



NWS Sacramento

California Dept. of Transportation

Kingvale 2018/2019 Winter Hazard Spin up
meeting

October 31st, 2018

**NWS Overview,
Fall/Winter Outlook 2018-2019**

Slides presented by: Michelle Mead

Presentation overview

- **CA Drought/Water Year update**
- **Are we still in a drought?**
 - What did last winter look like
 - Where are the 2018 burn areas
- **Water Story/ENSO/Fall/Winter Outlook**
 - *When do we get the most rain/snow*
 - *ENSO Update/Seasonal Outlooks*
 - These are not forecasts!
- **Best way for you to get weather information**
 - *Prepare ahead of the storm*
 - *Operational/staffing decisions*
 - *Using partners as message multipliers (CalTrans message boards and SM sites)*



CALIFORNIA 2017/28 WATER YEAR AND DROUGHT UPDATE

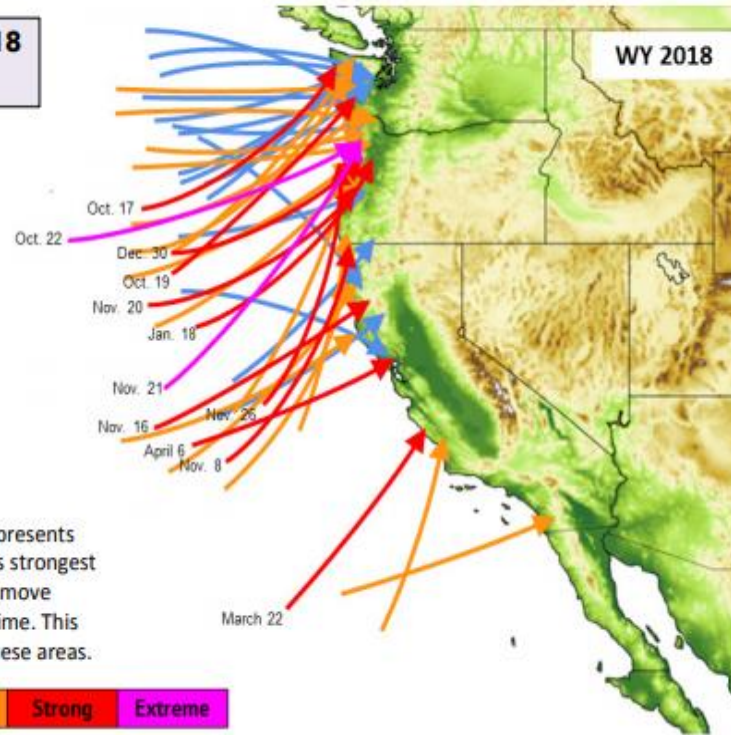
Water year 2017-2018 AR Storms

- California typically averages 5-7 Strong to Extreme atmospheric rivers (AR) a year

- 2017-2018 was below average
- 4 Strong

Distribution of Landfalling Atmospheric Rivers on the U.S. West Coast (From October 1, 2017, through September 30, 2018)

Water year 2018
AR landfall



Location of landfall represents position where AR was strongest at landfall. Many ARs move down the coast over time. This map does not show these areas.

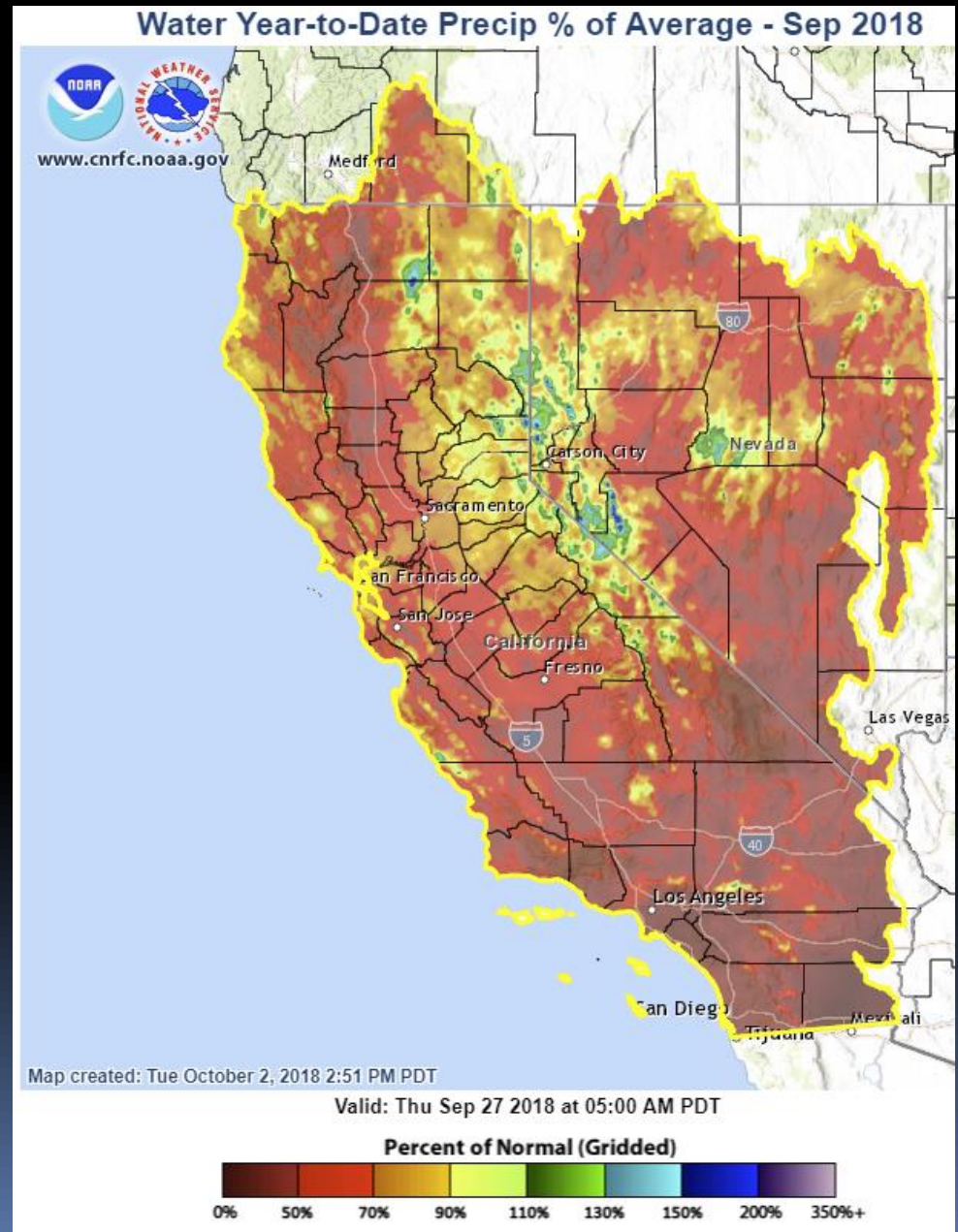
Atmospheric River Strength	Atmospheric River Count*
Weak	16
Moderate	16
Strong	10
Extreme	2

■ Weak: IVT=250-500 kg m⁻¹ s⁻¹
■ Moderate: IVT=500-750 kg m⁻¹ s⁻¹
■ Strong: IVT=750-1000 kg m⁻¹ s⁻¹
■ Extreme: IVT>1000 kg m⁻¹ s⁻¹
 IVT = integrated water vapor transport

Figure courtesy of Scripps Institution of Oceanography

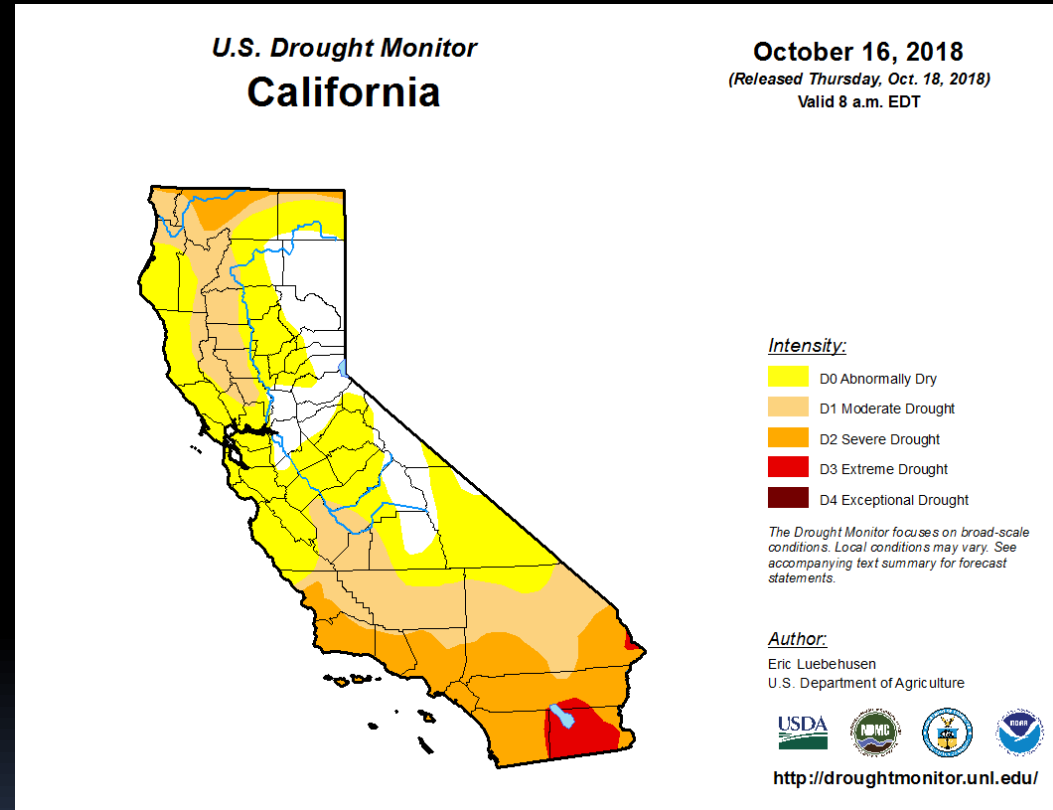
2017-2018 WY numbers

- Outside of Sierra Nevada Mountains, CA was below average for the 2017-2018 WY



Latest USDM Map for CA

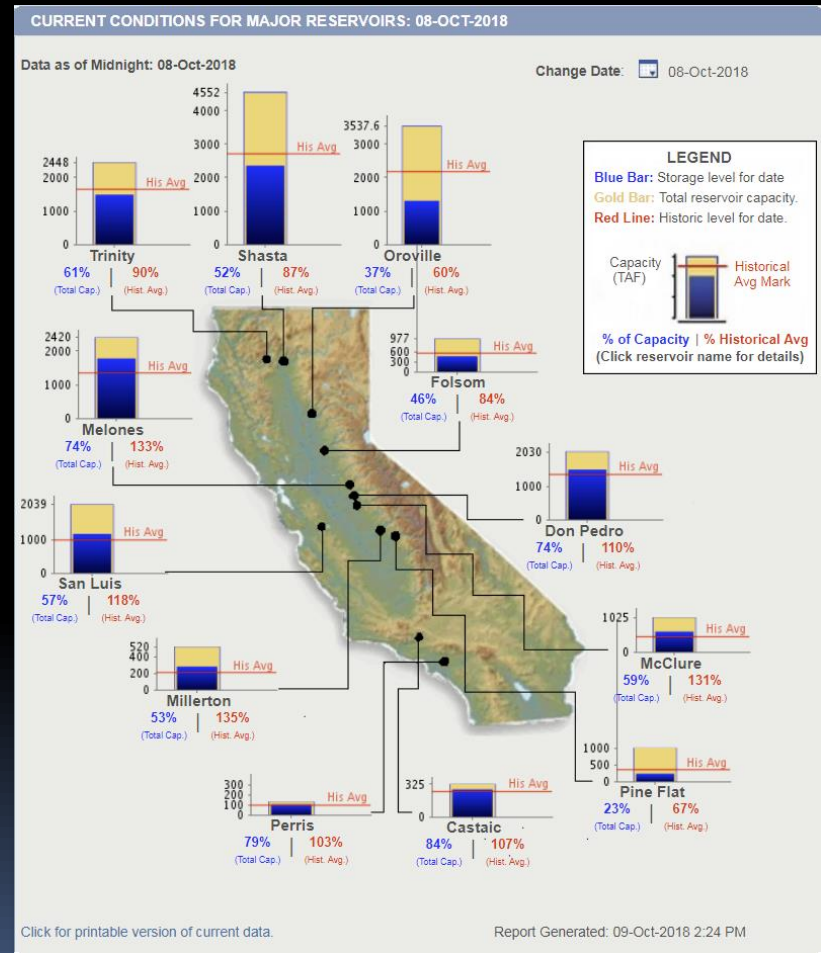
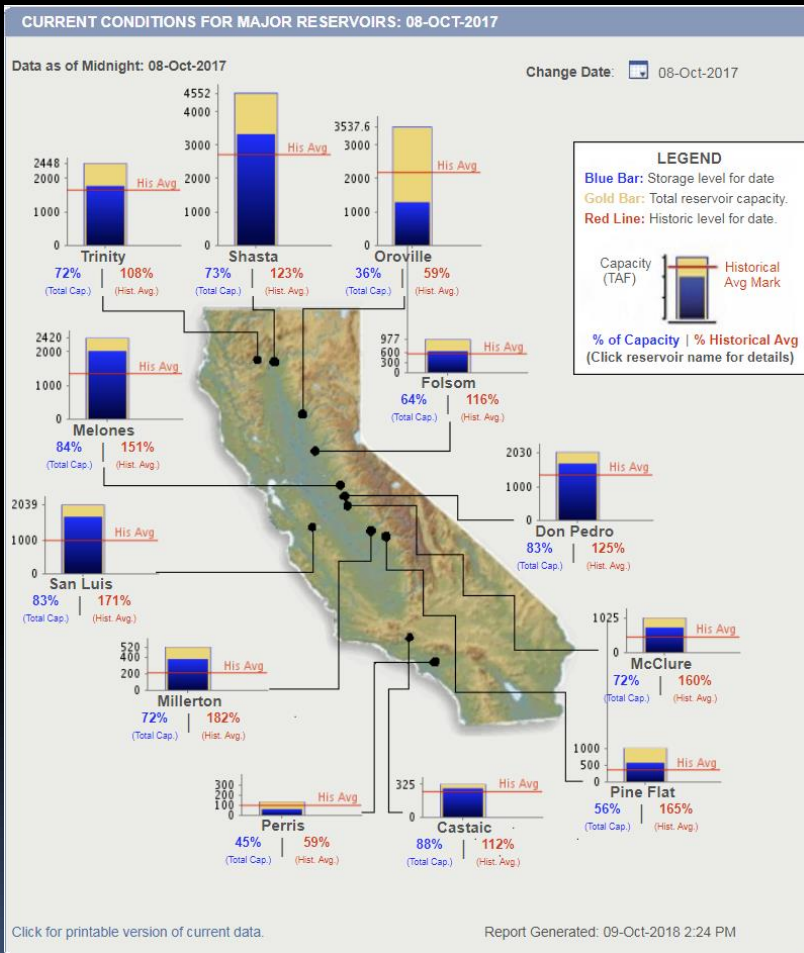
- DM map show's a similar outline of the driest conditions in SoCal to normal in the Sierra Nevada Mtns



Reservoir Conditions

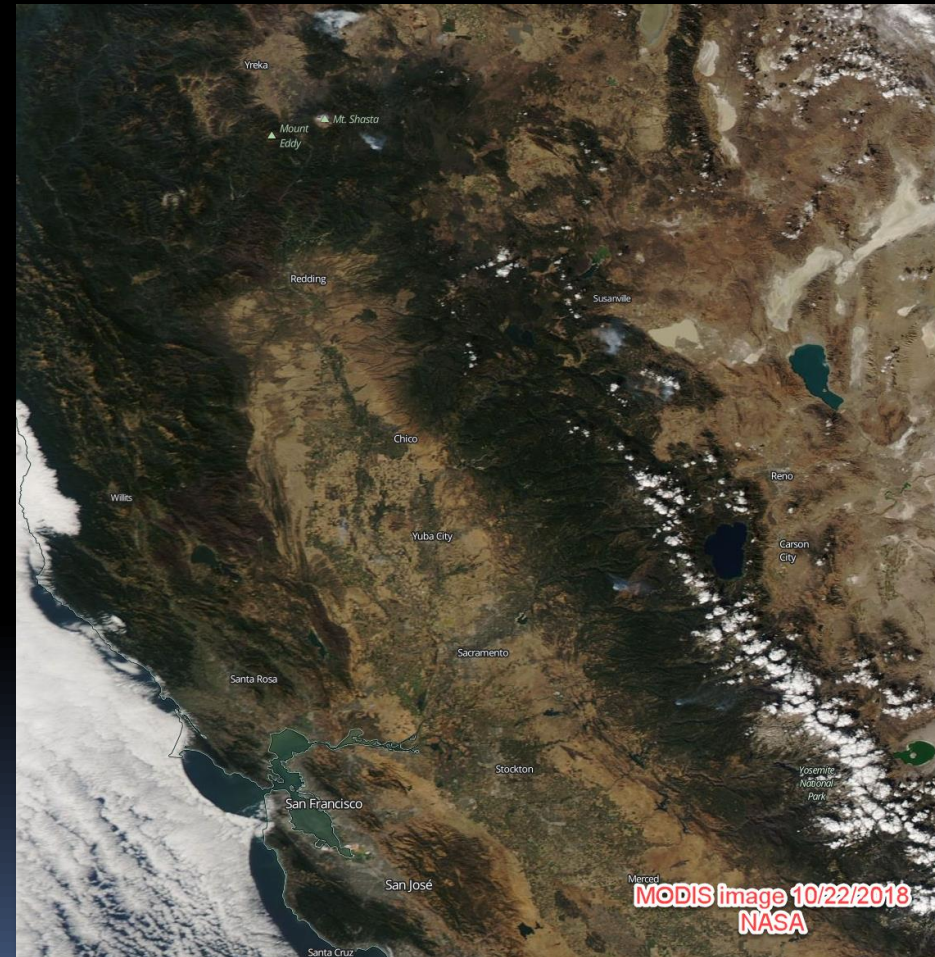
2017

2018



Still have Fire Weather to consider

- Still plenty of dry grass to burn
- East winds and low humidities will continue to create fire weather concerns
- Will remain in fire season until widespread rains cover NorCal



WINTER STORM
OVERNIGHT
USE CAUTION



NORTHERN SIERRA NEVADA RANGE WINTER HAZARDS AND CA WATER STORY

Northern Sierra Nevada impacts this winter:

- Occasional winds
 - Potential for more tree damage
- Mountain snow
- Valley rain
 - Unprepared drivers
 - Flashy foothill/mountain streams



Photo Courtesy of Stephen T. Coleman

Rainfall:

Travelers will transition for rain in valleys to snow in the foothills/mountains

Winds:

Dead/dying trees more susceptible to damage

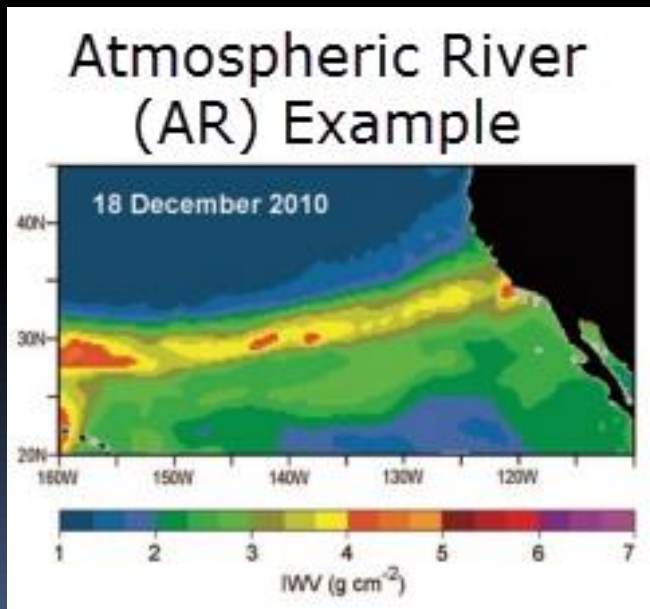
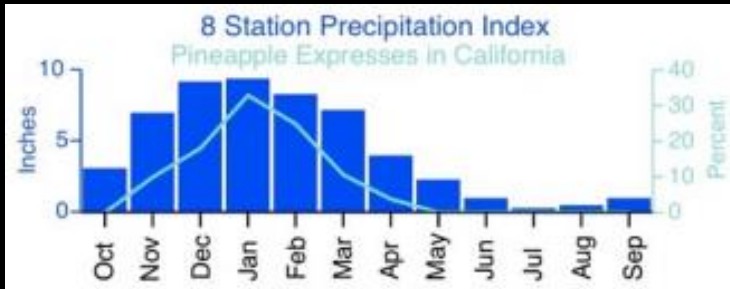


Photo Courtesy of Phil Hysell

Snowfall:

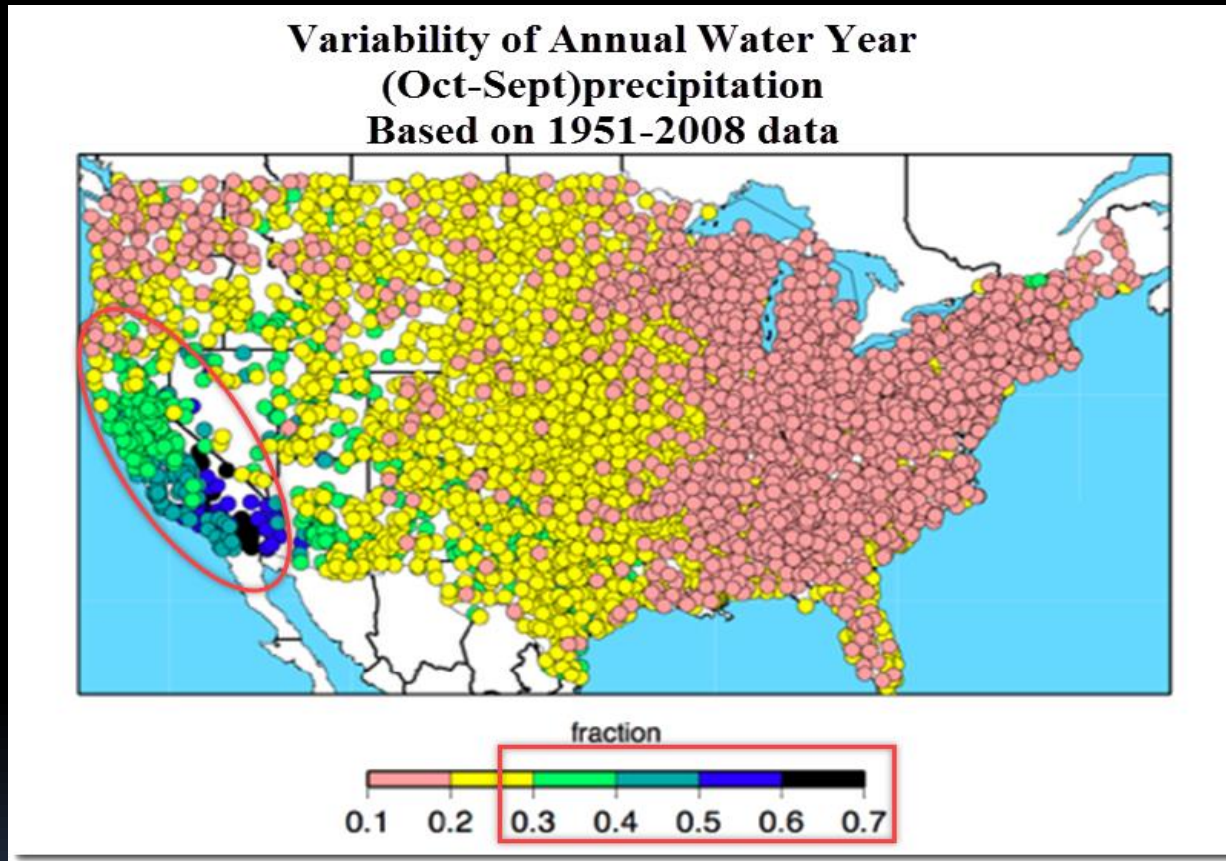
May take longer for people to acclimate to winter conditions (Driving etc)

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 COMPARED TO REST OF U.S. :



- 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

2017 Predictions

...According to CPC...

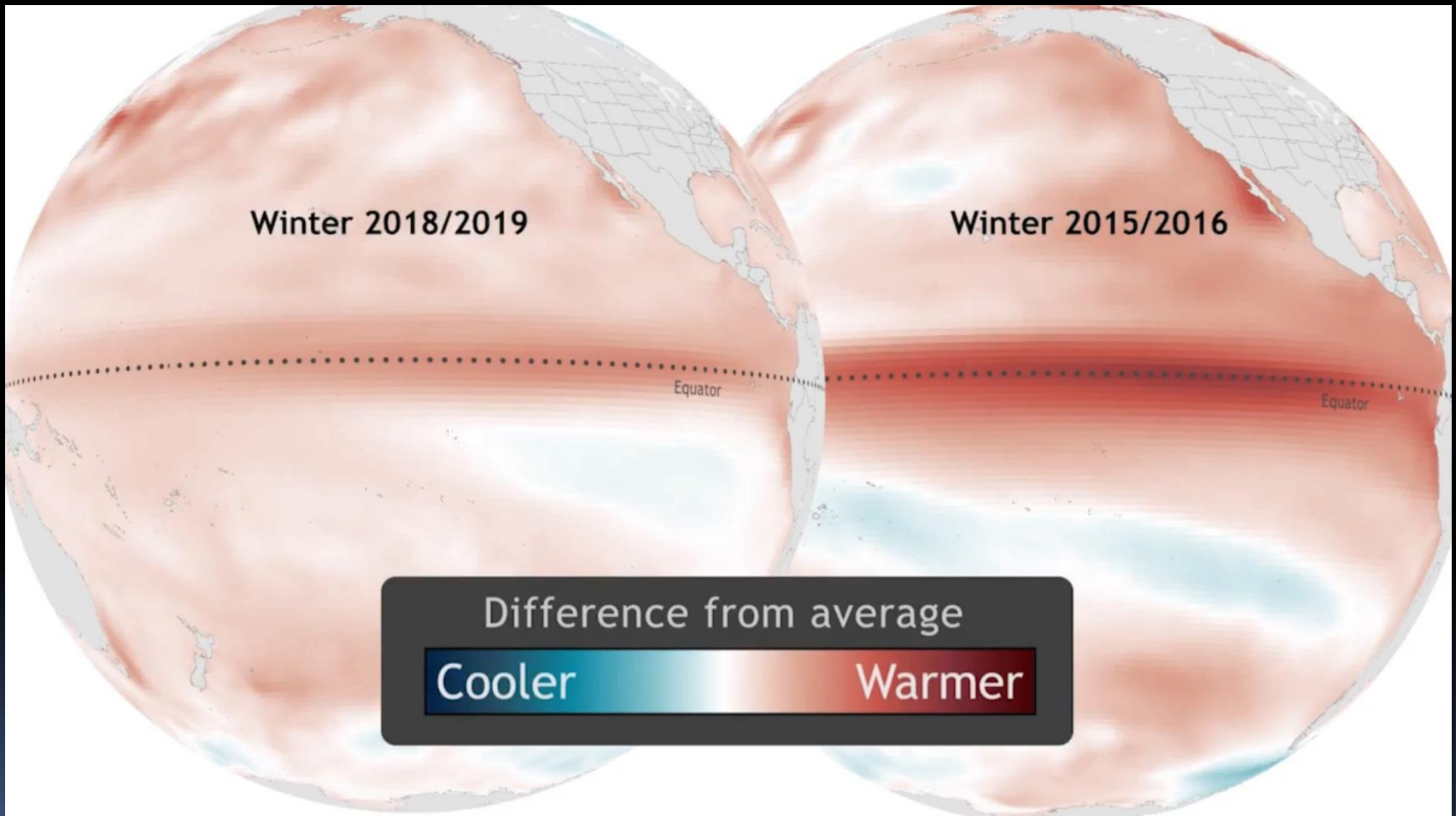
El Niño Watch Issued 6/14/2018

“El Niño is favored to form in the next couple of months and continue through the Northern Hemisphere winter 2018-19 (70-75% chance).”

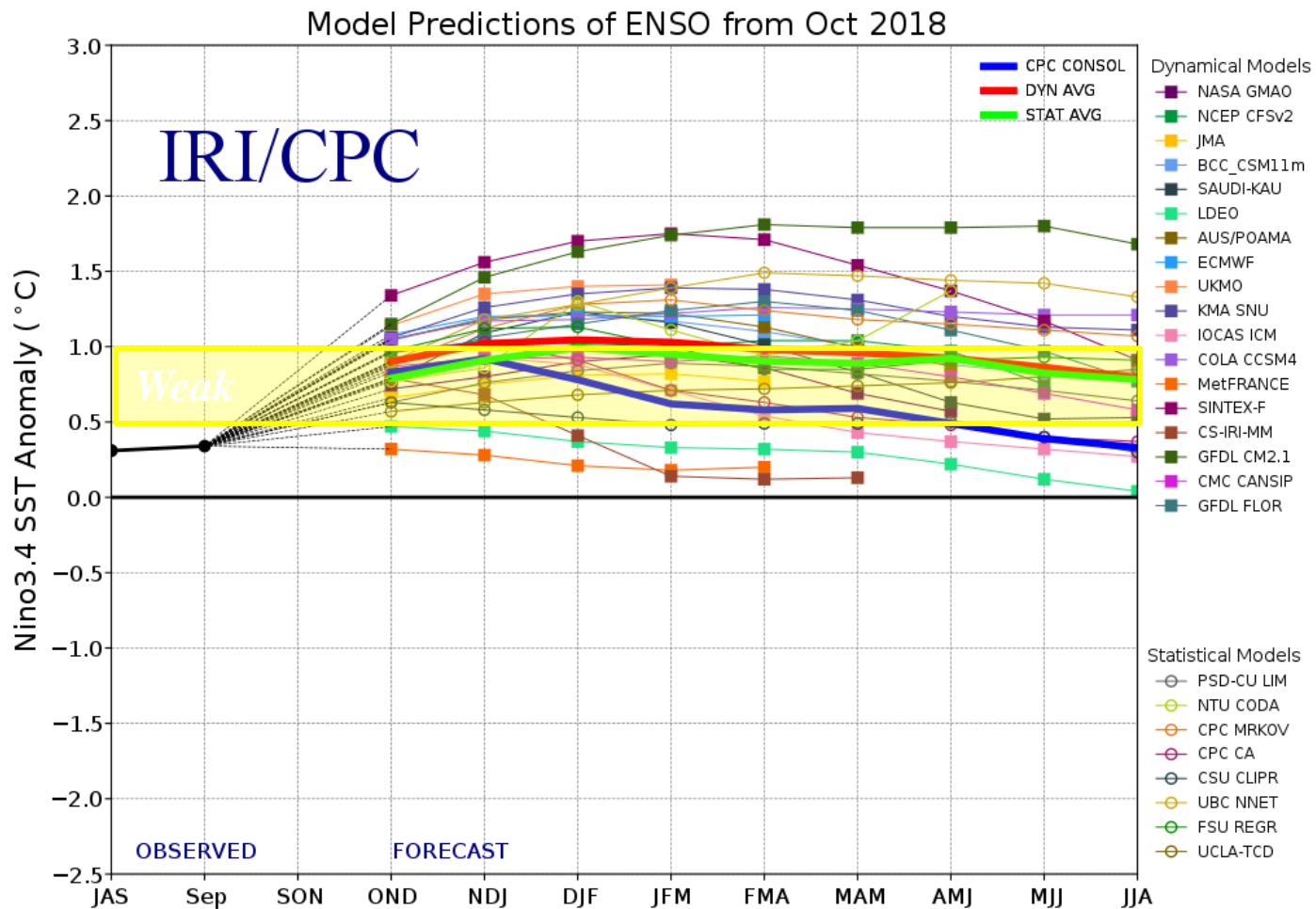
Highlights:

- Remember! El Niño does not guarantee lots of rain!

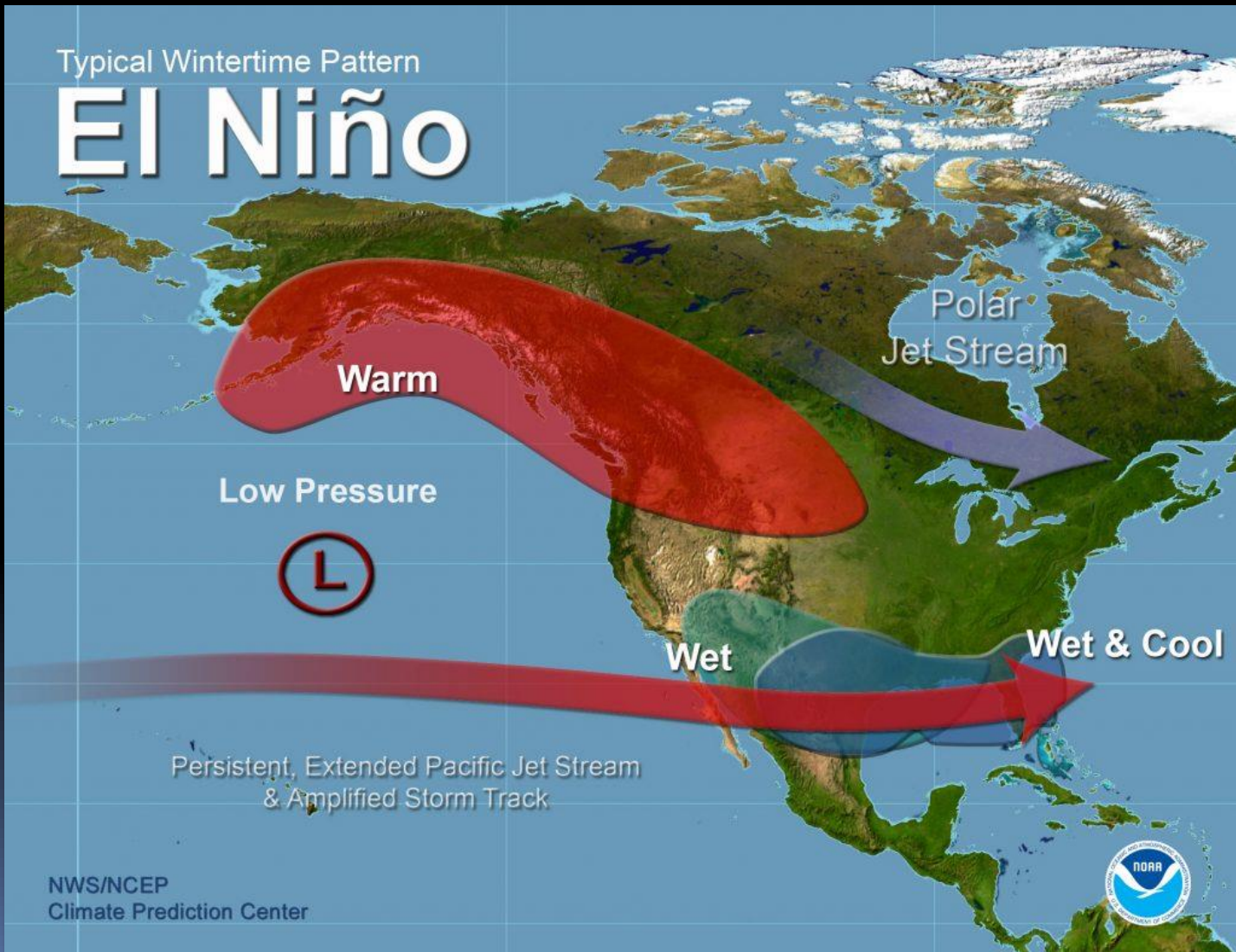
El Niño is forecast for the 2018/2019 Winter



Latest Long Range models ENSO Strength Forecast



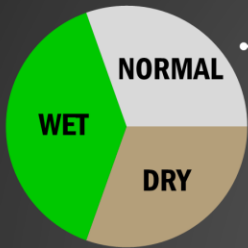
Typical El Niño Winter Storm Track



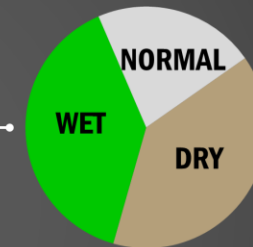
PAST EL NIÑO EVENTS

1950-2018*

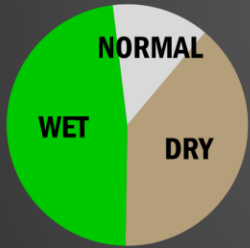
NORTHERN CA



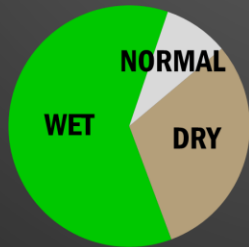
SIERRA NEVADA



CENTRAL CA



SOUTHERN CA



NATIONAL WEATHER SERVICE

SACRAMENTO, CA

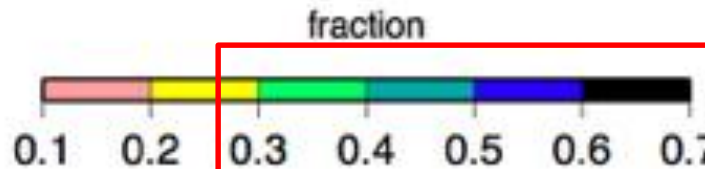
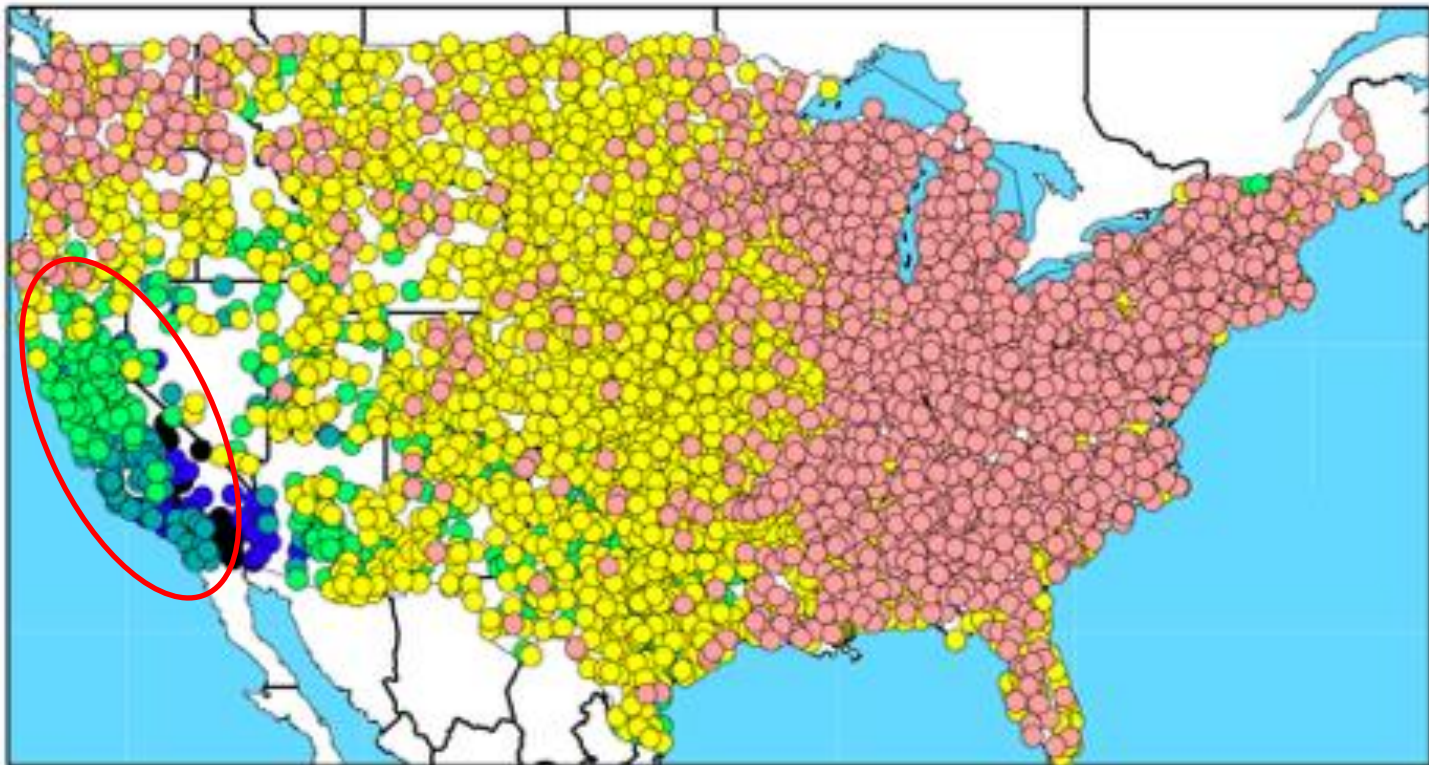
*23 historical El Niño Seasons
Data: PRISM, Oregon State University



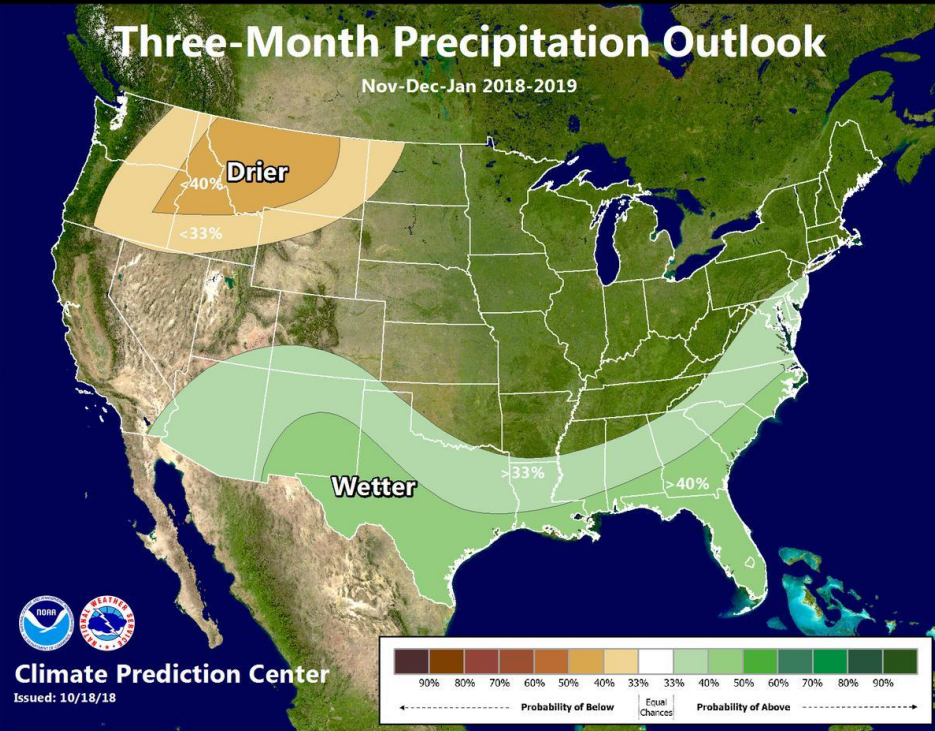
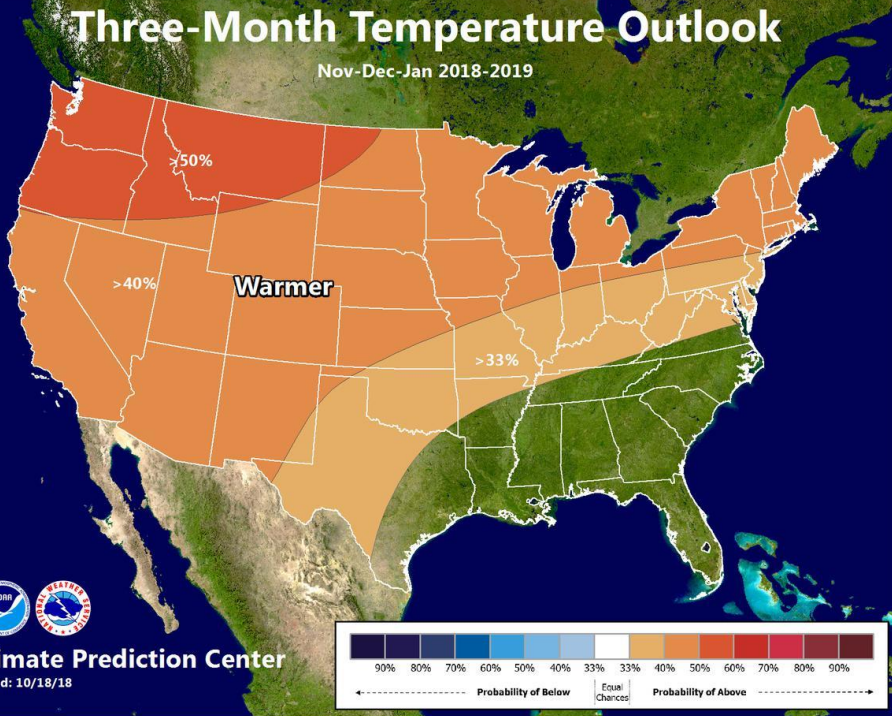
SEASONAL OUTLOOK

Remember this Map!!!

COEFFICIENTS OF VARIATION OF
TOTAL PRECIPITATION, WY 1951-2008



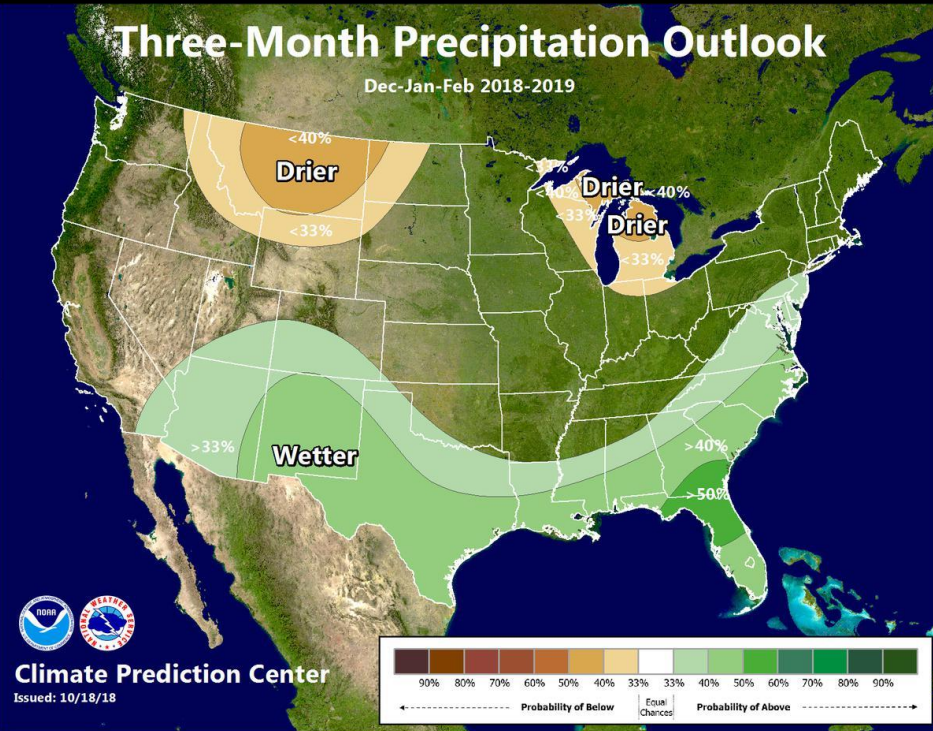
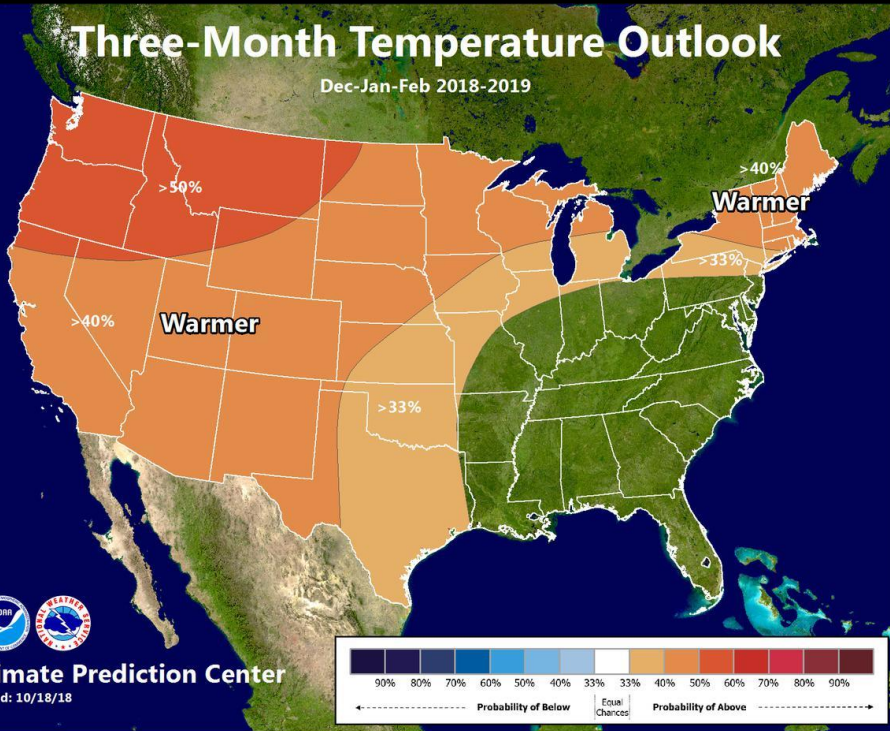
CPC 3 Month Outlooks Nov/Dec/Jan



Unshaded areas = Equal Chances, No Strong Indicators

Issued: 10/18/18

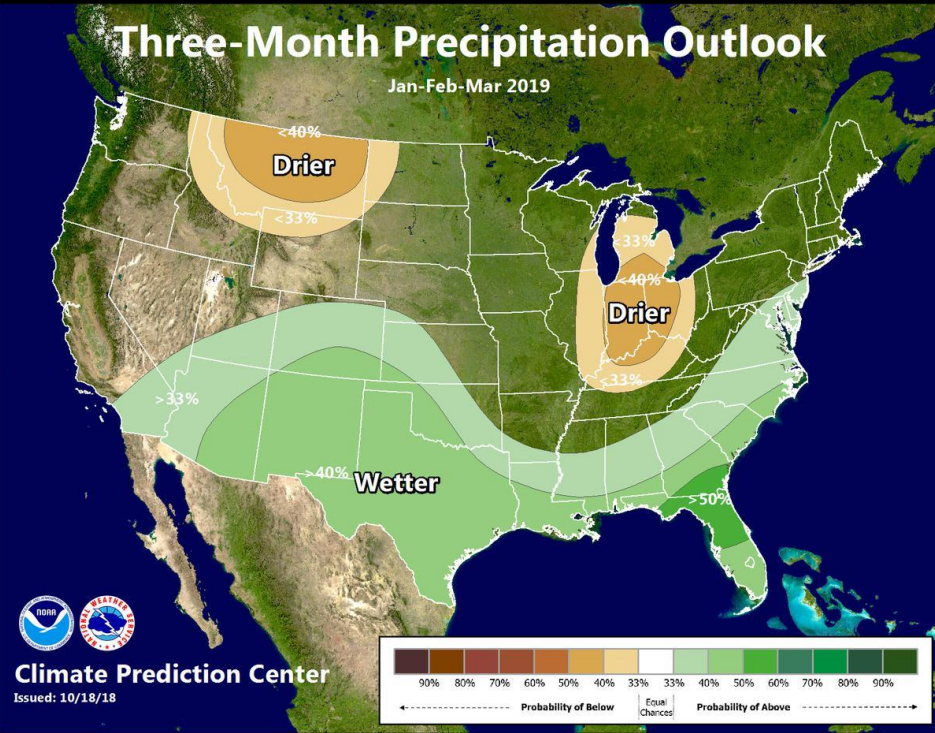
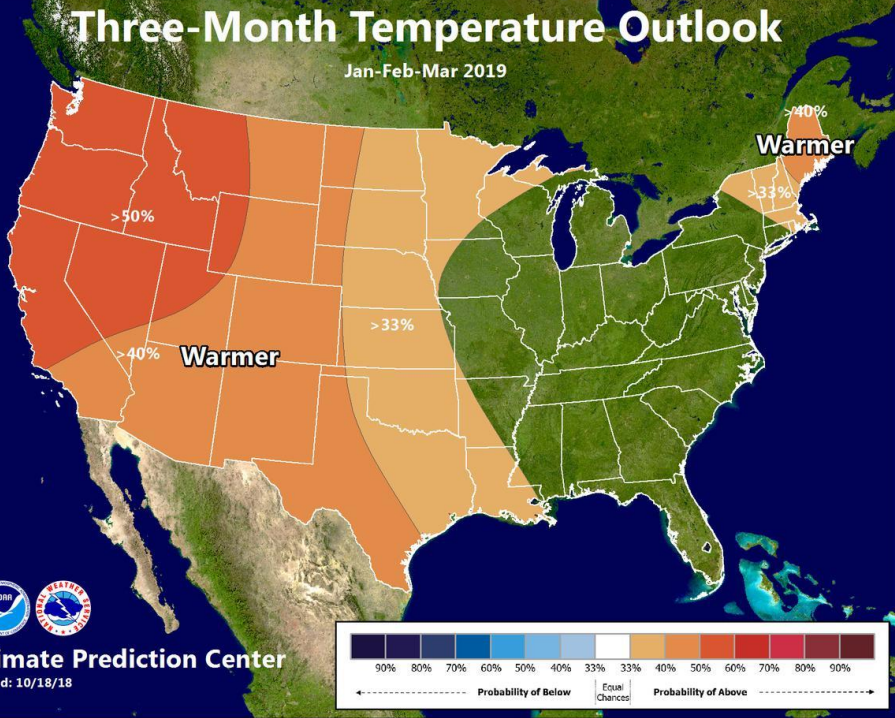
CPC 3 Month Outlooks Dec/Jan/Feb



Unshaded areas = Equal Chances, No Strong Indicators

Issued: 10/18/18

CPC 3 Month Outlooks Jan/Feb/Mar



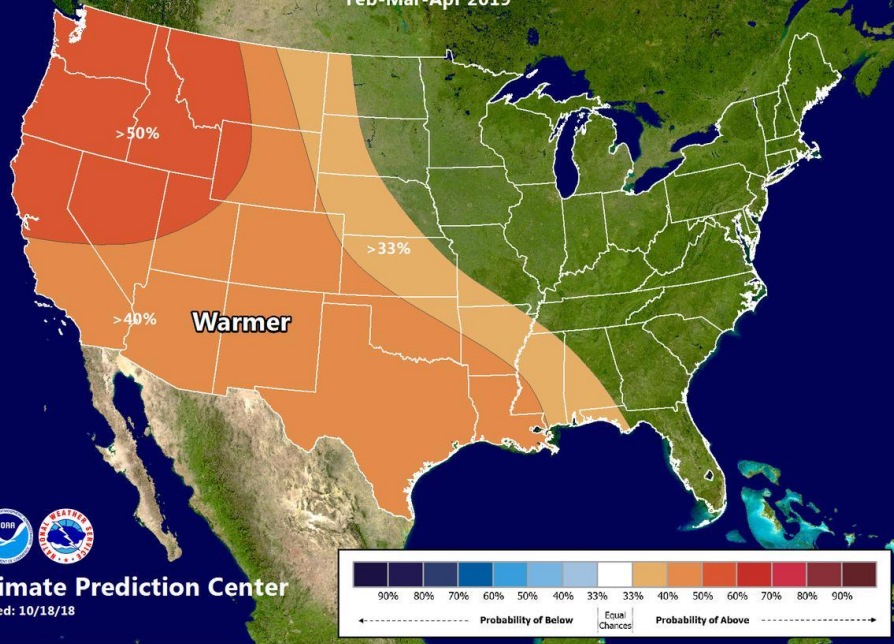
Unshaded areas = Equal Chances, No Strong Indicators

Issued: 10/18/18

CPC 3 Month Outlooks Feb/Mar/April

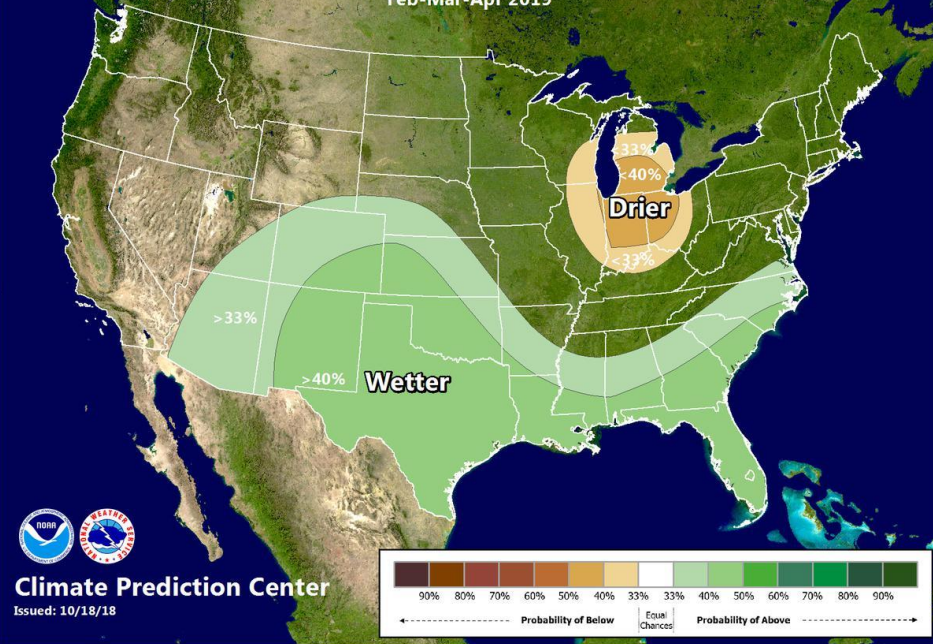
Three-Month Temperature Outlook

Feb-Mar-Apr 2019



Three-Month Precipitation Outlook

Feb-Mar-Apr 2019



Unshaded areas = Equal Chances, No Strong Indicators

Issued: 09/25/18

How do you prepare?



National Weather Service

www.weather.gov/STO

- Watches, Warnings, Advisories
- Detailed Hazards
- Weather Stories
- Daily Weather
- Social Media
- Partner Emails

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by "City, ST" or ZIP code

[Location Help](#)

A Large Scale Precipitation Event Starting on Tuesday
 A front arriving into the Upper Midwest and a digging jet stream over the West will set the stage for a large precipitation event Tuesday through Thursday. Heavy snow will be likely for the entire stretch of Rockies Tuesday into Wednesday morning, especially the CO Rockies. Heavy to excessive rain w/ the threat for severe t-storms will be expansive starting late Tuesday from TX to the Ohio Valley. [Read More >](#)

NWS Forecast Office Sacramento, CA Sacramento, CA
Weather Forecast Office

[Weather.gov > Sacramento, CA](#)

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

Red Flag Warning North Winds Weekly Forecast Fire Safety

Red Flag Warning
Tuesday October 30th, 2018

Impacts

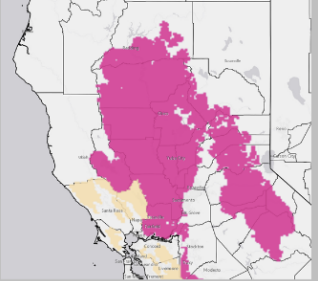
- Potential for rapid spread of fires

Timing

- Monday Night – Wednesday morning

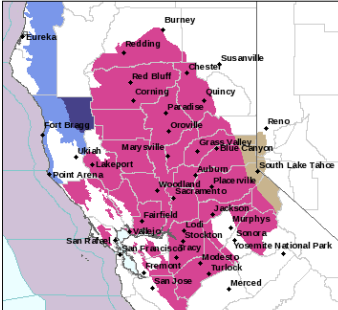
Winds & RH

- North winds 10-25 mph with gusts to 40 mph
- Minimum daytime humidity 10-15%
- Poor humidity recovery Tuesday night, 30-45%



[Show Caption](#)

Click a location below for detailed forecast.



Last Map Update: Mon, Oct. 29, 2018 at 3:49:31 pm PDT

Watches, Warnings & Advisories

- Freeze Warning
- Red Flag Warning
- Small Craft Advisory
- Lake Wind Advisory
- Frost Advisory
- Hazardous Weather Outlook

Text Product Selector (Selected product opens in current window)
 Latest Text Products Issued by STO

Social Media: Facebook, Twitter, YouTube, RSS, etc.

Tools: Sacramento Radar, Beale Radar, Satellite, Weather Map, Graphical Forecasts - Local

How to get dist 3 Forecasts

CalTrans Dist 3 Web Page:

www.weather.gov/sto/brief/caltransbrief.php

NATIONAL WEATHER SERVICE
Weather for Travelers over Sierra Northern California
Home | Current Hazards | Current Conditions | Forecasts | Hydrology | Climate | Weather Safety | Additional Info | Contact Us

Refresh | AutoRefresh is On | Updated 11:47 PDT Sep 07 2017

Travel Forecasts | Forecast Weather Tables | Graphical Forecasts | Radar | Satellites | Weather Observations | Weather Story | Zone Forecasts

Forecast Weather Tables: For Interstate 80: Forecast Weather Tables near Truckee, CA; Forecast Weather Tables near Castle Peak, CA; Forecast Weather Tables near Kingvale, CA; Forecast Weather Tables near Colfax, CA; Forecast Weather Tables near Auburn, CA; For Highways 89 and 49: Forecast Weather Tables near Tahoe City, CA; Forecast Weather Tables near Sierraville, CA; Forecast Weather Tables near Donner Summit, CA; Forecast Weather Tables near Nevada City, CA; Forecast Weather Tables near Luther Pass, CA; Forecast Weather Tables near Emerald Bay, CA; For Highway 50: Forecast Weather Tables near Echo Summit, CA; Forecast Weather Tables near Kyburz, CA; Forecast Weather Tables near Placerville, CA; Forecast Weather Tables near South Lake Tahoe, CA.

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Refresh | AutoRefresh is On | Updated 11:47 PDT Sep 07 2017

Travel Forecasts | Forecast Weather Tables | Graphical Forecasts | Radar | Satellites | Weather Observations | Weather Story | Zone Forecasts

Forecast Weather Tables:

For Interstate 80:

- Forecast Weather Tables near Truckee, CA
- Forecast Weather Tables near Castle Peak, CA
- Forecast Weather Tables near Donner Summit, CA
- Forecast Weather Tables near Kingvale, CA
- Forecast Weather Tables near Blue Canyon, CA
- Forecast Weather Tables near Colfax, CA
- Forecast Weather Tables near Auburn, CA

For Highway 50:

- Forecast Weather Tables near Echo Summit, CA
- Forecast Weather Tables near Kyburz, CA
- Forecast Weather Tables near Placerville, CA
- Forecast Weather Tables near South Lake Tahoe, CA

For Highways 89 and 49:

- Forecast Weather Tables near Tahoe City, CA
- Forecast Weather Tables near Sierraville, CA
- Forecast Weather Tables near Downieville, CA
- Forecast Weather Tables near Nevada City, CA
- Forecast Weather Tables near Luther Pass, CA
- Forecast Weather Tables near Emerald Bay, CA

For Highways 32 and 99:

- Forecast Weather Tables near Chico, CA
- For Highways 70 and 20: Forecast Weather Tables near Marysville, CA
- For Highway 16: Forecast Weather Tables near Esparto, CA
- For Highway 191: Forecast Weather Tables near Paradise, CA
- For Highway 267: Forecast Weather Tables near Brockway Summit, CA

NWS Partner Emails

Early heads up of impending weather (Prior to traditional Watches and Warnings)

Contact Michelle Mead, NWS Sacramento, if want to be added



NOAA – National Weather Service
Interior Northern California – Sacramento CA
www.weather.gov/sacramento



Weak Storm Sunday/Monday, High Impact Storm Late Week

Impacts

- Valley fog Sunday morning
- Slick roads from rain late Sunday into Monday
- Potential for hazardous travel, flooding, debris flow over burn scars, downed trees & power outages with late week storm

Forecast Confidence

- High in light precipitation later Sunday into Monday
- High in strong storm late Wednesday 12/11 - Friday 12/14
- Medium in timing and details

Timing and Strength

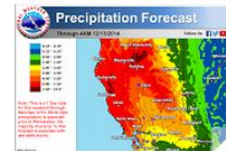
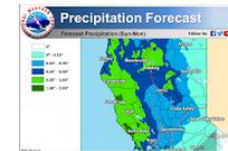
- Central/Southern Valley fog, potentially dense in some spots, Sunday morning
- Weak system Sunday afternoon into Monday. Light precipitation generally north of I-80
- Strong system moves in late Wednesday into Friday
- Moderate to heavy precipitation Thursday into Friday. Potential for 1-4" in the Valley, 5-10" in the mountains
- Gusty winds, especially Thursday into Friday
- Heavy mountain snow possible

Weather Summary

With lingering moisture, fog, dense in spots, may form late tonight into Sunday morning for central and southern portions of the valley. Another weak system will move in Sunday afternoon into Monday with light precipitation generally north of I-80. As mentioned yesterday, our attention is shifting toward what will likely be a major storm that impacts Northern California late next week. Exact details are still a bit uncertain this far out but we have increasing confidence this storm will occur late week. The combination of moderate to heavy precipitation and very windy conditions could bring widespread power outages, downed trees, urban and small stream flooding, and heavy snow to the Sierra. Debris flows over burn scars will be possible, especially with recent heavy rainfall. Unless things change drastically, we will send out the next update Monday so stay tuned!

NWS will continue to provide updates as the situation develops.

3 Attachments



NWS Partner Emails

Early heads up of impending weather (Prior to traditional Watches and Warnings)


Contact Chris Smallcomb, NWS Reno, if want to be added

Email body

NWS Reno -- Strong North Winds, Very Dry Air, and Cold - Then Super Quiet
1 message

Chris Smallcomb - NWS Reno <chris.smallcomb@noaa.gov> Sun, Oct 14, 2018 at 10:17 AM
To: Chris Smallcomb <Chris.Smallcomb@noaa.gov>
Bcc: rev.em.partners@noaa.gov

Hi all -- Hope your weekend is going well. ☀️ Looks pretty sunny out the window giving the impression of not much happening weather wise. My pre-dawn run commute was thankfully uneventful though I did come across a random toilet in the middle of a field...



We've got a decent cold front rolling through the region with a variety of issues to note:

- **Strong northerly winds** will develop as the day wears on - especially in areas such as ridge-tops, Lake Tahoe, and other districts prone to north winds such as Walker Lake Hwy 95 and Chalfant/Owens Valleys Hwys 395/6. The peak in valley winds will occur this afternoon with the peak Sierra ridge winds happening tonight. Not a major mountain wind event but strong nevertheless. Recreation impacts are likely in the mountains and some transport impacts are possible on Hwys 395, 6, and 95.
- This front has some **big time dry air** with it - so absolutely no chance of rainfall. Humidity values will drop today into tomorrow with the lowest humidity Monday afternoon possibly at or even below 5% in some spots. There could be a **few areas where critical fire weather exists today** with the stronger winds - such as Chalfant and Owens Valley along with mid-slopes and ridges around the rest of the region. Not enough area covered to warrant Red Flags but it's still something to watch.
- The **coldest temperatures since at least mid-April are projected for Monday morning** with widespread hard freezes likely even in urban areas and warm spots like the Reno Airport. Definitely time to wrap up irrigation and garden stuff, and be aware of icy spots on roads and sidewalks Monday morning from irrigation that may not be turned off. I can attest to this sprinkler ice hazard on 4 AM runs... 😬
- From **Tuesday onward things look super quiet**. None of our simulations indicate potential for big Pacific storm action through at least the 24th. Some simulations bring light showers to the eastern Sierra next weekend but it's not the favored scenario at the moment. Light winds will limit transport of smoke from any prescribed burns this coming week. In fact overall **ventilation will be limited Monday and Tuesday** with strong morning inversions in valleys.

That's all for now. Please write back or call with any follow-ups. Unless something in the long-range outlook changes I don't plan any additional email updates this week, so have a great one! 😊

-Chris

Freakout Scale

Situational Awareness - When Should I Freakout?


NWS Reno 7-14 Day Scan for Unusual Upcoming Weather across the Sierra and western Nevada

	Sun 10/14	Mon 10/15	Tues 10/16	Wed 10/17	Thurs 10/18	Fri 10/19	Sat 10/20	W2 10/21-27
Wind (travel, rec, property impacts)	Strong NE ridge winds and valley gusts (Mono + Mineral), Lake Tahoe: Rec + travel impacts a good bet.		Light and variable winds across the board.					
Snow (travel, rec impacts)	You can't even buy a snowflake!							
Thunderstorms (lighting, strong outflow winds, hail)	Can't buy a thunderstorm either...							
Flooding (flash floods, river flooding)	We're all good here.							
Unusual Cold or Heat (health impacts)	Turning decidedly colder. First widespread hard freeze Mon AM. Ag, gardens, irrigation impacts.		Still chilly AM but not as cold. Some freezes.	Warming to above normal readings.				Near to above normal favored.
Fire Weather (wind and low humidity, lightning starts, big plume days)	Areas of critical winds mid-slopes, ridges, Owens Chalfant Valleys.		Lighter winds but still gusty with super low RH ~5%...		Still low humidity values but light winds so no major concerns.			TBD.
Air Quality (big smoke plumes, air stagnation)	OK with cold front rolling thru.		Strong AM inversions with moderate ventilation PM. E/NE transport flow.		Overall moderate ventilation continues with light E/NE transport winds and gradually improving mixing each day.			TBD.

What Does This Mean? Integrates impacts and confidence

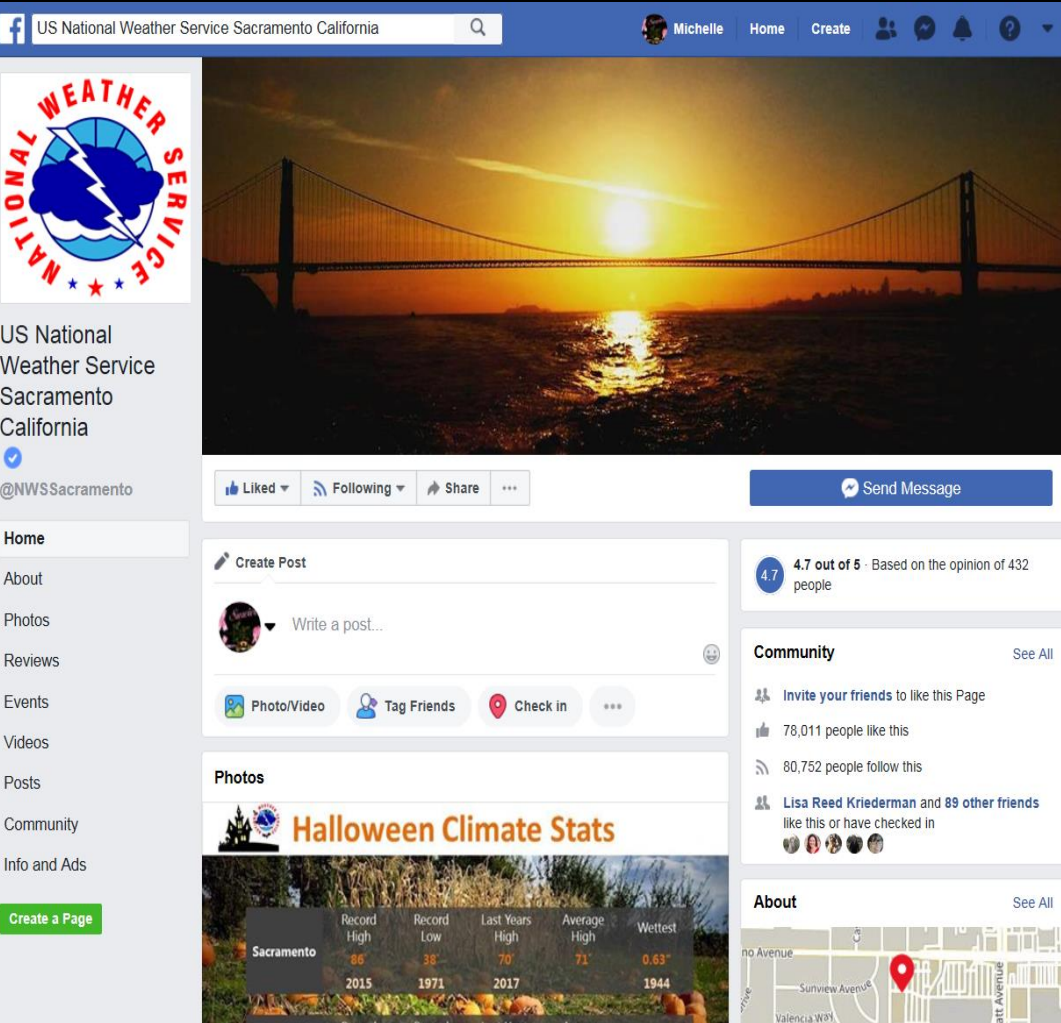
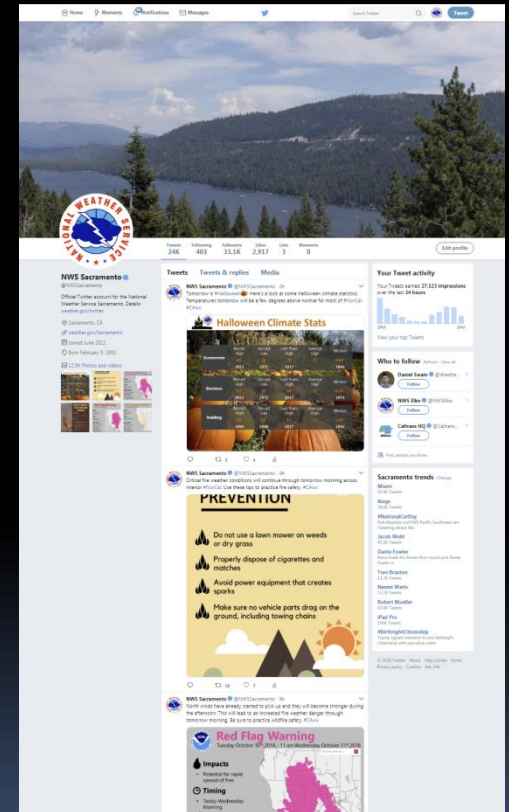
No worries 😊 Low freakout 😊 Moderate freakout 😐 High freakout 😞 Really bad 😡

Reno National Weather Service
Forecasting for the Sierra and western Nevada since 1905



Spreading the word through SM

Twitter



Facebook

Winter 2018-2019 Outlook Summary

REMEMBER!

- ❶ *Winter Season is Flood Season*
- ❷ *CA Wet season is typically Mid October-February*
 - ❶ *Highest precipitation typically Dec-Jan-Feb*
- ❸ *Weak El Niño expected*
 - ❶ *Does not guarantee a wet winter*
- ❹ *Seasonal outlooks will NOT capture how wet or dry winter will be*
 - ❶ *Winters are defined by the storms that occur through the season*
 - ❷ *They are only apparent in the 7-10 day forecast*
- ❺ *California Winters typically see 5 -7 Atmospheric River (Pineapple express) storms a year*
 - ❶ *These systems are short term forecasts, less than 10 days, and can not be captured in monthly/seasonal outlooks*
- ❻ *Reservoirs are lower than Sept 2017 but still near historical normal*
 - ❶ *Exception – Oroville*



Questions



If you have further questions or want to be added to
Partner email list, please contact

Michelle.mead@noaa.gov

(916) 979-3068

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