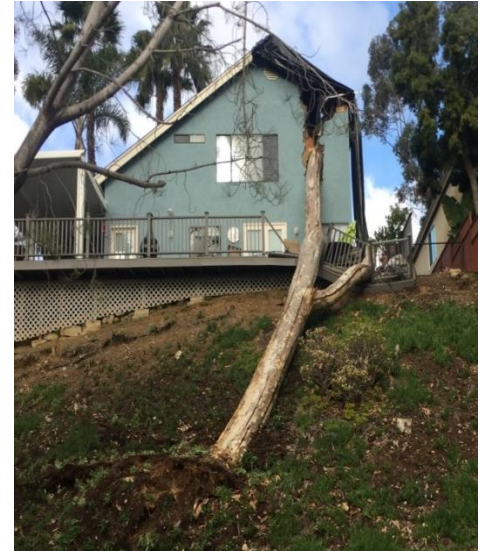


Winter 2016-17 review

Southern California Weather Impacts



WRN
Weather-Ready Nation



Encinitas

January 20-22, 2017 storms

John Ugrob



55 to 65 mph wind in San Diego County on January 20



https://www.youtube.com/watch?v=Tw_jr9S1fk4

Murrieta CA



On January 22, 3-4 inches of rain in 12 hours Riverside and Orange Counties



Visibility issues with Big Bear snow banks



Social Media Photo

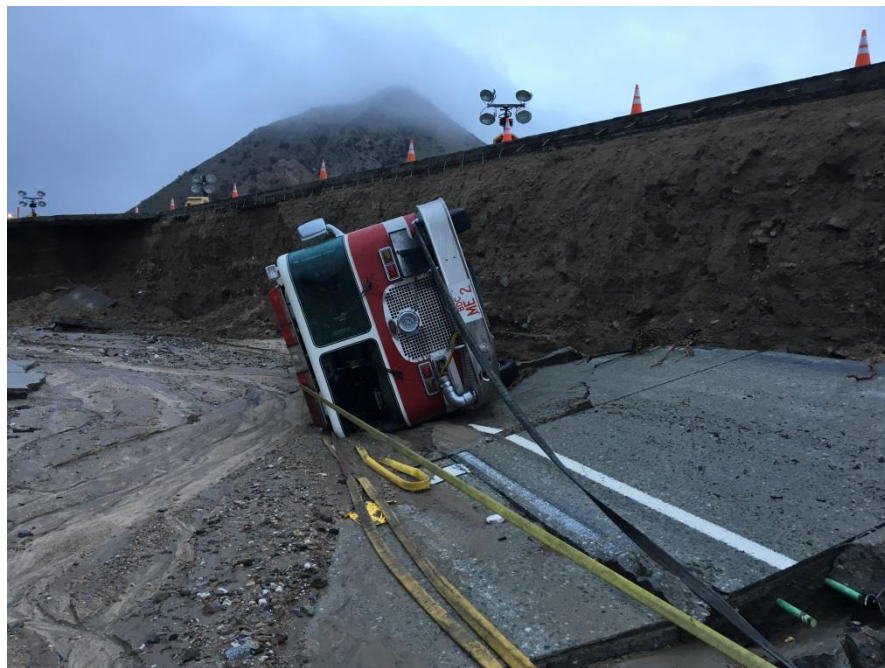
60 inches snow in Big Bear



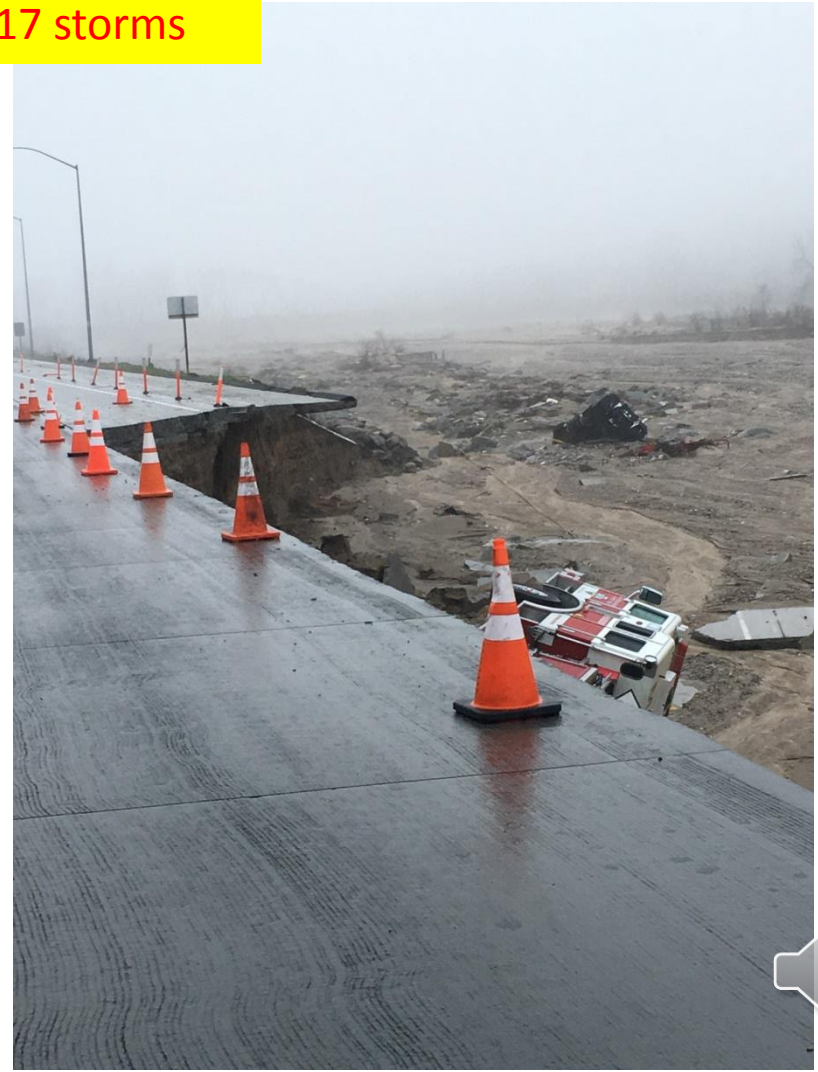
Caltrans incident on the I-15 Cajon Pass near highway 138

February 17, 2017 storms

Caltrans Photos



4 inches rain in 12 hours
7000 CFS in Cajon Creek



NBC7 photos - highway 163 incident



San Diego Major Flood Event February 27, 2017
NWS San Diego – Alex Tardy



14.15 feet on San Diego River, 3rd highest on record





830 am Tuesday on San Diego River
under Highway 163– Alex Tardy



Climate and Drought Recovery

Drought.gov

Intensity:



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

Author:

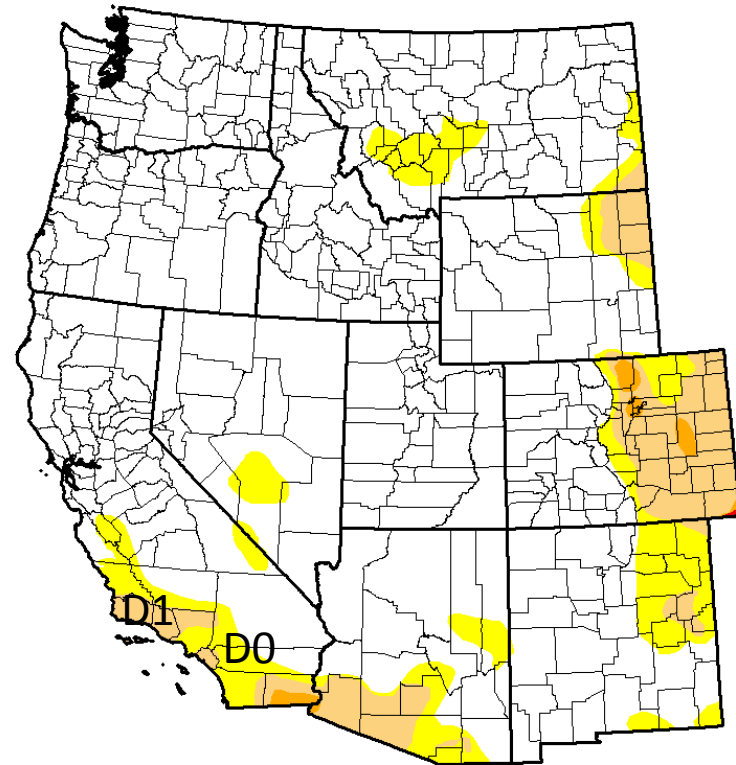
Brad Rippey
U.S. Department of Agriculture



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



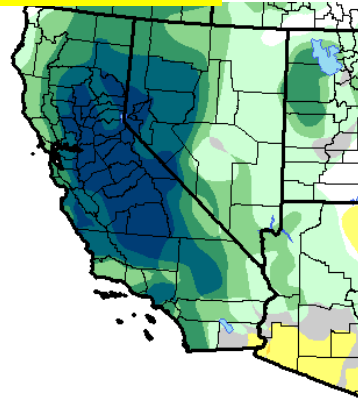
Weather-Ready Nation



As of March 16, 2017



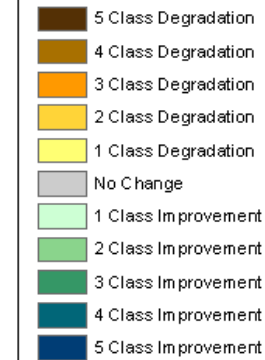
1 year change



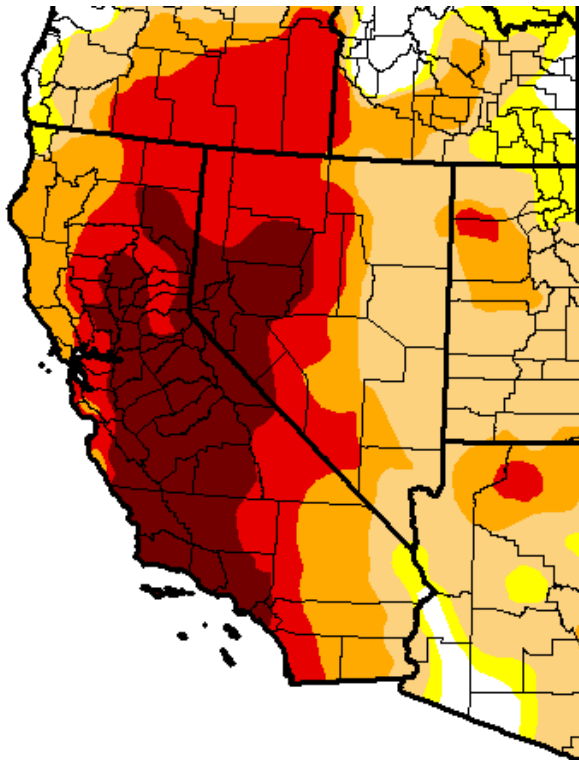
Intensity:



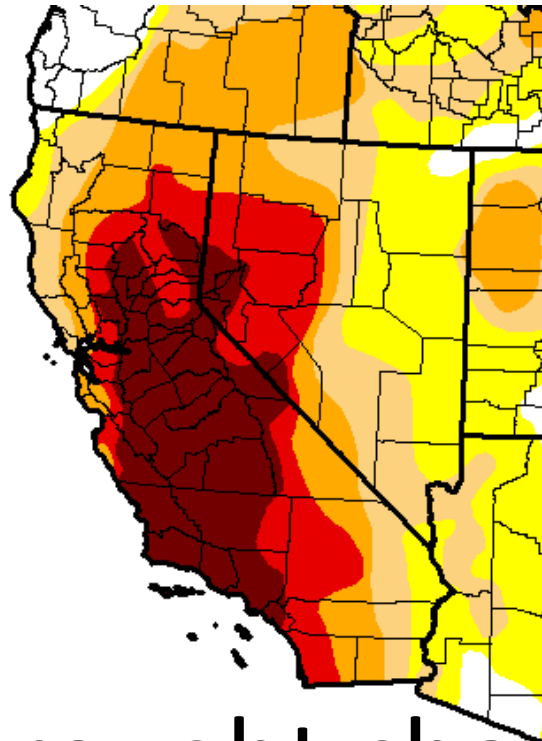
February 28, 2017
compared to
March 1, 2016



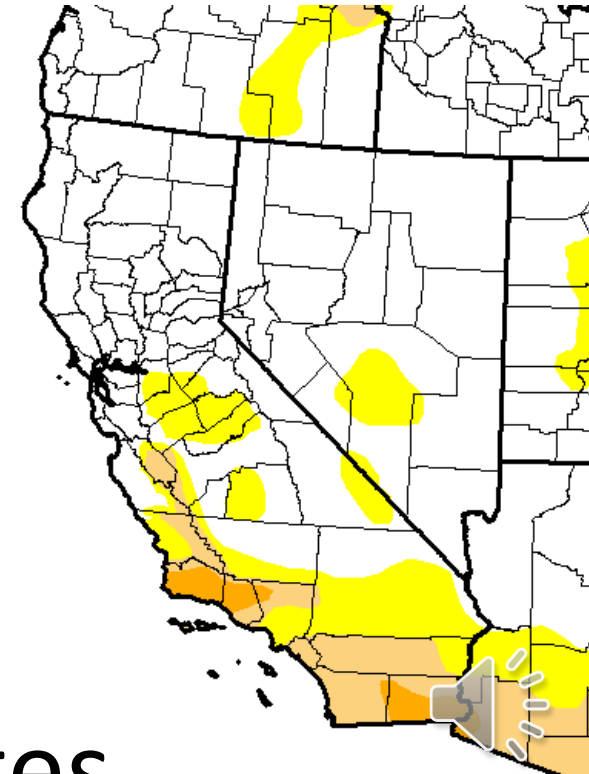
February 2015



February 2016

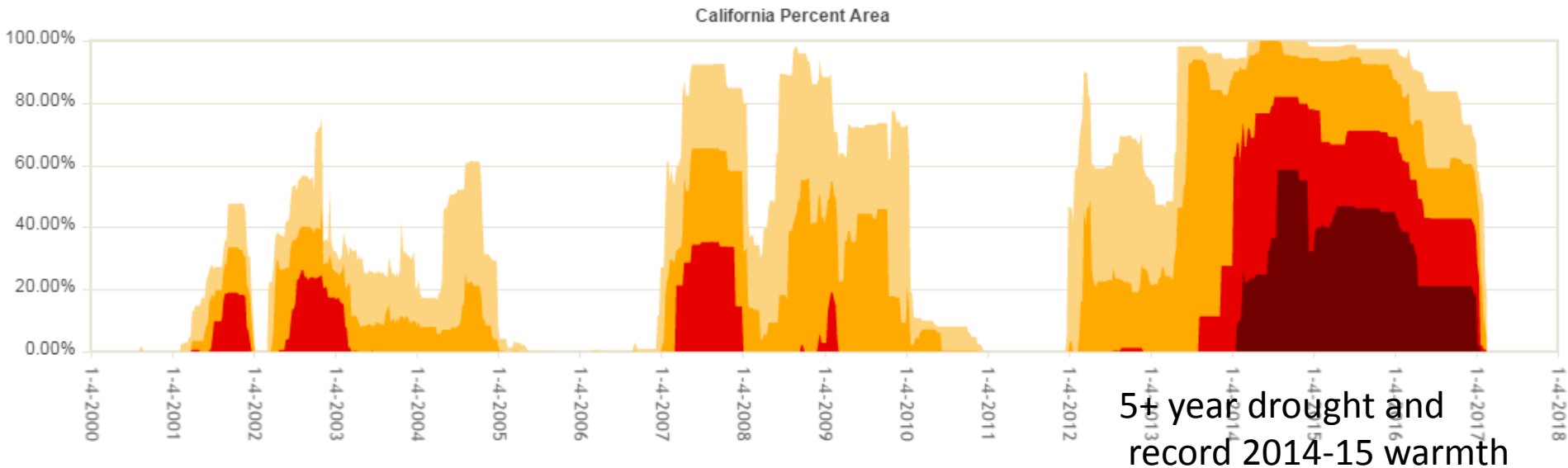


February 2017



Drought changes

California Drought Timeline



U.S. Drought Monitor Legend

Drought Severity

- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

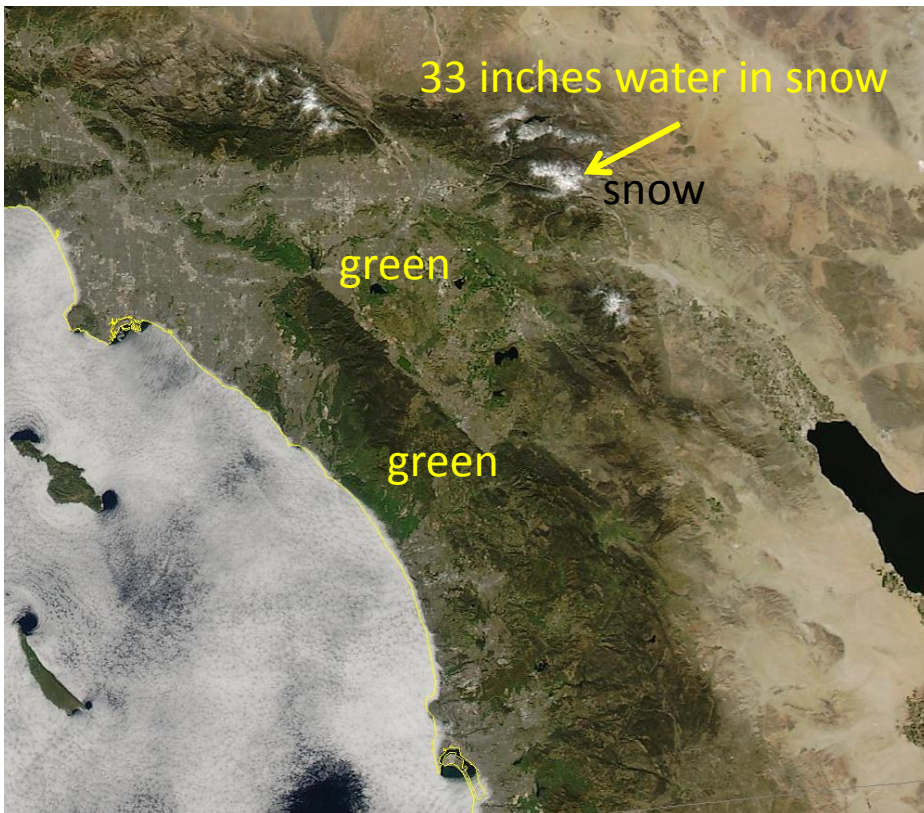


Lake Hodges changes

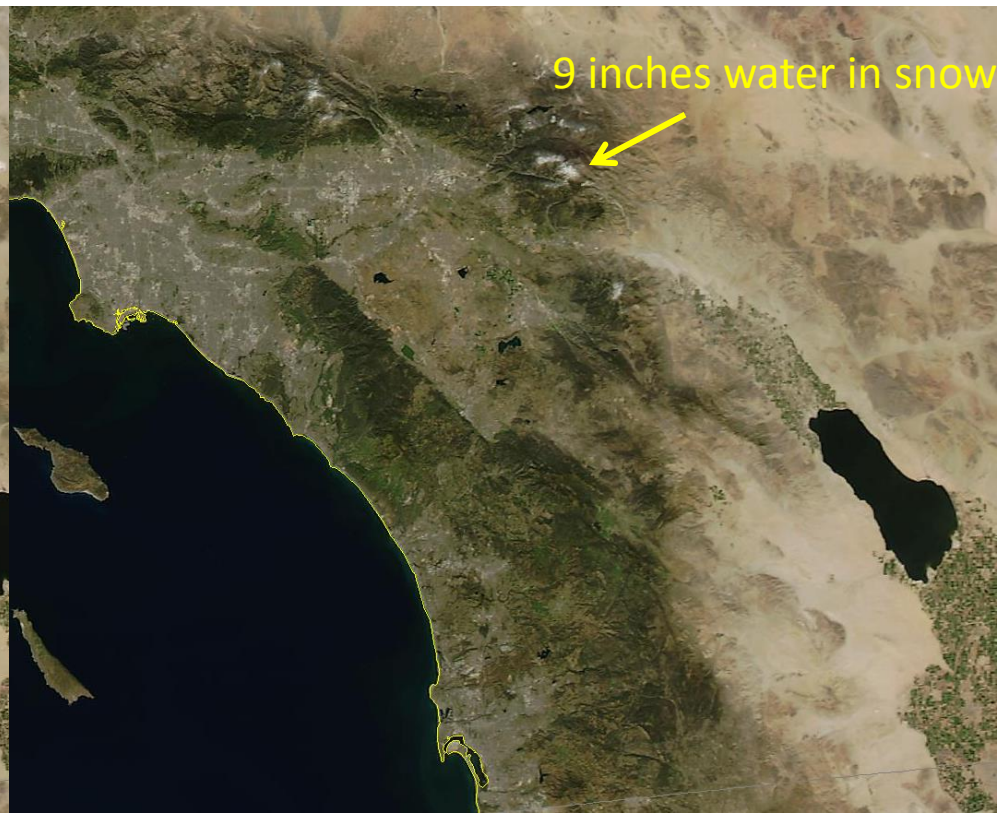


Greening up

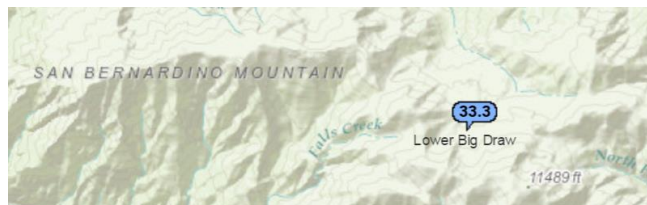
Visible MODIS satellite view



March 13, 2017

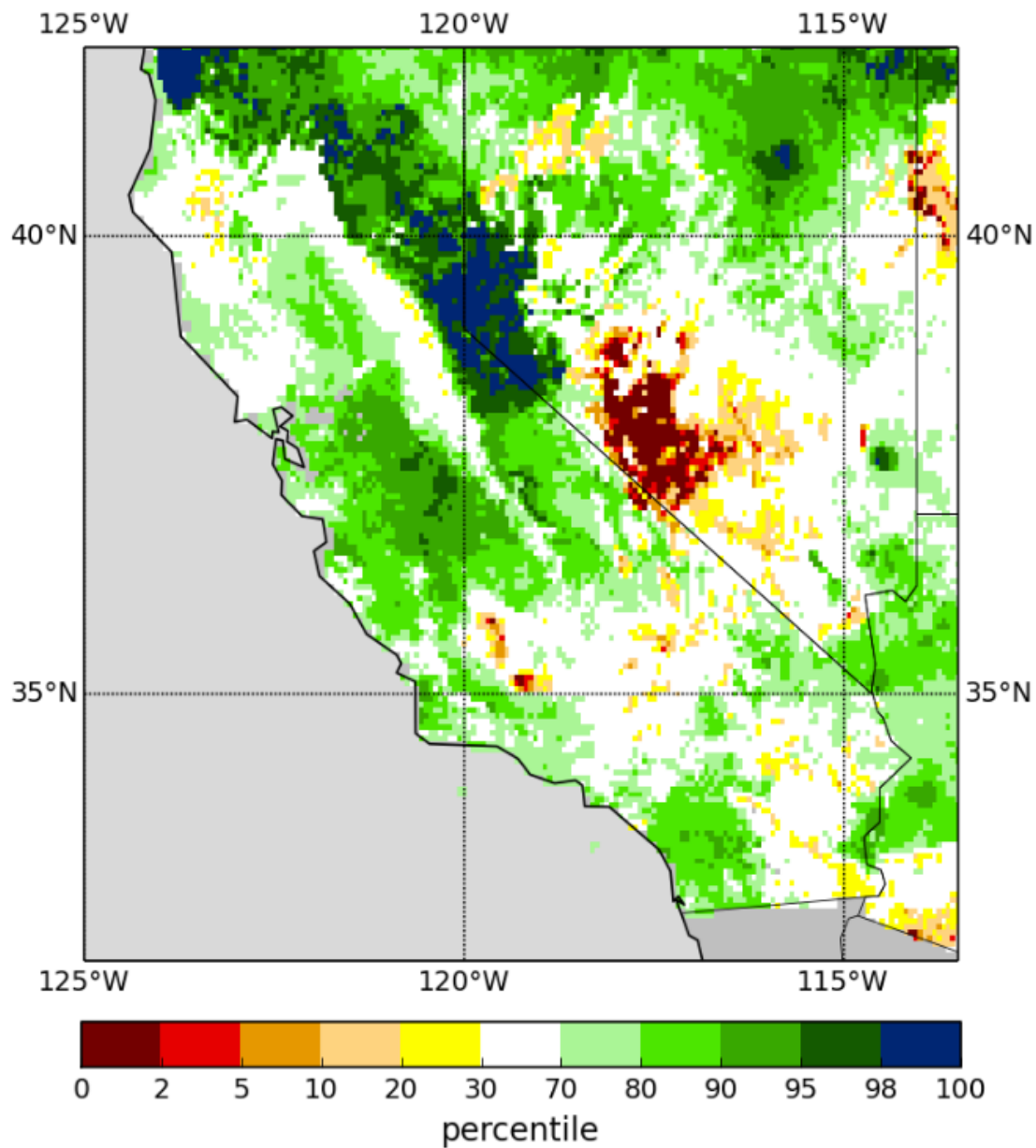


March 16, 2016



Total Moisture Percentile

2017-03-14



USGS information

California Active Water Level Network

Click site symbol to open information pop-up. Click Station ID in pop-up for county information and site selection.
 Map loading slowly? Try a different browser. Web browser performance varies significantly.



Explanation - Percentile classes (symbol color based on most recent measurement)								Wells	Springs
<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div> Real-Time	<div><div></div></div>
Low	<10	10-24	25-75	76-90	>90	High	Not Ranked	<div><div></div></div> Continuous	<div><div></div></div>
	Much Below Normal	Below Normal	Normal	Above Normal	Much Above Normal			<div><div></div></div> Periodic Measurements	<div><div></div></div>



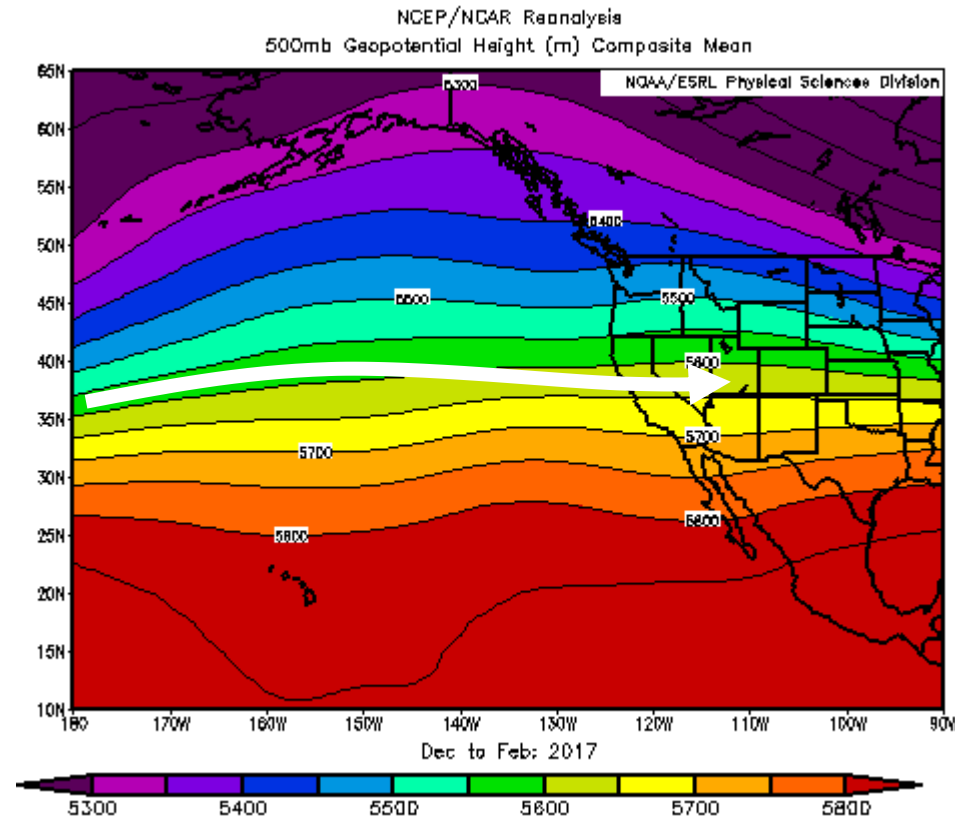
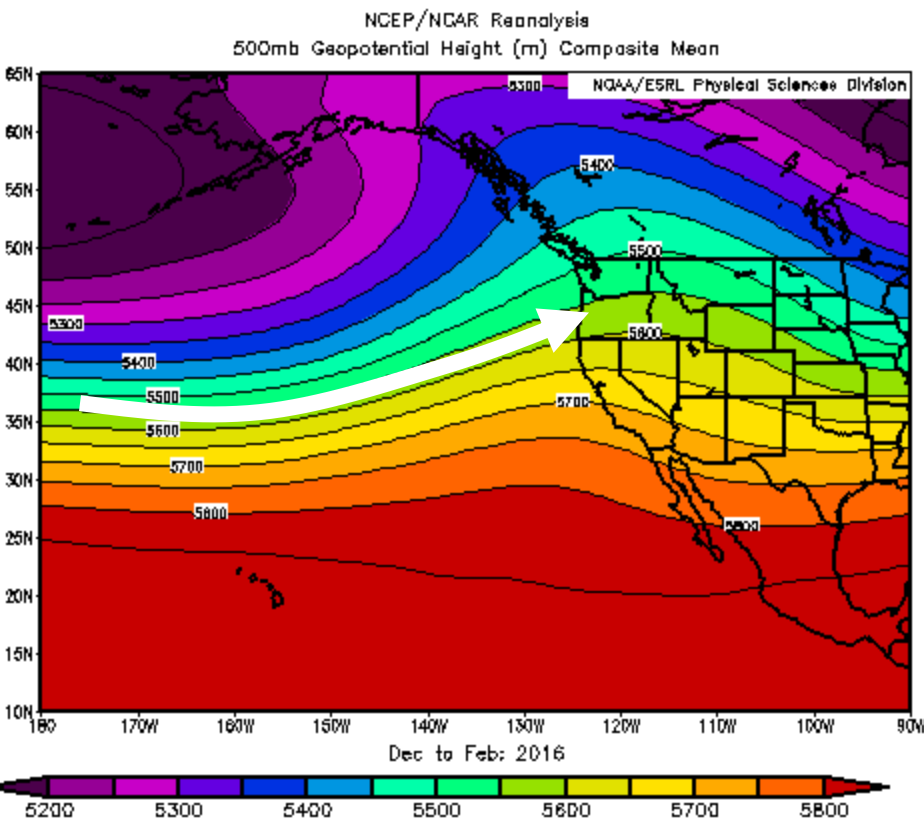
6 year precipitation since January 2011

March 7, 2017

Station 5 year precipitation	Total Deficit Calendar Year	2015-16 % Annual	Current water year Since Oct 1	30-y Annual average	Lost precipitation
San Diego (SAN)			* Percent total	water year average	
55.91	10.01 inches	8.18 or 79%	11.62 or 112% *	10.34	1 season
Santa Ana (Fire stn)					
54.29	33.17 inches	5.19 or 38%	16.03 or 123%	13.63	2 ½ seasons
Riverside (Fire stn)					
50.04	16.12 inches	5.59 or 54%	13.46 or 130%	10.33	1 ½ seasons
Palomar Mtn					
156.68	35.31 inches	18.59 or 62%	32.31 or 135%	30.20	1 season
Palm Springs					
22.50	8.78 inches	3.69 or 76%	5.80 or 144%	4.83	2 seasons



Weather Pattern December to February 2016 versus 2017



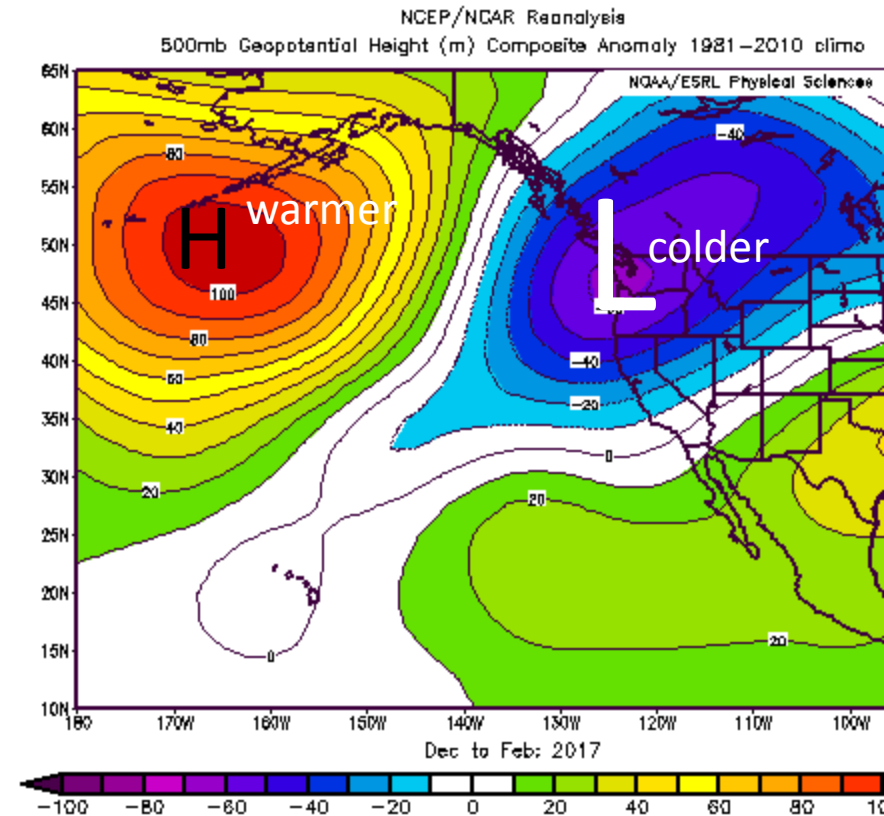
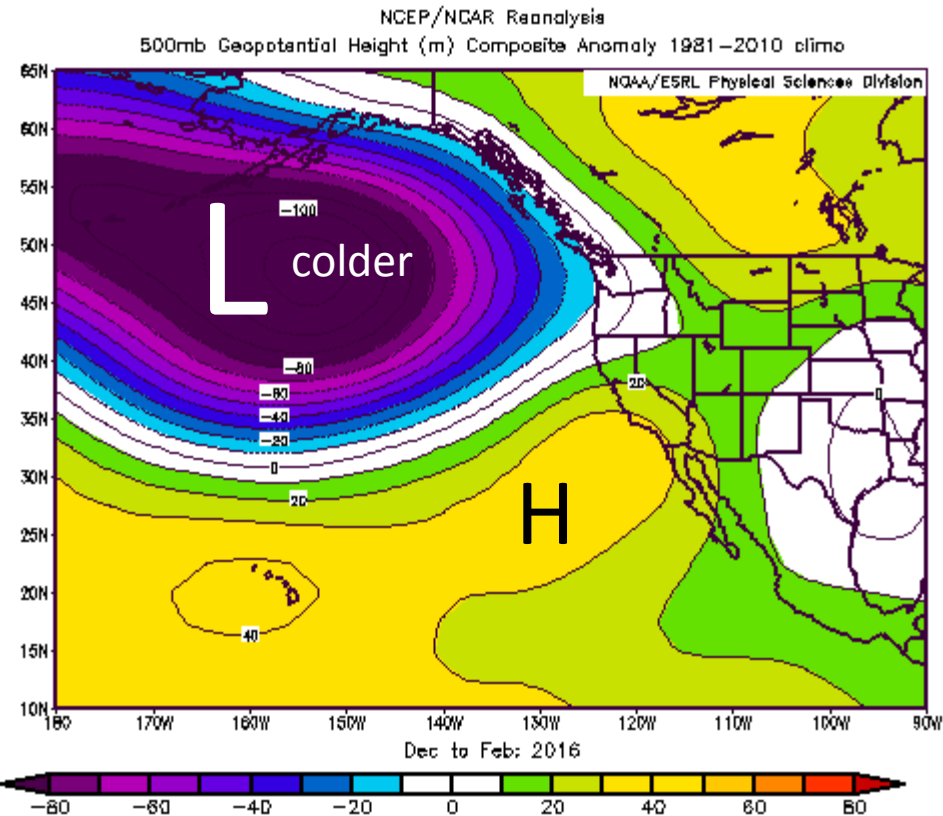
Storm Track controls California precipitation



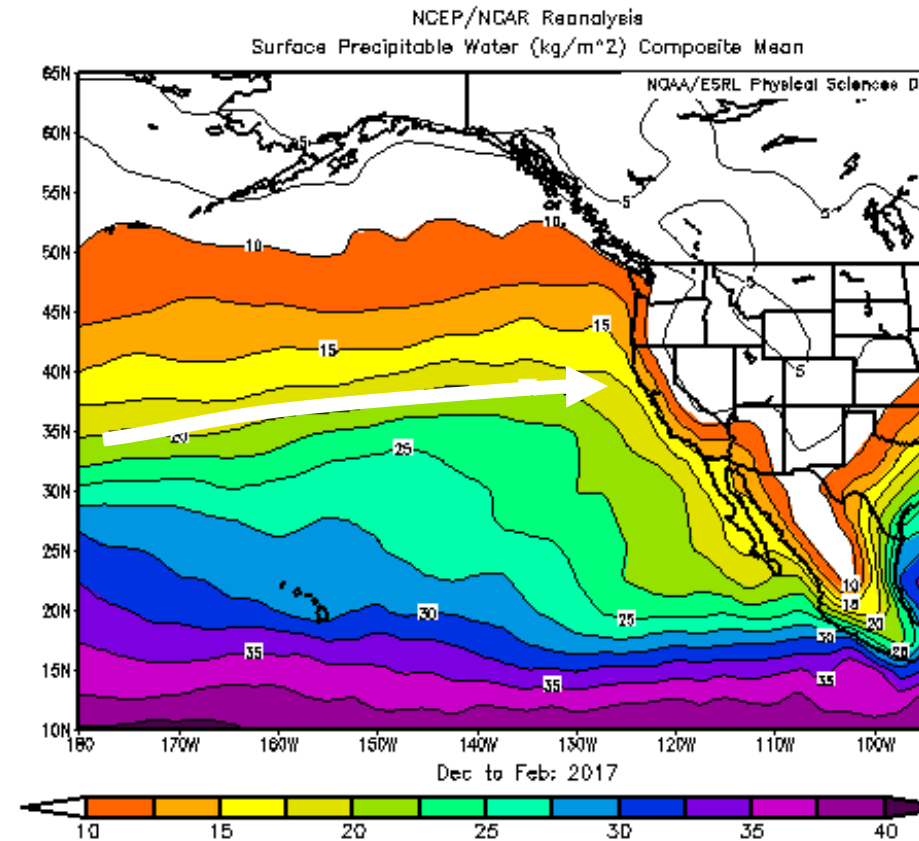
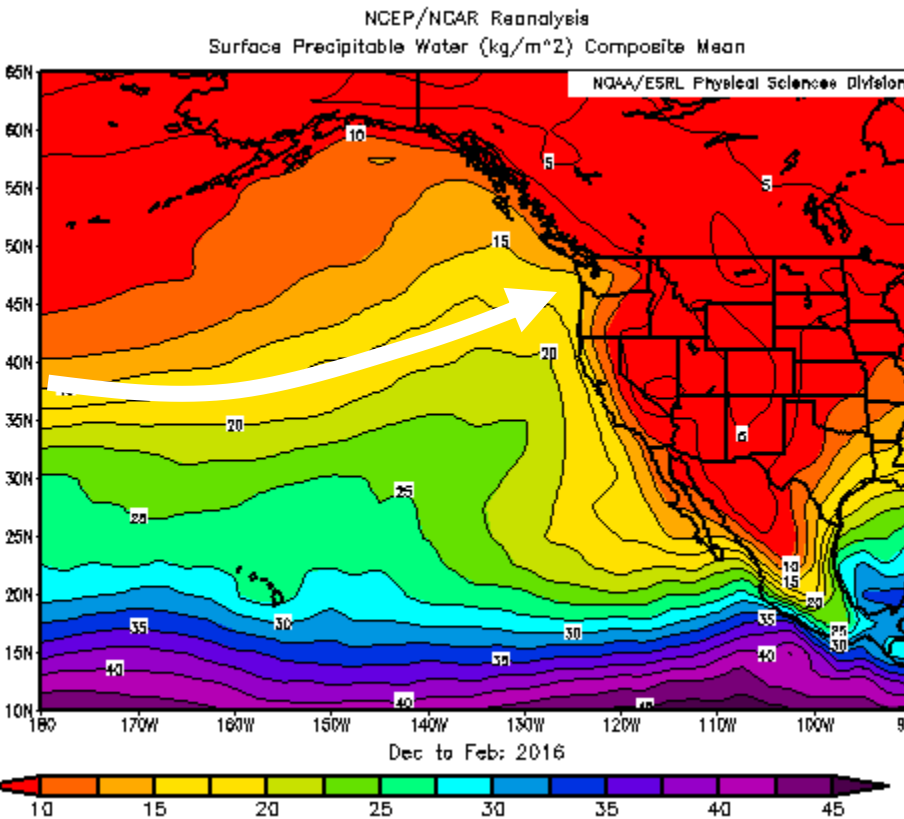
Winter 2016 and 2017

December to February

atmosphere departure from normal

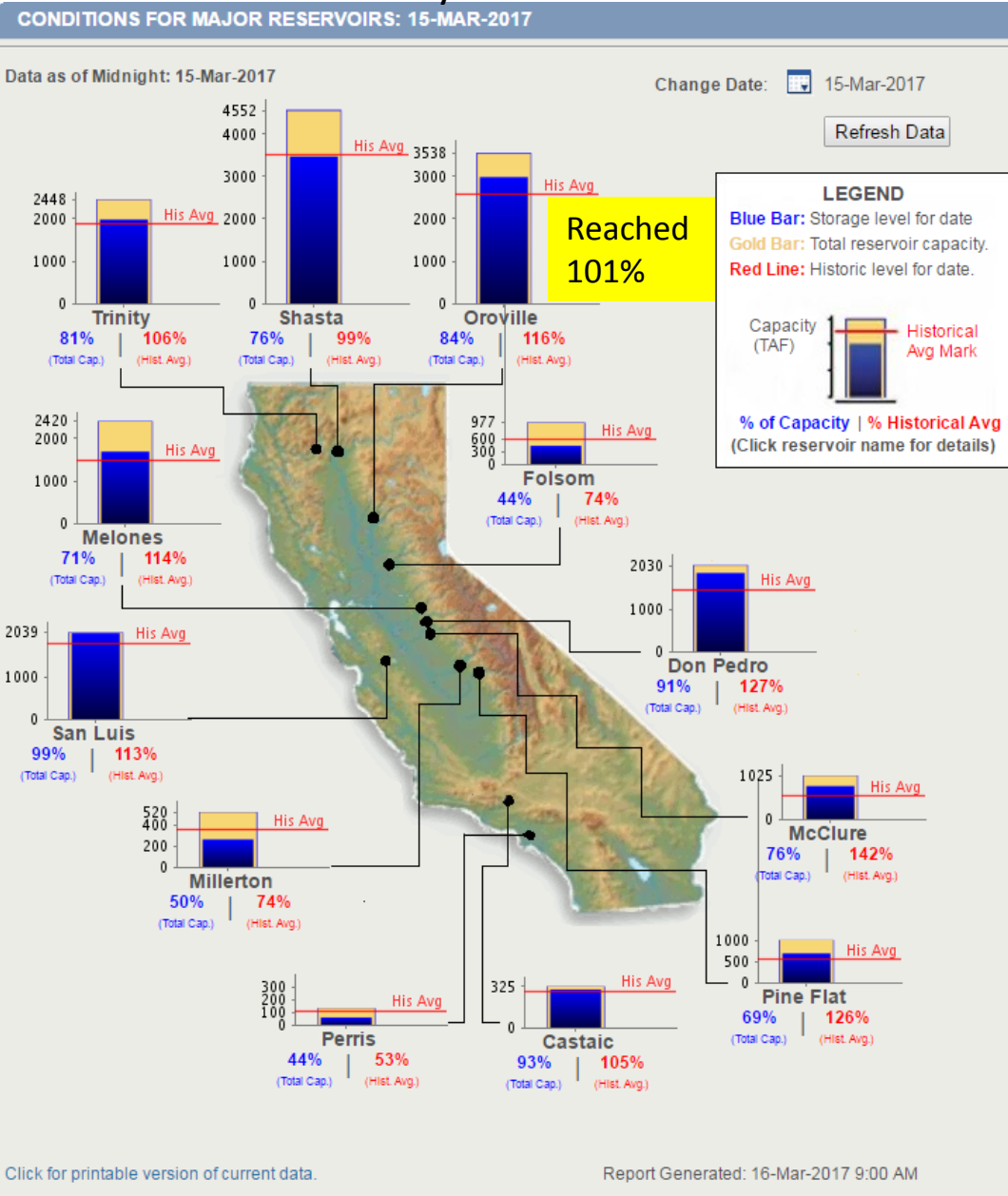


Tropical moisture gradient takes on shape of Jet Stream 2016 and 2017



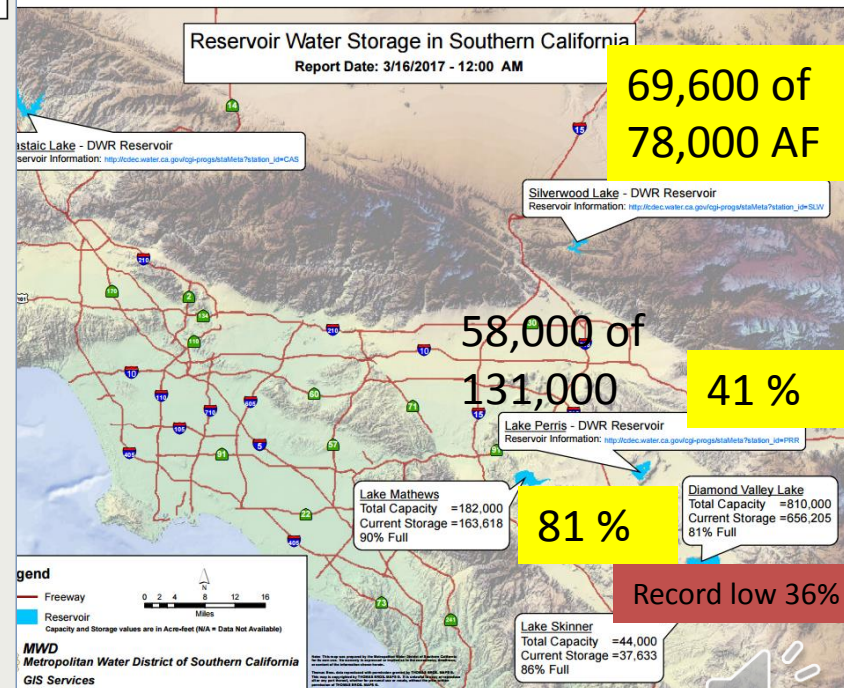
March 2017 levels

Courtesy of CDEC



Oroville increase 700,000 acre feet in one week – 42 % to 80 % full from December to January

Metropolitan Water



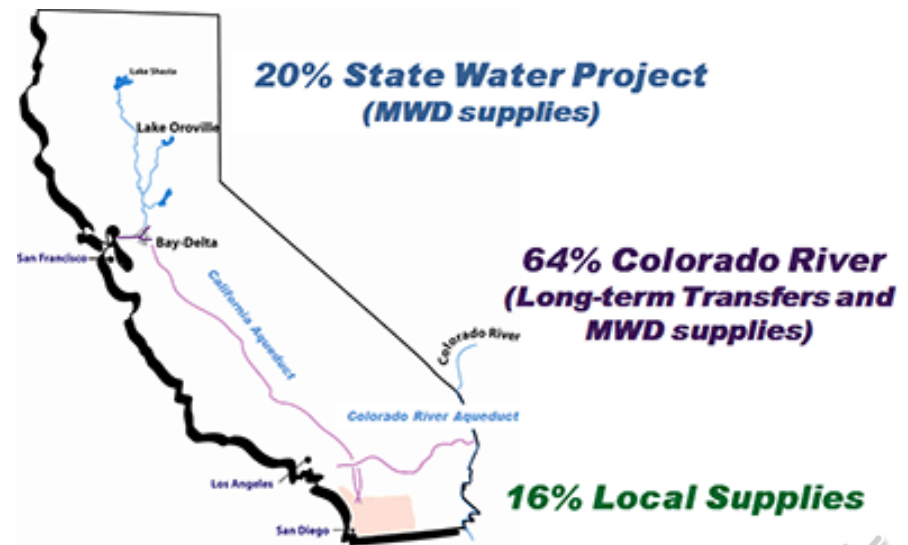
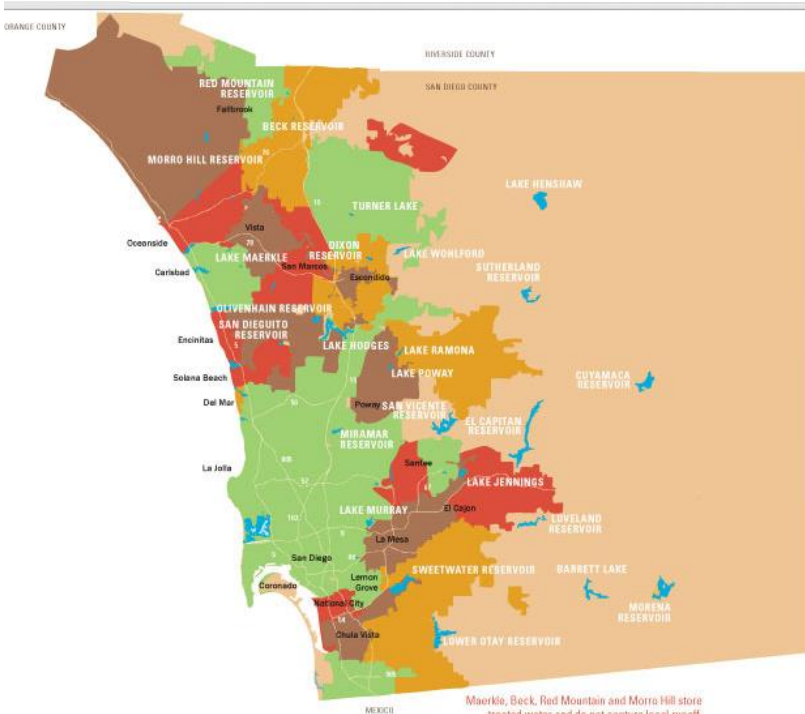
San Diego Water

Totals	City	569,020	347,800	61 %	+37,000 February 27 storm
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Totals	Water Authority	745,971	438,187	59 %	+123,000
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Otay and Poway filled

Change From January 1

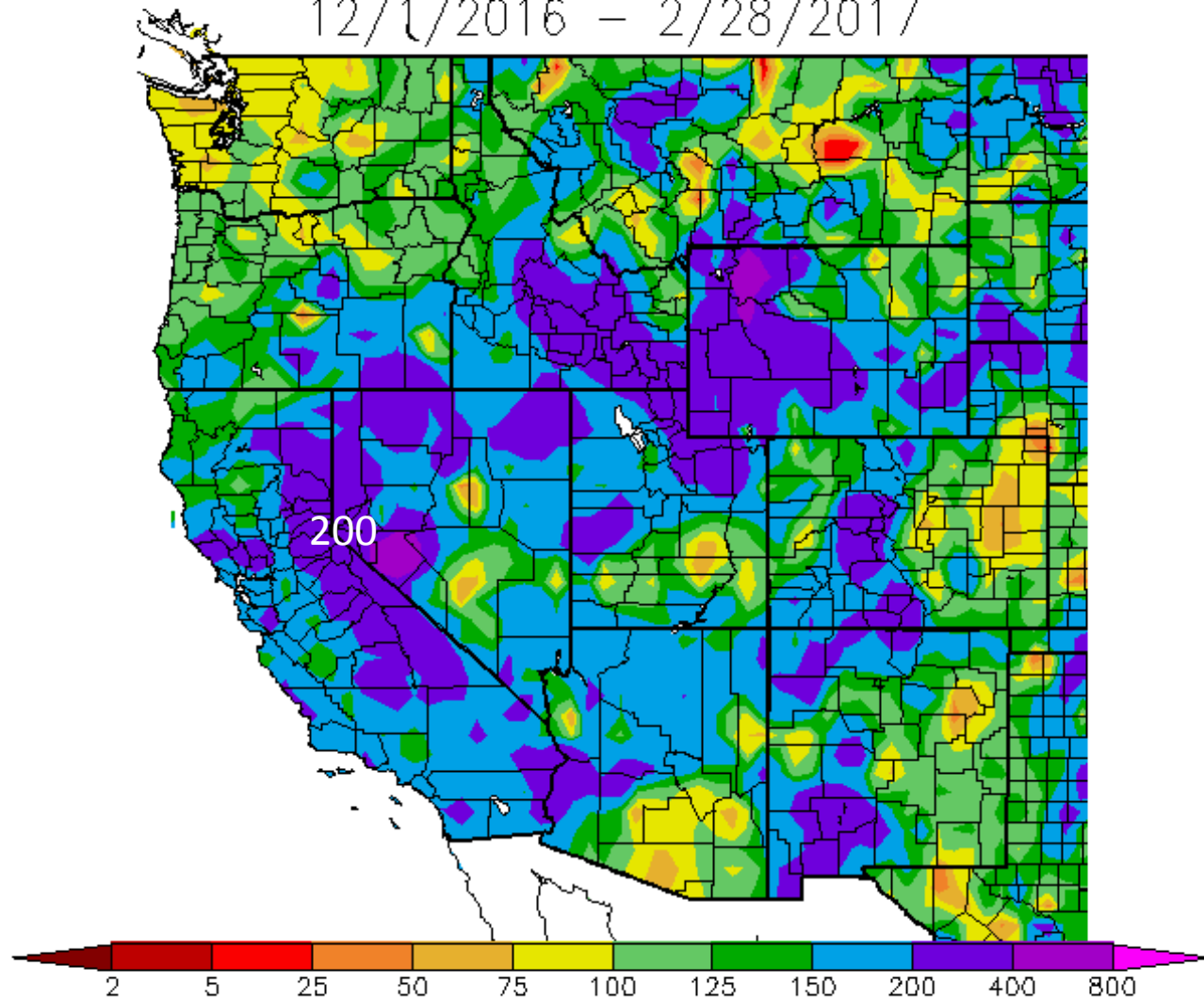


See more at: <http://www.sdcwa.org/reservoirs#sthash.RouSQX2C.dpuf>



December to February

Percent of Average Precipitation (%)
12/1/2016 – 2/28/2017

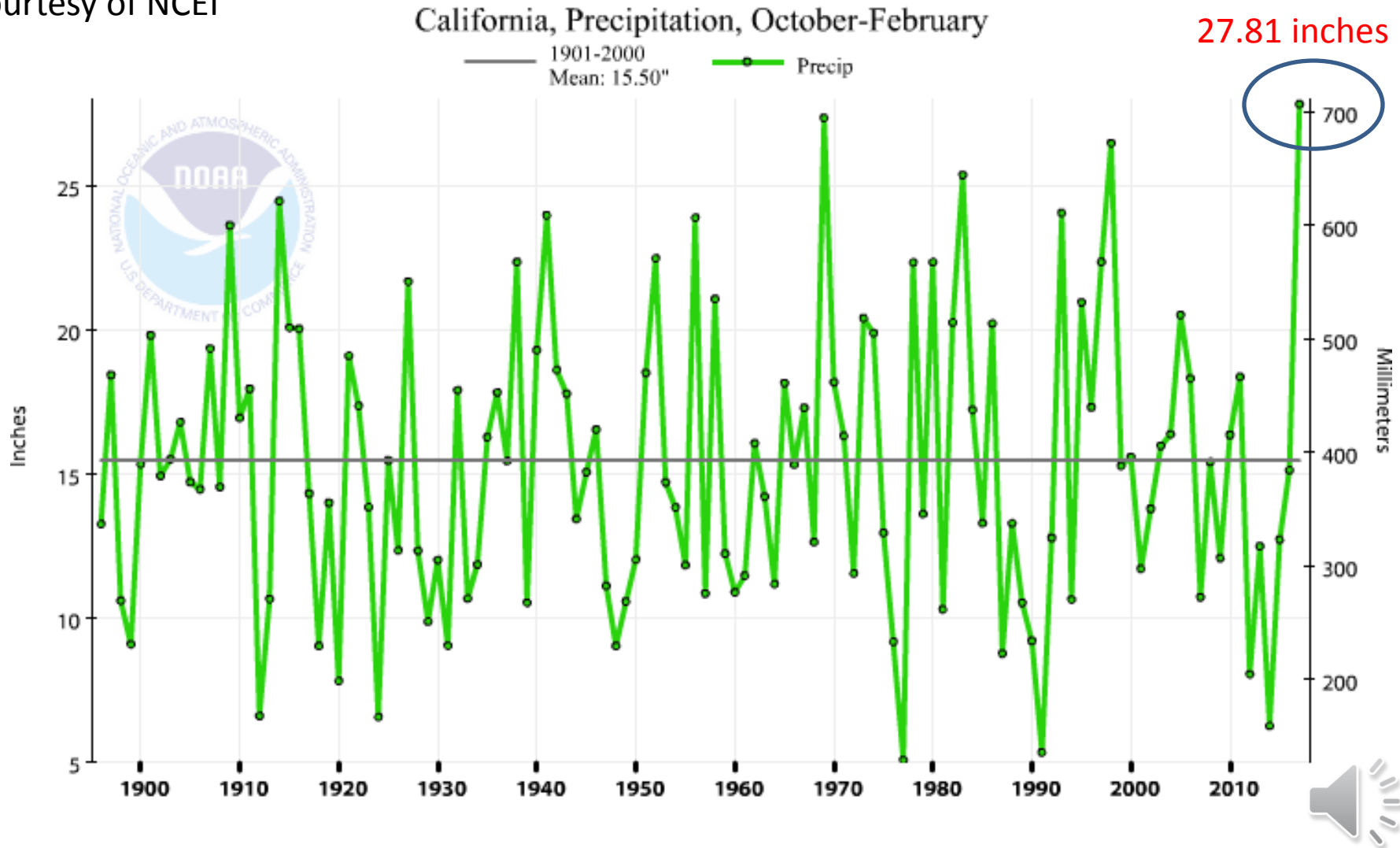


Generated 3/01/2017 at WRCC using provisional data.
NOAA Regional Climate Centers

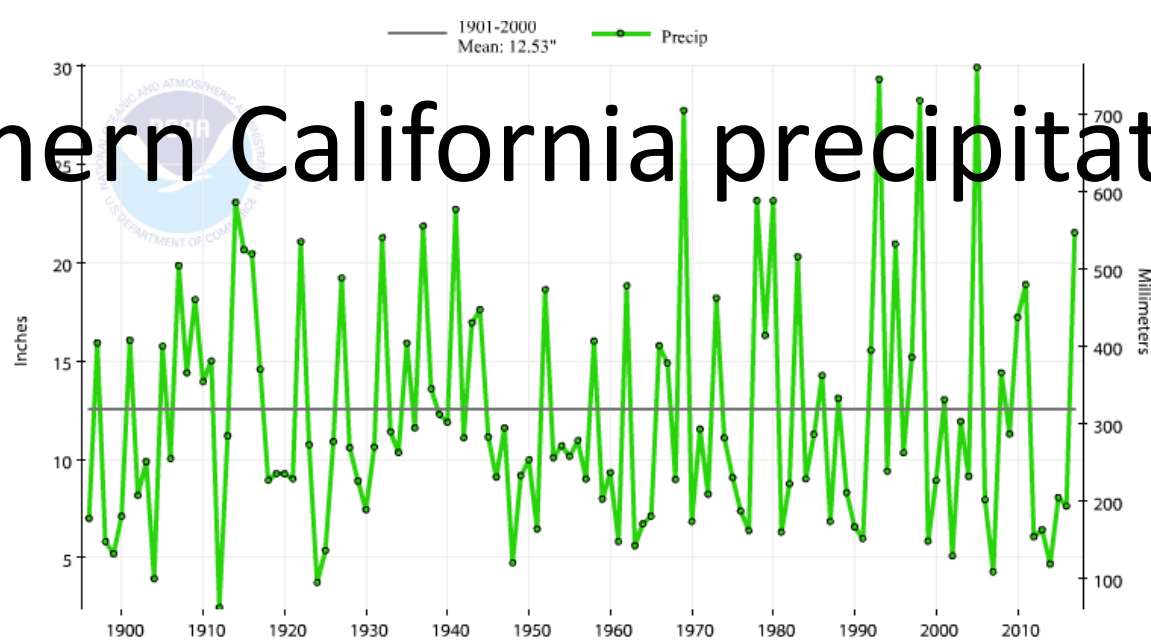




Wettest October to February 2017 for California

Courtesy of NCEI



Southern California precipitation



Download: [XML](#)  

◊ DATES	◊ VALUE	◊ RANK	◊ DEPARTURE FROM MEAN (12.53") 1901-2000 BASE PERIOD
200410 - 200502	29.91"	122	2004-5 17.38"
199210 - 199302	29.31"	121	1992-93 16.78"
199710 - 199802	28.23"	120	1997-98 15.70"
196810 - 196902	27.73"	119	1968-69 15.20"
197710 - 197802	23.15"	118	1977-78 10.62"
197910 - 198002	23.15"	118	10.62"
191310 - 191402	23.05"	116	10.52"
194010 - 194102	22.70"	115	10.17"
193610 - 193702	21.86"	114	9.33"
201610 - 201702	21.52"	113	2016-17 8.99"



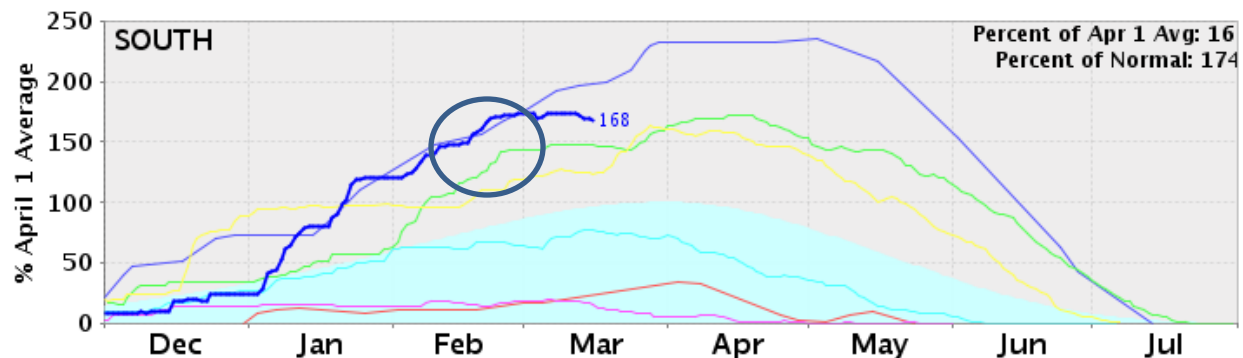
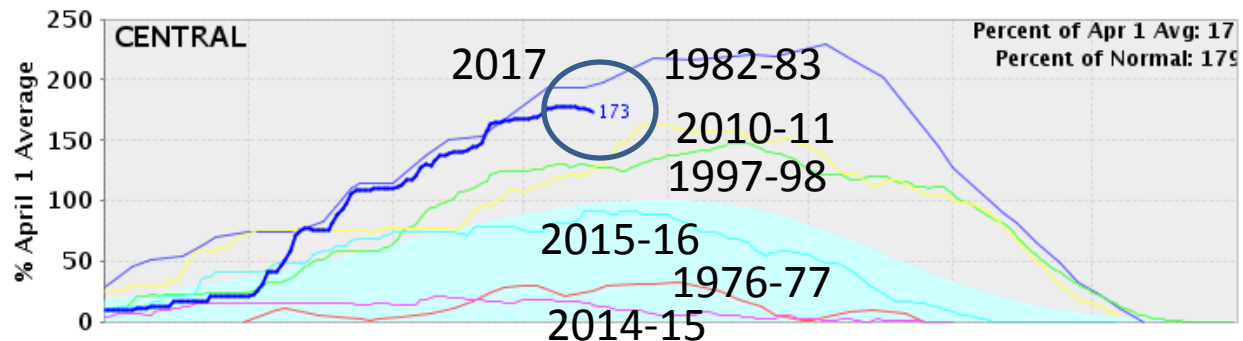
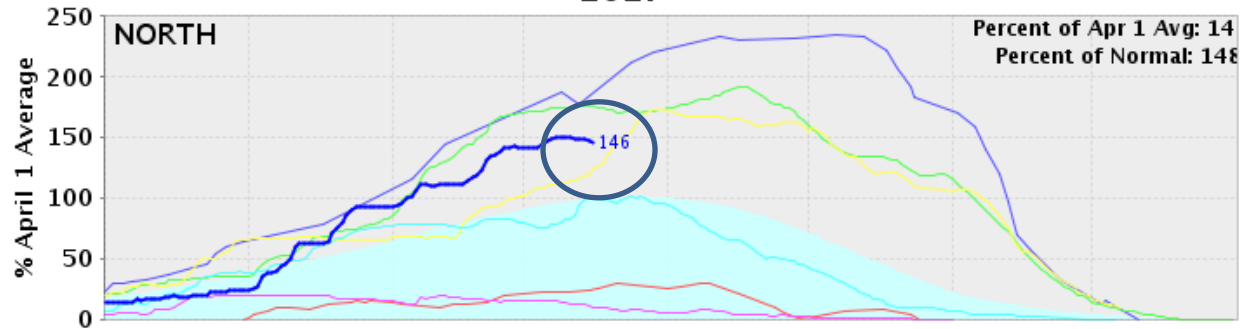
Near record snowpack

California Snow Water Content - Percent of April 1 Average For: 16-Mar-2017

Courtesy of CDEC

165 % avg
Statewide

211 inches
at 7800
feet near
Donner
Summit



— Average — 1976-1977 — 1982-1983 (max) — 1997-1998 — 2010-2011 — 2014-2015 (min) — 2015-2016
— 2016-2017 (current)



Big Bear Snowfall

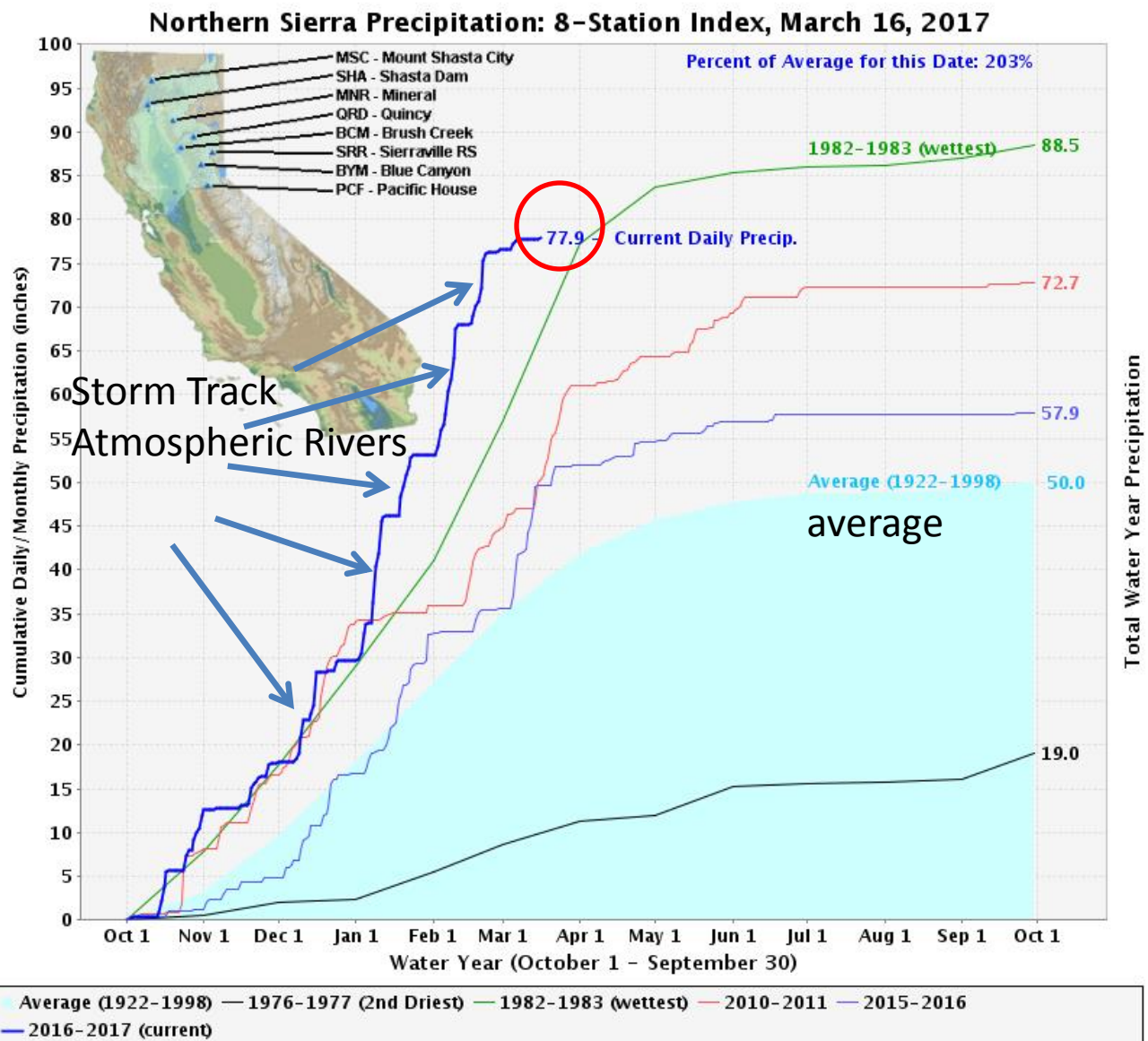
Maximum 6-Month Total Snowfall for BIG BEAR LAKE

Rank	Value	Ending Date	Missing Days
1	139.5	1979-03-31	10
2	119.0	1969-03-31	0
3	118.2	2001-03-31	16
4	112.6	1990-03-31	0
5	112.4	1991-03-31	0
6	108.5	1983-03-31	0
7	107.8	1993-03-31	0
8	106.2	2005-03-31	3
9	105.5	1982-03-31	22
10	104.3	1992-03-31	0
11	102.0	1995-03-31	0
12	92.3	2017-03-31	20
13	79.0	2011-03-31	2
14	77.0	1965-03-31	0
15	75.1	2010-03-31	1



Sierra Nevada precipitation

203 % avg



California
Data
Exchange
Center
(CDEC)

