

Water Supply Board Briefing

Water Operations Department

January 10, 2017

Water Supply Briefing

- Recent Storms
- California Water Supply
- District Water Supply
- Flood Control Operations
- Water Supply Projections
- Water Production
- Water Savings



California Water Supply

Storms Update



From January 1 to January 8, 2017...

- Increases in storage within State reservoirs ranged from 1% to 11% of capacity (Pardee increased 9% and is currently spilling)
- Observed Precipitation:
 - 10.8" at Northern Sierra 8-Station
 - 11.6" at San Joaquin 5-Station
 - 10.4" at Mokelumne 4-Station
- Snow water content increased from 70% to 126% of average (Caples snow water content increased 8" from 51% to 103% of average)
- Pardee received 43 TAF and instantaneous inflow peaked at 20,662 cfs

California Water Supply

Storms Update - Highway 49 Flow



California Water Supply

Storms Update – Pardee Release and Spill



California Water Supply

Storms Update – East Bay

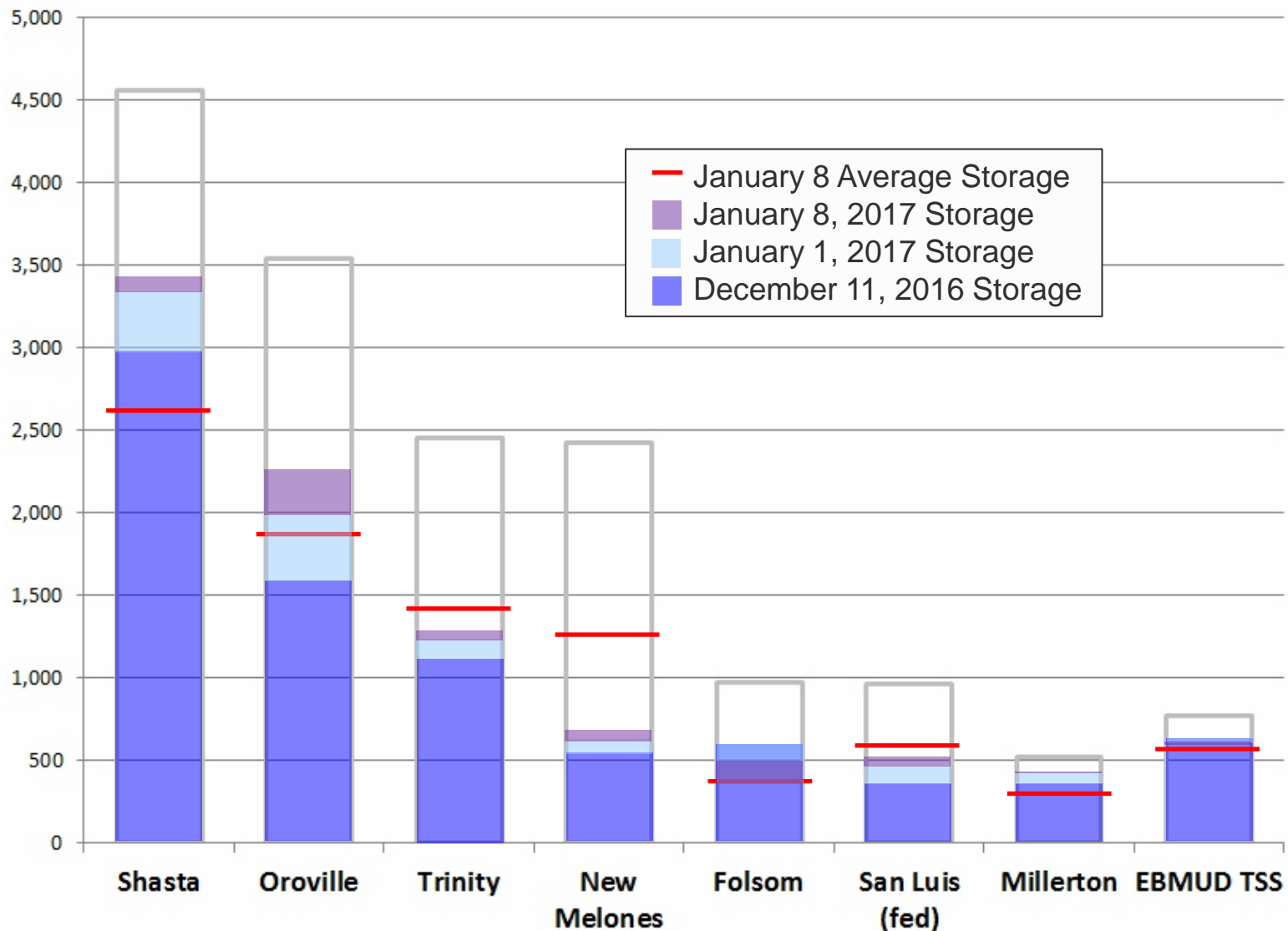


- January 1-8 East Bay precipitation was 4.7”
- San Pablo 150 cfs release from January 6-7
- No impacts to water service
- Local Damage and Outages
 - Lost power at 6 facilities
 - Fallen tree on Aqueduct ROW
- Roof leaks at 2 facilities in Bixler & Stockton



California Water Supply

California Reservoirs



Flood Control Operations

Folsom Releases



CA Department of Water Resources

California Water Supply

Storms Update

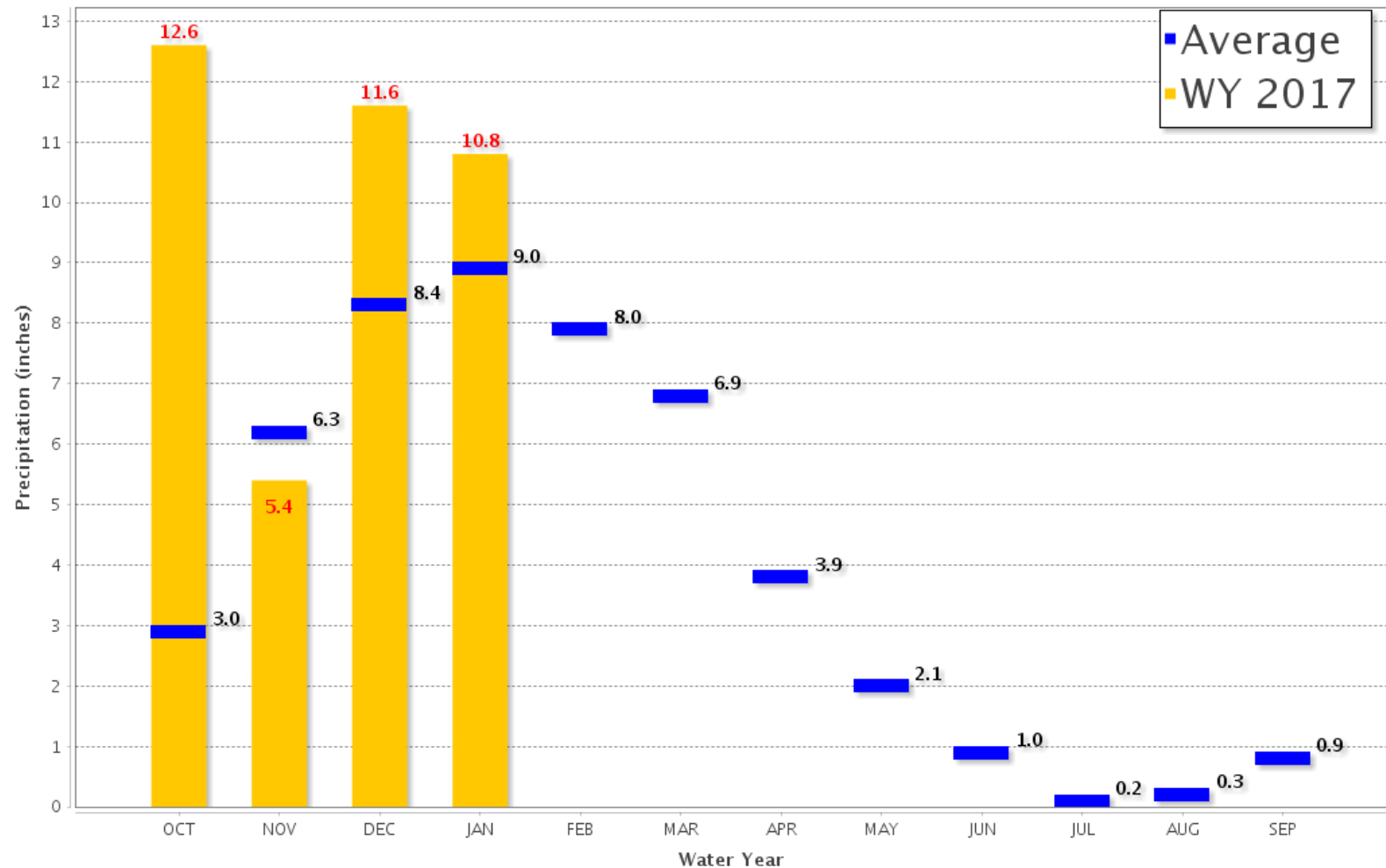


Northern Sierra 8-Station

Precipitation Index for Water Year 2017 – Updated on January 9, 2017 11:31 AM

Note: Monthly totals may not add up to seasonal total because of rounding

Water Year Monthly totals are calculated based on Daily precipitation data from 12am to 12am PST



California Water Supply

Storms Update

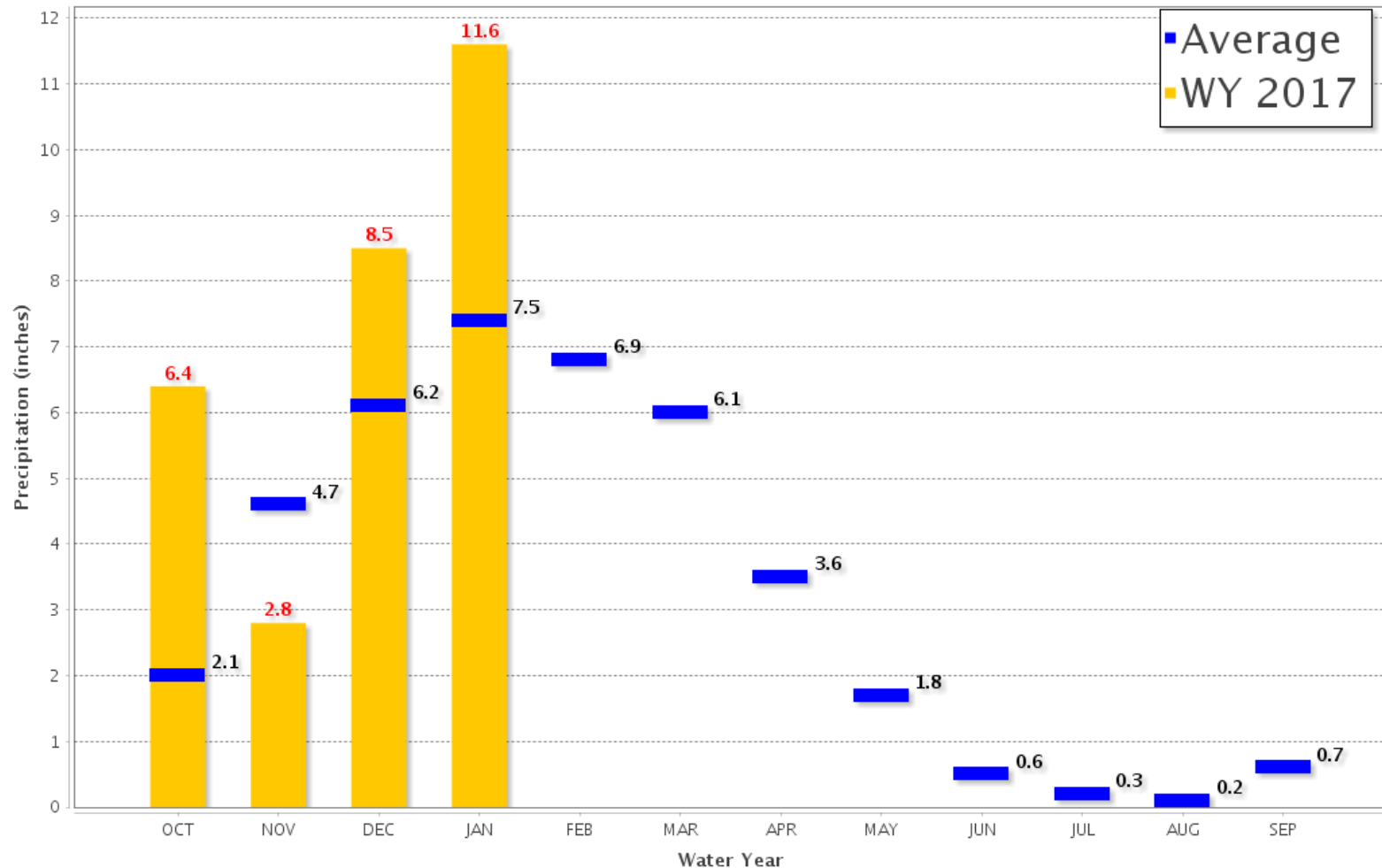


San Joaquin 5-Station

Precipitation Index for Water Year 2017 – Updated on January 9, 2017 11:30 AM

Note: Monthly totals may not add up to seasonal total because of rounding

Water Year Monthly totals are calculated based on Daily precipitation data from 12am to 12am PST



California Water Supply

Snow Surveys



CA Department of Water Resources

January
2016



CA Department of Water Resources

January
2017

California Water Supply

Snowpack – 2016 vs. 2017



% of April 1 Average / % of Normal for This Date



Automated Snow Measurements – Snow Water Equivalents

Year	% of Normal on January 9
2017	126%
2016	103%

- Snow station surveys conducted around January 1, 2017

California Water Supply

DWR – State Water Project (SWP)



Oroville Dam

State Water Project

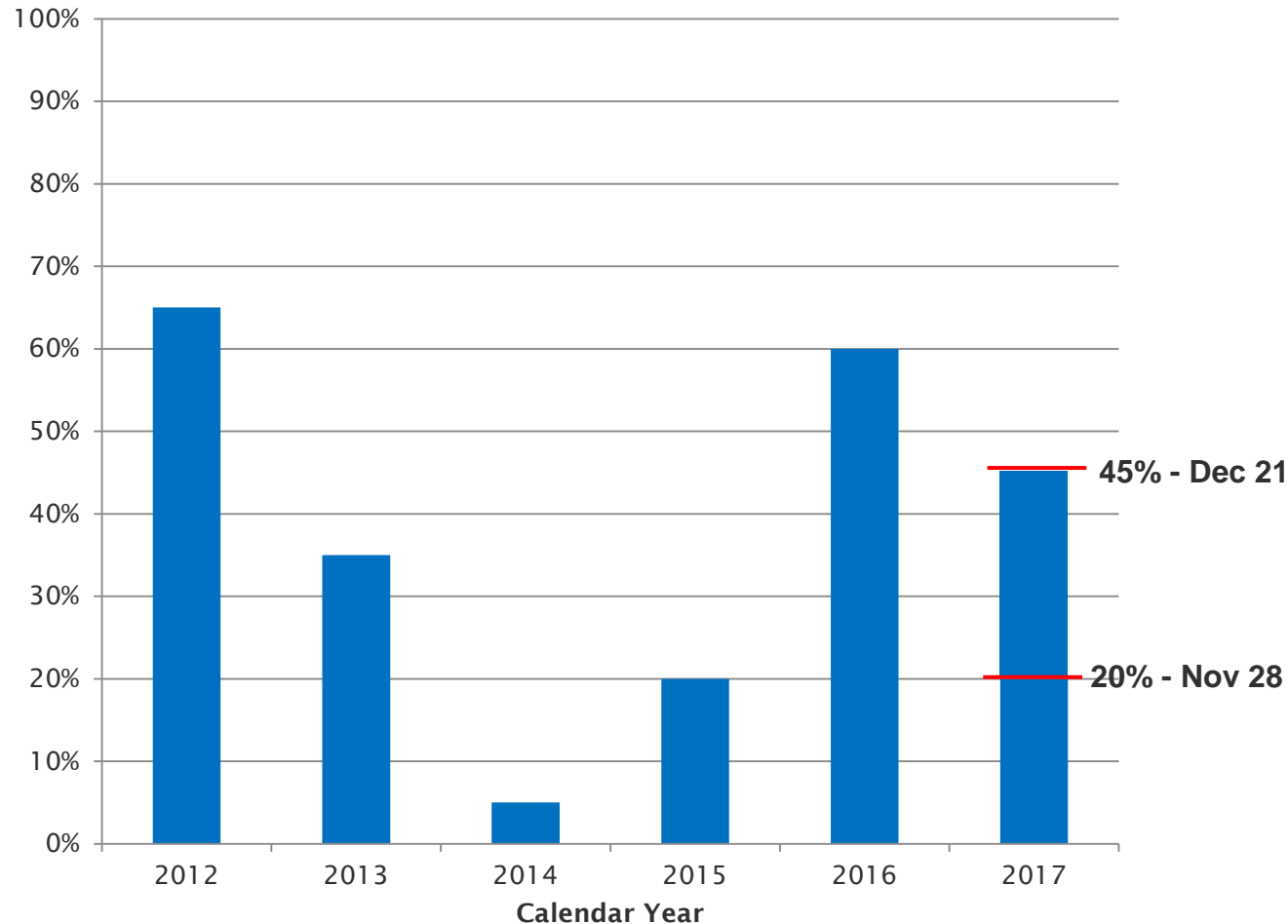
- Supplies 29 water agencies (25 million Californians and 750,000 acres of farmland)
- Delivers water to two-thirds of California's population

California Water Supply

DWR – State Water Project (SWP) Allocation



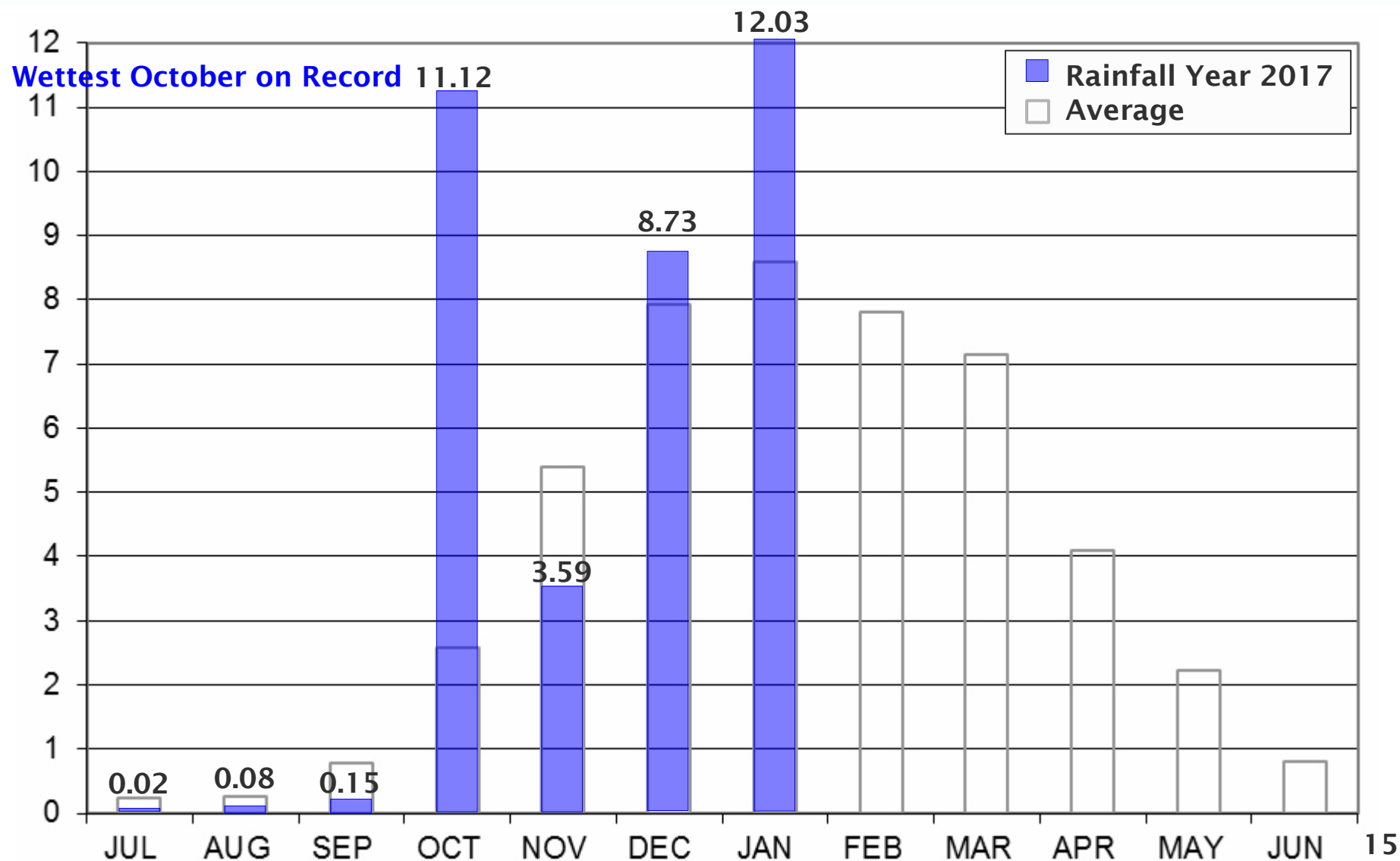
Year	SWP Allocation
2012	65%
2013	35%
2014	5%
2015	20%
2016	60%
2017	45%*



*As of December 21, 2016

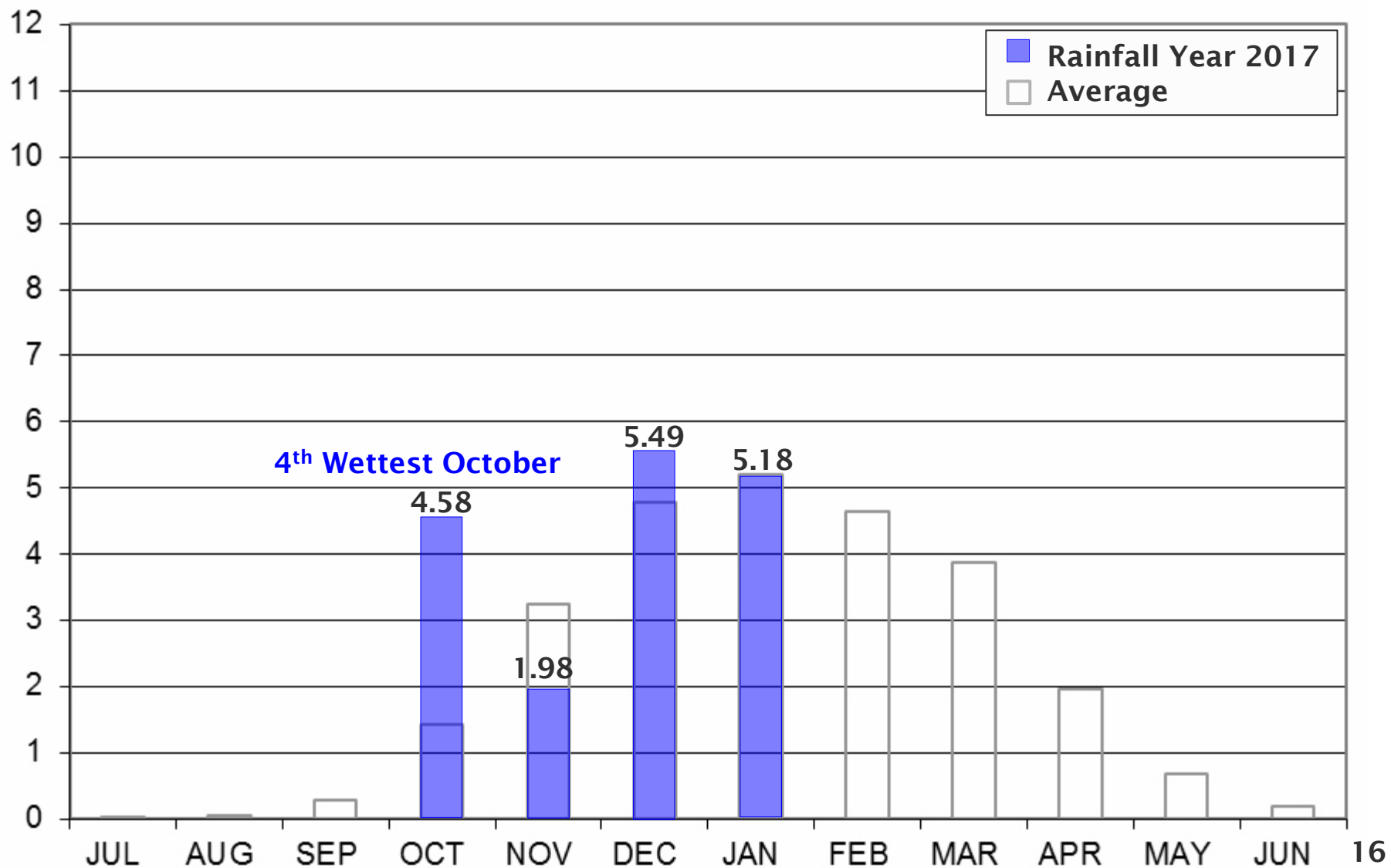
Current Water Supply

Mokelumne Precipitation



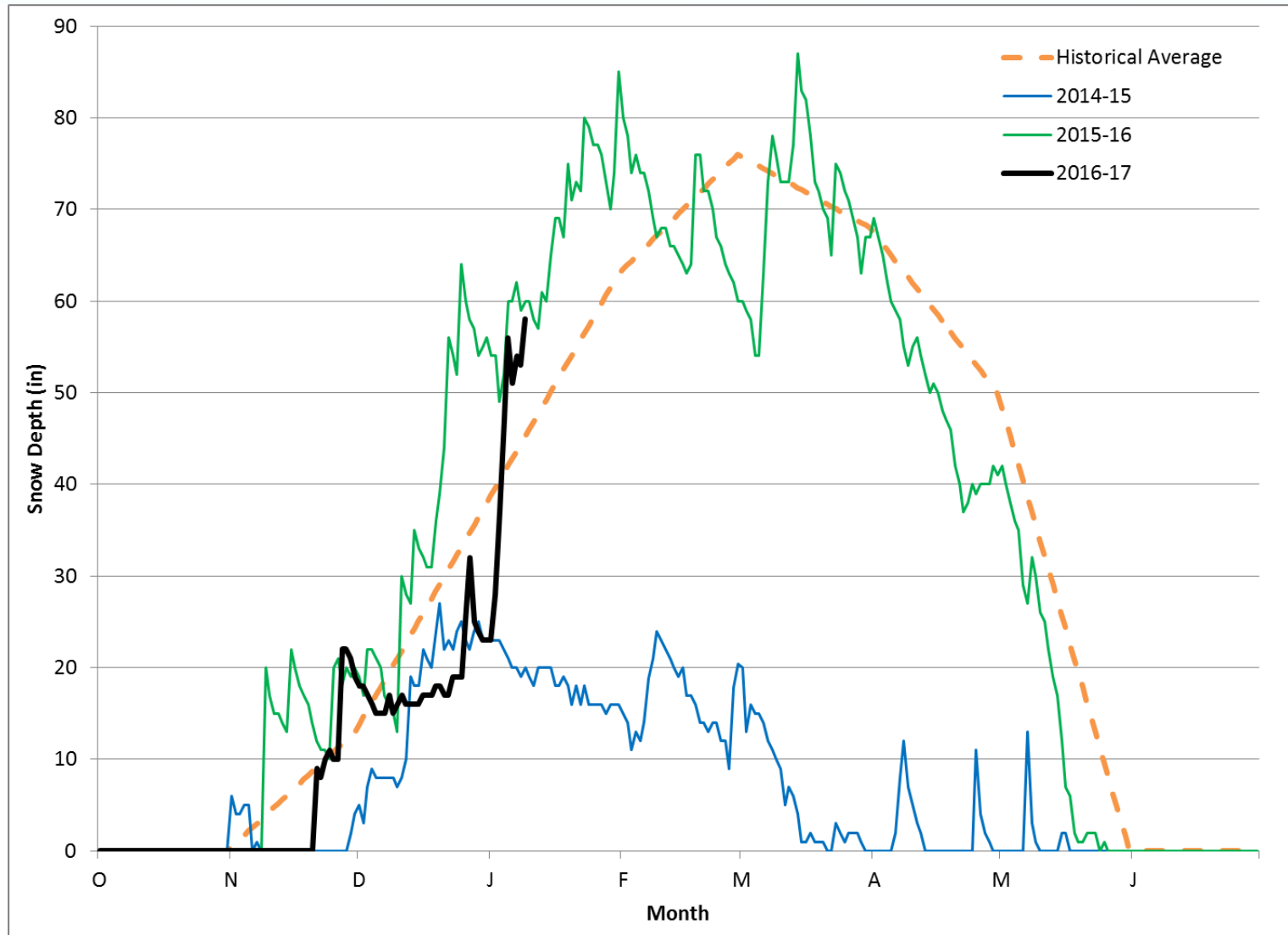
Current Water Supply

East Bay Precipitation



Current Water Supply

Caples Lake Snow Depth



Current Water Supply

Precipitation & Snow



As of 1/9/2017	Cumulative Precipitation	% of Average
East Bay		
East Bay Watershed	17.22"	150%
Mokelumne Basin		
4-Station Average	35.72"	180%
Caples Lake Snow Depth	58"	128%
Caples Lake Snow Water Content	14.62"	109%

Current Water Supply

Reservoir Storage



As of 1/9/17	Current Storage	Percent of Average	Percent of Capacity
Pardee	208,160 AF	116%	102%
Camanche	285,170 AF	110%	68%
East Bay	141,860 AF	115%	94%
Total System	635,190 AF	113%	82%

Current Water Supply

Runoff



Water Year	True Natural Flow (TAF)
2012	420
2013	435
2014	260
2015	220
2016	695
2017	265*

*Through January 9, 2017

Flood Control Operations

Conditions



- WY17 Mokelumne precipitation is 180% of average
- January 2017 Mokelumne precipitation is 12.03", 474% of average for the month
- Recent storms through Monday received over 10" of precipitation and 100 TAF runoff
- Pardee inflow exceeded 20,000 cfs
- Pardee has spilled 23.8 TAF into Camanche through 8:00AM Tuesday
- Camanche has released 51.8 TAF since ramping to 3,000 cfs on January 4
- San Pablo has released 195 AF
- Forecasts show continued precipitation this week

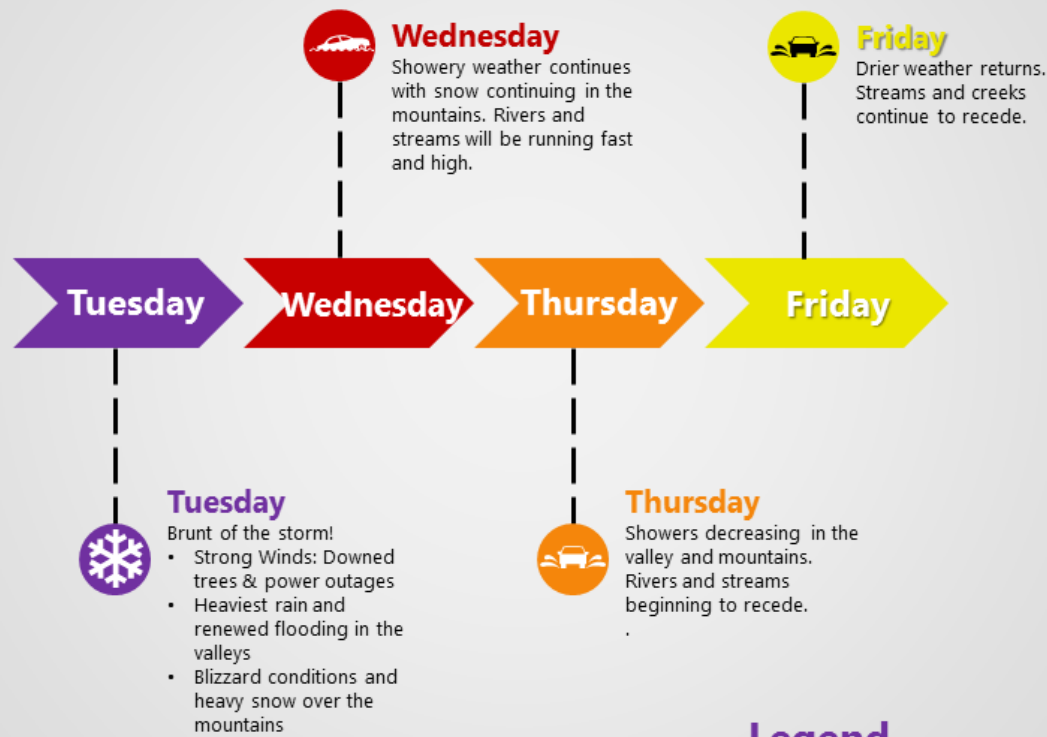
Flood Control Operations

Conditions



Storm Timeline

January 10-13, 2017
Interior Northern California



Issued: January 10

Legend

- Extreme Impact
- High Impact
- Moderate Impact
- Little to No Impact

Flood Control Operations

Camanche Release Timeline



Date	Camanche Release	Reason for Increase
Dec. 8, 2016	450 cfs	--
Dec. 12, 2016	900 cfs	To manage encroachment volume goal based on conditions at the time
Dec. 21, 2016	1,460 cfs	To manage encroachment volume goal based on increased runoff received
Jan. 4, 2017	3,000 cfs	To manage encroachment based on received runoff and a 14-day forecast of 12 inches of precipitation
Jan. 5, 2017	5,000 cfs	To manage encroachment based on received runoff, a 14-day forecast of 18 inches of precipitation, AND snow elevations increasing from 4,000 feet to 8,000 feet

Flood Control Operations

Camanche Releases



Flood Control Operations



Actions

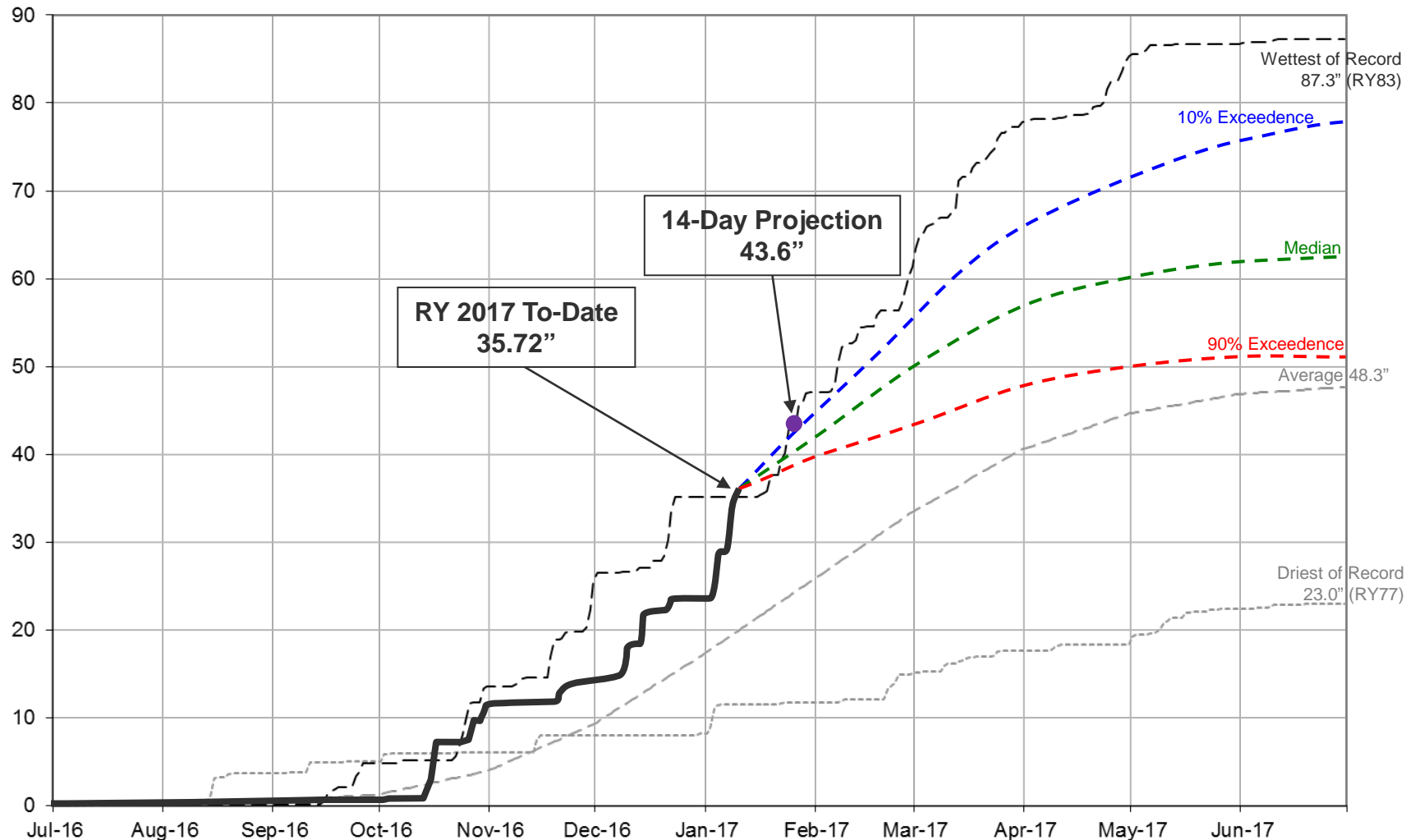
- Making maximum releases from Camanche Reservoir
- Made 150 cfs release from San Pablo Reservoir from January 6-7
- Notified City of San Pablo, CCCFC, CCCOES, EBRPD, and CA State Office of Emergency Services of possible spill from San Pablo Reservoir
- Preparing to make releases from other East Bay Reservoirs
- Notifying agencies and public regarding releases

Water Supply Projections

Mokelumne Precipitation Rainfall Year 2017



Mokelumne 4-Station Average Precipitation (in)
Rainfall Year 2017 Projection



Water Supply Projections

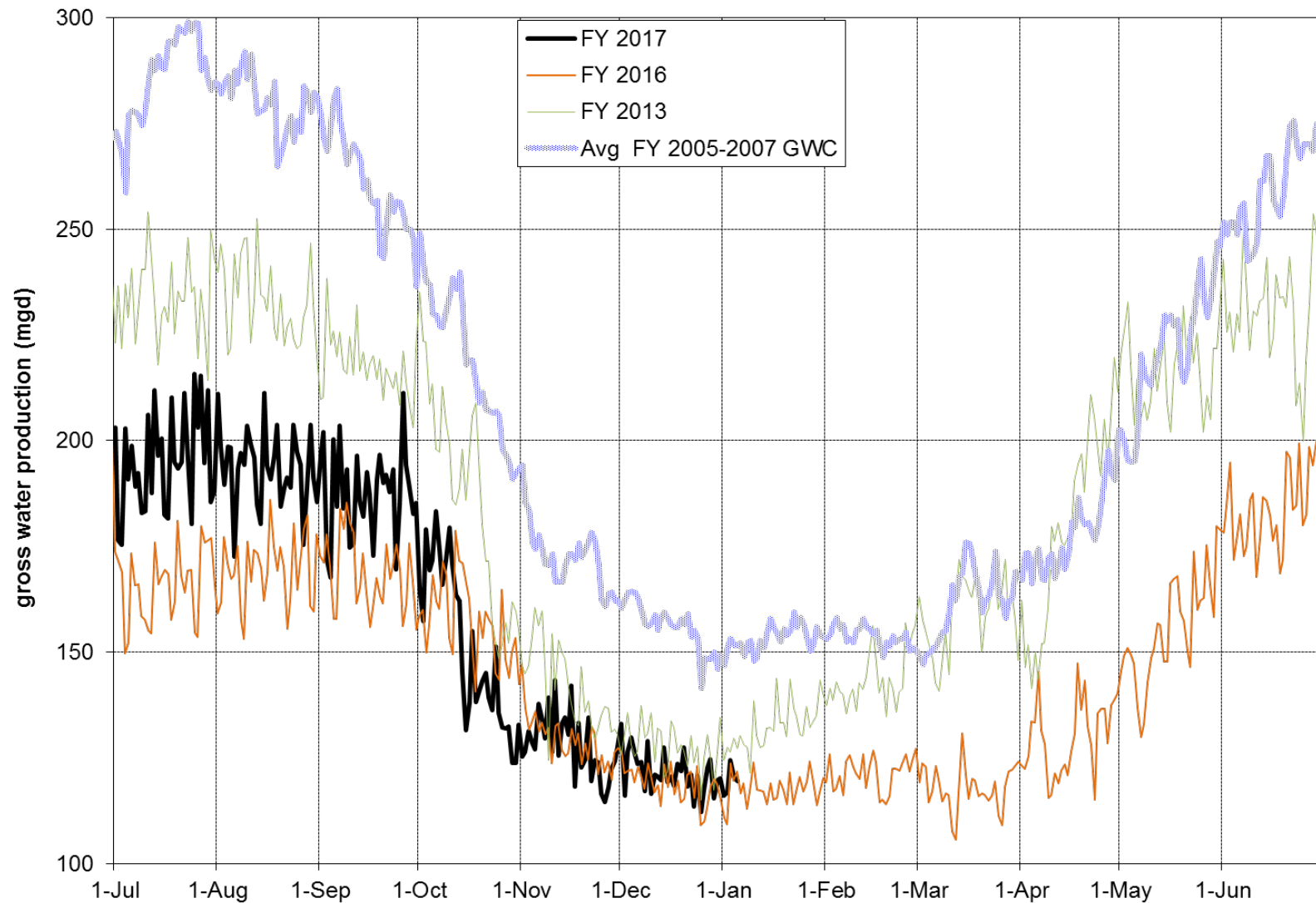
(Runoff Projections as of January 9, 2016)



Forecast	Annual Runoff	Total System Storage (on Sept 30, 2017)
90% Exceedence (9 of 10 years are wetter)	800 TAF	630 TAF
50% Exceedence (5 of 10 years are wetter)	1,060 TAF	630 TAF
10% Exceedence (1 of 10 years is wetter)	1,430 TAF	630 TAF
Average Year	745 TAF	630 TAF

Water Production

Gross Water Production



Water Production

Water Savings



	Savings Rate (2013 Baseline)
Jan. 1, 2016 – Dec. 31, 2016	21%
July 1, 2016 – Dec. 31, 2016	19%

Water Year 2017



Summary as of January 9, 2017

- East Bay watershed season precipitation is 150% of average
- Mokelumne River watershed season precipitation is 180% of average
- Precipitation accumulation season 41% complete (59% remaining)
- Camanche Reservoir Releases maintained at 5,000 cfs for flood control (51.8 TAF released from Camanche since January 4)
- True Natural Flow received to date is 265 TAF (100 TAF since January 4)
- Total system storage is 287 TAF more than last year at this time

Lots of snow!



WATER SUPPLY ENGINEERING DAILY REPORT

Monday, January 9, 2017

RESERVOIR STORAGE AND ELEVATION

	<u>WATER SURFACE</u>		<u>STORAGE</u>		<u>MAXIMUM CAPACITY</u>		<u>Release</u>	<u>Spill</u>
	<u>Elevation</u>	<u>+Gain</u>		<u>+Gain</u>	<u>Elevation</u>	<u>Storage</u>		
<u>MOKELUMNE</u>	<u>Feet</u>	<u>-Loss</u>	<u>Ac-Ft</u>	<u>-Loss</u>	<u>Feet</u>	<u>Ac-Ft</u>	<u>Cfs</u>	<u>Cfs</u>
Pardee	569.56	-0.02	208160	-40	567.65	203795	12656	9486
Camanche	216.3	2.92	285170	17940	235.5	417120	4989	0
<u>EAST BAY</u>								
Briones	575.52	0.23	58520	160	576.14	58960	0	0
Chabot	221.6	0.2	8520	60	227.25	10350	0	0
Lafayette	445.02	0.5	3740	60	449.16	4250	0	0
San Pablo	310.95	0.8	36360	640	313.68	38600	0	0
Upper San Leandro	454.33	1.26	34720	900	459.98	38905	0	0
Total East Bay Res.			141860	1820		151065		
TOTAL SYSTEM STORAGE			635190	19720		771980		

<u>DISTRIBUTION SYSTEM</u>			<u>MOKELUMNE SYSTEM</u>		
<u>DISTRIBUTION RESERVOIRS</u>			<u>AQUEDUCT DELIVERIES</u>		
	<u>Storage</u>	<u>Operating</u>		<u>MG</u>	<u>Flow Conditions</u>
	<u>MG</u>	<u>Capacity</u>	Line 1	12.5	THROTTLE
Today	316	720	Line 2	0	SHUTDOWN
Total Previous Day	331		Line 3	37.5	THROTTLE
Total Change	-15		TOTAL	50	77 Cfs
<u>WATER PRODUCTION</u>	<u>Million</u>	<u>Capacity</u>	<u>FSCC to MOK AQUEDUCTS (Measured at Brandt), MG</u>		
<u>AND DEMAND</u>	<u>Gallons</u>	<u>MGD</u>	Mok 1	0	
Lafayette WTP	9	25	Mok 2	0	
Orinda WTP	0	190		0 MG	
San Pablo WTP	11.3	30	<u>RIVER FLOWS AND RELEASES</u>		
Sobrante WTP	23.3	50			<u>Cfs</u>
Upper San Leandro WTP	33.3	45	Mokelumne River Natural Flow		23544
Walnut Creek WTP	31.2	90	Pardee Reservoir Inflow		12665
<u>TOTAL SURFACE PRODUCTION</u>	108.1	430	Pardee Release to Camanche Res.		12656
Miscellaneous(Estimated)	0		Pardee Release to JVID		0
<u>TOTAL WATER PRODUCTION</u>	108.1		Camanche Release to Mokel. River		4989
Change in Distribution System	-15		<u>PG&E CO. STORAGE (Acre-feet)</u>		
Wash Water from Distribution Sys.	2			<u>Storage</u>	<u>Maximum</u>
<u>SYSTEM DEMAND</u>	121.5		Old Reservoirs	12840	26560
East-of-Hills Demand	22.1		Salt Springs Res.	119772	15272
West-of-Hills Demand	99.4		Lower Bear Res.	42655	7414
			Total	175267	21578

<u>RAW WATER TRANSMISSION</u>			<u>PRECIPITATION (Inches)</u>				
	<u>INPUT</u>	<u>DRAFT</u>	<u>THIS YEAR</u>		<u>AVERAGE YEAR</u>		
Briones Res.	0	0	<u>STATION</u>	<u>Today</u>	<u>This Month</u>	<u>Season to-Date</u>	<u>Season to-Date</u>
San Pablo Res.	30	111					
U. San Leandro Res.	0	111	USL WTP	0.46	5.33	19.07	11.04
<u>TOTAL</u>	30	222	Orinda WTP	1.03	6.33	21.1	13.37
<u>REMARKS</u>			Lafayette Reservoir	0.57	5.02	15.37	11.85
WID Canal Diversion = 0 cfs			Walnut Creek WTP	1.02	6.68	17.18	9.7
Mokelumne River below WID = 4,204 cfs			Camp Pardee	0.57	4.29	14.56	8.64
			Salt Springs P.H.	1.54	10.73	32.17	18.72
			<u>CAPLES LAKE (7,830 FT) DATA</u>				
PG&E data as of 4:00 pm previous date.				<u>Today</u>	<u>Average</u>		
All other data as of midnight.			Snow Depth	58 Inches	45 Inches		
WTP capacities are sustainable rates.			Water Content	14.6 Inches	13.5 Inches		

EAST BAY MUNICIPAL UTILITY DISTRICT