Texas Water Conditions Report

September 2023

Water News:

A second Forecast Informed Reservoir Operations (FIRO) workshop was held at the University of Texas, Arlington, on September 21-22. The participants had the opportunity to learn about the latest developments in FIRO, review outcomes from the Texas FIRO Pilot study, gain an understanding of pressing forecast needs by reservoir operators, and identify activities that can facilitate the adoption of forecast informed reservoir management. Presentations can be viewed here https://hydromet.uta.edu/second-joint-workshop-on-texas-forecast-informed-reservoir-operations-firo/

RAINFALL

In September, areas of the High Plains, northern Low Rolling Plains, much of the Trans Pecos, southern Edwards Plateau, Southern, South Central, Lower Valley, areas of North Central, and East Texas climate divisions received below average amounts of rainfall [yellow, orange, and red shading, Figure 1(a)]. Above average rainfall [light and dark blue shading, Figure 1(a)] was seen in northern, central, and southeastern High Plains, Low Rolling Plains, Edwards Plateau, central Southern, a small area in central Lower Valley, North Central, northeastern and central South Central, East Texas, and the Upper Coast climate divisions.

Compared to historical data from 1991–2020, much of the state received 0–75 percent of normal rainfall [yellow, orange shading, Figure 1(b)]. 125–200 percent of normal rainfall [green shading, Figure 1(b)] was received in central and northern High Plains, central and southern Low Rolling Plains, central and northern Edwards Plateau, southern and western North Central, central and northern East Texas, small areas in northwestern and southeastern Trans Pecos, central Southern, northeastern South Central, and scattered areas of the Upper Coast climate divisions. 200–400 percent of normal rainfall [light to dark blue shading, Figure 1(b)] was received in central and northeastern High Plains, southern Low Rolling Plains, central and northern Edwards Plateau, western North Central, and central East Texas climate divisions.

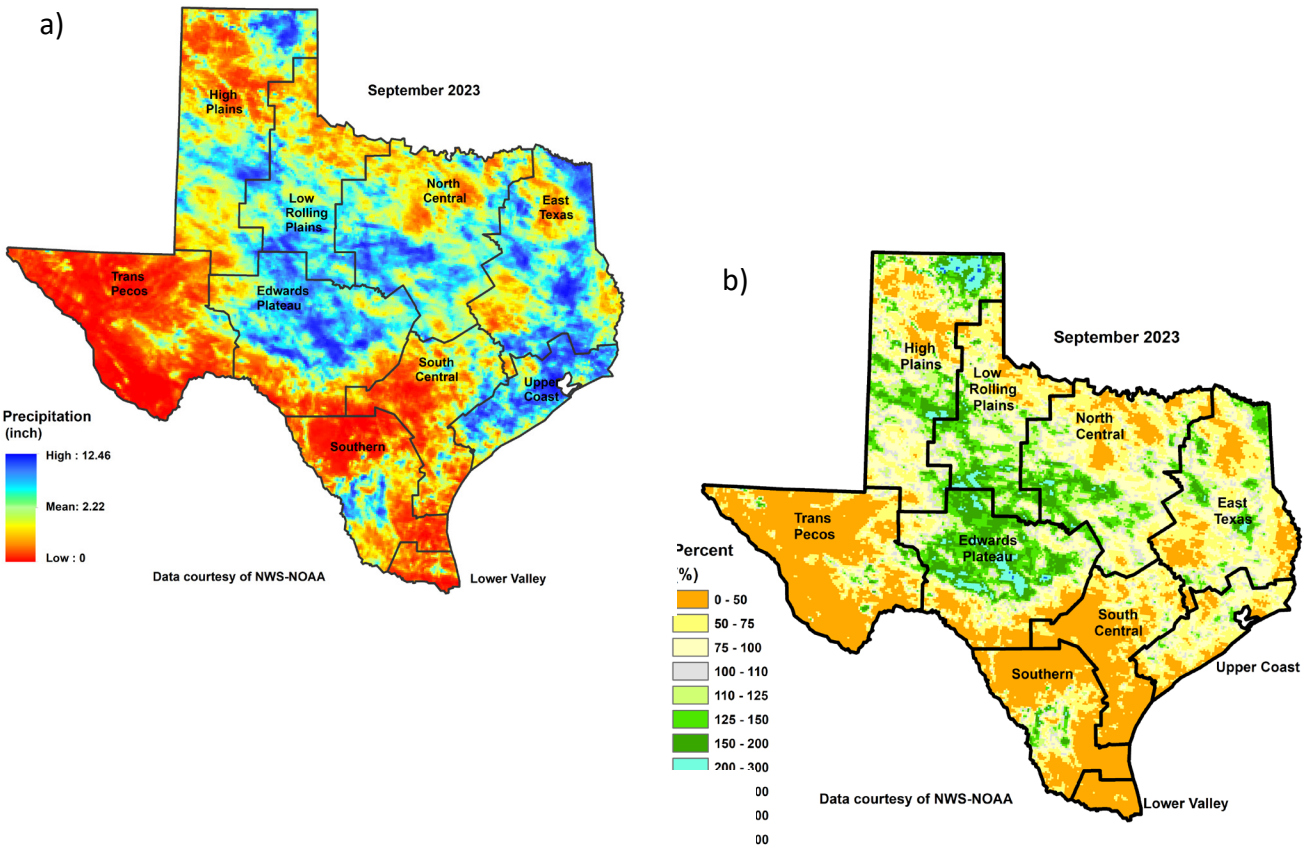

Figure 1: (a) Monthly accumulated rainfall, and (b) Percent of normal rainfall

DROUGHT

At the end of September, 93.12% of the state was in the D0 (abnormally dry) through D4 (exceptional drought) categories (**Figure 2**). That is a decrease of 5.33 % from the end of August.

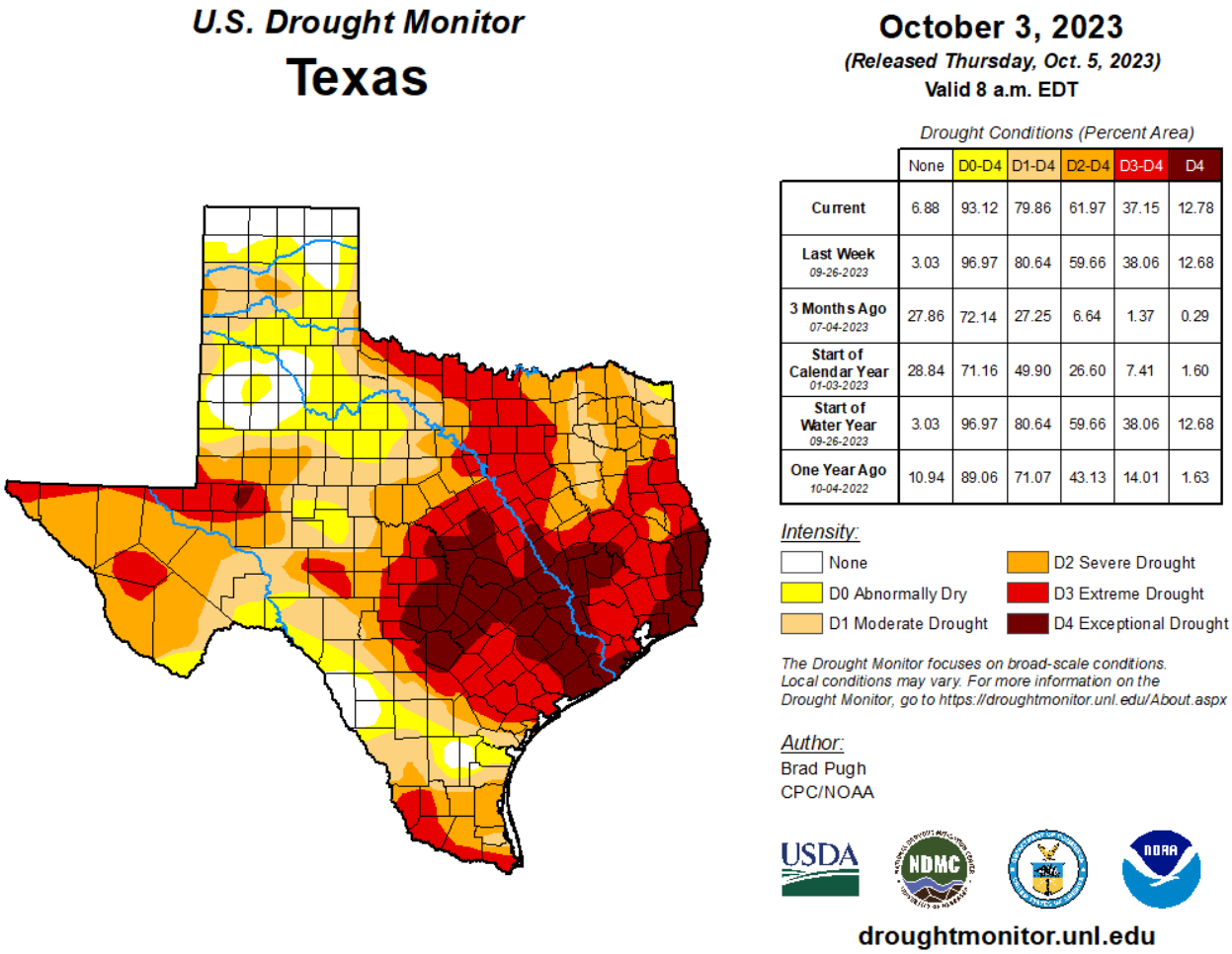

Figure 2. The percentage of drought in Texas according to the U.S. Drought Monitor map as of October 3, 2023.

RESERVOIR STORAGE

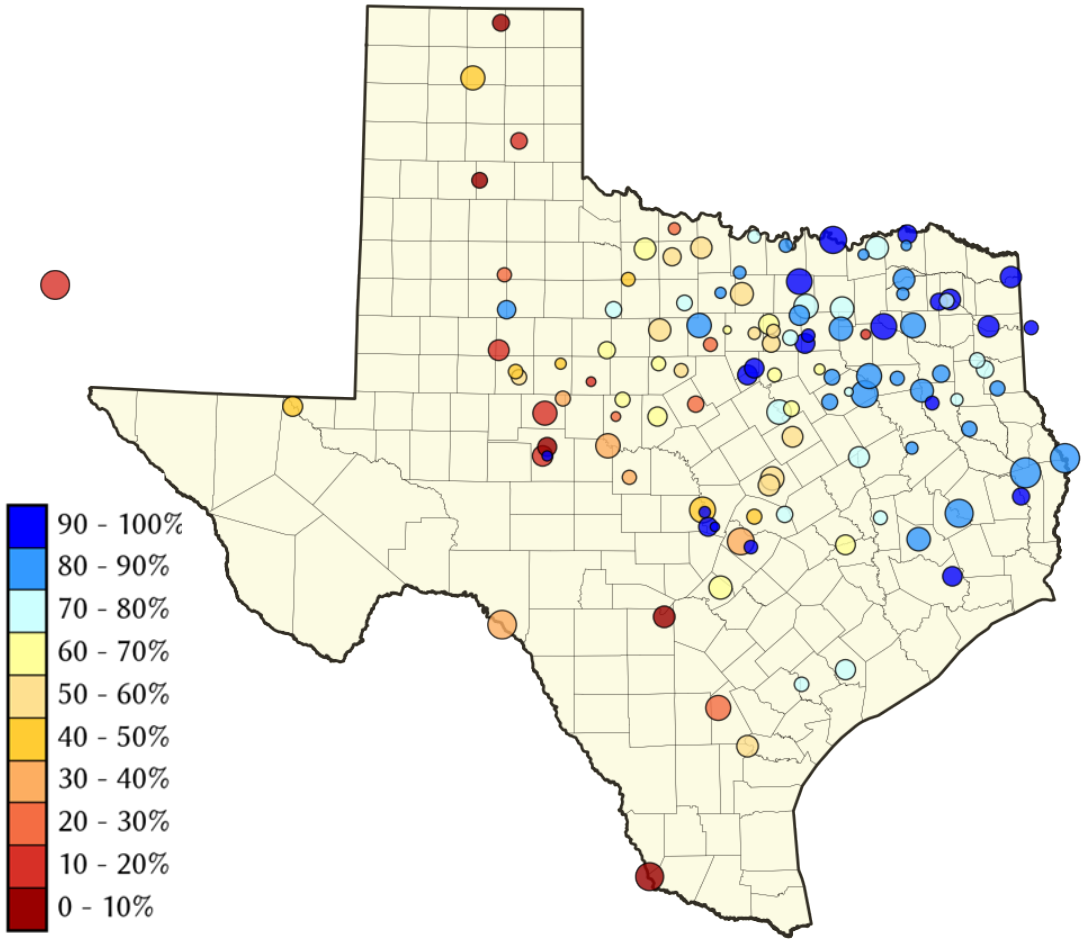

Figure 3. Reservoir conservation storage at end-September expressed as percent full (%)

Out of 119 reservoirs in the state, only 2 reservoirs held 100 percent conservation storage capacity (Caddo and Mountain Creek). Twenty-six reservoirs were at or above 90 percent full in September. Fifteen reservoirs remained below 30 percent full with one additional reservoir falling below 30 percent full this month: Abilene (20.2 percent full), Choke Canyon (26.6 percent full), E.V. Spence (16.4 percent full), Falcon (9.1 percent full), Greenbelt (11.3 percent full), Hords Creek (23.9 percent full), J.B. Thomas (18.6 percent full), Mackenzie (9.8 percent full), Medina Lake (4.0 percent full), New Terrell City (17.9 percent full), North Fork Buffalo Creek Reservoir (29.6 percent full), O.C. Fisher (2.2 percent full), Palo Duro Reservoir (7.0 percent full), Proctor (25.8 percent full), Twin Buttes (17.3 percent full), and the White River Lake (21.6 percent full). Elephant Butte Reservoir (New Mexico) was 17.5 percent full (Figure 3).

Reservoir conservation storage by climate division was at or above normal [storage ≥70 percent full, Figure 4(a)] for East Texas (84.4 percent full), North Central (79.1 percent full), and the Upper Coast (99.0 percent full) climate divisions. Conservation storage was moderately low (Figure 4(a)) for the Low Rolling Plains (50.5 percent full), and South Central (41.0 percent full) climate divisions. The High Plains (38.4 percent full), Edwards Plateau (33.8 percent full), and the Trans Pecos (21.7 percent full) climate divisions had severely low conservation storage (Figure 4(a)), and the Southern climate division (18.4 percent full) had extremely low conservation storage (Figure 4(a)).

Combined conservation storage by river basin or sub-basin was exceptionally low [<10 percent full, red shading, Figure 4(b)] in the San Antonio river basin and severely low [20–40 percent full, brown shading, Figure 4(b)] in the Upper/Mid Rio Grande, Lower Rio Grande, Nueces, and Upper Colorado river basins. The Canadian, Upper Red, and Lower Colorado river basins had moderately low conservation storage [40–60 percent full, orange shading, Figure 4(b)]. The Lower Brazos, Lavaca, and Guadalupe river basins had abnormally low conservation storage [60-70 percent full, yellow shading, Figure 4(b)]. Normal to high conservation storage [>70 percent full, blue shading, Figure 4(b)] was observed in the Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper Brazos, Neches, and San Jacinto river basins.

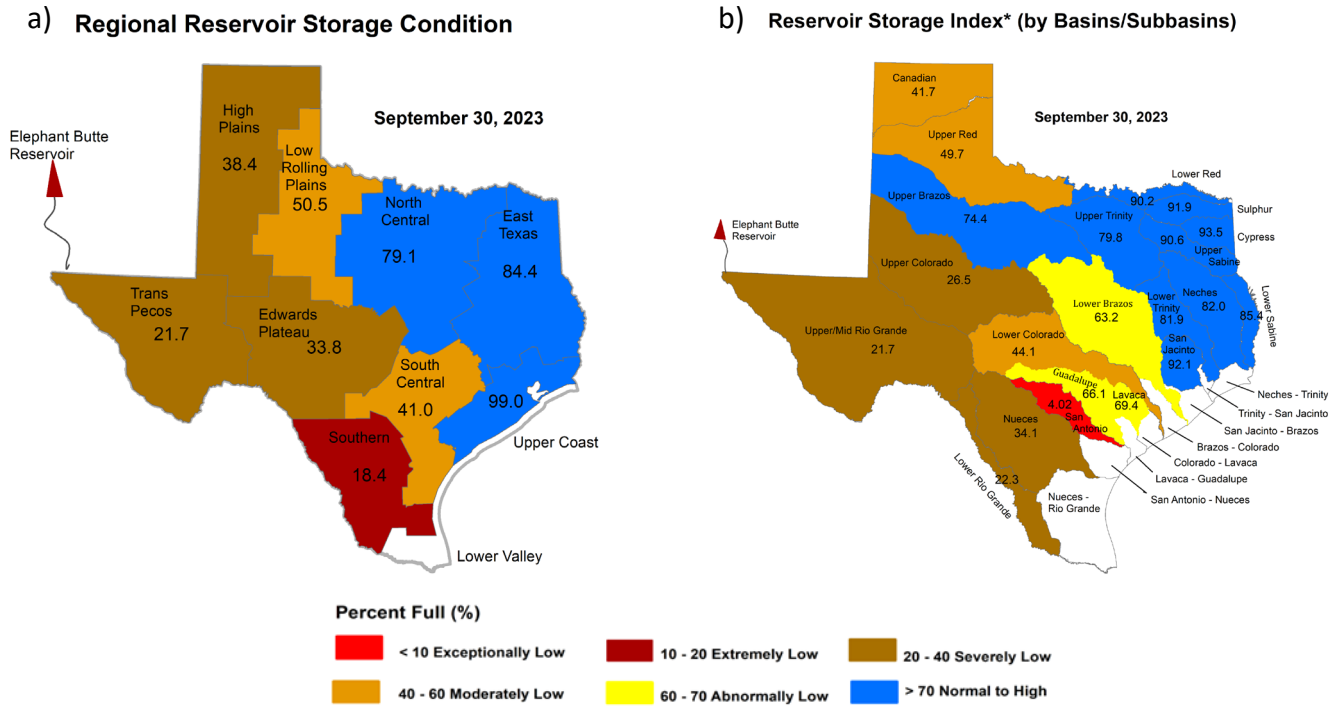

Figure 4: (a) Reservoir Storage Index* by climate division, and (b) Reservoir Storage Index* by basin/sub-basin.

*Reservoir Storage Index is defined as the percent full of conservation storage capacity.
Percent full is calculated as the combined conservation storage of all reservoirs in a climate region or a basin/subbasin, excluding dead pool storage.

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS							
Name of lake or reservoir	Storage capacity	Storage at end-September 2023		Storage change from end-Aug 2023		Storage change from end-Sep 2022	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Abilene, Lake	7,900	1,593	20.2	-42	0.0	-1,545	-19.6
Alan Henry Reservoir	96,207	84,794	88.1	373	0.4	11,412	11.9
*Amistad Reservoir (Texas & Mexico)	3,275,532	1,024,700	31.3	-34,714	-1.1	-263,180	-8.0
*Amistad Reservoir (Texas)	1,840,849	618,672	33.6	-46,955	-2.6	-188,162	-10.2
Amon G Carter, Lake	19,266	15,848	82.3	-885	-4.6	-1,171	-6.1
Aquilla Lake	43,243	28,737	66.5	-4,540	-10.5	344	0.8
Arlington, Lake	40,157	31,345	78.1	3,380	8.4	-2,945	-7.3
Arrowhead, Lake	230,359	128,136	55.6	-5,818	-2.5	-31,999	-13.9
Athens, Lake	29,503	26,312	89.2	-536	-1.8	-536	-1.8
*Austin, Lake	23,972	23,003	96.0	-16	0.0	46	0.2
B A Steinhagen Lake	69,186	66,958	96.8	-1,719	-2.5	1,792	2.6
Bardwell Lake	43,856	38,908	88.7	-1,185	-2.7	2,284	5.2
Belton Lake	432,631	241,152	55.7	-11,063	-2.6	-71,383	-16.5
Benbrook Lake	85,648	44,433	51.9	-12,042	-14.1	-16,123	-18.8
Bob Sandlin, Lake	192,417	179,304	93.2	-3,888	-2.0	601	0.3
Bois d'Arc Lake	367,609	268,649	73.1	-11,733	-3.2	134,200	36.5
Bonham, Lake	11,027	9,004	81.7	-664	-6.0	371	3.4
Brady Creek Reservoir	28,808	10,702	37.1	-17	0.0	-1,975	-6.9
Bridgeport, Lake	372,183	219,222	58.9	-14,886	-4.0	-66,222	-17.8
*Brownwood, Lake	130,868	81,855	62.5	-2,263	-1.7	-2,731	-2.1
Buchanan, Lake	822,207	371,217	45.1	-24,526	-3.0	-162,363	-19.7
Caddo, Lake	29,898	29,898	100.0	0	0.0	0	0.0
Canyon Lake	378,781	247,378	65.3	-10,598	-2.8	-74,400	-19.6
Cedar Creek Reservoir in Trinity	644,686	531,616	82.5	-18,910	-2.9	11,922	1.8
Champion Creek Reservoir	41,580	23,391	56.3	1,610	3.9	-868	-2.1
Cherokee, Lake	40,094	31,689	79.0	-2,124	-5.3	-2,476	-6.2
Choke Canyon Reservoir	662,820	176,179	26.6	-8,910	-1.3	-48,487	-7.3
*Cisco, Lake	29,003	18,379	63.4	-290	0.0	-2,933	-10.1
Coleman, Lake	38,075	24,536	64.4	-565	-1.5	-4,397	-11.5
Colorado City, Lake	31,040	23,718	76.4	-1,846	-5.9	-3,805	-12.3
*Coleto Creek Reservoir	30,758	15,248	49.6	-153	0.0	-2,130	-6.9
Conroe, Lake	417,577	375,866	90.0	-6,589	-1.6	-3,004	0.0
Corpus Christi, Lake	256,062	138,003	53.9	-9,513	-3.7	-81,419	-31.8
Crook, Lake	9,195	8,010	87.1	-223	-2.4	621	6.8
Cypress Springs, Lake	66,756	62,521	93.7	-1,260	-1.9	3,351	5.0
E. V. Spence Reservoir	517,272	84,744	16.4	1,742	0.3	-14,435	-2.8
Eagle Mountain Lake	179,880	113,717	63.2	-7,082	-3.9	-27,314	-15.2
Elephant Butte Reservoir (Texas)	852,491	149,344	17.5	-16,724	-2.0	102,178	12.0
Elephant Butte Reservoir (Total Storage)	1,960,900	345,704	17.6	-38,712	-2.0	236,524	12.1
*Falcon Reservoir (Texas & Mexico)	2,646,817	368,441	13.9	-36,505	-1.4	-131,735	-5.0
*Falcon Reservoir (Texas)	1,551,007	140,717	9.1	-19,904	-1.3	-108,530	-7.0
Fork Reservoir, Lake	605,061	542,394	89.6	-16,285	-2.7	91,762	15.2
Fort Phantom Hill, Lake	70,030	48,791	69.7	-1,010	-1.4	1,569	2.2
Georgetown, Lake	38,005	17,337	45.6	-1,468	-3.9	-2,774	-7.3
Gibbons Creek Reservoir	25,721	18,743	72.9	-1,024	-4.0	274	1.1
Graham, Lake	45,288	32,626	72.0	-1,217	-2.7	-4,287	-9.5
Granbury, Lake	132,949	120,189	90.4	-4,069	-3.1	4,998	3.8

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	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Continued							
Granger Lake	51,822	39,055	75.4	-3,021	-5.8	-4,856	-9.4
Grapevine Lake	163,064	134,321	82.4	-8,532	-5.2	-25,217	-15.5
Greenbelt Lake	59,968	6,785	11.3	-256	0.0	-855	-1.4
*Halbert, Lake	6,033	4,439	73.6	-139	-2.3	-93	-1.5
Hords Creek Lake	8,109	1,934	23.9	-77	0.0	-642	-7.9
Houston County Lake	17,113	14,353	83.9	-409	-2.4	-108	0.0
Houston, Lake	132,318	131,062	99.1	4,185	3.2	2,383	1.8
Hubbard Creek Reservoir	313,298	168,557	53.8	-5,280	-1.7	-53,397	-17.0
Hubert H Moss Lake	24,058	21,424	89.1	-502	-2.1	-82	0.0
Inks, Lake	13,729	13,068	95.2	-71	0.0	63	0.5
J. B. Thomas, Lake	199,931	37,098	18.6	-1,025	0.0	-16,897	-8.5
Jacksonville, Lake	25,670	23,398	91.1	-354	-1.4	11	0.0
Jim Chapman Lake (Cooper)	260,332	225,446	86.6	-17,861	-6.9	48,437	18.6
Joe Pool Lake	149,629	136,053	90.9	-3,538	-2.4	-3,852	-2.6
Kemp, Lake	245,307	151,080	61.6	-11,475	-4.7	16,037	6.5
Kickapoo, Lake	86,345	45,424	52.6	-1,892	-2.2	-7,169	-8.3
Lavon Lake	409,757	307,549	75.1	-25,998	-6.3	8,081	2.0
Leon, Lake	27,762	14,137	50.9	-547	-2.0	-3,395	-12.2
Lewisville Lake	563,228	439,912	78.1	-30,971	-5.5	-12,426	-2.2
Limestone, Lake	203,780	160,308	78.7	-13,603	-6.7	9,696	4.8
*Livingston, Lake	1,603,504	1,313,451	81.9	-73,008	-4.6	-249,359	-15.6
*Lost Creek Reservoir	11,950	10,735	89.8	-184	-1.5	67	0.6
Lyndon B Johnson, Lake	112,778	111,622	99.0	769	0.7	962	0.9
Mackenzie Reservoir	46,450	4,552	9.8	-120	0.0	1,563	3.4
Marble Falls, Lake	7,597	7,179	94.5	-48	0.0	18	0.2
Martin, Lake	75,726	59,415	78.5	-3,020	-4.0	-1,521	-2.0
Medina Lake	254,823	10,249	4.0	-903	0.0	-8,886	-3.5
Meredith, Lake	500,000	229,991	46.0	-3,589	0.0	69,870	14.0
Millers Creek Reservoir	26,768	12,343	46.1	-600	-2.2	-5,352	-20.0
*Mineral Wells, Lake	5,273	3,330	63.2	-203	-3.8	-1,000	-19.0
Monticello, Lake	34,740	26,996	77.7	-757	-2.2	82	0.2
Mountain Creek, Lake	22,850	22,850	100.0	788	3.4	0	0.0
Murvaul, Lake	38,285	32,717	85.5	65	0.2	-4,441	-11.6
Nacogdoches, Lake	39,522	33,254	84.1	-873	-2.2	817	2.1
Nasworthy	9,615	8,942	93	197	2	611	6
Navarro Mills Lake	49,827	40,093	80.5	-2,581	-5.2	3,747	7.5
New Terrell City Lake	8,583	1,540	17.9	-97	-1.1	-5,290	-61.6
Nocona, Lake (Farmers Crk)	21,444	15,097	70.4	-644	-3.0	-1,829	-8.5
North Fork Buffalo Creek Reservoir	15,400	4,553	29.6	-436	-2.8	-2,916	-18.9
O' the Pines, Lake	268,566	255,321	95.1	-13,245	-4.9	24,588	9.2
O. C. Fisher Lake	115,742	2,539	2.2	-141	0.0	-1,419	-1.2
*O. H. Ivie Reservoir	554,340	169,118	30.5	-5,335	0.0	-61,553	-11.1
Oak Creek Reservoir	39,210	14,116	36.0	-444	-1.1	-5,930	-15.1

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	(acre-feet)	(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
Continued							
Palestine, Lake	367,303	317,777	86.5	-8,729	-2.4	1,687	0.5
Palo Duro Reservoir	61,066	4,251	7.0	-30	0.0	4,016	6.6
Palo Pinto, Lake	26,766	8,066	30.1	-1,311	-4.9	-8,630	-32.2
Pat Cleburne, Lake	26,008	17,301	66.5	-1,026	-3.9	3,289	12.6
*Pat Mayse Lake	113,683	107,382	94.5	-3,552	-3.1	6,796	6.0
Possum Kingdom Lake	538,139	482,035	89.6	-20,513	-3.8	12,747	2.4
Proctor Lake	54,762	14,143	25.8	-1,218	-2.2	-11,386	-20.8
Ray Hubbard, Lake	439,559	353,645	80.5	-22,007	-5.0	-32,382	-7.4
Ray Roberts, Lake	788,167	729,714	92.6	-16,626	-2.1	-2,169	0.0
Red Bluff Reservoir	151,110	69,283	45.8	-3,090	-2.0	-29,937	-19.8
Richland-Chambers Reservoir	1,087,839	979,153	90.0	-20,940	-1.9	90,010	8.3
Sam Rayburn Reservoir	2,857,077	2,310,782	80.9	-88,834	-3.1	2,989	0.1
Somerville Lake	150,293	97,483	64.9	-12,557	-8.4	903	0.6
Squaw Creek, Lake	151,250	150,492	99.5	535	0.4	-758	0.0
Stamford, Lake	51,570	38,381	74.4	-1,583	-3.1	4,275	8.3
Stillhouse Hollow Lake	229,796	132,561	57.7	-4,147	-1.8	-41,251	-18.0
Striker, Lake	16,934	13,359	78.9	-562	-3.3	-1,147	-6.8
Sweetwater, Lake	12,267	6,000	48.9	-153	-1.2	-1,618	-13.2
*Sulphur Springs, Lake	17,747	15,999	90.2	-836	-4.7	4,050	22.8
Tawakoni, Lake	871,685	812,765	93.2	-16,734	-1.9	71,727	8.2
Texana, Lake	158,975	110,329	69.4	-8,709	-5.0	-6,007	-3.8
Texoma, Lake (Texas & Oklahoma)	2,487,601	2,246,121	90.3	-139,050	-5.6	-78,812	-3.2
Texoma, Lake (Texas)	1,243,801	1,123,060	90.3	-69,525	-5.6	-39,406	-3.2
Toledo Bend Reservoir (Texas & Louisiana)	4,472,900	3,825,744	85.5	-120,434	-2.7	67,456	1.5
Toledo Bend Reservoir (Texas)	2,236,450	1,910,822	85.4	-60,217	-2.7	33,728	1.5
Travis, Lake	1,098,044	393,281	35.8	-30,859	-2.8	-142,125	-12.9
Twin Buttes Reservoir	182,454	31,512	17.3	-2,154	-1.2	-24,193	-13.3
Tyler, Lake	72,073	60,930	84.5	-2,524	-3.5	548	0.8
Waco, Lake	189,418	107,617	56.8	-5,560	-2.9	-7,278	-3.8
Waxahachie, Lake	11,060	6,961	62.9	-751	-6.8	-1,361	-12.3
Weatherford, Lake	17,812	9,440	53.0	-34	0.0	-1,205	-6.8
White River Lake	29,880	6,455	21.6	691	2.3	1,841	6.2
Whitney, Lake	564,808	402,795	71.3	-12,214	-2.2	-17,908	-3.2
Worth, Lake	24,419	14,257	58.4	-356	-1.5	-2,064	-8.5
Wright Patman Lake	231,496	226,577	97.9	-4,919	-2.1	-4,919	-2.1
STATEWIDE TOTAL							
STATEWIDE TOTAL	**32,311,292**	**20,875,621**	**64.6**	**-185,507**	**0**	**-260,702**	**0**

*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 September 2023, root zone soil moisture was low [yellow, orange, Figure 5(a)] across the state. Areas of more severe dryness [brown shading, Figure 5(a)] were in the northern and southern High Plains, southern and northeastern Trans Pecos, northern and central Low Rolling Plains, Southern, South Central, western North Central, northern Lower Valley, and East Texas climate divisions. Average soil moisture [green shading, Figure 5(a)] was seen in central Southern, southern South Central, and central Edwards Plateau climate divisions.

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

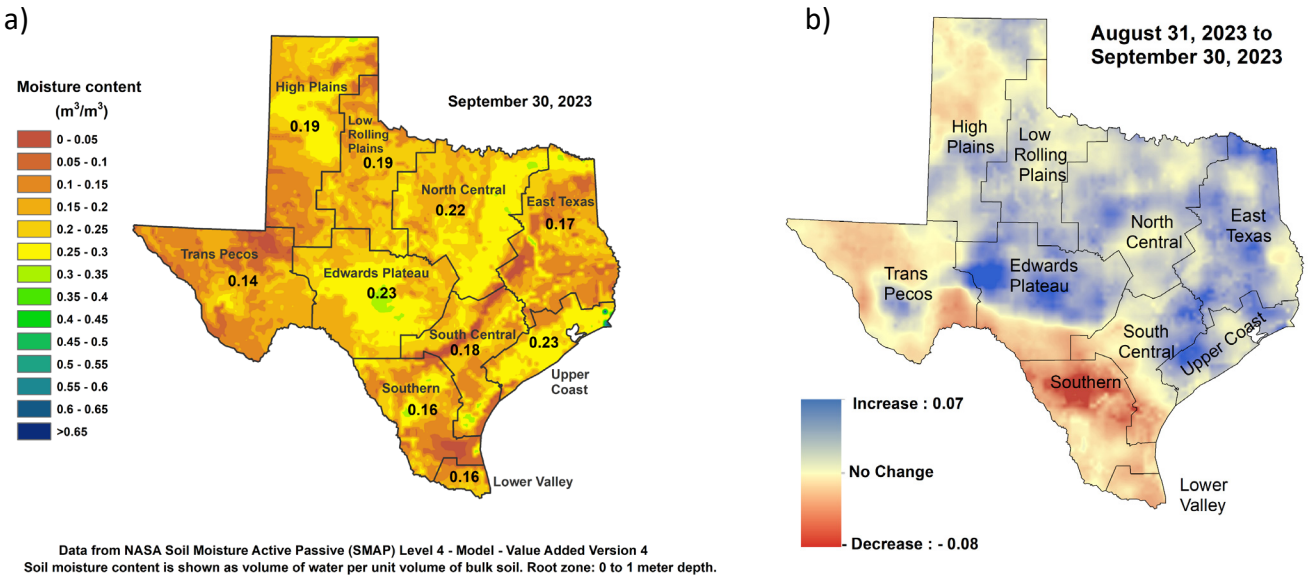


Figure 5: (a) Root zone soil moisture conditions in September 2023 and (b) the difference in root zone soil moisture between end-August 2023 and end-September 2023.

STREAMFLOW CONDITIONS

Normal streamflow (25–75th percentile, green shading, Figure 6) was recorded in parts of the Panhandle, Northern, Eastern, and Southern regions of Texas this month. Above normal streamflow (76–90th percentile, light blue shading, Figure 6) was seen in the Canadian (Lower Beaver, Middle Canadian-Spring watersheds), Upper Brazos, Upper Trinity (Denton watershed), and Upper Sabine (Lake Fork watershed) river basins. Much above normal streamflow (>90th percentile, dark blue shading, Figure 6) was seen in the Upper Brazos (Salt Fork Brazos watershed) river basin.

Below normal streamflow (10–24th percentile, orange shading, Figure 6) was recorded in the Upper Red, Sulphur, Cypress, Upper and Lower Brazos, Upper and Lower Trinity, Middle and Lower Colorado, Brazos-Colorado (East Matagorda Bay watershed), Lower Pecos-Red Bluff Reservoir watershed, Nueces, Nueces-Rio Grande, San Antonio (Cibolo and Lower San Antonio watersheds), San Antonio-Nueces (Aransas watershed), and San Jacinto river basins. Much below normal stream flow (< 10th percentile, dark red shading, Figure 6) was seen in the Upper and Lower Red, Pecos, northeastern portions of the Nueces, Nueces-Rio Grande (San Fernando and South Corpus Christi Bay watersheds), San Antonio-Nueces (Mission and Aransas Bay watersheds), Upper San Antonio (Medina watershed), Guadalupe, Lavaca, Colorado-Lavaca, Middle Colorado (Middle Colorado-Elm watershed) and Lower Colorado, Lavaca-Guadalupe, Lower Brazos, San Jacinto-Brazos (West Galveston Bay), Neches (Upper Angelina, Village, and Pine Island Bayou watersheds), and Lower Sabine river basins.

Record lows (bright red shading, Figure 6) were recorded in the Upper Red (Lower Prairie Dog Fork Red and Blue-China water sheds), and Brazos-Colorado (San Bernard watershed) river basins.

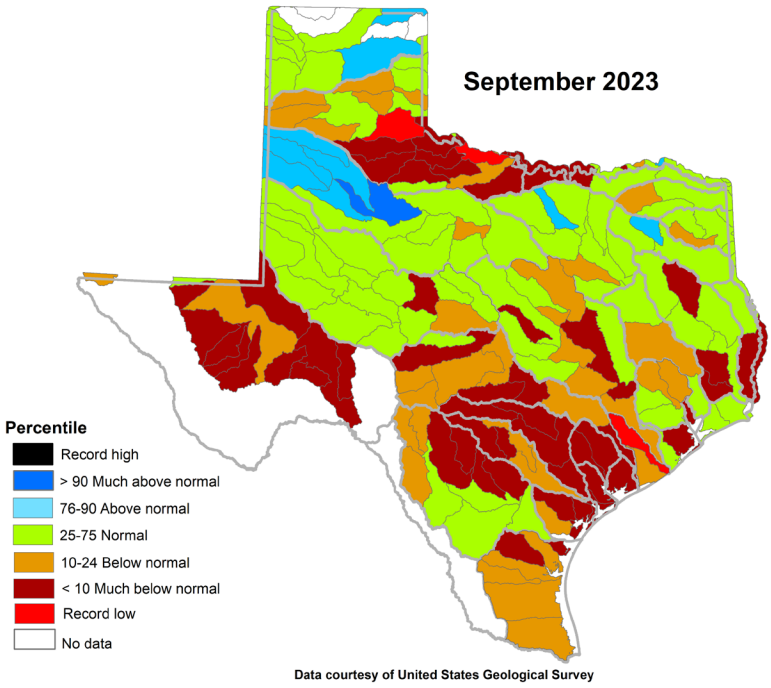
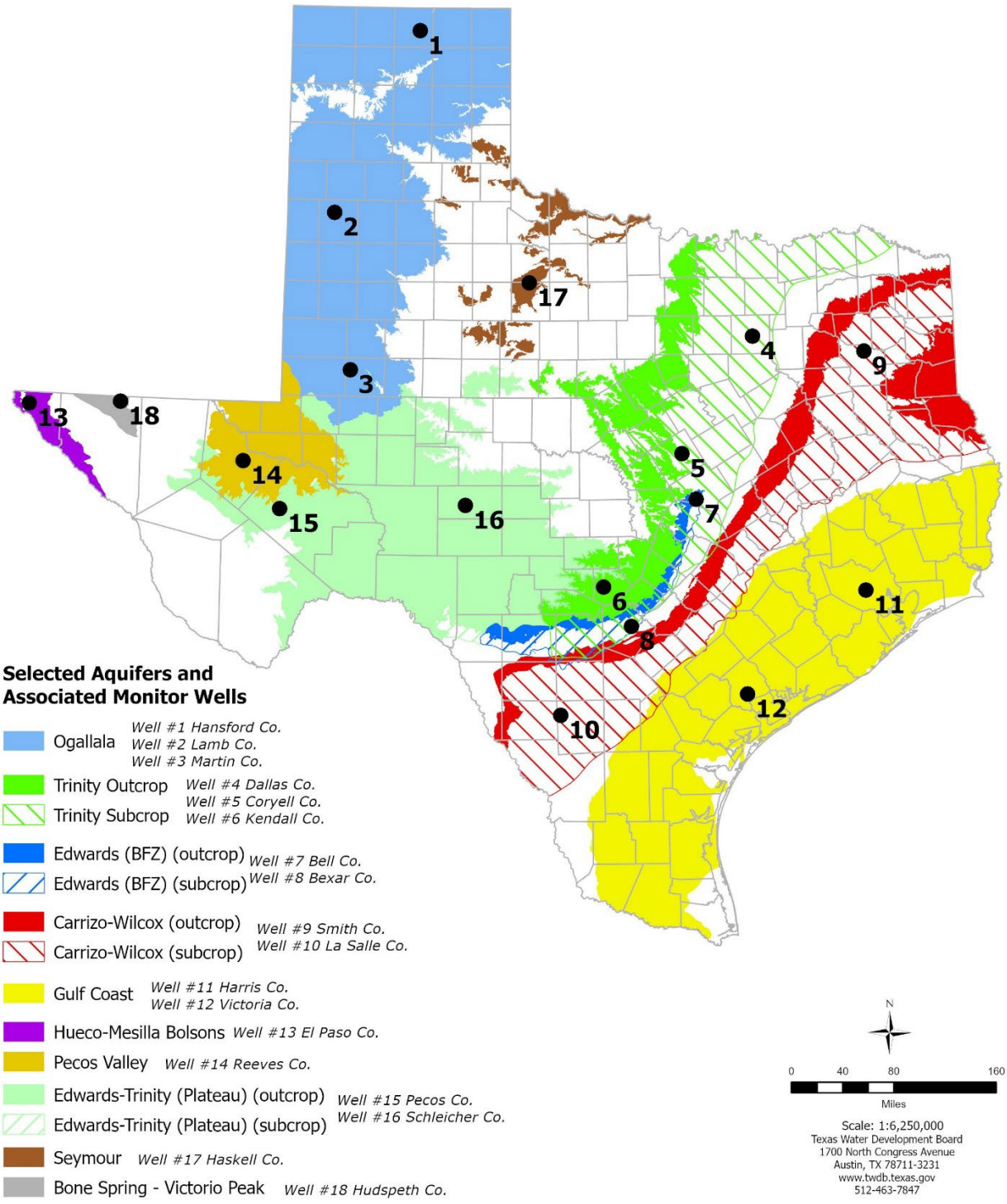


Figure 6: Runoff percentiles by the U.S. Geological Survey's Hydrologic Unit Code



SEPTEMBER 2023 GROUNDWATER LEVELS IN MONITORING WELLS

Water-level measurements were available for 15 key monitoring wells in the state. The recorders in three wells (#9, #14, and #15 on map) were offline during the reporting period. Water levels rose in six monitoring wells since the beginning of September, with an increase of 0.12 feet in the Martin County Ogallala Aquifer well (#3 on map) to 1.09 feet in the Coryell County Trinity Aquifer well (#5 on map). Water levels declined in nine monitoring wells, ranging from a decline of -0.06 feet in both the La Salle County Carrizo-Wilcox Aquifer and the Haskell County Seymour Aquifer wells (#10 and #17 on map, respectively) to -4.00 feet in the Harris County Gulf Coast Aquifer well (#11 on map). The J-17 well (#8 on map) in San Antonio recorded a water level of 101.40 feet below land surface or 629.60 feet above mean sea level. Water levels are 0.40 feet below the Stage 4 critical management levels for the San Antonio portion of the Edwards (Balcones Fault Zone) Aquifer. The Edwards Aquifer Authority declared Stage 4 water restrictions effective July 21, 2023, as a result of well J-17 water levels and area spring flow levels.

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

Monitoring Well	September (depth to water, feet)	August (depth to water, feet)	Month Change	Year Change	Historical Change*	First Measured (year)
(1) Hansford 0354301	164.77	164.56	-0.21	-2.27	-94.65	1951
(2) Lamb 1053602	154.35	154.23	-0.12	-1.21	-126.18	1951
(3) Martin 2739903	145.72	145.84	0.12	-0.14	-40.83	1964
(4) Dallas 3319101	508.38	507.33	-1.05	-5.16	-286.38	1954
(5) Coryell 4035404	547.07	548.16	1.09	7.31	-255.07	1955**
(6) Kendall 6802609	173.23	172.94	-0.29	NA	-113.23	1975
(7) Bell 5804816	128.91	128.73	-0.18	-1.67	-5.40	2008
(8) Bexar 6837203	101.40	102.20	0.80	-1.10	-54.76	1932
(9) Smith 3430907	NA	NA	NA	NA	-140.39	1977**
(10) La Salle 7738103	543.34	543.28	-0.06	-13.02	-290.27	2003
(11) Harris 6514409	196.88	192.88	-4.00	-4.85	-61.38	1947**
(12) Victoria 8017502	33.34	32.85	-0.49	1.29	0.66	1958**
(13) El Paso 4913301	298.65	299.23	0.58	1.88	-66.75	1964**
(14) Reeves 4644501	NA	156.53	NA	NA	-64.44	1952
(15) Pecos 5216802	NA	222.15	NA	NA	24.73	1976
(16) Schleicher 5512134	321.44	322.45	1.01	-4.30	-19.54	2003
(17) Haskell 2135748	47.86	47.80	-0.06	0.00	-4.86	2002
(18) Hudspeth 4807516	152.12	152.36	0.24	3.72	-48.20	1966

*** Change since the original measurement taken on the date indicated in the last column. The historical changes shown for recorder wells #9, #14, and #15 are based off the most recent water level records from April 2023, August 2023, and August 2023, respectively.**

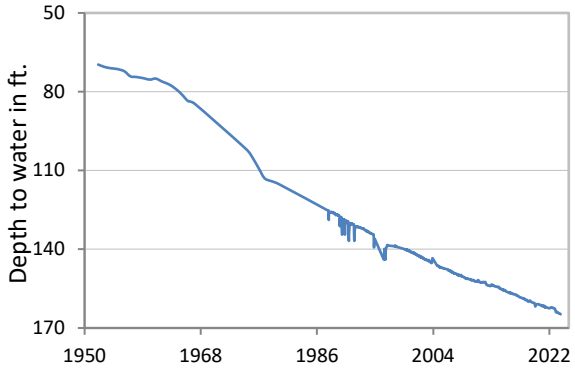
**** Measurement not shown on the hydrograph.**

NA (not available)

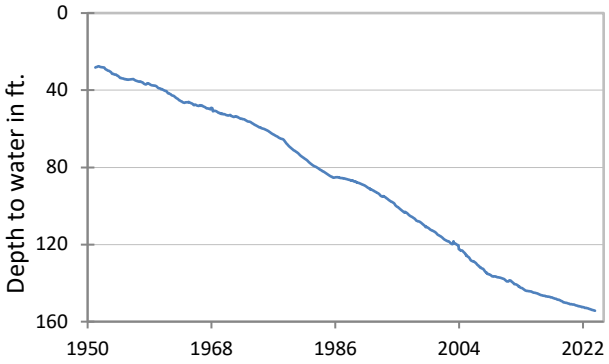
All data are provisional and subject to revision.

SEPTEMBER 2023 MONITORING WELL HYDROGRAPHS

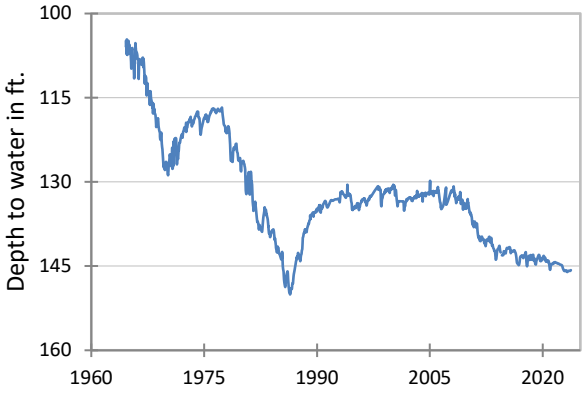
(1) State Well #03-54-301
Near Spearman, Hansford County
Ogallala Aquifer



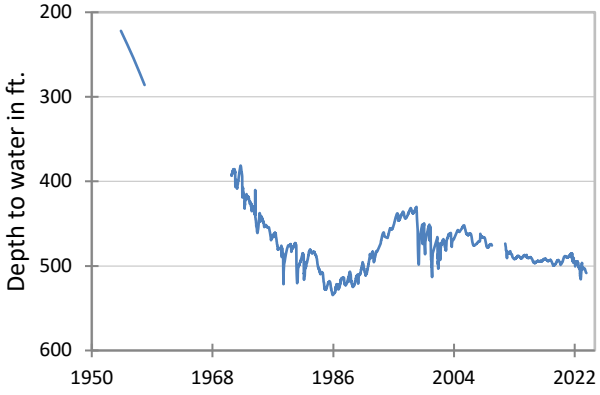
(2) State Well #10-53-602
Near Earth, Lamb County
Ogallala Aquifer



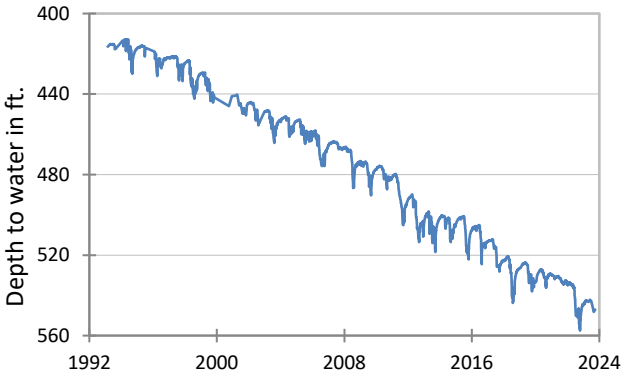
(3) State Well #27-39-903
Northwest Martin County
Ogallala Aquifer



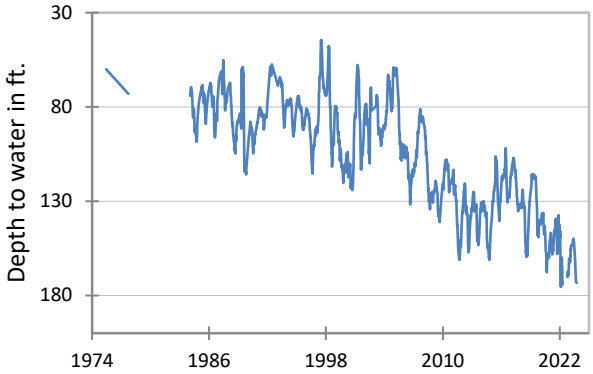
(4) State Well #33-19-101
Southeast Dallas, Dallas County
Twin Mountains Formation-Trinity Aquifer



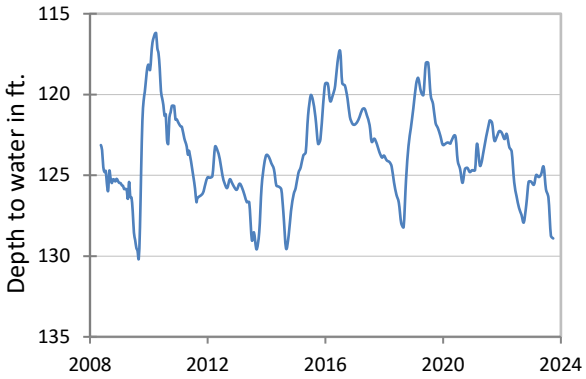
(5) State Well #40-35-404
Gatesville, Coryell County
Hosston Formation-Trinity Aquifer



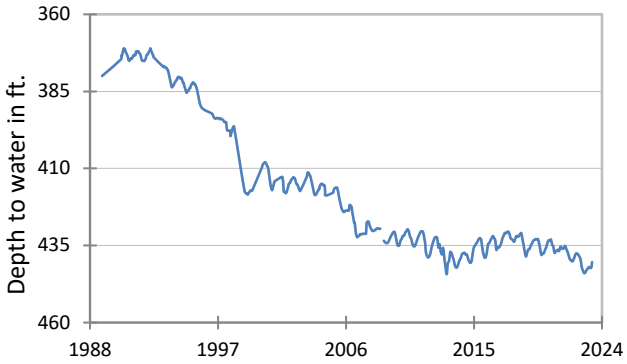
(6) State Well #68-02-609
Waring, Kendall County
Travis Peak Formation-Trinity Aquifer



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

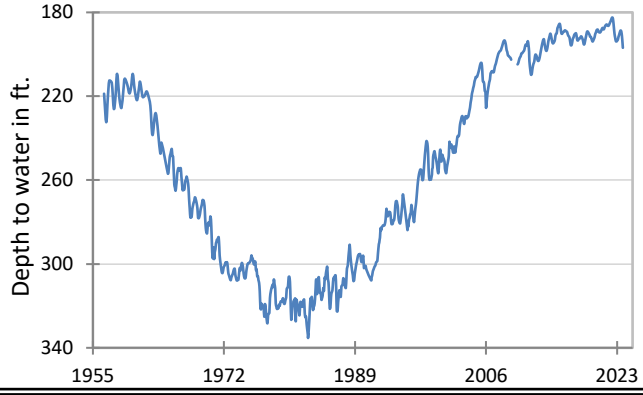


***(9) State Well #34-30-907**
Red Springs, Smith County
Carrizo-Wilcox Aquifer



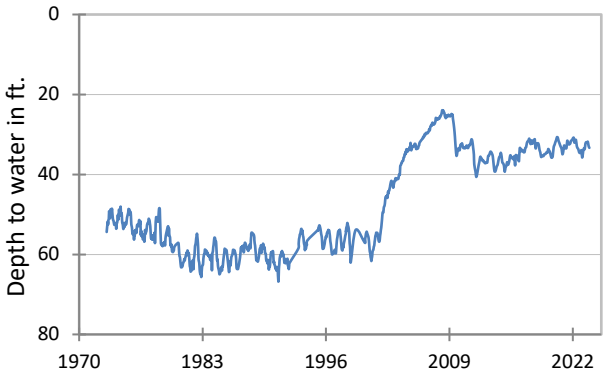
(10) State Well #77-38-103
Near Cotulla, La Salle County
Carrizo-Wilcox Aquifer

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

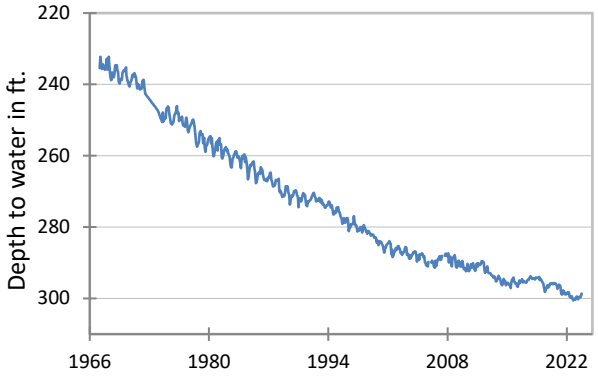


*** Recorder well #9 has been offline and has not recorded data since May 2023.**

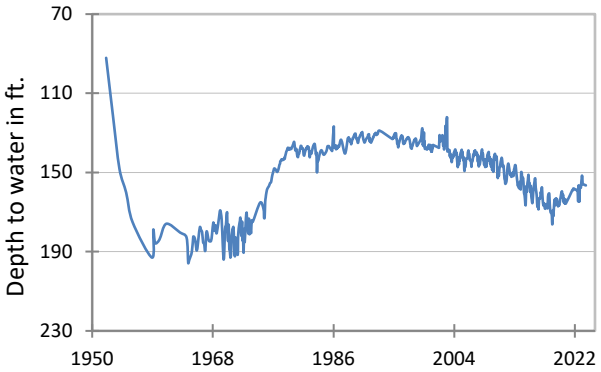
(12) State Well #80-17-502
Near Bloomington, Victoria County
Lissie Formation-Gulf Coast Aquifer



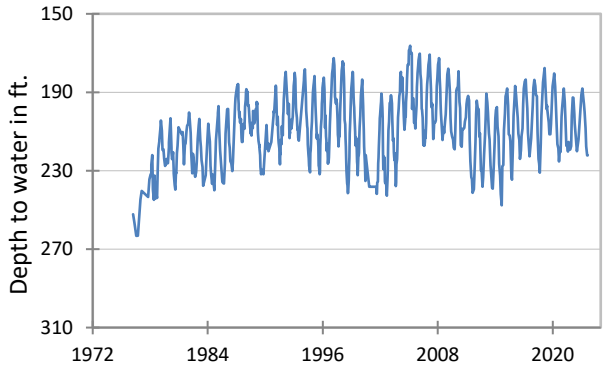
(13) State Well #49-13-301
El Paso, El Paso County
Hueco-Mesilla Bolsons Aquifer



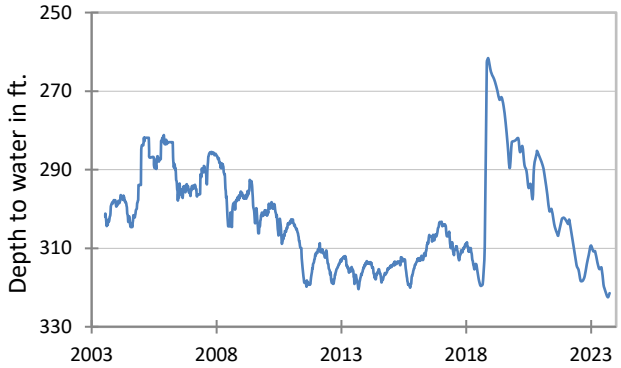
***(14) State Well #46-44-501**
Near Pecos, Reeves County
Pecos Valley Aquifer



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



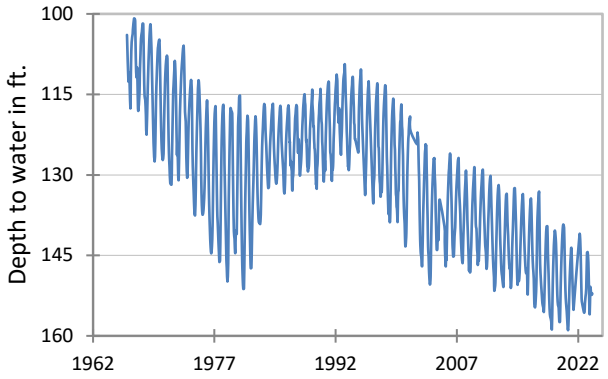
(16) State Well #55-12-134
Eldorado, Schleicher County
Edwards-Trinity (Plateau) Aquifer



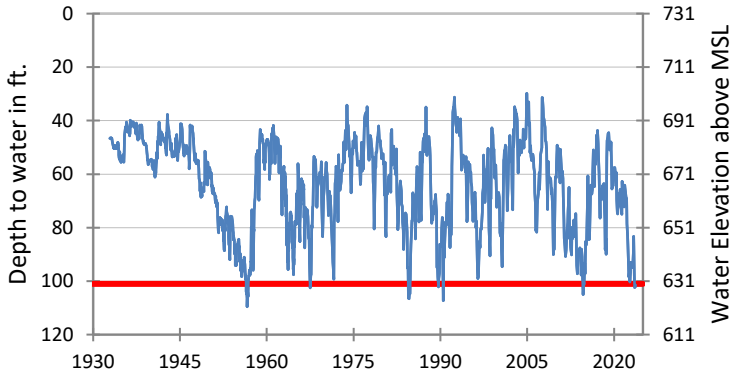
(17) State Well #21-35-748
Near O'Brien, Haskell County
Seymour Aquifer

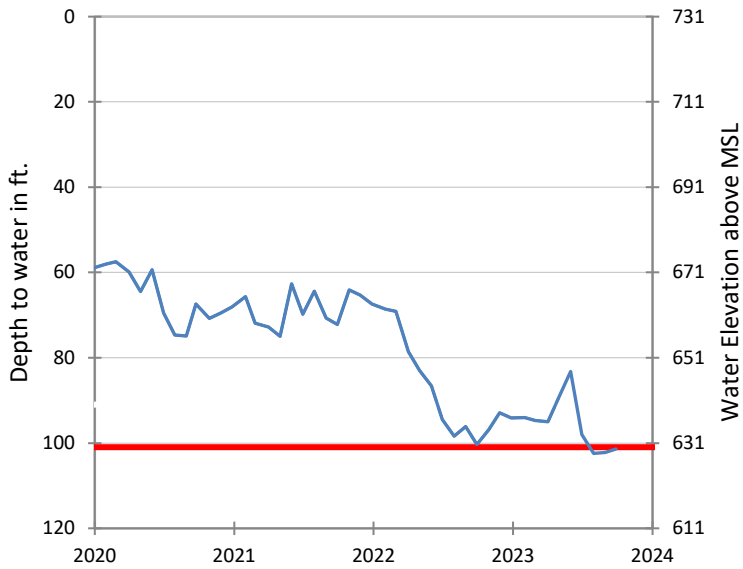
*** Recorder wells #14 and #15 have been offline and have not recorded data since September 2023.**

(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

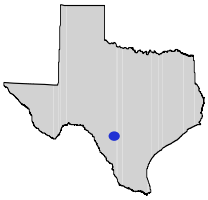




The late September water-level measurement in this Edwards (Balcones Fault Zone) Aquifer well, located at an elevation of 731 feet above mean sea level, was 101.40 feet below land surface, or 629.60 feet above mean sea level. This was 0.80 feet above last month's measurement, 1.10 feet below last year's measurement, and 54.76 feet below the initial measurement recorded in 1932.

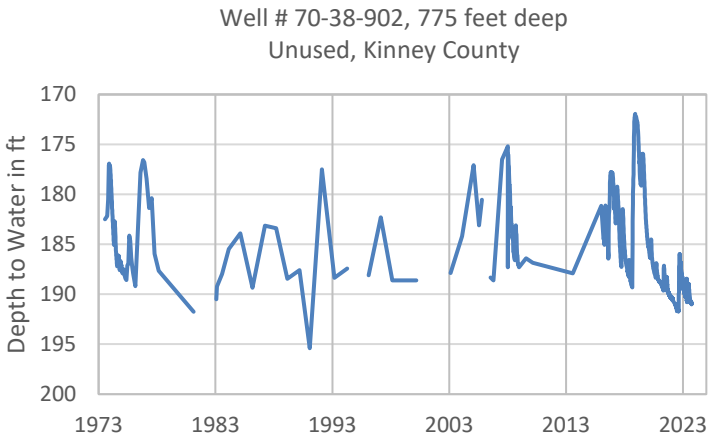
Water levels below the red line indicate periods in which Edwards Aquifer Authority Stage 4 drought restrictions are in effect. In September 2023, the aquifer remained below the Stage 4 critical management level. The Edwards Aquifer Authority declared Stage 4 water restrictions effective July 21, 2023, as a result of well J-17 water levels and area spring flow levels.

HYDROGRAPH OF THE MONTH



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

Edwards (Balcones Fault Zone) Aquifer



The Edwards (Balcones Fault Zone) Aquifer is a major aquifer in the southcentral 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.[1]

The initial water-level measurement of 182.50 feet below land surface was recorded by the TWDB in July 1973. An automatic water-level recorder was installed in November 1973 and continues to collect hourly measurements (available online) and daily measurements (in the TWDB Groundwater Database). Over the period of record, the hydrograph shows drastic water level changes over relatively short periods of time. This is likely attributed to the high permeability of the Edwards (Balcones Fault Zone) Aquifer. The 2022 to 2023 water levels are some of the lowest on record and reflect current drought conditions.

Photos of well #70-38-902: general setting (left) and up-close view of the measuring point on the well head (right)

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