

# Water

Are we running out ???



# Drought...an international problem



**While thousands have died and millions have been displaced by the conflict in Syria, severe drought in the region is heaping added misery on people.**

The conflict in Syria has devastated much of the country's agricultural sector. But while the fighting has left large tracts of farmland abandoned, irrigation systems smashed and livestock neglected, other forces have also been at work. Syria – and much of the Eastern Mediterranean region – is in the grips of one of the longest periods of drought on record.



The present period of drought hitting Syria and the wider region – including large parts of Iraq – started in 2008: dry conditions persisted through 2009 and 2010. Despite heavy snowfalls over the most recent winter, water supplies in many reservoirs are less than half their normal level. There has not been a five-year span that has been this dry.

In many parts of the world, from California to Southeast Asia, the land is parched from growing and persistent droughts.



Lake Oroville, California 2009



Lake Oroville, California 2014



In Texas, the seven-year dry spell of the 50's is the drought against which all other droughts were measured. It was so devastating that agriculture losses exceeded those of the Dust Bowl years, and so momentous that it kicked off the modern era of water planning in Texas. The drought changed the cultural landscape and accelerated the trend toward urbanization.

Texas began a campaign to store and conserve more water. From 1957 to 1970, workers built 69 dams, including Longhorn Dam on the Colorado River, which formed Lady Bird Lake in 1960.

In 2011, Texas endured the worst single-year drought in its history. Now the state has to make some hard choices about how to prepare for future droughts and water shortages as its population and water demand grows.

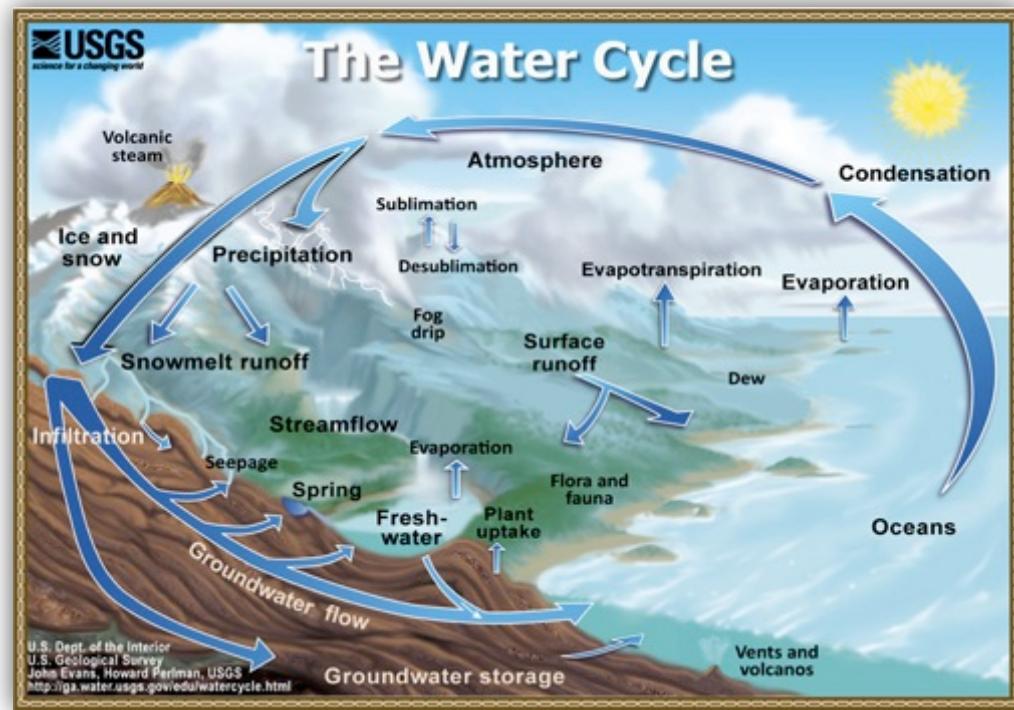


# The Water Cycle...



The “Hydrological Cycle” on this planet is a very well known principle. In the industrialized world, there have been many innovations that allow us to effect change within that cycle. Those innovations, taken in consideration of the overall cycle, are generally very minor, and afford limited additional opportunity to effect positive change.

The hydrological cycle is an integral part of the climatic conditions of the planet. Changes in the climate cause changes in the ‘water’ cycle, which cause changes for everything dependent on the cycle.





Catching and storing rainwater is truly an ancient method. Even the Greeks and Romans used these methods combined with man-made water ways to distribute water from areas of abundance to areas of need.

Technology and hydrological advances have improved our ability to intercept water in the cycle. Building dams on streams, springs and rivers is an effective but very dated method. Excavating or drilling holes in the earth to then bring water to the surface is not a truly modern method.





Even with our current plans to build huge dams and reservoirs, drilling deep wells, and treating and pumping water through pipelines, we are not always able to bring adequate water to all points of demand.



In consideration of the rapid growth in the southwestern United States and Texas in particular, initial development has always centered around water that was most available. As development expanded, growth was directly tied to water availability and the cost to produce it.



The current “state” of water affairs finds Texas at a cross-roads. Water systems across the State are localized, a few are regionalized. Most regional systems have no real capability to economically transport water to or from other local or regional systems. Given our current climatic considerations, a drought of record has everyone trying to decide how we can “catch-up”. The cost to “catch-up” in a crisis, is in the best case, not as cost effective as sound planning and pro-action. Big cities and small towns across Texas are facing water shortages, and some have run out of water completely. Texas has 5 of the 10 fastest growing cities in the U.S. and we are experiencing what may well be the worst drought in recorded history. Therefore the time to take action and implement concerted, cooperative planning, is NOW.

Over 1,000 people move to Texas every day, and our population is expected to double by 2060. During that same time, our water supplies are expected to decrease by 10%. Texas does not have enough water to meet the growing demands of our population.



# Groundwater...



So why is groundwater the best first choice?

There are several reasons that are directly related to the hydrological cycle. Groundwater enjoys two distinct advantages. Foremost, in physical terms, is that it is stored underground. Surface water in Central Texas is subject to the local evaporative loss that has a mean average of 72 inches annually. The quality of fresh groundwater is usually 2 to 3 times better than average surface water. The dissolved solids and other constituents in fresh groundwater more commonly meet potable drinking water standards than does surface water.

Water that is stored underground is less likely to be contaminated by surface conditions. Rainwater falls through the air, lands on the surface, percolates through the soil and is stored in voids and pervious material in the earth. And, there is more water stored in underground aquifers in Texas than can currently be stored in existing lakes in Texas.



The most prominent challenges with groundwater is accessibility and transmission. Ground water and surface water across the State has found their limits of supply in most of the developed regions. This has most recently been amplified by the persistent drought conditions. Hays County and its neighboring counties and cities are no exception. But, Hays County has begun a process to address the accessibility of groundwater in an undeveloped area and to work cooperatively with other public entities to bring water to the areas of need.

Some parts of Texas are finally receiving some much-needed rainfall, however, we are still in a record drought. The recent storms in pockets of the state are welcomed, but are literally a “drop in the bucket”. We must act now to secure our future.

# Forestar...



The contract that Hays County has with Forestar has many options that are planned to provide the best opportunities for the economical reservation, production, treatment, transmission and distribution of high quality groundwater to the Central Texas area.

The water resource is the Simsboro portion of the Carrizo-Wilcox Aquifer. The specific area is in the Lost Pines Groundwater Conservation District in Lee County. Quality samples from the Simsboro formation present water that is very similar to Edwards Aquifer water quality, which establishes it as equal to the best water found in Hays County and 3 to 10 times better than Trinity Aquifer water, also found in Hays County. Quantity estimates in the Simsboro section of the Lost Pines GCD are 46 million acre feet.

Conservative estimates of recoverable volume at 25% of storage is 11,500,000 acre feet. The requested permitted volume by Forestar, as reserved by Hays County, is 45,000 acre feet. The reserved volume represents less than .1 of 1% of the stored volume, or 1/1000<sup>th</sup> of the Lost Pines GCD stored volume of the Simsboro formation.



Hays County has and will continue to pursue opportunities to cooperate with Central Texas counties, municipalities and local water entities to find additional sources of water. But, the challenges are large and complex. The most efficient way to meet these challenges is cooperatively. The problem is supply and distribution. The resolution has to involve multiple levels of government and their statutory jurisdictions.

Groundwater is not the sole answer to future water supplies in localities, counties, regions or the State. The current State Water Plan recognizes that multiple initiatives need to be pursued immediately. Clearly, voters understood, because they overwhelmingly approved transferring almost \$2 Billion from the *State Rainy Day Fund* to address water issues.

# Conservation...



Hays County is basically divided between two water planning areas; Region K in the LCRA watershed and Region L in the GBRA watershed.

Each of the Regional Planning Areas covers multiple counties in whole or in part. Conservation in Region K is a major component in the overall plan. The plans in all areas have notable conservation goals. Hays County has conservation sensitive requirements in its areas of authority.

One method of conservation is water reuse, primarily from effluent sources. This technology will need to be addressed on a state-wide basis with shared responsibility between the County and municipal levels.



New surface reservoirs, off channel storage, aquifer recharge and recovery, black water purification and even de-humidification offer additional opportunities. The basic concept in all of these methods is that once we have intercepted the water in the “cycle”, we need to use it in the most effective way before it’s released back into the “cycle”.

It is my opinion that the primary need is to have alternative resources to be able to move water to areas of need and provide the most cost effective resources to allow time for development of additional methods of conservation and reuse.