

Texas Water Conditions Report



Morningchores.com

December 2021

Water News:

According to the state climatologist, December 2021 was the warmest December since 1889. For more information on drought and weather conditions visit: https://texaswaternewsroom.org/videos/water_and_weather_for_december_2021.html

RAINFALL

This month very little to no rain [yellow, orange, and red shading, Figure 1(a)] fell over most of the state, while eastern portions of Texas received above average rainfall, reaching 5.62 inches in some areas [dark blue shading, Figure 1(a)]. Some rainfall [light blue and dark blue shading, Figure 1(a)] was recorded in central and eastern North Central, small areas of northern Trans Pecos, northeastern Low Rolling Plains, portions of the Edwards Plateau, areas throughout South Central, particularly the northeastern portions, East Texas, Lower Valley, and the Upper Coast climate divisions.

Monthly rainfall for December was well below average, compared to historical data from 1981–2010, for most of the state [yellow and orange shading, Figure 1(b)]. Average rainfall [green shading, Figure 1(b)] was seen in northwestern Trans Pecos, southern North Central, a small area in southern East Texas, and the Lower Valley climate divisions.

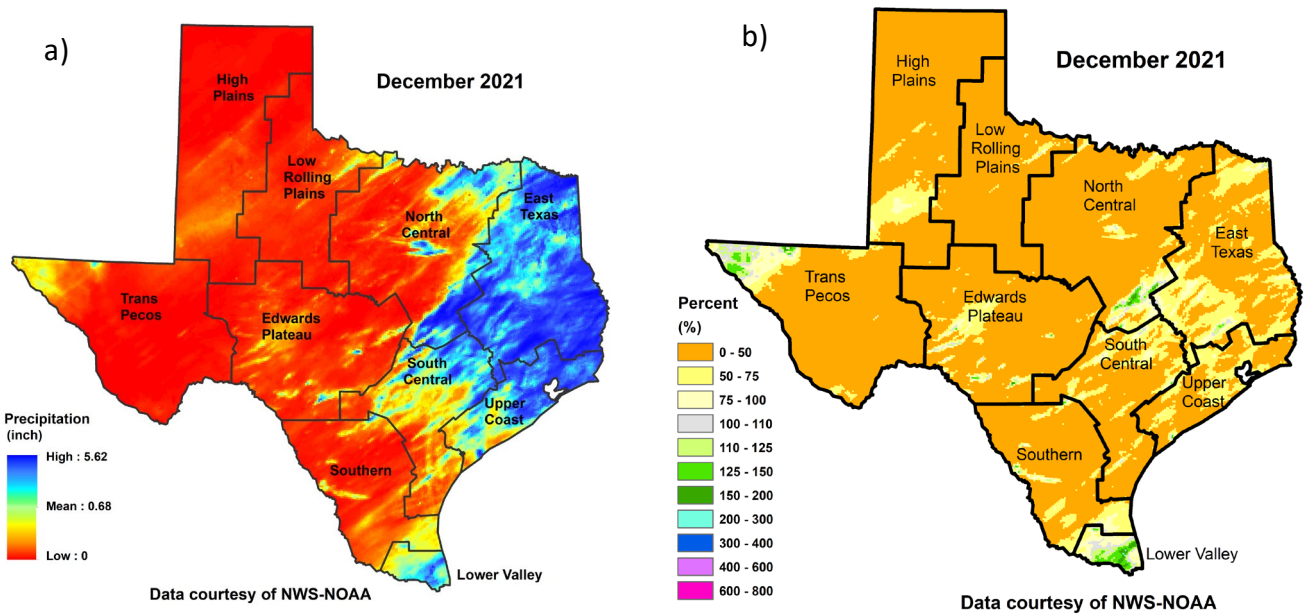


Figure 1: (a) Monthly accumulated rainfall and (b) Percent of normal rainfall

RESERVOIR STORAGE

At the end of December 2021, total conservation storage* in 122 of the state’s major water supply reservoirs was 24.54 million acre-feet or 77 percent of total conservation storage capacity (Figure 2). This is approximately 0.06-million-acre-feet more than a month ago and approximately 0.24 million acre-feet less than at the end of December 2020.

Statewide monitored major water supply reservoir conservation storage

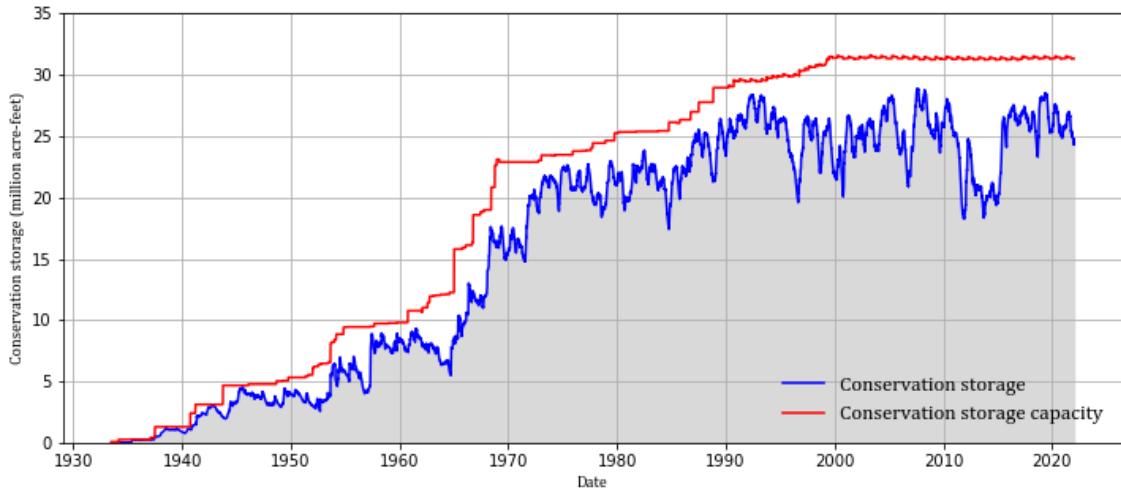


Figure 2: Statewide reservoir conservation storage

Out of 122 reservoirs in the state, 12 reservoirs held 100 percent of conservation storage capacity (Figure 3). Additionally, 46 were at or above 90 percent full. Eight reservoirs remained below 30 percent full: E.V. Spence (25 percent full), Greenbelt (16 percent full), Mackenzie (8 percent full), O. C. Fisher (6 percent full), Palo Duro Reservoir (1 percent full), Falcon (22 percent full), Medina Lake (26 percent full), and White River (19 percent full). Elephant Butte Reservoir (located in New Mexico) was 8 percent full.

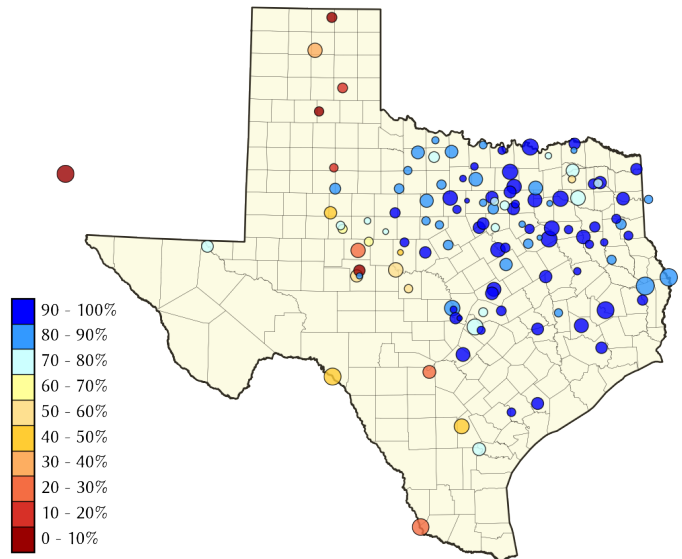


Figure 3: Reservoir conservation storage at end-December expressed as percent full (%)

*Storage is based on end of the month data in 122 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 (70.5 percent full), East Texas (89.5 percent full), North Central (92.0 percent full), South Central (73.6 percent full), and Upper Coast (98.9 percent full) climate divisions (Figure 4). The Edwards Plateau climate division had moderately low conservation storage (55.4 percent full). The High Plains (28.6 percent full) and Southern (28.2 percent full) climate divisions had severely low storage, and Trans Pecos climate division (18.3 percent full) had extremely low storage (Figure 4).

Combined conservation storage by river basin or sub-basin did not show much change from the previous month. Normal to high (>70 percent full, Figure 5) conservation storage was seen in the Upper and Lower Red, Sulphur, Cypress, Upper and Lower Sabine, Upper and Lower Trinity, Upper and Lower Brazos, San Jacinto, Lower Colorado, Guadalupe, and Lavaca river basins. The Upper Colorado and Nueces river basins had moderately low conservation storage (40–60 percent full, Figure 5), and the 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).

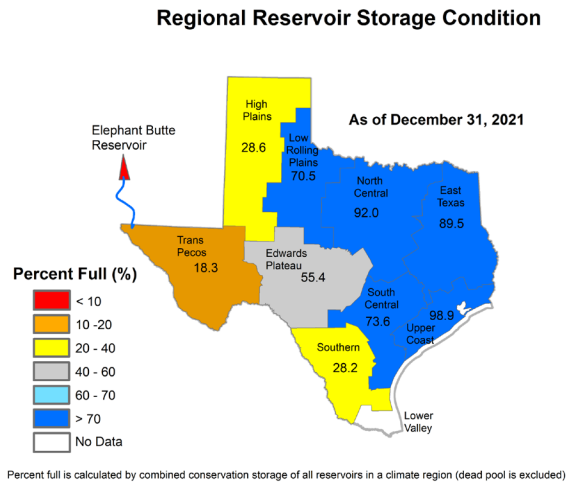


Figure 4: Reservoir Storage Index* by climate division at 12/31/2021

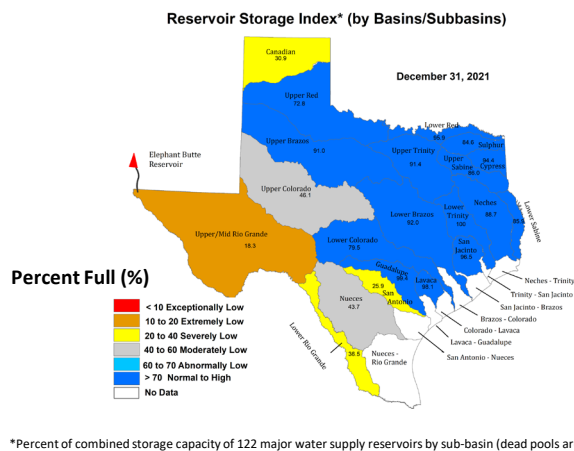


Figure 5: Reservoir Storage Index* by river basin/sub-basin at 12/31/2021

*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-December 2021 | | Storage change from end-Nov 2021 | | Storage change from end-Dec 2020 | |
|--|------------------|------------------------------|-----|----------------------------------|-----|----------------------------------|-----|
| | (acre-feet) | (acre-feet) | (%) | (acre-feet) | (%) | (acre-feet)** | (%) |
| Abilene, Lake | 7,900 | 5,996 | 76 | -263 | -3 | 462 | 6 |
| Alan Henry Reservoir | 96,207 | 86,533 | 90 | -1,358 | -1 | 1,539 | 2 |
| *Amistad Reservoir (Texas & Mexico) | 3,275,532 | 1,112,150 | 34 | -8,448 | 0 | -129,485 | -4 |
| *Amistad Reservoir (Texas) | 1,840,849 | 903,014 | 49 | -12,370 | 0 | -274,342 | -15 |
| Amon G Carter, Lake | 19,266 | 18,948 | 98 | -318 | -2 | 918 | 5 |
| Aquilla Lake | 43,243 | 39,391 | 91 | -914 | -2 | 0 | 0 |
| Arlington, Lake | 40,157 | 31,692 | 79 | -1,876 | -5 | -1,894 | -5 |
| Arrowhead, Lake | 230,359 | 199,027 | 86 | -2,949 | -1 | -25,143 | -11 |
| Athens, Lake | 29,503 | 29,503 | 100 | 0 | 0 | 0 | 0 |
| *Austin, Lake | 23,972 | 22,711 | 95 | -215 | 0 | -463 | -2 |
| B A Steinhagen Lake | 69,186 | 64,773 | 94 | -1,384 | -2 | -3,092 | -4 |
| Bardwell Lake | 46,122 | 45,123 | 98 | -373 | 0 | 960 | 2 |
| Belton Lake | 435,225 | 407,802 | 94 | -4,697 | -1 | -15,977 | -4 |
| Benbrook Lake | 85,648 | 71,611 | 84 | 7,933 | 9 | -4,542 | -5 |
| Bob Sandlin, Lake | 192,417 | 180,251 | 94 | 2,833 | 1 | -7,922 | -4 |
| Bonham, Lake | 11,027 | 8,335 | 76 | -167 | -2 | -2,048 | -19 |
| Brady Creek Reservoir | 28,808 | 16,586 | 58 | -212 | 0 | -3,087 | -11 |
| Bridgeport, Lake | 366,236 | 327,303 | 89 | -5,835 | -2 | 6,908 | 2 |
| *Brownwood, Lake | 130,868 | 121,169 | 93 | -1,957 | -1 | 8,393 | 6 |
| Buchanan, Lake | 860,607 | 757,726 | 88 | 0 | 0 | 38,604 | 4 |
| Caddo, Lake | 29,898 | 29,898 | 100 | 0 | 0 | no data | |
| Canyon Lake | 378,781 | 376,808 | 99 | -1,726 | 0 | 39,742 | 10 |
| Cedar Creek Reservoir in Trinity | 644,686 | 595,297 | 92 | -1,243 | 0 | -30,607 | -5 |
| Champion Creek Reservoir | 41,580 | 29,072 | 70 | -339 | 0 | 4,684 | 11 |
| Cherokee, Lake | 40,094 | 39,408 | 98 | 2,566 | 6 | -686 | -2 |
| Choke Canyon Reservoir | 662,820 | 290,026 | 44 | -4,926 | 0 | 56,009 | 8 |
| *Cisco, Lake | 29,003 | 25,337 | 87 | -282 | 0 | 2,328 | 8 |
| Coleman, Lake | 38,075 | 35,784 | 94 | -426 | -1 | 3,102 | 8 |
| Colorado City, Lake | 31,040 | 30,735 | 99 | -305 | 0 | 10,104 | 33 |
| *Coletto Creek Reservoir | 30,758 | 22,783 | 74 | -357 | -1 | 11,518 | 37 |
| Conroe, Lake | 410,988 | 392,418 | 95 | 3,730 | 1 | -5,068 | -1 |
| Corpus Christi, Lake | 256,062 | 203,268 | 79 | no data | | no data | |
| Crook, Lake | 9,195 | 8,050 | 88 | -31 | 0 | -1,145 | -12 |
| Cypress Springs, Lake | 66,756 | 61,115 | 92 | -1,311 | -2 | -5,641 | -8 |
| E. V. Spence Reservoir | 517,272 | 128,984 | 25 | -2,364 | 0 | 12,384 | 2 |
| Eagle Mountain Lake | 179,880 | 163,974 | 91 | -2,983 | -2 | 330 | 0 |
| Elephant Butte Reservoir (Texas) | 852,491 | 72,351 | 8 | 14,136 | 2 | 17,627 | 2 |
| Elephant Butte Reservoir (Total Storage) | 1,985,900 | 167,480 | 8 | 32,722 | 2 | 40,804 | 2 |
| *Falcon Reservoir (Texas & Mexico) | 2,646,817 | 405,585 | 15 | -11,969 | 0 | -122,771 | -5 |
| *Falcon Reservoir (Texas) | 1,551,007 | 335,318 | 22 | 2,297 | 0 | -135,372 | -9 |
| Fork Reservoir, Lake | 605,061 | 460,516 | 76 | -72,623 | -12 | -96,671 | -16 |
| Fort Phantom Hill, Lake | 70,030 | 65,848 | 94 | -980 | -1 | 4,104 | 6 |
| Georgetown, Lake | 36,823 | 27,464 | 75 | 1,168 | 3 | 4,710 | 13 |
| Gibbons Creek Reservoir | 25,721 | 22,241 | 86 | 1,053 | 4 | 1,275 | 5 |
| Graham, Lake | 45,288 | 39,247 | 87 | -647 | -1 | -3,265 | -7 |
| Granbury, Lake | 132,949 | 128,669 | 97 | 0 | 0 | -4,280 | -3 |

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

| Name of lake or reservoir | Storage capacity | Storage at end-December 2021 | | Storage change from end-Nov 2021 | | Storage change from end-Dec 2020 | |
|------------------------------------|------------------|------------------------------|-----|----------------------------------|-----|----------------------------------|-----|
| | (acre-feet) | (acre-feet) | (%) | (acre-feet) | (%) | (acre-feet)** | (%) |
| <i>Continued</i> | | | | | | | |
| Granger Lake | 51,822 | 51,822 | 100 | 0 | 0 | 4,849 | 9 |
| Grapevine Lake | 163,064 | 156,208 | 96 | -381 | 0 | -4,822 | -3 |
| Greenbelt Lake | 59,968 | 9,824 | 16 | -190 | 0 | -31 | 0 |
| *Halbert, Lake | 6,033 | 5,225 | 87 | 54 | 1 | -710 | -12 |
| Hords Creek Lake | 8,109 | 3,496 | 43 | -75 | 0 | -893 | -11 |
| Houston County Lake | 17,113 | 17,113 | 100 | 0 | 0 | 0 | 0 |
| Houston, Lake | 130,147 | 130,147 | 100 | 0 | 0 | 0 | 0 |
| Hubbard Creek Reservoir | 313,298 | 276,627 | 88 | -5,543 | -2 | -1,016 | 0 |
| Hubert H Moss Lake | 24,058 | 22,790 | 95 | -31 | 0 | -549 | -2 |
| Inks, Lake | 13,962 | 12,952 | 93 | -83 | 0 | 112 | 1 |
| J. B. Thomas, Lake | 199,931 | 80,254 | 40 | -2,149 | -1 | 51,965 | 26 |
| Jacksonville, Lake | 25,670 | 25,670 | 100 | 289 | 1 | 0 | 0 |
| Jim Chapman Lake (Cooper) | 260,332 | 206,656 | 79 | -9,813 | -4 | 14,689 | 6 |
| Joe Pool Lake | 175,800 | 166,908 | 95 | -2,398 | -1 | 3,096 | 2 |
| Kemp, Lake | 245,307 | 207,909 | 85 | -2,254 | 0 | 2,570 | 1 |
| Kickapoo, Lake | 86,345 | 65,454 | 76 | -1,304 | -2 | -4,841 | -6 |
| Lavon Lake | 406,388 | 331,625 | 82 | -4,559 | -1 | -37,630 | -9 |
| Leon, Lake | 27,762 | 24,296 | 88 | -546 | -2 | -1,283 | -5 |
| Lewisville Lake | 563,228 | 520,604 | 92 | -4,425 | 0 | -17,803 | -3 |
| Limestone, Lake | 203,780 | 184,601 | 91 | 2,958 | 1 | -11,310 | -6 |
| *Livingston, Lake | 1,741,867 | 1,741,867 | 100 | 4,912 | 0 | 0 | 0 |
| *Lost Creek Reservoir | 11,950 | 11,602 | 97 | -75 | 0 | 378 | 3 |
| Lyndon B Johnson, Lake | 115,249 | 110,881 | 96 | -306 | 0 | 184 | 0 |
| Mackenzie Reservoir | 46,450 | 3,564 | 8 | -57 | 0 | -607 | -1 |
| Marble Falls, Lake | 6,901 | 6,820 | 99 | -38 | 0 | 6 | 0 |
| Martin, Lake | 75,726 | 65,040 | 86 | -182 | 0 | 905 | 1 |
| Medina Lake | 254,823 | 66,044 | 26 | -1,986 | 0 | -40,199 | -16 |
| Meredith, Lake | 500,000 | 173,115 | 35 | -2,672 | 0 | -5,427 | -1 |
| Millers Creek Reservoir | 26,768 | 23,200 | 87 | -527 | -2 | -3,568 | -13 |
| *Mineral Wells, Lake | 5,273 | 5,125 | 97 | -78 | -1 | -148 | -3 |
| Monticello, Lake | 34,740 | 27,229 | 78 | 525 | 2 | -1,722 | -5 |
| Mountain Creek, Lake | 22,850 | 22,850 | 100 | 0 | 0 | 0 | 0 |
| Murvault, Lake | 38,285 | 37,226 | 97 | 878 | 2 | -682 | -2 |
| Nacogdoches, Lake | 39,522 | 34,718 | 88 | -199 | 0 | 532 | 1 |
| Nasworthy | 9,615 | 8,745 | 91 | 672 | 7 | 439 | 5 |
| Navarro Mills Lake | 49,827 | 44,545 | 89 | -404 | 0 | -3,554 | -7 |
| New Terrell City Lake | 8,583 | 7,654 | 89 | -74 | 0 | -551 | -6 |
| Nocona, Lake (Farmers Crk) | 21,444 | 18,988 | 89 | -319 | -1 | -887 | -4 |
| North Fork Buffalo Creek Reservoir | 15,400 | 12,362 | 80 | -345 | -2 | -2,053 | -13 |
| O' the Pines, Lake | 241,363 | 235,059 | 97 | -1,044 | 0 | -6,304 | -3 |
| O. C. Fisher Lake | 115,742 | 7,117 | 6 | -57 | 0 | -192 | 0 |
| *O. H. Ivie Reservoir | 554,340 | 302,630 | 55 | -3,545 | 0 | -33,354 | -6 |
| Oak Creek Reservoir | 39,210 | 26,962 | 69 | -482 | -1 | -3,564 | -9 |

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

| Name of lake or reservoir | Storage capacity | Storage at end-December 2021 | | Storage change from end-Nov 2021 | | Storage change from end-Dec 2020 | |
|---|-------------------|------------------------------|-----------|----------------------------------|------------|----------------------------------|-----------|
| | (acre-feet) | (acre-feet) | (%) | (acre-feet) | (%) | (acre-feet)** | (%) |
| <i>Continued</i> | | | | | | | |
| Palestine, Lake | 367,303 | 364,077 | 99 | 11,832 | 3 | -3,226 | 0 |
| Palo Duro Reservoir | 61,066 | 434 | 1 | -38 | 0 | -568 | 0 |
| Palo Pinto, Lake | 26,766 | 25,878 | 97 | -410 | -2 | 2,561 | 10 |
| Pat Cleburne, Lake | 26,008 | 20,741 | 80 | -365 | -1 | -1,179 | -5 |
| *Pat Mayse Lake | 113,683 | 102,229 | 90 | -1,711 | -2 | -11,454 | -10 |
| Possum Kingdom Lake | 538,139 | 518,886 | 96 | -2,967 | 0 | -9,825 | -2 |
| Proctor Lake | 54,762 | 47,371 | 87 | -831 | -2 | -4,565 | -8 |
| Ray Hubbard, Lake | 439,559 | 410,227 | 93 | -7,031 | -2 | -1,001 | 0 |
| Ray Roberts, Lake | 788,167 | 766,800 | 97 | -4,187 | 0 | 5,007 | 1 |
| Red Bluff Reservoir | 151,110 | 111,661 | 74 | 1,091 | 1 | 39,868 | 26 |
| Richland-Chambers Reservoir | 1,087,839 | 995,561 | 92 | -5,770 | 0 | -42,332 | -4 |
| Sam Rayburn Reservoir | 2,857,077 | 2,479,979 | 87 | -20,808 | 0 | 47,562 | 2 |
| Somerville Lake | 150,293 | 150,293 | 100 | 0 | 0 | 27,101 | 18 |
| Squaw Creek, Lake | 151,250 | 151,250 | 100 | 0 | 0 | 253 | 0 |
| Stamford, Lake | 51,570 | 44,994 | 87 | -1,270 | -2 | -6,576 | -13 |
| Stillhouse Hollow Lake | 227,771 | 215,379 | 95 | -3,553 | -2 | -12,392 | -5 |
| Striker, Lake | 16,934 | 16,932 | 100 | -2 | 0 | -2 | 0 |
| Sweetwater, Lake | 12,267 | 9,826 | 80 | -86 | 0 | -200 | -2 |
| *Sulphur Springs, Lake | 17,747 | 10,046 | 57 | -714 | -4 | -2,445 | -14 |
| Tawakoni, Lake | 871,685 | 801,475 | 92 | -8,106 | 0 | -18,033 | -2 |
| Texana, Lake | 159,566 | 156,637 | 98 | -1,919 | -1 | -2,929 | -2 |
| Texoma, Lake (Texas & Oklahoma) | 2,487,601 | 2,411,694 | 97 | 29,390 | 1 | -30,479 | -1 |
| Texoma, Lake (Texas) | 1,243,801 | 1,205,846 | 97 | 14,694 | 1 | -15,240 | -1 |
| Toledo Bend Reservoir (Texas & Louisiana) | 4,472,900 | 3,849,739 | 86 | 86,602 | 2 | -47,131 | -1 |
| Toledo Bend Reservoir (Texas) | 2,236,450 | 1,922,820 | 86 | 43,302 | 2 | -23,565 | -1 |
| Travis, Lake | 1,113,348 | 792,122 | 71 | -6,172 | 0 | 41,452 | 4 |
| Twin Buttes Reservoir | 182,454 | 94,647 | 52 | -311 | 0 | -2,942 | -2 |
| Tyler, Lake | 72,073 | 71,088 | 99 | 2,123 | 3 | -985 | -1 |
| Waco, Lake | 189,418 | 165,234 | 87 | -4,574 | -2 | -12,713 | -7 |
| Waxahachie, Lake | 10,780 | 8,750 | 81 | -180 | -2 | -541 | -5 |
| Weatherford, Lake | 17,812 | 14,856 | 83 | -239 | -1 | -1,057 | -6 |
| White River Lake | 29,880 | 5,814 | 19 | -262 | 0 | 2,216 | 7 |
| Whitney, Lake | 553,344 | 506,108 | 91 | -211 | 0 | 10,462 | 2 |
| Worth, Lake | 24,419 | 19,411 | 79 | -1,046 | -4 | 615 | 3 |
| Wright Patman Lake | 122,593 | 122,593 | 100 | 0 | 0 | 0 | 0 |
| STATEWIDE TOTAL | | | | | | | |
| STATEWIDE TOTAL | 31,912,775 | 24,542,326 | 77 | 57,491 | 0.2 | -236,038 | -1 |

*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 the last month or last year, respectively.

STREAMFLOW CONDITIONS

Much of the state had near normal streamflow in December 2021 (25–75th percentile, green shading, Figure 6). The only area of the state to have above normal streamflow (76–90th percentile, light blue shading in Figure 6) was in the Upper Sabine river basin. Below normal streamflow (10–24th percentile, orange shading in Figure 6) was recorded in the Canadian, Upper and Lower Red, Upper and Lower Brazos, Upper and Lower Colorado, Nueces, and Nueces-Rio Grande river basins. Much below normal streamflow (< 10th percentile, dark red shading in Figure 6) was recorded in the Upper and Lower Red, Upper Colorado, Upper Brazos, Nueces, and Pecos river basins. A record low (bright red shading in Figure 6) was seen in the Upper Red river basin.

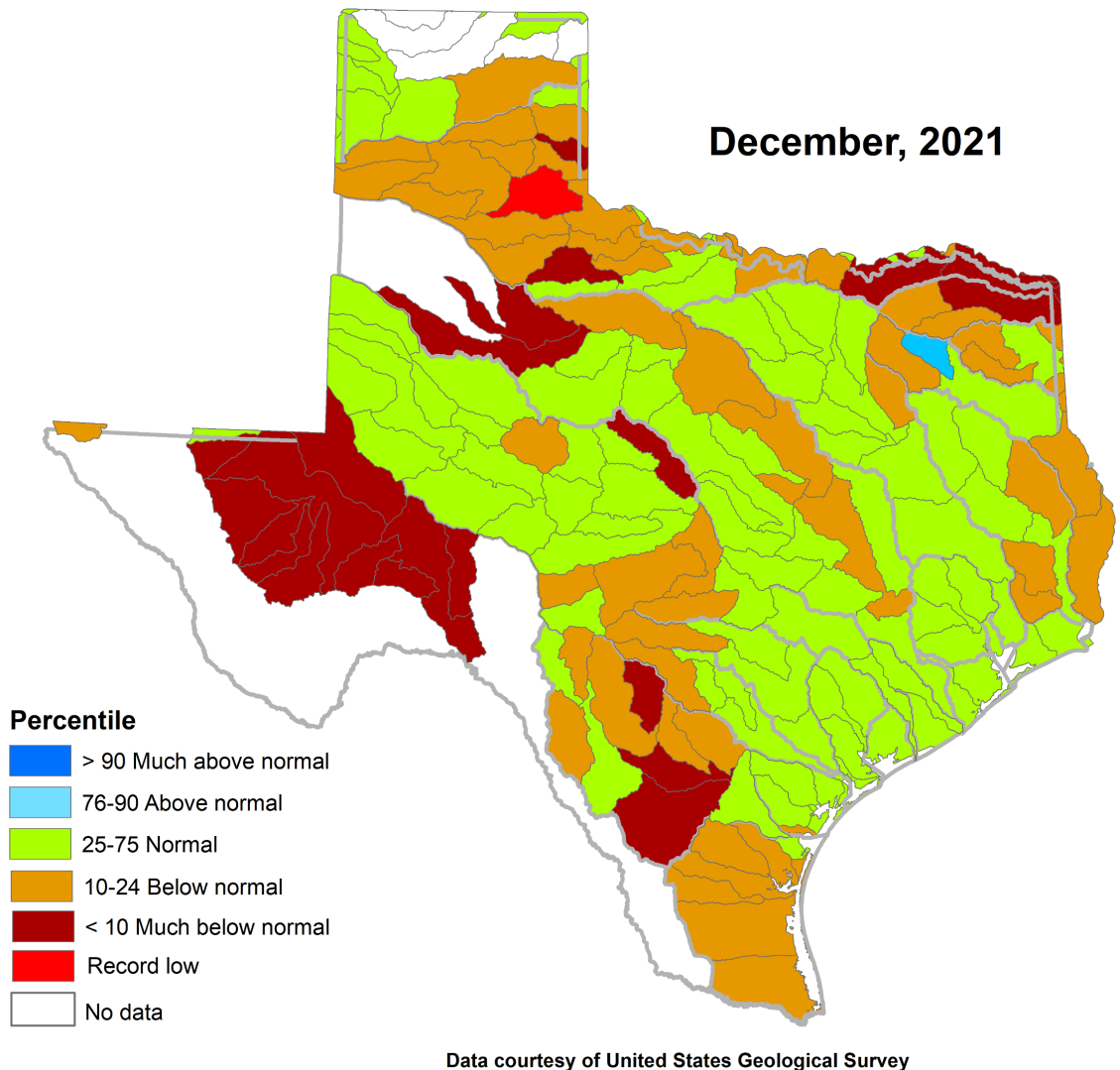
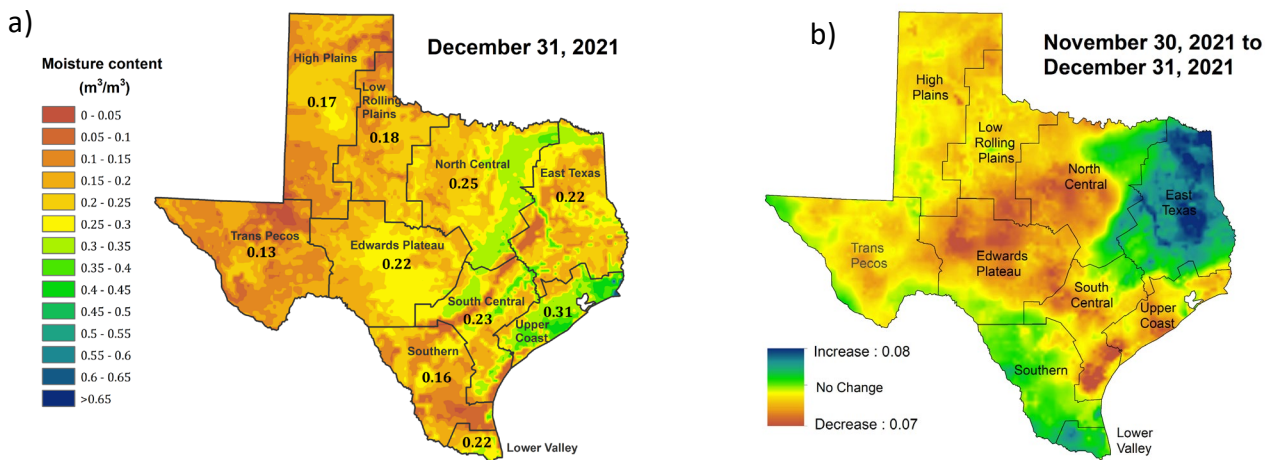


Figure 6: Runoff percentiles by the U.S. Geological Survey’s Hydrologic Unit Code

SOIL MOISTURE

Root zone soil moisture at the end of December 2021 [Figure 7(a)] was moderate [> 0.20 cubic meters of water per bulk cubic meter soil (m^3/m^3)] in the Edwards Plateau, North Central, East Texas, South Central, and Lower Valley. 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 High Plains, Low Rolling Plains, Trans Pecos, Edwards Plateau, Southern, Lower Valley, East Texas, western North Central, southwestern Upper Coast, southern South Central and stretching across the climate division from the northwest to the northeast. Average soil moisture [0.3 cubic meters of water per bulk cubic meter soil (m^3/m^3)] was seen in eastern North Central, northern and southern South Central, southeastern Southern, central Lower Valley, areas of East Texas, and most of the Upper Coast climate divisions.

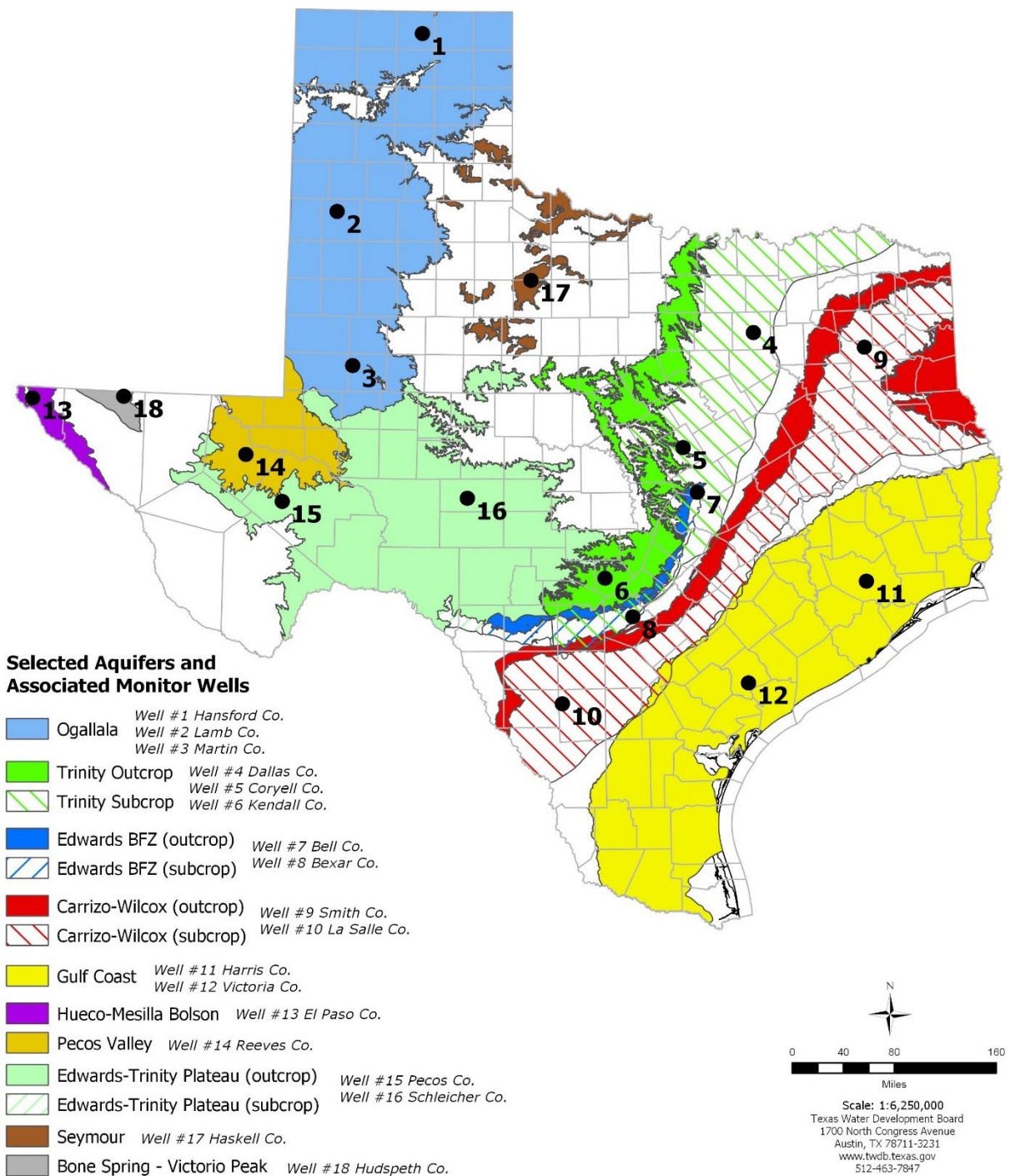
Compared to conditions at the end of November 2021, soil moisture content increased slightly [green to blue shading in Figure 7(b)] in portions of the Trans Pecos, High Plains, central Low Rolling Plains, southern Edwards Plateau, Southern, Lower Valley, eastern North Central, northern South Central,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



December 2021 GROUNDWATER LEVELS IN MONITORING WELLS

Water-level measurements were available for 15 key monitoring wells in the state. Recorders in 3 wells (#1, #14, and #18 on map) were offline during the reporting period. Water levels rose in 10 monitoring wells since the beginning of December, ranging from an increase of 0.09 feet in the Bell County Edwards (Balcones Fault Zone) Aquifer well (#7 on map) to 15.41 feet in the Pecos County Edwards-Trinity Plateau Aquifer well (#15 on map). Water levels remained the same for the Dallas County Trinity Aquifer well (#4 on map). Water levels declined in 4 monitoring wells, ranging from a decline of -0.06 feet in the Lamb County Ogallala Aquifer well (#2 on map) to -2.10 feet in the Bexar County Edwards (Balcones Fault Zone) Aquifer well (#8 on map). The J-17 well (#8 on map) in San Antonio recorded a water level of 67.40 feet below land surface or 663.60 feet above mean sea level. Water levels are 3.60 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 | December (depth to water, feet) | November (depth to water, feet) | Month Change | Year Change | Historical Change* | First Measured (year) |
|-------------------------|---------------------------------------|---------------------------------------|-----------------|----------------|-----------------------|-----------------------------|
| (1) Hansford 0354301 | NA | NA | NA | NA | -91.74 | 1951 |
| (2) Lamb 1053602 | 152.46 | 152.40 | -0.06 | -0.87 | -124.29 | 1951 |
| (3) Martin 2739903 | 144.56 | 144.45 | -0.11 | 1.11 | -39.67 | 1964 |
| (4) Dallas 3319101 | 495.53 | 495.53 | 0.00 | -5.86 | -273.53 | 1954 |
| (5) Coryell 4035404 | 534.72 | 532.97 | -1.75 | -5.11 | -242.72 | 1955** |
| (6) Kendall 6802609 | 148.15 | 149.01 | 0.86 | 2.36 | -88.15 | 1975 |
| (7) Bell 5804816 | 121.82 | 121.91 | 0.09 | 2.86 | 1.69 | 2008 |
| (8) Bexar 6837203 | 67.40 | 65.30 | -2.10 | 0.70 | -20.76 | 1932 |
| (9) Smith 3430907 | 439.69 | 440.18 | 0.49 | -2.91 | -139.69 | 1977** |
| (10) La Salle 7738103 | 501.81 | 503.73 | 1.92 | 11.49 | -248.74 | 2003 |
| (11) Harris 6514409 | 185.63 | 186.28 | 0.65 | 2.55 | -50.13* | 1947** |
| (12) Victoria 8017502 | 31.12 | 31.42 | 0.30 | 3.24 | 2.88 | 1958** |
| (13) El Paso 4913301 | 298.14 | 298.81 | 0.67 | -1.60 | -66.24 | 1964** |
| (14) Reeves 4644501 | NA | NA | NA | NA | -65.93 | 1952 |
| (15) Pecos 5216802 | 202.02 | 217.43 | 15.41 | -4.52 | 44.86 | 1976 |
| (16) Schleicher 5512134 | 279.24 | 279.90 | 0.66 | NA | 22.66 | 2003 |
| (17) Haskell 2135748 | 44.93 | 45.31 | 0.38 | -0.40 | -1.93 | 2002 |
| (18) Hudspeth 4807516 | NA | NA | NA | NA | -50.79 | 1966 |

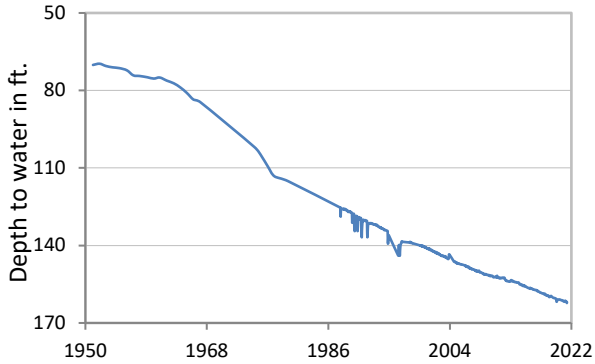
* Change since the original measurement taken on the date indicated in the last column. The historical changes shown for recorder wells #1, #14, and #18 are based off the most recent water level records from May, October, and June 2021, respectively.

** Measurement not shown on the hydrograph.

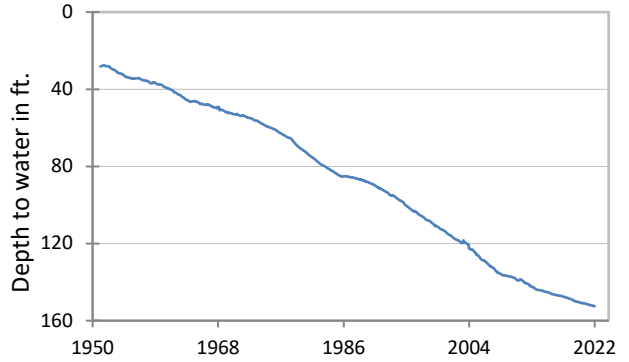
NA (not available)

December 2021 MONITORING WELL HYDROGRAPHS

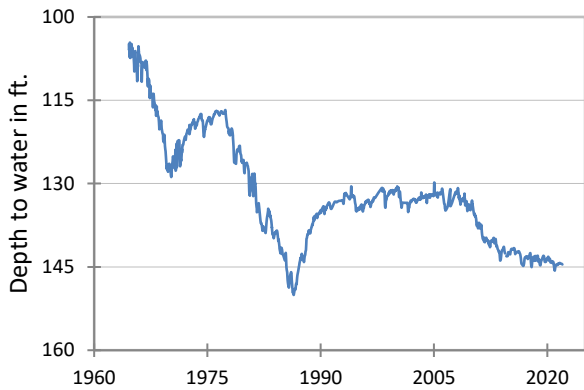
***(1) State Well #03-54-301
Near Spearman, Hansford County
Ogallala Aquifer**



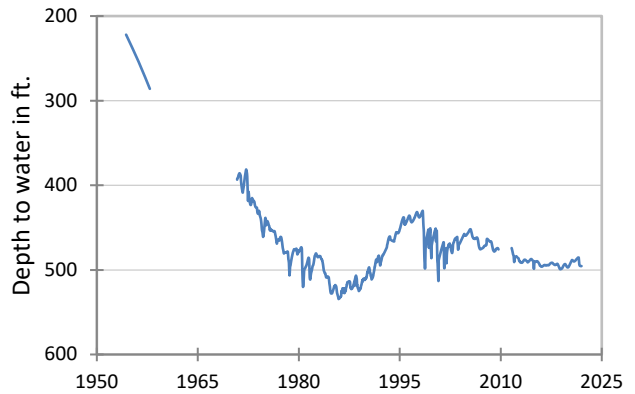
**(2) State Well #10-53-602
Near Earth, Lamb County
Ogallala Aquifer**



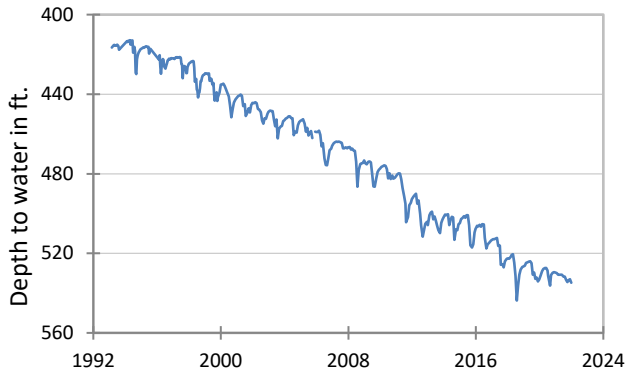
**(3) State Well #27-39-903
Northwest Martin County
Ogallala Aquifer**



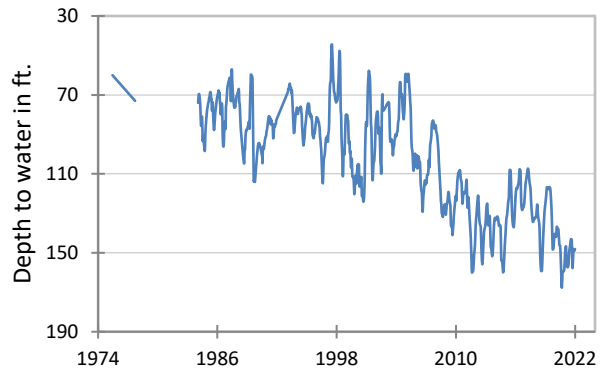
**(4) State Well #33-19-101
Southeast Dallas, Dallas County
Twin Mountains Formation-Trinity Aquifer**



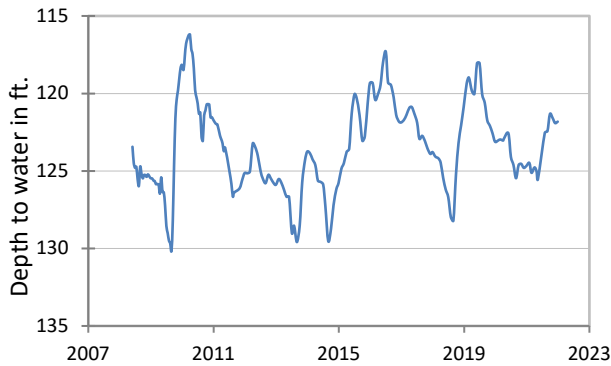
**(5) State Well #40-35-404
Gatesville, Coryell County
Hosston Formation-Trinity Aquifer**



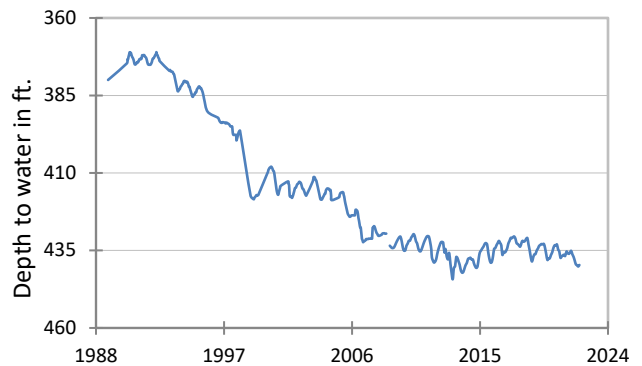
**(6) State Well #68-02-609
Waring, Kendall County
Travis Peak Formation-Trinity Aquifer**



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



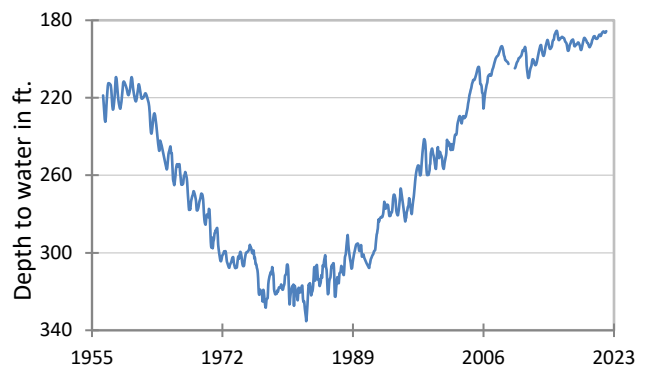
**(9) State Well #34-30-907
Red Springs, Smith County
Carrizo-Wilcox Aquifer**



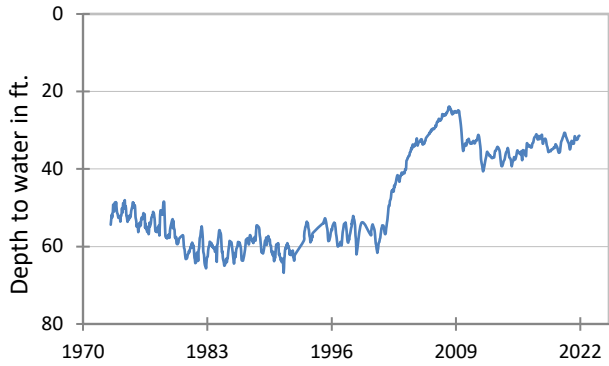
**(10) State Well #77-38-103
Near Cotulla, La Salle County
Carrizo-Wilcox Aquifer**



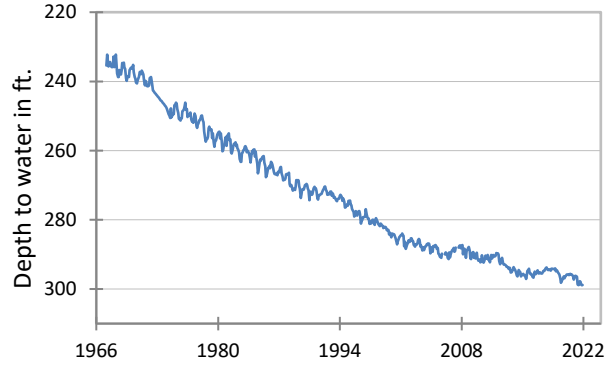
**(11) State Well #65-14-409
North Houston, Harris County
Evangeline Formation-Gulf Coast Aquifer**



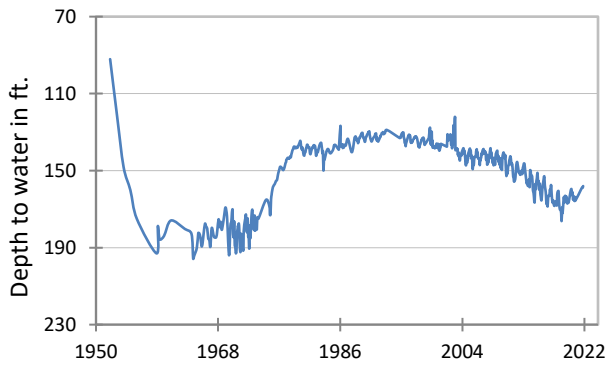
(12) State Well #80-17-502
Near Bloomington, Victoria County
Lissie Formation-Gulf Coast Aquifer



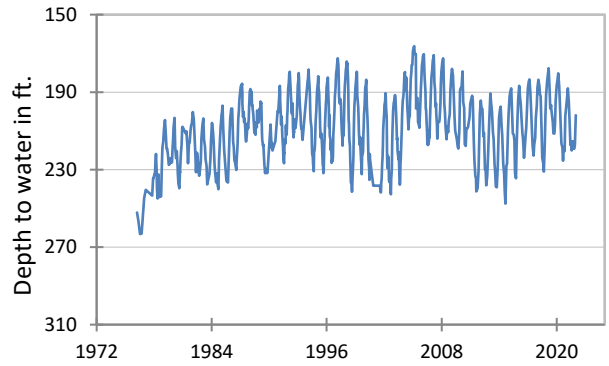
(13) State Well #49-13-301
El Paso, El Paso County
Hueco-Mesilla Bolsons Aquifer



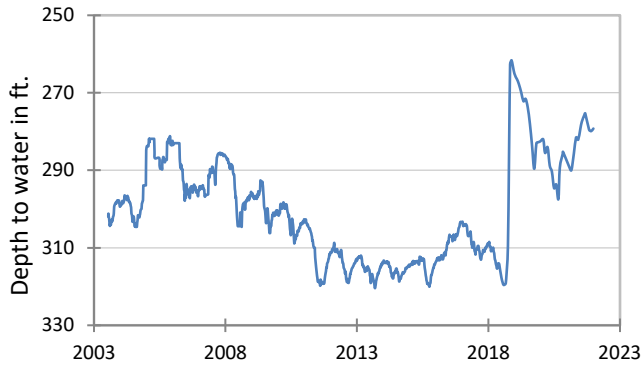
***(14) State Well #46-44-501**
Near Pecos, Reeves County
Pecos Valley Aquifer



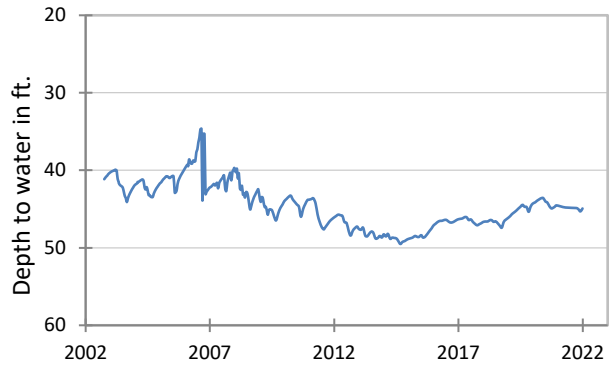
(15) State Well #52-16-802
Fort Stockton, Pecos County
Edwards-Trinity (Plateau) Aquifer



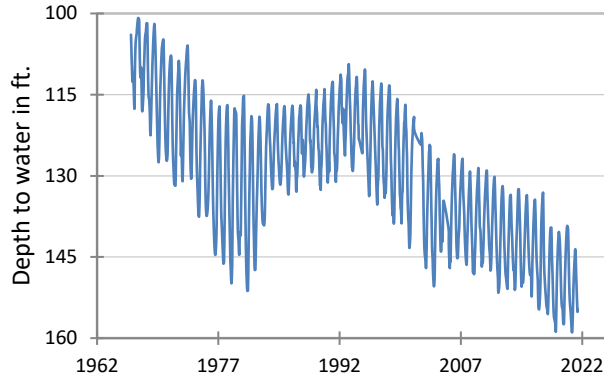
(16) State Well #55-12-134
Eldorado, Schleicher County
Edwards-Trinity (Plateau) Aquifer



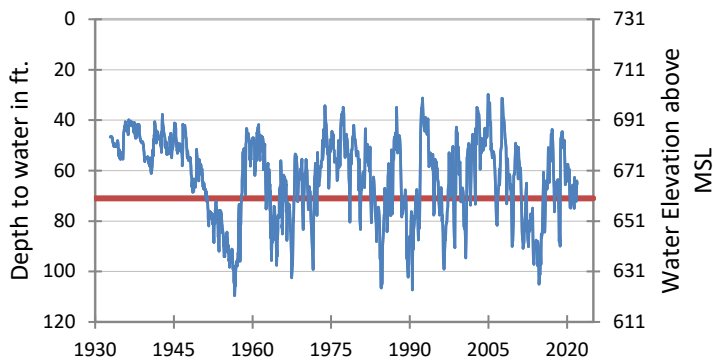
(17) State Well #21-35-748
Near O'Brien, Haskell County
Seymour Aquifer



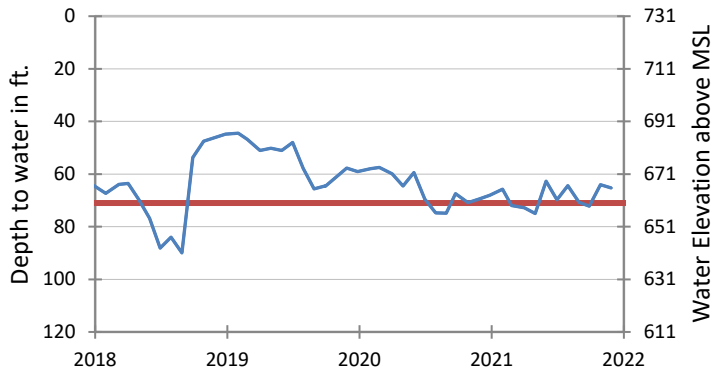
***(18) State Well #48-07-516
Dell City, Hudspeth County
Bone Spring - Victorio Peak Aquifer**



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



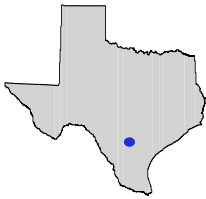
The late December water-level measurement in this Edwards (Balcones Fault Zone) Aquifer well, located at an elevation of 731 feet above mean sea level, was 67.40 feet below land surface, or 663.60 feet above mean sea level. This was 2.10 feet below last month's measurement, 0.70 feet above last year's measurement and 20.76 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 December 2021, Stage 1 drought restrictions were not in effect because the aquifer remained above the Stage 1 critical management level.

*Recorder wells #1, #14, and #18 were offline in December 2021 and did not record data.

HYDROGRAPH OF THE MONTH

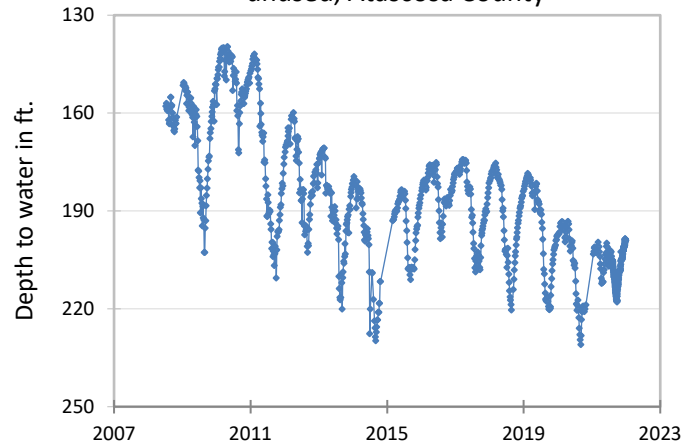


Each month this space features a new hydrograph (marked with the ● symbol on the map) depicting different aquifers and their conditions in Texas.

The Carrizo-Wilcox Aquifer is a major aquifer extending from the Louisiana border to the border of Mexico in a wide band adjacent to and northwest of the Gulf Coast Aquifer. It consists of the Wilcox Group and the overlying Carrizo Formation of the Claiborne Group. The aquifer is primarily composed of sand locally interbedded with gravel, silt, clay, and lignite. The Carrizo-Wilcox Aquifer reaches 3,000 feet in thickness, with the freshwater saturated thickness of the sands averaging 670 feet. Isolated areas of slightly saline to moderately saline groundwater exist in the eastern and central portions of the aquifer and more widespread in the southwest. In the deeper subsurface portions of the aquifer, high iron and manganese exceed secondary drinking water standards. The groundwater, although hard, is generally fresh in the outcrop, whereas softer groundwater occurs in the subsurface. Irrigation accounts for more than half the water pumped, while municipal supply accounts for another 40 percent.

Carrizo-Wilcox Aquifer

Well #78-04-508, 1840 feet deep
unused, Atascosa County



The initial measurement of 157.88 feet below land surface was taken by an automatic water level recorder that was installed by the TWDB in July 2008. The recorder continues to take hourly measurements (available online) and daily measurements (in the groundwater database). The period of record reveals a steady decline in water level equivalent to -3.05 feet/year, with seasonal fluctuations which may be attributed to less pumping for irrigation in the winter months.



Far away (left), and close-up (right) images of well #78-04-508.