Texas Water Development Board

WATER Conditions

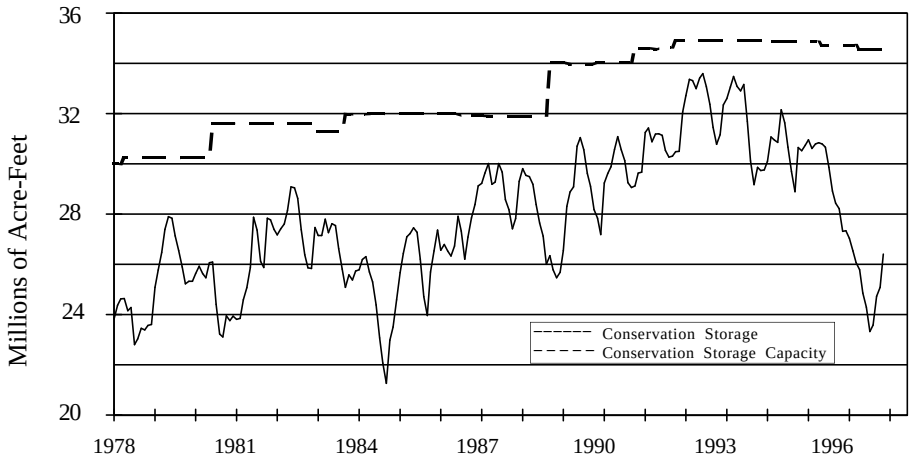
RESERVOIR STORAGE

December 1996

Near the end of November, the 77 reservoirs monitored for this report held 26,407,410 acre-feet in conservation storage. This was 76 percent of the conservation storage capacity of the State's major reservoirs. Compared to last month, storage has increased 1,321,870 acre-feet. Compared to this month last year, storage has decreased 901,800 acre-feet.

Of the monitored reservoirs, 26 held 100 percent or more of their conservation storage capacities near the end of November. Lakes Sulphur Springs, Eagle Mountain, Hubbard Creek, Graham, Possum Kingdom, Palo Pinto, Granbury, Cypress Springs, Steinhagen, Livingston, and Houston, were full and spilling. An additional amount of water (acre-feet) was contained in the flood storage pool in each of the reservoirs as follows: Texoma, 380,600; Pat Mayse, 46,500; Cooper, 107,110; Benbrook, 15,570; Roberts, 46,880; Lewisville, 4,110; Grapevine, 26,690; Lavon, 26,820; Whitney, 32,360; Waco, 10,950; Proctor, 7,960; Belton, 7,820; Granger, 1,740; Wright Patman, 238,510; and and Lake O' the Pines, 20,780.

Conservation Storage Data for Selected Major Texas Reservoirs



Current data are based on elevation near end of month at 77 reservoirs that represent 98 percent of total conservation storage capacity in Texas reservoirs having a capacity of 5,000 acre-feet or more.

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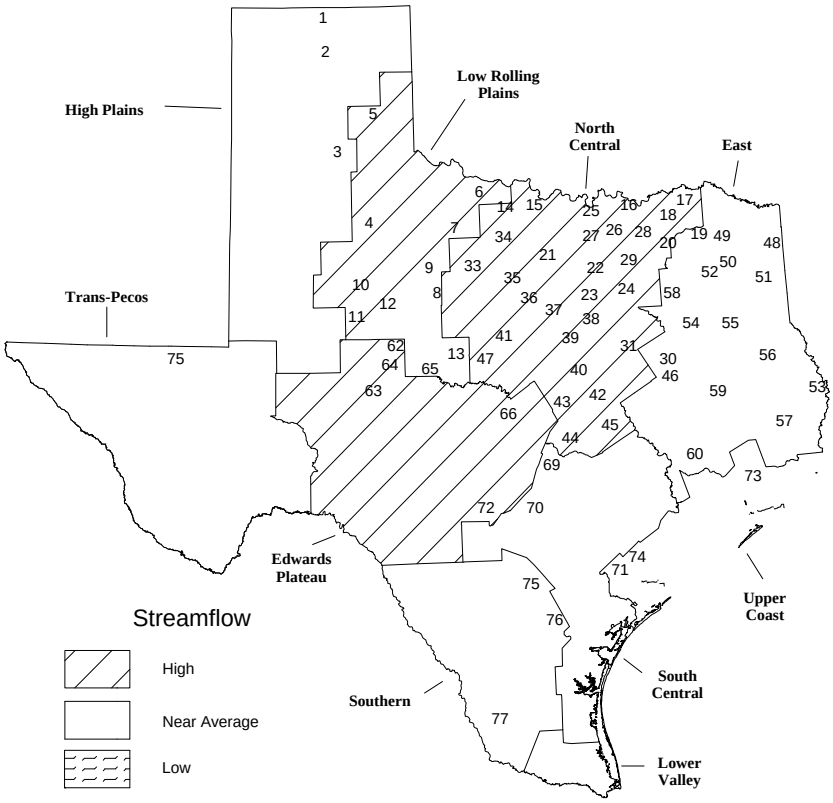
STREAMFLOW

Streamflow conditions across Texas ranged from above-normal to near-normal during the month of November. Rainfall throughout the middle of the state resulted in above normal streamflow conditions being reported across North-central, the Edwards Plateau, and the Low Rolling Plains climatic divisions. The remainder of the state mainly reported near-normal flow rates. The following is a summary of the measured flows at various index stations across the State.

The index station for the East Texas climatic division is located on the Neches River near Rockland. Streamflow for November was within the normal range, averaging 424 cubic feet per second (cfs). The monthly average flow rate, when compared to the 1961-90 reference period, was 65 percent of the reference period median and 235 cfs above the below-normal level for this location. For North-central Texas, the index station is located on the North Bosque River near Clifton. Streamflow past the gage was above normal for the fourth consecutive month, averaging 246 cfs, or 996 percent of the monthly reference period median. This was 208.1 cfs above the station's near-normal flow level. Elsewhere across the State, the index station for the Edwards Plateau is located on the North Concho River near Carlsbad. Streamflow past the gage averaged 6.93 cfs during the month, or 2,475 percent of the reference period median. This value was above-normal, 3.85 cfs above the station's near-normal November flow level. The index station for South-central and the Southern Texas is located on the Guadalupe River near Spring Branch. Flow during the month at the station was near-normal, averaging 245 cfs past the gage. This was 126 percent of the month's reference period median flow rate and was 191 cfs below the above-normal streamflow level.

STREAMFLOW CONDITIONS FOR DECEMBER COMPARED WITH PAST RECORD



Reservoirs Shown on Map

1. Palo Duro Reservoir
2. Lake Meredith
3. MacKenzie Reservoir
4. White River Lake
5. Greenbelt Reservoir
6. Lake Kemp
7. Miller's Creek Reservoir
8. Fort Phantom Hill Reservoir
9. Lake Stamford
10. Lake J. B. Thomas
11. Lake Colorado City
12. Champion Creek Reservoir
13. Hords Creek Lake
14. Lake Kickapoo
15. Lake Arrowhead
16. Lake Texoma
17. Pat Mayse Lake
18. Cooper Lake
19. Lake Sulphur Springs
20. Lake Tawakoni
21. Bridgeport Reservoir
22. Eagle Mountain Reservoir
23. Benbrook Lake
24. Joe Pool Lake
25. Ray Roberts Lake
26. Lewisville Lake
27. Grapevine Lake
28. Lavon Lake
29. Lake Ray Hubbard
30. Richland-Chambers Creek Lake
31. Navarro Mills Lake
32. Bardwell Lake
33. Hubbard Creek Reservoir
34. Lake Graham
35. Possum Kingdom Lake
36. Lake Palo Pinto
37. Lake Granbury
38. Lake Pat Cleburne
39. Whitney Lake
40. Waco Lake
41. Proctor Lake
42. Belton Lake
43. Stillhouse Hollow Lake
44. Lake Georgetown
45. Granger Lake
46. Lake Limestone
47. Lake Brownwood
48. Wright Patman Lake
49. Lake Cypress Springs
50. Lake Bob Sandlin
51. Lake O' the Pines
52. Lake Fork Reservoir
53. Toledo Bend Reservoir
54. Lake Palestine
55. Lake Tyler
56. Sam Rayburn Reservoir
57. B. A. Steinhagen Lake
58. Cedar Creek Reservoir
59. Lake Livingston
60. Lake Conroe
61. Red Bluff Reservoir
62. E. V. Spence Reservoir
63. Twin Buttes Reservoir
64. O. C. Fisher Lake
65. O. H. Ivie Reservoir
66. Lake Buchanan
67. Intl. Amistad Reservoir
68. Somerville Lake
69. Lake Travis
70. Canyon Lake
71. Coleto Creek Reservoir
72. Medina Lake
73. Lake Houston
74. Lake Texana
75. Choke Canyon Reservoir
76. Lake Corpus Christi
77. Intl. Falcon Reservoir

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

Name of Lake or Reservoir	No. on Map	Conservation Storage Capacity (acre-feet)	Conservation Storage in Acre-Feet and as Percent of Conservation Storage Capacity					
			Late Nov 1996		Late Oct 1996		Late Nov 1995	
HIGH PLAINS								
Palo Duro Reservoir	1	60,900	13,900	23	14,020	23	3,220	5
Lake Meredith (Texas)	2	500,000	371,600	74	374,560	75	330,280	66
Lake Meredith (Texas and Oklahoma)	(2)	(779,560)	(371,600)	(48)	(374,560)	(48)	(330,280)	(42)
MacKenzie Reservoir	3	46,250	7,790	17	7,840	17	7,960	17
White River Lake	4	31,850	7,900	25	7,980	25	19,670	62
TOTAL		639,000	401,190	63	404,400	63	361,130	56
LOW ROLLING PLAINS								
Greenbelt Reservoir	5	58,200	12,600	22	21,210	36	21,690	37
Lake Kemp	6	319,600	202,080	63	200,060	63	265,570	83
Miller's Creek Reservoir	7	27,890	12,130	43	12,640	45	13,370	48
Fort Phantom Hill Reservoir	8	70,030	58,880	84	59,580	85	60,290	86
Lake Stamford	9	52,700	21,290	40	21,760	41	31,330	59
Lake J. B. Thomas	10	202,300	8,890	4	8,490	4	15,750	8
Lake Colorado City	11	30,800	19,120	62	19,120	62	22,300	72
Champion Creek Reservoir	12	41,600	20,840	50	20,840	50	31,560	76
Hords Creek Lake	13	8,600	6,710	78	6,690	78	6,490	75
TOTAL		811,720	362,540	45	370,390	46	468,350	58
NORTH CENTRAL								
Lake Kickapoo	14	106,000	66,500	63	65,600	62	93,600	88
Lake Arrowhead	15	262,100	194,480	74	190,530	73	231,070	88
Lake Texoma	16	2,722,300	2,722,300	100	2,722,300	100	2,650,800	97
Pat Mayse Lake	17	124,500	124,500	100	124,500	100	108,800	87
Cooper Lake	18	273,000	273,000	100	269,080	99	257,710	94
Lake Sulphur Springs	19	17,710	17,710	100	12,300	69	13,740	78
Lake Tawakoni	20	936,200	774,700	83	654,100	70	823,100	88
Bridgeport Reservoir	21	374,830	326,600	87	302,500	81	342,100	91
Eagle Mountain Reservoir	22	178,380	178,380	100	155,660	87	161,060	90
Benbrook Lake	23	88,200	88,200	100	88,200	100	86,720	98
Joe Pool Lake	24	175,800	165,370	94	149,940	85	162,280	92
Ray Roberts Lake	25	798,760	798,760	100	735,400	92	757,950	95
Lewisville Lake	26	555,000	555,000	100	324,840	59	445,460	80
Grapevine Lake	27	187,700	187,700	100	133,040	71	157,990	84
Lavon Lake	28	443,800	443,800	100	260,410	59	348,100	78
Lake Ray Hubbard	29	490,000	477,300	97	399,600	82	427,100	87
Richland-Chambers Creek Lake	30	1,103,820	850,690	77	838,030	76	1,041,570	94
Navarro Mills Lake	31	55,810	37,450	67	34,790	62	48,730	87
Bardwell Lake	32	53,580	52,300	98	42,990	80	47,290	88
Hubbard Creek Reservoir	33	317,800	317,800	100	314,300	99	249,300	78
Lake Graham	34	45,000	45,000	100	45,000	100	45,000	100
Possum Kingdom Lake	35	551,820	551,820	100	540,030	98	522,390	95
Lake Palo Pinto	36	42,200	42,200	100	41,530	98	39,580	94
Lake Granbury	37	135,680	135,680	100	135,680	100	135,680	100
Lake Pat Cleburne	38	25,300	19,870	79	17,700	70	22,400	88
Whitney Lake	39	622,800	622,800	100	622,800	100	553,850	89
Waco Lake	40	144,550	144,550	100	144,550	100	140,950	97

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

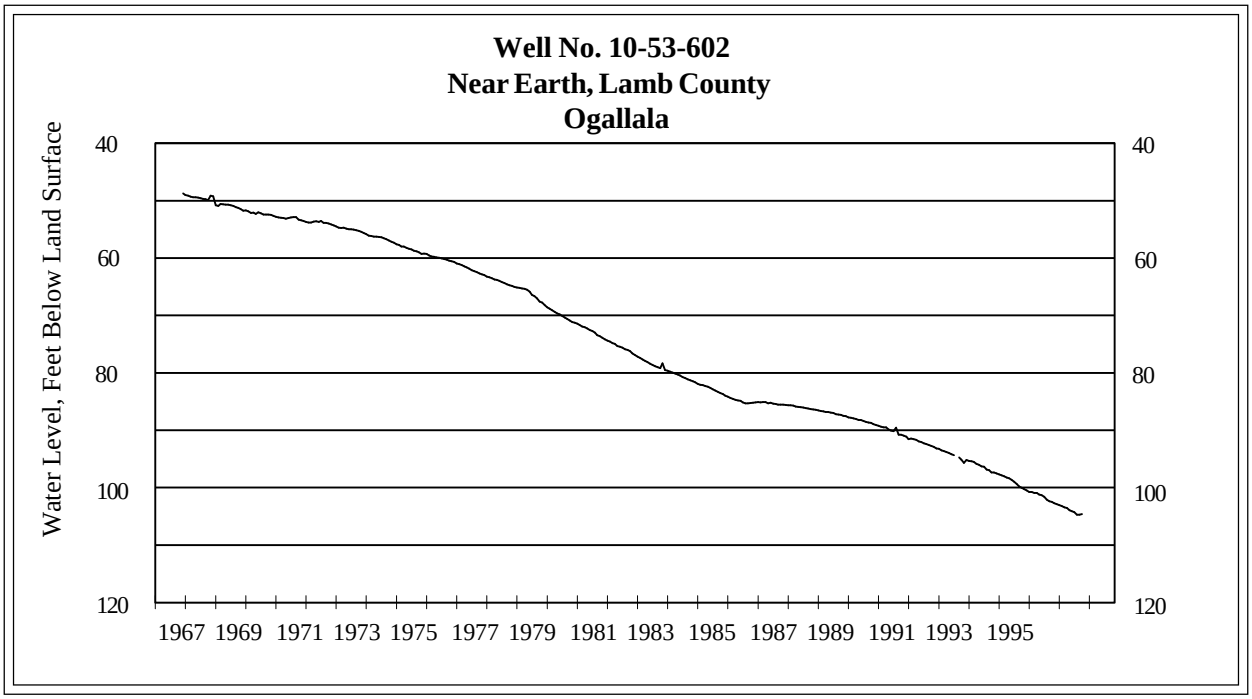
Name of Lake or Reservoir	No. on Map	Conservation Storage Capacity (acre-feet)	Conservation Storage in Acre-Feet and as Percent of Conservation Storage Capacity					
			Late Nov 1996		Late Oct 1996		Late Nov 1995	
NORTH CENTRAL (continued)								
Proctor Lake	41	55,590	55,590	100	55,590	100	57,360	97
Belton Lake	42	434,500	434,500	100	434,500	100	433,590	98
Stillhouse Hollow Lake	43	226,060	194,090	86	191,240	85	226,970	97
Lake Georgetown	44	37,010	20,860	56	20,770	56	29,260	79
Granger Lake	45	54,280	54,280	100	54,280	100	64,540	100
Lake Limestone	46	215,750	139,420	65	140,370	65	204,180	95
Lake Brownwood	47	143,400	142,000	99	141,300	99	123,800	86
TOTAL		11,999,230	11,255,200	94	10,403,450	87	11,083,990	92
EAST								
Wright Patman Lake	48	142,700	142,700	100	142,700	100	142,700	100
Lake Cypress Springs	49	66,800	66,800	100	66,800	100	63,240	95
Lake Bob Sandlin	50	202,300	200,450	99	173,710	86	181,460	90
Lake O' the Pines	51	252,000	252,000	100	252,000	100	239,640	95
Lake Fork Reservoir	52	635,200	632,200	99	551,710	87	574,750	90
Toledo Bend Reservoir	53	4,472,900	3,488,000	78	3,421,000	76	3,368,000	75
Lake Palestine	54	411,300	340,600	83	327,300	80	342,500	83
Lake Tyler	55	73,700	65,470	89	62,520	85	67,630	92
Sam Rayburn Reservoir	56	2,876,300	1,768,950	62	1,706,140	59	2,007,050	70
B. A. Steinhagen Lake	57	94,200	94,200	100	93,300	99	83,380	89
Cedar Creek Reservoir	58	637,050	516,200	81	492,200	77	597,300	88
Lake Livingston	59	1,750,000	1,750,000	100	1,652,000	94	1,750,000	100
Lake Conroe	60	429,900	412,270	96	406,620	95	413,070	96
TOTAL		12,044,350	9,729,840	81	9,348,000	78	9,830,720	82
TRANS-PECOS								
Red Bluff Reservoir	61	307,000	71,200	23	65,000	21	68,760	22
TOTAL		307,000	71,200	23	65,000	21	68,760	22
EDWARDS PLATEAU								
E. V. Spence Reservoir	62	484,800	116,000	24	115,400	24	163,500	34
Twin Buttes Reservoir	63	177,800	66,080	37	63,650	36	43,590	25
O. C. Fisher Lake	64	119,200	17,730	15	17,630	15	18,140	15
O. H. Ivie Reservoir	65	554,340	419,560	76	408,360	74	533,760	96
Lake Buchanan	66	896,980	617,850	69	599,340	67	770,030	86
Amistad Reservoir (Texas)	67	1,771,030	855,300	48	864,220	49	1,076,620	57
Amistad Reservoir (Texas and Mexico)	(67)	(3,151,300)	(1,268,760)	(40)	(1,267,139)	(40)	(1,243,630)	(37)
TOTAL		4,004,150	2,092,520	52	2,068,600	52	2,605,640	65
SOUTH CENTRAL								
Somerville Lake	68	155,060	151,750	98	149,450	96	160,100	100
Lake Travis	69	1,144,100	968,280	85	946,910	83	986,490	86
Canyon Lake	70	385,600	379,630	98	375,540	97	374,810	97
Coleto Creek Reservoir	71	35,060	27,580	79	29,090	83	24,950	71
Medina Lake	72	254,000	71,890	28	74,690	29	162,100	64
TOTAL		1,973,820	1,599,130	81	1,575,680	80	2,058,310	100

CONSERVATION STORAGE DATA FOR SELECTED MAJOR TEXAS RESERVOIRS

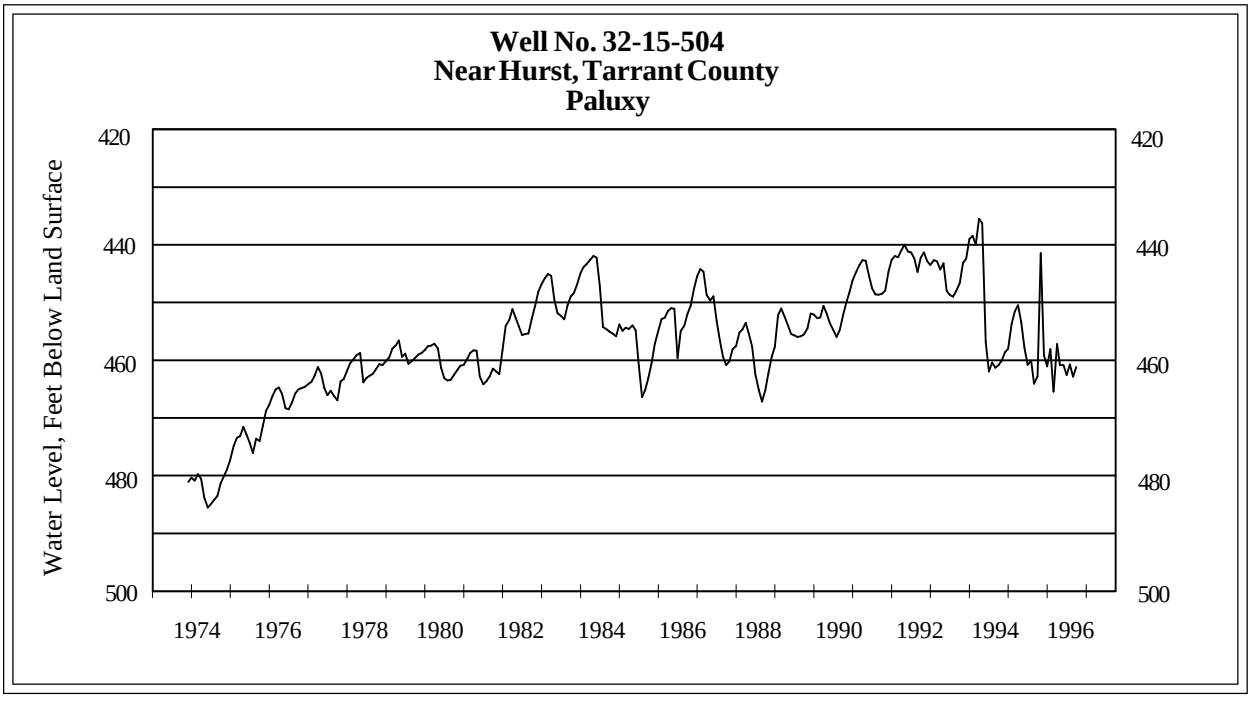
Name of Lake or Reservoir	No. on Map	Conservation Storage Capacity (acre-feet)	Conservation Storage in Acre-Feet and as Percent of Conservation Storage Capacity					
			Late Nov 1996		Late Oct 1996		Late Nov 1995	
UPPER COAST								
Lake Houston	73	128,860	128,860	100	128,860	100	140,500	100
Lake Texana	74	157,900	156,990	99	151,560	96	153,920	97
TOTAL		286,760	285,850	99	280,420	98	294,420	100
SOUTHERN								
Choke Canyon Reservoir	75	695,260	177,810	26	173,300	25	283,150	41
Lake Corpus Christi	76	241,240	119,200	49	101,200	42	129,500	54
Falcon Reservoir (Texas)	77	1,555,120	312,930	20	295,100	19	505,070	32
Falcon Reservoir (Texas and Mexico)	(77)	(2,653,290)	(570,740)	(21)	(556,147)	(21)	(761,260)	(29)
TOTAL		2,491,620	609,940	24	569,600	23	917,720	(37)
STATE TOTAL		34,557,650	26,407,410	76	25,085,540	73	27,309,210	79

NOTES: Conservation storage capacity is the space available to store water above the level of invert of lowest outlet works and below the level of 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 so-called dead storage (in the bottom of the reservoir, below the invert of lowest outlet works and consequently not removable by gravity flow alone). Percentages are based on the conservation storage capacity of and the conservation storage in the reservoirs for date shown. Current data are based on elevations near end of month at 77 reservoirs that together represent 98 percent of the total conservation storage capacity of major Texas reservoirs (those with capacity of 5,000 acre-feet or more each). Figures in parenthesis for Lake Meredith represent the total conservation storage excluding 58,014 acre-feet of dead storage and are not included in State total. Preliminary figures are shown for the United States' share of conservation storage in International Amistad and International Falcon Reservoirs; the estimates may be subject to revision on completion of international water accounting. Figures in parentheses show the total conservation storage for both Texas (United States' share) and Mexico and are not included in State total.

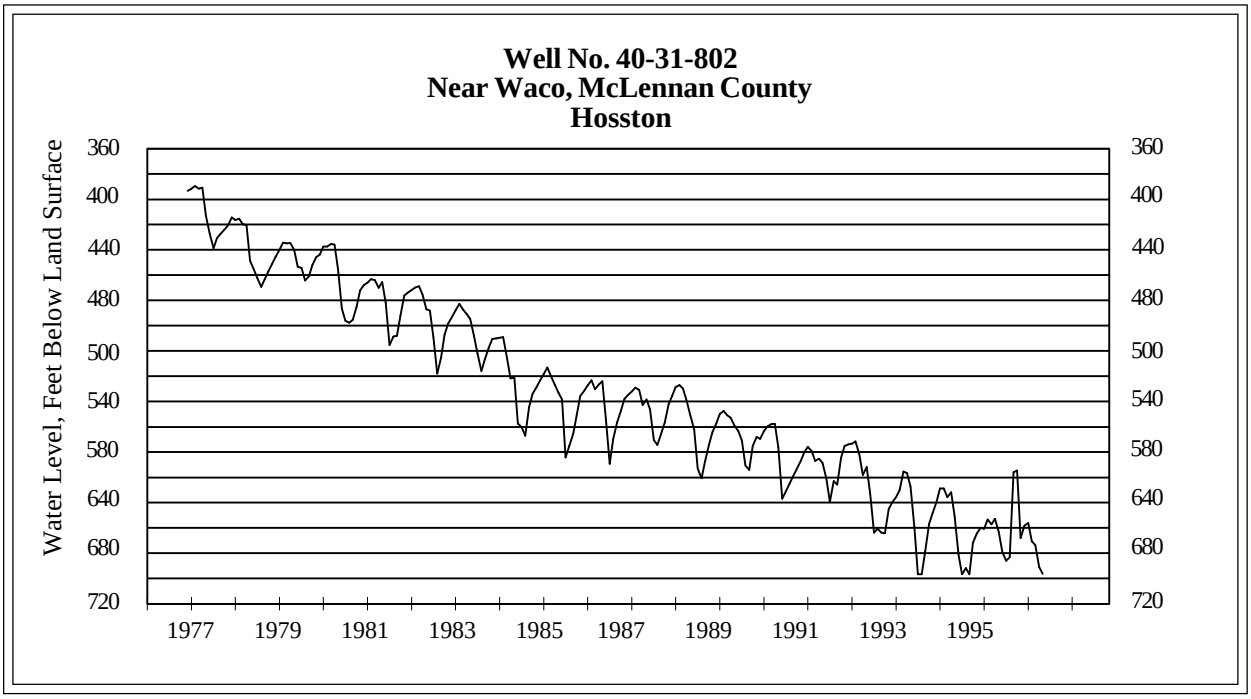
GROUND WATER LEVELS IN OBSERVATION WELLS



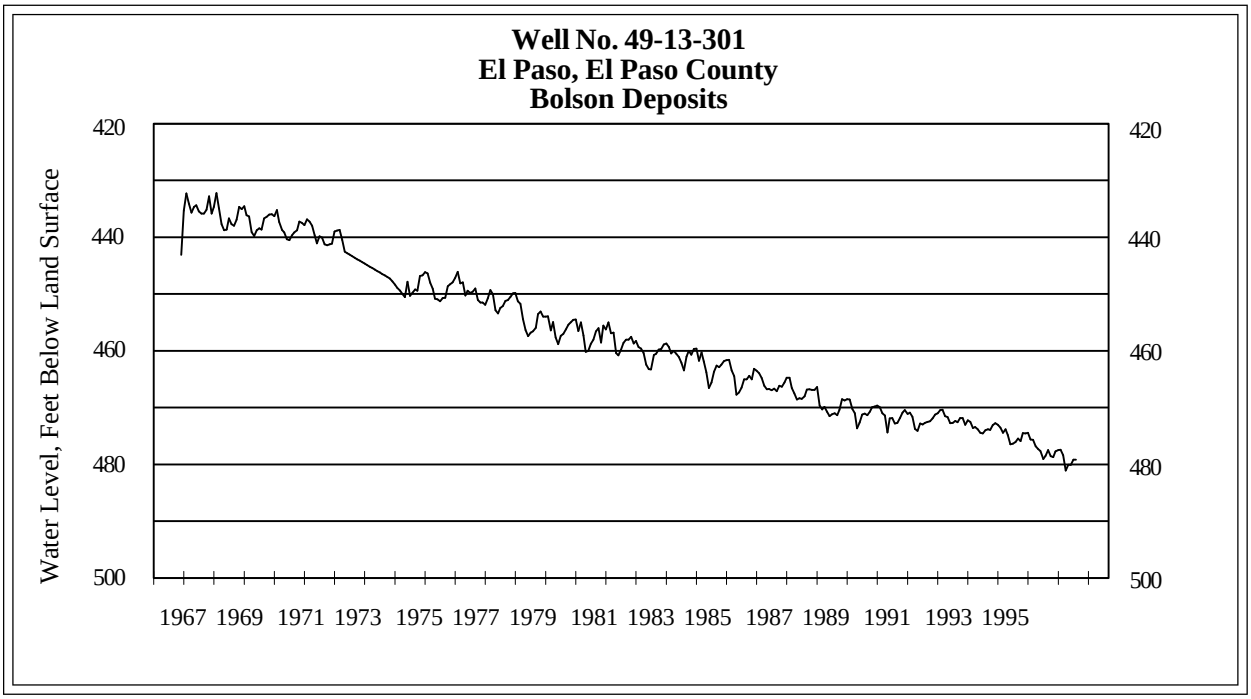
The November water-level measurement in this Ogallala aquifer well, elevation 3,667 feet above sea level, was 104.66 feet below land surface. This was 0.09 of a foot above last month's measurement, 2.12 feet below last year's measurement, and 76.51 feet below the initial measurement recorded in 1950.



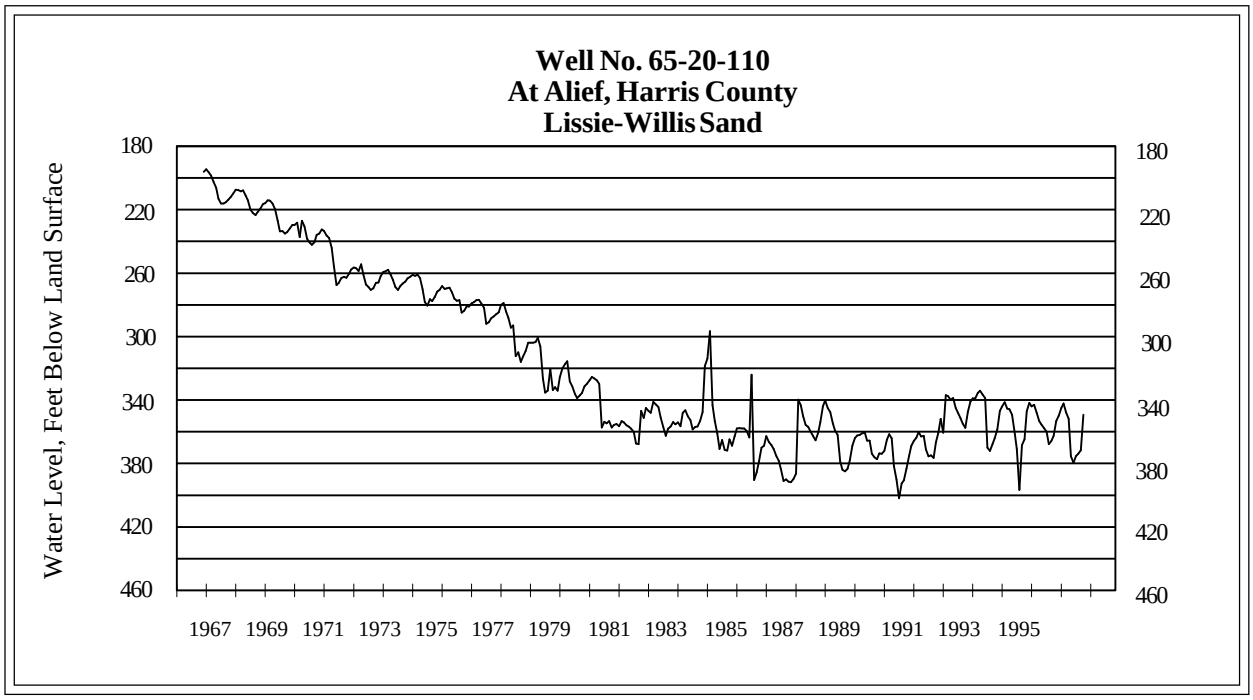
The November water-level measurement in this Paluxy aquifer well, elevation 535 feet above sea level, was 461.18 feet below land surface. The November measurement was 1.64 feet above last month's measurement, 1.62 feet above last year's measurement, and 67.79 feet below the initial measurement recorded in 1953.



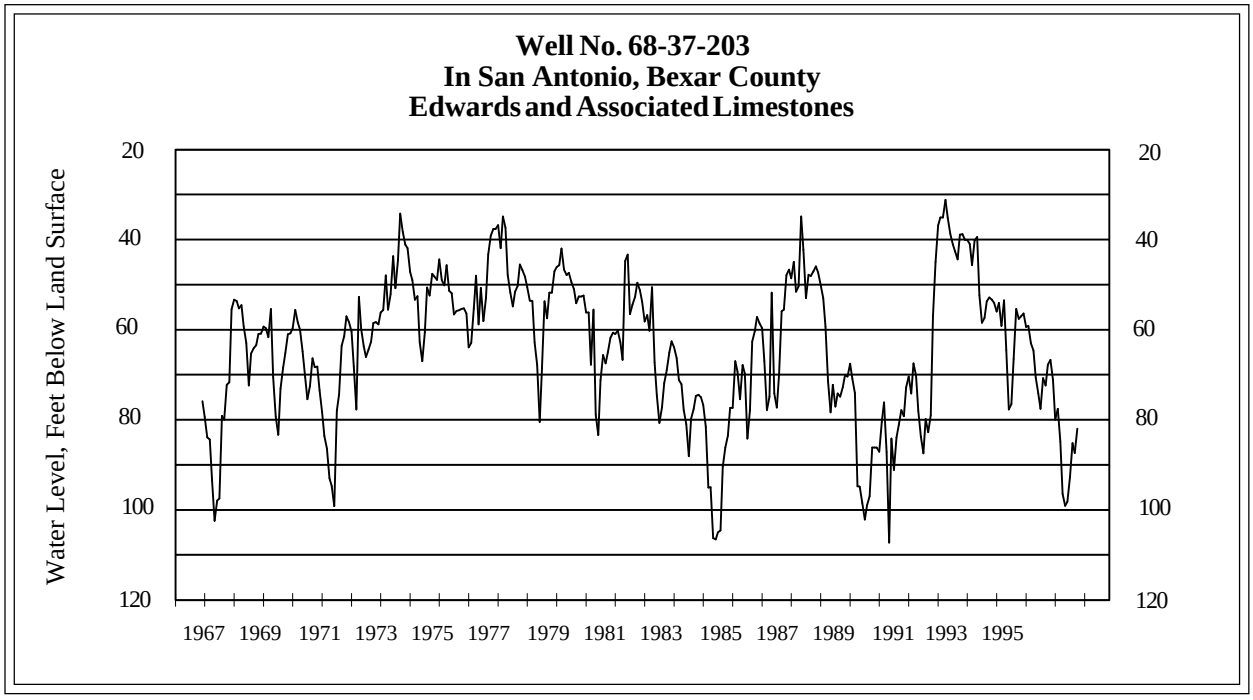
The November water-level measurement in this Hosston Formation aquifer well, elevation 593 feet above sea level, was not available due to a bridged casing. This well will be replaced with another Hosston well in the Waco area.



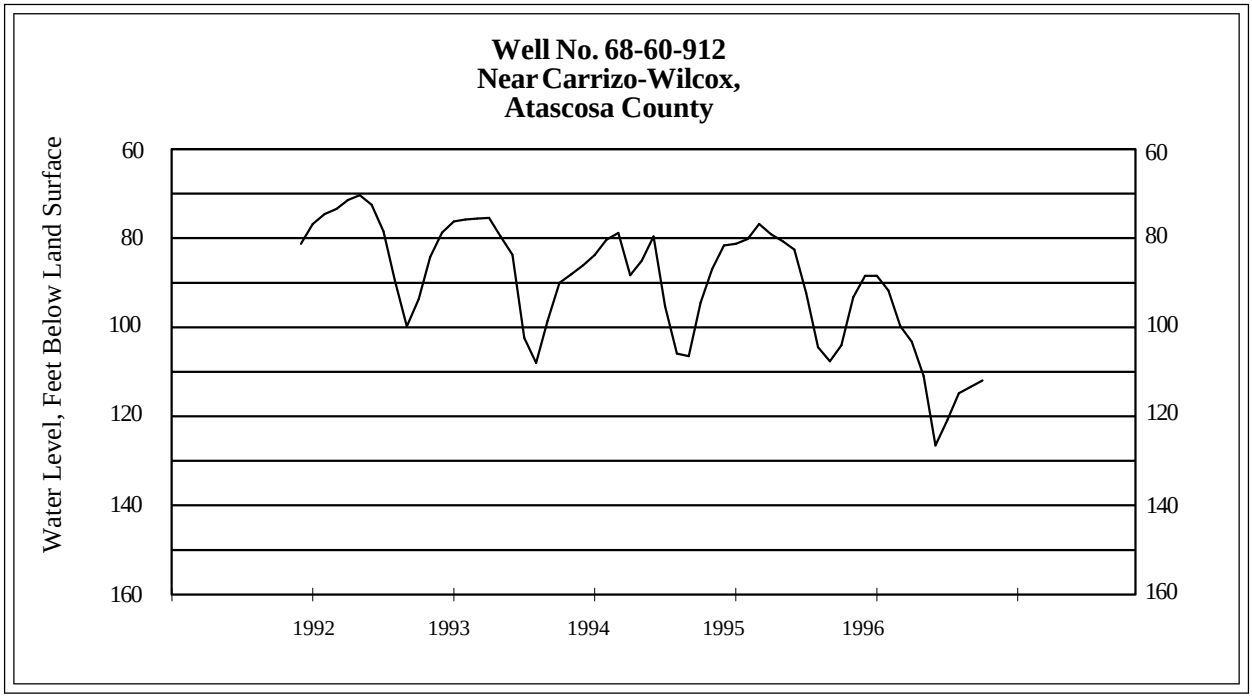
The November water-level measurement in this Bolson Deposits aquifer well, elevation 3,882 feet above sea level, was not available at the time of this report.



The November water-level measurement in this Lissie Willis Sand aquifer well, elevation 83 feet above sea level, was 349.36 feet below land surface. This was 22.31 feet above last month's measurement, 13.32 feet above last year's measurement, and 313.32 feet below the initial measurement recorded in 1939.



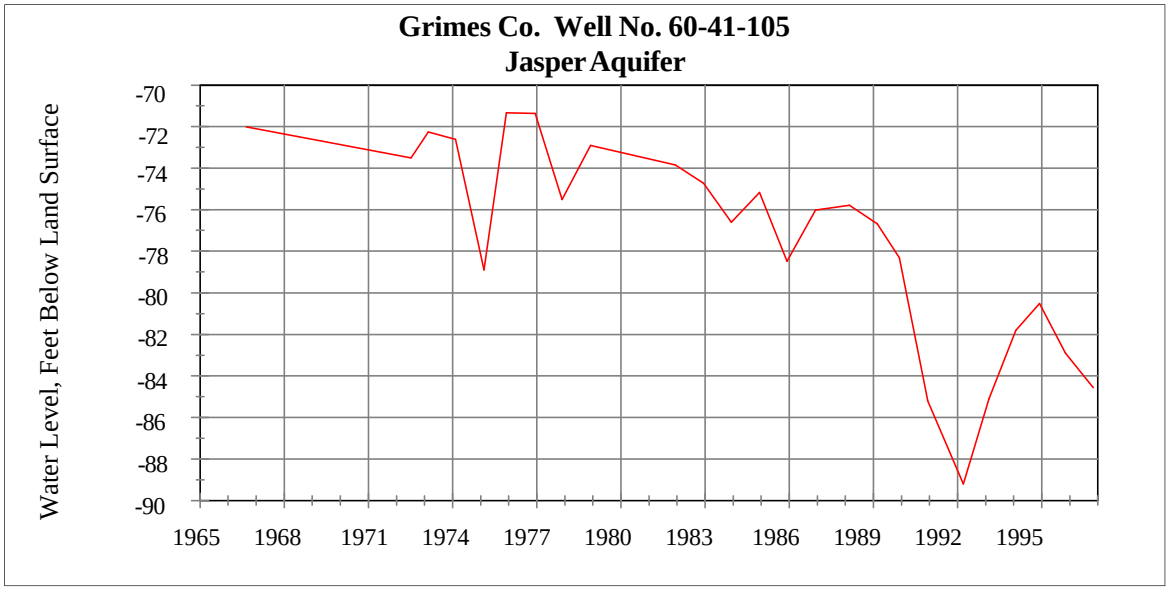
The November water-level measurement in this Edwards aquifer well, elevation 731 feet above sea level, was 82.00 feet below land surface. This was 5.40 feet above last month's measurement, 14.20 feet below last year's measurement, and 22.38 feet below the initial measurement recorded in 1962.



The November water-level measurement in this Carrizo aquifer well, elevation 446 feet above sea level, was 111.94 feet below land surface. This was 2.91 feet above last month's measurement, 7.84 feet below last year's measurement, and 30.36 feet below the initial measurement recorded in 1992.

Hydrograph of the Month

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



The November water-level measurement in this Jasper aquifer well, elevation 235 feet above sea level, was 84.55 feet below land surface. This was 1.65 feet below last year's measurement, and 12.55 feet below the initial measurement recorded in 1966.