

EDWARDS UNDERGROUND WATER DISTRICT

1619 Tower Life Building
San Antonio, Texas

BULLETIN 15

RECORDS OF PRECIPITATION, AQUIFER HEAD, AND GROUND-WATER RECHARGE TO THE EDWARDS AND ASSOCIATED LIMESTONES, SAN ANTONIO AREA, TEXAS, 1966

Compiled by

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Prepared in cooperation with the Geological Survey,
United States Department of the Interior,
the Texas Water Commission, and
the City of San Antonio

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The Edwards and associated limestones, the principal aquifer in the San Antonio area, has been the subject of numerous geologic and hydrologic reports. Records of precipitation, water levels, and estimates of recharge to the aquifer during 1966 are summarized in this report, which is one of three basic-data reports published yearly by the Edwards Underground Water District. The gathering of these records (and data) is part of the continuing hydrologic investigation by the U. S. Geological Survey in cooperation with the Edwards Underground Water District, the Texas Water Development Board, and the city of San Antonio.

Table 1 shows the annual precipitation at selected stations throughout the San Antonio area for 1966 and the annual average for each of these stations. Most of the area stations for 1966 show rainfall to be below the long-term mean.

Table 1.--Precipitation, in inches, at selected stations in the
San Antonio area, Texas, 1966.

Station	Precipitation	Long-term mean
Brackettville	21.63	20.32 (77 years)
Uvalde	20.87	23.80 (65 years)
Sabinal	21.54	25.02 (48 years)
Hondo	29.46	28.02 (63 years)
San Antonio	21.44	27.38 (90 years)
Boerne	29.05	31.85 (72 years)
New Braunfels	25.98	30.80 (73 years)
San Marcos	27.12	32.66 (66 years)

The recorded high and low water levels during 1966 in five selected key wells are shown in table 2. In 1966, the water levels fluctuated near or above the midpoint between the record high and low levels which are also shown in table 2. Ground water storage in the Edwards Limestone remained high, although rainfall in 1966 was below average.

Recharge to the Edwards and associated limestones is chiefly from streams which lose most of their base flow and a part of their flood flow as they cross the Balcones fault zone on the outcrop of the aquifer. The recharge is estimated from records of continuous discharge at gaging stations located above and below the infiltration areas in each of most of the streams. The monthly mean discharges at the gaging stations during October-December 1966 are shown in table 3. Streamflow records for January-September 1966 have been published by the U. S. Geological Survey (U. S. Department of the Interior, Geological Survey, Water Resources Division, 1966).

Table 2.--Annual recorded high and low water levels (feet above mean sea level)
in key wells tapping the Edwards and associated limestones.

San Antonio area, Texas, 1966

Well	High	Low	Record High	Record Low	Period of Record
H-5-1 (Uvalde County)	867.3	860.2	878.5 (11-22-61)	811.0 (4-13-57)	1929-32, 1934-66
J-1-82 (Medina County)	686.0	665.0	710.3 (2-27-61)	622.3 (8-18-56)	1950-66
*J-17 (Bexar County)	668.8	641.9	** 685.5 (6-26-35)	** 612.5 (8-17-56)	***1932-66
G-49 (Comal County)	625.8	623.1	627.3 (2-19-61)	613.3 (8-21-56)	1948-66
H-23 (Hays County)	588.6	566.2	593.6 (5-12-58)	542.2 (7-12-56)	1937-66

* Replaces well 26 and reflects almost the same water level (feet above mean sea level). The water-level data shown is a composite record of wells 26 and J-17.

** Record high and low for well 26.

*** Composite record - wells 26 and J-17.

Table 3.--Monthly mean discharge, in cubic feet per second, at
stream-gaging stations in the San Antonio area,

October-December 1966.

(Figures rounded to nearest cubic foot per second)

Station	1 9 6 6		
	Oct.	Nov.	Dec.
West Nueces River near Brackettville	5	<u>1</u> /	0
Nueces River at Laguna	151	99	83
Nueces River below Uvalde	68	34	24
Dry Frio River near Reagan Wells	32	18	13
Frio River at Concan	158	98	75
Frio River below Dry Frio River near Uvalde	0	0	0
Sabinal River near Sabinal	89	47	33
Sabinal River at Sabinal	5	2	1
Seco Creek at Miller Ranch near Utopia	15	6	4
Seco Creek near D'Hanis	0	0	0
Hondo Creek near Tarpley	20	8	5
Hondo Creek near Hondo	0	0	0
Medina River near Pipe Creek	111	72	55
Medina River near Riomedina	18	16	13
San Antonio River at San Antonio	19	15	15
Salado Creek (Upper station) at San Antonio	2	1	<u>1</u> /
Cibolo Creek at Selma	0	0	0
Guadalupe River at Comfort	104	84	76
Guadalupe River near Spring Branch	156	114	103
Guadalupe River above Comal River at New Braunfels	345	234	124
Comal River at New Braunfels	248	244	242
Blanco River at Wimberley	53	40	34
Blanco River near Kyle	32	23	20
San Marcos River spring flow at San Marcos	128	118	112

1/ less than 0.5

Table 4 shows the recharge in each basin of the San Antonio area for 1966 and the average annual recharge for the period 1934-65. The basic methods employed by Petitt and George (1956) and by Garza (1962) were used for estimating the 1966 recharge, which was well above the annual average. On August 13, 1966, greater than 10 inches of rain fell in the upper watersheds of the Nueces and Frio Rivers. This was followed by moderate rains during September. Recharge from the Nueces and Frio Rivers during August and September was 180 thousand acre-feet or 30 percent of all recharge for 1966. During these two months, the Nueces and Frio Rivers discharged 110 thousand acre-feet past the recharge area due to the high rainfall intensity.

Table 4.--Estimated recharge, in thousands of acre-feet,
to the Edwards and associated limestones,
San Antonio area, Texas, 1966

Basin	62	65	1966	1934-65 Average
Nueces and West Nueces Rivers		0	169.2	92.2
Frio and Dry Frio Rivers	-	0	134.0	79.6
Sabinal River	-	-	37.7	31.0
Medina Lake	-		50.5	50.7
Cibolo and Dry Comal Creeks		+	66.5	90.6
Blanco River and adjacent area		+	17.1 34.6	31.7
Area between Sabinal and Medina Rivers		+	78.2	68.6
Area between Cibolo Creek and Medina River		+	44.5	56.9
TOTALS			597.7	501.3 50.7

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