

Progress Made in Water Conservation in Texas

Report to the 85th Texas Legislature

Submitted by the

Water Conservation Advisory Council

www.savetexaswater.org

Karen Guz, Presiding Officer

December 1, 2016



Water Conservation Advisory Council

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Rural Water Users

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December 1, 2016

The Honorable Greg Abbott
Governor, State of Texas

The Honorable Dan Patrick
Lieutenant Governor of Texas

The Honorable Joe Straus, III
Speaker, Texas House of Representatives

Re: Water Conservation Advisory Council Report

Dear Sirs:

It is our honor as members of Water Conservation Advisory Council to provide you with the fifth biennial report on progress made in water conservation in Texas.

The council serves as a professional forum for the continuing development of water conservation resources, expertise, and progress evaluation of the highest quality for the benefit of Texas. In addition to their professional endeavors, the 23 members of the council, their designated alternates, and interested stakeholders have voluntarily dedicated countless time and effort to protecting water resources, reducing the consumption of water, eliminating the loss or waste of water, improving water use efficiency, and increasing the recycling and reuse of water.

The council would like to extend our sincere appreciation to C.E. Williams, who served as the presiding officer for almost ten years and who exemplifies what it means to selflessly serve Texas. *{placeholder for something more elegantly worded}*

Respectfully submitted on behalf of the 23 members of the council,

Signature

Karen Guz
Presiding Officer, Water Conservation Advisory Council

c: The Honorable Charles Perry
Chairman, Senate Committee on Agriculture, Water, & Rural Affairs

The Honorable Jim Keffer
Chairman, House Natural Resources Committee

Executive Summary (front and back max)

The 80th Texas Legislature created the Water Conservation Advisory Council to provide the resource of a select group of professional with expertise in water conservation. The council operates under the following mission: *to establish a professional forum for the continuing development of water conservation resources, expertise, and progress evaluation of the highest quality for the benefit of Texas — its state leadership, regional and local governments, and general public.*

This report summarizes the council's activities related to their seven statutory charges and includes recommendations for legislation to advance water conservation in Texas.

Summary of progress made on legislative charges

Spacing

Placeholder.

Summary of recommendations to the legislature

Spacing

Placeholder.

Legislative charges

Introduction

Texas' population is expected to increase more than 70 percent between 2020 and 2070, from 29.5 million to 51 million, with over half of this growth occurring in the Dallas-Fort Worth and Houston metropolitan areas. Water management strategies included in the 2016 regional water plans aim to meet projected future demands. By 2070, about 30 percent of the total volume of these strategies would be in the form of demand management¹. (TWDB, 2016)

In 2007 the 80th Texas Legislature, via passage of Senate Bill 3 and House Bill 4, established the Water Conservation Advisory Council. The legislature directed the council to report on progress made on water conservation in relation to seven specific charges. This is the fifth report to state leadership briefly addressing each charge and identifying key findings and recommendations to advance water conservation efforts in Texas.

Charge 1. Monitor trends in water conservation implementation

Agricultural Water Conservation

Agricultural producers consciously conserve water while maintaining economic viability and increasing food and fiber yields. Planting decisions reflect both water availability and fluctuations in commodity pricing. Effective precipitation or lack thereof impacts the actual applied volume of irrigation water prior to planting and during the growing season.

Statewide, irrigation water use hovers around 9 million acre-feet per year and has been close to that number since the 1970s, but agricultural production has increased steadily due to improvements in irrigation efficiency and crop genetics. Agricultural producers continue to voluntarily adopt best management practices to improve irrigation efficiency; however, the data needed to assess and quantify the extent of this trend is not readily available. The last statewide assessment of agricultural irrigation practices was conducted in 2001 and reported in TWDB *Report 347, Surveys of Irrigation in Texas*².

¹ Demand management refers to measures that reduce the need for additional water, such as conservation and drought management. Drought management includes activities that temporarily restrict water use for certain types of activities and businesses.

² Report 347 can be found at www.twdb.texas.gov and savetexaswater.org.

Institutional and Commercial Water Conservation

Institutional users include schools, hospitals, and nursing homes, whereas commercial users include offices, restaurants, and retail stores. Monitoring trends in water use and conservation for these water use sectors is difficult. A recent analysis by Hoffman³ conducted to isolate the commercial and institutional components of reported municipal water use found that 21 percent of the metered water was used by commercial entities and 4 percent went to institutional users. The study also noted that indoor per capita residential use was roughly equal to per capita use in the commercial and institutional sectors.

Determining a metric similar to the per capita water use associated with municipal use is difficult because it requires site-specific 'population' information that depends on the type of facility and may be proprietary in nature. For commercial facilities, 'population' could be based on square feet of heated space for an office building, the number of occupied guest rooms for a hotel, meals served for a restaurant, or beds in a hospital. Future efforts should focus on developing an appropriate metric that incorporates available site specific information with non-proprietary data that can be gathered from tax records or economic output reports.

Manufacturing and Electric Power Generation Water Conservation

Texas ranks first in the nation in electric power production and second for manufacturing output. A recent analysis² concluded that four categories account for 85 percent of water used in manufacturing in Texas: chemicals, petroleum refining, pulp and paper, and food processing. The study also showed a dramatic reduction in water use per unit of output in manufacturing and an increase in water used per kilowatt of power generated.

Water consumption by industries is highly variable making it difficult to compare one water user to another. Opportunities for improved efficiency and water conservation, though, are widespread. The council suggests that all industrial water users consider completing a water audit to identify and document all water coming into the facility and how and when that water is consumed on site.

Municipal Water Conservation

Municipal water conservation initiatives vary considerably across the state complicating monitoring efforts. The sector-based water use metric developed by the Texas Commission on Environmental Quality and the Texas Water Development Board, in consultation with the Water Conservation Advisory Council, allows for comparisons of water use among municipalities and water utilities. The forthcoming biennial report to the legislature titled *Water Use of Texas Water*

³ The full analysis can be found on the council's webpage under 'Resources'.

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*Utilities*⁴ provides a detailed analysis. Useful data is also provided to the state through water conservation plans and reports on implementation progress required of certain entities in Texas⁵. An entity's water conservation plan identifies strategies for reducing the consumption of water, reducing water loss, and increasing water reuse. The plan also contains best management practices which, if implemented, can help an entity reach their goals⁶. The most commonly reported activities from water conservation annual reports include meter replacement, leak repair, and customer education programs. The data compiled from the past five years of annual water conservation reports are shown **in the tables below**.

[Note: Per John Sutton, updated tables will be available closer to September.]

Consider moving the GPCD tables to Charge 7 instead. Also, need to define terms (total vs residential vs water loss gpcd)

Table #. Water conservation annual report data

	5-Year Goal	2009 Average	2010 Average	2011 Average	2012 Average	2013 Average
Total GPCD*	147	156	142	162	148	148
Residential GPCD*	NA	101	114	105	94	82
Water Loss GPCD*	19	17	18	19	21	20
Water Loss %	13	11	13	12	12	13
Water Reused %	8	6	6	6	7	6
Water Saved %	6	6	7	6	10	6

*GPCD = gallons per capita daily; NA = not applicable

Table #. Water conservation annual report activities

	2009	2010	2011	2012	2103
Meters Replaced	120,151	409,812	360,353	459,026	326,305
Leaks Repaired	110,387	138,129	194,587	154,674	96,991
Education Programs	198	227	354	301	308

⁴ In 2011, the 82nd Texas Legislature passed Senate Bill 181 to address the calculation and reporting of water usage by municipalities and water utilities for state water planning and other purposes. Through amendments to Chapter 16 of the Texas Water Code, this legislation established a consistent method for reporting water use data and to improve conservation reporting procedures. The next biennial report is due to the legislature on January 1, 2017.

⁵ A utility or water supplier is required to submit a water conservation plan if they are requesting financial assistance from the Texas Water Development Board in excess of \$500,000, if their water is associated with a surface water right, or if they have greater than 3,300 service connections.

⁶ A forthcoming report to the legislature, due January 1, 2017, from the Texas Water Development Board evaluates the inclusion of best management practices within water conservation plans.

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Drought Plan Activated	55	47	230	168	164
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{modified from KGuz} A recently completed study of water use within individual households documented changes in water use patterns across the country since 1999 and identified water conservation opportunities. The Water Research Foundation’s *Residential End Uses of Water, Version 2*⁷ contains detailed survey response data, historic billing data, and other data obtained for each study site, including data from San Antonio Water System and Austin Water Utility, and reveals several trends. First, indoor household water use dropped 22 percent since 1999 with most of that resulting from a transition to efficient water fixtures. Over time as older fixtures are replaced, indoor consumption should continue to drop. Significant water conservation gains are also expected as citizens become more aware of household leaks and more proactive about repair. Across all households, 12 percent of all water was lost due to preventable, unrepaired leaks. In fact, much of the water waste from came from 32 percent of households (with leaks of up to 600 gallons per household per day).

Finally, the study looked at outdoor water usage and found high variability even among households that seemed similar. Theoretical landscape water budgets were calculated for all participating households and compared to actual use: 70 percent of households watered less than this theoretical amount. The study underscored the need to target outdoor conservation programs carefully. Large water savings can be accomplished by working with households that water excessively. {end KGuz}

Charge 2. Monitor new technologies for possible inclusion by the Texas Water Development Board as best management practices in the Best Management Practices Guide developed by the Water Conservation Implementation Task Force

Members of the council, their designated alternates, and interested stakeholders continue to monitor new water conservation technologies across all sectors to ensure the guide contains the most up-to-date best management practices. Recent efforts, coordinated through the council’s workgroups, include updating outdated practices and composing original documents to reflect recent technological advances in water conservation.

⁷ The electronic version of the Executive Report is available to the public at www.waterrf.org/4309.

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Updates in progress include irrigation scheduling using real-time soil moisture monitoring and evapotranspiration networks; technical assistance and outreach for wholesale water providers; system water audits and water loss control; waste water management; and cooling towers, boilers, and other thermodynamic operations. In addition, new best management practices are being drafted on wholesale conservation water rates; supervisory control and data acquisition systems; the use of unmanned aerial systems for improved irrigation efficiency; custom rebates for the industrial, commercial, and institutional sectors; and landscape irrigation design changes and efficiency retrofits.

Charge 3. Monitor the effectiveness of the statewide water conservation public awareness program and associated local involvement in implementation of the program

Water conservation is the most cost-effective water management strategy to meet the state's water needs, and regional water planners often identify public awareness and education as a key component of that strategy. Municipal water conservation is recommended in the 2017 state water plan to meet almost 10% of the state's water demands by 2070.

In monitoring water conservation programs and public awareness efforts, the council found that consistent messaging supported by research and data proved most effective. The statewide water conservation public awareness program, "Water IQ: Know Your Water", was established by the Texas Legislature in 2007 with the enactment of Senate Bill 3 and House Bill 4.

The program supports existing local water conservation programs by inviting water suppliers, utilities, state agencies, school districts, and nonprofit groups to become Water IQ partners at no cost. Visitors to the WaterIQ.org website can locate the source of their drinking water, view population projections, and see local gallons per capita per day usage. The calendar page provides dates of upcoming events of interest within the water resources community. Almost one hundred entities are current Water IQ partners representing approximately 25 percent of zip codes in Texas.

Charge 4. Develop and implement a state water management resource library

The Council has partnered with the Alliance for Water Efficiency since 2008 to provide access to a national library of available water conservation resources including research, information, and tools. The Alliance for Water Efficiency is a stakeholder-based 501(c)(3) non-profit organization dedicated to the efficient and sustainable use of water.

In addition, council members representing various water use sectors and interest groups contribute additional resources that are posted on the council's webpage (savetexaswater.org). Recently added resources include an in-depth analysis of the commercial and institutional portion of reported municipal water use; snapshots of water conservation and reuse efforts undertaken by rural systems and urban utilities; and a water conservation scorecard.

Charge 5. Develop and implement a public recognition program for water conservation

The council created the Blue Legacy Awards in 2010 to recognize members of the municipal, agricultural, and manufacturing water use sectors who have demonstrated an incomparable commitment to water conservation. Awards are presented in conjunction with Texas Water Day at the capitol to elevate the importance and awareness of water conservation related issues. More than thirty champions of water conservation have been celebrated for their efforts to date. Their success stories and photographs can be found on savetexaswater.org.

Charge 6. Monitor the implementation of water conservation strategies by water users included in regional water plans

{modified from KKramer} Based on the October 2012 rule change by the Texas Water Development Board⁸, the council anticipated that the 2016 regional water plans would provide extensive information on the implementation of any water conservation strategies recommended for water user groups in the previous (2011) plans. However, a review of a selected sample of the 2016 regional water plans indicates that the plans vary widely in the level of detail, comprehensiveness, and usefulness of their respective discussions of the implementation of water conservation strategies recommended in the 2011 plans, and most of the evaluation, with some exceptions, is of municipal conservation strategies rather than conservation strategies in other sectors of water use⁹.

Indeed, the overview of conservation implementation found in most plans is minimal. The reasons most often cited for the paucity of information provided is inadequate budget to conduct a review of implementation and poor implementation survey response rates by water user groups and entities. Several regional plans, however, demonstrate a determined effort to gather and present information on conservation strategy implementation, with varying degrees of success. Among these are the 2016 plans for Regions C, H, and K. One common theme throughout most of the regional plans reviewed for this evaluation is that per capita water consumption in Texas is projected to continue to drop (although the 2011 base per capita use

⁸ Title 31, Part 10 of the Texas Administrative Code, Rule § 357.45.

⁹ Find the detailed analysis by Kramer on the council's website (savetexaswater.org).

for the 2016 regional plans in some regions was higher than the base used for the 2011 plans), and this in part reflects implementation of passive and active conservation requirements and initiatives.

Charge 7. Monitor target and goal guidelines for water conservation to be considered by the Texas Commission on Environmental Quality and Texas Water Development Board

As proposed by the Water Conservation Implementation Task Force in its 2004 report to the legislature¹⁰, targets and goals established by an entity should consider a minimum annual reduction of one percent in total gallons per capita per day (gpcd), based upon a five-year rolling average, until such time as the entity achieves a total gpcd of 140 or less. The task force also proposed a statewide goal of 140 gallons per capita per day. Total gpcd equals the total amount of water diverted or pumped for potable use divided by total population.

It is important to note that the selection of the goal of 140 gallons per capita per day was a compromise and that a more aggressive but achievable goal (if adopted) would save Texas even more water. In fact, according to the 2017 State Water Plan, if all the recommended municipal conservation and reuse strategies were implemented in 2070, the projected statewide municipal average gallons per capita per day would decline from the currently projected 163 gallons per capita per day in 2020 (without recommended conservation or reuse strategies) to approximately 124 gallons per capita per day in 2070 (with recommended conservation and reuse strategies). (TWDB, 2016)

The report by the task force includes the directive to revisit these targets and goals “as data become available to set more meaningful stretch goals and targets.” (WCITF, 2004, p. 67) The council continues to monitor target and goal guidelines in consultation with the Texas Commission on Environmental Quality and Texas Water Development Board.

¹⁰ The Water Conservation Implementation Task Force’s 2004 report can be found on savetexaswater.org.

Recommendations for legislation to advance water conservation in Texas

In 2015, the 84th Texas Legislature passed Senate Bill 551 directing the Council to include in their report “recommendations for legislation to advance water conservation in this state, which may include conservation through the reduction of the amount of water lost because of evaporation”.

Brief title of council approved recommendation

Text of recommendation.

{Note: This example is not meant to imply council approval of this text or this recommendation.}

Designation of a water conservation coordinator

The state requires municipal water suppliers with more than 3,300 connections to develop and implement water conservation plans; however, without dedicated staff resources, a well-developed plan may never be implemented.

A designated water conservation coordinator could improve the ability of a water supplier to implement their plan and associated programs. For example, in 2009 the Lower Colorado River Authority modified its water conservation plan rules for municipal contract customers to include a requirement to designate a water conservation coordinator tasked with implementing the plan. Several water supply customers have since reported more aggressive implementation of water conservation programs thanks to their designated coordinator.

The council recommends that the Texas Water Code be amended as follows:

Sec. 13.146. WATER CONSERVATION PLAN. The commission shall require a retail public utility that provides potable water service to 3,300 or more connections to

(a) submit to the executive administrator of the board a water conservation plan based on specific targets and goals developed by the retail public utility and using appropriate best management practices, as defined by Section 11.002, or other water conservation strategies; and

(b) designate an employee as the water conservation coordinator responsible for implementing the water conservation plan. The employee should be certified by a professional water association recognized by the State.

References

****Keep this section or stick to footnotes only?**

TWDB (Texas Water Development Board), 2016, Water for Texas—2017 State Water Plan: pre-publication version, Texas Water Development Board, 147 p.

WCITF (Water Conservation Implementation Task Force), 2004, Report to the 79th Legislature: Texas Water Development Board Special Report, November 2004, 78 p.,
http://www.savetexaswater.org/about/doc/WCITF_Report_2004.pdf

ch 10 water code