



# RE-WATER

*More complicated than just toilet-to-tap, water reclamation helps sustain thirsty cities*

The city of El Paso maintains four water reclamation plants.

Texas Cooperative Extension estimates statewide drought losses at \$4.1 billion, with \$1.9 billion in North Texas alone.

TWDB adopts Water for Texas 2007, the state water plan.

Hurricane Ike moves ashore near Galveston on September 12 with maximum sustained winds around 110 mph, making Ike a strong Category 2 storm. The hurricane causes 12 deaths directly and 25 indirectly, along with almost \$14 billion in damages.



## TIMELINE OF DROUGHTS IN TEXAS



Every day and all around the world, water is recycled. From upstream to downstream, one city's wastewater is eventually another city's water supply.

But in order to conserve and better manage precious water resources, some Texas cities are using innovative water reclamation technologies to speed up and improve this process.

Water reclamation involves taking effluent, or treated wastewater, and using refining processes to make it suitable for a variety of water needs such as irrigation, aquifer recharge, industrial processes and even potable water.

### El Paso leads the way

Thanks to water reclamation and conservation policies, the city of El Paso has become a desert city with a sustainable water supply. The El Paso Water Utilities (EPWU) reclaimed water program is an example for municipalities across the globe.

"For many years people have come from all over to learn about what we do," said Irazema Rojas, EPWU utility engineer. "We have received calls and visits from Australia, Mexico, Atlanta, Austin."

EPWU serves about 200,000 residential and commercial customers and also operates one of the most extensive reclaimed water systems in Texas.

"Located in a desert, EPWU made a decision many years ago to think of reclaimed water as a valuable resource rather than a by-product that needs to be disposed of," the EPWU website states.

EPWU maintains four wastewater reclamation plants, and each plant yields treated effluent for nonpotable use, suitable for customers to apply to parks, sports fields, landscape nurseries, golf

courses, construction projects and many other situations. Some of the treated wastewater is used for industrial processes, and EPWU recharges some of it back into the aquifer. All of the plants meet Texas Commission on Environmental Quality water quality regulations, Rojas said.

"This program started back in the 1960s, when the city began using treated effluent to irrigate the golf course," Rojas said. "And slowly the program became more aggressive, eventually using treated effluent for industrial and construction uses, in addition to irrigation."

The program has grown over the years, and now 44 percent of the EPWU reclaimed water is used for irrigation, 37 percent for industrial processes, 19 percent for aquifer recharge and small percentages for construction.

Research conducted by the Texas AgriLife Research Center in El Paso in close partnership with EPWU has frequently provided scientific support for the reclaimed water program. Through continued research, the center has produced several reports on effective uses of reclaimed water and landscape management.

According to EPWU, since its water conservation ordinance was established in 1991, its conservation and reclaimed water programs have saved 231 billion gallons of water, which is enough water to fill the Sun Bowl 6,392 times.

### Reclaiming water for drinking water

Starting next year, another West Texas city will join the other municipalities taking advantage of reclaimed water resources.

October 2010-September 2011 averages 11.18 inches, the driest 12-month period recorded in Texas.

In August, the Texas AgriLife Extension Service estimates agricultural losses caused by drought to be a record \$5.2 billion.



The Colorado River Municipal Water District (CRMWD) will build a \$13 million water reclamation plant near Big Spring that, unlike some other reclaimed water projects, will produce water for direct potable use.

“We’re taking treated effluent, normally discharged into a creek, and blending it with (traditionally supplied potable) water,” District Manager John Grant told Discovery News in August. In essence, the system speeds up what would naturally occur with the flow of discharged water through wetlands with more pristine results, Grant added.

In addition to four well fields, CRMWD currently depends on three lakes for its water supply: E.V. Spence Reservoir, which is at less than 1 percent of its capacity; Lake J.B. Thomas, which is at about 2 percent of its capacity; and O.H. Ivie Reservoir, which is at about 20 percent of its capacity.

The Big Spring Water Reclamation Project will provide 2 million gallons of water for the wide-reaching district, Grant told CNN in August.

“CRMWD looked at each charter city within the district and determined that the Big Spring project was the most economically viable,” said Todd Darden, Big Spring’s assistant city manager.

The project received some negative national news attention this summer for its plans to turn wastewater into drinking water, Darden said. “We had local meetings about the plan and those went well; we only received some negative comments when the story got picked up by larger media.

“It will be very good quality water—just as good as water out of our reservoirs and probably better,” Darden said. “But I always say that if it’s good enough for NASA’s astronauts, then it’s good enough for us.”


### The value of reclaimed water

As proven by El Paso’s well-documented, long-term success, water reclamation technology has been effective for decades. Darden noted that Big Spring and CRMWD had considered reclaimed water as an additional drinking water source for the area as far back as the 1980s, but the cost was prohibitive at that time.

Now Big Spring officials are looking forward to making the water supply more secure, Darden said. While “toilet-to-tap” sometimes may get a bad rap, many Texans know the value of water and the value of water reclamation technology.

“When you live out here in the desert, any drop of water you can find is well worth it,” said Darden, who praised the work of CRMWD. “I thank God every day that I know we’ll have enough water, because of the water district.”

Rojas noted the sustainability and benefits of El Paso’s reclaimed water program.

“We are very proud of our system,” Rojas said. “Not only is using reclaimed water advantageous to businesses because it is cheaper than potable water, but it is also important because it increases a city’s ability to conserve water and therefore prolongs the life of the water resources.” 

Texas’ population is projected to be 29.7 million.

Texas’ population is projected to be 33.7 million.

Texas’ population is projected to be 37.7 million.

Texas’ population is projected to be 41.9 million.

Texas’ population is projected to be 46.3 million.

Texas’ projected water demand is 19 million acre-feet per year.

Texas’ projected water demand is 19.8 million acre-feet per year.

Texas’ projected water demand is 20.5 million acre-feet per year.

Texas’ projected water demand is 21.2 million acre-feet per year.

Texas’ projected water demand is 22 million acre-feet per year.

2020

2030

2040

2050

2060

## TIMELINE OF DROUGHTS IN TEXAS



# Water for Texas 2012

## What is the plan?

The *Water for Texas 2012* state water plan, the ninth such plan compiled by the Texas Water Development Board (TWDB), is designed to meet the state's needs for water during times of drought, according to the plan's Executive Summary. This plan is based on the "drought of record," which occurred in the 1950s. Planning starts at the regional level with 16 regional water planning groups identifying water needs and recommending water management strategies to meet these needs. These groups represent the public, counties, agriculture, industry, the environment, municipalities, small businesses, water districts, river authorities, water utilities, groundwater management areas and electricity-generating utilities. Once each planning group adopts its regional water plan, it is sent to

the TWDB for approval. The TWDB then develops the state water plan based on information from the regional water plans and other sources.

Edward G. Vaughn, TWDB's chairman, wrote in a letter at the beginning of the plan: "The primary message of the 2012 State Water Plan is a simple one: in serious drought conditions, Texas does not and will not have enough water to meet the needs of its people, its businesses, and its agricultural enterprises."

Below are excerpts taken from the Executive Summary of the *Water for Texas 2012* state water plan that highlight the most important points of water needs during times of drought. To read more, see [www.twdb.state.tx.us/wrpi/swp/draft.asp](http://www.twdb.state.tx.us/wrpi/swp/draft.asp).

### How many Texans will there be?

The population in Texas is expected to increase significantly between the years of 2010 and 2060, growing from 25.4 million to 46.3 million people (see map on opposite page).

### How much water will we require?

Although the population is projected to increase 82 percent over 50 years, water demand in Texas is projected to increase by only 22 percent, from about 18 million acre-feet per year in 2010 to a demand of about 22 million acre-feet per year in 2060. Demand for municipal water (including rural county-other) is expected to increase from 4.9 million acre-feet in 2010 to 8.4 million acre-feet in 2060. However, demand for agricultural irrigation water is expected to decrease, from 10 million acre-feet per year in 2010 to about 8.4 million acre-feet per year in 2060...

### How much water do we have now?

Existing water supplies—categorized as surface water, groundwater, and reuse water—are projected to decrease about 10 percent, from about 17.0 million acre-feet in 2010 to about 15.3 million acre-feet in 2060.

Groundwater supplies are projected to decrease 30 percent, from about 8 million acre-feet in 2010 to about 5.7 million acre-feet in 2060.

Surface water supplies are projected to increase by about 6 percent, from about 8.4 million acre-feet in 2010 to about 9.0 million acre-feet in 2060.

### Do we have enough water for the future?

We do not have enough existing water supplies today to meet the demand for water during times of drought. In the event of severe drought conditions, the state would face an immediate need\* for additional water supplies of 3.6 million acre-feet per year with 86 percent of that need in irrigation and about 9 percent associated directly with municipal water uses. Total needs are projected to increase by 130 percent between 2010 and 2060 to 8.3 million acre-feet per year.

### What can we do to get more water?

The strategies recommended by regional water planning groups would provide, if implemented, 9.0 million acre-feet per year in additional water supplies by 2060. Water management strategies can include conservation, drought management, reservoirs, wells, water reuse, desalination plants and others.

### How much will it cost?

The estimated total capital cost of the 2012 state water plan, representing the capital costs of all water management strategies recommended in the 2011 regional water plans, is \$53 billion. This

amount represents about a quarter of the total needs for water supplies, water treatment and distribution, wastewater treatment and collection, and flood control required for the state of Texas in the next 50 years.

### What if we do nothing?

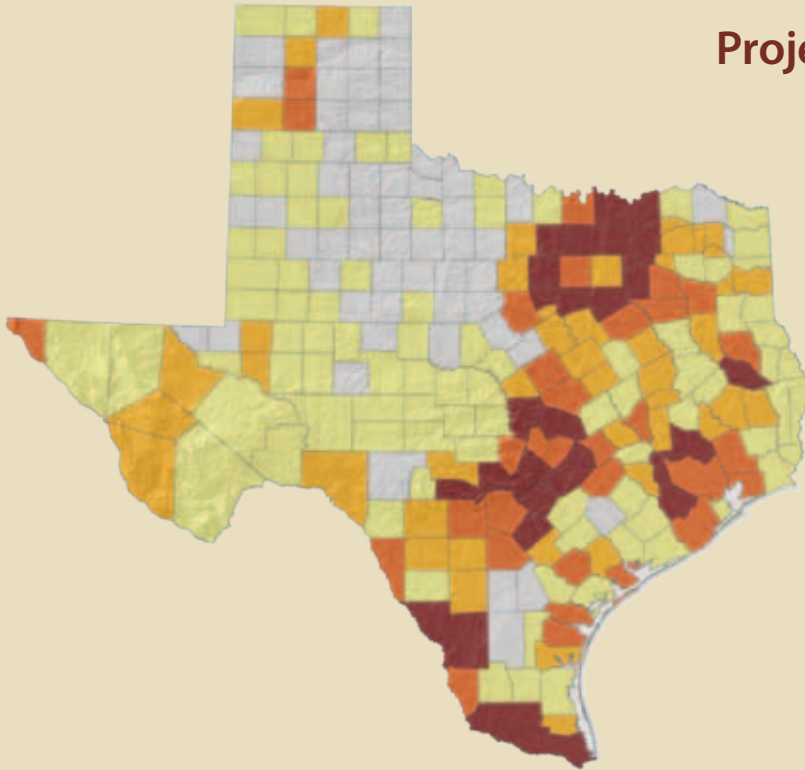
If drought of record conditions recur and water management strategies identified in regional water plans are not implemented, the state could suffer significant economic losses. If the drought affected the entire state like it did in the 1950s, economic models show that Texas businesses and workers could have lost almost \$12 billion in income in 2010. By 2060 lost income increases to roughly \$116 billion. Foregone state and local business taxes associated with lost commerce could amount to \$1.1 billion in 2010 and \$9.8 billion in 2060. Lost jobs total approximately 115,000 in 2010 and 1.1 million in 2060.

\* Needs are projected water demands in excess of existing supplies that would be legally and physically available during a drought of record. Total water needs are greater than the difference in total water demand and total water supplies because not all existing supplies are available to all user groups. In East Texas there are many areas that have a surplus that cannot necessarily be shifted to where there are greater needs in the western part of the state.

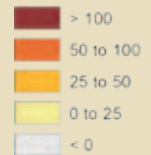
Maps adapted from the Texas Water Development Board's draft *Water for Texas 2012*. Maps created by Texas A&M University Institute of Renewable Natural Resources/Texas Water Resources Institute.

## Projected Texas Population Growth

The population in Texas is expected to increase 82 percent between the years 2010 and 2060, growing from 25.4 million to 46.3 million people.



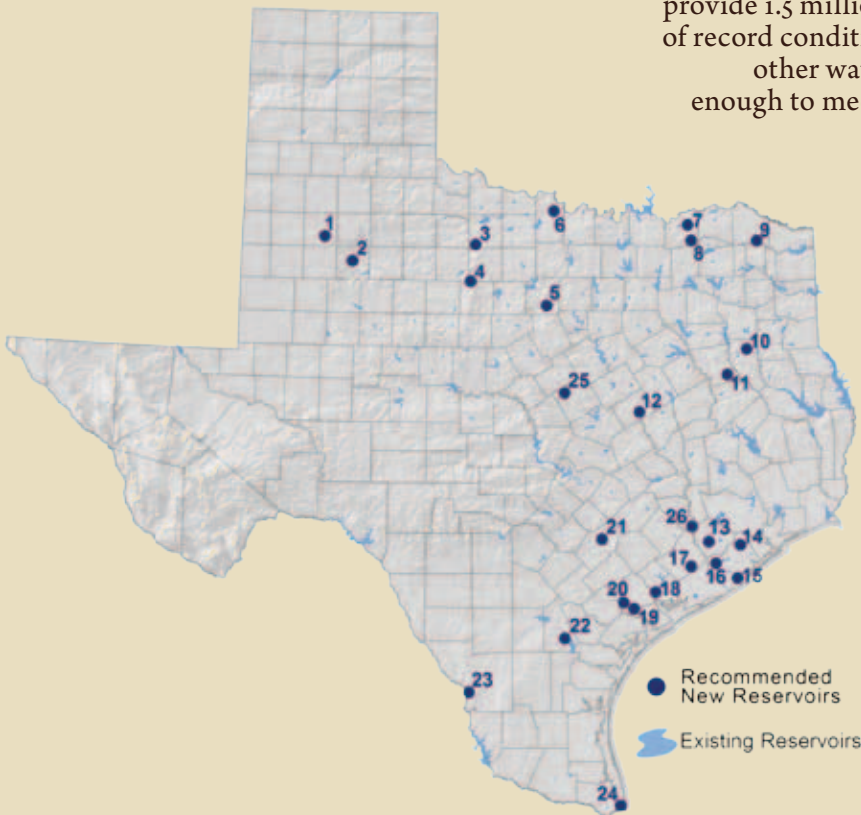
Population Growth Rate  
2010 to 2060  
(percent change)



## Recommended New Major Reservoirs

In 1950, the state had 50 major reservoirs; by 1980, the state had 179; and today, Texas has 188 major water supply reservoirs, with only a handful in some stage of planning or implementation.

The 2012 state water plan recommends 26 reservoirs that would provide 1.5 million acre-feet of water during a repeat of drought of record conditions in 2060. In the absence of these reservoirs, other water management strategies would simply not be enough to meet the needs of Texans during a severe drought.



- 1 Jim Bertram Lake 07
- 2 Post Reservoir
- 3 Millers Creek River Augmentation
- 4 Cedar Ridge Reservoir
- 5 Turkey Peak Reservoir
- 6 Lake Ringgold
- 7 Lower Bois d'Arc Reservoir
- 8 Lake Ralph Hall
- 9 Marvin Nichols Reservoir
- 10 Lake Columbia
- 11 Fastrill Replacement Project (Off-Channel)
- 12 Brushy Creek Reservoir
- 13 Fort Bend Off-Channel Reservoir
- 14 Brazoria Off-Channel Reservoir
- 15 Dow Off-Channel Reservoir
- 16 Gulf Coast Water Authority Off-Channel Reservoir
- 17 LCRA San Antonio Water System Project (Off-Channel)
- 18 Lavaca Off-Channel Reservoir
- 19 GBRA New Appropriation (Lower Basin, Off-Channel)
- 20 GBRA Exelon Project
- 21 GBRA Mid Basin Project (Off-Channel)
- 22 Nueces Off-Channel Reservoir
- 23 Laredo Low Water Weir
- 24 Brownsville Weir
- 25 Coryell County Reservoir (Off-Channel)
- 26 Allens Creek Reservoir