

State responds to the Texas drought

The current drought in Texas is the most intense one-year drought since the state began keeping rainfall records in 1895 and ranks among the five worst droughts in the state overall. Today, all of Texas' 254 counties are experiencing drought, most in the exceptional drought category. This has led to severe declines in aquifer and reservoir levels, compromising water supplies and delivery to several public water systems. It also has contributed to one of the worst wildfire seasons in Texas history. Texas has responded to more than 24,000 wildfires, which have burned more than 3.8 million acres and destroyed more than 7,000 homes and businesses.

A second year of drought in Texas is likely, according to state climatologist Dr. John Nielsen-Gammon, which would result in further drawdown of water supplies in 2012 and possibly beyond. The major drought of the 1950s, the "drought of record," led the state to invest in infrastructure for water supply, but this infrastructure has not really been tested by a comparable drought with a substantially larger population.

Texas lacks adequate water to meet the needs of people, businesses, and agricultural enterprises, according to the 2012 state water plan recently approved by the Texas Water Development Board (TWDB). The official plan is expected to be submitted to the Legislature in early 2012.

According to TWDB, if Texas does not implement the new projects or management strategies recommended in the plan, then the state is projected to need 8.3 million acre-feet of additional supply by 2060. An acre-foot of water is 325,851 gallons.

If water supply needs are not met and current drought conditions approach the drought of record, Texas could lose about \$11.9 billion in income annually and as much as \$115.7 billion annually by 2060, with more than a million lost jobs, according to TWDB.

Texas AgriLife Extension Service has estimated that the cost of the drought to the state as of August 2011 was about \$5.2 billion,

due to the lower yield and loss of major crop commodities such as cotton, wheat, corn, hay, and grain sorghum, as well as higher the costs of caring for livestock.

On October 1, 2011, Gov. Rick Perry renewed and extended a December 2010 disaster proclamation resulting from extreme fire danger to include the effects of prolonged drought and extreme high temperatures. The proclamation directs that all necessary measures, both public and private, be implemented to ameliorate the effects of the drought, including suspending rules and regulations that may inhibit or prevent prompt response to the threat.

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Reservoirs for water management

One strategy recommended by the state water plan to ensure adequate water supply is the designation of reservoirs. The Texas Legislature has designated 22 unique reservoir sites to date. Designating a site for the construction of a reservoir preserves the site for that purpose. Under the Water Code, it prevents a state agency or political subdivision from obtaining a fee title or easement for the site and blocking reservoir construction.

Construction on two of the designated reservoirs has been completed — Muenster Reservoir in Cooke County in 1997 by the city of Muenster and Wheeler Branch Reservoir in Somervell County in 2007 by the Somervell County Water District.

Three other sites are in various stages of development. The Ringgold Reservoir site in Clay County has been partially bought by the city of Wichita Falls and is recommended for construction by 2050. Allens Creek

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In addition, many Senate and House interim study charges focus on the drought and ways to implement the state water plan and enhance existing water supply. State agencies have responded to the drought by continually monitoring the status of public water systems, responding to calls for enforcement of water rights, and seeking ways to find and fund new sources of water and conserve existing ones.

Public water systems

State agencies are monitoring public water systems to ensure adequate water supplies and to offer assistance when available water falls below a certain threshold.

TCEQ monitoring. The Texas Commission on Environmental Quality (TCEQ) monitors water systems and contacts them to determine their condition and the status of their drought contingency plans. The commission has sent letters to about 6,000 public water systems statewide encouraging them to implement contingency conservation plans.

According to TCEQ, as of November 25, 2011, 964 public water systems had asked customers to follow outdoor water use restrictions. Of these, 320 had asked customers to follow a voluntary watering schedule and 644 had implemented mandatory water schedules, with 52 prohibiting all outside watering.

Emergency management. TCEQ is monitoring a targeted list of 11 public water systems with water supplies that either are unknown or are expected to last for fewer than 180 days. TCEQ has offered these systems financial, managerial, and technical help, including identifying alternative water sources and possible funding for those sources and coordinating emergency drinking water planning.

The Emergency Drinking Water Task Force — created and chaired by the Texas Department of Emergency Management (TDEM) with members from TDEM, TWDB, and TCEQ, which has operational responsibility — meets weekly to track systems identified by TCEQ as having 180 days or fewer of

La Niña's effects on drought

Texas had an accumulated statewide average of 11.18 inches of rainfall between October 2010 and September 2011, compared to a normal average of 29.45 inches, according to state climatologist Dr. John Nielsen-Gammon. Most of Texas had a relatively dry fall and winter, but a record dry March through May was followed by a record dry June through August. The 12-month rainfall total for October 2010 through September 2011 was far below the previous record low set in 1956. Average temperatures for June through August were more than 2 degrees above the previous Texas record and close to the warmest statewide summer temperatures ever recorded in the United States.

La Niña, formed when colder than usual ocean temperatures form in the central Pacific, has been blamed for starting the current drought. La Niña tends to create wetter than normal conditions in the Pacific Northwest and drier than normal conditions in the Southwest. A new La Niña in the central Pacific Ocean could extend drought conditions for Texas and much of the Southwest for another year. According to Nielsen-Gammon, it is impossible to predict with certainty whether the drought will end after two years, but Texas is known to be in a period of enhanced drought susceptibility due to global ocean temperature patterns, causing Texas to be warmer and more strongly affected by evaporation.

potable water. Once such a water supply is confirmed, the task force will support the system's attempts to obtain a new supply by providing technical assistance and help with locating funding or with grant or loan applications. Efforts could include:

- moving the water intake line, if possible, into a deeper section of the resource pool;
- establishing an interconnection with a nearby water system;
- re-establishing a previously used well;
- drilling a new well;
- establishing a new source of surface water via pipeline;

- hauling treated water from another public water system; or
- hauling untreated water for insertion into the local treatment system.

If efforts by the local water system will not prevent depletion of its water source, requests for state assistance are directed through the established emergency management system. This begins with the city, works up to the county, and ends with the state, the last resort being to have TDEM ship in potable water.

As an example of severe local water shortage, Mayor Jackie Levingston of the city of Groesbeck declared a local state of emergency in October due to an estimated 30-day supply of water and indicated in a letter to the governor a need for further state aid. Fort Parker Lake, the city's water source, was expected to reach a critical level by November 21, when the city no longer would be able to pump water from it. However,

recent rainfall has increased the lake level, providing an estimate of another 90 days of water supply.

Following the mayor's request, under the existing statewide disaster proclamation, TDEM, TCEQ, Texas Parks and Wildlife Department (TPWD), the Texas Department of Transportation, and the city of Nacogdoches have helped Groesbeck secure a pipeline to pump water from a nearby quarry. The pipeline, completed on December 1, is expected to provide an estimated six- to nine-month additional supply of water.

Representatives from city, state, and federal agencies and from local utilities recently attended a meeting in Groesbeck to address medium- and long-term plans to address the city's potential water shortages. Options discussed included interconnecting with nearby utilities and developing groundwater wells. Funding solutions discussed included rate increases, temporary surcharges, and grants or loans from the Texas Department of Agriculture and U.S. Department of Agriculture.

LCRA seeks drought relief

The effect of record-setting hot, dry conditions on Lake Travis and Lake Buchanan, the Austin region's water supply reservoirs, led the Lower Colorado River Authority's (LCRA's) board of directors, under emergency provisions of the Water Code and the governor's emergency declaration, to ask the Texas Commission on Environmental Quality (TCEQ) for permission to deviate from the state-approved water management plan. LCRA's water management plan determines who gets water from the lakes during a drought. The relief measures were approved by TCEQ in December and, if implemented, could cut back or even cut off water to farmers next year if drought conditions do not improve.

TCEQ approved LCRA's request to amend temporarily the river authority's downstream water rights to allow its existing municipal and industrial customers to use water from the river that is not being used by agriculture. This could reduce the amount of water downstream customers need from the Highland Lakes.

According to LCRA, customers and stakeholders representing interests in the basin, including lake businesses, municipal customers, and rice farmers, helped draft the proposal. The changes are intended to protect LCRA's municipal and industrial customers and prevent water from being released for a crop next year, only to have it cut off mid-crop, which would both cause the crop to wither in the field and waste the water.

Cities, industry, and power plants would have to cut their water use by 20 percent automatically if the combined storage in Lakes Buchanan and Travis fell to a level that triggered the LCRA board to declare a drought worse than the drought of record. Forecasts project this could happen as early as spring 2012. Interim changes to the water management plan would postpone for as long as possible the point at which 20 percent water cuts would occur.

Drought preparedness plan

The State Drought Preparedness Council, created by the 76th Texas Legislature in 1999, is responsible for preparing and updating a comprehensive state drought preparedness plan separate from the state water plan for mitigating the effects of drought in the state. The plan outlines long- and short-term measures to prepare for and respond to drought, identifying drought triggers and assigning responsibilities to agencies. It is continuously updated with input from all state agencies, federal partners, water utility systems, water authorities, and other stakeholders. The council now is working to identify drought triggers for all 10 climactic regions of the state. Chaired by TDEM, the council includes representatives from several state agencies and a representative of groundwater management interests appointed by the governor.

Water rights enforcement

Since April 2011, TCEQ, which is charged with managing surface water rights and regulating public water systems, has received 14 “senior calls.” A senior call occurs when a water right holder not receiving water to which the right holder is entitled calls on TCEQ

to enforce the “prior appropriations” doctrine. The prior appropriations doctrine is used to manage surface water rights in Texas and gives superior rights to first users of the water. This often is described as “first in time, first in right.” The most senior water rights are served first during times of drought, but domestic and livestock uses are superior to any appropriated rights. Water rights are suspended or curtailed by priority date, with the most recently issued – or “junior” – priority users suspended before senior water rights in the area.

Senior calls to TCEQ seeking to enforce water rights have included those on surface water in the Brazos, Guadalupe, Colorado, Sabine, and Neches river basins. TCEQ has suspended or curtailed more than 1,200 water right permits in response to senior calls and has stopped issuing temporary water right permits in basins affected by these calls. According to TCEQ, any curtailment can significantly affect other users, so their response to senior calls has been measured. TCEQ field staff have enforced suspensions and curtailments through on-the-ground and aerial investigations and have monitored stream flow to help the agency make informed decisions on management of senior calls.

In order to protect public health and welfare, water rights with municipal uses or for power generation have

Conserving water in San Antonio and statewide

Among the recommendations in Texas’ 2012 state water plan are calls to save water through conservation, with efficient use of and reduced demand for existing water supplies. San Antonio’s nationally recognized water conservation efforts have been a major factor in the city’s weathering the current drought. San Antonio will end the year with a surplus of available water and almost a half-year supply in aquifer storage and recovery.

San Antonio has a long history of using conservation measures to reduce per-capita demand for water and has used drought restriction measures as needed. The population of San Antonio has grown 67 percent over the past 25 years, but the San Antonio Water System (SAWS) has not had to increase the amount of water needed to serve that growing population. Without conservation, the same population would have needed 121,000 more acre-feet of water, according to SAWS.

The drought has been an inconvenience to San Antonio, but not the same crisis as in other communities, despite the city being in a drought-prone region and using a highly regulated water source — groundwater from the Edwards Aquifer. According to SAWS, a combination of conservation and investment in innovative water resource technologies has provided San Antonio

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not been suspended. TCEQ has advanced the stages of drought contingency plans in senior call areas, including requiring junior municipal water rights holders to implement mandatory restrictions to limit outdoor water use.

Suspending surface water rights

TCEQ's Sunset bill, HB 2694 by W. Smith, enacted by the 82nd Legislature during its 2011 regular session, allows the TCEQ executive director, by order and according to the priority of water rights established in the Water Code, to suspend or adjust rights during a drought or emergency shortage of water. Several factors must be considered before issuing such an order.

As required by HB 2694, TCEQ recently proposed rules to define "drought" and "emergency shortage of water" and to specify conditions and terms under which the executive director could suspend or adjust water rights during those times. TCEQ held a stakeholder meeting on August 11 to obtain public input. The close of the public comment period was December 5. TCEQ will consider adopting the rules on April 11, 2012.

The proposed rules would allow the executive director to issue an order without notice to cut off or adjust water rights during a drought or emergency shortage of water. A hearing would be required to affirm, modify, or set aside the order. The rules require that notice of the hearing be given to all holders of water rights that were suspended or adjusted under the order. These orders could be issued for up to 180 days, with 90-day extensions.

The rules would require that the executive director base determinations on the prior appropriations doctrine but allow other factors to be considered, such as an affected water right holder's efforts to develop and implement drought and conservation plans, prevent waste, and maximize beneficial uses.

State water plan

The state water plan is designed to meet water needs during times of drought. Its purpose is to ensure that cities, rural communities, farms, ranches, businesses, and industries have enough water during a repeat of the 1950s drought conditions. In Texas, each of 16 regional

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with water security during drought periods. SAWS spent time discussing water demands and dry periods in advance of the drought and sent a message to conserve and use water efficiently.

The 2012 state water plan recommends almost 767,000 acre-feet per year of water conservation savings, increasing to nearly 2.2 million acre-feet per year by 2060. The 2012 plan includes 129,000 acre-feet more of water conservation than did the 2007 plan.

Conservation measures may include ordinances, code standards, and retrofit programs to achieve water conservation passively in the normal course of daily activities, such as flushing a high-efficiency-flow toilet or showering with a low-flow showerhead. Other savings may be pursued through education and water utility programs to reduce water use. This may include teaching citizens to identify and repair leaks or helping them appreciate landscape and irrigation designs that require less supplemental water use.

Drought conditions may require emergency measures for further reductions. Local restrictions on water use during droughts and summers vary by location, especially for municipal landscape irrigation. Each water utility may set its own guidelines and restrictions, and enforcement of ordinances is the responsibility of the entity that adopted them.

water planning groups is responsible for creating a 50-year regional plan and refining it every five years so conditions can be monitored and assumptions reassessed. TWDB develops the state plan, which includes policy recommendations to the Legislature, with information from regional plans. The official state plan is expected to be delivered to the Legislature in early 2012.

The 2012 state water plan, recently approved by the TWDB, includes the cost of water management strategies and estimates of state financial assistance required to implement them. It also details economic losses likely to occur if these water supply needs cannot be met. Regional water planning groups recommended water management strategies that would account for another 9 million acre-feet of water by 2060 if all strategies were implemented, including 562 unique water supply projects. About 34 percent of the water would come from conservation and reuse, about 17 percent from new major reservoirs, about 34 percent from other surface water supplies, and the remaining 15 percent from various other sources.

Dedicated funding for water projects

Among TWDB's recommendations to the Legislature to facilitate implementation of the 2012 state water plan is the development of a long-term, affordable, and sustainable method to provide financing assistance to implement water supply projects.

According to TWDB, critical water shortages will increase over the next 50 years, requiring a long-term, reliable funding source to finance water and wastewater projects. The state water plan has identified projects intended to help avoid catastrophic conditions during a drought, but rising costs for local water providers, the capital-intensive investment required to implement large-scale projects, and the financial constraints on some communities necessitate a dedicated source of funding to help develop those projects. According to TWDB, the capital cost to design, build, or implement the recommended strategies and projects between now and 2060 will be \$53 billion. Municipal water providers are expected to need nearly \$27 billion in state financial assistance to implement these strategies.

General obligation bonds. On November 8, 2011, voters approved a constitutional amendment (Proposition 2) with 51.42 percent of the vote to allow TWDB to issue, in addition to the bonds authorized by other provisions of the Texas Constitution, general obligation bonds for one or more accounts of the Texas Water Development Fund II (DFund II). The aggregate principal amount of the bonds outstanding at any time may not exceed \$6 billion. According to TWDB, without the additional bond authority, TWDB would have been unable to provide the financing needed to meet the state's water and wastewater needs through the next two-year state budget period.

Water implementation fee. During the 2011 regular session, Rep. Allan Ritter introduced HB 3273 and HJR 138 to fund certain projects identified in the state water plan. The legislation would have established a state water implementation fee — a public water supply service connection fee that retail public utilities would have had to collect from each consumer. Both bills were reported favorably by the House Natural Resources Committee but never scheduled for floor debate.

Watermasters

Texas relies on the honor system in most parts of the state to protect water rights during a drought, but TCEQ has appointed two "watermasters" to oversee three areas and continuously monitor streamflows, reservoir levels, and water use. The Rio Grande watermaster coordinates releases from the Amistad and Falcon reservoir system. The South Texas watermaster serves the Nueces, San Antonio, Guadalupe, and Lavaca river basins, as well as their coastal basins, and serves the Concho River and its tributaries in the Colorado River basin.

TCEQ's Sunset bill, HB 2694, requires the executive director to assess the need for watermaster programs at least every five years in basins where programs to oversee and continuously monitor streamflows, reservoir levels, and water use do not now exist. The commission recently approved the criteria, process, and schedule for watermaster program evaluation. The executive director will evaluate the Brazos, Brazos-Colorado Coastal, Colorado, and Colorado-Lavaca coastal basins in 2012.

— by *Blair D. Parker*

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site in Austin County has a water right permit, and the site has been purchased by the Brazos River Authority, city of Houston, and Texas Water Development Board, but construction has not begun. Brownsville Weir in Cameron County has a water right permit and does not require a site purchase because it is an in-channel reservoir, formed by building underwater dams across the Lower Rio Grande.

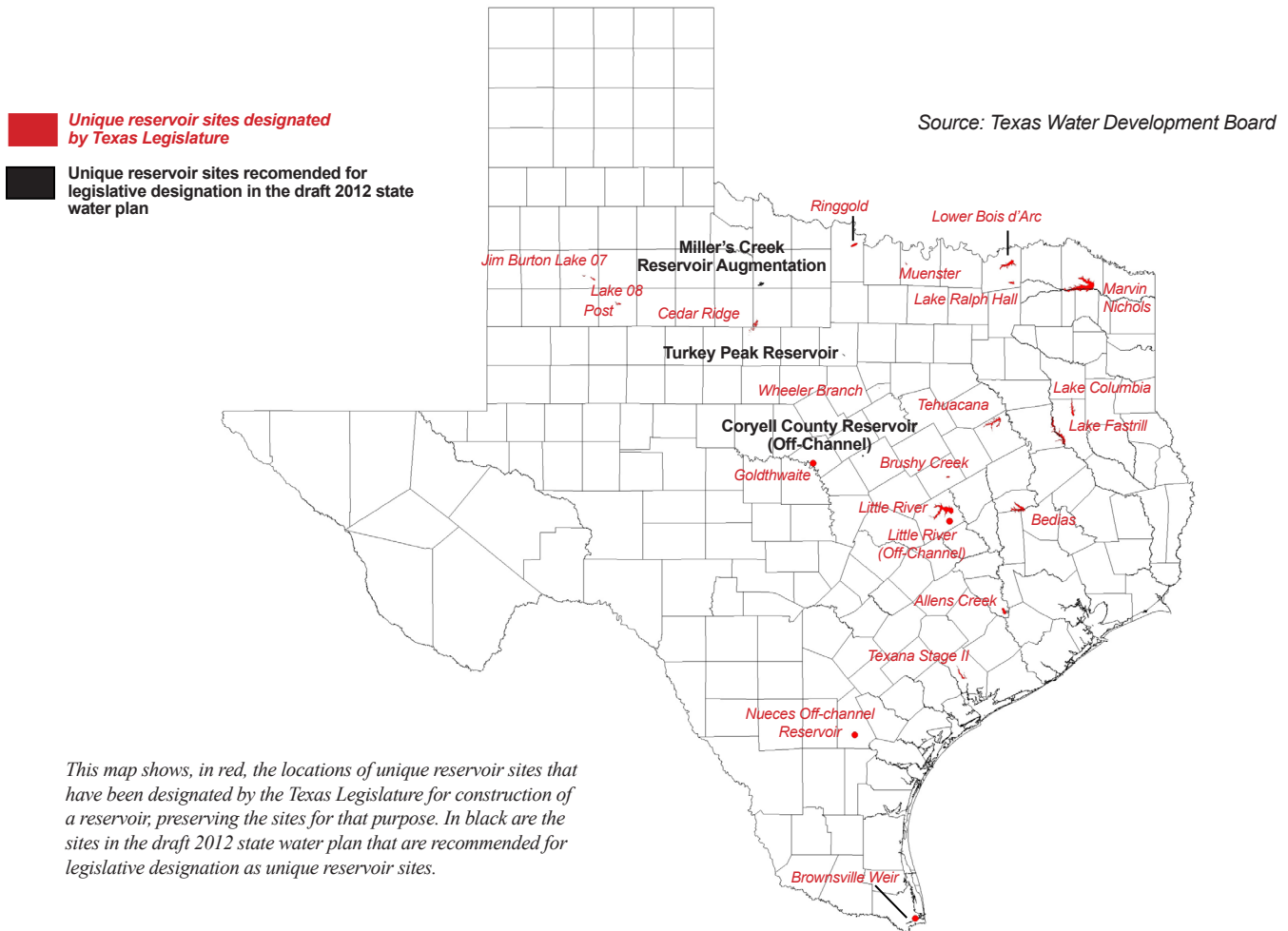
Local or regional water authorities are seeking water rights permits or permits through the U.S. Army Corps of Engineers for these five sites:

- Cedar Ridge in Throckmorton, Shackelford, and Haskell counties – city of Abilene;

- Lower Bois d’Arc in Fannin County – North Texas Municipal Water District;
- Lake Ralph Hall in Fannin County – Upper Trinity River Authority;
- Lake Columbia in Smith and Cherokee counties – Angelina & Neches River Authority; and
- Jim Burton Lake 07 in Lubbock County – city of Lubbock.

A Sunset provision in legislation enacted by the 80th Texas Legislature in 2007 terminates certain designations of sites on September 1, 2015, unless a sponsor makes necessary expenditures to build the reservoir or files applications for required permits under federal or state law. The following sites could lose their

Designated and recommended reservoir sites in Texas



designations if it were determined no action was taken to build the reservoir or obtain permits:

- Marvin Nichols in Red River, Titus, and Franklin counties*;
- Tehuacana Creek in Freestone County;
- Bedias in Grimes, Madison, and Walker counties;
- Texana Stage II in Jackson County*;
- Nueces Off-Channel in Live Oak County*;
- Goldthwaite Channel Dam on the Colorado River;
- Jim Burton Lake 08 in Lubbock County;
- Brushy Creek in Falls County*;
- Little River Off-Channel in Milam County;
- Little River in Milam County; and
- Lake Fastrill in Anderson and Cherokee counties.

**Reservoir sites with some activity, such as initiation of a study or finance committee, that could be enough to save the designations.*

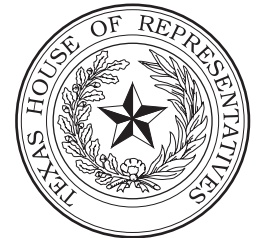
Lake Fastrill Reservoir, recommended in the 2007 state water plan to meet future water needs of Dallas, was effectively precluded from development after the U.S. Fish and Wildlife Service designated the Neches River National Wildlife Refuge by means of a conservation easement in the footprint of the proposed reservoir site. No action has been taken to permit or build the Post Reservoir site in Garza County, which was designated prior to SB 3 and does not have a Sunset provision.

The 2012 state water plan recommends that the Legislature designate three more sites for reservoir construction recommended in the 2011 regional water plans — Turkey Peak Reservoir in Palo Pinto County, Millers Creek Reservoir Augmentation in Baylor County, and Coryell County Reservoir in Coryell County.

The cost of acquiring these three sites, as well as remaining sites that do not yet have financing secured, is estimated to be \$558.2 million.

— by **Blair D. Parker**

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John H. Reagan Building
 Room 420
 P.O. Box 2910
 Austin, Texas 78768-2910

(512) 463-0752

www.hro.house.state.tx.us

Staff:

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