Job Report

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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, 1963 to December 31, 1963 Job No. 15

Hydrographic and Meteorological Study of the San Antonio Bay System

Abstract: Air temperatures ranged from a monthly average low of 8° C. in January to a high monthly average of 30° C. in late August.

Precipitation was below normal, averaging slightly over 1-inch per month. Two high months were June and November with 6.76 and 6.56 inches.

Wind velocities were higher than in 1962, averaging 25-30 miles per hour in March, April, May, and June. During this same period in 1962 they averaged 12-18 miles per hour.

Salinities were higher than in 1962. Range was 20 to over 40 parts per thousand, with the average being slightly over 30 parts per thousand.

Water temperatures ranged from 8° C. to over 30° C., about the same as in 1962.

Turbidities ranged above 50 parts per thousand in San Antonio Bay, and below 50 parts per thousand in Espiritu Santo Bay.

River discharge for the period October 1962 to September 1963 was 550,900 acre-feet. This is below the year October 1961 to September 1962 when 932,500 acre-feet were discharged. These are both below the 28-year average of 1,527,900 acre-feet per year.

Objectives: To compile hydrographic and meteorological data for the San Antonio Bay system.

Procedures: Six stations located in San Antonio and Espiritu Santo Bays were sampled twice each month, when possible. In addition, one station at Chicken Foot Reef was sampled monthly. These seven stations were used to provide a complete hydrographic coverage of this area. A surface water sample was collected at each station.

Salinities were determined with specific gravity hydrometers, reading directly in parts per thousand salinity. Temperature corrections of hydrometer readings were made at the time of sampling. Water temperatures were taken with a Centigrade scale thermometer. Turbidities were determined with the visual platinum wire method.

Information on precipitation and air temperatures were taken from U. S. Weather Bureau records recorded at Port Lavaca Station Number 2.

River flow data were taken from unpublished records of the United States Department of the Interior, Geological Survey, Water Resources Division.

Readings of flow data for the Guadalupe River were taken at Victoria, and for the San Antonio River, at Goliad.

Figure 1 is a map showing hydrographic sampling stations. Figures 2 through 8 show water temperatures in degrees Centigrade, and salinity in parts per thousand, at all sampling stations. Figure 9 shows turbidity, in parts per thousand, in San Antonio Bay. Figure 10 shows turbidity, in parts per thousand, in Espiritu Santo Bay. Figure 11 shows total monthly precipitations, in inches, taken at Port Lavaca. Figure 12 shows average monthly air temperatures in degrees Fahrenheit taken at Port Lavaca. Figure 13 shows the combined flow of the San Antonio and Guadalupe Rivers, in thousands of acre-feet. These records shown start in October and continue through September of the following year.

tober 1962-September 1963.

ndings and
scussion: Climatological Data:

Air Temperature--Air temperatures ranged from a monthly average low of C. in January to a high monthly average of 30° C. in August. After the August gh, temperatures gradually decreased toward the end of the year to a low of 0° C. monthly average in December.

Precipitation--Rainfall was below normal, and 1963 may be considered a year drought. The average for the year is slightly over 1-inch per month. In ne 6.76 inches of rain fell, and in November 6.56 inches, the only appreciable ounts during the year.

Wind--Wind velocities were above normal during the months of March, April, y, and June. Velocities varied from 15 to 45 miles per hour, with the average ing 25-30 miles per hour. These were mostly south winds, occasionally shifting the north during spring northers.

During this same period in 1962 wind velocities averaged 12-18 miles per ur from the south, with occasional shifts to the north.

Hydrographic Data:

Salinities--Salinities in the San Antonio Bay system were considerably gher in 1963 than in 1962. The salinity range was 20 parts per thousand to er 40 parts per thousand. In 1962 the range was 6 parts per thousand to 40 rts per thousand, the average being 20 parts per thousand. Most stations in 63 averaged over 30 parts per thousand.

Water Temperature--The range of water temperatures was from a low of 8° C. January to a high of slightly over 30° C. in late August and early September.

Water temperatures were generally about the same as in 1962, with the ception of the January 1962 low of at least 2° C.

Turbidity--Turbidities were consistently above 50 parts per thousand in n Antonio Bay, and generally below 50 parts per thousand in Espiritu Santo y.

Turbidities in San Antonio Bay ranged from 50 parts per thousand in October 118 parts per thousand in November. The range in Espiritu Santo Bay was from high of 60 parts per thousand in January to a low of 30 parts per thousand in rch, September, October, and November.

River Discharge--The combined flow of the San Antonio and Guadalupe Rivers s collected over a surface area of 9,079 square miles. These two rivers join, provide the only river discharge reaching this bay system.

After the peak discharge of 180,550 acre-feet in November 1961, the discharge clined to a low of 13,540 acre-feet in August 1963.

In June 1962 there was a slight recovery of flow to 93,860 acre-feet, and again in February 1963, a lesser rise to 79,330 acre-feet of discharge. After February 1963, the river discharge declined steadily to the low of August 1963. During the severe drought of 1955-56 the least river discharge recorded was 5,110 acre-feet in June 1956.

A total of 932,500 acre-feet of river discharge was recorded for the year October 1961-September 1962. In the October 1962-September 1963 period the rivers discharged only 550,900 acre feet. This is about one-third of the average yearly discharge of 1,527,900 acre-feet per year, averaged over a 28-year period. However, this is still much more than during the 1955-56 drought when the discharge declined to 156,810 acre-feet during the October 1955-September 1956 period.

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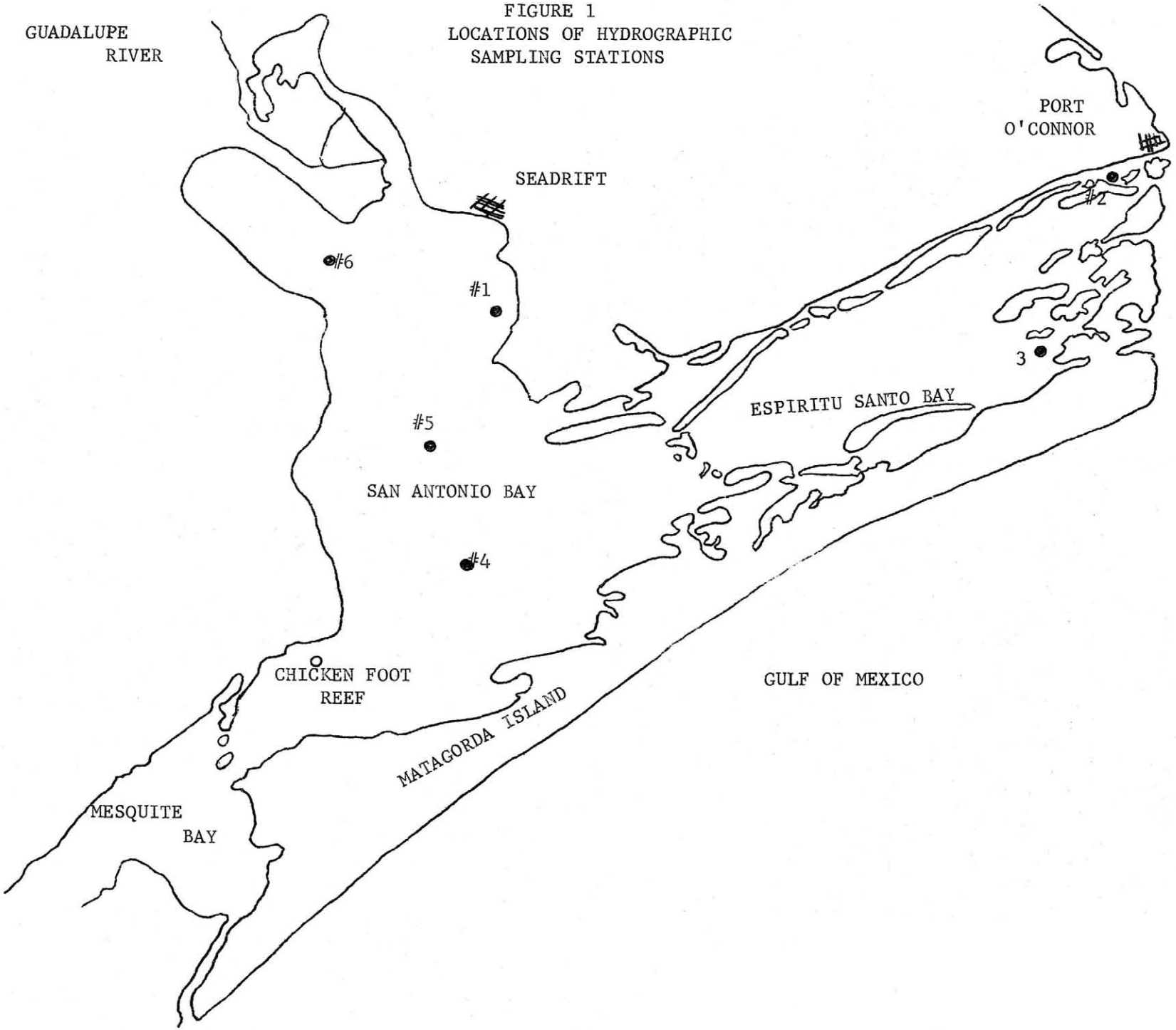

FIGURE 1
LOCATIONS OF HYDROGRAPHIC
SAMPLING STATIONS

FIGURE 2
Station #1
Temperature & Salinity

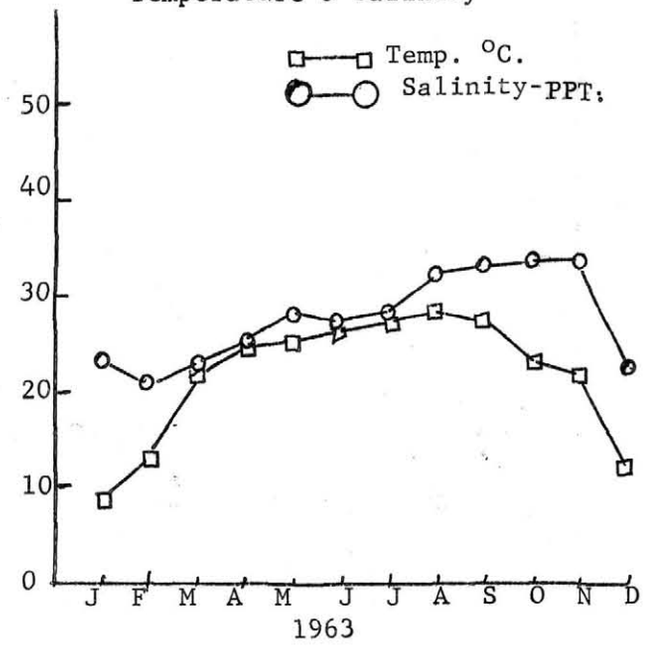

FIGURE 3
Station #2
Temperature & Salinity

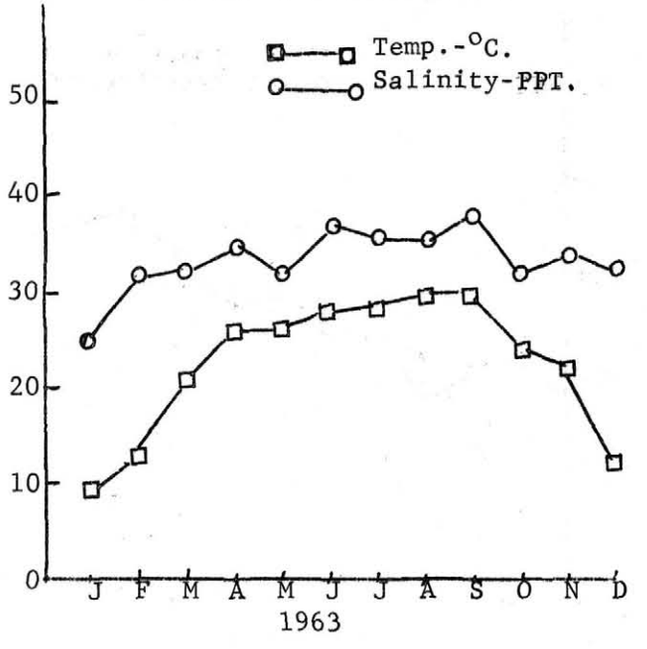

FIGURE 4
Station 3
Temperature & Salinity

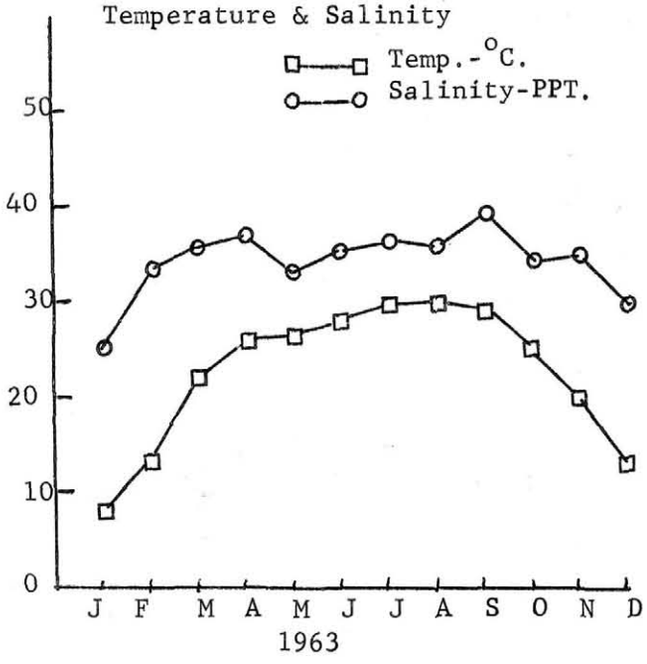

FIGURE 5
Station 4
Temperature & Salinity

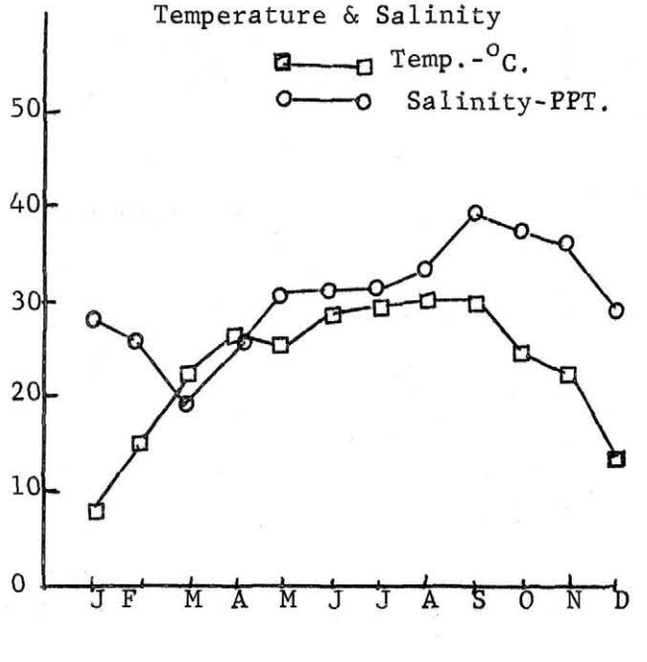

FIGURE 6
STATION 5
Temperature & Salinity

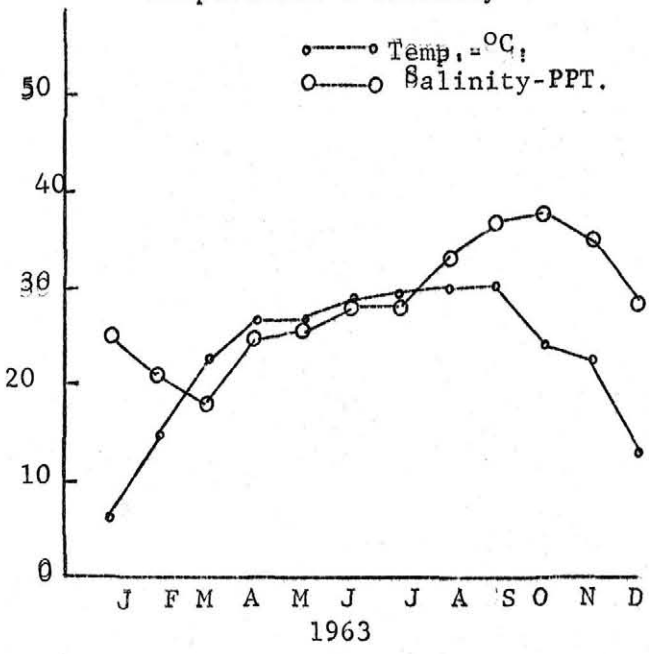

FIGURE 7
STATION 6
Temperature & Salinity

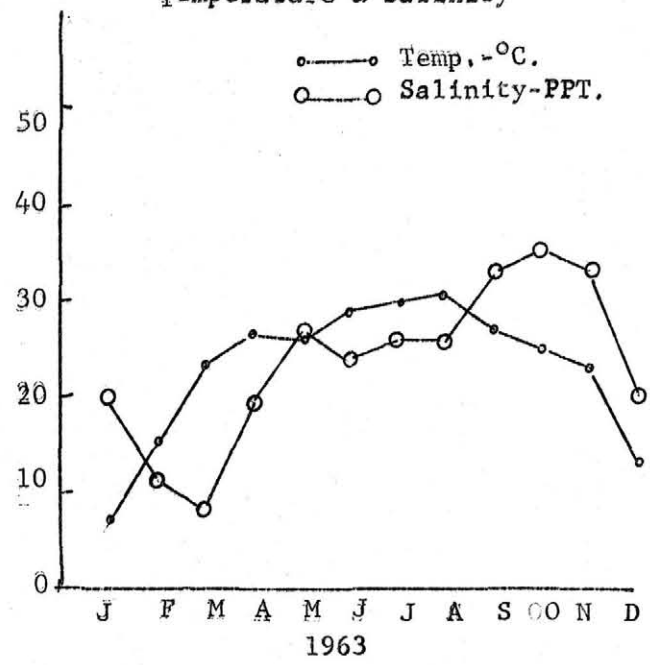

FIGURE 8
CHICKEN FOOT REEF
Temperature & Salinity

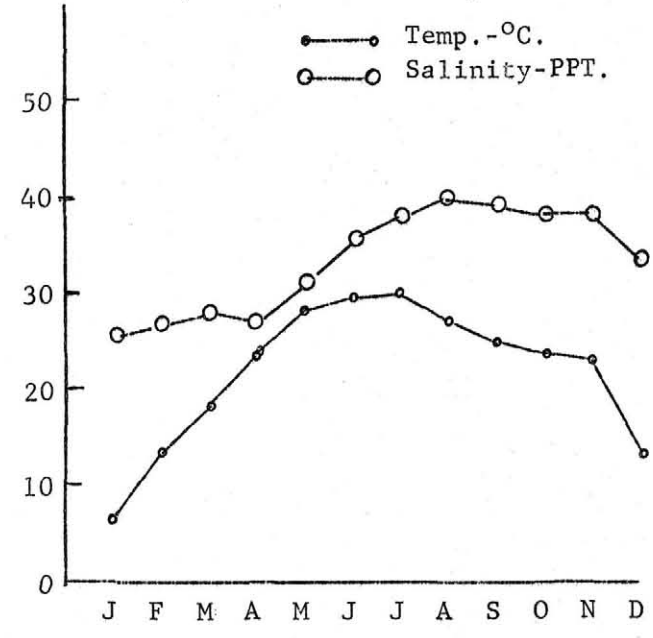

FIGURE 9
SAN ANTONIO BAY
Turbidity in PPT

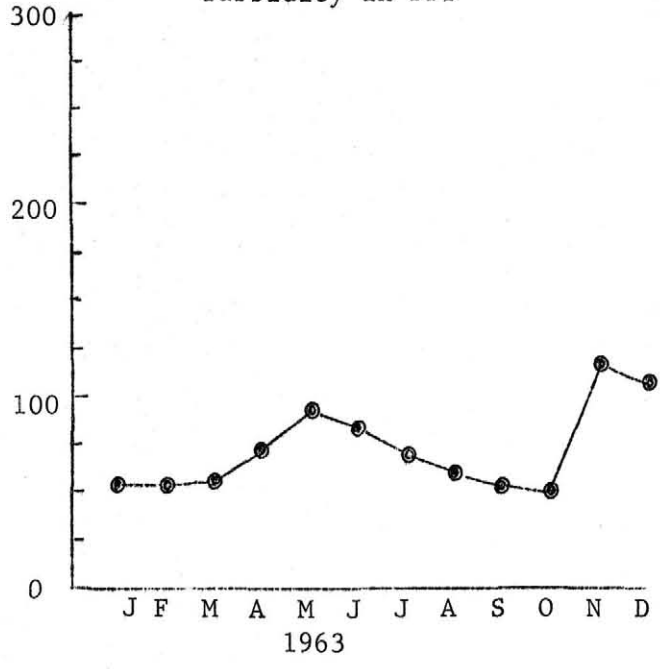

FIGURE 10
ESPIRITU SANTO BAY
Turbidity in PPT

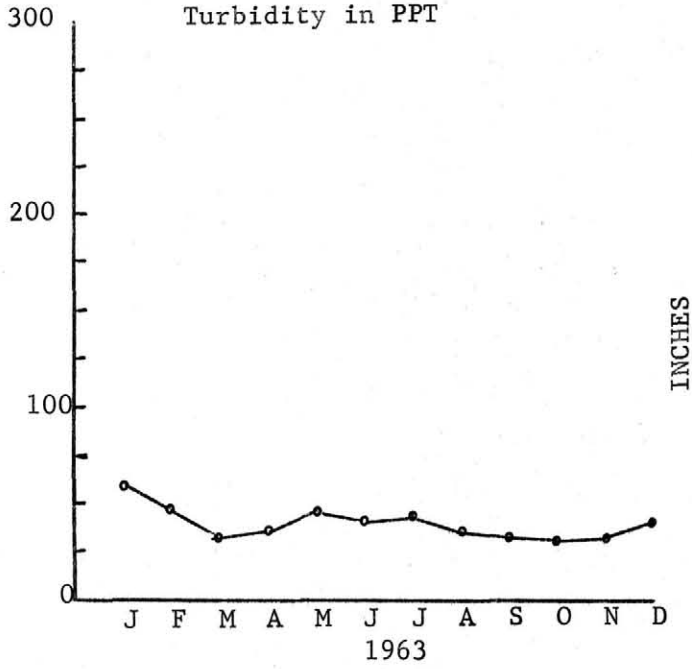

FIGURE 11
Precipitation
Area M-5

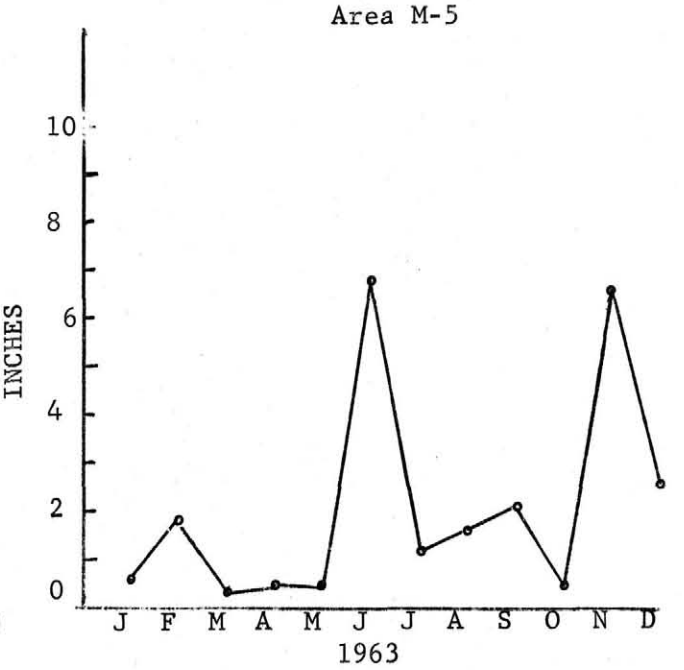

FIGURE 12
AREA M-5
Monthly Average Air Temp. in $^{o}F.$

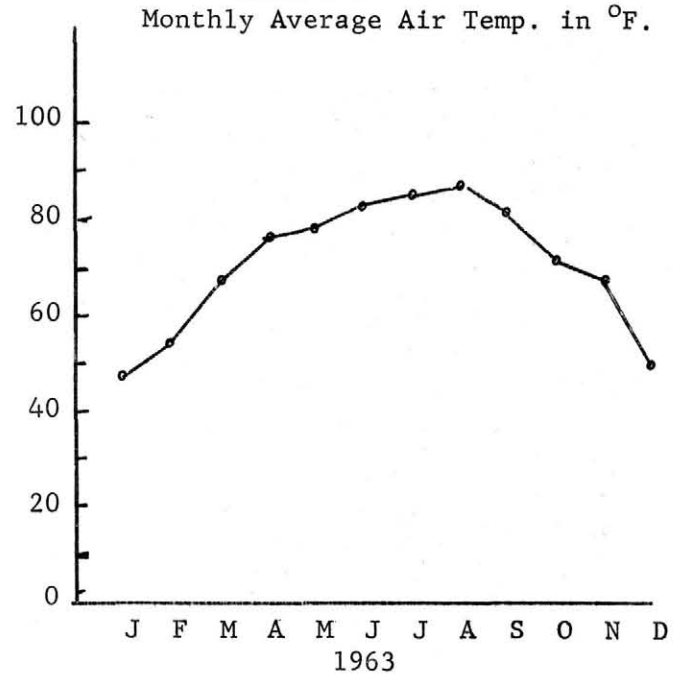

FIGURE 13
RIVER DISCHARGE REACHING SAN ANTONIO BAY
IN THOUSANDS OF ACRE FEET