

Texas Water Conditions Report

August 2021

Surface Water News:

Contracted studies that were recently completed:

Cumulative Effects- This study assessed the cumulative effects of water management strategies on environmental flow standards with a special case study on reuse. A tool (called CERST) was developed that regional water planning groups can use to assess impacts to the environment with the implementation of water management strategies.

Assessment of How Trends in the Brazos River Basin May Affect Surface Water Availability and Attainment of Environmental Flow Standards-This study used the Brazos River Basin Water Availability Model (Brazos WAM) to evaluate impacts of trended hydrology on existing and future water supplies and attainment of environmental flow metrics.

Evaluating the Attainment of Environmental Flow Standards- This study developed a standardized methodology for assessing the attainment of the adopted environmental flow standards using daily WAMs, for the Brazos, Trinity, and Neches river basins, to assist BBASCs with an understanding of how the key findings can be used in the adaptive management process.

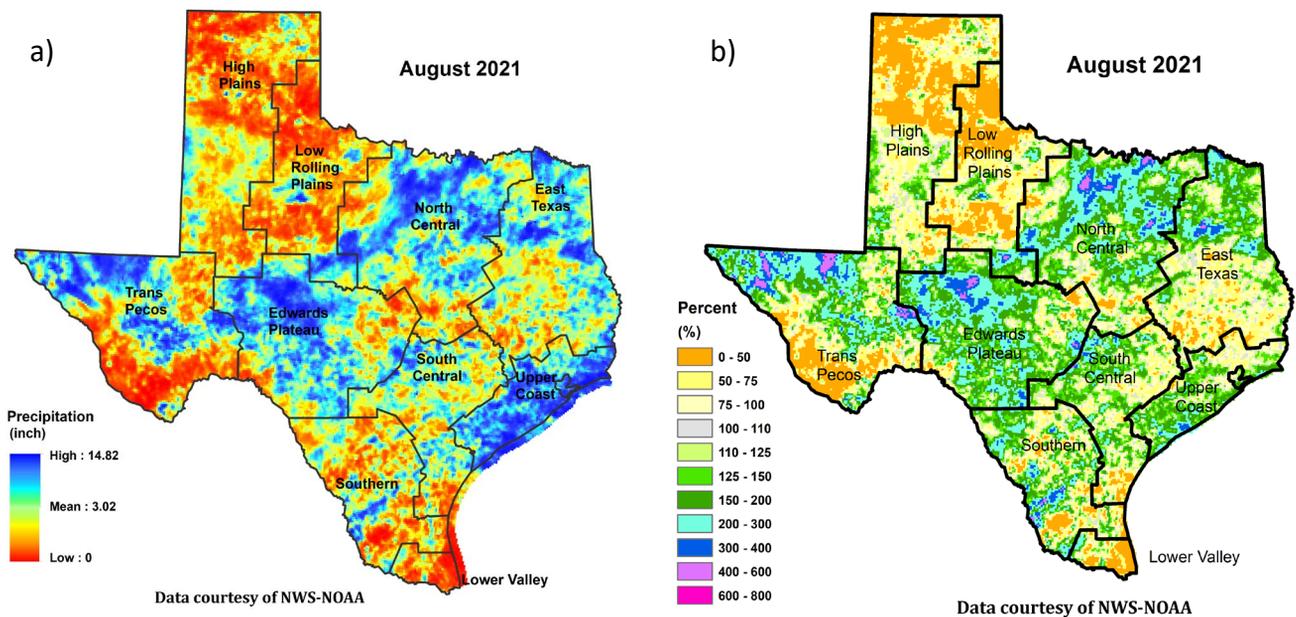
RAINFALL

Areas of Texas received much above average rainfall, reaching 14.82 inches in areas of the state [dark blue shading, Figure 1(a)]. Some rainfall [light blue and dark blue shading, Figure 1(a)] was recorded in much of the state particularly the Trans Pecos, Edwards Plateau, North Central, East Texas, areas of the High Plains, Low Rolling Plains, South Central, Southern, Lower Valley, Southern, and Upper Coast climate divisions. Little to no rain [yellow, orange, and red shading, Figure 1(a)] fell over northeastern and southern Trans Pecos, much of the High Plains, Low Rolling Plains, Southern, Lower Valley, areas of the Edwards Plateau, South Central, North Central, and East Texas climate divisions.

Monthly rainfall for August was much above average, compared to historical data from 1981–2010, receiving 3–6 times the average rainfall [dark blue and purple shading, Figure 1(b)] in portions the Trans Pecos, Low Rolling Plains, Edwards Plateau, North Central, East Texas, Southern, northern South Central, and southern Upper Coast climate divisions.

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

Rainfall was below average [yellow and orange shading, Figure 1(b)], in portions of the High Plains, Low Rolling Plains, Lower Valley, southern and northeastern Trans Pecos, southwestern and eastern Edwards Plateau, areas of Southern, South Central, North Central, northeastern Upper Coast, and southern East Texas climate divisions.



RESERVOIR STORAGE

At the end of August 2021, total conservation storage* in 118 of the state’s major water supply reservoirs was 26.5 million acre-feet or 82 percent of total conservation storage capacity (Figure 2). This is approximately 0.4 million acre-feet less than a month ago and approximately 1.2 million acre-feet more than at the end of August 2020.

Statewide monitored major water supply reservoir conservation storage

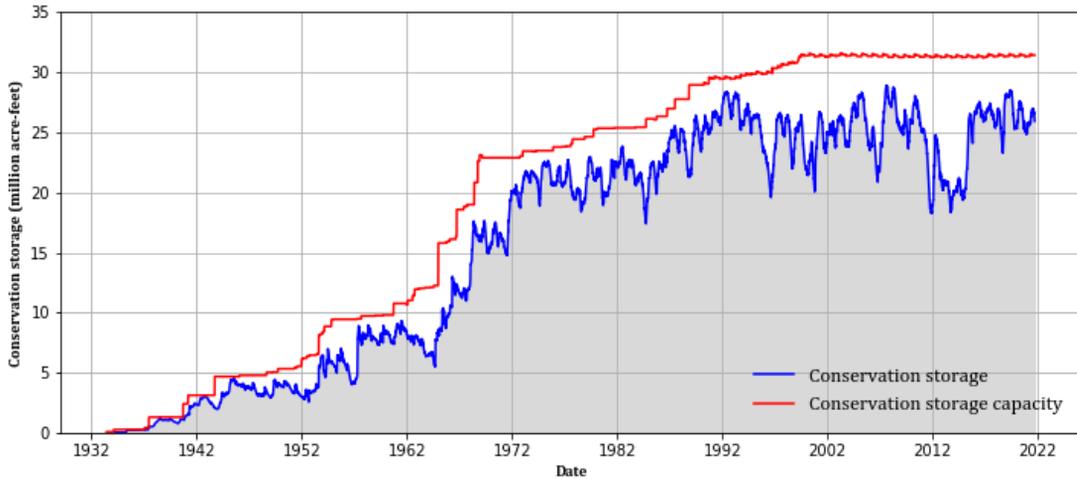


Figure 2: Statewide reservoir conservation storage

Out of 118 reservoirs in the state, 39 reservoirs held 100 percent of conservation storage capacity (Figure 3). Additionally, 47 were at or above 90 percent full. Seven reservoirs, E.V. Spence (28 percent full), Greenbelt (19 percent full), Mackenzie (8 percent full), O. C. Fisher (7 percent full), Palo Duro Reservoir (1 percent full), Falcon (24 percent full), and White River (25 percent full) remained below 30 percent full. Elephant Butte Reservoir (located in New Mexico) was 5 percent full.

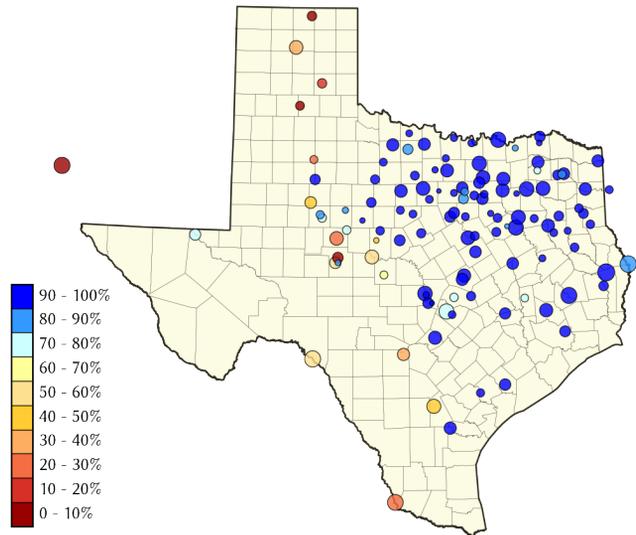


Figure 3: Reservoir conservation storage at end-August expressed as percent full (%)

*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 Low Rolling Plains (79.9 percent full), East Texas (94.5 percent full), North Central (98.3 percent full), South Central (76.1 percent full), and Upper Coast (99 percent full) climate divisions (Figure 4). The Edwards Plateau climate division had moderately low conservation storage (59.5 percent full). The High Plains (31.7 percent full) and Southern (37.3 percent full) climate divisions had severely low storage (Figure 4). The Trans Pecos climate division (15.9 percent full) had extremely low storage (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, Sulphur, Cypress, Upper and Lower Sabine, Neches, Upper and Lower Trinity, San Jacinto, Upper and Lower Brazos, Lower Colorado, Lavaca, and Guadalupe river basins. The Nueces river basin had abnormally low conservation storage (60–70 percent full, Figure 5). Conservation storage in the Upper Colorado river basins was moderately low (40–60 percent full, Figure 5), and the Canadian, San Antonio, and Lower Rio Grande river basins had severely low conservation storage (20–40 percent full, Figure 5). The Upper/Mid Rio Grande river basin had extremely low conservation storage (10–20 percent full, Figure 5).

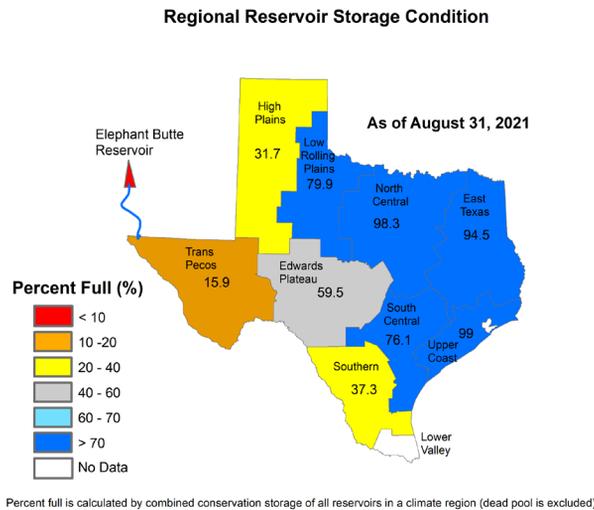


Figure 4: Reservoir Storage Index* by climate division at 8/31/2021

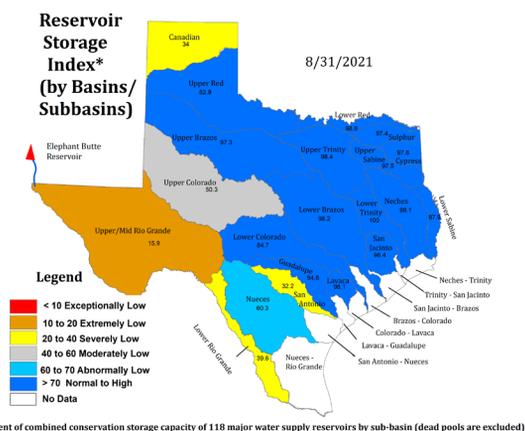


Figure 5: Reservoir Storage Index* by river basin/sub-basin at 8/31/2021

*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-August 2021		Storage change from end-Jul 2021		Storage change from end-Aug 2020	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Abilene, Lake	7,900	7,352	93	-387	-5	1,221	15
Alan Henry Reservoir	96,207	94,236	98	-1,971	-2	3,116	3
*Amistad Reservoir (Texas & Mexico)	3,275,532	1,155,919	35	32,756	1	33,473	1
*Amistad Reservoir (Texas)	1,840,849	976,637	53	13,000	1	-57,663	-3
Amon G Carter, Lake	19,266	19,266	100	0	0	449	2
Aquilla Lake	43,243	42,781	99	-462	-1	3,009	7
Arlington, Lake	40,157	36,792	92	-1,379	-3	5,958	15
Arrowhead, Lake	230,359	217,935	95	-4,667	-2	1,684	1
Athens, Lake	29,503	29,503	100	0	0	92	0
*Austin, Lake	23,972	22,926	96	92	0	0	0
B A Steinhagen Lake	69,186	65,761	95	397	1	3,991	6
Bardwell Lake	46,122	46,122	100	0	0	2,911	6
Belton Lake	435,225	433,649	100	-1,576	0	32,245	7
Benbrook Lake	85,648	73,491	86	-7,410	-9	5,823	7
Bob Sandlin, Lake	192,417	187,119	97	-4,676	-2	-1,230	0
Bonham, Lake	11,027	9,500	86	-619	-6	-1,140	-10
Brady Creek Reservoir	28,808	17,871	62	-259	0	-3,967	-14
Bridgeport, Lake	366,236	366,236	100	9,852	3	24,958	7
*Brownwood, Lake	130,868	130,868	100	3,371	3	27,134	21
Buchanan, Lake	816,904	780,472	96	-14,376	-2	33,068	4
Caddo, Lake	29,898	29,898	100	0	0	no data	
Canyon Lake	378,781	357,597	94	-317	0	4,583	1
Cedar Creek Reservoir in Trinity	644,686	639,463	99	-2,934	0	32,600	5
Champion Creek Reservoir	41,580	31,244	75	-409	0	6,293	15
Cherokee, Lake	40,094	40,094	100	0	0	1,658	4
Choke Canyon Reservoir	662,820	322,146	49	-9,875	-1	68,811	10
*Cisco, Lake	29,003	27,118	94	-625	-2	3,742	13
Coleman, Lake	38,075	38,075	100	4,516	12	3,664	10
Colorado City, Lake	31,040	30,946	100	-94	0	10,878	35
*Coletto Creek Reservoir	30,758	24,950	81	-716	-2	13,986	45
Conroe, Lake	410,988	391,671	95	-16,252	-4	5,211	1
Corpus Christi, Lake	256,062	232,219	91	-5,157	-2	81,776	32
Crook, Lake	9,195	8,397	91	-267	-3	-798	-9
Cypress Springs, Lake	66,756	65,116	98	-1,284	-2	573	1
E. V. Spence Reservoir	517,272	143,426	28	-4,000	0	23,941	5
Eagle Mountain Lake	179,880	177,647	99	8,107	5	11,769	7
Elephant Butte Reservoir (Texas)	852,491	45,048	5	-9,424	-1	-2,253	0
Elephant Butte Reservoir (Total Storage)	1,960,900	104,277	5	-21,020	-1	-5,215	0
*Falcon Reservoir (Texas & Mexico)	2,646,817	482,219	18	-15,783	0	-47,804	-2
*Falcon Reservoir (Texas)	1,551,007	367,144	24	-29,587	-2	-59,538	-4
Fork Reservoir, Lake	605,061	578,567	96	-11,040	-2	14,898	2
Fort Phantom Hill, Lake	70,030	70,030	100	0	0	8,715	12
Georgetown, Lake	36,823	28,669	78	-4,355	-12	6,698	18
Gibbons Creek Reservoir	25,721	20,113	78	-831	-3	-1,341	-5
Graham, Lake	45,288	42,752	94	-1,797	-4	1,383	3
Granbury, Lake	132,949	132,052	99	649	0	8,414	6

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

Name of lake or reservoir	Storage capacity	Storage at end-August 2021		Storage change from end-Jul 2021		Storage change from end-Aug 2020	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
<i>Continued</i>							
Granger Lake	51,822	51,822	100	0	0	5,233	10
Grapevine Lake	163,064	163,064	100	1,053	1	4,107	3
Greenbelt Lake	59,968	11,284	19	-296	0	214	0
*Halbert, Lake	6,033	5,176	86	-175	-3	146	2
Hords Creek Lake	8,109	3,824	47	-96	-1	-1,229	-15
Houston County Lake	17,113	17,100	100	-13	0	830	5
Houston, Lake	130,147	130,147	100	0	0	9,400	7
Hubbard Creek Reservoir	313,298	308,458	98	155	0	37,304	12
Hubert H Moss Lake	24,058	23,446	97	-364	-2	138	1
Inks, Lake	13,962	13,020	93	173	1	165	1
J. B. Thomas, Lake	199,931	92,475	46	-3,610	-2	55,437	28
Jacksonville, Lake	25,670	25,623	100	-47	0	81	0
Jim Chapman Lake (Cooper)	260,332	250,677	96	-8,765	-3	28,510	11
Joe Pool Lake	175,800	175,800	100	0	0	8,388	5
Kemp, Lake	245,307	245,307	100	0	0	48,303	20
Kickapoo, Lake	86,345	74,209	86	-2,058	-2	-1,568	-2
Lavon Lake	406,388	381,930	94	-16,667	-4	25,876	6
Leon, Lake	27,762	26,604	96	-170	0	3,588	13
Lewisville Lake	563,228	563,228	100	0	0	37,417	7
Limestone, Lake	203,780	198,967	98	-4,813	-2	11,505	6
*Livingston, Lake	1,741,867	1,741,867	100	0	0	36,841	2
*Lost Creek Reservoir	11,950	11,916	100	168	1	482	4
Lyndon B Johnson, Lake	115,249	111,003	96	-184	0	-491	0
Mackenzie Reservoir	46,450	3,886	8	-106	0	-612	-1
Marble Falls, Lake	6,901	6,869	100	55	1	44	1
Martin, Lake	75,726	73,175	97	-1,171	-2	3,405	4
Medina Lake	254,823	82,083	32	-5,538	-2	-55,700	-22
Meredith, Lake	500,000	189,806	38	-3,769	0	-709	0
Millers Creek Reservoir	26,768	26,768	100	0	0	1,858	7
*Mineral Wells, Lake	5,273	5,273	100	162	3	566	11
Monticello, Lake	34,740	28,582	82	-831	-2	-280	0
Mountain Creek, Lake	22,850	22,850	100	0	0	0	0
Murvault, Lake	38,285	38,285	100	137	0	616	2
Nacogdoches, Lake	39,522	37,931	96	-488	-1	1,725	4
Nasworthy	9,615	8,085	84	159	2	-148	-2
Navarro Mills Lake	49,827	49,123	99	-704	-1	2,267	5
New Terrell City Lake	8,583	8,480	99	-103	-1	494	6
Nocona, Lake (Farmers Crk)	21,444	20,818	97	-479	-2	277	1
North Fork Buffalo Creek Reservoir	15,400	14,398	93	-713	-5	248	2
O' the Pines, Lake	268,566	268,566	100	0	0	4,822	2
O. C. Fisher Lake	115,742	8,170	7	2,155	2	98	0
*O. H. Ivie Reservoir	554,340	325,591	59	2,280	0	-27,948	-5
Oak Creek Reservoir	39,210	30,246	77	-732	-2	-691	-2

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Name of lake or reservoir	Storage capacity	Storage at end-August 2021		Storage change from end-Jul 2021		Storage change from end-Aug 2020	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
<i>Continued</i>							
Palestine, Lake	367,303	367,303	100	0	0	18,651	5
Palo Duro Reservoir	61,066	851	1	-140	0	-701	-1
Palo Pinto, Lake	26,766	26,570	99	346	1	5,344	20
Pat Cleburne, Lake	26,008	24,643	95	-788	-3	903	3
*Pat Mayse Lake	113,683	111,046	98	-2,356	-2	-2,525	-2
Possum Kingdom Lake	538,139	538,139	100	0	0	35,421	7
Proctor Lake	54,762	54,762	100	0	0	17,500	32
Ray Hubbard, Lake	439,559	431,891	98	-3,918	0	23,866	5
Ray Roberts, Lake	788,167	788,167	100	0	0	19,416	2
Red Bluff Reservoir	151,110	114,301	76	no data		38,838	26
Richland-Chambers Reservoir	1,087,839	1,068,229	98	-19,610	-2	13,532	1
Sam Rayburn Reservoir	2,857,077	2,796,499	98	-60,578	-2	239,069	8
Somerville Lake	150,293	150,293	100	0	0	19,529	13
Squaw Creek, Lake	151,250	151,250	100	0	0	0	0
Stamford, Lake	51,570	51,570	100	0	0	2,403	5
Stillhouse Hollow Lake	227,771	227,771	100	0	0	18,224	8
Striker, Lake	16,934	16,934	100	0	0	270	2
Sweetwater, Lake	12,267	10,594	86	-218	-2	46	0
*Sulphur Springs, Lake	17,747	13,909	78	-1,530	-9	-658	-4
Tawakoni, Lake	871,685	860,270	99	-8,827	-1	32,918	4
Texana, Lake	159,566	156,546	98	-2,928	-2	6,132	4
Texoma, Lake (Texas & Oklahoma)	2,487,601	2,464,516	99	-380,440	-15	129,264	5
Texoma, Lake (Texas)	1,243,801	1,232,258	99	-11,543	0	64,632	5
Toledo Bend Reservoir (Texas & Louisiana)	4,472,900	3,935,911	88	-235,283	-5	-161,748	-4
Toledo Bend Reservoir (Texas)	2,236,450	1,965,906	88	-117,641	-5	-80,874	-4
Travis, Lake	1,113,348	842,110	76	-16,901	-2	36,420	3
Twin Buttes Reservoir	182,454	102,221	56	10,952	6	3,867	2
Tyler, Lake	72,073	72,073	100	0	0	4,873	7
Waco, Lake	189,418	189,418	100	0	0	16,144	9
Waxahachie, Lake	10,780	10,172	94	-327	-3	1,744	16
Weatherford, Lake	17,812	17,006	95	10	0	1,358	8
White River Lake	29,880	7,452	25	-441	-1	2,929	10
Whitney, Lake	553,344	535,810	97	1,994	0	56,160	10
Worth, Lake	24,419	20,919	86	-364	-1	-198	0
Wright Patman Lake	231,496	231,496	100	0	0	0	0
STATEWIDE TOTAL							
STATEWIDE TOTAL	32,261,240	26,467,210	82	-388,561	-1	1,163,564	4

*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 to much above normal streamflow in August 2021. Above normal streamflow (76–90th percentile, light blue shading in Figure 6) was seen in the Canadian, Upper and Lower Red, Sulphur, Cypress, Sabine, Neches, Trinity, Brazos, Colorado, Trinity-San Jacinto, San Jacinto, Brazos, Brazos-Colorado, Colorado, San Antonio, Colorado-Lavaca, Lavaca-Guadalupe, Pecos, Nueces, and San Antonio-Nueces river basins.

Much above normal streamflow (> 90 percentile, dark blue shading in Figure 6) was seen in the Canadian, Lower Red, Upper Brazos, Upper Colorado, Upper Trinity, Neches, Neches-Trinity, San Jacinto-Brazos, and Pecos river basins.

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

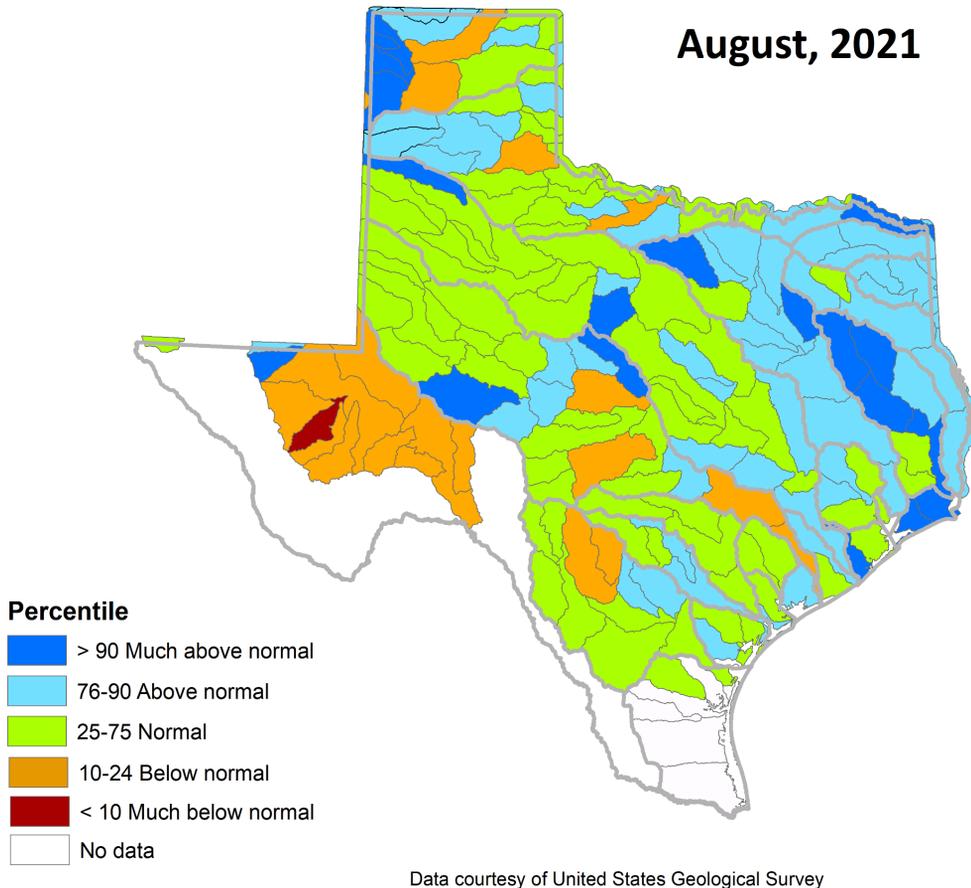


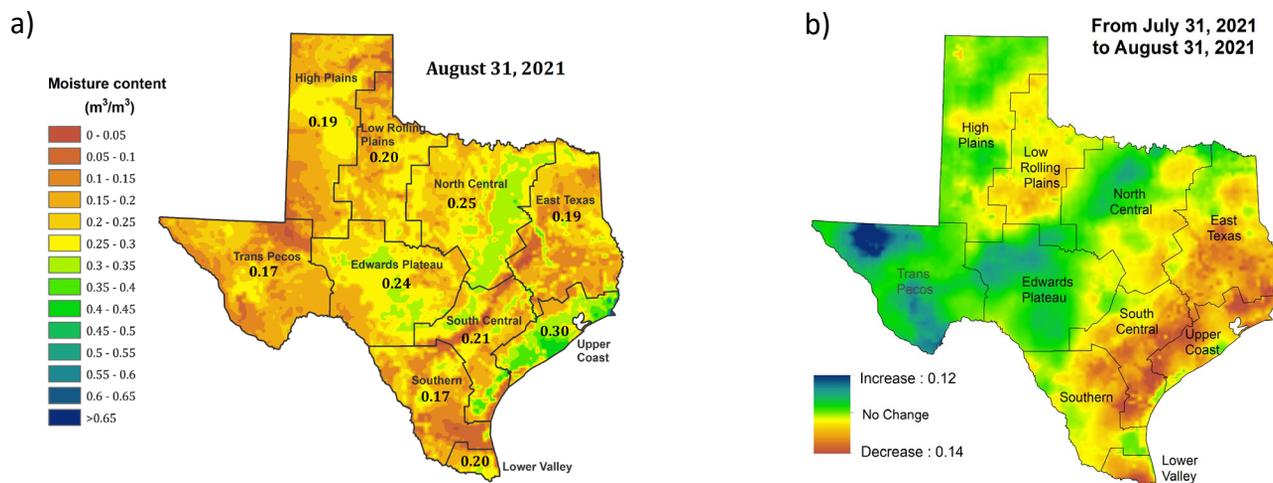
Figure 6: Runoff percentiles by the U.S. Geological Survey’s Hydrologic Unit Code

SOIL MOISTURE

Root zone soil moisture at the end of August 2021 [Figure 7(a)] was moderate [> 0.20 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in much of the state. 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, High Plains, Low Rolling Plains, Edwards Plateau, Southern, portions of North Central, East Texas, southern South Central and stretching across the climate division from the west to the northeast.

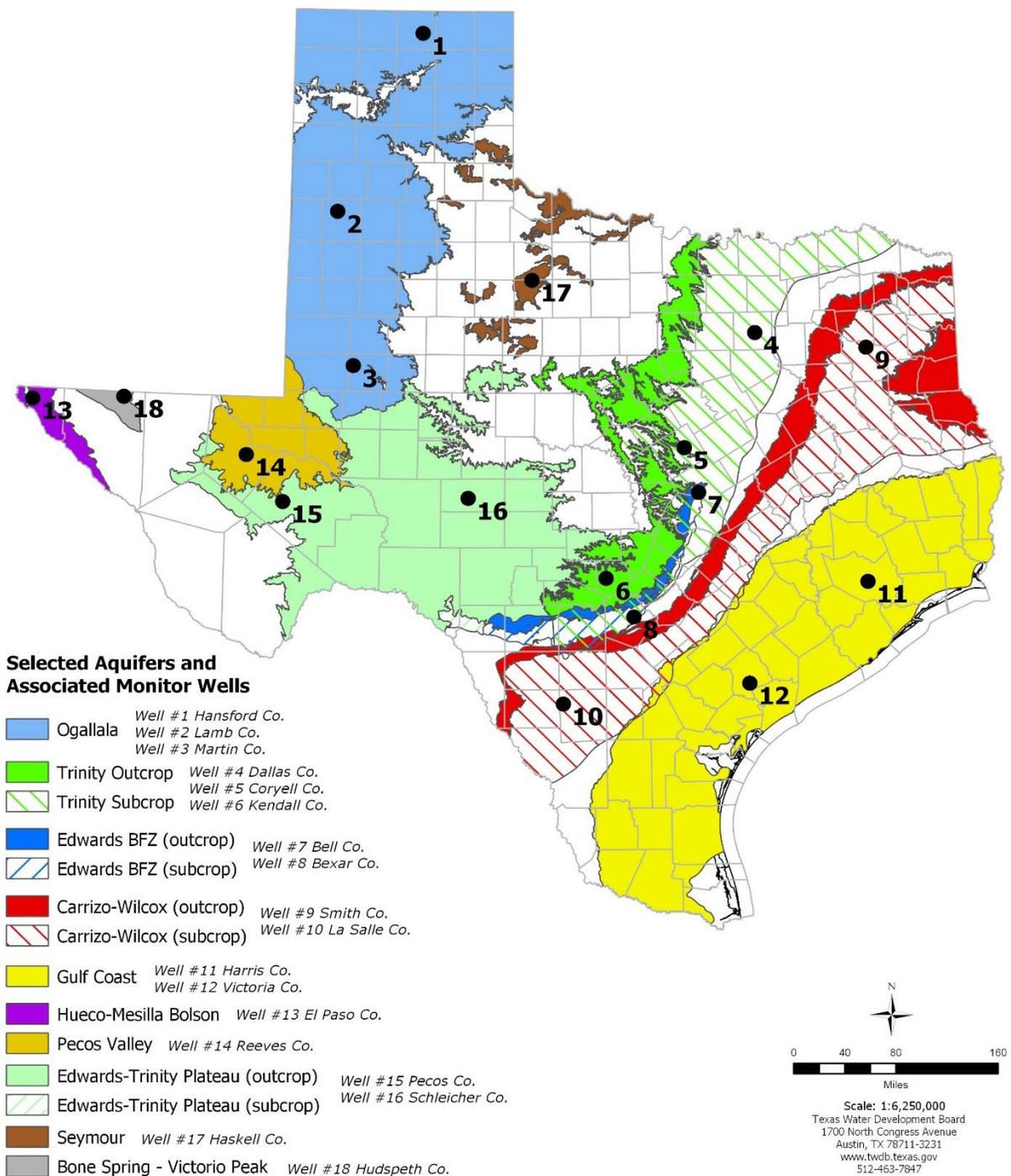
Soil moisture was high [> 0.3 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in a small area of the central High Plains, central Edwards Plateau, eastern North Central, portions of South Central, the Lower Valley, East Texas, and much of the Upper Coast climate divisions [Figure 7(a)].

Compared to conditions at the end of July 2021, soil moisture content increased [green to blue shading in Figure 7(b)] in much of the Trans Pecos, northern High Plains, portions of Low Rolling Plains, Edwards Plateau, northwestern and southeastern Southern, small portions of northwestern and southeastern South Central, eastern border of the Lower Valley, portions of North Central, northern East Texas, and portions of the southern border of the Upper Coast climate divisions. Soil moisture content decreased [yellow, orange, and brown shading in Figure 7(b)] in portions of the High Plains, much of the Low Rolling Plains, southern and eastern North Central, much of East Texas, Southern, South Central, Lower Valley, and the 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 August 2021 and (b) the difference in root zone soil moisture between end-July 2021 and end-August 2021



August 2021 GROUNDWATER LEVELS IN MONITORING WELLS

Water-level measurements were available for 15 key monitoring wells in the state. Recorders in 3 wells (#1, #17, and #18 on map) were temporarily offline and scheduled for repair. Water levels rose in 6 monitoring wells since the beginning of August, ranging from an increase of 0.05 feet in the Martin County Ogallala Aquifer well (#3 on map) to 4.88 feet in the Pecos County Edwards-Trinity Plateau Aquifer well (#15 on map). Water levels declined in 8 monitoring wells, ranging from a decline of -0.08 feet in the Lamb County Ogallala Aquifer well (#2 on map) to -7.96 feet in the Dallas County Trinity Aquifer well (#4 on map). Water levels remained the same for the Victoria County Gulf Coast Aquifer well (#12 on map). The J-17 well (#8 on map) in San Antonio recorded a water level of 70.70 feet below land surface or 660.3 feet above mean sea level. Water levels are 0.30 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	August	July	Month Change	Year Change	Historical Change	First Measured
(1) Hansford 0354301	NA	NA	NA	NA	-91.74	1951
(2) Lamb 1053602	152.18	152.10	-0.08	-1.07	-124.01	1951
(3) Martin 2739903	144.29	144.34	0.05	0.00	-39.40	1964
(4) Dallas 3319101	493.41	485.45	-7.96	-4.31	-271.41	1954
(5) Coryell 4035404	533.26	531.77	-1.49	3.01	-241.26	1955**
(6) Kendall 6802609	143.49	143.07	-0.42	24.21	-83.49	1975
(7) Bell 5804816	122.44	122.55	0.11	3.03	1.07	2008
(8) Bexar 6837203	70.70	64.40	-6.30	4.20	-24.06	1932
(9) Smith 3430907	438.25	437.02	-1.23	-0.90	-138.25	1977**
(10) La Salle 7738103	497.50	497.24	-0.26	16.01	-244.43	2003
(11) Harris 6514409	185.78	185.89	0.11	3.57	-50.28*	1947**
(12) Victoria 8017502	32.46	32.46	0.00	0.20	1.54	1958**
(13) El Paso 4913301	297.93	297.74	-0.19	-2.12	-66.03	1964**
(14) Reeves 4644501	158.82	159.22	0.40	4.93	-66.73	1952
(15) Pecos 5216802	215.30	220.18	4.88	10.07	31.58	1976
(16) Schleicher 5512134	275.76	277.48	1.72	21.69	26.14	2003
(17) Haskell 2135748	NA	NA	NA	NA	-1.08	2002
(18) Hudspeth 4807516	NA	NA	NA	NA	-50.79	1966

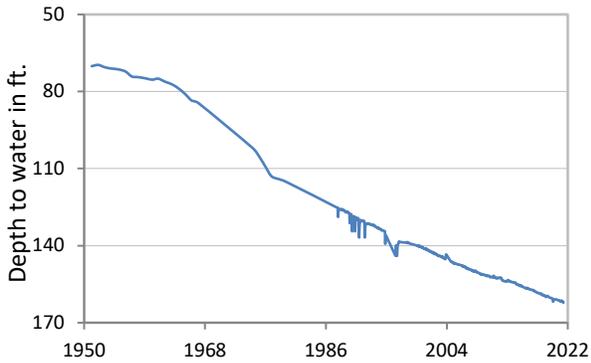
* Change since the original measurement taken on the date indicated in the last column. The historical changes shown for recorder wells #1, #17, and #18 are based off the most recent water level records from May, April, and June 2021, respectively.

** Measurement not shown on the hydrograph.

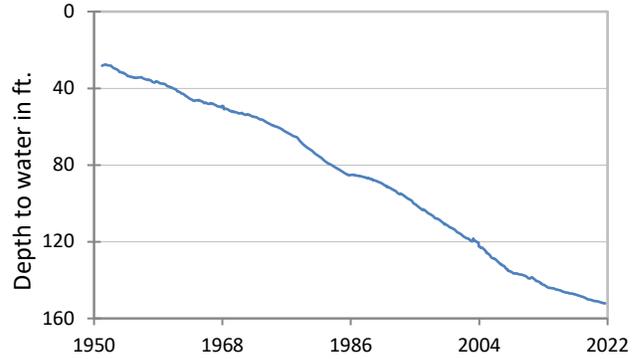
NA (not available)

August 2021 MONITORING WELL HYDROGRAPHS

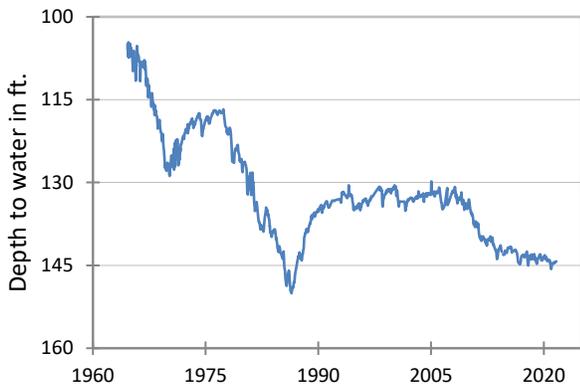
***(1) State Well #03-54-301**
Near Spearman, Hansford County
Ogallala Aquifer



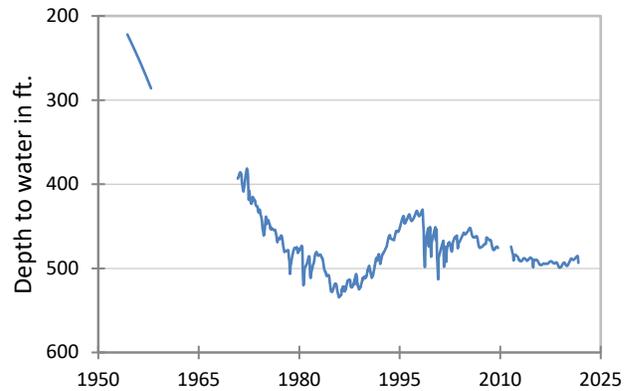
(2) State Well #10-53-602
Near Earth, Lamb County
Ogallala Aquifer



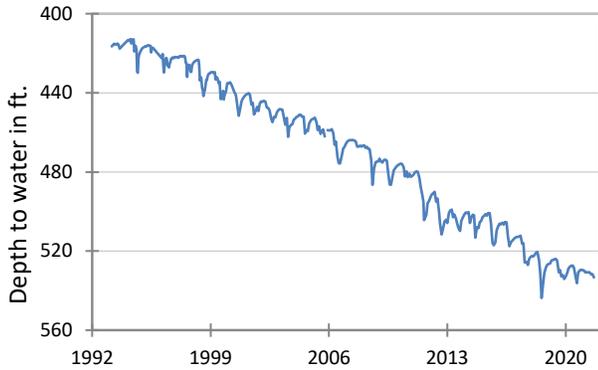
(3) State Well #27-39-903
Northwest Martin County
Ogallala Aquifer



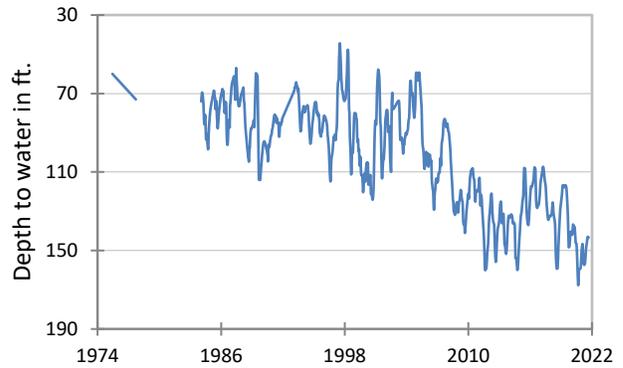
(4) State Well #33-19-101
Southeast Dallas, Dallas County
Twin Mountains Formation-Trinity Aquifer



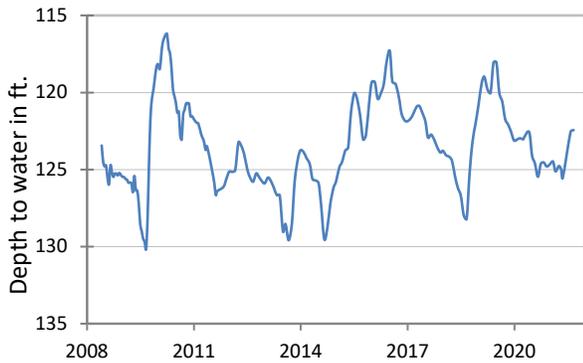
(5) State Well #40-35-404
Gatesville, Coryell County
Hosston Formation-Trinity Aquifer



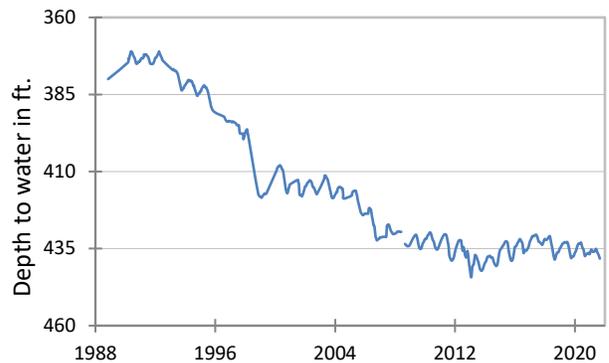
(6) State Well #68-02-609
Waring, Kendall County
Travis Peak Formation-Trinity Aquifer



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



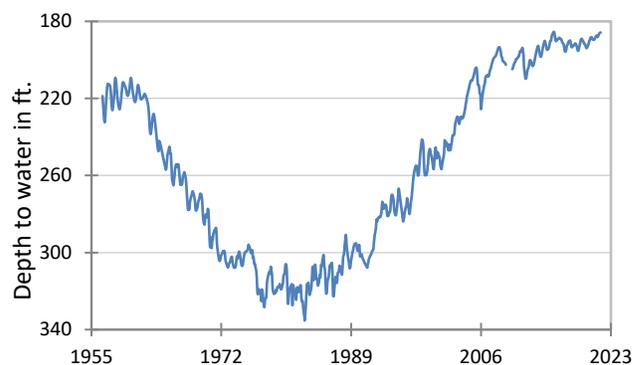
(9) State Well #34-30-907
Red Springs, Smith County
Carrizo-Wilcox Aquifer



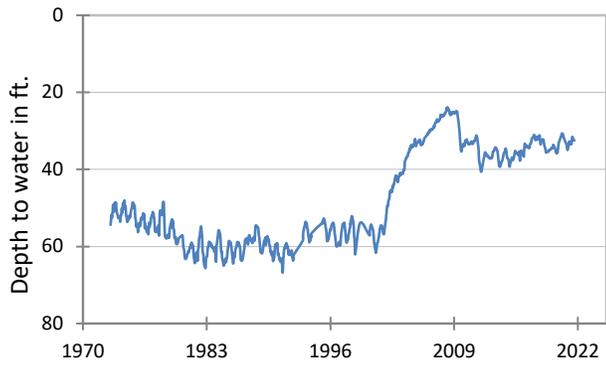
(10) State Well #77-38-103
Near Cotulla, La Salle County
Carrizo-Wilcox Aquifer



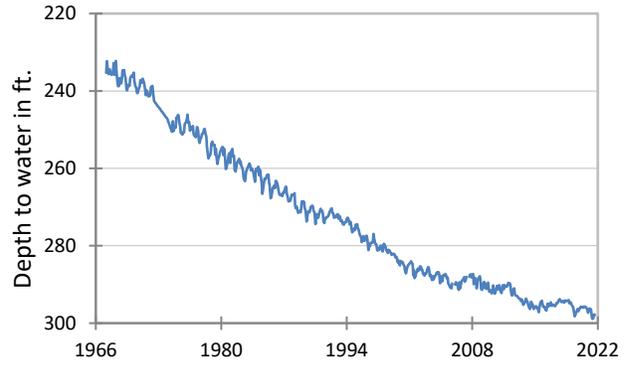
(11) State Well #65-14-409
North Houston, Harris County
Evangeline Formation-Gulf Coast Aquifer



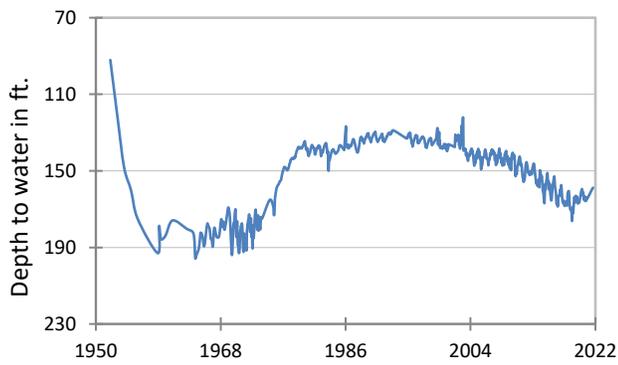
(12) State Well #80-17-502
Near Bloomington, Victoria County
Lissie Formation-Gulf Coast Aquifer



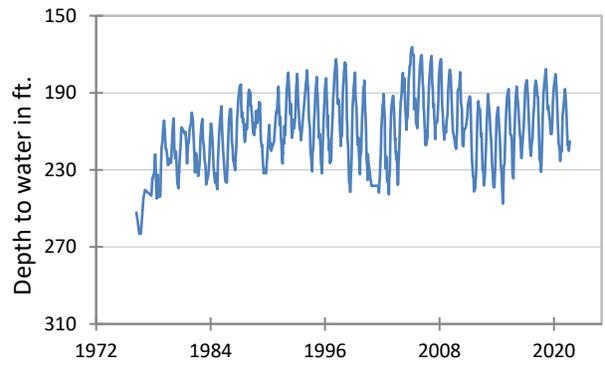
(13) State Well #49-13-301
El Paso, El Paso County
Hueco-Mesilla Bolsons Aquifer



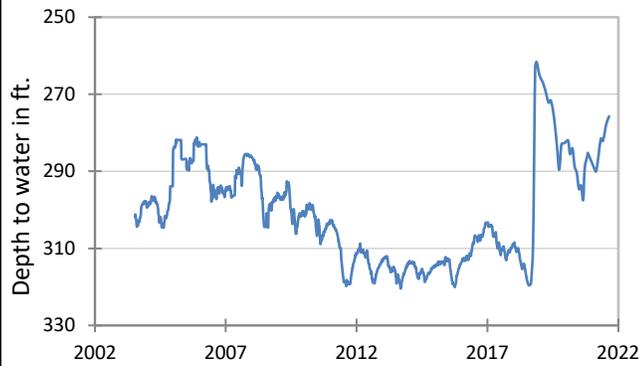
(14) State Well #46-44-501
Near Pecos, Reeves County
Pecos Valley Aquifer



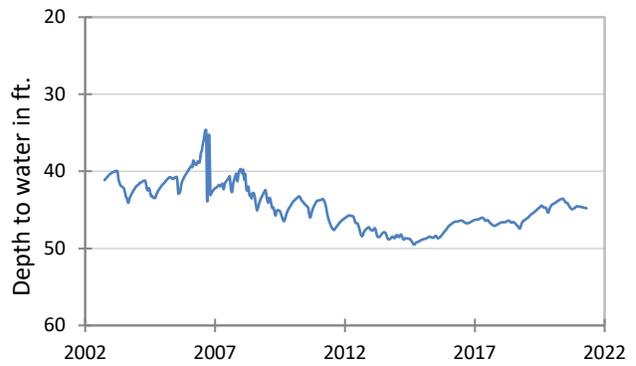
(15) State Well #52-16-802
Fort Stockton, Pecos County
Edwards-Trinity (Plateau) Aquifer



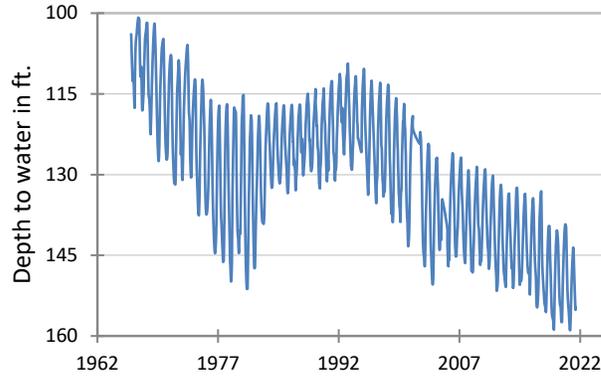
(16) State Well #55-12-134
Eldorado, Schleicher County
Edwards-Trinity (Plateau) Aquifer



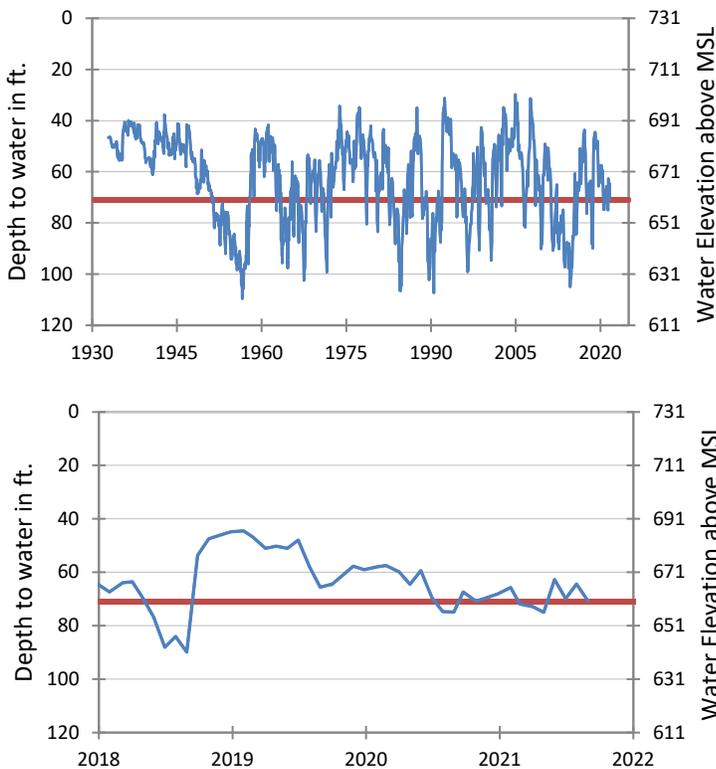
***(17) State Well #21-35-748**
Near O'Brien, Haskell County
Seymour Aquifer



***(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**

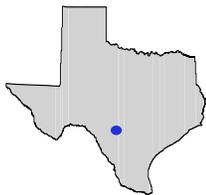


The late August water-level measurement in this Edwards (Balcones Fault Zone) Aquifer well, located at an elevation of 731 feet above mean sea level, was 70.70 feet below land surface, or 660.30 feet above mean sea level. This was 6.30 feet below last month's measurement, 4.20 feet above last year's measurement and 24.06 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 August 2021, Stage 1 drought restrictions were not in effect because the aquifer remained 0.30 feet above the Stage 1 critical management level.

*Recorder wells #1, #17, and #18 were temporarily offline in August 2021 and did not record data.

HYDROGRAPH OF THE MONTH

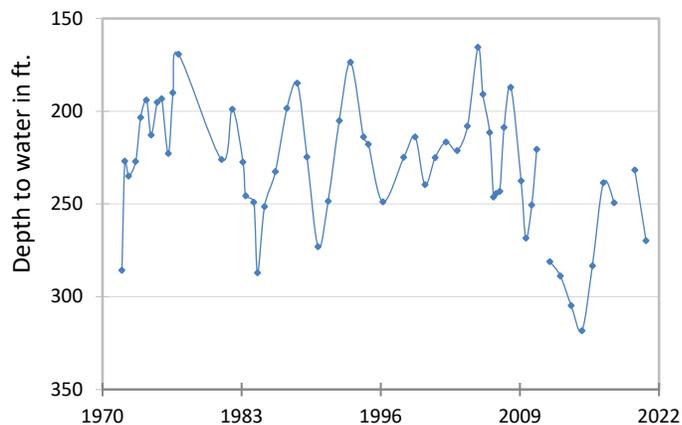


Each month this space features a new hydrograph (marked with the ● symbol on the map) depicting different aquifers and their conditions in Texas.

The Edwards (Balcones Fault Zone) Aquifer is a major aquifer in the south-central part of Texas. It consists primarily of partially dissolved limestone that creates a highly permeable aquifer. Aquifer thickness ranges from 200 to 600 feet, and freshwater saturated thickness averages 560 feet in the southern part of the aquifer. The groundwater, although hard, is generally fresh and contains less than 500 milligrams per liter of total dissolved solids. Water from the aquifer is primarily used for municipal, irrigation, and recreational purposes. The majority of San Antonio's water supply comes from the Edwards (Balcones Fault Zone) Aquifer. Several well-known springs are fed from the aquifer including Comal Springs in Comal County, which is the largest spring in the state, and San Marcos Springs in Hays County, which is the second largest. Because of the aquifer's highly permeable nature, water levels and spring flows respond quickly to rainfall, drought, and pumping.

Edwards (Balcones Fault Zone)

Well #69-44-301, 1317 feet deep
unused, Uvalde County



The initial measurement of 285.83 feet below land surface was observed by the USGS in October of 1971. Since then, the TWDB and its cooperators have taken near-annual water-level measurements. The period of record reveals drastic water-level fluctuations that are likely a result of the aquifer's high permeability. The largest annual water-level decline was 55.46 feet between July 2005 and 2006, while the largest water-level rise was 58.83 feet between October 1971 and February 1972. The lowest water-level measurements occurred between 2011 and 2014 during the drought that began in 2011, followed by a recovery of roughly 80 feet between 2014 and 2016.



Far away (left), and close-up (right) images of well #69-44-301.