STATE OF TEXAS
BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF IRRIGATION AND WATER CONSERVATION

FOURTEENTH ANNUAL REPORT

of

THE SILT LOAD OF TEXAS STREAMS

1951-1952

and

A SUMMARY OF SILT STUDIES MADE IN TEXAS

(The silt data contained in this report were obtained under a cooperative agreement between the Board of Water Engineers and U. S. Department of Agriculture, Soil Conservation Service, Division of Irrigation and Water Conservation.)

Austin, Texas
August, 1953

O R G A N I Z A T I O N

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SOIL CONSERVATION SERVICE
DIVISION OF IRRIGATION ENGINEERING AND WATER CONSERVATION

Cooperating in Studies on Silt of Texas Streams

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by

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INTRODUCTION

Some Texas streams carry large quantities of silt resulting from erosion on the upper portions of the watersheds during periods of unusually heavy precipitation.

At times drouths occur, especially in the western and central portion of Texas, and at other times, the precipitation is excessive. As a result of the erratic torrential rainfall wide fluctuations occur sometimes in the natural flow of the streams - varying in the course of a short time from a small flow, or even none, to heavy floods. This occurred during the September 1952 flood on the Pedernales and Llano Rivers.

After a reservoir has been established on a silt-carrying stream much of the transported material is deposited and the storage capacity reduced accordingly. When a new reservoir is being considered or planned it is necessary to determine the rate of silt deposition, economic feasibility, and other factors.

To obtain reliable and accurate information, both as to the amount of silt carried in Texas streams and the manner and conditions of its deposition in a reservoir, a cooperative silt study was initiated in 1924. The studies have been continued to the present time.

It is also a matter of great importance to Texas cities and towns, which will find it necessary to resort to the streams more and more for increased water supplies, to have some knowledge of the silt content of water before it can be made usable for domestic and other purposes. Desirability of good quality of water supply and its treatment in the elimination of silt is important to any municipality. The silt content of surface streams is also important to industries which are seeking locations in Texas. For many large concerns, the chemical quality as well as the silt content of the water is of major importance in the operation of their plants.

Erosion of soil materials in the form of sediment is always associated with stream flow in earthern channels. Sediment is usually divided into three classifications; namely, fine, medium and coarse-grained clastics. The

fine-grained clastics are composed of soil particles with dimensions of 1/16 mm. or under in size and forming silt and clay. The medium-grained clastics are composed of soil particles with dimensions of 1/16 mm. to 2 mm. in size and forming sand. The coarse-grained clastics are composed of soil particles with dimensions of more than 2 mm. in size and forming granules, pebbles, cobbles and boulders (usually known as gravels). The larger sized particles of the fine-grained clastics of less than 1/16 mm. in size are defined as silt. The greater part of the suspended silt load of streams and most of the sediment deposited in reservoirs is the fine-grained soil, and is of such fineness that it will pass a Tyler Standard No. 300 mesh sieve. In connection with the silt studies in Texas the Board of Water Engineers is primarily concerned with the fine-grained sediment that is usually deposited fairly uniformly in a reservoir and directly behind a dam or obstruction. Most of the coarse-grained material is usually deposited near the upper end of a reservoir, forming a delta which gradually extends upstream. This material, known as bed load, does not materially affect the storage capacity of a reservoir. The river waters entering some of the reservoirs (notably Red Bluff Lake and Lake Kemp) and containing large amounts of salts (especially sulphates and chlorides) cause the colloidal material to flocculate and settle near the upper end of a reservoir.

Procedure

From one to three or more water samples are taken at daily intervals from each station for silt determinations. The number depends on the width of the stream during low water flows and flood stages.

The samples are obtained with a simple device known as the Department of Agriculture or Texas type sampler (see picture on Page 1c in the appendix) which was designed and tested by an engineer of Irrigation Investigations, U. S. Department of Agriculture, and Texas Board of Water Engineers. This sampler has been used continuously since 1924, and during the past 28 years a total of 133,445 daily samplings have been made with it at 45 present and discontinued stations (see locations on relief map of Texas and description and pictures of stations in appendix), and approximately 200,000 water samples have been analyzed at cooperative laboratory for silt determinations.

In order to obtain suspended silt load of streams the water samples are taken within the top surface foot, and preferably at the six-tenths foot depth. The silt sample collectors are instructed to avoid getting any bed load material in the water samples by taking them near or on the stream bed during flood stage, although at times, on some of the streams that are wide and shallow and where there is considerable sand and stream channel erosion, some of the coarser materials are included with the suspended silt load. When this condition exists there has not been any study made to differentiate between suspended and bed load materials nor a mechanical analyses made of the fine and coarse materials.

The weight per cubic foot of sediment deposition in reservoirs varies according to the purpose of its construction and water storage conditions. In determining the silt load of streams it is impossible to know definitely whether a reservoir to be constructed will be completely filled at all times, partially filled or completely emptied at times. In calculating the space occupied by silt deposition in a reservoir it is necessary to determine the weight of one cubic foot of sediment that will replace water storage. It has been determined by experiments of a previous investigation in Texas that the average weight of dry material in silt deposits which are continuously submerged approaches 30 pounds per cubic foot. In those deposits which are occasionally

exposed the average weight approaches 70 pounds per cubic foot. In deposits where the reservoir is used exclusively for flood control and empty most of the time, the average weight ultimately approaches 90 pounds per cubic foot. In the silt determinations for Texas streams, where it is not known whether the deposits will be subject to alternate wetting or drying, 70 pounds per cubic foot of dry silt is used. This figure appears reasonable for the purpose for which it is used by some of the foremost silt authorities. The International Boundary and Water Commission - United States and Mexico - uses 66.7 pounds per cubic foot in determining the silt load of streams and silt deposition in reservoirs.

Summary of Silt Studies for 1951-1952

A certain portion of the water year of October 1, 1951, to September 30, 1952, was unusual in extremes. One of the most severe drouths in Texas and one of the greatest flash floods occurred on two watersheds during the water year. The drouth on many of the watersheds depleted natural vegetative growth and caused a dry, pulverized surface soil condition. When the unusual heavy and torrential precipitation occurred, the top soil was in such a dry physical condition that it eroded easily and contributed heavily to the silt load of some of Texas streams.

The silt load at 12 stations located on 9 of the principal watersheds was 6,957 acre feet as compared to 34,153 acre feet for a normal year. The small silt load is due to drouth and small river discharge conditions prevailing on these watersheds. Three other stations located on two watersheds in Central Texas had an unusual silt load of 12,408 acre feet as compared to 389 acre feet for a normal year. The abnormal silt load was due principally to a record-breaking flash flood on one tributary.

The total river discharge at the 12 stations was 7,896,060 acre feet as compared to an average discharge of 20,990,673 acre feet. At the three stations where the flash floods occurred, the river discharge was 874,510 acre feet as compared to an average discharge of 433,607 acre feet. These variations in river discharges had a great influence on the silt load of streams.

During the water year 916,690 acre feet of water was released from Possum Kingdom Lake, Lake Corpus Christi, and several lakes of the Lower Colorado River Authority as compared to an average release of 2,750,502 acre feet. The water stored in the lakes has been very limited and its withdrawal for irrigation and power purposes has been at a minimum. The amount of silt by-passing the dams was 57 acre feet as compared to an average silt load of 829 acre feet.

The silt content, or percentage of dry silt by weight, of the waters of 11 rivers in Texas varied from .011 percent at Logansport, La. Station to .301 percent at the San Saba Station, or a mean of .090 percent for the water year. The normal percentage for the 11 rivers varied from .017 percent at Rockland Station to .445 percent for the Richmond Station, or a mean of .172 percent. Unusual high average percentages of silt occurred at several stations during the water year. At the South Bend Station (Brazos River) the percentage was 1.696 as compared to .593 percent for an average year. At the Llano Station (Llano River) the percentage was 1.430 as compared to .122 percent for an average year. At the Johnson City Station (Pedernales River) the percentage of silt was 2.242 as compared to .144 percent for an average year. At the Spring Branch Station (Guadalupe River) the percentage of silt was .303 as compared to .056 percent for an average year.

The amount of silt contributed per square mile of watershed area for 12 stations varied from .003 acre foot at the Cotulla Station (Nueces River) to .078 acre foot at the Richmond Station (Brazos River). The average for the same stations for the water year was .056 acre foot as compared to .277 acre foot for an average year.

The largest silt load per square mile of watershed area ever to be recorded in connection with the silt studies of Texas occurred on the Pedernales River during the flood of September 10 and 11, 1952. It was 8.759 acre feet per square mile of watershed area. The watershed area is 947 square miles, which is among the smallest drainage basins in Texas. The river discharge during the flood was 376,800 acre feet and the silt load amounted to 12,588,328 tons or 8,257 acre feet of silt. The percentage of dry silt by weight was 2.454. The Llano River is an adjacent stream and has a drainage area of 4,000 square miles (over 400 percent larger than Pedernales River drainage area). During the same September flood (2 days) it had a river discharge of 231,500 acre feet and the silt load was 5,522,050 tons or 3,622 acre feet. The percentage of dry silt by weight was 1.752. The average silt load per square mile of watershed area was .910 acre foot as compared to 8.759 for the Pedernales watershed area.

The September flood on the Pedernales and Llano Rivers, tributaries to the Colorado River, deposited 11,879 acre feet of silt into Lake Travis. The total amount deposited by two rivers for the water year was only 11,936 acre feet. The total amount of silt by-passing the lowest stations, which are located on 9 watersheds, and deposited in the Gulf of Mexico amounted to 4,833 acre feet for the water year 1951-1952. The largest contribution of silt (87 percent) to the Gulf of Mexico occurred during the months of April, May, and June.

From 1924 to 1952 the silt studies of Texas streams show that 1,417,657,840 tons or 929,060 acre feet of silt have been deposited in the Gulf of Mexico. This is equivalent to one foot of top soil being eroded from approximately 930,000 acres of land. The total land area of Texas is approximately 169,000,000 acres.

During the water year a total of 6,880 daily samplings have been made at the 23 active silt stations (see relief map for locations) and 8,285 water samples were received at the cooperative laboratory for silt determinations.

Four of the 23 active silt sampling stations were discontinued during the water year; namely, Huffman (San Jacinto River), Humble (San Jacinto River), Horger (Angelina River), and Inks Dam (Colorado River). It is planned to reestablish new stations at different locations to replace the old ones that have been discontinued.

Cooperation

Some of the silt determinations were made possible through the splendid financial and other cooperation of several agencies in Texas who are vitally interested in the silt problems of Texas. These agencies are as follows:

Lower Colorado River Authority, Austin
Brazos River Conservation and Reclamation District, Mineral Wells
Chambers-Liberty Counties Navigation District, Anahuac

City of Houston, Water Department, Houston
City of Corpus Christi, Water Department, Corpus Christi
Surface Water Division, United States Geological Survey, Austin.

SILT DATA

Brazos River Watershed
at
EASTERLY STATION ON NAVASOTA RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	132	50	0	.028
November	164	50	0	.022
December	575	120	0	.015
1952				
January	642	90	0	.010
February	8,200	5,110	3	.046
March	9,850	5,990	4	.045
April	24,160	9,460	6	.029
May	42,580	26,340	17	.045
June	1,120	410	0	.027
July	133	20	0	.011
August	32	0	0	----
September	19	0	0	----
Totals	87,600	47,640	30	

U.S.G.S. yearly discharge in acre-feet	87,600
Total silt for year in acre-feet	30
Acre-feet of silt per year per square mile of contributing watershed	.032
Average percent of silt by weight for year	.040
Drainage area in square miles (net)	949

SUMMARY OF SILT DATA

for

Brazos River Watershed

Stream: NAVASOTA
Station: EASTERLY
Sampler: Goree King

(Samples were taken from bridge on U. S. Highway No. 79)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	199,750	142,600	94	.052
1942-43	84,820	59,600	39	.052
1943-44	592,670	889,340	584	.110
1944-45	556,120	607,980	400	.080
1945-46	617,980	513,050	337	.061
1946-47	441,190	193,110	127	.032
1947-48	99,160	79,980	53	.059
1948-49	105,970	89,010	58	.062
1949-50	256,050	137,000	88	.039
1950-51	16,910	7,770	5	.034
1951-52	87,600	47,640	30	.040
TOTALS	3,058,220	2,767,080	1,815	

For period 10.748 years

Average discharge in acre-feet per year	284,539
Average acre-feet of silt per year	169
Average acre-feet of silt per year per square mile of contributing watershed	.178
Average tons of silt per year	257,451
Average percent of silt by weight	.066
Drainage area in square miles (net)	949

1/ Station was established January 1, 1942.

SILT DATA

Brazos River Watershed
at
SOUTH BEND STATION ON BRAZOS RIVER

for
Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft	pct.
1951				
October	240	40	0	.012
November	340	140	0	.030
December	30	0	0	0
1952				
January	70	0	0	0
February	300	20	0	.049
March	180	10	0	.041
April	2,810	3,840	3	.100
May	20,190	487,021	319	1.772
June	9,770	199,625	131	1.501
July	9,430	313,723	206	2.444
August	140	60	0	.031
September	0	0	0	0
Totals	43,500	1,004,479	659	

U.S.G.S. yearly discharge in acre-feet	43,500
Total silt for year in acre-feet	659
Acre-feet of silt per year per square mile of contributing watershed	.053
Average percent of silt by weight for year	1.696
Drainage area in square miles (net)	12,360

SUMMARY OF SILT DATA

for

Brazos River Watershed

Stream: BRAZOS
Station: SOUTH BEND (Samples taken from bridge on State Highway No. 67)
Sampler: O. W. Hill

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	672,230	4,581,930	3,005	.501
1942-43	491,060	3,846,100	2,523	.575
1943-44	171,360	1,071,620	703	.459
1944-45	394,460	2,258,250	1,482	.421
1945-46	363,890	3,116,920	2,044	.629
1946-47	747,030	4,414,900	2,897	.434
1947-48	391,140	2,718,220	1,783	.510
1948-49	514,710	6,193,420	4,062	.884
1949-50	688,230	7,234,440	4,746	.772
1950-51	283,340	2,669,440	1,754	.692
1951-52	43,500	1,004,480	659	1.696
TOTALS	4,760,950	39,109,720	25,758	

For period of 10.710 years

Average discharge in acre-feet per year	444,533
Average acre-feet of silt per year	2,405
Average acre-feet of silt per year per square mile of contributing watershed	.195
Average tons of silt per year	3,651,701
Average percent of silt by weight	.603
Drainage area in square miles (net)	12,360

1/ Station was established January 15, 1942.

SILT DATA

Brazos River Watershed
at
POSSUM KINGDOM DAM STATION ON BRAZOS RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream 1/	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	17,540	1,120	1	.005
November	10,420	390	0	.003
December	10,120	500	0	.004
1952				
January	15,600	680	0	.003
February	3,560	110	0	.002
March	2,220	80	0	.003
April	6,130	270	0	.003
May	3,150	90	0	.002
June	34,980	2,470	2	.005
July	46,780	4,700	3	.007
August	39,570	2,050	1	.004
September	2,100	70	0	.002
Totals	192,170	12,530	7	

B.R.C.&R.D. yearly discharge in acre-feet - - - - - - - - 192,170

Total silt for year in acre-feet - - - - - - - - - - - 7

Acre-feet of silt per year per square mile of contributing watershed - - - - - - - - - ---

Average percent of silt by weight for year - - - - - - - .005

Drainage area in square miles (net) - - - - - - - - - ---

1/ Discharge figures for this station obtained from Brazos River Conservation and Reclamation District

SUMMARY OF SILT DATA

for

Brazos River Watershed

Stream: BRAZOS
Station: POSSUM KINGDOM DAM (Samples taken in tailrace and over spillway)
Sampler: J. P. Cochran

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	588,030	55,070	36	.007
1942-43	851,290	625,770	410	.054
1943-44	92,040	15,590	10	.012
1944-45	307,410	51,350	32	.012
1945-46	293,110	41,250	27	.010
1946-47	946,860	75,280	49	.006
1947-48	323,380	31,060	22	.007
1948-49	531,620	61,470	40	.008
1949-50	632,520	60,030	39	.007
1950-51	400,470	21,250	14	.004
1951-52	192,170	12,530	7	.005
TOTALS	5,158,900	1,050,650	686	

For period of 10.710 years

Average discharge in acre-feet per year	481,690
Average acre-feet of silt per year	64
Average acre-feet of silt per year per square mile of contributing watershed	--
Average tons of silt per year	98,100
Average percent of silt by weight	.015
Drainage area in square miles (net)	--

1/ Station was established January 15, 1942.

SILT DATA

Brazos River Watershed
at
RICHMOND STATION ON BRAZOS RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	48,610	7,470	5	.011
November	35,070	3,230	2	.007
December	37,700	4,670	3	.009
1952				
January	33,380	3,210	2	.007
February	54,840	20,620	14	.028
March	79,170	40,540	27	.038
April	334,400	1,599,930	1049	.351
May	355,700	1,879,810	1233	.388
June	212,900	545,060	358	.188
July	56,160	14,730	10	.019
August	36,930	5,090	3	.010
September	36,260	2,570	2	.005
Totals	1,321,120	4,126,930	2708	

U.S.G.S. yearly discharge in acre-feet	1,321,120
Total silt for year in acre-feet	2,708
Acre-feet of silt per year per square mile of contributing watershed	.078
Average percent of silt by weight for year	.229
Drainage area in square miles (net)	34,810

SUMMARY OF SILT DATA

for

Brazos River Watershed

Stream: BRAZOS
Station: RICHMOND (Samples taken from bridge on U. S. Highway No. 90)
Sampler: Earl Wright

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1923-24 1/	494,900	714,220	468	.106
1924-25	1,237,300	12,676,710	8,314	.753
1925-26	8,762,800	44,939,350	29,476	.377
1926-27	5,562,600	34,377,320	21,739	.454
1927-28	3,318,400	28,163,890	18,472	.623
1928-29	6,000,000	32,284,200	21,174	.395
1929-30	5,218,900	38,686,330	25,373	.545
1930-31	5,639,000	27,766,660	18,212	.362
1931-32 2-3/	8,041,000	63,649,510	41,749	.582
1932-33	2,563,100	15,175,520	9,954	.435
1933-34	3,372,670	23,318,780	15,294	.508
1934-35	7,334,480	63,472,990	41,633	.636
1935-36	6,031,540	40,330,500	26,453	.491
1936-37	5,405,790	25,531,710	16,747	.347
1937-38	7,203,600	55,656,280	36,544	.568
1938-39	1,966,110	14,742,470	9,668	.551
1939-40	3,161,120	23,679,220	15,531	.550
1940-41	16,124,370	97,306,510	63,824	.443
1941-42	8,522,910	71,490,110	46,891	.616
1942-43	3,255,310	11,426,360	7,496	.258
1943-44	7,626,500	46,735,630	30,654	.450
1944-45	9,804,730	57,254,020	37,555	.429
1945-46	7,399,590	35,484,230	23,275	.352
1946-47	6,345,770	21,011,530	13,783	.243
1947-48	1,950,620	3,950,720	2,591	.149
1948-49	3,362,850	14,456,500	9,482	.316
1949-50	4,186,500	9,543,800	6,259	.167
1950-51	1,026,600	1,079,170	708	.077
1951-52	1,321,120	4,126,930	2,708	.229
TOTALS	152,240,180	919,031,170	602,027	

For period of 28.306 years

Average discharge in acre-feet per year	5,378,371
Average acre-feet of silt per year	21,269
Average acre-feet of silt per year per square mile of contributing watershed	.611
Average tons of silt per year	32,467,716
Average percent of silt by weight	.443
Drainage area in square miles (net)	34,810

1/ Station was established at Rosenberg June 11, 1924.
2/ Station was discontinued at Rosenberg April 12, 1932.
3/ Station was established at Richmond April 13, 1932.

SILT DATA

Colorado River Watershed
at
LLANO STATION ON LLANO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	1,110	240	0	.016
November	2,180	310	0	.010
December	2,670	330	0	.009
1952				
January	2,650	190	0	.005
February	2,210	220	0	.007
March	2,640	200	0	.006
April	21,770	23,910	16	.081
May	14,880	3,530	2	.017
June	3,200	770	1	.018
July	420	70	0	.012
August	0	0	0	0
September	231,500	5,522,050	3,622	1.752
Totals	285,230	5,551,820	3,641	

U.S.G.S. yearly discharge in acre-feet	285,230
Total silt for year in acre-feet	3,641
Acre-feet of silt per year per square mile of contributing watershed	.910
Average percent of silt by weight for year	1.430
Drainage area in square miles (net)	4,000

SUMMARY OF SILT DATA

for

Colorado River Watershed

Stream: LLANO
Station: LLANO
Sampler: Mrs. Tracy Ward

(Samples were taken at U. S. Gaging Station ½ mile downstream from bridge on State Highway No. 16)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	65,990	252,700	166	.281
1942-43	235,470	381,560	250	.119
1943-44	196,070	120,450	79	.045
1944-45	156,920	90,120	60	.042
1945-46	142,740	249,740	164	.129
1946-47	141,550	28,750	18	.015
1947-48	327,420	1,471,400	965	.330
1948-49	187,600	82,260	53	.032
1949-50	113,980	14,300	8	.009
1950-51	54,150	10,350	7	.014
1951-52	285,230	5,551,820	3,641	1.430
TOTALS	1,907,120	8,253,450	5,411	

For period of 10.167 years

Average discharge in acre-feet per year	187,579
Average acre-feet of silt per year	532
Average acre-feet of silt per year per square mile of contributing watershed	.133
Average tons of silt per year	811,788
Average percent of silt by weight	.318
Drainage area in square miles (net)	4,000

1/ Station was established August 1, 1942.

SILT DATA

Colorado River Watershed
at
JOHNSON CITY STATION ON PEDERNALES RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	30	0	0	
November	150	0	0	
December	330	10		.002
1952				
January	280	10	0	.003
February	330	10	0	.002
March	740	60	0	.006
April	6,620	8,400	6	.093
May	18,050	35,010	23	.143
June	7,060	2,440	2	.025
July	4,020	11,280	7	.206
August	10	0	0	0
September	376,800	12,588,328 1/	8,257	2.454
Totals	414,420	12,645,548	8,295	

U.S.G.S. yearly discharge in acre-feet	414,420
Total silt for year in acre-feet	8,295
Acre-feet of silt per year per square mile of contributing watershed	8.759
Average percent of silt by weight for year	2.242
Drainage area in square miles (net)	947

1/ Estimated on basis of past floods following drouths on Llano and Pedernales Rivers. Bridge where silt samples are usually taken was washed out and it was not possible to obtain water samples for Sept.10, 11 and 12. The discharge of Llano River on Sept. 10 and 11 was 205,090 acre-feet as compared to 363,570 acre-feet for the Pedernales River on the same two days. The topography of the two watersheds are somewhat similar. The drainage area of Llano watershed is 4,000 square miles as compared to 947 square miles for the Pedernales watershed. Water samples were obtained at the Llano station for the two days and percentage of silt by weight was 2.434 and 1.510 respectively, while for the Johnson City station the estimated percentage was 2.400 and 2.600 which is believed to be very conservative.

SUMMARY OF SILT DATA

for

Colorado River Watershed

Stream: PEDERNALES
Station: JOHNSON CITY
Sampler: John W. Grisham

(Samples were taken from highway bridge on U.S. Hwy. 281, about 1½ miles north of Johnson City)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	22,630	107,030	70	.347
1942-43	79,850	150,740	99	.139
1943-44	167,700	724,550	476	.317
1944-45	187,000	191,740	126	.075
1945-46	94,140	132,430	88	.103
1946-47	128,460	107,670	71	.062
1947-48	31,690	42,340	27	.098
1948-49	37,660	54,560	35	.106
1949-50	18,290	9,100	5	.037
1950-51	17,460	23,410	16	.098
1951-52	414,420	12,645,550	8,295	2.242
TOTALS	1,199,300	14,189,120	9,308	

For period of 10.167 years

Average discharge in acre-feet per year	117,960
Average acre-feet of silt per year	916
Average acre-feet of silt per year per square mile of contributing watershed	.967
Average tons of silt per year	1,395,605
Average percent of silt by weight	.869
Drainage area in square miles (net)	947

1/ Station was established August 1, 1942.

SILT DATA

Colorado River Watershed
at
SAN SABA STATION ON COLORADO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	1,810	260	0	.011
November	2,340	180	0	.006
December	2,510	170	0	.005
1952				
January	2,880	230	0	.006
February	2,330	130	0	.004
March	1,500	180	0	.009
April	40,230	292,950	192	.535
May	149,400	884,520	580	.435
June	30,090	88,050	58	.215
July	780	80	0	.008
August	160	10	0	.005
September	238,400	667,930	438	.206
Totals	472,430	1,934,690	1,268	

U.S.G.S. yearly discharge in acre-feet	472,430
Total silt for year in acre-feet	1,268
Acre-feet of silt per year per square mile of contributing watershed	.068
Average percent of silt by weight for year	.301
Drainage area in square miles (net)	18,700

SUMMARY OF SILT DATA

for

Colorado River Watershed

Stream: COLORADO
Station: NEAR SAN SABA
Sampler: Robert A. Broyles

(Samples were taken from Red Bluff bridge about midway between San Saba and Lometa) 2/

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1929-30 1/	24,000	143,140	94	.439
1930-31	1,373,750	5,136,520	3,369	.275
1931-32	2,223,900	9,934,850	6,516	.328
1932-33	475,300	1,303,620	855	.201
1933-34	504,380	2,121,550	1,391	.309
1934-35	2,564,290	14,423,520	9,459	.413
1935-36	2,276,400	7,520,550	4,933	.243
1936-37	1,197,100	2,688,230	1,764	.165
1937-38	2,809,340	8,923,940	5,853	.233
1938-39	819,430	3,709,100	2,432	.333
1939-40	773,690	3,191,810	2,094	.303
1940-41	2,052,980	8,613,430	5,650	.308
1941-42	1,285,920	4,571,140	2,998	.261
1942-43	475,090	703,520	461	.109
1943-44	592,790	2,129,300	1,397	.264
1944-45	870,370	2,655,490	1,743	.224
1945-46	416,390	1,511,040	992	.267
1946-47	517,540	2,588,150	1,696	.367
1947-48	604,200	3,389,580	2,222	.412
1948-49	947,390	4,641,420	3,043	.360
1949-50	367,430	1,709,240	1,120	.342
1950-51	423,460	2,129,490	1,397	.369
1951-52	472,430	1,934,690	1,268	.301
TOTALS	24,067,570	95,673,320	62,747	

For period of 22.055 years

Average discharge in acre-feet per year	1,091,252
Average acre-feet of silt per year	2,845
Average acre-feet of silt per year per square mile of contributing watershed	.152
Average tons of silt per year	4,337,942
Average percent of silt by weight	.292
Drainage area in square miles (net)	18,700

1/ Station was established September 11, 1930.
2/ Water samples were discontinued at old Red Bluff bridge and started one-half mile upstream at the new Red Bluff bridge on May 24, 1940.

SILT DATA

Colorado River Watershed
at
INKS DAM STATION ON COLORADO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream 1/	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	25,990	780	1	.002
November 2/	7,200	240	0	.002
December				
1952				
January				
February				
March				
April				
May				
June				
July				
August				
September				
Totals	33,190	1,020	1	

L.C.R.A. discharge in acre-feet	33,190
Total silt for year in acre-feet	1
Acre-feet of silt per year per square mile of contributing watershed	---
Average percent of silt by weight for year	.002
Drainage area in square miles (net)	---

1/ Discharge figures for this station obtained from Lower Colorado River Authority
2/ Station discontinued November 31, 1951.

SUMMARY OF SILT DATA

for

Colorado River Watershed

Stream: COLORADO
Station: INKS DAM (Samples were taken from tailrace)
Sampler: Lloyd Myers

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	285,200	41,270	27	.011
1942-43	662,460	67,090	44	.007
1943-44	768,040	127,980	84	.012
1944-45	751,950	157,540	104	.015
1945-46	678,460	134,030	88	.015
1946-47	498,980	27,870	20	.004
1947-48	580,500	56,700	38	.007
1948-49	582,660	30,170	18	.004
1949-50	319,340	14,240	9	.003
1950-51	618,130	26,450	18	.003
1951-52 2/	33,190	1,020	1	.002
TOTALS	5,778,910	684,360	451	

For period of 9.333 years

Average discharge in acre-feet per year	619,191
Average acre-feet of silt per year	48
Average acre-feet of silt per year per square mile of contributing watershed	--
Average tons of silt per year	73,327
Average percent of silt by weight	.009
Drainage area in square miles (net)	--

1/ Station was established August 1, 1942.
2/ Station discontinued November 31, 1951.

SILT DATA

Colorado River Watershed
at
BUCHANAN DAM STATION ON COLORADO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream 1/	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	33,440	1,490	1	.003
November	20,320	930	1	.003
December	9,790	530		.004
1952				
January	15,270	830	1	.004
February	24,050	650		.002
March	4,410	120	0	.002
April	6,540	180	0	.002
May	23,440	950	1	.003
June	54,070	1,660	1	.002
July	99,260	2,960	2	.002
August	96,950	4,010	3	.003
September	17,850	480	0	.002
Totals	405,390	14,790	10	

L.C.R.A. yearly discharge in acre-feet - - - - - - - - - 405,390

Total silt for year in acre-feet - - - - - - - - - - - 10

Acre-feet of silt per year per square mile of contributing watershed - - - - - - - - - - ---

Average percent of silt by weight for year - - - - - - - .003

Drainage area in square miles (net) - - - - - - - - - - ---

1/ Discharge figures for this station obtained from Lower Colorado River Authority.

SUMMARY OF SILT DATA

for

Colorado River Watershed

Stream: COLORADO
Station: BUCHANAN DAM (Samples taken at power house)
Sampler: Lloyd Myers

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1947-48 1/	576,440	46,530	30	.006
1948-49	563,730	35,300	24	.005
1949-50	319,340	16,910	13	.004
1950-51	618,110	31,430	20	.004
1951-52	405,390	14,790	10	.003
TOTALS	2,483,010	144,960	97	

For period of 5.000 years

Average discharge in acre-feet per year	496,602
Average acre-feet of silt per year	19
Average acre-feet of silt per year per square mile of contributing watershed	---
Average tons of silt per year	28,992
Average percent of silt by weight	.004
Drainage area in square miles (net)	---

1/ Station was established October 1, 1947.

SILT DATA

Colorado River Watershed
at
AUSTIN STATION ON COLORADO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	24,200	1,770	1	.005
November	14,520	1,020	1	.005
December	12,180	1,540	1	.009
1952				
January	11,380	570	0	.004
February	11,640	1,080	1	.007
March	11,580	870	1	.006
April	26,680	2,490	2	.007
May	62,910	7,370	5	.009
June	103,100	9,390	6	.007
July	110,700	12,880	8	.009
August	105,000	8,230	5	.006
September	53,620	1,620	1	.002
Totals	547,510	48,830	32	

U.S.G.S. yearly discharge in acre-feet - - - - - - - - - 547,510

Total silt for year in acre-feet - - - - - - - - - - 32

Acre-feet of silt per year per square mile of contributing watershed - - - - - - - - - ---

Average percent of silt by weight for year - - - - - - - .007

Drainage area in square miles (net) - - - - - - - - - ---

SUMMARY OF SILT DATA

for

Colorado River Watershed

Stream: COLORADO
Station: AUSTIN (Samples taken from Montopolis Bridge)
Sampler: Mrs. Antona Frensley

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1936-37 1/	48,040	1,830	1	.003
1937-38*	3,609,570	8,881,220	5,826	.181
1938-39 2/	986,630	735,150	481	.055
1939-40*	1,334,120	906,750	596	.050
1940-41	3,869,250	979,240	642	.019
1941-42	986,440	121,570	80	.009
1942-43	1,787,770	328,050	215	.013
1943-44	1,392,380	186,590	122	.010
1944-45	1,750,770	444,540	292	.019
1945-46	1,554,930	256,770	170	.012
1946-47	1,523,070	234,770	155	.011
1947-48	957,750	122,060	82	.009
1948-49	878,750	104,440	67	.009
1949-50	914,530	71,700	49	.006
1950-51	764,560	60,400	40	.006
1951-52	547,510	48,830	32	.007
TOTALS	22,906,070	13,483,910	8,850	

For period of 15.164 years

Average discharge in acre-feet per year	1,510,556
Average acre-feet of silt per year	584
Average acre-feet of silt per year per square mile of contributing watershed	.022
Average tons of silt per year	889,205
Average percent of silt by weight	.043
Drainage area in square miles (net)	26,260

1/ Station was established August 2, 1937, and samples taken from Congress Avenue bridge.
2/ Samples taken from Montopolis Bridge.
* Rehabilitation of the old Austin Dam (now termed Tom Miller Dam) was started August 1, 1938. This construction at times doubtless distorted the silt load of samples which were taken from 1½ to 4 miles downstream therefrom. Rehabilitation was completed and the impounding of water was begun on January 7, 1940.

SILT DATA

Guadalupe River Watershed
at
SPRING BRANCH STATION ON GUADALUPE RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	363	10	0	.002
November	1,250	50	0	.003
December	2,220	140	0	.005
1952				
January	1,970	150	0	.006
February	1,800	160	0	.007
March	2,480	150	0	.004
April	6,540	1,200	1	.013
May	20,350	26,140	17	.094
June	9,140	4,050	3	.032
July	2,210	260	0	.009
August	436	20	0	.003
September	126,100	688,220	451	.401
Totals	174,860	720,550	472	

U.S.G.S. yearly discharge in acre-feet	174,860
Total silt for year in acre-feet	472
Acre-feet of silt per year per square mile of contributing watershed	.330
Average percent of silt by weight for year	.303
Drainage area in square miles (net)	1,432

SUMMARY OF SILT DATA

for

Guadalupe River Watershed

Stream: GUADALUPE
Station: SPRING BRANCH
Sampler: Alfred Bierle

(Samples taken 4 miles southeast of Spring Branch from bridge on old Highway No. 46)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	167,150	164,150	108	.072
1942-43	145,610	79,630	52	.040
1943-44	272,850	401,650	262	.108
1944-45	304,860	190,830	126	.046
1945-46	185,080	148,700	96	.059
1946-47	307,960	128,040	84	.031
1947-48	59,460	60,110	38	.074
1948-49	119,610	50,240	33	.031
1949-50	63,680	34,430	20	.040
1950-51	41,230	14,830	9	.026
1951-52	174,860	720,550	472	.303
TOTALS	1,842,350	1,993,160	1,300	

For period of 10.748 years

Average discharge in acre-feet per year	171,413
Average acre-feet of silt per year	121
Average acre-feet of silt per year per square mile of contributing watershed	.084
Average tons of silt per year	185,445
Average percent of silt by weight	.079
Drainage area in square miles (net)	1,432

1/ Station was established January 1, 1942.

SILT DATA

Guadalupe River Watershed
at
VICTORIA STATION ON GUADALUPE RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	14,640	1,320	1	.007
November	18,720	1,860	1	.007
December	20,050	2,200	1	.008
1952				
January	20,680	2,090	1	.007
February	23,080	3,320	2	.011
March	20,570	3,590	2	.013
April	35,110	7,380	5	.015
May	83,010	74,860	49	.066
June	80,640	59,800	39	.054
July	29,000	5,340	4	.014
August	11,090	910	1	.006
September	237,600	253,300	166	.078
Totals	594,190	415,970	272	

U.S.G.S. yearly discharge in acre-feet - - - - - - - - - 594,190

Total silt for year in acre-feet - - - - - - - - - - - 272

Acre-feet of silt per year per square mile of contributing watershed - - - - - - - - - - .051

Average percent of silt by weight for year - - - - - - - .051

Drainage area in square miles (net) - - - - - - - - - - 5,311

SUMMARY OF SILT DATA

for

Guadalupe River Watershed

Stream: GUADALUPE
Station: VICTORIA
Sampler: A. E. Anders

(Samples taken from bridge on U. S. Highway No. 59)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1944-45 1/	38,430	19,480	13	.037
1945-46	1,319,520	949,130	624	.053
1946-47	1,595,300	777,690	511	.036
1947-48	509,960	169,560	111	.024
1948-49	871,660	607,450	398	.051
1949-50	767,750	430,030	282	.041
1950-51	392,150	215,130	141	.040
1951-52	594,190	415,970	272	.051
TOTALS	6,088,960	3,584,440	2,352	

For period of 7.083 years

Average discharge in acre-feet per year	859,658
Average acre-feet of silt per year	332
Average acre-feet of silt per year per square mile of contributing watershed	.063
Average tons of silt per year	506,062
Average percent of silt by weight	.043
Drainage area in square miles (net)	5,311

1/ Station was established September 1, 1945. Record for one month.

SILT DATA

Lavaca River Watershed
at
EDNA STATION ON LAVACA RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	1,780	1,020	1	.042
November	830	230	0	.020
December	860	40	0	.003
1952				
January	670	40	0	.004
February	2,130	4,700	3	.162
March	1,480	180	0	.009
April	14,300	17,960	12	.092
May	79,630	56,060	37	.052
June	12,000	18,010	12	.110
July	1,810	120	0	.005
August	1,220	270	0	.016
September	1,030	310	0	.022
Totals	117,740	98,940	65	

U.S.G.S. yearly discharge in acre-feet	117,740
Total silt for year in acre-feet	65
Acre-feet of silt per year per square mile of contributing watershed	.073
Average percent of silt by weight for year	.062
Drainage area in square miles (net)	887

SUMMARY OF SILT DATA

for

Lavaca River Watershed

Stream: LAVACA
Station: EDNA
Sampler: Mrs. Ida Berryhill

(Samples were taken from bridge on U.S. Highway No. 59 between Victoria and Edna)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1944-45 1/	980	570	0	
1945-46	266,330	327,240	215	.090
1946-47	250,340	192,850	126	.057
1947-48	114,240	98,200	66	.063
1948-49	105,870	205,400	134	.143
1949-50	90,950	119,490	78	.096
1950-51	34,210	54,230	35	.116
1951-52	117,740	98,940	65	.062
TOTALS	980,660	1,096,920	719	

For period of 7.083 years

Average discharge in acre-feet per year	138,453
Average acre-feet of silt per year	102
Average acre-feet of silt per year per square mile of contributing watershed	.115
Average tons of silt per year	154,867
Average percent of silt by weight	.082
Drainage area in square miles (net)	887

1/ Station established September 1, 1945.

SILT DATA

Neches River Watershed
at
HORGER STATION ON ANGELINA RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	6,950 1/	660 1/	0	.007
November	9,060	900	1	.007
December	38,910	8,590	6	.016
1952				
January	43,490	5,140	3	.009
February	121,600	22,490	15	.014
March	233,600	39,710	26	.012
April	200,400	29,940	20	.011
May 2/	192,500	28,940	19	.011
June				
July				
August				
September				
Totals	846,510	136,370	90	

U.S.G.S. yearly discharge in acre-feet	846,510
Total silt for year in acre-feet	90
Acre-feet of silt per year per square mile of contributing watershed	.026
Average percent of silt by weight for year	.012
Drainage area in square miles (net)	3,435

1/ Estimated
2/ Station was discontinued May 31, 1952.

SUMMARY OF SILT DATA

for

Neches River Watershed

Stream: ANGELINA
Station: HORGER
Sampler: D. W. Moye

(Samples taken from bridge on State Highway No. 63 between Zavalla and Jasper)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1944-45 1/	19,470	11,020	7	.042
1945-46	3,869,300	1,826,050	1,198	.035
1946-47	3,200,750	393,530	259	.009
1947-48	1,619,040	227,070	149	.010
1948-49	1,544,530	276,680	180	.013
1949-50	3,690,020	481,440	317	.010
1950-51	700,960	119,460	78	.017
1951-52 2/	846,510	136,370	90	.012
TOTALS	15,490,580	3,471,620	2,278	

For period of 6.667 years

Average discharge in acre-feet per year	2,323,471
Average acre-feet of silt per year	342
Average acre-feet of silt per year per square mile of contributing watershed	.100
Average tons of silt per year	520,717
Average percent of silt by weight	.016
Drainage area in square miles (net)	3,435

1/ Station was established September 1, 1945.
2/ Discontinued May 31, 1952.

SILT DATA

Neches River Watershed
at
ROCKLAND STATION ON NECHES RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	5,380	680	0	.009
November	7,910	740	1	.007
December	22,830	4,330	3	.014
1952				
January	29,350	2,320	2	.006
February	80,660	18,320	12	.017
March	161,400	21,670	14	.010
April	199,200	29,180	19	.011
May	283,800	50,840	33	.013
June	91,660	13,220	9	.011
July	9,330	850	1	.007
August	3,550	320	0	.007
September	920	80	0	.006
Totals	895,990	142,550	94	

U.S.G.S. yearly discharge in acre-feet	895,990
Total silt for year in acre-feet	94
Acre-feet of silt per year per square mile of contributing watershed	.027
Average percent of silt by weight for year	.012
Drainage area in square miles (net)	3,539

SUMMARY OF SILT DATA

for

Neches River Watershed

Stream: NECHES
Station: ROCKLAND
Sampler: George W. Jones

(Samples were taken from bridge on U. S. Highway 69 between Woodville and Lufkin)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1929-30 1/	10,620	290	0	.002
1930-31	1,490,250	229,220	151	.011
1931-32	2,560,930	193,940	128	.006
1932-33	1,395,940	144,700	95	.008
1933-34	1,552,630	174,070	112	.008
1934-35	2,601,910	297,100	194	.008
1935-36	1,040,600	140,280	91	.010
1936-37	928,420	110,180	71	.009
1937-38	1,400,070	225,940	147	.012
1938-39	854,380	140,590	91	.012
1939-40	1,097,590	227,590	149	.015
1940-41	3,578,370	586,140	384	.012
1941-42	2,522,390	550,920	361	.016
1942-43	748,520	316,090	207	.031
1943-44	3,230,410	1,865,580	1,223	.042
1944-45	3,396,060	1,967,220	1,290	.043
1945-46	3,534,920	1,285,240	845	.027
1946-47	3,255,520	379,210	249	.009
1947-48	1,250,360	118,760	77	.007
1948-49	1,172,870	183,820	119	.012
1949-50	3,824,440	330,240	216	.009
1950-51	394,040	39,450	26	.007
1951-52	895,990	142,550	94	.012
TOTALS	42,737,230	9,649,120	6,320	

For period of 22.148 years

Average discharge in acre-feet per year	1,929,620
Average acre-feet of silt per year	285
Average acre-feet of silt per year per square mile of contributing watershed	.081
Average tons of silt per year	435,666
Average percent of silt by weight	.017
Drainage area in square miles (net)	3,539

1/ Station was established August 8, 1930.

SILT DATA

Nueces River Watershed
at
COTULLA STATION ON NUECES RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft	tons	ac.-ft.	pct.
1951				
October	510	40	0	0
November	70	0	0	0
December	0	0	0	0
1952				
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	21,530	16,830	11	.057
June	12,530	4,040	3	.024
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
Totals	34,640	20,910	14	

U.S.G.S. yearly discharge in acre-feet	34,640
Total silt for year in acre-feet	14
Acre-feet of silt per year per square mile of contributing watershed	.003
Average percent of silt by weight per year	.044
Drainage area in square miles (net)	5,260

SUMMARY OF SILT DATA

for

Nueces River Watershed

Stream: NUECES
Station: COTULLA (Samples Taken From Highway Bridge In Cotulla)
Sampler: C. G. Jennings

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42[1/]	141,380	64,130	42	.033
1942-43	64,240	33,270	22	.038
1943-44	482,520	367,860	241	.056
1944-45	82,440	65,460	43	.058
1945-46	347,610	284,210	186	.060
1946-47	92,610	16,550	11	.013
1947-48	72,900	29,100	19	.029
1948-49	277,520	115,640	75	.031
1949-50	57,760	18,550	12	.024
1950-51	31,050	10,010	7	.024
1951-52	34,640	20,910	14	.044
TOTALS	1,684,670	1,025,690	672	

For period of 10.748 years

Average discharge in acre-feet per year	156,743
Average acre-feet of silt per year	63
Average acre-feet of silt per year per square mile of contributing watershed	.012
Average tons of silt per year	95,431
Average percent of silt by weight	.045
Drainage area in square miles (net)	5,260

1/ Station was established January 1, 1942.

SILT DATA

Nueces River Watershed
at
THREE RIVERS STATION ON NUECES RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	15,610	18,430	12	.087
November	2,560	1,000	1	.029
December	870	90	0	.008
1952				
January	1,030	110	0	.008
February	10,700	45,620	30	.313
March	1,540	440	0	.021
April	12,730	39,370	26	.227
May	31,850	106,680	70	.246
June	66,480	59,060	39	.065
July	8,210	15,240	10	.136
August	240	40	0	.012
September	13,980	22,660	15	.119
Totals	165,800	308,740	203	

U.S.G.S. yearly discharge in acre-feet	165,800
Total silt for year in acre-feet	203
Acre-feet of silt per year per square mile of contributing watershed	.013
Average percent of silt by weight for year	.137
Drainage area in square miles (net)	15,600

SUMMARY OF SILT DATA

for

Nueces River Watershed

Stream: NUECES
Station: NEAR THREE RIVERS
Sampler: Carl Franze

(Samples were taken 2 miles south of Three Rivers from railroad bridge, except at extreme low stage when samples were taken at low dam)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1927-28 1/	318,930	617,920	405	.142
1928-29	741,300	1,303,600	855	.129
1929-30	596,510	721,440	473	.089
1930-31	455,880	443,420	291	.071
1931-32	1,006,200	581,880	381	.042
1932-33	287,120	275,050	179	.070
1933-34	253,800	668,320	438	.193
1934-35	2,547,150	2,383,630	1,565	.069
1935-36	768,200	752,320	494	.072
1936-37	318,050	142,270	94	.033
1937-38	479,730	771,540	506	.118
1938-39	306,600	450,960	297	.108
1939-40	840,190	1,035,600	679	.091
1940-41	1,300,860	1,635,320	1,073	.092
1941-42	1,107,790	987,340	648	.065
1942-43	260,470	323,990	213	.091
1943-44	700,090	668,660	439	.070
1944-45	297,070	590,010	387	.146
1945-46	927,400	1,134,770	744	.090
1946-47	810,070	578,310	379	.052
1947-48	128,330	253,400	164	.145
1948-49	780,920	765,590	500	.072
1949-50	266,300	385,840	253	.106
1950-51	406,340	607,760	398	.110
1951-52	165,800	308,740	203	.137
TOTALS	16,071,100	18,387,680	12,057	

For period of 25.000 years

Average discharge in acre-feet per year	642,844
Average acre-feet of silt per year	482
Average acre-feet of silt per year per square mile of contributing watershed	.031
Average tons of silt per year	735,507
Average percent of silt by weight	.084
Drainage area in square miles (net)	15,600

1/ Station was established October 1, 1927.

SILT DATA

Nueces River Watershed
at
CORPUS CHRISTI DAM STATION ON NUECES RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	19,250	870	1	.003
November	4,120	200	0	.004
December	2,490	160	0	.005
1952				
January	2,720	210	0	.006
February	3,410	190	0	.004
March	4,630	380	0	.006
April	9,360	1,410	1	.004
May	24,510	4,120	3	.012
June	82,160	16,320	11	.015
July	9,520	850	1	.007
August	4,700	560) ------	1	.009
September	10,440	400)		.003
Totals	177,310	25,670	18	

U.S.G.S. yearly discharge in acre-feet - - - - - - - - - - 177,310

Total silt for year in acre-feet - - - - - - - - - - - - 18

Acre-feet of silt per year per square mile of contributing watershed - - - - - - - - - - - --

Average percent of silt by weight for year - - - - - - - - .011

Drainage area in square miles (net) - - - - - - - - - - --

SUMMARY OF SILT DATA

for

Nueces River Watershed

Stream: NUECES
Station: CORPUS CHRISTI DAM (Samples taken below and adjacent to outlet gates)
Sampler: Eddie Wright

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	1,202,820	546,500	358	.033
1942-43	249,640	44,790	29	.013
1943-44	740,310	323,550	212	.032
1944-45	273,820	125,070	81	.034
1945-46	936,910	350,430	231	.027
1946-47	921,510	244,730	160	.020
1947-48	107,320	15,170	8	.010
1948-49	887,240	212,770	137	.018
1949-50	246,370	29,160	18	.009
1950-51	422,160	106,740	70	.019
1951-52	177,310	25,670	18	.011
TOTALS	6,165,410	2,024,580	1,322	

For period of 10.667 years

Average discharge in acre-feet per year	577,989
Average acre-feet of silt per year	124
Average acre-feet of silt per year per square mile of contributing watershed	---
Average tons of silt per year	189,798
Average percent of silt by weight	.024
Drainage area in square miles (net)	---

1/ Station was established February 2, 1942.

SILT DATA

Sabine River Watershed
at
LOGANSPORT STATION ON SABINE RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	5,820	720	0	.009
November	15,070	1,480	1	.007
December	51,860	5,830	4	.008
1952				
January	89,650	4,700	3	.004
February	344,900	64,760	42	.014
March	266,300	23,770	16	.007
April	383,600	69,080	45	.013
May	396,600	59,140	39	.011
June	238,000	46,530	31	.014
July	13,960	1,500	1	.008
August	6,270	550	0	.006
September	2,430	140	0	.004
Totals	1,814,460	278,200	182	

U.S.G.S. yearly discharge in acre-feet	1,814,460
Total silt for year in acre-feet	182
Acre-feet of silt per year per square mile of contributing watershed	.037
Average percent of silt by weight for year	.011
Drainage area in square miles (net)	4,858

SUMMARY OF SILT DATA

for

Sabine River Watershed

Stream: SABINE
Station: LOGANSPORT, LA.
Sampler: R. E. Davenport

(Samples were taken from U. S. Highway 84 bridge in downtown Logansport, La.)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1932-33 1/	2,545,700	503,740	330	.015
1933-34 2/	69,200	5,780	4	.006
1934-35 3/	13,910	400	0	.002
1935-36	841,410	137,020	89	.012
1936-37	1,689,660	270,430	176	.012
1937-38	3,155,000	537,990	353	.013
1938-39	1,325,580	291,500	190	.016
1939-40	1,302,990	458,990	301	.026
1940-41	4,876,180	825,330	541	.012
1941-42	3,817,160	1,439,880	944	.028
1942-43	1,716,620	999,370	655	.043
1943-44	4,193,070	3,002,050	1,969	.053
1944-45	5,996,730	4,502,820	2,953	.055
1945-46	5,137,000	2,650,320	1,738	.038
1946-47	3,318,320	553,900	363	.012
1947-48	2,820,560	452,390	298	.012
1948-49	1,882,220	391,520	255	.015
1949-50	4,225,130	934,380	610	.016
1950-51	1,033,160	217,420	142	.015
1951-52	1,814,460	278,200	182	.011
TOTALS	51,774,060	18,453,430	12,093	

For period of 18.156 years

Average discharge in acre-feet per year	2,851,623
Average acre-feet of silt per year	666
Average acre-feet of silt per year per square mile of contributing watershed	.137
Average tons of silt per year	1,016,382
Average percent of silt by weight	.026
Drainage area in square miles (net)	4,858

1/ Station was established December 1, 1932.
2/ Station was discontinued December 27, 1933.
3/ Station was re-established September 1, 1935.

SILT DATA

San Antonio River Watershed
at
GOLIAD STATION ON SAN ANTONIO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft	tons	ac.-ft.	pct.
1951				
October	9,250	2,150	1	.017
November	9,260	1,500	1	.012
December	9,250	740	0	.006
1952				
January	8,420	790	1	.007
February	12,330	5,820	4	.035
March	10,760	1,550	1	.011
April	18,820	29,170	19	.114
May	30,660	85,460	56	.205
June	10,440	5,690	4	.040
July	10,200	13,560	9	.098
August	4,760	500	0	.008
September	196,800	232,540	153	.087
Totals	330,950	379,470	249	

U.S.G.S. yearly discharge in acre-feet	330,950
Total silt for year in acre-feet	249
Acre-feet of silt per year per square mile of contributing watershed	.064
Average percent of silt by weight for year	.084
Drainage area in square miles (net)	3,918

SUMMARY OF SILT DATA

for

San Antonio River Watershed

Stream: SAN ANTONIO
Station: GOLIAD (Samples were taken near Goliad from bridge on State Hwy. No. 29)
Sampler: Polo Perez

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1941-42 1/	699,580	848,340	556	.089
1942-43	453,180	581,740	382	.094
1943-44	365,060	725,630	475	.146
1944-45	352,460	567,440	371	.118
1945-46	663,080	1,387,180	910	.154
1946-47	699,560	719,770	472	.076
1947-48	226,510	237,020	155	.077
1948-49	403,390	669,460	440	.122
1949-50	263,690	310,560	203	.087
1950-51	221,270	394,550	260	.131
1951-52	330,950	379,470	249	.084
TOTALS	4,678,730	6,821,160	4,473	

For period of 10.748 years

Average discharge in acre-feet per year	435,312
Average acre-feet of silt per year	416
Average acre-feet of silt per year per square mile of contributing watershed	.106
Average tons of silt per year	634,645
Average percent of silt by weight	.107
Drainage area in square miles (net)	3,918

1/ Station was established January 1, 1942.

SILT DATA

San Jacinto River Watershed
at
HUFFMAN STATION ON SAN JACINTO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	6,540	1,360	1	.015
November	7,120	910	1	.009
December	11,950	3,040	2	.019
1952				
January	10,040	2,310	2	.017
February	62,410	14,330	9	.017
March	29,540	8,710	6	.022
April 1/				
May				
June				
July				
August				
September				
Totals	127,600	30,660	21	

U.S.G.S. yearly discharge in acre-feet	127,600
Total silt for year in acre-feet	21
Acre-feet of silt per year per square mile of contributing watershed	.008
Average percent of silt by weight for year	.018
Drainage area in square miles (net)	2,791

1/ Discontinued March 31, 1952 on account of construction of dam.

SUMMARY OF SILT DATA

for

San Jacinto River Watershed

Stream: SAN JACINTO
Station: HUFFMAN (Samples were taken at Sheldon Pumping Plant, City of Houston)
Sampler: Phil Baker Scott

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1944-45 1/	221,940	163,730	107	.054
1945-46	2,246,700	1,345,020	881	.044
1946-47	2,466,540	2,096,730	1,377	.062
1947-48	499,740	108,300	70	.016
1948-49	937,040	374,450	246	.029
1949-50	2,698,180	938,770	614	.026
1950-51	171,240	41,700	27	.018
1951-52 2/	127,600	30,660	21	.018
TOTALS	9,368,980	5,099,360	3,343	

For period of 6.597 years

Average discharge in acre-feet per year	1,420,188
Average acre-feet of silt per year	507
Average acre-feet of silt per year per square mile of contributing watershed	.182
Average tons of silt per year	772,982
Average percent of silt by weight	.040
Drainage area in square miles (net)	2,791

1/ Station was established September 1, 1945.
2/ Station was discontinued March 31, 1952.

SILT DATA

San Jacinto River Watershed
at
HUMBLE STATION ON SAN JACINTO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	3,430	580		.012
November	3,680	570	1	.011
December	5,790	980	1	.012
1952				
January	4,960	600	0	.009
February	35,410	7,480	5	.016
March	22,030	3,750	3	.012
April 1/	151,800	78,500	51	.038
May				
June				
July				
August				
September				
Totals	227,100	92,460	61	

U.S.G.S. yearly discharge in acre-feet	227,100
Total silt for year in acre-feet	61
Acre-feet of silt per year per square mile of contributing watershed	.034
Average percent of silt by weight for year	.030
Drainage area in square miles (net)	1,811

1/ Discontinued April 30, 1952.

SUMMARY OF SILT DATA

for

San Jacinto River Watershed

Stream: SAN JACINTO
Station: HUFFMAN (Samples were taken at Sheldon Pumping Plant, City of Houston)
Sampler: Phil Baker Scott

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1944-45 1/	221,940	163,730	107	.054
1945-46	2,246,700	1,345,020	881	.044
1946-47	2,466,540	2,096,730	1,377	.062
1947-48	499,740	108,300	70	.016
1948-49	937,040	374,450	246	.029
1949-50	2,698,180	938,770	614	.026
1950-51	171,240	41,700	27	.018
1951-52 2/	127,600	30,660	21	.018
TOTALS	9,368,980	5,099,360	3,343	

For period of 6.597 years

Average discharge in acre-feet per year	1,420,188
Average acre-feet of silt per year	507
Average acre-feet of silt per year per square mile of contributing watershed	.182
Average tons of silt per year	772,982
Average percent of silt by weight	.040
Drainage area in square miles (net)	2,791

1/ Station was established September 1, 1945.
2/ Station was discontinued March 31, 1952.

SILT DATA

San Jacinto River Watershed
at
HUMBLE STATION ON SAN JACINTO RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	3,430	580		.012
November	3,680	570	1	.011
December	5,790	980	1	.012
1952				
January	4,960	600	0	.009
February	35,410	7,480	5	.016
March	22,030	3,750	3	.012
April 1/	151,800	78,500	51	.038
May				
June				
July				
August				
September				
Totals	227,100	92,460	61	

U.S.G.S. yearly discharge in acre-feet	227,100
Total silt for year in acre-feet	61
Acre-feet of silt per year per square mile of contributing watershed	.034
Average percent of silt by weight for year	.030
Drainage area in square miles (net)	1,811

1/ Discontinued April 30, 1952.

SUMMARY OF SILT DATA

for

San Jacinto River Watershed

Stream: WEST FORK OF SAN JACINTO
Station: NEAR HUMBLE
Sampler: L. C. Clark

(Samples were taken from highway bridge about 2 miles north of Humble)

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1932-33 1/	253,210	144,800	93	.042
1933-34 2/	7,450	520	0	.005
1936-37 3/	12,450	1,370	1	.008
1937-38	491,940	150,650	97	.022
1938-39	319,500	120,660	77	.028
1939-40	282,680	162,070	105	.042
1940-41	2,566,090	896,050	588	.026
1941-42	909,180	373,670	245	.030
1942-43	545,760	290,820	191	.039
1943-44	881,200	660,570	434	.055
1944-45	1,577,380	1,241,490	815	.058
1945-46	1,320,330	774,810	509	.043
1946-47	1,325,000	345,140	228	.019
1947-48	284,340	41,140	25	.011
1948-49	502,390	201,420	131	.029
1949-50	502,370	152,470	100	.022
1950-51	93,720	28,050	18	.022
1951-52 4/	227,100	92,460	61	.030
TOTALS	12,102,090	5,678,160	3,718	

For period of 15.920 years

Average discharge in acre-feet per year	760,182
Average acre-feet of silt per year	234
Average acre-feet of silt per year per square mile of contributing watershed	.129
Average tons of silt per year	356,668
Average percent of silt by weight	.034
Drainage area in square miles (net)	1,811

1/ Station was established December 1, 1932.
2/ Station was discontinued December 31, 1933.
3/ Station was reestablished July 1, 1937.
4/ Station was discontinued April 30, 1952.

SILT DATA

Trinity River Watershed
at
ROMAYOR STATION ON TRINITY RIVER

for

Water Year 1951-1952
(October 1, 1951 to September 30, 1952)

Month	Discharge of Stream	Silt Load of Stream		Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1951				
October	26,900	4,860	3	.013
November	33,050	9,130	6	.020
December	47,050	13,360	9	.021
1952				
January	53,100	16,120	11	.022
February	123,800	31,360	21	.019
March	160,300	73,260	48	.034
April	474,500	927,820	609	.144
May	659,400	584,440	383	.065
June	376,100	179,400	118	.035
July	31,750	4,800	3	.011
August	17,590	2,060	1	.009
September	14,100	2,020	1	.011
Totals	2,017,640	1,848,630	1,213	

U.S.G.S. yearly discharge in acre-feet	2,017,640
Total silt for year in acre-feet	1,213
Acre-feet of silt per year per square mile of contributing watershed	.071
Average percent of silt by weight for year	.067
Drainage area in square miles (net)	17,192

SUMMARY OF SILT DATA

for

Trinity River Watershed

Stream: TRINITY
Station: ROMAYOR (Samples taken from the railroad bridge)
Sampler: Claud Allen

Water Year	Discharge of Stream	Silt Load of Stream		Average Percentage of Dry Silt by Weight
	ac.-ft.	tons	ac.-ft.	pct.
1935-36 1/	42,130	5,220	4	.009
1936-37	3,900,920	3,481,600	2,285	.066
1937-38	6,753,160	6,741,220	4,423	.073
1938-39	2,165,150	3,199,280	2,099	.109
1939-40	3,218,170	4,999,040	3,280	.114
1940-41	12,258,630	9,657,990	6,335	.058
1941-42	9,901,100	9,447,990	6,197	.070
1942-43	4,298,370	4,914,950	3,224	.084
1943-44	7,588,430	11,433,850	7,501	.111
1944-45	12,202,840	13,559,310	8,893	.082
1945-46	8,391,500	8,643,330	5,670	.076
1946-47	7,009,180	5,290,980	3,468	.055
1947-48	4,476,720	3,284,720	2,154	.054
1948-49	4,029,430	3,411,700	2,238	.062
1949-50	8,017,800	5,538,990	3,634	.051
1950-51	1,727,990	884,850	580	.038
1951-52	2,017,640	1,848,630	1,213	.067
TOTALS	97,999,160	96,343,650	63,198	

For period of 16.142 years

Average discharge in acre-feet per year	6,071,067
Average acre-feet of silt per year	3,915
Average acre-feet of silt per year per square mile of contributing watershed	.228
Average tons of silt per year	5,968,508
Average percent of silt by weight	.072
Drainage area in square miles (net)	17,192

1/ Station was established August 10, 1936.

SUMMARY OF SILT DATA FOR SOME OF THE MAJOR TEXAS STREAMS

(For Water Year Ending September 30, 1952)

Water-shed	Stream	Silt Station	Years Samples Taken	Total Length Record	Average Run-off of Stream	Average Amount of Silt		Amt. of Silt per Sq. Mi. Watershed	Dry Silt by Weight	Net Drainage Area
				years	ac-ft	ac-ft	tons	ac-ft	per-cent	sq.mi.
Brazos	Salt Fork	Aspermont 1/	1924-25	1.238	111,100	2,818	4,297,420	1.272	2.842	2,216
Brazos	Salt Fork	Seymour 1/	1924-30	6.107	398,864	6,501	9,912,150	1.238	1.826	5,250
Brazos	Dbl.Mt.Fork	Aspermont 1/	1924-33	9.244	135,280	2,665	4,062,400	1.765	2.206	1,510
Brazos	Clear Fork	Crystal Falls 1/	1925-29	3.307	214,440	568	866,020	.131	.297	4,320
Brazos	Clear Fork	Eliasville 1/	1924-25	1.244	177,240	529	808,630	.092	.335	5,740
Brazos	Little River	Little River 1/	1924-29	4.962	419,870	752	1,147,190	.143	.201	5,253
Brazos	San Gabriel	Circleville 1/	1924-29	5.403	110,744	222	339,590	.369	.225	602
Brazos	Leon	Belton 2/	1945-50	4.333	339,520	353	527,417	.100	.114	3,547
Brazos	Navasota	Easterly	1942-52	10.748	284,539	169	257,451	.178	.066	949
Brazos	Brazos	South Bend	1942-52	10.710	444,533	2,405	3,651,701	.195	.603	12,360
Brazos	Brazos	Possum King Dam	1942-52	10.710	481,690	64	98,100	----	.015	---
Brazos	Brazos	Mineral Wells 1/	1924-34	10.332	953,550	6,506	9,920,060	.468	.764	13,910
Brazos	Brazos	Glen Rose 1/	1924-29	4.588	1,181,370	8,378	12,773,810	.537	.794	15,600
Brazos	Brazos	Waco 1/	1924-33	9.254	1,717,130	10,325	15,742,010	.536	.673	19,260
Brazos	Brazos	Bryan 1/	1899-02	3.419	4,156,736	39,117	---	1.340	.941 4/	29,190
Brazos	Brazos	Richmond	1924-52	28.306	5,378,371	21,269	32,467,716	.611	.443	34,810
Colorado	Llano	Llano	1942-52	10.167	187,579	532	811,788	.133	.318	4,000
Colorado	Pedernales	Johnson City	1942-52	10.167	117,960	916	1,395,605	.967	.869	947
Colorado	Colorado	San Saba	1930-52	22.055	1,091,252	2,845	4,337,942	.152	.292	18,700
Colorado	Colorado	Tow 1/	1927-32	5.162	1,245,440	3,360	5,122,520	.174	.302	19,300
Colorado	Colorado	Inks Dam 3/	1942-52	9.333	619,191	48	73,327	---	.009	---
Colorado	Colorado	Buchanan Dam	1947-52	5.000	496,602	19	28,992	---	.004	---
Colorado	Colorado	Austin	1937-52	15.164	1,510,556	584	889,205	.022	.043	26,260
Colorado	Colorado	Columbus-Eagle Lake 5/	1930-33 1937-41	6.997	3,167,710	5,898	8,991,960	.202	.209	29,140
Guadalupe	Guadalupe	Spring Branch	1942-52	10.748	171,413	121	185,445	.084	.079	1,432
Guadalupe	Guadalupe	Victoria	1945-52	7.083	859,658	332	506,062	.063	.043	5,311
Lavaca	Lavaca	Edna	1945-52	7.083	138,453	102	154,867	.115	.082	887
Neches	Angelina	Horger 6/	1945-52	6.667	2,323,471	342	520,717	.100	.016	3,435
Neches	Neches	Rockland	1930-52	22.148	1,929,620	285	435,666	.081	.017	3,539
Nueces	Nueces	Three Rivers	1927-52	25.000	642,844	482	735,507	.031	.084	15,600
Nueces	Nueces	Corpus Chr. Dam	1942-52	10.667	577,989	124	189,798	---	.024	---

SUMMARY OF SILT DATA (Continued)

Water-shed	Stream	Silt Station	Years Samples Taken	Total Length Record	Average Run-off of Stream	Average Amount of Silt		Amt. of Silt per Sq. Mi. Watershed	Dry Silt by Weight	Net Drainage Area
				years	ac-ft	ac-ft	tons	ac-ft	per-cent	sq.mi.
Nueces	Nueces	Cotulla	1942-52	10.748	156,743	63	95,431	.012	.045	5,260
Rio Grande	Rio Grande	Eagle Pass 7/	1934-43	9.068	3,180,057	9,776	14,904,545	.078	.344	125,260
Rio Grande	Rio Grande	Roma 7/	1929-43	14.184	4,166,619	12,588	19,192,311	.080	.338	157,204
Red	Pease	Crowell 8/	1942-47	5.000	113,411	992	1,512,834	.412	.980	2,410
Red	Red	Denison 1/	30-33;36-37	6.260	3,326,780	13,640	20,793,380	.415	.459	32,840
Red	Wichita	Wichita Falls 1/	1900-02	2.014	566,420	5,516	---	1.776	.974 4/	3,105
Sabine	Sabine	Logansport, La.	32-33;35-52	18.156	2,851,623	666	1,016,382	.137	.026	4,858
Sabine	Sabine	Ruliff 9/	1945-46	1.083	11,408,860	3,124	5,771,404	.331	.037	9,440
San Antonio	San Antonio	Falls City 1/	1927-33	5.967	127,120	142	216,730	.069	.125	2,070
San Antonio	San Antonio	Goliad	1942-52	10.748	435,312	416	634,645	.106	.107	3,918
San Jacinto	West Fork	Humble 10/	32-33;37-52	15.920	760,182	234	356,668	.129	.034	1,811
San Jacinto	San Jacinto	Huffman 11/	1945-52	6.597	1,420,188	507	772,982	.182	.040	2,791
Trinity	Trinity	Rosser 12/	1938-40	1.598	760,700	986	1,504,920	.122	.145	8,057
Trinity	Trinity	Romayor	1936-52	16.142	6,071,067	3,915	5,968,508	.228	.072	17,192

1/ Silt by months and summary data prior to 1940 contained in Progress Report No. 1.
2/ Station discontinued December 31, 1949.
3/ Station discontinued November 31, 1951.
4/ Percent of silt by volume.
5/ Station discontinued October 31, 1941.
6/ Station discontinued May 31, 1952.
7/ Station discontinued May 31, 1943.
8/ Station discontinued June 30, 1947.
9/ Station discontinued September 30, 1946.
10/ Station discontinued April 30, 1952.
11/ Station discontinued March 31, 1952.
12/ Station discontinued June 27, 1940.

A P P E N D I X

LOCATIONS AND OTHER INFORMATION PERTAINING TO SILT STATIONS IN TEXAS

Station	Water-shed	Tributary	County	Lati-tude	Longi-tude	Bridge on Highway	Location in regard to town, stream, or other recognized landmark	Drainage Area		Status of Record				Number of years records
								Contri-buting	Non-Contri-buting	Estab-lished	Discon-tinued	Re-estab-lished	Pre-sent	
Aspermont	Brazos	Salt Fork	Stonewall	33°20'	100°14'	US-83	13.2 mi. N Aspermont, 5.5 mi. downstream Dove Creek	2,064	2,770	6-4-24	8-29-25			1.2
Seymour	Brazos	Brazos	Baylor	33°35'	99°16'	US-277	3/4 mi. SW Seymour Courthouse, ½ mi. upstream Wichita Valley RR bridge	5,250	9,240	6-5-24	7-13-30			6.1
Aspermont	Brazos	Dbl.Mtn. Fork	Stonewall	33°00'	100°11'	US-83	9 mi. S Aspermont, 8 mi. downstream Mtn. Creek	1,509	6,470	6-4-24	8-31-33			9.2
Crystal Falls	Brazos	Clear Fork	Stephens	32°55'	98°51'		At Texas Co. pumping plant, 3¼ mi. NE Crystal Falls, 2½ mi. downstream Hubbard Creek	5,658		9-3-25	1-22-29			3.3
Eliasville	Brazos	Clear Fork	Young	32°59'	98°44'	Farm-710	1½ mi. NE Eliasville, 6 mi. above stream mouth	5,740		6-3-24	8-30-25			1.2
Little River	Brazos	Little River	Bell	30°57'	97°21'		2 mi. SE Little River at MKT RR bridge, 4½ mi. downstream Leon and Lampasas confluence	5,250		6-8-24	5-27-29			5.0
Circle-ville	Brazos	San Gabriel	William-son	30°38'	97°26'	Texas-95	.1 mi. S Circleville, 7 mi. upstream Williamson Creek	602		6-7-24	10-31-29			5.4
Belton	Brazos	Leon	Bell	31°06'	97°27'	Texas-317	1.6 mi. N Belton, 2 mi. down-stream Belton Dam	3,547		9-1-45	12-31-49			5.3
Easterly	Brazos	Navasota	Robertson	31°10'	96°18'	US-79	6 mi. NE Easterly, .6 mi. upstream MP RR bridge	949		1-1-42			A	10.7
South Bend	Brazos	Brazos	Young	33°02'	98°39'	Texas-67	2 mi. NE South Bend, .2 mi. upstream Wichita Falls and Southern RR bridge	12,360	9,240	1-15-42			A	10.7
Possum Kingdom Dam	Brazos	Brazos	Palo Pinto	32°52'	98°25'		Tailrace of Morris-Sheppard Dam	13,310	9,240	1-15-42			A	10.7
Mineral Wells	Brazos	Brazos	Palo Pinto	32°48'	98°12'	US-180	4 mi. W Mineral Wells, 4 mi. downstream Turkey Creek	23,100		6-2-24	9-30-34			10.3
Glen Rose	Brazos	Brazos	Somervell	32°16'	97°42'	Old Farm Road-200	2.6 mi. NE Glen Rose. 1 mi. upstream Paluxy Creek	15,600	9,240	6-1-24	8-31-29			4.6
Waco	Brazos	Brazos	McLennan	31°34'	97°08'	Alt.US-77	At Washington Ave. Bridge in Waco, 2½ mi. downstream Bosque River	19,260	9,240	5-31-24	8-31-33			9.3
Bryan	Brazos	Brazos	Brazos	30°34'	96°26'	Farm-60	6 mi. SW College Station at Jones Bridge	29,190	9,240	8-1-99	12-31-02			3.4
Richmond	Brazos	Brazos	Fort Bend	29°35'	95°45'	US-59 and 90A	In Richmond	34,810	9,240	6-11-24	4-12-32	4-13-32	A	28.3

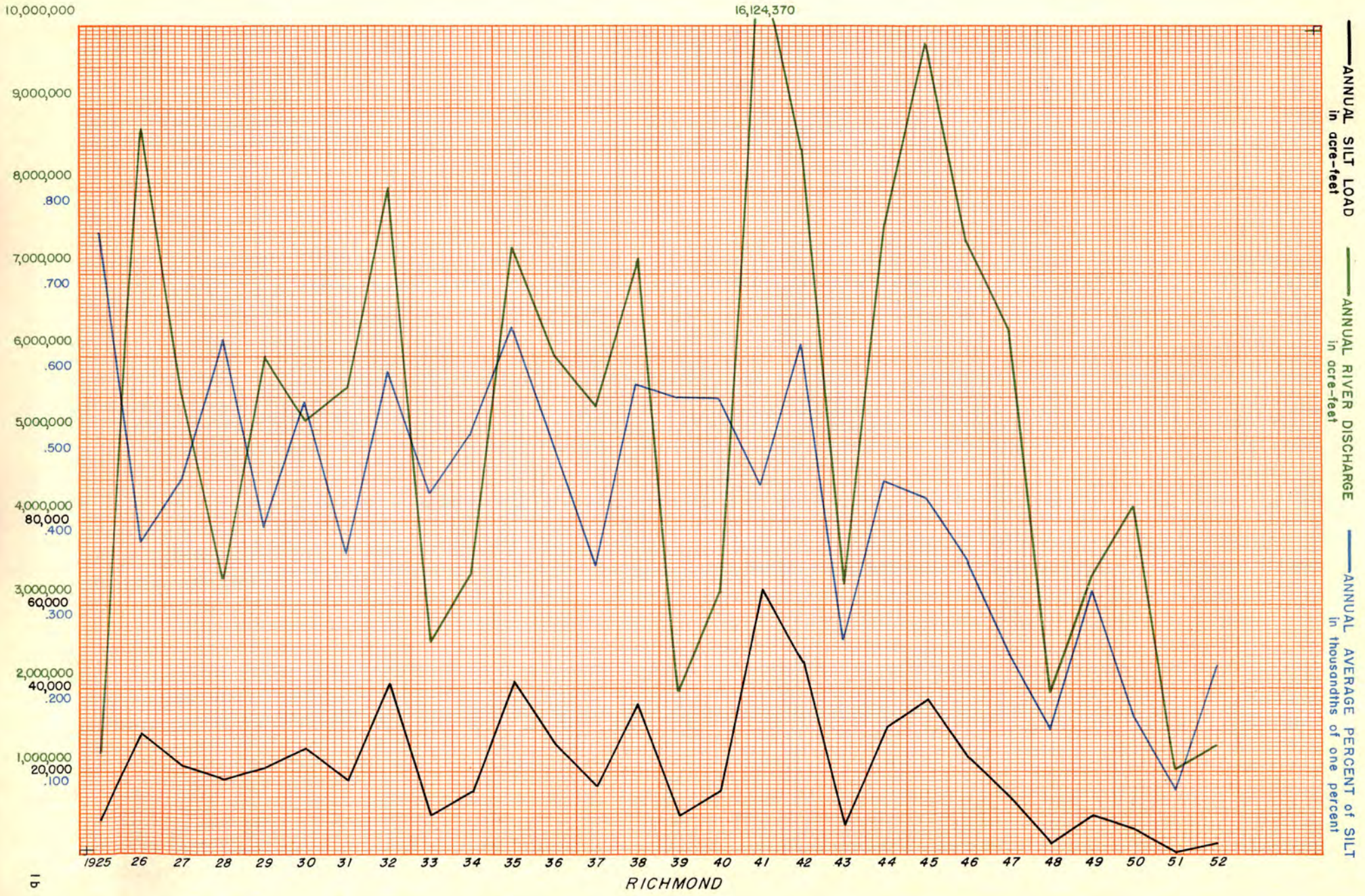
SILT STATIONS IN TEXAS - TABLE CONTINUED

Station	Watershed	Tributary	County	Latitude	Longitude	Bridge on Highway	Location in regard to town, stream or other recognized landmark	Drainage Area		Status of Record				Number of years records
								Contributing	Non-Contributing	Established	Discontinued	Re-established	Present	
Llano	Colorado	Llano	Llano	30°45'	98°41'		In Llano, .4 mi. below State Highway 16 bridge, 7 mi. above Little Llano River	4,000		8-1-42			A	10.2
Johnson City	Colorado	Pedernales	Blanco	30°18'	98°24'	US-281	1½ mi. NW Johnson City	947		8-1-42			A	10.2
San Saba	Colorado	Colorado	San Saba	31°13'	98°34'	US-190	9 mi. E San Saba, 5.2 mi. downstream San Saba River	18,700	11,900	9-11-30			A	22.0
Tow	Colorado	Colorado	Llano	30°54'	98°27'		Now under Buchanan Dam impounding, 2 mi. downstream Fall Creek	19,300	11,900	10-3-27	11-30-32			5.2
Inks Dam	Colorado	Colorado	Burnet	30°44'	98°23'		Tailrace of Roy Inks Dam	19,350	11,900	8-1-42	11-31-51			9.3
Buchanan Dam	Colorado	Colorado	Llano	30°45'	98°25'		Tailrace of Buchanan Dam	19,350	11,900	10-1-47			A	5.0
Austin	Colorado	Colorado	Travis	30°15'	97°42'	US-290	At Montopolis bridge, SE edge of Austin, 2.8 mi. upstream Walnut Creek	26,260	11,900	8-2-37			A	15.2
Columbus-				29°42'	96°32'	US-90	E edge of Columbus	28,940	11,900	8-3-30	8-31-33			
Eagle Lake	Colorado	Colorado	Colorado	29°35'	96°25'	US-90A	5 mi. W Eagle Lake, 1 mi. upstream Lakeside Irrig. Co. pumping plant	29,000	11,900	12-1-37	10-31-41			7.0
Spring Branch	Guadalupe	Guadalupe	Comal	29°52'	98°53'	County Highway	1.8 mi. SE Spring Branch store, 3.4 mi. downstream Spring Branch Creek	1,432		1-1-42			A	10.7
Victoria	Guadalupe	Guadalupe	Victoria	28°48'	97°01'	US-59 & 77	SW edge of Victoria, 1300 ft. upstream T&NO RR bridge	5,311		9-1-45			A	7.1
Edna	Lavaca	Lavaca	Jackson	28°58'	96°42'	US-59	2.8 mi. SW Edna, 550 ft. upstream T&NO RR bridge	887		9-1-45			A	7.1
Horger	Neches	Angelina	Jasper	31°00'	94°11'	Texas-63	¼ mi. W Beans Place, 5 mi. upstream Indian Creek	3,435		9-1-45	5-31-52			6.7
Rockland	Neches	Neches	Tyler	31°02'	94°24'	US-69	1 mi. NW Rockland, 4300 ft. upstream T&NO RR bridge	3,539		8-8-30			A	22.1
Cotulla	Nueces	Nueces	La Salle	28°26'	99°14'	US-81	At S edge Cotulla, .3 mi. upstream IGN RR bridge	5,260		1-1-42			A	10.7
Three Rivers	Nueces	Nueces	Live Oak	28°26'	98°11'		At SAU&G (MP) RR bridge, 1.2 mi. S Three Rivers	15,600		10-1-27			A	25.0

SILT STATIONS IN TEXAS - TABLE CONTINUED

Station	Watershed	Tributary	County	Latitude	Longitude	Bridge on Highway	Location in regard to town, stream or other recognized landmark	Drainage Area		Status of Record				Number of years records
								Contributing	Non-Contributing	Established	Discontinued	Re-established	Present	
Corpus Christi Dam	Nueces	Nueces	San Patricio	28°03'	97°52'		Tailrace of Corpus Christi, .8 mi. above US-81 Highway bridge	16,660		2-2-42			A	10.6
Eagle Pass	Rio Grande	Rio Grande	Maverick	28°41'	100°30'	International	At bridge between Eagle Pass and Piedras Negras, Mexico	125,260	163,800	4-2-34	5-31-43			9.1
Roma	Rio Grande	Rio Grande	Starr	26°24'	99°01'	International	At bridge between Roma and San Pedro, Mexico	157,204	163,857	3-26-29	5-31-43			14.2
Crowell	Red	Pease	Foard	34°06'	99°44'	Texas-283	7 mi. N Crowell	2,940	530	7-1-42	6-30-47			5.0
Wichita Falls	Red	Wichita	Wichita	33°55'	98°30'		At Ft. Worth & Denver City (Burlington) RR bridge in Wichita Falls	3,105		2-10-00	2-15-02			2.0
Denison	Red	Red	Grayson	33°49'	96°32'	US-75 & 69	4 mi. N Denison	32,890	5,440	8-13-30	8-31-33	8-31-36		6.3
Logansport	Sabine	Sabine	Shelby	31°59'	94°00'	US-84	In Logansport, La., 200 ft. above T&NO RR bridge	4,858		12-1-32	12-27-33	9-1-35	A	18.2
Ruliff	Sabine	Sabine	Newton	30°18'	93°39'	Texas-235	½ mi. N Deweyville, 4 mi. downstream Cypress Creek	9,440		9-1-45	9-30-46			1.1
Falls City	San Antonio	San Antonio	Karnes	28°57'	98°04'	Farm-791	3.4 mi. SW Falls City	2,071		9-13-27	8-31-33			6.0
Goliad	San Antonio	San Antonio	Goliad	28°39'	97°23'	Texas-29	1.3 mi. SE Goliad Courthouse, 10 mi. upstream Manahuilla Creek	3,918		1-1-42			A	10.7
Humble	San Jacinto	West Fork	Harris	30°02'	95°16'	US-59	2½ mi. N. Humble, 1160 ft. upstream T&NO RR bridge	1,811		12-1-32	12-31-33	7-1-37		15.9
Huffman	San Jacinto	San Jacinto	Harris	29°55'	95°08'		At pumping plant 4 mi. N Sheldon, 8 mi. below East & West Fork confluence	2,791		9-1-45	3-31-52			6.6
Rosser	Trinity	Trinity	Kaufman	32°26'	96°28'	Texas-34	2.3 mi. S Rosser, 5.7 mi. below East Fork	8,162		11-15-38	6-27-40			1.6
Romayor	Trinity	Trinity	Liberty	30°27'	94°51'		At GC&SF RR bridge, ¼ mi. W Romayor, 2½ mi. below Big Creek	17,192		8-10-36			A	16.1

A - Active stations as of September 30, 1952.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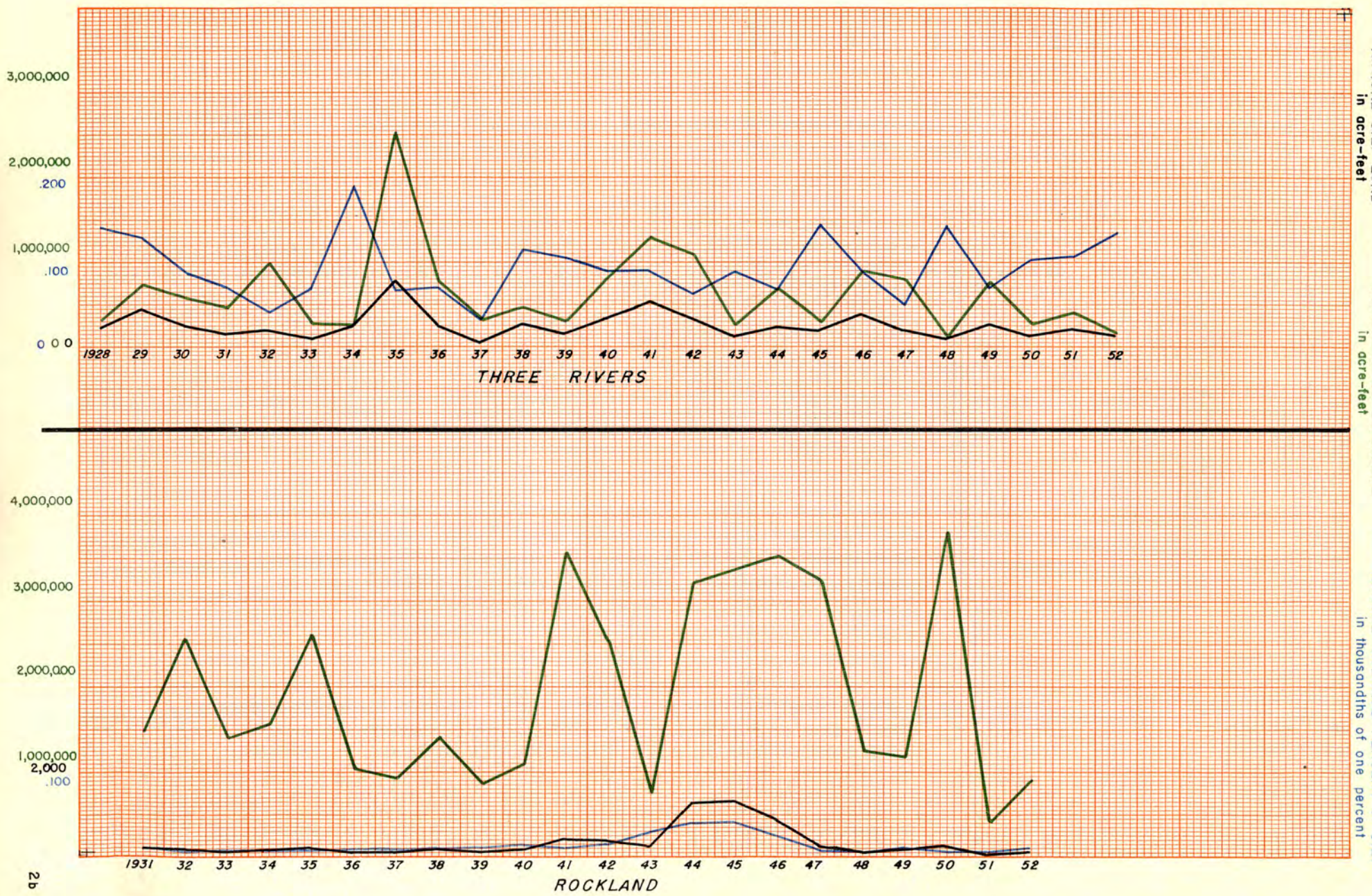
RICHMOND
ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent


ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent
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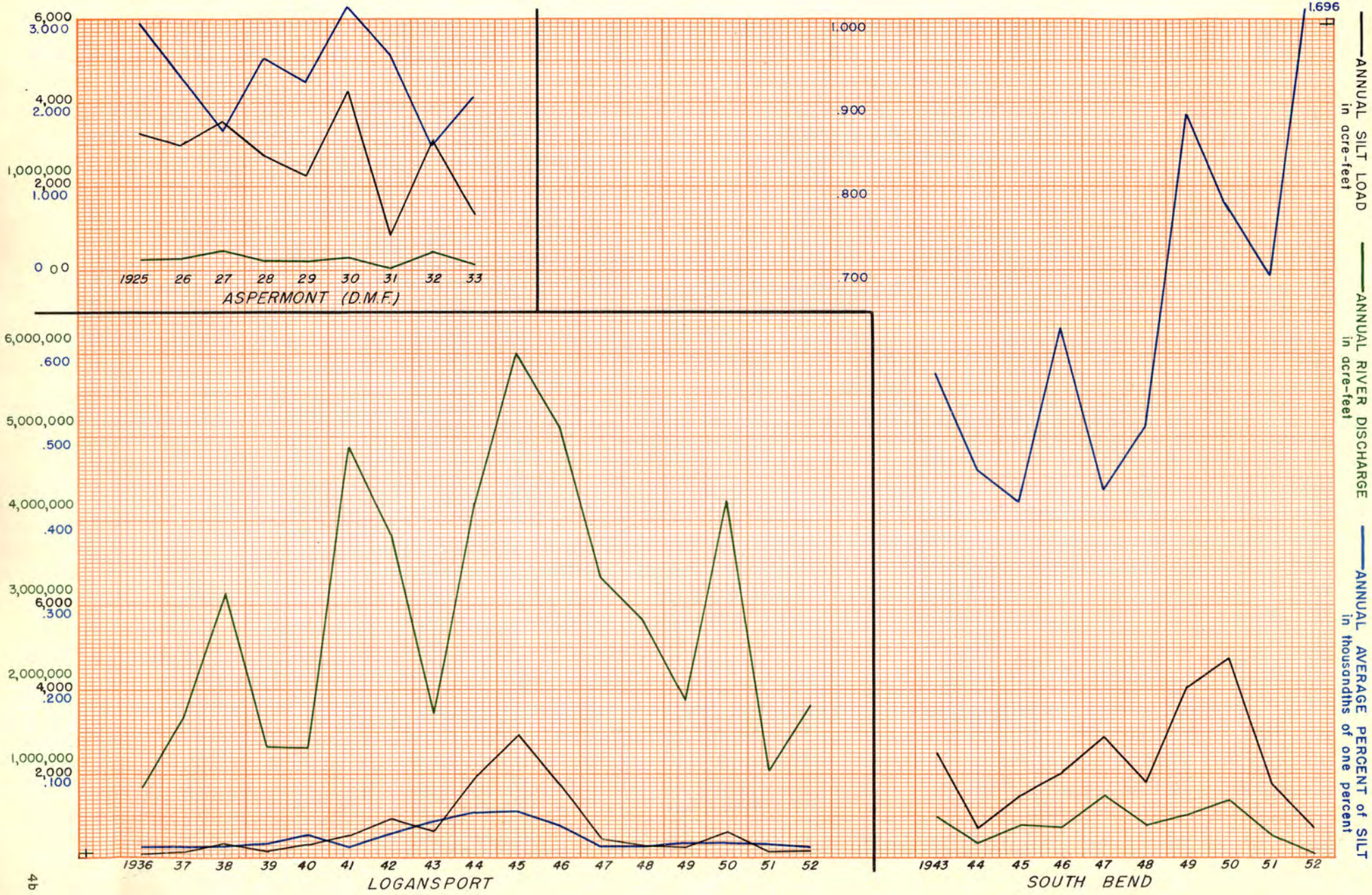
AUSTIN
ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent

3b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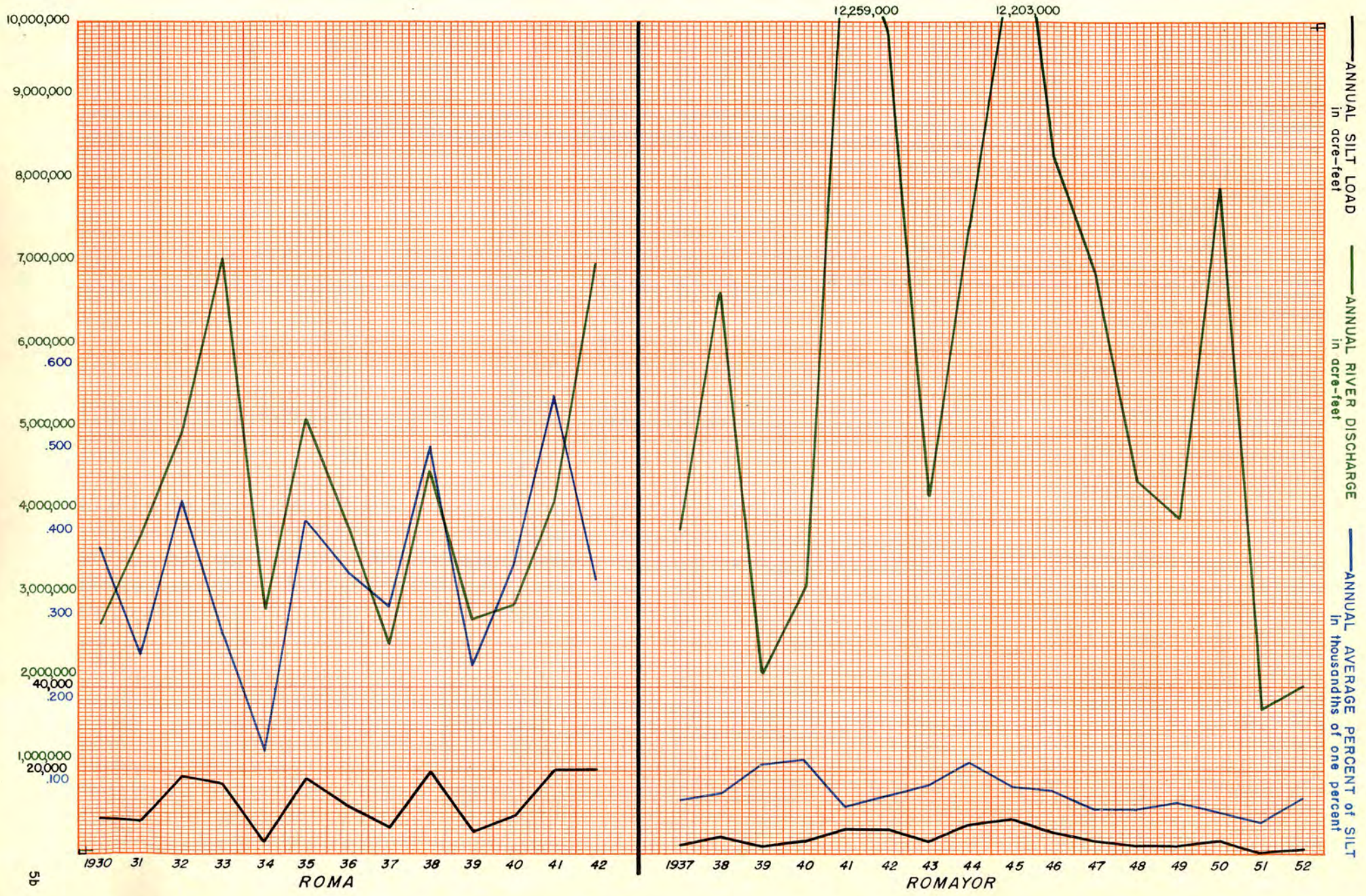
1936 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
LOGANSPORT
1943 44 45 46 47 48 49 50 51 52
SOUTH BEND
ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent

4b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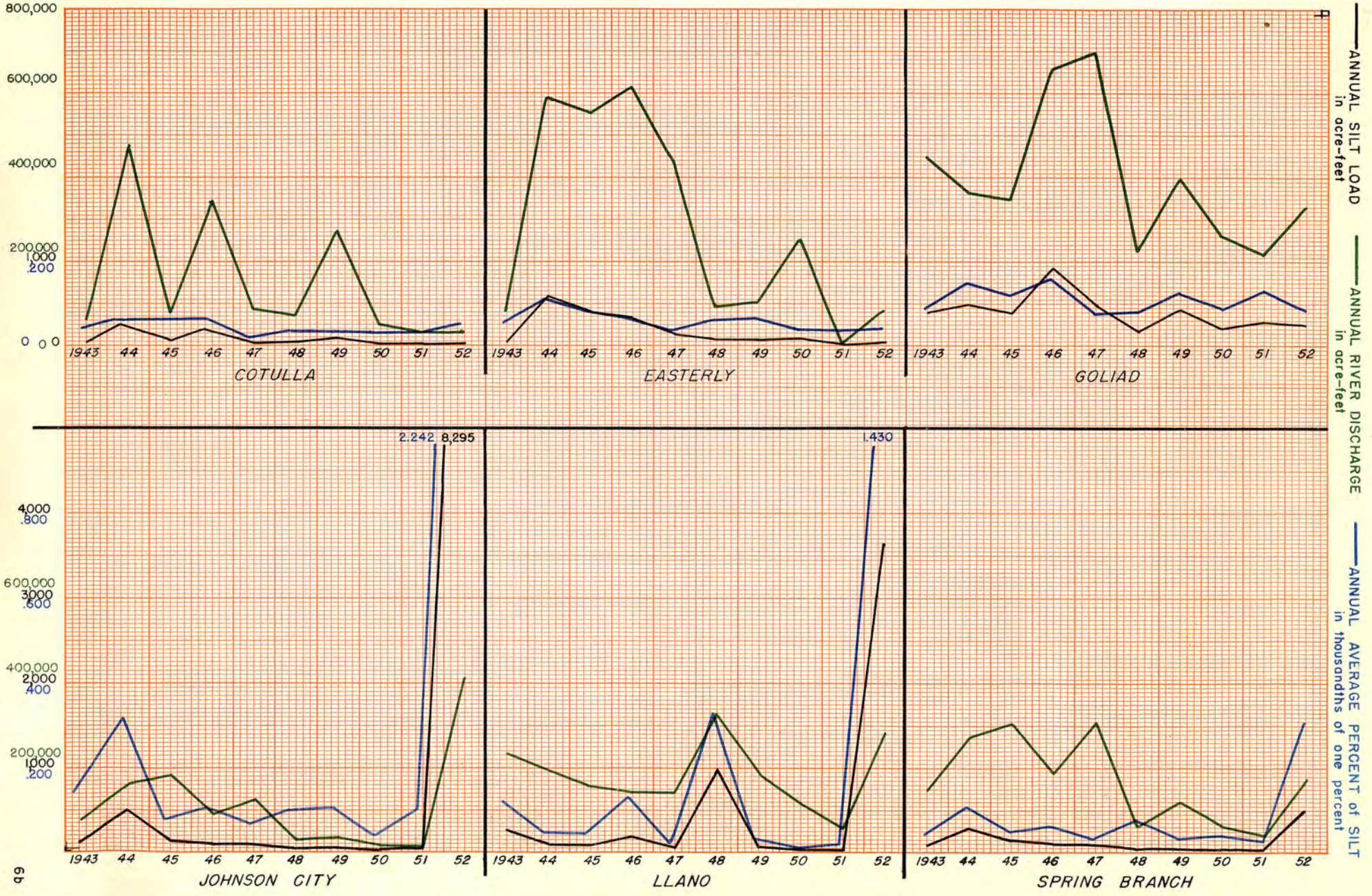
1930 31 32 33 34 35 36 37 38 39 40 41 42
ROMA
1937 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
ROMAYOR
ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent


800,000
600,000
400,000
200,000
1,000
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0 0 0
1943 44 45 46 47 48 49 50 51 52
COTULLA
EASTERLY
GOLIAD
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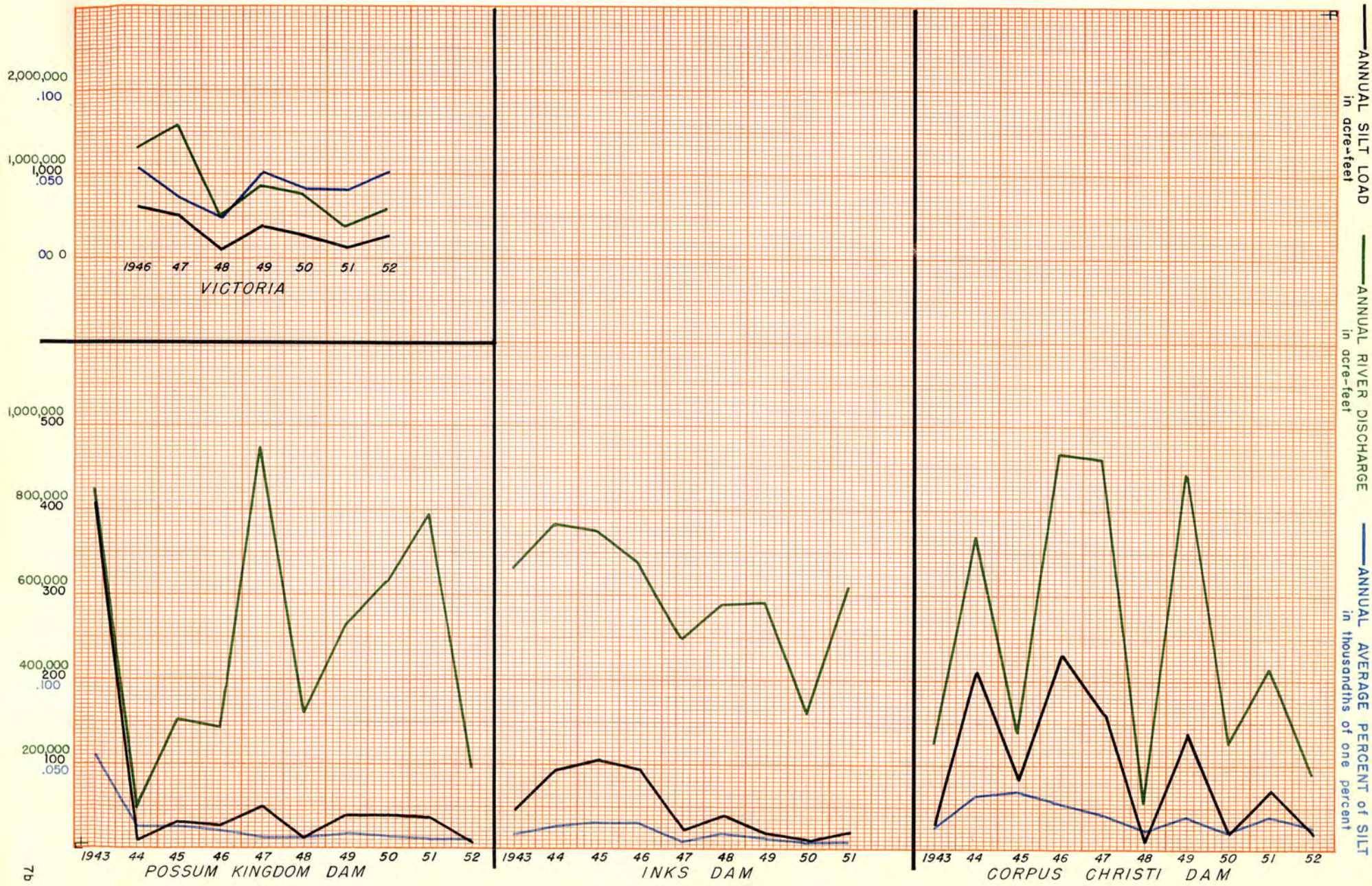
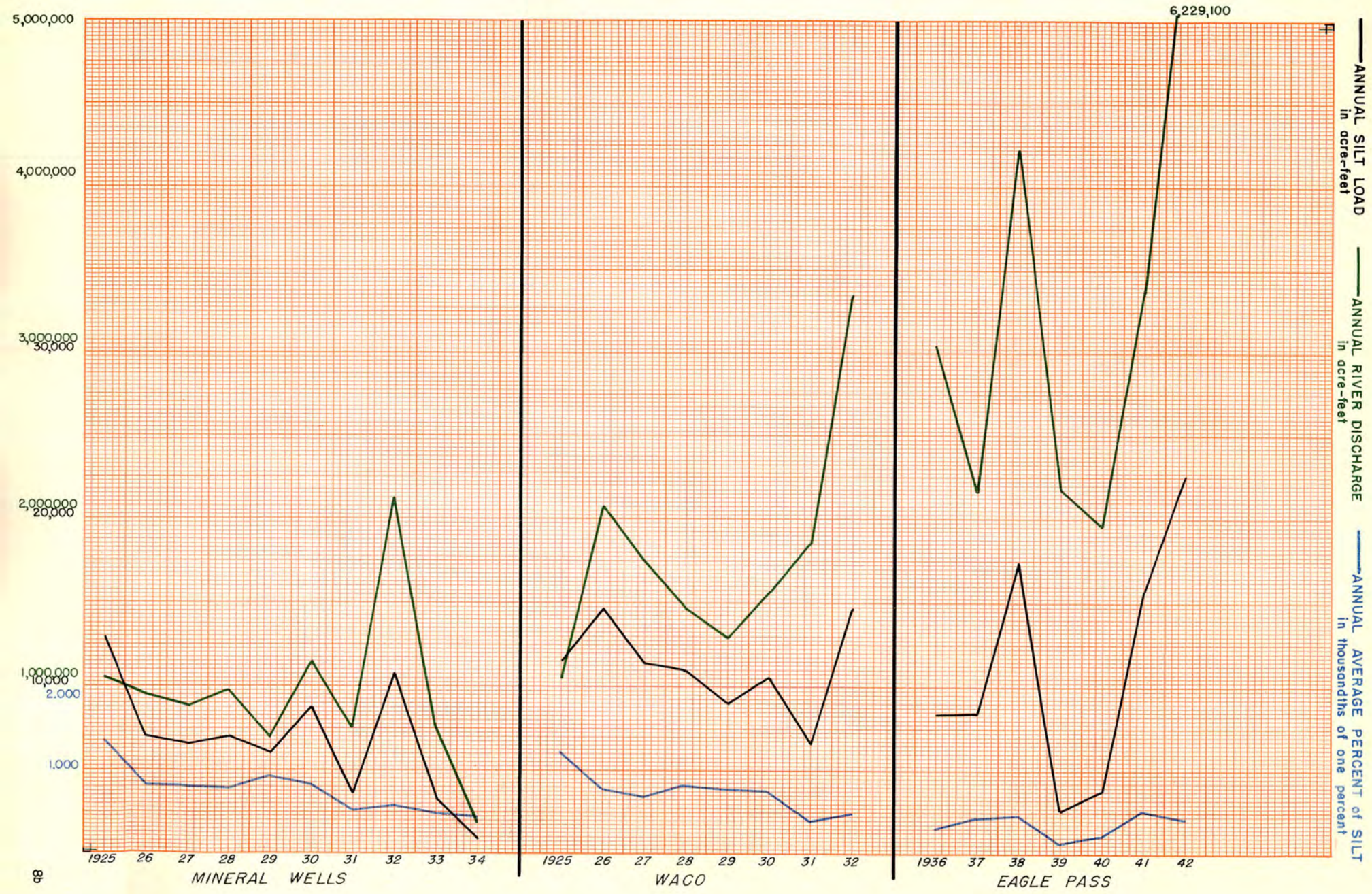
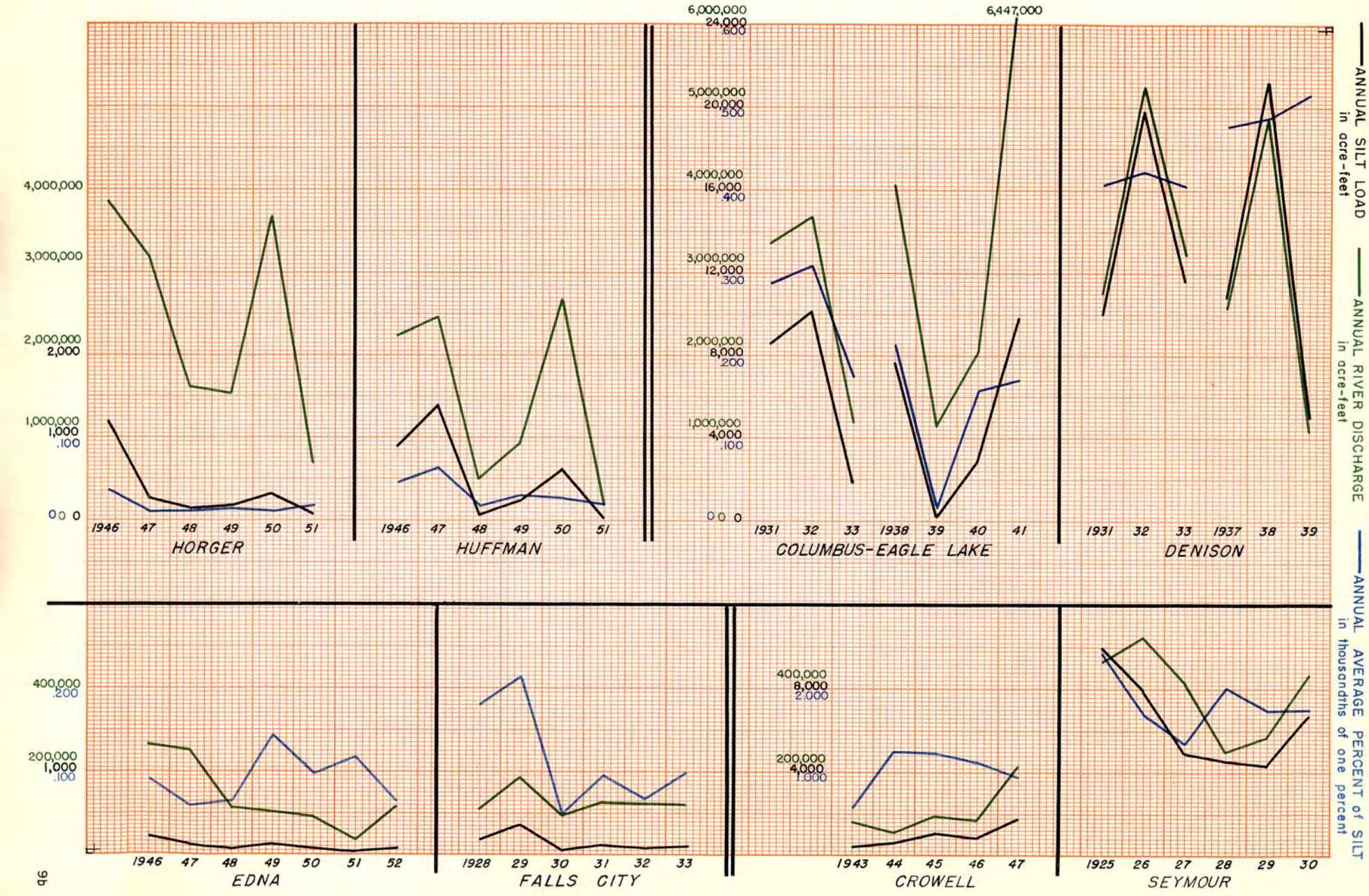
8,295
1,430
4,000
.800
600,000
3,000
.600
400,000
2,000
.400
200,000
1,000
.200
JOHNSON CITY
LLANO
SPRING BRANCH
ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent


2,000,000
.100
1,000,000
1,000
.050
00 0
1946 47 48 49 50 51 52
VICTORIA
1,000,000
500
800,000
400
600,000
300
400,000
200
.100
200,000
100
.050
1943 44 45 46 47 48 49 50 51 52
POSSUM KINGDOM DAM
1943 44 45 46 47 48 49 50 51
INKS DAM
1943 44 45 46 47 48 49 50 51 52
CORPUS CHRISTI DAM
ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent

7b


5,000,000
4,000,000
3,000,000
30,000
2,000,000
20,000
1,000,000
10,000
2,000
1,000
6,229,100
ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent
1925 26 27 28 29 30 31 32 33 34
MINERAL WELLS
1925 26 27 28 29 30 31 32
WACO
1936 37 38 39 40 41 42
EAGLE PASS


ANNUAL SILT LOAD in acre-feet
ANNUAL RIVER DISCHARGE in acre-feet
ANNUAL AVERAGE PERCENT of SILT in thousandths of one percent
4,000,000
3,000,000
2,000,000
2,000
1,000,000
1,000
.100
0 0 0
1946 47 48 49 50 51
HORGER
1946 47 48 49 50 51
HUFFMAN
6,000,000
24,000
.600
5,000,000
20,000
.500
4,000,000
16,000
.400
3,000,000
12,000
.300
2,000,000
8,000
.200
1,000,000
4,000
.100
0 0 0
6,447,000
1931 32 33 1938 39 40 41
COLUMBUS-EAGLE LAKE
1931 32 33 1937 38 39
DENISON
400,000
.200
200,000
1,000
.100
1946 47 48 49 50 51 52
EDNA
1928 29 30 31 32 33
FALLS CITY
400,000
8,000
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4,000
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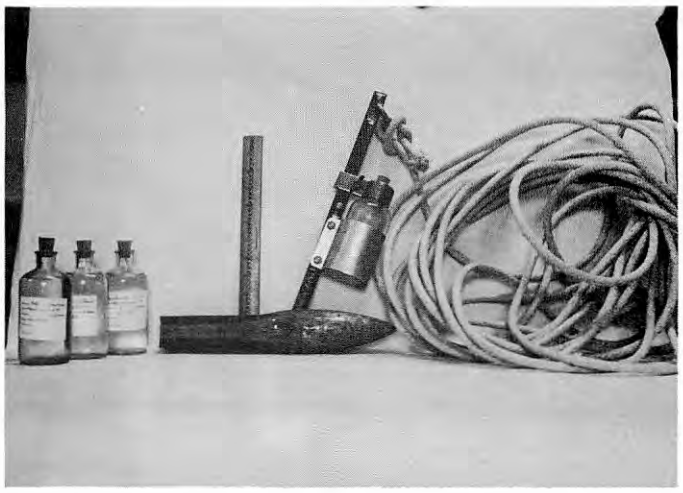
1943 44 45 46 47
CROWELL
1925 26 27 28 29 30
SEYMOUR



Department of Agriculture or Texas type of sampler used for obtaining water samples for silt determinations in Texas. This sampler, or a similar type has been used since 1924. It is simple to construct and operate and consists of a leaden fish weight of about 8 pounds, a pivoting flat iron bar on which a bottle holder is attached, and a sash cord rope for lowering the sampler into the water from a bridge or other forms of structure. Round 8-ounce bottles are used for collecting the water samples. Usually about 20 seconds are required to fill the bottles. The water samples are obtained in the surface foot of a stream in order to get a suspended silt load (fine silt or colloidal soil material) sample. Most of the sediment deposited in a lake, and especially near a dam, consists of the suspended silt load material. The ruler shown in the picture is 12 inches in length.

A corner of cooperative Federal-State laboratory in Austin, Texas where silt determinations of Texas streams are made.

Sedimentation of a lake in Texas before a dam has been completed. The original top soil of the lake bed has been removed (down to white material) and used for construction of this particular dam. The black colored material is sediment deposited in front of the dam from one flood.

A close-up view of sediment deposited in front of one of Texas's dams as result of one flood. This sediment will remain behind dam unless removed by artificial means. The original storage capacity has been decreased by the sediment.

The depth of sediment deposited in front of this dam from one flood is approximately 4 to 5 inches as indicated by size of pocket knife. The silt contains little moisture and is well compacted.

SILT STATIONS IN TEXAS
Located at Some of the Dams

The silt sampling station at Corpus Christi Dam is located below outlet gates. During floods the samples are taken at both the spillway and outlet gates. All of the suspended silt material entering lakes in Texas is not retained behind the dams, but by-passes them by either going over the spillways or by large volumes of water through the outlet gates. During this particular flood shown in picture, 10.4 acre feet, or 15,800 tons of suspended silt by-passed the dam. During the year of this particular flood 42 percent of the silt entering the lake by-passed the dam.

Silt sampling station at Possum Kingdom Dam. The water samples are obtained in the tailrace below power house at right in picture, or during floods, at both the usual location and at spillway of dam. During one year as much as 16 percent of the silt entering Possum Kingdom Lake by-passed the dam. The average amount by-passing the dam is 3 percent.

SILT STATIONS IN TEXAS
Austin Station (Montopolis Bridge)-Colorado River

Looking downstream from the silt sampling station.

The silt sampling station at Montopolis Bridge on US Highway 183 in the southeastern edge of Austin, about 6 miles downstream from Lake Austin. Most of the water samples are obtained from second section of bridge. Occasionally, some dirty water from gravel washing plants upstream have entered the main stream channel. The original station was established at Congress Street Bridge but the gravel plant operations and reconstruction of Austin Dam caused its removal further downstream to the Montopolis Bridge site.

Looking upstream from the silt sampling station. Large rocks and concrete blocks from an old bridge have been deposited in the stream channel above the station.

SILT STATIONS IN TEXAS
Belton Station-Leon River

Character of the normal stream channel below the silt sampling station.

Bridge on State Highway 317 that is used as silt sampling station. It is located 2 miles north of Belton. The original station was located near intake of pumping plant which supplies water for Temple. This site was above bridge on US Highway 81 and above low water dam. At times the water above the dam backed up to the sampling station shown in picture. When normal the velocity of the stream was very slow. The Belton Dam now under construction is about 1.5 miles upstream from the station. The station was discontinued on account of back water from dam and construction of Belton Dam.

Looking upstream from the silt sampling station.

SILT STATIONS IN TEXAS
Cotulla Station-Nueces River

Looking downstream from the silt sampling station during a small flash flood. The flow of the river was 6,545 acre feet for the day the picture was taken. The amount of silt carried by the stream for the same day was 1,604 tons or a little over one acre foot of silt.

The silt sampling station is located at a bridge on U.S. Highway 81 near Cotulla. The Nueces River at this station usually has a very small flow and small amount of silt for the greater part of the year. The USGS wire gage may be seen attached to the bridge railing. Looking upstream.

Looking upstream from silt sampling station during a small flash flood.

SILT STATIONS IN TEXAS
Crowell Station-Pease River

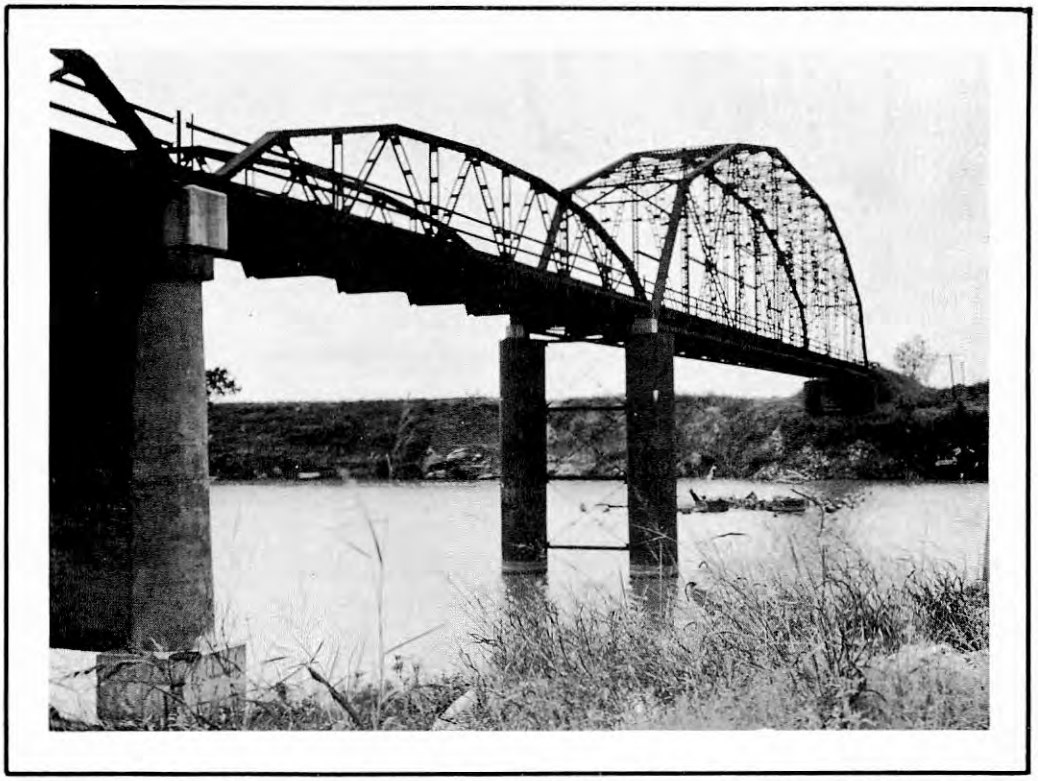
The character of the river bed and stream channel below the silt sampling station.

The silt sampling station is located at a bridge on State Highway 283 between Crowell and Quanah and wherever the stream channel happens to be at time water samples are obtained. The stream channel is very wide and shallow and shifts with every little rise of water from one bank to the other. At time picture was taken the USGS gaging station was "high and dry" and on the opposite bank of the stream channel.

Looking upstream from the silt sampling station. Bed load and suspended silt material has been deposited in the wide flat stream channel during previous floods. As the river flow recedes there is a constant cutting and sloughing of the sandy bed material as shown in the picture. The flash floods (characteristic of the stream) occurred one to two times each year during the 5 year study. These floods carried silt ranging from .976 to 1.581 percent by weight or 894 to 1,302 acre feet of silt. The annual average discharge of the stream is 113,411 acre feet.

Bridge on Highway 75 between Denison, Texas and Durant, Oklahoma that was used for a silt sampling station. Looking upstream.

Looking upstream from silt sampling station. The stream channel is wide and sandy. There is considerable shifting of the main stream through the sandy channel. The Denison Dam is being constructed several miles upstream and at horizon in center of picture.



Bridge on U. S. Highway 90-A between Eagle Lake and Altair where some of the water samples were obtained for silt determinations. This station was located about one mile upstream from the Lakeside Irrigation Company pumping plant where water samples were obtained for several years. The pumping plant is located about 5 miles southwest of Eagle Lake. Prior to the establishment of the station at the Lakeside Irrigation Company Plant the samples were taken at a highway bridge in Columbus.

Looking upstream from silt sampling station at bridge on U. S. Highway 90-A.

SILT STATIONS IN TEXAS
Easterly Station-Navasota River

Looking downstream from the silt sampling station during a small flood. The day of this particular flood the river discharge amounted to 12,300 acre feet and it contained 6 acre feet of silt (based on 70 pounds per cubic foot). During an extreme flood of 310,200 acre feet of water per day the silt amounted to 350 acre feet.

Bridge on U. S. Highway 79, between Marquez and Easterly, where water samples are obtained. The U.S.G.S. stream gaging station (concrete pipe) is located downstream and at center bent of wooden bridge piling. The small river discharge is characteristic of this stream most of the year as well as the silt content of the water.

Looking upstream from silt sampling station during a flood stage.

SILT STATIONS IN TEXAS
Goliad Station-San Antonio River

Looking downstream from silt sampling station. The river is discharging 1,924 acre feet of water per day. It carried about 3.5 acre feet of silt for the day.

Bridge on U. S. Highway 59 between Goliad and Berclair where water samples are obtained for silt determinations. The samples are taken near U.S.G.S. gaging station which is located on the upstream side of the bridge.

Looking upstream from silt sampling station. The stream channel is narrow and deep. The banks are covered with dense vegetation.

SILT STATIONS IN TEXAS
Goliad Station-San Antonio River
-During flood stage-

The San Antonio River at the Goliad silt station during an unusual flood stage. For the particular day the picture was taken the river flow was 55,140 acre feet and the silt load amounted to 27 acre feet. The river gage showed a reading of 42.15 feet.

Looking downstream from the silt station during flood stage.

SILT STATIONS IN TEXAS
Humble Station-West Fork, San Jacinto River

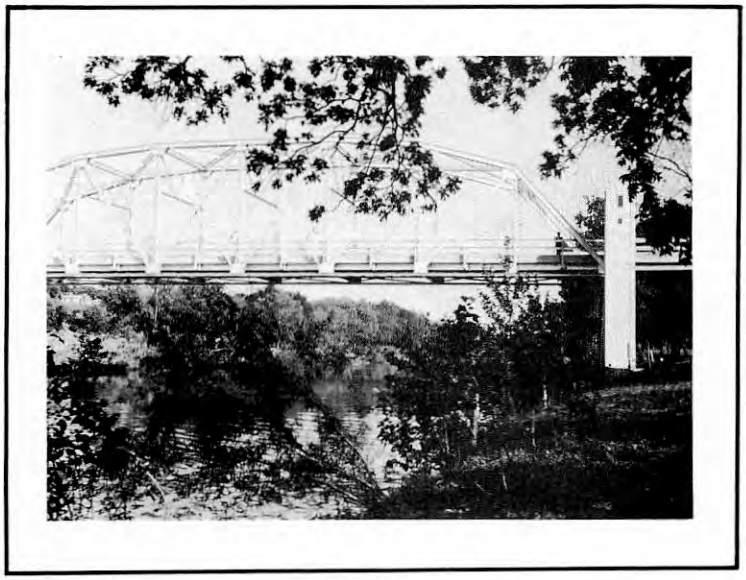
Looking downstream from the sampling station. Prior to 1939 the water samples were obtained at the railroad bridge.

(below) Bridge on U.S. Highway 59 where silt samples have been obtained. The station is located 2.5 miles north of Humble. The U.S.G.S. gaging station is located under bridge floor and attached to concrete pier at left in picture. Taken from downstream side of bridge.

Looking upstream from silt sampling station and showing character of the wide and sandy stream channel during low water flows.

SILT STATIONS IN TEXAS
Johnson City Station-Pedernales River

Looking downstream from silt sampling station.



Bridge on U.S. Highway 281, 1.5 miles north of Johnson City where water samples are taken for silt determinations. The U.S.G.S. gaging station is at right- concrete tower. Looking downstream.

Looking upstream from silt sampling station. The stream bed is rocky and the main channel is rather deep. At time picture was taken the river flow amounted to 690 acre feet for the day and the water was clear having only .003 percent of silt.

SILT OF TEXAS STREAMS
Johnson City Station-Pedernales River
(after September 10-11, 1952 flood)

Bridge at silt sampling station on US-Highway 281 after September 10 and 11, 1952 flood. During the two-day flood, 360,000 acre feet of water washed away the bridge and silt station. This flood contained approximately 13,000,000 tons of silt or about 8,300 acre feet. The drainage area above the station is 947 square miles. The amount of silt per square mile of watershed area was nearly 9 acre feet which is the largest amount of silt for any watershed studied in Texas.

Looking downstream from the bridge and silt station that were destroyed by the 2-day September flood. The concrete floor of steel bridge is noticeable on river bank and remainder of USGS concrete tower gaging station is seen at bottom of picture. A week after the flood the river was discharging 1908 acre feet per day and this flow is shown in the picture.

The location of the silt sampling station near USGS staff gage after the September flood. On September 18 the discharge was 962 second-feet.

SILT STATIONS IN TEXAS
Richmond Station-Colorado River

Looking upstream from silt sampling station.

Silt sampling station at bridge on US-Highway 50 in Richmond. Looking downstream. During the past 28 years, 919,031,170 tons or 602,027 acre feet of silt have passed this station into the Gulf of Mexico. This amount is sufficient to have jeopardized the economic life of a lake similar to Possum Kingdom Dam on the same watershed (capacity 750,000 acre feet). The river discharge during the 28 years amounted to 152,240,180 acre feet. Prior to 1932 the silt station was located at a bridge near Rosenberg.

Looking downstream from silt sampling station.

(above) Looking downstream from silt sampling station. The left fork is the location of several USGS staff gages for measuring heights of various stream flows. The regular stream channel is about 200 feet wide and rather deep. The discharge of the river on day picture was made was 12,575 acre feet and the silt load 2,396 tons or 1.6 acre feet.

Bridge on US Highway 69 between Zavalla and Rockland where water samples are obtained for silt determinations. Looking downstream from south bank. The discharge of the river was 3,491 acre feet and the silt content was negligible.

(below) Looking upstream from silt sampling station.

SILT STATIONS IN TEXAS
Roma Station-Rio Grande

Looking downstream toward the silt sampling station which is located on the International suspension bridge between Roma, Texas and San Pedro, Mexico. The river discharge was approximately 12,000 acre feet per day and silt load 18 acre feet.

Looking upstream and above the silt sampling station at Roma, Texas on the Rio Grande. The river is sluggish and the velocity is low.

SILT STATIONS IN TEXAS
Romayor Station-Trinity River

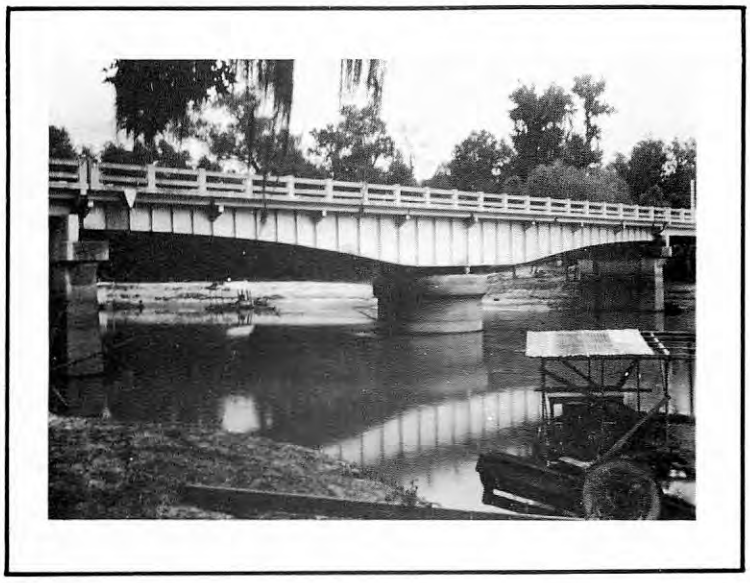
Gulf, Colorado and Santa Fe Railroad bridge at Romayor that was used for a number of years as a silt sampling station. Looking upstream. The river discharge was 11,300 acre feet of water for day and the silt load 11.7 acre feet.

Looking upstream from the silt station located at bridge on Texas State Highway 105.

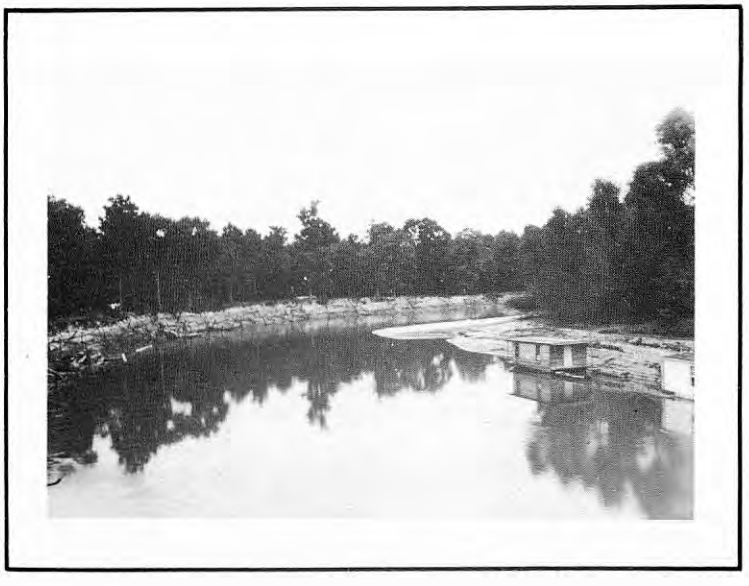
The present site of the silt sampling station at bridge on Texas State Highway 105 between Cleveland and Rye. Looking downstream. This station is about 2 miles below the old railroad bridge station.

SILT STATIONS IN TEXAS
Ruliff Station-Sabine River

Looking downstream from silt sampling station.

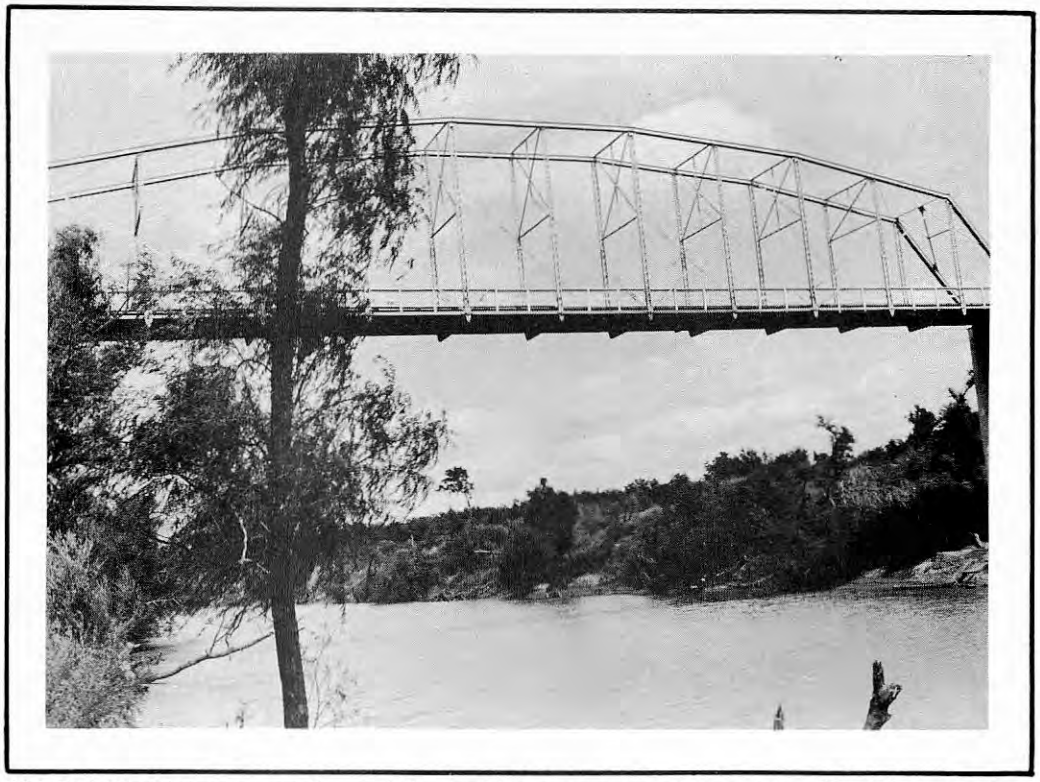


Bridge on Texas State Highway 235 between Deweyville, Texas and Starks, La., where water samples for silt determinations are obtained. The station is located 2.4 miles north of Ruliff.

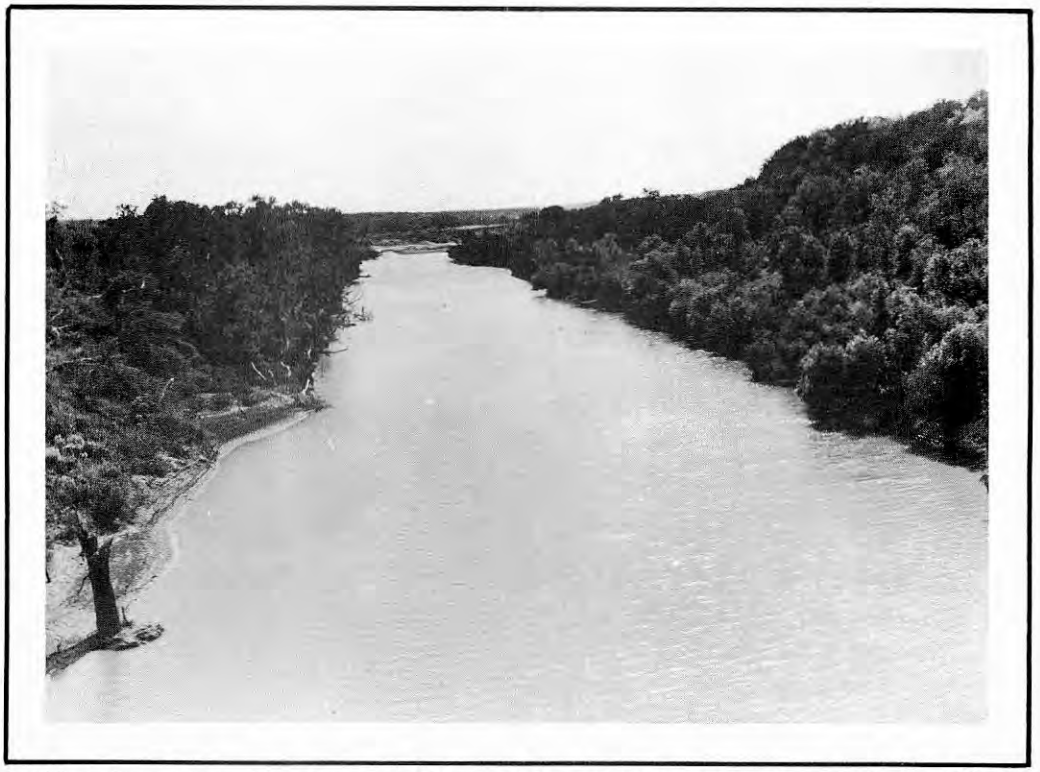


Looking upstream from silt sampling station.

SILT STATIONS IN TEXAS
San Saba Station-Colorado River



Old Red Bluff Bridge used as silt sampling station prior to May 24, 1940. During World War II it was blown up by Corps of Engineers for the steel. A new bridge was constructed about $\frac{1}{2}$ mile above and it is now used as a silt sampling station. Looking upstream.



Looking downstream from the old silt sampling station. The river flow was 184 acre feet per day and the silt content amounted to 8 tons for the day. The water was practically clear. A small gravel dam was made by the State Highway Department, as may be seen in picture, to secure gravel for new bridge being constructed upstream. The dam backed the water up beyond the station.

SILT STATIONS IN TEXAS
San Saba Station-Colorado River

Looking downstream from the silt sampling station. The stream channel is rather narrow and deep in places. A dense growth of native vegetation lines both banks of the stream.

Bridge on U.S. Highway 190 that has been used since May, 1940 as a silt sampling station. It is located between Lometa and San Saba. Picture taken from downstream side of bridge.

Looking upstream from the silt sampling station.

SILT STATIONS IN TEXAS
South Bend Station-Brazos River

Looking downstream from silt sampling station. When picture was taken the stream flow for one day was 516 acre feet and the silt load of 77 tons. (1524.6 tons = 1 acre foot)

Bridge on Texas State Highway 67, between Graham and South Bend where water samples are obtained for silt determinations. Looking upstream. The station is approximately 10 miles upstream from Possum Kingdom Lake.

Looking upstream from silt sampling station (taken same day as downstream picture). The stream channel is wide, shallow and consists of numerous sand bars. Many of the water samples contained considerable bed load as well as suspended material during the low stream flow. This stream at this station carried the highest percentage of any watershed studied in Texas. During one day in 1952 the highest percentage of silt ever obtained during the many years of silt studies was 5.038. The stream flow was not at flood stage and amounted to 1,642 acre feet of water and the silt load was 74 acre feet. The large percentage of silt was due to the scouring of the stream channel and the sloughing of the stream banks as well as erosion and scouring of other streams above this station.

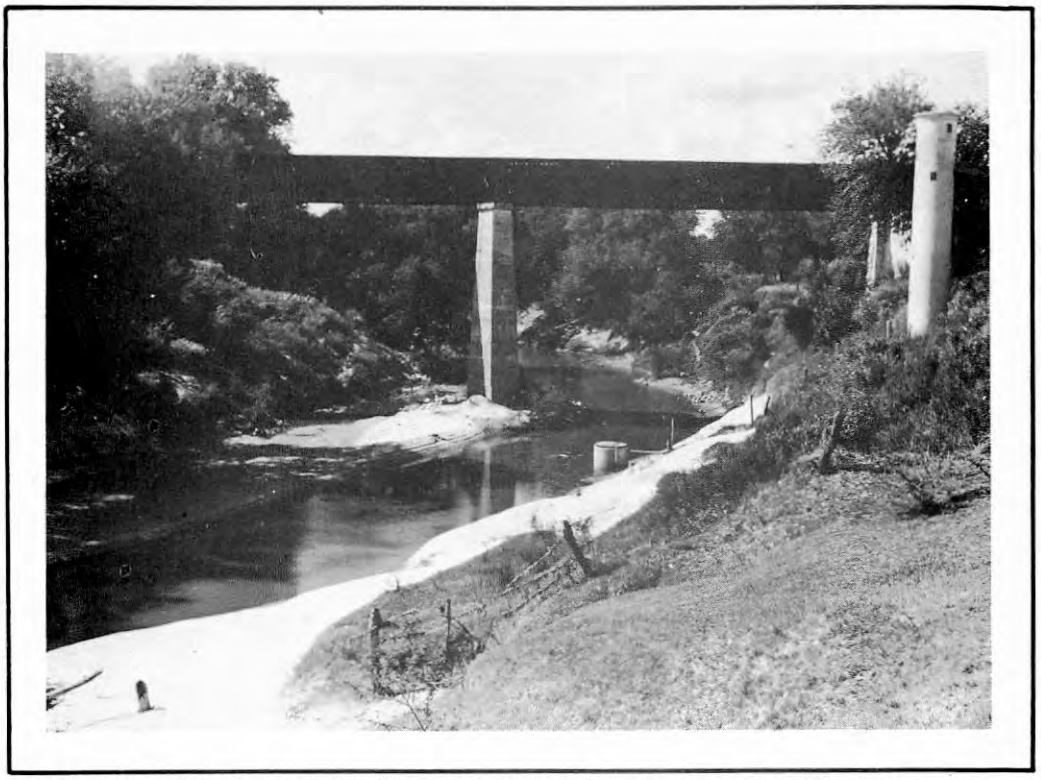
SILT STATIONS IN TEXAS
Spring Branch Station-Guadalupe River

Looking downstream from silt sampling station. The stream channel at station is rocky, narrow and shallow. At time picture was taken the stream flow was 222 acre feet per day and the silt load was 6 tons.

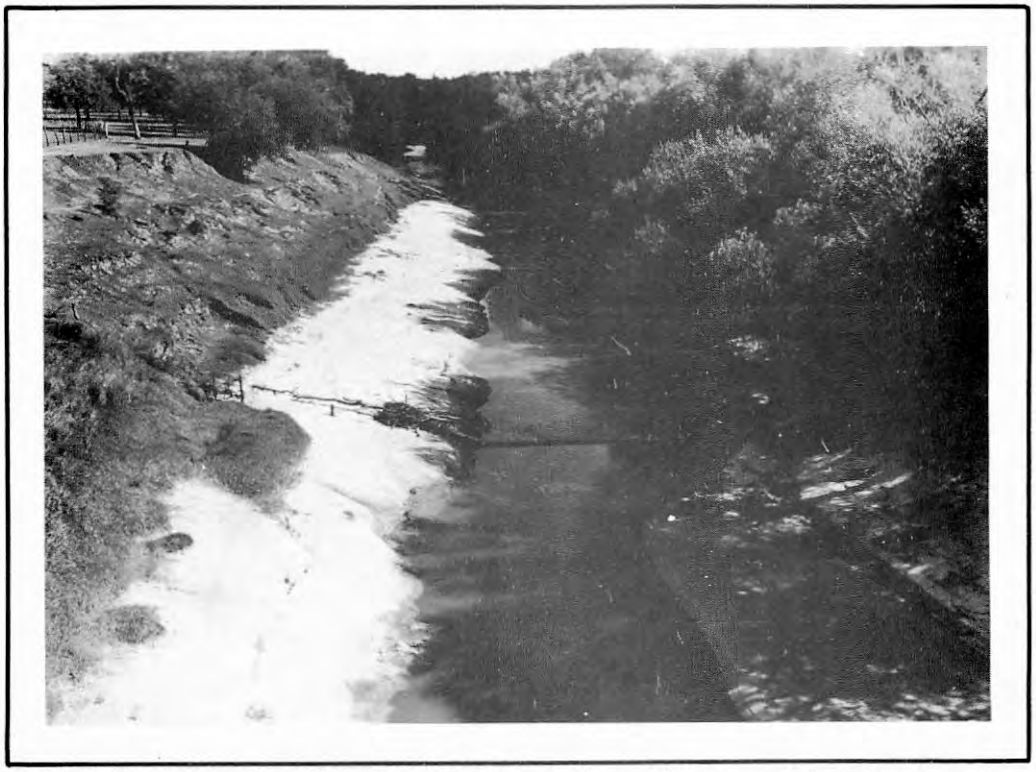
Bridge on old county highway (Smithson Valley road) which is four miles southeast of Spring Branch Post Office. This road is near Texas State Highway 46. U.S.G.S. gaging station at left end of bridge. Looking upstream.

Looking upstream from silt sampling station.

SILT STATIONS IN TEXAS
Three Rivers Station-Nueces River



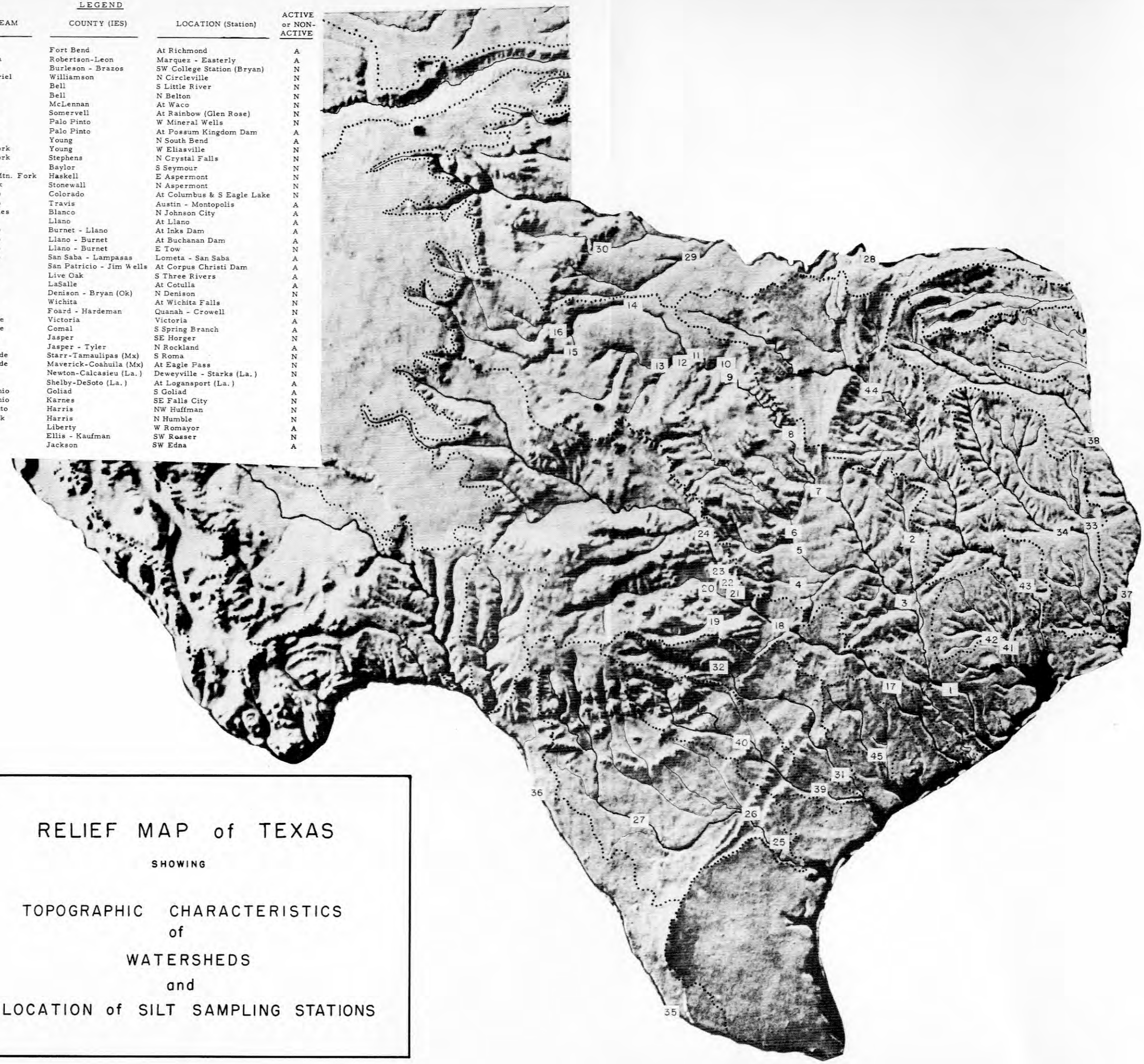
San Antonio, Uvalde and Gulf (Missouri Pacific) Railroad bridge used as a silt sampling station. This station, or at a small concrete dam one-foot high and about 150 feet below it, have been used for the past 25 years as sites for collecting water samples for silt determinations. One silt sample collector, Mr. Carl Franze, has been collecting the daily water samples during the long record at this station. This station is located about 25 miles upstream from Lake Corpus Christi. The drainage area between this station and the Lake is approximately 1,000 square miles.



Looking downstream from the silt sampling station. The stream channel has been cut in solid rock (white portion is rock).

LEGEND

No.	MAJOR WATERSHED	STREAM	COUNTY (IES)	LOCATION (Station)	ACTIVE or NON-ACTIVE
1	Brazos	Brazos	Fort Bend	At Richmond	A
2	Brazos	Navasota	Robertson-Leon	Marquez - Easterly	A
3	Brazos	Brazos	Burleson - Brazos	SW College Station (Bryan)	N
4	Brazos	San Gabriel	Williamson	N Circleville	N
5	Brazos	Little	Bell	S Little River	N
6	Brazos	Leon	Bell	N Belton	N
7	Brazos	Brazos	McLennan	At Waco	N
8	Brazos	Brazos	Somervell	At Rainbow (Glen Rose)	N
9	Brazos	Brazos	Palo Pinto	W Mineral Wells	N
10	Brazos	Brazos	Palo Pinto	At Possum Kingdom Dam	A
11	Brazos	Brazos	Young	N South Bend	A
12	Brazos	Clear Fork	Young	W Eliasville	N
13	Brazos	Clear Fork	Stephens	N Crystal Falls	N
14	Brazos	Brazos	Baylor	S Seymour	N
15	Brazos	Double Mtn. Fork	Haskell	E Aspermont	N
16	Brazos	Salt Fork	Stonewall	N Aspermont	N
17	Colorado	Colorado	Colorado	At Columbus & S Eagle Lake	N
18	Colorado	Colorado	Travis	Austin - Montopolis	A
19	Colorado	Pedernales	Blanco	N Johnson City	A
20	Colorado	Llano	Llano	At Llano	A
21	Colorado	Colorado	Burnet - Llano	At Inks Dam	A
22	Colorado	Colorado	Llano - Burnet	At Buchanan Dam	A
23	Colorado	Colorado	Llano - Burnet	E Tow	N
24	Colorado	Colorado	San Saba - Lampasas	Lometa - San Saba	A
25	Nueces	Nueces	San Patricio - Jim Wells	At Corpus Christi Dam	A
26	Nueces	Nueces	Live Oak	S Three Rivers	A
27	Nueces	Nueces	LaSalle	At Cotulla	A
28	Red	Red	Denison - Bryan (Ok)	N Denison	N
29	Red	Wichita	Wichita	At Wichita Falls	N
30	Red	Pease	Foard - Hardeman	Quanah - Crowell	N
31	Guadalupe	Guadalupe	Victoria	Victoria	A
32	Guadalupe	Guadalupe	Comal	S Spring Branch	A
33	Neches	Angelina	Jasper	SE Horger	N
34	Neches	Neches	Jasper - Tyler	N Rockland	A
35	Rio Grande	Rio Grande	Starr-Tamaulipas (Mx)	S Roma	N
36	Rio Grande	Rio Grande	Maverick-Coahuila (Mx)	At Eagle Pass	N
37	Sabine	Sabine	Newton-Calcasieu (La.)	Deweyville - Starks (La.)	N
38	Sabine	Sabine	Shelby-DeSoto (La.)	At Logansport (La.)	A
39	San Antonio	San Antonio	Goliad	S Goliad	A
40	San Antonio	San Antonio	Karnes	SE Falls City	N
41	San Jacinto	San Jacinto	Harris	NW Huffman	N
42	San Jacinto	West Fork	Harris	N Humble	N
43	Trinity	Trinity	Liberty	W Romayor	A
44	Trinity	Trinity	Ellis - Kaufman	SW Rosser	N
45	Lavaca	Lavaca	Jackson	SW Edna	A



RELIEF MAP of TEXAS

SHOWING

TOPOGRAPHIC CHARACTERISTICS
of
WATERSHEDS
and
LOCATION of SILT SAMPLING STATIONS