

Research Partnership on Rebate Program Incentives

Second Progress Report

January 20, 2016



Outline

- Project status
- Summary of work completed since December
- Presentation of new results
- Discussion

Project Status

Deliverables (December 2015):

- Impact of alternative pricing structures on water demand

Deliverables (January 2016):

- Identification of role of agency, household-level, community factors
- Impact of conservation programs on household water bills & agency revenue and costs

Upcoming Activities

- January – February: complete focus groups
- February – March: conduct in depth interviews
- March – May: survey development and pre-testing

Summary of new work completed

- ▶ Three related analyses
 - ▶ *Analysis 1: factors affecting program participation*
 - ▶ What makes customers more or less likely to participate in conservation programs?
 - ▶ *Analysis 2: estimates of program interactions*
 - ▶ Does participation in program A affect the likelihood of participation in program B?
 - ▶ ***Analysis 3: estimates of conservation effects***
 - ▶ **How much water is conserved when a customer participates in each program?**
 - ▶ **What are the financial implications for MNWD?**

Data used in our study

- 16,277 residential single-family accounts
- Continuous records from July 2011 through March 2015 (45 months)
 - Budget rates implemented in July 2011
- From MNWD:
 - Pricing, usage, household size, irrigated area, recent ET, conservation program participation
- From other sources:
 - Demographics (income, education)

Data: program statistics

Number and Percentage of Households Participating in Selected Water Conservation Programs (Sample Size=16275)

	Turf Removal	Turf to Synthetic	Weather Based Irrigation Controller	High Efficiency Clothes Washer	High Efficiency Toilet
Turf Removal	149 (.92%)				
Turf to Synthetic	26 (.16%)	202 (1.2%)			
Controllers	3 (.02%)	5 (.03%)	142 (.87%)		
Clothes Washers	27 (.17%)	30 (.18%)	26 (.16%)	2053 (12.6%)	
Toilets	32 (.20%)	39 (.24%)	31 (.19%)	363 (2.2%)	1688 (10.4%)

Estimates of conservation effects

- *How do programs affect customer demand and agency finances?*
- Focusing on four programs plus toilets:
 - Weather-based irrigation controllers
 - High-efficiency clothes washers
 - Turf removal
 - Turf to synthetic
 - High-efficiency toilets

Estimation strategy

1. Identify customers who participated in just one new program over a 3 year period.
2. Identify neighbors who did not participate in any new programs over the same period.
3. Measure changes in consumption from year 1 to year 3 for participants and non-participants.
4. Calculate the difference in these changes.

Results: irrigation controllers

- › Sample size: 142
- › Participants: 66
- › Estimated effect:
 - › -4.1% per controller
 - › 0.94 billing units/month (703 gallons/month)

Results: clothes washers

- › Sample size: 2053
- › Participants: 1158
- › Estimated effect:
 - › -4.5% per washer
 - › 0.76 billing units/month (568 gallons/month)

Results: turf removal

- › Sample size: 149
- › Participants: 2-20
- › Estimated effect:
 - › After 1 year:
 - › All participants: -7.5% per project (1.5" per month)
 - › Large projects: -29.7% per project (4.6" per month)
 - › After 2 years:
 - › All participants: -25.2% per project (6.2" per month)
 - › Large projects: -35.4% per project (6.0" per month)

Results: turf to synthetic

- › Sample size: 202
- › Participants: 45
- › Estimated effect:
 - › After 1 year:
 - › All participants: -1.25% (0.3" per month)
 - › Large projects: *insufficient data*
 - › After 2 years:
 - › All participants: *insufficient data*
 - › Large projects: *insufficient data*

Results: toilets

- › Sample size: 1688
- › Participants: 895
- › Estimated effect:
 - › -4.4% per toilet
 - › 0.65 billing units/month (486 gallons/month)
- › Also, customers who have participated in HET tend to participate in other programs 30-80% sooner than non-HET customers.

Results: financial implications

- How long does it take to recover rebate costs and what is the implied cost of water saved?

Program	Monthly savings (%)	Monthly savings (billing units)*	Monthly savings (\$)	MNWD rebate (\$)	Time to break-even (years)	Implied water cost (\$/AF)
Controllers	4.1	0.94	2.24	75	2.8	193.09
Washers	4.5	0.76	1.81	200	9.2	636.84
Turf	25.2	4.40	10.47	1698	13.6	933.90
Large Turf	35.4	8.59	20.44	3434	14.0	967.44
Toilets	4.4	0.65	1.55	150	8.1	558.46

* Assumes water is purchased at Met's Tier 1 rate.
 Assumes 15 year lifespan for technologies
 1 billing unit = 748 gallons.

Key take-aways

- › Data challenges: low participation rates
- › Program interactions: complementarities
 - › Prior HET increases participation
- › Conservation effects
 - › Savings ~4-5% for indoor appliances
 - › Savings ~25-35% for turf replacement



Orange County Drought Performance & Water Supply Report

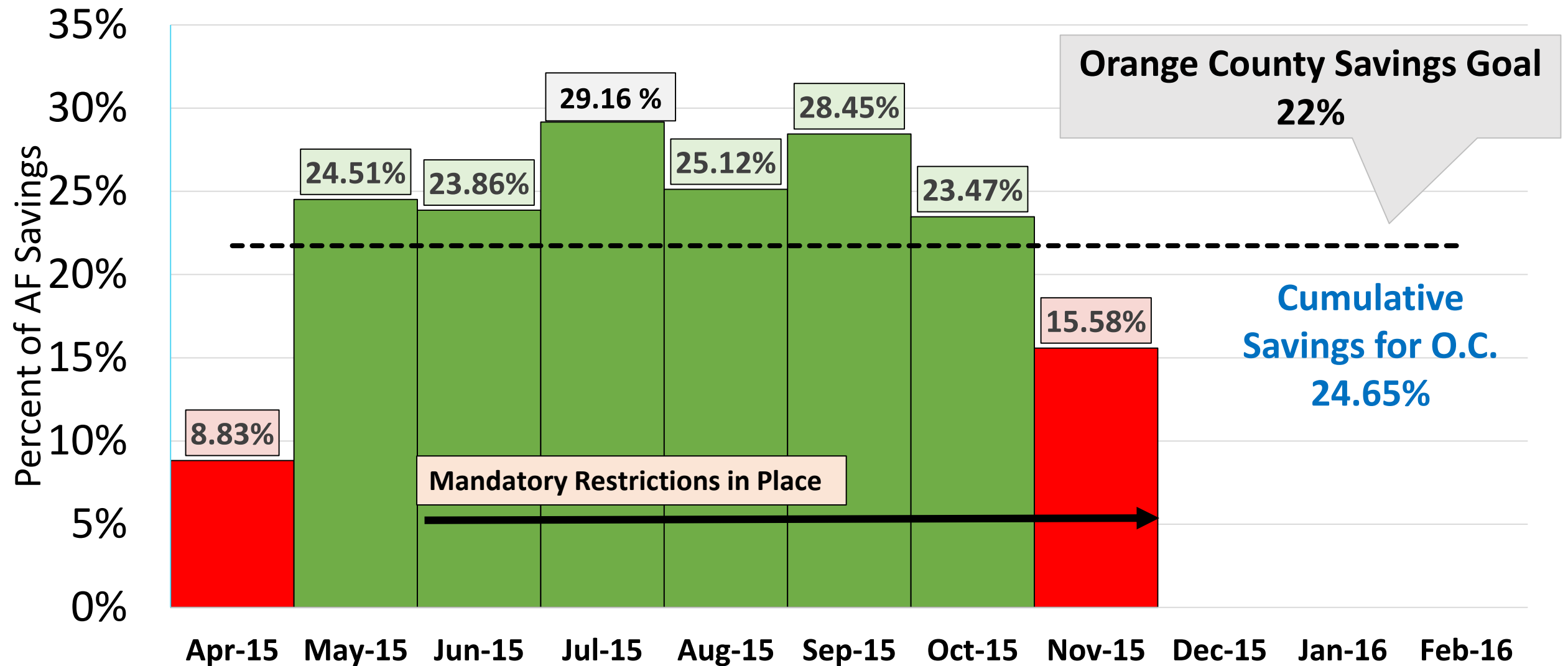
January 20, 2016

Municipal Water District of Orange County

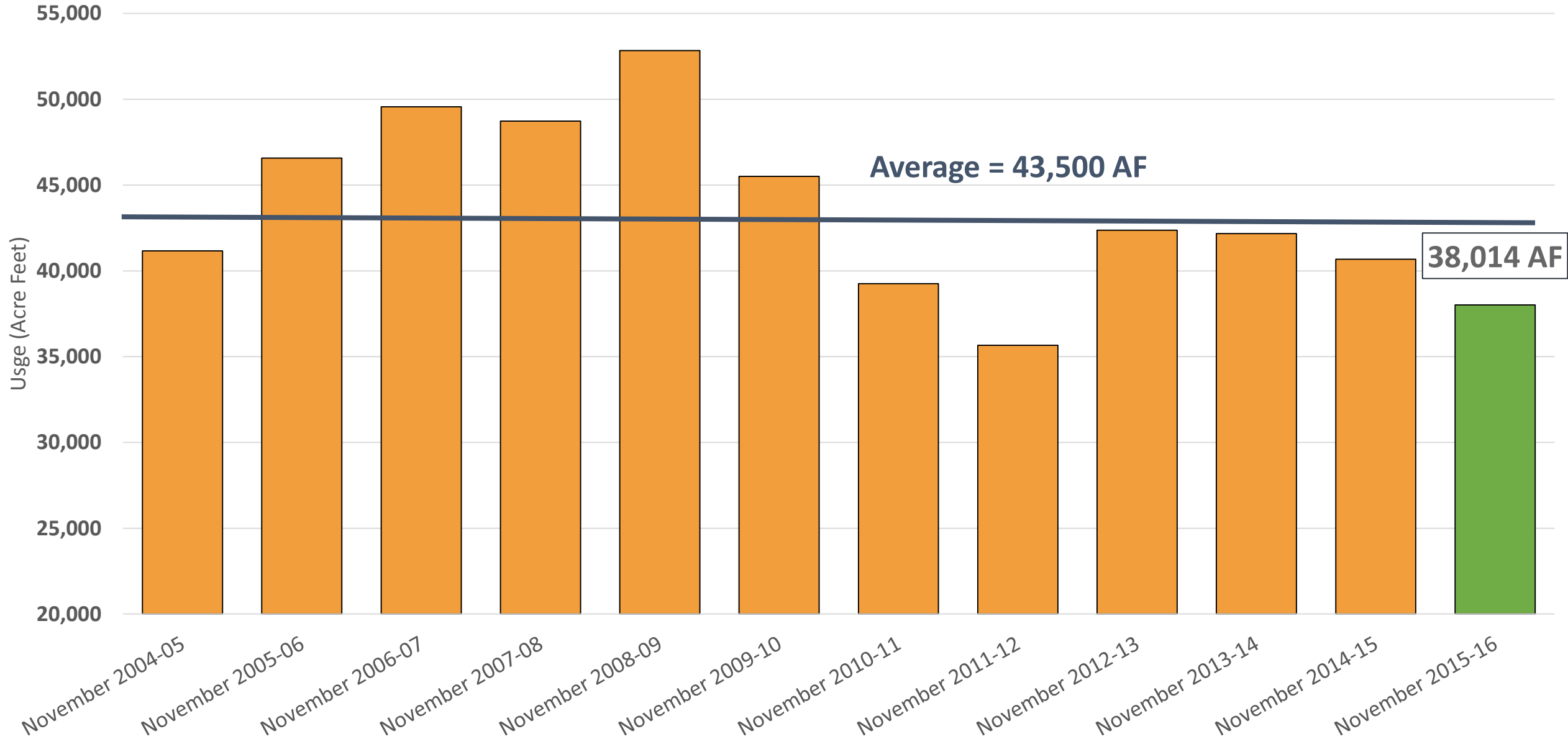
O.C. Water Savings Reported to SWRCB



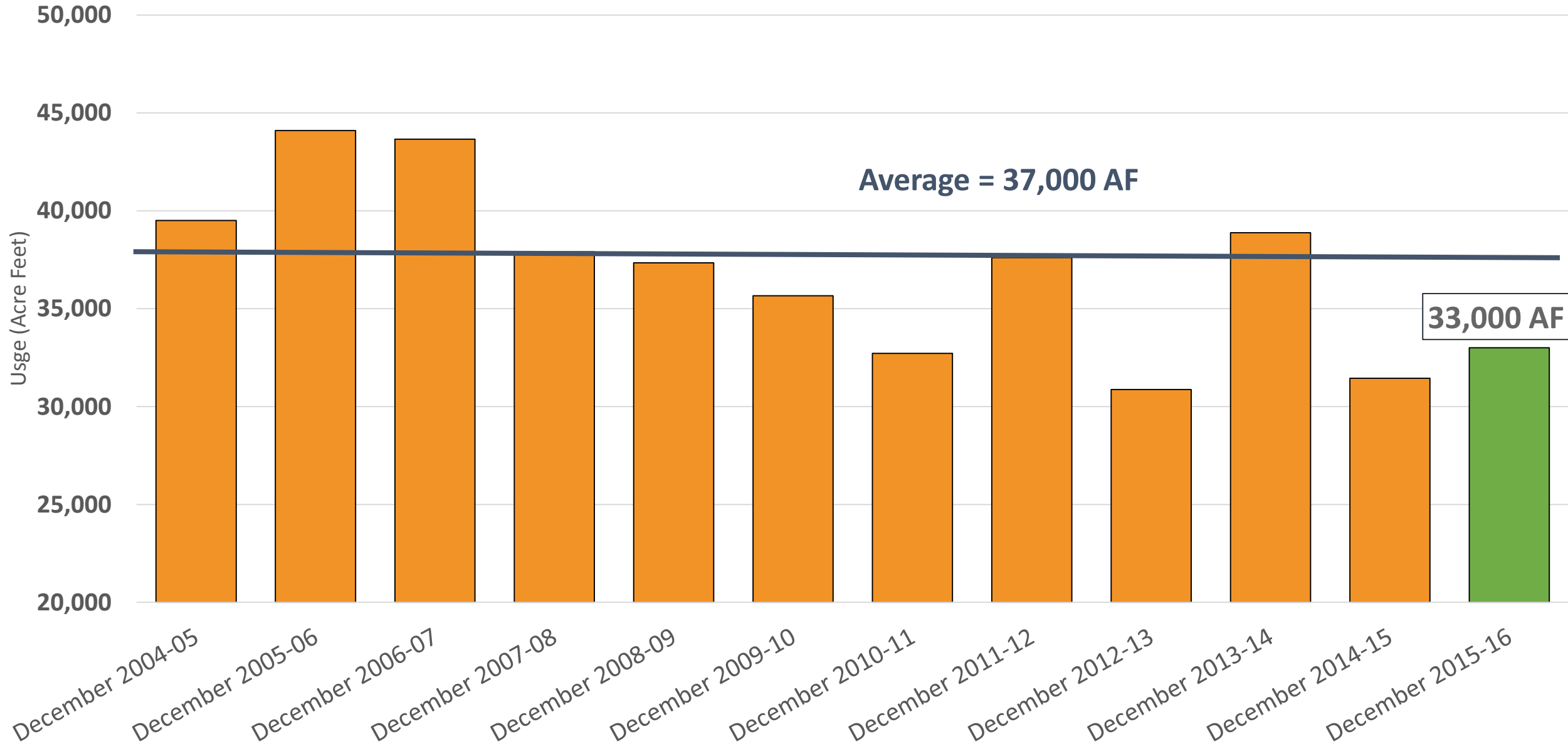
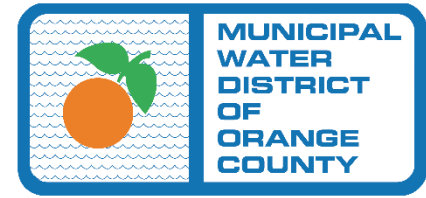
Average Monthly Water Savings for Orange County (2014-15 Vs CY 2013)



OC Historical November Water Usage



OC Historical December Water Usage



FY Annual Precipitation (Santa Ana)



Cumulative Year-to-Date

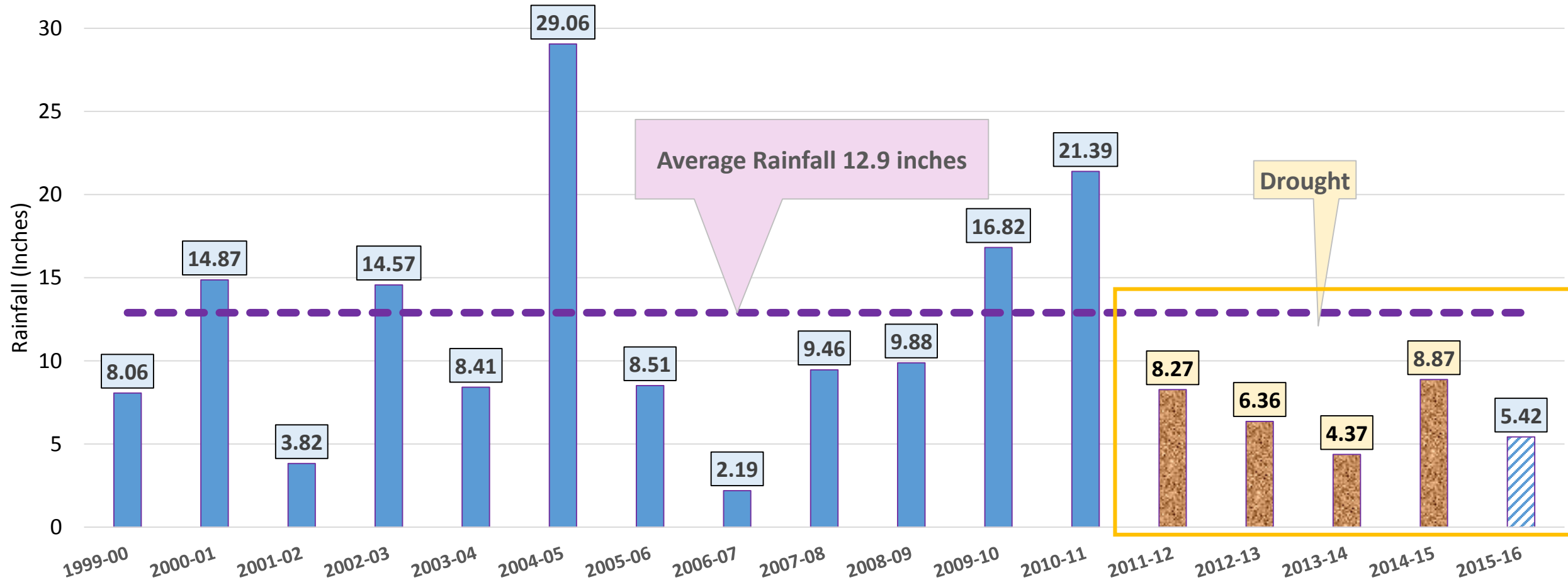
Average: 5.61"

2015-16: **5.42"**

Average Annual Rainfall: 12.9"

4-Year Deficit: 23.9" (2011-12 to Present)

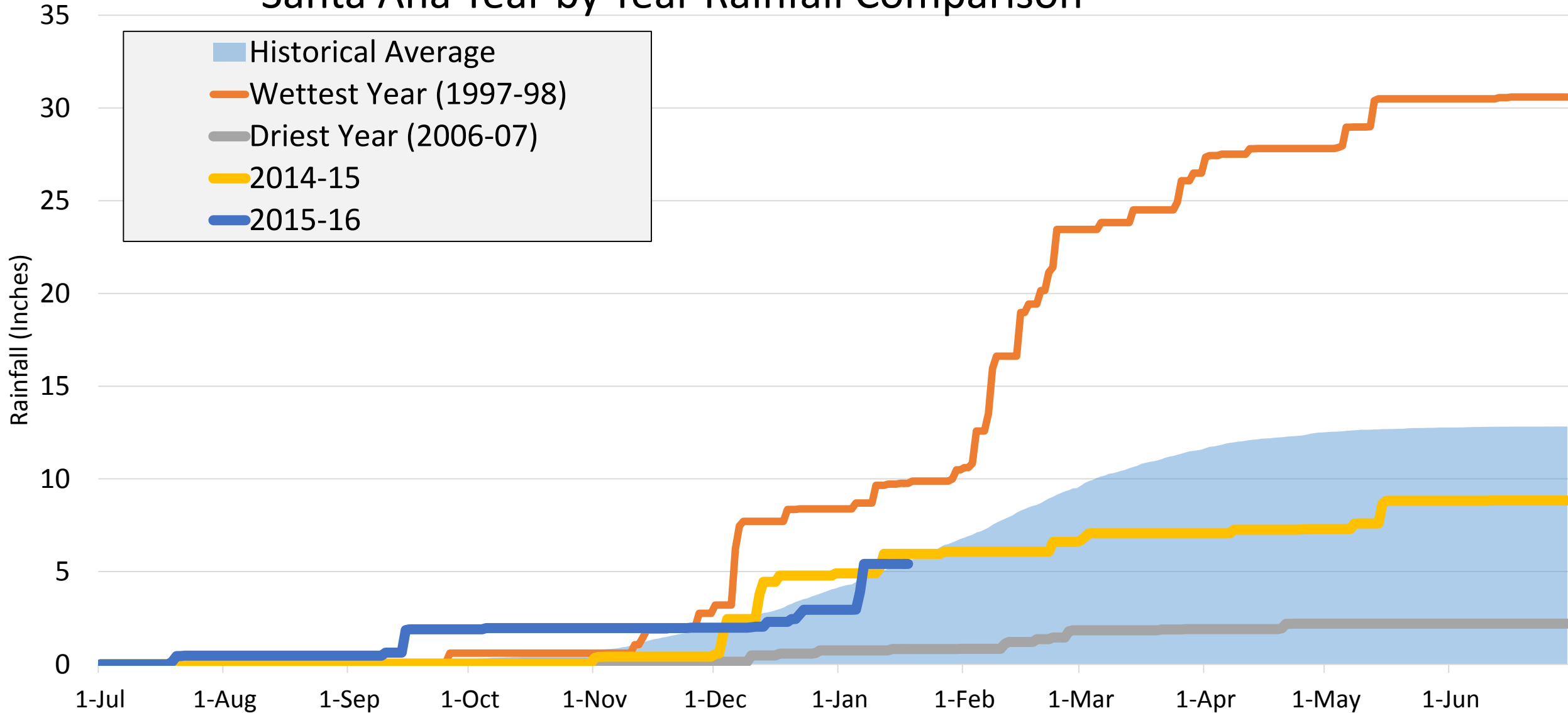
Santa Ana Annual Precipitation Statistics (Fiscal Year July-June)



FYD Rainfall Compared to Past



Santa Ana Year by Year Rainfall Comparison



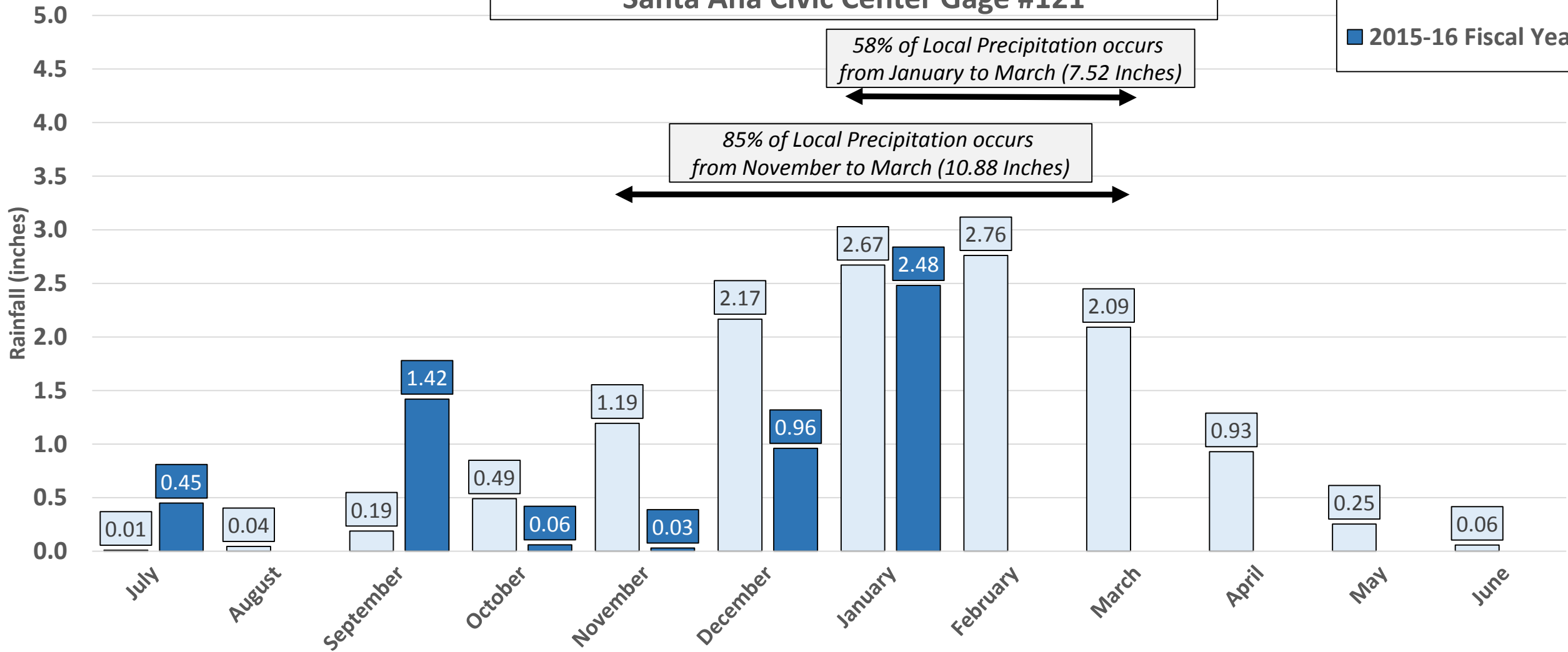
2015-16 FY Rainfall



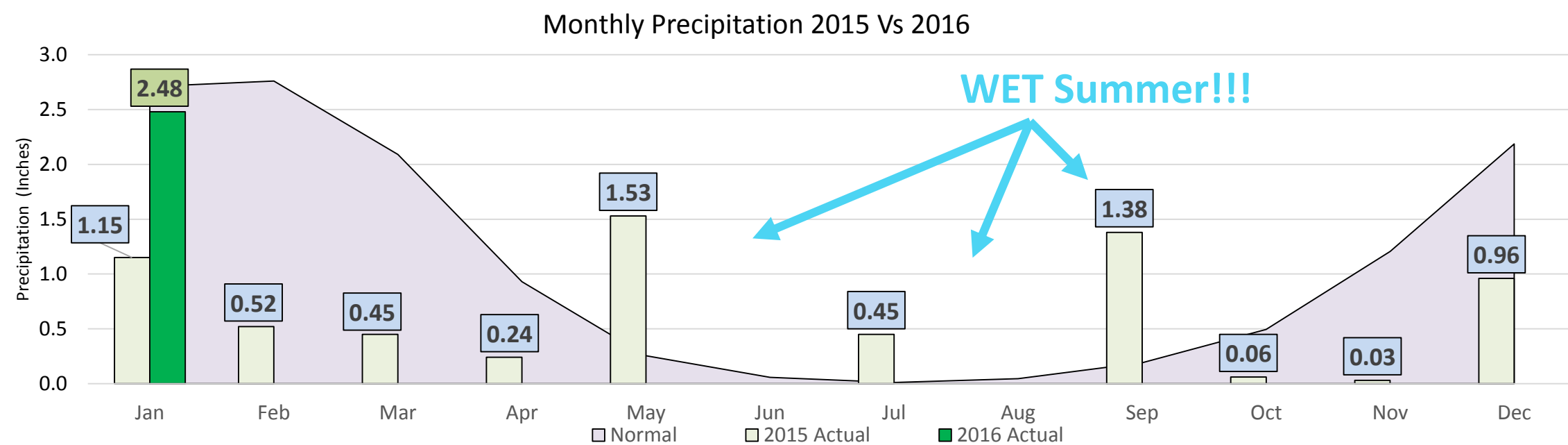
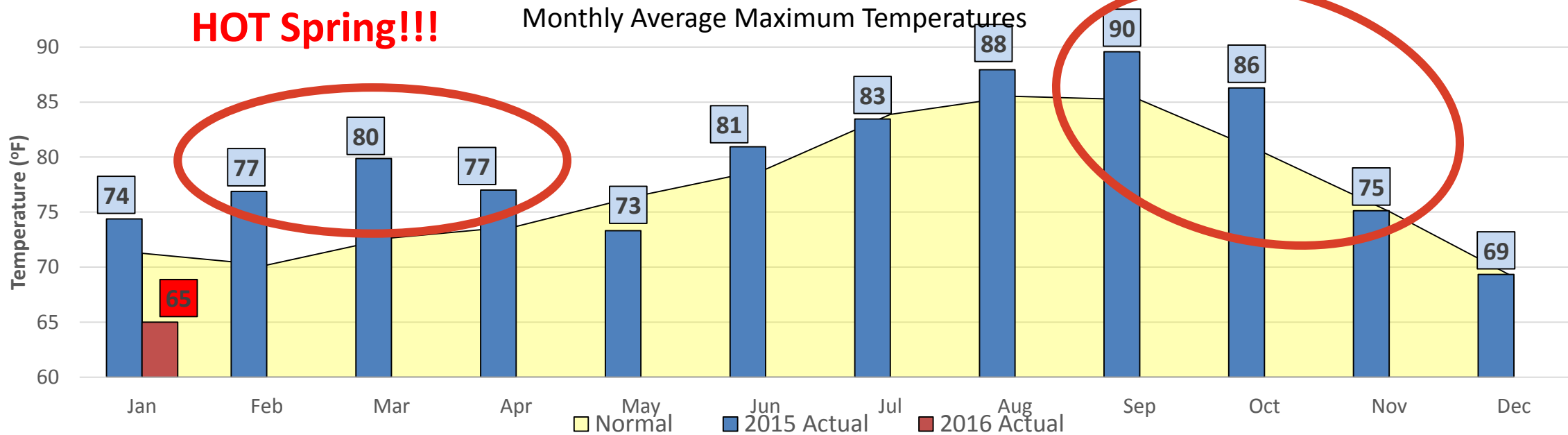
Average Monthly Precipitation in Orange County, Ca
Santa Ana Civic Center Gage #121

Legend:

- Avg Fiscal Year
- 2015-16 Fiscal Year



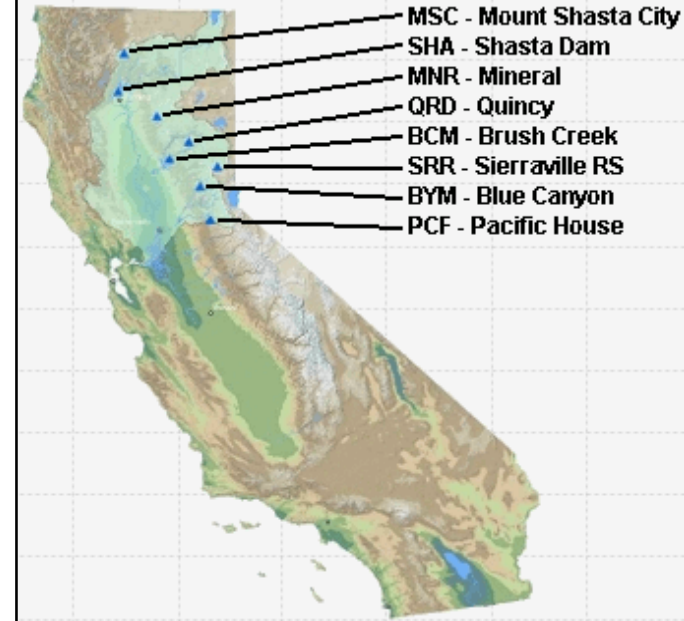
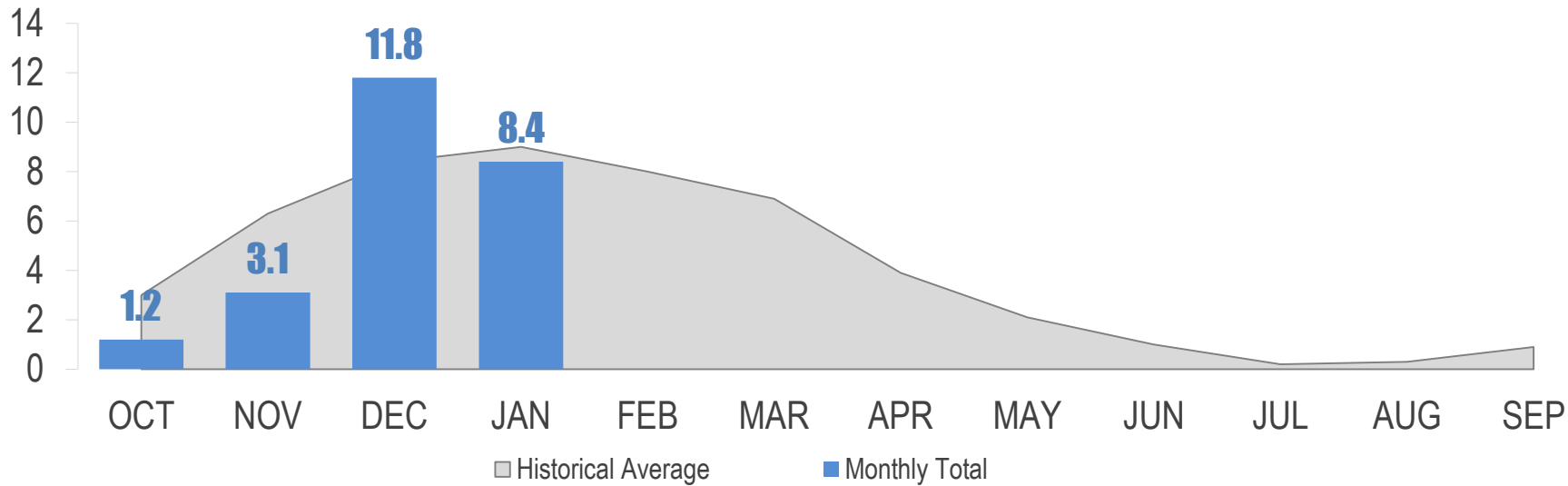
2015 vs. 2014 Weather



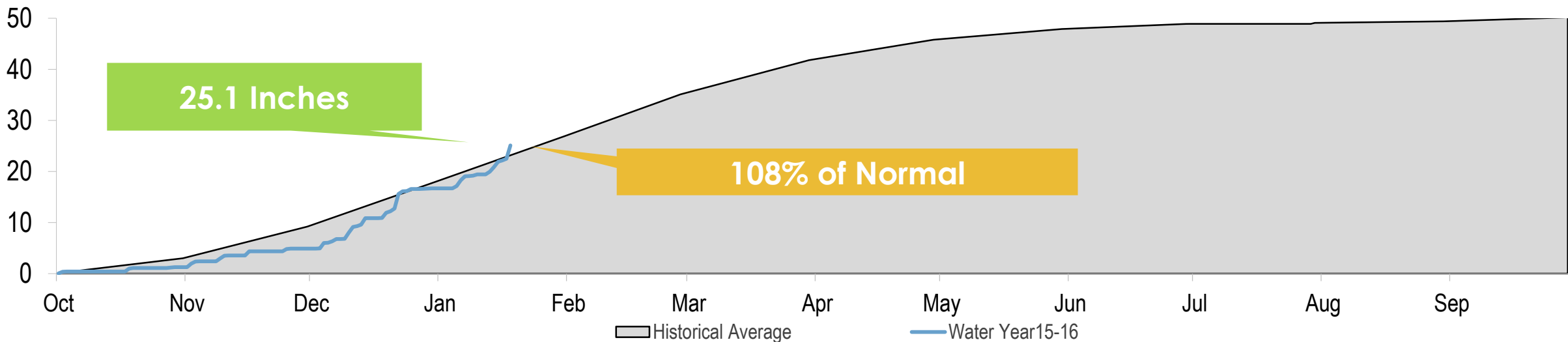
Northern California Accumulated Precipitation



Monthly Precipitation (8 Station Precip Index)



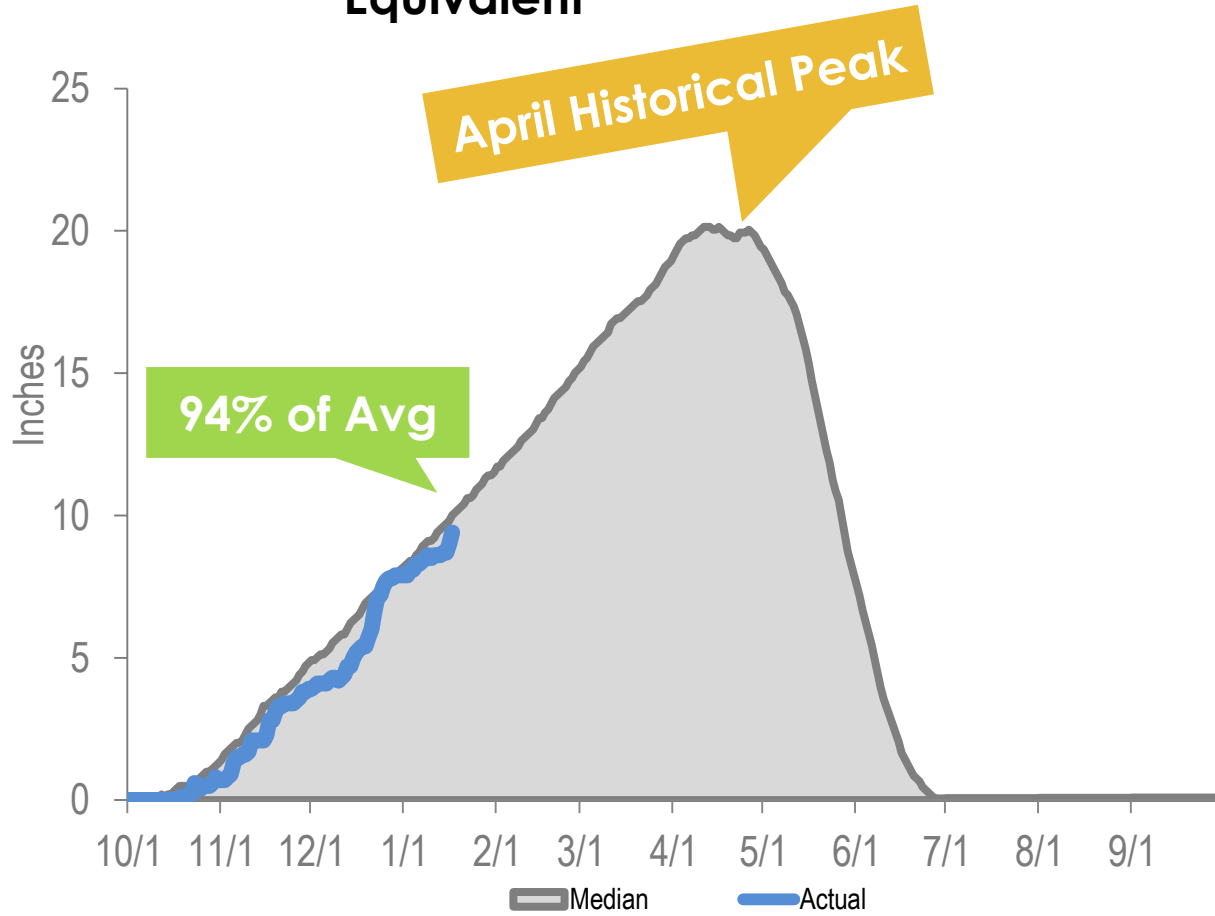
Accumulated Precipitation (8-Station Precip Index)



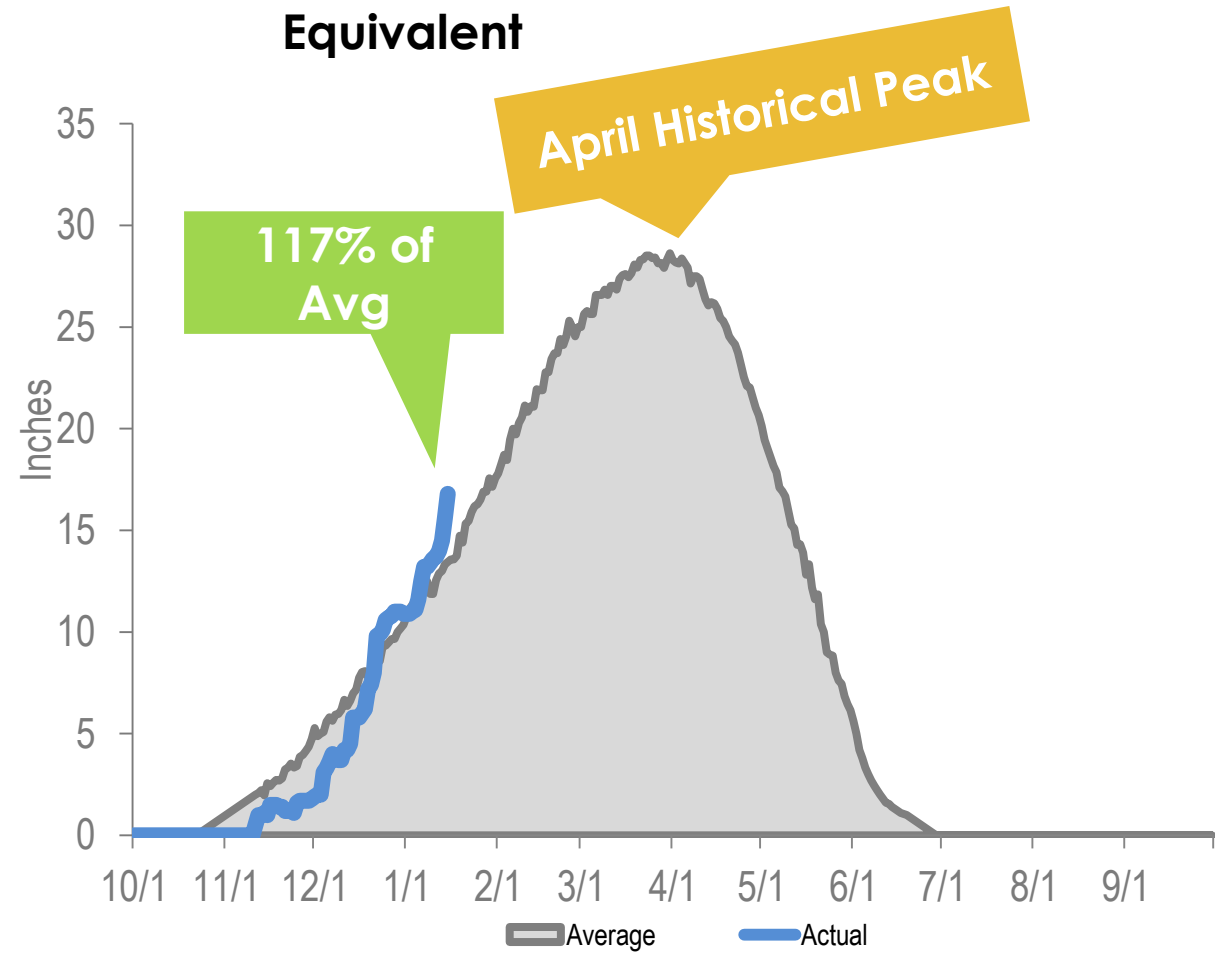
Snowpack



Colorado River Basin Snowpack Water Equivalent

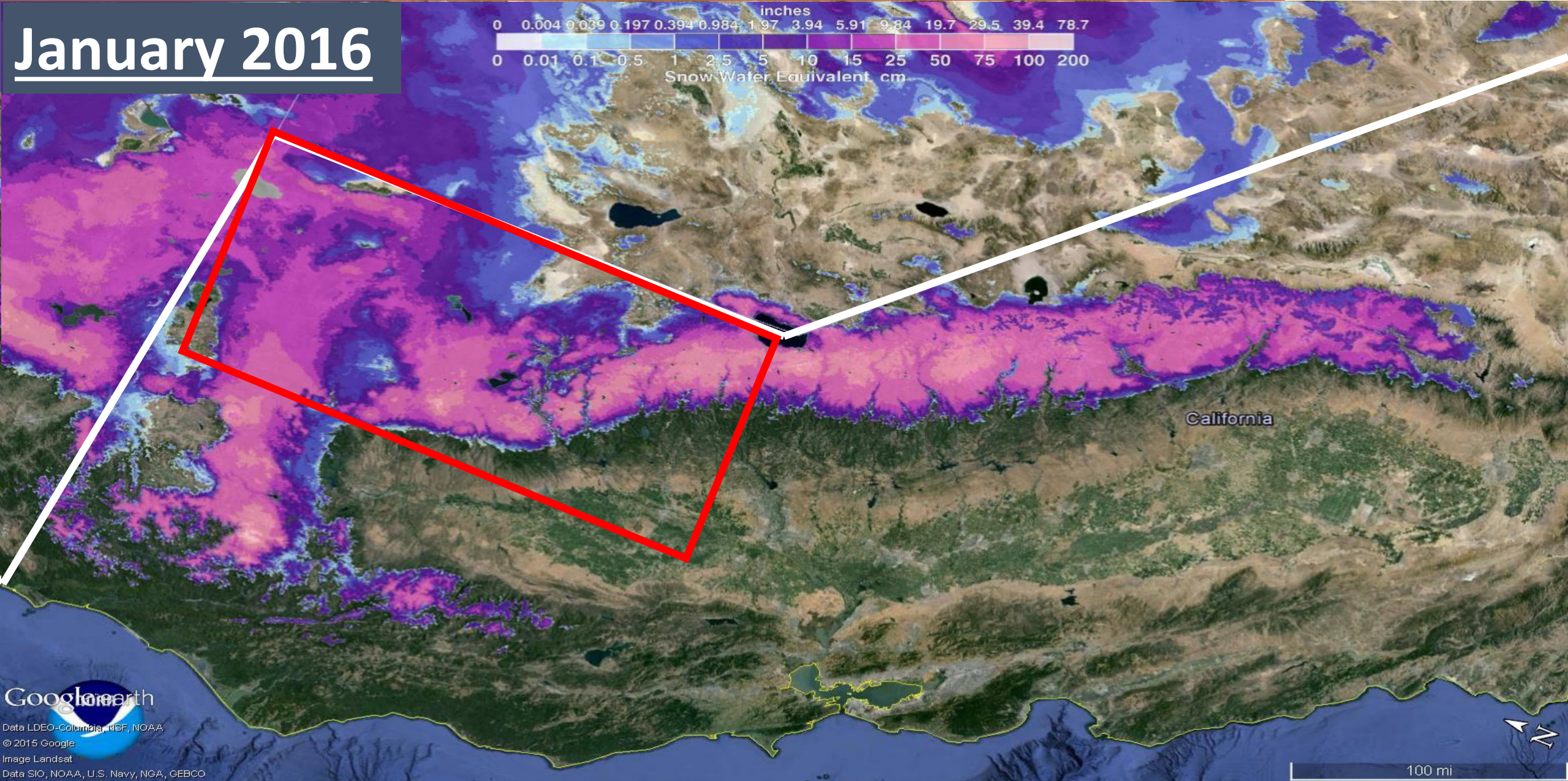


Northern Sierra Snowpack Water Equivalent



Snow Water Equivalent Jan 2016 VS Jan 2015

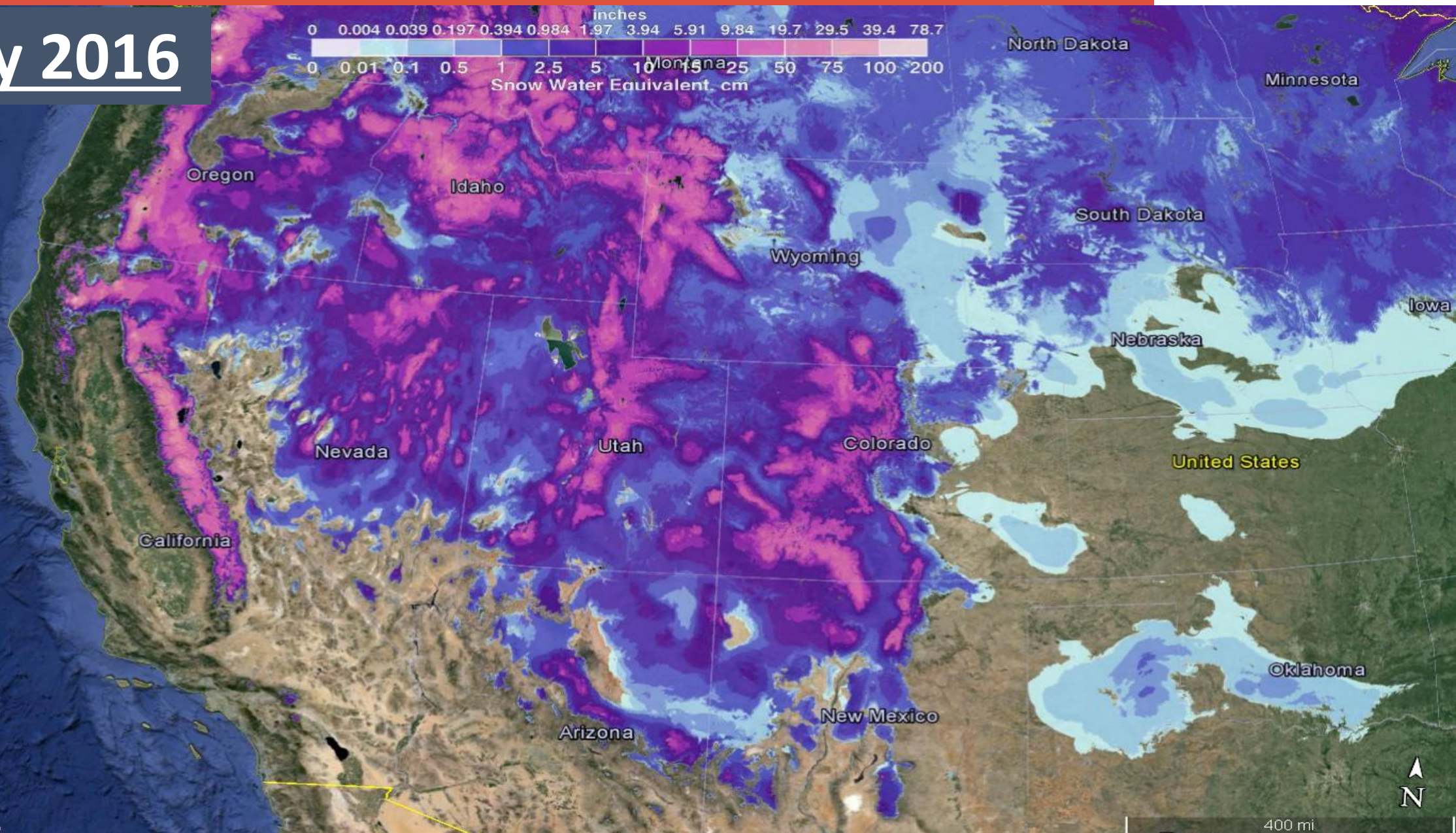
January 2016



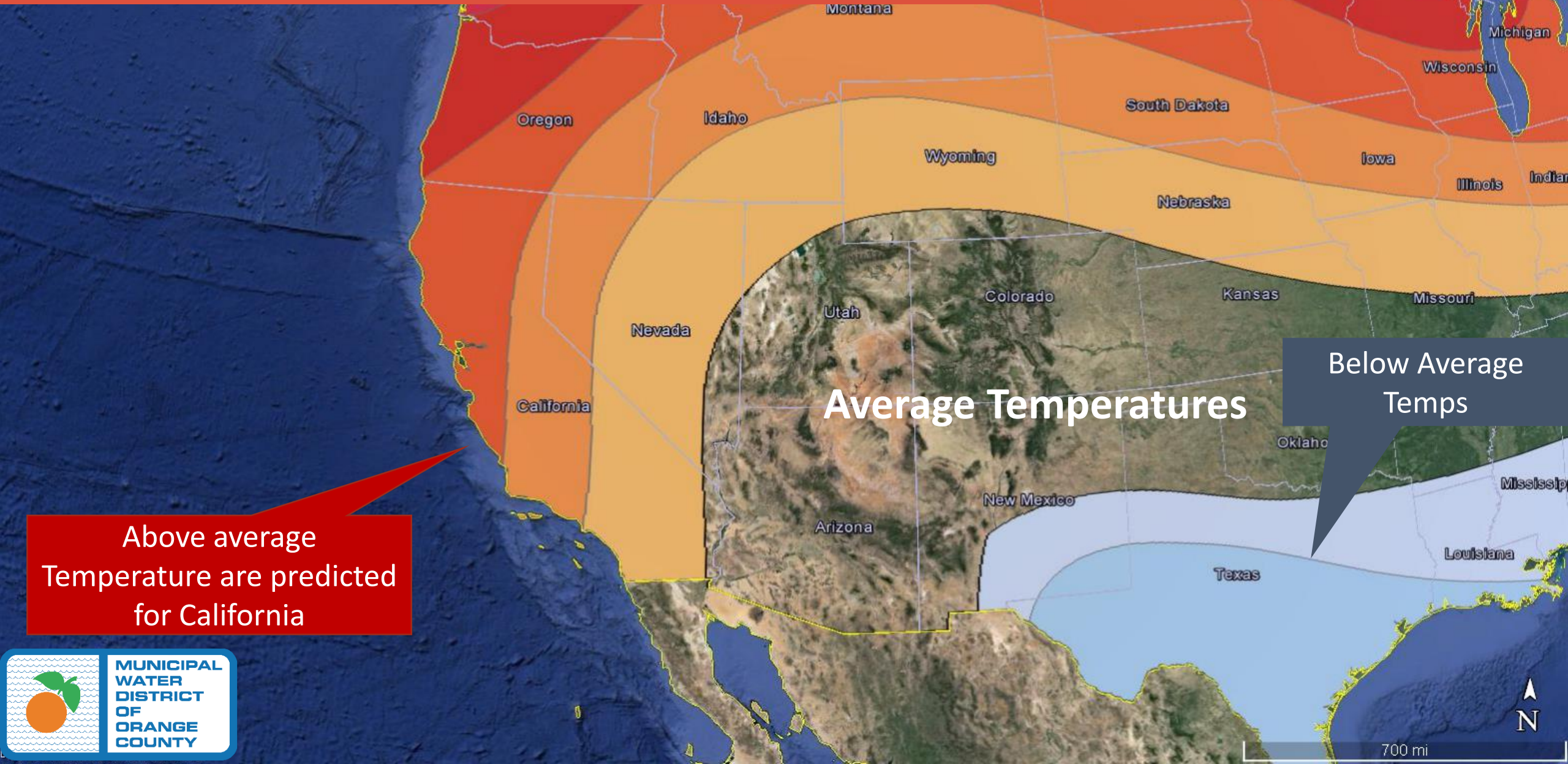
Data LDEO-Columbia, NEF, NOAA
© 2015 Google
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Snow Water Equivalent Jan 2016 VS Jan 2015

January 2016



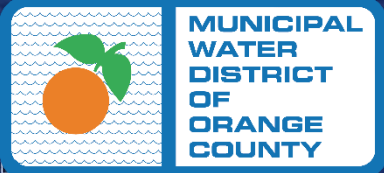
National Weather Service Temperature 3 Month Weather Outlook (January-March)



Above average
Temperature are predicted
for California

Below Average
Temps

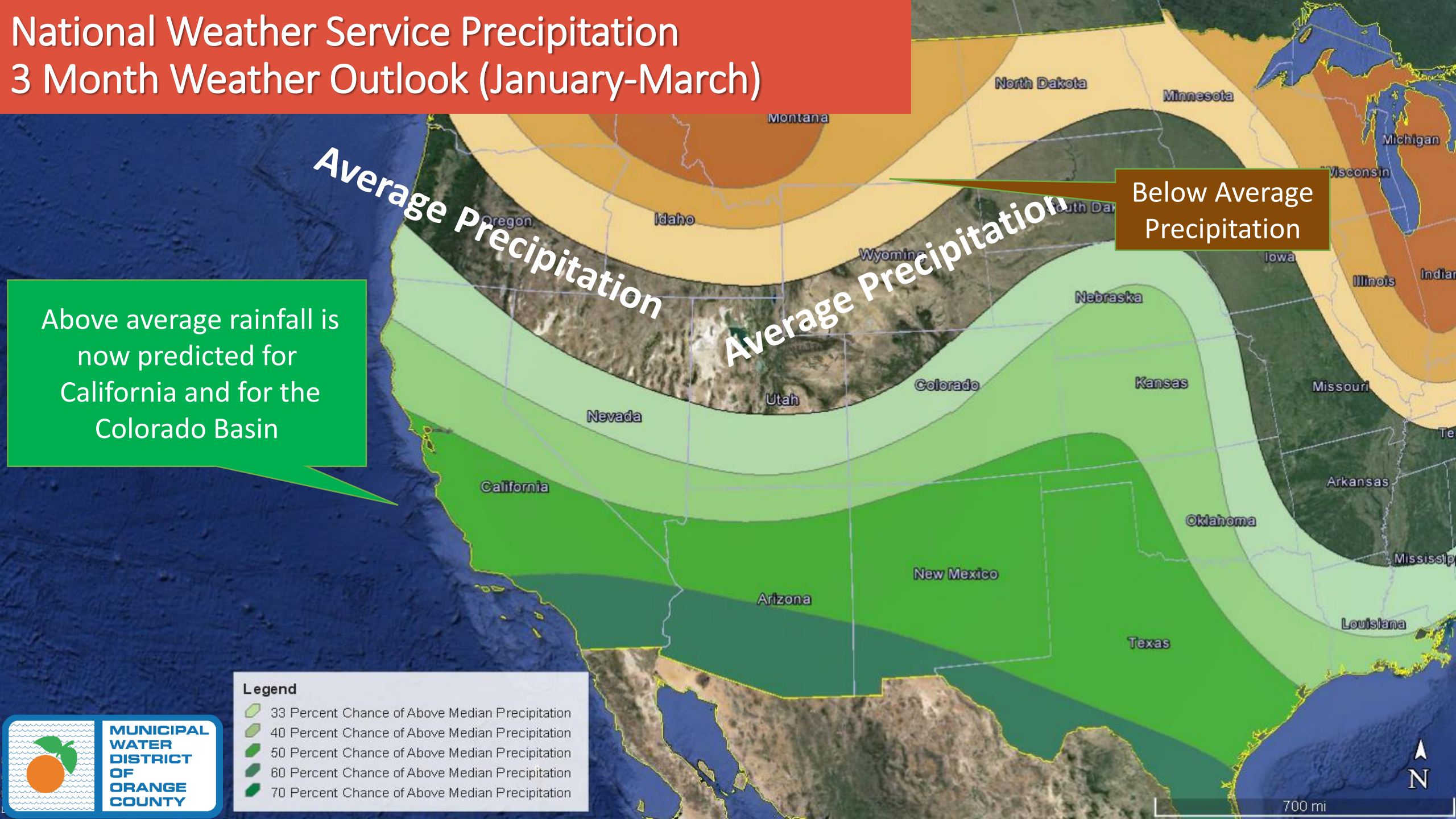
Average Temperatures



700 mi

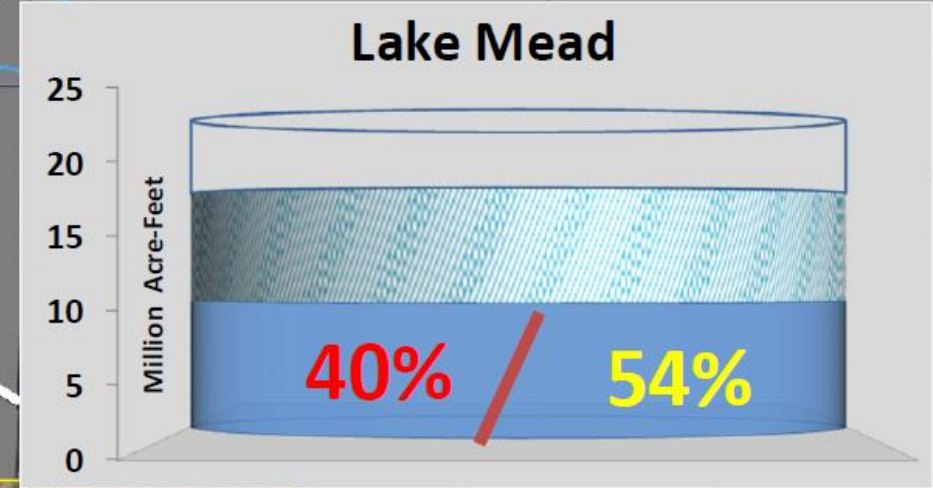
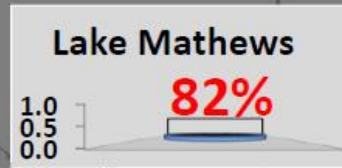
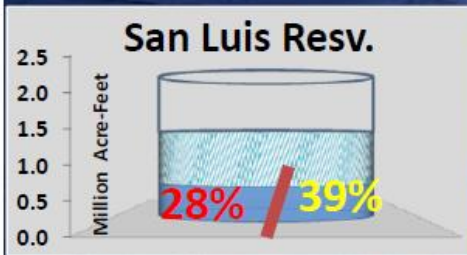
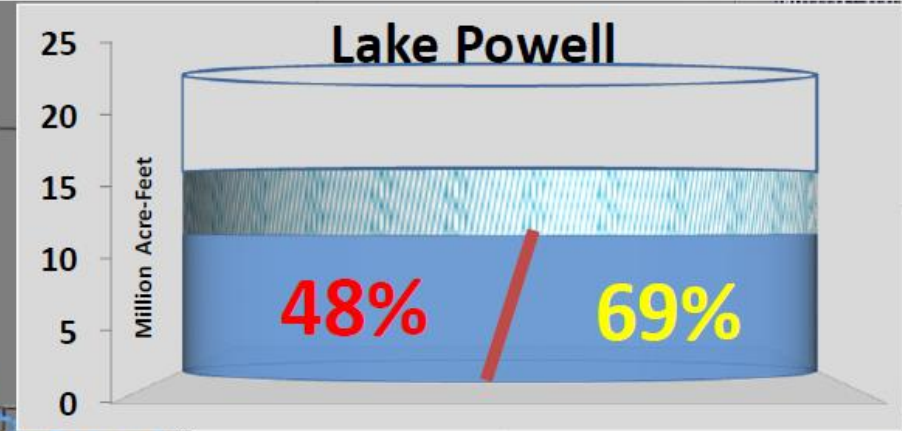
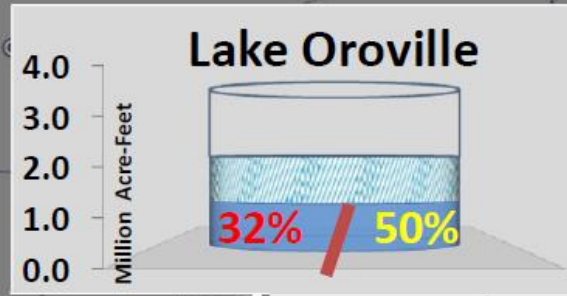
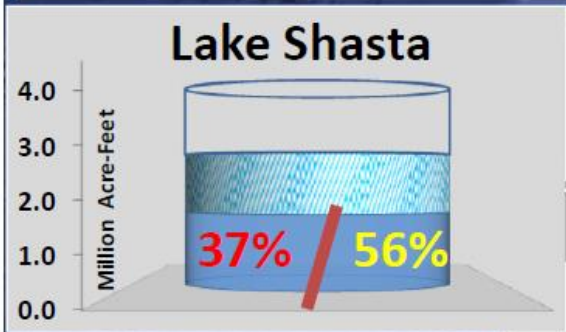


National Weather Service Precipitation 3 Month Weather Outlook (January-March)

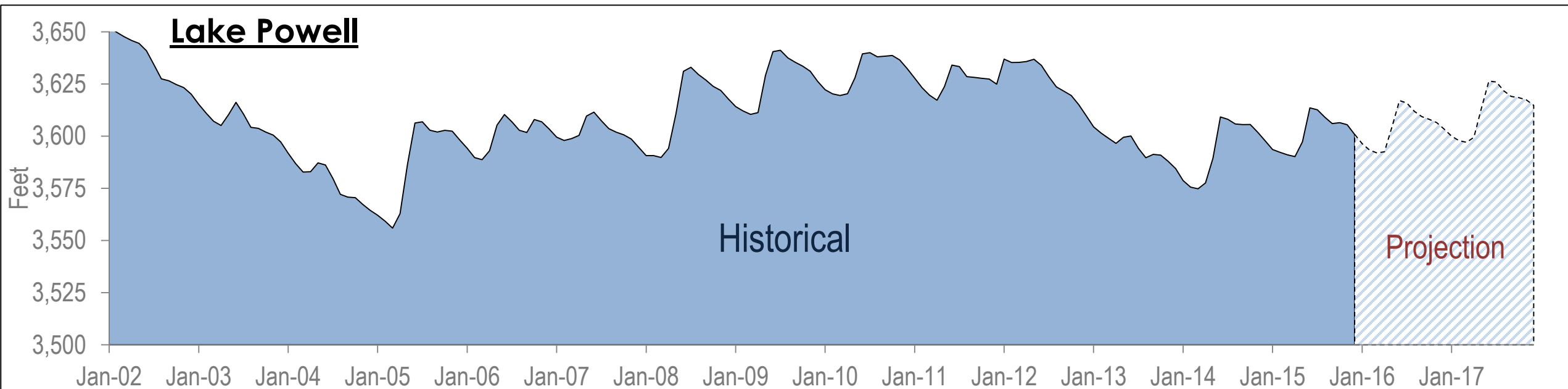
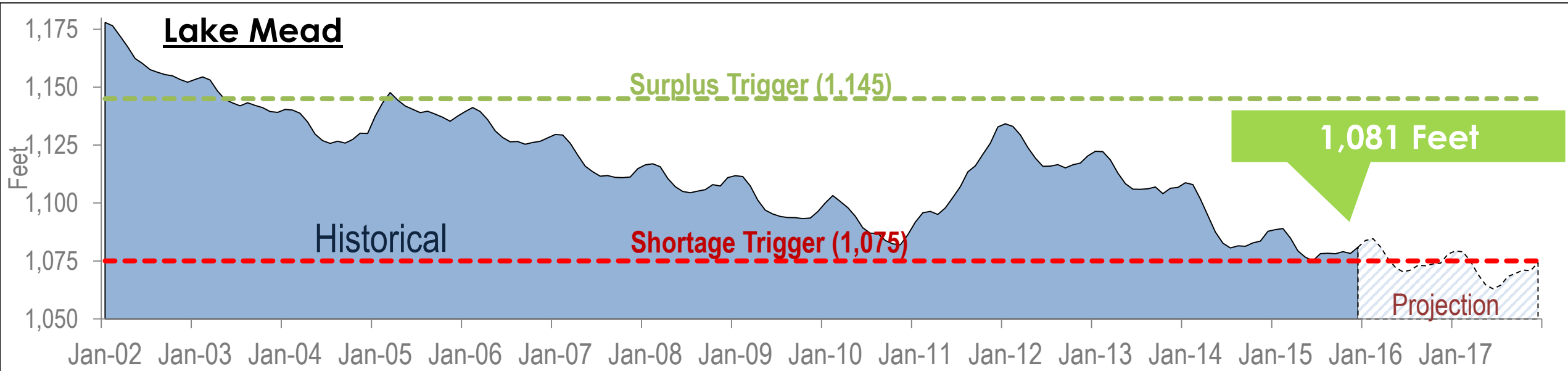


Reservoir Storage

State Water Project, Colorado River, and MWD Reservoir Storage as of January 18th, 2016

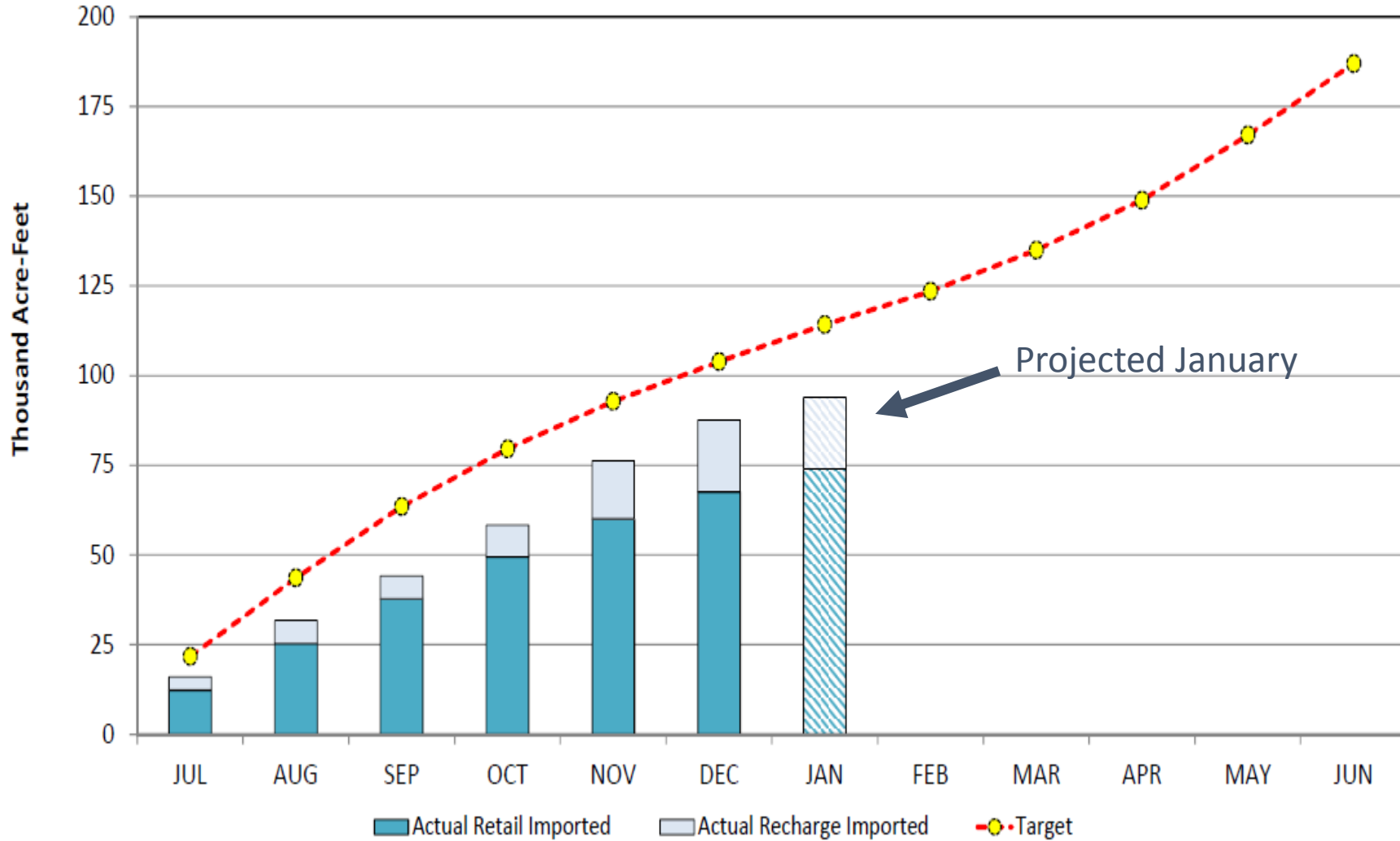


CRA Storage

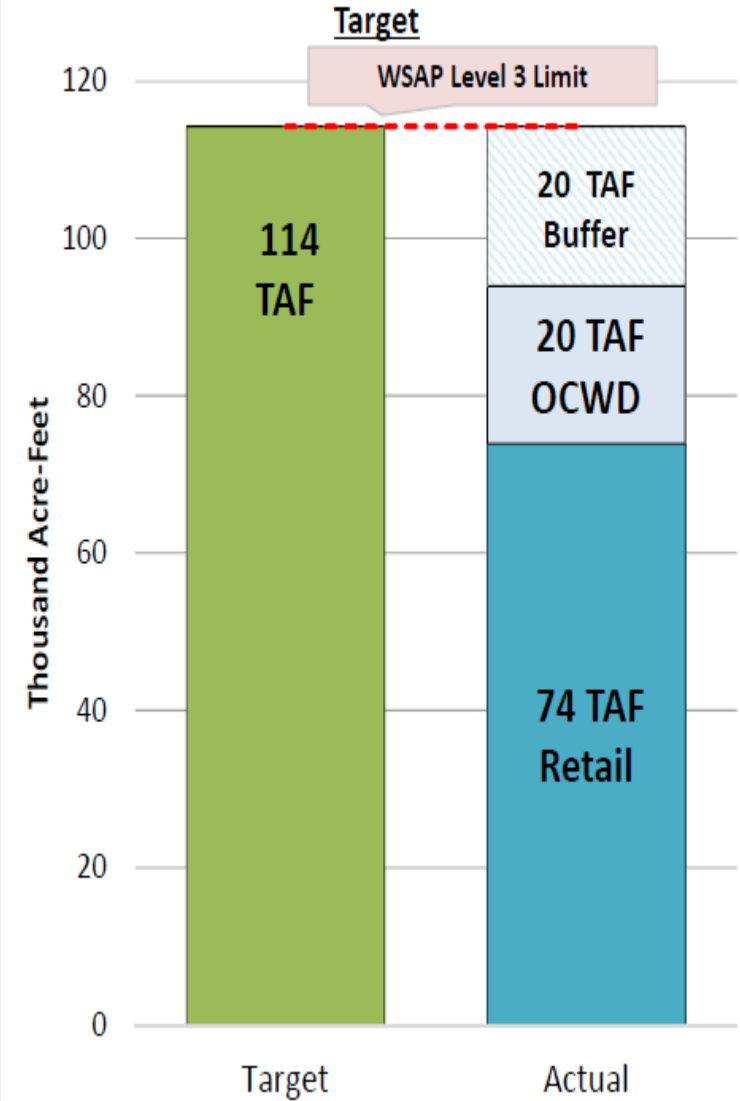


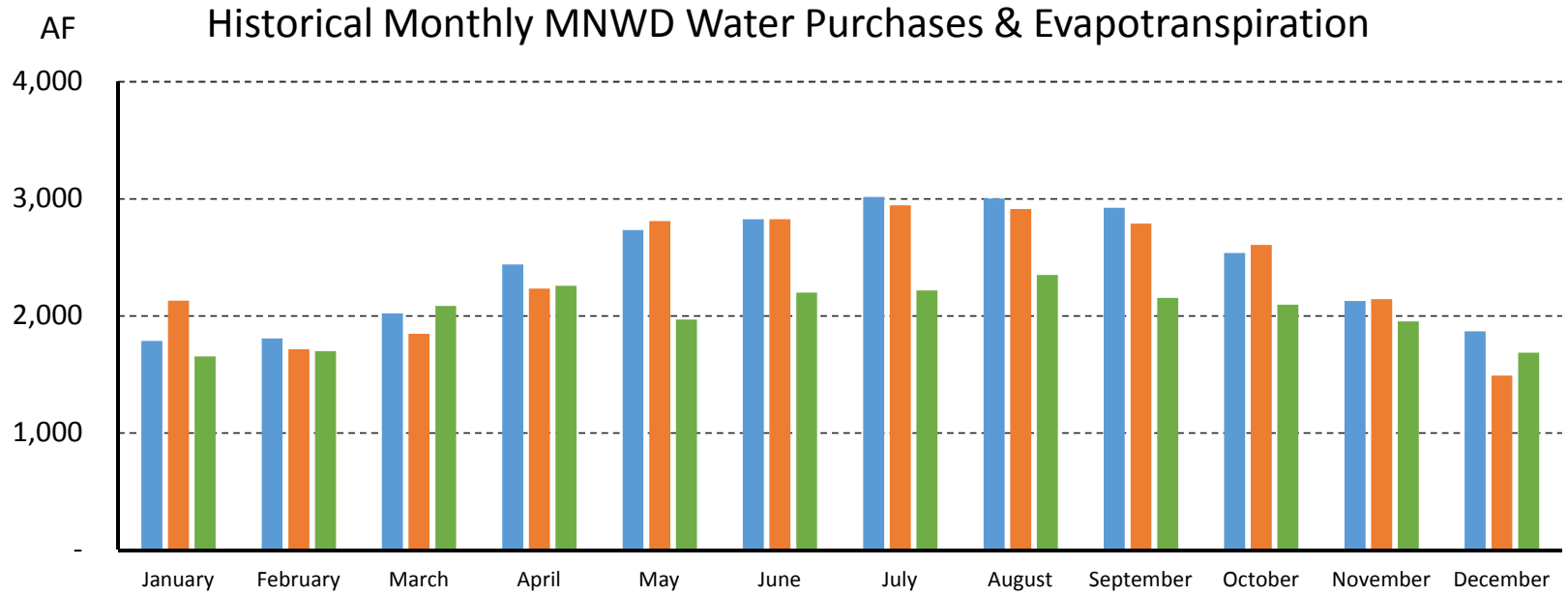
MWDOC's Stage III Allocated Water

Cumulative Imported Water Usage vs. Allocation Target



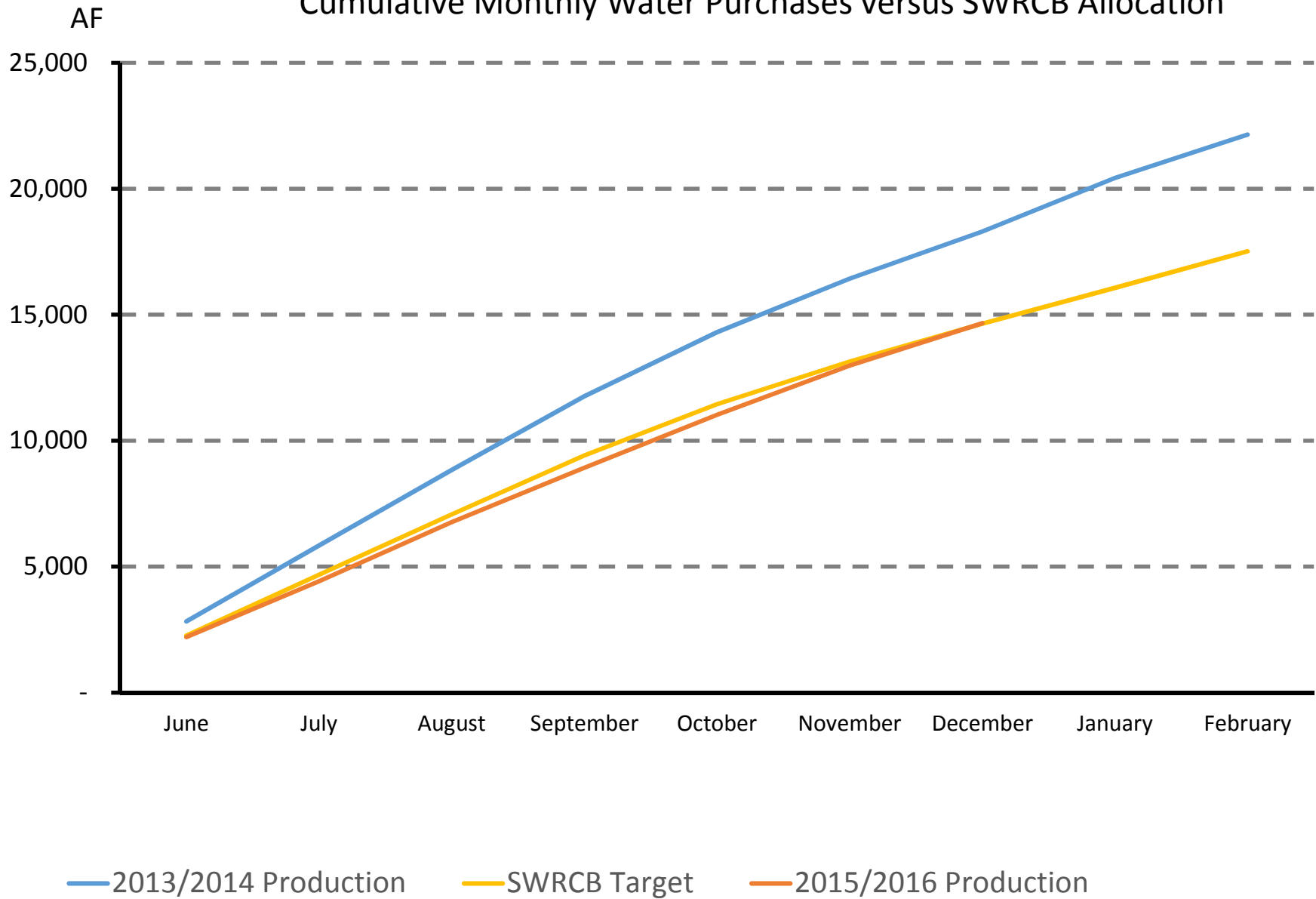
YTD Imported Water Usage Vs. Allocation





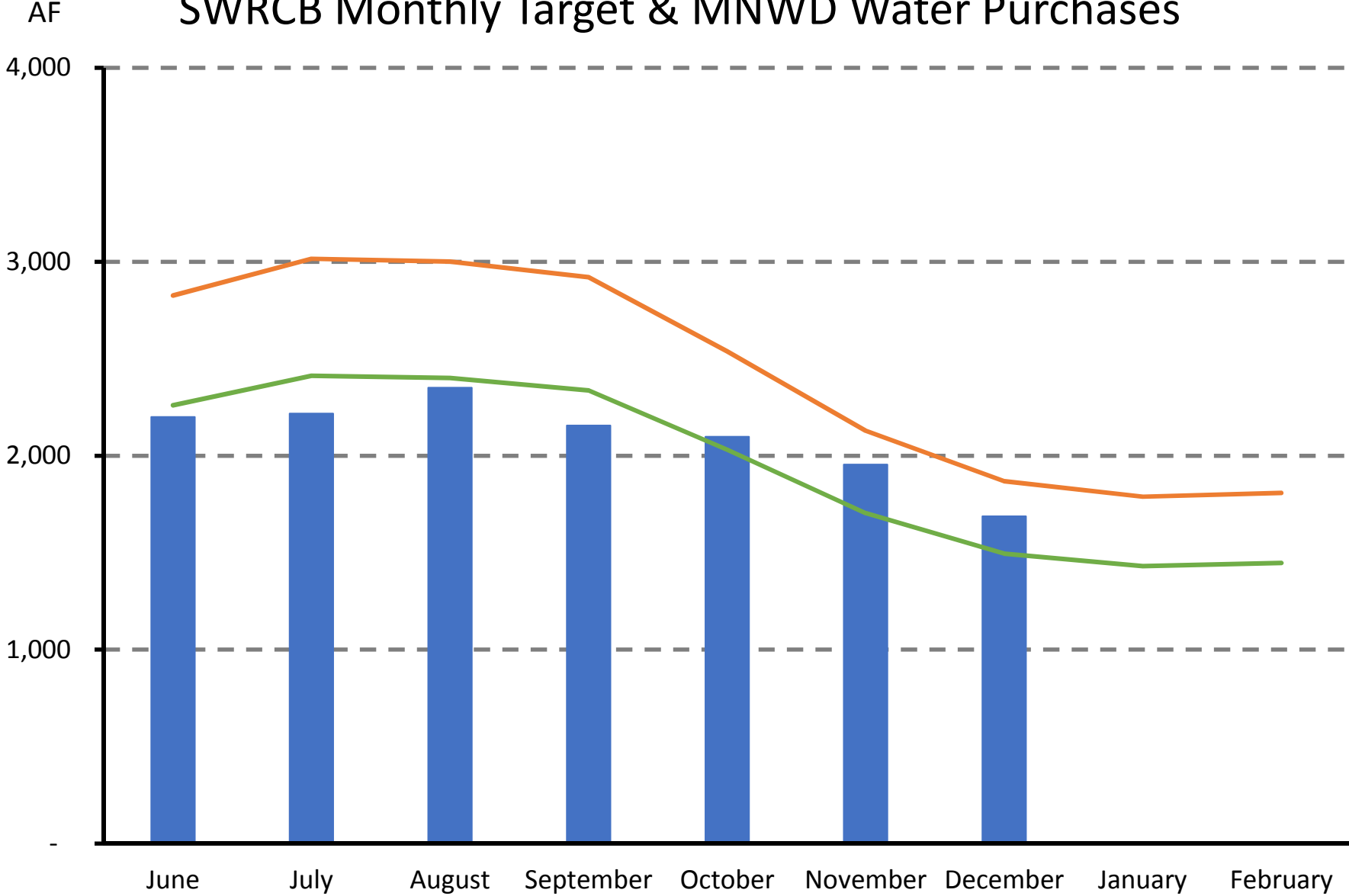
Year	ET (Inches)												
2013	2.54	2.88	4.08	4.79	5.99	6.07	5.81	6.53	5.26	3.92	2.52	2.49	
2014	2.82	2.64	4.09	5.54	6.39	6.45	6.54	6.23	5.21	3.94	3.16	1.91	
2015	2.52	3.02	4.96	5.31	4.48	5.75	5.69	6.27	5	3.88	3.24	2.35	

Cumulative Monthly Water Purchases versus SWRCB Allocation



January 20, 2016

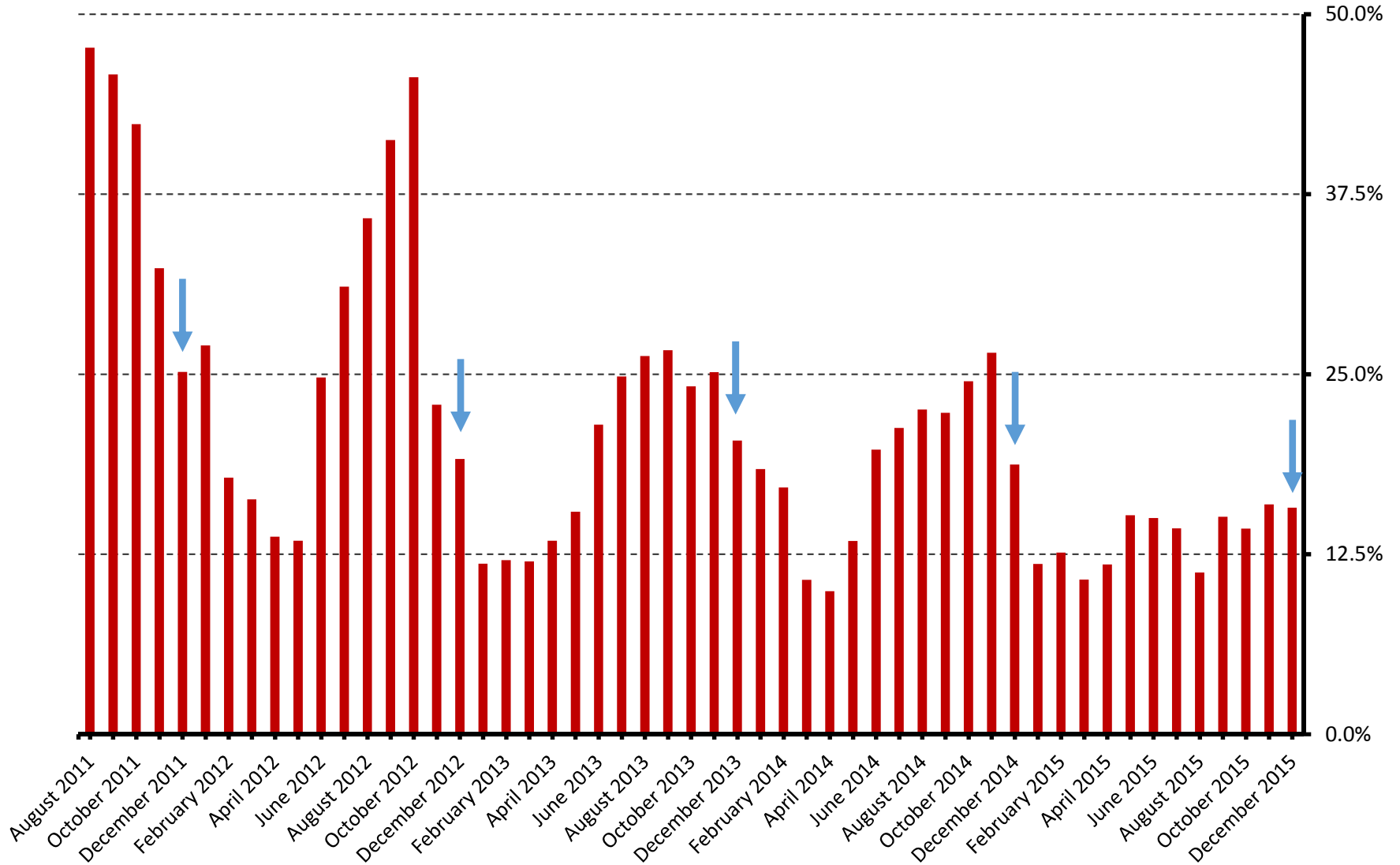
SWRCB Monthly Target & MNWD Water Purchases



■ 2015/2016 Production — 2013 Production — SWRCB Target

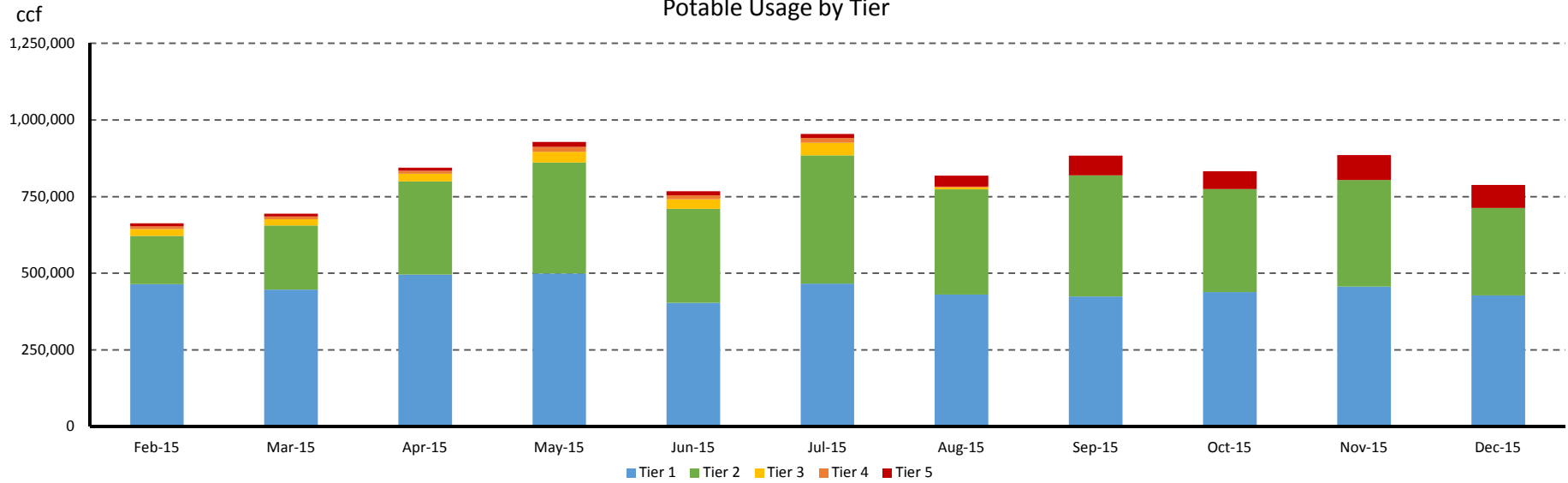
January 20, 2016

Single Family Residential Accounts Above Tier 2



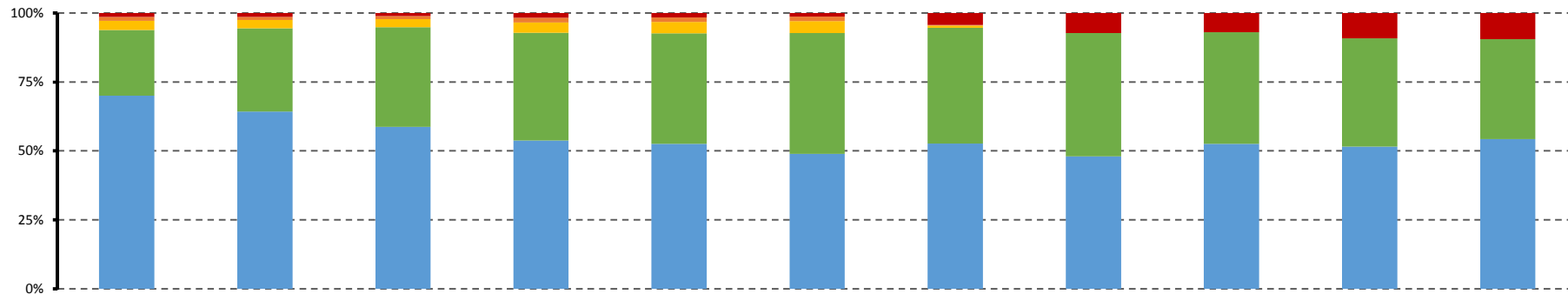
January 20, 2016

Potable Usage by Tier



AF in Tier 3, 4, 5	94	89	101	154	131	159	102	148	134	187	173
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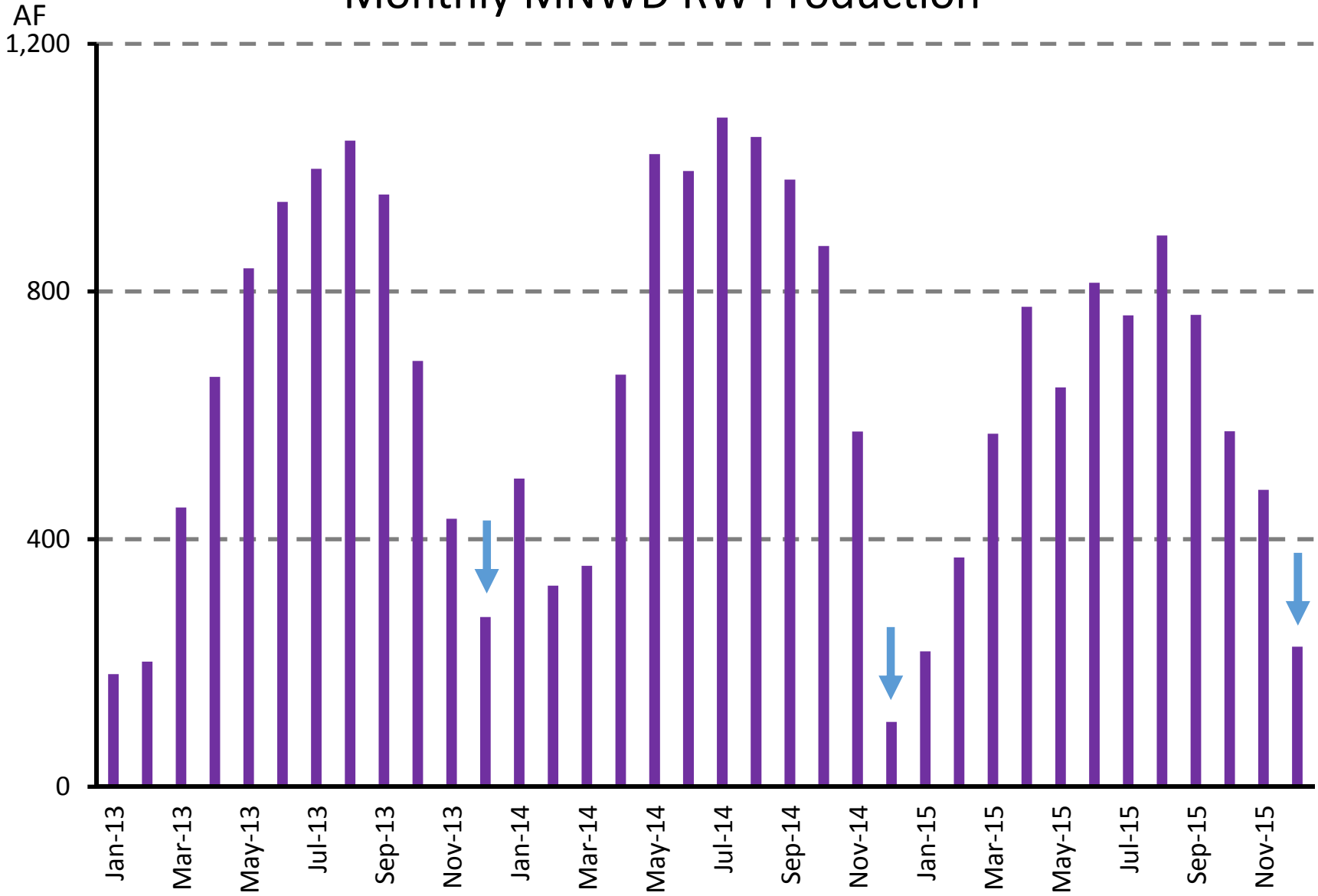
Percent Potable Usage by Tier



	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
Tier 5	1.5%	1.4%	1.1%	1.8%	1.6%	1.4%	4.3%	7.3%	7.0%	9.2%	9.6%
Tier 4	1.4%	1.2%	1.1%	1.7%	1.7%	1.6%	0.3%	0.0%	0.0%	0.0%	0.0%
Tier 3	3.3%	3.0%	3.0%	3.8%	4.1%	4.3%	0.8%	0.0%	0.0%	0.0%	0.0%
Tier 2	23.8%	30.1%	36.1%	39.0%	40.0%	43.8%	41.9%	44.7%	40.4%	39.2%	36.2%
Tier 1	70.0%	64.3%	58.7%	53.7%	52.6%	48.9%	52.6%	48.0%	52.6%	51.6%	54.3%

Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

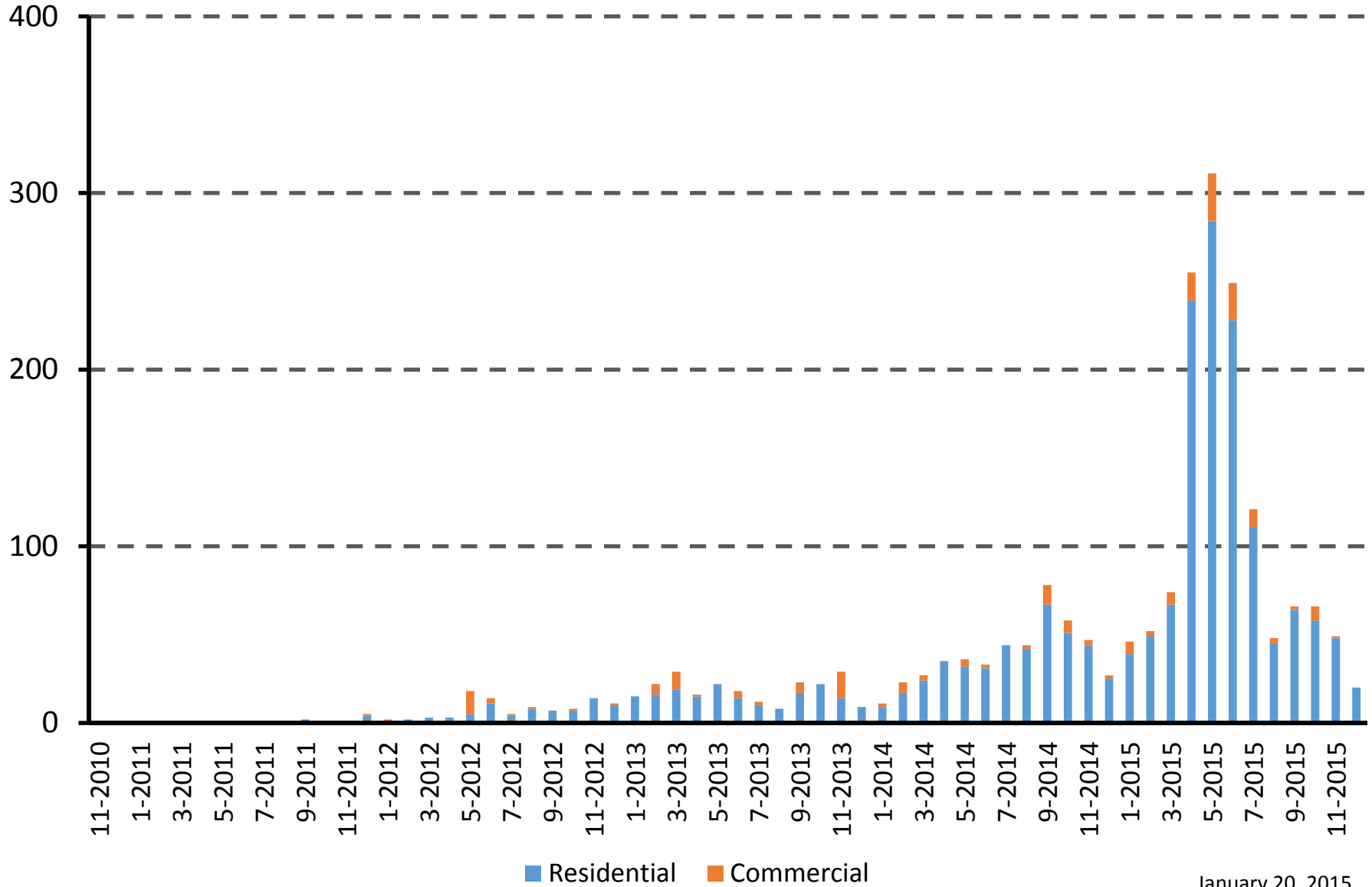
Monthly MNWD RW Production



January 20, 2016

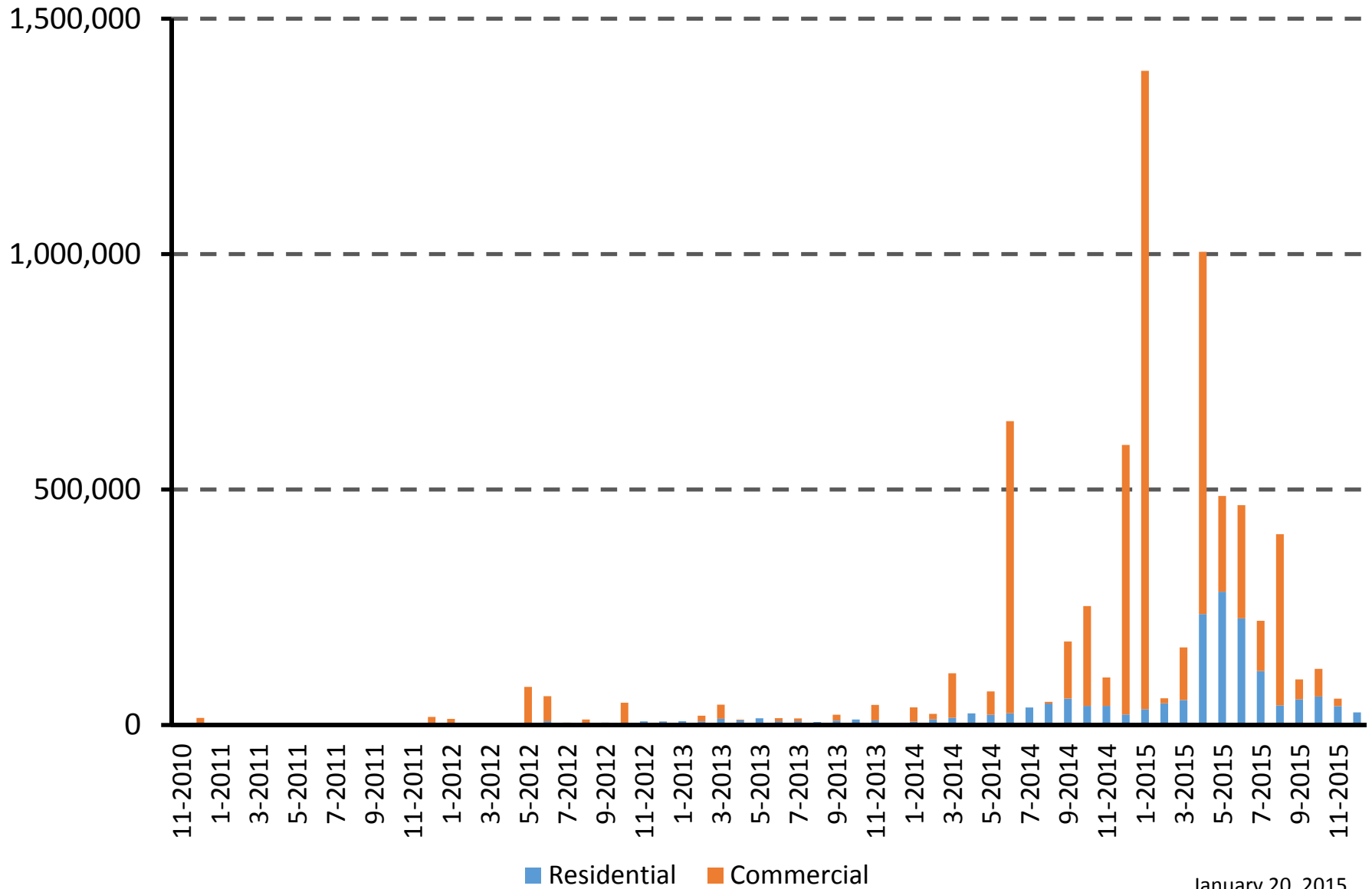
Total Turf Removal Applications by Month

Applications



January 20, 2015

Square Feet Total Turf Removal Application Size by Month





Moulton Niguel Water
Leading the Way in Service

DROUGHT EMERGENCY REGULATIONS UPDATE

Finance and Information Technology Board Meeting

January 20, 2016

HISTORICAL BACKGROUND

- January 2014: Governor calls for voluntary conservation
- July 2014: SWRCB issues mandatory restrictions
 - MNWD Alternative Plan Approval
- April 2015: Executive Order
- May 2015: SWRCB statewide mandatory conservation tiers
- November 2015: Governor extends “Drought state of emergency” through October 2016
- Through October: 27 % cumulative conservation statewide
 - MNWD: 23 % Cumulative (20% to date)



MNWD DROUGHT RESPONSE

- Budget Based Rate Structure
 - Strong pricing signal
 - Reduced budgets effective April 1, 2015
 - Stable financial position
- Water Shortage Contingency Plan (WSCP)
 - Stage 1: June 1, 2015
 - Stage 2: July 1, 2015
 - Stage 2 Extended: November 1, 2015
- Increased Conservation programs
- Engineering/Operations Programs
 - Expand recycled water program
 - Leak detection program
 - Advanced Meter Infrastructure (AMI) program
 - Bi-monthly to monthly billing conversion
- Customer Communications
 - Postcards
 - Bill Messages
 - Summer Newsletter
 - Press Releases
 - Newspaper Ads

PROJECTED TIMELINE

- Jan. 21: Proposed SWRCB drought regulation extension released
 - SWRCB Extension of Conservation Tiers w/ the following adjustments
 - Climate
 - Growth
 - Sustainable Supplies
- Early February 2016: SWRCB approves regulation extension
- April/May 2016: modified based on state hydrology
- October 2016: proposed drought regulation extension expires

RECOMMENDATION

- Continue Implementation of WSCP Stage 2 effective March 1, 2016
 - Customers pay penalty for exceeding budget
- Expires at the end of June 2016
 - Staff to actively monitor changing hydrology and future SWRCB adjustments.