



# California Climate and its impacts to fire conditions

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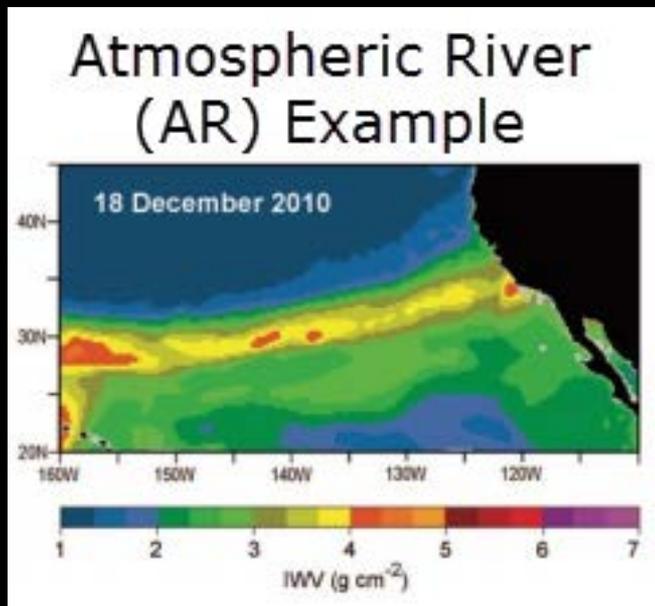
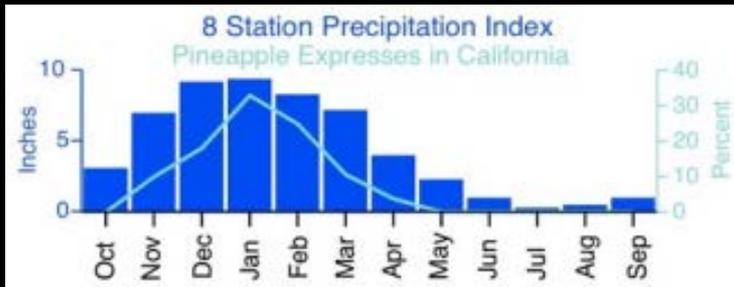
**National Weather Service**  
Serving the weather needs of Interior Northern California



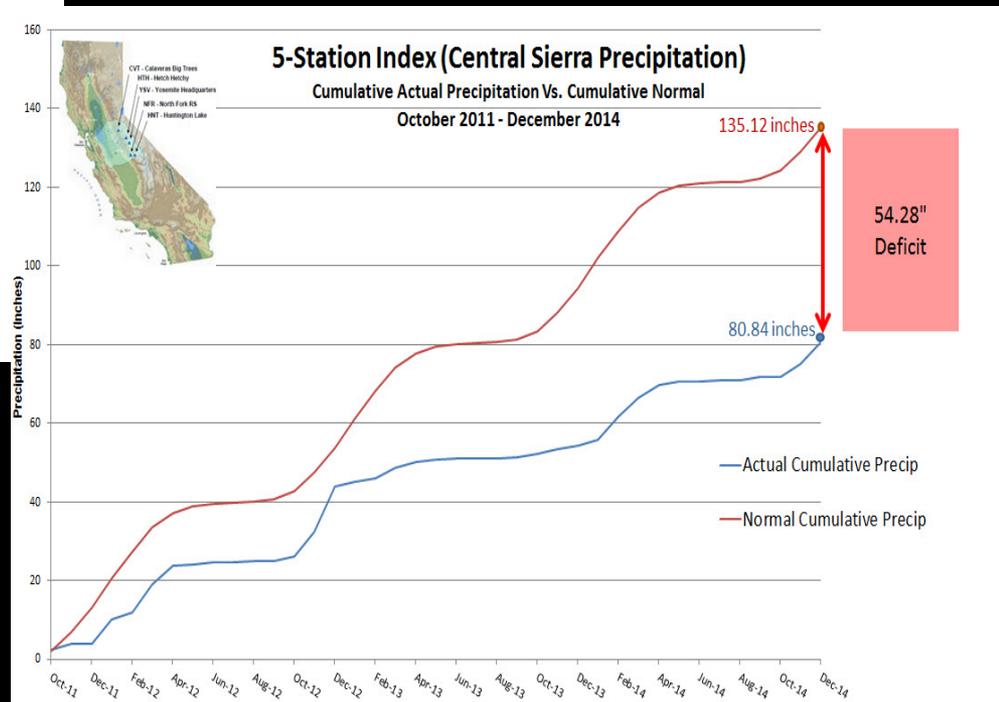
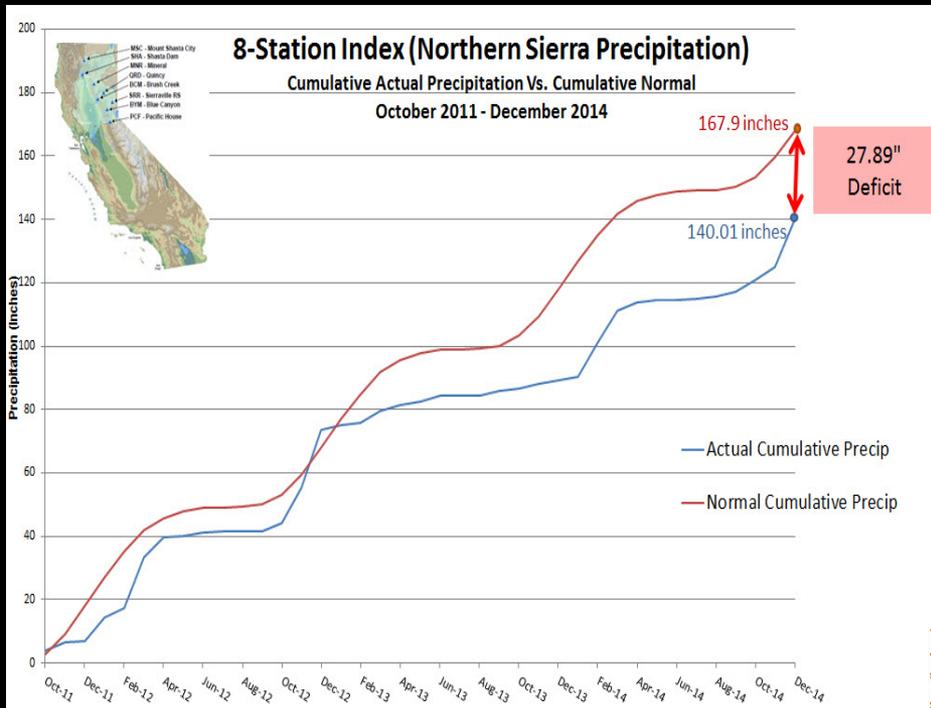


**LET'S LOOK BACK AT  
PRECIPITATION  
AND DROUGHT**

# California's Water Story:

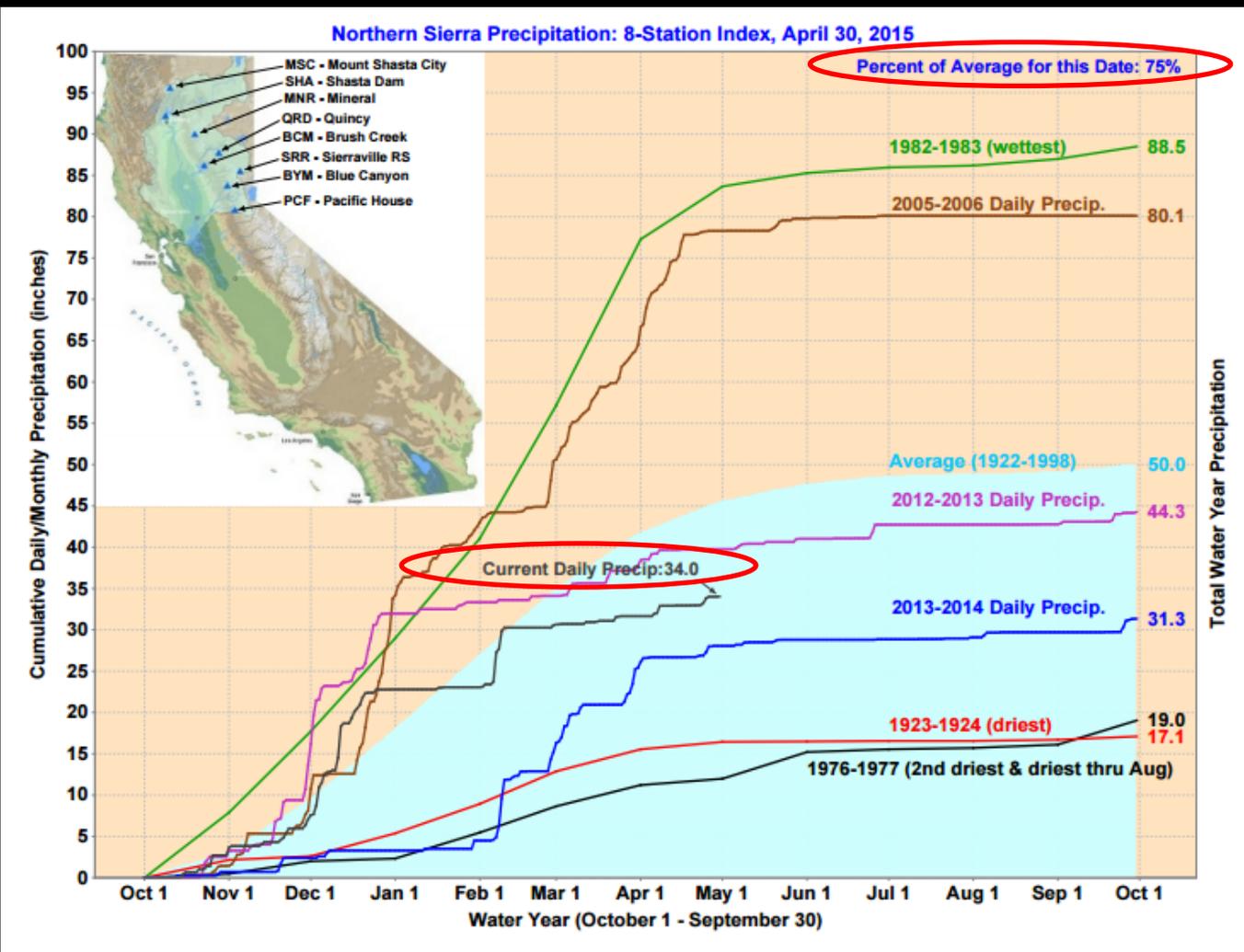


- Mediterranean Climate
  - About half the annual precipitation total arrives from December through February
- Winter storms come off the Pacific Ocean delivering rain and snow to California.
  - Some of these storms include moisture from Atmospheric Rivers (AR)
- On average 5-7 ARs contribute most of the precipitation during the wet months.
  - Last 4 water years, CA avg. was 2
- When more storms arrive, conditions are wetter; when fewer storms arrive, conditions are drier



## Past 3 Water Years – Big Picture

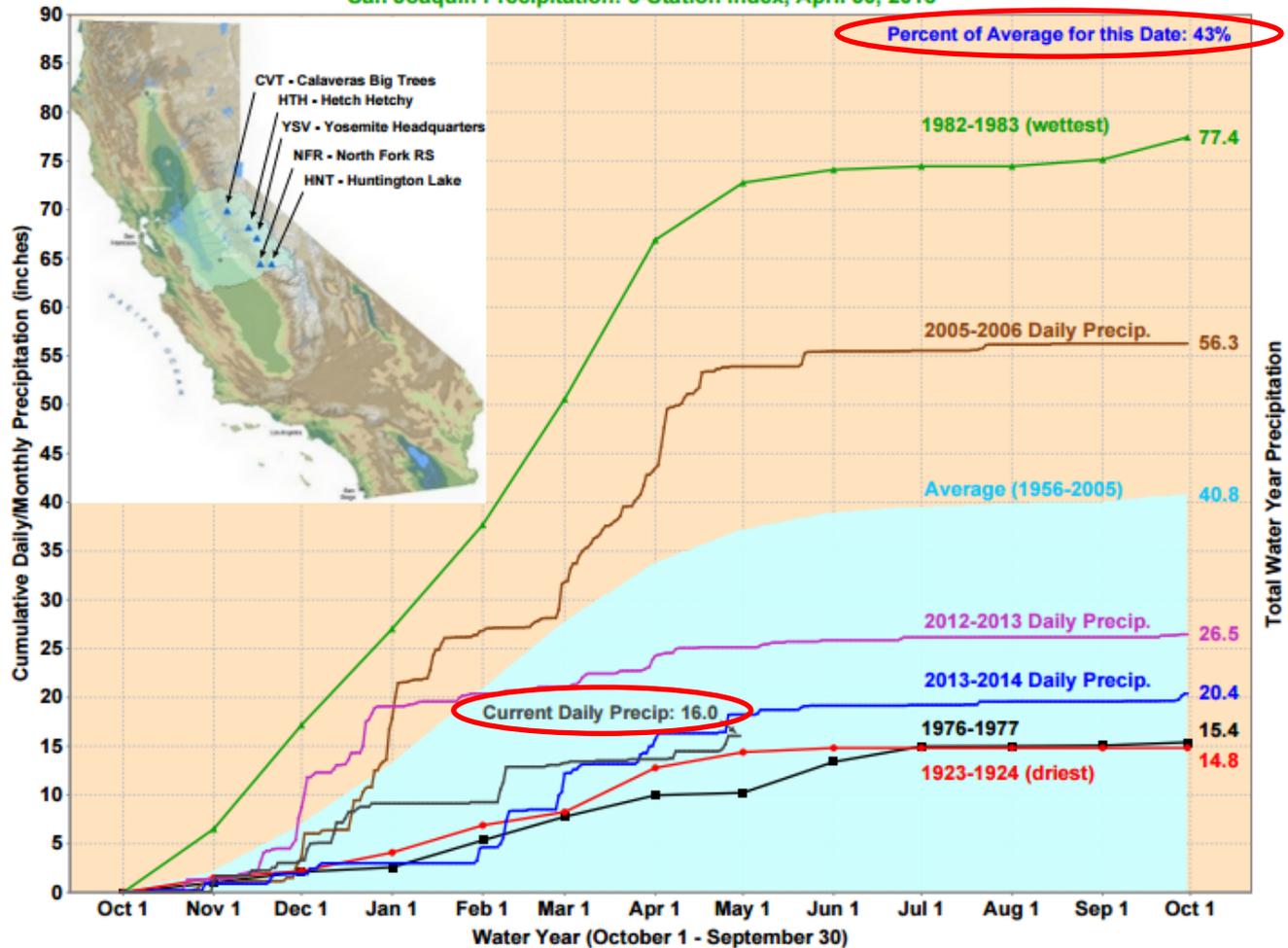
After three winters of below normal precipitation – 2014-15 is continuing that trend. We've also been very warm, with many month's breaking records for well above average temperatures. This results in high snow levels and much less snowpack in reserve



## Northern Sierra 8-Station Index

- ☀ So far this year 31.9" precipitation
- ☀ Last year 31.3" precipitation
- ☀ Average (1922-2008) = 50" precipitation

### San Joaquin Precipitation: 5-Station Index, April 30, 2015



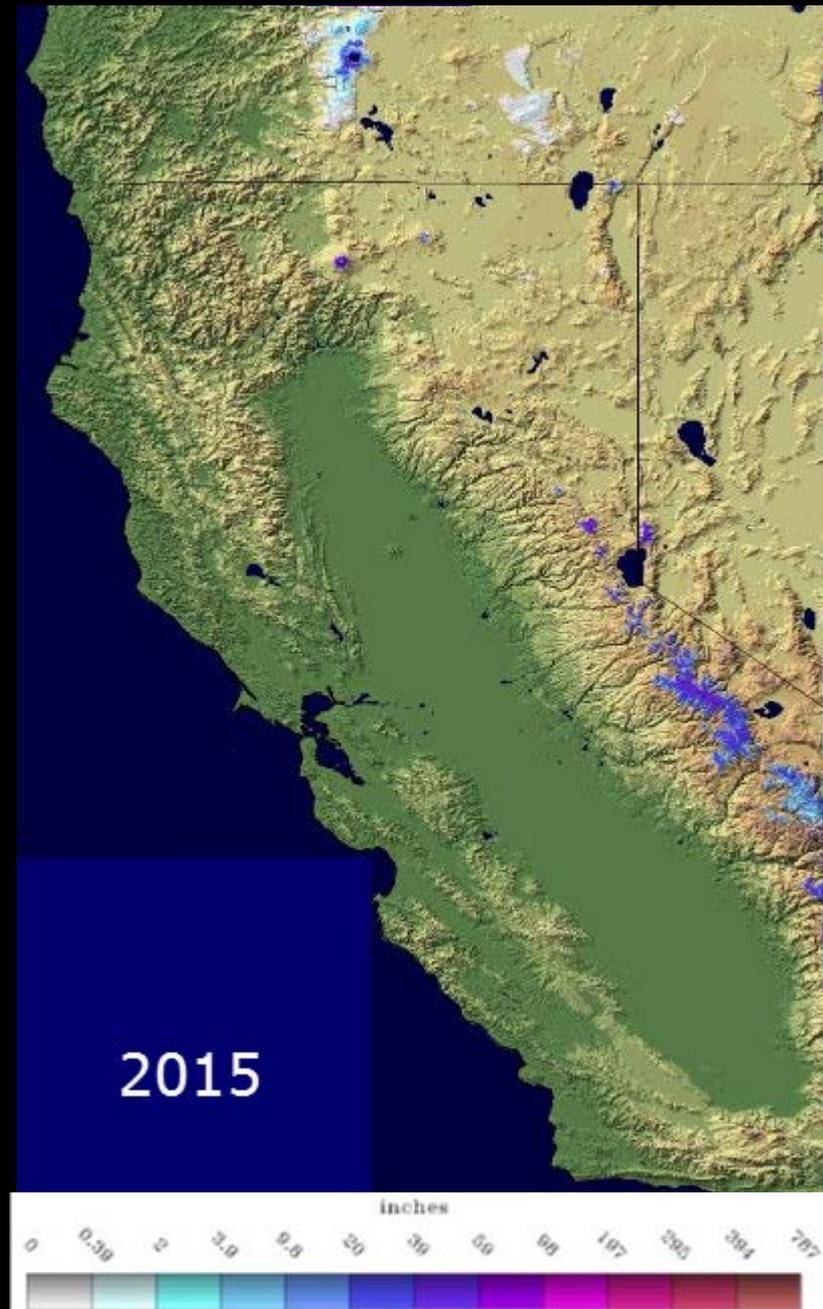
## Central Sierra 5-Station Index

- ☑ So far this year 13.7" precipitation
- ☑ Last year 20.4" precipitation
- ☑ Average (1961-2010) = 40.8" precipitation

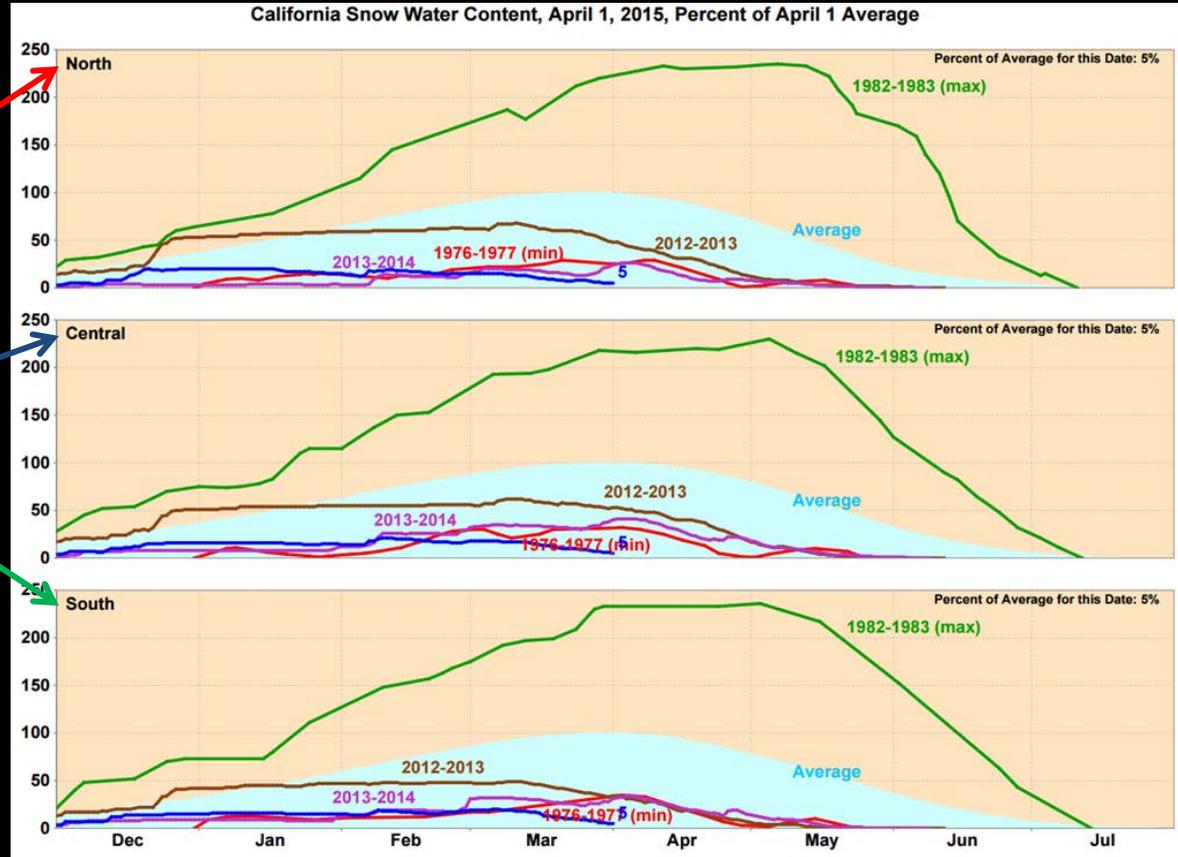
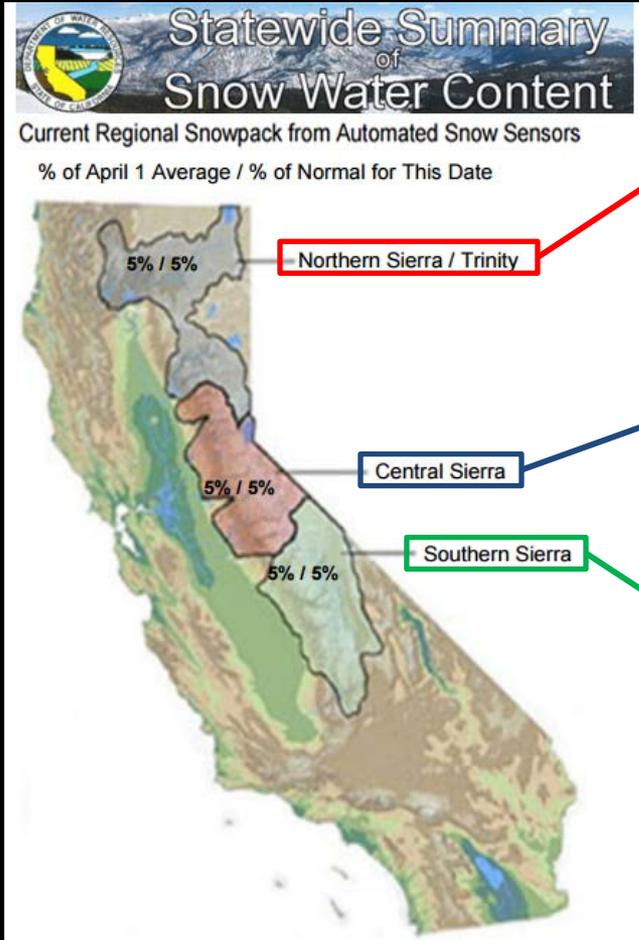
# California Snowpack April 1<sup>st</sup> 2011-2015

## Why is this Significant?

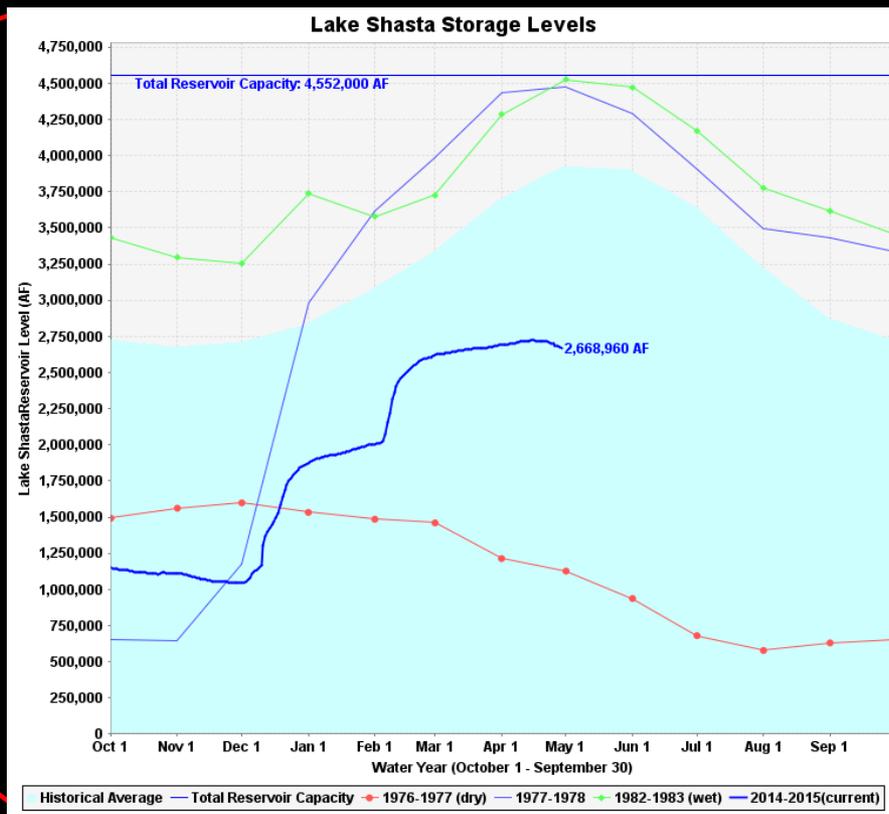
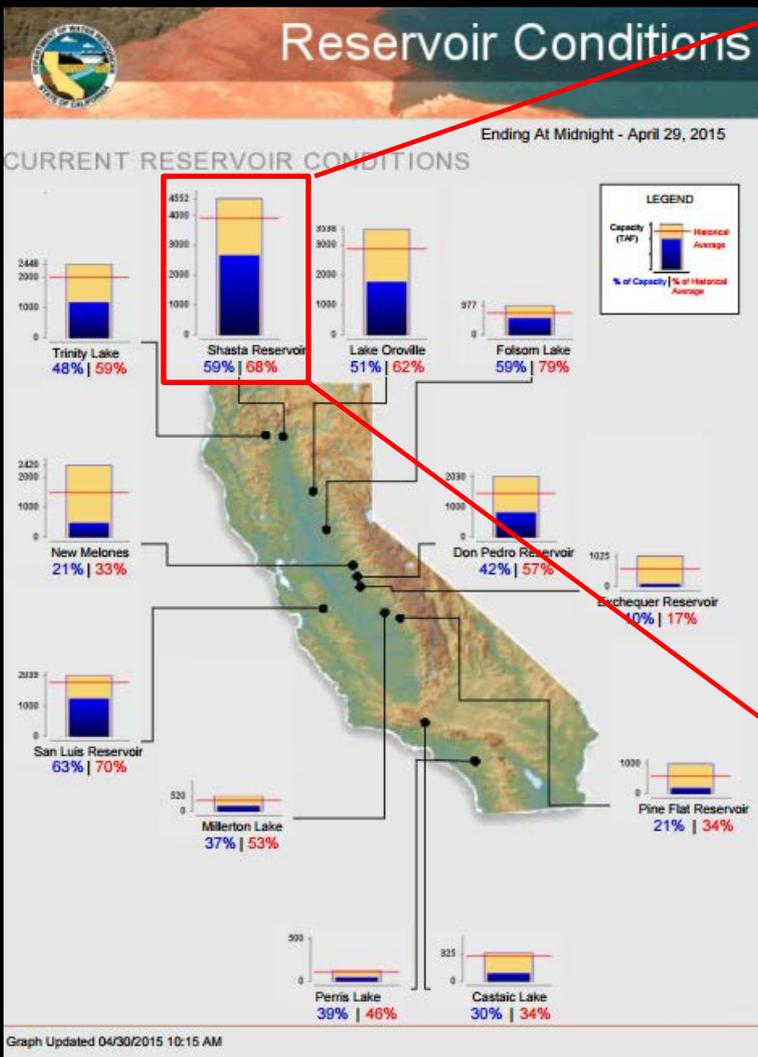
- Mountain snowpack act's as another giant reservoir
- Snowpack typically holds ~ 1/3 of CA water supply for the year
- Gradually melts off in the late spring and summer months, replenishing reservoirs
- No snowpack, no refill/reserve
- Impacts to economy (tourism) and environmental (fires)



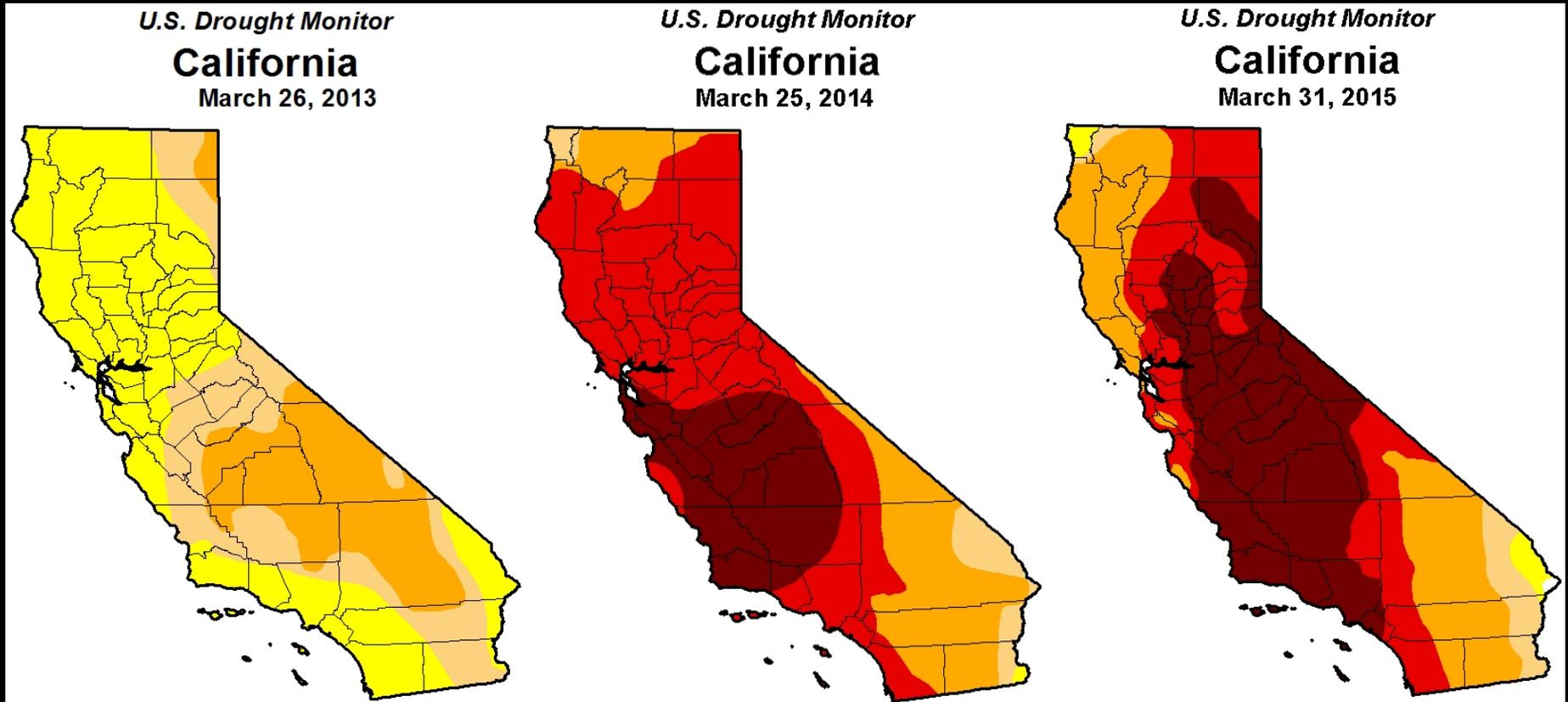
# What are the Latest Snow Water Content Numbers?



# California Reservoirs about half full.

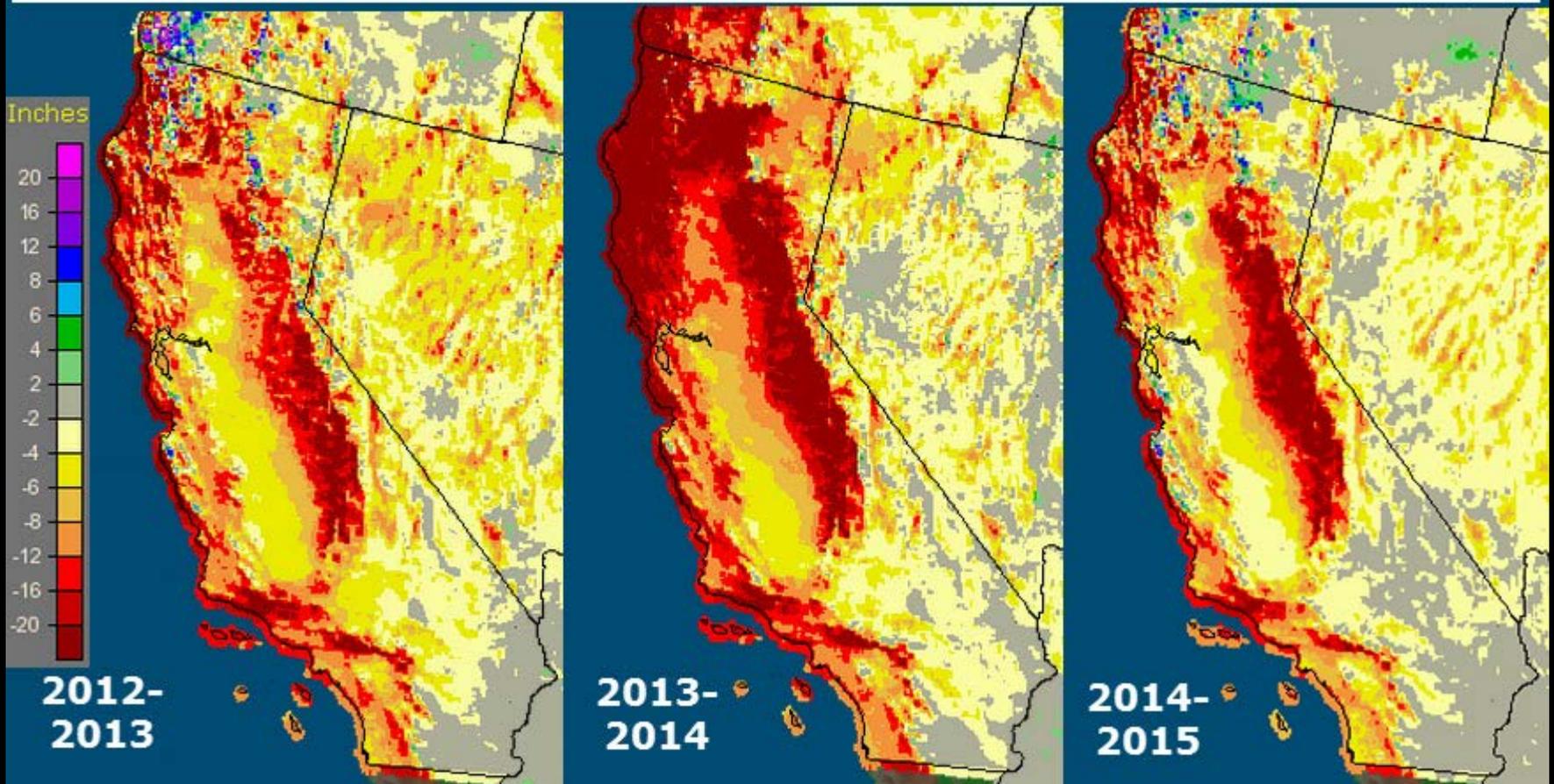


# Let's take a look at the Drought Monitor March 2013 to 2015



# Why did the drought intensify across CA

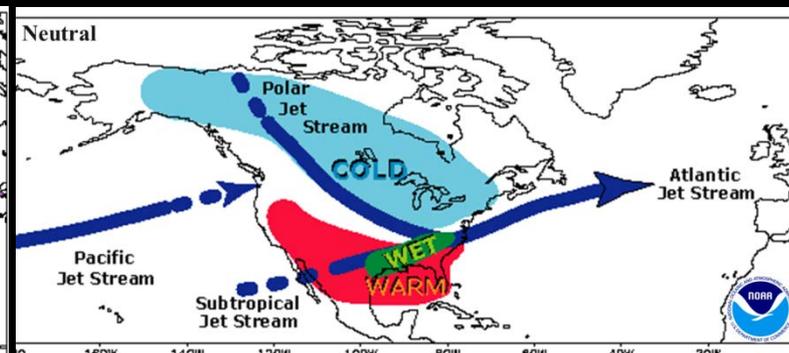
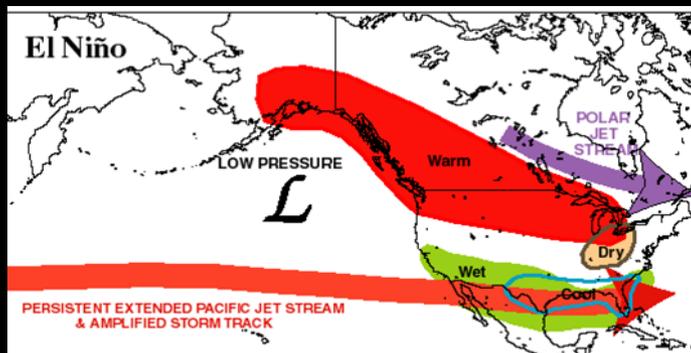
**Departure from Normal for Water Years 2012-2013, 2013-2014 and so far 2014-2015**



# Recent Winters

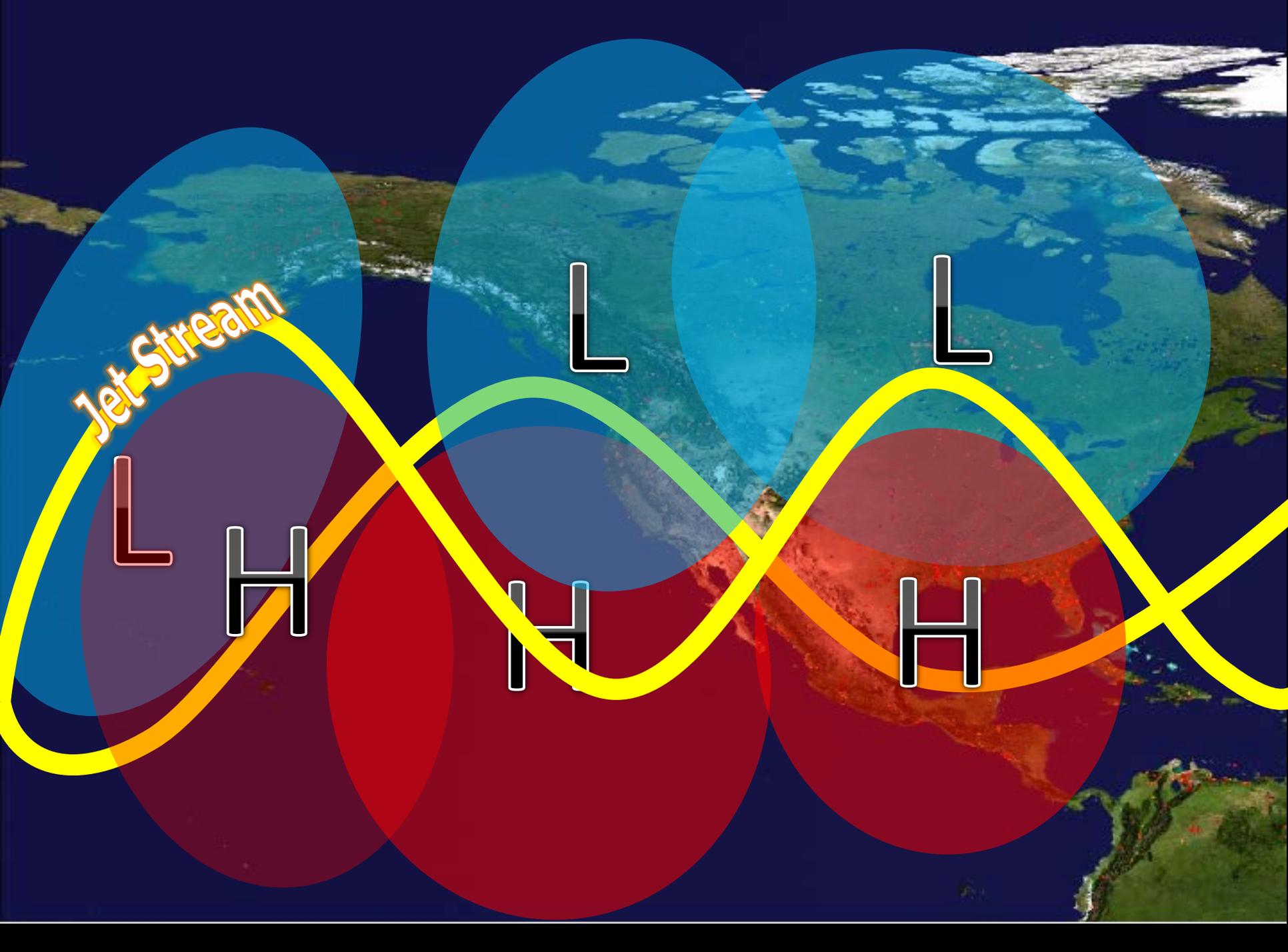
## ENSO Type and Sacramento/San Joaquin River Basin Runoff Type

- 2006-2007: **Weak El Niño** = Dry/Critical Dry
- 2007-2008: **Moderate La Niña** = Critical Dry/Critical Dry
- 2008-2009: **ENSO Neutral conditions** = Dry/Below Normal
- 2009-2010: **Moderate El Niño** = Below/Above Normal
- 2010-2011: **Strong La Niña** = Wet/Wet
- 2011-2012: **Weak La Niña** = Below Normal/Dry
- 2012-2013: **ENSO Neutral Conditions** = Dry/Dry
- 2013-2014: **ENSO Neutral Conditions** = Critical Dry/Critical Dry
- 2014-2015: **El Nino??? Neutral ???**





**SO WHAT CHANGED?**



Jet Stream

L

H

H

L

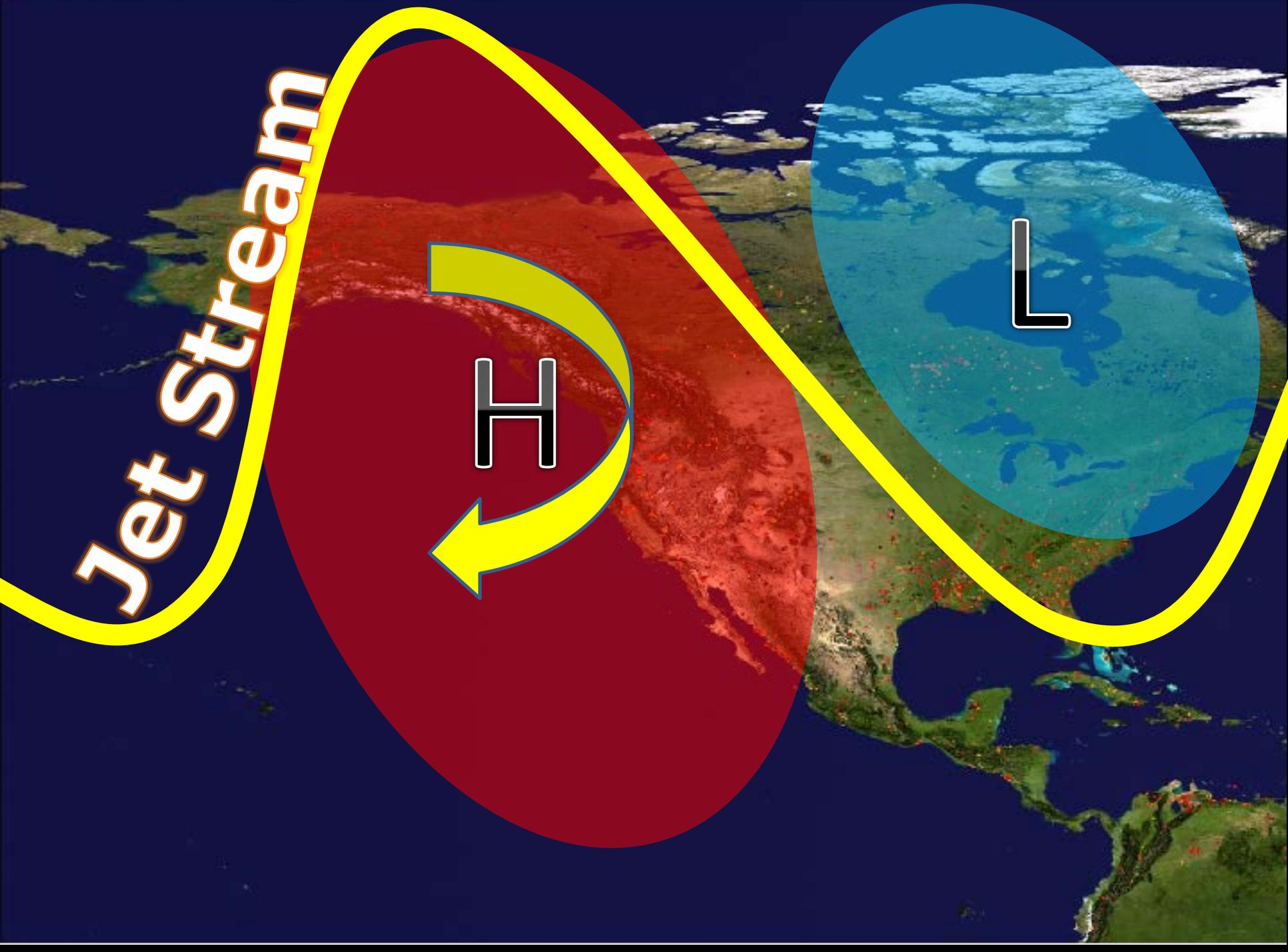
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**Jet Stream**

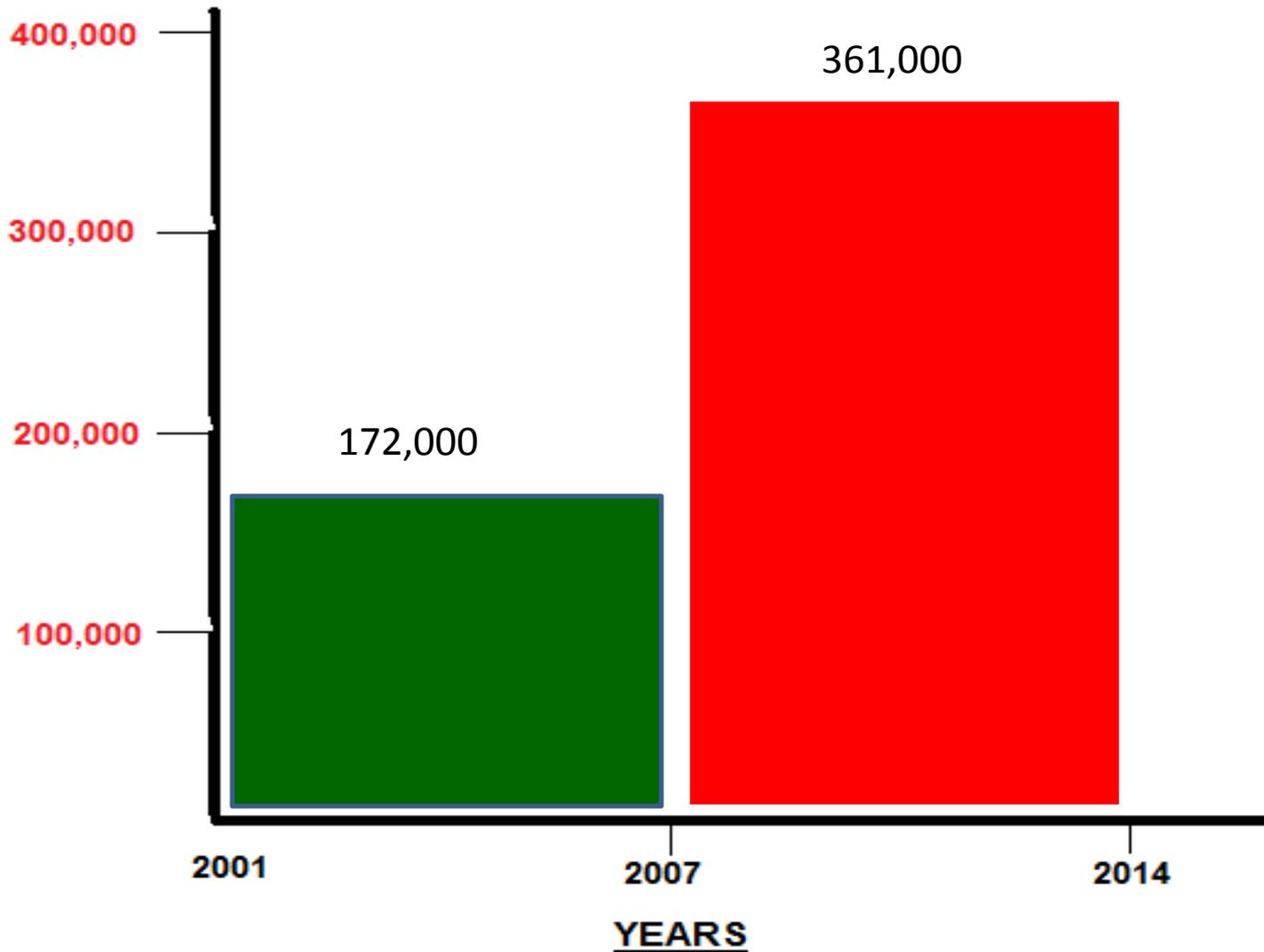
**H**

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# Northern California

Acres Burned





# **EL NINO UPDATE WEATHER & WATER OUTLOOK**

# Spring Prediction for 2015

*According to the Climate Prediction Center April 9th update:*

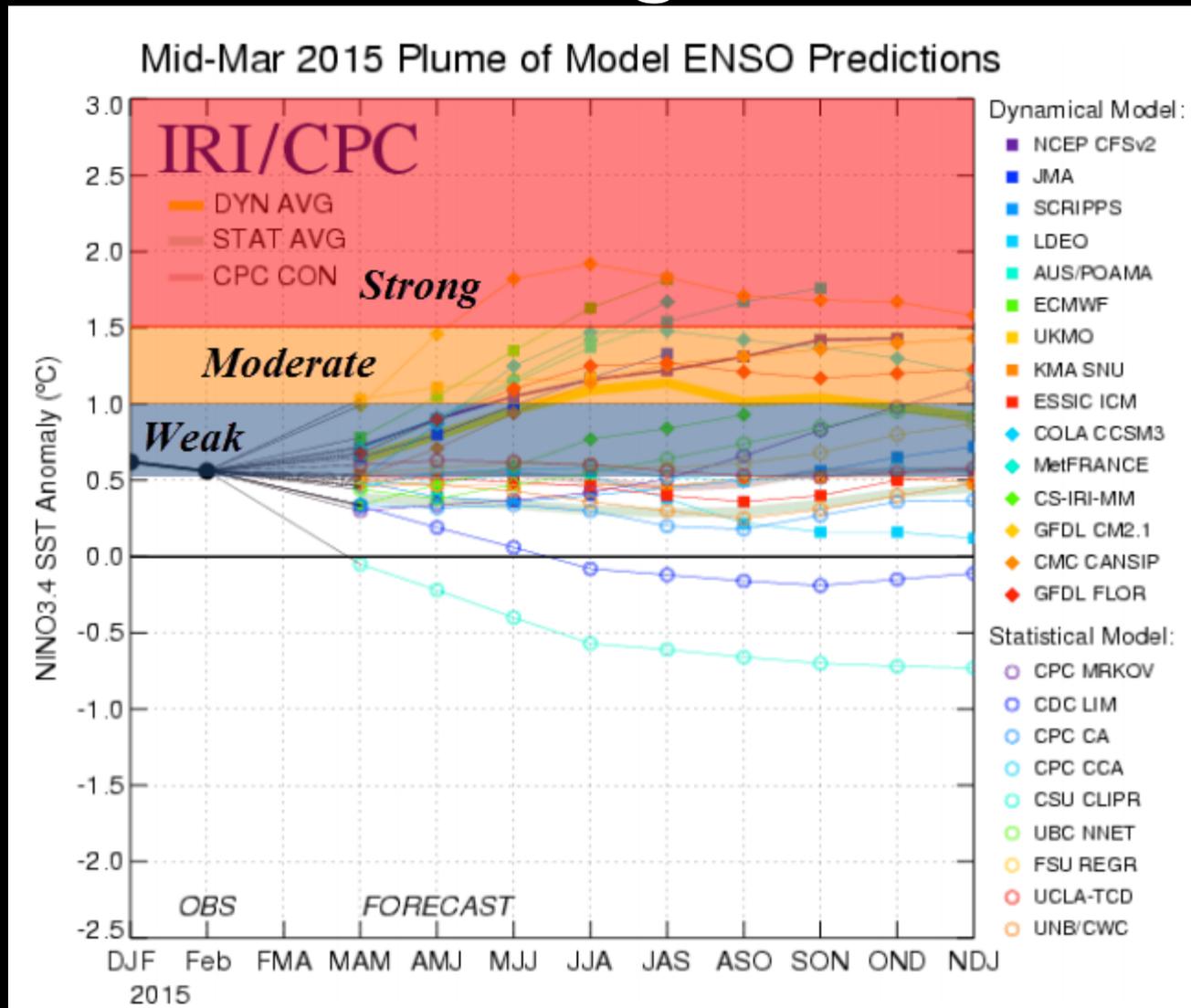
- **El Niño Advisory** (Weak El Niño)

There is an approximately 70% chance that El Niño will continue through Northern Hemisphere summer 2015

## Main takeaways:

- Model forecast skill tends to be lower during the Northern Hemisphere spring
- There is also considerable uncertainty as to how strong this event may become
  - California summers are dry and El Niño doesn't influence summer weather patterns
  - No improvement of the drought

# Latest Long Range models El Niño Strength Forecast



# Weak El Niño has no strong correlation to above normal precipitation for 8 station index

## Sacramento 8 Station Index ENSO Type vs Above Normal Precip

As of 11/12/2014

		SAC - 8 Station	
ENSO Type	# of Events	# Above Normal Precip	% Above Normal Precip
Strong El Nino	5	4	80%
Moderate El Nino	9	5	56%
Weak El Nino	7	4	57%
Neutral	22	8	36%

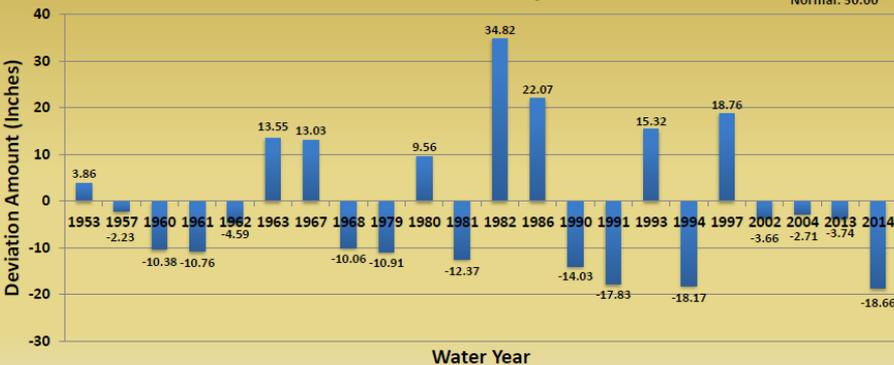
Weak El Niño Deviation From Normal Sacramento 8 Station Precipitation

Normal: 50.00"



Neutral Deviation From Normal Sacramento 8 Station Precipitation

Normal: 50.00"



# Weak El Niño has no strong correlation to above normal precipitation for 5 station index

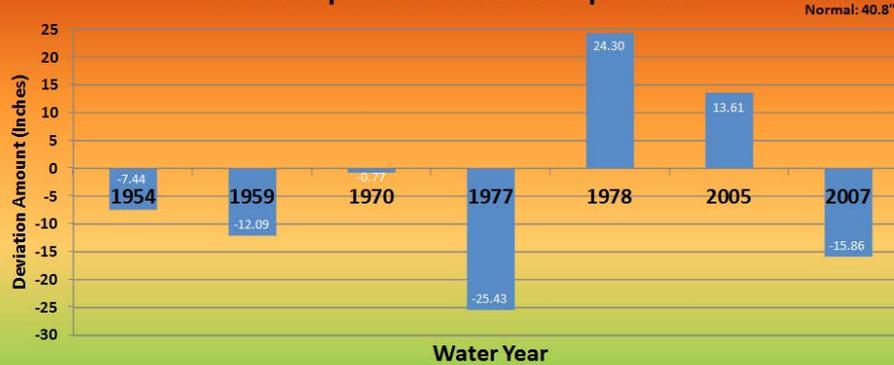
## San Joaquin 5 Station Index ENSO Type vs Above Normal Precip

As of 11/12/2014

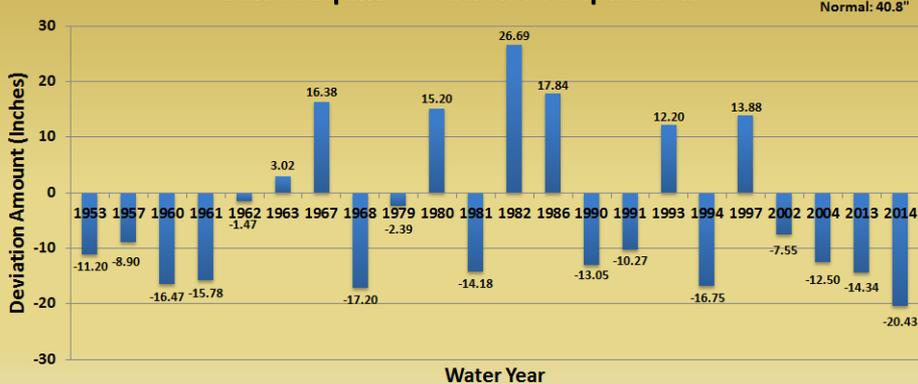
SJ - 5 Station

ENSO Type	# of Events	# Above Normal Precip	% Above Normal Precip
Strong El Nino	5	3	60%
Moderate El Nino	9	4	44%
Weak El Nino	7	2	29%
Neutral	22	7	32%

Weak El Niño Deviation From Normal San Joaquin 5 Station Precipitation

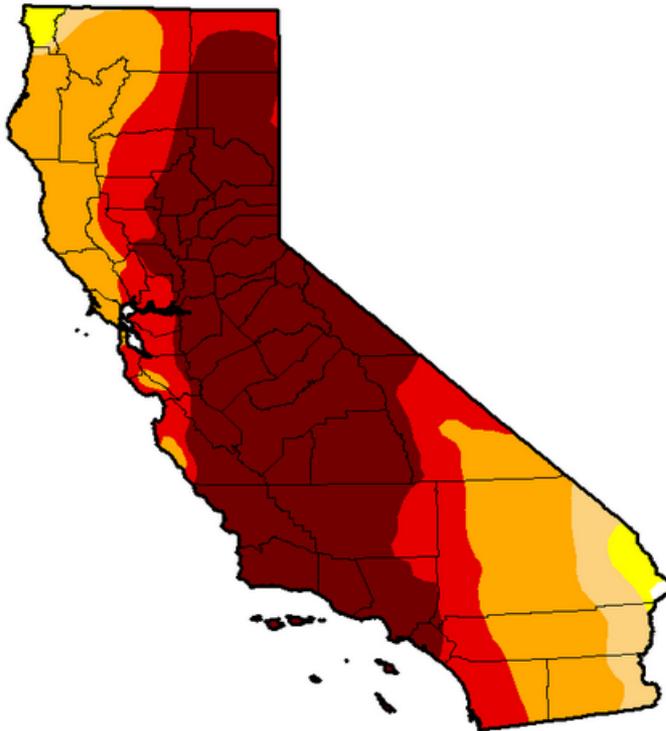


Neutral Deviation From Normal San Joaquin 5 Station Precipitation



# U.S. Drought Monitor California

**April 28, 2015**  
(Released Thursday, Apr. 30, 2015)  
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	0.14	99.86	98.11	93.44	66.60	46.77
<b>Last Week</b> 4/21/2015	0.14	99.86	98.11	93.44	66.60	46.77
<b>3 Months Ago</b> 1/27/2015	0.00	100.00	98.13	94.34	77.52	39.99
<b>Start of Calendar Year</b> 12/31/2014	0.00	100.00	98.12	94.34	77.94	32.21
<b>Start of Water Year</b> 9/30/2014	0.00	100.00	100.00	95.04	81.92	58.41
<b>One Year Ago</b> 4/29/2014	0.00	100.00	100.00	96.01	76.68	24.77

Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

**Author:**  
Anthony Artusa  
NOAA/NWS/NCEP/CPC



<http://droughtmonitor.unl.edu/>

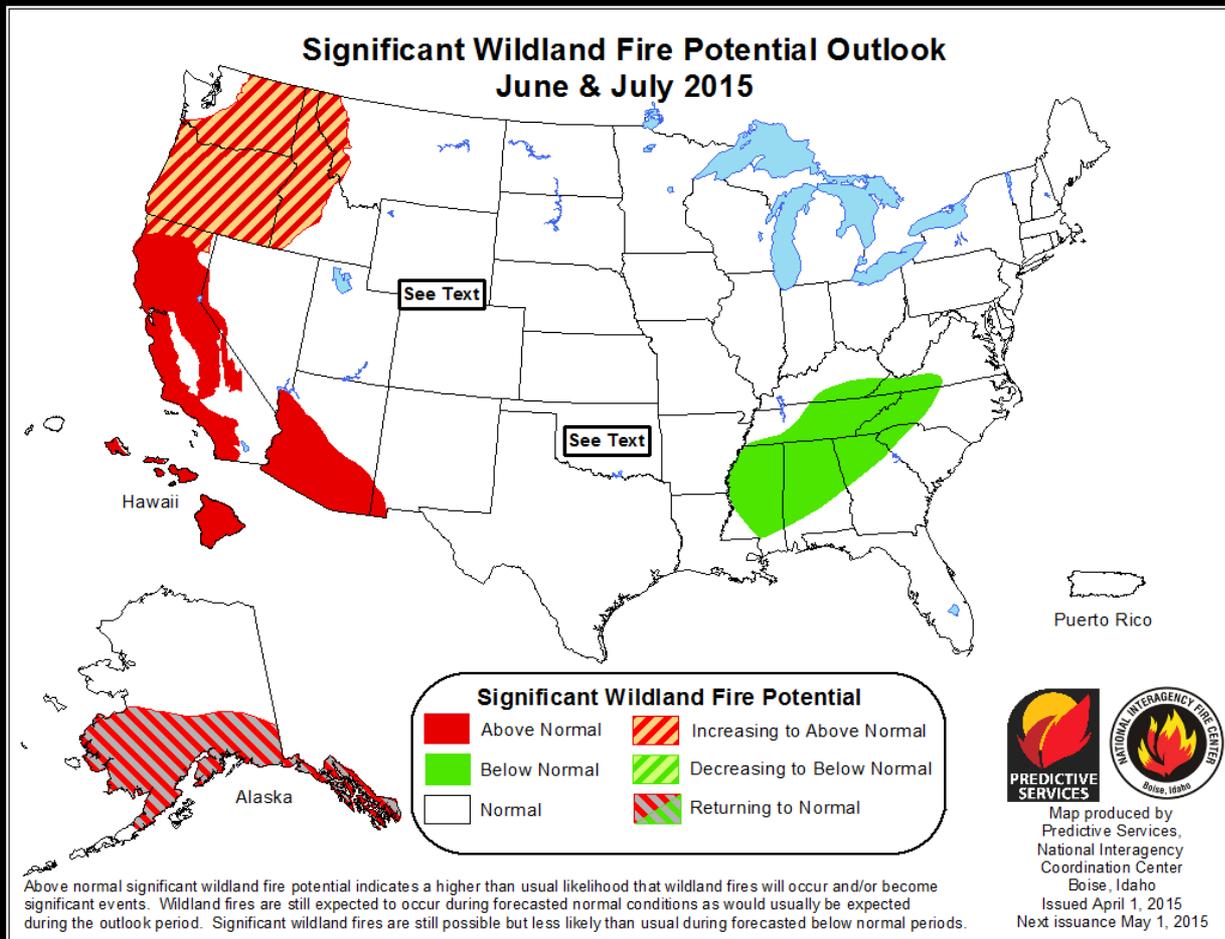
## Seasonal Drought Outlook

- ☑ Drought impacts to persist or intensify after this past dry winter
  - ☑ now ending our fourth dry winter in a row!
- ☑ D3-D4 Drought intensity...Extreme-Exceptional Drought covers 67% of the state
- ☑ Can we predict when the drought will end? – no.



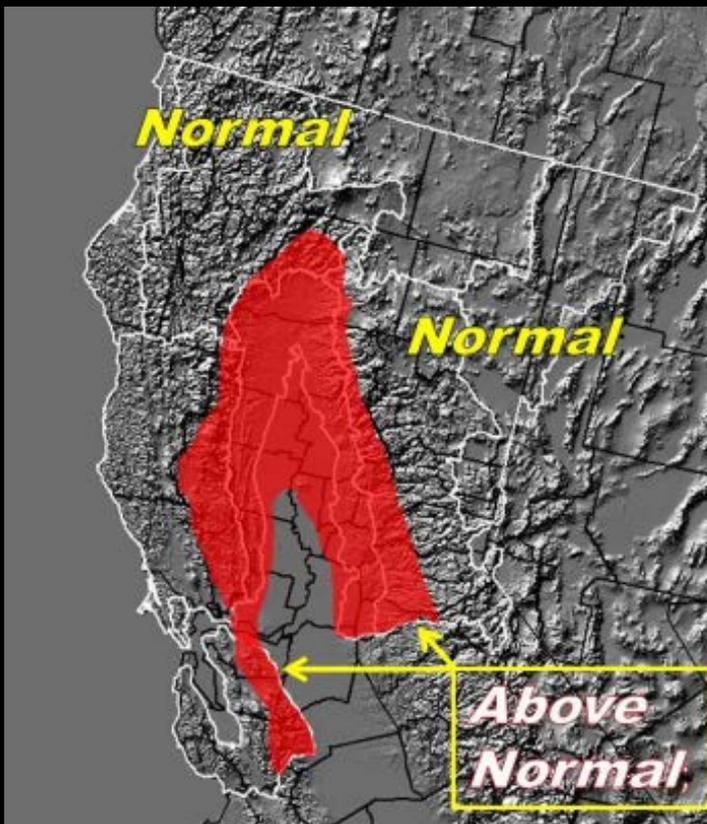
## Spring/Summer Outlook

- ☑ Official outlook – Since El Nino isn't a spring/summer player, and Summer season is traditionally dry, no good indicator for precipitation outlook.
- ☑ Above normal temperatures are favored – moderate confidence.
- ☑ Forecast skill of these outlooks is not great. Plan for anything.



## National Fire Outlook April-July 2015

- 🌀 **April:** Above normal wildland fire potential will develop across portions of Southern California
- 🌀 **May:** Above normal wildland fire potential will expand across into northern California, southwestern Arizona
- 🌀 **June-July:** - Above normal wildland fire potential will expand to across the West Coast, part of the northern Rockies and Great Basin



May 2015

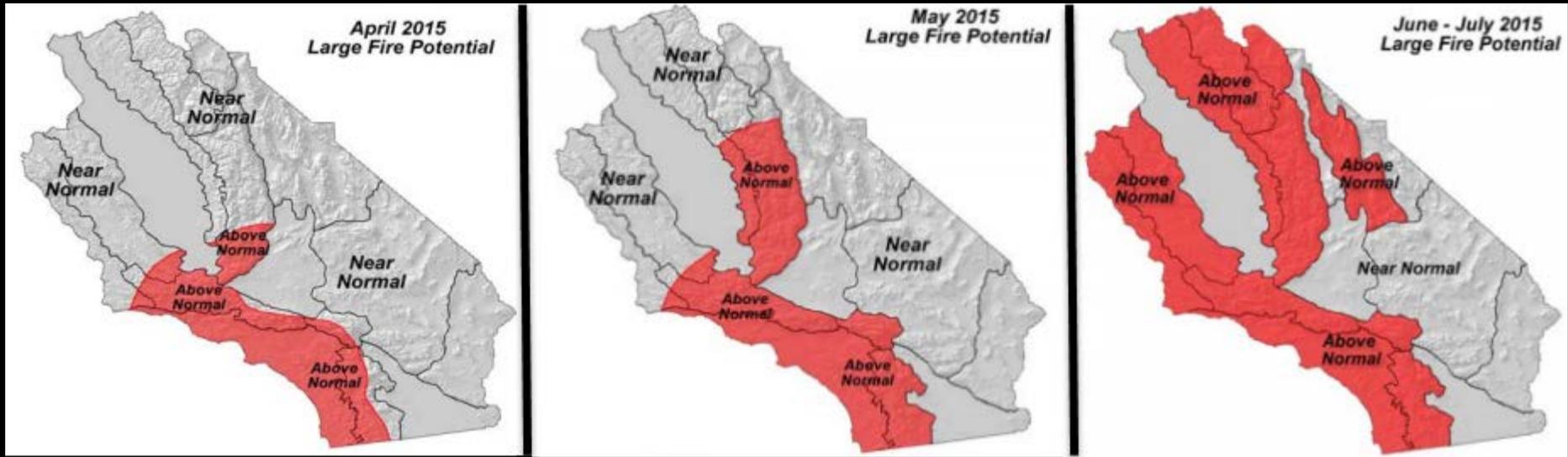


June-July 2015

## Fire Outlook for Nor Cal: April-July 2015

- 🔵 **April:** Grasses in the lower elevations have already greened and are starting to cure across most aspects
  - 🔵 Live Fuels in the higher elevations, normally under snow cover, are currently greening up about 6-8 weeks ahead of schedule
- 🔵 **May-July:** Live fuels nearly 2 months ahead of schedule in the higher terrain as well as the expectation of curing of grasses in the lower elevations within the next few weeks, **ABOVE NORMAL LARGE FIRE POTENTIAL** in May for lower elevations below 3500 ft (top left)...expanding to most other areas in June and July (top right)

25



## Fire Outlook SoCal April-July 2015

- 🌀 No significant additional precipitation expected during the remainder of "rainy season"
- 🌀 Above or much average temperatures likely through July
- 🌀 Large fire potential expanding from south to north during the period
- 🌀 High amount of bug kill trees and diseased forests will add to a high large fire potential in alpine areas



# **NWS PRODUCTS & SERVICES**

## Fire Weather Watch

vs

## Red Flag Warning

- Potential Red Flag Warning Event
- Reasonable confidence of critical fire weather
- Issued about 24-72 hours before the predicted start of the event

- Critical fire weather conditions are imminent or occurring
- High confidence will occur within 24-36 hours.
- Upgrade of a Watch or issued as is.

# Web Access weather.gov/sacramento

National Weather Service Forecast Office  
**Sacramento, CA**

Home News Organization FAQ Share

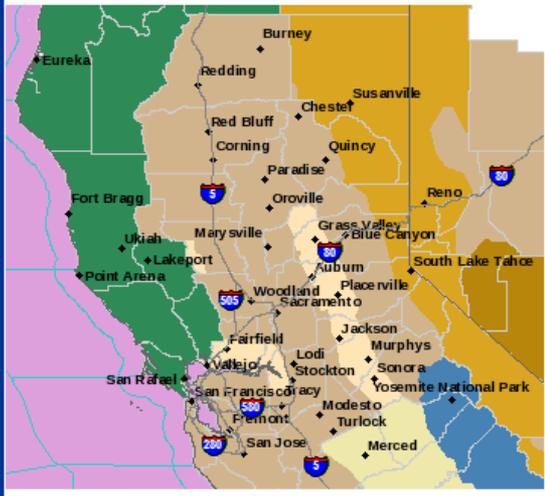
Forecast by "City, St" or ZIP  
Enter location ...  
Go

Top News of the Day  
Last 50 Products Issue Forecast by City

A very wet storm system will be moving through Northern ...more...

Watches & Warnings Observations Forecast Graphics Rivers & Lakes Climate **Fire Weather** Detailed Hazards

North Central California Weather  
Click on the map below for the latest forecast.



Last map update: Feb, 5th 2015 at 2:39:29 pm PST

Weather Returns  
Wet Weather Returns

Read watches, warnings & advisories

- High Wind Warning
- Flash Flood Watch
- Gale Warning
- Small Craft Advisory For Rough Bar
- Small Craft Advisory
- Lake Wind Advisory
- Wind Advisory
- Winter Storm Watch
- Hazardous Seas Watch
- Flood Watch
- High Wind Watch
- Special Weather Statement
- Hazardous Weather Outlook
- Hydrologic Outlook

National Weather Service Forecast Office  
**Sacramento, CA**

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**Fire Weather Zones**

Select: Fire Weather Zones Point Forecast Matrix Digital Point Forecast FARGITE Obs/AVUW Activity Planner

Sumounding Offices: Eureka | Madras | Reno | Marysville | Mantro

Fire Weather Planning Forecast last issued: Wed Feb 11 3:13 PST 2015

Click a location on the Map below OR Select a Fire Weather Zone from the drop down box OR enter a lat/lon location in decimal degrees.

Fire Weather Zones: Go Or Lat: Lon: Go



Spot Request Fire Status Forecasts/Outlooks Fuels Weather Tools Admin Detailed Hazards

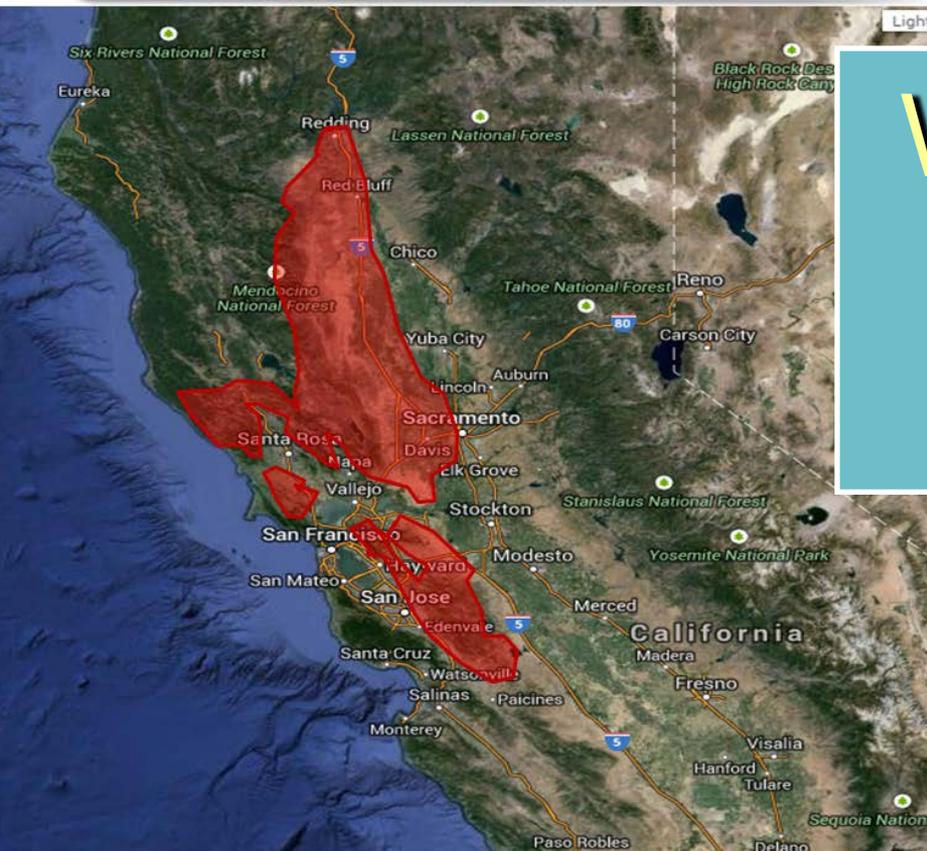
Current Hazards  
Watches / Warnings  
Outlooks  
Submit Report  
Local Outlook  
Current Conditions  
Observations  
Radar  
Satellite  
Precipitation  
Soundings/Profilers  
Other Observations  
Forecasts  
Forecast Discussion  
Local Area  
Activity Planner  
Aviation Weather  
Fire Weather  
Marine Weather  
Severe Weather  
Hurricane Center  
User Defined Area  
Weather Tables  
Hydrology  
Rivers and Lakes  
Other Hydro Info  
Climate  
Local  
National  
Drought  
More  
Climate portal  
Weather Safety  
Preparedness  
Weather Radio  
SkyWarn™  
StormReady  
Weather Spotters  
Additional Info  
Items of Interest  
Other Useful Links  
Education Resources  
COOP Observer  
Our Office  
Computer models  
NWS News  
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Contact Info  
Feedback  
FAQ

USA.gov



# Fire Weather Concerns

Saturday Night into Monday Morning



**Breezy and Gusty North Winds  
and Low Humidities**

# New Services

## Weather Stories

## Partner Emails



NOAA – National Weather Service  
Interior Northern California – Sacramento CA  
[www.weather.gov/sacramento](http://www.weather.gov/sacramento)

### Widespread Wet Weather Expected Later This Week

Updates are Highlighted

#### Impacts

- Localized urban and small stream flooding
- Limited road problems as snow levels will likely be at or above Sierra pass levels
- Occasional power outages over higher terrain due to strong southerly winds
- Potential for debris flows near wildfire burn scars **added impact**

#### Forecast Confidence

- High for wetter pattern change by Friday
- Medium for snow at or above Sierra pass levels
- Medium for gusty winds
- Low for exact precipitation amounts due to model variability...especially for areas south of Interstate 80 **added location specifics**

#### Timing and Strength

- Precipitation expected Thursday through the weekend, beginning over northwest California and spreading southward of Interstate 80 by early Friday
- Snow levels initially at pass levels, then rising well above by Sunday **added**
- Strongest winds expected Friday with gusts up to 45 mph in the valley and stronger in the mountains **added**

#### Weather Summary

Please view attached graphics

An atmospheric river (concentrated area of moisture) is taking aim towards the Pacific Northwest and Northern California later this week. This wetter pattern is forecast Thursday through Monday. Snow levels will start near Sierra pass levels and then rise. Models are still variable in terms of total precipitation amounts, but it should be a decent rain event for much of NorCal. Highest confidence of heavy rainfall is north of Interstate 80. Rainfall amounts along the southern portion of the storm (ie South of I-80) could change significantly based on storm track. We will continue to update as the storm gets closer to the West Coast and confidence improves.

# NWS Sacramento Social Media

## Facebook

**US National Weather Service Sacramento California**  
3,029 likes · 2,095 talking about this · 73 were here

Government Organization  
This page is an experimental service provided by NWS to explore the use of Facebook to extend the reach of NWS information. Facebook posts do not always reflect the most

About Photos Likes Map Events

**US National Weather Service Sacramento California**  
April 4

Flash flood warning issued for the Shasta Lake/Redding I5 corridor due to excessive rainfall from a line of training storms.

A long-lived line of training thunderstorms is producing excessive amounts of rain over the Redding/Shasta Lake I5 Corridor. A flash flood warning has been issued for the impacted region.

**Sent Tweets**  
(NWSSacramento)

7 retweets

**NWSSacramento**  
Apr 4, 6:29pm via NWSBot  
STO issues Severe Thunderstorm Warning for Tehama [CA] till 7:00 PM PDT  
nwschat.weather.gov/vtec/#2013-O-N...  
5 retweets

**NWSSacramento**  
Apr 4, 5:05pm via HootSuite  
Thunderstorms are popping up in the Sac Valley west of Corning & Orland. Watch out for heavy rain & small hail ow.ly/jLiqI #sacwx  
3 retweets

## Twitter

## Graphical NOWcasts

# Key Takeaways

- Drought impacts to **persist and/or intensify** this year
- Wildfire **potential** normal for spring for larger fuels and timber in the North and above normal for fine fuels (grasses) South
- Thunderstorm activity in Spring then again late summer Monsoon
- **Potential**  **Reality**
  - Without ignitions, no big fires
  - Wild cards will be people and lightning
- El Niño potential does not mean more precipitation to Northern California this Spring/Summer Season
- NWS offices across CA are here to help



# Questions



If you have further questions,  
please contact

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(916) 979-3041 x 223