



# March 2018 RESERVOIR STORAGE\*

At the end of March 2018, total conservation storage<sup>\*</sup> in 118 of the state's major water supply reservoirs was 26.99 million acre-feet or 84 percent of total conservation storage capacity. This is approximately 0.08 million acre-feet less than a month ago but 0.1 million acre-feet more than storage at this time last year.

Fifty-one (51) reservoirs held 100 percent of conservation storage capacity, primarily in the North Central (29 reservoirs) and East (20 reservoirs) regions. Two reservoirs, Palo Duro (1 percent) and Twin Buttes (7 percent) remained below 10 percent full.

Total combined storage was at or above normal (storage  $\geq$ 70 percent) in the East (100 percent), North Central (97 percent), Upper Coast (91 percent), and South Central (82 percent) regions. The High Plains (33 percent) and Trans-Pecos (30 percent) regions had the lowest percentage of storage. Overall, storage increased in two and decreased in seven regions over the past month.



\*Storage is based on end of the month data in 118 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.





CONSERVAT	ION STORAGE DA	TA FOR SELE	ECTED I	MAJOR TEXAS	S RESER	RVOIRS					
Name of lake or reservoir	Conservation storage capacity	Conservation storage end of March 2018 (acre-feet) (%)		Change since end of February 2018 (acre-feet)** (%)		Change since end of March 2017 (acre-feet)** (%)					
	(acre-feet)										
HIGH PLAINS											
MacKenzie Reservoir	46,450	6,629	14	-106	-0	-208	-0				
Meredith, Lake	500,000	200,854	40	-1,682	-0	80,523	16				
Palo Duro Reservoir	61,066	452	1	-63	-0	-428	-1				
White River Lake	29,880	5,300	18	-269	-1	-2,112	-7				
TOTAL	637,396	213,235	33	-2,120	-0	77,775	12				
		LOW ROLLING PI	LAINS								
Abilene, Lake	7,900	4,146	52	-183	-2	-3,504	-44				
Alan Henry Reservoir	94,808	78,072	82	-1,216	-1	-11,816	-12				
Champion Creek Reservoir	41,580	18,929	46	-254	-1	3,231	8				
Coleman, Lake	38,075	33,750	89	-139 -0		-3,766	-10				
Colorado City, Lake	30,758	11,843	39	-346	-1	-2,581	-8				
Fort Phantom Hill, Lake	70,030	61,744	88	-251	-0	-8,286	-12				
Greenbelt Lake	59,968	14,920	25	-130	-0	-1,738	-3				
Hords Creek Lake	8,443	5,282	63	-55	-1	-1,919	-23				
J. B. Thomas, Lake	199,931	89,818	45	-2,610	-1	-34,315	-17				
Kemp, Lake	245,307	210,402	86	-11,486	-5	-34,905	-14				
Millers Creek Reservoir North Fork Buffalo Creek	26,768	23,931 89		-330 -1		-2,837 -11					
Reservoir	15,400	11,098	72	-176	-1	-884	-6				
Stamford, Lake	51,570	46,359	90	-1,053	-2	-1,828	-4				
Sweetwater, Lake	12,267	2,306	19	-56	-0	-633	-5				
TOTAL	902,805	612,600	68	-18,285	-2	-105,781	-12				
		NORTH CENTR									
Amon G Carter, Lake	19,266	19,266	100	0	0	0	0				
Aquilla Lake	43,243	43,243	100	0	0	0	0				
Arlington, Lake	40,188	40,188	100	0	0	2,478	6				
Arrowhead, Lake	230,359	211,247	92	10,481	5	-13,208	-6				
Bardwell Lake	46,122	46,122	100	0	0	0	0				
Belton Lake	435,225	409,207	94	4,903	1	-26,018	-6				
Benbrook Lake	85,648	85,648	100	0	0	19,636	23				
Bonham, Lake	11,027	11,027	100	0	0	3,048	28				
Bridgeport, Lake	366,236	358,115	98	10,000	3 -1	-8,121	-2				
*Brownwood, Lake	128,839	105,356	82			-23,483	-18				
*Cisco, Lake	29,003	23,884	82	-143	-0	-1,929	-7				
Crook, Lake	9,195	9,195	100	0	0	188	2				
Eagle Mountain Lake Georgetown, Lake	179,880	179,880	100	0	0 -2	0	0				
Graham, Lake	36,823 45,288	24,553 43,889	67 97	-647 1,041	-2	-12,270 -980	-33 -2				
Granbury, Lake			100	1,041	2	-980	-2 0				
Granger Lake	132,949 51,822	132,378 51,822	100	0	0	0	0				
Grapevine Lake	164,703	164,703	100	0	0	0	0				
*Halbert, Lake	6,033	5,539	92	-45	-1	583	10				
Hubbard Creek Reservoir	318,067	271,328	85	-43	-1 -0	-42,467	-13				
Hubert H Moss Lake	24,058	23,928	99	-130	-0 -1	107	-13				
Jim Chapman Lake (Cooper)	260,332	260,332	100	-130	-1 0	69,457	27				
Joe Pool Lake	175,358	175,358	100	0	0	0,457	0				
Kickapoo, Lake	86,345	73,086	85	796	0 1	-4,995	-6				
Lavon Lake	406,388	406,388	100	0	0	39,935	10				
Leon, Lake	27,762	23,587	85	-47	-0	62	10				
Lewisville Lake	563,228	563,228	100	-47	-0 0	0	0				
Limestone, Lake	203,780	190,702	94	28,089	0 14	-13,078	-6				
*Lost Creek Reservoir	11,950	11,895	100	-55	-0	-21	-0				
*Mineral Wells, Lake	5,273	5,273	100	-55	-0	0	0				
Mountain Creek, Lake	22,850	22,850	100	0	0	0	0				

			CTED I	Change de	20	Change	
Name of lake or reservoir	Conservation storage capacity	Conservation st end of March 2		Change sinc end of February		Change sin end of March	
Nume of face of reservoir	(acre-feet)	(acre-feet) (%)		(acre-feet)**	(%)	(acre-feet)**	(%)
		(North Central cont	inued)				
Navarro Mills Lake	49,827	48,842	98	5,281	11	-985	-
New Terrell City Lake	8,583	8,583	100	0	0	43	
Nocona, Lake (Farmers Crk)	21,444	21,444	100	0	0	0	
Palo Pinto, Lake	26,766	24,654	92	277	1	64	
Pat Cleburne, Lake	26,008	26,008	100	0	0	0	
*Pat Mayse Lake	113,683	113,683	100	0	0	12,938	1
Possum Kingdom Lake	538,139	523,606	97	4,894	ů 1	-12,566	
Proctor Lake	54,762	45,724	83	0	0	-8,486	-1
Ray Hubbard, Lake	439,559	438,306	100	-1,253	-0	11,934	1
Ray Roberts, Lake	788,167	788,167	100	-1,253 -0 0 0		0	
Richland-Chambers Reservoir	1,087,839	1,085,699	100	50,734	5	-2,140	-
			99				
Squaw Creek, Lake Stillhouse Hollow Lake	151,250	150,082		-1,168	-1	1,098	1
	227,771	204,190	90 100	119	0	-23,581	-1
Tawakoni, Lake	871,685	871,685	100	0	0	107,071	1
Texoma, Lake (Texas) Texoma, Lake (Texas &	1,258,113	1,234,041	98	-24,072	-2	74,545	
Oklahoma)	2,525,281	2,468,089	98	-151,902	-6	149,090	
Waco, Lake	189,418	179,281	95	8,321	4	-10,137	-
Waxahachie, Lake	10,780	10,780	100	0	0	0	
Weatherford, Lake	17,812	17,780	100	250	1	379	
Whitney, Lake	553,344	505,896	91	8,592	2	21,859	
Worth, Lake	33,495	33,495	100	0	0	2,403	
TOTAL	10,635,685	10,325,163	97	103,777	1	163,526	
		EAST					
Athens, Lake	29,503	29,503	100	0	0	0	
B A Steinhagen Lake	66,961	56,253	84	-6,037	-9	-4,616	-
Bob Sandlin, Lake	190,822	190,822	100	0	0	0	
Caddo, Lake	29,898	29,898	100	0	0	0	
Cedar Creek Reservoir in Trinity	644,686	644,686	100	0	0	981	
Cherokee, Lake	40,094	40,094 10		0	0	0	
Conroe, Lake	410,988	410,988 1		0	0	384	
Cypress Springs, Lake	66,756	66,756 10		0	0	1,191	
Fork Reservoir, Lake	605,061	601,358 99		-3,703	-1	49,375	
Houston County Lake	17,113	17,113 100		0	0	0	
Jacksonville, Lake	25,670	25,670 100		0	0	0	
*Livingston, Lake	1,785,348	1,785,348	100	0	0	0	
Martin, Lake	75,726	75,479	100	1,671	2	6,040	
Monticello, Lake	34,740	30,930	89	-2,264	-7	-3,810	-1
Murvaul, Lake	38,285	38,285	100	0	0	1,971 1,124	
Nacogdoches, Lake	39,522	39,522	100	88	0	1,124	
O' the Pines, Lake	241,363	241,363	100	0	0	0	
Palestine, Lake	367,303	367,303	100	0	0	0	
Sam Rayburn Reservoir	2,857,077	2,857,077	100	0	0	171,331	
Striker, Lake	16,934	16,934	100	0	0	289	
*Sulphur Springs, Lake	17,747	16,635	94	-1,112	-6	1,771	1
Toledo Bend Reservoir (Texas) Toledo Bend Reservoir (Texas &	2,236,450	2,236,450	100	0	0	204,022	
Louisiana)	4,472,900	4,654,872	100	33,244	1	585,917	1
Tyler, Lake	72,073	72,073	100	0	0	0	
Wright Patman Lake	122,593	122,593	100	0	0	0	
TOTAL	10,032,713	10,013,133	100	-11,357	-0	430,053	

CONSERVATIO	N STORAGE DA	TA FOR SELE	ECTED I	MAJOR TEXAS	RESEF	RVOIRS			
Name of lake or reservoir	Conservation storage capacity			Change since end of February 2018		Change since end of March 2017			
	(acre-feet)	(acre-feet)	(%)	(acre-feet)**	(%)	(acre-feet)**	(%)		
		TRANS-PECC	)S						
Elephant Butte Reservoir (Texas) Elephant Butte Reservoir (Texas	852,491	188,431	22	-20,210	-2	54,222	6		
& New Mexico)	1,973,358	436,182	22	-46,782	-2	125,515	6		
Red Bluff Reservoir	151,110	111,661	74	-182	-0	-20,965	-14		
TOTAL	1,003,601	300,092	30	-20,392	-2	33,257	3		
		EDWARDS PLAT	ΓΕΑυ						
*Amistad Reservoir (Texas) *Amistad Reservoir (Texas &	1,840,849	1,381,044	75	-8,635	-0	-64,036	-3		
Mexico)	3,275,532	2,011,221	61	-7,547	-0	-61,318	-2		
Brady Creek Reservoir	28,808	15,893	55	-228	-1	-2,974	-10		
Buchanan, Lake	860,607	774,708	90	3,834	0	-42,414	-5		
E. V. Spence Reservoir	517,272	62,667	12	-1,011	-0	-7,211	-1		
Inks, Lake	13,962	13,066	94	219	2	181	1		
Lyndon B Johnson, Lake	115,249	110,453	96	-183	-0	244	0		
Marble Falls, Lake	6,901	6,798	99	5	0	0	0		
Nasworthy	9,615	8,000	83 -147		-2	436	5		
Oak Creek Reservoir	39,210	18,625	48	-310	-1	-4,631	-12		
O. C. Fisher Lake	119,445	11,541	10	-99	-0	-5,513	-5		
*O. H. Ivie Reservoir	554,340	102,510	18	-2,794	-1	-32,771	-6		
Twin Buttes Reservoir	182,454	12,321	7	-176	-0	-12,779	-7		
TOTAL	4,288,712	2,517,626	59	-9,525	-0	-171,468	-4		
		SOUTH CENTR	RAL						
*Austin, Lake	23,972	23,081	96	355	1	416	2		
Canyon Lake	378,781	351,757	93	2,973	1	-27,024	-7		
*Coleto Creek Reservoir	31,040	27,352	88	-782	-3	-3,547	-11		
Medina Lake	254,823	155,352	61	-3,932	-2	-80,619	-32		
Somerville Lake	147,104	147,104	100	0	0	0	0		
Travis, Lake	1,113,348	893,385	80	-5,843	-1	-219,963	-20		
TOTAL	1,949,068	1,598,031	82	-7,229	-0	-330,737	-17		
		UPPER COAS	ST						
Houston, Lake	120,686	120,686	100	0	0	0	0		
Texana, Lake	159,566	134,633	84	2,459	2	-23,923	-15		
TOTAL	280,252	255,319	91	2,459	1	-23,923	-9		
	•	SOUTHERN		,		,			
Choke Canyon Reservoir	662,820	192,431	29	-3,924	-1	-70,791	-11		
Corpus Christi, Lake	256,062	228,427	89	-7,799	-3	-12,797	-5		
*Falcon Reservoir (Texas) *Falcon Reservoir (Texas &	1,551,007	733,620	47	-108,251	-7	119,917	8		
Mexico)	2,646,817	1,204,577	46	-206,675	-8	421,503	16		
TOTAL	2,469,889	1,154,478	47	-119,974	-5	36,329	1		
STATEWIDE TOTAL									
STATEWIDE TOTAL	32,200,121	26,989,677	84	-82,646	-0	109,031	0		

\* 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 (some may have seasonal variations), 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.

The computed 30-day mean flow status for 29 reporting index stations monitored this month is presented below. Mean flow increased at 16 index stations, decreased at 11 stations, and remained unchanged at two stations.

Streamflow Status	Number of Stations		
Near or Above Normal (>30%)	21		
Abnormally Low (20-30%)	4		
Moderately Low (15-20%)	2		
Severely Low (10-15%)	0		
Extremely Low (5-10%)	1		
Exceptionally Low (<5%)	1		

On a regional basis, as shown below, stream flows were exceptionally low in the Trans Pecos region, abnormally low in the Edwards Plateau region, but near or above normal in all other 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.



### **Soil Moisture Condition**

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.



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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 at the end of March 2018 (*top image*), as compared to soil moisture at the end of February 2018 (*bottom image*), increased in four climate regions ranging from 6 - 12 percent with the greatest increases in Low Rolling Plains and South Central regions, declined in the Upper Coast region by 8 percent, and remained unchanged in five other climate regions.



Water-level measurements were available for all 17 key monitoring wells in the state. Water levels rose in 7 monitoring wells since the beginning of March 2018, ranging from an increase of 0.02 feet in the Victoria County Gulf Coast Aquifer well (#12 on map) to 0.93 feet in the Coryell County Trinity Aquifer well (#5 on map). Water levels declined in 10 monitoring wells, ranging from a decline of 0.21 feet in the Lamb County Ogallala Aquifer well (#2 on map) to 5.24 feet in the Hudspeth County Bone Springs-Victorio Peak Aquifer well (#17 on map). The J-17 well (#8 on map) in San Antonio recorded a water level of 63.51 feet below land surface or 667.49 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 7.49 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	March	February	Month Change	Year Change	Historical Change	First Measured
(1) Hansford 0354301	159.34	158.99	-0.35	-1.40	-89.22	1951
(2) Lamb 1053602	148.52	148.31	-0.21	-1.25	-120.35	1951
(3) Martin 2739903	143.91	143.19	-0.72	-0.83	-39.02	1964
(4) Dallas 3319101	493.67	493.78	0.11	-0.36	-271.67	1954
(5) Coryell 4035404	520.80	521.73	0.93	-8.16	-228.80	1955
(6) Kendall 6802609	130.46	125.52	-4.94	-23.15	-70.46	1975
(7) Bell 5804816	124.46	124.19	-0.27	-3.53	-0.95	2008
(8) Bexar 6837203	63.51	63.91	0.40	-14.90	-16.87	1932
(9) Smith 3430907	431.22	431.81	0.59	-0.20	-131.22	1977
(10) La Salle 7738103	498.94	497.74	-1.20	-28.74	-245.87	2003
(11) Harris 6514409	191.79	192.43	0.64	0.71	-56.29*	1947**
(12) Victoria 8017502	32.35	32.37	0.02	-0.65	1.65	1958
(13) El Paso 4913301	294.68	294.52	-0.16	0.88	-62.78	1964
(14) Reeves 4644501	165.71	160.56	-5.15	-0.20	-73.62	1952
(15) Pecos 5216802	191.34	186.76	-4.58	-1.01	55.54	1976
(16) Haskell 2135748	46.45	46.60	0.15	-0.41	-3.45	2002
(17) Hudspeth 4807516	144.83	139.59	-5.24	-0.81	-40.91	1966

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

# MARCH 2018 GROUNDWATER LEVELS IN OBSERVATION WELLS





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









The late March water-level measurement in this Edwards (Balcones Fault Zone) Aquifer well, elevation 731 feet above mean sea level, was 63.51 feet below land surface, or 667.49 feet above mean sea level. This was 0.40 feet above last month's measurement, 14.90 feet below last year's measurement, and 16.87 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.

Marble Falls Aquifer

The Marble Falls Aquifer is a minor aquifer that is present in several separated outcrops along the northern and eastern flanks of the Llano Uplift region of Central Texas. Groundwater occurs in fractures, solution cavities, and channels in the limestone of the Marble Falls Formation of the Bend Group. Maximum thickness of the formation is 600 feet. Because the limestone beds composing the aquifer are relatively shallow, the aquifer is susceptible to pollution by surface uses and activities.

The groundwater contains less than 1,000 milligrams per liter of total dissolved solids. Water from the aquifer is used for municipal, agricultural, and industrial uses, and no significant water-level declines have occurred in wells measured by the TWDB.



The initial measurement in this domestic well was 25 feet below land surface as recorded in 1967 by the driller (not shown). The TWDB has measured this well every year since 1977. The water level has remained relatively stable throughout the period of record with no more than an overall decline of 10 feet in the last 39 years. The lowest water level measurement of 34.8 feet below land surface was recorded in 2014 during drought conditions.