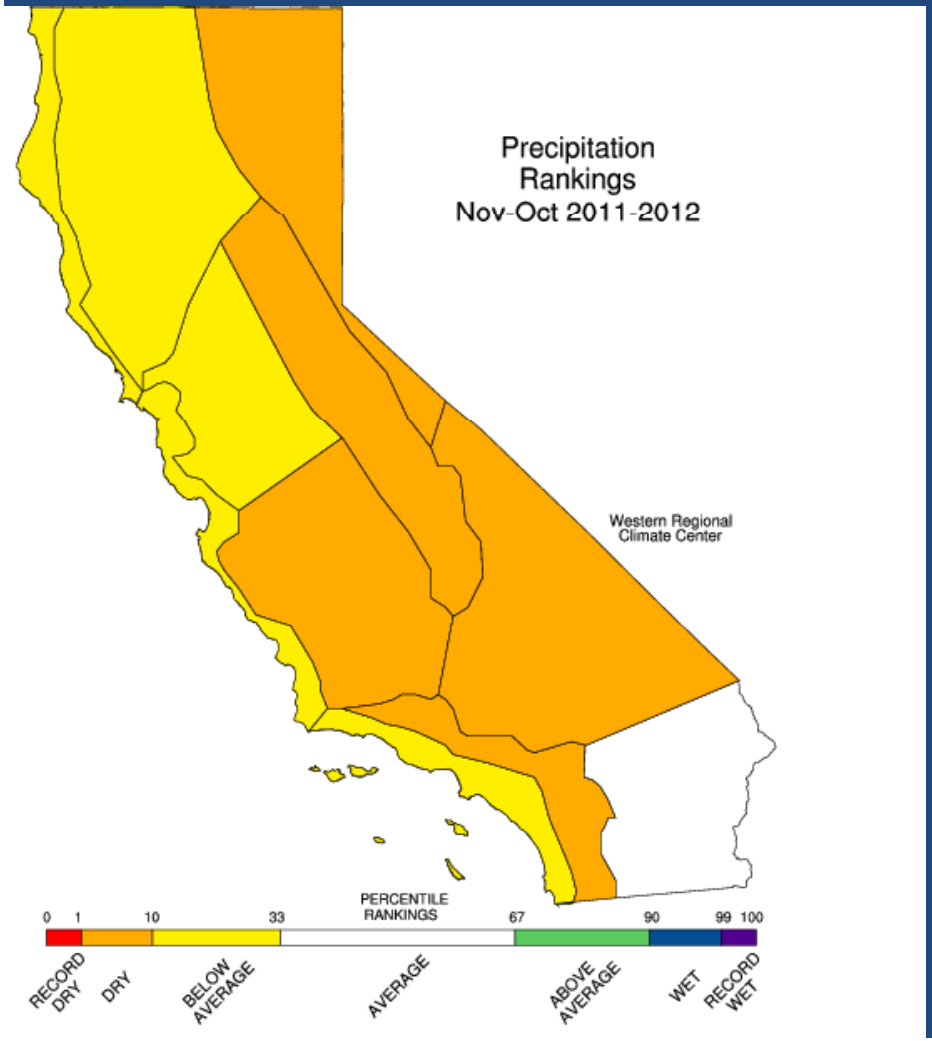
- US dynamical forecast models indicate drier than average winter for California
- WY 1977 was a weak El Niño year that resulted from a late transition from La Niña
- Solar/Lunar/Earth cycle theory suggests we are due for extremely dry winter

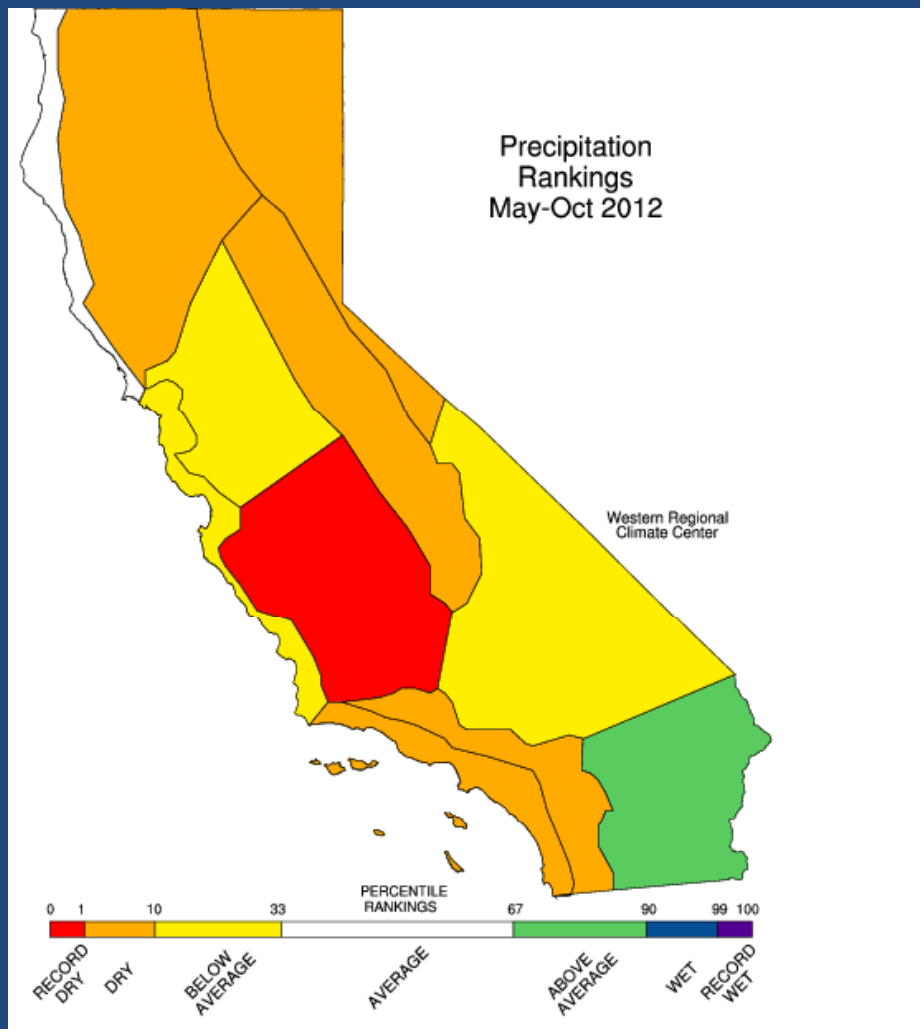
Questions?

Email:
Michael.L.Anderson@water.ca.gov
(manderso@water.ca.gov)


Maximum Temperature Rankings
Nov-Oct 2011-2012
Western Regional
Climate Center
PERCENTILE
RANKINGS
0 1 10 33 67 90 99 100
RECORD COLD
VERY COLD
COOL
AVERAGE
WARM
VERY WARM
RECORD WARM


Minimum Temperature Rankings
Nov-Oct 2011-2012
Western Regional
Climate Center
PERCENTILE
RANKINGS
0 1 10 33 67 90 99 100
RECORD COLD
VERY COLD
COOL
AVERAGE
WARM
VERY WARM
RECORD WARM


Precipitation
Rankings
Nov-Oct 2011-2012
Western Regional
Climate Center
PERCENTILE
RANKINGS
0
1
10
33
67
90
99
100
RECORD
DRY
DRY
BELOW
AVERAGE
AVERAGE
ABOVE
AVERAGE
WET
RECORD
WET


Precipitation
Rankings
May-Oct 2012
Western Regional
Climate Center
PERCENTILE
RANKINGS
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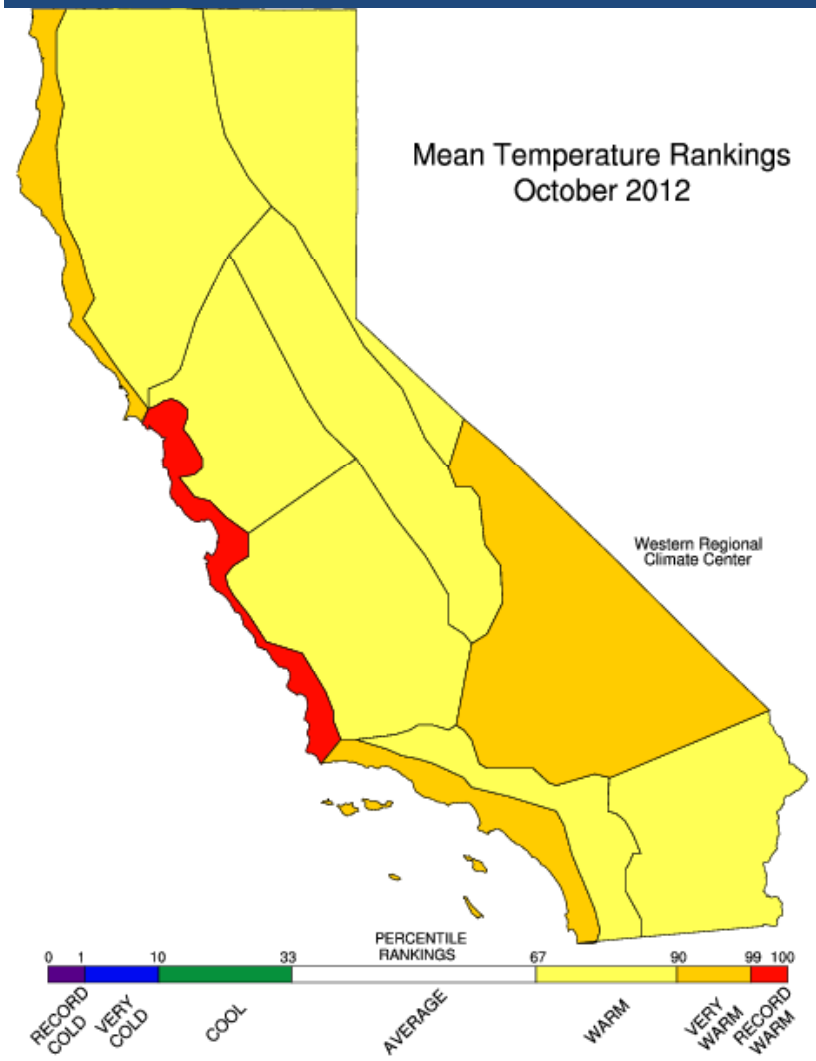
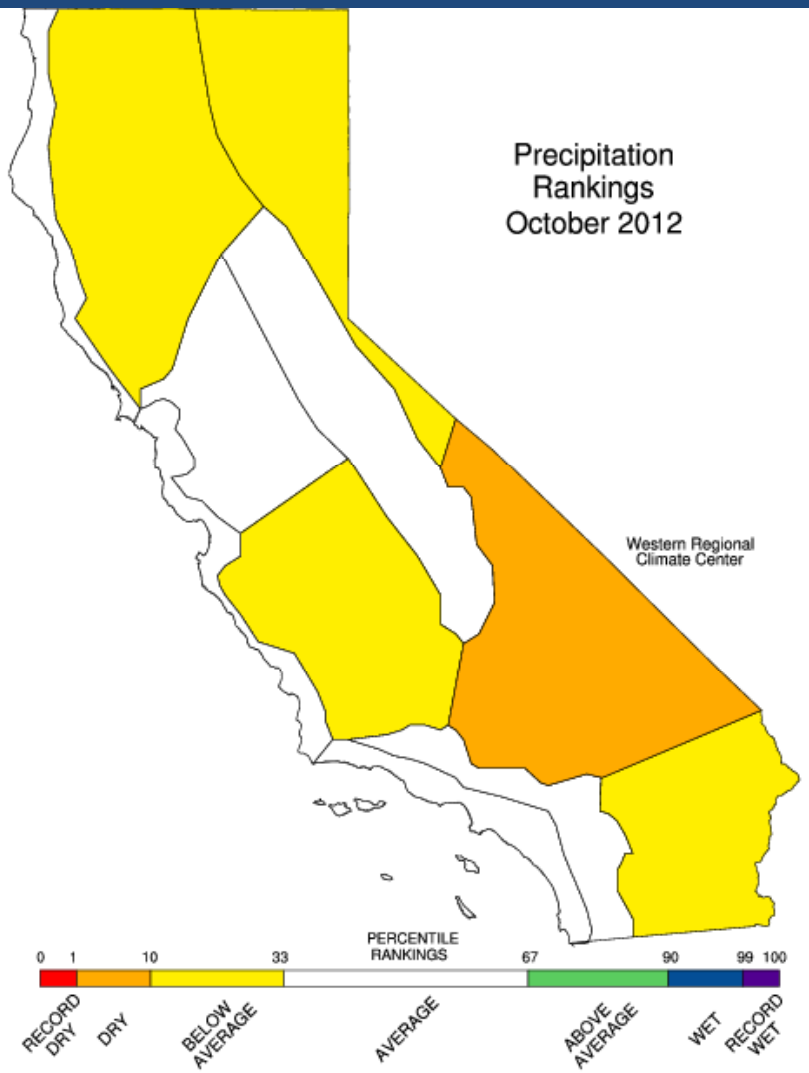
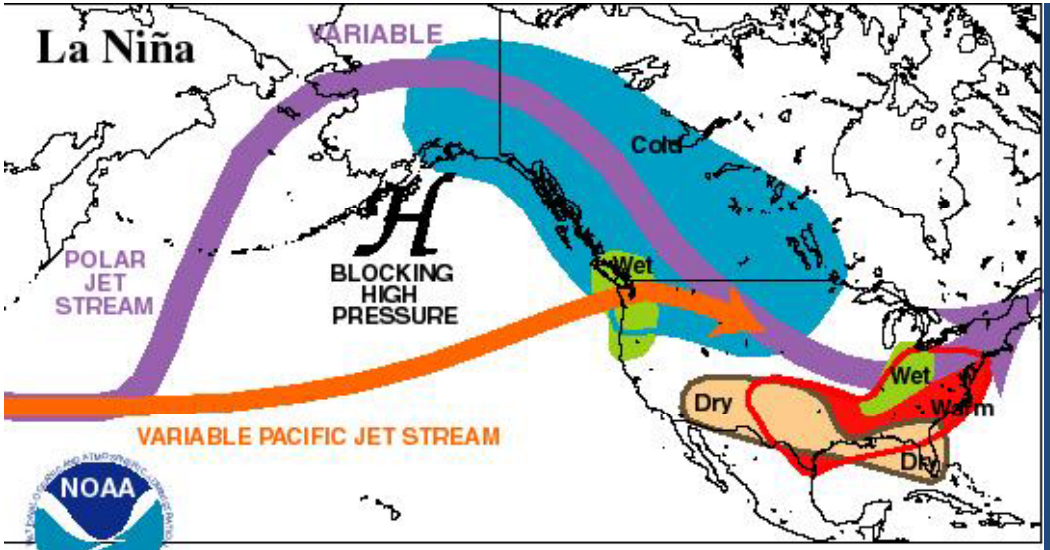
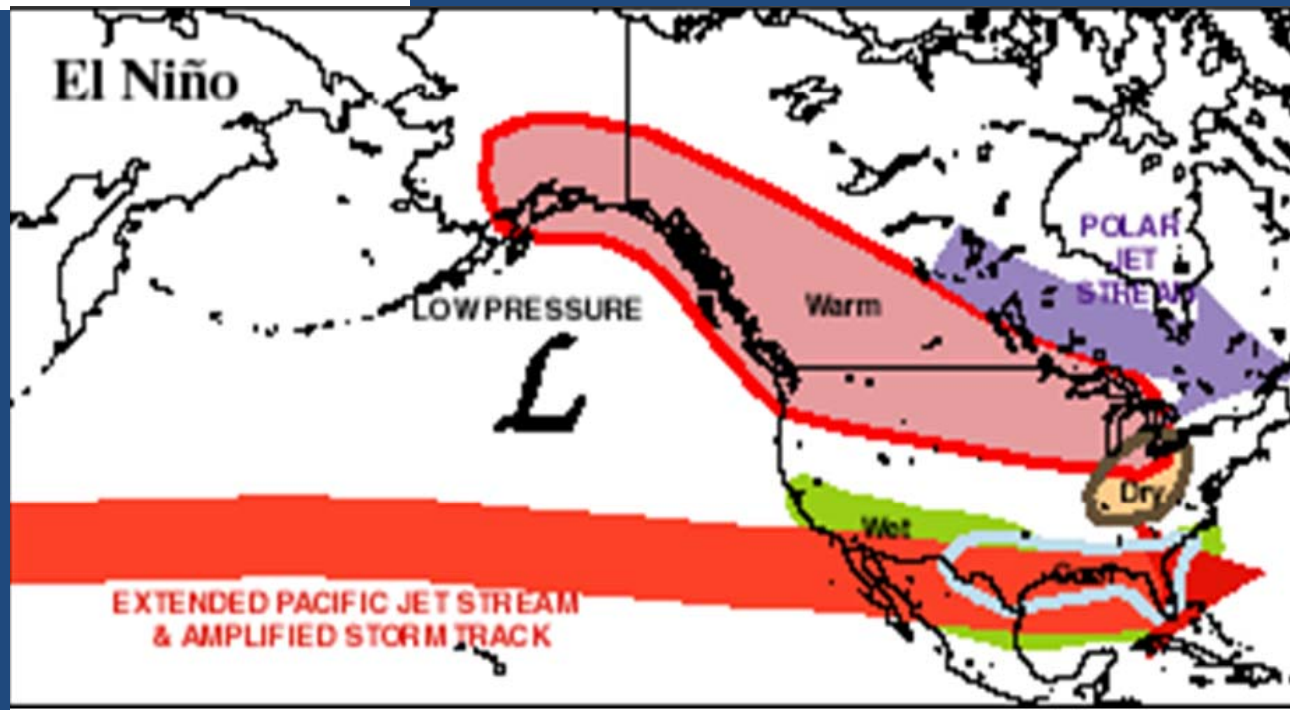
1
10
33
67
90
99
100
RECORD
DRY
DRY
BELOW
AVERAGE
AVERAGE
ABOVE
AVERAGE
WET
RECORD
WET

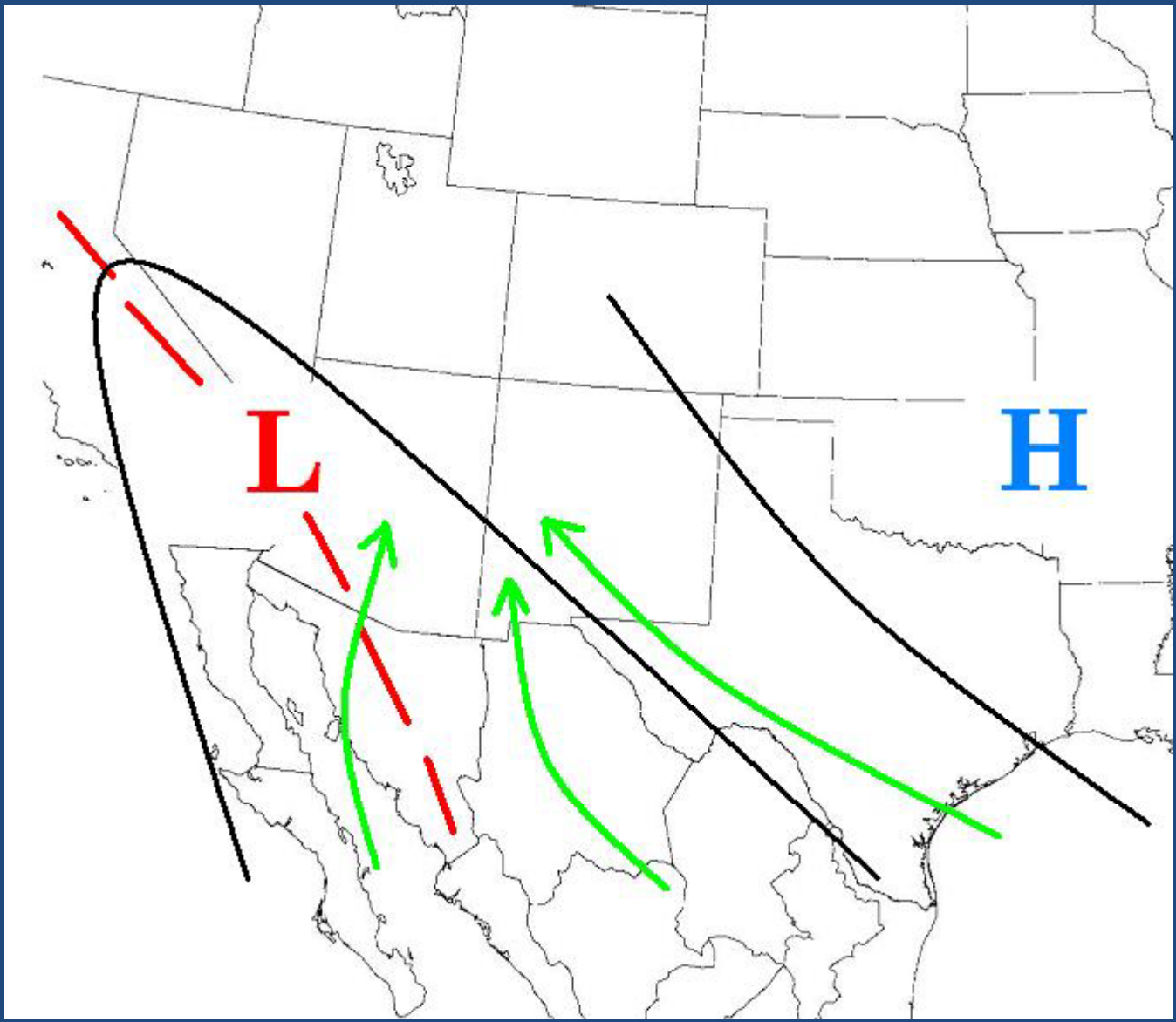

Mean Temperature Rankings
October 2012
Western Regional
Climate Center
PERCENTILE
RANKINGS
0
1
10
33
67
90
99
100
RECORD
COLD
VERY
COLD
COOL
AVERAGE
WARM
VERY
WARM
RECORD
WARM


Precipitation
Rankings
October 2012
Western Regional
Climate Center
PERCENTILE
RANKINGS
0
1
10
33
67
90
99
100
RECORD
DRY
DRY
BELOW
AVERAGE
AVERAGE
ABOVE
AVERAGE
WET
RECORD
WET



Climate Prediction Center/NCEP/NWS

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