

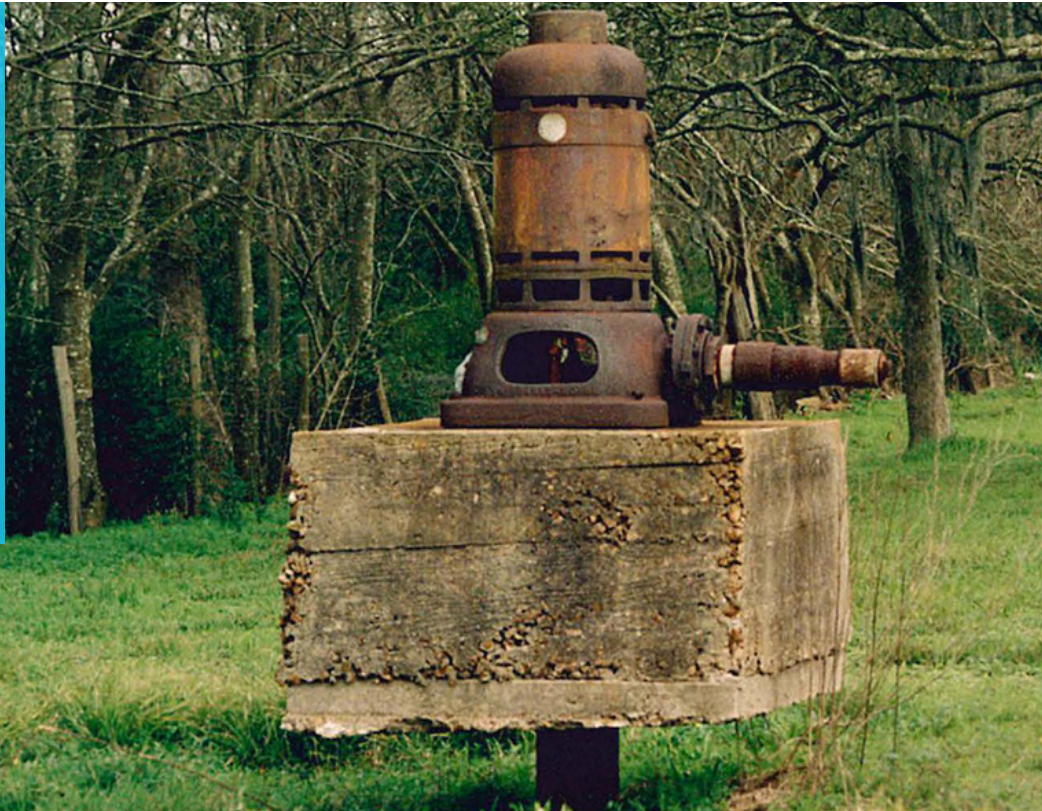
PARTNERS IN PROGRESS

WINTER 2020



WHAT IS SUBSIDENCE AND WHY SHOULD WE CARE ABOUT IT?

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2020 RISING COST OF WATER BROCHURES ARE AVAILABLE.



Order the 2020 edition of the Rising Cost of Water Brochure by visiting the West Harris County Regional Water Authority website and following the link on the home page.

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EVERY DROP ADDS UP!

The easiest and most cost-effective way to help ensure we have enough water for the future is to conserve the water we currently have. That's where everyone in Texas comes in.

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Introducing the Authority's Water Quality Mobile Teaching Lab and MIZ WATERLADY!

The WHCRWA has a new mobile attraction that has been featured at special events hosted by a variety of MUDs. Visitors learn about the critical issues of Stormwater Pollution and how to avoid it; Patty Potty's NO WIPES IN THE PIPES Campaign that teaches people about what shouldn't be flushed down toilets; proper disposal of F.O.G. -- Fats, Oil and Grease; the importance of “Scooping the Poop” (cleaning up after your dog); and a display about various careers in “WATER”.

MIZ WATERLADY hosts this fun and informative venue, shares helpful handouts, and answers questions. Her team staffs a series of related games with prizes for the winners. Miz Waterlady and the Mobile Lab are available to ISDs and MUDs within the WHCRWA boundaries. There is a reservation form on the Authority's website (www.whcrwa.com).



Every Drop Adds Up!



By Kathleen Jackson, Board Member, Texas Water Development Board

Last fall, at the end of September, just a few weeks after Tropical Depression Imelda dropped more than 40 inches of rainfall in parts of southeast Texas, approximately 48 percent of the state was in drought. That was a 10 percent increase over the month before!

How can that be, when so many Texans are hurting from yet another instance of too much water? How can we even think about having too little water after such an event? It's a pattern seen throughout history: Texas is a state of perpetual drought punctuated by times of flood. Because of the vast size of our state and the diversity of our climate, Texans are almost guaranteed the constant contradiction of simultaneous flood and drought. That is why the state must address them concurrently. We must continue to plan for the next drought and for our future water supply needs even when recovering from floods.

The [2017 State Water Plan](#) tells us that Texas faces significant water shortages over the next 50 years if steps are not taken to conserve and develop additional water supplies. Rapid population growth is expected and along with it, water demands. Texas' existing water supplies—those that can already be relied on in the event of drought—are expected to decline.

As we've said before and we'll no doubt say

again, ***there is no new water to be created on Earth.*** The water available to us now is the same water that was here thousands of years ago and the same water that will be used by generations to come.

The easiest and most cost-effective way to help ensure we have enough water for the future is to conserve the water we currently have. That's where everyone in Texas comes in.

Perhaps you're thinking, "Can I really make a difference as one person?" Yes, you can! Besides, if everyone does a little, it adds up to a BIG difference for our state! There are many ways to conserve water, several of which are small changes that we can all make in our daily routines.

One easy option is to shorten shower time. Did you know that reducing your shower from 10 to 5 minutes could save approximately 12.5 gallons per shower with an efficient showerhead? That's more than 4,500 gallons a year! Consider this:

If you and 24 family members, friends, or neighbors each made this change, it would add up to more than 100,000 gallons per year. That's well over a million 12-ounce cans of your favorite beverage.

Or, put another way, currently in Texas, the average annual per-person water use is approximately 59,495 gallons a year.¹ That shorter shower by 25 people just created enough water for

more than one person for an entire year. Imagine the difference it would make if our entire population of 28 million shortened their showers.

To put this into perspective, the state has estimated that by 2020 it will need to save 72,990,720,743 gallons through municipal conservation to meet the water needs of residents. That amount quadruples in 50 years. And everyone can help us meet those goals.

So, how else can you save water as you go about your daily activities? We're glad you asked. And no, you don't need to give up your morning coffee! Here are a few ideas, some of which you may already be doing:

- ◆ Turn off the tap when brushing your teeth.
- ◆ Install water-efficient appliances.
- ◆ Check your toilet and fixtures for leaks.
- ◆ Water your yard in the morning or late evening.
- ◆ Run the dishwasher, rather than washing dishes by hand.



In addition to individual efforts, communities across Texas recognize the importance of conservation and efficiencies in their water operations. For example, some utilities have incorporated advanced metering infrastructure into their systems, offering the ability to monitor meters in real time to obtain more accurate data on water usage throughout the system. This means that leaks and water loss in the distribution network can be detected earlier, helping utilities conserve water and money.

Reprinted by permission from the Texas Water Development Board.



Reuse is another way communities are making smart use of their water supply. Water reuse generally refers to the process of using treated wastewater (reclaimed water) for a beneficial purpose. The degree of treatment depends on the proposed use for the water. Examples of water reuse include irrigation, cooling, and augmenting water supplies.

We can all play a part in reducing water use and making smart decisions to help ensure this critical resource will be available for generations to come and in times when Texas needs it most. A few drops from a leaky faucet or five minutes of shower time may seem insignificant, but every drop adds up.



¹ According to data provided in the 2017 State Water Plan



WE CERTAINLY GOT A LOT OF RAIN LAST YEAR. DOES THAT MEAN WE CAN STOP CONSERVING WATER?

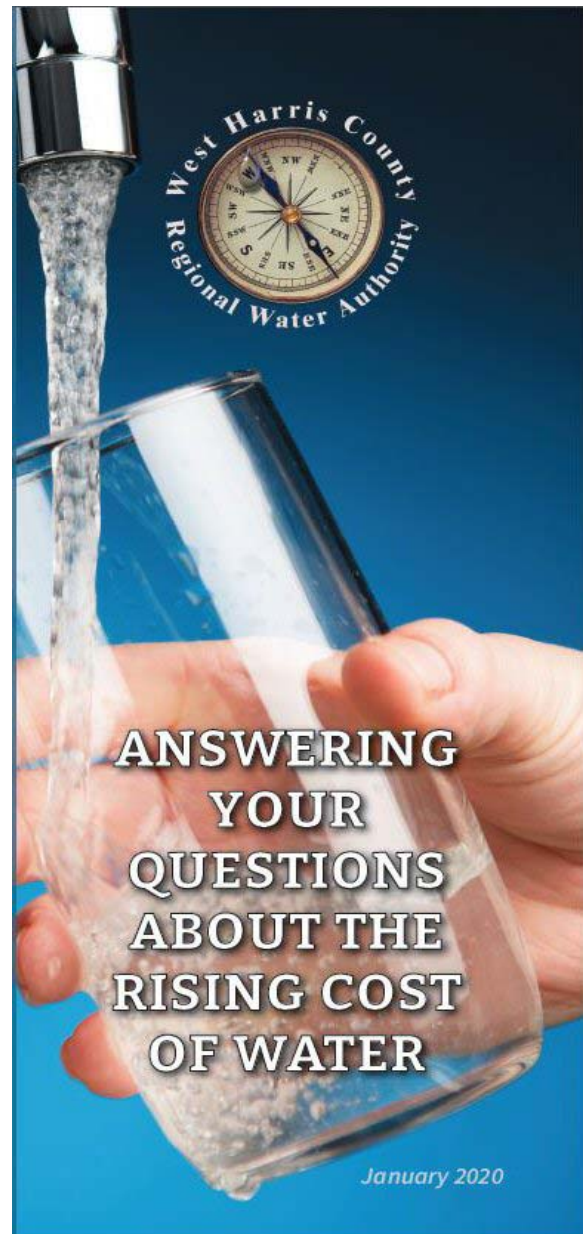
Texans are used to dramatic weather extremes, with the pendulum swinging back and forth between scorching drought and raging floods. Heavy rainfall may fill the creeks, streams, rivers and lakes, but the aquifers below are slow to recharge.

In Texas, about 60% of our drinking water is supplied by groundwater, so it is critical to use our finite water resources more efficiently – come rain or shine.

Please use water wisely!



The water we conserve today
can serve us tomorrow.
www.SaveWaterTexas.org



**Order online now...
2020 Rising Cost
of Water Brochure**

www.whcrwa.com

SOME FUN WITH FOLKLORE...



When February rolls around each year, there's great anticipation in Punxsutawney, a little town in Pennsylvania. According to folklore, if it is cloudy when a groundhog (Punxsutawney Phil, in this case) emerges from its burrow on February 2nd, it will leave the burrow, signifying that winter will soon end. If, on the other hand, it is a sunny day, the groundhog will see its shadow and scamper back into its burrow, predicting that winter will last for six more weeks.

Punxsutawney held its first **Groundhog Day** in the 1800s. The first official trek to Gobbler's Knob, where the celebration takes place, was made on February 2, 1887. This annual celebration began with the Germans, Pennsylvania's earliest settlers. They brought with them the legend of **Candlemas Day**, which foretells, "*For as the sun shines on Candlemas day, so far will the snow swirl in May...*". The settlers found groundhogs to be plentiful and decided they were the most intelligent and sensible animal to carry on the legend of Candlemas Day.

The Punxsutawney celebration is televised and shown around the world. The full schedule of events, that begin in January, include "Breakfast with Phil", poetry and book readings, and several gala fundraising events. The official website of the Punxsutawney Groundhog Club posts the schedules, and introduces the town's Groundhog Club's *Inner Circle* -- a group of local dignitaries who carry on the tradition of Groundhog Day every year. They not only have the task of planning the celebration's events, but they're also responsible for the feeding and care of Phil himself! On February 2nd, they dress for the occasion in top hats and tux. Folklore it may be, but Phil has a pretty impressive track record for being right about the weather.

When it comes to water, there are many superstitions that have been passed down over the ages. Perhaps one of the most interesting of these, however, is the folklore surrounding "water witching." That's the "skill" of using a forked stick, rod, pendulum, or some similar device that "points" to where underground water is located. The phrase was first used in America around 1810 - 1820, according to the Random House Unabridged Dictionary.

This is a topic on which "practitioners" and science collide, perhaps not surprisingly. The National Ground Water Association *strongly opposes the use of water witchers to locate groundwater on the grounds that controlled experimental evidence clearly indicates that the technique is totally without scientific merit.*

Over the centuries, history tells us that there have been people able to "find" water underground. They have been called water-pointers, dowzers, or sometimes stick-witchers. As long as man grows crops and raises animals, they say, he will need water. The better the supply, the better for his future. Therefore, the water witchers point out, if someone can come along and identify, with relative ease, where to place a well to get a steady supply of good water, he should be appreciated as a benefactor to the community. No mystery or superstition about it. And, if he is good at it, word will get around and he will find water sources for more of his neighbors and his business will grow.

There are people -- including some with scientific educations -- that absolutely believe that underground water can be discovered by this method. There are societies devoted to this craft -- serious followers and providers of the "witching" services -- who remain active today! ♦



IS THERE A GHOST IN YOUR HOUSE?



**This common household problem
can steal your water and money, too!**

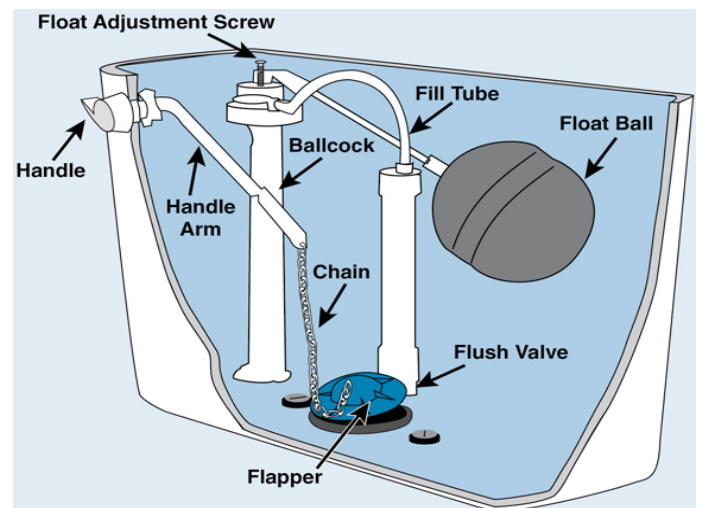
Halloween is long past, but at all times of the day and night, a strange noise invades the silence at your house...it wakes you from sleep or sends you chasing around in search of the annoying source. The noise is not predictable...it doesn't have a regular schedule but comes and goes. It sounds like someone turning on a hose outside...like water briefly rushing through a pipe...and then its gone again.

Finally, you just happen to be in the bathroom when, there it is. There's no one there, but the toilet is flushing itself. No, it isn't that famous cat that drove its owners nuts by repeatedly flushing the toilet causing an outrageously high water bill. Yours is a phantom flush...you're the only one there to hear the *flush* echo around the empty bathroom.

Now that you've solved the mystery, what

can you do to make it stop?

The best place to start is to understand the way a toilet works. When you push the lever for a flush, the water in the tank rushes into the bowl. As the water in the tank drains, the water level recedes and finally gets low enough for the float to activate the fill valve, which triggers the tank to refill again.



While this process is going on, as the levers cause the water to come and go, the sounds are familiar and reassuring; the toilet is performing as expected. A toilet that cuts on and off by itself, or runs intermittently, on the other hand, has a problem that plumbers call a "phantom flush".



GHOST TOILET LEAKS...

Continued from page 7

A toilet that seems to flush all by itself usually has a slow leak from the tank to the bowl. The water level drops below a certain point, so the float signals that the tank needs to be refilled...which causes the flushing sound as it adds more water. This is usually caused by a deteriorating *flapper* or *flapper seat* (see diagram).

This annoying -- and costly -- problem can usually be fixed without calling a plumber. Here's a place to start the "diagnosis".

Lift the lid on the tank and put a few drops of food coloring in the tank, and don't flush the toilet for about 30 minutes. If this color starts seeping into the toilet bowl, you'll know the flapper is leaking.



One thing you can try is to lengthen the chain holding the flapper to the flush handle by one or two links. When the chain is too short, it prevents the flapper from "seating" in the syphon hole and can cause the type of slow leak that produces the phantom flushing. Repeat the dye test, and if the water changes color again, replace the flapper.

Turn off the water supply and hold down the flush handle to empty the tank. Remove the old flapper by disconnecting it from the chain and unhook its two "ears" from the overflow tube. Take it with you to the hardware store to make sure that you purchase an identical replacement. Follow the instructions to install the new flapper -- making sure the chain has enough slack for the flapper to fully seat. If you're satisfied that everything is working properly, repeat the dye test. Test flush the toilet a few more times before you put it back in service.

Always find and fix toilet leaks...they waste water and money! 💧



**WE HAVE A LIMITED NUMBER
OF TOILET LEAK TEST TABS
AVAILABLE FOR DISTRICT
EVENTS.**

**PLEASE USE THE ONLINE ORDER
FORM TO REQUEST THEM.**

WWW.WHCRWA.COM

Where will their water come from?

BE A WATER HERO! USE WATER WISELY.



The water we conserve today can serve ~~us~~ ^{them} tomorrow!



An Important message from the Save Water Texas Coalition - savewatertexas.org



CONGRATS TO OUR PATTY POTTY... FEATURE ARTICLE IN NATIONAL TRADE PUBLICATION, TREATMENT PLANT OPERATOR!

*Also highlighted in
their social media*



What's a WATER "FOOTPRINT" and How Big is Yours?



It sounds strange, but water experts have recently begun calculating water usage for individuals, households, communities and even whole countries by considering how much water they directly or indirectly consume in any given time frame. This includes "virtual water"—the amount of water needed to produce everyday things we rely on like food, energy, clothing and shelter.

Did you know that the water footprint of a pound of plastic is 24 gallons. That means that the container of bottled water, juice or soft drink uses three to five times as much water to create as the beverage it contains! Get the picture? Most folks have no idea how much fresh water they consume in a day. That's where the water footprint concept comes in -- it can remind us where our water comes from and its true value as *the* critical component in virtually everything in our lives and lifestyle. Consider all the ways you can use water more efficiently — taking shorter showers, running the dishwasher or washing machine only with full loads, and **MOST IMPORTANTLY**, water your lawn only when it needs it. Use less....save more!

If you think of your 'footprint' as how much water you use, are you a tip-toe...or a BIG FOOT? Here's a quiz to see what you think "uses" a lot of water to grow, create or make! Guess how many gallons of water each of these items require. The answers are below...no peeking!

**HERE ARE YOUR CHOICES: 25 gallons; 122 gallons; 5,000 gallons; 65 gallons;
400 gallons; 40,000 gallons; 1,400 gallons; 45 gallons;
100,000 gallons; 2,500 gallons.**



loaf of bread



burger, fries & a drink



slow faucet drip



automobile



glass of milk



pair of blue jeans



1 pound of beef



5 minute shower



full load, washing machine



serving of chicken

ANSWERS: bread: 122 gallons; burger, fries, drink: 1,400 gallons; faucet drip: 5,000 gallons; auto: 100,000 gallons; milk: 65 gallons; blue jeans: 40,000 gallons; pound of beef: 2,500 gallons; 5 minute shower: 25 gallons; full load of wash: 45 gallons; serving of chicken: 400 gallons.

WHAT IS SUBSIDENCE AND WHY SHOULD WE CARE ABOUT IT?



Sub-si-dence – the sinking down of land resulting from natural shifts or human activity, frequently causing structural damage to buildings.

Following a period of rapid and sustained growth and an influx of new residents triggered by the expansion of the petrochemical industry and allied businesses following World War II, six or more feet of subsidence had occurred in Harris and Galveston Counties by the mid-1970's along the Ship Channel. By 1979, up to 10 feet of subsidence was measured there, and over 3,000 square miles had 'sunk' by more than 1 foot. The elevation of the land surface is lowered when the many layers of clay beneath the land surface are compacted.

As people have been saying for centuries, "Nature abhors a vacuum." When large amounts of groundwater are drawn out of the aquifers, it should be no surprise that the clay layers would collapse under the weight of everything above them, and effectively decrease the storage capacity of the aquifer...never to return to previous levels. Some natural settling or shifting of sediments laid down millions of years ago may also cause subsidence, but not to the extent of that caused by the withdrawal of oil and gas, subsurface coal mining, and the pumpage of groundwater.



An example of what can happen when land loses elevation by subsidence. (USGS photo)

Most of the groundwater wells that supply drinking water to the Houston-Galveston area are completed in the upper 1,000 to 2,000 feet of the Chicot and Evangeline aquifers. As subsidence

increased inland – north and west of Houston – water levels have declined more than 100 feet in the Evangeline aquifer between 1977 and 1997. The area's steadily increasing population and decades of aggressive water usage have resulted in a corresponding decline of the aquifers and in subsidence.

That "sinking" feeling...

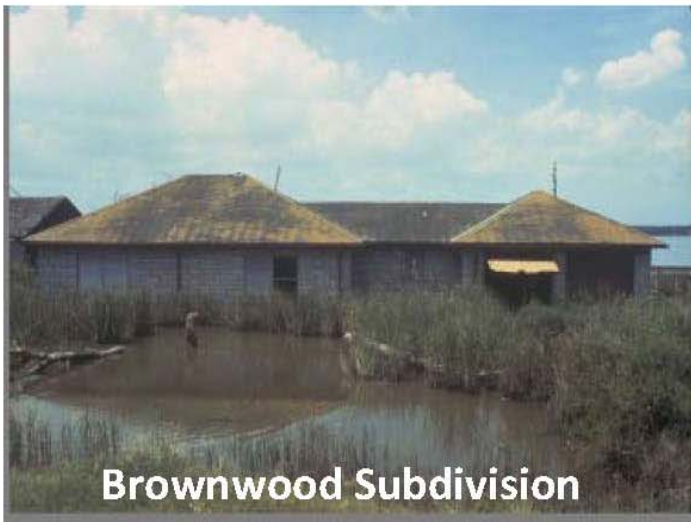
According to the United States Geological Service (USGS), the greater Houston area has been more adversely impacted by subsidence than any other metropolitan area in the U.S. Extensive subsidence – caused primarily by groundwater pumping (and to a lesser extent, by oil and gas extraction) has caused damage to the area's industrial and transportation infrastructure, increased the frequency of flooding, and has cost millions of dollars. (One conservative estimate places the average annual direct and indirect cost of subsidence to property owners at more than \$90 billion in 1998 dollars.)

Look at it this way. If the elevation of your house is only 10 feet above sea level and you lose 10 feet of elevation because of subsidence...your house is now under water. This actually happened to Brownwood, a subdivision in the City of Baytown that had to be abandoned – an extreme example of the effects of subsidence in coastal areas. While regional land subsidence can be subtle and difficult to detect, there are locations in and near Houston where the effects are quite evident. As much as 10 feet of subsidence has shifted the coastline and changed the distribution of important wetlands. One of the most obvious impacts of subsidence has occurred at the San Jacinto Battleground State Historical Park, where Texas won its independence, which is now partly submerged with 100 acres of the park under water.

In search of solutions...

It was a growing awareness of subsidence and related problems that prompted community and business leaders to lobby for some relief. The 1975 Texas Legislature responded with the creation of the

Continued next page



Brownwood Subdivision

Harris-Galveston Coastal Subsidence District (HGSD) “for the purpose of ending subsidence which contributes to, or precipitates, flooding, inundation, and overflow of any area within the Subsidence District....” The HGSD was authorized to control the issuance of well permits, promote water conservation and education, and promote conversion from groundwater to surface water supplies. It was largely successful in its efforts to arrest subsidence in the coastal plain east of Houston.

After addressing subsidence in areas south of Houston, in 2000 the HGSD required the phased conversion from groundwater (water wells) to surface water (lakes and reservoirs) in northwest Harris County. This mandate required that we reduce reliance on groundwater at least 30 percent by 2010; 70 percent by 2020; and by 80 percent in 2030. Failure to meet these deadlines would trigger huge Subsidence District penalties of \$7.00/1000 gallons. Since that time, there have been a number of increases and today, the Disincentive fee is \$9.24/ per 1,000 gallons.



A road that provided access to the San Jacinto Monument was closed due to flooding caused by subsidence.

By 2013, there were serious concerns about population projections and the ability to meet the HGSD’s 2020 mandate. At its January 2013 board meeting, the Subsidence District voted to delay the next conversion date from 2020 to 2025, and to reduce the percentage conversion from 70 percent to 60 percent of total water usage. The 2030 deadline was also extended to 2035. For ratepayers, that means a more gradual – but still substantial – increase in rates to pay for the construction of new waterlines and capacity throughout the West Harris County region, and allows a more logical, reasonable approach to the design, bid and construction process.

In addition to pursuing its Capital Improvement and construction programs to meet Subsidence District mandates, the WHCRWA continues to encourage water conservation by offering incentives to individual water districts that find creative ways to reuse water resources, or find other alternatives to groundwater pumping. And, as it has since its inception in 2001, the Authority aggressively promotes water efficiency by residents of all ages, through educational programs and community outreach efforts.

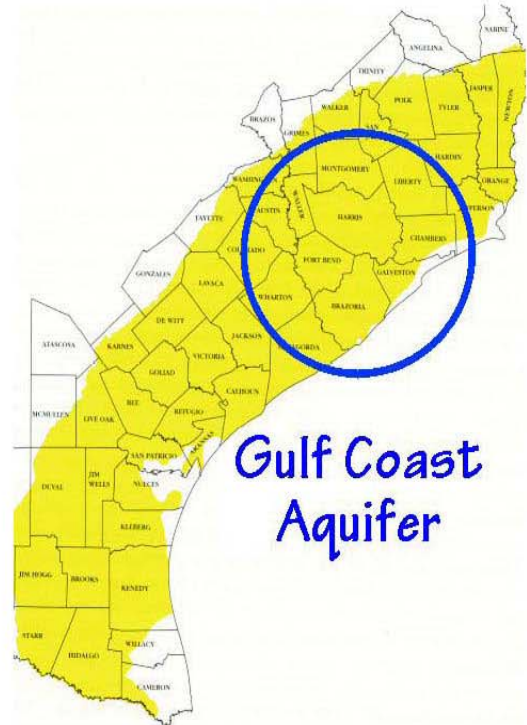
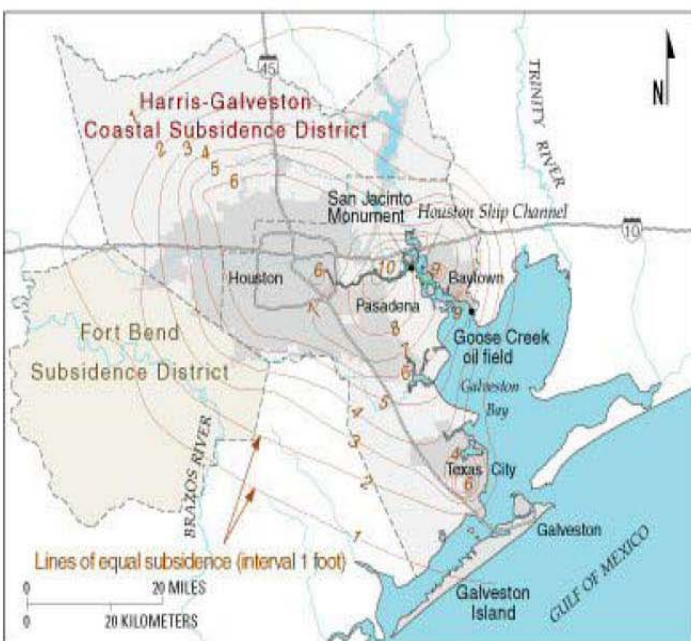
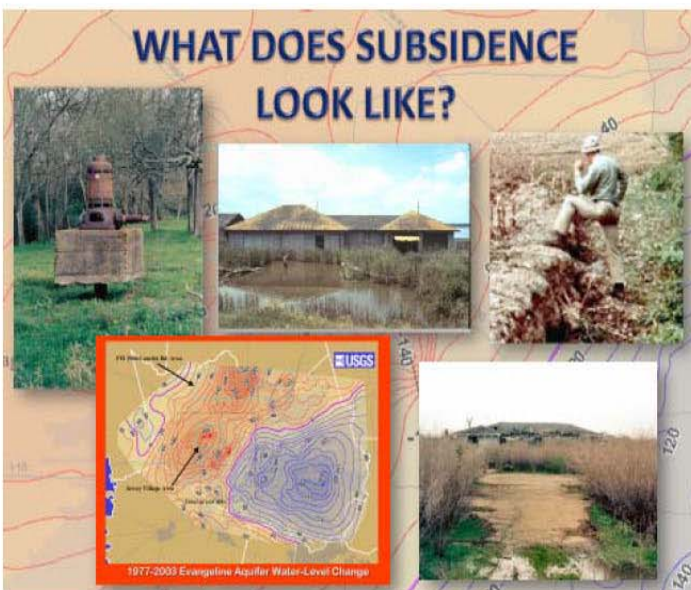
WATER...WHAT WOULD WE DO WITHOUT IT?

West Harris County Regional Water Authority

Member of the Save Water Texas Coalition
www.SaveWaterTexas.org



Measuring Subsidence



The **Gulf Coast Aquifer** forms an irregular shaped belt along the Gulf of Mexico from Florida to Mexico. In Texas, it provides water to all or parts of 54 counties, and the greater Houston metropolitan area. The aquifer is made up of a combination of clays, silts, sands, and gravels that are all connected to form a large, leaky artesian aquifer system comprised of four major components. The deepest of these water producing formations is the Catahoula. Above that is the Jasper Aquifer, followed by the Evangeline Aquifer, and topped by the Chicot Aquifer.

According to the Texas Water Development Board, years of heavy pumpage in portions of the aquifer have resulted in areas of significant water level decline. Declines of 200 to 300 feet have been measured in some areas of eastern and southeastern Harris and northern Galveston County. Although there is some continued decline in the Galveston area, conversion to surface water and a reduction in groundwater usage has slowed the rate of decline, and has actually allowed some recharge of the aquifer in at least one location.



**Did you know that WHCRWA has some NEW, FREE
billing inserts for distribution to District customers...
and they can be ordered online?
<https://www.whcrwa.com/order-form/>**

A LEAKY FAUCET

Can waste thousands of dollars a year!



THAT'S MONEY DOWN THE DRAIN!



**WATER LESS
SAVE MORE**
savewaterutexas.org

LEAKY TOILET

The single greatest water waster in the home is a leaking TOILET!



A leak of one gallon every six minutes adds up to ten gallons an hour, or 240 gallons per day!



**WATER LESS
SAVE MORE**
savewaterutexas.org

RUN THE DISHWASHER ONLY WHEN IT'S FULL!



Save water, energy and money!



**WATER LESS
SAVE MORE**
savewaterutexas.org

STOP THOSE LEAKS

Save water and money! Stop leaky faucets and toilets.

More than 10% of the water used in the home can be due to leaks



Check routinely for leaking faucets, leaking toilets, and leaking appliances. Watch your water bill for any sudden increase in usage without changing your usual patterns. Fixing leaky faucets and plumbing joints can save 20 gallons a day for each one stopped.



**WATER LESS
SAVE MORE**
savewaterutexas.org

TAKE SHORTER SHOWERS

Even a one or two minute shorter shower can save up to 700 gallons of water a month.



Multiply that reduction in water use by the number of people in your household and you're talking about some serious water savings!



**WATER LESS
SAVE MORE**
savewaterutexas.org

THE WASHING MACHINE

The second largest water user in your home.

Can account for as much as 22% of residential water use.



RUN ONLY WITH FULL LOADS
MINIMUM VOLUME SHORTER WASH CYCLES



**WATER LESS
SAVE MORE**
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TURN OFF THE WATER WHILE BRUSHING YOUR TEETH

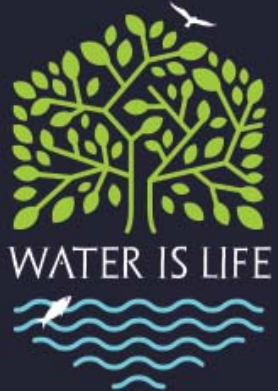


Did you know that turning off the water while you brush your teeth can save four gallons each time? In one year that adds up to be about 2,880 gallons of water!




**WATER LESS
SAVE MORE**
savewaterutexas.org

WATER IS LIFE



Every Living Creature Needs It To Survive!



**WATER LESS
SAVE MORE**
savewaterutexas.org