Water Conservation Education Standards: The Pipeline to Conserving Water

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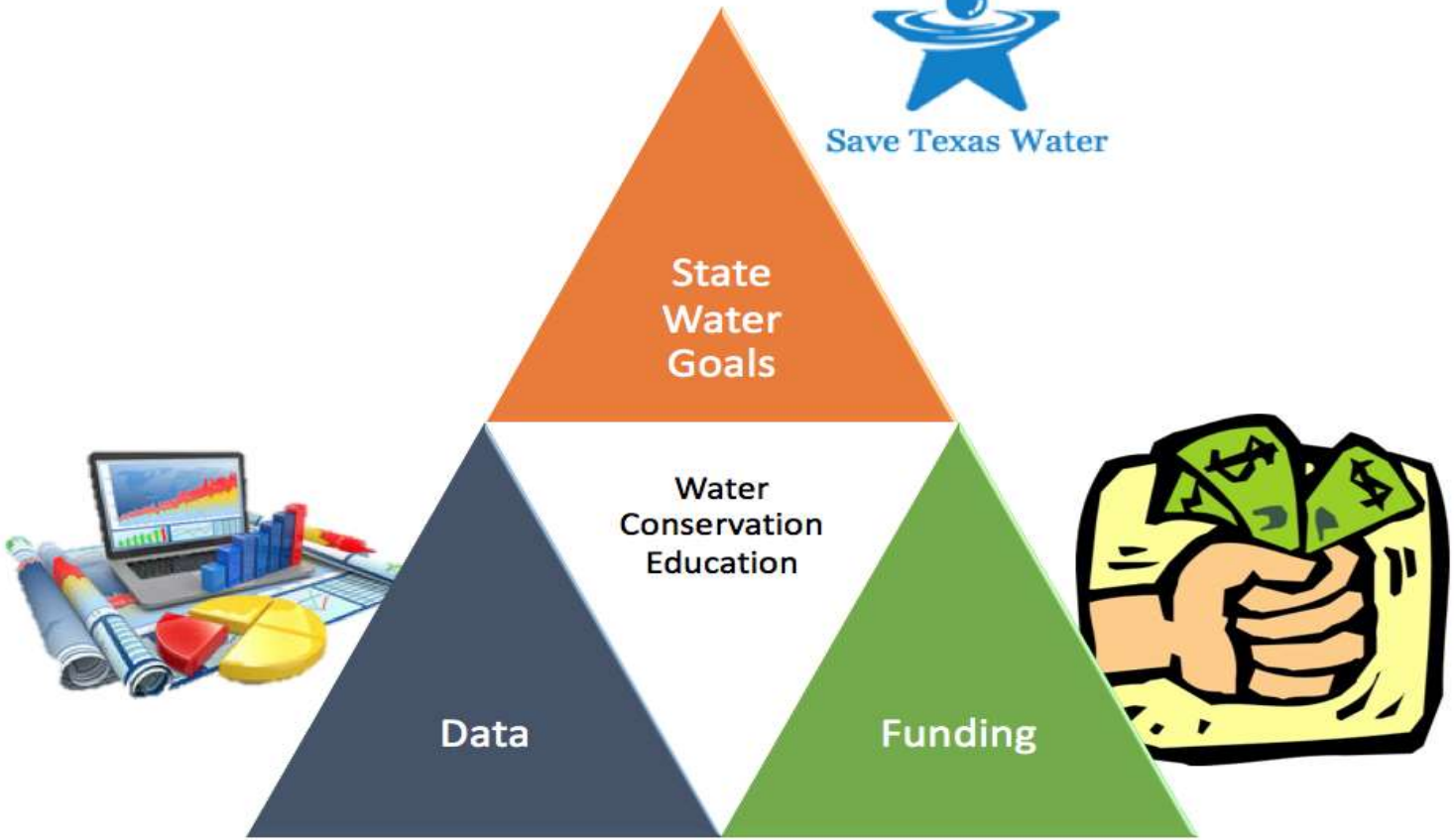
WATER MANAGEMENT
& HYDROLOGICAL SCIENCE
TEXAS A&M UNIVERSITY

Save Texas Water



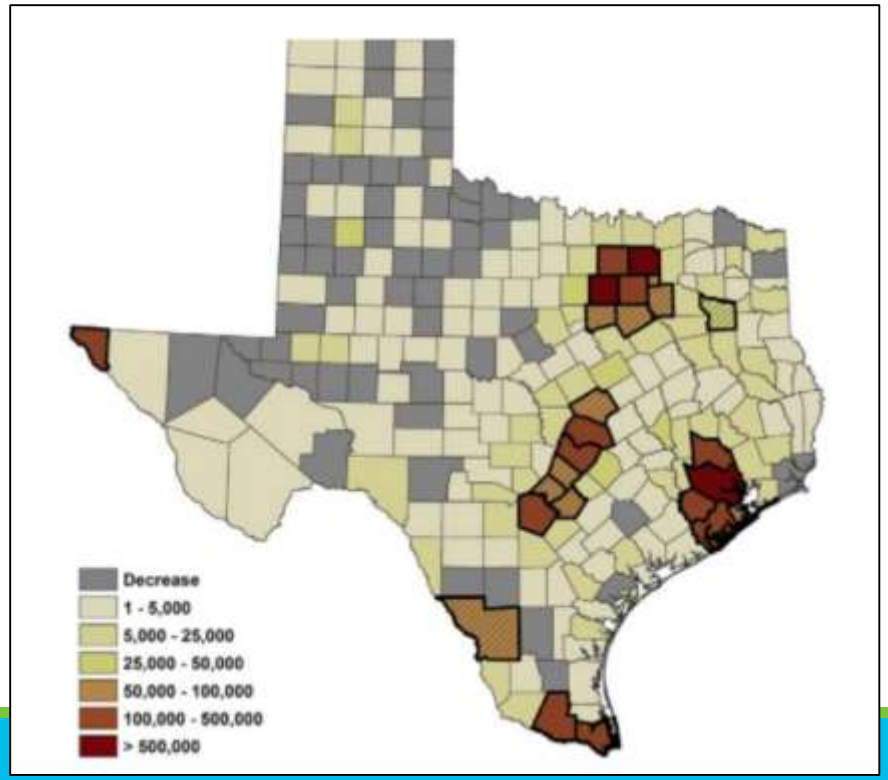
Research Questions

- How are water conservation programs quantifying water conservation post-participation?
- How are these programs alternatively determining efficacy of conserving water post-programming?

Overview

1. Site Selection: Texas as Study Area
2. Methodology
3. Review of Conservation Programs:
    i. San Antonio
    ii. Houston
    iii. Dallas
4. Analysis of Texas Water Conservation Education Programs
5. Discussion / Conclusion

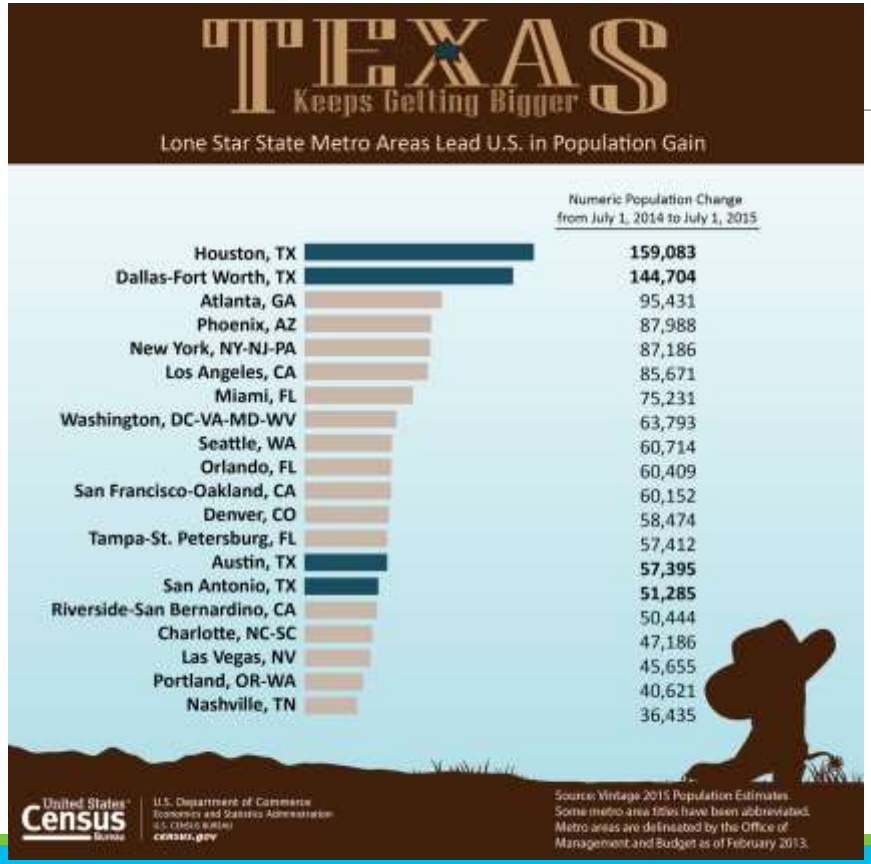
Site Selection:
Major Urban Areas of Texas

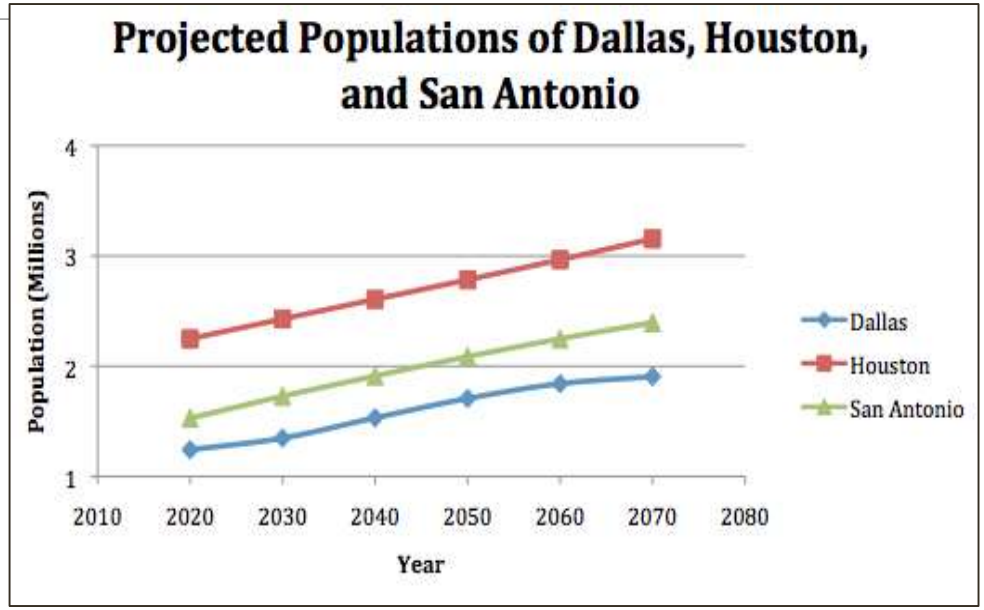


- Increasing population
- Droughts impact on public water supply systems
- Increased projected water demands are unmet by projected supplies

Statewide change in total population by county from 1997-2012. Top 25 highest total population growth counties highlighted. Source- Institute of Renewable Natural Resources

Texas Urban City Population Projections





Projected populations of Dallas, Houston, and San Antonio, TX. Source: TWDB 2017 State Water Plan

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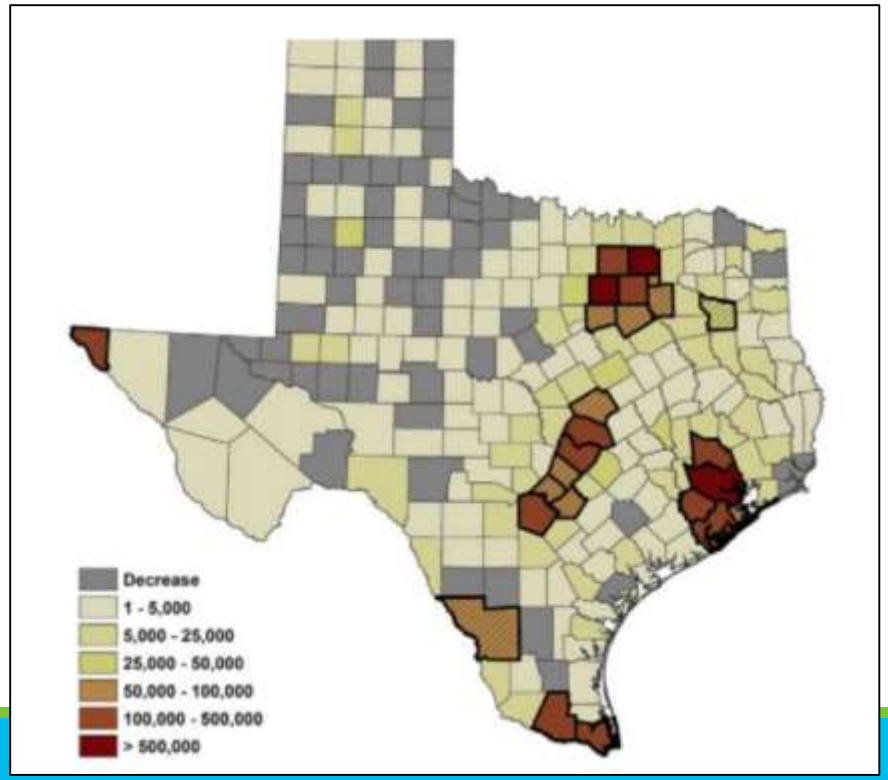

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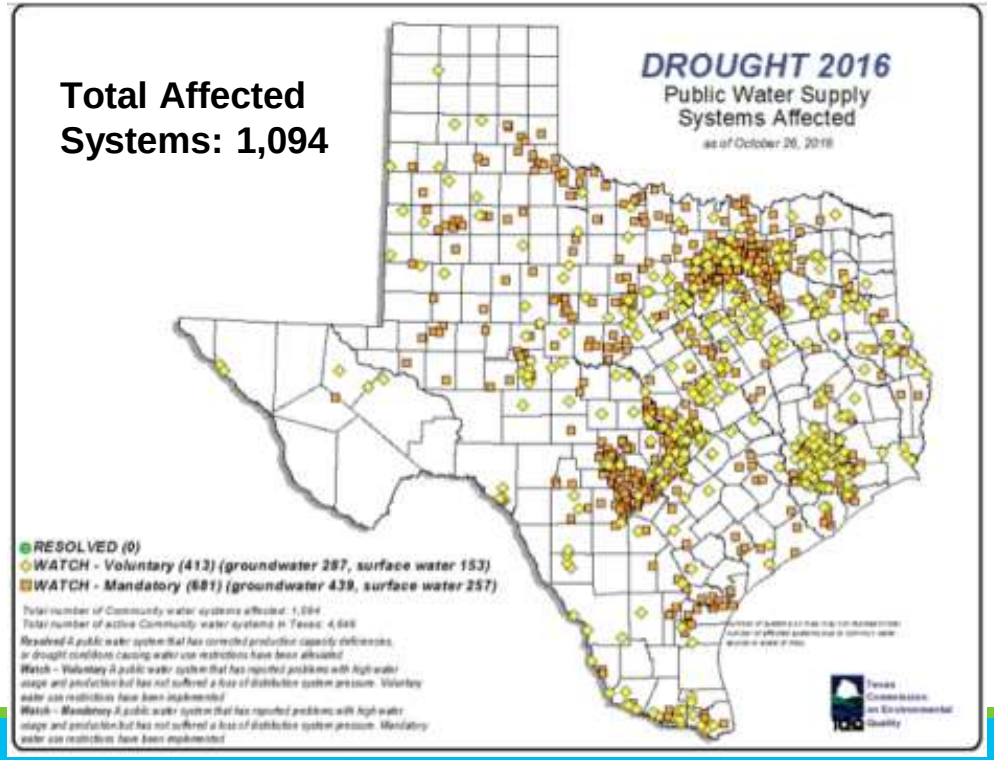
Affected Public Water Systems



- Total of 4,646 active community water systems
- 39% of affected water supply systems are within major urban areas

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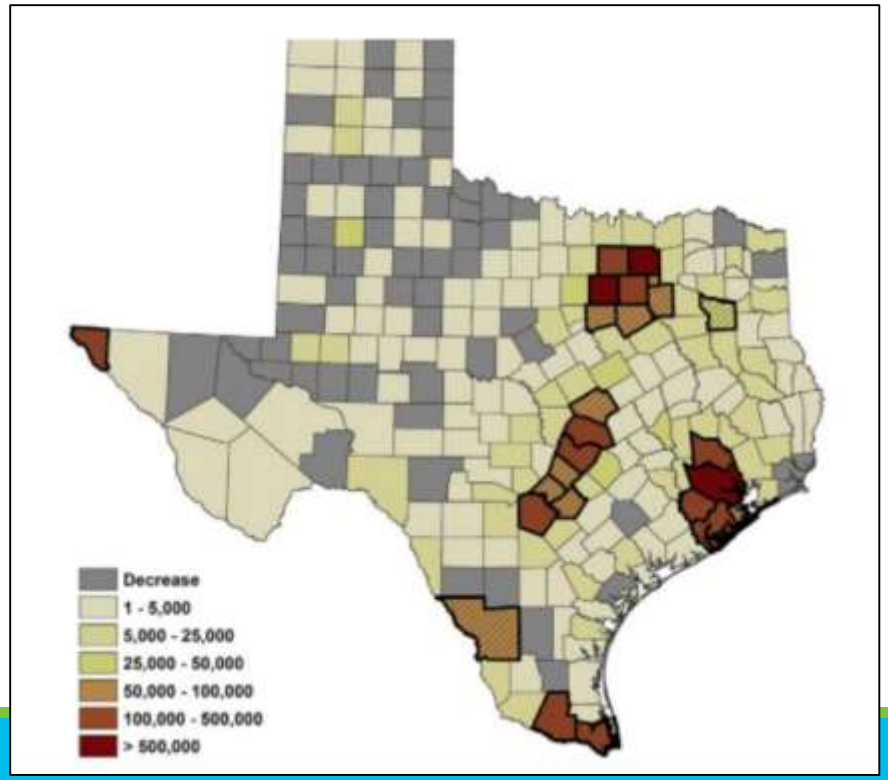

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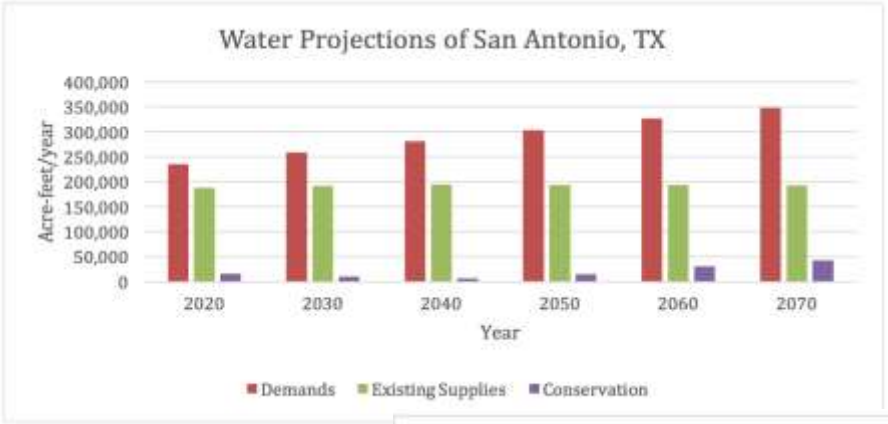
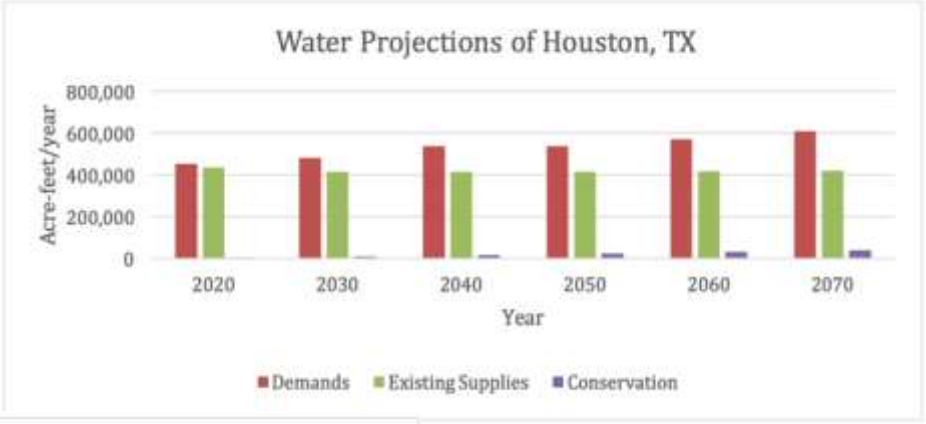
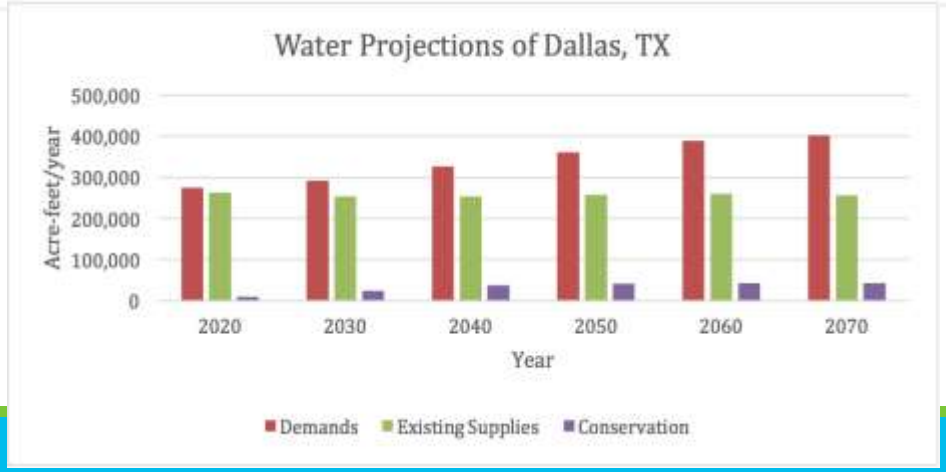
Water Projections







Methodology

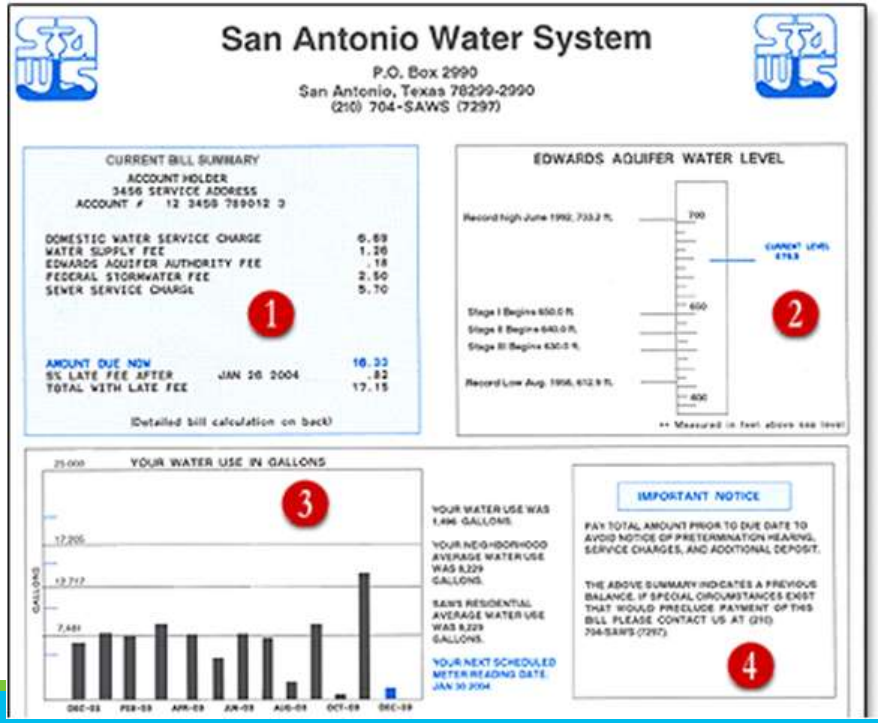
- Locate major conservation education programs in most populated cities in Texas
- Review online programming information, published literature, and phone call interviews of each program to answer research question

San Antonio, TX

- Indoor and outdoor programs
  - Coupons and rebates
  - Focus on irrigation
- Community Outreach
  - Educational Materials

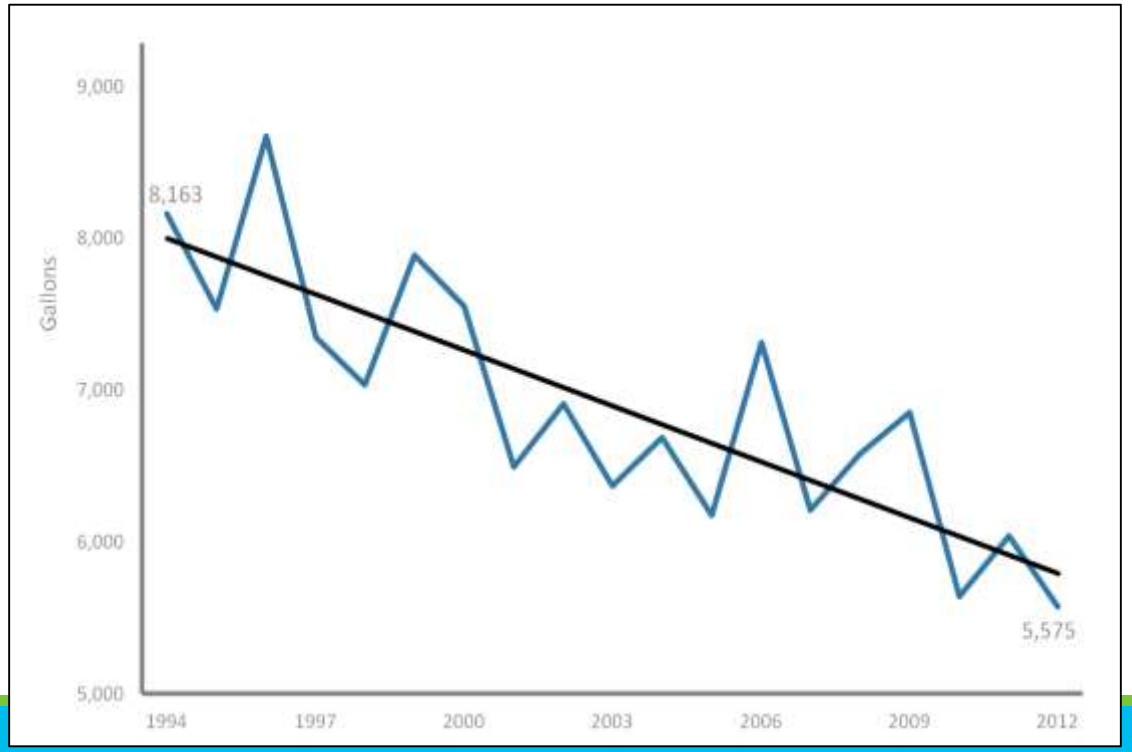
San Antonio Water System

Evaluating Effectiveness: San Antonio



- Commitment to program
- Household comparison of metering data
  - Estimates of gallons saved or acre-feet saved per year

Monthly Average Residential Indoor (winter) Usage in Gallons 1994 – 2012



Houston, TX

- Consumption Awareness Program
  - Use of AMI
  - Real time data about water usage and flow detection
- Education Programming
  - Water Works Education Center
  - Public Seminars

Evaluating Effectiveness: Houston

- Alliance for Water Efficiency Water Conservation Tracking Tool
- Use of AMI Data
  - Bring real-time water usage to its customers.

Dallas, TX

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UNIVERSITY OF NORTH TEXAS

- A research-informed conservation education program
- Target Audience
- Lessons
- Implementation
- Over a four-year period, water conservation lessons were taught to more than 17,000 students.

Evaluating Effectiveness: Dallas

Lesson Evaluation	1-least agreement to 10-most agreement
Grade level/age appropriate	
Appropriate quality of language used in lesson	
Instructions were understandable to teachers and students	
The lesson was interesting/informative to the students	
The lesson was interesting/informative for the teacher	
The lesson helped to met local curricular objectives	
The lesson provided a new way for meeting mandatory standards	
The lesson provided a challenge for the students	

Presenter Evaluation	1-least agreement to 10-most agreement
The presenter used appropriate (educational quality of language throughout lesson)	
The presenter maintained an appropriate (educational) quality of style, pace and delivery	
The presenter had excellent instructional skills	
The presenter's interactions with students and teachers were positive and educationally appropriate	
The EEI presentations exceeded my expectations	

My Water Promise:

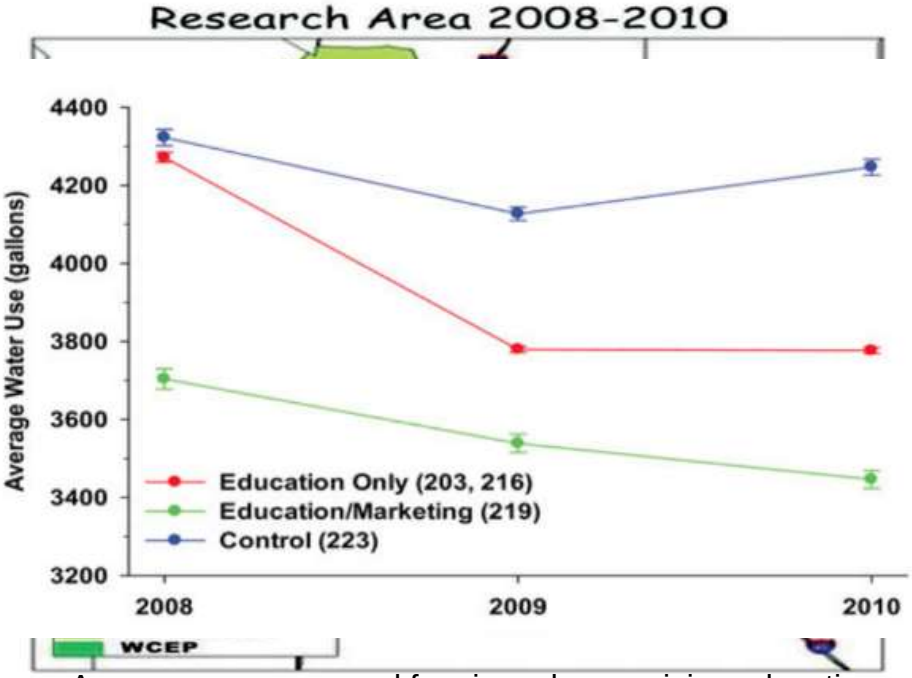
Water is an important thing you know.
We don't want it to run out or get low.
We need it to drink and keep clean.
Wasting it would indeed be mean!
So while brushing, my water is off for you and me.
What a difference that will make, you wait and see!

I_____promise to turn the water off when I brush my teeth!

Date:_____ Grade: _____

Dallas Follow-Up Study

- Limitation in original study - No numerical data
- A 2013 follow-up study utilized water bills for the same time period to measure conservation.
- Methods of study
- Results show an actual saving of 436,000 gallons per month, a savings of 5,240,000 gallons per year.



Location of elementary schools within research area.

Average use compared for zip codes receiving education only, education/marketing materials, and those that did not receive any education or marketing materials.

Thompson et al., 2011

Analysis: Texas Urban Water Conservation Education Programs

	San Antonio, TX	Houston, TX	Dallas, TX
Commitment to Saving Water			
Commitment to Program(s)			
Presentation Quality			
Comparing Metering Data (Water Bills) Post Program			
Use of Automatic Metering Infrastructure (AMI) Data			

Discussion

- Lack of data showing GPCD conservation from programs
- Lack of methodology to evaluate GPCD
- Lack of standard evaluation methods
- Use of AMI
- AWWA accreditation system
- Congruent goals and methods
- Increased investment = expected return

Questions?

Every DROP counts