



Board of Directors

Brian Brennan, Director
Pete Kaiser, Director

Neil Cole, Director
Richard Hajas, Director

CASITAS MUNICIPAL WATER DISTRICT Meeting to be held at the

The meeting will be held via teleconference.
To attend the meeting please call
(888) 788-0099 or (877) 853-5247 US Toll Free
Enter Meeting ID: 981 5243 6958#
Passcode: 620226#

SPECIAL MEETING
April 21, 2021 @ 5:00 PM

Right to be heard: Members of the public have a right to address the Board directly on any item of interest to the public which is within the subject matter jurisdiction of the Board. The request to be heard should be made immediately before the Board's consideration of the item. No action shall be taken on any item not appearing on the agenda unless the action is otherwise authorized by subdivision (b) of §54954.2 of the Government Code and except that members of a legislative body or its staff may briefly respond to statements made or questions posed by persons exercising their public testimony rights under section 54954.3 of the Government Code.

1. CALL TO ORDER
2. ROLL CALL
3. PUBLIC COMMENTS - Presentation on District related items that are not on the agenda - three minute limit.
4. ACTION ITEM
 - 4.a. Discussion and Possible Action on the Draft Casitas MWD Comprehensive Water Resources Plan.
[Memo_Board_CWRP_Apr21-2021_2.pdf](#)
[ATT1_Board_CWRP_Apr21-2021.pdf](#)

5. ADJOURNMENT

**CASITAS MUNICIPAL WATER DISTRICT
MEMORANDUM**

TO: BOARD OF DIRECTORS
FROM: MICHAEL FLOOD, GENERAL MANAGER
SUBJECT: DISCUSSION OF COMPREHENSIVE WATER RESOURCES PLAN
DATE: 04/21/21

RECOMMENDATION:

The Board of Directors review demand and supply analyses related to the Comprehensive Water Resources Plan, and direct staff on planning policies related to safety factors.

BACKGROUND:

The Board of Directors authorized a consulting services agreement with Stantec in January 2019 to prepare the Comprehensive Water Resources Plan (CWRP). An overview of the draft CWRP was presented at a Board Workshop held on February 8, 2020, and the draft CWRP report was released for public review from June 26, 2020 through August 24, 2020. Several public comments were received on the draft CWRP report, which were provided to the Board of Directors on September 23, 2020 and December 9, 2020. The full draft CWRP report is found on the District's website: <https://www.casitaswater.org/your-water/casitas-water-security>.

On December 9, 2020, the Board of Directors discussed the need for additional Board meetings to discuss the goals of the Comprehensive Water Resources Plan. The Board has continued to meet and discuss the CWRP at subsequent meetings held on December 16, 2020; December 23, 2020; January 15, 2021, February 17, 2021, and February 26, 2021.

At the January 15, 2021 meeting, the Board directed staff to revise the hydrologic modeling assumptions used to estimate the future Lake Casitas operational yield as follows, and prepare a demand and supply analysis for further discussion.

Revised hydrologic modeling assumptions for future Lake Casitas Yield:

- Safe Yield approach that models the largest yield that can be withdrawn from the lake in every year without dropping below the minimum allowable storage level
- Historical hydrologic period from 1945-2018
- Minimum Allowable Storage of 950 AF, which is the dead pool elevation at which water can no longer flow by gravity to the water treatment plant
- Robles Diversion Efficiency of 70%
- Initial Lake Volume of 237,761 AF (full reservoir)
- Use demand assumption of 16,000 AFY for the Casitas System
- Provide safety factors to account for future uncertainty

On February 17, 2021, the District held a Special Board Meeting to review the various aspects of the probabilistic analysis in the draft plan. On February 26, 2021, the Board directed staff to return with additional information related to safety factors and related levels in Lake Casitas.

DISCUSSION:

Future Long-term Demand Analysis:

The following is a summary of historical demands, planned future demands, and additional considerations related to uncertainty in future demands.

Historical Demands

A summary of actual water produced from Lake Casitas for customer demands and system losses is presented in Table 1, based on 5-year periods going back to 2006. In addition, historical water demands by customer class are shown in Attachment 1. Casitas implements managed demand reductions as lake levels decline according with the Water Efficiency Allocation Plan (WEAP), and the effect of this type of demand management during droughts is apparent during the post-1989 and post-2016 periods.

**Table 1. Water Produced from Lake Casitas
 At Marion Walker Water Treatment Plant¹**

	2006-2010	2011-2015	2016-2020
5-Year Average	17,760	17,509	11,296
Annual Minimum	14,637	14,841	7,668
Annual Maximum	21,326	20,402	14,151
¹ Data reported by Calendar Year. All units are Acre-Feet per Year.			

Demands from Agricultural and Resale customers together make up the majority of Casitas' customer demands, representing 84% of total average demands from 2006-2015 and 73% from 2016-2020. Annual demands from these customers can vary significantly from year to year. Unconstrained demands for water typically increase during dry periods and decrease during wet periods. However, both of these customer classes have demonstrated lower water use from Casitas in response to the recent drought (refer to Attachment 1) and the District's associated demand management measures through the WEAP, including a \$5.00/HCF¹ Conservation Penalty in 2016 which currently remains in place.

Planned Demands

The Draft CWRP is based on a future average non-drought demand of 16,000 AFY for the Casitas System (which includes approximately 525 AFY added to the Ojai system), and a future average non-drought demand of 2,350 AFY for the Ojai system, for a total combined demand of 17,825 AFY (16,000 – 525 + 2350 = 17,825). These demands represent the amount of water produced

¹ Hundred Cubic Feet

to meet both customer uses and losses in the water delivery systems. Additional information can be found in Sections 3 and Appendix C of the Draft CWRP report.

The Draft CWRP planned demands are approximately 10% less than previously planned² long-term demands of 17,500 AFY for the Casitas system and 2,570 AFY for the Ojai system to reflect that the recent drought will likely result in some permanent changes in customer water use in the long-term. Water demands typically rebound after drought periods, but do not fully return to pre-drought levels due material changes such as replacement of landscaping, irrigation systems, and appliances with more water-efficient devices. A comparison of Draft CWRP planned demands and previous UWMP planning demands is presented in Attachment 1 (Table 3). For purposes of this analysis, the distribution of demand by customer class is assumed to be consistent with previous planning reports.

Additional Considerations related to Agricultural and Resale Demands

Agricultural and Resale customers rely on groundwater as a primary supply, and use Lake Casitas water as a backup. There are several processes currently underway related to groundwater pumping, including the Sustainable Groundwater Management Act, the City of Ventura's groundwater adjudication lawsuit, and the State of California's Ventura River Instream Flow Study. The outcome of these processes is currently unknown, and all have the potential to limit the availability of groundwater during certain periods; which could increase demands on Lake Casitas. Until more information is known regarding future groundwater availability, there is some uncertainty in long-term future demands on Lake Casitas.

Planning for Demand Uncertainty

The Draft CWRP assumes a future planned demand of 16,000 AFY for the Casitas System, and a planned demand of 17,825 AFY for the entire District service area including the Ojai System. The following is a summary of considerations related to future demand uncertainty:

- Planned demand on the Casitas System is less than the historical average demands prior to implementation of the WEAP (2006-2015).
- Planned demand is lower than previous UWMP planning demands, since it assumes demands will rebound but not fully return to pre-drought levels.
- Future groundwater supplies may be less than were available historically, and there is a potential for increased reliance on Casitas (particularly from Resale and Agricultural customers).

However, current water demands on the Casitas System are less than 16,000 AFY and it could take several years before average demands increase to that level. The Board may want to consider keeping planned demands down through demand management given the constraints on existing supplies. The average demands on the Casitas System over the last 10 years from 2011-2020 was approximately 14,525 AFY³ (including losses), which includes periods before and after the WEAP was implemented. In any case, it is recommended that the Board incorporate future

² Urban Water Management Plans (UWMPs) for Casitas and Ojai systems

³ Based on Lake Casitas releases to Marion Walker water treatment plant and one groundwater well in production.

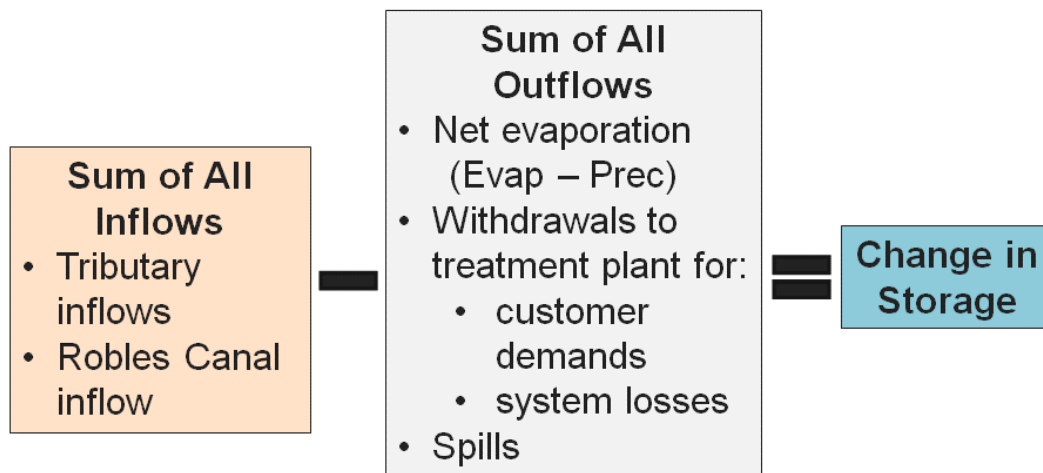
demand uncertainty into an adaptive management strategy. Demands will be tracked over time, and once more information is known regarding future groundwater availability, then additional adaptive management measures could be taken (such as increased demand management or alternative supply development).

Future Long-Term Supply Analysis:

The water supply availability from Lake Casitas was previously studied by the United States Bureau of Reclamation in the 1954 evaluation of the Ventura River Project, and later by the District in the 1989 and 2004. In the most recent study (2004), the Lake Casitas safe yield was estimated to be 20,540 AFY (assuming potential impacts of the 2003 Robles Biological Opinion operating criteria and the removal of Matilija Dam).

The Lake Casitas yield model is a mass-balance model that tracks Lake Casitas inflows, outflows (including evaporation) and change in storage to simulate operations over a time series of assumed hydrology conditions (refer to Figure 1). The previous Lake Casitas yield analyses used historical hydrology in the simulations. That includes historical data for direct inflows to Lake Casitas from tributaries, flows in the Ventura River on which diversions at the Robles Diversion Structure were based, and net evaporation from the Lake.

Figure 1. Mass Balance Model in Excel for Estimating Lake Casitas Yield



As part of the CWRP, the yield model was updated to include the following improvements.

Current Yield Model Updates and Improvements

- Extended hydrologic period of record of 1945-2018 (from previous of 1945-1999)
- Incorporated results of recent Lake Casitas bathymetric survey – reduced maximum storage capacity from 254,000 AF to 237,761 AF
- Added function to compute reservoir spills

- Incorporated Robles Diversion operations based on 2003 Biological Opinion requirements and 2018 Critical Drought Protection Measures
- Reduced modeled Robles diversions based on a diversion efficiency of 70 percent, consistent with operational data since the Fish Passage Facility was constructed
- Improved method of calculating monthly net evaporation loss

The Draft CWRP analyses incorporated future hydrologic variability by generating 100 synthetic hydrologic datasets (or 100 traces) derived from the historical dataset from 1945-2018 and having the same basic statistics, providing a probabilistic analysis of supply reliability. However, the same model can be used to evaluate Lake Casitas Yield based on the historic hydrologic dataset (or a single trace).

The planned Lake Casitas yield is dependent on various policy assumptions and criteria, such as assumed hydrologic assumptions (probabilistic versus historic), minimum allowable storage, and future withdrawals to meet demands, and others. In regard to withdrawals for demands, the model is programmed to evaluate both a “safe yield” approach with constant withdrawals every year, as well as a “safe demand” approach that incorporates demand reductions as lake levels decline according with the District’s Water Efficiency and Allocation Program.

Policy Assumptions and Criteria related to Yield Modeling

On January 15, 2021, the Board directed staff to use the modeling and policy assumptions as follows, which results in a Lake Casitas safe yield of 18,420 AFY. These policies are revised from the Draft CWRP, and resulted in a higher Lake Casitas yield than reported in the Draft CWRP.

- Safe Yield approach that models the largest yield that can be withdrawn from the lake in every year without dropping below the minimum allowable storage level
- Historical hydrologic period from 1945-2018
- Minimum Allowable Storage of 950 AF, which is the dead pool elevation at which water can no longer flow by gravity to the water treatment plant
- Robles Diversion Efficiency of 70%
- Initial Lake Volume of 237,761 AF (full reservoir)

In addition, the Board directed staff to provide considerations for a safety factor for future hydrologic uncertainty.

Supply Safety Factor

The revised modeling and policy assumptions are based on historical hydrology. However, historical hydrology cannot be expected to repeat itself, and hydrologic variability from year to year is significant (refer to Attachment 1, Figure 3). Future droughts could be more severe than the droughts in the 1945-2018 historical record. Because the Casitas System is dependent on surface water for its water supply, its exposure to risk from future changes in regional climate and hydrology is significant. A safety factor is intended to account for uncertainty of future supply availability.

On February 26, 2021, the California Department of Fish and Wildlife (CDFW) released Draft Instream Flow Recommendations for the Lower Ventura River and Coyote Creek. The CDFW flow recommendations are expected to be considered in a groundwater-surface water model currently under development by the State Water Resources Control Board (SWRCB) which will evaluate groundwater pumping and surface diversions and their impact on instream flows. The SWRCB modeling study is anticipated to be released in late 2021 or early 2022. Based on preliminary analysis of the CDFW Instream Flow Recommendations, the potential supply impacts would exceed the supply safety factors considered herein. Therefore, this analysis will need to be revisited once more information is known regarding the SWRCB modeling study.

Future Long-Term Demand and Supply Scenarios:

Table 2 presents a summary of potential future demands and existing supplies. Two demand levels on the Casitas System are presented ranging between 14,525 AFY and 16,000 based on the last 10 years of production data and the Draft CWRP, respectively.

The projected existing supplies reflect the revised Lake Casitas modeling and policy assumptions, with varying levels of supply safety factors (ranging between 0-20 percent). All scenarios assume a 4% reduction in supply reflecting a climate change adjustment consistent with the Draft CWRP assumptions. The projected existing supply for the Casitas System ranges between 14,080 AFY and 17,800 AFY depending on the level of safety factor.

Ojai System

Casitas acquired the Ojai System from Golden State Water Company in June 2017. The Ojai System receives water from Ojai Basin groundwater and two interconnects supplying water from the Casitas System. Approximately 525 AFY of the planned demands on the Casitas System are for deliveries to the Ojai System. The 2017 acquisition included several groundwater wells, with some wells over 45 years old and in need of rehabilitation and replacement. The wells acquired by GSWC were unable to produce their original design capacity of 4,404 AFY and average Ojai wellfield production from 1994-2016 was about 1,800 AFY. Casitas has made progress in improving the condition of the wells, although work is still underway and not yet completed. The well improvements are anticipated to provide an average production of 2,300 AFY.

Request for Board Direction to Staff:

Staff is requesting policy direction on the planned demands and safety factors, which affect the gap analysis and planned projects.

**Table 2. Future Demand and Supply Comparison,
 With Various Demand and Safety Factor Scenarios**

All units in AFY unless noted otherwise.

Casitas System

FUTURE DEMAND					
Draft CWRP:	16,000	16,000	16,000	16,000	16,000
Average Last 10 Years (2011-2020):	14,525	14,525	14,525	14,525	14,525
PROJECTED EXISTING SUPPLY					
Modeled Lake Casitas Safe Yield:	18,420	18,420	18,420	18,420	18,420
Planned Groundwater Well Yield:	180	180	180	180	180
Supply Safety Factor:	0%	-5%	-10%	-15%	-20%
Climate Change Adjustment:	-4.3%	-4.3%	-4.3%	-4.3%	-4.3%
Projected Supply:	17,800	16,870	15,940	15,010	14,080

Ojai System

FUTURE DEMAND	
Planned Average Demand:	2,350
PROJECTED EXISTING SUPPLY	
Planned Casitas System Yield ¹ :	525
Ojai Well Yield ² :	1,800
Projected Supply:	2,325

Notes

¹ May be reduced depending on planned demand and supplies on the Casitas System.

² Does not reflect work underway to improve condition and production rates of Ojai Wells.

ATTACHMENTS:

Attachment 1:

- Figure 1. Historic Water Use by Customer Class (Line Chart)
- Figure 2. Historic Water Use by Customer Class (Area Chart)
- Figure 3. Historical Lake Levels, Inflow, and Drought Periods
- Table 1. Summary of Water Use from 2006-2020 (Casitas and Ojai Systems)
- Table 2. Summary of Water Use from 2016-2020 (Casitas System Only)
- Table 3. Comparison of Planning Demands

Figure 1. Historic Water Use by Customer Class (Line Chart)

All data is by Fiscal Year.

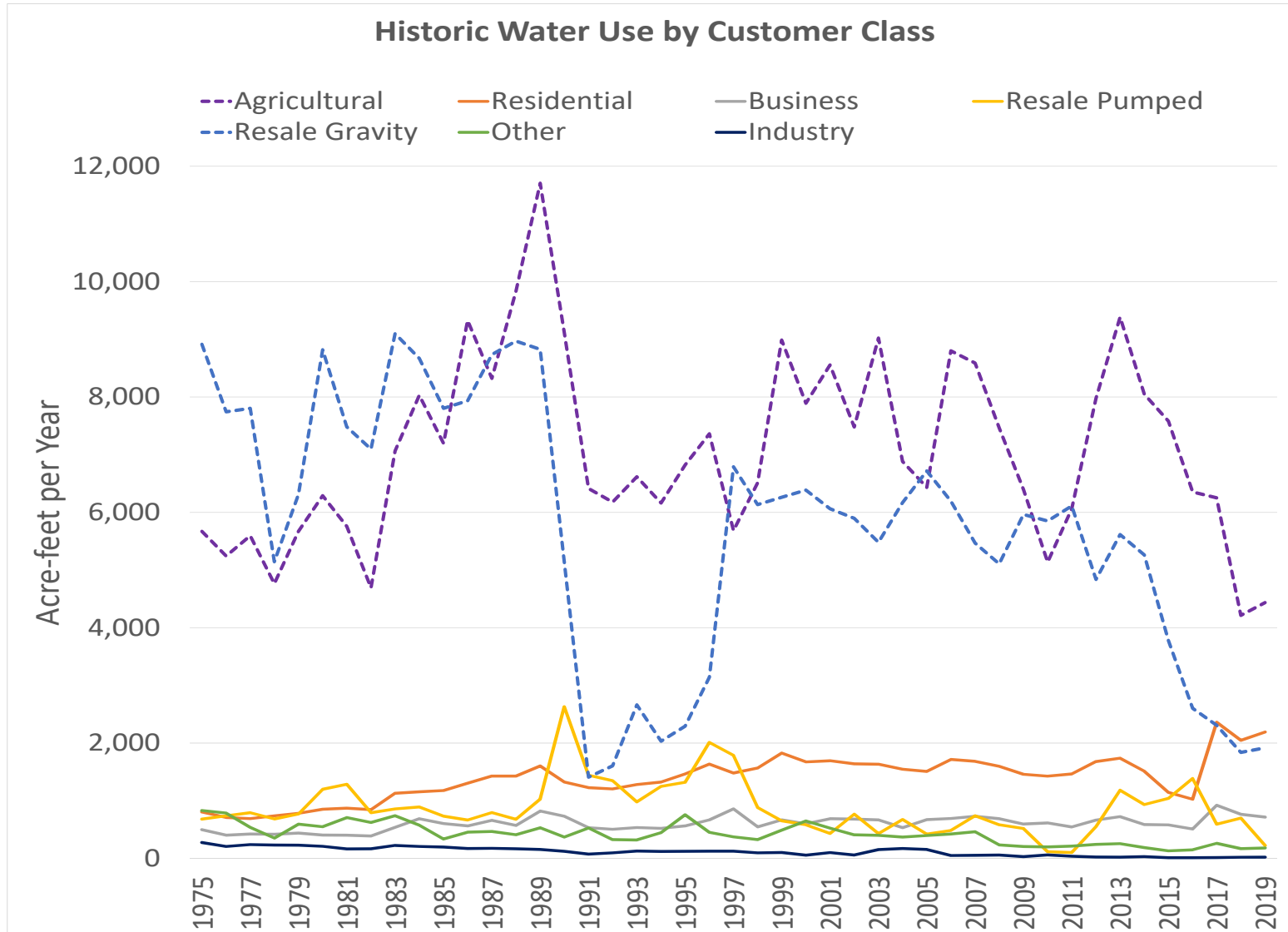


Figure 2. Historic Water Use by Customer Class (Area Chart)

All data is by Fiscal Year.

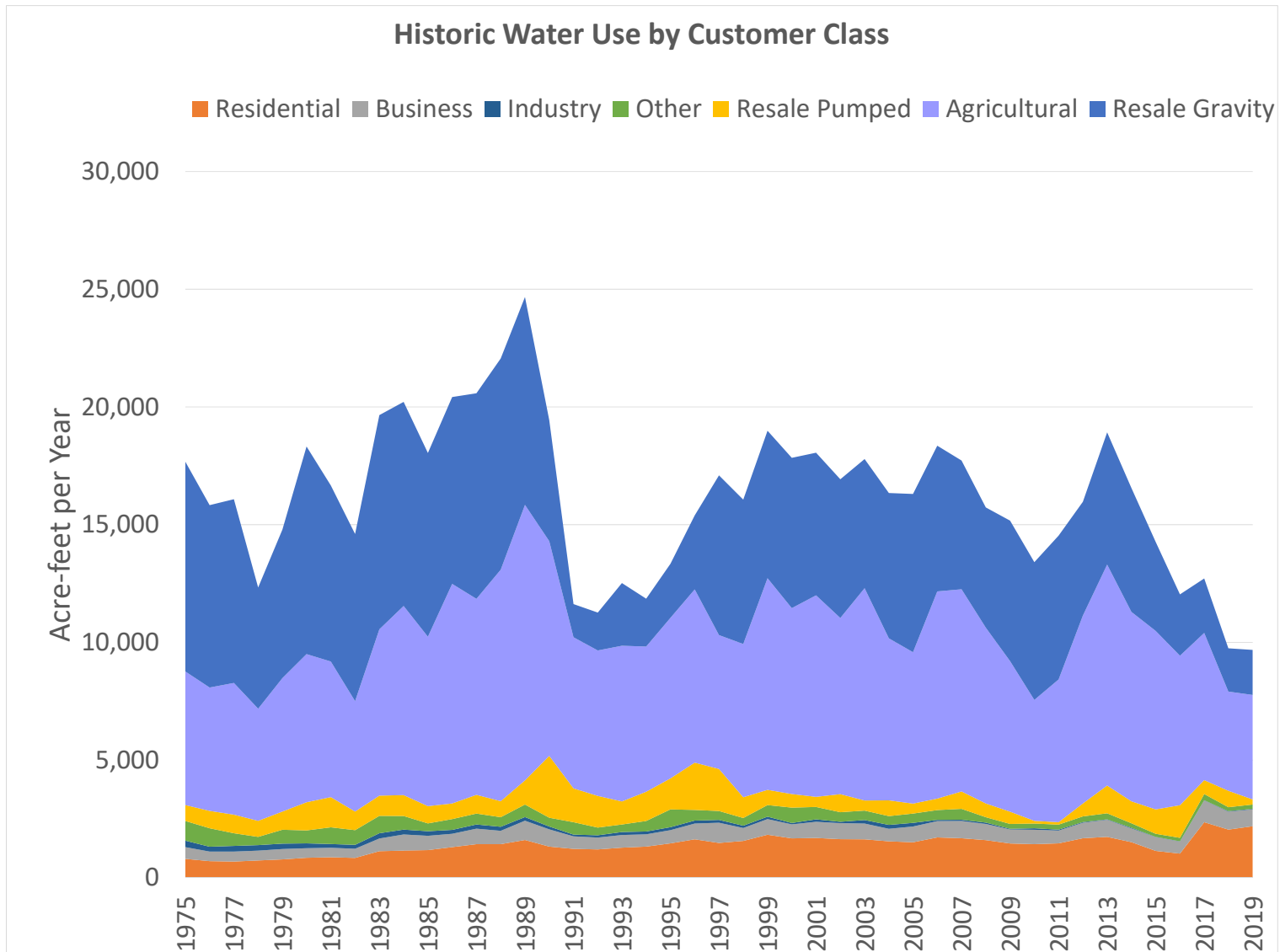


Table 1. Summary of Water Use from 2006-2020 (Casitas and Ojai Systems) ^{1,2}

	2006-2015			2016-2020 ³		
	Min	Max	Average	Min	Max	Average
Retail	2,135	3,064	2,623	1,900	3,531	3,109
Retail Agriculture	4,800	8,857	7,290	3,767	6,961	5,464
Resale	4,927	8,150	6,355	1,627	3,969	3,019
TOTAL	13,474	19,859	16,268	8,479	12,830	11,592

¹ Represents metered customer demands (does not include system losses).
² Data reported by calendar year. All units in Acre-Feet per Year.
³ The Ojai Water System was acquired in 2017, which increased Retail demands by approximately 1,570 AFY and reduced Resale demands by about 300 AFY on average from 2017-2020. Ojai demands are served by the Casitas System and Ojai Basin groundwater wells.

Table 2. Summary of Water Use from 2016-2020 (Casitas System Only) ^{1,2}

	2016	2017	2018	2019	2020	Average
Retail	1,900	1,990	1,962	1,668	2,006	1,905
Retail Agriculture	6,961	6,337	4,945	3,701	5,116	5,412
Resale	3,969	2,769	3,632	1,627	3,095	3,019
Ojai Interconnects	664	193	411	67	369	341
Total	13,494	11,288	10,950	7,063	10,586	10,676

¹ Represents metered customer demands (does not include system losses).
² Data reported by calendar year. All units in Acre-Feet per Year.

Table 3. Comparison of Planning Demands

Casitas System Demand Category	Planned Future Demand		
	2015 UWMP ¹ (2040 Projections)	Draft CWRP ^{2,3} (2040 Projections)	Percent Reduction in Planned Demand
Retail	2,889	2,628	9%
Retail – Agricultural	7,705	7,009	9%
Resale	6,260	5,695	9%
Subtotal	16,855	15,332	9%
Water Loss	645	668 ⁴	-4%
Total Water Demand	17,500	16,000	9%
<p>Notes All data is reported in AFY except where noted otherwise. ¹ The 2015 UWMP demand/supply comparisons are based on 17,500 AFY, and did not include estimated water loss. Demands by water use category have been adjusted accordingly. ² Draft CWRP demand projections include 525 AFY for the Ojai system. ³ Estimated future water use by customer class is assumed to be the same distribution as 2015 UWMP projections. ⁴ Based on average water loss in 2018 and 2019. Assumes water loss is proportional to pipe length between Casitas and Ojai systems.</p>			

Ojai System Demand Category	GSWC 2010 UWMP (2035 Projections)	Draft CWRP ¹ (2040 Projections)	Percent Reduction in Planned Demand
Retail	NA	2,093	NA
Water Loss	NA	257 ²	NA
Total Water Demand	2,570	2,350	8%
<p>Notes: ¹ The Draft CWRP assumes 525 AFY of Ojai System demands would be met by the Casitas system. ² Based on average water loss in 2018 and 2019. Assumes water loss is proportional to pipe length between Casitas and Ojai systems.</p>			

Figure 3. Historical Lake Levels, Inflow, and Drought Periods

