UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

ANNUAL REPORT FOR YEAR ENDING DECEMBER 31, 2024

Upper Trinity Groundwater Conservation District

2024 Annual Report

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General Manager's Report 2024

In terms of new well registrations, 2024 saw a continued slow-down from 2022 and 2023, with 2022 being the busiest year since the creation of the District. However, staff still processed approximately 1,400 new well registrations – 60% of which were in Parker County. Additionally, the District processed more new permit applications than in any previous year.

In more exciting news, 2024 was the second year the District awarded grant funds as part of our Annual Rainwater Harvesting Grant Program, however we were able to see the projects which received funding in 2023 come to fruition.

Finally, I am happy to report that the District met or exceeded each Management Plan objective, as set forth in our Management Plan, for 2024. Furthermore, an independent auditor has reported favorably in regard to the District's financial position.

Below are a few highlights from 2024:

Staff/Board:

- Sara Scoggins left the District for a position with the City of Fort Worth.
- Clayton Holloman joined our staff in the summer of 2024 as a Field Technician.
- Director Todd Vineyard was appointed by the Board to fill the vacancy on the Board for Wise County created by Brent Wilson's resignation in the spring 2024.
- Jay Love received his Professional Geoscientist license (PG) and completed graduate school in 2024.

Other Notable Accomplishments:

- In response to SB 2440 (88th Regular Session), the District entered into several interlocal agreements with counties and municipalities to review GACs on their behalf. Staff spent a tremendous amount of time and effort not only reviewing these certifications, but also teaching others how they should be completed.
- In coordination with the other districts in GMA 8, the District took part in the updating of the Groundwater Availability Model for the Trinity Aquifer.

District staff is pleased to submit the remainder of this report to the Board, to highlight the fulfillment of our objectives.

Doug Shaw
General Manager

Brief History 2024

- ✓ In 2006, based on data from the Texas Water Development Board (TWDB) and the Texas Commission on Environmental Quality (TCEQ), the counties of Montague, Wise, Parker, and Hood were included in the designation of the North Texas Priority Groundwater Management Area (PGMA).
- ✓ In 2007, the 80th Texas Legislature created the Upper Trinity Groundwater Conservation District (UTGCD).
- ✓ In November 2007, over 78 percent of voting residents within the District's four counties approved creation of the groundwater conservation district.
- ✓ On November 30, 2009, the Board of Directors of the UTGCD revised and adopted the Temporary Rules for Water Wells; they allow the District to enforce spacing regulations between wells and minimum distance from property boundaries for water wells drilled after January 1, 2009.
- ✓ In 2017, UTGCD purchased property in Springtown, Parker County to build a new District office and education center, and in 2018 the District moved into the new facility.
- ✓ On October 15, 2018, the Board of Directors adopted a revised District Management Plan. Its Objectives and Performance Standards are discussed on the following pages.
- ✓ On August 19, 2019, UTGCD adopted updated Rules for Water Wells in Hood, Montague, Parker, and Wise Counties, Texas, which now include permitting requirements for nonexempt water wells.
- ✓ In 2020, the District awarded grant funding, for the first time, for a large rainwater collection project in Parker Co. The District was awarded the Rain Catcher Award by the Texas Water Development Board.
- ✓ On June 15, 2020, the Board of Directors adopted a revised District Management Plan. Its Objectives and Performance Standards are discussed on the following pages.
- ✓ In the fall of 2022, the District adopted an ongoing annual Rainwater Harvesting Grant Program.
- ✓ In the fall/winter of 2023, the District began entering into interlocal agreements with counties and municipalities to review the newly required groundwater availability certifications related to new subdivisions.

Mission Statement

The Mission of the Upper Trinity Groundwater Conservation District is to develop rules to provide protection to existing wells, prevent waste, promote conservation, provide a framework that will allow availability and accessibility of groundwater for future generations, protect the quality of the groundwater in the recharge zone of the aquifer, ensure that the residents of Montague, Wise, Parker, and Hood Counties maintain local control over their groundwater, respect and protect the property rights of landowners in groundwater, and operate the District in a fair and equitable manner for all residents of the District.

District Staff 2024

Doug Shaw
General Manager

Kyle Russell, P.G.
Assistant G.M.

Jill Garcia, P.G.
Assistant .M.

Blaine Hicks, P.G.
Staff Geologist

Ann Devenney
Office Manager

Laina Furlong
Office Admin

Jacob Dove, P.G.
GIS Analyst

Jennifer Hach
Registration Coor

Jay Love
.Reporting Coord.

Zane Bearden
Field Technician
Education Specialist

Clayton Holloman
Field Technician

Dawson Lowe
Field Technician

Part Time:
Heather Bird
Fallon Word
Anthony Rodriguez

Board of Directors

The Board of Directors of the Upper Trinity Groundwater Conservation District is composed of two members, per county, appointed by their county's Commissioners' Court. In May, 2024 Brent Wilson resigned from the Board. On October 17, 2024, the Board adopted Resolution 24-005 Appointing Mr. Todd Vineyard to the Board of Directors. In a Regular Board Meeting on June 29, 2023, the Board of Directors elected District Officers to serve two-year terms ending July 2025. The appointments are as follows:

Tracy Mesler – President	Montague County
Shannon Nave – Vice President	Parker County
Tim Watts – Secretary/Treasurer	Parker County
Jarrod Reynolds – Assistant Secretary	Hood County
Mike Berkley – Assistant Secretary	Montague County
Bob Lusk– Assistant Secretary	Hood County
Donald Majka – Assistant Secretary	Wise County
Brent Wilson/Todd Vineyard – Assistant Secretary	Wise County

Board of Directors

The District's Management Plan sets forth a methodology for tracking the District's progress in achieving management goals. The Plan requires the District to prepare an Annual Report to the District's Board of Directors, which must contain an update on the District's performance in regard to achieving management goals and objectives. This report is intended to satisfy the annual reporting requirements of the District's Management Plan. After adoption by the Board of Directors, the Annual Report is made available to the public.

Well Registrations 2024

A1. Objective - Each year the District will require registration of all new wells within the District.

A.1 Performance Standard - Annual reporting of well registration statistics will be included in the Annual Report provided to the Board of Directors.

The District Rules for Water Wells require any water well drilled on or after January 1, 2009, to be registered with the District; additionally, owners of any exempt well drilled prior to 2009 may voluntarily register their well(s) with the District. Furthermore, the District requires all operational nonexempt wells are registered and the monthly volume of groundwater produced from those wells be reported to the District. The number of well registrations the District received continues to decline from 2022.

County	Exempt	Nonexempt	Existing	New	Total
Hood	122	16	29	109	138
Montague	168	4	23	149	172
Parker	889	26	159	756	915
Wise	352	39	68	323	391
Total:	1,531	85	279	1,337	1,616

Year	Total Registrations
2009	2,086
2010	839
2011	996
2012	892
2013	1,054
2014	1,226
2015	1,107
2016	988
2017	1,187
2018	1,290
2019	1,252
2020	1,596
2021	2,084
2022	2,332
2023	1,653
2024	1,616

Groundwater Production Report 2024

A.2 Objective - Each year the District will monitor annual production from all non-exempt wells within the District.

A.2 Performance Standard - The District will require installation of meters on all non-exempt wells and reporting of production to the District. The annual production of groundwater from non-exempt wells will be included in the Annual Report provided to the Board of Directors.

The District has adopted rules requiring metering, reporting and fee payment for all wells determined to be subject to those requirements (nonexempt wells). Owners/Operators of these nonexempt wells must report groundwater production semi-annually and pay water usage fees, set annually by the Board.

In 2024, Public Water Supply production accounted for approximately 88% of total groundwater extracted from non-exempt water wells within the District. The table below shows total groundwater production for each of the three categories of use (Public Water Supply, Oil and Gas, and Commercial/Business) in each of the four counties that comprise the District .

Public Water Supply	Gallons Reported	Category Percentage
Hood	1,438,447,098	36.49%
Montague	122,639,045	3.11%
Parker	1,185,079,992	30.06%
Wise	707,195,242	17.94%
Total:	**3,453,361,377**	**87.59%**

Oil & Gas Production	Gallons Reported	Category Percentage
Hood	0	0.00%
Montague	37,474,525	0.95%
Parker	13,599,557	0.34%
Wise	146,063,390	3.70%
Total:	**197,137,472**	**5.00%**

Commercial/Business	Gallons Reported	Category Percentage
Hood	93,927,239	2.38%
Montague	1,081,490	0.03%
Parker	161,120,963	4.09%
Wise	35,887,730	0.91%
Total:	**292,017,422**	**7.41%**

2024 Grand Total:	**3,942,516,271**	

Permitted Groundwater Production Volumes 2024

A.3 Objective - Each year the District will monitor permitted groundwater production volumes.

A.3 Performance Standard - Annual permitted volume of groundwater will be included in the Annual Report provided to the Board of Directors.

In 2019, the District's Board of Directors adopted rules implementing a permitting process related to wells determined to be subject to those requirements (nonexempt wells); two types of permits were included – Operating Permits (OP) and Historic Use Permits (HUP). OPs apply to all new nonexempt wells drilled after December 31, 2019, and wells drilled, or for which administratively complete applications were received, prior to that date are eligible for HUPs.

The District began issuing OPs in 2020, and the original deadline to submit an application for a HUP was December 31, 2020 (this was extended to June 30, 2021, due to COVID). The District's Board of Directors began issuing HUPs in 2021. Below you will find the authorized and pending volumes requested in HUP applications received prior to the end of 2024.

Total Approved and Pending Permits as of December 31, 2024

Public Water Supply	Operating Permits	Historic Use Permits (Including Authorized and Pending)	Compliance Order Permits
Hood	209,806,218	2,752,527,823	0
Montague	3,652,000	205,031,630	0
Parker	308,631,089	1,593,535,790	566,960
Wise	531,279,762	794,108,622	0
Total:	**1,053,369,069**	**5,345,203,865**	**566,960**

Oil & Gas Production	Operating Permits	Historic Use Permits (Including Authorized and Pending)	Compliance Order Permits
Hood	0	209,727,038	0
Montague	68,612,370	874,178,290	0
Parker	0	910,008,081	0
Wise	76,208,919	2,661,163,365	0
Total:	**144,821,289**	**4,655,076,774**	**0**

Commercial/Business	Operating Permits	Historic Use Permits (Including Authorized and Pending)	Compliance Order Permits
Hood	63,248,138	495,086,950	0
Montague	34,629,450	5,100,000	0
Parker	61,289,355	453,909,388	0
Wise	136,353,000	174,699,329	0
Total:	**295,519,943**	**1,128,795,667**	**0**

Total Permits	**12,623,353,567**

Waste of Groundwater 2024

B.1 Objective - Annual evaluation of the rules to determine if any amendments are recommended to decrease waste of groundwater within the District.
B.1 Performance Standard - Annual discussion of the evaluation of the rules and a reporting of whether any of the District rules require amendment to prevent waste of groundwater to be included in the Annual Report provided to the Board of Directors.

In August of 2019, the District's Board of Directors adopted District Rules which include the following definition related to the waste of groundwater:

(59) "Waste" means one or more of the following:

(a) withdrawal of groundwater from a groundwater reservoir at a rate and in an amount that causes or threatens to cause an intrusion into the reservoir of groundwater unsuitable for agriculture, gardening, domestic, stock raising, or other beneficial purposes;

(b) the flowing or producing of water from the groundwater reservoir by artificial means if the groundwater produced is not used for a beneficial purpose;

(c) the escape of groundwater from a groundwater reservoir to any other reservoir or geologic strata that does not contain groundwater;

(d) pollution or harmful alteration of groundwater in a groundwater reservoir by saltwater or by other deleterious matter admitted from another stratum or from the surface of the ground;

(e) willfully or negligently causing, suffering, or allowing groundwater to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or road ditch, or onto any land other than that of the owner of the well unless such discharge is authorized by permit, rule, or other order issued by the Texas Commission on Environmental Quality under Chapter 26 of the Texas Water Code;

(f) groundwater pumped for irrigation that escapes as irrigation tailwater onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge;

(g) for groundwater produced from an artesian well, "waste" has the meaning assigned by Section 11.205, Texas Water Code;

(h) operating a deteriorated well; or

(i) producing groundwater in violation of any District rule governing the withdrawal of groundwater through production limits on wells, managed depletion, or both.

Additionally, District staff and the District's general counsel worked closely with the Texas Legislature, and regularly update the District's Board, during the 88th regular session on House Bill 4444, relating to the conservation and waste of groundwater. Although the bill ultimately did not make it through the process, the Board was prepared to update District Rules to reflect any changes in the law. The District's GM and general counsel also worked with several groups on the concepts included in HB 4444, during the interim, in preparation for the 89th regular session (2025).

Furthermore, District staff continues to monitor and evaluate the activities of well owners within the District and enforce the District's rules to promote conservation and prevent waste of groundwater. Usually, once an issue is brought to the owner's attention, the matter is corrected immediately.

Water Use Fees 2024

B.2 Objective - The District will encourage the elimination and reduction of groundwater waste through the collection of a water-use fee for non-exempt production wells within the District.

B.2 Performance Standard - Annual reporting of the total fees paid and total groundwater used by non-exempt wells will be included in the Annual Report provided to the Board of Directors.

UTGCD's Board of Directors set the fee for groundwater usage at a rate of .22 cents per thousand gallons ($.22/1,000 gallons) for all commercial, municipal, and industrial users within the District that are not exempt from the metering, monitoring, reporting or payment requirements as set forth in the temporary rules adopted by the District.

In 2024, the District invoiced a total of $866,580.85 for nonexempt water use fees, however total nonexempt groundwater production would have actually totaled a value of $867,353.58. The difference between the total amount invoiced and the total value of the total reported groundwater production is due to issues such as reported emergency use being exempt from fee payment and issues of both over and under reporting by multiple entities. Staff has provided a detailed explanation of these discrepancies as subtext to the table below.

Use Category		Hood	Montague	Parker	Wise	Total
Public Water Supply	GW Production	1,438,447,098	122,639,045	1,185,079,992	707,195,242	**3,453,361,377**
	Fees Collected	$316,423.76 *	$26,976.52 **	$260,714.62 ***	$155,572.11 ****	$759,687.00
Oil & Gas	GW Production	0	37,474,525	13,599,557	146,063,390	**197,137,472**
	Fees Collected	$0.00	$8,244.40	$2,991.90	$32,133.95	$43,370.24
Commercial/ Business	GW Production	93,927,239	1,081,490	161,120,963	35,887,730	**292,017,422**
	Fees Collected	$20,650.36 *****	$237.93	$34,717.25 ******	$7,918.58 *******	$63,524.11
Total	GW Production	**1,532,374,337**	**161,195,060**	**1,359,800,512**	**889,146,362**	**3,942,516,271**
	Fees Collected	**$337,074.11**	**$35,458.84**	**$298,423.77**	**$195,624.63**	**$866,581.36**

* Includes the deduction of fees for 77,300 gallons of emergency water used for the City of Tolar, and the deduction of 80,000 gallons of emergency water used for Cresson Crossroad Municipal Utility District #2.

** Includes the deduction of fees for 18,500 gallons of emergency water used for the City of Saint Jo.

*** Includes the deduction of fees for 8,225 gallons of emergency water used for the City of Willow Park, and the deduction of 5,300 gallons of emergency water used for the Town of Annetta.

**** Includes the deduction of fees for 49,310 gallons of emergency water used for the Slidell Water Supply Corp.

***** District staff made an error in invoicing only 1,000 gallons of groundwater production, rather than the 62,987 gallons that was reported by Wolf Hollow II Power, LLC for the 24SA1 reporting period. The invoice has been corrected and resent to Wolf Hollow II Power, LLC to correct the error.

****** Includes the deduction of fees for 3,315,300 gallons of groundwater produced for agricultural irrigation between October 2019 and June 2024 that was misreported as commercial use from Well ID 13184.

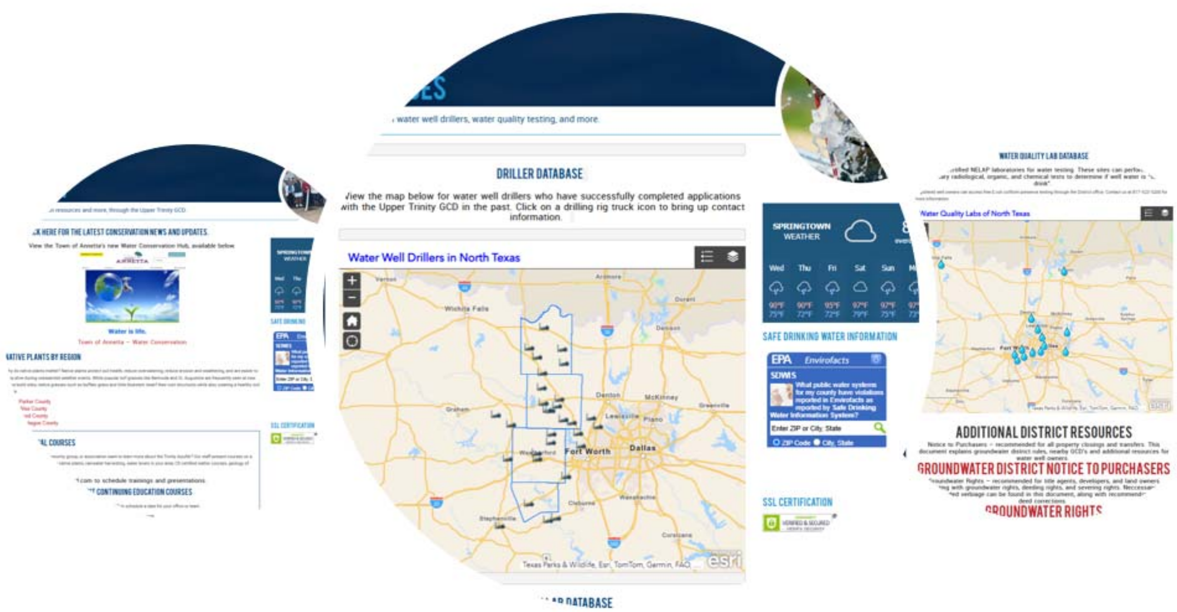
******* Includes the addition of fees for 105,831 gallons of groundwater production reported in 2024 to correct reports submitted in 2023.

B.3 Objective - Each year, the District will provide information to the public on eliminating and reducing wasteful practices in the use of groundwater by including information on groundwater waste reduction on the District's website.

B.3 Performance Standard - Each year, a copy of the information provided on the groundwater waste reduction page of the District's website will be included in the District's Annual Report to be given to the District's Board of Directors.

The Upper Trinity Groundwater Conservation District's website provides information about eliminating waste on the "Education" and "Resources" page, which can be found at http://uppertrinitygcd.com/education/ and https://uppertrinitygcd.com/resources/. The website is promoted through the District's news releases, advertising, social media, and brochures.

Additionally, local educators and event coordinators can schedule a free on-site visit of the Groundwater Education Mobile (GEM) through the "Education" page. In 2023, over 4,000 elementary school, middle school, and high school students and over 500 adults were able to tour the District's education trailer, both virtually and in-person. Students are encouraged to engage in critical thinking about our most precious resource. In addition to touring the exhibits, staff participated in many STEM-based learning activities that included customized lesson plans with hydrogeology curriculum, content development seminars with Region 11, water pollution simulations, and water conservation principles. UTGCD makes the GEM available to North Texas schools and entities interested in water conservation and aquifer resources.



https://uppertrinitygcd.com/education/

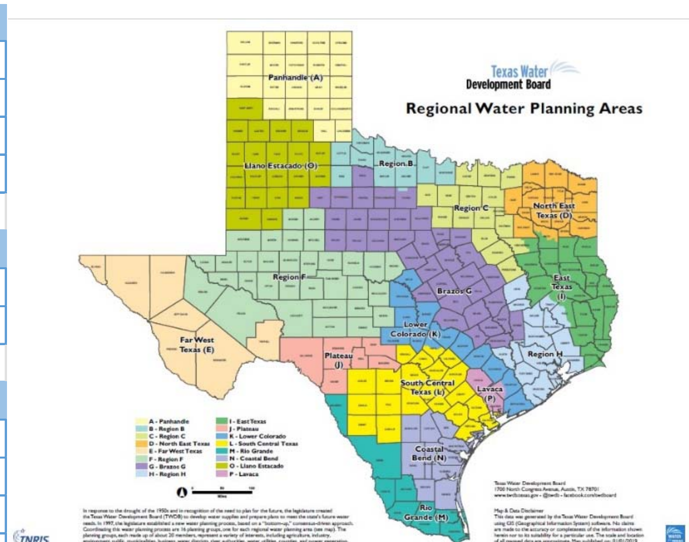
Regional Water Planning Participation 2024

C.1 Objective - Each year the District will participate in the regional water planning process by attending at least one of the Region B, C or G Regional Water Planning Group Meetings to encourage the development of surface water supplies to meet the needs of water user groups within the District.

C.1 Performance Standard - The attendance of a District representative at any Regional Water Planning Group meeting will be noted in the Annual Report provided to the Board of Directors.

Throughout the year, the District's staff attended various water-planning meetings. Staff and Board members also participated in meetings and/or conferences concerning public outreach or other groundwater issues. A record of attendance at regional water planning meetings by District Representatives follows.

Region B Water Planning Group		
2/7/2024	Wichita Falls, TX	Tracy Mesler and Doug Shaw
5/15/2024	Wichita Falls, TX	Tracy Mesler
9/25/2024	Wichita Falls, TX	Tracy Mesler and Doug Shaw
12/4/2024	Wichita Falls, TX	Tracy Mesler and Doug Shaw
Region C Water Planning Group		
4/29/2024	Arlington, TX	Doug Shaw
9/30/2024	Arlington, TX	Doug Shaw
Region G Water Planning Group		
2/13/2024	Waco, TX	Doug Shaw
3/27/2024	Waco, TX	Doug Shaw
8/1/2024	Waco, TX	Doug Shaw
11/7/2024	Waco, TX	Doug Shaw



Injection Well Applications 2024

D.1 Objective - Ongoing monitoring and review of all applications submitted to the Railroad Commission of Texas to inject fluid into a reservoir productive of oil or gas within the boundaries of the District and all counties immediately adjacent to the District.

D.1 Performance Standard - Regular updates to the District's Board of Directors concerning injection well applications received and reviewed and inclusion of summary of all applications received and reviewed by the District in the Annual Report provided to the Board of Directors.

Injection Well Applications
Received by the District in 2023

Operator	Registration No.	Location	Date District Received	Well Site Protested	Resolution/Notes
Felderhoff Production Company	58268	Cooke, 11.5 miles Northeast of Gainesville	12/6/2024	no	
BLS Production Co., INC.	58247	Cooke, 1.5 miles Northeast of Woodbine	11/22/2024	no	
BKV Barnett, LLC	58204	Wise, 2.8 miles Southwest of Boyd	11/19/2024	yes	Resolved
Bridwell Oil Co.	58188	Clay, 10 miles Southwest of Blue Grove	11/13/2024	no	
Oleum Partners, LLC	58187	Cooke, 0.5 miles Southeast of Rosston	11/13/2024	no	
Felderhoff Production Company	58154	Cooke, 4.6 miles Southeast of Gainesville	11/5/2024	no	
Mokan Capital, LLC	58050	Jack, 10 miles Northeast of Jacksboro	9/27/2024	no	
Bulwark Oil & Gas, LLC	57957	Palo Pinto, 1 mile West of Graford	8/26/2024	no	
Caribou Operating, Inc.	57952	Jack, 6 miles East of Antelope	8/22/2024	no	
HWH Production, LLC	57859	Cooke, 1.7 miles North of Muenster	8/6/2024	no	
HWH Production, LLC	57858	Cooke, 1.7 miles North of Muenster	8/6/2024	no	
BKV Dearbon Venture, LLC.	57814	Tarrant, 4 miles Northeast of Azle	7/17/2024	no	
Skinner Tank Trucks, Inc.	57806	Montague, 2 miles South of Nocona	7/16/2024	no	
Ross, Dwight M. DRLG. CO., INC.	57809	Montague, 8 miles Northwest of Saint Jo	7/16/2024	yes	Resolved
Skinner Tank Trucks, Inc.	57805	Montague, 2 miles South of Nocona	7/16/2024	no	
Stephens & Johnson Operating Co.	57787	Palo Pinto, 5.5 miles northeast of Strawn	7/3/2024	no	
BKV Barnett, LLC	57544	Wise, 5 miles northwest of Decatur	4/19/2024	no	
Triple G Well Service, Inc.	57511	Cooke, 3 miles southeast of Gainesville	4/12/2024	no	
NEC Operating, LLC	57484	Wise, 5 miles southeast of Alvord	4/1/2024	yes	
HWH Production, LLC	57483	Cooke, 1.8 miles north of Muenster	4/1/2024	no	
Quail Ridge Operating LLC	57481	Montague, 6 miles west of Bowie	3/28/2024	no	
Quail Ridge Operating LLC	57480	Montague, 7 miles west of Bowie	3/28/2024	no	
Oakridge Oil and Gas, LP	57476	Jack, 1 mile southeast of Jacksboro	3/27/2024	no	
B.O.L.D. Oil and Gas LLC	57470	Jack, 5 miles East of Jacksboro	3/26/2024	no	
Kodiak Oil & Gas, Inc	57424	Montague, 2.6 miles south of St. Jo	3/19/2024	no	
Best Petrolium Explorations, Inc.	57320	Jack, 1 mile southwest of Jacksboro	2/15/2024	no	
Quail Ridge Operating LLC	57256	Montague, 6 miles west of Bowie	2/5/2024	no	

Drought Conditions 2024

E.1 Objective - Monthly review of drought conditions within the District using the Texas Water Development Board's Monthly Drought Conditions Presentation available at: http://www.twdb.texas.gov/surfacewater/conditions/report/index.asp

E.1 Performance Standard - An annual review of drought conditions within the District will be included in the Annual Report provided to the Board of Directors and on the District website.

The National Drought Mitigation Center defines drought as "a deficiency of precipitation over an extended period of time (usually a season or more) resulting in a water shortage." (Source: https://drought.unl.edu/Education/DroughtBasics.aspx). The District reviews the Texas Water Conditions Report published by the Texas Water Development Board every month.

Beginning on the next page, you will find the TWDB's monthly Texas Water Conditions Report (TWCR).

Texas Water Conditions Report

January 2024

Water News:

Discover the current state of drought, historical comparisons of temperature and rainfall, and what to expect in the coming months with our Texas Water Newsroom, monthly Water and Weather segment. https://texaswaternewsroom.org/videos/water_and_weather_january_2024.html.

RAINFALL

In January, little to no rainfall [yellow, orange, and red shading, Figure 1(a)] was received in the Trans Pecos, High Plains, much of the Low Rolling Plains, Edwards Plateau, much of the Southern, Lower Valley, central North Central, and portions of southern South Central climate divisions. Whereas, above average to high amounts of rainfall [light and dark blue shading, Figure 1(a)] were seen on the eastern border of the Edwards Plateau, eastern and western North Central, South Central, East Texas, and the Upper Coast climate divisions.

Compared to historical data from 1991–2020, the Trans Pecos, southern High Plains, much of the Edwards Plateau, western Southern, and areas of the Lower Valley climate divisions received 0–75 percent of normal rainfall [yellow, orange shading, Figure 1(b)]. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in the northern High Plains, Low Rolling Plains, central and eastern North Central, northwestern and portions of southern East Texas, portions of eastern Southern, areas of southern South Central, and the southwestern Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in northern High Plains, northern and eastern Low Rolling Plains, western and southern North Central, northern and eastern Southern, much of South Central, much of East Texas, and the Upper Coast climate divisions. The northern South Central and southwestern East Texas received 400-600 percent of normal rainfall [light purple, Figure 1(b)].

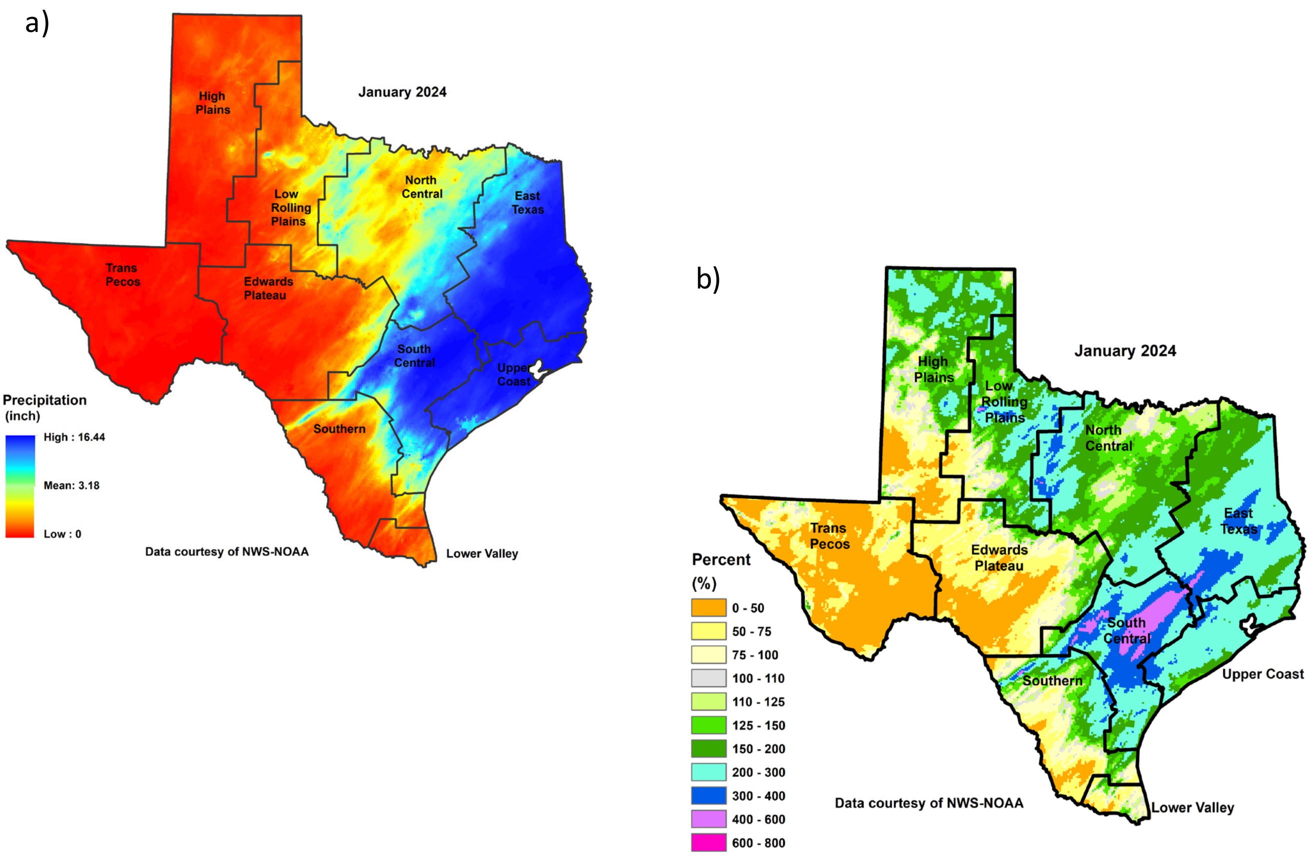
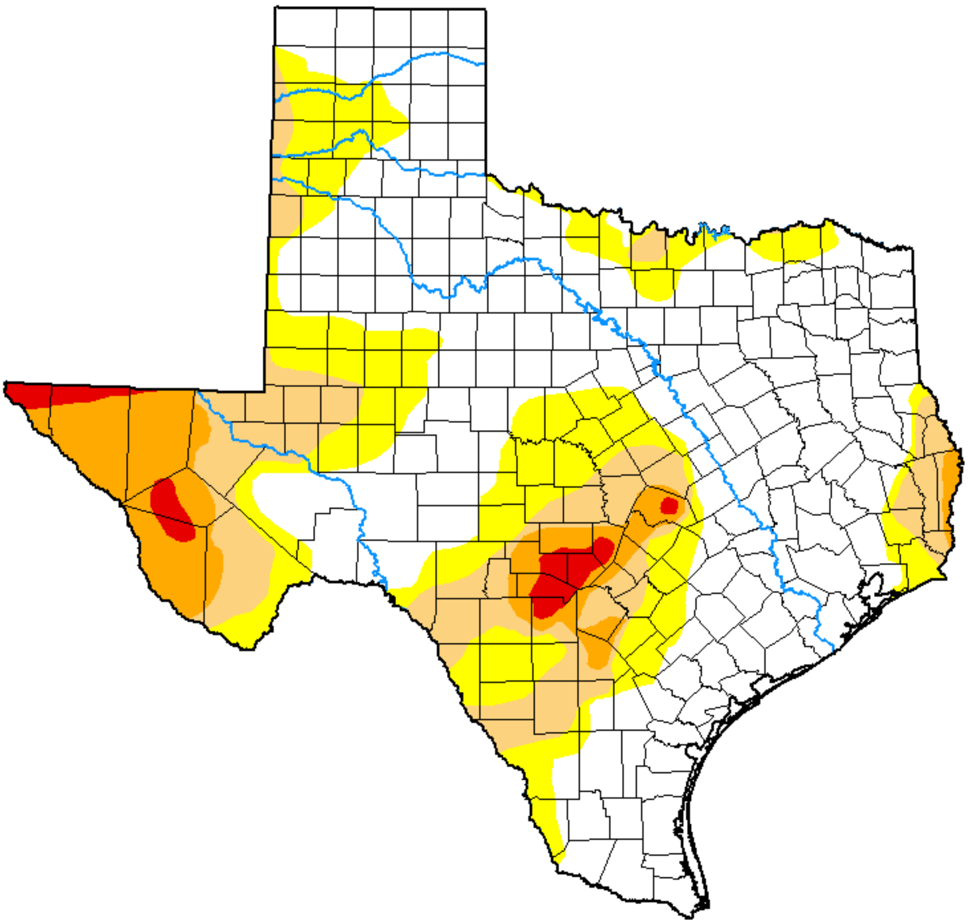


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of January 56.93% of the state was in the D0 (abnormally dry) through D3 (exceptional drought) categories (**Figure 2**). That is a decrease of 2.85% from the end of December.



Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2024-01-30	56.93	43.07	22.75	9.68	1.92	0.00

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of January 30, 2024.

RESERVOIR STORAGE

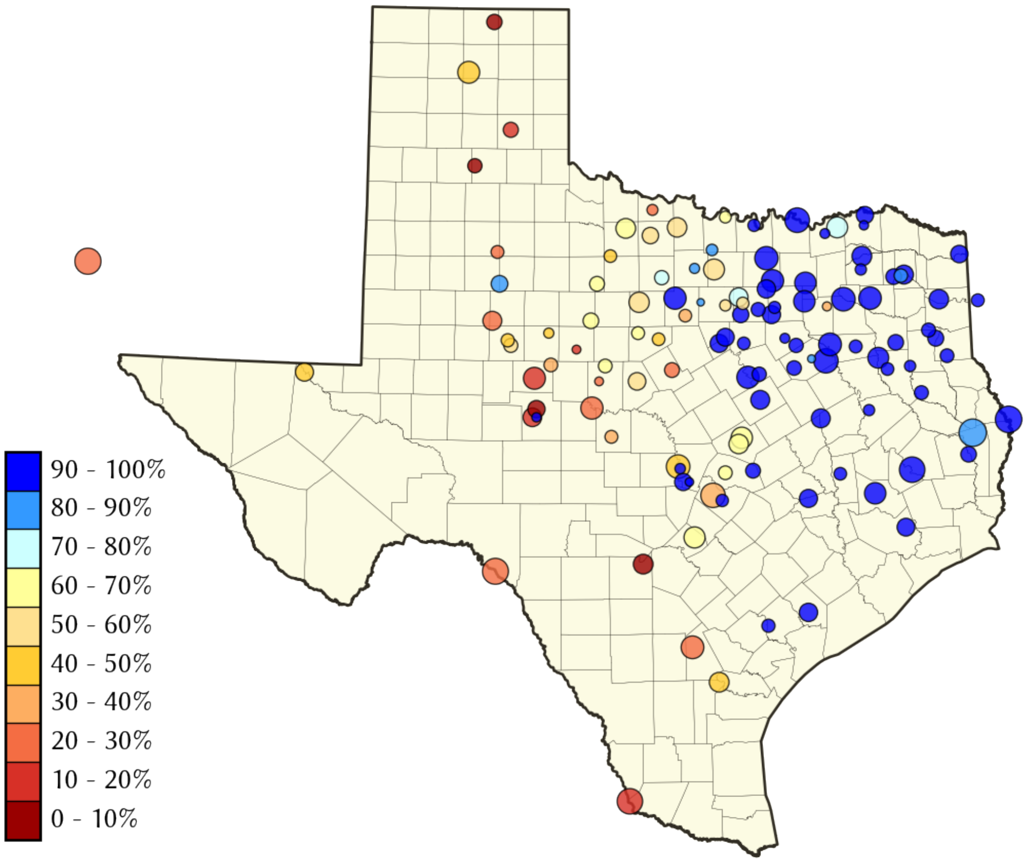


Figure 3. Reservoir conservation storage at end-January expressed as percent full (%)

Out of 119 reservoirs in the state, 31 reservoirs held 100 percent conservation storage capacity, and 30 reservoirs were at or above 90 percent full in December. Seventeen reservoirs remained below 30 percent full: Abilene (14.9 percent full), Amistad (24.6 percent full), Choke Canyon (24.5 percent full), E.V. Spence (16.1 percent full), Falcon (17.8 percent full), Greenbelt (11.2 percent full), Hords Creek (22.3 percent full), J.B. Thomas (21.7 percent full), Mackenzie (9.4 percent full), Medina Lake (3.3 percent full), North Fork Buffalo Creek Reservoir (28.5 percent full), O.C. Fisher (2.0 percent full), O.H. Ivie (27.7 percent full), Palo Duro Reservoir (4.5 percent full), Proctor (27.7 percent full), Twin Buttes (15.3 percent full), and the White River Lake (24.0 percent full). Elephant Butte Reservoir (New Mexico) was 25.1 percent full (Figure 3).

Reservoir conservation storage by climate division was at or above normal (Figure 4(a)) for East Texas (94.3 percent full), North Central (89.9 percent full), and the Upper Coast (99.8 percent full) climate divisions. Conservation storage was moderately low (Figure 4(a)) for the Low Rolling Plains (52.2 percent full), and South Central (43.9 percent full) climate divisions. The High Plains (36.9 percent full), Edwards Plateau (29.8 percent full), the Trans Pecos (27.6 percent full), and the Southern (22.6 percent full) climate divisions had severely low conservation storage (Figure 4(a)).

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin, and severely low [20–40 percent full, brown shading, Figure 4(b)] in the Upper/Mid Rio Grande, Lower Rio Grande, Nueces, Upper Colorado, and Canadian river basins. The Upper Red, and Lower Colorado river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. The Guadalupe river basin had abnormally low conservation storage [60-70 percent full, yellow shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

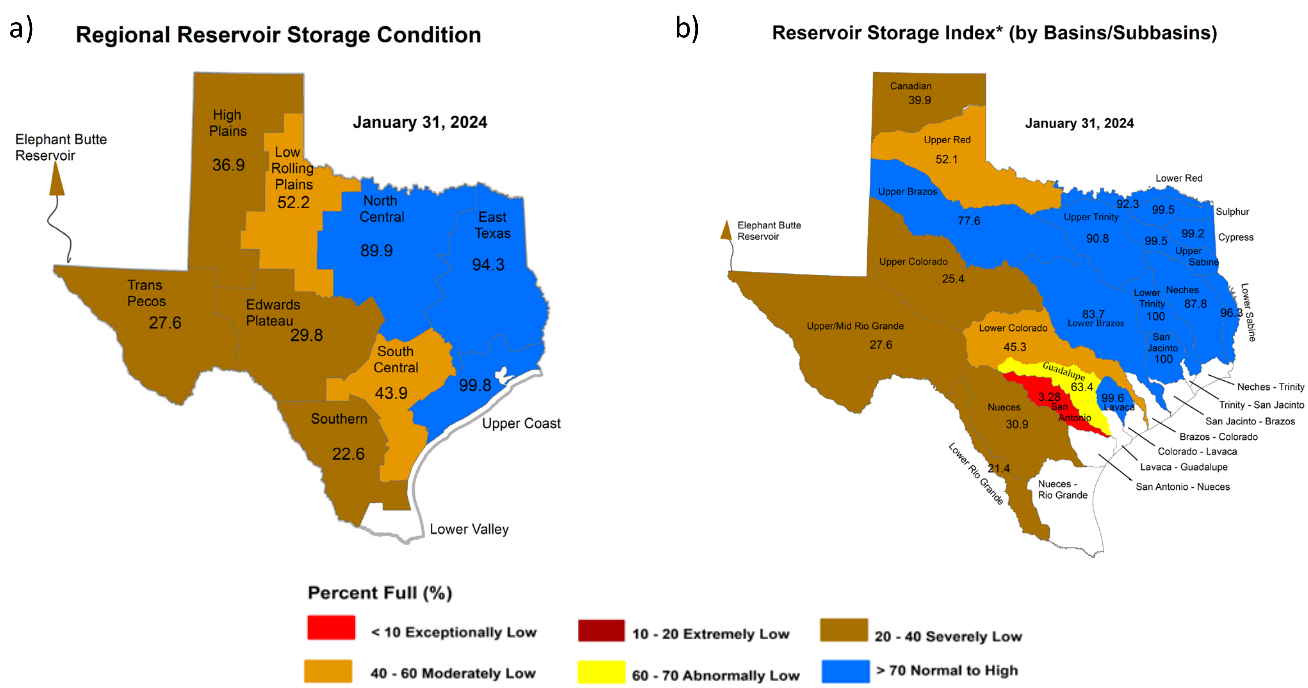


Figure 4: (a) Reservoir Storage Index* by climate division, and (b) Reservoir Storage Index* by basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Water News:

The Texas Water Development Board, Water Science and Conservation Office is hiring! View and apply for current opportunities https://www.twdb.texas.gov/jobs/index.asp.

TWDB - 24-50 - Hydrometeorology Data Scientist

TWDB - 24-38 - Recorder Program Specialist

TWDB - 24-66 - WSC Office Coordinator (Executive Assistant I)

RAINFALL

In February, little to no rainfall [yellow, orange, and red shading, Figure 1(a)] was received in the Trans Pecos, High Plains, western Low Rolling Plains, western Edwards Plateau, portions of western and southern North Central, western and central Southern, and northwestern and southern South Central climate divisions. Above average to high amounts of rainfall [light and dark blue shading, Figure 1(a)] were seen in the eastern Low Rolling Plains, northern and eastern Edwards Plateau, northern and southern Southern, Lower Valley, much of the North Central, South Central, the Upper Coast, and East Texas climate divisions.

Compared to historical data from 1991–2020, northeastern and southern High Plains, northern and southern Low Rolling Plains, southern Low Rolling Plains, much of the Edwards Plateau, northern and central Southern, northern and southern South Central, much of North Central, much of East Texas, and eastern Upper Coast climate divisions received 0–75 percent of normal rainfall [yellow, orange shading, Figure 1(b)]. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in northern and central High Plains, northern Low Rolling Plains, northwestern and central Trans Pecos, northern Edwards Plateau, northern and southern Southern, eastern Lower Valley, central South Central, northwestern Upper Coast, and central East Texas climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in northern High Plains, northern and southern Southern, central South Central, and western Lower Valley climate divisions.

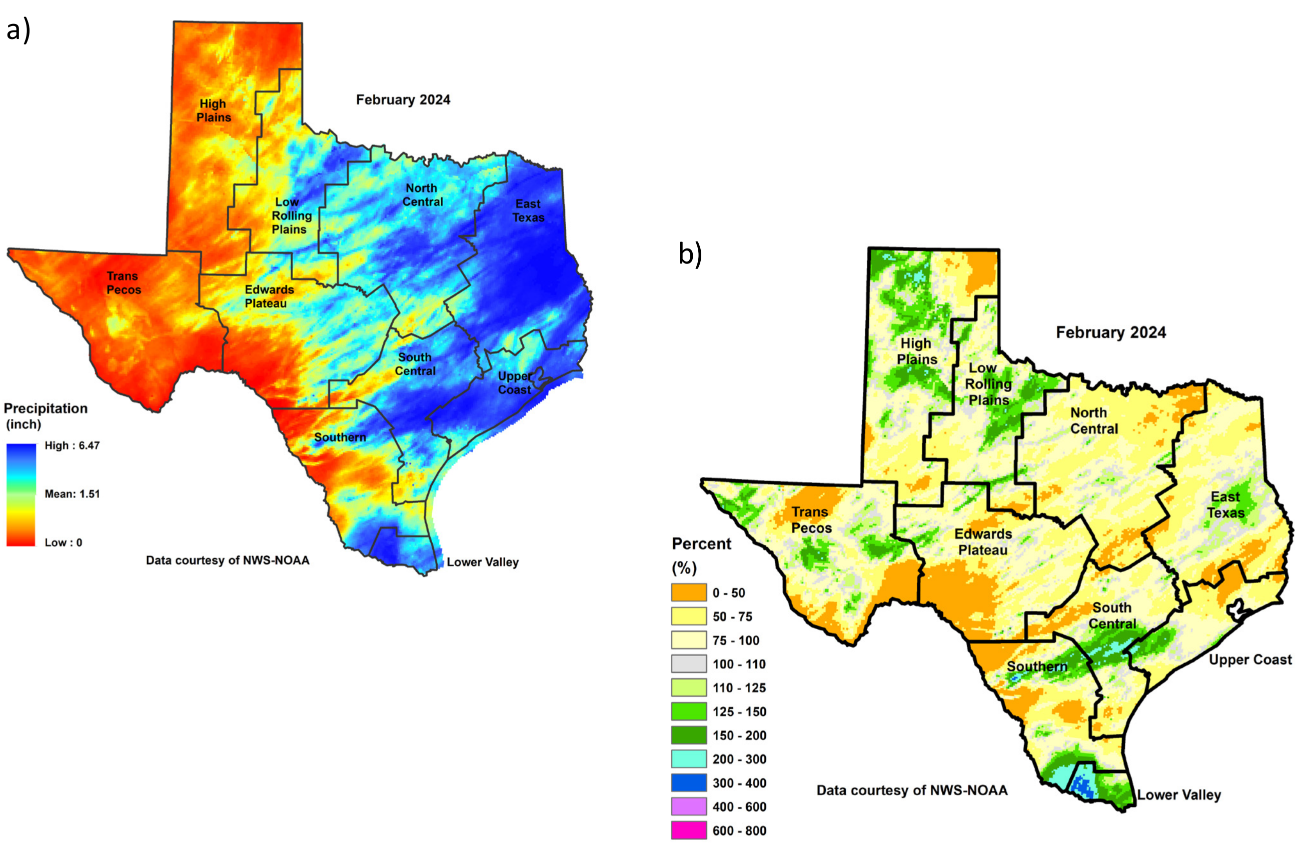


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

By the end of February drought conditions in portions of western Texas worsened compared to drought conditions at the end of January, while portions of northern, central, and eastern regions of Texas showed improvements in drought conditions (**Figure 2).**

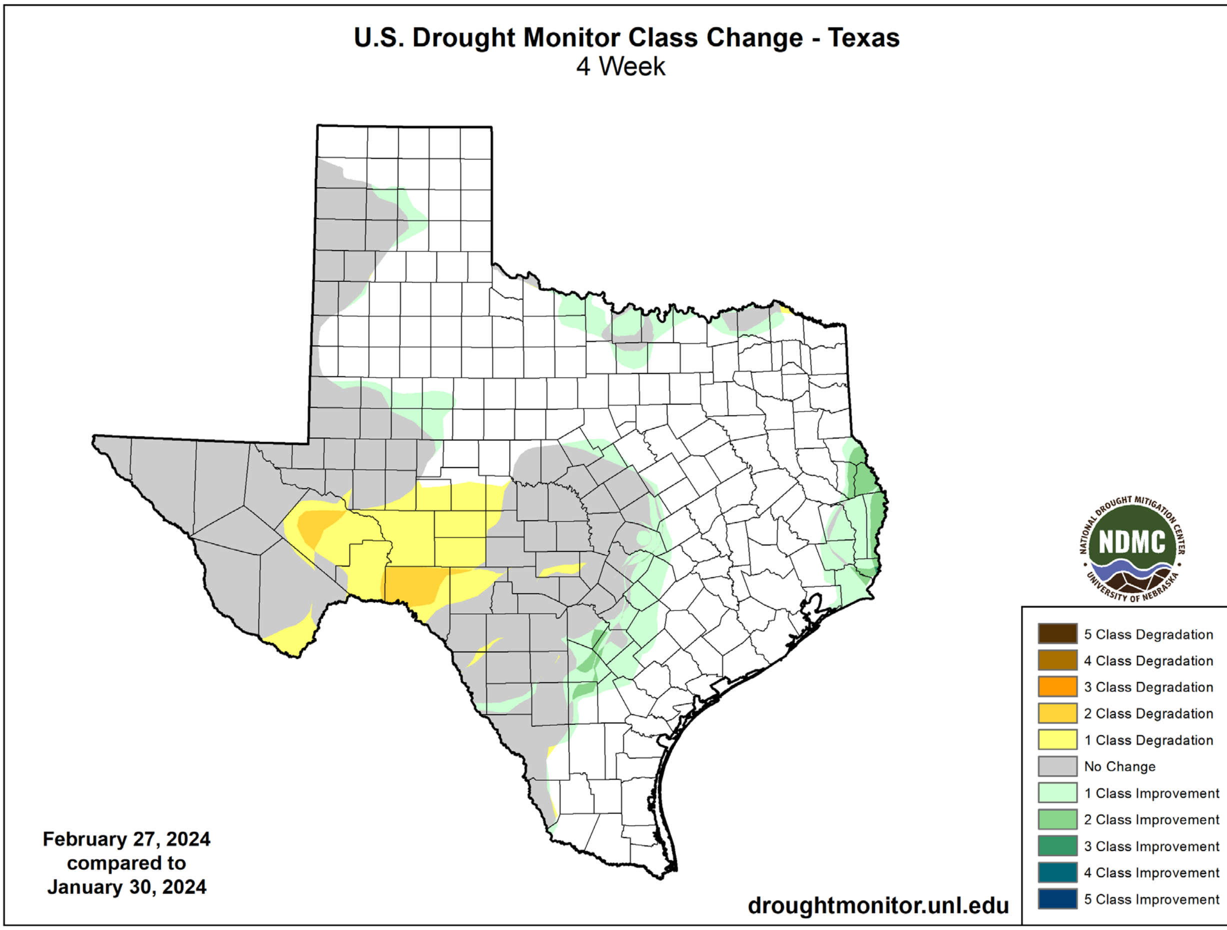


Figure 2. Comparison of drought conditions between February 27, and January 30, 2023. Areas of drought improvement shown in shades of green. Areas of drought degradation shown in shades of yellow. Gray shading reflects areas of no change in drought conditions.

RESERVOIR STORAGE

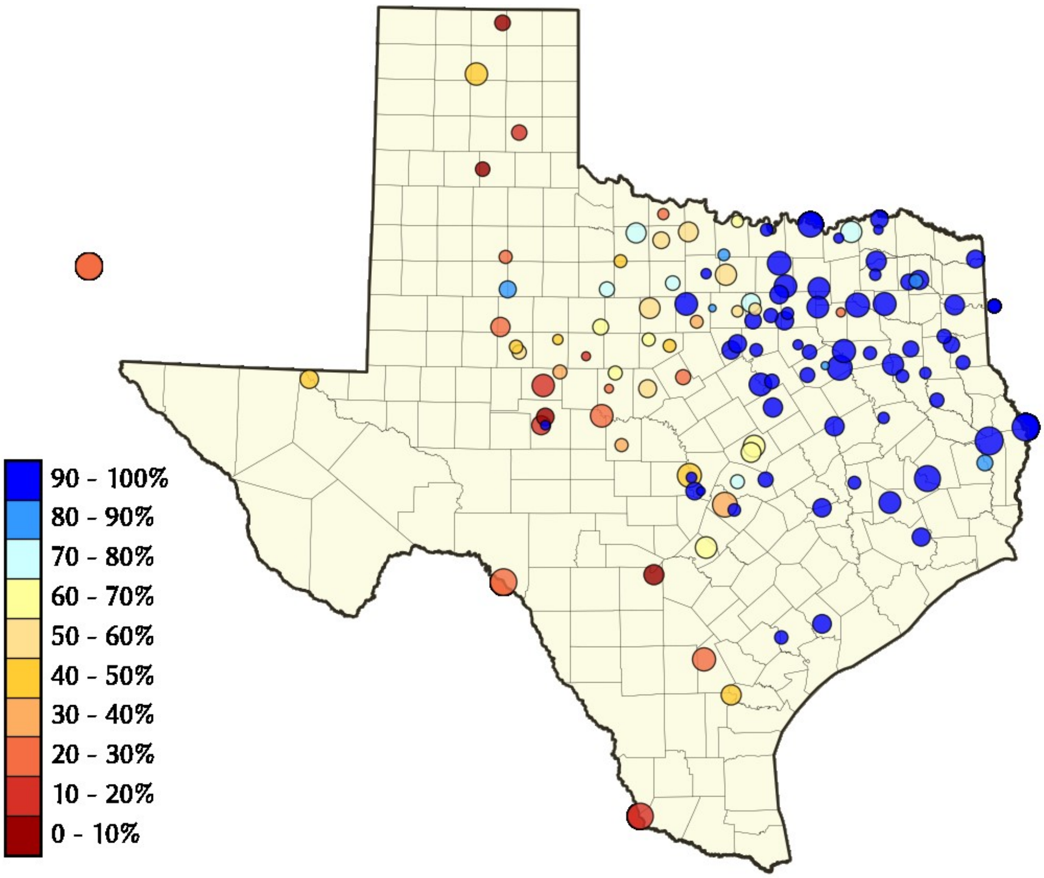


Figure 3. Reservoir conservation storage at end-February expressed as percent full (%)

Out of 119 reservoirs in the state, 35 reservoirs held 100 percent conservation storage capacity, and thirty reservoirs were at or above 90 percent full in February. Eighteen reservoirs remained below 30 percent full: Abilene (13.9 percent full), Amistad (26.7 percent full), Choke Canyon (24.1 percent full), E.V. Spence (15.8 percent full), Falcon (16.4 percent full), Greenbelt (11.2 percent full), Hords Creek (22.1 percent full), J.B. Thomas (21.1 percent full), Mackenzie (9.3 percent full), Medina Lake (3.1 percent full), New Terrell City Lake (28.5 percent full), North Fork Buffalo Creek Reservoir (29.0 percent full), O.C. Fisher (1.9 percent full), O.H. Ivie (27.3 percent full), Palo Duro Reservoir (4.0 percent full), Proctor (27.4 percent full), Twin Buttes (15.0 percent full), and the White River Lake (25.5 percent full). Elephant Butte Reservoir (New Mexico) was 25.3 percent full (Figure 3).

Reservoir conservation storage by climate division was at or above normal (Figure 4(a)) for East Texas (95.6 percent full), North Central (90.5 percent full), and the Upper Coast (99.3 percent full) climate divisions. Conservation storage was moderately low (Figure 4(a)) for the Low Rolling Plains (53.1 percent full), and South Central (44.4 percent full) climate divisions. The High Plains (37.1 percent full), Edwards Plateau (30.6 percent full), the Trans Pecos (27.7 percent full), and Southern (21.6 percent full) climate divisions had severely low conservation storage (Figure 4(a)).

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin, and severely low [20–40 percent full, brown shading, Figure 4(b)] in the Upper/Mid Rio Grande, Lower Rio Grande, Nueces, and Upper Colorado river basins. The Canadian, Upper Red, and Lower Colorado river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. The Guadalupe river basin had abnormally low conservation storage [60-70 percent full, yellow shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

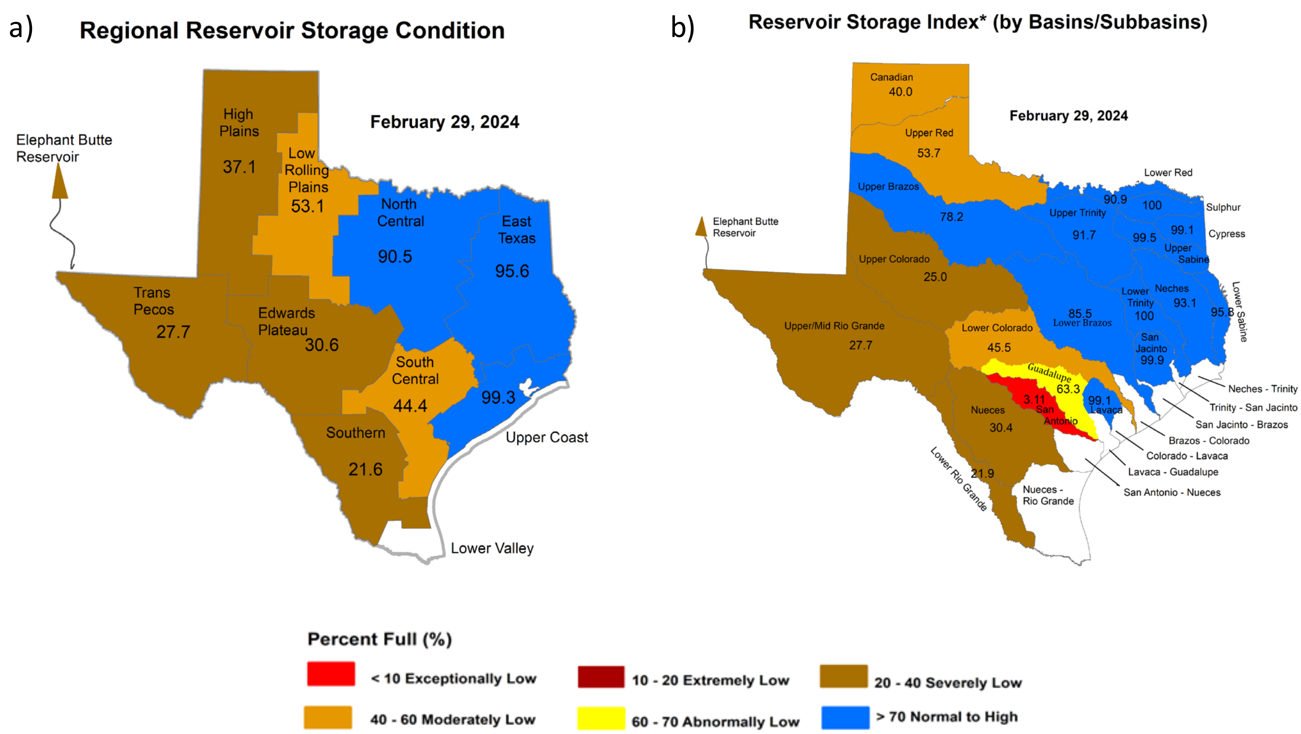


Figure 4: (a) Reservoir Storage Index* by climate division, and (b) Reservoir Storage Index* by basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

March 2024

Water News:

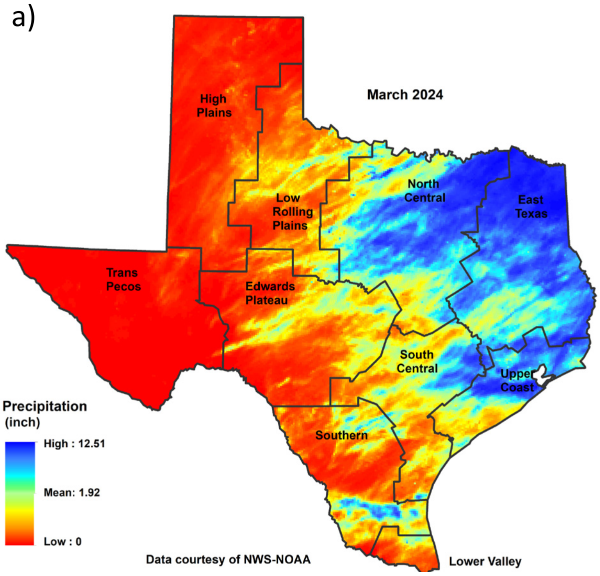
On March 19, the Lower Colorado River Authority and Texas Water Development Board hosted a workshop *on Surface water evaporation monitoring and estimation: new developments and implications for reservoir operations and water planning. Collaborators from across Texas and beyond met to hear about the latest advancements and future goals in evaporation studies.*

RAINFALL

In March, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in the Trans Pecos, High Plains, much of the Low Rolling Plains, Edwards Plateau, northwestern and southern North Central, much of the Southern, South Central, Lower Valley, western Upper Coast, and southwestern East Texas climate divisions. Above average to high amounts of rainfall [light and dark blue shading, Figure 1(a)] were seen in northeastern and southern Low Rolling Plains, central and eastern Edwards Plateau, northeastern and southern Southern, portions of South Central, much of North Central, East Texas, and the eastern Upper Coast climate divisions.

Compared to historical data from 1991–2020, much of the High Plains, Low Rolling Plains, Trans Pecos, Edwards Plateau, South Central, Lower Valley, northwestern and southern North Central, northern Southern, western Upper Coast, and southern East Texas climate divisions received 0–75 percent of normal rainfall [yellow, orange shading, Figure 1(b)]. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in portions of the eastern High Plains, northeastern Trans Pecos, central and northeastern Edwards Plateau, central and northeastern North Central, northeastern and southern Southern, northern East Texas, eastern Upper Coast, northeastern South Central, and northern Lower Valley climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in northeastern North Central, northern East Texas, central Upper Coast, southern Southern, and northern Lower Valley climate divisions. 400–600 percent of normal rainfall [light purple shading, Figure 1(b)] was received in southern portions of the Southern climate division.

a)



b)

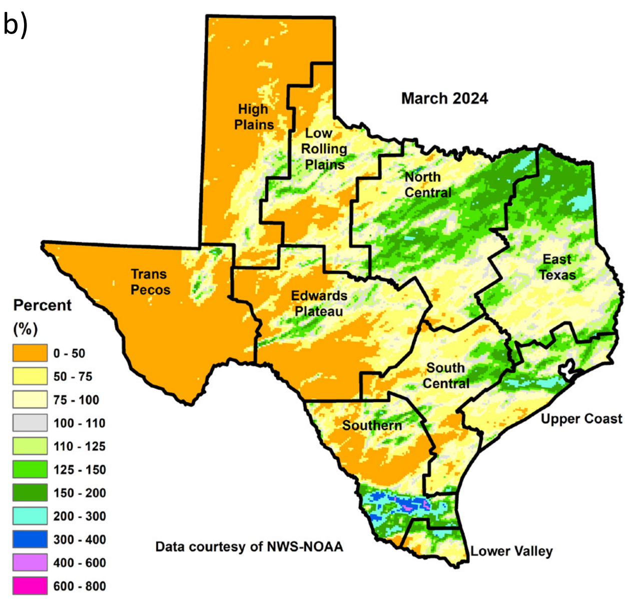


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

RESERVOIR STORAGE

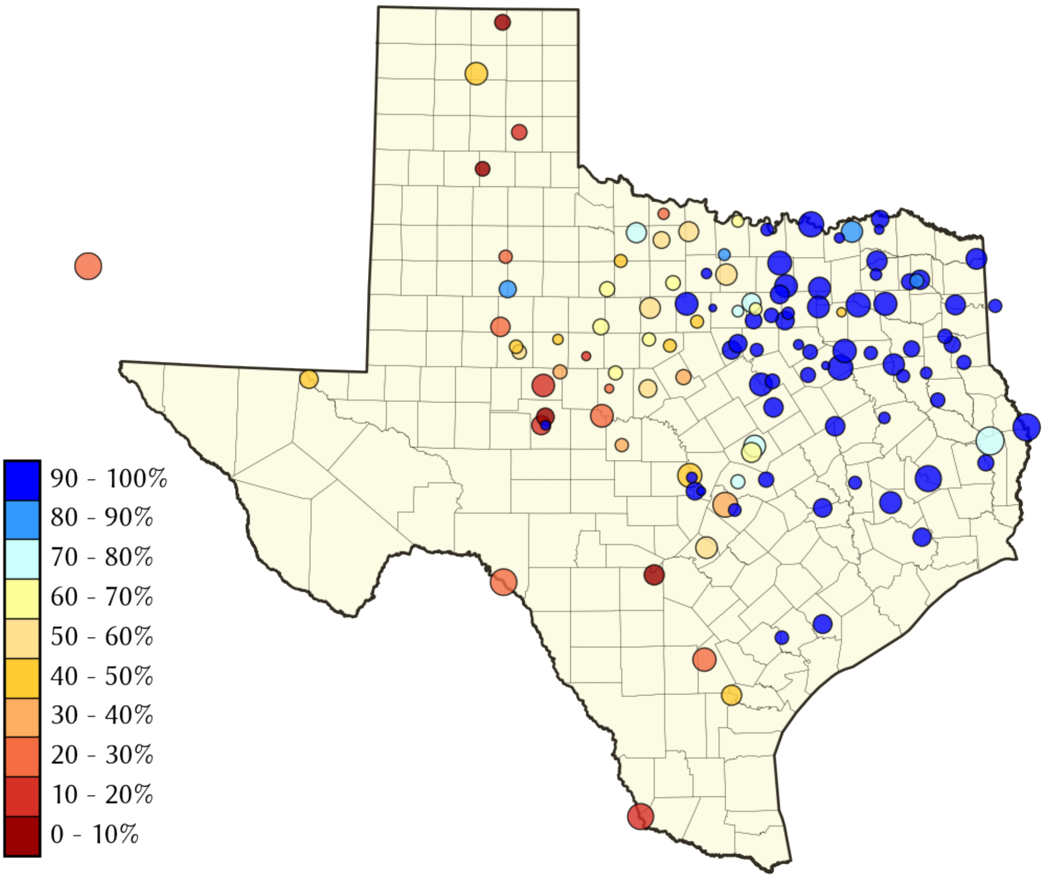


Figure 3. Reservoir conservation storage at end-March expressed as percent full (%)

Out of 119 reservoirs in the state, 46 reservoirs held 100 percent conservation storage capacity, and 20 reservoirs were at or above 90 percent full in March. Sixteen reservoirs remained at or below 30 percent full: Abilene (12.8 percent full), Amistad (28.2 percent full), Choke Canyon (23.6 percent full), E.V. Spence (15.3 percent full), Falcon (16.0 percent full), Greenbelt (11.1 percent full), Hords Creek (22.0 percent full), J.B. Thomas (20.4 percent full), Mackenzie (9.2 percent full), Medina Lake (2.9 percent full), North Fork Buffalo Creek Reservoir (29.1 percent full), O.C. Fisher (1.8 percent full), O.H. Ivie (26.7 percent full), Palo Duro Reservoir (3.6 percent full), Twin Buttes (14.4 percent full), and the White River Lake (23.3 percent full). Elephant Butte Reservoir (New Mexico) was 21.9 percent full (Figure 3).

Reservoir conservation storage by climate division was at or above normal (Figure 4(a)) for East Texas (91.3 percent full), North Central (90.7 percent full), and the Upper Coast (99.6 percent full) climate divisions. Conservation storage was moderately low (Figure 4(a)) for the Low Rolling Plains (53.0 percent full), and South Central (43.9 percent full) climate divisions. The High Plains (36.7 percent full), Edwards Plateau (31.2 percent full), the Trans Pecos (24.8 percent full), and Southern (20.9 percent full) climate divisions had severely low conservation storage (Figure 4(a)).

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin, and severely low [20–40 percent full, brown shading, Figure 4(b)] in the Canadian, Upper/Mid Rio Grande, Lower Rio Grande, Nueces, and Upper Colorado river basins. The Upper Red and Lower Colorado river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. The Guadalupe river basin had abnormally low conservation storage [60-70 percent full, yellow shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

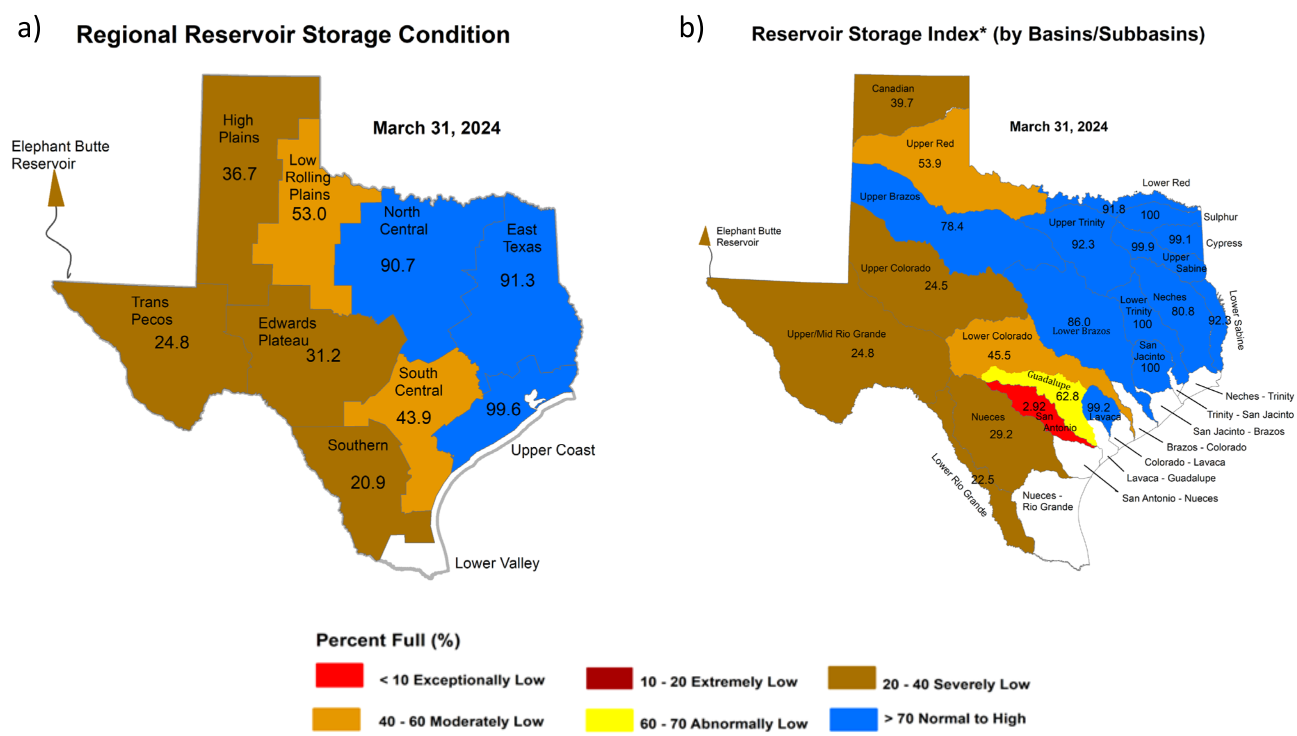


Figure 4: (a) Reservoir Storage Index* by climate division, and (b) Reservoir Storage Index* by basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

April 2024

Water News:

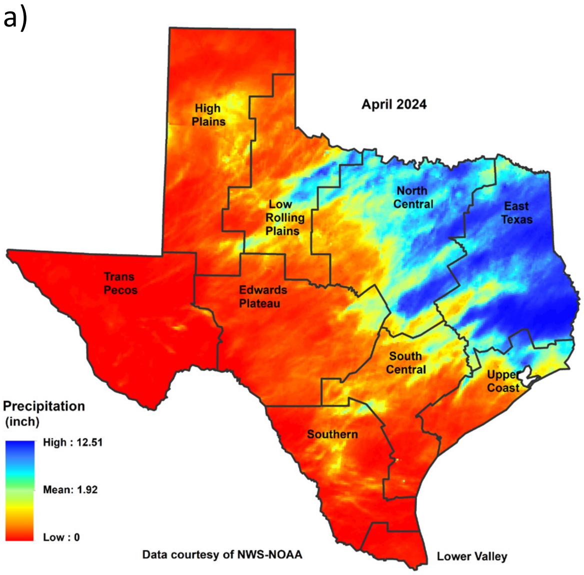
TWDB Coastal Science staff hosted a Estuary Science Exchange webinar featuring Dr. Victoria Congdon and Katie Swanson of the Mission Aransas National Estuarine Research Reserve who presented *System–Wide Monitoring Programs and Updates for the Mission-Aransas Reserve.* https://missionaransas.org/

RAINFALL

In April, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in the Trans Pecos, High Plains, much of the Low Rolling Plains, Edwards Plateau, western and portions of southern North Central, much of the Southern, South Central, Lower Valley, western Upper Coast, and southwestern East Texas climate divisions. Above average to high amounts of rainfall [light and dark blue shading, Figure 1(a)] were seen in northeastern Low Rolling Plains, portions of northeastern South Central, much of North Central, East Texas, and the eastern Upper Coast climate divisions.

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow, orange shading, Figure 1(b)] was received in the northern High Plains, portions of the Low Rolling Plains, Trans Pecos, much of the Edwards Plateau, southern South Central, Lower Valley, portions of Southern, and the western Upper Coast climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in portions of the central and southern High Plains, north and northeastern Edwards Plateau, areas of North Central, northeastern and southern central Southern, northern South Central, portions of East Texas, and eastern Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in central and southern High Plains, southern and eastern Low Rolling Plains, much of North Central, much of East Texas, central Southern, northern South Central, and eastern Upper Coast climate divisions. 400–600 percent of normal rainfall [light purple shading, Figure 1(b)] was received in northeastern Low Rolling Plains, southern and eastern North Central, western and southern East Texas climate division. 600–800 percent of normal rainfall [dark pink shading, Figure 1(b)] was observed in areas of the southern East Texas climate division.

a)



b)

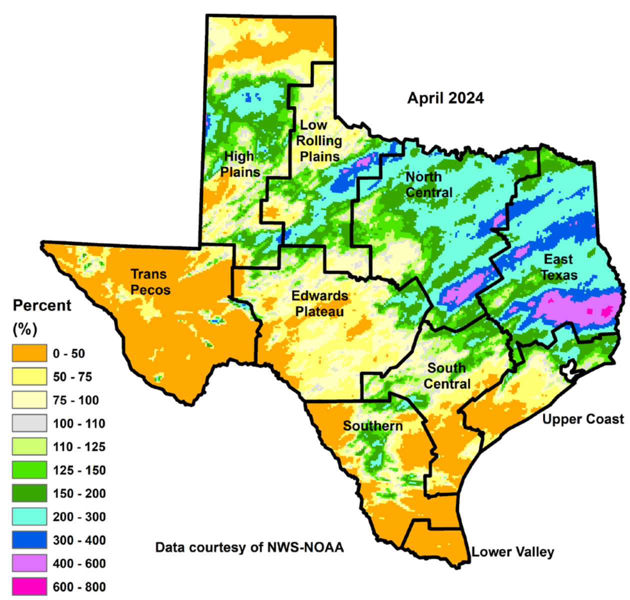
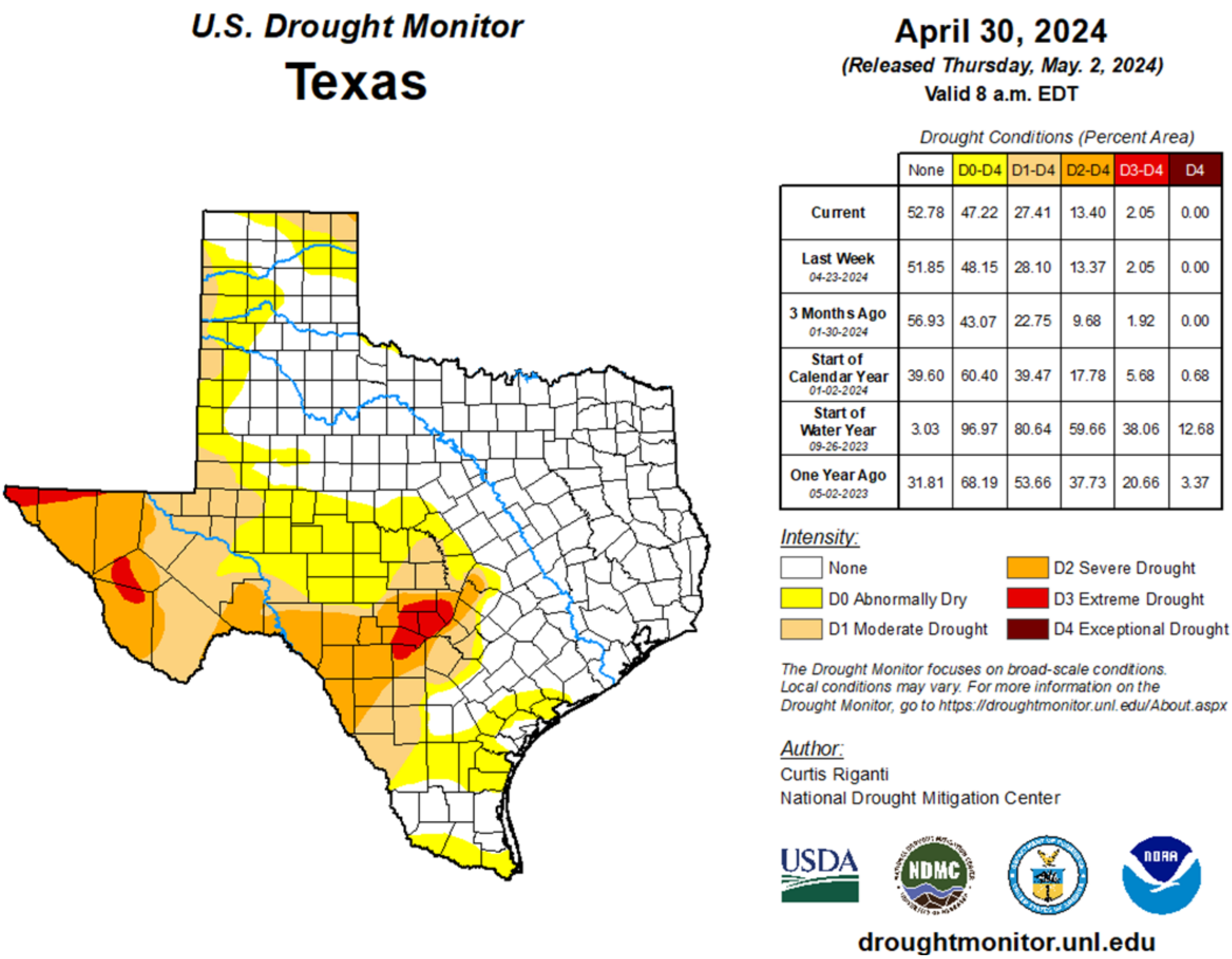


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of April, 47.22% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 21% lower than this time last year.



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	52.78	47.22	27.41	13.40	2.05	0.00
Last Week 04-23-2024	51.85	48.15	28.10	13.37	2.05	0.00
3 Months Ago 01-30-2024	56.93	43.07	22.75	9.68	1.92	0.00
Start of Calendar Year 01-02-2024	39.60	60.40	39.47	17.78	5.68	0.68
Start of Water Year 09-26-2023	3.03	96.97	80.64	59.66	38.06	12.68
One Year Ago 05-02-2023	31.81	68.19	53.66	37.73	20.66	3.37

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of April 30, 2024.

RESERVOIR STORAGE

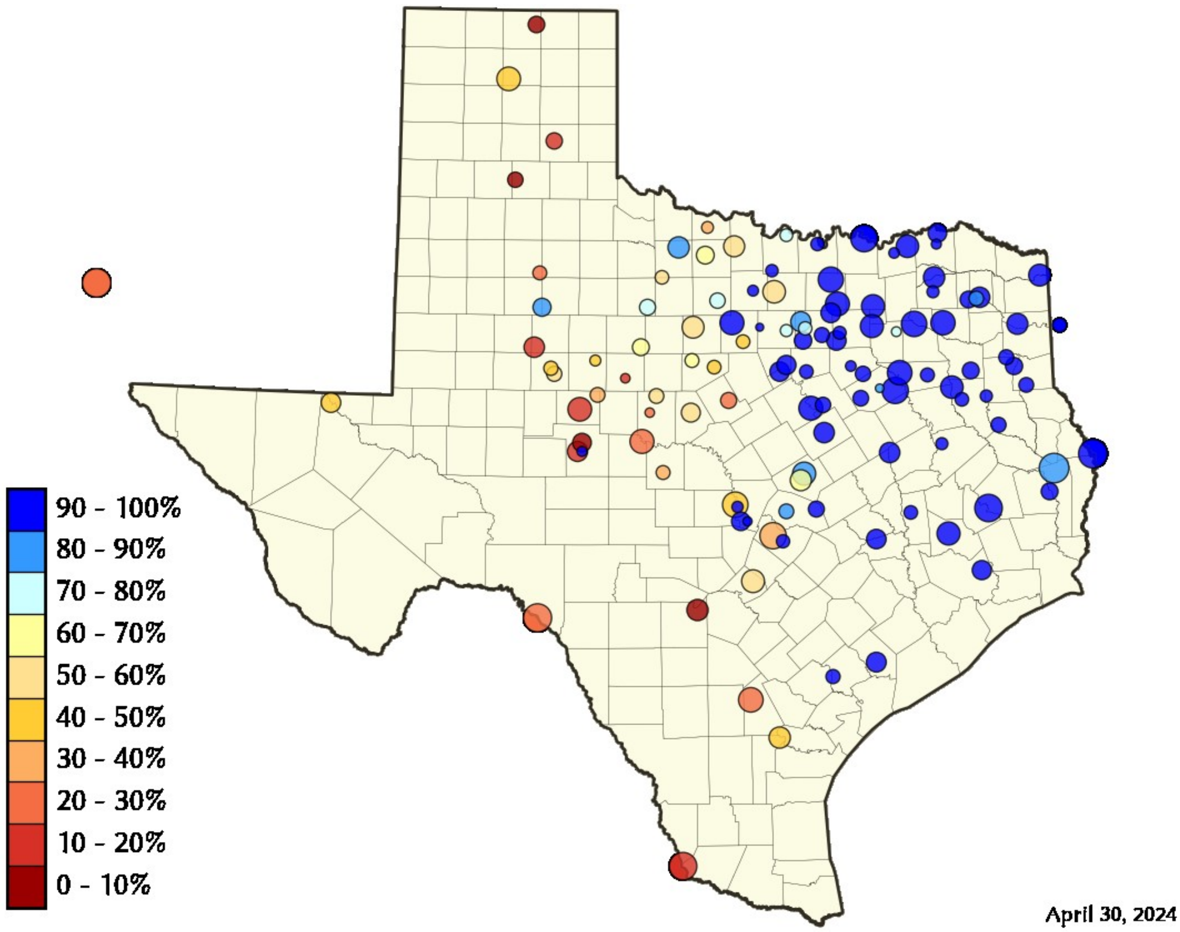


Figure 3. Reservoir conservation storage at end-April expressed as percent full (%)

Out of 119 reservoirs in the state, 57 reservoirs held 100 percent conservation storage capacity, and 9 reservoirs were at or above 90 percent full in April. Sixteen reservoirs remained at or below 30 percent full: Abilene (12.8 percent full), Amistad (27.9 percent full), Choke Canyon (22.9 percent full), E.V. Spence (15.2 percent full), Falcon (11.1 percent full), Greenbelt (11.2 percent full), Hords Creek (21.3 percent full), J.B. Thomas (19.3 percent full), Mackenzie (9.2 percent full), Medina Lake (2.8 percent full), O.C. Fisher (1.6 percent full), O.H. Ivie (26.2 percent full), Palo Duro Reservoir (3.2 percent full), Proctor (29.7 percent full), Twin Buttes (13.6 percent full), and the White River Lake (21.6 percent full). Elephant Butte Reservoir (New Mexico) was 21.5 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (97.3 percent full), North Central (92.5 percent full), and the Upper Coast (97.3 percent full) climate divisions. Conservation storage was moderately low [Figure 4(a)] for the Low Rolling Plains (55.9 percent full), and South Central (43.3 percent full) climate divisions. The High Plains (36.2 percent full), Edwards Plateau (31.1 percent full), and the Trans Pecos (24.4 percent full) climate divisions had severely low conservation storage. The Southern (17.2 percent full) climate division had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin, and severely low [20–40 percent full, brown shading, Figure 4(b)] in the Canadian, Upper/Mid Rio Grande, Nueces, and Upper Colorado river basins. The Upper Red and Lower Colorado river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. The Guadalupe river basin had abnormally low conservation storage [60-70 percent full, yellow shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

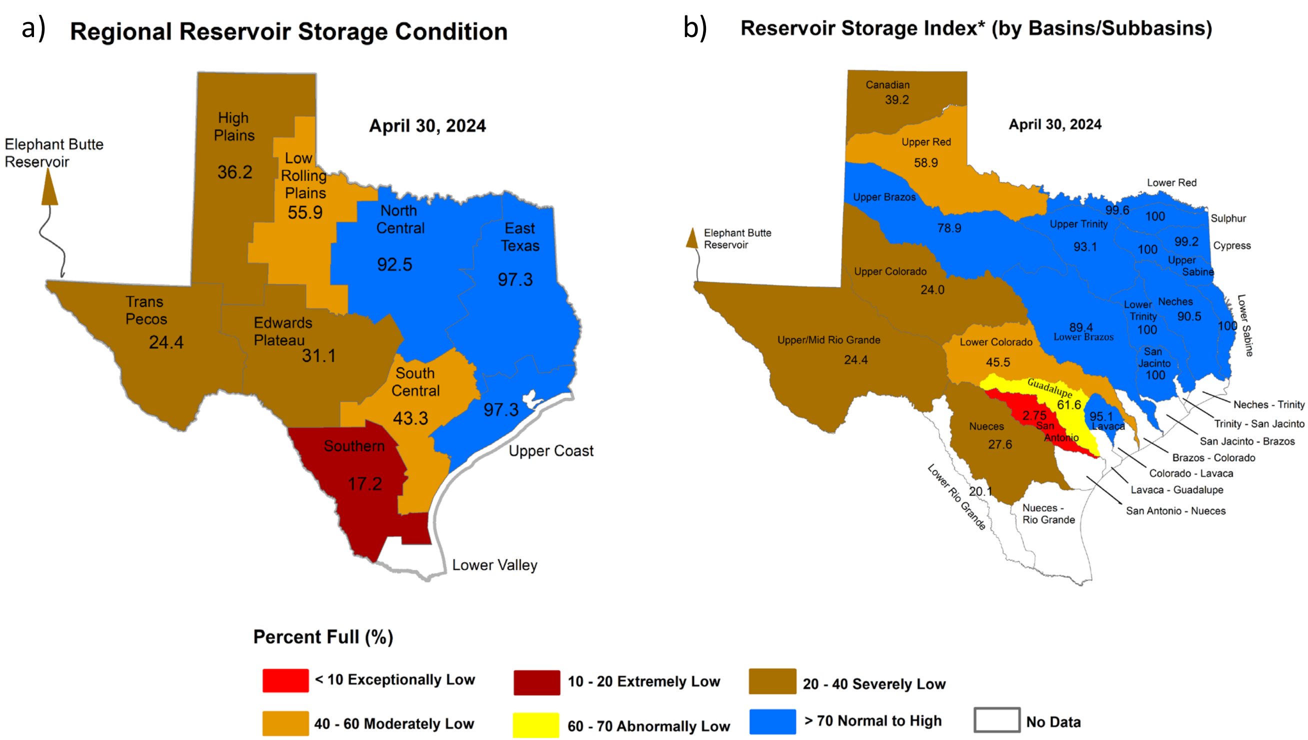


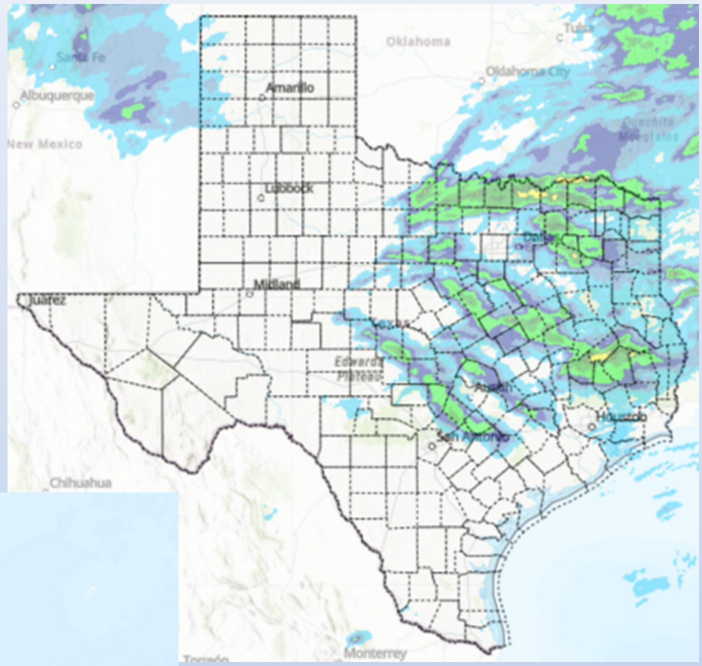
Figure 4: (a) Reservoir Storage Index* by climate division, and (b) Reservoir Storage Index* by basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

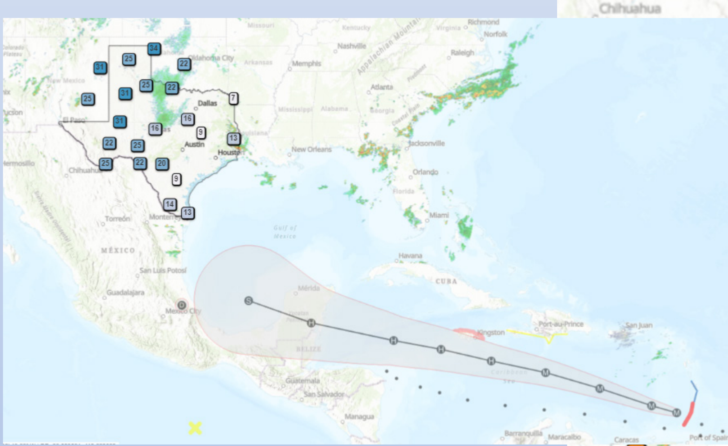
Texas Water Conditions Report

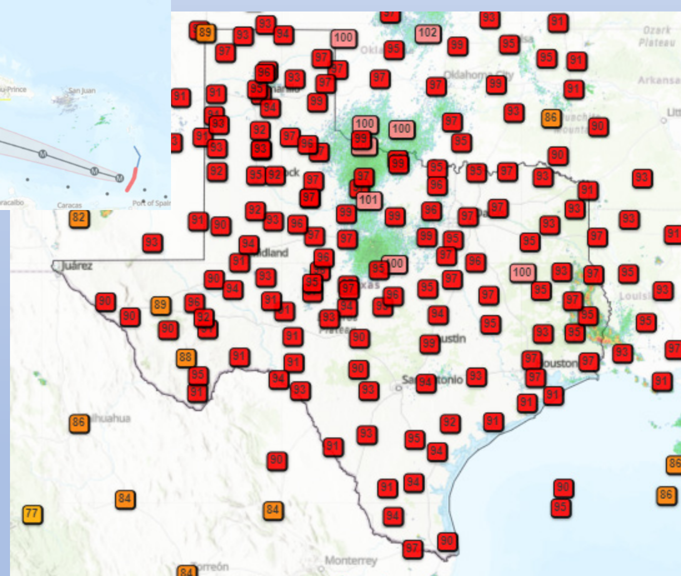
May 2024

Precipitation



National Weather Service
Hurricane Alert





Temperature

Water News:

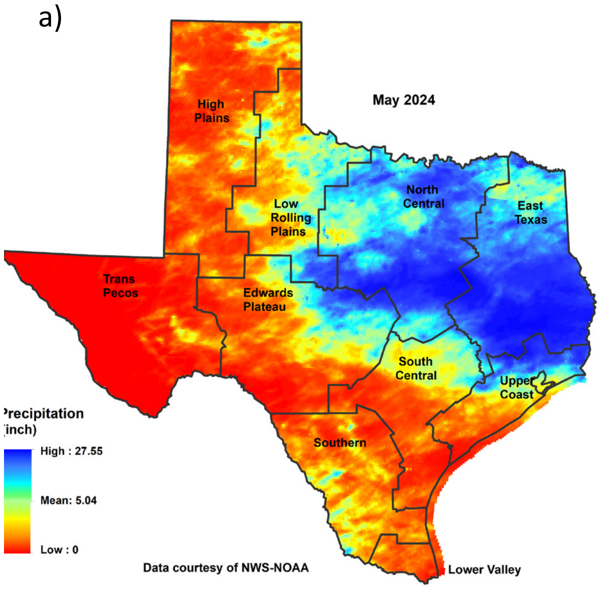
You can find current weather information including precipitation, temperature, soil moisture, and National Weather Service alerts all in one place at the Texas Water Development Board's Texmesonet.org.

RAINFALL

In May, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in the Trans Pecos, High Plains, areas of the Low Rolling Plains, much of the Edwards Plateau, much of the Southern, South Central, Lower Valley, and western Upper Coast climate divisions. Above average to high amounts of rainfall [light and dark blue shading, Figure 1(a)] were seen in portions of the Low Rolling Plains, northeastern Edwards Plateau, portions of northeastern South Central, much of North Central, East Texas, and the eastern Upper Coast climate divisions.

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow and orange shading, Figure 1(b)] was received in areas of the High Plains, northern Low Rolling Plains, much of the Trans Pecos, southern and western Edwards Plateau, much of South Central, portions of northern and eastern Southern, and the western Upper Coast climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in portions of the High Plains, much of the Low Rolling Plains, central and northeastern Edwards Plateau, northern and southern North Central, western and southern Southern, northeastern South Central, northern East Texas, and eastern Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in scattered areas of the High Plains, central and southern Low Rolling Plains, much of North Central, central and southern East Texas, western Southern, and eastern Upper Coast climate divisions. 400–600 percent of normal rainfall [light purple shading, Figure 1(b)] was received in southern North Central, and southern East Texas climate divisions.

a)



b)

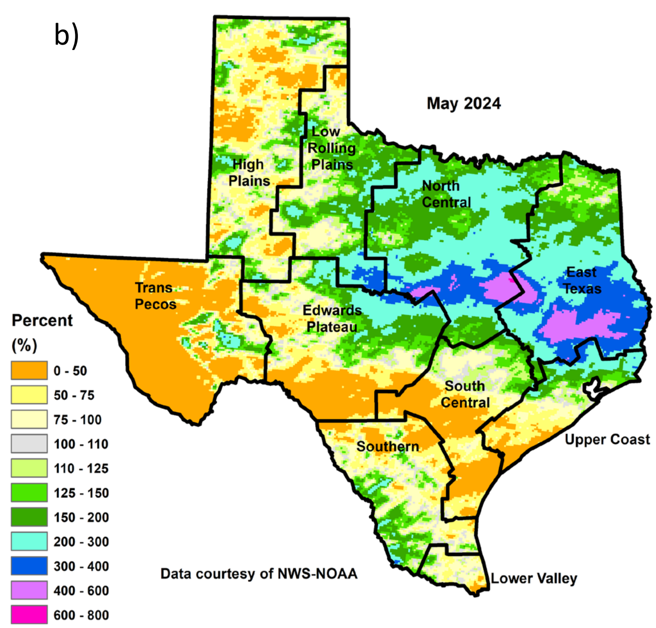


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of May 49.15% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 1.93% higher than last month.

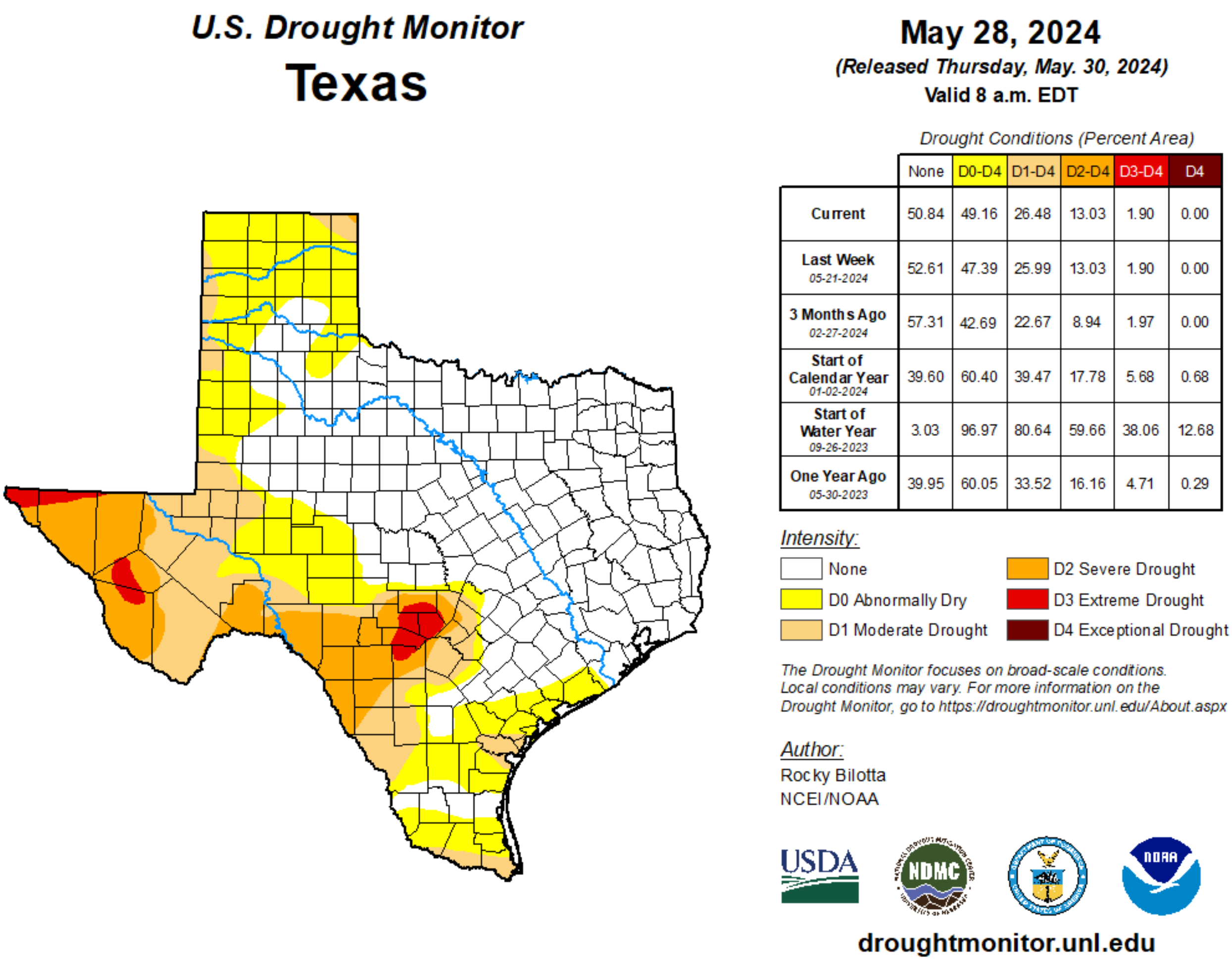


Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of May 28, 2024.

RESERVOIR STORAGE

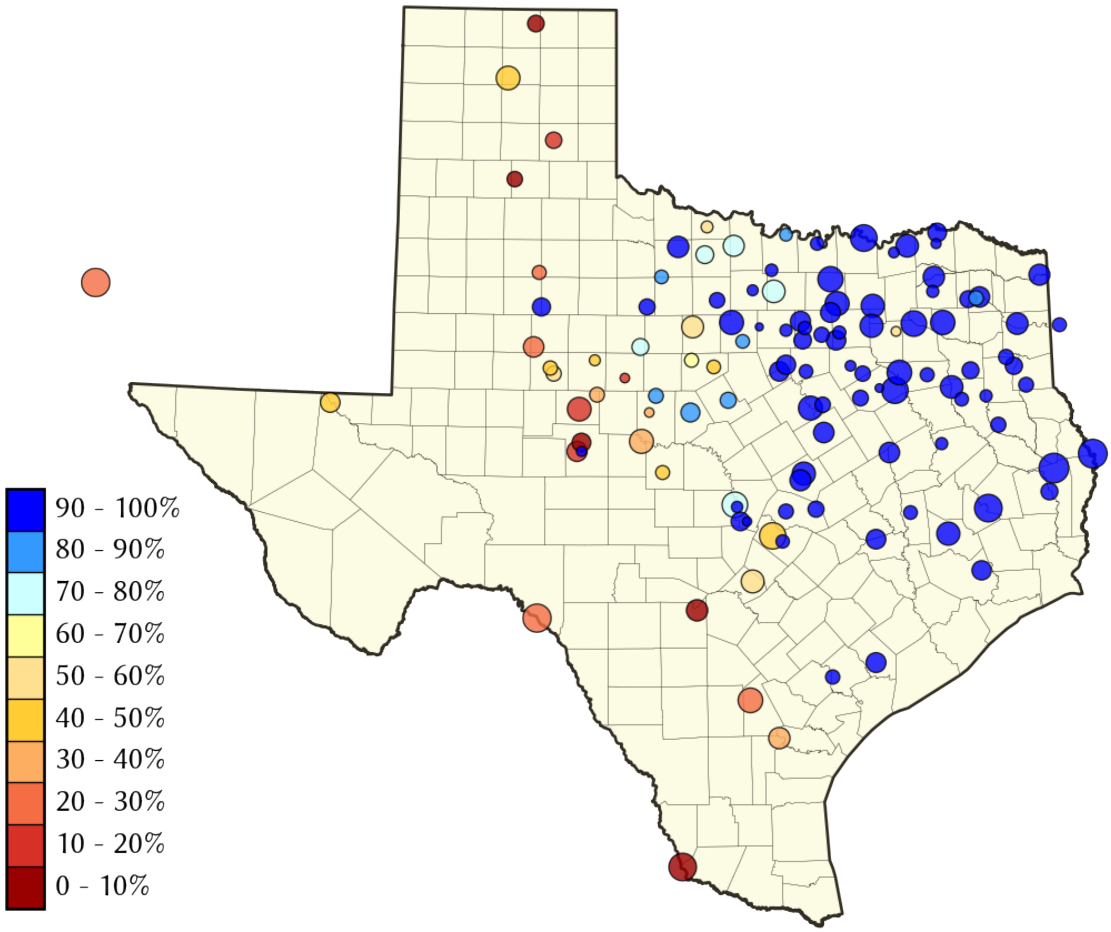


Figure 3. Reservoir conservation storage at end-May expressed as percent full (%)

Out of 119 reservoirs in the state, 59 reservoirs held 100 percent conservation storage capacity, including Lake Bois d'Arc that reached 100% on April 30th for the first time since the lake was impounded in the fall of 2021. There were 18 reservoirs at or above 90 percent full. Fifteen reservoirs remained at or below 30 percent full: Abilene (12.6 percent full), Amistad (26.7 percent full), Choke Canyon (22.3 percent full), E.V. Spence (15.2 percent full), Falcon (9.6 percent full), Greenbelt (10.9 percent full), Hords Creek (29.6 percent full), J.B. Thomas (20.2 percent full), Mackenzie (9.2 percent full), Medina Lake (2.5 percent full), O.C. Fisher (1.6 percent full), O.H. Ivie (29.0 percent full), Palo Duro Reservoir (2.9 percent full), Twin Buttes (13.1 percent full), and the White River Lake (22.2 percent full). Elephant Butte Reservoir (New Mexico) was 23.2 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (99.8 percent full), North Central (95.8 percent full), and the Upper Coast (96.1 percent full) climate divisions. Conservation storage was moderately low [Figure 4(a)] for the South Central (44.4 percent full) climate division. The Low Rolling Plains (64.1 percent full) climate division had abnormally low conservation storage. The High Plains (35.5 percent full), Edwards Plateau (36.4 percent full), and the Trans Pecos (25.7 percent full) climate divisions had severely low conservation storage, and the Southern (15.7 percent full) climate division had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin, and extremely low [10–20 percent full, dark red shading] in the Lower Rio Grande river basin. Severely low conservation storage [20–40 percent full, brown shading, Figure 4(b)] was seen in the Canadian, Upper/Mid Rio Grande, Nueces, and Upper Colorado river basins. The Lower Colorado river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. The Guadalupe river basin had abnormally low conservation storage [60-70 percent full, yellow shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Upper and Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

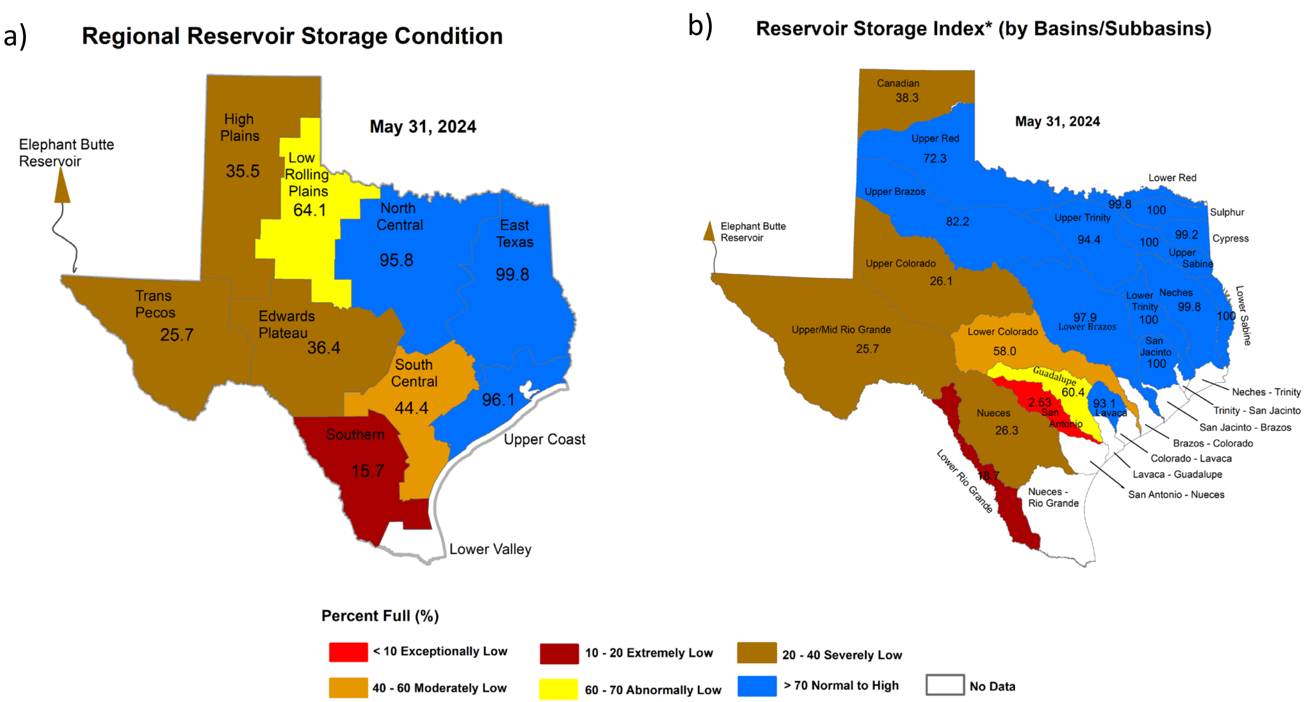


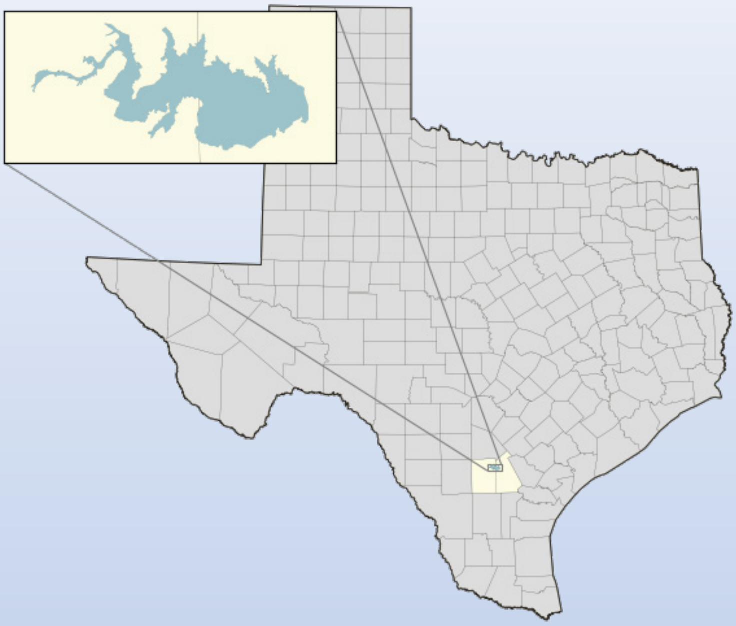
Figure 4: (a) Reservoir Storage Index* by climate division, and (b) Reservoir Storage Index* by basin/sub-basin.

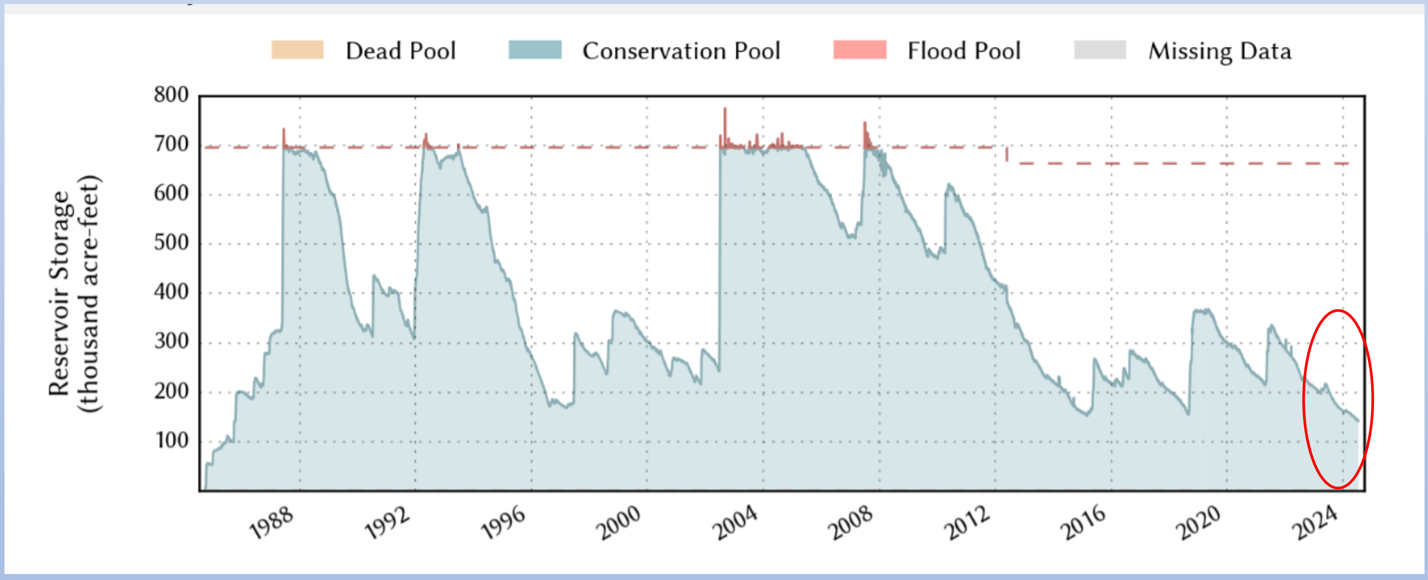
*Reservoir Storage Index is defined as the percent full of conservation storage capacity. Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

June 2024

Choke Canyon Reservoir





Water News:

Choke Canyon Reservoir located in the Nueces river basin was 21.7 percent full and dropping as of June 30, 2024. That is a record low for this reservoir and approximately 2% lower than the previous record that was reached in 2018.
https://waterdatafortexas.org/reservoirs/individual/choke-canyon

RAINFALL

In June, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in the Trans Pecos, areas of northern and southern High Plains, areas of northern and southern Low Rolling Plains, much of the Edwards Plateau, North Central, southwestern East Texas, northern South Central, and areas of northern and eastern Southern climate divisions. Above average to high amounts of rainfall [light and dark blue shading, Figure 1(a)] were seen in portions of the High Plains, central Low Rolling Plains, southern Edwards Plateau, eastern North Central, northern and eastern East Texas, small areas of western and central Trans Pecos, much of the South Central, Southern, Low Valley, and the Upper Coast climate divisions.

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow and orange shading, Figure 1(b)] was received in southern and areas of the northern High Plains, northern and southern Low Rolling Plains, much of North Central, Trans Pecos, northern Edwards Plateau, and southern East Texas climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in much of the High Plains, central Low Rolling Plains, areas of the Trans Pecos, southern Edwards Plateau, eastern North Central, northern East Texas, much of the Southern, Lower Valley, and southern Southern, and western Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in scattered areas across northern and central High Plains, central Low Rolling Plains, central and southern Southern, northeastern and western Lower Valley, southern South Central, and western Upper Coast climate divisions. 400–600 percent of normal rainfall [light purple shading, Figure 1(b)] was received in the western Trans Pecos climate division.

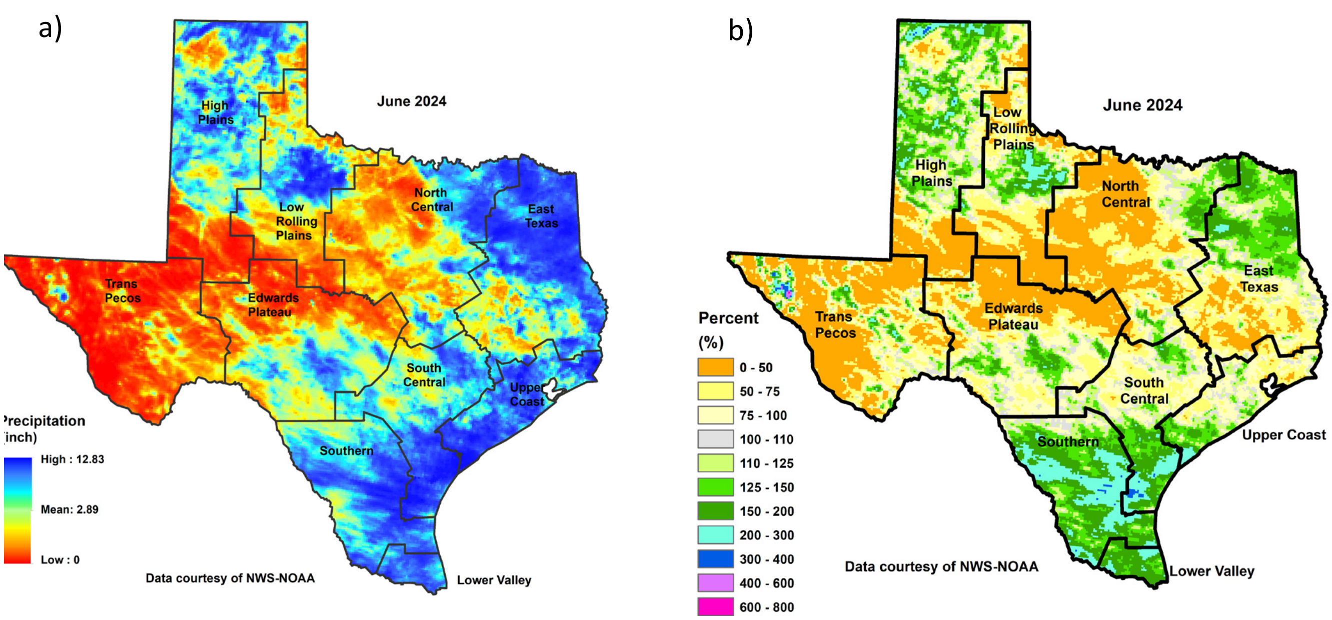
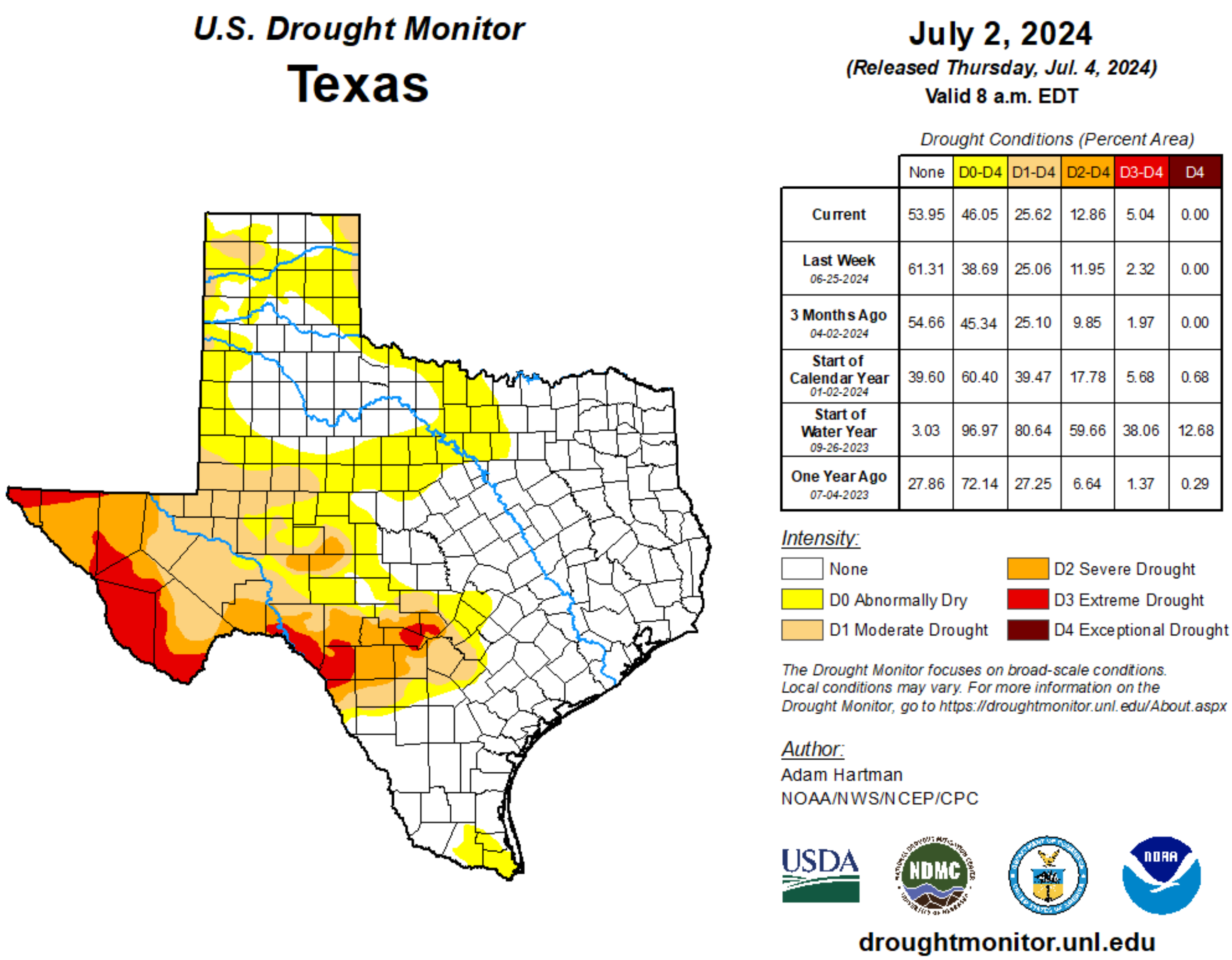


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

Heading into July, 45.05% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 4.1% lower than at the end of May.



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	53.95	46.05	25.62	12.86	5.04	0.00
Last Week 06-25-2024	61.31	38.69	25.06	11.95	2.32	0.00
3 Months Ago 04-02-2024	54.66	45.34	25.10	9.85	1.97	0.00
Start of Calendar Year 01-02-2024	39.60	60.40	39.47	17.78	5.68	0.68
Start of Water Year 09-26-2023	3.03	96.97	80.64	59.66	38.06	12.68
One Year Ago 07-04-2023	27.86	72.14	27.25	6.64	1.37	0.29

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of July 2, 2024.

RESERVOIR STORAGE

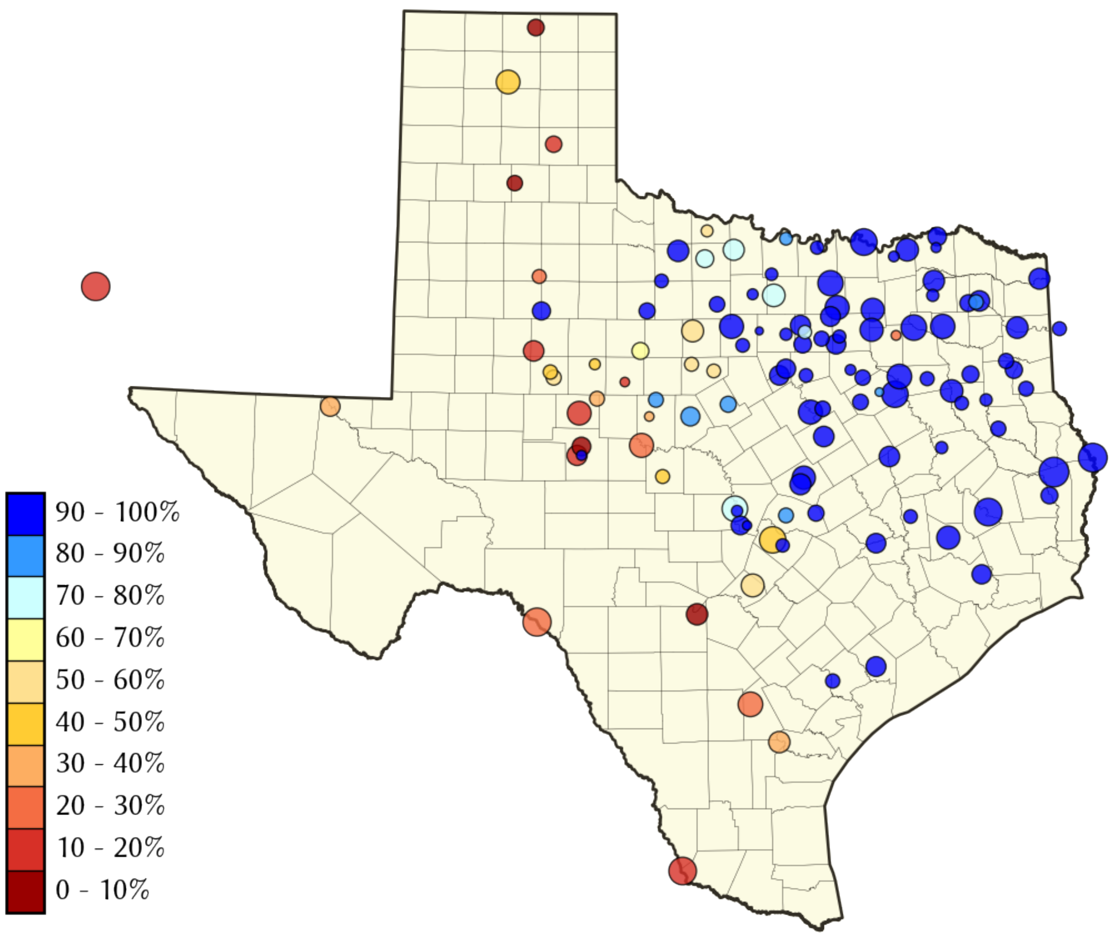


Figure 3. Reservoir conservation storage at end-July expressed as percent full (%)

Out of 119 reservoirs in the state, 47 reservoirs held 100 percent conservation storage capacity, and 30 reservoirs were at or above 90 percent full this month. Fifteen reservoirs remained at or below 30 percent full: Abilene (10.3 percent full), Amistad (24.2 percent full), Choke Canyon (21.7 percent full), E.V. Spence (14.4 percent full), Falcon (13.5 percent full), Greenbelt (10.3 percent full), Hords Creek (29.6 percent full), J.B. Thomas (19.5 percent full), Mackenzie (9.3 percent full), Medina Lake (2.3 percent full), O.C. Fisher (1.6 percent full), O.H. Ivie (28.6 percent full), Palo Duro Reservoir (2.7 percent full), Twin Buttes (11.6 percent full), and the White River Lake (20.6 percent full). Elephant Butte Reservoir (New Mexico) was 17.5 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (99.7 percent full), North Central (96.0 percent full), and the Upper Coast (97.5 percent full) climate divisions. Conservation storage was moderately low [Figure 4(a)] for the South Central (44.8 percent full) climate division. The Low Rolling Plains (66.2 percent full) climate division had abnormally low conservation storage. The High Plains (35.0 percent full), Edwards Plateau (35.3 percent full), and the Trans Pecos (20.8 percent full) climate divisions had severely low conservation storage and the Southern (18.2 percent full) climate division had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin, and extremely low [10–20 percent full, dark red shading] in the Lower Rio Grande river basin. Severely low conservation storage [20–40 percent full, brown shading, Figure 4(b)] was seen in the Canadian, Upper/Mid Rio Grande, Nueces, and Upper Colorado river basins. The Lower Colorado and Guadalupe river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Upper and Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

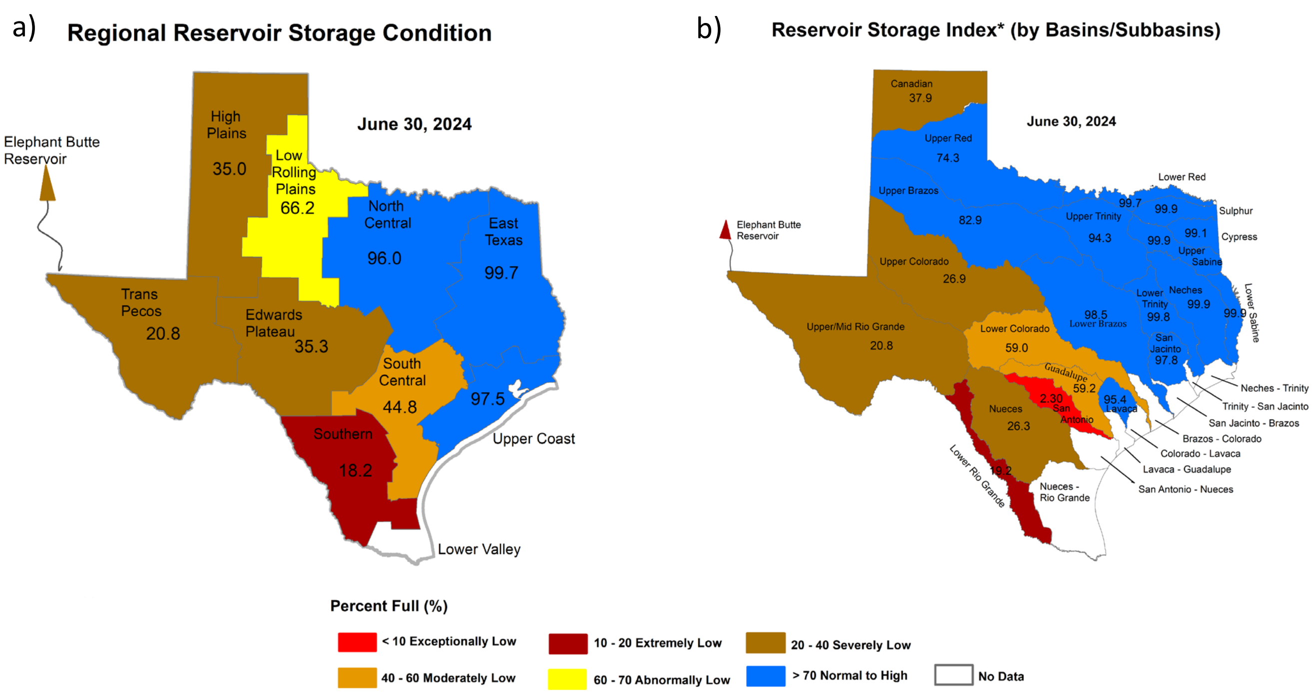
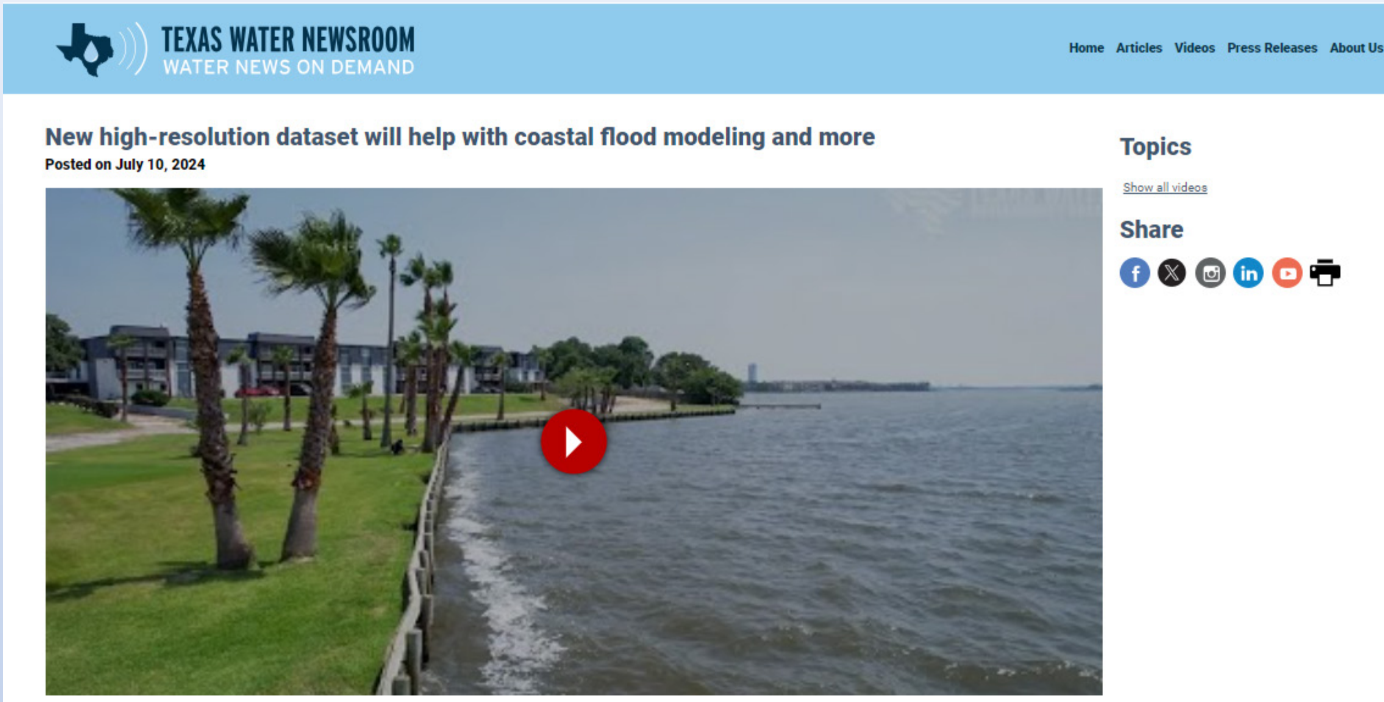


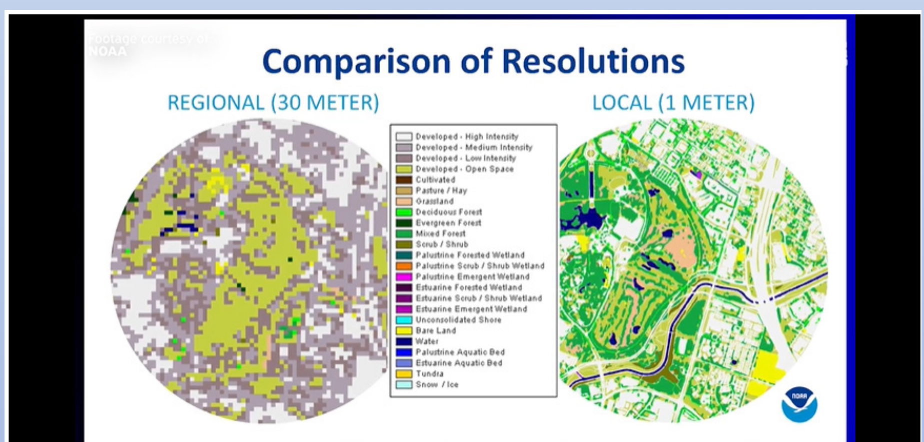
Figure 4: (a) Reservoir Storage Index* by climate division, and (b) Reservoir Storage Index* by basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

July 2024





Water News:

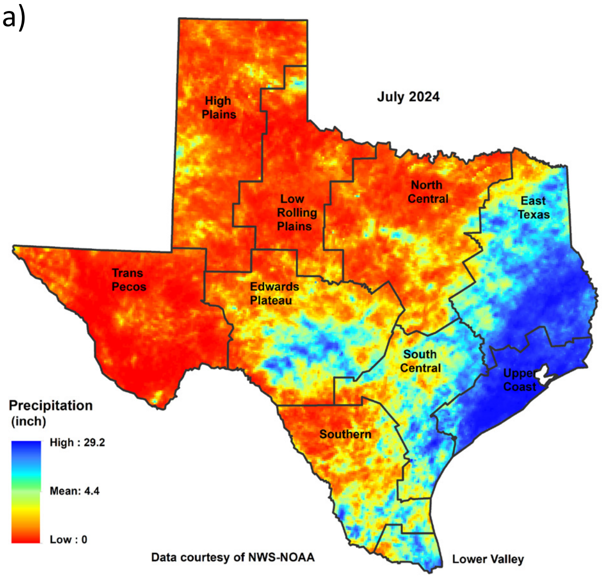
An improved 1-meter resolution land cover dataset released by NOAA can be utilized for urban forestry planning, coastal erosion mitigation, climate resiliency planning, and better flood modeling and forecasting. To learn more visit https://texaswaternewsroom.org/videos/new_high-resolution_dataset.html.

RAINFALL

In July, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in the Trans Pecos, High Plains, Low Rolling Plains, areas of the Edwards Plateau, North Central, portions of northern and western East Texas, areas of South Central, western Lower Valley, and areas of Southern climate divisions. Above average to high amounts of rainfall [light and dark blue shading, Figure 1(a)] were seen in a small area of the western High Plains, a small area of northern Low Rolling Plains, central Edwards Plateau, portions of central North Central, much of East Texas, much of the South Central, portions of southern and eastern Southern, Lower Valley, and the Upper Coast climate divisions.

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow and orange shading, Figure 1(b)] was received in central and northern High Plains, much of the Low Rolling Plains, Trans Pecos, northern and western North Central, and northern Southern climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in portions of the High Plains, areas of northern and southern Low Rolling Plains, Edwards Plateau, areas of North Central, northern and western South Central, Southern, northern East Texas, western Lower Valley climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in central and southern High Plains, northern and southern Low Rolling Plains, Edwards Plateau, central and southern North Central, South Central, areas of Southern, western and eastern Upper Coast, South Central, Lower Valley, and East Texas climate divisions. 400–600 percent of normal rainfall [light purple shading, Figure 1(b)] was received in central North Central, central Edwards Plateau, southern Southern, eastern Lower Valley, northern and southern South Central, southern and central East Texas, and much of the Upper Coast climate divisions. 600–800 percent of normal rainfall [bright pink shading, Figure 1(b)] was received in central Edwards Plateau, central Upper Coast, and southwestern Southern climate divisions.

a)



b)

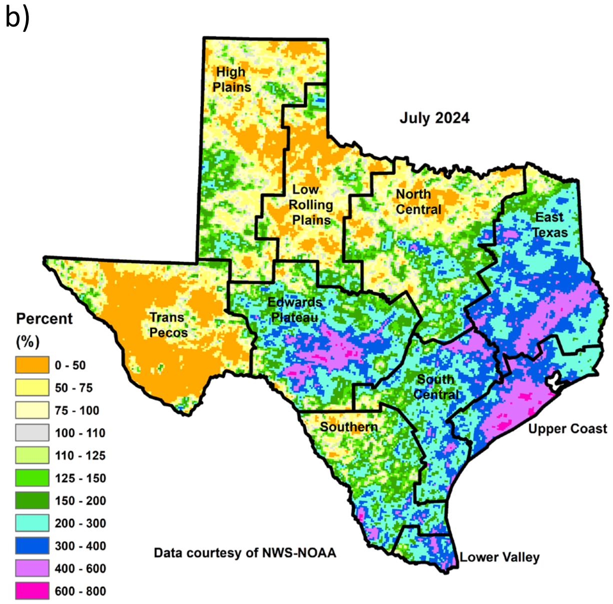


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of July, 41.85% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 3.2% lower than the end of June.

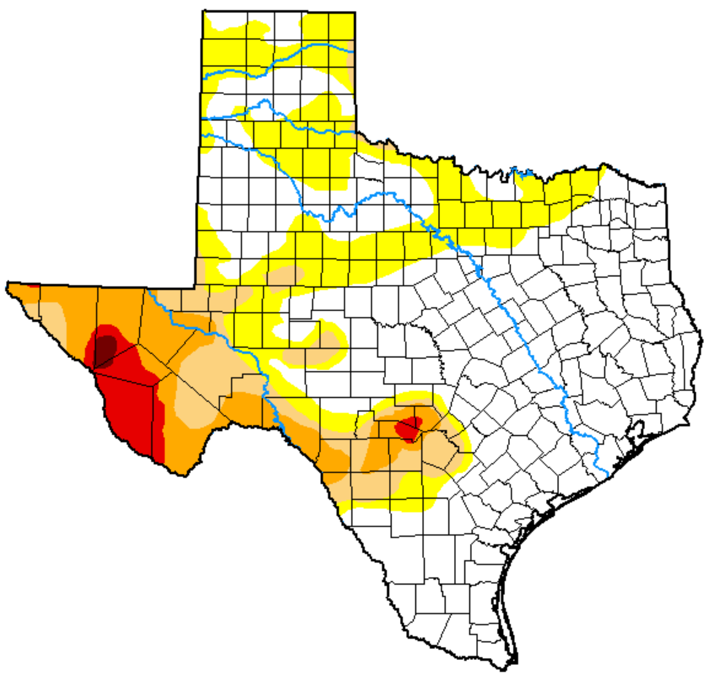
U.S. Drought Monitor

Texas

July 30, 2024

(Released Thursday, Aug. 1, 2024)

Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	58.15	41.85	20.39	11.88	3.36	0.30
Last Week *07-23-2024*	57.12	42.88	21.26	12.79	3.41	0.30
3 Months Ago *04-30-2024*	52.78	47.22	27.41	13.40	2.05	0.00
Start of Calendar Year *01-02-2024*	39.60	60.40	39.47	17.78	5.68	0.68
Start of Water Year *09-26-2023*	3.03	96.97	80.64	59.66	38.06	12.68
One Year Ago *08-01-2023*	21.20	78.80	52.09	19.26	4.81	1.06

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
Lindsay Johnson
National Drought Mitigation Center

droughtmonitor.unl.edu

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of July 2, 2024.

RESERVOIR STORAGE

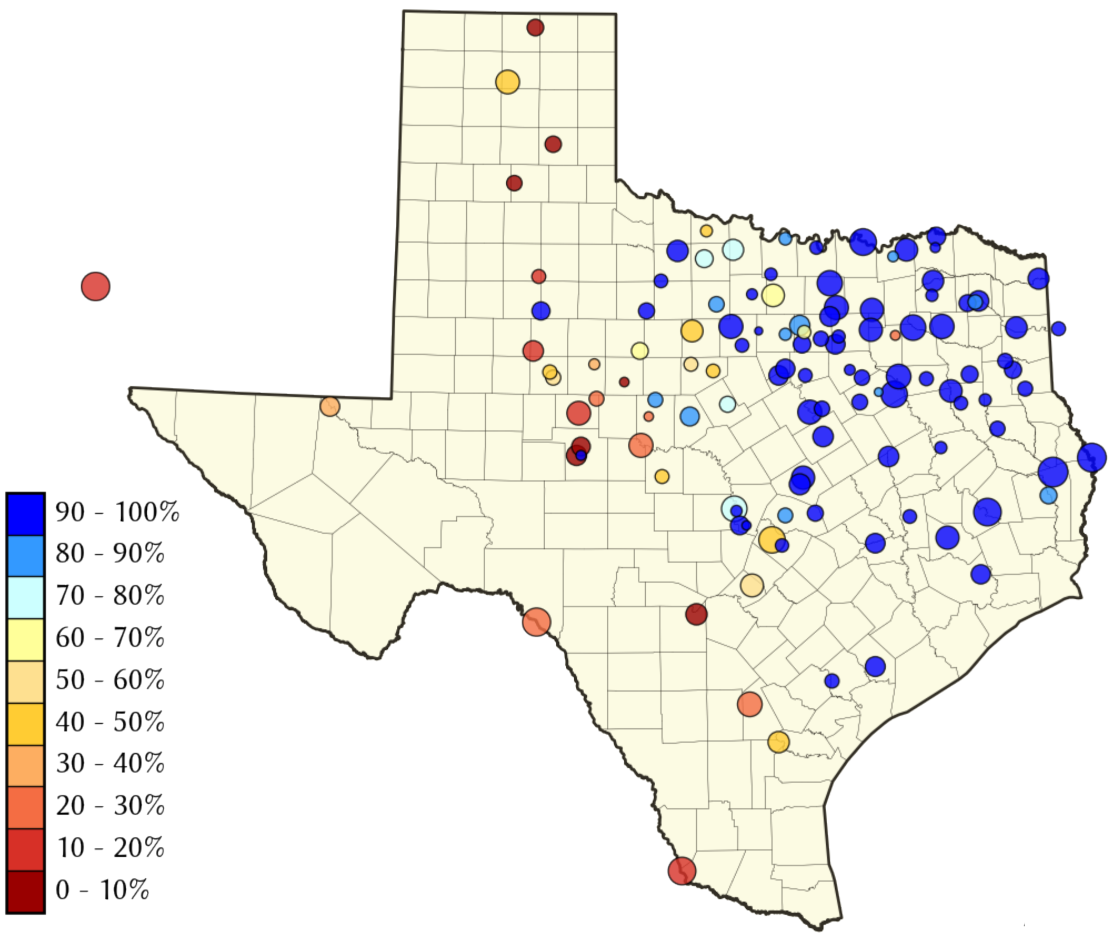


Figure 3. Reservoir conservation storage at end-July expressed as percent full (%)

Out of 119 reservoirs in the state, 39 reservoirs held 100 percent conservation storage capacity, and 35 reservoirs were at or above 90 percent full this month. Seventeen reservoirs remained at or below 30 percent full: Abilene (8.4 percent full), Amistad (25.0 percent full), Choke Canyon (21.2 percent full), E.V. Spence (13.8 percent full), Falcon (13.5 percent full), Greenbelt (9.7 percent full), Hords Creek (29.0 percent full), J.B. Thomas (18.0 percent full), Mackenzie (9.0 percent full), Medina Lake (3.6 percent full), New Terrell City (27.8 percent full), O.C. Fisher (1.0 percent full), O.H. Ivie (27.0 percent full), Oak Creek (29.2 percent full), Palo Duro Reservoir (2.2 percent full), Twin Buttes (10.1 percent full), and the White River Lake (19.9 percent full). Elephant Butte Reservoir (New Mexico) was 12.0 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (98.6 percent full), North Central (95.0 percent full), and the Upper Coast (99.7 percent full) climate divisions. Conservation storage was moderately low [Figure 4(a)] for the South Central (49.3 percent full) climate division. The Low Rolling Plains (63.6 percent full) climate division had abnormally low conservation storage. The High Plains (34.0 percent full) and Edwards Plateau (34.5 percent full) climate divisions had severely low conservation storage and the Trans Pecos (16.0 percent full) and the Southern (18.4 percent full) climate divisions had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin, and extremely low [10–20 percent full, dark red shading] in the Upper/Mid and Lower Rio Grande river basins. Severely low conservation storage [20–40 percent full, brown shading, Figure 4(b)] was seen in the Canadian, Nueces, and Upper Colorado river basins. The Lower Colorado and Guadalupe river basins had abnormally low conservation storage [60–70 percent full, yellow shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Upper and Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

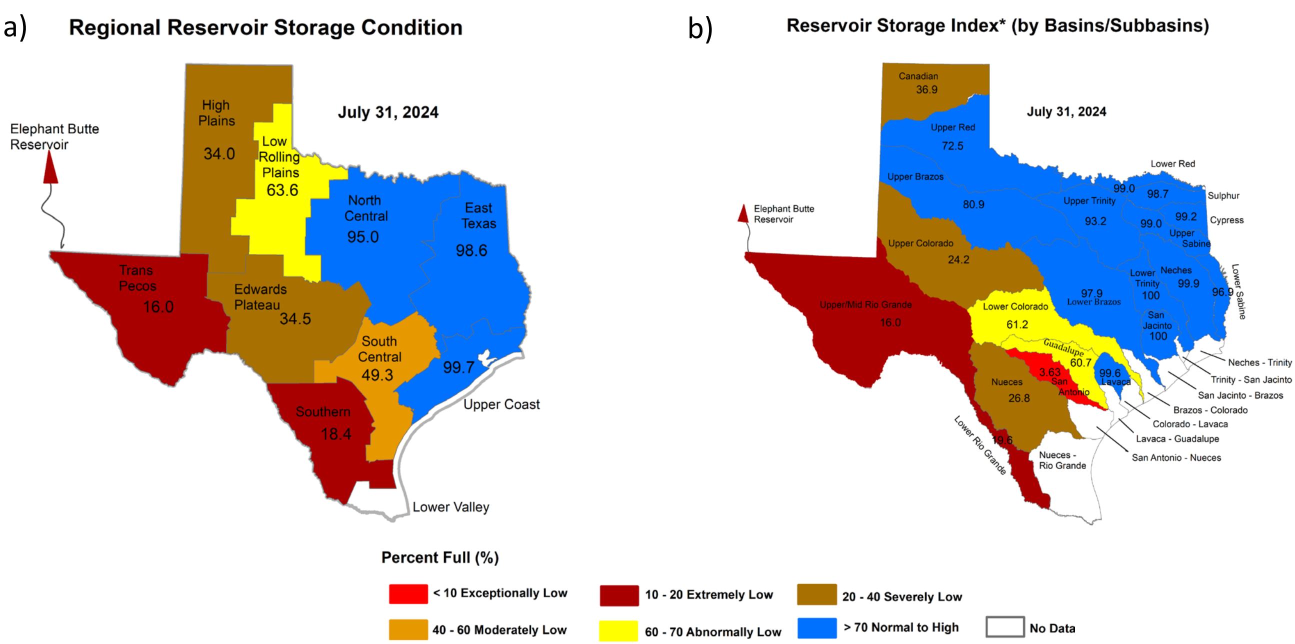


Figure 4: (a) Reservoir Storage Index* by climate division, and (b) Reservoir Storage Index* by basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

August 2024

Water News:

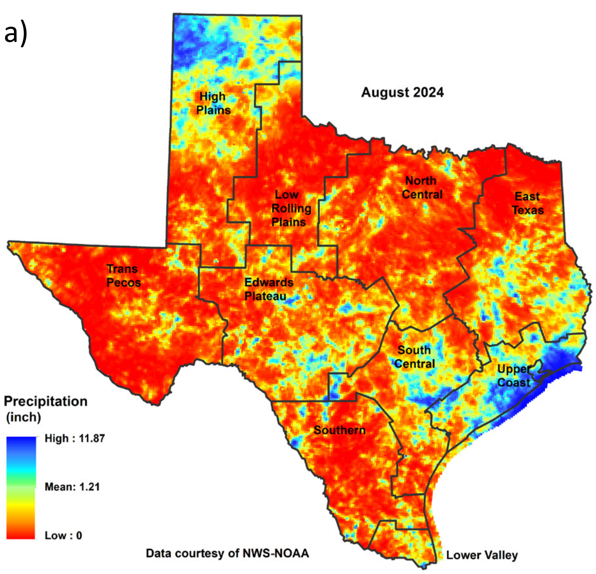
The Texas Water Development Board (TWDB) adopted the 2024 State Flood Plan on August 15th, 2024. The plan is the first of its kind for the state and includes a comprehensive assessment of flood hazard risk across Texas, and strategies for flood mitigation and flood hazard reduction.

RAINFALL

In August, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in the Trans Pecos, southern High Plains, Low Rolling Plains, much of the Edwards Plateau, North Central, much of East Texas, much of South Central, Lower Valley, Southern, and areas of the Upper Coast climate divisions. High amounts of rainfall [light and dark blue shading, Figure 1(a)] were seen in area of the northern High Plains, small areas of northern and southern Low Rolling Plains, scattered areas across the Edwards Plateau, areas of North Central, parts of central and southern East Texas, northern South Central, northern Southern, portions of eastern Lower Valley, and much of the southeastern Upper Coast climate divisions.

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow and orange shading, Figure 1(b)] was received across all climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in the northern High Plains, areas of northern and southern Low Rolling Plains, scattered areas across the Edwards Plateau, small areas of central North Central, northern South Central, northwestern and southwestern Southern, areas in southwestern East Texas, areas of the eastern Lower Valley climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in portions of northwestern High Plains, northwestern South Central, and northwestern Southern climate divisions. 400–600 percent of normal rainfall [light purple shading, circled in red, Figure 1(b)] was received in the northwest Southern climate division.

a)



b)

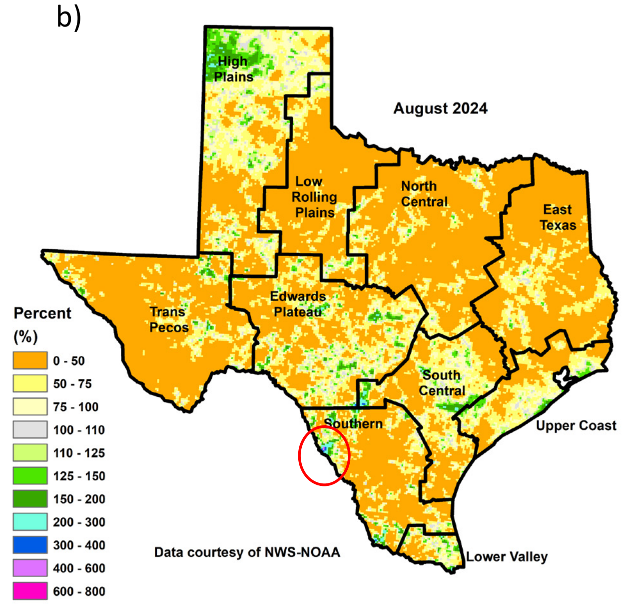
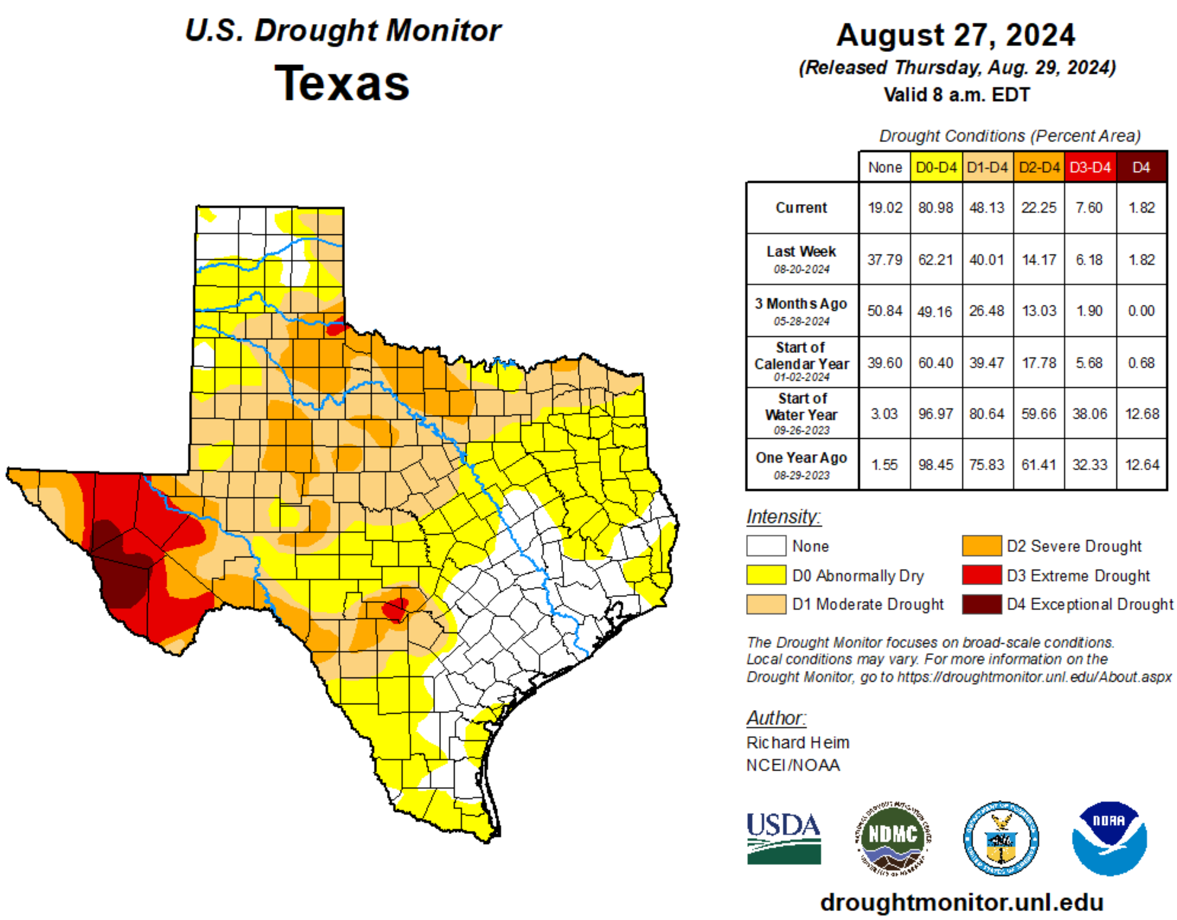


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of August, 80.98% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 39.13% higher than the end of July.



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	19.02	80.98	48.13	22.25	7.60	1.82
Last Week 08-20-2024	37.79	62.21	40.01	14.17	6.18	1.82
3 Months Ago 05-28-2024	50.84	49.16	26.48	13.03	1.90	0.00
Start of Calendar Year 01-02-2024	39.60	60.40	39.47	17.78	5.68	0.68
Start of Water Year 09-26-2023	3.03	96.97	80.64	59.66	38.06	12.68
One Year Ago 08-29-2023	1.55	98.45	75.83	61.41	32.33	12.64

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of August 27, 2024.

RESERVOIR STORAGE

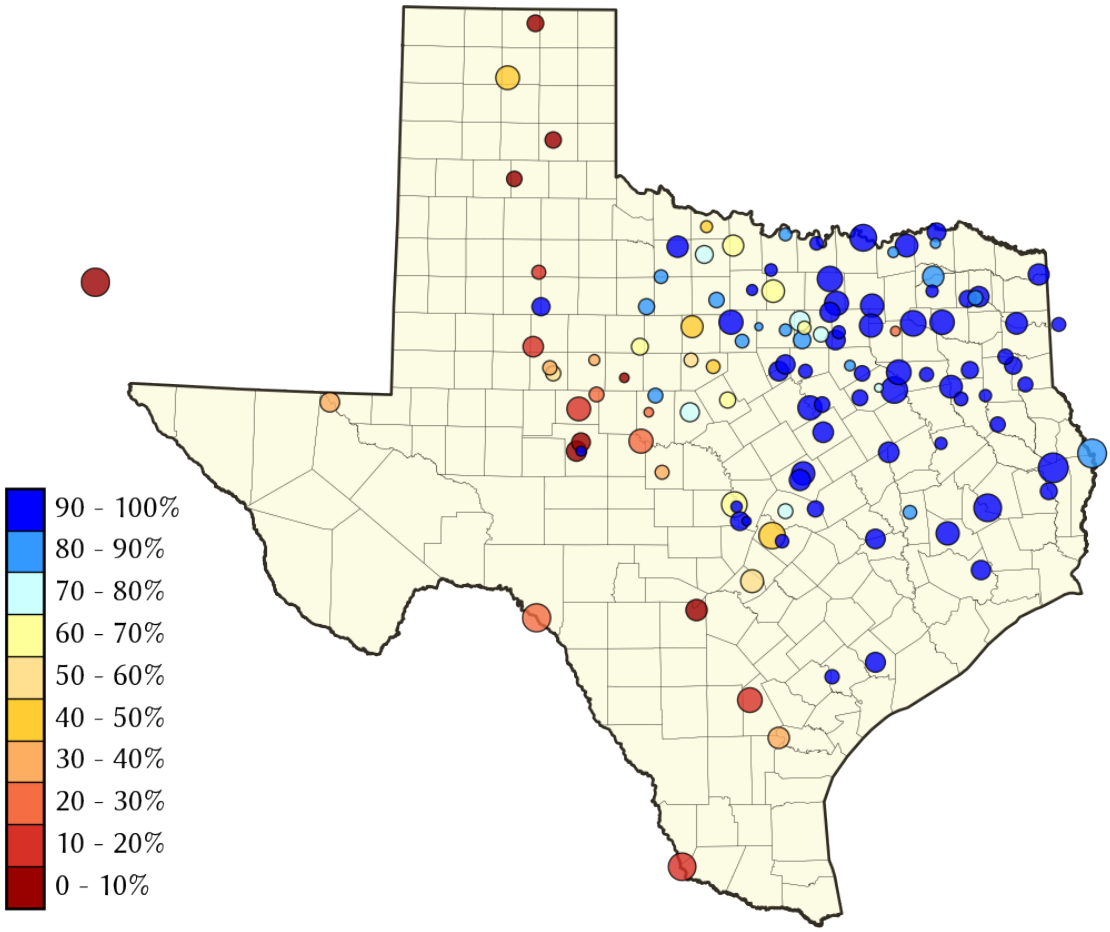


Figure 3. Reservoir conservation storage at end-August expressed as percent full (%)

Out of 119 reservoirs in the state, 11 reservoirs held 100 percent conservation storage capacity, and 51 reservoirs were at or above 90 percent full this month. Seventeen reservoirs remained at or below 30 percent full: Abilene (6.6 percent full), Amistad (24.9 percent full), Choke Canyon (20.0 percent full), E.V. Spence (13.0 percent full), Falcon (11.5 percent full), Greenbelt (9.0 percent full), Hords Creek (27.2 percent full), J.B. Thomas (16.5 percent full), Mackenzie (8.6 percent full), Medina Lake (3.3 percent full), New Terrell City (25.0 percent full), O.C. Fisher (0.8 percent full), O.H. Ivie (25.3 percent full), Oak Creek (27.0 percent full), Palo Duro Reservoir (1.8 percent full), Twin Buttes (8.5 percent full), and the White River Lake (17.6 percent full). Elephant Butte Reservoir (New Mexico) was 8.0 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (93.8 percent full), North Central (91.8 percent full), and the Upper Coast (97.2 percent full) climate divisions. The Low Rolling Plains (62.4 percent full) climate division had abnormally low conservation storage. Conservation storage was moderately low [Figure 4(a)] for the South Central (48.2 percent full) climate division. The High Plains (33.3 percent full) and Edwards Plateau (33.3 percent full) climate divisions had severely low conservation storage and the Trans Pecos (12.3 percent full) and the Southern (16.3 percent full) climate divisions had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin, and extremely low [10–20 percent full, dark red shading] in the Upper/Mid and Lower Rio Grande river basins. Severely low conservation storage [20–40 percent full, brown shading, Figure 4(b)] was seen in the Canadian, Nueces, and Upper Colorado river basins. The Lower Colorado and Guadalupe river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Upper and Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

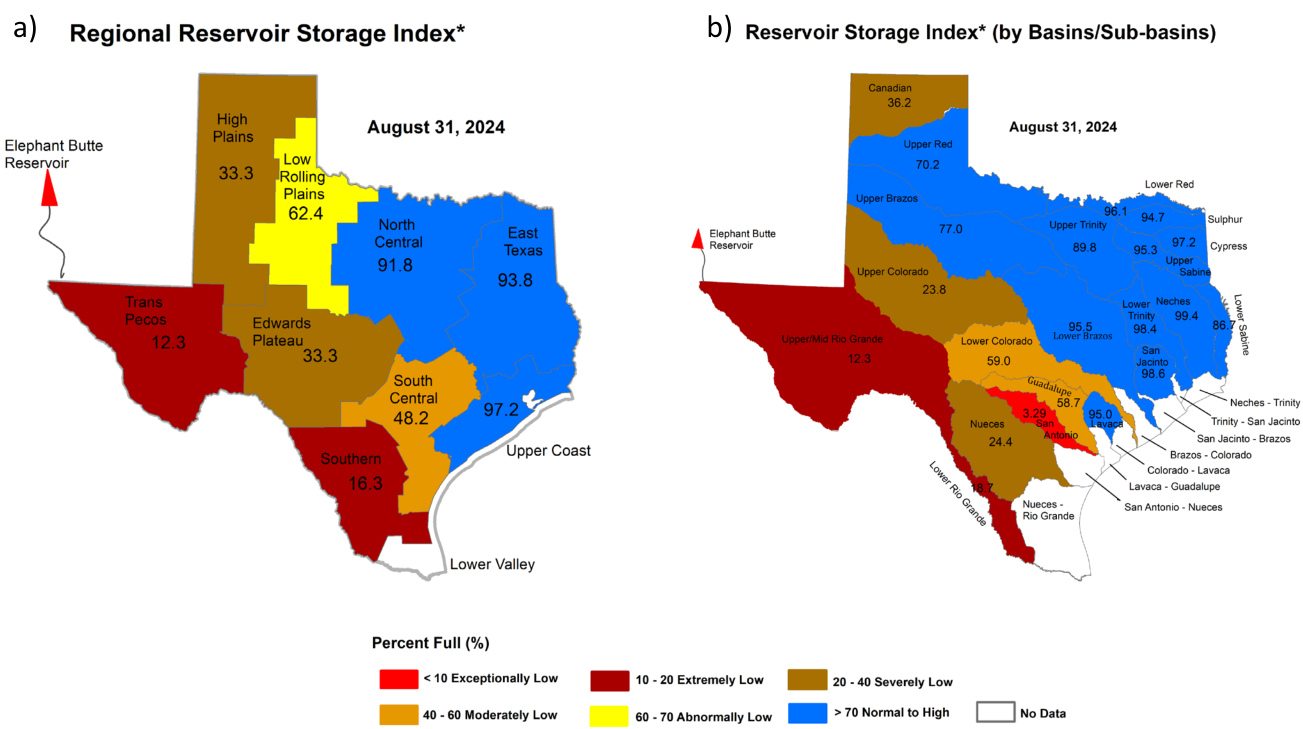


Figure 4: Reservoir Storage Index by a) climate division, and b) basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

September 2024

Water News:

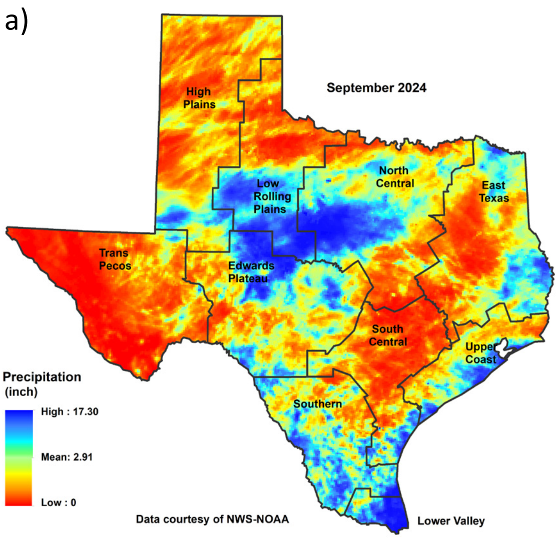
The Texas Water Development Board’s Coastal Science staff participated in the 5th annual San Antonio Bay Partnership Shorelines Cleanup, removing plastic bottles, jugs, and old crab trap buoys from East Guadalupe Bay.

RAINFALL

In September, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in the Trans Pecos, High Plains, northern Low Rolling Plains, areas of the Edwards Plateau, portions of North Central, much of East Texas, much of South Central, northern Southern, and areas of the Upper Coast climate divisions. Rainfall of 10" or greater [light and dark blue shading, Figure 1(a)] was seen in areas of the southern High Plains, southern Low Rolling Plains, portions of eastern Trans Pecos, areas across the Edwards Plateau, western North Central, parts of northern and southeastern East Texas, southern South Central, much of the Southern, Lower Valley, and areas of central and western Upper Coast climate divisions.

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow and orange shading, Figure 1(b)] was received across all climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in areas of the High Plains, southern Low Rolling Plains, eastern Trans Pecos, scattered areas across the Edwards Plateau, western and central North Central, southern South Central, areas of Southern, northern and southeastern East Texas, areas of the Lower Valley, and central and southwestern Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received the southern High Plains, southern Low Rolling Plains, western North Central, northern and eastern Edwards Plateau, western Southern, and Lower Valley climate divisions. 400–600 percent of normal rainfall [light purple shading, Figure 1(b)] was received in the southern High Plains, southern Low Rolling Plains, western North Central, and northern Edwards Plateaus climate division.

a)



b)

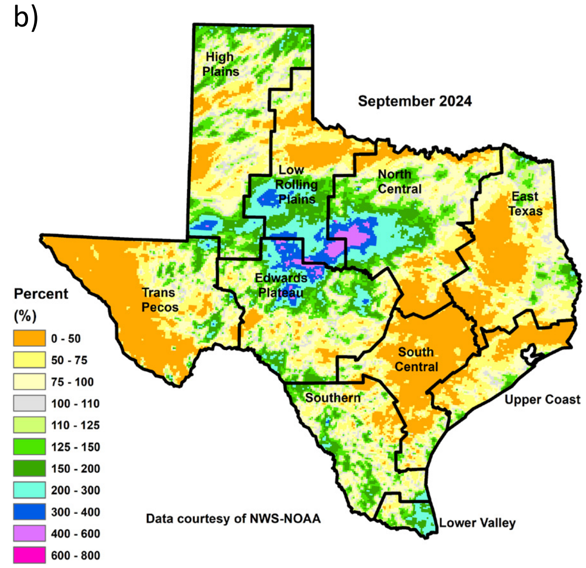
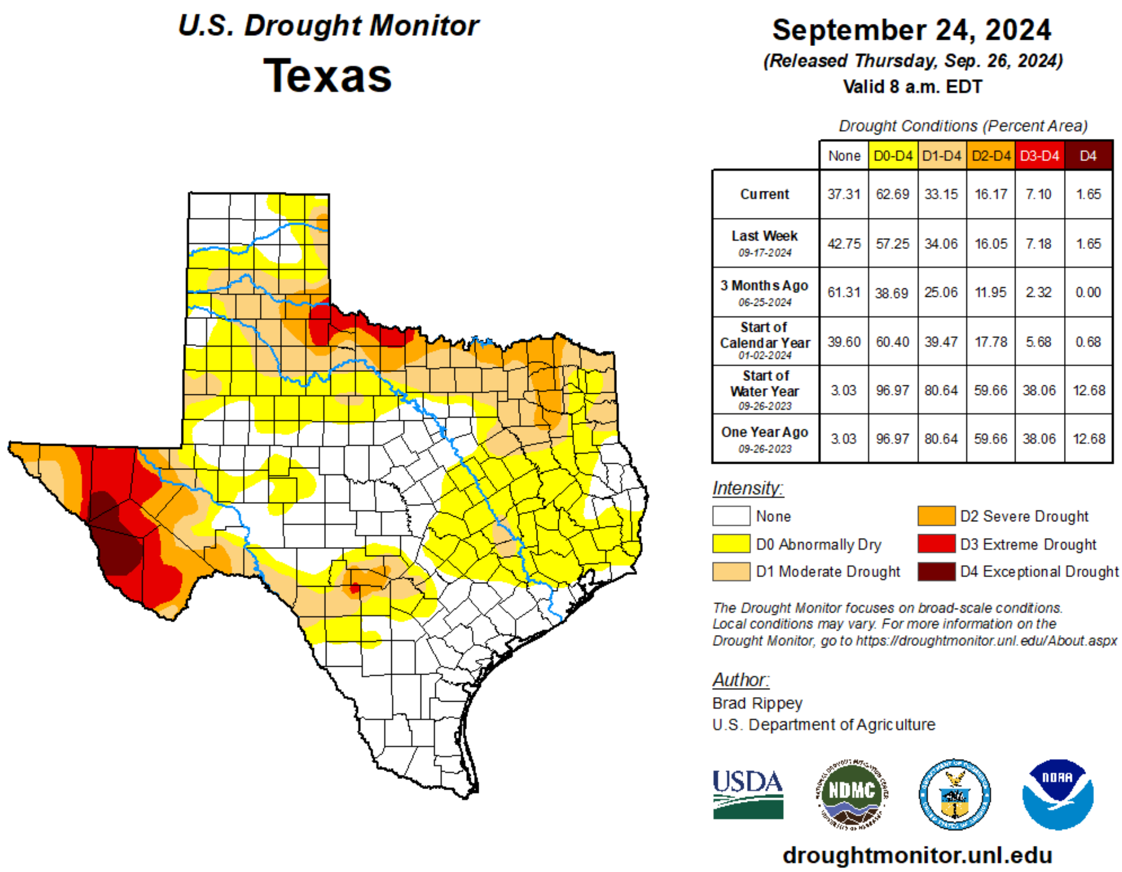


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of September, 62.69% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 18.29% lower than the end of August.



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	37.31	62.69	33.15	16.17	7.10	1.65
Last Week 09-17-2024	42.75	57.25	34.06	16.05	7.18	1.65
3 Months Ago 06-25-2024	61.31	38.69	25.06	11.95	2.32	0.00
Start of Calendar Year 01-02-2024	39.60	60.40	39.47	17.78	5.68	0.68
Start of Water Year 09-26-2023	3.03	96.97	80.64	59.66	38.06	12.68
One Year Ago 09-26-2023	3.03	96.97	80.64	59.66	38.06	12.68

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of September 24, 2024.

RESERVOIR STORAGE

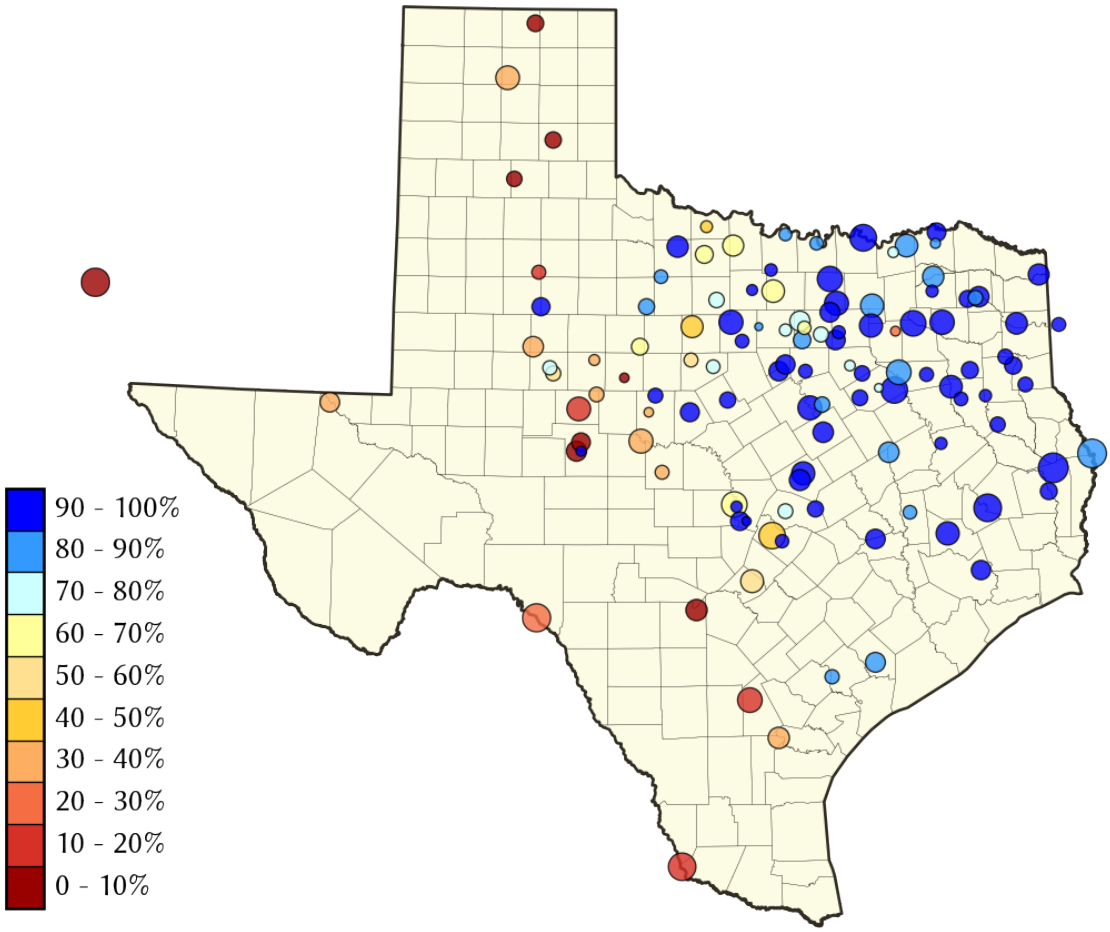


Figure 3. Reservoir conservation storage at end-August expressed as percent full (%)

Out of 119 monitored reservoirs in the state, eight reservoirs held 100 percent conservation storage capacity, and 50 reservoirs were at or above 90 percent full this month. Thirteen reservoirs remained at or below 30 percent full: Abilene (7.2 percent full), Amistad (27.0 percent full), Choke Canyon (19.0 percent full), E.V. Spence (17.7 percent full), Falcon (13.7 percent full), Greenbelt (8.7 percent full), Mackenzie (8.5 percent full), Medina Lake (3.1 percent full), New Terrell City (23.9 percent full), O.C. Fisher (7.2 percent full), Palo Duro Reservoir (1.6 percent full), Twin Buttes (9.7 percent full), and the White River Lake (16.6 percent full). Elephant Butte Reservoir (New Mexico) was 5.7 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (91.4 percent full), North Central (90.3 percent full), and the Upper Coast (93.0 percent full) climate divisions. The Low Rolling Plains (69.7 percent full) climate division had abnormally low conservation storage. Conservation storage was moderately low [Figure 4(a)] for the South Central (47.3 percent full) climate division. The High Plains (32.7 percent full) and Edwards Plateau (36.2 percent full) climate divisions had severely low conservation storage and the Trans Pecos (10.6 percent full) and the Southern (17.3 percent full) climate divisions had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin. Severely low conservation storage [20–40 percent full, brown shading, Figure 4(b)] was seen in the Canadian, Nueces, Lower Rio Grande, and Upper Colorado river basins. The Lower Colorado and Guadalupe river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. Abnormally low conservation storage [60–70 percent full, yellow shading, Figure 4(b)] was seen in the Upper Red river basin. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

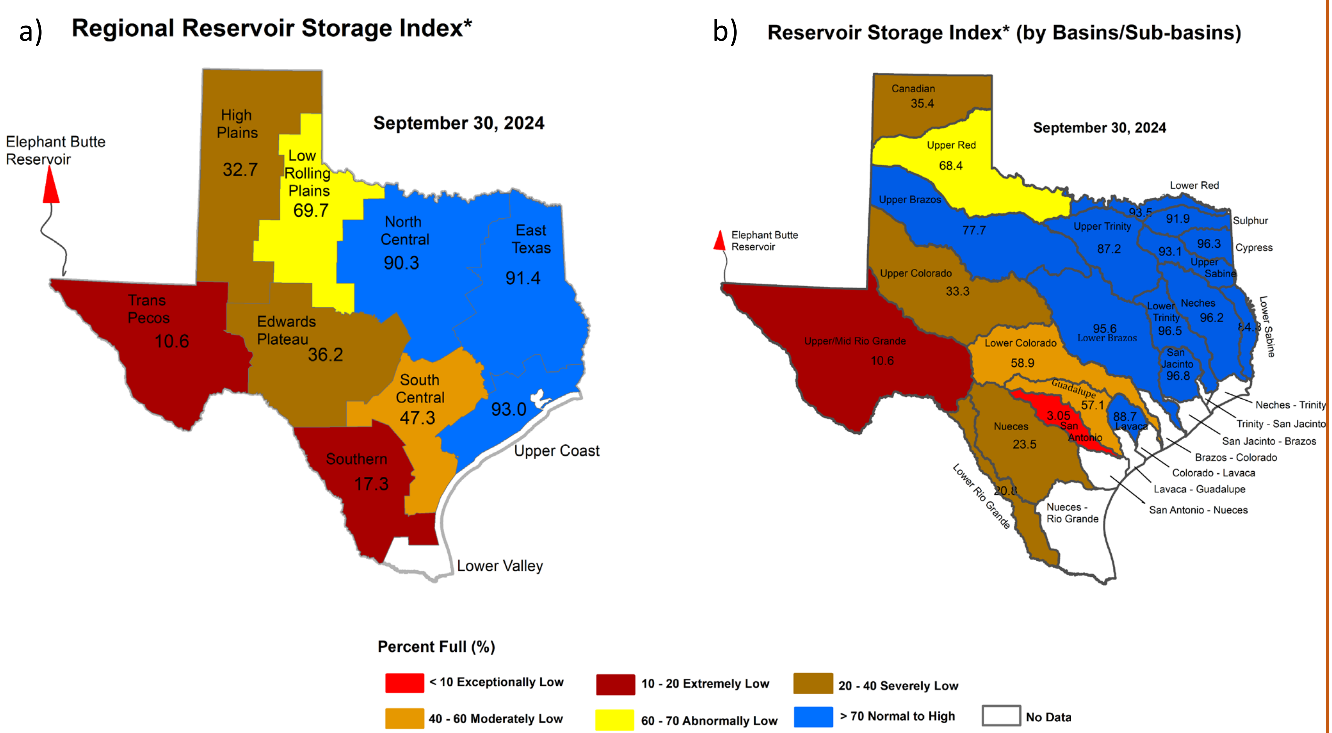


Figure 4: Reservoir Storage Index by a) climate division, and b) basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

October 2024

Water News:

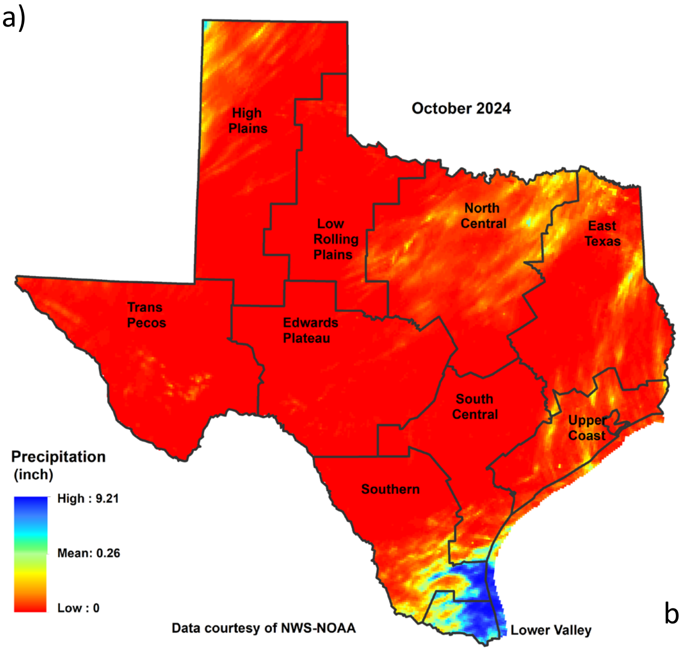
The Texas Water Development Board (TWDB) is partnering with several agencies to improve and expand estimates of reservoir evaporation to more accurately plan for the future. To learn more about new evaporation datasets and current studies read this article from the Texas Water Newsroom.

RAINFALL

In October, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell over 90% of the state. The only exception was in the Lower Valley, southeastern Southern, and the very southern tip of the South Central climate divisions where over 9” of rainfall fell [light and dark blue shading, Figure 1(a)].

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow and orange shading, Figure 1(b)] was received across all climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in the southeastern Southern and eastern Lower Valley climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in the southeastern Southern and northeastern Lower Valley climate divisions.

a)



b)

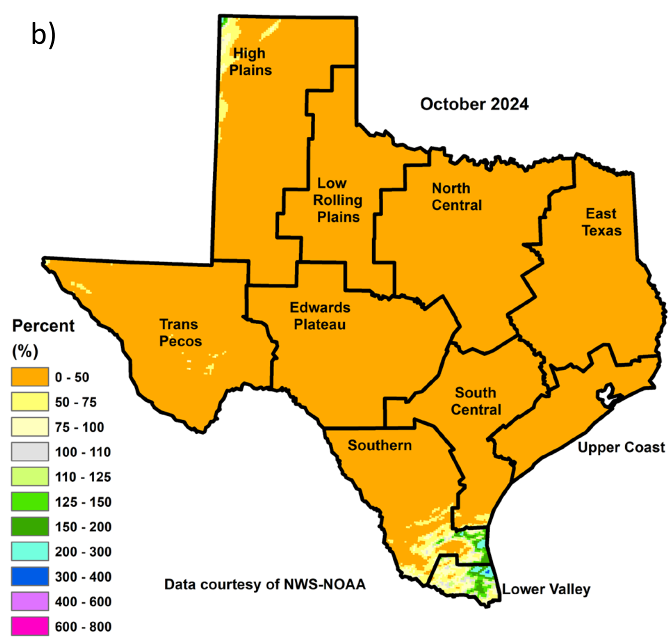
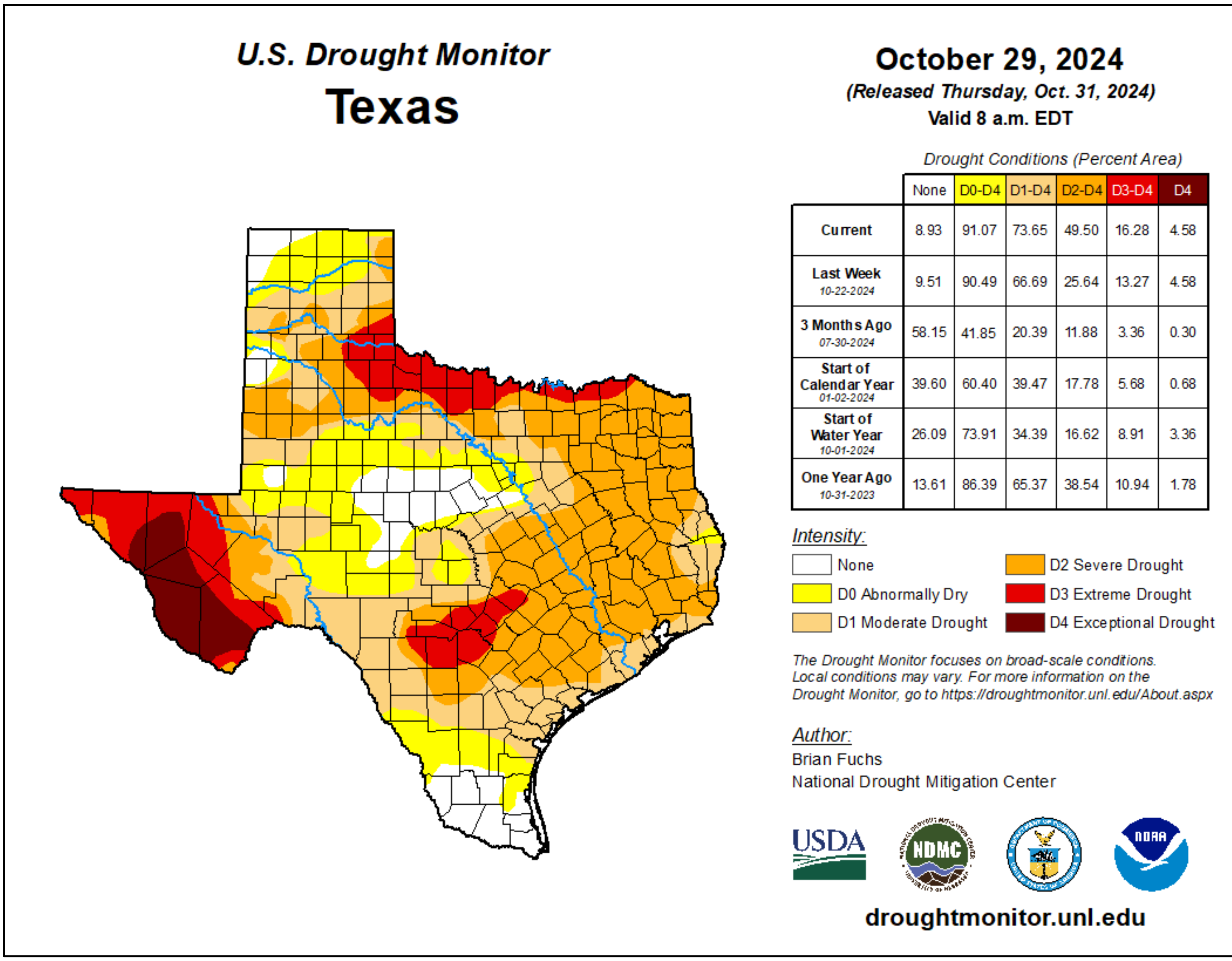


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

At the end of October, 91.07% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 28.38% higher than the end of September.



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	8.93	91.07	73.65	49.50	16.28	4.58
Last Week 10-22-2024	9.51	90.49	66.69	25.64	13.27	4.58
3 Months Ago 07-30-2024	58.15	41.85	20.39	11.88	3.36	0.30
Start of Calendar Year 01-02-2024	39.60	60.40	39.47	17.78	5.68	0.68
Start of Water Year 10-01-2024	26.09	73.91	34.39	16.62	8.91	3.36
One Year Ago 10-31-2023	13.61	86.39	65.37	38.54	10.94	1.78

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of October 29, 2024.

RESERVOIR STORAGE

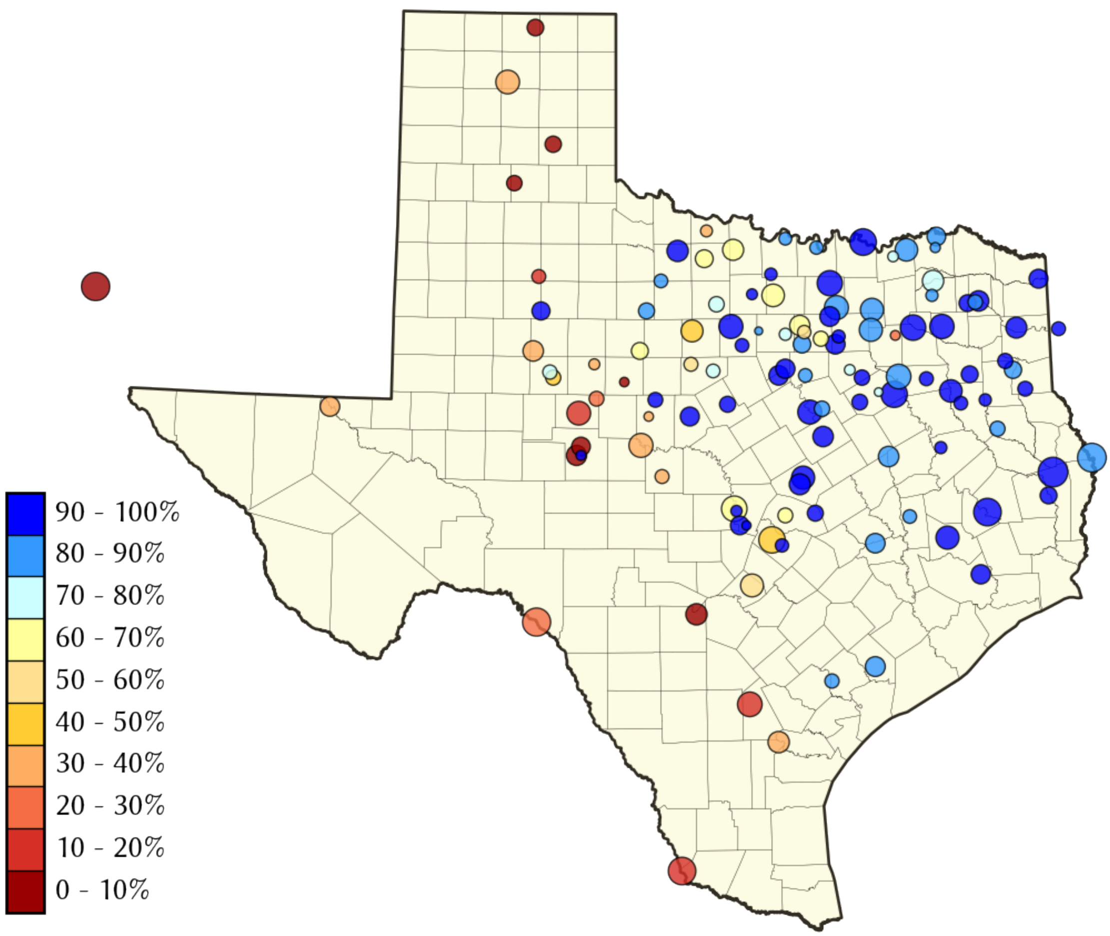


Figure 3. Reservoir conservation storage at end-October expressed as percent full (%)

Out of 119 monitored reservoirs in the state, four reservoirs held 100 percent conservation storage capacity, and 40 reservoirs were at or above 90 percent full this month. Twelve reservoirs remained at or below 30 percent full: Abilene (6.0 percent full), Amistad (26.8 percent full), Choke Canyon (17.8 percent full), E.V. Spence (17.0 percent full), Falcon (13.3 percent full), Greenbelt (8.1 percent full), Mackenzie (8.3 percent full), Medina Lake (2.8 percent full), O.C. Fisher (6.5 percent full), Palo Duro Reservoir (1.3 percent full), Twin Buttes (8.7 percent full), and the White River Lake (15.2 percent full). Elephant Butte Reservoir (New Mexico) was 5.9 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (87.9 percent full), North Central (86.9 percent full), and the Upper Coast (89.5 percent full) climate divisions. The Low Rolling Plains (66.5 percent full) climate division had abnormally low conservation storage [Figure 4(a)]. Conservation storage was moderately low [Figure 4(a)] for the South Central (45.0 percent full) climate division. The High Plains (31.9 percent full) and Edwards Plateau (35.1 percent full) climate divisions had severely low conservation storage and the Trans Pecos (10.8 percent full) and the Southern (14.6 percent full) climate divisions had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin. The Upper-Mid Rio Grande and the Nueces river basins had extremely low conservation storage [10–20 percent full, dark red shading, Figure 4 (b)]. Severely low conservation storage [20–40 percent full, brown shading, Figure 4(b)] was seen in the Canadian, Lower Rio Grande, and Upper Colorado river basins. The Lower Colorado and Guadalupe river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. Abnormally low conservation storage [60–70 percent full, yellow shading, Figure 4(b)] was seen in the Upper Red river basin. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

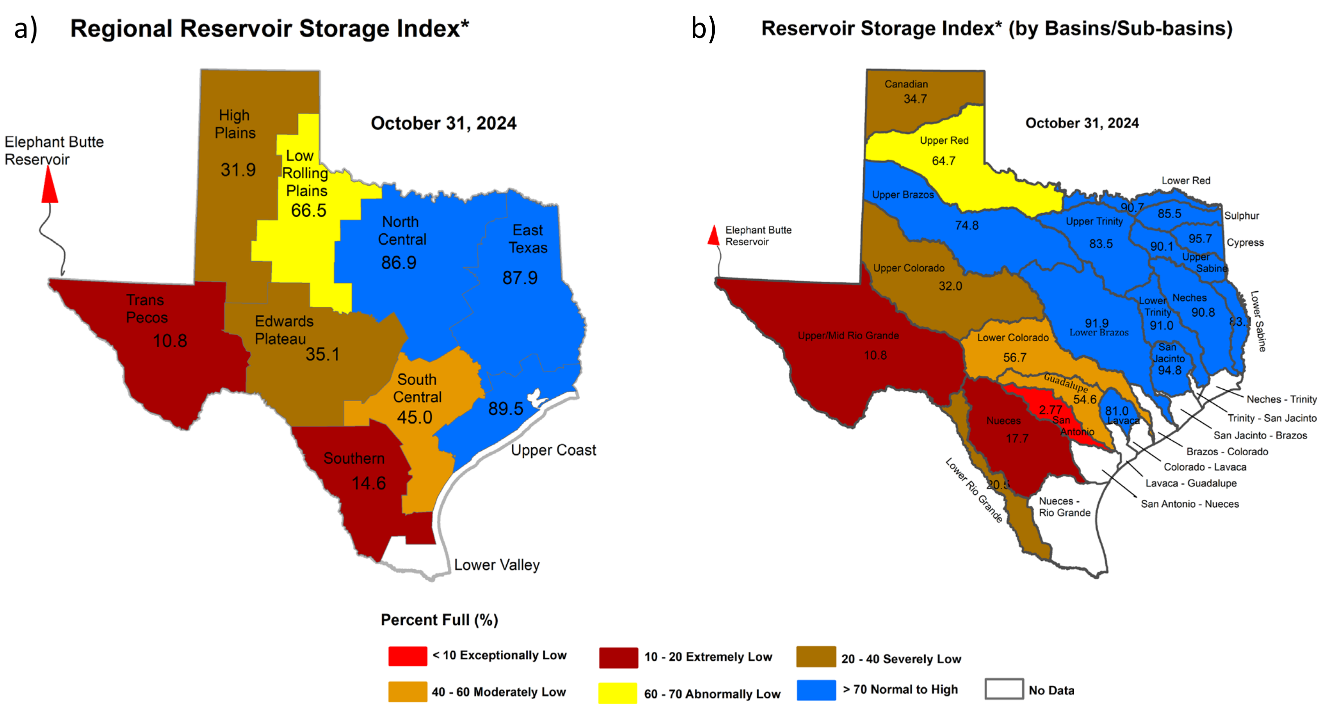
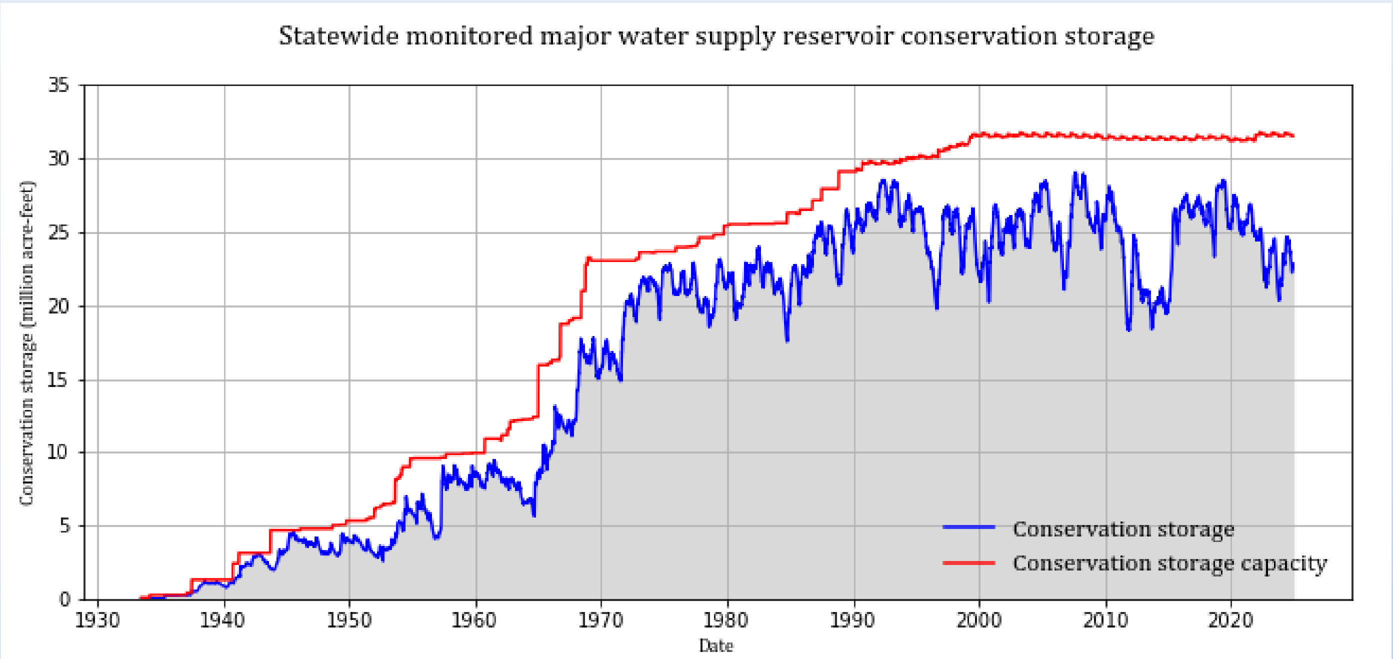


Figure 4: Reservoir Storage Index by a) climate division, and b) basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

November 2024



Water News:

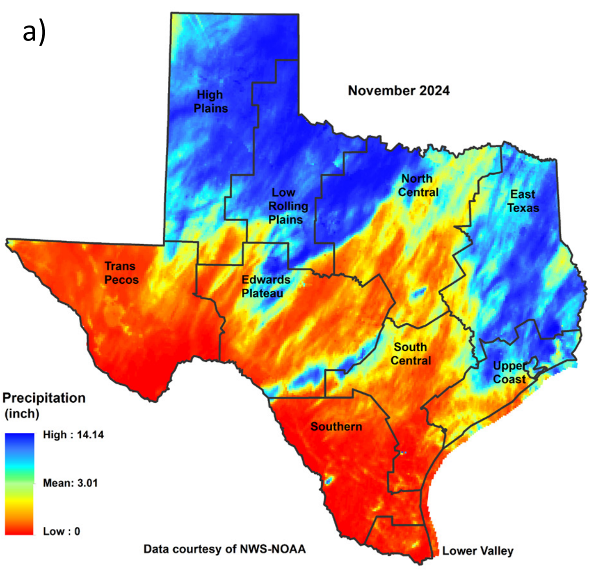
The statewide conservation storage at the end of November was 70.1 percent, ~1 percent more than last month and 3.4 percent more than this time last year. More detailed conservation storage information can be found in the Reservoir Storage section of this report.

RAINFALL

In November, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell over West, Central and Southern portions of the state. The High Plains, the Lower Rolling Plains, northern and southeastern Edwards Plateau, western North Central, East Texas, and eastern Upper Coast climate divisions received upwards to 14.14 inches this month [light and dark blue shading, Figure 1(a)].

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow and orange shading, Figure 1(b)] was received in the southern Trans Pecos, central and eastern Edwards Plateau, southern North Central, Southern, South Central, Lower valley, and western Upper Coast climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in the Trans Pecos, northwestern and southeastern Edwards Plateau, northern North Central, East Texas, and eastern Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received the Trans Pecos, Edwards Plateau, southern High Plains, southern and eastern Low Rolling Plains, western North Central, and a small area of western Southern climate divisions. 400–800 percent of normal rainfall [light purple and bright pink shading, Figure 1(b)] was received in the High Plains, Low Rolling, western North Central and northern Edwards Plateau climate divisions.

a)



b)

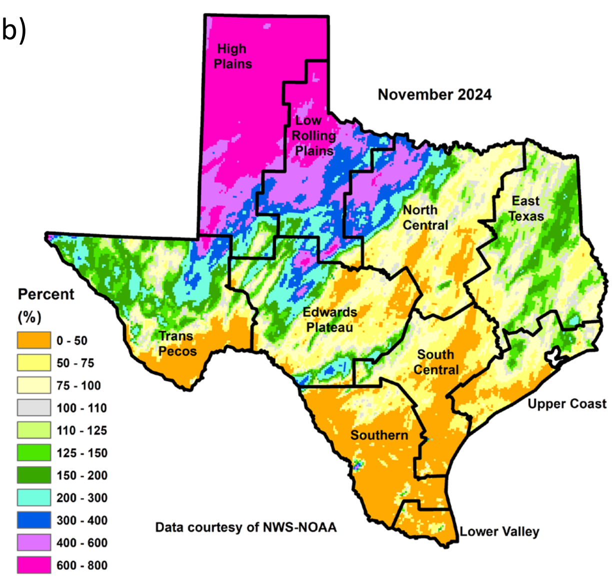


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of November, 66.99% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 24.08% lower than the end of October.

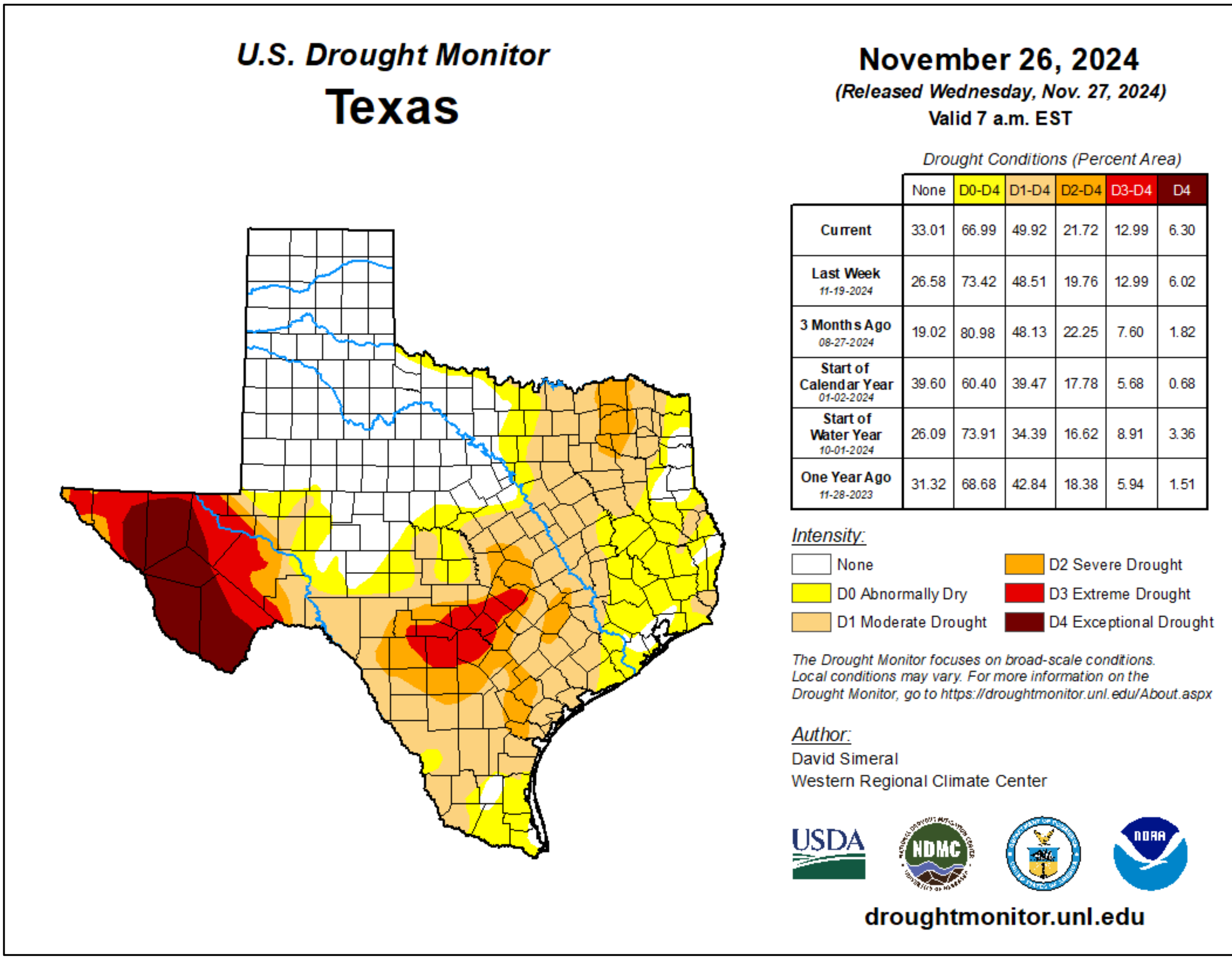


Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of November 26, 2024.

RESERVOIR STORAGE

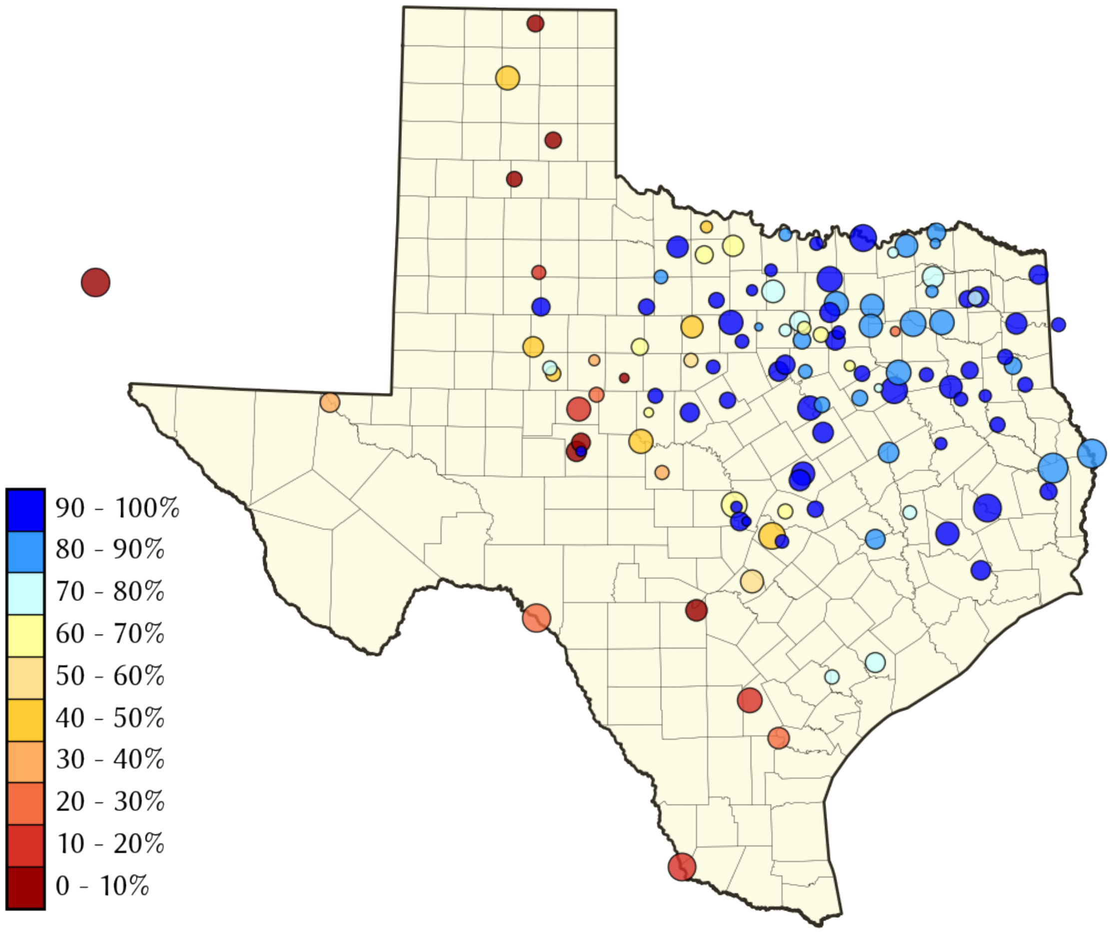


Figure 3. Reservoir conservation storage at end-November expressed as percent full (%)

Out of 119 monitored reservoirs in the state, 17 reservoirs held 100 percent conservation storage capacity, and 34 reservoirs were at or above 90 percent full this month. Fifteen reservoirs remained at or below 30 percent full: Abilene (6.6 percent full), Amistad (26.6 percent full), Choke Canyon (17.2 percent full), Corpus Christi (28.1 percent full), E.V. Spence (17.5 percent full), Falcon (12.8 percent full), Greenbelt (9.1 percent full), Mackenzie (9.4 percent full), Medina Lake (2.8 percent full), New Terrell City (21.9 percent full), O.C. Fisher (8.7 percent full), Oak Creek (29.1 percent full), Palo Duro Reservoir (1.4 percent full), Twin Buttes (9.3 percent full), and the White River Lake (18.3 percent full). Elephant Butte Reservoir (New Mexico) was 7.4 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (88.6 percent full), North Central (89.2 percent full), Low Rolling Plains (71.9 percent full), and the Upper Coast (84.1 percent full) climate divisions. Conservation storage was moderately low [Figure 4(a)] for the South Central (44.4 percent full) climate division. The High Plains (33.6 percent full) and Edwards Plateau (36.1 percent full) climate divisions had severely low conservation storage and the Trans Pecos (12.2 percent full) and the Southern (15.5 percent full) climate divisions had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin. The Upper-Mid Rio Grande river basin had extremely low conservation storage [10–20 percent full, dark red shading, Figure 4 (b)]. Severely low conservation storage [20–40 percent full, brown shading, Figure 4(b)] was seen in the Canadian, Nueces, Lower Rio Grande, and Upper Colorado river basins. The Lower Colorado and Guadalupe river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Upper and Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

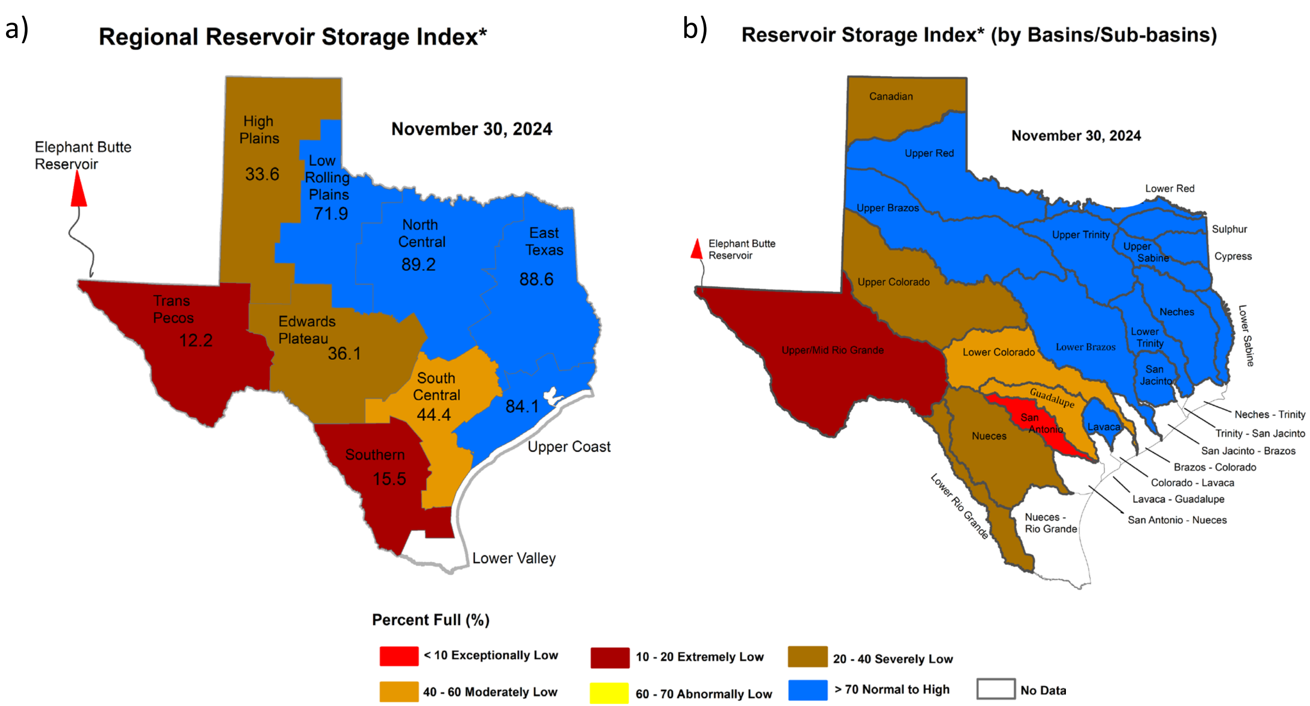
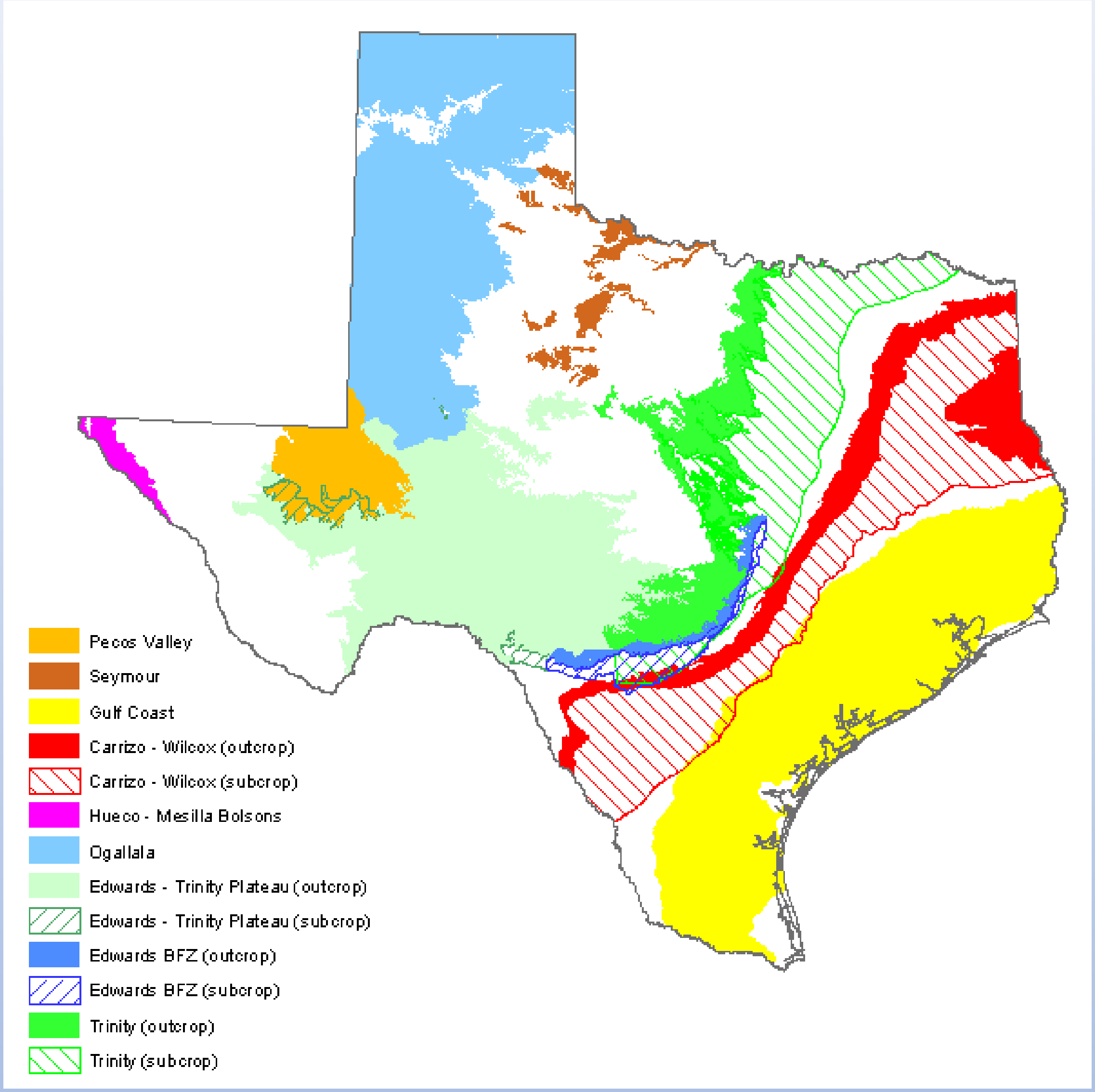


Figure 4: Reservoir Storage Index by a) climate division, and b) basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity. Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Texas Water Conditions Report

December 2024



Water News:

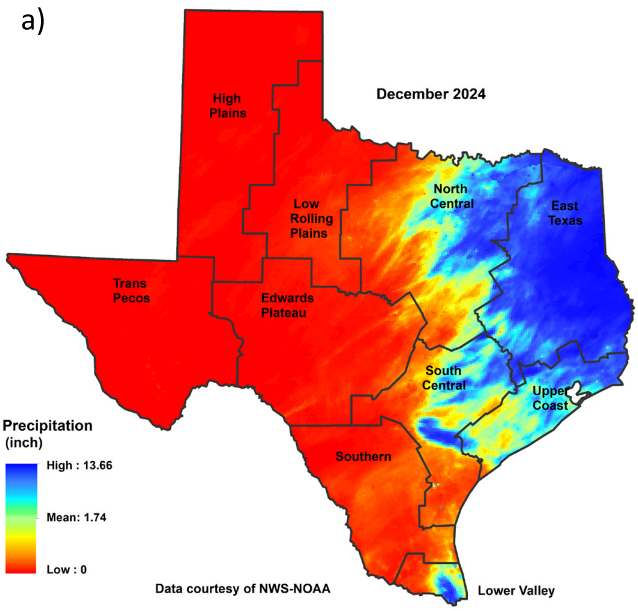
Staff from the TWDB's Groundwater Monitoring Recorder Well team explain some of the differences in geology and how that affects aquifer recharge rates across the state in this video posted on https://texaswaternewsroom.org/.

RAINFALL

In December, little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in over West, Central and Southern areas of the state. The northeastern North Central, northern South Central, Upper Coast, eastern Lower Valley, and East Texas climate divisions received upwards to 13.66 inches this month [light and dark blue shading, Figure 1(a)].

Compared to historical data from 1991–2020, 0–75 percent of normal rainfall [yellow and orange shading, Figure 1(b)] was received in High Plains, Trans Pecos, Low Rolling Plains, Edwards Plateau, Southern, western Lower Valley, southern and western South Central, and western and southern North Central climate divisions. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received northeastern North Central, northern South Central, East Texas, Lower Valley, and eastern Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in central North Central, Central East Texas, central South Central, and eastern Lower Valley climate divisions. 400–600 percent of normal rainfall [light purple shading, Figure 1(b)] was seen in the eastern Lower Valley climate division.

a)



b)

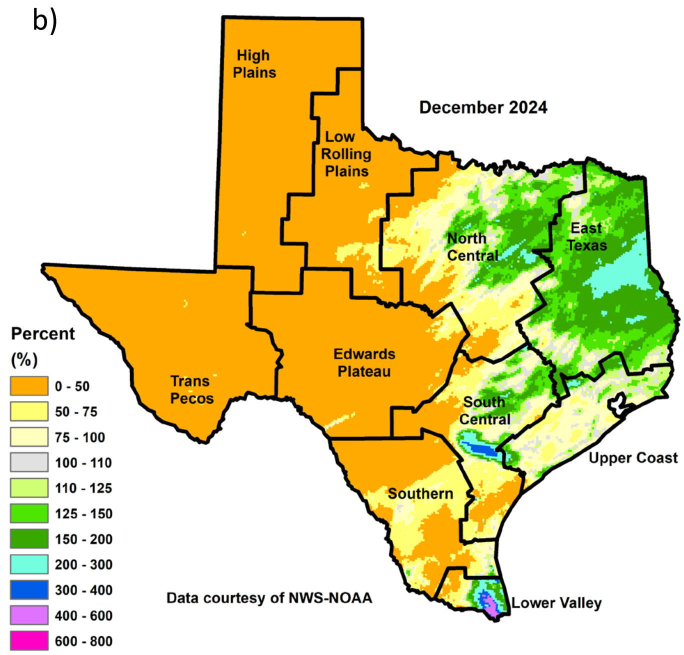
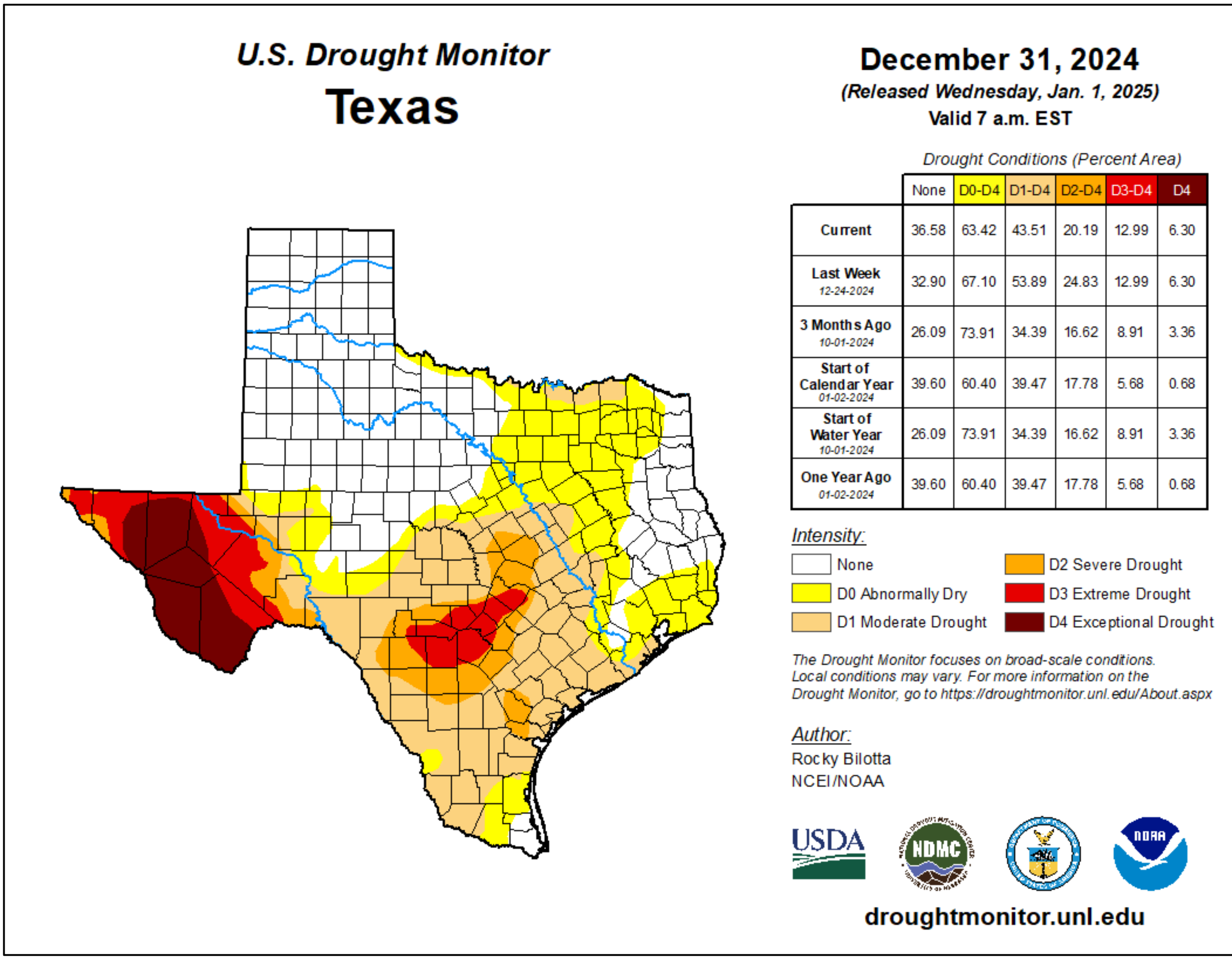


Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of December, 63.42%of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). This is approximately 3.57% lower than the end of November.



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	36.58	63.42	43.51	20.19	12.99	6.30
Last Week 12-24-2024	32.90	67.10	53.89	24.83	12.99	6.30
3 Months Ago 10-01-2024	26.09	73.91	34.39	16.62	8.91	3.36
Start of Calendar Year 01-02-2024	39.60	60.40	39.47	17.78	5.68	0.68
Start of Water Year 10-01-2024	26.09	73.91	34.39	16.62	8.91	3.36
One Year Ago 01-02-2024	39.60	60.40	39.47	17.78	5.68	0.68

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of December 31, 2024.

RESERVOIR STORAGE

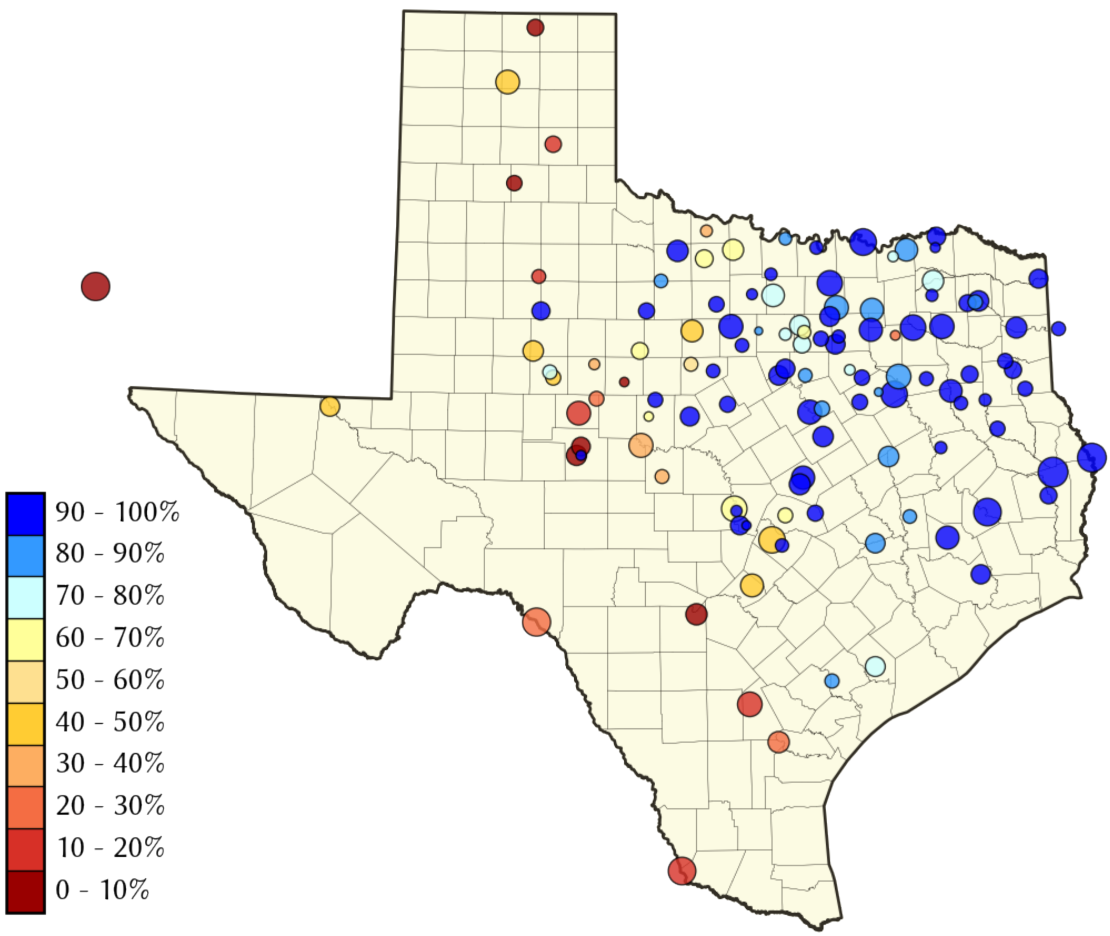


Figure 3. Reservoir conservation storage at end-November expressed as percent full (%)

Out of 119 monitored reservoirs in the state, 26 reservoirs held 100 percent conservation storage capacity, and 36 reservoirs were at or above 90 percent full this month. Fifteen reservoirs remained at or below 30 percent full: Abilene (6.0 percent full), Amistad (26.5 percent full), Choke Canyon (16.8 percent full), Corpus Christi (26.1 percent full), E.V. Spence (17.2 percent full), Falcon (13.8 percent full), Greenbelt (9.0 percent full), Mackenzie (9.2 percent full), Medina Lake (2.7 percent full), New Terrell City (24.1 percent full), O.C. Fisher (8.4 percent full), Oak Creek (28.5 percent full), Palo Duro Reservoir (1.2 percent full), Twin Buttes (9.1 percent full), and the White River Lake (17.6 percent full). Elephant Butte Reservoir (New Mexico) was 9.4 percent full (Figure 3).

Reservoir conservation storage was at or above normal [Figure 4(a)] for East Texas (94.1 percent full), North Central (90.7 percent full), Low Rolling Plains (71.3 percent full), and the Upper Coast (84.4 percent full) climate divisions. Conservation storage was moderately low [Figure 4(a)] for the South Central (44.2 percent full) climate division. The High Plains (33.6 percent full) and Edwards Plateau (35.4 percent full) climate divisions had severely low conservation storage and the Trans Pecos (14.1 percent full) and the Southern (15.8 percent full) climate divisions had extremely low conservation storage [Figure 4(a)].

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin. The Upper-Mid Rio Grande, and Nueces river basins had extremely low conservation storage [10–20 percent full, dark red shading, Figure 4 (b)]. Severely low conservation storage [20–40 percent full, brown shading, Figure 4(b)] was seen in the Canadian, Lower Rio Grande, and Upper Colorado river basins. The Lower Colorado and Guadalupe river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Upper and Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, Lavaca, and San Jacinto river basins.

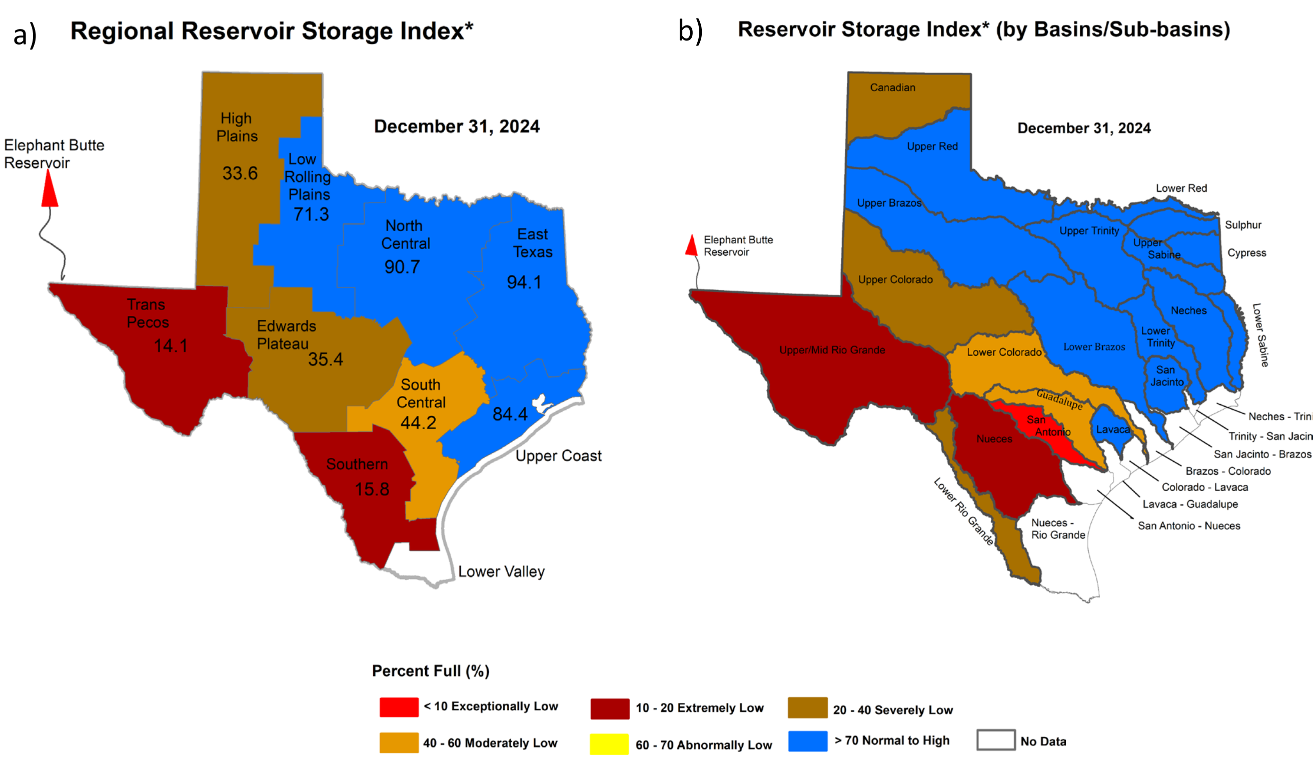


Figure 4: Reservoir Storage Index by a) climate division, and b) basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

Making Headlines 2024

F.1 Objective - The District will annually submit an article regarding water conservation for publication to at least one newspaper of general circulation in the District counties.

F.1 Performance Standard - Each year, a copy of the conservation article will be included in the District's Annual Report to be given to the District's Board of Directors.

F.2 Objective - The District will annually submit an article regarding rainwater harvesting for publication to at least one newspaper of general circulation in the District counties.

F.2 Performance Standard - Each year, a copy of the rainwater harvesting article will be included in the District's Annual Report to be given to the District's Board of Directors.

F.3 Objective - Each year, the District will include an informative flier on water conservation within at least one mail out to groundwater non-exempt water users distributed in the normal course of business for the District.

F.3 Performance Standard - Each year, a copy of the water conservation mail-out flyer will be included in the District's Annual Report to be given to the District's Board of Directors.

There are several newspapers in the District that routinely publish information provided by the District, including meeting notifications and conservation ideas. In addition, District staff routinely submit articles for publication and send out updates and newsletters related to general updates on the District, water level monitoring, new well registrations, groundwater production, water conservation and rainwater harvesting. The following pages are examples of information released by the District to fulfill our management objectives in 2021.

F.1:

- Water conservation article submitted to all newspapers in the District on October 30, 2024.

F.2:

- Rainwater harvesting article submitted to all newspapers in the District on April 8th, 2024.

F.3:

- District Newsletter provided to all non-exempt well owners and any other individuals that have signed up for the District's mailing list in May of 2024.

Subject: Press Release

From: Upper Trinity Groundwater Conservation District

Date: Wednesday, October 30th, 2024

Article: Go Big and Small with Water Conservation this Fall

With the oppressive summer heat dissipating and the welcome chill of fall in the air, water conservation takes on a different look for Texans. Scalable projects from dispensing spare ice in houseplants to harvesting thousands of gallons of rainwater, can be found below.

Small business owners - does your storefront ever flood when it rains? Many beautiful and historic shops in North Texas lack gutters, and torrential autumn storms degrade sidewalks and parking lots. Rain barrels and underground storage systems divert those volumes to a native plant or barrel planter, saving money and time. With La Nina expected to bring a wetter winter to North Texas, convert some or all of your roof into a rain refuge.

Fertilizer packages often picture beautiful green lawns, however, less is usually more. Farmers and ranchers complete training for utilizing pesticides and fertilizers, however many new homeowners or landowners aren't always sure what to apply. Researching what your lawn needs, if it's nitrogen, phosphorus, or potassium, is a great first step to a healthy yard. And those native plants in your yard don't need much, if any, turf builder this fall. Conservative distribution reduces excess fertilizer that often runs into surface streams and creeks, quelling nuisance algal blooms.

Do steep slopes or hills make it difficult for greenery to thrive? Native plant mixes sold by Texas owned companies address this issue! Check out varieties such as big bluestem, Texas cupgrass, and sand lovegrass to establish roots quickly and reduce soil erosion. Saving soil from your neighbor's property down the road saves time and money.

Soaker hoses are suitable for accent areas in the yard or garden. If the holes close up from debris and calcium precipitate, incorporating a filtration system will ensure your watering system stays in tip top shape. Placing them in a long grid pattern about 3-4 inches below the soil ensures they won't be impacted by cooler weather. Watering in the early morning is best for soaking soil and root systems and reduces evaporation of irrigated water.

Xeriscaping isn't just for Arizona, it's a great option to save natural resources in the Lone Star State. 25% of your yard transformed into an area with native plants, local rocks and fossils reduces water consumption by hundreds of gallons. Rock options like karst limestone, scoria, pumice, and river stones make great ground coverage between plants.

Take the headache out of watering – there's an app for that. Phone apps like WaterMyYard are a great option to reduce water while maintaining curb appeal.

Take this holiday season to bless your family with a water audit! Discovering how much water you and your family or business use will gives insight on how you can save. Monitor your appliances and irrigation system to estimate how much water each person uses per day. In the summer months up to 70% of water usage in Texas goes directly to our lawns.

For more information about using water wisely, contact the Upper Trinity GCD at 817-523-5200 or visit us online at uppertrinitygcd.com.

Press Release: Rainwater Harvesting: Your District Guide

Date: 4/8/2024

From: Jill Garcia, P.G., - Upper Trinity Groundwater Conservation District

Rainwater Harvesting: Your District Guide

With a wet April already in full swing and more storms expected in the coming months, the Upper Trinity is here to provide tips and tricks on creating your very own rainwater harvesting system. Nearby counties received between 24-28 inches of rain last year, and just a fraction caught from roofs and barns can sustain landscaping, livestock, or family homes. Rainwater harvesting helps alleviate stress on local groundwater systems, preserves streets and roadways, and can even slash your monthly utility bill. View our recommendations below and consider a harvesting system today.

Rainwater systems come in all shapes and sizes. A barn, apartment rooftop, or single-family home all have potential surfaces for harvesting. Not sure how much rain you want to catch? Decide on what you're aiming to use it for, be it animals, irrigation, or potable household use. This will dictate your storage material and size. A great rule of thumb is for every square foot or roof or surface, estimate .62 gallons for every inch of rain. That means a 2,000 square foot home could catch 1,240 gallons in a brief thunderstorm! Rain isn't the only catchment option, as many large structures also collect tens of gallons of dew on misty mornings.

For homes with existing gutter systems, consider attaching a harvesting barrel at the base of your outflow. Filters at the base of the gutter outlet will reduce vegetation and debris from reaching your storage tank, increasing the longevity of your system.

Don't have gutters? No problem – go outside and survey the shape of your roof. Roof footprints allow you to anticipate the drainage pattern and determine where a rain chain could be installed to lead water to a storage system. While less efficient than a gutter, they save time and money for those looking to install something creative and less permanent. Harvesting from ground surfaces and creating in-ground rock features to steer runoff is also a popular option.

If you're aiming to catch from a barn or larger building, pump and filtration systems help treat and move larger volumes of water. Micron sediment filters and activated charcoal cartridges can help reduce debris and ensure clean water is entering your storage systems – and they come in a variety of sizes. To check out some certified contractors and designers in the North Texas area, visit the American Rainwater Catchment Systems Association database at arcsaresource.com.

Grant Program Update: UTGCD recently contacted grant finalists for the second annual year of rainwater grants. The District will announce the 2024 winners at our April 18th board meeting, available in Springtown, TX and via Zoom. The winners will have ribbon cuttings for their systems while also featuring resources for residents to design their own systems and learn about harvesting's numerous benefits. UTGCD is grateful to all applicants who applied this year, and encourage those who were not selected this year to re-apply next year.

To share your systems or request more rainwater resources, reach out to the Jill Garcia with the District at 817-523-5200 or chat with us online at uppertrinitygcd.com.

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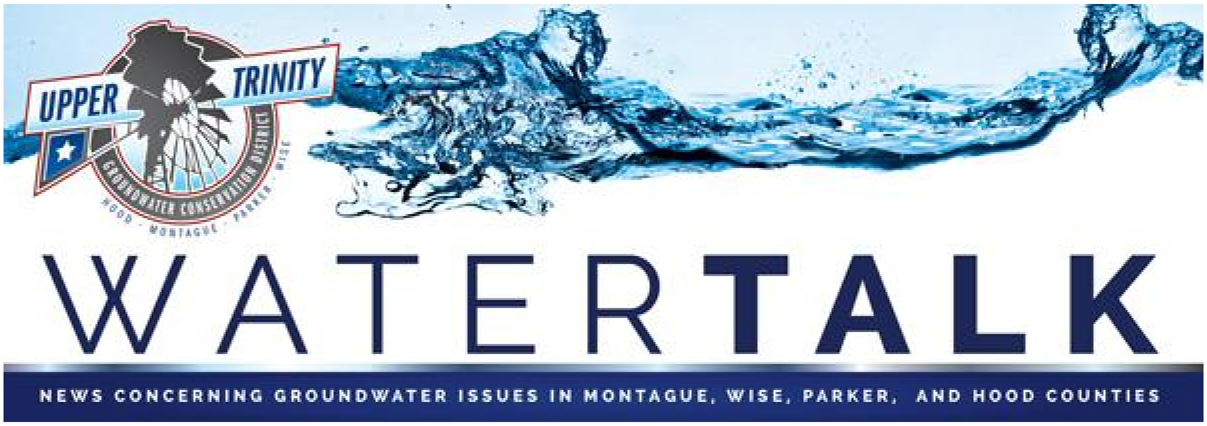


latest news

District awards five rainwater harvesting grants in Parker & Wise Counties

UTGCD recently interviewed multiple applicants as finalists in this year's rainwater harvesting grant program. Ultimately, the Board of Directors at the April meeting awarded funds to the following five projects in Parker and Wise Counties:

events

May:

16th - Board Meeting
5pm, District Office, Springtown, TX

27th - Memorial Day (Office Closed)

June:

19th - Juneteenth (Office Closed)

20th - Board Meeting
5pm, District Office, Springtown, TX

July:

4th - Fourth of July (Office Closed)

18th - Board Meeting
5pm, District Office, Springtown, TX

Board Meetings are held at

the softball fields to provide 25% of the irrigation needs of the site.

- Slidell ISD – Slidell ISD is designing raised bed and pollinator gardens to include rainwater harvesting capabilities from a portion of the school roof. Produce from the gardens will be used for the high school culinary program.
- The City of New Fairview – New Fairview is adding a catchment system to their municipal building complex.
- Parker County Sheriff's Posse - The sheriff's posse is adding additional storage to their original system that the District funded in 2020.
- Parker County Precinct 3 - Precinct 3 is adding additional storage to their system that was funded through the first year of grant applications. The new system will completely eliminate the use of groundwater via existing wells at the site.

The District thanks all applicants who submitted projects this year, and encourages all to apply again during our 2025 round of funding. Staff will be meeting with recipients in the coming weeks to complete grant agreements, and finalize development schedules.

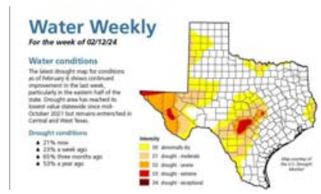
For updates on the five projects, visit uppertrinitygcd.com or the District's social media channels on Facebook and Instagram.

Groundwater Availability Certification Reviews: District Update

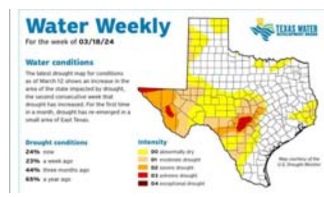
at 5:00pm.

They are open to the public and free to attend, and available virtually through Zoom. Check our meetings page on our website for login information.

drought **status**



February 2024



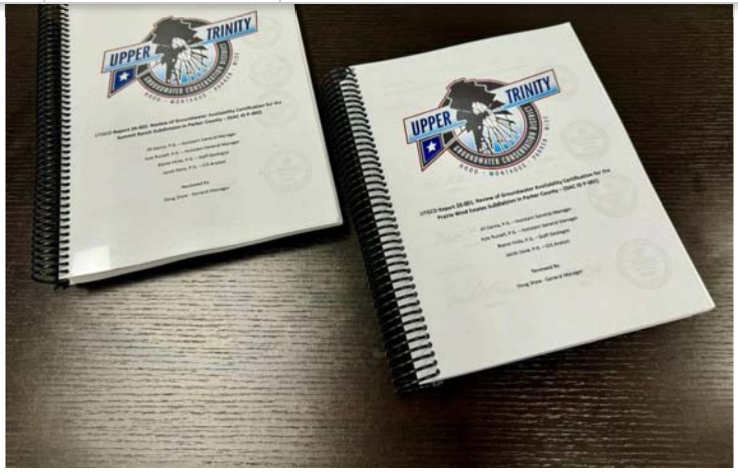
March 2024

April 2024

District Staff

Doug Shaw,
General Manager

Kyle Russell, P.G.
Assistant General Manager



UTGCD GAC Database

The Upper Trinity recently completed reviews of the following groundwater availability certifications:

- Summit Ranch Estates - Parker County
- Prairie Wind Estates - Parker County

For copies of these reports - access the database by clicking the link above. As part of an interlocal agreement with multiple platting authorities within our area, UTGCD reviews completed studies submitted alongside preliminary plat applications. Developers looking to contact licensed geoscientists and engineers regarding availability certifications can access state database links at uppertrinitygcd.com/gacreview.

Assistant General Manager

Laina Furlong, *Administrative Assistant*

Ann Devenney, *Office Manager*

Jennifer Hachtel, *Data Coordinator*

Blaine Hicks, P.G. *Staff Geologist*

Jacob Dove, P.G. *GIS Analyst*

Jay Love, G.I.T. *Compliance Coordinator*

Dawson Lowe, *Field Technician*

Zane Bearden, *Educational Specialist / Field Technician*

Heather Bird *Part-Time Administative Assistant*

Water Quality Testing

UTGCD offers no-cost coliform and e.coli presence testing for registered well owners.

Native Plant Spotlight: Antelope Horn Milkweed

- Zane Bearden, Ed. Specialist

Asclepias, commonly known as Milkweed, named after thew milky sap that extrudes from leaves and stem, is a genus of herbaceous perennial flowering plants belonging to the dogbane family. Their flowers are often clusters of small, beautiful blooms that can come in all different shapes and colors. Antelope Horn Milkweed (Asclepias Asperula) plays a crucial role in sustaining the state insect of Texas, the monarch butterfly.

Monarch populations have been adversely impacted by urbanization and development, removing much of their natural habitat. With Milkweed functioning as the primary food source for monarch caterpillars, symbiosis exists between plant and pollinator. The poisonous milky sap is credited with making the Monarchs distasteful to birds, a useful adaptation. Planting Antelope Horn Milkweed is an effective way to support native organisms with native vegetation.

Antelope Horn is hardy species and can thrive in

Texas, visit https://uppertrinitygcd.com/resources/.

Well Registrations

Registration of water wells protects groundwater and landowner rights. Registration of existing wells within the District is free. Visit our website at https://uppertrinitygcd.com/forms-documents/ to access the application.

appropriate drainage. Requiring minimal watering, varieties are able to thrive for significant periods without rain. Consider planting milkweed this spring and summer to prepare for incoming migrations.

Looking for a quick way to find plants native to your area? Check out this database via the Audubon Bird Society, simply type in your zip code and a list of native plants will be sent straight to your email.

https://www.audubon.org/native-plants

Recent Events & Activities

View some of the recent water trailer and outreach events completed by District staff.

- Camp El Tesoro - Acton, Texas
- Aledo ISD - Aledo, Texas
- Jacksboro ISD - Jacksboro, Texas
- Nocona ISD - Nocona, Texas
- Bowie ISD - Bowie, Texas
- Decatur, ISD - Decatur, Texas

Weatherford, Texas
- Chico Public Library - Chico, Texas
- Wise County Home & Garden Show - Decatur, Texas

District staff continue to travel and host continuing education courses for realtors and title agencies. UTGCD now offers:
- 4-hour course on Wells and Groundwater (#44677)
- 1-hour course on Rainwater Harvesting (#47972)
- 1-hour course on Native Grasses and Plants (#49479)

To schedule your course contact the District at 817-523-5200.

Board Meeting Updates

Over the last several months, the Board has taken action to issue several violations to Non-exempt well owners (Public Water Systems, Commercial, and Oil and Gas) related to the removal of meters. Please note, the District must be notified prior to removing a meter from a well.
This only applies to wells that require a meter - wells used for public water supply, commercial, or oil and gas activity.

website: https://uppertrinitygcd.com/meetings/

2024 District Wells Update

View well registration numbers since January of 2024.

Upper Trinity GCD Well Count - 2024					
	Hood	Parker	Wise	Montague	Totals
New	35	245	107	52	439
Existing	2	19	12	0	33
Non-Exempt	2	8	5	0	15
Exempt	35	256	114	52	457

Aquifer Trends & Health

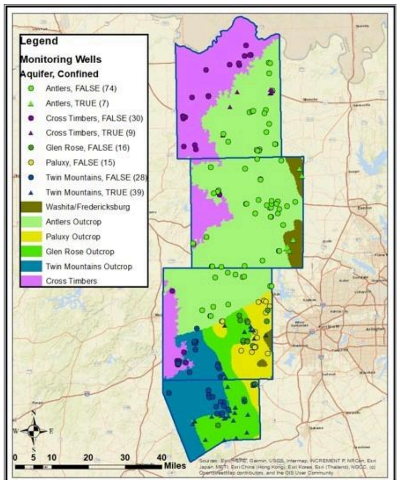
		Outcrop					Subcrop				
	County	Antlers	Paluxy	Glen Rose	Twin Mountains	Cross Timbers	Antlers	Paluxy	Glen Rose	Twin Mountains	Cross Timbers
1-Year Water Level Change	Montague	-0.4	-	-	-	-1.5	-	-	-	-	-17.7
	Wise	-3.6	-	-	-	28.3	-2.5	-	-	-	-
	Parker	2.3	-2.1	-2.4	-2.3	-3.5	-	-	-	5.5	-
	Hood	-	-	1.7	0.7	-	-	-	-	1.1	-

View one year water level changes for the outcrop and subcrop units of the Trinity Aquifer Group. This data is generated from quarterly monitoring of wells within the District's program. UTGCD will provide updated trend analyses during August 2024.

District Spacing Rules

Maximum Allowed Well Production	Minimum Tract Size	Spacing from Other Well Sites	Spacing from Property Line
The maximum amount of groundwater the well can actually produce as equipped in gallons per minute (gpm).	The minimum tract size that may be considered an appropriate site for a well.	The minimum distance, in feet, that a new well or proposed well site may be located from an existing registered or permitted well, existing unregistered well identified by the General Manager under Rule 4.3(b), or approved well site.	The minimum distance, in feet, that a new well or proposed well site may be located from the nearest property line of the tract of land on which it is to be located.
<17.36 gpm	Minimum Tract Size is 2 Acres	150 ft.	50 ft.
17.36 - 30 gpm		500 ft.	150 ft.
30 - 50 gpm		1,000 ft.	250 ft.
50 - 80 gpm		1,750 ft	500 ft.
80 – 100 gpm		2,500 ft.	750 ft.
>100 gpm		3,250 ft.	1,000 ft.

Monitoring Well Program



Water well owners are invited to join the District's ongoing monitoring program. Those registered in the program receive quarterly updates on water level depth.

Staff are continuously looking for interested landowners to assist with water data collection throughout the Trinity & Cross Timbers Aquifers – email blaine@uppertrinitygcd.com for more information regarding the program or visit our website at uppertrinitygcd.com.

Water Production Report Dates & Reminders

Water Production Report Dates			
Reporting Period	**Due Date**	**Usage Dates**	**Late Payment Penalties**
Semi- Annual 2	Janary 31	July 1 - December 31	30 days over due: the greater of $25.00 or 10% of the water use fees
Semi- Annual 1	July 31	January 1 - June 30	60+ days overdue: up to three times the amount of the water use fees

Non-Exempt Water Use Fees

Water usage reports and fees for non-exempt wells are due to the District on the following dates:

Usage and Fees:

- $0.22 per thousand gallons for groundwater usage
- 50% charge for groundwater export
- $30 returned check fee
- 5% convenience fee for MasterCard, Visa, or American Express

Failure to accurately and timely register, meter, or submit water production reports and fees within the required reporting period for each well mandated by the rules constitutes a major violation.

The District must be notified if the exemption status of a well changes, a meter is replaced, or if production capacity is altered. To file your water production report electronically, an e-WPR can be emailed upon request and water production report forms are available on the District's website. Call **817-523-5200** for questions or assistance.

Keep up to date by following us on social media!

Our mailing address is:
|P.O. Box 1749 Springtown, TX 76082|
Our physical address is:
|1859 W. Hwy 199 Springtown, TX 76082|

Groundwater Monitoring Program

G.1 Objective - Within 3 years of Groundwater Management Plan adoption develop a Groundwater Monitoring Program within the District.

G.1 Performance Standard - Upon development, attachment of the District Groundwater Monitoring Program to the District's Annual Report to be given to the District's Board of Directors.

G.2 Objective - Upon approval of the District Monitoring Program – conduct water level measurements at least annually on groundwater resources within the District.

G.2 Performance Standard - Annual evaluation of water-level trends and the adequacy of the monitoring network to monitor aquifer conditions within the District and comply with the aquifer resources desired future conditions. The evaluation will be included in the District's Annual Report to be given to the District's Board of Directors. The District may also take into consideration any measurements made by the TWDB groundwater measurement team.

G.3 Objective - Monitor non-exempt pumping within the District for use in evaluating District compliance with aquifer desired future conditions.

G.3 Performance Standard - Annual reporting of groundwater used by nonexempt wells will be included in the Annual Report provided to the District's Board of Directors.

G.1 & G.2:

A brief history of the monitoring program is presented here followed by a description of activities conducted in 2024.

In 2010, the District developed and instituted a Groundwater Monitoring Program in compliance with Objective and Performance Standard F.1. Phase I of the program secured 108 monitor wells within the District where water levels are measured quarterly using the Steel Tape Method, the Air Line Method, and/or the Electrical Line Method in compliance with Objective F.2. District staff was trained by personnel from the Texas Water Development Board on correct procedures for measurement of water levels. Participating well owners volunteered their wells to allow District staff to take water-level measurements. The District actively pursued additional monitoring wells to improve our ability to monitor groundwater conditions, comply with GMA-8 requirements, and meet the mission of the District as a whole. All activities regarding the District Groundwater Monitoring Program were presented for review and consent to the District Board.

A review of the Phase I Monitor Well System of wells indicated that gaps existed in the monitoring well network both spatially and vertically within the Trinity Aquifer and the Paleozoic aquifers (Cross Timbers). In response, the District contracted with INTERA Inc. to augment the monitor well network in a Phase II process. In 2011, the consultant completed a draft report that documented the hydrogeologic framework for the aquifers within the District with emphasis on the Paleozoic aquifers and also developed the strategy for assessing the Phase I monitoring well network and selecting the Phase II wells to meet the performance objectives and mission of the District. The monitoring strategy was focused to develop the data required to evaluate aquifer conditions within the boundaries of the District relative to the Trinity Aquifer DFCs and for potential future Cross Timbers aquifers DFC. This report is included as Appendix 2.

Based upon the data analysis presented in the Phase II report, 65 wells of the original 108 Phase I wells were suggested for retention in the network. An additional 120 optimally located wells were targeted for inclusion in the monitoring network. During 2013, District Staff and INTERA focused on securing agreements with owners of the identified wells. However, the process of acquiring new wells at optimal locations proved more difficult than anticipated and, as a result, progress was slower than originally expected. As of the end of December 2013, 24 new wells had been added to the monitoring network as part of the Phase II efforts.

In 2015, District staff conducted an internal assessment of the program which resulted in several wells being removed from the program due to new owners electing not to participate in the monitoring program, changes in well configuration resulting in an inability to access the well, and well collapse. Many of the wells removed from the program had not been actively monitored for several years yet had been included in the trend analysis presented to the Board in previous annual reports. Figure A below shows all wells in which the District, is currently collecting water level data.

In the spring of 2015, the District purchased and installed the first 14 pressure transducers, which have been recording daily water level readings since that time. A few of these transducers have been strategically relocated, and two had to be removed for a short period of time due to malfunctioning equipment, both cases have been resolved by sending the device back to the manufacturer for repair.

In the last few years, the District has installed pressure transducers in several other wells and equipped seven wells with well sounders. In 2018, the District also drilled two monitoring wells which are located at the District office site. Those wells are equipped with pressure transducers which take water level readings every 15 minutes and are connected to the TWDB's TexMesonet, data from those wells can be found at https://texmesonet.org. In 2020 the District drilled five monitoring wells, four in Parker County and one in Montague County. Each of these wells are equipped with pressure transducers. A total of 28 new monitoring wells were added to the program in 2024, making the total number of active monitoring wells now at 285. Locations and associated aquifers for all wells equipped with constant monitoring devices (transducers/sounders) can be seen in Figure B. District staff visits these locations to download data on a quarterly basis. The District has begun converting OTT pressure transducers to In situ pressure transducers. These devices are more reliable and have telemetry capabilities. The District currently has two In situ pressure transducers in operation and plans to phase out the OTT transducers as needed. In early 2023 the District drilled a Cross Timbers monitoring well in Parker County. This was an exploratory well that yielded less than 0.5 gallons per minute, was highly saline, contained volatiles, and had artesian pressure of unknown origins. The District had the well plugged due to environmental concerns. Moving forward, it is likely in the best interest of the District to continue to identify the best candidate wells for transducers to bolster the monitoring program.

In the spring of 2018, the District had INTERA begin the development of a web based water level trend analysis/DFC tracking tool to be used to streamline the process of analyzing the District's water level data and to help minimize human error in that process. This tool was used to analyze the water level data collected from the wells in the District monitoring well program in order to provide insight into long-term water-level changes in the District.

Table 1 summarizes the average water-level changes obtained from the trend analysis, by county and aquifer (outcrop and subcrop). Appendix 1, attached to this report, includes a summary report for each aquifer/county/outcrop-subcrop split with greater detail, including the Well ID and the number of wells used in the analysis. The results in Table 1 represent water level changes over a defined time period for each of the defined aquifer units (outcrop and subcrop) in each of the 4 counties.

Table 1. Average Trend of Water-Level Changes since 2010.

		Outcrop					Subcrop				
	County	Antlers	Paluxy	Glen Rose	Twin Mountains	Cross Timbers	Antlers	Paluxy	Glen Rose	Twin Mountains	Cross Timbers
Desired Future Conditions	**Montague**	-40	-	-	-	-	-	-	-	-	-
	Wise	-60	-	-	-	-	-154	-	-	-	-
	Parker	-42	-6	-20	-7	-	-	-2	-50	-68	-
	Hood	-	-	-9	-13	-	-	-	-39	-72	-
1-Year Water Level Change	**Montague**	0.0	-	-	-	-3.0	-	-	-	-	8.0
	Wise	-0.9	-	-	-	1.1	-0.0	-	-	-	-
	Parker	-0.9	-0.9	-1.0	-0.5	0.9	-	-	-	-1.6	-
	Hood	-	-	1.2	1.7	-	-	-	-	-0.8	-
5-Year Water Level Change	**Montague**	-1.8	-	-	-	5.5	-	-	-	-	-10.9
	Wise	-4.4	-	-	-	-	-9.7	-	-	-	-
	Parker	-0.2	-7.1	-4.3	-1.7	-5.0	-	-	-	0.7	-
	Hood	-	-	4.5	3.8	-	-	-	-	2.0	-
Cumulative Water Level Change (2010 to Present)	**Montague**	3.2	-	-	-	13.2	-	-	-	-	-0.3
	Wise	-1.1	-	-	-	34.7	-3.0	-	-	-	-
	Parker	-5.8	-12.9	-3.4	-5.8	-1.0	-	-	-	-14.1	-
	Hood	-	-	9.4	3.6	-	-	-	-	7.2	-
DFCs vs Cumulative Change	**Montague**	43.2	-	-	-	-	-	-	-	-	-
	Wise	58.9	-	-	-	-	151.0	-	-	-	-
	Parker	36.2	-6.9	16.6	1.2	-	-	-	-	54.0	-
	Hood	-	-	18.4	16.6	-	-	-	-	79.2	-

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

In the table above

- Desired Future Condition is the current adopted DFC for each of the defined formations. Remember the DFC requires no more than a certain level of water level decline (values in the table), from 2010 water levels, by 2080.
- 1-year water level change represents the change in water levels from the 2023 "aquifer year" to the 2024 "aquifer year".
- 5-year water level change represents the change in water levels from the 2019 "aquifer year" to the 2024 "aquifer year"
- Cumulative water level change (2010 to present) represents the change in water levels from the 2010 "aquifer year" to the 2024 "aquifer year".
- DFC vs. Cumulative change is simply a comparison of the cumulative water level change to the DFC

One of the key reasons the District monitors water levels is to track compliance with adopted desired future conditions (DFCs). The current DFCs are shown in Table 1 and describe water-level changes between 2010 and 2080. Since water level changes before water year 2010 do not apply to DFC compliance, they are removed from the analysis.

During collection of water levels, District staff note if the water level measurement was taken while the well is pumping or has recently been pumping. Water levels taken during pumping can be valuable for characterizing aquifer properties but are not appropriate for evaluating water level trends. These measurements are removed from this analysis, but they are maintained in the District's water level database.

Water levels in wells commonly fluctuate throughout a year, which can be due to changes in demands on the aquifer, changes in rainfall, or a combination of these and other factors. Typically, water levels are lower during summer months when demands are highest. The levels then recover between late fall and early spring when demands are lower. In order to ensure that water level measurements can be reasonably compared to each other, the data used in the analysis is limited to measurements taken between October and April. Each measurement is then assigned to a "water year" (WY). For example, water level measurements between October 2010 and April 2011 are assigned as WY 2010.

Although all wells in the District's monitoring program are measured multiple times per year, or continuously monitored with a transducer or other device, this analysis uses the shallowest measurement in each well in each water year (as defined above) to develop water level trends. This ensures that water levels compared across years are as analogous as possible.

The result of this process is a set of single water level measurements for each water year in each well. Where water level measurements are available for two consecutive water years, the water level change is calculated. For example, a calculated water level change for WY 2011 requires a water level measurement for the well in both WY 2010 and WY 2011.

District staff maintains aquifer assignments for each well in the monitoring program as well as whether the well represents outcrop/unconfined conditions or subcrop/confined conditions. Using these assignments, the average water level change associated with each DFC is calculated. Based on the current DFCs, the water level trends are divided by county, aquifer and outcrop/subcrop designation. One feature of this approach is that a different set of wells may be used to characterize water level changes for each year depending on availability of water level measurements. This allows for the District to make use of data from new wells added to the monitoring program or historical data for wells no longer monitored.

Currently, District staff continue to review all well registration applications to evaluate the potential for addition of that well to the monitoring well program. The District is incrementally expanding and improving the monitoring network to characterize groundwater conditions more effectively throughout the District. The District has also been actively working with landowners and developers in the District to acquire sites to drill monitoring well.

G.3:

In 2015, the District staff reviewed the best available information to develop estimated exempt groundwater use volumes by county. These estimates were presented to the District's Board of Directors in the 2015 Annual Report and were also provided to the Texas Water Development Board (TWDB). The TWDB then took those estimates and developed projections for exempt groundwater use for the years 2020, 2030, 2040, 2050, 2060 & 2070. In developing this data for the TWDB, District staff was asked to estimate exempt use for both the Trinity Aquifer group and the Paleozoic formations; only estimates for the Trinity Group were reported in the 2015 Annual Report.

For the 2024 exempt use estimates, staff took the TWDB estimate for 2015 and projection for 2020, and used a linear function to calculate estimated 2024 groundwater use by county. Also, it is noteworthy to mention that staff has included estimated exempt use from the Paleozoic formations in this report, as mentioned earlier only estimates from the Trinity Group were used in the 2015 report.

Non-exempt use was also estimated at the same time, this is largely based on metered volumes reported to the District by non-exempt well owners. Table 6 provides a best estimate of exempt and non-exempt groundwater use for the District in 2023 utilizing data from the following sources:

- The Region B, C, and G 2011, 2016, and 2021 Regional Water Plans;
- The report developed under contract to the TWDB titled "Total Projected Water Use in the Texas Mining and Oil and Gas Industry;
- Exempt pumping estimates from the TWDB

- Water Use Survey data from the TWDB
- Metered data reported to the District.

Table 2. Estimated Exempt and Non-exempt Groundwater Use for the District by County

Category	Groundwater Use (AFY)[1]				
	Hood	Montague	Parker	Wise	Total
Exempt Use	5,917	3,645	7,053	5,929	**22,545**
Non-Exempt Use	4,703	495	4,185	2,729	**12,111**
Total	**10,620**	**4,140**	**11,238**	**8,658**	**34,656**

(1) *AFY = acre-feet per year*

(2) Groundwater volumes reported elsewhere in the report are stated in gallons, any discrepancies are due to conversion and rounding.

Figure A. **All wells in the District with Water Level Data**

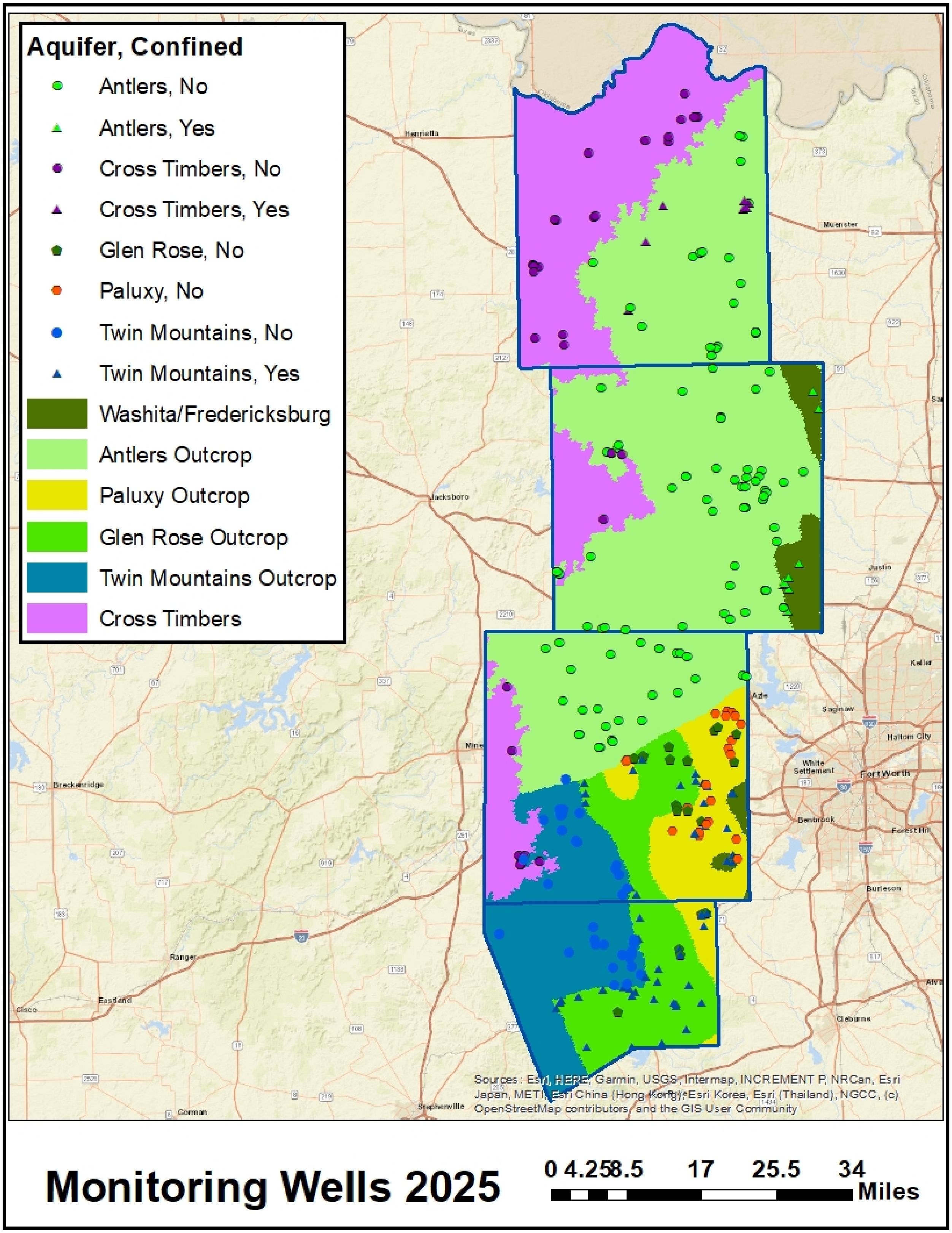
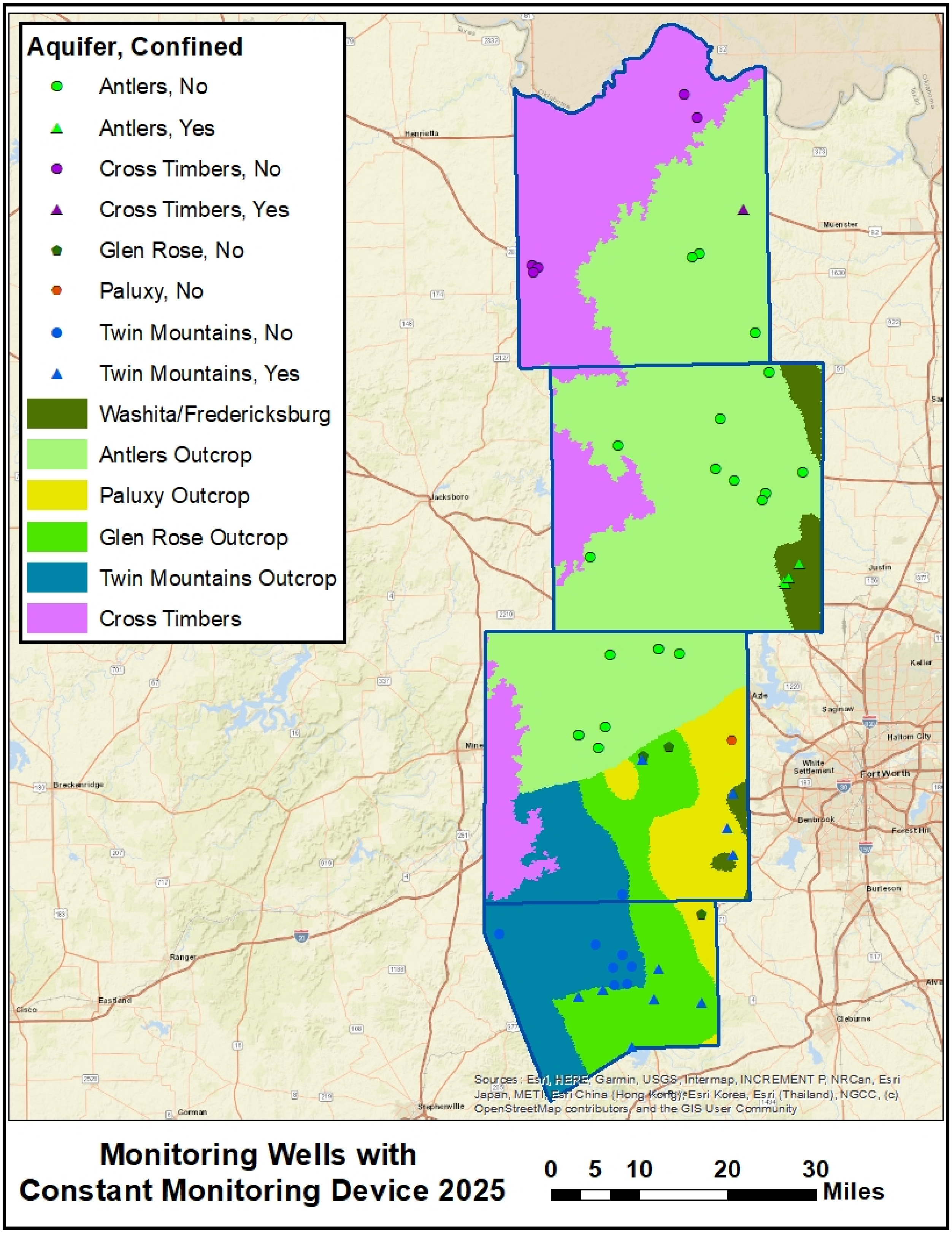


Figure B. Wells in the District's Monitoring Well Network Equipped with A Constant Monitoring Device



APPENDIX 1

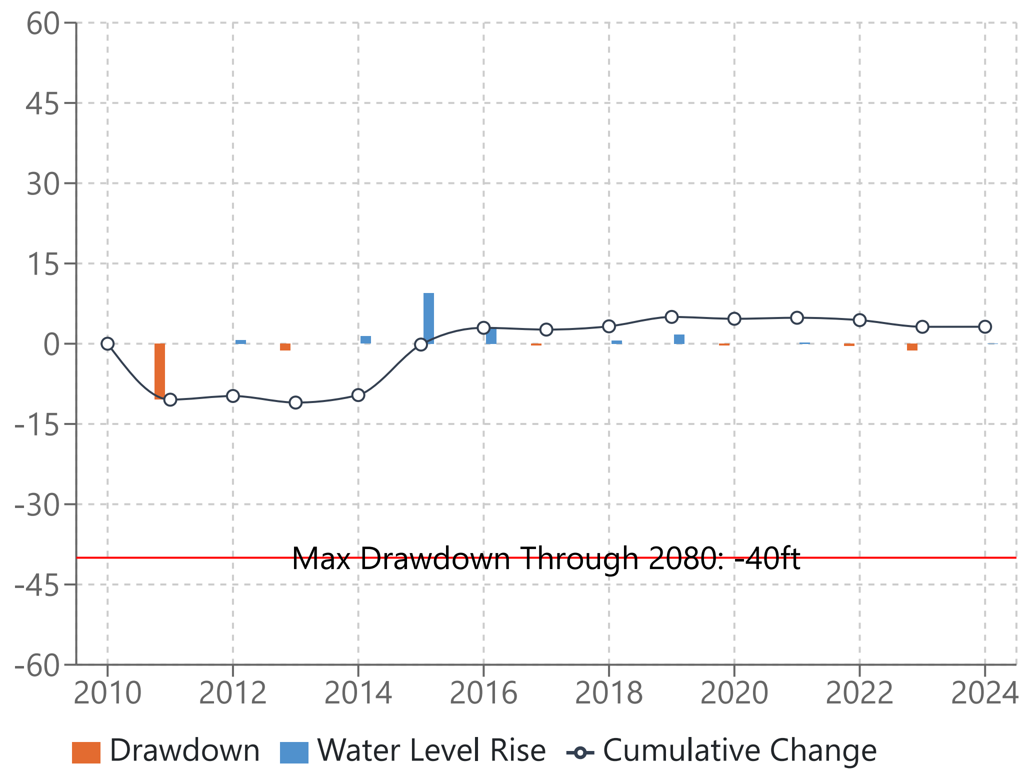
Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

		Outcrop					Subcrop				
	County	**Antlers**	**Paluxy**	**Glen Rose**	**Twin Mountains**	**Cross Timbers**	**Antlers**	**Paluxy**	**Glen Rose**	**Twin Mountains**	**Cross Timbers**
Desired Future Conditions	**Montague**	-40	-	-	-	-	-	-	-	-	-
	Wise	-60	-	-	-	-	-154	-	-	-	-
	Parker	-42	-6	-20	-7	-	-	-2	-50	-68	-
	Hood	-	-	-9	-13	-	-	-	-39	-72	-
1-Year Water Level Change	**Montague**	0.0	-	-	-	-3.0	-	-	-	-	8.0
	Wise	-0.9	-	-	-	1.1	-0.0	-	-	-	-
	Parker	-0.9	-0.9	-1.0	-0.5	0.9	-	-	-	-1.6	-
	Hood	-	-	1.2	1.7	-	-	-	-	-0.8	-
5-Year Water Level Change	**Montague**	-1.8	-	-	-	5.5	-	-	-	-	-10.9
	Wise	-4.4	-	-	-	-	-9.7	-	-	-	-
	Parker	-0.2	-7.1	-4.3	-1.7	-5.0	-	-	-	0.7	-
	Hood	-	-	4.5	3.8	-	-	-	-	2.0	-
Cumulative Water Level Change (2010 to Present)	**Montague**	3.2	-	-	-	13.2	-	-	-	-	-0.3
	Wise	-1.1	-	-	-	34.7	-3.0	-	-	-	-
	Parker	-5.8	-12.9	-3.4	-5.8	-1.0	-	-	-	-14.1	-
	Hood	-	-	9.4	3.6	-	-	-	-	7.2	-
DFCs vs Cumulative Change	**Montague**	43.2	-	-	-	-	-	-	-	-	-
	Wise	58.9	-	-	-	-	151.0	-	-	-	-
	Parker	36.2	-6.9	16.6	1.2	-	-	-	-	54.0	-
	Hood	-	-	18.4	16.6	-	-	-	-	79.2	-

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Montague County-Antlers-Outcrop

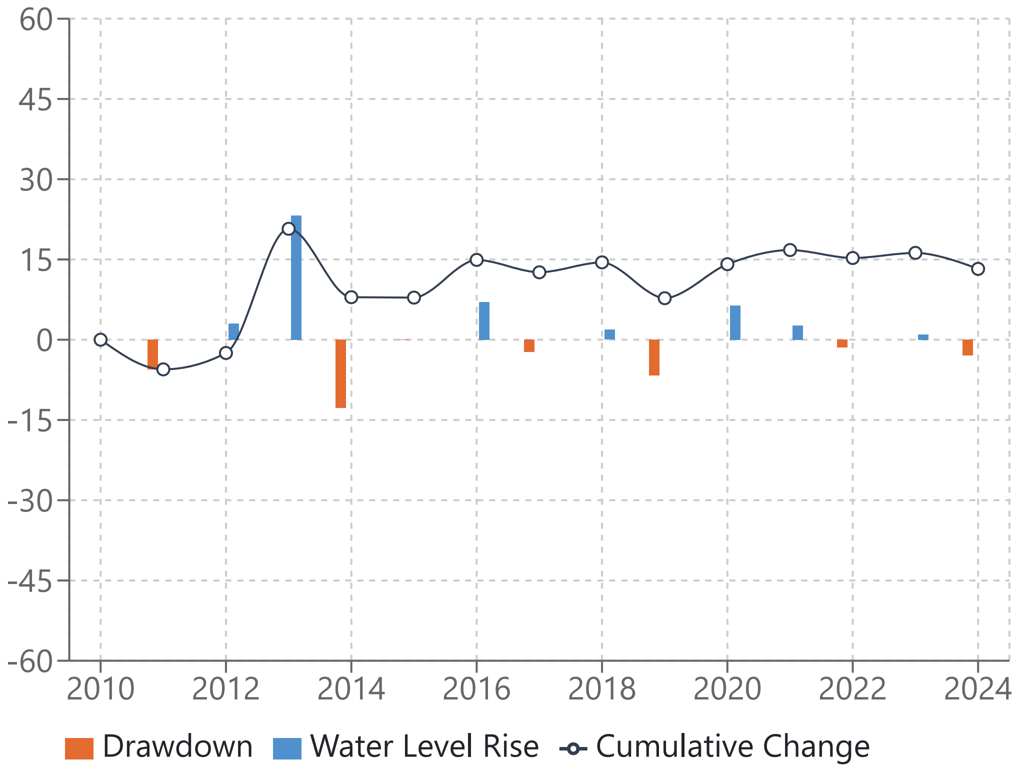


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-40	Not Applicable	Not Applicable
1-Year Water Level Change	0.0	21	9505, 8890, 4107, 632, 4402, 5121, 1497, 1495, 1410, 8882, 1500, 304, 2813, 2899, 2898, 2097, 2096, 196, 200, 2897, 4062
5-Year Water Level Change	-1.8	21	9505, 8890, 632, 1497, 1495, 1410, 8882, 1500, 304, 2813, 2899, 2898, 2097, 2096, 196, 200, 2897, 4062, 4107, 4402, 5121
Cumulative Water Level Change (2010 to Present)	3.2	21	1497, 1495, 1500, 304, 2097, 2096, 196, 200, 632, 8882, 8890, 1410, 2813, 2898, 2897, 4062, 4107, 9505, 4402, 2899, 5121
DFCs vs Cumulative Change	43.2	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

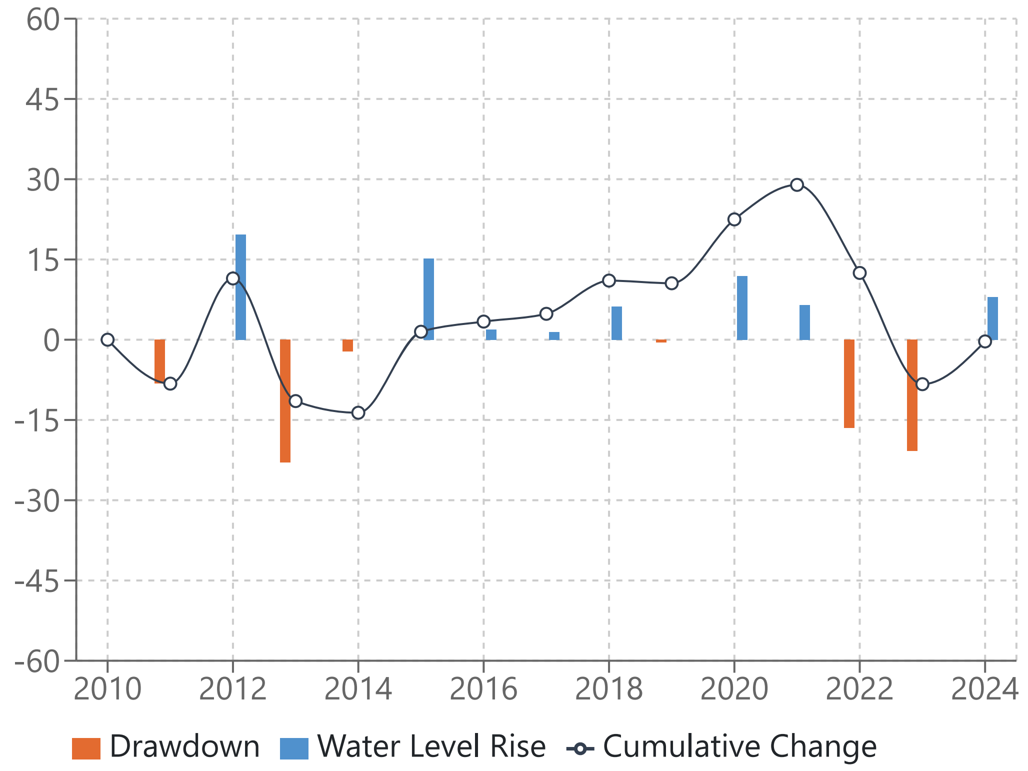
Montague County-Cross Timbers-Outcrop



	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions		Not Applicable	Not Applicable
1-Year Water Level Change	-3.0	20	13293, 8881, 1298, 2728, 592, 593, 1295, 1296, 2413, 1016, 1015, 6208, 6207, 8866, 2196, 6604, 2608, 6605, 5199, 14174
5-Year Water Level Change	5.5	21	8881, 1298, 2728, 592, 593, 1295, 1296, 2413, 1016, 1015, 6208, 8866, 2196, 6604, 2608, 6605, 5199, 6433, 13293, 14174, 6207
Cumulative Water Level Change (2010 to Present)	13.2	21	1298, 1295, 1296, 2413, 8866, 2608, 8881, 592, 2728, 6604, 6605, 5199, 6433, 593, 2196, 1016, 1015, 6208, 13293, 14174, 6207
DFCs vs Cumulative Change	Not Avaliable	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Montague County-Cross Timbers-Subcrop

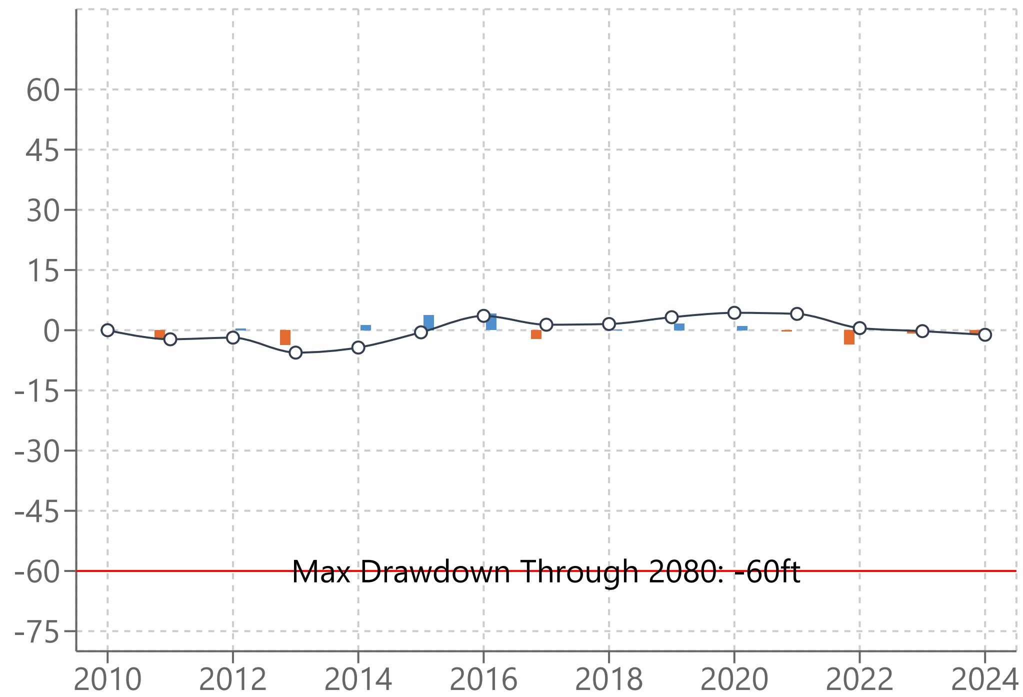


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions		Not Applicable	Not Applicable
1-Year Water Level Change	8.0	6	3970, 666, 637, 638, 636, 4401
5-Year Water Level Change	-10.9	8	3970, 666, 637, 638, 636, 633, 635, 4401
Cumulative Water Level Change (2010 to Present)	-0.3	9	637, 638, 634, 635, 636, 633, 3970, 666, 4401
DFCs vs Cumulative Change	Not Avaliable	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Wise County-Antlers-Outcrop

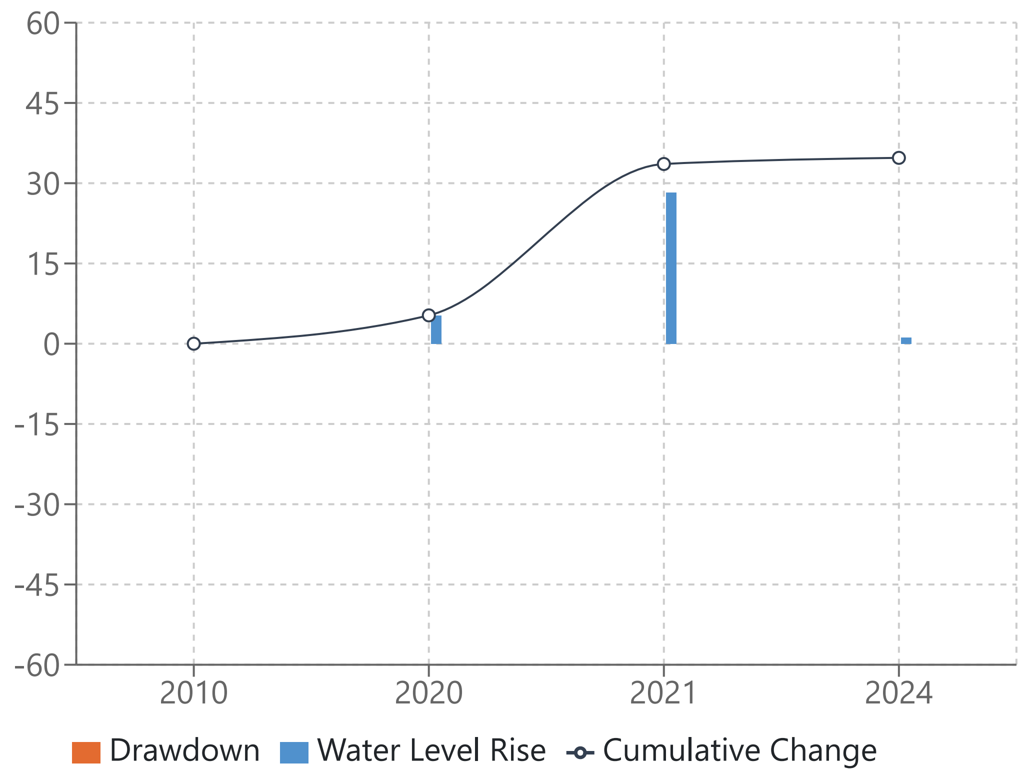


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-60	Not Applicable	Not Applicable
1-Year Water Level Change	-0.9	50	8883, 4344, 19732, 4404, 1830, 8863, 1075, 1076, 13061, 13062, 3308, 1106, 1114, 7010, 7011, 11238, 266, 1102, 10320, 1129, 1108, 1115, 3055, 3056, 1128, 10318, 10319, 10321, 10425, 1759, 15109, 19284, 10590, 1138, 14157, 11820, 13001, 13000, 8887, 9095, 13745, 14348, 14383, 3841, 1010, 11629, 1011, 18298, 18402, 21161
5-Year Water Level Change	-4.4	50	4344, 4404, 8863, 1076, 3308, 1106, 1114, 7010, 7011, 1102, 10320, 1108, 1115, 3055, 3056, 1128, 10318, 10425, 1759, 1138, 8887, 3841, 1010, 11629, 1075, 10319, 10321, 9095, 13745, 8883, 13061, 13062, 14157, 13001, 13000, 14348, 1830, 11238, 1011, 1129, 18298, 18402, 19732, 266, 15109, 19284, 10590, 11820, 14383, 21161
Cumulative Water Level Change (2010 to Present)	-1.1	50	8863, 1075, 1076, 8887, 1010, 1011, 8883, 4344, 4404, 3055, 3056, 1759, 7010, 7011, 3308, 1106, 1114, 1102, 1108, 1115, 1128, 1138, 3841, 10425, 10320, 10318, 11629, 10319, 10321, 9095, 13745, 13061, 13062, 14157, 13001, 13000, 14348, 1830, 11238, 1129, 18298, 18402, 19732, 266, 15109, 19284, 10590, 11820, 14383, 21161
DFCs vs Cumulative Change	58.9	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Wise County-Cross Timbers-Outcrop

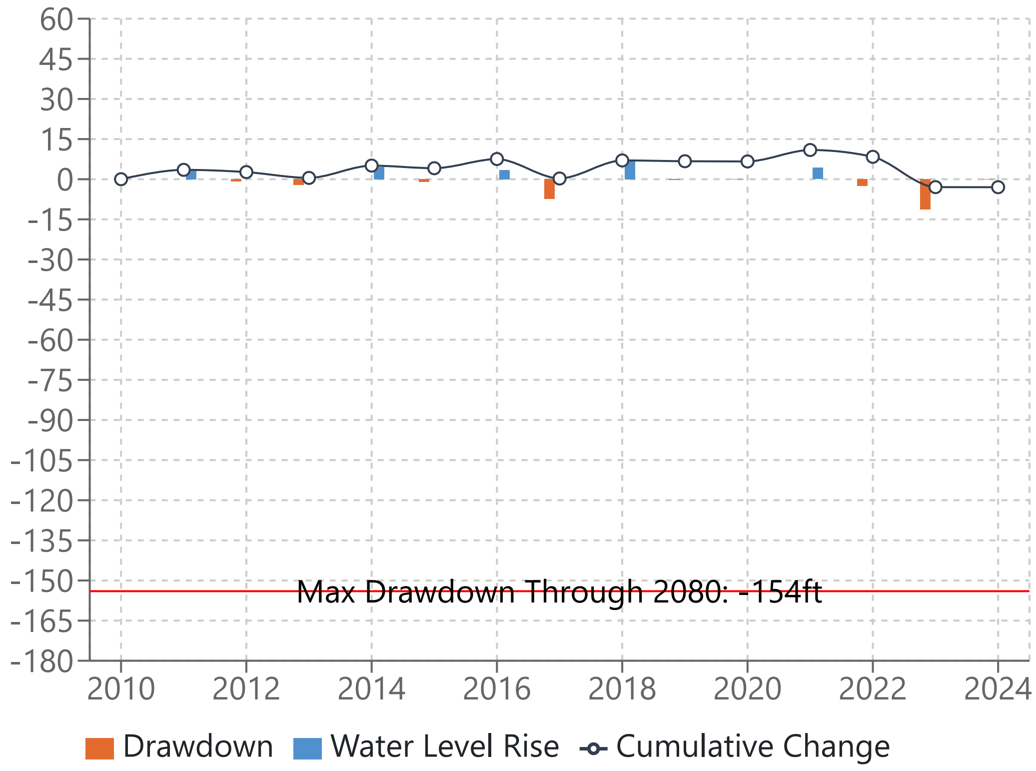


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions		Not Applicable	Not Applicable
1-Year Water Level Change	1.1	1	20335
5-Year Water Level Change		Not Avaliable	Not Avaliable
Cumulative Water Level Change (2010 to Present)	34.7	2	1325, 20335
DFCs vs Cumulative Change	Not Avaliable	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Wise County-Antlers-Subcrop

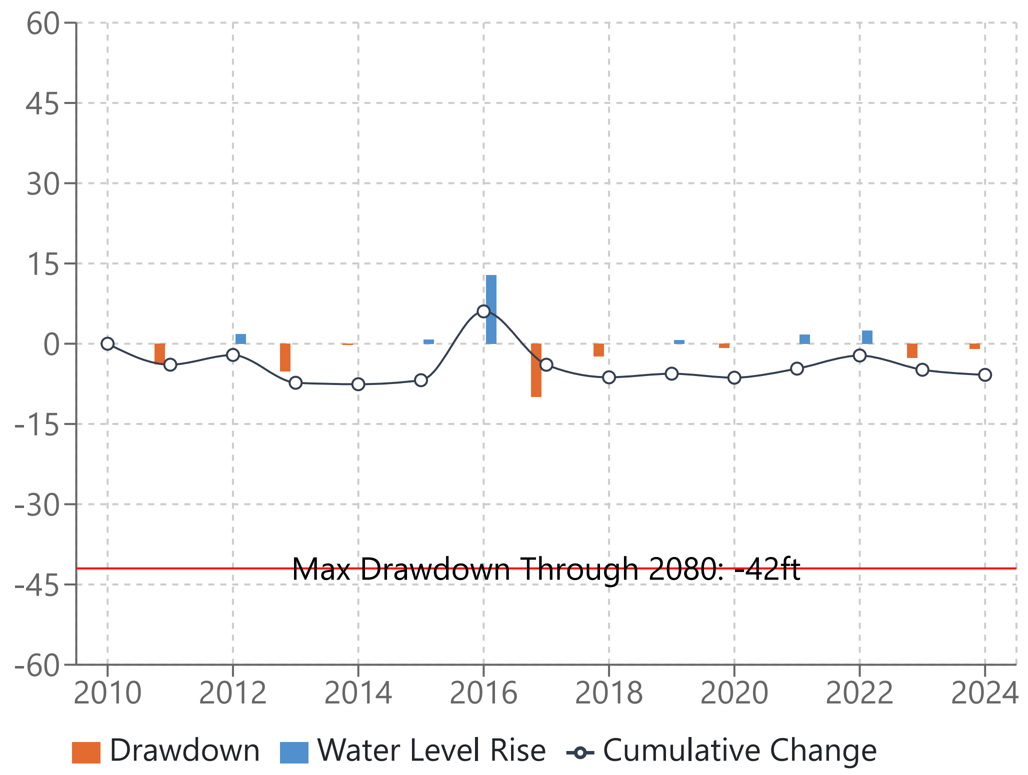


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-154	Not Applicable	Not Applicable
1-Year Water Level Change	-0.0	8	8884, 8888, 11290, 18374, 18552, 11164, 11110, 14118
5-Year Water Level Change	-9.7	8	8884, 8888, 11110, 11290, 11164, 14118, 18374, 18552
Cumulative Water Level Change (2010 to Present)	-3.0	8	8884, 8888, 11110, 11290, 11164, 14118, 18374, 18552
DFCs vs Cumulative Change	151.0	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Parker County-Antlers-Outcrop

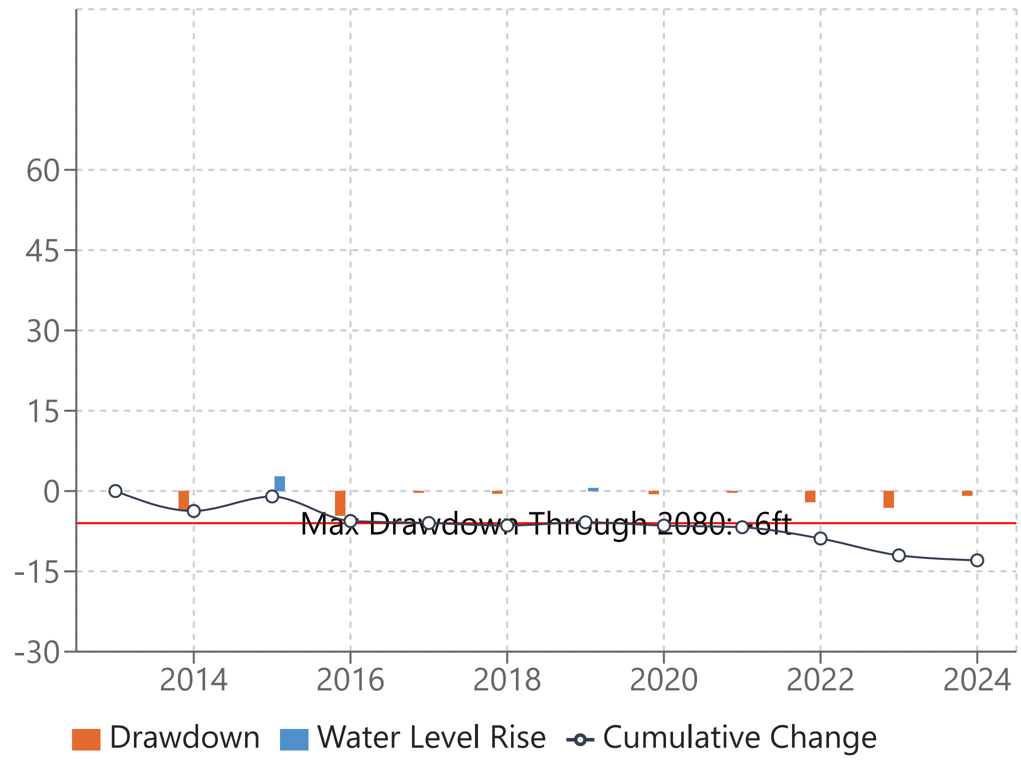


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-42	Not Applicable	Not Applicable
1-Year Water Level Change	-0.9	25	4473, 20638, 21046, 12929, 8872, 8864, 10884, 10885, 1809, 13095, 13216, 18805, 763, 630, 2200, 14134, 14135, 985, 996, 19130, 975, 565, 18961, 19883, 19884
5-Year Water Level Change	-0.2	25	8872, 8864, 10884, 10885, 1809, 630, 2200, 985, 975, 565, 12929, 14134, 14135, 996, 4473, 13216, 19130, 18961, 20638, 21046, 13095, 18805, 763, 19883, 19884
Cumulative Water Level Change (2010 to Present)	-5.8	25	8872, 8864, 985, 996, 975, 1809, 630, 2200, 10884, 10885, 565, 12929, 14134, 14135, 4473, 13216, 19130, 18961, 20638, 21046, 13095, 18805, 763, 19883, 19884
DFCs vs Cumulative Change	36.2	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

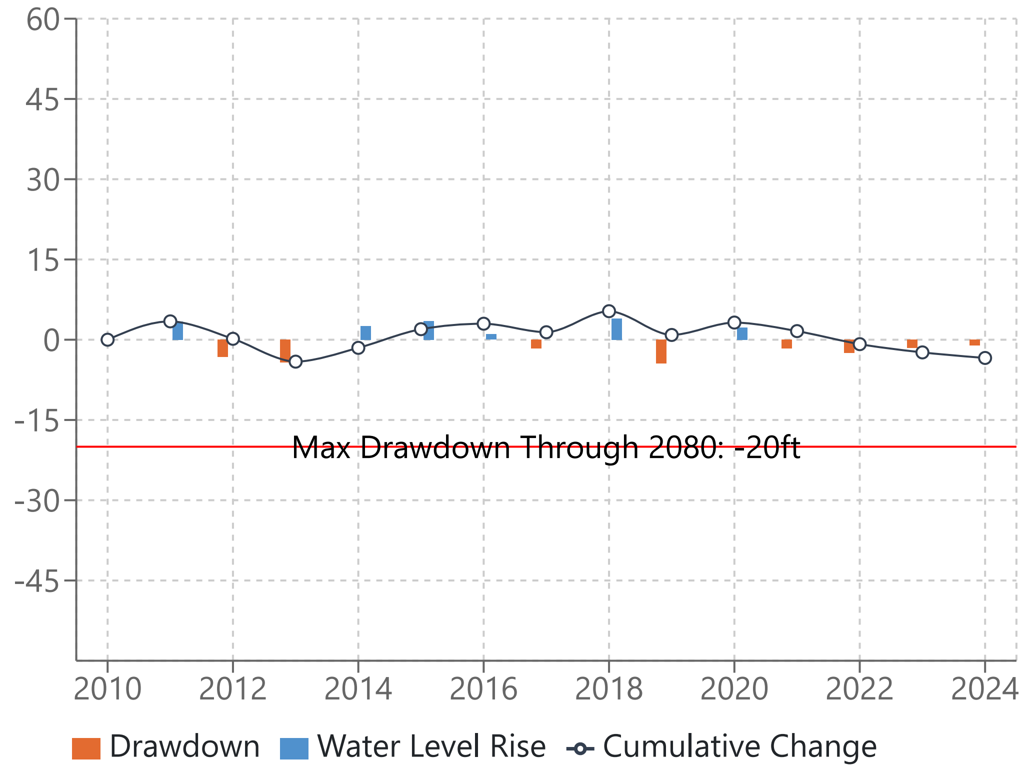
Parker County-Paluxy-Outcrop



	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-6	Not Applicable	Not Applicable
1-Year Water Level Change	-0.9	21	5212, 6638, 8718, 6178, 10740, 8568, 2596, 10145, 13584, 20194, 12075, 12144, 1653, 19239, 9699, 3261, 4993, 8459, 11483, 4365, 12994
5-Year Water Level Change	-7.1	21	5212, 6638, 8718, 6178, 10740, 8568, 2596, 12075, 12144, 1653, 4993, 11483, 4365, 8459, 12994, 10145, 13584, 19239, 9699, 3261, 20194
Cumulative Water Level Change (2010 to Present)	-12.9	21	4365, 5212, 6638, 1653, 6178, 4993, 8718, 8568, 2596, 10740, 12075, 12144, 11483, 8459, 12994, 10145, 13584, 19239, 9699, 3261, 20194
DFCs vs Cumulative Change	-6.9	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Parker County-Glen Rose-Outcrop

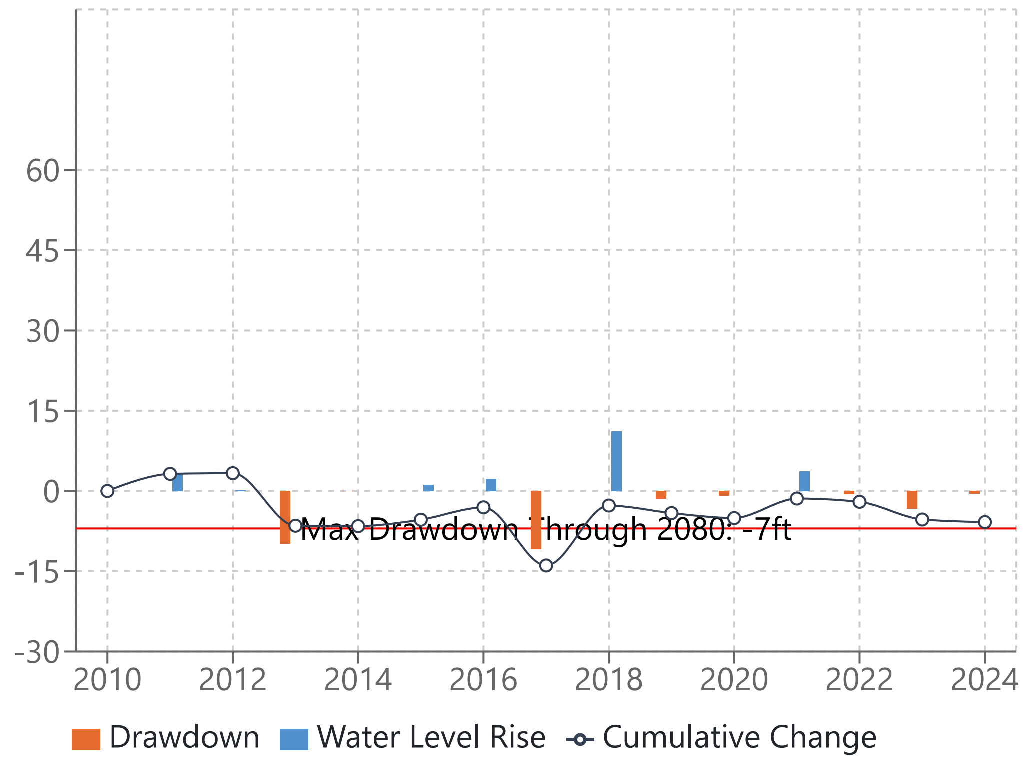


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-20	Not Applicable	Not Applicable
1-Year Water Level Change	-1.0	13	18523, 8291, 8873, 8874, 8875, 8876, 14973, 18403, 8878, 8889, 11881, 2826, 9106
5-Year Water Level Change	-4.3	14	8873, 995, 8874, 8875, 8876, 8878, 8889, 9106, 11881, 18523, 8291, 14973, 18403, 2826
Cumulative Water Level Change (2010 to Present)	-3.4	14	8873, 995, 8874, 8875, 8876, 8878, 8889, 9106, 11881, 18523, 8291, 14973, 18403, 2826
DFCs vs Cumulative Change	16.6	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Parker County-Twin Mountains-Outcrop

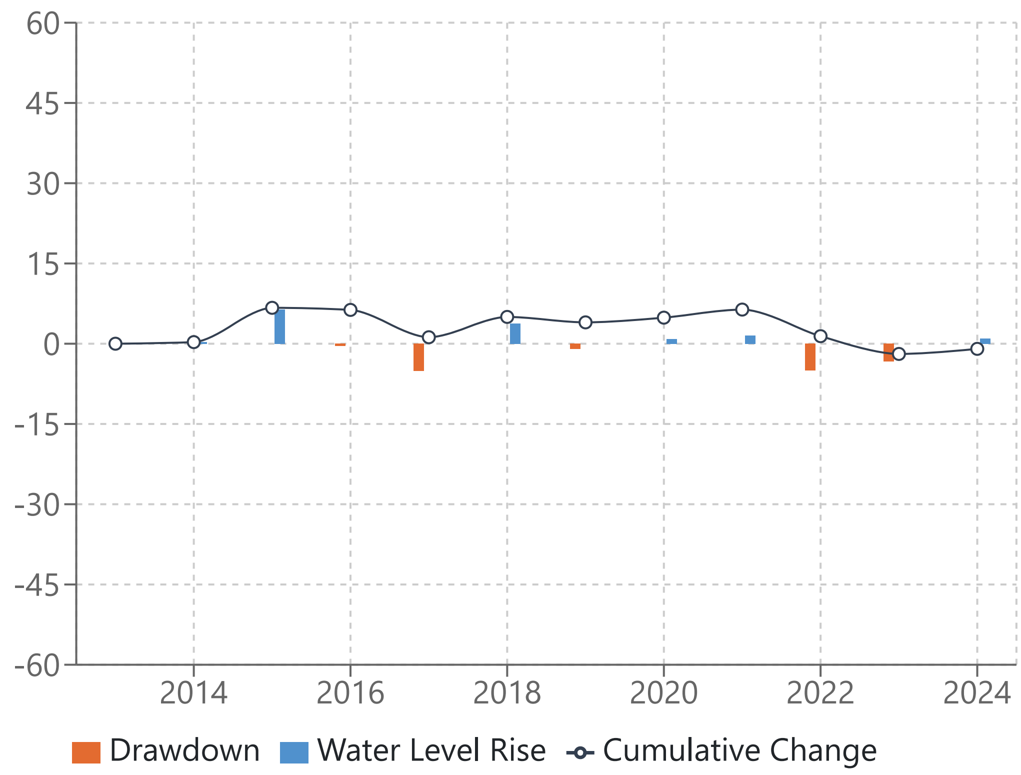


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-7	Not Applicable	Not Applicable
1-Year Water Level Change	-0.5	15	4911, 19131, 2484, 16161, 15588, 7800, 2376, 6851, 7408, 12609, 17061, 8880, 978, 13295, 13294
5-Year Water Level Change	-1.7	17	4911, 2484, 8880, 1774, 978, 13295, 13294, 979, 15588, 7800, 2376, 6851, 7408, 17061, 19131, 16161, 12609
Cumulative Water Level Change (2010 to Present)	-5.8	17	8880, 978, 979, 1774, 2484, 4911, 13295, 13294, 15588, 7800, 2376, 6851, 7408, 17061, 19131, 16161, 12609
DFCs vs Cumulative Change	1.2	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

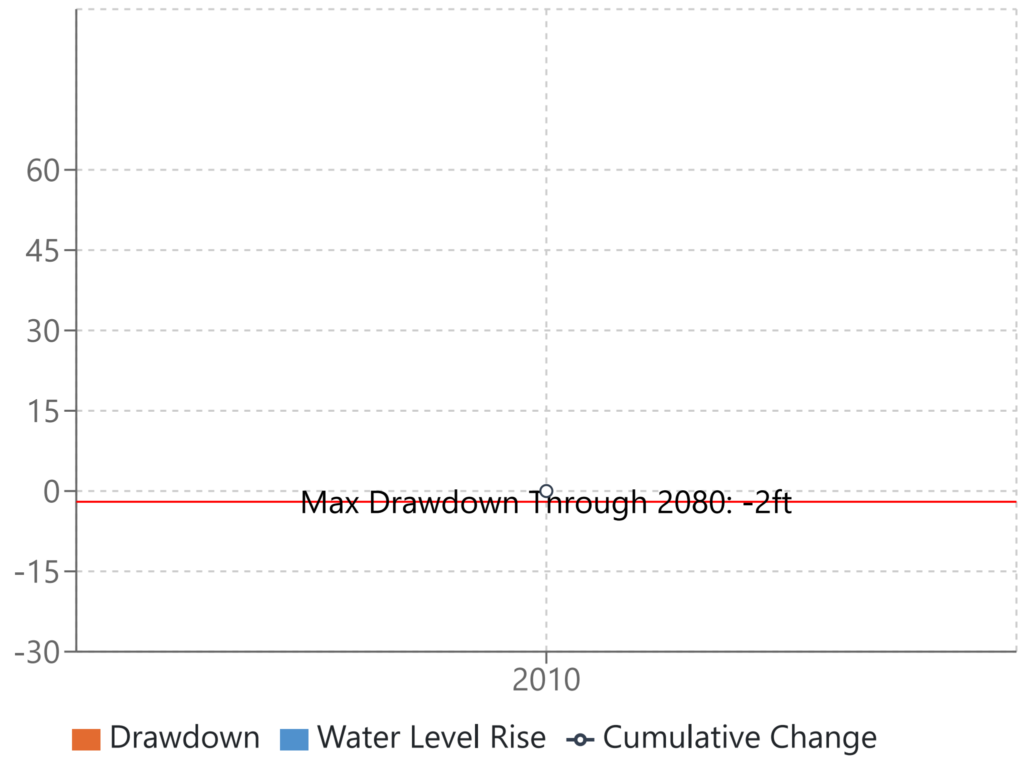
Parker County-Cross Timbers-Outcrop



	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions		Not Applicable	Not Applicable
1-Year Water Level Change	0.9	10	12621, 4416, 12682, 517, 14615, 15284, 15283, 15285, 16153, 15282
5-Year Water Level Change	-5.0	10	4416, 12621, 12682, 517, 14615, 15283, 15285, 16153, 15282, 15284
Cumulative Water Level Change (2010 to Present)	-1.0	10	4416, 12621, 12682, 517, 14615, 15283, 15285, 16153, 15282, 15284
DFCs vs Cumulative Change	Not Avaliable	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Parker County-Paluxy-Subcrop

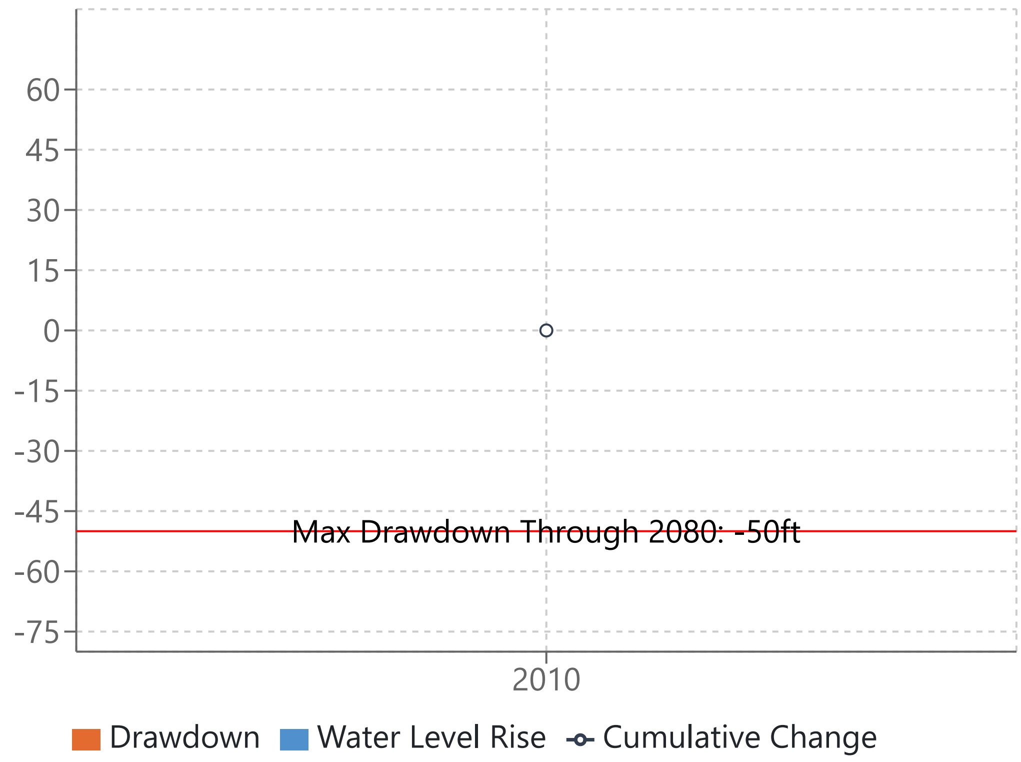


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-2	Not Applicable	Not Applicable
1-Year Water Level Change		Not Avaliable	Not Avaliable
5-Year Water Level Change		Not Avaliable	Not Avaliable
Cumulative Water Level Change (2010 to Present)		Not Avaliable	Not Avaliable
DFCs vs Cumulative Change	NaN	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Parker County-Glen Rose-Subcrop

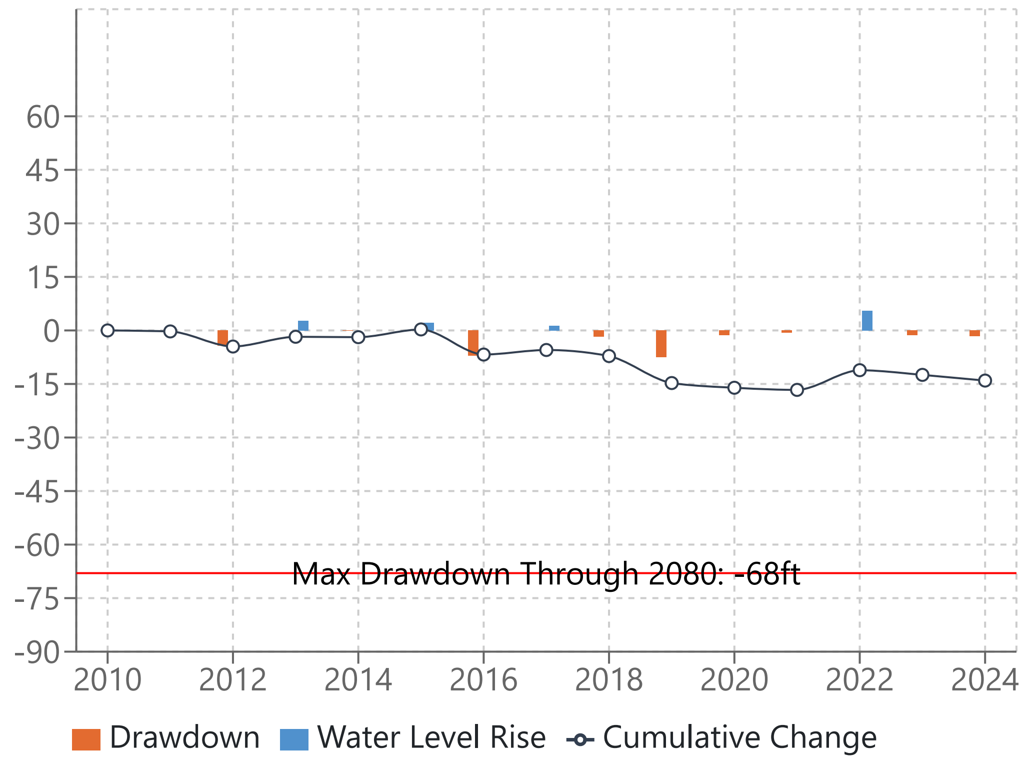


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-50	Not Applicable	Not Applicable
1-Year Water Level Change		Not Avaliable	Not Avaliable
5-Year Water Level Change		Not Avaliable	Not Avaliable
Cumulative Water Level Change (2010 to Present)		Not Avaliable	Not Avaliable
DFCs vs Cumulative Change	NaN	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Parker County-Twin Mountains-Subcrop

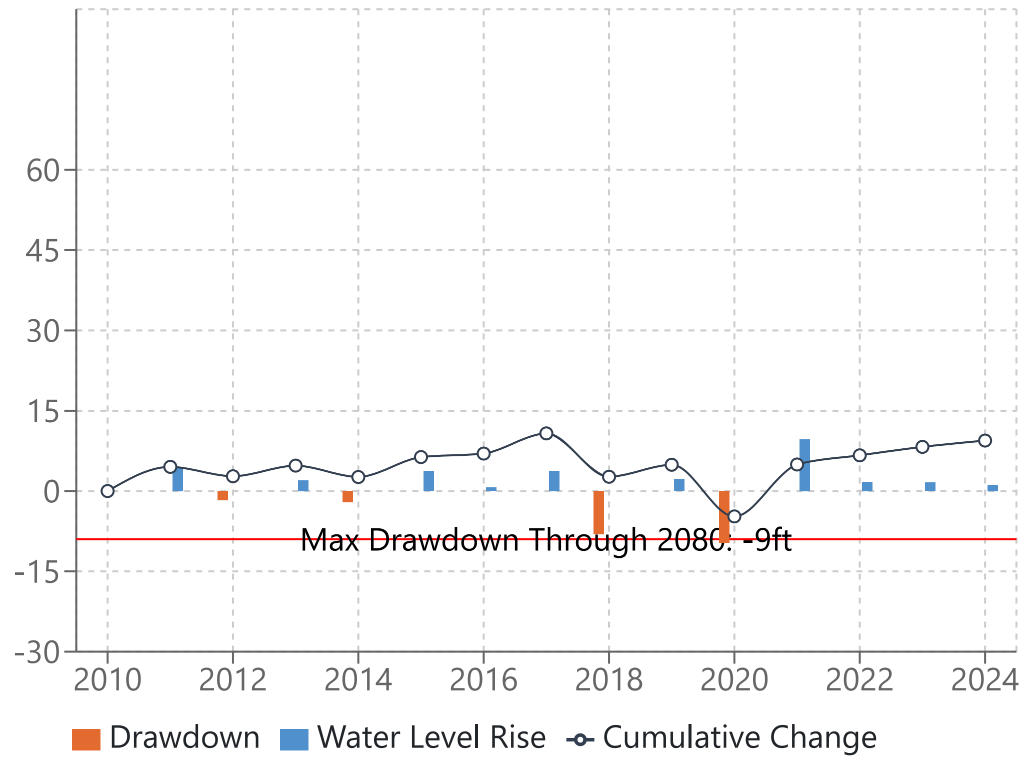


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-68	Not Applicable	Not Applicable
1-Year Water Level Change	-1.6	15	6534, 18524, 11387, 11386, 19132, 6073, 8879, 4142, 11986, 17031, 17032, 10350, 12241, 11323, 17658
5-Year Water Level Change	0.7	17	6534, 4142, 4144, 10350, 12241, 11323, 11386, 11387, 8879, 11986, 12111, 18524, 19132, 17031, 17032, 17658, 6073
Cumulative Water Level Change (2010 to Present)	-14.1	17	6534, 8879, 4142, 4144, 10350, 12241, 11323, 11386, 11387, 11986, 12111, 18524, 19132, 17031, 17032, 17658, 6073
DFCs vs Cumulative Change	53.9	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Hood County-Glen Rose-Outcrop

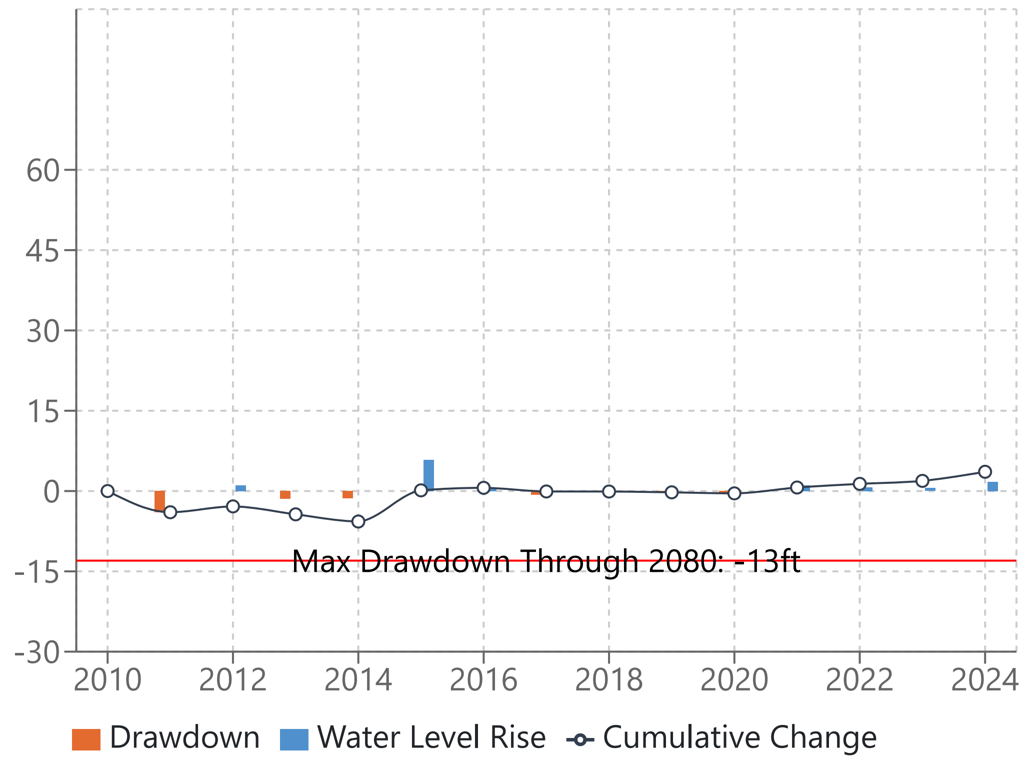


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-9	Not Applicable	Not Applicable
1-Year Water Level Change	1.2	4	311, 310, 8870, 10
5-Year Water Level Change	4.5	6	311, 310, 312, 10, 3, 8870
Cumulative Water Level Change (2010 to Present)	9.4	6	311, 312, 8870, 10, 310, 3
DFCs vs Cumulative Change	18.4	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Hood County-Twin Mountains-Outcrop

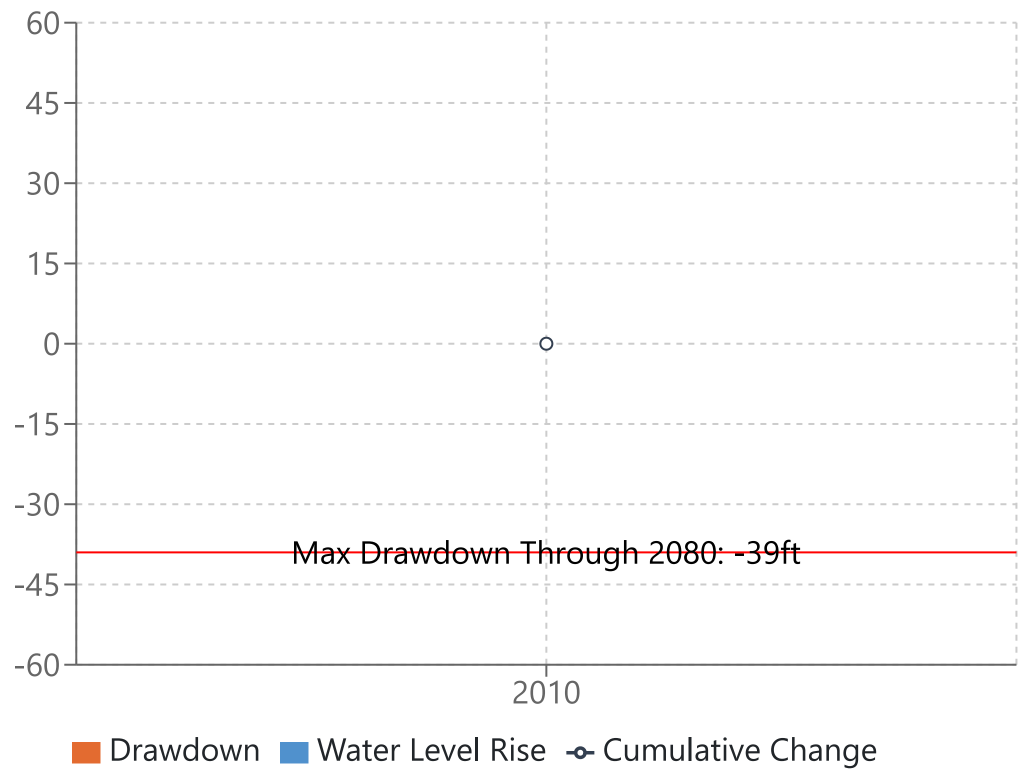


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-13	Not Applicable	Not Applicable
1-Year Water Level Change	1.7	14	8868, 1009, 18404, 8867, 710, 1085, 705, 701, 711, 8869, 2181, 990, 534, 319
5-Year Water Level Change	3.8	15	8868, 1009, 8869, 2181, 990, 8867, 711, 981, 710, 1085, 705, 701, 18404, 534, 319
Cumulative Water Level Change (2010 to Present)	3.6	15	8868, 1009, 8869, 981, 990, 2181, 8867, 711, 710, 1085, 705, 701, 18404, 534, 319
DFCs vs Cumulative Change	16.6	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Hood County-Glen Rose-Subcrop

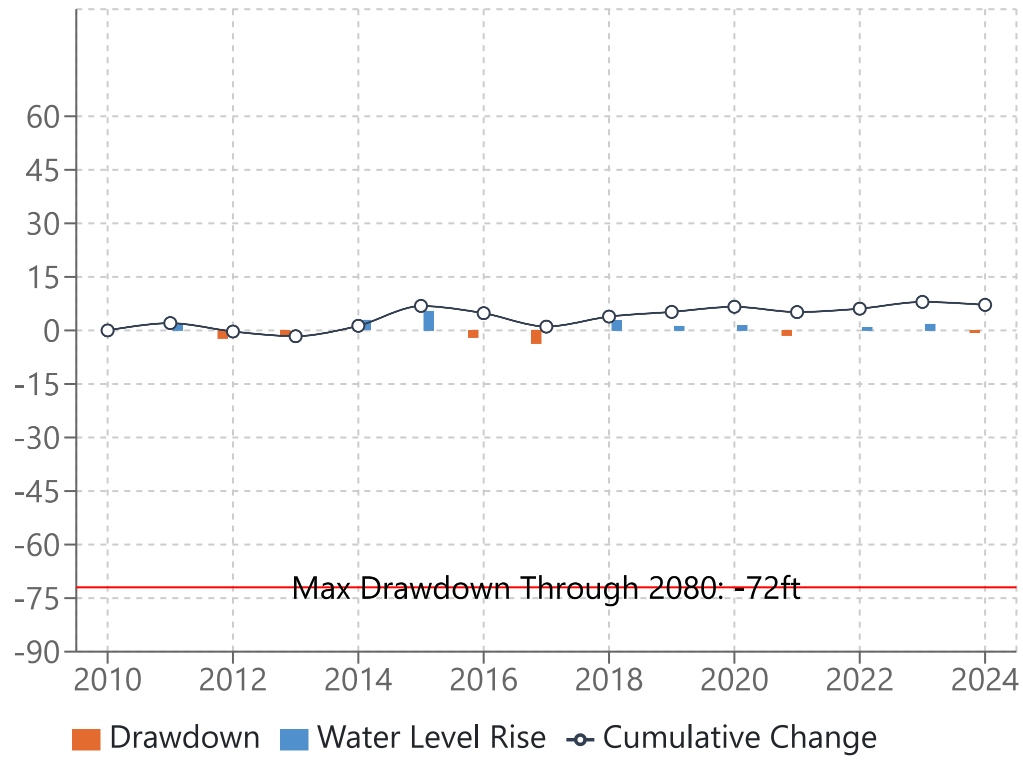


	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-39	Not Applicable	Not Applicable
1-Year Water Level Change		Not Avaliable	Not Avaliable
5-Year Water Level Change		Not Avaliable	Not Avaliable
Cumulative Water Level Change (2010 to Present)		Not Avaliable	Not Avaliable
DFCs vs Cumulative Change	NaN	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

Summary of Desired Future Conditions and Water Level Trends
Upper Trinity Groundwater Conservation District
May 19, 2025

Hood County-Twin Mountains-Subcrop



	Water Level Change (feet)	Number of Wells Used	IDs for Wells Used
Desired Future Conditions	-72	Not Applicable	Not Applicable
1-Year Water Level Change	-0.8	22	581, 322, 325, 243, 239, 244, 1002, 738, 984, 1006, 318, 8865, 11534, 7100, 13784, 824, 825, 9438, 8871, 17, 2341, 8891
5-Year Water Level Change	2.0	26	581, 325, 243, 239, 1002, 984, 1006, 8865, 7100, 4, 11, 9438, 17, 2341, 8891, 738, 999, 324, 11534, 8871, 322, 13784, 244, 318, 824, 825
Cumulative Water Level Change (2010 to Present)	7.2	28	324, 325, 240, 243, 239, 1002, 8865, 4, 11, 9438, 8871, 17, 322, 999, 1001, 581, 984, 2341, 1006, 8891, 7100, 738, 11534, 13784, 244, 318, 824, 825
DFCs vs Cumulative Change	79.2	Not Applicable	Not Applicable

Note: All Values are in feet of water level change. Positive values indicate a water level rise. Negative values indicate a water level decline.

APPENDIX 2

Upper Trinity Groundwater Conservation District
Water Level Monitoring Program

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1.0 Introduction

The District is undertaking the establishment of a monitor well network at key locations throughout the four counties to monitor water levels and aquifer conditions over time. The collection of District-scale hydrogeologic data such as water levels is key to the District's Mission and all resulting policies, management objectives and rules. Information from the well network will be assimilated along with groundwater production and use reports and estimates, well location and completion data, information on aquifer recharge rates and other hydrogeologic properties, and other information in a database that the District is continuing to develop to better understand and manage the groundwater resources of the area. Information gleaned from these efforts will be used by the District in the future establishment of desired future conditions (DFC) for the aquifers, in the monitoring of actual conditions of the aquifers, in the improvement of a future groundwater availability model (GAM), in making planning decisions, and in the development of permanent District rules that may include a permitting system for water wells.

The Upper Trinity Groundwater Conservation District (UTGCD) has completed Phase I of their Monitor Well Program. There are currently 108 wells identified by the UTGCD as monitor wells and the monitor well database contains a total of 146 wells. The District started quarterly monitoring of the Phase I monitoring network in the fourth quarter of 2010. **Figure 1** plots the wells in the UTGCD monitor well database along with the surface geology in the District. From a review of Figure 1 it can be seen that the distribution of wells both areally and by aquifer is not uniform across the District.

Building on the success of the Phase I monitor well network, the District recognized that the Phase I monitoring network and data collected to date must be evaluated in context to a monitoring strategy based upon meeting the management goals of the District. To this end, the District developed a set of goals for the Phase II monitoring plan which are listed below:

1. Analysis of all data collected to date including water levels and locations of the wells;
2. Expansion of the current monitoring program to collect data in locations not adequately represented in Phase I;
3. Determine appropriate layers of the District's aquifers that need study (including the Paleozoic);
4. Provide a model for the District's Board and staff to expand its monitoring program.

Based upon the stated objectives, INTERA developed a work scope for the performance of Phase II which is based upon a task structure comprised of five tasks. The five tasks are listed below:

- Task 1 – Development of a Hydrogeologic Framework for Management
- Task 2 – Development of a Monitoring Strategy
- Task 3 –Analysis of Phase I Monitor Wells and Collected Data
- Task 4 – Recommendations for Phase II Monitor Wells
- Task 5 – Phase II Monitor Well Survey and Initial Sampling

The task structure follows a sequential process by which the background data and the monitoring strategy (Tasks 1 and 2) are developed first. These are followed by Task 3 which is an assessment of the Phase I wells based upon the monitoring strategy laid out in Task 2. Based upon that analysis, the Phase I monitor well network will be augmented through the search for new monitor wells and potentially through the deletion of some Phase I wells considered of limited value. Finally, in Task 5 the new wells are brought into the network through a site visit, initial measurement and documentation.

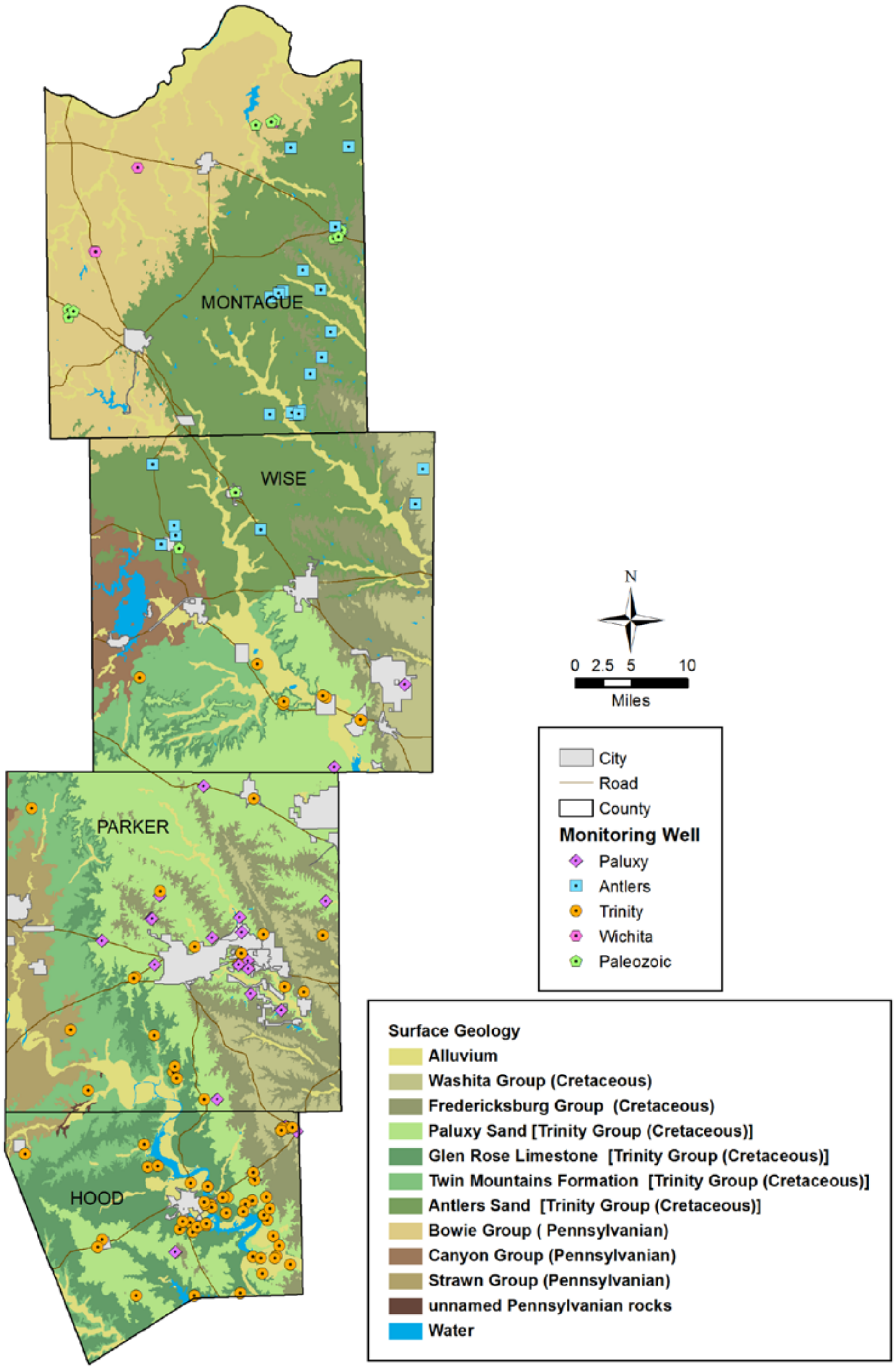


Figure 1. UTGCD Phase I Monitor Wells by Stratum and District Surface Geology.

This report is organized by chapters documenting each of the five tasks described above. This draft version of the report only documents efforts completed for Tasks 1 and 2. This document serves as the Task 1 and 2 milestone submittal. It has been delivered as an electronic file (pdf) and as a hard copy to promote comments from the Board and staff that can be used in the implementation of the remaining tasks.

2.0 Development of a Hydrogeologic Framework for Management

The objective of Task 1 is to develop an initial hydrogeologic framework for aquifer management within the District. Because the Paleozoics aquifer systems (Wichita, Bowie, Cisco and Canyon and Strawn Groups) are important in the District, this framework will include these aquifers as well as the Northern Trinity aquifer and associated formations as defined by the Texas Geologic Atlas Sherman and Dallas Sheets (McGowen et al., 1967; Barnes, 1972). The deliverable is a set of geologic cross-sections across the District. The geologic interpretations presented in this section are the product of Allan Standen (PG # 1227) in cooperation with INTERA personnel.

2.1 Overview of District Hydrogeology

Groundwater resources in the four counties making up the District include the Cretaceous-age Trinity Aquifer, several water-bearing units of Pennsylvanian- and Permian-age, referred to as the Paleozoic aquifers, and alluvial deposits (Figure 1). The Trinity Aquifer is recognized by the TWDB as a major aquifer in Texas. The Paleozoic aquifers are not recognized by the TWDB as either major or minor aquifers. No minor aquifers, as defined by the TWDB, are located in the District. The TWDB defines a major aquifer as one that supplies large quantities of water over large areas of the state and defines a minor aquifer as one that supplies relatively small quantities of water over large areas of the state or supplies large quantities of water over small areas of the state (Ashworth and Hopkins, 1995). A generalized stratigraphic section representative of the hydrogeology of the District is provided in **Table 1**. To properly design a monitoring network, one of the key components is an understanding of the hydrostratigraphic units which comprise the resource. This, in addition to an understanding of the groundwater use patterns by hydrostratigraphic unit (sub-aquifer), provides the data needed to make sure monitoring is occurring in the correct horizons. At this point, only the Trinity Aquifer has been considered in GMA-8 joint planning. However, the Paleozoic aquifer system which has not been included in the past must be for the next round of planning.

2.1.1 Geologic Setting

The oldest geologic units comprising aquifers in the District are the Paleozoic aquifers which are composed fluvial-deltaic and fluvial deposits originating from the Ouachita and Arbuckle mountains to the north and east of the District. These deposits were influenced by deep-seated structural features which influenced deposition through Cretaceous time. **Figure 2** shows the principal pre-Pennsylvanian structural features in the District and areas to the west. Important features for District aquifers are the Muenster Arch in Montague County which is an area of faulting and uplift and the Mineral Wells Fault Zone which is in south Wise County. These features have been shown to impact deposition through the Pennsylvanian and Permian and possibly into the Cretaceous (Trinity Aquifer).

The Paleozoic aquifers within the District were deposited on the eastern shelf of the Permian Basin. The Paleozoic aquifers are composed of a sequence of fluvial-deltaic deposits. The Paleozoic aquifers in the District are comprised from oldest to youngest of the Strawn, Canyon, Cisco, Bowie and Wichita Groups. The age of the Paleozoic aquifers at surface tends to get older as one moves north through the District to the south. The Strawn Group is primarily a fluvial-deltaic system comprised of several sandstone units inter-layered with shales.

Table 1. General Stratigraphy (Bené and others 2004; McGowen and others, 1967; 1972; Brown and others, 1972).

System	Hydrogeologic Characteristic	Group	Formation	
			North	South
	Water-Bearing		alluvial deposits	
Cretaceous	Confining Units (locally productive)	Washita	Weno Denton Fort Worth Duck Creek Kiamichi	
	Confining Units (locally productive)	Fredericksburg	Goodland	Edwards
				Comanche Peak
			Walnut Clay	Walnut Clay
	Aquifer	Trinity	Antlers	Paluxy
				Glen Rose
				Twin Mountains
Permian	Water-Bearing	Wichita	Nocona	
		Bowie	Archer City Markley	
Pennsylvanian		Cisco	Thrifty and Graham, undivided	
	Water-Bearing	Canyon	Colony Creek Shale	
			Ranger	
			Ventioner	
			Jasper Creek	
			Chico Ridge Limestone	
			Willow Point	
	Water-Bearing	Strawn	Mineral Wells	
			Brazos River	
			Mingus	
			Buck Creek Sandstone	
			Grindstone Creek	
			Lazy Bend	

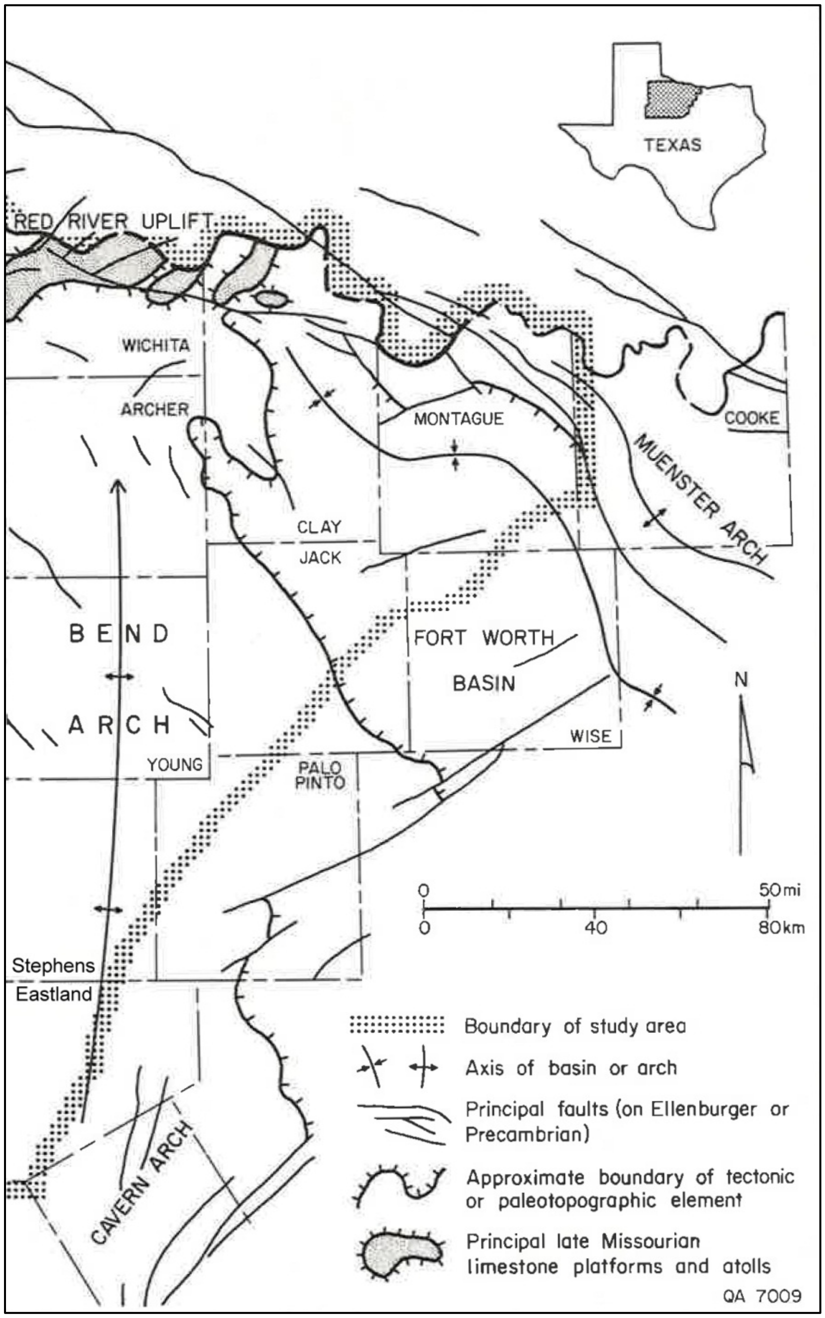


Figure 2. Principal Pre-Pennsylvanian structural features (after Brown et al. 1990)

The Canyon Group is a fluvial-deltaic system composed of sandstones and shales but which also has limestones reflecting a lower energy depositional environment. The Cisco Group is composed of fluvial-deltaic and marine deposits. The Cisco has many sandstone units that are poorly mapped because they are intermittent but has extensive limestone units (Brown et al., 1990). The Bowie Group represents a continental depositional facies and is typically composed of more coarse grained sediments than the underlying Cisco. The Wichita Group (Nocona Formation) is also a continental deposit and is composed of highly heterogeneous deposits of sand, gravel and shale. The Cretaceous Trinity Group unconformably overlies the Paleozoic aquifers system in the District, meaning that a period of erosion occurred after deposition of the Paleozoic aquifers and before the deposition of the Trinity aquifer. The Paleozoic aquifers generally dip in a westerly direction while the Cretaceous Trinity Group dips to the east-southeast. The Trinity Group was deposited from a sediment source feeding from the west and north into the East Texas Basin. Each of these aquifers will be discussed below.

2.1.1 Trinity Aquifer

The Trinity Aquifer, shown in Figure 1, is defined by the TWDB as a major aquifer composed of several individual aquifers contained within the Trinity Group. In the District, the Trinity Aquifer consists of the aquifers of the Paluxy Sand, the Glen Rose Formation, the Twin Mountains Formation, and the Antlers Formation. The Antlers Formation is the coalescence of the Paluxy and Twin Mountains formations north of the line where the Glen Rose Formation thins to extinction. This occurs approximately in central Wise County (Figure 1). The Cretaceous-age Fredericksburg and Washita Groups are generally considered confining units and they overlie the downdip portion of the Trinity Aquifer in the easternmost areas of the District.

The Paluxy Sand consists of sand, silt, and clay, with sand dominating. The sand and silts in the aquifer are primarily fine-grained, well sorted, and poorly cemented (Bené and others, 2004). Coarse-grained sand is found in the lower sections grading up to fine-grained sand with shale and clay in the upper section (Nordstrom, 1982). In general, natural groundwater flow in the Paluxy Sand is east to southeast (Langley, 1999). Wells completed into the Paluxy Sand typically yield small to moderate quantities of water that is fresh to slightly saline (Nordstrom, 1982). Where the Glen Rose Formation is absent, the Paluxy Sand is equivalent to the upper sands of the Antlers Formation (Baker and others, 1990).

The Glen Rose Formation consists primarily of limestone with some shale, sandy-shale, and anhydrite. In general, the aquifer yields small quantities of water in localized areas (Baker and others, 1990). Groundwater flow in the Glen Rose Formation is generally to the east and southeast.

The Twin Mountains Formation consists predominantly of medium- to coarse-grained sand, silty clay, and conglomerates. A massive sand is found in the lower portion of the formation while less sand is found in the upper portion of the aquifer due to increased interbedding of shale and clay (Nordstrom, 1982). In general, wells are primarily completed into the lower part of the aquifer. Where the Glen Rose Formation is absent, the Twin Mountains Formation is equivalent to the lower sands of the Antlers Formation (Baker and others, 1990). Typically, wells completed into the Twin Mountains Formation yield fresh and slightly saline water in moderate to large quantities (Nordstrom, 1982). Groundwater flow in this formation is generally to the east and southeast.

Typically, the Antlers Formation consists of a basal conglomerate and sand overlain by poorly consolidated sand interbedded with discontinuous clay layers (Nordstrom, 1982). Considerably more clay is found in the middle portion of the formation than in the upper and lower portions. Limestone is also found in the middle portion near the updip limit of the Glen Rose Formation. Generally, groundwater flow in the Antlers Formation is to the east and southeast. Well yield in the Antlers Formation is similar to that in the Twin Mountains Formation with downdip wells generally more productive than those in the outcrop areas.

2.1.2 Paleozoic Aquifers

Several Pennsylvanian- and Permian-age formations in the District are capable of producing usable quantities of groundwater. These formations are referred to collectively as the Paleozoic aquifers (see Figure 1). Literature regarding these formations is very limited and, therefore, information regarding their hydrologic characteristics is also limited. The Paleozoic aquifers are a significant source of groundwater in northern and western portions of Montague County, west-central Wise County, and western Parker County where the Trinity Aquifer is absent. Based on information in the TWDB groundwater database as of November 2009, the percentage of wells in the District completed into the Paleozoic aquifers is 78.2, 14.8, 5.4, and 0.0 percent for Montague, Wise, Parker, and Hood counties, respectively.

From youngest to oldest, the formations of the Wichita, Bowie, Cisco, Canyon, and Strawn groups make up the Paleozoic aquifers. The Wichita Group consists of the Nocona Formation (mudstone with sandstone and siltstone in thin lenticular beds throughout). The Bowie Group is composed of the Archer City Formation (predominantly mudstone with thin siltstone beds and sandstone) and the Markley Formation (mudstone with local thin beds of sandstone in upper portion and mudstone and shale with some coal and limestone below). The Cisco is comprised of the undivided Thrifty and Graham formations (predominantly mudstone and shale with thin sandstone beds and some sandstone sheets locally and two limestone members).

The underlying Canyon Group is comprised of the Colony Creek Shale (shale with some siltstone, local thin to medium beds of sandstone, and limestone lentils), the Ranger Limestone (predominantly limestone with local thin shale beds), the Ventioner Formation (shale and mudstone with numerous sandy and silty lenses and thin to medium beds), the Jasper Creek Formation (upper portion predominantly shale with thin siltstone beds throughout and isolated massive sandstone lenses and lower portion shale with thin limestone lentils and local thin and lenticular thick sandstone beds), the Chico Ridge Limestone (predominantly limestone with local shale beds), the Willow Point Formation (shale and claystone locally silty and sandy with local thin beds of sandstone and several limestone beds in lower portion and a single coal bed), and the Palo Pinto Formation (predominantly limestone and marl with some sandstone and shale and found west of the District). Sandstone lenses found in the Canyon Group are locally important to the occurrence of groundwater though are hard to map (Bayha, 1967).

The Strawn Group consists of the Mineral Wells Formation (shale containing local sandstone beds and a few limestone beds), the Brazos River Formation (sandstone with local lenses of conglomerate and mudstone), the Mingus Formation (sandy shale with one thin coal seam and some limestone beds), the Buck Creek Sandstone (sandstone), the Grindstone Creek Formation (shale, in part sandy, with local thin coal beds and sandstone lentils and limestone beds with some shale), and the Lazy Bend Formation (shale, in part sandy or silty, with local coal beds and limestone beds). While the Paleozoic aquifers are described as having many formations based upon outcrop, correlation of sandstone units in particular is very problematic in the subsurface.

The Paleozoic aquifers are the primary source of water in Montague County (Bayha, 1967) as indicated by the high percentage of wells completed into these aquifers in the county. Bayha (1967) indicates that groundwater is difficult to trace in these aquifers due to the complex depositional sequence.

2.1.2 Alluvial Deposits

Some alluvial deposits of Pleistocene to Recent age are capable of producing water in the District, especially along the Red River in Montague County and the Brazos River in Parker County. The majority of these sediments are stream deposits but some are of windblown origin. The alluvial deposits, consisting of sand, gravel, silt, and clay, yield small to large quantities of fresh water. Based on information in the TWDB groundwater database as of November 2009, the percentage of wells in the District completed into alluvial deposits is 10.0, 0.4, 3.0, and 0.1 percent for Montague, Wise, Parker, and Hood counties, respectively.

2.2 Approach for Development of the Hydrogeologic Sections

The construction of Paleozoic and Cretaceous formation cross-sections for the District required integration of subsurface information from numerous data sources and types. Available state agency published references (Texas Water Development Board (TWDB) and Bureau of Economic Geology (BEG)) were reviewed to identify and capture useful descriptions of stratigraphic marker beds and/or stratigraphic picks. The Sherman, Dallas and Abilene Geologic Atlas of Texas (GAT) sheets provided the geospatial distribution of the surface formation outcrops to connect with the top and base of subsurface picks.

The Paleozoic geologic surface outcrops are youngest in northern Montague County (Permian) and get progressively older (Pennsylvanian, Strawn) moving south into Parker County. Paleozoic rocks generally dip to the northwest-west at about 80 to 100 feet per mile. Over 1,000 scout tickets and cable tool driller's reports were screened to select wells with good location and Paleozoic (Permian and Pennsylvanian) formation top and base picks. A total of 40 locations with Paleozoic formation picks were selected for the created cross-sections. The number and geographic distribution of scout tickets and cable tool driller's reports decreased dramatically from Montague County south towards Hood County. Paleozoic formation top picks (Bowie Group, Gunsight Limestone, Canyon Group picks included the Home Creek, Ranger and Palo Pinto limestones and Strawn Group pick included the Caddo formation) were derived from the scout ticket and cable tool driller's reports which were compared with Paleozoic formation picks from BEG Report of Investigations 197, by Brown et. al., 1990. Formation picks from these two sources were compatible and in agreement.

The deeper Paleozoic picks for the Ranger, Palo Pinto and the Caddo formations are not illustrated in the constructed cross-sections because they were below the zone of interest for groundwater resources (upper 1,000 feet). However, these Paleozoic picks were used to construct subsurface formation surfaces. The geospatial subsurface thickness variations and extents of these Paleozoic formations are poorly known within the study area. Cross-section Paleozoic thicknesses in areas without data used outcrop thicknesses from the respective GAT sheets as a default.

Over 8,000 wells from the TWDB WIID website (groundwater database and submitted driller's reports) were screened by well depth (deepest) and the quality of the driller's reports lithologic description. A total of 102 driller's reports were selected to construct the cross-sections. Four Cretaceous formation top surfaces were mapped; the Paluxy Sand, Glen Rose Limestone, Twin Mountain Formation and the Antlers Sand. Cretaceous rocks generally dip to the east-southeast at about 40 to 60 feet per mile. A literature review of available older publications (Hendricks, 1957, Scott and Armstrong, 1932, Scott, 1930 and Stramel, 1951) as well as more recent publications (Baker, et. al., 1990, Duffin and Beynon, 1992, Harden, et al., 2004, Langley, 1999, McGowen et al, 1991 and Nordstrom, 1982) suggested that the Hensell and Hosston (aquifer units in the Travis Peak Formation) were not mappable geologic units within the study area. The older publications and the GAT sheet explanation provided detailed lithologic descriptions based on outcrops which were useful in the identification of formation tops and bases from the driller's report descriptions. The Hensell and Hosston were not positively identified within any of the 102 driller's reports which is consistent with the published geological reports in the area.

Brown, 1990 text and figures (1 and 6) provided general, structural subsurface guidance for the surface construction of the Paleozoic formations. A total of thirteen cross-sections (A - A' through M - M') were constructed for the District (see **Figure 3** for locations). The Paleozoic (Permian and Pennsylvanian Formations) interpretations in these cross-sections are based on very limited subsurface well data and should not be used or considered to replace or supersede more detailed regional structural studies. This study was intended to assist the District in understanding the stratigraphic framework and the designing of a water level monitoring system of their groundwater resources.

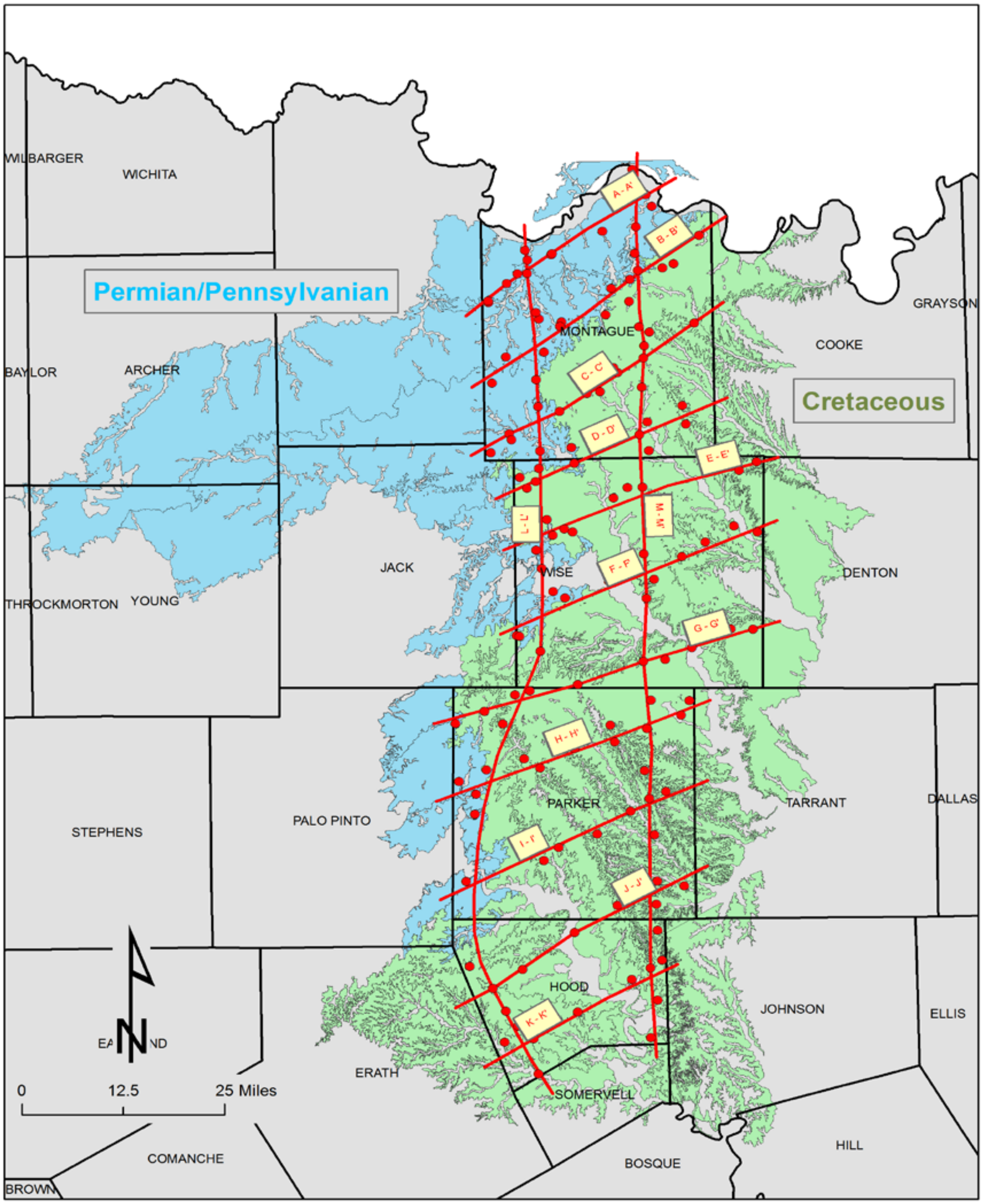


Figure 3. Cross-Section Base Map

2.3 Subsurface Data Sources and Reference Material Reviewed

Multiple subsurface data sources were investigated and used to construct the cross-sections for the UTGCD.

- The Bureau of Economic Geology (BEG) has a large collection of subsurface data including geophysical logs (1940's to present), scout tickets (1950's to 1990's) and cable tool driller's reports (1910 to 1960's).
- BEG publication, Brown et al, 1990, provided detailed information for the shallow Paleozoics in Montague County.
- UTGCD well data provided on CD.
- TWDB website (WIID) Texas Department of Licensing and Regulations (TDLR) submitted driller's reports (2001 to 2011) and groundwater well database driller's reports (1940s to present).
- University of Texas, Austin Thesis and Dissertations
- Texas Water Development Board (TWDB) publications

In addition to the subsurface data sources used to develop the correlations, many publications were reviewed for relevant information to help in the cross-section development and to understand the basic geology of the Trinity Aquifer and the Paleozoic Aquifers. The primary references reviewed include the following:

Baker, B., Duffin, G., Flores, R., and Lynch, T., 1990, Evaluation of Water Resources in Part of North-Central Texas, Report 318, Texas Water Development Board, 67 p

Bayha, D. C., 1967, Occurrence and Quality of Ground Water in Montague County Texas, Texas Water Development Board, Report 58, 102 p.

Barnes, V. E., 1988, Dallas Sheet, Geologic Atlas of Texas, 1:250,000, Bureau of Economic Geology

Brown, Jr., L. F., Goodson, J. L., Goodson, Harwood, P., and Barnes, V. E. Barnes, 2001, Abilene Sheet, Geologic Atlas of Texas, 1:250,000, Bureau of Economic Geology.

Brown, L. F., Solis-Iriarte, R. F. and Johns, D. A., 1990, Regional Depositional Systems Tracts, Paleogeography and Sequence Stratigraphy, Upper Pennsylvanian and Lower Permian Strata, North and West Central Texas, Report of Investigations No. 197, Texas Bureau of Economic Geology, 27 plates, 116 p.

Bullard, F. M. and Cuyler, R. H., 1930, A Preliminary Report on the Geology of Montague County, Texas, Bureau of Economic Geology, Part 1, pages 57 – 76.

Duffin, G. L. and Beynon, B. E., 1992, Evaluation of Water Resources in parts of the Rolling Prairies of North-Central Texas, Report 337, Texas Water Development Board, 93 p.

Harden, R. W. & Associates, Freese & Nichols Inc., HDR Engineering Inc., LBG-Guyton Associates, USGS, and Yelderman, J. Jr., 2004, Northern Trinity / Woodbine Aquifer Groundwater Availability Model, prepared for Texas Water Development Board, 391 p.

Hendricks, L., 1957, Geology of Parker County, Bureau of Economic Geology, Publication Number 5724, 67 p.

Langley, L., 1999, Updated Evaluation of Water Resources in Part of North-Central Texas, Report 349, Texas Water Development Board, 72 p.

McGowen, J. H., Hentz, T. F., Owen, D. E., Pieper, M. K., Shelby, C. A. and Barnes, V. E., 1991, Sherman Sheet, Geologic Atlas of Texas, 1:250,000, Bureau of Economic Geology

Nordstrom, P. L., 1982, Occurrence, Availability and Chemical Water Quality of Ground Water in the Cretaceous Aquifers of North Central Texas, Volumes 1 and 2, Report 269, Texas Water Development Board.

Scott, G. and Armstrong, J. M., 1932, The Geology of Wise County, The University of Texas, Bulletin 3224, pages 5 – 73.

2.4 Review of the Hydrogeologic Framework as Defined by Cross-Sections

Each of the thirteen cross-sections is depicted in Figures 4 through 16 and each will briefly be discussed below.

A – A' (Figure 4) - Cross-section has a southwestern to northeastern strike which parallels the outcrops of the Permian Archer City and Nocona formations. These Paleozoic formations possibly have been deformed by the Muenster Arch in the northeastern half of this cross-section.

B – B', (Figure 5) - Cross-section has a southwestern to northeastern strike which parallels the outcrops of the Permian Archer City and the Bowie Group Markley formations and includes the easterly dipping Cretaceous Trinity Aquifer, Antlers Formation. The Paleozoic formations possibly have been deformed by the Muenster Arch in the northeastern half of this cross-section.

C – C', (Figure 6) - Cross-section has a southwestern to northeastern strike which parallels the outcrops of the Bowie Group Markley Formation and includes the easterly dipping Cretaceous Trinity Aquifer, Antlers Formation.

D – D', (Figure 7) - Cross-section has a southwestern to northeastern strike which approximately parallels the outcrops of the Bowie Group Markley and Thrifty and Graham formation and includes the easterly dipping Cretaceous Trinity Aquifer, Antlers Formation.

E – E', (Figure 8) - Cross-section has a southwestern to northeastern strike which approximately parallels the outcrops of the Canyon Group undivided (Ventioner Formation) and includes the easterly dipping Cretaceous Trinity Aquifer, Antlers Formation.

F – F', (Figure 9) - Cross-section has a southwestern to northeastern strike which approximately parallels the outcrops of the Canyon Group undivided (Jasper Creek Formation) and includes the easterly dipping Cretaceous Trinity Aquifer, Antlers Formation transitioning into the Twin Mountain Formation. This cross-section is just north of the Mineral Wells – Newark East Fault system.

G – G', (Figure 10) - Cross-section has a southwestern to northeastern strike which approximately parallels the outcrops of the Strawn Group Mineral Wells Formation and includes the easterly dipping Cretaceous Trinity Aquifer, Twin Mountain Formation and overlying Paluxy Formation. This cross-section is in very close proximity and parallels the Mineral Wells – Newark East Fault system.

H – H', (Figure 11) - Cross-section has a southwestern to northeastern strike which approximately parallels the outcrops of the Strawn Group Mineral Wells and Brazos River formations and includes the easterly dipping Cretaceous Trinity Aquifer, Twin Mountain Formation and overlying Paluxy Formation.

I – I', (Figure 12) - Cross-section has a southwestern to northeastern strike which approximately parallels the outcrops of the Strawn Group Grindstone Creek and Lazy Bend formations and includes the easterly dipping Cretaceous Trinity Aquifer, Twin Mountain Formation and overlying Paluxy Formation.

J – J', (Figure 13) - Cross-section has a southwestern to northeastern strike and includes the easterly dipping Cretaceous Trinity Aquifer, Twin Mountain Formation and overlying Paluxy Formation

K – K', (Figure 14) - Cross-section has a southwestern to northeastern strike and includes the easterly dipping Cretaceous Trinity Aquifer, Twin Mountain Formation and overlying Paluxy Formation.

L – L', (Figure 15) - Cross-section has a north to south strike on the western side of the District. The Paleozoic formations (Permian and Pennsylvanian) seem to form a basin in this region of the District with the Paleozoic Formations becoming shallower to the south.

M – M', (Figure 16) - Cross-section has a north to south strike on the eastern side of the District. This section also shows a potential sub-basin in the Paleozoic formations (Permian and Pennsylvanian) with the formations becoming shallower to the south. General locations of the Muenster Arch and Mineral Wells – Newark East Fault system are noted in the cross-section.

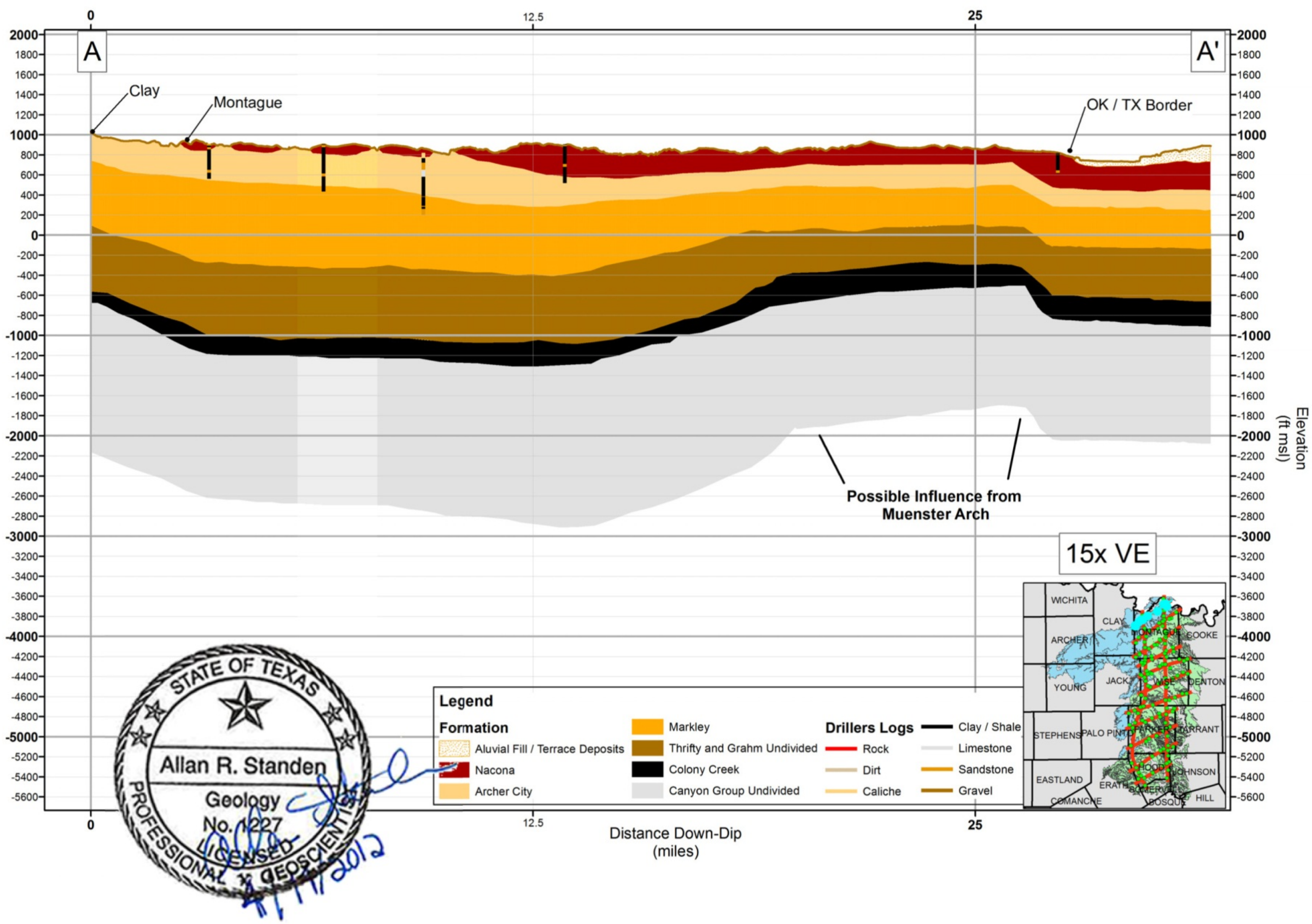


Figure 4. Hydrogeologic Cross-Section A – A.

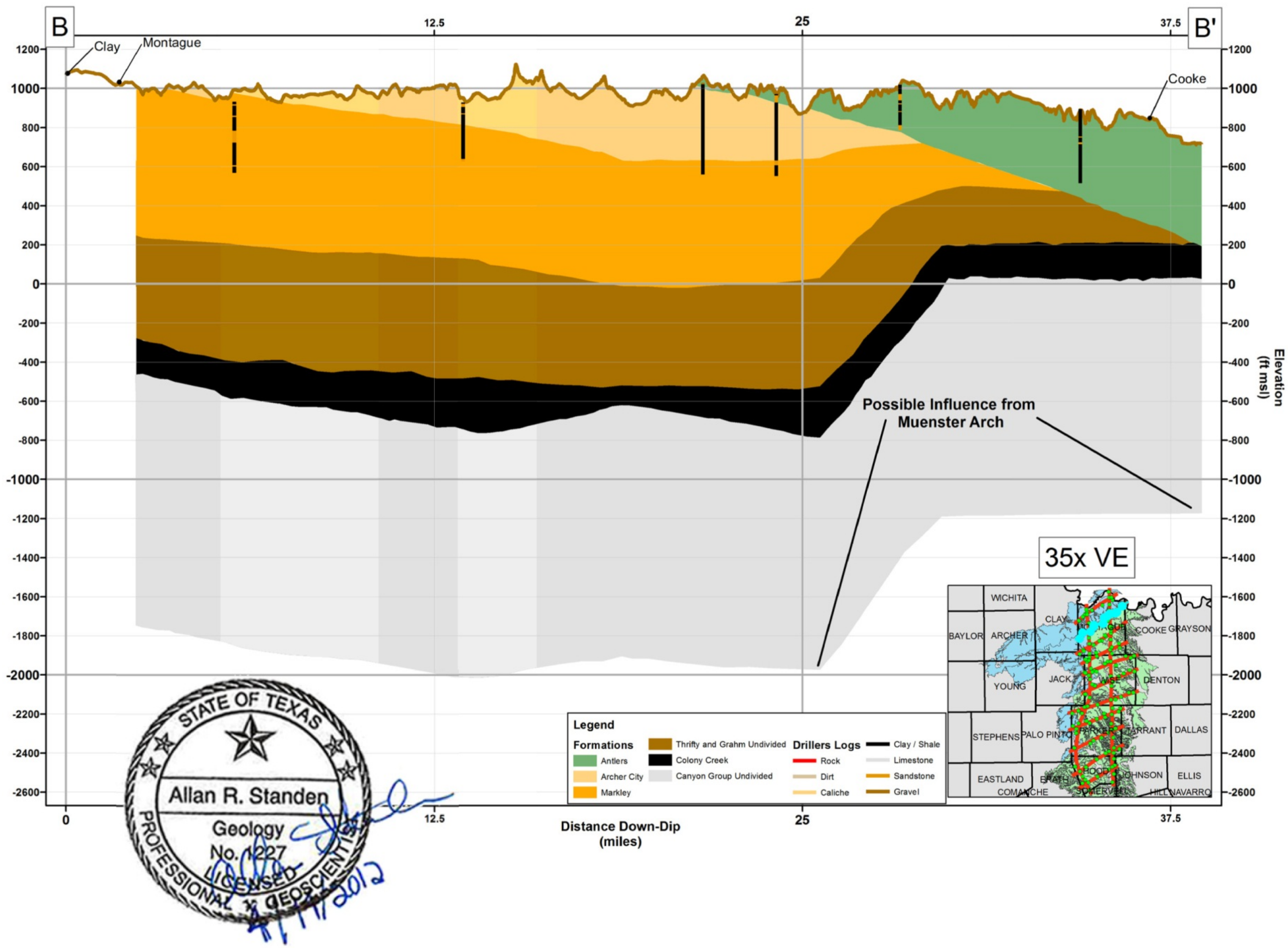
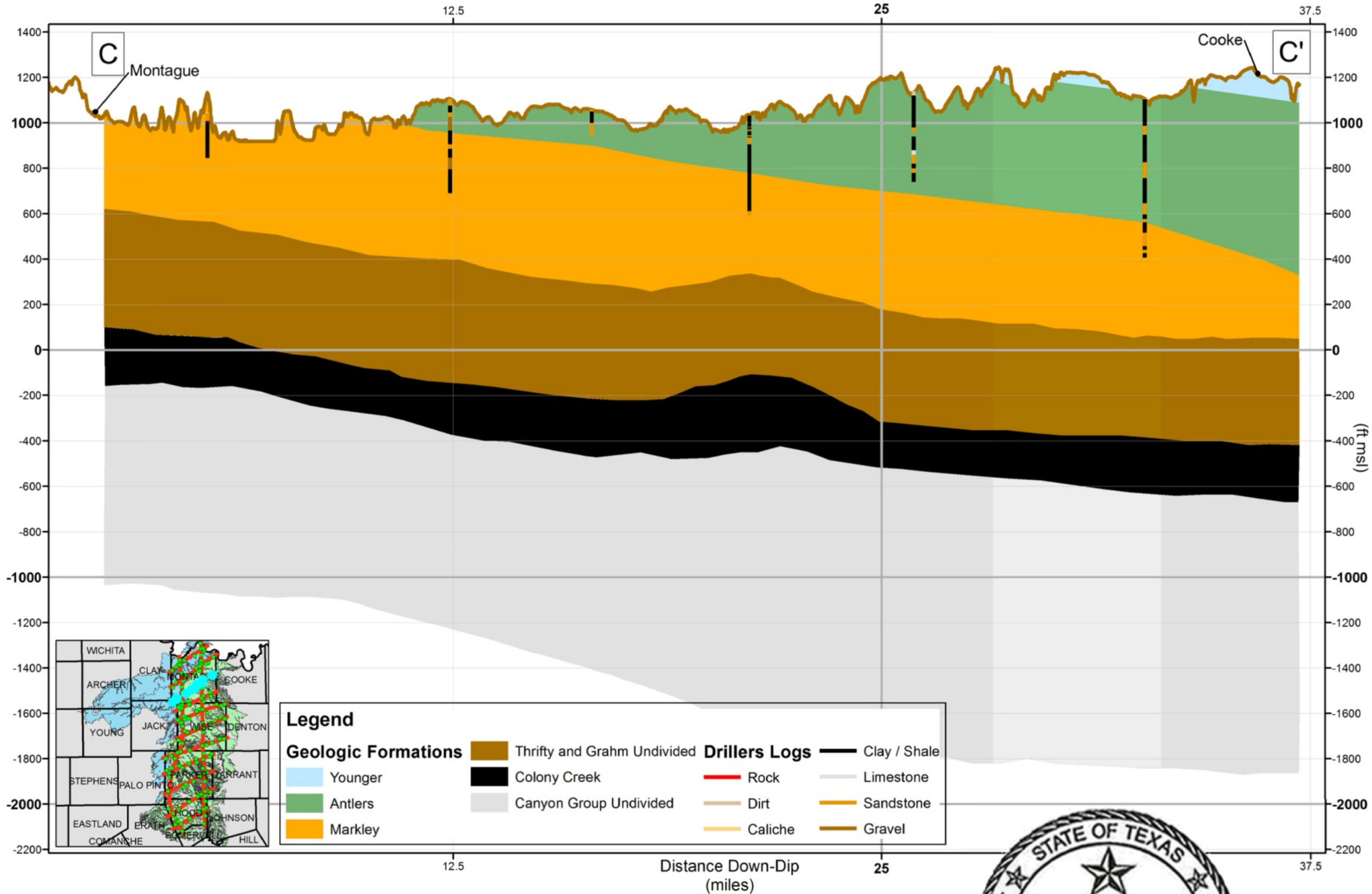


Figure 5. Hydrogeologic Cross-Section B – B.



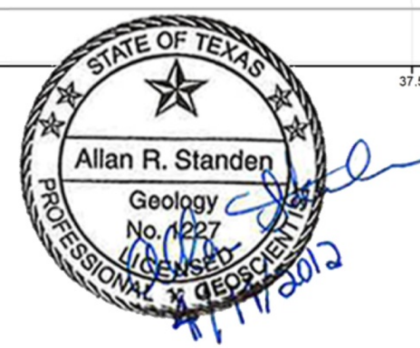


Figure 6. **Hydrogeologic Cross-Section C – C.**

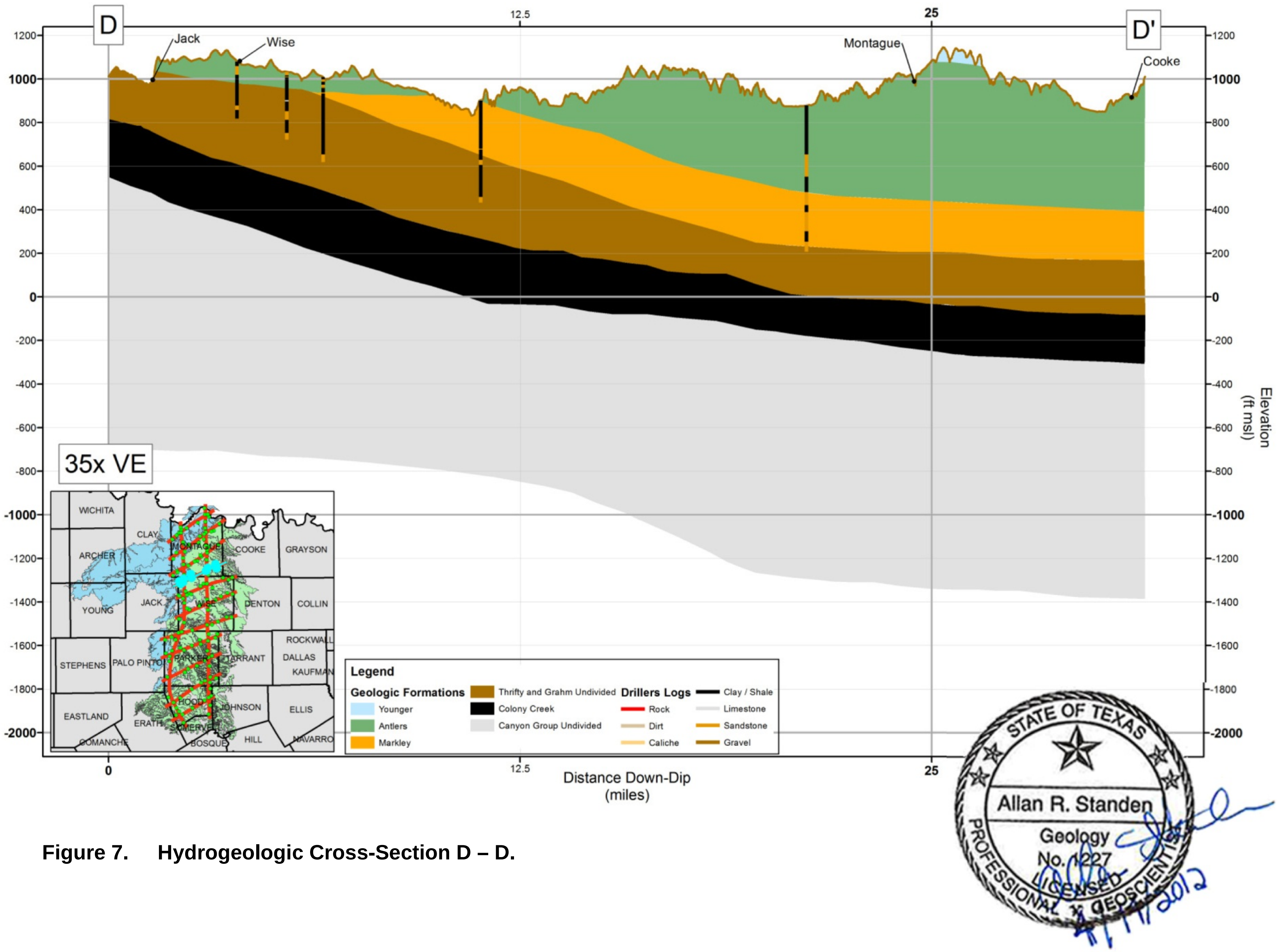


Figure 7. Hydrogeologic Cross-Section D – D.

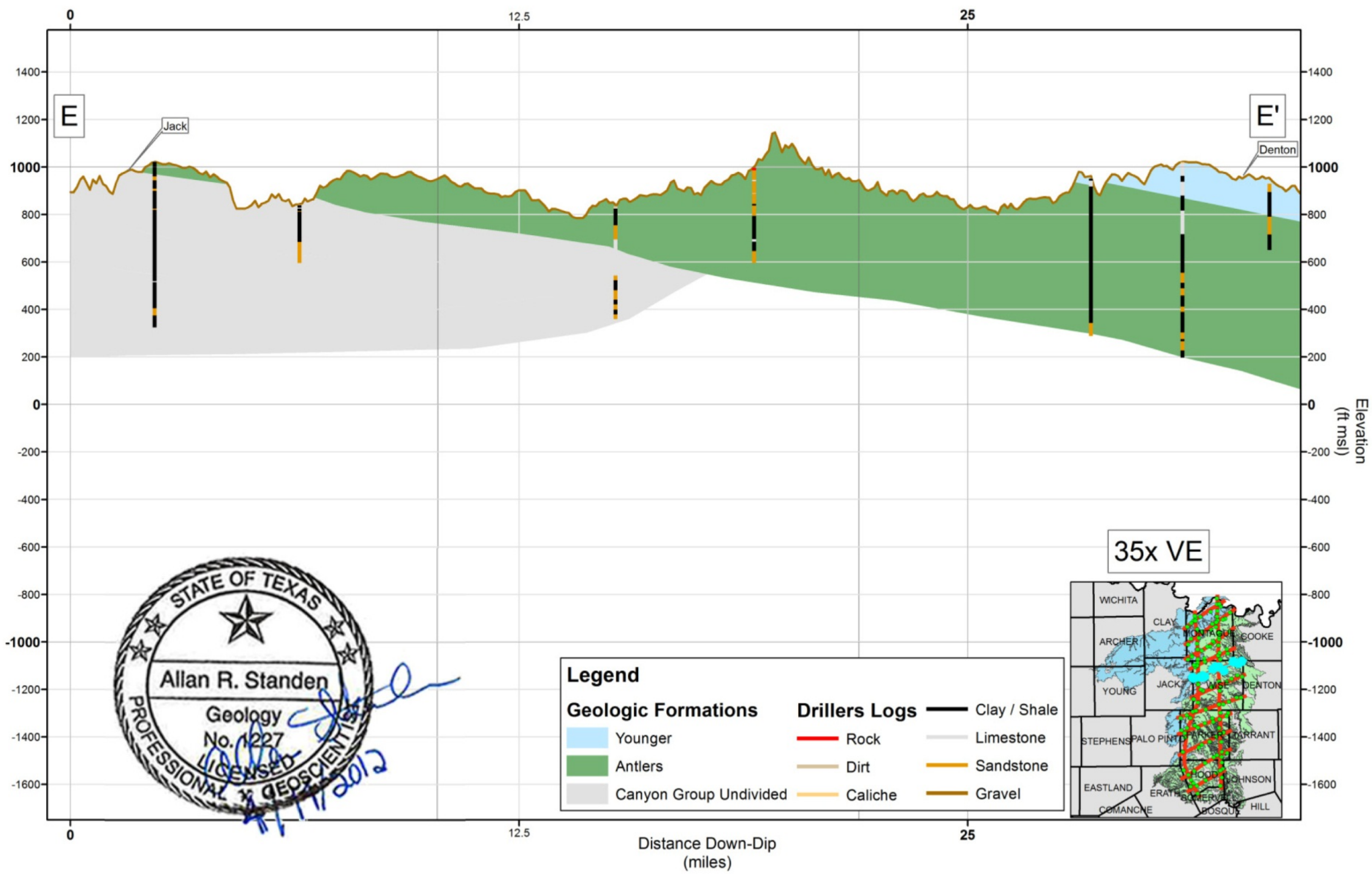


Figure 8. Hydrogeologic Cross-Section E – E.

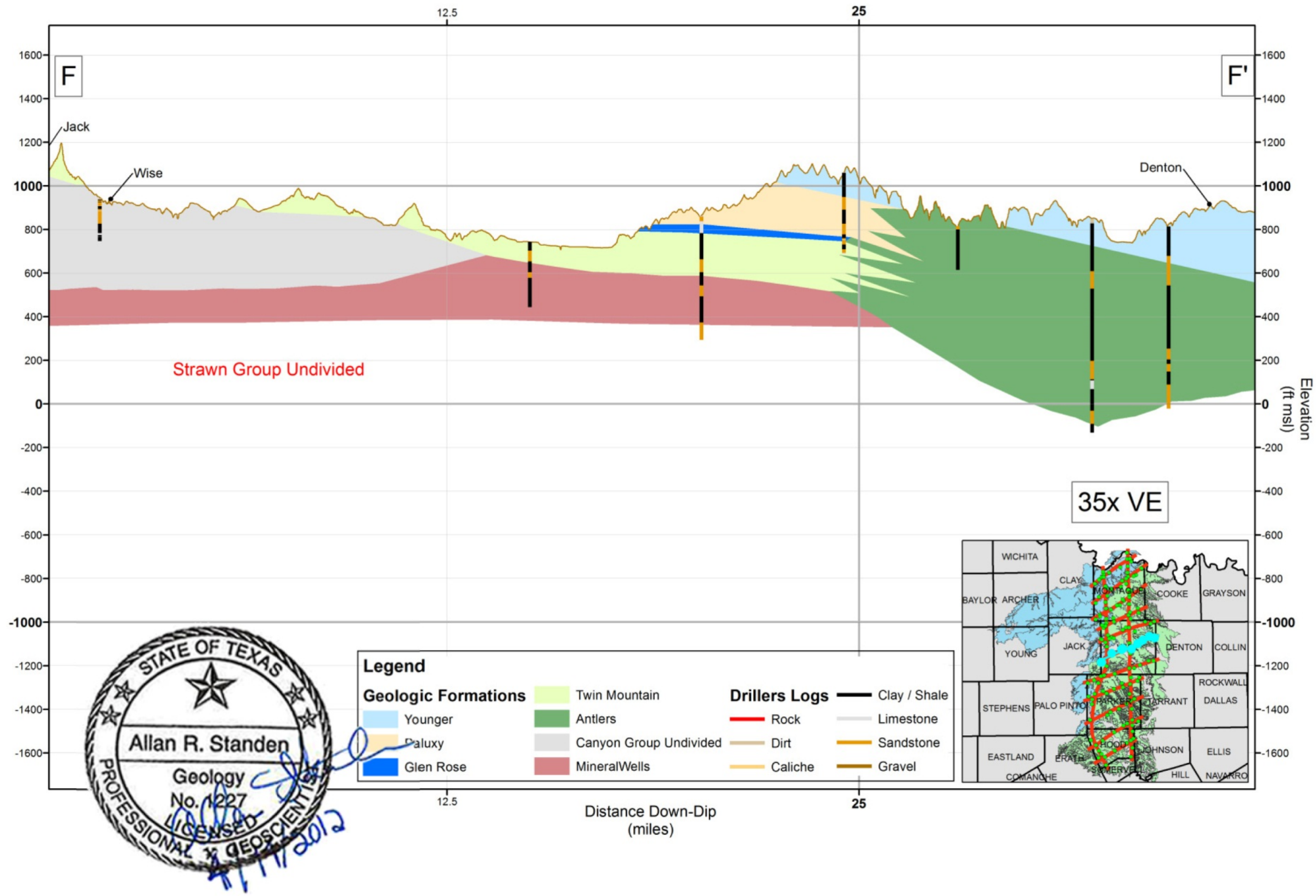


Figure 9. Hydrogeologic Cross-Section F – F.

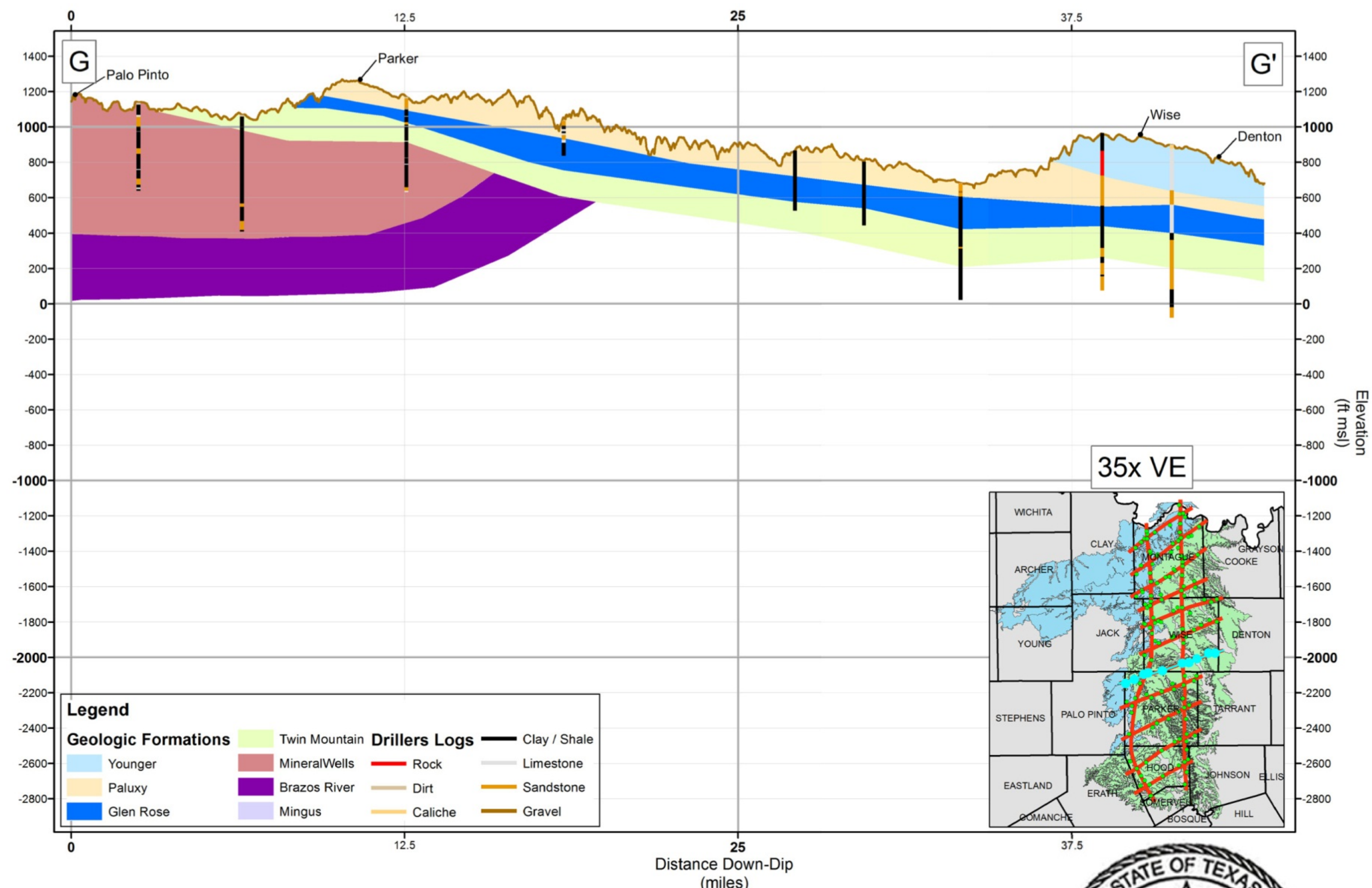
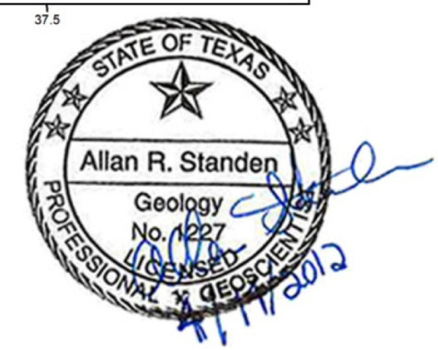


Figure 10. Hydrogeologic Cross-Section G – G.



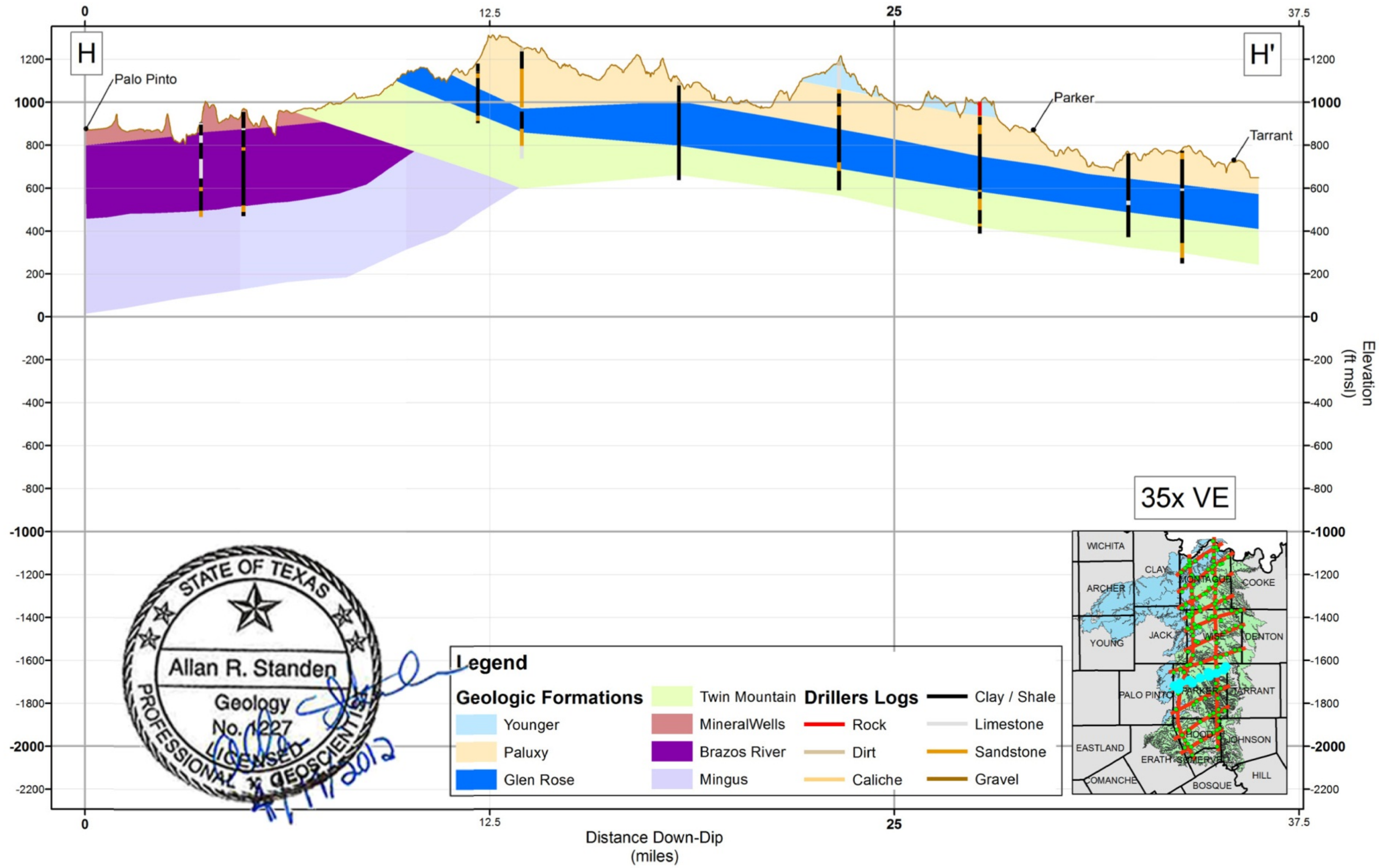


Figure 11. **Hydrogeologic Cross-Section H – H.**

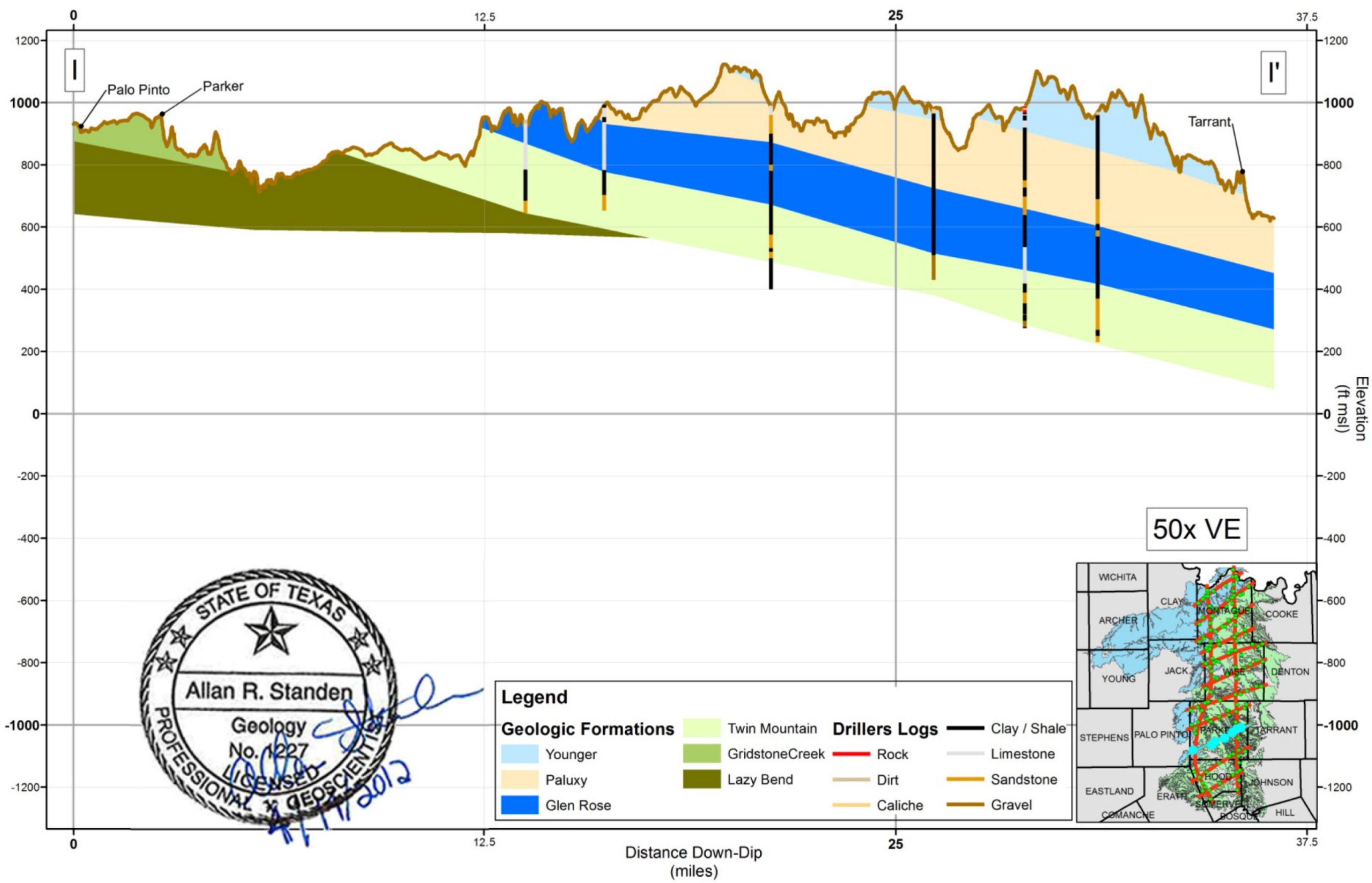


Figure 12. **Hydrogeologic Cross-Section I – I.**

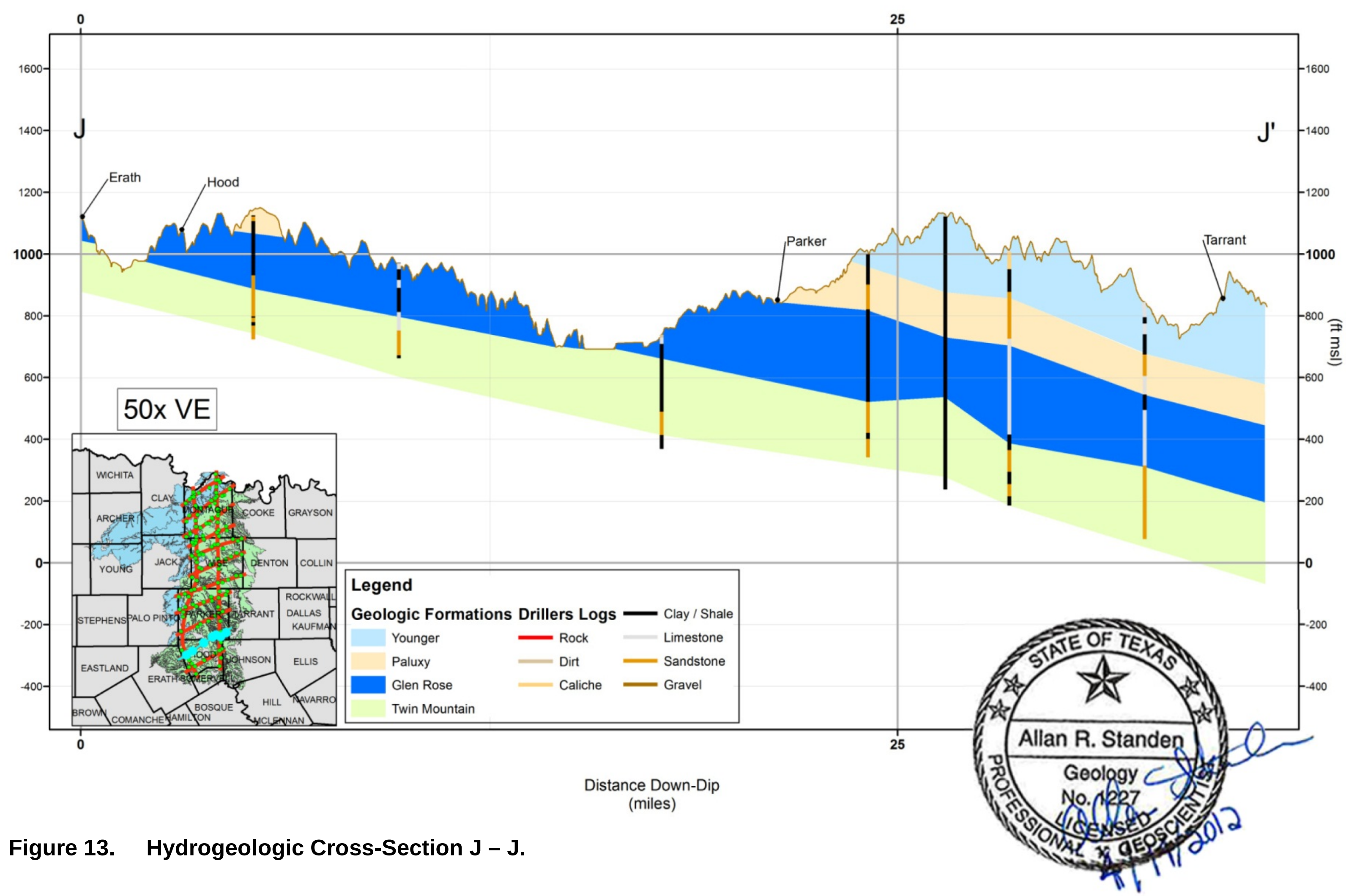


Figure 13. Hydrogeologic Cross-Section J – J.

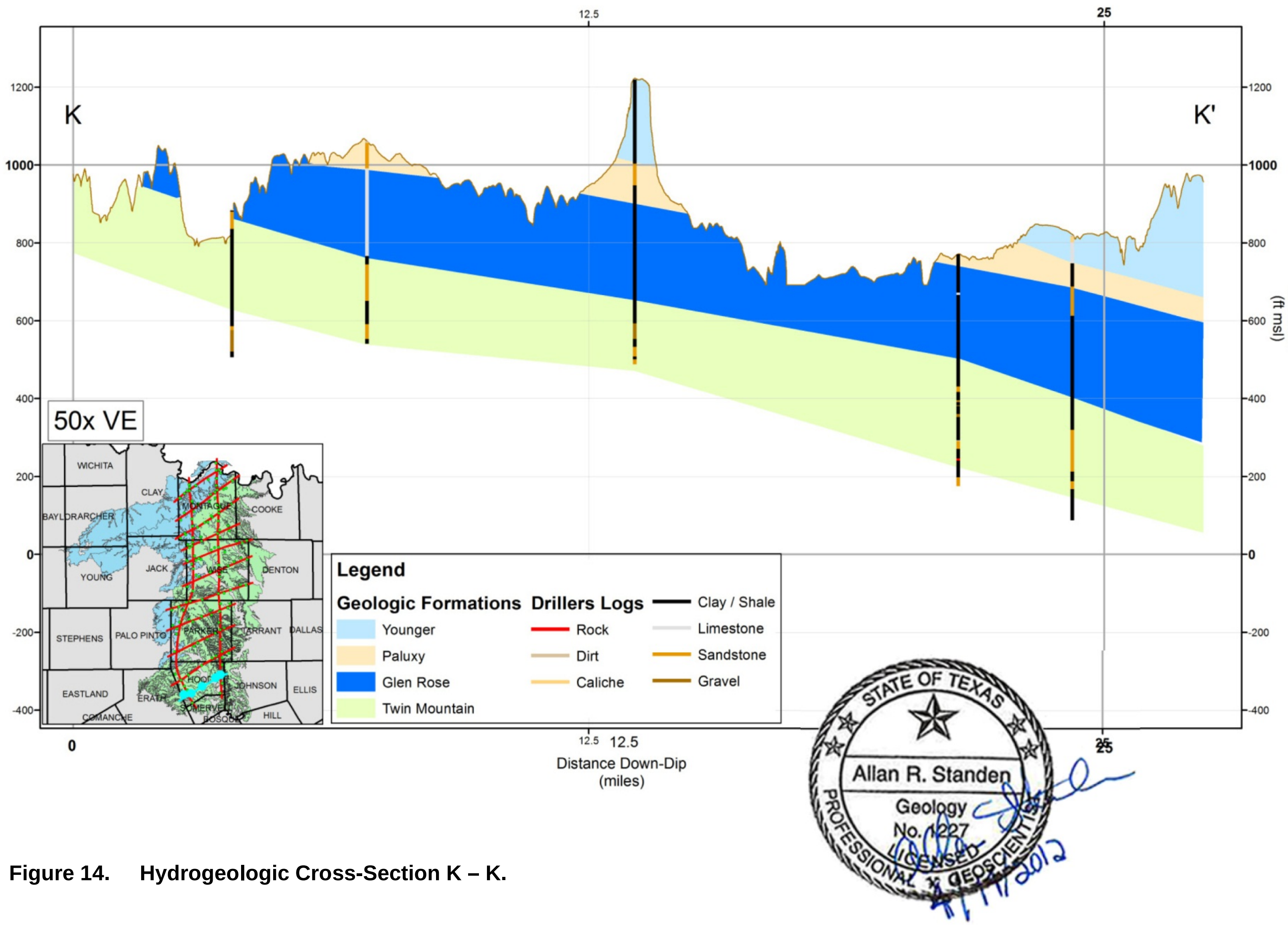


Figure 14. Hydrogeologic Cross-Section K – K.

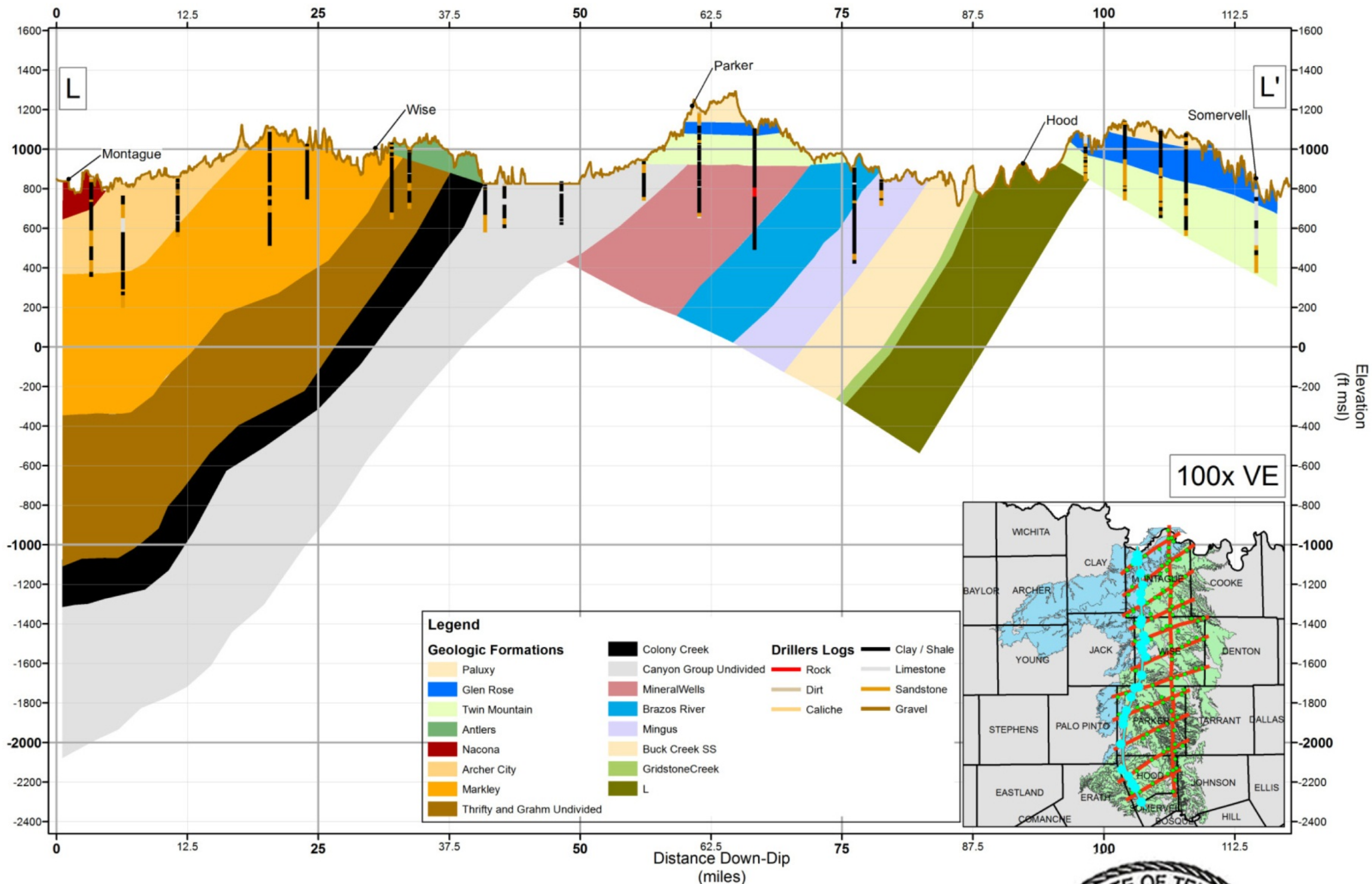
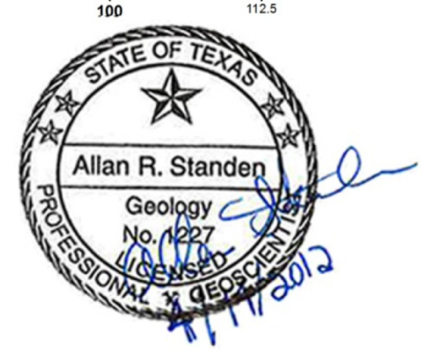


Figure 15. **Hydrogeologic Cross-Section L – L.**



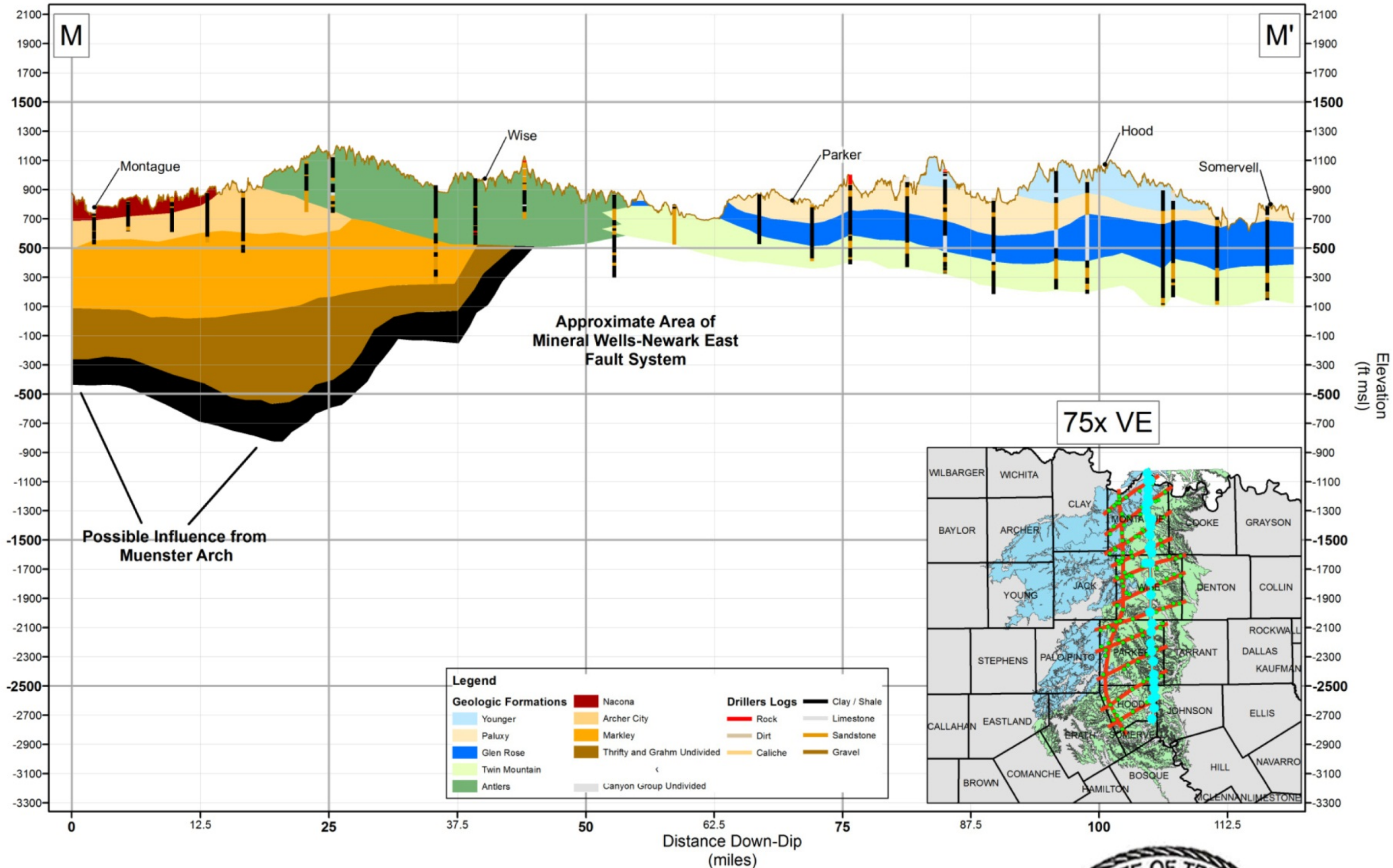


Figure 16. Hydrogeologic Cross-Section M – M.

3.0 Development of the UTGCD Monitoring Strategy

The purpose of Task 2 is to document a monitoring strategy for the District that defines the objectives and goals of the monitoring network, provides a context for evaluating Phase I monitor wells, and helps guide the expansion of the monitoring network in Phase II. The process of developing the monitoring strategy has been divided into three primary activities:

- Refine monitoring plan objectives and goals;
- Define monitoring constraints, if they exist; and
- Develop the strategy for expansion of the monitor well network and program

These activities are documented in this section.

3.1 Monitoring Plan Objectives and Goals

There are many objectives that can be defined for a monitoring program, derived from several separate but overlapping requirements of a District. In our review of the potential monitoring requirements, it was determined that monitoring objectives could be derived from several sources including:

- Chapter 36 (The Water Code) of the Texas Administrative Code;
- Current and future District rules;
- Groundwater Management Plan; and
- Fundamental hydrogeologic characterization of aquifer conditions.

A review of the requirements that precipitate monitoring will be followed by a list of potential monitoring objectives.

3.1.1 Chapter 36 of the Texas Administrative Code

At a fundamental level, all monitoring requirements are derived from the statute defining the Groundwater Conservation Districts (TAC 36).

TAC 36.101 – Rulemaking Authority - Under TAC 36.101 the District has the authority to develop rules. The District is still in the early stages of its development of a comprehensive system to manage the groundwater resources located within its boundaries. The District is acutely aware that the path it ultimately pursues for the permitting and regulation of water wells may have a significant impact on the manner in which water is provided to support human, animal, and plant life, land development, public water supplies, commercial and industrial operations, agriculture, and other economic growth in the District. The District Board takes its responsibilities very seriously with regard to these decisions and the impacts they may have on the property rights of the citizens of the District, and desires to undertake its approach to the development of a permitting and regulatory system in a careful, measured, and deliberate manner. In that regard, the District is determined to accumulate as much data and information as is practicable on the groundwater resources located within its boundaries before developing permanent rules and regulations that would impose permitting or groundwater production regulations on water wells.

The District began its initial studies and analysis of the aquifers and groundwater use patterns in early 2008 in an attempt to both catch up with then-ongoing discussions regarding the development of desired future conditions of the aquifers by the existing groundwater conservation districts in GMA-8, and to develop some baseline information on which decisions could be made for the development of temporary rules governing water wells. In August 2008, the District adopted its first set of temporary rules, which pioneer the District's information-gathering initiative. The District recognizes that the collection of District-scale hydrogeologic information such as groundwater levels, stratigraphy and hydraulic properties is critical to making sound policy and rules. As a result, both the Phase I and Phase II Monitoring Programs are being developed to support these fundamental requirements of the District.

TAC.36.1071 – Management Plan - The 75th Texas Legislature established a comprehensive regional and statewide water planning process in 1997. A critical component of that far-reaching overhaul of the Texas' water planning process included a requirement that each groundwater conservation district develop a management plan that defines the water needs and supply within each district and defines the goals the district will use to manage the groundwater in order to meet the stated needs or demonstrate that the needs exceed available groundwater supplies. Information from each district's management plan is incorporated into the regional and state water plans. The management plan is also used as the basis for the development of the district's permitting and groundwater management rules. A key component of the management plan is the establishment of a set of performance standards and management objectives which the District will use to demonstrate that they are achieving management goals set forth in the plan.

TAC.36.108 – Joint Planning in Management Area - This statute requires joint planning among districts located within the same Groundwater Management Area ("GMA"). Among other activities conducted pursuant to this joint planning process, the districts within each GMA must establish desired future conditions for all relevant aquifers located in whole or in part within the GMA. The desired future conditions established through this process are then submitted to the Texas Water Development Board ("TWDB"), which is required to provide each district with estimates concerning the amount of groundwater that can be produced from each relevant aquifer annually within each county located in the GMA in order to achieve the desired future conditions established for each aquifer. This quantified annual water budget for each aquifer is known as the "Modeled Available Groundwater" or "MAG" amount. Chapter 36 requires that technical information, such as the desired future conditions of the relevant aquifers within a district's jurisdiction and the amount of managed available groundwater from such aquifers, be included in the district's management plan. In addition, it is a requirement of the District to be able to demonstrate that they are achieving the DFC which can only be done through a monitoring program.

Other key aspects of this statute that are relevant to monitoring include the ability for a District to consider aquifer conditions and how they may vary geographically across a District. Statute TAC.36.108.D-1(1) states that districts can set DFCs differently in each aquifer, subdivision of an aquifer or geologic strata. This allows the District to adopt dissimilar regulatory approaches for wells completed in separate aquifers or in different geographic regions of the District, in order to address critical areas or to otherwise tailor regulations that are more suitable for a particular aquifer or area. For example, groundwater management strategies employed for the outcrop of the aquifer may differ from those utilized in subcrop areas. This regulatory flexibility may be appropriate to a District but requires hydrogeologic data including monitoring data to define these portions of the aquifer that may warrant such treatment.

3.1.2 Current or Future District Rules

In August 2008, the District adopted its first set of temporary rules, which pioneer the District's information-gathering initiative. Among other things, the rules require most large wells to be registered with the District, have meters installed to record the amount of groundwater produced, and submit records of the amounts produced to the District. Large well owners are also required to submit fee payments to the District based upon the amount of groundwater produced.

In addition, all new wells are required to be registered with the District and comply with the minimum well spacing requirements of the District. The minimum well spacing requirements were developed by the District to try to limit the off-property impacts of new wells to existing registered wells and adjoining landowners. They include minimum tract size requirements, spacing requirements from the property line on the tract where the well is drilled, and spacing requirements from registered wells in existence at the time the new well is proposed. The spacing distances were developed through hydrogeologic modeling of the varying sizes of the cones of depression of various well capacities, and such distances naturally increase with increases in well capacities. The District's spacing requirements should go a long way toward limiting well interference problems between new wells and between new and existing wells.

The District's monitoring network can be assimilated with groundwater production and use reports and estimates, well location and completion data, information on aquifer recharge rates and other hydrogeologic properties, and other information, in a database that the District is developing to enable it to better understand and manage the groundwater resources of the area. Information gleaned from these efforts will be used by the District in the future in the establishment of desired future conditions for the aquifers, in the monitoring of actual conditions of the aquifers and calibration of modeled conditions, in making planning decisions, and in the development of permanent District rules. These rules may include a permitting system for water wells and the potential for managing the District aquifers in a series of management zones recognizing the potential variability within the aquifers and their use.

3.1.3 Groundwater Management Plan

The Groundwater Management Plan provides several policy statements or management goals and performance standards that relate to the District Monitoring Plan. Specifically, the District's Mission statement states that the District will manage groundwater in a fair and equitable manner such that availability and accessibility of groundwater will remain for future generations. In addition the statement explicitly provides a desire to protect the quality of the groundwater in the recharge zone of the aquifer. This mission statement implies an understanding of the conditions of the aquifer (both water levels and water quality) that can only be accomplished through a deliberate monitoring program.

In the goals, management objective and performance standards section of the Management Plan the District sets specific goals and objectives specific to monitoring to comply with 31TAC(a)(1)(H) ((Implementing TWC §36.1071(a)(8)). These are reproduced below.

F.1 Objective - Within 3 years of Groundwater Management Plan adoption develop a Groundwater Monitoring Program within the District.

F.1 Performance Standard - Upon development, attachment of the District Groundwater Monitoring Program to the District's Annual Report to be given to the District's Board of Directors.

F.2 Objective - Upon approval of the District Monitoring Program – conduct water level measurements at least annually on groundwater resources within the District.

F.2 Performance Standard - Annual evaluation of water-level trends and the adequacy of the monitoring network to monitor aquifer conditions within the District and comply with the aquifer resources desired future conditions. The evaluation will be included in the District's Annual Report to be given to the District's Board of Directors. (See Table 5, in the main document)

F.3 Objective - Monitor non-exempt pumping within the District for use in evaluating District compliance with aquifer desired future conditions.

F.3 Performance Standard - Annual reporting of groundwater used by non-exempt wells will be included in the Annual Report provided to the District's Board of Directors. (See Table 2in the main document)

3.1.4 Fundamental Hydrogeologic Characterization of Aquifer Conditions

In addition to the requirements of monitoring described above, the management of groundwater implies groundwater monitoring and the collection of hydrogeologic data to characterize groundwater conditions. These generally support all of the implied or explicit objectives or requirements for monitoring and basic data collection defined in the preceding three sections. The objectives which may be classified as supporting hydrogeologic characterization include:

- Characterize current baseline groundwater levels in aquifers within the District;
- Characterize trends in aquifer levels in the District;
- Characterize hydraulic gradients within the District, i.e.:
  - Horizontal within aquifers
  - Vertical between aquifers
- Identify aquifers or aquifer zones that may respond distinctively to development and thus may be candidates for different management rules, e.g.:
  - Shallow versus deep (unconfined versus confined)
- Characterize aquifer response to pumping;
- Quantify available groundwater in the District;
- Identify areas susceptible to drought or significant drawdown from increased pumping during drought;
- Monitor aquifer water quality and trends in water quality, e.g.:
  - Isotopic fingerprinting of methane and other higher hydrocarbons (C_2-C_6) in areas of intense fracing operations
  - Characterization of brackish resources in the District
- Identify zones prone to surface contamination;
- Estimate recharge;
- Estimate groundwater and surface water interaction.

3.1.5 Summary of Monitoring Goals and Objectives

From the review of potential monitoring objectives and requirements provided in the sections above, one can conclude that there are many reasons for monitoring, many of which overlap. All of these monitoring objectives are worthy of consideration and relevant to the management of groundwater resources. While all identified objectives may be considered given the general mission statement for the District, it makes sense to prioritize the most important objectives above those that are not required through rule, statute or Management Plan requirements.

We consider the following monitoring objectives to be most important because they are either implicitly or explicitly required based upon the Districts rules or Management Plan.

- Establish current baseline groundwater levels in aquifers within the district;
- Establish trends in aquifer levels in the District;
- Define unique aquifer areas that could be established as separate groundwater management areas and therefore be handled differently in future rules, e.g.:
  - Shallow versus deep
  - Aquitards versus Aquifers
  - Paleozoic aquifer system versus the Trinity aquifer
- Provide adequate information to define future DFCs both in the Trinity and the Paleozoic Aquifers;

    - Better inform what is sustainable pumping
    - To be used to develop a better groundwater availability model
- Provide a means for definition of Desired Future Conditions within the district and a method for compliance demonstration.

There are several other monitoring requirements that are likely important to the District but may be of lower priority. These could include:

- Establish water quality within the District and trends in water quality;
- Determine areas prone to water quality degradation;
- Determine areas prone to drought to perhaps assist in drought planning;
- Provide a basis for drought management planning and drought impacts on groundwater conditions; and
- Define the base of freshwater in the District as well as the extent of brackish resources;
- Monitor the base of useable water as defined by the Railroad Commission, especially in areas of high density oil and gas exploration and production;
- Develop some isotope signature data in the deep aquifers in areas of high density oil and gas exploration and production;
- Monitor recharge in the shallow unconfined aquifer systems;
- Monitor aquifer levels at the borders of the District to define potential impacts from pumping outside of the District.

3.2 Monitoring Constraints

There are several constraints that one may consider applicable to the expansion of an existing monitoring network. These may include:

- Staff resources available to monitor network (number of wells);
- Costs associated with monitoring (number of wells);
- Current DFC and inherent assumptions and
- New versus existing wells.

Each of the more important constraints to our analysis will be described in the following sections.

3.2.1 Number of Wells

There exists a physical limit as to the number of wells that District staff can visit in a quarter and measure water level while still performing their other duties. This constraint has been brought up with the Board and the General Manager and at this time it is the District's opinion that they could double the number of wells in the current network. For purposes of this analysis, we are assuming that another 80 wells could be brought into the network in addition to those currently in the network. This number could change as we go through the analysis phase of this study. It is also assumed that the resources required to manage the larger network are available to current District staff.

3.2.2 Cost Constraints

It will be assumed that costs associated with the addition of 80 monitor wells will be acceptable from a District perspective. In addition, we will assume that each existing well will require an equal resource commitment for sampling.

3.2.3 Desired Future Condition and Basis

The current Northern Trinity Aquifer DFC is based upon the Northern Trinity GAM (Bené and others, 2004). In the GAM, the Trinity Aquifer is divided into four model layers generally representing the dominant hydrostratigraphy of the Trinity Aquifer in Central and North-Central

Texas; the Upper Trinity (Paluxy and Glen Rose aquifers), the Middle Trinity (Hensell aquifer) and the Lower Trinity (Hosston aquifer). The GAM models the Paluxy aquifer as model layer 3, the Glen Rose aquifer as model layer 4, the Hensell aquifer as model layer 5, and the Hosston aquifer as model layer 7. Model layer 6 represents the Pearsall/Cow Creek/Hammett members of the Travis Peak Formation, which are conceptualized as a confining unit. The relationship between these model layers and the hydrostratigraphy in the District is illustrated in **Table 2**. Table 2 shows that the GAM layering is inconsistent with the District hydrostratigraphy and this discrepancy becomes worse as one moves into the Antlers Formation in the Northern parts of the District. The Hensell and Hosston aquifers are generally not defined in the District but are combined as the Travis Peak Formation. As one moves north of the middle of Wise County, the Glen Rose (model layer 4) also becomes unidentifiable as a distinct unit and is generally lumped with the Antlers Formation. In regions of the District north of Decatur, the entire Trinity Aquifer sequence is generally mapped as the Antlers Formation.

Because the GAM was used as a means of defining desired future conditions as well as estimating the modeled available groundwater, the following discussion of the DFC uses terms of hydrostratigraphic nomenclature and model layers consistent with the GAM.

Table 2. Relationship Between District Trinity Aquifer Hydrostratigraphy and the Current Northern Trinity Aquifer GAM.

<table>
<tr><th colspan="2">District Geology</th><th colspan="2">GAM Model</th></tr>
<tr><th>Montague and northern Wise counties</th><th>Hood, Parker, southern Wise counties</th><th>Model Stratigraphy</th><th>Model Layer</th></tr>
<tr><td rowspan="5">Antlers Formation</td><td>Paluxy Sand</td><td>Paluxy aquifer</td><td>3</td></tr>
<tr><td>Glen Rose Formation</td><td>Glen Rose aquifer</td><td>4</td></tr>
<tr><td rowspan="3">Twin Mountains Formation</td><td>Hensell aquifer</td><td>5</td></tr>
<tr><td>Pearsall/Cow Creek/Hammett/ Sligo confining unit</td><td>6</td></tr>
<tr><td>Hosston aquifer</td><td>7</td></tr>
</table>

The desired future conditions were specified based upon average drawdown from the year 2000 through the year 2050 on a county and aquifer (model layer) basis. **Table 3** defines the desired future conditions for the four counties comprising the District for the Northern Trinity Aquifer. For example, for the Hosston aquifer in Hood County, the specified management goal (desired future condition) is defined "from estimated year 2000 conditions, the average drawdown of the Hosston Aquifer should not exceed approximately 56 feet after 50 years" (Wade, 2009). All of the desired future conditions are specified in Wade (2009) in a similar format. These are summarized in **Table 3**.

Table 3. Desired Future Conditions and Managed Available Groundwater for the Northern Trinity Aquifer in the District.

County	Trinity Sub-Aquifer	Desired Future Condition(1)	Managed Available Groundwater (2) (AFY)
Hood	Paluxy	1	942
	Glen Rose	2	4
	Hensell	16	3,595
	Hosston	56	6,604
Hood County Total		NA	11,145
Parker	Paluxy	5	9,800
	Glen Rose	6	192
	Hensell	16	1,441
	Hosston	40	3,815
Parker County Total		NA	15,248
Wise	Paluxy	4	2,559
	Glen Rose	14	5
	Hensell	23	1,480
	Hosston	53	5,238
Wise County Total		NA	9,282
Montague	Paluxy	0	505
	Glen Rose	1	-
	Hensell	3	362
	Hosston	12	1,807
Montague County		NA	2,674
District Total		**NA**	**38,349**

(1) Average drawdown in feet after 50 years from the year 2000
(2) from GAM Run 08-84mag (Wade, 2009)

From a monitoring network perspective, any aquifer DFC is very important in that it defines a constraint on how the monitoring network should be configured. The District Management Plan has explicit performance standards for evaluating the District monitoring program with respect to its adequacy to comply with the DFC. As a result, the monitoring network must be evaluated against the DFC. The current Trinity Aquifer DFC and MAG are couched in terms of GAM model layers that do not necessarily correlate to the District hydrogeology. However, the model layering must be used as a basis for evaluating and further developing the District monitoring network. We will also review the monitoring network using the hydrogeologic framework defined in Section 2.0.

GMA-8 did not propose a DFC for the Paleozoic aquifers systems in the District during Round 1 of the Joint-Planning Process. As a result, there is no equivalent DFC to be used to constrain the monitoring network. For the Paleozoic aquifers we will use the hydrogeologic framework defined in Section 2.0.

Finally, it has been documented by the District that the current Northern Trinity GAM has limitations to its use. As a result, four Districts within GMA-8 agreed to make revisions to the GAM over the course of the last 2 years. GAMs provide useful tools for supporting monitor well network development activities. The current Northern Trinity GAM is not ideal for these purposes for the UTGCD. However, we will try to use the GAM to the degree possible to understand the development of a monitor well network that can defensibly be used to evaluate aquifer conditions as they relate to the DFC.

3.2.4 New Versus Existing Wells

We are assuming that due to cost considerations, the Phase II wells will overwhelmingly consist of existing wells. It may be that once the analysis of the current network and the availability of existing wells are known, drilling a new well may be recommended to the District. However, new wells will only be recommended after the analysis has determined the need.

3.3 Monitoring Strategy

The monitoring strategy is meant to define the strategic concepts or framework that will guide the evaluation and augmentation of the Phase I monitoring network. While the summary in Section 3.1.5 shows that the individual objectives of a monitoring program can be numerous and varied, they all fall within a fundamental requirement: to be able to monitor the aquifer resources within the District at a scale commensurate with the management objectives or the future management objectives.

The current most important management objective stated for the District is the DFC Statement adopted by GMA-8 and instituted into the District Management Plan (Section 3.2.3 above). We will develop a strategy that keeps the DFC in center focus while also looking at other important aspects of District hydrogeology such as trends in water levels, current pumping distribution, shallow versus deep well screens and the hydrogeologic framework defined in Section 2.0.

The Paleozoic Aquifers do not currently have a DFC developed. The strategy that is developed for the Paleozoic aquifers will be informed by the development of the Trinity Aquifer monitoring strategy, with variation for the unique hydrogeology of the Paleozoic aquifers.

3.3.1 Trinity Aquifer Monitoring Strategy

Our strategy for the assessment of the current Phase I Trinity Aquifer monitoring network will also be used to guide the augmentation of the network in Phase II. The process will be sequential, as outlined in the following.

Step 1 – Establish Full Set of Potential Monitor Wells:

The first step will require two data sets. One is the existing Phase I monitor well network and data. The second will be a database with the available completion (screen location) information for all other potential wells. A potential well must have adequate location, elevation and completion information available, that any water level measurement can be accurately referenced to a common vertical datum, and definitely assigned to a particular aquifer or section of aquifer. It will also be important that the monitor well has a history of water level measurements. Because the DFC is based upon drawdown since the year 2000, it would be best if the time series starts by the year 2000, or can be reliably extrapolated back to that time.

In addition to these attributes, there are other practical considerations that can only be assessed once site visits have begun.

Step 2 – Develop DFC Zones:

The second step will be to divide the Trinity Aquifer within the District into 20 zones based upon the current DFC (termed DFC Zones). These zones are defined by the combination of Northern Trinity Aquifer GAM layer (based on the model grid discretization) and county. An initial assessment of the Phase I wells will be performed to determine whether a monitor well currently exists in each DFC Zone. If this is not the case, we try to find a candidate well for those "empty" zones.

Step 3 – Investigation of Monitor Well Location Based Upon DFC Methods:

Step 3 is an empirical study of the required or optimal number of monitor wells that may be required in a given DFC Zone to reproduce the DFC as calculated from the GAM. The TWDB calculated the DFC using the GAM by averaging drawdown calculated at each GAM model cell for a given model layer and county (DFC Zone) from the year 2000 to 2050. The GAM model grid is a one square mile grid. The District cannot support a monitoring program that would monitor every square mile of the District (3,208 square miles times four model layers equals 12,832 monitor wells). Therefore, the question that has to be addressed is how many monitor wells are required to provide good agreement with the model average methods used by GMA-8.

To test the number of required wells, we will simulate the performance of a hypothetical monitoring network using the existing DFC run. We will start by ensuring that each DFC Zone has at least one monitor well, from the Phase I wells and potential new monitor wells. At these well locations, we will extract the simulated head from the DFC run. These point "measurements" of head represent the simulated monitoring network. We will then estimate average drawdown in each DFC Zone based on these heads. The average will be calculated by interpolating the point "measurements" onto a one square mile grid, then taking the arithmetic mean of the grid values for each DFC Zone.

The DFC Zone drawdown averages estimated from the simulated monitoring network will be compared to the actual DFC run drawdown averages by DFC Zone. We expect there will be a difference between the two values, since the monitoring network has a limited head coverage compared to the GAM.

In a next iteration, we increase the number of monitor wells in those zones with the greatest difference between the estimate from the hypothetical monitoring network and the GAM. The new wells will be located based on an equal area, space filling approach or potentially by adding monitor points at locations where we have identified potential monitor wells. We will consider both options. This increase in well coverage will improve the performance of the monitor well network in those zones. Thus with each iteration, the hypothetical monitoring network will provide an average drawdown estimate that is closer to the DFC.

By this analysis, we hope to gain insight into the number (and potentially the strategy for location) of monitor wells that will adequately track the DFC. The best case we can expect out of this analysis approach is an optimal number of monitor wells in each DFC Zone.

An enhancement to the above analysis would be to look at the improvement (i.e., decrease in monitoring points) that may occur if we account for pumping in our monitor well selection process, instead of the initial space-filling approach. This would require calculation of a pumping density function (acre-feet per year per square-mile) that will be used to guide the location of additional monitor wells. Theoretically, this approach should improve our ability to reproduce the DFC with a smaller number of monitor points.

At the end of Step 3, we hope to have insight into the number of monitor wells it takes to satisfactorily reproduce the DFC average drawdown for each DFC Zone. We will also gain insight into the proposed approach for locating new wells based on pumping density.

Step 4 – Consideration of Water Level Trends:

In Step 4 we will use an analysis of water level trends to provide additional information for locating monitor wells. A monitor well program should be able to track large scale water level declines as a result of large pumping centers as well as regions of the aquifer that appear stable. Our objective is to characterize the trends in water levels at a scale much smaller than a county but not directly affected by pumping (i.e. not in a pumping well or directly adjacent to one).

We will use the data from the Phase I monitor wells in addition to any other available time series data to develop trends. We will focus our analysis on the time period from 2000 to present as this is the drawdown baseline used in the GMA-8 DFC calculations. We will look at two alternatives for this analysis. First, we will see if we have adequate time series data to investigate trends in each DFC Zone. Second, we will look at the dataset more globally and see if the data is defining areas of stable versus decreasing water level trends.

Step 5 - Initial Monitor Well Location Based Previous Analyses:

By this point in the analysis we will have developed some insight into:

- the number of wells needed to satisfactorily reproduce the DFC calculations;
- the influence of pumping on developing a better monitoring network; and
- trends in water levels across the District.

Based on this knowledge, we are ready to evaluate the Phase I wells and start identifying potential Phase II wells.

The first requirement will be the development of a District pumping dataset based upon the District's metered data and the District's best estimate of groundwater use. We will attempt to locate pumping as closely as possible to point locations. Once this is developed, we will use the actual District pumping data to develop a pumping density function for the District. We will then use the DFC Zones, the pumping data and the water level trend data to evaluate Phase I wells and to identify potential Phase II monitor wells.

Step 6 –Screen Monitor Well Locations Based on Updated Hydrogeology:

Because much of the focus at this point has been on the GAM model layering which is based on hydrostratigraphy that is not well matched to District conditions, the next step in the strategy is to compare the draft monitoring network to the hydrogeology developed as part of this scope of work (see Section 2). We will intersect all monitor well screens with the new hydrogeologic framework and make sure that these intervals are being adequately monitored.

Step 7 –Screen Monitor Well Locations Considering Shallow versus Deep:

Finally, we will review the draft monitoring network in terms of how well it does at monitoring aquifer conditions across the District in both shallow (unconfined to semi-confined) and deep (confined) portions of the aquifer system. We will also develop a registered well density coverage and assess whether the overall monitoring network does a good job of mimicking the density of groundwater use as it can be defined from registered wells.

3.3.2 Paleozoic Aquifer Monitoring Strategy

Our strategy for the Paleozoic Aquifers will be similar to that proposed for the Northern Trinity Aquifer with the exception that we will not be defining DFC Zones. Below each step will be discussed in terms of the Paleozoic Aquifers. We will develop similar zones based upon the hydrogeologic framework for assessment of the current Phase I Trinity Aquifer monitoring network. These zones will also be used to guide the augmentation of the network in Phase II. The process will be sequential.

Step 1 – Establish Universe of Potential Monitor Wells:

The same strategy and process used for the Trinity aquifer will be used for the Paleozoic aquifers (see Section 3.3.1, Step 1).

Step 2 – Develop Hydrostratigraphic-County Zones:

The second step will be to divide the Paleozoic aquifers into unique Hydrostratigraphic-County zones. Initially we will define five unique hydrostratigraphic units (Wichita, Bowie, Cisco, Canyon and Strawn) and four counties making 20 maximum combinations. In reality, there are fewer because each hydrostratigraphic unit does not reside in every county. An initial assessment of the Phase I wells will determine whether a monitor well is located in each of the Hydrostratigraphic-County zones. If this is not the case, we try to identify a potential well in each.

Step 3 – Investigation of Monitor Well Location Based Upon DFC Methods:

Step 3 cannot be performed for the Paleozoic aquifers because they have neither a DFC nor a GAM.

Step 4 – Consideration of Water Level Trends:

In Step 4 we will use an analysis of water level trends to provide additional information for locating monitor wells. In a monitor well program you want to be able to monitor large scale water level declines as a result of large pumping centers as well as monitor regions of the aquifer that appear stable. Our objective is to characterize the trends in water levels at a scale much smaller than a county but not directly affected by pumping (ie., not in a pumping well or directly adjacent to one).

We will use the data from the Phase I monitor wells in addition to any other available time series data to develop trends. We will look at two alternatives for this analysis. First, we will see if we have adequate time series data to investigate trends in each Hydrostratigrahic-County zone. Secondly, we will look at the dataset more globally and see how the data is defining areas of stable versus decreasing water level trends.

Step 5 - Initial Monitor Well Location Based Previous Analyses:

We will use the insight gained from Step 3 in the Trinity aquifer analysis along with the trend analysis data to evaluate the Phase I wells and to start identifying potential Phase II wells.

The first step of this analysis will be the development of a District pumping dataset based upon the District's metered data and the District's best estimate of groundwater use. We will attempt to locate pumping as closely as possible to point locations. Once this is developed, we will use the actual District pumping data to develop a pumping density function for the District. Once we have that we will use the Hydrotsratigraphic-County zones, the pumping data and the water level trend data to identify Phase I redundant wells and to identify potential Phase II monitor wells. In addition to the District database, we currently have the last 10 years of driller's reports for wells identified as being drilled for oil and gas exploration. We can also get the last 10 years of oil and gas well locations from the Railroad Commission for approximately $200. This data can help us see where oil and gas water use is most likely.

Step 6 –Screen Monitor Well Locations Based on Updated Hydrogeology:

Because we are using the hydrostratigrahic framework to develop the network, this step is unnecessary.

Step 7 –Screen Monitor Well Locations Based Upon Shallow versus Deep Screens:

Finally, we will review the draft monitoring network in terms of how well it does at monitoring aquifer conditions across the District in both shallow (unconfined to semi confined) and deep (confined) portions of the aquifer system. We will also develop a registered-well density coverage to assess whether the overall monitoring network does a good job of mimicking the density of groundwater use as it can be defined from registered wells.

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APPENDIX 3

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Annual Financial Report
December 31, 2024

INDEPENDENT AUDITORS' REPORT

Board of Directors and General Manager
Upper Trinity Groundwater Conservation District
Springtown, Texas

Opinions

We have audited the accompanying financial statements of the governmental activities and each major fund of the Upper Trinity Groundwater Conservation District (the District) as of and for the year ended December 31, 2024, and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities and each major fund of the District as of December 31, 2024, and the respective changes in financial position for the year end ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinions

We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the District and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with generally accepted auditing standards will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

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In performing an audit in accordance with generally accepted auditing standards, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, budgetary comparison information, schedule of change in Net Pension Liability and Related Ratios, Schedule of Contributions, and Notes to Required Supplementary Information (the Supplementary Information) be presented to supplement the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Supplementary Information is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

Boucher, Morgan & Young

Granbury, Texas
July 17, 2025

MANAGEMENT'S DISCUSSION AND ANALYSIS

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT
Management's Discussion and Analysis

As management of the Upper Trinity Groundwater Conservation District, we offer readers of the District's financial statement this narrative overview and analysis of the financial activities of the District for the fiscal year ended December 31, 2024. The District has implemented Governmental Accounting Standards Board Statement 34 – Basic Financial Statements and Management's Discussion and Analysis for State and Local Governments.

Financial Highlights:

The assets and deferred outflows of the Upper Trinity Groundwater Conservation District exceeded its liabilities and deferred inflows at the close of the most recent fiscal year by $8,111,847.

The District's total net position increased by $52,067 during the fiscal year.

Overview of Financial Statements:

This discussion and analysis is intended to serve as an introduction to the District's basic financial statements. The District's basic financial statements are comprised of three components: 1) government-wide financial statements, 2) fund financial statements, and 3) notes to the financial statements. This report also contains other supplementary information in addition to the basic financial statements themselves.

Government-wide financial statements – The government-wide financial statements are designed to provide readers with a broad overview of the District's finances, in a manner similar to a private-sector business.

The Statement of Net Position presents information on all of the District's assets and liabilities, with the difference between two reported as net position. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the District is improving or deteriorating.

The Statement of Activities presents information showing how the District's net position changed during the fiscal year. All changes in net position are reported when the underlying event giving rise to change occurs, regardless of the timing of related cash flow. Thus, revenues and expenses are reported in this statement for some items that will only result in cash flows in the future fiscal periods.

Both of the government-wide financial statements distinguish functions of the District that are principally supported by charges and fees. The governmental activity of the District is to develop and enforce rules to provide protection to existing wells, to prevent waste and promote groundwater conservation.

Fund financial statements – A fund is a grouping of related accounts that is used to maintain control over resources that have been segregated for specific activities or objectives. The District, like other state and local governments, uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. The funds of the District consist solely of the one governmental fund.

Governmental Funds – Governmental funds are used to account for essentially the same functions reported as governmental activities in the government-wide financial statements. However, unlike the government-wide financial statements, governmental fund financial statements focus on near-term inflows and outflows of spendable resources, as well as on balances of spendable resources available at the end of the fiscal year. Such information may be useful in evaluating a government's near-term financing requirements.

Because the focus of governmental funds is narrower than that of the government-wide financial statements, it is useful to compare the information presented for governmental funds with similar information presented for governmental activities in the government-wide financial statements. By doing so, readers may better understand the long-term impact of a government's near-term financing decisions. Both the governmental fund balance sheet and the governmental fund statement of revenues, expenditures and changes in fund balance provide a reconciliation to facilitate this comparison between governmental funds and governmental activities.

At the close of the current fiscal year, the District's governmental fund reported ending fund balance of $5,738,328 compared to the $5,614,184 in the prior year.

Notes to the Financial Statements – The notes provide additional information that is essential to a full understanding of the data provided in the government-wide and fund financial statements. The notes to the financial statements can be found on pages 16-26 of this report.

Governmental-Wide Financial Analysis

As noted earlier, net position may serve, over time, as a useful indicator of a government's financial position. In the case of Upper Trinity Groundwater Conservation District, assets and deferred outflows exceeded liabilities and deferred inflows by $8,111,847 as of December 31, 2024.

The largest portion of the District's net position is Unrestricted, while the remaining balance reflects its net investment in capital assets.

Upper Trinity Groundwater Conservation District's Net position:

	Governmental Activities 2023	Governmental Activities 2024
Current assets	$ 5,760,627	$ 5,861,692
Capital assets	2,358,851	2,278,850
Net pension asset	-	8,995
Total assets	8,119,478	8,149,537
Deferred outflows	139,151	133,502
Total assets and deferred outflows	8,258,629	8,283,039
Current liabilities	146,443	123,364
Net pension liability	8,882	-
Compensated absences	-	47,828
Total liabilities	155,325	171,192
Net position:		
Net investment in capital assets	2,358,851	2,278,850
Unrestricted	5,744,453	5,832,997
Total net position	$ 8,103,304	$ 8,111,847

As of December 31, 2024, the District is able to report positive balances in both categories of net position.

Analysis of the District's Operations – The following table provides a summary of the District's operations for the year ended December 31, 2024. Governmental-type activities increased the District's net position by $52,067.

Upper Trinity Groundwater Conservation District's Changes in Net position

		Governmental Activities 2023		Governmental Activities 2024
Revenues:				
Program Revenues:				
Water usage fees	$	933,255	$	867,442
New well registration fees		904,665		804,000
Other program revenue		130,993		127,850
Total program revenues		1,968,913		1,799,292
General Revenues:				
Miscellaneous revenue		12,012		8,808
Gain on disposal of capital assets		12,500		-
Investment earnings		85,793		157,396
Total revenues		2,079,218		1,965,496
Expenses:				
Groundwater conservation		1,860,596		1,913,429
Total expenses		1,860,596		1,913,429
Change in net position		218,622		52,067
Net position - beginning of year, as originally stated		7,884,682		8,103,304
Prior period adjustment		-		(43,524)
Net position - beginning of year, as restated		7,884,682		8,059,780
Net position - end of year	$	8,103,304	$	8,111,847

Financial Analysis of the Government's Funds

The net position increased in 2024 by $52,067 compared to a $218,622 increase in 2023. New well registration fees decreased $100,665 which contributed to the decrease in program revenues of $169,621. Expenses increased from the previous year by $52,833.

Capital Assets

The Upper Trinity Groundwater Conservation District's investment in capital assets as of December 31, 2024, amounts to $2,278,850 (net of accumulated depreciation). This investment in capital assets includes land, construction in progress, buildings and improvements, vehicles, furniture and equipment, monitoring wells, and software.

Capital Assets at Year-End Net of Accumulated Depreciation

		Governmental - Type Activities 2023		Governmental - Type Activities 2024
Land	$	267,834	$	267,834
Construction in progress		37,700		-
Building and improvements		1,252,504		1,271,264
Vehicles		200,564		184,525
Furniture and equipment		156,465		146,542
Monitoring wells		334,691		327,668
Software		109,093		81,017
Total	$	2,358,851	$	2,278,850

Depreciation expense on all assets amounted to $198,571 for the year.

Economic Factors for Next Year

The original budget for the 2025 fiscal year shows projected revenues of $1,960,700 and expenditures of $1,870,600.

On November 21, 2024 the Board of Directors of UTGCD passed and adopted Resolution 24-009 Allocation of Funds for the District. They designated “Committed Funds” for Operating Reserve Fund and Legal Reserve and Litigation Fund. They also designated “Assigned Funds” for Monitoring Well Drilling Fund, Facilities/Building Fund, Rainwater Harvesting Grant Program Fund, GAM Development Fund, Special Advertising Fund, and Technology Development Fund.

The Board believes it is very prudent to recognize the litigious nature of the process of DFC adoptions and issues related to rules which contain permit limitations on non-exempt water wells. In addition, the revenues from water usage could decline if certain situations occur. Therefore, the Board deems it wise to accumulate sufficient funds to cover operations and unexpected expenses should they lose any major fee payers.

The District’s immediate and long-term financial goals are to fund necessary water conservation and monitoring programs with program revenues and to safeguard the cash on hand for future needs.

Political issues affecting the District include potential groundwater ownership legislative issues, definition of “brackish” water, and discussions of the authority of groundwater conservation districts.

Production of groundwater by public water systems could decrease if they increase conservation efforts or increase their supply of surface water. The District witnessed a decrease in new well registrations due to the changes in the housing market and interest rates.

Request for Information

This financial report is designed to provide our citizens, customers, investors and creditors with a general overview of the District’s finances. If you have questions about this report or need any additional information, contact Upper Trinity Groundwater Conservation District in care of Doug Shaw, General Manager, 1859 W Hwy 199, P.O. Box 1749, Springtown, Texas 76082.

BASIC FINANCIAL STATEMENTS

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Statement of Net Position
December 31, 2024

		Governmental Activities
ASSETS		
Current assets:		
Cash and cash equivalents	$	2,111,035
Certificates of deposit		3,247,441
Receivables, net of allowance		486,724
Prepaid expenses		12,782
Deposits		1,610
Undeposited funds		2,100
Total current assets		5,861,692
Non-current assets:		
Capital assets:		
Nondepreciable		267,834
Depreciable, net		2,011,016
Net pension asset		8,995
Total assets		8,149,537
DEFERRED OUTFLOWS		
Related to TCDRS pension		133,502
Total deferred outflows		133,502
Total assets and deferred outflows	$	8,283,039
LIABILITIES		
Current liabilities:		
Accounts and credit card payables	$	36,764
Payroll liabilities		18,960
Well completion report deposits		67,640
Noncurrent liabilities		
Due within one year		37,621
Due in more than one year		10,207
Total liabilities		171,192
NET POSITION		
Net investment in capital assets		2,278,850
Unrestricted		5,832,997
Total net position	$	8,111,847

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Statement of Activities
For the Year Ended December 31, 2024

	Expenses	Program Revenues: Charges for Services	Net (Expense) Revenue and Changes in Net Position: Primary Government: Governmental Activities
Primary Government			
Governmental Activities			
General government	$ 1,913,429	$ 1,799,292	$ (114,137)
Total governmental	$ 1,913,429	$ 1,799,292	(114,137)
General revenues			
Miscellaneous revenue			8,808
Investment earnings			157,396
Total general revenues			166,204
Change in net position			52,067
Net position - beginning, as originally stated			8,103,304
Prior period adjustment			(43,524)
Net position - beginning, as restated			8,059,780
Net position - ending			$ 8,111,847

The accompanying notes are an integral part of the financial statements.

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Balance Sheet - Governmental Fund

December 31, 2024

	General Fund
ASSETS	
Cash and cash equivalents	$ 2,111,035
Certificates of deposit	3,247,441
Accounts receivable, net of allowance	486,724
Prepaid expenditures	12,782
Security deposits	1,610
Undeposited funds	2,100
Total assets	$ 5,861,692
LIABILITIES	
Accounts and credit cards payable	$ 36,764
Payroll liabilities	18,960
Well completion report deposits	67,640
Total liabilities	123,364
FUND BALANCE	
Nonspendable	12,782
Committed	1,500,000
Assigned	1,800,000
Unassigned	2,425,546
Total fund balance	5,738,328
Total liabilities and fund balance	$ 5,861,692

The accompanying notes are an integral part of the financial statements.

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Reconciliation of the Governmental Fund Balance Sheet
to the Statement of Net Position
December 31, 2024

Total Fund Balance - Governmental Fund		$ 5,738,328
Capital assets used in governmental activities are not financial resources and therefore are not reported in governmental funds balance sheet.		2,278,850
The statement of net position includes the District's proportionate share of the TCDRS net pension (liability) asset as well as certain pension related transactions accounted for as Deferred Inflows and Outflows of resources.		
Net pension asset (liability)	8,995	
Deferred retirement contributions	59,834	
Deferred investment experience	12,342	
Deferred actual vs. assumption	28,016	
Deferred assumption/input changes	33,310	142,497
Compensated absences are not due and payable in the current period and, therefore, are not reported in the funds.		(47,828)
Net Position of Governmental Activities		$ 8,111,847

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Statement of Revenues, Expenditures
And Changes in Fund Balance - Governmental Fund
For the Year Ended December 31, 2024

	General Fund
REVENUES	
Exception fees	$ 3,210
Penalties assessed	72,590
Forfeited deposits	6,100
New well registration fees	804,000
GAC review fees	27,200
Permit application fees	18,750
Semi-annual program income	867,442
Total program revenue	1,799,292
Investment earnings	157,396
Other sources	8,808
Total revenues	1,965,496
EXPENDITURES	
General government	1,722,782
Capital outlay	118,570
Total expenditures	1,841,352
Net change in fund balance	124,144
Fund balance - beginning of year	5,614,184
Fund balance - end of year	$ 5,738,328

The accompanying notes are an integral part of the financial statements.

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Reconciliation of the Governmental Fund Statement of Revenues, Expenditures and Changes in Fund Balance to the Statement of Activities

For the Year Ended December 31, 2024

Total Net Change in Fund Balance - Governmental Fund	$	124,144
Current year capital outlays are expenditures in the fund financial statements, but they should be shown as increases in capital assets in the government-wide financial statements. The net effect of removing the 2023 capital outlays is to increase net position.		118,570
Depreciation is not recognized as an expense in governmental funds since it does not require the use of current financial resources. The net effect of the current year's depreciation is to decrease net position.		(198,571)
Net pension liabilities as well as the related deferred inflows and outflows of resources generated from those assets are not payable from current resources and therefore, are not reported in the governmental funds. These balances increased (decreased) by this amount.		12,228
Changes in compensated absences is not an expenditure in the governmental funds but is recorded as a liability in the statement of net position. The net increase in the liability decreases net position.		(4,304)
Change in Net Position of Governmental Activities	$	52,067

NOTES TO FINANCIAL STATEMENTS

NOTE 1. ORGANIZATION

The Upper Trinity Groundwater Conservation District (the "District") is a political subdivision of the State of Texas created under the authority of Article XVI, Section 59, Texas Constitution, and operating pursuant to the provisions of the Texas Water Code, Chapter 36, and Senate Bill 1983, Acts of the 80th Legislature, Regular Session, 2007. The creation of the District was confirmed in an election by the citizens of Montague, Wise, Parker and Hood counties, Texas, on November 6, 2007.

The mission of the Upper Trinity Groundwater Conservation District is to develop rules to provide protection to existing wells, prevent waste, promote conservation, provide a framework that will allow availability and accessibility of groundwater for future generations, protect the quality of the groundwater in the recharge zone of the aquifer, ensure that the residents of Montague, Wise, Parker, and Hood counties maintain local control over their groundwater, respect and protect the property rights of landowners in groundwater, and operate the District in a fair and equitable manner for all residents of the District.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Generally Accepted Accounting Principles – Upper Trinity Groundwater Conservation District prepares its financial statements in accordance with accounting principles generally accepted in the United States of America, in conformity with authoritative pronouncements of the Governmental Accounting Standards Board (GASB).

A. Basis of Presentation – Government – Wide Statements

The government-wide financial statements (the statement of net position and the statement of activities) report information on all the activities of the District. There are only governmental activities, which normally are supported by governmental revenues, and are reported separately from business-type activities, which rely to a significant extent on fees and charges for support. The District has no business-type activities.

The statement of activities demonstrates the degree to which the direct expenses of a given program are offset by program revenues. Direct expenses are those that are clearly identifiable with a specific program. Program revenues include charges to customers or applicants who purchase, use, or directly benefit from goods, services, meeting the operational or capital requirements of a particular program. Taxes and other items not properly included among program revenues are reported instead as general revenues.

B. Measurement focus, Basis of Accounting and Basis of Presentation

The government-wide statements are reported using the economic resources measurement focus and the accrual basis of accounting. Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of related cash flow.

Governmental fund financial statements are reported using the current financial resources measurement focus and the modified accrual basis of accounting. Under the modified accrual basis of accounting, revenues are recognized as soon as they are measurable and available. Revenues are considered to be available when they are collectible within the current period or soon enough thereafter to pay the liabilities of the current period. Water usage fees for each six month period are due and payable one month after the period ends. The District recognizes all fees pertaining to the calendar year as revenues for that year.

Expenditures are generally recorded when the related fund liability is incurred.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

B. Measurement focus, Basis of Accounting and Basis of Presentation

The accounts of the District are organized and operated on the basis of funds. A fund is an independent fiscal and accounting entity with self-balancing set accounts. Fund accounting segregates funds according to their purpose and is used to aid management in demonstrating compliance with finance-related legal and contractual provisions. The minimum number of funds is maintained consistent with legal and managerial requirements.

The District reports the following major governmental fund: The *general fund* is the government's primary operating fund. It accounts for all financial resources of the general government, except those required to be accounted for in another fund.

There are no proprietary funds of the District generating significant operating revenues, such as charges for services, resulting from exchange transactions associated with the principal activity of the fund.

C. Cash and Cash Equivalents

For purposes of the statements of cash flows, the District considers highly liquid investments with a maturity of three months or less to be cash equivalent.

D. Accounts Receivable

Gross accounts receivable of $500,102 are presented in the Balance Sheet and Statement of Net Position net of an allowance for doubtful accounts in the amount of $13,378.

E. Prepaid Items

Certain payments to vendors reflects costs applicable to future periods are are recorded as prepaid items in both the government-wide and fund financial statements.

F. Capital Assets, Depreciation, and Amortization

The District's capital assets with useful lives of more than one year stated as historical cost and comprehensively reported in the government-wide financial statements. The District generally capitalizes individual assets with an initial cost of $1,500 or more, or a grouping of like-kind assets with a total cost of $5,000 or more. Capital assets are depreciated using the straight-line method. When capital assets are disposed, the cost and applicable accumulated depreciation are removed from the respective accounts, and the resulting gain or loss is recorded in operations.

Estimated useful lives, in years, for depreciable assets are as follows:

Vehicles	5-10 years
Furniture and equipment	3-25 years
Monitoring wells	50 years
Software	3-10 years
Building and improvements	15-30 years

Maintenance and repairs which do not materially improve or extend the lives of the respective assets are charged to expense as incurred.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

G. Deferred Outflows and Deferred Inflows of Resources

In addition to assets, the statement of financial position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, deferred outflows of resources, represents a consumption of net position that applies to future period(s) and so will not be recognized as an outflow of resources (expense/expenditure) until then.

In addition to liabilities, the statement of financial position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, deferred inflows of resources, represents an acquisition of net position that applies to a future period(s) and so will not be recognized as an inflow of resources (revenue) until that time.

H. Compensated Absences

It is the District's policy to permit employees to accumulate earned but unused vacation and sick benefits. All vacation and sick pay is accrued for leave that has not been used if the leave is attributable to services already rendered, the leave accumulates, and the leave is more likely than not to be used for time off or otherwise paid in cash or settled through noncash means and leave that has been used, but not yet paid in cash or settled through noncash means.

I. Pensions

For purposes of measuring the net pension liability (asset), deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the Fiduciary Net Position of the Texas County and District Retirement System (TCDRS) and additions to/deductions from TCDRS' Fiduciary Net Position have been determined on the same basis as they are reported by TCDRS. For this purpose, plan contributions are recognized in the period that compensation is reported for the employee, which is when contributions are legally due. Benefit payments and refunds are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

J. Budget

The District is legally required to adopt a budget and has done so in order to better manage its resources.

1. The budget is adopted on a basis consistent with accounting principles generally accepted in the United States of America (GAAP). Annual appropriated budgets are adopted for the general fund. All annual appropriations lapse at fiscal year-end. The final amended expenditures budget for the general fund for the year ended December 31, 2024 totaled $2,135,459. The general fund revenues budgeted for the year were $2,082,700 which were less than the budgeted expenditures, resulting in a deficit budget for the year.

2. The Board of Directors may approve budget amendments during the year. The Board approved budget amendments through the year as required.

3. Formal budgetary integration is employed as a management control device during the year for the general fund.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

K. Net Position and Fund Balance

Net position represents the difference between assets and deferred outflows and liabilities deferred inflows on the government-wide financial statements. The net investment in capital assets component of net position consists of capital assets, net of accumulated depreciation, reduced by the outstanding balances of any borrowing used for the acquisition, construction or improvement of those assets, and adding back unspent proceeds. Net position is reported as restricted when there are limitations imposed on its use either through the enabling legislation adopted by the District or through external restrictions imposed by creditors, grantors, or laws and/or regulations of other governments. Unrestricted net position is the net position that does not meet the definition of “net investment in capital assets” or “restricted net position”.

Sometimes the District will fund outlays for a particular purpose from both restricted (e.g. restricted bond or grant proceeds) and unrestricted resources. In order to calculate the amounts to report as restricted net position and unrestricted net position in the government-wide financial statements, a flow assumption must be made about the order in which the resources are considered to be applied. It is the District’s policy to consider restricted net position to have been depleted before unrestricted net position is applied.

Fund Balance Classification - The governmental fund financial statements present fund balances based on classifications that comprise a hierarchy that is based primarily on the extent to which the District is bound to honor constraints on the specific purpose for which amounts in the respective governmental funds can be spent. The classifications used in the governmental fund financial statements are as follows:

Nonspendable - Resources which cannot be spent because they are either a) not in spendable form or; b) legally or contractually required to be maintained intact.

Restricted – Resources with constraints placed on the use of resources are either a) externally imposed by creditors (such as through debt covenants), grantors, contributors, or laws or regulations of other governments; or b) imposed by law through constitutional provisions or enabling legislation.

Committed – Resources which are subject to limitations the government imposes upon itself at its highest level of decision making (resolution), and that remain binding unless removed in the same manner.

Assigned - Resources neither restricted nor committed for which a government has a stated intended use as established by the Board of Directors or an official to which to the Board of Directors has delegated the authority to assign amounts for specific purposes.

Unassigned – Resources which cannot be properly classified in one of the other four categories. The General fund is the only fund that reports a positive unassigned fund.

Sometimes the District will fund outlays for a particular purpose from both restricted and unrestricted resources (the total of committed, assigned, and unassigned fund balance). In order to calculate the amounts to report as restricted, committed, assigned, and unassigned fund balance in the government fund financial statements, a flow assumption must be about the order in which the resources are considered to be applied. It is the District’s policy to consider restricted fund balance to have been depleted before using any components of unrestricted fund balance. Further, when the components of unrestricted fund balance can be used for the same purpose, committed fund balance is depleted first, followed by assigned fund balance. Unassigned fund balance is applied last.

L. Estimates

The preparation of financial statements in conformity with accounting principles generally accept in the United States of America required management to make estimates and assumptions that affect the amounts reported in the financial statements. Actual results may differ from those estimates.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

M. Implementation of New Accounting Standards

In 2024, the District implemented GASB Statement No. 101, *Compensated Absences*. The objective of this statement is to better meet information needs of financial statements users by aligning the recognition and measurement guidance under a unified model and by amending certain previously required disclosures. This Statement requires that liabilities for compensated absences for leave that has been used but not yet paid in cash or settled through noncash means as well as for leave that has not been used if (a) the leave is attributable to services already rendered, (b) the leave accumulates, and (c) the leave is more likely than not to be used for time off or otherwise paid in cash or settled through noncash means.

NOTE 3. CASH AND CASH EQUIVALENTS AND CERTIFICATES OF DEPOSIT

As of December 31, 2024, the District did not own any investments. All cash and cash equivalents and certificates of deposit were deposited with financial institutions.

A. Authorized Investments

The State Public Funds Investments Act authorizes the government to invest in obligations of the U.S. Treasury, obligations of states, agencies, counties, cities and other political subdivisions, secured certificates of deposit, repurchase agreements, bankers' acceptances, commercial paper, mutual funds, guaranteed investment contracts and investment pools. During the year ended December 31, 2024, the District did not own any types of securities other than those permitted by statute.

B. Custodial Credit Risk

Custodial credit risk is the risk that in the event of a bank failure, the District's deposits may not be returned to it. At year end, the book balance of the District's cash and cash equivalents and certificates of deposit was $5,358,476 which was all unrestricted. The bank balance of $5,405,966 was partially covered with federal depository insurance and pledged collateral while the remaining $3,409 was not collateralized. The District believes it is not exposed to any significant credit risk on its cash and cash equivalents and certificates of deposit balances.

C. Interest Rate Risk

The District's policy is that investments be made in a manner to attain the maximum rate of return allowed through prudent and legal investing of District funds while preserving and protecting capital in the overall portfolio. As of December 31, 2024 the District was not invested in any investments subject to interest rate risk.

D. Credit Risk and Concentration of Credit Risk

Credit risk is the risk that the issuer or other counterparty to an investment will not fulfill its obligations. It is the District's policy to allow for investments in obligations of the U.S. or its agencies and instrumentalities, certificates of deposit and local government investment pools.

NOTE 4. CAPITAL ASSETS

Capital assets consist of the following:

	Balance 12/31/2023	Additions	Retirements/ Adjustments	Balance 12/31/2024
Governmental activities:				
Non-depreciable assets:				
Land	$ 267,834	$ -	$ -	$ 267,834
Construction in progress	37,700	33,950	(71,650)	-
Total non-depreciable assets	305,534	33,950	(71,650)	267,834
Capital assets being depreciated:				
Building and improvements	1,467,320	-	71,650	1,538,970
Vehicles	483,581	57,957	(32,839)	508,699
Furniture and equipment	321,449	26,663	-	348,112
Monitoring wells	351,200	-	-	351,200
Software	315,374	-	-	315,374
Total capital assets being depreciated	2,938,924	84,620	38,811	3,062,355
Less accumulated depreciation:				
Building and improvements	(214,816)	(52,890)	-	(267,706)
Vehicles	(283,017)	(73,996)	32,839	(324,174)
Furniture and equipment	(164,984)	(36,586)	-	(201,570)
Monitoring wells	(16,509)	(7,023)	-	(23,532)
Software	(206,281)	(28,076)	-	(234,357)
Total accumulated depreciation	(885,607)	(198,571)	32,839	(1,051,339)
Total capital assets being depreciated, net	2,053,317	(113,951)	71,650	2,011,016
Governmental activities capital assets, net	$ 2,358,851	$ (80,001)	$ -	$ 2,278,850

Depreciation expense charged to the general government operations was $198,571.

NOTE 5. RISK MANAGEMENT

The District is exposed to various risks of loss related to torts; theft of, damage to and destruction of assets; errors and omissions; injuries to employees; natural disasters; and the litigious nature of the political environment in which it operates. The District is covered through third-party insurance policies, and risk is also mitigated by the protections afforded it through the Texas Water Code, Chapter 36, Sections 36.066, 36.251 and 36.253. Management believes such coverage is sufficient to preclude any significant uninsured losses to the District. Settled claims have not exceeded the commercial coverage in any of the past three fiscal years.

NOTE 6. LONG-TERM LIABILITIES

Long-term liability activity for the year ended December 31, 2024 was as follows:

	Balance 12/31/2023 *	**Additions**	**Reductions**	**Balance 12/31/2024**	**Due Within One Year**
Compensated absences	$ 43,524	$ 4,304	$ -	$ 47,828	$ 37,621
	$ 43,524	$ 4,304	$ -	$ 47,828	$ 37,621

* Balance was restated for implementation of GASB 101

NOTE 7. FUND BALANCE CLASSIFICATIONS

The Board passed a resolution during 2024 in order to commit a total of $1,500,000 for a legal reserve and litigation fund.

The Board has assigned the 2024 fund balance for the following purposes:

Monitoring well drilling fund	$750,000
Rainwater harvesting grant fund	250,000
Facilities and building fund	250,000
Groundwater availability model development fund	250,000
Special Advertising fund	50,000
Technology development fund	250,000

NOTE 8. RETIREMENT PLAN

A. Plan Description

The District provides retirement benefits for all of its full-time and part-time employees through a nontraditional defined benefit plan in the state-wide Texas County and District Retirement System (TCDRS). The Board of Trustees of TCDRS is responsible for the administration of the state-wide agent multiple-employer public employee retirement. TCDRS in the aggregate issues an annual comprehensive financial report (ACFR) on a calendar year basis. The ACFR is available upon written request from the TCDRS Board of Trustees at P.O. Box 2034, Austin, TX 78768-2034 or at www.tcdrs.org.

B. Benefits Provided

The plan provisions are adopted by the governing body of the employer, within the options available in the Texas state statutes governing TCDRS (TCDRS Act). Members can retire at age 60 and above with 5 or more years of service, with 30 years of service regardless of age, or when the sum of their age and years of service equals 75 or more, when vested. Members are vested after 5 years of service but must leave their accumulated contributions in the plan to receive any employer-financed benefit. Members who withdraw their personal contributions in a lump sum are not entitled to any amounts contributed by their employer.

Benefit amounts are determined by the sum of the employee's contributions to the plan, with interest, and employer-financed monetary credits. The level of these monetary credits is adopted by the governing body of the employer within the actuarial constraints improved by the TCDRS Act so that the resulting benefits can expect to be adequately financed by the employer's commitment to contribute. At retirement, death or disability, the benefit is calculated by converting the sum of the employee's accumulated contributions and the employer-financed monetary credits to a monthly annuity using annuity purchase rates prescribed by the TCDRS Act. There are no automatic post-employment benefit changes, including automatic COLAs.

At the December 31, 2023 valuation and measurement date, the following employees were covered by the benefit terms:

Inactive employees or beneficiaries currently receiving benefits	2
Inactive employees entitled to but not yet receiving benefits	9
Active employees	12
	23

NOTE 8. RETIREMENT PLAN (CONTINUED)

C. Contributions

The District has elected the annually determined contribution rate (Variable Rate) plan provision of the TCDRS Act. The plan is funded by monthly contributions from both employee members and the employer based on the covered payroll of employee members. Under the TCDRS Act, the contribution rate of the employer is actuarially determined annually.

The District contributed using the actuarially required contribution rate of 7.03% for the calendar year ending 2024. The deposit rate payable by the employee members for calendar year 2024 is the rate of 5% as adopted by the governing body of the employer. The employee and employer deposit rates may be changed by the governing body of the District within the options available in the TCDRS Act.

D. Net Pension Liability

The District's Net Pension Liability (NPL) for the year ended December 31, 2024, was measured as of December 31, 2023, and the Total Pension Liability (TPL) used to calculate the Net Pension Liability was determined by an actuarial valuation as of that date.

<u>Actuarial Assumptions:</u>

The Total Pension Liability in the December 31, 2023 actuarial valuation was determined using the following actuarial assumptions:

Inflation	2.50% per year
Overall payroll growth	4.70% per year
Investment rate of return	7.60%, net of pension plan investment and administrative expenses

The annual salary increase rates assumed for individual members vary by length of service and by entry-age group. The annual rates consist of a general wage inflation component of 3.00% (made up of 2.50% inflation and 0.50% productivity increase assumptions) and a merit, promotion and longevity component that on average approximates 1.70% per year for a career employee.

Mortality rates for depositing members as well as service retirees, beneficiaries and non-depositing members were based on 135% of the Pub-2010 General Employees Amount-Weighted Mortality Table for males and 120% of the Pub-2010 General Employees Amount-Weighted Mortality Table for females as appropriate, projected with 100% of the MP-2021 Ultimate scale after 2010. Disabled retirees were based on 160% of the Pub-2010 General Disabled Retirees Amount-Weighted Mortality Table for males and 125% of the Pub-2010 General Disabled Retirees Amount-Weighted Mortality Table for females as appropriate, projected with 100% of the MP-2021 Ultimate scale after 2010.

The demographic assumptions were developed from an actuarial experience investigation of TCDRS over the years 2017-2020 and were adopted by the TCDRS Board of Trustees in December of 2021. All economic assumptions were adopted by the TCDRS Board of Trustees in March of 2021. These assumptions, except where required to be different by GASB 68, are used to determine the total pension liability as of December 31, 2023. The assumptions are reviewed annually for continued compliance with the relevant actuarial standards of practice.

NOTE 8. RETIREMENT PLAN (CONTINUED)

D. Net Pension Liability (continued)

The long-term expected rate of return of 7.60% is determined by adding expected inflation to expected long-term real returns, and reflecting expected volatility and correlation. The capital market assumptions and information shown below are provided by TCDRS' investment consultant, Cliffwater LLC. The numbers shown are based on January 2023 information for a 10-year time horizon and are re-assessed at a minimum of every four years, and is set based on a long-term time horizon. Best estimates of geometric real rates of return (net of inflation, assumed at 2.30%) for each major asset class included in the target asset allocation (per Cliffwater's 2023 capital market assumptions) were adopted at the March 2023 TCDRS board meeting and are summarized below:

Asset Class	Benchmark	Target Allocation (1)	Geometric Real Rate of Return (2)
U.S. Equities	Dow Jones U.S. Total Stock Market Index	11.50%	4.75%
Global Equities	MSCI World (net) Index	2.50%	4.75%
Int'l Equities - Developed Markets	MSCI World Ex USA (net) Index	5.00%	4.75%
Int'l Equities - Emerging Markets	MSCI Emerging Markets (net) Index	6.00%	4.75%
Investment-Grade Bonds	Bloomberg U.S. Aggregate Bond Index	3.00%	2.35%
Strategic Credit	FTSE High-Yield Cash-Pay Index	9.00%	3.65%
Direct Lending	Morningstar LTSA US Leveraged Loan TR USD Index	16.00%	7.25%
Distressed Debt	Cambridge Associates Distressed Securities Index (3)	4.00%	6.90%
REIT Equities	67% FTSE NAREIT All Equity REITs Index + 33% S&P Global REIT (net) Index	2.00%	4.10%
Master Limited Partnerships	Alerian MLP Index	2.00%	5.20%
Private Real Estate Partnerships	Cambridge Associates Real Estate Index (4)	6.00%	5.70%
Private Equity	Cambridge Associates Global Private Equity & Venture Capital Index (5)	25.00%	7.75%
Hedge Funds	Hedge Fund Research, Inc. (HFRI) Fund of Funds Composite Index	6.00%	3.25%
Cash Equivalents	90-Day U.S. Treasury	2.00%	0.60%
Total		100.00%	

(1) Target asset allocation adopted at the March 2024 TCDRS Board meeting.

(2) Geometric real rates of return equal the expected return for the asset class minus the assumed inflation rate of 2.2%, per Cliffwater's 2024 capital market assumptions.

(3) Includes vintage years 2005-present of Quarter Pooled Horizon IRRs.

(4) Includes vintage years 2007-present of Quarter Pooled Horizon IRRs.

(5) Includes vintage years 2006-present of Quarter Pooled Horizon IRRs.

Discount Rate

The discount rate used to measure the Total Pension Liability was 7.60%. Using the alternative method, the projected fiduciary net position is determined to be sufficient compared to projected benefit payments based on the funding requirements under the District's funding policy and the legal requirements under the TCDRS Act.

1. TCDRS has a funding policy where the unfunded actuarial accrued liability (UAAL) shall be amortized as a level percent of pay over 20-year closed layered periods.
2. Under the TCDRS Act, the District is legally required to make the contribution specified in the funding policy.
3. The District assets are projected to exceed its accrued liabilities in 20 years or less. When this point is reached, the District is still required to contribute at least the normal cost.
4. Any increased cost due to the adoption of a COLA is required to be funded over a period of 15 years, if applicable.

NOTE 8. RETIREMENT PLAN (CONTINUED)

D. Net Pension Liability (continued)

Since the projected fiduciary net position is projected to be sufficient to pay projected benefit payments in all future years, the discount rate for purposes of calculating the total pension liability and the net pension liability of the District is equal to the long-term assumed rate of return on investments, net of investment expenses but gross of inflation.

	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability/(Asset) (a) - (b)
Balance at 12/31/2022	$ 711,865	$ 702,983	$ 8,882
Changes for the year:			
Service cost	83,274	-	83,274
Interest on total pension liability	60,284	-	60,284
Effect of plan changes	-	-	-
Effect of economic/demographic gains or losses	17,368	-	17,368
Effect of assumptions changes or inputs	-	-	-
Refund of contributions	(469)	(469)	-
Benefit payments	(3,447)	(3,447)	-
Administrative expenses	-	(458)	458
Member contributions	-	40,382	(40,382)
Net investment income	-	78,172	(78,172)
Employer contributions	-	55,808	(55,808)
Other	-	4,898	(4,898)
Net changes	$ 157,010	$ 174,886	$ (17,876)
Balance at 12/31/2023	**$ 868,875**	**$ 877,870**	**$ (8,995)**

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability of the District, calculated using the discount rate of 7.60%, as well as what the District's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.60%) or 1-percentage point higher (8.60%) than the current rate:

	1% Decrease in Discount Rate (6.60%)	Current Discount Rate (7.60%)	1% Increase in Discount Rate (8.60%)
Total pension liability	$ 1,058,305	$ 868,875	$ 717,835
Fiduciary net position	877,871	877,870	877,871
Net pension liability (asset)	$ 180,434	$ (8,995)	$ (160,036)

Pension Plan Fiduciary Net Position

Detailed information about the pension plan's Fiduciary Net Position is available in a separately-issued TCDRS comprehensive annual financial report. The most recent report may be obtained on the internet at www.tcdrs.org.

Pension Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

For the fiscal year ended December 31, 2024, the District recognized pension expense of $46,212.

NOTE 8. RETIREMENT PLAN (CONTINUED)

D. Net Pension Liability (continued)

As of December 31, 2024, the District reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	Deferred Inflows of Resources	Deferred Outflows of Resources
Differences between expected and actual experience	$ 17,731	$ 45,747
Changes of assumptions	-	33,310
Net difference between projected and actual earnings	-	12,342
Contributions subsequent to the measurement date	N/A	59,834
Total	$ 17,731	$ 151,233

$59,834 reported as deferred outflows of resources related to pensions resulting from contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability for the year ending December 31, 2025. Other amounts reported as deferred outflows and inflows of resources related to pensions will be recognized in pension expense as follows:

Valuation year ended December 31:	
2024	$ 8,490
2025	9,662
2026	23,943
2027	4,277
2028	5,442
Thereafter	21,854

NOTE 9. PRIOR PERIOD ADJUSTMENT

As a result of implementing GASB Statement No. 101, Compensated Absences, the District has restated the beginning net position in the government-wide Statement of Net Position, effectively decreasing net position as of January 1, 2024 by $43,524. The decrease results from recognizing additional compensated absences that was attributable to services already rendered, accumulates, and is more likely than not to be used for time off or otherwise paid in cash or settled through noncash means. The effect of this change as of December 31, 2023 is an increase of $43,524 in long-term liabilities and a corresponding decrease in net position.

	Governmental Activities
Net Position January 1, 2024, as originally stated	$ 8,103,304
Prior period adjustment - change in accounting principle	(43,524)
Net Position January 1, 2024, as restated	$ 8,059,780

REQUIRED SUPPLEMENTARY INFORMATION

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Statement of Revenues, Expenditures and
Changes in Fund Balance - Budget and Actual
General Fund
For the Year Ended December 31, 2024

	GAAP Basis			Variance
	Budgeted Amounts			Positive
	Original	Final	Actual	(Negative)
REVENUES				
Exception fees	$ 2,500	$ 2,500	$ 3,210	$ 710
Export fees	-	-	-	-
Penalties assessed	10,000	10,000	72,590	62,590
Forfeited deposits	2,500	2,500	6,100	3,600
New well registration fees	990,000	990,000	804,000	(186,000)
GAC review fees	52,500	52,500	27,200	(25,300)
Permit application fees	7,200	7,200	18,750	11,550
Semi-annual program income	950,000	950,000	867,442	(82,558)
Total program revenue	2,014,700	2,014,700	1,799,292	(215,408)
Investment earnings	60,000	60,000	157,396	97,396
Other sources	8,000	8,000	8,808	808
Total revenues	2,082,700	2,082,700	1,965,496	(117,204)
EXPENDITURES				
General government	1,855,400	2,007,959	1,722,782	285,177
Capital outlay	31,500	127,500	118,570	8,930
Total expenditures	1,886,900	2,135,459	1,841,352	294,107
Excess (Deficiency) of Revenues Over (Under) Expenditures	195,800	(52,759)	124,144	176,903
Fund balance - beginning of year	5,614,184	5,614,184	5,614,184	-
Fund balance - end of year	$ 5,809,984	$ 5,561,425	$ 5,738,328	$ 176,903

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Schedule of Changes in Net Pension Liability
and Related Ratios
Last 10 Measurement Years

Total Pension Liability	**2023**	**2022**	**2021**	**2020**
Service Cost	$ 83,274	$ 72,494	$ 78,518	$ 61,653
Interest on total pension liability	60,284	48,992	40,206	31,131
Effect of plan changes	-	-	-	-
Effect of assumption changes or inputs	-	-	8,698	40,015
Effect of economic/demographic (gains) or losses	17,368	20,001	(2,335)	683
Benefit payments/refunds of contributions	(3,916)	(3,447)	(3,447)	(7,811)
Net Change in Total Pension Liability	157,010	138,040	121,640	125,671
Total Pension Liability, beginning	711,865	573,825	452,185	326,514
Total Pension Liability, ending (a)	$ 868,875	$ 711,865	$ 573,825	$ 452,185
Fiduciary Net Position				
Employer contributions	$ 55,808	$ 61,535	$ 39,700	$ 36,959
Member contributions	40,382	37,430	31,811	28,965
Investment income net of investment expenses	78,172	(45,636)	109,023	37,674
Benefit payments/refunds of contributions	(3,916)	(3,447)	(3,447)	(7,811)
Administrative expenses	(458)	(412)	(346)	(337)
Other	4,898	13,983	2,056	1,755
Net Change in Fiduciary Net Position	174,887	63,454	178,797	97,205
Fiduciary Net Position, beginning	702,983	639,529	460,732	363,527
Fiduciary Net Position, ending (b)	$ 877,870	$ 702,983	$ 639,529	$ 460,732
Net Pension Liability (Asset), ending = (a) - (b)	$ (8,995)	$ 8,882	$ (65,704)	$ (8,547)
Fiduciary net position as a % of total pension liability	101.04%	98.75%	111.45%	101.89%
Pensionable covered payroll	$ 807,639	$ 748,606	$ 636,212	$ 579,299
Net pension liability as a % of covered payroll	-1.11%	1.19%	-10.33%	-1.48%

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Schedule of Changes in Net Pension Liability
and Related Ratios - continued
Last 10 Measurement Years

2019	2018	2017	2016	2015	2014
$ 54,635	$ 48,441	$ 44,816	$ 42,402	$ 19,962	$ 21,024
25,387	19,544	14,109	10,705	6,204	4,158
-	-	-	-	(3,620)	-
-	-	119	-	1,886	-
(10,528)	1,244	8,751	(25,799)	26,243	3,650
(3,447)	(3,138)	(5,458)	(13,040)	(2,766)	-
66,047	66,091	62,337	14,268	47,909	28,832
260,467	194,376	132,039	117,771	69,862	41,030
$ 326,514	$ 260,467	$ 194,376	$ 132,039	$ 117,771	$ 69,862
$ 31,573	$ 29,233	$ 26,740	$ 28,501	$ 13,860	$ 11,178
24,822	23,845	21,088	19,959	17,724	14,747
43,539	(3,498)	22,875	7,967	(1,459)	3,400
(3,447)	(3,138)	(5,458)	(13,040)	(2,766)	-
(277)	(213)	(145)	(86)	(67)	(49)
1,863	1,510	567	4,417	246	(3)
98,073	47,739	65,667	47,718	27,538	29,273
265,454	217,715	152,048	104,330	76,792	47,519
$ 363,527	$ 265,454	$ 217,715	$ 152,048	$ 104,330	$ 76,792
$ (37,013)	$ (4,987)	$ (23,339)	$ (20,009)	$ 13,441	$ (6,930)
111.34%	101.91%	112.01%	115.15%	88.59%	109.92%
$ 496,432	$ 476,893	$ 421,761	$ 399,176	$ 354,472	$ 294,939
-7.46%	-1.05%	-5.53%	-5.01%	3.79%	-2.35%

UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT

Schedule of Employer Contributions
Last 10 Fiscal Years

Year Ending December 31	Actuarially Determined Contribution	Actual Employer Contribution	Contribution Deficiency (Excess)	Pensionable Covered Payroll	Actual Contribution as a % of Covered Payroll
2015	13,860	13,860	-	354,472	3.91%
2016	28,501	28,501	-	399,176	7.14%
2017	26,740	26,740	-	421,761	6.34%
2018	29,233	29,233	-	476,893	6.13%
2019	31,573	31,573	-	496,432	6.36%
2020	36,959	36,959	-	579,299	6.38%
2021	39,700	39,700	-	636,212	6.24%
2022	61,535	61,535	-	748,606	8.22%
2023	55,808	55,808	-	807,639	6.91%
2024	59,076	59,076	-	840,873	7.03%

Budget

Annual operating budget is adopted on a basis consistent with generally accepted accounting principles for a governmental fund. The budget lapses at fiscal year-end.

The Board of Directors follows these procedures in establishing budgetary data reflected in the financial statements:

a. Prior to the beginning of the fiscal year, a proposed budget is submitted by the Finance Committee to the Board for approval.
b. During the year, the Board may amend the budget.
c. Budgetary control is maintained at the line item level, subject to adjustments permitted as described above.

Retirement Schedules

Valuation Date

Actuarially determined contribution rates are calculated as of December 31, two years prior to the end of the fiscal year in which contributions are reported.

Methods and Assumptions Used to Determine Contribution Rates

Actuarial Cost Method	Entry Age (level percentage of pay)
Amortization Method	Level percentage of payroll, closed
Remaining Amortization Period	18.1 years (based on contribution rate calculated in 12/31/2023 valuation)
Asset Valuation Method	5-year smoothed market
Inflation	2.50%
Salary Increases	Varies by age and service. 4.7% average over career including inflation
Investment Rate of Return	7.50%, net of administrative and investment expenses, including inflation
Retirement Age	Members who are eligible for service retirement are assumed to commence receiving benefit payments based on age. The average age at service retirement for recent retirees is 61.
Mortality	135% of the Pub-2010 General Retirees Table for males and 120% of the Pub-2010 General Retirees Table for females, both projected with 100% of the MP-2021 Ultimate scale after 2010.
Changes in Assumptions and Methods Reflected in the Schedule of Employer Contributions*	2015: New inflation, mortality and other assumptions were reflected 2017: New mortality assumptions were reflected 2019: New inflation, mortality and other assumptions were reflected 2022: New investment return and inflation assumptions were reflected
Changes in Plan Provisions Reflected in the Schedule of Employer Contributions*	2015: No changes in plan provisions were reflected in the Schedule. 2016: Employer contributions reflect that the current service matching rate was increased to 200%. 2017: New Annuity Purchase Rates were reflected for benefits earned after 2017. 2018: No changes in plan provisions were reflected in the Schedule. 2019: No changes in plan provisions were reflected in the Schedule. 2020: No changes in plan provisions were reflected in the Schedule. 2021: No changes in plan provisions were reflected in the Schedule. 2022: No changes in plan provisions were reflected in the Schedule. 2023: No changes in plan provisions were reflected in the Schedule.

** Only changes that affect the benefit amount and that are effective 2015 and later are shown in the Notes to the Schedule.*