

Coastal Hydrographic and Meteorological Study

Project No. MH-R-2 (Job No. 8)

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Abstract

Hydrographic and climatological data collected in the field and taken from publications are presented in this report.

Rainfall was 29 per cent higher in 1966 than in 1965, with heaviest rainfall occurring in May.

Water temperatures followed normal seasonal trends and varied very little from the preceding year. There were no fish kills caused by extreme freezes.

Salinities were generally lower than in 1965 as a result of increased rainfall and influx of fresh water from river discharge.

High tides were experienced in early May with readings of over three feet above mean low tide in most areas. High tides were also experienced in September as a result of the autumnal equinox. An increase in tide, associated with Hurricane Inez, occurred along the lower coast in October.

Habitat modification included routine maintenance dredging in the Galveston and Corpus Christi Ship Channels and in the Upper and Lower Laguna Madre Intra-coastal Waterways, oil well operations, marine development operations, and hurricane protection operations.

Introduction

Coastal Fisheries landings indicate that hydrographic and climatological conditions affect the productivity and abundance of shrimp, crabs and most species of game fish. This project monitors tide, rainfall, runoff, salinity, water temperature, siltation and habitat modifications affecting nursery areas. This report covers sampling from January 1966 to December 1966.

Materials and Methods

Water samples were taken at fixed stations in each bay area on a monthly or semi-monthly basis throughout the period (Figures 1-7). These samples were checked for salinity, turbidity and temperature. Information on precipitation was taken from U. S. Weather Bureau records. River discharge information was obtained from the Water Resources Division of the U. S. Department of Interior, Geological Survey Branch.

Habitat modification of productive nursery area in each bay was determined and any changes or alterations, man-made or natural, were recorded.

Results and Discussions

Rainfall

Coastwide, rainfall totals were 29 per cent higher in 1966 than in 1965. A comparison of 1965 and 1966 rainfall totals by bay area is presented in Table 1. Heaviest rainfall was recorded in May, with monthly totals ranging from 11.21 inches in Galveston Bay to 6.05 inches in the Lower Laguna Madre (Tables 2 and 3, Figures 8 and 9). Spring rains were of sufficient intensity to bring about flooding of most rivers along the coast.

Rainfall was above average during June, July and August. In the Galveston Bay area, 6.40 inches fell in August and brought about heavy runoff from rice field drainage into East Bay.

Reduced amounts were recorded at most bay stations in fall. Coastwide rainfall totals were 1.99 inches below 1965 fall readings. In the Matagorda Bay area the recorded 2.76 inches in fall was 6.72 inches less than for the same period in 1965.

December rainfall totals were extremely low, ranging from 0.00 in the San Antonio Bay area to 1.53 inches in the Galveston Bay area. All coastal bay areas south of San Antonio Bay recorded less than one-inch rainfall in December. Heavy spring rains and moderate summer rains made up for the reduced amounts in fall and winter. Nursery grounds received heavy runoff in May and had extremely low salinities. This influx of fresh water came at a critical time for juvenile shrimp and probably played a major role in shrimp survival and in the drop in shrimp production in 1966. It also killed many oysters.

River Discharge

River flow measurements were available for six major rivers entering coastal bay areas and are presented in Table 4. Measurements were available from January through September. There was a general decrease from the upper to lower coast. The Galveston Bay area experienced heavy to moderate flooding from the Trinity-San Jacinto River Basins in May and June. The Galveston Bay area has received a historical average of 6.2 million acre-feet annually. The Matagorda Bay area received 454,470 acre-feet through the Lavaca-Navidad Rivers, which was 107,400 acre-feet less than in 1965. The San Antonio Bay area experienced flooding of the Guadalupe River in early May and in June. This area has received an average of 1.4 million acre-feet annually, but exact measurements were not available for 1966. The Aransas Bay area received 104,542 acre-feet from January through September, which was 62,680 acre-feet more than in 1965. The Corpus Christi Bay area received 310,460 acre-feet through the Nueces River from January through September. This was 41,860 acre-feet less than in 1965. The historic average for the Nueces River is over 610,000 acre-feet annually, but this flow is virtually eliminated by Wesley Seale Dam before it enters Nueces Bay.

Salinity

Salinities were generally lower in 1966 than in 1965 as a result of increased rainfall. Salinities in May (Table 2, Figures 8 and 9) were at the lowest levels since 1960 (Tables 5 through 11). Trinity Bay, Upper Galveston Bay, Clear Lake and adjacent small bays were virtually fresh in May when highest salinity recorded in Trinity Bay was 4.1 ppt. Matagorda Bay area salinities

ranged from 8.3 ppt to 20.5 ppt with an average of 15.3 ppt during the March-May period. San Antonio Bay area salinities ranged from 0.0 ppt in Guadalupe Bay to 31.6 ppt at Grass Island in Espiritu Santo Bay. The Aransas Bay area ranged from 2.78 ppt to 33.31 ppt with an average of 19.2 ppt. The Corpus Christi Bay area ranged from 5.6 ppt to 32.7 ppt with an average of 28.6 ppt. The Upper Laguna Madre ranged from 33.9 ppt to 46.0 ppt. The Lower Laguna Madre ranged from 22.2 ppt to 39.9 ppt. Salinity samples taken in the Gulf of Mexico in May averaged 25.05 off Port Aransas and 30.03 off Port Mansfield.

Salinity readings in summer were generally lower than in 1965. The lowest reading in the Galveston Bay area was 0.98 ppt in Trinity Bay in June and the highest was 30.07 ppt in West Bay in August. San Antonio Bay salinities ranged from 0.0 ppt in Guadalupe Bay to 29.42 ppt in Big Bayou. Aransas Bay area salinities ranged from 6.66 ppt in Mission Bay in June to 37.20 ppt in Aransas Bay in August. Corpus Christi Bay area salinities ranged from 2.78 ppt in Nueces Bay in June to 33.3 ppt in Corpus Christi Bay in August. The Upper Laguna Madre had an average of 35.90 ppt and the Lower Laguna Madre had an average of 36.66 ppt.

In the fall, reduced amounts of rainfall were recorded at most stations and salinity readings were generally higher than in the summer, but were slightly lower than 1965 readings. Salinities increased slightly in December and the highest average was 43.7 ppt in the Upper Laguna Madre.

Tide Levels

Tide gauge readings were generally low from January through March with readings from 0.3 to 0.6 feet below normal. In April tides returned to normal and continued to increase towards the end of the month. High tides were experienced in early May with recordings of up to 3.6 feet above mean low tide in most areas. Tides dropped to normal in June and July. The upper coast experienced higher tides in August than in June or July. Both the upper and lower coast experienced high tides resulting from the autumnal equinox in September. Tides dropped gradually after October and remained low through December. The lower coast experienced a slight increase in tide in October as a result of Hurricane Inez which hit land below Brownsville.

Water Temperature

Water temperatures were low in all bays during January and February (Table 2, Figures 8 and 9), but there were no fish kills reported from severe freezes. The Galveston Bay area water temperatures ranged from 4.8°C. to 20.0°C. in January. The Matagorda Bay area experienced two freezes, but they were not severe enough to cause damage to marine life. Seadrift area water temperatures dropped to a low of 5.8°C. in January. In February, water temperature ranged from 8.0°C. to 16.3°C. The lower coast water temperatures ranged from 8.0°C. to 19.2°C. in January. Water temperatures increased in all bay areas after March. In summer water temperatures followed normal seasonal trends and average temperatures ranged from 29.2°C. to 31.3°C. Water temperatures decreased after September and continued to decrease steadily through December. There were no fish kills due to freezes during this period.

Habitat Modification

The Galveston Bay area had several areas of modification which includes 1200 feet of shoreline bulkheaded, marsh area drained and Basford Bayou partially blocked. In Moses Lake a hurricane wall was finished with a 65-foot gate replacing a one-mile natural opening. Work was started on a Corps of Engineers project which will turn several square miles of marshland into a fresh water impoundment. In West Bay (Lake Como) approximately 30 acres of shallow nursery area were modified by a large basin and 11,000 foot access channel. At Wilson Point (Jones Lake) natural marshland was bulkheaded and filled for a housing development. The Matagorda Bay area had the Palacios Turning Basin redredged and settled with rock mounds and the Palacios Ship Channel deepened and widened. In the San Antonio Bay area modification included the laying of a six-inch pipeline in the Seadrift area near Mosquito Point Reef. An oil well placed in Ayers Bay in June resulted in damage to the bay bottom. Another oil well placed in State tract 178 caused extensive damage when spoil from a 2,500-foot channel covered about 100 acres of prime nursery ground. The Aransas area reported only a few wells in deep water that caused no appreciable damage to nursery ground areas. The Corpus Christi Bay area had several areas of modification which included 30 acres of shallow water area filled to enlarge a recreational area. This area was a popular fishing spot for wade fishermen. The Corpus Christi Ship Channel and Turning Basin were redredged to a depth of 42 feet. An area 500 feet long was bulkheaded at the end of the Jewel Fulton Channel in Ingleside Cove. In Redfish Bay a well was dug in shallow water. Spoil from a channel going to the well was placed in deeper water and damage was minor. In Nueces Bay a 1,200-foot channel was dug to an oil well close to the north shore. The Upper Laguna Madre had approximately 10 acres of nursery ground covered by dredged spoil in the vicinity of the Pure Oil Channel. Maintenance dredging of the Intracoastal waterway resulted in deposition of spoil that closed three small passes between Marker 31 and Marker 43 where water circulation is already critical. The Lower Laguna Madre had habitat modification which included dredging of an oil well channel near the Willacy and Cameron County line, redredging of the Intracoastal waterway in Redfish Bay opposite Port Mansfield and dredging at the junction of the Arroyo Colorado which resulted in silting up of several small but important nursery areas.

Comparison of 1965-1966 Rainfall Totals By Area
Rainfall Annual Totals, January-December

	<u>1965</u>	<u>1966</u>	<u>Difference</u>
Galveston Bay	58.42	34.25	24.17
Matagorda Bay	40.36	28.63	11.73
San Antonio Bay	36.58	29.75	6.83
Aransas Bay	29.27	26.29	2.98
Corpus Christi Bay	29.89	25.29	4.60
Upper Laguna Madre	26.59	25.29	1.30
Lower Laguna Madre	24.68	21.21	3.47

Comparison of 1965-1966 Runoff Totals
River Discharge in Acre Feet, January-September

	<u>Trinity</u>	<u>Lavaca</u>	<u>Navidad</u>	<u>Aransas</u>	<u>Mission</u>	<u>Nueces</u>
1965	3,914,170	245,550	316,320	9,281	32,578	352,320
1966	<u>5,964,900</u>	<u>131,680</u>	<u>322,790</u>	<u>19,241</u>	<u>85,301</u>	<u>310,460</u>
Diff.	2,050,730	-113,870	6,470	9,960	52,723	-41,860

Figure 1
Hydrographic Stations - Galveston Bay Area

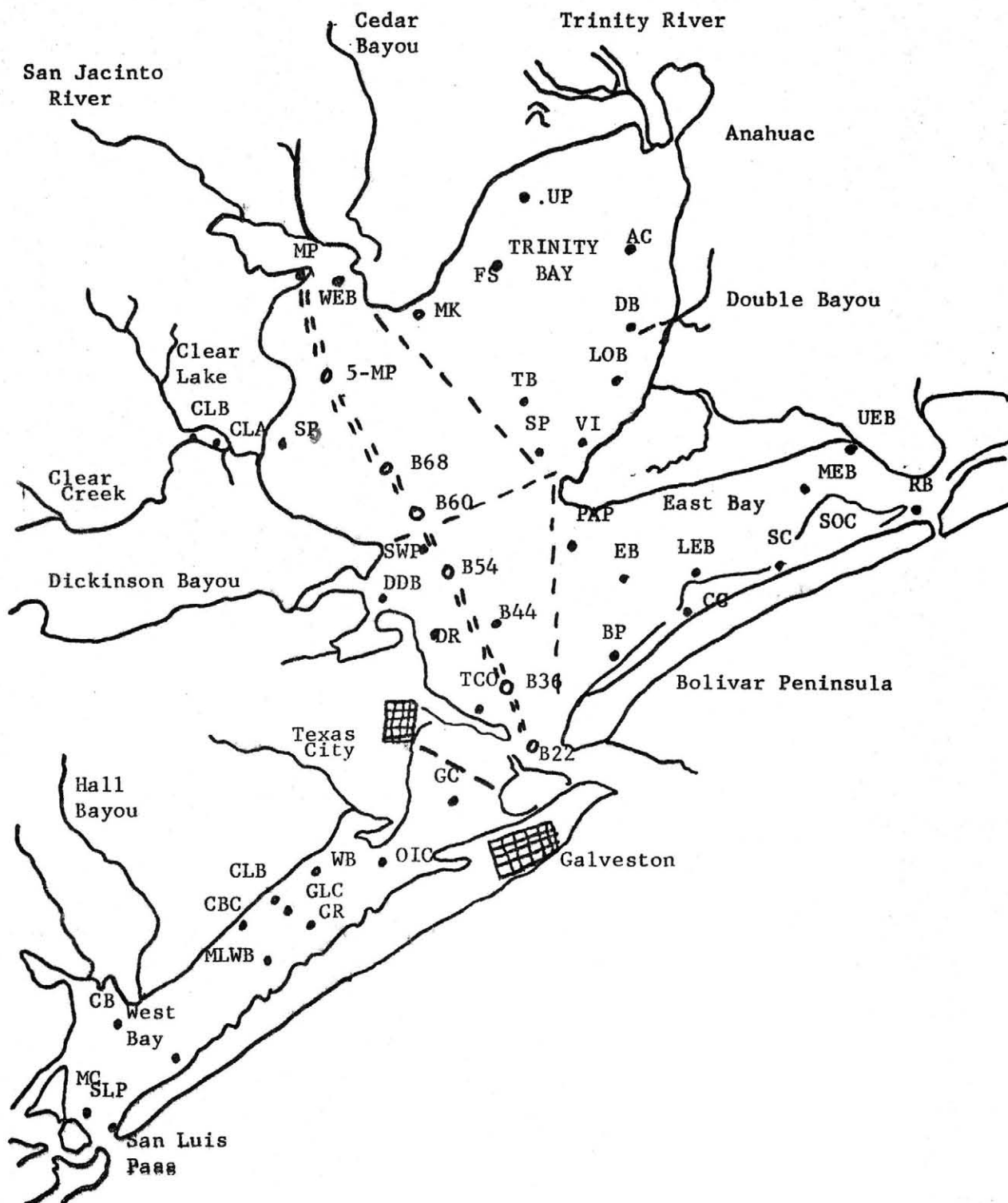


Figure 2 Sampling Stations in Matagorda Bay

Area #1

1. Port O'Connor
2. Buoy 68
3. LaSalle Bayou
4. Lavaca #1
5. Powderhorn Lake
6. Lavaca #60
7. Sand Point Reef

8. Keller Bay
9. Keller Creek
10. Carancahua Pass
11. Matagorda Club
12. Range D
13. Middle #2
14. Piling #3

Area #2

1. Crescent V
2. Carancahua Causeway
3. Jensen Point
4. Turtle Bay
5. Whiskey Flat
6. Red Bluff
7. Coon Island
8. Fence Post
9. Coon Island
10. Well Point
11. X42 Well
12. Beacon 2
13. Trout Bayou
14. State Mats
15. Buoy 10
16. Cotton Bayou
17. Cedars
18. Gadwall Reefs

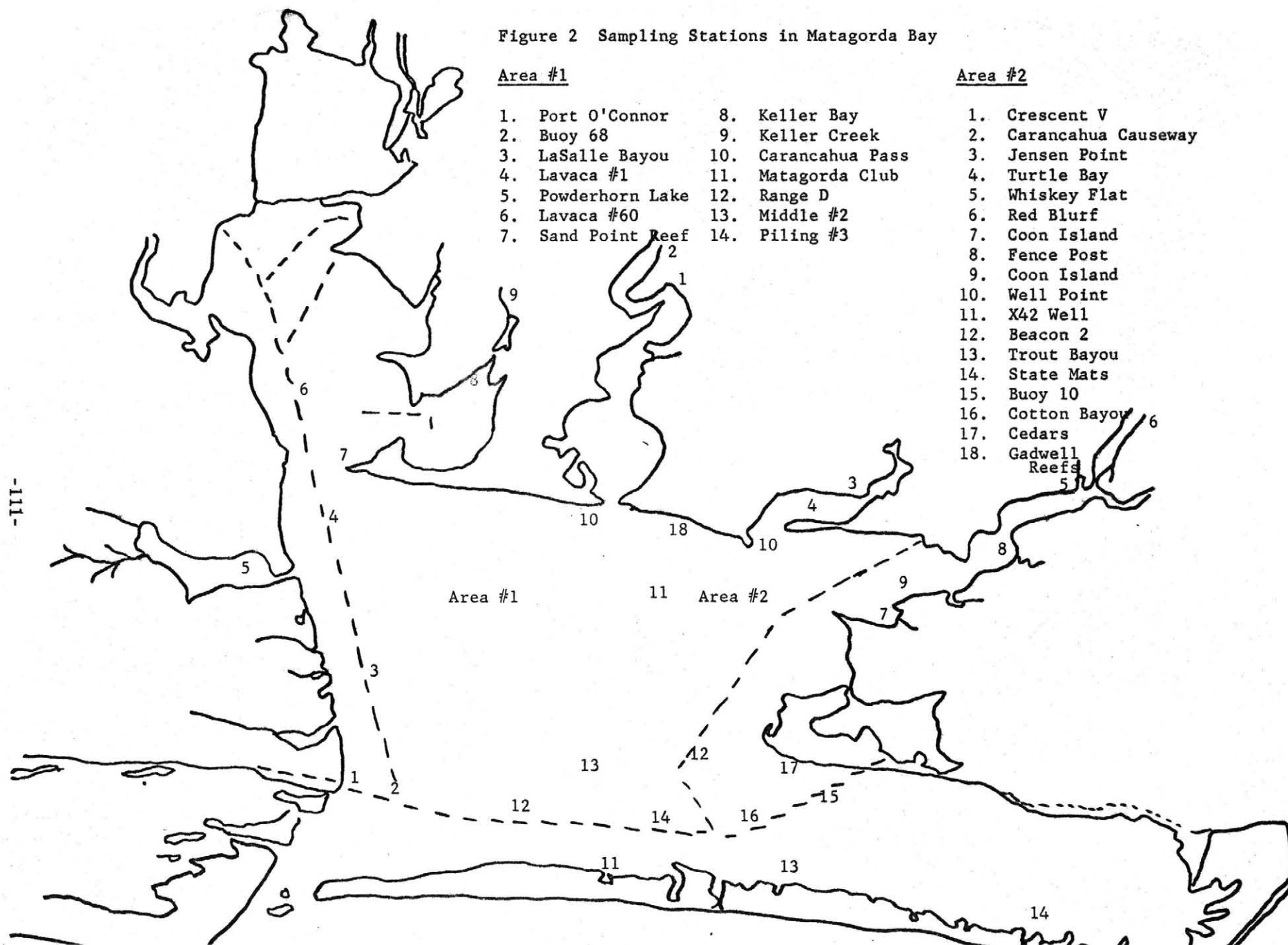


Figure 3

Area #3 East Maragorda Bay

1. Dressing Point
2. Brown Cedar Cut
3. Eidelach Flat
4. Raymond Landing
5. Gulf Cut

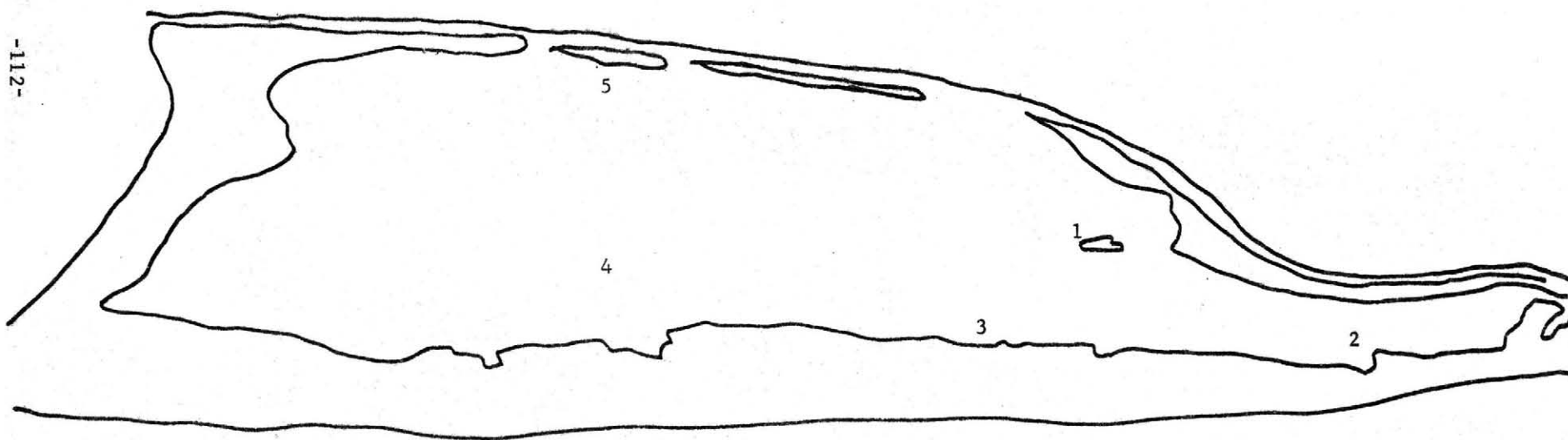


Figure 4

San Antonio Bay - Hydrographic Station

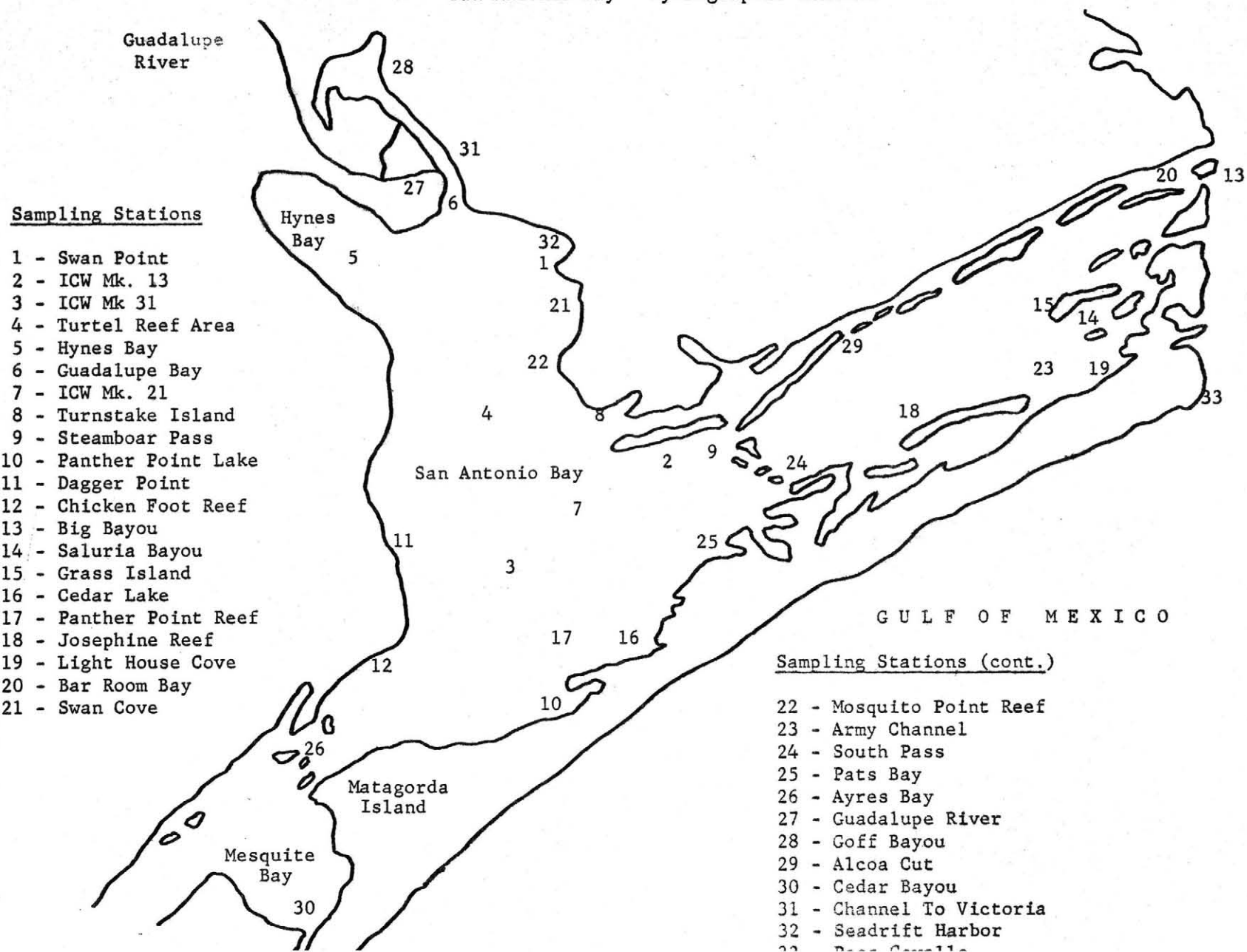
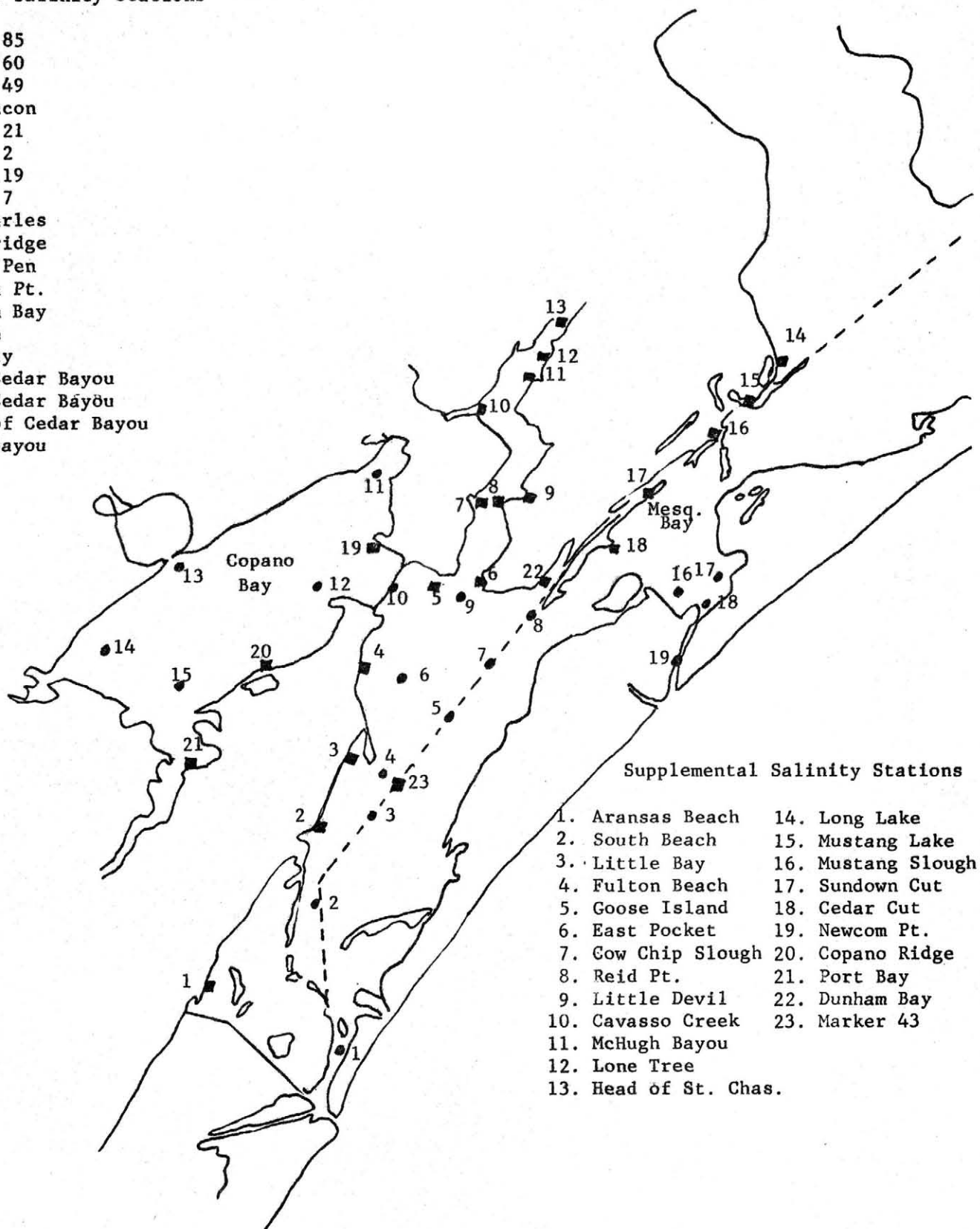


Figure 5
1966 Salinity Stations
Aransas, Copano, Mesquite and St. Charles Bays

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ker 85
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Hydrographic Stations
Corpus Christi Area

Figure 6

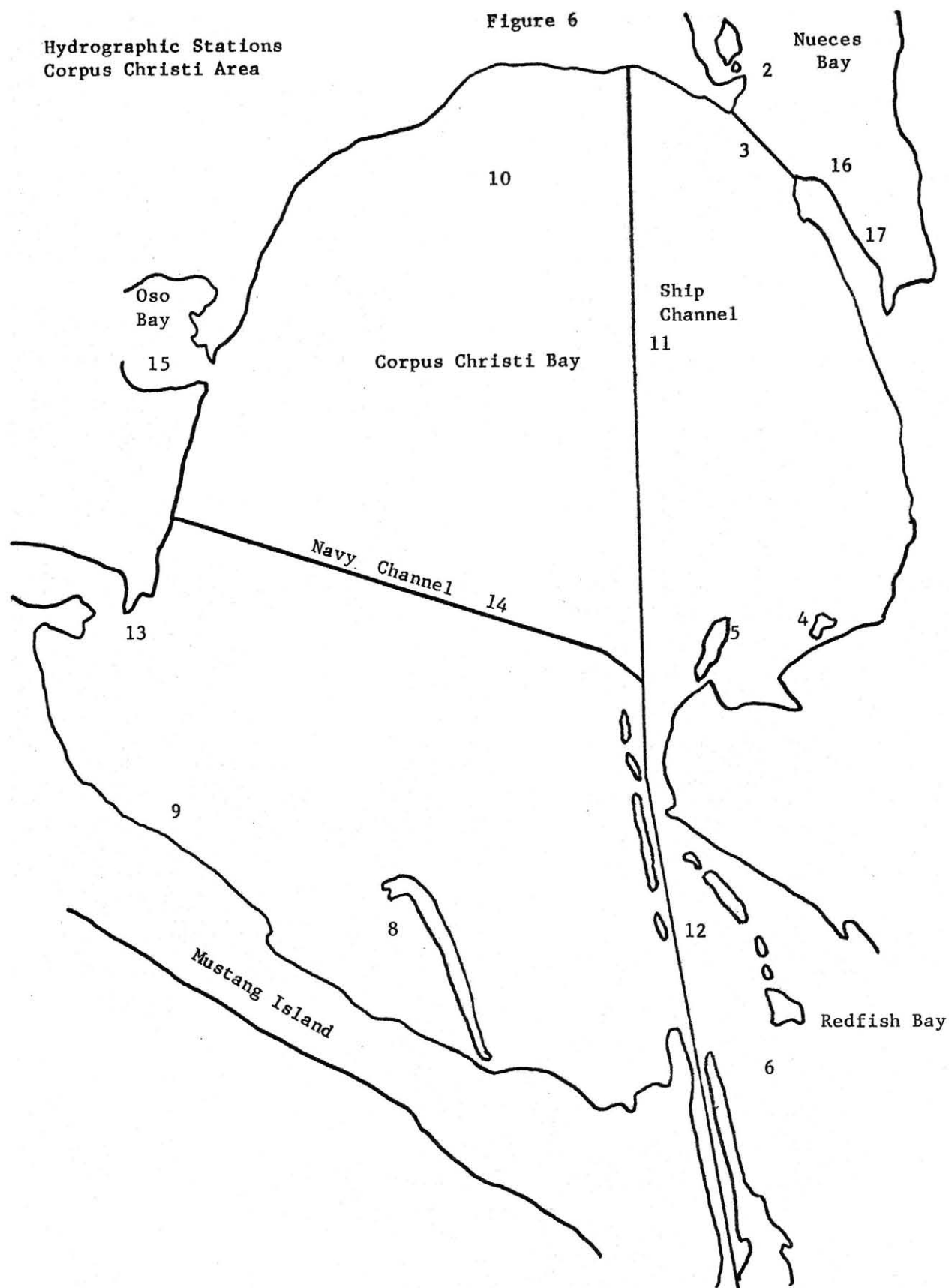


Figure 7
 Map of the Upper Laguna Madre
 Showing Location of Siltation and Hydrographic Stations

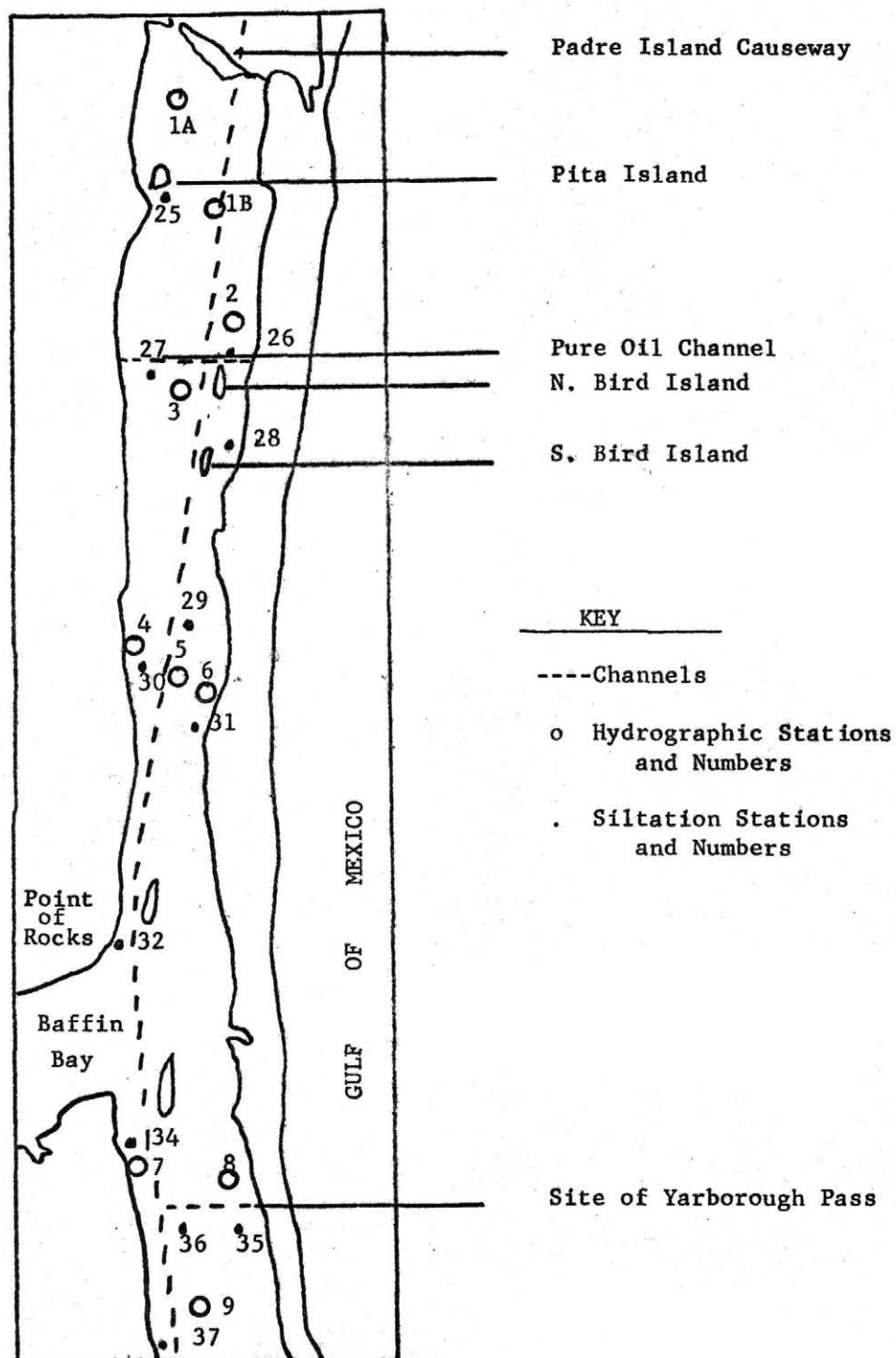


Figure 8
Location of Hydrographic Stations in the Lower Laguna Madre

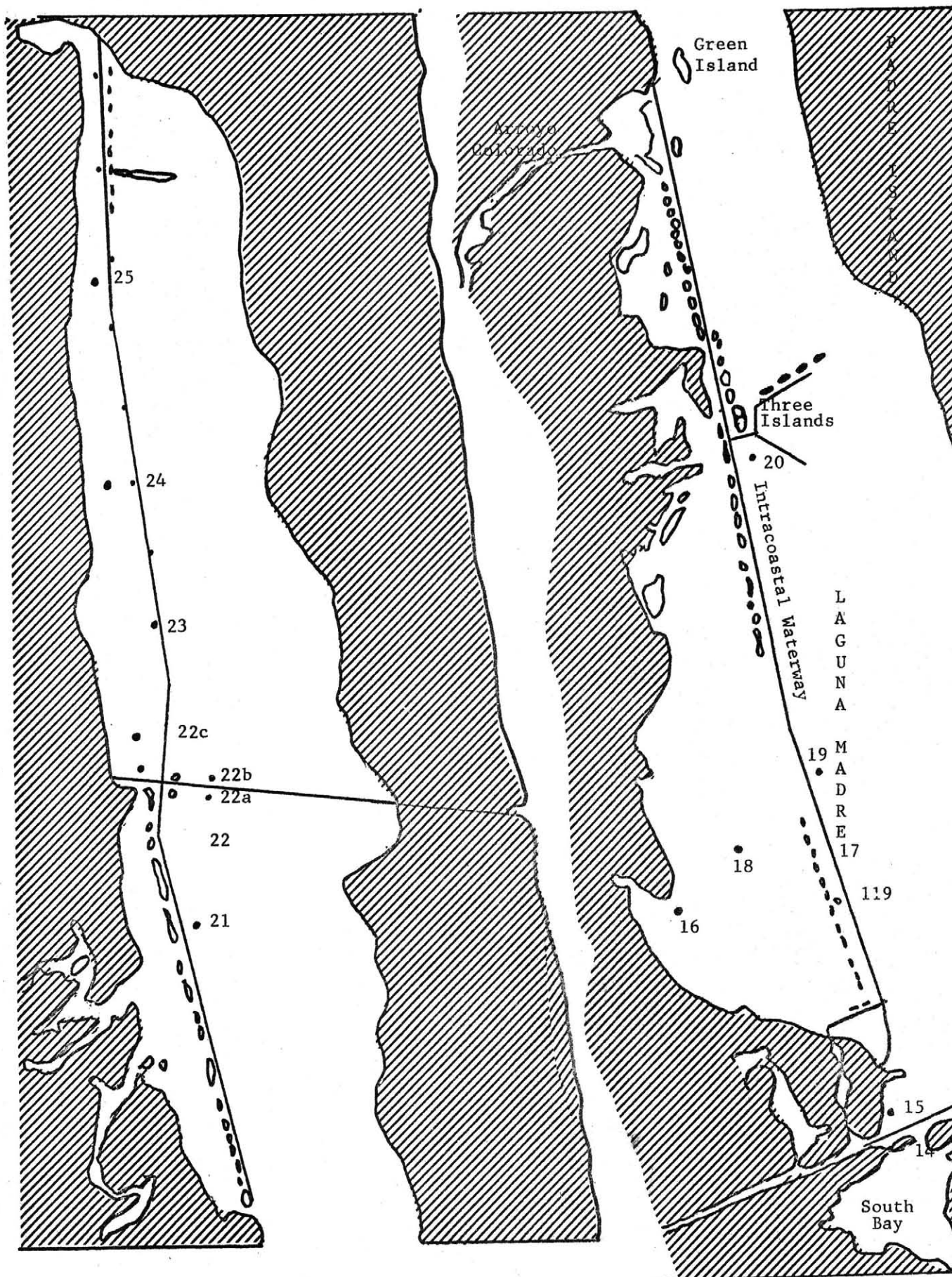


Table 2

Coastal Hydrographic Data (1966)
Average of All Stations by Month for Each Area

		<u>January</u>		
	Salinity	Water Temp.	Turbidity	Rainfall
Galveston Bay	15.6	14.4	N.D.	4.46
Matagorda Bay	14.6	12.9	49.2	5.49
San Antonio Bay	12.8	12.7	88.8	3.38
Aransas Bay	19.88	9.2	25.0	3.50
Corpus Christi Bay	31.50	10.8	34.0	2.12
Upper Laguna Madre	35.00	8.0	N.D.	2.12
Lower Laguna Madre	33.00	19.2	N.D.	3.45
<u>February</u>				
Galveston Bay	15.4	14.8	N.D.	7.75
Matagorda Bay	14.7	13.6	58.2	3.45
San Antonio Bay	15.7	11.1	69.7	2.51
Aransas Bay	21.13	9.0	53.0	2.32
Corpus Christi Bay	30.8	14.1	34.0	1.15
Upper Laguna Madre	34.4	8.0	N.D.	1.15
Lower Laguna Madre	33.0	18.2	N.D.	0.83
<u>March</u>				
Galveston Bay	N.D.	N.D.	N.D.	2.20
Matagorda Bay	18.3	18.3	40.0	0.82
San Antonio Bay	15.8	16.6	53.2	0.62
Aransas Bay	20.9	18.5	35.0	0.52
Corpus Christi Bay	30.7	18.9	54.9	0.69
Upper Laguna Madre	38.4	20.5	50.7	0.40
Lower Laguna Madre	35.4	20.5	N.D.	0.53
<u>April</u>				
Galveston Bay	17.5	21.8	N.D.	7.98
Matagorda Bay	16.8	22.7	116.8	2.85
San Antonio Bay	17.1	21.4	91.6	4.86
Aransas Bay	22.5	22.7	44.0	2.14
Corpus Christi Bay	31.2	24.6	67.5	5.03
Upper Laguna Madre	42.5	23.5	48.0	4.20
Lower Laguna Madre	35.3	22.0	N.D.	0.80
<u>May</u>				
Galveston Bay	5.8	25.1	N.D.	11.21
Matagorda Bay	10.9	27.1	71.5	8.21
San Antonio Bay	11.4	26.1	69.8	6.40
Aransas Bay	14.1	27.6	51.8	6.99
Corpus Christi Bay	23.9	27.4	56.6	7.23
Upper Laguna Madre	36.5	28.0	77.0	8.10
Lower Laguna Madre	29.2	27.6	N.D.	6.05

Table 2--Continued

Coastal Hydrographic Data (1966)
Average of All Stations by Month for Each Area

	Salinity	<u>June</u> Water Temp.	Turbidity	Rainfall
Galveston Bay	9.34	29.1	N.D.	4.42
Matagorda Bay	12.60	23.4	64.0	5.40
San Antonio Bay	11.80	23.3	34.0	6.84
Aransas Bay	13.14	28.2	46.0	2.72
Corpus Christi Bay	21.51	28.3	45.0	4.35
Upper Laguna Madre	32.00	30.0	31.0	3.65
Lower Laguna Madre	29.63	29.6	N.D.	2.18

July

Galveston Bay	13.81	31.3	N.D.	1.45
Matagorda Bay	14.30	30.2	69.0	4.37
San Antonio Bay	11.70	29.5	49.0	3.61
Aransas Bay	16.51	29.5	25.0	1.15
Corpus Christi Bay	29.64	30.7	40.0	1.23
Upper Laguna Madre	34.20	30.8	26.0	0.61
Lower Laguna Madre	33.91	29.9	N.D.	1.59

August

Galveston Bay	16.48	30.7	N.D.	6.40
Matagorda Bay	15.30	29.3	51.0	5.62
San Antonio Bay	13.30	30.3	74.0	1.80
Aransas Bay	18.94	30.0	25.0	4.71
Corpus Christi Bay	31.15	31.2	39.0	4.15
Upper Laguna Madre	41.50	29.4	27.0	2.49
Lower Laguna Madre	39.66	29.0	N.D.	0.58

September

Galveston Bay	18.4	29.3	N.D.	4.01
Matagorda Bay	17.1	27.5	16.0	1.94
San Antonio Bay	15.5	28.0	30.1	4.37
Aransas Bay	23.7	29.5	N.D.	2.14
Corpus Christi Bay	32.9	29.3	37.7	2.84
Upper Laguna Madre	42.0	29.5	27.9	3.07
Lower Laguna Madre	41.8	28.0	N.D.	0.52

October

Galveston Bay	20.4	23.1	N.D.	5.45
Matagorda Bay	22.4	22.9	26.5	N.D.
San Antonio Bay	14.9	24.7	41.1	1.57
Aransas Bay	23.2	23.3	N.D.	2.30
Corpus Christi Bay	34.1	24.8	53.0	0.85
Upper Laguna Madre	40.0	26.8	41.5	0.57
Lower Laguna Madre	37.4	25.9	N.D.	7.45

Table 2--Continued

Coastal Hydrographic Data (1966)
Average of all Station by Month for Each Area

	Salinity	<u>November</u> Water Temp.	Turbidity	Rainfall
Galveston Bay	20.1	19.6	N.D.	1.56
Matagorda Bay	20.6	21.2	47.0	0.81
San Antonio Bay	19.3	18.9	31.8	0.50
Aransas Bay	25.2	24.2	N.D.	0.00
Corpus Christi Bay	34.3	22.0	40.3	0.07
Upper Laguna Madre	43.1	23.8	42.3	0.02
Lower Laguna Madre	37.8	23.0	N.D.	0.02
<u>December</u>				
Galveston Bay	19.9	15.9	N.D.	1.53
Matagorda Bay	25.0	17.3	37.4	1.40
San Antonio Bay	16.7	11.5	25.0	0.00
Aransas Bay	24.32	19.2	25.0	0.78
Corpus Christi Bay	34.90	12.6	35.8	0.18
Upper Laguna Madre	43.70	12.7	43.1	0.21
Lower Laguna Madre	36.82	12.0	30.0	0.68

Table 3

Rainfall Monthly Totals by Area 1966

<u>Month</u>	<u>Area</u>						
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
January	4.46	5.49	3.38	3.50	2.12	2.12	3.45
February	7.75	3.45	2.51	2.32	1.15	1.15	0.83
March	2.20	0.82	0.62	0.52	0.69	0.40	0.53
April	7.98	2.85	4.86	2.14	5.03	4.20	0.80
May	11.21	8.21	6.40	6.99	7.23	8.10	6.05
June	4.42	5.40	6.84	2.72	4.35	3.65	2.18
July	1.45	4.37	3.61	1.15	1.23	0.61	1.59
August	6.40	5.62	1.80	4.71	4.15	2.49	0.58
September	4.01	1.94	4.37	2.14	2.84	3.07	0.52
October	5.45	N.D.	1.57	2.30	0.85	0.57	7.45
November	1.56	0.81	0.50	0.00	0.07	0.02	0.02
December	1.53	1.40	0.00	0.73	0.18	0.21	0.68

Area 1. Galveston Bay	Area 5. Corpus Christi Bay
Area 2. Matagorda Bay	Area 6. Upper Laguna Madre
Area 3. San Antonio Bay	Area 7. Lower Laguna Madre
Area 4. Aransas Bay	

Table 4

River Discharge in Acre-Feet by Month
January 1966 - September 1966

<u>Date</u>	<u>River System</u>							
	<u>Trinity</u>	<u>Lavaca</u>	<u>Navidad</u>	<u>Guadalupe</u>	<u>San Antonio</u>	<u>Aransas</u>	<u>Mission</u>	<u>Nueces</u>
January	211,100	7,580	20,700	N.D.	N.D.	85	1,030	4,700
February	459,300	16,100	40,380	N.D.	N.D.	91	2,580	5,200
March	155,800	9,240	21,830	N.D.	N.D.	34	331	5,950
April	591,000	34,890	53,270	N.D.	N.D.	6,570	14,510	7,810
May	3,197,000	45,160	110,800	N.D.	N.D.	11,730	49,650	205,700
June	695,300	8,480	29,590	N.D.	N.D.	104	1,830	53,330
July	368,700	5,330	16,100	N.D.	N.D.	37	10,680	12,840
August	158,000	2,770	18,790	N.D.	N.D.	74	3,190	8,090
September	128,700	2,130	11,330	N.D.	N.D.	516	1,500	6,840
1966 Total	5,964,900	131,680	322,790			19,241	85,301	310,460
1965 Total	3,914,170	248,550	316,320			9,280	32,578	352,320

N.D. = No Data

TABLE 5

Salinity (ppt) and Water Temperature (°C) in Galveston Bay, 1966

Salinity												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
B		18.0		16.1	8.0	3.9	12.9	11.2	12.8			14.4
EB	14.5	19.4	10.4	14.6	6.6	4.3	8.4	11.3	9.4	16.3	17.0	18.3
EB	10.2	18.6	4.3	19.1	8.3	5.2	8.2	7.9	10.5	11.3	15.3	17.8
EB	5.9	9.5	3.3	9.7	3.1	5.2	9.0	6.0	5.0	11.3	16.8	20.5
B	16.7	22.5	10.1	11.5	6.0	8.5	22.4	13.6	16.6	22.9	16.3	20.6
OC		23.4	19.9	11.4	8.5	10.4	15.1	13.9	16.1	23.7	24.0	23.1
C		23.9		16.0		11.6	13.3	15.8	16.1			
C		28.2	28.7	19.6	5.7	9.0	18.4	14.2	15.0	25.3	21.9	22.9
P		28.2		18.9	5.9	4.1	19.1	16.6	20.5			
-22	21.7	17.7	32.2	16.8	14.9	20.1	25.7	23.7	26.6	27.1	24.8	26.5
BS	6.3	12.3	5.8	.8	.7	3.3	6.4	8.8	2.0	6.7	12.8	17.8
LS	21.1	19.7	24.8	7.7	6.3	.5	18.8	23.0	11.5	14.4	22.6	25.5
LS	11.4	10.2	9.4	2.2	5.9	5.9	7.7	7.4	2.7	8.9	.5	16.7
OS	4.6	2.3	2.7	.8	.5	5.6	10.5	13.0	10.6	4.5	16.7	19.4
OBS	2.7	5.4	3.2	1.4	.3	.4	.5	2.0	1.0	9.9	.5	16.7
LT	9.1		7.9	8.0	.9	4.8	6.5	13.5	12.0	5.6	10.5	8.9
CT	14.6		10.5	18.0	6.8	5.7	9.9	14.7	13.1	17.7	18.9	6.6
CDT			16.9	28.1	9.0	15.5	20.8	12.0	24.5	28.1	28.9	
DL	5.6	2.1	4.7	.7	.5		4.9	6.6		7.8	.6	13.3
YL	18.1	2.3	6.5	.7	.8		6.0	9.2		7.8	0	16.6
P	15.8	16.3	18.9	16.2	7.1	3.5	8.9	11.9	16.9	17.7	18.9	21.1
WP	14.8	11.4	10.7	14.8	6.7	6.9	11.5	16.1	16.5	21.0	20.0	22.8
R												
CD	27.0	23.3	31.7	19.7	9.2	10.8	20.5	23.2	19.4	25.7	21.6	24.9
R	18.1	21.5	25.3	17.5	6.9	9.1	16.3	17.5	17.2	20.7	19.9	22.9
BB		19.0		17.6		8.8	15.0	16.7	16.1			
-68	20.7	16.5	27.7	11.2	4.5	11.4	12.7	17.2	21.7	24.3	19.9	22.2
MP	21.5	15.2		18.3	2.4	11.1	10.8	16.0	20.4		18.3	22.2
P	16.0	16.2		18.0	1.5	10.0	10.7	16.1	18.7		16.1	20.5
GB	15.8	7.8	8.6	17.9	1.9	5.6	8.0	12.2	18.7	15.6	15.0	21.1
K	15.2	6.5	14.4	14.7	.2	3.2	6.5	10.6	14.5	16.5	16.7	15.5
S	14.0	7.0	3.4	12.7	.2	2.4	4.4	8.2	13.6	11.7	16.7	13.9
P	13.8	4.6	.8	10.9	0	.1	.5	2.7	11.0	7.0	11.1	11.7
C	6.7	4.8	7.4	7.0	0	.1	.7	.4	8.4	11.1	11.7	12.2
EB	9.5	4.8		8.3		.2	1.0	1.1	8.5	11.1	14.4	15.0
OB	11.2	5.7		10.5	.5	.3	1.3	4.1	9.5	15.4	16.1	16.7
I	11.6	5.5	1.8	10.9	1.4	1.2	2.3	4.9	11.7	12.9	14.4	17.8
B	10.7	6.4	5.7	11.5	1.1	2.6	4.4	7.3	13.3	14.1	16.7	17.8
P	11.5	5.3	16.7	11.2	1.5	2.2	4.3	7.5	12.7	19.7	14.4	18.3
PAP	16.6	8.5	31.6	13.3	1.1	5.7	6.7	13.7	16.5	23.7	16.7	21.1
-36	19.6	20.0		24.0	8.1	23.1	17.5	26.8	25.7			25.0
-44	21.5	19.4	30.8	22.8	6.2	20.1	14.8	21.5	25.2	27.9	27.5	23.9
-54	21.0	17.3		19.0	4.3	13.4	13.9	17.8	24.2		21.1	22.2
WP	18.6	10.5		18.8	6.1	11.3	11.8	16.9	17.4		19.4	22.2
-60	19.7	18.4		19.3	3.9	12.1	13.1	18.3	21.3		21.1	22.2
EB	12.5	6.0	11.5	16.9	3.4	6.7	9.7	14.4	16.1	19.2	18.8	21.7
EL-A												
EL-B	9.1	2.5	9.1	11.3	.9	4.8	6.5	13.5	12.0	13.4	10.5	8.9

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
NPS		13.0	16.4	2.5	1.4	11.1	10.2	11.4	18.9	11.7	19.4	
MCS		17.8	22.6	28.0	28.9	16.7	30.1	29.1	27.5	20.5	27.2	
CBS		22.9	32.0	28.2		22.8	25.2	27.7	28.3		27.7	
TGPS		23.0	23.9	27.7	20.4	21.7	29.8	32.0	27.5	23.8	27.7	
MPS		21.6	17.0	24.2	12.6	18.3	17.3	29.1	28.3	32.7	26.1	
CLT												
HCT												
TCDT												
MDL												
TYL												
BAR												

Water Temperature

EB						28.0			25.0			8.5
LEB												
MEB												
UEB												
RB												
SOC												
SC						28.0						
GC												
BP												
B-22									28.0			
DBS	17.2	17.8	20.4	22.0	29.0	27.0	30.0	30.5	29.0	17.5	21.0	22.0
JLS												
MLS	18.0	20.2	19.8	22.2	29.0	27.0	30.5	30.5	28.0	17.5	23.0	22.5
SOS	17.6	9.2	20.8	24.0	30.0	29.0	33.0	29.0	28.5	22.0	22.0	15.0
DOBS	15.6	15.0	21.8	21.8	27.0	29.0	34.0	33.5	28.0	23.6	22.0	20.5
CLT			16.6	24.2	27.5	30.3	31.5	31.0	30.1	24.4	17.8	12.0
MCT			16.2	23.5	27.7	29.6	30.8	31.0	30.5	23.3	18.9	12.0
TCDT			17.8	23.0	28.7	28.9	29.6	31.0	28.8	25.9	17.1	15.8
MDL					31.0							
TYL												
HP												
SWP												
CR												
TCD												
DR									26.0			
DBB						28.0						
B-68								30.0	27.0			
5MP					23.2			30.0	26.2			
MP								30.0	26.3			
UGB								30.0	25.0			
MK						30.0		30.0	26.1			
FS					21.8	28.6	30.1	30.0	25.8		25.0	15.0
UP								30.0	25.6			
AC								30.0	25.4			
DB								30.0	25.4			
LOB						29.0		30.0	25.2			
VI		11.9					30.1	30.0	25.0			
TB	5.6			18.4	26.5			30.0	25.4			

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
P								30.0	25.3			
AP								29.0	25.9			
-36		11.9			24.9	28.6		30.0	27.7			14.0
-44								30.0	27.3			
-54								30.0	27.2			
WF								30.0	26.0			
-60	6.2			19.0			31.4	30.0	26.6		25.0	
B		11.8		18.5	24.7	29.3	30.2	29.4	26.4		21.0	13.0
L-A												
L-B												
PS		15.8	18.0	29.0		30.0	29.0	30.0	30.0	21.0	14.0	
CS		15.9	16.0	26.5		30.0	30.0	30.0	31.5	16.0	14.0	
BS		16.4	17.6	26.0		29.3	31.0	28.5	32.0		24.0	
GFS		18.8	18.0	27.0		30.0	35.0	30.5	28.0	15.5	14.0	
PS		17.2	18.6	27.0		30.5	34.0	30.5	29.0	20.5	14.0	
LT												
CT												
CDT												
DL												
YL												
AR												

Table 6

Salinity (ppt), Water Temperature (°C) and Turbidity (ppm) in Matagorda Bay
1966

Station	January			February		
	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
Well Point	19.4	9.6	36	19.4	15.0	28
Beacon 2	20.0	10.0	36	22.2	14.0	25
A2 Well	22.2	9.9	40	21.6	14.4	25
Arancagua Pass	19.4	9.6	41	19.4	15.6	25
Avaca #60	21.6	9.8	78	22.8	15.6	34
Avaca #47	18.9	9.6	49	23.9	14.5	50
La Salle Bayou	20.0	13.2	66	25.0	14.4	25
Buoy 68	25.0	13.7	36	29.4	13.4	25
Range D	22.2	13.7	25	30.0	13.4	25
Middle 2	20.0	13.5	25	27.8	13.8	25
Piling 3	20.0	13.8	33	23.3	14.0	25
Trout Bayou	16.7	12.6	39	26.6	14.2	27
State Mats	11.1	12.4	85	23.9	14.5	25
Buoy 10	18.3	12.9	29	23.3	14.0	25
Boon Island	15.8	13.0	85	20.0	16.4	25
Vence Post	11.3	12.5	27	20.5	17.0	25
Powderhorn	15.2	17.1	46	20.5	11.9	37
Keller Creek	0.0	14.6	390	0.0	11.3	150
Arancagua Creek	0.0	17.0	170	0.0	13.5	390

Station	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
Jensen Point	14.4	18.8	62	12.2	14.9	25
Redbluff	0.0	-	113	0.6	16.1	305
Cedars	-	-	-	-	-	-
Mud Island	-	-	-	-	-	-
Coon Island	-	-	-	-	11.8	25
Grassy Point	12.8	6.7	25	16.7	15.0	25
Cotton B.	-	-	-	-	-	-
Pt. O'Connor	11.8	7.2	25	28.3	17.9	25
Crescent V	6.1	7.2	25	-	-	-
Gulf Cut	-	-	-	-	14.0	25
Dressing Pt.	-	-	-	-	-	-
Eidlebach	-	-	-	-	-	-
Raymond Landing	-	-	-	-	-	-
Turtle Bay	-	-	-	-	-	-
Wolf Point	-	-	-	-	-	-
Sand Point	-	-	-	-	-	-
Matagorda Club	-	-	-	29.4	14.0	25

	March			April		
Well Point	20.5	19.8	31	23.3	18.3	90
Beacon 2	22.2	19.6	25	23.3	19.0	50
XA2 Well	22.2	19.2	28	23.3	18.5	33
Carancahua Pass	22.2	18.9	25	23.3	19.1	25
Lavaca #60	20.0	19.5	25	25.5	18.2	32
Lavaca #47	22.2	19.4	25	25.5	18.6	27
La Salle Bayou	25.0	19.0	25	27.8	18.0	25
Buoy 68	29.4	18.9	25	30.0	18.0	25
Range D	27.8	18.6	25	31.1	18.0	25
Middle 2	27.8	19.1	25	27.8	18.4	25
Piling 3	25.5	19.8	25	25.0	18.4	25
Trout Bayou	-	-	-	-	-	-
State Mats	-	-	-	-	-	-
Buoy 10	-	-	-	-	-	-
Coon Island	-	-	-	-	-	-
Fence Post	20.5	21.0	45	22.2	19.0	95
Powderhorn	11.7	20.0	42	18.3	18.7	27
Keller Creek	0.0	15.0	170	18.3	18.0	25
Carancahua Creek	0.0	14.4	210	9.4	18.6	27
Jensen Point	12.2	15.8	105	22.8	21.4	29
Redbluff	0.0	13.4	135	14.4	20.0	26
Cedars	18.9	14.0	25	24.4	19.4	160
Mud Island	17.8	14.6	35	24.4	19.2	60
Coon Island	-	16.2	27	23.3	19.8	62
Grassy Point	17.8	11.9	25	11.7	21.8	145
Cotton B.	23.2	18.8	25	25.0	22.0	25
Pt. O'Connor	-	-	-	20.5	21.8	25
Crescent V	-	-	-	13.3	21.8	128
Gulf Cut	-	-	-	8.9	24.5	144
Dressing Pt.	-	-	-	15.0	24.3	135
Eidlebach	-	-	-	14.4	23.6	46
Raymond Landing	-	-	-	13.3	23.8	198
Turtle Bay	-	-	-	-	-	-
Wolf Point	11.7	14.0	25	-	-	-
Sand Point	-	-	-	-	-	-
Matagorda Club	30.0	19.2	25	26.1	25.3	41

Station	May			June		
	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
Well Point	17.2	23.5	36	13.6	28.3	35
Beacon 2	17.2	24.0	25	16.1	28.5	25
A2 Well	16.7	23.5	25	17.2	23.2	25
Barancahua Pass	-	-	-	15.0	27.4	25
Avaca #60	13.9	23.0	40	10.2	28.1	40
Avaca #47	16.7	22.8	29	15.4	28.2	32
La Salle Bayou	16.7	22.0	25	20.0	28.2	25
Buoy 68	20.5	23.5	26	25.5	28.3	25
Range D	22.2	24.0	25	25.8	28.3	25
Middle 2	20.0	23.0	25	23.8	28.3	25
Piling 3	15.0	23.8	25	21.9	28.2	27
Frout Bayou	-	-	-	-	-	-
State Mats	-	-	-	-	-	-
Buoy 10	-	-	-	-	-	-
Boon Island	-	-	-	11.1	27.9	25
Beacon Post	7.8	25.0	45	11.1	29.4	27
Powderhorn	0.0	24.8	340	12.5	28.1	34
Seller Creek	0.0	25.0	130	0.0	27.2	36
Barancahua Creek	0.0	24.8	180	0.0	25.5	124
Jensen Point	1.1	24.8	90	7.2	31.7	76
Redbluff	0.0	28.4	280	0.0	28.5	163
Bedars	5.6	25.0	100	11.9	26.9	34
Red Island	1.1	25.0	180	24.4	25.9	117
Boon Island	13.3	25.0	25	11.1	27.9	25
Grassy Point	5.6	30.1	29	-	-	-
Bottom B.	17.8	23.8	25	20.0	26.7	25
Pt. O'Connor	21.1	27.5	25	26.1	30.0	29
Brescent V	1.1	27.8	27	0.0	30.2	150
Gulf Cut	6.7	28.4	135	8.9	30.2	202
Dressing Pt.	11.1	29.4	31	8.9	28.7	25
Hidlebach	11.1	30.0	105	-	-	-
Raymond Landing	11.7	28.4	40	-	-	-
Turtle Bay	-	-	-	-	-	-
Wolf Point	-	-	-	-	-	-
Sand Point	9.4	26.1	27	15.5	28.0	27
Matagorda Club	-	-	-	23.3	28.3	25

Station	July			August		
	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
Well Point	18.9	30.2	56	17.2	29.3	25
Beacon 2	18.9	30.3	29	20.5	29.8	35
A2 Well	17.2	29.9	25	20.0	29.5	28
Barancahua Pass	16.1	29.5	53	17.8	31.0	25
Avaca #60	15.0	29.8	25	17.8	29.7	102
Avaca #47	17.8	29.9	25	21.1	29.9	44
La Salle Bayou	22.8	29.6	25	22.8	29.6	25
Buoy 68	29.4	29.5	25	27.8	29.6	25
Range D	30.0	29.9	25	31.6	29.1	25
Middle 2	27.8	29.8	25	29.4	29.5	25
Piling 3	22.2	29.5	25	25.0	29.9	25
Frout Bayou	-	-	-	-	-	-
State Mats	-	-	-	-	-	-
Buoy 10	-	-	-	-	-	-

Station	July			August		
	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
Coon Island	-	-	-	-	-	-
Fence Post	13.9	30.9	26	13.3	30.0	31
Powderhorn	5.6	31.2	43	3.3	32.0	120
Keller Creek	0.0	30.0	37	0.0	28.8	39
Garancahua Creek	0.0	30.0	75	0.0	28.5	64
Jensen Point	8.9	35.3	67	13.3	31.2	41
Redbluff	0.0	32.8	25	0.0	31.0	88
Cedars	20.0	29.9	128	21.1	30.0	82
Mud Island	19.4	29.9	90	22.2	30.0	224
Coon Island	16.7	30.5	29	16.7	30.1	25
Grassy Point	7.8	32.2	25	1.1	27.1	25
Cotton B.	23.3	29.5	25	25.0	29.3	29
Pt. O'Connor	22.8	27.5	25	28.9	32.0	25
Crescent V	2.2	31.2	38	4.4	29.0	25
Gulf Cut	11.1	31.6	25	10.0	30.0	34
Dressing Pt.	12.2	30.8	25	11.1	29.0	42
Eidlebach	-	-	-	-	-	-
Raymond Landing	14.4	30.0	53	-	-	-
Turtle Bay	-	-	-	15.6	28.8	78
Wolf Point	-	-	-	-	-	-
Sand Point	-	-	-	17.8	30.0	25
Matagorda Club	27.8	30.6	25	-	-	-

Station	September			October		
	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
Well Point	22.8	26.9	25	26.1	20.9	25
Beacon 2	26.6	28.0	25	26.7	20.0	25
XA2 Well	23.9	27.2	25	27.8	20.8	25
Carancahua Pass	24.4	28.5	28	26.1	21.8	29
Lavaca #60	22.2	27.3	25	23.3	20.0	55
Lavaca #47	25.5	27.4	25	25.0	20.7	33
La Salle Bayou	27.8	27.7	25	25.6	20.9	25
Buoy 68	30.5	27.2	25	28.3	21.5	25
Range D	31.1	28.2	25	29.4	21.5	25
Middle 2	30.5	28.0	25	28.3	20.8	51
Piling 3	27.8	27.8	25	27.2	19.8	25
Trout Bayou	-	-	-	-	-	-
State Mats	-	-	-	-	-	-
Buoy 10	-	-	-	-	-	-
Coon Island	22.2	29.8	25	21.7	24.5	73
Fence Post	21.1	27.8	25	22.2	20.5	25
Powderhorn	20.0	27.5	25	18.9	27.2	25
Keller Creek	0.0	28.0	27	6.7	28.8	25
Garancahua Creek	0.0	27.9	80	3.9	30.0	25
Jensen Point	15.5	29.1	51	20.0	32.0	103
Redbluff	0.0	29.0	70	1.7	29.0	68
Cedars	27.8	29.0	28	25.0	23.5	69
Mud Island	22.8	28.0	61	22.8	20.5	50
Coon Island	17.8	29.5	25	23.3	22.7	25
Grassy Point	21.7	26.0	25	22.2	22.8	35
Cotton B	27.8	29.9	25	27.8	22.3	39
Pt. O'Connor	27.2	26.0	25	27.8	23.5	25

Station	September			October		
	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
Rescort V	7.8	33.0	25	13.9	22.6	25
Gulf Cut	13.3	27.0	25	-	-	-
Dressing Pt.	10.0	25.0	25	-	-	-
Idlebach	11.1	26.5	28	-	-	-
Raymond Landing	11.7	27.0	25	-	-	-
Turtle Bay	-	-	-	-	-	-
Golf Point	-	-	-	-	-	-
Sand Point	23.3	29.5	52	23.3	26.0	25
Matagorda Club	30.0	28.5	25	28.3	19.3	46

Station	November			December		
	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
Well Point	26.1	20.2	25	26.1	18.8	25
Beacon 2	26.6	19.8	25	27.2	19.2	25
A2 Well	26.1	19.5	25	27.2	18.5	25
Arancagua Pass	26.1	15.7	38	26.1	18.5	25
Avaca #60	25.5	19.5	25	26.6	18.6	25
Avaca #47	26.1	19.7	25	29.4	18.9	25
La Salle Bayou	28.9	19.9	25	31.6	20.1	25
Boat 68	31.1	21.8	25	31.1	19.9	25
Range D	30.5	21.0	25	31.1	19.3	25
Middle 2	30.5	20.7	25	27.8	19.3	25
Willing 3	28.3	19.8	25	-	-	-
Trout Bayou	-	-	-	-	-	-
State Mats	-	-	-	-	-	-
Boat 10	-	-	-	-	-	-
Boon Island	23.9	15.0	46	-	-	-
Beacon Post	25.5	21.5	48	25.0	19.7	30
Powderhorn	21.1	17.0	260	23.3	20.8	33
Miller Creek	18.9	16.5	27	22.2	21.0	29
Arancagua Creek	10.5	16.3	60	14.4	21.5	36
Jensen Point	23.9	19.0	27	25.0	22.8	60
Redbluff	13.9	17.0	48	18.3	21.3	75
Bedars	24.4	13.8	92	-	-	-
Red Island	17.8	14.8	33	-	-	-
Boon Island	24.4	20.7	41	-	-	-
Grassy Point	23.3	24.7	56	24.4	15.5	37
Bottom B.	26.1	16.5	34	-	-	-
Pt. O'Connor	31.1	23.5	25	-	-	-
Rescort V	17.2	24.5	65	20.5	15.0	87
Gulf Cut	11.7	25.8	180	-	-	-
Dressing Pt.	15.5	22.2	31	-	-	-
Idlebach	15.5	24.0	25	-	-	-
Raymond Landing	14.4	22.5	29	-	-	-
Turtle Bay	-	-	-	-	-	-
Golf Point	-	-	-	-	-	-
Sand Point	22.8	15.7	32	-	-	-
Matagorda Club	-	-	-	30.5	20.5	25

Table 7

Hydrographic Data by Station
San Antonio Bay System

<u>Stations</u>	<u>December</u>			<u>January</u>			<u>February</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
1	17.5	17.4	43	11.0	12.0	39	12.2	10.8	29
2	18.6	16.5	-25	15.5	15.9	32	16.9	9.3	27
3	18.0	16.9	-25	6.66	15.1	230	15.3	9.2	31
4	15.3	17.4	82	5.00	15.3	295	9.4	9.4	46
5	6.1	16.6	44	1.67	15.5	158	5.6	9.8	109
6	0.0	17.1	99	0.00	15.6	190	0.00	10.5	182
7				23.9	6.1	57	25.0	16.3	28
8	28.3	17.9	-25	27.8	12.9	-25	25.5	8.0	57
9	29.4	17.5	-25	26.6	12.6	-25	28.9	9.5	78
10				13.1	10.7	26	21.1	11.9	31
11	20.5	14.0	-25	17.8	10.5	-25	21.1	12.3	-25
12				13.3	11.8	28	13.9	15.7	99
13	8.6	17.0	46	5.28	11.6	-25	9.72	11.8	163

<u>Stations</u>	<u>March</u>			<u>April</u>			<u>May</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
1	12.0	15.4	154	16.0	19.5	97	7.1	26.2	57
2	13.6	15.7	-25	13.9	24.1	32	9.4	24.7	65
3	14.4	15.6	-25	17.5	23.2	54	14.4	25.0	48
4	9.7	16.4	-25	13.0	20.4	212	6.9	25.9	60
5	7.2	17.1	38	5.6	18.9	306	0.3	27.4	126
6	0.0	17.6	95	3.9	18.8	117	0.0	26.7	141
7	23.9	14.7	33						
8	26.6	15.8	31	31.4	21.0	41	23.3	25.6	37
9	27.2	16.0	57	31.6	21.0	-25	21.7	26.4	29
10	18.6	18.2	35	15.5	24.8	52	9.4	25.6	101
11	25.3	18.9	-25	24.9	23.8	-25	19.2	27.2	27
12	12.8	15.8	149						
13	14.7	18.6	25	15.8	20.9	47	14.2	26.4	77

<u>Station</u>	<u>June</u>			<u>July</u>			<u>August</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
1	5.6	27.9	25	7.2	29.3	42	10.4	29.0	80
2	7.8	29.2	-25	8.9	30.1	46	10.5	29.6	74
3	9.9	29.6	-25	12.8	31.3	27	23.6	29.7	70
4	7.8	29.3	31	7.8	31.0	58	9.2	29.8	88
5	3.3	31.6	46	2.2	30.9	82	4.9	30.1	109
6	0.0	31.8	44	0.0	31.5	55	1.2	30.5	81
7									
8	29.4	26.2	25	25.5	27.2	-25	20.5	29.9	49
9	29.4	25.0	-25	26.1	26.2	-25	22.8	30.0	45
10	11.6	27.5	58	11.1	27.7	125	8.3	29.7	115
11	12.8	25.9	-25	15.5	27.2	-25	18.3	31.0	47
12									
13	12.2	27.5	34	11.7	27.3	32	16.7	32.0	56

Hydrographic Data by Station
San Antonio Bay System

Stations	September			October			November		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
1	9.9	28.6	41	13.8	22.3	31	15.5	15.3	26
2	16.6	28.8	32	23.3	22.9	41	23.3	16.8	-25
3	19.1	29.2	-25	14.7	22.8	28	20.5	17.7	41
4	13.3	29.3	31	14.4	23.1	-25	19.7	17.7	-25
5	5.3	29.7	39	5.8	23.4	59	10.3	17.1	53
6	0.0	30.0	57	3.1	24.0	52	3.3	17.4	38
7									
8	29.9	28.4	-25	30.5	28.8	-25	30.5	21.3	41
9	29.4	27.8	-25	29.9	28.4	-25	29.4	21.5	-25
10	18.9	27.8	-25	21.6	24.2	56	20.5	20.8	-25
11	18.3	28.4	32	21.1	28.8	-25	26.1	21.3	-25
12									
13	9.9	28.8	33	5.6	23.2	86	13.9	21.3	26

Stations	December		
1	14.98	14.4	25
2	20.26	14.8	25
3	18.32	11.3	25
4	16.66	14.0	25
5	8.88	12.7	25
6	5.00	14.2	31
7			25
8	30.53	19.8	25
9	29.97	20.2	25
10	23.87	20.4	25
11	23.87	21.2	25
12			25
13	19.98	21.7	25

Salinity in parts per thousand
Temperature in degrees Centigrade
Turbidity in parts per million

0.00 means less than number, such as less than 25 parts per million.

Station Locations

1. Swan Point
2. ICW Mkr. 13
3. ICW Mkr. 31
4. Turtle Reef area
5. Hynes Bay
6. Guadalupe Bay
7. Turnstake Island
8. Big Bayou
9. Grass Island
10. Little Bird Island
11. Cedar Lake
12. Live Oak Point
13. Dagger Point

Table 8

Hydrographic Recording for Aransas, Copano, and Mesquite Bays
January, 1966

<u>Station</u>	<u>Salinity</u>	<u>Temperature</u>	<u>Turbidity</u>
Fulton Beach	21.25	13.0	> 25
Goose Island	16.30	12.5	
South Beach	24.55	16.0	
Marker 85	19.60	7.3	
M-60	18.50	7.0	
M-49	18.50	6.8	
M-21	19.60	6.6	
M-19	18.50	6.0	
M-7	16.30	7.4	
St. Charles	17.40	9.5	
Draw Bridge	19.60	8.5	
Beacon 2	18.50	8.8	
Turtle Pen	24.00	10.0	
Mission	25.10	8.5	
Bayside	24.00	8.5	
Port Bay	24.00	9.0	
Red Fish	24.00	8.5	
Cedar Bayou (middle)	17.40	12.0	
Cedar Bayou (mouth)	16.85	12.5	
North of Bayou	15.75	12.5	
South of Bayou	17.95	12.0	

Rainfall: 3.50 inches

Tide: 1.40 feet Wind: 8.60 m.p.h.

February, 1966

Beacon 7	21.80	9.1	25
Beacon 49	18.80	9.4	25
Beacon 2	18.80	9.7	85
Red Beacon	18.80	9.4	25
Fulton Beach	20.15	8.7	140
South Beach	22.90	9.0	25
Newcom Point	22.90	9.1	25
Copano Bridge	22.90	8.8	38
Port Bay	22.90	8.9	87
Sundown Cut	18.50	8.2	38
Cedar Bayou (mouth)	20.70	9.0	25
Cedar Bayou (middle)	21.80	8.3	25
North of Bayou	21.80	8.7	25
South of Bayou	22.90	9.2	210
Third Chain	20.70	9.3	25
Cedar Dugout	21.80	9.5	25

Rainfall: 2.32 inches

Tide: 1.05 feet Wind: 8.56 m.p.h.

Hydrographic Recording for Aransas, Copano, and Mesquite Bays
March, 1966

<u>Station</u>	<u>Salinity</u>	<u>Temperature</u>	<u>Turbidity</u>
edar Bayou	31.086	14.4	64
edar Bayou (mouth)	23.872	15.0	-25
edar Bayou (N. of mouth)	26.092	14.8	-25
edar Bayou (S. of mouth)	24.426	14.9	-25
edar Cut	20.542	14.3	-25
ndown Cut	19.986	15.6	-25
ittle Devil	15.548	15.9	30
one Tree	14.436	16.4	-25
ilton Beach	20.543	15.9	40
ose Island	18.876	16.0	-25
outh Beach	21.098	23.4	-25
ission Bay	16.104	21.5	150
ort Bay	23.318	19.9	-25
opano Ridge	22.764	18.2	-25
ewcom Bend	22.210	16.2	-25
arker 7	14.436	20.8	-25
arker 19	17.768	21.8	42
arker 31	19.986	18.8	-25
ed Beacon	21.094	19.5	-25
ed Beacon #2	19.986	19.3	-25
aw Bridge	21.094	19.5	-25
ed Fish Point	22.210	21.0	30
ort Bay	22.210	20.8	-25
ayside	22.210	20.9	-25
urtle Pen	21.094	19.9	-25
ission	22.210	21.2	-25
ow Chip	18.876		78
ugh Bayou	19.986		30
ittle Devil	17.768		80
ast Pocket	18.876		50
ilton Beach	22.210	19.2	-25
ose Island	18.322	20.4	-25
outh Beach	25.536	27.2	37
ewcom Bend	19.986	21.3	-25
opano Ridge	23.872	22.5	-25
ort Bay	24.426	24.3	27

April, 1966

edar Bayou	29.654	17.9
outh of Bayou	22.764	18.2
orth of Bayou	25.5361	17.7
outh of Bayou	24.426	17.2
it. Cut	20.542	17.8
edar Bayou	25.5361	16.9
edfish Bay	22.21	14.5
urtle Pen	22.21	18.8
aw Bridge	21.094	19.8
ission Bay	22.764	18.5
eacon #2	22.21	
ort Bay	22.21	19.2

Table 8--Continued
 April--Continued

Hydrographic Recording for Aransas, Copano, and Mesquite Bays

<u>Station</u>	<u>Salinity</u>	<u>Temperature</u>	<u>Turbidity</u>
Int. Cut	23.318	22.5	29
Cedar Cut	23.318	22.5	
In Bayou	33.310	21.5	
Mouth of Bayou	33.310	22.0	
South of Bayou	33.866	22.6	
Mustang Lake	22.764	24.0	-25
Mustang Slough	22.764	24.6	-25
Long Lake	26.648	25.5	-25
Dunham Bay	23.318	26.0	-25
Little Devil	26.092	25.5	-25
Turtle Pen	21.654	20.1	
Fulton Beach	22.21	23.5	125
Goose Island	23.827	25.2	65
Newcom Point	22.764	25.2	110
Port Bay	23.872	26.0	-25
Aransas Beach	31.085	26.5	-25
South Beach	31.086	28.2	90
Cedar Cut	22.764	24.8	-25
Cedar Bayou	26.648	25.0	-25
Mouth of Bayou	24.981	24.0	62
North of Bayou	23.872	26.0	28
South of Bayou	23.318	26.5	-25
Int. Cut	21.654	26.5	28
Marker #43	23.872	24.5	
Mission Bay	11.656	26.4	
Turtle Pen	19.43	23.0	
Marker #19	23.876	24.4	
Mustang Lake	20.094	25.1	45
Mustang Slough	20.542	26.3	-25
Dunham Bay	20.542	28.1	-25
Little Devil	18.876	28.4	-25
Fulton Beach	22.21	25.5	100
Goose Island	24.98	26.0	110
Newcom Point	19.43	26.1	65
Copano Ridge	22.21	25.8	-25
Port Bay	22.21	27.8	-25
Aransas Beach	26.648	27.2	30
South Beach	26.648	27.7	30
Little Bay	22.21	28.6	-25

May, 1966

Mouth of Bayou	21.054	24.5	-25
South of Bayou	21.094	25.0	-25
In Bayou	21.654	25.5	-25
Int. Cut	16.660	26.0	-25
Cedar Cut	19.430	25.7	-25
North of Bayou	22.210	25.2	-25
Fulton Beach	11.656	24.8	32
Port Bay	12.212	25.0	33

ly--Continued

Hydrographic Recording for Aransas, Copano, and Mesquite Bays

<u>Station</u>	<u>Salinity</u>	<u>Temperature</u>	<u>Turbidity</u>
Aransas Beach	19.430	26.8	49
Copano Ridge	14.992	24.8	-25
South Beach	17.214	26.5	-25
Rose Island	8.886	25.4	90
Swcom Point	12.212	25.5	115
Mission Bay	5.004		
Little Pen	8.886		
Marker #43	13.880	26.3	
Marker #19	14.436	26.3	
South Beach	18.876	33.8	-25
Port Bay	10.548	32.0	55
Elton Beach	9.440	27.0	45
Aransas Beach	23.872	31.0	-25
Rose Island	8.886	27.7	300
Copano Ridge	8.886	30.1	150
Swcom Point	9.440	29.2	35
Mission Bay	5.560		
St. Charles	11.100	27.4	
Ridge	8.886	28.3	
Little Pen	7.218	28.0	
Marker #43	14.436	27.7	
Marker #19	13.880	27.2	
Indian Bay	17.768	32.4	60
Little Devil	4.448	34.3	90
St. Cut	19.430	29.0	-25
South of Bayou	23.318	27.1	-25
Star Cut	18.876	27.5	-25
Bayou	25.536	27.4	-25
South of Bayou	22.764	28.0	-25
North of Bayou	22.210	27.6	-25
Head of St. Charles	2.780		
Id Point	9.440		
Vasso Creek	2.780		

June, 1966

Star Platform	13.334	27.0	
Marker #43	17.768	26.0	
Marker #19	16.66	25.6	
Little Pen Flats	7.218	26.0	
South of Mission	6.662	26.5	
Elton Beach	12.212	28.3	-25
Rose Island	16.104	30.3	54
Aransas Beach	31.642	30.3	-25
South Beach	23.318	34.2	-25
Swcom Point	13.324	31.3	120
Copano Ridge	9.44	31.0	-25
Port Bay	9.994	29.8	51

June--Continued

Hydrographic Recording for Aransas, Copano, and Mesquite Bays

<u>Station</u>	<u>Salinity</u>	<u>Temperature</u>	<u>Turbidity</u>
Marker #19	16.660	27.9	
Marker #43	15.548	27.5	
Draw Bridge	11.656	30.1	
Mouth of Mission	8.330	28.5	
Turtle Pen	11.100	30.1	

July, 1966

Marker #19	22.20	30.0	<25
Turtle Pen	14.99	31.5	<25
Marker #43	26.65	30.0	<25
Mission Bay	12.21	30.0	<25
Copano Bridge	11.10	29.0	<25
Draw Bridge	18.88	28.0	<25
Fulton Beach	16.10	28.8	<25
Turtle Pen	9.99	29.0	<25

July rainfall: 1.15 inches

August, 1966

Goose Island	20.54		-25
Fulton Beach	17.77		-25
Ski Basin	26.01		-25
South Beach	33.87		-25
Copano Ridge	14.99		-25
Newcom Point	19.43		37
Port Bay	13.88		-25
Lone Tree	9.99		-25
Little Devil	13.88		-25
Half Moon Reef	24.98		-25
Dunham Bay	28.31		-25
Goose Island	23.32		-25
Fulton Beach	26.65		-25
South Beach	37.20		-25
Little Bay	19.43		32
Marker #19	26.65		-25
Draw Bridge	22.21		-25
Marker #43	35.53		-25
Newcom Point	21.09		-25
Port Bay	14.44		-25
Copano Ridge	15.55		-25
Mission Bay	13.88		-25
Little Devil	17.77		-25
Lone Tree	15.54		-25

<u>Monthly Average</u>	<u>Salinity</u>	<u>Temperature</u>
Aransas	26.34	29.8
Copano	16.18	30.2
St. Charles	14.30	30.0

<less than

Aransas Hydrographic Data
September, 1966

<u>Station</u>	<u>Salinity</u>	<u>Temperature</u>	<u>Turbidity</u>
istang Lake	19.43	23.4	
istang Slough	18.87	25.3	
istang Lake	21.01	31.0	
istang Slough	19.43	31.0	
istang Lake	21.04	31.0	
ong Lake	33.86	26.9	
ong Lake	26.64	34.5	
inham Bay	29.42	27.8	
inham Bay	28.31	32.6	
ittle Devil	21.09	30.3	
ittle Devil	16.66	33.8	
ilton Beach	24.98	27.5	
ilton Beach	25.53	28.3	
ose Island	23.87	29.0	
ose Island	25.53	28.0	
ansas Beach	33.31	35.6	
ansas Beach	32.75	32.5	
uth Beach	31.08	37.0	
uth Beach	29.42	31.4	
ittle Bay	21.09	33.8	
awcom Point	21.09	30.9	
awcom Point	23.31	29.8	
opano Ridge	14.99	30.0	
opano Ridge	17.76	28.9	
ort Bay	14.43	31.9	
ort Bay	14.99	29.4	

October, 1966

istang Lake	12.7	16.5
istang Lake	15.4	21.4
ong Lake	27.2	16.2
ong Lake	38.8	22.6
ittle Devil	21.6	19.4
ittle Devil	22.2	23.8
ilton Beach	20.5	21.0
ilton Beach	23.3	25.3
ose Island	19.4	20.8
ose Island	22.2	25.9
ansas Beach	33.3	27.9
ansas Beach	29.9	25.1
uth Beach	32.1	31.5
uth Beach	24.9	24.2
awcom Point	23.8	28.5
opano Ridge	19.4	28.0
opano Ridge	20.5	21.4
ort Bay	17.7	27.3
ort Bay	17.2	23.2

Aransas Hydrographic Data
November, 1966

<u>Station</u>	<u>Salinity</u>	<u>Temperature</u>	<u>Turbidity</u>
Fulton Beach	23.3	22.0	
Goose Island	25.5	22.9	
Aransas Beach	31.0	25.2	
South Beach	30.0	25.5	
Little Bay	26.0	25.7	
Newcom Point	24.4	23.2	
Copano Ridge	20.5	23.0	
Port Bay	20.5	23.6	

December, 1966

Fulton Beach	19.7	23.318
Goose Island	21.1	24.426
Newcom Point	21.1	23.318
Copano Ridge	21.3	20.542
Port Bay	20.9	19.986
Aransas Beach	23.5	29.976
South Beach	24.4	27.76
Little Devil	20.6	23.318
Little Devil	15.7	21.654
Fulton Beach	14.7	23.318
Goose Island	15.6	24.426
Newcom Bend	15.9	22.764
Copano Ridge	17.2	21.654
Port Bay	18.2	23.318
Aransas Beach	16.6	30.530
South Beach	20.8	28.868

Table 9

Hydrographic Data by Station
Corpus Christi Bay System

Station	<u>December</u>			<u>January</u>			<u>February</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
2	30.7	17.7	65.5	30.5	14.8	70	31.4	14.5	50
3	32.7	17.6	65.5	31.0	14.5	70	30.7	14.5	50
4	31.6	17.7	25.0	31.5	15.0	50	29.5	14.0	25
5	33.5	18.7	25.0	31.4	15.0	50	30.6	14.2	25
6	33.6	18.7	25.0	32.0	14.6	50	30.4	14.4	25
7	32.3	18.7	25.0	31.8	14.5	50	30.6	14.0	25
8	33.5	18.6	25.0	31.4	14.8	50	31.8	14.6	25
9	32.1	18.4	25.0	32.0	14.6	50	29.5	14.0	25
10	31.6	18.5	28.0	31.6	14.5	50	29.5	13.5	25
11	32.7	18.6	28.0	31.8	15.5	50	30.5	13.8	25
12	32.4	18.9	28.0	31.8	15.0	50	31.0	13.8	25
13	34.5	19.0	37.0	32.0	15.2	50	31.9	13.8	50
14	33.1	18.9	25.0	31.4	15.4	50	29.5	14.0	25
15	33.9	18.0	25.0	31.2	15.0	50	31.6	13.7	50
16	32.8	17.7	67.5	30.5	14.8	70	30.5	15.0	50
17	33.0	17.6	67.5	30.5	14.6	70	30.2	14.8	50

infall: 3.50 inches
 tide: 1.80 feet

2.12 inches
 1.40 feet

1.15 inches
 1.00 feet

Station	<u>March</u>			<u>April</u>			<u>May</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
2	31.7	20.5	70	28.9	24.8	36	5.6	26.5	75
3	31.7	21.0	70	28.9	24.6	75	10.5	26.5	75
4	29.3	19.0	45	31.6	25.0	50	28.9	27.0	50
5	29.3	19.0	45	31.1	25.0	55	28.9	27.5	52
6	27.3	18.0	45	31.1	24.0	75	28.3	28.0	36
7	30.5	18.0	30	31.8	24.5	75	29.4	28.0	40
8	30.5	18.4	35	30.6	24.5	90	30.5	28.5	52
9	30.6	18.5	30	30.6	24.2	90	30.5	28.0	60
10	31.1	18.6	40	31.8	24.8	70	28.3	27.5	32
11	31.7	18.0	38	31.1	24.5	75	28.3	27.5	60
12	30.6	18.0	38	32.7	24.5	80	28.9	28.0	32
13	31.7	19.5	35	32.2	24.6	75	30.5	27.0	62
14	31.7	19.2	35	32.0	24.8	70	30.5	27.5	55
15	30.6	19.0	35	31.8	25.0	95	30.5	28.0	60
16	31.5	19.5	68	28.9	24.5	35	5.6	26.5	75
17	31.0	19.2	65	28.9	24.5	35	6.1	27.0	75

infall: 0.69 inches

5.03 inches

7.23 inches

Station	<u>June</u>			<u>July</u>			<u>August</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
2	2.7	27.5	18.6	21.0	29.8	55	23.8	31.4	39
3	10.5	27.8	40	27.7	30.0	52	30.5	31.5	35
4	26.6	28.2	26	30.5	30.5	30	31.6	31.7	30
5	26.0	28.4	33	32.1	30.5	35	30.5	31.5	30
6	28.8	28.4	27	30.5	30.8	50	30.0	30.8	25
7	28.3	28.5	28	30.0	30.5	50	27.7	31.0	25

June, July, August--continued

Hydrographic Data by Station
Corpus Christi Bay System

Station	<u>June</u>			<u>July</u>			<u>August</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
8	28.3	28.5	26	31.0	30.8	35	28.3	31.2	60
9	29.4	28.6	25	32.1	31.0	25	30.0	31.0	65
10	27.2	28.6	29	32.1	31.2	30	30.5	30.9	35
11	27.7	28.4	25	29.9	32.0	30	31.6	31.5	30
12	26.6	28.5	25	30.0	32.0	32	30.5	31.4	30
13	28.3	28.5	25	31.0	31.8	40	30.5	31.7	65
14	26.6	27.8	25	29.9	30.2	35	31.0	31.5	30
15	24.4	28.5	50	31.0	30.8	45	31.6	30.8	65
16	3.9	28.4	72	24.9	30.0	50	23.8	31.0	30
17	3.9	28.2	80	24.4	29.8	55	23.3	30.6	35

Rainfall: 4.35 inches

Tide: 1.5 feet

1.23 inches

1.8 feet

4.15 inches

2.0 feet

	<u>September</u>			<u>October</u>			<u>November</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
2	32.2	30.5	37	33.8	29.5	33	33.3	21.5	38
3	32.4	30.0	30	34.4	21.5	25	32.7	21.6	39
4	32.7	29.0	35	33.8	16.0	25	33.8	22.0	42
5	32.4	30.0	37	33.3	22.5	30	33.8	21.9	45
6	32.7	28.0	38	32.7	23.0	35	33.3	21.8	25
7	33.3	29.0	35	32.7	29.5	25	34.4	22.0	25
8	34.4	29.5	40	33.8	24.0	30	33.8	22.4	40
9	33.8	29.0	42	33.8	21.0	32	34.4	22.3	42
10	33.3	31.0	48	32.7	22.5	40	34.9	22.1	40
11	32.4	29.0	41	32.7	20.5	42	34.4	22.8	43
12	32.7	29.5	40	33.3	26.0	45	35.5	22.6	45
13	33.3	30.0	35	34.9	27.5	43	34.4	22.5	42
14	32.4	29.0	38	34.4	26.0	40	34.8	22.2	45
15	33.3	30.0	42	34.9	29.0	38	34.4	22.0	42
16	32.2	28.5	37	33.8	30.0	34	32.7	21.6	44
17	32.4	29.2	29	34.4	28.0	35	33.3	21.7	48

Rainfall: 2.84 inches

Tide: 2.3 feet

0.85 inches

1.7 feet

0.07 inches

1.6 feet

	<u>December</u>			<u>Station</u>	<u>December</u>		
	Sal.	Temp.	Turb.		Sal.	Temp.	Turb.
2	36.09	12.1	40	10	37.19	12.0	25
3	34.42	12.2	55	11	33.86	13.9	25
4	34.42	12.9	35	12	33.31	12.9	25
5	32.42	12.5	48	13	36.09	13.6	30
6	32.19	12.6	35	14	36.64	13.9	35
7	33.31	12.0	45	15	34.42	12.3	25
8	36.09	12.9	50	16	34.42	12.2	35
9	36.09	12.0	25	17	35.53	13.3	40

Table 10
Hydrographic Data by Station
Upper Laguna Madre Area

Station	January			February					
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.			
	32.8	8.0		32.8	8.0				
	35.0	N.D.		32.8	N.D.				
	32.8	N.D.		32.8	N.D.				
	33.9	N.D.		33.3	N.D.				
	35.0	N.D.		33.3	N.D.				
	32.8	N.D.		33.1	N.D.				
	36.1	N.D.		33.9	N.D.				
	39.4	N.D.		39.4	N.D.				
	36.1	N.D.		38.3	N.D.				
	36.1	N.D.		38.3	N.D.				
Ave.	35.0			34.4					
	March			April			May		
	34.4	19.5	<25	35.5	18.0	<25	37.7	28.0	37
	35.0	21.0	<25	41.5	24.5	34	37.7	29.0	71
	35.5	20.0	<25	38.5	22.5	32	37.2	27.0	51
	36.1	22.0	<25	44.5	25.5	42	37.7	28.5	112
	35.0	21.5	<25	45.5	24.5	37	37.2	28.0	59
	37.7	19.5	25	45.5	23.0	33	36.1	27.0	100
	36.6	21.5	<25	45.5	24.5	43	38.8	28.0	107
	39.9	19.5	54	46.0	23.0	58	35.5	26.5	100
	42.7	20.0	100	45.0	23.0	63	35.0	27.5	70
	42.1	20.5	45	45.0	22.5	50	not taken	not taken	
	42.7	20.5	65	44.5	23.0	65	36.1	28.5	81
	42.1	20.0	52	41.0	22.5	75	35.5	29.0	93
St. #21 ICW	33.9	21.0	48	34.5	20.0	60	36.1	28.0	58
and Cut	42.1	21.0	68	40.5	23.0	47	34.4	28.5	53
Ave.	38.4	20.5		42.5	23.5	48	36.5	28.0	77
	June			July			August		
	32.7	29.5	30	32.7	29.5	29	39.4	29.5	<25
	31.1	28.5	<25	35.0	31.5	28	41.6	29.5	<25
	29.9	28.0	<25	33.8	31.5	34	41.1	28.2	<25
	not taken			35.0	32.0	26	40.5	29.0	<25
	32.7	30.5	<25	35.0	31.0	31	40.5	29.5	<25
	30.5	32.0	<25	34.5	31.0	<25	41.6	31.5	<25
	31.6	31.5	<25	35.0	29.9	40	43.3	29.0	<25
	30.5	31.5	<25	33.3	30.0	38	42.2	29.3	30
	not taken			not taken			42.7	30.0	29
	because of			because of			42.7	29.2	<25
	intensive drag			intensive drag			42.7	29.6	<25
	seine sampling			seine sampling			43.3	29.4	<25
and Cut							42.7	29.6	<25
St. #21 ICW	37.7	30.0	<25	34.0	30.5	<25	38.3	28.8	<25
Ave.	32.0	30.0	3	34.2	30.8		41.5	29.4	

N.D. - No data
< - less than

Hydrographic Data by Station
Upper Laguna Madre Area

Station	<u>September</u>			<u>October</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
25	34.4	30.5	25	36.3	27.0	41
26	36.1	29.0	26	36.1	26.5	35
27	40.0	28.0	28	36.0	27.0	42
28	42.7	29.0	25	36.6	28.0	45
29	41.7	29.0	26	36.6	27.5	40
30	44.4	29.5	27			
31	43.8	29.0	29	44.4	27.0	35
32	44.9	31.0	38	45.5	26.5	47
34	46.0	30.0	31			
35						
36	46.6	30.0	25			
37	46.6	29.5	27			
Land Cut	44.9	30.0	26	52.8	25.5	48
Mkr. #21 ICW	<u>35.5</u>	<u>30.0</u>	<u>30</u>	<u>36.0</u>	<u>27.0</u>	<u>41</u>
Ave.	42.0	29.5	27.9	40.0	26.8	41.5

Station	<u>November</u>			<u>December</u>		
	Sal.	Temp.	Turb.	Sal.	Temp.	Turb.
25	36.6	21.0	36	37.8	10.0	45
26	37.2	24.0	30	40.5	10.5	34
27				41.7	11.5	55
28	39.3	24.3	38	N. D.	N. D.	N. D.
29	42.2	24.0	42	41.6	14.5	40
30				43.3	15.0	38
31	45.5	24.0	45	45.5	14.5	38
32	45.5	25.0	44	46.0	14.0	48
34				47.2	13.0	42
35	47.2	23.2	51	N. D.	N. D.	N. D.
36	47.7	23.6	54	48.8	13.0	40
37	48.3	24.0	40	N. D.	N. D.	N. D.
Land Cut	41.6	23.0	43	49.4	13.0	46
Mkr. #21 ICW	<u>37.1</u>	<u>24.0</u>	<u>42</u>	<u>37.8</u>	<u>11.0</u>	<u>50</u>
Ave.	42.5	23.8	42.3			

N.D. No data

Hydrographic Data by Station
Upper Laguna Madre Area

Month	Precipitation Inches*	Tides** High-Low-Ave.	Prevailing Winds Dir. m.p.h.	Air Temp. °C High-Low-Ave.
March	0.4	0.3 1.0 0.3	SSE @ 12.7	23.5 12.5 18.0
April	4.2	0.6 0.7 0.1	SSE @ 14.6	26.5 17.7 22.2
May	8.1	1.9 0.3 0.5	SSE @ 11.0	28.0 20.5 24.0
June	3.65	+1.1 -.7 +.2	SSE @ 9.6	33.8 17.5 26.5
July	0.61	+1.4 -.9 -.6	SSE @ 9.4	36.2 21.0 28.2
August	2.49	+1.4 -.4 -.2	SSE @ 11.8	37.2 20.5 29.1
September	3.07	2.2	SE @ 8.3	26.8
October	0.57	1.9	ESE @ 9.9	22.1
November	0.02	1.7	SE @ 10.6	19.6

Average amount of three stations throughout area/

* Figures represent plus or minus variance from normal tide

Table 11

Hydrographic Data by Stations
Lower Laguna Madre Area

Station	December		January		February	
	Sal.	W. Temp.	Sal.	W. Temp.	Sal.	W. Temp.
14	33.0	21.0			31.7	17.2
15	33.2	21.5			33.0	16.7
16	34.5	21.6	33.3	18.0	32.2	18.5
17	34.3	21.5	32.0	17.5	32.0	18.1
18	34.7	21.9	33.3	18.4	32.2	18.5
19	34.5	21.5	33.3	17.5	30.8	18.5
20	33.2	21.6	32.0	22.4	31.5	19.5
21	33.4	22.0	33.3	18.1	33.3	17.5
22	34.7	22.0	33.0	22.2	34.0	19.9
22b	34.9	22.5	28.8	18.15	35.6	17.0
22c	34.7	22.2	33.0	21.4	33.6	19.0
23	34.8	22.4	33.9	20.2	32.2	18.5
24	35.2	22.5	32.6	19.6	32.5	18.4
25	35.4	22.4	36.6	19.6	37.1	17.5
Average	34.4		33.0			
	March		April		May	
14	35.55	19.0				
15	31.70	19.5	34.45			
16	31.15	21.0	34.42	22.0	30.53	27.0
17	32.80	20.0	35.00		34.98	25.0
18	31.15	20.5			32.75	28.5
19	32.25	19.5				
20	33.90	20.5	37.20		29.98	29.0
21	36.10	20.5	38.31		27.20	28.5
22	36.65	22.2	36.64		23.32	28.5
22b	38.30	20.0	34.42		29.98	27.0
22c	37.75	21.3				
23	39.95	21.0	33.87		22.21	
24	39.95	21.0	33.87			
25	39.40	21.0			32.20	
Average	35.47	20.5	35.35	22.0	29.24	27.6
	June		July		August	
14			38.306	23.5	38.860	29.5
15			35.534	28.5	38.306	28.0
16			38.306	30.5	38.306	30.0
17			38.860	29.5	39.414	29.0
18			38.306	30.5	38.306	29.9
19			41.076	30.0	41.076	29.0
20	32.198	29.0	41.630	30.0	41.076	30.0
21			42.198	29.5	41.076	28.0
22	27.760	29.5	38.306	31.0	42.742	29.5

Hydrographic Data by Stations Lower Laguna Madre Area

Station	June		July		August				
	Sal.	W. Temp.	Sal.	W. Temp.	Sal.	W. Temp.			
1a			40.522	29.5	44.410	28.0			
1c	28.868	30.0	37.752	30.5	40.522	29.5			
2			38.860	30.5	39.414	29.0			
3			33.866	30.5	39.414	29.0			
4			33.310	30.5	38.306	29.0			
Average			38.910	29.9	39.665	29.0			
Station	September			October			November		
	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.	Sal.	W. Temp.	Turb.
1	35.534	28.0	53	34.422	28.0	30	33.866	22.0	27
2	36.090	28.5	<25	33.310	28.0	<25	36.644	22.5	<25
3	37.198	28.0	<25	37.198	28.5	<25	36.644	24.0	<25
4	37.198	28.0	<25	34.978	26.5	<25	36.644	23.5	<25
5	37.198	29.0	32	34.978	28.0	<25	37.752	24.0	<25
6	39.968	28.0	<25	38.860	26.5	<25	38.306	23.5	<25
7	38.860	28.5	<25	38.860	28.0	<25	37.198	23.0	<25
8	41.076	27.0	<25	37.198	28.0	<25	37.752	23.0	<25
9	42.186	28.0	27	37.572	28.0	42	36.644	24.0	<25
10a	34.978	28.0	<25	38.860	23.0	75	37.198	23.5	<25
10c	41.630	27.5	<25	40.522	23.5	80	37.752	23.0	<25
11	42.742	28.0	30	39.414	22.5	55	38.860	22.0	25
12	43.298	28.0	68	40.522	22.5	70	40.522	22.0	<25
13	45.518	27.0	55	37.198	22.5	55	43.854	22.5	<25
December									
1				38.306	16	75 ppm.			
2				33.310	17				
3				37.752	13	all remaining			
4				34.978	14.5	stations were			
5				38.306	14	less than 25 ppm.			
6				38.806	12.5				
7				37.752					
8				37.752	10.0				
9				38.860	11				
10a				42.186	11.5				
10c				38.860	10.0				
11				41.076	10.5				
12				43.854	10.5				
13				48.292	10.5				

less than

Table 11--Continued

Hydrographic Data by Station
Lower Laguna Madre Area

TIDE TABLE

Obtained from Port Director-Willacy County Navigation
District - Gauge located at Port Mansfield, Texas

<u>Date</u>	<u>December</u>	<u>January</u>	<u>February</u>
1	1.0	.8	.6
2	1.0	.7	.7
3	1.4	.7	.6
4	1.4	.6	.5
5	1.2	.4	.4
6	1.0	.4	.4
7	1.1	.4	.4
8	1.3	.4	.5
9	1.4	.4	.6
10	1.5	.4	.8
11	1.6	.4	.8
12	1.6	.4	.9
13	1.6	.4	.9
14	1.6	.6	.8
15	1.6	.5	.6
16	1.6	.4	.6
17	1.6	.4	.7
18	1.7	.4	.6
19	1.7	.4	.5
20	1.5	.5	.4
21	1.0	.5	.6
22	1.0	.6	.8
23	1.0	.6	.3
24	1.3	.6	.3
25	1.2	.7	.3
26	1.0	.6	.3
27	.8	.4	.3
28	.8	.5	.3
29	.7	.7	
30	.7	.7	
31	.7	.4	

Table 11-Continued

Record of relative tide levels at Port Mansfield in tenths of feet
obtained from the Harbormaster's Office, Port Mansfield, Texas

<u>Date</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October*</u>	<u>November</u>
	.6	.7	1.8	.8	1.1	.6	.7	.8	.6
	.6	.7	1.8	.7	1.0	.5	.7	.8	.4
	.7	.7	1.5	.7	.8	.5	.7	.6	.4
	.8	1.1	1.6	.7	.8	.5	.7	.7	.4
	.8	.8	2.0	.8	.9	.5	.6	.7	.4
	.7	.7	1.8	.7	1.0	.5	.7	1.0	.4
	.6	.7	1.8	.7	1.1	.5	.7	1.0	.6
	.5	.6	1.8	.7	.9	.5	.7	1.1	.6
	.6	.5	1.8	.7	.8	.5	.7	1.3	.7
	.6	.5	2.1	.7	.8	.5	.7	1.5	.7
	.6	.3	2.1	.7	.6	.5	.7	1.4	.8
	.6	.6	2.4	.6	.6	.5	.8	1.7	.8
	.6	.7	2.3	.5	.6	.5	.9	1.9	.9
	.7	.7	1.9	.5	.7	.5	1.0	1.9	1.0
	.7	.6	1.9	.5	.8	.6	1.0	2.4	1.0
	.7	.6	1.7	.5	.7	.6	1.2	1.7	1.0
	.7	.6	1.7	.5	.7	.6	1.3	1.7	1.1
	.7	.9	1.8	.5	.6	.6	1.3	1.9	1.1
	.7	1.0	1.5	.5	.6	.6	1.4	1.9	1.0
	.7	1.2	1.7	.6	.6	.6	1.5	1.4	.9
	.7	1.9	1.5	.5	.6	.7	1.4	1.4	.8
	.8	1.2	1.5	.5	.6	.8	1.3	1.4	.9
	1.6	1.6	1.3	.5	.5	.7	1.2	1.3	.8
	1.5	1.8	1.3	.6	.5	.7	1.1	1.0	.9
	.7	1.8	1.1	.8	.5	.6	1.0	1.0	1.0
	.6	1.8	1.0	1.2	.5	.6	1.0	.9	1.0
	.5	1.7	.8	1.2	.6	.6	1.0	.6	1.2
	.6	1.7	.8	1.2	.6	.6	1.3	.6	1.0
	.8	1.8	1.2	1.2	.6	.7	1.0	.6	.9
	.7	1.8	.7	1.2	.6	.7	.9	.6	.8
	.7		.7		.6	.7		.6	

Higher readings may be due to Hurricane Inez

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES

COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT

FINAL (Annual)
~~QUARTERLY~~ PROGRESS REPORT

State Texas

Sub-Project No. 2-12-R-1

Project Title An Evaluation of the Effects of Estuarine Engineering Projects

Sub-Project Title The Effects of Engineering Projects on Galveston Bay Estuaries

Period Covered April 25, 1966 - March 31, 1967

Prepared By Roy B. Johnson Jr. Date May 30, 1967

Approved By Terence R. Leary Date MAY 31 1967

Statement of Project Accomplishment
(Instructions on reverse side)

The Texas Parks and Wildlife Department has contributed 100 per cent of the project costs and with funds new to the commercial fisheries research. The Bureau of Commercial Fisheries has agreed to reimburse the State for 75 per cent of the cost of the project.

INSTRUCTIONS FOR PREPARATION OF PROGRESS REPORTS

Reimbursement for costs of completed project work will be subject to the submission of satisfactory quarterly progress reports no later than 20 days following the close of a quarter.

Progress reports should be prepared as follows:

1. **SUB-PROJECT NO.:** Indicate Bureau sub-project number.
2. **PROJECT AND SUB-PROJECT TITLES:** Titles should correspond with those on other project documents.
3. **PERIOD COVERED:** Indicate the quarter of the year covered by report.
4. **PREPARED BY:** Signature and title of principal investigator preparing report. Indicate date of preparation.
5. **APPROVED BY:** Signatures and title of project leader, coordinator, or other supervisory official. Indicate date of approval.
6. **ABSTRACT:** Summarize overall project accomplishments during the quarter covered by this report. In addition, indicate any problems encountered, progress in relation to time schedules, and recommendations for future work.
7. **PHASE PROGRESS:** Progress and accomplishments should be detailed for each phase of a research or development sub-project. Phase titles should correspond to those listed in the PS&E and Notice of Research or Development Project (Form 2-116b). Present complete results of research or development work, indicating procedures and techniques used, and recommendations useful to other researchers. Estimated phase completion dates should be indicated.
8. **PUBLICATIONS:** List all publications issued or in preparation, indicating titles, authors, publication media, and other pertinent data.

Note: Quarterly reports on construction and coordination projects should adequately summarize progress and accomplishment only, inasmuch as a phase breakdown is not required on project documents.