Texas Water Conditions Report

Texas Water Development Board

APRIL 2016 RESERVOIR STORAGE

At the end of the month, total storage in 114 of the state's major water supply reservoirs was at 27.49 million acre-feet* or 87% of total conservation storage capacity. This is approximately 0.3 million acre-feet more than a month ago and 4.2 million acre-feet more than storage at this time last year.

Seventy-six (76) reservoirs held 100% of conservation storage capacity, primarily in the North Central (45) and East (21) regions. Two (2) reservoirs remain below 10% full, Palo Duro (3%) and Twin Buttes (7%).

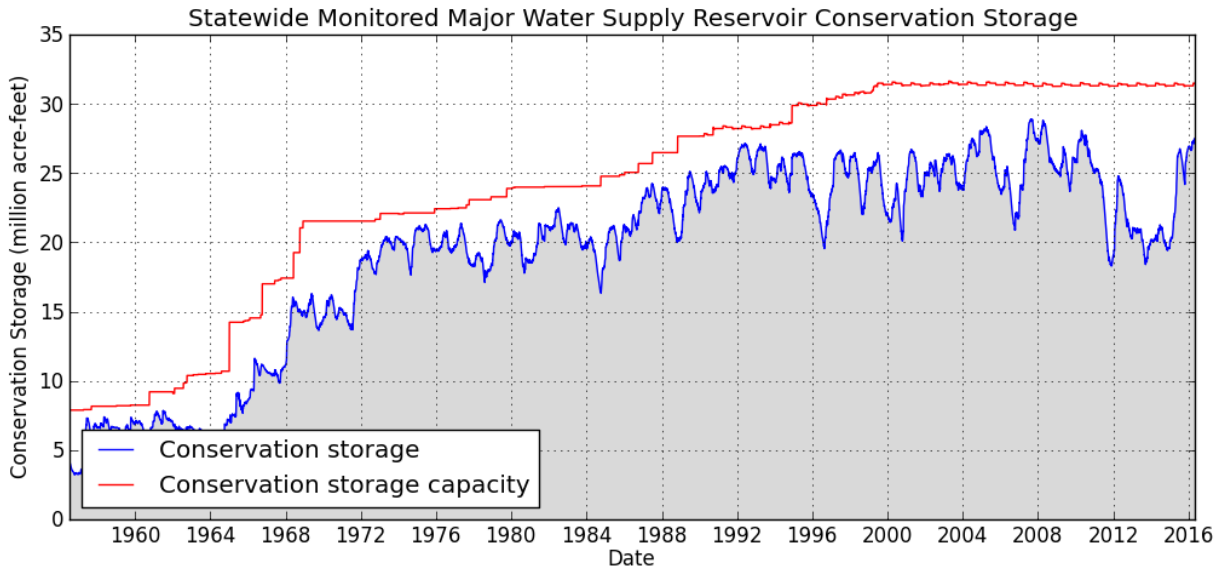
Total combined storage was greater than 70% in the East (100%), Upper Coast (100%), North Central (99%), South Central (95%), Trans-Pecos (91%), and Low Rolling Plains (79%) regions. The region with the lowest percentage of storage was the High Plains (24%) region. Storage increased in seven regions and decline in two regions over the past month.

Elephant Butte reservoir held 335,228 acre-feet or 17% of storage capacity. This is 73,744 acre-feet less than a month ago.

* Only the Texas share of storage in border reservoirs is counted.

CONSERVATION STORAGE DATA FOR 114 MAJOR RESERVOIRS

Storage is based on end of the month data in 114 major reservoirs that represent 96% of the total conservation storage capacity of 188 major water supply reservoirs in Texas. Major reservoirs are defined as having a conservation storage capacity of 5,000 acre-feet or greater.



1700 N. Congress Ave., P.O. Box 13231, Austin, TX 78711-3231
Telephone (512) 463-7847 • Fax (512) 936-0816 • 1-800-RELAYTX (for the hearing impaired)
www.twdb.texas.gov

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS							
Name of Lake or Reservoir	Conservation Storage Capacity (acre-feet)	Conservation Storage end of Apr 2016 (acre-feet)	(%)	Change since end of Mar 2016 (acre-feet)	(%)	Change since end of Apr 2015 (acre-feet)**	(%)
HIGH PLAINS							
Palo Duro Reservoir	61,066	1,614	3	-94	-0	849	1
Meredith, Lake (Texas)	500,000	132,873	27	802	0	104,865	21
Meredith, Lake (Texas & Oklahoma)	779,556	132,873	17	802	0	104,865	13
MacKenzie Reservoir	46,450	7,416	16	-11	-0	4,060	9
White River Lake	29,880	9,721	33	186	1	8,671	29
TOTAL	**637,396**	**151,624**	**24**	**883**	**0**	**118,445**	**19**
LOW ROLLING PLAINS							
Greenbelt Lake	59,968	14,390	24	281	0	6,726	11
N. Fork Buffalo Crk Reservoir	15,400	13,127	85	927	6	12,509	81
Kemp, Lake	245,307	244,238	100	28,311	12	172,402	70
Millers Creek Reservoir	26,768	26,768	100	0	0	24,635	92
Alan Henry Reservoir	94,808	87,794	93	153	0	17,806	19
Stamford, Lake	51,570	51,570	100	0	0	43,002	83
J B Thomas, Lake	199,931	138,880	69	-705	-0	50,765	25
Fort Phantom Hill, Lake	70,030	70,030	100	0	0	45,511	65
Sweetwater, Lake	12,267	2,163	18	364	3	576	5
Colorado City, Lake	30,758	8,256	27	-52	-0	1,274	4
Champion Creek Reservoir	41,580	9,326	22	0	0	6,983	17
Abilene, Lake	7,900	6,559	83	4,025	51	no data	
Coleman, Lake	38,075	38,075	100	6,494	17	24,961	66
Hords Creek Lake	8,443	4,882	58	705	8	1,433	17
TOTAL	**902,805**	**716,058**	**79**	**40,503**	**4**	**408,583**	**45**
NORTH CENTRAL							
Nocona, Lake (Farmers Crk)	21,444	21,444	100	0	0	12,685	59
Hubert H Moss Lake	24,058	22,622	94	1,024	4	-1,436	-6
Texoma, Lake (Texas)	1,258,113	1,258,113	100	49,806	4	0	0
Texoma, Lake (Texas & Oklahoma)	2,525,281	1,258,113	50	49,806	2	0	0
*Pat Mayse Lake	113,683	113,683	100	0	0	no data	
Kickapoo, Lake	86,345	86,345	100	1,285	1	62,146	72
Arrowhead, Lake	230,359	230,359	100	0	0	183,437	80
Bonham, Lake	11,027	11,027	100	1	0	0	0
Crook, Lake	9,195	9,195	100	52	1	0	0
Amon G Carter, Lake	19,266	19,266	100	0	0	no data	
Ray Roberts, Lake	788,167	788,167	100	0	0	12,698	2
Jim Chapman Lake (Cooper)	260,332	260,332	100	0	0	0	0
Graham, Lake	45,288	45,288	100	591	1	27,953	62
*Lost Creek Reservoir	11,950	11,950	100	0	0	4,190	35
Bridgeport, Lake	366,236	366,236	100	0	0	223,834	61
Lewisville Lake	563,228	563,228	100	0	0	0	0
Lavon Lake	406,388	406,388	100	0	0	0	0
Hubbard Creek Reservoir	318,067	199,843	63	56,273	18	161,588	51
Possum Kingdom Lake	523,873	520,937	99	-2,447	-0	165,720	32
*Mineral Wells, Lake	6,760	6,760	100	0	0	0	0
Weatherford, Lake	17,812	17,812	100	0	0	5,091	29
Eagle Mountain Lake	179,880	179,880	100	0	0	45,472	25
Worth, Lake	33,495	33,495	100	0	0	8,066	24
Grapevine Lake	164,703	164,703	100	0	0	11,866	7
Ray Hubbard, Lake	452,040	452,040	100	0	0	61,039	14
New Terrell City Lake	8,583	8,583	100	0	0	0	0
Palo Pinto, Lake	26,766	26,766	100	0	0	18,859	70
Benbrook Lake	85,648	85,648	100	0	0	13,052	15
Arlington, Lake	40,188	40,188	100	250	1	365	1

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS							
Name of Lake or Reservoir	Conservation Storage Capacity (acre-feet)	Conservation Storage end of Apr 2016 (acre-feet)	(%)	Change since end of Mar 2016 (acre-feet)	(%)	Change since end of Apr 2015 (acre-feet)**	(%)
(North Central Continued)							
Joe Pool Lake	175,358	175,358	100	0	0	0	0
*Cisco, Lake	25,895	22,707	88	3,057	12	11,032	43
Leon, Lake	26,476	26,476	100	68	0	9,980	38
Granbury, Lake	125,756	124,392	99	-605	-0	5,673	5
Pat Cleburne, Lake	26,008	26,008	100	0	0	0	0
Waxahachie, Lake	10,780	10,780	100	0	0	0	0
Bardwell Lake	46,122	46,122	100	0	0	0	0
Proctor Lake	55,457	55,457	100	0	0	39,211	71
Whitney, Lake	553,344	553,344	100	2,500	0	124,506	23
Aquilla Lake	43,243	43,243	100	0	0	0	0
Navarro Mills Lake	49,827	49,827	100	0	0	0	0
*Halbert, Lake	6,033	5,668	94	394	7	79	1
Richland-Chambers Reservoir	1,087,839	1,087,839	100	0	0	160,512	15
*Brownwood, Lake	128,839	128,839	100	0	0	62,799	49
Waco, Lake	189,418	189,418	100	0	0	0	0
Limestone, Lake	208,014	208,014	100	0	0	0	0
Belton Lake	435,225	435,225	100	0	0	121,348	28
Stillhouse Hollow Lake	227,771	227,771	100	0	0	73,220	32
Georgetown, Lake	36,823	36,823	100	0	0	13,395	36
Granger Lake	50,779	50,779	100	0	0	0	0
Tawakoni, Lake	871,685	871,685	100	0	0	134,375	15
Mountain Creek, Lake	22,850	22,850	100	668	3	0	0
Squaw Creek, Lake	151,250	151,250	100	2,703	2	0	0
TOTAL	**10,572,229**	**10,500,173**	**99**	**115,620**	**1**	**1,772,755**	**17**
EAST							
Wright Patman Lake	310,382	310,382	100	187,789	61	0	0
*Sulphur Springs, Lake	17,747	17,747	100	1,781	10	0	0
Cypress Springs, Lake	66,756	66,756	100	0	0	0	0
Bob Sandlin, Lake	190,822	190,822	100	0	0	0	0
Caddo, Lake	29,898	29,898	100	0	0	no data	
Martin, Lake	75,726	75,726	100	0	0	297	0
Monticello, Lake	34,740	34,740	100	0	0	102	0
Fork Reservoir, Lake	605,061	605,061	100	3,440	1	5,021	1
O the Pines, Lake	241,363	241,363	100	0	0	0	0
Cedar Creek Reservoir in Trinity	644,686	644,686	100	0	0	0	0
Athens, Lake	29,503	29,503	100	0	0	0	0
Palestine, Lake	367,303	367,303	100	0	0	0	0
Tyler, Lake	72,073	72,073	100	0	0	0	0
Murvaul, Lake	38,285	38,285	100	0	0	0	0
Jacksonville, Lake	25,670	25,670	100	0	0	0	0
Nacogdoches, Lake	39,522	39,522	100	695	2	0	0
Houston County Lake	17,113	17,113	100	0	0	0	0
Sam Rayburn Reservoir	2,857,077	2,857,077	100	0	0	0	0
Toledo Bend Reservoir (Texas)	2,236,450	2,236,450	100	0	0	0	0
Toledo Bend Reservoir (TX & LA)	4,472,900	2,236,450	50	0	0	0	0
*Livingston, Lake	1,785,348	1,785,348	100	0	0	0	0
B A Steinhagen Lake	66,961	61,375	92	2,605	4	4,043	6
Conroe, Lake	410,988	410,988	100	0	0	0	0
TOTAL	10,163,474	10,157,888	100	196,310	2	9,463	0
TRANS-PECOS							
Red Bluff Reservoir	151,110	138,227	91	-993	-1	16,459	11
TOTAL	**151,110**	**138,227**	**91**	**-993**	**-1**	**16,459**	**11**

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS							
Name of Lake or Reservoir	Conservation Storage Capacity (acre-feet)	Conservation Storage end of Apr 2016 (acre-feet)	(%)	Change since end of Mar 2016 (acre-feet)	(%)	Change since end of Apr 2015 (acre-feet)**	(%)
EDWARDS PLATEAU							
Oak Creek Reservoir	39,210	16,358	42	2,404	6	10,520	27
E V Spence Reservoir	517,272	51,469	10	4,252	1	36,287	7
O C Fisher Lake	115,742	18,096	16	-211	-0	17,432	15
*O H Ivie Reservoir	554,340	77,150	14	8,800	2	4,880	1
Twin Buttes Reservoir	182,454	13,633	7	2,175	1	7,651	4
Nasworthy	9,615	7,890	82	169	2	516	5
Brady Creek Reservoir	28,808	12,384	43	350	1	5,002	17
Buchanan, Lake	860,607	808,668	94	36,942	4	491,788	57
Inks, Lake	13,962	12,907	92	-8	-0	-159	-1
Lyndon B Johnson, Lake	115,249	109,480	95	-1,401	-1	-1,217	-1
*Amistad Reservoir (Texas)	1,840,849	1,370,990	74	-5,486	-0	217,525	12
*Amistad Reservoir (TX & Mexico)	3,275,532	1,370,990	42	-5,486	-0	217,525	7
TOTAL	**4,278,108**	**2,499,025**	**58**	**47,986**	**1**	**790,225**	**18**
SOUTH CENTRAL							
Travis, Lake	1,113,348	1,113,348	100	0	0	699,821	63
*Austin, Lake	23,972	22,634	94	46	0	-92	-0
Somerville Lake	147,104	147,104	100	0	0	0	0
Canyon Lake	378,781	378,781	100	0	0	76,230	20
Medina Lake	254,823	163,576	64	4,569	2	152,903	60
*Coleto Creek Reservoir	31,040	31,040	100	3,883	13	0	0
TOTAL	**1,949,068**	**1,856,483**	**95**	**8,498**	**0**	**928,862**	**48**
UPPER COAST							
Houston, Lake	120,686	120,686	100	0	0	0	0
Texana, Lake	159,566	159,566	100	1,925	1	368	0
TOTAL	**280,252**	**280,252**	**100**	**1,925**	**1**	**368**	**0**
SOUTHERN							
Choke Canyon Reservoir	695,262	233,241	34	-6,971	-1	51,044	7
Corpus Christi, Lake	256,961	193,192	75	-7,287	-3	168	0
*Falcon Reservoir (Texas)	1,551,007	767,750	50	-67,834	-4	148,967	10
*Falcon Reservoir (TX & Mexico)	2,646,817	767,750	29	-67,834	-3	148,967	6
TOTAL	**2,503,230**	**1,194,183**	**48**	**-82,092**	**-3**	**200,179**	**8**
STATEWIDE TOTAL							
STATEWIDE TOTAL	**31,437,672**	**27,438,456**	**87**	**319,305**	**1**	**4,234,243**	**13**
Elephant Butte Reservoir	1,973,358	335,228	17	-73,744	-4	-57,630	-3

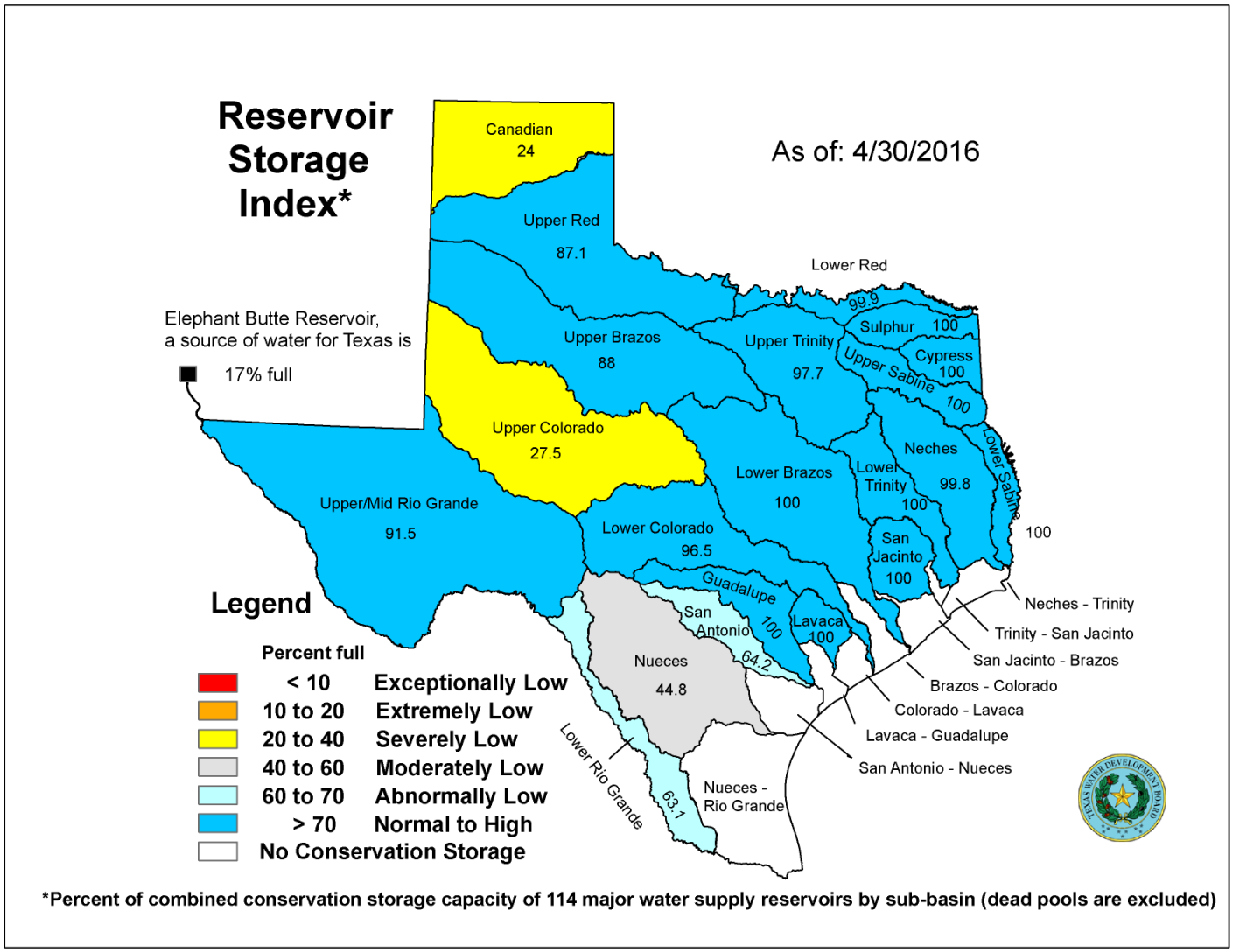
* Conservation volume is used as conservation storage capacity, because the dead storage is unknown.

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

Note:

Conservation storage capacity is the space available to store water above the lowest outlet and below the top of conservation pool, or normal maximum operating level. Conservation storage refers to the volume of water held within the conservation storage space. Not included is any water in flood control storage (above the top of conservation pool or normal maximum operating level) or any water in the dead storage. Conservation storage percentage is based on the conservation storage capacity of the reservoir and the conservation storage in the reservoir on date shown. Percent change is given by 100*(current conservation storage - past conservation storage)/conservation storage capacity. Figures shown are for the Texas share of conservation storage in all reservoirs.

APRIL 2016 RESERVOIR CONDITIONS



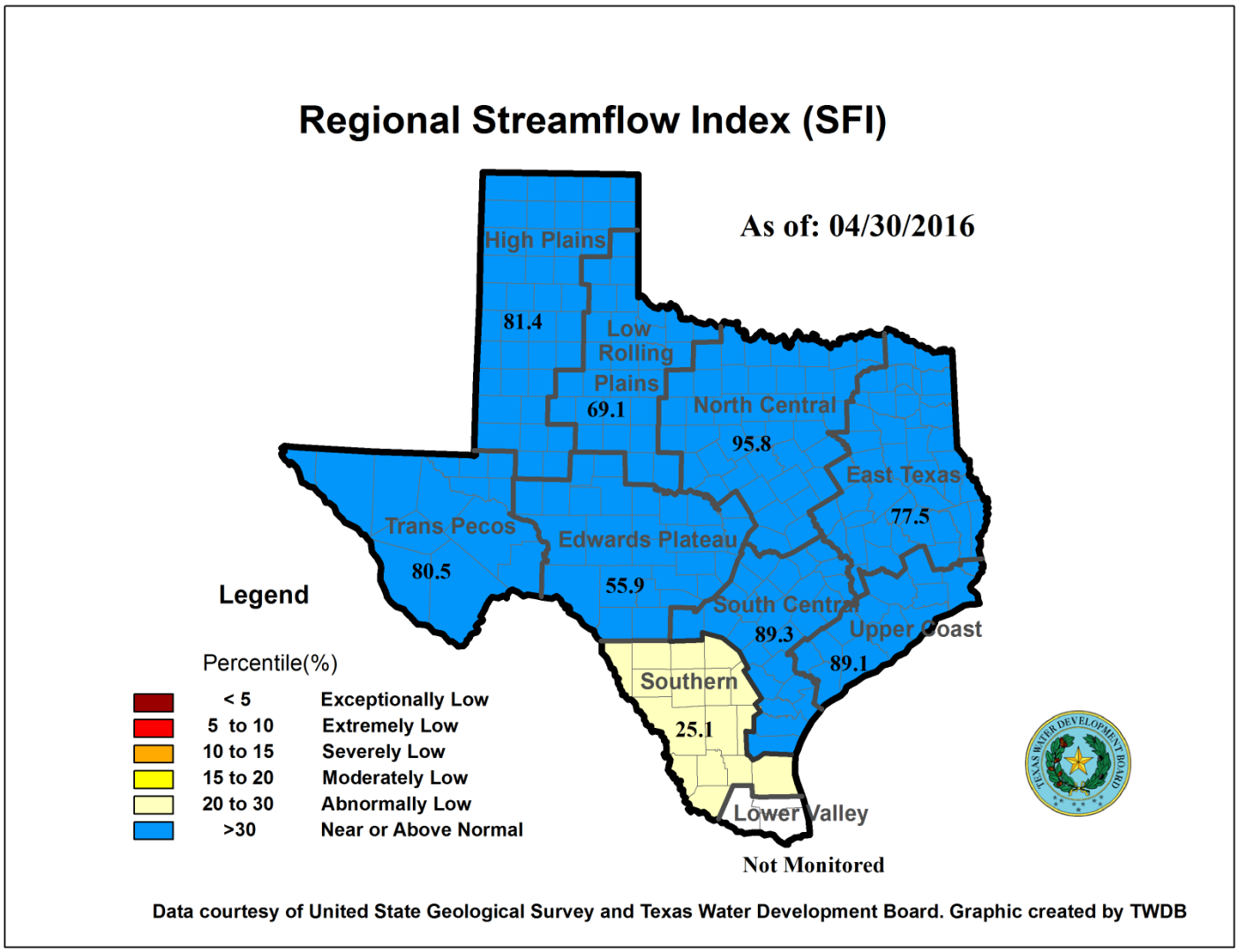
*Reservoir Storage Index is defined as the percent full of conservation storage capacity.

APRIL 2016 STREAMFLOW CONDITIONS

The computed 30-day mean flow status for 29 reporting index stations monitored this month is presented below. Mean flow increased at 13 index stations, decreased at 15 stations, and remained unchanged at 1 station.

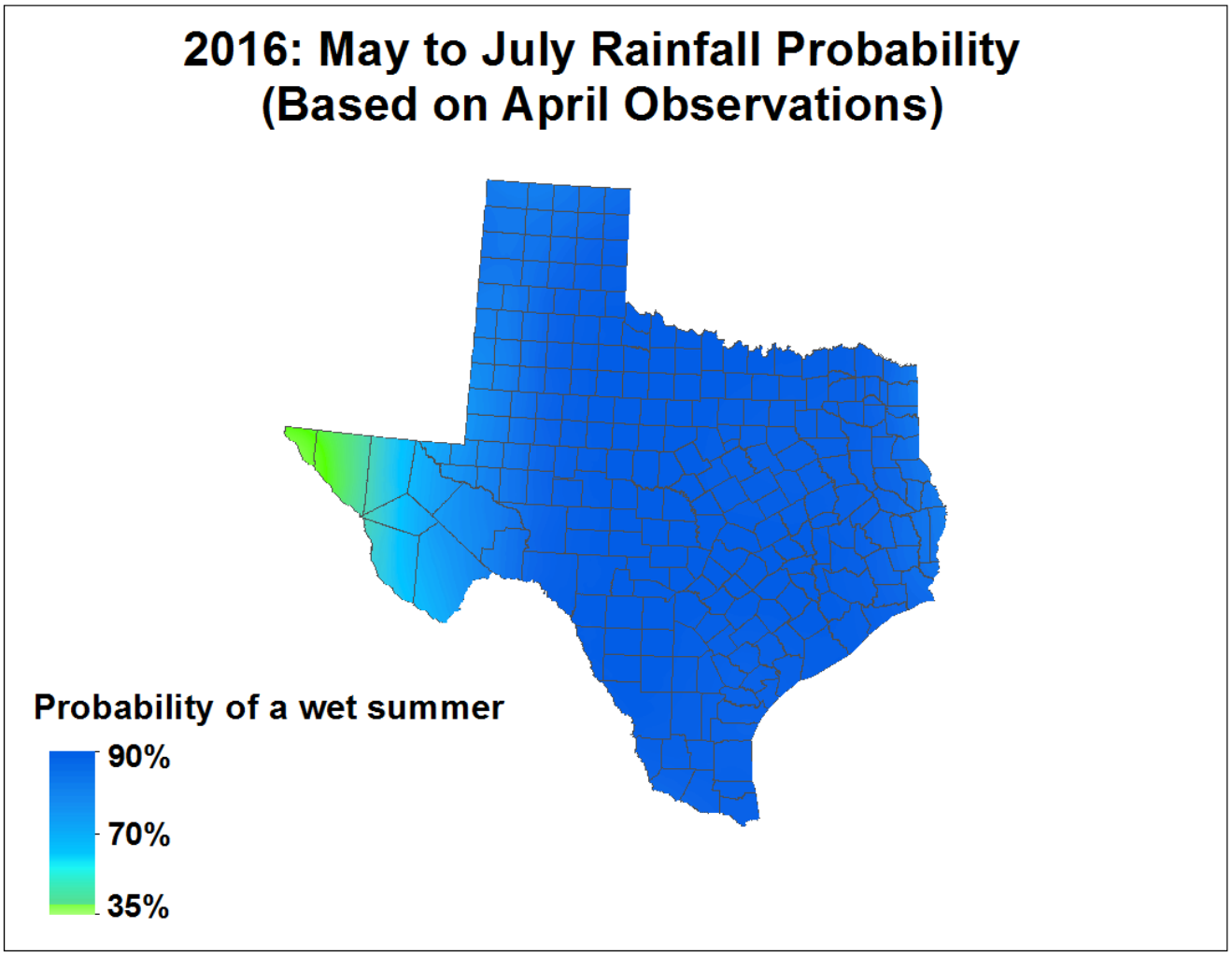
Streamflow Status	Number of Stations
Near or Above Normal (>30%)	26
Abnormally Low (20-30%)	1
Moderately Low (15-20%)	1
Severely Low (10-15%)	0
Extremely Low (5-10%)	1
Exceptionally Low (<5%)	0

On a regional basis, as shown below, flows at index stations were at abnormally low in Southern region and near or above normal in all other eight regions. Streamflow in the Lower Valley region is not monitored.



*Streamflow Index is defined as the percentile flow that exceeds a given percent of observed flows.

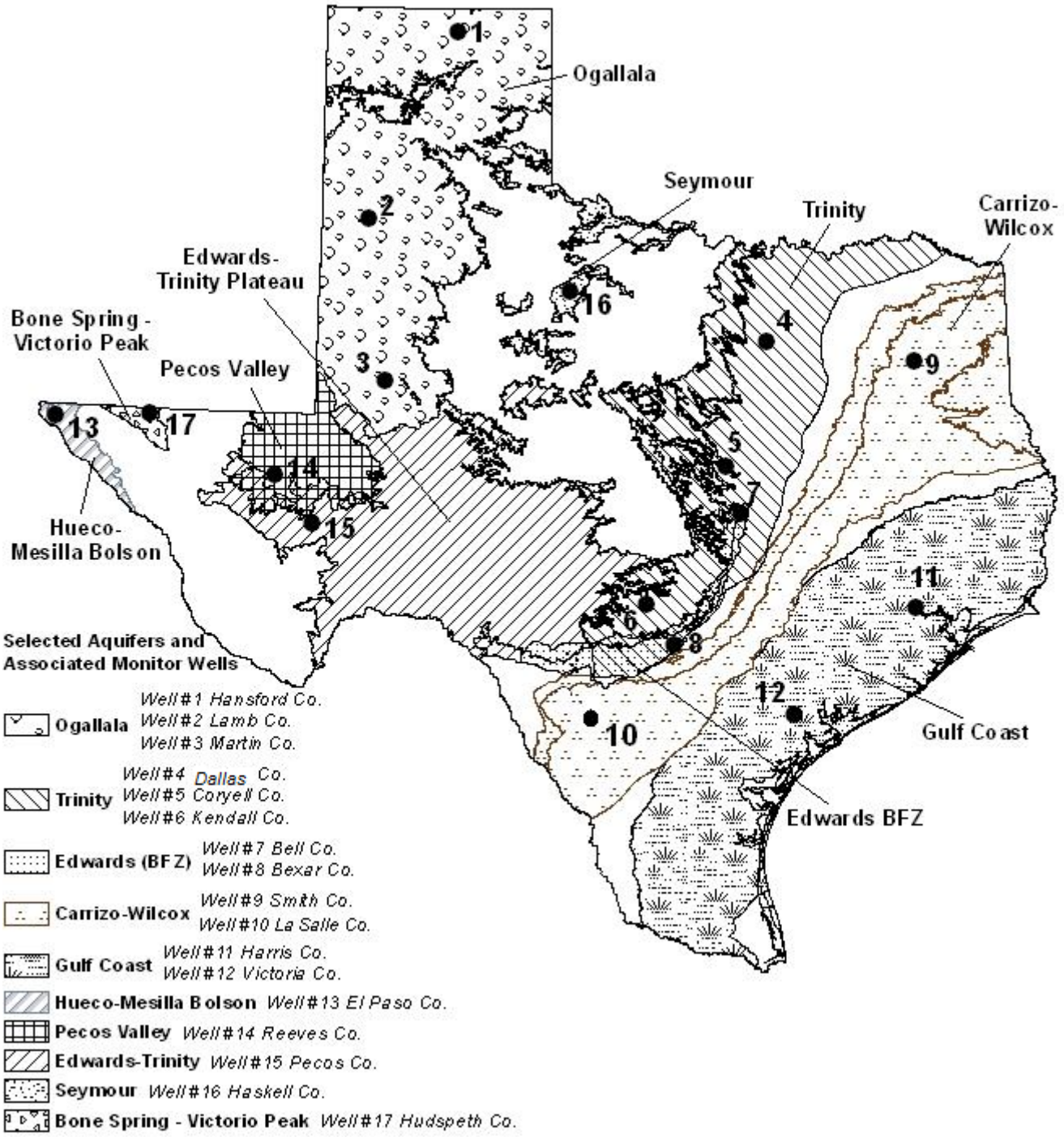
2016 SUMMER RAINFALL PROBABILITY FORECAST



Note:

1. The forecast map (above) provides information on the likelihood that total rainfall from May–July (MJJ) 2016 will be greater than normal, where the term "normal" refers to the average 3-month rainfall observed for MJJ over the time period 1982–2015.
2. The forecast is based on April observations of select atmospheric circulation patterns and soil moisture over Texas known to be influential in driving MJJ rainfall. The forecast is generated using the methodology described in the TWDB Technical Note 15-02 on 'Early warning of summer drought over Texas and the south central United States: spring conditions as a harbinger of summer drought'. It is built on an understanding of the spring drivers of intense summer drought over Texas.
3. A seasonal rainfall forecast typically provides information on the likelihood of above-, near-, or below-normal rainfall for a given season. The forecast is expressed as occurrence probabilities for each of three possible categories: below-normal, near-normal, or above-normal.
4. If there is no clear signal of whether the coming season is going to be wetter or dryer than normal, each category would have an equal likelihood of occurring. Each category would then be assigned a 33.3% probability of occurrence. If, however, there is a clear signal that the coming season is going to be wetter or dryer than normal, then either the wetter or the dryer category will have a greater probability of occurring. For example, if there is a clear signal that the coming MJJ season is going to be dryer than normal, the probabilities for each forecast category might be 55% for the below-normal category, 20% for the near-normal category, and 25% for the above-normal category.
5. For each county, only the highest probability value is shown in shading on the map. For MJJ 2016, all counties have probabilities for above-normal exceeding 35%. Therefore, only the above-normal category is depicted on the map (above).
6. The forecast does not provide information on how much wetter than normal each county is going to be in the MJJ season. The forecast only provides an estimate of what the chances are for each county to experience an MJJ season that will be wetter than the long-term average.
7. The rainfall forecasts provided are only for the MJJ season because the tool is specifically designed to incorporate physical mechanisms in the spring known to influence summer rainfall over Texas. Further research on drivers of rainfall in other seasons is needed before a tool to forecast rainfall in these seasons can be developed.
8. The MJJ rainfall probability forecasts by county are available at: http://www.waterdatafortexas.org/drought/drought-forecast

APRIL 2016 GROUNDWATER LEVELS IN OBSERVATION WELLS



April 2016

Water-level measurements were available for 17 key monitoring wells in the state. Water levels rose in eight monitoring wells since the beginning of April, ranging from an increase of 0.01 feet in the Haskell County Seymour Aquifer well to 6.00 feet in the Bexar County Edwards (Balcones Fault Zone) Aquifer well. Water levels declined in nine monitoring wells, ranging from a decline of 0.05 feet in the Lamb County Ogallala Aquifer well to 6.34 feet in the Pecos County Edwards-Trinity (Plateau) Aquifer well. The J-17 well in San Antonio recorded a water level of 59.81 feet below land surface or 671.19 feet above mean sea level. There are no restrictions currently in place for the San Antonio portion of the Edwards (Balcones Fault Zone), with water levels at 11.19 feet above Stage I critical management levels.

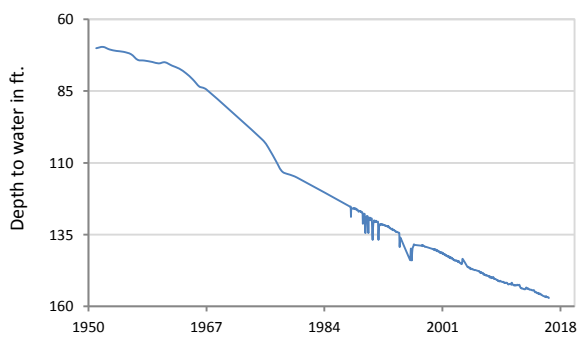
***IDs used in this publication on the aquifer map to indicate the monitoring well location (IDs 1 - 17) are different than the TWDB's six- or seven-digit state well identification number.**

Monitoring Well	April	March	Month Change	Year Change	Historical Change	First Measured
(1) Hansford 0354301	157.07	156.8	-0.27	-0.98	-86.95	1951
(2) Lamb 1053602	146.58	146.53	-0.05	-1.24	-118.43	1951
(3) Martin 2739903	142.49	142.22	-0.27	-0.69	-37.6	1964
(4) Dallas 3319101	495.08	495.47	0.39	-4.88	-273.08	1954
(5) Coryell 4035404	506.58	505.63	-0.95	-4.41	-214.58	1955
(6) Kendall 6802609	113.69	115.7	2.01	7.93	-53.69	1975
(7) Bell 5804816	119.46	120.04	0.58	4.11	3.67	2008
(8) Bexar 6837203	59.81	65.81	6	19.29	-13.17	1932
(9) Smith 3430907	431.9	432.57	0.67	1.02	-65.9	1987
(10) La Salle 7738103	453.9	456.84	2.94	49.68	-200.83	2003
(11) Harris 6514409	188.82	188.55	-0.27	-1.89	-53.32*	1947**
(12) Victoria 8017502	36.64	36.23	-0.41	-0.36	-2.64	1958
(13) El Paso 4913301	295.77	296.76	0.99	0.19	-63.84	1964
(14) Reeves 4644501	162.69	159.85	-2.84	-2.84	-70.6	1952
(15) Pecos 5216802	202.99	196.65	-6.34	-6.26	43.89	1976
(16) Haskell 2135748	46.52	46.53	0.01	2.06	-3.52	2002
(17) Hudspeth 4807516	144.28	139.13	-5.15	-1.99	-40.36	1966

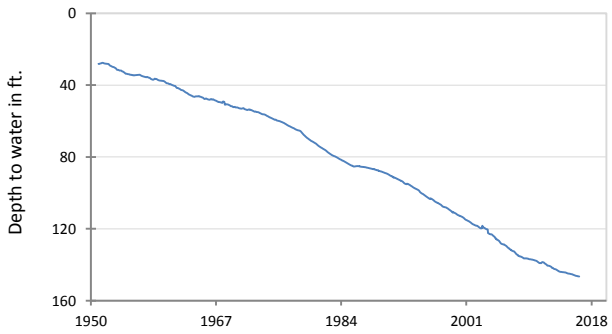
*Change since the original measurement of 135.5 feet below land surface in 1947 (**measurement not shown on the hydrograph)

APRIL 2016 GROUNDWATER LEVELS IN OBSERVATION WELLS

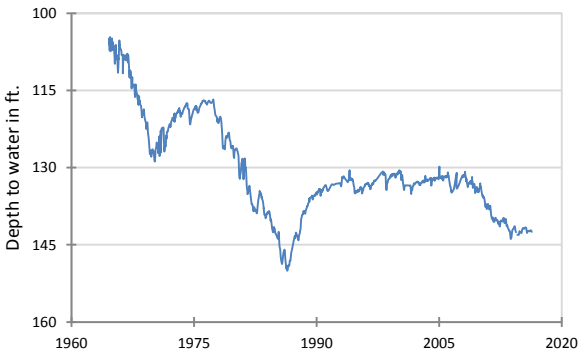
(1) State Well ID 03-54-301
Near Spearman, Hansford County
Ogallala Aquifer



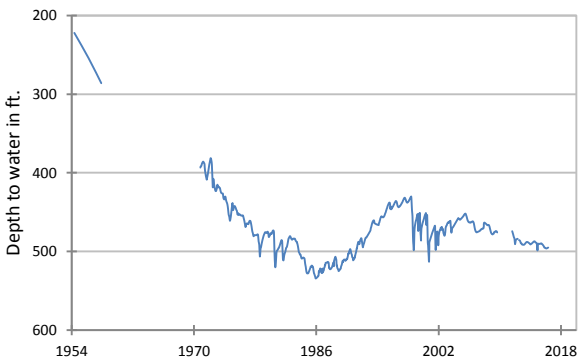
(2) State Well ID 10-53-602
Near Earth, Lamb County
Ogallala Aquifer



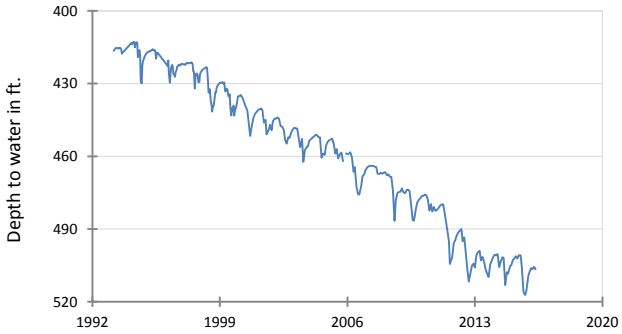
(3) State Well ID 27-39-903
Northwest Martin County
Ogallala Aquifer



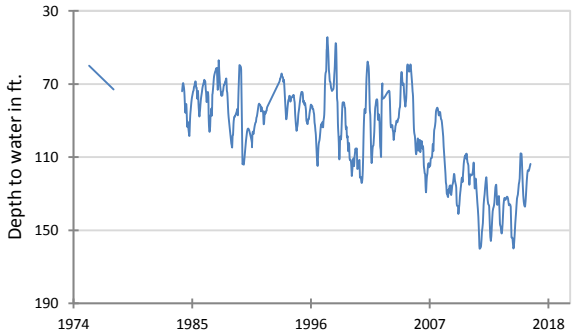
(4) State Well ID 33-19-101
Southeast Dallas, Dallas County
Twin Mountains Formation-Trinity Aquifer



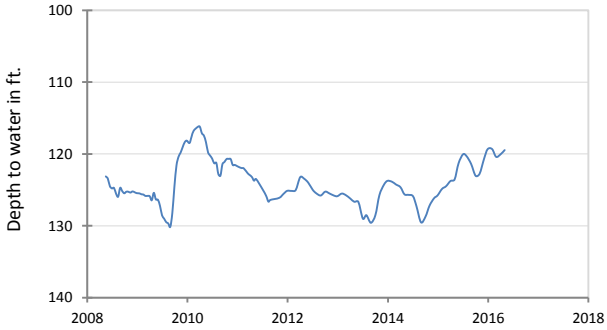
(5) State Well ID 40-35-404
Gatesville, Coryell County
Hosston Formation-Trinity Aquifer



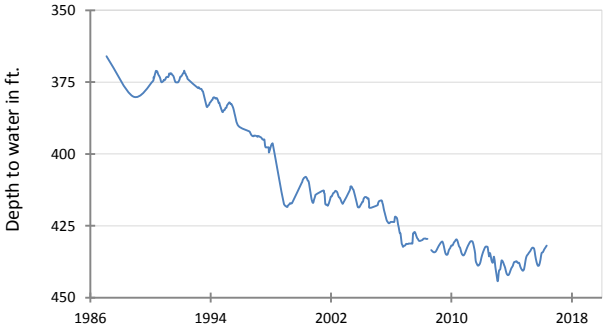
(6) State Well ID 68-02-609
Waring, Kendall County
Cow Creek Formation-Trinity Aquifer



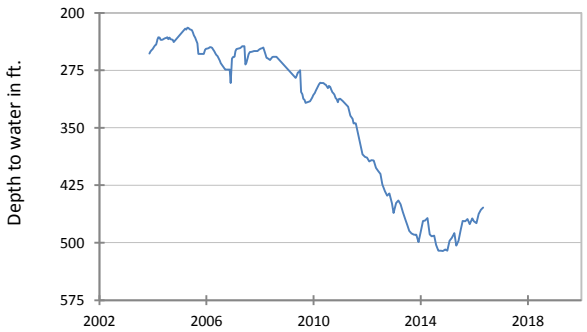
(7) State Well ID 58-04-816
Near Salado, Bell County
Edwards (Balcones Fault Zone) Aquifer



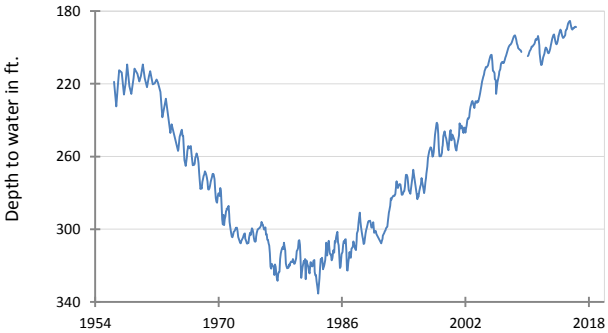
(9) State Well ID 34-30-907
Red Springs, Smith County
Carrizo-Wilcox Aquifer



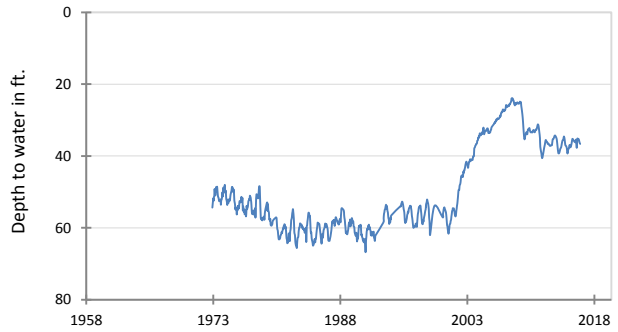
(10) State Well ID 77-38-103
Near Cotulla, La Salle County
Carrizo-Wilcox Aquifer



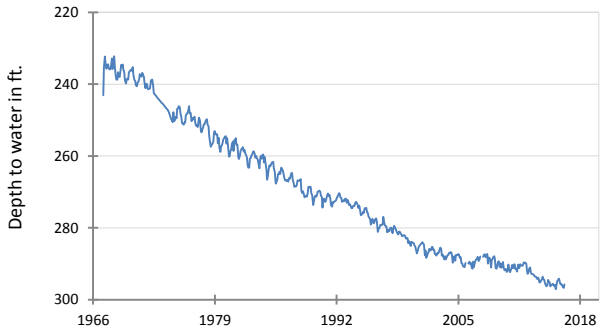
(11) State Well ID 65-14-409
Alief, Harris County
Evangeline Formation-Gulf Coast Aquifer



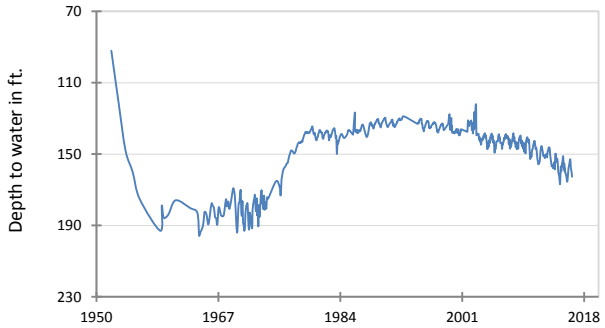
(12) State Well ID 80-17-502
Near Bloomington, Victoria County
Lissie Formation-Gulf Coast Aquifer



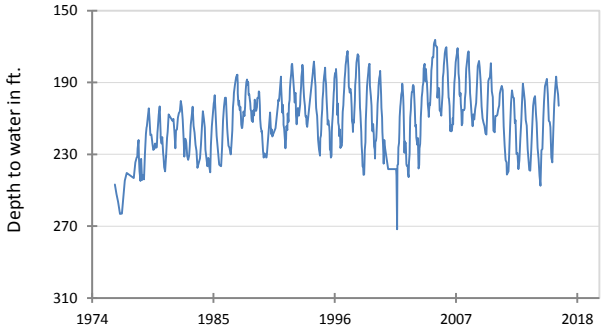
(13) State Well ID 49-13-301
El Paso, El Paso County
Hueco-Mesilla Bolson Aquifer



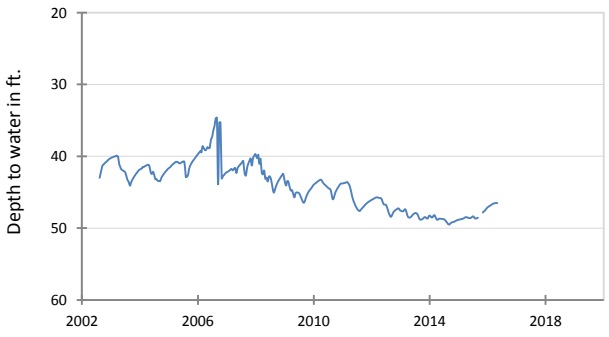
(14) State Well ID 46-44-501
Near Pecos, Reeves County
Pecos Valley Aquifer



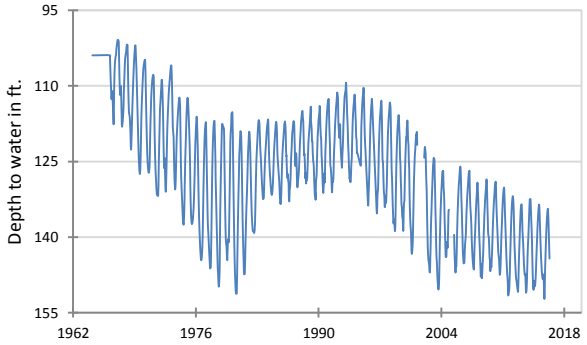
(15) State Well ID 52-16-802
Fort Stockton, Pecos County
Edwards-Trinity (Plateau) Aquifer



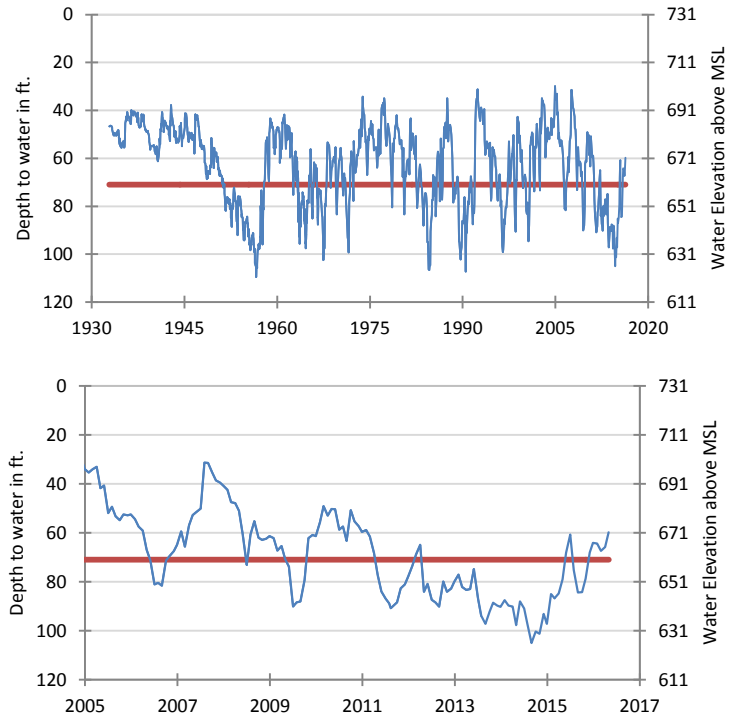
(16) State Well ID 21-35-748
Near O'Brien, Haskell County
Seymour Aquifer



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



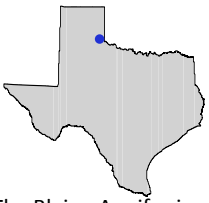
(8) State Well ID 68-37-203 (J-17)
In San Antonio, Bexar County
Edwards (Balcones Fault Zone) Aquifer



The late April water-level measurement in this Edwards (Balcones Fault Zone) Aquifer well, elevation 731 feet above mean sea level, was 59.81 feet below land surface, or 671.19 feet above mean sea level. This was 6.00 feet above last month's measurement, 19.29 feet above last year's measurement, and 13.17 feet below the initial measurement recorded in 1932.

***** Water levels below the red line indicate periods in which Edwards Aquifer Authority Stage I drought restrictions are in effect. *****

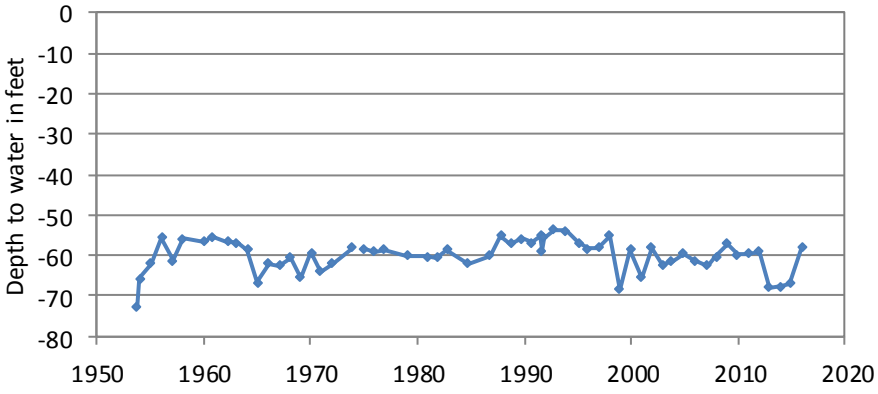
HYDROGRAPH OF THE MONTH



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

Blaine Aquifer

Well # 1223603, 177 feet deep
Irrigation, northern Childress County



The Blaine Aquifer is a minor aquifer located at the east end of the High Plains in North Texas. The aquifer is part of the Permian Blaine Formation, which is composed of red silty shale, gypsum, anhydrite, salt, and dolomite. The formation consists of cycles of marine and non-marine sediments deposited in a broad, shallow sea that once covered the southwestern United States. Groundwater occurs primarily in solution channels and caverns within the beds of anhydrite and gypsum that contribute to the overall poor quality of the water. Although some wells contain slightly saline water, with total dissolved solids between 1,000 and 3,000 milligrams per liter, most contain moderately saline water, with total dissolved solids between 3,000 and 10,000 milligrams per liter, with almost all exceeding the secondary drinking water standard of 1,000 milligrams per liter. Sulfate values are also well in excess of their secondary drinking water standard of 300 milligrams per liter. Water from the Blaine Aquifer is used for livestock and for irrigation of crops that are highly tolerant of salt.

The water level has been measured consistently in this well since 1953, with the TWDB taking over measuring in 1962. The initial measurement of 72.75 feet below land surface in 1953 has proven to be the lowest measurement in the period of record thus far. Since the initial measurement in 1953, the measurements have stayed within a range of 14.88 feet with the highest measurement of 53.62 feet below land surface observed in 1992.