

FISCAL IMPACT OF DROUGHT ON STATE AGENCIES AND PUBLIC INSTITUTIONS OF HIGHER EDUCATION, FISCAL YEAR 2011

Since September 2010, Texas continues to suffer from an intense La Niña¹ driven drought with 100 percent of the state experiencing some level of drought during fiscal year 2011. The drought is affecting surface water and groundwater supplies, which affects water supply systems, agriculture, the economy, and the environment.

According to a Legislative Budget Board (LBB) staff survey of state agencies and public institutions of higher education, the total fiscal impact to these state entities was \$253.1 million in fiscal year 2011. This report summarizes the fiscal impact of this intense drought on state government, including the effect of wildfires in fiscal year 2011.

FACTS AND FINDINGS

- ◆ According to a LBB staff survey, the fiscal impact to Texas state agencies and public institutions of higher education was \$253.1 million in fiscal year 2011.
- ◆ In Texas, 956 (out of 6,954) public water systems declared mandatory water restrictions.
- ◆ Highland Lakes Travis and Buchanan, which provide water to more than one million Texans, were down to 38 percent of capacity.
- ◆ One community's (Spicewood Beach) water supply was depleted and it had to hire trucks to haul water.
- ◆ According to the Texas AgriLife Extension Service, the estimated economic loss to state agriculture due to the drought was at least \$7.6 billion.
- ◆ According to the Texas Forest Service, approximately 5.6 million trees died in urban areas throughout Texas because of the drought.

EFFECT ON THE TEXAS ECONOMY

There is no definitive assessment of how the drought affected the Texas economy during fiscal year 2011 because of the far-reaching effects the drought has had on various parts of the economy. To date, there are three, sector-specific reports available. In August 2011, the Texas AgriLife Extension Service published the first report, which calculated a \$5.2

¹According to the National Oceanic and Atmospheric Administration, La Niña refers to the periodic cooling of ocean surface temperatures in the central and east-central equatorial Pacific that occurs approximately every 3 to 5 years.

billion loss to Texas agriculture, to that point in the drought. Texas AgriLife Extension Service in March 2012 updated the 2011 economic losses to \$7.6 billion. The updated report disaggregated the effect of the losses by commodity, including livestock (\$3.2 billion), cotton (\$2.2 billion), hay (\$750 million), corn (\$736 million), wheat (\$314 million), and sorghum (\$385 million). According to the Texas AgriLife Extension Service, this is the greatest economic loss of any previous drought, with the previous record of \$4.1 billion attributed to the 2006 drought.

In December 2011, BBVA Research, a private economic forecasting firm, estimated the indirect losses to secondary market participants attributable to the drought at \$3.5 billion.

In February 2012, the Texas Forest Service released a preliminary estimate that 5.6 million trees in urban areas throughout the state perished in the drought to date.

In addition to these more formal reports, there is anecdotal evidence of further effects of the drought. According to the Texas AgriLife Extension Service:

- cattle ranchers shipped approximately 26 percent more cattle out of Texas than in 2010 due to a scarcity of hay and water;
- beef cow production in Texas, the nation's largest beef cow producing state, declined in 2011, resulting in the smallest cow herd since 1960;
- oyster farmers suffered economic losses as the salinity in the state's bays increases due to a lack of freshwater inflows; and
- cattle prices and the prices for other commodities have risen because of the agricultural losses.

IMPACT ON WATER SUPPLY INFRASTRUCTURE

Drought stresses the water supply infrastructure, with adverse impacts on entire communities. Drought can affect water supply systems in several ways.

The most obvious effect is that supplies dwindle as the rate of consumption is not met by rainfall to replenish reservoirs and aquifers. A drought also affects water supply capacity. During a drought, water supplies can be relatively adequate,

but demand for water at times can be so great that many water systems cannot handle it. As a result, some systems fail in various ways including burst pipes and overwhelmed treatment plants.

DROUGHT AND FIRE SUPPRESSION

Drought increases the likelihood and intensity of wildfires. According to the Texas Forest Service, Texas has experienced severe wildfires because of the drought

Because of the wildfires, approximately one-third of the state’s forestry crop was lost. During this drought, approximately 21,000 fires have destroyed over 1,171 houses throughout Texas through August 2011. These amounts exclude the 1,691 housing losses associated with the Bastrop County fire, which reportedly is the most destructive fire in Texas history.

DISCUSSION

This analysis summarizes the fiscal impact of this intense drought on state government, and state agencies and public institutions of higher education in particular, including the effect of wildfires in fiscal year 2011. Of the 135 state entities that responded to a LBB staff survey, 37 reported a drought-related fiscal impact, identifying a total fiscal impact of \$253.1 million in fiscal year 2011 (see **Figures 1** and **2**). This fiscal impact reflects the cost to agencies and institutions for activities and services that would not have been provided if there had been no drought.

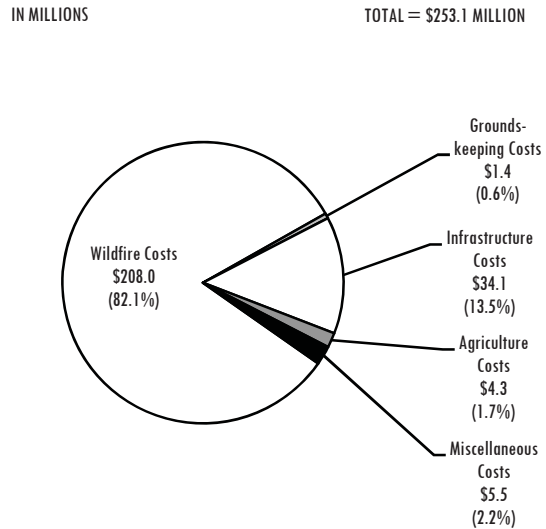
This analysis includes effects of the drought through August 31, 2011. Therefore, this snapshot does not capture any impact of the wildfires of September 2011.

The impacts to state agencies and public institutions of higher education are categorized as: (1) wildfire costs; (2) administrative or program costs; and (3) an impact on revenue generation. The administrative or program costs can be further subdivided into:

- costs related to responding to wildfires;
- groundskeeping costs, including irrigation and the removal of dead trees;
- infrastructure costs;
- costs related to agriculture; and
- other miscellaneous costs. (See **Figure 1**.)

Figure 2 shows an overview of the fiscal impact of the drought on state agencies and public institutions of higher

**FIGURE 1
FISCAL IMPACT OF DROUGHT ON STATE AGENCIES AND
PUBLIC INSTITUTIONS OF HIGHER EDUCATION
FISCAL YEAR 2011**



NOTE: Totals may not sum due to rounding.
SOURCE: Legislative Budget Board.

education, including all three fiscal impact categories described previously.

Revenue impacts were the result of decreased agricultural sales. Not all of the costs and revenue impacts directly related to the drought can be accurately quantified. For example, the Texas Parks and Wildlife Department reported that although the drought affected the agency in multiple ways including the loss of trees and the loss of revenue for fishing licenses, it is not possible to quantify the impact to the state because of these effects. Additionally, some state agencies provided services to Texans affected by the drought, which could be considered within the normal operations of the agency. For example, the Texas Department of Agriculture distributes the Disaster Resource Information Packet following any natural disaster, including drought. Since these costs occur within normal operations, this analysis reports them separately.

**ADMINISTRATIVE OR
PROGRAM COSTS/SAVINGS**

WILDFIRES

In fiscal year 2011, 16 state entities reported costs related to fighting wildfires. These costs total \$208.0 million and include:

- \$196.8 million expended by the Texas Forest Service to fight forest fires;
- \$5.4 million expended by the Department of Public Safety related to the operation of the State Operations Center and aviation and communication support, and payments to local fire departments that voluntarily participated in wildfire suppressions efforts in fiscal year 2011;
- \$2.2 million expended by the Texas Department of Transportation;
- \$1.6 million expended by the Adjutant General Department to deploy active duty guard personnel to fight fires;
- \$0.6 million expended by the Texas Engineering and Extension Service to facilitate and support the deployment of Texas Task Force 1 to Camp Swift;²
- \$0.5 million expended by the Department of Housing and Community Affairs to provide temporary shelter and other immediate needs resulting from disasters;
- \$0.7 million expended by the Texas Parks and Wildlife Department and the University of Texas at Austin related to fires at Davis Mountains and Possum Kingdom state parks, and the effect of wildfires in April and May 2011 on the McDonald Observatory; and
- A total of \$0.2 million expended by nine additional state entities related to wildfires in fiscal year 2011.

GROUNDKEEPING COSTS

In fiscal year 2011, 16 public institutions of higher education experienced additional groundskeeping costs related to the drought. These costs total \$1.4 million and include:

- \$0.4 million expended by Texas A&M University for additional irrigation usage and sports field repair work;
- \$0.3 million expended by Prairie View A&M University due to landscaping and irrigation costs;
- \$0.2 million expended by the University of Texas Medical Branch – Galveston for irrigation costs;
- \$0.1 million expended by the University of Texas at Austin related to additional landscaping costs;

²Texas Task Force 1 is a FEMA Urban Search and Rescue Task Force funded through the Texas Engineering Extension Service.

- \$0.1 million expended by Texas A&M International University for irrigation and landscaping costs; and
- A total of \$0.4 million expended by an additional 11 public institutions of higher education for groundskeeping and irrigation costs.

INFRASTRUCTURE COSTS

In fiscal year 2011, six state entities experienced additional infrastructure costs. These costs total \$34.1 million and include:

- \$32.4 million expended by the Texas Department of Transportation primarily related to pavement maintenance directly attributable to the drought;
- \$1.0 million expended by the Texas Youth Commission related to foundation, structure, and road repairs; and
- \$0.6 million expended by four other state agencies and public institutions of higher education for infrastructure repairs.

AGRICULTURE COSTS

In fiscal year 2011, six state entities experienced additional costs related to agriculture. These costs total \$4.3 million and include:

- a \$4.0 million expenditure by the Texas Department of Criminal Justice related to a loss in the agricultural production of field crops and vegetables;
- \$0.2 million was expended by Prairie View A&M University for increased animal feed costs; and
- a total of \$0.1 million expended by four other state agencies and public institutions of higher education related to agriculture.

MISCELLANEOUS ADMINISTRATIVE PROGRAM COSTS/SAVINGS

In fiscal year 2011, three state agencies experienced a total of \$5.5 million in miscellaneous program costs, including:

- \$4 million expended by the Texas AgriLife Extension Service for work and outreach related to the drought;
- \$1.5 million expended by the Animal Health Commission (personnel and brucellosis testing costs) due to drought-driven increase in cattle sales; and

- \$0.1 million expended by the Texas Commission on Environmental Quality, the Department of Aging and Disability Services, another state agency and two higher education institutions related to additional site visits, water use and water right activities due to the drought.

IMPACT ON REVENUE GENERATION

In fiscal year 2011, five state agencies and institutions of higher education saw a net decline in revenue of \$0.1 million related primarily to decreases in agriculture-related revenue, including a decrease in corn and hay sales. Also, as previously indicated, many of these revenue impacts (e.g., the effect of lower water levels and high temperatures on visitation and overnight stays at park facilities) have not been quantified.

This impact on revenue generation is only related to revenue reported by the state agencies and public institutions of higher education and does not include the impact the drought has had on all state revenue streams including the possible implications on state sales tax receipts.

**FIGURE 2
SUMMARY OF COSTS, SAVINGS, AND EFFECT ON REVENUE GENERATION OF DROUGHT, FISCAL YEAR 2011**

AGENCY /INSTITUTION OF HIGHER EDUCATION*	WILDFIRES	ADMINISTRATIVE OR PROGRAM (COSTS)/SAVINGS	REVENUE EFFECT	TOTAL	EXPLANATION
Texas Forest Service	(\$196,808,902)	\$-	\$-	(\$196,808,902)	These are wildfire suppression costs and include out of state resources mobilized to assist the state with the suppression efforts.
Texas Department of Transportation	(\$2,164,366)	(\$32,432,993)	\$-	(\$34,597,359)	Administration costs of the drought relate to the repair of cracked roadways, dead tree and shrub removal from ROW, etc.
Department of Public Safety	(\$5,440,425)	\$-	\$-	(\$5,440,425)	Wildfire expenses relate to the operation of State Operations Center and aviation, communications support and Texas Intrastate Fire Mutual Aid System (TIFMAS) payments to local fire departments voluntarily participating in wildfire suppression efforts (approx.\$3.9 million out of General Revenue appropriations made to the Governor's office for disaster assistance).
Texas AgriLife Extension Service	(\$50,972)	(\$4,025,519)	\$-	(\$4,076,491)	Texas AgriLife Extension Service, through its network of county extension agents and specialists across the state, support Texas Forest Service to prevent and mitigate wildfires through public information and education addressing mitigation around homes, workplaces, highways and farmsteads.
					AgriLife Extension had an estimated 93 full-time equivalent extension educators working on drought related projects during fiscal year 2011. It conducted 203 educational sessions on drought related topics, published a report on beef production systems in the Panhandle of Texas and surrounding states, executed several mass media efforts relative to water conservation and landscape irrigation management during exceptionally dry conditions; and released a report on the economic impact of the drought on agriculture in Texas.
					The Soil, Water and Forage Testing Laboratory responded to the recent state-wide drought through several avenues. These included: (1) water testing for irrigators, homeowner, agricultural producers and for municipalities seeking new water resources, (2) working with municipalities, oil production companies and other industrial water uses on the evaluation and use of reclaimed water for both parks and sporting fields, agricultural irrigation, livestock watering, and reuse for industrial purposes, (3) testing of hay purchased to supplement livestock due to the loss of forages drought and testing of crop residues baled for emergency livestock feed due to the potential for nitrate accumulations due to drought and 4) soil testing campaigns to detect residual fertilizer not used due to drought damage to crops.
Texas Department of Criminal Justice	\$-	(\$4,000,000)	\$-	(\$4,000,000)	Administrative costs relate to a loss in the agricultural production of field crops and vegetables.

**FIGURE 2 (CONTINUED)
SUMMARY OF COSTS, SAVINGS, AND EFFECT ON REVENUE GENERATION OF DROUGHT, FISCAL YEAR 2011**

AGENCY /INSTITUTION OF HIGHER EDUCATION*	WILDFIRES	ADMINISTRATIVE OR PROGRAM (COSTS)/SAVINGS	REVENUE EFFECT	TOTAL	EXPLANATION
Texas Animal Health Commission	(\$94,678)	(\$1,487,491)	\$-	(\$1,582,169)	Wildfire costs relate to emergency response by agency employees for animal health & welfare for fires. Due to drought conditions, there was an increase in sales of test eligible cattle. For example, in fiscal year 2011, 1,153,316 test eligible cattle were sold through livestock markets compared to 960,969 test eligible cattle sold in fiscal year 2010. This resulted in increased costs of \$759,740 for first point brucellosis testing and employee expenses of \$1,165,968 for a total of \$1,925,708 in General Revenue related expenses.
Adjutant General's Department	(\$1,567,053)	\$-	\$-	(\$1,567,053)	State Active Duty to fight the wildfires included payroll, meals, lodging and equipment rental.
Texas Youth Commission	\$-	(\$1,049,937)	\$-	(\$1,049,937)	Administrative costs related to infrastructure costs.
Texas Engineering Extension Service	(\$598,456)	\$-	\$-	(\$598,456)	The Texas Engineering Extension Service (TEEX) facilitated and supported the deployment of Texas Task Force 1 (approximately 100 personnel) to Camp Swift within the wildfire affected area.
Department of Housing and Community Affairs	(\$521,000)	\$-	\$-	(\$521,000)	In response to wildfires, the agency made \$200,000 in Community Services Block Grant (CSBG) discretionary funding to CSBG subrecipients in affected areas available to provide temporary shelter as well as other immediate needs resulting from disasters, such as toiletries and blankets. Additionally, the agency disbursed \$321,000 in federal funds to provide temporary shelter where supply of power to the dwelling is disrupted causing temporary evacuation.
Prairie View A&M University	\$-	(\$465,395)	(\$13,797)	(\$479,192)	Administrative costs of the drought relate to landscaping and irrigation costs, and increased animal feed costs. Revenue impacts of the drought relate to decreased corn sales and an increase in revenue from selling animals that would have been kept had there not been a drought.
Texas Parks and Wildlife Department	(\$442,022)	(\$9,762)	Unable to Quantify	(\$451,784)	Agency wildfire expenses relate to fires at Davis Mountains State Park and Possum Kingdom State Park and include costs for salary and operating amounts associated with firefighting execution, ensuring public safety and security near fire areas, and repairs at state parks due to the fires. Program costs relate to additional pumps that were purchased because of declining lake levels, which jeopardized intake pipes for some of the ponds. The agency indicates that revenue collections have been affected by the drought, but the amount cannot be determined.

**FIGURE 2 (CONTINUED)
SUMMARY OF COSTS, SAVINGS, AND EFFECT ON REVENUE GENERATION OF DROUGHT, FISCAL YEAR 2011**

AGENCY /INSTITUTION OF HIGHER EDUCATION*	WILDFIRES	ADMINISTRATIVE OR PROGRAM (COSTS)/SAVINGS	REVENUE EFFECT	TOTAL	EXPLANATION
Texas A&M University	\$-	(\$394,831)	\$-	(\$394,831)	Administration costs include additional irrigation campus wide, golf course repair and intramural sports field repair.
The University of Texas at Austin	(\$240,930)	(\$148,913)	\$-	(\$389,843)	Wildfire costs related to the McDonald Observatory, which had considerable costs as a result of the Rock House Wildfire (April 2011) and the Tejano Canyon Wildfire (May 2011).
Stephen F. Austin State University	\$-	(\$144,250)	(\$34,992)	(\$179,242)	Administrative costs relate to increased expenditures for landscaping. Administrative costs of the drought relate to the purchase of hay and increased irrigation costs.
University of Texas Medical Branch Galveston	\$-	(\$150,000)	\$-	(\$150,000)	The revenue impact of the drought relates to decreased revenue for horse boarding and lost sales to the Stephen F. Austin Gardens.
University of Houston	\$-	(\$143,230)	\$-	(\$143,230)	Administrative costs relate to increased irrigation and cooling costs.
Texas A&M International University	\$-	(\$110,000)	\$-	(\$110,000)	Administrative costs relate to repairing infrastructure and landscaping costs.
Angelo State University	\$-	(\$17,930)	(\$53,900)	(\$71,830)	Administrative costs relate to irrigation and landscaping costs. Administrative costs relate to building a fence to keep cattle from crossing a dry lakebed.
Texas Commission on Environmental Quality	\$-	(\$66,868)	\$-	(\$66,868)	Revenue impacts of the drought relate to decreased hay sales. Administrative costs related to the drought include: compensatory time accrued for staff dedicated to drought-related activities; contract costs for drought-related assistance; and costs for large mail-outs to water right holders and local officials regarding drought conditions and response.
Midwestern State University	\$-	(\$64,210)	\$-	(\$64,210)	Costs for services provided relate to: flyovers by the agency to assess drought conditions; and water right investigations as a result of water rights compliance initiatives held across the state.
Firefighters' Pension Commission	(\$60,212)	\$-	\$-	(\$60,212)	Administrative costs relate to irrigation and landscaping costs. Related to death benefits and annuities to beneficiaries upon a firefighters' death.
University of Texas at Tyler	\$-	(\$55,983)	\$-	(\$55,983)	Administrative costs relate to increased irrigation costs.

**FIGURE 2 (CONTINUED)
SUMMARY OF COSTS, SAVINGS, AND EFFECT ON REVENUE GENERATION OF DROUGHT, FISCAL YEAR 2011**

AGENCY /INSTITUTION OF HIGHER EDUCATION*	WILDFIRES	ADMINISTRATIVE OR PROGRAM (COSTS)/SAVINGS	REVENUE EFFECT	TOTAL	EXPLANATION
The University of Texas at San Antonio	\$-	(\$47,240)	\$-	(\$47,240)	Administrative costs relate to increased irrigation costs.
Texas A&M University-Texarkana	\$-	(\$37,500)	\$-	(\$37,500)	Administrative costs relate to increased irrigation costs.
Department of Aging and Disability Services	(\$10,819)	(\$12,553)	\$-	(\$23,372)	Agency wildfire expenses include additional staff time to monitor regulatory and service delivery activities as well as to assist in evacuation of individuals to safer locales. Administration costs include the repair of cracked water pipes due to soil/ground shifting.
University of Houston-Victoria	\$-	(\$21,000)	\$-	(\$21,000)	Administrative costs relate to increased irrigation costs.
University of Houston-Clear Lake	\$-	(\$20,128)	\$-	(\$20,128)	Administrative costs relate to removing dead trees.
Texas A&M University Galveston	\$-	(\$15,000)	\$-	(\$15,000)	Administrative costs relate to replacing dead trees and repairing water infrastructure.
Texas Historical Commission	(\$1,640)	(\$7,403)	(\$4,804)	(\$13,847)	Agency wildfire expenses relate to staff time (49.4 hours) working with the public on issues related to wildfires. Administrative costs include additional site visits, response to phone inquiries and emails, as well as working with FEMA and other state agencies as necessary.
Tarleton State University	\$-	(\$11,000)	\$-	(\$11,000)	Administrative costs include additional hay for feeding livestock and additional electricity for pumping water.
Lamar State College Port Arthur	\$-	(\$10,270)	\$-	(\$10,270)	Administrative costs relate to increased water usage.
Texas State Technical College	\$-	(\$8,350)	\$-	(\$8,350)	Administrative costs relate to increased irrigation costs.
Department of State Health Services	(\$5,768)	\$-	\$-	(\$5,768)	Wildfire costs are related to Cook County wildfire in April 2011, where ambulances were deployed to assist firefighters.
Texas Department Of Insurance	(\$2,171)	\$-	\$-	(\$2,171)	Travel related to wildfires.
Texas Department of Motor Vehicles	(\$410)	\$-	\$-	(\$410)	Overtime and travel related to the wildfires.
Texas Veterinary Medical Diagnostic Laboratory	\$-	\$-	\$2,616	\$2,616	Increase in certain diagnostic testing because of the drought.
GRAND TOTAL	(\$208,009,825)	(\$44,957,757)	(\$104,877)	(\$253,072,458)	

Notes: Fiscal impacts for Fiscal Year 2011 were reported by affected state agencies and institutions of higher education through an LBB staff survey. State agencies and institutions of higher education are listed by size of fiscal impact, from largest to smallest.
Source: Legislative Budget Board.