Job Report

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Project Name: Survey of Oyster Populations and Associated Organisms

Period Covered: September 1, 1961 to December 31, 1962 Job No. 5

Study of Oyster Growth and Population Structure in Aransas, Mesquite and Copano Bays

Abstract: Population studies conducted in Aransas, Mesquite and Copano Bays have shown an increase in growth rate and population abundance over that found during the 1961-1962 study.

Dermocystidium marinum, a parasitic fungus prevalent in the area, did not cause any noticeable mortalities, a factor which was reflected by an increase in survival rate of commercial size oysters.

Salinities in Aransas, Mesquite and Copano Bays have shown a correlated increase with a decrease in precipitation. Salinities during the late summer months extended above the 25.0 o/oo average and in some areas were as high as 38.0 o/oo creating conditions comparable to those found during the 1951-1957 drouth.

Objective: To obtain data on the growth rate and population density of oysters in Aransas, Mesquite, and Copano Bays for use in making management recommendations and to determine the commercial oyster harvest centers in these bays.

Procedure: Monthly population samples were collected by a one bushel oyster dredge pulled by a power boat. Each sample was calibrated by volume using a U. S. standard bushel capacity box (2,150 cubic inches). All oysters in the calculated bushel were measured in millimeters and a count sheet utilized for recording data. Count and measurement data were transferred to an oyster population sample sheet (Figure 1). Oyster measurements were then grouped into five millimeter classes and divided into three classifications; spat, seed, and market size oysters. Data pertaining to hydrography, associated organisms, and methods of obtaining samples were also recorded on the data sheet.

Sample stations for Aransas Bay were selected on a basis of ecological and hydrographic conditions. Three stations were established in Aransas Bay (Figure 2). The first is at Pintail Reef, an artificially constructed reef in an area which normally has salinities approaching that of gulf waters (33-38 o/oo) and supports a number of organisms commonly found in high salinities. The second station was established at Long Reef, an old natural reef on the east side of Aransas Bay in an area of moderate salinity (15-25 o/oo) and has a past history of fluctuating production. The third station was established at Half Moon Reef in an area that generally receives more fresh water than the other stations. This station has a salinity range of 10-20 parts per thousand and supports many low salinity organisms.

One sample station was established in Copano Bay at Lap Reef. The waters in which this station is located, normally has a low salinity range of 10-15 o/oo throughout the year and receives very little commercial fishing pressure.

One station was established at Bray's Cove in Mesquite Bay. This reef is in an area that is normally 25 to 35 parts per thousand salinity. Fresh water which, during floods on the Guadalupe River, empties into San Antonio Bay then into Mesquite Bay sharply decreasing the salinity.

Ten oysters from each monthly population sample were examined for the presence and degree of the parasitic fungus, Dermocystidium marinum. Results of this study are presented in Job Report No. 6, under Project MO-R-4.

Commercial oyster harvest data was obtained through oyster house inquiries and by counts of oyster boats working in the various areas.

Findings and Discussion: Hydrographic Conditions.

The first month of the project year, September 1961, brought a total of 10.32 inches of rainfall into the Aransas Bay area. This was in conjunction with Hurricane Carla, which struck the Texas coast on September 10, 1961. The fifteen months following September 1961, produced less than twenty-five inches of rain. The monthly precipitation totals recorded at Region V headquarters of Rockport, Texas for the sixteen-month project period are shown in Figure 3. Total precipitation for the project period was 34.94 inches. Salinities for Aransas, Mesquite and Copano Bays have approached the level they attained during the drouth of 1951-1957. Corresponding graphs in Figure 4 show monthly salinity recordings for each of the five sample stations. In each instance the salinities show an increase correlation with the decreased rainfall following September 1961.

In January 1962 the Texas coast was severely affected by a freeze which killed many of the shallow and exposed oysters in the local area. Damage to reefs lying in two feet of water or more was not noticed but may account for the poor production from Mesquite Bay reefs which are normally in two to three feet of water. Air temperature recordings taken at the laboratory in Rockport are shown in Figure 5.

Population Characteristics.

Table 1 shows the population structures of each sample station in the three bay areas. The overall population count is divided into three groups for comparison. Spat are those oysters smaller in length from hinge to bill than 26 millimeters. This group of oysters is usually between a few days and a few weeks old. Seed oysters are between 26 and 85 millimeters in size and range in age from two months to two years. Commercial oysters are those larger than 85 millimeters and may range in age from about eighteen months to several years. There is some overlap between each size group in respect to age.

The spat set in Aransas, Mesquite and Copano Bays began in June 1962 and reached its peak the same month. Intermittent spat setting was noted in each successive month through December 1962. The latest spat set, noticed the previous year, was in December 1961.

Pintail Reef was built by the Game and Fish Commission in July 1960 and has been closely checked from that time to the present. Monthly population records (Table 1) show that Pintail Reef has acquired the characteristics of a natural reef and is producing a good number of marketable size oysters. The reef has not been worked by commercial oystermen but indications are that it would now be a commercially productive reef.

Production and Harvest.

Mesquite Bay, located to the north of Aransas Bay (Figure 2), was a moderately productive area during the 1961-1962 oyster season with approximately 6,343 pounds of oyster meats harvested. The September through December period of the 1962-1963 oyster season showed no production from Mesquite Bay.

Aransas and Copano Bay harvest records were combined for the 1961-1962 season showing a total of 5,503 pounds of meats produced in the two bay areas. September through November landing reports showed only 358 pounds produced during the early portion of the 1962-1963 season.

Copano Bay has not been extensively worked during the first part of the 1962-1963 season because of oil pollution which imparts a disagreeable oily taste to the oysters. Some measures have been taken to eliminate pollution in Copano Bay, but the many wells and pipelines in this area make this a most difficult task. However, Copano Bay is valuable as a source of seed oysters for transplanting to private leases and State built oyster reefs. The salinity in Copano Bay (Figure 3) has increased to a point that is comparable to many other bay areas, and the seed oysters receive minimum salinity shock in transplanting.

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Table 1

Oyster Reef Population Samples of Aransas, Mesquite and Copano Bays

Station	Date	% Commercial size oysters	% Seed oysters	% Seed oysters	No. Commercial oysters	No. seed oysters	No. Spat	No. Bu.
1. Pintail	9/25/61	1.00	47.30	51.70	2	92	101	195
	10/17/61	0.00	61.00	39.00	0	188	77	265
	11/ 9/61	3.20	79.80	17.00	9	226	48	283
	12/17/61	8.84	77.91	13.25	22	194	33	249
	1/30/62	1.00	99.00	00.00	2	178	0	180
	2/21/62	4.27	87.20	08.50	7	143	14	164
	3/16/62	2.00	95.00	03.00	4	237	8	249
	4/18/62	0.00	76.36	23.64	0	210	65	275
	5/10/62	6.39	89.89	03.72	12	169	7	188
	6/12/62	0.85	13.11	86.04	24	368	2416	2808
	7/25/62	0.73	14.15	85.12	12	232	1396	1640
	8/23/62	1.89	59.75	38.36	3	95	61	159
	9/25/62	5.38	61.55	33.07	27	309	166	502
	10/31/62	1.16	43.99	54.85	6	227	283	516
	11/29/62	4.35	65.94	29.71	24	364	164	552
	2/17/62	8.84	77.91	13.25	22	194	33	249
				Average	10.2	213.5	304.5	
2. Long Reef	9/25/61	3.70	72.00	24.30	8	154	53	156
	10/27/61	0.60	59.70	39.70	2	188	125	315
	11/ 9/61	2.60	75.65	21.75	8	233	67	308
	12/19/61	4.01	81.12	14.85	10	202	37	249
	1/30/62	9.81	79.44	10.75	21	170	23	214
	2/21/62	2.84	88.64	08.52	5	156	15	176
	3/21/62	6.25	85.94	07.81	12	165	15	192
	4/18/62	10.47	76.96	12.57	20	147	24	191
	5/10/62	2.41	88.94	08.65	5	185	18	208
	6/11/62	0.82	09.24	89.94	16	180	1752	1948
	7/25/62	0.00	16.02	83.98	0	316	1656	1972
	8/31/62	0.20	29.26	70.54	1	146	352	499
	9/25/62	0.75	64.76	34.49	6	522	278	806
	10/31/62	0.58	72.32	27.10	7	870	326	1203
	11/29/62	1.09	63.68	35.23	8	470	260	738
	12/17/62	1.89	89.59	08.52	6	284	27	317
				Average	8.4	274.3	314.3	

Table 1--Continued

Station	Date	% Commercial size oysters	% Seed oysters	% Seed oysters	No. Commercial oysters	No. seed oysters	No. Spat	No. Bu.
3. Bray's Cove	10/17/61	4.70	69.60	25.70	17	257	95	369
	11/ 9/61	3.20	79.80	17.00	9	226	48	283
	12/19/61	9.22	82.89	07.89	14	126	12	152
	1/30/62	3.55	92.90	03.55	12	314	12	338
	2/ 5/62	10.80	73.80	15.40	21	144	30	195
	3/ 8/62	7.94	89.89	02.17	22	249	6	277
	4/18/62	5.65	84.78	09.57	13	195	22	230
	5/10/62	8.68	76.58	14.58	25	221	42	288
	6/11/62	0.90	06.59	92.51	28	204	2864	3096
	7/25/62	1.28	25.11	73.61	24	468	1372	1864
	8/31/62	1.65	69.33	29.02	13	547	229	789
	9/25/62	1.82	75.79	22.39	12	501	148	661
	10/31/62	0.00	65.22	34.78	0	647	345	992
	11/29/62	2.95	76.79	20.25	14	364	96	474
	12/17/62	1.33	87.38	11.29	4	263	34	301
				Average	15.0	323.0	357.0	
4. Half Moon	9/25/61	3.80	81.20	15.00	6	126	23	155
	10/18/61	2.20	65.80	32.00	6	183	89	278
	11/10/61	0.40	77.60	22.00	1	190	54	245
	12/19/61	2.86	90.28	06.86	5	158	12	175
	1/30/62	5.66	87.74	06.60	6	93	7	106
	2/21/62	3.85	75.00	21.15	8	156	44	208
	3/21/62	6.32	84.48	09.20	11	147	16	174
	4/16/62	0.54	73.57	25.89	2	270	95	367
	5/10/62	1.76	81.50	16.74	4	185	38	227
	6/12/62	0.57	16.79	82.64	12	356	1752	2120
	7/19/62	1.34	16.41	82.25	28	344	1724	2096
	8/23/62	0.72	66.91	32.37	1	93	45	139
	9/ 6/62	0.52	84.27	15.21	3	482	87	572
	10/31/62	0.73	62.13	37.14	7	592	354	935
	11/29/62	0.26	63.23	36.51	2	478	276	756
	12/17/62	1.89	89.59	08.52	6	284	27	317
				Average	6.8	258.5	289.7	

Table 1--Continued

Station	Date	% Commercial size oysters	% Seed oysters	% Seed oysters	No. Commercial oysters	No. seed oysters	No. Spat	No. Bu.
5. Lap Reef	9/25/61	1.20	72.10	26.70	3	182	68	253
	10/18/61	0.00	63.10	36.90	0	113	66	179
	11/10/61	0.60	68.80	30.60	2	216	96	314
	12/19/61	0.53	83.96	15.51	1	157	29	187
	1/30/62	0.58	90.06	09.36	1	154	16	171
	2/ 5/62	7.14	89.56	03.30	13	163	6	182
	3/21/62	3.33	93.34	03.33	3	84	3	90
	4/16/62	1.54	83.47	14.96	4	212	38	254
	5/10/62	0.82	86.89	12.29	2	212	30	244
	6/11/62	0.85	13.11	86.04	24	368	2416	2808
	7/19/62	0.00	08.53	91.47	0	200	2144	2344
	8/31/62	0.00	20.80	79.20	0	141	537	678
	9/26/62	0.00	78.99	21.01	0	534	142	676
	10/31/62	0.00	74.43	25.57	0	652	224	876
	11/29/62	0.64	85.82	13.54	6	811	128	945
	12/17/62	1.33	92.68	05.99	6	418	27	451
				Average	4.06	288.6	373.1	

Table 2

Oyster Production for Aransas and Mesquite Bays (in pounds)
September 1961 - December 1962

Month	Aransas	Mesquite
September 1961	---	---
October 1961	---	---
November 1961	936	184
December 1961	1890	---
January 1962	105	1050
February 1962	---	2187
March 1962	332	2074
April 1962	2240	848
September 1962	---	---
October 1962	---	---
November 1962	358	---
December 1962	---	---
Total	5861 pounds	6343 pounds

Figure 1
OYSTER POPULATION SAMPLE

Biologist_____ Date of Sample_____

Name of Reef_____ Name of Bay_____

Bottom Salinity_____ o/oo Bottom Temperature_____ °C

Sample Type: Population_____ Market_____ D. Marinum_____ Disease_____

Sample Method: Dredge_____ Tong_____ Hand_____

Area Sampled_____ Sample Volume_____

Oysters - No./Sample

Class	Spat			Seed			Market			
Group	3		28		58		88		118	
	8		33		63		93		123	
	13		38		68		98		128	
	18		43		73		103		133	
	23		48		78		108		138	
			53		83		113		143	

Class	Number	Percentage
Spat		
Seed		
Market		
Total		

% of Trash: _____

Associated Organisms:

Predators_____

_____

Fouling Organisms_____

_____

Other Organisms_____

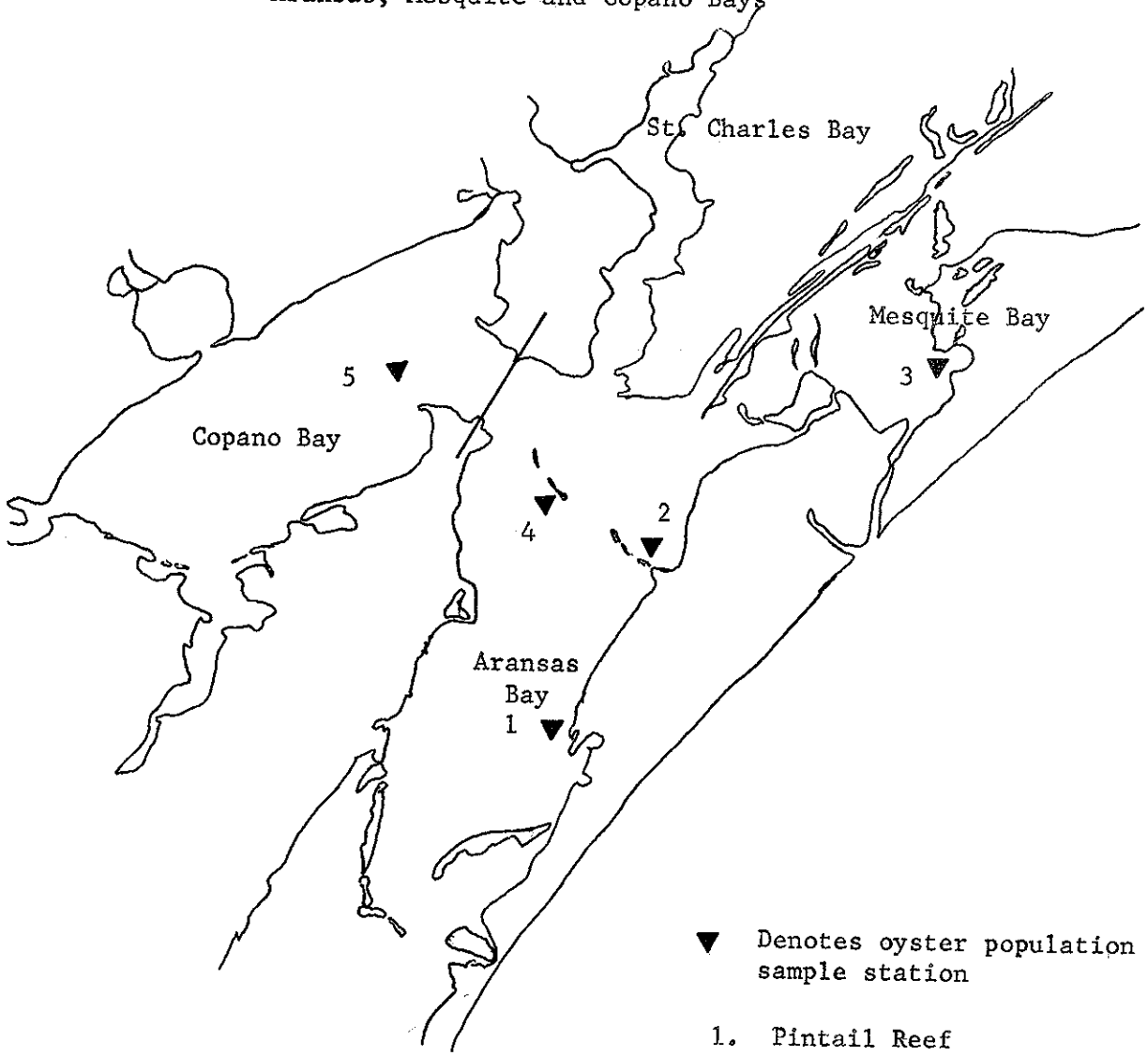
_____

Remarks_____

_____

_____

Figure 2
Oyster Population Sample Stations for
Aransas, Mesquite and Copano Bays



▼ Denotes oyster population sample station

1. Pintail Reef
2. Long Reef
3. Bray's Cove Reef
4. Half Moon Reef
5. Lap Reef

Figure 3

Aransas Bay Monthly Precipitation Totals

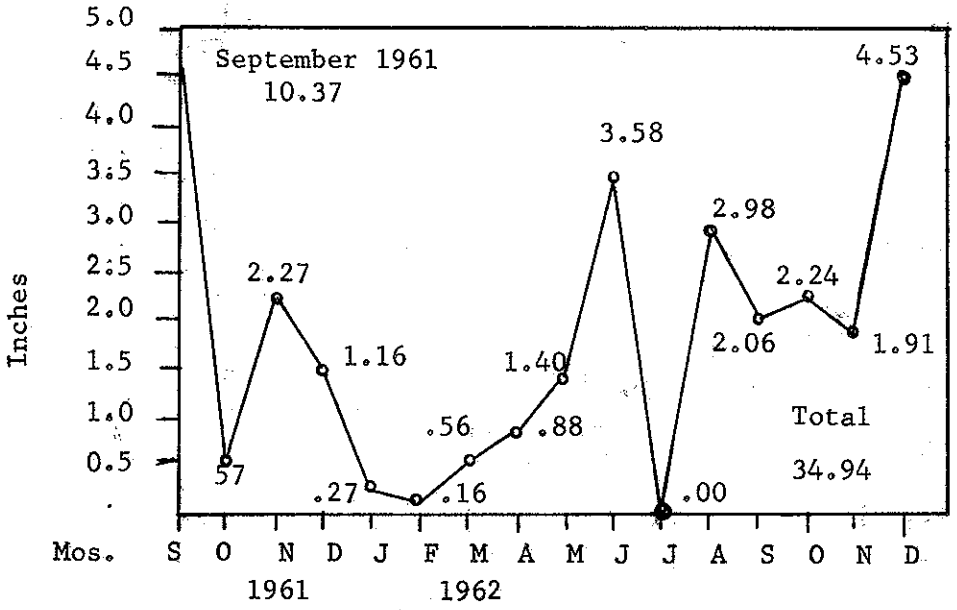


Figure 4

Monthly Salinity Recordings for Sample Stations

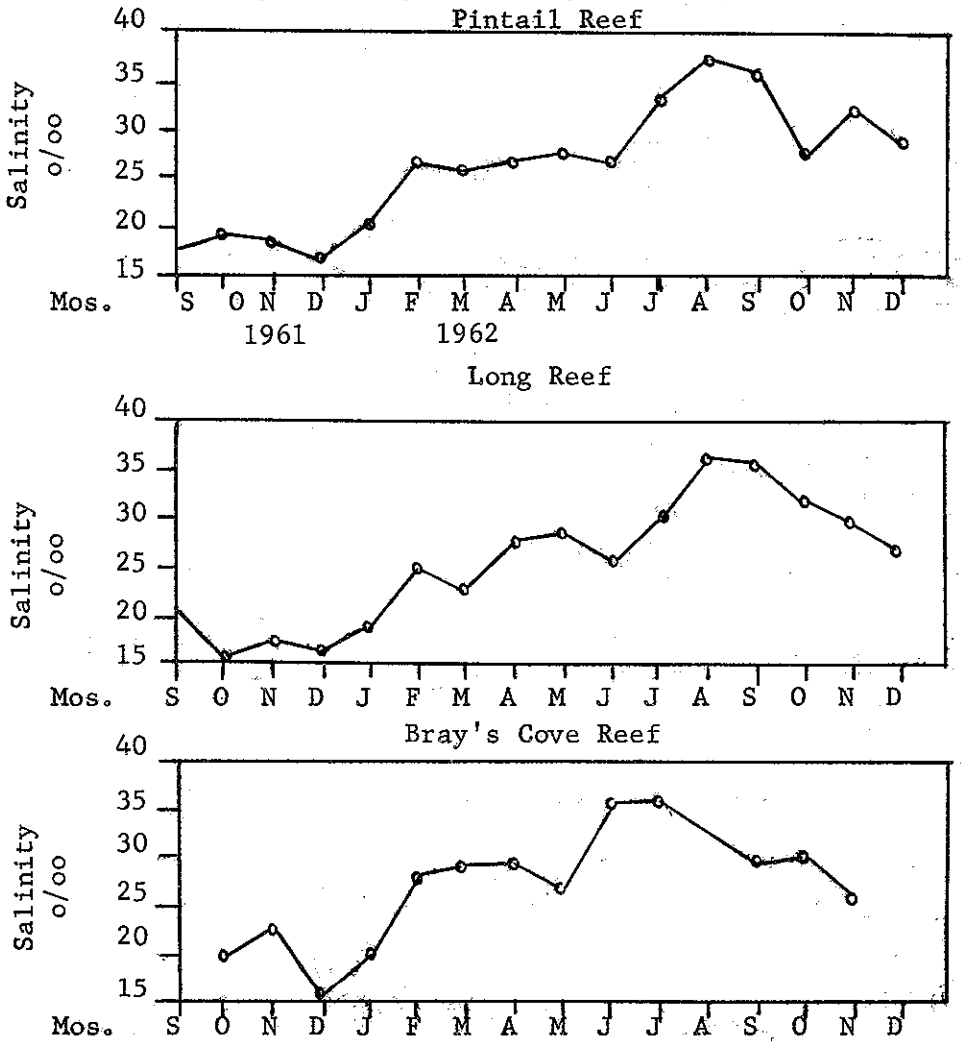


Figure 4--Continued

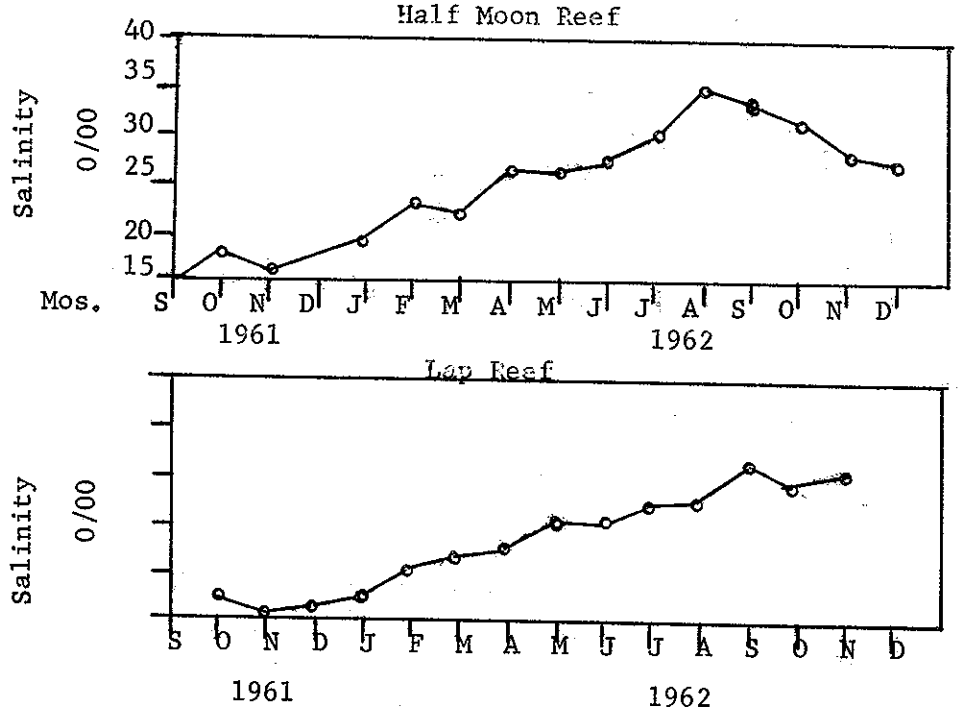


Figure 5