Texas Water Conditions Report

November 2020

Texas Water Development Board

RAINFALL

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

Some rainfall [light blue and dark blue shading, Figure 1(a)], was recorded over portions of the northeastern Low Rolling Plains, northern and central North Central, portions of northeastern and southern East Texas, areas of southern Edwards Plateau, northern Southern, the majority of the South Central, and Upper Coast climate divisions, reaching 8.63 inches in southeastern portions of the state [dark blue shading, Figure 1(a)].

Monthly rainfall for November was below average [yellow and orange shading, Figure 1(b)], compared to historical data from 1981–2010, across the majority of Texas. Exceptions to this were in portions of the southern Edwards Plateau, central and southern South Central, and northern and western Upper Coast climate divisions, where above average rainfall occurred [green shading, Figure 1(b)].

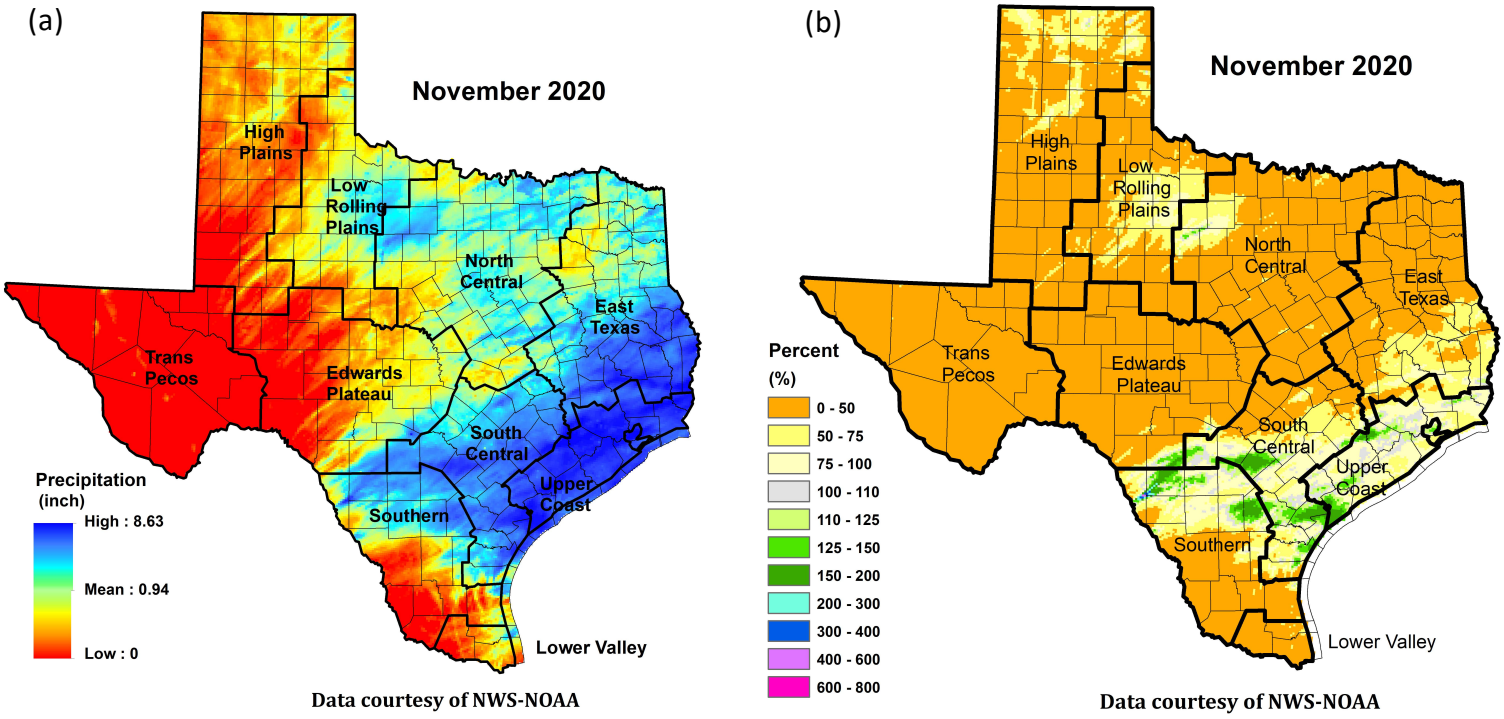


Figure 1: (a) Monthly accumulated rainfall and (b) Percent of normal rainfall

RESERVOIR STORAGE

At the end of November 2020, total conservation storage* in 118 of the state's major water supply reservoirs plus Elephant Butte Reservoir in New Mexico was 25.06 million acre-feet or 78 percent of total conservation storage capacity (Figure 2). This is approximately 0.14 million acre-feet less than a month ago and approximately 0.53 million acre-feet less than the end of November 2019.

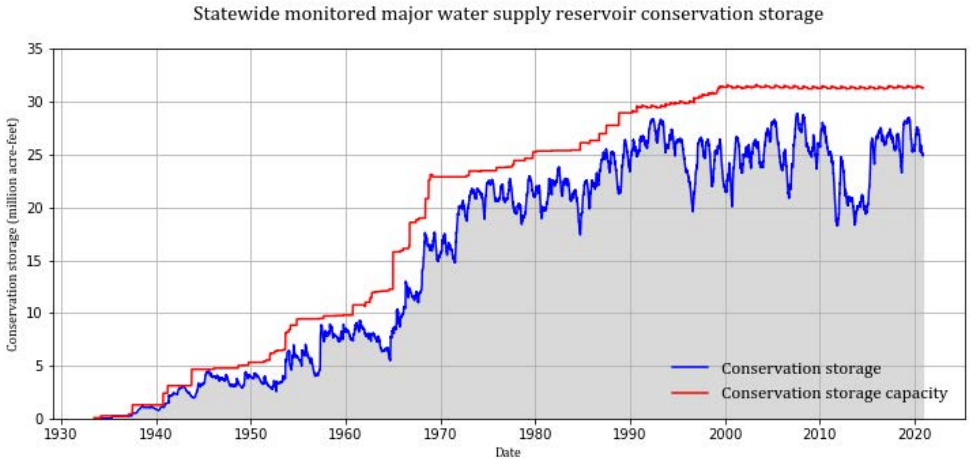


Figure 2: Statewide reservoir conservation storage

Out of 118 reservoirs in the state, 15 reservoirs held 100 percent of conservation storage capacity (Figure 3). Additionally, 49 were at or above 90 percent full. Seven reservoirs [E.V. Spence (23.0 percent full), Greenbelt (16.8 percent full), J.B. Thomas (15.1 percent full), Mackenzie (9.1 percent full), O. C. Fisher (6.4 percent full), Palo Duro Reservoir (1.8 percent full), and White River (12.3 percent full) remained below 30 percent full. Elephant Butte Reservoir (located in New Mexico) was at 5.1 percent full.

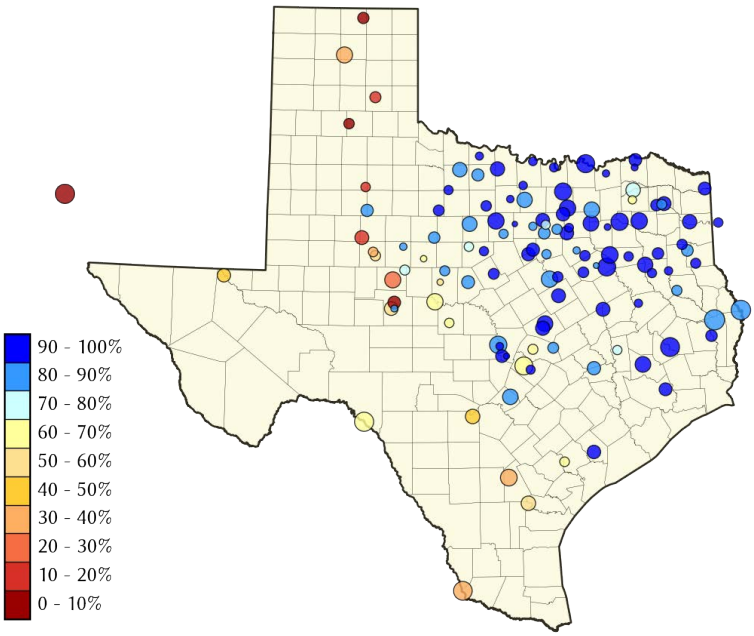


Figure 3: Reservoir conservation storage at end-November expressed as percent full (%)

*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 (94.1 percent full), East Texas (90.7 percent full), South Central (71.9), and Upper Coast (95.9 percent full) climate divisions (Figure 4). Conservation storage in the Edwards Plateau (63.4 percent full) and Low Rolling Plains (64.8) climate divisions was abnormally low (Figure 4). The High Plains (29.9 percent full), and Southern (35.8 percent full) climate divisions had severely low storage, and the Trans Pecos (11.3 percent full) climate division had extremely low conservation storage (Figure 4).

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

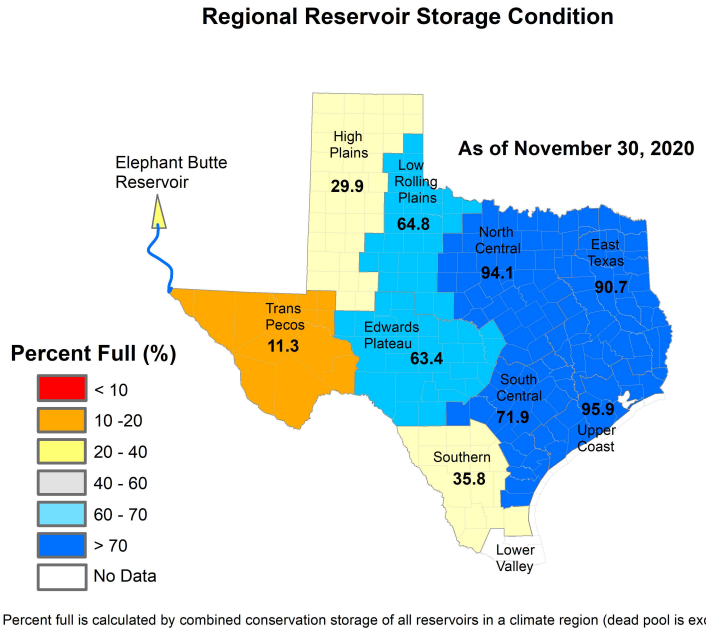


Figure 4: Reservoir Storage Index* by climate division at 11/30/2020

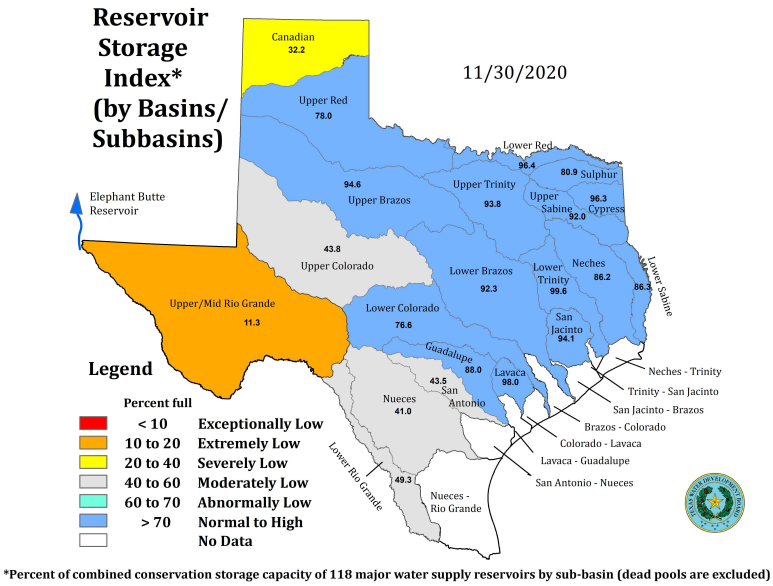


Figure 5: Reservoir Storage Index* by river basin/sub-basin at 11/30/2020

*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-November		Storage change from end-Oct 2020		Storage change from end-Nov 2019	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Abilene, Lake	7,900	5,728	72.5	-224	-2.8	601	7.6
Alan Henry Reservoir	96,207	86,000	89.4	-1,299	-1.4	-5,120	-5.3
*Amistad Reservoir (Texas & Mexico)	3,275,532	1,242,312	37.9	28,955	0.9	-410,637	-12.5
*Amistad Reservoir (Texas)	1,840,849	1,194,186	64.9	1,959	0.1	-190,057	-10.3
Amon G Carter, Lake	19,266	18,262	94.8	-234	-1.2	359	1.9
Aquilla Lake	43,243	39,772	92.0	-533	-1.2	4,335	10.0
Arlington, Lake	40,157	31,656	78.8	-917	-2.3	-5,532	-13.8
Arrowhead, Lake	230,359	227,181	98.6	-3,178	-1.4	23,452	10.2
Athens, Lake	29,503	29,503	100.0	0	0.0	1,710	5.8
*Austin, Lake	23,972	22,911	95.6	31	0.1	246	1.0
B A Steinhagen Lake	69,186	62,633	90.5	-1,454	-2.1	-2,731	-3.9
Bardwell Lake	46,122	44,317	96.1	-744	-1.6	4,507	9.8
Belton Lake	435,225	425,216	97.7	-4,446	-1.0	21,609	5.0
Benbrook Lake	85,648	71,905	84.0	1,076	1.3	16,173	18.9
Bob Sandlin, Lake	192,417	184,758	96.0	-1,397	0.0	-611	0.0
Bonham, Lake	11,027	10,261	93.1	-348	-3.2	1,025	9.3
Brady Creek Reservoir	28,808	19,947	69.2	-397	-1.4	-4,585	-15.9
Bridgeport, Lake	366,236	324,958	88.7	-4,585	-1.3	11,085	3.0
*Brownwood, Lake	130,868	114,025	87.1	-2,204	-1.7	4,945	3.8
Buchanan, Lake	860,607	725,728	84.3	-10,172	-1.2	-49,620	-5.8
Caddo, Lake	29,898	29,898	100.0	0	0.0	0	0.0
Canyon Lake	378,781	340,429	89.9	-3,928	-1.0	-15,425	-4.1
Cedar Creek Reservoir in Trinity	644,686	618,562	95.9	-7,983	-1.2	46,031	7.1
Champion Creek Reservoir	41,580	24,571	59.1	-255	0.0	-3,206	-7.7
Cherokee, Lake	40,094	39,080	97.5	36	0.1	216	0.5
Choke Canyon Reservoir	662,820	239,124	36.1	-3,773	0.0	-65,797	-9.9
*Cisco, Lake	29,003	23,211	80.0	-273	0.0	-2,212	-7.6
Coleman, Lake	38,075	33,024	86.7	-466	-1.2	-172	0.0
Colorado City, Lake	31,040	20,329	65.5	382	1.2	-2,720	-8.8
*Coleto Creek Reservoir	30,758	11,265	36.6	-369	-1.2	-2,679	-8.7
Conroe, Lake	410,988	379,267	92.3	3,295	0.8	8,573	2.1
Corpus Christi, Lake	256,062	137,706	53.8	-4,791	-1.9	-59,102	-23.1
Crook, Lake	9,195	9,080	98.7	-115	-1.3	-115	-1.3
Cypress Springs, Lake	66,756	64,352	96.4	-159	0.0	-2,404	-3.6
E. V. Spence Reservoir	517,272	118,802	23.0	-2,809	0.0	-21,981	-4.2
Eagle Mountain Lake	179,880	163,396	90.8	-4,059	-2.3	-1,902	-1.1
Elephant Butte Reservoir (Texas)	852,491	43,117	5.1	5,418	0.6	-166,660	-19.5
Elephant Butte Reservoir (Total Storage)	1,985,900	99,809	5.0	12,542	0.6	-385,787	-19.4
*Falcon Reservoir (Texas & Mexico)	2,646,817	531,689	20.1	-19,053	0.0	-89,006	-3.4
*Falcon Reservoir (Texas)	1,551,007	478,478	30.8	-20,037	-1.3	-7,424	0.0
Fork Reservoir, Lake	605,061	547,792	90.5	-5,922	0.0	-4,191	0.0
Fort Phantom Hill, Lake	70,030	63,042	90.0	-1,393	-2.0	2,331	3.3
Georgetown, Lake	36,823	21,498	58.4	119	0.3	-2,945	-8.0
Gibbons Creek Reservoir	25,721	20,287	78.9	-240	0.0	-372	-1.4
Graham, Lake	45,288	42,993	94.9	-459	-1.0	4,205	9.3
Granbury, Lake	132,949	131,565	99.0	-1,139	0.0	1,132	0.9

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS							
Name of lake or reservoir	Storage capacity	Storage at end-November		Storage change from end-Oct 2020		Storage change from end-Nov 2019	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Continued							
Granger Lake	51,822	45,636	88.1	-494	0.0	-6,186	-11.9
Grapevine Lake	163,064	159,926	98.1	-130	0.0	-3,138	-1.9
Greenbelt Lake	59,968	10,061	16.8	-266	0.0	-1,869	-3.1
*Halbert, Lake	6,033	5,301	87.9	0	0.0	303	5.0
Hords Creek Lake	8,109	4,517	55.7	-143	-1.8	-1,839	-22.7
Houston County Lake	17,113	17,113	100.0	103	0.6	0	0.0
Houston, Lake	130,147	130,147	100.0	5,024	3.9	10,157	7.8
Hubbard Creek Reservoir	313,298	282,611	90.2	-3,838	-1.2	6,129	2.0
Hubert H Moss Lake	24,058	23,265	96.7	-85	0.0	-760	-3.2
Inks, Lake	13,962	12,900	92.4	-105	0.0	-75	0.0
J. B. Thomas, Lake	199,931	30,223	15.1	-1,803	0.0	-21,504	-10.8
Jacksonville, Lake	25,670	25,670	100.0	128	0.5	1,032	4.0
Jim Chapman Lake (Cooper)	260,332	189,474	72.8	-12,248	-4.7	-37,618	-14.5
Joe Pool Lake	175,800	164,820	93.8	-2,736	-1.6	8,931	5.1
Kemp, Lake	245,307	206,502	84.2	-820	0.0	2,088	0.9
Kickapoo, Lake	86,345	71,079	82.3	-1,476	-1.7	-1,052	-1.2
Lavon Lake	406,388	366,653	90.2	-7,216	-1.8	34,483	8.5
Leon, Lake	27,762	25,962	93.5	-573	-2.1	2,125	7.7
Lewisville Lake	563,228	543,167	96.4	-8,777	-1.6	-4,779	0.0
Limestone, Lake	203,780	192,633	94.5	-3,643	-1.8	25,365	12.4
*Livingston, Lake	1,741,867	1,736,136	99.7	20,467	1.2	-5,731	0.0
*Lost Creek Reservoir	11,950	11,304	94.6	-42	0.0	100	0.8
Lyndon B Johnson, Lake	115,249	111,126	96.4	-245	0.0	367	0.3
Mackenzie Reservoir	46,450	4,228	9.1	-72	0.0	-1,127	-2.4
Marble Falls, Lake	6,901	6,831	99.0	-38	0.0	0	0.0
Martin, Lake	75,726	62,080	82.0	-2,371	-3.1	1,624	2.1
Medina Lake	254,823	110,955	43.5	-7,619	-3.0	-95,852	-37.6
Meredith, Lake	500,000	179,788	36.0	-1,594	0.0	-28,288	-5.7
Millers Creek Reservoir	26,768	26,768	100.0	0	0.0	3,527	13.2
*Mineral Wells, Lake	5,273	5,273	100.0	0	0.0	477	9.0
Monticello, Lake	34,740	28,062	80.8	-293	0.0	-189	0.0
Mountain Creek, Lake	22,850	22,850	100.0	0	0.0	0	0.0
Murvaul, Lake	38,285	35,510	92.8	-435	-1.1	133	0.3
Nacogdoches, Lake	39,522	33,698	85.3	-724	-1.8	-1,358	-3.4
Nasworthy	9,615	8,208	85.4	-49	0.0	-37	0.0
Navarro Mills Lake	49,827	47,223	94.8	-830	-1.7	7,735	15.5
New Terrell City Lake	8,583	7,753	90.3	-174	-2.0	-503	-5.9
Nocona, Lake (Farmers Crk)	21,444	20,005	93.3	-339	-1.6	441	2.1
North Fork Buffalo Creek Reservoir	15,400	14,499	94.1	-344	-2.2	2,854	18.5
O' the Pines, Lake	241,363	237,675	98.5	-3,688	-1.5	-3,688	-1.5
O. C. Fisher Lake	115,742	7,430	6.4	-206	0.0	-3,460	-3.0
*O. H. Ivie Reservoir	554,340	337,225	60.8	-3,036	0.0	-47,082	-8.5
Oak Creek Reservoir	39,210	30,812	78.6	-503	-1.3	-3,538	-9.0

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS							
Name of lake or reservoir	Storage capacity	Storage at end-November		Storage change from end-Oct 2020		Storage change from end-Nov 2019	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Continued							
Palestine, Lake	367,303	362,241	98.6	1,603	0.4	32,287	8.8
Palo Duro Reservoir	61,066	1,091	1.8	-123	0.0	-2,454	-4.0
Palo Pinto, Lake	26,766	23,952	89.5	-873	-3.3	3,322	12.4
Pat Cleburne, Lake	26,008	22,352	85.9	-676	-2.6	684	2.6
*Pat Mayse Lake	113,683	113,683	100.0	0	0.0	0	0.0
Possum Kingdom Lake	538,139	530,125	98.5	-1,951	0.0	10,716	2.0
Proctor Lake	54,762	52,297	95.5	-1,455	-2.7	12,156	22.2
Ray Hubbard, Lake	439,559	404,034	91.9	-6,793	-1.5	19,971	4.5
Ray Roberts, Lake	788,167	763,737	96.9	-7,530	0.0	-24,430	-3.1
Red Bluff Reservoir	151,110	70,345	46.6	290	0.2	-22,297	-14.8
Richland-Chambers Reservoir	1,087,839	1,029,119	94.6	-15,481	-1.4	80,455	7.4
Sam Rayburn Reservoir	2,857,077	2,396,552	83.9	-39,979	-1.4	-194,703	-6.8
Somerville Lake	150,293	122,476	81.5	-4,841	-3.2	-25,684	-17.1
Squaw Creek, Lake	151,250	151,250	100.0	0	0.0	4,569	3.0
Stamford, Lake	51,570	51,570	100.0	0	0.0	5,684	11.0
Stillhouse Hollow Lake	227,771	227,771	100.0	0	0.0	17,493	7.7
Striker, Lake	16,934	16,934	100.0	0	0.0	0	0.0
Sweetwater, Lake	12,267	10,160	82.8	-146	-1.2	-1,679	-13.7
*Sulphur Springs, Lake	17,747	12,274	69.2	-744	-4.2	-4,488	-25.3
Tawakoni, Lake	871,685	816,665	93.7	-6,404	0.0	1,774	0.2
Texana, Lake	159,566	156,455	98.1	3,710	2.3	32,452	20.3
Texoma, Lake (Texas & Oklahoma)	2,487,601	2,391,623	96.1	128,923	5.2	-229,417	-9.2
Texoma, Lake (Texas)	1,243,801	1,195,811	96.1	64,461	5.2	-47,990	-3.9
Toledo Bend Reservoir (Texas & Louisiana	4,472,900	3,867,346	86.5	36,804	0.8	536,288	12.0
Toledo Bend Reservoir (Texas)	2,236,450	1,931,623	86.4	18,402	0.8	268,144	12.0
Travis, Lake	1,113,348	757,722	68.1	-11,814	-1.1	-169,694	-15.2
Twin Buttes Reservoir	182,454	98,299	53.9	-1,038	0.0	-15,814	-8.7
Tyler, Lake	72,073	71,134	98.7	-562	0.0	8,757	12.2
Waco, Lake	189,418	178,574	94.3	-4,027	-2.1	24,030	12.7
Waxahachie, Lake	10,780	8,709	80.8	332	3.1	-702	-6.5
Weatherford, Lake	17,812	15,985	89.7	-288	-1.6	900	5.1
White River Lake	29,880	3,684	12.3	-199	-1	-2,080	-7
Whitney, Lake	553,344	496,474	89.7	-6,680	-1.2	71,367	12.9
Worth, Lake	24,419	18,958	77.6	-910	-3.7	129	0.5
Wright Patman Lake	122,593	122,593	100.0	-12,476	-10.2	0	0.0
STATEWIDE TOTAL							
STATEWIDE TOTAL	**32,138,957**	**25,063,879**	**78.0**	**-143,110**	**0**	**-531,654**	**-1.7**

STREAMFLOW CONDITIONS

Much of the state had near normal streamflow (25–75th percentile, green shading in Figure 6) in November 2020. Above normal streamflow (76-90th percentile, light blue shading in Figure 6) was seen in the Upper Colorado river basin.

Below normal streamflow (10–24th percentile, orange shading in Figure 6) was recorded in Upper and Lower Red, Upper and Lower Brazos, Upper and Lower Colorado, Upper Rio Grande, Lower Trinity, San Jacinto, Neches, Brazos-Colorado, Lavaca, Guadalupe, San Antonio, San Antonio-Nueces, Nueces, and Nueces-Rio Grande river basins.

Some watersheds in the Upper and Lower Red, Upper and Lower Colorado, Upper Rio Grande, Nueces, Nueces-Rio Grande, and San Antonio-Nueces river basins had much below normal streamflow (less than the 10th percentile, dark brown shading in Figure 6). Record low streamflow was seen in the Upper Brazos river basin.

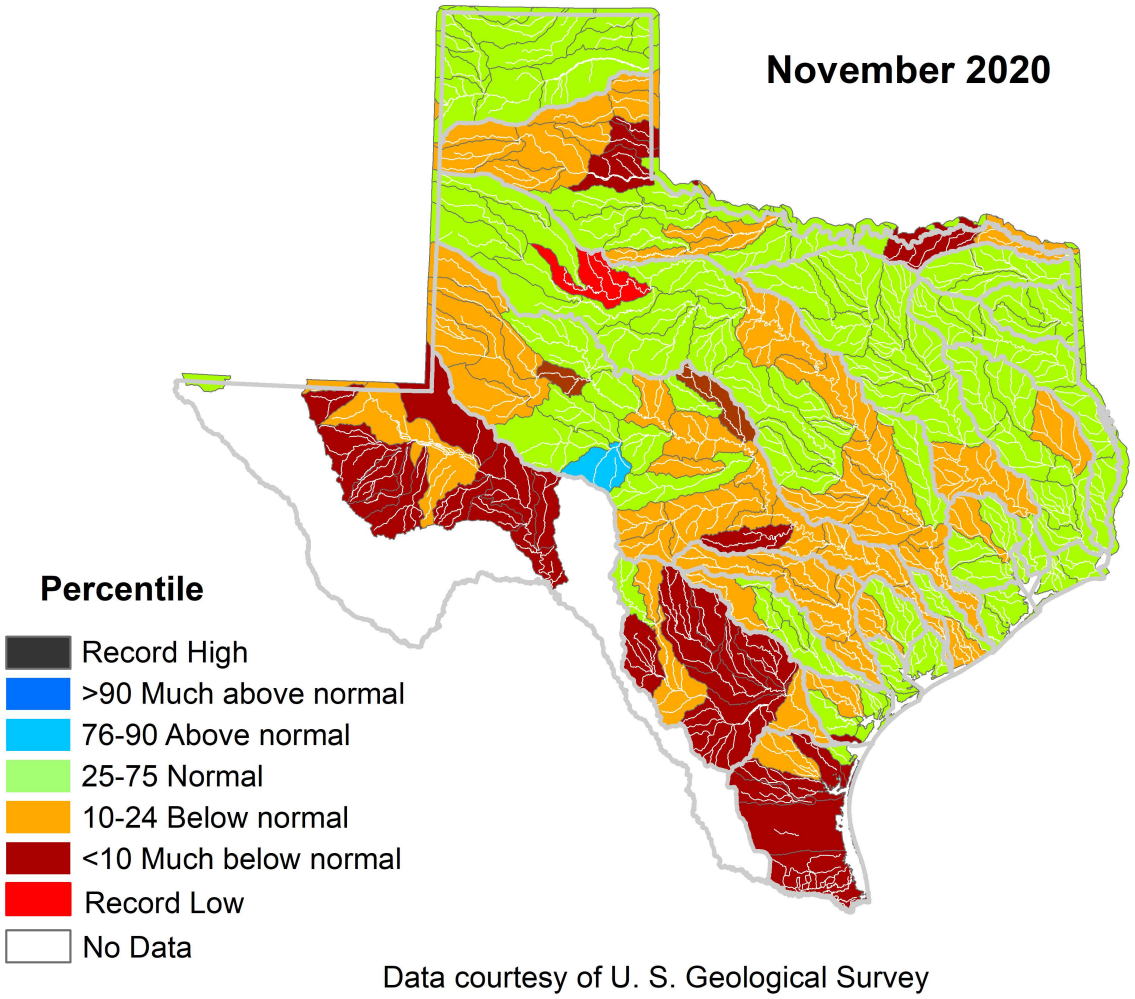
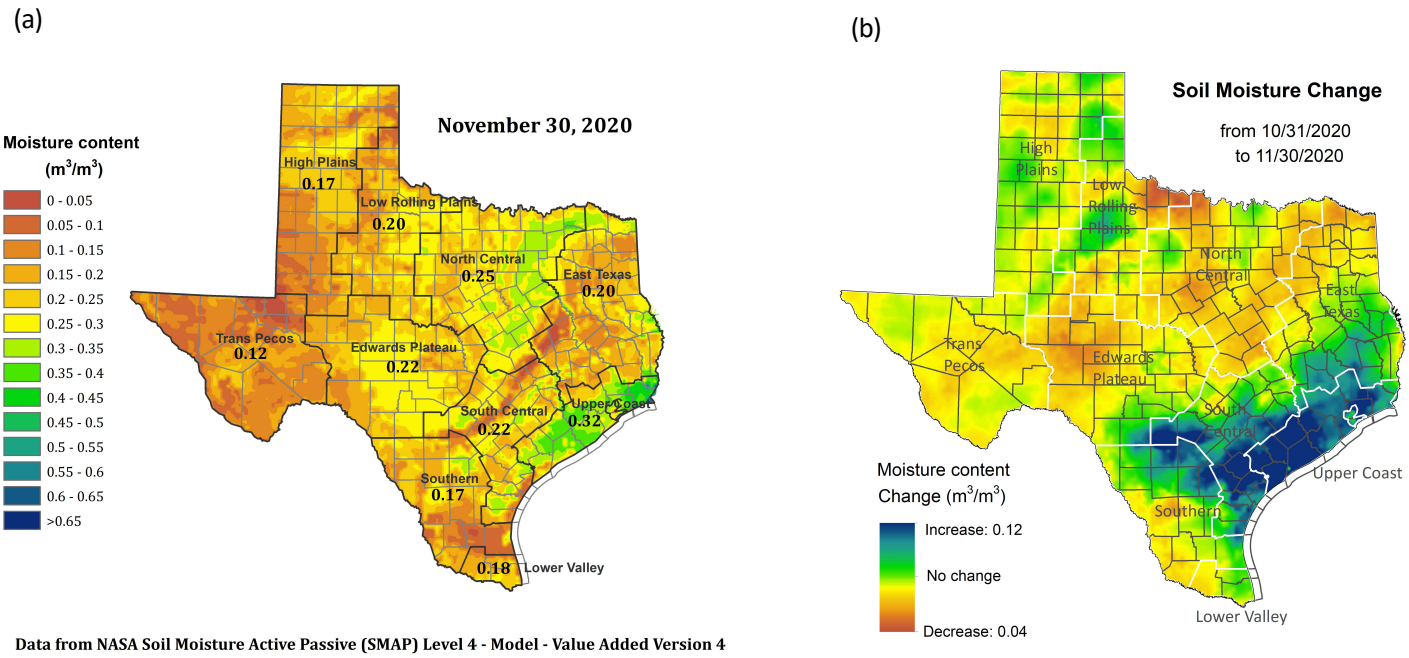


Figure 6: Runoff percentiles by the U.S. Geological Survey's Hydrologic Unit Code

SOIL MOISTURE CONDITIONS

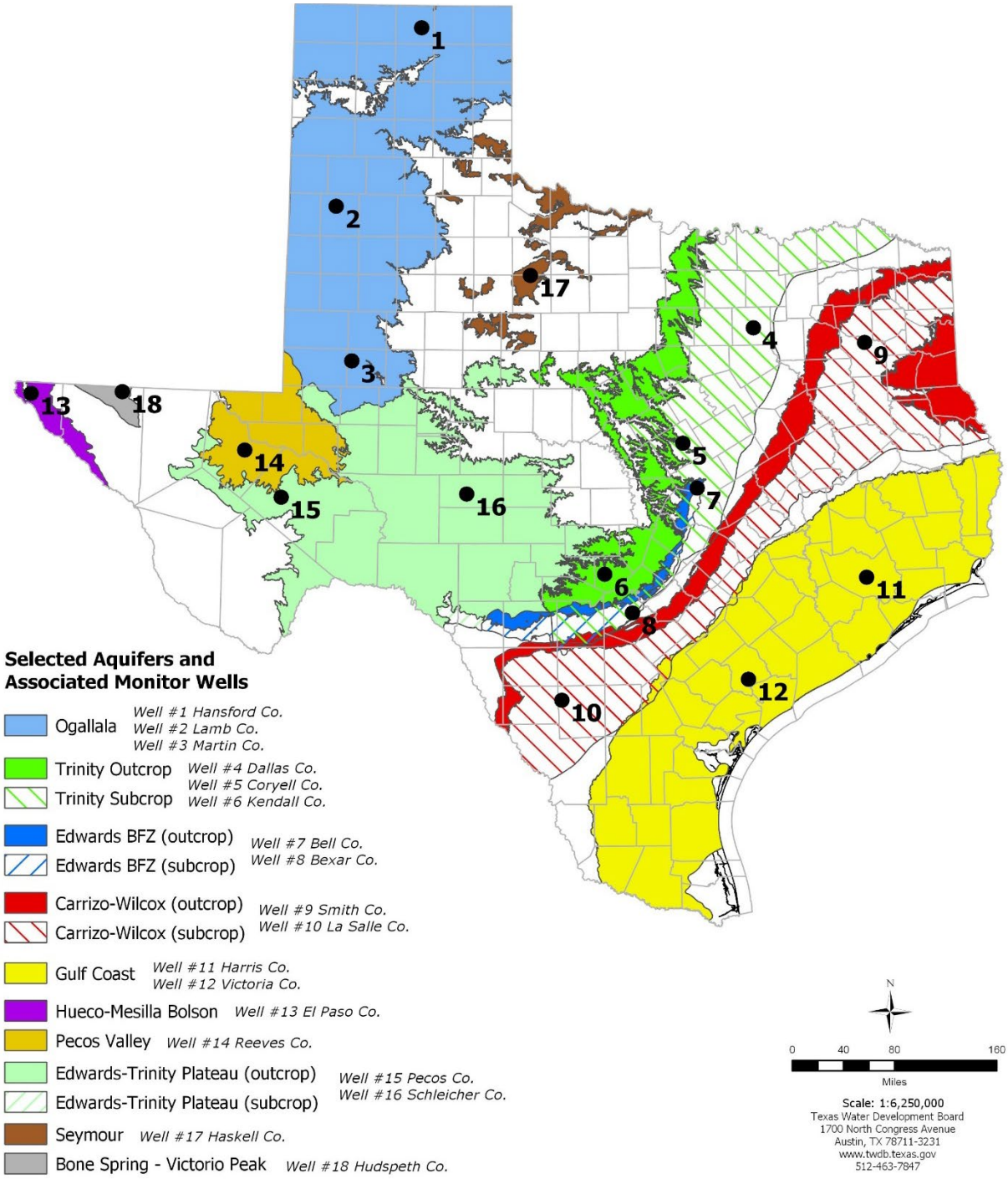
Root zone soil moisture at the end of November 2020 [Figure 7(a)] was moderate [> 0.20 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in the majority of the Edward Plateau, North Central, South Central, Low Rolling Plains, Lower Valley, and areas of East Texas climate divisions. There were areas of low soil moisture [< 0.15 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in the majority of the Trans Pecos, southern and northern High Plains, southern Southern, central and northeastern South Central, northwestern Low Rolling Plains, and southwestern East Texas climate divisions. Soil moisture was high [>0.3 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in areas of eastern North Central, Upper Coast, portions of northern and southern South Central, northeastern Southern, and portions of northern and eastern East Texas climate divisions [Figure 7(a)].

Compared to conditions at the end of October 2020, soil moisture content increased [green to blue shading in Figure 7(b)] in portions of the state, including areas of the High Plains, northern and central Low Rolling Plains, northern North Central, central and southern East Texas, southeastern Edwards Plateau, northern and eastern Southern, eastern Lower Valley, South Central, and Upper Coast climate divisions. Soil moisture content decreased [yellow, orange, and brown shading in Figure 7(b)] in the Trans Pecos, the majority of the Edwards Plateau, southern and northeastern Low Rolling Plains, the majority of the North Central, northern East Texas, southeastern Southern, areas of the High Plains, and western Lower Valley 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: Root zone soil moisture conditions in November, 2020 (a) and the difference in root zone soil moisture between end-October 2020 and end-November 2020 (b)



November 2020 GROUNDWATER LEVELS IN OBSERVATION WELLS

Water-level measurements were available for 17 key monitoring wells in the state. Water levels rose in 9 monitoring wells since the beginning of November, ranging from an increase of 0.12 feet in the Haskell County Seymour Aquifer well (#17 on map) to 17.94 feet in the Pecos County Edwards-Trinity (Plateau) Aquifer (#15 on map). Water levels declined in 7 monitoring wells, ranging from a decline of -0.07 feet in the Dallas County Trinity Aquifer well (#4 on map) to -3.99 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 69.50 feet below land surface or 661.50 feet above mean sea level. Water levels are 1.50 feet above the Stage I critical management level for the San Antonio portion of the Edwards (Balcones Fault Zone) Aquifer.

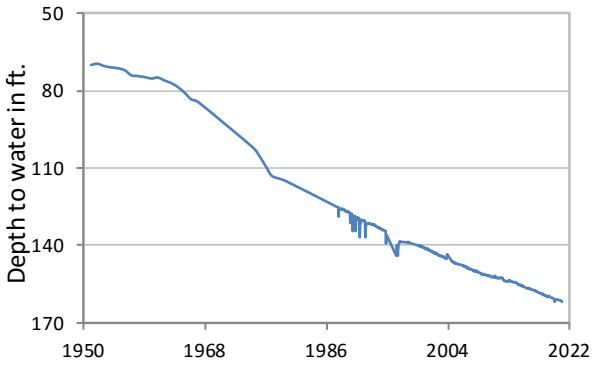
***Well numbers used in this publication on the aquifer map to indicate the monitoring well location (numbers 1 - 18) are different than the TWDB's seven-digit state well number.**

Monitoring Well	November	October	Month Change	Year Change	Historical Change	First Measured
(1) Hansford 0354301	161.78	161.47	-0.31	NA	-91.66	1951
(2) Lamb 1053602	151.48	NA	NA	-0.86	-123.31	1951
(3) Martin 2739903	145.12	144.31	-0.81	-1.58	-40.23	1964
(4) Dallas 3319101	490.00	489.93	-0.07	6.99	-268.00	1954
(5) Coryell 4035404	529.46	529.75	0.29	4.64	-237.46*	1955**
(6) Kendall 6802609	158.65	159.48	0.83	-17.84	-98.65	1975
(7) Bell 5804816	124.80	124.54	-0.26	-2.25	-1.29	2008
(8) Bexar 6837203	69.50	70.80	1.30	-11.80	-22.86	1932
(9) Smith 3430907	436.39	436.61	0.22	1.15	-136.39*	1977**
(10) La Salle 7738103	520.90	516.91	-3.99	8.08	-267.83	2003
(11) Harris 6514409	188.92	189.44	0.52	4.44	-53.42*	1947**
(12) Victoria 8017502	34.96	33.62	-1.34	0.55	-0.96*	1958**
(13) El Paso 4913301	297.32	296.38	-0.94	-0.93	-65.42*	1964**
(14) Reeves 4644501	NA	NA	NA	NA	NA	1952
(15) Pecos 5216802	202.51	220.45	17.94	-8.20	44.37	1976
(16) Schleicher 5512134	285.26	285.79	0.53	-2.52	16.64	2003
(17) Haskell 2135748	44.69	44.81	0.12	-0.02	-1.69	2002
(18) Hudspeth 4807516	151.12	156.29	5.17	-4.57	-47.20	1966

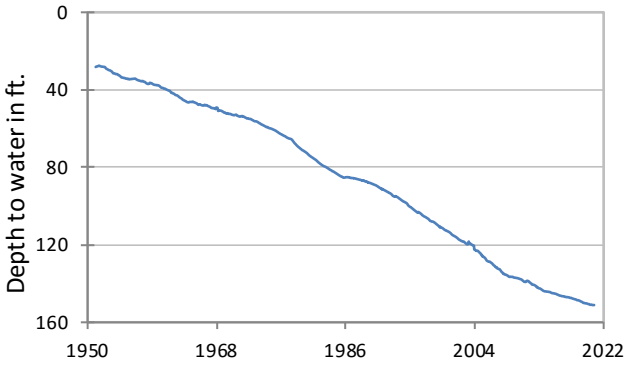
*Change since the original measurement taken on the date indicated in the last column (**measurement not shown on the hydrograph)

November 2020 OBSERVATION WELL HYDROGRAPHS

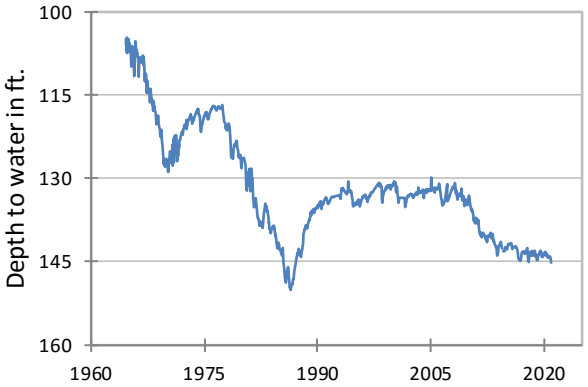
(1) State Well #03-54-301
Near Spearman, Hansford County
Ogallala Aquifer



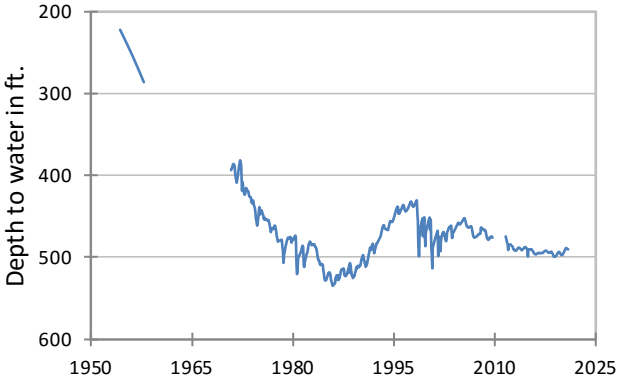
(2) State Well #10-53-602
Near Earth, Lamb County
Ogallala Aquifer



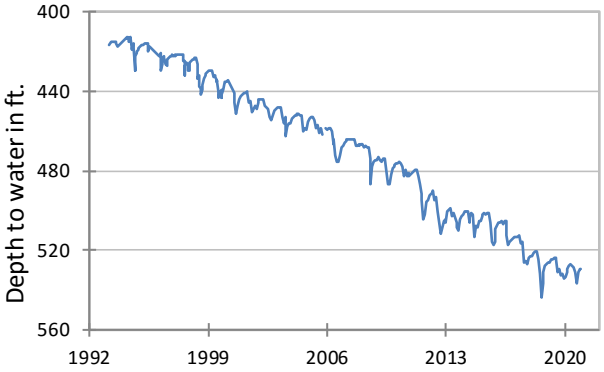
(3) State Well #27-39-903
Northwest Martin County
Ogallala Aquifer



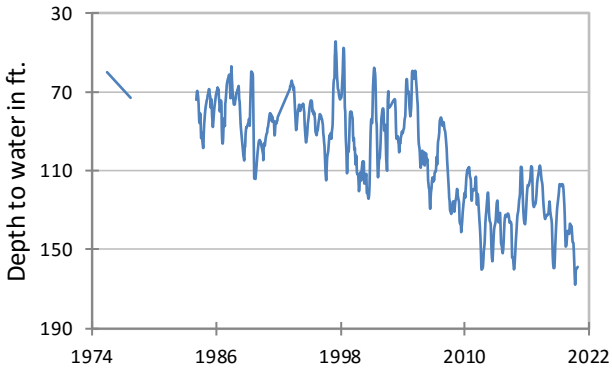
(4) State Well #33-19-101
Southeast Dallas, Dallas County
Twin Mountains Formation-Trinity Aquifer



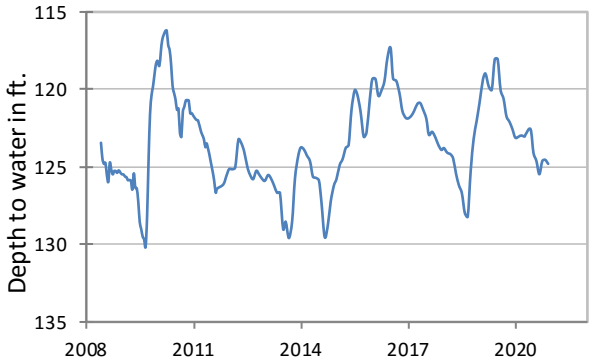
(5) State Well #40-35-404
Gatesville, Coryell County
Hosston Formation-Trinity Aquifer



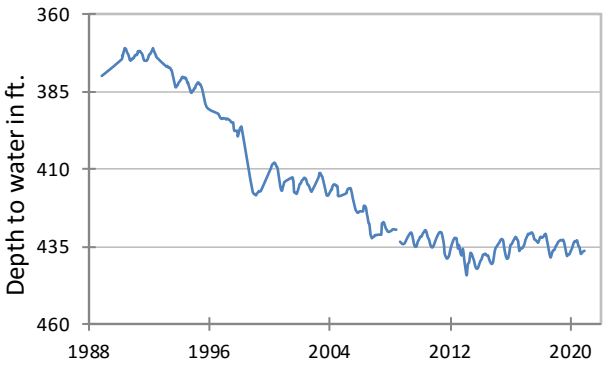
(6) State Well #68-02-609
Waring, Kendall County
Travis Peak Formation-Trinity Aquifer



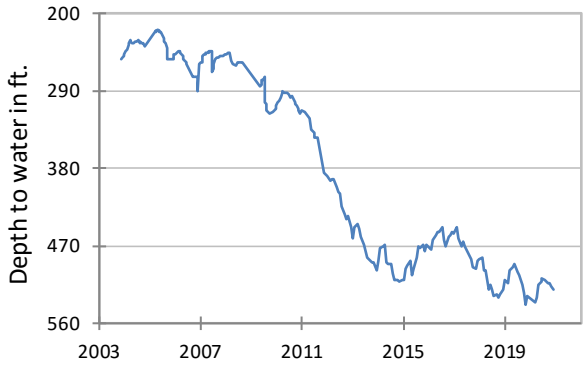
(7) State Well #58-04-816
Near Salado, Bell County
Edwards (Balcones Fault Zone) Aquifer



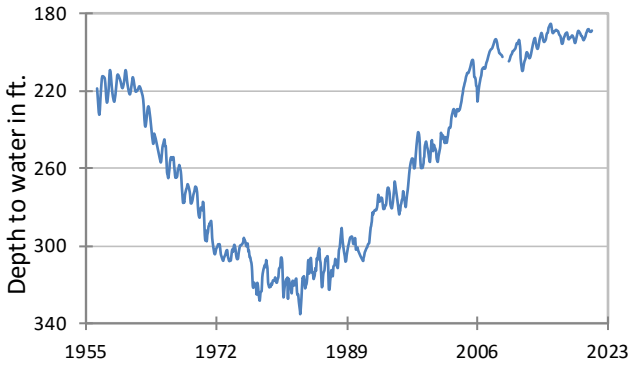
(9) State Well #34-30-907
Red Springs, Smith County
Carrizo-Wilcox Aquifer



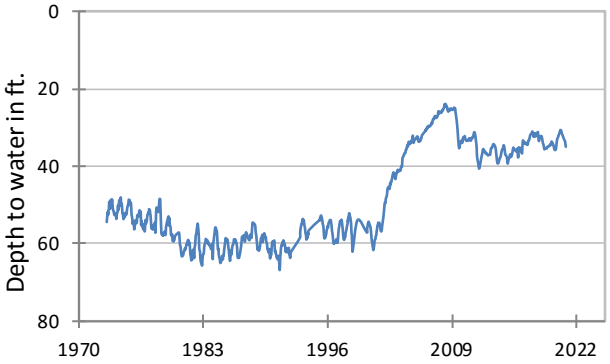
(10) State Well #77-38-103
Near Cotulla, La Salle County
Carrizo-Wilcox Aquifer



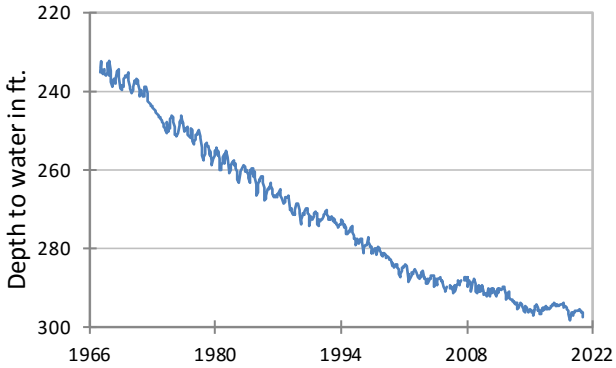
(11) State Well #65-14-409
North Houston, Harris County
Evangeline Formation-Gulf Coast Aquifer



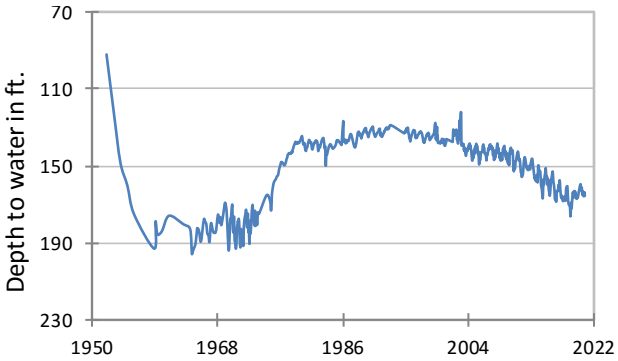
(12) State Well #80-17-502
Near Bloomington, Victoria County
Lissie Formation-Gulf Coast Aquifer



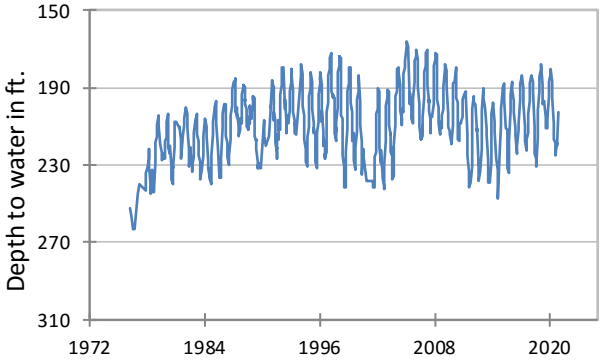
(13) State Well #49-13-301
El Paso, El Paso County
Hueco-Mesilla Bolsons Aquifer



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



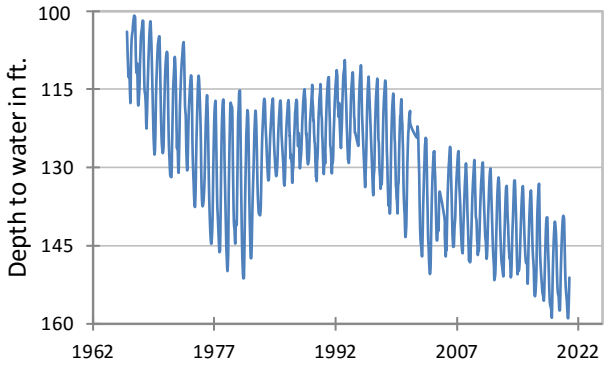
(15) State Well #52-16-802
Fort Stockton, Pecos County
Edwards-Trinity (Plateau) Aquifer



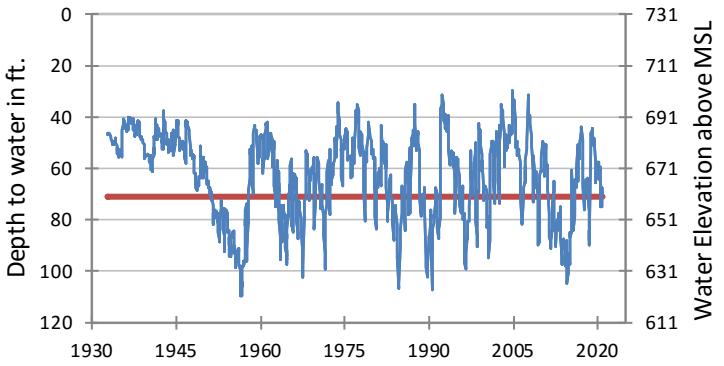
(16) State Well #55-12-134
Eldorado, Schleicher County
Edward-Trinity (Plateau) Aquifer

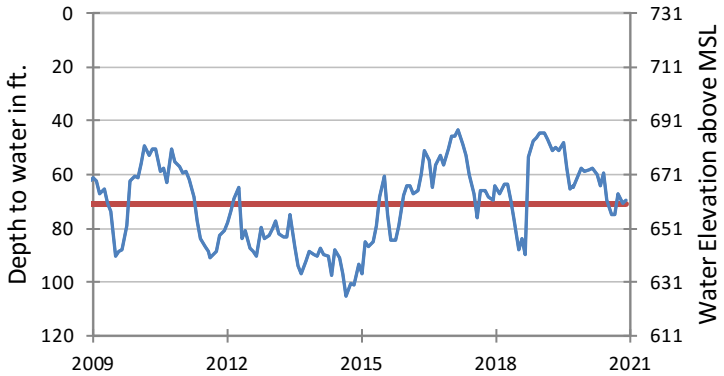
(17) State Well #21-35-748
Near O'Brien, Haskell County
Seymour Aquifer

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



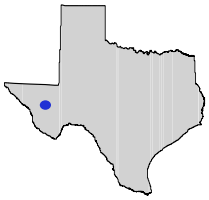
(8) State Well #68-37-203 (J-17)
San Antonio, Bexar County
Edwards (Balcones Fault Zone) Aquifer





The late November water-level measurement in this Edwards (Balcones Fault Zone) Aquifer well was 69.50 feet below land surface, or 661.50 feet above mean sea level. This was 1.30 feet above last month's measurement, 11.80 feet below last year's measurement, and 22.86 feet below the initial measurement recorded in 1932.

Water levels below the red line indicate periods when the Edwards Aquifer Authority's Stage 1 drought restrictions are in effect.

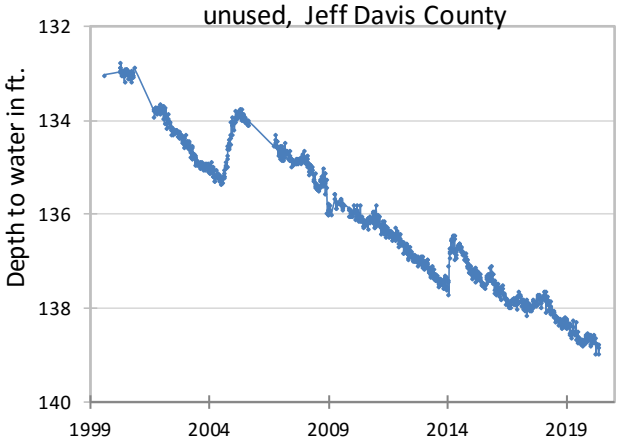


HYDROGRAPH OF THE MONTH

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

Igneous Aquifer

Well #52-25-209, 392 feet deep
unused, Jeff Davis County



The Igneous Aquifer is a minor aquifer located in Far West Texas. The aquifer consists of volcanic rocks made of a complex series of welded pyroclastic rock, lava, volcaniclastic sediments. It includes more than 40 different named units as much as 6,000 feet thick in total. Freshwater saturated thickness averages about 1,800 feet. The best water-bearing zones are found in igneous rocks with primary porosity and permeability, such as vesicular basalts, interflow zones in lava successions, sandstone, conglomerate, and breccia. Although water in the aquifer is fresh and contains less than 1,000 milligrams per liter of total dissolved solids, elevated levels of silica and fluoride have been found in water from some wells, reflecting the igneous origin of the rock. Water is primarily used to meet municipal needs for the cities of Alpine, Fort Davis, and Marfa, as well as some agricultural needs. There have been no significant water-level declines in wells measured by the TWDB throughout the aquifer.

The initial water-level measurement in this well was taken by the TWDB in August of 1999 at 133.03 feet below land surface. TWDB installed an automatic water-level recorder in this well in March of 2000 and has since collected near-daily measurements. The period of record reveals a steady decline of nearly six feet in 21 years with brief periods of recharge in 2004 and 2014 and the lowest water level of 138.97 feet below land surface measured in April of 2020.

Far away (left), and close-up (right) images of well #52-25-209.