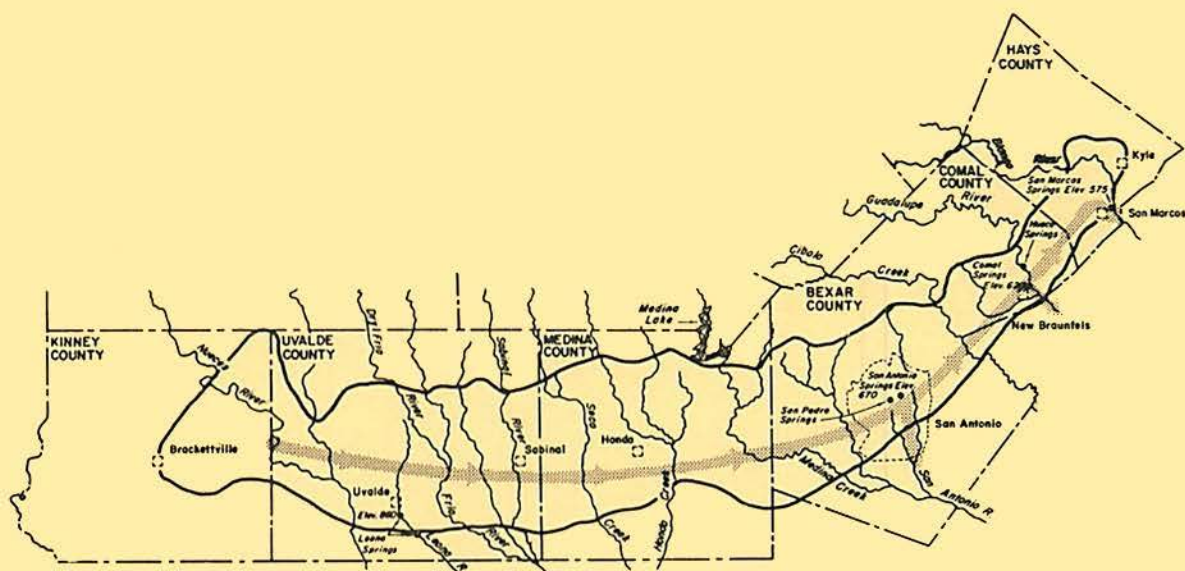


# Records of Precipitation, Water Levels and Ground-Water Recharge to the Edwards and Associated Limestones San Antonio Area, Texas, 1971

Bulletin 30  
Edwards Underground Water District  
San Antonio, Texas



Prepared in cooperation with the U.S. Geological  
Survey and the Texas Water Development Board

**EDWARDS UNDERGROUND WATER DISTRICT**

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**BULLETIN 30**

**RECORDS OF PRECIPITATION, WATER LEVELS, AND GROUND-WATER**

**RECHARGE TO THE EDWARDS AND ASSOCIATED LIMESTONES,**

**SAN ANTONIO AREA, TEXAS, 1971**

Compiled by

Celso Puente

United States Geological Survey

Prepared by the U. S. Geological Survey  
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Texas Water Development Board

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CONTENTS

	Page
Introduction - - - - -	3
Precipitation - - - - -	3
Water levels - - - - -	5
Ground-water recharge - - - - -	5
References - - - - -	10

TABLES

Table 1. Precipitation at selected stations in the San Antonio area, 1971 - - - - -	4
2. Annual recorded high and low water levels in key wells in the Edwards and associated limestones in the San Antonio area, 1971 - -	6
3. Monthly mean discharge at stream-gaging stations in the San Antonio area, October- December 1971 - - - - -	7
4. Estimated recharge to the Edwards and associated limestones in the San Antonio area, 1971 - - - - -	9

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INTRODUCTION

Records of precipitation, water levels, and estimates of recharge to the Edwards and associated limestones in the San Antonio area during 1971 are summarized in this report. The compilation of these basic records is part of a continuing hydrologic investigation by the U. S. Geological Survey in cooperation with the Edwards Underground Water District and the Texas Water Development Board. Previous reports are given in the list of references.

PRECIPITATION

The annual precipitation at selected stations throughout the San Antonio area for 1971 and the annual average for each of these stations are shown in table 1. Rainfall was above average throughout most of the recharge area during 1971.

Table 1.--Precipitation at selected stations in the  
San Antonio area, 1971

Station	Precipitation (inches)	Long-term mean (inches)
Brackettville	29.46 <u>1/</u>	20.71 (82 years)
Uvalde	31.01	24.14 (70 years)
Sabinal	31.00	25.71 (53 years)
Hondo	32.96	28.68 (68 years)
San Antonio	31.80	27.96 (95 years)
Boerne	45.24	32.37 (77 years)
New Braunfels	29.43	31.24 (78 years)
San Marcos	31.10	33.00 (71 years)

Data from the U. S. Department of Commerce (1971).

1/ Estimated annual precipitation.

## WATER LEVELS

The recorded high and low water levels in five selected key wells during 1971 are shown in table 2. During the year, the water levels reached a lower point during June than had been experienced for several years; however, toward the latter part of the year, the water levels fluctuated near the record highs. The record highs and lows are also given in table 2. Ground-water storage in the Edwards Limestone remained above average during 1971.

## GROUND-WATER RECHARGE

Recharge to the Edwards and associated limestones is chiefly from streams that 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 discharge records at gaging stations located above and below the infiltration areas on most of the streams. The monthly mean discharge at the gaging stations for October-December 1971 is given in table 3. Streamflow records for January-September 1971 will be published by the U. S. Geological Survey in late 1972.

Table 2.--Annual recorded high and low water levels in key wells in the Edwards and associated limestones in the San Antonio area, 1971  
(feet above mean sea level)

Well	High	Low	Record High	Record Low	Period of Record
H-5-1 (Uvalde County)	877.7	864.0	878.5 (11-22-61)	811.0 (4-13-57)	1929-32 1934-71
J-1-82 (Medina County)	701.3	646.4	710.3 (2-27-61)	622.3 (8-18-56)	1950-71
J-17 <u>1/</u> (Bexar County)	674.6	627.9	685.5 <u>2/</u> (6-26-35)	612.5 <u>2/</u> (8-17-56)	1932-71 <u>3/</u>
G-49 (Comal County)	626.2	621.0	627.3 (2-19-61)	613.3 (8-21-56)	1948-71
H-23 (Hays County)	577.1	551.5	593.8 (3-29-68)	542.2 (7-12-56)	1937-71

1/ Replaces well 26 and reflects almost the same water level; composite record of wells 26 and J-17.

2/ Record high and low for well 26.

3/ Composite record of wells 26 and J-17.

Table 3.--Monthly mean discharge at stream-gaging stations in  
the San Antonio area, October-December 1971

(Figures rounded to nearest cubic foot per second)

Station	1 9 7 1		
	Oct.	Nov.	Dec.
West Nueces River near Brackettville	134	9	3
Nueces River at Laguna	594	323	235
Nueces River below Uvalde	578	325	203
Dry Frio River near Reagan Wells	166	80	40
Frio River at Concan	479	295	188
Frio River below Dry Frio River near Uvalde	169	14	0
Sabinal River near Sabinal	318	184	95
Sabinal River at Sabinal	238	84	21
Seco Creek at Miller Ranch near Utopia	169	46	20
Seco Creek at Rowe Ranch near D'Hanis <u>1/</u>	183	0	0
Hondo Creek near Tarpley	254	74	37
Hondo Creek at King Waterhole near Hondo	160	11	0
Medina River near Pipe Creek	664	367	206
Medina River near Riomedina	877	346	166
Salado Creek (upper station) at San Antonio	2	2	3
Cibolo Creek at Selma	26	<u>2/</u>	0
Guadalupe River at Comfort	593	323	240
Guadalupe River near Spring Branch	1048	633	509
Guadalupe River at Sattler	687	796	682
Guadalupe River above Comal River at New Braunfels	775	931	859
Comal River at New Braunfels	260	293	319
Blanco River at Wimberley	63	79	177
Blanco River near Kyle	39	81	193
Plum Creek at Lockhart	0	0	27
San Marcos River springflow at San Marcos	108	120	189

1/ Formerly Crook Ranch.

2/ Less than 0.5.



The recharge in each basin of the San Antonio area for 1971 and the average annual recharge for the period 1934-70 are given in table 4. The basic methods employed by Pettitt and George (1956) and by Garza (1962) were used for estimating the 1971 recharge.

Total recharge in 1971 was in excess of the average annual recharge by nearly 400,000 acre-feet and was about 75 percent above the annual average (see table 4).

Floods resulting from high-intensity rains during August through November provided about 75 percent of the annual recharge, while the remaining recharge was provided by springflow from the Edwards Plateau.

Table 4.--Estimated recharge to the Edwards and associated  
limestones in the San Antonio area, 1971  
(in thousands of acre-feet)

Basin	1971	1934-70 Average
Nueces and West Nueces Rivers	263.4	96.4
Frio and Dry Frio Rivers	212.4	87.9
Sabinal River	39.2	32.2
Medina Lake	68.7	51.4
Cibolo and Dry Comal Creeks	82.4	90.7
Blanco River and adjacent area	22.2	32.5
Area between Sabinal and Medina Rivers	150.3	73.1
Area between Cibolo Creek and Medina River	81.4	57.0
<b>TOTALS</b>	<b>920.0</b>	<b>521.2</b>

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