A topographic map of California, showing the state's outline and internal terrain features. The map uses a color gradient from green (low elevation) to brown and tan (high elevation) to represent topography. Major river networks are shown in blue. The map is centered on the state of California, with the surrounding ocean visible to the west and south.

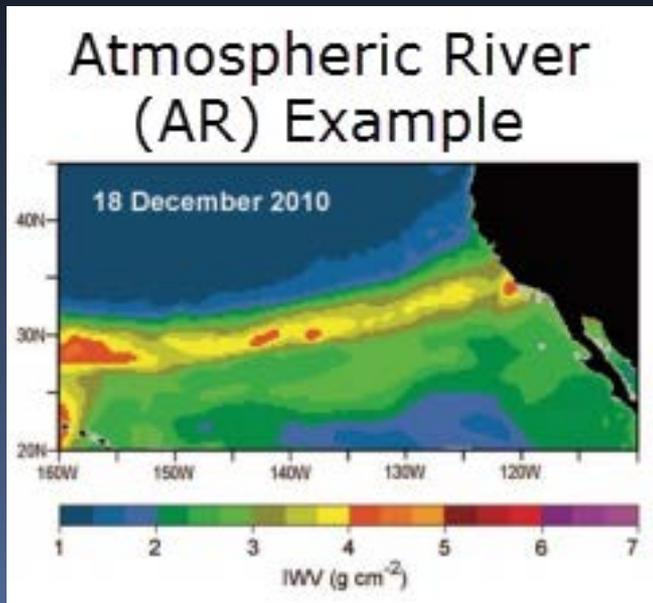
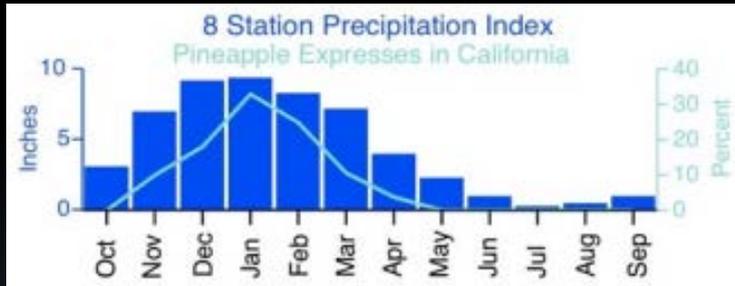
California El Niño/Winter Outlook and Flood Preparedness

November 18, 2015



CALIFORNIA WINTERS AND ATMOSPHERIC RIVERS

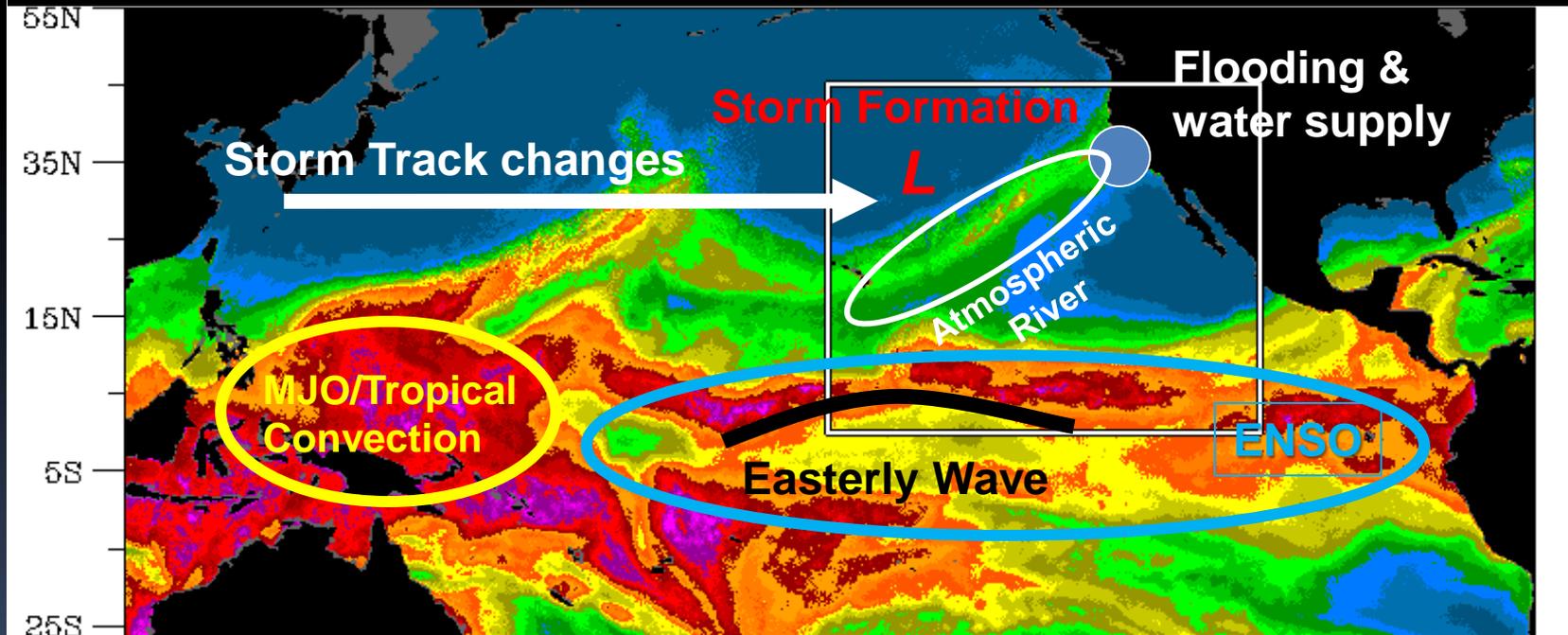
California's Water Story:



- California should always prepare for flood in Winter
 - El Niño or Not
- 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 (Flooding and Drought Improvement)
- When fewer storms arrive, conditions are drier (Drought Continues)
- El Niño does not guarantee an increase in AR storms

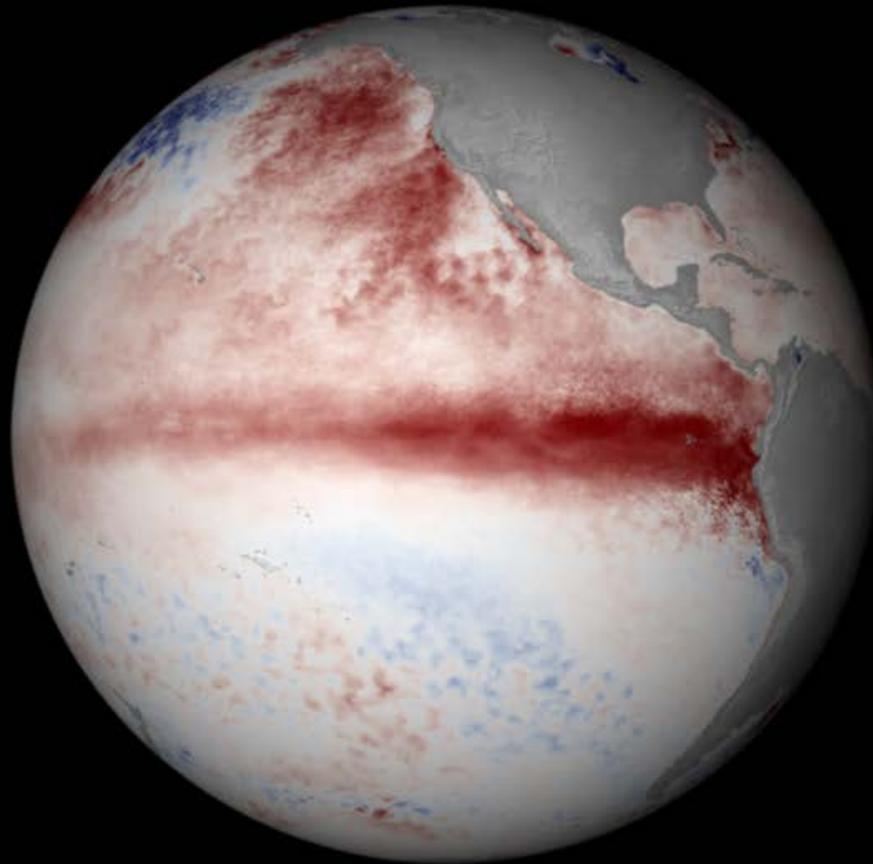
Key Phenomena Affecting California Water Supply/Flooding:

Polar Processes



The size, number, and strength of atmospheric river events (ARs) result from all the “Puzzle Pieces” lining up!

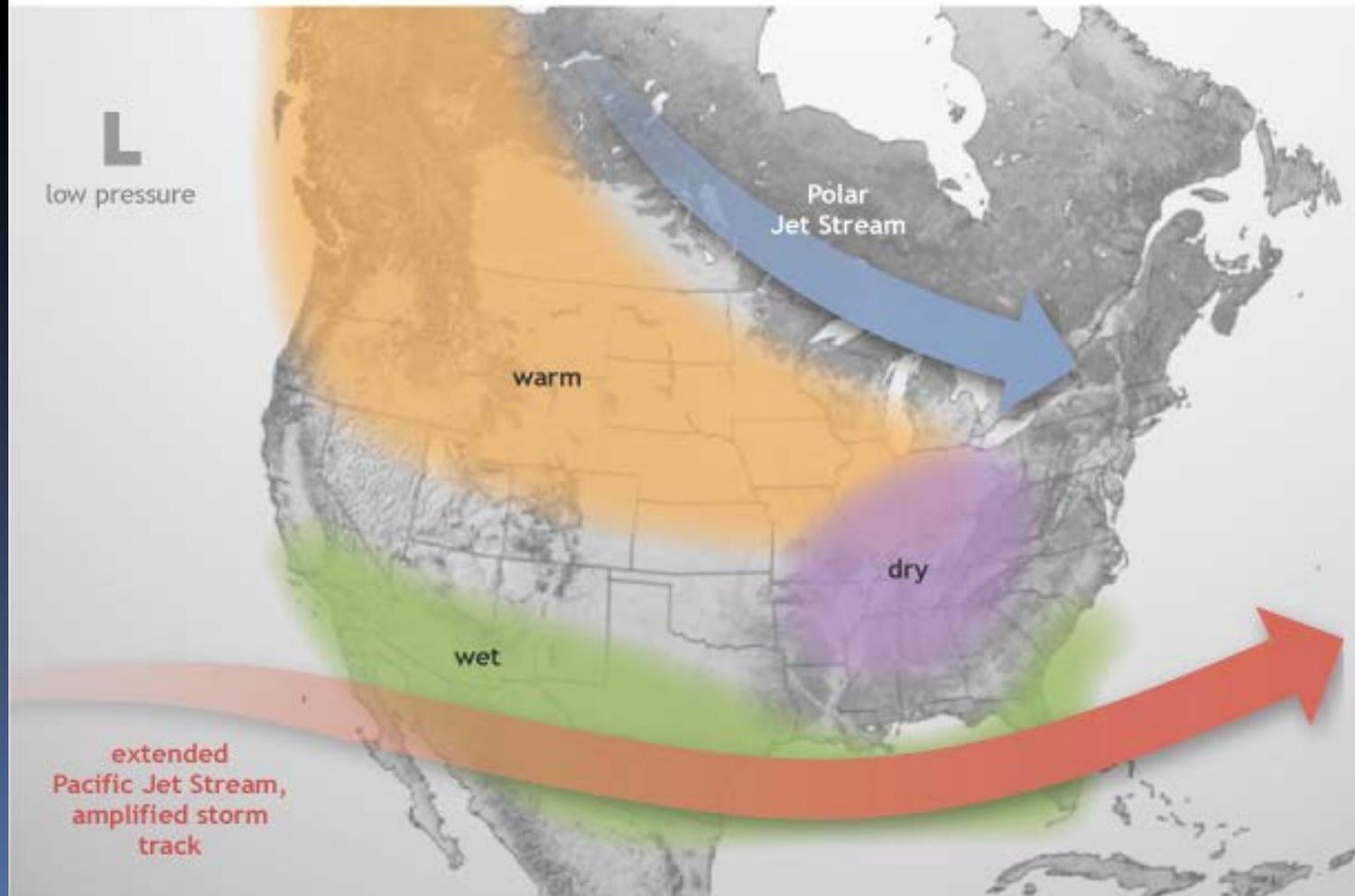
El Niño is here!



NOAA

Typical El Niño Winter Storm Track

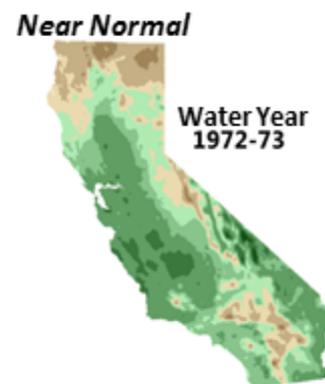
Wintertime El Niño pattern



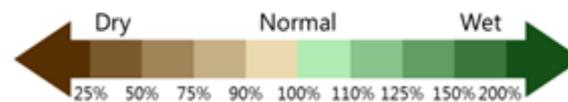


What does Strong El Niño mean for California?

- Strong El Niño events do not necessarily mean above normal precipitation
- Although a strong El Niño might increase precipitation chances in CA, it may not be enough to end the long term drought conditions

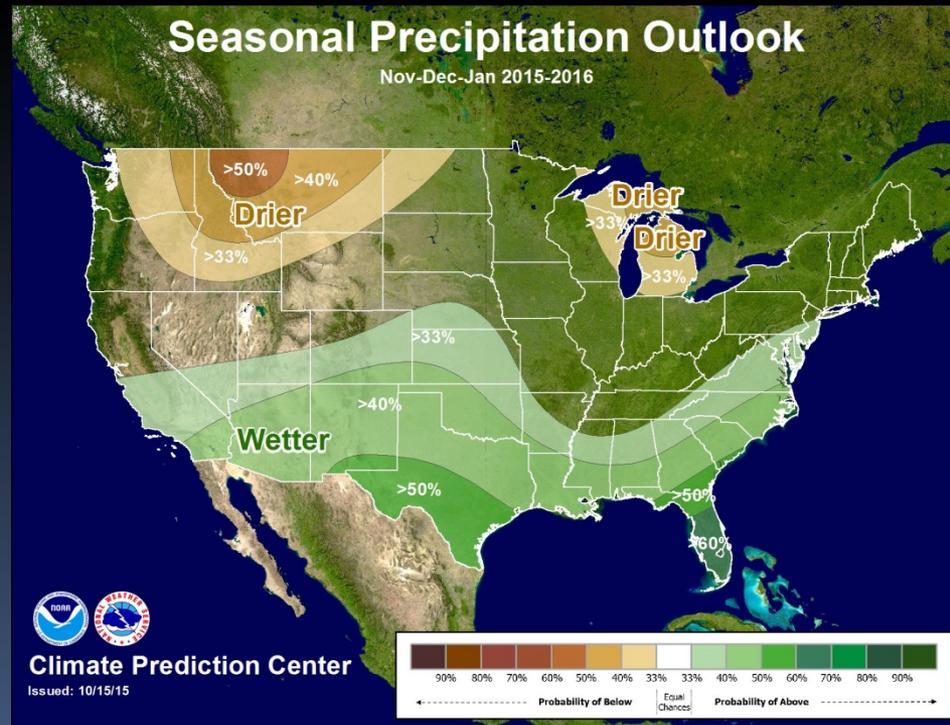
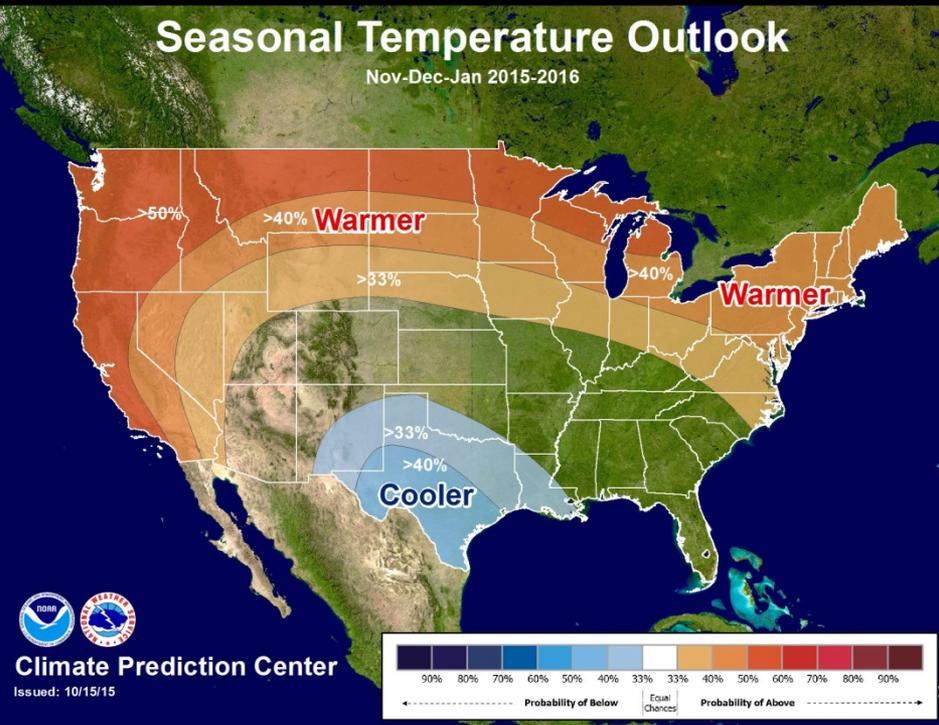


PRISM, Oregon State University



Your Winter Outlook

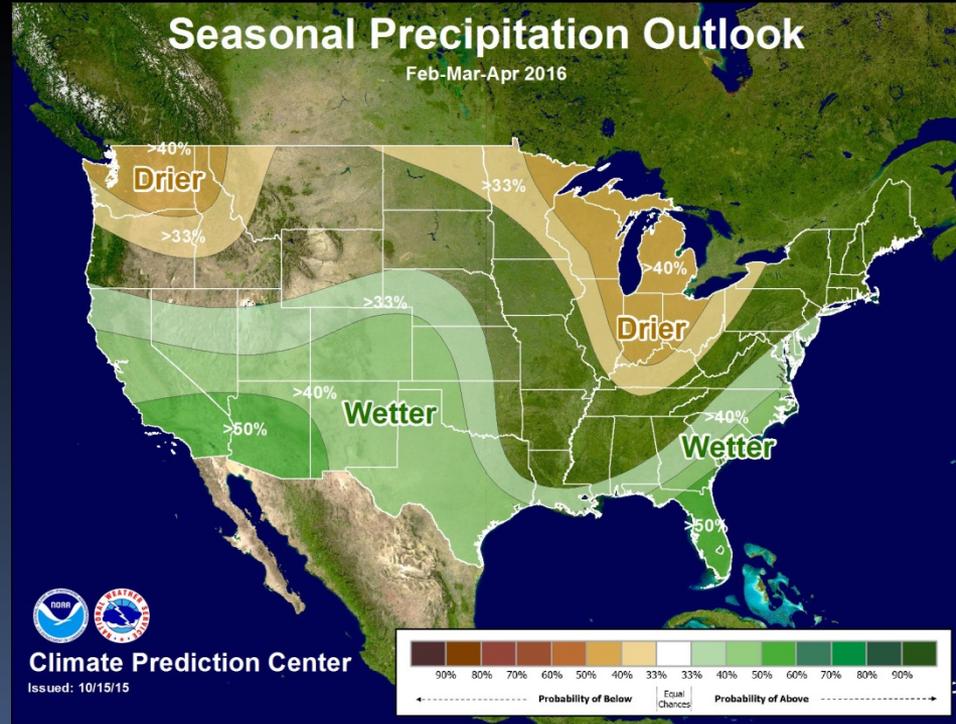
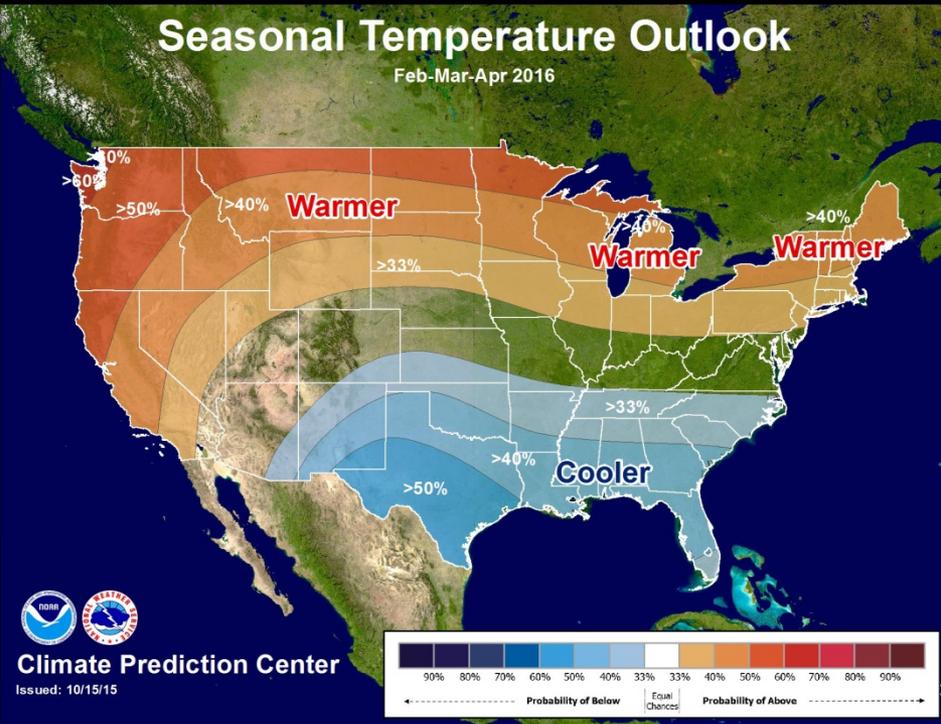
CPC 3 Month Outlooks Nov/Dec/Jan



Unshaded areas = Equal Chances, No Strong Indicators

Issued: 10/15/15

CPC 3 Month Outlooks Feb/Mar/Apr



Unshaded areas = Equal Chances, No Strong Indicators

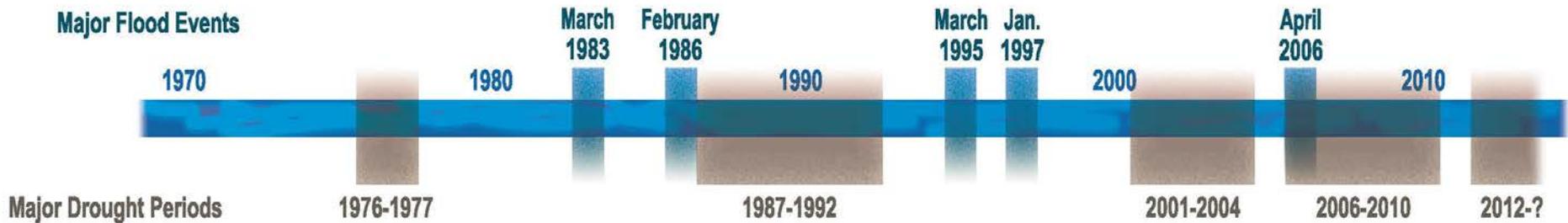
Issued: 10/15/15

Winter 2015-2016 Outlook Summary

REMEMBER!

-  ***El Niño is occurring! Now we need to focus on the individual storms***
-  ***El Niño brings the potential of increased precipitation, not a guarantee***
-  ***California Winters typically see 5 Atmospheric River (Pineapple express) storms a year***
 -  ***El Niño does not guarantee an increase in the number of Atmospheric Rivers***
 -  ***These systems are short term forecasts, less than 10 days, and can not be captured in monthly/seasonal outlooks***

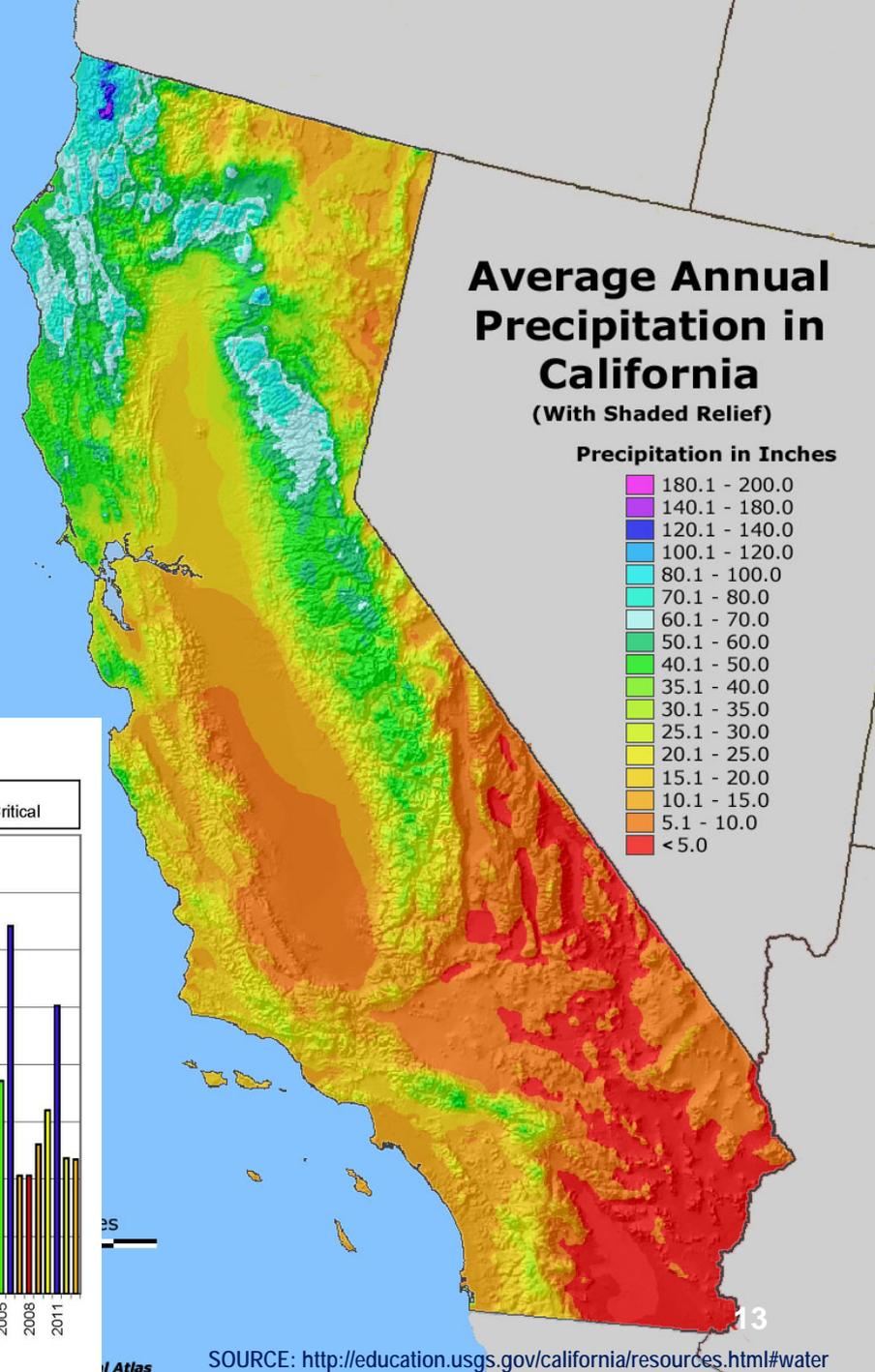
California's Water Management Challenge: A Tale of Two Extremes



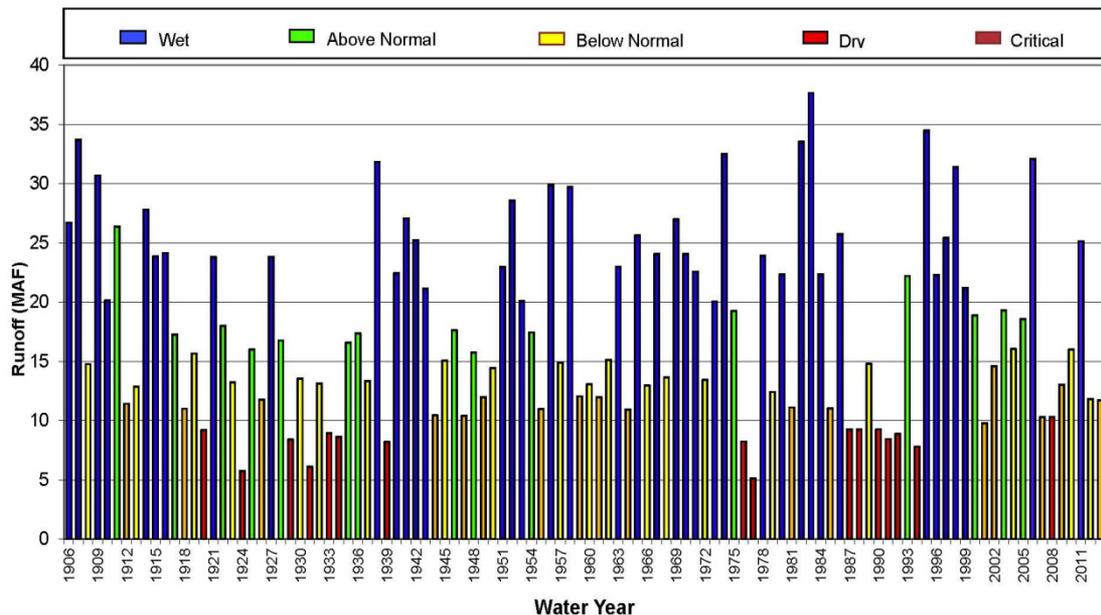
California Precipitation

Variable & Extreme Over Time & Location

Most precipitation occurs November - March

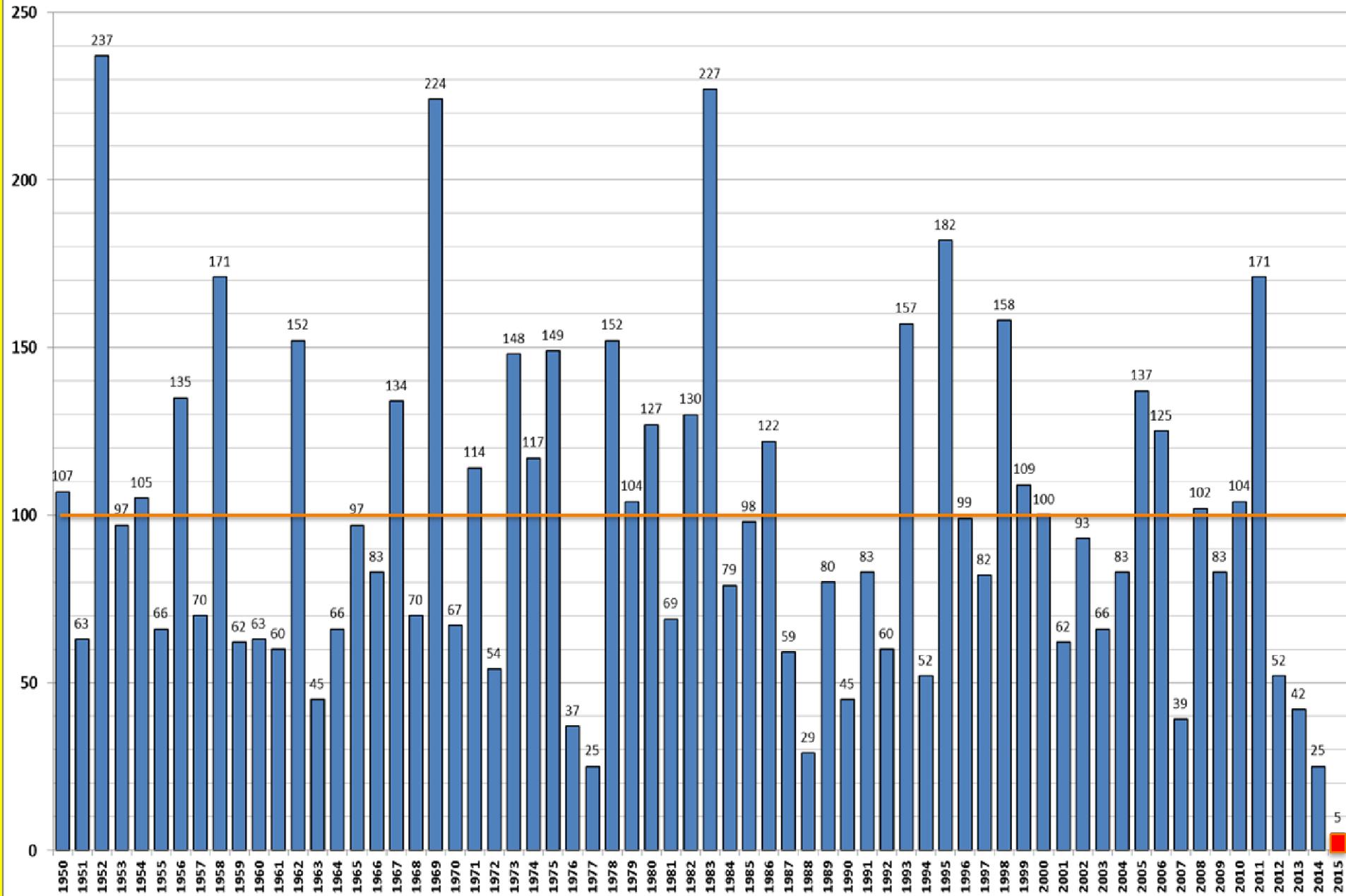


Sacramento Valley Water Year Types



April 1 Snowpack Water Content

Statewide Percent of Average

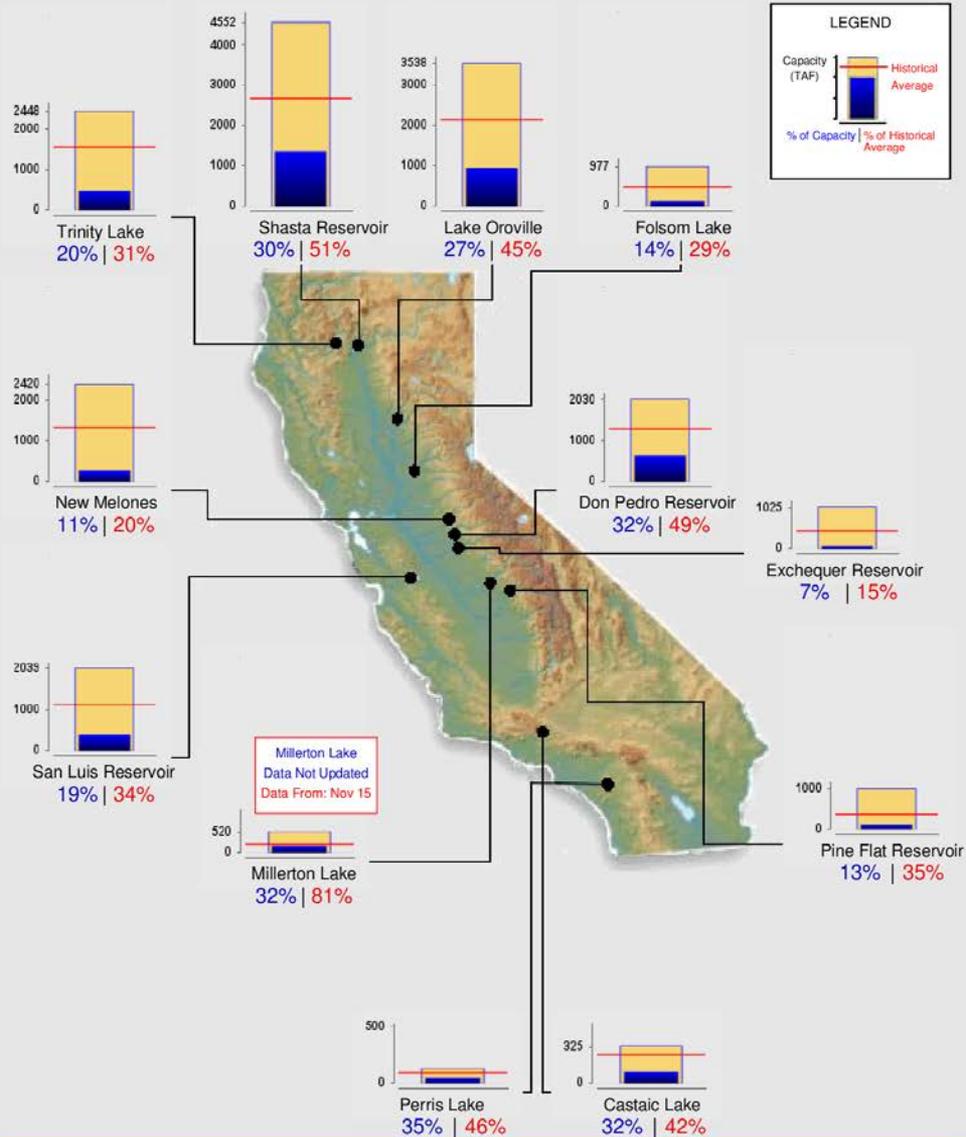




Reservoir Conditions

Ending At Midnight - November 16, 2015

CURRENT RESERVOIR CONDITIONS



1997-1998 El Niño Impacts

**Division of Flood Management
California Department of Water Resources**

Flood Risk in CA: El Niño 1997/98 - Water Year

- Statewide Rainfall **170%**
- April 1 Snowpack **160%**
- Statewide Runoff **175%**
- Sept 30 Res Storage: 29.6 MAF **136%**
- Northern Sierra Rainfall: 82.4” **165%**

Storm of February 2-3, 1998

- *Northern California Coast and Upper Sacramento Valley*
- *Upper Sacramento River - Flood Stages*
- *Streams on West Side of Valley*
- *Rio Vista Tides approached Flood Stage*
- *Russian River, Pajaro River and Napa River exceeded Flood Stage*
- *Large flows in Santa Barbara, Ventura, Orange and San Diego Counties*
- *Localized Flooding in the Central Valley*

1997-98 Impacts

February 1998:

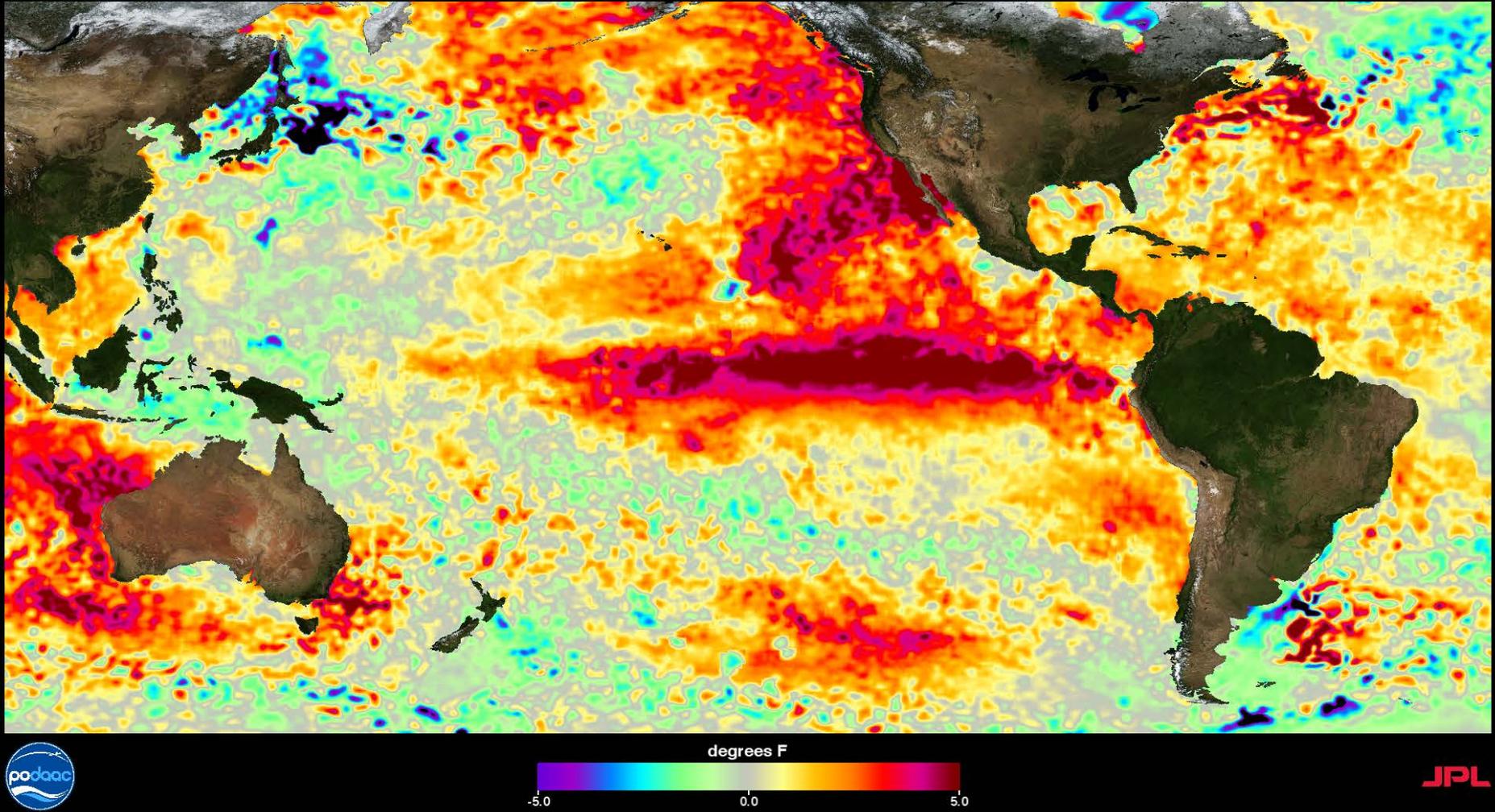
- 40 Counties Declared
- 17 Deaths
- \$550 Million



Feather River, 1997

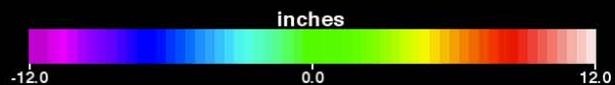
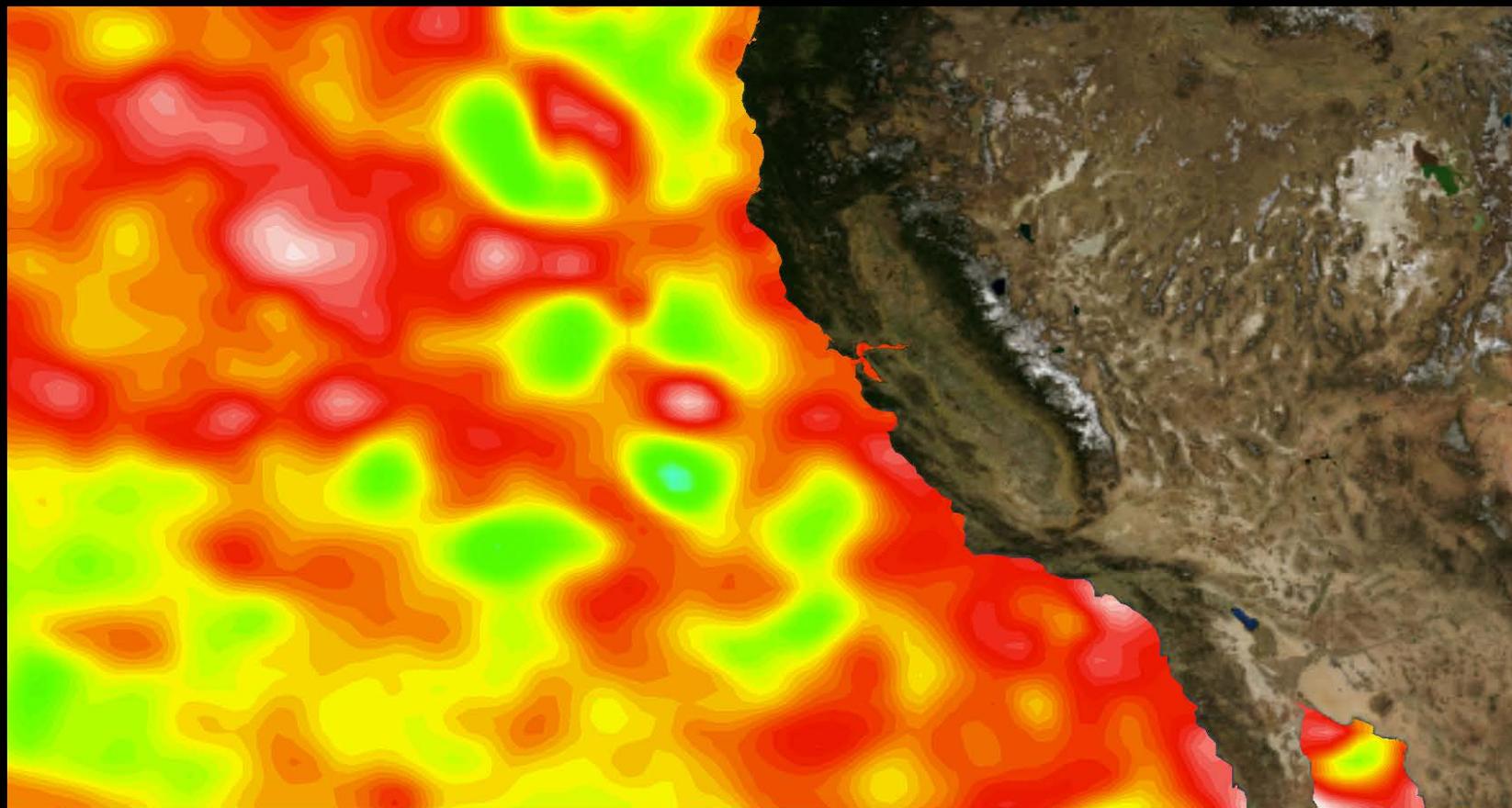
Sea Surface Temperature Anomaly (SSTA)

October 29, 2015

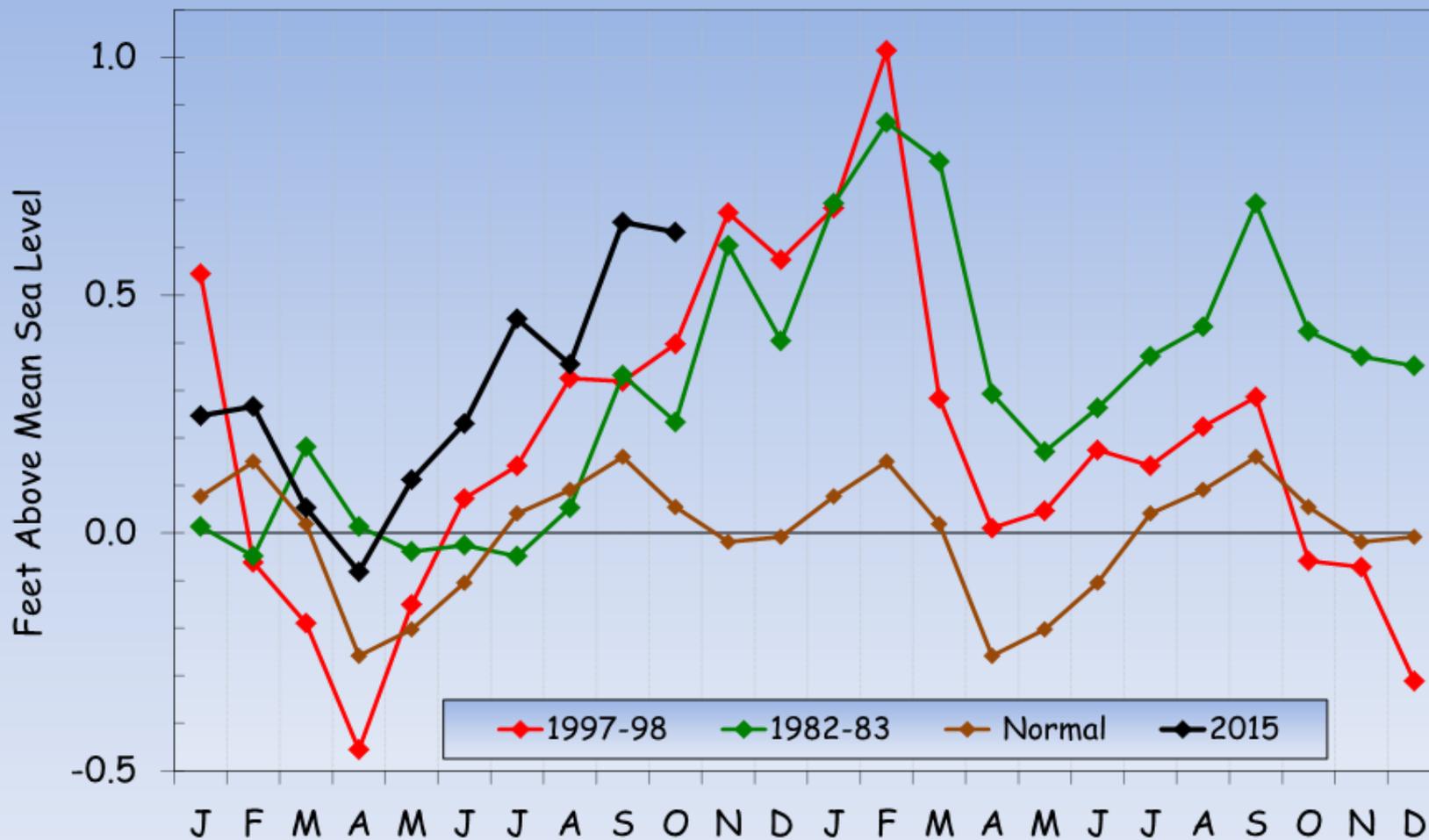


Sea Level Anomaly (SLA)

October 29, 2015



Monthly Mean Water Level - Golden Gate, CA



San Francisco – November/December 2015 Dates for Extreme Tides Assuming 1 ft Anomaly due to El Nino and Warm Ocean

Mon	Tues	Weds	Thurs	Fri	Sat	Sun
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
Mon	Tues	Weds	Thurs	Fri	Sat	Sun
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			23

Embarcadero, San Francisco

October 2015



Sherman Island

(Confluence of Sacramento and San Joaquin Rivers)



Feather River Break, 1997



Meridian, 1997

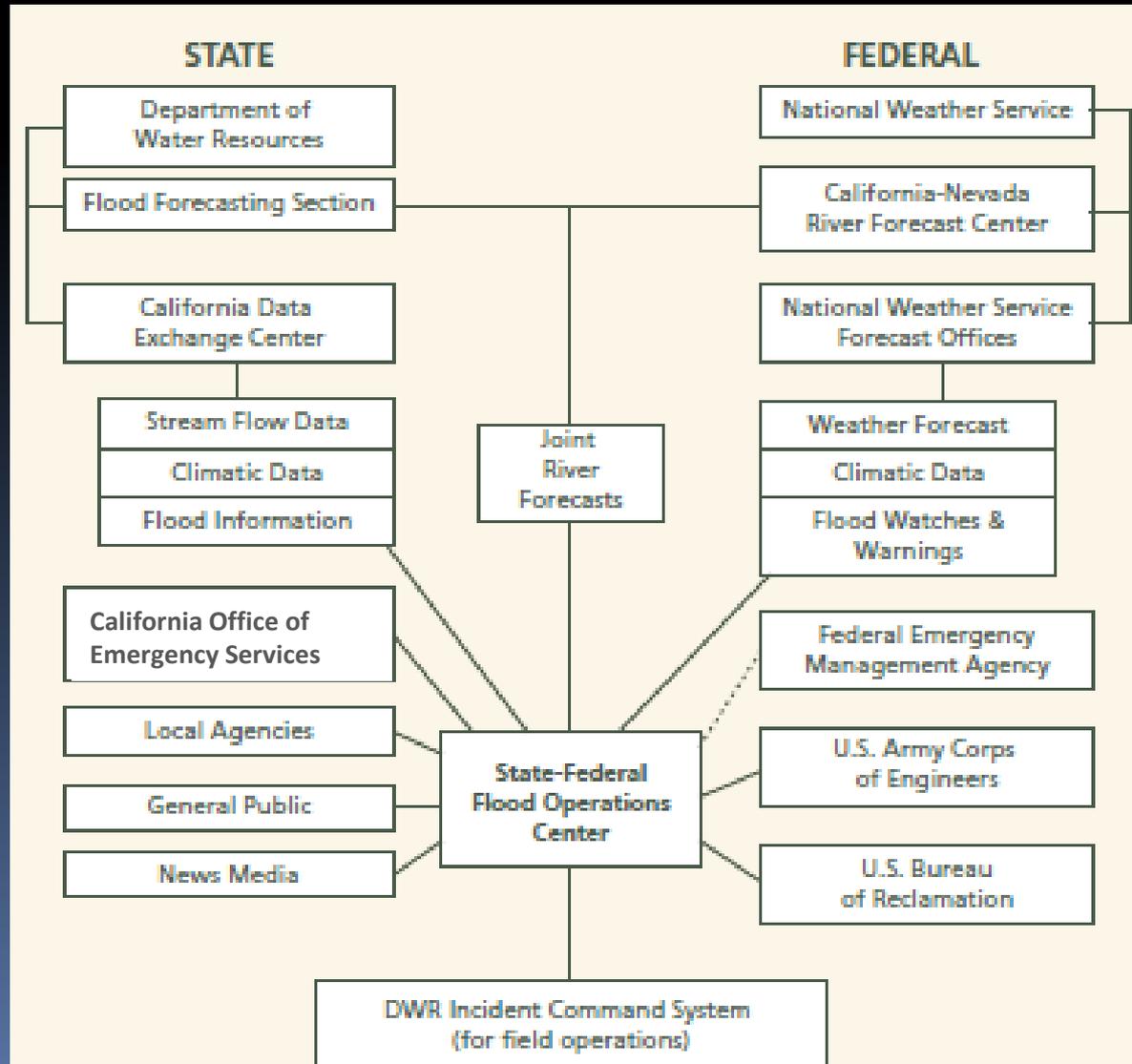


Homes damaged by mudslide in Camarillo Springs, CA, December 2014



(photo by Bill Nash, County of Ventura)

Joint State-Federal Flood Operations Center



Flood Operations Center

- **Information Gathering and Dissemination**
 - Forecasted Meteorological and Hydrological Information
 - Flood System Status
 - Emergency Contacts
- **Coordination**
- **Preparedness**
- **Response**



Flood Operations Center Coordination

Does Coordinate:

- Local Agency Requests for State Technical and Direct Assistance
- Flood Fight Activities Statewide
- USACE Technical and Direct Assistance Under Public Law 84-99

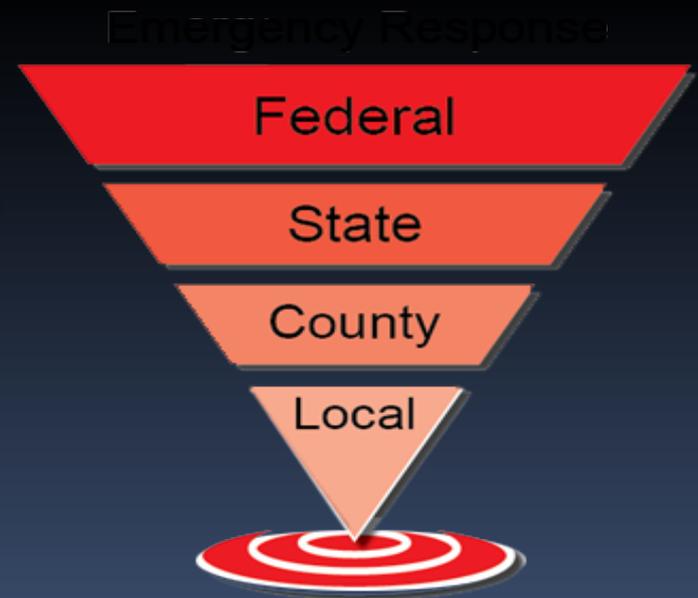
Does Not:

- Declare emergencies
- Order evacuations
- Repair levees



State/Local/Tribal Coordination

- **Role of Cal OES:
Support Emergency Needs**
 - *Mutual Aid*
 - *Tasking State Agencies*
 - *Out of State Assistance*
 - *Federal Assistance*



Operations Center Functions

State Operations Center

- Overall Emergency Event Coordination:
 - *Evacuation Support*
 - *Search and Rescue*
 - *Support to Shelters*
 - *Medical/Health Response*
 - *Utilities Response and Restoration*



Promoting Urban Water and Energy Efficiency by Replacing Turf and Old Toilets



Residential
Turf Removal
and
Replacement
Rebate
Program



Residential
High
Efficiency
Toilet Retrofit
Program



Direct-Install
High
Efficiency
Toilet Retrofit
Program

Thank you

**For More Information,
Please Visit:**

www.storms.ca.gov