

## *MARCH 2016 RESERVOIR STORAGE*

At the end of the month, total storage in 114 of the state's major water supply reservoirs was at 27.17 million acre-feet\* or 87% of total conservation storage capacity. This is 351,150 acre-feet more than a month ago and 5.3 million acre-feet more than storage at this time last year.

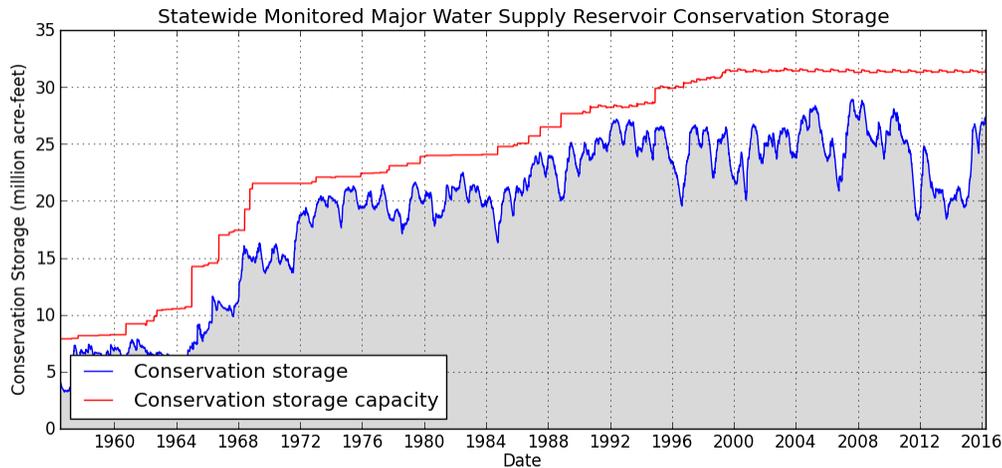
Sixty-four (64) reservoirs held 100% of conservation storage capacity, primarily in the North Central (39) and East (18) regions. Three (3) reservoirs remain below 10% full, Palo Duro (3%), E.V. Spence (9%), and Twin Buttes (6%).

Total combined storage was greater than 70% in the East (100%), Upper Coast (99%), North Central (98%), South Central (95%), Trans-Pecos (92%), and Low Rolling Plains (75%) regions. The region with the lowest percentage of storage was the High Plains (24%) region. Storage increased in six regions and decline in three regions over the past month.

Elephant Butte reservoir held 409,187 acre-feet or 21% of storage capacity. This is 8,139 acre-feet more 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.

**CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS**

Name of Lake or Reservoir	Conservation Storage Capacity (acre-feet)	Conservation Storage end of Mar 2016		Change since end of Feb 2016		Change since end of Mar 2015		
		(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)	
<b>HIGH PLAINS</b>								
Palo Duro Reservoir	61,066	1,690	3	-165	-0	870	1	
Meredith, Lake (Texas)	500,000	132,071	26	0	0	104,143	21	
Meredith, Lake (Texas & Oklahoma)	779,556	132,071	17	0	0	104,143	13	
MacKenzie Reservoir	46,450	7,427	16	-106	-0	4,105	9	
White River Lake	29,880	9,535	32	-328	-1	8,480	28	
<b>TOTAL</b>	<b>637,396</b>	<b>150,723</b>	<b>24</b>	<b>-599</b>	<b>-0</b>	<b>117,598</b>	<b>18</b>	
<b>LOW ROLLING PLAINS</b>								
Greenbelt Lake	59,968	14,109	24	-110	-0	6,579	11	
N. Fork Buffalo Crk Reservoir	15,400	12,200	79	-462	-3	11,673	76	
Kemp, Lake	245,307	215,927	88	-6,686	-3	147,537	60	
Millers Creek Reservoir	26,768	26,768	100	0	0	24,776	93	
Alan Henry Reservoir	94,808	87,641	92	-1,493	-2	17,478	18	
Stamford, Lake	51,570	51,570	100	0	0	46,271	90	
J B Thomas, Lake	199,931	139,585	70	-2,061	-1	51,424	26	
Fort Phantom Hill, Lake	70,030	70,030	100	1,210	2	47,166	67	
Sweetwater, Lake	12,267	1,799	15	65	1	190	2	
Colorado City, Lake	30,758	8,308	27	-222	-1	1,841	6	
Champion Creek Reservoir	41,580	9,326	22	-129	-0	6,958	17	
Abilene, Lake	7,900	2,534	32	256	3	no data		
Coleman, Lake	38,075	31,581	83	1,317	3	19,743	52	
Hords Creek Lake	8,443	4,177	49	118	1	693	8	
<b>TOTAL</b>	<b>902,805</b>	<b>675,555</b>	<b>75</b>	<b>-8,197</b>	<b>-1</b>	<b>382,329</b>	<b>42</b>	
<b>NORTH CENTRAL</b>								
Nocona, Lake (Farmers Crk)	21,444	21,444	100	0	0	14,468	67	
Hubert H Moss Lake	24,058	21,598	90	-732	-3	-2,406	-10	
Texoma, Lake (Texas)	1,258,113	1,208,307	96	19,821	2	71,699	6	
Texoma, Lake (Texas & Oklahoma)	2,525,281	1,208,307	48	19,821	1	71,699	3	
*Pat Mayse Lake	113,683	113,683	100	0	0	no data		
Kickapoo, Lake	86,345	85,060	99	-1,285	-1	60,102	70	
Arrowhead, Lake	230,359	230,359	100	0	0	184,315	80	
Bonham, Lake	11,027	11,026	100	-1	-0	84	1	
Crook, Lake	9,195	9,143	99	-52	-1	-52	-1	
Amon G Carter, Lake	19,266	19,266	100	0	0	8,305	43	
Ray Roberts, Lake	788,167	788,167	100	0	0	149,470	19	
Jim Chapman Lake (Cooper)	260,332	260,332	100	0	0	36,528	14	
Graham, Lake	45,288	44,697	99	-591	-1	27,546	61	
*Lost Creek Reservoir	11,950	11,950	100	0	0	4,592	38	
Bridgeport, Lake	366,236	366,236	100	0	0	226,168	62	
Lewisville Lake	563,228	563,228	100	0	0	106,053	19	
Lavon Lake	406,388	406,388	100	0	0	86,943	21	
Hubbard Creek Reservoir	318,067	143,570	45	-1,666	-1	103,659	33	
Possum Kingdom Lake	523,873	523,384	100	-489	-0	181,616	35	
*Mineral Wells, Lake	6,760	6,760	100	0	0	3,302	49	
Weatherford, Lake	17,812	17,812	100	0	0	7,176	40	
Eagle Mountain Lake	179,880	179,880	100	0	0	75,222	42	
Worth, Lake	33,495	33,495	100	0	0	10,658	32	
Grapevine Lake	164,703	164,703	100	0	0	55,138	33	
Ray Hubbard, Lake	452,040	452,040	100	0	0	114,243	25	
New Terrell City Lake	8,583	8,583	100	0	0	0	0	
Palo Pinto, Lake	26,766	26,766	100	0	0	24,333	91	
Benbrook Lake	85,648	85,648	100	1,354	2	22,061	26	
Arlington, Lake	40,188	39,938	99	-250	-1	4,108	10	

**CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS**

Name of Lake or Reservoir	Conservation Storage Capacity (acre-feet)	Conservation Storage end of Mar 2016		Change since end of Feb 2016		Change since end of Mar 2015		
		(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)	
<i>(North Central Continued)</i>								
Joe Pool Lake	175,358	175,358	100	0	0	0	0	
*Cisco, Lake	25,895	19,650	76	-27	-0	7,805	30	
Leon, Lake	26,476	26,408	100	12	0	9,902	37	
Granbury, Lake	125,756	124,997	99	-759	-1	49,158	39	
Pat Cleburne, Lake	26,008	26,008	100	0	0	7,201	28	
Waxahachie, Lake	10,780	10,780	100	0	0	262	2	
Bardwell Lake	46,122	46,122	100	0	0	no data		
Proctor Lake	55,457	55,457	100	0	0	39,095	70	
Whitney, Lake	553,344	550,618	100	44,510	8	176,401	32	
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	5,274	87	44	1	-44	-1	
Richland-Chambers Reservoir	1,087,839	1,087,839	100	0	0	251,109	23	
*Brownwood, Lake	128,839	128,839	100	257	0	66,815	52	
Waco, Lake	189,418	189,418	100	0	0	6,022	3	
Limestone, Lake	208,014	208,014	100	123	0	0	0	
Belton Lake	435,225	435,225	100	0	0	130,375	30	
Stillhouse Hollow Lake	227,771	227,771	100	0	0	75,658	33	
Georgetown, Lake	36,823	36,823	100	0	0	11,867	32	
Granger Lake	50,779	50,779	100	0	0	0	0	
Tawakoni, Lake	871,685	871,685	100	0	0	227,903	26	
Mountain Creek, Lake	22,850	22,205	97	1,459	6	-645	-3	
Squaw Creek, Lake	151,250	148,547	98	-500	-0	1,370	1	
<b>TOTAL</b>	<b>10,627,686</b>	<b>10,384,350</b>	<b>98</b>	<b>61,228</b>	<b>1</b>	<b>2,635,585</b>	<b>25</b>	
<b>EAST</b>								
Wright Patman Lake	122,593	122,593	100	0	0	0	0	
*Sulphur Springs, Lake	17,747	15,966	90	-1,781	-10	-1,781	-10	
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	0	0	
Monticello, Lake	34,740	34,740	100	0	0	0	0	
Fork Reservoir, Lake	605,061	601,621	99	-3,440	-1	71,630	12	
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	981	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	
Murvail, 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	38,827	98	-194	-0	-695	-2	
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	14,268	1	0	0	
Toledo Bend Reservoir (TX & LA)	4,472,900	2,236,450	50	14,268	0	0	0	
*Livingston, Lake	1,785,348	1,785,348	100	0	0	0	0	
B A Steinhagen Lake	66,961	58,770	88	-5,265	-8	4,565	7	
Conroe, Lake	410,988	410,988	100	0	0	0	0	
<b>TOTAL</b>	<b>9,975,685</b>	<b>9,961,578</b>	<b>100</b>	<b>3,588</b>	<b>0</b>	<b>74,700</b>	<b>1</b>	
<b>TRANS-PECOS</b>								
Red Bluff Reservoir	151,110	139,220	92	2,376	2	8,945	6	
<b>TOTAL</b>	<b>151,110</b>	<b>139,220</b>	<b>92</b>	<b>2,376</b>	<b>2</b>	<b>8,945</b>	<b>6</b>	

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS							
Name of Lake or Reservoir	Conservation Storage Capacity (acre-feet)	Conservation Storage end of Mar 2016		Change since end of Feb 2016		Change since end of Mar 2015	
		(acre-feet)	(%)	(acre-feet)	(%)	(acre-feet)**	(%)
<b>EDWARDS PLATEAU</b>							
Oak Creek Reservoir	39,210	13,954	36	136	0	8,084	21
E V Spence Reservoir	517,272	47,217	9	-1,608	-0	37,567	7
O C Fisher Lake	115,742	18,307	16	-253	-0	17,669	15
*O H Ivie Reservoir	554,340	68,350	12	187	0	-7,392	-1
Twin Buttes Reservoir	182,454	11,458	6	1,596	1	5,040	3
Nas worthy	9,615	7,721	80	-12	-0	300	3
Brady Creek Reservoir	28,808	12,034	42	1,340	5	4,341	15
Buchanan, Lake	860,607	771,726	90	59,794	7	460,878	54
Inks, Lake	13,962	12,915	93	0	0	75	1
Lyndon B Johnson, Lake	115,249	110,881	96	-245	-0	-61	-0
*Amistad Reservoir (Texas)	1,840,849	1,376,476	75	139,755	8	221,698	12
*Amistad Reservoir (TX & Mexico)	3,275,532	1,376,476	42	139,755	4	221,698	7
<b>TOTAL</b>	<b>4,278,108</b>	<b>2,451,039</b>	<b>57</b>	<b>200,690</b>	<b>5</b>	<b>748,199</b>	<b>17</b>
<b>SOUTH CENTRAL</b>							
Travis, Lake	1,113,348	1,113,348	100	57,863	5	712,390	64
*Austin, Lake	23,972	22,588	94	-307	-1	-788	-3
Somerville Lake	147,104	147,104	100	0	0	0	0
Canyon Lake	378,781	378,781	100	0	0	84,023	22
Medina Lake	254,823	159,007	62	-1,298	-1	150,700	59
*Coletto Creek Reservoir	31,040	27,157	87	-2,476	-8	-3,883	-13
<b>TOTAL</b>	<b>1,949,068</b>	<b>1,847,985</b>	<b>95</b>	<b>53,782</b>	<b>3</b>	<b>942,442</b>	<b>48</b>
<b>UPPER COAST</b>							
Houston, Lake	120,686	120,686	100	0	0	0	0
Texana, Lake	159,566	157,641	99	-1,833	-1	-1,925	-1
<b>TOTAL</b>	<b>280,252</b>	<b>278,327</b>	<b>99</b>	<b>-1,833</b>	<b>-1</b>	<b>-1,925</b>	<b>-1</b>
<b>SOUTHERN</b>							
Choke Canyon Reservoir	695,262	240,212	35	276	0	65,889	9
Corpus Christi, Lake	256,961	200,479	78	-2,048	-1	49,734	19
*Falcon Reservoir (Texas)	1,551,007	835,584	54	41,887	3	262,210	17
*Falcon Reservoir (TX & Mexico)	2,646,817	835,584	32	41,887	2	262,210	10
<b>TOTAL</b>	<b>2,503,230</b>	<b>1,276,275</b>	<b>51</b>	<b>40,115</b>	<b>2</b>	<b>377,833</b>	<b>15</b>
<b>STATEWIDE TOTAL</b>							
<b>STATEWIDE TOTAL</b>	<b>31,305,340</b>	<b>27,165,052</b>	<b>87</b>	<b>351,150</b>	<b>1</b>	<b>5,285,706**</b>	<b>17</b>
Elephant Butte Reservoir	1,973,358	409,187	21	8,139	0	41,875	2

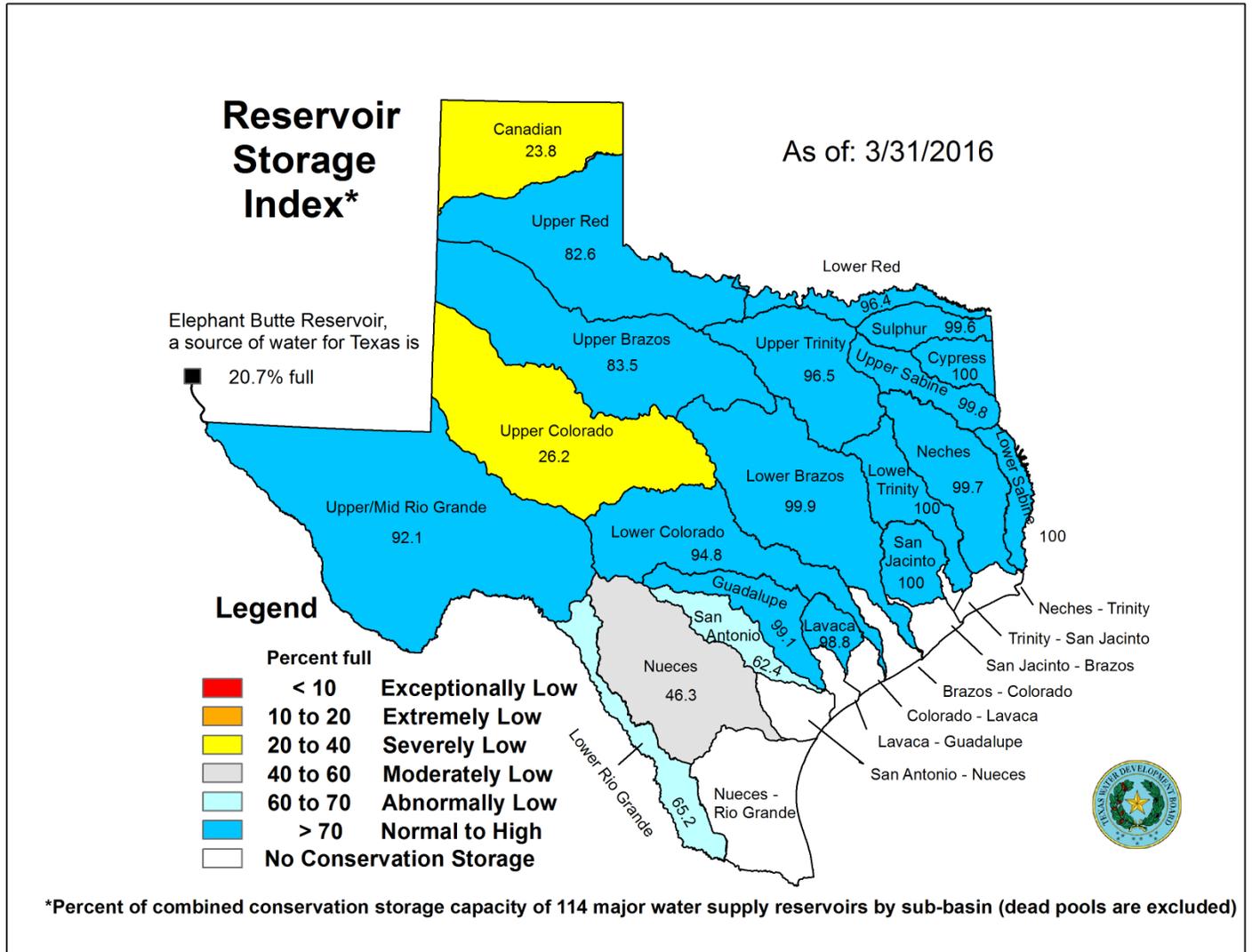
\* Conservation volume is used as conservation storage capacity, because the dead storage is unknown.

\*\* Yearly changes do not include reservoirs that did not have data in last March.

**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  $100 * (\text{current conservation storage} - \text{past conservation storage}) / \text{conservation storage capacity}$ . Figures shown are for the Texas share of conservation storage in all reservoirs.

# MARCH 2016 RESERVOIR CONDITIONS



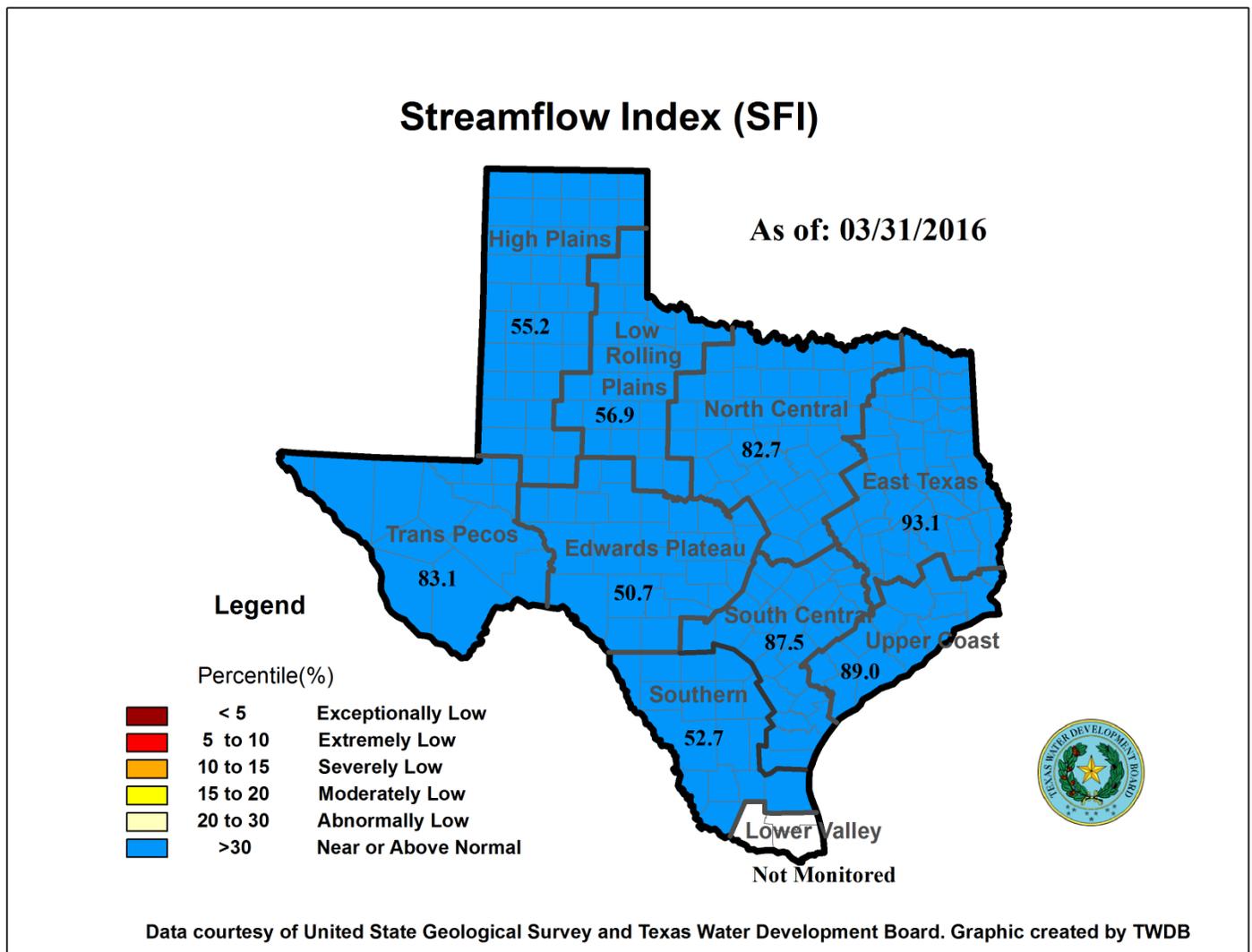
\*Reservoir Storage Index is defined as the percent full of conservation capacity.

# MARCH 2016 STREAMFLOW CONDITIONS

The computed 30-day mean flow status for 29 reporting index stations monitored this month is presented below:

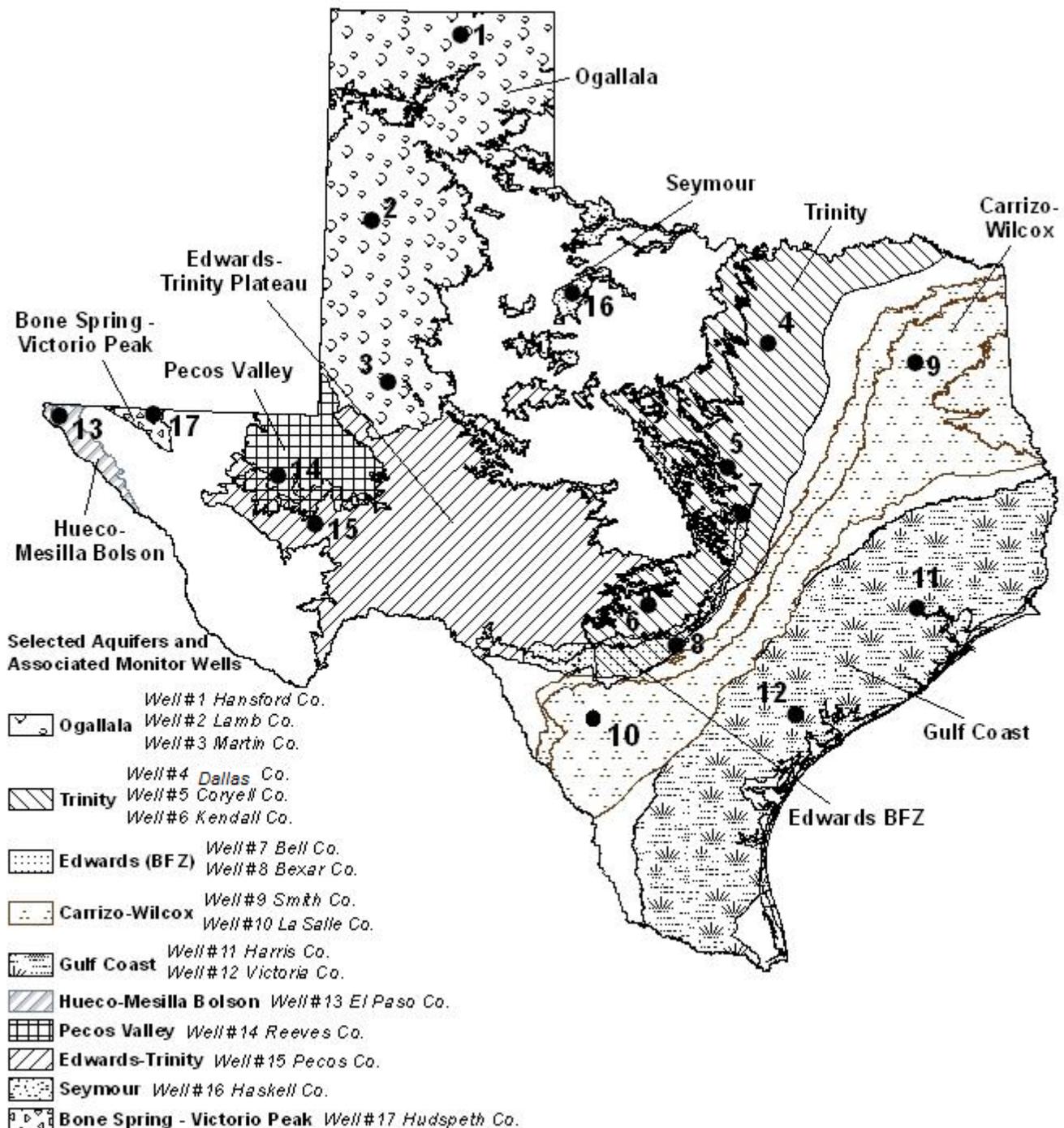
Streamflow Status	Number of Stations
Near or Above Normal (>30%)	26
Abnormally Low (20-30%)	1
Moderately Low (15-20%)	2
Severely Low (10-15%)	0
Extremely Low (5-10%)	0
Exceptionally Low (<5%)	0

Mean flow increased at 18 index stations and decreased at 11 stations. On a regional basis, flows at index stations were near or above normal in all nine 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.

# MARCH 2016 GROUNDWATER LEVELS IN OBSERVATION WELLS



March 2016

Water-level measurements were available for 17 key monitoring wells in the state. Water levels rose in 10 monitoring wells since the beginning of March, ranging from an increase of 0.05 feet in the Hansford County Ogallala Aquifer well to 5.67 feet in the LaSalle County Carrizo-Wilcox Aquifer well. Water levels declined in seven monitoring wells, ranging from a decline of 0.02 feet in the Martin County Ogallala Aquifer well to 5.04 feet in the Pecos County Edwards-Trinity (Plateau) Aquifer well. The J-17 well in San Antonio recorded a water level of 65.81 feet below land surface or 665.19 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 5.19 feet above Stage I critical management levels.

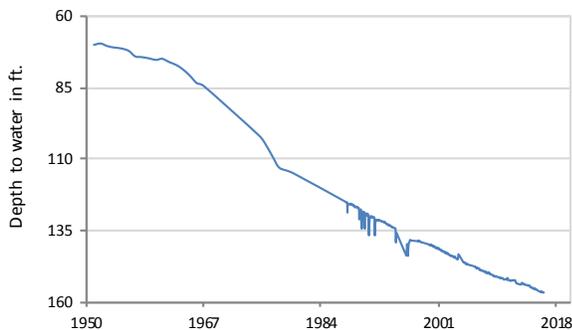
\*IDs used in this publication on the aquifer map to indicate the monitoring well location (IDs 1 - 17) are different than the TWDB's six- or seven-digit state well identification number.

Monitoring Well	March	February	Month Change	Year Change	Historical Change	First Measured
(1) Hansford 0354301	156.8	156.85	0.05	-0.94	-86.68	1951
(2) Lamb 1053602	146.53	146.49	-0.04	-1.26	-118.38	1951
(3) Martin 2739903	142.22	142.2	-0.02	-0.47	-37.33	1964
(4) Dallas 3319101	495.47	495.98	0.51	-5.29	-273.47	1954
(5) Coryell 4035404	505.63	506.46	0.83	-4.35	-213.63	1955
(6) Kendall 6802609	115.7	117.64	1.94	9.04	-55.7	1975
(7) Bell 5804816	120.04	120.41	0.37	3.72	3.09	2008
(8) Bexar 6837203	65.81	67.41	1.6	18.99	-19.17	1932
(9) Smith 3430907	432.57	433.3	0.73	1.15	-66.57	1987
(10) La Salle 7738103	456.84	462.51	5.67	30.76	-203.77	2003
(11) Harris 6514409	188.55	188.78	0.23	-0.94	-53.05*	1956
(12) Victoria 8017502	36.23	35.36	-0.87	0.94	-2.23	1958
(13) El Paso 4913301	296.76	296.49	-0.27	-0.46	-64.86	1964
(14) Reeves 4644501	159.85	157.63	-2.22	-4.46	-67.76	1952
(15) Pecos 5216802	196.65	191.61	-5.04	-8.57	50.23	1976
(16) Haskell 2135748	46.53	46.67	0.14	1.94	-5.2	2002
(17) Hudspeth 4807516	139.13	134.49	-4.64	-1.03	-35.21	1966

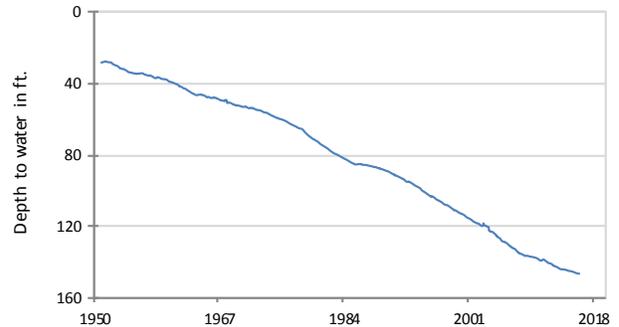
\*Change since the original measurement of 135.5 feet below land surface in 1947 (measurement not shown on the hydrograph)

### MARCH 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



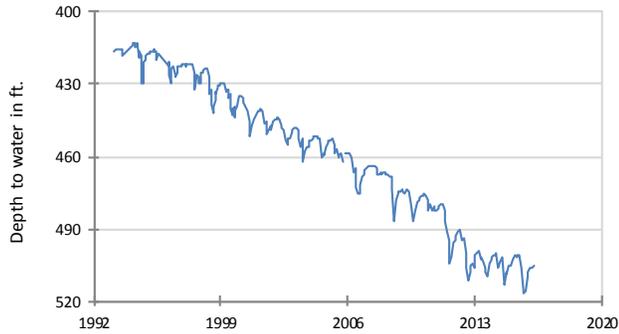
(3) State Well ID 27-39-903  
Northwest Martin County  
Ogallala Aquifer



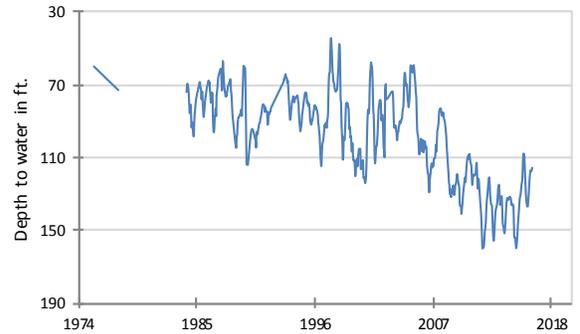
(4) State Well ID 33-19-101  
Southeast Dallas, Dallas County  
Twin Mountains Formation-Trinity Aquifer



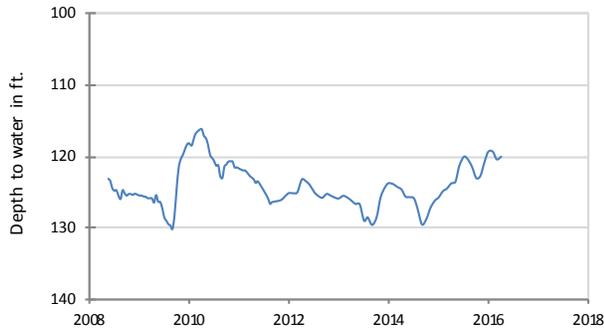
**(5) State Well ID 40-35-404  
Gatesville, Coryell County  
Hosston Formation-Trinity Aquifer**



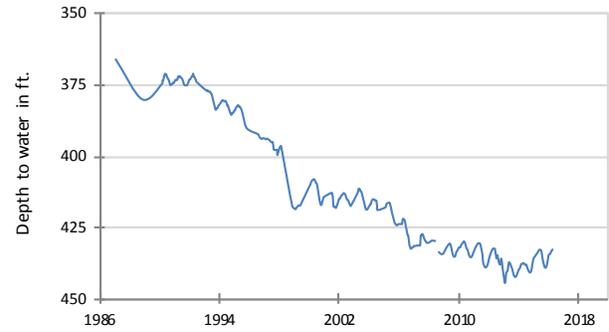
**(6) State Well ID 68-02-609  
Waring, Kendall County  
Cow Creek Formation-Trinity Aquifer**



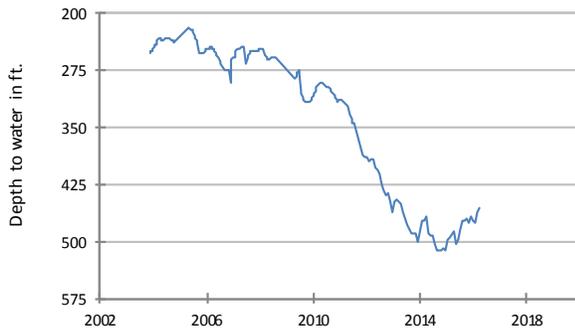
**(7) State Well ID 58-04-816  
Near Salado, Bell County  
Edwards (Balcones Fault Zone) Aquifer**



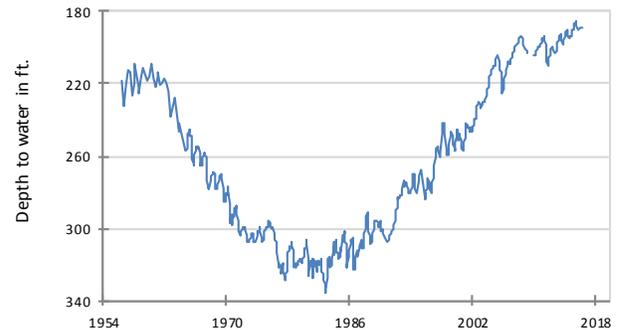
**(9) State Well ID 34-30-907  
Red Springs, Smith County  
Carrizo-Wilcox Aquifer**



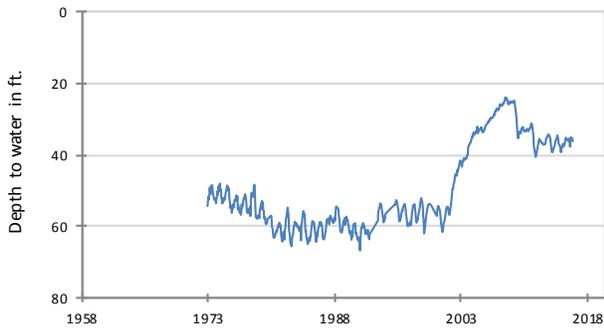
**(10) State Well ID 77-38-103  
Near Cotulla, La Salle County  
Carrizo-Wilcox Aquifer**



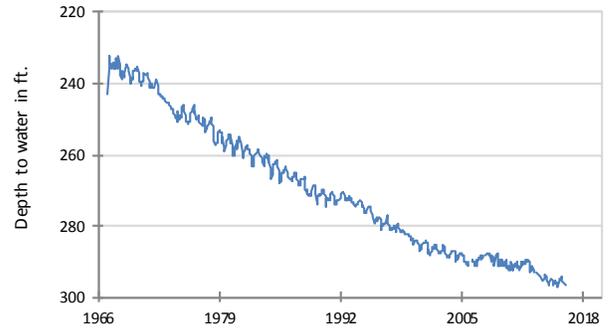
**(11) State Well ID 65-14-409  
Alief, Harris County  
Evangeline Formation-Gulf Coast Aquifer**



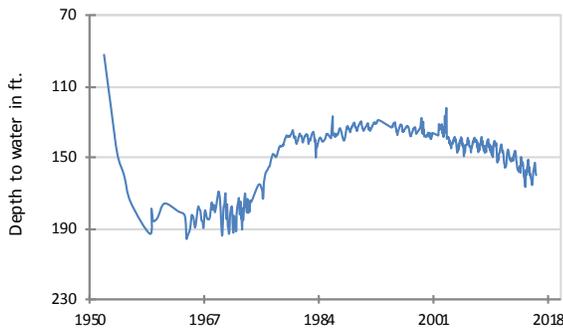
**(12) State Well ID 80-17-502**  
**Near Bloomington, Victoria County**  
**Lissie Formation-Gulf Coast Aquifer**



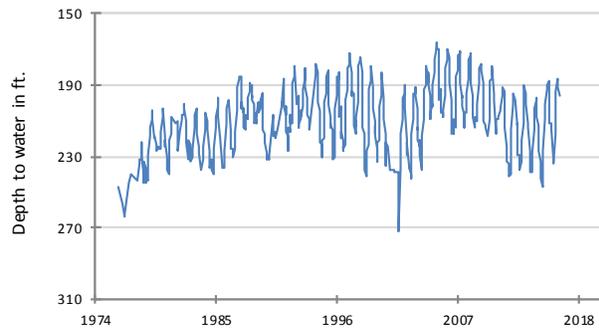
**(13) State Well ID 49-13-301**  
**El Paso, El Paso County**  
**Hueco-Mesilla Bolson Aquifer**



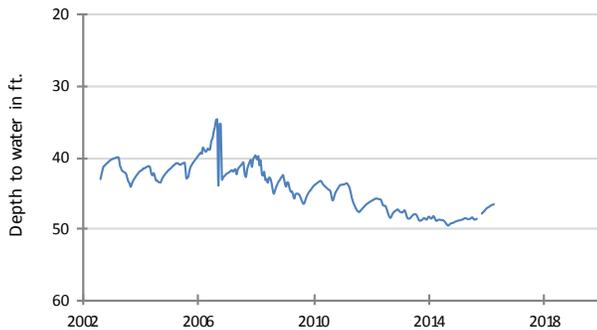
**(14) State Well ID 46-44-501**  
**Near Pecos, Reeves County**  
**Pecos Valley Aquifer**



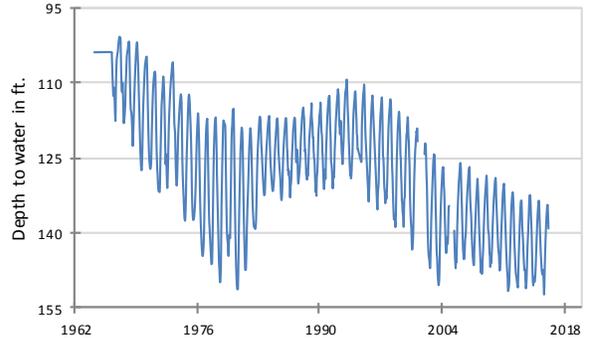
**(15) State Well ID 52-16-802**  
**Fort Stockton, Pecos County**  
**Edwards-Trinity (Plateau) Aquifer**



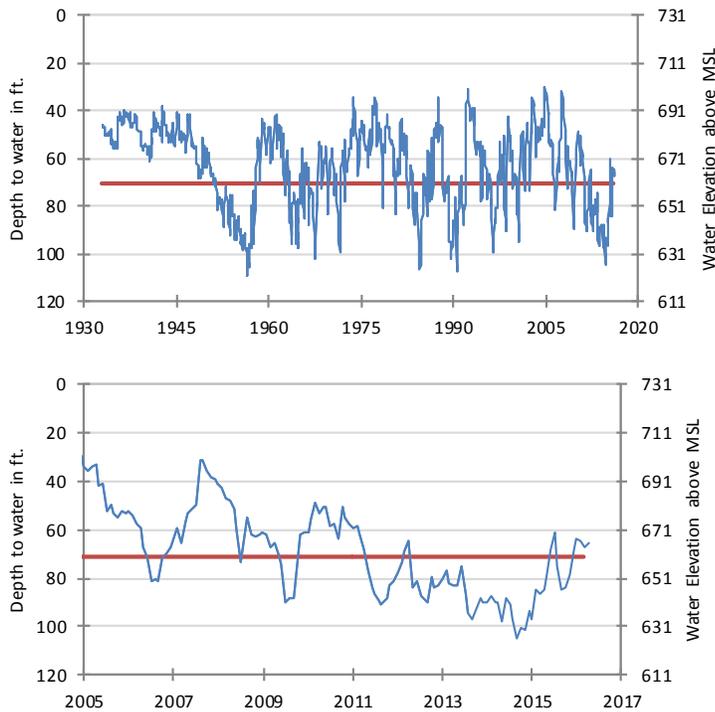
**(16) State Well ID 21-35-748**  
**Near O'Brien, Haskell County**  
**Seymour Aquifer**



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

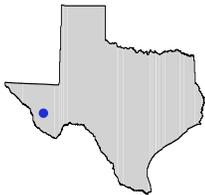


**(8) State Well ID 68-37-203 (J-17)  
In San Antonio, Bexar County  
Edwards (Balcones Fault Zone) Aquifer**



The late March water-level measurement in this Edwards (BFZ) Aquifer well, elevation 731 feet above mean sea level, was 65.81 feet below land surface, or 665.19 feet above mean sea level. This was 1.6 feet below last month's measurement, 18.99 feet above last year's measurement, and 19.17 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. \*\*\***



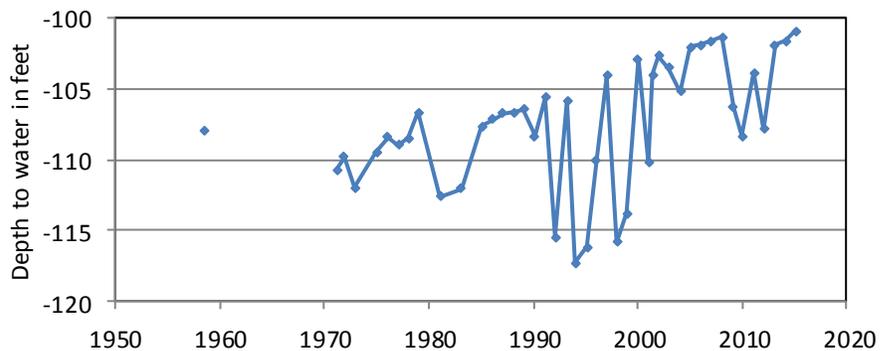
***HYDROGRAPH OF THE MONTH***

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

**Igneous Aquifer**

**Well #5249901, unknown depth stock, northwest Presidio County**

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



The first recorded measurement for this stock well was in 1958 by the USGS. The TWDB has consistently measured this well every year since 1971. Historically, the water level has been on an upward trend with a few declines of just over ten feet throughout the 1990s. The lowest recorded measurement was -117.33 in 1994, and the highest was -100.96 in 2015. The overall rise in the water level is possibly due to a reduction of pumping in the area.