

# USACE SF District El Niño Workshop Winter Weather Briefing

Mark Strudley  
Hydrologist/Geomorphologist  
NOAA/NWS

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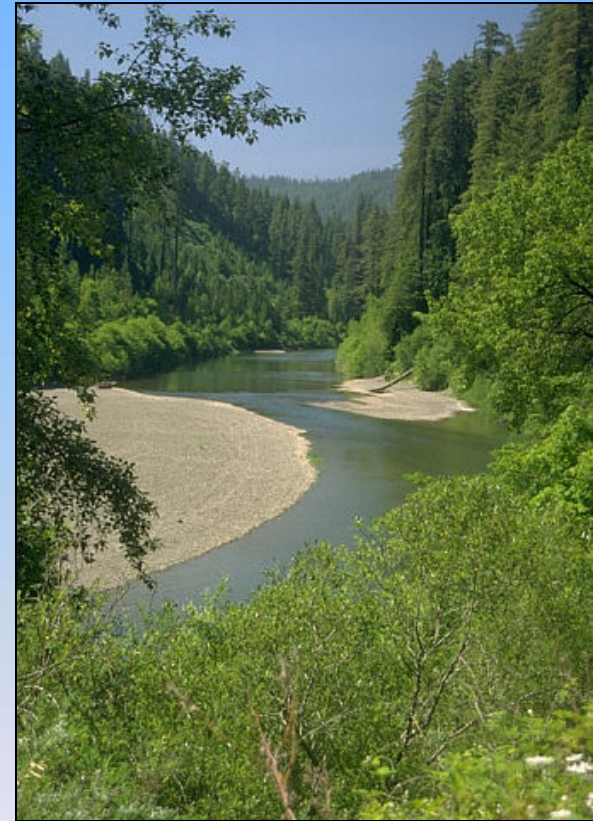
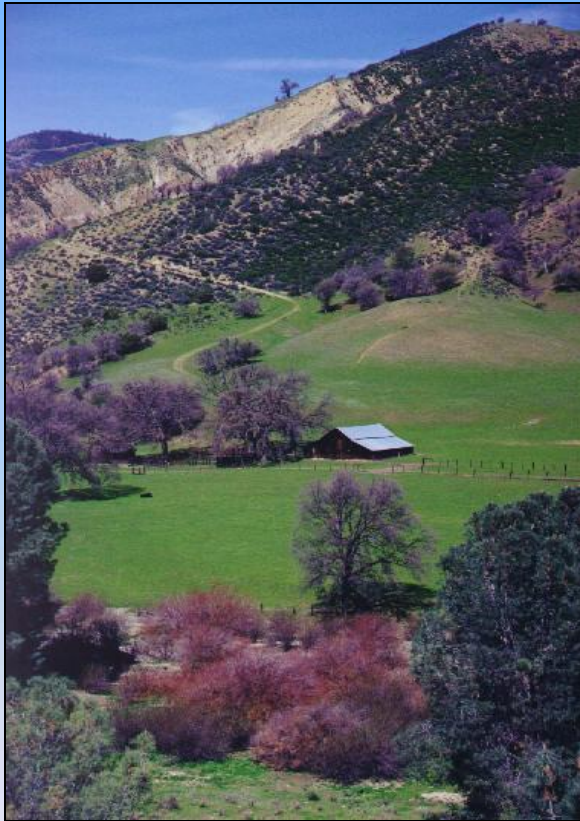
National Weather Service

*SF/Monterey Bay Area  
Weather Forecast Office  
Monterey, CA*



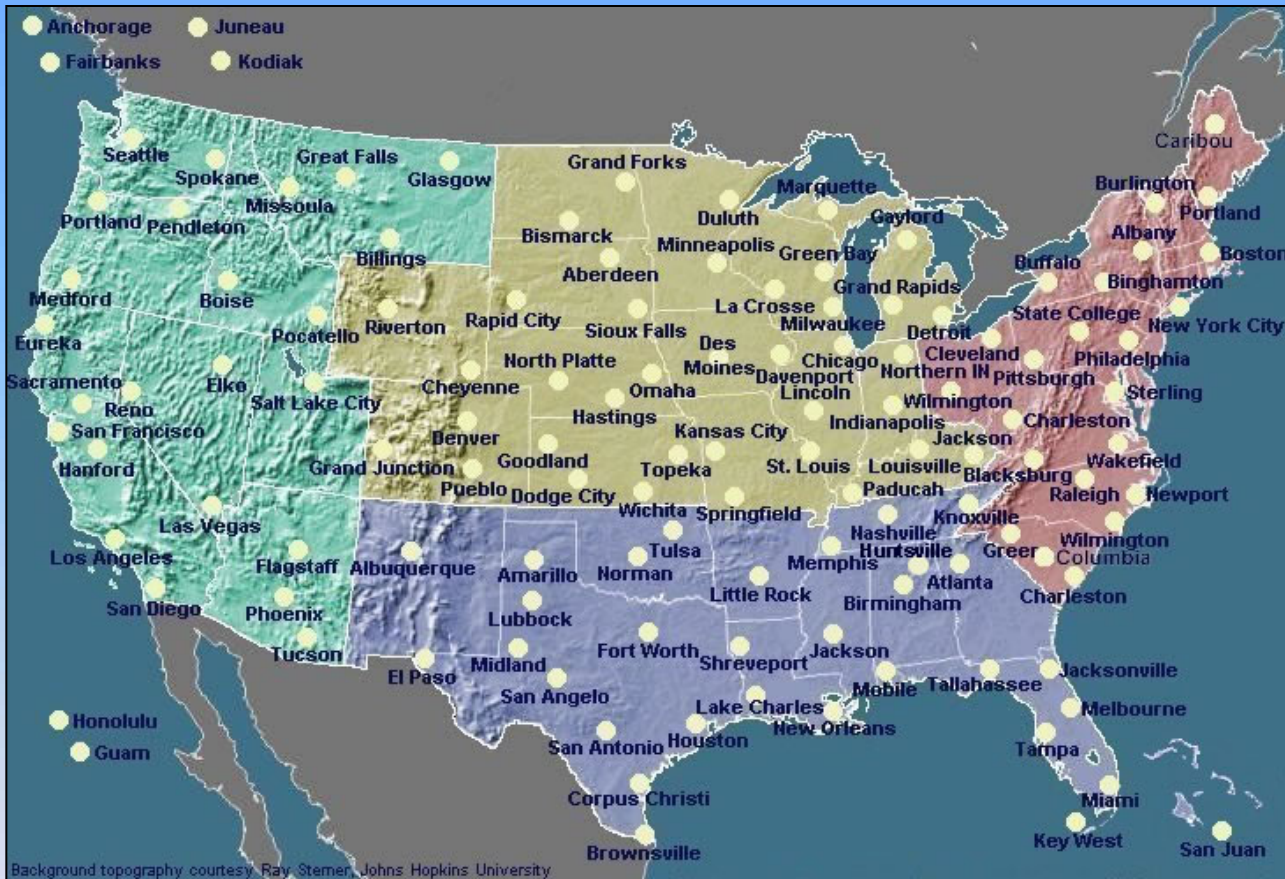
# Weather Forecast Office

San Francisco Bay Area  
Monterey, California



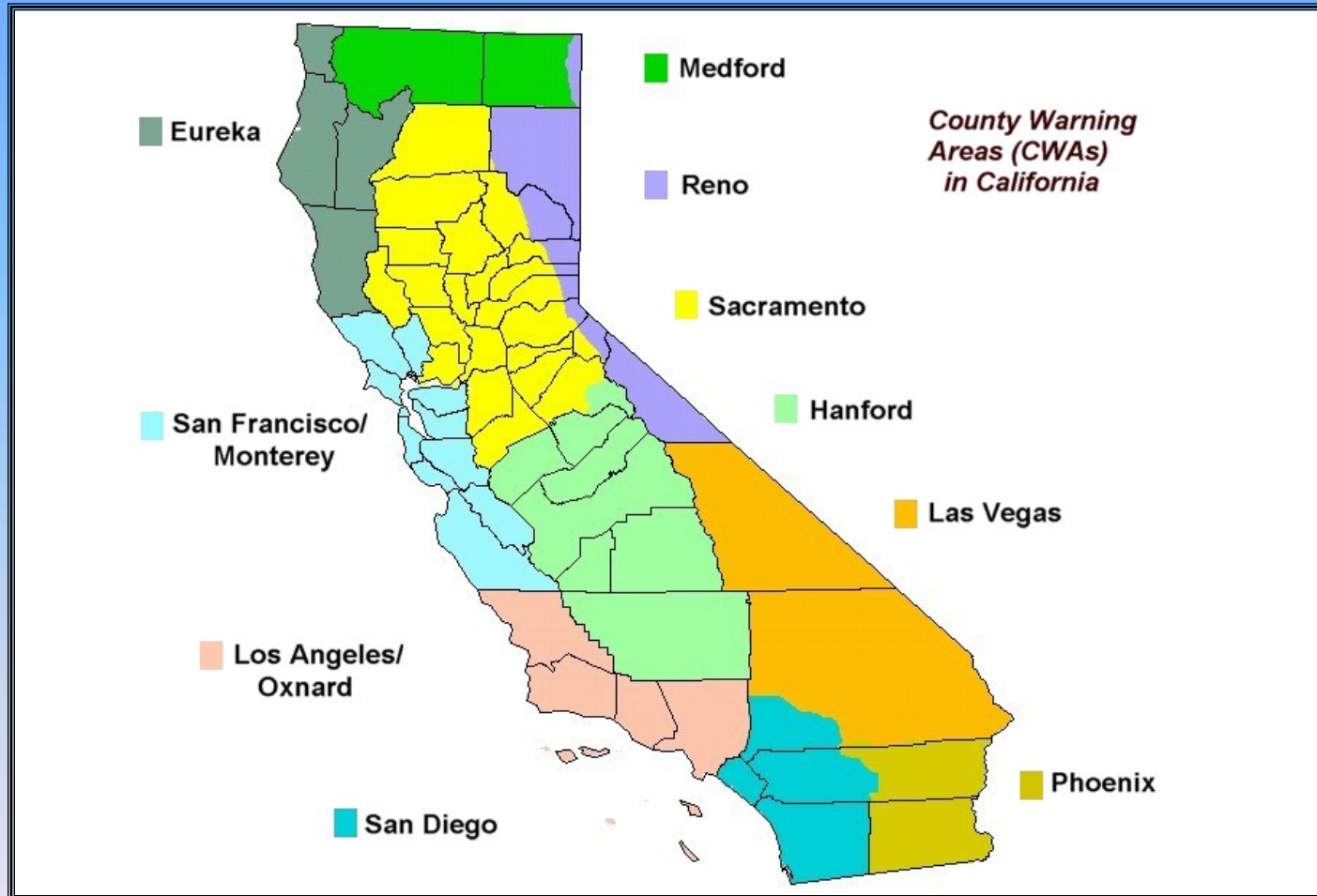
Serving the San Francisco and Monterey Bay Areas...

# 122 NWS Forecast Offices

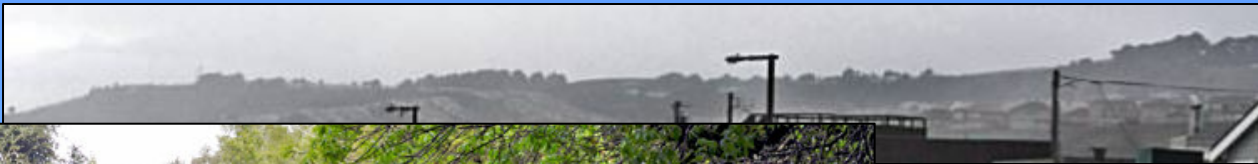


providing forecasts and critical weather warnings and decision support - 24 hours a day, every day.

# California - Areas of Responsibility



Ten NWS forecast offices



# Weather Topics

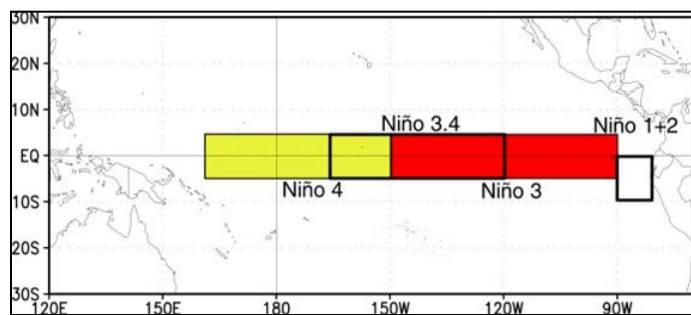
***El Niño***

***Does it matter?***

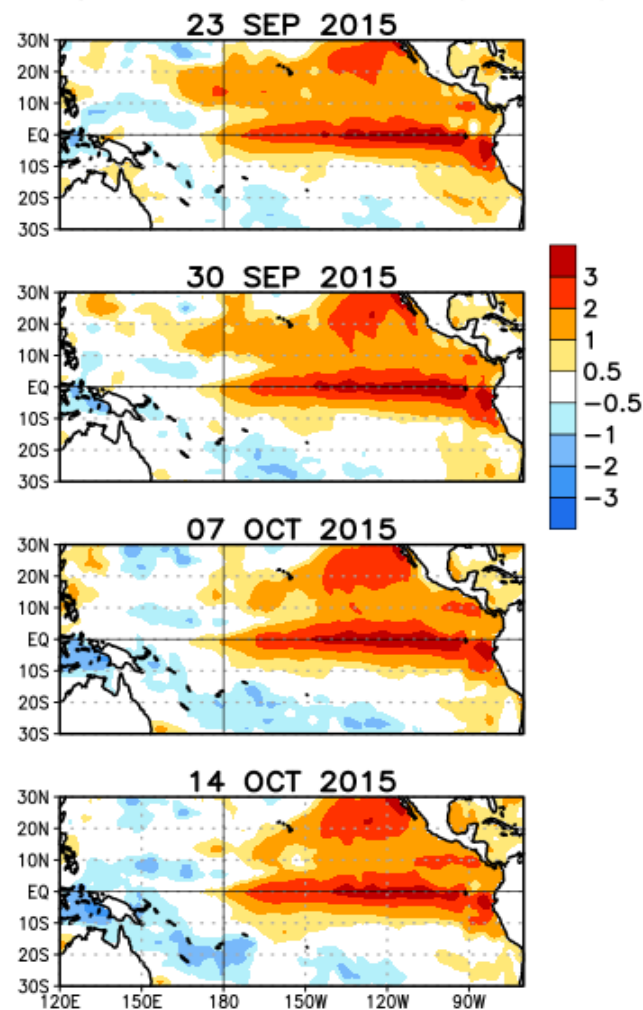
# Weekly SST Departures during the Last Four Weeks

The latest weekly SST departures are:

Niño 4	1.1°C
Niño 3.4	2.4°C
Niño 3	2.6°C
Niño 1+2	2.5°C



## Weekly SST Anomalies (DEG C)

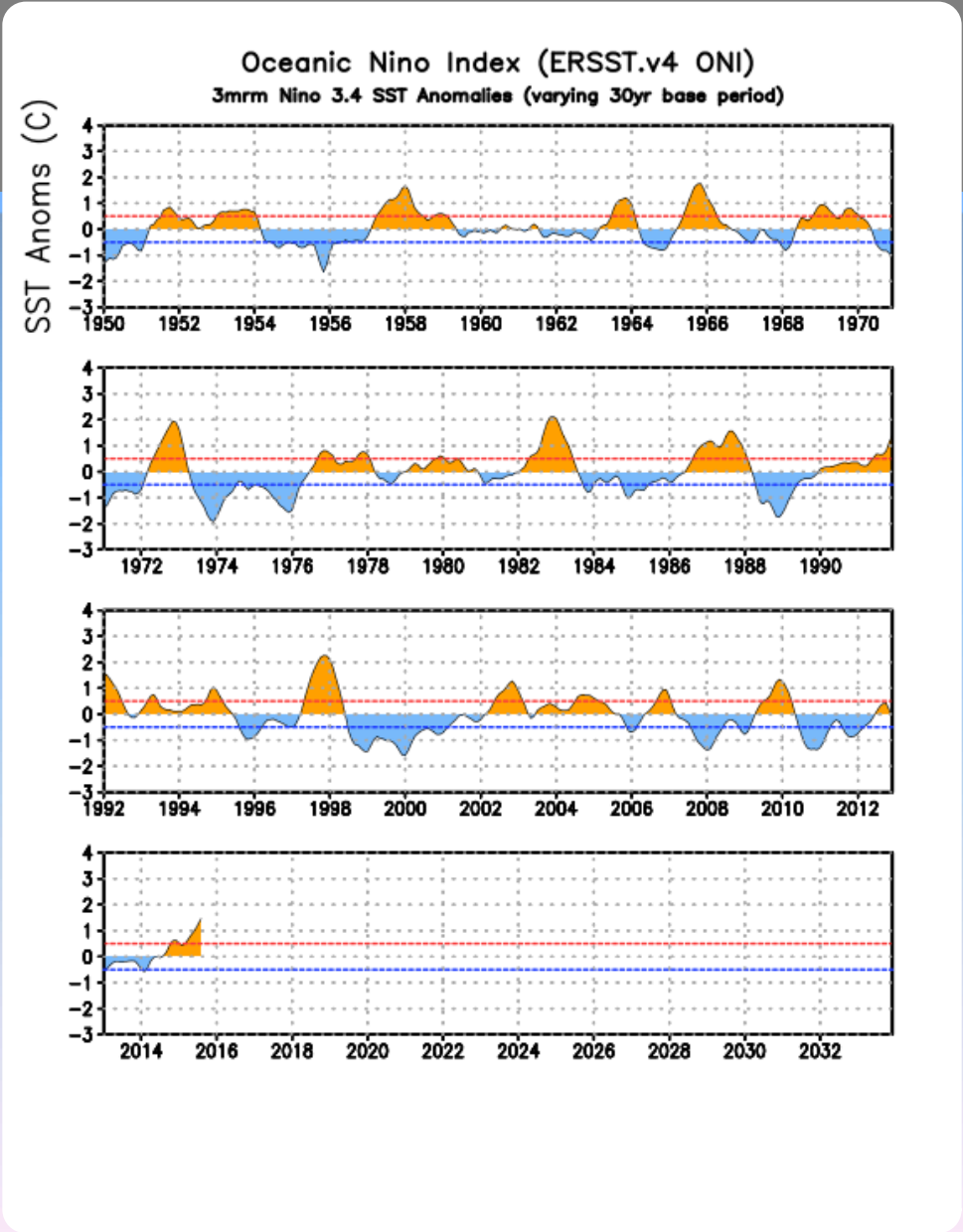


During the last four weeks, positive equatorial SST anomalies extended across most of the Pacific.

# ONI (°C): Evolution since 1950

The most recent ONI value (July - September 2015) is 1.5°C.

The ONI is based on SST departures from average in the Niño 3.4 region, and is a principal measure for monitoring, assessing, and predicting ENSO.





# IRI/CPC Pacific Niño 3.4 SST Model Outlook

Most models indicate that Niño 3.4 will be above +1.5°C (a "strong" El Niño) during late 2015 into early 2016.

Positive anomalies are predicted to weaken through the Northern Hemisphere Spring 2016.

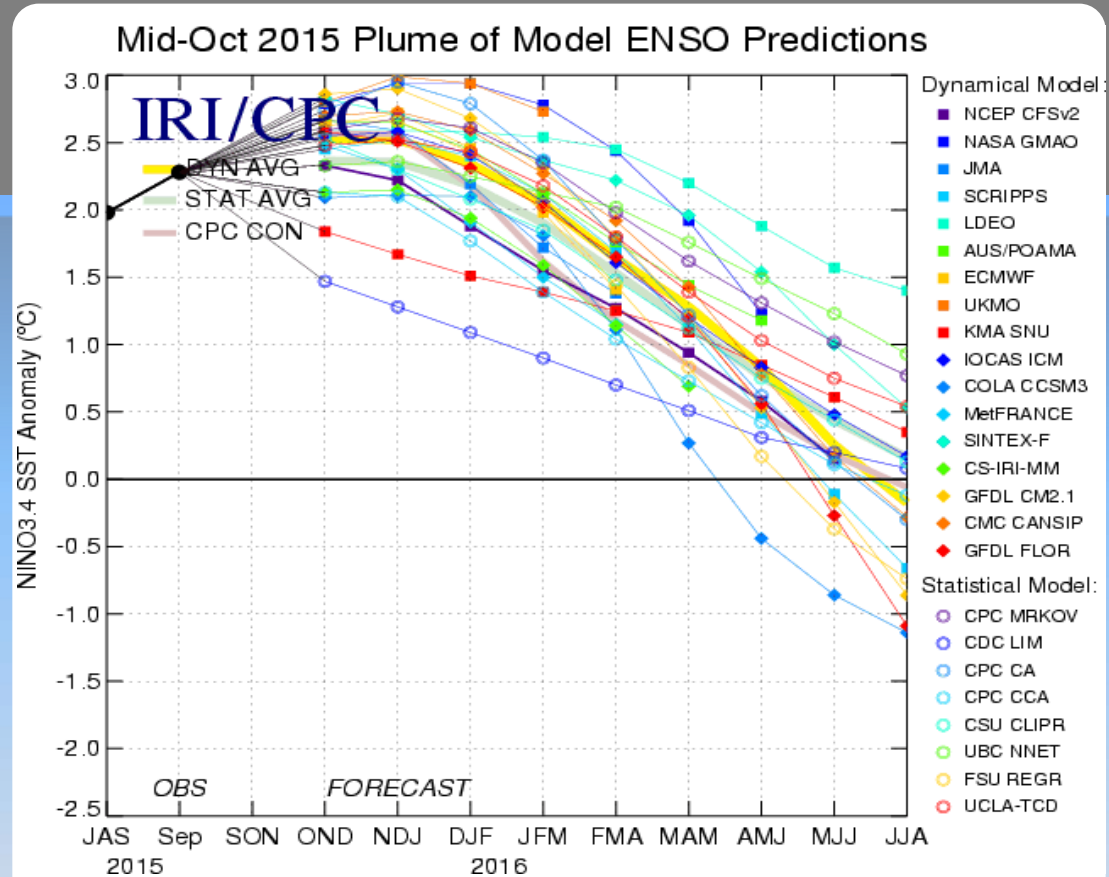
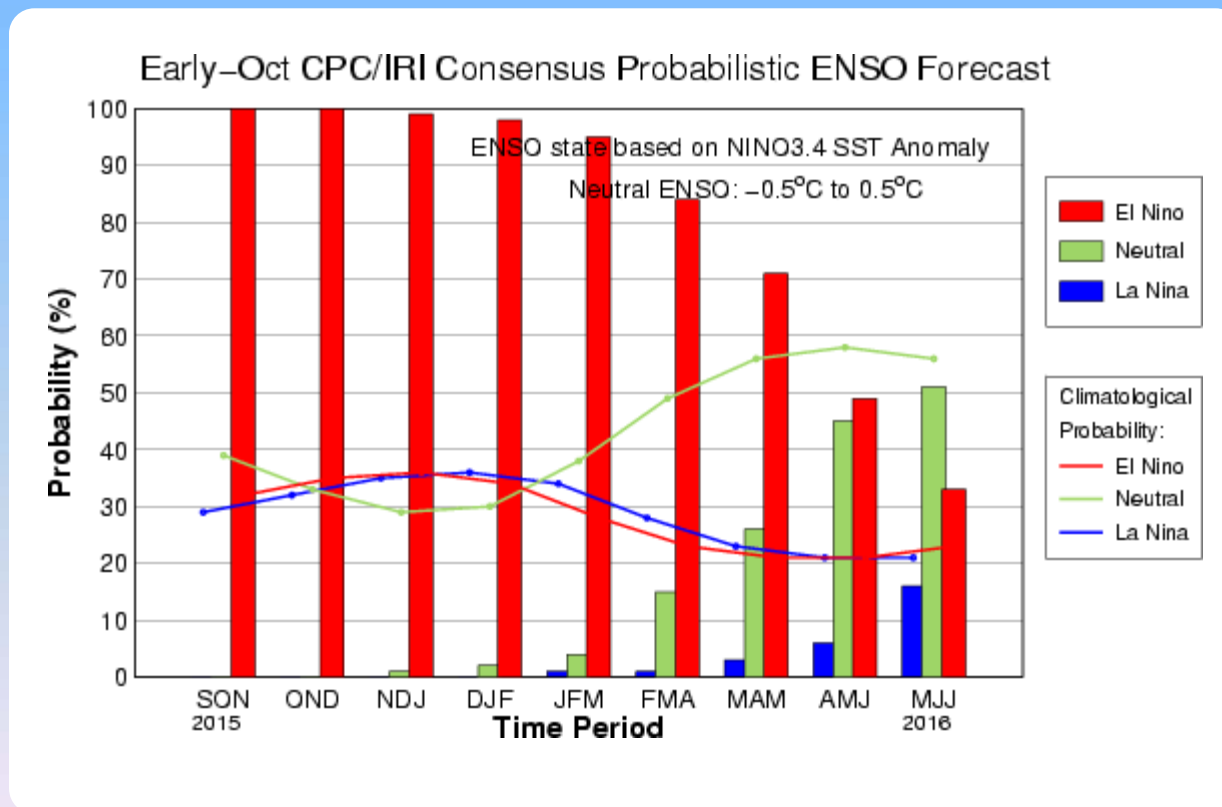


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 13 October 2015).

# CPC/IRI Probabilistic ENSO Outlook

Updated: 10 September 2015

The chance of El Niño is approximately 95% through Northern Hemisphere winter and is just under 50% by the late spring (AMJ) 2016.



# Summary

## ENSO Alert System Status: El Niño Advisory

El Niño conditions are present.\*

Positive equatorial sea surface temperature (SST) anomalies continue across most of the Pacific Ocean.

There is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016.\*

\* Note: These statements are updated once a month (2<sup>nd</sup> Thursday of each month) in association with the ENSO Diagnostics Discussion.

# Past El Nino Events

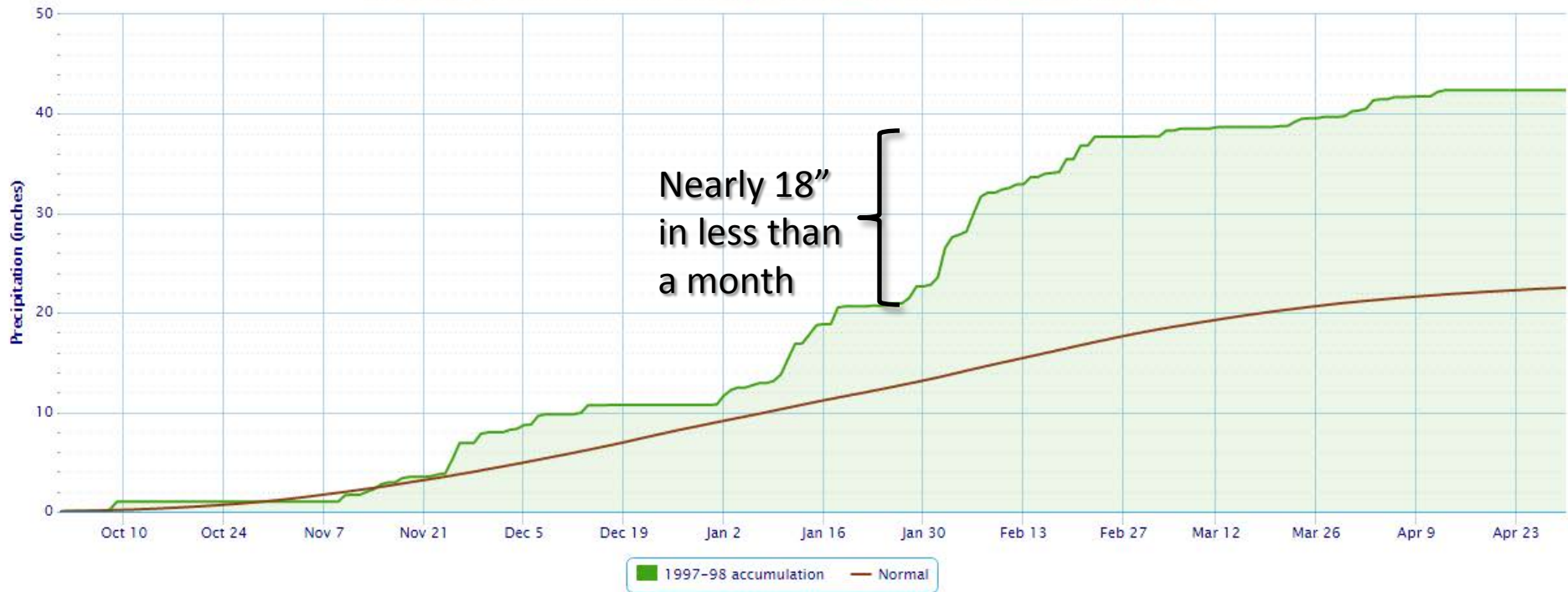
Very Strong: 1982-83, 1997-98  
(record)

Strong: 1957-58, 1965-66,  
1972-73, 1991-92

# 1997-98 (very strong)

Accumulated Precipitation – SAN FRANCISCO DWTN, CA

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



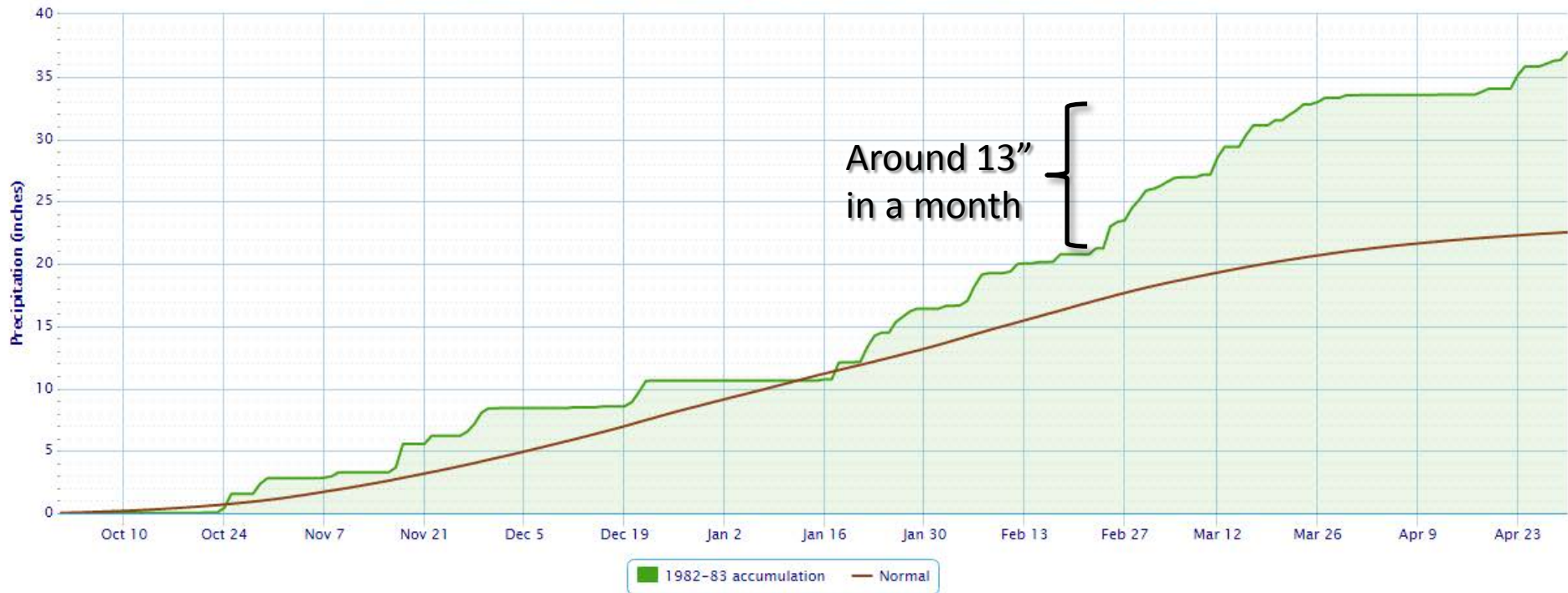
Powered by ACIS

42.38" total (188% of normal)

# 1982-83 (very strong)

Accumulated Precipitation – SAN FRANCISCO DWTN, CA

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



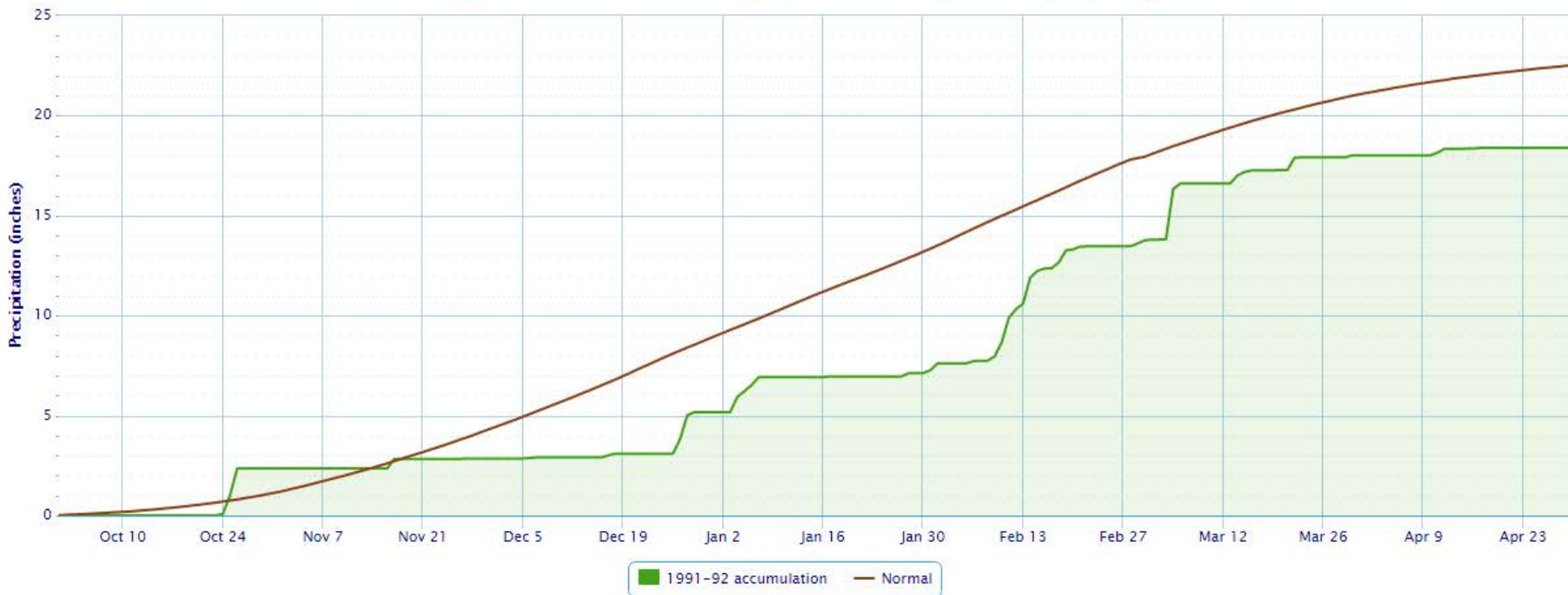
Powered by ACIS

36.98" total (164% of normal)

# 1991-92 (strong)

## Accumulated Precipitation – SAN FRANCISCO DWTN, CA

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



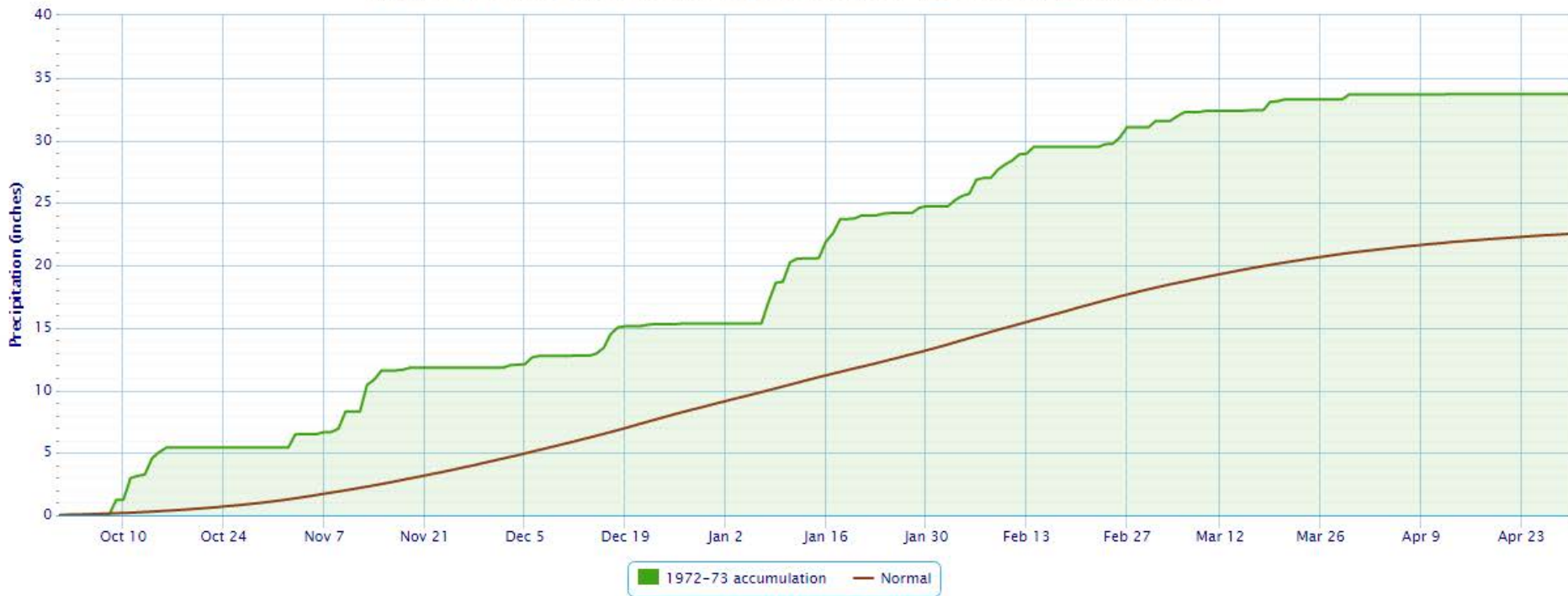
Powered by ACIS

18.39" total (82% of normal)

# 1972-73 (strong)

## Accumulated Precipitation – SAN FRANCISCO DWTN, CA

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

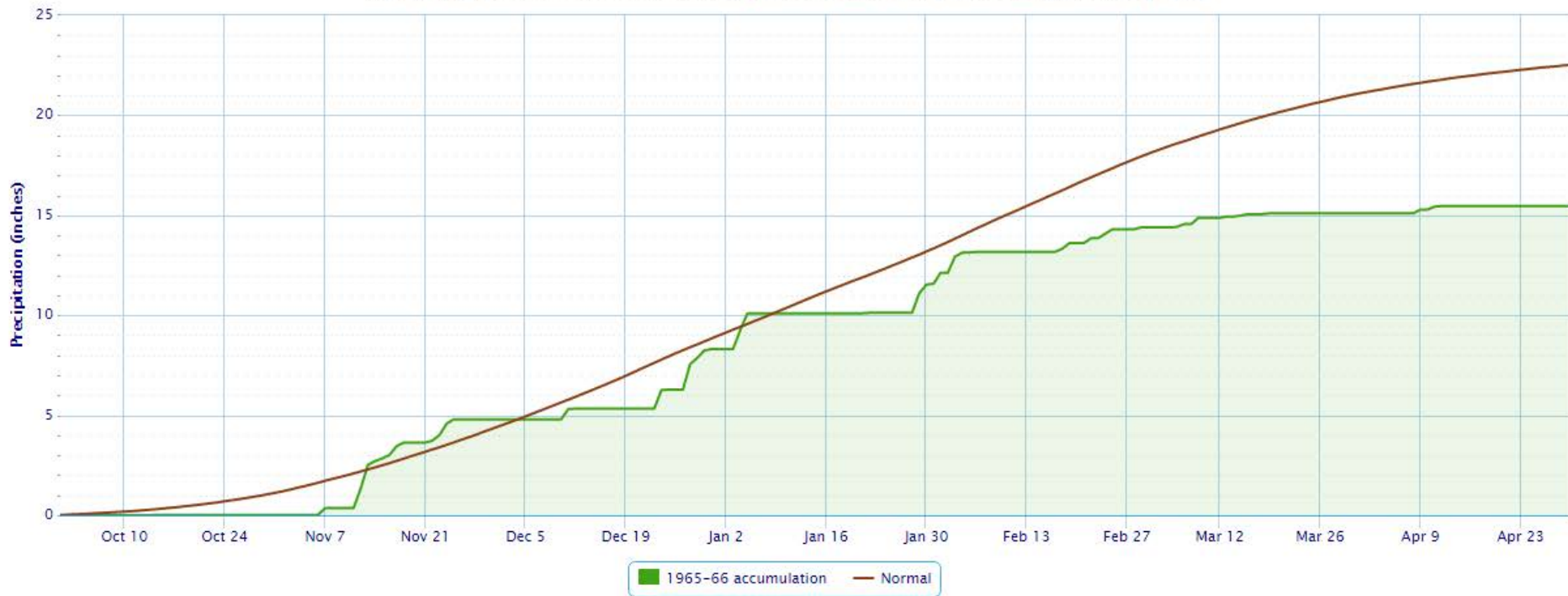
28.33" total (150% of normal)



# 1965-66 (strong)

Accumulated Precipitation – SAN FRANCISCO DWTN, CA

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



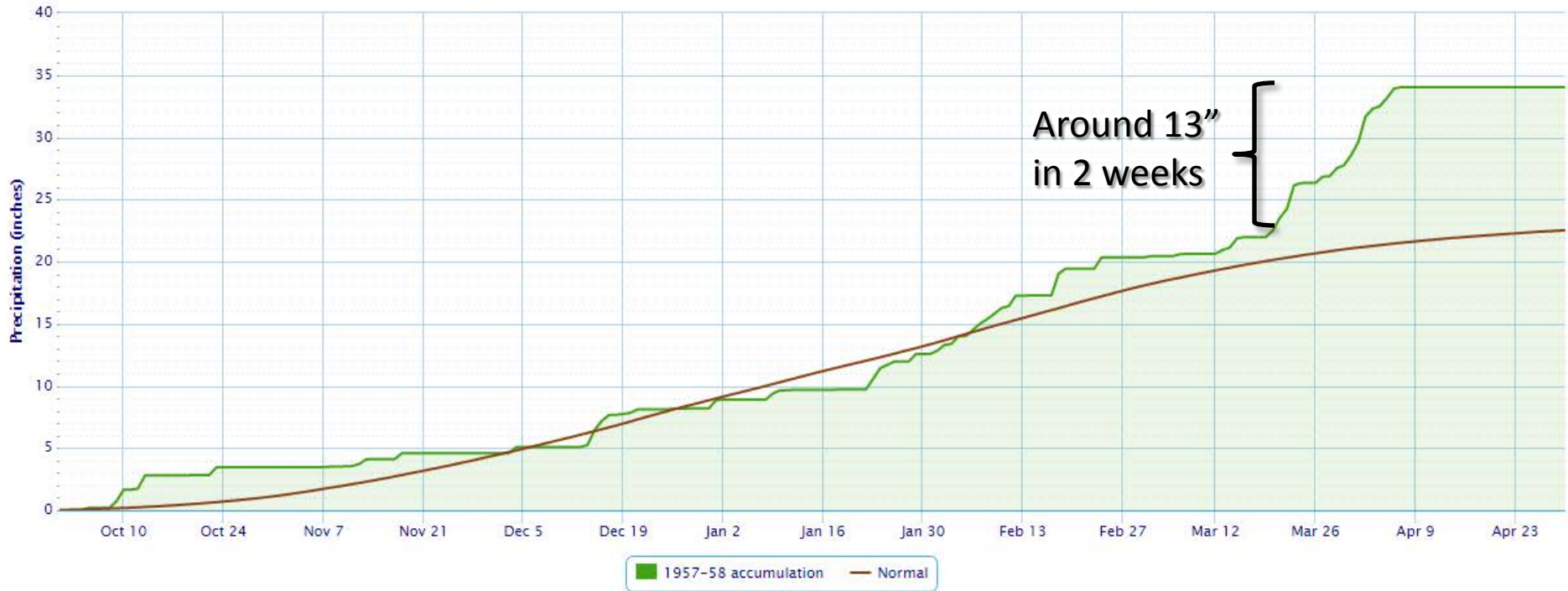
Powered by ACIS

15.46" total (69% of normal)

# 1957-58 (strong)

Accumulated Precipitation – SAN FRANCISCO DWTN, CA

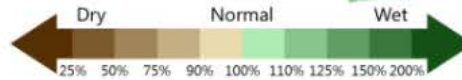
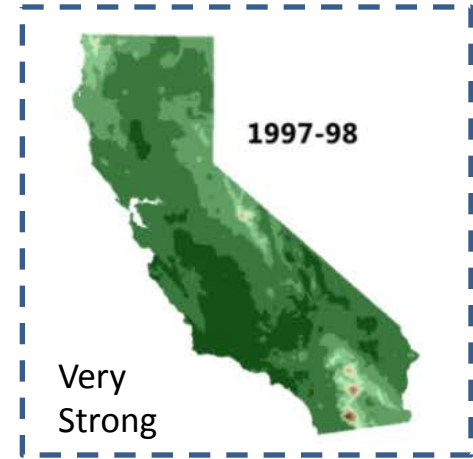
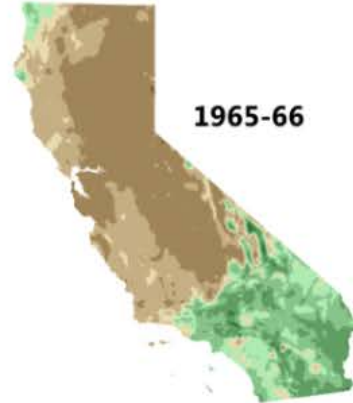
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

34.04" total (151% of normal)

# Statewide Look:



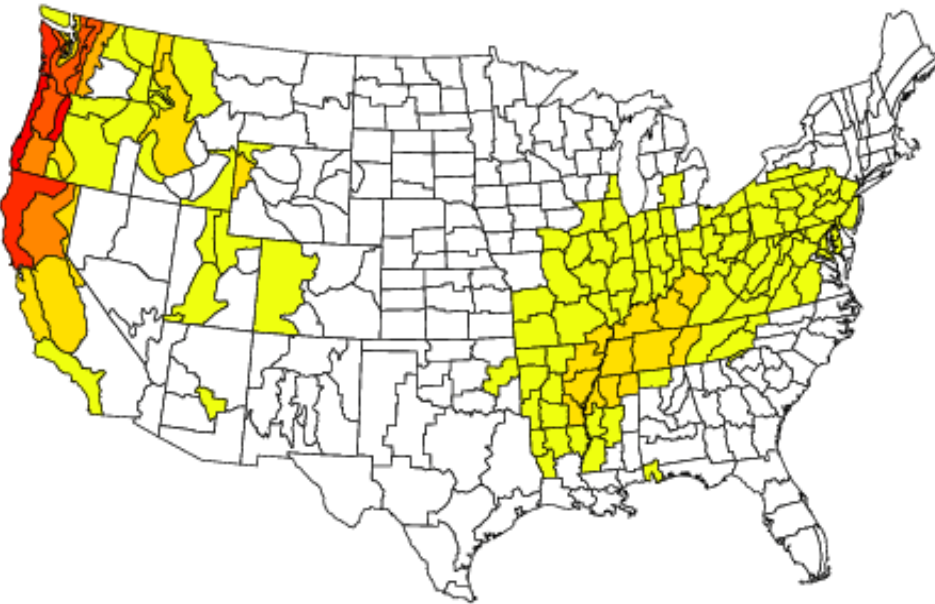
PRISM, Oregon State University



# A tale of two years

(both weak El Nino years)

NOAA/NCDC Climate Division Precipitation Anomalies (in)  
Dec to Feb 1976-77  
Versus 1981-2010 Longterm Average



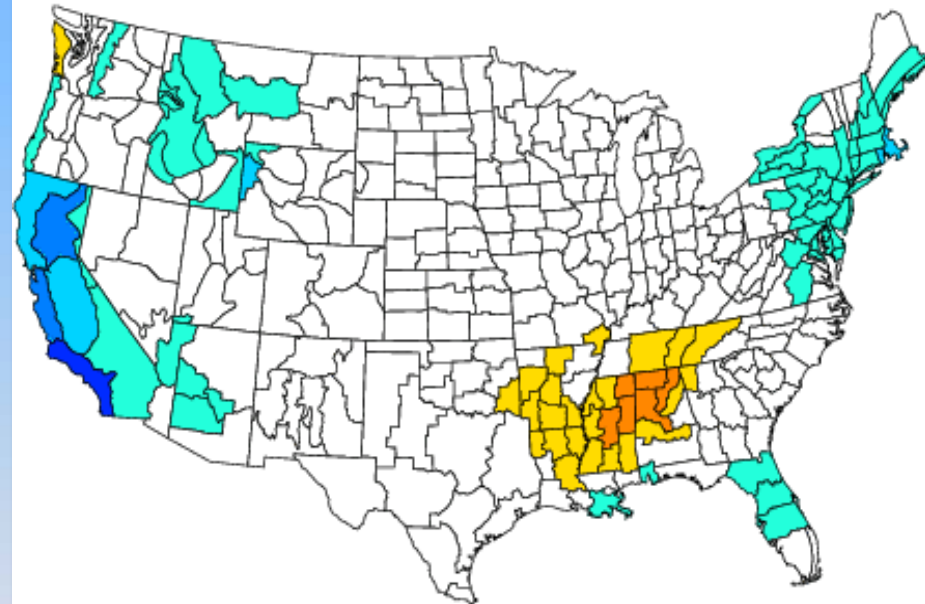
NOAA/ESRL PSD and CIRES-CU

-24.0 -18.0 -12.0 -6.0 0.0 6.0 12.0 18.0 24.0

1976-77

SF 5.31 inches (8" below normal)

NOAA/NCDC Climate Division Precipitation Anomalies (in)  
Dec to Feb 1977-78  
Versus 1981-2010 Longterm Average



NOAA/ESRL PSD and CIRES-CU

-12.0 -9.0 -6.0 -3.0 0.0 3.0 6.0 9.0 12.0

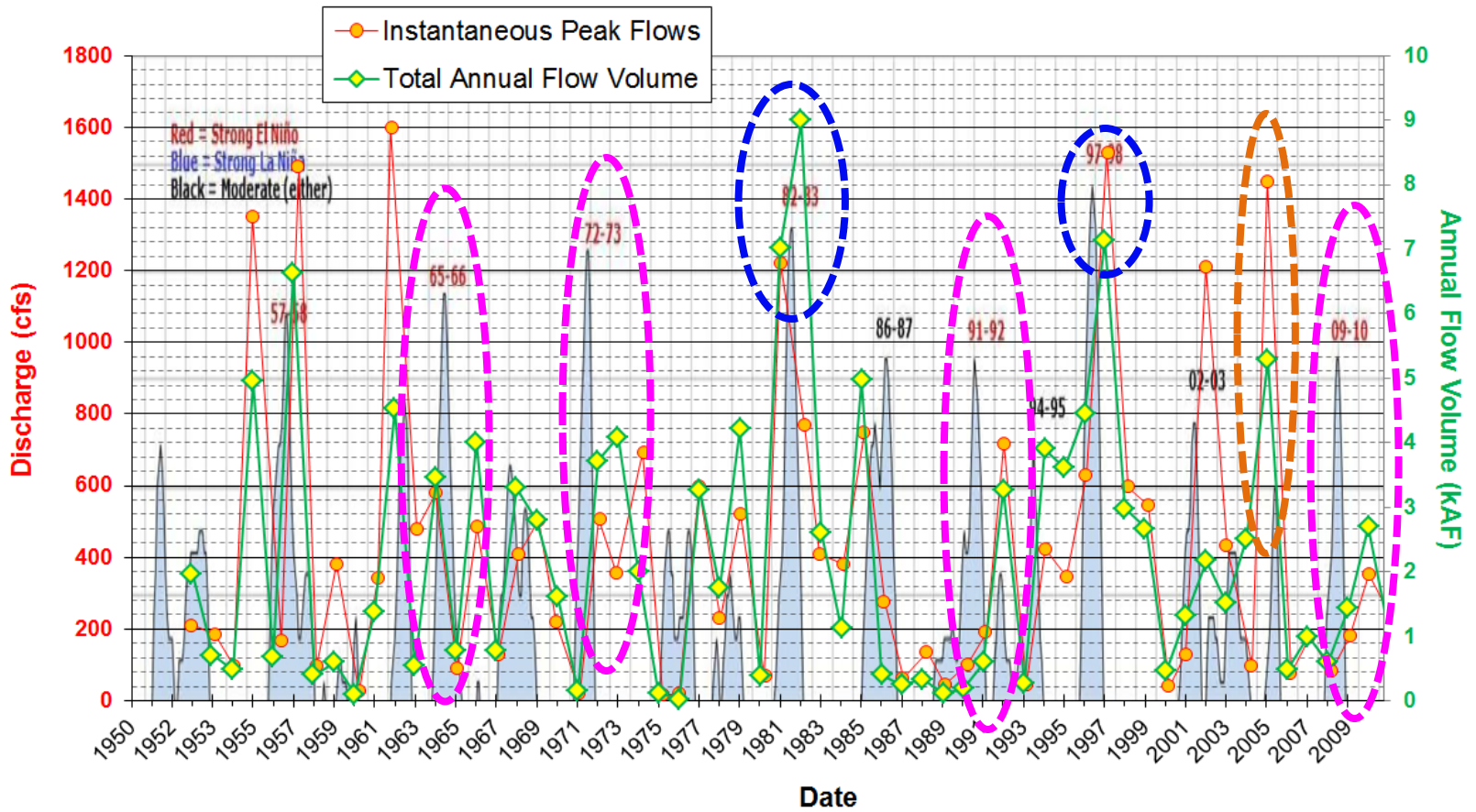
1977-78

SF 14.41 inches (1" above normal)

Strong El Niño; strong hydro response

Strong El Niño; weak hydro response

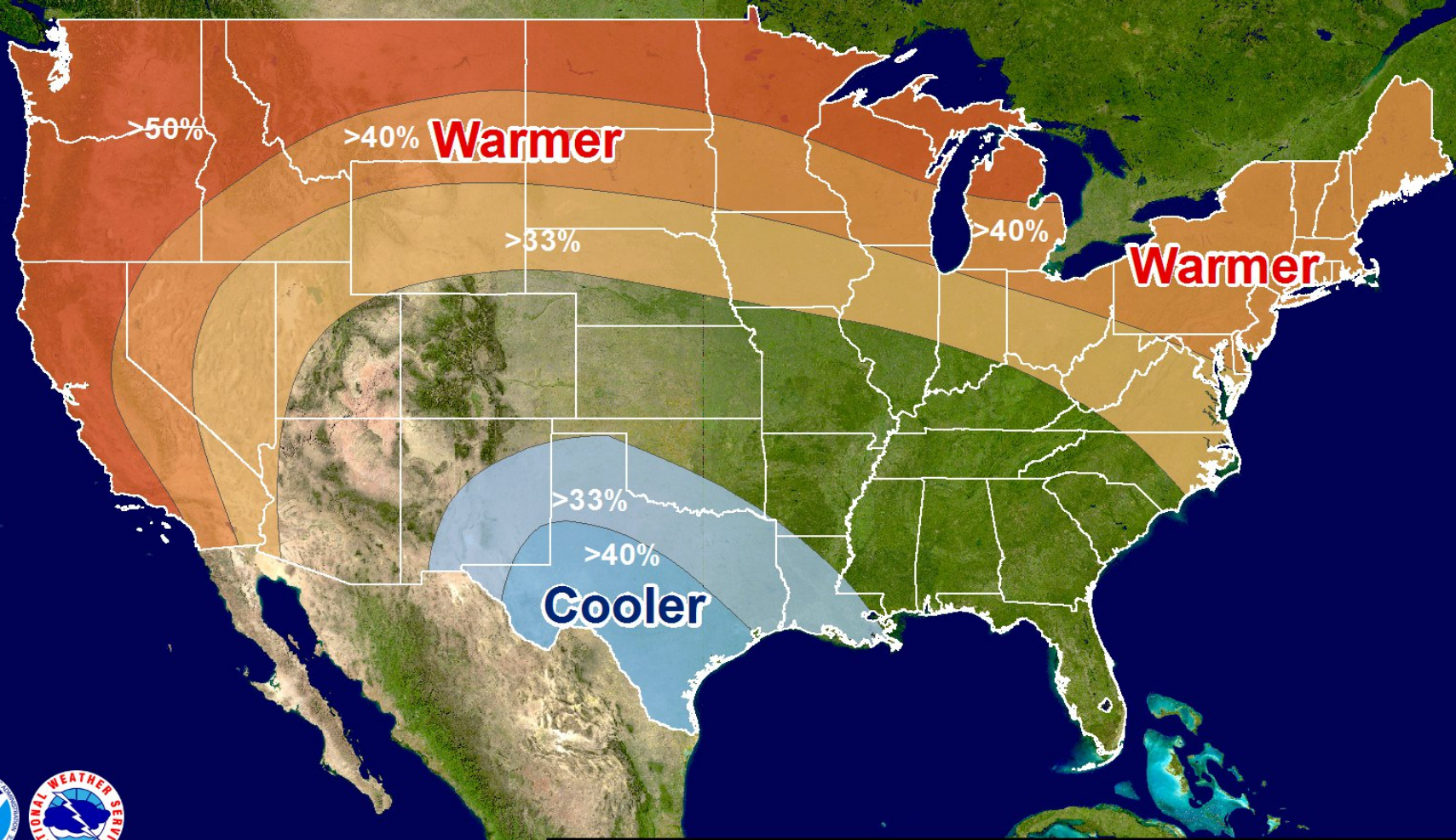
Weak El Niño or La Niña; strong hydro response



Instantaneous peak flow and total annual flow volume, plotted with positive Oceanic Niño Index (ONI) for USGS gaging station #11182500 (San Ramon Creek at San Ramon, CA), Contra Costa County, California. Not all "El Niño" years correspond to high annual flow volume nor high peak discharge.

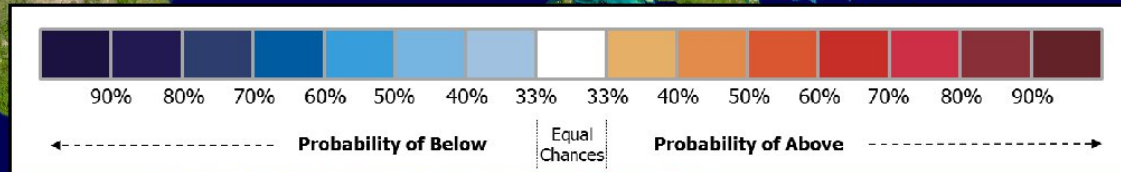
# Seasonal Temperature Outlook

Nov-Dec-Jan 2015-2016



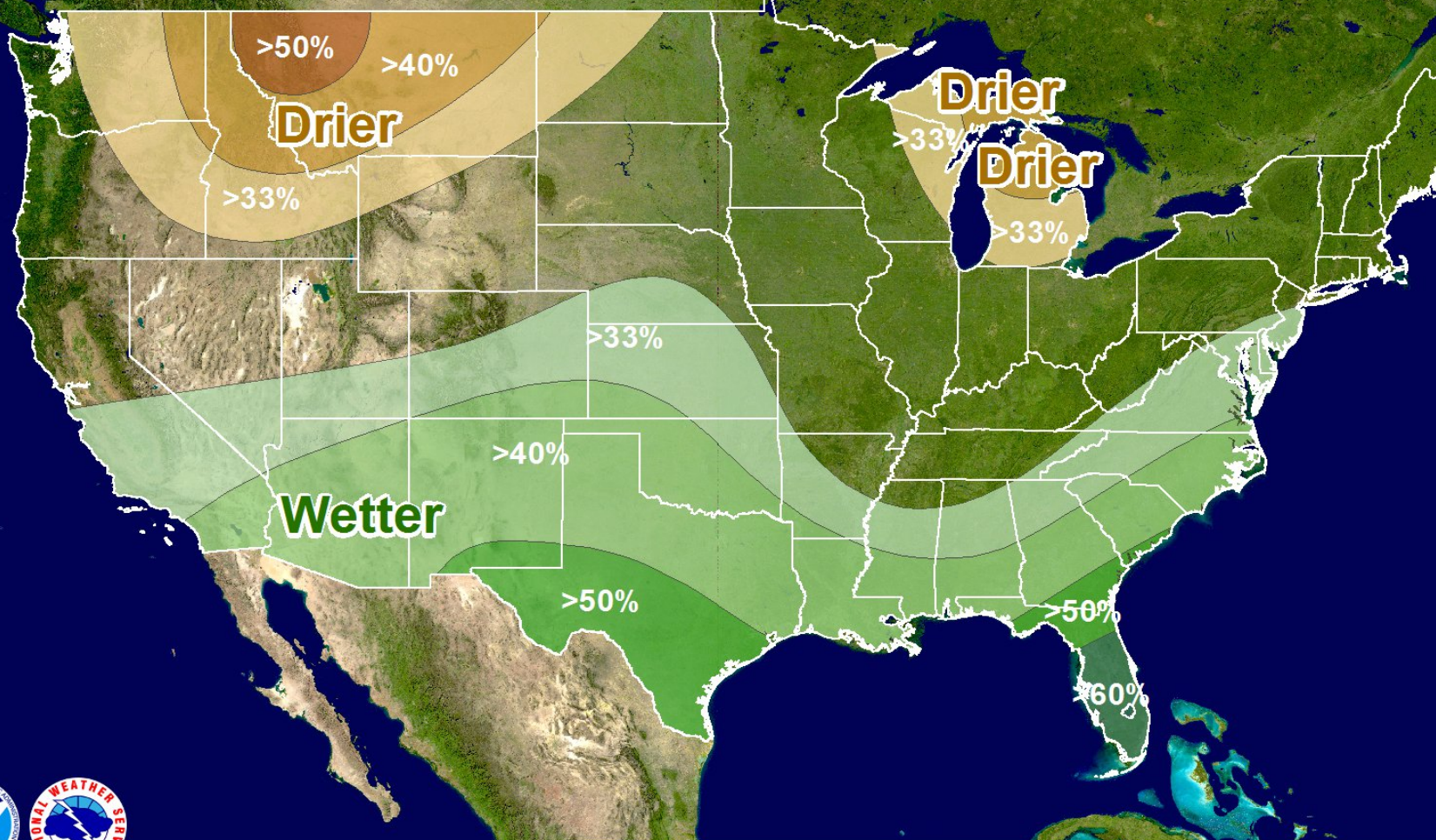
Climate Prediction Center

Issued: 10/15/15



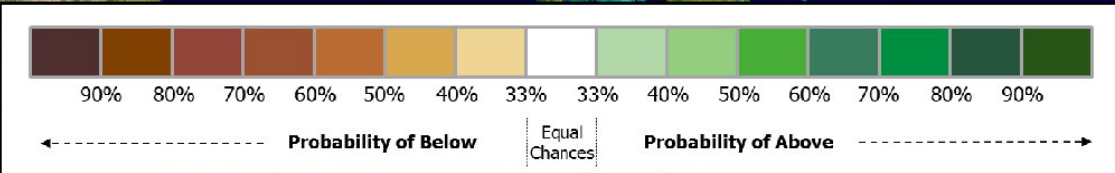
# Seasonal Precipitation Outlook

Nov-Dec-Jan 2015-2016



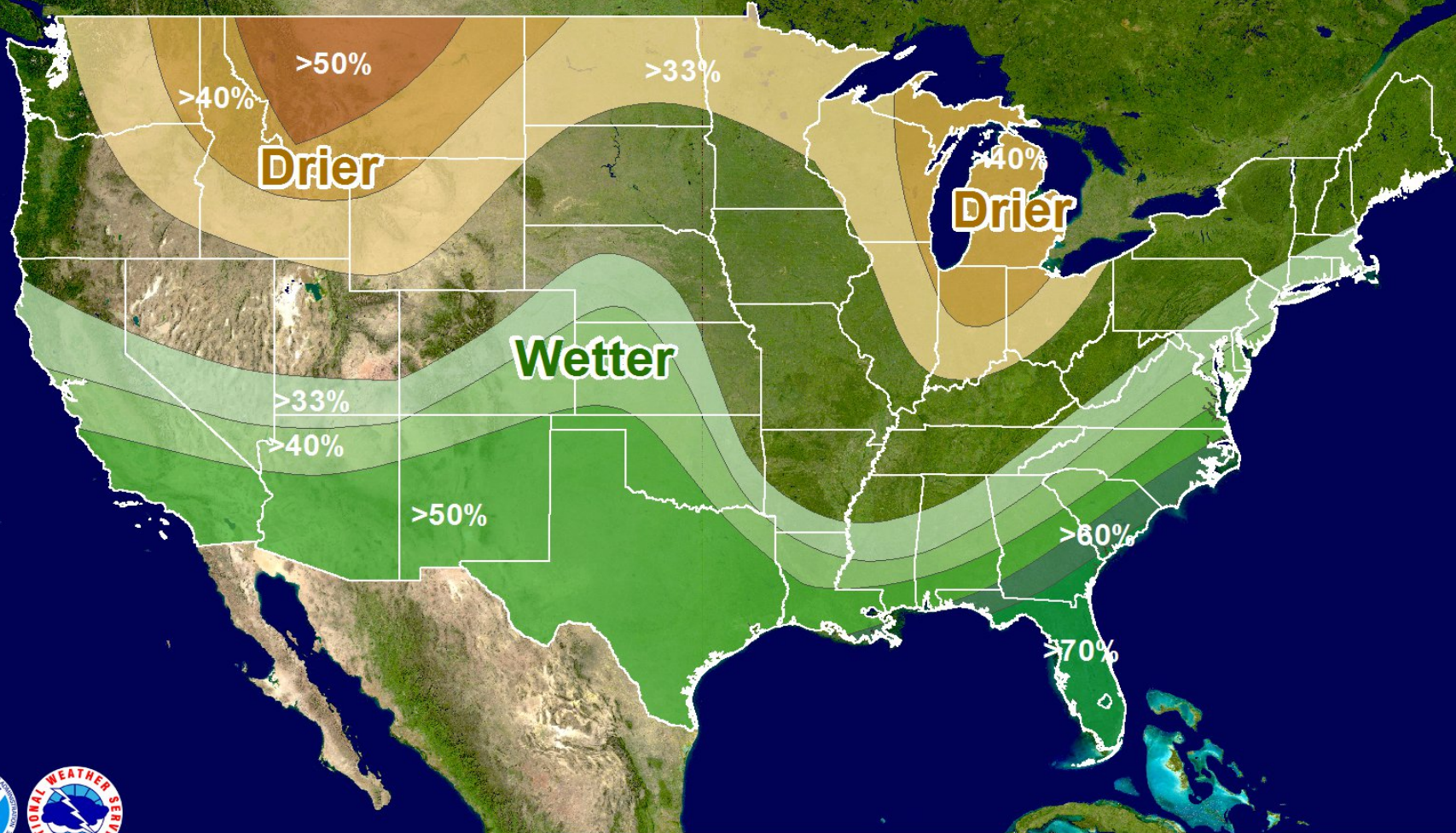
Climate Prediction Center

Issued: 10/15/15



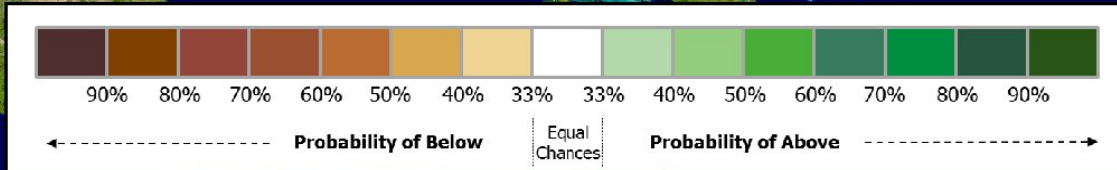
# Seasonal Precipitation Outlook

Dec-Jan-Feb 2015-2016



Climate Prediction Center

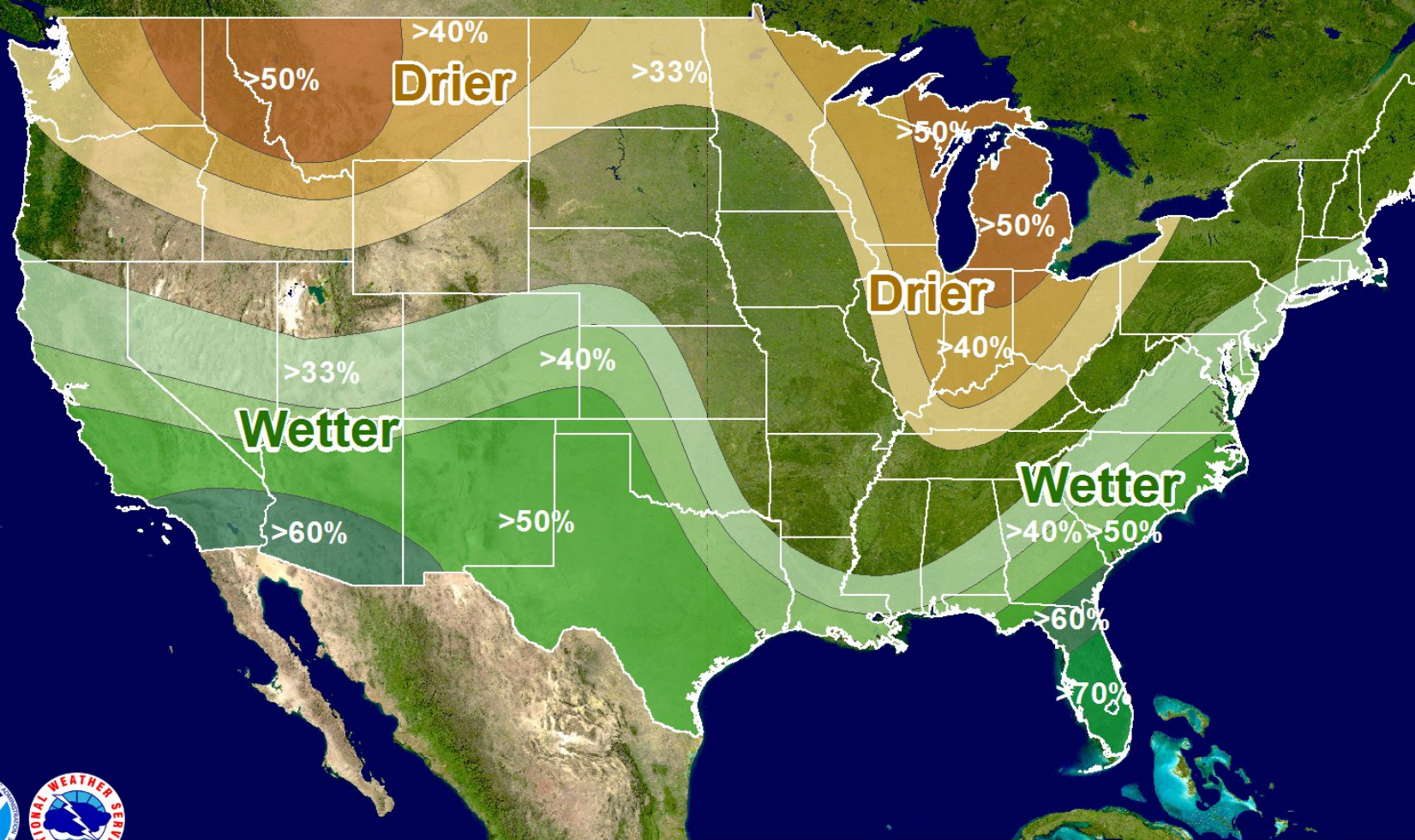
Issued: 10/15/15





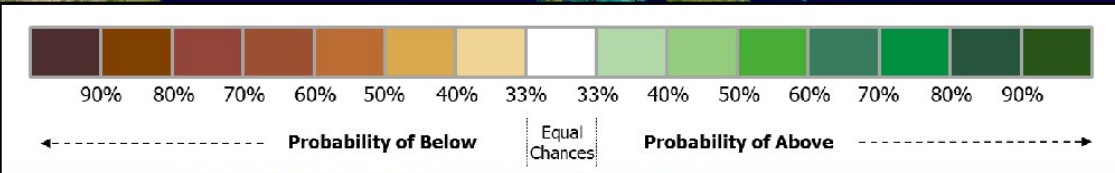
# Seasonal Precipitation Outlook

Jan-Feb-Mar 2016



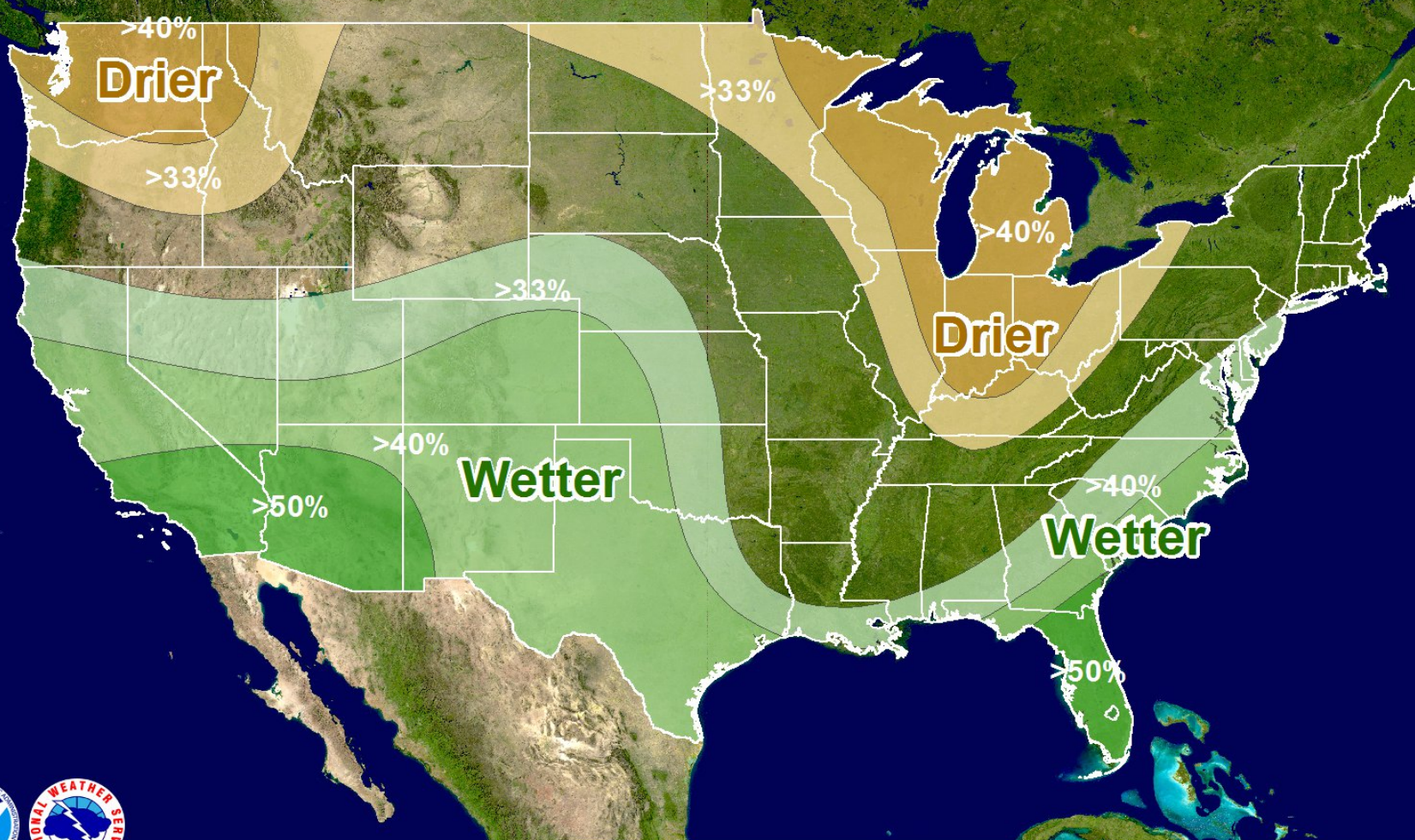
Climate Prediction Center

Issued: 10/15/15



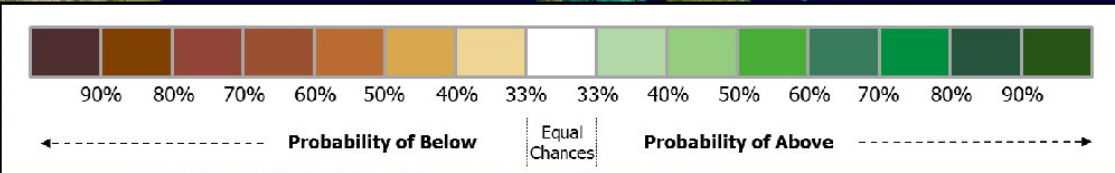
# Seasonal Precipitation Outlook

Feb-Mar-Apr 2016



Climate Prediction Center

Issued: 10/15/15



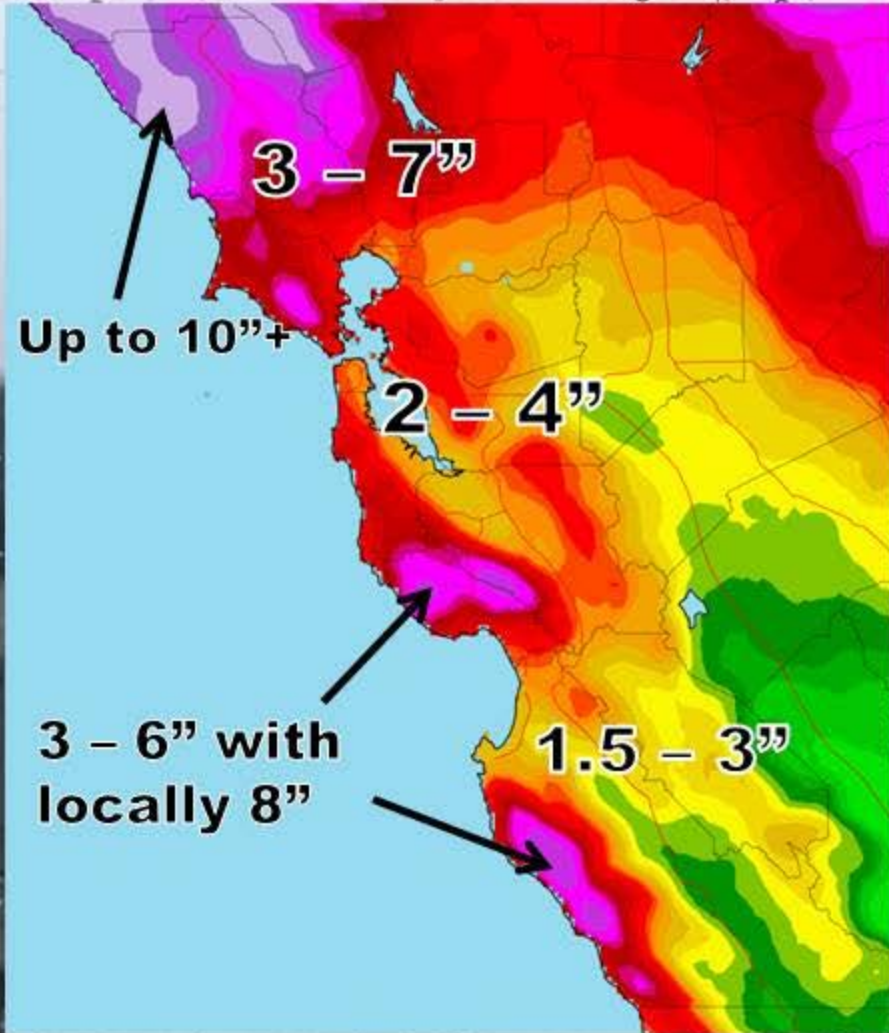
# Weather Topics

***Flood Forecasting***

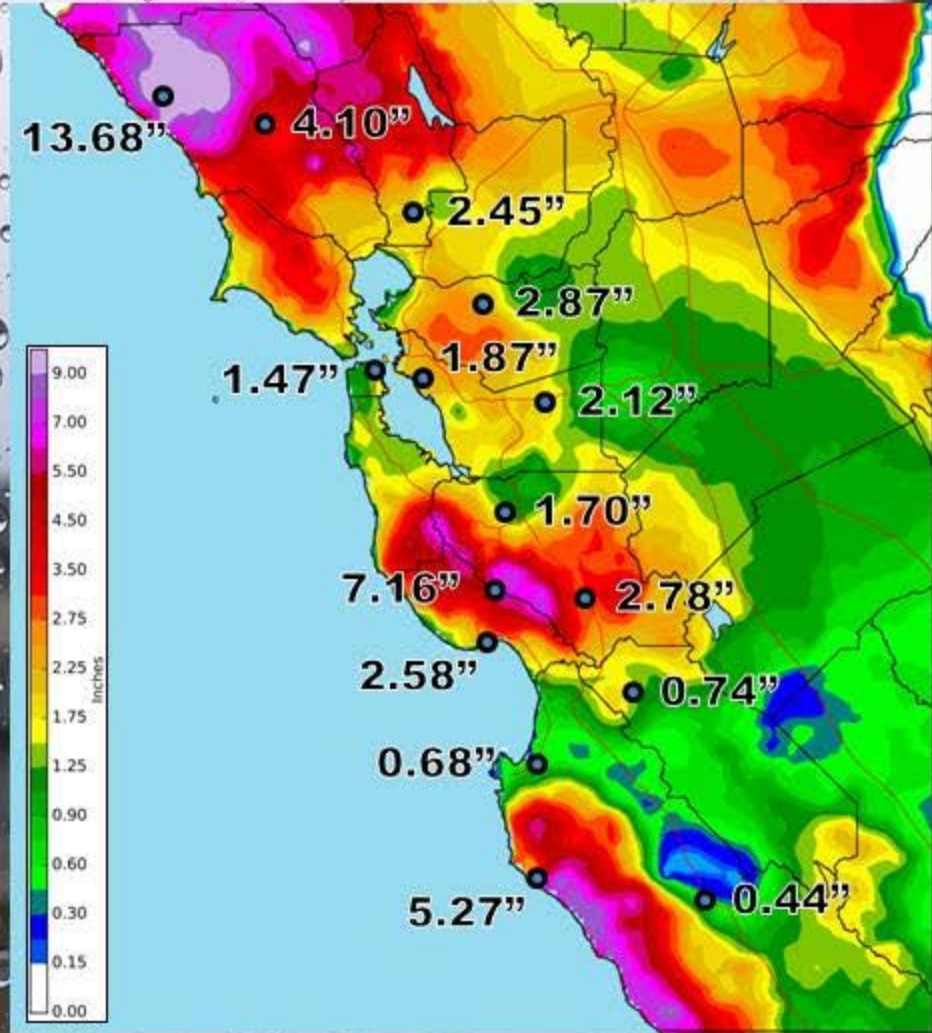


# Forecast Comparison

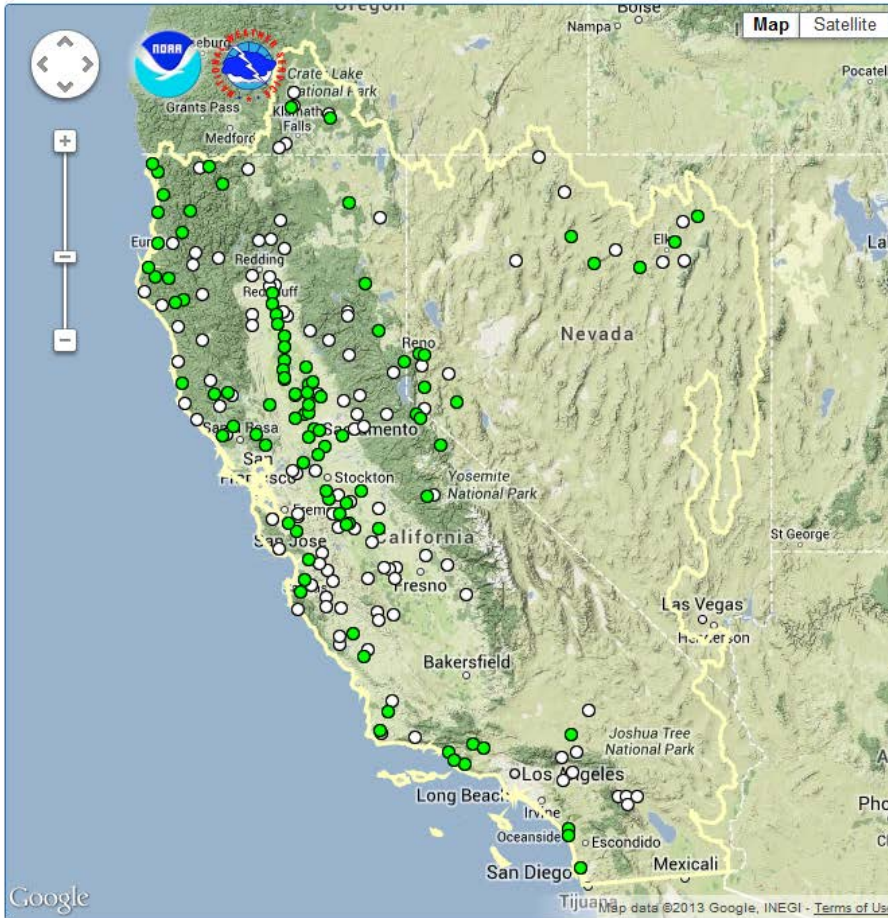
## Forecasted



## Storm Total



- Boundaries**  CNRFC Area of Responsibility  Counties  Drainage Basins  2013 Burn Areas



No Monitor or Flood Stage Available  
  94 Normal Conditions  
  0 Above Monitor Stage  
  0 Above Flood Stage  
  0 Above Danger Stage  
 The number inside each circle above represents the number of gages with forecast conditions inside that category.

[KML](#) [XML](#) File Downloads

River Forecast Data for Fcst and Other Pts

**Rivers/Reservoirs**

**Forecasts** Show only critical stages (fcst pts only)   
 Data updated: Thu Nov 07 2013 at 9:41 AM PST  
 Ens. fcst updated: Thu Nov 07 2013 at 7:49 AM PST  
 Forecast Points  Other Points  Ensemble

**Observed Data**  
 Data updated: Thu Nov 07 2013 at 9:36 AM PST

**Forecast Points** Show only critical stages   
 Latest Hour  1 Hr Ago  2 Hrs Ago  3 Hrs Ago

**Other Points**  
 Latest Hour  1 Hr Ago  2 Hrs Ago  3 Hrs Ago

**Reservoirs**  
 Latest Hour  1 Hr Ago  2 Hrs Ago  3 Hrs Ago

[Water Resources](#)

[Snow Data](#)

[Observed Precipitation](#)

[Forecast Precipitation](#)

[Observed Temperatures](#)

[Forecast Temperatures](#)

[Freezing Levels](#)

[Flash Flood Guidance](#)

[Water Temperatures](#)



Disclaimer



# National Weather Service Advanced Hydrologic Prediction Service

water.weather.gov/ahps2/index.php?wfo=mtr

Home

News

Organization

Local weather forecast by "City, ST"

City, ST  Go

Adjacent Areas:



National Conditions  
Rivers  
Satellite  
Climate  
Observed Precip

Local Conditions  
Warnings  
Weather  
Forecast  
Radar

AHPS Documentation  
User Guide  
User Brochure

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Ask Questions



National Observations

WFO Observations

Notice: New features, functions, and enhancements to AHPS pages as of 8/11/2015. [Click here for details](#)

Weather Forecast Office San Francisco Bay Area

River Observations

River Forecast

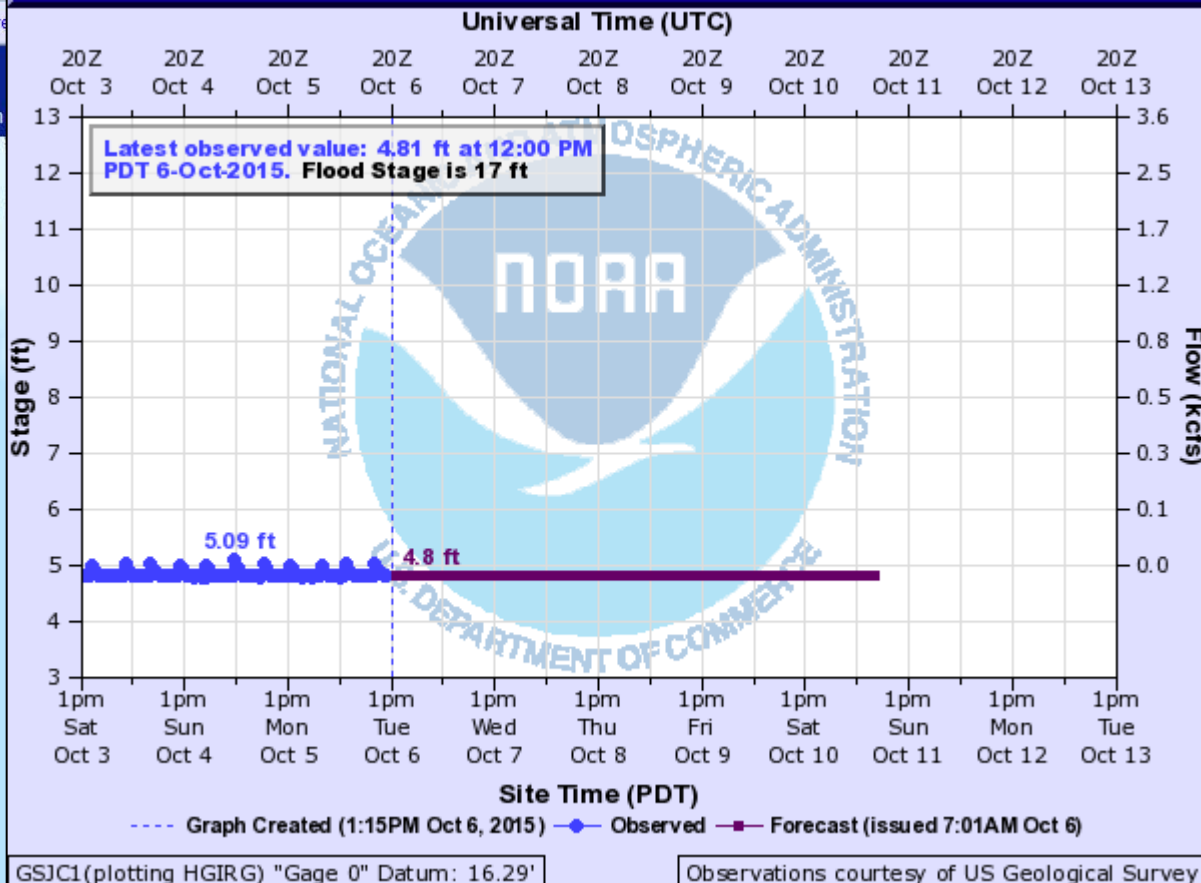
Auto Refresh: OFF



175 total gauges 0 gauges in



## GUADALUPE RIVER (CA) ABOVE HWY 101 AT SAN JOSE



# Warning Dissemination:

Flash Flood Watch (1-2 days out)

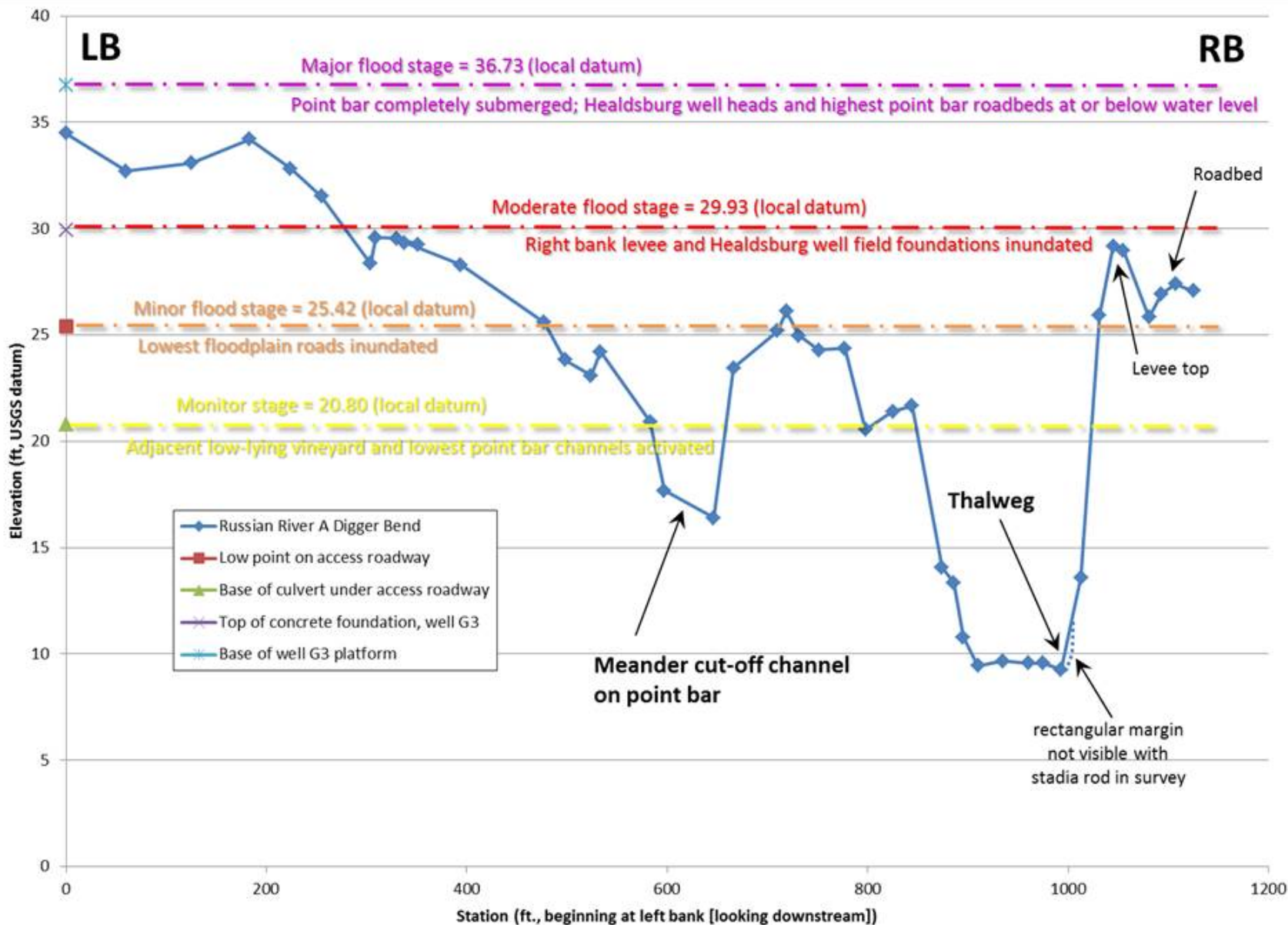
Flood Watch



- Urban/Small Stream Advisory
- Flash Flood Warning
- Flood Warning (forecast points)

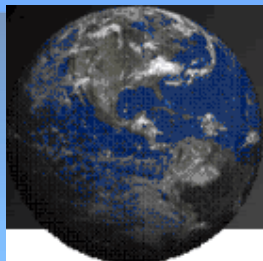


**Flash Flood Emergency**





# How we can help each other...



## Strengthening Partnerships WRN Ambassador Initiative

### What organizations can be a part of and contribute toward building a Weather-Ready Nation?

- ✔ All levels of government
- ✔ Weather, Water, Climate Enterprise
- ✔ Academia
- ✔ Businesses & non-profits

### Formal recognition of organizations that work with NOAA toward building a Weather-Ready Nation

- ✔ Promote WRN messages and themes
- ✔ Engage with NOAA on potential collaborations
- ✔ Share success stories
- ✔ Serve as an “Example”



Visit: [www.noaa.gov/wrn](http://www.noaa.gov/wrn)

# Weather Topics

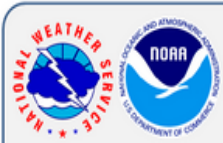
***Decision Support Services***

# NWS Decision Support Services

Services provided by NWS to support your decisions.

- Heads Up Email Briefings
- Conference Calls
- Exercise participation and support
- Emergency Response Support
- Large Event Public Safety Support

# Heads Up Email Briefings



NOAA – National Weather Service  
San Francisco Bay Area – Monterey, CA  
831.656.1724 [www.weather.gov/sanfrancisco](http://www.weather.gov/sanfrancisco)  
@nwsbayarea

## Overview

*A strong ridge of high pressure over the Western states will produce unseasonably warm weather for the next several days. Temperatures will be warmest on Thursday and highs will be near record-setting with interior locations well into the 90s. This will be the first widespread hot weather of the year. Search #heatwave on Twitter and FB for additional information.*

## CONFIDENCE

- **High Confidence in near record heat for interior areas**
- **Low-Moderate Confidence in how close to the coast the 90s are.**

## UPDATED INFORMATION

- Updated high temperatures Wed/Thu and included info on Records (attached).

## TIMING

- Each day this week will steadily get warmer, with Thursday being the warmest day.
- Temperatures will cool considerably by Friday.

## LOCATIONS

- Hottest temperatures will be in the interior valleys of the area, especially in the valleys of southern Monterey County. 95-100 in the hottest interior valleys.
- Cooler on the immediate coast, but even 75-80 degrees in coastal locales.
- Overnight lows will remain 50-60 degrees in most locations.
- **MAJOR URBAN AREAS:**
  - San Francisco/Oakland: 75-85 Wed/Thu
  - San Jose: 85-95 Wed/Thu

Not on the list? See me to be added.

# Emergency Response Support

- Remote
  - Call us when you have specific emergency response needs (fire, hazmat, SAR, and more)
  - We can provide spot forecasts, verbal or email summaries and briefings of conditions.
- Onsite
  - We have incident meteorologists – trained in ICS structure, EM courses, giving briefings, etc.
  - We can serve as a Technical Specialist in your planning section during an EOC activation
  - **New: BAER and post-fire flooding and debris flow/slope stability support from your NWS Hydrologist**

# NWS Website Highlights

**NWS Enhanced Data Display v4.0**  
A Product of the Charleston, WV Weather Ready Nation Pilot Project  
\*\*\*Experimental\*\*\*

Interface: Advanced

Quick Layers: Clear All

Radar: [Icons]

Satellite: [Icons]

Hazards: [Icons] Backup

Tropical: [Icons]

Rivers: [Icons]

Grid Forecast: [Icons]

Observations: [Icons]

Upper Air: [Icons]

Model Spread: [Icons]

Webcams: [Icons]

Outlooks: [Icons]

Background: ESRI Nat Geo

More Layers Quick Links

Layer Tree

Opacity: [Slider]

Search for a layer by name...

- Boundaries
- Boundaries (Specific)
- Climate
- Demographics
- Experimental
- Fire Weather
- Hazards
- Hydrology
- Marine
- Models

**Hazard Watch**

Filter by: Filters Disabled Age: 3 minutes

Action	Phenomenon	Signifi...	Ends in	Populat...	State	Office Long N...
CON	High Wind	Warning	1d 3h	7,453,620	CA	San Diego
CON	High Wind	Warning	1d 1h	2,488,149	CA	Los Angeles/C
CON	Red Flag	Warning	1d 6h	10,477,3...	CA	Los Angeles/C
CON	Red Flag	Warning	6h 13m	121,450	NV	Las Vegas
CON	Red Flag	Warning	1d 6h	6,278,258	CA	San Diego
EXT	Red Flag	Warning	6h 13m	206,859	AZ	Phoenix
EXB	Red Flag	Warning	6h 13m	81	AZ	Phoenix
CON	Red Flag	Warning	3h 13m	4,543,679	AZ	Phoenix

1 of 16 rows

Elevation: 2845 ft / 867.3 m  
Lat: 35.67379, Lon: -118.40436

NWS Chat

Terms of Use F00'W 121°30'W 121°00'W 120°30'W 120°00'W 119°30'W 119°00'W 118°30'W 118°00'W 117°30'W 117°00'W 116°30'W 116°00'W 115°30'W 115°00'W 114°30'W 114°00'W

State Overlay Map Storm Reports Save/Share

Privacy/POD

<http://preview.weather.gov/edd/>

# Social Media

<http://twitter.com/nwsbayarea>

[www.youtube.com/nwsbayarea](http://www.youtube.com/nwsbayarea)



NWS San Francisco Bay Area/Monterey, CA

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All activities



NWS San Francisco Bay Area/Monterey, CA uploaded and posted

Customize your message



**Update on Drought Conditions Across Our Area**

1 month ago • 943 views

This is the latest drought information across the San Francisco and Monterey Bay Region. It also includes a weather outlook through the third week in March....

CC



NWSBayArea uploaded a video



**MID STORM UPDATE**

2 months ago • 425 views

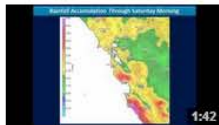
An overview on what happened overnight and what is forecast through the evening hours.

...

CC



NWSBayArea uploaded a video



**Update on Friday Storm System**

2 months ago • 329 views

Short video covering impacts of a Pacific storm system in the San Francisco and Monterey Bay Areas...

CC



PewDiePie

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JennaMarbles

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Smosh

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OneDirectionVEVO

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RihannaVEVO

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HolaSoyGerman

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# We are a resource for you!

***Mark Strudley***

***Hydrologist***

***San Francisco Bay Area National Weather Service***

**[mark.strudley@noaa.gov](mailto:mark.strudley@noaa.gov)**

**(831) 656-1710 x228 – My direct line**

**(831) 656-1717 24x7 Forecaster Support**

---

**National Weather Service**

***SF/Monterey Bay Area  
Weather Forecast Office  
Monterey, CA***

