Job Report

Roy B. Johnson Marine Biologist

Project	No.	MF-R-6 Date August 24, 1965
Project	Name:	Analysis of Populations of Sports and Commercial Fin-Fish and
		of Factors Which Affect These Populations in the Coastal Bays
		of Texas.

Period Covered: January 1, 1964 to December 31, 1964 Job No. 19

Hydrographic and Meteorological Study of the Lower Laguna Madre

<u>Abstract</u>: Water surface temperatures were relatively low in the spring of 1964 due to abnormally low air temperatures in late February and unusually high in November and December. Two days with below freezing temperatures were recorded in February. Rainfall was 11.0 inches below normal in 1964 compared to 8.0 inches below normal in 1963. Salinities were generally higher than in 1963, but were lower in 1964 during early summer. Salinities below 40.0 p.p.t. were recorded from the north end of the bay for the first time since August 1962.

<u>Objectives</u>: To gather information on the hydrography and meteorology of the Lower Laguna Madre.

<u>Procedures</u>: Water samples were taken monthly from each of the 16 hydrographic stations shown in Figure 1. Water surface temperatures were recorded to the nearest 0.1 degree centigrade. Salinity was measured in parts per thousand using specific gravity hydrometers and Knudsen's Hydrographic Tables. Wind direction and velocity, turbidity, tide level and current direction were also estimated at the time each station was occupied.

Air temperature and precipitation data were obtained from the U. S. Weather Bureau at Brownsville, Texas. Tide data were obtained from the Harbormaster at Port Mansfield, Texas. Tide readings were taken daily from a tide gauge at Port Mansfield Harbor.

Findings and

Discussion: Monthly water surface temperatures by station are shown in Table 1. Average monthly air and water temperatures for 1963-1964 are presented in Figure 2. Air temperatures increased from an average of 14.7° C. in February to 30.0° C. in August 1964, and decreased from 28.4° C. in September to 15.6° C. in December.

Below normal air temperatures in late February produced cool water temperatures in the spring of 1964. Water temperatures increased from an average of 7.3 °C. in January to 18.1° °C. in March, and to 23.6° °C. in April. In 1963 average temperatures of 22.5 and 26.7 °C. were recorded in March and April, respectively. Highest water temperatures (29.0-30.0 °C.) were recorded during July, August and September 1964. Mild fall and winter weather was reflected in relatively warm water temperatures in November and December. In these months

average temperatures were 25.8 and 21.0° C., respectively.

Monthly salinities by station are shown in Table 2. Tide, precipitation and salinity data for 1963-1964 are presented in Figure 3. Tides were highest from April to June and from August to November. No abnormal tides were noted. A total of 15.7 inches of precipitation was recorded. Monthly totals of 3.1, 4.9 and 2.8 inches were noted in May, September and December, respectively. Rainfall was 11.0 inches below normal compared to 8.0 inches below normal in 1963.

Salinities were generally higher in 1964 than in 1963, but were much lower in early summer. The average salinity decreased from 47.2 p.p.t. in January to 35.7 p.p.t. in June 1964. This decrease was related to rainfall, high spring tides, and strong southeast winds which circulated relatively low salinity water throughout the bay. The horizontal salinity gradient which normally existed from Station 14 to Station 25 (Table 2) was not observed in June. In this month salinities below 40.0 p.p.t. were recorded at Stations 23-25 for the first time since August 1962. Monthly salinities increased to 40.9 p.p.t. in July and were above 40.0 p.p.t. through December.

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Approved by

Ernest G. Simmons Regional Supervisor

Coordinator

	Month	
	by	
	y Station	(1964)
-10	(oc) p	Madre
Table	erature	Laguna
	Tempe	Lower
	Surface	
	Water	

Dec.	21.0	20.8	21.0	20.5	20.5	19.5	20.5	19.2	21.2	21.3	22.0	21.5	21.7	21.7	22.0	22.0	21.0
Nov.	25.7	26.0	26.1	25.6	26.5	25.5	25.5	26.5	25.0	26.0	25.5	25.0	26.0	26.0	25.7	25.8	25.8
Oct.	24.5	24.5	24.5	23.6	24.8	23.8	24.5	24.2	17.6	19.7	19.0	19.0	18.5	19.0	19.7	17.9	21.6
Sept.	29.3	29.7	29.7	29.5	29.6	29°2	29.6	29.1	31.0	30.6	30.6	31.9	30.7	29°1	29.9	29.9	30.0
<u>Aug.</u>	30.6	29.0	29.8	30.0	30.2	29°9	27 ° 2	29 . 3	29.9	30°0	29.6	30.0	30.0	30 . 1	30.1	30,2	29.7
<u>July</u>	28.4	28.0	29.5	28.7	29.5	28.6	28.7	28.8	29.6	31.2	29.4	29.6	31.1	31,2	30.7	30.7	29.6
June	27.0	26.8	27.7	27.5	27.7	27.5	27.5	27.0	28.4	29.7	29.5	29.5	29.5	28.4	28.3	28,1	28.1
May	26.8	27.4	28.8	27.0	29 .0	28.1	26.6	27.2	25.4	28.3	26.6	26.0	27。4	27.1	27 ° 0	26。6	27.2
<u>Apr.</u>	21.5	22.3	23.5	1	23.4	23.4	22 ° 0	22.2	23.5	24.0	23.5	23.0	23.6	26 °4	26 . 0	25 ° 5	23.6
Mar.	18.4	17.5	18.8	20.0	18.5	16.8	18.5	17.2	16.8	18.2	18.3	17.7	18.3	18, 6	17.9	18.5	18.1
Feb.	17.2	16.5	17.5	16.8	17.1	16.5	15,9	20.2	17,2	17.2	18.4	18.9	17.5	17 .4	18.0	18.0	17.5
<u>Jan.</u>	5.2	7.3	6.3	6.4	7.1	6 , 0	6.8	6 .6	7 . 3	8°0	8°5	8 ,5	8.1	8。0	8 , 2	8.5	7.3
Station	14	15	16	17	18	19	ICW #119	20	21	22	22a	22b	22c	23	24	25	Average

÷ i Table 2 Salinity (p.p.t.) by Station by Month Lower Laguna Madre (1964)

Station	Jan.	Feb.	<u>Mar.</u>	<u>Apr.</u>	May	June	July	<u>Aug.</u>	Sept.	Oct.	Nov.	Dec.	Avg.
14	37.6	35.5	36.0	32.5	32.0	36.4	37.4	41.9	38.3	34.9	36.2	38.8	36.5
15	38.7	36.1	35.7	32.8	32.2	36.0	37.1	36.7	37.5	34.9	36.0	36.3	35.8
16	42.8	41.6	38.2	35.9	33.9	37.2	39.4	38,3	39.3	37.0	36.3	39.6	38.3
17	44.9	41.7	42.6	l l	34.5	37.2	40.6	39.1	37.5	38.7	38.7	36.8	39.3
18	41.4	40.4	39.3	38.5	32.8	37.2	40.7	38.0	39.3	38.0	36.7	38.1	38.4
19	47.6	44.3	42.1	39.8	37.7	35.6	41.3	40.7	39.5	38.7	41.1	40.7	40.8
LCW 非119	40°7	38,5	36.0	32.7	31.8	37.2	38.7	36.7	37.1	36.7	37.1	35.2	36.5
20	45.1	45.6	45.2	41.3	38.1	36.4	41.5	43.2	42.9	41.3	41.0	42.3	42.0
21	49°8	46.4	44.8	44.6	40°6	33.7	41.8	43,3	43.8	45.5	43.2	42.8	43.4
22	45.4	47.3	45.8	46.4	42.1	35.0	41.4	47.3	44.8	47.5	45.6	48.0	44.7
22a	52,8	47.8	46.5	46.1	41.0	35.3	42.3	48°4	46.2	51.1	44.6	46.1	45.7
22b	52.8	47.7	45°7	48.9	41.4	33,8	41.9	49°0	44°0	50.0	43.3	47,3	45.5
22c	52,9	45.7	45.6	45.1	41°7	33.8	42.2	48.0	47.0	46.4	45.4	45.9	45.0
23	51,6	48.2	48.5	45.6	42.9	36.9	43.0	46°9	40°2	47.4	46.1	48.0	45,5
24	53°4	50,8	52,3	45.5	42.6	36 , 9	42,8	48,0	47°1	50.6	47.5	49.8	47.3
25	58.4	52.5	54.9	44.6	40.8	33.7	42.3	48.5	47.7	58,5	50,1	52.5	48.7
Average	47.2	44.4	43.7	41.4	37.9	35.7	40.9	43.4	42.0	43.6	41.8	43.0	





