



# **NWS Sacramento**

**Sacramento Regional Water Authority**

**Meeting January 9<sup>th</sup> , 2018**

**CA Water Story, precipitation and  
ENSO update and winter outlook**

**Slides prepared by: Michelle Mead  
Warning Coordination Meteorologist**

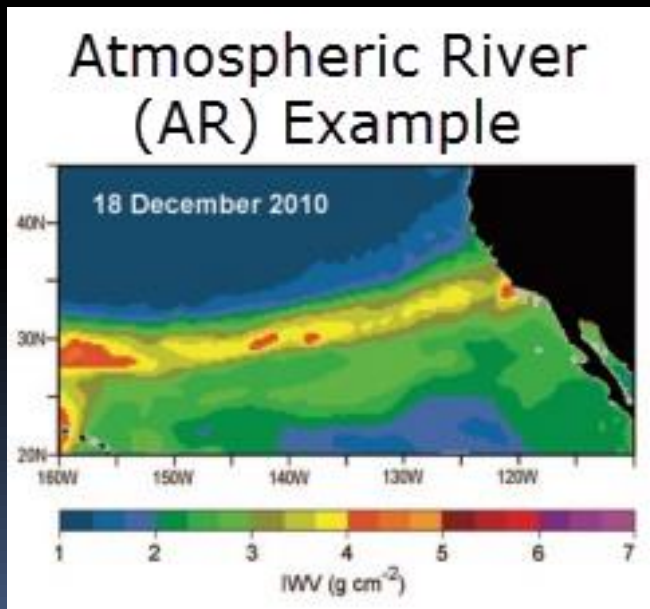
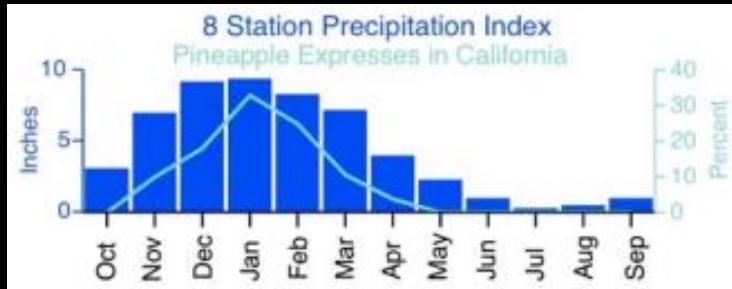
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# CA WATER STORY

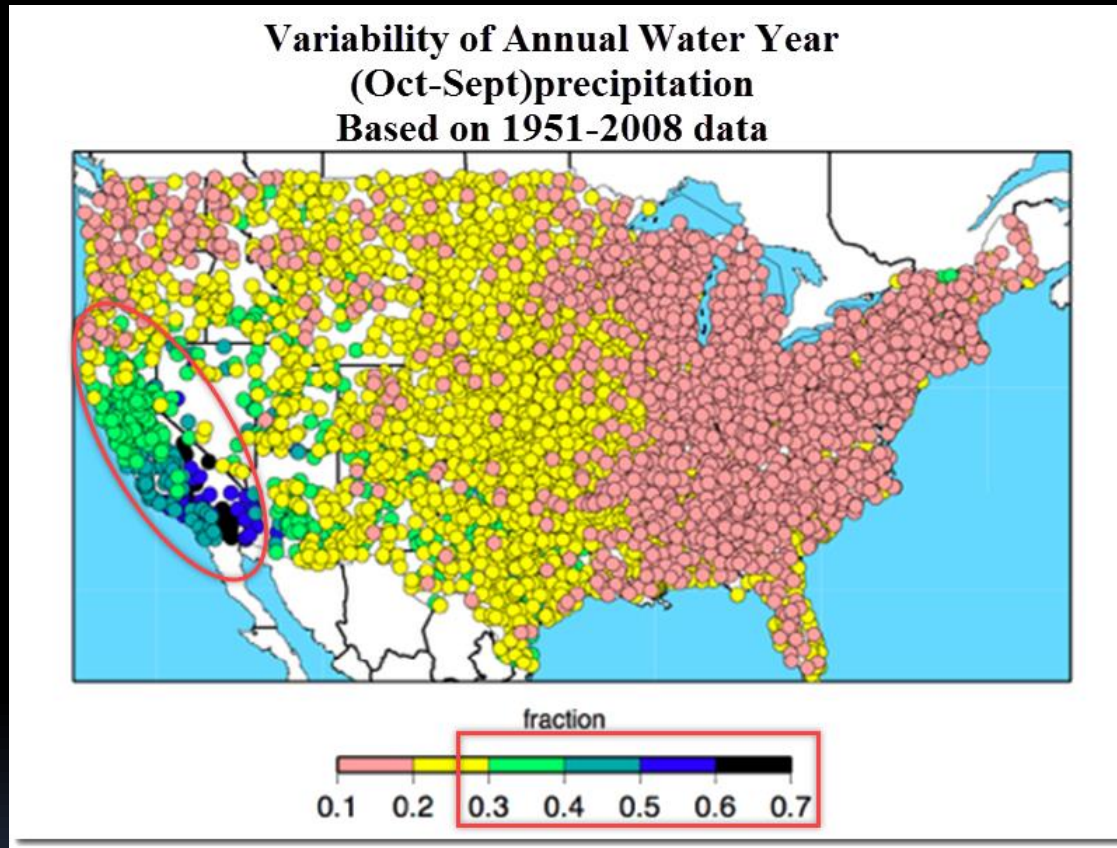
# California's Water Story:



- California should always prepare for flood in Winter
  - *El Niño* / *La Niña* or *Neutral*
- 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.
  - *2011-2015, CA avg. was 2*
  - *2015-2016, CA had 5*
  - *2016/2017, CA had 14*
- When more storms arrive, conditions are wetter (Drought Improvement)
- When fewer storms arrive, conditions are drier (Drought Continues)
- *ENSO phase does not guarantee an increase in AR storms (2017 Neutral)*



# CALIFORNIA'S WATER YEAR VARIABILITY :

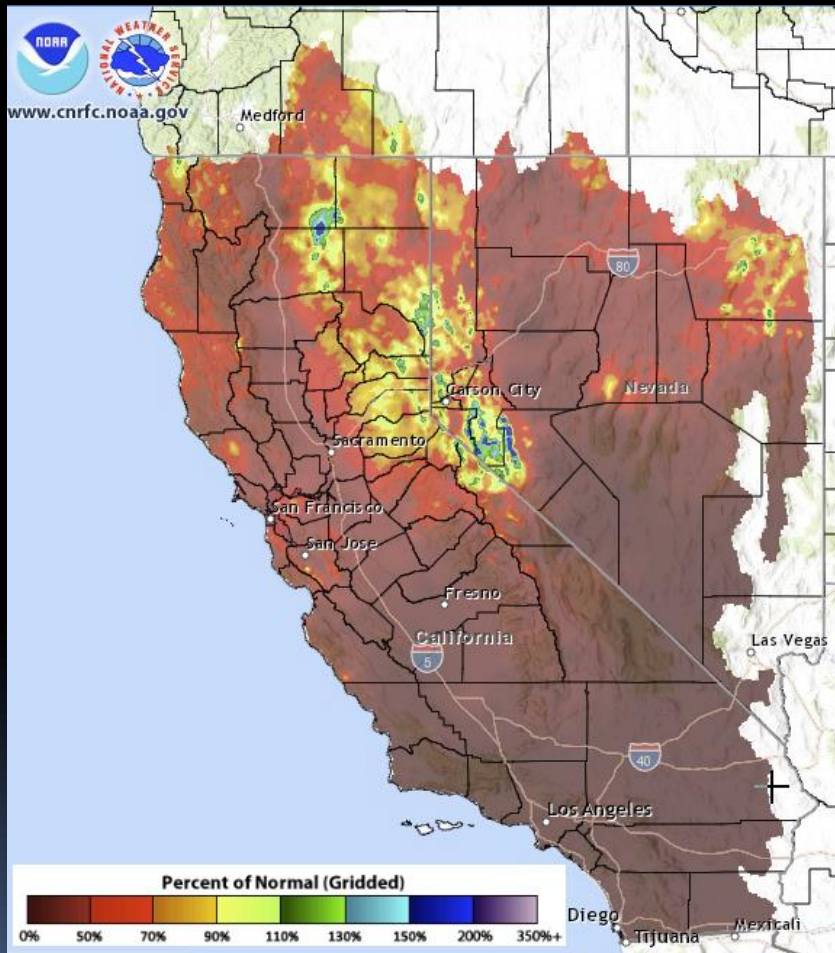


- Across the Nation, California has the largest year-to-year variability depicted by the green, blue and black circles
- Yearly variability on the order of half the annual average



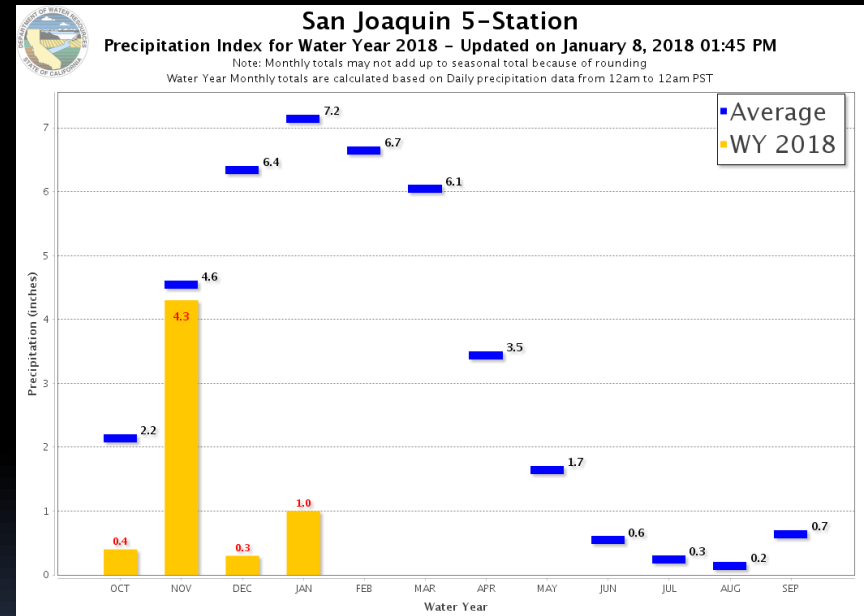
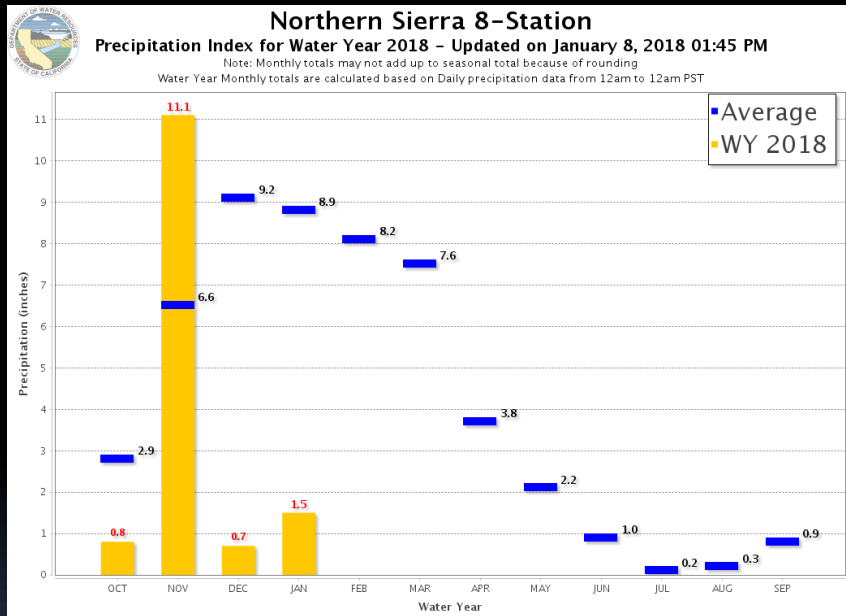
# CA WATER PICTURE TO DATE

# Water Year to date Percent of Normal



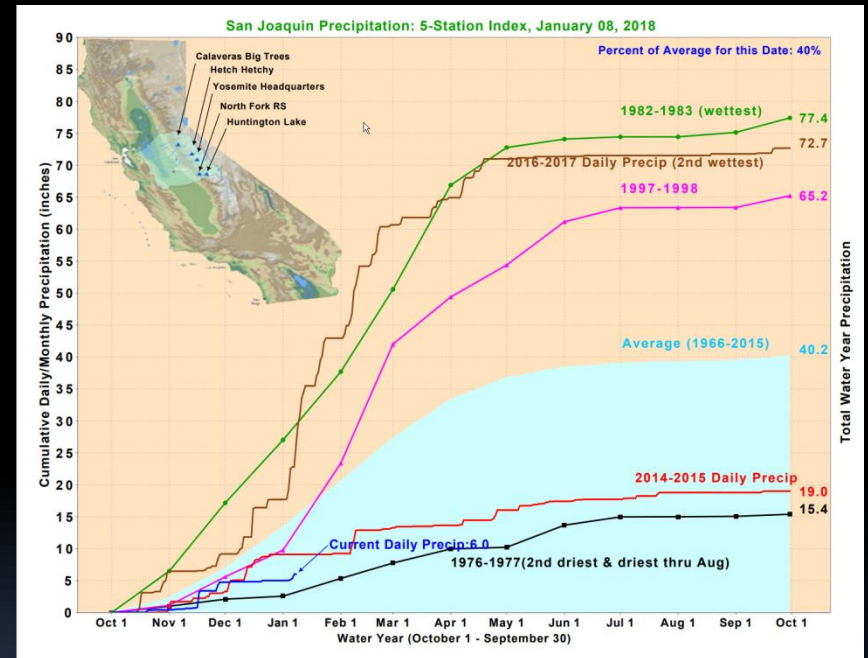
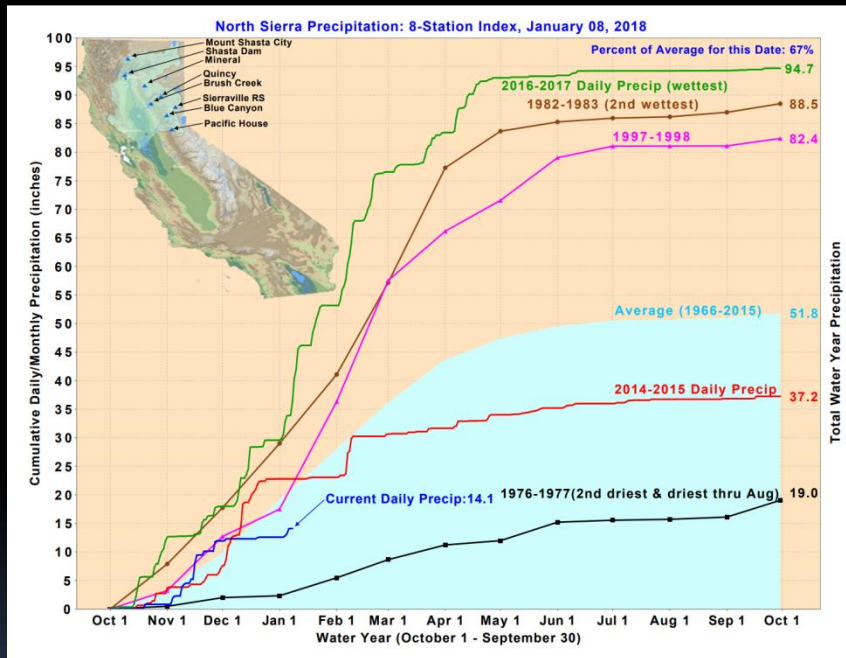
- Much of the state is well below (50% or less) normal to date
- Sierra Nevada range is better with 70-124% of normal
  - *Major reservoirs are located in Sierra Nevada*

# Northern and Central Sierra index totals to date



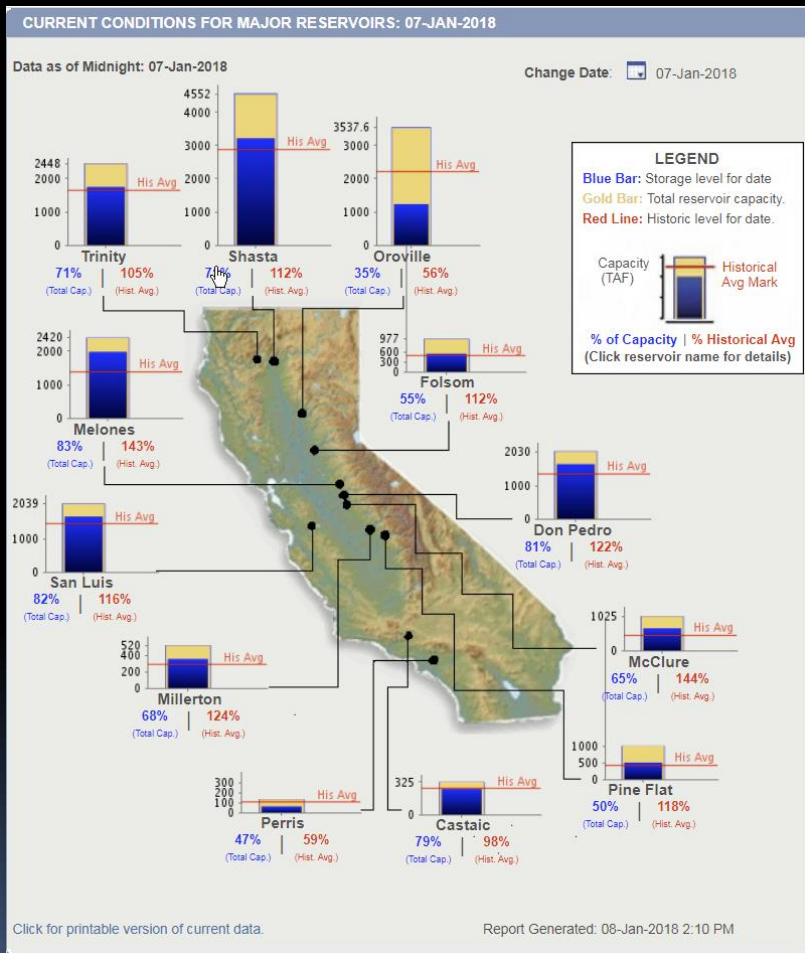


# North and Central Sierra Index accumulative



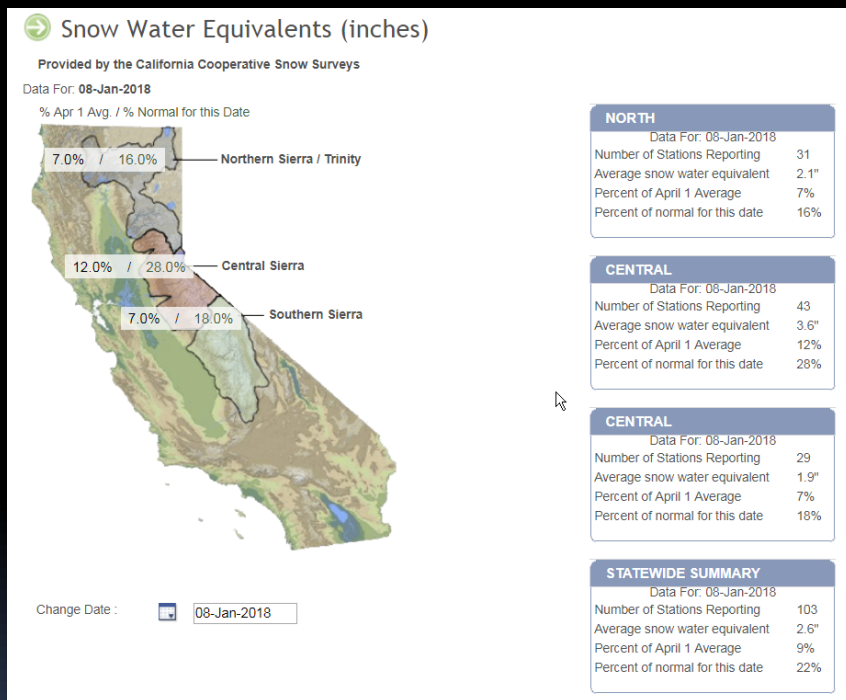


# Major Reservoir storage to date



- All reservoirs are at or above historical average despite dry December
  - *Exception Oroville for spillway repairs*
- As long as they remain near historical levels water supply needs for 2018 will be met
- Conservation is always recommended

# Sierra Snow pack to date



- Snow pack to date is below average
- Still early in the water/snow cycle
- January through March account for much of the snow accumulation
  - *Cold storms add to snow pack*



# ENSO UPDATE

# 2017/2018 Predictions

***...According to CPC...***

*La Niña Advisory issued 10/14/2017*

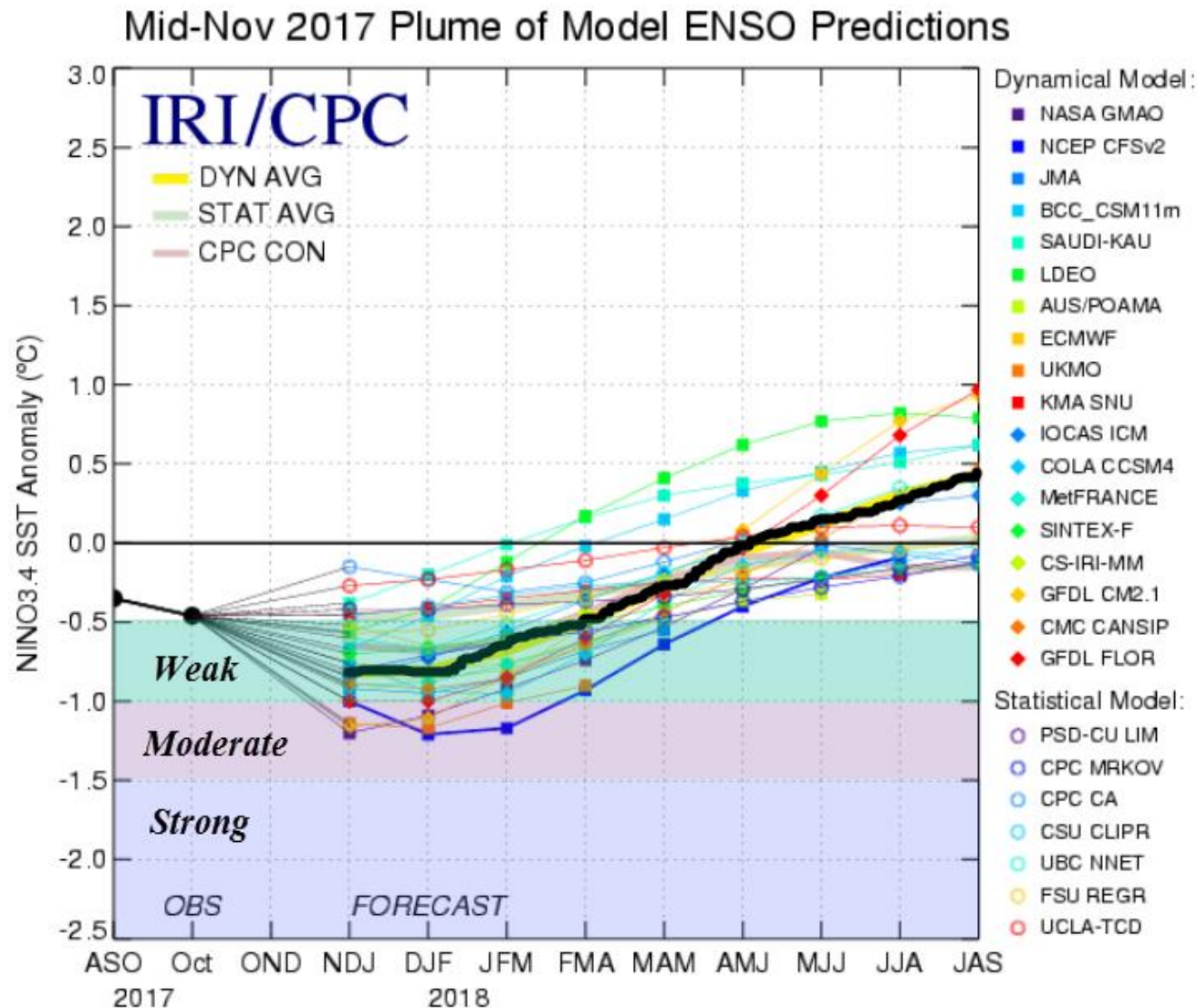
**“La Niña conditions expected during the Northern Hemisphere winter 2017-18, transitioning to ENSO-Neutral during the mid to late Spring 2018.”**

## ***Highlights:***

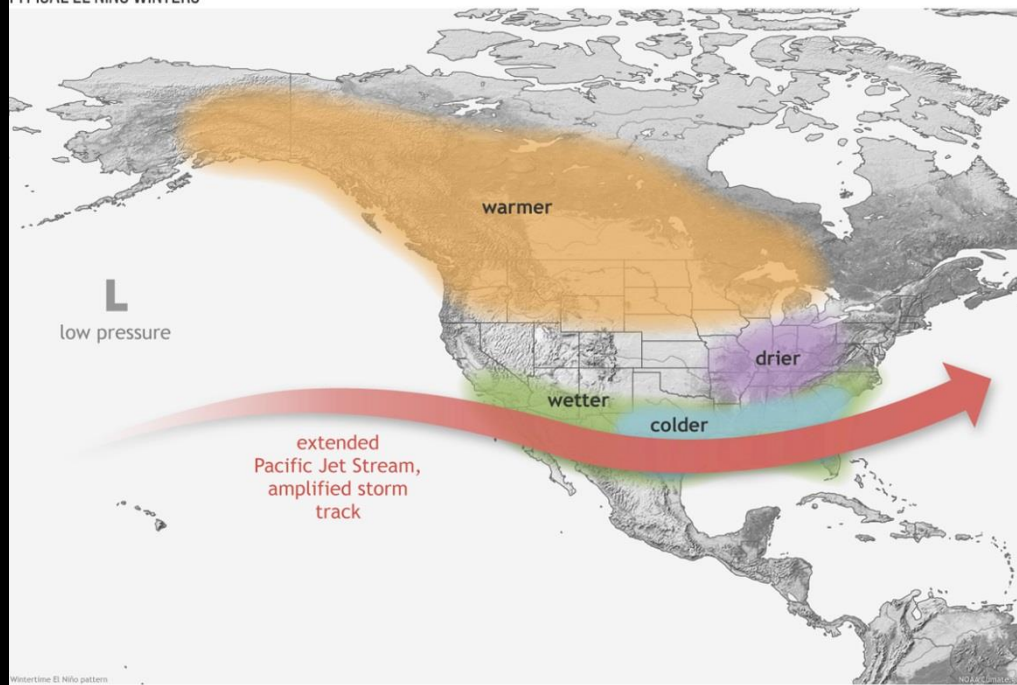
- Past La Niña and Neutral years have resulted in a wide distribution of outcomes from very dry to normal to very wet for Northern California
  - *Meaning no strong signal – anything goes*



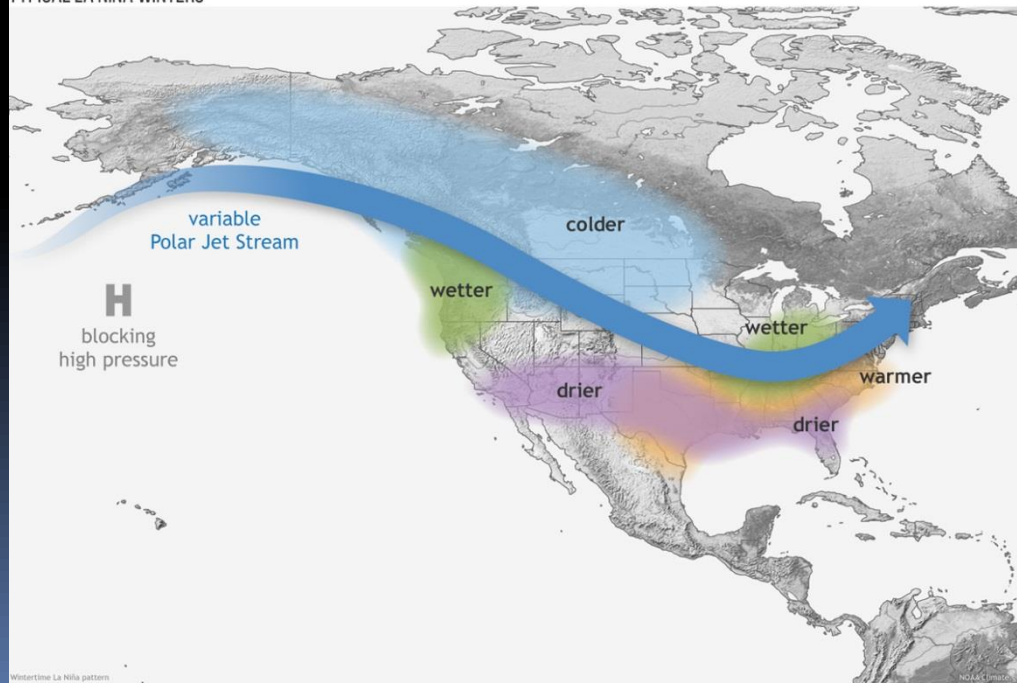
# Latest Long Range models ENSO Strength Forecast



TYPICAL EL NIÑO WINTERS



TYPICAL LA NIÑA WINTERS



**Storm Track  
set up during  
Neutral  
Conditions is  
variable**

Our future water supply  
will be dependent upon  
the individual storms.

# Weak La Niña Conditions

Past La Niña events have historically favored near normal or dry winter months, but past conditions do not guarantee a future outcome

**Northern California**



**Central California**



**Sierra Nevada**



**Southern California**



Based on 10 historical Weak La Niña Seasons  
Data: PRISM, Oregon State University

# ENSO Neutral Conditions

When neither El Niño nor La Niña conditions are in place, everything is on the table for California. Past neutral years have yielded more dry winter seasons than normal or wet ones, but past conditions do not guarantee a future outcome

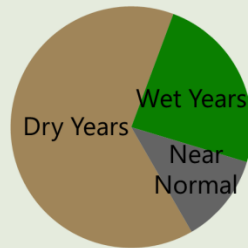
## Northern California



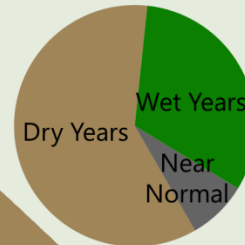
## Central California



## Southern California



## Sierra Nevada



Based on 25 historical ENSO Neutral Seasons  
Data: PRISM, Oregon State University

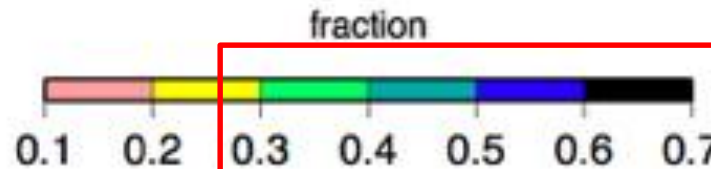
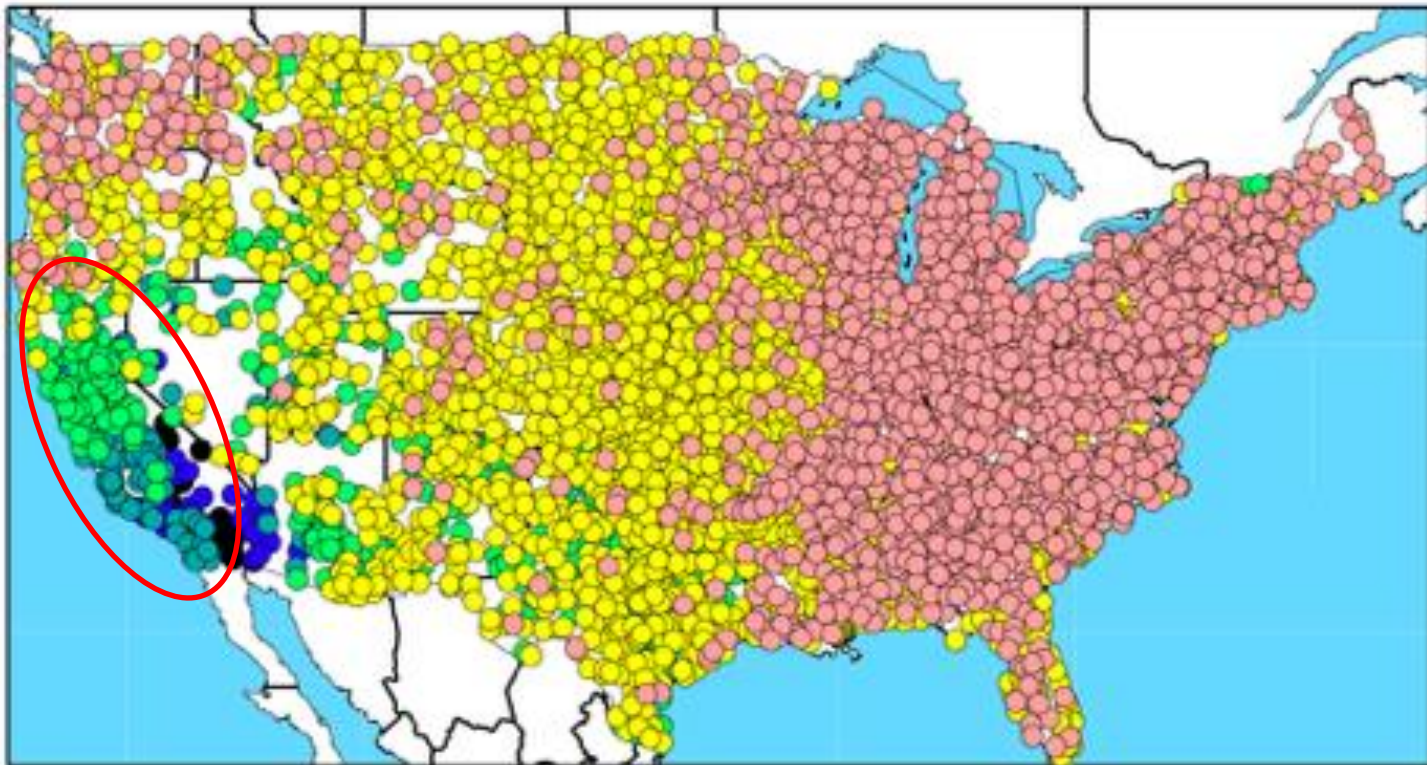




# WINTER OUTLOOK

# Remember this Map!!!

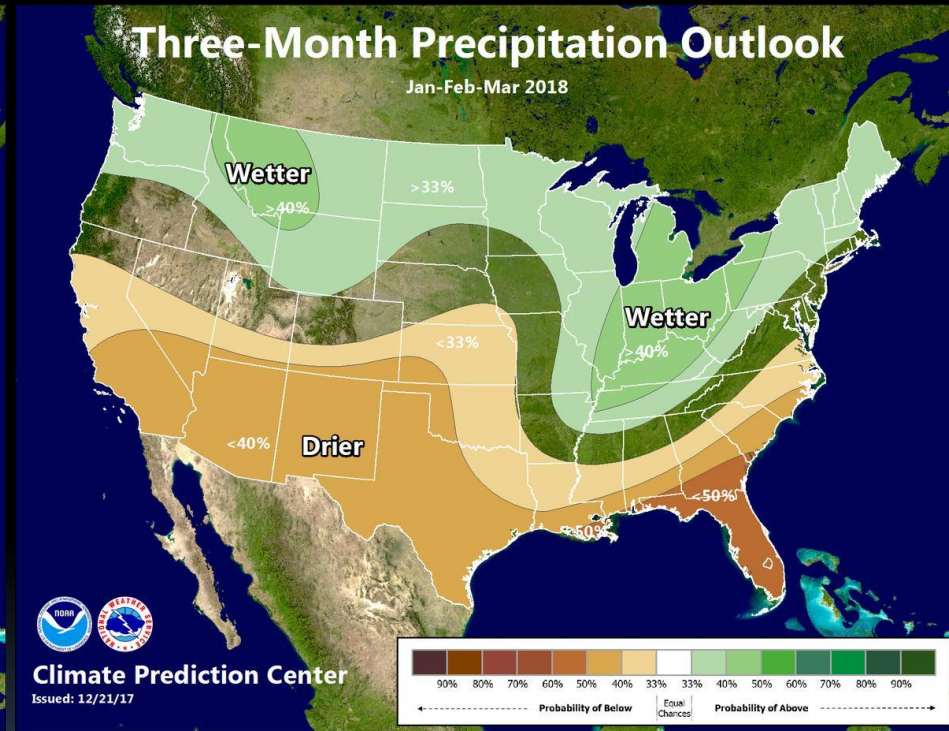
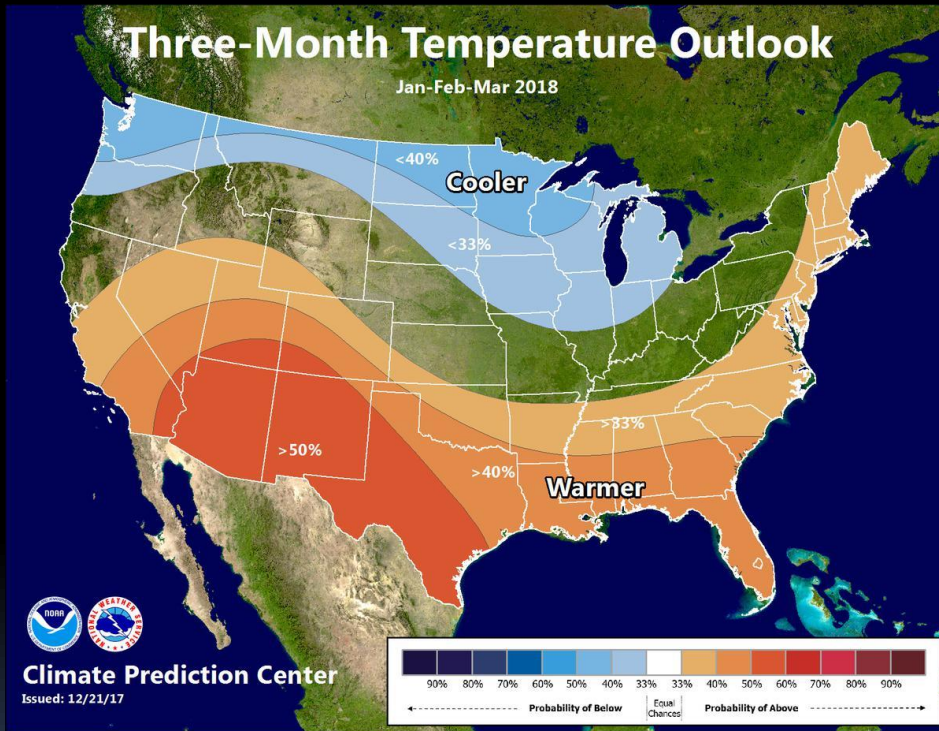
COEFFICIENTS OF VARIATION OF  
TOTAL PRECIPITATION, WY 1951-2008





# CPC 3 Month Outlooks

## Jan/Feb/Mar

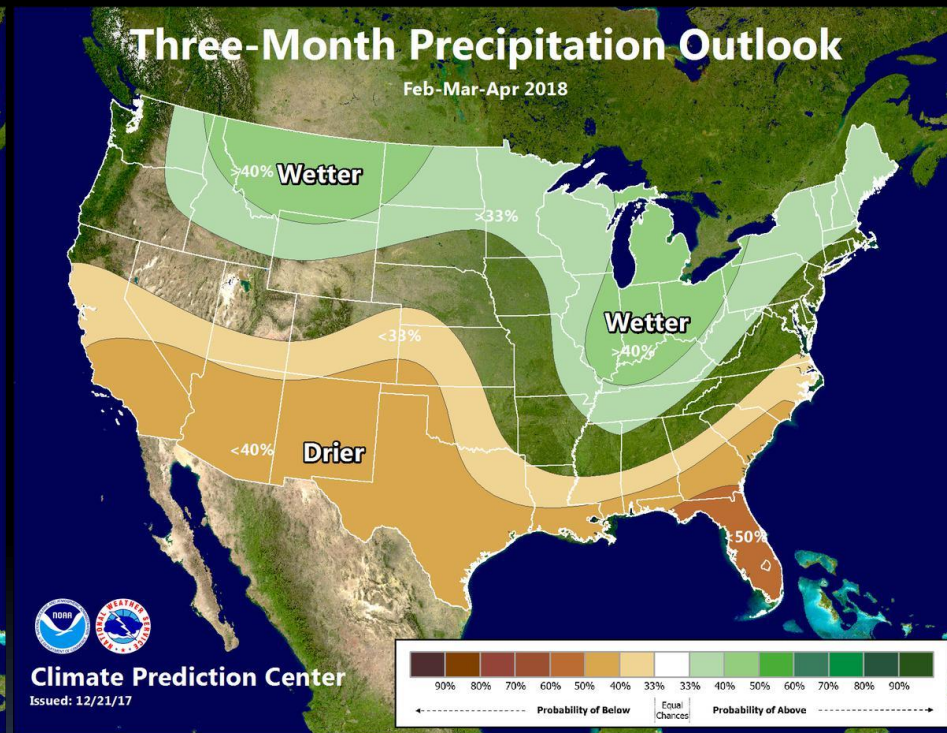
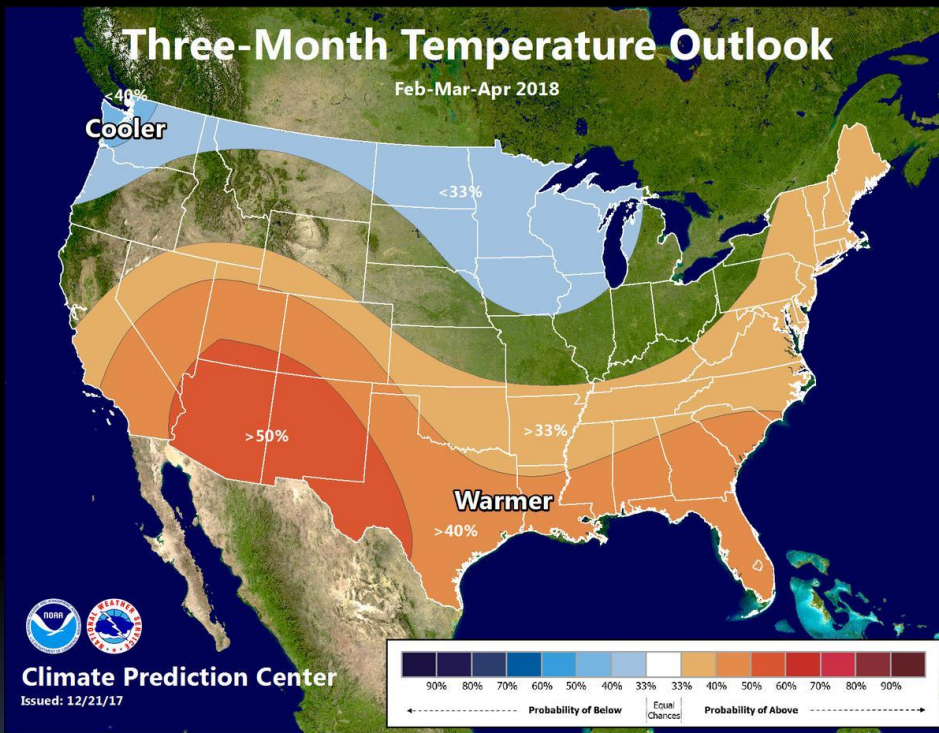


Unshaded areas = Equal Chances, No Strong Indicators

Issued : 12/21/17 Next: 1/18/18

# CPC 3 Month Outlooks

## Feb/Mar/Apr



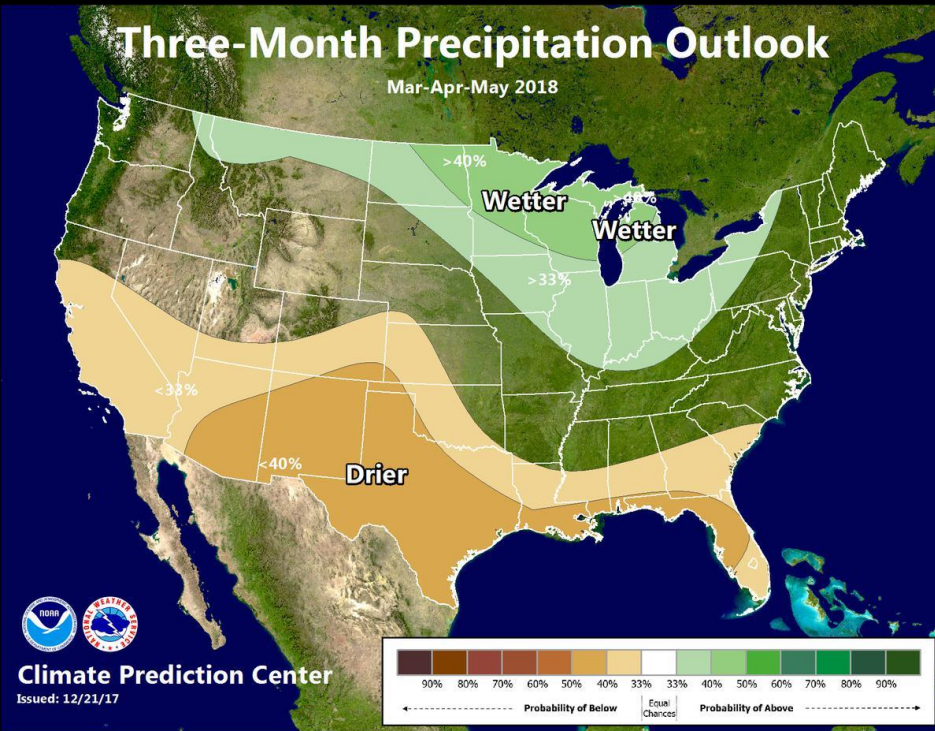
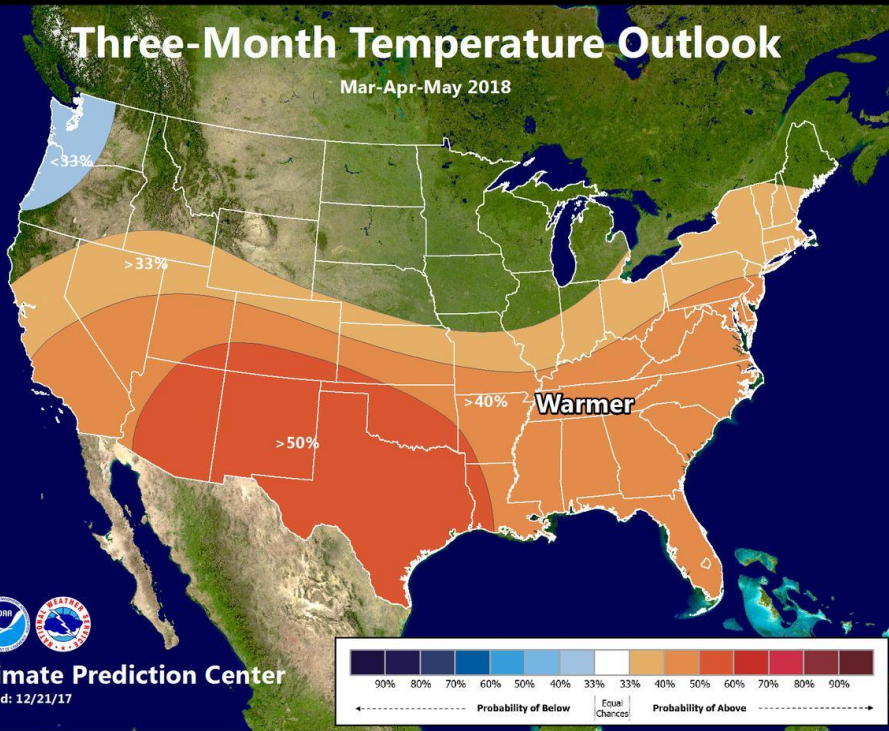
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# CPC 3 Month Outlooks

## Mar/Apr/May

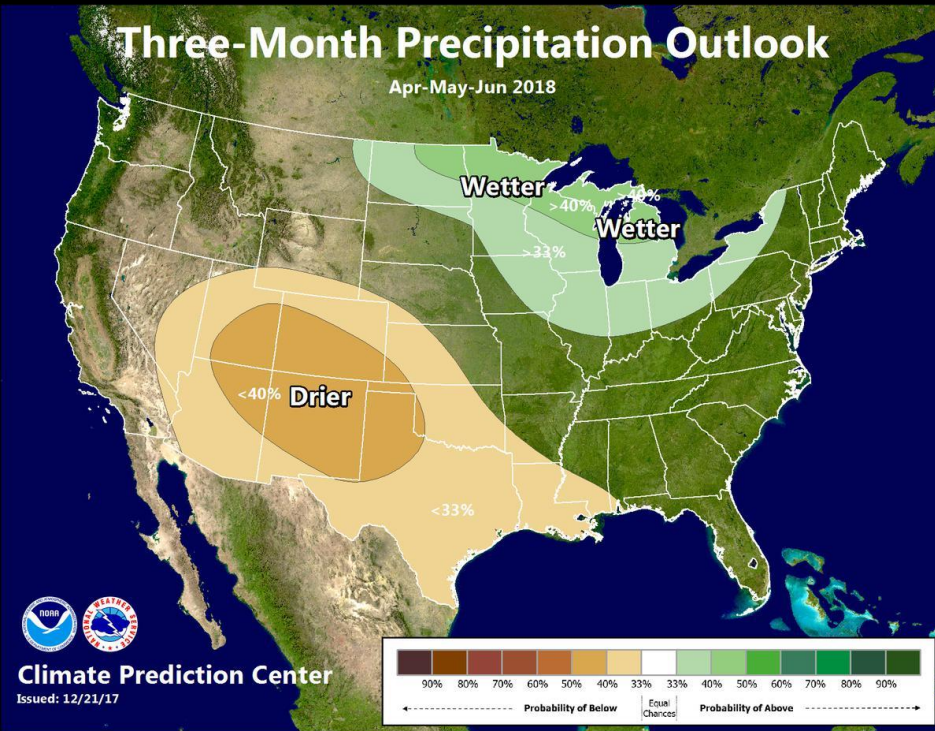
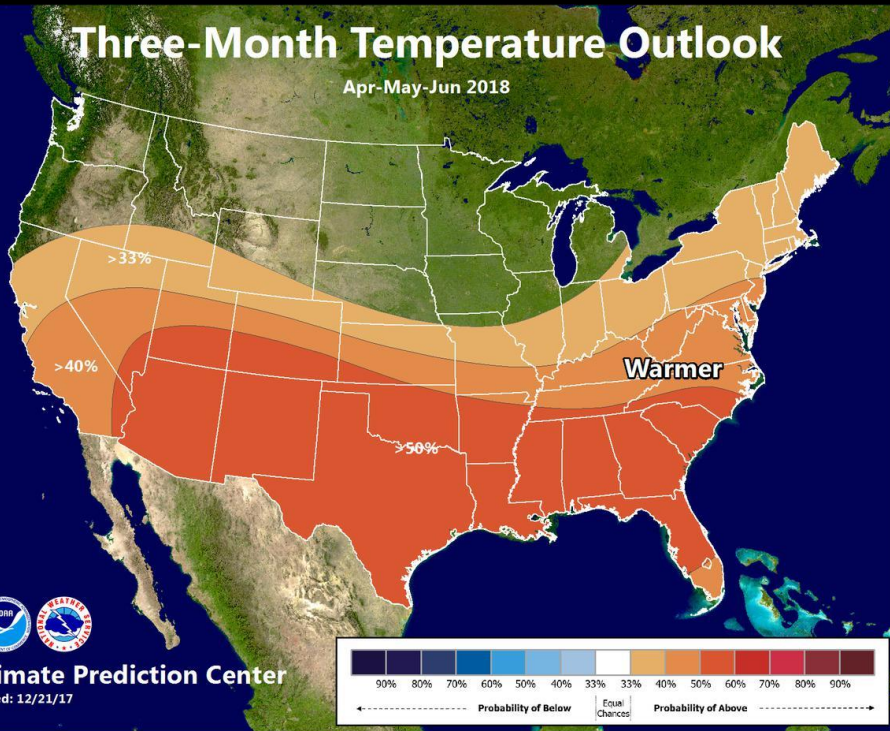


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# CPC 3 Month Outlooks

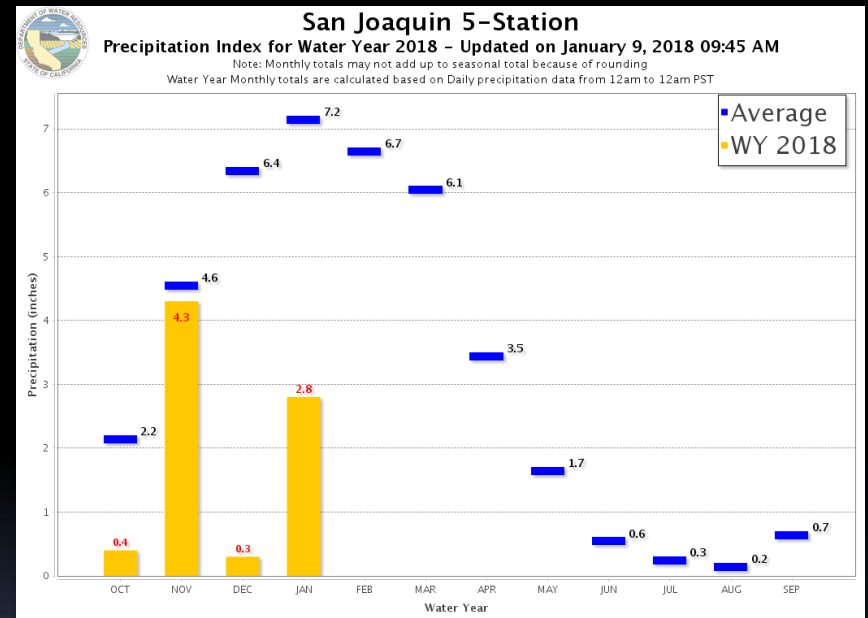
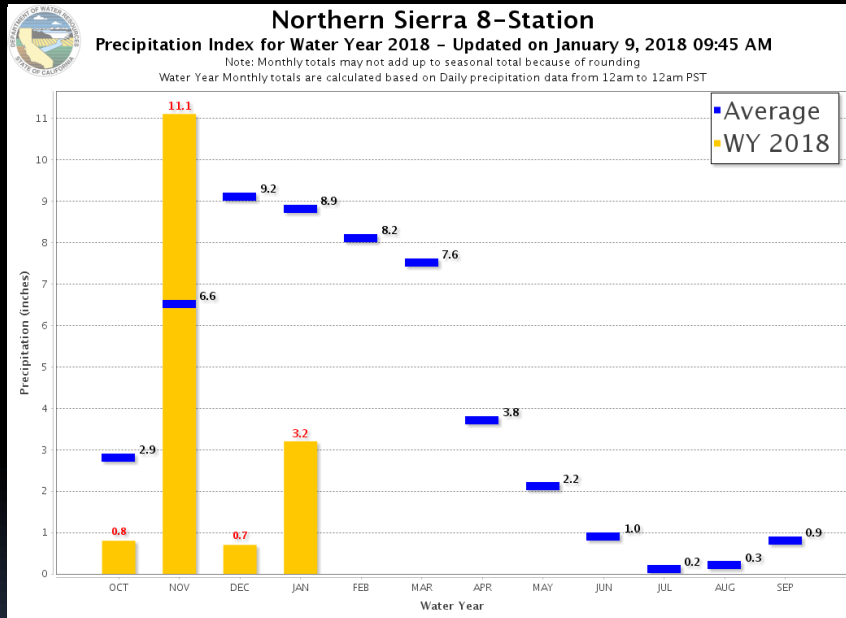
## Apr/May/June



Unshaded areas = Equal Chances, No Strong Indicators

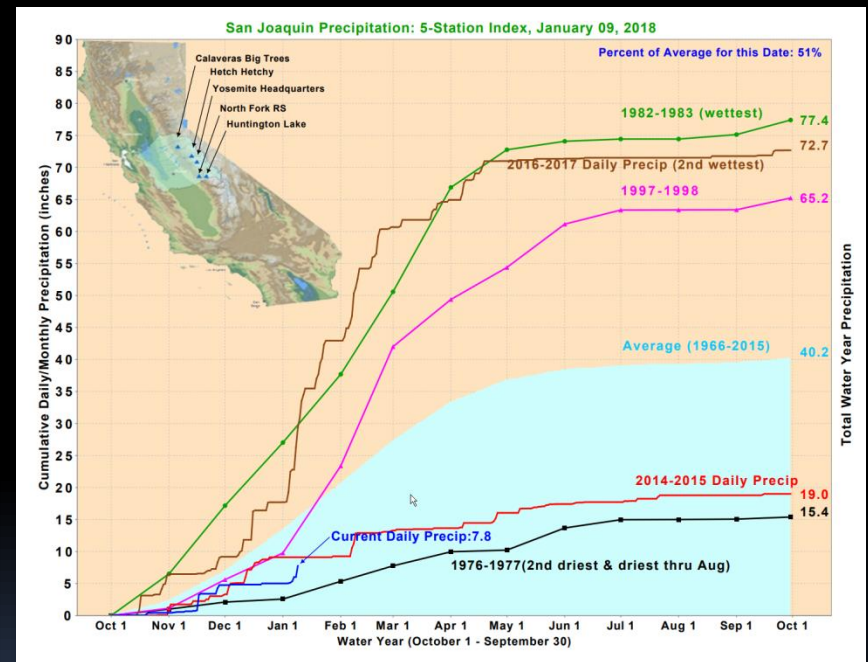
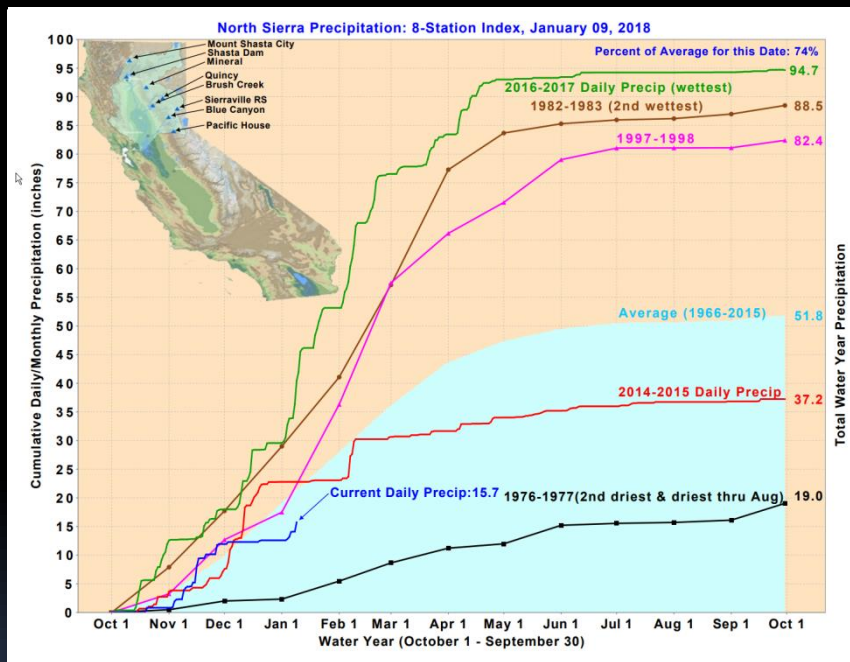
Issued : 12/21/17 Next: 1/18/18

# Northern and Central Sierra index totals to date...what a difference one storm makes!





# North and Central Sierra Index accumulative...what a difference one storm makes!





# Winter 2017-2018 Outlook Summary

## REMEMBER!

- *CA Wet season is typically Mid October-February*
  - Highest precipitation typically Dec-Jan-Feb
- *Winter Season is Flood Season*
- *Seasonal outlooks will NOT capture how wet or dry winter will be*
  - Winters are defined by the storms that occur through the season
  - They are only apparent in the 7-10 day forecast
- *California Winters typically see 5 Atmospheric River (Pineapple express) storms a year*
  - These systems are short term forecasts, less than 10 days, and can not be captured in monthly/seasonal outlooks
- *Reservoirs are higher than any year since 2011*
- *Runoff and rises may occur sooner than 2016/2017*
  - Any large storm runoff could cause moderate flood control releases

# STAY Informed.....

## California Data Exchange Center (CDEC)

<https://cdec.water.ca.gov/>

## Local NWS Sacramento Links

[www.weather.gov/sacramento](http://www.weather.gov/sacramento)

[www.facebook.com/nws.sacramento](https://www.facebook.com/nws.sacramento)

[Twitter.com/NWSSacramento](https://twitter.com/NWSSacramento)

## Climate Prediction Center:

Long range outlooks are updated every month

Update Schedule: **Third Thursday** of the month. Next update : October 19, 2017

[www.cpc.ncep.noaa.gov/](http://www.cpc.ncep.noaa.gov/)

## NOAA El Nino Web Page

[www.cpc.noaa.gov/products/precip/CWlink/MJO/enso.shtml](http://www.cpc.noaa.gov/products/precip/CWlink/MJO/enso.shtml)

## CPC IRI ENSO Forecasts

Update Schedule: Approximately **first and third Thursday**. Next update : January 18, 2018

<http://iri.columbia.edu/our-expertise/climate/forecasts/enso/>



# Questions



If you have further questions, please contact

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A Forecaster can be reached (916) 979-3045 (24/7)