Drought Status & Water Supply Update

Quarterly Report
January 2016

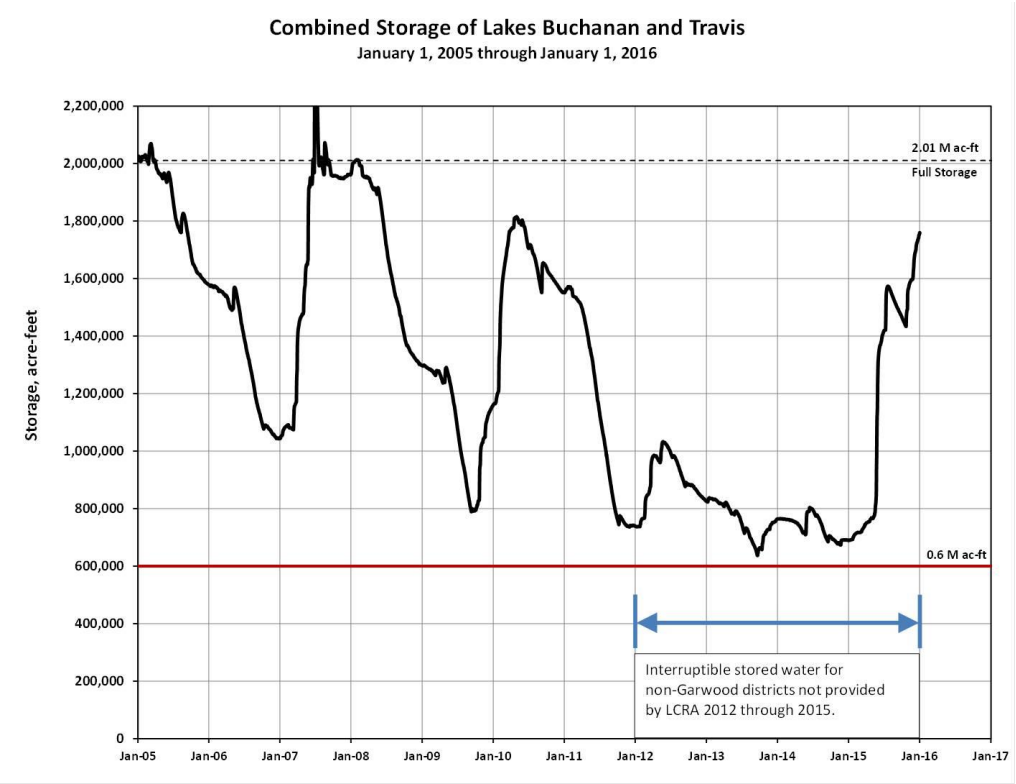


Figure 1

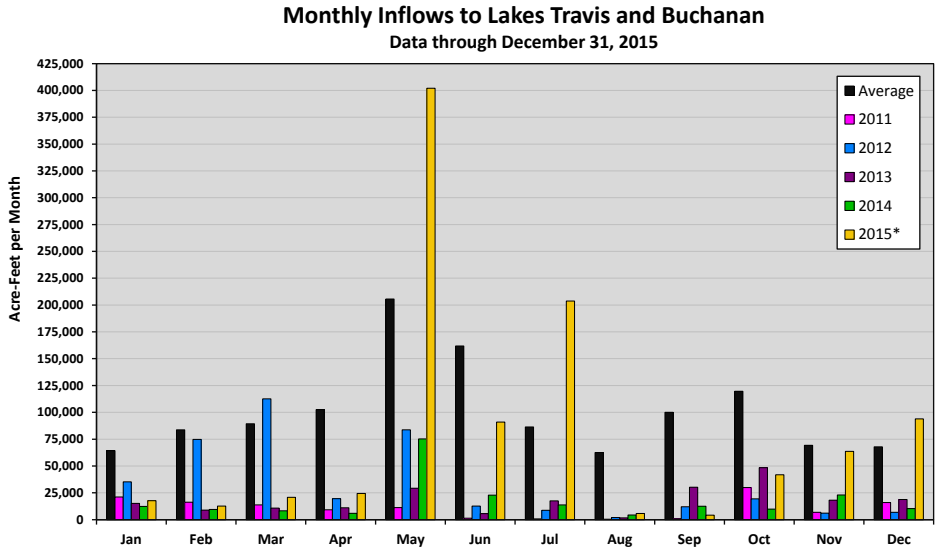
Drought Status and Water Supply Report:

Despite recent rains, in terms of reservoir storage and cumulative inflows over the last several years, as described herein, the Colorado River Basin remains in a historic drought that continues to strain water resources. The region's water supply reservoirs benefited from significant rain events in the Spring and Fall of 2015, but reservoir storage has not fully recovered. The following "Drought Status and Water Supply Report" is updated on a quarterly basis to provide information on the Basin's ongoing drought as well as Austin Water's drought management efforts.

Inflows to Lakes Travis and Buchanan:

Inflow of total water volume to Lakes Travis and Buchanan is a key measure of the drought's intensity, and during the current drought, these inflows have been dramatically low. Strong storm events in May and Fall 2015 brought significant inflow into the lakes; however, cumulative inflows since the drought began remain much lower than inflows during the region's 1950's drought, which had long stood as the drought intensity benchmark prior to the current drought.

The inflow volumes for October, November, and December 2015 are 41,869, 63,554, and 93,862 acre feet (AF), respectively, according to provisional United States Geological Survey (USGS) data. For reference, one acre foot is approximately 325,851 gallons and is defined as a volume covering one acre in area and one foot in depth. As indicated in Figure 2, the annual inflow for 2015 of 981,107 AF is still below the average annual inflow of 1,145,133 AF over the period of record. The monthly inflows from January 2011 through December 2015 are shown in Figure 2.



Calendar Year Totals, ac-ft	
Average:	1,213,098
2011:	127,802
2012:	393,163
2013:	215,138
2014:	207,626
2015:	981,107

Monthly averages correspond to the historical period of record, 1942 through present.

*Inflow data for 2015 are preliminary and subject to revision.

Figure 2

Annual inflows since the start of the current drought in 2008 are exceptionally low. The top-five lowest annual inflows in the period of record have occurred since 2006. These annual inflows are each considerably less than the lowest annual inflow during the 1950's drought of record (501,926 AF in 1950). Additionally, annual inflow in 2011 was only 10% of the average annual inflow since Lakes Travis and Buchanan were built in the early 1940's. Table 1 displays the lowest annual inflows on record, with years representing the current drought (which began in 2008) highlighted in blue. These current drought inflows make up six of the top ten lowest annual values.

Top 10 Lowest Years of Inflows

Rank	Year	Annual Total in Acre-Feet
1	2011	127,802
2	2014	207,579
3	2013	215,138
4	2008	284,462
5	2006	285,229
6	1963	392,589
7	2012	393,163
8	1983	433,312
9	1999	448,162
10	2009	499,732
Average Annual Total	1942 to 2014	1,216,274

Table 1

Figure 2 and Table 1 display "historical inflows" based on flows measured at four stream gages in drainage areas upstream of Lakes Travis and Buchanan. Inflow to these four gages is used to estimate inflow into the lakes and this inflow is also adjusted to account for ungaged runoff area into the lakes. New reservoirs have been built upstream of Lake Buchanan since the 1950's, including the O.H. Ivie reservoir, which began impounding water in 1990. Only inflows downstream of the Lake O.H. Ivie reservoir contribute to the combined storage for Lakes Travis and Buchanan. In addition to the above table that ranks the lowest "historical inflows", another useful comparison of understanding the magnitude of the current drought is to compare the cumulative "historical inflows" of the current drought to the cumulative inflow of the 1950's drought. For this cumulative inflow comparison, models are used to adjust historical inflows from the 1950s drought to approximate inflows as if the new upstream reservoirs had existed in the 1950's drought. These model adjusted inflows are referred to as "reference inflows".

Figure 3, shown below, compares the cumulative historical inflow into lakes Travis and Buchanan since the beginning of the current drought in March 2008 to the cumulative "reference inflows" during the 1950's drought of record. In this comparison, the current cumulative volume is approximately 1.125 million AF below the cumulative inflow through the same number of months during the drought of record. While storm events in May and Fall 2015 reduced the cumulative inflow difference, it is clear that total inflow during the current drought remains well below that of the 1950s drought. Total inflow to the lakes is a key hydrological measure of the drought's intensity and these recent statistics indicate the current drought is still in uncharted territory for drought inflows in the basin.

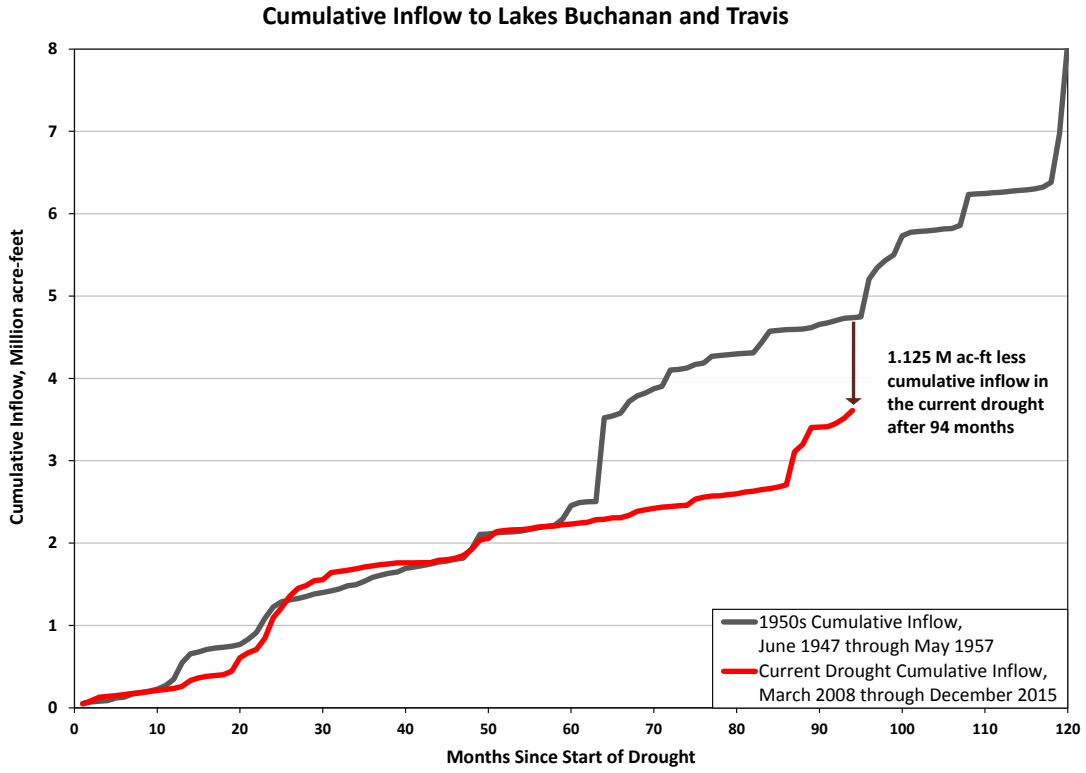


Figure 3

Combined Storage Volume and Forecast:

Another key measure of the drought's intensity and duration is the combined storage volume in lakes Travis and Buchanan. As of January 4th, combined storage is approximately 1,764,776 AF (87% full). Figure 1 on the cover page of this report shows the combined storage volumes in lakes Travis and Buchanan since January 2005.

Although there has been a significant increase in combined storage, these volumes still remain lower than the full volume of 2.01 million AF, as indicated in Figure 4. Additionally, during the course of a drought, periods of high inflow into the lakes can be followed by continued drought conditions, as was case during both the 1950's drought and the current drought. For example, in the months between late 2009 and early 2010, the combined storage volume increased more than 1 million AF to just above 1.8 million AF in total combined storage. This period of increased inflows was followed by an extremely dry year in 2011, which is the lowest inflow year in the period of record

dating back to 1942. Another example of a significant inflow event that was followed by multiple years of continued drought was in September 1952. In that month, more than 1 million AF flowed into the lakes, primarily into Lake Travis. However, the drought continued for approximately 5 years after this event.

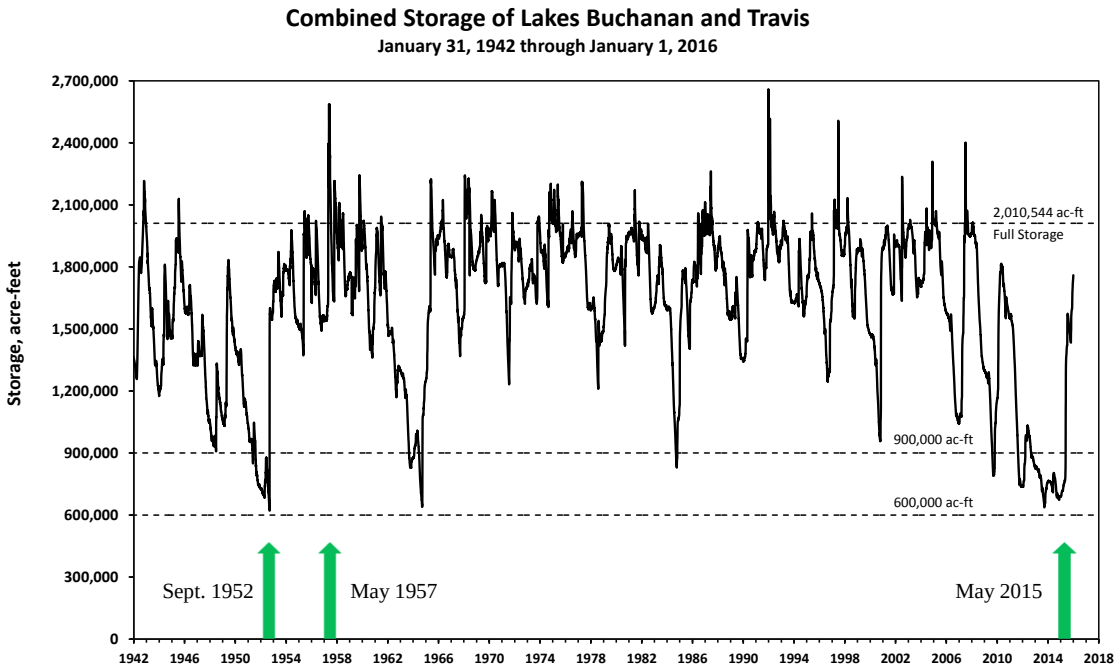


Figure 4

The time span for the 1950's drought of June 1947 to May 1957 is based on Water Availability Model (WAM) results that simulate the combined firm yield (CFY) using the hydrological period of record for the Highland Lakes. The CFY simulation assumes full water rights demand and full firm water contract utilization. The CFY simulation results show the expected response of the combined storage under these assumed conditions in a repeat of the historic hydrology. Note that the actual measured combined storage span from when the lakes started full and refilled during the drought of the 1950's was August 1945 to June 1955.

LCRA references early 2008 as the start of the current drought based on the last time the lakes were at their maximum allowable water conservation storage levels. However, the noticeable decline in storage since 2005 shown in Figure 1 indicates that the recent pattern of drought extends back approximately ten years. LCRA provides 6-month projections based on stochastic models. The storage projection for January was not available at the time of writing this report; however, the storage projection for December is shown in Figure 5.

December 1, 2015 LCRA 6-Month Combined Storage Projection:

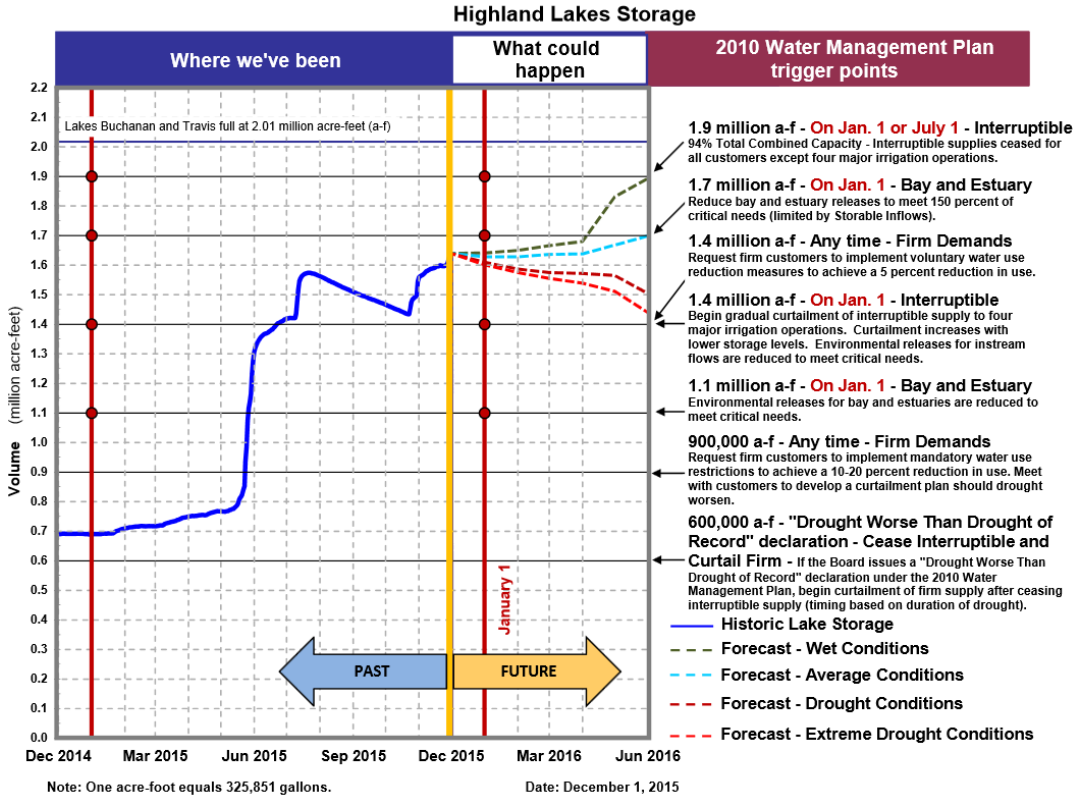


Figure 5

<u>LCRA's Announcement of a new "Critical Period" and reduction of Firm Yield:</u>
Based on the unprecedented conditions of the current drought, LCRA in February 2015 announced that the basin is in a new "critical period", which LCRA defines as the time period with the driest conditions and lowest inflows. With this announcement, LCRA has said that there has been a reduction of approximately 100,000 AF per year from the "firm yield" from the Highland Lakes system. Firm yield is defined as the amount of water that LCRA can reliably supply on annual basis through a repeat of the critical period.

Previously, the firm yield of LCRA's Highland Lakes system water supply "inventory" was calculated to be 600,000 AF per year based on a critical period defined during the "Drought of Record" from 1947 to 1957. Now, the firm yield estimate of LCRA's Highland Lakes system, given the announcement of a new critical period, is 500,000 AF per year. As the drought continues, further firm yield reductions are possible.

In its February 18, 2015 press release, LCRA announced that:

> "Preliminary 2014 data shows the drought gripping the Highland Lakes is now the most severe drought the region has experienced since construction of the lakes began in the 1930's."

> …"the Highland Lakes are now in a new 'critical period' marking the driest conditions on record, eclipsing the 1947-57 drought that until now was the worst on record for this region."

The February 18, 2015 press release, further states that:

> "The revised estimate of the firm yield changes the amount of water available for sale in the future, but does not impact existing contracts, such as those held by the City of Austin and other firm customers."

While LCRA has announced a new critical period and has recalculated the firm yield of the Highland Lakes system, it is important to clarify that this determination of a new critical period based on this drought's eclipsing the 1947-1957 drought is different than LCRA's Board declaring a "Drought Worse than the Drought of Record" (DWDR). LCRA's Water Management Plan (WMP) is a TCEQ-approved document that governs the ways in which LCRA operates and manages the water stored in Lakes Travis and Buchanan. TCEQ approved an updated plan that is expected to be implemented for the 2016 crop season which starts in March, as discussed on page 11. This WMP includes three triggers that must be simultaneously met before LCRA's Board declares a DWDR, as follows:

1. Drought duration of at least 24 consecutive months; and
2. Drought intensity greater than that of the Drought of Record as measured by inflows in Lakes Buchanan and Travis; and
3. Combined Storage in Lakes Buchanan and Travis is less than 600,000 AF

Additionally, the LCRA Board of Directors will declare a DWDR when a drought's duration is at least 10 years and combined storage in lakes Buchanan and Travis is less than 600,000 acre-feet.

The first two criteria for declaration of a DWDR are currently met based on the drought duration and low inflow volumes. However, combined storage is above 600,000 acre-feet, and therefore the DWDR declaration by the LCRA Board has not been triggered even though the current drought is hydrologically worse than the 1947-1957 drought. The recently approved LCRA WMP uses a drought intensity criterion that is based on cumulative inflows similar to Figure 3. For more on LCRA's recently approved WMP see page 10.

Drought Conditions and Weather Outlook:

Based on an update released on December 31st, the U.S. Drought Monitor currently designates a small portion of the Colorado River Basin near the coast as "Abnormally Dry". The latest release of the Texas portion of the U.S. Drought Monitor is shown in Figure 6.

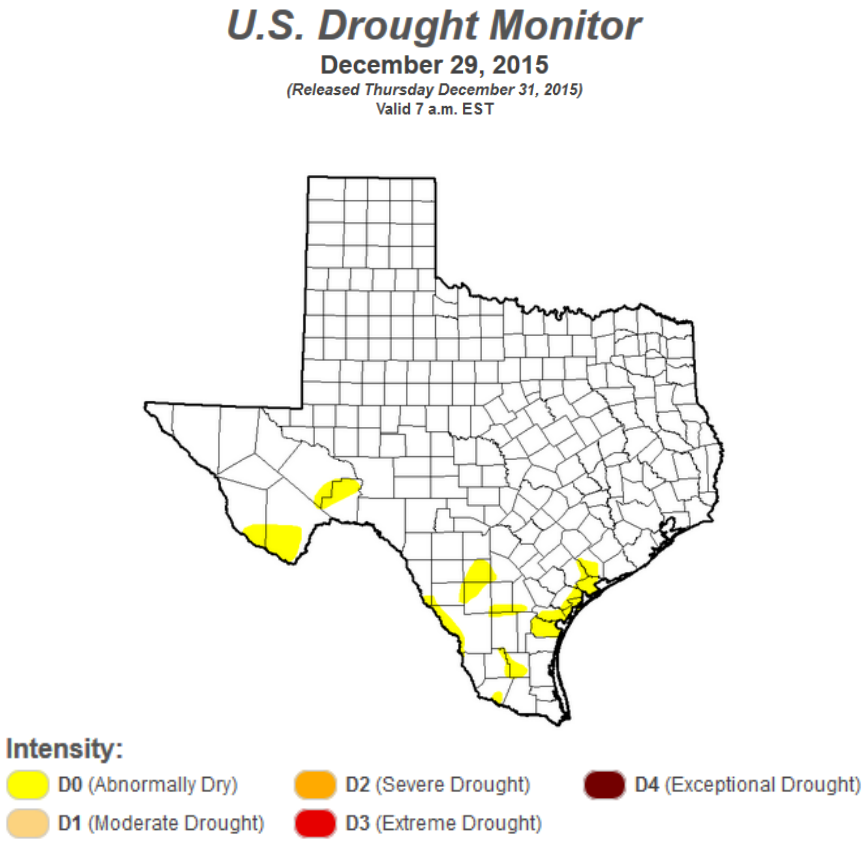


Figure 6

After the spring rains, from July through mid-October the region experienced what LCRA's meteorologist described as a "flash drought." Conditions rapidly deteriorated in some parts of the state from no drought to the most intense stages of drought in just a few months. As recently as October 22, 2015 U.S. Drought Monitor for Texas showed a large portion of Travis County in extreme drought condition (D3) and a large area bordering Travis County in the highest stage of drought, (D4) exceptional drought. Just three months earlier on July 21, 2015, the drought monitor indicated no drought for Travis and surrounding counties. This event puts the state on notice as to just how quickly the worst drought conditions can return after very wet conditions.

El Niño predictions are important in precipitation forecasts because these conditions typically generate wet weather patterns in Central Texas. According to the December 10th statement from the National Oceanic and Atmospheric Administration (NOAA), "[m]ost models indicate that a strong El Niño will continue through the Northern Hemisphere winter 2015-16, followed by weakening and a transition to ENSO-neutral during the late spring or early summer".

Demand-Side Management:
During this drought and beyond, Austin's core water management strategies have included demand-side management through implementation of the City's Water Conservation Program and Drought Contingency Plans, as well as continued development of water reuse.

Austin has been and continues to remain in Drought Contingency Plan (DCP) Stage 2 restrictions, which include no more than 1-day per week watering, nearly continuously since September 2011. Due to these limitations and other water-saving measures, Austin has already been using less water than would be allowed under the initial 20% pro-rata LCRA firm water customer curtailment plan. As part of its firm water customer pro-rata curtailment plan process, LCRA confirmed over 26,000 AF of documented annual water savings in the "reference year" (September 2010 through August 2011) from Austin's water conservation programs, including water reuse. These documented annual water conservation savings do not include additional savings Austin has achieved through Stage 2 implementation.

Community response in Austin to water conservation and the drought continues to be strong and positive. Figure 7 shows the estimated cumulative City of Austin water savings since just 2011 for both on-going water conservation programs and drought restrictions.

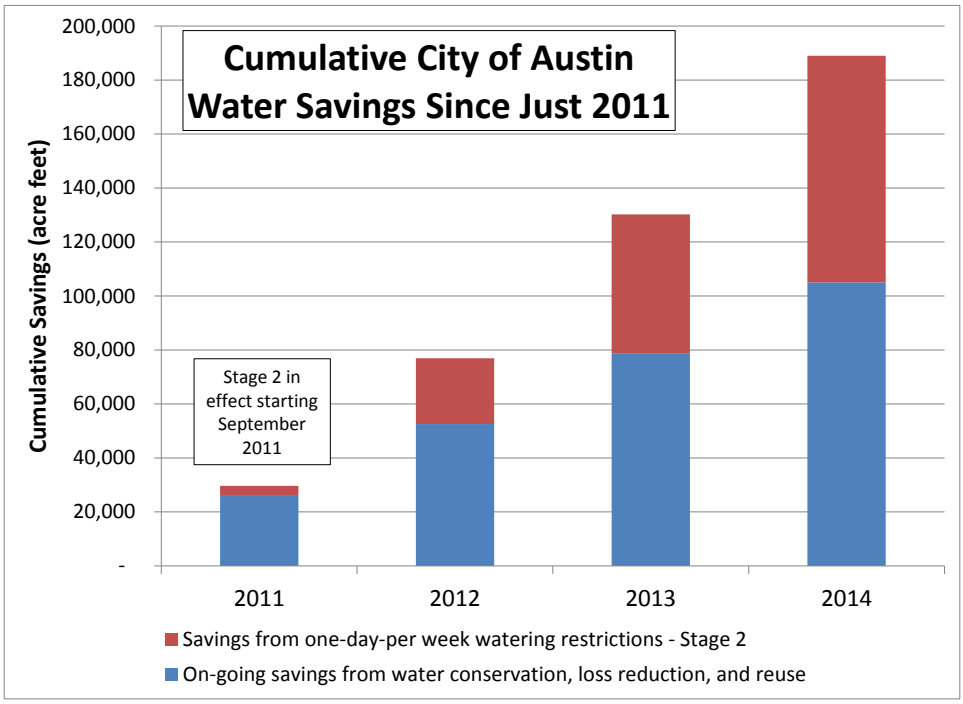


Figure 7

For the recent fiscal year (FY) wrapping up at the end of September 2015, Austin's total water use in terms of gallons per capita per day (GPCD) for FY 2015 was 122 GPCD. Based on billed consumption, water use in the residential sector was 67 GPCD of that total. Total and residential GPCD values for FY 1996 through 2015 are shown in Figure 8.

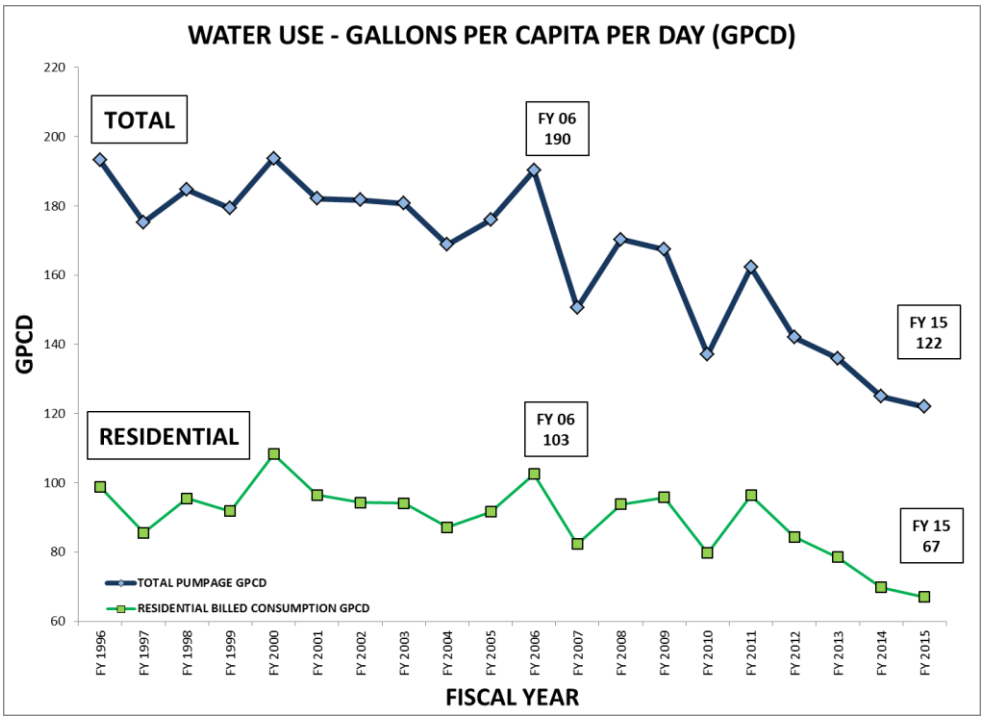


Figure 8

LCRA Water Management Plan (WMP) Revisions and Emergency Orders:

With more than a century of reliance and investment, Austin's core supply and infrastructure systems are centered on the Colorado River supply. Therefore, protection of Colorado River system firm water interests is critical. Austin has senior water rights and firm water supply agreements with LCRA that provide Austin with firm water supplies of up to 325,000 AF per year. This amount is more than double Austin's current level of demand.

LCRA's operations and management of the water stored in lakes Travis and Buchanan is guided by the LCRA Water Management Plan (WMP), a document approved by the Texas Commission on Environmental Quality (TCEQ). In November 2015, TCEQ approved an updated WMP that is expected to govern LCRA's operation of the lakes for the 2016 crop season starting in March. The updated plan better protects the water supply for firm customers, including City of Austin, and allows LCRA to more quickly adapt its operations as drought conditions change. Revisions include incorporating procedures for curtailing interruptible water such that combined storage in Lakes Travis and Buchanan is maintained above 600,000 AF through a repeat of historic hydrology through 2013. The revised plan also incorporates a three-tier regime that considers inflows, current storage, and modeled future storage conditions in determining water availability given to interruptible agricultural customers. Additionally, availability of interruptible stored water will be determined separately for each of the two crop seasons, rather than having the determination made once for both crop seasons, as was the case in the previous WMP. The revised WMP also places volumetric limits on interruptible stored water.

While the WMP was in the revision process, LCRA had been operating under TCEQ Emergency Orders (EOs) for 2012, 2013, 2014, and 2015. These EOs allowed LCRA to depart from operating under their current WMP. EOs and the on-going drought

conditions have resulted in cutoff of interruptible stored water supply from Lakes Travis and Buchanan for three of the four agricultural irrigation divisions in the lower counties of the lower Colorado River basin. The revised WMP provides a framework for lake operations that may allow water to be managed in such a way to avoid EOs in the future.

City of Austin representatives worked diligently through the critical LCRA WMP revision and TCEQ Emergency Order processes to proactively ensure reservoir management of Lakes Travis and Buchanan is consistent with Austin's firm water interests and with LCRA's lake permit duties and firm customer agreements.

Drought Response Planning Update:

Austin Water Resource Planning Task Force (AWRPTF)
The Austin Water Resource Planning Task Force (Task Force) was created by City Council (Resolution No. 20140410-033) in April 2014 to evaluate the City's water needs, to examine and make recommendations regarding future water planning, and to evaluate potential water resource management scenarios for Council consideration. The Task Force was charged with making recommendations on any alternative water sources including conservation, reuse, regional transmission systems and partnerships, groundwater, aquifer storage, as well as other potential sources in the region. The Task Force was supported by Austin Water and Watershed Protection.

The Task Force convened its first meeting on May 5, 2014 and met intensively through June 25, 2104 to execute their charge. The Task Force's findings including their final report and recommendations to Council are available on-line at:
http://www.cityofaustin.org/edims/document.cfm?id=214146

August 7, 2014 Council Resolution (Resolution No. 20140807-090)
On August 7, 2014, City Council passed a resolution (Resolution No. 20140807-090) directing the City Manager to report back to Council by September 25, 2014 with a proposed schedule, plan, and budget for implementing certain key recommendations from the Task Force report and to include a plan for a stakeholder process. Council Resolution No. 20140807-090 is available on-line at:
http://www.austintexas.gov/edims/document.cfm?id=214617

The September 25, 2014 report to Council summarizes the key AWRPTF recommendations from the Task Force report with schedule information, available preliminary budget estimates, and plans for stakeholder input.

The September 25, 2014 report to Council is available on-line at:
http://www.cityofaustin.org/edims/document.cfm?id=218197

Integrated Water Resource Plan
One of the key recommendations of the AWRPTF was the development of an Integrated Water Resource Plan (IWRP) to evaluate the City's water needs, to examine and make recommendations on future water planning, and to evaluate potential water-resource management scenarios for Council consideration. On December 11th

2014, City council passed a resolution (Resolution No. 20141211-119) to create the Austin Integrated Water Resource Planning Community Task Force (AIWRPCTF) to support the development of the IWRP. More information about the IWRP is included in the following attached document. Council Resolution No. 20141211-119 is available on-line at: http://www.austintexas.gov/edims/document.cfm?id=223726

Attached to this Drought Status and Water Supply Report is a summary of supply-side and demand-side strategies recommended by the Austin Water Resource Planning Task Force (AWRPTF) with schedule, budget, and status updates.

Attachment

Summary Austin Water Resource Planning Task Force (AWRPTF) Strategy Updates
January 2016

Austin Water has classified the Task Force Key Recommendations into the following categories for purposes of planning and budgeting:

1) Short-term demand-side management strategies (SD)
2) Short-term supply-side management strategies (SS)
3) Proposed code and rules changes (CR)
4) Feasibility and engineering analysis for supply-side strategy grouping (FEA)
5) Integrated Water Resources Plan (IWRP)

1) Short-term Demand-side Management Strategies (SD) Summary

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
SD1. Benchmarks	Continue to develop benchmarks for conservation and use benchmarks for water conservation program selection.	On-going.	In-house resources to be utilized.	Not applicable.	For program selection, continuing to use cost benchmarks Austin Water developed with Resource Management Commission. Plan to develop broader supply & demand benchmarks through the Integrated Water Resources Plan (IWRP) process.
SD2. Water report software/services	Pilot project targeting 10,000 customers to evaluate the benefits of water report services and customer interface software.	Pilot project is currently underway.	$48,000 for initial launch of pilot project (includes one-time startup costs).	~$48,000 for year-one of pilot project. Initial estimate of 45 acre feet (AF) of water savings for pilot project.	Selected vendor, Dropcountr, is currently working with customers in a pilot study of changes prompted by use of water report services and customer interface software. Approximately 7,000 residential customers have begun receiving the Dropcountr mobile app home water use report since its introduction in early May. Another 1,500 written reports are being provided to three test groups and approximately 1,500 spots remain available to the general public.

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
SD3. Reclaimed: Completing the Core	Near-term implementation of the Reclaimed Water Master Plan to enable Austin Water to provide reclaimed water to additional customers.	On-going construction program with staged project completion over the next 5 to 7 years.*	Capital Projects: $41.4 million (in current CIP).	Estimated $41.4 capital cost. 1,800 AF per year	Completing the Core projects are integrated into Austin Water's Capital Improvement Plan and staggered over the next few years. Various projects are in the planning, design, and construction phases. Capital Complex Main started construction on 11/16/15. Junction 420 Main advertised with bid opening on 11/23/15.

*Note: There are other reclaimed water projects, beyond completing the core, discussed below in the "Feasibility and Engineering Analyses for Supply-Side Strategy Grouping (FEA)" section, that could be accelerated due to the current drought. These potential drought response strategies, including Lake Long enhanced off-channel storage and indirect potable reuse, include construction of additional reclaimed water system infrastructure components contained in Austin Water's reclaimed master plan.

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
SD4. Leak/water loss reduction	Continue and enhance efforts to reduce leaks and system losses from Austin Water infrastructure.	On-going leak detection, pipe condition assessment, & remediation programs; develop and share cost relationship information by end of 2015.	Continue to fund efforts through annual O&M and CIP budget process; use in-house resources for developing cost relationship information. Staff is exploring options to prioritize efforts and efficiently utilize resources within the given budget constraints.	To be determined.	Continuing on-going leak detection, pipe condition assessment, and remediation programs. AW has formulated a Leak Detection Core Team (LDCT) to discuss current and future leak detection contract services and provide update on in-house crews' active leak detection program. LDCT is using loggers to proactively identify and repair leaks. Additionally, a district meter has been installed for North Imperial Drive and data is currently being analyzed. LDCT reviewed *Water Research Foundation* real loss component analysis model data for 2014. This preliminary information is used to determine the Economic Percentage of System to be leak surveyed per year. Preparing final report on water loss management strategies including shared cost relationship between leak detection and asset management.

2) Short-term Supply-side Management Strategies (SS) Summary					
Strategy	**Project Description**	**Schedule**	**Budget**	**Cost and Yield**	**Status**
SS1. Enhance Longhorn dam gate operations	Valve adjustments for improved hydraulic efficiency and bascule gate enhancements to improve hydraulic performance from the existing structure.	Continue to monitor and coordinate with LCRA – make further gate adjustments and plan for further improvements, as necessary.	Bascule dam gate improvement project funded by Austin Energy.	Approx. 3,000 AF per year Bascule dam gate improvement project funded by AE through current CIP (~$650,000). Cost estimates for possible future improvements are to be determined.	Completed: - Gate adjustments, using in-house resources. - AE's bascule dam gate improvement project.
SS2. Lake Long operating level (existing capacity)	Operate Walter E. Long (Decker) Lake with a 3-foot variation in lake level to help preserve stored water in Lakes Travis and Buchanan through strategic lake refill operations in wetter conditions.	On-going coordination between AE and LCRA to implement modified operations.	In-house resources to be utilized. Pro-rata curtailment plan amendment between AE and LCRA approved.	Preliminary estimate - approx. 2,500 AF per year No capital cost requirements.	Completed: Pro-rata curtailment plan amendment between AE and LCRA approved.

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
SS3. Lake Austin operating level	Operate Lake Austin within an approximate 3-foot operation range during non-peak recreational months.	Proposed to be implemented during non-peak recreational months (October through May) after combined storage in the Highland Lakes falls below 600,000 acre-feet (AF). On an ongoing basis, AW will monitor LCRA combined storage projections to provide adequate opportunity to conduct a robust public outreach and education process in advance of possible implementation triggering.	Coordination to be implemented using in-house resources. Austin Water may need to budget for professional public outreach resources to implement this strategy. However, a scope and budget for these resources has not yet been developed.	Preliminary estimate - approx. 2,500 AF per year. No capital cost requirements.	Ongoing monitoring of LCRA combined storage projections.

3) Proposed code and rules changes (CR) Summary

These include recommendations to amend existing codes and rules, for which development and stakeholder involvement processes can begin prior to the completion of an IWRP.

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
CR1. Drought response stages	Solicit public input to assess the potential for an additional restriction in Stage 3 that would allow hand water only to delay Stage 4 condition.	Applicable code revisions proposed for 2016 implementation.	In-house resources to be utilized.	To be determined.	Public input process for additional restrictions completed in spring 2015. Input gathered on additional drought strategies is being incorporated into a new public process to consider permanent once-per-week watering restrictions, with recommendations for drought plan and code revisions expected in Spring 2016.
CR2. Toilet replacement	Work with stakeholders to develop code language and an implementation plan to require retrofits in the commercial and multifamily sectors.	Schedule pending results of Conservation Potential Assessment to be completed in 2016/2017.	In-house resources to be utilized.	To be determined.	Strategy to be analyzed as part of current Conservation Potential Assessment in the Integrated Water Resource Plan.
CR3. Cooling tower condensate	Work with stakeholders to develop requirements for new facilities to capture air conditioning condensate and use in cooling towers.	Work with stakeholders to incorporate in City's regular plumbing code update.	Coordination to be implemented using in-house resources.	Initial estimate 31 acre feet per year.	Austin Water will work with stakeholders to develop requirements for new facilities in preparation for next scheduled plumbing code update, anticipated to occur in 2016. Note that schedule may shift based on plumbing code revision timeline.

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
CR4. Gray water amendments	Review possible impediments to graywater systems while still protecting public health and safety.	Amendments sent to Council late 2014.	Not applicable.	To be determined based on analysis in Integrated Water Resource Plan	Amendments approved by Council November 20, 2014.
CR5. Irrigation-related measures	Develop voluntary standards in conjunction with LCRA and homebuilders for drought resistant single-family landscapes. Work with Planning and Development Review Department and Department of Watershed Protection on revisions to Land Development Code and Plumbing Code to require drought tolerant landscapes in new commercial and multifamily developments.	Working with stakeholders to consider adoption of standards in future updates of the LDC Residential standards (voluntary) for new homes complete	In-house resources to be utilized.		Landscaping guidelines that reflect a drought-tolerant, conservation approach have been created and adopted by the HBA. Symposiums to promote these standards were held in the Fall of 2015. HBA members are expected to abide by these water-saving principles when building new homes.

4) Feasibility and Engineering Analyses for Supply-Side Strategy Grouping (FEA) Summary					
Strategy	**Project Description**	**Schedule**	**Budget**	**Cost and Yield**	**Status**
FEA1. Lake Long enhanced	Potential use of Walter E. Long Lake (Decker Lake) as enhanced off-channel storage for water supply augmentation.	Complete feasibility and engineering analyses, including water quality modeling and assessments by early 2016. Note that permit requirement consultations with TCEQ will be on-going in 2015 and early 2016.	Contract for feasibility and engineering analyses (FEA) for FEA 1 – 4 group: ~$730,000 Contract for reclaimed water pipeline design engineering is ~$922,000	Preliminary yield estimate 20,000 acre feet per year. Cost and yield to be determined as part of FEA Studies.	Working on reports for sizing reclaimed water pipeline and river pump station expansion. Beginning assessment of potential additional treatment plant requirements at Walnut Creek Wastewater Treatment Plant. The contract to design a reclaimed water main is at the 15% design stage. Contracts to design pump station improvements, outfall, and dechlorination facilities are on hold pending the results of the FEA 1-4 Study. Completed model data acquisition and assessment for Walter E. Long Lake, including the field bathymetric data collection. Working on water quality model development. Conducting Water Availability Model (WAM) simulations to support potential refinement of operational model for Walter E. Long Lake.

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
FEA2. Indirect potable reuse	Convey a portion of South Austin Regional (SAR) Wastewater Treatment Plant (WWTP) treated effluent discharge to Lady Bird Lake (LBL) to then be withdrawn via an intake barge below Tom Miller Dam. Requires construction of pumping facilities and pipeline to pump water from LBL into Ullrich WTP intake system. Task Force recommendation is for the City to consider exercising this option in deep emergency drought conditions in the event of 400,000 acre feet or less of combined storage in Lakes Travis and Buchanan.	Preliminary engineering for the reclaimed water pipelines associated with this option currently underway, Preliminary Engineering Report (PER) completed in 2015. Complete additional feasibility and engineering analyses, including water quality modeling and assessments, by early 2016. Note that permit requirement consultations with TCEQ will be on-going in 2016.	Contract for feasibility and engineering analyses (FEA) for FEA 1 – 4 group: ~$730,000 Construction costs for the main is estimated by the Routing Study Engineer is $37 million.	Preliminary cost and yield estimate being developed as part of the FEA Studies.	Model data acquisition and assessment for Lady Bird Lake is complete. Working on water quality model development. Conducting Water Availability Model (WAM) simulations to support development of potential operational strategies for Lady Bird Lake. Beginning assessment of potential additional treatment plant requirements at South Austin Regional Wastewater Treatment Plant.

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
FEA3. Reclaimed water infiltration	Spread treated wastewater from South Austin Regional (SAR) Wastewater Treatment Plant (WWTP) in an infiltration basin. Water would then recharge into the Colorado Alluvium formation and be recaptured in alluvial wells along the river to be pumped to the water treatment plant.	Complete feasibility and engineering analyses, including water quality modeling and assessments, by early 2016. Note that permit requirement consultations with TCEQ will be on-going in 2015 and early 2016.	Contract for feasibility and engineering analyses (FEA) for FEA 1 – 4 group: ~$730,000	Preliminary yield estimate 30,000 acre feet per year. Cost and yield to be determined as part of FEA Studies.	Reviewing soil boring reports and researching infiltration basin designs to prepare preliminary conceptual design of basin and cost estimate. Preparing conceptual design and cost estimate for recovery wells.
FEA4. Capture Lady Bird Lake inflows	Install floating pump intake barge below Tom Miller Dam and a transmission main to pump water from Lady Bird Lake (LBL) into Ullrich water Treatment Plant intake line. This strategy would allow the capture of spring flows including flows from Barton springs into LBL and other storm flows when they are not needed downstream.	Complete feasibility and engineering analyses, including conduct water quality modeling and assessments, by early 2016. This analysis is to be done in coordination with feasibility and engineering work on other strategies that involve pumping water from Lady Bird Lake into the Ullrich Water Treatment Plant for treatment and distribution.	Contract for feasibility and engineering analyses (FEA) for FEA 1 – 4 group: ~$730,000	Preliminary yield estimate 1,000 acre feet per year. Cost and yield to be determined as part of FEA Studies.	Evaluating potential pump station options near Tom Miller Dam, assessing pump station power requirements, and working with Austin Energy on electrical service coordination effort.

Strategy	Project Description	Schedule	Budget	Cost and Yield	Status
FEA5. Aquifer Storage and Recovery	Evaluation of the potential feasibility of aquifer storage and recovery (ASR) project(s) in the lower Trinity and fresh Edwards Aquifers north of the Colorado River, within Travis County. The general concept of an ASR project is to store water in an aquifer for later recovery and use during dry periods, for example.	Complete preliminary feasibility and engineering analysis in 2016.	Approx. $138,000 for consultant contract.	Cost and yield to be determined as part of FEA Study.	Preliminary work to estimate potential ASR project yield has begun.

5) Integrated Water Resources Plan (IWRP) Summary					
Strategy	**Project Description**	**Schedule**	**Budget**	**Cost and Yield**	**Status**
IWRP1. Integrated Water Resources Plan Project (IWRP) including a Conservation Potential Assessment	Integrated evaluation of recommendations for demand and supply-side strategies. Council Resolution No. 20141211-119, passed by Mayor and Council on December 11, 2014, created the Austin Integrated Water Resource Planning Community Task Force (AIWRPCTF) to support development of the IWRP – see link to the resolution below: http://www.austintexas.gov/edims/document.cfm?id=223726 The IWRP will incorporate public participation and stakeholder input throughout the process as well as coordination with other City of Austin departments.	Conduct project over approximately 2 years with substantial completion by Fall 2017.	In addition to in-house resources: -~$1,000,000 Additional water availability modeling and precipitation hydrology analysis and projection consulting services: ~$200,000 Note that additional budget requirements may be determined through the project process.	Not applicable.	Main IWRP Professional Consulting Services consultant procurement process is underway. The next AIWRPCTF meeting will be held on January 5th at 6 pm on the first floor of Waller Creek Center, 625 E. 10th Street. In process items include developing disaggregated demand models, developing a public outreach framework, and working with Watershed Protection Department on elements including rainwater harvesting and landscaping. Additionally, contracting is complete for the Water Availability Modeling (WAM)/Hydrology Consultant. The following is the link to the Task Force's Boards and Commissions web-page: http://www.austintexas.gov/aiwrpctf