

The background of the slide is a composite image. The top half shows a satellite view of the Earth, with a prominent green lake in the upper right quadrant. The bottom half shows a weather map of the United States, with the western and central regions highlighted in shades of orange and red, indicating a specific weather pattern or forecast. The text is overlaid on these images.

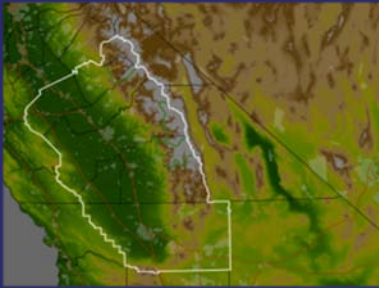
Recapping the 2015-16 El Niño Event

&

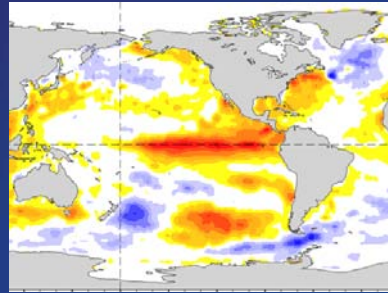
Examining the 2016-17 Winter Outlook



National Weather Service
Hanford, California



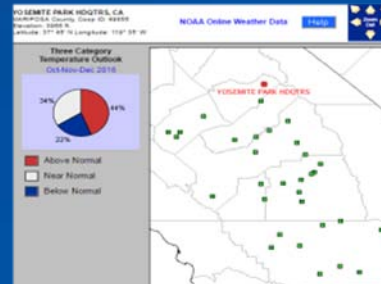
Introduction



El Niño 2015-16



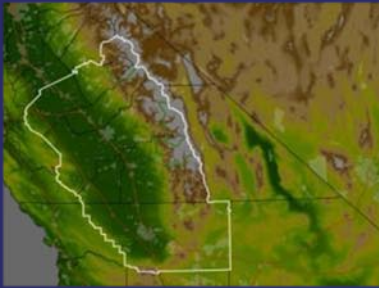
Winter 2016-17



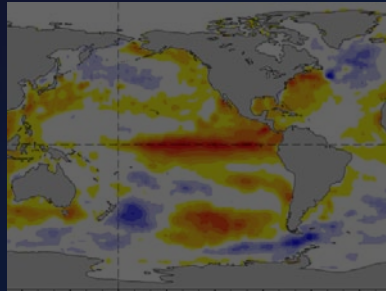
Resources



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Hanford, California



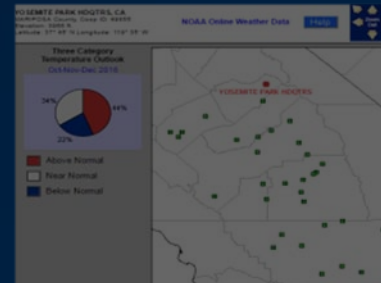
Introduction



El Niño 2015-16



Winter 2016-17



Resources



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Hanford, California

Area of Responsibility

8 Counties

3 National Parks

2.8 Million Residents

Valley, Mountains, Desert

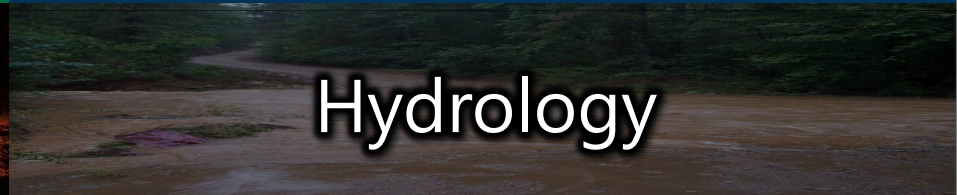
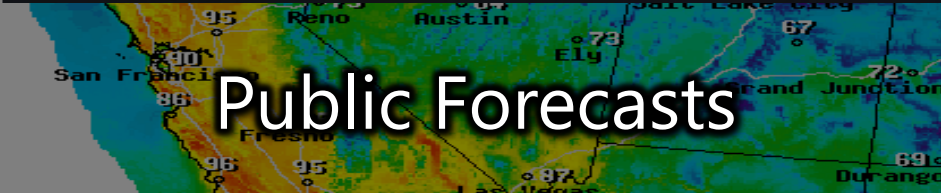
~14,400 ft Elevation Spread



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Hanford, California



Office Programs/Responsibilities

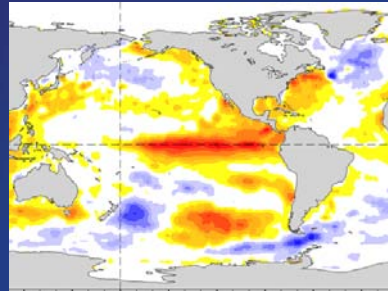


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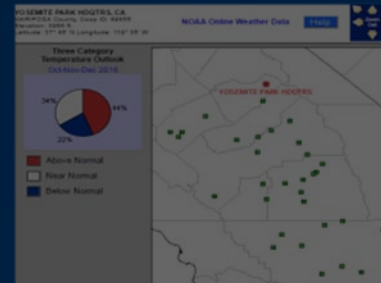
Introduction



El Niño 2015-16



Winter 2016-17



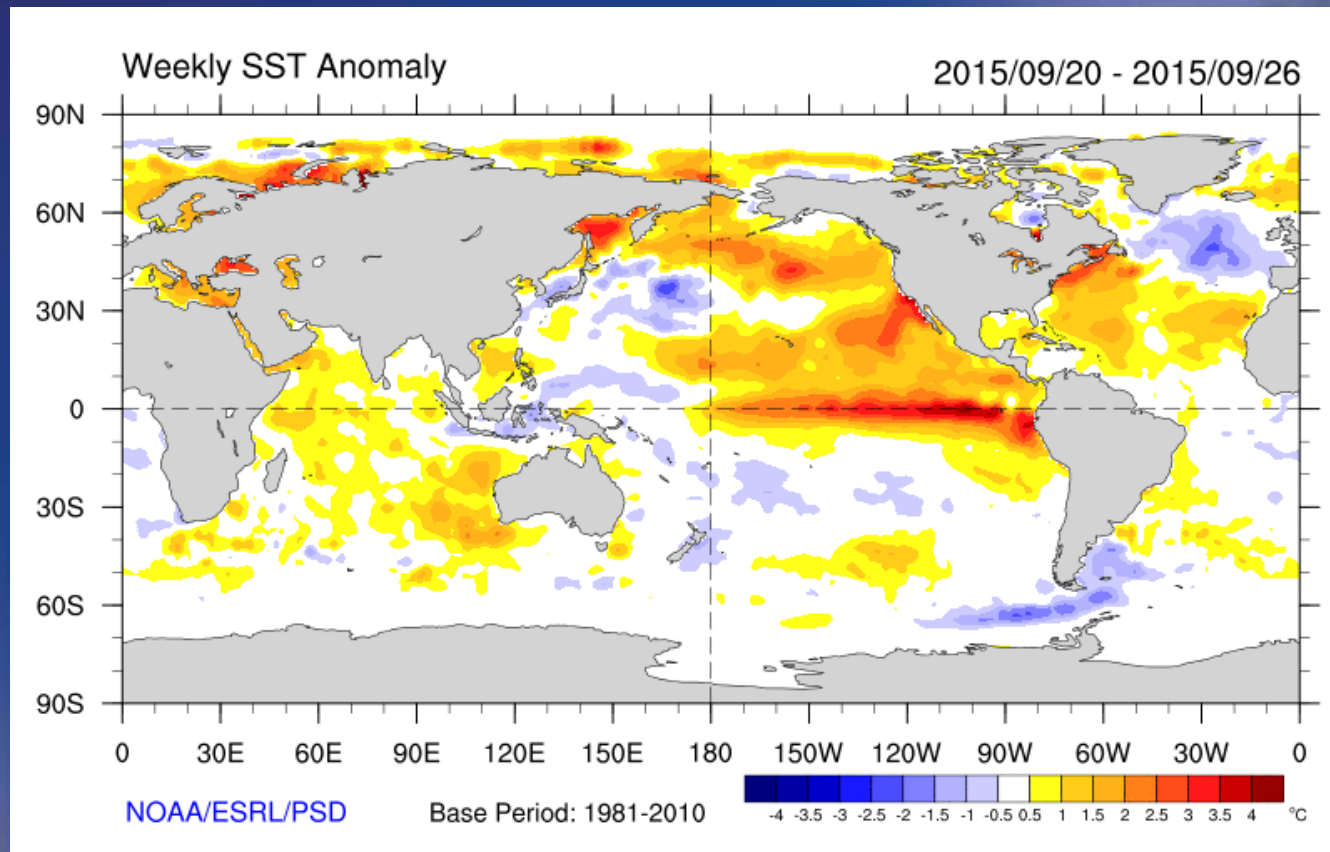
Resources



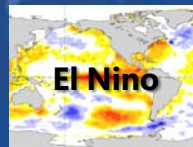
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What is El Niño?

Above average sea surface temperature anomalies in the Equatorial Pacific Ocean.



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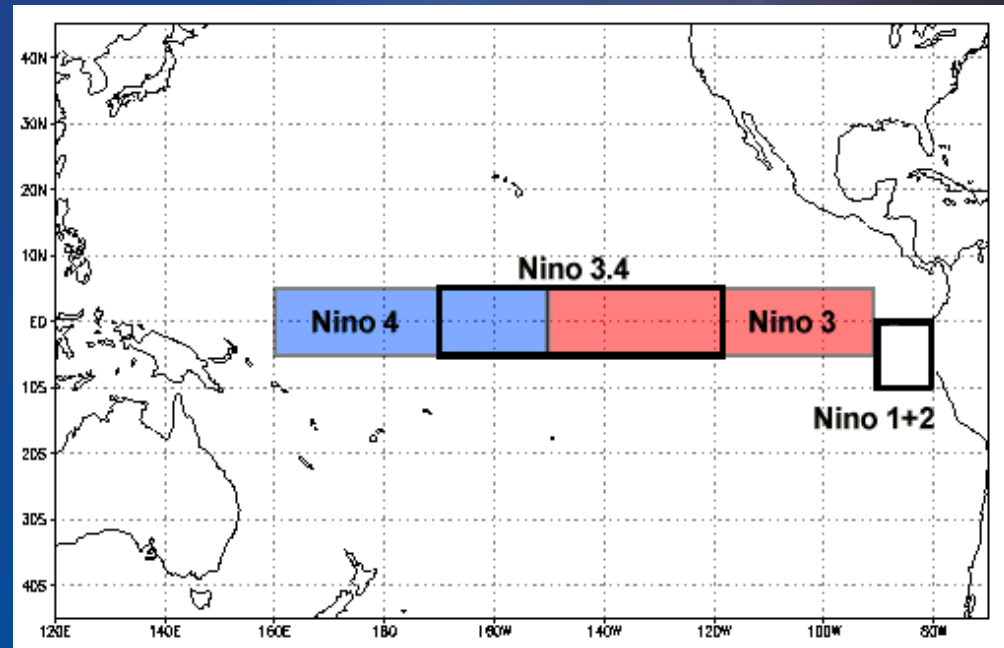


How do we quantify/measure El Niño?

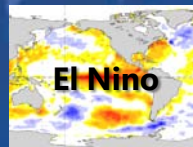
We calculate the 3-month mean SST anomalies in the Niño 3.4 region. Value is commonly referred to as the Oceanic Niño Index (ONI).

El Niño is present if the 3-month mean exceeds $+0.5^{\circ}\text{C}$ for 5 consecutive months.

La Niña is present if the 3-month mean exceeds -0.5°C for 5 consecutive months.

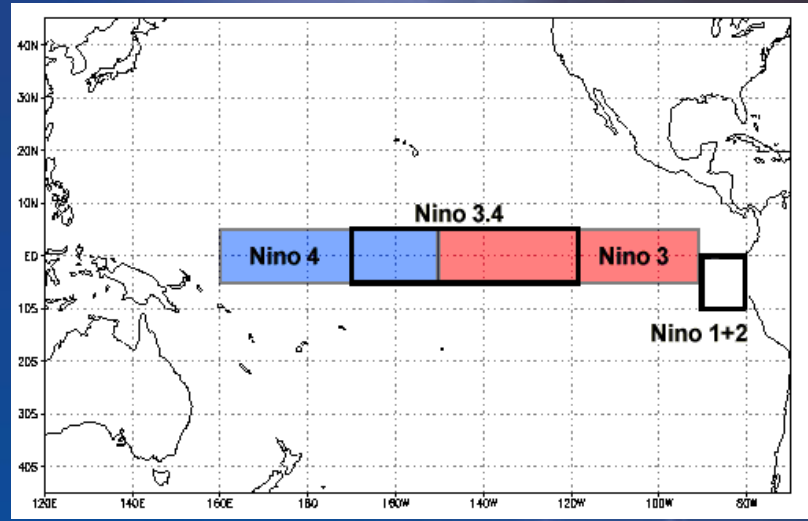
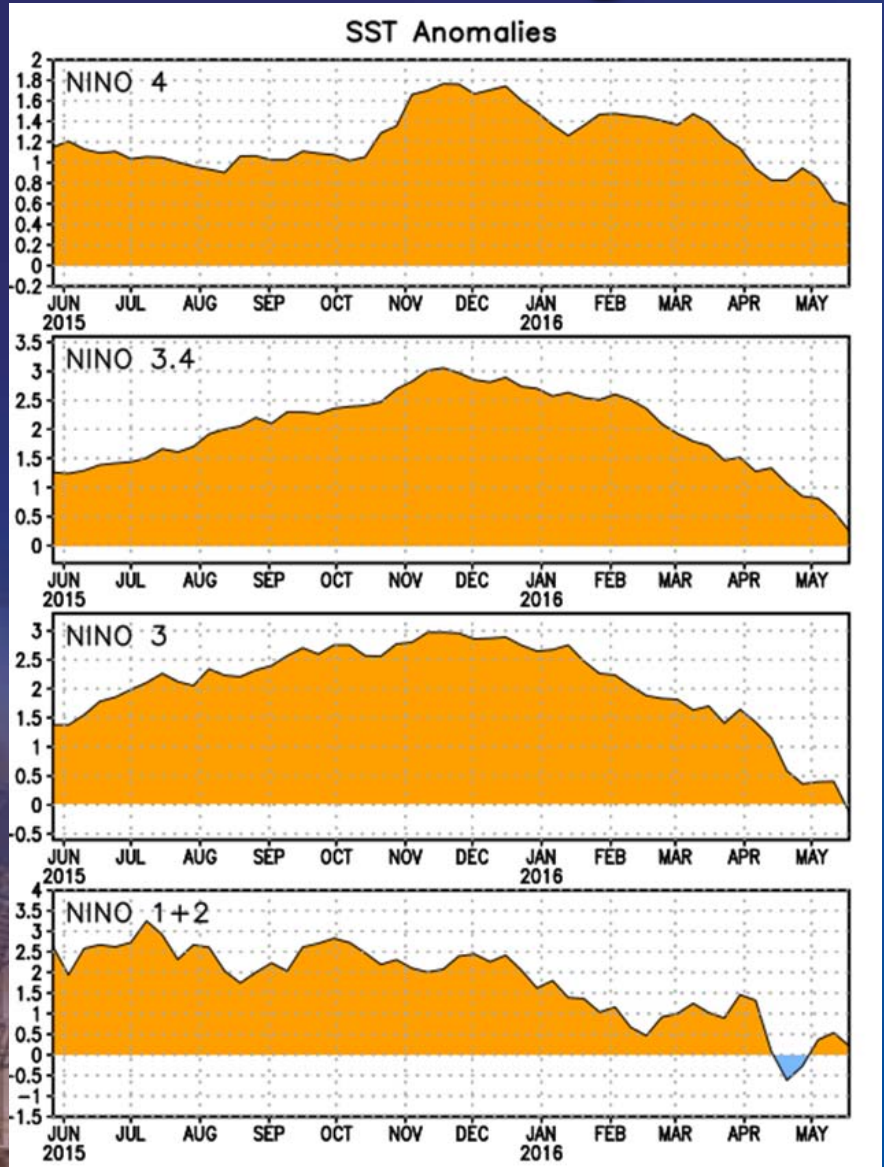


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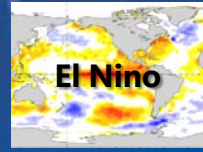


El Niño 2015-16 by the Numbers

Weekly SST Anomalies



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Previous Strong El Niños

ONI Values During Strong El Nino Episodes

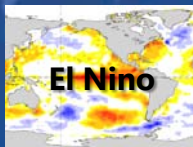
Year	JJA	JAS	ASO	SON	OND	NDJ	DJF	JFM	FMA	MAM	AMJ	MJJ
1957-58	1	1.2	1.1	1.2	1.3	1.6	1.7	1.5	1.2	0.8	0.7	0.6
1965-66	1	1.3	1.6	1.7	1.8	1.5	1.3	1	0.9	0.6	0.3	0.2
1972-73	1.1	1.3	1.5	1.8	2	1.9	1.7	1.2	0.6	0	-0.4	-0.8
1982-83	0.8	1	1.5	1.9	2.1	2.1	2.1	1.8	1.5	1.2	1	0.7
1991-92	0.7	0.7	0.8	1.2	1.4	1.6	1.5	1.4	1.2	1	0.8	0.5
1997-98	1	1.4	1.7	2	2.2	2.3	2.3	2.1	1.8	1.4	1	0.5
2015-16	1	1.2	1.4	1.7	2	2.2	2.3	2.2	2	1.6	1.1	0.6

ONI (ERSSTv4) data goes back to 1950

Solely from the perspective of the ONI value, the El Niño of 2015-16 was similar to the 1997-98 event. But a thorough review of an El Niño event also considers overall circulation changes around the globe.



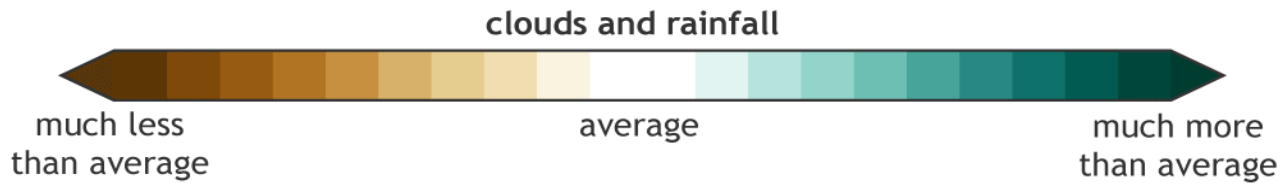
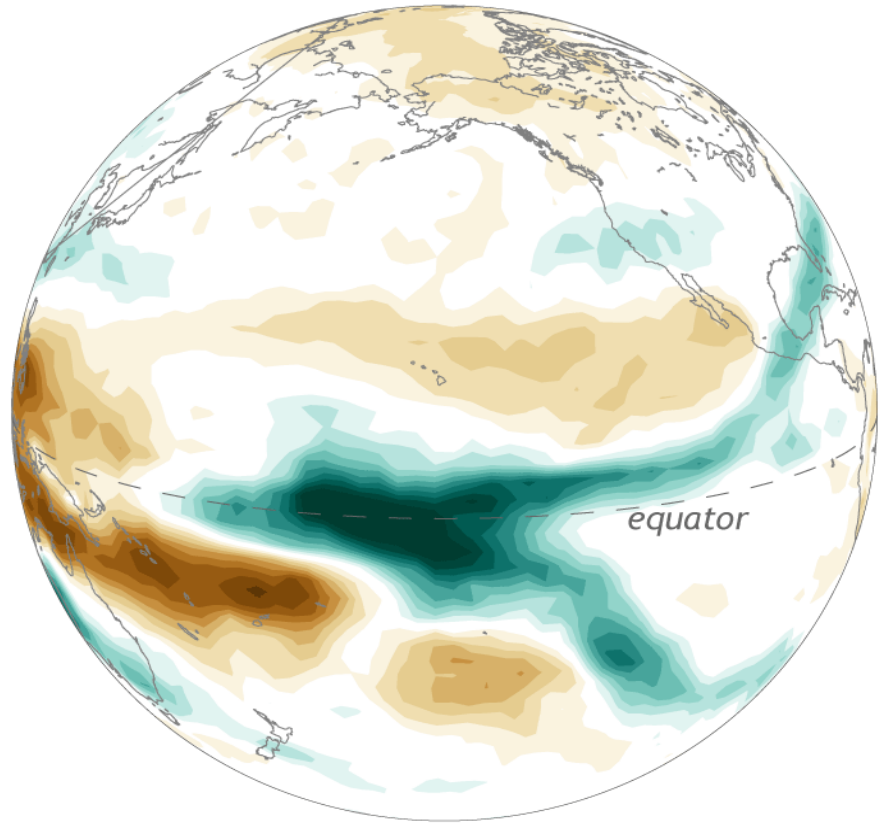
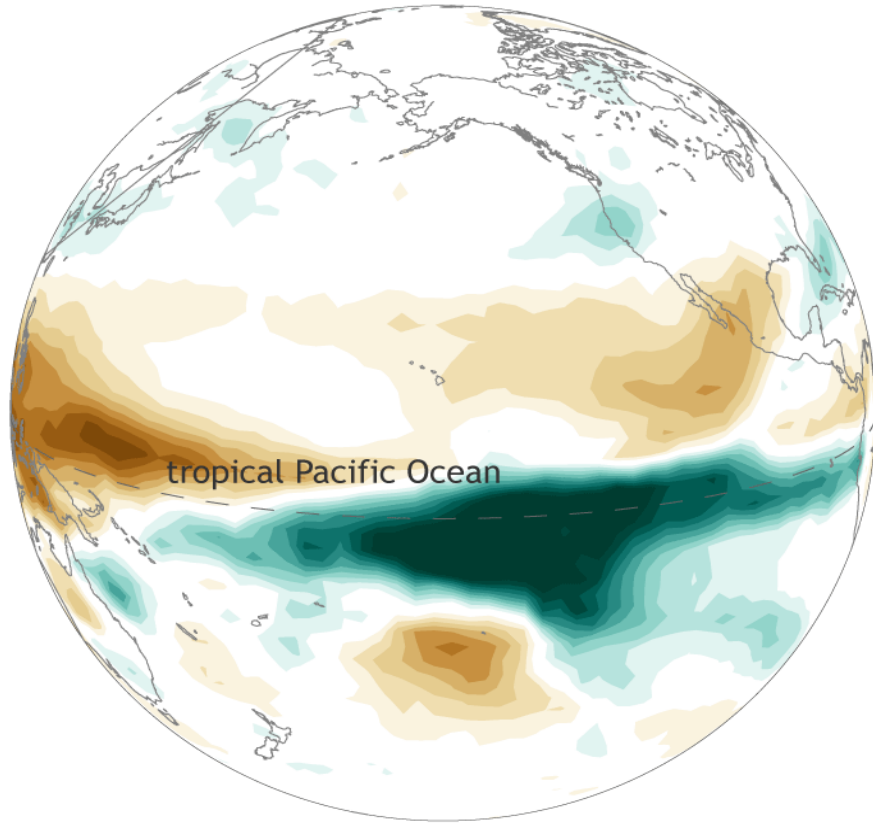
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Previous Strong El Niños

January 1998

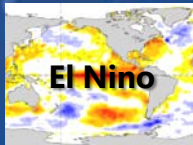
January 2016



NOAA Climate.gov

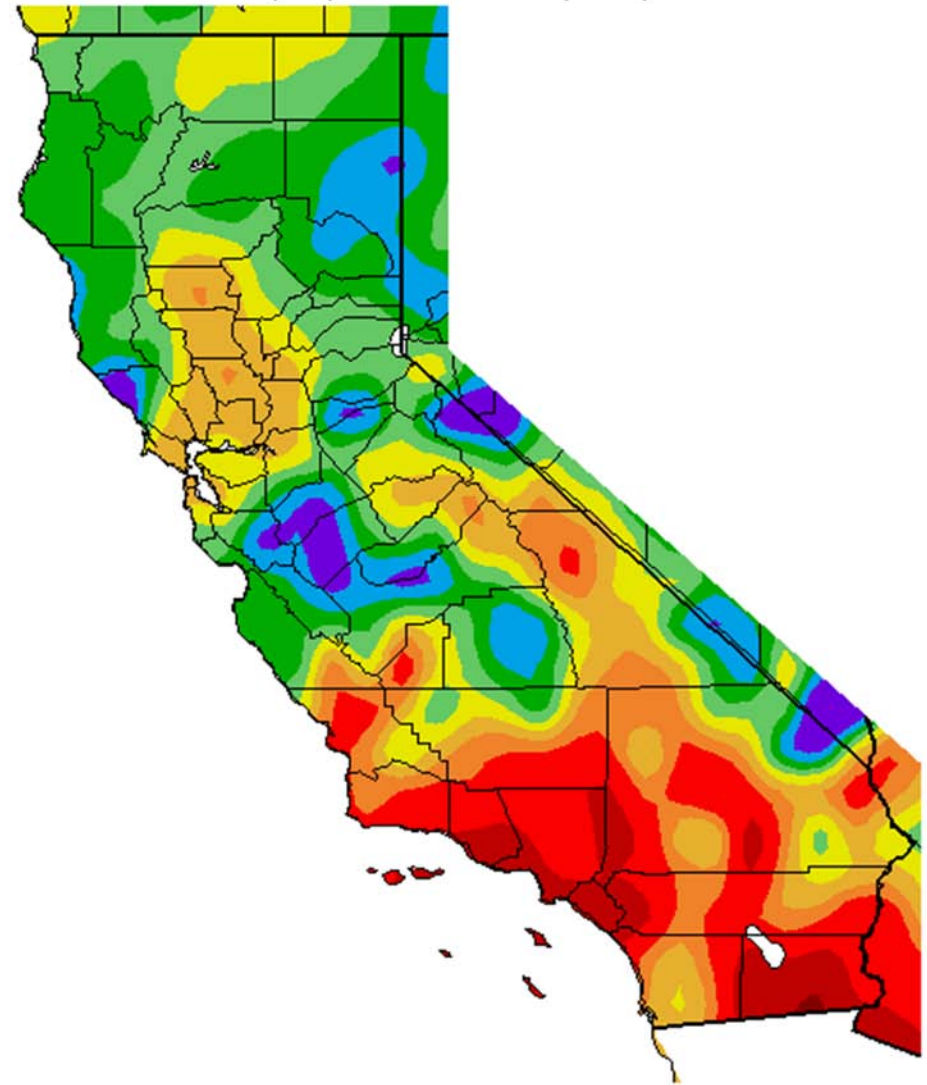


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Precipitation 2015-2016

Percent of Average Precipitation (%)
10/1/2015 – 9/26/2016



Generated 9/27/2016 at WRCC using provisional data.
NOAA Regional Climate Centers

Above normal for:

- Northwest coastal areas
- Northern Sierra
- Northern San Joaquin Valley
 - Fresno: **~125% of normal**

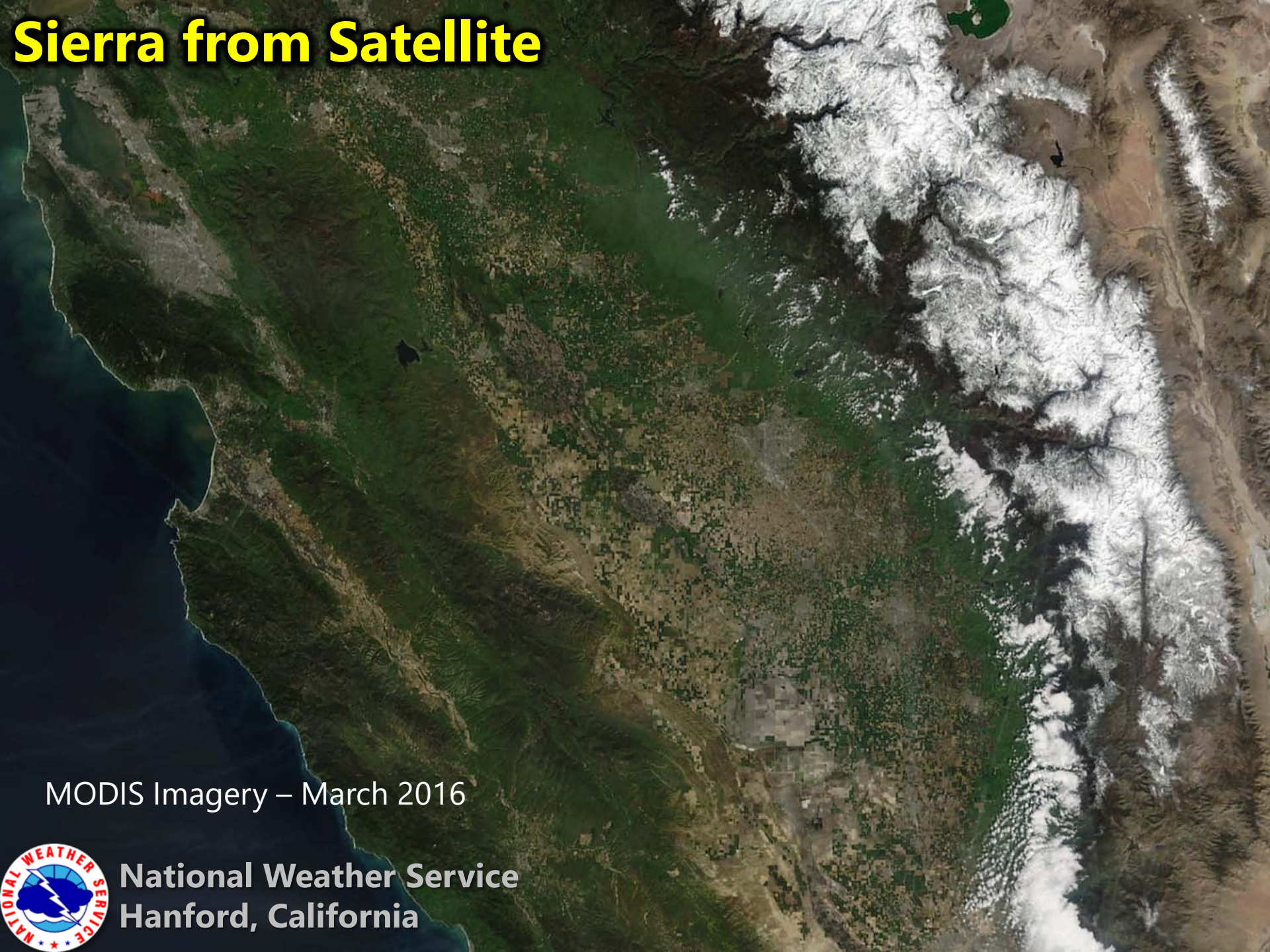
Below normal for:

- Central/Southern San Joaquin Valley
 - Hanford: **~82% of normal**
 - Bakersfield: **~84% of normal**
- Southern California
- Central/Southern Sierra Nevada
- Mojave Desert



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Sierra from Satellite



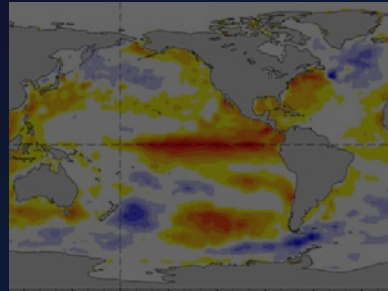
MODIS Imagery – March 2016



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Introduction



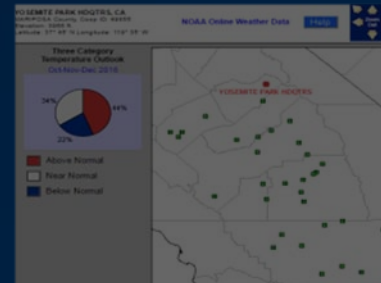
El Niño 2015-16



Winter 2016-17

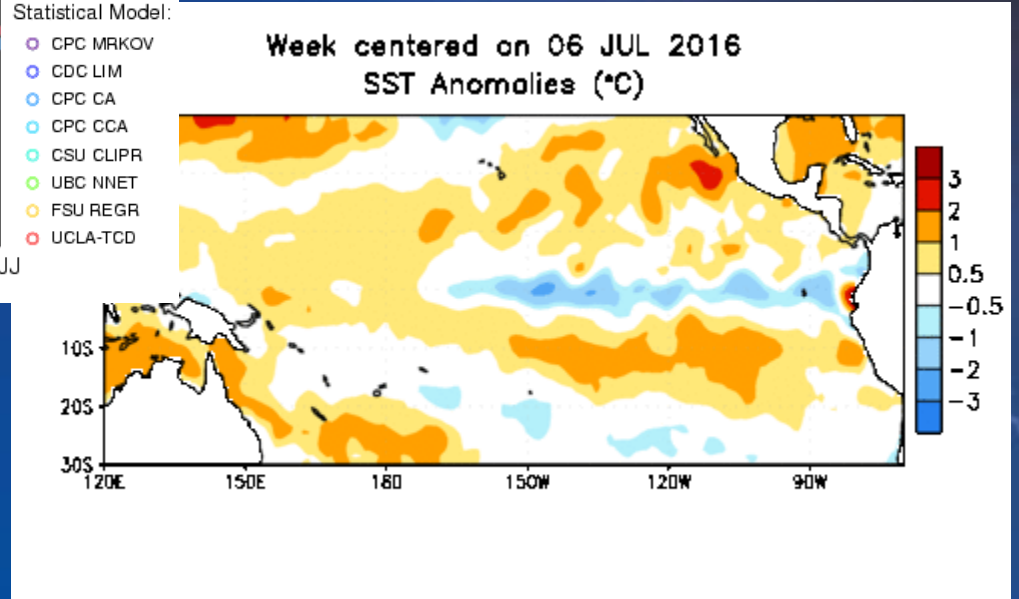
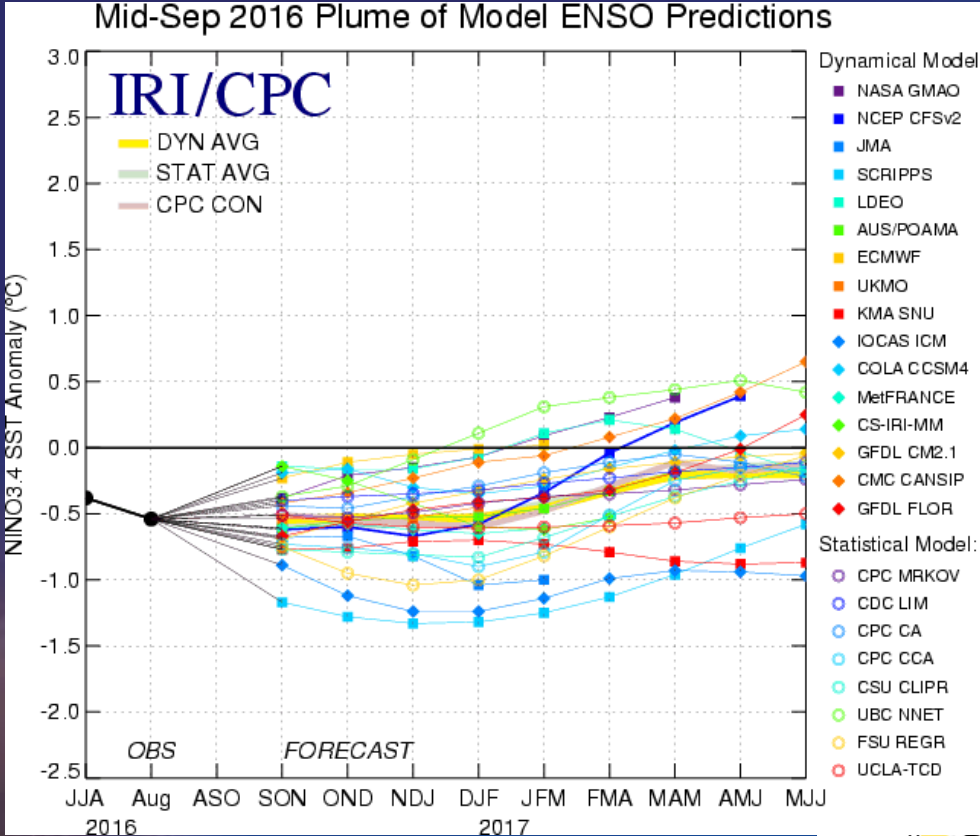


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Resources

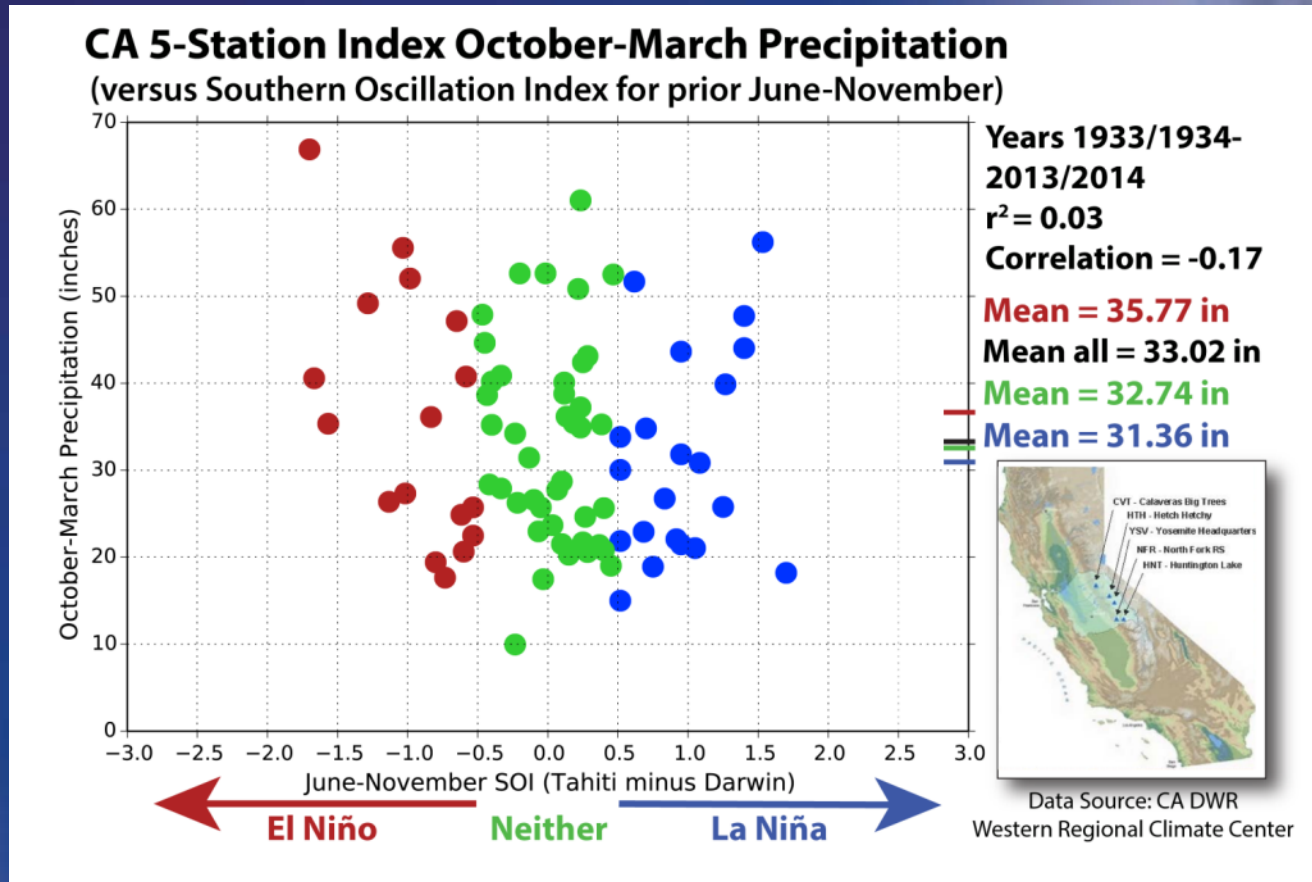
ENSO Status: Neutral



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Hanford, California

Winter
2016-17

What have previous ENSO neutral winters yielded?



Wet, dry, and near normal conditions have all been observed in central California.



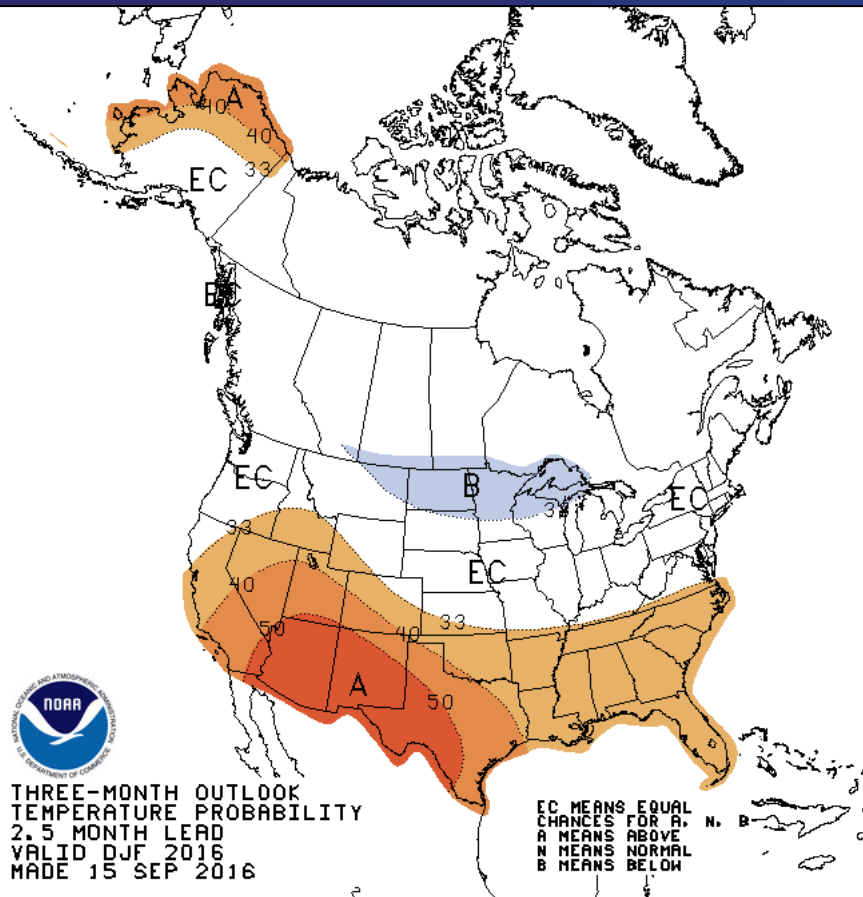
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Hanford, California



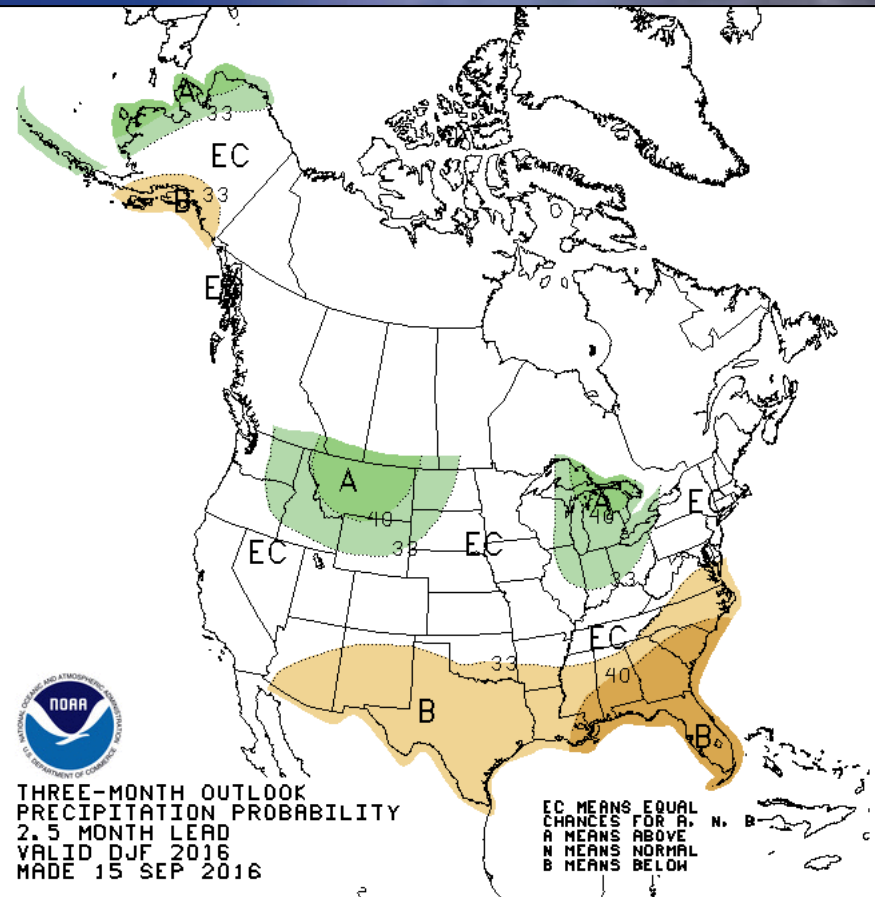
Climate Prediction Center Outlooks

Dec/Jan/Feb

Temperature



Precipitation



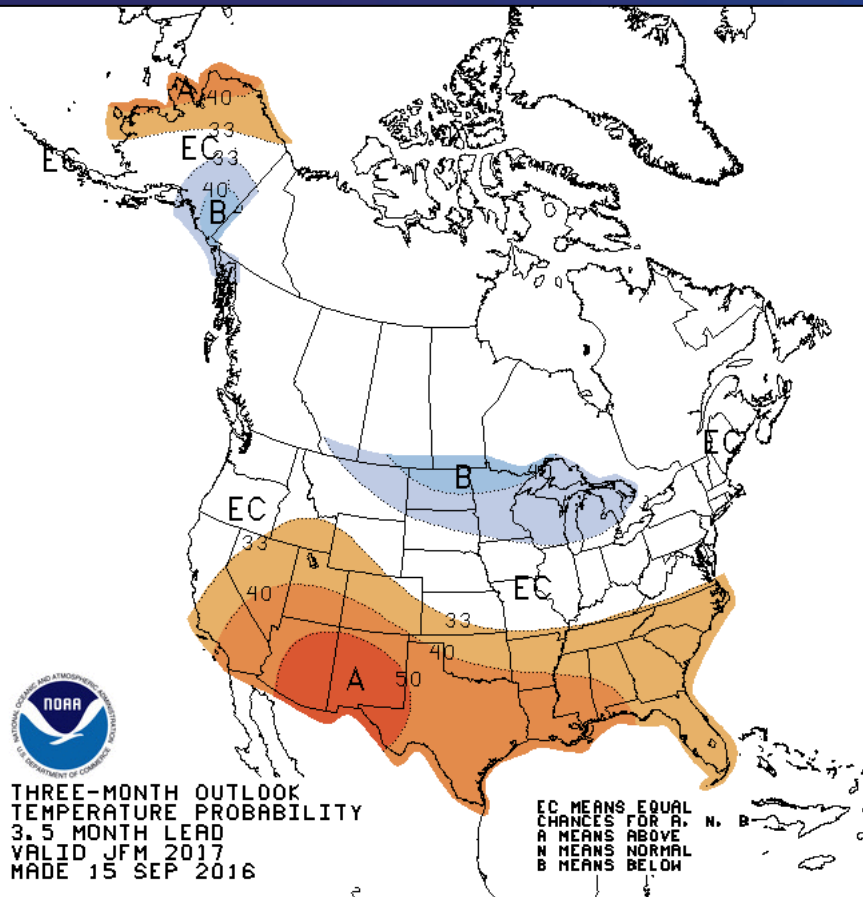
National Weather Service
Hanford, California

Winter
2016-17

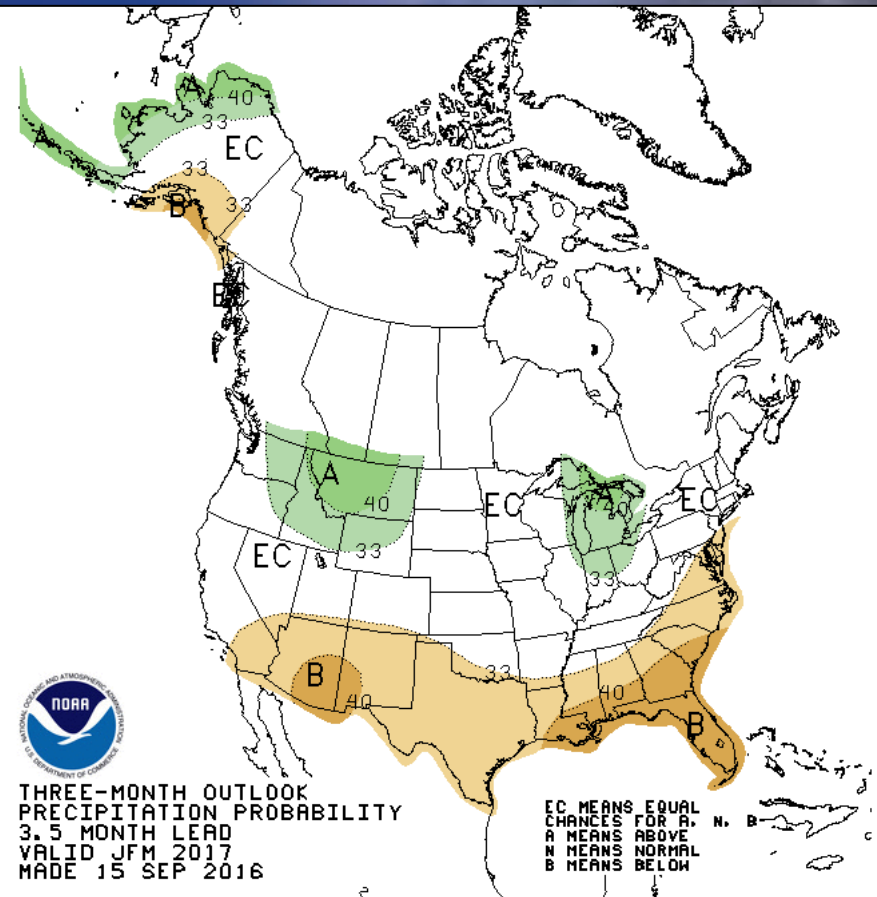
Climate Prediction Center Outlooks

Jan/Feb/Mar

Temperature



Precipitation



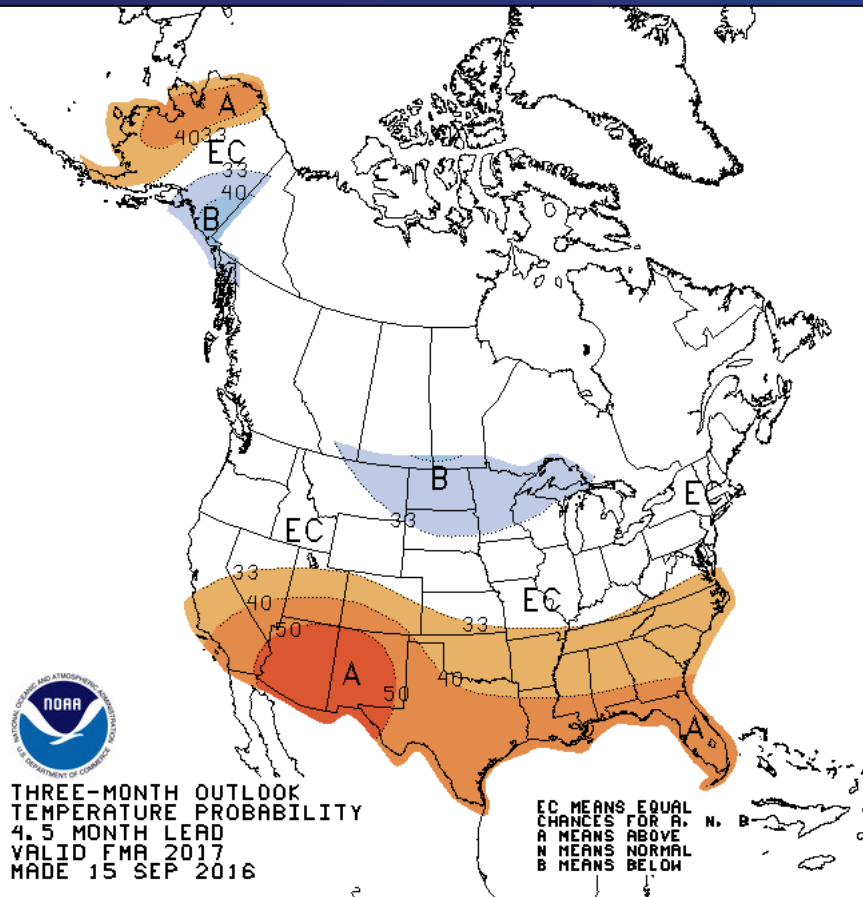
National Weather Service
Hanford, California

Winter
2016-17

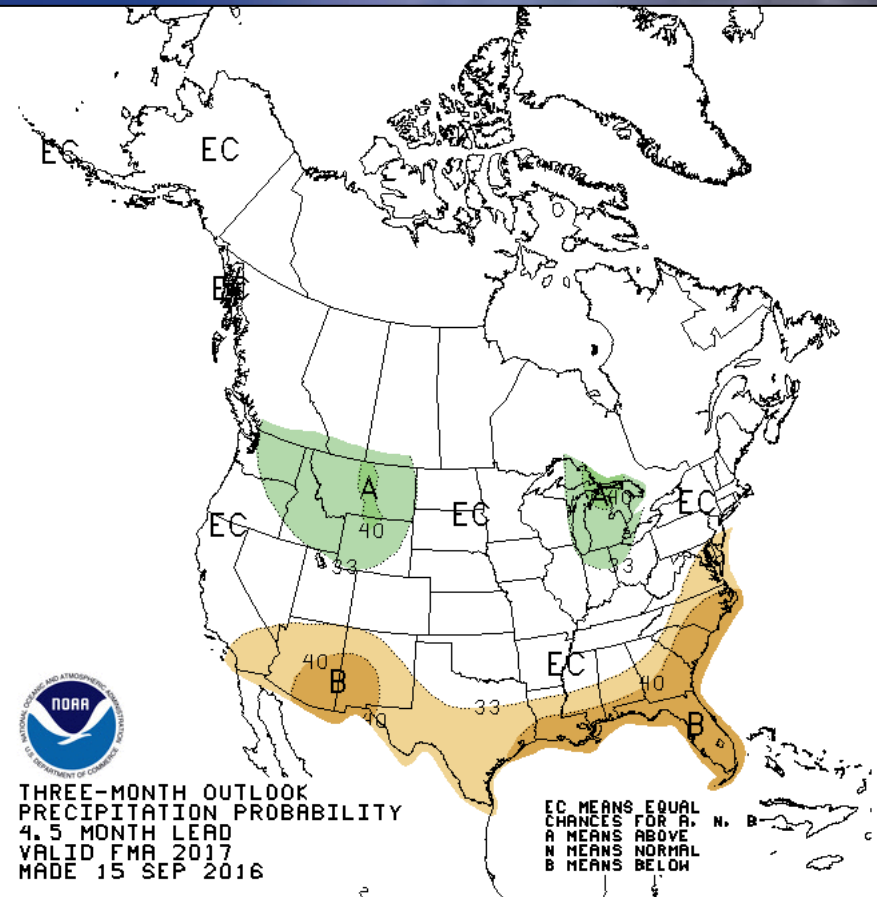
Climate Prediction Center Outlooks

Feb/Mar/Apr

Temperature



Precipitation



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Winter
2016-17

Climate Prediction Center Outlooks

Summary

Temperature:

- Increased likelihood of **above normal temperatures** for the southern two-thirds of California.

Precipitation:

- Equal chances of either above or below normal precipitation. Southern California slightly favored for below normal precipitation.

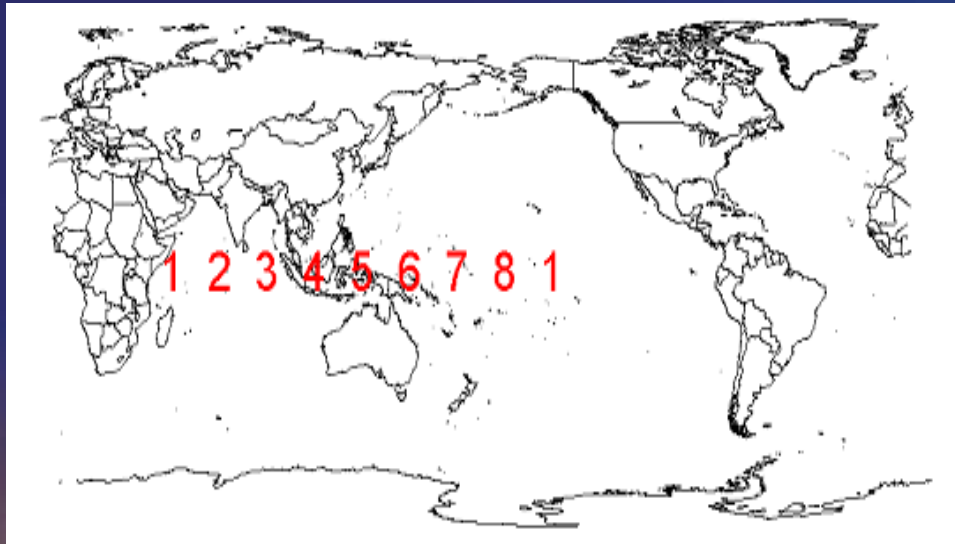


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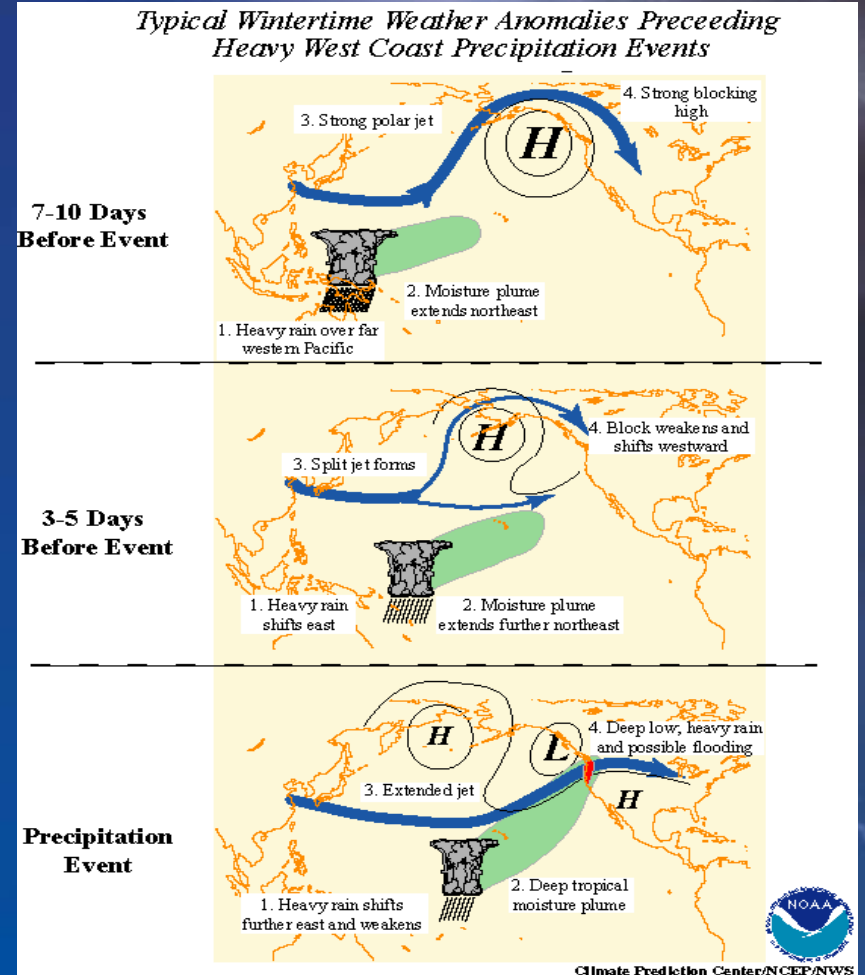
Winter
2016-17

Intraseasonal Variability

Madden Julian Oscillation (MJO)



The MJO is a tropical disturbance that propagates eastward through the Indian and Pacific Ocean which impacts atmospheric circulation and precipitation at times across portions of the west coast and California. 30-60 day cycle.



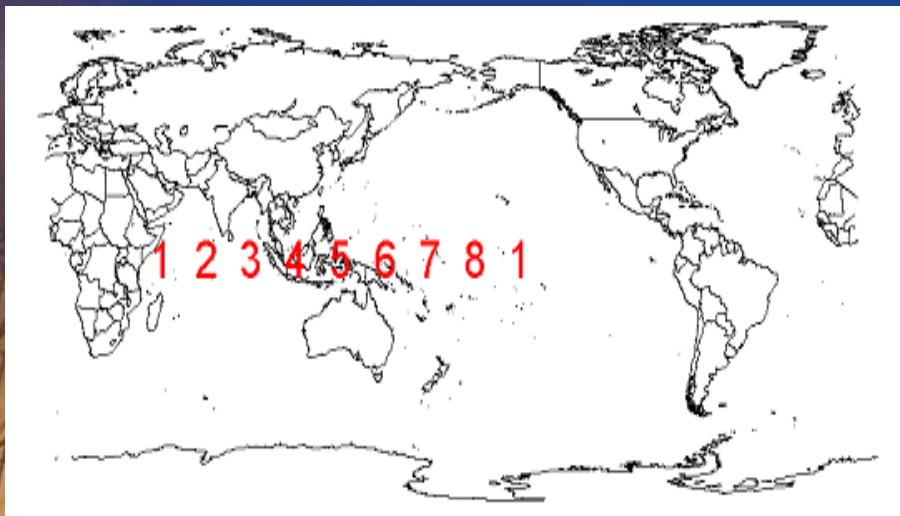
National Weather Service
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Winter
2016-17

Intraseasonal Variability

Madden Julian Oscillation (MJO)

- *MJO is most active during ENSO **Neutral** years*
- *Lag time of about a week. Can be used to increase confidence of a pattern change towards a "wetter" period*
- *MJO Phase 1-3 correlates best with rainfall during November/December/January across Central California*

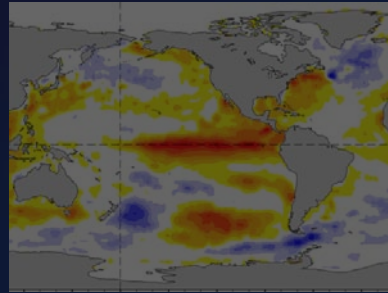


National Weather Service
Hanford, California

Winter
2016-17



Introduction



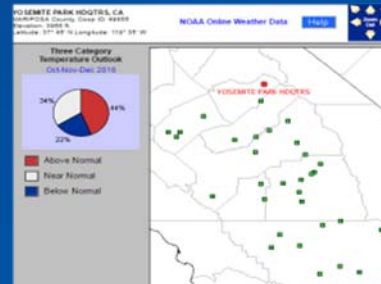
El Niño 2015-16



Winter 2016-17



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Resources

NWS Hanford Resources for Partners

NWS Hanford Webpage – weather.gov/hanford

NWS San Joaquin Valley/Hanford, CA

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Get Local Forecast for: Enter location Search Help

Top News of the Day Archived News

Are You Prepared for Hazardous Weather?

Hot conditions will persist throughout central California

Watches & Warnings Observations Forecast Graphics River & Lake Climate Fire Weather Detailed Hazards Español

South Central California Weather

Click on the map below for the latest forecast.

Last map update: Sep, 27th 2016 at 1:59:31 pm PDT

Observed Weather Reports

1. Product »
 Daily Climate Report (CLI)
 Preliminary Monthly Climate Data (CF6)
 Record Event Report (RER)
 Monthly Weather Summary (CLM)
 Regional Summary (RTP)
 State Summary (Temp/Precip)

2. Location »
Fresno
Bakersfield
Madera
Merced
Hanford

3. Timeframe »
 Most Recent
 Archived Data:
September 26th, 2016
September 25th, 2016
September 24th, 2016
September 23rd, 2016
September 22nd, 2016
September 21st, 2016

4. View »
Go

Storm Event Database (NCDC)

Product Description:
DAILY CLIMATE REPORT - issued daily:
Detailed daily weather statistics (usually for yesterday), including temperature, precipitation, degree days, wind, humidity, sunrise/sunset, and record temperature data for the following day. Precipitation data includes both calendar year and water year totals, percent of normal values, and comparisons to normal. This product is

- Daily Climate Reports
- Monthly Climate Reports



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NWS Hanford Webpage – weather.gov/hanford

Observed Weather
Climate Locations
Climate Prediction
Climate Resources
Local Data/Records
Astronomical
NOWData

Climate Prediction and Variability

Climate Prediction
Long range forecasts across the U.S.

Local 3-Month Outlook



Climate Prediction Web Sites

- Climate Prediction Center (CPC)
- Climate Diagnostics Center (CDC)

Week Two Forecasts (6-14 days)

- 6-10 Day Temperature Forecast Map
- 6-10 Day Precipitation Forecast Map
- 8-14 Day Temperature Forecast Map
- 8-14 Day Precipitation Forecast Map
- 6-10 Day & 8-14 Day Forecast Discussions
- U.S. Hazards Assessment

Monthly (30 day) Outlooks

- CPC Monthly Outlook
- Monthly Outlook Discussion
- Monthly & Seasonal Outlook Maps

Seasonal (90 day) Outlooks

- CPC Seasonal Outlooks
- Seasonal Outlook Discussion
- Monthly & Seasonal Outlook Maps

Climate Variability
Topics important to climate assessment and prediction

Information on El Niño and La Niña

- CPC's El Niño / La Niña Page
- El Niño Theme Page
- What is La Niña
- ENSO Diagnostic Discussion

Drought Information

- U.S. Drought Assessment

Intraseasonal Oscillations

- Monitoring Intraseasonal Oscillations
- Madden-Julian Oscillation
- Daily Indices

Teleconnections

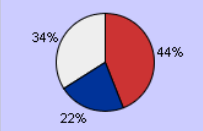
- Northern Hemisphere Teleconnections
- Daily Indices
- Forecasts of Teleconnection Indices

- Climate Outlooks from CPC
- Local temperature outlooks for point locations, including Yosemite National Park

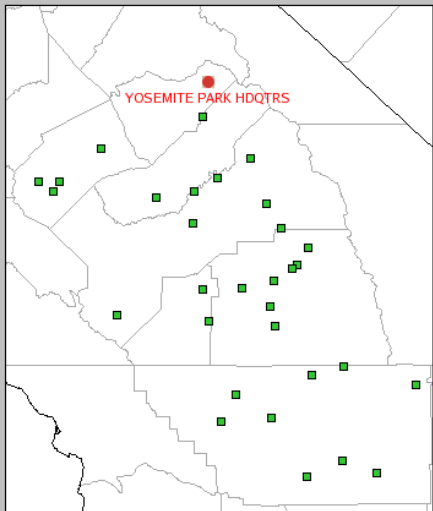
YOSEMITE PARK HDQTRS, CA
MARIPOSA County, Coop ID: 49855
Elevation: 3900 ft.
Latitude: 37° 45' N Longitude: 119° 35' W

NOAA Online Weather Data [Help](#)

Three Category Temperature Outlook
Oct-Nov-Dec 2016



■ Above Normal
■ Near Normal
■ Below Normal



Click site to change location or use Select Location tool below.

Nov-Dec-Jan 2016_17	Dec-Jan-Feb 2016_17	Jan-Feb-Mar 2017	Feb-Mar-Apr 2017	Mar-Apr-May 2017	Apr-May-Jun 2017
35% 27%	35% 29%	33% 32%	34% 32%	34% 30%	34% 30%
May-Jun-Jul 2017	Jun-Jul-Aug 2017	Jul-Aug-Sep 2017	Aug-Sep-Oct 2017	Sep-Oct-Nov 2017	Oct-Nov-Dec 2017
34% 26%	34% 27%	34% 23%	33% 23%	33% 27%	34% 26%

Click on individual chart to view outlook details.
*Outlooks are calculated using the 1981-2010 climatological reference period.





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Other Resources

- NWS Hanford on Social Media:
 -  Twitter: @NWSHanford
 -  Facebook: /NWSHanford
- Climate Prediction Center - www.cpc.ncep.noaa.gov/
- Neighboring NWS Forecast Offices:
 - NWS Sacramento: weather.gov/sacramento
 - NWS Monterey/San Francisco: weather.gov/monterey
 - NWS Los Angeles/Oxnard: weather.gov/losangeles
 - NWS San Diego: weather.gov/sandiego
 - NWS Las Vegas: weather.gov/lasvegas
 - NWS Reno: weather.gov/reno
- Western Regional Climate Center - wrcc.dri.edu/
- Drought Monitor: drought.gov



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Getting in Contact with Us!

NWS Hanford on Social Media:

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Phone:

559.584.3752

(Staffed 24/7/365)

Thank you!
Questions?



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