



DECEMBER 2016 RESERVOIR STORAGE*

At the end of December 2016, total conservation storage^{*} in 115 of the state's major water supply reservoirs was at 26.3 million acre-feet or 82 percent of total conservation storage capacity. This is approximately 0.11 million acre-feet more than a month ago but 0.70 million acre-feet less than storage at this time last year.

Twenty-eight (28) reservoirs held 100 percent of conservation storage capacity, primarily in the North Central (16 reservoirs) and East (six reservoirs) regions. One reservoir, Palo Duro (2 percent), remained below 10 percent full.

Total combined storage was at or above normal (storage \geq 70 percent) in the South Central (99 percent), Upper Coast (99 percent), North Central (95 percent), East (91 percent), and Low Rolling Plains (80 percent) regions. The High Plains region had the lowest percentage of storage at 21 percent. Overall, storage increased in six regions but declined in three regions over the past month.

New Feature: Incorporation of Elephant Butte State Share

Elephant Butte reservoir is a supply source for Trans-Pecos region, and the Texas share of its storage is now included in the Trans-Pecos regional sub-total and in the Texas state total. According to the Rio Grande Compact, 43.2 percent of Elephant Butte's storage is deemed Texas' share. This percentage will be used as an estimate of the water for Texas in the monthly water condition report going forward. However, this percentage does not reflect the reservoir's dynamic water allotment for Texas. For Texas' exact water allotment, please contact U.S. Bureau of Reclamation. The month-end storage of the Trans-Pecos and state total, as well as the changes over past month and past 12-month periods in the reservoir table on next page, are revised to reflect this change.

In past water condition reports, the Trans-Pecos region was solely represented by the storage in Red Bluff Reservoir with a total regional capacity of 151,110 acre-feet. Because of the inclusion of Elephant Butte, expanding the reported regional capacity to 1,003,601 acre-feet, and because of the recent low storage in this reservoir, the storage percent full for the Trans-Pecos region at the end of December 2016 is now 22 percent instead of 86 percent. Similarly, with Elephant Butte included in the statewide total this month, conservation storage for the state is reported as 82 percent of total conservation capacity (where statewide capacity was revised from 31,274,001 to 32,119,717 acre-feet). For comparison to previous water conditions reports, total conservation storage at the end of December 2016, without Elephant Butte included in the statewide total, would have been reported as 84 percent. Going forward in 2017, the monthly water conditions reports will report an estimate of Texas' share of Elephant Butte in the regional and statewide conservation storage totals.

*Storage is based on end of the month data in 114 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.





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

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS							
	Conservation	Conservation storage		Change since		Change since	
Name of lake or reservoir	storage capacity	end of December 2016		end of November 2016		end of December 2015	
	(acre-feet)	(acre-feet)	(%)	(acre-feet)**	(%)	(acre-feet)**	(%)
		HIGH PLAINS					
MacKenzie Reservoir	46,450	6,915	15	-66	-0	-662	-1
Meredith, Lake	500,000	115,499	23	-1,128	-0	-12,951	-3
Palo Duro Reservoir	61,066	1,045	2	-68	-0	-1,207	-2
White River Lake	29,880	7,380	25	-87	-0	-2,510	-8
IUIAL	637,396	130,839	21	-1,349	-0	-17,330	-3
Abilono Lako	7 000	LOW KULLING PLA	AINS	26	0	6 204	70
Abiene, Lake	7,900	7,709	90 05	-30	-0	0,204	/9
Champion Crook Posoryoir	94,000 41 590	15 556	93 27	-409	-0	-1,202	-1 1/
Coleman Lake	41,500 38.075	35,695	97.	-248	-1	5,971	15
Colorado City Lake	30,075	14 850	48	-240	-1	5,010 6,056	20
Fort Phantom Hill Lake	70.030	68.010	97	-270	-0	-617	-1
Greenbelt Lake	59 968	16 153	27	73	0	2 261	4
Hords Creek Lake	8 4 4 3	6965	82	-147	-2	2,201	34
I. B. Thomas. Lake	199,931	128,739	64	-1.818	-1	-16.353	-8
Kemp, Lake	245.307	244.849	100	153	0	39.046	16
Millers Creek Reservoir	26,768	26.768	100	0	0	0,010	0
North Fork Buffalo Creek	20,700	20,700	100	0	Ũ	Ū	Ŭ
Reservoir	15,400	12,406	81	-301	-2	-1,252	-8
Stamford, Lake	51,570	49,811	97	-597	-1	-1,759	-3
Sweetwater, Lake	12,267	2,678	22	76	1	1,168	10
TOTAL	902,805	719,921	80	-3,574	-0	48,220	5
_		NORTH CENTRA	4L				
Amon G Carter, Lake	19,266	19,266	100	0	0	0	0
Aquilla Lake	43,243	41,897	97	-365	-1	-1,346	-3
Arlington, Lake	40,188	31,184	78	2,427	6	-9,004	-22
Arrowhead, Lake	230,359	218,357	95	-2,541	-1	-12,002	-5
Bardwell Lake	46,122	44,998	98	-32	-0	-1,124	-2
Belton Lake	435,225	435,225	100	0	0	0	0
Benbrook Lake	85,648	70,829	83	-684	-1	-14,819	-17
Bonham, Lake	11,027	8,089	73	-256	-2	-2,938	-27
Bridgeport, Lake	366,236	364,839	100	-1,397	-0	-1,397	-0
*Brownwood, Lake	128,839	128,839	100	0	0	0	0
*Cisco, Lake	25,895	25,895	100	0	0	5,831	23
Crook, Lake	9,195	7,728	84	-40	-0	-1,467	-16
Eagle Mountain Lake	179,880	175,177	97	-3,326	-2	-4,703	-3
Georgetown, Lake	36,823	35,791	97	1,799	5	-1,032	-3
Granam, Lake	45,288	45,017	99	-2/1	-1	-2/1	-1
Granbury, Lake	132,949	132,541	100	0	0	3,/12	3
Granger Lake	51,822	51,822	100	0	0	0	0
sucher tele	104,703	104,703	100	0	0	0	0 14
Halbert, Lake	0,033	4,792	79	2/	0	-842	-14
Hubbard Creek Reservoir	318,067	308,978	97	-1,602	-1	160,284	50
Hubert H Moss Lake	24,030	22,392 100 E06	93 77	10	0	-1,000	-/
	200,332	199,300	05	-2,092	-1 1	-00,020	-23 E
Vickanoo Lake	175,550	107,530	93	-1,903	-1 2	-0,020	-5
Lavon Lake	406 388	226 724	91	-1,399	-2	-7,407	-9
Lavon Lake	400,300	550,754 22,401	03 84	-0,090	-2	-09,034	-17
Leon, Lake	563 228	23,401 550/52	04	-330	-1	-4,301	-10
Limestone Lake	202,220 202,720	JJ7,4JZ 177 QA/	דע 27	-3,770	-1 .2	-3,770 -25 074	-1 _1?
*Lost Creek Reservoir	203,700 11 QC0	177,004 11 QQ7	07 QQ	-3,039 _27	-2	-23,970	-15
*Mineral Wells Labo	11,73U 5 772	5 072 5 1,007	100	-37	-0	-US 0	-1
Mountain Creek, Lake	3,473 77 QEA	3,473 22 REN	100	0	0	0	0
Navarro Mills Lake	49.827	49.123	99	281	1	-704	-1

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS								
	Conservation	Conservation storage		Change since	9	Change since		
Name of lake or reservoir	storage capacity	end of December 2016		end of November 2016		end of December 2015		
	(acre-feet)	(acre-feet)	(%)	(acre-feet)**	(%)	(acre-feet)**	(%)	
	0 700	(North Central conti	nued)					
New Terrell City Lake	8,583	8,205	96	-86	-1	-378	-4	
Nocona, Lake (Farmers Crk)	21,444	20,449	95	0	0	-995	-5	
Paio Pinto, Lake	26,766	25,339	95	-4/4	-2	-1,42/	-5 17	
*Dat Mayoo Lake	20,000	21,504	00	-430 1 741	-2	-4,444	-17 12	
Pat Mayse Lake	522 872	59,400 00 522,284 100		-1,741	-2	-14,203	-12	
Proctor Lake	54,762	525,504	51 891 95 360		1	-2 871	-5	
Ray Hubbard Lake	439 559	411 830	94	-11 900	-3	-26.894	-6	
Ray Roberts Lake	788 167	786 750	100	-1 417	-0	-1 417	-0	
Richland-Chambers Reservoir	1.087.839	1.022.455	94	-8.751	-1	-65.384	-6	
Squaw Creek. Lake	151.250	151.250	100	0,701	0	00,001	0	
Stillhouse Hollow Lake	227,771	227,771	100	0	0	0	0	
Tawakoni, Lake	871,685	772,891	89	-10,401	-1	-98,794	-11	
Texoma, Lake (Texas)	1,258,113	1,258,113	100	0	0	0	0	
Texoma, Lake (Texas &								
Oklahoma)	2,525,281	2,590,939	100	-50,586	-2	-573,957	-23	
Waco, Lake	189,418	189,418	100	0	0	0	0	
Waxahachie, Lake	10,780	9,973	93	154	1	-807	-7	
Weatherford, Lake	17,812	16,900	95	-106	-1	-912	-5	
Whitney, Lake	553,344	481,638	87	-24,893	-4	-71,706	-13	
Worth, Lake	33,495	30,858	92	433	1	-2,637	-8	
TOTAL	10,618,311	10,080,736	95	-85,322	-1	-350,827	-3	
Ath and I also	20 502	EASI	00	700	2	F07	2	
Atnens, Lake	29,503	28,916	98	700	2	-58/	-Z	
B A Stellingen Lake	00,901	01,079	92	-203 E 222	-0	0,003	12	
Caddo Lako	20,022	21 026	94 70	-8 862	-30	-10,719	-20	
Cedar Creek Reservoir in Trinity	644 686	586.010	91	-0,002	-30	-58.676	-30	
Conroe Lake	410 988	410 988	100	14 819	4	0 (0	0	
Cypress Springs, Lake	66.756	65.532	98	3.419	5	-1.224	-2	
Fork Reservoir, Lake	605.061	530.717	88	-3.877	-1	-74.344	-12	
Houston County Lake	17.113	17,113 100		0	0	0	0	
Jacksonville, Lake	25,670	25,670	100	185	1	0	0	
*Livingston, Lake	1,785,348	1,785,348	100	0	0	0	0	
Martin, Lake	75,726	66,965	965 88		3	-8,662	-11	
Monticello, Lake	34,740	34,597	100	-143	-0	-143	-0	
Murvaul, Lake	38,285	35,044	92	1,023	3	-3,241	-8	
Nacogdoches, Lake	39,522	37,994	96	1,439	4	-1,528	-4	
O' the Pines, Lake	241,363	223,900	93	-509	-0	-17,463	-7	
Palestine, Lake	367,303	332,337	90	6,474	2	-34,966	-10	
Sam Rayburn Reservoir	2,857,077	2,519,611	88	46,901	2	-337,466	-12	
*Sulphur Springs, Lake	17,747	14,340	81	-507	-3	-1,264	-7	
Toledo Bend Reservoir (Texas) Toledo Bend Reservoir (Texas &	2,236,450	1,906,825	85	52,185	2	-329,625	-15	
Louisiana)	4,472,900	3,817,750	85	104,370	2	-827,580	-19	
Tyler, Lake	72,073	67,920	94	3,159	4	-4,153	-6	
Wright Patman Lake	122,593	122,593	100	0	0	0	0	
TOTAL	9,975,685	9,075,238	91	121,301	1	-884,920	-9	
Ded Dluff Deserves in	151 140	TRANS-PECOS	01			6.046	-	
Kea Bluff Keservoir	151,110	130,413	86	no data	2	-6,846	-5	
Elephant Butte Reservoir (Texas)	852,491	87,143	10	18,003	Z	-51,615	-6	
& New Mexico)	1,973,358	201,721	10	41,674	2	-119,480	-6	
IUIAL	1,003,601	217,556	22	18,003	2	-58,461	-6	

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS								
Name of lake or reservoir	Conservation storage capacity	Conservation storage end of December 2016		Change since end of November 2016		Change since end of December 201		
	(acre-feet)	(acre-feet)	(%)	(acre-feet)**	(%)	(acre-feet)**	(%)	
	EDWARDS PLATEAU							
*Amistad Reservoir (Texas)	1,840,849	1,552,345	84	14,283	1	323,606	18	
Mexico)	3,275,532	2,335,429	71	27,931	1	407,881	12	
Brady Creek Reservoir	28,808	17,858	62	360	1	7,274	25	
Buchanan, Lake	860,607	815,602	95	-1,302	-0	127,818	15	
E. V. Spence Reservoir	517,272	69,918	14	202	0	19,085	4	
Inks, Lake	13,962	12,810	92	-67	-0	-105	-1	
Lyndon B Johnson, Lake	115,249	110,392	96	-428	-0	-122	-0	
Nasworthy	9,615	7,793	81	-194	-2	24	0	
Oak Creek Reservoir	39,210	21,146	54	435	1	8,733	22	
O. C. Fisher Lake	119,445	18,220	15	315	0	-2,841	-2	
*O. H. Ivie Reservoir	554,340	130,214	23	1,493	0	59,698	11	
Twin Buttes Reservoir	182,454	21,425	12	2,146	1	12,024	7	
TOTAL	4,281,811	2,777,723	65	17,243	0	555,194	13	
		SOUTH CENTRA	۱L					
*Austin, Lake	23,972	22,665	95	-77	-0	-462	-2	
Canyon Lake	378,781	378,781	100	905	0	0	0	
*Coleto Creek Reservoir	31,040	25,082	81	391	1	-3,222	-10	
Medina Lake	254,823	235,273	92	1,566	1	72,870	29	
Somerville Lake	147,104	147,104	100	0	0	0	0	
Travis, Lake	1,113,348	1,113,348	100	0	0	81,338	7	
TOTAL	1,949,068	1,922,253	99	2,785	0	150,524	8	
		UPPER COAST	•					
Houston, Lake	120,686	120,686	100	0	0	0	0	
Texana, Lake	159,566	155,546	97	12,462	8	-3,744	-2	
TOTAL	280,252	276,232	99	12,462	4	-3,744	-1	
		SOUTHERN						
Choke Canyon Reservoir	662,820	268,337	40	-303	-0	51,618	8	
Corpus Christi, Lake	256,961	243,736	95	5,735	2	31,234	12	
*Falcon Reservoir (Texas)	1,551,007	594,940	38	27,349	2	-219,399	-14	
*Falcon Reservoir (Texas &								
Mexico)	2,646,817	902,880	34	41,238	2	-622,547	-24	
TOTAL	2,470,788	1,107,013	45	32,781	1	-136,547	-6	
		STATEWIDE TOT	'AL					
STATEWIDE TOTAL	32,119,717	26,307,511	82	114,330	0	-697,891	-2	

* 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 month 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 pool 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. Values shown are for the Texas share of conservation storage in all reservoirs.

The computed 30-day mean flow status for 29 reporting index stations monitored this month is presented below. Mean flow increased at 21 index stations and decreased at eight stations.

Streamflow Status	Number of Stations		
Near or Above Normal (>30%)	25		
Abnormally Low (20-30%)	2		
Moderately Low (15-20%)	1		
Severely Low (10-15%)	0		
Extremely Low (5-10%)	0		
Exceptionally Low (<5%)	1		

On a regional basis, as shown below, flows at index stations were near or above normal in all 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.



Data from NASA Soil Moisture Active Passive (SMAP) Level 4 - Model - Value Added Version 2 Soil moisture content is shown as volume of water per unit volume of bulk soil. Root zone: 0 to 1 meter depth.

Soil moisture decreased or remained the same in the past 30-day period across much of the state. In the central part of the state, sizeable areas of soil moisture in the 0.3–0.35 range remained, but pockets of greater soil moisture decreased. In South Texas, West Texas, the northern Panhandle, and along a belt extending from the southwest to the northeast soil moisture predominately remained in the 0.1 to less than 0.05 range. In contrast, the Upper Coast had large areas greater than 0.3, as more of the region increased in soil moisture.

DECEMBER 2016 GROUNDWATER LEVELS IN OBSERVATION WELLS



December 2016

Water-level measurements were available for all 17 key monitoring wells in the state. Water levels rose in 12 monitoring wells since the beginning of December, ranging from an increase of 0.01 feet in the Lamb County Ogallala Aquifer well (#2 on map) to 8.01 feet in the Pecos County Edwards-Trinity (Plateau) Aquifer well (#15 on map). Water levels declined in five monitoring wells, ranging from a decline of 0.05 feet in the Bell County Edwards (Balcones Fault Zone) Aquifer well (#7 on map) to 2.28 feet in the LaSalle County Carrizo-Wilcox Aquifer well (#10 on map). The J-17 well (#8 on map) in San Antonio recorded a water level of 45.51 feet below land surface or 680.19 feet above mean sea level. There are no restrictions currently in place for the San Antonio portion of the Edwards (Balcones Fault Zone) Aquifer, with water levels at 25 feet above the Stage I critical management level.

*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	December	November	Month Change	Year Change	Historical Change	First Measured
(1) Hansford 0354301	157.47	157.67	0.20	-0.57	-87.35	1951
(2) Lamb 1053602	147.02	147.03	0.01	-0.73	-118.85	1951
(3) Martin 2739903	143.49	144.33	0.84	-1.17	-38.60	1964
(4) Dallas 3319101	494.56	494.28	-0.28	1.75	-272.56	1954
(5) Coryell 4035404	513.39	513.83	0.44	-5.65	-221.39	1955
(6) Kendall 6802609	116.09	122.05	5.96	6.25	-56.09	1975
(7) Bell 5804816	121.87	121.82	-0.05	-2.63	1.64	2008
(8) Bexar 6837203	45.51	50.81	5.30	18.40	1.13	1932
(9) Smith 3430907	432.79	434.18	1.39	1.54	-132.79	1987
(10) La Salle 7738103	455.59	453.31	-2.28	14.49	-202.52	2003
(11) Harris 6514409	195.66	194.31	-1.35	-6.26	-60.16*	1947**
(12) Victoria 8017502	33.41	34.41	1.00	1.80	0.59	1958
(13) El Paso 4913301	295.18	295.42	0.24	0.75	-6 3.2 8	1964
(14) Reeves 4644501	160.73	159.78	-0.95	-6.18	-68.64	1952
(15) Pecos 5216802	188.12	196.13	8.01	5.13	58.76	1976
(16) Haskell 2135748	46.32	46.42	0.10	0.81	-3.32	2002
(17) Hudspeth 4807516	136.84	140.27	3.43	1.22	-32.92	1966

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

DECEMBER 2016 GROUNDWATER LEVELS IN OBSERVATION WELLS



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



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



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







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



The late December water-level measurement in this Edwards (Balcones Fault Zone) Aquifer well, elevation 731 feet above mean sea level, was 45.51 feet below land surface, or 685.49 feet above mean sea level. This was 5.30 feet above last month's measurement, 18.40 feet above last year's measurement, and 1.13 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.

Yegua-Jackson Aquifer

The Yegua-Jackson Aquifer is a minor aquifer stretching across the southeast part of the state, serving 34 counties. It includes waterbearing parts of the Yegua Formation (part of the upper Claiborne Group) and the Jackson Group (comprising the Whitsett, Manning, Wellborn, and Caddell formations). These geologic units consist of interbedded sand, silt, and clay layers originally deposited as fluvial and deltaic sediments. Freshwater saturated thickness averages about 170 feet. Water quality varies greatly due to the composition of the water bearing formations, and in all areas the aquifer becomes highly mineralized at depth. Most groundwater is produced from the sand units of the aquifer, where the water is fresh, ranging from less than 50 to 1,000 milligrams per liter of total dissolved solids. Some slight to moderately saline water, ranging from 1,000 to 10,000 milligrams per liter of total dissolved solids, also occurs in the aquifer. The water is primarily used for livestock and domestic consumption, while other uses include municipal, industrial, and agricultural purposes.



The first recorded water-level measurement for this domestic well was 26 feet below land surface in 1974 when the well was drilled. The TWDB began measuring this well in 1976 and has measured consistently since. The water level has remained relatively stable throughout the recorded history. The highest recorded measurement of 16.48 feet below land surface was in 1986, and the lowest recorded measurement of 30.8 feet below land surface was in 2005.