

# Texas Water Conditions Report

December 2023

**Texas Water Development Board**

## Coastal Science Projects

200 Projects

All Projects

Sabine-Neches Estuary

Trinity-San Jacinto Estuary

Colorado-Lavaca Estuary

Guadalupe Estuary

Mission-Aransas Estuary

Nueces Estuary

Laguna Madre Estuary

Contract Title

Search assess

- Assessing cumulative effects of water management s...
- Assessing the Effects of Freshwater Inflows and Othe...
- Assessing the effects of freshwater inflows and other...
- Assessing the Precursors, persistence, and predictabil...
- Assessment of how streamflow and groundwater ele...

Contractor

Search

- Anchor QEA, LLC
- Aqua Strategies/Texas State University
- Batchelor and Guthrie
- BIO-WEST, INC
- BMT Fluid Mechanics

Project Title	Report Link	Project Location	Funding Year	Contractor
A new concept: Water for Preservation of Bays and Estuaries	<a href="#">Report</a>	Galveston, Matagorda, San Antonio, Aransas, Corpus Christi, Baffin	1967	Lockwood, Andrews, and Newman Inc
Guadalupe Estuary: A study of the influence of freshwater inflows	<a href="#">Report</a>	Guadalupe Estuary	1980	Texas Department of Water Resources
Lavaca-Tres Palacios Estuary: A study of the Influence of freshwater inflows	<a href="#">Report</a>	Colorado-Lavaca Estuary	1980	Texas Department of Water Resources
Nueces and Mission-Aransas Estuaries: A study of the influence of freshwater inflows	<a href="#">Report</a>	Mission-Aransas Estuary and Nueces Estuary	1981	Texas Department of Water Resources
Sabine-Neches Estuary: A study of the Influence of freshwater inflows	<a href="#">Report</a>	Sabine-Neches Estuary	1981	Texas Department of Water Resources

## Water News:

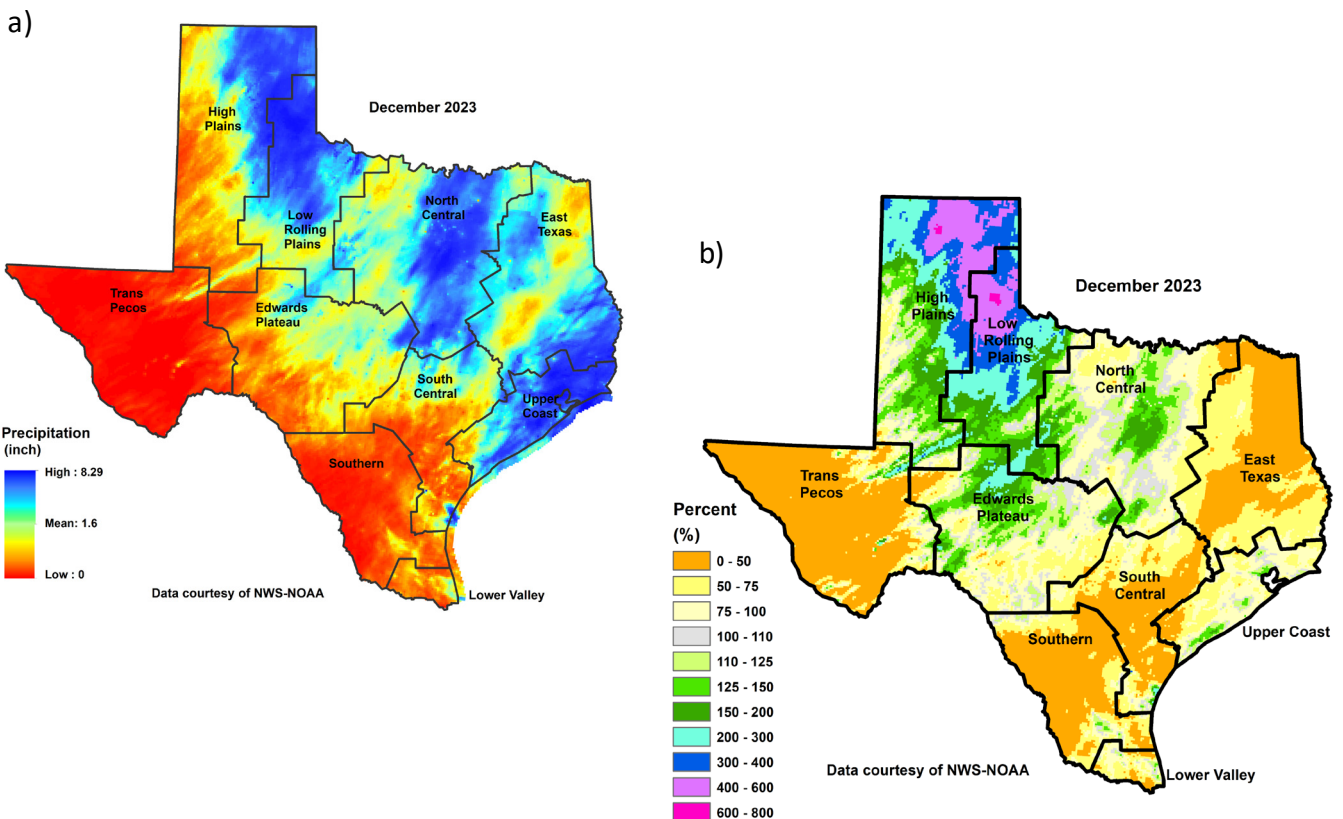
The TWDB launched the Coastal Science Project Dashboard, where a collection of 200 projects and access to final reports can be searched by estuary, project title, funding year, or contractor.

<https://www.twdb.texas.gov/surfacewater/bays/dashboard.asp>.

# RAINFALL

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

Compared to historical data from 1991–2020, the Trans Pecos, East Texas, Southern, South Central, portions of Lower Valley, and western 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 central and southern High Plains, northern Edwards Plateau, western and central North Central, and portions of the southern Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in northern and eastern High Plains, northern and a portion of southern Low Rolling Plains, and north central Edwards Plateau climate divisions. The northern and eastern High Plains and northern Low Rolling Plains received 400-800 percent of normal [light purple, dark pink shading, Figure 1(b)].

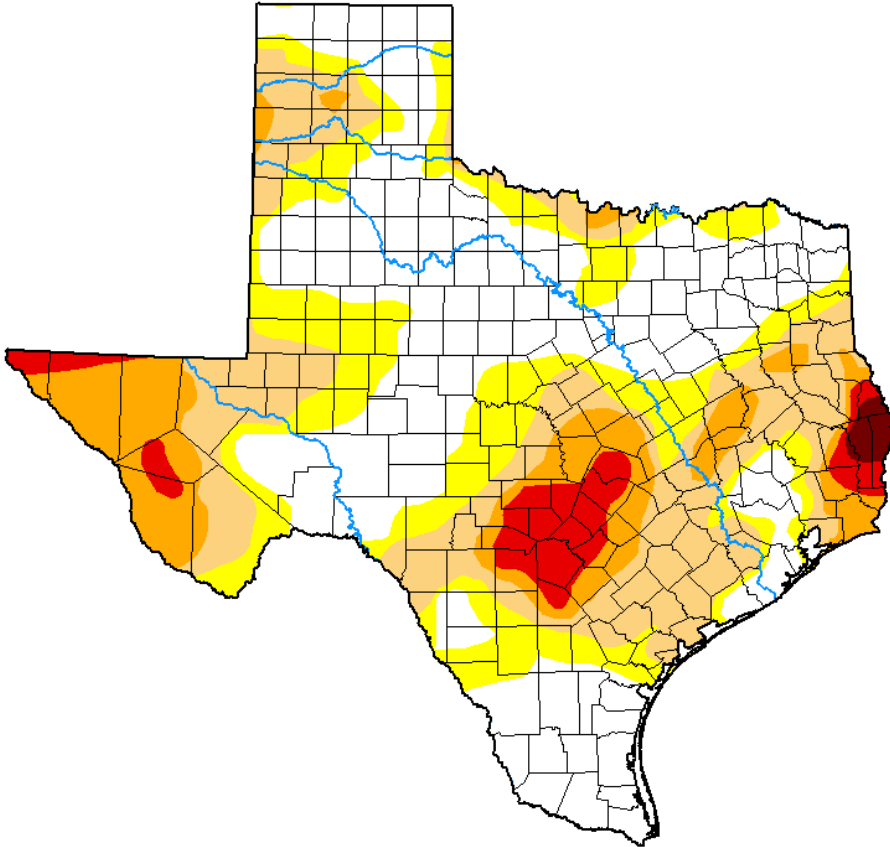


**Figure 1:** (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

## DROUGHT

At the end of December, 59.78% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). That is a decrease of 8.9 % from the end of November.

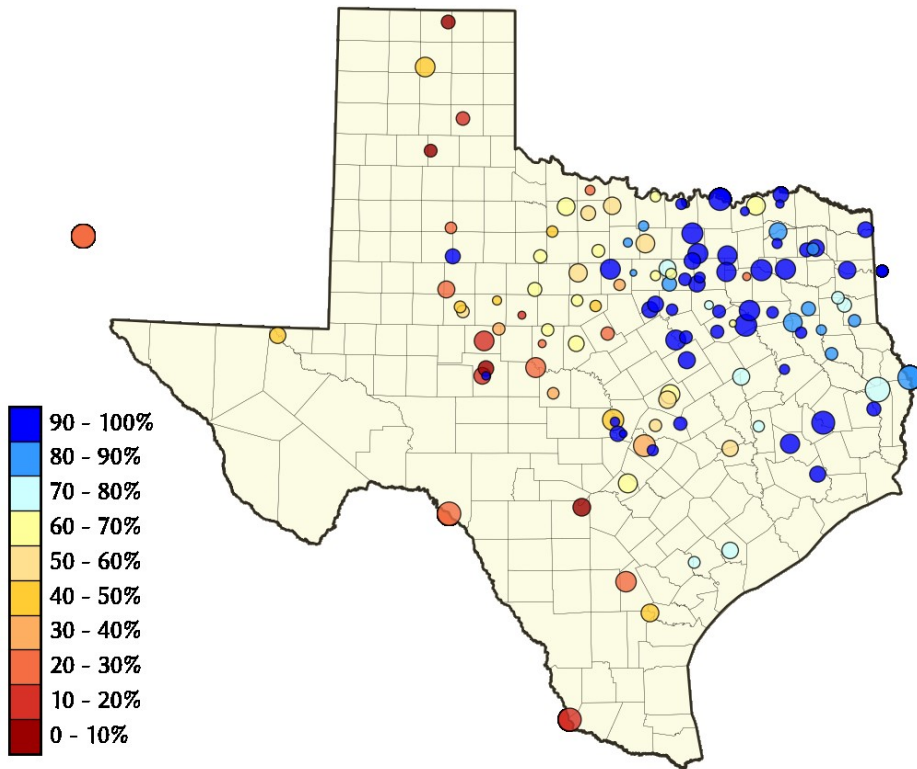
**December 26, 2023**



Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<u>2023-12-26</u>	40.22	59.78	39.21	17.38	5.68	0.68

**Figure 2.** The percentage of drought in Texas according to the U.S. Drought Monitor map as of December 26, 2023.

## RESERVOIR STORAGE



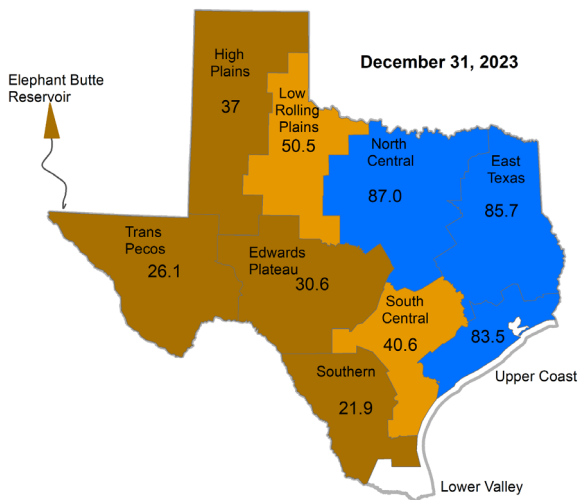
**Figure 3.** Reservoir conservation storage at end-December expressed as percent full (%)

Out of 119 reservoirs in the state, 14 reservoirs held 100 percent conservation storage capacity. Thirty-one reservoirs were at or above 90 percent full in December. Eighteen reservoirs remained below 30 percent full: Abilene (15.8 percent full), Amistad (26.5 percent full), Choke Canyon (24.4 percent full), E.V. Spence (16.3 percent full), Falcon (16.8 percent full), Greenbelt (11.0 percent full), Hords Creek (22.4 percent full), J.B. Thomas (22.1 percent full), Mackenzie (9.4 percent full), Medina Lake (3.4 percent full), North Fork Buffalo Creek Reservoir (28.7 percent full), O.H. Ivie (28.1 percent full), O.C. Fisher (2.1 percent full), Palo Duro Reservoir (4.8 percent full), Proctor (27.4 percent full), Twin Buttes (15.5 percent full), and the White River Lake (26.9 percent full). Elephant Butte Reservoir (New Mexico) was 23.6 percent full (Figure 3).

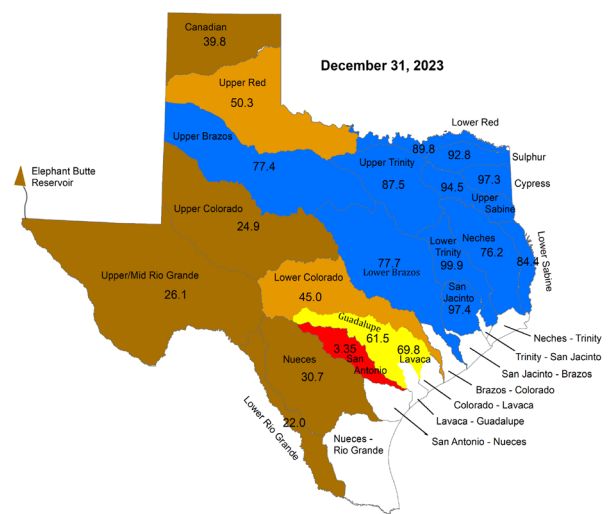
Reservoir conservation storage by climate division was at or above normal (Figure 4(a)) for East Texas (85.7 percent full), North Central (87.0 percent full), and the Upper Coast (83.5 percent full) climate divisions. Conservation storage was moderately low (Figure 4(a)) for the Low Rolling Plains (50.5 percent full), and South Central (40.6 percent full) climate divisions. The High Plains (37.0 percent full), Edwards Plateau (30.6 percent full), the Trans Pecos (26.1 percent full), and the Southern climate division (21.9 percent full) 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 and Lavaca 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 Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, and San Jacinto river basins.

a) Regional Reservoir Storage Condition



b) Reservoir Storage Index\* (by Basins/Subbasins)



**Percent Full (%)**

< 10 Exceptionally Low	10 - 20 Extremely Low	20 - 40 Severely Low
40 - 60 Moderately Low	60 - 70 Abnormally Low	> 70 Normal to High

**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.

## CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

Name of lake or reservoir	Storage capacity	Storage at end-December 2023		Storage change from end-Nov 2023		Storage change from end-Dec 2022	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Abilene, Lake	7,900	1,245	15.8	-83	-1.1	-1,519	-19.2
Alan Henry Reservoir	96,207	87,248	90.7	-154	0.0	15,523	16.1
*Amistad Reservoir (Texas & Mexico)	3,275,532	891,289	27.2	-1,509	0.0	-601,068	-18.4
*Amistad Reservoir (Texas)	1,813,408	480,987	26.5	-5,847	0.0	-383,736	-21.2
Amon G Carter, Lake	19,266	15,964	82.9	-91	0.0	-399	-2.1
Aquilla Lake	43,243	40,186	92.9	7,949	18.4	12,157	28.1
Arlington, Lake	40,157	40,157	100.0	2,327	5.8	347	0.9
Arrowhead, Lake	230,359	123,979	53.8	-1,006	0.0	-28,629	-12.4
Athens, Lake	29,503	27,636	93.7	704	2.4	-616	-2.1
*Austin, Lake	23,972	23,034	96.1	-16	0.0	62	0.3
B A Steinhagen Lake	69,186	66,157	95.6	-2,418	-3.5	1,973	2.9
Bardwell Lake	43,856	43,856	100.0	0	0.0	525	1.2
Belton Lake	432,631	266,546	61.6	449	0.1	-19,139	-4.4
Benbrook Lake	85,648	74,865	87.4	10,118	11.8	6,058	7.1
Bob Sandlin, Lake	192,417	184,409	95.8	2,864	1.5	-1,746	0.0
Bois d'Arc Lake	367,609	257,292	70.0	-267	0.0	78,385	21.3
Bonham, Lake	11,027	10,200	92.5	542	4.9	-648	-5.9
Brady Creek Reservoir	28,808	10,566	36.7	-78	0.0	-2,336	-8.1
Bridgeport, Lake	372,183	209,439	56.3	-1,598	0.0	-63,062	-16.9
*Brownwood, Lake	130,868	77,497	59.2	-1,038	0.0	-3,292	-2.5
Buchanan, Lake	866,694	391,102	45.1	1,960	0.2	-133,579	-15.4
Caddo, Lake	29,898	29,898	100.0	0	0.0	0	0
Canyon Lake	378,781	228,691	60.4	-5,242	-1.4	-73,012	-19.3
Cedar Creek Reservoir in Trinity	644,686	615,070	95.4	15,724	2.4	69,603	10.8
Champion Creek Reservoir	41,580	24,294	58.4	-141	0.0	-667	-1.6
Cherokee, Lake	40,094	31,842	79.4	337	0.8	-8,252	-20.6
Choke Canyon Reservoir	662,820	161,993	24.4	-4,422	0.0	-47,848	-7.2
*Cisco, Lake	29,003	17,680	61.0	-109	0.0	-3,171	-10.9
Coleman, Lake	38,075	23,416	61.5	-70	-0.2	-5757	-15.1
Colorado City, Lake	31,040	23,696	76.3	86	0.3	-1,638	-5.3
*Coleta Creek Reservoir	30,758	14,799	48.1	-92	0.0	-2,370	-7.7
Conroe, Lake	417,577	403,784	96.7	585	0.1	1,949	0.5
Corpus Christi, Lake	256,062	120,351	47.0	-6,161	-2.4	-71,507	-27.9
Crook, Lake	9,195	8,397	91.3	204	2.2	-610	-6.6
Cypress Springs, Lake	66,756	66,465	99.6	2,335	3.5	868	1.3
E. V. Spence Reservoir	517,272	84,514	16.3	-1,014	0.0	-10,392	-2.0
Eagle Mountain Lake	185,087	132,554	71.6	5,618	3.0	-17,372	-9.4
Elephant Butte Reservoir (Texas)	852,491	201,243	23.6	40,118	4.7	103,911	12.2
Elephant Butte Reservoir (Total Storage)	1,985,900	465,841	23.5	92,866	4.7	240,534	12.1
*Falcon Reservoir (Texas & Mexico)	2,646,817	467,353	17.7	10,928	0.4	-19,032	0
*Falcon Reservoir (Texas)	1,562,367	261,853	16.8	22,047	1.4	33,226	2.1
Fork Reservoir, Lake	605,061	559,675	92.5	12,375	2.0	81,371	13.4
Fort Phantom Hill, Lake	70,030	48,033	68.6	-849	-1.2	871	1.2
Georgetown, Lake	38,005	20,030	52.7	2,401	6.3	-433	-1.1
Gibbons Creek Reservoir	25,721	18,322	71.2	-147	0.0	-7,195	-28.0
Graham, Lake	45,288	31,417	69.4	-360	0.0	-3,784	-8.4
Granbury, Lake	132,949	131,890	99.2	2,501	1.9	14,630	11.0

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	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
<i>Continued</i>							
Granger Lake	51,822	48,099	92.8	5,404	10.4	-1,618	-3.1
Grapevine Lake	163,064	163,064	100.0	8,437	5.2	0	0.0
Greenbelt Lake	59,968	6,604	11.0	405	0.7	-464	0.0
*Halbert, Lake	6,033	4,137	68.6	-20	0.0	-1,475	-24.4
Hords Creek Lake	8,109	1,813	22.4	-12	0.0	-705	-8.7
Houston County Lake	17,113	15,520	90.7	455	2.7	-473	-2.8
Houston, Lake	132,318	132,318	100.0	114	0.1	0	0.0
Hubbard Creek Reservoir	313,298	160,838	51.3	-1,525	0.0	-50,198	-16.0
Hubert H Moss Lake	24,058	23,095	96.0	1,630	6.8	1,905	7.9
Inks, Lake	13,729	13,005	94.7	70	0.5	-142	-1.0
J. B. Thomas, Lake	199,931	44,103	22.1	-711	0.0	-4,295	-2.1
Jacksonville, Lake	25,670	23,819	92.8	277	1.1	-616	-2.4
Jim Chapman Lake (Cooper)	258,723	229,980	88.9	2,552	1.0	4,753	1.8
Joe Pool Lake	149,629	149,629	100.0	0	0.0	0	0.0
Kemp, Lake	245,307	161,236	65.7	4,621	1.9	25,112	10.2
Kickapoo, Lake	86,345	43,853	50.8	-77	0.0	-7,099	-8.2
Lavon Lake	409,757	370,670	90.5	26,597	6.5	-14,852	-3.6
Leon, Lake	27,762	13,494	48.6	-186	0.0	-3,480	-12.5
Lewisville Lake	563,228	521,644	92.6	22,658	4.0	4,671	0.8
Limestone, Lake	203,780	157,150	77.1	974	0.5	12,809	6.3
*Livingston, Lake	1,603,504	1,603,504	100.0	10,844	0.7	0	0.0
*Lost Creek Reservoir	11,950	10,491	87.8	-77	0.0	-27	0.0
Lyndon B Johnson, Lake	112,778	110,660	98.1	-449	0.0	-193	0.0
Mackenzie Reservoir	46,450	4,383	9.4	-5	0.0	1,498	3.2
Marble Falls, Lake	7,597	7,275	95.8	120	1.6	2,853	37.6
Martin, Lake	75,726	53,962	71.3	-1,396	-1.8	-9,275	-12.2
Medina Lake	254,823	8,542	3.4	-493	0.0	-7,551	-3.0
Meredith, Lake	500,000	220,446	44.1	1,208	0.2	67,236	13.4
Millers Creek Reservoir	26,768	12,068	45.1	-120	0.0	-4,407	-16.5
*Mineral Wells, Lake	5,273	4,420	83.8	4	0.1	256	4.9
Monticello, Lake	34,740	27,993	80.6	562	1.6	-414	-1.2
Mountain Creek, Lake	22,850	22,850	100.0	0	0.0	0	0.0
Murvaul, Lake	38,285	32,944	86.0	97	0.3	-5,341	-14.0
Nacogdoches, Lake	39,522	31,858	80.6	-429	-1.1	-1,147	-2.9
Nasworthy	9,615	8,846	92.0	-141	-1.5	478	5.0
Navarro Mills Lake	49,827	47,683	95.7	5,627	11.3	10,666	21.4
New Terrell City Lake	8,583	2,474	28.8	24	0.3	-6,109	-71.2
Nocona, Lake (Farmers Crk)	21,444	14,424	67.3	-145	0.0	-1,585	-7.4
North Fork Buffalo Creek Reservoir	15,400	4,417	28.7	-71	0.0	-2,517	-16.3
O' the Pines, Lake	241,363	241,363	100.0	0	0.0	0	0.0
O. C. Fisher Lake	115,742	2,393	2.1	17	0.0	-1,279	-1.1
*O. H. Ivie Reservoir	554,340	155,955	28.1	-2,464	0.0	-65,219	-11.8
Oak Creek Reservoir	39,210	13,254	33.8	-174	0.0	-5,839	-14.9



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Name of lake or reservoir	Storage capacity	Storage at end-December 2023		Storage change from end-Nov 2023		Storage change from end-Dec 2022		
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)	
<i>Continued</i>								
Palestine, Lake	367,303	322,655	87.8	6,354	1.7	-16,458	-4.5	
Palo Duro Reservoir	61,066	2,958	4.8	-207	0.0	2,745	4.5	
Palo Pinto, Lake	26,766	9,614	35.9	-293	-1.1	-5,938	-22.2	
Pat Cleburne, Lake	26,008	26,008	100.0	0	0.0	10,622	40.8	
*Pat Mayse Lake	113,683	103,189	90.8	-804	0.0	-10,494	-9.2	
Possum Kingdom Lake	538,139	515,065	95.7	5,518	1.0	73,039	13.6	
Proctor Lake	54,762	14,982	27.4	-303	0.0	-8,385	-15.3	
Ray Hubbard, Lake	439,559	423,527	96.4	22,081	5.0	-11,454	-2.6	
Ray Roberts, Lake	788,167	764,572	97.0	23,707	3.0	12,183	1.5	
Red Bluff Reservoir	151,110	60,862	40.3	1,234	0.8	-34,985	-23.2	
Richland-Chambers Reservoir	1,099,417	1,017,922	92.6	22,759	2.1	109,777	10.0	
Sam Rayburn Reservoir	2,857,077	2,105,892	73.7	-49,496	-1.7	-159,327	-5.6	
Somerville Lake	150,293	89,441	59.5	-346	0.0	-11,427	-7.6	
Squaw Creek, Lake	151,250	151,250	100.0	0	0.0	0	0.0	
Stamford, Lake	51,570	35,869	69.5	-97	-0.2	-3,347	-6.5	
Stillhouse Hollow Lake	229,796	136,121	59.2	-1,303	0.0	-30,337	-13.2	
Striker, Lake	16,878	14,545	86.2	838	5.0	-1,963	-11.6	
Sweetwater, Lake	12,267	5,824	47.5	-36	0.0	-1,574	-12.8	
*Sulphur Springs, Lake	17,747	17,747	100.0	2,686	15.1	2,341	13.2	
Tawakoni, Lake	871,685	863,571	99.1	16,419	1.9	25,453	2.9	
Texana, Lake	158,975	111,044	69.8	-5,376	-3.4	-33,847	-21.3	
Texoma, Lake (Texas & Oklahoma)	2,487,601	2,384,454	95.9	80,848	3.3	-32,398	-1.3	
Texoma, Lake (Texas)	1,243,801	1,192,226	95.9	40,424	3.3	-16,200	-1.3	
Toledo Bend Reservoir (Texas & Louisiana)	4,472,900	3,779,279	84.5	35,675	0.8	-202,427	-4.5	
Toledo Bend Reservoir (Texas)	2,236,450	1,887,590	84.4	17,838	0.8	-101,213	-4.5	
Travis, Lake	1,098,044	412,970	37.6	-7,393	0.0	-89,973	-8.2	
Twin Buttes Reservoir	182,454	28,287	15.5	-210	0.0	-24,809	-13.6	
Tyler, Lake	72,073	59,627	82.7	167	0.2	-3,051	-4.2	
Waco, Lake	189,418	188,124	99.3	1,530	0.8	79,829	42.1	
Waxahachie, Lake	11,060	8,289	74.9	1,026	9.3	-1,303	-11.8	
Weatherford, Lake	17,812	10,663	59.9	35	0.2	-123	0.0	
White River Lake	29,880	8,049	26.9	245	0.8	3,863	12.9	
Whitney, Lake	564,808	564,808	100.0	29,628	5.2	140,275	24.8	
Worth, Lake	24,419	15,093	61.8	-122	0.0	-795	-3.3	
Wright Patman Lake	122,593	122,593	100.0	0	0.0	0	0.0	
<b>STATEWIDE TOTAL</b>								
<b>STATEWIDE TOTAL</b>	<b>32,297,657</b>	<b>21,850,240</b>	<b>67.7</b>	<b>310,913</b>	<b>1.0</b>	<b>-525,870</b>	<b>-1.6</b>	

\*Total volume below elevation of conservation pool top is used as the conservation storage capacity, because the dead pool storage is unknown.

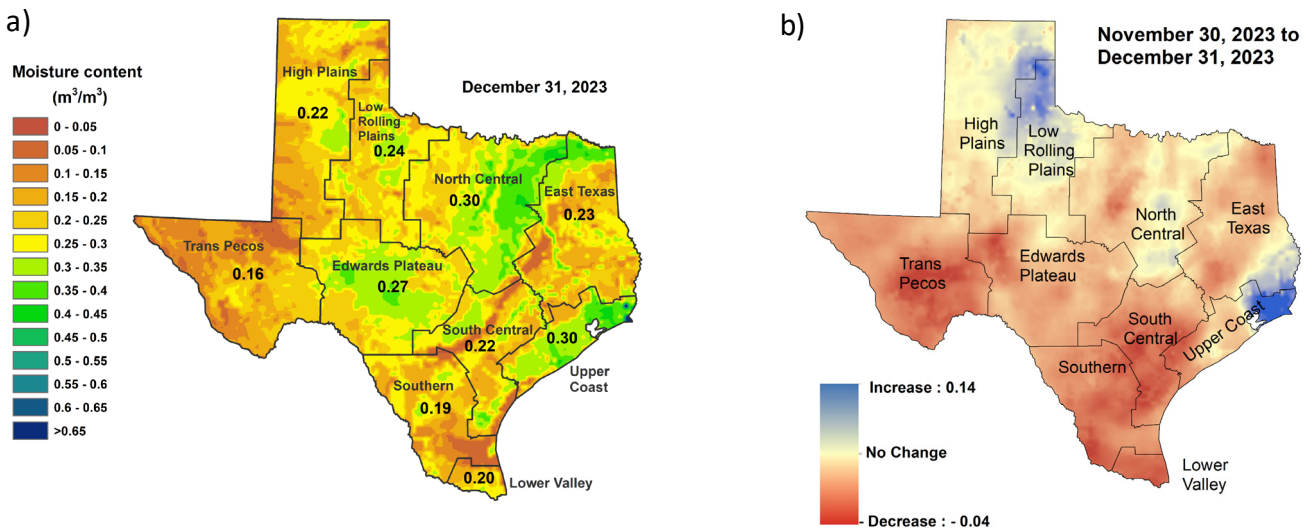
\*\*Monthly and yearly changes do not include reservoirs that did not have data in the last month or last year, respectively.



## SOIL MOISTURE

At the end of December 2023, root zone soil moisture was low [yellow, orange, Figure 5(a)] across much of the state. Areas of more severe dryness [brown shading, Figure 5(a)] were in northeastern and southern High Plains, northern Low Rolling Hills, areas of the Trans Pecos, northeastern and southern Southern, northern and southeastern South Central, and southwestern East Texas climate divisions. Average soil moisture [green shading, Figure 5(a)] was seen in central High Plains, northern and central Low Rolling Plains, central and eastern North Central, northern and western East Texas, central Edwards Plateau, portions of northern and southern South Central, portions of northern and southeastern Southern, and the Upper Coast climate divisions.

Compared to conditions at the end of November 2023, soil moisture increased [blue shading in Figure 5(b)] in eastern High Plains, northern Low Rolling Plains, southeastern East Texas, and the eastern Upper Coast climate divisions. Soil moisture decreased [red shading in Figure 5(b)] in the Trans Pecos, Edwards Plateau, Southern, Lower Valley, South Central, western North Central, East Texas, and central and western Upper Coast climate divisions.



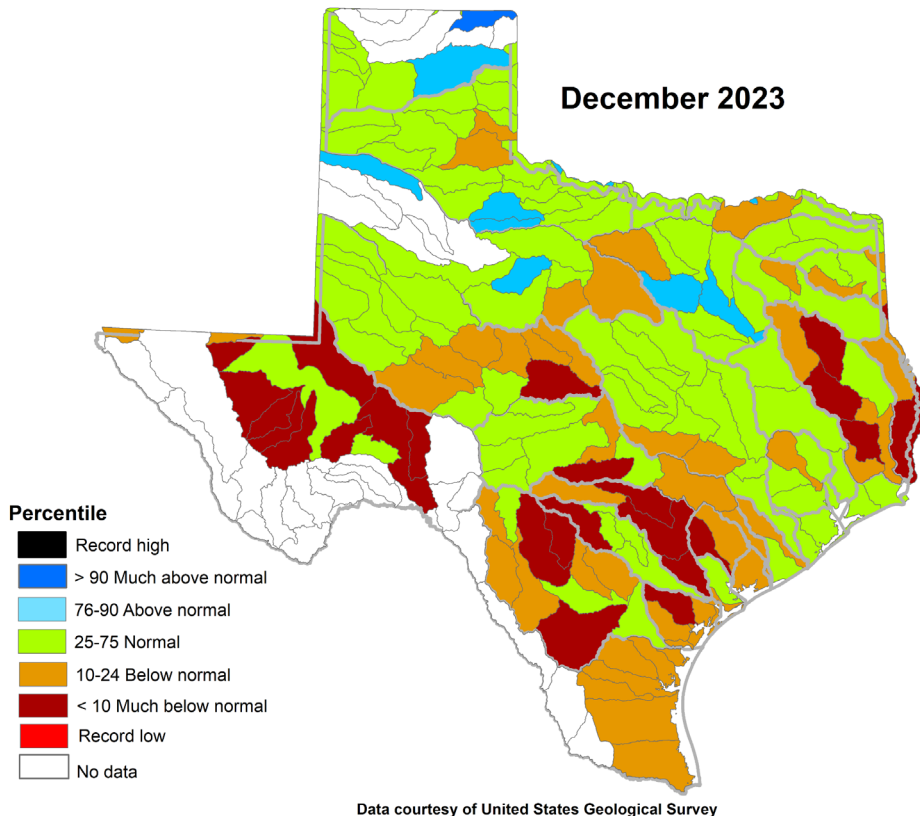
Data from NASA Soil Moisture Active Passive (SMAP) Level 4 - Model - Value Added Version 7.  
Soil moisture content is shown as volume of water per unit volume of bulk soil. Root zone: 0 to 1 meter depth.

**Figure 5:** (a) Root zone soil moisture conditions in December 2023 and (b) the difference in root zone soil moisture between end-November 2023 and end-December 2023.

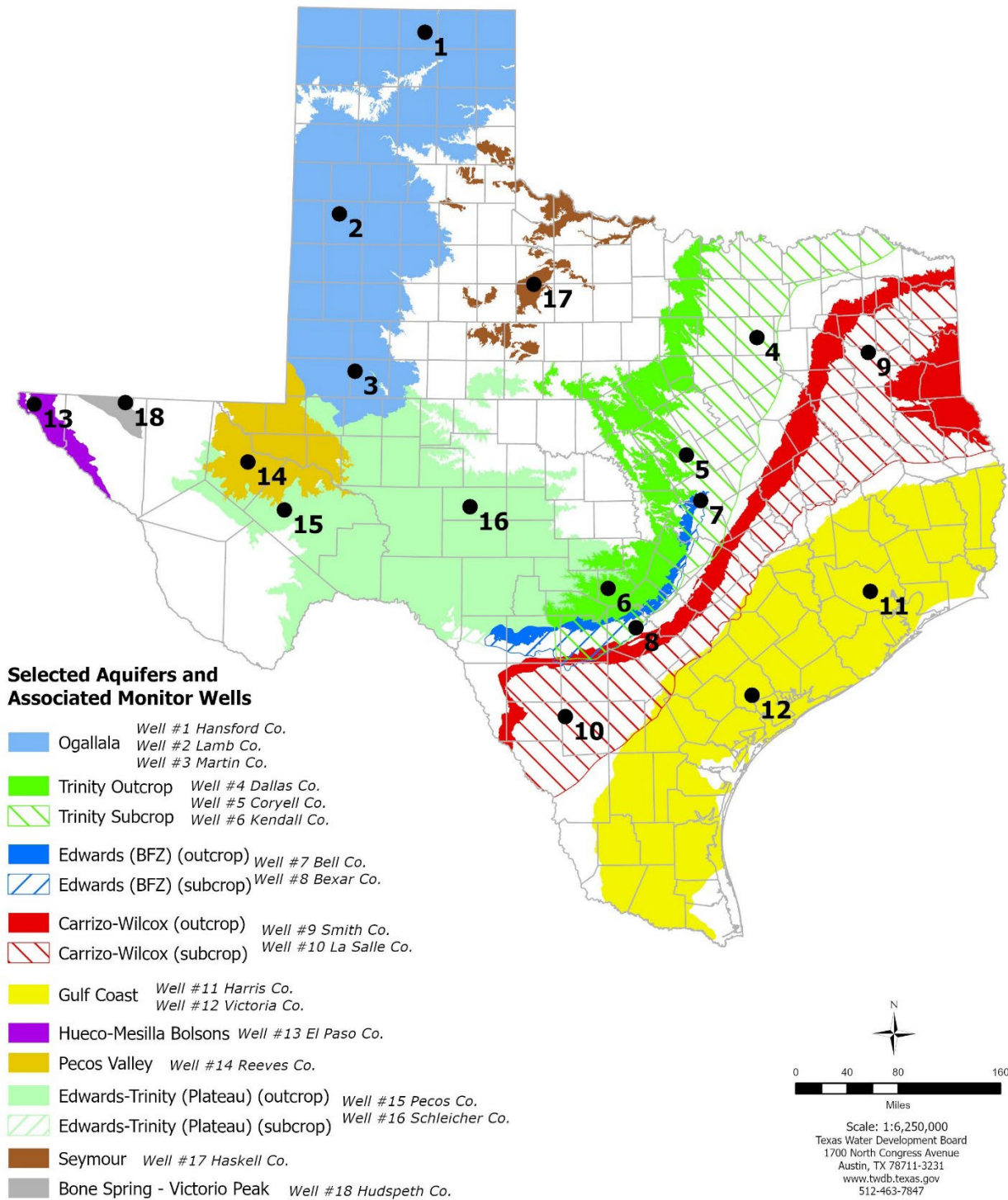
## STREAMFLOW CONDITIONS

Normal streamflow (25–75<sup>th</sup> percentile, green shading, Figure 6) was recorded in parts of the Panhandle, Northern, Eastern, and Western regions of Texas this month. Above normal streamflow (76–90<sup>th</sup> percentile, light blue shading, Figure 6) was seen in the Canadian (Middle Canadian-Spring watershed), and Brazos (Running Water Draw and Paint watersheds), and Upper Trinity (Lower West Fork Trinity and Upper Trinity watersheds) river basins. Much above normal streamflow (>90<sup>th</sup> percentile, dark blue shading, Figure 6) was seen in the Canadian (Lower Beaver watershed) river basin.

Below normal streamflow (10–24<sup>th</sup> percentile, orange shading, Figure 6) was recorded in the Upper Red (Lower Salt Fork Red and Lower Prairie Dog Town Fork Red watersheds), Lower Red (Bois D Arc-Island watershed), Upper Brazos (Hubbard and Middle Brazos-Palo Pinto watersheds), Lower Brazos (San Gabriel and Yegua watersheds), Trinity (Upper West Fork Trinity watershed), Upper and Lower Colorado, Upper Sabine (Lake Fork watershed), Lower Sabine (Toledo Bend reservoir watershed), San Jacinto (West Fork watershed), Cypress ( Little Cypress and Cross Bayou watersheds), Neches (Upper, Lower Neches and Pine Island watersheds) Lavaca (Navidad watershed), Nueces, Upper Guadalupe, and San Antonio-Nueces (Aransas and Aransas Bay watersheds), and Nueces-Rio Grande river basins. Much below normal stream flow (< 10<sup>th</sup> percentile, dark red shading, Figure 6) was seen in Middle Colorado, Guadalupe, San Antonio (Medina watershed), Nueces (Upper Frio, Middle Nueces, and Hondo watersheds), Pecos, Lower Sabine, San Antonio-Nueces (Mission watershed) river basins.



**Figure 6:** Runoff percentiles by the U.S. Geological Survey's Hydrologic Unit Code



## DECEMBER 2023 GROUNDWATER LEVELS IN MONITORING WELLS

Water level measurements were available for 16 key monitoring wells in the state. The recorders in two wells (#9 and #15 on map) were offline or the well experienced issues during the reporting period. Water levels rose in eight monitoring wells since the beginning of December, with an increase of 0.11 feet in the Haskell County Seymour Aquifer well (#17 on map) to 5.72 feet in the La Salle County Carrizo-Wilcox Aquifer well (#10 on map). Water levels declined in eight monitoring wells, ranging from a decline of -0.12 feet in both the Coryell County Trinity Aquifer well and Lamb County Ogallala Aquifer well (#5 and #2 on map) to -5.77 feet in the Reeves County Pecos Valley Aquifer well (#14 on map). The J-17 well (#8 on map) in San Antonio recorded a water level of 91.60 feet below land surface or 639.40 feet above mean sea level. Water levels are 0.60 feet below the Stage 3 critical management levels for the San Antonio portion of the Edwards (Balcones Fault Zone) Aquifer.

\* Well numbers used in this publication on the aquifer map to indicate the monitoring well locations (numbers 1 to 18) are different than the TWDB's seven-digit state well number.

Monitoring Well	December (depth to water, feet)	November (depth to water, feet)	Month Change	Year Change	Historical Change*	First Measured (year)
(1) Hansford 0354301	165.02	164.65	-0.37	-1.29	-94.90	1951
(2) Lamb 1053602	154.64	154.52	-0.12	-1.17	-126.47	1951
(3) Martin 2739903	146.21	145.99	-0.22	-0.40	-41.32	1964
(4) Dallas 3319101	503.84	503.31	-0.53	NA	-281.84	1954
(5) Coryell 4035404	547.01	546.89	-0.12	-2.51	-255.01	1955**
(6) Kendall 6802609	163.03	165.86	2.83	-2.46	-103.03	1975
(7) Bell 5804816	126.55	127.32	0.77	-1.24	-3.04	2008
(8) Bexar 6837203	91.60	94.40	2.80	2.10	-44.96	1932
(9) Smith 3430907	NA	NA	NA	NA	-140.39	1977**
(10) La Salle 7738103	534.32	540.04	5.72	-0.90	-281.25	2003
(11) Harris 6514409	199.28	199.59	0.31	-5.73	-63.78*	1947**
(12) Victoria 8017502	33.49	33.22	-0.27	2.32	0.51	1958**
(13) El Paso 4913301	298.58	298.30	-0.28	1.64	-66.68	1964**
(14) Reeves 4644501	164.26	158.49	-5.77	NA	-72.17	1952
(15) Pecos 5216802	NA	206.17	NA	NA	40.71	1976
(16) Schleicher 5512134	315.39	317.05	1.66	-5.77	-13.49	2003
(17) Haskell 2135748	46.87	46.98	0.11	-0.34	-3.87	2002
(18) Hudspeth 4807516	146.90	148.66	1.76	-1.59	-42.98	1966

\*Change since the original measurement taken on the date indicated in the last column. The historical changes shown for recorder wells #9 and #15 are based off the most recent water level records from April 2023 and November 2023, respectively.

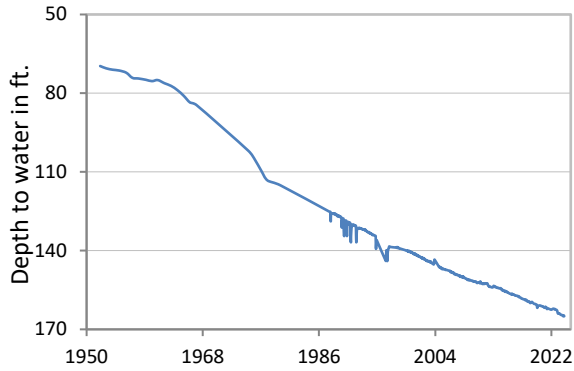
\*\* Measurement not shown on the hydrograph.

NA (not available)

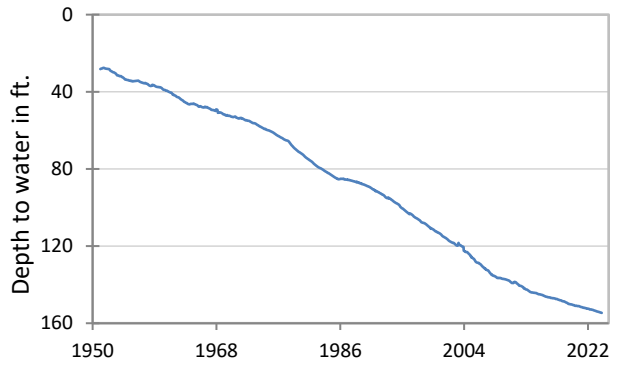
All data are provisional and subject to revision.

**DECEMBER 2023 MONITORING WELL HYDROGRAPHS**

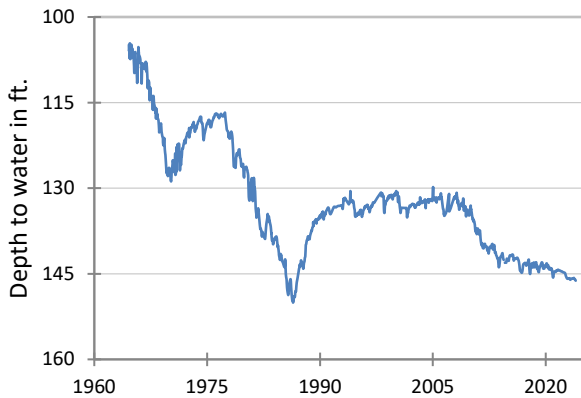
**(1) State Well #03-54-301  
Near Spearman, Hansford County  
Ogallala Aquifer**



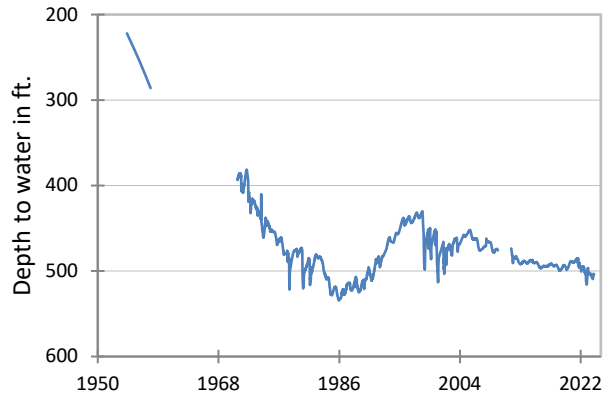
**(2) State Well #10-53-602  
Near Earth, Lamb County  
Ogallala Aquifer**



**(3) State Well #27-39-903  
Northwest Martin County  
Ogallala Aquifer**

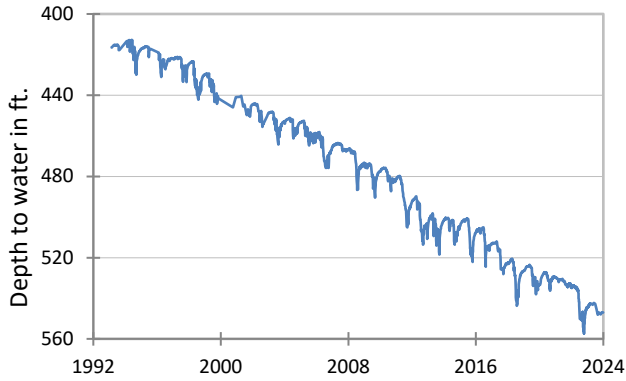


**\* (4) State Well #33-19-101  
Southeast Dallas, Dallas County  
Twin Mountains Formation-Trinity Aquifer**

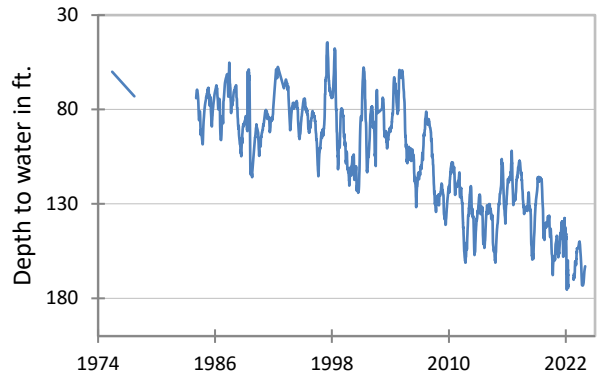


\*Previous data for recorder well #4 is currently under review and subject to revision.

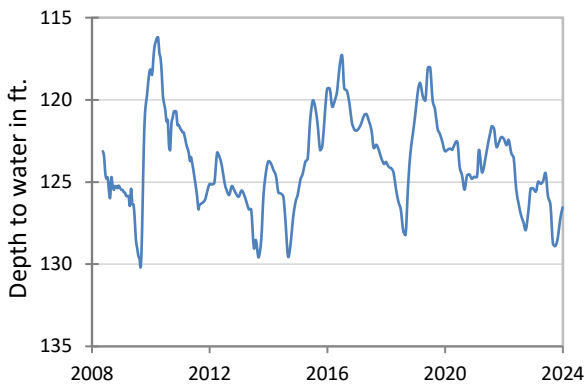
**(5) State Well #40-35-404  
Gatesville, Coryell County  
Hosston Formation-Trinity Aquifer**



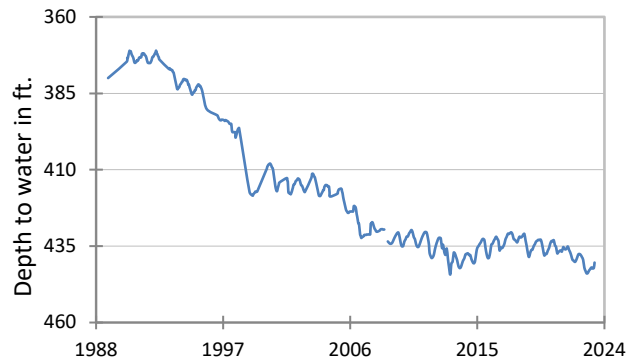
**(6) State Well #68-02-609  
Waring, Kendall County  
Travis Peak Formation-Trinity Aquifer**



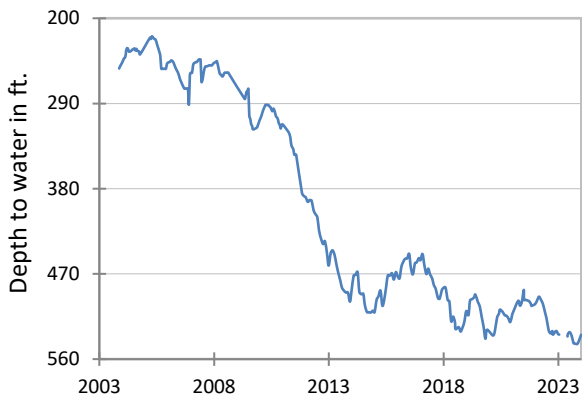
**(7) State Well #58-04-816  
Near Salado, Bell County  
Edwards (Balcones Fault Zone) Aquifer**



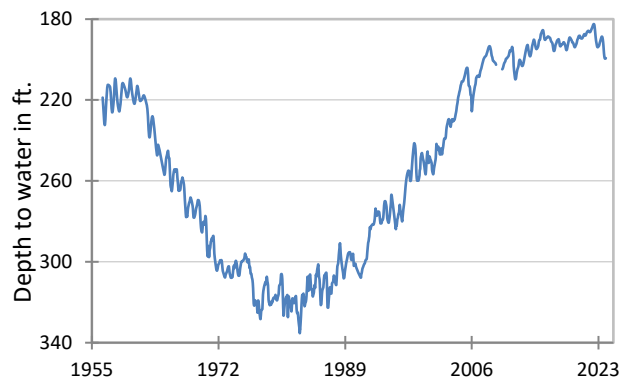
**\* (9) State Well #34-30-907  
Red Springs, Smith County  
Carrizo-Wilcox Aquifer**



**(10) State Well #77-38-103  
Near Cotulla, La Salle County  
Carrizo-Wilcox Aquifer**

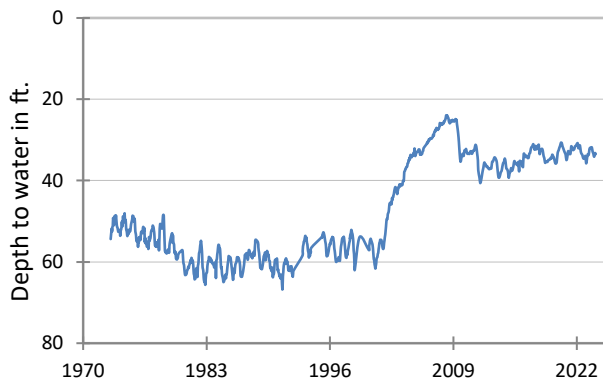


**(11) State Well #65-14-409  
North Houston, Harris County  
Evangeline Formation-Gulf Coast Aquifer**

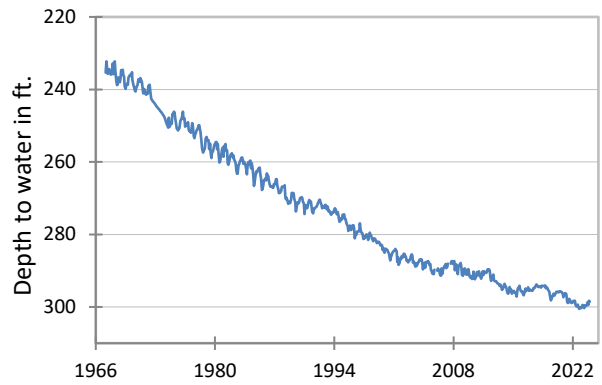


\* Recorder well #9 has been offline or the well has experienced issues since May 2023.

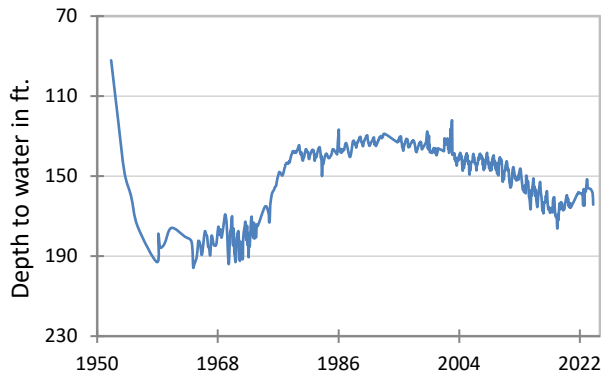
**(12) State Well #80-17-502**  
**Near Bloomington, Victoria County**  
**Lissie Formation-Gulf Coast Aquifer**



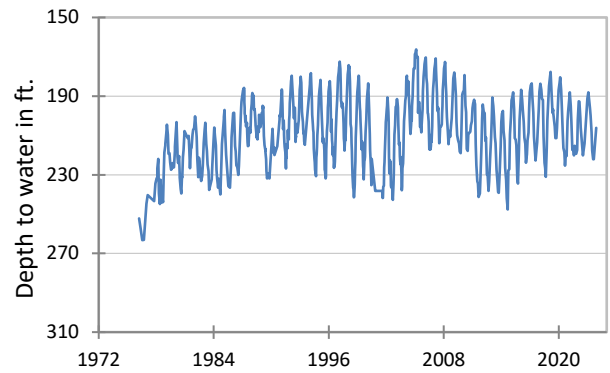
**(13) State Well #49-13-301**  
**El Paso, El Paso County**  
**Hueco-Mesilla Bolsons Aquifer**



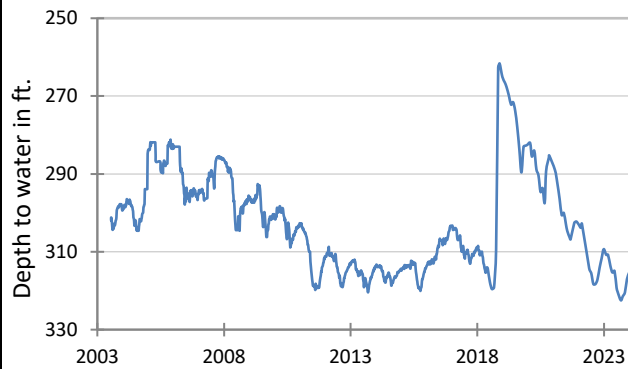
**(14) State Well #46-44-501**  
**Near Pecos, Reeves County**  
**Pecos Valley Aquifer**



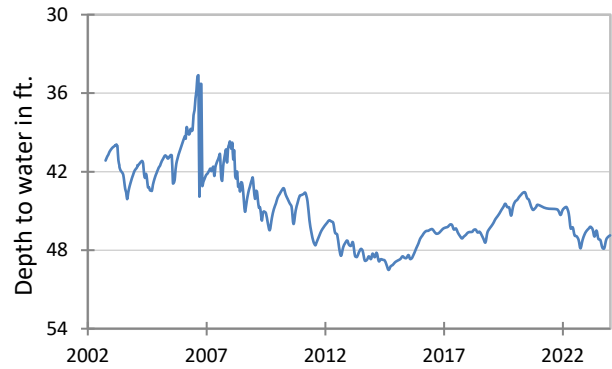
**\* (15) State Well #52-16-802**  
**Fort Stockton, Pecos County**  
**Edwards-Trinity (Plateau) Aquifer**



**(16) State Well #55-12-134**  
**Eldorado, Schleicher County**  
**Edwards-Trinity (Plateau) Aquifer**



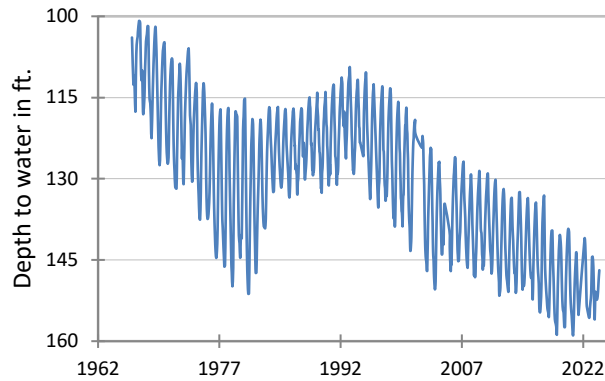
**(17) State Well #21-35-748**  
**Near O'Brien, Haskell County**  
**Seymour Aquifer**



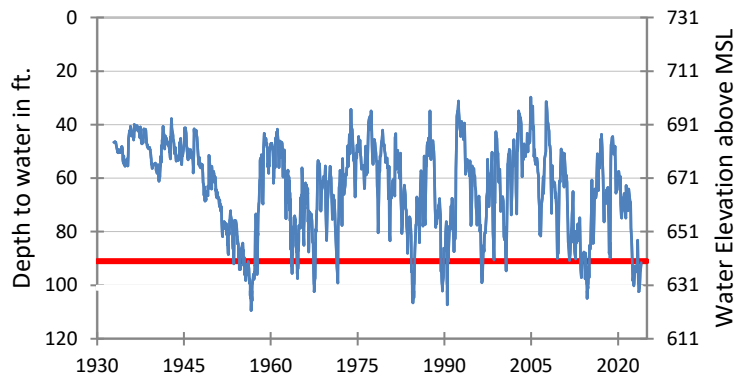
\* Recorder well #15 has been offline since September 2023 and did not record data.



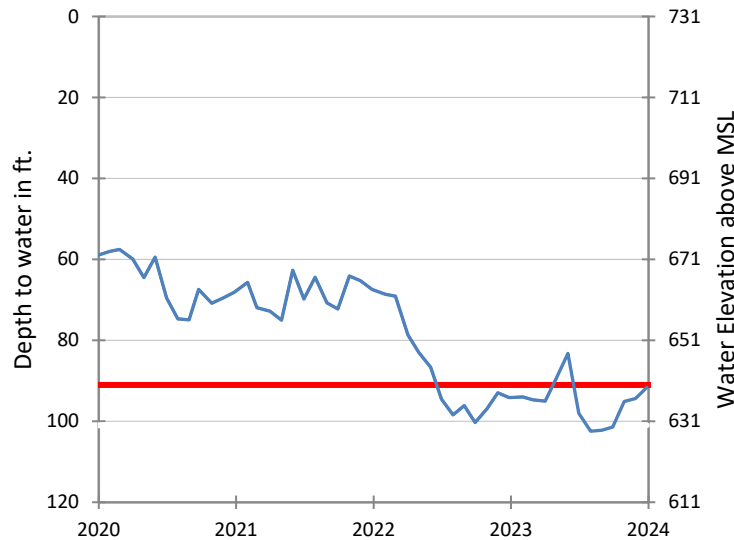
**(18) State Well #48-07-516  
Dell City, Hudspeth County  
Bone Spring-Victorio Peak Aquifer**



**(8) State Well #68-37-203 (J-17)  
San Antonio, Bexar County  
Edwards (Balcones Fault Zone) Aquifer**

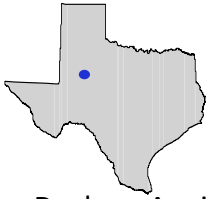


The late December water level measurement in this Edwards (Balcones Fault Zone) Aquifer well, located at an elevation of 731 feet above mean sea level, was 91.60 feet below land surface, or 639.40 feet above mean sea level. This was 2.80 feet above last month's measurement, 2.10 feet above last year's measurement, and 44.96 feet below the initial measurement recorded in 1932.



**Water levels below the red line indicate periods in which Edwards Aquifer Authority Stage 3 drought restrictions are in effect. The Edwards Aquifer Authority declared Stage 3 water restrictions effective November 1, 2023, as a result of well J-17 water levels and area spring flow levels.**

## HYDROGRAPH OF THE MONTH

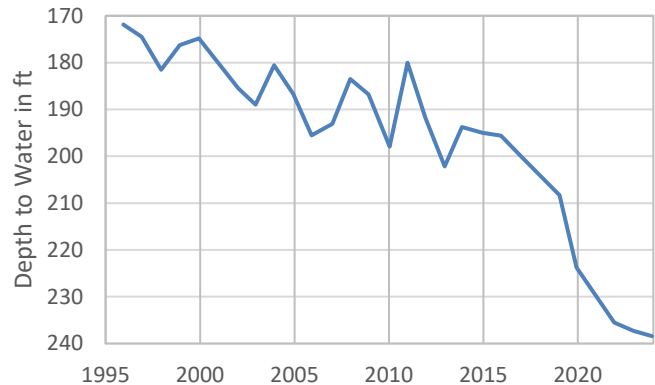


Each month this space features a new hydrograph (marked with the • symbol on the map) depicting different aquifers and their conditions in Texas.

The Dockum Aquifer is a minor aquifer located in the northwest part of the state and is part of the High Plains Aquifer System. It is defined stratigraphically by the Dockum Group and includes, from youngest to oldest, the Santa Rosa Formation, the Tecovas Formation, the Trujillo Sandstone, and the Cooper Canyon Formation. The Dockum Group consists of gravel, sandstone, siltstone, mudstone, shale, and conglomerate. Groundwater located in the sandstone and conglomerate units is recoverable. The water quality in the aquifer is generally poor-with freshwater outcrop areas in the east and brine in the western subsurface portions of the aquifer-and the water is very hard. Naturally occurring radioactivity from uranium present within the aquifer has resulted in gross alpha radiation in excess of the state's primary drinking standard. Radium-226 and -228 also occur in amounts above acceptable standards. Groundwater from the aquifer is used for irrigation, municipal water supply, and oil field waterflooding operations, particularly in the southern High Plains. Water level rises and declines have occurred in different areas of the aquifer.<sup>1</sup>

### Dockum Aquifer

Well # 28-13-901, 470 feet deep  
Unused, Borden County



The initial water level measurement of 171.86 feet below land surface was recorded by TWDB in 1995. Since then, TWDB staff have returned almost every year to collect water level measurements. From 1995 to 2015, the hydrograph shows an overall declining trend with water levels fluctuating between  $\pm 5$  to 10 feet per year. Beginning in approximately 2015, water levels begin to decline more rapidly through 2023. As of December 2023, the depth to water was 238.42 feet below land surface, which is 66.56 feet deeper than the original measurement taken in 1995 and the lowest level recorded at this well.



Photos of well #28-13-901 general setting (left) and measuring point (right)

1. Peter G. George, Ph.D., P.G., Robert E. Mace, Ph.D., P.G., Rima Petrossian, P.G. *Aquifers of Texas: Report 380*; 2011. <https://www.twdb.texas.gov/groundwater/aquifer/minors/dockum.asp>