

# W A T E R W O R K S

**WINTER 2016**

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## **Why does the cost of water keep going up?**

### **and other frequently asked questions**

For more than a decade, the West Harris County Regional Water Authority has been providing surface water to MUDs within our boundaries to comply with a mandate to reduce the use of groundwater issued by the Harris Galveston Subsidence District (HGSD). Since the Authority was created by the Texas Legislature in 2001, we have been communicating with area residents about our efforts to provide alternate water supplies as required, and providing information about how to use our finite water resources more efficiently. What follows is a recap of some of the most frequently asked questions....

### **WHERE DOES THE WATER YOU USE AT YOUR HOME COME FROM?**

Traditionally, our drinking water has been provided and delivered to homes and businesses by individual MUDs -- municipal utility districts -- from groundwater wells that might have been in service since the 1950's and 60's. The aquifers that have provided what seemed like an endless supply of drinking water have begun to decline and some of the districts encountered arsenic over Environmental Protection Agency limits.

Due to HGSD regulations, the WHCRWA began delivering surface water to MUDs in 2005. The WHCRWA provided an average of 20.9 million gallons a day (MGD) of surface water to MUDs within its boundaries for the period of 12/1/14 to 11/30/15 and is 37.7 percent converted to non-groundwater supplies.

### **WHAT IS THE WHCRWA FEE ON YOUR WATER BILL?**

The WHCRWA was given **no taxing authority** when it was created by the Legislature, so the Authority charges fees for water pumped by the utility districts and well owners within their boundaries and for surface water provided to them by the Authority. Since its inception in 2001, these fees --in addition to a series of bond sales -- have helped to fund securing a long-term water supply contract with the City of Houston; costs related to the development and execution of the Groundwater Reduction Plan (GRP) required by HGSD; engineering to design and construct an entirely new infrastructure to transport and deliver surface water to the region; and funds to purchase the staggering number of easements for new waterlines necessary to comply with the conversion timeline mandate.

We will increasingly rely on surface water in the years ahead. In fact, in 2025, 60 percent of the water we'll use must come from surface or alternate water supplies. Dramatic population increases are forecast for our region of Texas in the future so -- in addition to securing additional water resources -- we'll need to significantly increase our efforts to use water more efficiently and to initiate more

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## Frequently Asked Questions...

*Continued from page 1*

water reuse projects to be able to meet the spiraling demand.

### WHAT IS BEING DONE TO ENSURE A LONG TERM SUPPLY OF WATER FOR OUR COMMUNITY?

Along with other entities charged with similar conversion missions, the WHCRWA has adopted a partnership approach whenever possible to minimize costs and maximize project timetables.

The San Jacinto River system with Lake Conroe and Lake Houston will not be able to provide all the water needed to meet future demand so the four regional water Authorities -- WHCRWA, North Harris County Regional Water Authority, Central Harris County Regional Water Authority, and North Fort Bend Water Authority (NFBWA) -- teamed up with the City of Houston and the Coastal Water Authority (CWA) to initiate the **Luce Bayou project** with the capacity to bring nearly 500 million gallons a day (MGD) of raw water from the Trinity River to Lake Houston and the Northeast Water Purification Plant (NEWPP). This project, when completed, will cost nearly \$350 million. The WHCRWA prorated share is estimated to be approximately \$70 million.

With more raw water to come into the San Jacinto/Lake Houston reservoir, more treatment capacity will be urgently needed. The four regional water authorities (including WHCRWA) and the City of Houston have agreed to partner in a **phased expansion of the NEWPP** with some capacity to be ready by 2021 and the remainder by 2024. The NEWPP's treatment capacity will increase from the current 80 MGD to 400 MGD at a cost currently estimated to be approximately \$1.28 billion. The WHCRWA will have 82.42 MGD treatment capacity in the plant. In total, the WHCRWA share of the NEWPP's capital costs will be about \$326 million.



To convey the surface water from the NEWPP, the WHCRWA (in partnership with the North Fort Bend Water Authority) will construct the **Surface Water Supply Project**, a 39-mile-long, eight foot diameter water line to supply water from the NEWPP through north Houston, to

the Fry Road area. The estimated cost of this project is \$680 million, with the WHCRWA share being \$375 million.

In addition to these projects, the WHCRWA will also build more infrastructure to receive and deliver the water to MUDs, costing in the range of \$361 million over the next decade or so, to construct another 75 miles of transmission and distribution lines to add an additional 52 MUDs receiving surface water.

### HOW WILL WE PAY FOR ALL THE NEW INFRASTRUCTURE AND ADDITIONAL WATER SUPPLY?

This massive investment is not only needed for the near-term, but for future generations of water users. In 2015, the Texas Water Development Board (TWDB) awarded WHCRWA a multi-year commitment of \$812 million in low-interest **SWIFT\*** funds that will help keep our debt service costs as low as possible.

*\*State Water Implementation Revenue Fund for TX*

### WHCRWA HISTORY TIMELINE

- **1975** -- Harris Galveston Subsidence District (HGSD) created by Texas Legislature to end subsidence resulting from large ground-water withdrawals from the aquifers, causing clay layers to collapse, which decreases the storage capacity of the aquifer.
- **1976** -- HGSD issued its first Regulatory Plan mandating reduction of groundwater withdrawals in the coastal areas. The strategy successfully halted subsidence in those areas.
- **1999** -- HGSD issued Regulatory Plan mandating phased reductions in groundwater withdrawals in north and northwest Harris County, with first reduction milestone in 2010.
- **2001** -- the 77th Texas Legislature created the West Harris County Regional Water Authority (WHCRWA) to manage a massive conversion to surface water mandated by HGSD.
- **2003** -- The Authority negotiates a long term water supply contract with the City of Houston.
- **2005** -- WHCRWA delivered the first ever surface water in northwest Harris County -- within its initial schedule and within budget constraints.
- **2015** -- WHCRWA has purchased easements for, and constructed over 57 miles of new waterlines; has constructed Pump Station #1, and is delivering up to 28.25 million gallons of surface water a day to 53 water plants, with a little over 37.7 percent of the Authority's water usage converted. Included in the WHCRWA boundaries are the City of Katy, 118 municipal utility districts, and 450,000 people within about 226 square miles.
- **2016** -- The 2016 WHCRWA fees are: \$2.25/1000 gallons Groundwater/GRP rate and \$2.65/1000 gallons for Surface Water.



# Climate is what you expect...Weather is what you get!

## *The State's continuing saga of rain and drought and floods*

By **Jeff Lindner**, Flood Watch Department Manager/Meteorologist,  
Harris County Flood Control District

During 2015, weather patterns resulted in vast fluctuations between intense periods of excessive rainfall and intense periods of dryness. Few would have imagined -- after the record breaking spring rainfall -- that drought conditions would develop in just a few months over the region and that the developing drought would end abruptly with more significant flooding, and underscore the need for flood control and mitigation and water conservation.

The fact that these weather extremes occurred within such short time periods emphasizes how important it is for local residents to know the risks of both flood and drought across Harris County and the state of Texas. Understanding how quickly such extremes can onset enables residents to take the necessary actions to mitigate damages related to these weather events.

### ***Weather Extremes...***

Last year -- 2015 -- started off similar to the previous six years with below normal rainfall across much of southeast Texas. Rainfall greatly increased across the area in March 2015 with the following three months bringing extraordinary rainfall to much of the state. The period from March to May 2015 became the *wettest spring period ever on record for the City of Houston* with 26.61 inches of rainfall surpassing the previous record of 22.79 inches in 1993. More rain fell in that three month period than during all of 2011 which recorded 24.57 inches of rain.

May and June 2015 brought several major flooding events across Texas, including the devastating Blanco River flood and the Memorial Day evening flood that hit portions of Harris and Fort Bend Counties. During a three hour period that evening, portions of southwest Harris County and northeastern Fort Bend County received a staggering 8.0-11.0 inches of rainfall. This resulted in one of the most significant urban flash flood events across the City of Houston since Tropical Storm Allison (June 2001).

May 2015 became the wettest month ever for the state of Texas with an average of 8.93 inches of rainfall surpassing the previous record of 6.66 inches in June 2004 by an impressive 2.27 inches. ***The statewide average of 8.93 inches of rainfall in that one month was equivalent to 35 trillion gallons of water.***

Only a few weeks later -- in the middle of June -- Tropical Storm Bill made landfall on the middle Texas coast resulting in additional flooding rainfall across the western counties of southeast Texas from Wharton to

Sealy to College Station. A record crest of West Mustang Creek at Ganado closed US 59 in both directions following the passage of Tropical Storm Bill and the Lavaca River at Edna reached its fourth highest crest ever.

### ***The Pendulum Swings...***

After an incredibly wet first half of 2015, the rainfall greatly subsided during the first week of July. Areas north of I-10 recorded generally less than 10.0 inches of rainfall from early July to mid October with some locations recording less than 5.0 inches of rainfall. Rainfall for that period ranged from 1.0 to 8.0 inches below normal over southeast Texas.

After the cool temperatures and soaking rains of spring the dramatic shift to dry and hot conditions resulted in a rapid deterioration of vegetation across the region that had become accustomed to the plentiful rainfall. ***Irrigation demands greatly increased in the August and September time period.*** Lake Conroe after reaching a peak of 202.42 ft on May 27 (1.42 ft into its flood pool) fell steadily to a low of 198.98 ft on October 21st, or 2.02 ft below its conservation pool level. The "flash drought" came to an abrupt end in late October when two significant rainfall events struck the region.

The first rainfall event occurred from October 23-26 as the remnants of powerful eastern Pacific Hurricane Patricia moved across Texas. Rainfall averaged 8.0-10.0 inches across portions of southeast Texas including Harris County. Since the area was suffering from ongoing drought conditions flooding was minimal with this rainfall. Less than a week later, however, another significant rainfall event would impact Texas.

On October 30<sup>th</sup>, severe flash flooding struck the I-35 corridor with many of the same locations impacted on Memorial Day weekend being hit again. An incredible 10.81 inches of rainfall was recorded by a Lower Colorado River Authority gage at Onion Creek and HWY 183 in a 2 hour period. A day later, 8.0-10.0 inches of rain fell across central and eastern Harris County into Liberty County resulting in significant flooding. During the last 9 days of October, portions of eastern Harris County recorded over 20.0 inches of rainfall compared to just 9.0 inches for the entire period from early July to mid October.

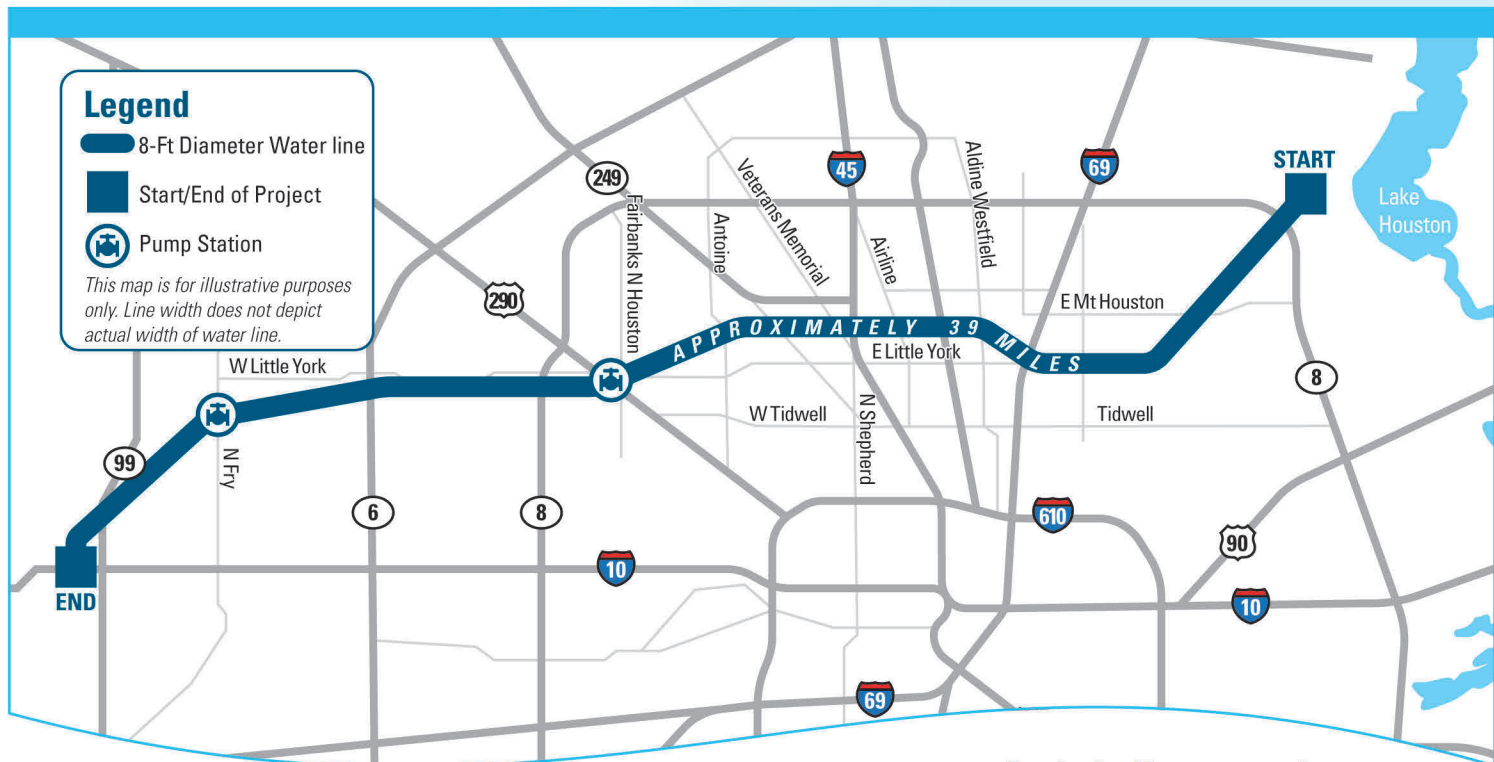
***2015 ended as the wettest year ever for the state of Texas with an average statewide rainfall of 41.39 inches surpassing the previous record of 40.22 inches in 1941. ♠***





## SURFACE WATER SUPPLY PROJECT

# Project Update



### About the Surface Water Supply Project

The Greater Houston metropolitan area is one of the fastest growing regions in the nation. From 2000 to 2030, our metropolitan area is projected to rank fifth in the nation in population growth – bringing the current population of 6.5 million to greater than 9.2 million residents.

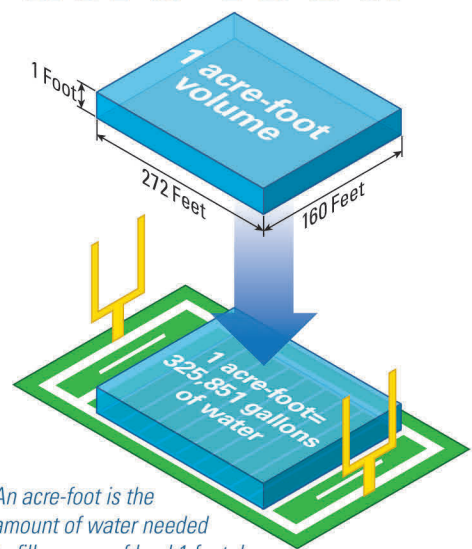
This population growth presents an urgent need to maintain and expand public infrastructure, including roadways, water-supply, sewer, and other utilities. The West Harris County Regional Water Authority and North Fort Bend Water Authority are responding to this need by delivering the Surface Water Supply Project, formerly identified as the Second Source Project.

In order for the West Harris County Regional Water Authority and North Fort Bend Water Authority to meet water demands for 2025 and beyond, the Authorities have partnered to deliver the Surface Water Supply Project. The project provides a primary source of surface water necessary to meet the service areas' water needs and maintain compliance with the Harris Galveston Subsidence District and the Fort Bend Subsidence District's groundwater reduction requirements.

Surface water will be supplied from Lake Houston by way of the City of Houston's Northeast Water Purification Plant, through approximately 39 miles of an 8-foot-diameter pipeline and two large pump stations. The project extends through north Houston to the City of Katy and south to the North Fort Bend Water Authority.

For more information, visit us at [www.surfacewatersupplyproject.com](http://www.surfacewatersupplyproject.com)

## What is an acre-foot?



*An acre-foot is the amount of water needed to fill an acre of land 1 foot deep (325,851 gallons). That's almost enough to flood a football field with a foot of water!*





*Example 8-foot-diameter pipeline*

Residents and businesses located within the West Harris County Regional Water Authority and the North Fort Bend Water Authority will be the recipients of water supplied by this project. Surface water would be delivered through a series of pump stations and 8-foot-diameter pipelines to municipal utility districts, or MUDs, for distribution to residents and businesses.

Design for the proposed Surface Water Supply Project, including the 39-mile water line and two large pump stations, will begin in the spring of 2016. Construction is anticipated to begin in early 2018, and delivery of surface water to WHCRWA and NFBWA residents through this line is scheduled to begin in fall 2021.

This project is funded through bonds issued by the West Harris County Regional Water Authority and the North Fort Bend Water Authority. A significant portion of these bonds will be sold to the Texas Water Development Board through a state-wide program for financing water projects. The total project costs are estimated to be \$680 million.

If you have questions, concerns, or feedback related to the Surface Water Supply Project, please contact the Surface Water Supply Project team at [info@surfacewatersupplyproject.com](mailto:info@surfacewatersupplyproject.com).

### How is this project going to affect me?

During construction, residents, business owners, property owners, and anyone traveling in the vicinity of the proposed pipeline alignment may experience detours, traffic delays, access issues, and other construction activities associated with large-scale linear projects. Safety, access, and detour information will be communicated proactively and in multiple languages throughout the life of the project. Construction is scheduled to begin in early 2018.

If your property is located along the proposed alignment, you will be contacted well in advance of this construction activity, and you may have already been contacted regarding right-of-way acquisitions and right-of-entry to your property. If you have questions, please contact [info@surfacewatersupplyproject.com](mailto:info@surfacewatersupplyproject.com).

# Upcoming Activities

2016

## Design Begins

of the proposed project, including the 39-mile water line and two large pump stations

2018

## Construction Begins

Construction of the pump stations and water line

2021

## Delivery

of surface water to WHCRWA and NFBWA residents

### Why is it important to conserve groundwater resources?

Groundwater is available in limited quantities, and it is often used as a primary source of potable water. Depleting groundwater resources limits the quantity of available water and contributes to subsidence over time. Since groundwater is an important and vital resource for everyone, it is important to protect and conserve it. Additionally, subsidence negatively impacts roads, water, and waste water lines causing premature and burdensome maintenance expenses.

To support groundwater conservation, the Harris Galveston Subsidence District and the Fort Bend Subsidence District have mandated significant reductions (up to 80%) in groundwater pumping through their regulatory plans. Through the Surface Water Supply Project, the WHCRWA and the NFBWA are meeting these regulatory requirements by delivering an alternative water supply solution to serve their many customers.

The Surface Water Supply Project provides a primary water supply source through surface water from Lake Houston. ***This project supports groundwater conservation by relying on surface water as the primary water supply, instead of ground water.***



# WATER 101...Learning the Lexicon

**WATER** -- *we're using up supplies of this valuable natural resource faster than they can be replenished, and has become a topic of global concern. Here are some key definitions that will help you join the discussion...*

**AQUIFER** -- A body of saturated rock through which water can easily move. Normally such water must be pumped to the surface so a well is drilled into the ground to penetrate the aquifer. If water is pumped from a well faster than it is replenished, the water table is lowered and the well may go dry.

**CONSERVATION** -- Water conservation refers to any beneficial reduction of water usage, loss or waste. It also includes the strategies and activities to manage and protect our finite water resources to meet the demand for human consumption (e.g, agriculture, municipal, industrial, and residential uses).

**DIRECT REUSE** -- Water **reuse** is the practice of using water that has already been used. **Direct reuse** refers to the introduction of reclaimed water via pipe-lines, storage tanks, and other necessary infrastructure directly from a water reclamation plant to a distribution system. For example, treating wastewater and then piping it to an industrial center or a golf course is considered direct reuse.

**E.P.A.** -- The U.S. Environmental Protection Agency. The Agency's basic mission is to "protect human health and the environment". When Congress writes an environmental law, EPA implements it by writing

regulations. They often set national standards that states enforce through their own regulations.

**EVAPOTRANSPIRATION** -- (ET) is a measurement of the total amount of water needed to grow plants and crops (*Evaporation* -- loss of water from the soil in the form of a vapor or gas; and *transpiration* -- the loss of water from the plants and grasses themselves).

**GROUNDWATER** -- the water present beneath Earth's surface in soil pore spaces and in the fractures of rock formations. Heavy rains or melting snow replenish or recharge groundwater supplies by seeping down into the cracks and crevices beneath the land's surface. Serious water shortages occur when groundwater is used faster than it is naturally replenished. Groundwater is used for drinking water by more than 50 percent of the people in the United States, including almost everyone who lives in rural areas. The largest use for groundwater is to irrigate crops.

**REUSE** -- There are two major categories of water reuse: direct reuse and indirect reuse. **Indirect reuse** is the placement of water, usually treated effluent, back into a water supply source, such as a lake, river, or aquifer, and then retrieve it to be used again. Indirect reuse projects that involve a watercourse require a *bed and banks permit* from the state,

which authorizes the permit holder to convey and subsequently divert water.

**TEXAS WATER DEVELOPMENT BOARD (TWDB):** The Texas agency charged with creating and administering the State's water plan and providing water planning, data collection and dissemination, financial assistance and technical assistance services.

**STATE WATER IMPLEMENTATION FUND FOR TEXAS (SWIFT):** A new fund that lowers the cost of borrowing for regional water projects. Voters overwhelmingly approved amending the Texas Constitution to allow \$2 billion to flow from the Rainy Day Fund to SWIFT. This money is expected to help finance more than \$25 billion in water projects over the next 50 years.

**STATE WATER IMPLEMENTATION REVENUE FUND FOR TEXAS (SWIRFT):** A vehicle used to issue revenue bonds, or bonds repaid through income generated by the project. SWIRFT secures lower interest rates for regional water providers.

**STATE WATER PLAN (SWP):** Development of the state water plan is central to the mission of the TWDB. Based on 16 regional water plans, the plan addresses the needs of all water user groups in the state -- municipal, irrigation, manufacturing, livestock, mining, and steam-electric power.

**SURFACE WATER** -- water on the surface of the planet -- such as in a stream, river, lake, wetland, or ocean. Of all the water used in the United States, about 75-80 percent comes from surface water sources. 💧





# WHO SAYS WATER CONSERVATION IS IMPORTANT?

“Some Texas cities still use 50 percent or more of their water for landscapes, a prime target for water conservation.... As a horticulturist, I can reasonably say that one half of that water use is unnecessary. In most of Texas, you can have attractive landscapes if your irrigation technology is good, you have no leaks and you are using the right amount of water and the right kind of plants.”

**Dr. Calvin Finch**, *Director, Texas A&M Water Conservation and Technology Center*



“Unknowingly, many homeowners put two to three times more water on their outdoor landscapes than is needed, which undermines efforts to provide water to meet the essential needs of all Texans....In the absence of strong measures, the amount of water wasted will increase with our population. Just by limiting lawn watering frequency and eliminating watering during the heat of the day, in the Houston-Galveston area savings by 2060 could total over 62,000 acre-feet (about 20 billion gallons) per year, potentially avoiding more than \$200 million in infrastructure costs.”

**Myron Hess**, *Manager of Texas Water Projects, National Wildlife Federation*



“Many residents are not aware of exactly where their water comes from. Past studies have shown that the more people are aware of their water source, the more likely and willing they are to participate in water conservation activities. Residents should be able to look at their water bill and understand how many gallons they used and for what activity. Once people have that realization, they can better decide for themselves on what they may want to do to reduce use or at least be aware of their use.”

**John Sutton**, *team leader for Texas Water Development Board’s municipal water conservation program*



“The earth is largely covered by water. But only about 2% of that water is drinkable. And, with a constantly growing population, that small amount of water is being shared by more and more people, as well as having to supply all of the water needed for agriculture, manufacturing, power generation, our cities and neighborhoods, too. We have taken our precious water supplies for granted...for too long. Now, water — quantity and quality — is a global issue. That’s why we have to learn to be better stewards of this finite resource...and learn to make informed decisions about how we use it.”

**Carole Baker**, *President, Texas Water Foundation*



“In recent research on urban landscape water use in Texas, we found that water use by residential, municipal, business and educational landscapes and golf courses represented roughly 46 percent of total urban/municipal water use during 2010. Even without factoring in golf course water use, they estimate that the total annual water use for lawns and landscapes ranges from 1.9 million acre-feet to 4 million acre-feet. This effectively positions urban irrigation as the state’s third largest water user, after agricultural irrigation and other urban uses, such as in-home and municipal use.”

**Dr. Raul Cabrera**, *Associate Professor, Department of Horticultural Sciences, Texas A&M University*



“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. Some receive credits for using treated effluent to fill their amenity lakes or water their golf courses. Others receive credits for obtaining permits to use water pumped straight from nearby creeks for their lakes and irrigation. Districts that reuse water captured from stormwater drainage systems also get credits. 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.”

**Bruce Parker**, *President, WHCRWA*



To learn more about water conservation, visit: [www.SaveWaterTexas.org](http://www.SaveWaterTexas.org); [www.TexasWater.org](http://www.TexasWater.org); [www.twdb.texas.gov/](http://www.twdb.texas.gov/); <http://water.tamu.edu/water-conservation/water-conservation-and-technology-center/>; [http://texaslivingwaters.org/wpcontent/uploads/2015/03/SC\\_WaterConservByYard\\_report\\_031115\\_R.pdf](http://texaslivingwaters.org/wpcontent/uploads/2015/03/SC_WaterConservByYard_report_031115_R.pdf)



# WHAT DO SUNFLOWERS HAVE TO DO WITH WATER CONSERVATION?

Most people think of sunflowers as lovely, giant flowers. But in Texas, Sunflowers are also a crop that thrives in dry, warm conditions. Sunflowers have a hearty root system that stretches deep into the ground to draw out nutrients, minerals and moisture the plant needs to grow so it can survive on less rainfall than some other crops.

Many of the plants are harvested for the seeds which will be crushed into sunflower oil. Some farmers grow a different variety for seeds that provide a healthy snack, and other fields of Sunflowers are planted for their oversized, ornamental blooms.

Like the farmers who grow them, Sunflowers are sturdy and drought-tolerant...and are able to weather hard times! This enchanting flower is therefore the logical “poster child” for water conservation!

## INTRODUCING SUNFLOWER SUZIE...

As a child growing up in urban Harris County, Texas, Susan especially loved going to her grandparents’ farm for long summer visits. There were many things on the farm that she fancied...including the wonderful variety of fresh fruits and vegetables her grandmother grew in her kitchen garden and her grandfather’s cheerful fields of sunflowers. Susan loved the sunflowers best, so she always visited during mid-summer when the giant flowers are at their peak. By the time she was a teenager, her family and friends had begun calling her “Sunflower Sue”, or just “Sunny”. It fit her cheerful disposition and ready smile, so the nickname stuck.

Sunny’s passion for nature and gardening led her to learn as much as she could about landscaping principles, soils and plant nutrition, various kinds of gardening -- including growing plants in patio containers. She studied the impact of insects -- both good and bad -- weed management, the benefits of composting, and the critical importance of water conservation in landscaped areas and for turf irrigation.



[www.SunflowerSuzie.com](http://www.SunflowerSuzie.com)

Sunny is still happiest when she’s helping Mother Nature outdoors and when she shares what she has learned with others! She has created several special **workshops** appropriate for adults and youngsters, and also stars in some “how to” videos on her website. Some sessions involve making things to enhance yardscapes, and her “**Young Sprouts Club**” helps kids learn the joys of creating and maintaining a garden! A special kids “activity” book has instructions for projects that can be done with the whole family or in the classroom, and a new handbook explains the water-sparing principles of **Xeriscaping**.

As Sunny says, “Every living thing needs water to survive so we all have to learn to use it wisely!” Visit her online and learn how you can participate in these fun and informative programs! 💧

