

## RESERVOIR STORAGE

*September 2013*

At the end of the month, total storage in 115 of the state's major water supply reservoirs was at 18.87 million acre-feet\*, or 60% of their total conservation storage capacity. This is 115 thousand acre-feet less than a month ago and 2.65 million acre-feet less than the storage at this time last year.

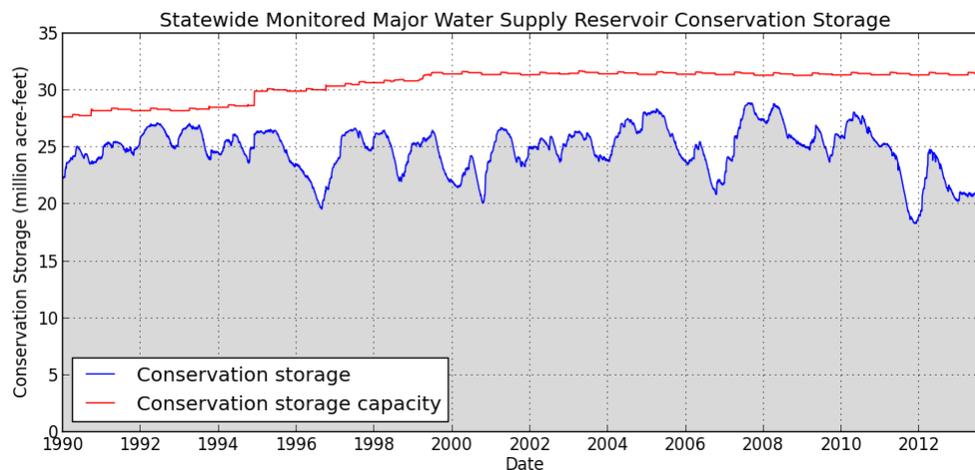
Five reservoirs, most in North Central and East regions, held 100% of conservation storage capacity. Thirteen (13) reservoirs were at or below 10% full: Meredith, White River, Electra, and Twin Buttes were effectively empty, North Fork Buffalo Creek and O. C. Fisher were at 1%, J. B. Thomas was at 2%, Medina was at 4%, E.V. Spence was at 5%, Palo Duro and Mackenzie were at 6%, Abilene was at 7%, and Champion Creek was at 8% full.

Total combined storage was greater than 70% in the Upper Coast (90%), and East (82%) regions. The regions with the lowest percentage storage were the High Plains (1%) and Low Rolling Plains regions (25%). Storage over the last month declined in 5 regions and increased in 4 regions.

Elephant Butte reservoir held 163,034 acre-feet, or 8% of storage capacity. This is 72,248 acre-feet more than a month ago.

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

### CONSERVATION STORAGE DATA FOR



Figures are based on the end of the month data at 115 major reservoirs that represent 96 percent of the total conservation storage capacity of the 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		Change since		Change since		
		Storage end of Sep 2013 (acre-feet)		end of Aug 2013 (%)	(acre-feet)	(%)	end of Sep 2012 (acre-feet)	(%)
<b>HIGH PLAINS</b>								
Palo Duro Reservoir	61,066	3,604	6	-640	-1	1,546	3	
Meredith, Lake (Texas)	500,000	0	0	0	0	0	0	
Meredith, Lake (Texas & Oklahoma)	779,556	0	0	0	0	0	0	
MacKenzie Reservoir	46,450	2,609	6	-51	-0	-687	-1	
White River Lake	29,880	0	0	-7	-0	-2,214	-7	
<b>TOTAL</b>	<b>637,396</b>	<b>6,213</b>	<b>1</b>	<b>-698</b>	<b>-0</b>	<b>-1,355</b>	<b>-0</b>	
<b>LOW ROLLING PLAINS</b>								
Greenbelt Lake	59,968	8,821	15	489	1	243	0	
*Electra, Lake	5,626	0	0	0	0	-11	-0	
N. Fork Buffalo Crk Reservoir	15,400	209	1	-71	-0	-1,021	-7	
Kemp, Lake	268,811	70,399	26	-277	-0	-3,271	-1	
Millers Creek Reservoir	26,768	5,157	19	-276	-1	-3,005	-11	
Alan Henry Reservoir	94,808	63,765	67	-1,043	-1	-9,040	-10	
Stamford, Lake	51,570	9,443	18	-296	-1	-6,768	-13	
J B Thomas, Lake	199,931	3,008	2	-481	-0	2,580	1	
Fort Phantom Hill, Lake	70,030	33,820	48	-386	-1	-871	-1	
Sweetwater, Lake	12,267	2,750	22	-40	-0	-1,245	-10	
Colorado City, Lake	30,758	8,590	28	-325	-1	-219	-1	
Champion Creek Reservoir	41,580	3,192	8			-721	-2	
Abilene, Lake	7,900	564	7	-28	-0	-1,388	-18	
Coleman, Lake	38,075	16,336	43	-303	-1	-1,303	-3	
Hords Creek Lake	8,443	2,808	33	-27	-0	-371	-4	
<b>TOTAL</b>	<b>931,935</b>	<b>228,862</b>	<b>25</b>	<b>-3,064</b>	<b>-0</b>	<b>-26,411</b>	<b>-3</b>	
<b>NORTH CENTRAL</b>								
Nocona, Lake (Farmers Crk)	21,444	9,215	43	-424	-2	-2,431	-11	
Hubert H Moss Lake	24,058	20,213	84	-544	-2	-1,765	-7	
Texoma, Lake (Texas)	1,258,113	1,127,983	90	-125,656	-10	-22,030	-2	
Texoma, Lake (Texas & Oklahoma)	2,525,281	1,127,983	45	-125,656	-5	-22,030	-1	
*Pat Mayse Lake	113,683	86,797	76	-3,023	-3	-12,683	-11	
Kickapoo, Lake	85,825	30,747	36	-152	-0	-7,745	-9	
Arrowhead, Lake	235,997	70,533	30	-3,150	-1	-33,571	-14	
Bonham, Lake	11,027	8,785	80	-607	-6	468	4	
Crook, Lake	9,195	7,588	83	-321	-3	426	5	
Amon G Carter, Lake	19,266	9,758	51	-302	-2	-3,544	-18	
Ray Roberts, Lake	788,167	615,944	78	-14,372	-2	-99,762	-13	
Jim Chapman Lake (Cooper)	260,332	83,371	32	-12,447	-5	-100,532	-39	
Graham, Lake	45,288	25,786	57	-1,193	-3	-11,149	-25	
*Lost Creek Reservoir	11,950	8,933	75	-222	-2	-1,806	-15	
Bridgeport, Lake	366,236	168,109	46	-4,718	-1	-64,874	-18	
Lewisville Lake	563,228	362,850	64	-17,168	-3	-77,773	-14	
Lavon Lake	406,388	201,521	50	-17,969	-4	-71,755	-18	
Hubbard Creek Reservoir	326,559	89,299	27	-4,173	-1	-19,534	-6	
Possum Kingdom Lake	540,340	370,752	69	-8,692	-2	-47,420	-9	
*Mineral Wells, Lake	6,760	4,137	61	-159	-2	-1,317	-19	
Weatherford, Lake	17,812	10,131	57	-558	-3	-2,228	-13	
Eagle Mountain Lake	179,880	125,987	70	-9,259	-5	-18,850	-10	
Worth, Lake	33,495	22,290	67	-604	-2	-3,891	-12	
Grapevine Lake	164,703	110,456	67	-3,178	-2	-23,138	-14	
Ray Hubbard, Lake	452,040	325,765	72	-14,401	-3	-75,832	-17	
New Terrell City Lake	8,583	5,738	67	-72	-1	-1,582	-18	
Daniel, Lake	9,515	2,525	27	-181	-2	-952	-10	

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

Name of Lake or Reservoir	Conservation Storage Capacity (acre-feet)	Conservation Storage end of Sep 2013 (acre-feet)		Change since end of Aug 2013 (%)	Change since end of Aug 2013 (acre-feet)	Change since end of Sep 2012 (%)	Change since end of Sep 2012 (acre-feet)
(North Central Continue)							
Palo Pinto, Lake	26,827	9,967	37	-911	-3	-9,937	-37
Benbrook Lake	85,648	58,673	69	-3,045	-4	930	1
Arlington, Lake	40,188	29,127	72	144	0	1,326	3
Joe Pool Lake	175,358	162,362	93	1,865	1	360	0
*Cisco, Lake	25,895	15,460	60	-318	-1	4,850	19
Leon, Lake	26,476	23,061	87	-701	-3	4,017	15
Granbury, Lake	128,046	79,346	62	-340	-0	-18,558	-14
Pat Cleburne, Lake	26,008	16,105	62	-464	-2	-4,303	-17
Waxahachie, Lake	10,780	7,710	72	-421	-4	-1,635	-15
Bardwell Lake	46,122	32,032	69	-688	-1	-7,127	-15
Proctor Lake	55,457	28,011	51	-1,659	-3	-10,375	-19
Whitney, Lake	553,344	340,686	62	297	0	-60,762	-11
Aquila Lake	44,460	26,924	61	-326	-1	-9,192	-21
Navarro Mills Lake	49,827	36,221	73	-964	-2	-5,792	-12
*Halbert, Lake	6,033	4,039	67	233	4	-617	-10
Richland-Chambers Reservoir	1,087,839	706,315	65	-20,816	-2	-252,472	-23
*Brownwood, Lake	128,839	77,811	60	-1,712	-1	12,925	10
Waco, Lake	189,567	134,708	71	-3,575	-2	-34,188	-18
Limestone, Lake	208,014	129,395	62	-3,398	-2	-36,231	-17
Belton Lake	435,225	293,947	68	-14,654	-3	-92,683	-21
Stillhouse Hollow Lake	227,771	172,099	76	-3,117	-1	-36,902	-16
Georgetown, Lake	36,823	18,347	50	92	0	-1,745	-5
Granger Lake	50,779	44,068	87	-938	-2	-3,353	-7
Tawakoni, Lake	871,685	583,546	67	-18,620	-2	-173,175	-20
Mountain Creek, Lake	22,850	22,850	100	1,149	5	668	3
Squaw Creek, Lake	151,250	151,250	100	0	0	0	0
<b>TOTAL</b>	<b>10,670,995</b>	<b>7,109,273</b>	<b>67</b>	<b>-316,432</b>	<b>-3</b>	<b>-1,439,241</b>	<b>-13</b>
<b>EAST</b>							
Wright Patman Lake	231,496	231,496	100	0	0	19,622	8
*Sulphur Springs, Lake	17,747	14,103	79	-163	-1	-448	-3
Cypress Springs, Lake	66,756	58,895	88	1,400	2	-2,345	-4
Bob Sandlin, Lake	190,822	135,657	71	2,830	1	-15,704	-8
Caddo, Lake	29,898	16,570	55	710	2	1,418	5
Martin, Lake	75,116	54,489	73	-1,754	-2	980	1
Monticello, Lake	34,740	34,740	100	0	0	1,050	3
Fork Reservoir, Lake	605,061	466,179	77	2,722	0	-46,783	-8
O the Pines, Lake	268,566	182,761	68	7,189	3	1,210	0
Cedar Creek Reservoir in Trinity	644,686	456,316	71	-5,609	-1	-107,421	-17
Athens, Lake	29,435	22,884	78	288	1	-1,294	-4
Palestine, Lake	373,199	343,968	92	6,167	2	-2,991	-1
Tyler, Lake	73,161	50,217	69	-903	-1	-6,623	-9
Murvault, Lake	38,285	34,482	90	691	2	-1,161	-3
Jacksonville, Lake	25,670	23,852	93	-515	-2	-684	-3
Nacogdoches, Lake	39,522	33,854	86	253	1	1,417	4
Houston County Lake	17,113	14,281	83	-276	-2	-2,832	-17
Sam Rayburn Reservoir	2,857,077	2,188,616	77	-44,344	-2	-273,730	-10
Toledo Bend Reservoir (Texas)	2,245,752	1,875,892	84	-2,444	-0	-115,800	-5
Toledo Bend Reservoir (TX & LA)	4,472,900	1,875,892	42	-2,444	-0	-115,800	-3
*Livingston, Lake	1,785,348	1,654,273	93	-2,383	-0	-53,640	-3
B A Steinhagen Lake	66,961	63,108	94	410	1	1,226	2
Conroe, Lake	416,177	349,492	84	-2,108	-1	-13,865	-3
<b>TOTAL</b>	<b>10,132,588</b>	<b>8,306,125</b>	<b>82</b>	<b>-37,839</b>	<b>-0</b>	<b>-618,398</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 Sep 2013 (acre-feet)		Change since end of Aug 2013 (%)	Change since end of Aug 2013 (acre-feet)	Change since end of Sep 2012 (%)	Change since end of Sep 2012 (acre-feet)
<b>TRANS-PECOS</b>							
Red Bluff Reservoir	151,110	56,635	37	30,103	20	34,481	23
<b>TOTAL</b>	151,110	56,635	37	30,103	20	34,481	23
<b>EDWARDS PLATEAU</b>							
Oak Creek Reservoir	39,210	8,865	23	-170	-0	-3,745	-10
E V Spence Reservoir	517,272	24,999	5	-1,847	-0	22,532	4
O C Fisher Lake	119,445	912	1	0	0	-1,789	-1
*O H Ivie Reservoir	554,340	87,228	16	-5,865	-1	-39,372	-7
Twin Buttes Reservoir	182,454	0	0	0	0	-7,073	-4
Brady Creek Reservoir	28,808	8,882	31	82	0	1,046	4
Buchanan, Lake	816,904	286,144	35	-9,944	-1	-95,774	-12
Inks, Lake	13,962	12,960	93	128	1	-30	-0
Lyndon B Johnson, Lake	115,056	112,541	98	1,355	1	2,332	2
*Amistad Reservoir (Texas)	1,840,849	871,767	47	125,832	7	-92,434	-5
*Amistad Reservoir (TX & Mexico)	3,275,532	871,767	27	125,832	4	-92,434	-3
<b>TOTAL</b>	4,228,300	1,414,298	33	109,571	3	-214,307	-5
<b>SOUTH CENTRAL</b>							
Travis, Lake	1,113,348	340,880	31	-242	-0	-125,137	-11
*Austin, Lake	23,972	23,050	96	262	1	400	2
Somerville Lake	147,104	79,522	54	-4,936	-3	-49,847	-34
Canyon Lake	378,781	289,773	77	-3,387	-1	-33,705	-9
Medina Lake	254,823	10,968	4	-455	-0	-23,127	-9
*Coleto Creek Reservoir	31,040	22,769	73	-906	-3	-1,876	-6
<b>TOTAL</b>	1,949,068	766,962	39	-9,664	-0	-233,292	-12
<b>UPPER COAST</b>							
Houston, Lake	128,054	128,054	100	2,980	2	0	0
Texana, Lake	159,566	130,237	82	3,258	2	-17,243	-11
<b>TOTAL</b>	287,620	258,291	90	6,238	2	-17,243	-6
<b>SOUTHERN</b>							
Choke Canyon Reservoir	695,262	249,858	36	-4,740	-1	-109,196	-16
Corpus Christi, Lake	256,961	63,743	25	1,764	1	21,412	8
*Falcon Reservoir (Texas)	1,551,007	408,870	26	109,322	7	-42,277	-3
*Falcon Reservoir (TX & Mexico)	2,646,817	408,870	15	109,322	4	-42,277	-2
<b>TOTAL</b>	2,503,230	722,471	29	106,346	4	-130,061	-5
<b>STATE TOTAL</b>	31,492,242	18,869,130	60	-115,299	-0	2,645,827	-8

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

Elephant Butte Reservoir	1,973,358	163,044	8	72,248	4	50,048	3
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**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.

# SEPTEMBER RESERVOIR CONDITIONS

## Reservoir Storage Index\*

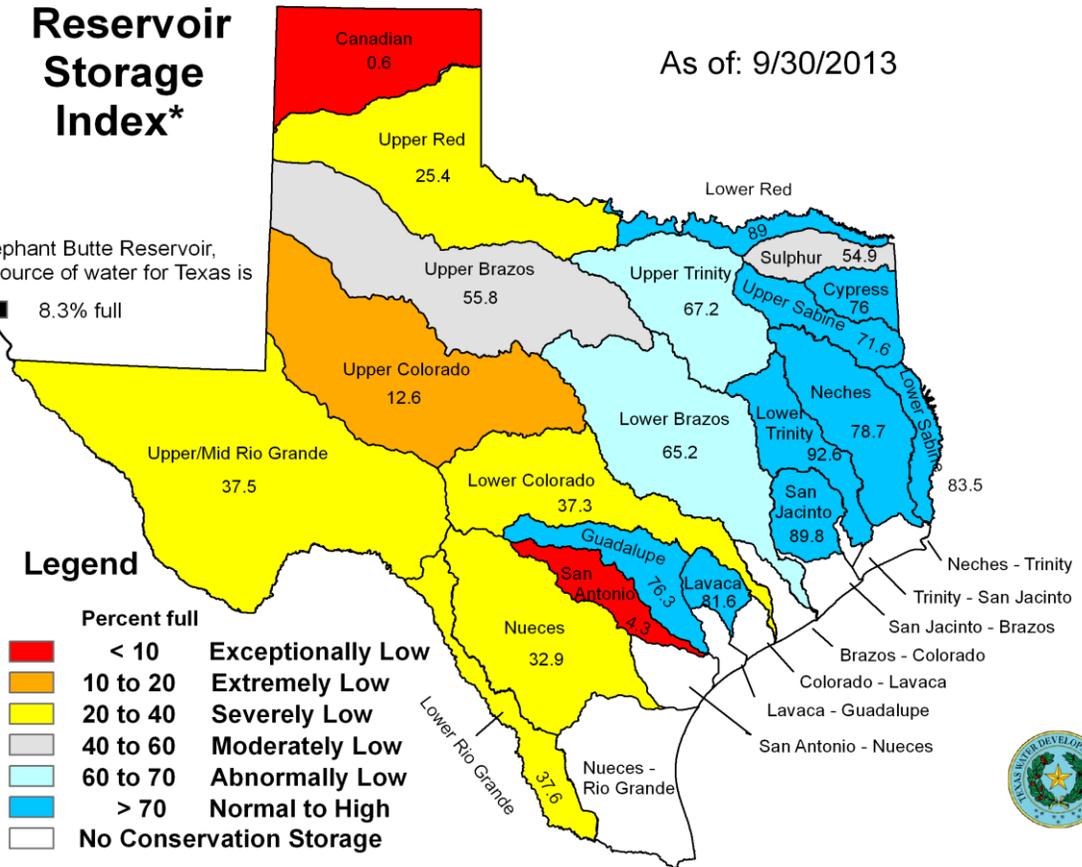
As of: 9/30/2013

Elephant Butte Reservoir, a source of water for Texas is

■ 8.3% full

### Legend

Percent full	Category
< 10	Exceptionally Low
10 to 20	Extremely Low
20 to 40	Severely Low
40 to 60	Moderately Low
60 to 70	Abnormally Low
> 70	Normal to High
No Conservation Storage	

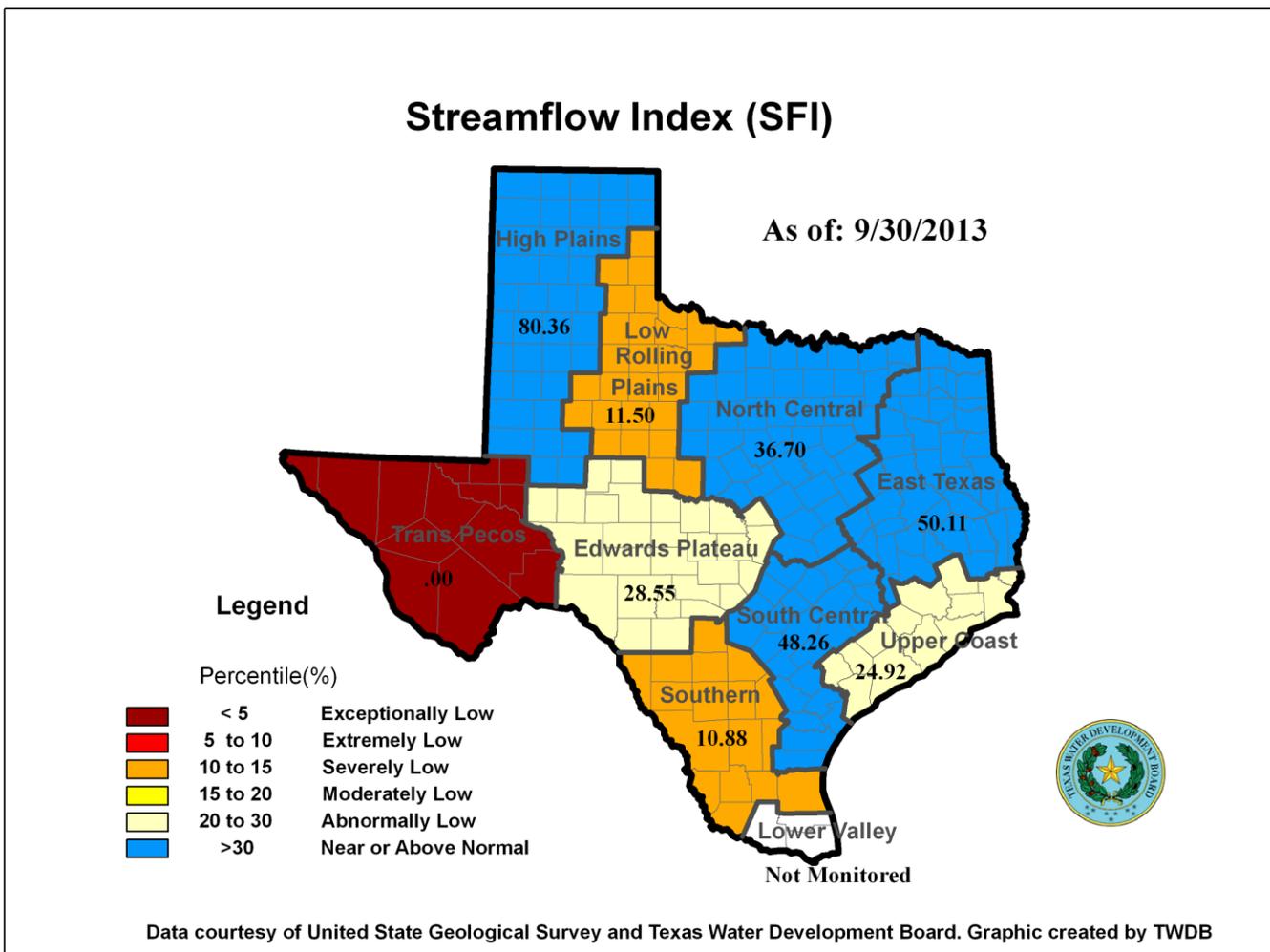


\*Percent of combined conservation storage capacity of 115 major water supply reservoirs by sub-basin (dead pools are excluded)

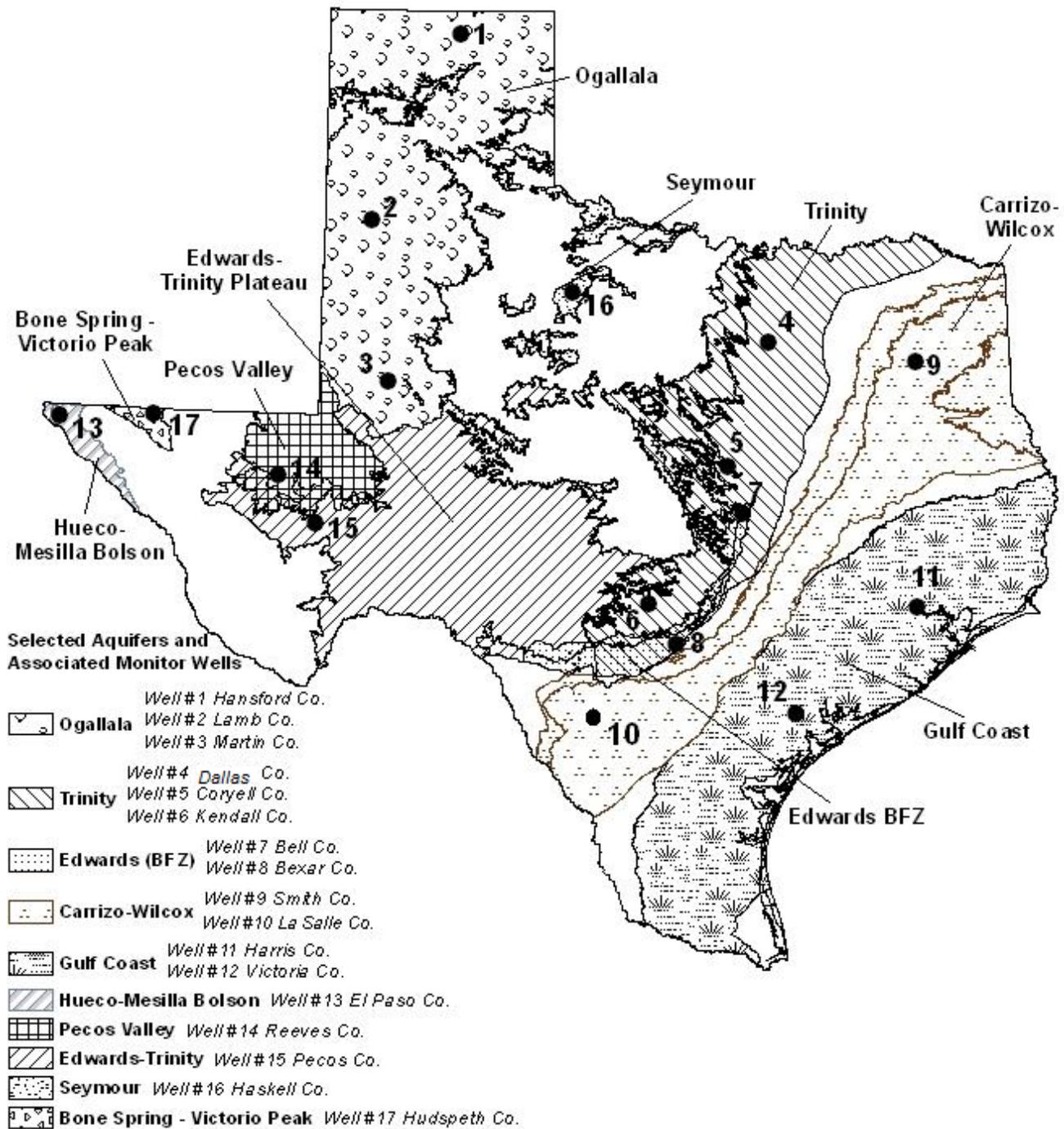
## *SEPTEMBER STREAMFLOW CONDITIONS*

Of 29 reporting index stations monitored this month, computed 30-day mean flows were exceptionally low (<5%) at 9 stations, extremely low (5-10%) at 2 stations, severely low (10-15%) at 1 station, moderately low (15-20%) at 2 stations, and near normal (30% - 70%) at the remaining 15 stations. Compared to last month, flows have increased at 20 index stations and decreased at 6 stations.

On a regional basis, flows in this month were exceptionally low in the Trans-Pecos region, severely low in the Low Rolling Plains and Southern regions, abnormally low in the Edwards Plateau and Upper Coast regions, and near or above normal in the High Plains, North Central, East Texas, and South Central regions. Streamflow in the Lower Valley region is not monitored.



# SEPTEMBER 2013 GROUNDWATER LEVELS IN OBSERVATION WELLS



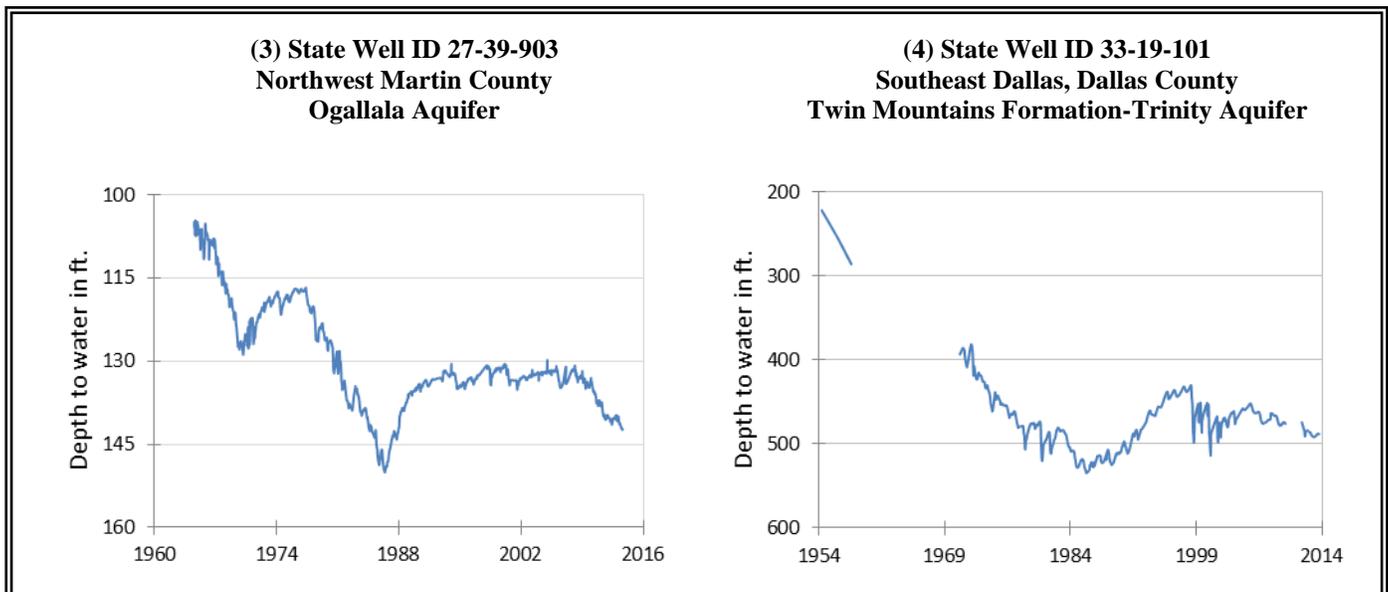
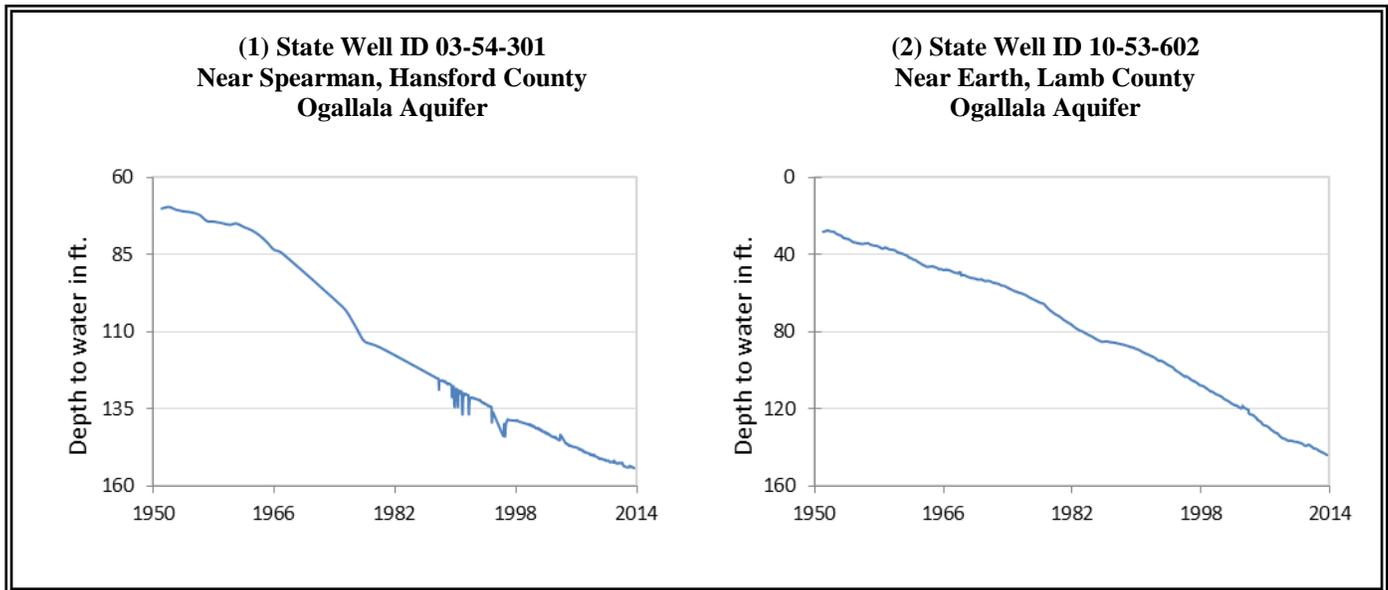
September, 2013

Water level measurements were available for all seventeen key monitoring wells in the state. Water levels rose in seven of the monitoring wells since the beginning of September, ranging from 0.05 feet in the Haskell County Seymour Aquifer well to 5.56 feet in the Kendall County Trinity Aquifer well. Water levels declined in ten monitoring wells, ranging from 0.08 feet in the Hansford County Ogallala Aquifer well to 2.06 feet in the La Salle County Carrizo-Wilcox Aquifer well. The J-17 well in San Antonio recorded a water level of 92.3 feet below land surface or 638.7 feet above mean sea level. This water level is 1.3 feet below the Stage III critical management level in that segment of the Edwards Aquifer. Stage III restrictions were declared by the EAA when the ten-day average fell below the 640-foot elevation, or 91 feet below land surface.

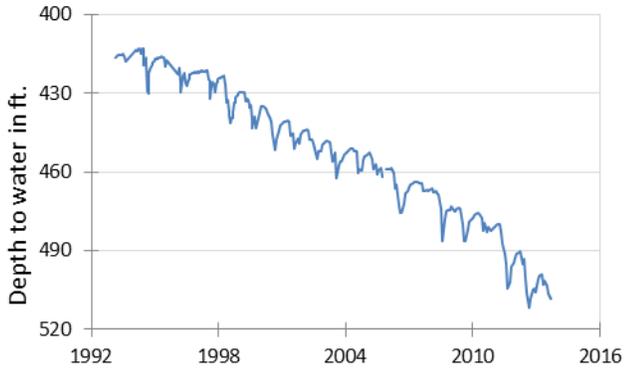
\* ID is used in this publication to differentiate between the monitoring well number (1 - 17) as displayed on the aquifer map and the TWDB's six- or seven-digit state well "identification" number.

Monitoring Well	September	August	month change	year change	historical change	first measured
(1) Hansford 0354301	154.22	154.14	-0.08	-0.22	-84.1	1951
(2) Lamb 1053602	143.98	143.86	-0.12	-2.2	-115.83	1951
(3) Martin 2739903	143.83	142.31	-1.52	-3.37	-38.94	1964
(4) Dallas 3319101	488.94	488.21	-0.73	0.76	-266.94	1954
(5) Coryell 4035404	509.83	508.33	-1.5	-1.5	-217.83	1955
(6) Kendall 6802609	146.2	151.76	5.56	1.65	-86.2	1975
(7) Bell 5804816	128.53	129.59	1.06	-3.28	-5.4	2008
(8) Bexar 6837203	92.3	97.20	4.9	-12.4	-45.66	1932
(9) Smith 3430907	442.19	441.53	-0.66	-4.34	-76.19	1987
(10) La Salle 7738103	489.77	487.71	-2.06	-51.26	-236.7	2003
(11) Harris 6514409	198	196.55	-1.45	5.17	-62.5	1956
(12) Victoria 8017502	39.23	37.53	-1.7	-2.06	-5.23	1958
(13) El Paso 4913301	295.14	295.25	0.11	-2.67	-63.24	1967
(14) Reeves 4644501	156.62	157.95	1.33	-6.72	-64.53	1952
(15) Pecos 5216802	239.1	238.77	-0.33	-5.69	7.78	1976
(16) Haskell 2135748	48.74	48.79	0.05	-0.96	-7.41	2002
(17) Hudspeth 4807516	149.06	151.08	2.02	1.74	-45.14	1964

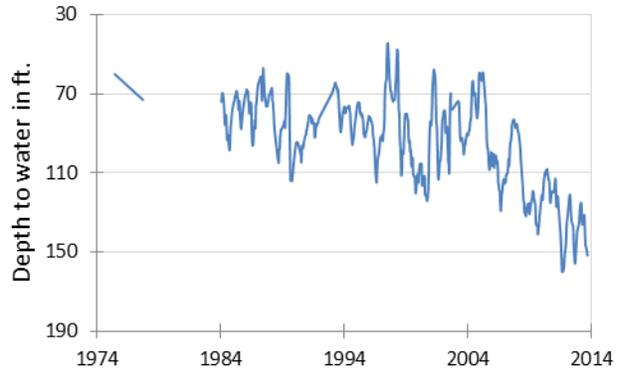
## SEPTEMBER GROUNDWATER LEVELS IN OBSERVATION WELLS



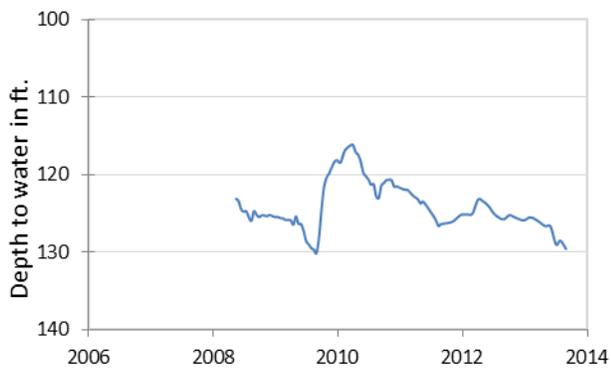
**(5) State Well ID 40-35-404  
Gatesville, Coryell County  
Hosston Formation-Trinity Aquifer**



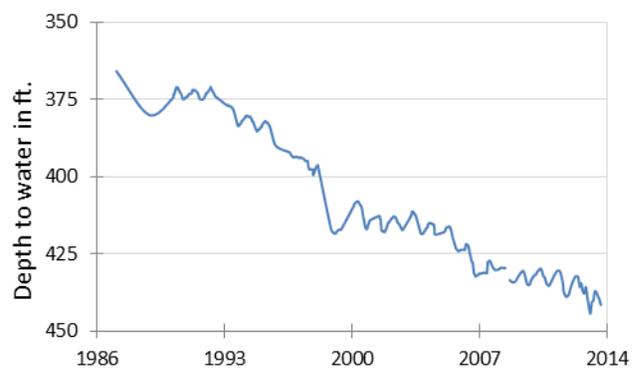
**(6) State Well ID 68-02-609  
Waring, Kendall County  
Cow Creek Formation-Trinity Aquifer**



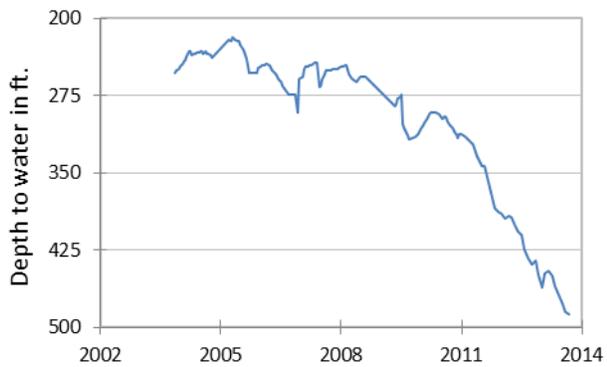
**(7) State Well ID 58-04-816  
Near Salado, Bell County  
Edwards (BFZ) Aquifer**



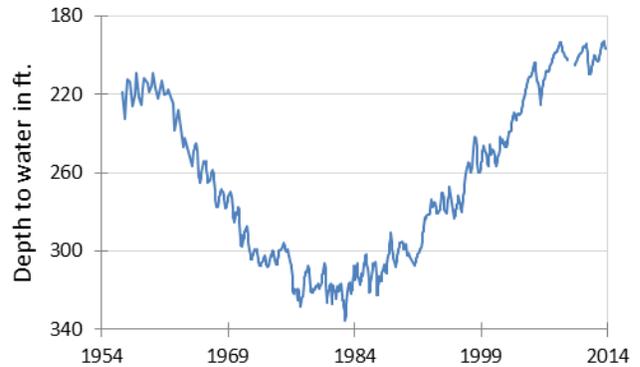
**(9) State Well ID 34-30-907  
Red Springs, Smith County  
Carrizo-Wilcox Aquifer**



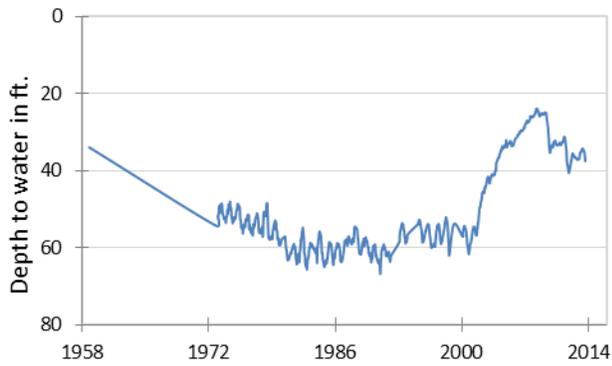
**(10) State Well ID 77-38-103  
Near Cotulla, La Salle County  
Carrizo-Wilcox Aquifer**



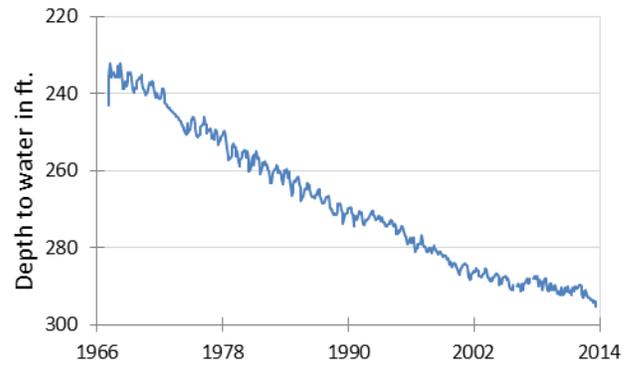
**(11) State Well ID 65-14-409  
Alief, Harris County  
Evangeline Formation-Gulf Coast Aquifer**



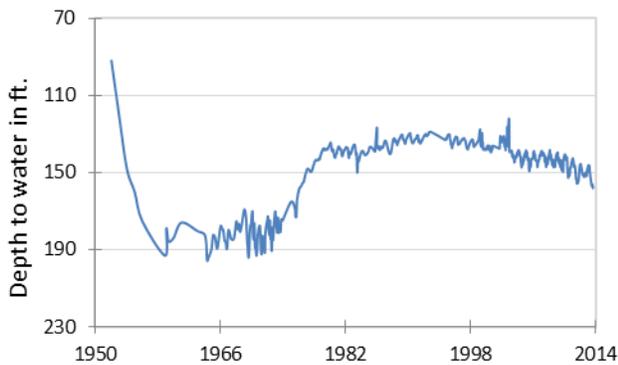
**(12) State Well ID 80-17-502**  
Near Bloomington, Victoria County  
Lissie Formation-Gulf Coast Aquifer



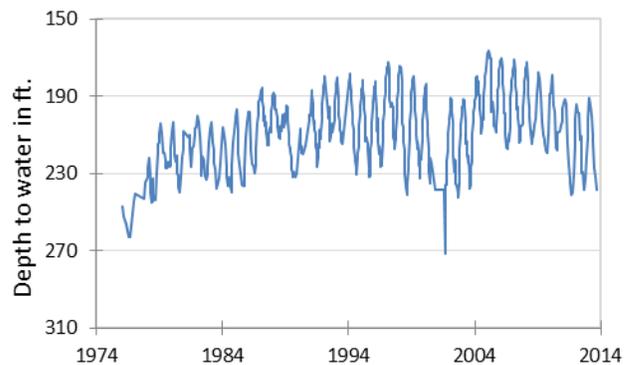
**(13) State Well ID 49-13-301**  
El Paso, El Paso County  
Hueco-Mesilla Bolson Aquifer



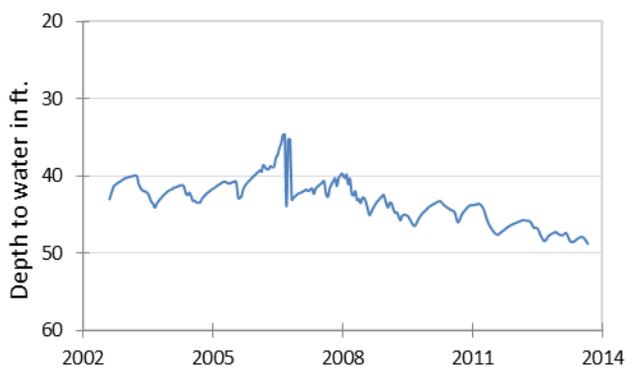
**(14) State Well ID 46-44-501**  
Near Pecos, Reeves County  
Pecos Valley Aquifer



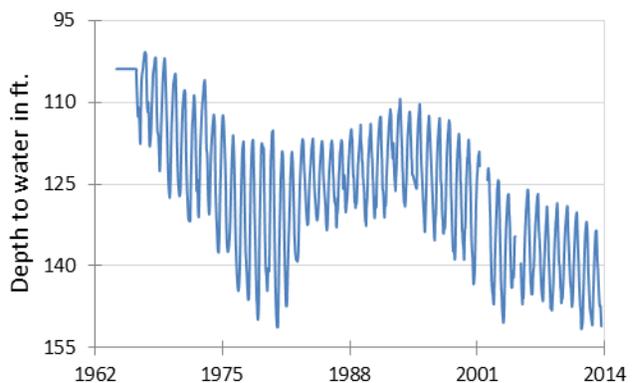
**(15) State Well ID 52-16-802**  
Fort Stockton, Pecos County  
Edwards-Trinity (Plateau) Aquifer



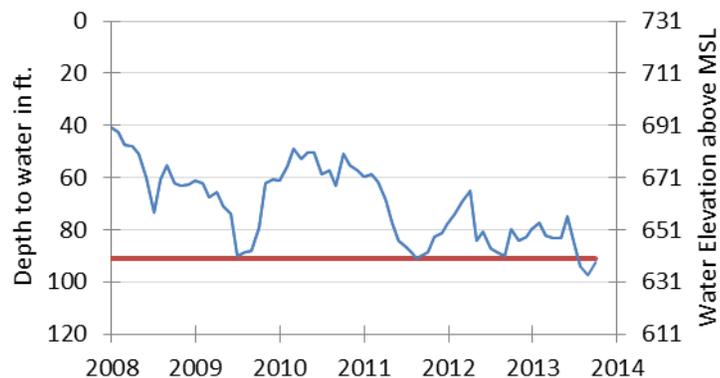
**(16) State Well ID 21-35-748**  
Near O'Brien, Haskell County  
Seymour Aquifer



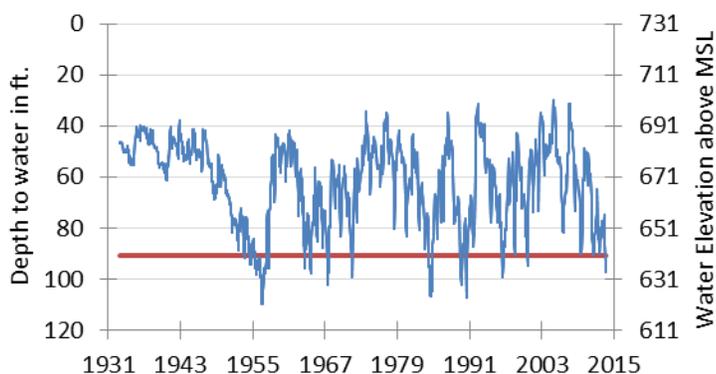
**(17) State Well ID 48-07-516**  
Dell City, Hudspeth County  
Bone Spring - Victorio Peak Aquifer



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



The late September water level measurement in this Edwards (BFZ) Aquifer well, elevation 731 feet above mean sea level, was 92.3 feet below land surface, or 638.7 feet above mean sea level. This was 4.9 feet above last month's measurement, 12.4 feet below last year's measurement, and 45.66 feet below the initial measurement recorded in 1932.



**\*\*\* Water levels below the red line indicate Edwards Aquifer Authority Stage III drought restrictions. \*\*\***

***HYDROGRAPH OF THE MONTH***



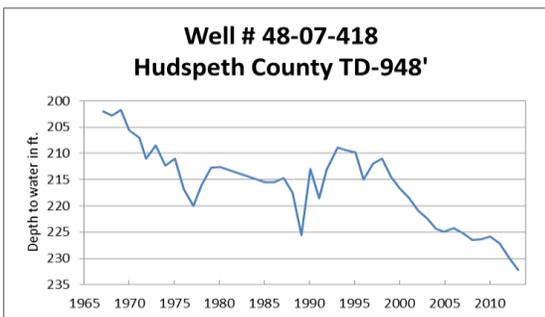
Each month this space features a new hydrograph (marked with the • symbol on the map) depicting different aquifers and different conditions in Texas.

**Bone Spring-Victorio Peak Aquifer**

The Bone Spring-Victorio Peak Aquifer is a minor aquifer located in northern Hudspeth County in far west Texas. It is composed of the Permian aged Bone Spring and Victorio Peak Limestone formations. The Bone Spring Limestone is predominantly a black to dark-gray, cherty limestone with thin interbedded black or brown layers of siliceous shale. It grades upward into the Victorio Peak Limestone, a light-gray, thick-bedded, mainly calcitic but slightly dolomitic limestone. Both formations were deposited in a shallow marine basin sheltered from the open ocean within an extensive interior bay in middle Permian times when Texas was on the North American west coast. The aquifer is karstic in nature, and groundwater is concentrated in interconnected solution cavities that have developed in joints, fractures, and bedding planes. Well production is thus linked to the number and size of cavities intercepted by the well bore and not necessarily by depth alone. Water quality is generally slightly saline, with total dissolved solids of 1,000 to 3,000 milligrams per liter. The primary use of produced water is for irrigation of salt tolerant crops and to water livestock, but some water is desalinated and treated for consumption by the nearby community of Dell Valley.

This unused irrigation well, at an elevation of 3,805 feet above sea level, has experienced a water-level decline of over 40 feet since the late sixties, typical of declines in the area. Wells measured since the late forties have experienced an additional 20 to 30 feet of decline. Measured yield of the well in 1975, when it was deepened to 948 feet, was 900 gallons per minute with a drawdown of 111 feet after 4 hours.

**Well # 48-07-418  
Hudspeth County TD-948'**



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