

Texas Water Conditions Report

May 2021

Surface Water News:

John Zhu, Nelun Fernando, and Carla G. Guthrie, 2021. *Estimate of Long-Term Water Availability for a Reservoir in Texas Using a Markov Chain Monte Carlo Method with Paleo Drought and Trend Consideration*. American Society of Civil Engineers.

Abstract link:

<https://doi.org/10.1061/9780784483466.099>

RAINFALL

Many areas of Texas, particularly in southeastern, north central, and the Gulf Coast saw accumulations exceeding 20 inches this month. Portions of southeastern Texas received much above average rainfall, reaching 28.07 inches in some areas [dark blue shading, Figure 1(a)].

Some rainfall [light blue and dark blue shading, Figure 1(a)] was recorded over areas of the High Plains, central Low Rolling Plains, a portion of the Trans Pecos, areas of eastern Edwards Plateau, eastern Southern, areas of the Lower Valley, much of North Central, South Central, East Texas, and the Upper Coast climate divisions.

Little to no rain [yellow, orange, and red shading, Figure 1(a)] fell over much of the Trans Pecos, areas of the High Plains, northern and southern Low Rolling Plains, Edwards Plateau, western Southern, areas of the Lower Valley, northwestern North Central, and areas of northwestern South Central climate divisions.

Monthly rainfall was much above average compared to historical data from 1981–2010, with some areas receiving 3–6 times the average rainfall [dark blue and purple shading, Figure 1(b)] in central High Plains, portions of northern and eastern Trans Pecos, central Low Rolling Plains, areas of North Central, areas of the Edwards Plateau, eastern Southern, eastern Lower Valley, areas of South Central, East Texas, and the Upper Coast climate divisions. An area of eastern Trans Pecos climate division received 6–8 times the average rainfall [pink shading, Figure 1(b)].

Above average rainfall [green and light blue shading, Figure 1(b)] occurred in portions of the Trans Pecos, much of the High Plains, Low Rolling Plains, Edwards Plateau, North Central, Southern, Lower Valley, South Central, East Texas, and the Upper Coast climate divisions.

Monthly rainfall for May was below average [yellow and orange shading, Figure 1(b)], in portions of the Trans Pecos, High Plains, Low Rolling Plains, Edwards Plateau, and Southern climate divisions.

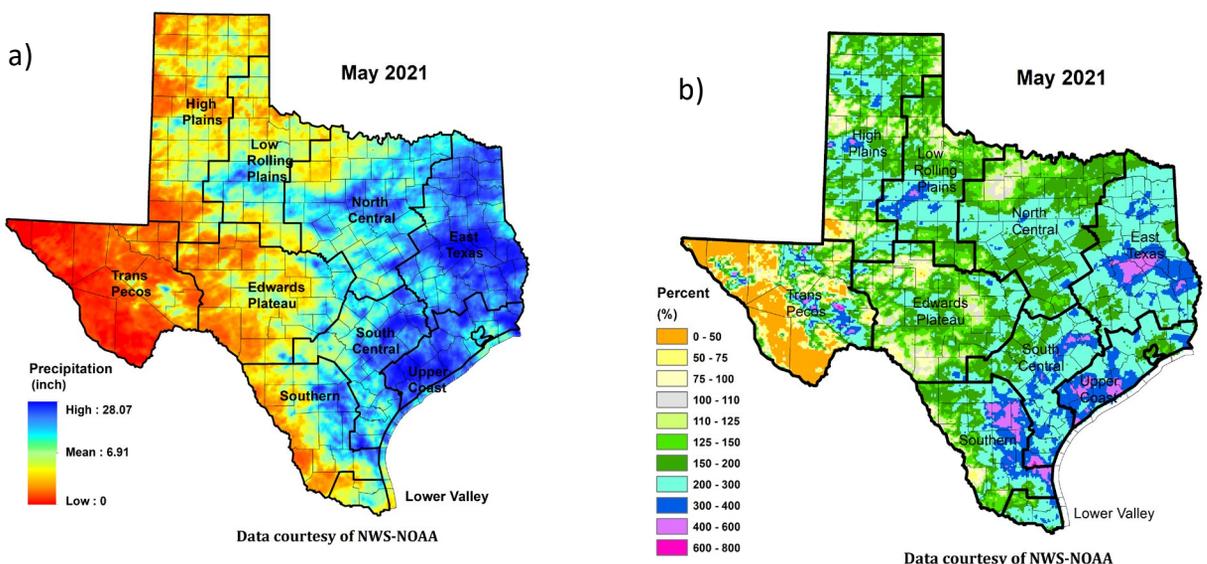


Figure 1: (a) Monthly accumulated rainfall and (b) Percent of normal rainfall

RESERVOIR STORAGE

At the end of May 2021, total conservation storage* in 118 of the state’s major water supply reservoirs plus Elephant Butte Reservoir in New Mexico was 26.5 million acre-feet or 83 percent of total conservation storage capacity (Figure 2). This is approximately 0.66 million acre-feet more than a month ago and approximately 0.8 million acre-feet less than at the end of May 2020.

Statewide monitored major water supply reservoir conservation storage

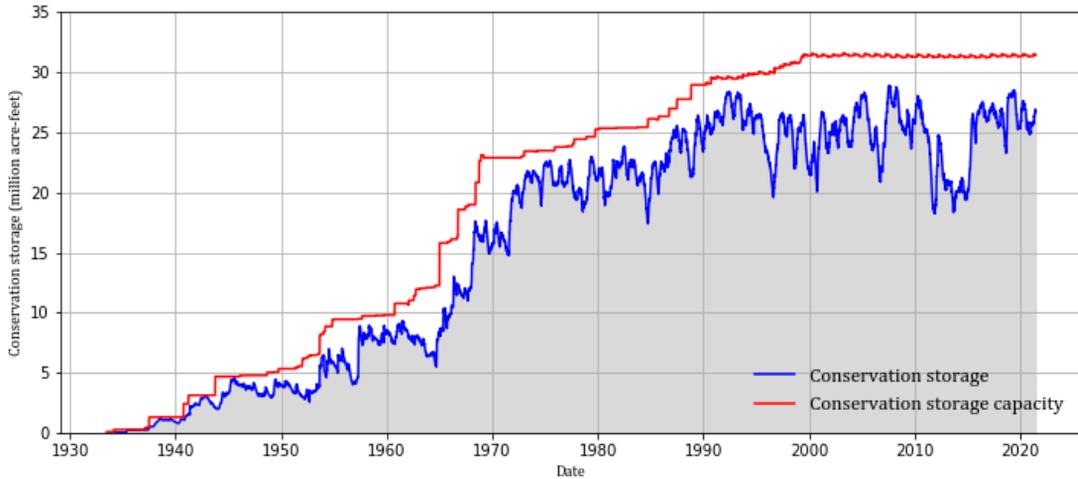


Figure 2: Statewide reservoir conservation storage

Out of 118 reservoirs in the state, 76 reservoirs held 100 percent of conservation storage capacity (Figure 3). Additionally, 12 were at or above 90 percent full. Eight reservoirs, E.V. Spence (22 percent full), Greenbelt (18 percent full), J.B. Thomas (14 percent full), Mackenzie (8 percent full), O. C. Fisher (6 percent full), Palo Duro Reservoir (1 percent full), Falcon (26 percent full), and White River (15 percent full) remained below 30 percent full. Elephant Butte Reservoir (located in New Mexico) was 12 percent full.

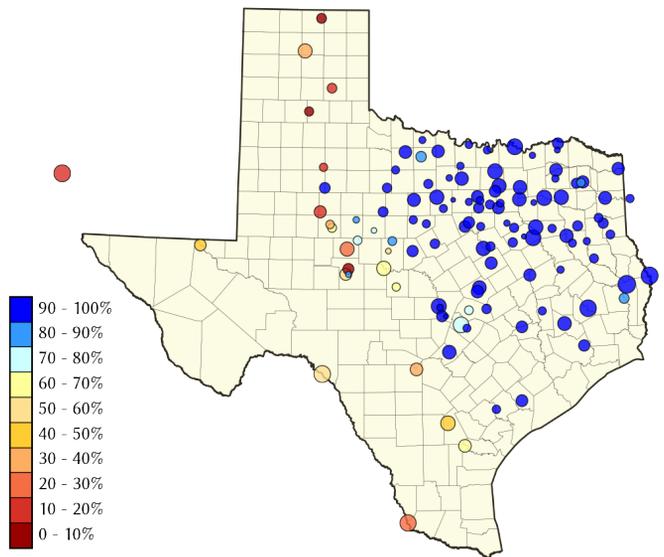


Figure 3: Reservoir conservation storage at end-May expressed as percent full (%)

*Storage is based on end of the month data in 118 major reservoirs that represent 96 percent of the total conservation storage capacity of 188 major water supply reservoirs in Texas plus Elephant Butte Reservoir in New Mexico. Major reservoirs are defined as having a conservation storage capacity of 5,000 acre-feet or greater. Only the Texas share of storage in border reservoirs is counted.

Total regionally combined conservation storage was at or above-normal (storage ≥ 70 percent full) in the North Central (99.5 percent full), East Texas (99.9 percent full), and Upper Coast (100 percent full) climate divisions (Figure 4). Conservation storage in the Low Rolling Plains (67.2) climate division was abnormally low (Figure 4). The Edwards Plateau climate division had moderately low conservation storage (57.2 percent full). The High Plains (29.3 percent full) and Southern (34 percent full) climate divisions had severely low storage, and the Trans Pecos climate division had extremely low conservation storage (17.2 percent full) (Figure 4).

Combined conservation storage by river basin or sub-basin showed normal to high (>70 percent full, Figure 5) conservation storage in the Upper and Lower Red, Upper and Lower Brazos, Upper and Lower Sabine, Upper and Lower Trinity, Sulphur, Cypress, Neches, San Jacinto, Lower Colorado, Guadalupe, and Lavaca river basins. Conservation storage in the Upper Colorado and Nueces river basins was moderately low (40–60 percent full, Figure 5). The Canadian, San Antonio, and Lower Rio Grande river basins had severely low conservation storage (20–40 percent full, Figure 5). Conservation storage in the Upper/Mid Rio Grande river basin was extremely low (10–20 percent full, Figure 5).

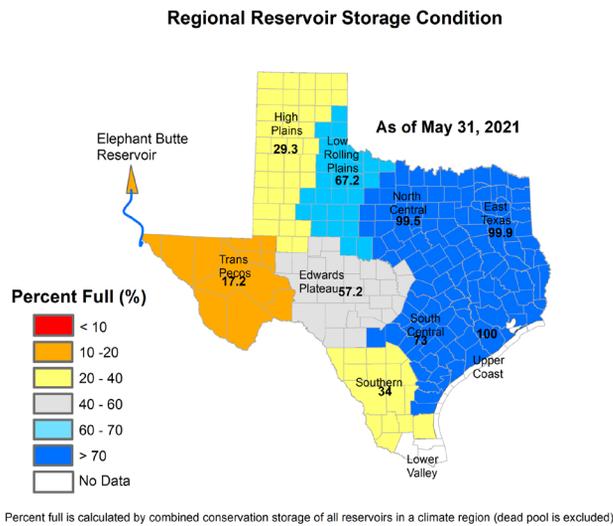


Figure 4: Reservoir Storage Index* by climate division at 5/31/2021

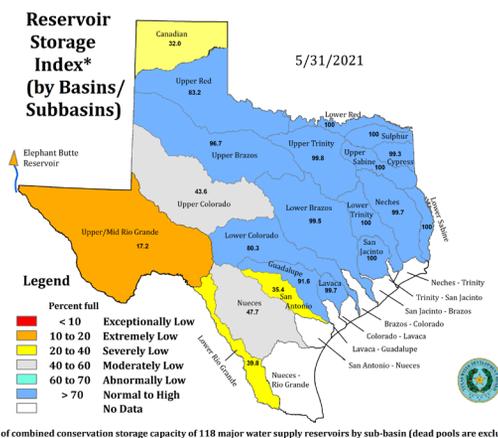


Figure 5: Reservoir Storage Index* by river basin/sub-basin at 5/31/2021

*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-May 2021		Storage change from end-Apr 2021		Storage change from end-May 2020	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Abilene, Lake	7,900	5,738	73	592	7	-1,492	-19
Alan Henry Reservoir	96,207	94,402	98	13,224	14	-1,805	-2
*Amistad Reservoir (Texas & Mexico)	3,275,532	1,062,650	32	-26,270	0	-85,567	-3
*Amistad Reservoir (Texas)	1,840,849	950,749	52	-42,652	-2	-129,360	-7
Amon G Carter, Lake	19,266	19,266	100	0	0	0	0
Aquilla Lake	43,243	43,243	100	0	0	0	0
Arlington, Lake	40,157	40,157	100	327	1	212	1
Arrowhead, Lake	230,359	230,359	100	0	0	0	0
Athens, Lake	29,503	29,503	100	0	0	0	0
*Austin, Lake	23,972	23,158	97	370	2	93	0
B A Steinhagen Lake	69,186	61,009	88	567	1	-190	0
Bardwell Lake	46,122	46,122	100	0	0	0	0
Belton Lake	435,225	435,225	100	9,650	2	0	0
Benbrook Lake	85,648	85,648	100	697	1	0	0
Bob Sandlin, Lake	192,417	192,417	100	0	0	0	0
Bonham, Lake	11,027	11,027	100	0	0	0	0
Brady Creek Reservoir	28,808	18,734	65	26	0	-6,991	-24
Bridgeport, Lake	366,236	362,863	99	40,356	11	-3,373	0
*Brownwood, Lake	130,868	130,868	100	14,765	11	10,283	8
Buchanan, Lake	816,904	741,536	91	52,748	6	-74,068	-9
Caddo, Lake	29,898	29,898	100	0	0	no data	
Canyon Lake	378,781	344,512	91	16,274	4	-25,036	-7
Cedar Creek Reservoir in Trinity	644,686	644,686	100	0	0	0	0
Champion Creek Reservoir	41,580	25,179	61	1,190	3	-1,726	-4
Cherokee, Lake	40,094	40,094	100	0	0	0	0
Choke Canyon Reservoir	662,820	282,324	43	68,476	10	-2,503	0
*Cisco, Lake	29,003	25,710	89	2,370	8	430	1
Coleman, Lake	38,075	32,785	86	715	2	-3,692	-10
Colorado City, Lake	31,040	31,040	100	8,962	29	7,062	23
*Coletto Creek Reservoir	30,758	10,886	35	160	1	-2,109	-7
Conroe, Lake	410,988	410,988	100	0	0	15,571	4
Corpus Christi, Lake	256,062	156,695	61	47,335	18	-24,611	-10
Crook, Lake	9,195	9,195	100	0	0	0	0
Cypress Springs, Lake	66,756	66,756	100	0	0	0	0
E. V. Spence Reservoir	517,272	115,370	22	4,933	1	-19,426	-4
Eagle Mountain Lake	179,880	179,880	100	9,922	6	0	0
Elephant Butte Reservoir (Texas)	852,491	102,000	12	4,846	1	-72,661	-9
Elephant Butte Reservoir (Total Storage)	1,960,900	236,112	12	11,217	1	-168,196	-9
*Falcon Reservoir (Texas & Mexico)	2,646,817	445,556	17	69,116	3	-113,993	-4
*Falcon Reservoir (Texas)	1,551,007	400,875	26	59,514	4	-92,962	-6
Fork Reservoir, Lake	605,061	605,061	100	0	0	0	0
Fort Phantom Hill, Lake	70,030	70,030	100	6,404	9	1,711	2
Georgetown, Lake	36,823	27,003	73	2,108	6	864	2
Gibbons Creek Reservoir	25,721	24,259	94	-1,284	-5	-249	0
Graham, Lake	45,288	45,288	100	0	0	0	0
Granbury, Lake	132,949	131,890	99	-162	0	243	0

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Name of lake or reservoir	Storage capacity	Storage at end-May 2021		Storage change from end-Apr 2021		Storage change from end-May 2020	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
<i>Continued</i>							
Granger Lake	51,822	51,822	100	0	0	0	0
Grapevine Lake	163,064	163,064	100	0	0	0	0
Greenbelt Lake	59,968	10,679	18	530	1	-1,217	-2
*Halbert, Lake	6,033	5,329	88	336	6	-60	0
Hords Creek Lake	8,109	4,168	51	90	1	-1,877	-23
Houston County Lake	17,113	17,113	100	0	0	0	0
Houston, Lake	130,147	130,147	100	5,244	4	10,049	8
Hubbard Creek Reservoir	313,298	308,925	99	30,555	10	4,951	2
Hubert H Moss Lake	24,058	24,058	100	0	0	0	0
Inks, Lake	13,962	12,900	92	8	0	-105	0
J. B. Thomas, Lake	199,931	27,312	14	4,541	2	-18,738	-9
Jacksonville, Lake	25,670	25,670	100	0	0	0	0
Jim Chapman Lake (Cooper)	260,332	260,332	100	0	0	0	0
Joe Pool Lake	175,800	175,800	100	0	0	0	0
Kemp, Lake	245,307	234,268	95	12,816	5	-11,039	-5
Kickapoo, Lake	86,345	74,640	86	3,456	4	-10,304	-12
Lavon Lake	406,388	406,388	100	0	0	0	0
Leon, Lake	27,762	27,762	100	1,447	5	902	3
Lewisville Lake	563,228	563,228	100	0	0	0	0
Limestone, Lake	203,780	203,780	100	0	0	0	0
*Livingston, Lake	1,741,867	1,741,867	100	0	0	0	0
*Lost Creek Reservoir	11,950	11,950	100	9	0	0	0
Lyndon B Johnson, Lake	115,249	110,575	96	487	0	-122	0
Mackenzie Reservoir	46,450	3,941	8	-40	0	-1,084	-2
Marble Falls, Lake	6,901	6,901	100	114	2	49	1
Martin, Lake	75,726	75,726	100	0	0	0	0
Medina Lake	254,823	90,371	35	5,396	2	-83,014	-33
Meredith, Lake	500,000	179,165	36	1,864	0	-26,093	-5
Millers Creek Reservoir	26,768	26,768	100	0	0	0	0
*Mineral Wells, Lake	5,273	5,273	100	0	0	0	0
Monticello, Lake	34,740	30,949	89	556	2	501	1
Mountain Creek, Lake	22,850	22,850	100	0	0	0	0
Murvail, Lake	38,285	38,285	100	0	0	0	0
Nacogdoches, Lake	39,522	39,522	100	0	0	867	2
Nasworthy	9,615	8,444	88	1,171	3	51	0.6
Navarro Mills Lake	49,827	49,827	100	0	0	0	0
New Terrell City Lake	8,583	8,583	100	0	0	0	0
Nocona, Lake (Farmers Crk)	21,444	21,444	100	0	0	0	0
North Fork Buffalo Creek Reservoir	15,400	15,400	100	0	0	0	0
O' the Pines, Lake	268,566	268,566	100	27,203	10	0	0
O. C. Fisher Lake	115,742	6,479	6	-246	0	-3,586	-3
*O. H. Ivie Reservoir	554,340	334,604	60	-828	0	-58,286	-11
Oak Creek Reservoir	39,210	29,581	75	176	0	-6,226	-16

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

Name of lake or reservoir	Storage capacity	Storage at end-May 2021		Storage change from end-Apr 2021		Storage change from end-May 2020	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
<i>Continued</i>							
Palestine, Lake	367,303	367,303	100	0	0	0	0
Palo Duro Reservoir	61,066	608	1	-71	0	-1,335	-2
Palo Pinto, Lake	26,766	26,766	100	0	0	1,770	7
Pat Cleburne, Lake	26,008	26,008	100	1,688	6	0	0
*Pat Mayse Lake	113,683	113,683	100	0	0	0	0
Possum Kingdom Lake	538,139	533,498	99	-2,674	0	178	0
Proctor Lake	54,762	54,762	100	0	0	1,147	2
Ray Hubbard, Lake	439,559	438,724	100	-835	0	-417	0
Ray Roberts, Lake	788,167	788,167	100	0	0	0	0
Red Bluff Reservoir	151,110	71,021	47	-966	0	-23,983	-16
Richland-Chambers Reservoir	1,087,839	1,087,839	100	3,425	0	0	0
Sam Rayburn Reservoir	2,857,077	2,857,077	100	0	0	11,249	0
Somerville Lake	150,293	150,293	100	14,130	9	0	0
Squaw Creek, Lake	151,250	151,250	100	0	0	0	0
Stamford, Lake	51,570	51,570	100	0	0	0	0
Stillhouse Hollow Lake	227,771	227,771	100	1,864	1	0	0
Striker, Lake	16,934	16,934	100	0	0	0	0
Sweetwater, Lake	12,267	10,068	82	167	1	-1,935	-16
*Sulphur Springs, Lake	17,747	17,747	100	0	0	0	0
Tawakoni, Lake	871,685	871,685	100	0	0	0	0
Texana, Lake	159,566	159,106	100	13,919	9	-276	0
Texoma, Lake (Texas & Oklahoma)	2,487,601	2,757,127	100	384,859	15	111,244	4
Texoma, Lake (Texas)	1,243,801	1,243,801	100	57,667	5	0	0
Toledo Bend Reservoir (Texas & Louisiana)	4,472,900	4,562,464	100	86,804	2	85,911	2
Toledo Bend Reservoir (Texas)	2,236,450	2,236,450	100	670	0	224	0
Travis, Lake	1,113,348	787,885	71	63,824	6	-178,401	-16
Twin Buttes Reservoir	182,454	94,491	52	-1,195	0	-26,548	-15
Tyler, Lake	72,073	72,073	100	0	0	0	0
Waco, Lake	189,418	189,418	100	4,267	2	0	0
Waxahachie, Lake	10,780	10,780	100	0	0	0	0
Weatherford, Lake	17,812	17,812	100	475	3	43	0
White River Lake	29,880	4,340	15	693	2	-1,552	-5
Whitney, Lake	553,344	553,344	100	32,668	6	23,717	4
Worth, Lake	24,419	24,419	100	4,224	17	0	0
Wright Patman Lake	310,382	310,382	100	13,774	4	0	0
STATEWIDE TOTAL							
STATEWIDE TOTAL	32,330,511	26,747,515	83	655,212	2	-795,207	-2

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

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

STREAMFLOW CONDITIONS

Much of the state had near normal streamflow (25–75th percentile, green shading in Figure 6) in May 2021. Above normal streamflow (76–90th percentile, light blue shading in Figure 6) was seen in the Upper and Lower Brazos, Upper and Lower Trinity, Upper and Lower Red, Sulphur, Cypress, Sabine, Neches, Trinity-San Jacinto, Upper and Lower Colorado, Guadalupe, Nueces, Nueces-Rio Grande, San Antonio-Nueces, and San Antonio river basins. Much above normal streamflow (>90th percentile, dark blue shading in Figure 6) was seen in the Upper Brazos, Sulphur, Cypress, Sabine, Neches, Upper Trinity, Neches-Trinity, San Jacinto, San Jacinto-Brazos, Lavaca, Lavaca-Guadalupe, San Antonio-Nueces, Nueces-Rio Grande, Upper Rio Grande river basins. Record highs (dark gray shading in Figure 6) were recorded in the Neches, Brazos-Colorado, Colorado-Lavaca, and Lavaca-Guadalupe river basins.

Below normal streamflow (10–24th percentile, orange shading in Figure 6) was recorded in the Upper Rio Grande, Canadian, Upper Red, Upper Brazos, Upper Colorado, and Nueces river basins. Some watersheds in the Upper Colorado, and Canadian river basins had much below normal streamflow (< 10th percentile, dark red shading in Figure 6).

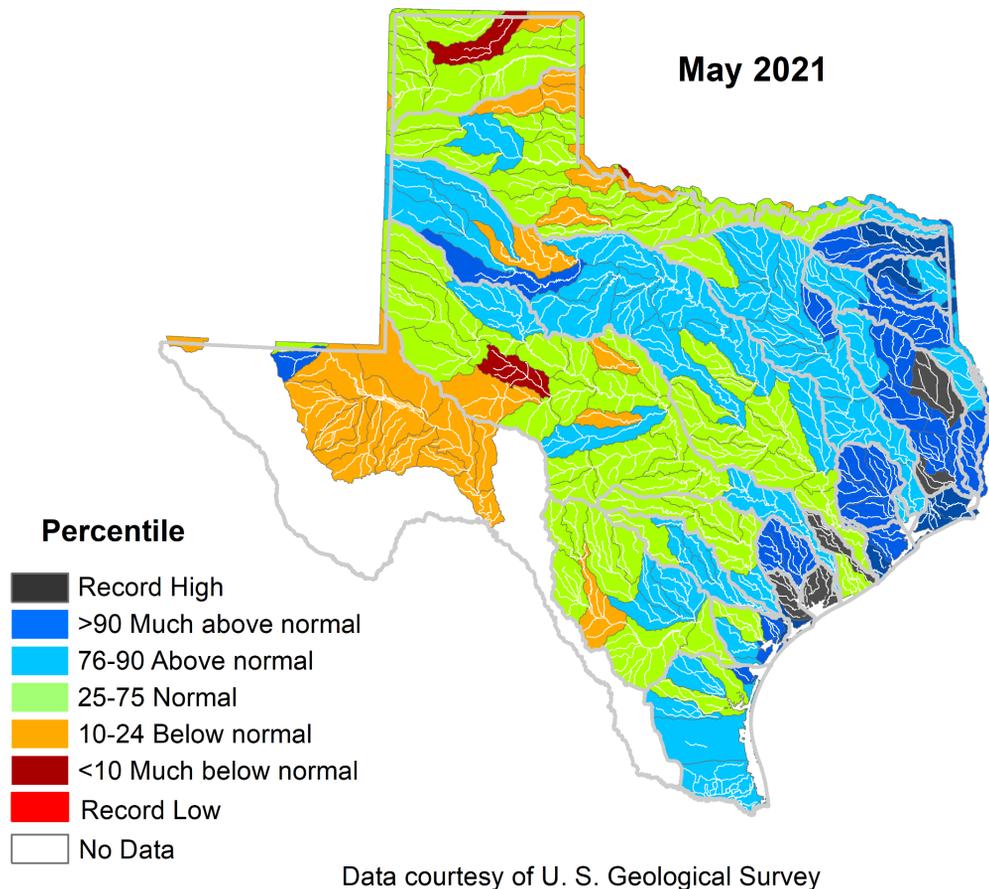
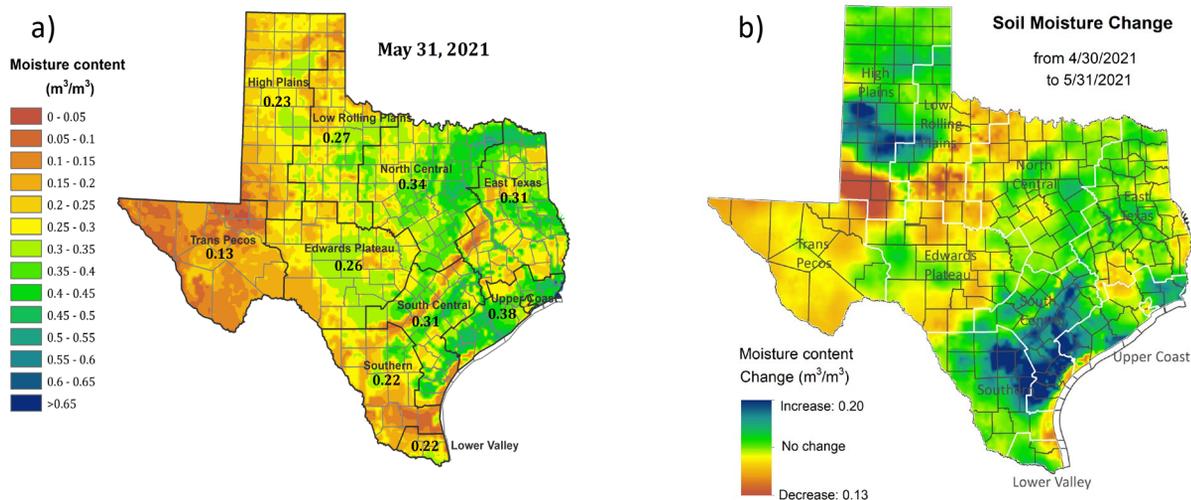


Figure 6: Runoff percentiles by the U.S. Geological Survey's Hydrologic Unit Code

SOIL MOISTURE

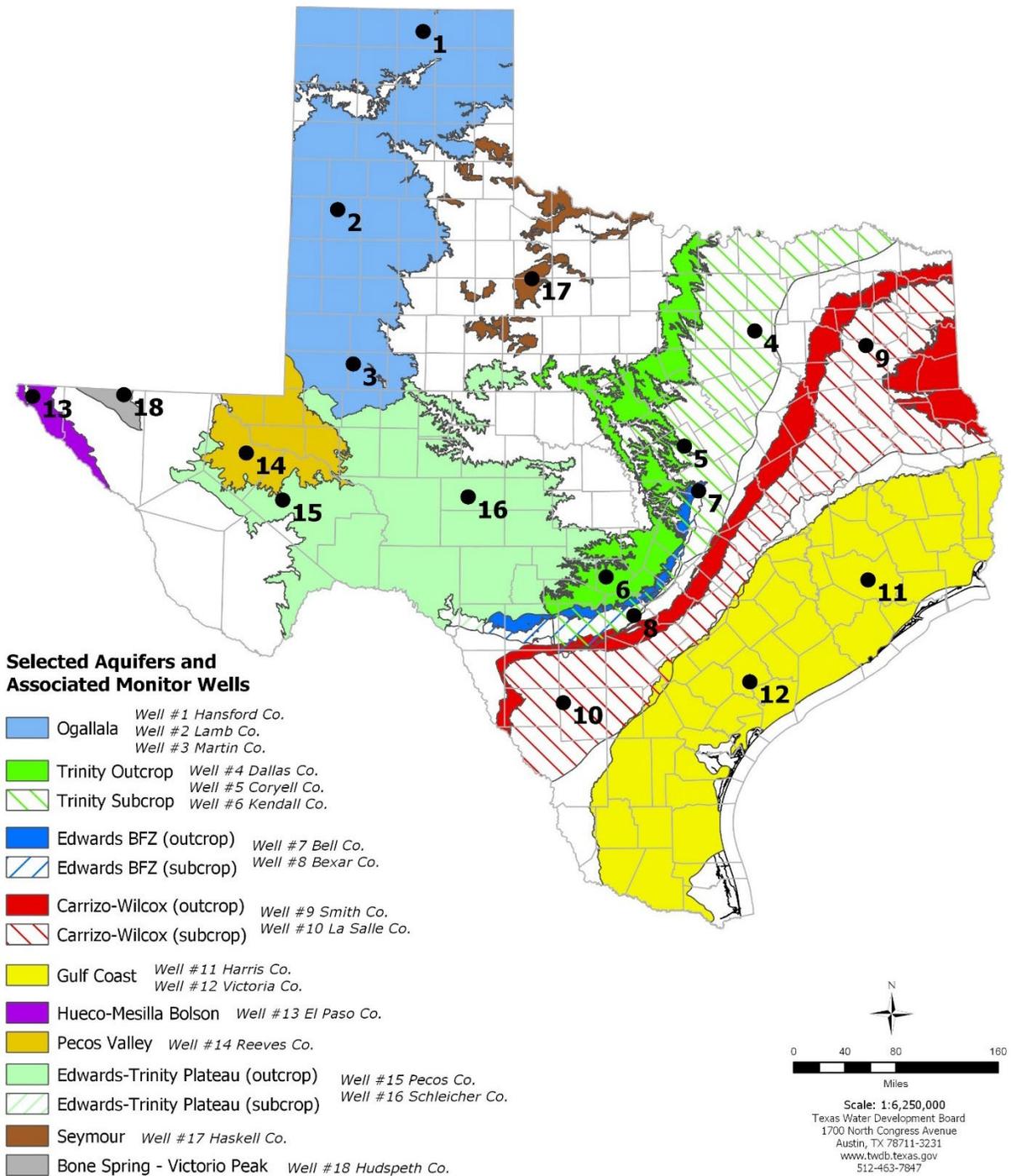
Root zone soil moisture at the end of May 2021 [Figure 7(a)] was moderate [> 0.20 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in portions of the Trans Pecos, High Plains, Low Rolling Plains, Edwards Plateau, Southern, Lower Valley, North Central, East Texas, and South Central climate divisions. There were areas of low soil moisture [< 0.15 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in portions of the Trans Pecos, northern and southern High Plains, northern Low Rolling Plains, areas of southern South Central and stretching across the climate division from the west to the northeast and into southwestern East Texas climate division. Soil moisture was high [> 0.3 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in eastern High Plains, areas of Low Rolling Plains, central and eastern Edwards Plateau, portions of East Texas, north central Southern, southern Lower Valley, much of North Central, South Central, and the Upper Coast climate divisions [Figure 7(a)].

Compared to conditions at the end of April 2021, soil moisture content increased [green to blue shading in Figure 7(b)] in areas of central and eastern Trans Pecos, central and eastern Edwards Plateau, western Low Rolling Plains, much of the High Plains, North Central, East Texas, Southern, Lower Valley, South Central and the Upper Coast climate divisions. Soil moisture content decreased [yellow, orange, and brown shading in Figure 7(b)] in much of the Trans Pecos, Edwards Plateau, eastern Lower Valley, western Low Rolling Plains, portions of central and western North Central, eastern and southern East Texas, southeastern Southern, southeastern and portions of central South Central, southern High Plains, and a portion of southwestern Upper Coast climate divisions.



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 7: (a) Root zone soil moisture conditions in May 2021 and (b) the difference in root zone soil moisture between end-April 2021 and end-May 2021



May 2021 GROUNDWATER LEVELS IN MONITORING WELLS

Water-level measurements were available for 16 key monitoring wells in the state. Recorders in 2 wells (#14 and #17 on map) were temporarily offline and scheduled for repair. Water levels rose in 11 monitoring wells since the beginning of May, ranging from an increase of 0.06 feet in the Lamb County Ogallala Aquifer well (#2 on map) to 12.30 feet in the Bexar County Edwards (Balcones Fault Zone) Aquifer well (#8 on map). Water levels declined in 5 monitoring wells, ranging from a decline of -0.10 feet in the Bell County Edwards (Balcones Fault Zone) Aquifer well (#7 on map) to -14.28 feet in the Pecos County Edwards-Trinity (Plateau) Aquifer well (#15 on map). The J-17 well (#8 on map) in San Antonio recorded a water level of 62.70 feet below land surface or 668.30 feet above mean sea level. Water levels are 8.3 feet above the Stage I critical management level 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 location (numbers 1 - 18) are different than the TWDB's seven-digit state well number.

Monitoring Well	May (depth to water, feet)	April (depth to water, feet)	Month Change	Year Change	Historical Change	First Measured (year)
(1) Hansford 0354301	161.86	162.28	0.42	-0.77	-91.74	1951
(2) Lamb 1053602	151.93	151.99	0.06	-0.93	-123.76	1951
(3) Martin 2739903	144.40	144.67	0.27	-0.20	-39.51	1964
(4) Dallas 3319101	486.00	486.77	0.77	NA	-264.00	1954
(5) Coryell 4035404	530.68	530.89	0.21	-3.28	-238.68*	1955**
(6) Kendall 6802609	149.30	156.03	6.73	-3.31	-89.30	1975
(7) Bell 5804816	125.53	125.43	-0.10	-2.97	-2.02	2008
(8) Bexar 6837203	62.70	75.00	12.30	-3.30	-16.06	1932
(9) Smith 3430907	435.12	435.63	0.51	-2.05	-135.12*	1977**
(10) La Salle 7738103	499.49	503.62	4.13	12.51	-246.42	2003
(11) Harris 6514409	186.77	187.59	0.82	1.48	-51.27*	1947**
(12) Victoria 8017502	31.59	33.46	1.87	-0.83	2.41*	1958**
(13) El Paso 4913301	298.89	298.67	-0.22	-3.05	-66.99*	1964**
(14) Reeves 4644501	NA	NA	NA	NA	-71.28*	1952
(15) Pecos 5216802	217.32	203.04	-14.28	-8.78	29.56	1976
(16) Schleicher 5512134	282.11	281.54	-0.57	8.24	19.79	2003
(17) Haskell 2135748	NA	44.80	NA	NA	-1.80*	2002
(18) Hudspeth 4807516	155.15	152.02	-3.13	-3.78	-51.23	1966

* Change since the original measurement taken on the date indicated in the last column

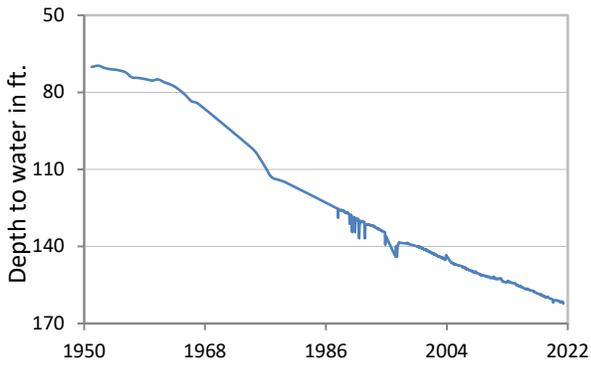
** Measurement not shown on the hydrograph.

NA (not available)

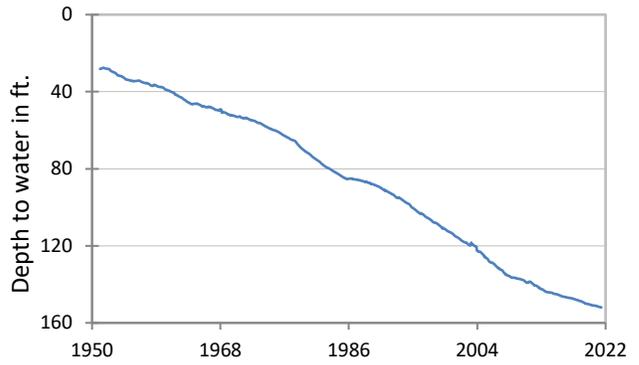
The historical changes shown for recorder wells #14 and #17 are based off the most recent water level records from February and April 2021, respectively.

May 2021 MONITORING WELL HYDROGRAPHS

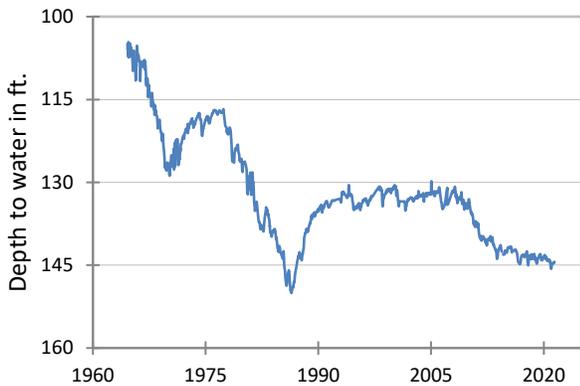
**(1) State Well #03-54-301
Near Spearman, Hansford County
Ogallala Aquifer**



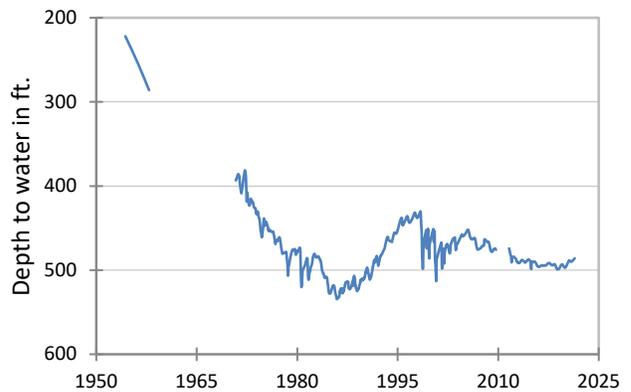
**(2) State Well #10-53-602
Near Earth, Lamb County
Ogallala Aquifer**



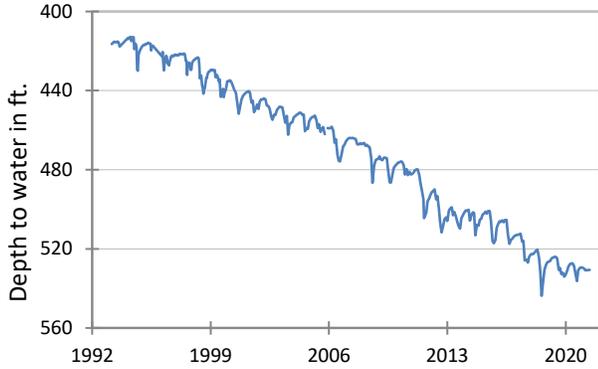
**(3) State Well #27-39-903
Northwest Martin County
Ogallala Aquifer**



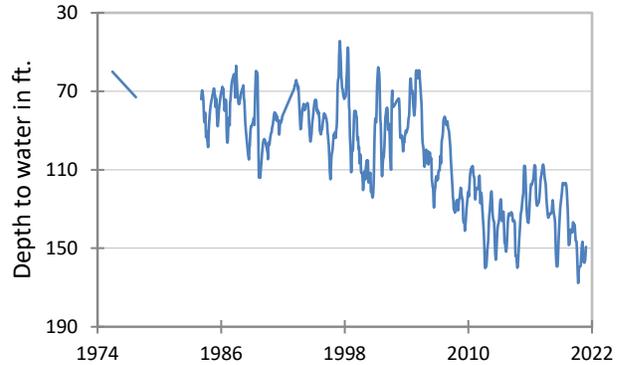
**(4) State Well #33-19-101
Southeast Dallas, Dallas County
Twin Mountains Formation-Trinity Aquifer**



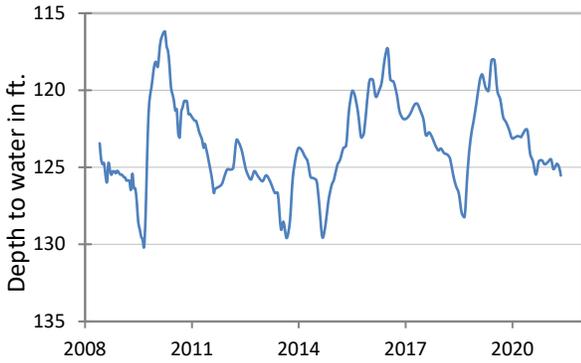
(5) State Well #40-35-404
Gatesville, Coryell County
Hosston Formation-Trinity Aquifer



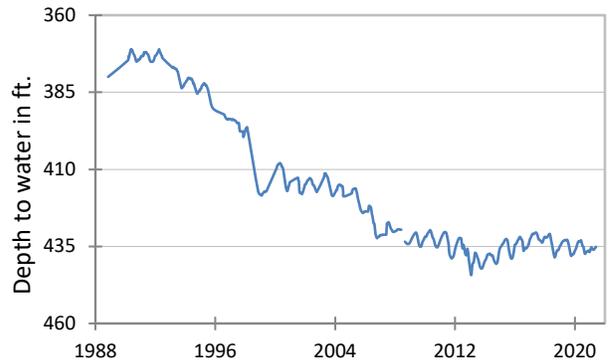
(6) State Well #68-02-609
Waring, Kendall County
Travis Peak Formation-Trinity Aquifer



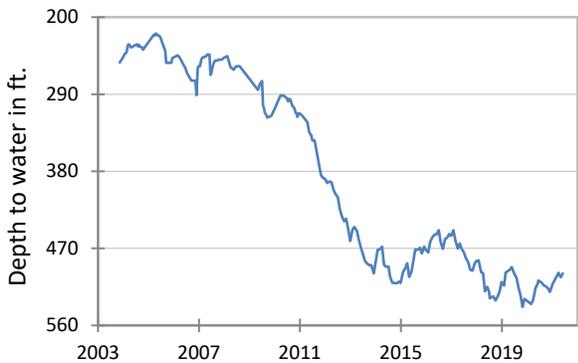
(7) State Well #58-04-816
Near Salado, Bell County
Edwards (Balcones Fault Zone) Aquifer



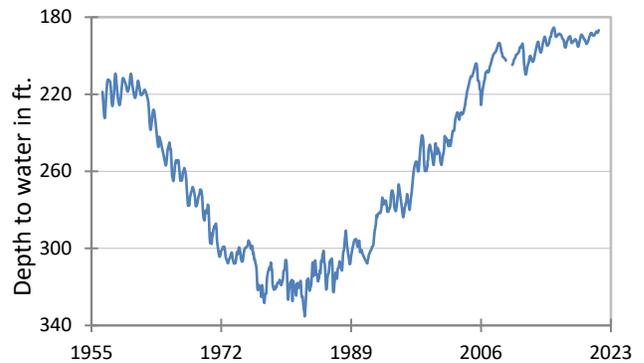
(9) State Well #34-30-907
Red Springs, Smith County
Carrizo-Wilcox Aquifer



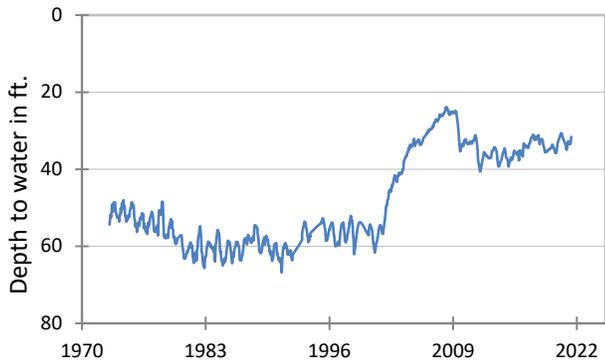
(10) State Well #77-38-103
Near Cotulla, La Salle County
Carrizo-Wilcox Aquifer



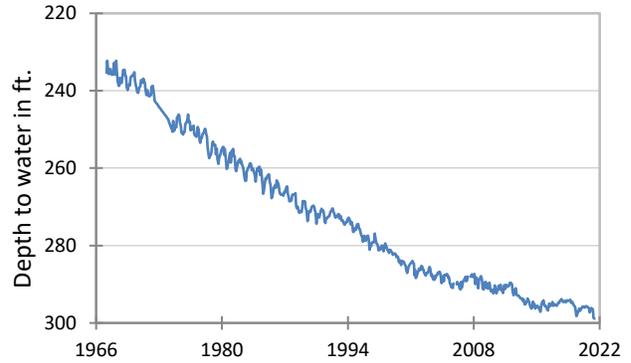
(11) State Well #65-14-409
North Houston, Harris County
Evangeline Formation-Gulf Coast Aquifer



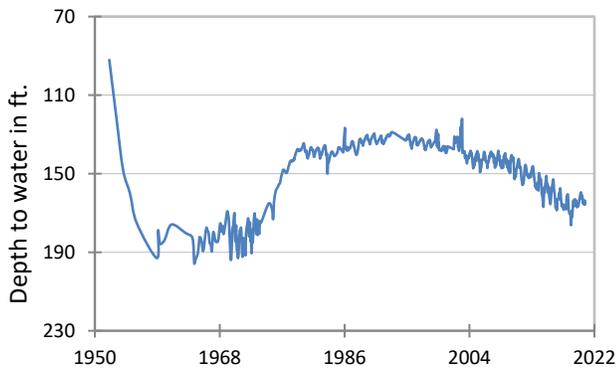
(12) State Well #80-17-502
Near Bloomington, Victoria County
Lissie Formation-Gulf Coast Aquifer



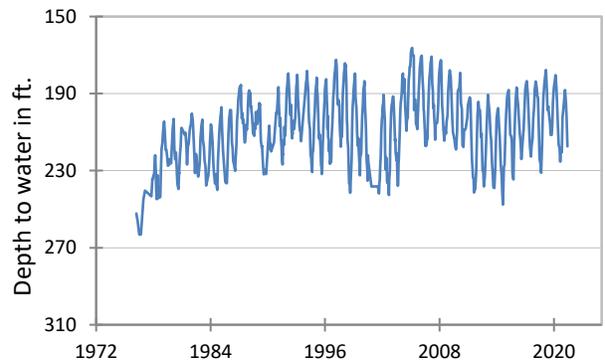
(13) State Well #49-13-301
El Paso, El Paso County
Hueco-Mesilla Bolsons Aquifer



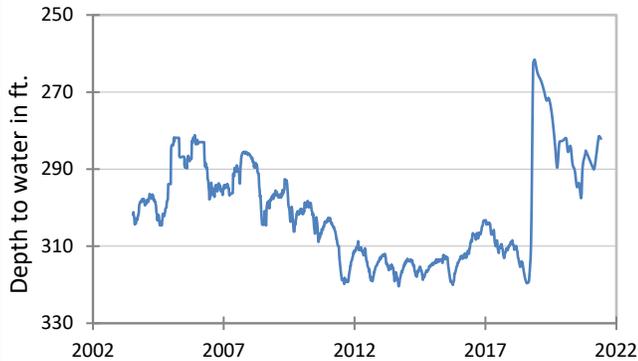
***(14) State Well #46-44-501**
Near Pecos, Reeves County
Pecos Valley Aquifer



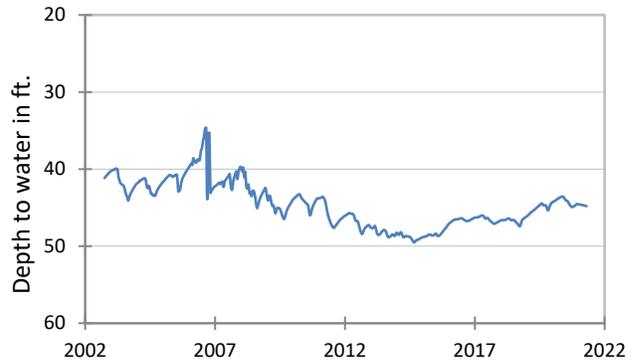
(15) State Well #52-16-802
Fort Stockton, Pecos County
Edwards-Trinity (Plateau) Aquifer



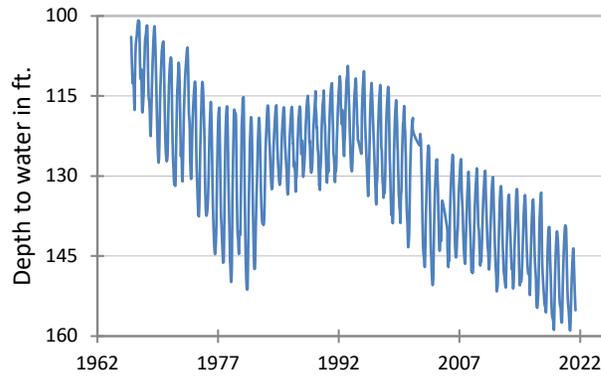
(16) State Well #55-12-134
Eldorado, Schleicher County
Edwards-Trinity (Plateau) Aquifer



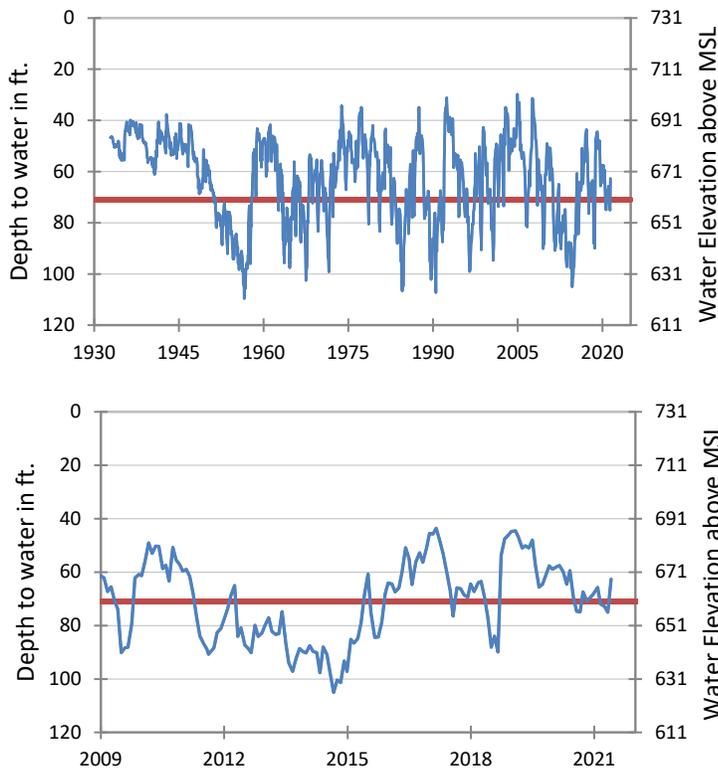
***(17) State Well #21-35-748**
Near O'Brien, Haskell County
Seymour Aquifer



**(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**

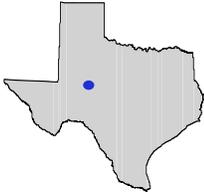


The late May water-level measurement in this Edwards (Balcones Fault Zone) Aquifer well, located at an elevation of 731 feet above mean sea level, was 62.70 feet below land surface, or 668.30 feet above mean sea level. This was 12.30 feet above last month's measurement, 3.30 feet below last year's measurement and 16.06 feet below the initial measurement recorded in 1932.

Water levels below the red line indicate periods in which Edwards Aquifer Authority Stage 1 drought restrictions are in effect. In May 2021, Stage 1 drought restrictions were no longer in effect because the aquifer rose 8.30 feet above the Stage 1 critical management level.

*Recorder wells #14 and #17 were temporarily offline in May 2021 and did not record data.

HYDROGRAPH OF THE MONTH

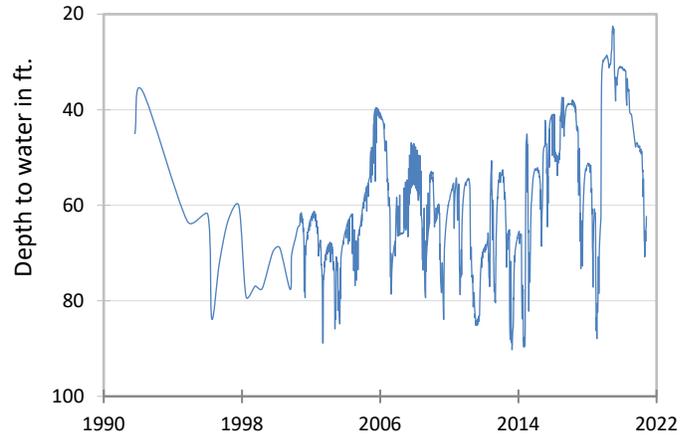


Each month this space features a new hydrograph (marked with the ● symbol on the map) depicting different aquifers and their conditions in Texas.

The Lipan Aquifer is a minor aquifer found in parts of Coke, Concho, Glasscock, Irion, Runnels, Schleicher, Sterling, and Tom Green counties located in west-central Texas. The aquifer includes water-bearing alluvium and the up-dip portions of older, underlying strata. The alluvium includes as much as 125 feet of saturated sediments of the Quaternary Leona formation. The underlying strata include the San Angelo Sandstone of the Pease River Group and the Choza Formation, Bullwagon Dolomite, Vale Formation, Standpipe Limestone, and Arroyo Formation of the Clear Fork Group. These units are predominantly limestones and shales. Groundwater in the alluvial deposits and the upper parts of the older rocks is hydraulically connected, and most wells in the area are completed in both units. Groundwater in the alluvium ranges from fresh to slightly saline, containing between 350 and 3,000 milligrams per liter of total dissolved solids, and is very hard. The aquifer is primarily used for irrigation but also supports livestock and municipal, domestic, and manufacturing uses.

Lipan Aquifer

Well #43-45-306, 155 feet deep
unused, Tom Green County



The initial measurement of 45 feet below land surface was recorded by the Texas Water Development Board in October of 1991. The Lipan-Kickapoo Water Conservation District collected 20 measurements in the unused well from 1992 to 2001. In May of 2001, the TWDB installed an automatic water-level recorder, which began collecting hourly measurements (with weekly measurements reported in the TWDB Groundwater Database). The period of record reveals seasonal fluctuations in water level that are likely the result of nearby groundwater pumping for irrigation. The overall water level increased from 2015 to 2017 and 2019 and is currently in a seasonal decline pattern, with a recent increase in water level from May to June 2021.



Far away (left), and close-up (right) images of well #43-45-306.