WATER CONSERVATION BY THE YARD:

A STATEWIDE ANALYSIS OF OUTDOOR WATER SAVINGS POTENTIAL

SIERRA CLUB

NATIONAL WILDLIFE FEDERATION

Texas Living Waters Project

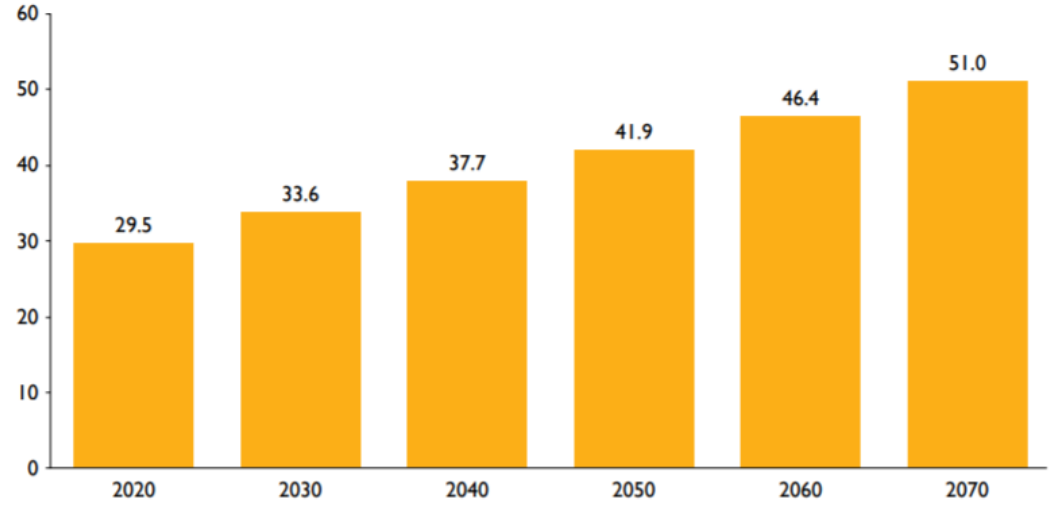
Agenda

- Motivations
- Overview
- Findings
- Conclusions

Motivations for the report

- Population growth in Texas

Figure ES.2 - Projected population in Texas (millions)



- History of drought in Texas

Water Weekly

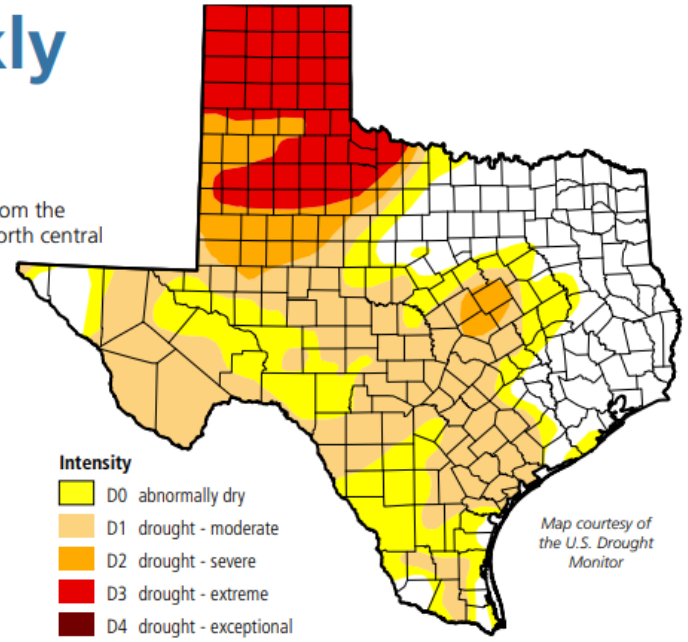
For the week of 03/19/18

Water conditions

Last week's drought map is little changed from the previous week. Drought retreated a bit in north central Texas but expanded by a similar amount in south Texas. The total area impacted by drought remains 54 percent of the state.

Drought conditions

- 54% now
- 54% a week ago
- 26% three months ago
- 5% a year ago

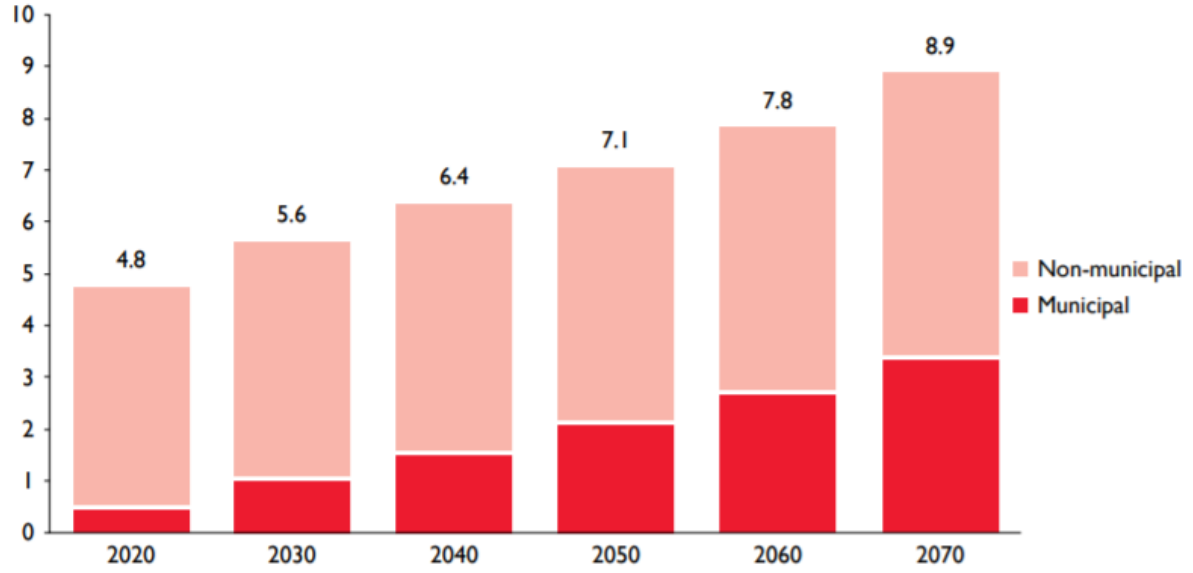


Motivations for the report

- Conservation's role in maintaining healthy environmental flows

- Projected municipal water needs statewide

Figure ES.4 - Projected annual water needs in Texas (millions of acre-feet)



Why is this important to the Gulf Coast?

- Fluctuations between extreme flooding & drought has become the new norm for Texas – *following Hurricane Harvey, the Houston area had 90 days of below normal rainfall & average monthly temperatures 5 degrees above normal (USA Today)*
- Maintaining a consistent conservation message during times of drought & non-drought is essential to changing water use behaviors long-term
- Ensuring adequate environmental flows is a critical concern for the health of the Gulf Coast region & our bays & estuaries
- Projected population growth in Region H will drive greater outdoor water use in the coming decades
- Water conservation extends surface water supplies that are being tapped due to land subsidence control efforts

Report overview

- Statewide study on the implementation of no more than twice per week watering restrictions
- Utilizes municipal-level data & extrapolates it to the regional & statewide scale
- Incorporates a range of potential savings based on household demand & level of implementation efforts
- Presents projected municipal savings broken down by region & planning decade (2020, 2040, & 2060)
- Translates projected municipal savings as a percentage of future municipal needs
- Offers design & implementation strategies for locking in the full savings potential of watering restrictions
- TWDB's Statewide Water Conservation Quantification Project lists no more than twice per week watering restrictions as a top recommendation.

Taking a deeper look

Water Conservation by the Yard (2015)

- Scope: Regions C & H
- Measures daily outdoor household demand for Regions C & H
- Utilizes a single percent savings estimate based on outdoor household use in Regions C & H
- Presents projected municipal savings for 2010 & 2060

Water Conservation by the Yard – Statewide Analysis (2018)

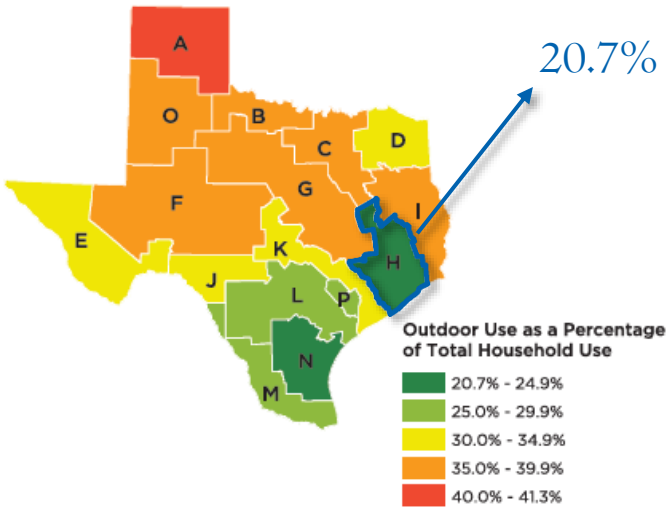
- Scope: All 16 water planning regions
- Presents projected municipal savings in context with future municipal needs
- Measures daily outdoor household demand for each region & categorizes regions as low, medium, or high
- Uses both single-family residential outdoor demand & the level of implementation effort to develop a range of savings potentials for both single-family & municipal
- Presents projected municipal savings for 2020, 2040, & 2070

Report findings

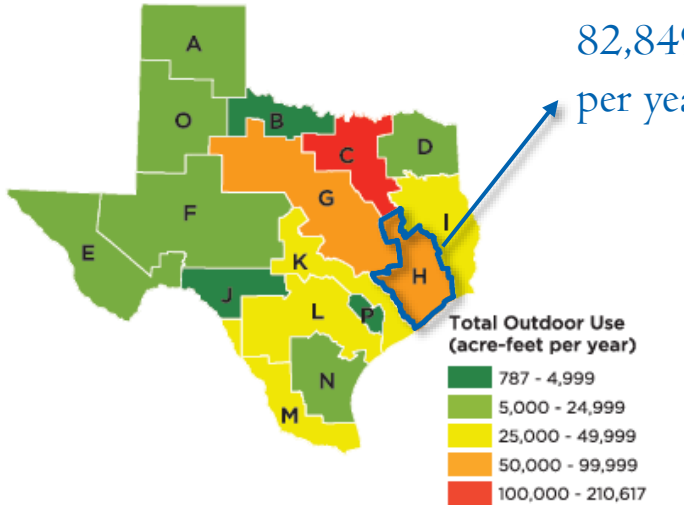
Residential outdoor water use

- Single-family households in Texas use as much as 590,000 acre-feet of water annually for landscape irrigation

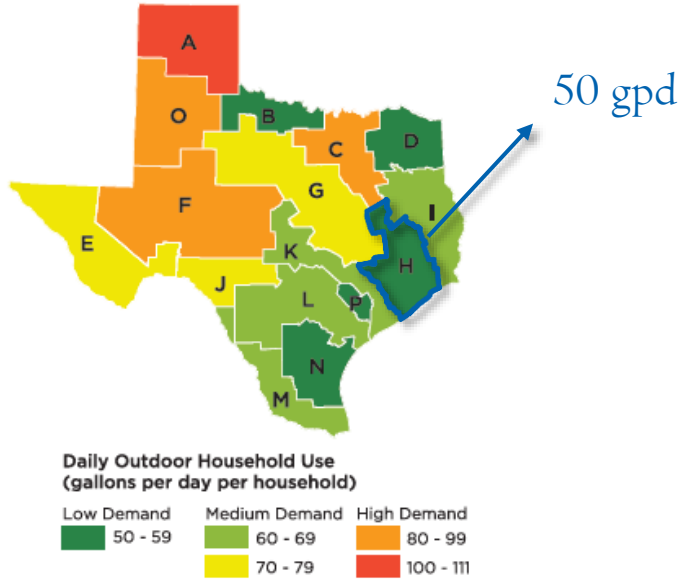
MAP 1: OUTDOOR WATER USE AS A PERCENTAGE OF TOTAL HOUSEHOLD USE



MAP 2: TOTAL ANNUAL SINGLE-FAMILY RESIDENTIAL OUTDOOR WATER USE



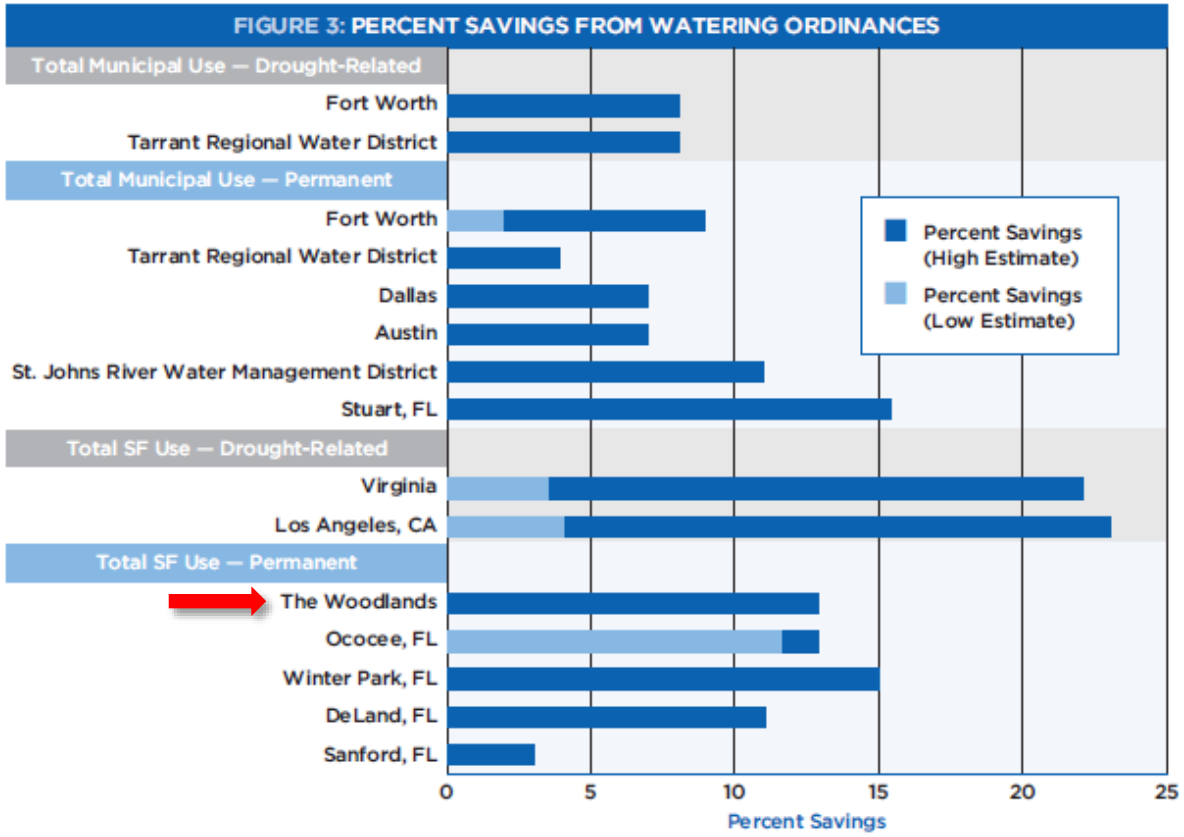
MAP 3: DAILY OUTDOOR HOUSEHOLD USE



Report findings

➢ Examples of savings from outdoor watering restrictions

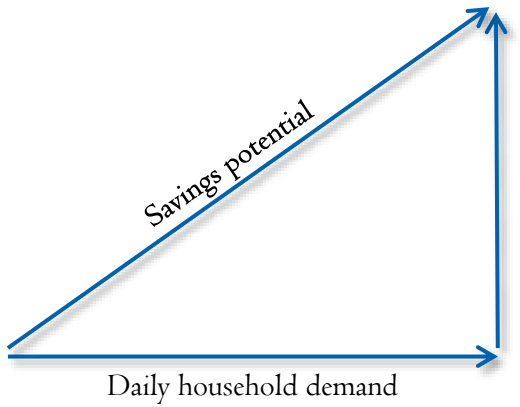
- The Woodlands estimated 13% reductions in total single-family usage as a result of permanent restrictions put into place between 2012 & 2013
- Above all, robust education & enforcement efforts are key to achieving greater water savings



Report findings

➢ Range of estimated savings from watering restrictions

- Based on level of outdoor household demand (low, medium, high) and level of implementation effort (low, high)



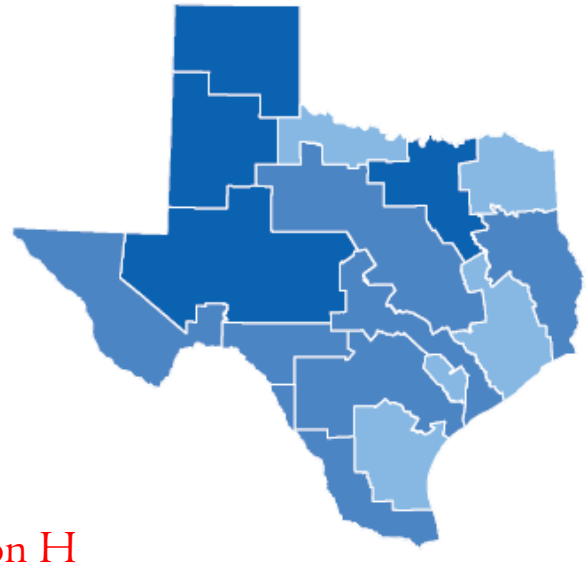
Level of Implementation Effort

TABLE 4: SAVINGS ESTIMATE MATRIX — TOTAL MUNICIPAL USAGE (INCLUDES SINGLE-FAMILY, MULTI-FAMILY, ICI)

Outdoor Household Demand	Level of Effort/Education	
	Low	High
Low	2.0%	7.0%
Medium	3.5%	8.5%
High	7.0%	11.0%

Region H

MAP 4: LEVEL OF OUTDOOR HOUSEHOLD DEMAND (BASED ON DAILY OUTDOOR HOUSEHOLD USE)



Level of Outdoor Household Demand (based on daily outdoor household use)

- Low Demand (59 gallons or less per day)
- Medium Demand (60 to 79 gallons per day)
- High Demand (80 to 111 gallons per day)

Report findings

➢ Projected municipal savings for Region H:

- Approximately 88,000 acre-feet per year in 2020
- By 2070, Region H savings would reach 132,000 acre-feet per year

TABLE 7: PROJECTED MUNICIPAL SAVINGS BASED ON 2017 STATE WATER PLAN MUNICIPAL DEMANDS

Region	2020 Planning Decade			2040 Planning Decade			2070 Planning Decade		
	Municipal Demand (acre-feet/year)	Water Savings (acre-feet/year)		Municipal Demand (acre-feet/year)	Water Savings (acre-feet/year)		Municipal Demand (acre-feet/year)	Water Savings (acre-feet/year)	
		LOW	HIGH		LOW	HIGH		LOW	HIGH
A	91,637	6,415	10,080	98,792	7,440	11,691	133,572	9,350	14,693
B	32,563	651	2,279	32,784	656	2,296	33,827	677	2,368
C	1,481,530	103,707	162,968	1,675,385	132,631	208,419	2,594,833	181,638	285,432
D	134,310	2,686	9,402	142,631	3,051	10,678	208,132	4,163	14,569
E	141,818	4,964	12,055	156,499	5,971	14,501	215,923	7,557	18,353
F	141,454	9,902	15,560	151,070	11,229	17,646	193,585	13,551	21,294
G	403,094	14,108	34,263	450,798	17,615	42,779	693,829	24,284	58,975
H	1,257,276	25,146	88,009	1,377,892	29,838	104,432	1,893,397	37,868	132,538
I	188,646	6,603	16,035	196,302	7,145	17,353	239,607	8,386	20,367
J	25,567	895	2,173	26,874	978	2,376	31,315	1,096	2,662
K	306,560	10,730	26,058	359,194	14,412	35,000	558,949	19,563	47,511
L	469,065	16,417	39,871	526,806	20,385	49,506	754,306	26,401	64,116
M	311,591	10,906	26,485	368,997	14,966	36,347	612,127	21,424	52,031
N	112,081	2,242	7,846	117,701	2,421	8,475	128,510	2,570	8,996
O	94,753	6,633	10,423	101,434	7,575	11,903	132,718	9,290	14,599
P	7,997	160	560	7,984	159	556	8,088	162	566
TOTAL	**5,199,942**	**222,163**	**464,066**	**5,791,143**	**276,471**	**573,957**	**8,432,718**	**367,981**	**759,069**

Report findings

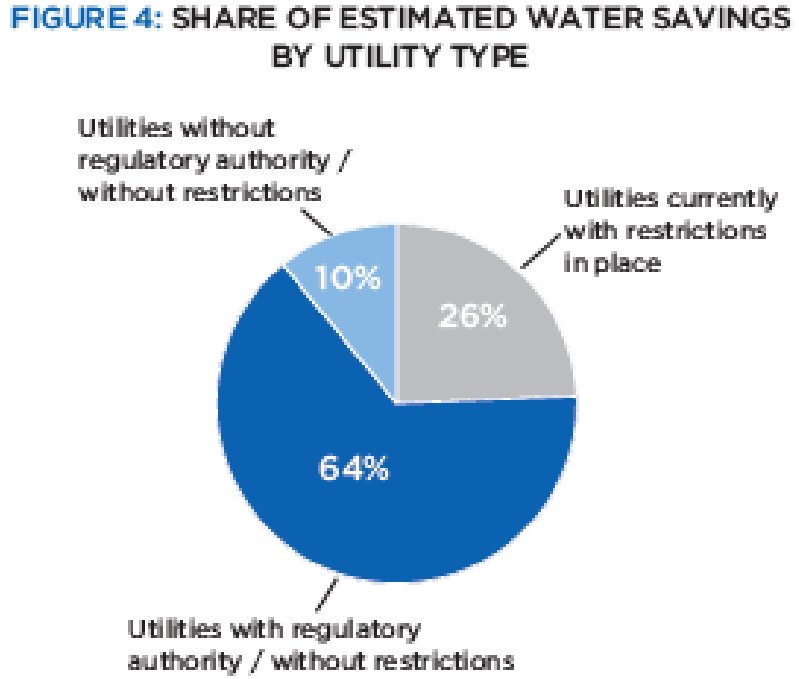
- **Projected municipal savings as a percentage of future municipal needs**
  - Outdoor watering ordinances can generate enough water savings to fulfill 62% of Region H's projected municipal water needs in 2020

TABLE 8: PROJECTED MUNICIPAL SAVINGS AS A PERCENTAGE OF 2017 STATE WATER PLAN MUNICIPAL NEEDS

Region	2020 Planning Decade			2040 Planning Decade			2070 Planning Decade		
	Municipal Needs (acre-feet/year)	Water Savings as a Percent of Needs		Municipal Needs (acre-feet/year)	Water Savings as a Percent of Needs		Municipal Needs (acre-feet/year)	Water Savings as a Percent of Needs	
		LOW	HIGH		LOW	HIGH		LOW	HIGH
A	10,074	64%	100%	38,521	19%	30%	81,559	11%	18%
B	8,060	8%	28%	9,092	7%	25%	10,848	6%	22%
C	106,718	97%	> 100%	539,183	25%	39%	1,227,956	15%	23%
D	22,341	12%	42%	29,850	10%	36%	51,390	8%	28%
E	5,623	88%	> 100%	14,734	41%	98%	58,011	13%	32%
F	36,262	27%	43%	56,120	20%	31%	88,349	15%	24%
G	32,314	44%	106%	102,132	17%	42%	259,402	9%	23%
H	141,908	18%	62%	420,866	7%	25%	760,957	5%	17%
I	121	> 100%	> 100%	1,476	> 100%	> 100%	13,629	62%	> 100%
J	3,462	26%	63%	3,925	25%	61%	4,228	26%	63%
K	7,881	> 100%	> 100%	45,883	31%	76%	182,173	11%	26%
L	72,636	23%	55%	148,627	14%	33%	304,164	9%	21%
M	48,534	22%	55%	132,173	11%	27%	312,410	7%	17%
N	1,583	> 100%	> 100%	1,567	> 100%	> 100%	1,683	> 100%	> 100%
O	13,233	50%	79%	30,937	24%	38%	56,371	16%	26%
P	0	-	-	0	-	-	0	-	-
TOTAL	**510,750**	**43%**	**91%**	**1,575,086**	**18%**	**36%**	**3,413,130**	**11%**	**22%**

Report findings

- **Savings by utility type: those with regulatory authority to enforce watering restrictions & those without**
  - Municipalities in Region H with restrictions in place:
    - The Woodlands
    - City of Conroe
    - Montgomery County MUD 47



Conclusions

- Texans use a lot of water outdoors – while Region H uses less water on a daily household basis, watering restrictions can still yield considerable savings
- Education & enforcement are key to realizing the full savings potential of outdoor watering restrictions
- There is much less drive to implement no more than twice per week watering restrictions in Region H compared to other areas of the state
- Additional efforts are needed to encourage broader adoption of no more than twice per week watering restrictions, including BMPs, educational resources, etc.
- TWDB's Statewide Water Conservation Quantification Project lists no more than twice per week watering restrictions as a top recommendation, further underscoring the importance of restrictions in meeting conservation objectives

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