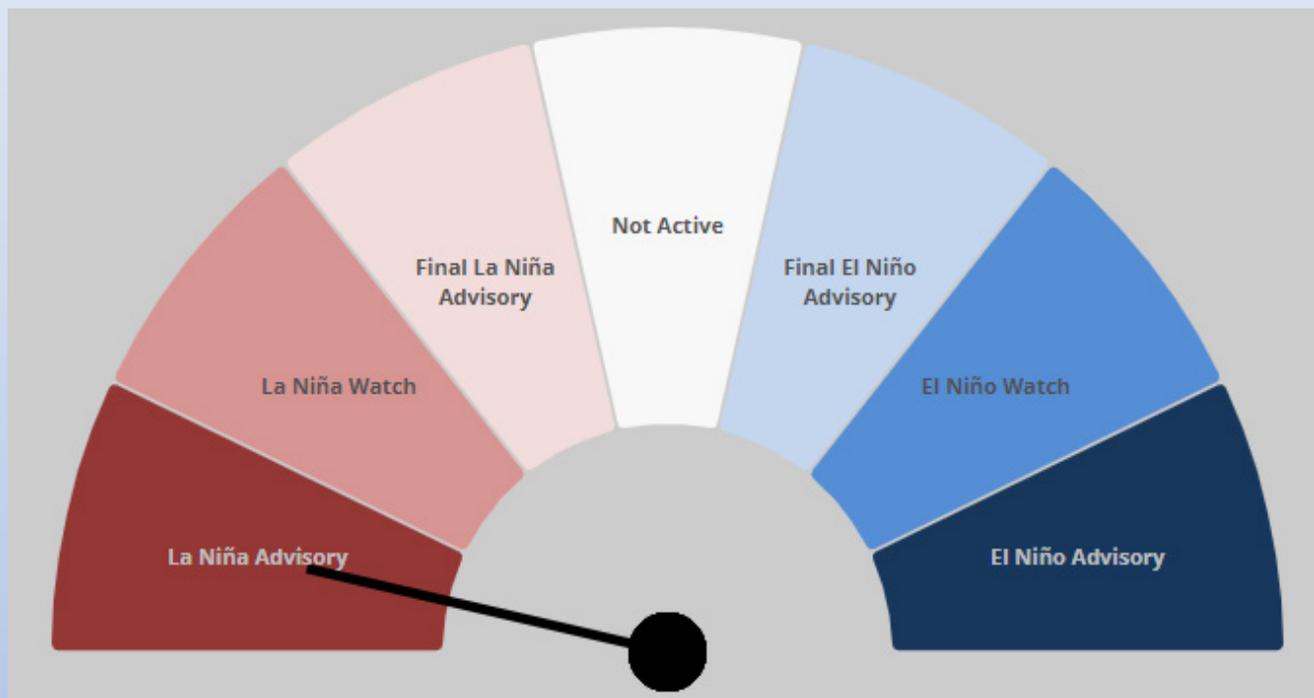


# Texas Water Conditions Report

December 2022



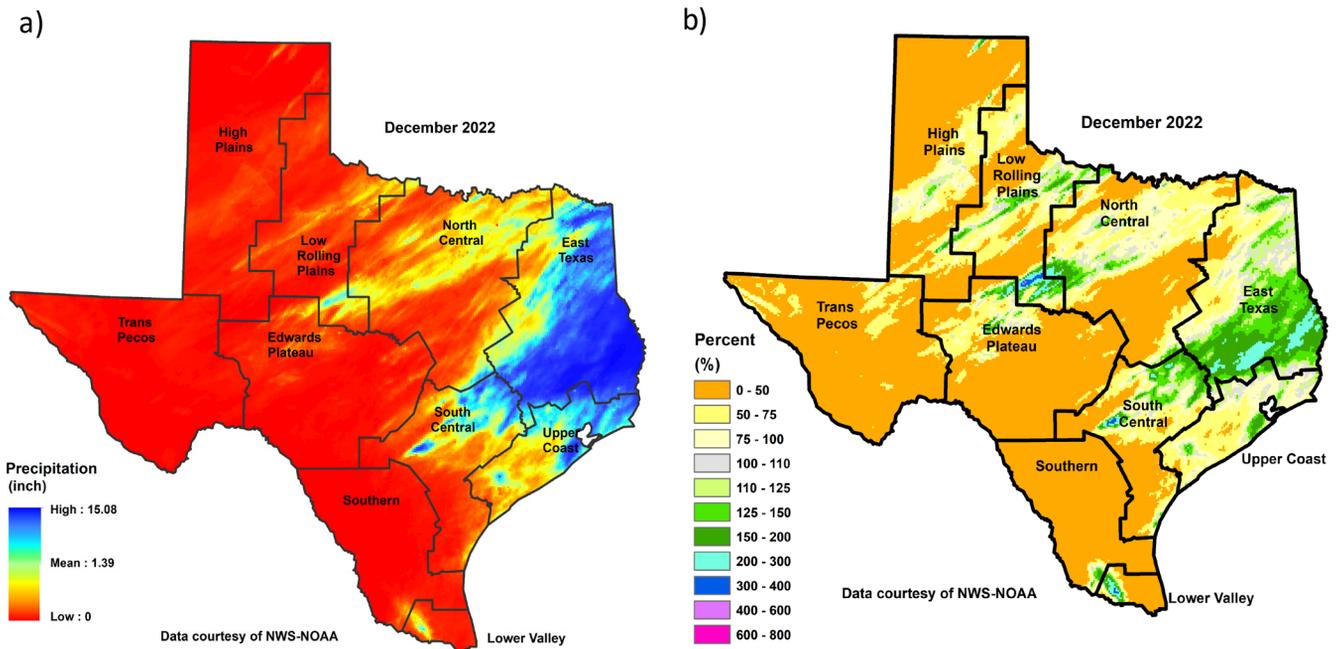
## Water News:

La Niña (warmer and drier than normal) conditions are expected to continue through the winter, with equal chances of La Niña and ENSO-neutral conditions occurring during January-March 2023. In February-April 2023, there is a 71% chance of returning to more neutral (ENSO-neutral) conditions. <https://waterdatafortexas.org/drought/drought-outlook>

# RAINFALL

Little to no rain [yellow, orange, and red shading, Figure 1(a)] fell in the High Plains, much of the Low Rolling Plains, Trans Pecos, Edwards Plateau, Southern, northwestern and southern South Central, Lower Valley, much of the North Central, western Upper Coast, and western East Texas climate divisions. Some rainfall [light blue and dark blue shading, Figure 1(a)] was seen in southern Low Rolling Plains, areas of northern and southeastern North Central, northern South Central, eastern and areas of western Upper Coast, portions of western Lower Valley, and much of East Texas, with accumulations reaching 15.08 inches.

Compared to historical data from 1991–2020, much of the state received below average rainfall [yellow and orange shading, Figure 1(b)]. Small portions of the High Plains, areas of central and southern Low Rolling Plains, western North Central, northern Edwards Plateau, southern Southern, western Lower Valley, northern South Central, areas of the Upper Coast, and eastern and southern East Texas climate divisions received 125–200 percent of normal rainfall [light green, dark green shading, Figure 1(b)]. 200–300 percent of normal rainfall [light blue shading, Figure 1(b)] was seen in the northern High Plains, southern Low Rolling Plains, western North Central, northern South Central, southern East Texas, and western Lower Valley climate divisions. The Low Rolling Plains, northern Southern, and western Lower Valley climate divisions received 300–400 percent of normal rainfall [(dark blue shading, Figure 1 (b))].

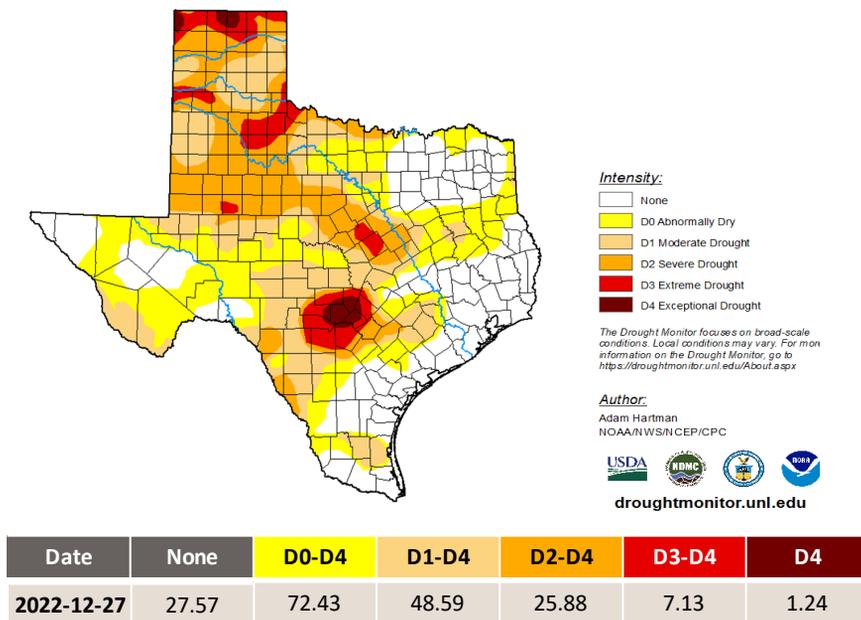


**Figure 1:** (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

## DROUGHT

At the end of December, 72.43% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). That is a decrease of 1.71% from the end of November.

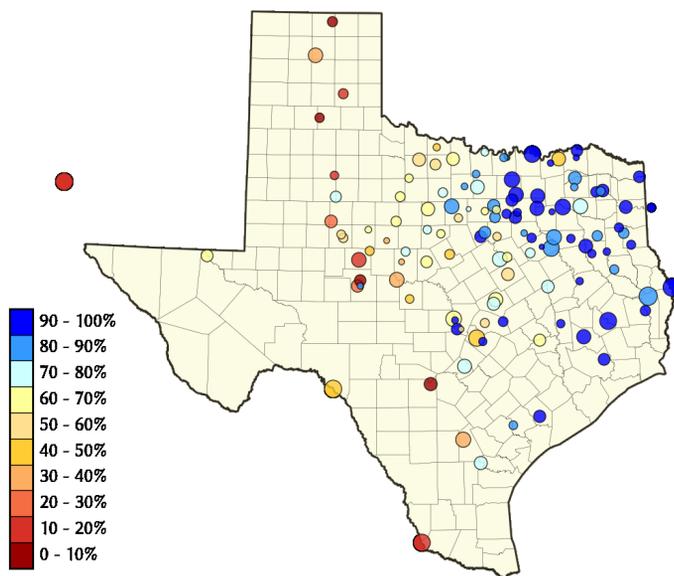
December 27, 2022



**Figure 2.** The percentage of drought in Texas according to the U.S. Drought Monitor map as of December 27, 2022.

## RESERVOIR STORAGE

Out of 119 reservoirs in the state, 13 reservoirs held 100 percent conservation storage capacity (Figure 3). Additionally, 25 reservoirs were at or above 90 percent full. Ten reservoirs remained below 30 percent full: E.V. Spence (18.3 percent full), O. C. Fisher (3.2 percent full), J.B. Thomas (24.2 percent full), Falcon (14.7 percent full), Greenbelt (11.8 percent full), Mackenzie (6.2 percent full), Medina Lake (6.3 percent full), Palo Duro Reservoir (0.3 percent full), Twin Buttes (29.1 percent full), and the White River Lake (14.0 percent full). Elephant Butte Reservoir (New Mexico) was 11.4 percent full (Figure 3).



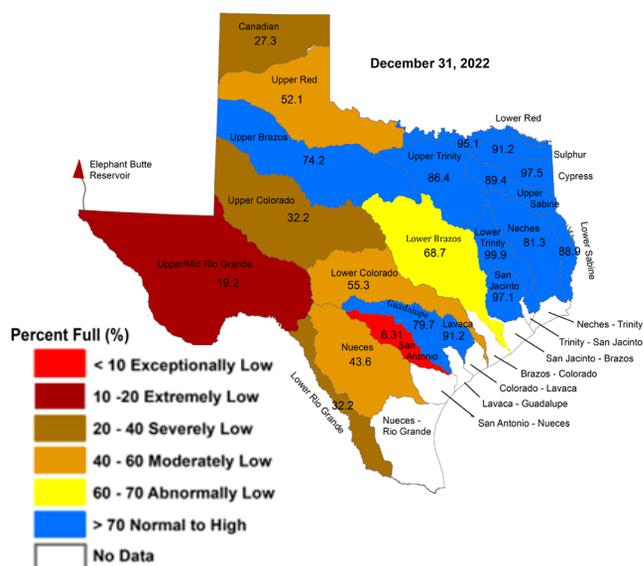
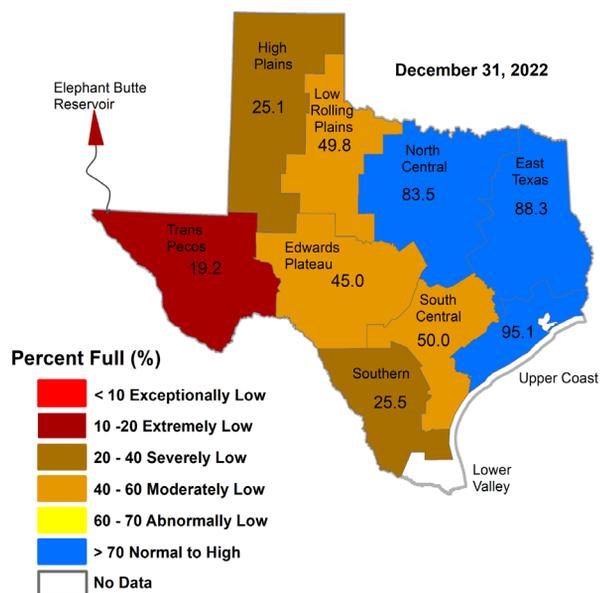
**Figure 3.** Reservoir conservation storage at end-December expressed as percent full (%)

Reservoir conservation storage by climate division was at or above normal [storage  $\geq 70$  percent full, Figure 4(a)] for East Texas (88.3 percent full), North Central (83.5 percent full), and the Upper Coast (95.1 percent full) climate divisions. Conservation storage was moderately low (Figure 4(a)) for the Low Rolling Plains (49.8 percent full), Edwards Plateau (45.0 percent full), and South Central (50.0 percent full) climate divisions. The High Plains (25.1 percent full) and Southern (25.5 percent full) climate divisions had severely low conservation storage (Figure 4(a)). The Trans Pecos (19.2 percent full) climate division had extremely low conservation storage (Figure 4(a)).

Combined conservation storage by river basin or sub-basin was normal to high ( $>70$  percent full, Figure 4(b)) in the Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, Neches, San Jacinto, Lavaca, and Guadalupe river basins. The Lower Brazos river basin had abnormally low conservation storage. The Lower Colorado, Upper Red, and Nueces river basins had moderately low conservation storage (40–60 percent full, Figure 4(b)). The Canadian, Upper Colorado, and Lower Rio Grande river basins had severely low conservation storage (20–40 percent full, Figure 4(b)). The Upper/Mid Rio Grande river basin had extremely low conservation storage (10–20 percent full, Figure 4(b)) and the San Antonio river basin had exceptionally low or less than 10 percent of conservation storage (Figure 4 (b)).

a) Regional Reservoir Storage Condition

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



**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.

## CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

Name of lake or reservoir	Storage capacity	Storage at end-December 2022		Storage change from end-Nov 2022		Storage change from end-Dec 2021	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Abilene, Lake	7,900	2,764	35.0	-118	-1.5	-3,222	-40.8
Alan Henry Reservoir	96,207	71,725	74.6	-329	0.0	-14,808	-15.4
*Amistad Reservoir (Texas & Mexico)	3,275,532	1,492,357	45.6	16,614	0.5	380,207	11.6
*Amistad Reservoir (Texas)	1,840,849	864,723	47.0	3,464	0.2	-38,291	-2.1
Amon G Carter, Lake	19,266	16,363	84.9	-219	-1.1	-2,556	-13.3
Aquilla Lake	43,243	28,029	64.8	-387	0.0	-11,274	-26.1
Arlington, Lake	40,157	39,810	99.1	-347	0.0	8,154	20.3
Arrowhead, Lake	230,359	152,608	66.2	-2,063	0.0	-46,419	-20.2
Athens, Lake	29,503	28,305	95.9	669	2.3	-1,198	-4.1
*Austin, Lake	23,972	22,972	95.8	-109	0.0	261	1.1
B A Steinhagen Lake	69,186	64,184	92.8	0	0.0	-589	0.0
Bardwell Lake	43,856	43,331	98.8	1,684	3.8	1,363	3.1
Belton Lake	432,631	285,685	66.0	-5,360	-1.2	-119,136	-27.5
Benbrook Lake	85,648	68,712	80.2	4,118	4.8	-2,866	-3.3
Bob Sandlin, Lake	192,417	186,155	96.7	4,004	2.1	5,904	3.1
Bois d'Arc Lake	367,609	178,509	48.6	15,415	4.2	81,156	22.1
Bonham, Lake	11,027	10,848	98.4	-179	-1.6	2,494	22.6
Brady Creek Reservoir	28,808	12,902	44.8	-182	0.0	-3,684	-12.8
Bridgeport, Lake	372,183	272,193	73.1	-1,749	0.0	-59,356	-15.9
*Brownwood, Lake	130,868	80,789	61.7	-1,117	0.0	-40,315	-30.8
Buchanan, Lake	866,694	524,681	60.5	2,037	0.2	-237,398	-27.4
Caddo, Lake	29,898	29,898	100.0	0	0.0	0	0.0
Canyon Lake	378,781	301,703	79.7	-4,830	-1.3	-75,105	-19.8
Cedar Creek Reservoir in Trinity	644,686	545,467	84.6	0	0.0	-49,830	-7.7
Champion Creek Reservoir	41,580	24,961	60.0	-207	0.0	-4,111	-9.9
Cherokee, Lake	40,094	40,094	100.0	3,558	8.9	576	1.4
Choke Canyon Reservoir	662,820	209,841	31.7	-4,658	0.0	-80,185	-12.1
*Cisco, Lake	29,003	20,878	72.0	9	0.0	-4,440	-15.3
Coleman, Lake	38,075	29,173	76.6	891	2.3	-6,575	-17.3
Colorado City, Lake	31,040	25,334	81.6	-552	-1.8	-5,401	-17.4
*Coletto Creek Reservoir	30,758	17,169	55.8	-220	0.0	-5,667	-18.4
Conroe, Lake	417,577	401,835	96.2	29,334	7.0	3,688	0.9
Corpus Christi, Lake	256,062	191,683	74.9	-11,224	-4.4	-15,239	-6.0
Crook, Lake	9,195	9,007	98.0	-178	-1.9	977	10.6
Cypress Springs, Lake	66,756	65,597	98.3	3,202	4.8	4,513	6.8
E. V. Spence Reservoir	517,272	94,906	18.3	-1,903	0.0	-34,078	-6.6
Eagle Mountain Lake	179,880	146,831	81.6	4,139	2.3	-16,813	-9.3
Elephant Butte Reservoir (Texas)	852,491	97,333	11.4	20,432	2.4	24,981	2.9
Elephant Butte Reservoir (Total Storage)	1,985,900	225,307	11.3	47,296	2.4	57,827	2.9
*Falcon Reservoir (Texas & Mexico)	2,646,817	486,385	18.4	5,437	0.2	80,800	3.1
*Falcon Reservoir (Texas)	1,551,007	228,627	14.7	9,586	0.6	-106,691	-6.9
Fork Reservoir, Lake	605,061	478,304	79.1	13,940	2.3	17,788	2.9
Fort Phantom Hill, Lake	70,030	47,162	67.3	-630	0.0	-18,611	-26.6
Georgetown, Lake	38,005	20,463	53.8	522	1.4	-8,058	-21.2
Gibbons Creek Reservoir	25,721	25,543	99.3	6,716	26.1	3,302	12.8
Graham, Lake	45,288	35,201	77.7	-387	0.0	-4,046	-8.9
Granbury, Lake	132,949	117,260	88.2	2,215	1.7	-11,409	-8.6

## CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

Name of lake or reservoir	Storage capacity	Storage at end-December 2022		Storage change from end-Nov 2022		Storage change from end-Dec 2021	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
<i>Continued</i>							
Granger Lake	51,822	50,238	96.9	2,257	4.4	-1,584	-3.1
Grapevine Lake	163,064	163,064	100.0	0	0.0	7,046	4.3
Greenbelt Lake	59,968	7,068	11.8	-98	0.0	-2,756	-4.6
*Halbert, Lake	6,033	5,612	93.0	173	2.9	387	6.4
Hords Creek Lake	8,109	2,522	31.1	12	0.1	-974	-12.0
Houston County Lake	17,113	15,993	93.5	891	5.2	-1,120	-6.5
Houston, Lake	132,318	132,318	100.0	1,939	1.5	0	0.0
Hubbard Creek Reservoir	313,298	211,036	67.4	-2,420	0.0	-65,446	-20.9
Hubert H Moss Lake	24,058	21,190	88.1	-122	0.0	-1,600	-6.7
Inks, Lake	13,729	13,147	95.8	95	0.7	55	0.4
J. B. Thomas, Lake	199,931	48,398	24.2	-1,685	0.0	-31,856	-15.9
Jacksonville, Lake	25,670	24,435	95.2	937	3.7	-1,235	-4.8
Jim Chapman Lake (Cooper)	260,332	227,586	87.4	20,930	8.0	20,771	8.0
Joe Pool Lake	175,800	175,800	100.0	0	0.0	8,892	5.1
Kemp, Lake	245,307	136,124	55.5	3,507	1.4	-71,785	-29.3
Kickapoo, Lake	86,345	50,952	59.0	-472	0.0	-14,502	-16.8
Lavon Lake	409,757	385,522	94.1	40,871	10.0	51,405	12.5
Leon, Lake	27,762	16,974	61.1	50	0.2	-7,322	-26.4
Lewisville Lake	563,228	516,973	91.8	37,654	6.7	-3,631	0.0
Limestone, Lake	203,780	144,135	70.7	720	0.4	-40,466	-19.9
*Livingston, Lake	1,603,504	1,603,504	100.0	0	0.0	0	0.0
*Lost Creek Reservoir	11,950	10,518	88.0	24	0.2	-1,084	-9.1
Lyndon B Johnson, Lake	112,778	110,853	98.3	-512	0.0	0	0.0
Mackenzie Reservoir	46,450	2,895	6.2	-18	0.0	-666	-1.4
Marble Falls, Lake	7,597	4,422	58.2	-33	0.0	-2,781	-36.6
Martin, Lake	75,726	63,237	83.5	4,209	5.6	-1,803	-2.4
Medina Lake	254,823	16,093	6.3	-920	0.0	-49,906	-19.6
Meredith, Lake	500,000	153,210	30.6	-1,503	0.0	-20,041	-4.0
Millers Creek Reservoir	26,768	16,533	61.8	-248	0.0	-6,667	-24.9
*Mineral Wells, Lake	5,273	4,164	79.0	-26	0.0	-961	-18.2
Monticello, Lake	34,740	28,407	81.8	875	2.5	1,144	3.3
Mountain Creek, Lake	22,850	22,850	100.0	0	0.0	0	0.0
Murvaul, Lake	38,285	38,285	100.0	0	0.0	1,059	2.8
Nacogdoches, Lake	39,522	33,005	83.5	1,702	4.3	-1,674	-4.2
Nasworthy	9,615	8,368	87.0	25	0.3	-377	-3.9
Navarro Mills Lake	49,827	37,017	74.3	-126	0.0	-7,528	-15.1
New Terrell City Lake	8,583	8,583	100.0	129	1.5	929	10.8
Nocona, Lake (Farmers Crk)	21,444	15,998	74.6	-200	0.0	-2,990	-13.9
North Fork Buffalo Creek Reservoir	15,400	6,802	44.2	-28	0.0	-5,560	-36.1
O' the Pines, Lake	241,363	241,363	100.0	3,514	1.5	6,304	2.6
O. C. Fisher Lake	115,742	3,672	3.2	-69	0.0	-3,445	-3.0
*O. H. Ivie Reservoir	554,340	221,174	39.9	-915	0.0	-80,949	-14.6
Oak Creek Reservoir	39,210	19,093	48.7	-265	0.0	-7,869	-20.1

## CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

Name of lake or reservoir	Storage capacity	Storage at end-December 2022		Storage change from end-Nov 2022		Storage change from end-Dec 2021		
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)	
<i>Continued</i>								
Palestine, Lake	367,303	339,113	92.3	15,818	4.3	-24,964	-6.8	
Palo Duro Reservoir	61,066	213	0.3	-6	0.0	-217	0.0	
Palo Pinto, Lake	26,766	15,552	58.1	261	1.0	-10,326	-38.6	
Pat Cleburne, Lake	26,008	15,386	59.2	987	3.8	-5,355	-20.6	
*Pat Mayse Lake	113,683	113,683	100.0	4,031	3.5	11,454	10.1	
Possum Kingdom Lake	538,139	442,026	82.1	442	0.1	-76,164	-14.2	
Proctor Lake	54,762	23,367	42.7	-431	0.0	-24,004	-43.8	
Ray Hubbard, Lake	439,559	434,981	99.0	5,550	1.3	24,754	5.6	
Ray Roberts, Lake	788,167	752,389	95.5	9,062	1.1	-14,411	-1.8	
Red Bluff Reservoir	151,110	95,903	63.5	2,305	1.5	-15,818	-10.5	
Richland-Chambers Reservoir	1,087,839	900,610	82.8	-396	0.0	-94,540	-8.7	
Sam Rayburn Reservoir	2,857,077	2,261,293	79.1	64,061	2.2	-218,686	-7.7	
Somerville Lake	150,293	100,960	67.2	7,829	0.5	-49,333	-32.8	
Squaw Creek, Lake	151,250	151,250	100.0	0	0.0	0	0.0	
Stamford, Lake	51,570	32,522	63.1	-616	-1.2	-12,472	-24.2	
Stillhouse Hollow Lake	229,796	166,508	72.5	-2,944	-1.3	-50,956	-22.2	
Striker, Lake	16,934	16,703	98.6	778	4.6	-229	-1.4	
Sweetwater, Lake	12,267	7,402	60.3	-92	0.0	-2,418	-19.7	
*Sulphur Springs, Lake	17,747	15,406	86.8	-2,341	-13.2	5,360	30.2	
Tawakoni, Lake	871,685	838,118	96.1	27,123	3.1	36,643	4.2	
Texana, Lake	158,975	144,988	91.2	23,214	0.16	-10,722	-6.7	
Texoma, Lake (Texas & Oklahoma)	2,487,601	2,418,341	97.2	105,297	4.3	70,005	2.8	
Texoma, Lake (Texas)	1,243,801	1,208,426	97.2	17,633	1.4	128,992	10.6	
Toledo Bend Reservoir (Texas & Louisiana)	4,472,900	3,983,383	89.1	159,238	3.6	133,644	3.0	
Toledo Bend Reservoir (Texas)	2,236,450	1,989,642	89.0	79,620	3.6	66,822	3.0	
Travis, Lake	1,098,044	502,943	45.8	-6,506	0.0	-275,798	-25.1	
Twin Buttes Reservoir	182,454	53,096	29.1	254	0.1	-41,499	-22.7	
Tyler, Lake	72,073	62,678	87.0	2,967	4.1	-8,456	-11.7	
Waco, Lake	189,418	106,942	56.5	-2,219	-1.2	-59,963	-31.7	
Waxahachie, Lake	11,060	9,543	86.3	271	2.5	555	5.0	
Weatherford, Lake	17,812	10,786	60.6	-258	-1.4	-4,070	-22.8	
White River Lake	29,880	4,186	14.0	-154	0.0	-1,628	-5.4	
Whitney, Lake	564,808	424,533	75.2	1,395	0.2	-92,245	-16.3	
Worth, Lake	24,419	15,672	64.2	-1,244	-5.1	-4,000	-16.4	
Wright Patman Lake	122,593	122,593	100.0	0	0.0	0	0.0	
<b>STATEWIDE TOTAL</b>								
<b>STATEWIDE TOTAL</b>	<b>31,170,633</b>	<b>21,349,678</b>	<b>68.5</b>	<b>-648,246</b>	<b>-2.1</b>	<b>-3,226,344</b>	<b>-10.4</b>	

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

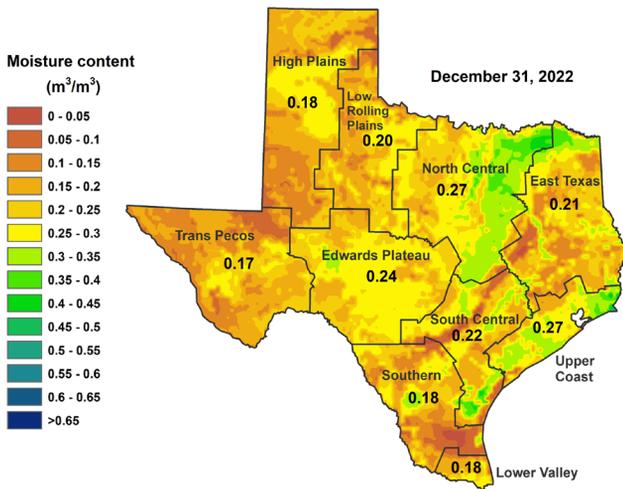
\*\*Monthly and yearly changes do not include reservoirs that did not have data in the last month or last year, respectively.

# SOIL MOISTURE

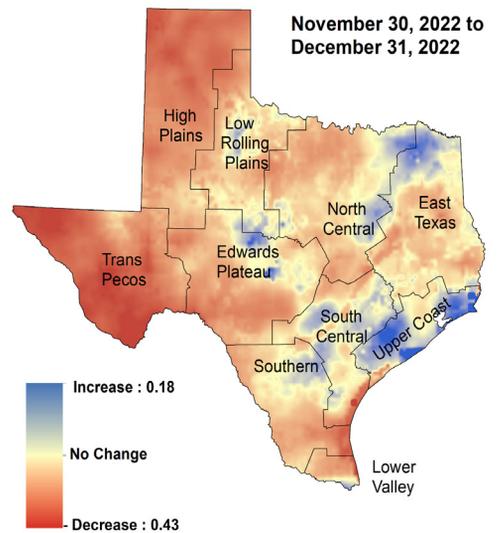
At the end of December 2022, root zone soil moisture was low [light orange, dark orange Figure 5(a)] in the High Plains, Trans Pecos, Low Rolling Plains, much of the Southern, southeastern and portions of northern South Central, and much of East Texas climate divisions. Average to slightly above average soil moisture [light green, dark green shading, Figure 5(a)] was seen in the eastern North Central, areas of East Texas, northwestern Edwards, central and southeastern Southern, northern and southern South Central, and Upper Coast climate divisions.

Compared to conditions at the end of November 2022, soil moisture content increased [blue shading in Figure 5(b)] in central Low Rolling Plains, northern Edwards Plateau, eastern North Central, northeastern Southern, areas of the South Central, southern Lower Valley, northern East Texas, and the Upper Coast climate divisions. Soil moisture content decreased [red shading in Figure 5(b)] across much of the state in all climate divisions.

a)



b)



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

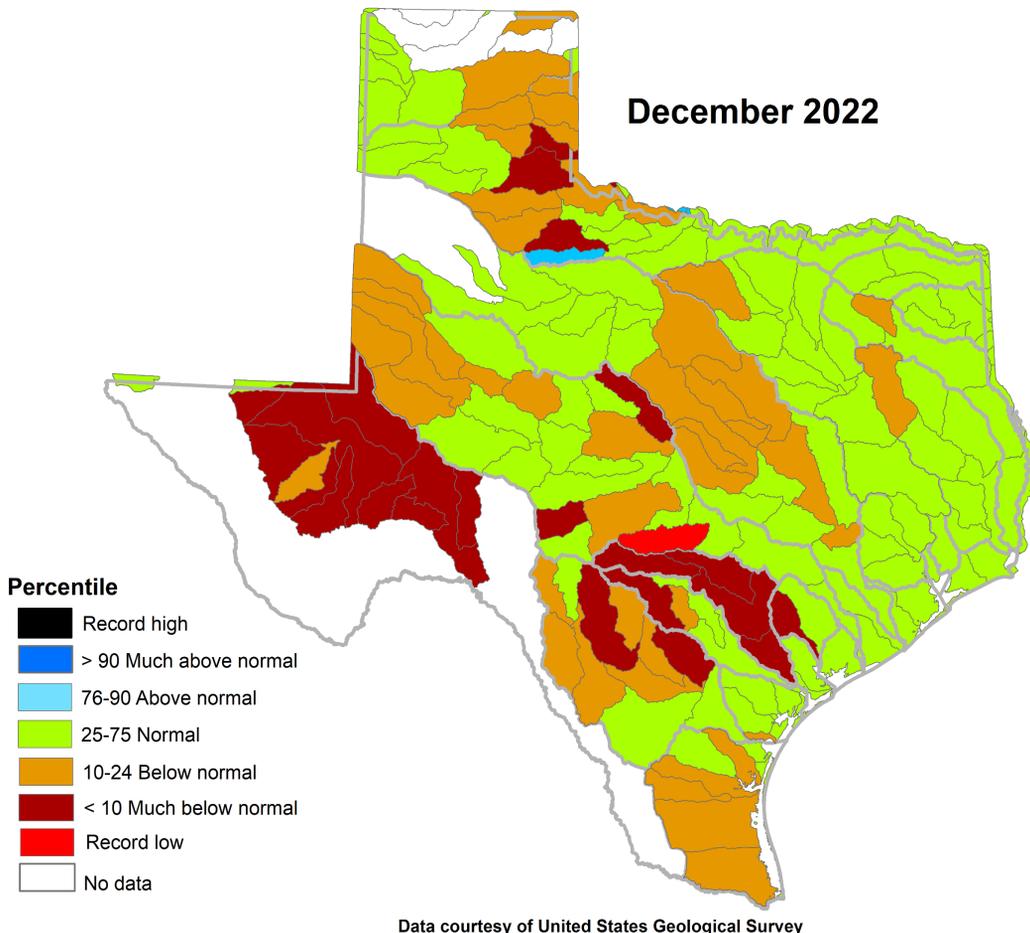
**Figure 5:** (a) Root zone soil moisture conditions in December 2022 and (b) the difference in root zone soil moisture between end-November 2022 and end-December 2022

## STREAMFLOW CONDITIONS

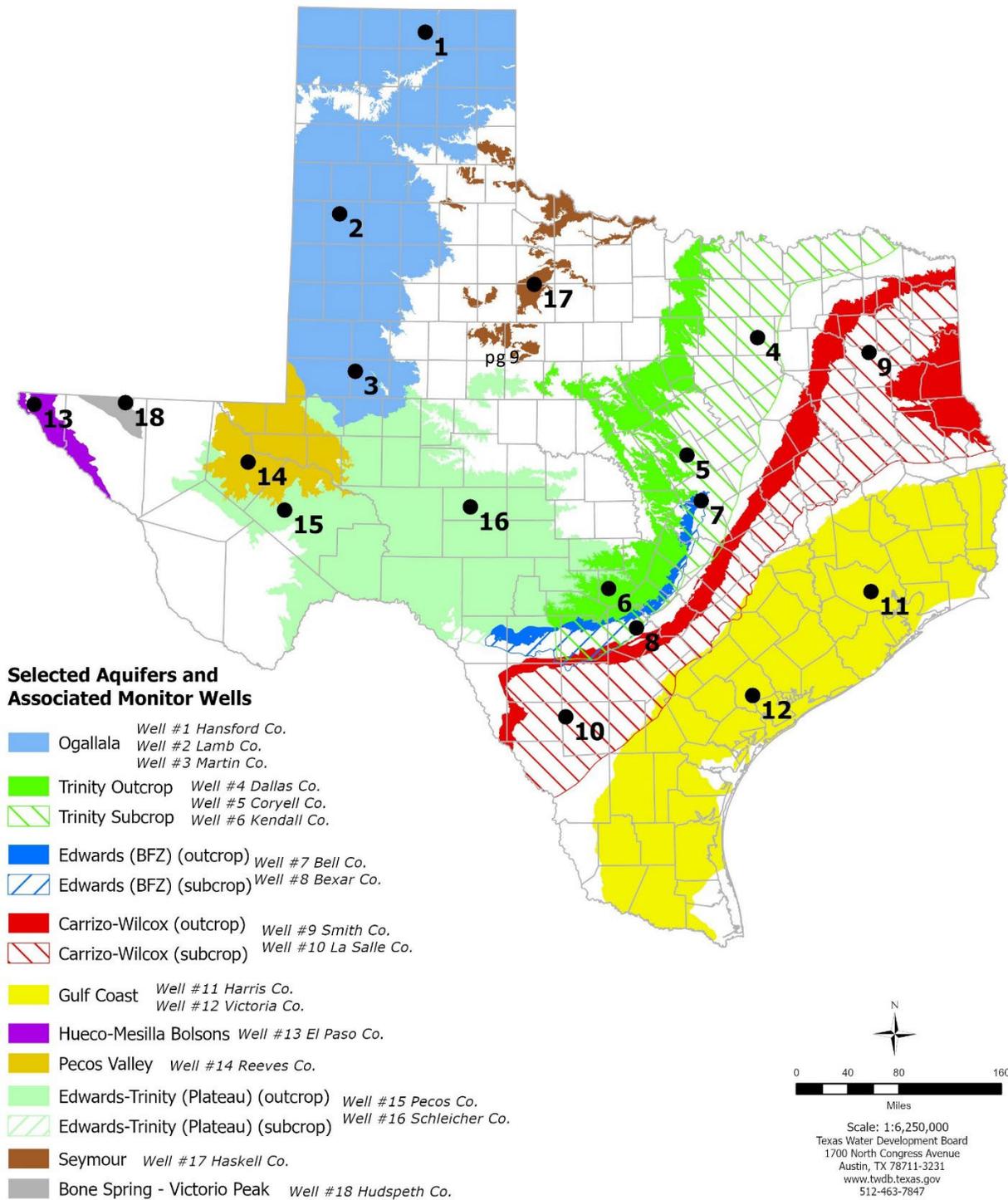
Normal streamflow (25–75<sup>th</sup> percentile, green shading, Figure 6) was recorded in parts of the panhandle, central, east, and coastal regions of Texas this month. Above normal (76–90<sup>th</sup> percentile, light blue shading, Figure 6) streamflow was seen in the South Wichita watershed in the Upper Red river basin.

Below normal streamflow (10–24<sup>th</sup> percentile, orange shading, Figure 6) was recorded in the Canadian, Upper Red, Upper Trinity, Mid and Lower Brazos, Upper Sabine (Lake Fork watershed), Upper and Mid Colorado, Upper San Antonio, Upper Nueces, Nueces-Rio Grande river basins, and the Toyah watershed in the Pecos river basin.

Much below normal stream flow (< 10<sup>th</sup> percentile, dark red shading, Figure 6) was seen in the Upper and Middle Guadalupe, San Antonio (Medina watershed), Nueces (Upper Frio and Atascosa watersheds), Lavaca, Mid Colorado (Pecan Bayou and North Llano watersheds), Upper Red (Lower Salt Fork Red, Lower Prairie Dog Town Fork Red, and North Wichita watersheds), and Pecos river basins. A record low (bright red shading, Figure 6) was seen in the Pedernales watershed in the Colorado river basin.



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



## DECEMBER 2022 GROUNDWATER LEVELS IN MONITORING WELLS

Water-level measurements were available for 16 key monitoring wells in the state. The recorders in two wells (#4 and #14 on map) were offline during the reporting period. Water levels rose in 10 monitoring wells since the beginning of December, ranging from an increase of 0.02 feet in the Bell County Edwards (Balcones Fault Zone) Aquifer well (#7 on map) to 7.51 feet in the Kendall County Trinity Aquifer well (#6 on map). Water levels declined in six monitoring wells, ranging from a decline of -0.08 feet in the Lamb County Ogallala Aquifer well (#2 on map) to -3.22 feet in the La Salle County Carrizo-Wilcox Aquifer well (#10 on map). The J-17 well (#8 on map) in San Antonio recorded a water level of 94.10 feet below land surface or 636.90 feet above mean sea level. Water levels are 3.10 feet below the Stage 3 critical management level for the San Antonio portion of the Edwards (Balcones Fault Zone) Aquifer. Stage 3 water restrictions have been in effect since June 13, 2022.

\* Well numbers used in this publication on the aquifer map to indicate the monitoring well location (numbers 1 to 18) are different from 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	163.81	162.97	-0.84	-0.27	-93.69	1951
(2) Lamb 1053602	153.46	153.38	-0.08	-1.00	-125.29	1951
(3) Martin 2739903	145.83	145.88	0.05	-1.27	-40.94	1964
(4) Dallas 3319101	NA	515.84	NA	NA	-293.84*	1954
(5) Coryell 4035404	544.52	546.05	1.53	-9.80	-252.52	1955**
(6) Kendall 6802609	160.48	167.99	7.51	-12.33	-100.48	1975
(7) Bell 5804816	125.39	125.41	0.02	-3.57	-1.88	2008
(8) Bexar 6837203	94.10	92.90	-1.20	-26.70	-47.46	1932
(9) Smith 3430907	442.56	443.05	0.49	-2.87	-142.56	1977**
(10) La Salle 7738103	533.49	530.27	-3.22	-31.68	-280.42	2003
(11) Harris 6514409	193.55	193.92	0.37	-7.92	-58.05	1947**
(12) Victoria 8017502	35.77	33.97	-1.80	-4.65	-1.77	1958**
(13) El Paso 4913301	300.30	300.05	-0.25	-2.16	-68.40	1964**
(14) Reeves 4644501	NA	157.68	NA	NA	-65.59*	1952
(15) Pecos 5216802	191.15	196.27	5.12	10.87	55.73	1976
(16) Schleicher 5512134	311.31	311.70	0.39	-8.43	-9.41	2003
(17) Haskell 2135748	46.55	46.83	0.28	-1.62	-3.55	2002
(18) Hudspeth 4807516	151.19	152.60	1.41	NA	-47.27	1966

\* Change since the original measurement taken on the date indicated in the last column. The historical changes shown for recorder wells #4 and #14 are based off the most recent water level records from November 2022.

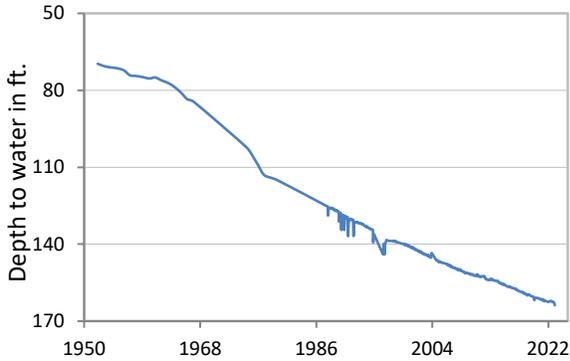
\*\* Measurement not shown on the hydrograph.

NA (not available)

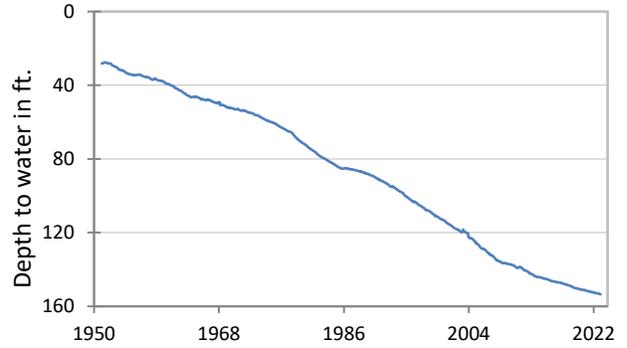
All data are provisional and subject to revision

**DECEMBER 2022 MONITORING WELL HYDROGRAPHS**

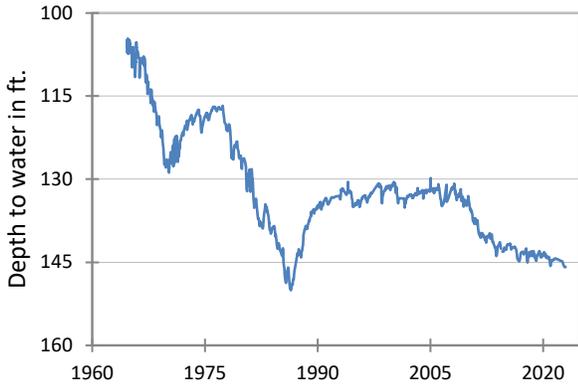
**(1) State Well #03-54-301  
Near Spearman, Hansford County  
Ogallala Aquifer**



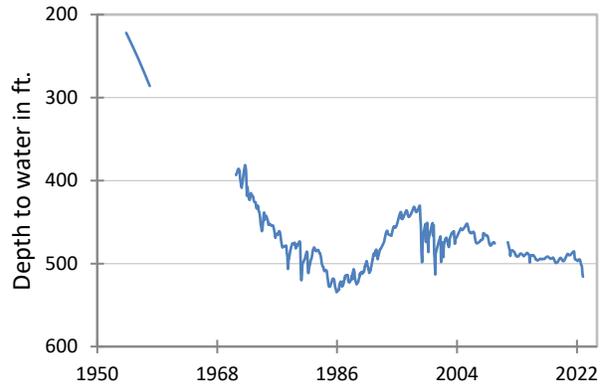
**(2) State Well #10-53-602  
Near Earth, Lamb County  
Ogallala Aquifer**



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

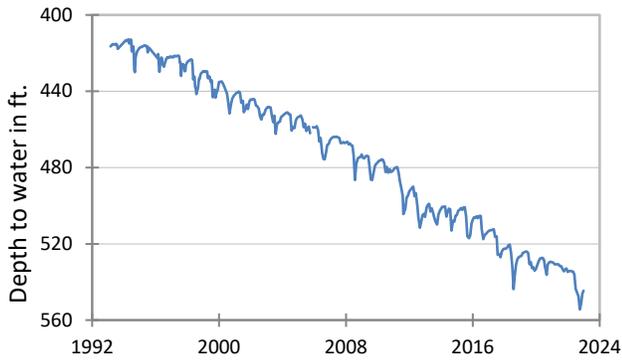


**\* (4) State Well #33-19-101  
Southeast Dallas, Dallas County  
Twin Mountains Formation-Trinity Aquifer**

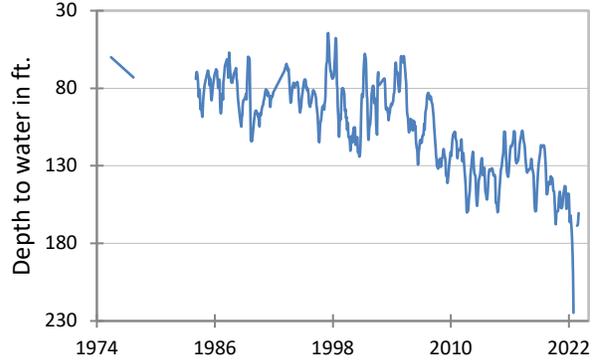


\*Recorder wells #4 was offline in December 2022 and did not record data.

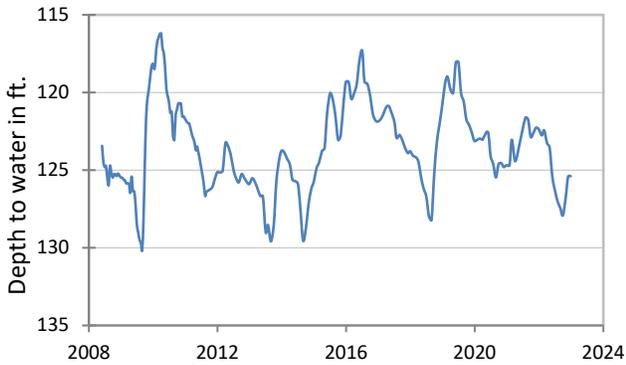
**(5) State Well #40-35-404**  
**Gatesville, Coryell County**  
**Hosston Formation-Trinity Aquifer**



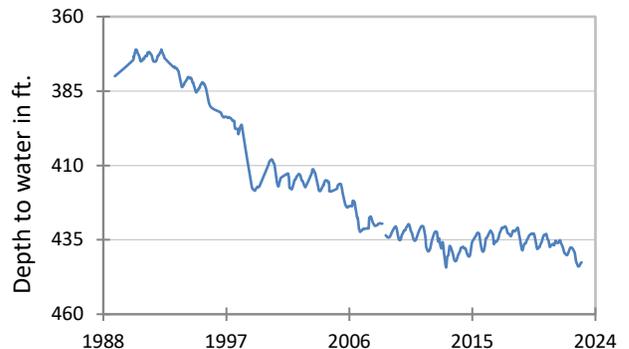
**(6) State Well #68-02-609**  
**Waring, Kendall County**  
**Travis Peak Formation-Trinity Aquifer**



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



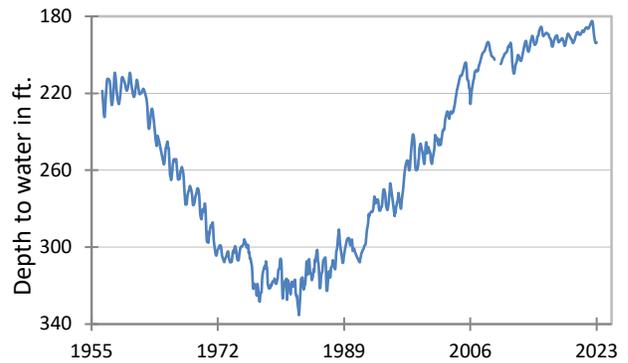
**(9) State Well #34-30-907**  
**Red Springs, Smith County**  
**Carrizo-Wilcox Aquifer**



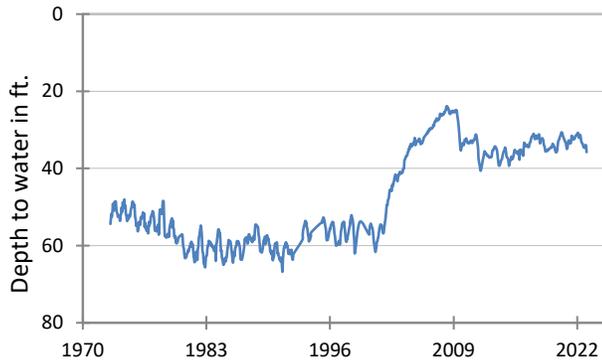
**(10) State Well #77-38-103**  
**Near Cotulla, La Salle County**  
**Carrizo-Wilcox Aquifer**



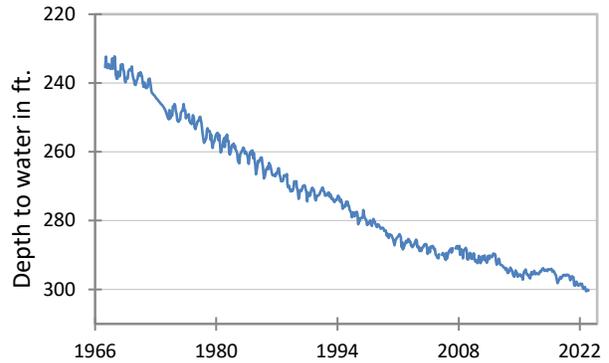
**(11) State Well #65-14-409**  
**North Houston, Harris County**  
**Evangeline Formation-Gulf Coast Aquifer**



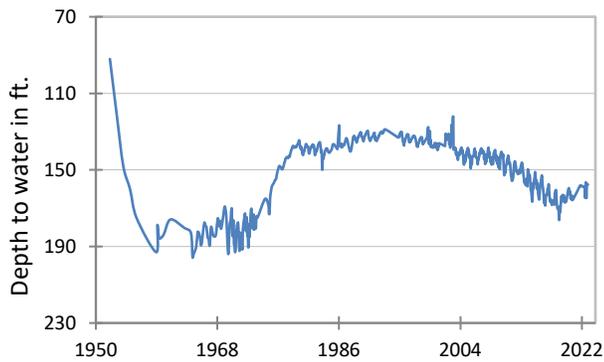
**(12) State Well #80-17-502**  
**Near Bloomington, Victoria County**  
**Lissie Formation-Gulf Coast Aquifer**



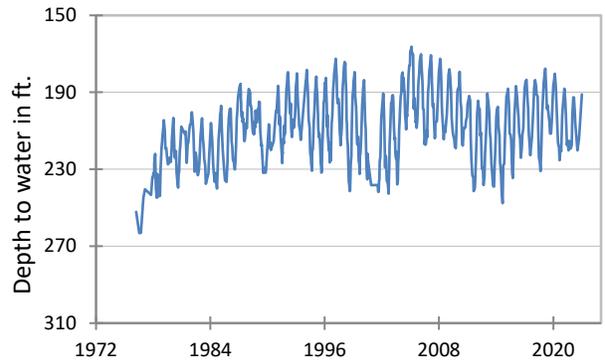
**(13) State Well #49-13-301**  
**El Paso, El Paso County**  
**Hueco-Mesilla Bolsons Aquifer**



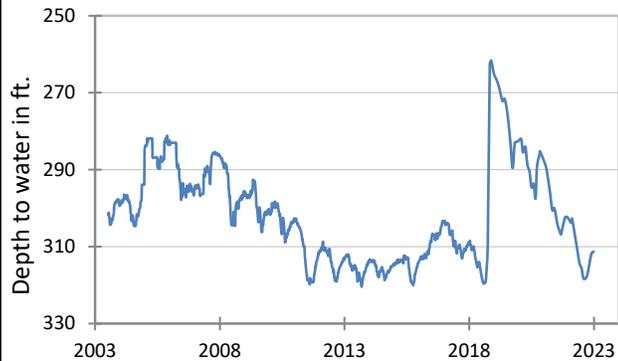
**\*(14) State Well #46-44-501**  
**Near Pecos, Reeves County**  
**Pecos Valley Aquifer**



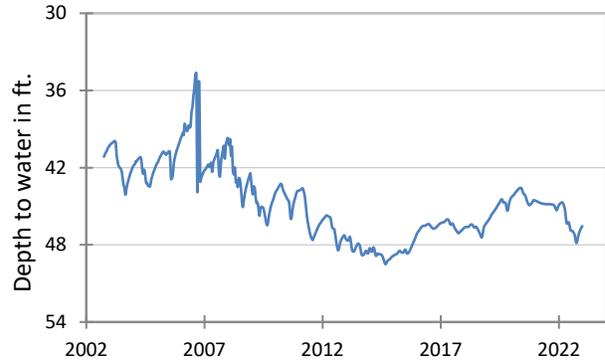
**(15) State Well #52-16-802**  
**Fort Stockton, Pecos County**  
**Edwards-Trinity (Plateau) Aquifer**



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

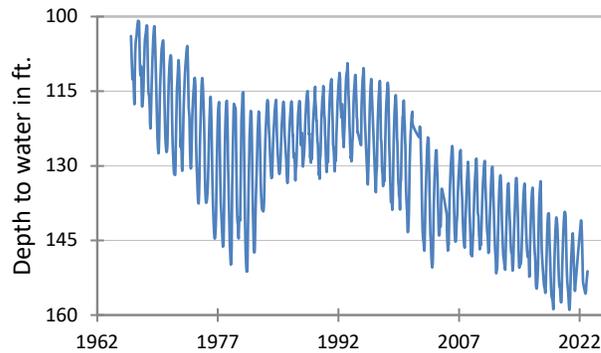


**(17) State Well #21-35-748**  
**Near O'Brien, Haskell County**  
**Seymour Aquifer**

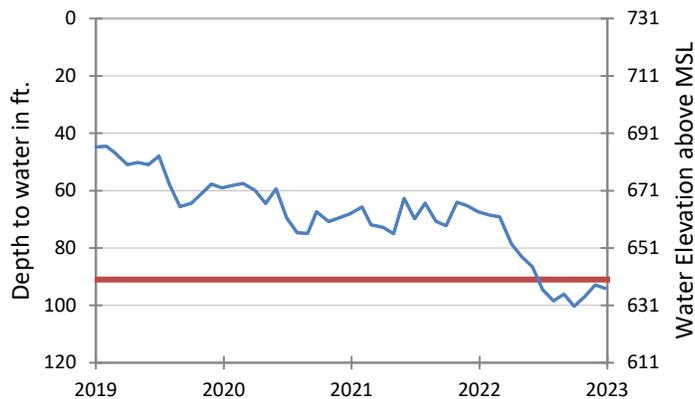
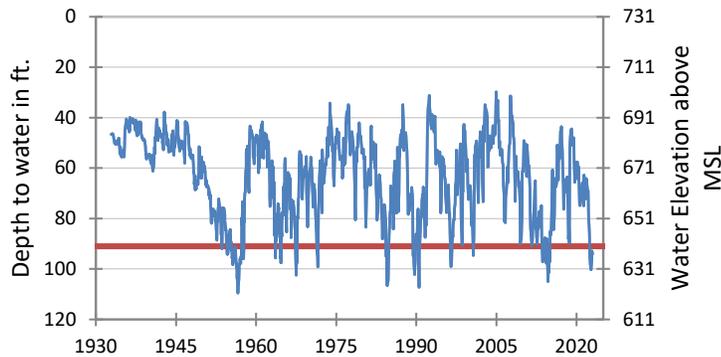


\*Recorder wells #14 was offline in December 2022 and did not record data.

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



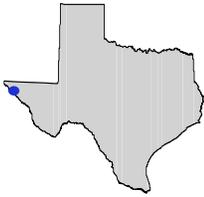
**(8) State Well #68-37-203 (J-17)  
San Antonio, Bexar County  
Edwards (Balcones Fault Zone) Aquifer**



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 94.10 feet below land surface, or 636.90 feet above mean sea level. This was 1.20 feet below last month's measurement, 26.70 feet below last year's measurement, and 47.46 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. In December 2022, Stage 3 drought restrictions were in effect because the aquifer remained below the Stage 3 critical management level.**

## HYDROGRAPH OF THE MONTH

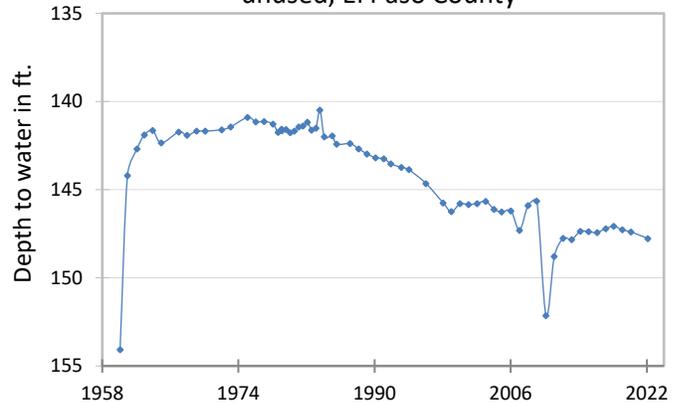


Each month this space features a new hydrograph (marked with the ● symbol on the map) depicting different aquifers and their conditions in Texas.

The Hueco-Mesilla Bolsons Aquifer, located east and west of the Franklin Mountains in Far West Texas, is recognized as a major aquifer in Texas. The Hueco Bolson is considered the southern portion of the Tularosa-Hueco Basin. The northern portion of the aquifer, the Tularosa Basin, lies entirely in the state of New Mexico. The Hueco and Mesilla Bolsons also extend under the Rio Grande River into Mexico. The aquifer is composed of basin-fill deposits of silt, sand, gravel, and clay in two basins, or bolsons: the Hueco Bolson, which has a maximum thickness of 9,000 feet, and the Mesilla Bolson, which has a maximum thickness of 2,000 feet. Although the Hueco and Mesilla Bolsons share similar geology, very little water travels between them. Fresh groundwater stored in the aquifer system beneath El Paso and Ciudad Juarez is bordered by regions of brackish to saline groundwater. The upper portion of the Hueco Bolson contains fresh to slightly saline water, ranging from less than 1,000 to 3,000 milligrams per liter of total dissolved solids. The Mesilla Bolson also contains fresh to saline water, ranging from less than 1,000 to 10,000 or more milligrams per liter of total dissolved solids. Its salinity typically increases to the south and in the shallower parts of the aquifer. In both aquifers, water level declines have contributed to higher salinity. Water levels have declined several hundred feet primarily due to municipal pumping in the Hueco Bolson up to the late 1980s. Since that time, however, observation wells indicate that water levels have stabilized.

### Hueco-Mesilla Bolsons Aquifer

Well #49-31-201, 400 feet deep  
unused, El Paso County



The initial water-level measurement of 154.08 feet below land surface was taken in this well by the USGS in February 1960. The USGS continued to take near-annual measurements in the well until the TWDB began monitoring activities 1978. The period of record reveals a distinct rise in water levels from 1960 to 1963, which may be explained by a change in use of the well. From 1963 to 2022, water levels have trended downwards at a rate averaging -0.11 feet per year. A sudden decline in water levels between 2009 and 2012 may be explained by a temporary increase in withdrawal of water in the area.



Far away (left), and close-up (right) images of well #49-31-201.