

Job Report

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Survey of Oyster Populations
in Aransas and Copano Bays

Abstract: Population studies of five reefs in Aransas and Copano Bays have shown that the oyster growth was retarded during the months of November, 1960 through March, 1961, by an overabundance of fresh water from abnormally heavy rainfall in the central coastal region.

Copano Bay had heavy mortality from the fresh water on the reefs near Mission Bay and the Aransas River. Spat set in June and July, 1961, was heavy, creating an overabundance of small oysters on the reefs in the two bays.

Objective: To make a survey of the growth and condition of oysters in Aransas and Copano Bays.

Procedure: Five sample stations were established for monthly population counts and Dermocystidium marinum checks. Four stations were in Aransas Bay and one in Copano Bay (Figure 1). A standard bushel of oysters from each sample station was counted and measured. The percentages and number of the commercial size oysters (3.5 inches or larger) and seed oysters (under 3.5 inches) were recorded. These figures are shown in Table 1.

Each oyster in the bushel sample from each station was measured to the nearest centimeter, and all were then grouped into centimeter classes (Figures 2-6). All samples were taken with a commercial-type oyster dredge. None of the samples were culled, and only the live oysters were counted.

The results from the Dermocystidium marinum samples are reported in Job Completion Report B-2c under Project No. MO-2-R-3.

Findings: The four sample stations in Aransas Bay--Pintail Reef, Paul's Mott Reef, Long Reef, and Half Moon Reef--have shown good late growth and had a heavy spat set during the May, June, and July, 1961 period. Expected growth during the winter months--November 1960 through March 1961--was sharply retarded by fresh water entering Aransas Bay through Copano Bay and by drainage from San Antonio Bay. Growth patterns are shown in the monthly population graphs presented in Figures 2-6. Heavy rainfall in the central coastal region in October 1960, with additional precipitation in November and December, lowered salinities in some sections of the bay below the minimum needed for oysters to survive through extended periods of time. Mortality in Aransas Bay was not severe, but the growth was retarded; and this, combined with a heavy spat set that occurred during the early summer months, has created an overabundance of small oysters on the reefs. The number and percentage of commercial size oysters is very low and the reefs are beginning to become populated with

clusters of small unmarketable oysters.

Monthly precipitation recordings made at the Marine Laboratory in Rockport are shown in Table 2.

Copano Bay was severely damaged by fresh water entering the bay through the Mission River and the Aransas River. All reefs near the mouths of these rivers were completely killed. By January 1961, over ninety percent of the oysters on Copano Reef, the monthly sample station for Copano Bay, had succumbed to fresh water (Figure 6). Salinity recordings are shown in Table 3. The sample for February 1961 produced no live oysters from the entire reef area. A survey of Copano Bay during this same month found that all the oysters in the vicinity of Mission Bay, where the Mission River enters Copano Bay, were killed. The monthly sample station was then changed to Lap Reef, located near the junction of Copano Bay and Aransas Bay. Lap Reef was one of the least affected by the fresh water and was used as a check station from March to August, 1961. Additional checks in June and July on the reefs previously killed indicated that a heavy spat set had occurred and many small oysters were present in the area. Indications are that the population has been re-established in the upper portion of the bay, and a commercial harvest could be obtained within the next two years if conditions remain favorable.

Pintail Reef, the artificial reef near St. Joseph Island, has been checked closely from the time of its construction. (The report of the construction and seeding of this reef is presented in Job Completion Report B-3b under Project No. MO-2-R-2, 1959-1960.) In July, 1960, one hundred and fifty barrels of seed oysters were transplanted from Copano Bay to the artificial reef. Repeated checks were made on the survival of the seed stock and whether the cultch shell would be adequate to collect oyster spat. These seed oysters did not spawn during the late summer months of 1960 as anticipated, and approximately 40 percent had died from unknown causes within eight weeks after planting. The cultch shell became heavily populated with jingle shells, Anomia simplex, and slipper shells, Crepidula plana and C. fornicata. An influx of fresh water in October 1960 lowered salinities below the minimum tolerance for these fouling species and they began to decline; by January, 1961, nearly all the jingle and slipper shells had died. In November, 1960, a light spat set was noticed on the cultch shell. Regular monthly population samples were begun in January, 1961, when the population had increased enough to allow a count. The January sample presented in Figure 2 shows the seed oysters as those in the three centimeter group and larger. The November spat set is shown in groups of spat (less than one centimeter), one and two centimeters. The population can be followed into June, 1961, when the initial summer spat set makes its appearance. In July a lighter spat set is present, with a marked growth of the June spat and a decrease attributed to natural mortality of small oysters. During the first four or five weeks, this mortality of one and two centimeter oysters is from 65 to 80 percent, leveling off upon reaching the four and five centimeter groups.

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Table 1

Oyster Reef Population Samples For Arkansas and Copano Bays

Station	Date	% Comm. Size		No. Comm.		% Seed		No. Seed Oysters	No. Per Bushel
		Oysters	Oysters	Oysters	Oysters	Oysters	Oysters		
1. Pintail Reef	1/ 9/61	1.6		3		98.4		182	185
"	2/ 2/61	6.7		12		93.3		166	178
"	3/22/61	4.0		16		96.0		188	204
"	4/19/61	7.2		7		92.8		89	96
"	5/22/61	2.9		4		97.1		133	137
"	6/20/61	0.0		0		100.0		1,827	1,827
"	7/17/61	0.0		0		100.0		617	617
"	8/22/61	0.0		0		100.0		574	574
2. Paul's Mott	10/3/60	1.3		4		98.7		290	294
"	11/2/60	1.6		3		98.4		181	184
"	1/ 9/61	2.0		5		98.0		241	246
"	2/ 2/61	.55		1		99.45		181	182
"	3/22/61	4.9		13		95.1		153	266
"	4/19/61	5.6		11		94.4		185	196
"	5/22/61	5.3		15		94.7		269	284
"	6/20/61	.86		7		99.14		803	810
"	7/17/61	2.8		13		97.2		451	464
"	8/22/61	1.7		5		98.3		291	296
3. Long Reef	10/3/60	4.3		7		95.7		156	163
"	11/2/60	3.8		6		96.2		149	155
"	1/ 9/61	7.5		13		92.5		159	172
"	2/ 2/61	4.0		9		96.0		214	223
"	3/22/61	9.3		19		90.7		185	204
"	4/19/61	12.4		29		87.6		203	232
"	5/22/61	13.4		24		86.6		154	178
"	6/20/61	.9		6		99.1		618	624
"	7/17/61	1.4		7		98.6		486	493
"	8/22/61	1.1		5		98.9		438	443

Table 1 Continued

<u>Station</u>	<u>Date</u>	<u>% Comm. Size</u> <u>Oysters</u>	<u>No. Comm.</u> <u>Oysters</u>	<u>% Seed</u> <u>Oysters</u>	<u>No. Seed</u> <u>Oysters</u>	<u>No. Per</u> <u>Bushel</u>
4. Half Moon	10/3/60	2.5	6	97.5	232	238
"	11/2/60	7.2	14	92.8	184	198
"	1/ 9/61	4.9	10	95.1	194	204
"	2/ 2/61	1.9	4	98.1	204	208
"	3/22/61	2.6	8	97.4	290	298
"	4/19/61	4.0	8	96.0	189	197
"	5/22/61	4.8	12	95.2	134	246
"	6/20/61	2.0	8	98.0	397	405
"	7/17/61	2.0	5	98.0	289	294
"	8/22/61	0.0	0	100.0	213	213
5. Copano Reef	10/3/60	12.3	56	81.7	396	452
"	11/7/60	4.2	12	95.8	271	283
"	1/ 9/61	0.0	0	100.0	13	13
Lap Reef	3/22/61	.7	3	99.3	399	402
"	4/19/61	1.2	5	98.8	432	437
"	5/22/61	.7	2	99.3	282	284
"	6/20/61	.1	1	99.9	623	624
"	7/17/61	.1	2	99.9	1,763	1,765
"	8/22/61	.4	2	99.6	533	535

Table 2

Precipitation Recordings at the Marine Laboratory
Rockport, Texas

1960

January	1.29	inches	July	.94	inches
February	1.58	"	August	8.69	"
March	.24	"	September	1.56	"
April	2.25	"	October	16.30	"
May	3.03	"	November	4.95	"
June	6.65	"	December	7.27	"

1961

January	3.57	inches	June	12.01	inches
February	5.75	"	July	4.11	"
March	0.00	"	August	1.24	"
April	1.50	"			
May	1.60	"			

Table 3

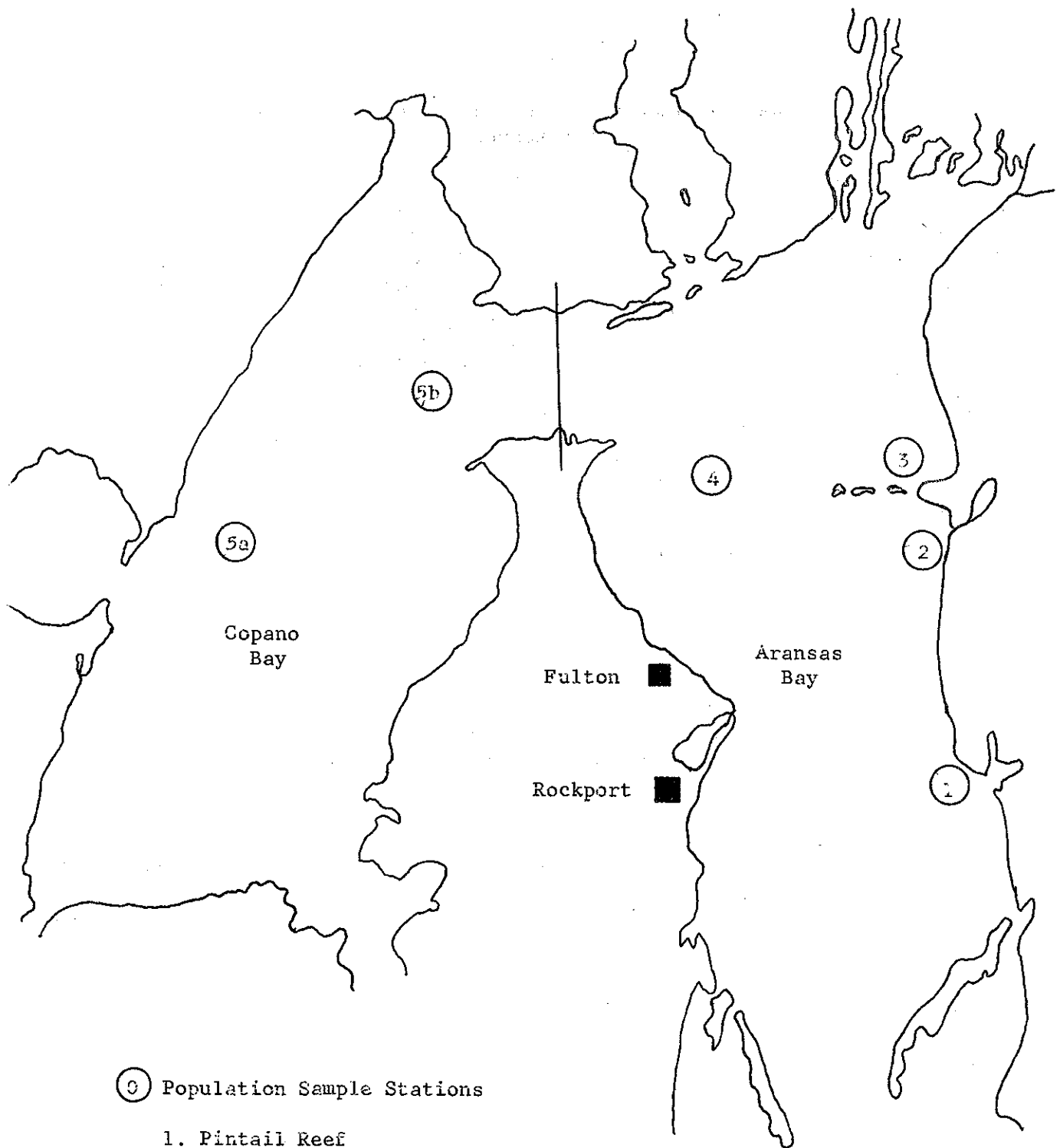
Monthly Salinity Averages for
Aransas and Copano Bays, 1960 - 1961

1960

	Aransas Bay	Copano Bay
January	17.7 o/oo	14.0 o/oo
February	23.3	14.3
March	19.5	15.6
April	22.2	16.6
May	23.8	17.7
June	25.7	16.2
July	25.8	12.0
August	25.2	10.9
September	20.8	12.7
October	15.9	7.7
November	5.8	1.6
December	7.5	2.4

1961

January	No Data	No Data
February	9.2	2.5
March	15.4	4.1
April	15.8	5.3
May	20.4	7.7
June	18.6	10.0
July	20.6	10.8
August	23.2	10.0
September	18.6	13.3



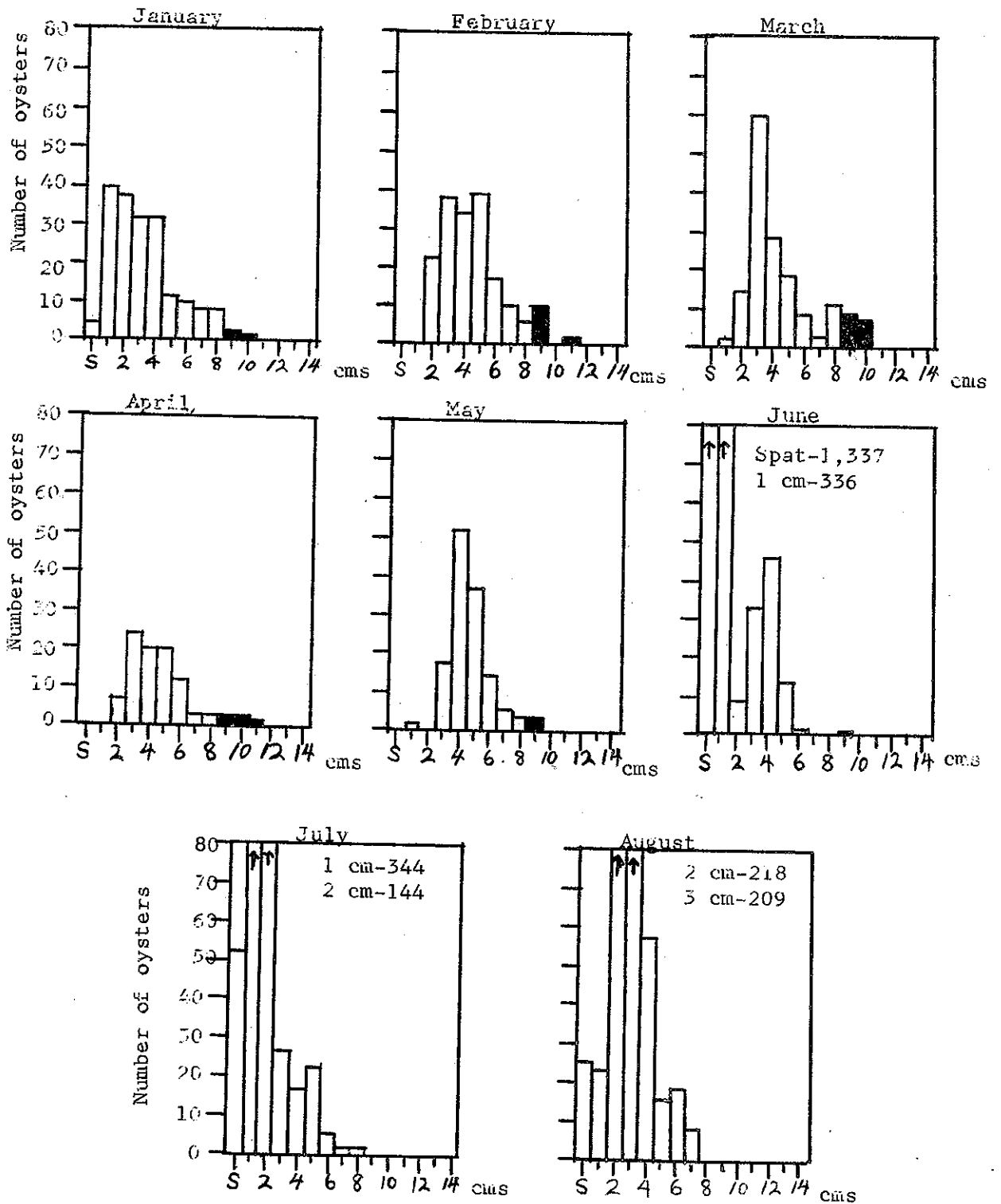
① Population Sample Stations

- 1. Pintail Reef
- 2. Paul's Mott
- 3. Long Reef
- 4. Half Moon
- 5a. Copano Reef
- 5b. Lap Reef

Figure 1

Population Sample Stations

Figure 2
Station 1. Pintail Reef Population by Month



■ Denotes commercial size oysters
S Denotes spat (less than 1 cm.)

Figure 3
Station 2. Paul's Mott Reef Population by Month

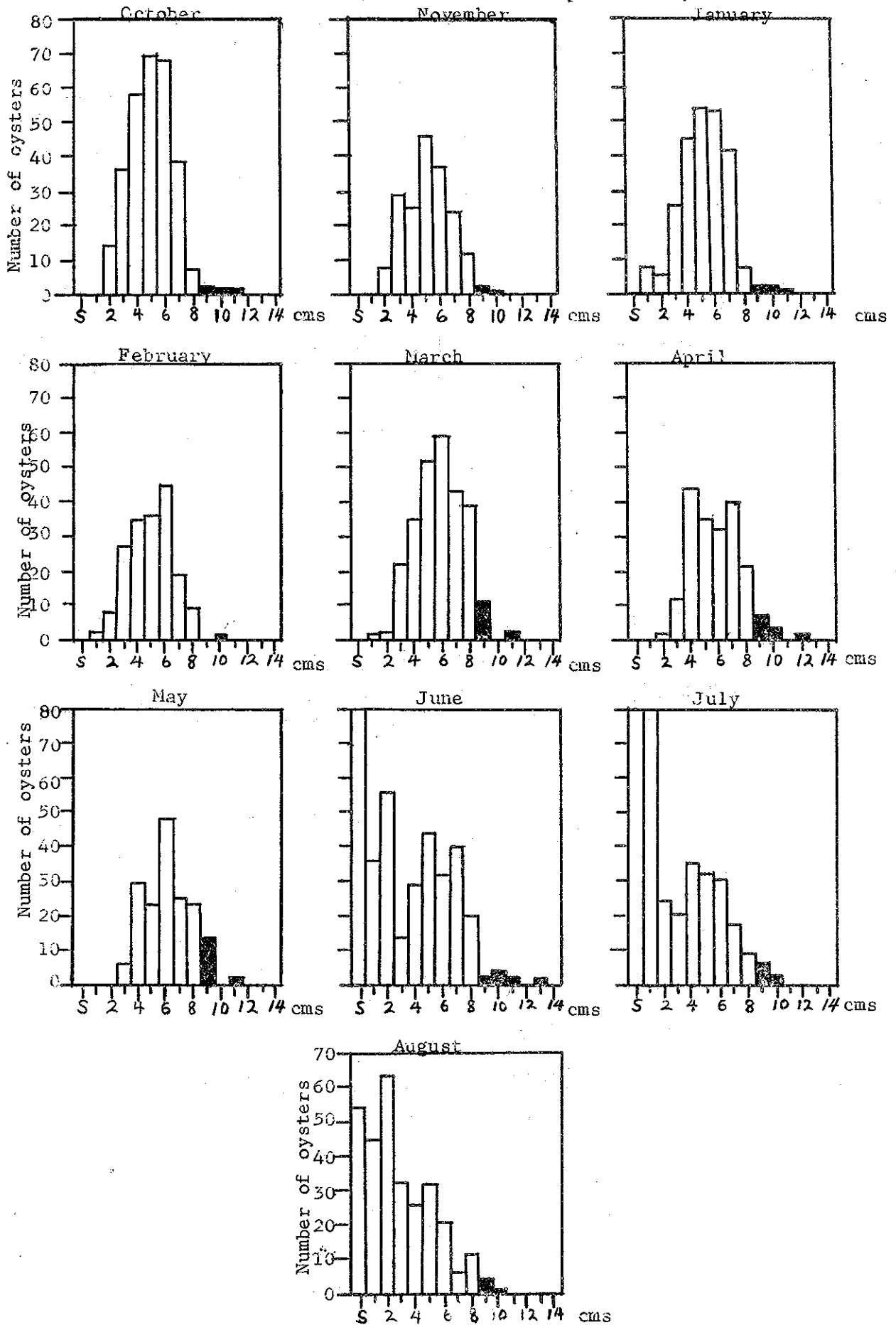


Figure 4
Station 3. Long Reef Population by Month

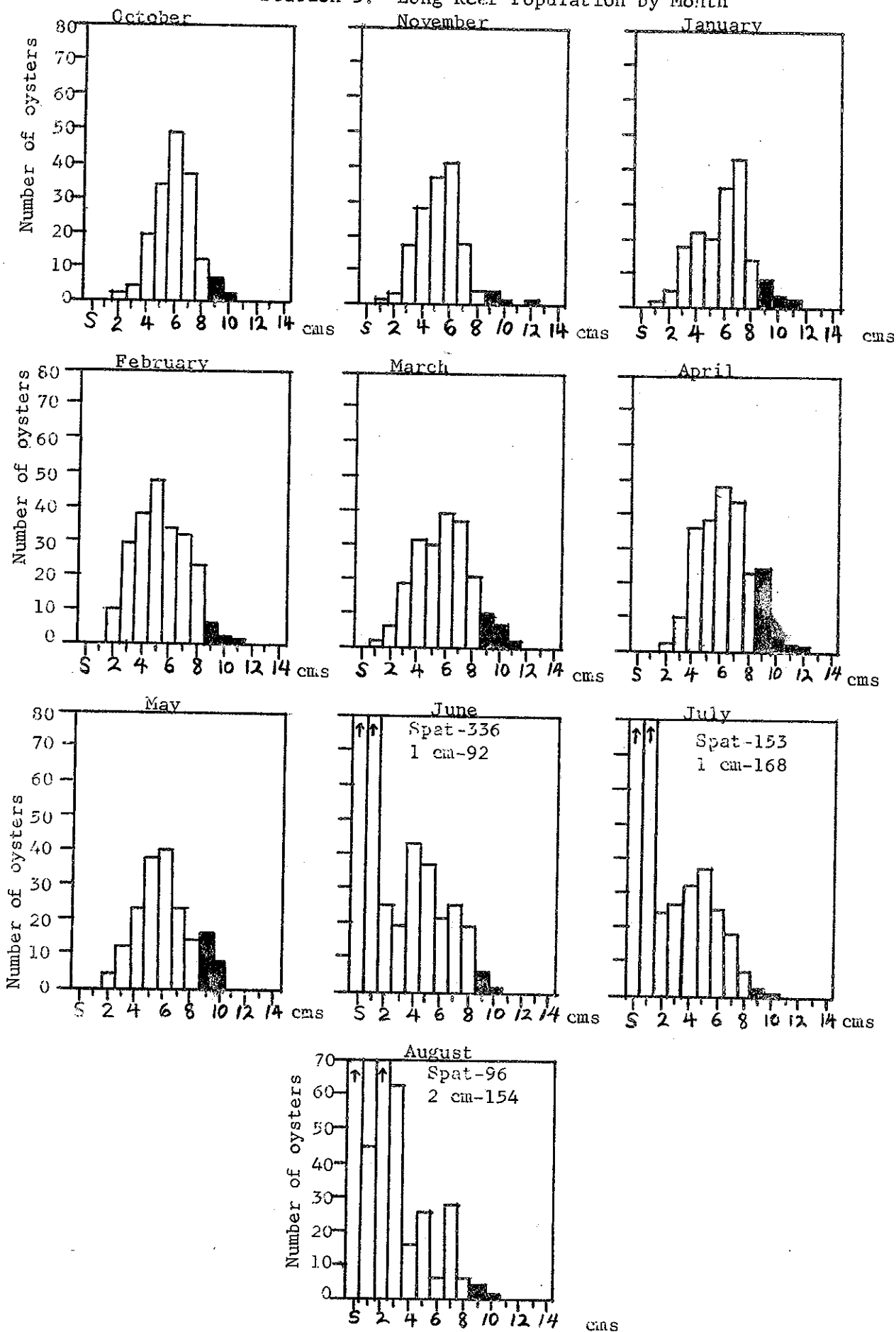


Figure 5
 Station 4. Half Moon Reef Population by Month

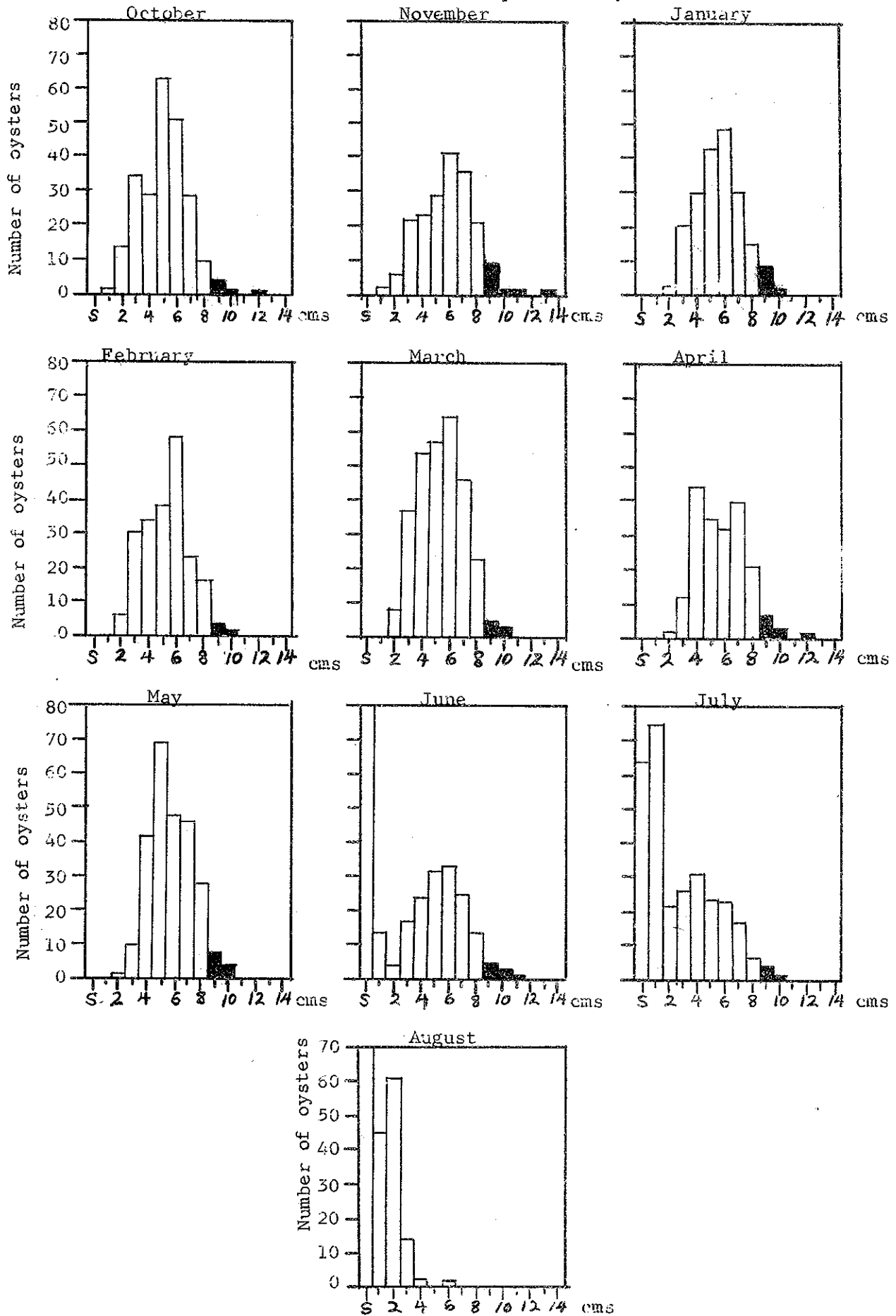
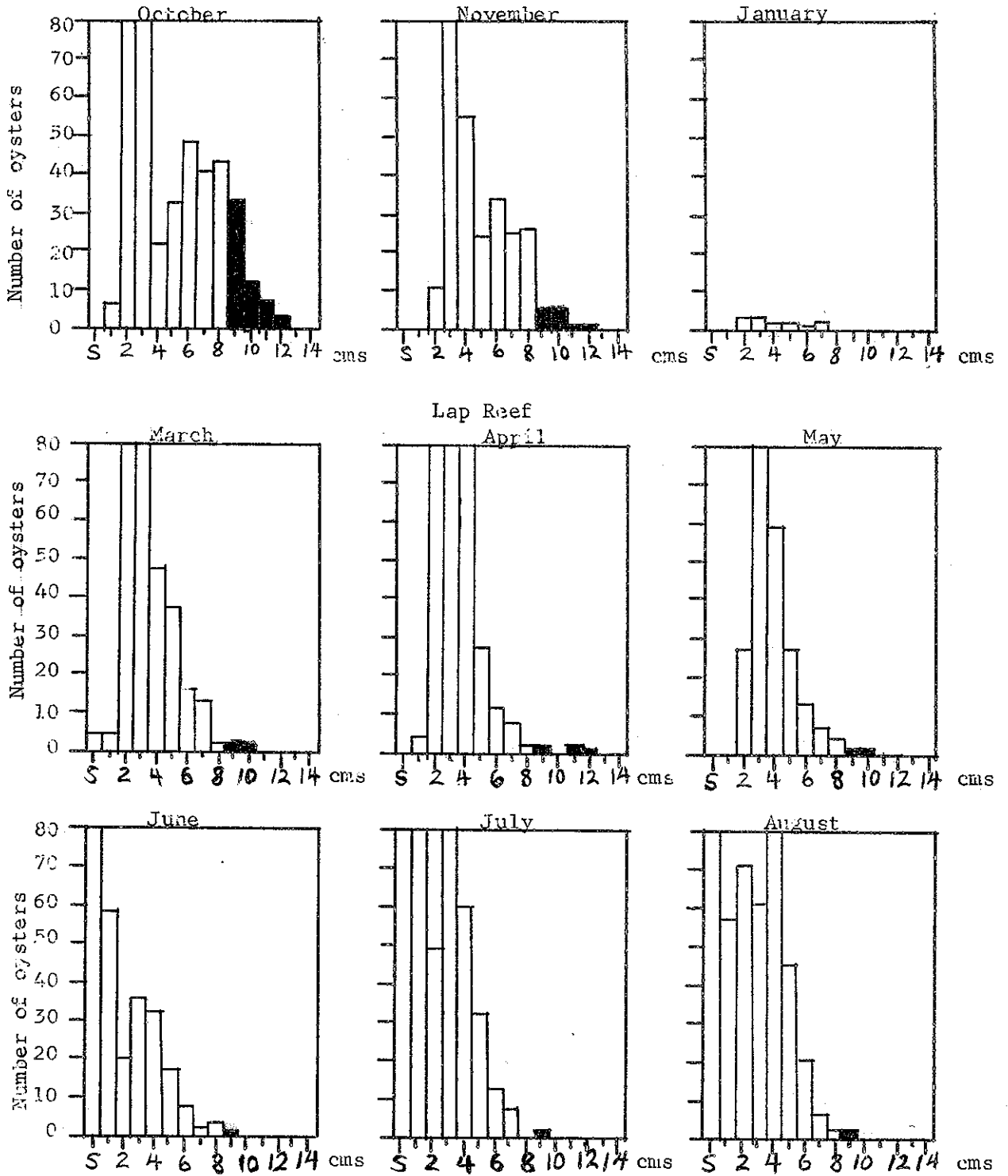


Figure 6
 Stations 5a and 5b. Copano Reef and Lap Reef Population by Month



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