Water Year 2013 Review
Water Year 2014 Preview

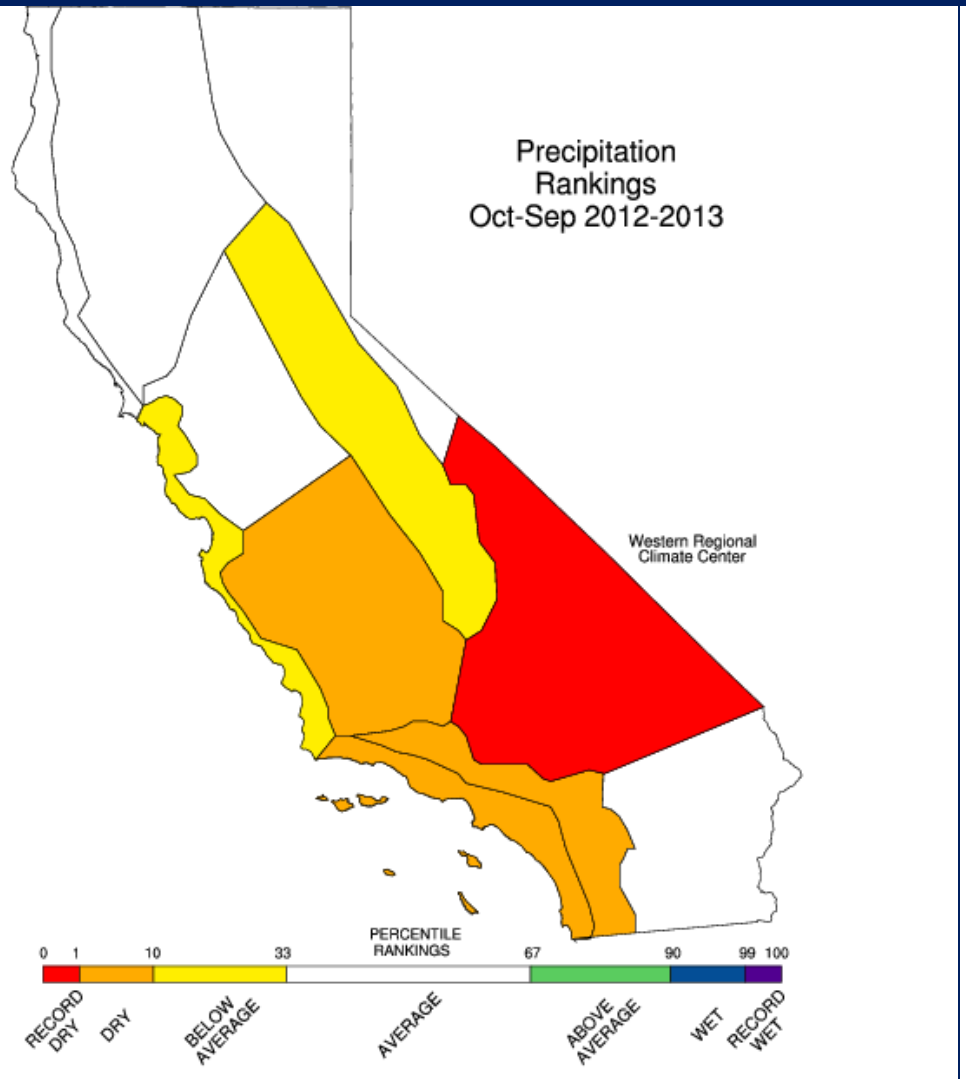
CCSS Annual Meeting

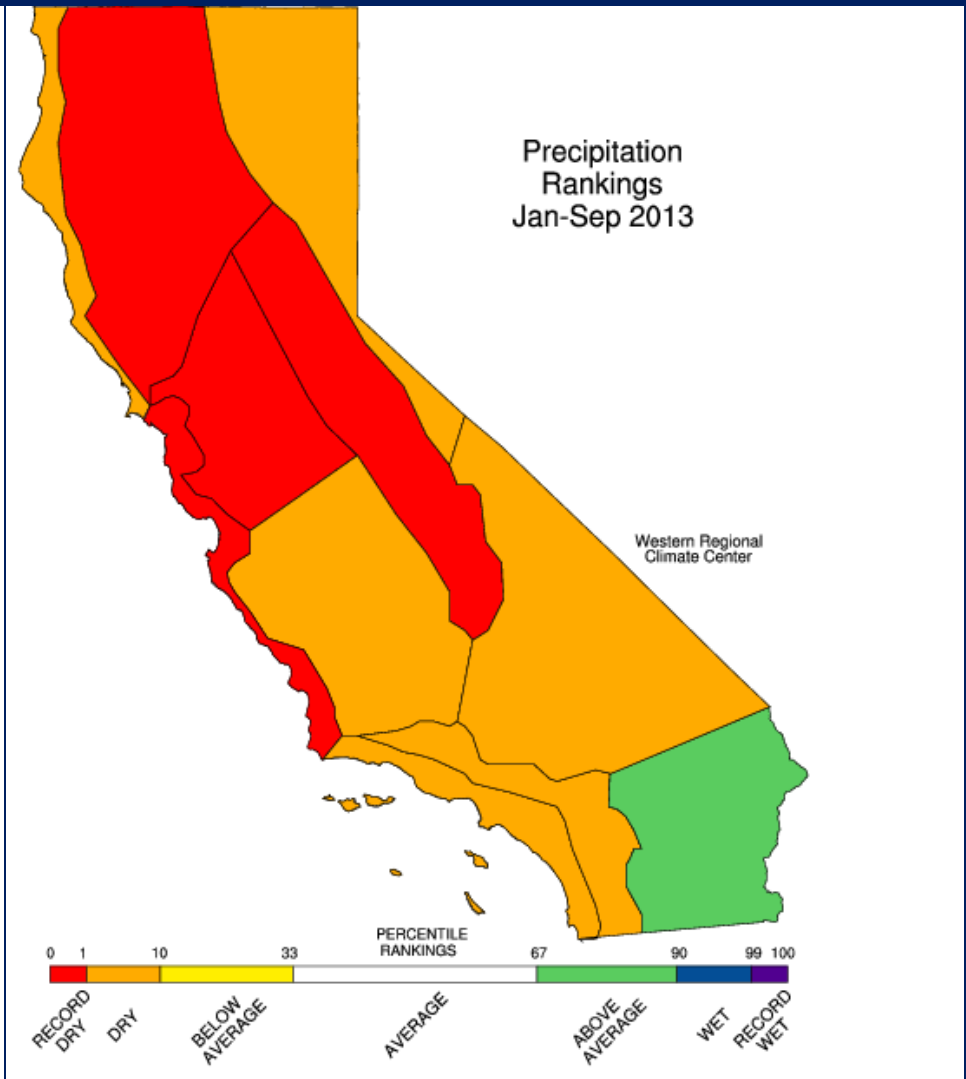
November 6-8, 2013

Talk Overview

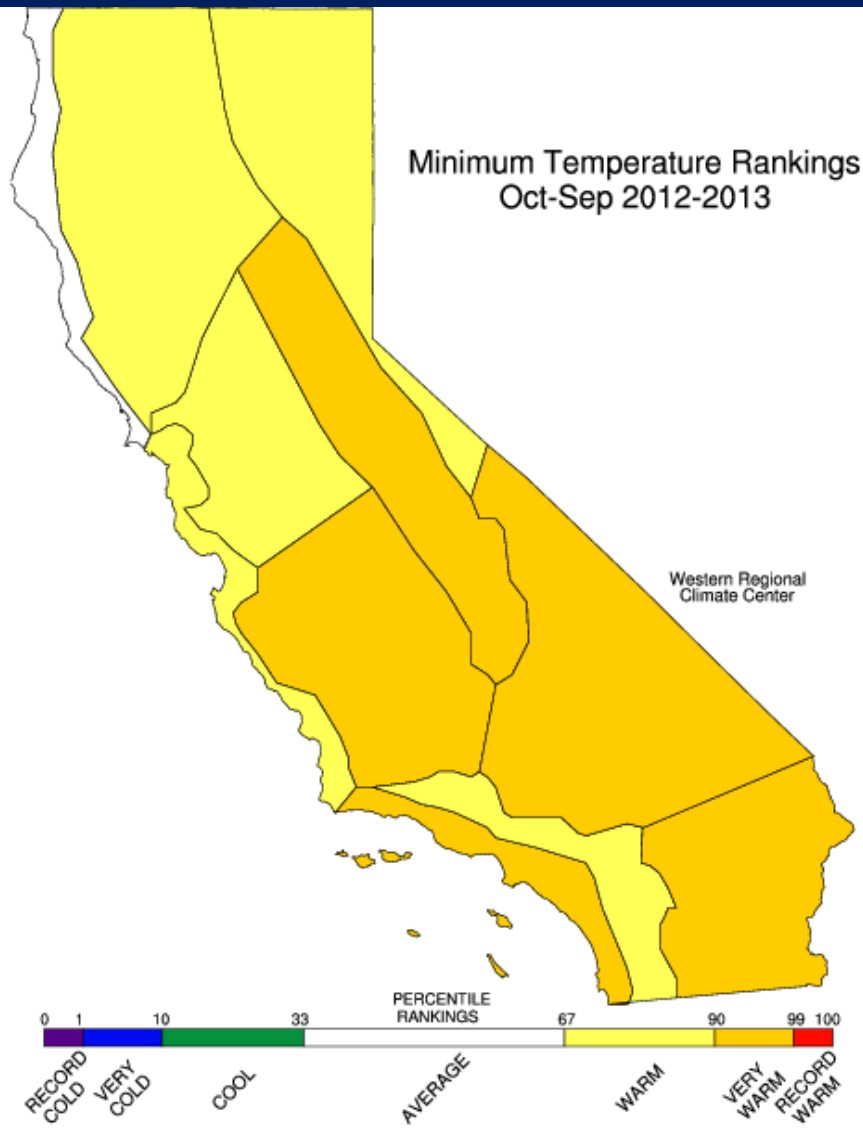
- WY 2013 - A tale of two seasons
- Variability
- Current Conditions
- Looking Ahead to WY2014

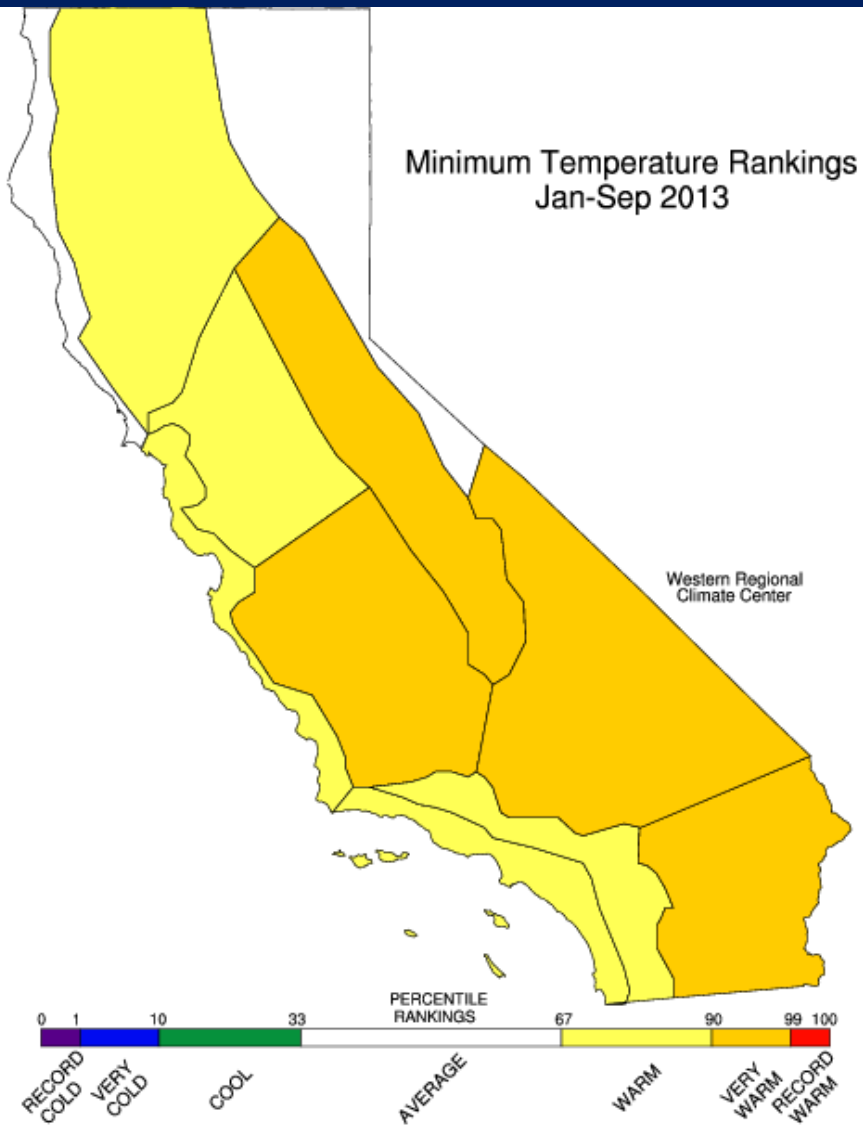
California Climate Tracker



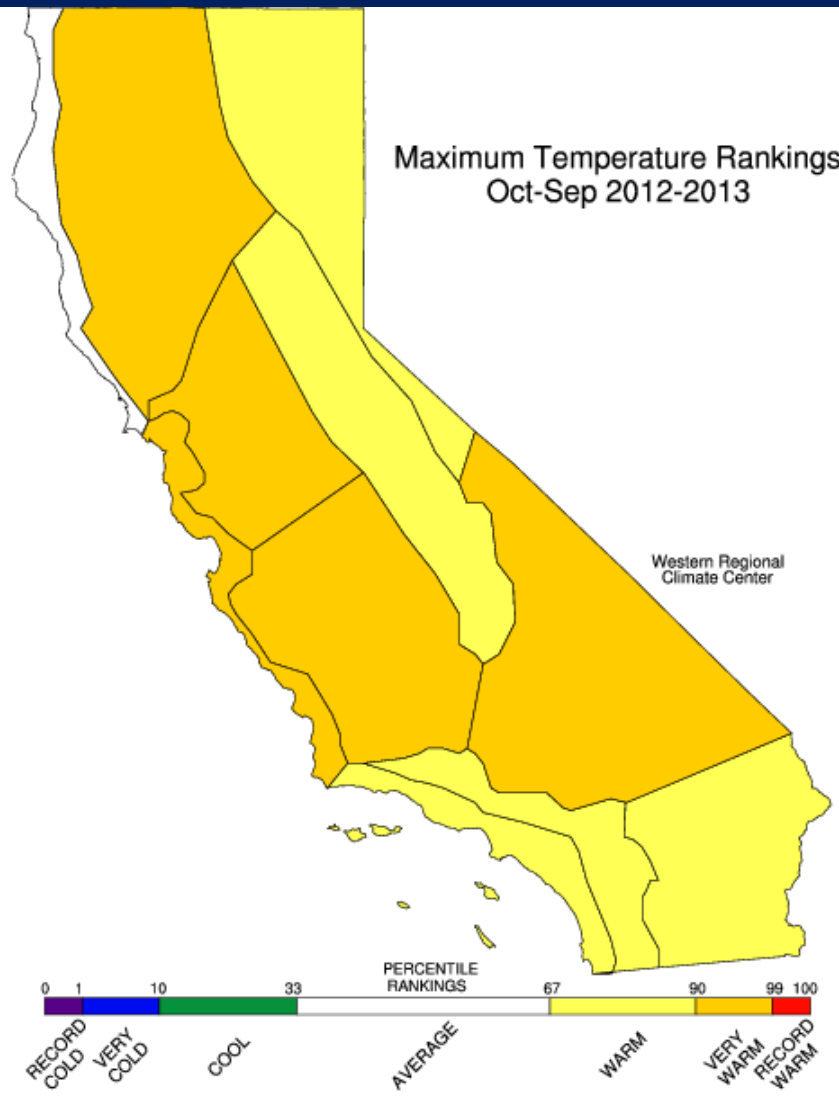


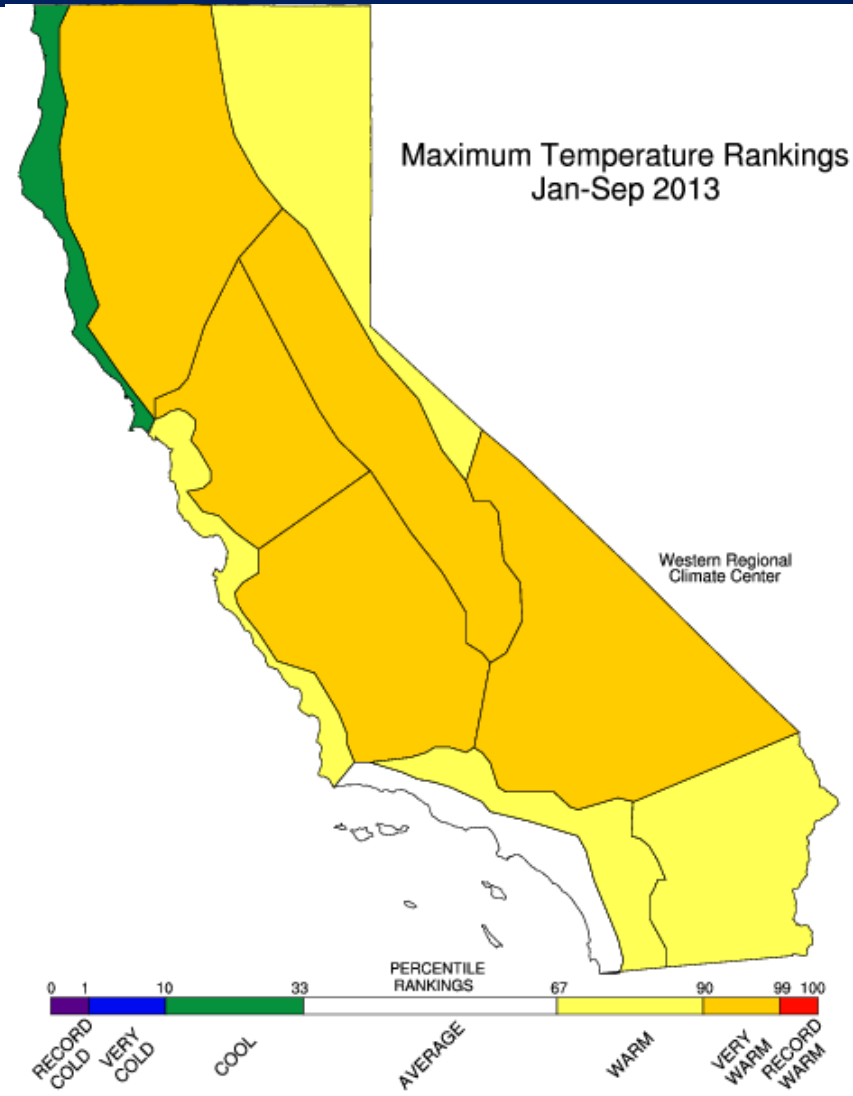
California Climate Tracker



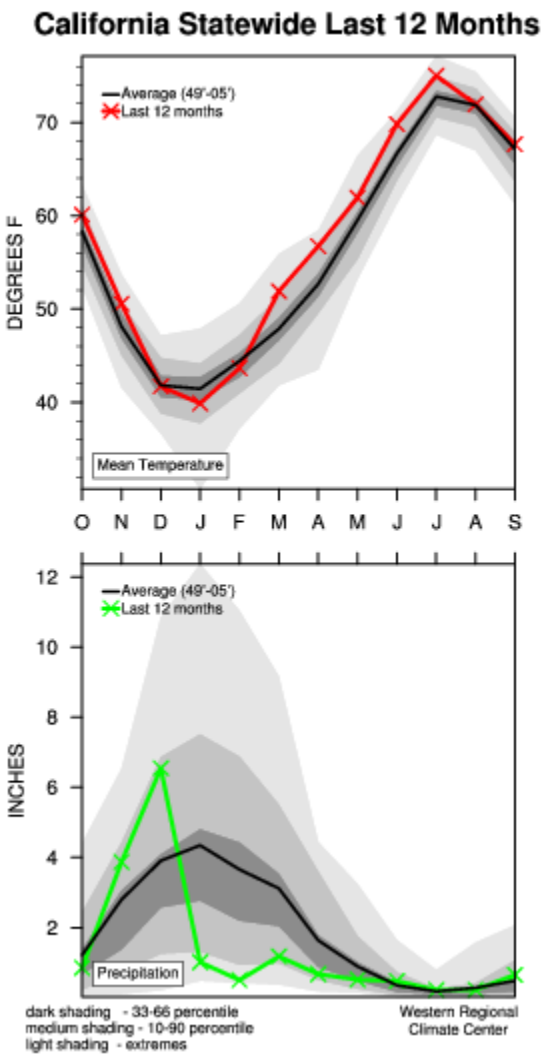


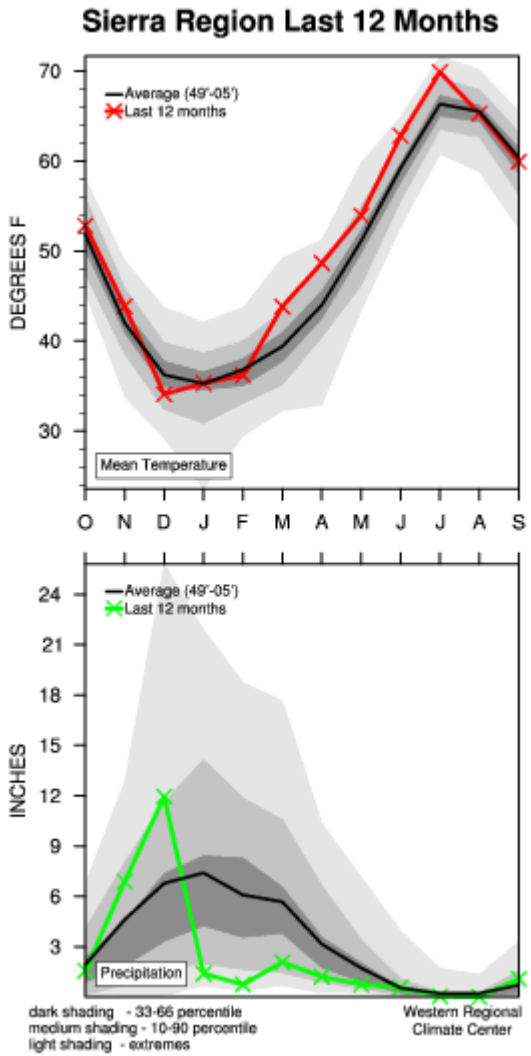
California Climate Tracker

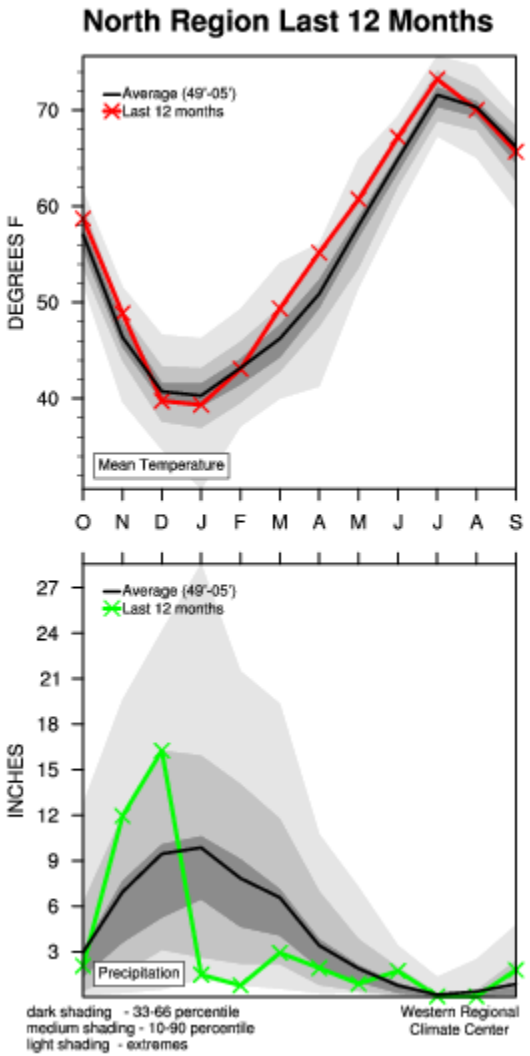




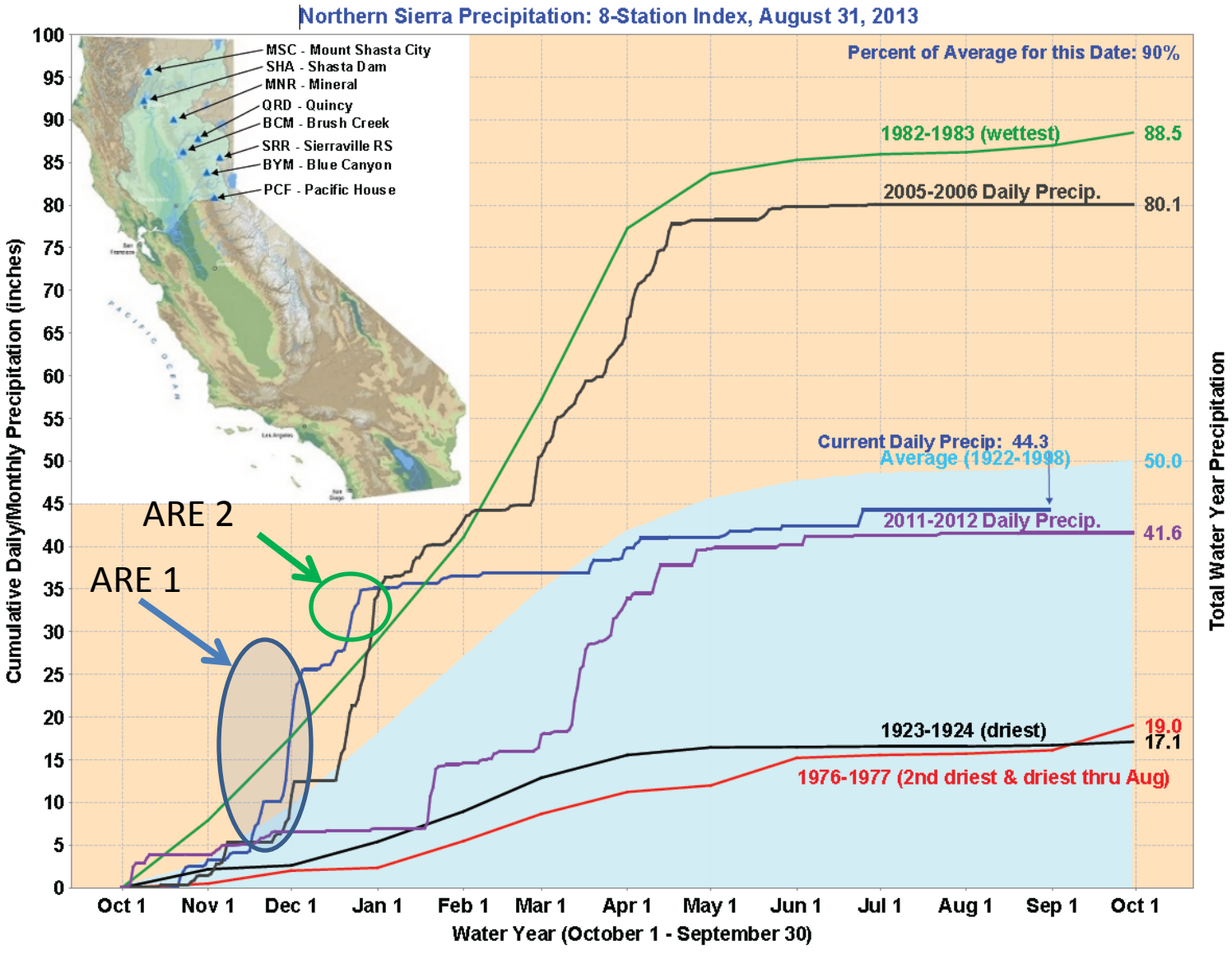
California Climate Tracker





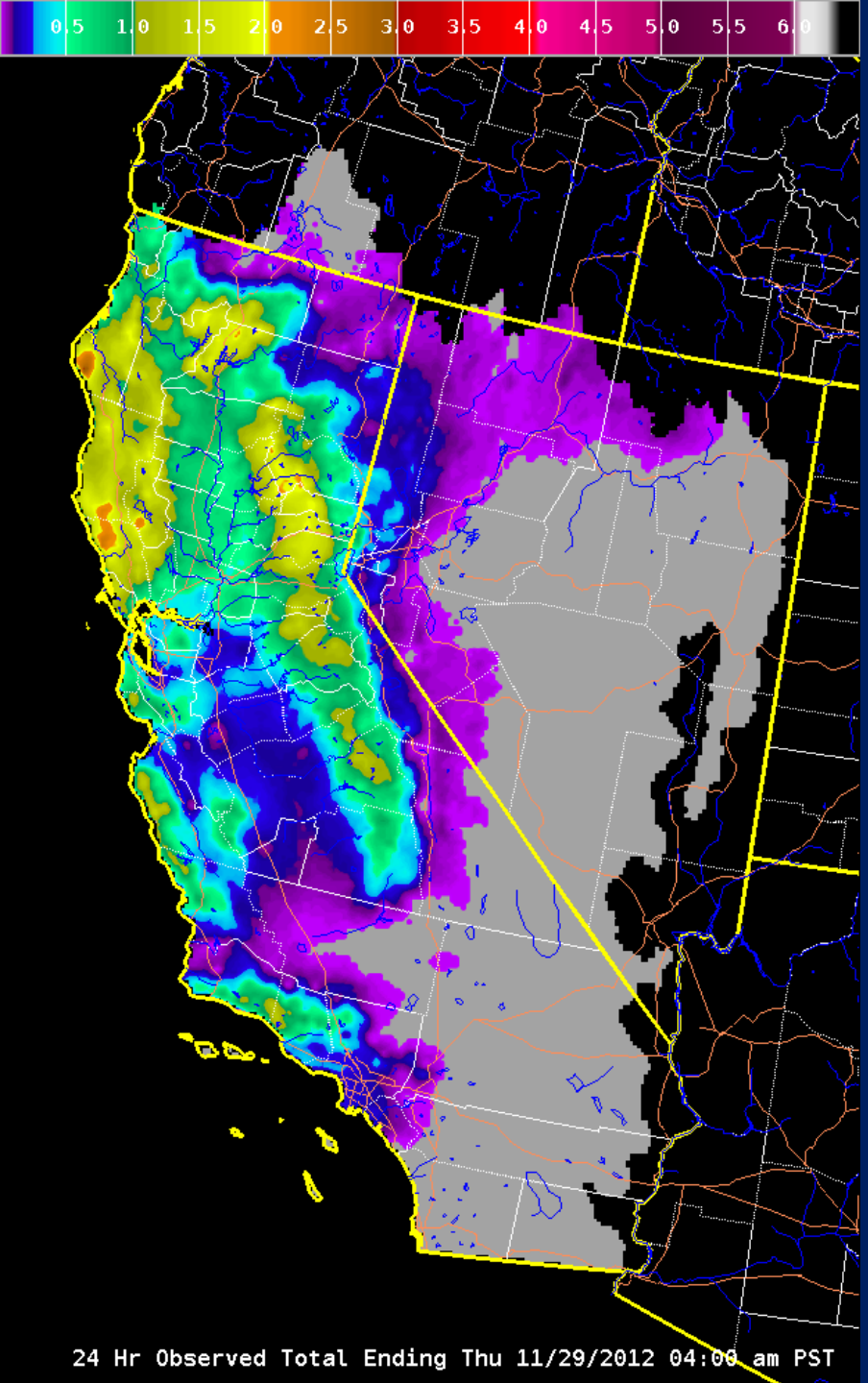


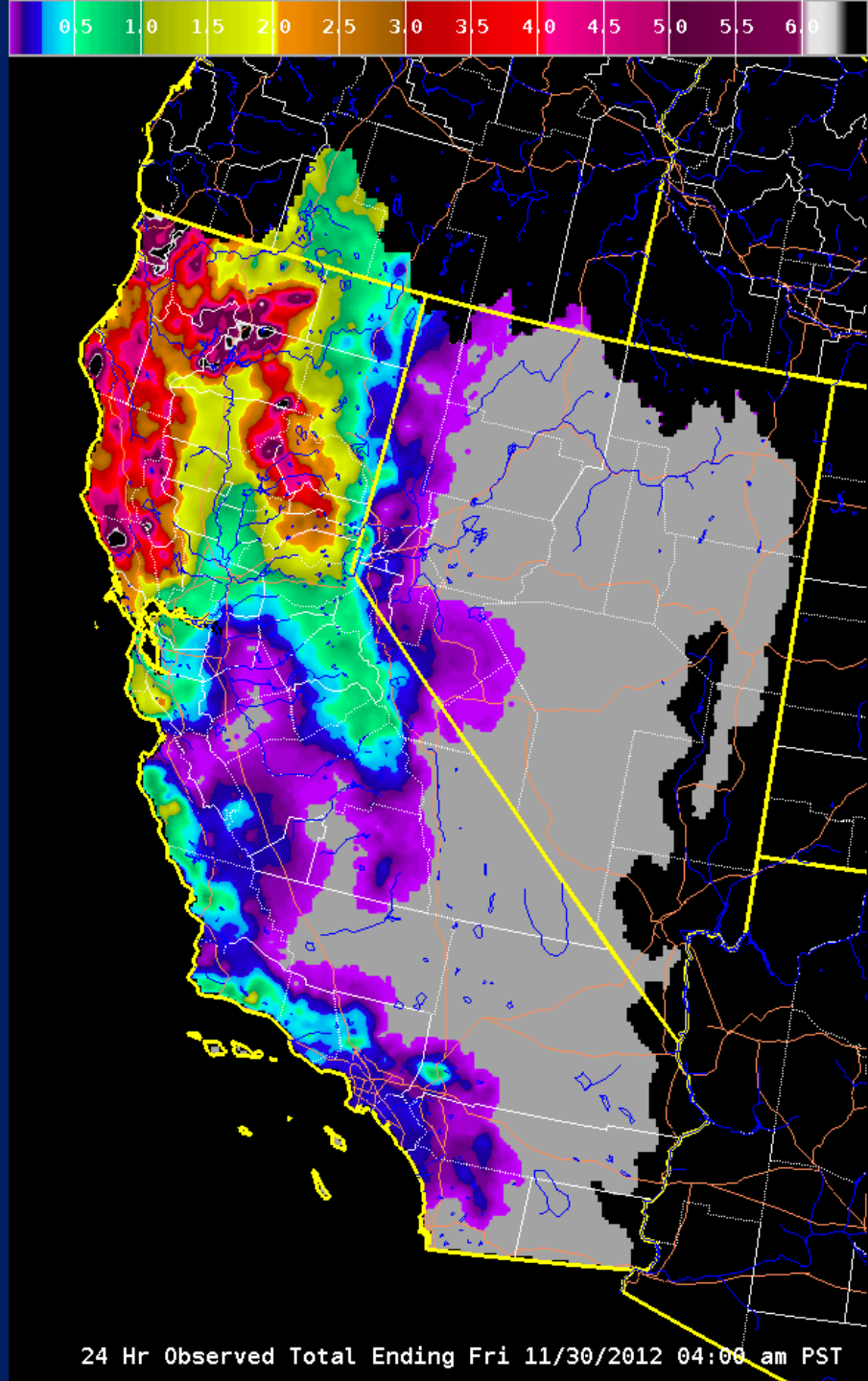
2013 ARE's of Note

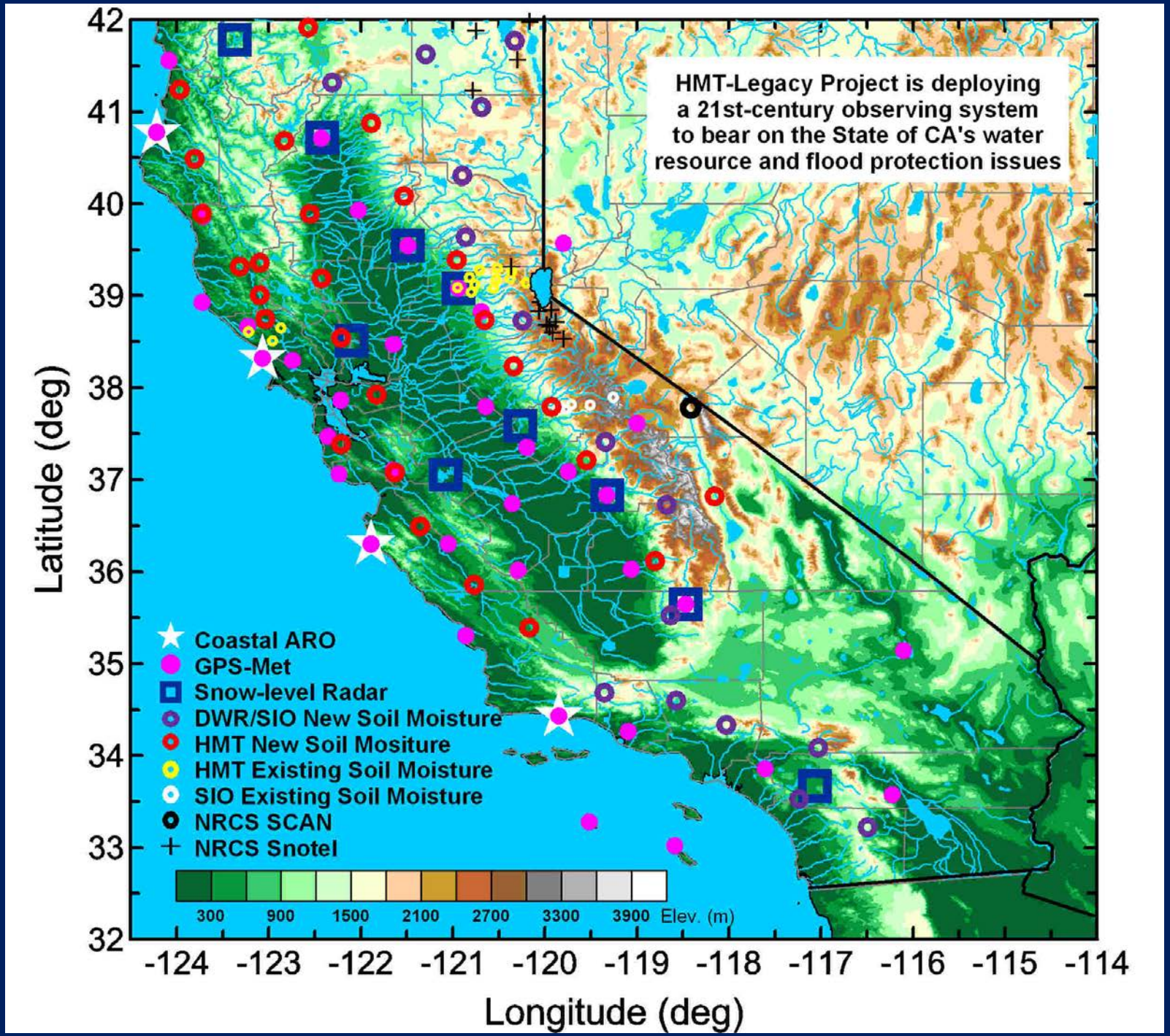


ARE 1:
15.5 inches in 8 days (33% of WY total)

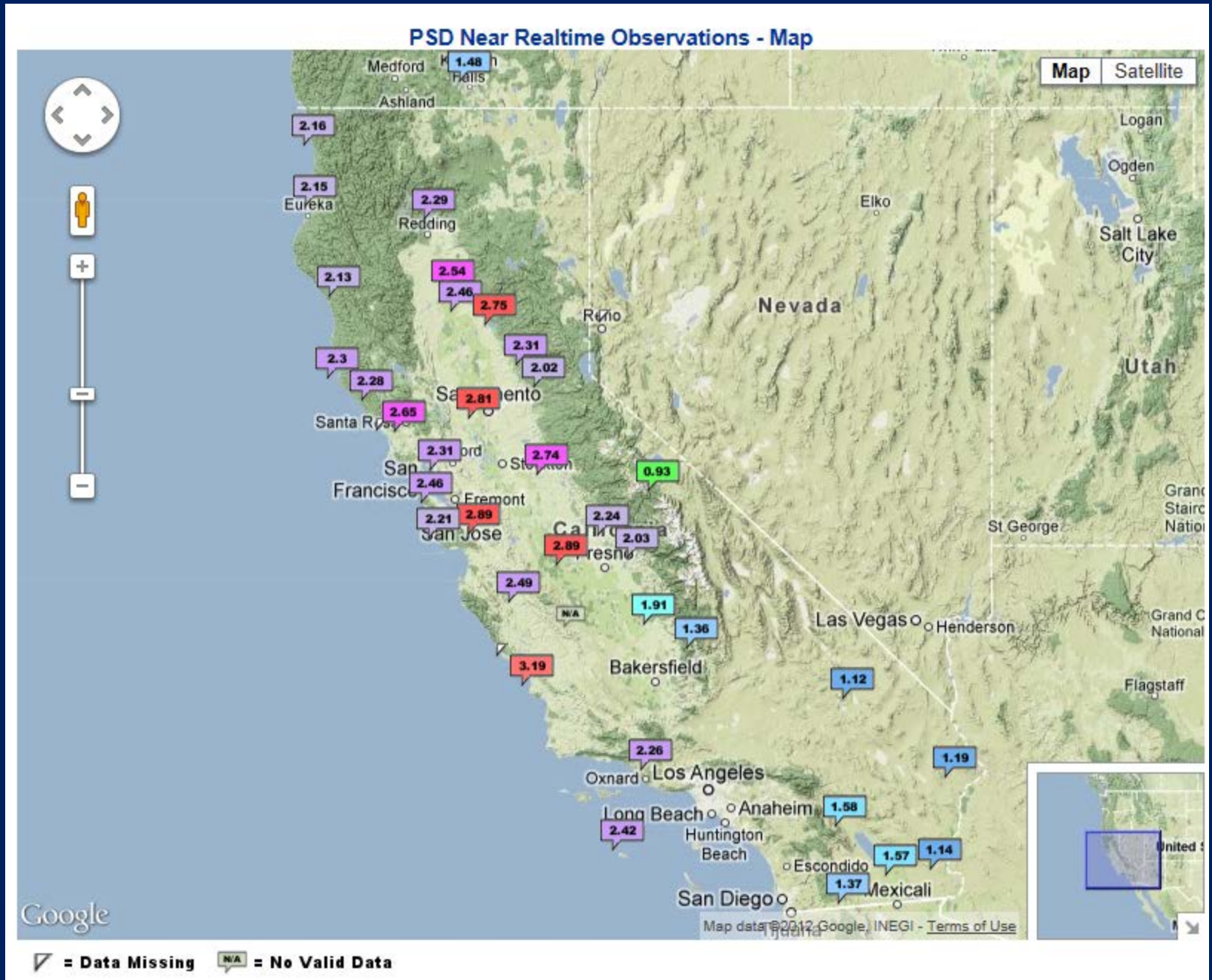
ARE 2:
6 inches SWE in 5 days (32% of WY total)


0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0
24 Hr Observed Total Ending Thu 11/29/2012 04:00 am PST

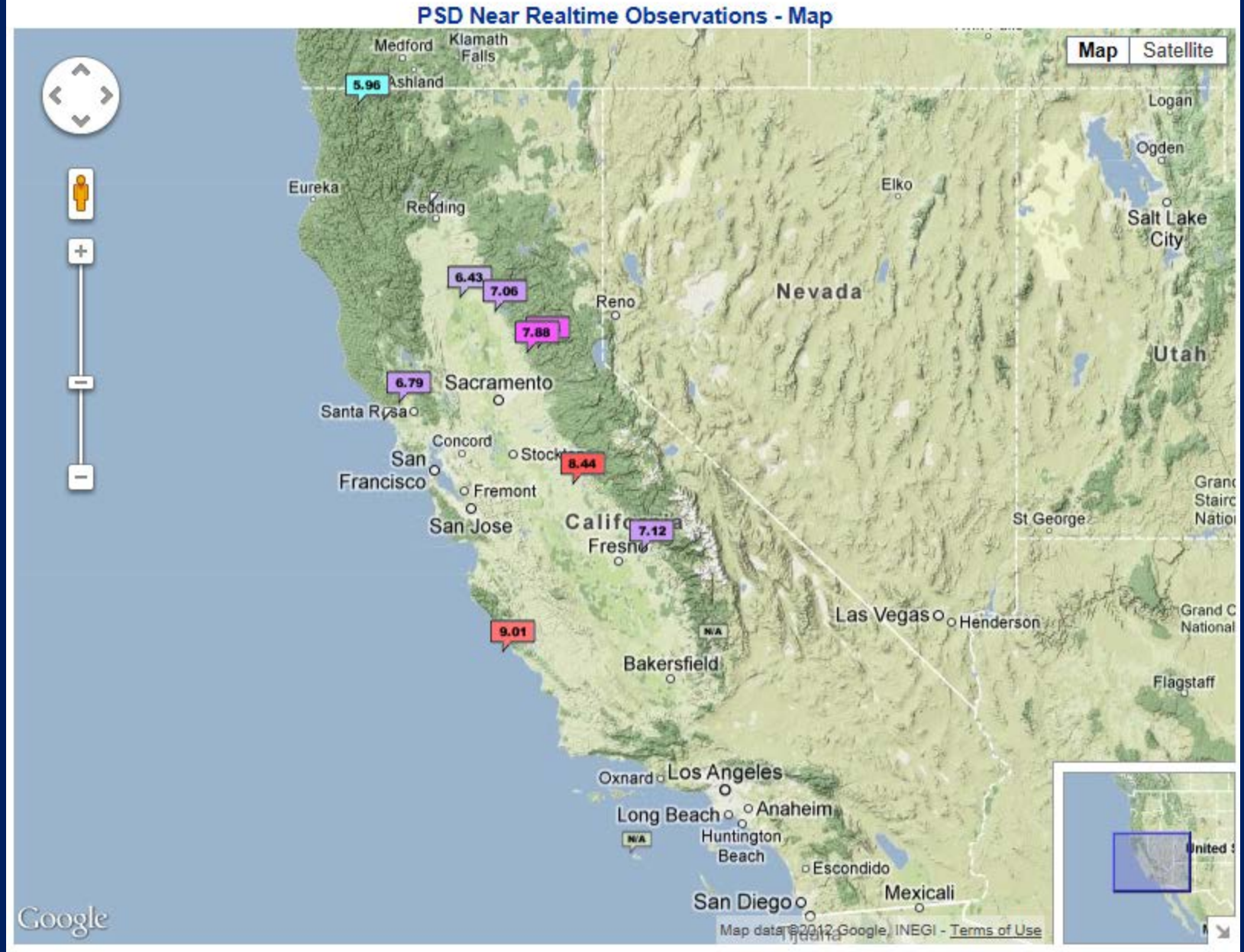

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0
24 Hr Observed Total Ending Fri 11/30/2012 04:00 am PST


HMT-Legacy Project is deploying a 21st-century observing system to bear on the State of CA's water resource and flood protection issues
Coastal ARO
GPS-Met
Snow-level Radar
DWR/SIO New Soil Moisture
HMT New Soil Mositure
HMT Existing Soil Moisture
SIO Existing Soil Moisture
NRCS SCAN
NRCS Snotel
300 900 1500 2100 2700 3300 3900 Elev. (m)
Latitude (deg)
42 41 40 39 38 37 36 35 34 33 32
Longitude (deg)
-124 -123 -122 -121 -120 -119 -118 -117 -116 -115 -114

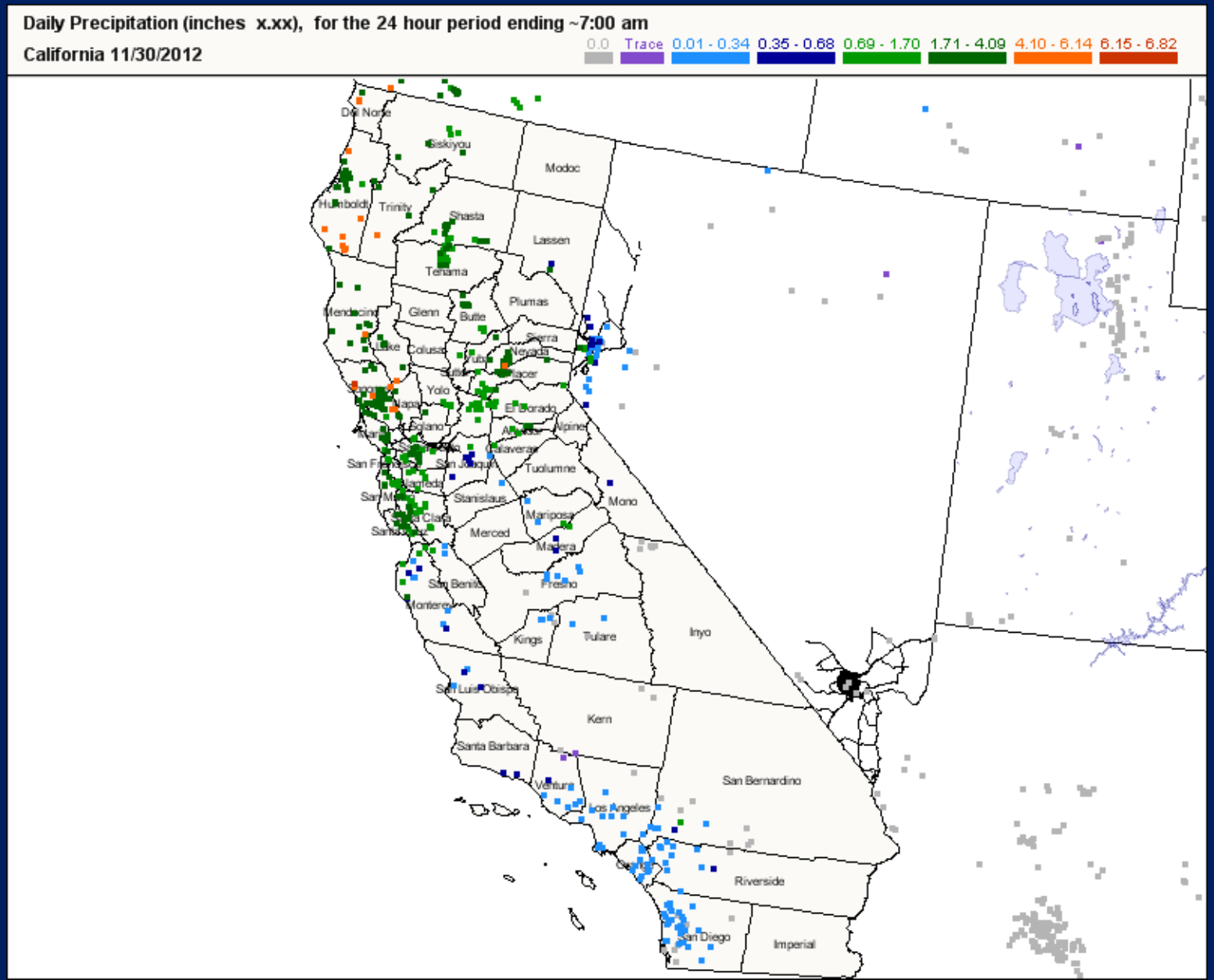
Integrated Water Vapor 11/28/12 12:15 pm



Freezing Elevation 11/28/12 12:15 pm

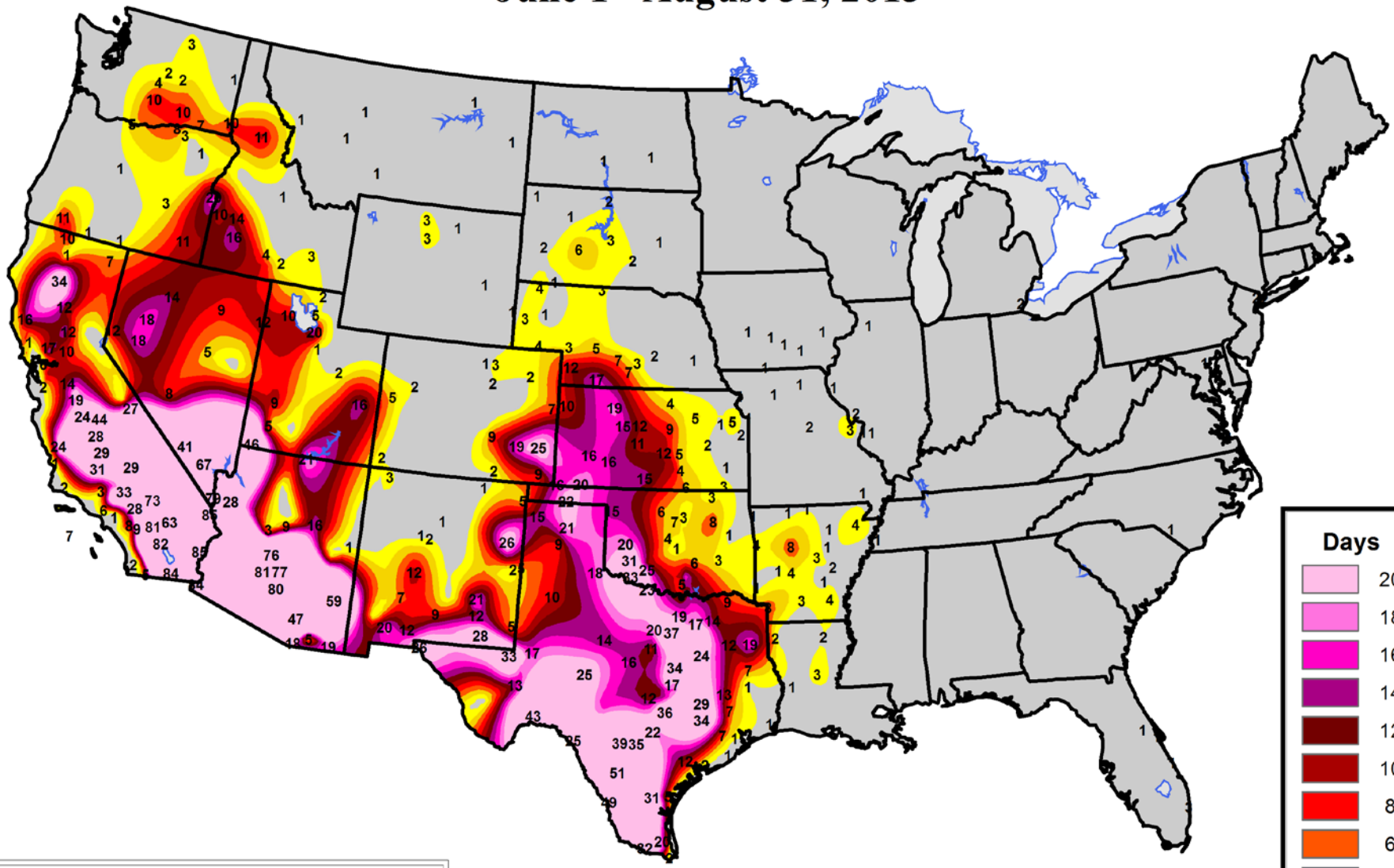


CoCoRaHS


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am
California 11/30/2012
0.0 Trace 0.01 - 0.34 0.35 - 0.68 0.69 - 1.70 1.71 - 4.09 4.10 - 6.14 6.15 - 6.82
Del Norte
Siskiyou
Modoc
Humboldt
Trinity
Shasta
Lassen
Tehama
Plumas
Mendocino
Glenn
Butte
Sierra
Nevada
Lake
Colusa
Yuba
Placer
Yolo
Napa
El Dorado
Solano
Alpine
Calaveras
San Francisco
San Joaquin
Tuolumne
Marin
Stanislaus
Mono
Santa Clara
Mariposa
Merced
Madera
San Benito
Fresno
Monterey
Kings
Tulare
Inyo
San Luis Obispo
Kern
Santa Barbara
San Bernardino
Ventura
Los Angeles
Orange
Riverside
San Diego
Imperial

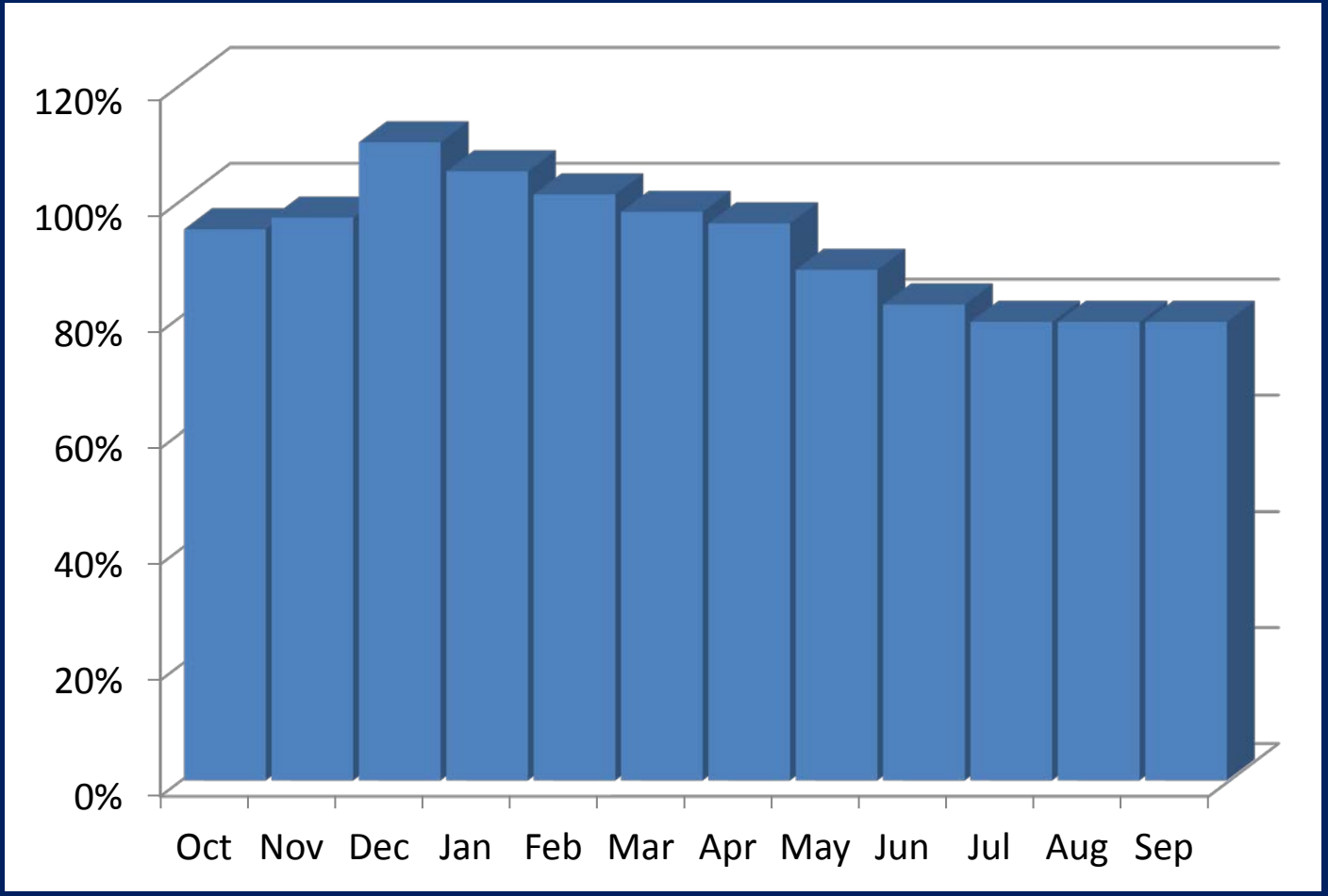
Number of Days >= 100°F

June 1 - August 31, 2013



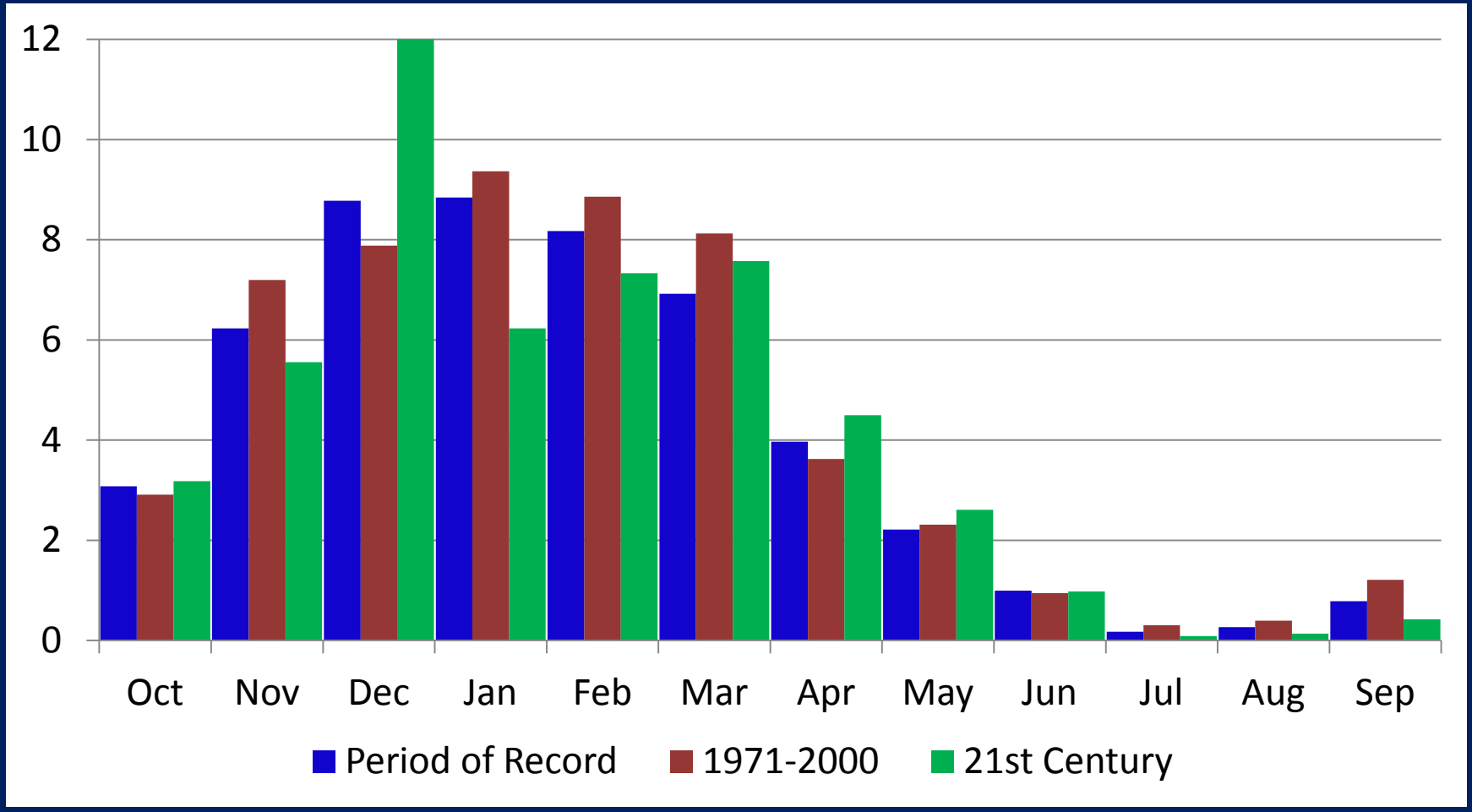
USDA Agricultural Weather Assessments
World Agricultural Outlook Board

Percent of Average Reservoir Storage

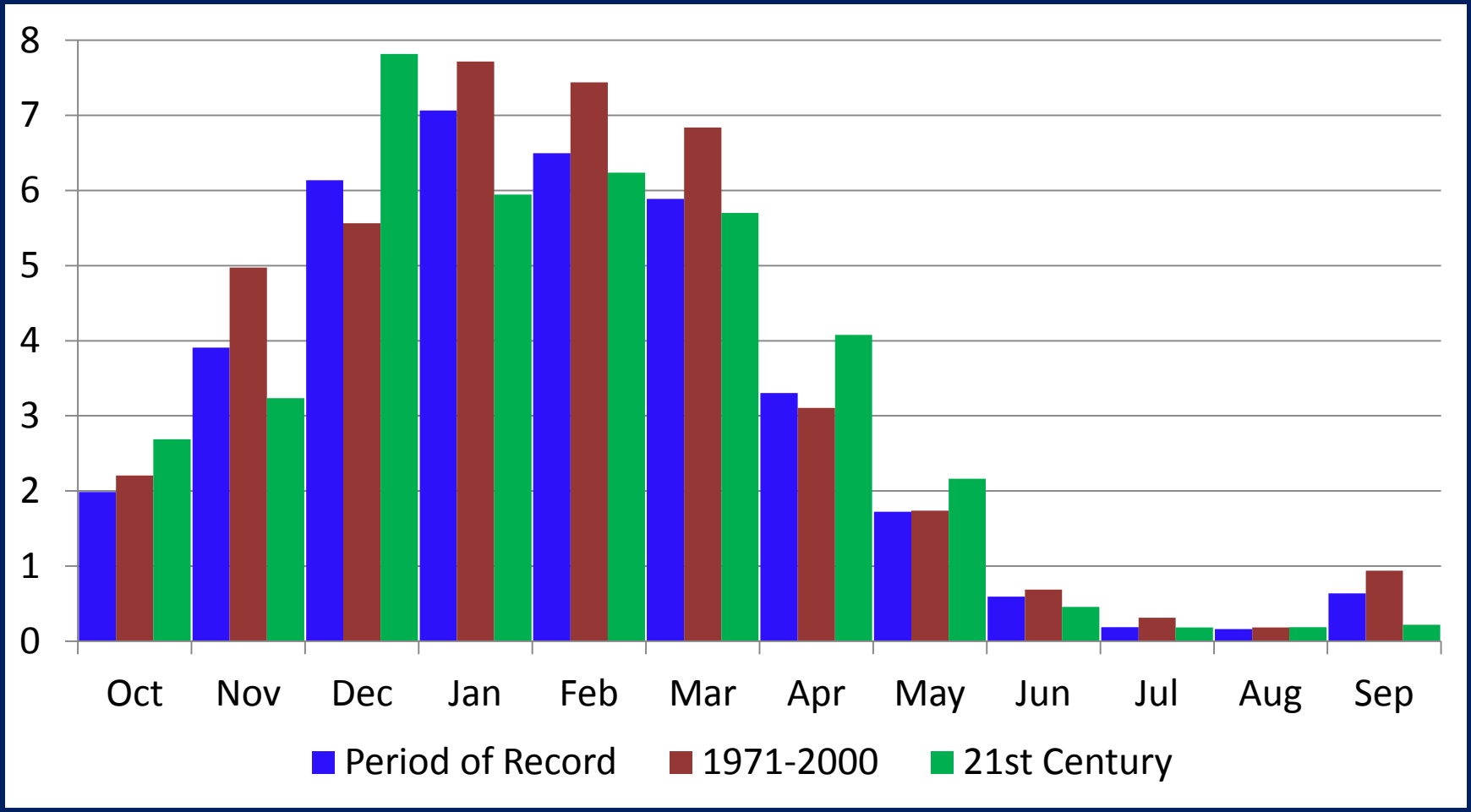


Variability

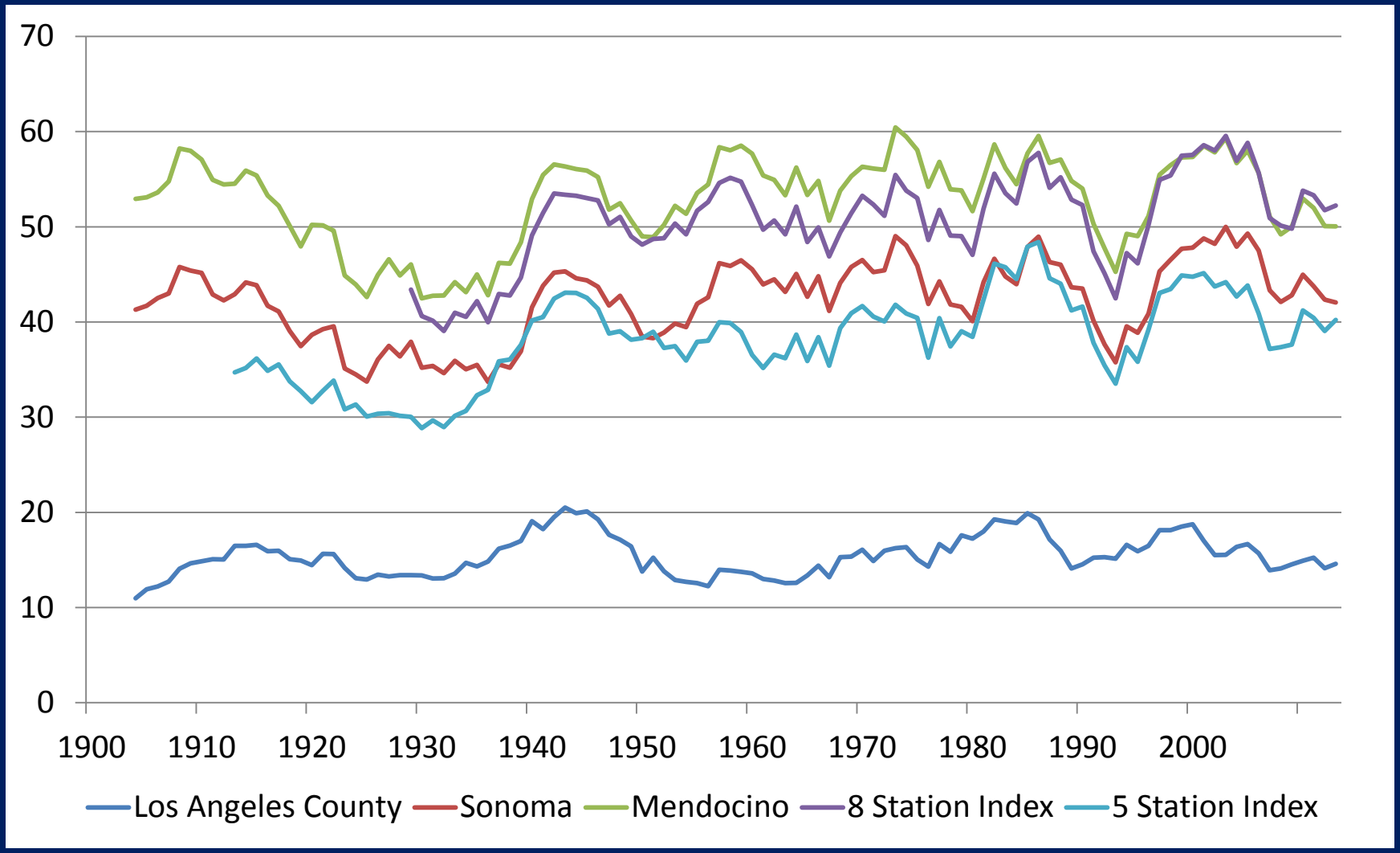
8-Station Index WY Precipitation



5-Station Index WY Precipitation



Decadal Scale Variability

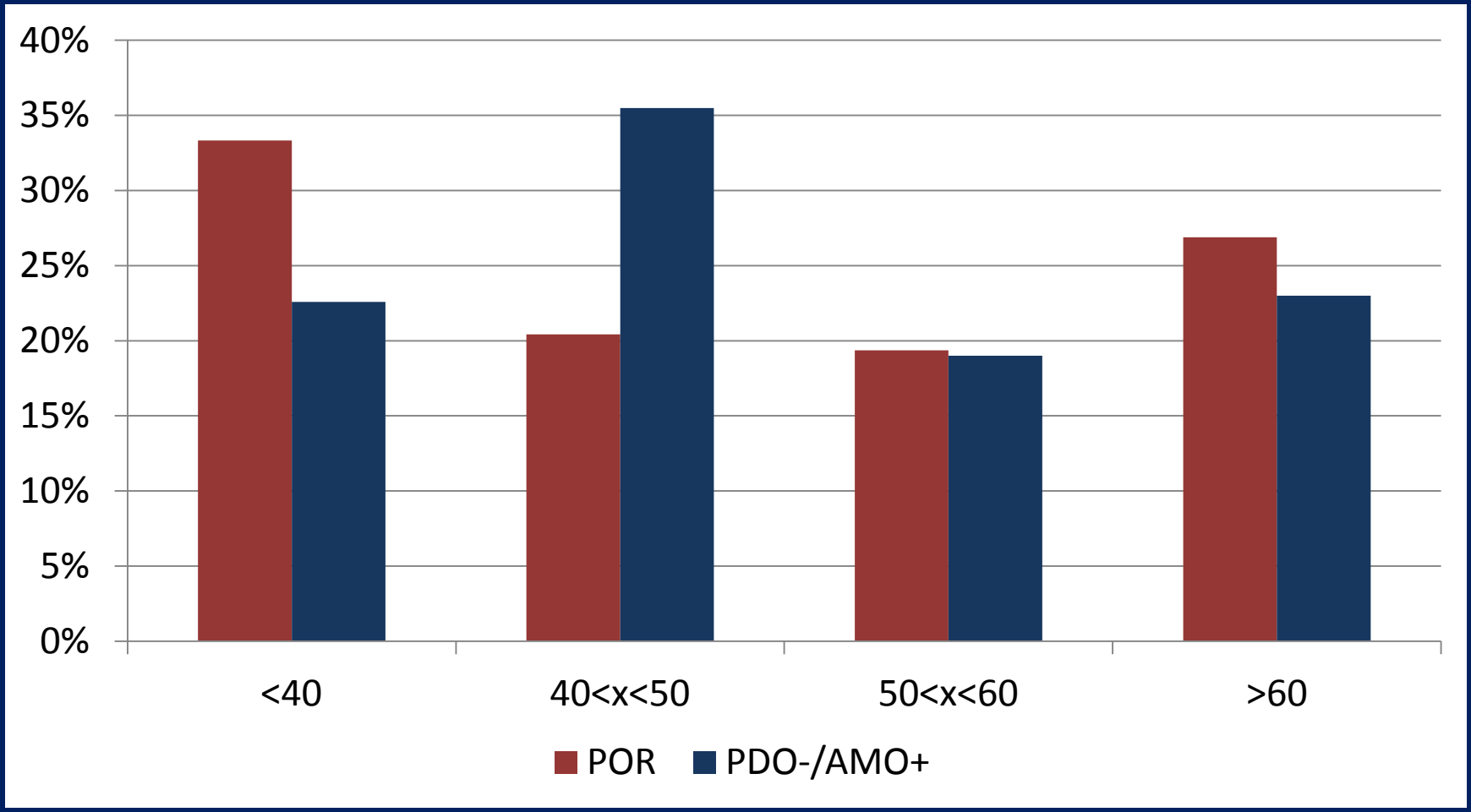


Current Conditions

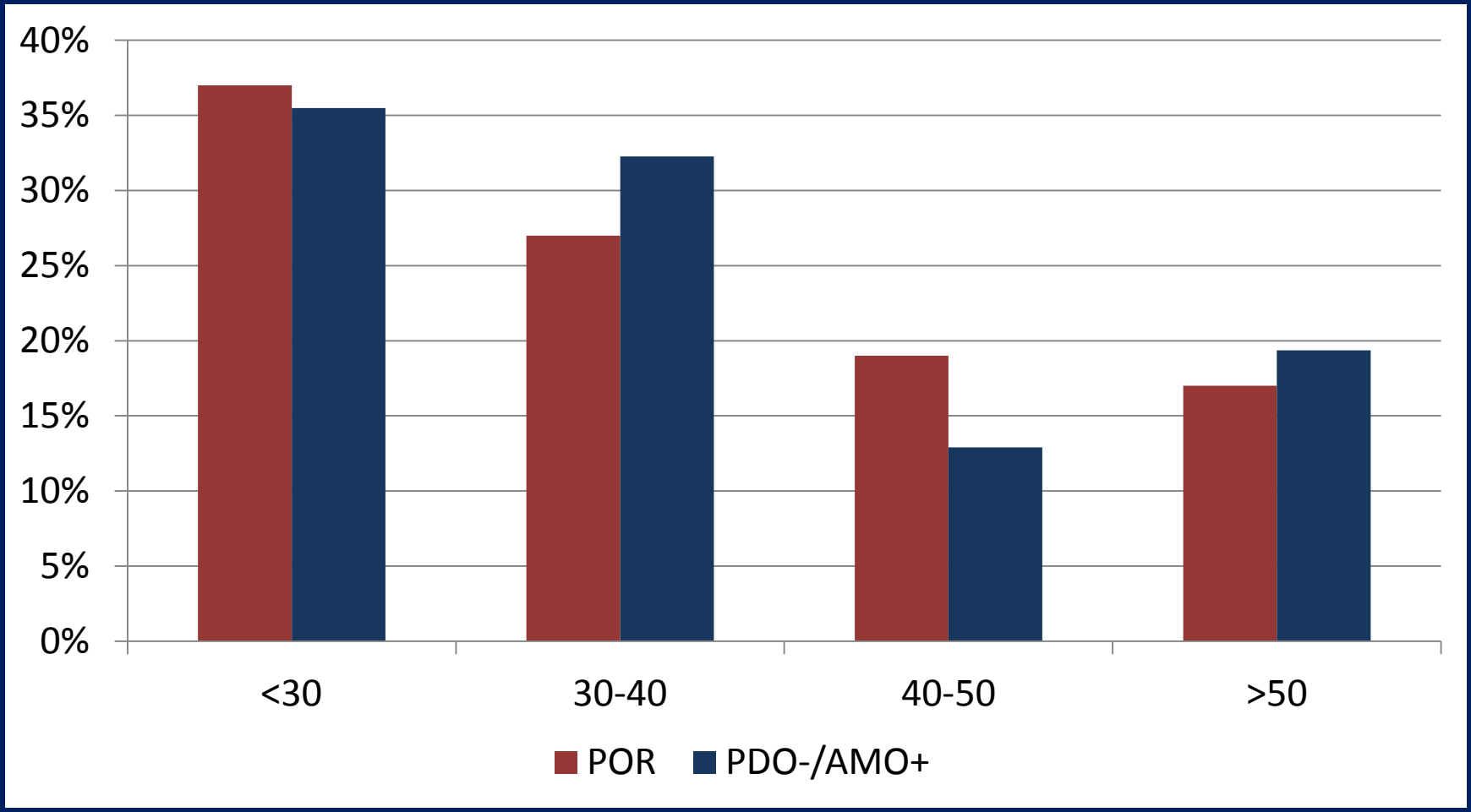
Current Climate Signals

- Pacific Decadal Oscillation in Cold Phase
- Atlantic Multi-Decadal Oscillation in Warm Phase
- El Nino/Southern Oscillation Neutral (Cold Bias)
- North Atlantic Oscillation Negative
- Arctic Oscillation Negative for 7 of last 11 Months
- Madden Julian Oscillation Active Over Past Year

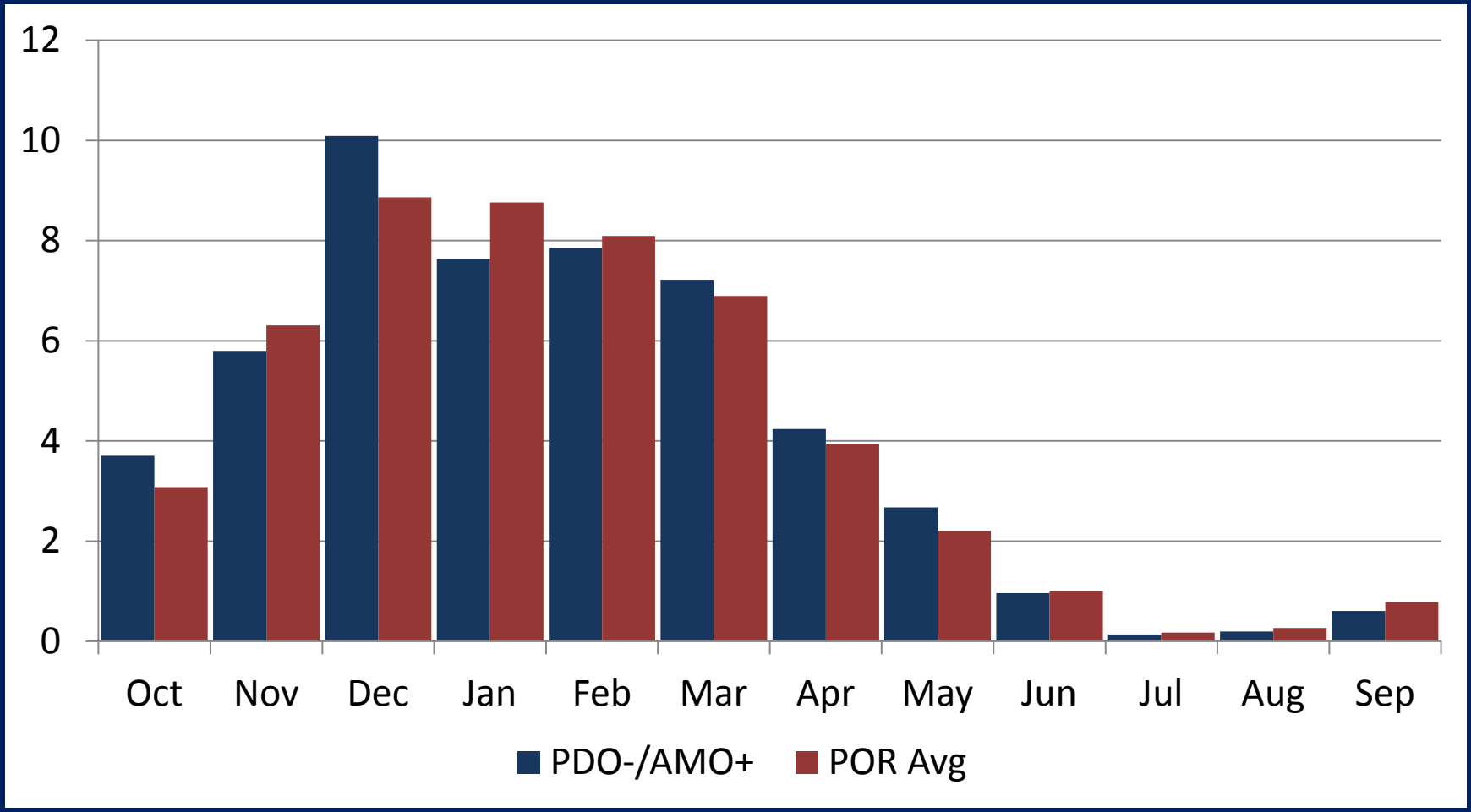
8 Station Index WY Relative Frequency



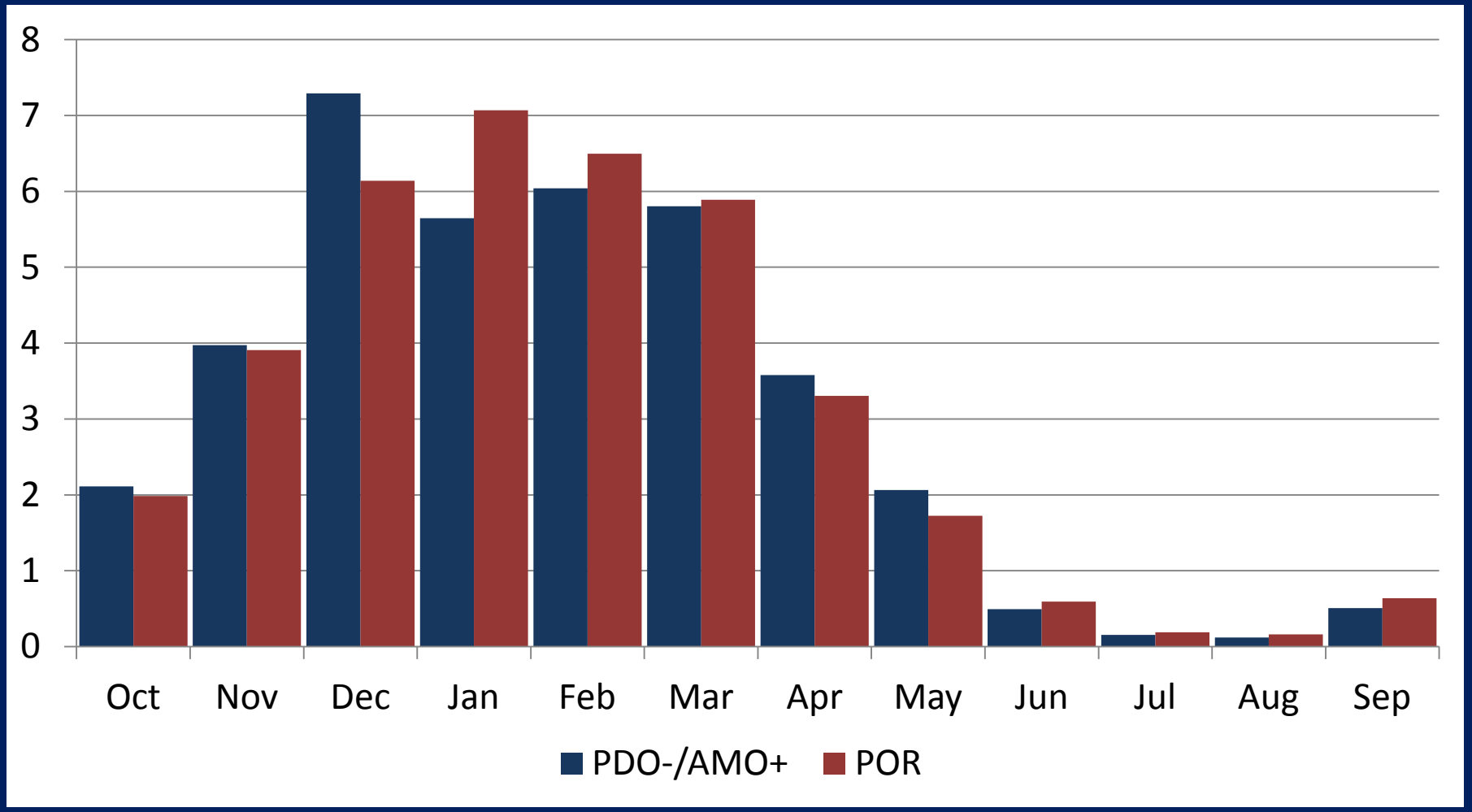
5 Station Index WY Relative Frequency



8-Station Monthly Distributions

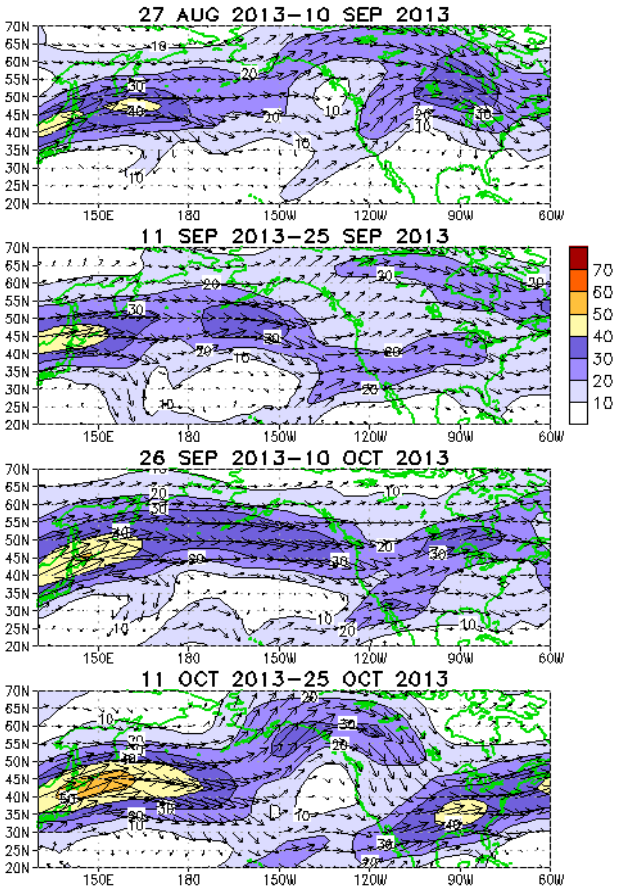


5-Station Monthly Distributions

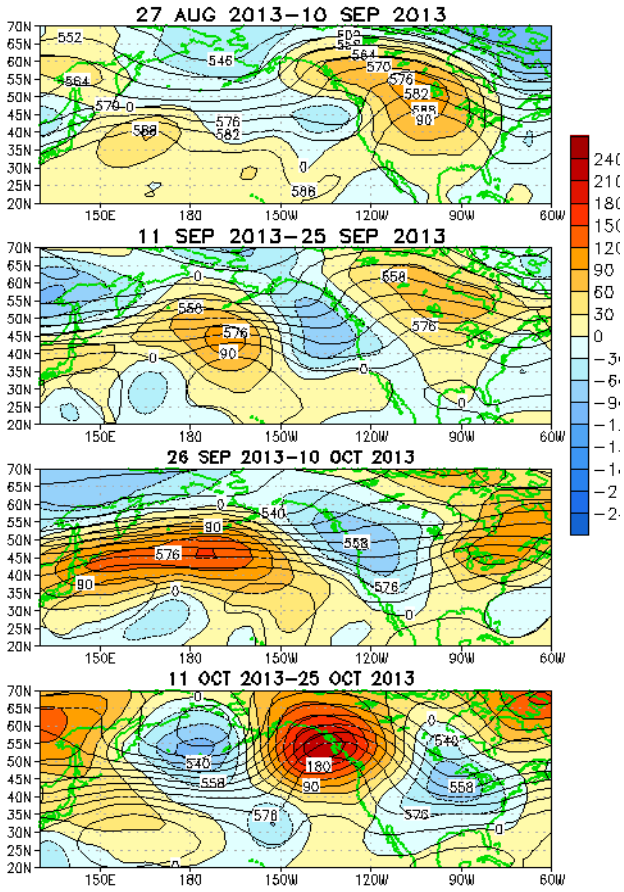


Atmospheric Circulation over the North Pacific & North America During the Last 60 Days

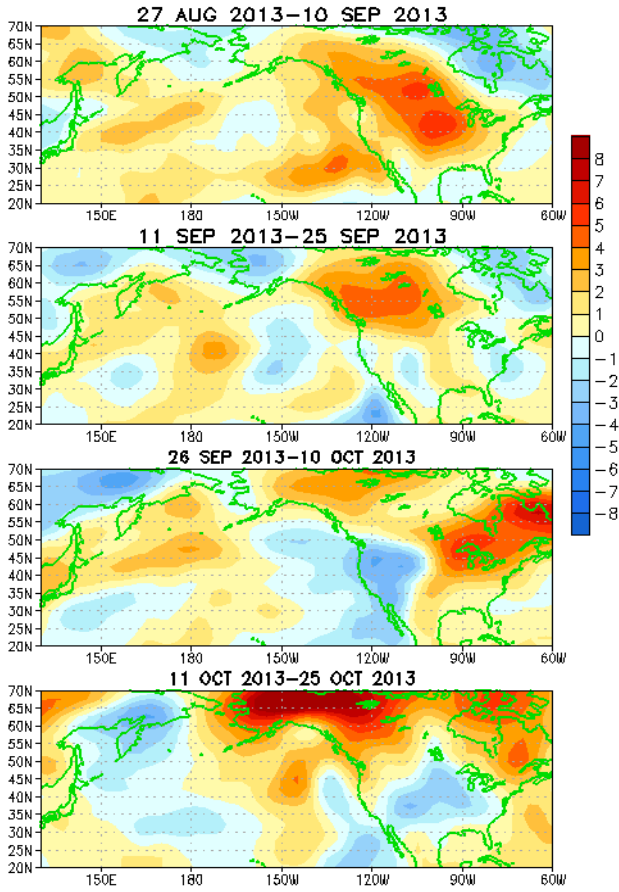
200-hPa Wind



500-hPa Height & Anoms.



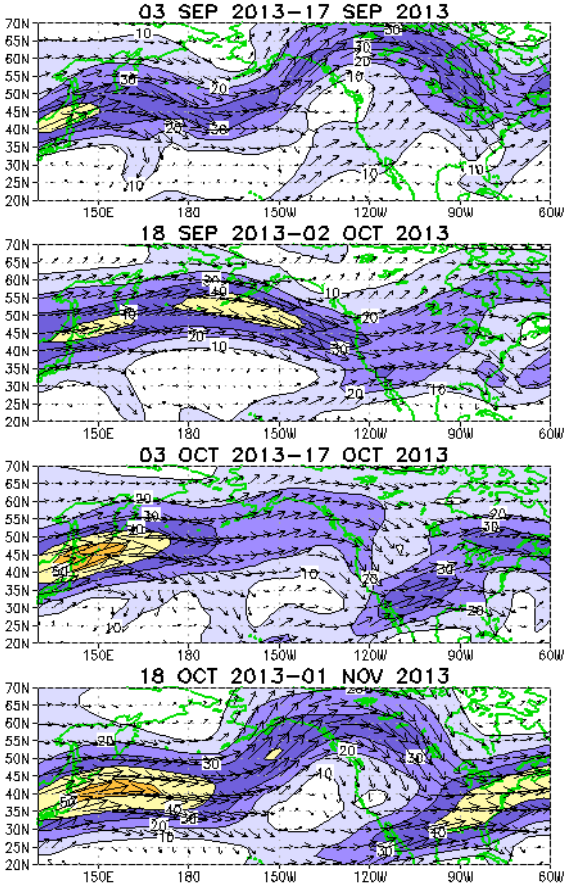
925-hPa Temp. Anoms. (°C)



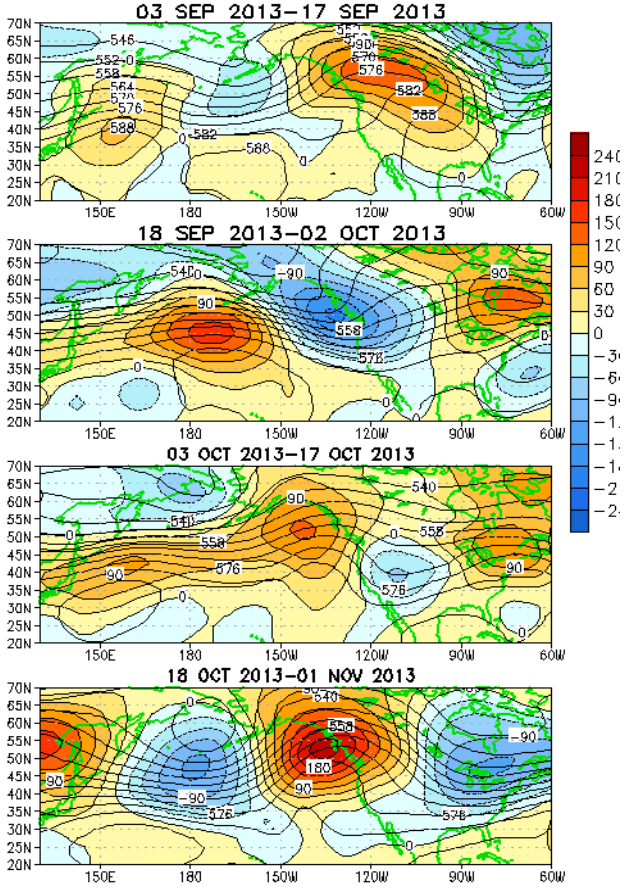
During late August through mid-September, anomalous ridging and above-average temperatures prevailed over much of North America. During late September through mid-October, an anomalous ridge and above-average temperatures dominated eastern North America, while an anomalous trough and below-average temperatures affected portions of the western U.S. Recently, an anomalous trough and below-average temperatures affected the central U.S., and strong ridging and above-average temperatures prevailed over Alaska and northwestern Canada.

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

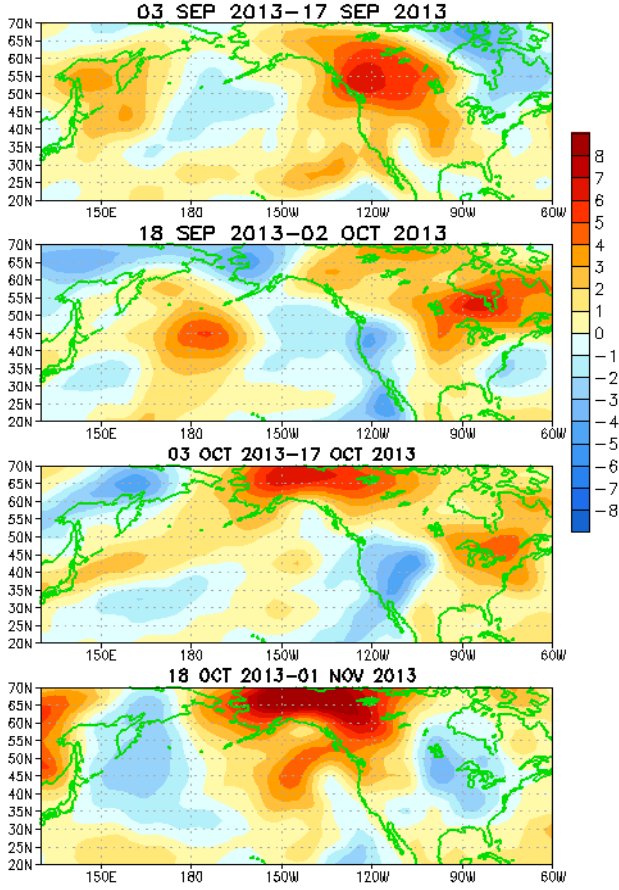
200-hPa Wind



500-hPa Height & Anoms.



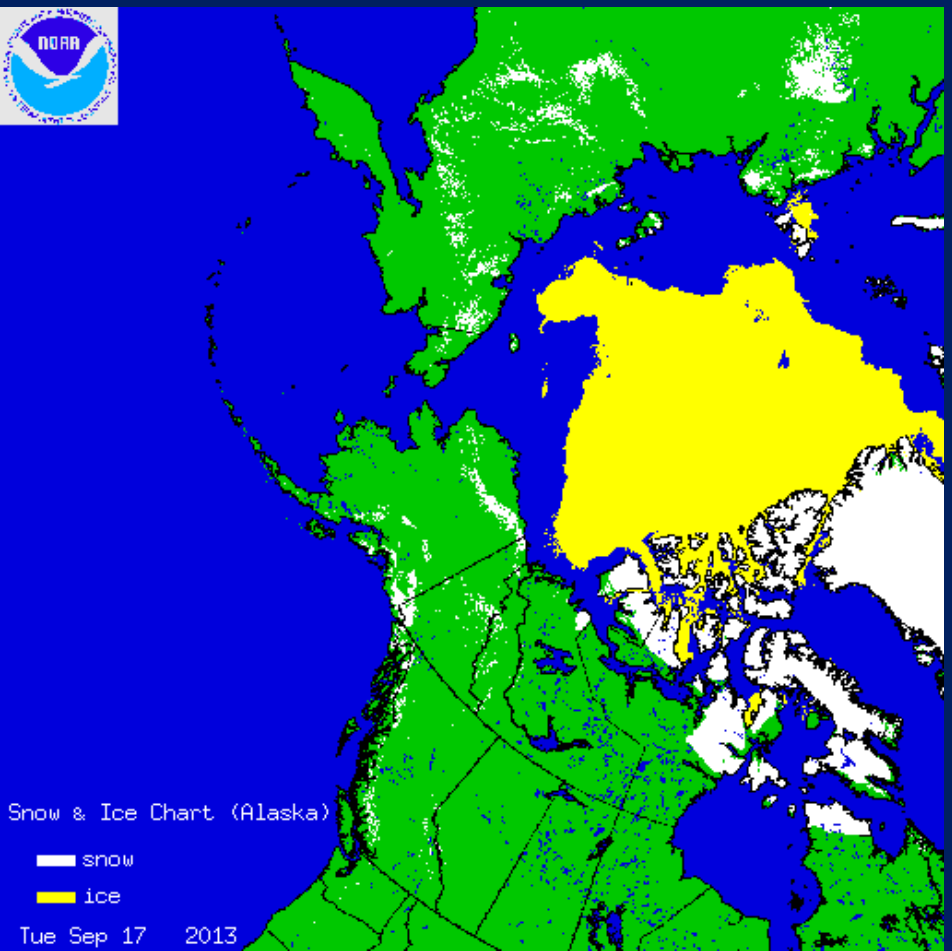
925-hPa Temp. Anoms. (°C)



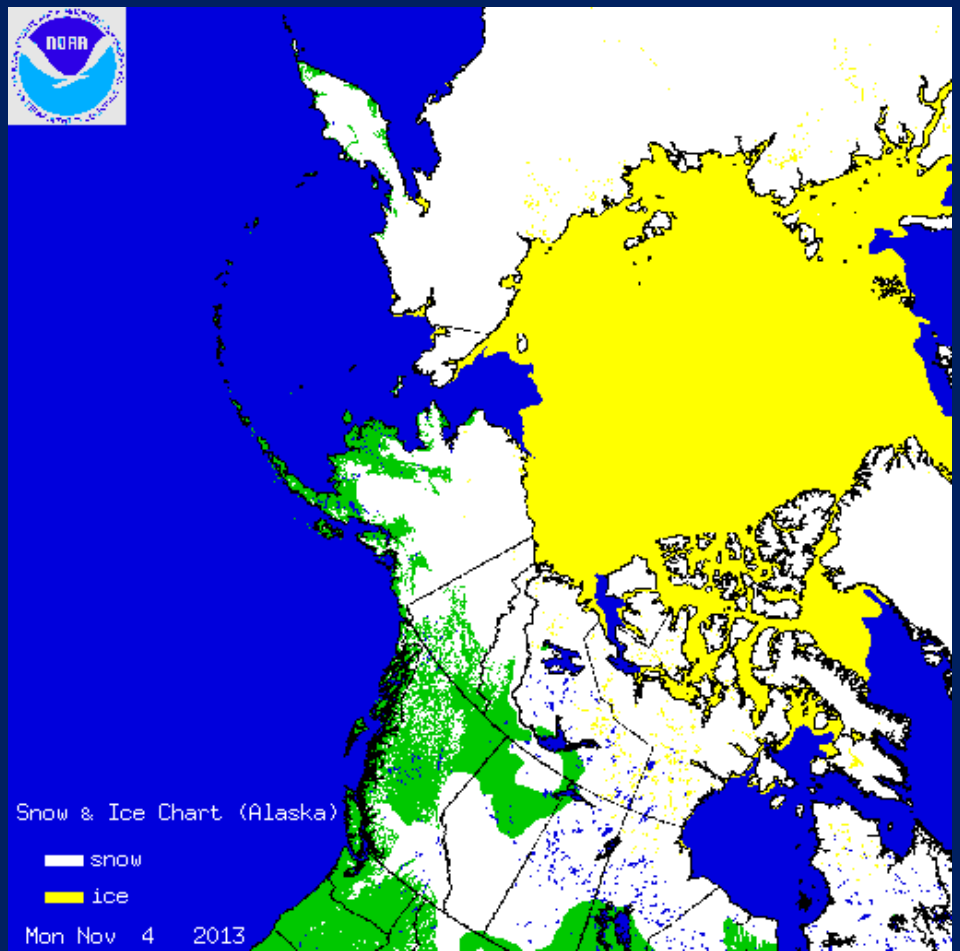
During the first half of September, anomalous ridging and above-average temperatures prevailed over much of North America. During late September through mid-October, an anomalous ridge and above-average temperatures dominated eastern North America and Alaska, while an anomalous trough and below-average temperatures affected portions of the western U.S. Recently, an anomalous trough and below-average temperatures affected central and eastern N. America, and strong ridging and above-average temperatures prevailed over Alaska and northwestern Canada.

North Pole Sea Ice

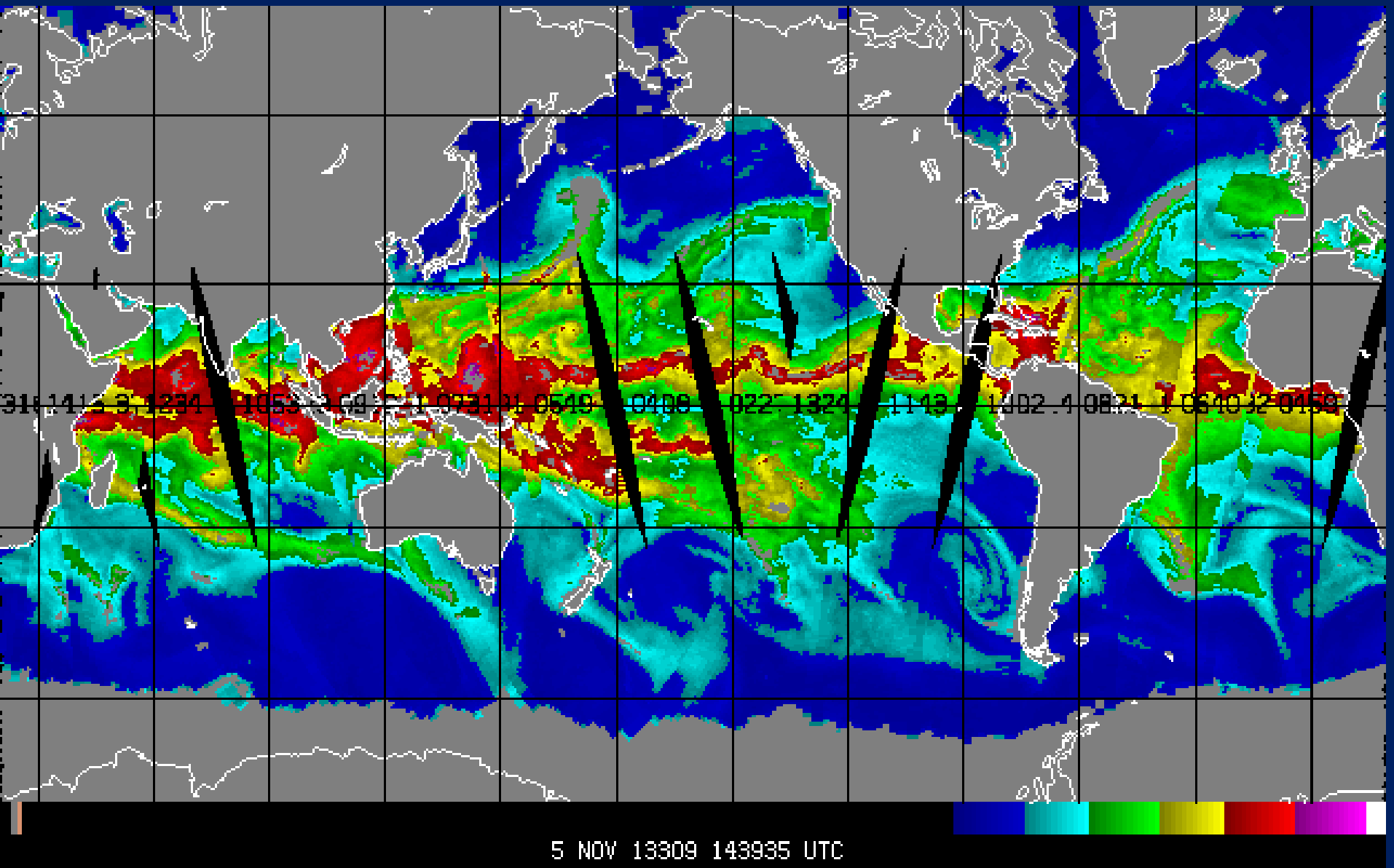
9/17/2013



11/4/2013



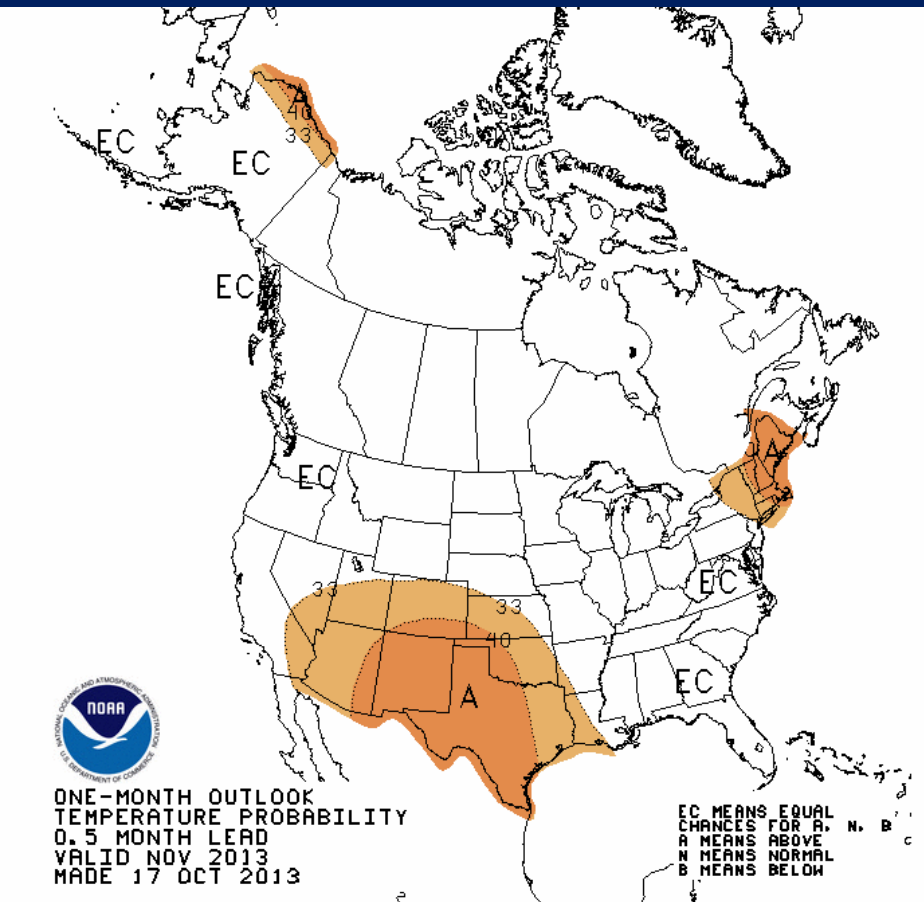
Atmospheric Water Vapor



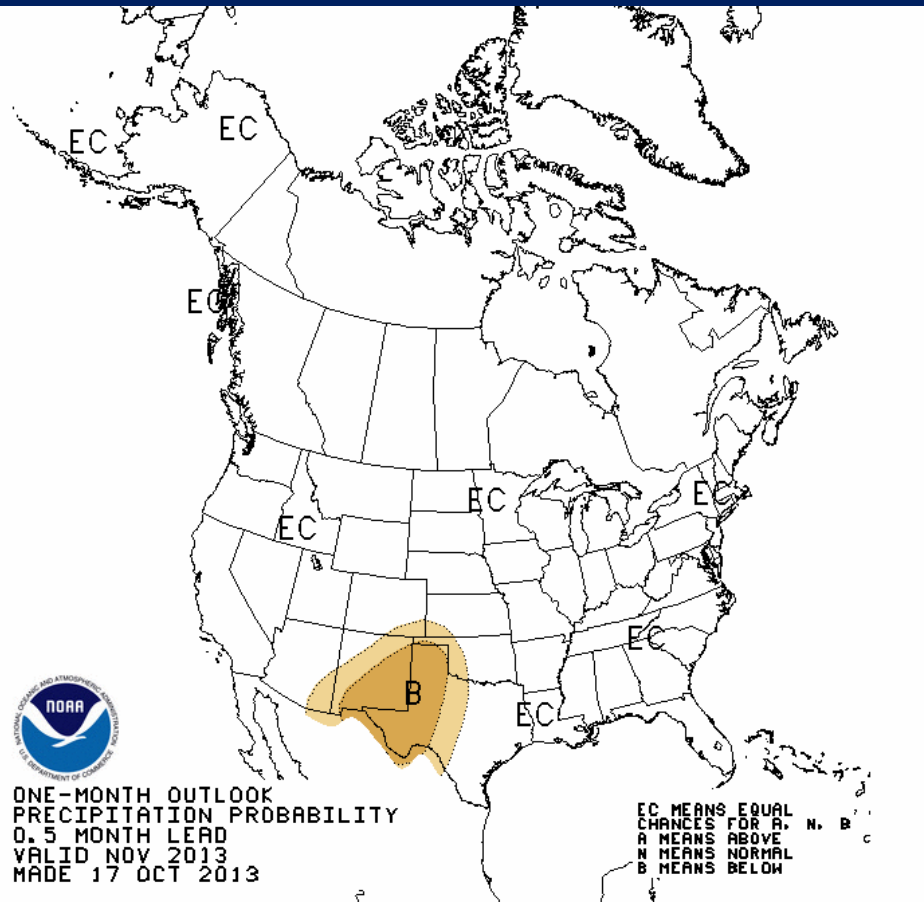

Looking Ahead

U. S. Monthly Outlooks
November 2013

Temperature

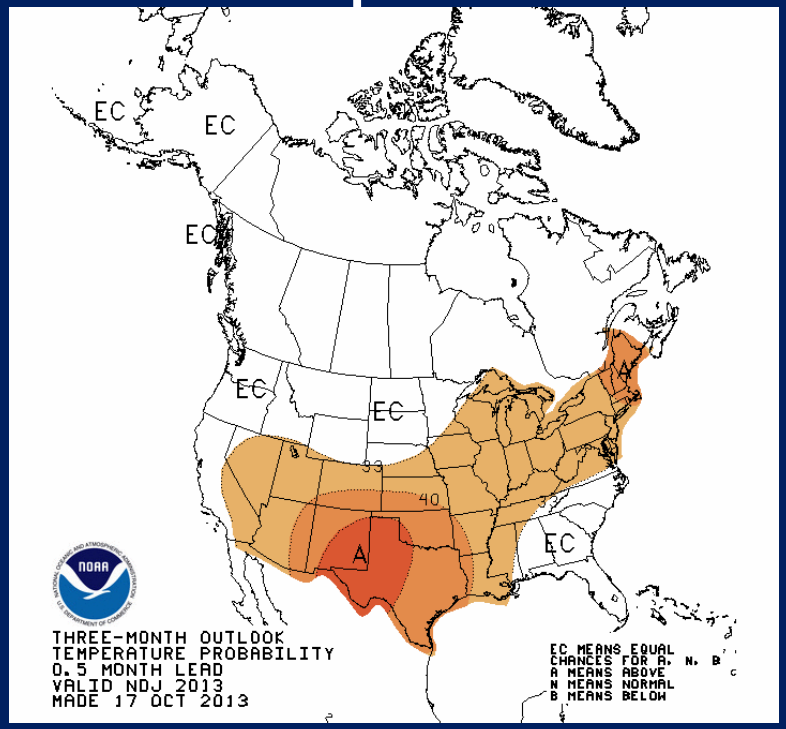


Precipitation

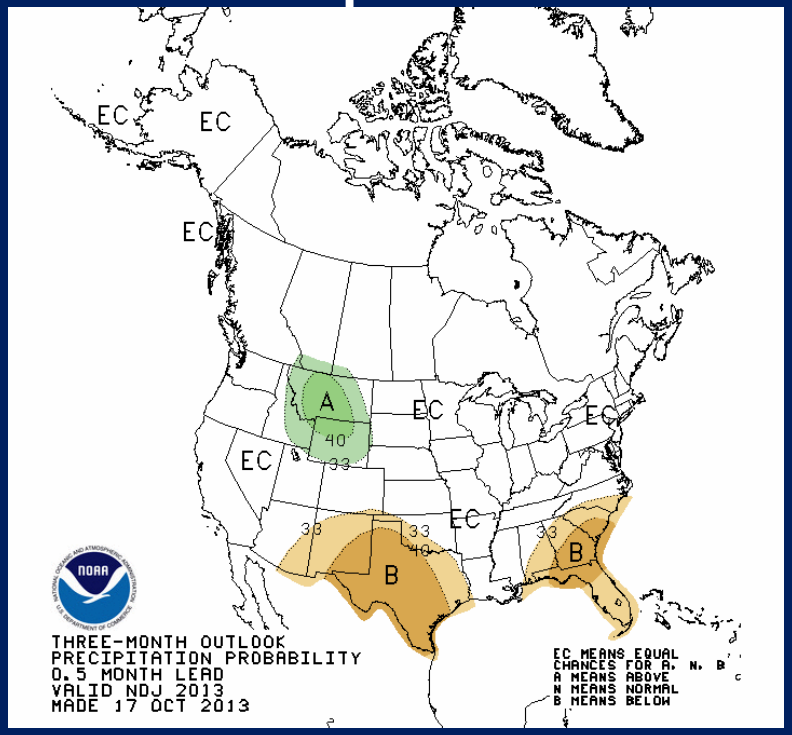


U. S. Seasonal Outlooks
November 2013 - January 2014

Temperature

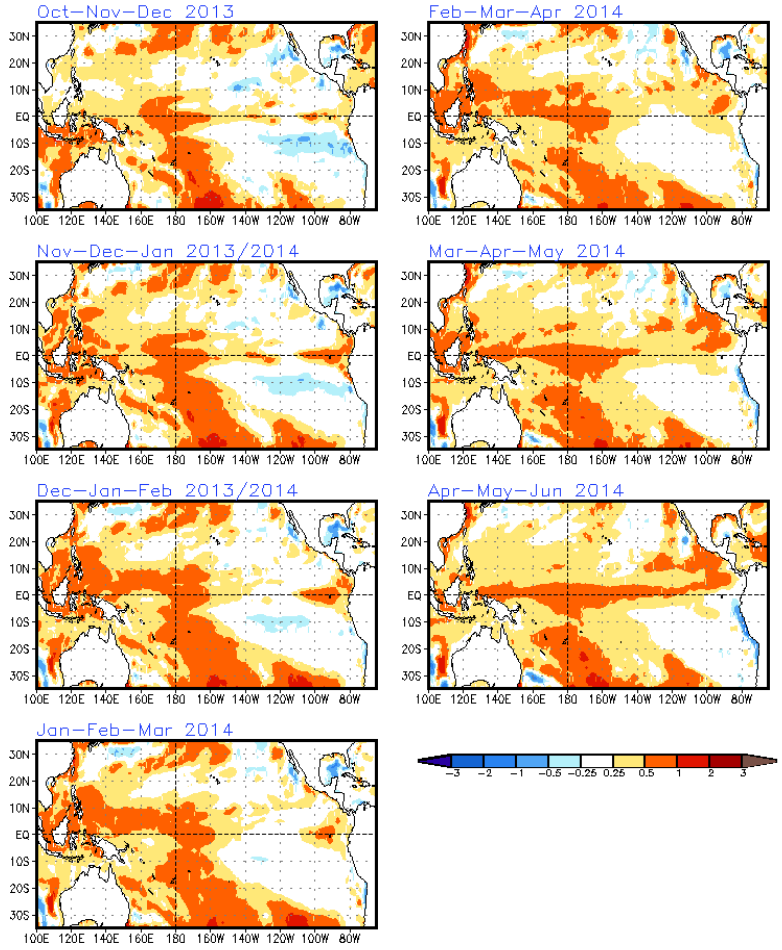


Precipitation



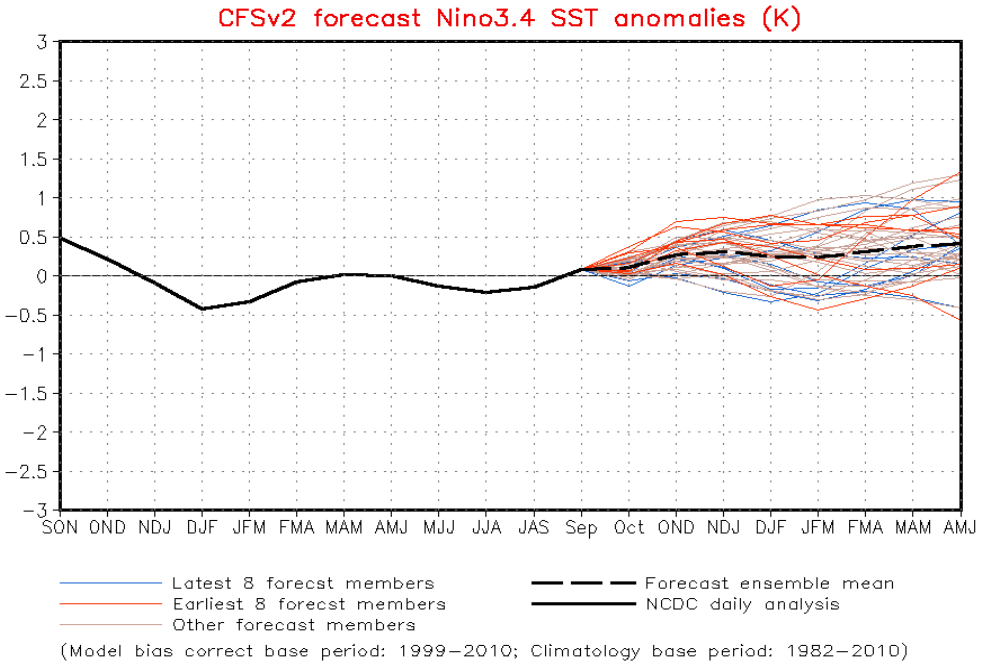
The seasonal outlooks combine the effects of long-term trends, soil moisture, and, when appropriate, ENSO.

SST Outlook: NCEP CFS.v2 Forecast Issued 16 September 2013



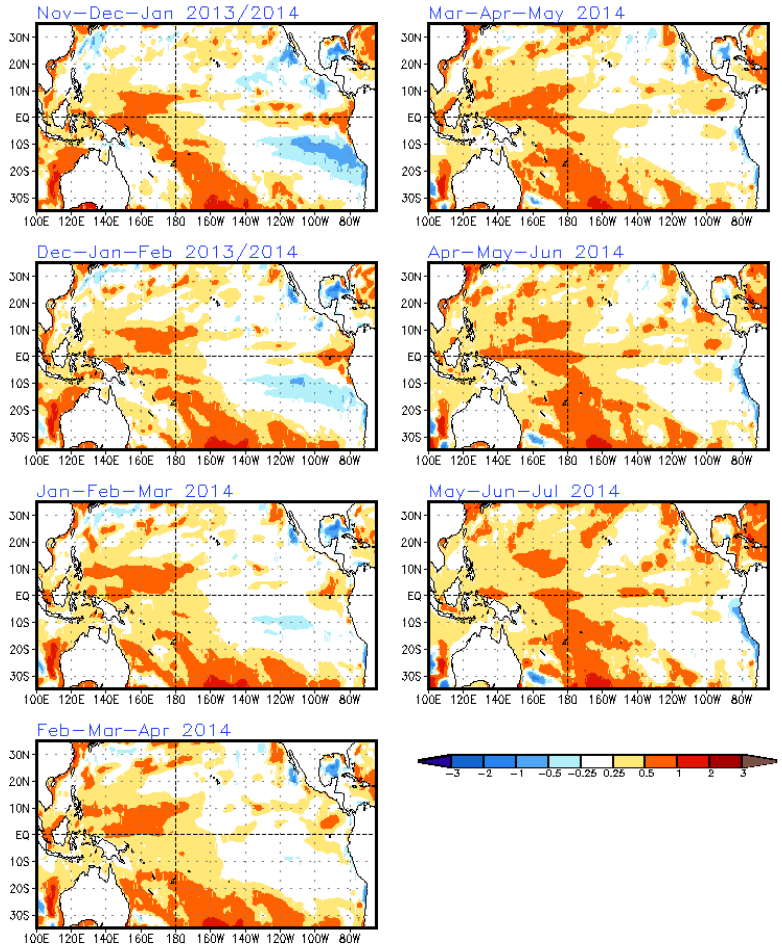
(Model bias correction base period: 1999–2010; Climatology base period: 1982–2010)

The CFS.v2 ensemble mean (black dashed line) predicts ENSO-neutral conditions into early 2014.



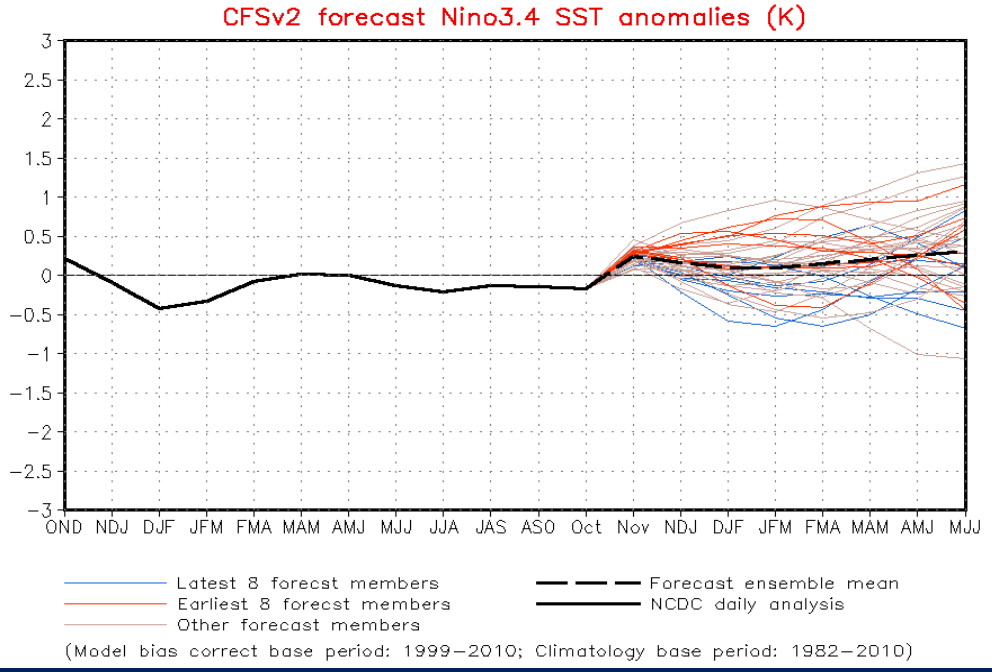
(Model bias correct base period: 1999–2010; Climatology base period: 1982–2010)

SST Outlook: NCEP CFS.v2 Forecast Issued 28 October 2013



(Model bias correction base period: 1999–2010; Climatology base period: 1982–2010)

The CFS.v2 ensemble mean (black dashed line) predicts ENSO-neutral conditions through spring 2014.



(Model bias correct base period: 1999–2010; Climatology base period: 1982–2010)

Reasons for Optimism

- One Significant Atmospheric River Event can make a difference

- Acorns

Reasons for Pessimism

- Persistence
- North American Multimodel Ensemble Forecast Indicates Drier than Average Water Year


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