

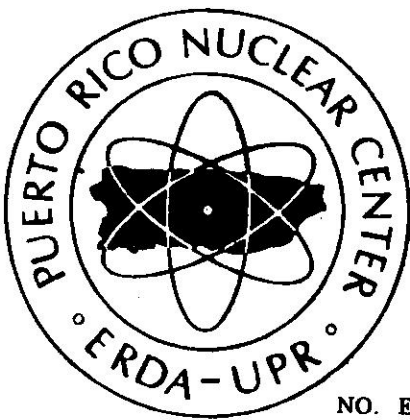
# PUERTO RICO NUCLEAR CENTER

ENVIRONMENTAL STUDIES OF THE PROPOSED  
NORTH COAST NUCLEAR PLANT UNIT NO. 1 SITE

FINAL REPORT

June 1975

VOLUME II



OPERATED BY UNIVERSITY OF PUERTO RICO UNDER CONTRACT  
NO. E-(40-1)-1833 FOR US ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION



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NORTH COAST NUCLEAR PLANT UNIT NO. 1 SITE

FINAL REPORT

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VOLUME TWO

Prepared for the Puerto Rico Water Resources Authority by  
the staff of the Puerto Rico Nuclear Center of the University  
of Puerto Rico

The Puerto Rico Nuclear Center is operated by the University  
of Puerto Rico under Contract No. AT (40-1)-1833 for the U.S.  
Energy Research and Development Administration



VOLUME 2

APPENDIX

1	Intensive Measurement and Analysis of Islote Nearshore Currents,	1.1-1
	1. January-February 1974	1.1-1
	2. May-June 1974	1.2-1
	3. August-September 1974	1.3-1
2	Results of Drogue Study	2.1
3	Aerial Dye Drops Study	3.1
4	Sediment Transport at Islote	4.1
5	Salinity and Sigma-T versus Depth Plots Arranged Chronologically by area: Islote, Punta Manati, Tortuguero Bay	5.1
6	Relative Abundance of Forbs, Grasses and Trees Found in the 36-Acre Area of Islote	6.1
7	List of Trees and Shrubs, Forbs and Grasses Found in the One-Mile Exclusion Zone of Islote	7.1
8	Fruit Trees Found in the One Square Mile Exclusion Zone	8.1
9	Medicinal Properties, Poisonous and/or Toxic Properties of Toxic Properties of Trees, Forbs and Grasses Found in the One Square Mile Exclusion Zone	9.1
9A	Poisonous Trees, Shrubs and Forbs, and Grasses Found in the One Square Mile Exclusion Zone	9-A-1
10	L-1: Effect of Plant Density as Influenced by Moisture 1974-75	10.1
	Average Number of Individuals per Plot:	10.5
	L-2: Plot No. E-2	10.5
	L-3: East, Center and West Transects	10.32
	L-4: Species Composition, East, Center and West Transects	10.36
	L-5: Composition by Slope Aspect: North Facing, Ridge and South Facing Slopes	10.40
	L-6: Frequency of Plant Species	10.44
11	Summary of Number of Species Found by Sampling Plot for each of the Quarterly Periods	11.1
12	Total Phytoplankton Abundance (Cyanophyceae not included)	12.1

13	Means of Total Numbers of Diatoms, Dinoflagellates, Coccolithophores, and Other Species by Month for all Stations: Inshore Stations (1,2,3) and Offshore Stations (4,5). Cyanophyceae not included (1974-1975)	13.1
14	Individual Values, Means, Variances, and Confidence Intervals for Zooplankton Groups at Station 2, Islote	14.1
15	Mean Values for Zooplankton Groups at Stations 1,2,3, and 4, Islote	15.1
16	Organisms Collected in Preliminary Hard Bottom Samples	16.1
17	Organisms Collected from Permanent Sampling Stations	17.1
18	List of Fishes Observed in the Islote Area	18.1
19	Monthly Tally of Species Caught	19.1
20	Monthly Tally of Species Caught on Algal Mat	20.1
21	Monthly Tally of Species Caught on Rock Outcrops	21.1
22	Monthly Tally of Species Caught on Sand	22.1

APPENDIX 1

SECTION 1

INTENSIVE MEASUREMENT AND ANALYSIS OF  
ISLOTE NEARSHORE CURRENTS, JAN-FEB 1974

Puerto Rico Nuclear Center  
Mayaguez, Puerto Rico

ABSTRACT

Currents were intensively measured at Islote in the waters directly offshore from the proposed NORCO plant site during January-February, 1974. Ten current meters recorded speed and direction over a period of a month, supplemented by drogue measurement on 3 separate days.

Results indicate a strong tidal dominance on flow, essentially parallel to the coast, with peak tidal velocities of around 30 cm/sec, alternately westward and eastward. Average net flow along the coast was found to be 3 cm/sec westward. Occasional strong easterly winds appear to accelerate the net westward flow.



## INTRODUCTION

Coastal currents were measured off Islote during the period 15 January thru 27 February, 1974. Ten current meters were located in 5 stations positioned such that the stations form a cross perpendicular to the coastline (see Figure 1).

During the above time period, on 3 separate days surface drift currents were measured with 10 drogues deployed by ship and 19 expendable anchored drogues deployed by aircraft. The rhodamine dye patch diffusion observations which were made concurrently will be reported elsewhere. Data were recorded by aerial photographs.

Hydrographic data were taken offshore during late January for the purpose of relating with nearshore current measurements. Intermittent sea level measurements were also recorded.

## INSTRUMENTS

The 5 current meter stations were laid out in the form of a cross in order that 4 adjacent triangles could provide flow continuity information, each triangle being self-sufficient. The CENTER station was a taut-wire installation consisting of a large concrete block (approximately 500 kg), 2 ducted-impeller type Bendix Q-15 current meters, a subsurface buoy (about 250 kg net buoyancy) and a surface marker buoy. The Bendix current meters were at depths of 5 m and 13 m, and the sea floor was at 20 m.

The EAST station consisted of an automobile engine block on the bottom at 20 m, a tilt-type, (film-recording) General Oceanics current meter at 16 m, a Savonius-rotor type Hydro Products current meter at 6 m, two 9-liter polyurethane foam subsurface floats, and a surface marker float. The WEST

station consisted of a small Danforth anchor and chain and lead weight on the bottom at 20 m, a General Oceanics current meter at 17 m depth, and a surface marker float. The SOUTH station consisted of an automobile engine block on the bottom at 13 m, a General Oceanics current meter at 11 m depth, an identical instrument at 6 m depth, and a surface marker buoy.

The NORTH station consisted of an automobile engine block on the bottom at 54 m, General Oceanics current meters at 48 m, 32 m and 15 m, a 9-liter polyurethane subsurface float at 10 m, and a surface marker float.

Ten sea surface drogues were constructed of 1.2 m plywood squares. Galvanized wire connected the plywood to the middle of four 0.6 m square vertical vanes made of galvanized sheet metal, hanging at a depth of 3 m. The 19 aircraft expendable anchored surface current probes (drogues) were manufactured by EOTECH.

#### EQUIPMENT LOSSES & MALFUNCTIONS

Due to ambient winter weather typical of the north coast of Puerto Rico, a number of the small surface buoys and the one large (6' high) nun-type surface buoy at the CENTER station broke their lines and/or chains and were lost. Two current meters sank to the bottom due to loss of surface and subsurface buoys at the EAST station but were recovered. The Hydro Products instrument was removed from service; the General Oceanics instrument was put back down, although in need of repair.

The 2 Bendix current meters were only operational about 50% of the time due to loss of and damage to direction vanes and electrical cables, and to inadequate battery charges. The vanes were modified and repaired as best possible in the field. During the final recovery of one Bendix meter, the recorder unit opened up and became flooded.

The General Oceanics current meter at 15 m depth at the NORTH station was lost due to a material failure of its swivel.

Of the 10 total current meters set out, 6 provided data, 3 failed to operate under the prevailing winter conditions, and 1 was lost.

#### TIDES

A Weather Measure type F552 water level recorder was installed on the pier inside the jetty at Arecibo, after installation at Palmas Altas proved impractical.

During the first week of operation, the recorder was lost for reasons unknown. A second recorder was ordered and installed several weeks later.

Limited results indicate that sea level at Arecibo is in good agreement with predictions for San Juan. Phase at Arecibo appears to lag San Juan by 0 to 0.4 hours (Figures 3 and 6). Dietrich (1957, plates 6 and 7) in his cotidal charts indicates that the diurnal tide wave passes essentially from west to east along the north shore of Puerto Rico, and that the semidiurnal tide wave passes in the opposite direction.

#### CURRENTS

Measurements indicate that tidal forces dominate the flow along the coast with maximum velocities of about 30 cm/sec, alternately westward and eastward. The net flow averaged over a month and several current meters indicates a value of about 3 cm/sec westward, or about an order of magnitude less than maximum daily tidal velocities. Qualitatively observed surge velocities from 1 to 2 m swells of around 5-6 seconds period over a bottom depth of 20 m appeared to be an order of magnitude larger than maximum tidal velocities during average winter conditions.

Figures 2 through 6 contain graphs of measured current speed versus time for the CENTER and the NORTH stations. Speeds are given as positive

for westward flow and as negative for eastward flow. As can be seen from the direction versus time data in Figures 2 and 8, the flow is essentially east-west parallel to the shore. Predicted sea level at San Juan versus time is presented next to measured speed in Figures 2 through 6. It appears that eastward flow follows flood tide and westward flow follows ebb tide, with maximum speed lagging mid-flood tide or mid-ebb tide by 1 or 2 hours. The complex nature of the tide-dominated flow requires further analysis.

Figure 7 presents measured current speed versus time for current meters at the WEST, SOUTH, and EAST stations. There is notable agreement in the fluctuation of all these current meters. Westward only flow from 30 January through 1 February at the SOUTH station is probably attributable to wave-induced alongshore flow. This station is in close proximity to the surf zone. Data on wind speed essentially from the east (Figure 9) indicate that higher average easterly wind speeds accelerate the net westward flow of water (Figure 7). Data in both of these figures represent 1-hour averages. Current speeds in Figures 2 through 6 represent 15-minute averages. All of the speed and direction data clearly demonstrate the tidal nature of the fluctuation in the flow.

Progressive vector diagrams, calculated from individual data measurements and summed by vector components, are presented in Figures 10 through 15. Individual water particles tend to range several kilometers back and forth along the coastline with a net tendency to progress slowly westward at WEST, SOUTH, and EAST stations (Figure 10 through 13). As a result of strong easterly winds (Figure 9) during 29 January through 1 February, the flow moves consistently westward.

The progressive vector diagram for the CENTER station is presented in Figure 14 with reservation. On 19 February at 1100 hours, the instrument

was observed underwater. Its direction vanes indicated a current toward the west. Current speed was estimated at 25 cm/sec. The speed estimate is in good agreement with measurement (Figure 6), but the direction measurement of  $340^{\circ}$  (see Figure 14) is definitely not in agreement. Also, on 25 February at 1035 hours, instrument vanes were observed indicating a current toward the east as contrasted with measurement indicating south-east. Furthermore, intermittent failure of electrical connectors caused readings to go off scale toward  $360^{\circ}$ . The nature of the direction sensor is such that high electrical resistance indicates high direction number. In addition, the electronic adjustment for direction scale is such that error magnitude increases linearly with direction number from  $0^{\circ}$  to  $360^{\circ}$ . There could be an error of  $+20^{\circ}$  at east and one of  $+60^{\circ}$  at west. Drogue measurements indicated east-west flow. The northward net flow indication of the CENTER station is inconsistent with other observations.

The progressive vector for the NORTH station in somewhat deeper water indicates net flow toward the east (see Figure 15). During the windy period of 29 January through 1 February, eastward progress was nearly arrested. This effect is in agreement with the effects of wind action shown in Figures 10 through 13.

## DISCUSSION

The situation for the CENTER station requires that the measurements be repeated. If in fact flow at this station is northward and flow at the NORTH station at all depths in the water column is eastward, then there is an eddy circulating clockwise off Islote. Such an eddy could seriously affect the removal of heated water.

In any case, it appears that a cooling water intake located substantially seaward of the heated water discharge (perhaps twice the distance from intake to shore) would involve minimum risk of reentrainment. If the intake were

put nearer shore than the discharge, the former would be likely to ingest heated water for a good part of each tidal cycle. Drogue measurements indicate a gradual drift toward shore during both westward and eastward tidal excursion (Figure 16). Drogue measurements will be done more intensively and with better instruments during the spring sampling period.

#### DATA SUMMARY

The data for winter 1974 off Islote are summarized as follows:

##### WEST station

net flow 5.8 cm/sec toward  $237^{\circ}$  (westward)

maximum hour averaged velocity excursion (tidal):

35.0 cm/sec westward

35.1 cm/sec eastward

##### SOUTH station

net flow 3.7 cm/sec toward  $298^{\circ}$  (westward):  
(top)

2.2 cm/sec toward  $280^{\circ}$  (westward)  
(bottom)

maximum hour averaged velocity excursion (tidal)

westward  
33.3 cm/sec  
(top)

23.1 cm/sec  
(bottom)

eastward  
25.8 cm/sec  
(top)

20.9 cm/sec  
(bottom)

##### EAST station

net flow 2.1 cm/sec toward  $217^{\circ}$  (westward)

maximum hour averaged velocity excursion (tidal)

24.0 cm/sec westward

23.6 cm/sec eastward

CENTER station

net flow 4.2 cm/sec toward  $342^{\circ}$  (northward)

maximum hour averaged velocity excursion (tidal)

30.8 cm/sec westward

23.1 cm/sec eastward

NORTH station

net flow 4.6 cm/sec toward  $101^{\circ}$  (eastward)

maximum hour averaged velocity excursion (tidal)

35.0 cm/sec westward

35.1 cm/sec eastward

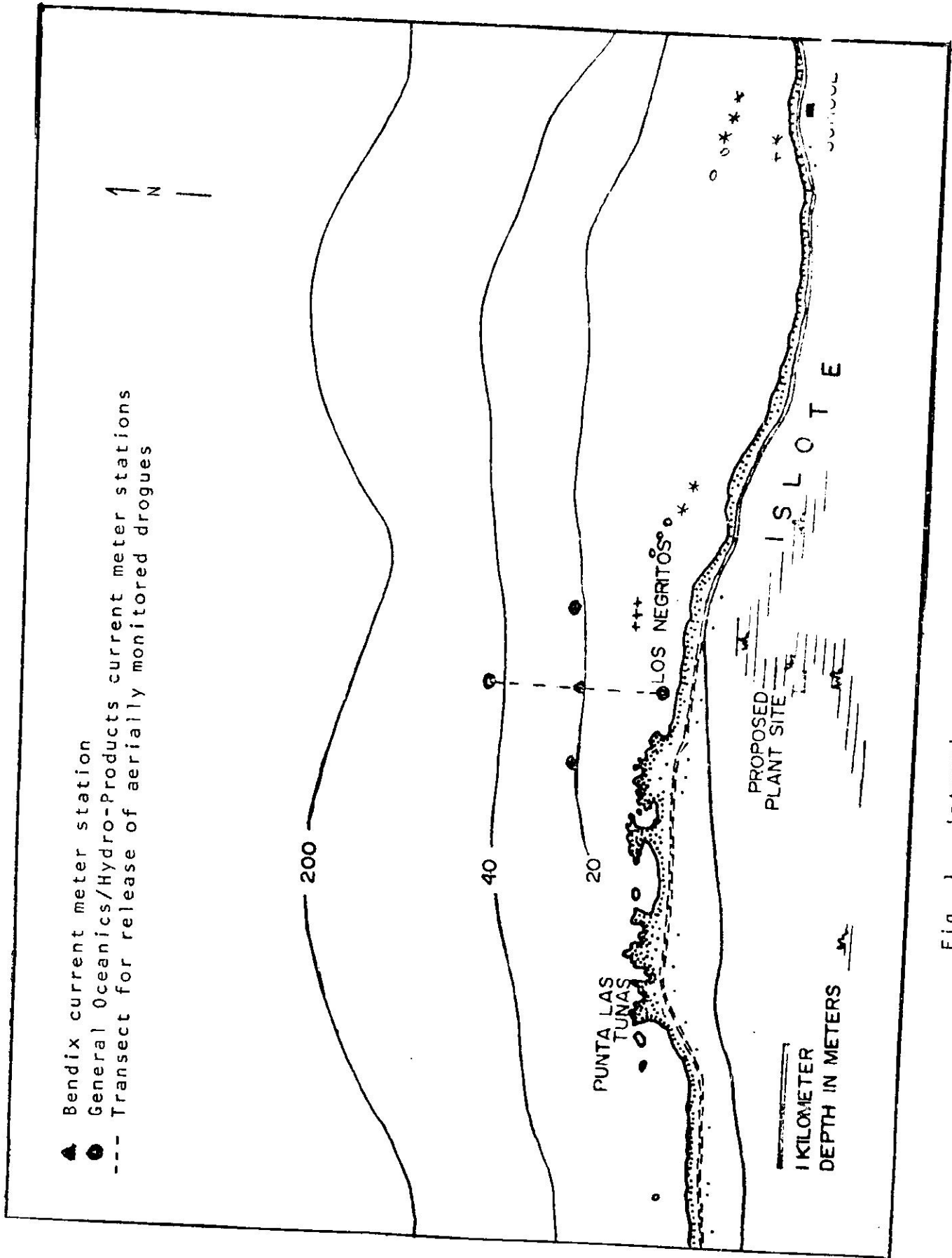
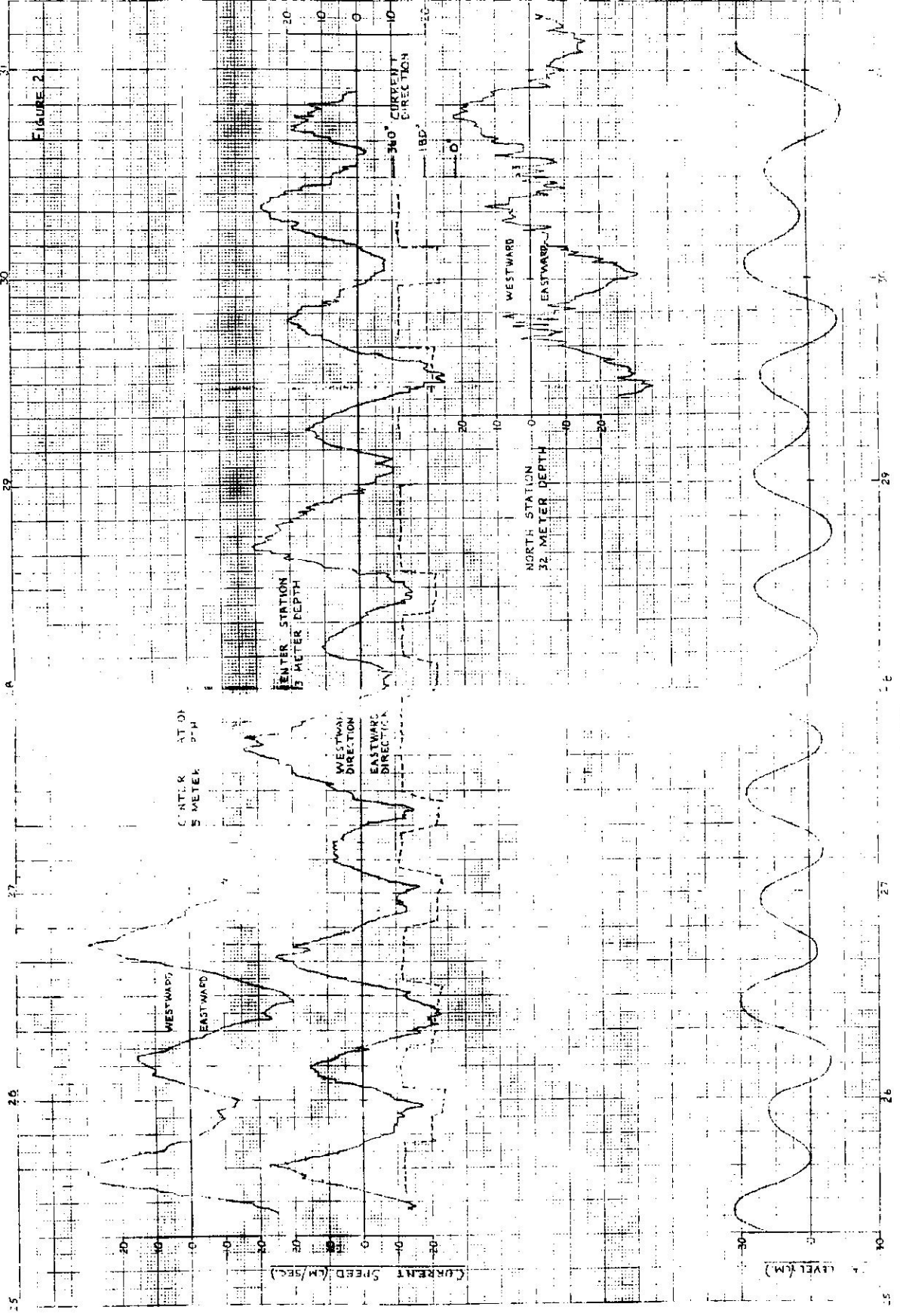


Fig. 1. Intensive oceanographic study

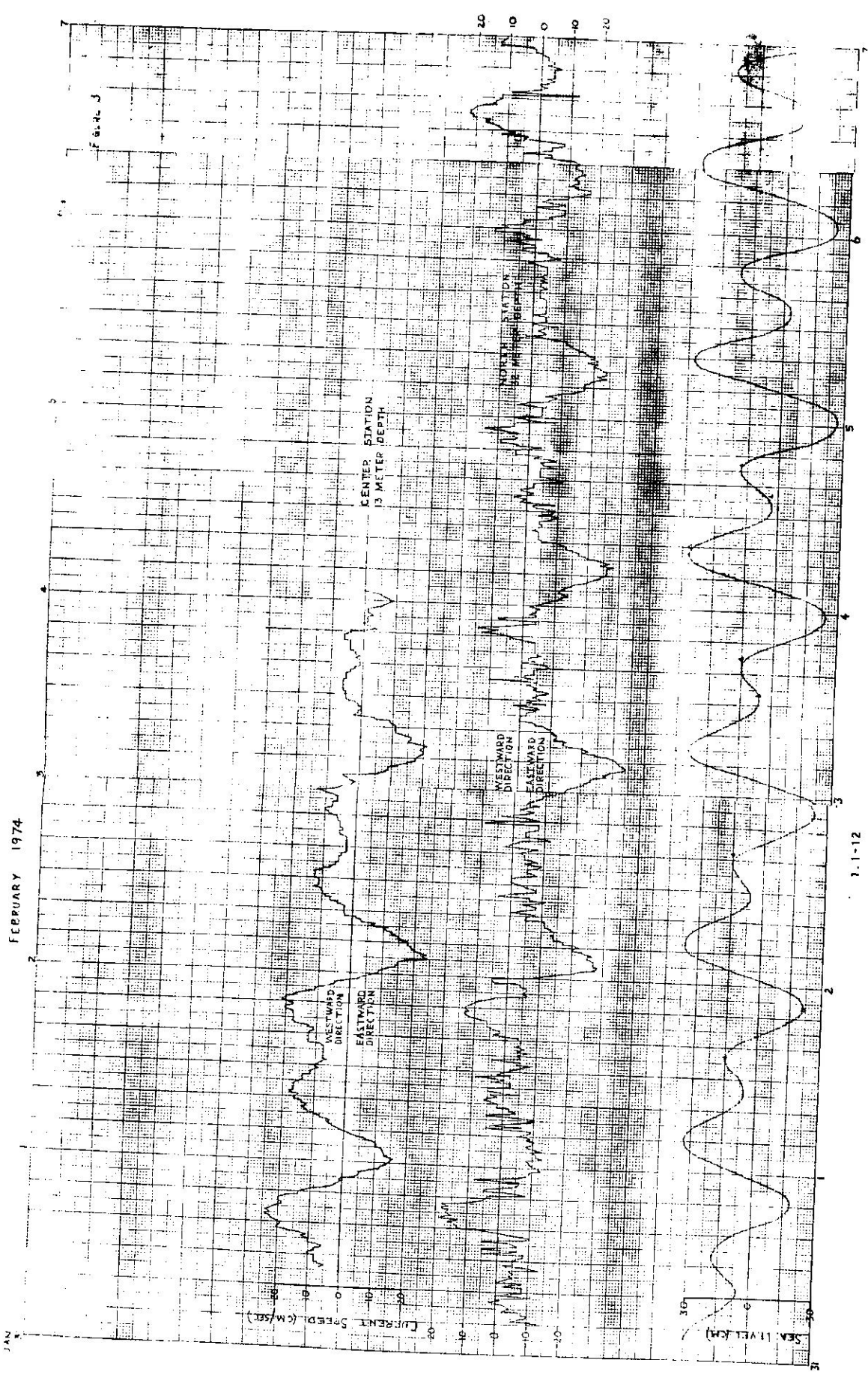


JANUARY 1974



1.1-11

JAN 31  
FEBRUARY 1974



1.1-12

FEBRUARY 1974

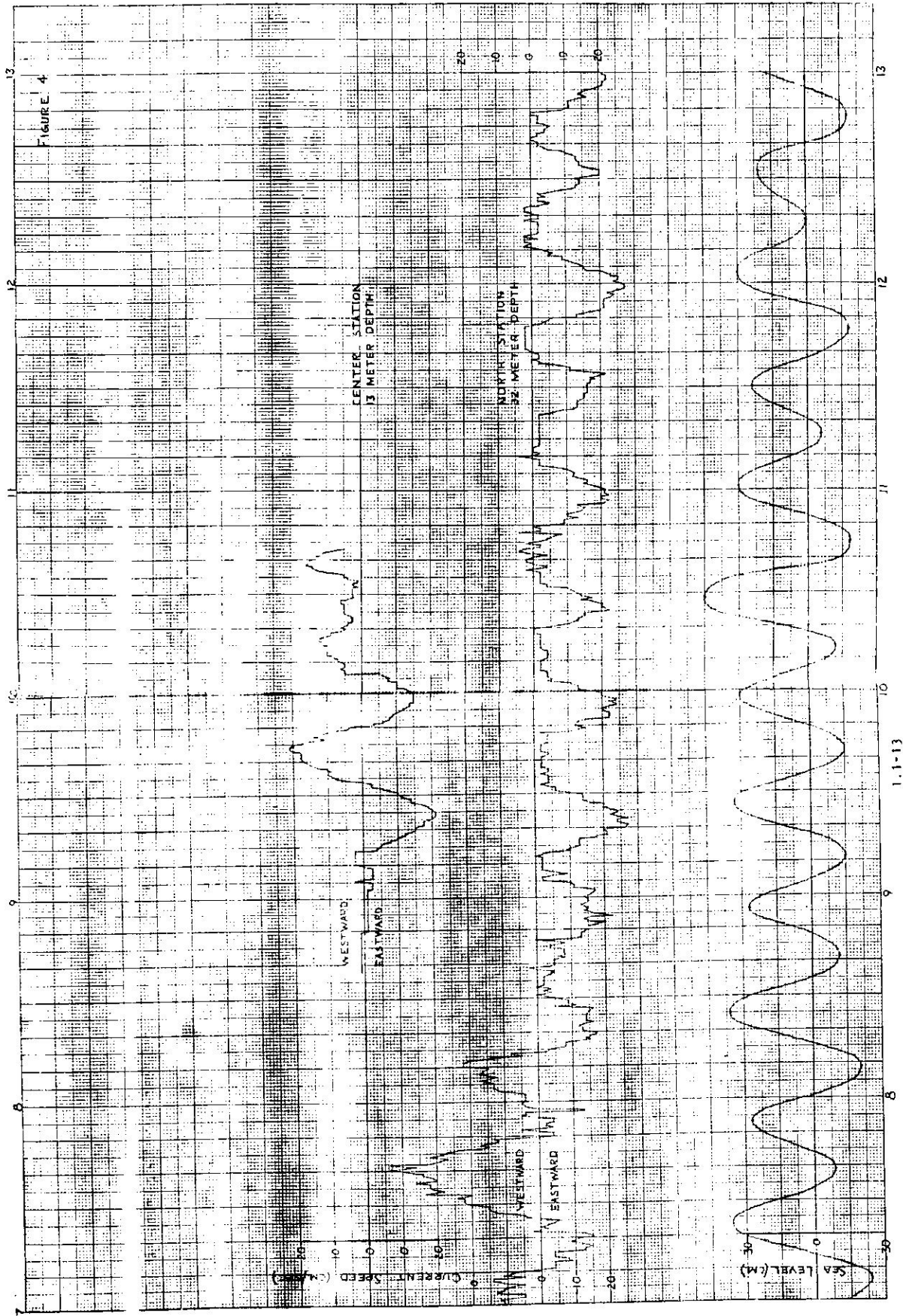


FIGURE 4

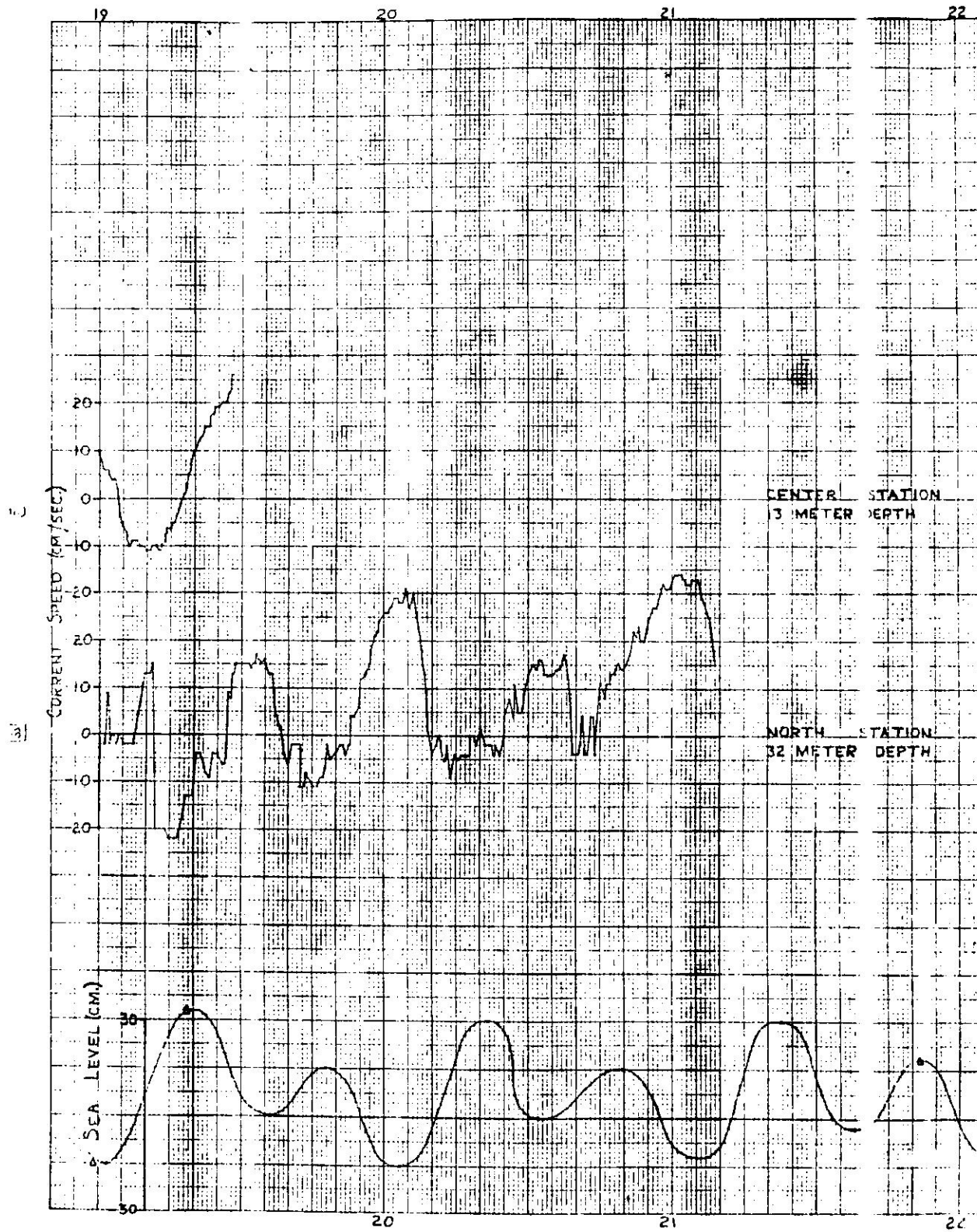
FEBRUARY 1974



1.1-14

FEBRUARY 1974

FIGURE 6

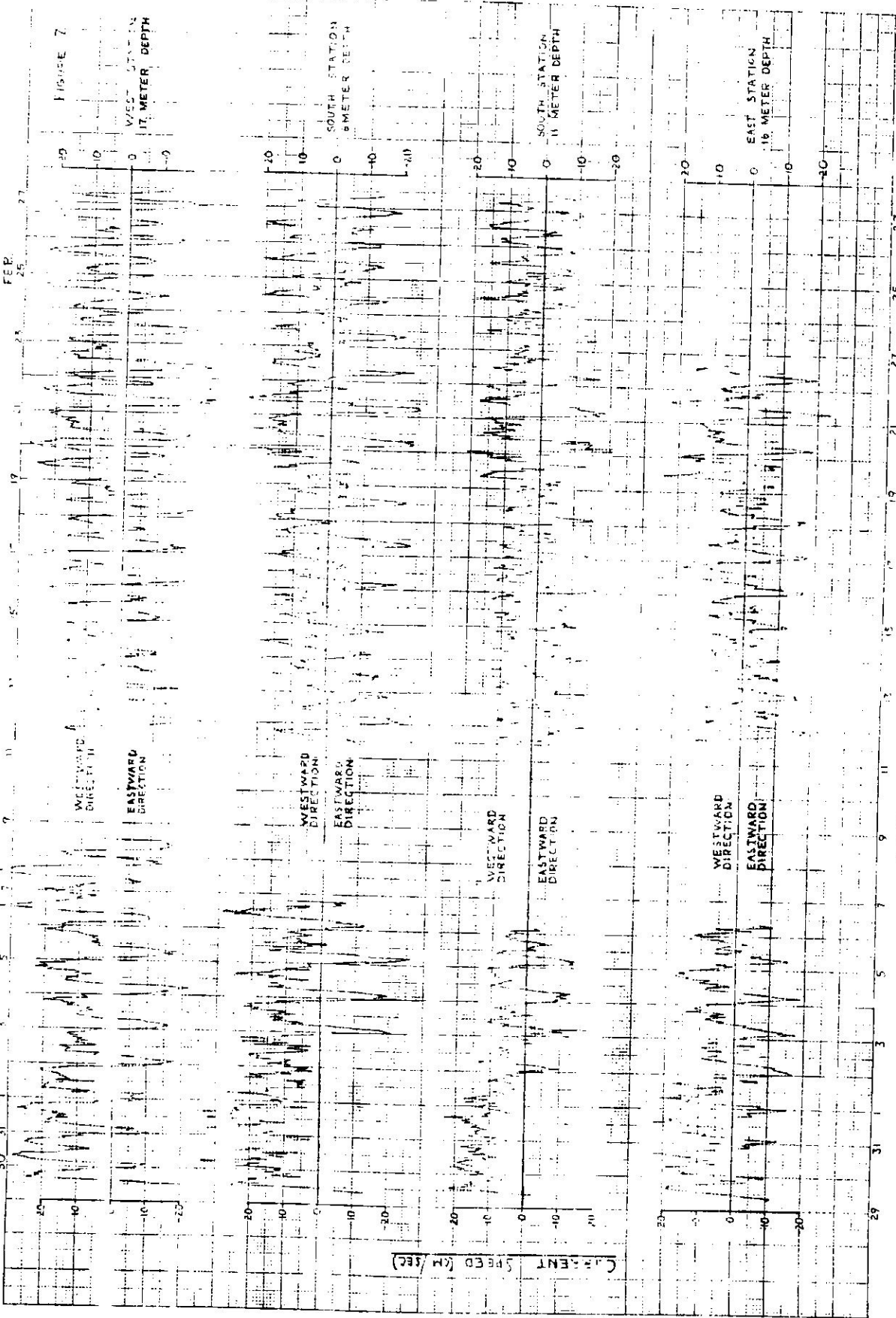


1.1-15

JAN. 30 31

FEB.

FEB. 25 27



CURRENT SPEED (KM/SEC)

FEB.

27

25

23

21

19

17

15

13

11

9

7

5

3

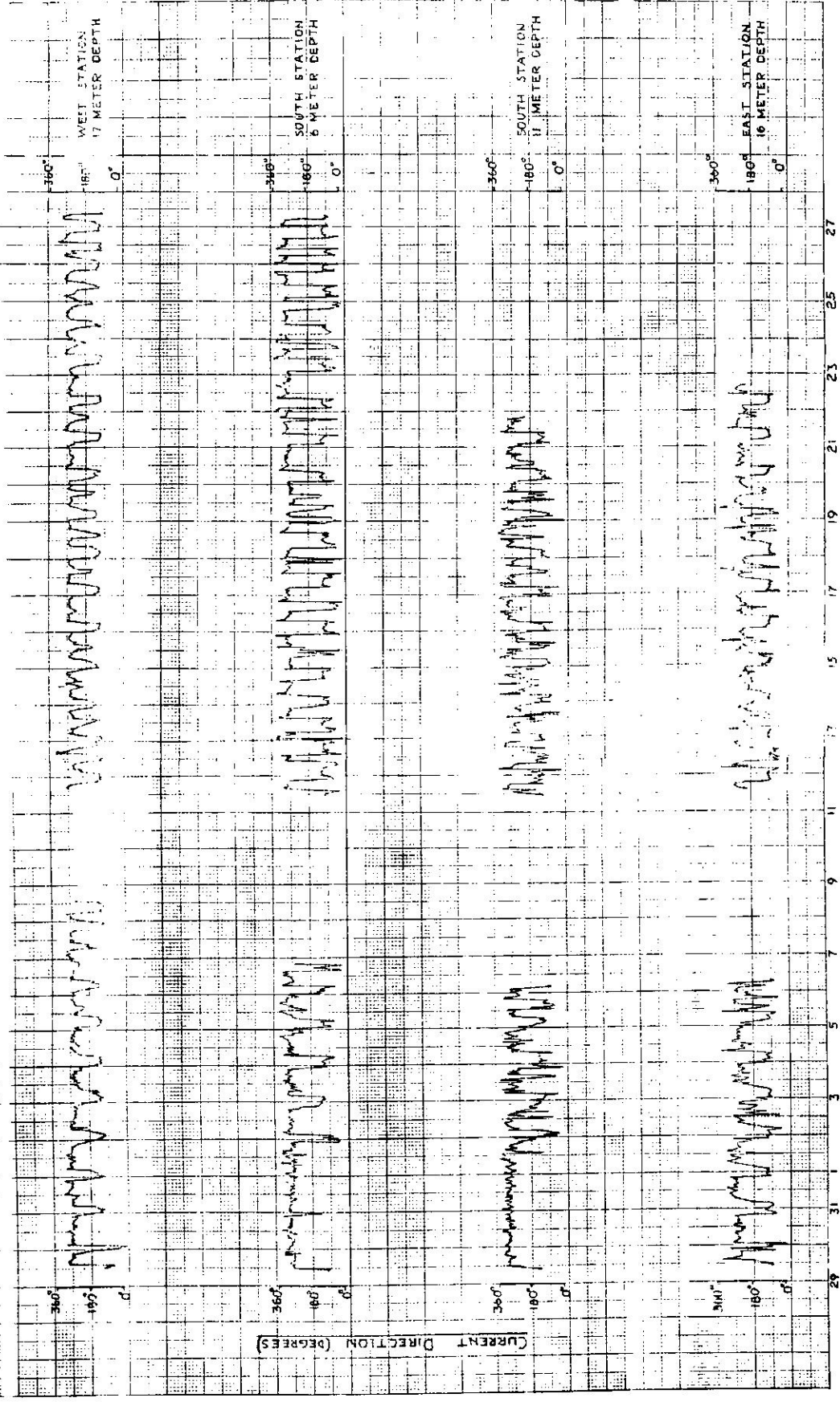
1

JAN.

31

29

FIGURE 8



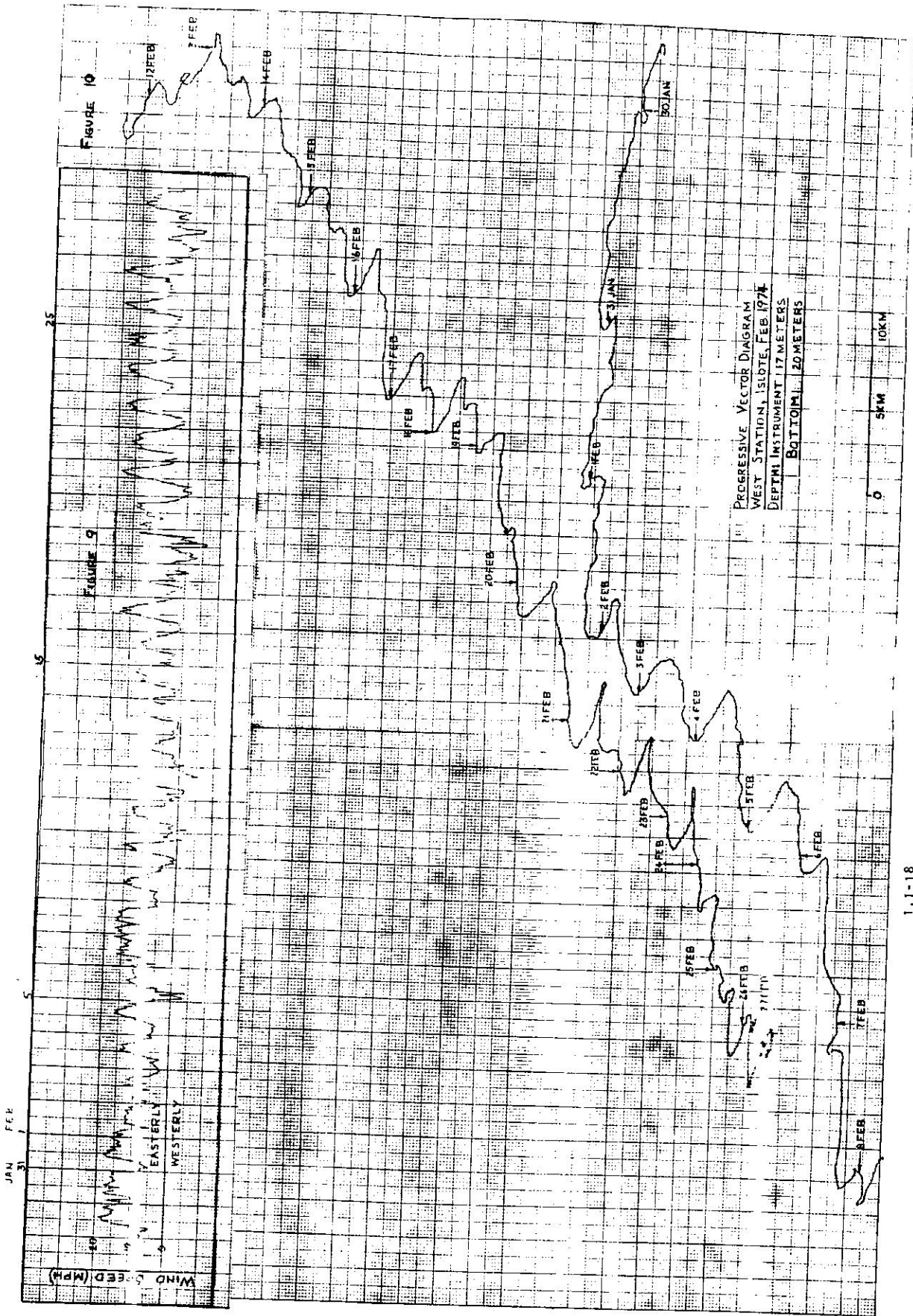
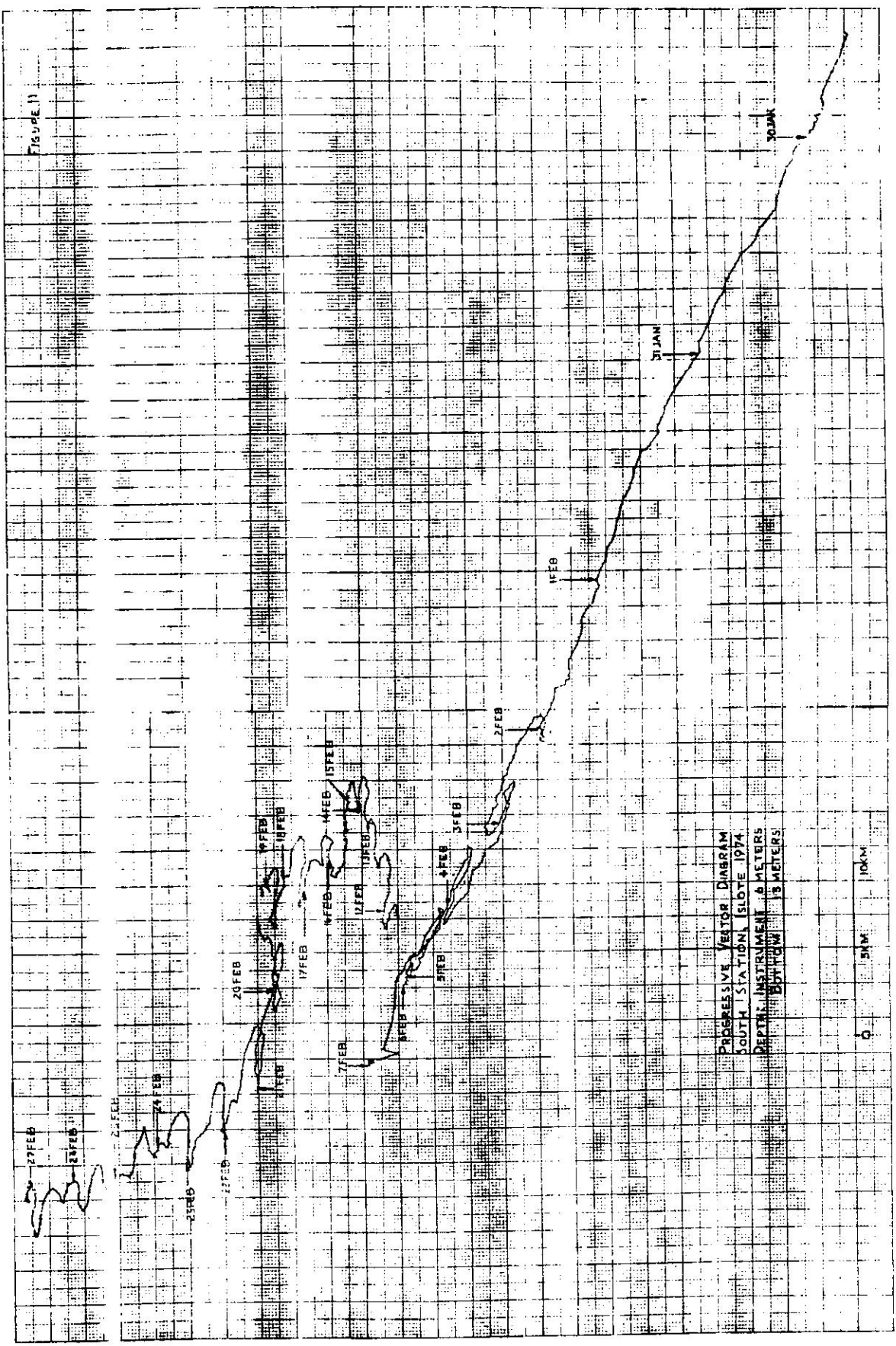




FIGURE 11



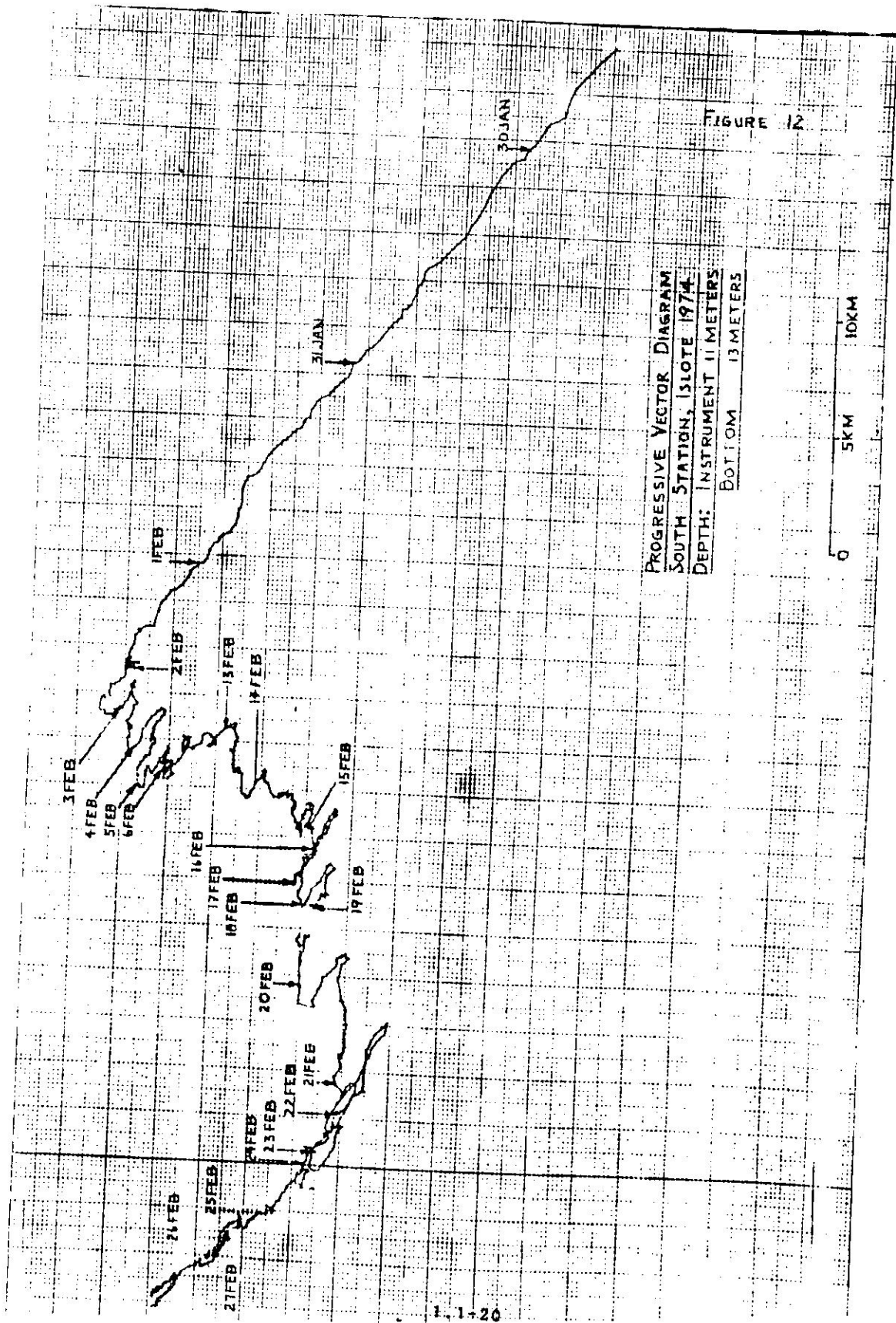
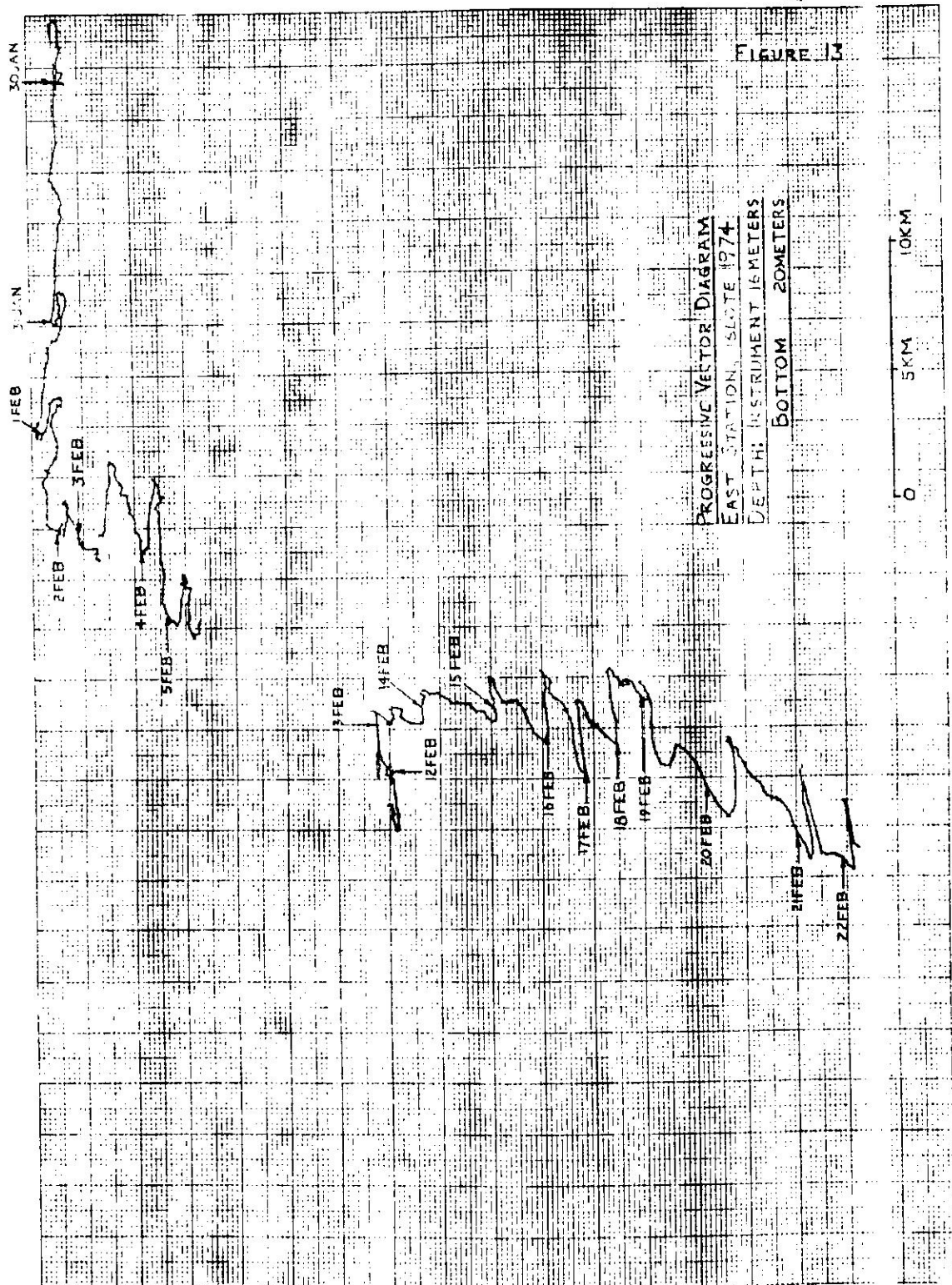
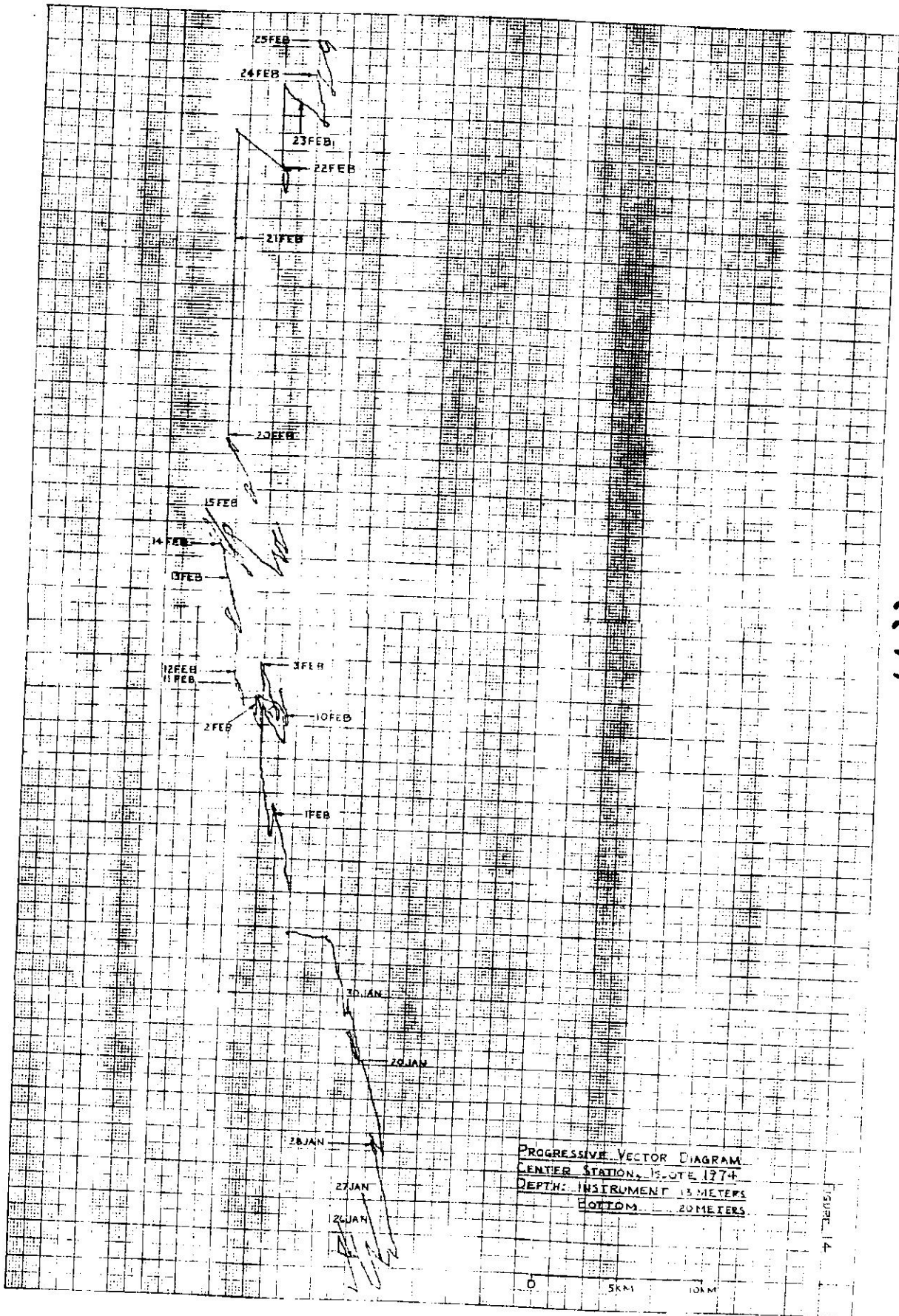


FIGURE 12





1.1-22

15 FEB 4

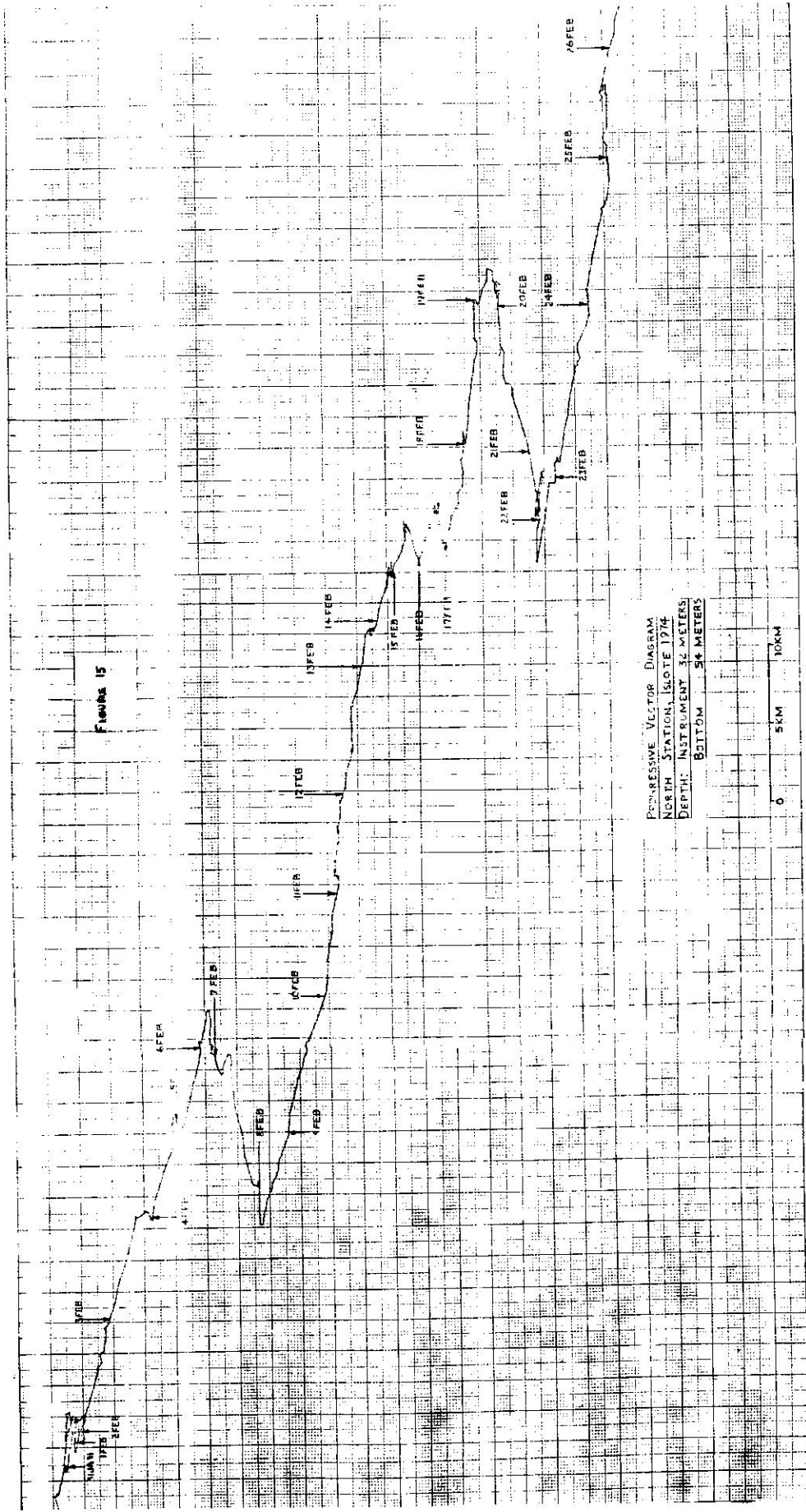


FIGURE 15

PROGRESSIVE VECTOR DIAGRAM  
 NORTH STATION, ISOTE 1974  
 DEPTH INSTRUMENT 34 METERS  
 BOTTOM 54 METERS

0 5 KM 10 KM

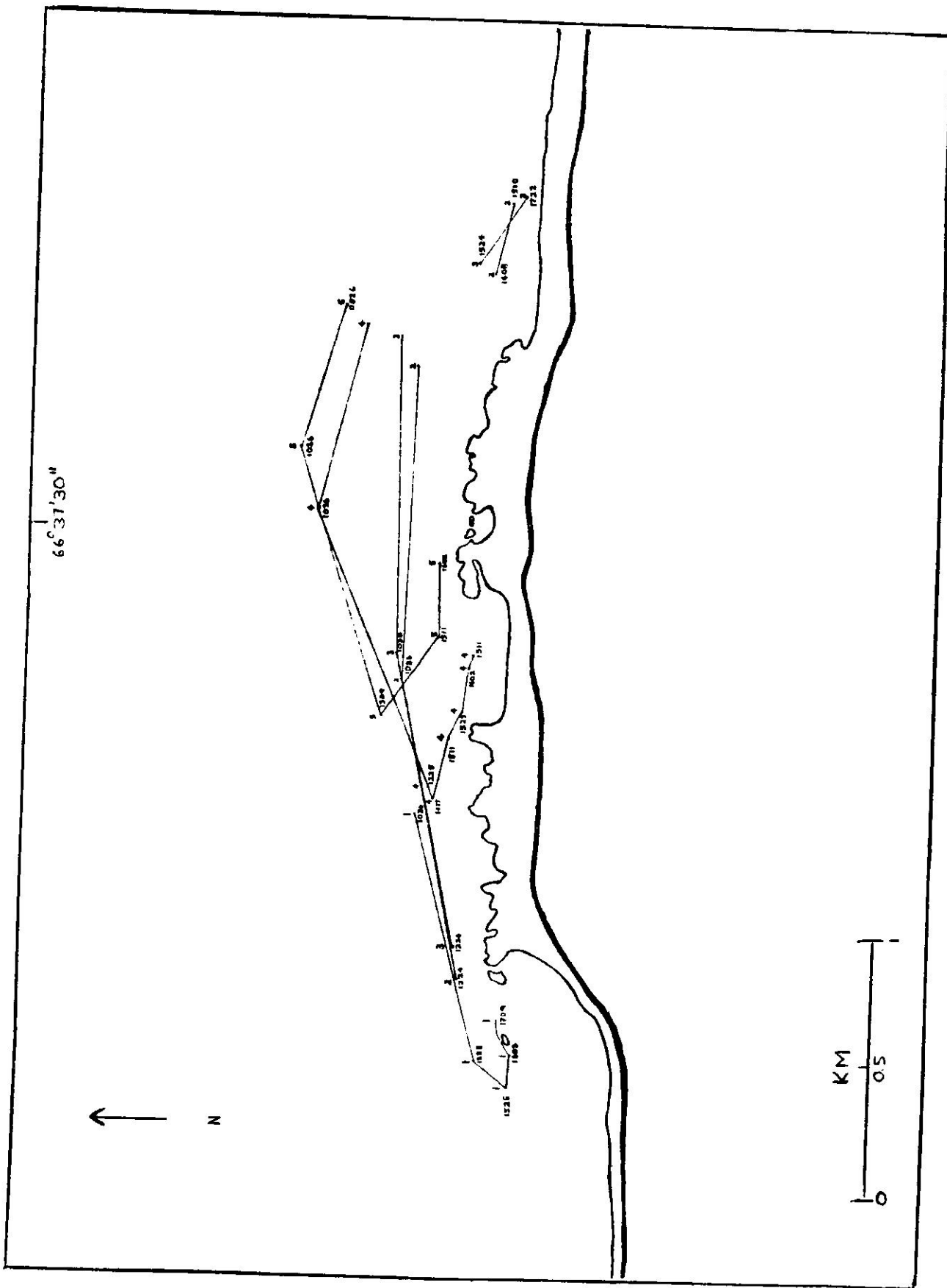


Fig. 16

APPENDIX 1

SECTION 2

MEASUREMENT AND ANALYSIS OF ISLOTE  
NEARSHORE CURRENTS, MAY - JUNE 1974

Puerto Rico Nuclear Center  
Mayaguez, Puerto Rico

28 June 1974

## INTRODUCTION

Coastal currents were measured off Islote during the period 1-6 June 74 (Fig. 1 & 2). Five General Oceanics current meters were located at 3 station positions which had been previously measured during January - February 1974. \* These stations are referred to as the NORTH, CENTER, and EAST stations. One instrument at the NORTH station failed to record. Data from the single instrument at the EAST station will be presented in a later report, with results that are expected not to be significantly different from earlier measurements at the EAST station.

## DISCUSSION

Earlier reported measurements at the CENTER station for winter 1974 had direction data that were suspected of being not representative due to instrument failure and calibration error. The related data results for the 15 Jan-27 Feb period and the presently reported period, 1-6 Jun, are tabulated in Table 1. It appears in fact that flow at the CENTER station is principally WEST-EAST in direction (see Fig. 3). The apparent 180° difference (Table 1) in net flow direction at around 14 meter depth is artificial; the progressive vector diagram (Fig. 3) clearly illustrates the dominant west-east movement. The lower near-bottom velocities during June correlate with the disappearance of a well-mixed surface layer found (from hydrographic data) during Jan-Feb 1974.

\* See topical report "Intensive Measurement and Analysis of Islote Nearshore Currents, Jan-Feb 1974", dated May 1974.



69.01

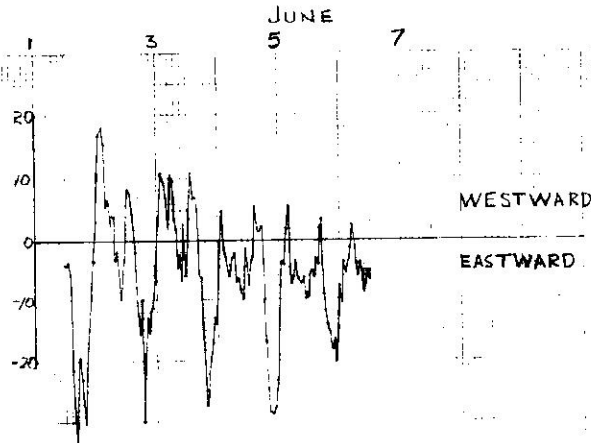
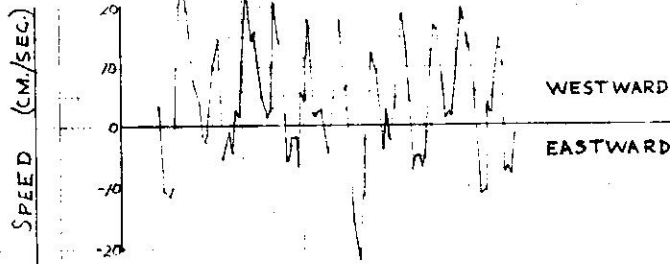


FIGURE 1

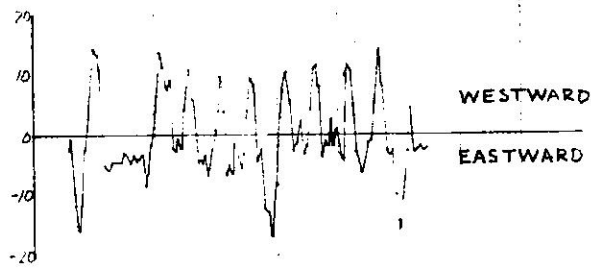
NORTH STATION  
15 METER DEPTH

58.17



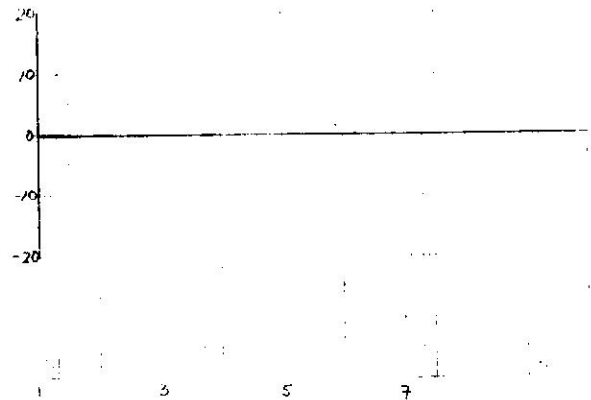
CENTER STATION  
8 METER DEPTH

58.01



CENTER STATION  
14 METER DEPTH

69.03



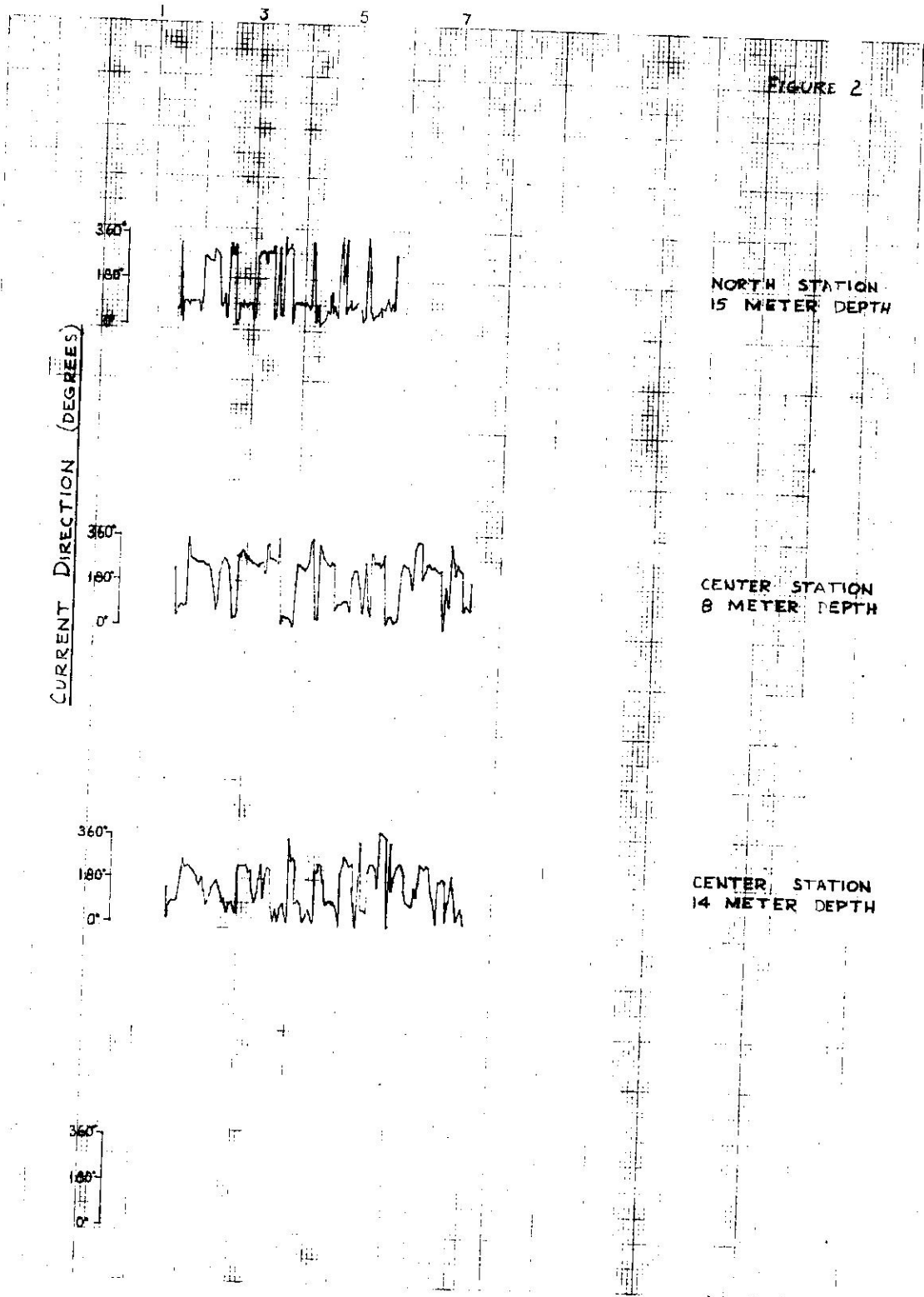


FIGURE 2

NORTH STATION  
15 METER DEPTH

CENTER STATION  
8 METER DEPTH

CENTER STATION  
14 METER DEPTH

FIGURE 3

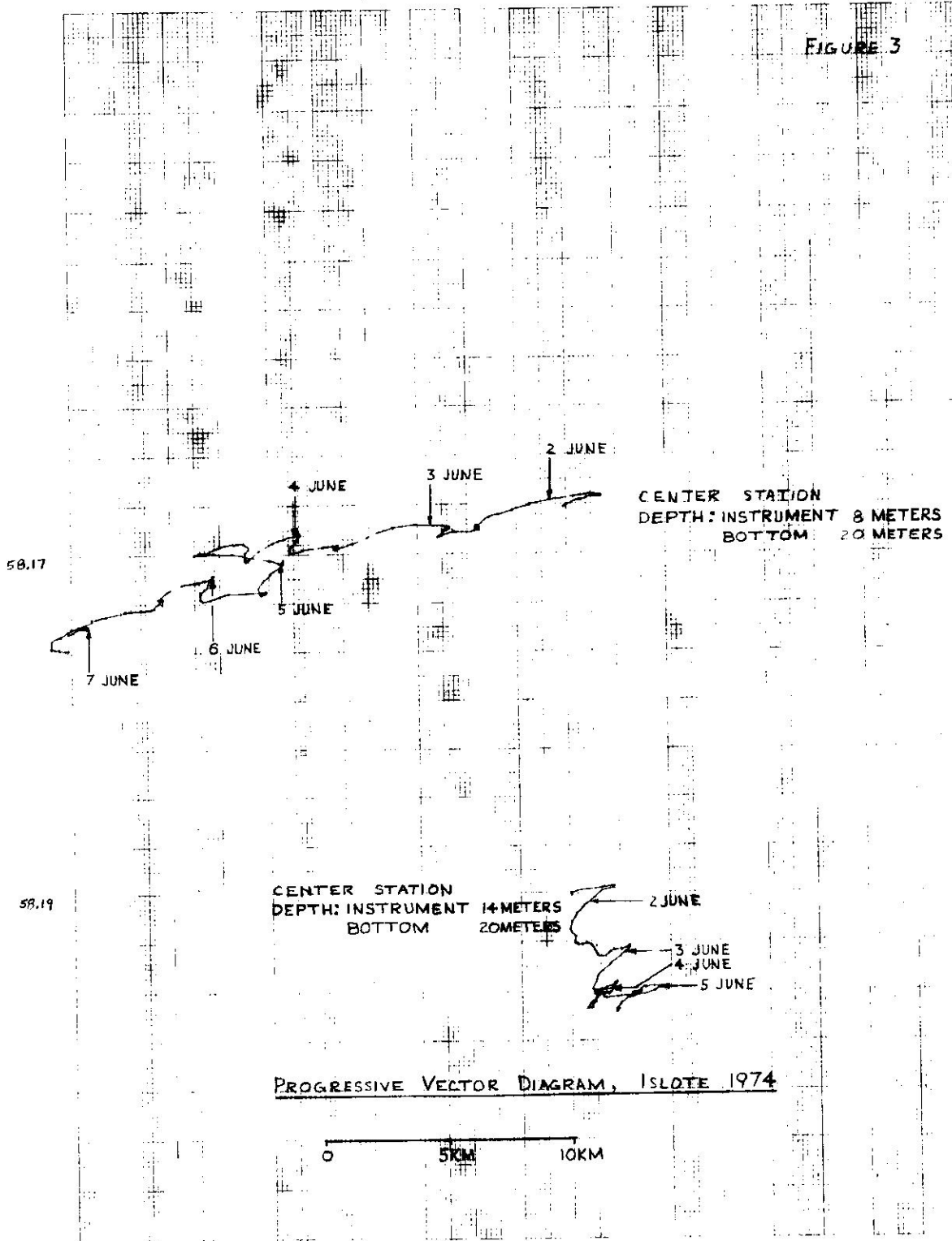


TABLE 1  
DATA SUMMARY

STATION DEPTH (M)	1974	MAXIMUM HOUR AVERAGED WESTWARD (cm/sec)	VELOCITY EXCURSION EASTWARD (cm/sec)	NET FLOW (cm/sec)	DIRECTION
NORTH	32	JAN-FEB 35.0	35.1	4.6	101°
	15	JUNE 18.2	33.3	5.5	70°
CENTER	5	JAN-FEB -	-	-	-
	8	JUNE 23.7	21.7	4.2	256°
	13	JAN-FEB 30.8	23.1	4.2	342°
	14	JUNE 14.1	17.0	1.4	167°

APPENDIX 1

SECTION 3

MEASUREMENT AND ANALYSIS OF  
ISLOTE NEARSHORE CURRENTS, AUG-SEPT 1974

Puerto Rico Nuclear Center  
Mayaguez, Puerto Rico

10 December 1974

## Introduction

Coastal currents were measured off Islote, during the period 27 August through 4 September 1974, coincident with 24 hour (expanded time scale) sea level measurements at Muelle Arecibo. Four General Oceanics current meters were positioned at the Center and East stations. Also, currents were measured during the period 17-27 September 1974 with two General Oceanics current meters at the East station in conjunction with drift-poles (an improved type of drogoue that measures velocity average over a 5 meter thick surface layer of water and is relatively unaffected by surface wind).

Previous current measurements were reported in

"Intensive Measurements and Analysis of Islote  
Nearshore Current, Jan-Feb 1974" dated May 1974,

"Measurement and Analysis of Islote Nearshore Currents,  
May-June 1974" dated 28 June 1974.

Detailed bathymetry of the nearshore area off Islote and hydrology of the ocean off the north coast of Puerto Rico, encompassing the Islote area, including detailed temperature and salinity structure for Jan 1973 through May 1974 were reported in

"Environmental Report for Nuclear Power Plant,  
Section 2.5.2" submitted 2 August 1974.

An updated version of the Environmental Report section 2.5.2 concurrently being completed will include additional hydrology data.

## Discussion

Current measurements off Islote indicate a net flow eastward during August-September 1974 (see Table 1). A reference station to the east of Islote and another reference station to the west of Islote confirm the net flow eastward. Furthermore, drift-pole (drogoue) measurements indicate eastward flow (Figures 1, 2 and 3). This net eastward flow is in contrast to net westward flow during January-February 1974 and May-June 1974.

Analysis of speed versus time curves (e.g. Figure 4) over 3 of 4 seasons suggests an annual net flow eastward of approximately 4 or 5 cm/second. Tidal velocity fluctuation up to 30 cm/second alternatively eastward and westward tend

to mask any long term net flow whenever measurements are limited to a few days or less (all previously reported measurements of currents around Puerto Rico by other groups). The North station measurements during January-February and June 1974 were the first clue that net flow to the east occurs (see Table 1).

During January-February, wind wave induced alongshore transport is westward from the shore out to a demarcation line of no net flow, somewhere between the Center station (20 meter depth contours) and the North station (50 meter depth contours). During May-June, wind wave induced alongshore transport has diminished considerably and appears to be limited to a well-mixed surface layer of about 10 meter thickness. By August-September wind waves no longer come from the northeast, but from the northwest. Alongshore transport is now to the east. This net flow to the east during August-September appears stronger than other seasons because it is probably the sum of alongshore eastward flow and an annual net eastward flow.

TABLE 1

Maximum Velocity (Hour Average)

	Station	Depth (m)	1974 No. Days	Westward (cm/sec)	Eastward (cm/sec)	Net Flow (cm/sec)	Direction
91ARI	Arecibo		Sept.	25.9	36.9	14.9	95°
89ARI	Light house		Sept.	12.8	27.6	9.1	72°
87IL2	Center	4-6	Aug. 27-31	28.3 LD	27.7 LD	9.6	280° LD
89IL2		16	Aug. 27-Sept.	20.1	32.9	8.9	84°
94IL5	East	4	Aug. -Sept.	26.3	36.0	8.4	101°
93IL5		16	Aug. -Sept.	18.2	27.7	5.0	86°
94IL6			Sept.	19.0	33.7	6.2	90°
93IL6			Sept.	10.9	24.7	1.7	110°
88PNI	Puerto Nuevo	4	Aug. -Sept.	25.0	42.0	8.3	87°
91PNI		16	Aug. -Sept.	23.4	31.1	8.2	69°



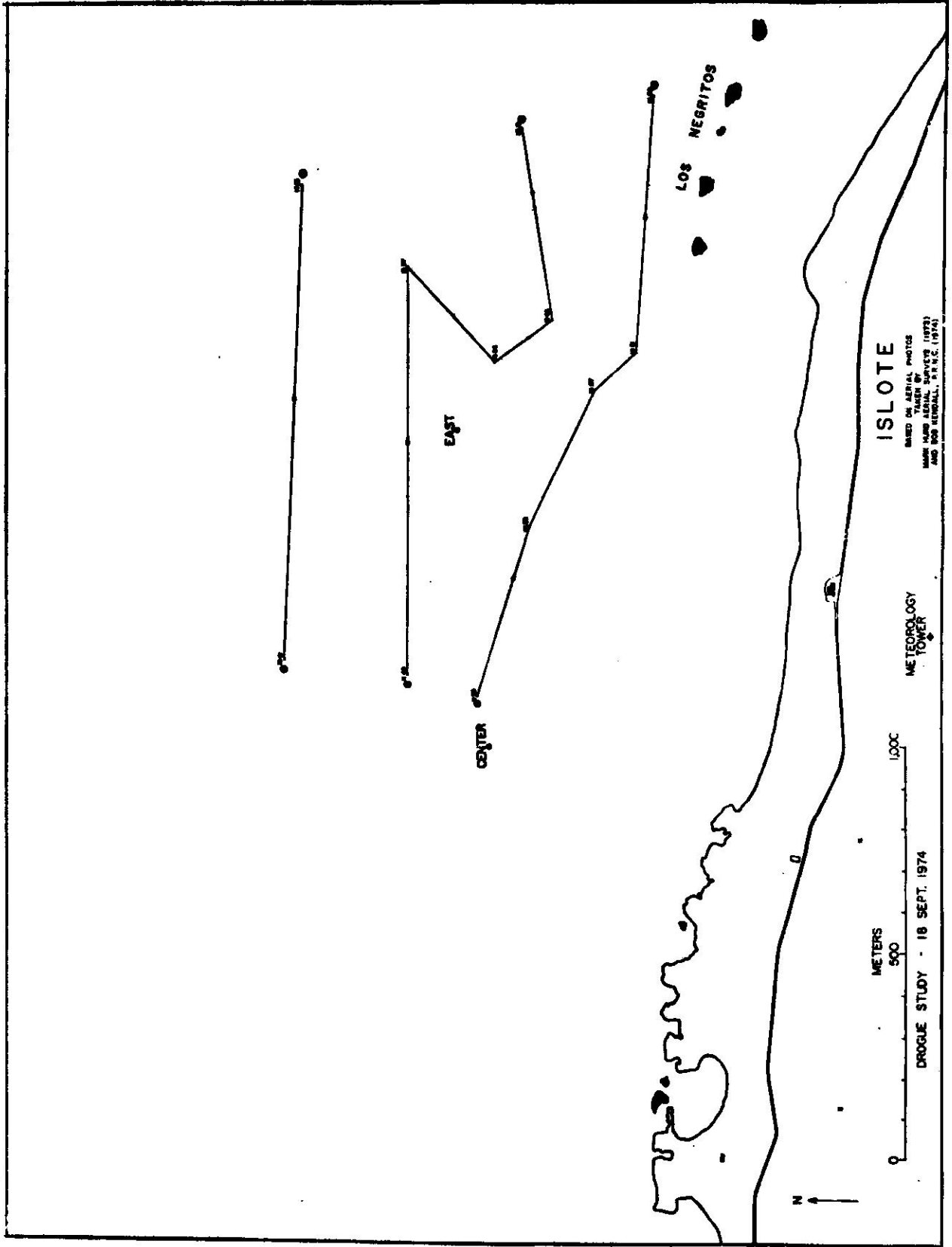


Fig. 1

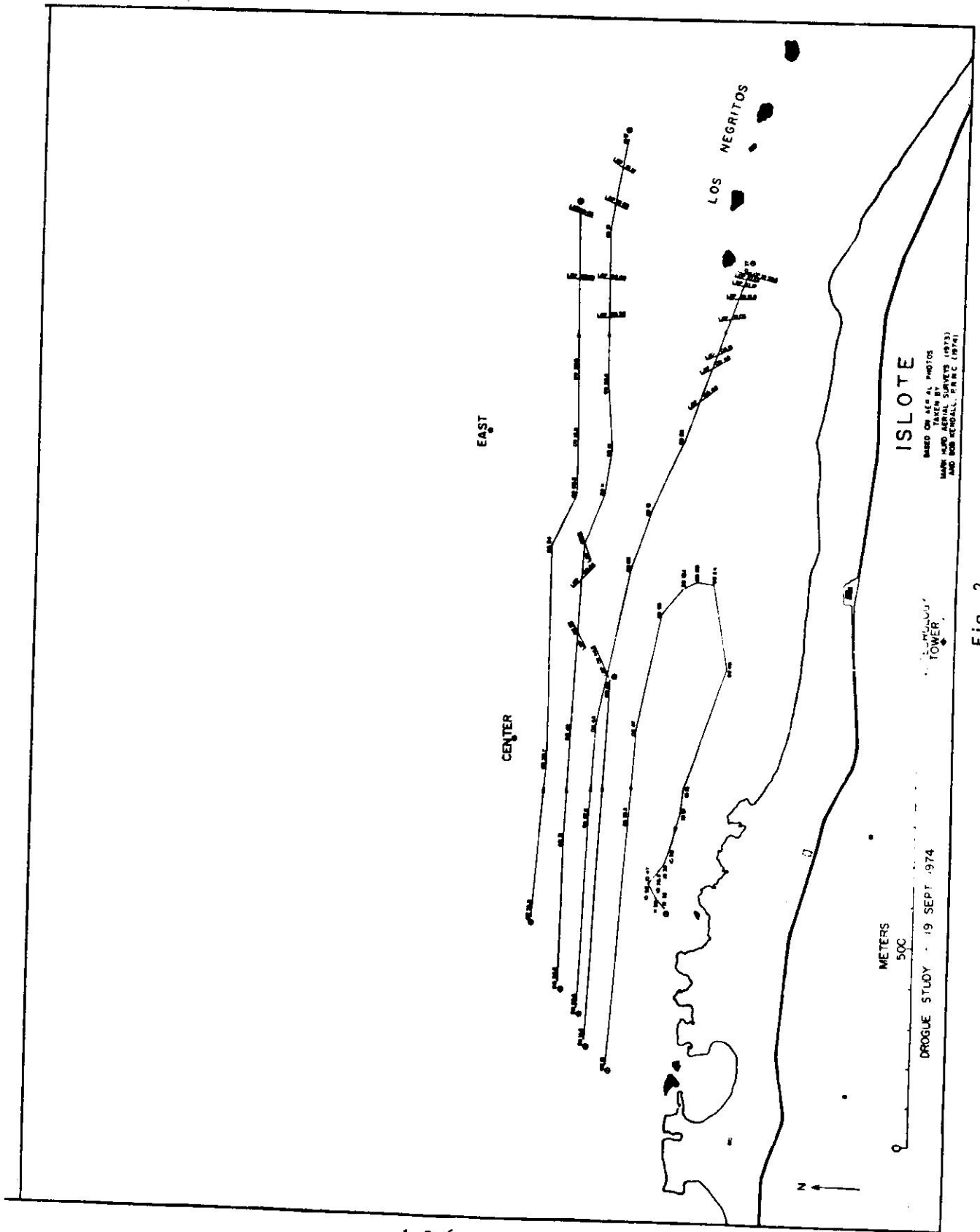
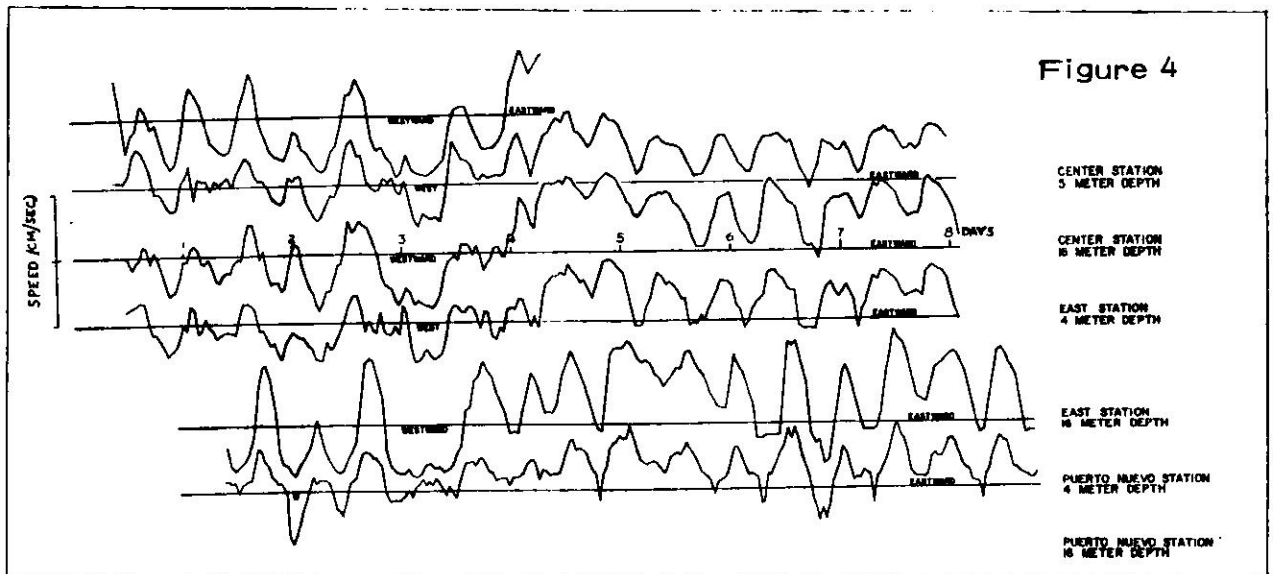
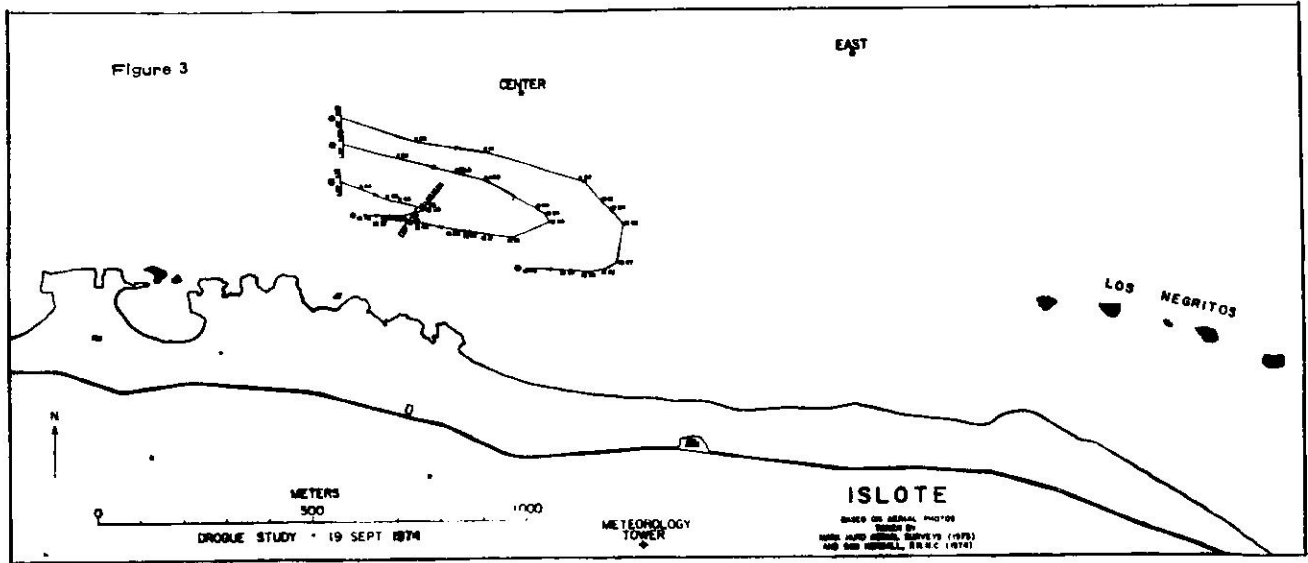
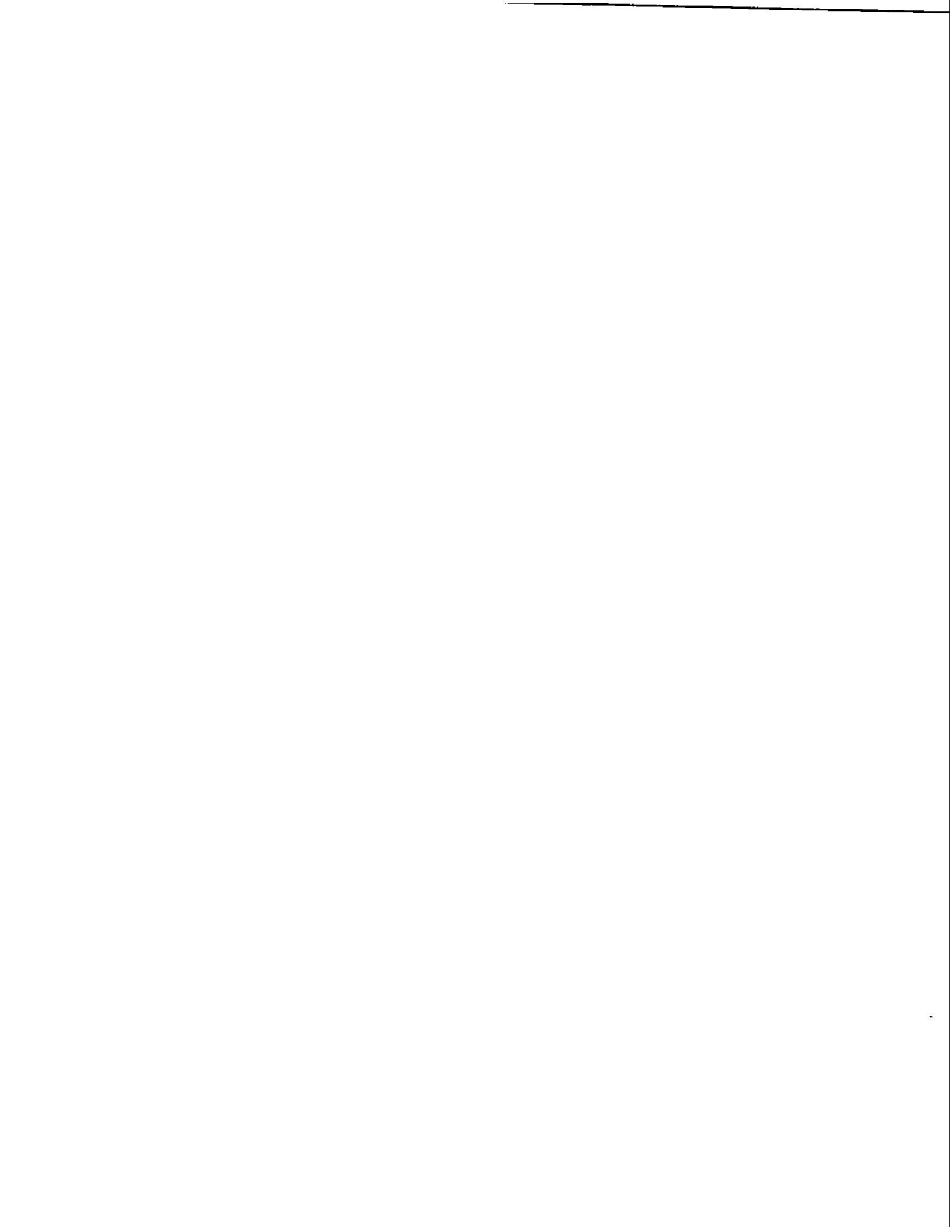


Fig. 2





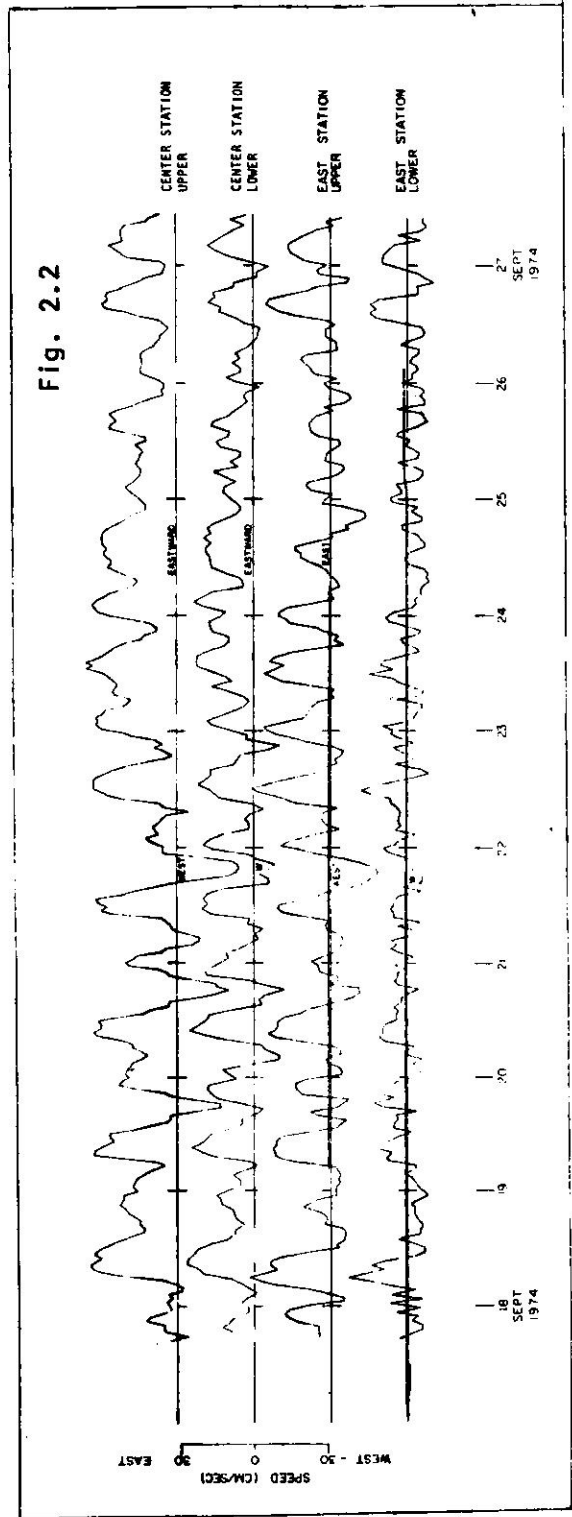
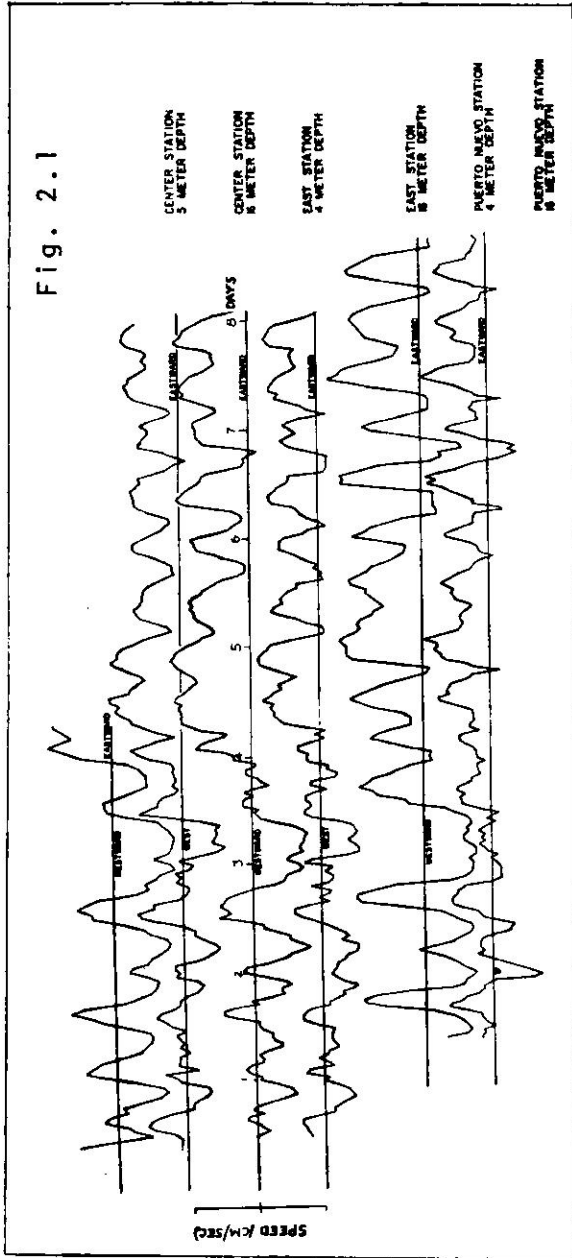
APPENDIX 2

RESULTS OF DROGUE STUDY

Puerto Rico Nuclear Center  
Mayaguez, Puerto Rico

## FIGURE LEGENDS

- Figure 2.1 Current Speed (cm/sec) eastward and westward along North Coast of Puerto Rico and San Juan predicted sea level August-September 1974
- 2.2 Current Speed (cm/sec) eastward and westward along North Coast of Puerto Rico and San Juan predicted sea level September 1974
- 2.3 Current Speed (cm/sec) eastward and westward along North Coast of Puerto Rico and San Juan predicted sea level October-November 1974
- 2.4 Current Speed (cm/sec) eastward and westward along North Coast of Puerto Rico and San Juan predicted sea level November 1974
- 2.5 Current Speed (cm/sec) eastward and westward along North Coast of Puerto Rico and San Juan predicted sea level December 1974
- 2.6 Current Speed (cm/sec) eastward and westward along North Coast of Puerto Rico and San Juan predicted sea level December-January 1975
- 2.7 Drogue Study 18 September 1974
- 2.8 Drogue Study 19 September 1974
- 2.9 Drogue Study 19 September 1974
- 2.10 Drogue Study 6 December 1974
- 2.11 Drogue Study 6 December 1974
- 2.12 Drogue Study 6 December 1974
- 2.13 Drogue Study 6 December 1974
- 2.14 Drogue Study 19 December 1974
- 2.15 Drogue Study 19 December 1974
- 2.16 Drogue Study 20 December 1974
- 2.17 Drogue Study 20 December 1974



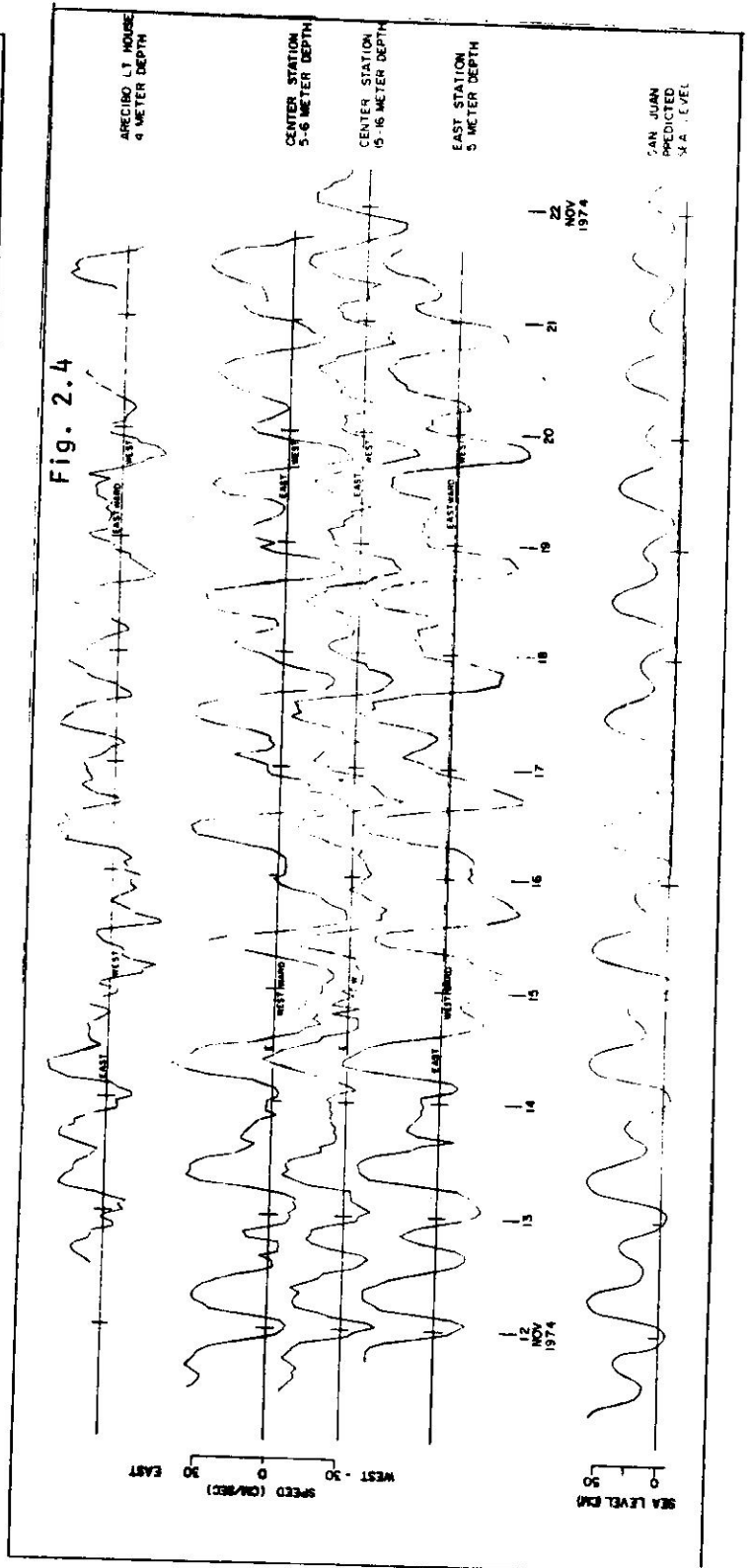
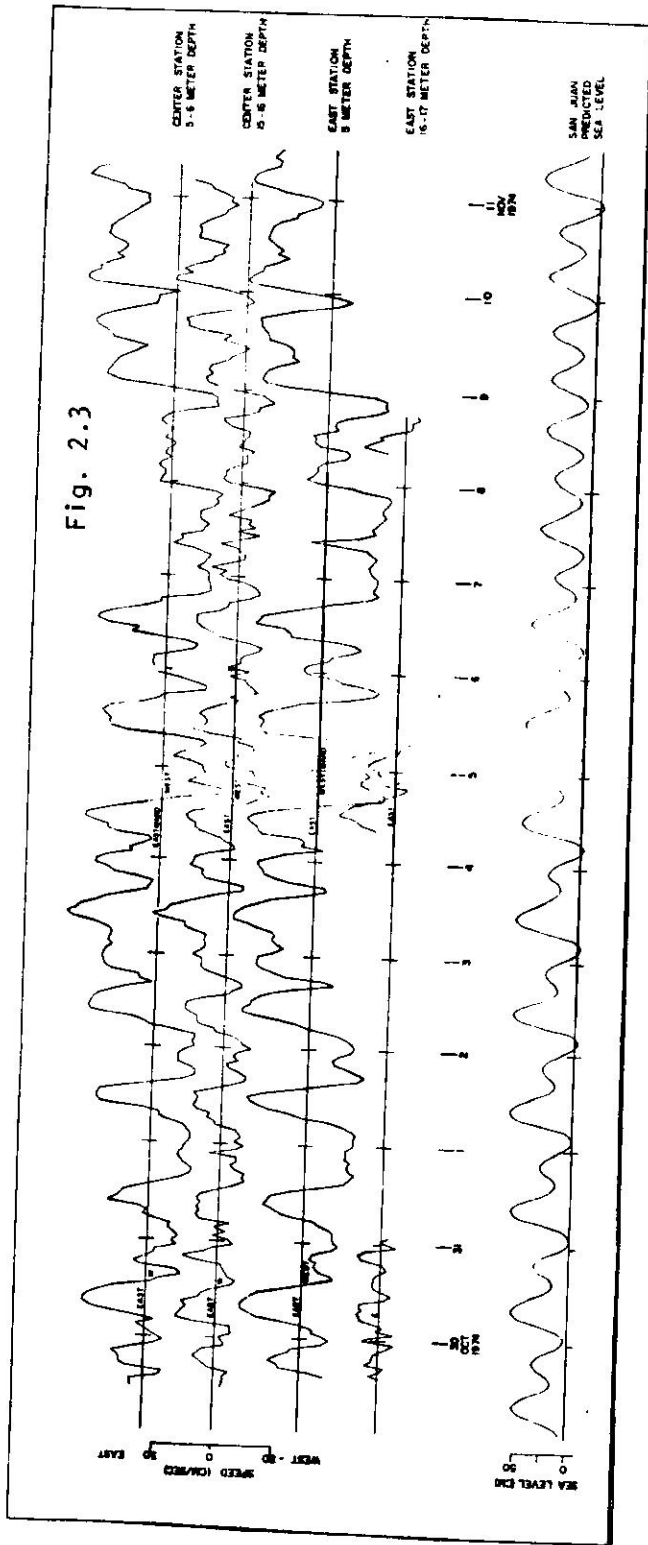




Fig. 2.5

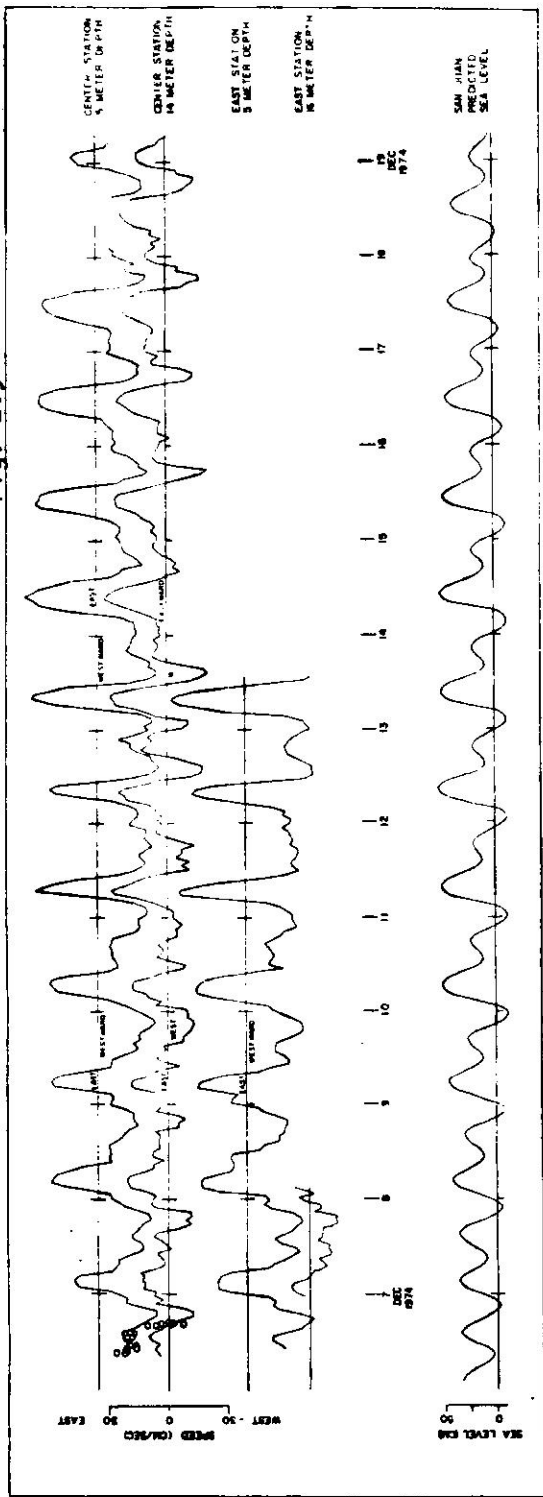
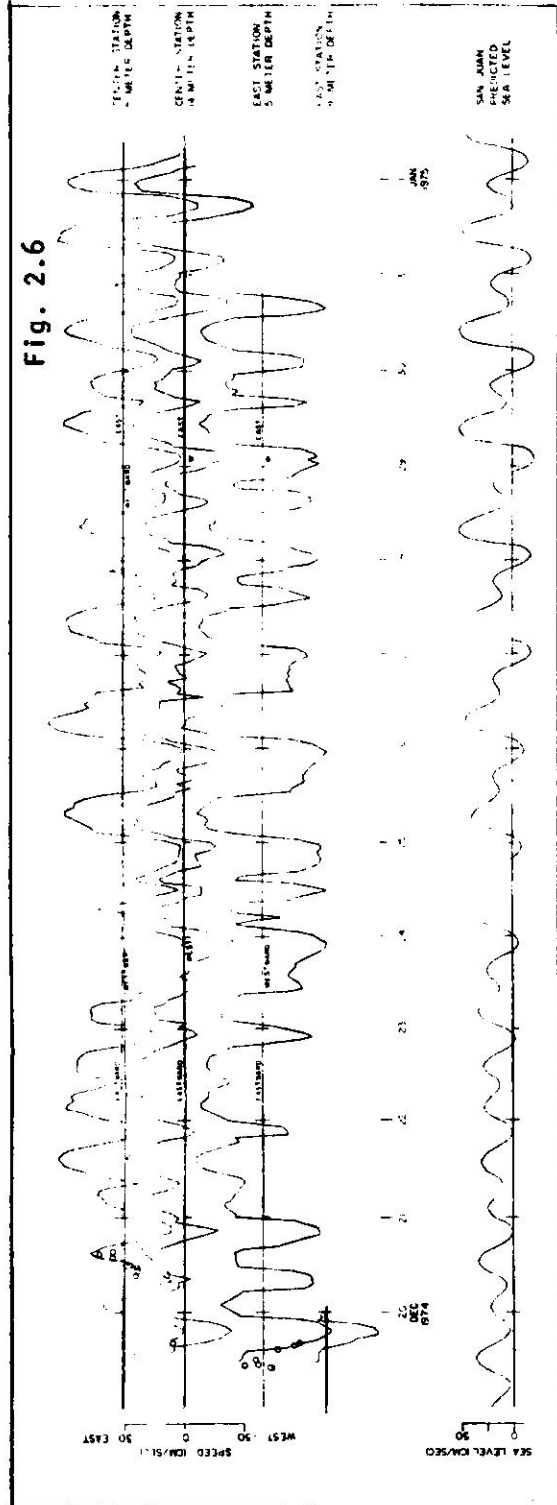


Fig. 2.6



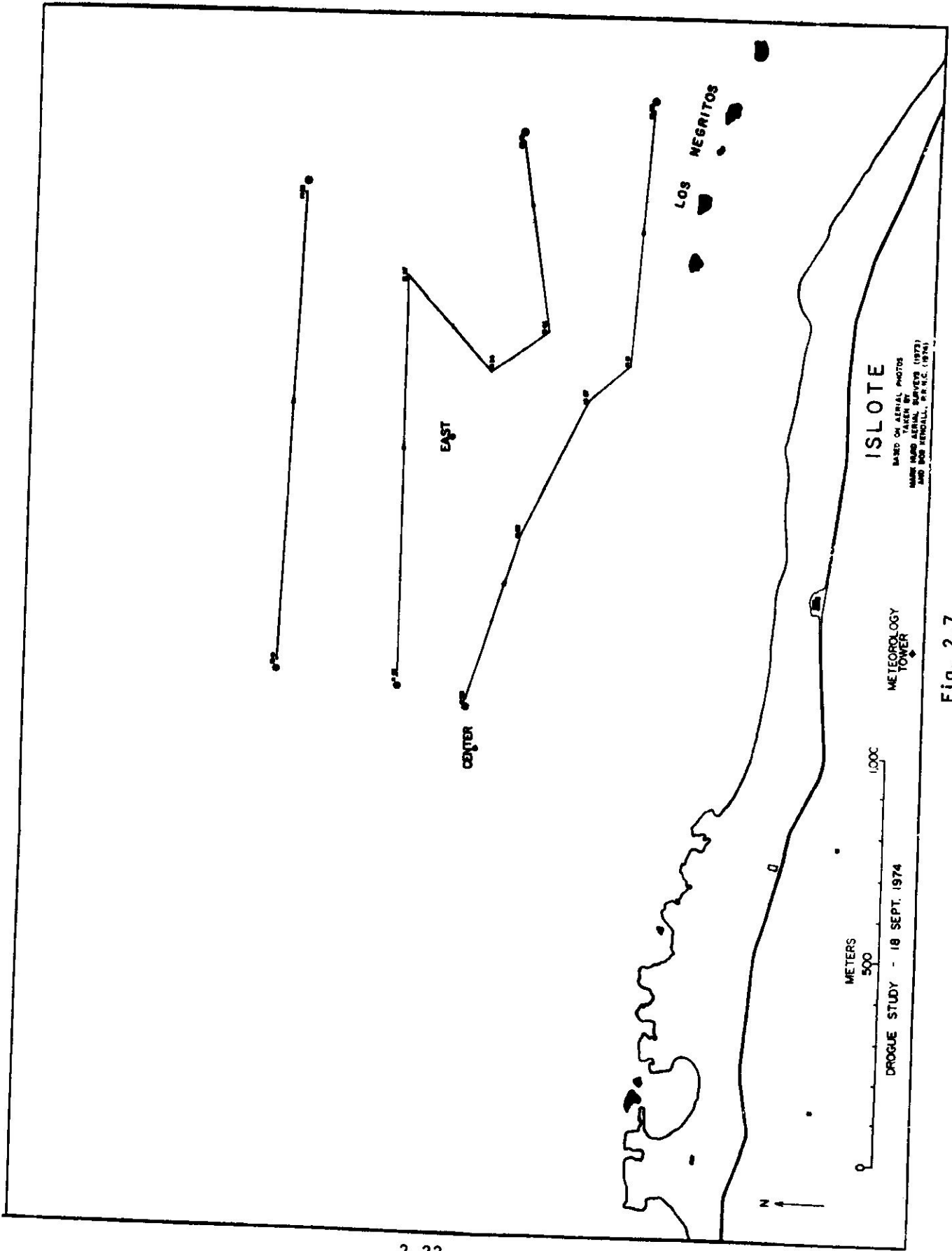


Fig. 2.7

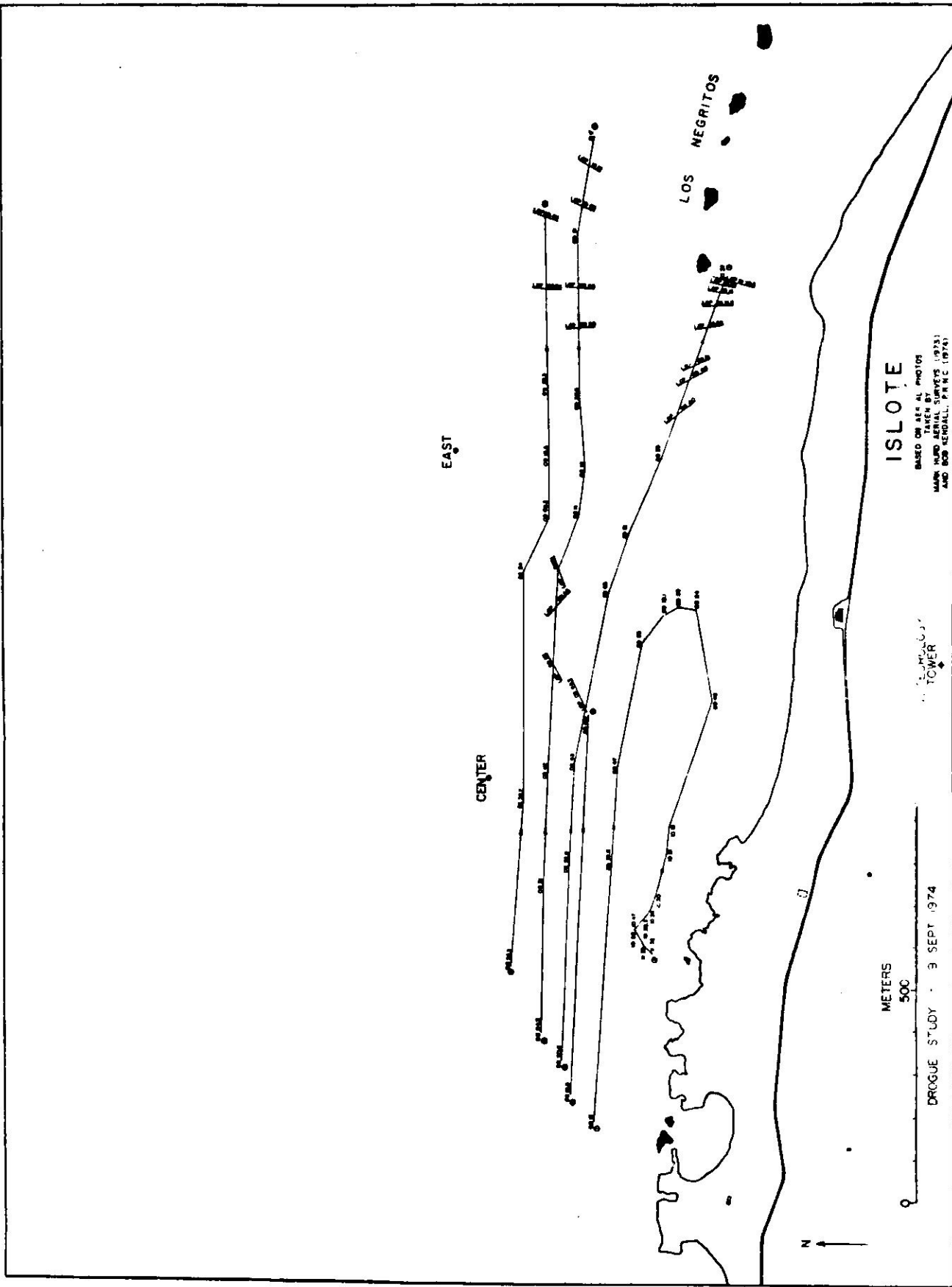


Fig. 2.8

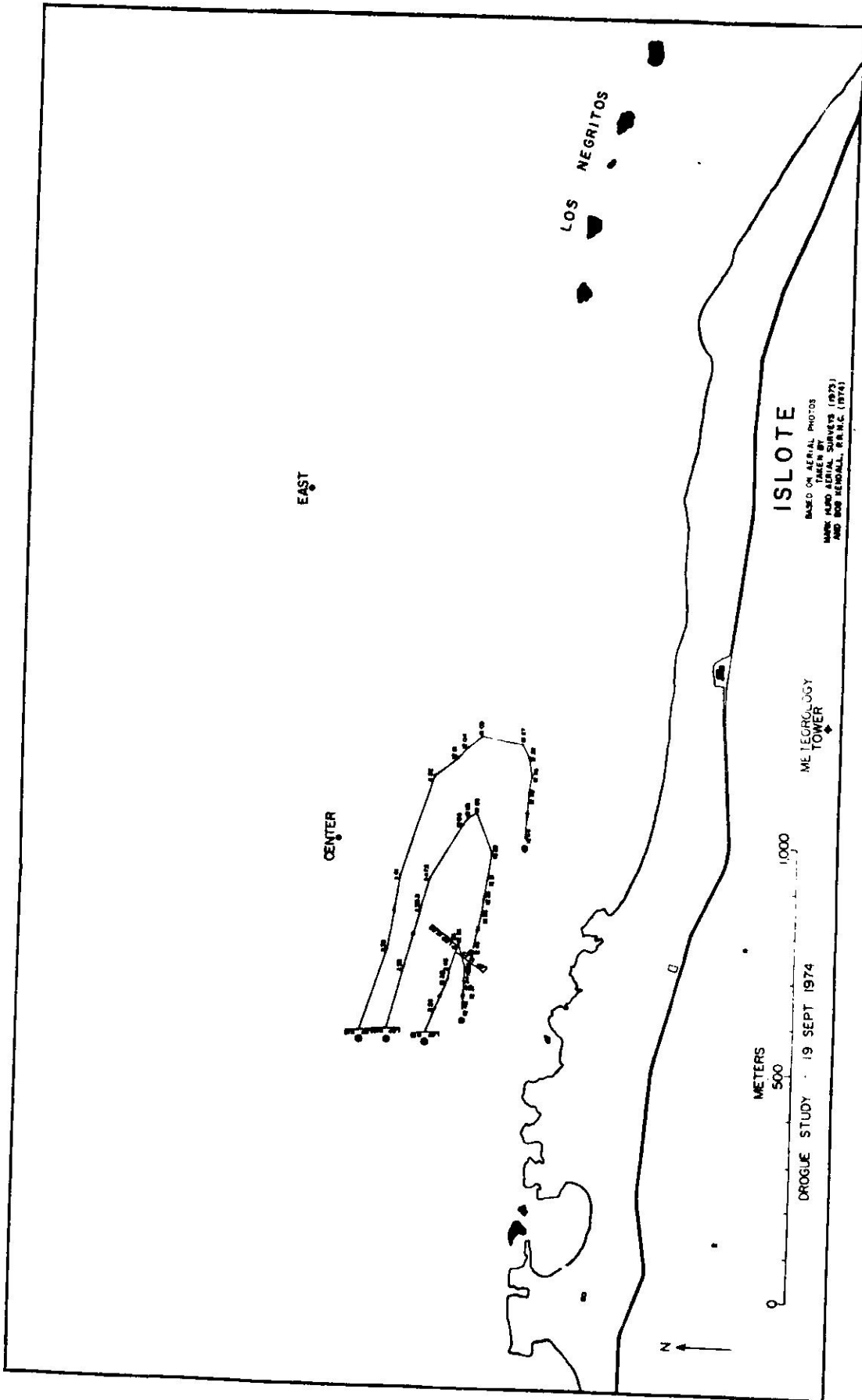


Fig. 2.9

Fig. 2.10

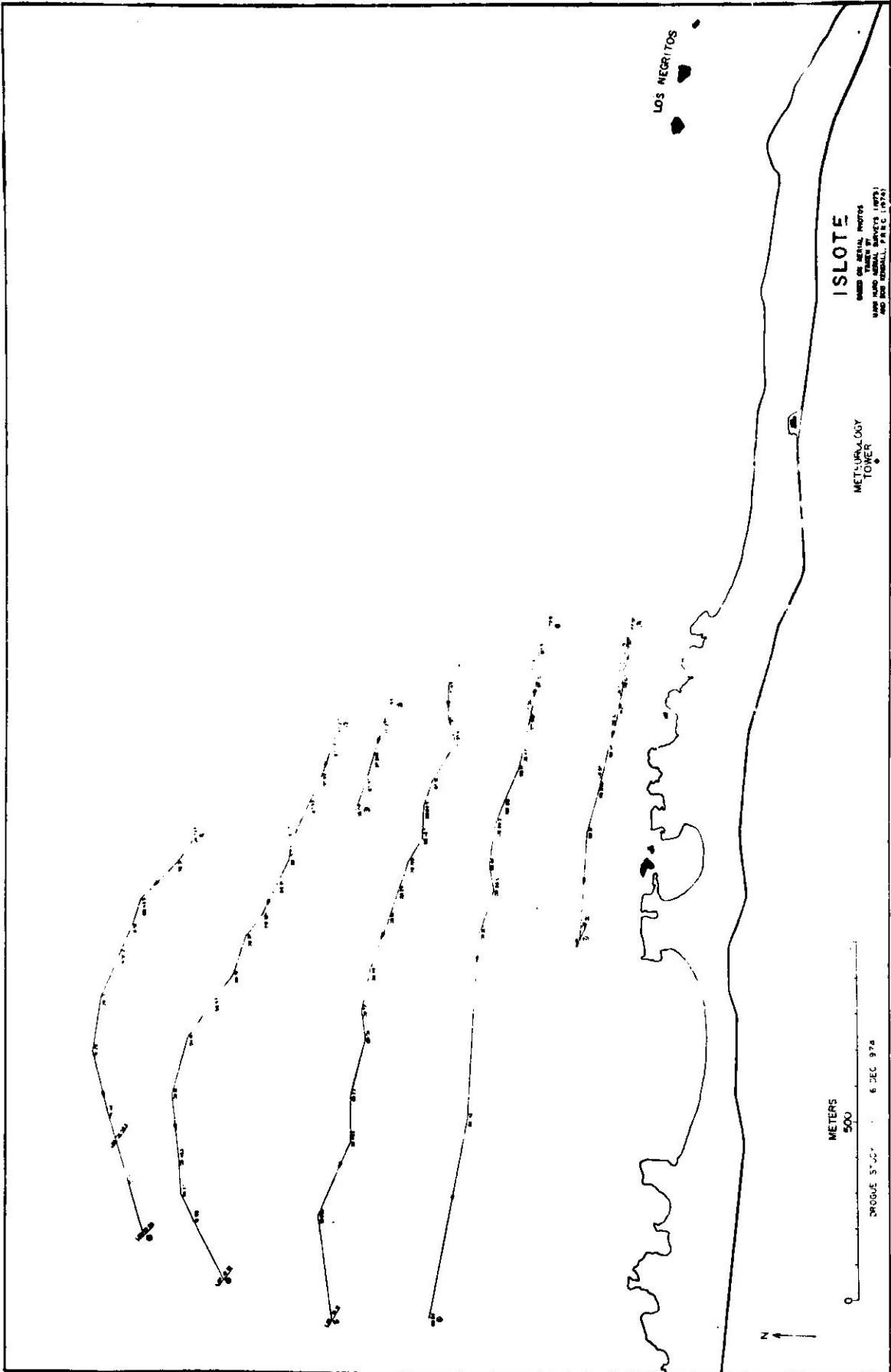


Fig. 2.11

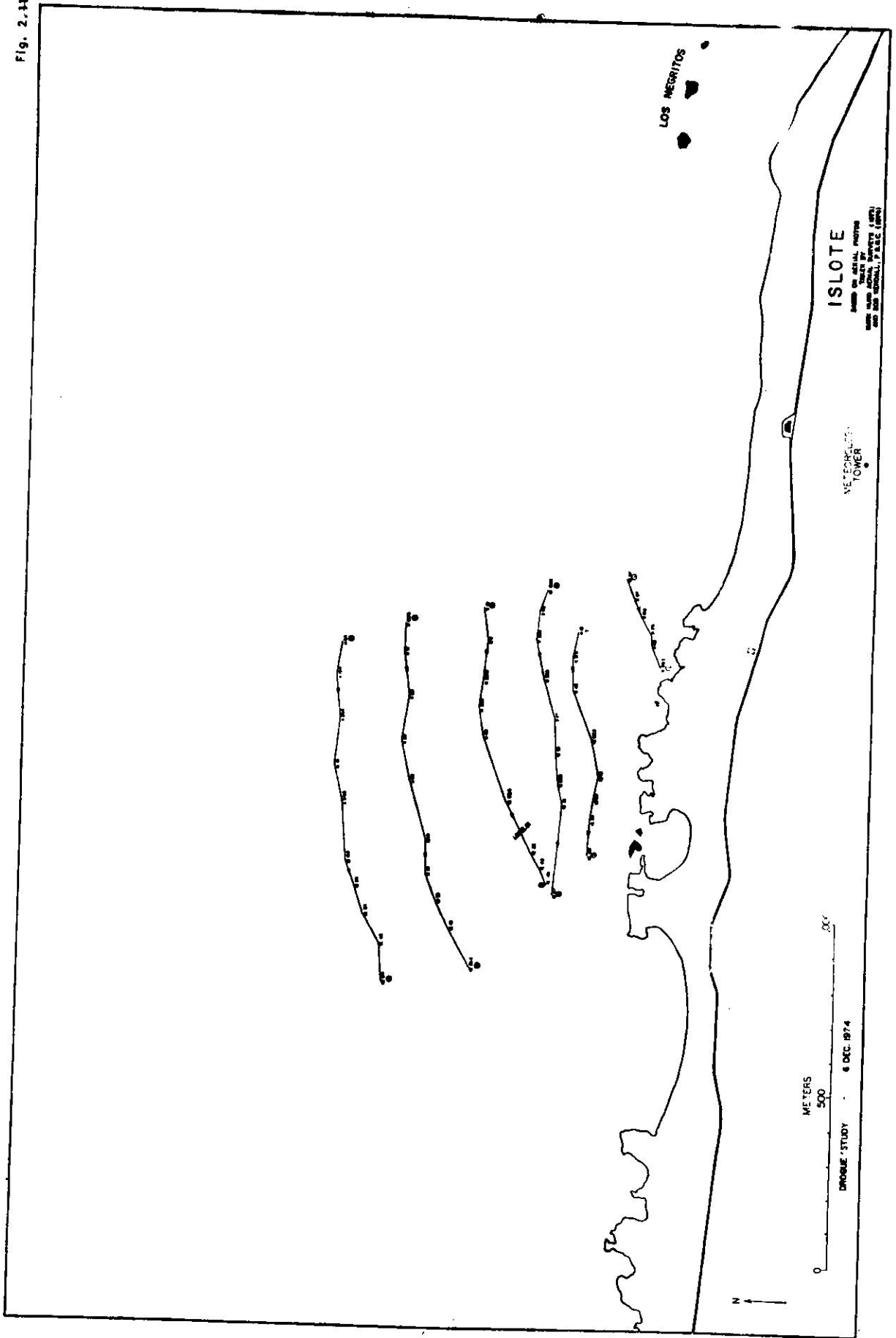
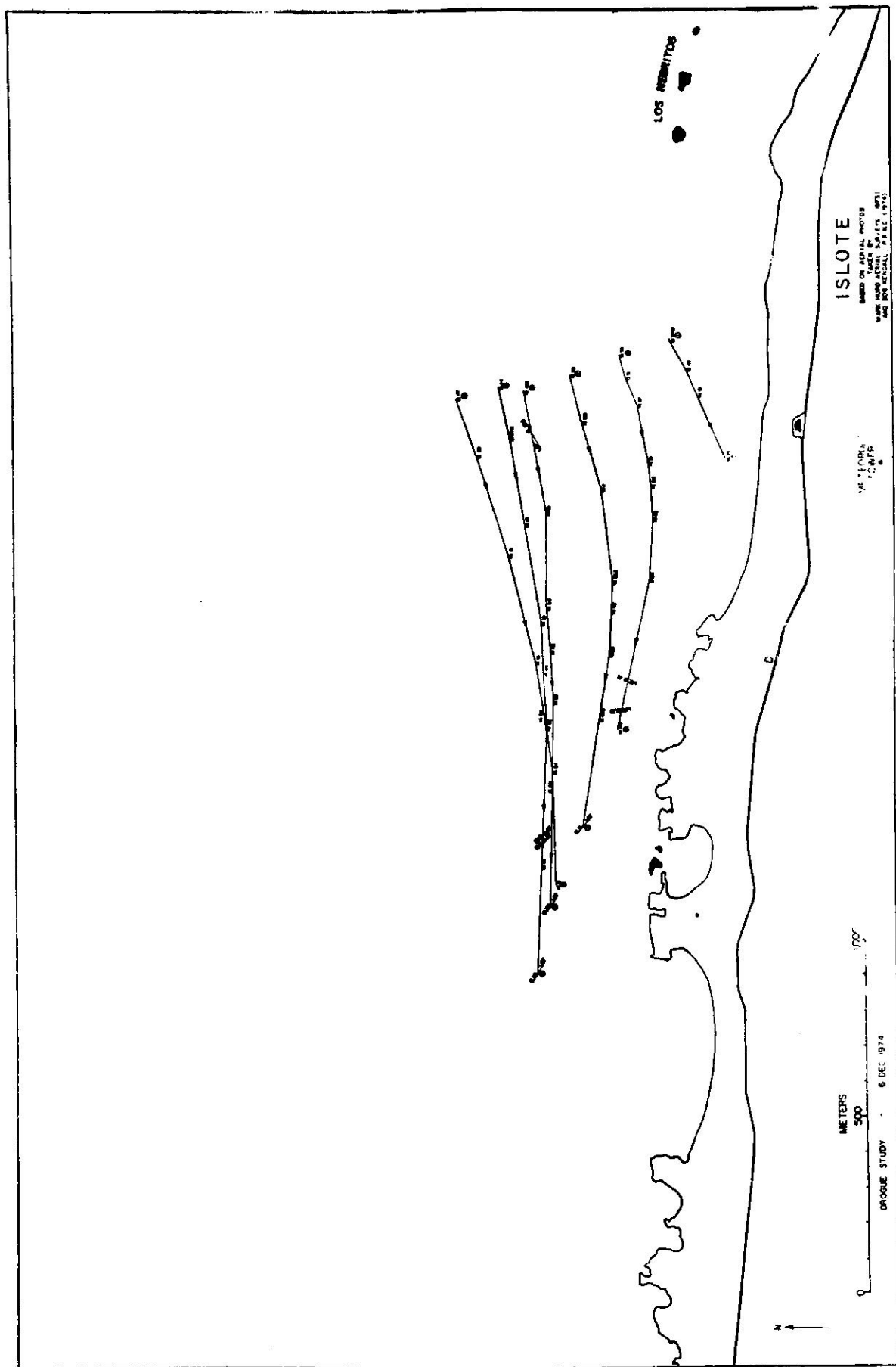


Fig. 2.12



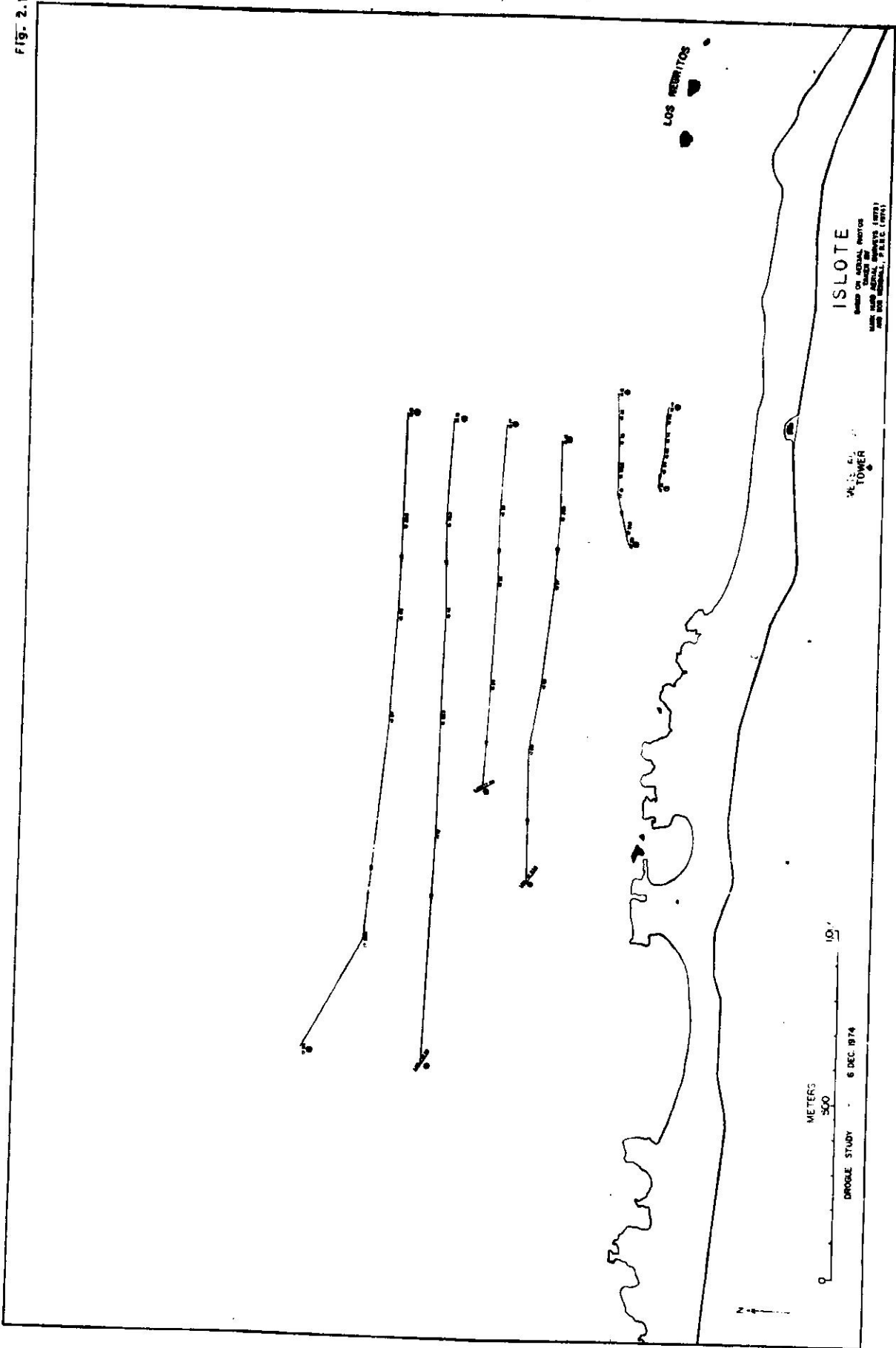




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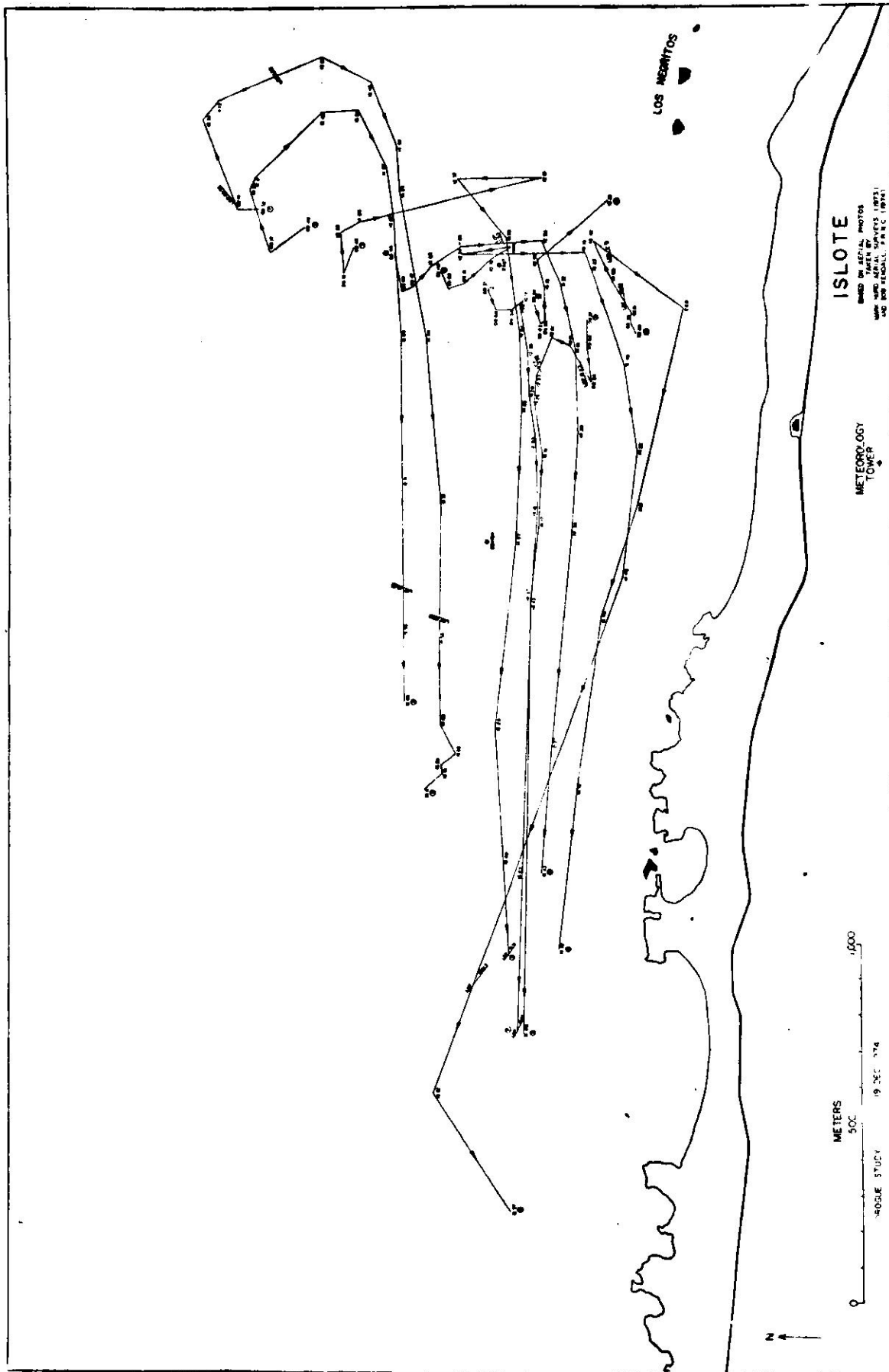


Fig. 2.15

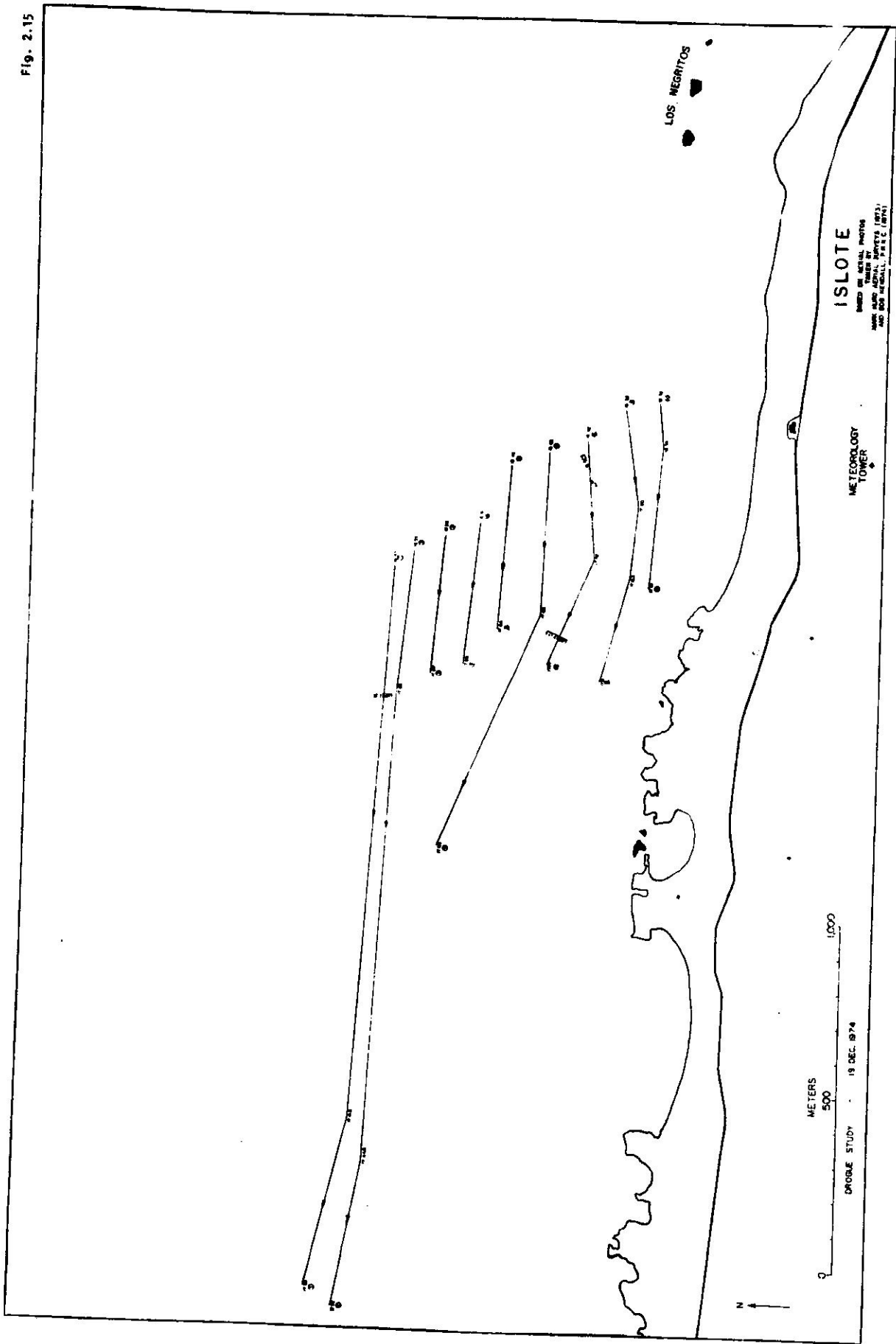


Fig. 2.16

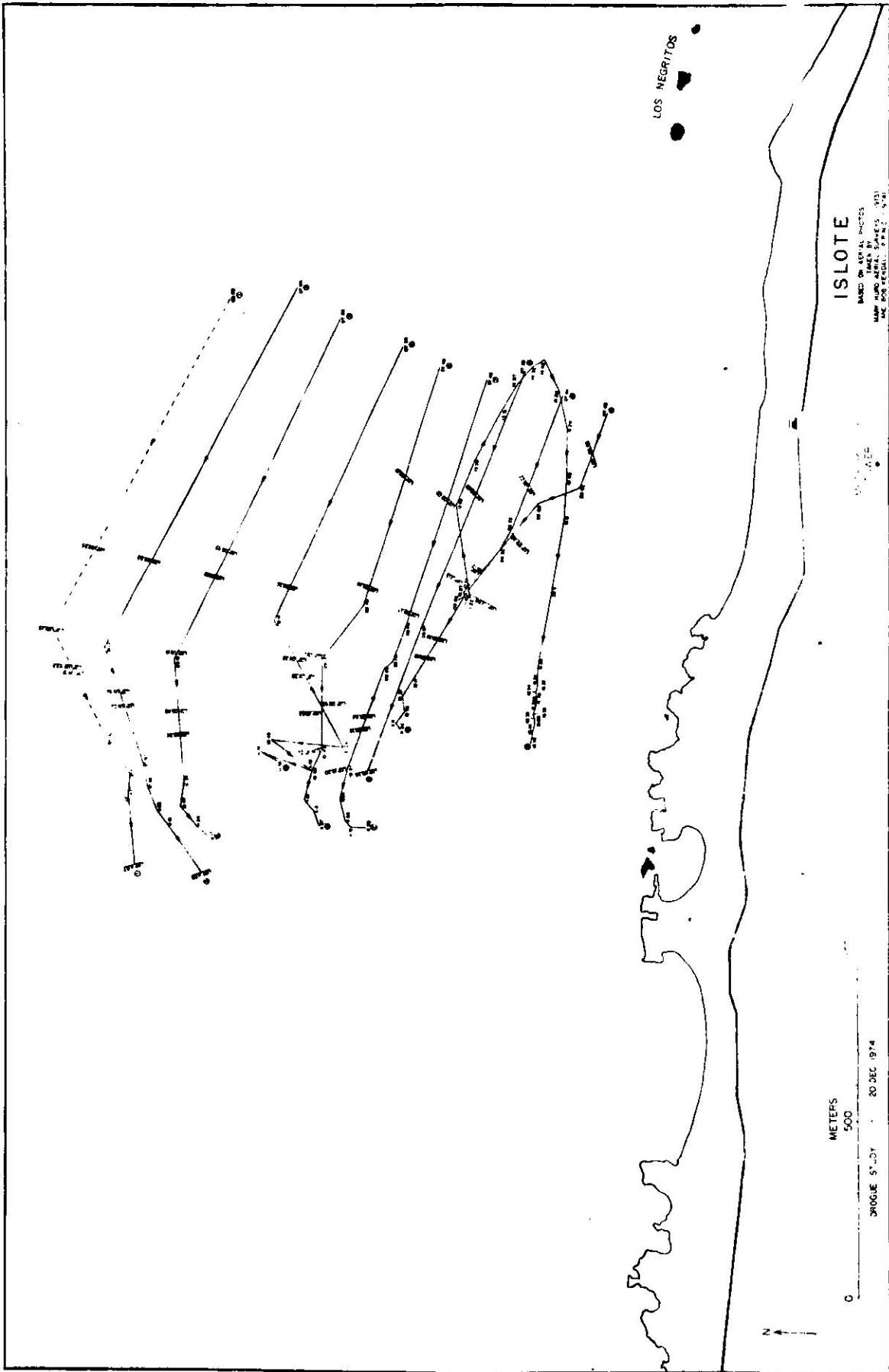
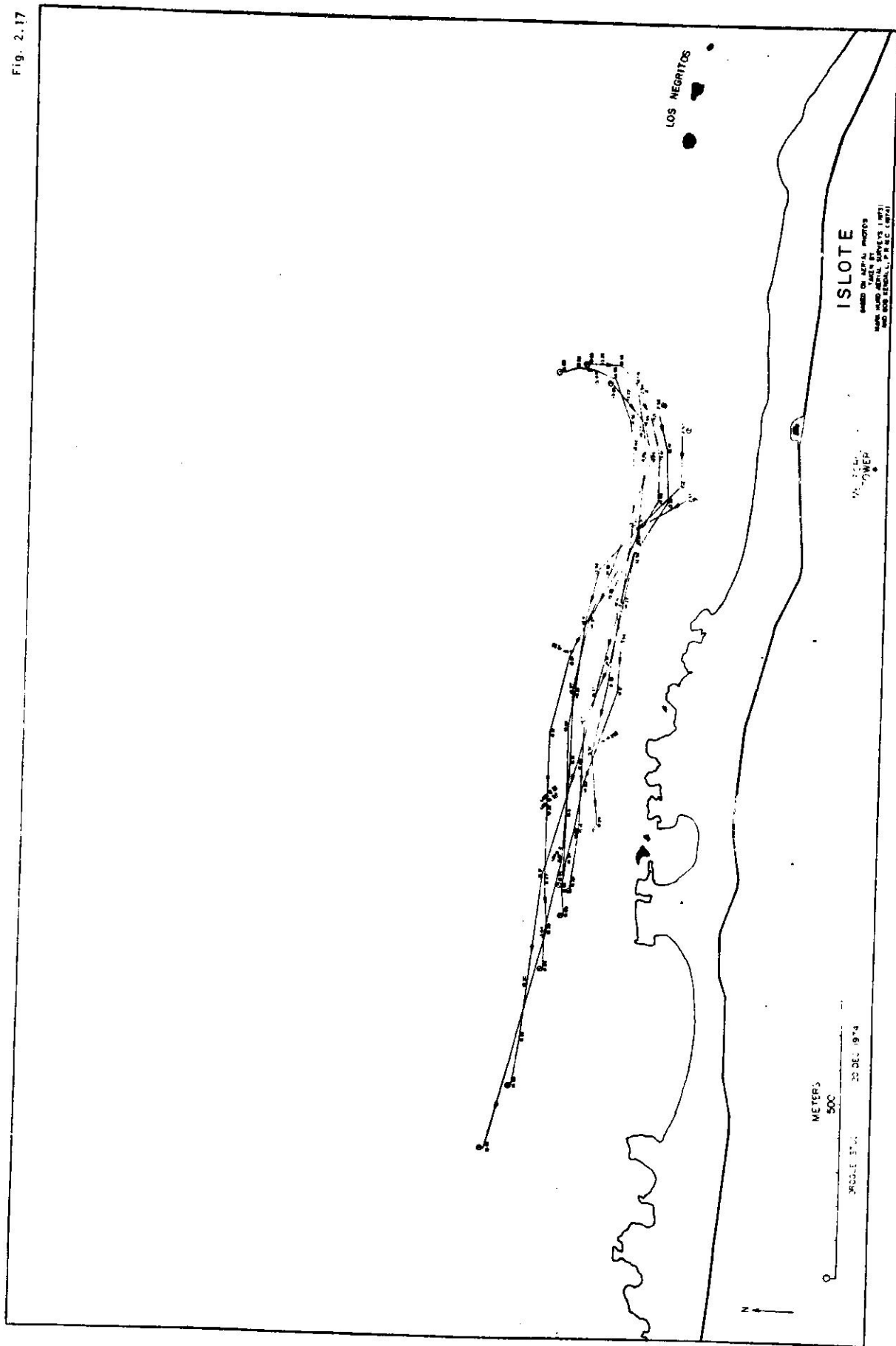


Fig. 2.17



**APPENDIX 3**

**AERIAL DYE DROPS STUDY**

**Puerto Rico Nuclear Center  
Mayaguez, Puerto Rico**

## Aerial Dye Drops 12/4/74

The first run began at 0924; the area was observed from the air and drops were made at 0930. The spacing was too close with only the outermost bag beyond the 20 m contour. Standard Navy sea markers were used to which partially inflated toy ballons were tied to insure flotation. Three observation runs were made at an altitude of 1,200 feet at about 20 minute intervals. All 6 dye packets remained in view throughout the period. Currents were to the east at all points with a slight shoreward component toward the end of the observation period. When observation was resumed at 1220 PM (Drop 2), four of the six packets were still streaming and were seen in the area off Punta Palma Altas (Barceloneta).

The second drop was made at 1225. Initial movement of all dye patches was apparently to the east. The patch closest to shore (A) entered the surf-zone slightly to the east of its original position and the dye dissipated in the surf (1235). Patch B appeared to reverse direction, moving westward and entered the surfzone near Punta de las tunas after approximately 1 hour. Patch C moved eastward generally parallel to the coast for about 40 minutes and then moved towards the west and shoreward. Patch D moved east parallel to the coast with shoreward movement increasing at the end of the hour. Patches E and F moved parallel to the coast in an easterly motion for the first hour and then exhibited more motion shoreward.

As it appeared that a current reversal might be starting, an additional drop was made at 1340 (due to scheduling requirements the helicopter was expected in San Juan at 1530). At the starting of this run dye patches E and F from Drop 2 were clearly discernible. Patch D was highly diffuse in the area of the awash rocks and A, B and C were gone or dissipating in the surf to the west of the drop line. Patches A and B moved westward, patch C was essentially stationary and patches D, E and F moved westward toward the southwest.

DYE STUDY COMMENTS

12/9/74

Drop 1 - All parallel to coast and westward - Patch A dispersed in eye between  $T_3$  and  $T_4$ .

Drop 2 - Three offshore patches to west (D.E.F). Inshore patches moved west then east.

Drop 3 - All patches moved west - patch A entered surf zone near headland and dispersed at  $T_3$ .

DYE STUDY COMMENTS

12/18/74

Drop 1 - Initial motion eastward. Eastward motion per unit time showed a marked increase between  $T_2$  and  $T_3$ . Some onshore movement but generally parallel to coast.

Drop 2 - One packet (innermost) caught on helicopter float and deployed at end of and west of drop line. Eastward motion initially by all patches with a strong shoreward motion. Patch A reversed direction.

Drop 3 - All patches moved west and shoreward. Package A entered surf and dispersed at  $T_1$  - At time  $T_3$  packet B was lifted onto the cliffs of the first headland.



- Drop 1 - A really mixed bag - The drop went at 0918 - buoy CH was straddled-a slight easterly motion was apparent at  $T_1$ . All patches except patch D had moved eastward - patch D moved westward at  $T$ . Patches A,C,D,E & F had moved eastward and shoreward to varying degrees. White patch B moved northward. At  $T-3$  patches A,B, C,D & E had moved westward while patch F showed continued motion toward the southwest.
- Drop 2 - At 1220 an overflight indicated that dye patches from drop 1 were in the area of the N-s line from CH buoy and met tower - for this reason the drop was made on a N-s line passing thru the westernmost awash rock. Initial motion was westward. Patch A moved very rapidly westward and washed ashore near the first headland to the west of the site at  $T_2$ . The balance of the dye patches moved approximately westward during the observation period.
- Drop 3 - The drop was not made on a N-s line due to high velocity winds - Motion was generally parallel to the coast - Patch A entered the "eye" between  $T_2$  and  $T_3$ .

Date: 12/4/74

Wind: VAR 0.5

Waves: NNW 5-6s

TD = 0930

T1 = 0948

T2 = 1005

T3 = 1029

3.6

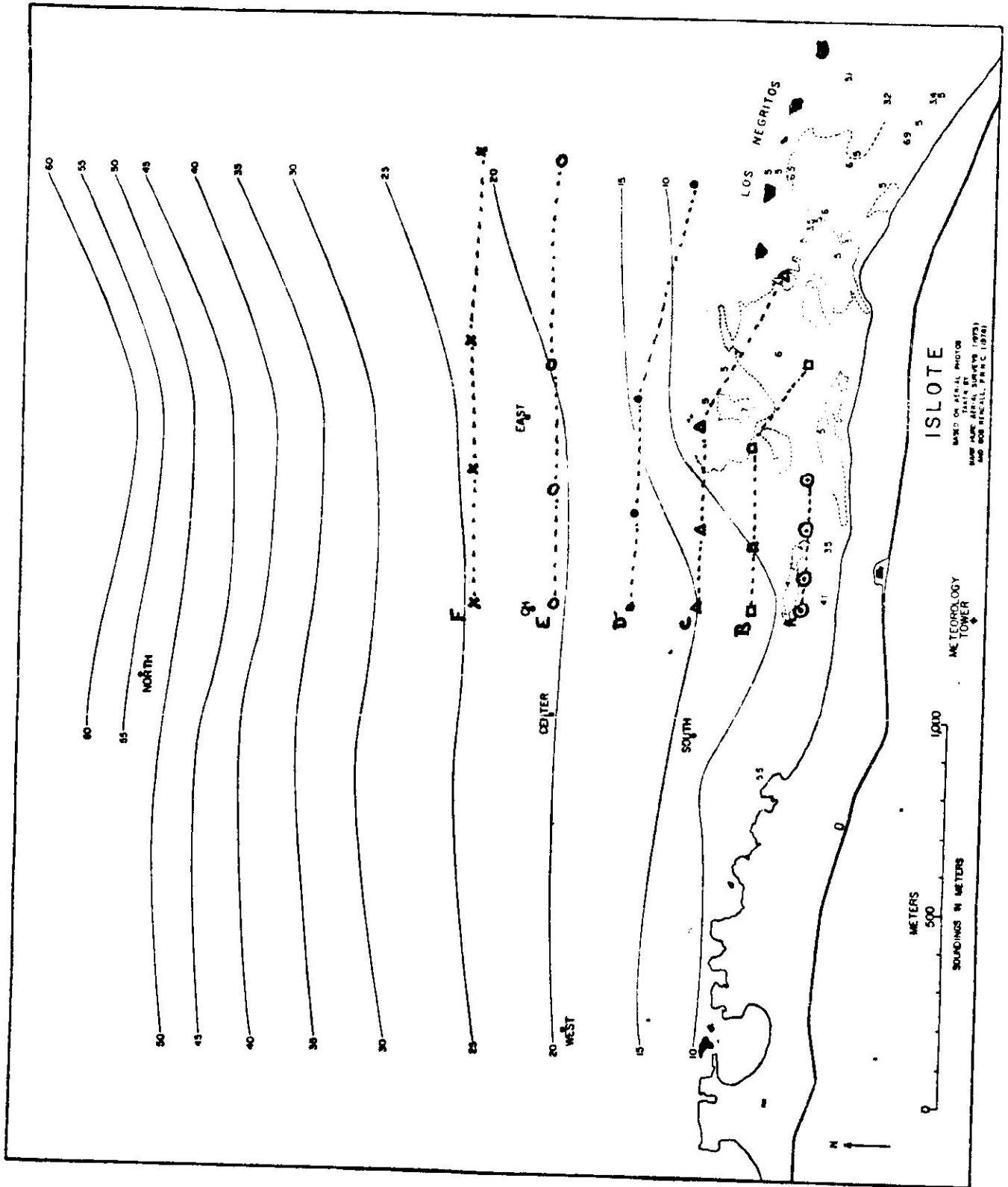


Fig. 3-1

Date: 12/4/74

Wind: ENE 5-10

Waves: NNW 5-6s

TD = 1225

T1 = 1245

T2 = 1305

T3 = 1320

T4 = 1335

T5 = 1350

3.7

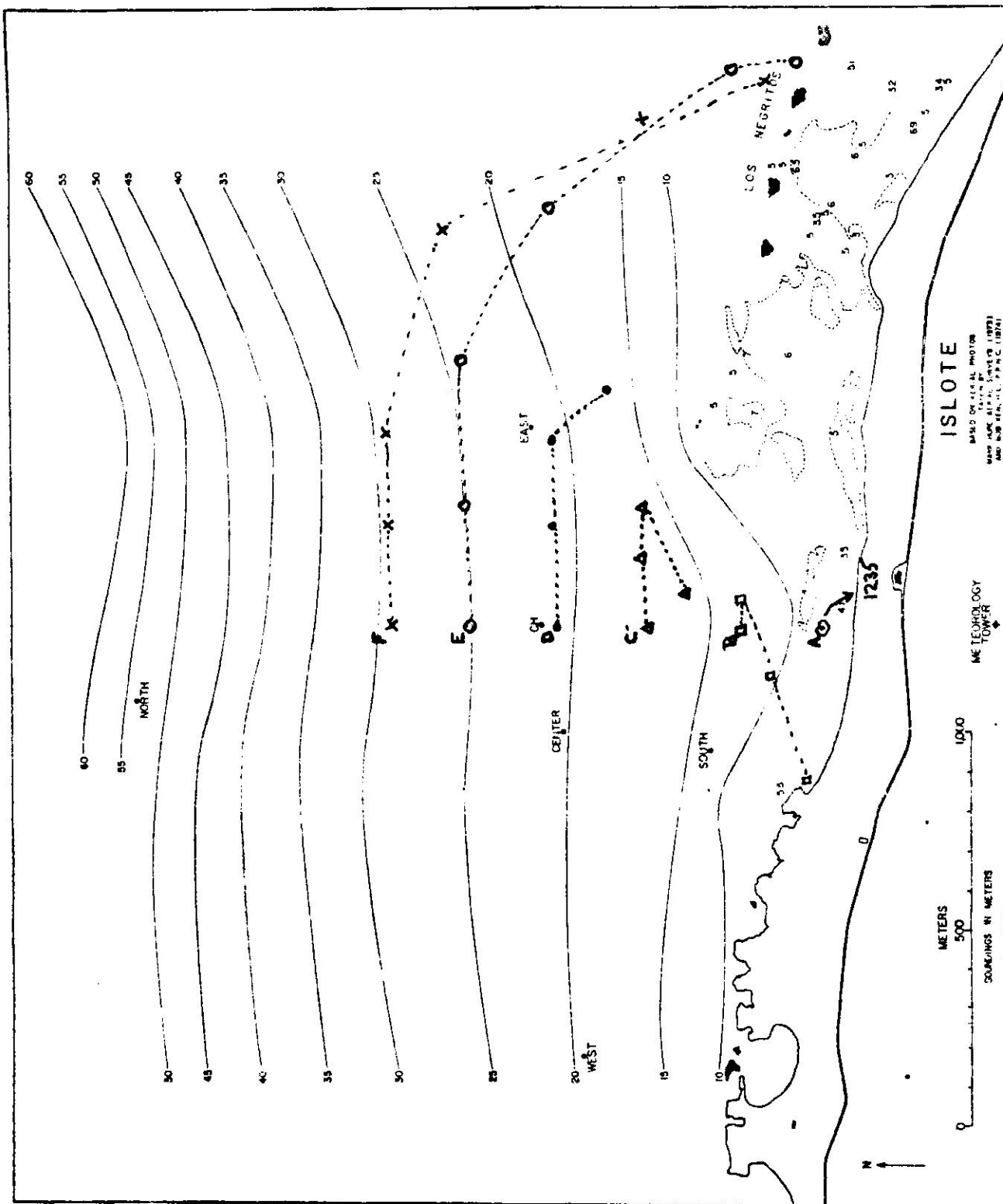


Fig. 3-2

Date: 12/4/74

Wind: ENE 5-10

Waves: NNW 5-6s

TD = 1340

T1 = 1355

T2 = 1405

T3 = 1425

3. 8

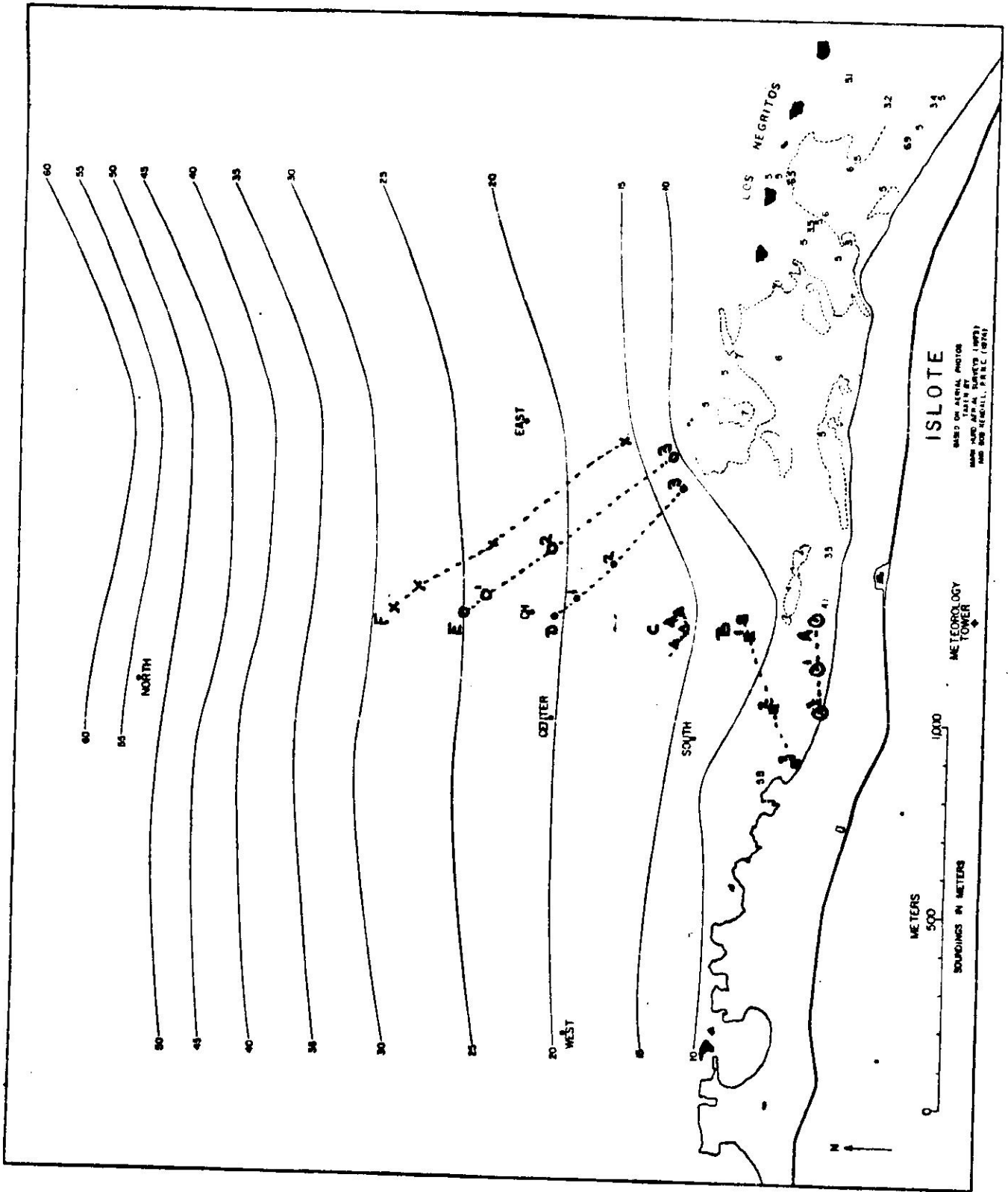


Fig. 3-3

Date: 12/9/74  
 Wind: VAR 0.5  
 Waves: NNE 3-4s  
 TD = 0924  
 T1 = 0944  
 T2 = 1018  
 T3 = 1050  
 T4 = 12M

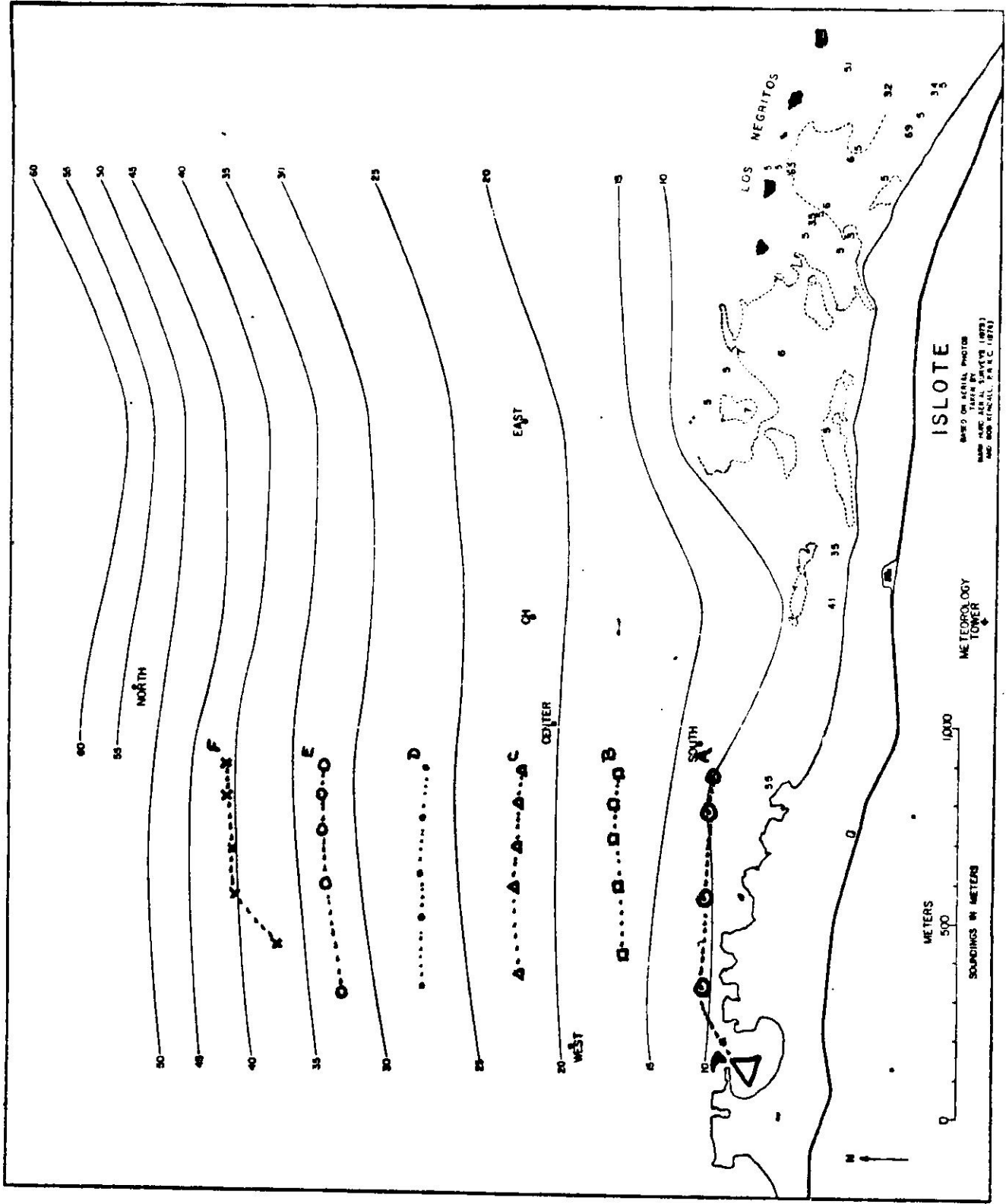


Fig. 3-4

Date: 12/9/74

Wind: NE 5-10

Waves: NNW 5-6s

TD = 1155

T1 = 1222

T2 = 1245

T3 = 1304

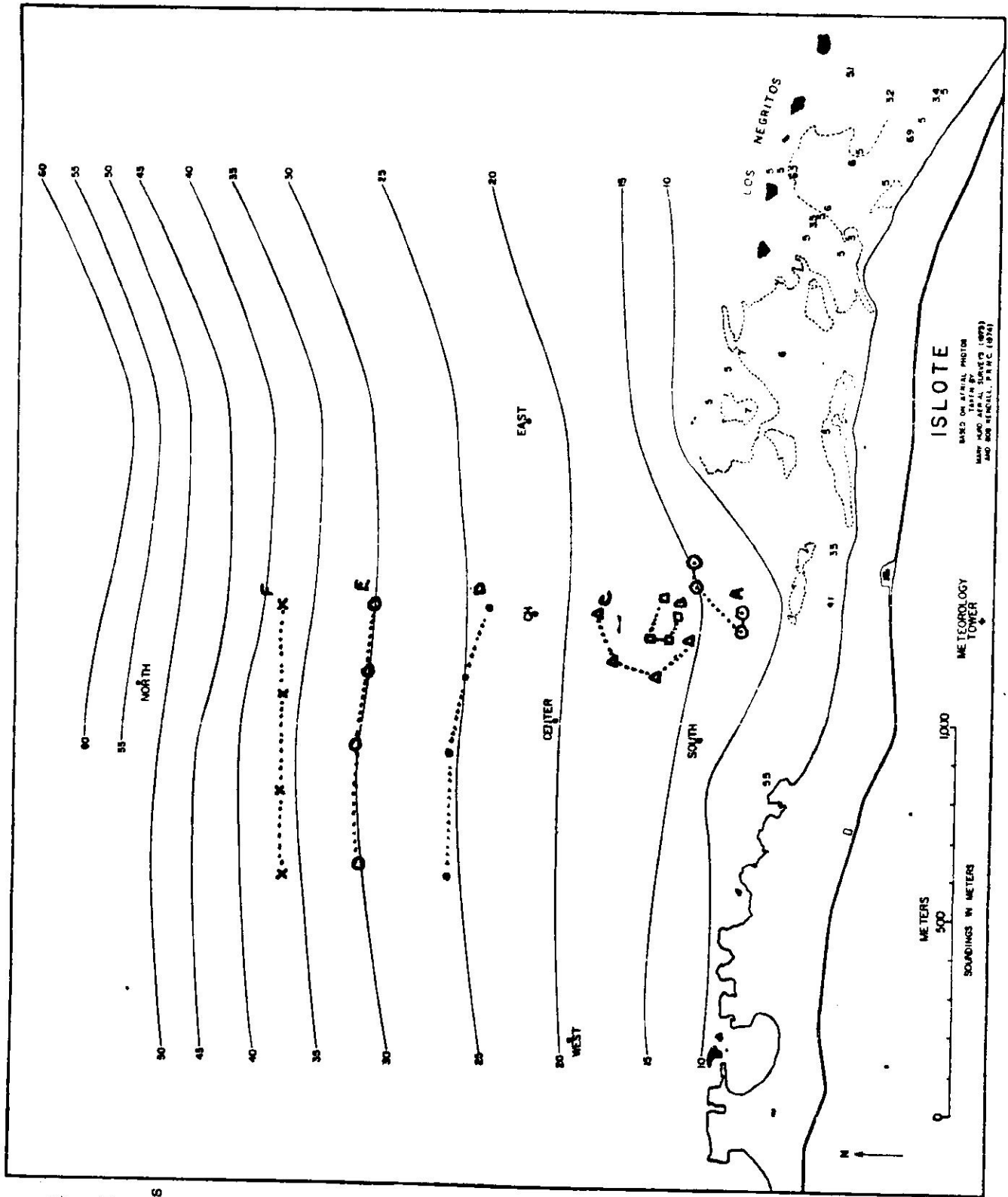


Fig. 3-5

Date: 12/9/74  
 Wind: VAR 5-10  
 Waves: NNW 5-6s  
 TD = 1424  
 T1 = 1452  
 T2 = 1510  
 T3 = 1530

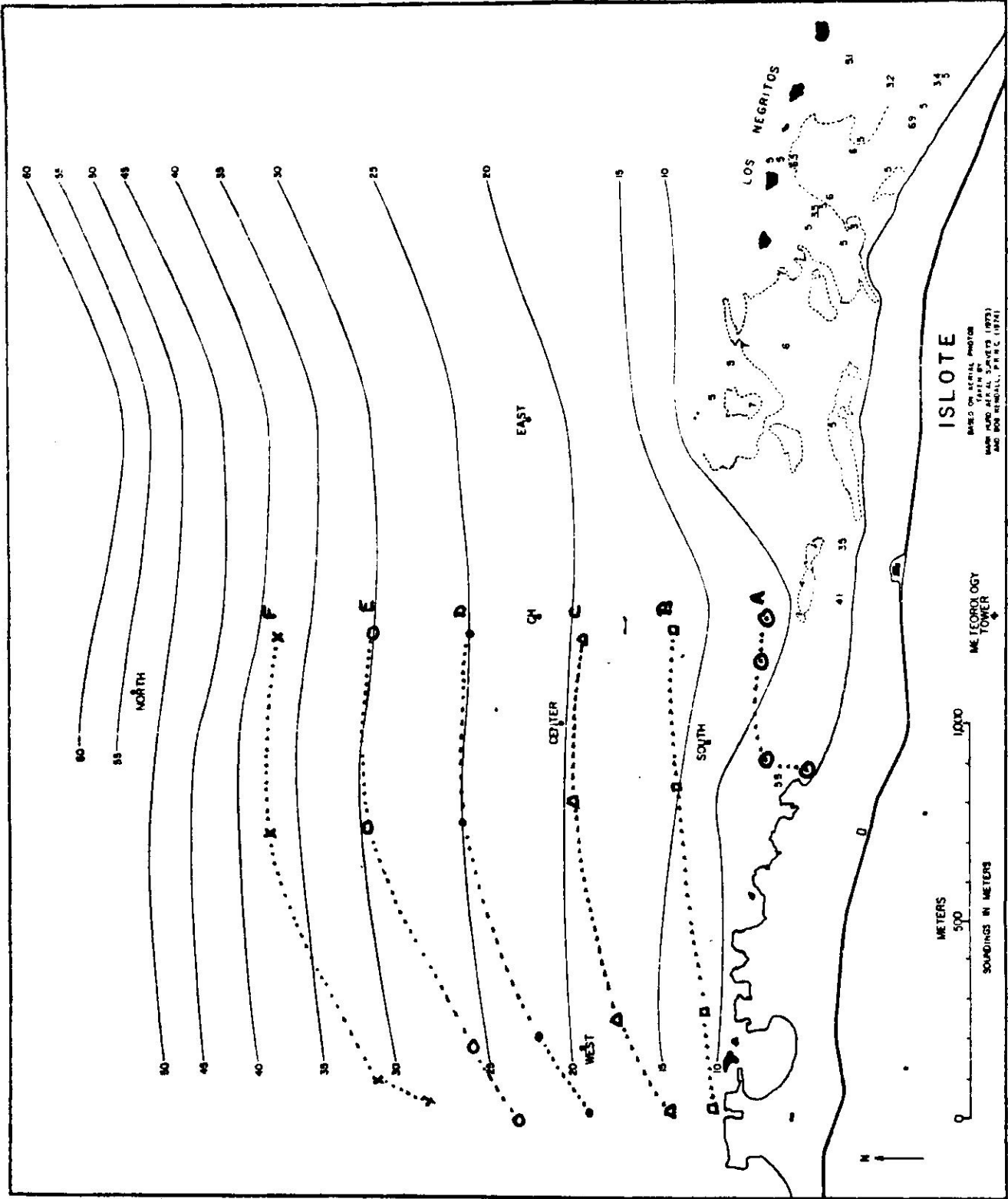


Fig. 3-6

Date: 12/18/74

Wind: ESE 1-2

Waves: N - NNW 10s

T1 = 0805

T2 = 0828

T3 = 0855

T4 = 0920

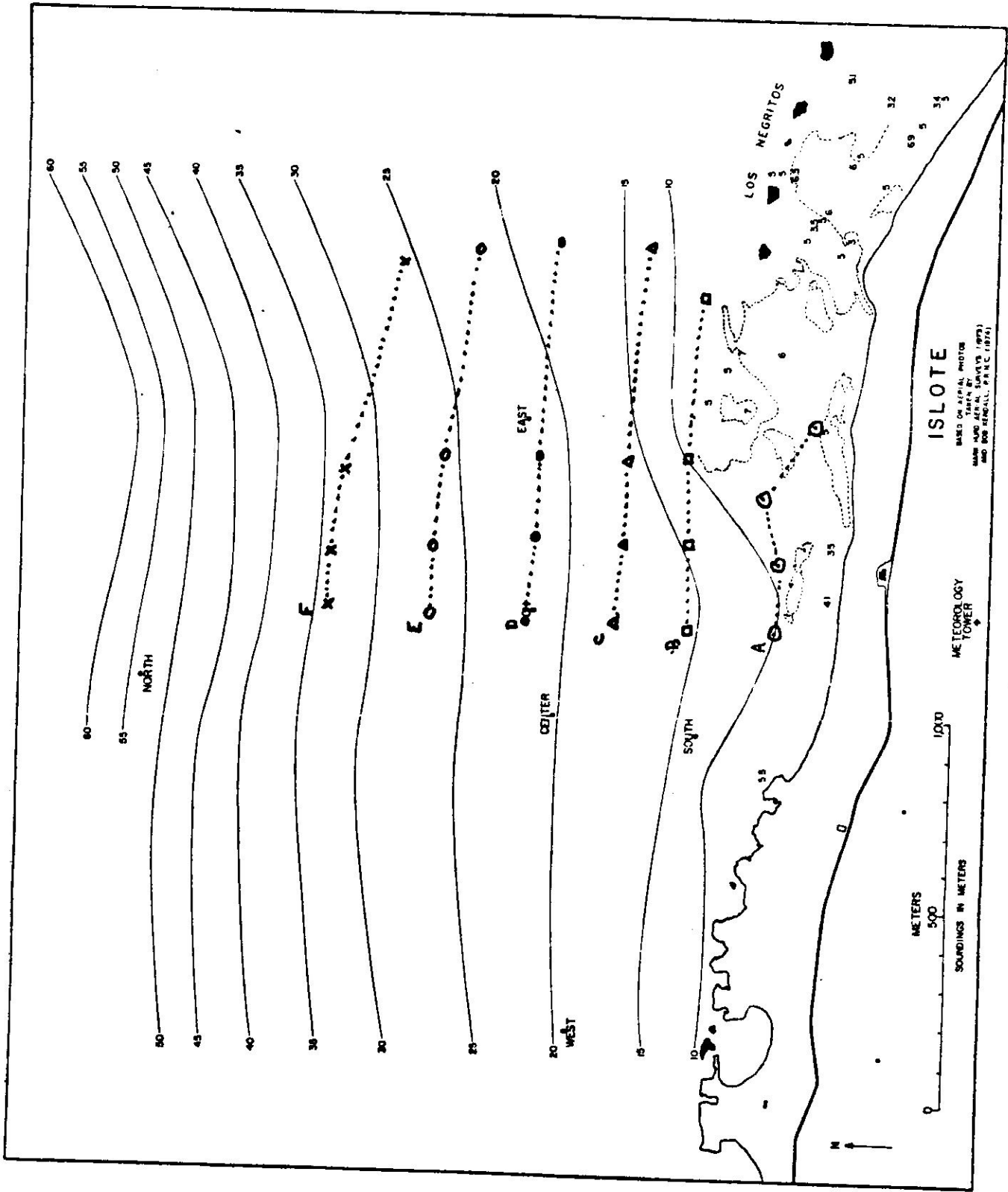


Fig. 3-7



Date: 12/18/74

Wind: E 5-10

Waves: N 8-10

TD = 1208

T1 = 1232

T2 = 1252

T3 = 1315

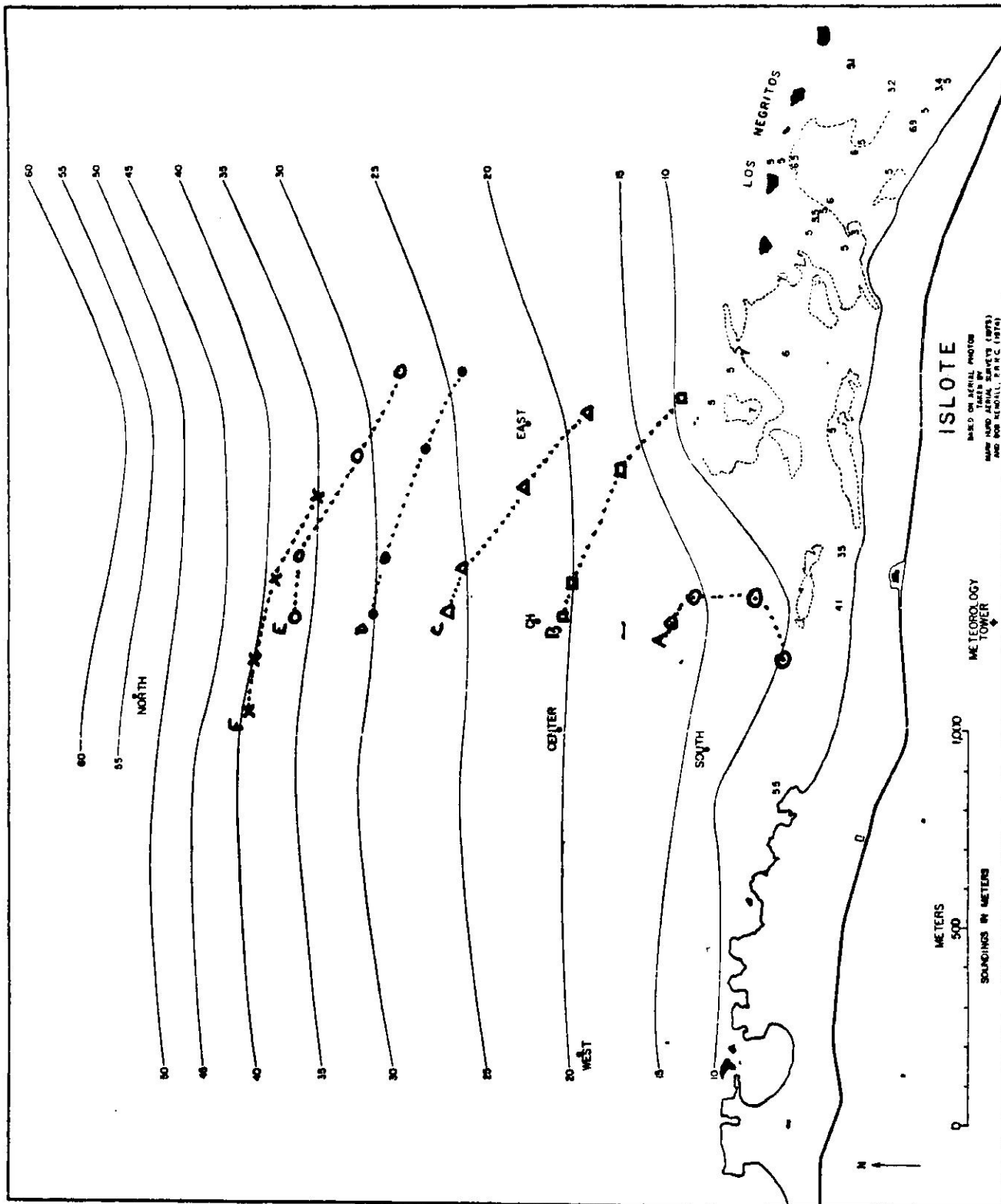


Fig. 3-8

Date: 12/10/74

Wind: 15-20

Waves: NEN 10-12s

TD = 1505

T1 = 1525

T2 = 1545

T3 = 1605

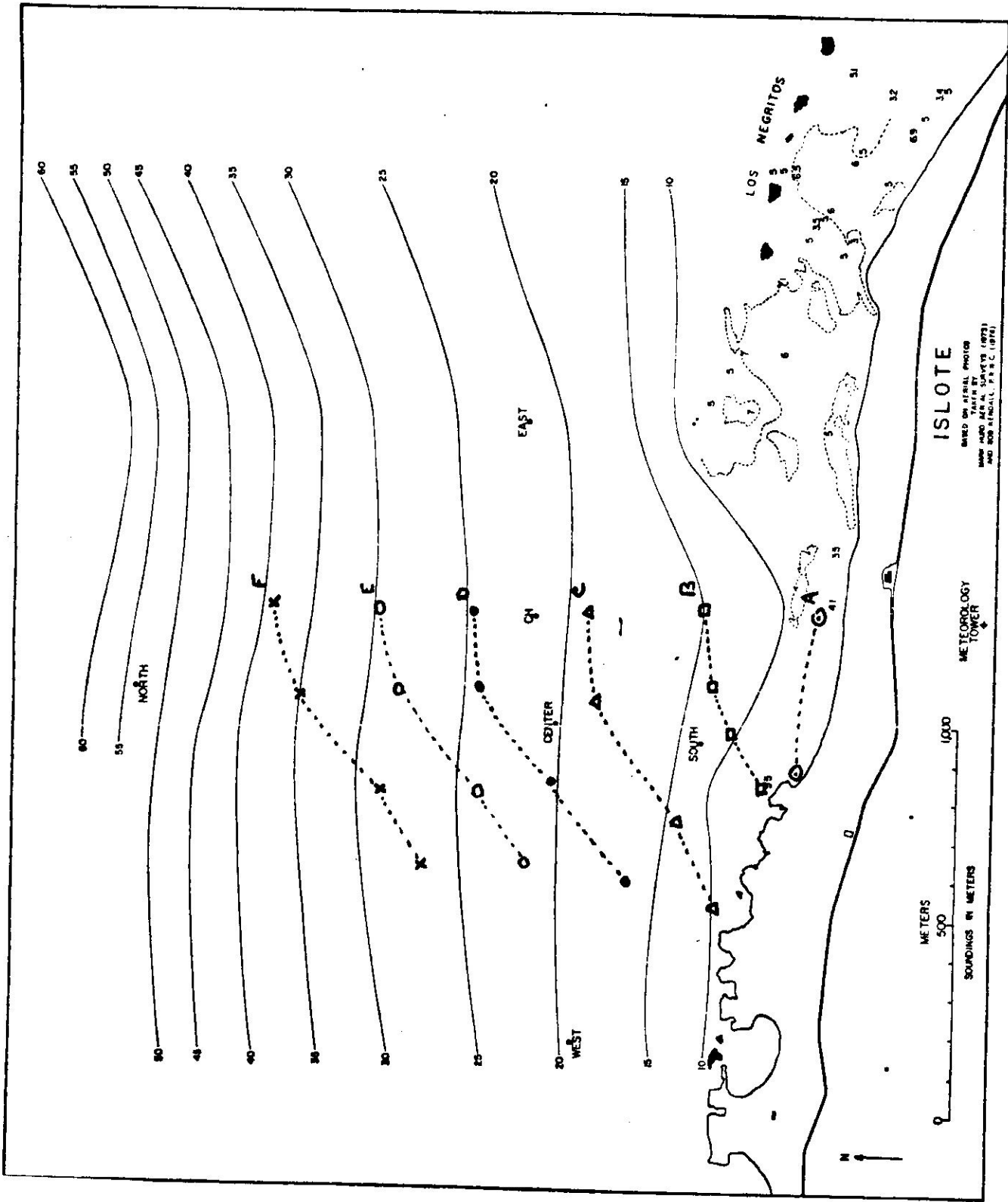


Fig. 3-9

Date: 12/19/74

Wind: ESE 5

Waves: NNE 12

TD = 0918

T1 = 0935

T2 = 0955

T3 = 1025

3.15

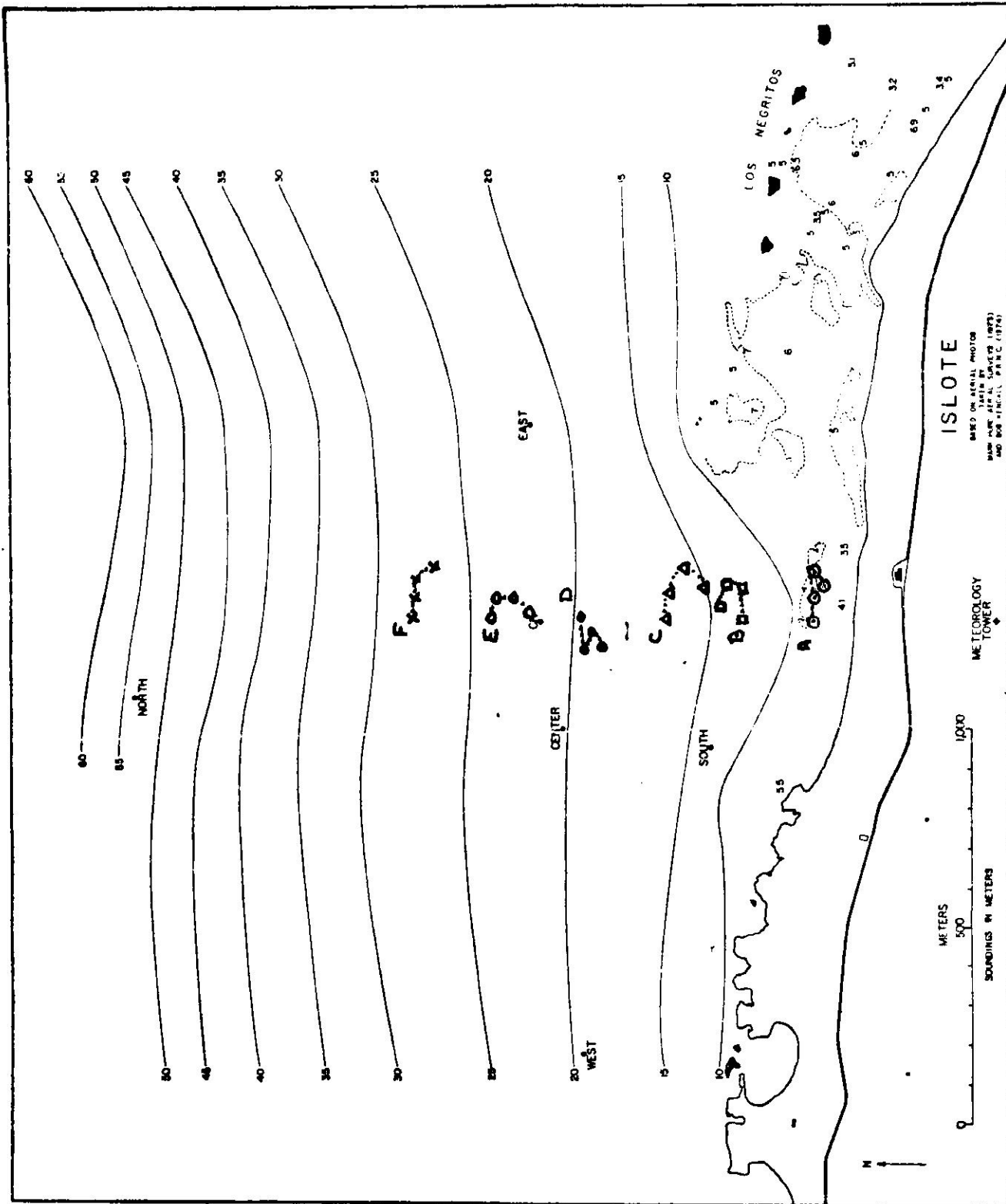


Fig. 3-10

Date: 12/19/74

Wind: E 18-20

Waves: NNE 8s

TD = 1225

T1 = 1250

T2 = 1310

T3 = 1334

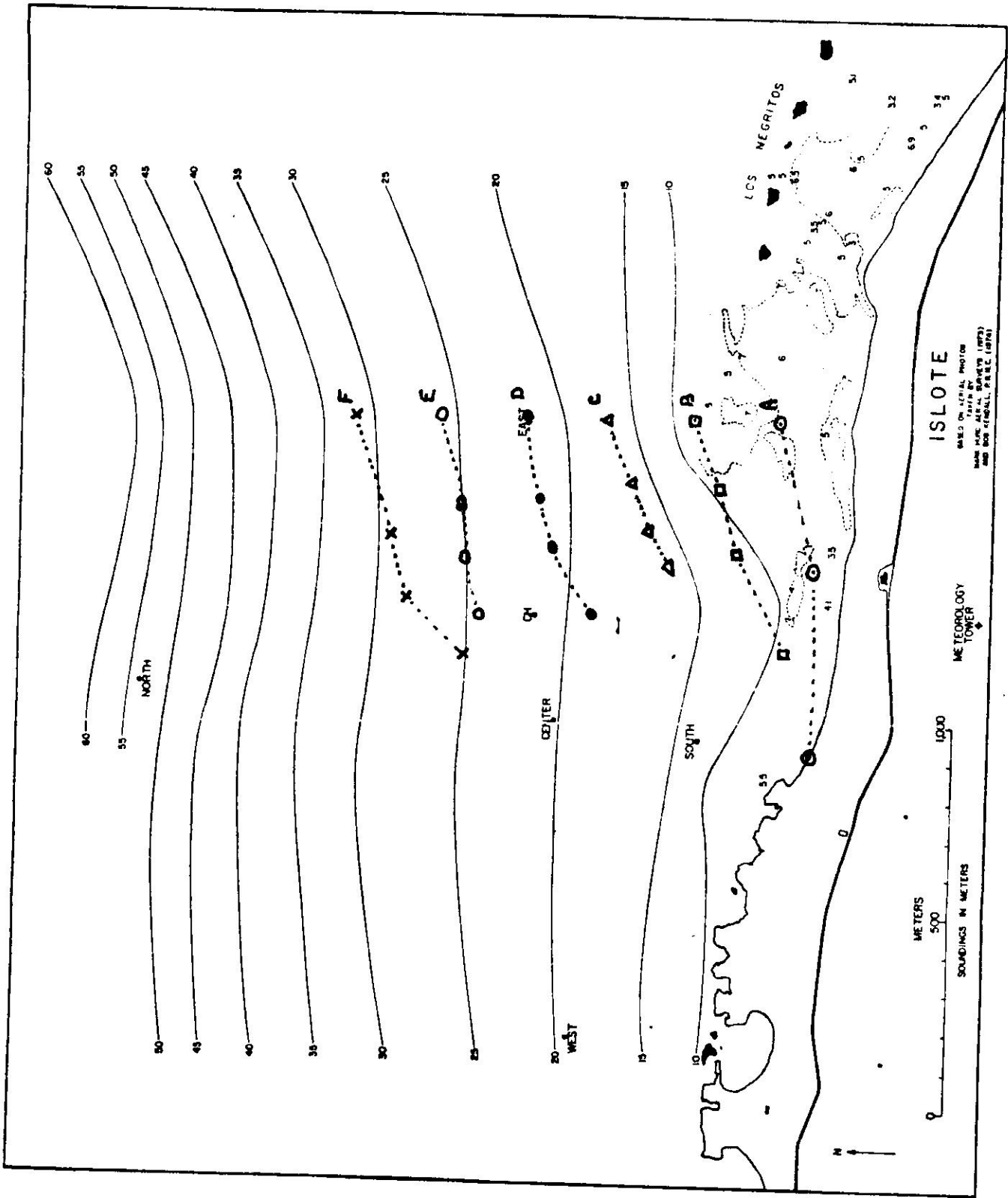


Fig. 3-11

Date: 12/19/74

Wind: E 25-30

Waves: NNW 6-8s

TD = 1535

T1 = 1555

T2 = 1615

T3 = 1635

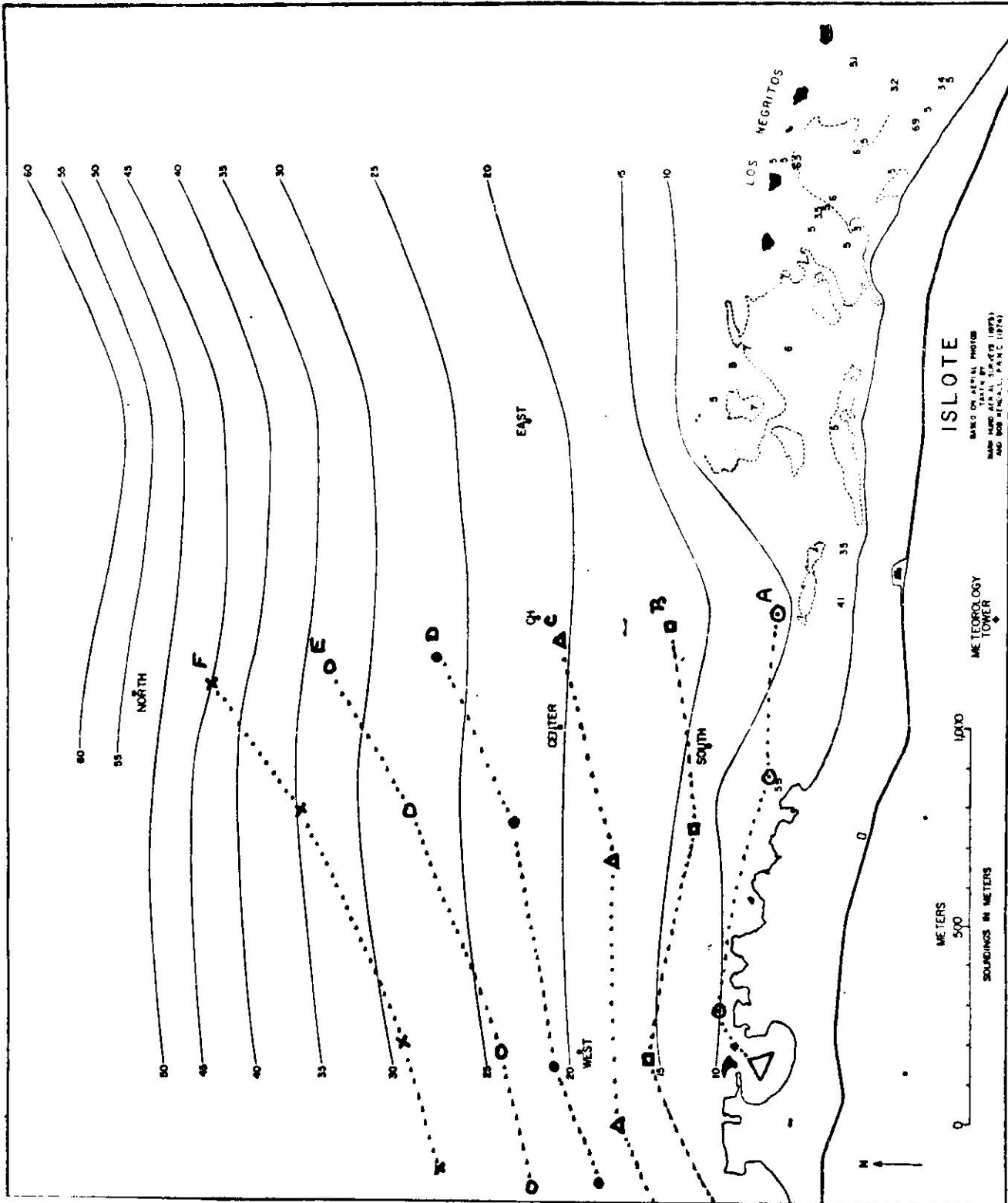


Fig. 3-12



APPENDIX 4

SEDIMENT TRANSPORT AT ISLOTE

by

Mounir T. Moussa, Ph.D.  
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University of Puerto Rico, and  
Scientist, Environmental Studies  
Project, Puerto Rico Nuclear  
Center, Mayaguez, Puerto Rico

March 1975

## Sediment Transport at Islote

A field study of sediment transport in the nearshore waters off the NORCO NP-1 site (see Figure 1) was conducted on 15 October 1974.

A large sample of sand which had previously been collected from the site was washed to remove salt, dried, and a subsample removed for grain size analysis (see Figure 2). The remainder of the sample was dyed with a fluorescent dye using the method of Wright as described in Ingle (1966). The dye solution consisted of 17.6g of anthracene dissolved in 1.0 liters of chloroform.

SCUBA divers released 2.5 kilograms of dyed sand at the center of a steel grid which had been placed on the seabottom (5 meter depth) at the study location with one axis oriented North-South. The dyed sediment was then subjected to normal sediment transport forces for a period of four hours. Samples were then taken from 24 grid locations (see Figure 3) utilizing plastic cards coated with a thin layer of machine grease. The cards were pressed firmly against the sea bottom by divers and the surface sand grains became entrapped in the grease coating. The cards were returned to the laboratory where the number of fluorescent grains adhering to the grease coating were counted under ultraviolet light. Results were plotted on polar coordinate paper (see Figure 4).

Net sediment transport was to the east which is in agreement with diver observations on current direction during the study period. No quantitative estimates of sediment transport can be derived from the study.

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### Reference:

Ingle, Jr., James C., 1966, The Movement of Beach Sand. Amsterdam, Elsevier Publishing Co. 221 p.



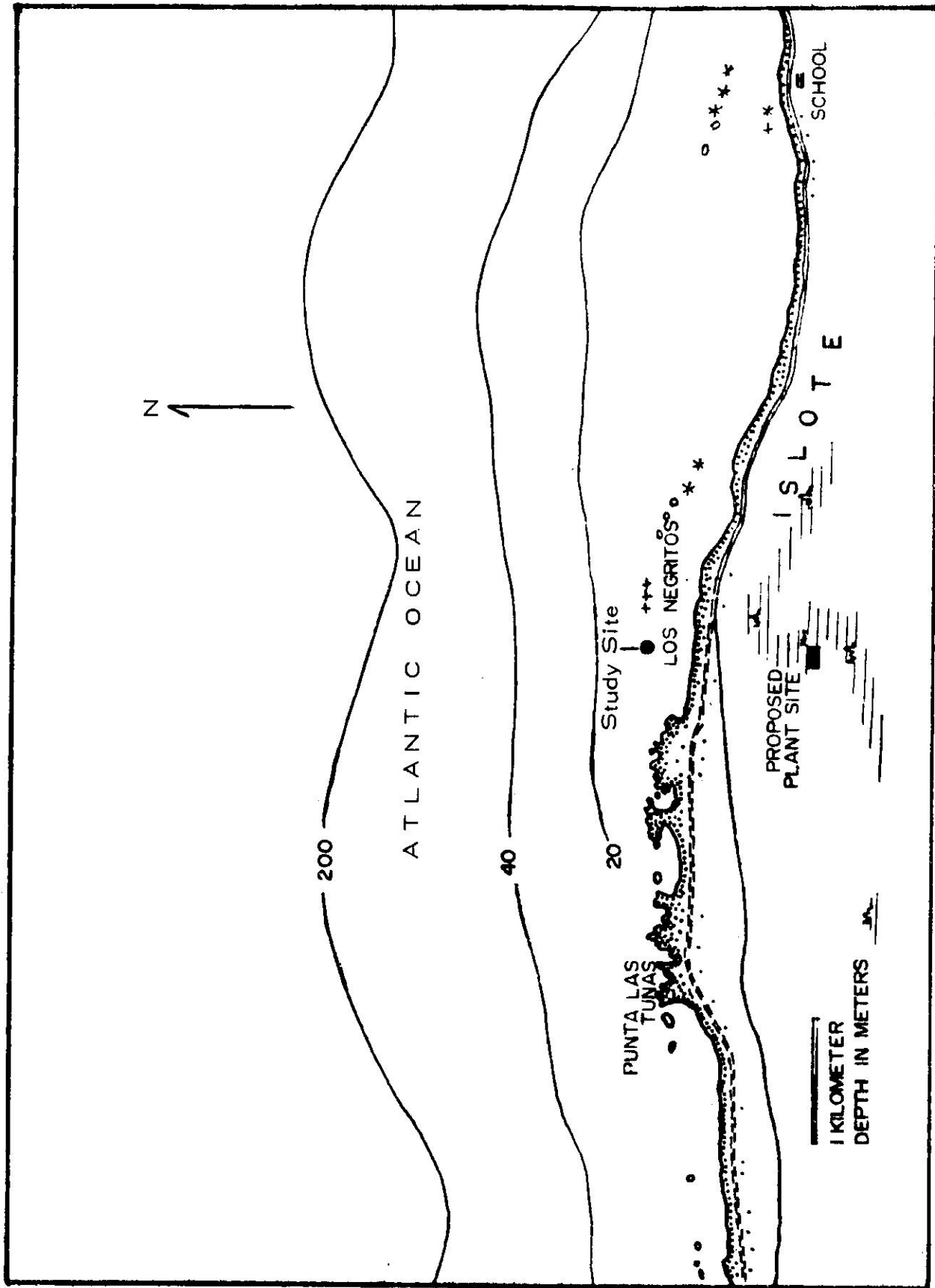
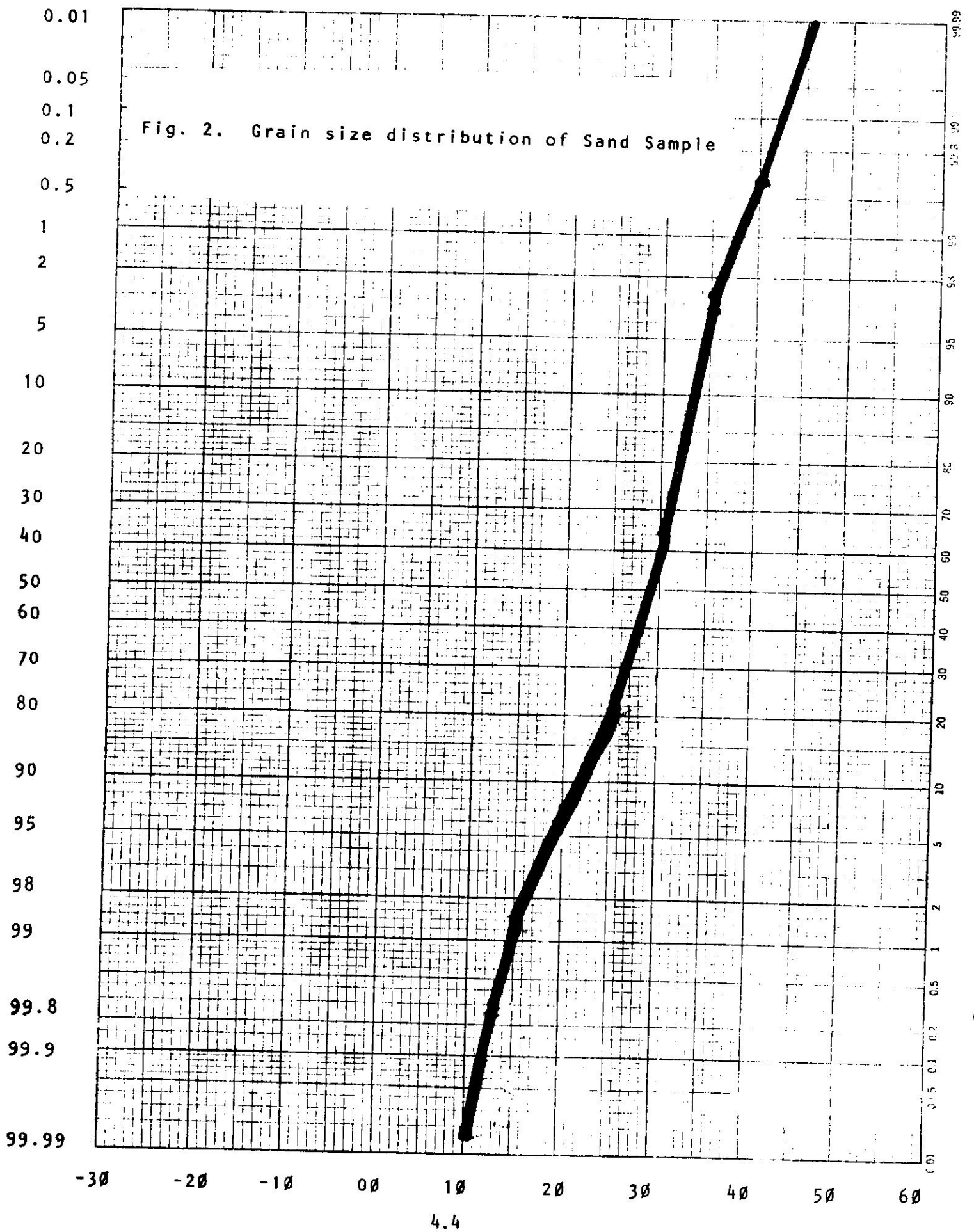


Fig. 1. Location of Sediment Transport Study at Islote



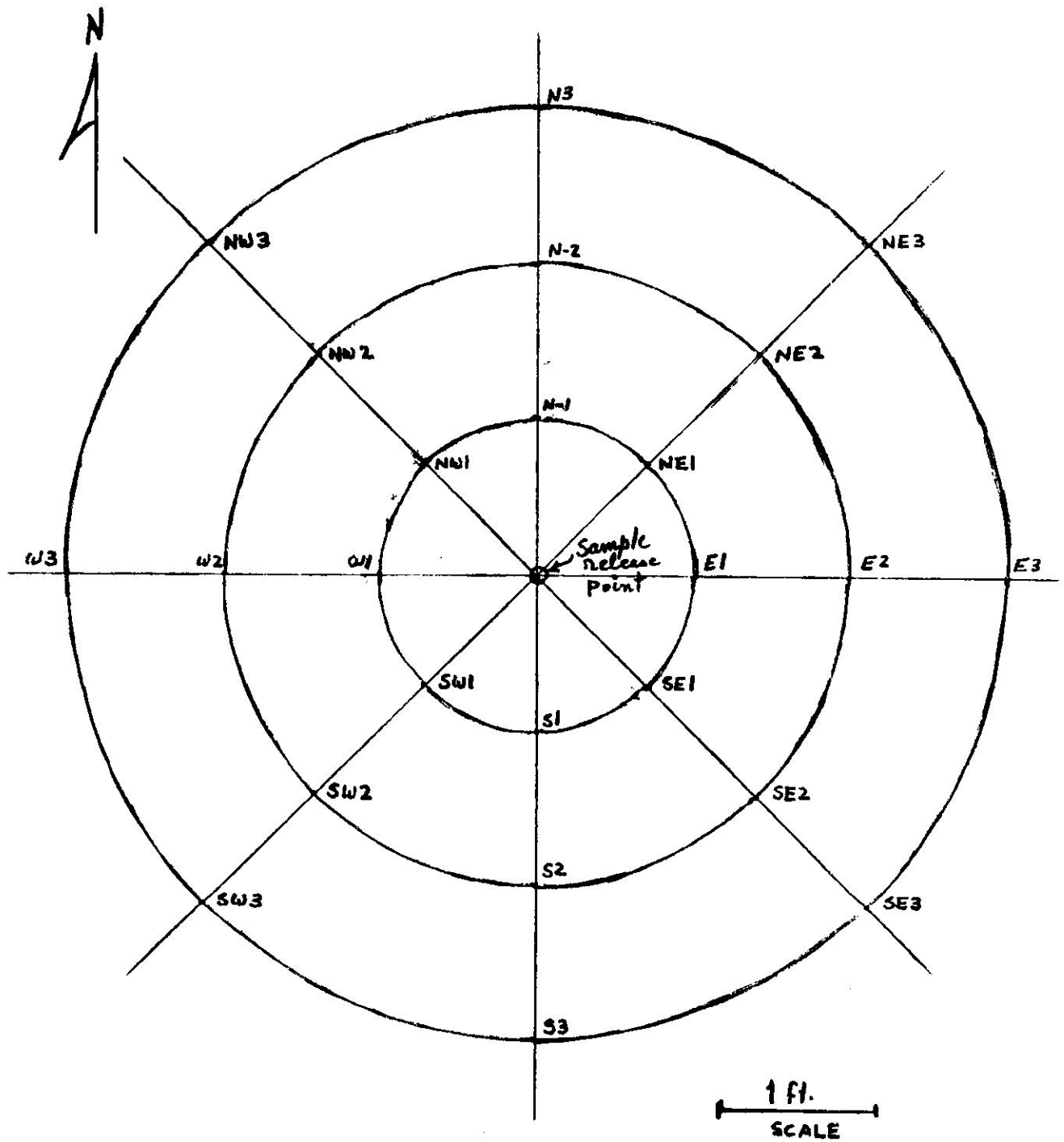


Fig. 3. Arrangement of Sampling Stations in Relation to Sample Release Point

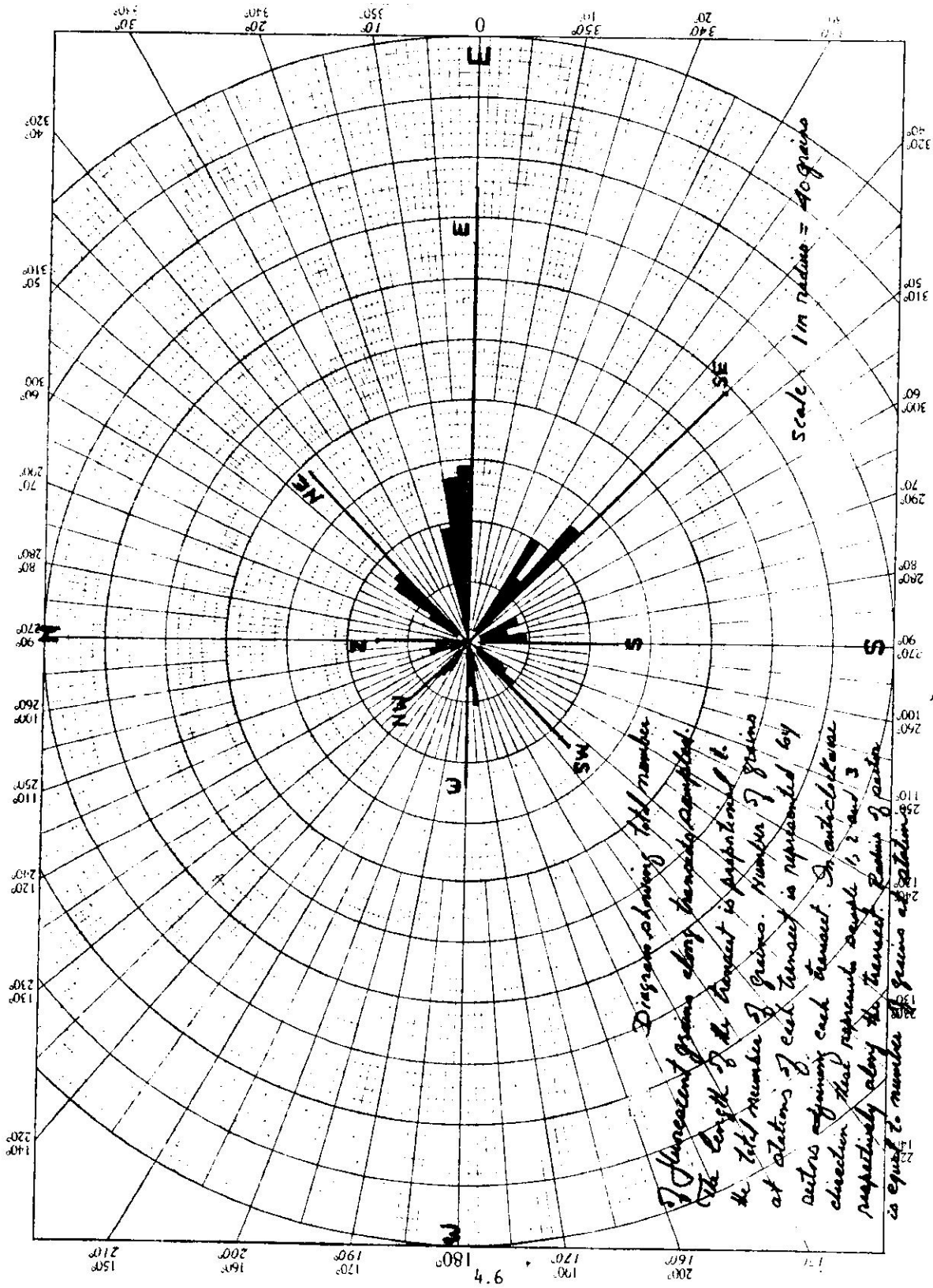


Fig. 4. Diagram Showing Total Number of Fluorescent Grains Along Transects Sampled.

Table 1. Fluorescent Grain Counts  
per 5.7 x 8.9 cm area

Station	No. of Grains	Station	No. of Grains
N1	11	S1	19
N2	13	S2	13
N3	6	S3	17
NE1	32	SW1	20
NE2	30	SW2	15
NE3	15	SW3	13
E1	57	W1	14
E2	54	W2	21
E3	38	W3	9
SE1	51	NW1	11
SE2	26	NW2	10
SE3	40	NW3	7



## APPENDIX 5

### SALINITY AND SIGMA-T VERSUS DEPTH PLOTS

Arranged chronologically by area:

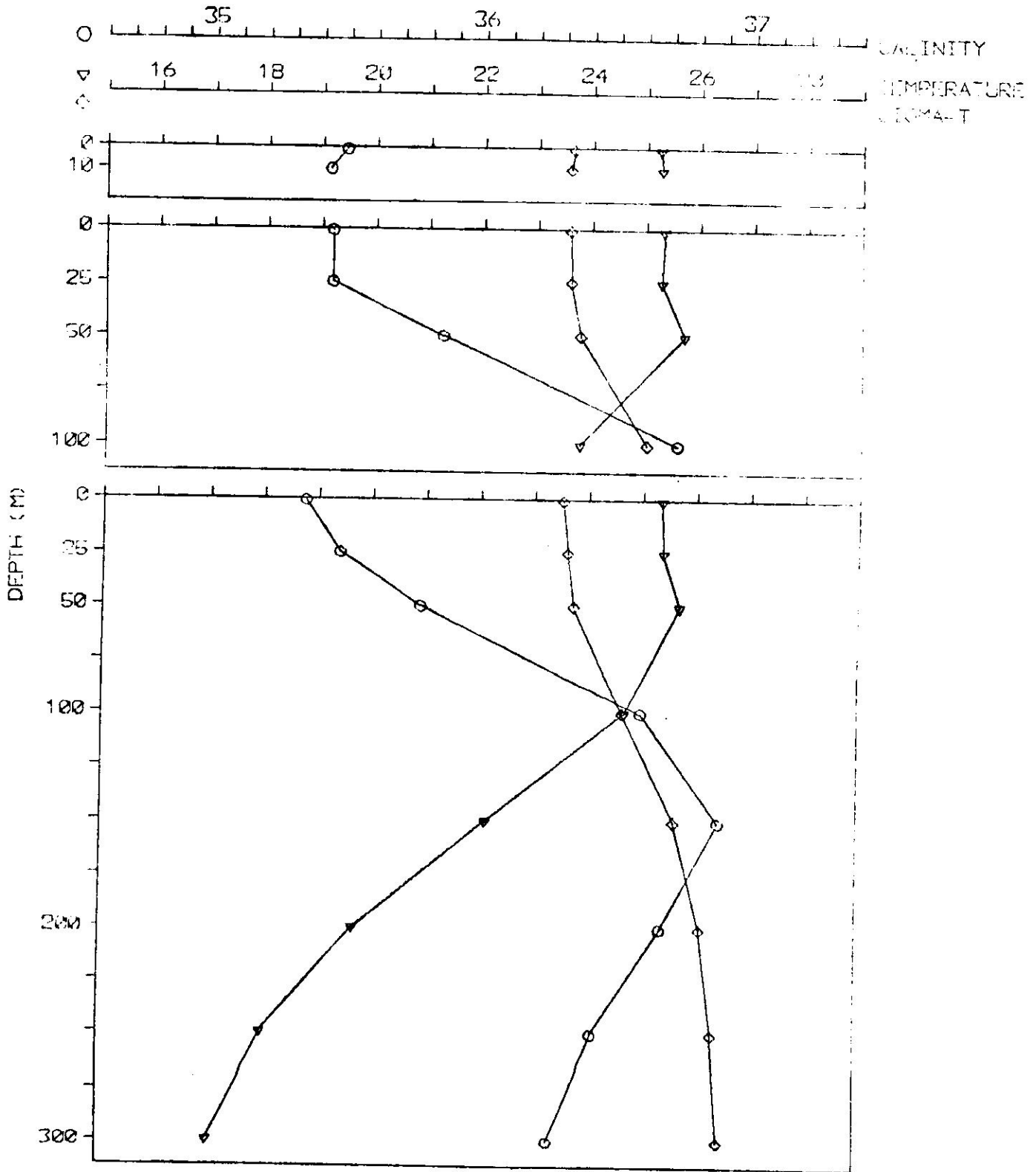
Islote

Punta Manati

Tortuguero Bay

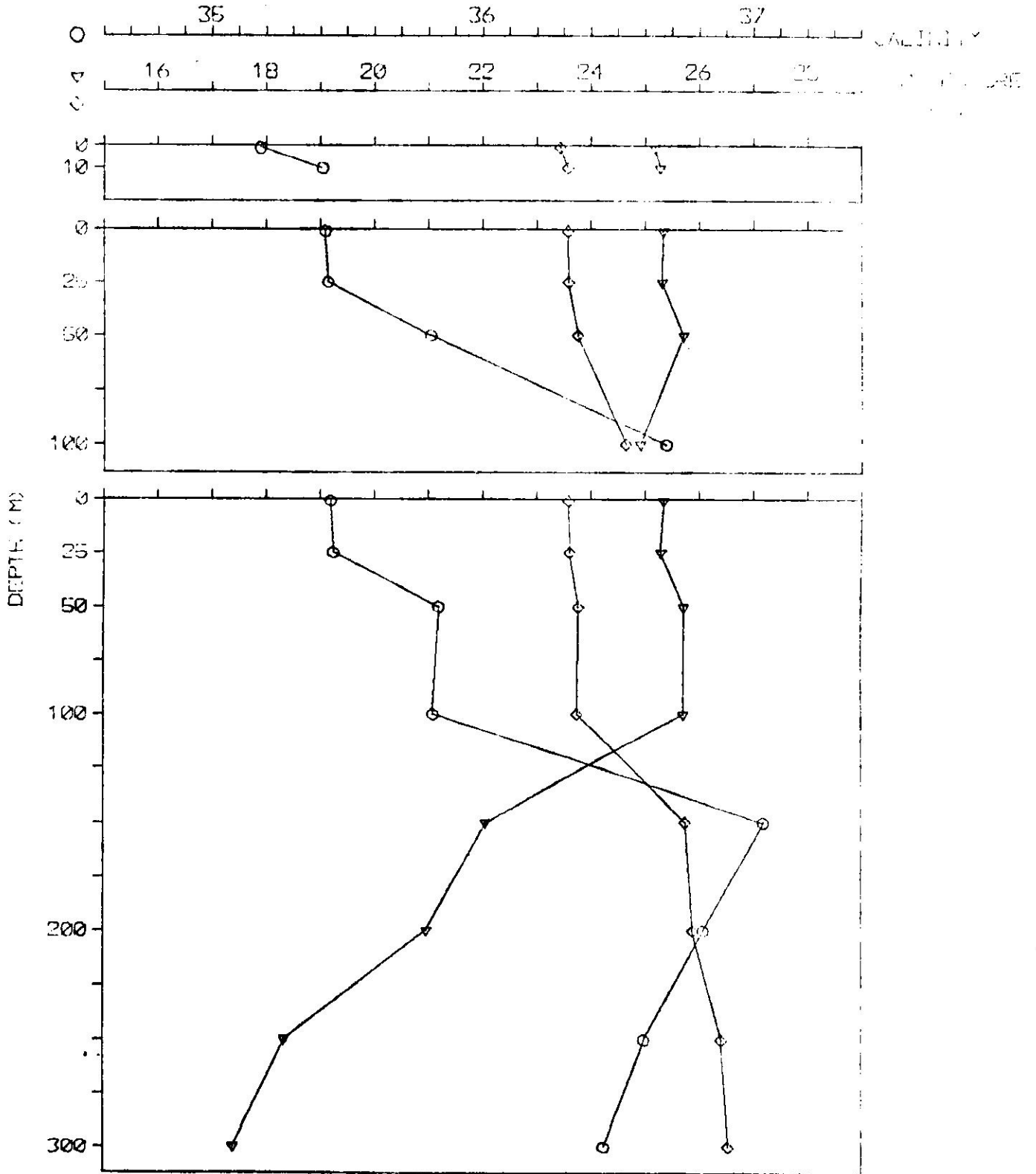
Puerto Rico Nuclear Center  
Mayaguez, Puerto Rico

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 SALINITY AND SIGMA-T.  
 TRANSECT ISL-1. DATE 1/24/74

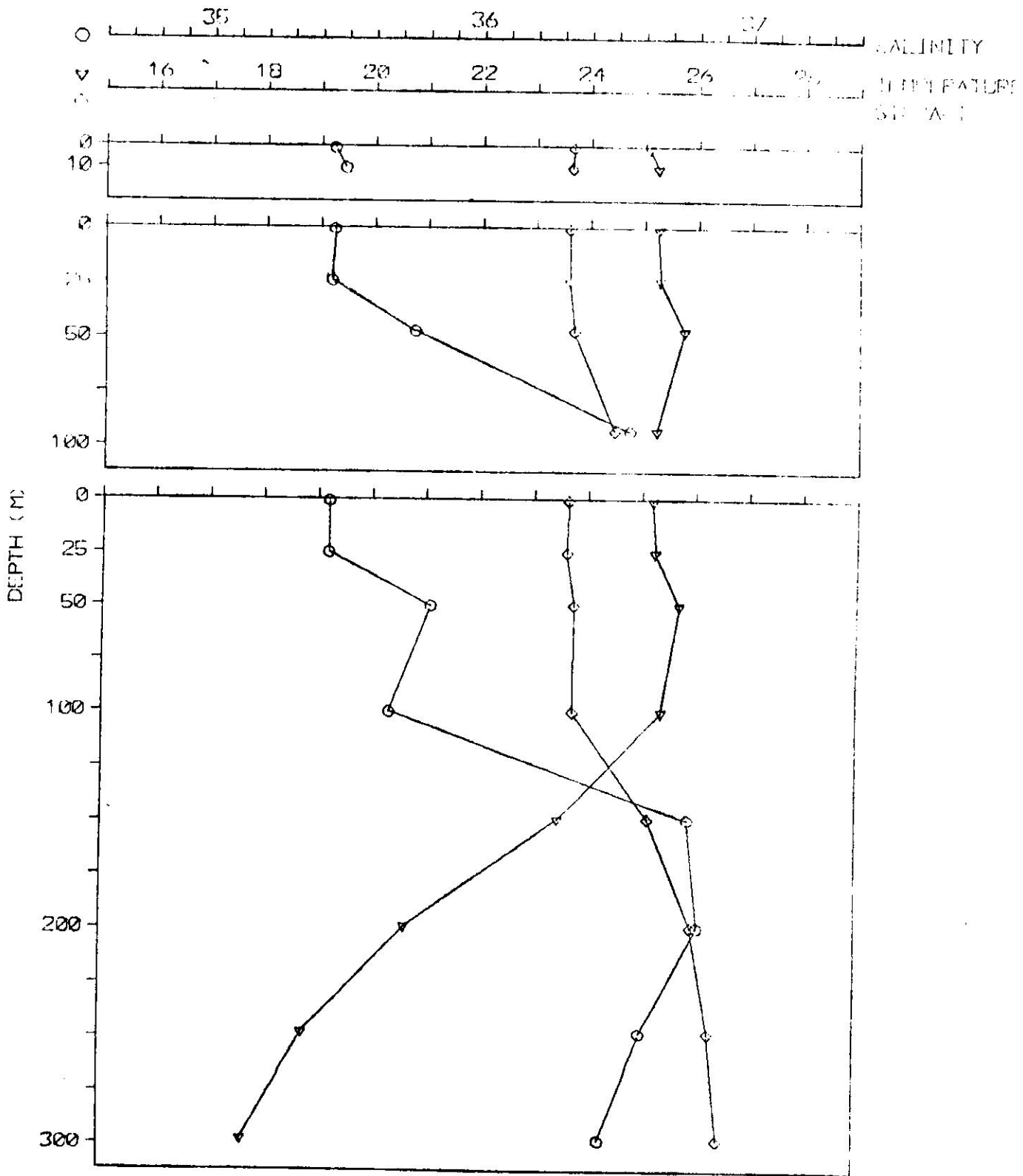




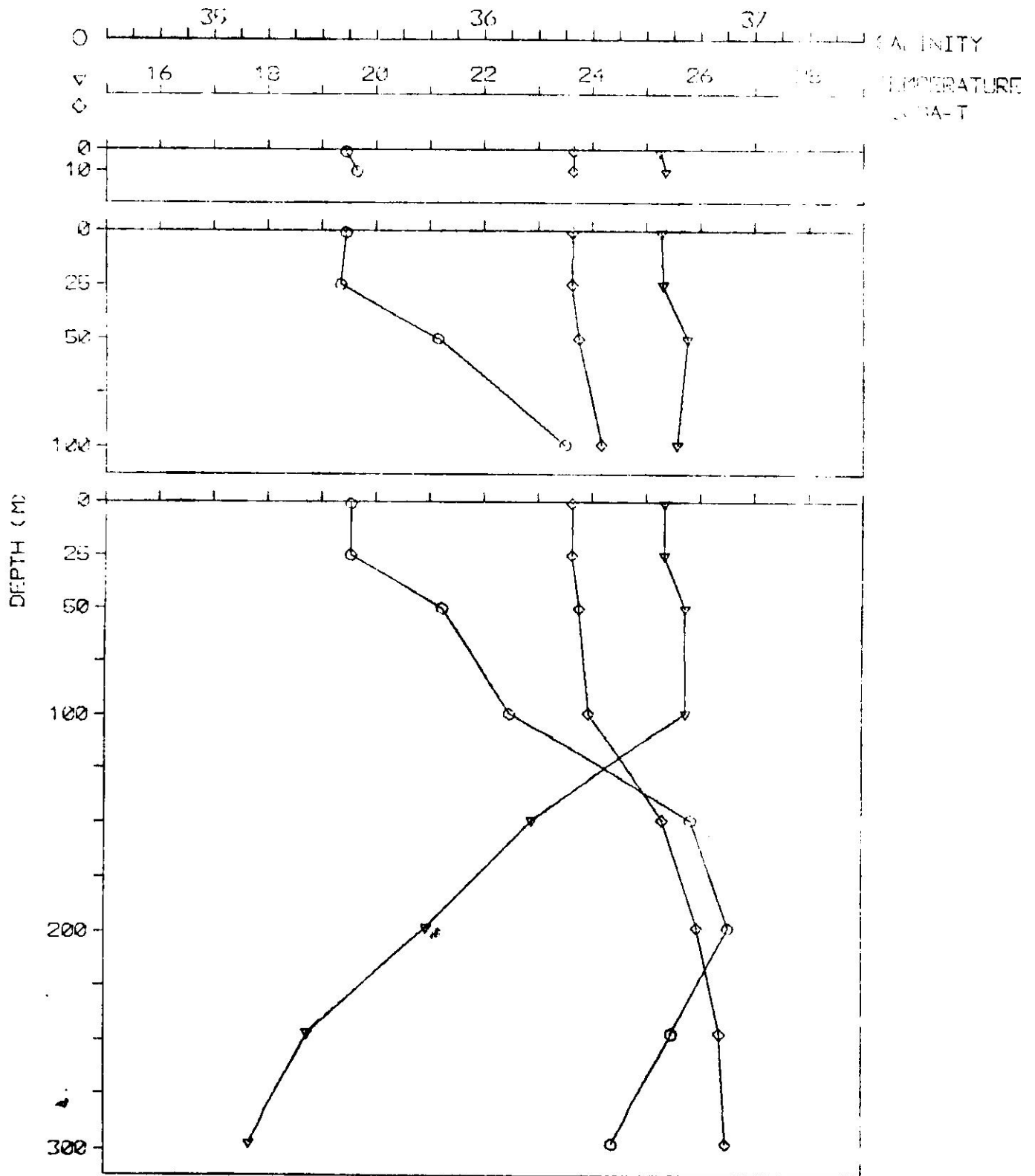
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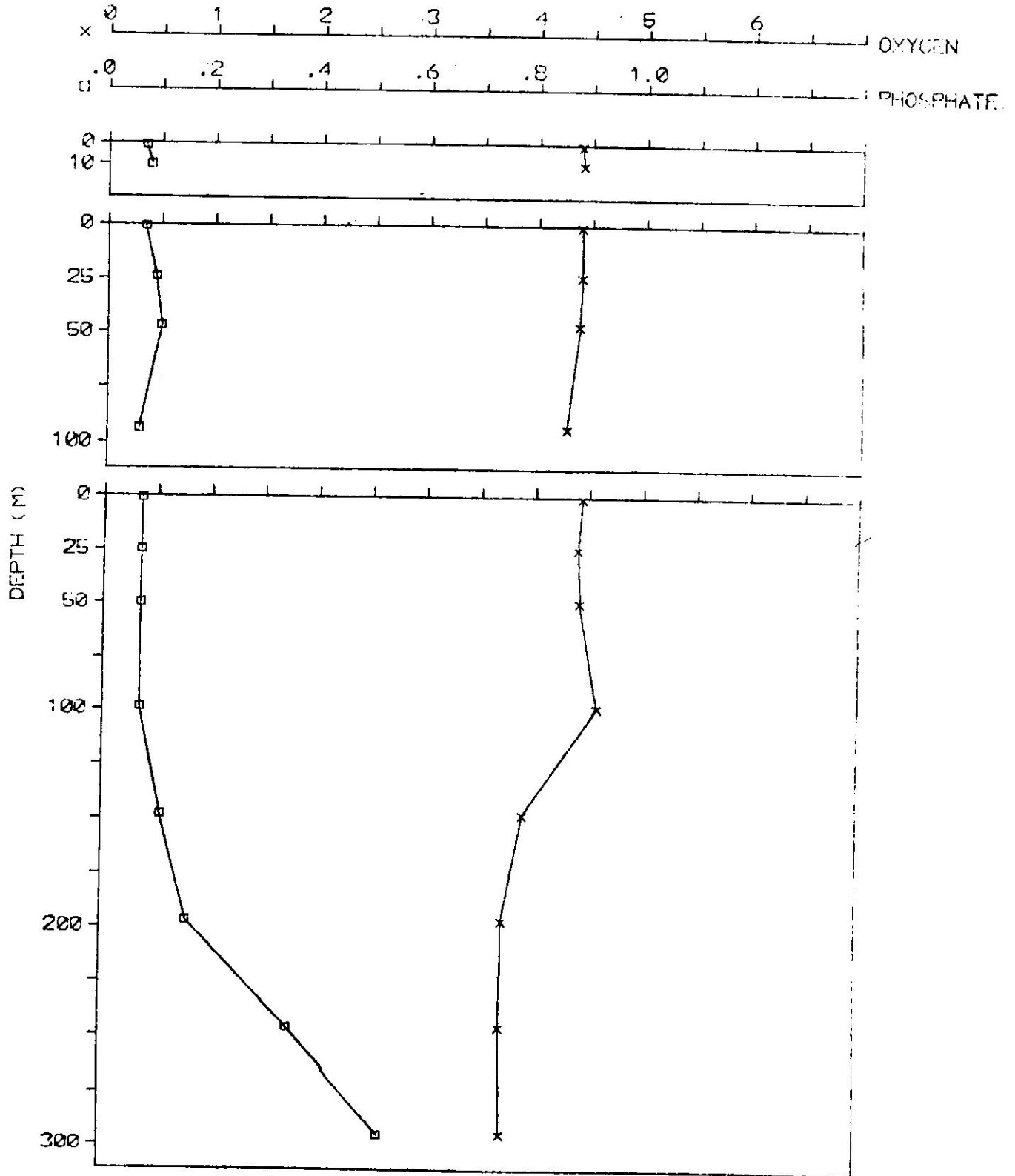
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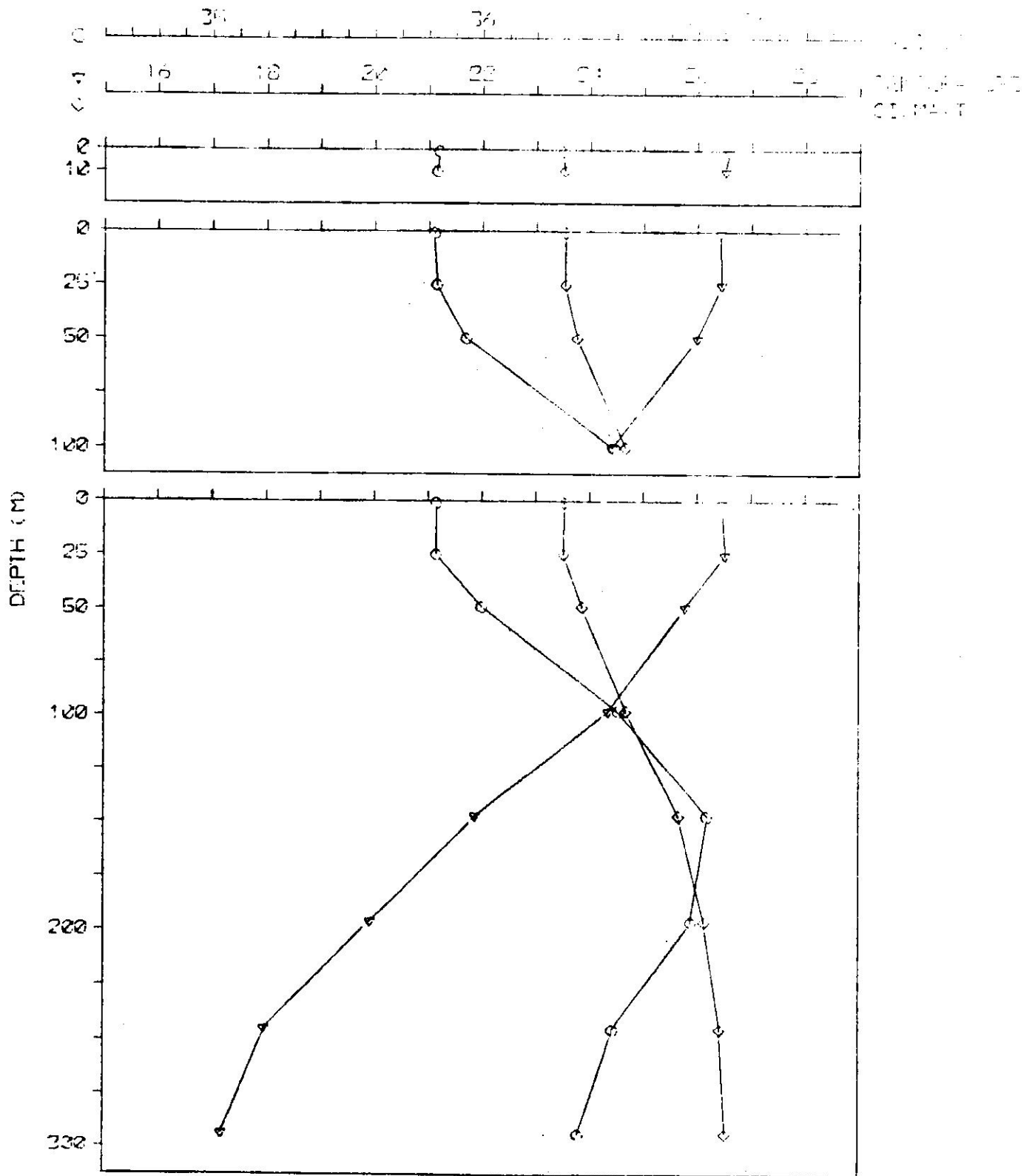
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 SALINITY AND SIGMA-T.  
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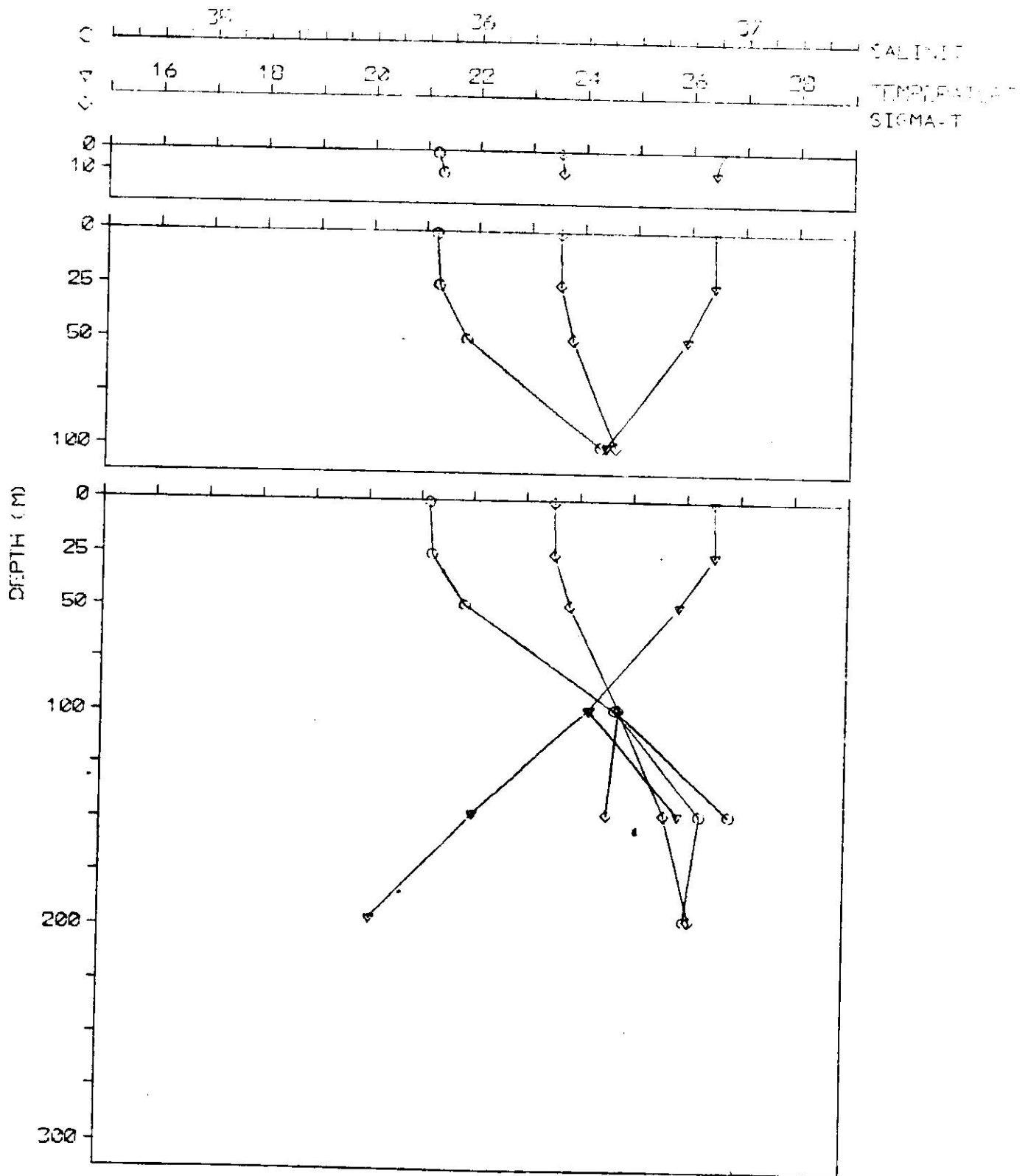
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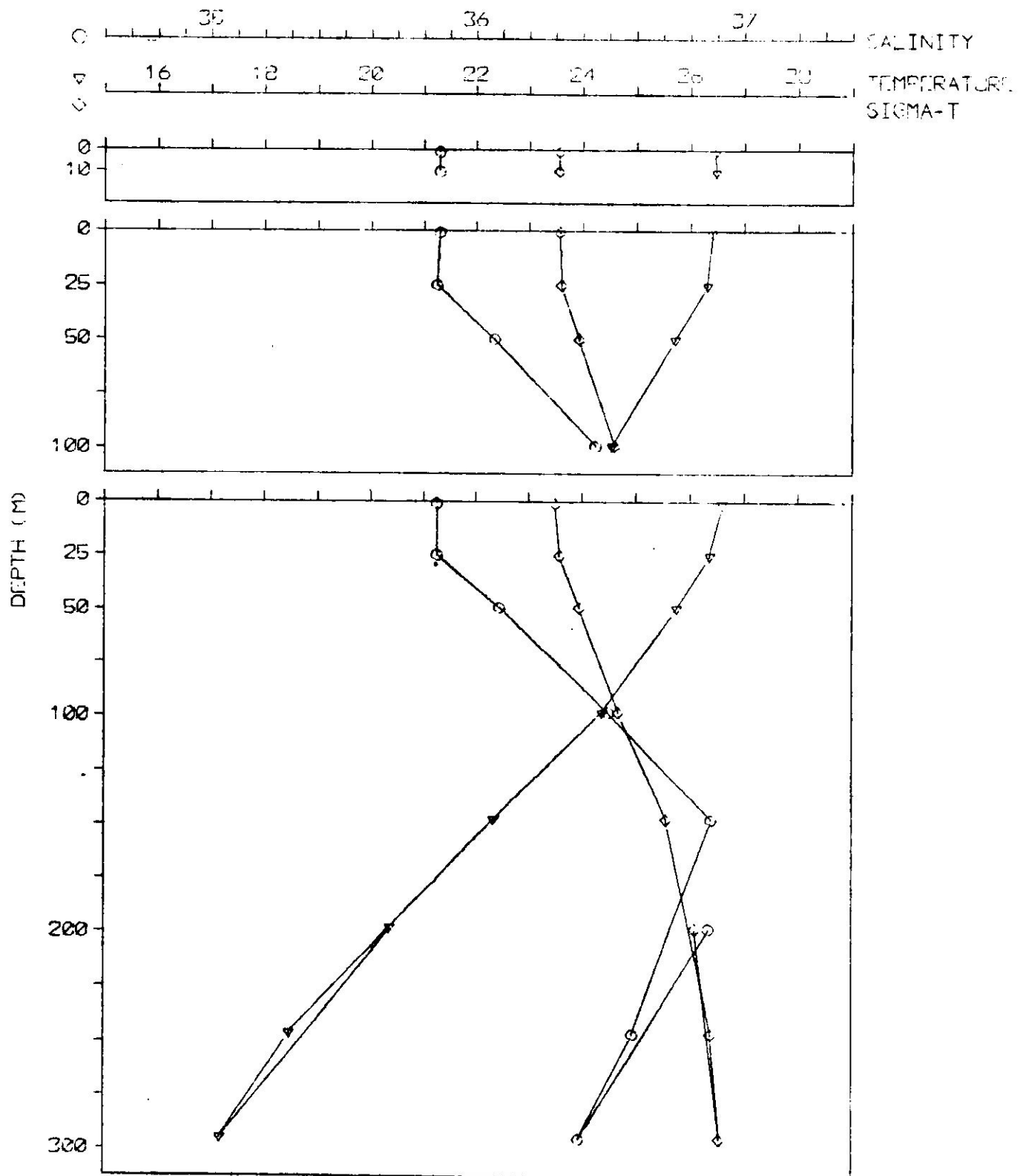
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 SALINITY AND DENSITY  
 TRANSECT ISLAND DATE: 5/21/74



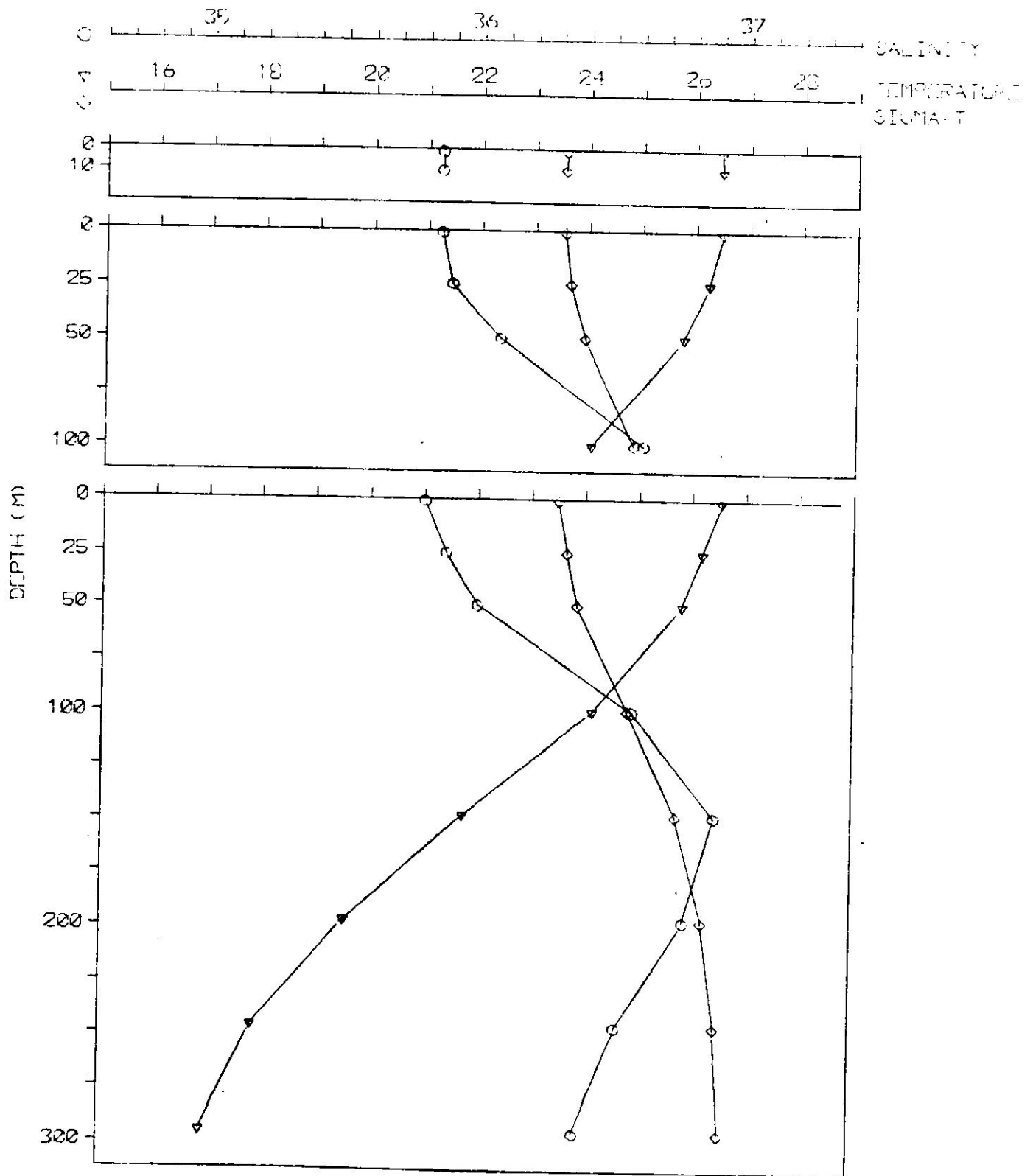
HYDROSTATION VERTICAL PROFILES FOR TEMPERATURE,  
 SALINITY AND SIGMA-T  
 TRANSECT IGL-2, DATE 5/22/74



HYDROSTATION VERTICAL PROFILES FOR TEMPERATURE,  
 SALINITY AND SIGMA-T,  
 TRANSECT ISL-3. DATE 5/22/74

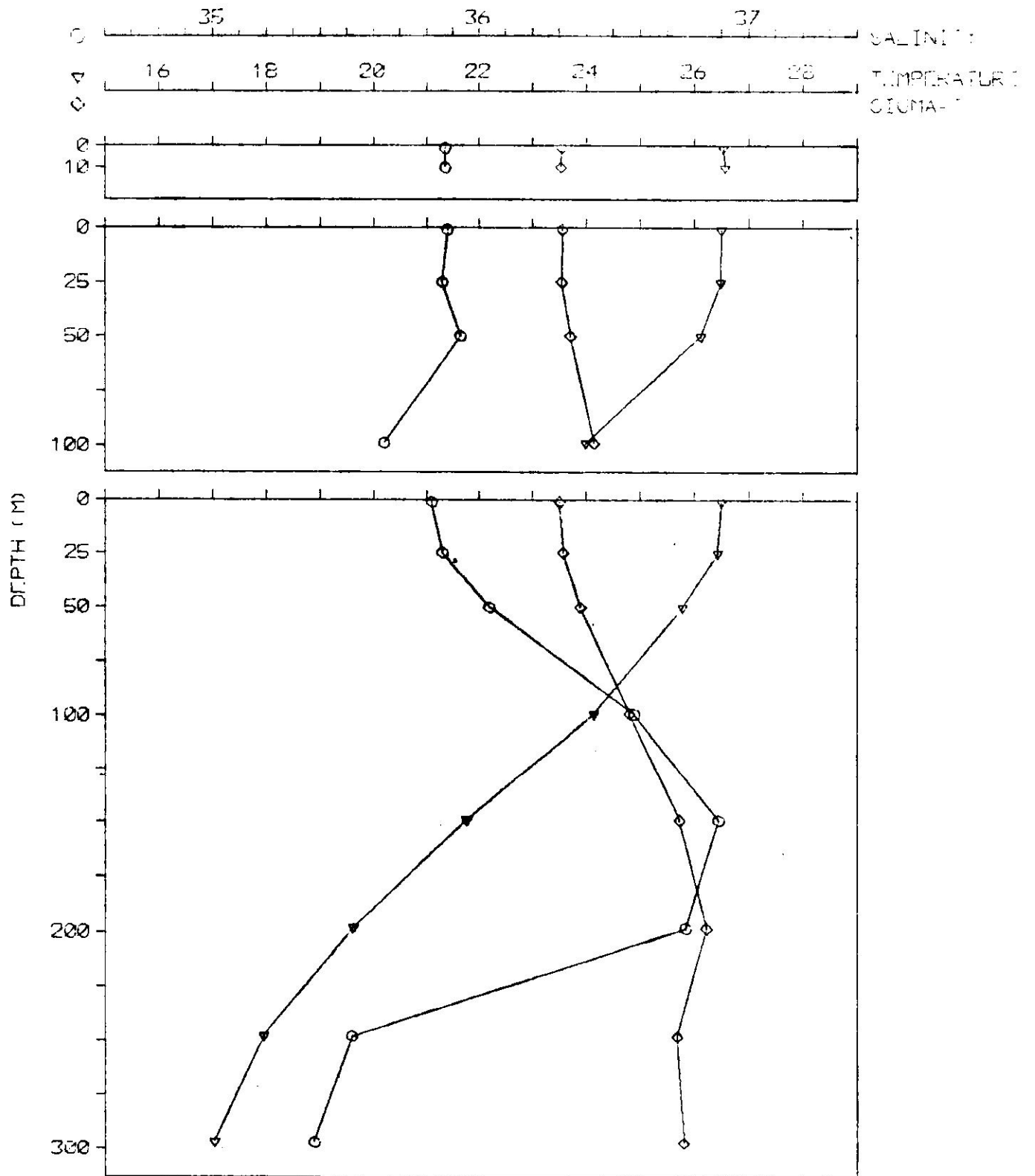


HYDROSTATION VERTICAL PROFILES FOR TEMPERATURE,  
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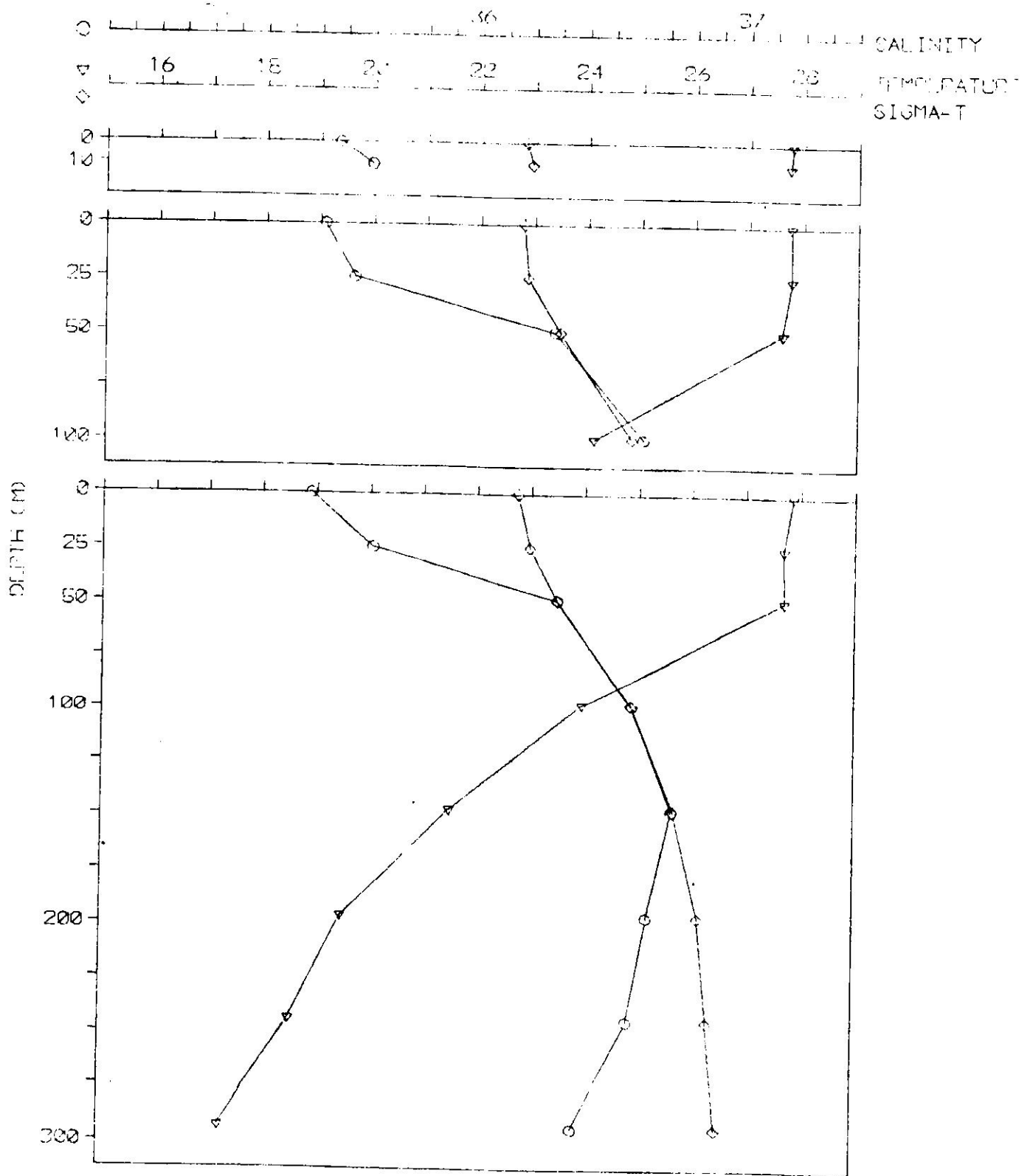




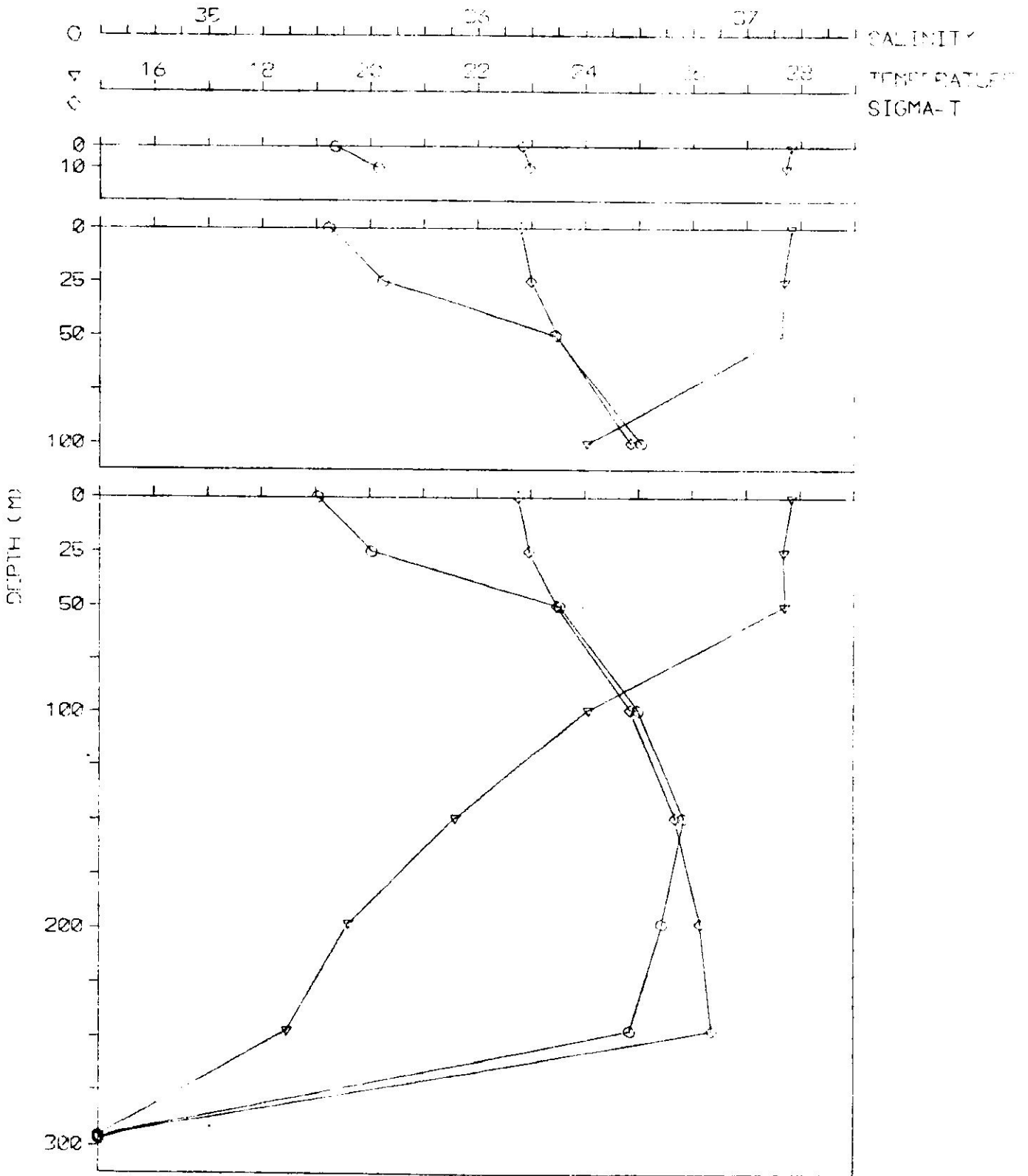
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 SALINITY AND SIGMA-T.  
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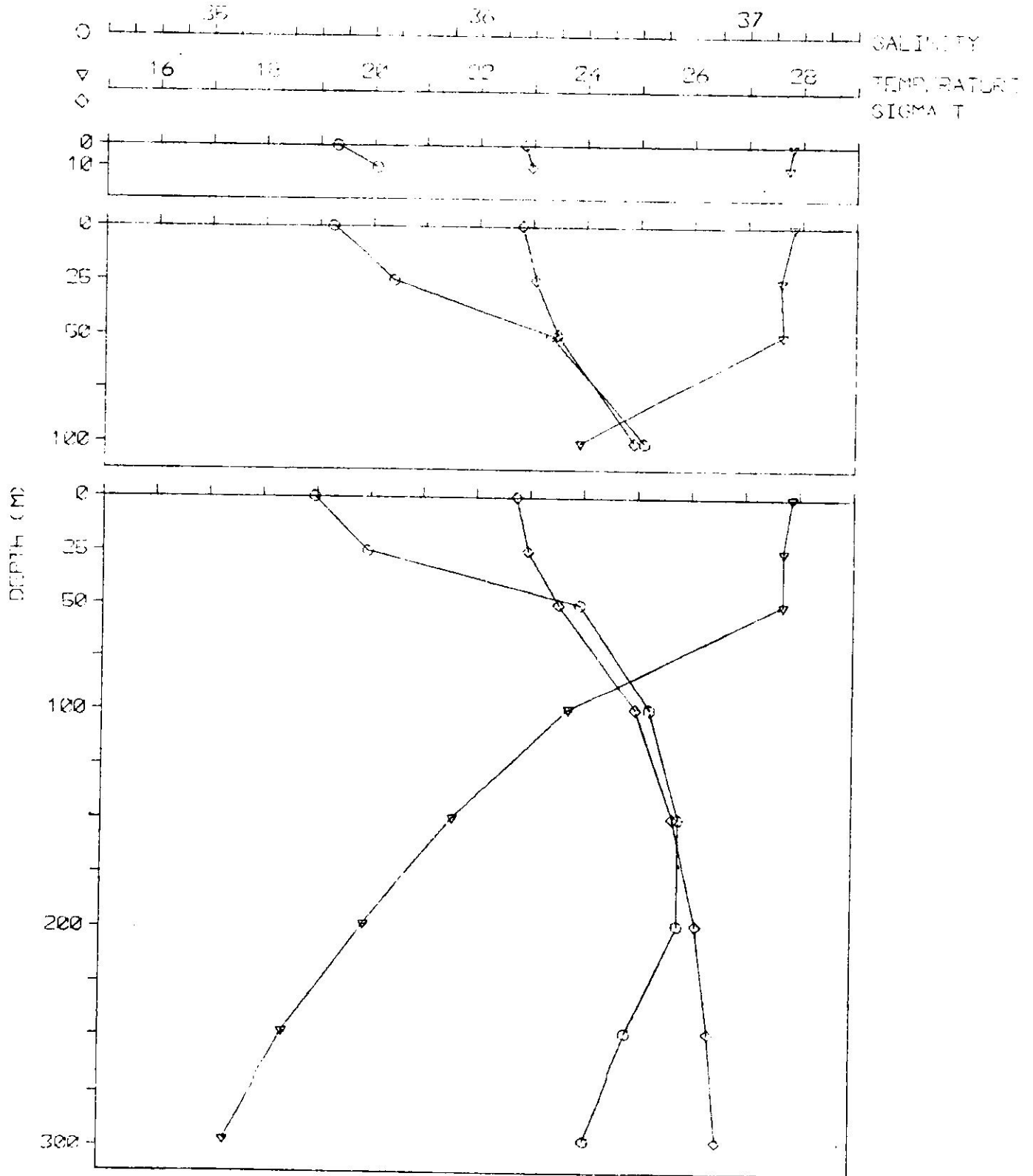
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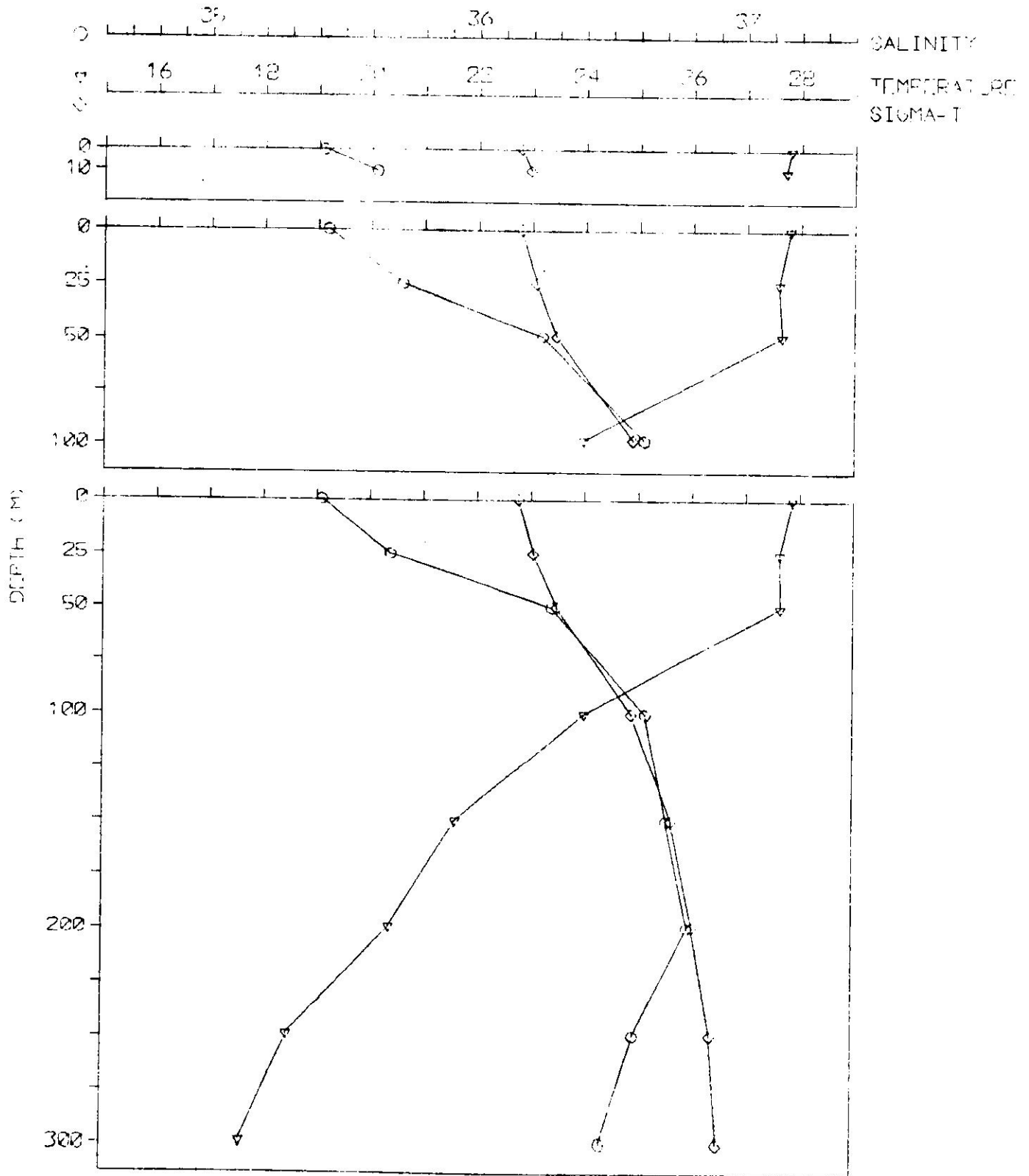
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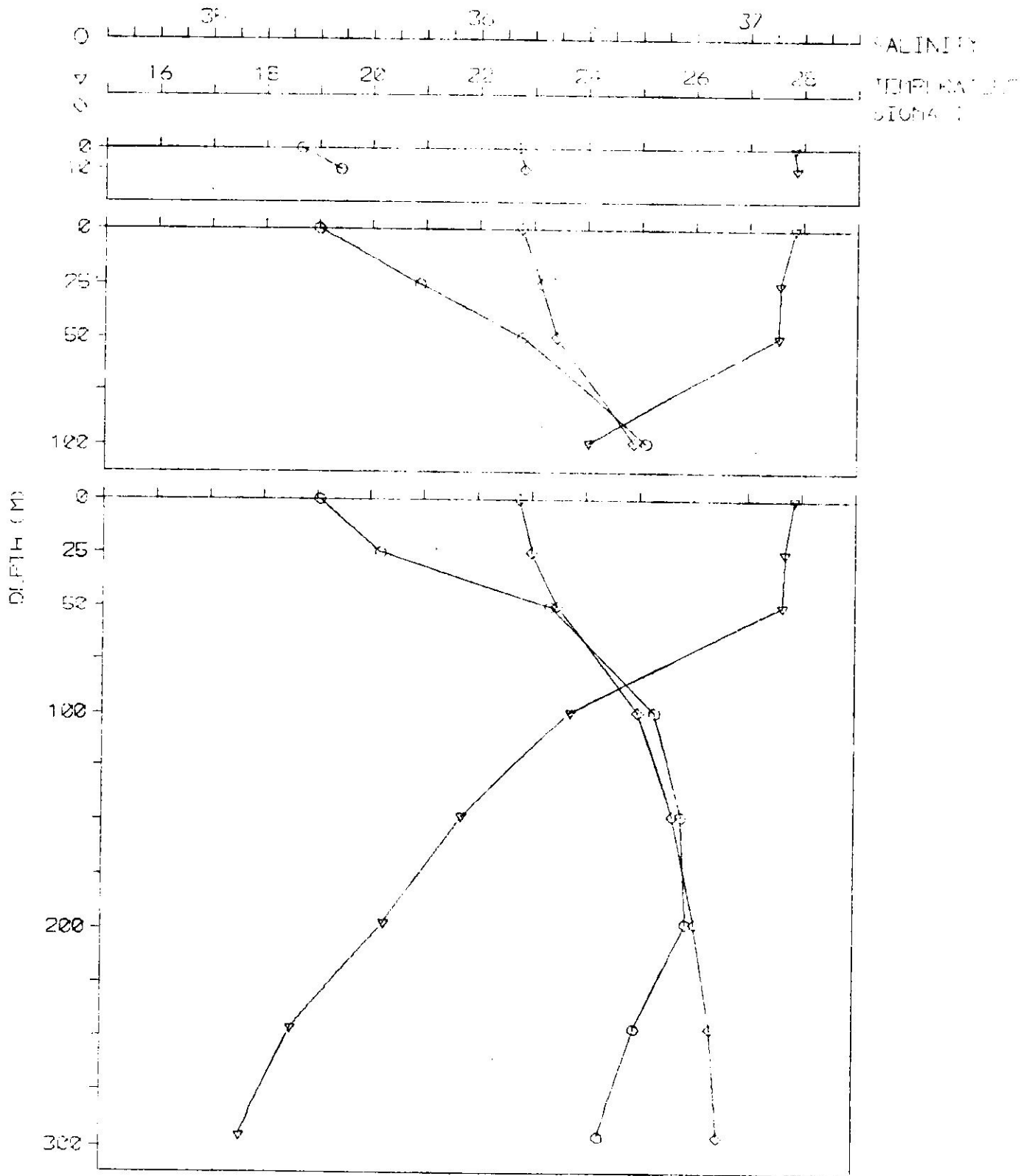
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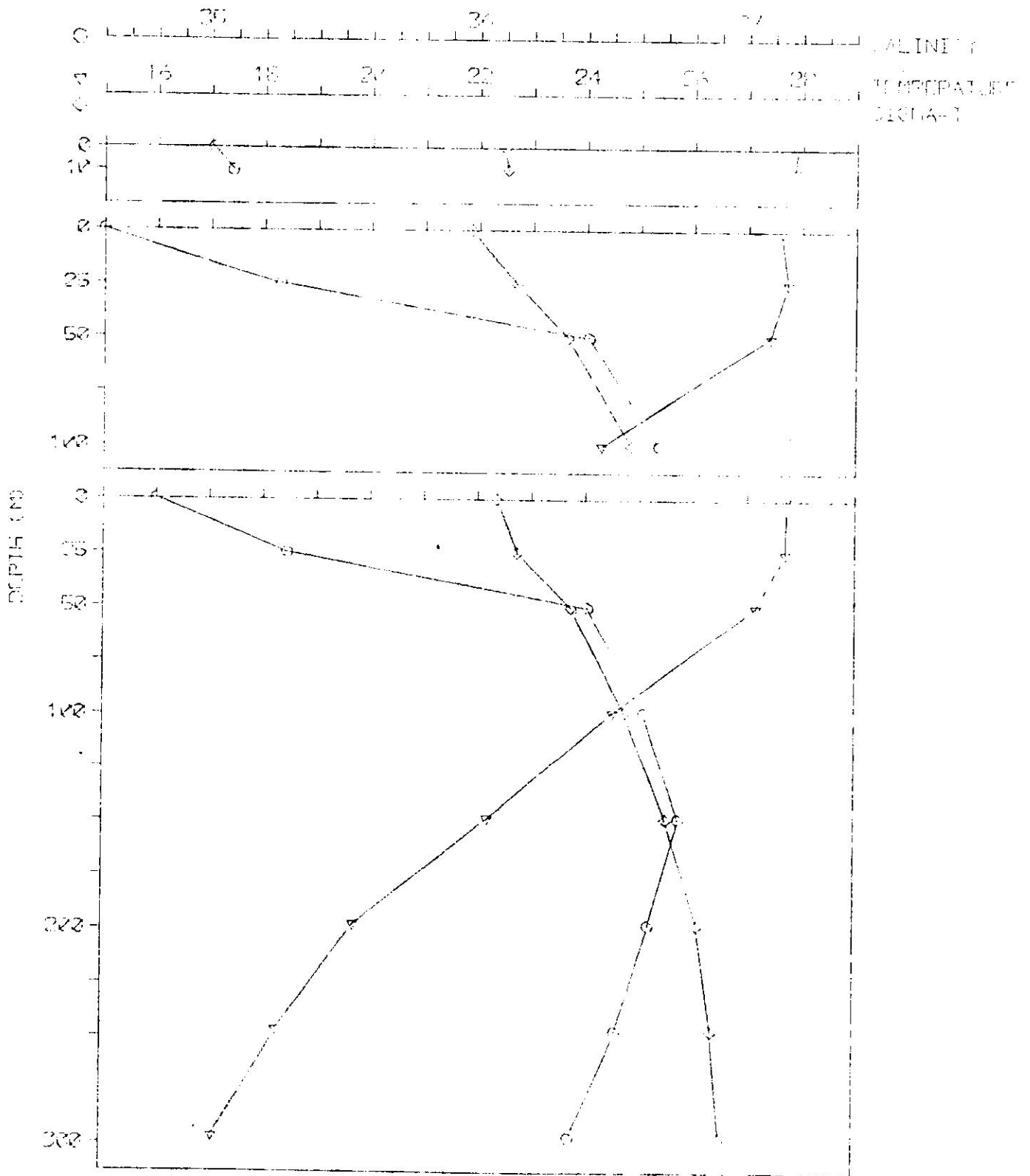
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 TRANSECT ISL 4, DATE 2/15/74



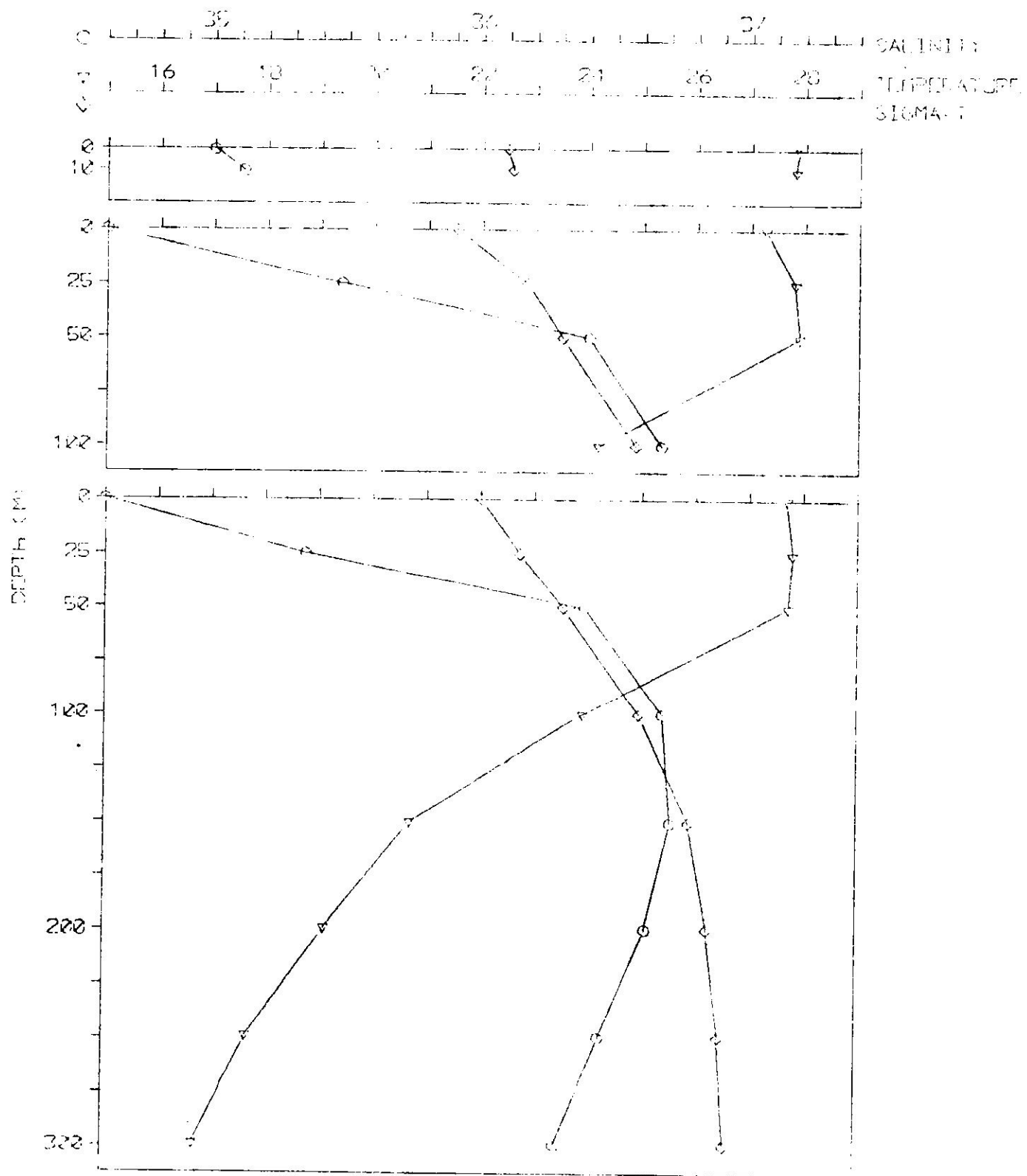
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 SALINITY AND SIGMA-T.  
 TRANSECT ISL 5, DATE 8/16/74



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 TRANSECT 16L-1 DATE 10/31/74

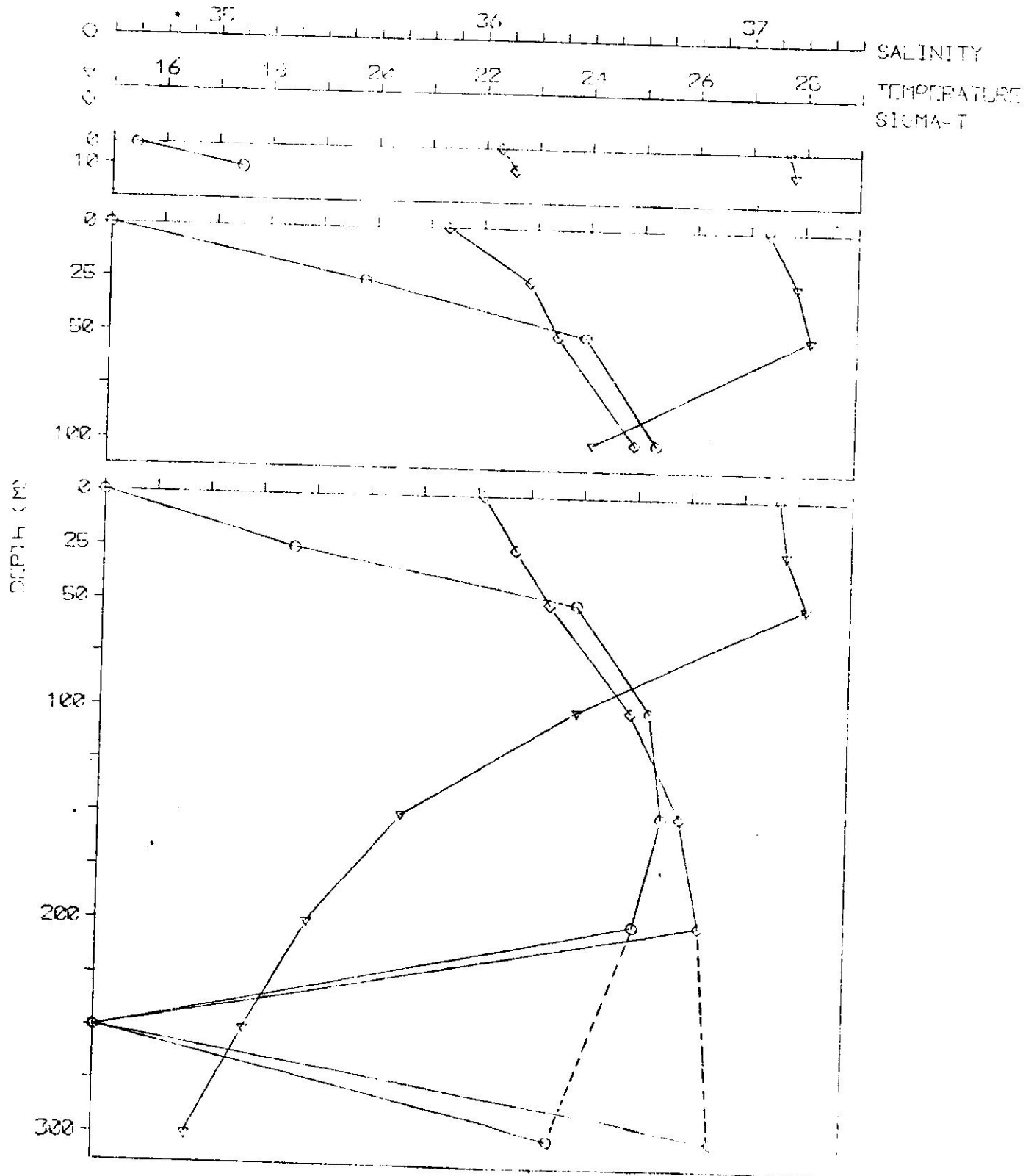


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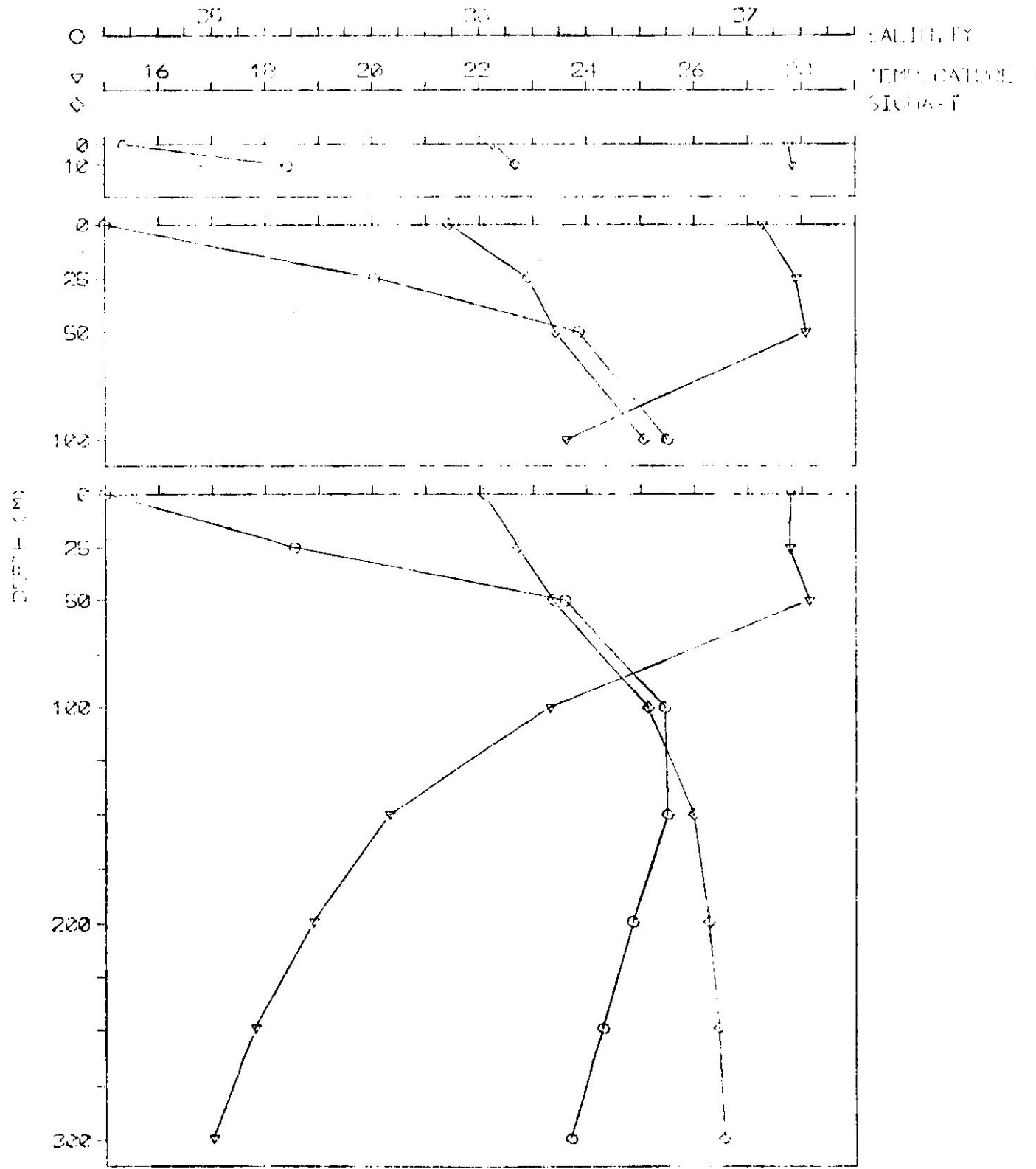




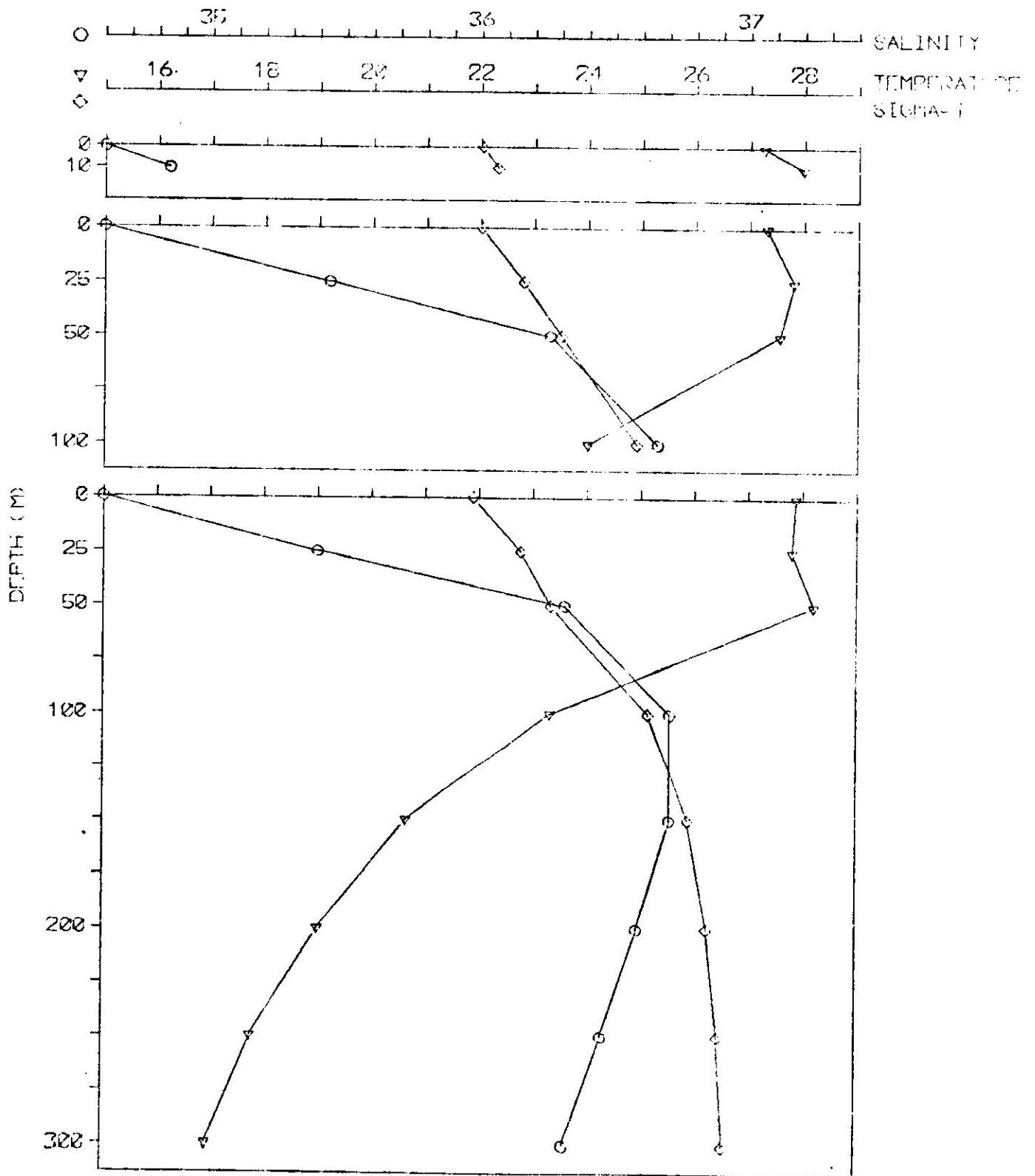
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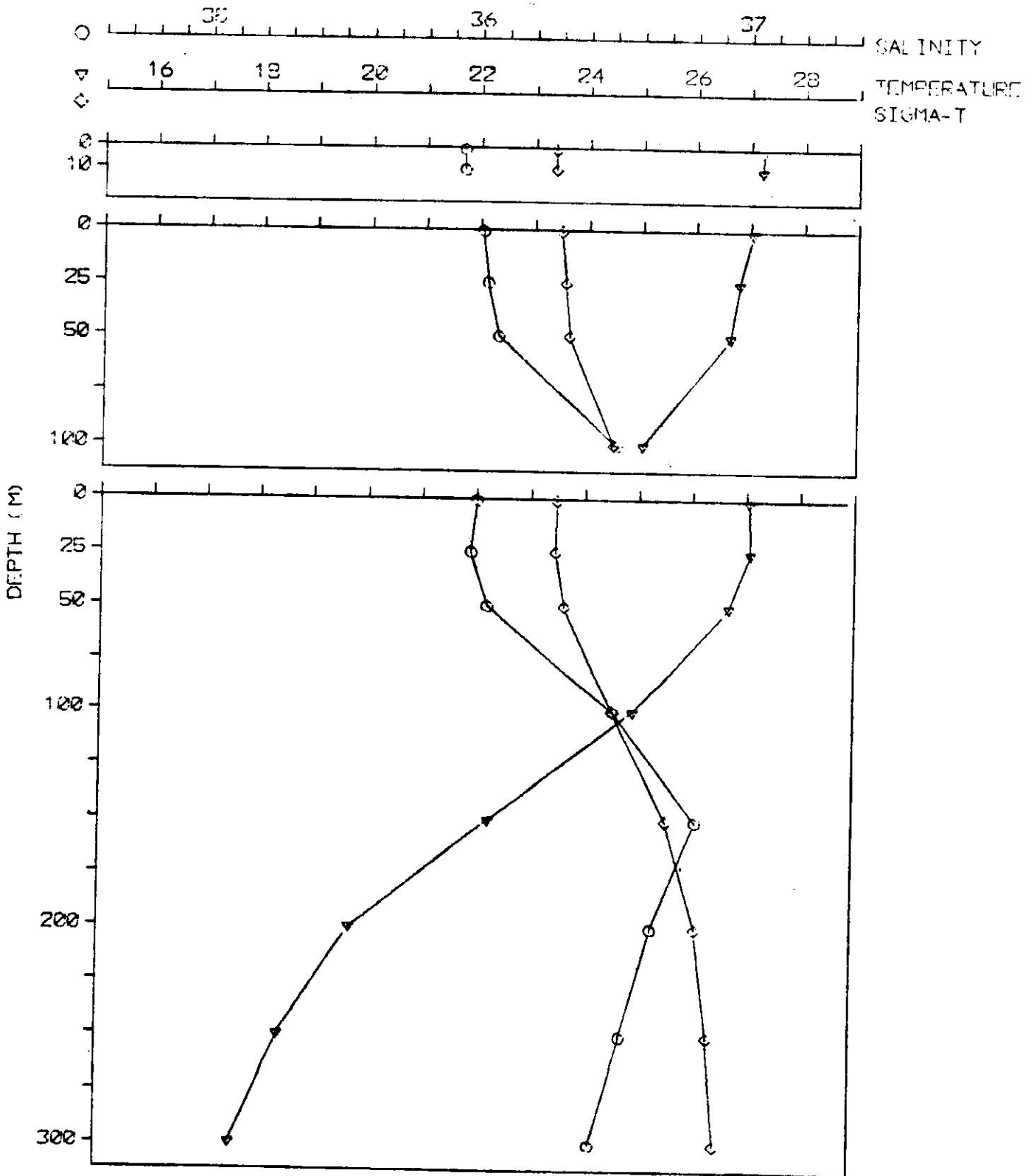
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 TRANSECT TSI-4, DATE 10/31/74



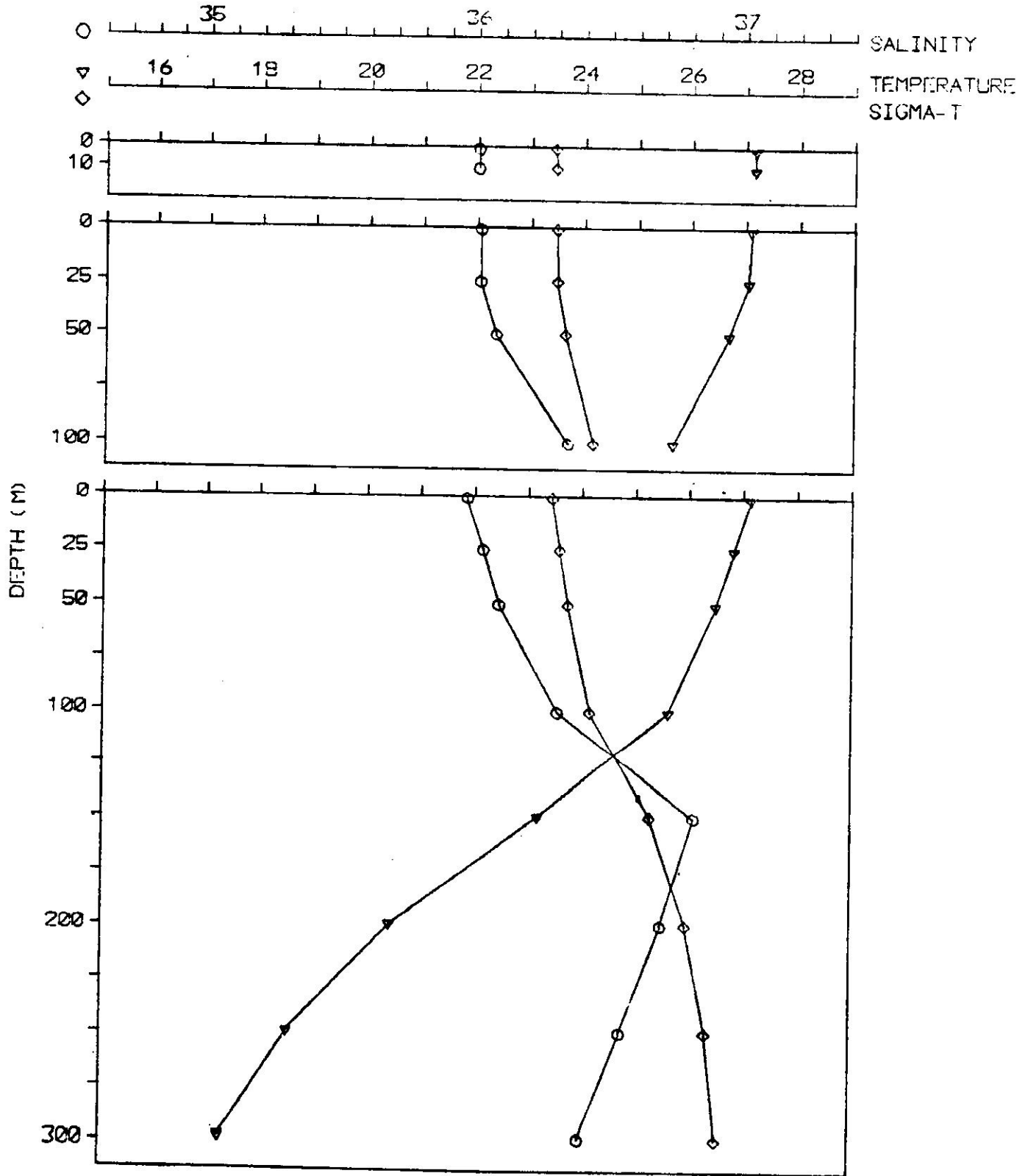
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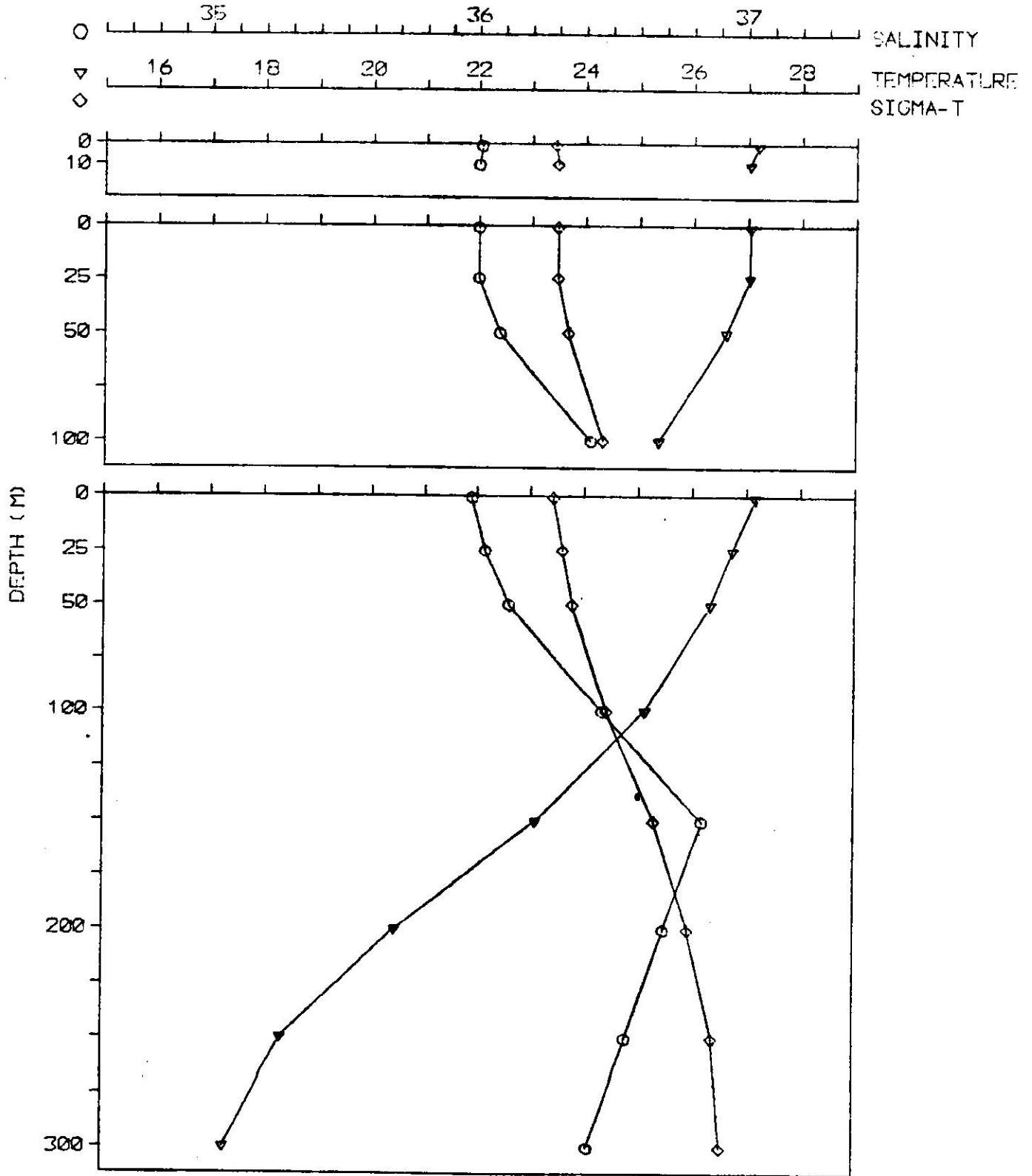
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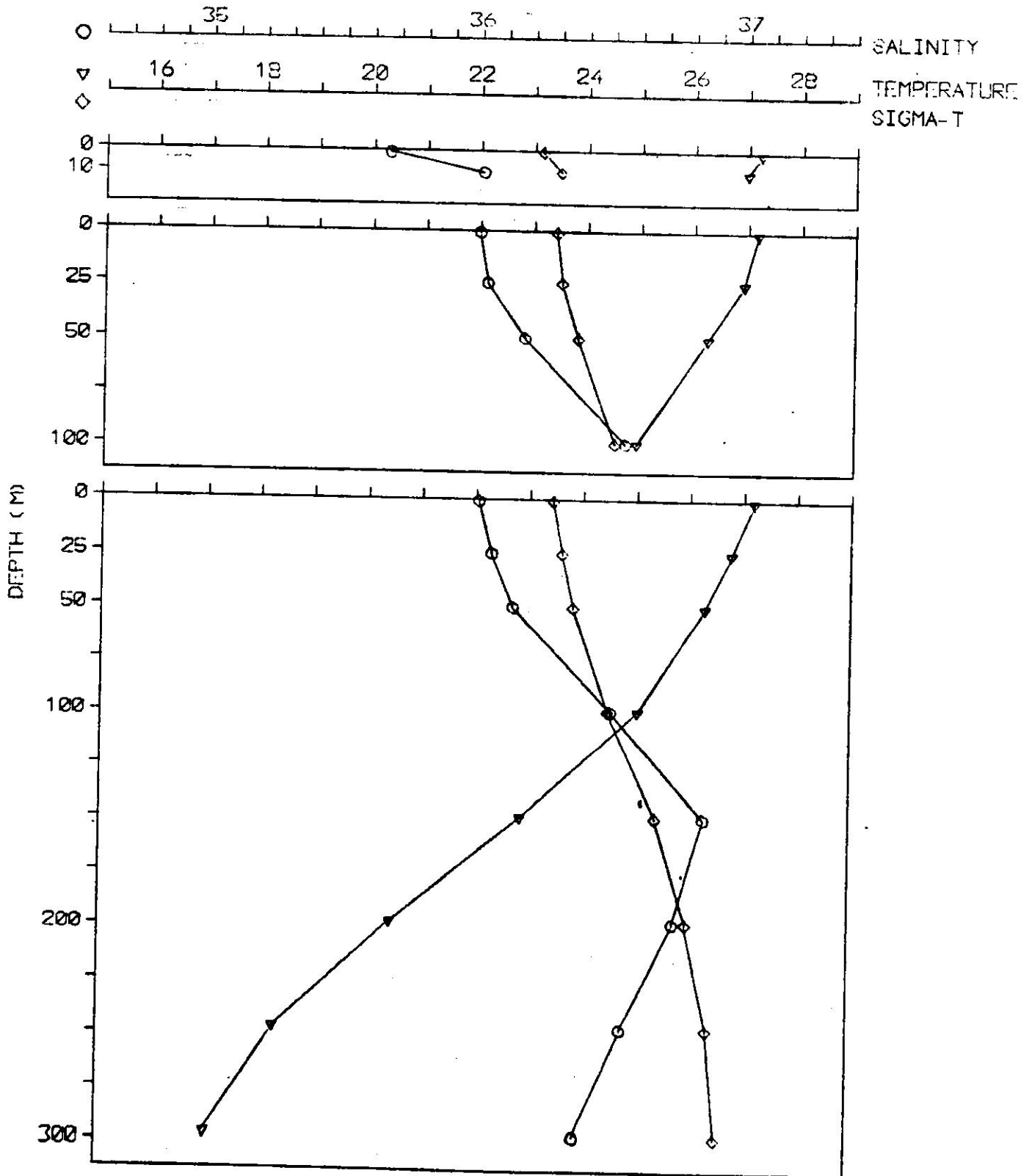
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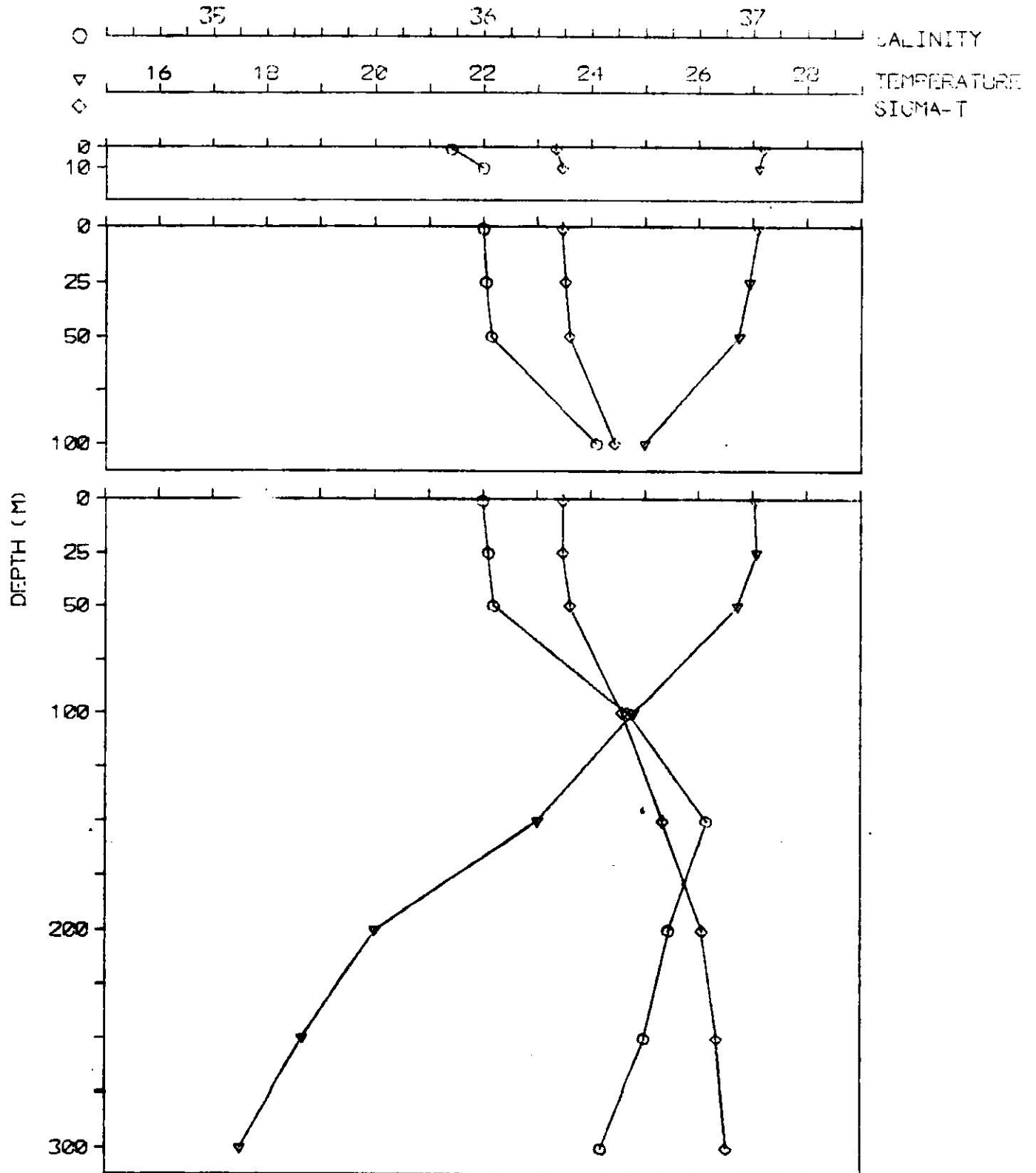
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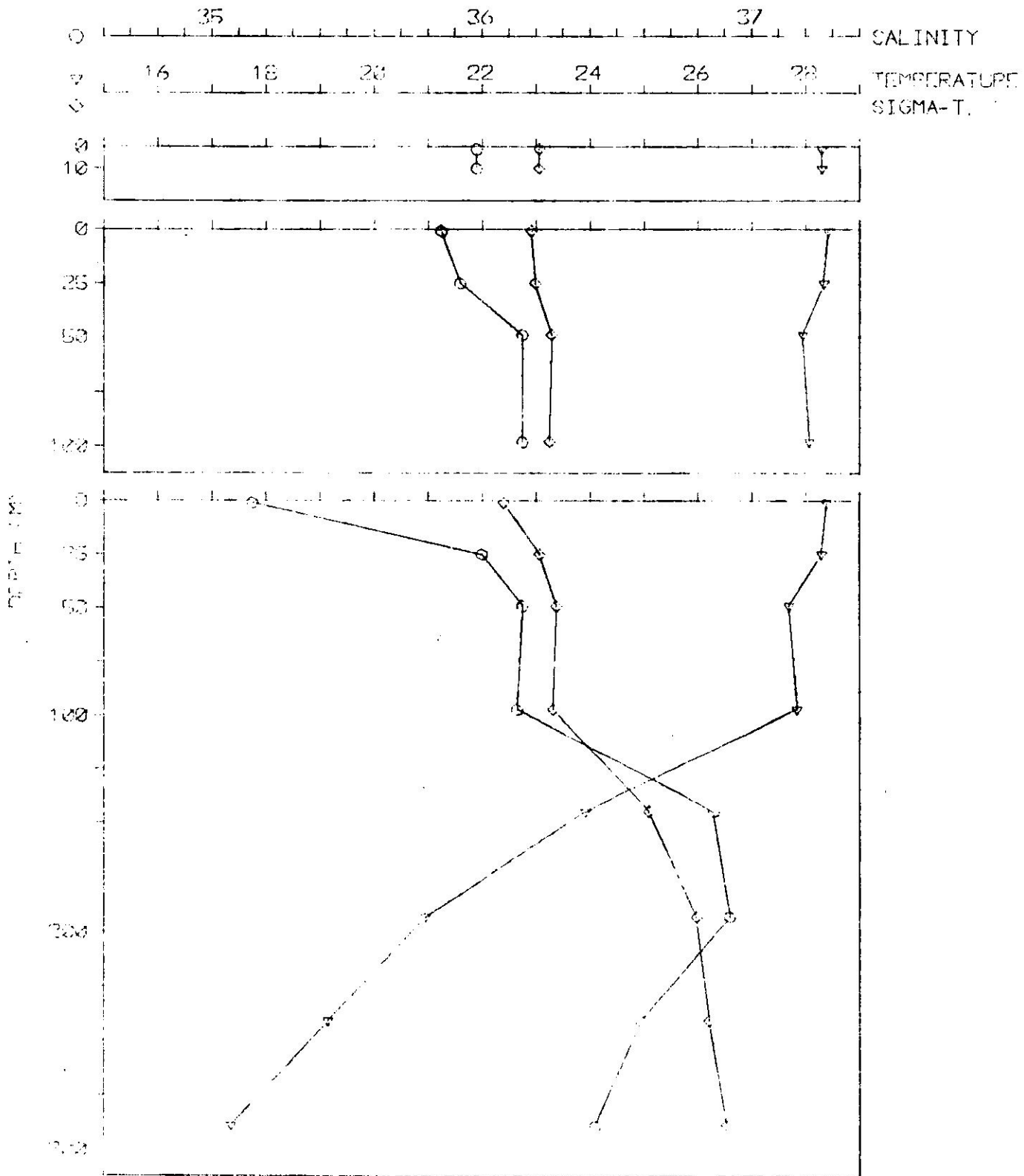


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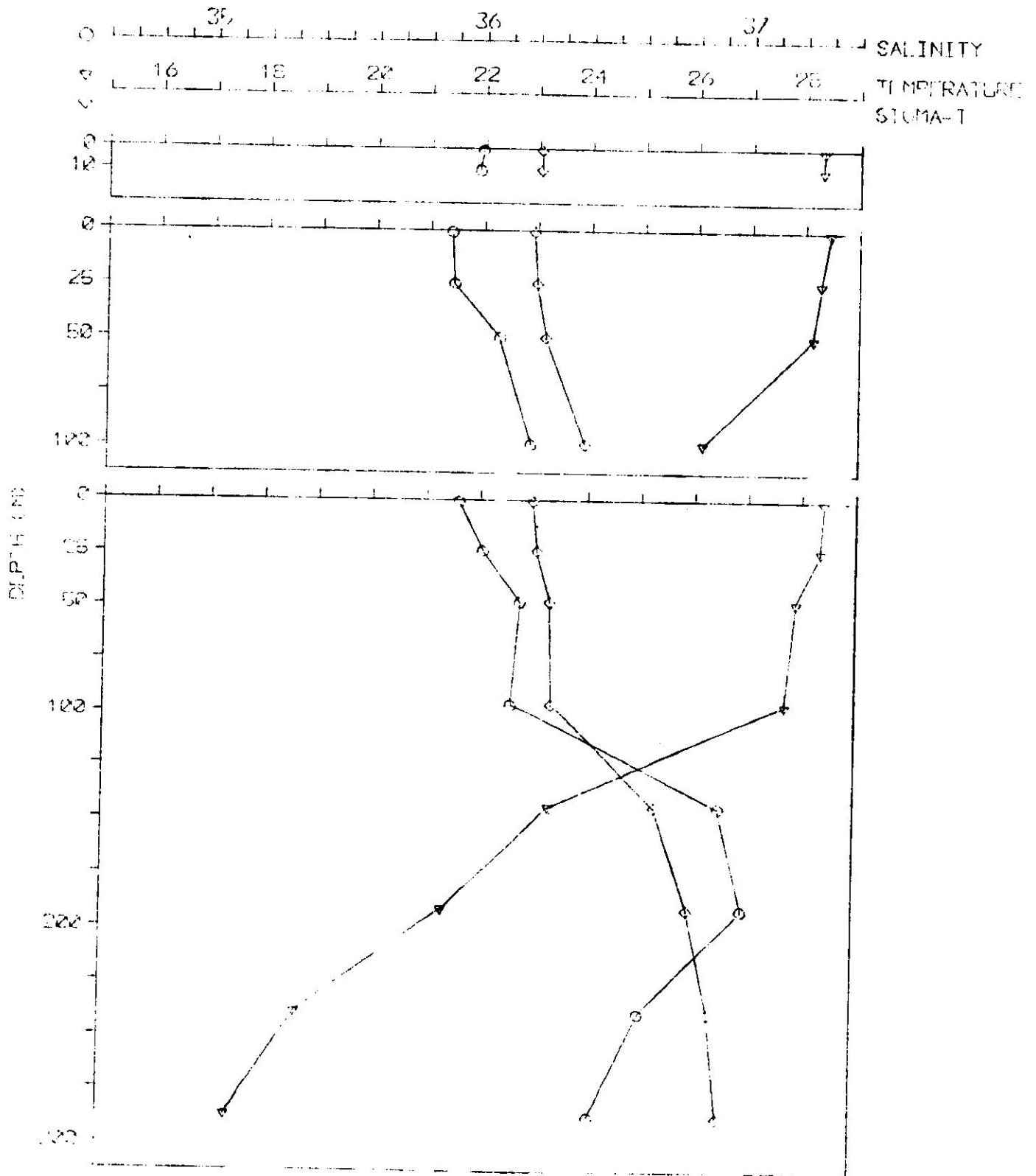




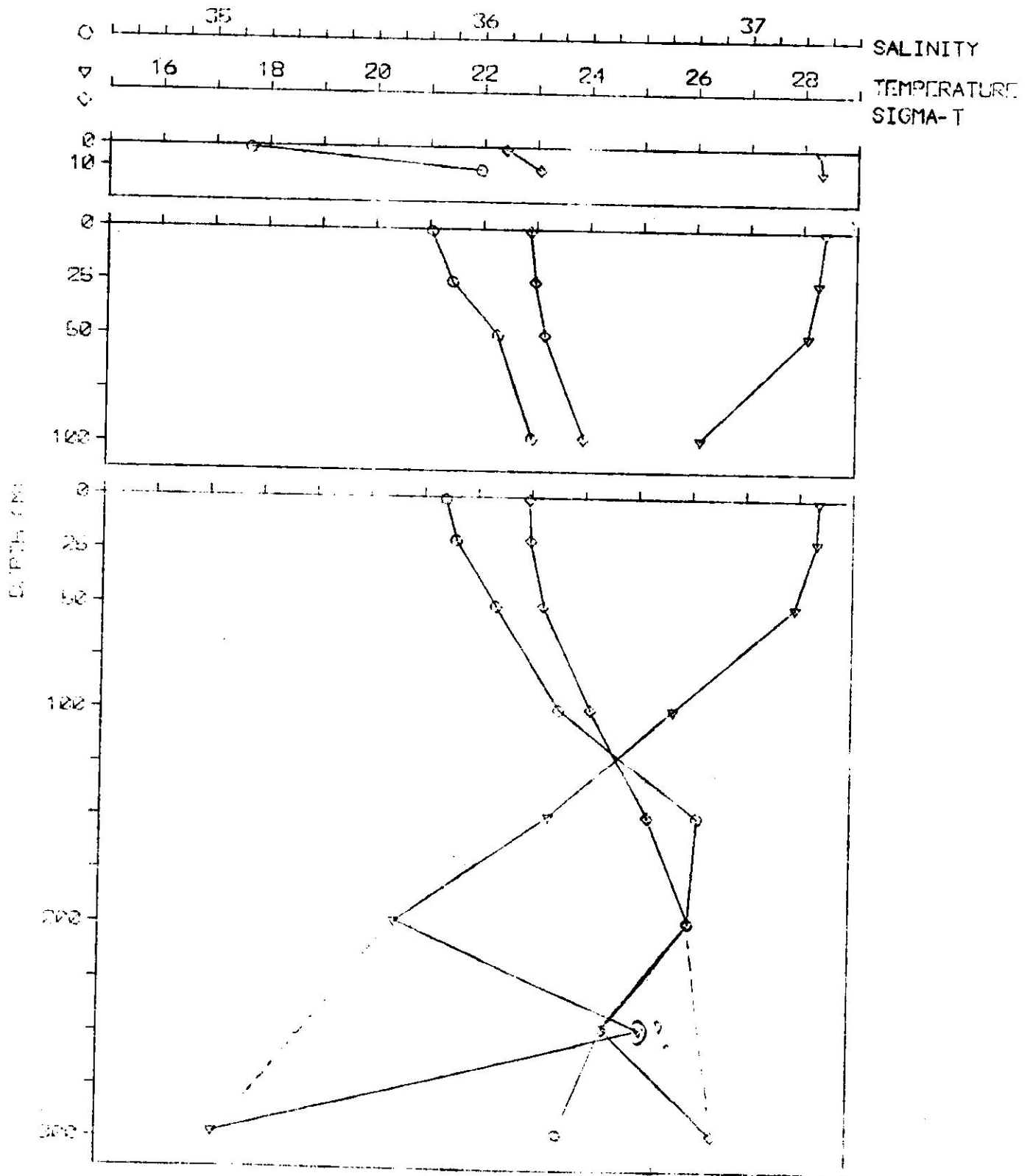
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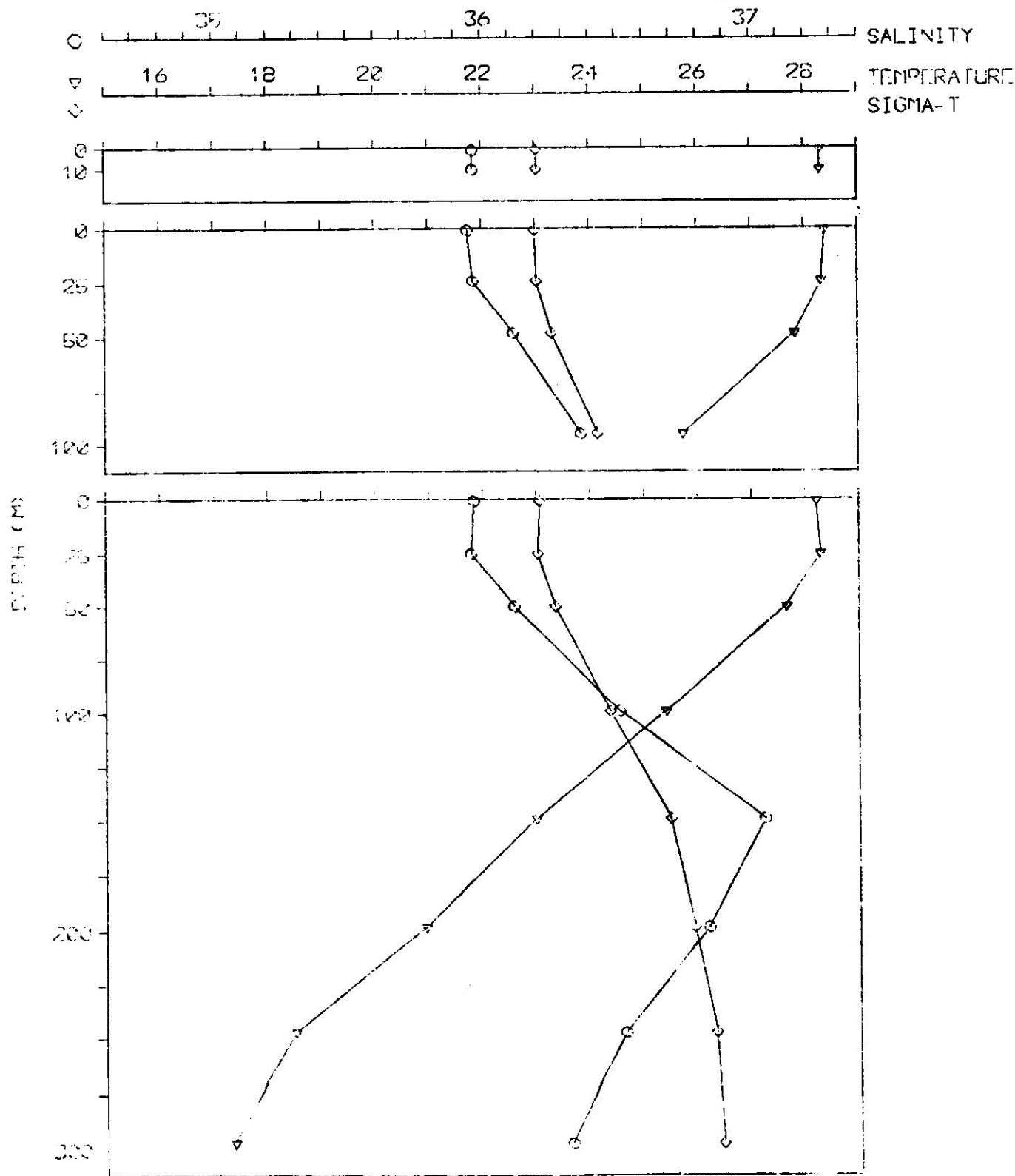
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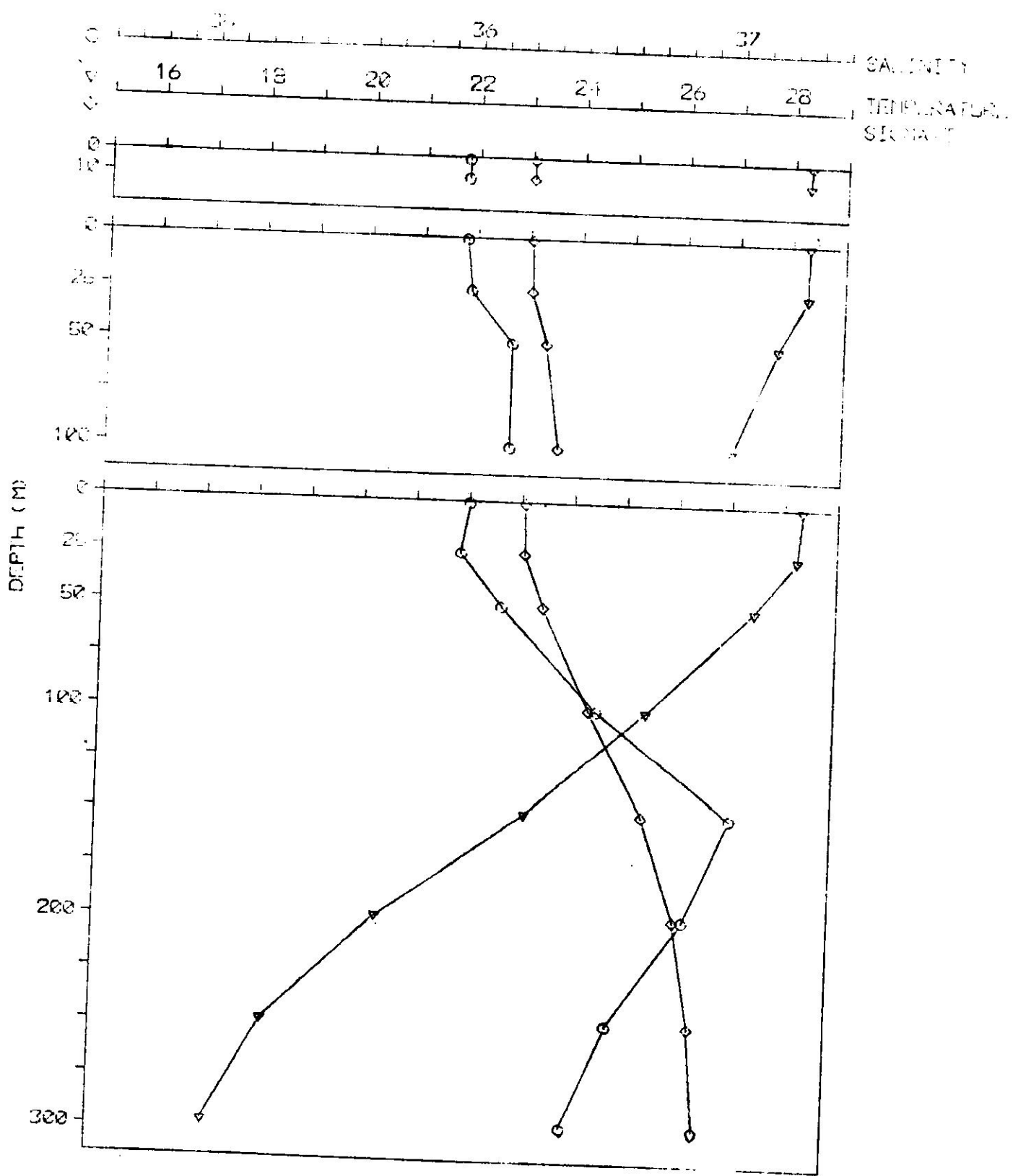
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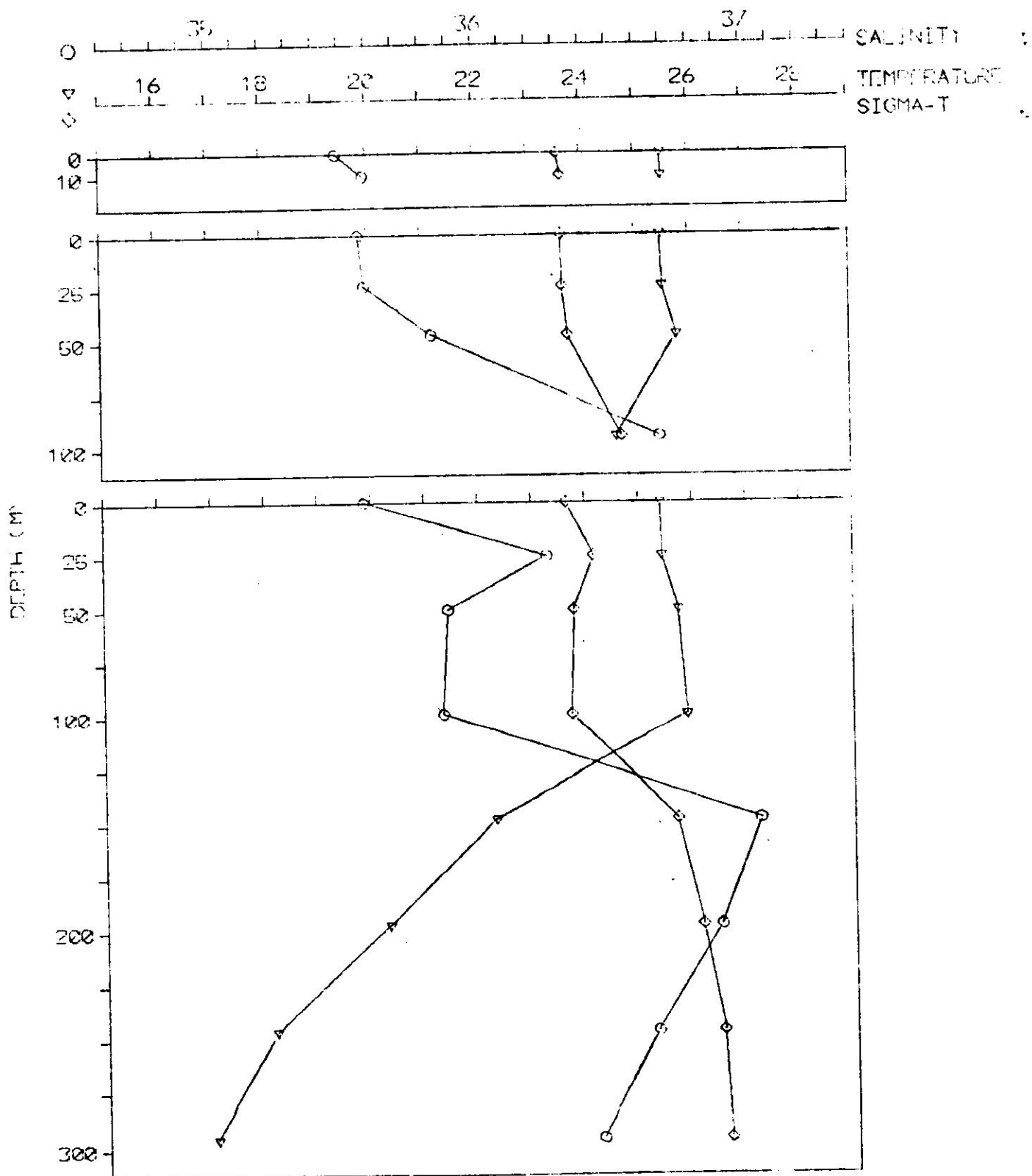
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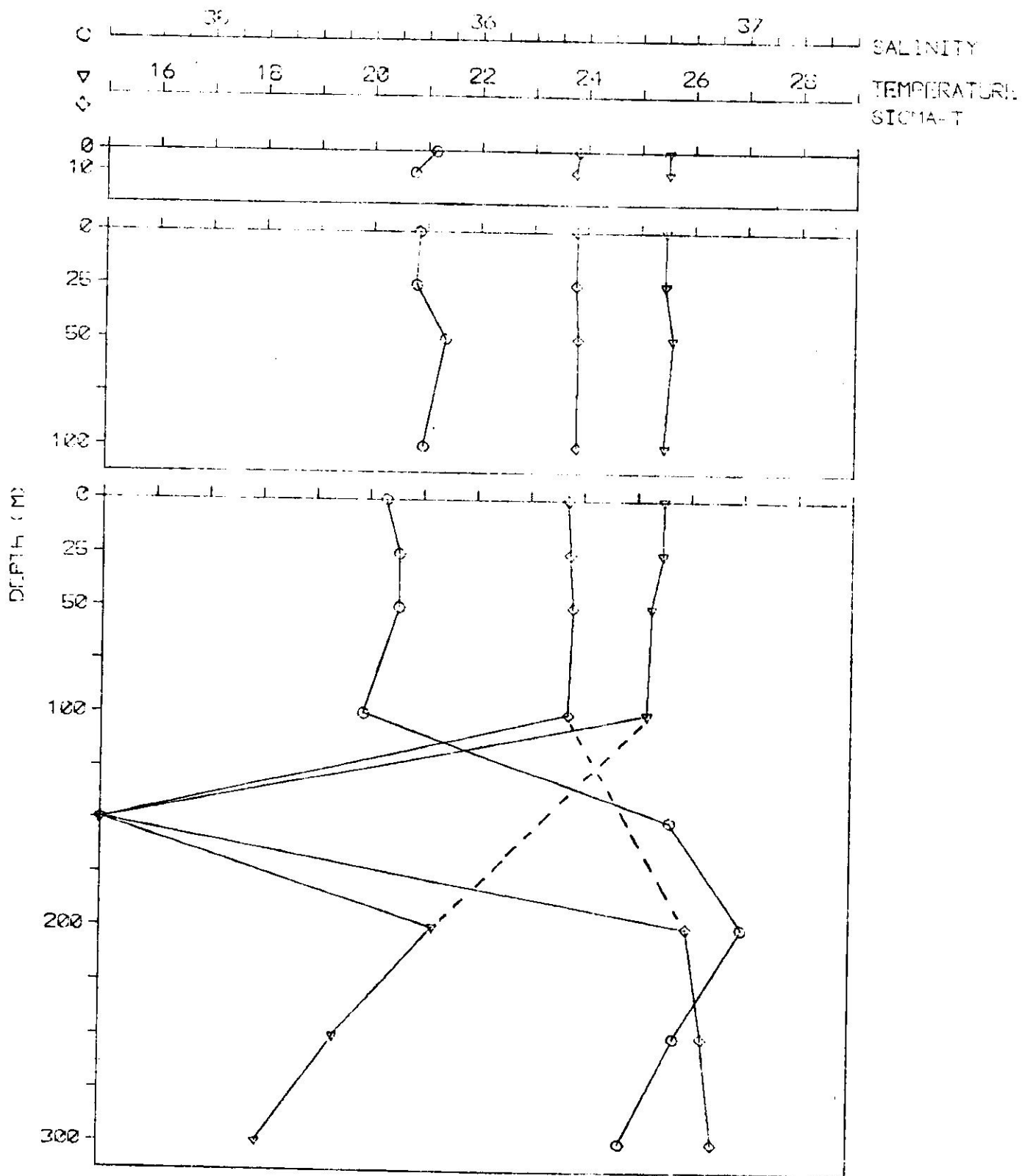
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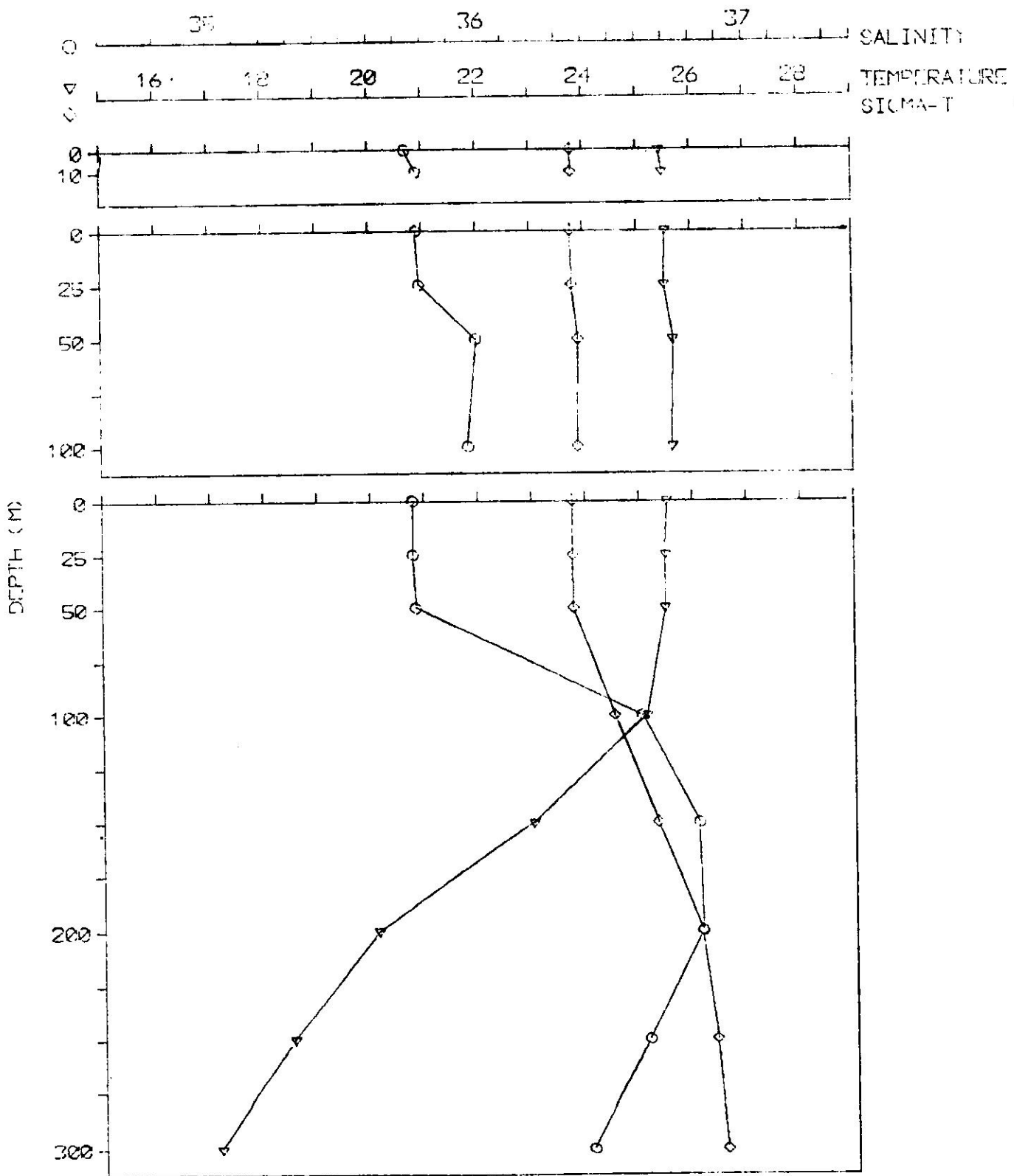
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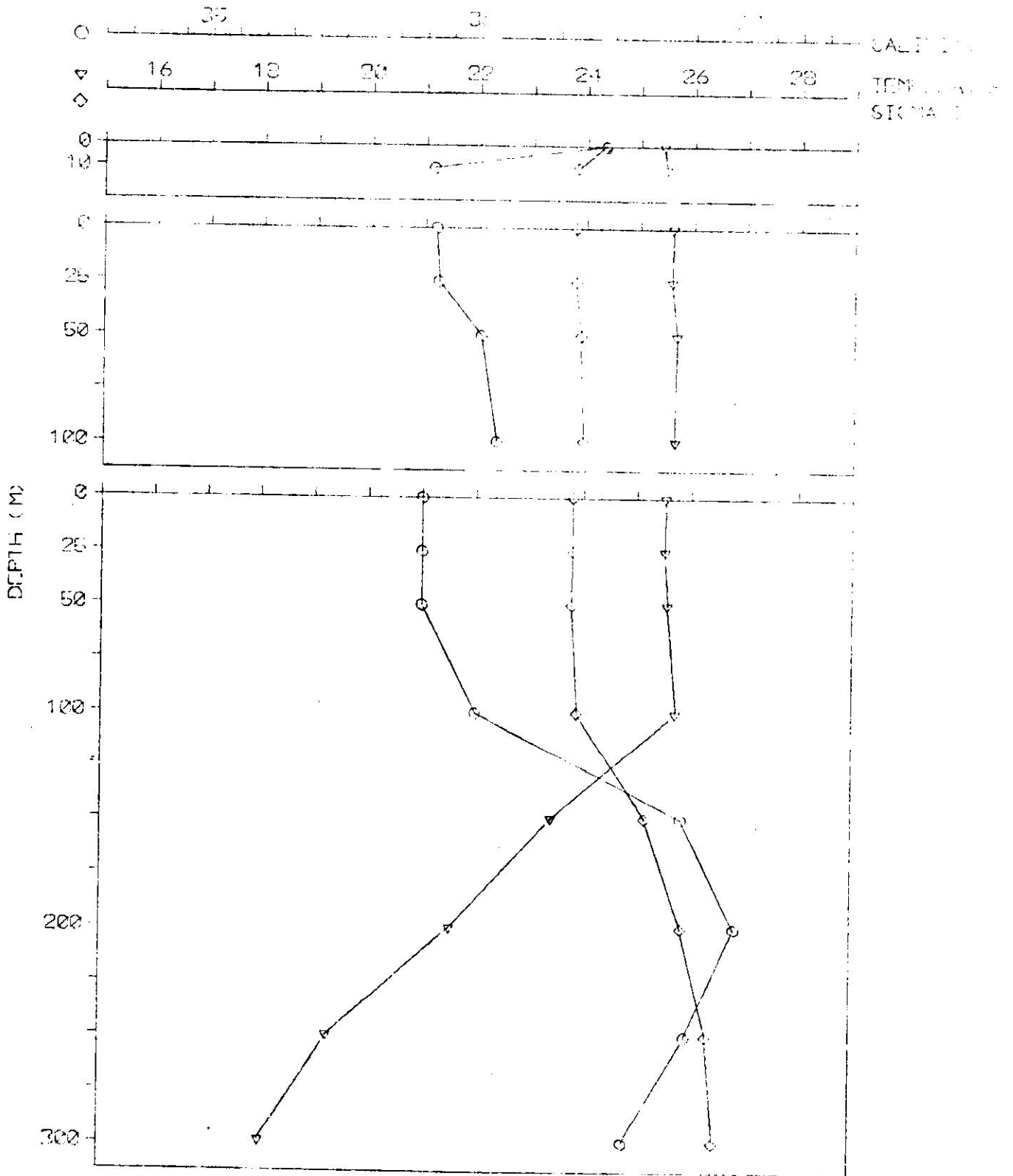


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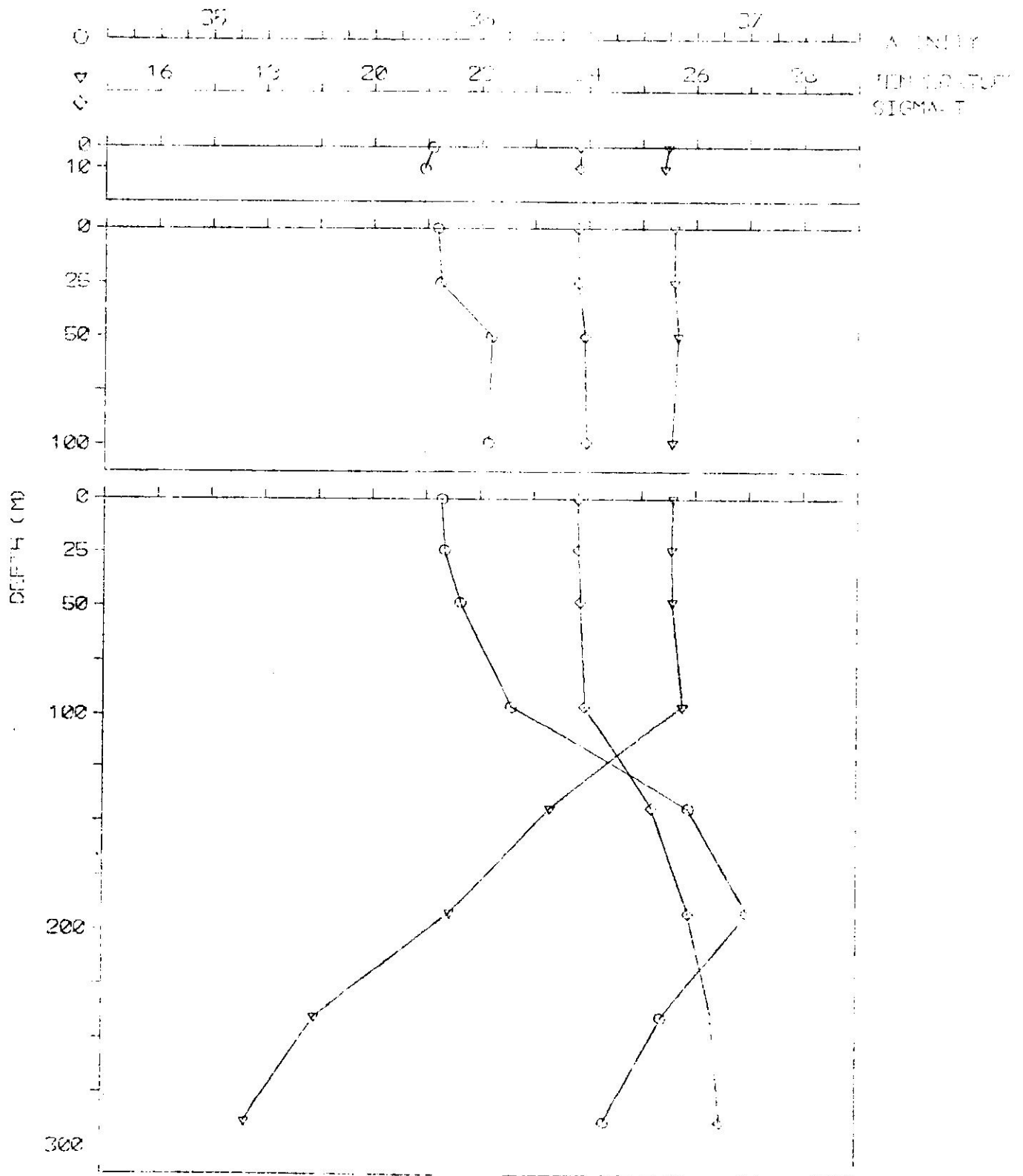




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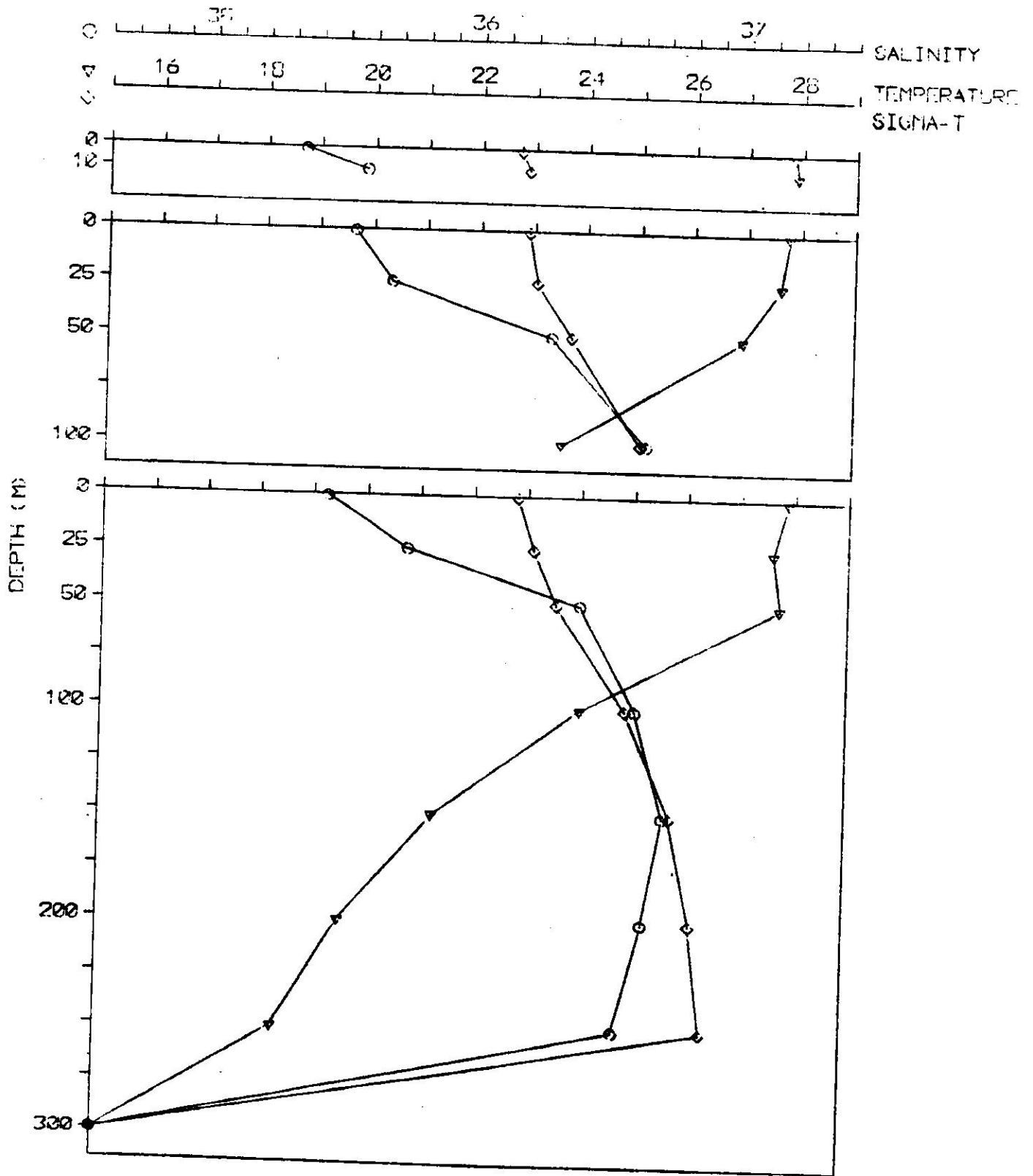


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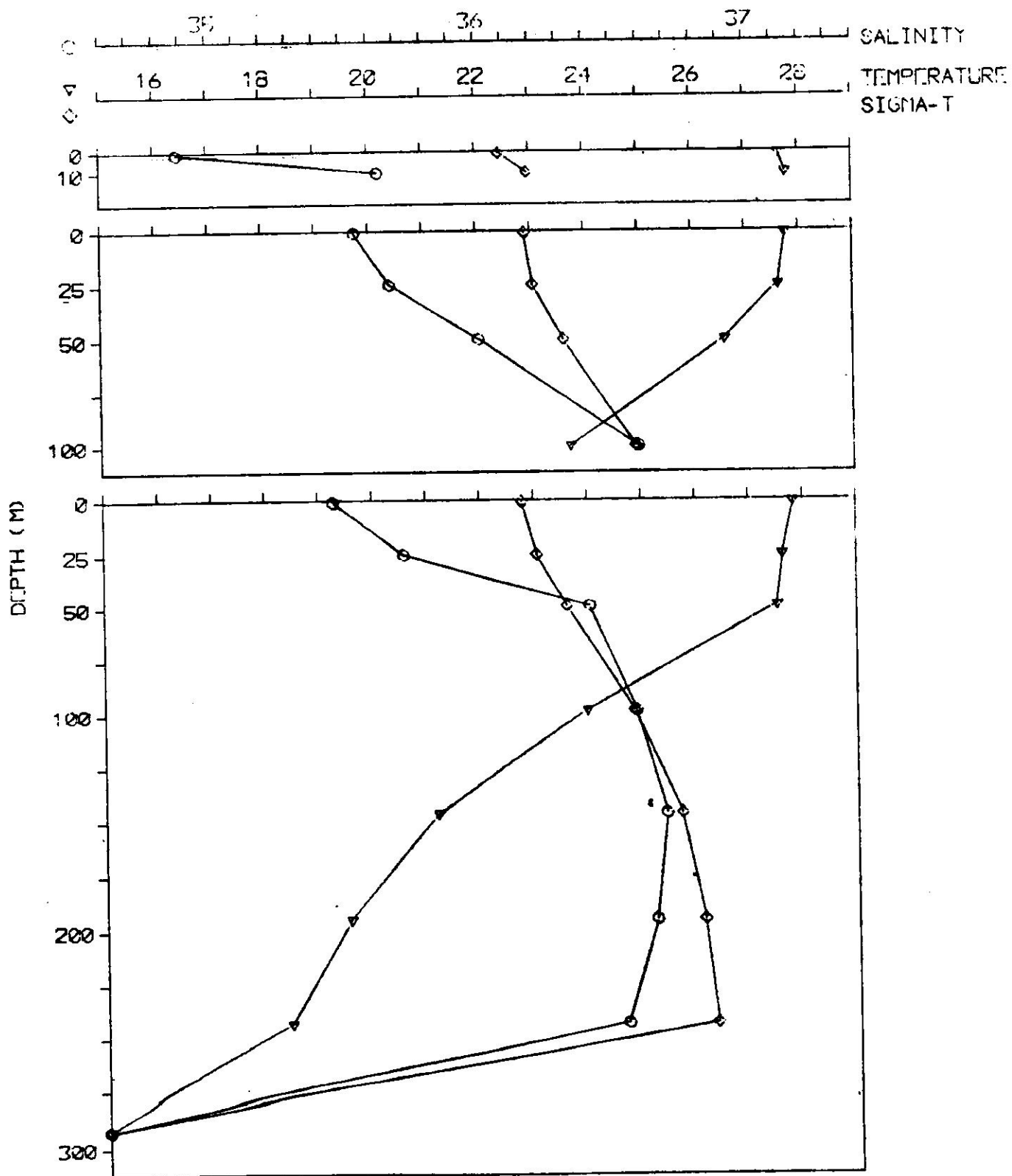


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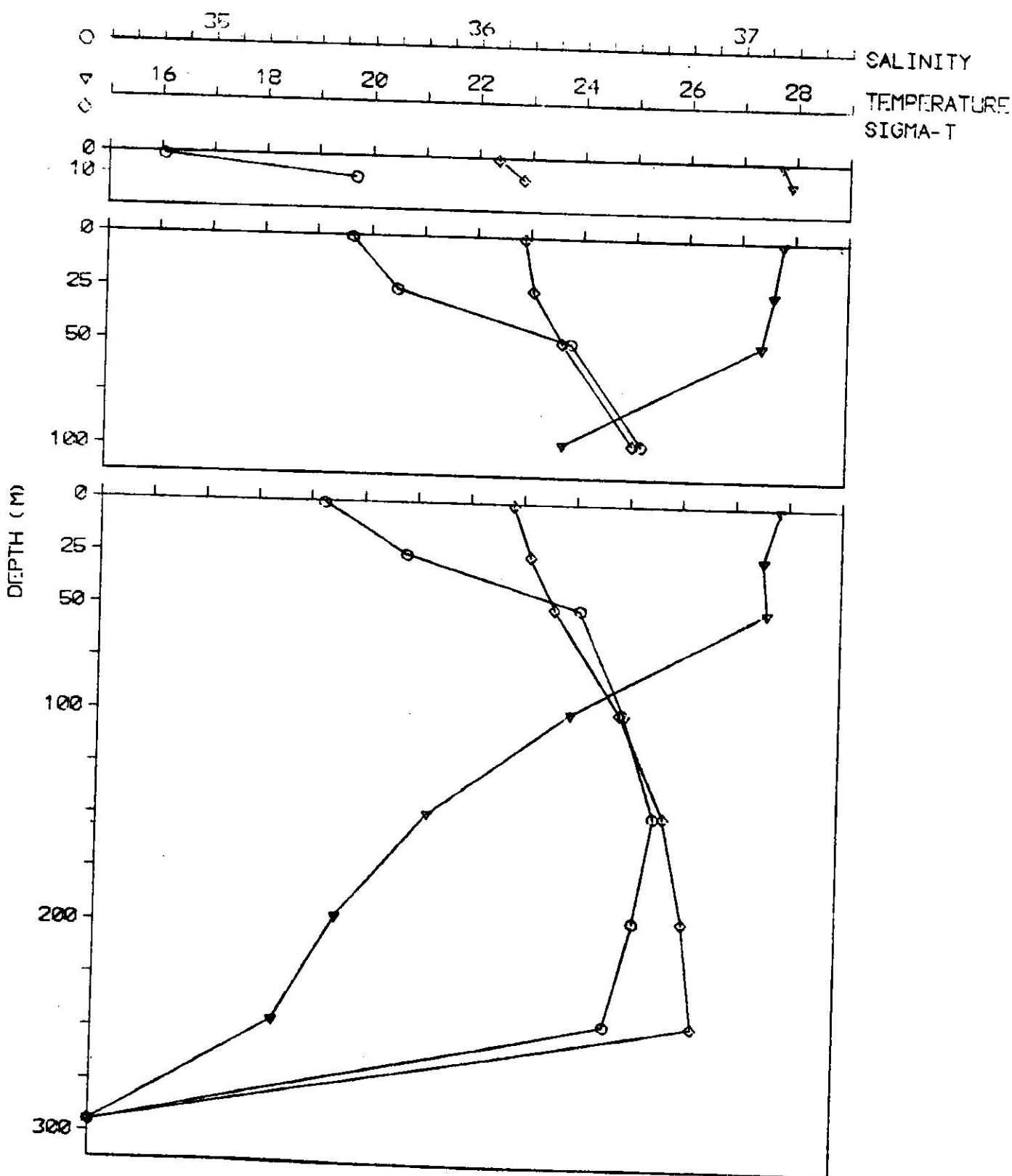
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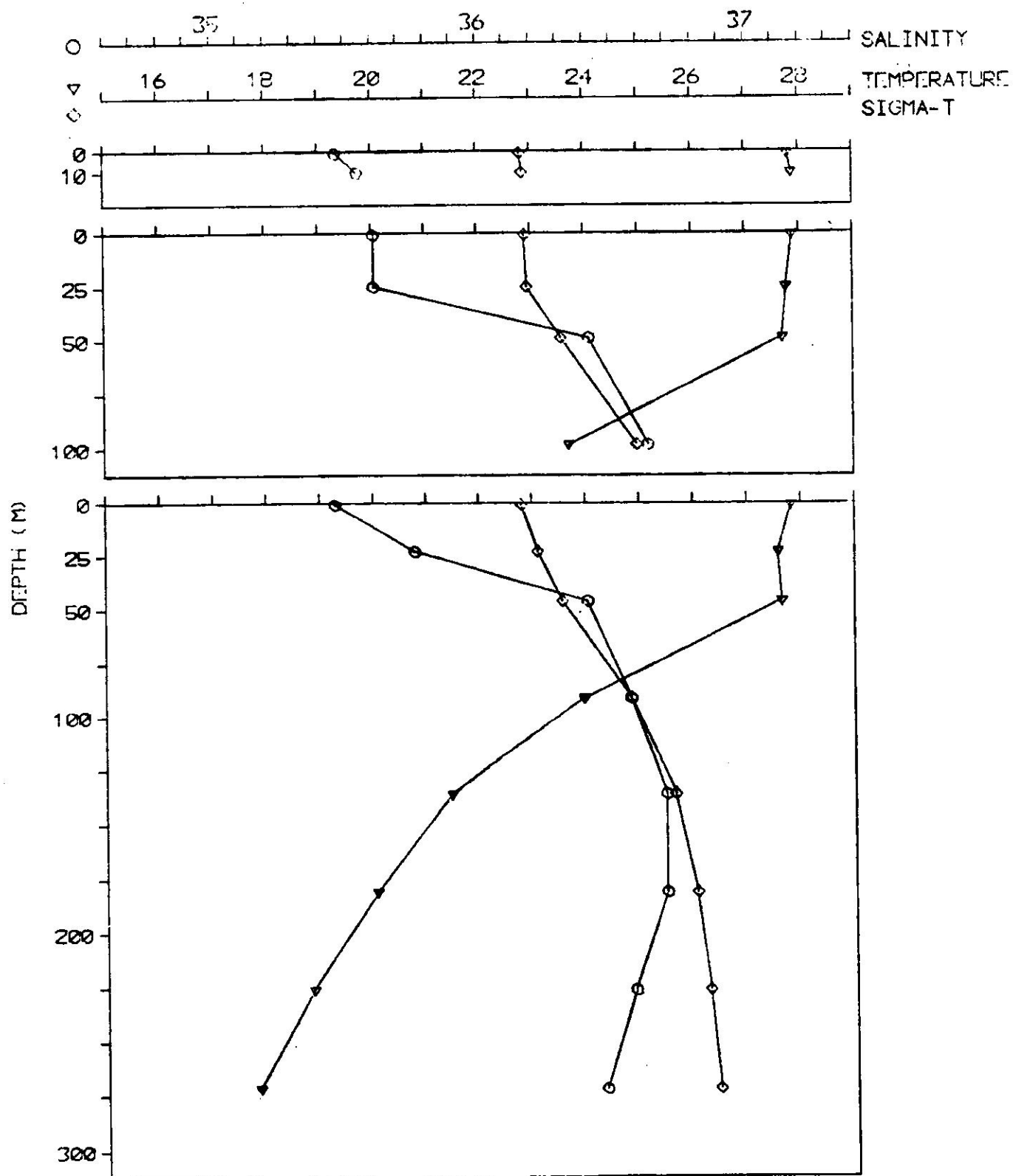
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 SALINITY AND SIGMA-T.  
 TRANSECT PMA-4, DATE 8/15/74

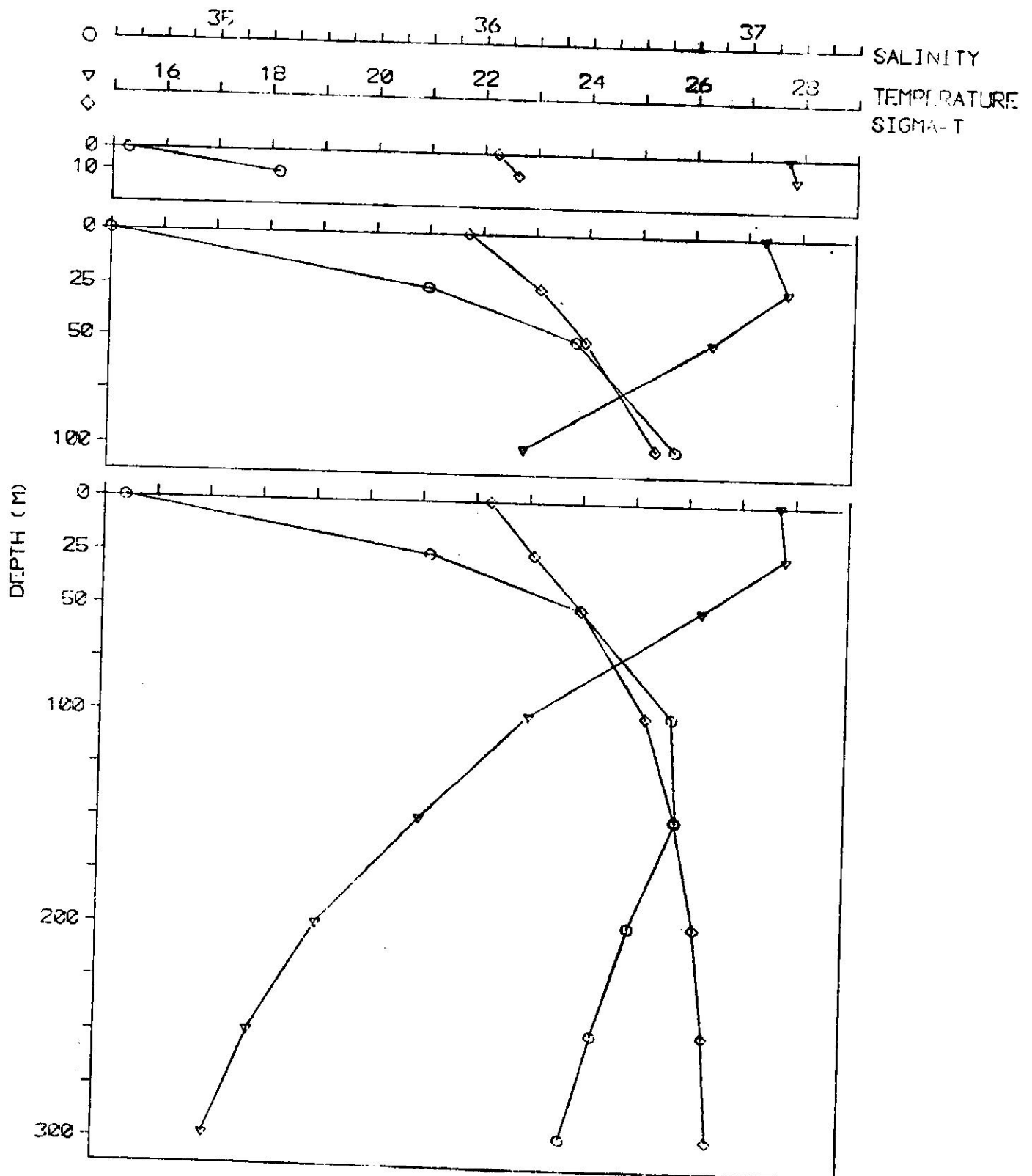


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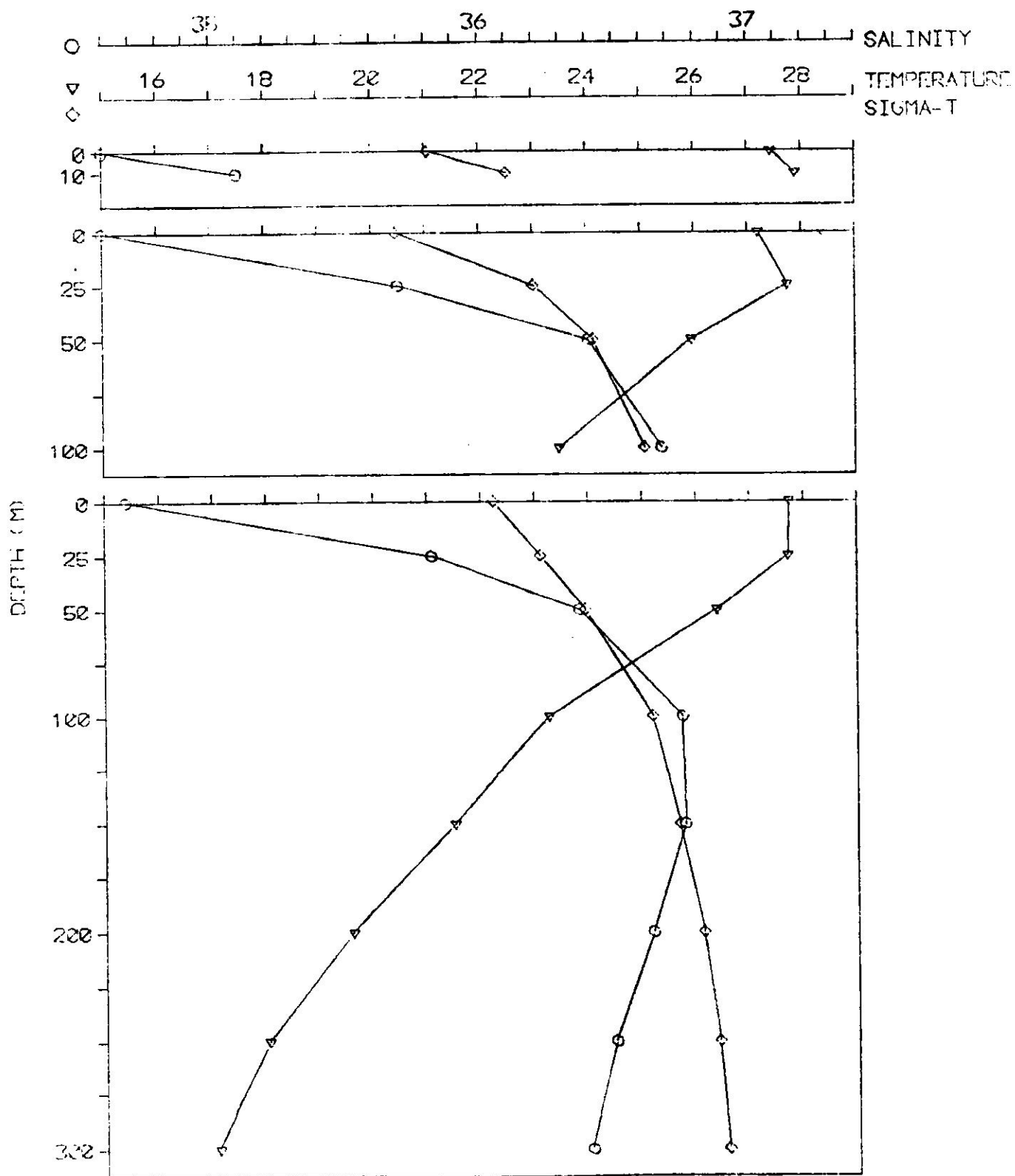


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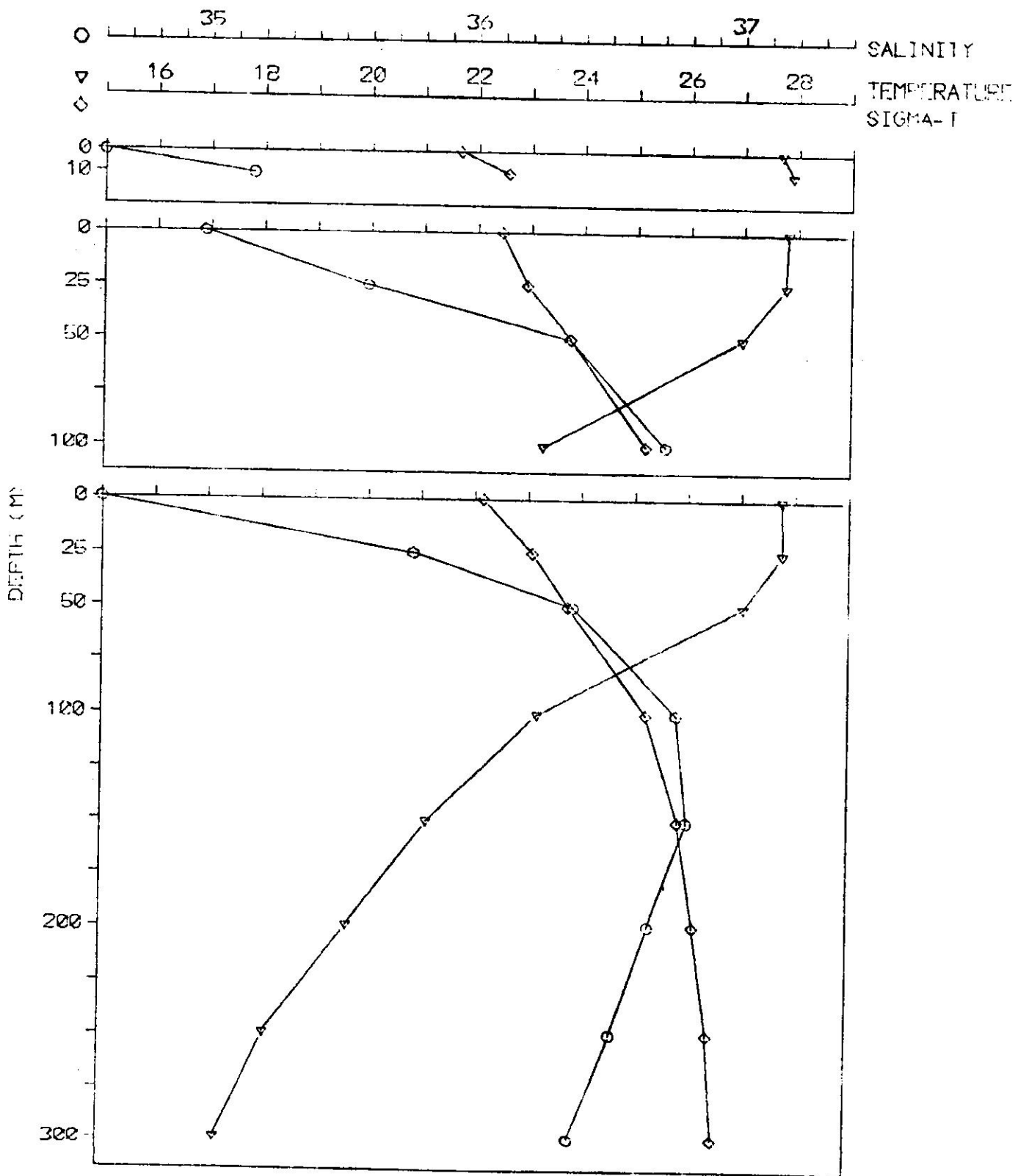


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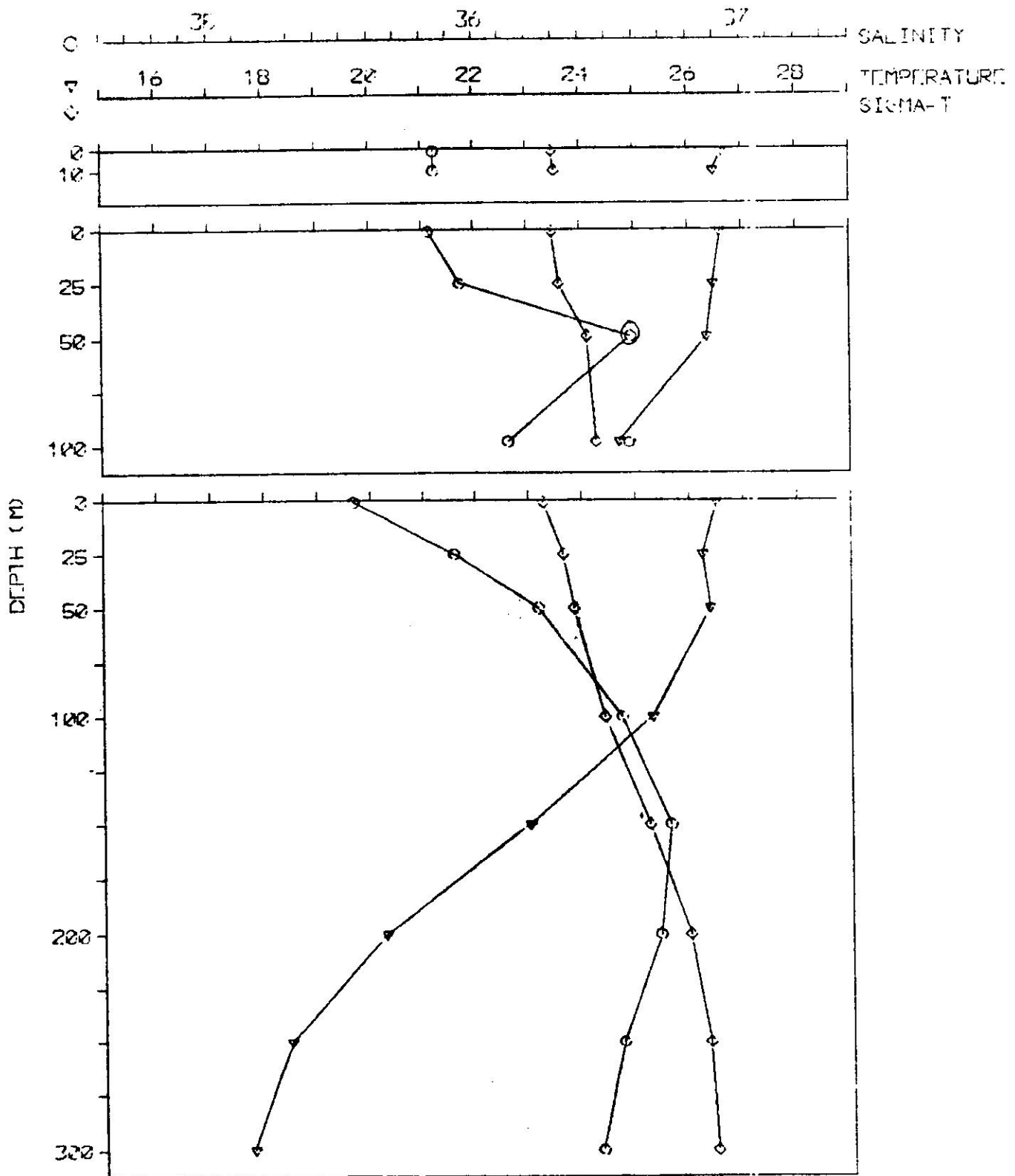




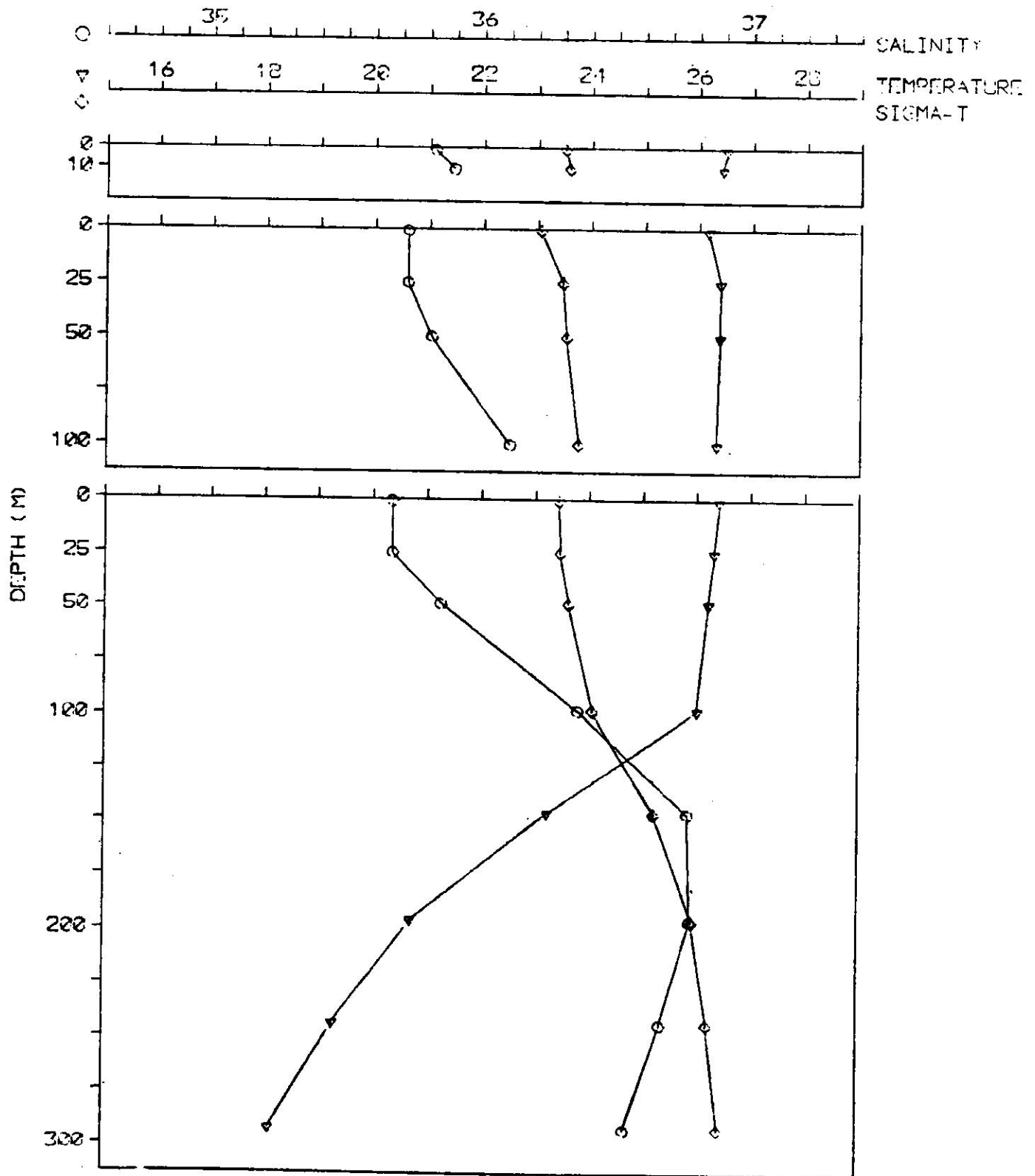
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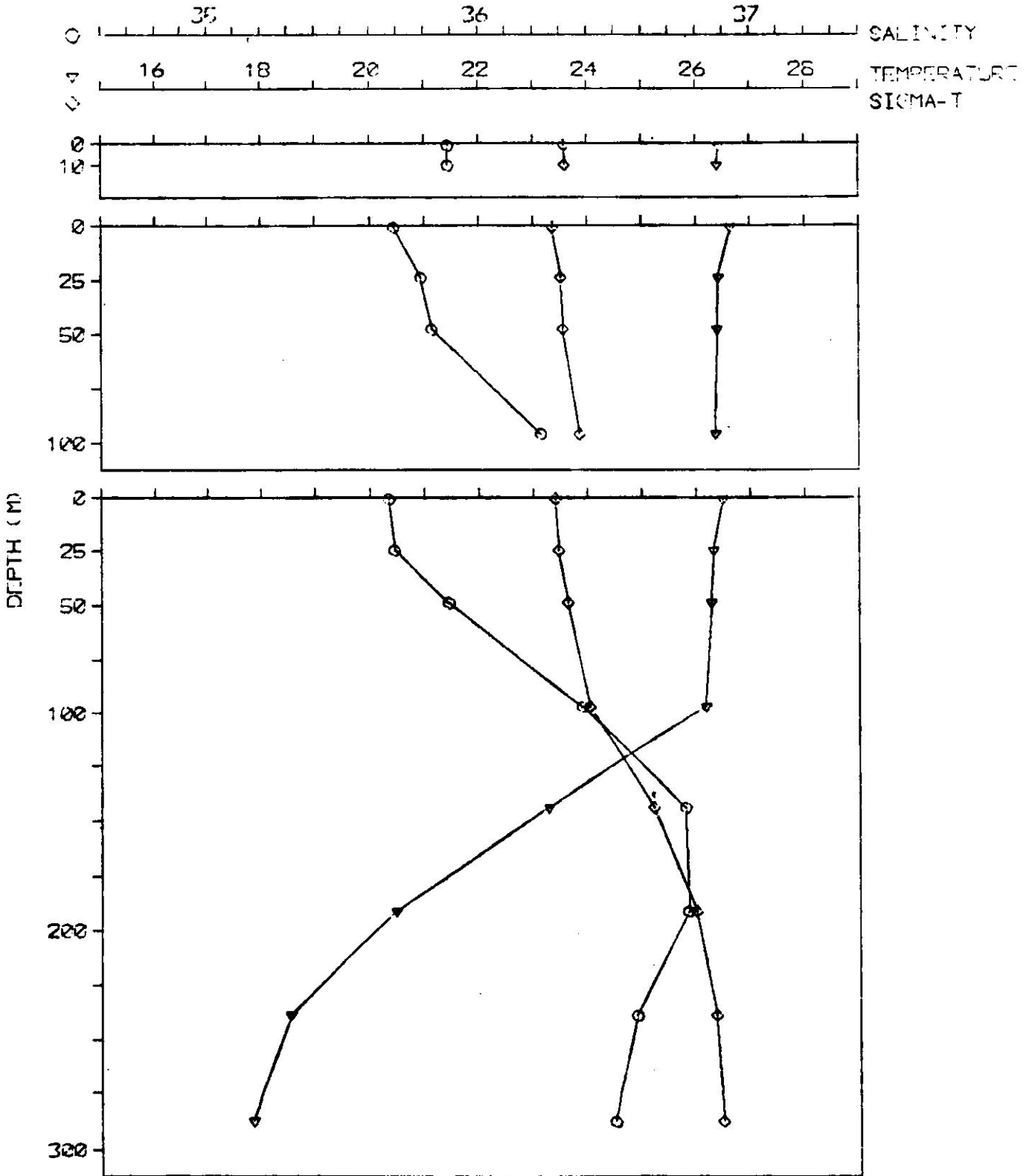
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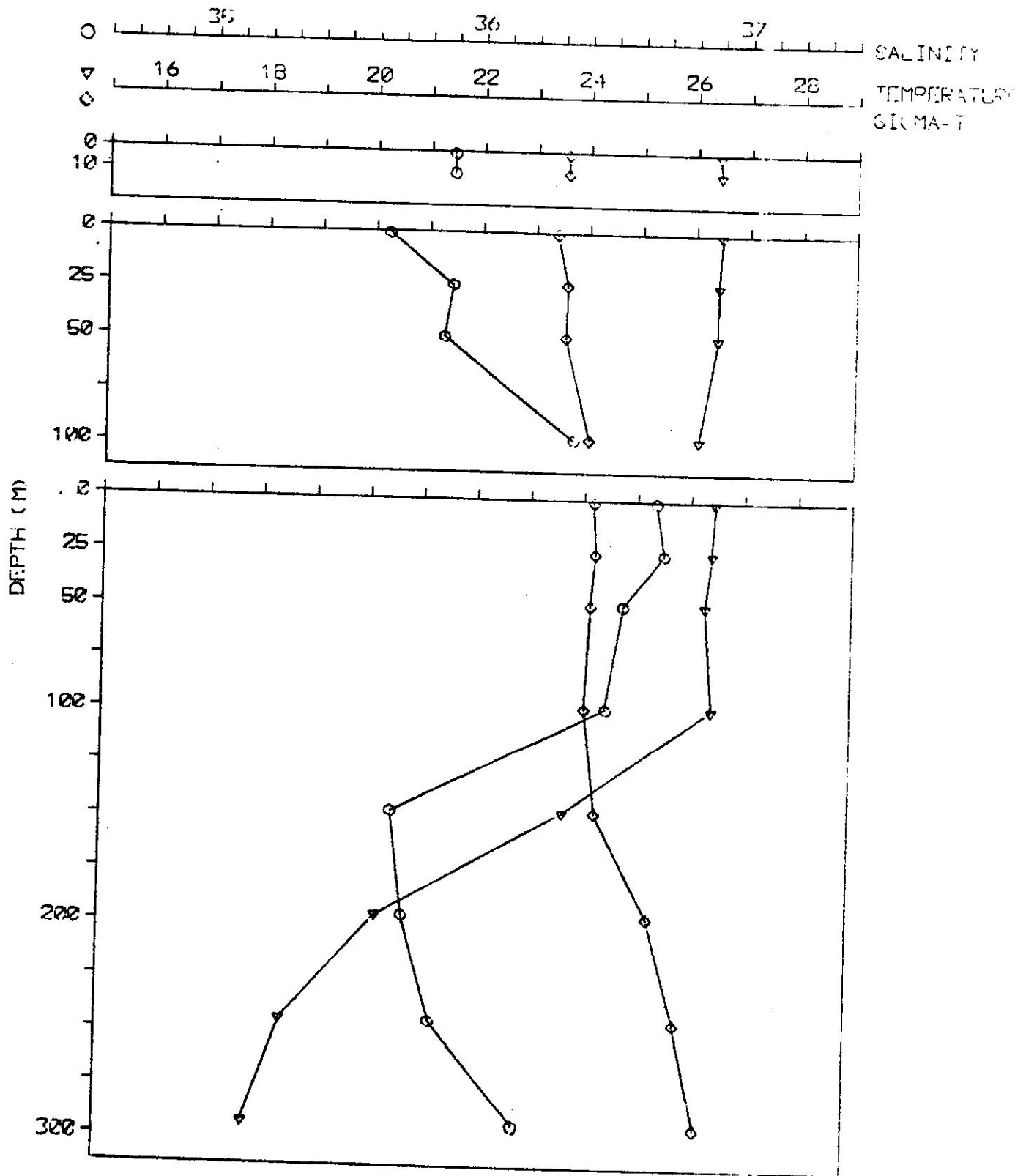
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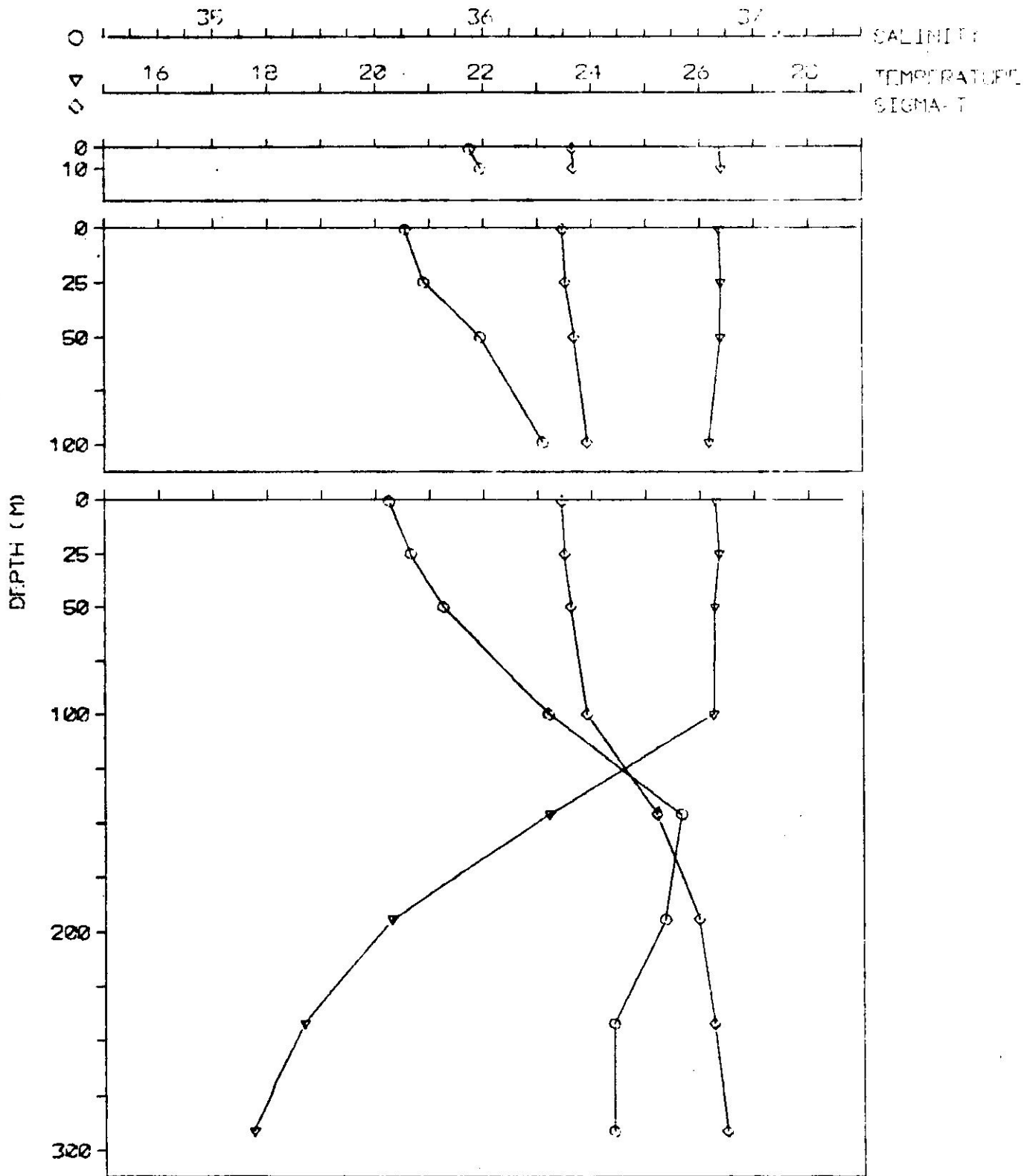
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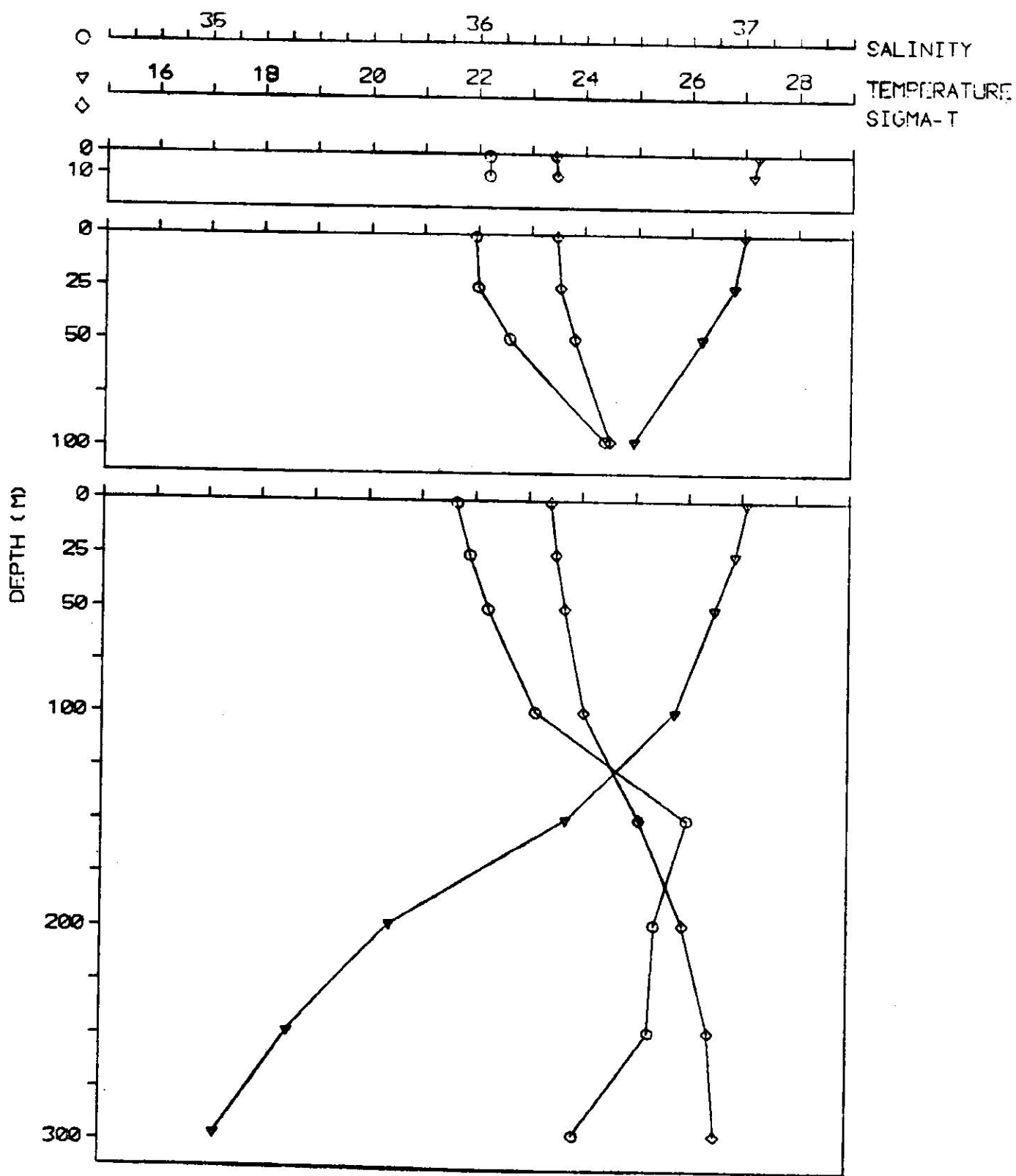
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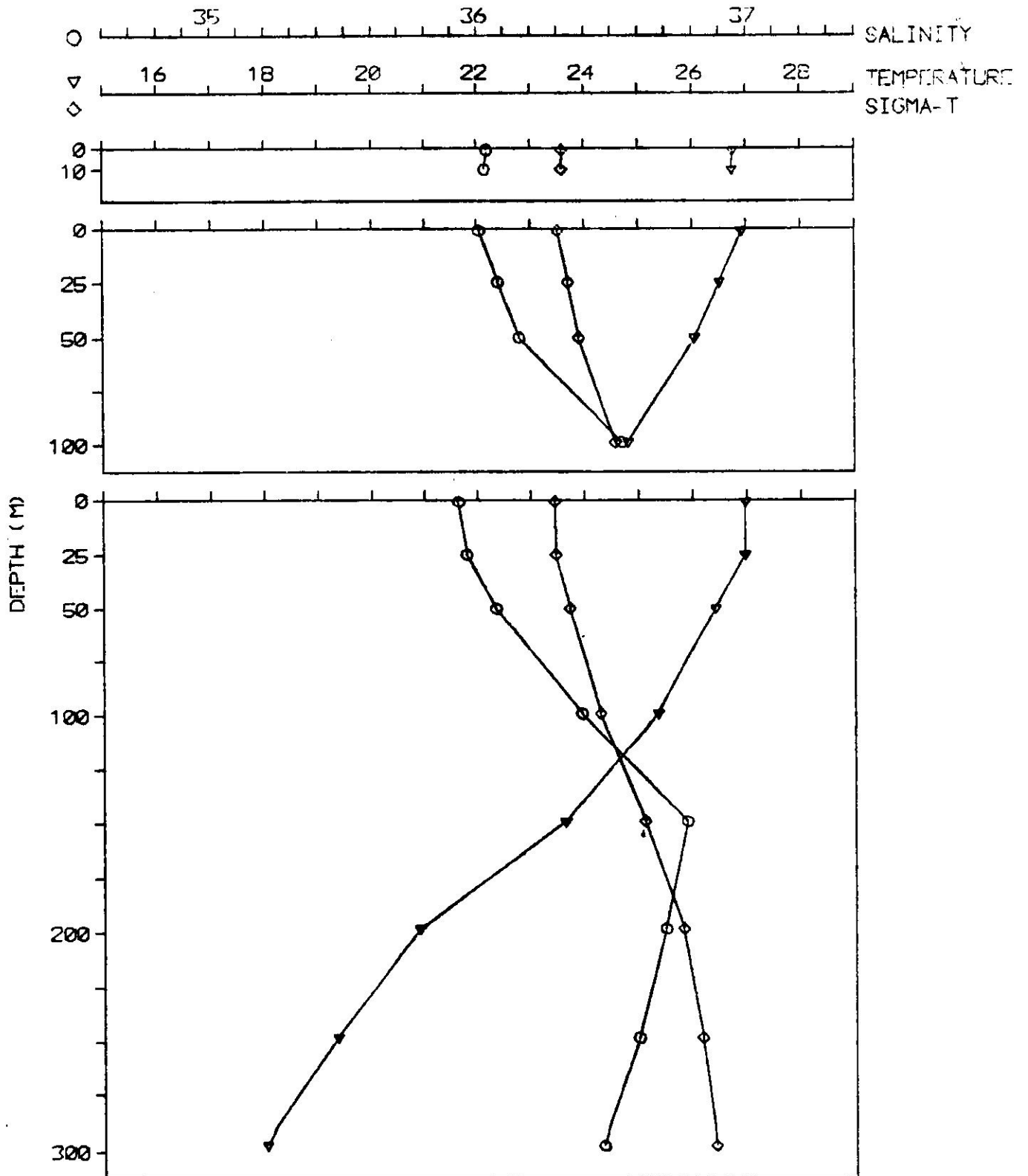
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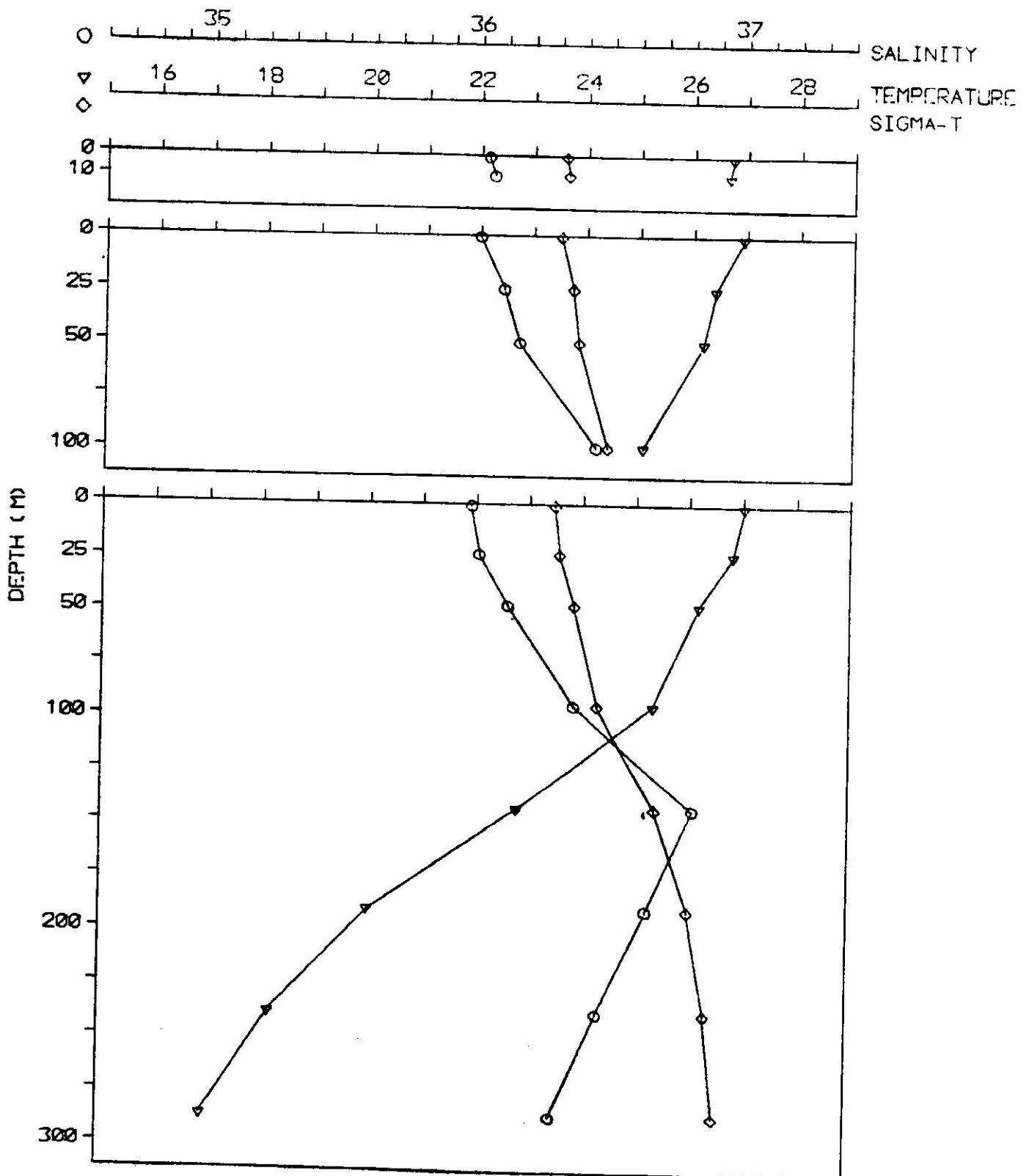


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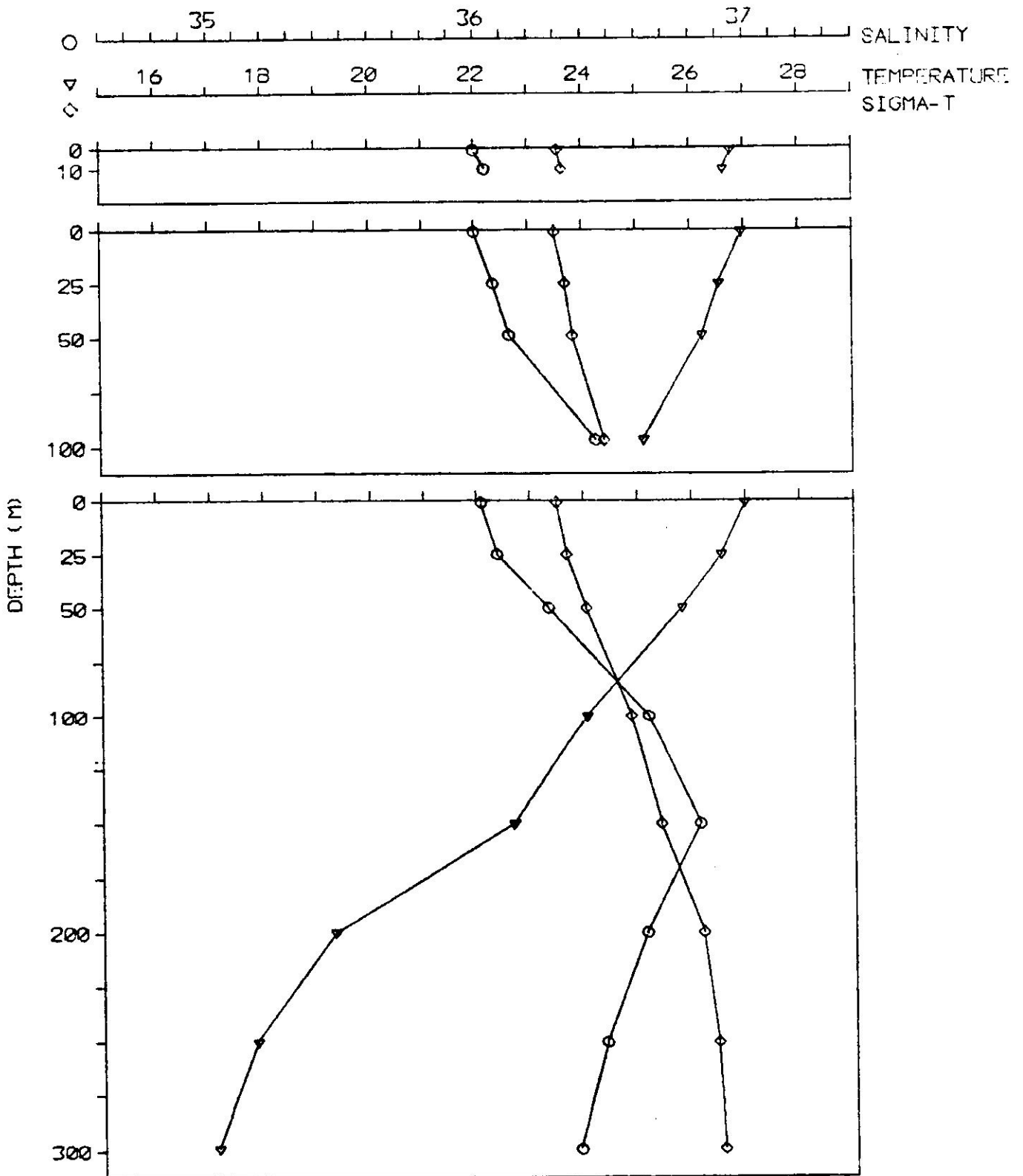




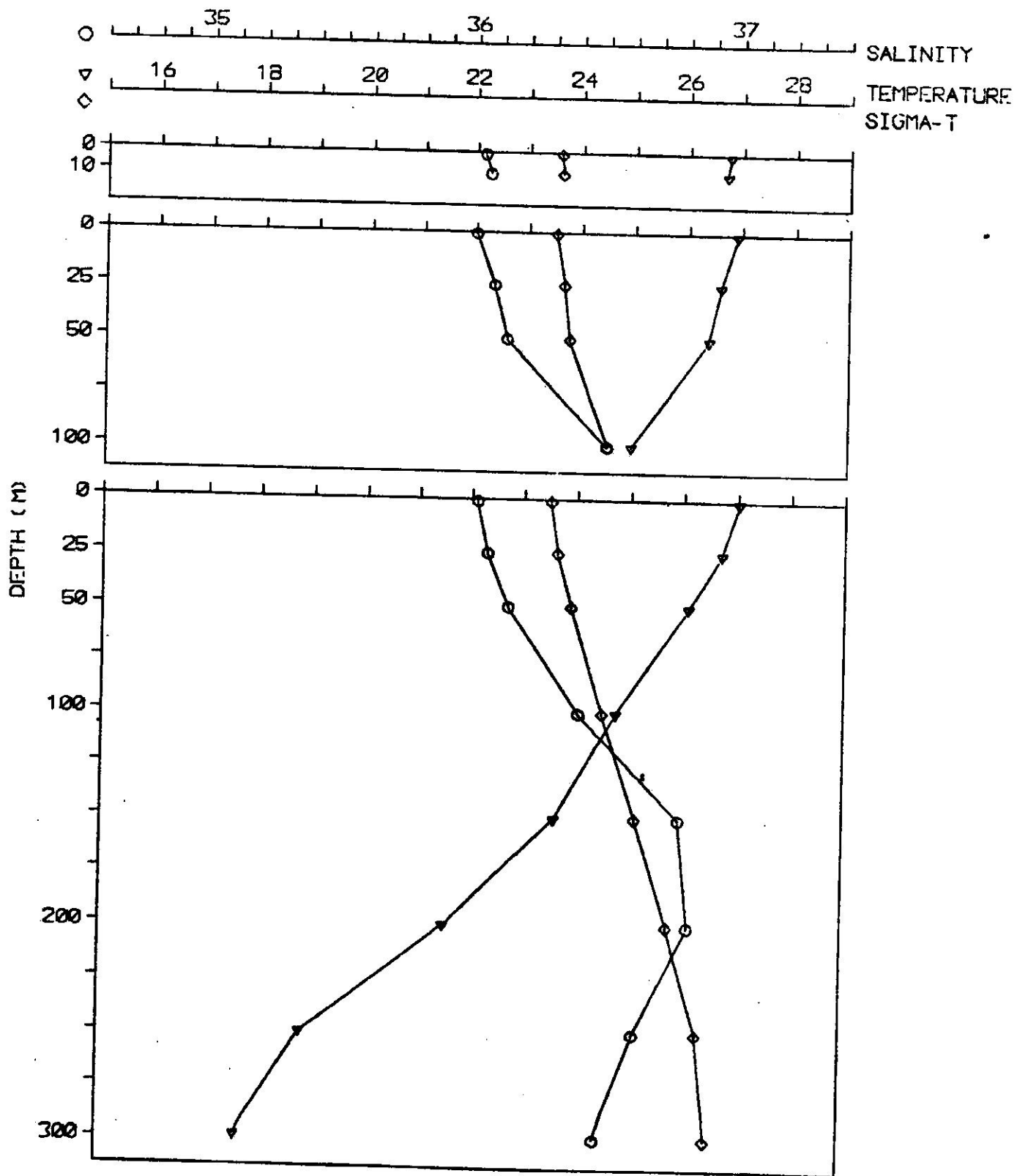
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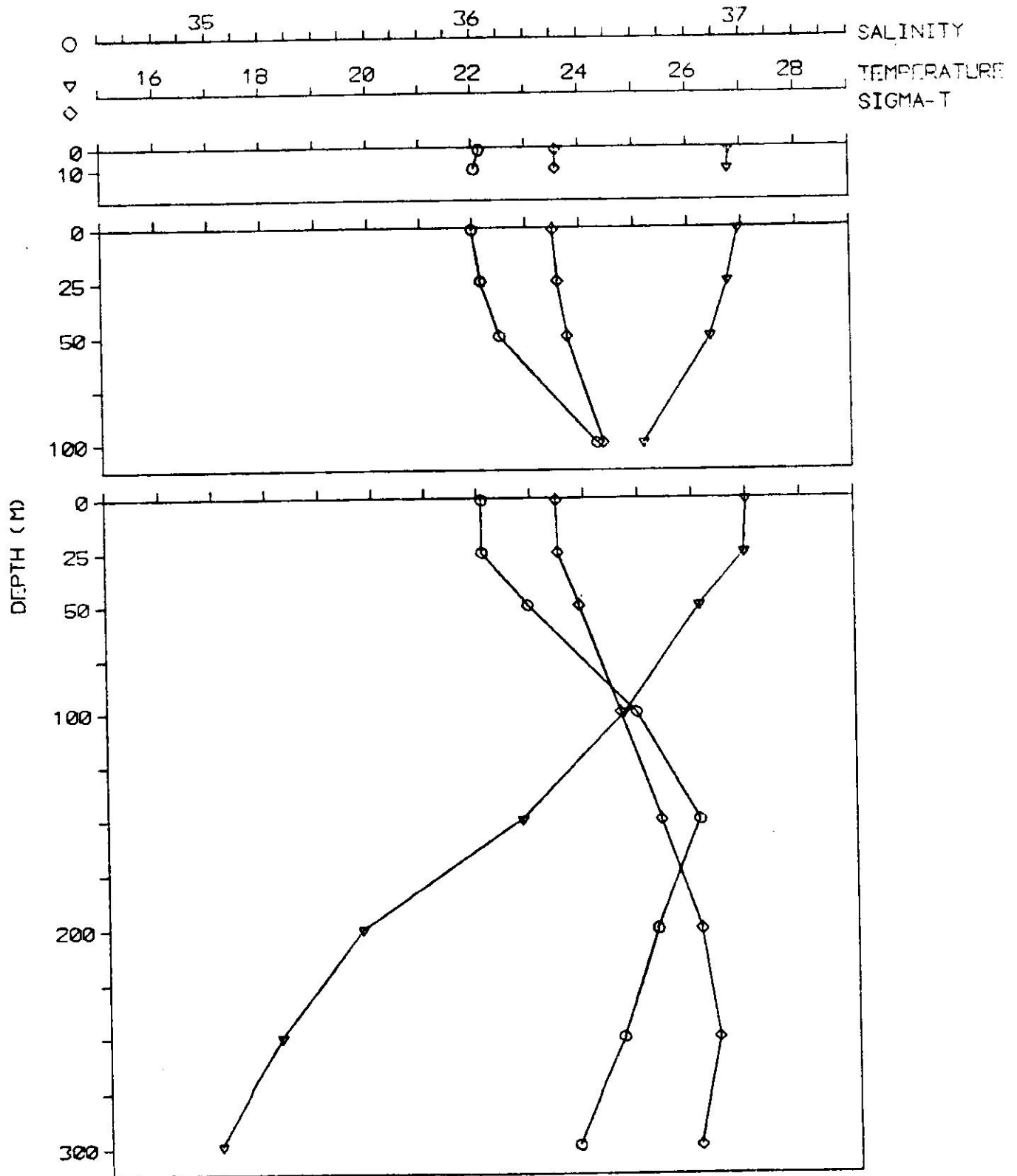
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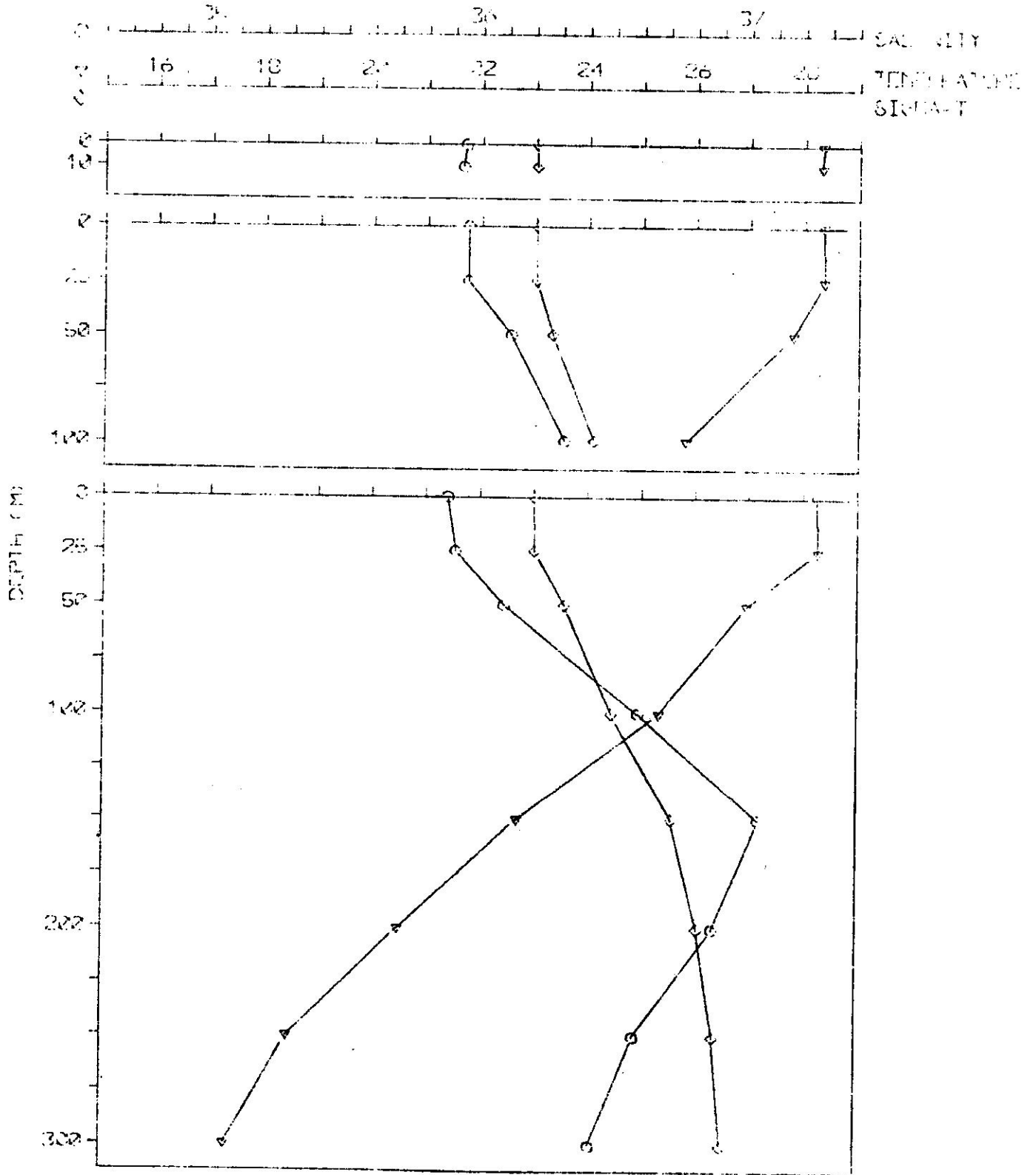
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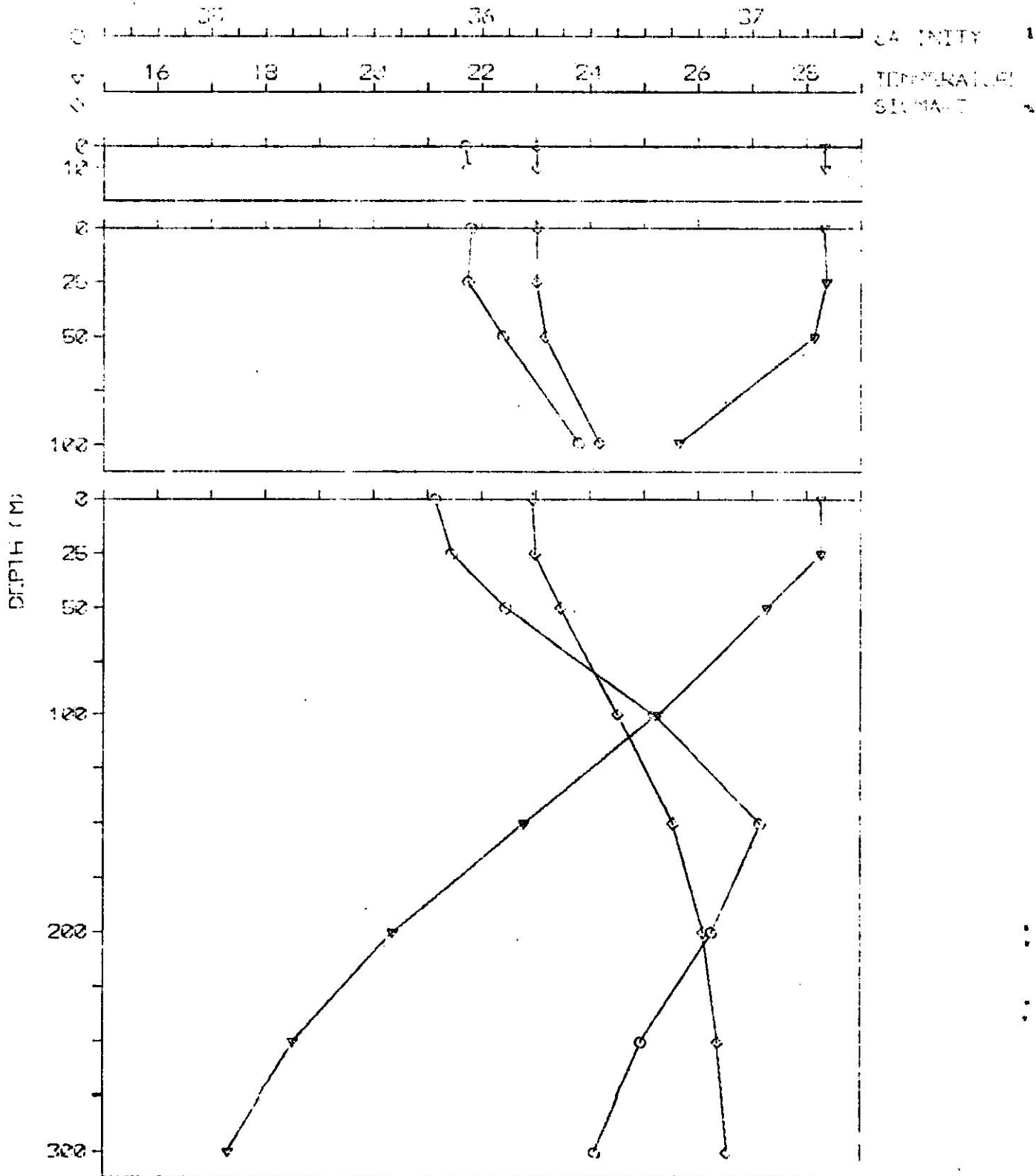
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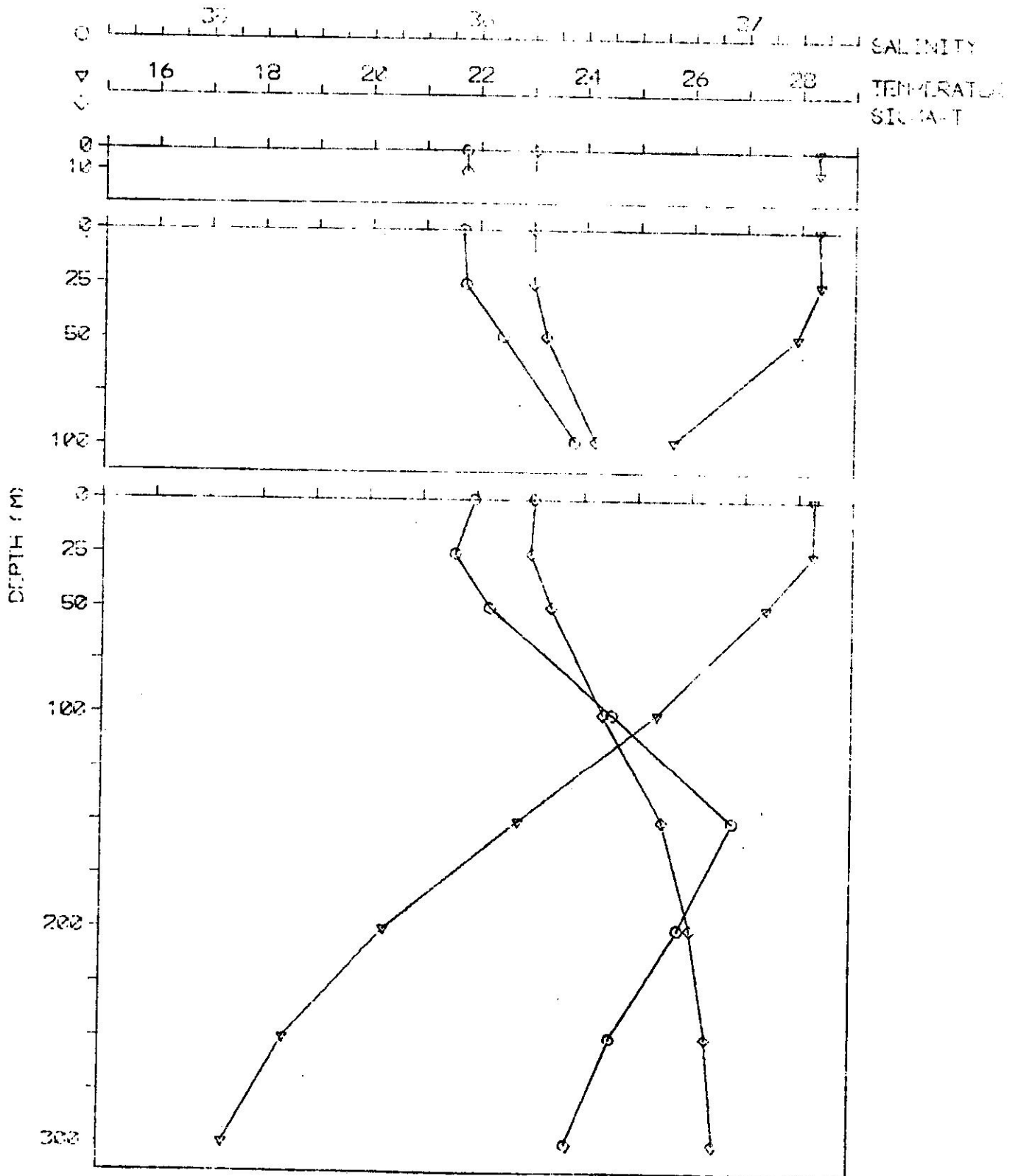
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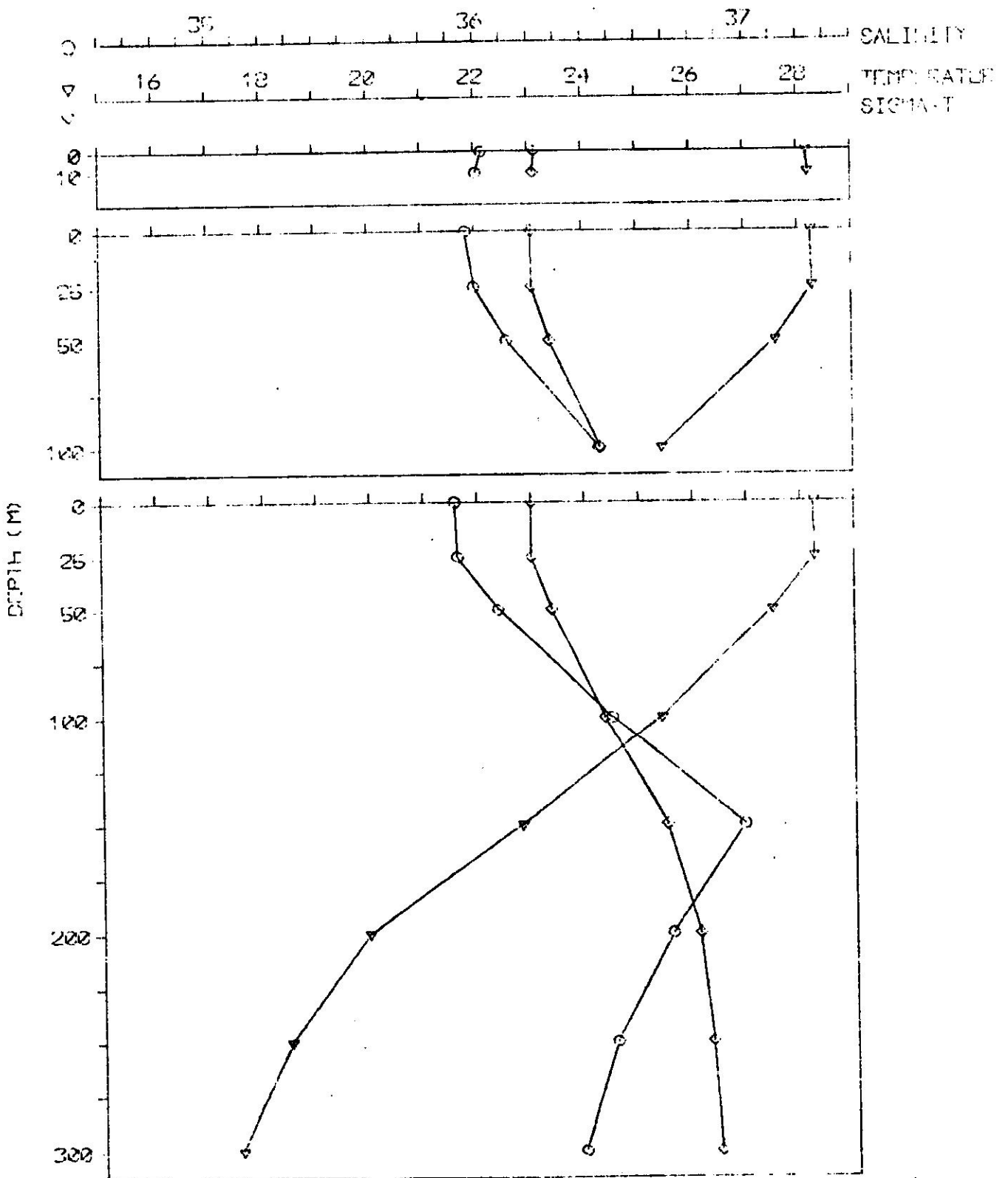
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 SALINITY AND SIGMA-T.  
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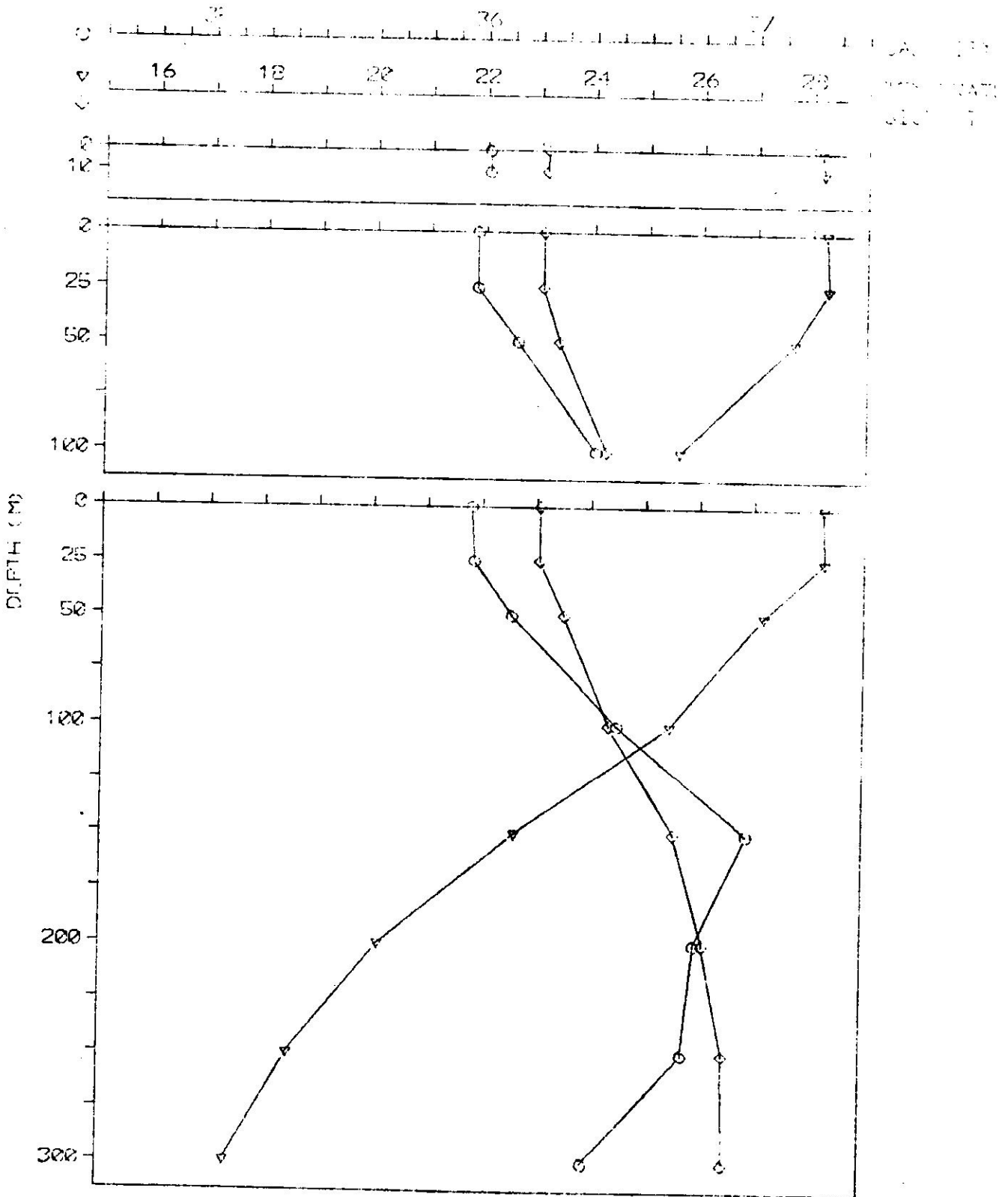


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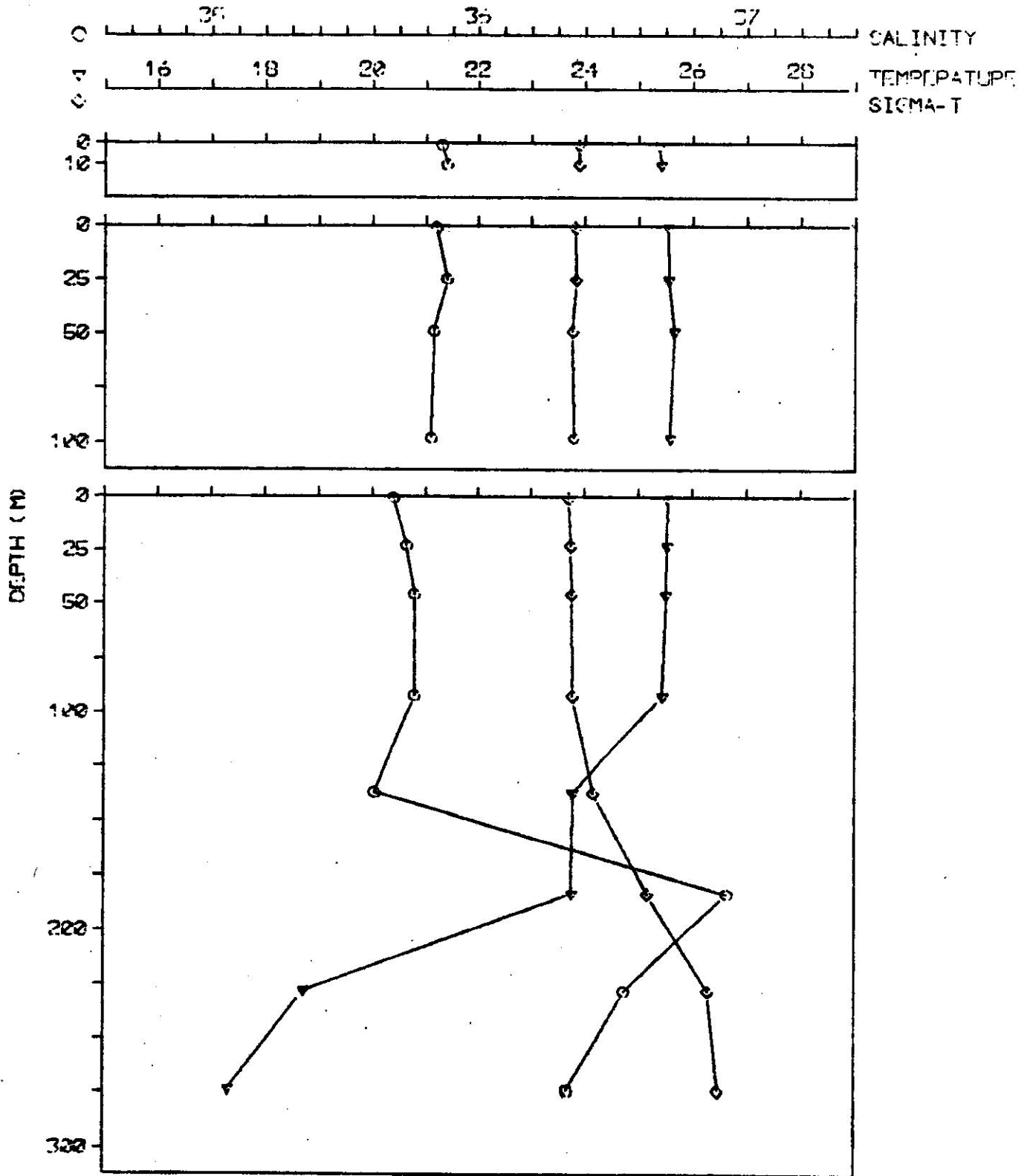


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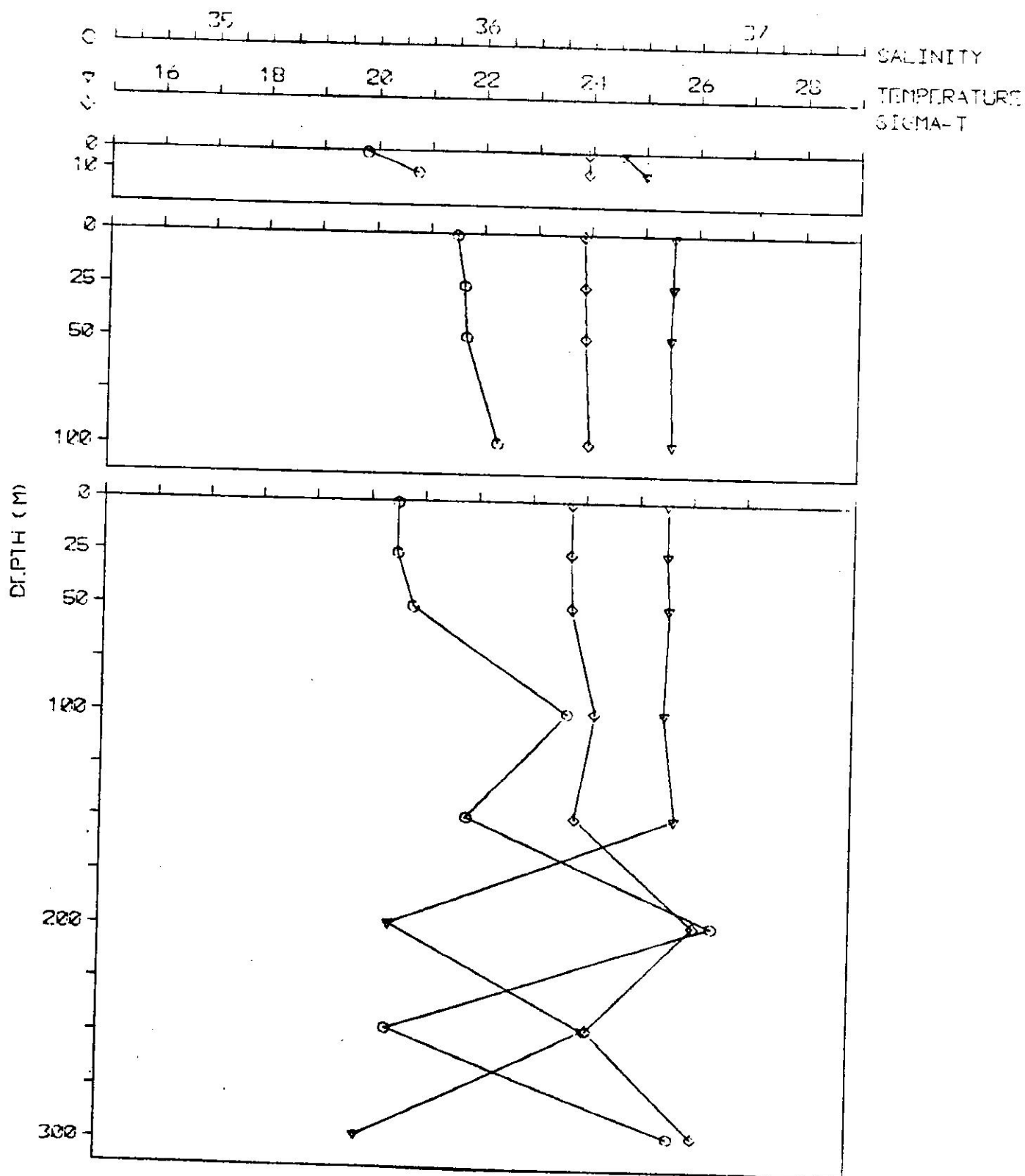


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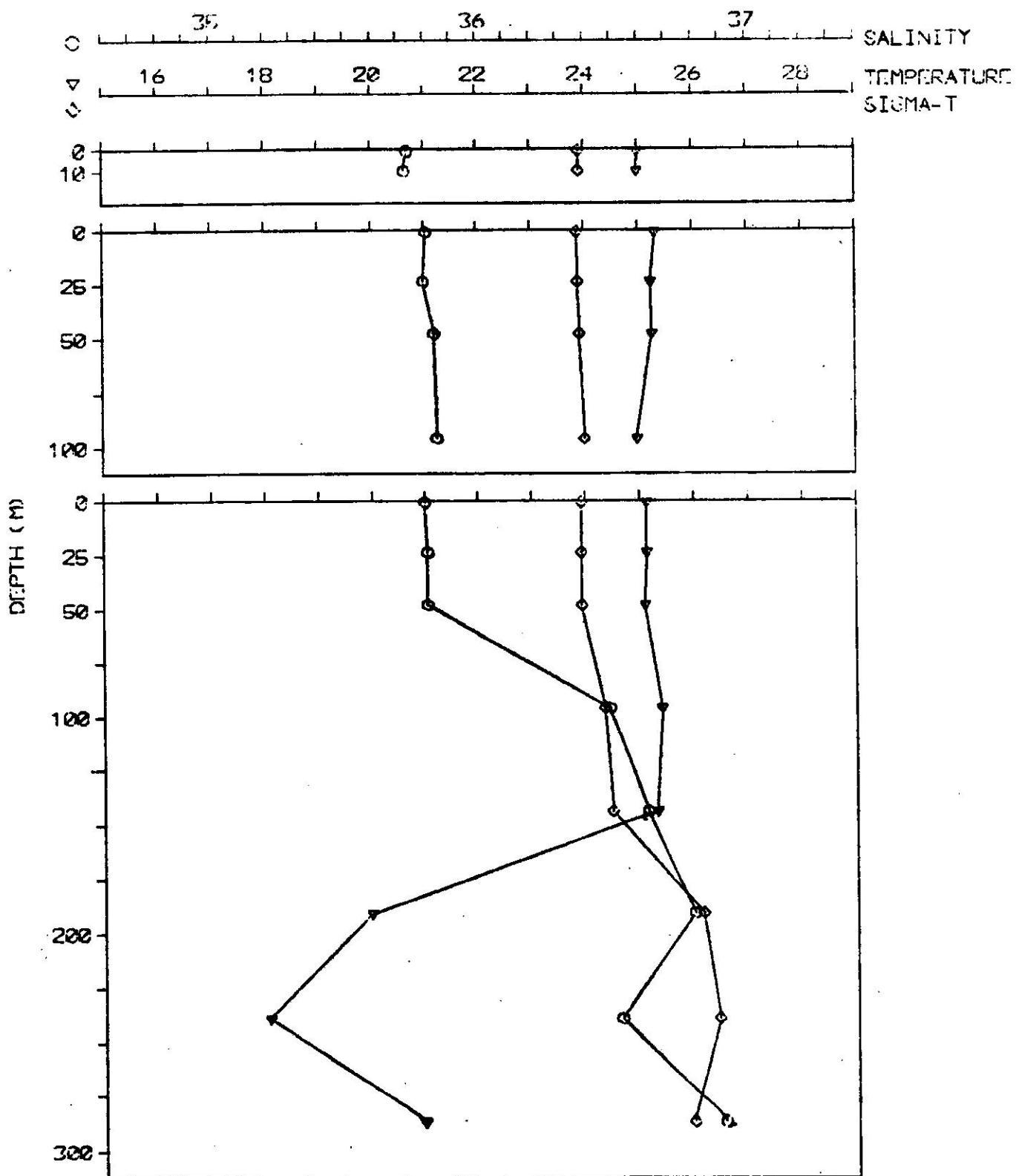
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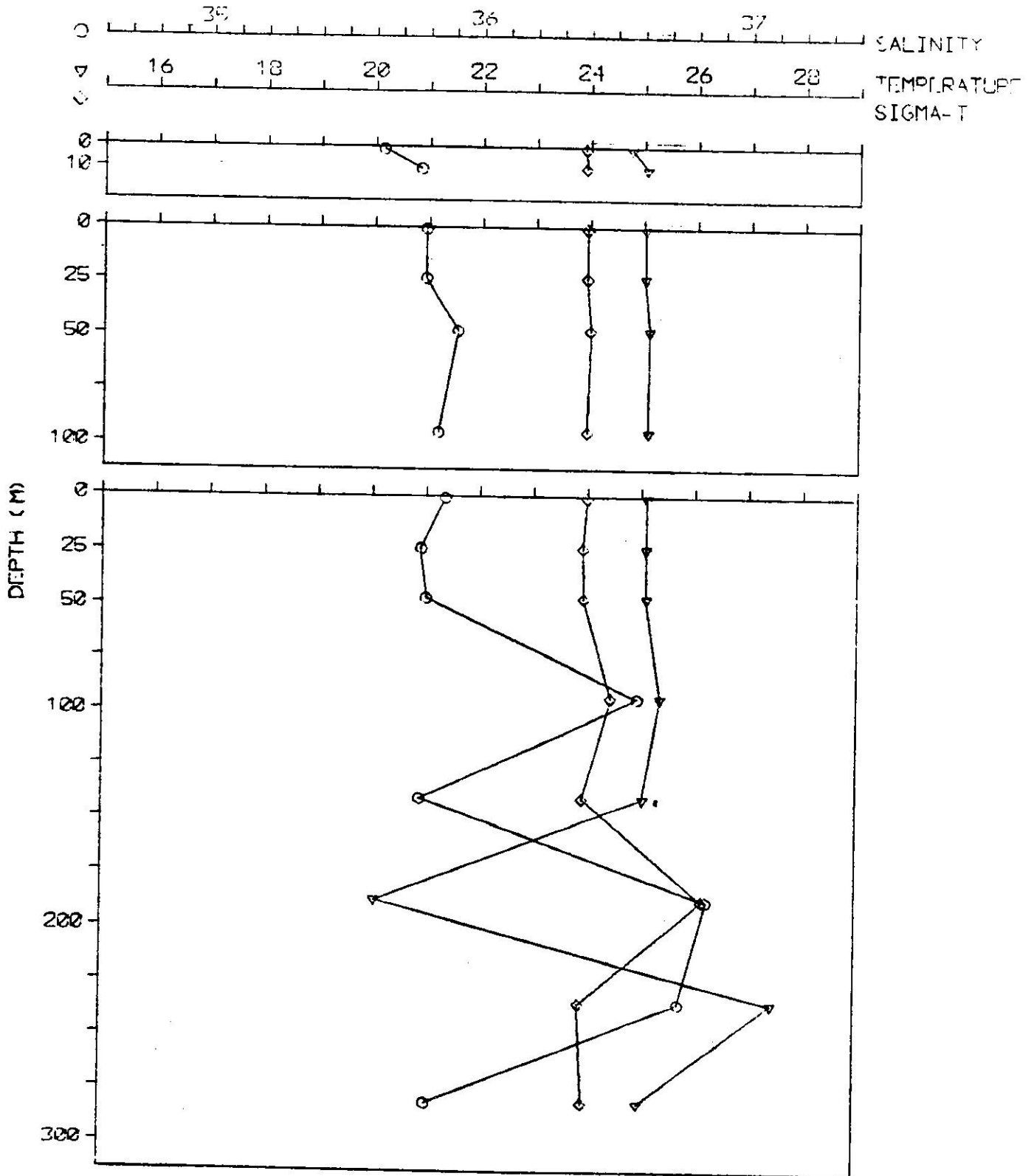
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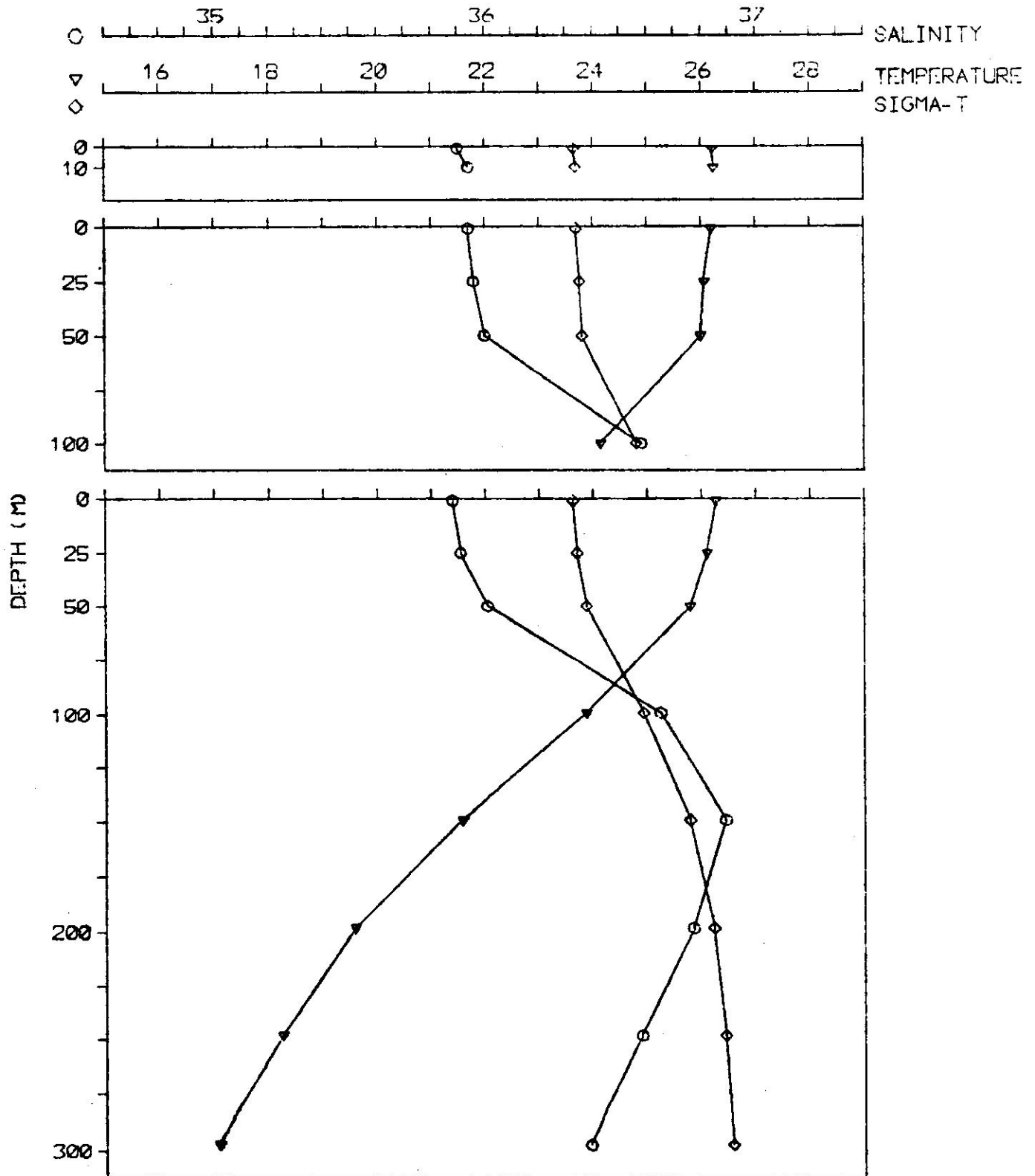


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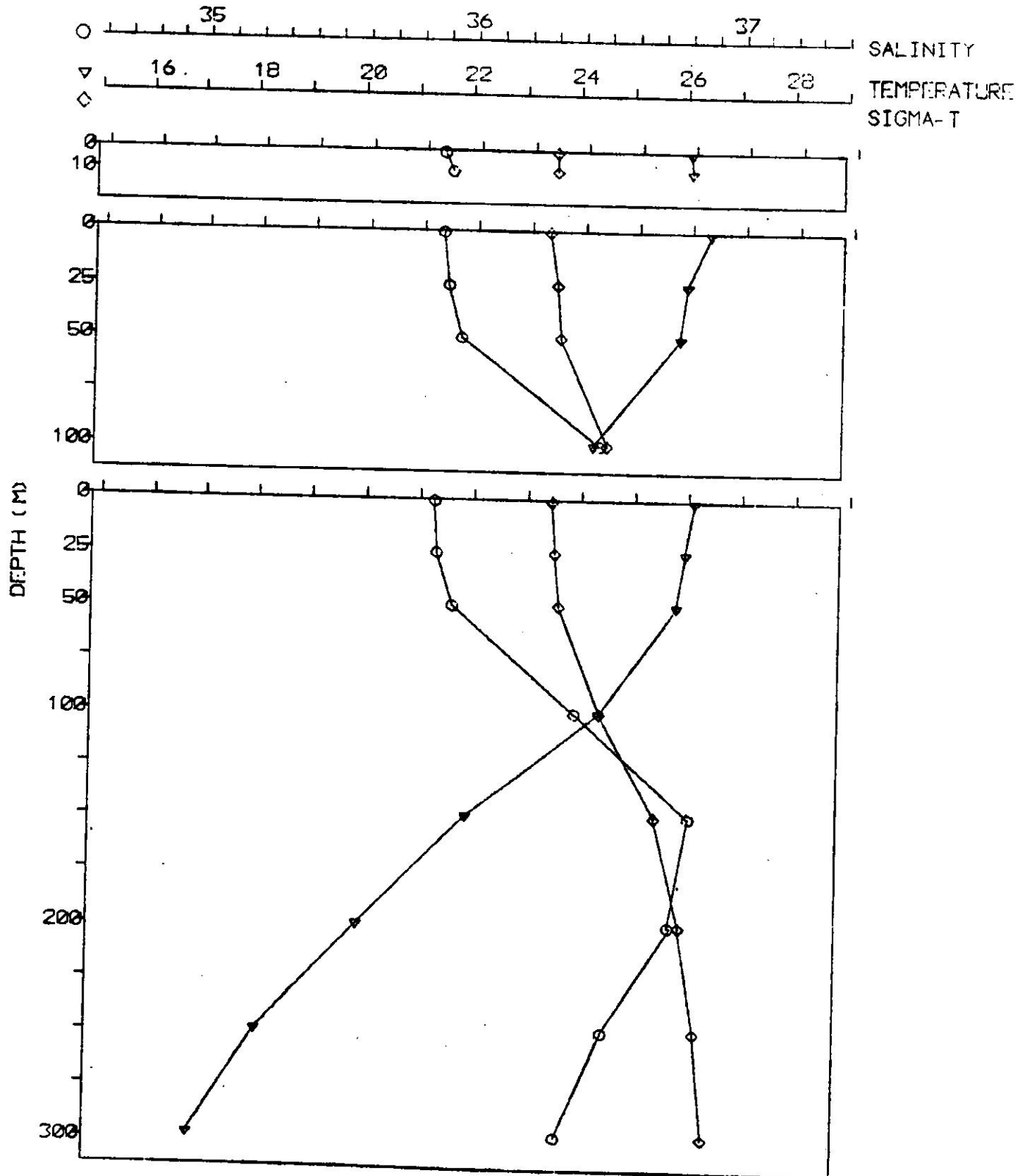


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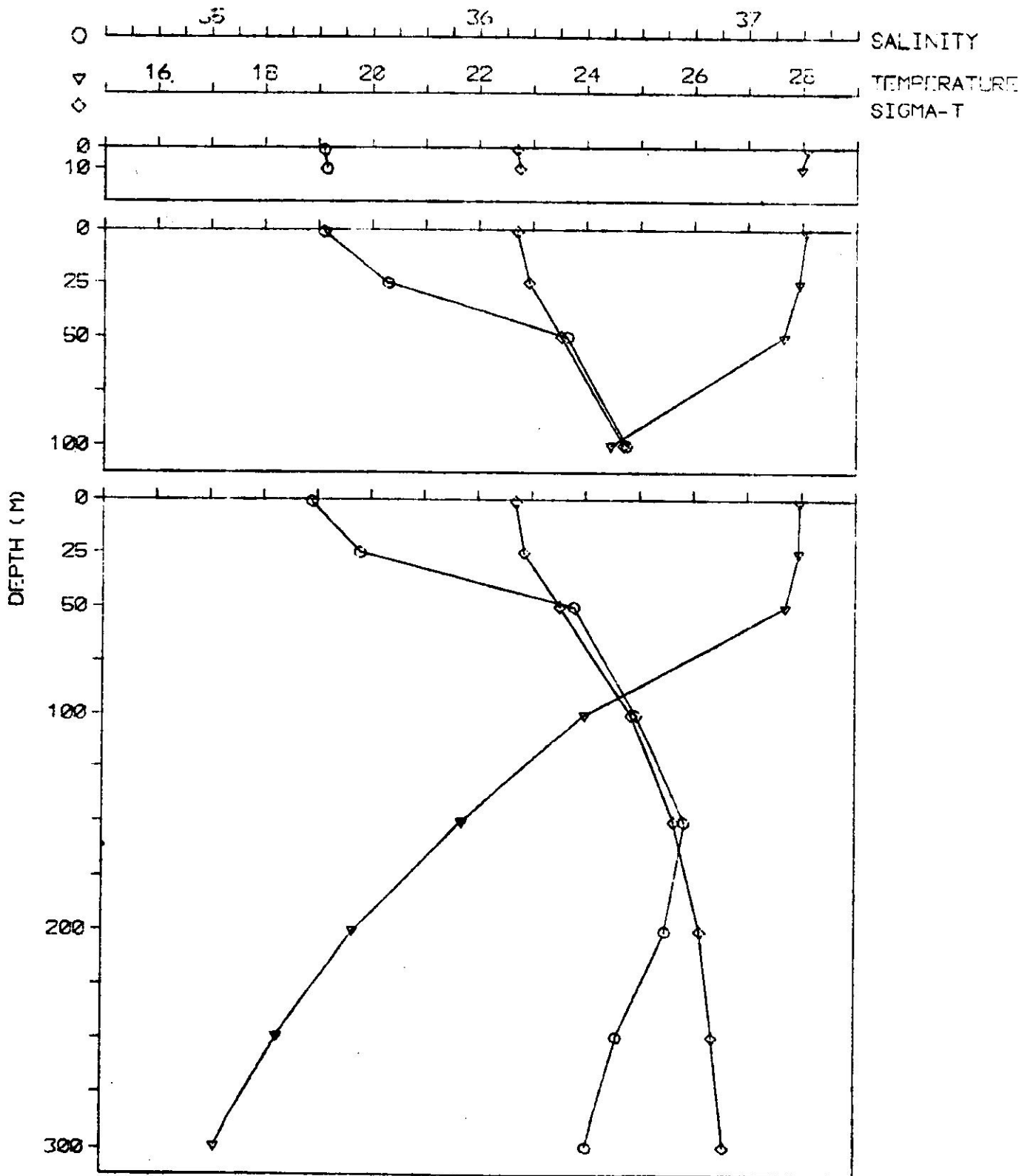
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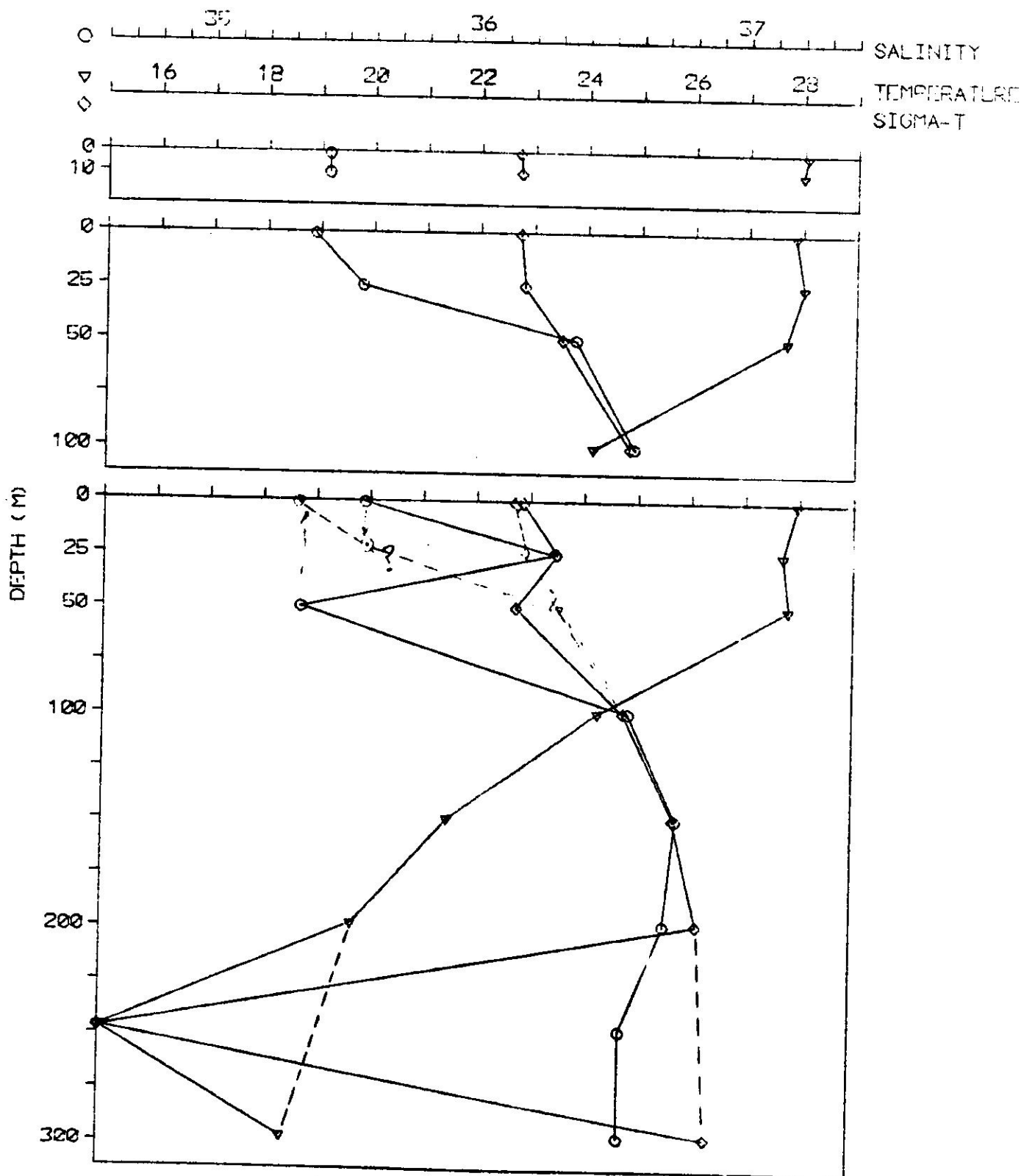


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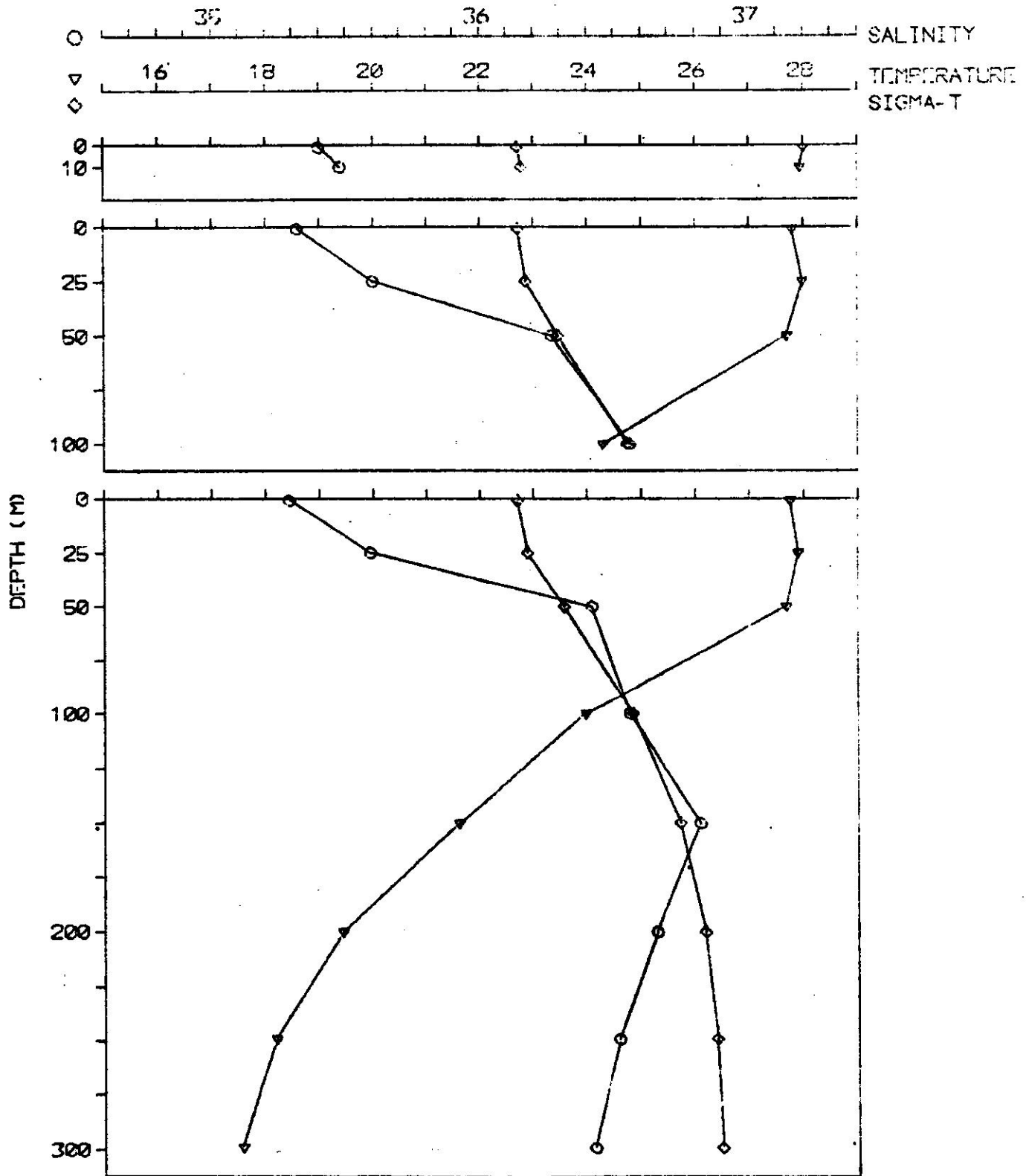




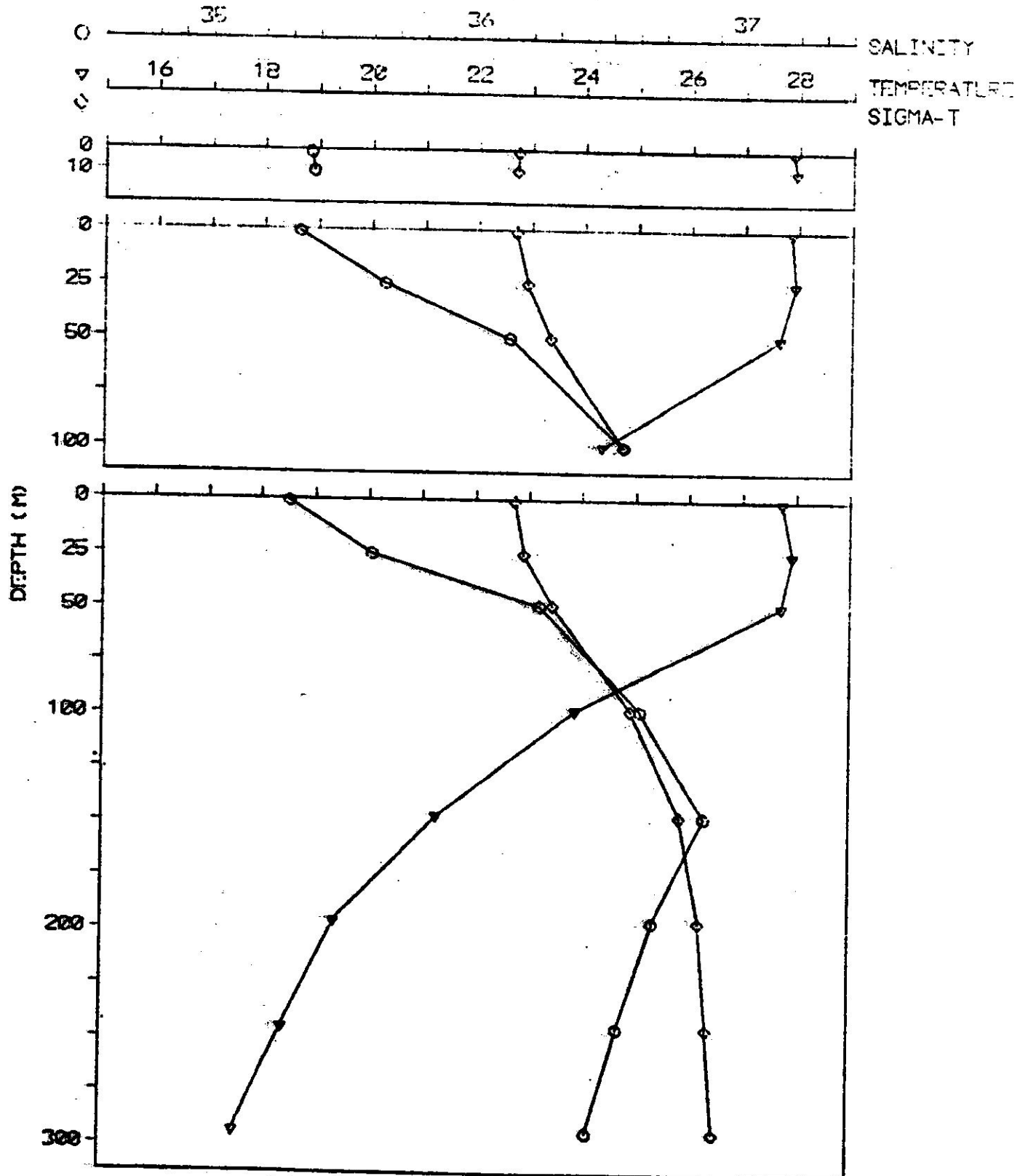
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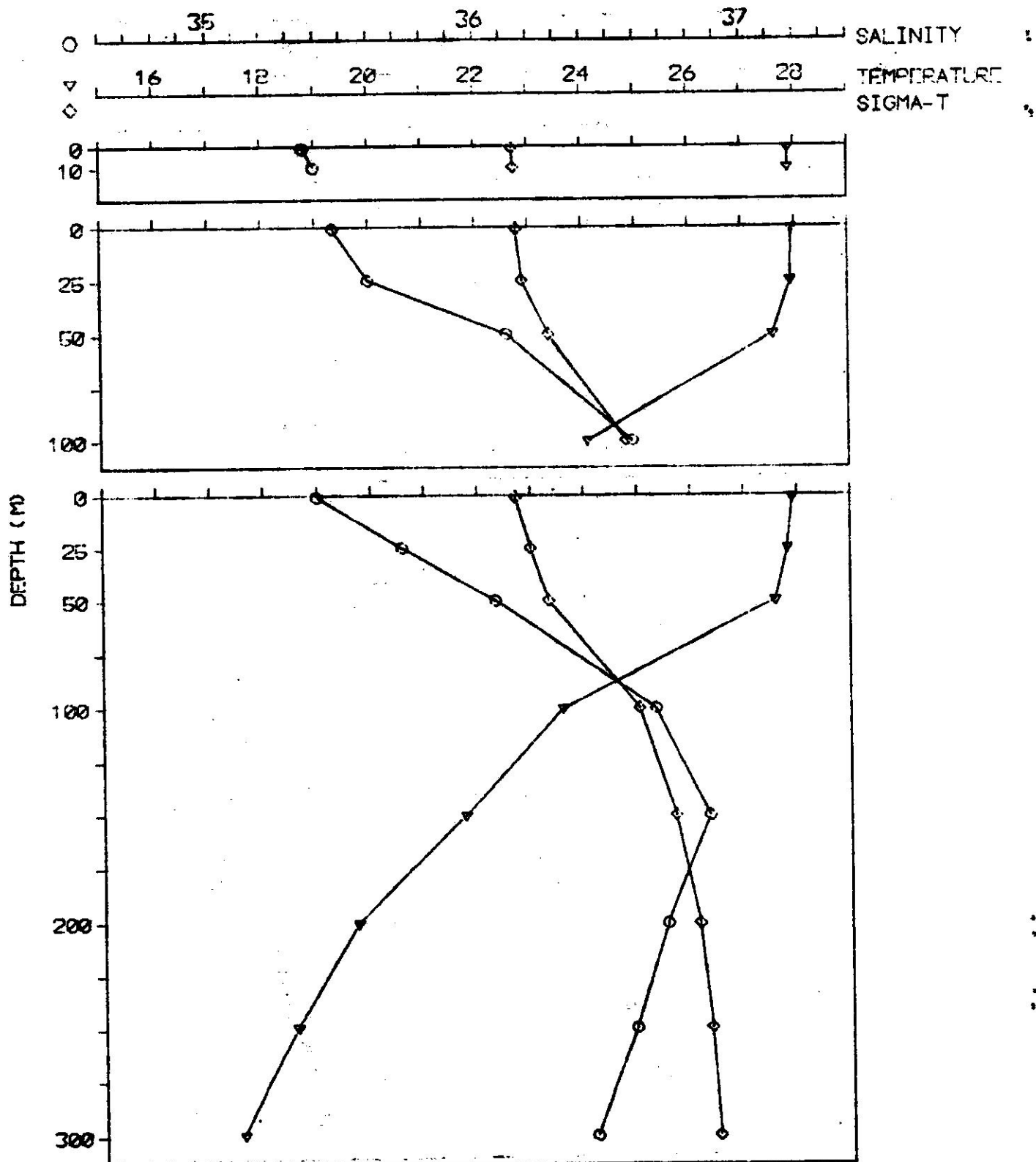
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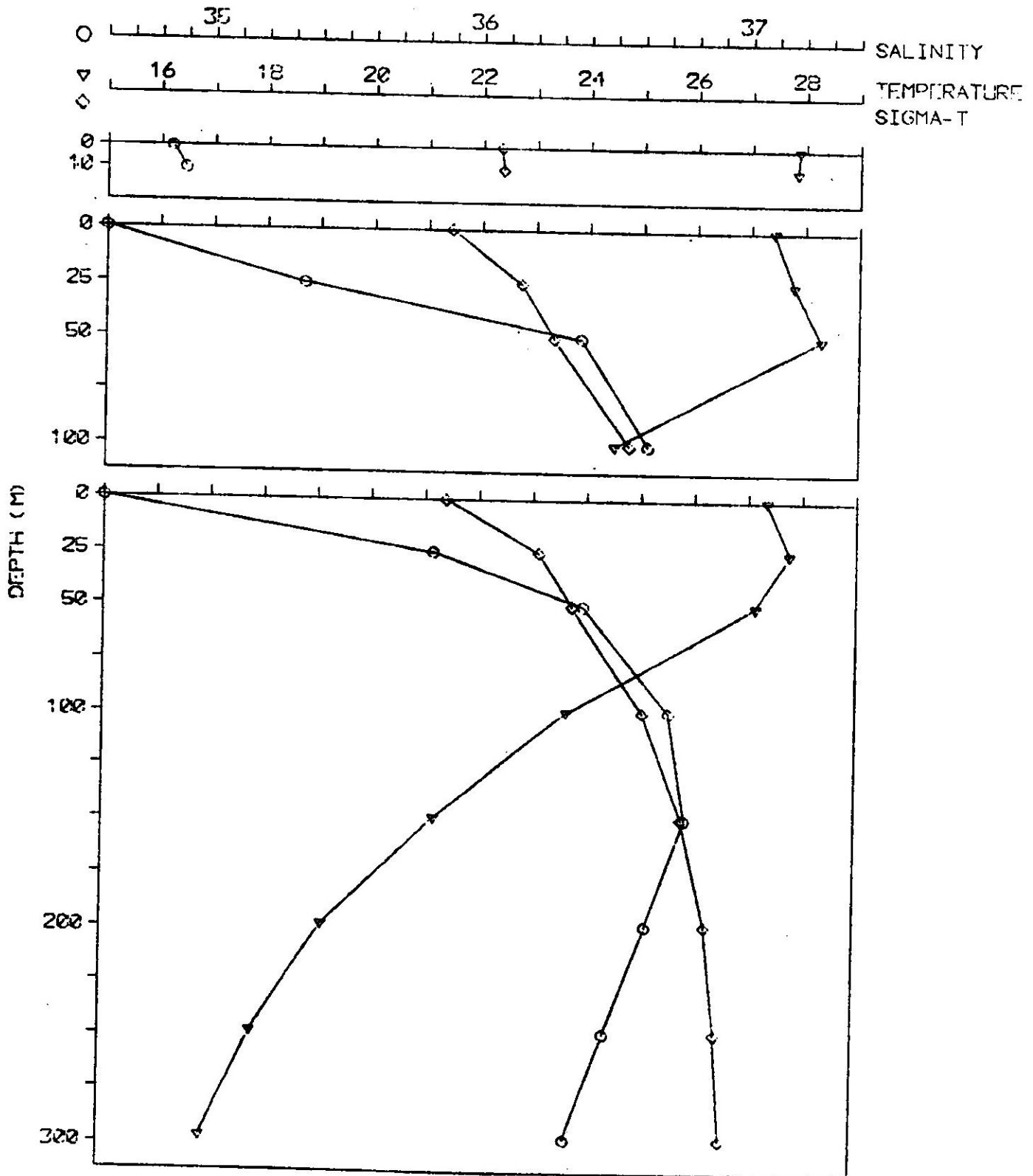
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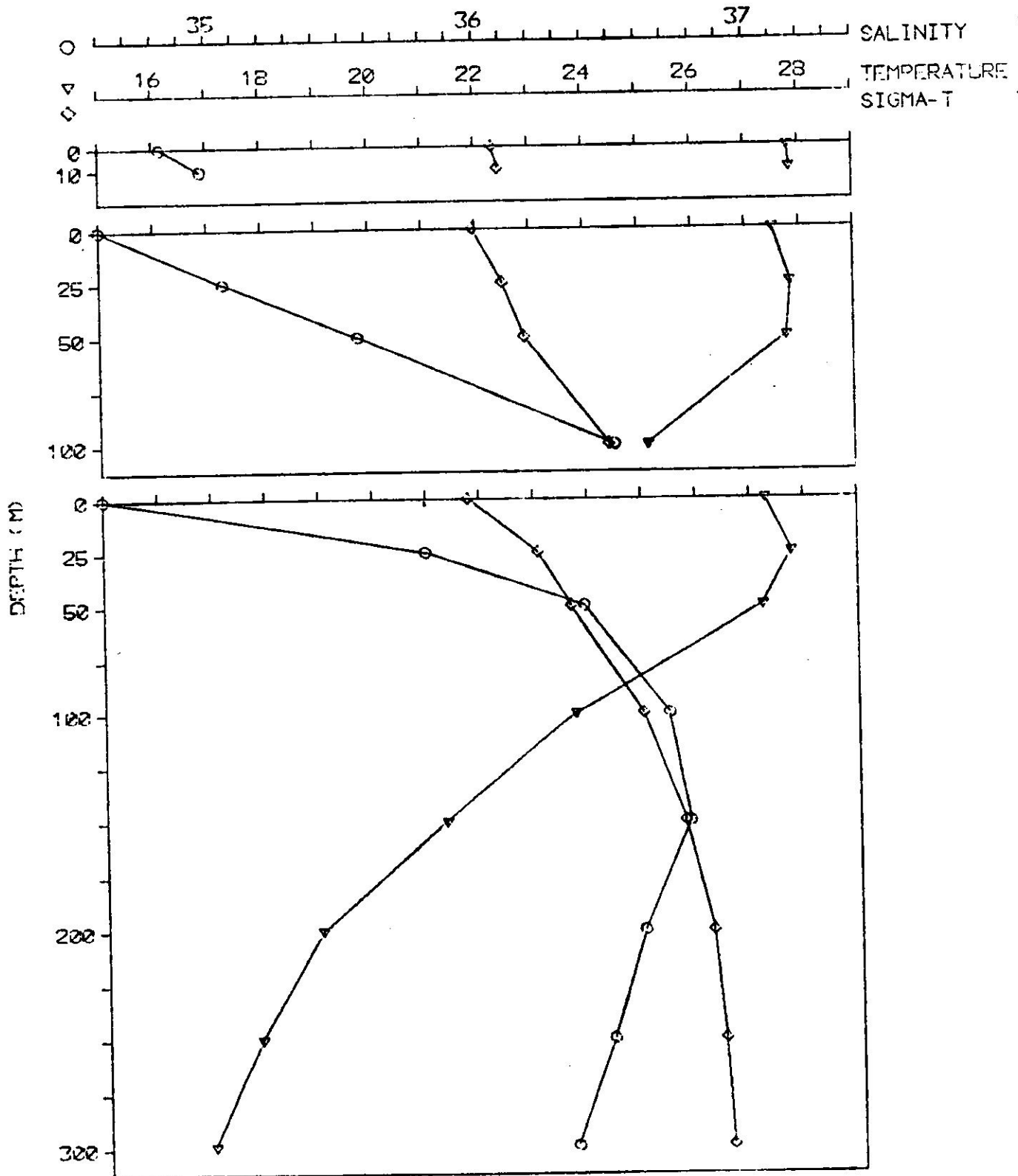
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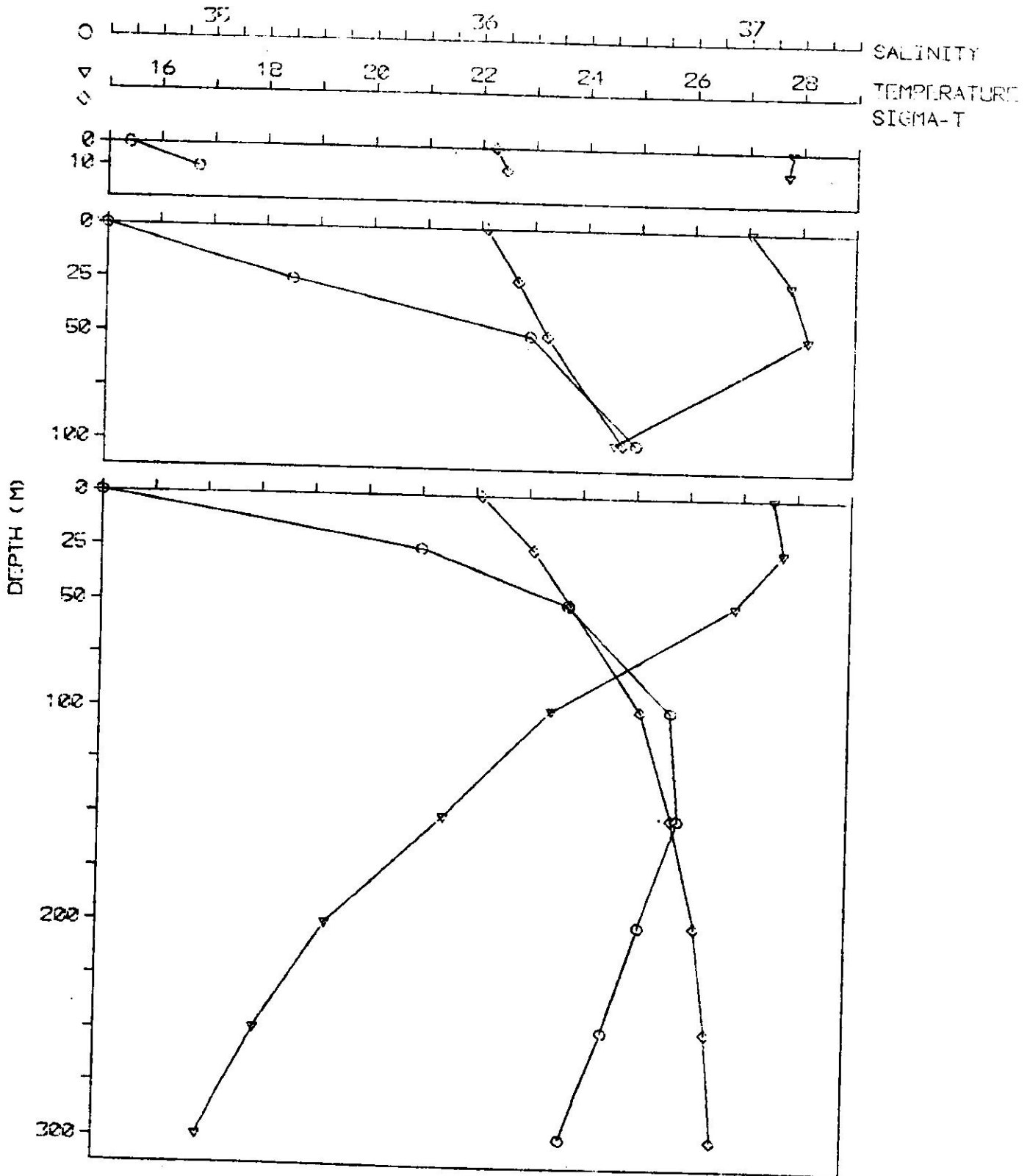
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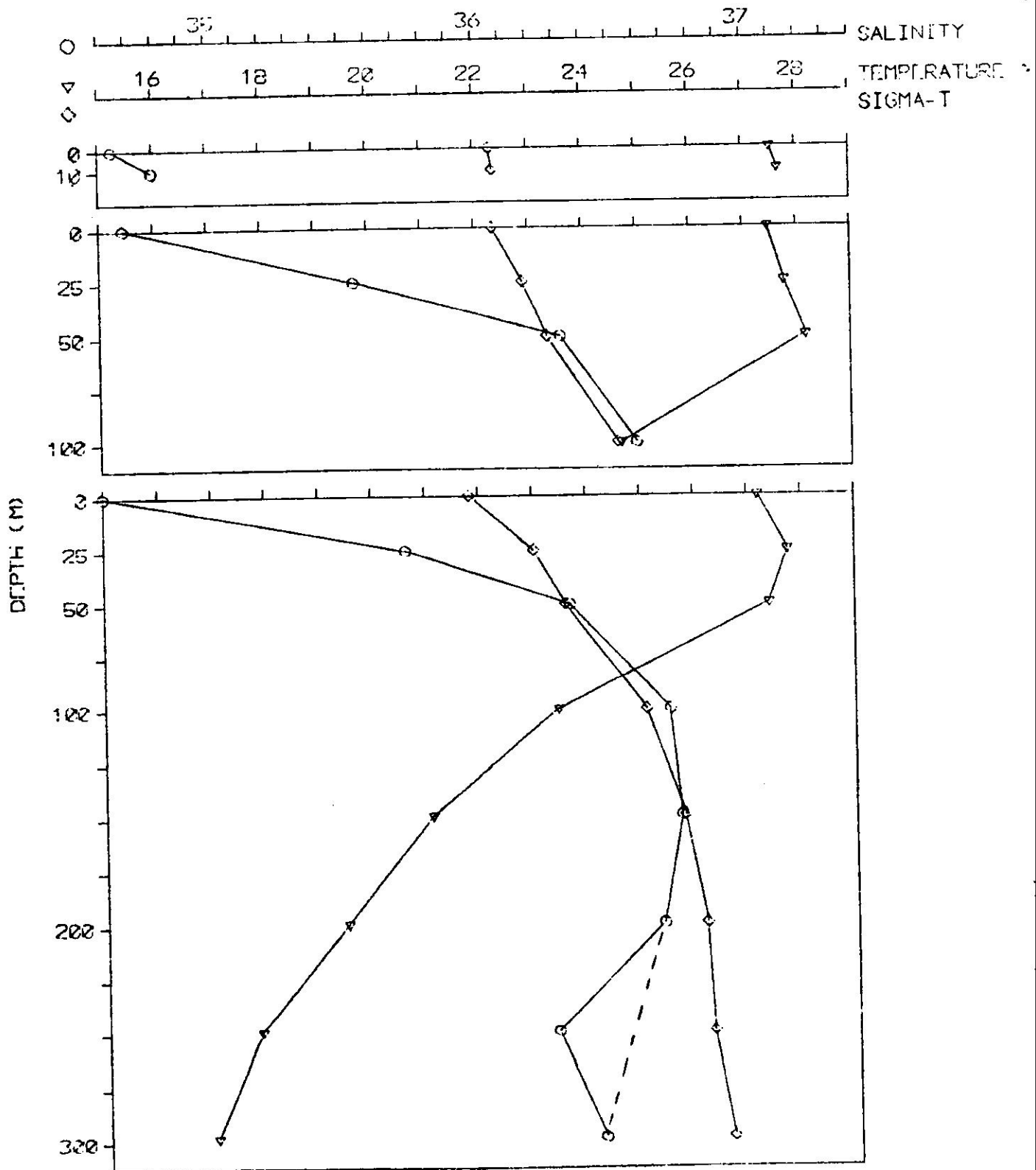
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 SALINITY AND SIGMA-T.  
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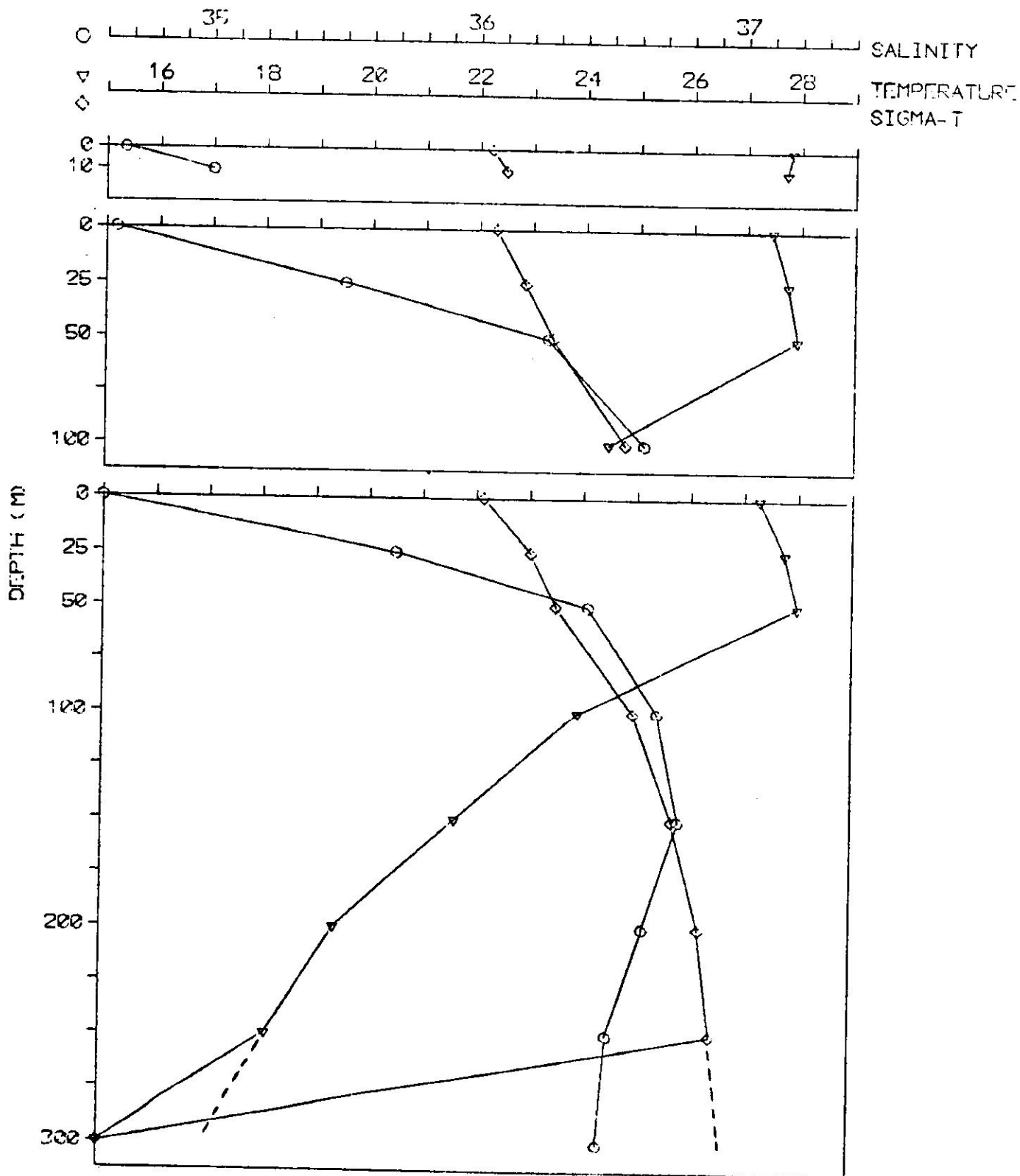


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 SALINITY AND SIGMA-T.  
 TRANSECT TOR-4, DATE 10/30/74





HYDROSTATION VERTICAL PROFILES FOR TEMPERATURE,  
 SALINITY AND SIGMA-T.  
 TRANSECT TOR-5, DATE 10/30/74





APPENDIX 6

RELATIVE ABUNDANCE OF FORBS, GRASSES AND  
TREES FOUND IN THE 36 ACRE AREA  
OF ISLOTE

FORBS AND GRASSES

Scientific Name	Common Name	Estimated Abundance Per Section*					
		1	2	3	4	5	6
<u>Sida carpinifolia</u>	Escoba Blanca	a	a	a	a	a	a
<u>Stachytarpheta jamaicensis</u>	Verbena	a	a	a	a	a	a
<u>Bidens pilosa</u>	Margarita Silvestre	a	a	a	a	a	a
<u>Cissus sicyoides</u>	Bejuco de Caro	a	c	c	c	c	c
<u>Centrosema pubescens</u>	Flor de Pito	c	d	d	d	c	d
<u>Blechnum pyramidatum</u>	Yerba de Papagayo	c	c	c	d	d	d
<u>Emelista tora</u>	Dormidera	c	c	c	c	c	c
<u>Borreria verticillata</u>	Botón Blanco	a	c	c	c	c	c
<u>Lippia nodiflora</u>	Cidrón	c	a	a	b	a	a
<u>Parthenium hysterophorus</u>	Artemisa Cimarrona	c	d	d	c	d	d
<u>Lantana camara</u>	Cariaquillo	d	d	d	a	d	d
<u>Aderonopium gossipifolium</u>	Tau Tuá, Tuatúa	d	d	d	c	d	d
<u>Mimosa pudica</u>	Morivivir, Morivivi	a	a	a	a	a	a
Forb #1 unidentified		d			d		
<u>Euphorbia hirta</u>	Lechecillo	d	d	c	d	d	d
<u>Indigofera endecaphylla</u>	Anil de Pasto	d	c	c	c	c	c
<u>Senecioides cinerea</u>	Rabo de Buey	d					
<u>Synedrella nodiflora</u>	Cerbatana	d				d	d
<u>Solanum torvum</u>	Berenjena Cimarrona	d			d		

\*a - widespread; b - large patches; c - small patches; d - one or two individuals disseminated throughout the entire section.

Appendix 6 (continued)

Scientific Name	Common Name	Estimated Abundance Per Section*					
		1	2	3	4	5	6
<u>Wedelia trilobata</u>	Manzanilla de Playa	c	a	a	a	a	a
<u>Phyllanthus niruri</u>	Quinino de Pobre	d	d	d	d	d	d
Forb #2 unidentified		d	c		d		
<u>Achyranthes indica</u>	Anamu, Rabo de Raton	c	c	c	c	c	
Forb #3 unidentified		d	a	a	a	a	a
<u>Melochia pyramidata</u>	Bretonica Piramidal	a	a	a	a	a	a
<u>Ricinus communis</u>	Higuereta, Ricino				c		
<u>Leonotis nepetaefolia</u>	Boton de Cadete			d	c		
<u>Abrus praecatorius</u>	Peronia			c	d	c	
<u>Crotolaria striata</u>	Cascabelillo					c	d
<u>Tridax procumbens</u>	Tridax					d	
<u>Ditremsa occidentalis</u>	Hedionda		d	d	d	d	d
<u>Desmodium sp.</u>	Salsabacoa, Pega Pega		b	a	a	d	a
<u>Amaranthus spinosus</u>	Blero Espinoso			c		d	d
<u>Malachra capitata</u>	Malva			c		d	
<u>Salvia serotina</u>	Moradilla Azul					c	
<u>Euphorbia hypericifolia</u>	Lechecilla	d	d	d	d	d	c
<u>Dolicholus minimus</u>	Frijolillo	c	d	d	d	d	d
<u>Eupatorium odoratum</u>	Santa Maria					d	
<u>Desmodium sp.</u>	Pega Pega Pequeno	d	d	d	d	a	d
<u>Emilia sonchifolia</u>	Huye que to Cojo					d	
<u>Urena trilobata</u>	Malva Cimarrona de Flores Lilas, Cadillo	c				d	
<u>Cordia corymbosa</u>	Cordia rugosa			d	d	d	d

\*a - widespread; b - large patches; c - small patches; d - one or two individuals disseminated throughout the entire section.

Appendix 6 (continued)

Scientific Name	Common Name	Estimated Abundance per Section*					
		1	2	3	4	5	6
<u>Commelina diffusa</u>	Cohitre	d	d	d	d	d	d
<u>Pectis ciliaris</u>	Romero Cimarron		d	d	d	d	d
<u>Vigna repens</u>	Frijol Silvestre	d	d	d	d	d	d
<u>Phaseolus adenanthus</u>	Habichuela Cimarrona	d	d	d	d	d	d
<u>Momordica charantia</u>	Cundeamor	d	d	d	d	d	c
<u>Boerhaavea diffusa</u>	Yerba de Puerco		c	c	c	c	c
<u>Asclepias nivea</u>	Algodoncillo			c		c	c
<u>Portulaca pilosa</u>	Don Diego Silvestre		c	c		d	d
<u>Argemone mexicana</u>	Cardo Santo		c		c	d	c
<u>Coleus amboinicus</u>	Oregano Brujo					d	c
<u>Portulaca oleracea</u>	Verdolaga		c	c			
<u>Chamaecrista aeschynomene</u>	Morivivi Bobo		c	c			
<u>Macroptilium lathyroides</u>	Habichuela Parada		c	c		d	
<u>Solanum caribaeum</u>	Yerba Mora		d	d			d
<u>Tribulus cistoides</u>	Abrojo			d			
<u>Gomphrena dispersa</u>	Siempreviva Silvestre		c				
<u>Pluchea purpurascens</u>	Salvia Cimarrona			d			
<u>Ipomea tiliacea</u>	Bejuco de Vaca			c			
<u>Agalinis fasciculata</u>	Yerba Veronica						
<u>Leptilon pusillum</u>	Pascueta		c				

\*a - widespread; b - large patches; c - small patches; d - one or two individuals disseminated throughout the entire section.

Appendix 6 (continued)

Scientific Name	Common Name	Estimated Abundance per Section*					
		1	2	3	4	5	6
<u>Chenopodium ambrosioides</u>	Pazote		c				
<u>Scoparia dulcis</u>	Culantrillo		d				
<u>Mollugo berteriana</u>	Alfombra		b				
<u>Catharanthus roseus</u>	Playera		c				
<u>Urena lobata</u>	Cadillo			c			
Forb #5 unidentified				c			
Forb #6 unidentified				d			
Forb #7 unidentified				d			
<u>Poinsetta heterophylla</u>	Pascua Silvestre		d	d	d	d	d
<u>Hyptis pectinata</u>	Marubio		d	d			
<u>Lepidium virginicum</u>	Mastuerzo			d			
<u>Malochia tomentosa</u>	Bretonica Afelpada			d			
<u>Axonopus compressus</u>	Yerba Alfombra		b	b	b	b	b
<u>Stenotaphrum secundatum</u>	Yerba San Agustin		c	c			
<u>Cynodon dactylon</u>	Yerba Bermuda		c	b			c
<u>Paspalum conjugatum</u>	Yerba Horquetilla		a	a	a	a	a
<u>Cyperus rotundus</u>	Coqui		b	b			
<u>Craacina elegans</u>	Zinnia					b	
<u>Jatropha curcas</u>	Tartago					d	
<u>Cenchrus echinatus</u>	Abrojo		d	d		d	d

\*a - widespread; b - large patches; c - small patches; d - one or two individuals disseminated throughout the entire section.

Appendix 6 (continued)

Scientific Name	Common Name	Estimated Abundance per Section*					
		1	2	3	4	5	6
<u>Panicum maximum</u>	Yerba de Guinea		d	b	d		
<u>Eleocharis interstincta</u>	Junco		b	b			
<u>Paspalum millegrana</u>	Yerba Cortadora			c			c
<u>Digitaria decumbens</u>	Pangola Grass		c				a
<u>Chloris inflata</u>	Paraguaita	c	d	c	a	b	d
<u>Tricholaena repens</u>	Yerba Rosada			b			
<u>Digitaria sanguinalis</u>	Pendejuelo			c	c		
<u>Panicum purpurascens</u>	Malojillo			c	c		
<u>Bromelia pinguin</u>	Maya	a	a	a	a	a	a
<u>Amaranthus dubius</u>	Blero Blanco		c				
<u>Randia mitis</u>	Tintillo		d		d	d	
<u>Calophyllum brasiliense</u>	Maria		1	1			1
<u>Casuarina equisetifolia</u>	Casuarina		1	2			
<u>Citrus aurantifolia</u>	Limon, Lime						1
<u>Citrus aurantium</u>	Naranja Agria			1			
<u>Citrus limon</u>	Limon de Cabro					1	1
<u>Citrus sinensis</u>	China						1
<u>Cocos nucifera</u>	Palma de Coco	5	26	11	15		17
<u>Crescentia cujete</u>	Higuero						1

\*a - widespread; b - large patches; c - small patches; d - one or two individuals disseminated throughout the entire section.

Appendix 6 (continued)

Scientific Name	Common Name	Estimated Abundance per Section*					
		1	2	3	4	5	6
<u>Hippomane mancinella</u>	Manzanilla de Playa		1	1			
<u>Persea americana</u>	Aguacate						1
<u>Psidium guajava</u>	Guayaba						1
<u>Randia aculeata</u>	Tintillo			6		1	2
<u>Roystonea borinquena</u>	Palma Real				1		
<u>Terminalia catappa</u>	Almendro		3				
<u>Thespesia populnea</u>	Emajaguilla						9

\*a - widespread; b - large patches; c - small patches; d - one or two individuals disseminated throughout the entire section.



## APPENDIX 7

LIST OF TREES AND SHRUBS, FORBS AND GRASSES  
FOUND IN THE ONE MILE EXCLUSION ZONETREES AND SHRUBS

<u>Scientific Name</u>	<u>English Common Name</u>	<u>Spanish Common Name</u>
<u>Albicia lebek</u>	Tibet, Lebbek	Acacia amarilla
<u>Anacardium occidentale</u>	Cashew	Pajuil
<u>Andira inermis</u>	Cabbage angelin	Moca
<u>Annona muricata</u>	Soursop	Guanabana
<u>Annona reticulata</u>	Custard apple	Corazon
<u>Bromelia pinguin</u>		Maya
<u>Bursera simaruba</u>	Turpentine tree	Almacigo
<u>Byrsonima coriacea</u>	Locust berry	Maricao
<u>Cactus</u> sp.	Finger tree	Arbol de dedo
<u>Calophyllum brasiliense</u>	Not available	Maria del pais
<u>Carica papaya</u>	Papaw tree	Papaya
<u>Casuarina equisetifolia</u>	Australian beefwood	Pino, Casuarina
<u>Cecropia peltata</u>	Trumpet tree	Yagrumo hembra
<u>Chalcas exotica</u>		Cafe de la india
<u>Chrysobalanus icaco</u>	Coco plum	Icaco prieto
<u>Citharexylum fruticosum</u>	Florida fiddlewood	Pendula
<u>Citrus aurantifolia</u>	Lime	Limon
<u>Citrus nobilis</u>	Tangerine	Mandarina
<u>Citrus paradisi</u>	Grapefruit	Toronja
<u>Citrus sinensis</u>	Orange	China
<u>Clusia rosea</u>	Wild mammee	Cupey del rio

## Appendix 7 (continued)

Scientific Name	English Common Name	Spanish Common Name
<u>Phyllanthus acidus</u>	Gooseberry tree	Grosella
<u>Pimenta racemosa</u>	Bay-rum tree	Malagueta
<u>Pithecellobium dulce</u>		Guama americano
<u>Pithecellobium saman</u>	Raintree	Saman
<u>Punica granatum</u>	Pomegranate	Granada
<u>Psidium guajava</u>	Guava	Guayaba
<u>Randia aculeata</u>	Boxbriar	Tintillo
<u>Roystonea borinquena</u>	Puerto Rico royal palm	Palma real
<u>Sabal causiarum</u>	Puerto Rico palmetto	Palme de sombrero
<u>Sesbania grandiflora</u>	Agati	Baculo
<u>Spathodea campanulata</u>	African tulip tree	Tulipan africano
<u>Spondias mombin</u>	Hogplum	Jobo
<u>Tabebuia heterophylla</u>	White cedar	Roble
<u>Tamarindus indica</u>	Tamarind	Tamarindo
<u>Terminalia catapa</u>	Indian almond	Almendro
<u>Thespesia populnea</u>	Portiatree	Emajaguilla
<u>Trichilia hirta</u>	Broomstick	Tinacio
<u>Not available</u>	<u>Not available</u>	Icaco blanco
<u>Not available</u>	<u>Not available</u>	Jobo cimarron
<u>Not available</u>	<u>Not available</u>	Maria americano
Unidentified citrus like tree		
Unidentified dark leaf tree		

## Appendix 7 (continued)

Scientific Name	English Common Name	Spanish Common Name
<u>Coccoloba uvifera</u>	Seagrape	Uvas de playa
<u>Cocos nucifera</u>	Coconut tree	Palma de coco
<u>Colubrina reclinata</u>	Soldierwood	Mavi
<u>Cordia alliodora</u>	Capa	Capa prieto
<u>Crescentia cujete</u>	Calabash tree	Higuero
<u>Delonix regia</u>	Flamboyant tree	Flamboyan
<u>Elaeodendrum xylocarpum</u>	Marble tree	Coscorron
<u>Erithrina poeppigiana</u>	Mountain immortelle	Bucare gigante
<u>Ficus elastica</u>	India rubber	Goma
<u>Ficus laevigata</u>	Shortleaf fig	Jaguey blanco
<u>Gliricidia sepium</u>	Mother of cocoa	Mata de raton
<u>Hibiscus tiliaceus</u>	Sea hibiscus	Majagua
<u>Hippomane mancinella</u>	Manchineel	Manzanillo de playa
<u>Malpighia puniceifolia</u>	West Indian cherry	Acerola
<u>Mamea americana</u>	Mammee apple	Mamey
<u>Mangifera indica</u>	Mango	Mango
<u>Manilkara</u> sp.	Bullet wood	Asubo
<u>Melicococus bijugatus</u>	Ginep	Quenepa
<u>Ocotea</u> sp.		Laurel sp.
<u>Opuntia dillenii</u>		Tuna brava
<u>Persea americana</u>	Avocado	Aguacate
<u>Phthirusa bicolor</u>		Icaquillo

GRASSES

Scientific Name	English Common Name	Spanish Common Name
<u>Axonopus compressus</u>	Carpet grass	Yerba alfombra
<u>Chloris inflata</u>		Yerba paraguaita
<u>Cynodon dactylon</u>	Bermuda grass	Yerba bermuda
<u>Digitaria decumbens</u>	Pangola grass	Yerba pangola
<u>Panicum maximum</u>	Guinea grass	Yerba de guinea
<u>Panicum purpurascens</u>	Para grass	Yerba malojillo
<u>Paspalum conjugatum</u>	Sour paspalum	Yerba horquetilla
<u>Paspalum millegrana</u>		Yerba cortadora
<u>Sporobolus indicus</u>	Dropseed	Cerrillo
<u>Sporobolus virginicus</u>	Seashore dropseed grass	Yerba matojo de burro
<u>Stenotaphrum secundatum</u>	St. Augustine grass	Yerba San Agustin
<u>Tricholaena repens</u>		Yerba rosada
Not available		Yerba de Playa No. 1
Not available		Yerba de Playa No. 2
<u>Digitaria sanguinalis</u>	Crabgrass	Pendejuelo
<u>Cyperus rotundus</u>	Nutgrass	Coqui
<u>Eleocharis interstinta</u>	Rush	Junco
<u>Cenchrus equinatus</u>	Sandburr	Abrojo

## Appendix 7 (continued)

## FORBS

Scientific Name	English Common Name	Spanish Common Name
<u>Abrus praecatorius</u>		Peronia
<u>Achyranthes indica</u>		Rabo de raton
<u>Aderonopium gossipifolium</u>		Tautua
<u>Agalinis fasciculata</u>	Black night shade	Yerba veronica
<u>Agave americana</u>	Century plant	Maguey
<u>Aloe vulgaris</u>	Aloe	Sabila
<u>Amaranthus dubius</u>	Amaranth	Blero blanco
<u>Amaranthus spinosus</u>	Spiny amaranth	Blero espinoso
<u>Argemone mexicana</u>	Mexican poppy	Cardo santo
<u>Asclepias nivea</u>	Bastard ipecac	Algodoncillo
<u>Atamasco sp.</u>	Atamasco lily	Duende
<u>Batis maritima</u>	Saltwort	Planta de sal
<u>Bidens pilosa</u>	Shepperd's needle	Margarita silvestre
<u>Blechum pyramidatum</u>		Yerba de papagayo
<u>Boherhaavea diffusa</u>		Yerba de puerco
<u>Borreria verticillata</u>		Boton blanco
<u>Bryophyllum pinnatum</u>	Life plant	Bruja
<u>Canavalia maritima</u>	Bay bean	Haba de playa
<u>Castalia odorata</u>	Water lily	Lirio de agua
<u>Catharanthus roseus</u>	Periwinkle	Playera
<u>Centrosema pubescens</u>	Butterfly pea	Flor de pito

## Appendix 7 (continued)

## FORBS

Scientific Name	English Common Name	Spanish Common Name
<u>Chamaecrista aeschynomene</u>		Morivivi bobo
<u>Chenopodium ambrosioides</u>	Wormseed	Pazote
<u>Cissus sicyoides</u>	Pinakoop	Bejuco de caro
<u>Coleus amboinicus</u>	Spanish marjoram	Oregano brujo
<u>Commelina diffusa</u>	French weed	Cohitre
<u>Cordia corymbosa</u>		Cordia rugosa
<u>Crascina elegans</u>	Zinnia	Zinia
<u>Crotalaria striata</u>		Cascabelillo
<u>Desmodium sp.</u>		Pega pega pequeno
<u>Desmodium sp.</u>		Salsabacoa, pega-pega
<u>Ditremexa occidentalis</u>	Stinking weed	Hedionda
<u>Dolicholus minimus</u>		Frijolillo
<u>Dryopteris sprengelii</u>	Fern	Helecho de lana
<u>Eichornia crassipes</u>	Water hyacinth	Jacinto de agua
<u>Eleocharis interstincta</u>	Bulrush	Junco
<u>Emelista tora</u>		Dormidera
<u>Emilia sonchifolia</u>		Huye que te cojo
<u>Eupatorium odoratum</u>		Santa maria
<u>Euphorbia hirta</u>		Lehecilla
<u>Euphorbia hypericifolia</u>		Lehecilla
<u>Gomphrena dispersa</u>		Siempre viva silvestre

FORBS

Scientific Name	English Common Name	Spanish Common Name
<u>Hyptis pectinata</u>		Maruvio
<u>Indigofera endecaphylla</u>	Trailing indigo	Anil de pasto
<u>Ipomoea pes caprae</u>	Bay hops	Bejuco de playa
<u>Ipomoea tiliacea</u>	Moon vine	Bejuco de vaca
<u>Jatropha curcas</u>	Physic nut	Tartago
<u>Lantana camara</u>	Yellow sage	Cariaquillo amarillo
<u>Lantana involucrata</u>	Violet sage	Cariaquillo lila
<u>Leonotis nepetaefolia</u>	Lion ear	Boton de cadete
<u>Lepidium virginicum</u>		Mastuerzo
<u>Leptilon pusillum</u>		Pascueta
<u>Lippia nodiflora</u>	Cape weed	Cidron
<u>Macroptilium lathyroides</u>		Habichuela parada
<u>Malachra capitata</u>	Mallow	Malva
<u>Melochia pyramidata</u>		Bretonia piramidal
<u>Melochia tomentosa</u>	Broom wood	Bretonia afelpada
<u>Mimosa pudica</u>	Sensitive plant	Morivivi
<u>Mollugo berteriana</u>	Carpet weed	Alfombra
<u>Momordica charantia</u>	Wild balsam-apple	Cundeamor
<u>Ocimum sanctum</u>	Basil	Albahaca de puerco
<u>Parthenium hysterophorus</u>	Fewew few?	Artemisa cimarrona
<u>Passiflora sp.</u>	Passion fruit	Parcha
<u>Pectis ciliaris</u>		Romero cimarron

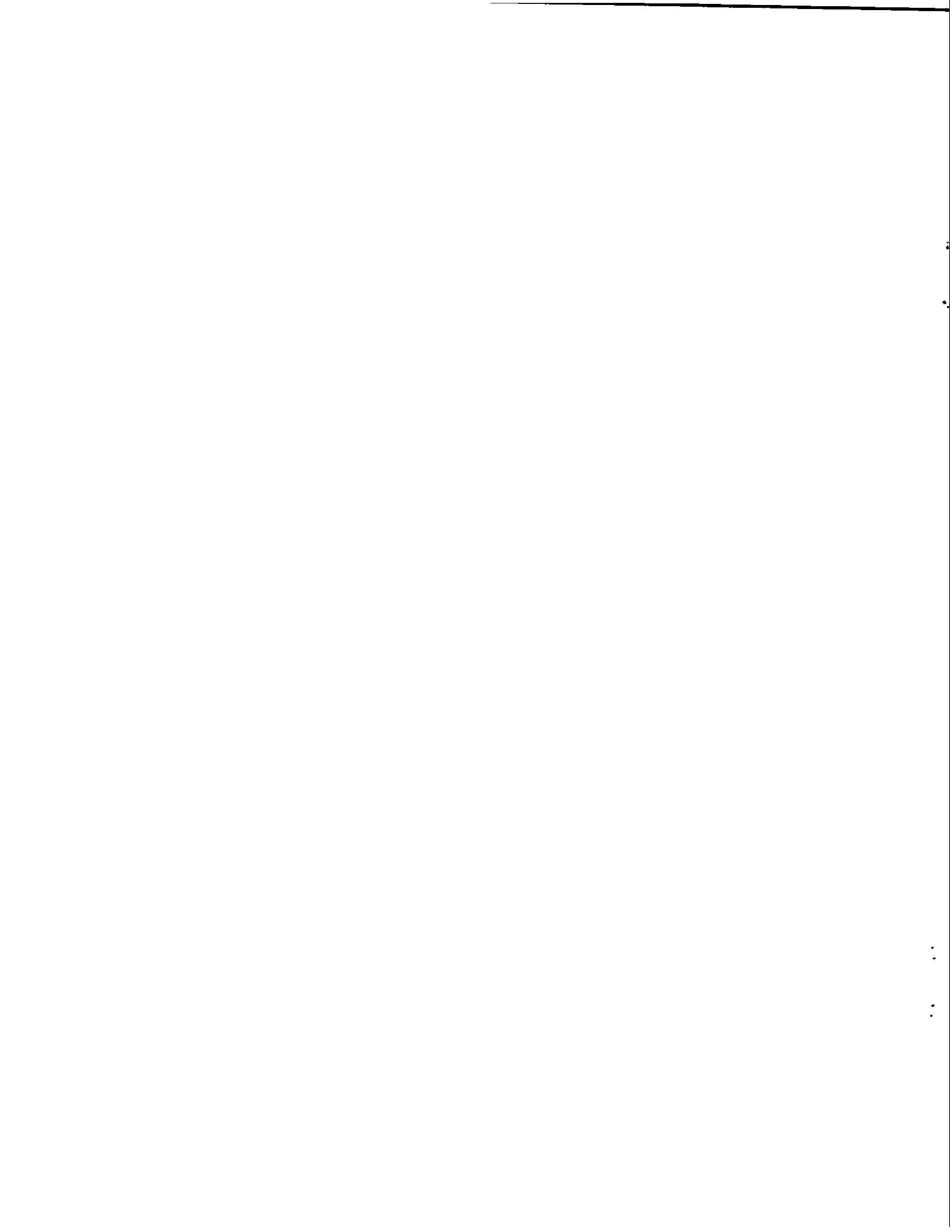
## FORBS

Scientific Name	English Common Name	Spanish Common Name
<u>Phaseolus adenanthus</u>	Wild bean	Habichuela cimarrona
<u>Phyllanthus niruri</u>	Gale of the wind	Quinino de pobre
<u>Pluchea purpurascens</u>		Salvia cimarrona
<u>Poinsettia heterophylla</u>		Pascua silvestre
<u>Portulaca oleracea</u>	Purslane	Verdolaga
<u>Portulaca pilosa</u>		Don diego silvestre
<u>Psidium guajava</u>		
<u>Ricinus communis</u>	Castor oil plant	Higuereta
<u>Sansevieria guineensis</u>	African bowstring hemp	Lengua de vaca, sansevieria
<u>Salvia serotina</u>		Moradillo azul
<u>Scoparia dulcis</u>		Culantrillo
<u>Senecioides cinerea</u>	Long shoot	Rabo de buey, yerba socialista
<u>Sida carpinifolia</u>	Wire weed	Escoba blanca
<u>Solanum caribaeum</u>	Night shade	Yerba mora
<u>Solanum torvum</u>	Turkey berry	Berenjena cimarrona
<u>Stachytarpheta jamaicensis</u>		Verbena
<u>Stigmaphyllon tomentosum</u>		Bejuco de toro
<u>Synedrella nodiflora</u>		Cerbatana
<u>Tragia volubilis</u>	Singing vine	Pringamosa
<u>Tribulus cistoides</u>		Abrojo
<u>Tridax procumbens</u>		Tridax



## FORBS

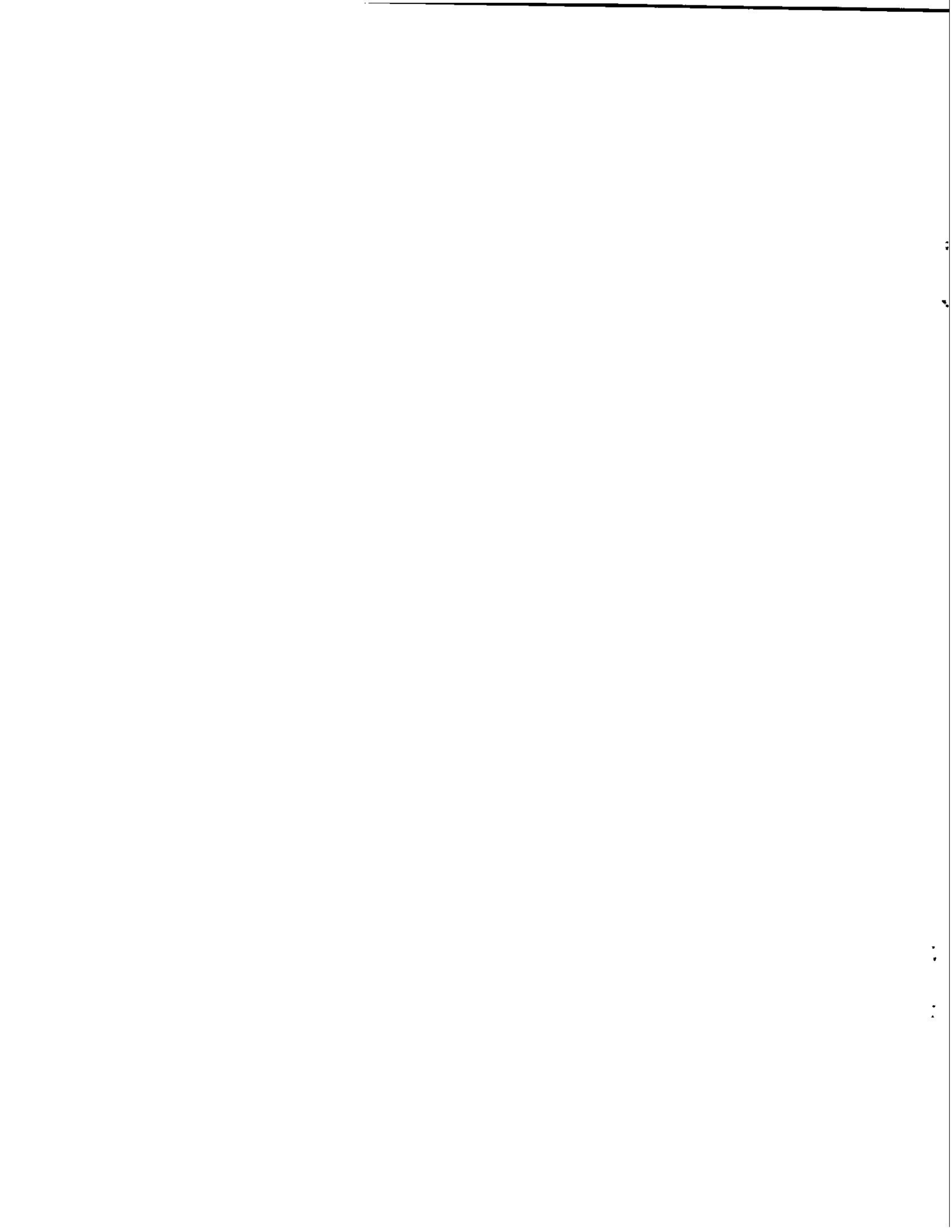
Scientific Name	English Common Name	Spanish Common Name
<u>Urena lobata</u>	Burr	Cadillo
<u>Urena trilobata</u>	Burr	Cadillo
<u>Vigna repens</u>		Frijol silvestre
<u>Wedelia trilobata</u>		Manzanilla de playa
<u>Not available</u>	<u>Not available</u>	Arbusto de playa No. 1
<u>Not available</u>	<u>Not available</u>	Arbusto de playa No. 2
<u>Not available</u>	<u>Not available</u>	Arbusto espinoso
<u>Not available</u>	<u>Not available</u>	Bejuco de nigua
<u>Not available</u>	<u>Not available</u>	Bejuco de pendeja
<u>Not available</u>	<u>Not available</u>	Bejuco trepador
<u>Not available</u>	<u>Not available</u>	Malva cimarrona



APPENDIX 8

FRUIT TREES FOUND IN ONE SQUARE MILE  
EXCLUSION ZONE

Scientific Name	English Common Name	Spanish Common Name
<u>Anacardium occidentale</u>	Cashew	Pajuil
<u>Annona muricata</u>	Soursop	Guanabana
<u>Annona reticulata</u>	Custard apple	Corazon
<u>Carica papaya</u>	Papaw tree	Papaya
<u>Chrysobalanus icaco</u>	Coco plum	Icaco prieto
<u>Chrysobalanus sp.</u>	<u>Not Available</u>	Icaco blanco
<u>Citrus aurantifolia</u>	Lime	Limon (lime)
<u>Citrus sp.</u>	Tangerine	Mandarina
<u>Citrus paradisi</u>	Grapefruit	Toronja
<u>Citrus sinensis</u>	Orange	China
<u>Cocoloba uvifera</u>	Seagrape	Uvas playeras
<u>Cocos nucifera</u>	Coconut tree	Palma de coco
<u>Malpighia puniceifolia</u>	West Indian cherry	Acerola
<u>Mamea americana</u>	Mamee apple	Mamey
<u>Mangifera indica</u>	Mango	Mango
<u>Melicococus bijugatus</u>	Ginep	Quenepa
<u>Persea americana</u>	Avocado	Aguacate
<u>Phyllanthus acidus</u>	Gooseberry tree	Grosella
<u>Pithecellobium dulce</u>	<u>Not Available</u>	Guama americano
<u>Psidium guajava</u>	Guava	Guayaba
<u>Punica granatum</u>	Pomegranate	Granada
<u>Spondus mombin</u>	Hogplum	Jobo
<u>Tamarindus indica</u>	Tamarind	Tamarindo
<u>Terminalia catappa</u>	Indian almond	Almendro



APPENDIX 9

MEDICINAL PROPERTIES, POISONOUS AND/OR TOXIC  
 PROPERTIES OF TREES, FORBS AND GRASSES FOUND  
 IN THE ONE SQUARE MILE EXCLUSION ZONE

TREES

Scientific Name	Medicinal Use	Spanish/English Common Name
<u>Albizia lebeck</u>	Use not available.	Acacia amarilla Tibet, Lebbek
<u>Anacardium occidentale</u>	Fruit coat is used as a vermifuge and for healing warts and callouses.	Pajuil Cashew
<u>Andira enermis</u>	Bark and seeds have been employed as vermifuge, purgative, and narcotic.	Moca Cabbage angelin
<u>Annona muricata</u>	Insecticide for lice has been made from the leaves.	Guanabana Soursop
<u>Annona reticulata</u>	a. The pulp is used in home remedies. b. The powdered seeds serve as an insecticide to kill lice.	Corazon Custard apple
<u>Bursera simaruba</u>	Aromatic resin has been employed in domestic medicines.	Almacigo Turpentine tree
<u>Cecropia peltata</u>	Leaves, bark, and latex are employed in local medicine in some countries.	Yagrumo hembra Trumpet tree
<u>Clusia rosea</u>	Yellow resinous latex of bark, fruit and other parts have been used in medicine.	Cupey Mamee
<u>Coccoloba uvifera</u>	Astringent roots and bark have been used in medicines.	Uvas de playa Seagrape
<u>Colubrina reclinata</u>	Concoctions made from the bitter bark and leaves have been used in local medicines.	Mavi Soldierwood
<u>Cordia alliodora</u>	Seeds and leaves have been used in home medicines.	Capa prieto Capa
<u>Crescentia cujete</u>	Fruit pulp, although poisonous, has been employed in local medicines.	Higuero Calabash tree

TREES

Scientific Name	Medicinal Use	Spanish/English Common Name
<u>Persea americana</u>	Some parts of the plant, such as leaves, seeds, fruit rind, and bark have been employed in folk medicine.	Aguacata Avocado
<u>Pimenta racemosa</u>	Myrcia oil, which is used in medicines, is extracted from the leaves.	Malagueta Bay-rum tree
<u>Pithecellobium dulce</u>	Bark is an ingredient in home remedies.	Guama americano <u>Not available</u>
<u>Punica granatum</u>	a. Bark extract has anti-helminthic effect. b. Fruit is used as an astringent in cases of diarrhea and dysentery.	Granada Pomegranate
<u>Sesbania grandiflora</u>	Extracts of leaves, flowers, and bark have been used medicinally.	Baculo Agati
<u>Tamarindus indica</u>	Fruit pulp is employed in home medicine as the source of a laxative. It has antiscorbutic properties.	Tamarindo Tamarind
<u>Thespesia populnea</u>	Fruit is employed medicinally for the treatment of skin eruptions.	Emajaguilla Portia tree
<u>FORBS AND GRASSES</u>		
<u>Aderonopium gossipifolium</u>	Leaf extract used to treat gastric ulcers, colds, and as diuretic.	Tautua <u>Not available</u>
<u>Agave americana</u>	a. Root extract used as blood depurative. b. Dried leaves used as anti-inflammatory agent.	Maguey Century plant
<u>Aloe vulgaris</u>	a. Leaf extract used as cathartic and as emmenagogue. b. Low dose acts as expectorant.	Savila Aloe

## FORBS AND GRASSES

Scientific Name	Medicinal Use	Spanish/English Common Name
<u>Argemone mexicana</u>	<p>a. Vegetative parts used to treat warts and external ulcers. Infusions from green leaves are used as a cough suppressor and as anti-asthmatic with action similar to opium.</p> <p>b. Fresh seeds are used as a vomitive.</p>	Cardo santo Mexican Poppy
<u>Bidens pilosa</u>	Used as emmenagogue in infusions and as expectorant against colds.	Margarita silvestre Shepperd's needle
<u>Bryophyllum pinnatum</u>	Leaves used as demulcent and as expectorant.	Bruja Life Plant
<u>Chenopodium ambrosioides</u>	Leaves and flowers used in extract as antihelminthic particularly against intestinal worms.	Pazote Worm seed
<u>Cissus sicyoides</u>	Use not available.	Bejuco de caro Pinakoop
<u>Cyperus rotundus</u>	Used as diuretic and to dissolve kidney stones.	Coqui Nutgrass
<u>Ditremexa occidentalis</u>	<p>a. Root infusion used as anti-spasmodic.</p> <p>b. Leaves have anti-inflammatory effects.</p>	Hedionda Stinking weed
<u>Jatropha curcas</u>	Use not available.	Tartato Physic nut
<u>Lantana camara</u>	Leaves in infusion are used to stimulate digestion and food assimilation.	Cariaquillo amarillo Yellow sage
<u>Lepidium virginicum</u>	Leaves used to treat scurvy and as diuretic.	Mastuerzo <u>Not available</u>
<u>Malachra capitata</u>	Leaves and flowers in infusion are used as emulcent. Crushed leaves are used to treat inflamed areas.	Malva Mallow

## Appendix 9 (continued)

## FORBS AND GRASSES

Scientific Name	Medicinal Use	Spanish/English Common Name
<u>Momordica charantia</u>	Leaves have hypoglycemic effect.	Cundeamor Wild Balsam- apple
<u>Osmia odorata</u>	Leaves and flowers used to prepare aromatic baths to alleviate colds and rheumatism.	Santa maria <u>Not available</u>
<u>Pepo moschata</u>	Seeds used as anti-helminthic particularly against tenia.	Calabaza <u>Not available</u>
<u>Phyllanthus niruri</u>	Roots, leaves and branches are used as diuretic, stomachic, and fortifying tonic.	Quinino de pobre Gale of the Wind
<u>Portulaca oleracea</u>	a. Leaves and stem extracts are used as refreshing drink, medicinal tea, demulcent, diuretic, emollient, and in salad as an anti-scurvy agent. b. Crushed seeds have a vermifuge effect.	Verdolaga Purslane
<u>Ricinus communis</u>	Seeds contain cathartic oils.	Higuereta Castor oil plant
<u>Scorpiia dulcis</u>	Use not available.	Culantrillo <u>Not available</u>
<u>Solanum caribaeum</u>	a. Leaves in infusion are used to suppress body secretions, like gastric acidity, sweating, and urine. They are also used as an antiasthmatic and sedative. b. Fruits have a purgative effect.	Yerba mora Night shade
<u>Stachytarpheta jamaicensis</u>	Leaves have an emetic-cathartic effect.	Verbena <u>Not available</u>



APPENDIX 9-A

POISONOUS TREES, SHRUBS AND FORBS, AND GRASSES  
FOUND IN ONE SQUARE MILE EXCLUSION ZONE

Scientific Name	Spanish/English Common Name	Toxicity
<u>TREES</u>		
<u>Albicia lebek</u>	Acacia amarilla Tibet, Lebbek	Inner bark only dangerous
<u>Anacardium occidentale</u>	Pajuil Cashew	Resin, seeds, and peel toxic.
<u>Andira inermis</u>	Moca Cabbage Angelin	Bark, limbs and seeds toxic.
<u>Annona muricata</u>	Guanabana Soursop	Leaves only toxic.
<u>Annona reticulata</u>	Corazon Custard apple	Bark, limbs and seeds toxic.
<u>Byrsonima coriacea</u>	Mariacao Locust berry	Inner bark only dangerous
<u>Calophyllum brasiliense</u>	Maria <u>Not available</u>	Inner bark only dangerous
<u>Carica papaya</u>	Papaya Papaw tree	Sap and juice of green fruit toxic.
<u>Cecropia peltata</u>	Yagrumo hembra Trumpet tree	Inner bark only dangerous
<u>Clusia rosea</u>	Cupey del rio Wild mammee	Inner bark only dangerous
<u>Columbrina reclinata</u>	Mavi Soldierwood	Inner bark only dangerous
<u>Crescentia cujete</u>	Higuero Calabash tree	Inner bark, fruit pulp toxic.
<u>Erithrina poeppigiana</u>	Bucare gigante Mountain immortelle	Inner bark only dangerous
<u>Hippomane mancinella</u>	Manzanillo de playa Manchineel	Deadly fruit. Sap irri- tating. Wood smoke toxic to eyes.

Appendix 9-A (continued)

Scientific Name	Spanish/English Common Name	Toxicity
<u>Mamea americana</u>	Mamey Mammee apple	Seeds toxic to poultry and fish. Peel of fruit toxic.
<u>Mangifera indica</u>	Mango Mango	Sap and juice of green fruit toxic.
<u>Manilkara sp.</u>	Ausubo Bulletwood	Inner bark only dangerous.
<u>Persea americana</u>	Aguacate Avocado	Seeds and bark toxic to animals.
<u>Pimenta racemosa</u>	Malagueta Bay-rum tree	Inner bark only dangerous.
<u>Pithecellobium dulce</u>	Guama americano <u>Not available</u>	Inner bark only dangerous.
<u>Pithecellobium saman</u>	Saman Raintree	Inner bark only dangerous.
<u>Psidium guajava</u>	Guayaba Guava	Inner bark only dangerous.
<u>Sesbania grandiflora</u>	Baculo Agati	Inner bark only dangerous.
<u>Spathodea campanulata</u>	Tulipan africano African tulip tree	Inner bark only dangerous.
<u>Tabebuia heterophylla</u>	Roble White cedar	Inner bark only dangerous.
<u>Tamarindus indica</u>	Tamarindo Tamarind	Inner bark only dangerous.
<u>Terminalia catappa</u>	Almendro Indian almond	Inner bark only dangerous.
<u>Trichilia hirta</u>	Tinacio Broomstick	Inner bark only dangerous.
<u>BUSHES AND FORBS</u>		
<u>Abrus praecatorious</u>	Peronia <u>Not available</u>	Seeds only toxic.

## Appendix 9-A (continued)

Scientific Name	Spanish/English Common Name	Toxicity
<u>Adenoropium gossipi- folium</u>	Tautua <u>Not available</u>	Sap irritating.
<u>Agave americana</u>	Maguey Century Plant	Toxic to cattle.
<u>Amaranthus sp.</u>	Bleros Amaranth	Toxic to cattle.
<u>Argemone mexicana</u>	Cardo santo Mexican poppy	Seeds fatal to pigs. Medicinal sap dangerous in overdose.
<u>Canavalia maritima</u>	Haba de playa Bay bean	Toxic to cattle.
<u>Capsicum frutescens</u>	Aji picante <u>Not available</u>	Can be lethal if in- gested in large quantities.
<u>Catharanthus roseau</u>	Playera Periwinkle	Inhaling smoke from burning petals can produce hallucinogenic effects.
<u>Cenchrus cistioides</u>	Abrojo Sandburr	Toxic to cattle and poultry.
<u>Chenopodium ambrosioides</u>	Pazote Wormseed	Can be lethal if in- gested pure in large quantities.
<u>Crotalaria sp.</u>	Cascabelillo <u>Not available</u>	Toxic to cattle and poultry.
<u>Ditremexa occidentalis</u>	Hedionda Stinking weed	Toxic to cattle.
<u>Indigofera endecaphylla</u>	Anil de pasto Trailing indigo	Toxic to cattle.
<u>Ipomoea pes-caprae</u>	Bejuco de playa Bay hops	Ingested seeds can cause hallucinogenic effects.
<u>Jatropha curcas</u>	Tartago Physic nut	Toxic to cattle.
<u>Lantana sp.</u>	Cariaquillo Yellow or Violet sage	Leaves, seeds toxic to humans and cattle.

Appendix 9-A (continued)

Scientific Name	Spanish/English Common Name	Toxicity
<u>Momordica charantia</u>	Cundeamor Wild balsam apple	Fruit, seed, leaves toxic.
<u>Phaseolus adenanthus</u>	Habichuela cimarrona Wild bean	Ingestion of beans toxic. Pollen causes allergies.
<u>Portulaca pilosa</u>	Don Diego silvestre <u>Not available</u>	Toxic to cattle.
<u>Ricinus comunis</u>	Higuereta Castor oil plant	All parts except oil toxic.
<u>Sida carpinifolia</u>	Escoba blanca Wire weed	Toxic to cattle.
<u>Solanum torvum</u>	Berenjena cimarrona Turkey berry	Fruit and seeds toxic.
<u>Stachytarpheta jamaicensis</u>	Verbena <u>Not available</u>	Juices can be toxic.
<u>GRASSES</u>		
<u>Cynodon dactylon</u>	Bermuda <u>Not available</u>	Toxic to farm animals.
<u>Panicum maximum</u>	Guinea <u>Not available</u>	Causes photosensi- tization in cattle.
<u>Solanum caribaeum</u>	Yerba mora Night shade	Fruits or erroneous medication can be fatal.
<u>OTHER</u>		
<u>Manihot manihot</u>	Yuca Cassava	Lethal if eaten raw.

APPENDIX 10  
(L-1)

EFFECT OF PLANT DENSITY AS INFLUENCED BY MOISTURE 1974-1975

Family Poacea	EAST				CENTER				WEST			
	E-2	E-3	E-4	C-2	C-3	C-4	W-2	W-3	W-4			
<u>Axonopus compressus</u>				0.8		0.6	0.2	0.6	0.1			
<u>Cenchrus echinatus</u> L.	0.9		13.4	8.2	6.1	4.2	0.2	4.5	1.2			
<u>Chloris inflata</u> Link	21.6	1.5			6.4	0.4	1.8	1.0	0.1			
<u>Cynodon dactylon</u> L. (Pers.)	17.2	0.4		7.1	0.2	2.1		0.4	20.9			
<u>Dactyloctenium aegyptium</u> L. (Willd)									0.1			
<u>Digitaria decumbens</u>	0.4		1.0	19.8	6.9	15.5	0.1	0.1	16.9			
<u>Digitaria sanguinalis</u> Scop.		0.6										
<u>Eleusine indica</u> L. Gaertn.	0.1							21.8	1.3			
<u>Panicum fasciculatum</u>								0.6				
<u>Panicum maximum</u> Jacq.								1.0				
<u>Panicum purpurascens</u>	24.8	132.5	72.5	26.4	103.5	111	191	120.1	119.9			
<u>Paspalum conjugatum</u> Berg.			0.9	0.2		1						
<u>Paspalum fimbriatum</u> H.B.K.				0.1								
<u>Setaria geniculata</u> (Lam.) Beauv.			0.1	19.8	64	15.6		7.0	4.8			
<u>Sporobolus indicus</u> (L.) R. Br.												
<u>Sporobolus virginicus</u> (L.) Kunth				31.4	7.1		0.2	3.3	2.8			
<u>Stenotaphrum secundatum</u> (Walt) Kuntze			0.6			0.4						
<u>Tricholeena repens</u> (Willd.) Hitch.												
<u>Trichachne insularis</u> Nees.												
Fam. Cyperaceae												
<u>Cyperus rotundus</u> L.	572.5		1.5	1.6	23	1.2	48.1	1.1	249.6			
<u>Cyperus</u> sp.					18	0.5						
Fam. Commelinaceae												
<u>Commelina diffusa</u> Burm f.				0.1	0.9			8.5	0.2			
Fam. Acanthaceae												
<u>Blechnum pyramidatum</u> (Lam.) Urban			5.2	32.1		3.6						
<u>Buellia tuberosa</u> L.	6.1	6.9										
Fam. Aizoaceae												
<u>Mollugo berteriana</u> L.									0.2			

APPENDIX 10  
(L-1)

	E-2	E-3	E-4	C-2	C-3	C-4	W-2	W-3	W-4
<u>Fam. Amaranthaceae</u>									
<u>Achyranthes indica</u> Mill.		5.5	0.4						
<u>Alternanthera sessilis</u> (L.) R.B.	0.1	0.5							
<u>Amaranthus dubius</u>		2.6	0.1	3.1	89.4	0.4	0.1		63.4
<u>Gomphrena dispersa</u> Standley									
<u>Fam. Apocinaeae</u>									
<u>Catharanthus roseus</u> (L.) Dow							0.1		
<u>Fam. Boraginaceae</u>									
<u>Cordia corymbosa</u> G. Don					0.2				
<u>Fam. Caparidaceae</u>									
<u>Cleome gynandra</u> (L.)									0.2
<u>Fam. Carduaceae</u>									
<u>Bidens pilosa</u> L.	0.8	0.5	0.2		0.2		37.6	124.4	2.1
<u>Emilia sonchifolia</u> (L.) DC	0.1				1.5				
<u>Eupatorium odoratum</u> L.									
<u>Parthenium hysterophorus</u> L.		1.0	0.5						
<u>Senecioides cinerea</u> (L.) Kuntze	0.1		2.5	4.2	1.2		0.1		
<u>Synedrella nodiflora</u> (L.) Gaertn.				0.4	25.4				
<u>Tridax procumbens</u> L.	0.1				1.0				
<u>Wedelia trilobata</u> (L.) Hitch.						0.1	0.1	0.1	7.1
<u>Fam. Cesalpiniaceae</u>									
<u>Characrista aeschynomene</u> (DC) Green	2.2		2.9	1.9	2.4	5.1	1.8	9.2	2.1
<u>Characrista occidentalis</u> (L.) Britton & Rose	7.2	1.0	15.8	5.0	0.5				
<u>Characrista tirma</u> (L.) Britton & Rose	0.1	0.4	4.1	7.6	25.5	7	3.9		
<u>Mimosa pudica</u> L.						15.1	33.5	11.5	
<u>Fam. Cistocillaceae</u>									
<u>Caesalpinia coriaria</u> (L.) G	0.6			0.1					
<u>Caesalpinia coriaria</u> (L.) G									0.5

APPENDIX 10  
(L-1)

Fam.	Cucurbitaceae	E-2	E-3	E-4	C-2	C-3	C-4	W-2	W-3	W-4
	<u>Luffa cylindrica</u> (L.) Roemer						0.1	0.1	0.1	
	<u>Momordica charantia</u> L.									
	Fam. Euphorbiaceae									
	<u>Adenopium gossipifolium</u> L. (Pohl)		0.2	4.9	2.0	3.6	0.2	1.0	46.2	
	<u>Euphorbia hirta</u> (L.) Millsp.	14.5	5.8	0.4		2.0	0.2	5.8	6.9	9.8
	<u>Euphorbia hypericifolia</u>			3.6		0.8	0.2	0.5		4.0
	<u>Euphorbia nutans</u> (L.) Polak	19.6	0.6	4.2		0.8	0.6	0.1	3.9	
	<u>Phyllanthus niruri</u> L.		0.2	0.1						16.8
	<u>Poinsettia heterophylla</u> (L) Kl & Garoke	11.1	0.1	0.1						
	Fam. Esterculiaceae									
	<u>Melochia pyramidata</u> (L) Britton	0.1	4.4	4.2	0.1	0.2	0.1	0.2		6.0
	<u>Melochia</u> sp.				0.2					
	Fam. Fabaceae									
	<u>Centrosema pubescens</u> Benth.	1.1		0.1	0.1		1.8	0.5	0.1	1.2
	<u>Crotolaria retusa</u> L.			2.2		0.2				0.6
	<u>Crotolaria striata</u>	0.1	0.5	0.2	6.1	42.1	5.1	6.0	11.2	11.0
	<u>Desmodium</u> sp.	5.9								
	<u>Delicholus minimus</u> (L) Medic.	4.4						0.2		
	<u>Indigofera endecaphylla</u>	0.1							0.5	
	<u>Indigofera suffruticosa</u> Mill.									
	<u>Macroptilium lathyroides</u> (L.) Urban									
	<u>Phaseolus adenanthus</u> G.F.W. Meyer	2.2	0.4	79.1	0.1	5.5	89	1.5	23.1	0.2
	<u>Stylosanthes hamata</u> (L.) Toubert			2.6	1.9	3.0	0.8	1.0	22.8	0.9
	<u>Tephrosia cinerea</u> Pers.	2.1	0.2							
	Fam. Lamiaceae									
	<u>Coleus amboinicus</u> Lour.			0.1	0.1	3.4				
	<u>Hyptis capitata</u> Jacq.	0.5				0.8				
	<u>Hyptis</u> sp.									
	<u>Ocimum basilicum</u> L.			0.8						
	<u>Ocimum sanctum</u> L.			1.4						
	<u>Salvia serotina</u> L.	1.9								

APPENDIX 10  
(L-1)

	E-2	E-3	E-4	C-2	C-3	C-4	W-2	W-3	W-4
<u>Fam. Malvaceae</u>									
<u>Malachra capitata</u> L.						0.1			
<u>Sida carpinifolia</u> L.f.	11.9	155.4	71.8	109.6	46.9	141.8	34.5	2.9	0.1
<u>Urena lobata</u> L.									8.8
<u>Urena trilobata</u> Vell									1.5
<u>Fam. Nictaginaginaceae</u>									
<u>Boerhaavea diffusa</u> L.		2.8	0.2			0.1	9.8	0.4	
<u>Fam. Poligalaceae</u>									
<u>Elsota virgata</u> (SW) Kuntze				0.2					
<u>Fam. Portulacaceae</u>									
<u>Portulaca icosandra</u>		0.6	0.4		21.6	0.8		0.1	
<u>Portulaca oleracea</u> L.		2.4	11.2	2.2		2.4		157.9	15.8
<u>Portulaca pilosa</u> L.									
<u>Fam. Rubiaceae</u>									
<u>Borreria ocimoides</u> (Burn f.) Dc.		0.6	0.1	0.8	0.5	2.2	0.1		
<u>Borreria verticillata</u> (L.) Meyer			1.4			0.4			2.0
<u>Hemidiodia ocimifolia</u> (Willd)									
<u>Fam. Verbenaceae</u>									
<u>Lippia nodiflora</u> (L) Michx.	5.9	3.1	0.1	4.8		5.9	0.1		0.4
<u>Stachytarpheta jamaicensis</u> Vahl.			12.2	396.5					



Average Number of Individuals per plot in Plot No. E-2  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Family Poaceae						
<u>Axonopus compressus</u>						
<u>Cenchrus echinatus</u> L.						
<u>Chloris inflata</u> Link	-	-	-	3.5	0.9	25
<u>Cynodon dactylon</u> L. (Pers.)	6	67	5.5	86.5	21.6	100
<u>Dactyloctenium aegyptium</u> L. (Willd)	-	-	28.0	41.0	17.2	50
<u>Digitaria decumbens</u>						
<u>Digitaria sanguinalis</u> Scop.	1.5	-	-	-	0.4	25
<u>Eleusine indica</u> L. Gaertn.						
<u>Panicum fasciculatum</u>	-	-	0.5	-	0.1	25
<u>Panicum maximum</u> Jacq.						
<u>Panicum purpurascens</u>						
<u>Paspalum conjugatum</u> Berg.	-	-	47.5	51.5	24.8	50
<u>Paspalum fimbriatum</u> H.B.K.						
<u>Setaria geniculata</u> (Lam.) Bequv.						
<u>Sporobolus indicus</u> (L.) R. Br.						
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze						
<u>Tricholaena repens</u> (Willd.) Hitch.						
<u>Trichachne insularis</u> Nees.						
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.	400.5	53.5	1280.5	555.5	572.5	100
<u>Cyperus</u> sp.						
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.						
Fam. Acanthaceae						
<u>Blechum pyramidatum</u> (Lam.) Urban						
<u>Ruellia tuberosa</u> L.	-	-	27.5	-	6.9	25
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.						
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.						
<u>Alternanthera sessilis</u> (L.) R.B.	-	-	0.5	-	0.1	25
<u>Amaranthus dubius</u>						
<u>Gomphrena dispersa</u> Standley						
Fam. Apocinaeae						
<u>Catharanthus roseus</u> (L.) Dow		10.5				

Average Number of Individuals per plot in Plot No. E-2  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don						
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)						
Fam. Carduaceae						
<u>Bidens pilosa</u> L.	-	-	9	10	4.8	50
<u>Emilia sonchifolia</u> (L.) DC						
<u>Eupatorium odoratum</u> L.	-	-	-	0.5	0.1	25
<u>Parthenium hysterophorus</u> L.						
<u>Senecioides cinerea</u> (L.) Kuntze	-	-	-	0.5	0.1	25
<u>Synedrella nodiflora</u> (L.) Gaertn.						
<u>Tridax procumbens</u> L.						
<u>Wedelia trilobata</u> (L.) Hitchc.	-	-	0.5	-	0.1	25
Fam. Cesalpinaceae						
<u>Chamaecrista aescynomene</u> (DC) Green	-	-	6	3	2.2	50
<u>Ditremexa occidentalis</u> (L.) Britton & Rose						
<u>Emelista tora</u> (L.) Britton & Rose	7.5	-	6	15.5	7.2	75
<u>Mimosa pudica</u> L.	-	-	-	0.5	0.1	25
Fam. Cigofilaceae						
<u>Kallstroenia maxima</u> (L.) T & C	-	-	2.5	-	0.6	25
<u>Tribulus cistoides</u> L.						
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer						
<u>Momordica charantia</u> L.						
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)						
<u>Euphorbia hirta</u> (L.) Millsp.	-	-	3	55	14.5	50
<u>Euphorbia hypericifolia</u>						
<u>Euphorbia nutans</u> (L.) Polak						
<u>Phyllanthus niruri</u> L.	-	-	78.5	-	19.6	25
<u>Poinsettia heterophylla</u> (L) Kl & Garoke	15	1	20	8.5	11.1	100
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton	-	-	0.5	-	0.1	25
<u>Melochia</u> sp.						
					10.6	

Average Number of Individuals per plot in Plot No. E-2  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Fabaceae						
<u>Centrosema pubescens</u> Benth.	-	-	-	4.5	1.1	25
<u>Crotolaria retusa</u> L.	-	0.5	-	-	0.1	25
<u>Crotolaria striata</u>	-	14.5	8.0	1	5.9	75
<u>Desmodium</u> sp.	-	-	17.5	-	4.4	25
<u>Dolicholus minimus</u> (L.) Medic.	-	-	-	-	-	-
<u>Indigofera endecaphyla</u>	-	-	-	-	-	-
<u>Indigofera suffruticosa</u> Mill.	0.5	-	-	-	0.1	25
<u>Macroptilium lathyroides</u> (L.) Urban	-	-	-	-	-	-
<u>Phaseolus adenanthus</u> G.F.W. Meyer	-	-	9	-	2.2	25
<u>Stylosanthes hamata</u> (L.) Toubert	-	-	6.5	2.0	2.1	50
<u>Tephrosia cinerea</u> Pers.	-	-	-	-	-	-
Fam. Lamiaceae						
<u>Coleus amboinicus</u> Lour.	-	-	-	-	-	-
<u>Hyptis capitata</u> Jacq.	2	-	-	-	0.5	25
<u>Hyptis</u> sp.	-	-	-	-	-	-
<u>Cuminum basilicum</u> L.	-	-	-	-	-	-
<u>Cuminum sanctum</u> L.	-	-	-	-	-	-
<u>Salvia serotina</u> L.	-	-	7.5	-	1.9	25
Fam. Malvaceae						
<u>Malacra capitata</u> L.	-	-	-	-	-	-
<u>Sida carminifolia</u> L.f.	-	-	16.5	31	11.9	50
<u>Urena lobata</u> L.	-	-	-	-	-	-
<u>Urena trilobata</u> Vell	-	-	-	-	-	-
Fam. Mictaginaginaceae						
<u>Boerhaavea diffusa</u> L.	-	-	-	-	-	-
Fam. Poligalaceae						
<u>Eisota virgata</u> (SW) Kuntze	-	-	-	-	-	-
Fam. Portulacaceae						
<u>Portulaca icosandra</u>	-	-	-	-	-	-
<u>Portulaca oleracea</u> L.	-	-	-	-	-	-
<u>Portulaca pilosa</u> L.	-	-	-	-	-	-
Fam. Rubiaceae						
<u>Borreria ocimoides</u> (Burn f.) DC.	-	-	-	-	-	-
<u>Borreria verticillata</u> (L.) Meyer	-	-	-	-	-	-
<u>Hemidicidia ocimifolia</u> (Willd)	-	-	-	-	-	-
Fam. Verbenaceae						
<u>Lippia nodiflora</u> (L.) Michx.	-	-	-	-	-	-
<u>Stachytarpheta jamaicensis</u> Vahl.	-	1	1	21.5	5.9	75
		10.7				

Average Number of Individuals per plot in Plot No. E-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Family Poaceae						
<u>Axonopus compressus</u>						
<u>Cenchrus echinatus</u> L.						
<u>Chloris inflata</u> Link						
<u>Cynodon dactylon</u> L. (Pers.)	1.5	4.5	-	-	1.5	50
<u>Dactyloctenium aegyptium</u> L. (Willd)	-	-	-	1.5	0.4	25
<u>Digitaria decumbens</u>						
<u>Digitaria sanguinalis</u> Scop.						
<u>Eleusine indica</u> L. Gaertn.	-	-	-	2.5	0.6	25
<u>Panicum fasciculatum</u>						
<u>Panicum maximum</u> Jacq.						
<u>Panicum purpurascens</u>						
<u>Paspalum conjugatum</u> Berg.	12.5	137.5	94.5	173.5	132.5	100
<u>Paspalum fimbriatum</u> H.B.K.						
<u>Setaria geniculata</u> (Lam.) Bequv.						
<u>Sporobolus indicus</u> (L.) R. Br.						
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze						
<u>Tricholaena repens</u> (Willd.) Hitch.	2.5	-	-	-	0.6	25
<u>Trichachne insularis</u> Nees.						
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.						
<u>Cyperus</u> sp.						
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.						
Fam. Acanthaceae						
<u>Blechum pyramidatum</u> (Lam.) Urban						
<u>Ruellia tuberosa</u> L.	3.5	2	6.5	15.5	6.9	100
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.						
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.	-	-	12	10	5.5	50
<u>Alternanthera sessilis</u> (L.) R.B.						
<u>Amaranthus dubius</u>	0.5	-	1.5	-	0.5	50
<u>Gomphrena dispersa</u> Standley	1	-	4.5	5	2.6	75
Fam. Apocinaeae						
<u>Catharanthus roseus</u> (L.) Dow						
					10.8	

Average Number of Individuals per plot in Plot No. E-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don						
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)						
Fam. Carduaceae						
<u>Bidens pilosa</u> L.	-	-	2	-	0.5	25
<u>Emilia sonchifolia</u> (L.) DC						
<u>Eupatorium odoratum</u> L.						
<u>Parthenium hysterophorus</u> L.	17.5	-	-	6.5	1.0	50
<u>Senecioides cinerea</u> (L.) Kuntze						
<u>Synedrella nodiflora</u> (L.) Gaertn.						
<u>Tridax procumbens</u> L.						
<u>Wedelia trilobata</u> (L.) Hotch.						
Fam. Cesalpinaceae						
<u>Chamaecrista aescynomene</u> (DC) Green						
<u>Ditremexa occidentalis</u> (L.) Britton & Rose	-	-	1.5	2.5	1.0	50
<u>Emelista tora</u> (L.) Britton & Rose	2.5	-	-	1	0.9	50
<u>Mimosa pudica</u> L.	-	1.5	-	-	0.4	25
Fam. Cigofilaceae						
<u>Kallstroenia maxima</u> (L.) T & C						
<u>Tribulus cistoides</u> L.						
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer						
<u>Momordica charantia</u> L.						
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)	-	-	0.5	0.5	0.2	25
<u>Euphorbia hirta</u> (L.) Millsp.	1	2	5.5	14.5	5.8	100
<u>Euphorbia hypericifolia</u>						
<u>Euphorbia nutans</u> (L.) Polak	-	-	0.5	2	0.6	50
<u>Phyllanthus niruri</u> L.	-	-	1	-	0.2	25
<u>Poinsettia heterophylla</u> (L) Kl & Garoke	0.5	-	-	-	0.1	25
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton	-	-	3	14.5	4.4	50
<u>Melochia</u> sp.						
					10.9	

Average Number of Individuals per plot in Plot No. E-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Fabaceae						
<u>Centrosema pubescens</u> Benth.						
<u>Crotolaria petusa</u> L.						
<u>Crotolaria striata</u>	-	1	-	-	0.5	25
<u>Desmodium</u> sp.						
<u>Delicholus minimus</u> (L.) Medic.						
<u>Indigofera endecaphyla</u>						
<u>Indigofera suffruticosa</u> Mill.						
<u>Macroptilium lathyroides</u> (L.) Urban						
<u>Phaseolus adenanthus</u> G.F.W. Meyer	-	-	1.5	-	0.4	25
<u>Stylosanthes hamata</u> (L.) Toubert						
<u>Tephrosia cinerea</u> Pers.	-	0.5	0.5	-	0.2	50
Fam. Lamiaceae						
<u>Coleus amboinicus</u> Lour.						
<u>Hyptis caritata</u> Jacq.						
<u>Hyptis</u> sp.						
<u>Ocimum basilicum</u> L.						
<u>Ocimum sanctum</u> L.						
<u>Salvia serotina</u> L.						
Fam. Malvaceae						
<u>Malacra capitata</u> L.						
<u>Sida carpinifolia</u> L.f.	9.5	13	229	288	155.4	100
<u>Urena lobata</u> L.						
<u>Urena trilobata</u> Vell						
Fam. Nictaginaceae						
<u>Boerhaavia diffusa</u> L.	4.5	5	1.5	-	2.8	75
Fam. Poligalaceae						
<u>Passota virgata</u> (SW) Kuntze						
Fam. Portulacaceae						
<u>Portulaca icosandra</u>						
<u>Portulaca oleracea</u> L.	-	1.5	1	-	0.6	50
<u>Portulaca pilosa</u> L.	-	1	-	8.5	2.4	50
Fam. Rubiaceae						
<u>Borreria ocimoides</u> (Burn f.) Dc.						
<u>Borreria verticillata</u> (L.) Meyer	-	-	-	0.5	0.6	25
<u>Hemidiodia scimifolia</u> (Willd)						
Fam. Verbenaceae						
<u>Lippia nodiflora</u> (L) Michx.						
<u>Stachytarpheta jamaicensis</u> Vahl.	0.5	-	-	12.5	3.1	50
		10.10				

Average Number of Individuals per plot in Plot No. E-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Family Poaceae						
<u>Axonopus compressus</u>						
<u>Cenchrus echinatus</u> L.						
<u>Chloris inflata</u> Link	16	25.5	3.5	8.5	13.4	100
<u>Cynodon dactylon</u> L. (Pers.)						
<u>Dactyloctenium aegyptium</u> L. (Willd)						
<u>Digitaria recumbens</u>						
<u>Digitaria sanguinalis</u> Scop.	-	-	4	-	1.0	25
<u>Eleusine indica</u> L. Gaertn.						
<u>Panicum fasciculatum</u>						
<u>Panicum maximum</u> Jacq.						
<u>Panicum purpurascens</u>						
<u>Paspalum conjugatum</u> Berg.	14.5	63.5	150	62	72.5	100
<u>Paspalum fimbriatum</u> H.B.K.	-	-	3.5	-	0.9	25
<u>Setaria geniculata</u> (Lam.) Bequv.						
<u>Sporobolus indicus</u> (L.) R. Br.	-	-	-	0.5	0.1	25
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze						
<u>Tricholaena repens</u> (Willd.) Hitch.						
<u>Trichachne insularis</u> Nees.	-	-	-	2.5	0.6	25
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.	-	-	6	-	1.5	25
<u>Cyperus</u> sp.						
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.						
Fam. Acanthaceae						
<u>Blechnum pyramidatum</u> (Lam.) Urban						
<u>Ruellia tuberosa</u> L.	3	8.5	1.5	8	5.2	100
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.						
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.	-	-	-	1.5	0.4	25
<u>Alternanthera sessilis</u> (L.) R.B.						
<u>Amaranthus dubius</u>						
<u>Gomphrena dispersa</u> Standley	-	-	0.5	-	0.1	25
Fam. Apocinaeae						
<u>Catharanthus roseus</u> (L.) Dow						

Average Number of Individuals per plot in Plot No. E-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don						
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)						
Fam. Carduaceae						
<u>Bidens pilosa</u> L.	-	-	-	1	0.2	25
<u>Emilia sonchifolia</u> (L.) DC						
<u>Eupatorium odoratum</u> L.						
<u>Parthenium hysterophorus</u> L.	-	-	-	2	0.5	25
<u>Senecioides cinerea</u> (L.) Kuntze	-	-	-	10	2.5	25
<u>Synedrella nodiflora</u> (L.) Gaertn.						
<u>Tridax procumbens</u> L.						
<u>Wedelia trilobata</u> (L.) Hotch.						
Fam. Cesalpinaceae						
<u>Chamaecrista aescynomene</u> (DC) Green	-	-	5.5	6.0	2.9	50
<u>Ditremexa occidentalis</u> (L.) Britton & Rose						
<u>Emelista tora</u> (L.) Britton & Rose	-	-	20.5	42.5	15.8	50
<u>Mimosa pudica</u> L.	-	1.5	7.5	7.5	4.1	75
Fam. Cigofilaceae						
<u>Kallstroenia maxima</u> (L.) T & C						
<u>Tribulus cistoides</u> L.						
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer						
<u>Momordica charantia</u> L.						
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)						
<u>Euphorbia hirta</u> (L.) Millsp.	-	-	2.5	17	4.9	50
<u>Euphorbia hypericifolia</u>	-	-	1.5	-	0.4	25
<u>Euphorbia nutans</u> (L.) Polak	-	-	6.5	8	3.6	50
<u>Phyllanthus niruri</u> L.	-	-	17	-	4.2	25
<u>Poinsettia heterophylla</u> (L) Kl & Garoke	-	-	-	0.5	0.1	25
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton	-	-	2.5	14.5	4.2	50
<u>Melochia</u> sp.			1		0.8	25

10.12



Average Number of Individuals per plot in Plot No. E-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave.	
Fam. Fabaceae						
<u>Centrosema pubescens</u> Benth.	-	-	-	0.5	0.1	25
<u>Crotolaria retusa</u> L.						
<u>Crotolaria striata</u>	0.5	8.5	-	-	2.2	50
<u>Desmodium</u> sp.	-	-	0.5	0.5	0.2	50
<u>Dolicholus minimus</u> (L.) Medic.						
<u>Indigofera endecaphyla</u>						
<u>Indigofera suffruticosa</u> Mill.						
<u>Macroptilium lathyroides</u> (L.) Urban.						
<u>Phaseolus adenanthus</u> G.F.W. Meyer						
<u>Stylosanthes hamata</u> (L.) Toubert	117.5	59.5	27.5	112	79.1	100
<u>Tephrosia cinerea</u> Pers.	-	-	7	3.5	2.6	50
Fam. Lamiaceae						
<u>Coleus amboinicus</u> Lour.	0.5	-	-	-	0.1	25
<u>Hyptis capitata</u> Jacq.						
<u>Hyptis</u> sp.						
<u>Ocimum basilicum</u> L.	3	-	-	-	0.8	25
<u>Ocimum sanctum</u> L.	-	-	-	5.5	1.4	25
<u>Salvia serotina</u> L.						
Fam. Malvaceae						
<u>Malacra capitata</u> L.						
<u>Sida carpinifolia</u> L.f.	13.5	20	149	104.5	71.8	100
<u>Urena lobata</u> L.						
<u>Urena trilobata</u> Vell						
Fam. Nictaginaceae						
<u>Boerhaavia diffusa</u> L.	-	1	-	-	0.2	25
Fam. Poligalaceae						
<u>Eisota virgata</u> (SW) Kuntze						
Fam. Portulacaceae						
<u>Portulaca icosandra</u>						
<u>Portulaca oleracea</u> L.	-	-	1.5	-	0.4	25
<u>Portulaca pilosa</u> L.	3	3.5	22	18.5	11.2	100
Fam. Rubiaceae						
<u>Borreria ocimoides</u> (Burn f.) DC.	-	-	-	2	0.5	25
<u>Borreria verticillata</u> (L.) Meyer	-	-	-	0.5	0.1	25
<u>Hemidiodia ocimifolia</u> (Willd)	-	-	5.5	-	1.4	25
Fam. Verbenaceae						
<u>Lippia nodiflora</u> (L) Michx.	-	-	-	0.5	0.1	25
<u>Stachytarpheta jamaicensis</u> Vahl.	3	2.5	19.5	24	12.2	100
		10.13				

APPENDIX 10 (L-2)

Average Number of Individuals per plot in Plot No. 0-2  
of the MORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Percentage
	May	July	Oct.	Jan.	Ave. Density	
Family Poaceae						
<u>Axonopus compressus</u>						
<u>Cenchrus echinatus</u> L.	-	-	-	3	0.8	25
<u>Chloris inflata</u> Link	-	-	23	10	8.2	50
<u>Cynodon dactylon</u> L. (Pers.)						
<u>Dactyloctenium aegyptium</u> L. (Willd.)	-	-	-	28.5	7.1	25
<u>Digitaria decumbens</u>						
<u>Digitaria sanguinalis</u> Scop.	0.5	4.5	66.5	7.5	19.8	100
<u>Eleusine indica</u> L. Gaertn.						
<u>Panicum fasciculatum</u>						
<u>Panicum maximum</u> Jacq.						
<u>Panicum purpurascens</u>						
<u>Paspalum conjugatum</u> Berg.	34.5	83	29.5	63	26.1	100
<u>Paspalum fimbriatum</u> H.B.K.	-	-	0.5		0.2	50
<u>Setaria geniculata</u> (Lam.) Bequv.	0.5	-	-	-	0.1	25
<u>Sporobolus indicus</u> (L.) R. Br.	17.5	40	3.5	18	19.8	100
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze	-	-	-	125.5	31.4	25
<u>Tricholaena repens</u> (Willd.) Hitch.						
<u>Trichachne insularis</u> Nees.						
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.	-	-	-	6.5	1.6	25
<u>Cyperus</u> sp.						
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.	-	-	0.5	-	0.1	25
Fam. Acanthaceae						
<u>Blechnum pyramidatum</u> (Lam.) Urban						
<u>Buellia tuberosa</u> L.	-	-	84.5	44	32.1	50
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.						
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.						
<u>Alternanthera sessilis</u> (L.) R.B.						
<u>Amaranthus dubius</u>						
<u>Gomphrena dispersa</u> Standley	-	-	6	6	.1	25
Fam. Apocinaeae						
<u>Catharantus roseus</u> (L.) Dow						

APPENDIX 10 (L-2)

Sheet 11 of 27 pages.

Average Number of Individuals per plot in Plot No. C-2 of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don						
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)						
Fam. Carduaceae						
<u>Bidens pilosa</u> L.						
<u>Emilia sonchifolia</u> (L.) DC						
<u>Eupatorium odoratum</u> L.						
<u>Parthenium hysterophorus</u> L.						
<u>Senecioides cinerea</u> (L.) Kuntze	-	-	-	17	4.2	25
<u>Synedrella nodiflora</u> (L.) Gaertn.	-	-	-	1.5	0.4	25
<u>Tridax procumbens</u> L.						
<u>Wedelia trilobata</u> (L.) Hitch.						
Fam. Gesalpinaceae						
<u>Chamaecrista aescynomene</u> (DC) Green	-	-	2	5.5	1.9	50
<u>Ditremexa occidentalis</u> (L.) Britton & Rose						
<u>Emelista tora</u> (L.) Britton & Rose	12	3.5	1.5	2	5.0	100
<u>Mimosa pudica</u> L.	-	3.5	9	18	7.6	75
Fam. Cigofilaceae						
<u>Kallstroemia maxima</u> (L.) T & C	-	-	0.5	-	0.1	25
<u>Tribulus cistoides</u> L.						
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer						
<u>Momordica charantia</u> L.						
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)						
<u>Euphorbia hirta</u> (L.) Millsp.	1	1	1.5	4.5	2.0	100
<u>Euphorbia hypericifolia</u>						
<u>Euphorbia nutans</u> (L.) Polak						
<u>Phyllanthus niruri</u> L.						
<u>Poinsettia heterophylla</u> (L) Kl & Garoke						
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton	-	-	0.5	-	0.1	25
<u>Melochia</u> sp.						

10.15

Average Number of Individuals per plot in Plot No C-2  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot				Ave. Density	Frequency
	May	July	Oct.	Jan.		
Fam. Fabaceae						
<u>Centrosema pubescens</u> Benth.	-	-	-	0.5	0.1	25
<u>Crotolaria retusa</u> L.						
<u>Crotolaria striata</u>						
<u>Desmodium</u> sp.	1	0.5	4.5	18.5	6.1	100
<u>Dolicholus minimus</u> (L.) Medic.						
<u>Indigofera endecaphyla</u>						
<u>Indigofera suffruticosa</u> Mill.						
<u>Macroptilium lathyroides</u> (L.) Urban.						
<u>Phaseolus adenanthus</u> G.F.W. Meyer	-	-	0.5	-	0.1	25
<u>Stylosanthes hamata</u> (L.) Toubert	48.5	53.5	145	42.5	72.4	100
<u>Tephrosia cinerea</u> Pers.	2	-	-	5.5	1.9	50
Fam. Lamiaceae						
<u>Coleus amboinicus</u> Lour.	-	0.5	-	-	0.1	25
<u>Hyptis capitata</u> Jacq.						
<u>Hyptis</u> sp.						
<u>Ocimum basilicum</u> L.						
<u>Ocimum sanctum</u> L.						
<u>Salvia serotina</u> L.						
Fam. Malvaceae						
<u>Sida acuta</u> L.						
<u>Sida carpinifolia</u> L.f.	10.5	42	276.5	109.5	109.6	100
<u>Urena lobata</u> L.						
<u>Urena trilobata</u> Vell.						
Fam. Nictaginaceae						
<u>Boerhaavia diffusa</u> L.						
Fam. Foligalaceae						
<u>Lasota virgata</u> (Sw.) Kuntze	1	-	-	-	0.2	25
Fam. Portulacaceae						
<u>Portulaca icosandra</u>						
<u>Portulaca cleracea</u> L.						
<u>Portulaca pilosa</u> L.	0.5	1.5	-	7	2.2	75
Fam. Rubiaceae						
<u>Borreria ocimoides</u> (Burn f.) DC.						
<u>Borreria verticillata</u> (L.) Meyer	0.5	1	-	1.5	0.8	50
<u>Hemidiodia ocimifolia</u> (Willd.)						
Fam. Verbenaceae						
<u>Lippia nodiflora</u> (L.) Michx.						
<u>Stachytarpheta jamaicensis</u> Vahl.	0.5	6	0.5	12	4.8	100
		10.16				

Average Number of Individuals per plot in Plot No. C-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Family Poaceae						
<u>Axonopus compressus</u>						
<u>Cenchrus echinatus</u> L.						
<u>Chloris inflata</u> Link	-	-	0.5	-	0.1	25
<u>Cynodon dactylon</u> L. (Pers.)	0.5	7.5	12.5	5	6.4	100
<u>Dactyloctenium aegyptium</u> L. (Willd)	-	-	-	1	0.2	25
<u>Digitaria decumbens</u>						
<u>Digitaria sanguinalis</u> Scop.	12.5	0.5	4.5	10	6.9	100
<u>Eleusine indica</u> L. Gaertn.						
<u>Panicum fasciculatum</u>						
<u>Panicum maximum</u> Jacq.						
<u>Panicum purpurascens</u>						
<u>Paspalum conjugatum</u> Berg.	47.5	88	217.5	61	103.5	100
<u>Paspalum fimbriatum</u> H.B.K.						
<u>Setaria geniculata</u> (Lam.) Bequv.						
<u>Sporobolus indicus</u> (L.) R. Br.	108.5	59	60.5	28	64	100
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze	-	-	-	28.5	7.1	50
<u>Tricholaena repens</u> (Willd.) Hitch.						
<u>Trichachne insularis</u> Nees.						
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.	53	6.5	21	11.5	23	100
<u>Cyperus</u> sp.	-	-	10.5	60.5	18	50
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.	1.5	2	-	-	0.9	50
Fam. Acanthaceae						
<u>Blechnum pyramidatum</u> (Lam.) Urban						
<u>Ruellia tuberosa</u> L.						
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.						
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.						
<u>Alternanthera sessilis</u> (L.) R.B.						
<u>Amaranthus dubius</u>						
<u>Gomphrena dispersa</u> Standley	4	0.5	304	49	89.4	100
Fam. Apocinaeae						
<u>Catharantlus roseus</u> (L.) Dow						
					10.17	

## APPENDIX 10 (L-2)

Average Number of Individuals per plot in Plot No. C-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don	1	-	-	-	0.2	25
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)						
Fam. Carduaceae						
<u>Bidens pilosa</u> L.	1	-	-	-	0.2	25
<u>Emilia sonchifolia</u> (L.) DC	-	-	-	6	1.5	25
<u>Eupatorium odoratum</u> L.						
<u>Parthenium hysterophorus</u> L.						
<u>Senecioides cinerea</u> (L.) Kuntze	-	-	-	5	1.2	25
<u>Synedrella nodiflora</u> (L.) Gaertn.	1.5	-	-	100	25.4	50
<u>Tridax procumbens</u> L.	-	-	4		1.0	25
<u>Wedelia trilobata</u> (L.) Hitch.						
Fam. Cesalpinaceae						
<u>Chamaecrista aescynomene</u> (DC) Green	1	-	4	4.5	2.4	75
<u>Ditremexa occidentalis</u> (L.) Britton & Rose	-	-	1	1	0.5	50
<u>Emelista tora</u> (L.) Britton & Rose	8.5	2	64	27.5	25.5	100
<u>Mimosa pudica</u> L.						
Fam. Cigofilaceae						
<u>Kallstroenia maxima</u> (L.) T & C						
<u>Tribulus cistoides</u> L.						
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer						
<u>Momordica charantia</u> L.						
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)						
<u>Euphorbia hirta</u> (L.) Millsp.	-	-	6.5	8	3.6	50
<u>Euphorbia hypericifolia</u>	-	-	8	-	2.0	25
<u>Euphorbia nutans</u> (L.) Polak	-	-	3	-	0.8	25
<u>Phyllanthus niruri</u> L.						
<u>Poinsettia heterophylla</u> (L) Kl & Garoke						
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton						
<u>Melochia</u> sp.						

Average Number of Individuals per plot in Plot No. C-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Density
	May	July	Oct.	Jan.	Ave.	
Fam. Fabaceae						
<u>Centrosema pubescens</u> Benth.						
<u>Crotolaria petusa</u> L.				1	0.2	25
<u>Crotolaria striata</u>						
<u>Desmodium</u> sp.	34.5	2.5	86	45.5	42.1	100
<u>Dolicholus minimus</u> (L.) Medic.						
<u>Indigofera endecaphyla</u>						
<u>Indigofera suffruticosa</u> Mill.						
<u>Macroptilium lathyroides</u> (L.) Urban						
<u>Phaseolus adenanthus</u> G.F.W. Meyer	3.5	8	8	2.5	5.5	100
<u>Stylosanthes hamata</u> (L.) Toubert						
<u>Tephrosia cinerea</u> Pers.	-	3	9	-	3.0	50
Fam. Lamiaceae						
<u>Coleus amboinicus</u> Lour.	11	-	-	2.5	3.4	50
<u>Egyptis capitata</u> Jacq.						
<u>Egyptis</u> sp.	-	-	-	3	0.8	25
<u>Ocimum basilicum</u> L.						
<u>Ocimum sanctum</u> L.						
<u>Salvia serotina</u> L.						
Fam. Malvaceae						
<u>Malacra capitata</u> L.						
<u>Sida carpinifolia</u> L.f.	18.5	2.5	87.5	79	46.9	100
<u>Urena lobata</u> L.						
<u>Urena trilobata</u> Vell						
Fam. Nictaginaceae						
<u>Boerhaavea diffusa</u> L.						
Fam. Poligalaceae						
<u>Eisota virgata</u> (SW) Kuntze						
Fam. Portulacaceae						
<u>Portulaca icosandra</u>						
<u>Portulaca oleracea</u> L.	4	-	82.5	-	21.6	50
<u>Portulaca pilosa</u> L.						
Fam. Rubiaceae						
<u>Borreria ocimoides</u> (Burn f.) DC.						
<u>Borreria verticillata</u> (L.) Meyer	2	-	-	-	0.5	25
<u>Hemidiodia coccinifolia</u> (Willd)						
Fam. Verbenaceae						
<u>Lippia nodiflora</u> (L) Michx.						
<u>Stachytarpheta jamaicensis</u> Vahl.						
			10.19			

APPENDIX 10 (L-2)

Average Number of Individuals per plot in Plot No. C-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Family Poaceae						
<u>Axonopus compressus</u>						
<u>Cenchrus echinatus</u> L.	-	-	-	2.5	0.6	25
<u>Chloris inflata</u> Link	-	-	4	13	4.2	50
<u>Cynodon dactylon</u> L. (Pers.)	0.5	-	-	1	0.4	50
<u>Dactyloctenium aegyptium</u> L. (Willd)	-	-	-	8.5	2.1	25
<u>Digitaria decumbens</u>						
<u>Digitaria sanguinalis</u> Scop.	-	1	61	-	15.5	50
<u>Eleusine indica</u> L. Gaertn.						
<u>Panicum fasciculatum</u>						
<u>Panicum maximum</u> Jacq.						
<u>Panicum purpurascens</u>						
<u>Paspalum conjugatum</u> Berg.	112	21.5	99.5	211	111	100
<u>Paspalum fibriatum</u> H.B.K.	-	-	3.5	0.5	1	50
<u>Setaria geniculata</u> (Lam.) Bequv.						
<u>Sporobolus indicus</u> (L.) R. Br.	0.5	38	14.5	9.5	15.6	100
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze						
<u>Tricholaena repens</u> (Willd.) Hitch.	-	1.5	-	-	0.4	25
<u>Trichachne insularis</u> Nees.						
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.	-	4	-	1	1.2	50
<u>Cyperus</u> sp.	-	-	-	2	0.5	25
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.						
Fam. Acanthaceae						
<u>Blechum pyramidatum</u> (Lam.) Urban						
<u>Ruellia tuberosa</u> L.	10	-	17.5	11	9.6	75
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.						
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.						
<u>Alternanthera sessilis</u> (L.) R.B.						
<u>Amaranthus dubius</u>						
<u>Gomphrena dispersa</u> Standley	-	0.5	-	1.0	0.4	50
Fam. Apocinaeae						
<u>Catharanthus roseus</u> (L.) Dow						

10.20



Average Number of Individuals per plot in Plot No. C-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don						
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)						
Fam. Carduaceae						
<u>Bidens pilosa</u> L.						
<u>Emilia sonchifolia</u> (L.) DC						
<u>Eupatorium odoratum</u> L.						
<u>Parthenium hysterophorus</u> L.						
<u>Senecioides cinerea</u> (L.) Kuntze	-	-	-	1	0.2	25
<u>Synedrella nodiflora</u> (L.) Gaertn.	-	-	-	24.5	6.1	25
<u>Tridax procumbens</u> L.						
<u>Wedelia trilobata</u> (L.) Hotch.	-	-	-	0.5	0.1	25
Fam. Cesalpinaceae						
<u>Chamaecrista aescynonene</u> (DC) Green	-	-	3	14.5	5.1	50
<u>Ditremexa occidentalis</u> (L.) Britton & Rose						
<u>Emelista tora</u> (L.) Britton & Rose	-	9	2	17	7	75
<u>Mimosa pudica</u> L.	1	9	15	35.5	15.1	100
Fam. Cigofilaceae						
<u>Kallstroenia maxima</u> (L.) T & C						
<u>Tribulus cistoides</u> L.						
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer						
<u>Momordica charantia</u> L.	-	-	0.5	-	0.1	25
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)						
<u>Euphorbia hirta</u> (L.) Millsp.		0.5	-	0.5	0.2	50
<u>Euphorbia hypericifolia</u>	-	-	1	-	0.2	25
<u>Euphorbia nutans</u> (L.) Pclak	1	1.5	-	-	0.6	50
<u>Phyllanthus niruri</u> L.						
<u>Poinsettia heterophylla</u> (L) Kl & Garoke						
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton	-	-	0.5	-	0.1	25
<u>Melochia</u> sp.						

Average Number of Individuals per plot in Plot No. C-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave.	
Fam. Fabaceae						
<u>Centrosema pubescens</u> Benth.				7	1.3	25
<u>Crotolaria retusa</u> L.						
<u>Crotolaria striata</u>						
<u>Desmodium</u> sp.	-	3.5	3	14	5.1	75
<u>Dolicholus minimus</u> (L.) Medic.						
<u>Indigofera endecaphyla</u>	-	1	-	-	0.2	25
<u>Indigofera suffruticosa</u> Mill.						
<u>Macroptilium lathyroides</u> (L.) Urban						
<u>Phaseolus adenanthus</u> G.F.W. Meyer						
<u>Stylosanthes hamata</u> (L.) Teubert	89	-	237	30	89	75
<u>Tephrosia cinerea</u> Pers.	-	2.5	0.5	-	0.8	50
Fam. Lamiaceae						
<u>Coleus amboinicus</u> Lour.						
<u>Hyptis capitata</u> Jacq.						
<u>Hyptis</u> sp.						
<u>Cuminum basilicum</u> L.						
<u>Cuminum sanctum</u> L.						
<u>Salvia serotina</u> L.						
Fam. Malvaceae						
<u>Malacra capitata</u> L.	-	-	-	0.5	0.1	25
<u>Sida carpinifolia</u> L.f.	42	34	350.5	140.5	141.8	100
<u>Urena lobata</u> L.						
<u>Urena trilobata</u> Vell						
Fam. Nictaginaginaceae						
<u>Boerhaavia diffusa</u> L.	-	0.5	-	-	0.1	25
Fam. Poligalaceae						
<u>Lasota virgata</u> (SW) Kuntze						
Fam. Portulacaceae						
<u>Portulaca icosandra</u>	-	3	-	-	0.2	25
<u>Portulaca oleracea</u> L.						
<u>Portulaca pilosa</u> L.	0.5	-	5.5	2.5	2.4	75
Fam. Rubiaceae						
<u>Borreria ocimoides</u> (Burn f.) Dc.						
<u>Borreria verticillata</u> (L.) Meyer	-	1.5	0.5	-	2.2	75
<u>Hemidiodia ocimifolia</u> (Willd)	-	-	1.5	-	0.2	25
Fam. Verbenaceae						
<u>Lippia nodiflora</u> (L.) Michx.						
<u>Stachytarpheta jamaicensis</u> Vahl.	7.5	0.5	7	2.5	5.9	75
	10.22					

Average Number of Individuals per plot in Plot No. W-2  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Family Poaceae						
<u>Axonopus compressus</u>						
<u>Cenchrus echinatus</u> L.	-	-	1	-	0.2	25
<u>Chloris inflata</u> Link						
<u>Cynodon dactylon</u> L. (Pers.)						
<u>Dactyloctenium aegyptium</u> L. (Willd)	-	-	2.5	4.5	1.8	50
<u>Digitaria decumbens</u>						
<u>Digitaria sanguinalis</u> Scop.						
<u>Eleusine indica</u> L. Gaertn.	-	-	-	0.5	0.1	25
<u>Panicum fasciculatum</u>						
<u>Panicum maximum</u> Jacq.						
<u>Panicum purpurascens</u>						
<u>Paspalum conjugatum</u> Berg.	203.5	77	198.5	285	191	100
<u>Paspalum fimbriatum</u> H.B.K.						
<u>Setaria geniculata</u> (Lam.) Bequv.						
<u>Sporobolus indicus</u> (L.) R. Br.						
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze						
<u>Tricholaena repens</u> (Willd.) Hitch.	1	-	-	-	0.2	25
<u>Trichachne insularis</u> Nees.						
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.	52	96.5	44	-	48.1	75
<u>Cyperus</u> sp.						
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.						
Fam. Acanthaceae						
<u>Blechnum pyramidatum</u> (Lam.) Urban						
<u>Ruellia tuberosa</u> L.						
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.						
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.						
<u>Alternanthera sessilis</u> (L.) R.B.						
<u>Amaranthus dubius</u>						
<u>Gomphrena dispersa</u> Standley	-	-	-	0.5	0.1	25
Fam. Apocinaeae						
<u>Catharanthus roseus</u> (L.) Dow	-	-	0.5	-	0.1	25

Average Number of Individuals per plot in Plot No. W-2  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don						
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)						
Fam. Carduaceae						
<u>Bidens pilosa</u> L.	24	12.5	33.5	80.5	37.6	100
<u>Emilia sonchifolia</u> (L.) DC						
<u>Eupatorium odoratum</u> L.						
<u>Parthenium hysterophorus</u> L.						
<u>Senecioides cinerea</u> (L.) Kuntze	-	-	0.5	-	0.1	25
<u>Synedrella nodiflora</u> (L.) Gaertn.						
<u>Tridax procumbens</u> L.						
<u>Wedelia trilobata</u> (L.) Hitch.						
Fam. Cesalpinaceae						
<u>Chamaecrista aeschynomene</u> (DC) Green	3.5	-	3.5	-	1.8	50
<u>Ditremexa occidentalis</u> (L.) Britton & Rose						
<u>Emelista tora</u> (L.) Britton & Rose	-	-	2	13.5	3.9	50
<u>Mimosa pudica</u> L.	0.5	1	1	31	33.5	100
Fam. Cigofilaceae						
<u>Kallstroenia maxima</u> (L.) T & C						
<u>Tribulus cistoides</u> L.						
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer						
<u>Momordica charantia</u> L.	-	-	-	0.5	0.1	25
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)	-	0.5	-	0.5	1.0	50
<u>Euphorbia hirta</u> (L.) Millsp.	3	-	8	12	5.8	75
<u>Euphorbia hypericifolia</u>	-	-	2	-	0.5	25
<u>Euphorbia nutans</u> (L.) Polak	-	-	-	0.5	0.1	25
<u>Phyllanthus niruri</u> L.						
<u>Poinsettia heterophylla</u> (L) Kl & Garoke						
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton	1	-	-	-	0.2	25
<u>Melochia</u> sp.						

Average Number of Individuals per plot in Plot No. W-2  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Fabaceae						
<u>Centrosema pubescens</u> Benth.	-	-	-	2	0.5	25
<u>Crotolaria retusa</u> L.						
<u>Crotolaria striata</u>						
<u>Desmodium</u> sp.	1.2	2	-	20.5	6	75
<u>Dolicholus minimus</u> (L) Medic.						
<u>Indigofera endecaphyla</u>						
<u>Indigofera suffruticosa</u> Mill.						
<u>Macroptilium lathyroides</u> (L.) Urban			6	-	1.5	25
<u>Phaseolus adenanthus</u> G.F.W. Meyer	-	-				
<u>Stylosanthes hamata</u> (L.) Toubert	-	-	3.5	0.5	1.0	50
<u>Tephrosia cinerea</u> Pers.						
Fam. Lamiaceae						
<u>Coleus amboinicus</u> Lour.						
<u>Hyptis capitata</u> Jacq.						
<u>Hyptis</u> sp.						
<u>Ocimum basilicum</u> L.						
<u>Ocimum sanctum</u> L.						
<u>Salvia serotina</u> L.						
Fam. Malvaceae						
<u>Malacra capitata</u> L.						
<u>Sida carpinifolia</u> L.f.	4	24.5	55.5	54	34.5	100
<u>Urena lobata</u> L.						
<u>Urena trilobata</u> Vell						
Fam. Nictaginaginaceae						
<u>Boerhaavia diffusa</u> L.	0.5	3.5	31.5	3.5	9.8	100
Fam. Poligalaceae						
<u>Passota virgata</u> (SW) Kuntze						
Fam. Portulacaceae						
<u>Portulaca icosandra</u>						
<u>Portulaca oleracea</u> L.						
<u>Portulaca pilosa</u> L.						
Fam. Rubiaceae						
<u>Borreria ocimoides</u> (Burn f.) Dc.						
<u>Borreria verticillata</u> (L.) Meyer	-	-	0.5	-	0.1	25
<u>Hemidiodia ocimifolia</u> (Willd)						
Fam. Verbenaceae						
<u>Lippia nodiflora</u> (L) Michx.						
<u>Stachytarpheta jamaicensis</u> Vahl.	-	-	0.5	-	0.1	25
			10.25			

Average Number of Individuals per plot in Plot No. W-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave.	
Family Poaceae					Density	
<u>Axonopus compressus</u>						
<u>Cenchrus echinatus</u> L.	-	-	-	2.5	0.6	25
<u>Chloris inflata</u> Link	-	-	10.5	7.5	4.5	50
<u>Cynodon dactylon</u> L. (Pers.)	4	-	-	-	1	25
<u>Dactyloctenium aegyptium</u> L. (Willd)	-	-	-	1.5	0.4	25
<u>Digitaria decumbens</u>						
<u>Digitaria sanguinalis</u> Scop.	-	0.5	-	-	0.1	25
<u>Eleusine indica</u> L. Gaertn.						
<u>Panicum fasciculatum</u>						
<u>Panicum maximum</u> Jacq.	29.5	0.5	23.5	33.5	21.8	100
<u>Panicum purpurascens</u>	2.5	-	-	-	0.6	25
<u>Paspalum conjugatum</u> Berg.	57	64.5	336.5	22.5	120.1	100
<u>Paspalum fimbriatum</u> H.B.K.	-	-	-	4	1	25
<u>Setaria geniculata</u> (Lam.) Beauv.						
<u>Sporobolus indicus</u> (L.) R. Br.	4	4.5	9	10.5	7	100
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze						
<u>Tricholaena repens</u> (Willd.) Hitch.	-	15	-	-	3.8	25
<u>Trichachne insularis</u> Nees.						
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.	-	-	3.5	1.5	1.1	50
<u>Cyperus</u> sp.						
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.	-	0.5	32.5	1	8.5	75
Fam. Acanthaceae						
<u>Blechnum pyramidatum</u> (Lam.) Urban						
<u>Ruellia tuberosa</u> L.						
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.						
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.						
<u>Alternanthera sessilis</u> (L.) R.B.						
<u>Amaranthus dubius</u>						
<u>Gomphrena dispersa</u> Standley						
Fam. Apocinaeae						
<u>Catharanthus roseus</u> (L.) Dow						

Average Number of Individuals per plot in Plot No. W-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don						
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)						
Fam. Carduaceae						
<u>Bidens pilosa</u> L.	14.5	1	198.5	283.5	124.4	100
<u>Emilia sonchifolia</u> (L.) DC						
<u>Eupatorium odoratum</u> L.						
<u>Parthenium hysterophorus</u> L.						
<u>Senecioides cinerea</u> (L.) Kuntze						
<u>Synedrella nodiflora</u> (L.) Gaertn.						
<u>Tridax procumbens</u> L.						
<u>Wedelia trilobata</u> (L.) Hotch.	-	-	0.5	-	0.1	25
Fam. Cesalpinaceae						
<u>Chamaecrista aescynomene</u> (DC) Green	-	-	11.5	25.5	9.2	50
<u>Ditremexa occidentalis</u> (L.) Britton & Rose						
<u>Emelista tora</u> (L.) Britton & Rose	2	-	-	44	11.5	50
<u>Mimosa pudica</u> L.						
Fam. Cigofilaceae						
<u>Kallstroenia maxima</u> (L.) T & C						
<u>Tribulus cistoides</u> L.	-	-	2	-	0.5	25
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer	-	-	0.5	-	0.1	25
<u>Momordica charantia</u> L.						
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)	4	-	102	79	46.2	75
<u>Euphorbia hirta</u> (L.) Millsp.	-	-	27.5	-	6.9	25
<u>Euphorbia hypericifolia</u>						
<u>Euphorbia nutans</u> (L.) Polak	-	0.5	15	-	3.9	50
<u>Phyllanthus niruri</u> L.						
<u>Poinsettia heterophylla</u> (L) Kl & Garoke						
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton						
<u>Melochia</u> sp.						

Average Number of Individuals per plot in Plot No. W-3  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave.	
Fam. Fabaceae						
<u>Centrosema pubescens</u> Benth.	-	-	-	0.5	0.1	25
<u>Crotolaria retusa</u> L.						
<u>Crotolaria striata</u>						
<u>Desmodium</u> sp.	1.5	1.5	17.5	24.5	11.2	100
<u>Dolicholus minimus</u> (L) Medic.						
<u>Indigofera endecaphyla</u>						
<u>Indigofera suffruticosa</u> Mill.	2	-	-	-	0.5	25
<u>Macroptilium lathyroides</u> (L.) Urban						
<u>Phaseolus adenanthus</u> G.F.W. Meyer						
<u>Stylosanthes hamata</u> (L.) Toubert	6.5	4	62.5	19.5	23.1	100
<u>Tephrosia cinerea</u> Pers.	0.5	8.5	35	47	22.8	100
Fam. Lamiaceae						
<u>Coleus amboinicus</u> Lour.						
<u>Hyptis capitata</u> Jacq.						
<u>Hyptis</u> sp.						
<u>Ocimum basilicum</u> L.						
<u>Ocimum sanctum</u> L.						
<u>Salvia serotina</u> L.						
Fam. Malvaceae						
<u>Malacra capitata</u> L.						
<u>Sida carpinifolia</u> L.f.	-	3.5	-	8	2.9	50
<u>Urena lobata</u> L.						
<u>Urena trilobata</u> Vell						
Fam. Nictaginaceae						
<u>Boerhaavia diffusa</u> L.	-	-	1.5	-	0.4	25
Fam. Poligalaceae						
<u>Eisota virgata</u> (SW) Kuntze						
Fam. Portulacaceae						
<u>Portulaca icosandra</u>						
<u>Portulaca oleracea</u> L.	-	-	0.5	-	0.1	25
<u>Portulaca pilosa</u> L.	24.5	75	529.5	2.5	157.9	100
Fam. Rubiaceae						
<u>Borreria ocimoides</u> (Burn f.) Dc.						
<u>Borreria verticillata</u> (L.) Meyer						
<u>Hemidiodia ocimifolia</u> (Willd)						
Fam. Verbenaceae						
<u>Lippia nodiflora</u> (L) Michx.						
<u>Stachytarpheta jamaicensis</u> Vahl.						



Average Number of Individuals per plot in Plot No. W-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Family Poaceae						
<u>Axonopus compressus</u>	0.5	-	-	-	0.1	25
<u>Cenchrus echinatus</u> L.	1	-	4	-	1.2	50
<u>Chloris inflata</u> Link	-	-	0.5	-	0.1	25
<u>Cynodon dactylon</u> L. (Pers.)	-	-	-	0.5	0.1	25
<u>Dactyloctenium aegyptium</u> L. (Willd)	-	-	70.5	13	20.9	50
<u>Digitaria recumbens</u>	0.5	-	-	-	0.1	25
<u>Digitaria sanguinalis</u> Scop.	18	14.5	10	25	16.9	100
<u>Eleusine indica</u> L. Gaertn.						
<u>Panicum fasciculatum</u>						
<u>Panicum maximum</u> Jacq.	-	-	7	-	1.8	25
<u>Panicum purpurascens</u>						
<u>Paspalum conjugatum</u> Berg.	83	61.5	105.5	229.5	119.9	100
<u>Paspalum fimbriatum</u> H.B.K.						
<u>Setaria geniculata</u> (Lam.) Bequv.						
<u>Sporobolus indicus</u> (L.) R. Br.	-	12.5	2.5	4	4.8	75
<u>Sporobolus virginicus</u> (L.) Kunth						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze						
<u>Tricholaena repens</u> (Willd.) Hitch.	10.5	-	0.5	-	2.8	50
<u>Trichachne insularis</u> Nees.						
Fam. Cyperaceae						
<u>Cyperus rotundus</u> L.	25	3	877	93.5	249.6	100
<u>Cyperus</u> sp.	-	-	-	16	4	25
Fam. Commelinaceae						
<u>Commelina diffusa</u> Burm f.	-	0.5	-	0.5	0.2	50
Fam. Acanthaceae						
<u>Blechum pyramidatum</u> (Lam.) Urban						
<u>Ruellia tuberosa</u> L.						
Fam. Aizoaceae						
<u>Mollugo berteriana</u> L.	-	-	1	-	0.2	25
Fam. Amaranthaceae						
<u>Achyranthes indica</u> Mill.						
<u>Alternanthera sessilis</u> (L.) R.B.						
<u>Amaranthus dubius</u>						
<u>Gomphrena dispersa</u> Standley	5.5	4.5	158.5	85	63.4	100
Fam. Apocinaeae						
<u>Catharanthus roseus</u> (L.) Dow						
			10.29			

Average Number of Individuals per plot in Plot No. W-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave. Density	
Fam. Boraginaceae						
<u>Cordia corymbosa</u> G. Don						
Fam. Caparidaceae						
<u>Cleome gynandra</u> (L.)	-	-	0.5	-	0.1	25
Fam. Carduaceae						
<u>Bidens pilosa</u> L.	2	3	-	3.5	2.1	75
<u>Emilia sonchifolia</u> (L.) DC						
<u>Eupatorium odoratum</u> L.						
<u>Parthenium hysterophorus</u> L.						
<u>Senecioides cinerea</u> (L.) Kuntze	-	-	9	6.5	3.9	50
<u>Synedrella nodiflora</u> (L.) Gaertn.						
<u>Tridax procumbens</u> L.						
<u>Wedelia trilobata</u> (L.) Hitch.	8	15	5	0.5	7.1	100
Fam. Cesalpinaceae						
<u>Chamaecrista aeschynomene</u> (DC) Green	1.5	2	0.5	5.5	2.4	100
<u>Ditremexa occidentalis</u> (L.) Britton & Rose						
<u>Emelista tora</u> (L.) Britton & Rose						
<u>Mimosa pudica</u> L.	2	2.5	-	11.5	4	75
Fam. Cigofilaceae						
<u>Kallstroenia maxima</u> (L.) T & C						
<u>Tribulus cistoides</u> L.						
Fam. Cucurbitaceae						
<u>Luffa cylindrica</u> (L.) Roemer						
<u>Momordica charantia</u> L.						
Fam. Euphorbiaceae						
<u>Adenoropium gossipifolium</u> L. (Pohl)						
<u>Euphorbia hirta</u> (L.) Millsp.	0.5	-	-	38.5	9.8	50
<u>Euphorbia hypericifolia</u>	-	-	16	-	4	25
<u>Euphorbia nutans</u> (L.) Polak						
<u>Phyllanthus niruri</u> L.	-	1	66	-	16.8	50
<u>Poinsettia heterophylla</u> (L) Kl & Garoke						
Fam. Esterculiaceae						
<u>Melochia pyramidata</u> (L) Britton	-	-	24	-	6	25
<u>Melochia</u> sp.						

10.30

Average Number of Individuals per plot in Plot No. W-4  
of the NORCO NP-1 Site for 1974-1975.

SCIENTIFIC NAME	Average Individuals per plot					Frequency
	May	July	Oct.	Jan.	Ave.	
Fam. Fabaceae						
<i>Centrosema pubescens</i> Benth.	-	-	-	5	1.2	25
<i>Crotolaria retusa</i> L.	-	-	2.5	-	0.6	25
<i>Crotolaria striata</i>						
<i>Desmodium</i> sp.	2	6	58	18	11	100
<i>Dolicholus minimus</i> (L.) Medic.						
<i>Indigofera endecaphyla</i>						
<i>Indigofera suffruticosa</i> Mill.						
<i>Macroptilium lathyroides</i> (L.) Urban	-	-	1	-	0.2	25
<i>Phaseolus adenanthus</i> G.F.W. Meyer	-	-	1	-	0.2	25
<i>Stylosanthes hamata</i> (L.) Toubert						
<i>Tephrosia cinerea</i> Pers.	-	3.5	-	-	0.9	25
Fam. Lamiaceae						
<i>Coleus amboinicus</i> Lour.						
<i>Egyptis caritata</i> Jacq.						
<i>Egyptis</i> sp.	-	-	-	2.5	0.6	25
<i>Ocimum basilicum</i> L.						
<i>Ocimum sanctum</i> L.						
<i>Salvia serotina</i> L.						
Fam. Malvaceae						
<i>Malacra caritata</i> L.						
<i>Sida carpinifolia</i> L.f.	-	-	-	0.5	0.1	25
<i>Urena lobata</i> L.	-	-	33.5	1.5	8.8	50
<i>Urena trilobata</i> Vell	3	0.5	-	2.5	1.5	75
Fam. Nictaginaceae						
<i>Boerhaavea diffusa</i> L.						
Fam. Poligalaceae						
<i>Elisota virgata</i> (Sw) Kuntze						
Fam. Portulacaceae						
<i>Portulaca icosandra</i>						
<i>Portulaca oleracea</i> L.						
<i>Portulaca pilosa</i> L.	18.5	3.5	1.5	39.5	15.8	100
Fam. Rubiaceae						
<i>Borreria ocimoides</i> (Burn f.) Dc.						
<i>Borreria verticillata</i> (L.) Meyer						
<i>Hemidiodia ocimifolia</i> (Willd)	-	-	6.5	1.5	2	50
Fam. Verbenaceae						
<i>Lippia nodiflora</i> (L) Michx.						
<i>Stachytarpheta jamaicensis</i> Vahl.	-	-	-	1.5	0.4	25
	10.31					

APPENDIX 10

(L-3)

PLANT DENSITY (AVERAGE NUMBER OF INDIVIDUALS/m<sup>2</sup>) IN EAST, CENTER AND WEST  
TRANSECTS OF THE NORCO NP-1 EXCLUSION ZONE

Family	North Slope				Ridge				South Slope										
	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4	
<u>Axonopus compressus</u>			0.8	0.2			0.6					13.4					0.6		0.1
<u>Cenchrus echinatus</u> L.	0.9		8.2		1.5		4.5										4.2		1.2
<u>Chloris inflata</u> Link	21.6			1.8			1.0										0.4		0.1
<u>Cynodon dactylon</u> L. (Pers.)	17.2		7.1		0.4		0.4										2.1		20.9
<u>Dactyloctenium aegyptium</u> L. (Willd.)																			0.1
<u>Digitaria decumbens</u>	0.4		19.8		6.9		0.1					1.0					15.5		16.9
<u>Digitaria sanguinalis</u> Scop.				0.1	0.6														
<u>Eleusine indica</u> L. Gaertn.	0.1				103.5														1.8
<u>Panicum fasciculatum</u>							21.8												
<u>Panicum maximum</u> Jacq.							0.6												
<u>Panicum purpurascens</u>	24.8		26.4	191	132.5		120.1					72.5	111.0				1.0		119.9
<u>Paspalum conjugatum</u> Berg.			0.2				1.0					0.9							
<u>Paspalum fimbriatum</u> H.B.K.			0.1																
<u>Setaria geniculata</u> (Lam.) Bequv.			19.8				64.0					0.1					15.6		4.8
<u>Sporobolus indicus</u> (L.) R. Br.																			
<u>Sporobolus virginicus</u> (L.) Kunth			31.4				7.1												
<u>Stenotaphrum secundatum</u> (Walt) Kuntze				0.2	0.6							0.6					0.4		2.8
<u>Tricholena repens</u> (Willd.) Hitch.																			
<u>Trichachne insularis</u> Nees.																			
Fam. Cyperaceae																			
<u>Cyperus rotundus</u> L.	572.5		1.6	48.1			23.0					1.5					1.2		249.6
<u>Cyperus</u> sp.							18.0										0.5		4.0
Fam. Commelinaceae																			
<u>Commelina diffusa</u> Burm f.			0.1				0.9					8.5							0.2
Fam. Acanthaceae																			
<u>Blechnum pyramidatum</u> (Lam.) Urban																			
<u>Euellia tuberosa</u> L.	6.9		32.1		6.9												9.6		
Fam. Aizoaceae																			
<u>Mollugo berteriana</u> L.																			0.2

APPENDIX 10  
(L-3)

Fam. Amaranthaceae	E-2	C-2	N-2	E-3	O-3	W-3	E-4	C-4	W-4
<u>Achyranthes indica</u> Mill.				5.5			0.4		
<u>Alternanthera sessilis</u> (L.) R.B.	0.1			0.5					
<u>Amaranthus dubius</u>			0.1	2.6	89.4		0.1	0.4	63.4
<u>Gomphrena dispersa</u> Standley									
Fam. Apocynaceae									
<u>Catharanthus roseus</u> (L.) Dow			0.1						
Fam. Boraginaceae									
<u>Cordia corymbosa</u> G. Don					0.2				
Fam. Caparidaceae									
<u>Cleome gynandra</u> (L.)									0.1
Fam. Carduaceae									
<u>Bidens pilosa</u> L.	0.8		37.6	0.5	0.2	124.4	0.2		2.1
<u>Emilia sonchifolia</u> (L.) DC	0.1				1.5				
<u>Eupatorium odoratum</u> L.				1.0			0.5		
<u>Parthenium hysterophorus</u> L.	0.1	4.2	0.1		1.2		2.5	0.2	3.9
<u>Senecioides cinerea</u> (L.) Kuntze		0.4			25.4			6.1	
<u>Synedrella nodiflora</u> (L.) Gaertn.	0.1				1.0				
<u>Tridax procumbens</u> L.						0.1		0.1	7.1
<u>Wedelia trilobata</u> (L.) Hitch.									
Fam. Cesalpiniaceae									
<u>Chamaecrista aeschynomene</u> (DC) Green	2.2	1.9	1.8		2.4	9.2	2.9	5.1	2.4
<u>Ditremexa occidentalis</u> (L.) Britton & Rose	7.2	5.0	3.9	1.0	0.5		15.8	7.0	
<u>Emelista tora</u> (L.) Britton & Rose	0.1	7.6	33.5	0.9	25.5	11.5	4.1	15.1	4.0
<u>Mimosa pudica</u> L.				0.4					
Fam. Cigofilaceae									
<u>Kallstroenia maxima</u> (L.) T & C	0.6	0.1							0.5
<u>Tribulus cistoides</u> L.									

APPENDIX 10  
(L-3)

	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4
<u>Fam. Cucurbitaceae</u>									
<u>Luffa cylindrica</u> (L.) Roemer									
<u>Momordica charantia</u> L.			0.1			0.1		0.1	
<u>Fam. Euphorbiaceae</u>									
<u>Adenoropium gossipifolium</u> L. (Fohl)			1.0	0.2	3.6	46.2			
<u>Euphorbia hirta</u> (L.) Millsp.	14.5	2.0	5.8	5.8		6.9	4.9	0.2	9.8
<u>Euphorbia hypericifolia</u>			0.5		2.0		0.4	0.2	4.0
<u>Euphorbia nutans</u> (L.) Polak	19.6		0.1	0.6	0.8	3.9	3.6	0.6	16.8
<u>Phyllanthus niruri</u> L.				0.2			4.2		
<u>Poinsettia heterophylla</u> (L) Kl & Garoke	11.1			0.1			0.1		
<u>Fam. Esterculiaceae</u>									
<u>Melochia pyramidata</u> (L) Britton	0.1	0.1	0.2	4.4			4.2	0.1	6.0
<u>Melochia</u> sp.							0.2		
<u>Fam. Fabaceae</u>									
<u>Centrosema pubescens</u> Benth.	1.1	0.1	0.5			0.1	0.1	1.8	1.2
<u>Crotolaria retusa</u> L.	0.1			0.5	0.2		2.2		0.6
<u>Crotolaria striata</u>	5.9	6.1	6.0		42.1	11.2	0.2	5.1	11.0
<u>Desmodium</u> sp.	4.4								
<u>Dolicholus minimus</u> (L) Medic.								0.2	
<u>Indigofera endecaphylla</u>	0.1				0.5				
<u>Indigofera suffruticosa</u> Mill.									
<u>Macroptilium lathyroides</u> (L.) Urban						0.5			
<u>Phaseolus adenanthus</u> G.F.W. Meyer	2.2	0.1	1.5	0.4					0.2
<u>Stylosanthes hamata</u> (L.) Toubert		72.4			5.5	23.1	79.1	89	0.2
<u>Tephrosia cinerea</u> Pers.	2.1	1.9	1.0	0.2	3.0	22.8	2.6	0.8	0.9
<u>Fam. Lamiaceae</u>									
<u>Coleus amboinicus</u> Lour.		0.1			3.4		0.1		
<u>Hyptis capitata</u> Jacq.	0.5				0.8		0.8		0.6
<u>Hyptis</u> sp.									
<u>Ocimum basilicum</u> L.									
<u>Ocimum sanctum</u> L.									
<u>Salvia serotina</u> L.	1.9						1.4		

APPENDIX 10  
(L-3)

	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4
Fam. Malvaceae								
<u>Malachra capitata</u> L.	11.9	109.6	34.5	155.4	46.9	2.9	71.8	0.1
<u>Sida carpinifolia</u> L. f.								148.0
<u>Urena lobata</u> L.								
<u>Urena trilobata</u> Vell								
Fam. Mictaginaginaceae								
<u>Boerhaavia diffusa</u> L.			9.8	2.8		0.4	0.2	0.1
Fam. Poligalaceae								
<u>Elaeagnus virgata</u> (SW) Kuntze	0.2							
Fam. Portulacaceae								
<u>Portulaca icosandra</u>				0.6	21.6	0.1	0.4	0.8
<u>Portulaca oleracea</u> L.				2.4			11.2	2.4
<u>Portulaca pilosa</u> L.	2.2							
Fam. Rubiaceae								
<u>Borreria ocimoides</u> (Burn f.) Dc.		0.8	0.1	0.6	0.5	152.9	0.5	2.2
<u>Borreria verticillata</u> (L.) Meyer							1.4	0.4
<u>Hemidiodia ocimifolia</u> (Willd)								
Fam. Verbenaceae								
<u>Lippia nodiflora</u> (L) Michx.							0.1	
<u>Stachytarpheta jamaicensis</u> Vahl.	5.9	396.5	0.1	3.1			12.2	5.9

APPENDIX 10  
(L-4)

SPECIES COMPOSITION (%) IN EAST, CENTER AND WEST TRANSECTS OF THE NORCO NP-1 EXCLUSION ZONE.

Family Poacea	E-2	E-3	E-4	C-2	C-3	C-4	W-2	W-3	W-4
<u>Axonopus compressus</u>	2.9								0.02
<u>Cenchrus echinatus</u> L.				0.2		0.1	0.1	0.1	0.2
<u>Cyperis inflata</u> Link	0.1		4.1	2.1	0.02	1.0		0.8	0.02
<u>Cyperus dactylon</u> L. (Pers.)	2.3	0.4		1.8	1.3	0.1		0.2	0.02
<u>Cyperoctenium aegyptium</u> L. (Willd)		0.1			0.05	0.5	0.5	0.1	3.5
<u>Digitaria decumbens</u>									0.02
<u>Digitaria sanguinalis</u> Scop.	0.05	0.2	0.3	5.0	1.4	3.5	0.4	0.02	2.8
<u>Eleusine indica</u> L. Gaertn.	0.02								
<u>Panicum fasciculatum</u>									
<u>Panicum maximum</u> Jacq.								3.7	0.3
<u>Panicum purpurascens</u>								0.1	
<u>Paspalum conjugatum</u> Berg.	3.3	39.2	22.4	13.2	20.4	24.8	54.0	20.3	20.5
<u>Paspalum fibriatum</u> H.B.K.			0.3	0.06		0.2		0.2	
<u>Setaria geniculata</u> (Lam.) Beauv.				0.03					
<u>Sporobolus indicus</u> (L.) R. Br.				5.0	12.6			1.2	0.8
<u>Sporobolus virginicus</u> (L.) Kunth			0.04						
<u>Stenotaphrum secundatum</u> (Walt) Kuntze				7.9	1.4				
<u>Tricholaena repens</u> (Willd.) Hitch.		0.2						0.6	0.5
<u>Trichachne insularis</u> Nees.			0.2						
Fam. Cyperaceae									
<u>Cyperus rotundus</u> L.	77.2		0.5	0.4	4.5	0.3	13.6	0.2	41.9
<u>Cyperus</u> sp.					3.5	0.1			0.7
Fam. Commelinaceae									
<u>Commelina diffusa</u> Burm f.				0.03	0.2			1.4	0.02
Fam. Acanthaceae									
<u>Blechnum pyramidatum</u> (Lam.) Urban		0.3							
<u>Ruellia tuberosa</u> L.	0.9	2.0	1.6	8.1		2.1			
Fam. Aizoaceae									
<u>Mollugo berteriana</u> L.									0.02



APPENDIX 10  
(L-4)

	E-2	E-3	E-4	C-2	C-3	C-4	W-2	W-3	W-4
<u>Fam. Amaranthaceae</u>									
<u>Achyrocline indica</u> Mill.		1.6	0.1						
<u>Alternanthera sessilis</u> (L.) R.B.	0.02								
<u>Amaranthus dubius</u>		0.1							
<u>Combrenea dispersa</u> Standley		0.8	0.04	0.8	17.6	0.1	0.4		10.6
<u>Fam. Apocinaeae</u>									
<u>Catharanthus roseus</u> (L.) Dow							0.04		
<u>Fam. Boraginaceae</u>									
<u>Cordia corymbosa</u> G. Don					0.05				
<u>Fam. Caparidaceae</u>									
<u>Cleome gynandra</u> (L.)									
									0.02
<u>Fam. Carduaceae</u>									
<u>Bidens pilosa</u> L.	0.6	0.1	0.1		0.05		10.6	21.0	0.4
<u>Emilia sonchifolia</u> (L.) DC					0.3				
<u>Eupatorium odoratum</u> L.	0.02								
<u>Parthenium hysterophorus</u> L.		1.8	0.2						
<u>Senecioides chinerea</u> (L.) Kuntze	0.02		0.8	1.1	0.2	0.1	0.04		0.6
<u>Synedrella nodiflora</u> (L.) Gaertn.				0.1	5.0	1.4			
<u>Tridax procumbens</u> L.					0.2				
<u>Wedelia trilobata</u> (L.) Hotch.	0.02					0.03		0.02	1.2
<u>Fam. Cesalpinaceae</u>									
<u>Chamaecrista aescynomene</u> (DC) Green	0.3		0.8	0.5	0.5	1.1	0.5	1.6	0.4
<u>Ditremsa occidentalis</u> (L.) Britton & Rose		0.3							
<u>Emelista tora</u> (L.) Britton & Rose	1.0	0.2	4.8	1.3	0.1	1.6	1.1		
<u>Mimosa pudica</u> L.	0.02	0.1	1.3	1.9	5.0	3.4	2.4	1.9	0.7
<u>Fam. Cigofilaceae</u>									
<u>Kallstroemia maxima</u> (L.) T & C	0.08			0.03					
<u>Tribulus cistoides</u> L.									0.1

APPENDIX 10  
(L-4)

	E-2	E-3	E-4	C-2	C-3	C-4	W-2	W-3	W-4
<u>Fam. Cucurbitaceae</u>									
<u>Luffa cylindrica</u> (L.) Roemer						0.03	0.01	0.02	
<u>Momordica charantia</u> L.									
<u>Fam. Euphorbiaceae</u>									
<u>Adenoropium gossipifolium</u> L. (Pohl)	0.1						0.1		
<u>Euphorbia hirta</u> (L.) Millsp.	2.0	1.7	1.5	0.5	0.7	0.1	1.6	7.8	1.6
<u>Euphorbia hypericifolia</u>		0.4	0.1			0.1	0.1	1.2	0.7
<u>Euphorbia nutans</u> (L.) Polak		0.2	1.1		0.4	0.1	0.01		
<u>Phyllanthus niruri</u> L.	2.6	0.1	1.3		0.2			0.6	2.8
<u>Poinsettia heterophylla</u> (L) Kl & Garoke	1.5	0.04	0.04						
<u>Fam. Sterculiaceae</u>									
<u>Melochia pyramidata</u> (L) Britton	0.02	1.3	1.3	0.03		0.03	0.1		1.0
<u>Melochia</u> sp.			0.1						
<u>Fam. Fabaceae</u>									
<u>Centrosema pubescens</u> Benth.	0.2		0.04	0.03		0.4	0.1	0.02	0.2
<u>Crotolaria retusa</u> L.	0.02	0.1	0.7		0.05				0.1
<u>Crotolaria striata</u>	0.8		0.1	1.5	8.3	1.1	1.7	1.9	3.5
<u>Desmodium</u> sp.	0.6								
<u>Dolicholus minimus</u> (L) Medic.						0.1		0.1	
<u>Indigofera endecaphylla</u>	0.02								
<u>Indigofera suffruticosa</u> Mill.									
<u>Macroptilium lathyroides</u> (L.) Urban									
<u>Phaseolus adenanthus</u> G.F.W. Meyer	0.3	0.1	24.4	0.03			0.4		0.02
<u>Stylosanthes hamata</u> (L.) Toubert			0.8	18.2	1.1	19.9		3.9	0.02
<u>Tephrosia cinerea</u> Pers.	0.3	0.1	0.8	0.5	0.6	0.2	0.3	3.8	0.1
<u>Fam. Lamiaceae</u>									
<u>Coleus amboinicus</u> Lour.			0.04	0.03	0.7				
<u>Hyptis capitata</u> Jacq.	0.07								
<u>Hyptis</u> sp.		0.1							0.1
<u>Ocimum basilicum</u> L.			0.2		0.2				
<u>Ocimum sanctum</u> L.			0.4						
<u>Salvia serotina</u> L.	0.2								

APPENDIX 10  
(L-4)

	E-2	E-3	E-4	C-2	C-3	C-4	W-2	W-3	W-4
Fam. Malvaceae									
<u>Malachra capitata</u> L.						0.03			
<u>Sida carpinifolia</u> L.f.	1.6	45.9	22.1	27.6	9.2	31.6	9.8	0.5	0.02
<u>Urena lobata</u> L.									1.5
<u>Urena trilobata</u> Vell									0.2
Fam. Nictaginaceae									
<u>Boerhaavia diffusa</u> L.		0.8	0.1			0.03	2.8	0.1	
Fam. Polygalaceae									
<u>Elsota virgata</u> (SW) Kuntze				0.06					
Fam. Portulacaceae									
<u>Portulaca icosandra</u>						0.2			
<u>Portulaca oleracea</u> L.		0.2	0.1					0.02	
<u>Portulaca pilosa</u> L.		0.7	3.5	0.6	4.3	0.5		26.6	2.6
Fam. Rubiaceae									
<u>Borreria ocimoides</u> (Burn f.) Dc.									
<u>Borreria verticillata</u> (L.) Meyer		0.2	0.04	0.2	0.1	0.5	0.04		0.3
<u>Hemiodia ocimifolia</u> (Willd)			0.4			0.1			
Fam. Verbenaceae									
<u>Lippia nodiflora</u> (L) Michx.									
<u>Stachytarpheta jamaicensis</u> Vahl.	0.8	0.9	3.8	1.2		1.3	0.04		0.1

APPENDIX 10  
(L-5)

SPECIES COMPOSITION (%) BY SLOPE ASPECT: NORTH FACING, RIDGE AND SOUTH FACING SLOPES IN THE NORCO NP-1 EXCLUSION ZONE.

Family Poaceae	NORTH FACING				RIDGE				SOUTH FACING									
	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4
<u>Axonopus compressus</u>	2.9	0.2	0.1			0.1											0.1	0.02
<u>Cenchrus echinatus</u> L.	0.1	2.1			0.02	0.8	4.1										1.0	0.02
<u>Chloris inflata</u> Link				0.4	1.3	0.2											0.1	0.02
<u>Cynodon dactylon</u> L. (Pers.)	2.3	1.8	0.5	0.1	0.05	0.1											0.5	3.5
<u>Dactyloctenium aegyptium</u> L. (Willd)																		0.02
<u>Digitaria decumbens</u>	0.05	5.0	0.04	0.2	1.4	0.02	0.3										3.5	2.8
<u>Digitaria sanguinalis</u> Scop.																		
<u>Eleusine indica</u> L. Gaertn.	0.02																	
<u>Panicum fasciculatum</u>																		
<u>Panicum maximum</u> Jacq.						3.7												0.3
<u>Panicum purpurascens</u>						0.1												
<u>Paspalum conjugatum</u> Berg.	3.3	13.2	54.0	39.2	20.4	20.3	22.4	24.8	20.5									
<u>Paspalum fimbriatum</u> H.B.K.		0.06				0.2	0.3	0.2										
<u>Setaria geniculata</u> (Lam.) Bequv.		0.03																
<u>Sporobolus indicus</u> (L.) R.Br.		5.0			12.6	1.2			0.8									
<u>Sporobolus virginicus</u> (L.) Kunth																		
<u>Stenotaphrum secundatum</u> (Walt) Kuntze		7.9	0.1	0.2	1.4	0.6	0.2											
<u>Tricholaena repens</u> (Willd.) Hitch.																		
<u>Trichachne insularis</u> Nees.																		
Fam. Cyperaceae																		
<u>Cyperus rotundus</u> L.	77.2	0.4	13.6		4.5	0.2	0.5	0.3	41.9									
<u>Cyperus</u> Sp.					3.5			0.1	0.7									
Fam. Commelinaceae																		
<u>Commelina diffusa</u> Burn f.		0.03			0.2	1.4			0.02									
Fam. Acanthaceae																		
<u>Blechnum pyramidatum</u> (Lam.) Urban				0.3														
<u>Ruellia tuberosa</u> L.	0.9	8.1		2.0			1.6	2.1										
Fam. Aizoaceae																		
<u>Mollugo berteriana</u> L.																		0.02

APPENDIX 10 (L-5)

	NORTH FACING				RIDGE				SOUTH FACING			
	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4			
Fam. Amaranthaceae												
<u>Achyranthes indica</u> Mill.				1.6			0.1					
<u>Alternanthera sessilis</u> (L.) R.B.	0.02			0.1								
<u>Amaranthus dubius</u>		0.8	0.4	0.8	17.6		0.04	0.1	10.6			
<u>Gomphrena dispersa</u> Standley												
Fam. Apocinaceae												
<u>Catharanthus roseus</u> (L.) Dow				0.04								
Fam. Boraginaceae												
<u>Cordia corymbosa</u> G. Don					0.05							
Fam. Caparidaceae												
<u>Cleome gynandra</u> (L.)												0.02
Fam. Carduaceae												
<u>Bidens pilosa</u> L.	0.6		10.6	0.1	0.03	21.0	0.1		0.4			
<u>Emilia sonchifolia</u> (L.) DC	0.02				0.3							
<u>Eupatorium odoratum</u> L.							0.2					
<u>Parthenium hysterophorus</u> L.				1.8			0.8					
<u>Senecioides cinerea</u> (L.) Kuntze	0.02	1.1	0.04		0.2			0.1	0.6			
<u>Syntherisma nodiflora</u> (L.) Gaertn.		0.1			5.0			1.4				
<u>Tridax procumbens</u> L.					0.2							
<u>Wedelia trilobata</u> (L.) Hitch.	0.02					0.02		0.03	1.2			
Fam. Cesalpiniaceae												
<u>Chamaecrista aescynomene</u> (DC) Green	0.3	0.5	0.5		0.5	1.6	0.8	1.1	0.4			
<u>Ditremexa occidentalis</u> (L.) Britton & Rose	1.0	1.3	1.1	0.3	0.1		4.8	1.6				
<u>Emelista tora</u> (L.) Britton & Rose	0.02	1.9	2.4	0.1	5.0	1.9	1.3	3.4	0.7			
<u>Mimosa pudica</u> L.												
Fam. Cigofilaceae												
<u>Kallstroemia maxima</u> (L.) T. & C.	0.08	0.03										
<u>Tribulus cistoides</u> L.										0.1		

APPENDIX 10 (L-5)

	NORTH FACING				RIDGE				SOUTH FACING			
	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4			
<u>Fam. Cucurbitaceae</u>												
<u>Luffa cylindrica</u> (L.) Roemer			0.1			0.02		0.03				
<u>Momordica charantia</u> L.												
<u>Fam. Euphorbiaceae</u>												
<u>Adenoropium gossipifolium</u> L. Pohl.			0.1	0.1								
<u>Euphorbia hirta</u> (L.) Millsp.	2.0	0.5	1.6	1.7	0.7	7.8	1.5	0.1	1.6			
<u>Euphorbia hypericifolia</u>			0.1	0.4		1.2	0.1	0.1	0.7			
<u>Euphorbia nutans</u> (L.) Polak			0.01	0.2	0.4		1.1	0.1				
<u>Phyllanthus niruri</u> L.	2.6			0.1	0.2	0.6	1.3		2.8			
<u>Poinsettia heterophylla</u> (L) Kl & Garoke	1.5			0.04			0.04					
<u>Fam. Esterculiaceae</u>												
<u>Melochia pyramidata</u> (L) Britton	0.02	0.03	0.1	1.3			1.3	0.03	1.0			
<u>Melochia</u> sp.							0.1					
<u>Fam. Fabaceae</u>												
<u>Centrosema pubescens</u> Benth.	0.2	0.03	0.1			0.02	0.04	0.4	0.2			
<u>Crotolaria retusa</u> L.									0.1			
<u>Crotolaria striata</u>	0.02			0.1	0.05		0.7					
<u>Desmodium</u> sp.	0.8	1.5	1.7		8.3	1.9	0.1	1.1	3.5			
<u>Dolicholus minimus</u> (L) Medic.	0.6											
<u>Indigofera endecaphylla</u>						0.1		0.1				
<u>Indigofera suffruticosa</u> Mill.	0.02											
<u>Macroptilium lathyroides</u> (L) Urban	0.03	0.03	0.4	0.1					0.02			
<u>Phaseolus adenanthus</u> G.F.W. Meyer		18.2			1.1	3.9	24.4	19.9	0.02			
<u>Stylosanthes hamata</u> (L) Taubert	0.3	0.5	0.3	0.1	0.6	3.8	0.8	0.2				
<u>Tephrosia cinerea</u> Pers.												
<u>Fam. Lamiaceae</u>												
<u>Coleus amboinicus</u> Lour.		0.03			0.7		0.04					
<u>Hyptis capitata</u> Jacq.	0.07											0.1
<u>Hyptis</u> sp.												
<u>Cocimam basilicum</u> L.					0.1							
<u>Cocimam sanctum</u> L.							0.2					
<u>Salvia serotima</u> L.	0.2				0.2		0.4					

APPENDIX 10 (L-5)

	NORTH FACING				RIDGE				SOUTH FACING										
	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4	
<u>Fam. Malvaceae</u>																			
<u>Malachra capitata</u> L.																			
<u>Sida carpinifolia</u> L.f.	1.6	27.6	9.8	45.9	9.2	0.5	22.1	31.6	0.03										0.02
<u>Urena lobata</u> L.																			1.5
<u>Urena trilobata</u> Vell.																			0.2
<u>Fam. Nictaginaceae</u>																			
<u>Boerhaavia diffusa</u> L.			2.8	0.8		0.1	0.1	0.03											
<u>Fam. Poligalaceae</u>																			
<u>Elsota virgata</u> (SW) Kuntze		0.06																	
<u>Fam. Portulacaceae</u>																			
<u>Portulaca icosandra</u>				0.2		0.02		0.2											0.2
<u>Portulaca oleracea</u> L.				0.7	4.3	26.6		3.5	0.1										0.1
<u>Portulaca pilosa</u> L.		0.6																	2.6
<u>Fam. Rubiaceae</u>																			
<u>Borreria ocimoides</u> (Burn f.) Dc.									0.2										0.3
<u>Borreria verticillata</u> (L) Meyer		0.2	0.04	0.2	0.1				0.04	0.5									0.1
<u>Hemidiodia ocimifolia</u> (Willd & Schum)									0.4	0.1									
<u>Fam. Verbenaceae</u>																			
<u>Lippia nodiflora</u> (L) Michx.									0.04										0.1
<u>Stachytarpheta jamaicensis</u> Vahl.	0.8	1.2	0.04	0.9					3.8	1.3									0.1

APPENDIX 10  
(L-6)

FREQUENCY OF PLANT SPECIES IN THE ONE SQUARE METER PLOTS OF THE NORCO NP-1 SITE.

Family Poaceae	North Slope				Bridge			South Slope			Frequency
	E-2	C-2	W-2	E-5	C-3	W-3	E-4	C-4	W-4		
<u>Axonopus compressus</u>		P				P				P	11
<u>Eleocharis echinata</u> L.		P				P				P	56
<u>Eleocharis inflata</u> Link		P				P				P	78
<u>Eleocharis acetylosa</u> L. (Pers.)		P		P		P				P	78
<u>Eleocharis acetylosa</u> L. (Willd)		P		P		P				P	78
<u>Eleocharis acedens</u>		P				P				P	11
<u>Eleocharis acedens</u> Scop.		P				P				P	78
<u>Eleusine indica</u> L. Gaertn.		P				P				P	22
<u>Panicum fasciculatum</u>											11
<u>Panicum maximum</u> Jacq.											22
<u>Panicum purpurascens</u>											11
<u>Paspalum conjugatum</u> Berg.		P				P				P	100
<u>Paspalum fimbriatum</u> H.B.K.		P				P				P	44
<u>Paspalum aciculata</u> (Lam.) Bequv.		P				P				P	11
<u>Sporobolus indicus</u> (L.) R.Br.		P				P				P	66
<u>Sporobolus virginicus</u> (L.) Kunth		P				P				P	00
<u>Stenotaphrum secundatum</u> (Walt) Kuntzw											22
<u>Tricholena nemens</u> (Willd.) Hitch.											66
<u>Trichachne insularis</u> Nees.											00
Fam. Cyperaceae											
<u>Cyperus rotundus</u> L.		P				P				P	29
<u>Cyperus</u> sp.										P	33
Fam. Commelinaceae											
<u>Commelina diffusa</u> Burm f.										P	44
Fam. Acanthaceae											
<u>Blechnum pyramidalatum</u> (Lam.) Urban											11
<u>Ruellia tuberosa</u> L.										P	44
Fam. Aizoaceae											
<u>Mollugo berteriana</u> L.										P	11



APPENDIX 10  
(L-6)

Fam. Malvaceae	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4	% Frequency
<u>Malachra capitata</u> L.								P	P	11
<u>Sida carpinifolia</u> L. f.	P	P	P	P	P	P	P	P	P	100
<u>Urena lobata</u> L.									P	11
<u>Urena trilobata</u> Vell.									P	11
Fam. Nictaginaginaceae										
<u>Boerhaavia diffusa</u> L.			P	P	P	P	P	P		56
Fam. Poligalaceae										
<u>Elsota virgata</u> (SW) Kuntze		P								11
Fam. Portulacaceae										
<u>Portulaca icosandra</u>								P		11
<u>Portulaca oleracea</u> L.				P	P	P	P	P	P	33
<u>Portulaca pilosa</u> L.		P		P	P	P	P	P	P	78
Fam. Rubiaceae										
<u>Borreria oelmeoides</u> (Burn f.) Dc.							P			11
<u>Borreria verticillata</u> (L) Meyer		P	P	P	P		P	P	P	78
<u>Hemidiodia ocimifolia</u> (Willd. & Schum)							P	P		22
Fam. Verbenaceae										
<u>Lippia nodiflora</u> (L) Michx.										
<u>Stachytarpheta jamaicensis</u> Vahl.	P	P	P	P	P		P	P	P	11
										78

APPENDIX 10  
(L-6)

Fam.	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4	% Frequency
<b>Fam. Cucurbitaceae</b>									
<u>Cuffa cylindrica</u> (L) Roemer					P		P		11
<u>omordica charantia</u> L.		P							22
<b>Fam. Euphorbiaceae</b>									
<u>denoropium gossipifolium</u> L. (Pohl.)		P	P		P	P			44
<u>euphorbia hirta</u> (L) Millsp.	P	P	P		P	P	P	P	89
<u>euphorbia hypericifolia</u>		P		P		P	P	P	59
<u>euphorbia nutans</u> (L.) Polak	P	P	P	P	P	P	P	P	78
<u>hillanthus niruri</u> L.			P			P			33
<u>joinsethia heterophylla</u> (L) Kl & Garoke	P		P			P			33
<b>Fam. Esterculiaceae</b>									
<u>lelochia pyramidata</u> (L) Britton	P	P	P			P	P	P	78
<u>lelochia</u> sp.						P			11
<b>Fam. Fabaceae</b>									
<u>lentrosema pubescens</u> Benth.	P	P			P	P	P	P	78
<u>protolaria retusa</u> L.	P							P	11
<u>protolaria striata</u>	P	P	P	P		P	P	P	44
<u>desmodium</u> sp.	P								89
<u>colicholus minimus</u> (L) Medic.	P				P				11
<u>indigofera endecaphylla</u>	P								22
<u>indigofera suffruticosa</u> Mill.									11
<u>macropitillium lathyroides</u> (L) Urban	P	P	P				P	P	11
<u>Phaseolus adenanthus</u> G.F.W. Meyer	P	P							56
<u>Stylosanthes hamata</u> (L) Taubert	P	P	P	P	P	P	P	P	56
<u>Tephrosia cinerea</u> Pers.	P	P	P	P	P	P	P	P	100
<b>Fam. Lamiaceae</b>									
<u>Coleus amboinicus</u> Lour.				P		P			33
<u>Hyptis capitata</u> Jacq.	P							P	11
<u>Hyptis</u> sp.			P						33
<u>Ocimum basilicum</u> L.						P			11
<u>Ocimum sanctum</u> L.						P			11
<u>Salvia serotima</u> L.	P								11

APPENDIX 10  
(L-6)

Fam. Amaranthaceae	E-2	C-2	W-2	E-3	C-3	W-3	E-4	C-4	W-4	% Frequency
<u>Chyranthes indica</u> Mill.				P			P			22
<u>Amaranthus sessoris</u> (L.) R.B.	P			P						11
<u>Amaranthus dubius</u>		P	P	P	P		P	P	P	11
<u>Amaranthus dispersa</u> Standley										78
Fam. Apocynaceae										
<u>Atharanthus rosus</u> (L.) Dow			P							11
Fam. Boraginaceae										
<u>Jordia corymbosa</u> G. Don					P					11
Fam. Caparidaceae										
<u>Mecme synandra</u> (L.)									P	11
Fam. Carduaceae										
<u>Hidens pilosa</u> L.	P		P	P	P	P	P		P	78
<u>Milia sonchifolia</u> (L.) DC					P					11
<u>Lupatorium odoratum</u> L.	P									11
<u>Parthenium hysterophorus</u> L.				P			P			22
<u>Benecioides cinerea</u> (L.) Kuntze	P		P		P		P	P	P	78
<u>Synedrella nodiflora</u> (L.) Gaertn.		P	P	P	P		P	P		33
<u>Eriqax procumbens</u> L.	P									22
<u>Wedelia trilobata</u> (L.) Hitch.						P		P	P	33
Fam. Cesalpinaceae										
<u>Thamaecrista aeschynomene</u> (DC) Green	P	P	P		P	P	P	P	P	89
<u>Pithecomia occidentalis</u> (L.) Britton & Rose				P	P					22
<u>Melista tora</u> (L.) Britton & Rose	P	P	P	P	P		P	P	P	78
<u>Mimosa pudica</u> L.	P	P	P	P	P	P	P	P	P	89
Fam. Cigofilaceae										
<u>Callstroemia maxima</u> (L.) T & C	P	P								22
<u>Tribulus cisticoides</u> L.						P				11



APPENDIX 11

SUMMARY OF NUMBER OF SPECIES FOUND BY SAMPLING PLOT  
FOR EACH OF THE QUARTERLY PERIODS.

Transect	Plot No.	<u>Grasses</u>			
		"Dry Season" 1974		"Wet Season" 1974	
		May	July	October	January
East	E-2	3	2	5	5
	E-3	3	2	1	3
	E-4	2	2	5	4
Center	C-2	4	3	5	9
	C-3	5	5	7	8
	C-4	3	5	5	9
West	W-2	3	2	4	3
	W-3	5	5	5	8
	W-4	7	4	9	7

Transect	Plot No.	<u>Forbs</u>			
		May	July	October	January
East	E-2	4	4	18	18
	E-3	10	9	16	14
	E-4	8	8	19	23
Center	C-2	10	10	14	16
	C-3	13	6	13	14
	C-4	7	13	15	17
West	W-2	8	6	14	13
	W-3	8	7	14	10
	W-4	9	10	16	16

## Appendix 11 (continued)

NUMBER OF INDIVIDUALS AND SPECIES  
COMPOSITION OF ONE SQUARE METER QUADRATS

Plot No. E-2,1

May, July, October, 1974

NO DATA

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
E-2,1	<u>Cyperus rotundus</u>	173	30.2
	<u>Dactyloctenium aegyptium</u>	82	14.3
	<u>Chamaesyce hirta</u>	63	11.0
	<u>Sida carpinifolia</u>	62	10.8
	<u>Euphorbia hirta</u>	40	7.0
	<u>Stachytarpheta jamaicensis</u>	39	6.8
	<u>Emelista tora</u>	31	5.4
	<u>Paspalum conjugatum</u>	26	4.5
	<u>Cynodon dactylon</u>	15	2.6
	<u>Bidens pilosa</u>	10	1.7
	<u>Poinsettia heterophylla</u>	10	1.7
	<u>Chloris inflata</u>	7	1.2
	<u>Centrosema pubescens</u>	6	1.0
	<u>Chamaecrista aeschynomene</u>	6	1.0
	<u>Tephrosia cinerea</u>	4	0.7
	<u>Desmodium sp.</u>	2	0.35
	<u>Mimosa pudica</u>	1	0.17
	<u>Senecioides cinerea</u>	1	0.17
Total		572	

MAY, JULY, OCTOBER, 1974

E-2,2	<u>Cyperus rotundus</u>	801	92.49
	<u>Poinsettia heterophylla</u>	30	3.46
	<u>Emelista tora</u>	15	1.73
	<u>Cynodon dactylon</u>	12	1.38
	<u>Hyptis capitata</u>	4	0.46
	<u>Digitalis sanguinalis</u>	3	0.34
	<u>Indigofera suffruticosa</u>	1	0.11
Total		866	

## Appendix 11 (continued)

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
E-2,2	<u>Cyperus rotundus</u>	938	89.5
	<u>Paspalum conjugatum</u>	77	7.3
	<u>Bidens pilosa</u>	10	0.95
	<u>Euphorbia hirta</u>	7	0.67
	<u>Poinsettia heterophylla</u>	7	0.67
	<u>Stachytarpheta jamaicensis</u>	4	0.38
	<u>Centrosema pubescens</u>	3	0.29
	<u>Cyndon dactylon</u>	1	0.1
	<u>Eupatorium odoratum</u>	1	0.1
Total		1048	

MAY, JULY, OCTOBER, 1974

E-3,1	<u>Paspalum conjugatum</u>	169	88.02
	<u>Ruellia tuberosa</u>	7	3.64
	<u>Sida carpinifolia</u>	7	3.64
	<u>Emelista tora</u>	5	2.60
	<u>Euphorbia hirta</u>	2	1.04
	<u>Gomphrena dispersa</u>	2	1.04
Total		192	

JANUARY, 1975

E-3,1	<u>Sida carpinifolia</u>	411	61.6
	<u>Paspalum conjugatum</u>	147	22.0
	<u>Melochia pyramidata</u>	29	4.3
	<u>Achyranthes indica</u>	14	2.1
	<u>Ruellia tuberosa</u>	14	2.1
	<u>Parthenium hysterophorus</u>	11	1.6
	<u>Stachytarpheta jamaicensis</u>	10	1.5
	<u>Portulaca pilosa</u>	7	1.0
	<u>Borreria verticillata</u>	5	0.75
	<u>Chamaesyce nutans</u>	4	0.6
	<u>Eleusine indica</u>	4	0.6
	<u>Chamaesyce hirta</u>	3	0.45
	<u>Dactyloctenium aegyptium</u>	3	0.45
	<u>Euphorbia hirta</u>	2	0.3
	<u>Gomphrena dispersa</u>	2	0.3
	<u>Adenoropium gossypifolium</u>	1	0.15
Total		667	

## Appendix 11 (continued)

MAY, JULY, OCTOBER, 1974

Plot No.	Species	Individuals/ Plot	Percent
E-3,2	<u>Sida carpinifolia</u>	176	56.41
	<u>Paspalum conjugatum</u>	81	25.96
	<u>Parthenium hysterophorus</u>	35	11.21
	<u>Boerhaavea diffusa</u>	9	2.88
	<u>Tricholaena repens</u>	5	1.60
	<u>Cynodon dactylon</u>	3	0.96
	<u>Amaranthus dubius</u>	1	0.32
	<u>Poinsettia heterophylla</u>	1	0.32
	<u>Stachytarpheta jamaicensis</u>	1	0.32
Total		312	

JANUARY, 1975

E-3,2	<u>Paspalum conjugatum</u>	200	43.0
	<u>Sida carpinifolia</u>	165	35.5
	<u>Euphorbia hirta</u>	22	4.7
	<u>Ruellia tuberosa</u>	17	3.7
	<u>Stachytarpheta jamaicensis</u>	14	3.0
	<u>Portulaca pilosa</u>	10	2.2
	<u>Blechum pyramidatum</u>	8	1.7
	<u>Gomphrena dispersa</u>	8	1.7
	<u>Achyranthes indica</u>	6	1.3
	<u>Ditremexa occidentalis</u>	5	1.1
	<u>Hyptis sp.</u>	3	0.65
	<u>Chamaesyce hirta</u>	2	0.43
	<u>Emelista tora</u>	2	0.43
	<u>Parthenium hysterophorus</u>	2	0.43
	<u>Eleusine indica</u>	1	0.22
Total		465	

Plot No. E-4,1

May, July, October, 1974

NO DATA

JANUARY, 1975

E-4,1	<u>Stylosanthus hamata</u>	165	33.4
	<u>Sida carpinifolia</u>	130	26.3
	<u>Paspalum conjugatum</u>	75	15.2
	<u>Melochia pyramidata</u>	26	5.3
	<u>Senecioides cinerea</u>	20	4.0
	<u>Ruellia tuberosa</u>	16	3.2
	<u>Styachytarpheta jamaicensis</u>	12	2.4
	<u>Chloris inflata</u>	9	1.8



## Appendix 11 (continued)

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
E-4,1	<u>Chamaesyce nutans</u>	7	1.4
	<u>Paspalum fimbriatum</u>	7	1.4
	<u>Sporobolus virginicus</u>	5	1.0
	<u>Euphorbia hirta</u>	4	0.81
	<u>Trichachne insularis</u>	4	0.81
	<u>Parthenium hysterophorus</u>	3	0.61
	<u>Bidens pilosa</u>	1	0.20
	<u>Borreria verticillata</u>	1	0.20
	<u>Chamaesyce hirta</u>	1	0.20
	<u>Lippia nodiflora</u>	1	0.20
Total		494	

MAY, JULY, OCTOBER, 1974

E-4,2	"Hoja Menuda"	235	67.33
	<u>Chloris inflata</u>	32	9.16
	<u>Paspalum conjugatum</u>	29	8.30
	<u>Sida carpinifolia</u>	27	7.73
	<u>Ocimum basilicum</u>	6	1.71
	<u>Portulaca pilosa</u>	6	1.71
	<u>Ruellia tuberosa</u>	6	1.71
	<u>Stachytarpheta jamaicensis</u>	6	1.71
	<u>Coleus amboinicus</u>	1	0.28
	<u>Crotalaria striata</u>	1	0.28
Total		349	

JANUARY, 1975

E-4,2	<u>Emelista tora</u>	85	18.8
	<u>Sida carpinifolia</u>	79	17.5
	<u>Stylosanthes hamata</u>	59	13.1
	<u>Paspalum conjugatum</u>	49	10.9
	<u>Stachytarpheta jamaicensis</u>	36	8
	<u>Portulaca pilosa</u>	33	7.3
	<u>Euphorbia hirta</u>	23	5.1
	<u>Mimosa pudica</u>	15	3.3
	<u>Chamaecrista aescynomene</u>	12	2.7
	<u>Ocimum sanctum</u>	11	2.4
	<u>Chamaesyce nutans</u>	9	2
	<u>Chloris inflata</u>	8	1.8
	<u>Tephrosia cinerea</u>	7	1.6
	<u>Chamaesyce hirta</u>	6	1.3
	<u>Borreria occimoides</u>	4	0.89
	<u>Achyranthes indica</u>	3	0.67
	<u>Melochia pyramidata</u>	3	0.67
	<u>Melochia sp.</u>	2	0.44

## Appendix 11 (continued)

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
E-4,2	<u>Bidens pilosa</u>	1	0.22
	<u>Centrosema pubescens</u>	1	0.22
	<u>Desmodium sp.</u>	1	0.22
	<u>Parthenium hysterophorus</u>	1	0.22
	<u>Poinsettia heterophylla</u>	1	0.22
	<u>Sporobolus virginicus</u>	1	0.22
	<u>Trichachne insularis</u>	1	0.22
Total		451	

Plot No. C-2,1

May, July, October, 1974

NO DATA

JANUARY, 1975

C-2,1	<u>Stenotaphrum secundatum</u>	251	38.4
	<u>Sida carpinifolia</u>	102	15.6
	<u>Desmodium sp.</u>	37	5.7
	<u>Mimosa pudica</u>	35	5.6
	<u>Chamaecrista aeschynomene</u>	34	5.2
	<u>Senecioides cinerea</u>	34	5.2
	<u>Dactyloctenium aegyptium</u>	29	4.4
	<u>Sporobolus virginicus</u>	29	4.4
	<u>Digitaria sanguinalis</u>	15	2.3
	<u>Paspalum conjugatum</u>	14	2.1
	<u>Portulaca pilosa</u>	14	2.1
	<u>Gomphrena dispersa</u>	13	2
	<u>Cyperus rotundus</u>	13	2
	<u>Tephrosia cinerea</u>	10	1.5
	<u>Cenchrus equinatus</u>	6	0.92
	<u>Euphorbia hirta</u>	5	0.77
	<u>Chamaesyce hirta</u>	4	0.61
	<u>Synedrella nodiflora</u>	3	0.46
	<u>Borreria verticillata</u>	2	0.31
	<u>Emelista tora</u>	2	0.31
<u>Stylosanthus hamata</u>	1	0.15	
Total		653	

MAY, JULY, OCTOBER, 1974

C-2,2	"Hoja menuda"	97	37.16
	<u>Paspalum conjugatum</u>	69	26.43
	<u>Sporobolus virginicus</u>	35	13.40
	<u>Emelista tora</u>	24	9.19
	<u>Sida carpinifolia</u>	21	8.04
	<u>Tephrosia cinerea</u>	4	1.53

## Appendix 11 (continued)

MAY, JULY, OCTOBER, 1974 (cont.)

Plot No.	Species	Individuals/ Plot	Percent
C-2,2	<u>Euphorbia hirta</u>	2	0.76
	<u>Desmodium sp.</u>	2	0.76
	<u>Elsota virgata</u>	2	0.76
	<u>Borreria verticillata</u>	1	0.38
	<u>Digitaria sanguinalis</u>	1	0.38
	<u>Portulaca pilosa</u>	1	0.38
	<u>Setaria geniculata</u>	1	0.38
	<u>Stachytarpheta jamaicensis</u>	1	0.38
Total		261	

JANUARY, 1975

C-2,2	<u>Sida carpinifolia</u>	117	24.4
	<u>Paspalum conjugatum</u>	112	23.4
	<u>Ruellia tuberosa</u>	88	18.4
	<u>Stylosanthes hamata</u>	84	17.5
	<u>Dactyloctenium aegyptium</u>	28	5.8
	<u>Chloris inflata</u>	20	4.2
	<u>Stachytarpheta jamaicensis</u>	12	2.5
	<u>Sporobolus virginicus</u>	7	1.5
	<u>Emelista tora</u>	4	0.84
	<u>Chamaecrista aeschynomene</u>	2	0.42
	<u>Borreria verticillata</u>	1	0.21
	<u>Centrosema pubescens</u>	1	0.21
	<u>Mimosa pudica</u>	1	0.21
	<u>Paspalum fimbriatum</u>	1	0.21
<u>Tephrosia cinerea</u>	1	0.21	
Total		479	

MAY, JULY, OCTOBER, 1974

C-3,1	<u>Sporobolus virginicus</u>	159	37.06
	<u>Desmodium sp.</u>	64	14.91
	<u>Paspalum conjugatum</u>	63	14.68
	<u>Cyperus rotundus</u>	55	12.82
	<u>Sida carpinifolia</u>	31	7.22
	<u>Coleus amboinicus</u>	14	3.26
	<u>Mimosa pudica</u>	11	2.56
	"Hoja menuda"	7	1.63
	<u>Portulaca pilosa</u>	7	1.63
	<u>Digitaria sanguinalis</u>	6	1.39
	<u>Gomphrena dispensa</u>	3	0.69
	<u>Synedrella nodiflora</u>	3	0.69
	<u>Borreria verticillata</u>	2	0.46
	<u>Commelina diffusa</u>	2	0.46
	<u>Bidens pilosa</u>	1	0.23
	<u>Chamaecrista aeschynomene</u>	1	0.23
Total		429	

## Appendix 11 (continued)

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
C-3,1	<u>Paspalum conjugatum</u>	105	22.7
	<u>Gomphrena dispersa</u>	60	13
	<u>Stenotaphrum secundatum</u>	57	12.3
	<u>Cyperus sp.</u>	53	11.5
	<u>Desmodium sp.</u>	49	10.6
	<u>Sporobolus virginicus</u>	33	7.1
	<u>Mimosa pudica</u>	32	6.9
	<u>Digitaria sanguinalis</u>	20	4.3
	<u>Euphorbia hirta</u>	14	3.0
	<u>Cynodon dactylon</u>	9	1.9
	<u>Emilia sonchifolia</u>	6	1.3
	"Oregano cimarron"	5	1.1
	<u>Senecioides cinerea</u>	5	1.1
	<u>Chamaecrista aeschynomene</u>	4	0.87
	<u>Sida carpinifolia</u>	4	0.87
	<u>Dactyloctenium aegyptium</u>	2	0.43
	<u>Hyptis sp.</u>	2	0.43
<u>Crotolaria striata</u>	1	0.22	
<u>Synedrella nodiflora</u>	1	0.22	
Total		462	

MAY, JULY, OCTOBER, 1974

C-3,2	<u>Sporobolus virginicus</u>	58	29.74
	<u>Cyperus rotundus</u>	51	26.15
	<u>Paspalum conjugatum</u>	32	16.41
	<u>Digitaria sanguinalis</u>	19	9.74
	<u>Coleus amboinicus</u>	8	4.10
	<u>Mimosa pudica</u>	6	3.07
	<u>Desmodium sp.</u>	5	2.56
	<u>Gomphrena dispensa</u>	5	2.56
	<u>Sida carpinifolia</u>	6	3.07
	<u>Cordia corymbosa</u>	1	0.51
	<u>Cynodon doctylon</u>	1	0.51
	<u>Chamaecrista aeschynomene</u>	1	0.51
	<u>Commelina diffusa</u>	1	0.51
	<u>Portulaca pilosa</u>	1	0.51
Total		195	

JANUARY, 1975

C-3,2	<u>Synedrella nodiflora</u>	199	32
	<u>Sida carpinifolia</u>	154	24.8
	<u>Cyperus sp.</u>	68	10.9
	<u>Desmodium sp.</u>	42	6.8
	<u>Gomphrena dispersa</u>	38	6.1

## Appendix 11 (continued)

JANUARY, 1975 (cont)

Plot No.	Species	Individuals/ Plot	Percent
C-3,2	<u>Cyperus rotundus</u>	23	3.7
	<u>Mimosa pudica</u>	23	3.7
	<u>Sporobolus virginicus</u>	23	3.7
	<u>Paspalum conjugatum</u>	17	2.7
	<u>Chamaecrista aeschynomene</u>	5	0.80
	<u>Stylosanthus hamata</u>	5	0.80
	<u>Chamaesyce hirta</u>	2	0.32
	<u>Cynodon dactylon</u>	1	0.16
	<u>Emelista tora</u>	1	0.16
	<u>Hyptis sp.</u>	1	0.16
Total		622	

Plot No. C-4,1

May, July, October, 1974

NO DATA

JANUARY, 1975

C-4,1	<u>Paspalum conjugatum</u>	181	31.6
	<u>Sida carpinifolia</u>	146	25.5
	<u>Mimosa pudica</u>	55	9.6
	<u>Synedrella nodiflora</u>	49	8.6
	<u>Chamaecrista aeschynomene</u>	35	6.1
	<u>Emelista tora</u>	17	3
	<u>Ruellia tuberosa</u>	14	2.4
	<u>Borreria verticillata</u>	13	2.3
	<u>Desmodium sp.</u>	13	2.3
	<u>Sporobolus virginicus</u>	12	2.1
	<u>Portulaca pilosa</u>	7	1.2
	<u>Centrosema pubescens</u>	4	0.7
	<u>Chloris inflata</u>	4	0.7
	<u>Cyperus sp.</u>	4	0.7
	<u>Cenchrus equinatus</u>	3	0.52
	<u>Stachytarpheta jamaicensis</u>	3	0.52
	<u>Cyperus rotundus</u>	2	0.35
	<u>Dactyloctenium aegyptium</u>	2	0.35
	<u>Senecioides cinerea</u>	2	0.35
	<u>Euphorbia hirta</u>	1	0.17
	<u>Gomphrena dispersa</u>	1	0.17
	<u>Stylosanthus hamata</u>	1	0.17
	<u>Malachra sp.</u>	1	0.17
	<u>Paspalum fimbriatum</u>	1	0.17
<u>Wedelia trilobata</u>	1	0.17	
Total		572	

## Appendix 11 (continued)

MAY, JULY, OCTOBER, 1974

Plot No.	Species	Individuals/ Plot	Percent
C-4,2	<u>Paspalum conjugatum</u>	221	42.58
	"Hoja menuda"	178	33.84
	<u>Sida carpinifolia</u>	84	15.96
	<u>Ruellia tuberosa</u>	20	3.80
	<u>Stachytarpheta jamaicensis</u>	15	2.85
	<u>Mimosa pudica</u>	2	0.38
	<u>Cynodon dactylon</u>	1	0.19
	<u>Portulaca pilosa</u>	1	0.19
	<u>Sporobolus virginicus</u>	1	0.19
Total		526	

JANUARY, 1975

C-4,2	<u>Sida carpinifolia</u>	135	34.1
	<u>Stylosanthes hamata</u>	59	14.9
	<u>Paspalum conjugatum</u>	30	7.6
	<u>Choloris inflata</u>	22	5.6
	<u>Emelista tora</u>	17	4.3
	<u>Mimosa pudica</u>	16	4.0
	<u>Dactyloctenium aegyptium</u>	15	3.8
	Desmodium sp.	15	3.8
	<u>Stachytarpheta jamaicensis</u>	14	3.5
	<u>Centrosema pubescens</u>	10	2.5
	<u>Ruellia tuberosa</u>	7	1.8
	<u>Sporobolus virginicus</u>	7	1.8
	<u>Cenchrus equinatus</u>	2	0.51
	<u>Cynodon dactylon</u>	2	0.51
	<u>Borreria verticillata</u>	1	0.25
	<u>Gomphrena dispersa</u>	1	0.25
<u>Ruellia tuberosa</u>	1	0.25	
Total		396	

MAY, JULY, OCTOBER, 1974

W-2,1	<u>Paspalum conjugatum</u>	285	67.21
	<u>Cyperus rotundus</u>	88	20.75
	<u>Bidens pilosa</u>	36	8.49
	<u>Euphorbia hirta</u>	6	1.41
	<u>Melochia pyramidata</u>	2	0.47
	Desmodium sp.	2	0.47
	<u>Sida carpinifolia</u>	2	0.47
	<u>Tricholaena repens</u>	2	0.47
	<u>Boerhaavea diffusa</u>	1	0.23
	Total		424

## Appendix 11 (continued)

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
W-2,1	<u>Paspalum conjugatum</u>	315	56.1
	<u>Bidens pilosa</u>	113	20.1
	<u>Mimosa pudica</u>	37	6.6
	<u>Sida carpinifolia</u>	28	5
	<u>Desmodium sp.</u>	21	3.7
	<u>Chamaesyce hirta</u>	14	2.5
	<u>Achyranthes indica</u>	7	1.2
	<u>Emelista tora</u>	5	0.89
	<u>Euphorbia hirta</u>	4	0.71
	<u>Digitaria sanguinalis</u>	3	0.53
	<u>Dactyloctenium aegyptium</u>	1	0.18
	<u>Eleusine indica</u>	1	0.18
	<u>Gomphrena dispersa</u>	1	0.18
Total		561	

MAY, JULY, OCTOBER, 1974

W-2,2	<u>Paspalum conjugatum</u>	122	73.93
	<u>Cyperus rotundus</u>	16	9.39
	<u>Bidens pilosa</u>	12	7.27
	<u>Chamaecrista aeschynomene</u>	7	4.24
	<u>Sida carpinifolia</u>	6	3.63
	<u>Desmodium sp.</u>	1	0.60
	<u>Mimosa pudica</u>	1	0.60
Total		165	

JANUARY, 1975

W-2,2	<u>Paspalum conjugatum</u>	255	53.2
	<u>Sida carpinifolia</u>	80	16.7
	<u>Bidens pilosa</u>	48	10.0
	<u>Mimosa pudica</u>	25	5.2
	<u>Emelista tora</u>	22	4.6
	<u>Desmodium sp.</u>	20	4.2
	<u>Dactyloctenium aegyptium</u>	8	1.7
	<u>Boerhaavea diffusa</u>	7	1.5
	<u>Centrosema pubescens</u>	4	0.84
	<u>Euphorbia hirta</u>	4	0.84
	<u>Chamaesyce hirta</u>	2	0.42
	<u>Adenoropium gossypifolium</u>	1	0.21
	<u>Chamaesyce nutans</u>	1	0.21
	<u>Momordica charantia</u>	1	0.21
<u>Temphrosia cinerea</u>	1	0.21	
Total		479	

## Appendix 11 (continued)

MAY, JULY, OCTOBER, 1974

Plot No.	Species	Individuals/ Plot	Percent
W-3,1	<u>Panicum maximum</u>	59	46.82
	<u>Paspalum conjugatum</u>	23	18.25
	<u>Bidens pilosa</u>	14	11.11
	<u>Cynodon dactylon</u>	8	6.34
	"Hoja menuda"	7	5.55
	<u>Panicum purpurascens</u>	5	3.96
	<u>Euphorbia hirta</u>	4	3.17
	<u>Desmodium sp.</u>	3	2.38
	<u>Indigofera endecaphylla</u>	3	2.38
Total		126	

JANUARY, 1975

W-3,1	<u>Bidens pilosa</u>	159	34.9
	<u>Chamaesyce hirta</u>	67	14.7
	<u>Panicum maximum</u>	51	11.2
	<u>Euphorbia hirta</u>	43	9.4
	<u>Mimosa pudica</u>	33	7.2
	<u>Stylosanthus hamata</u>	26	5.7
	<u>Chamaecrista aeschynomene</u>	21	4.6
	<u>Paspalum conjugatum</u>	16	3.5
	<u>Sporobolus virginicus</u>	14	3.1
	<u>Desmodium sp.</u>	7	1.5
	<u>Sida carpinifolia</u>	7	1.5
	<u>Tephrosia cinerea</u>	5	1.1
	<u>Portulaca pilosa</u>	3	0.66
	<u>Commelina diffusa</u>	2	0.44
	<u>Chloris inflata</u>	1	0.22
<u>Mimosa pudica</u>	1	0.22	
Total		456	

MAY, JULY, OCTOBER, 1974

W-3,2	<u>Paspalum conjugatum</u>	81	47.92
	<u>Portulaca pilosa</u>	49	28.99
	<u>Bidens pilosa</u>	15	8.87
	<u>Sporobolus virginicus</u>	8	4.73
	"Hoja menuda"	6	3.55
	<u>Euphorbia hirta</u>	4	2.36
	<u>Mimosa pudica</u>	4	2.36
	<u>Indigofera endecaphylla</u>	1	0.59
	<u>Tephrosia cinerea</u>	1	0.59
Total		169	



## Appendix 11 (continued)

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
W-3,2	<u>Bidens pilosa</u>	80	19.0
	<u>Panicum maximum</u>	67	16
	<u>Mimosa pudica</u>	54	12.9
	<u>Chamaesyce hirta</u>	44	10.5
	<u>Desmodium sp.</u>	42	10.0
	<u>Chamaecrista aescynomene</u>	30	7.1
	<u>Paspalum conjugatum</u>	29	6.9
	<u>Chloris inflata</u>	14	3.3
	<u>Stylosanthes hamata</u>	13	3.1
	<u>Sida carpinifolia</u>	9	2.1
	<u>Paspalum fimbriatum</u>	8	1.9
	<u>Sporobolus virginicus</u>	7	1.7
	<u>Cenchrus equinatus</u>	5	1.2
	<u>Tephrosia cinerea</u>	5	1.2
	<u>Euphorbia hirta</u>	4	0.95
	<u>Cyperus rotundus</u>	3	0.71
	<u>Dactyloctenium aegyptium</u>	3	0.71
<u>Portulaca pilosa</u>	2	0.48	
<u>Centrosema pubescens</u>	1	0.24	
Total		420	

MAY, JULY, OCTOBER, 1974

W-4,1	<u>Paspalum conjugatum</u>	107	60.79
	<u>Cyperus rotundus</u>	38	29.59
	<u>Wedelia trilobata</u>	16	9.09
	<u>Desmodium sp.</u>	3	1.70
	<u>Bidens pilosa</u>	2	1.13
	<u>Cenchrus echinatus</u>	2	1.13
	<u>Chamaecrista aescynomene</u>	2	1.13
	<u>Gomphrena dispersa</u>	2	1.13
	<u>Axonopus compressus</u>	1	0.56
	<u>Euphorbia hirta</u>	1	0.56
	<u>Digitaria decumbens</u>	1	0.56
	<u>Urena trilobata</u>	1	0.56
	Total		176

## Appendix 11 (continued)

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
W-4,1	<u>Paspalum conjugatum</u>	249	37.3
	<u>Cyperus sp.</u>	187	28.0
	<u>Digitaria sanguinalis</u>	62	9.3
	<u>Gomphrena dispersa</u>	51	7.6
	<u>Euphorbia hirta</u>	30	4.5
	<u>Desmodium sp.</u>	21	3.1
	<u>Portulaca pilosa</u>	21	3.1
	<u>Mimosa pudica</u>	16	2.5
	<u>Senecioides cinerea</u>	11	1.6
	<u>Urena lobata</u>	5	0.75
	<u>Sporobolus virginicus</u>	3	0.45
	<u>Bidens pilosa</u>	2	0.3
	<u>Dactyloctenium aegyptium</u>	2	0.3
	<u>Hyptis sp.</u>	2	0.3
	<u>Stachytarpheta jamaicensis</u>	2	0.3
	<u>Centrosema pubescens</u>	1	0.15
	<u>Commelina diffusa</u>	1	0.15
<u>Cynodon dactylon</u>	1	0.15	
Total		667	

MAY, JULY, OCTOBER, 1974

W-4,2	<u>Paspalum conjugatum</u>	59	31.72
	<u>Portulaca pilosa</u>	37	19.89
	<u>Digitaria sanguinalis</u>	35	18.81
	<u>Cyperus rotundus</u>	12	6.44
	<u>Gomphrena dispersa</u>	9	4.83
	<u>Urena trilobata</u>	5	2.68
	<u>Mimosa pudica</u>	4	2.15
	<u>Bidens pilosa</u>	2	1.07
	<u>Chamaecrista aeschynomene</u>	1	0.53
	<u>Desmodium sp.</u>	1	0.53
Total		186	

## Appendix 11 (continued)

JANUARY, 1975

Plot No.	Species	Individuals/ Plot	Percent
W-4,2	<u>Paspalum conjugatum</u>	210	34.7
	<u>Gomphrena dispersa</u>	119	19.6
	<u>Portulaca pilosa</u>	58	9.6
	<u>Digitaria sanguinalis</u>	50	8.3
	<u>Euphorbia hirta</u>	47	7.8
	<u>Cyperus sp.</u>	32	5.3
	<u>Dactyloctenium aegyptium</u>	24	4
	<u>Desmodium sp.</u>	15	2.5
	<u>Chamaecrista aeschynomene</u>	11	1.8
	<u>Centrosema pubescens</u>	9	1.5
	<u>Mimosa pudica</u>	7	1.2
	<u>Bidens pilosa</u>	5	0.83
	<u>Sporobolus virginicus</u>	5	0.83
	<u>Borreria verticillata</u>	3	0.5
	<u>Hyptis sp.</u>	3	0.5
	<u>Urena lobata</u>	3	0.5
	<u>Senecioides cinerea</u>	2	0.33
	<u>Sida carpinifolia</u>	1	0.17
<u>Stachytarpheta jamaicensis</u>	1	0.17	
<u>Wedlia trilobata</u>	1	0.17	
	Total	606	



APPENDIX 12

TOTAL PHYTOPLANKTON ABUNDANCE\*

Station	Date	Time	Depth(m)	No. Species	Total Cells/Liter	Margalef	Diversity Indices MacArthur
1	12 Feb	0810	1	65	1,384	1.99	4.41
2	"	0825	1	70	1,064	2.01	4.46
2	"	0830	20	63	1,418	2.02	4.51
2	"	1310	1	74	2,592		
3	"	1245	1	54	1,110	1.84	3.96
4	"	1255	1	73	3,540	1.95	4.27
5	"	1300	1	57	1,414	1.70	3.55
5	"	1305	20	80	2,196	2.06	4.63
1	20 Mar	1215	1	58	1,454	1.76	3.71
2	"	0920	1	57	730	1.99	4.42
2	"	0930	20	68	1,156	2.08	4.70
3	"	1030	1	47	1,996	1.51	3.09
4	"	1110	1	58	1,569	1.86	3.98
5	"	1135	1	57	1,161	1.90	4.12
5	"	1145	20	68	1,552	1.96	4.31
5	"	1155	100	69	1,878	2.03	4.54
1	18 Apr	0807	1	60	1,004	1.98	4.37
1	"	1320	1	52	1,886		
2	"	0812	1	63	1,810	1.80	3.82
2	"	0815	20	59	2,086	1.99	4.42
3	"	0830	1	64	2,056	1.94	4.23
4	"	0857	1	65	2,638	1.98	4.37
5	"	0905	1	64	1,760	1.99	4.39
5	"	0910	20	60	1,796	1.93	4.21
5	"	0920	100	48	2,044	1.86	3.99
H-1	"	0952	1	72	2,050		
H-2	"	1300	1	73	4,066		
H-2	"	1310	1	64	3,442		
H-3	"	0943	1	65	2,500		
H-4	"	0934	1	61	2,172		
H-5	"	0930	1	82	2,808		
1	15 May	0750	1	58	1,376	1.80	3.82
2	"	0855	1	69	1,920	1.70	3.54
3	"	1005	1	67	2,636	1.94	4.23
4	"	1015	1	85	2,226	2.00	4.42
5	"	1030	1	74	1,872	1.96	4.30

\*not including Cyanophyceae

Station	Date	Time	Depth(m)	No. Species	Total Cells/Liter	Diversity Indices	
						Margalef	MacArthur
1	13 Jun	1000	1	68	3,754	1.94	4.23
2	"	0900	1	75	5,364	1.84	3.93
2	"	0905	20	73	7,512	1.72	3.60
3	"	0920	1	75	5,056	1.87	4.03
3	"	0925	20	85	7,992		
4	"	0935	1	72	2,147	1.98	4.37
5	"	0942	1	69	3,796	1.94	4.26
5	"	0945	20	72	4,498	1.81	3.86
1	9 Jul	0730	1	77	5,756	1.65	3.40
2	"	0752	1	84	6,136	1.85	3.97
2	"	0756	20	77	4,612	1.97	4.33
3	"	0845	1	74	3,964	1.96	4.29
4	"	0900	1	61	3,208	1.75	3.69
5	"	0914	1	59	4,732	1.74	3.66
5	"	0920	20	67	4,598	1.79	3.80
H-1	9 Jul	0950	1	84	6,594		
H-2	"	0945	1	63	4,452		
H-3	"	0935	1	67	4,820		
H-4	"	0930	1	74	6,220		
H-5	"	0925	1	64	4,764		
1	20 Aug	0728	1	72	9,540	1.51	3.07
2	"	0742	1	79	11,577	1.36	2.74
2	"	0747	20	77	11,460	1.44	2.93
3	"	0837	1	74	7,840	1.68	3.50
4	"	0900	1	65	6,024	1.61	3.32
5	"	0920	1	75	18,602	0.96	2.05
5	"	0927	20	81	8,324	1.56	3.20
5	"	0940	100	58	3,536	1.76	3.70
1	24 Sep	0740	1	62	3,892	1.71	3.56
2	"	0755	1	69	5,488	1.71	3.57
2	"	0805	20	68	5,012*	1.80	3.81
3	"	0815	1	70	5,564	1.71	3.58
4	"	0950	1	69	5,188	1.78	3.78
5	"	0820	1	59	5,340	1.71	3.58
5	"	0830	20	54	3,992	1.68	3.50

Station	Date	Time	Depth(m)	No. Species	Total Cells/Liter	Diversity Indices	
						Margalef	MacArthur
1	22 Oct	0805	1	68	4,836	1.80	3.83
2	"	0935	1	70	5,784	1.84	3.95
2	"	0944	20	54	7,290	1.54	3.15
3	"	0915	1	75	4,574	1.98	4.37
4	"	1050	1	72	5,284	1.87	4.01
5	"	1012	1	60	4,364	1.82	3.87
5	"	1016	20	62	4,468	1.75	3.69
5	"	1025	100	47	1,420	1.83	3.91
H-1	"	0928	1	65	3,232		
H-1	"	0930	1	76	4,992		
H-3	"	0950	1	66	6,908		
H-3	"	0954	1	81	6,848		
H-4	"	0958	1	74	6,856		
H-4	"	1002	1	70	6,788		
H-5	"	1006	1	75	6,664		
H-5	"	1009	1	83	6,780		
1	19 Nov	0826	1	62	2,918		
2	"	0847	1	62	3,488		
2	"	0853	20	73	3,608*	1.96	4.32
3	"	0935	1	66	4,964	.86	2.99
4	"	0947	1	66	4,608	2.01	4.45
5	"	1005	1	65	5,000	1.84	3.94
5	"	1010	20	75	5,736	1.94	4.23
5	"	1020	100	53	2,832	1.90	4.11
1	18 Dec	1150	1	72	5,232	1.92	4.18
2	"	1035	1	69	4,428	1.81	3.86
2	"	1040	20	80	6,074	1.79	3.80
3	"	1050	1	64	5,452	1.87	4.02
4	"	1105	1	57	4,612	1.78	3.77
5	"	1115	1	57	4,288	1.88	4.07
5	"	1125	20	63	3,794*	1.78	3.77
5	"	1140	100	47	2,381	1.88	4.06
1	21 Jan	0820	1	86	11,724	1.86	3.98
2	"	1103	1	87	10,848	1.72	2.59
2	"	1105	20	88	11,068	1.88	4.07
3	"	0935	1	78	10,360	1.93	4.22
						1.92	4.19*
						1.93	4.22
						1.92	4.19*
						1.93	4.22

Appendix 12 continued

Station	Date	Time	Depth(m)	No. Species	Total Cells/Liter	Diversity Indices	
						Margalef	MacArthur
4	"	1005	1	81	7,438	2.01	4.37
5	"	1020	1	83	9,904	1.98	4.37
5	"	1025	20	79	9,600	1.94	4.24
5	"	1033	100	51	2,168	1.83	3.90
H-1	"	1108	1	81	10,064		
H-3	"	1053	1	76	9,440		
H-4	"	1049	1	77	8,184		
H-5	"	1046	1	80	10,006		



APPENDIX 13

MEANS OF TOTAL NUMBERS OF DIATOMS, DINOFLAGELLATES, COCCOLITHOPHORES,  
AND OTHER SPECIES BY MONTH FOR ALL STATIONS; INSHORE STATIONS (1,2,3)  
AND OFFSHORE STATIONS (4,5). CYANOPHYCEAE NOT INCLUDED. (1974-1975)

		Diatoms	Dinoflag.	Coccolth.	Other
Feb. 1.	$\bar{X}$	724	639	137	19
	d	202	569	46	12
2.	$\bar{X}$	1,453	851	190	71
	d	284	473	64	57
3.	$\bar{X}$	998	718	157	38
	d	434	511	56	41
Mar. 1.	$\bar{X}$	492	634	136	75
	d	302	332	86	53
2.	$\bar{X}$	462	454	419	203
	d	174	45	77	45
3.	$\bar{X}$	477	544	278	139
	d	229	240	169	82
Apr. 1.	$\bar{X}$	797	634	148	206
	d	250	288	83	164
2.	$\bar{X}$	829	439	410	384
	d	477	89	199	90
3.	$\bar{X}$	811	541	264	285
	d	342	231	193	159
May 1.	$\bar{X}$	1,165	463	132	215
	d	414	46	66	156
2.	$\bar{X}$	681	513	270	622
	d	92	50	51	54
3.	$\bar{X}$	1,027	483	187	378
	d	436	49	92	250
Jun. 1.	$\bar{X}$	3,039	1,922	337	615
	d	2,202	1,319	233	137
2.	$\bar{X}$	838	806	736	761
	d	338	204	273	239
3.	$\bar{X}$	2,213	1,506	487	570
	d	2,025	1,156	308	181

Appendix 13 continued

		Diatoms	Dinoflag.	Coccolth.	Other
July 1.	$\bar{X}$	2,782	619	577	1,139
	d	202	569	46	12
2.	$\bar{X}$	836	641	1,227	1,475
	d	297	76	235	429
3.	$\bar{X}$	1,948	628	855	1,283
	d	1,226	101	381	400
Aug. 1.	$\bar{X}$	7,779	725	287	1,332
	d	2,183	63	105	338
2.	$\bar{X}$	7,122	490	308	1,180
	d	6,819	140	167	260
3.	$\bar{X}$	7,463	608	298	1,256
	d	4,730	161	130	291
Sep. 1.	$\bar{X}$	2,754	823	215	1,335
	d	824	230	69	48
2.	$\bar{X}$	2,198	1,065	271	1,269
	d	586	332	96	53
3.	$\bar{X}$	2,516	927	239	1,298
	d	736	282	80	65
Oct. 1.	$\bar{X}$	3,896	789	120	763
	d	1,832	494	64	263
2.	$\bar{X}$	1,441	932	577	898
	d	842	481	283	376
3.	$\bar{X}$	2,669	883	346	853
	d	1,861	457	307	301
Nov. 1.	$\bar{X}$	1,996	815	282	650
	d	559	124	53	180
2.	$\bar{X}$	2,370	888	327	835
	d	913	283	25	131
3.	$\bar{X}$	2,183	852	305	743
	d	729	206	45	176

Appendix 13 continued

		Diatoms	Dinoflag.	Coccolth.	Other
Dec.	1. $\bar{X}$	3,129	905	505	734
	d	845	264	117	107
	2. $\bar{X}$	1,384	775	848	762
	d	571	313	291	221
	3. $\bar{X}$	2,257	840	676	748
	d	1,147	277	275	162
Jan.	1. $\bar{X}$	8,803	668	565	831
	d	510	76	57	377
	2. $\bar{X}$	4,929	713	612	895
	d	2,817	309	268	261
	3. $\bar{X}$	6,865	691	589	863
	d	2,793	210	181	302

1 - inshore

2 - offshore

3 - mean of all stations

$\bar{X}$  - mean

d - standard deviation



APPENDIX 14

INDIVIDUAL VALUES, MEANS, VARIANCES, AND CONFIDENCE INTERVALS  
FOR ZOOPLANKTON GROUPS AT STATION 2. ISLOTE, PUERTO RICO.

BIOMASS ml/100 m<sup>3</sup>

Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	10					
3 Apr 74	17					
17 Apr 74	7	9	7	8	2	4 to 11
1 May 74	13	9	14	12	5	6 to 17
15 May 74	12	20	-	16	4*	11 to 24
29 May 74	22	19	18	20	5	14 to 25
12 Jun 74	54	53	48	51	8	45 to 58
25 Jun 74	7	12	13	11	11	3 to 19
9 Jul 74	31	17	32	26	64	7 to 46
24 Jul 74	9	11	8	10	2	6 to 13
20 Aug 74	21	18	13	17	14	8 to 27
10 Sep 74	6	6	6	6	0	6 to 7
24 Sep 74	19	16	15	16	6	10 to 23
10 Oct 74	9	10	10	10	0	8 to 11
22 Oct 74	6	7	2	5	7	0 to 11
5 Nov 74	8	10	9	9	1	7 to 11
19 Nov 74	22	18	21	20	4	15 to 25
3 Dec 74	15	24	26	22	29	8 to 35
16 Dec 74	10	9	7	9	2	6 to 12
10 Jan 75	13	14	12	13	1	10 to 16
21 Jan 75	14	13	16	14	3	10 to 18
4 Feb 75	17	14	17	16	2	12 to 20
18 Mar 75	9	11	11	10	1	9 to 11

\*Estimated variance

TOTAL ZOOPLANKTON per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	464					
3 Apr 74	986					
17 Apr 74	608	788	684	691	8294	465 to 917
1 May 74	881	730	1024	882	21904	514 to 1249
15 May 74	2000	1876		1940		1151 to 2759*
29 May 74	784	1009	976	919	13881	626 to 1211
12 Jun 74	947	771	598	772	30327	340 to 1204
25 Jun 74	728	832	837	801	4024	644 to 959
9 Jul 74	1697	1365	1951	1671	86261	942 to 2400
24 Jul 74	1127	1614	859	1200	146610	249 to 2150
20 Aug 74	1570	1258	1276	1368	30658	933 to 1803
10 Sep 74	906	993	1024	974	3693	823 to 1125
24 Sep 74	1560	2451	2404	2138	251562	893 to 3384
10 Oct 74	879	739	1072	897	28068	481 to 1313
22 Oct 74	535	574	524	544	687	479 to 609
5 Nov 74	1450	1175	1139	1254	29091	831 to 1678
19 Nov 74	1681	1591	1357	1542	27973	1127 to 1957
3 Dec 74	1972	1838	2480	2097	114855	1255 to 2938
16 Dec 74	508	407	389	435	4137	275 to 594
10 Jan 75	1339	1174	1102	1205	14796	903 to 1507
21 Jan 75	1225	1190	1093	1169	4676	999 to 1375
4 Feb 75	1246	869	1141	1099	41001	596 to 1601
18 Mar 75	687	690	720	699	333	654 to 744

\*Confidence interval estimated by extrapolation

COPEPODS per m<sup>3</sup>Sheet 2 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	313					
3 Apr 74	457					
17 Apr 74	306	494	371	389	9196	151 to 628
1 May 74	555	443	780	595	29772	166 to 1023
15 May 74	1078	1329		1204	3969*	737 to 1671
29 May 74	400	499	546	481	5603	295 to 667
12 Jun 74	693	481	351	508	29747	80 to 936
25 Jun 74	464	586	551	535	4037	377 to 693
9 Jul 74	1282	960	1401	1214	52103	648 to 1781
24 Jul 74	827	1296	716	946	94804	182 to 1711
20 Aug 74	1213	823	905	980	42346	469 to 1491
10 Sep 74	652	787	720	720	4591	551 to 888
24 Sep 74	1126	2053	2038	1739	282093	421 to 3058
10 Oct 74	632	569	743	648	7755	430 to 867
22 Oct 74	384	447	418	417	1008	338 to 495
5 Nov 74	1081	949	956	995	5521	810 to 1179
19 Nov 74	1345	1219	1059	1207	20547	851 to 1562
3 Dec 74	1737	1575	2147	1820	86805	1088 to 2551
16 Dec 74	322	233	205	253	3729	101 to 405
10 Jan 75	1031	960	869	953	6630	751 to 1156
21 Jan 75	1036	944	828	1096	136155	180 to 2012
4 Feb 75	818	595	571	662	18798	321 to 1002
18 Mar 75	482	509	482	491	243	452 to 530

\*Variance estimated as 1/4 the range

CHAETOGNATHS per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	20					
3 Apr 74	47					
17 Apr 74	40	33	45	39	35	25 to 54
1 May 74	23	26	24	25	2	21 to 28
15 May 74	61	77		69		
29 May 74	20	52	44	39	282	0 to 80
12 Jun 74	18	23	10	17	42	1 to 33
25 Jun 74	25	25	28	26	3	22 to 30
9 Jul 74	20	13	26	20	40	4 to 35
24 Jul 74	59	85	9	51	1479	0 to 147
20 Aug 74	39	46	29	38	70	17 to 58
10 Sep 74	15	11	11	12	7	6 to 19
24 Sep 74	42	44	60	48	99	24 to 73
10 Oct 74	15	12	16	14	4	9 to 19
22 Oct 74	33	32	29	31	4	26 to 37
5 Nov 74	42	14	21	26	220	0 to 63
19 Nov 74	54	28	42	41	169	9 to 74
3 Dec 74	79	20	51	50	877	0 to 124
16 Dec 74	18	21	27	22	20	11 to 33
10 Jan 75	30	16	19	21	53	3 to 39
21 Jan 75	8	8	21	14	39	0 to 29
4 Feb 75	44	54	61	53	72	32 to 74
18 Mar 75	7	11	21	13	52	0 to 31

LARVACEANS per m<sup>3</sup>Sheet 3 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	5					
3 Apr 74	38					
17 Apr 74	1	9	0	3	23	0 to 15
1 May 74	28	32	11	24	121	0 to 51
15 May 74	2	20		11		
29 May 74	16	32	16	21	81	0 to 43
12 Jun 74	38	10	13	20	236	0 to 58
25 Jun 74	38	25	39	34	64	14 to 64
9 Jul 74	49	37	81	56	502	0 to 111
24 Jul 74	5	0	1	2	7	0 to 9
20 Aug 74	110	184	154	149	1394	56 to 242
10 Sep 74	85	81	72	79	42	63 to 96
24 Sep 74	71	78	91	80	104	55 to 106
10 Oct 74	21	31	49	33	205	0 to 69
22 Oct 74	13	7	14	12	16	2 to 20
5 Nov 74	30	26	17	24	47	7 to 47
19 Nov 74	97	74	84	85	133	56 to 114
3 Dec 74	17	61	40	39	470	0 to 93
16 Dec 74	32	25	46	34	120	7 to 62
10 Jan 75	52	26	40	39	165	7 to 71
21 Jan 75	80	49	136	101	2066	0 to 213
4 Feb 75	10	2	9	7	19	0 to 17
18 Mar 75	10	29	20	20	90	0 to 44

PTEROPODS per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	8					
3 Apr 74	2					
17 Apr 74	0	1	0	0	1	0 to 2
1 May 74	10	3	19	11	69	0 to 31
15 May 74	8	16		12		
29 May 74	3	8	27	13	158	0 to 44
12 Jun 74	8	6	0	5	17	0 to 15
25 Jun 74	0	0	2	1	1	0 to 3
9 Jul 74	0	3	0	1	2	0 to 5
24 Jul 74	0	0	3	1	2	0 to 5
20 Aug 74	4	2	0	2	4	0 to 7
10 Sep 74	0	0	0	0	0	0 to 0
24 Sep 74	0	3	0	1	3	0 to 5
10 Oct 74	0	0	0	0	0	0 to 0
22 Oct 74	1	0	0	0	0	0 to 0
5 Nov 74	0	0	0	0	0	0 to 0
19 Nov 74	9	4	9	7	9	0 to 14
3 Dec 74	3	4	0	2	5	0 to 8
16 Dec 74	2	2	4	2	1	0 to 5
10 Jan 75	0	0	4	1	6	0 to 7
21 Jan 75	0	0	0	0	0	0 to 0
4 Feb 75	12	2	0	5	43	0 to 21
18 Mar 75	0	9	6	5	21	0 to 16



OSTRACODS per m<sup>3</sup>Sheet 4 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	3					
3 Apr 74	200					
17 Apr 74	75	57	92	74	304	31 to 118
1 May 74	2	1	3	2	1	0 to 5
15 May 74	44	8		26		
29 May 74	3	1	17	7	78	0 to 29
12 Jun 74	2	0	0	1	1	0 to 3
25 Jun 74	0	11	2	4	32	0 to 18
9 Jul 74	0	0	0	0	0	0 to 0
24 Jul 74	0	0	0	0	0	0 to 0
20 Aug 74	4	4	2	3	1	0 to 6
10 Sep 74	0	0	0	0	0	0 to 0
24 Sep 74	3	0	0	0	3	0 to 5
10 Oct 74	0	1	0	0	1	0 to 2
22 Oct 74	0	0	0	0	0	0 to 0
5 Nov 74	2	0	0	1	1	0 to 3
19 Nov 74	0	0	0	0	0	0 to 0
3 Dec 74	10	0	0	3	36	0 to 18
16 Dec 74	0	4	1	2	4	0 to 7
10 Jan 75	5	8	4	6	4	1 to 10
21 Jan 75	5	26	18	18	87	0 to 41
4 Feb 75	186	92	392	223	23528	0 to 604
18 Mar 75	1	0	0	0	0	0 to 1

CLADOCERANS per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	0					
3 Apr 74	11					
17 Apr 74	0	4	6	3	8	0 to 10
1 May 74	2	4	0	2	5	0 to 7
15 May 74	6	0		3		
29 May 74	1	3	2	2	1	0 to 4
12 Jun 74	3	10	8	7	12	0 to 15
25 Jun 74	5	9	26	13	127	0 to 41
9 Jul 74	3	0	0	1	3	0 to 5
24 Jul 74	2	2	0	1	1	0 to 4
20 Aug 74	4	4	0	3	5	0 to 8
10 Sep 74	0	3	2	2	2	0 to 6
24 Sep 74	3	0	0	1	3	0 to 5
10 Oct 74	0	0	0	0	0	0 to 0
22 Oct 74	0	0	0	0	0	0 to 0
5 Nov 74	1	2	2	1	2	0 to 5
19 Nov 74	14	28	9	19	61	0 to 38
3 Dec 74	0	8	3	4	17	0 to 14
16 Dec 74	9	1	1	4	20	0 to 15
10 Jan 75	2	0	4	2	4	0 to 7
21 Jan 75	5	1	0	3	18	0 to 13
4 Feb 75	0	0	2	1	2	0 to 4
18 Mar 75	3	0	0	1	3	0 to 3

MEDUSAE per m<sup>3</sup>Sheet 5 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	2					
3 Apr 74	2					
17 Apr 74	1	2	1	2	1	0 to 4
1 May 74	0	0	2	1	1	0 to 3
15 May 74	4	4		4		
29 May 74	5	0	3	3	7	0 to 9
12 Jun 74	2	5	3	3	3	0 to 7
25 Jun 74	3	0	15	6	61	0 to 25
9 Jul 74	3	11	9	7	16	0 to 17
24 Jul 74	5	0	1	2	7	0 to 9
20 Aug 74	2	4	4	3	1	1 to 6
10 Sep 74	1	2	8	4	17	0 to 14
24 Sep 74	0	0	4	1	4	0 to 6
10 Oct 74	6	0	0	2	11	0 to 10
22 Oct 74	0	0	0	0	0	0 to 0
5 Nov 74	1	0	6	3	10	0 to 11
19 Nov 74	17	35	6	19	216	0 to 56
3 Dec 74	24	12	5	14	94	0 to 38
16 Dec 74	4	2	5	4	2	1 to 7
10 Jan 75	5	10	4	7	12	0 to 11
21 Jan 75	3	0	2	2	4	0 to 7
4 Feb 75	0	0	0	0	0	0 to 0
18 Mar 75	4	11	3	6	19	0 to 17

SIPHONOPHORE BRACTS per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	5					
3 Apr 74	0					
17 Apr 74	4	0	4	3	6	0 to 9
1 May 74	2	0	6	3	11	0 to 11
15 May 74	0	12		6		
29 May 74	8	15	30	18	126	0 to 46
12 Jun 74	11	6	14	10	15	1 to 20
25 Jun 74	6	0	0	2	13	0 to 11
9 Jul 74	6	13	9	9	15	0 to 19
24 Jul 74	2	0	0	1	1	0 to 3
20 Aug 74	6	2	2	3	6	0 to 9
10 Sep 74	4	5	6	5	2	1 to 8
24 Sep 74	9	6	7	7	2	3 to 11
10 Oct 74	0	4	3	2	4	0 to 7
22 Oct 74	0	0	0	0	0	0 to 0
5 Nov 74	0	2	0	1	1	0 to 4
19 Nov 74	17	4	6	9	52	0 to 27
3 Dec 74	14	0	8	7	48	0 to 24
16 Dec 74	3	3	6	4	2	1 to 7
10 Jan 75	5	3	4	4	1	1 to 7
21 Jan 75	0	5	8	4	7	0 to 11
4 Feb 75	0	0	0	0	0	0 to 0
18 Mar 75	3	8	8	6	8	0 to 13

THALIACEA per m<sup>3</sup>Sheet 6 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	10					
3 Apr 74	2					
17 Apr 74	0	0	0	0	0	0 to 0
1 May 74	2	3	2	2	1	0 to 4
15 May 74	2	0		1		
29 May 74	38	27	25	30	49	13 to 48
12 Jun 74	30	34	54	40	171	7 to 72
25 Jun 74	3	0	9	4	22	0 to 16
9 Jul 74	17	3	3	8	69	0 to 28
24 Jul 74	0	0	0	0	0	0 to 0
20 Aug 74	8	7	6	7	1	4 to 10
10 Sep 74	1	0	0	0	0	0 to 2
24 Sep 74	0	0	4	1	4	0 to 6
10 Oct 74	0	0	0	0	0	0 to 0
22 Oct 74	0	0	0	0	0	0 to 0
5 Nov 74	0	0	0	0	0	0 to 0
19 Nov 74	3	4	0	2	3	0 to 7
3 Dec 74	0	0	0	0	0	0 to 0
16 Dec 74	0	0	1	0	1	0 to 2
10 Jan 75	0	0	2	1	1	0 to 4
21 Jan 75	3	0	2	2	4	0 to 7
4 Feb 75	2	0	0	1	2	0 to 4
18 Mar 75	0	4	2	2	4	0 to 7

ANNELID LARVAE per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	1					
3 Apr 74	5					
17 Apr 74	6	0	3	3	8	0 to 10
1 May 74	5	6	5	5	0	4 to 6
15 May 74	13	32		23		
29 May 74	19	29	2	16	187	0 to 50
12 Jun 74	3	3	4	4	1	2 to 5
25 Jun 74	21	16	7	16	67	0 to 36
9 Jul 74	20	5	6	10	70	0 to 31
24 Jul 74	3	14	0	6	55	0 to 24
20 Aug 74	6	2	6	5	6	0 to 11
10 Sep 74	1	0	0	0	0	0 to 2
24 Sep 74	15	17	14	15	3	11 to 20
10 Oct 74	4	0	3	2	4	0 to 7
22 Oct 74	4	0	3	2	5	0 to 8
5 Nov 74	11	7	10	9	4	4 to 14
19 Nov 74	3	7	6	5	5	0 to 11
3 Dec 74	3	8	0	4	16	0 to 14
16 Dec 74	0	3	3	2	3	0 to 6
10 Jan 75	2	5	4	4	2	1 to 7
21 Jan 75	0	2	2	1	2	0 to 5
4 Feb 75	7	2	7	5	9	0 to 13
18 Mar 75	1	1	2	1	0	0 to 2

CIRRIPEDE per m<sup>3</sup>Sheet 7 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	0					
3 Apr 74	0					
17 Apr 74	0	0	0	0	0	0 to 0
1 May 74	2	1	0	1	1	0 to 3
15 May 74	0	0		0		
29 May 74	1	3	0	1	2	0 to 5
12 Jun 74	2	3	0	2	3	0 to 6
25 Jun 74	0	0	2	1	1	0 to 3
9 Jul 74	0	3	0	1	2	0 to 5
24 Jul 74	2	0	0	1	1	0 to 3
20 Aug 74	0	0	0	0	0	0 to 0
10 Sep 74	0	0	0	0	0	0 to 0
24 Sep 74	3	3	4	3	0	2 to 4
10 Oct 74	0	0	1	0	1	0 to 3
22 Oct 74	0	0	0	0	0	0 to 0
5 Nov 74	7	2	4	5	6	0 to 10
19 Nov 74	3	14	6	8	33	0 to 22
3 Dec 74	0	0	3	1	2	0 to 4
16 Dec 74	1	1	0	1	0	0 to 2
10 Jan 75	0	0	2	1	1	0 to 4
21 Jan 75	0	0	0	0	0	0 to 0
4 Feb 75	10	11	4	8	13	0 to 17
18 Mar 75	4	3	6	4	2	1 to 8

ECHINODERM LARVAE per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	1					
3 Apr 74	0					
17 Apr 74	0	0	1	0	1	0 to 2
1 May 74	0	0	3	1	4	0 to 6
15 May 74	6	4		5		
29 May 74	17	11	6	11	26	0 to 24
12 Jun 74	2	6	2	3	7	0 to 10
25 Jun 74	11	2	6	6	22	0 to 18
9 Jul 74	3	5	12	7	20	0 to 18
24 Jul 74	3	0	3	2	3	0 to 7
20 Aug 74	2	0	4	2	4	0 to 7
10 Sep 74	1	0	6	3	7	0 to 11
24 Sep 74	6	3	4	4	3	0 to 8
10 Oct 74	0	0	1	0	1	0 to 3
22 Oct 74	0	0	0	0	0	0 to 0
5 Nov 74	7	2	6	5	6	0 to 11
19 Nov 74	0	0	6	2	12	0 to 11
3 Dec 74	3	8	3	5	9	0 to 12
16 Dec 74	0	1	1	1	0	0 to 2
10 Jan 75	0	5	0	2	9	0 to 9
21 Jan 75	0	0	0	0	0	0 to 0
4 Feb 75	0	2	0	1	1	0 to 3
18 Mar 75	0	0	0	0	0	0 to 0

ECTOPROCT LARVAE per m<sup>3</sup>

Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	2					
3 Apr 74	0					
17 Apr 74	0	0	1	0	1	0 to 2
1 May 74	0	0	0	0	0	0 to 0
15 May 74	0	0		0		
29 May 74	0	0	0	0	0	to 0
12 Jun 74	0	0	0	0	0	0 to 0
25 Jun 74	2	0	2	1	1	0 to 4
9 Jul 74	3	3	3	3	0	3 to 3
24 Jul 74	2	2	1	2	0	1 to 3
20 Aug 74	0	2	0	1	1	0 to 3
10 Sep 74	0	0	0	0	0	0 to 0
24 Sep 74	0	0	0	0	0	0 to 0
10 Oct 74	0	0	0	0	0	0 to 0
22 Oct 74	0	0	0	0	0	0 to 0
5 Nov 74	0	2	0	1	2	0 to 4
19 Nov 74	3	0	0	1	3	0 to 5
3 Dec 74	0	4	3	2	4	0 to 7
16 Dec 74	0	0	1	0	0	0 to 1
10 Jan 75	0	0	0	0	0	0 to 0
21 Jan 75	0	0	0	0	0	0 to 0
4 Feb 75	2	2	0	1	2	0 to 5
18 Mar 75	0	0	0	0	0	0 to 0

BIVALVE LARVAE per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	95 C.I.
20 Mar 74	2					
3 Apr 74	0					
17 Apr 74	0	0	3	1	3	0 to 5
1 May 74	0	0	2	1	1	0 to 3
15 May 74	13	4		8		
29 May 74	2	1	3	2	1	0 to 4
12 Jun 74	8	5	0	4	15	0 to 14
25 Jun 74	3	0	2	2	3	0 to 6
9 Jul 74	11	3	3	6	25	0 to 18
24 Jul 74	5	6	3	5	3	0 to 9
20 Aug 74	2	4	0	2	3	0 to 6
10 Sep 74	2	0	0	1	2	0 to 4
24 Sep 74	9	3	0	4	21	0 to 15
10 Oct 74	0	0	3	1	3	0 to 5
22 Oct 74	1	2	0	1	1	0 to 4
5 Nov 74	7	5	8	7	3	2 to 11
19 Nov 74	0	4	0	1	4	0 to 6
3 Dec 74	3	12	10	9	21	0 to 20
16 Dec 74	2	2	1	2	1	0 to 4
10 Jan 75	2	0	2	2	2	0 to 5
21 Jan 75	0	1	0	0	0	0 to 2
4 Feb 75	2	4	2	3	1	1 to 5
18 Mar 75	3	3	2	3	0	1 to 4

GASTROPOD VELIGERS per m<sup>3</sup>

## Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	23					
3 Apr 74	18					
17 Apr 74	28	30	22	27	17	16 to 37
1 May 74	70	56	50	59	106	34 to 85
15 May 74	516	154		336		
29 May 74	32	40	47	40	60	21 to 59
12 Jun 74	20	3	14	12	70	0 to 33
25 Jun 74	24	21	24	23	3	19 to 27
9 Jul 74	83	133	81	99	885	25 to 173
24 Jul 74	92	57	39	62	732	0 to 130
20 Aug 74	32	21	27	27	33	13 to 41
10 Sep 74	17	15	8	13	19	3 to 24
24 Sep 74	68	29	25	41	579	0 to 100
10 Oct 74	13	9	37	20	231	0 to 58
22 Oct 74	3	12	9	8	19	0 to 19
5 Nov 74	50	14	31	32	314	0 to 76
19 Nov 74	34	56	24	38	270	0 to 79
3 Dec 74	48	73	56	59	157	28 to 90
16 Dec 74	18	12	6	12	38	0 to 27
10 Jan 75	5	8	8	7	3	2 to 12
21 Jan 75	27	19	8	22	243	0 to 61
4 Feb 75	29	30	35	31	10	24 to 39
18 Mar 75	58	18	46	41	421	0 to

FORAMINIFERA per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	1					
3 Apr 74	5					
17 Apr 74	4	5	7	5	2	2 to 9
1 May 74	0	3	10	4	25	0 to 17
15 May 74	0	0		0		
29 May 74	18	30	33	27	68	6 to 48
12 Jun 74	0	2	0	1	1	0 to 3
25 Jun 74	5	5	4	5	1	3 to 7
9 Jul 74	0	3	6	3	8	0 to 10
24 Jul 74	9	6	1	5	14	0 to 15
20 Aug 74	12	7	13	11	12	2 to 19
10 Sep 74	7	2	8	6	14	0 to 15
24 Sep 74	3	0	11	5	30	0 to 18
10 Oct 74	0	3	6	3	8	0 to 10
22 Oct 74	9	7	5	7	4	2 to 12
5 Nov 74	7	2	0	3	13	0 to 12
19 Nov 74	3	7	0	3	12	0 to 11
3 Dec 74	0	0	0	0	0	0 to 0
16 Dec 74	2	4	0	2	4	0 to 7
10 Jan 75	2	8	6	6	8	0 to 12
21 Jan 75	3	1	0	2	4	0 to 7
4 Feb 75	12	4	0	5	39	0 to 21
18 Mar 75	4	6	6	5	1	2 to 8

MALACOSTRACAN LARVAE per m<sup>3</sup>

Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	7					
3 Apr 74	16					
17 Apr 74	24	14	37	25	137	0 to 54
1 May 74	33	16	31	27	90	3 to 50
15 May 74	46	32		39		
29 May 74	21	30	44	32	143	2 to 61
12 Jun 74	11	23	17	17	36	2 to 32
25 Jun 74	9	7	6	7	4	2 to 12
9 Jul 74	32	40	72	48	454	0 to 101
24 Jul 74	12	22	8	14	54	0 to 32
20 Aug 74	20	28	29	26	22	14 to 37
10 Sep 74	13	11	17	14	10	6 to 21
24 Sep 74	18	35	32	28	82	6 to 51
10 Oct 74	21	15	33	23	88	0 to 46
22 Oct 74	11	15	17	14	7	8 to 21
5 Nov 74	5	5	6	5	1	4 to 7
19 Nov 74	17	14	18	16	4	11 to 22
3 Dec 74	31	4	10	15	201	0 to 50
16 Dec 74	9	9	16	11	17	1 to 22
10 Jan 75	10	16	6	11	22	0 to 22
21 Jan 75	11	23	18	19	13	10 to 28
4 Feb 75	10	17	31	19	111	0 to 45
18 Mar 75	18	13	40	24	206	0 to 60

FISH LARVAE per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	0					
3 Apr 74	7					
17 Apr 74	2	2	3	2	0	1 to 4
1 May 74	3	1	3	3	1	0 to 5
15 May 74	0	8		4		
29 May 74	1	0	2	1	1	0 to 3
12 Jun 74	0	2	0	1	1	0 to 3
25 Jun 74	0	4	0	1	4	0 to 6
9 Jul 74	0	3	3	2	3	0 to 6
24 Jul 74	2	0	3	1	2	0 to 5
20 Aug 74	4	0	4	3	5	0 to 8
10 Sep 74	0	2	0	1	1	0 to 3
24 Sep 74	3	3	0	2	3	0 to 6
10 Oct 74	0	3	1	1	2	0 to 5
22 Oct 74	2	2	2	2	0	2 to 3
5 Nov 74	0	0	2	1	1	0 to 4
19 Nov 74	6	0	0	2	11	0 to 10
3 Dec 74	3	0	0	1	4	0 to 6
16 Dec 74	0	2	1	1	1	0 to 3
10 Jan 75	0	0	2	1	1	0 to 4
21 Jan 75	0	0	2	1	1	0 to 4
4 Feb 75	2	0	0	1	2	0 to 4
18 Mar 75	0	1	2	1	1	0 to 3

FISH EGGS per m<sup>3</sup>Sheet 11 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74		29				
3 Apr 74		33				
17 Apr 74	32	52	22	35	236	0 to 73
1 May 74	28	52	68	50	399	0 to 99
15 May 74	51	61		56		23 to 99*
29 May 74	134	99	90	107	534	50 to 165
12 Jun 74	101	73	68	80	332	35 to 126
25 Jun 74	93	83	65	80	206	45 to 116
9 Jul 74	109	99	92	100	72	79 to 121
24 Jul 74	64	55	17	45	612	0 to 107
20 Aug 74	67	68	63	66	6	60 to 72
10 Sep 74	42	44	72	53	227	12 to 94
24 Sep 74	181	157	102	147	1650	46 to 248
10 Oct 74	122	79	98	99	469	46 to 153
22 Oct 74	37	31	32	33	9	26 to 41
5 Nov 74	95	85	62	81	288	39 to 123
19 Nov 74	54	63	33	50	238	12 to 88
3 Dec 74	35	32	58	42	204	6 to 77
16 Dec 74	75	77	64	72	51	54 to 90
10 Jan 75	71	73	94	80	167	48 to 112
21 Jan 75	40	54	25	46	338	0 to 91
4 Feb 75	22	30	39	30	74	9 to 52
18 Mar 75	70	51	73	65	142	35 to 95

\*Variance estimated by extrapolation

Temora turbinata per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	38					
3 Apr 74	55					
17 Apr 74	44	30	52	42	128	14 to 70
1 May 74	257	210	328	267	3560	118 to 415
15 May 74	348	737		543		
29 May 74	11	42	43	32	326	0 to 77
12 Jun 74	319	214	98	211	12220	0 to 485
25 Jun 74	79	252	157	163	7459	0 to 377
9 Jul 74	6	19	9	11	46	0 to 28
24 Jul 74	23	4	15	14	86	0 to 37
20 Aug 74	67	39	33	46	336	1 to 92
10 Sep 74	34	18	30	27	66	7 to 48
24 Sep 74	508	202	651	464	63791	147 to 780
10 Oct 74	56	24	102	61	1539	0 to 158
22 Oct 74	3	5	6	5	9	1 to 9
5 Nov 74	216	240	236	229	233	192 to 267
19 Nov 74	407	169	247	274	14761	0 to 576
3 Dec 74	224	158	313	232	6097	38 to 426
16 Dec 74	34	35	22	30	54	12 to 48
10 Jan 75	118	154	239	170	3879	16 to 325
21 Jan 75	107	79	99	95	197	60 to 130
4 Feb 75	264	183	133	193	4388	29 to 358
18 Mar 75	20	23	17	20	9	13 to 27



Temora stylifera per m<sup>3</sup>

Sheet 12 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	47					
3 Apr 74	12					
17 Apr 74	4	4	1	3	2	0 to 7
1 May 74	10	10	18	13	20	2 to 24
15 May 74	2	8		5		
29 May 74	8	21	16	15	37	0 to 30
12 Jun 74	3	0	2	2	2	0 to 6
25 Jun 74	2	7	17	8	59	0 to 27
9 Jul 74						
24 Jul 74						
20 Aug 74						
10 Sep 74	2	11	0	4	32	0 to 18
24 Sep 74	3	3	9	6	14	1 to 10
10 Oct 74	4	3	1	3	1	0 to 5
22 Oct 74	0	0	0			
5 Nov 74	7	5	6	6	1	3 to 9
19 Nov 74	14	32	3	16	208	0 to 52
3 Dec 74	3	4	18	8	65	0 to 28
16 Dec 74	1	2	4	2	1	0 to 5
10 Jan 75	5	8	12	8	15	0 to 18
21 Jan 75	3	4	6	4	3	0 to 9
4 Feb 75	4	2	0	2	6	0 to 8
18 Mar 75	3	5	6	5	2	1 to 9

Small calanoid copepods per m<sup>3</sup>\*

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	101					
3 Apr 74	8					
17 Apr 74	127	197	111	142	2372	21 to 263
1 May 74	159	95	151	135	1203	49 to 221
15 May 74	405	369		387		
29 May 74	189	310	305	268	4682	98 to 437
12 Jun 74	169	105	77	117	2230	0 to 234
25 Jun 74	168	183	264	205	2766	75 to 336
9 Jul 74	763	488	765	672	25407	276 to 1068
24 Jul 74	428	662	232	441	46382	0 to 975
20 Aug 74	803	471	615	630	27796	216 to 1043
10 Sep 74	338	444	172	389	2821	257 to 521
24 Sep 74	759	585	1083	841	35087	607 to 1076
10 Oct 74	414	337	480	411	5108	233 to 588
22 Oct 74	224	318	279	273	2229	156 to 391
5 Nov 74	437	440	359	409	1929	300 to 510
19 Nov 74	635	752	560	649	9307	409 to 888
3 Dec 74	1154	1066	1473	1231	45724	700 to 1760
16 Dec 74	181	109	109	133	1716	30 to 236
10 Jan 75	748	606	621	659	6089	465 to 850
21 Jan 75	716	715	528	652	11548	385 to 919
4 Feb 75	364	283	268	305	2702	176 to 434
18 Mar 75	267	298	261	275	394	226 to 444

\*Small calanoid copepods includes Paracalanus aculeatus, Paracalanus parvus, Clausocalanus furcatus, Mecynocera clausi, Calocalanus sp., Acrocalanus sp. and other juvenile calanoids.

Nannocalanus gracilis per m<sup>3</sup>

Sheet 13 of 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	8					
3 Apr 74	3					
17 Apr 74	0	5	7	4	13	0 to 13
1 May 74	3	0	5	3	6	0 to 9
15 May 74	0	4				
29 May 74	1	0	3			
12 Jun 74	3	2	1	2	1	0 to 4
25 Jun 74	5	5	0	3	8	0 to 11
9 Jul 74	14	39	46	27	277	0 to 69
24 Jul 74	9	12	0	7	39	0 to 22
20 Aug 74	6	7	0	4	14	0 to 14
10 Sep 74	9	6	4	7	7	0 to 13
24 Sep 74	9	15	3	8	19	3 to 14
10 Oct 74	0	0	0	0	0	0 to 0
22 Oct 74	0	0	0	0	0	0 to 2
5 Nov 74	0	0	2	1	1	0 to 4
19 Nov 74	6	18	3	9	60	0 to 28
3 Dec 74	3	8	13	8	21	0 to 19
16 Dec 74	1	2	2			
10 Jan 75	2	0	2	2	2	0 to 5
21 Jan 75	5	2	4	4	2	0 to 8
4 Feb 75	4	4	2	4	2	0 to 7
18 Mar 75	3	8	5	5	6	0 to 11

Acartia spirata per m<sup>3</sup>

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	17					
3 Apr 74						
17 Apr 74				0	0	0 to 0
1 May 74	10	17	16	15	16	5 to 24
15 May 74	116	24		70		
29 May 74	8	14	13	12	8	5 to 18
12 Jun 74	32	18	14	21	86	0 to 44
25 Jun 74	17	11	2	10	61	0 to 29
9 Jul 74						
24 Jul 74	213	375	299	295	6522	95 to 496
20 Aug 74	0	7	10	6	25	0 to 18
10 Sep 74	11	9	6	9	5	3 to 14
24 Sep 74	40	42	49	46	69	36 to 57
10 Oct 74	23	17	14	18	17	8 to 28
22 Oct 74	43	31	34	35	57	16 to 54
5 Nov 74	21	33	17	23	72	2 to 44
19 Nov 74	0	0	0	0	0	0 to 0
3 Dec 74	45	24	51	40	192	6 to 74
16 Dec 74	7	6	1	4	10	0 to 12
10 Jan 75	2	3	0			
21 Jan 75	0	0	0			
4 Feb 75	4	7	4	6	3	2 to 10
18 Mar 75	31	16	12	20	100	0 to 45

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	22					
3 Apr 74	21					
17 Apr 74	51	85	59	65	333	20 to 110
1 May 74	17	12	58	29	662	0 to 93
15 May 74	2	16		9		
29 May 74	14	12	9	12	5	6 to 18
12 Jun 74	36	56	70	54	284	12 to 96
25 Jun 74	27	19	9	19	78	0 to 40
9 Jul 74	255	192	167	205	2070	92 to 318
24 Jul 74	5	30	23	19	166	0 to 51
20 Aug 74	14	18	13	15	5	10 to 20
10 Sep 74	73	63	70	69	28	56 to 82
24 Sep 74	87	33	32	52	705	18 to 85
10 Oct 74	17	20	7	15	45	0 to 31
22 Oct 74	42	26	27	31	83	9 to 54
5 Nov 74	46	35	35	39	33	24 to 50
19 Nov 74	23	42	24	30	117	3 to 57
3 Dec 74	83	69	202	118	5367	0 to 300
16 Dec 74	41	18	13	24	225	0 to 61
10 Jan 75	59	52	40	50	94	26 to 74
21 Jan 75	48	35	37	40	50	22 to 58
4 Feb 75	32	15	15	21	94	0 to 41
18 Mar 75	50	54	75	60	180	26 to 84

Corycaeus spp.

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	8					
3 Apr 74	7					
17 Apr 74	31	42	61	45	213	8 to 81
1 May 74	10	10	26	13	152	0 to 43
15 May 74	17	40		28		
29 May 74	9	5	9	8	4	3 to 13
12 Jun 74	54	45	41	47	45	30 to 64
25 Jun 74	21	18	7	15	48	0 to 32
9 Jul 74	83	43	147	91	2753	0 to 221
24 Jul 74	125	136	109	123	175	90 to 156
20 Aug 74	69	63	40	57	228	20 to 95
10 Sep 74	21	37	23	27	71	6 to 48
24 Sep 74	71	33	70	48	416	23 to 74
10 Oct 74	4	8	14	9	29	0 to 22
22 Oct 74	22	21	17	20	9	12 to 28
5 Nov 74	44	47	37	43	24	30 to 55
19 Nov 74	20	25	18	21	11	13 to 29
3 Dec 74	55	24	78	53	736	0 to 120
16 Dec 74	10	12	10	11	2	7 to 14
10 Jan 75	30	23	34	29	26	16 to 42
21 Jan 75	24	11	21	18	47	1 to 35
4 Feb 75	61	35	35	44	228	6 to 81
18 Mar 75	35	13	26	25	122	0 to 52

*Oithona* spp.

Sheet 15 to 15  
Station 2. Islote, Puerto Rico

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	20					
3 Apr 74	64					
17 Apr 74	9	17	25	17	54	0 to 36
1 May 74	15	8	21	15	39	0 to 30
15 May 74	44	69		57		
29 May 74	23	27	55	35	320	0 to 80
12 Jun 74	18	18	15	17	2	13 to 21
25 Jun 74	60	37	26	41	304	0 to 84
9 Jul 74	66	43	101	70	853	0 to 142
24 Jul 74	24	24	8	19	88	0 to 42
20 Aug 74	99	103	98	100	7	93 to 107
10 Sep 74	48	69	62	60	109	34 to 86
24 Sep 74	71	36	81	58	452	31 to 84
10 Oct 74	64	116	99	93	711	27 to 159
22 Oct 74	18	10	21	16	29	3 to 30
5 Nov 74	95	61	95	83	374	35 to 131
19 Nov 74	142	98	118	119	486	65 to 174
3 Dec 74	90	93	101	95	34	80 to 109
16 Dec 74	28	21	8	19	106	0 to 45
10 Jan 75	34	31	19	28	68	8 to 49
21 Jan 75	45	71	68	61	195	27 to 96
4 Feb 75	44	20	70	45	610	0 to 106
18 Mar 75	41	31	46	39	58	20 to 58

*Oncaea* spp.

Date	Tow 1	Tow 2	Tow 3	Mean	Variance	.95 C.I.
20 Mar 74	1					
3 Apr 74	2					
17 Apr 74	4	0	0	1	6	0 to 7
1 May 74	0	7	3	3	13	0 to 12
15 May 74	8	4		6		
29 May 74	6	5	8	6	2	0 to 10
12 Jun 74	2	2	0	1	1	0 to 3
25 Jun 74	27	26	7	20	123	0 to 48
9 Jul 74	57	29	43	43	196	0 to 78
24 Jul 74	5	4	8	6	4	0 to 11
20 Aug 74	91	53	42	62	668	0 to 126
10 Sep 74	40	43	49	44	20	33 to 55
24 Sep 74	81	36	46	47	409	22 to 79
10 Oct 74	53	27	43	41	171	8 to 73
22 Oct 74	8	5	2	5	9	0 to 13
5 Nov 74	30	16	25	24	44	7 to 40
19 Nov 74	14	35	45	32	249	0 to 71
3 Dec 74	41	8	58	36	649	0 to 99
16 Dec 74	6	15	6	9	26	0 to 22
10 Jan 75	54	47	36	46	87	22 to 69
21 Jan 75	19	23	25	22	9	14 to 30
4 Feb 75	20	18	17	18	1	16 to 21
18 Mar 75	7	13	20	13	42	0 to 29

APPENDIX 15

MEAN VALUES FOR ZOOPLANKTON GROUPS AT STATIONS  
1, 2, 3, AND 4. ISLOTE, PUERTO RICO

## APPENDIX 15

Sheet 1 of 15

Biomass ml/100 m <sup>3</sup>	Individual Stations				Islote, Puerto Rico
Date	Station 1	Station 2	Station 3	Station 4	
20 Mar 74	13	10	15	8	
3 Apr 74	14	17	13	7	
17 Apr 74	7	8	5	7	
1 May 74	15	12	9	6	
15 May 74	18	16	18	11	
29 May 74	14	20	43	20	
12 Jun 74	41	51	13	28	
25 Jun 74	15	11	13	22	
9 Jul 74	25	26	13	16	
24 Jul 74	10	10	15	19	
20 Aug 74	19	17	16	21	
10 Sep 74	6	6	9	13	
24 Sep 74	17	17	14	32	
10 Oct 74	5	10	17	15	
22 Oct 74	12	5	9	13	
5 Nov 74	8	9	16	21	
19 Nov 74	12	20	21	12	
3 Dec 74	26	22	32	21	
16 Dec 74	12	9	16	11	
10 Jan 75	11	13	12	12	
21 Jan 75	18	14	16	7	
4 Feb 75	13	16	10	11	
18 Mar 75	9	10	19	12	

Date	Station 1	Station 2	Station 3	Station 4	
20 Mar 74	538	464	618	530	
3 Apr 74	967	986	1185	746	
17 Apr 74	927	691	315	513	
1 May 74	1829	882	441	457	
15 May 74	2713	1940	1405	690	
29 May 74	896	919	759	818	
12 Jun 74	1131	772	1050	1084	
25 Jun 74	753	801	761	1836	
9 Jul 74	1988	1671	1141	783	
24 Jul 74	630	1200	1128	694	
20 Aug 74	1317	1368	983	1587	
10 Sep 74	1070	974	1543	1979	
24 Sep 74	2146	2138	1716	1784	
10 Oct 74	587	891	1362	1078	
22 Oct 74	654	544	738	569	
5 Nov 74	1198	1254	2158	1315	
19 Nov 74	1119	1542	1000	547	
3 Dec 74	1645	2097	1450	993	
16 Dec 74	483	435	762	422	
10 Jan 75	1481	1205	1124	934	
21 Jan 75	1638	1359	1206	828	
4 Feb 75	1532	1099	399	464	
18 Mar 75	659	699	1338	853	

Copepods per m <sup>3</sup>		Individual Stations				Islote, Puerto Rico
Date	Station 1	Station 2	Station 3	Station 4		
20 Mar 74	268	313	319	260		
3 Apr 74	547	457	592	376		
17 Apr 74	592	389	109	280		
1 May 74	1256	595	243	244		
15 May 74	1872	1204	1000	387		
29 May 74	527	481	395	372		
12 Jun 74	834	508	759	619		
25 Jun 74	535	535	516	1224		
9 Jul 74	1527	1214	844	415		
24 Jul 74	373	946	646	481		
20 Aug 74	901	980	645	1060		
10 Sep 74	808	720	1180	1594		
24 Sep 74	1722	1739	1261	1061		
10 Oct 74	337	648	1098	745		
22 Oct 74	436	417	559	396		
5 Nov 74	980	995	1776	983		
19 Nov 74	865	1207	758	336		
3 Dec 74	1314	1820	1225	783		
16 Dec 74	275	253	551	185		
10 Jan 75	1125	953	900	697		
21 Jan 75	1275	1096	999	605		
4 Feb 75	979	662	235	268		
18 Mar 75	467	491	777	611		

Chaetognaths per m <sup>3</sup>		Individual Stations				Islote, Puerto Rico
Date	Station 1	Station 2	Station 3	Station 4		
20 Mar 74	17	20	23	16		
3 Apr 74	30	47	63	23		
17 Apr 74	9	39	13	3		
1 May 74	39	25	16	18		
15 May 74	123	69	55	65		
29 May 74	3	39	23	44		
12 Jun 74	27	17	22	36		
25 Jun 74	17	26	38	74		
9 Jul 74	65	20	9	10		
24 Jul 74	38	51	39	23		
20 Aug 74	25	38	13	74		
10 Sep 74	37	12	5	23		
24 Sep 74	31	48	27	77		
10 Oct 74	40	14	34	33		
22 Oct 74	41	31	12	10		
5 Nov 74	34	26	70	61		
19 Nov 74	38	41	29	23		
3 Dec 74	48	50	42	40		
16 Dec 74	31	22	42	33		
10 Jan 75	52	21	20	40		
21 Jan 75	26	14	18	15		
4 Feb 75	44	53	31	31		
18 Mar 75	15	13	56	11		

Larvaceans per m <sup>3</sup>		Individual Stations				Islote, Puerto Rico
Date	Station 1	Station 2	Station 3	Station 4		
20 Mar 74	8	5	19	13		
3 Apr 74	24	38	9	38		
17 Apr 74	2	3	4	17		
1 May 74	27	24	11	50		
15 May 74	17	11	3	26		
29 May 74	17	21	0	11		
12 Jun 74	25	20	51	33		
25 Jun 74	11	34	35	101		
9 Jul 74	7	56	47	67		
24 Jul 74	0	2	0	12		
20 Aug 74	149	149	153	136		
10 Sep 74	57	79	113	112		
24 Sep 74	118	80	38	148		
10 Oct 74	13	33	64	89		
22 Oct 74	30	12	7	5		
5 Nov 74	13	24	45	28		
19 Nov 74	60	85	73	77		
3 Dec 74	23	39	20	42		
16 Dec 74	51	34	37	60		
10 Jan 75	79	39	29	24		
21 Jan 75	92	101	65	90		
4 Feb 75	9	7	1	44		
18 Mar 75	49	20	8	39		

Pteropods per m <sup>3</sup>		Individual Stations				Islote, Puerto Rico
Date	Station 1	Station 2	Station 3	Station 4		
20 Mar 74	0	8	8	3		
3 Apr 74	0	2	2	3		
17 Apr 74	0	0	0	0		
1 May 74	10	11	0	1		
15 May 74	0	12	16	1		
29 May 74	1	13	7	2		
12 Jun 74	0	5	0	0		
25 Jun 74	0	1	0	12		
9 Jul 74	5	1	3	4		
24 Jul 74	1	1	0	1		
20 Aug 74	2	2	2	2		
10 Sep 74	0	0	0	6		
24 Sep 74	3	1	3	5		
10 Oct 74	0	0	0	4		
22 Oct 74	0	0	0	2		
5 Nov 74	0	0	2	7		
19 Nov 74	0	7	7	0		
3 Dec 74	0	2	5	0		
16 Dec 74	4	2	4	2		
10 Jan 75	0	1	0	0		
21 Jan 75	3	0	0	2		
4 Feb 75	6	5	3	1		
18 Mar 75	5	5	3	2		



Ostracods per m<sup>3</sup>

Individual Stations

Islote, Puerto Rico

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	0	3	4	54
3 Apr 74	106	200	156	92
17 Apr 74	25	74	8	2
1 May 74	7	2	6	3
15 May 74	30	26	55	1
29 May 74	8	7	3	2
12 Jun 74	0	1	2	0
25 Jun 74	3	4	8	6
9 Jul 74	0	0	4	0
24 Jul 74	1	0	0	1
20 Aug 74	2	3	0	0
10 Sep 74	0	0	0	3
24 Sep 74	3	1	3	0
10 Oct 74	0	0	0	0
22 Oct 74	0	0	0	0
5 Nov 74	0	1	2	0
19 Nov 74	2	0	1	1
3 Dec 74	0	3	0	0
16 Dec 74	1	2	1	0
10 Jan 75	16	6	2	4
21 Jan 75	63	18	4	2
4 Feb 75	316	223	35	2
18 Mar 75	1	0	3	0

Cladocerans per m<sup>3</sup>

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	0	0	2	0
3 Apr 74	0	11	5	0
17 Apr 74	8	3	1	6
1 May 74	30	2	0	1
15 May 74	13	3	0	1
29 May 74	4	2	0	1
12 Jun 74	5	7	5	25
25 Jun 74	5	13	26	18
9 Jul 74	9	1	0	0
24 Jul 74	0	1	0	0
20 Aug 74	0	3	0	2
10 Sep 74	0	2	3	3
24 Sep 74	0	1	0	3
10 Oct 74	0	0	0	6
22 Oct 74	0	0	5	4
5 Nov 74	2	1	2	11
19 Nov 74	12	19	4	4
3 Dec 74	13	4	0	0
16 Dec 74	1	4	2	7
10 Jan 75	2	2	4	0
21 Jan 75	0	3	4	0
4 Feb 75	0	1	0	2
18 Mar 75	1	1	0	2

Date	Individual Stations				Islote, Puerto Rico
	Station 1	Station 2	Station 3	Station 4	
20 Mar 74	5	2	6	4	
3 Apr 74	9	2	0	5	
17 Apr 74	1	2	1	1	
1 May 74	0	1	3	7	
15 May 74	0	4	2	48	
29 May 74	3	3	0	1	
12 Jun 74	0	3	2	8	
25 Jun 74	0	6	3	15	
9 Jul 74	5	7	4	4	
24 Jul 74	0	2	0	3	
20 Aug 74	7	3	5	2	
10 Sep 74	0	4	0	11	
24 Sep 74	6	1	8	11	
10 Oct 74	0	2	5	8	
22 Oct 74	1	0	0	2	
5 Nov 74	0	3	12	0	
19 Nov 74	10	19	7	2	
3 Dec 74	10	14	2	0	
16 Dec 74	3	4	4	5	
10 Jan 75	2	7	0	7	
21 Jan 75	3	2	4	3	
4 Feb 75	0	0	2	2	
18 Mar 75	2	6	5	5	

Siphonophore bracts per m<sup>3</sup>

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	16	5	13	10
3 Apr 74	22	0	0	18
17 Apr 74	2	3	3	16
1 May 74	0	3	2	5
15 May 74	17	6	3	7
29 May 74	27	18	13	28
12 Jun 74	0	10	2	14
25 Jun 74	9	2	7	6
9 Jul 74	2	9	0	5
24 Jul 74	3	1	0	8
20 Aug 74	0	3	7	11
10 Sep 74	1	5	16	11
24 Sep 74	0	7	5	16
10 Oct 74	0	2	7	13
22 Oct 74	4	0	1	13
5 Nov 74	5	1	5	4
19 Nov 74	0	9	4	4
3 Dec 74	5	7	5	13
16 Dec 74	1	4	2	2
10 Jan 75	9	4	11	9
21 Jan 75	3	4	7	3
4 Feb 75	0	0	1	2
18 Mar 75	11	6	0	5

Thaliacea per m<sup>3</sup>

Individual Stations

Islote, Puerto Rico

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	8	10	7	1
3 Apr 74	2	2	0	1
17 Apr 74	1	0	1	1
1 May 74	0	2	1	1
15 May 74	0	1	0	4
29 May 74	11	30	70	20
12 Jun 74	40	40	8	18
25 Jun 74	11	4	7	0
9 Jul 74	9	8	1	1
24 Jul 74	0	0	0	4
20 Aug 74	5	7	13	4
10 Sep 74	0	0	0	9
24 Sep 74	3	1	5	11
10 Oct 74	4	0	2	5
22 Oct 74	3	0	0	3
5 Nov 74	0	0	0	0
19 Nov 74	8	2	3	0
3 Dec 74	0	0	0	4
16 Dec 74	0	0	1	2
10 Jan 75	5	1	4	4
21 Jan 75	0	2	0	0
4 Feb 75	0	1	1	1
18 Mar 75	2	2	0	3

Annelid larvae per m<sup>3</sup>

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	6	1	10	3
3 Apr 74	9	5	0	8
17 Apr 74	2	3	3	4
1 May 74	5	5	2	5
15 May 74	42	23	17	5
29 May 74	18	16	15	19
12 Jun 74	4	4	3	16
25 Jun 74	17	16	12	15
9 Jul 74	5	10	3	3
24 Jul 74	1	6	7	4
20 Aug 74	5	5	4	6
10 Sep 74	3	0	0	3
24 Sep 74	25	15	3	5
10 Oct 74	2	2	0	3
22 Oct 74	0	2	1	1
5 Nov 74	2	9	2	7
19 Nov 74	2	5	1	2
3 Dec 74	10	4	0	8
16 Dec 74	1	2	1	0
10 Jan 75	7	4	0	3
21 Jan 75	0	1	2	2
4 Feb 75	9	5	2	2
18 Mar 75	2	1	3	3

Gastropod veligers per m <sup>3</sup>		Individual Stations				Islote, Puerto Rico
Date	Station 1	Station 2	Station 3	Station 4		
20 Mar 74	80	23	45	36		
3 Apr 74	32	18	86	37		
17 Apr 74	75	27	33	24		
1 May 74	93	59	13	9		
15 May 74	355	336	142	41		
29 May 74	42	40	25	41		
12 Jun 74	64	12	54	45		
25 Jun 74	16	23	12	30		
9 Jul 74	68	99	37	9		
24 Jul 74	66	62	315	22		
20 Aug 74	30	27	42	27		
10 Sep 74	23	13	32	26		
24 Sep 74	31	41	33	37		
10 Oct 74	21	20	18	18		
22 Oct 74	16	8	26	13		
5 Nov 74	18	32	27	22		
19 Nov 74	24	38	24	8		
3 Dec 74	81	59	39	44		
16 Dec 74	6	12	20	8		
10 Jan 75	27	7	0	7		
21 Jan 75	40	22	25	12		
4 Feb 75	32	31	21	35		
18 Mar 75	11	41	114	38		

Foraminifera per m<sup>3</sup>

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	6	1	6	2
3 Apr 74	17	5	9	6
17 Apr 74	25	5	3	24
1 May 74	0	4	1	5
15 May 74	4	0	2	7
29 May 74	28	27	15	32
12 Jun 74	2	1	5	10
25 Jun 74	6	5	3	12
9 Jul 74	12	3	4	5
24 Jul 74	14	5	7	11
20 Aug 74	12	11	7	10
10 Sep 74	6	6	0	23
24 Sep 74	6	5	3	24
10 Oct 74	6	3	7	17
22 Oct 74	6	7	51	3
5 Nov 74	8	3	5	7
19 Nov 74	4	3	1	0
3 Dec 74	0	0	0	0
16 Dec 74	1	2	1	5
10 Jan 75	5	6	5	5
21 Jan 75	0	2	5	5
4 Feb 75	13	5	3	9
18 Mar 75	6	5	0	9

Malacostracan larvae per m<sup>3</sup>

Individual Stations

Sheet 10 of 15

Islote, Puerto Rico

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	6	7	7	5
3 Apr 74	37	16	57	10
17 Apr 74	15	25	28	6
1 May 74	91	27	40	9
15 May 74	21	39	23	6
29 May 74	27	32	41	10
12 Jun 74	33	17	20	22
25 Jun 74	28	7	20	62
9 Jul 74	80	48	19	13
24 Jul 74	17	14	33	9
20 Aug 74	27	26	24	48
10 Sep 74	12	14	13	20
24 Sep 74	28	28	49	16
10 Oct 74	21	23	9	11
22 Oct 74	30	14	16	4
5 Nov 74	8	5	10	9
19 Nov 74	10	16	10	4
3 Dec 74	20	15	20	11
16 Dec 74	16	11	12	11
10 Jan 75	23	11	9	13
21 Jan 75	40	19	14	11
4 Feb 75	19	19	26	3
18 Mar 75	14	24	286	11

Fish larvae per m<sup>3</sup>

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	0	0	4	0
3 Apr 74	20	7	9	1
17 Apr 74	2	2	5	0
1 May 74	7	3	1	1
15 May 74	0	4	3	2
29 May 74	0	1	2	0
12 Jun 74	2	1	0	0
25 Jun 74	0	1	0	0
9 Jul 74	0	2	1	0
24 Jul 74	0	1	2	0
20 Aug 74	5	3	4	4
10 Sep 74	3	1	0	0
24 Sep 74	0	2	0	8
10 Oct 74	0	1	0	3
22 Oct 74	4	2	0	1
5 Nov 74	0	1	2	7
19 Nov 74	2	2	1	0
3 Dec 74	3	1	0	0
16 Dec 74	0	1	0	1
10 Jan 75	2	1	0	0
21 Jan 75	0	1	4	0
4 Feb 75	0	1	2	2
18 Mar 75	0	1	46	3

Fish eggs per m<sup>3</sup>

Individual Stations

Islote, Puerto Rico

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	47	29	60	67
3 Apr 74	15	33	25	52
17 Apr 74	39	35	25	64
1 May 74	30	50	34	34
15 May 74	46	56	35	30
29 May 74	105	107	90	77
12 Jun 74	62	80	74	107
25 Jun 74	71	80	62	107
9 Jul 74	103	100	107	159
24 Jul 74	41	45	46	90
20 Aug 74	74	66	84	103
10 Sep 74	59	53	87	83
24 Sep 74	99	147	82	177
10 Oct 74	101	99	82	110
22 Oct 74	42	33	23	73
5 Nov 74	88	81	122	99
19 Nov 74	62	50	40	57
3 Dec 74	33	42	44	32
16 Dec 74	65	72	52	82
10 Jan 75	77	80	110	110
21 Jan 75	38	46	36	44
4 Feb 75	54	30	15	48
18 Mar 75	43	65	56	85

Temora turbinata per m<sup>3</sup>

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	4	38	16	40
3 Apr 74	78	55	149	17
17 Apr 74	27	42	8	7
1 May 74	499	267	30	15
15 May 74	600	543	437	13
29 May 74	24	32	18	7
12 Jun 74	184	211	345	23
25 Jun 74	134	163	76	24
9 Jul 74	84	11	31	3
24 Jul 74	13	14	65	9
20 Aug 74	50	46	29	6
10 Sep 74	41	27	66	6
24 Sep 74	508	538	206	0
10 Oct 74	33	61	339	31
22 Oct 74	18	5	17	8
5 Nov 74	168	229	758	131
19 Nov 74	247	274	261	1
3 Dec 74	210	232	149	15
16 Dec 74	101	30	115	2
10 Jan 75	146	170	128	15
21 Jan 75	355	95	19	1
4 Feb 75	152	193	71	12
18 Mar 75	32	20	20	20

Temova stylifera per m<sup>3</sup>

Individual Stations

Islote, Puerto Rico

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	30	47	48	16
3 Apr 74	4	12	11	5
17 Apr 74	1	3	1	1
1 May 74	22	13	2	2
15 May 74	4	5	3	0
29 May 74	10	15	3	0
12 Jun 74	7	2	3	18
25 Jun 74	36	8	12	9
9 Jul 74	-	-	-	-
24 Jul 74	-	-	-	-
20 Aug 74	-	-	-	-
10 Sep 74	7	4	0	0
24 Sep 74	3	7	3	5
10 Oct 74	0	3	5	10
22 Oct 74	-	-	-	-
5 Nov 74	5	6	15	9
19 Nov 74	8	16	7	6
3 Dec 74	0	8	10	11
16 Dec 74	3	2	6	5
10 Jan 75	23	8	15	1
21 Jan 75	3	4	0	0
4 Feb 75	0	2	1	1
18 Mar 75	5	5	10	16

Small calanoid copepods per m<sup>3</sup>

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	88	101	103	36
3 Apr 74	126	108	185	127
17 Apr 74	243	142	42	91
1 May 74	371	135	84	101
15 May 74	376	387	284	143
29 May 74	136	268	180	209
12 Jun 74	344	117	222	302
25 Jun 74	199	205	194	743
9 Jul 74	901	672	491	212
24 Jul 74	162	441	274	274
20 Aug 74	569	630	418	678
10 Sep 74	489	389	703	1123
24 Sep 74	759	869	841	742
10 Oct 74	191	411	537	411
22 Oct 74	223	273	408	312
5 Nov 74	422	409	671	464
19 Nov 74	346	649	330	224
3 Dec 74	873	1231	854	556
16 Dec 74	128	133	246	97
10 Jan 75	666	659	462	450
21 Jan 75	718	652	712	373
4 Feb 75	518	305	79	127
18 Mar 75	296	275	390	388

Small calanoid copepods includes Paracalanus aculeatus, Paracalanus parvus, Clausocalanus furcatus, Mecynocera clausi, Calocalanus sp., Acrocalanus sp. and other juvenile calanoids.

Oithona spp. per m<sup>3</sup>

Individual Stations

Islote, Puerto Rico

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	41	20	57	24
3 Apr 74	43	64	14	89
17 Apr 74	38	17	7	20
1 May 74	7	15	4	18
15 May 74	135	57	38	157
29 May 74	19	35	25	70
12 Jun 74	42	17	34	98
25 Jun 74	46	41	53	113
9 Jul 74	129	70	47	22
24 Jul 74	10	19	39	57
20 Aug 74	121	100	74	105
10 Sep 74	26	60	72	146
24 Sep 74	77	58	38	95
10 Oct 74	28	93	64	126
22 Oct 74	31	16	12	36
5 Nov 74	152	83	97	33
19 Nov 74	80	119	43	20
3 Dec 74	28	95	54	44
16 Dec 74	11	19	45	13
10 Jan 75	47	28	22	66
21 Jan 75	52	61	80	90
4 Feb 75	148	45	21	85
18 Mar 75	29	39	35	25

Oncaea sp. per m<sup>3</sup>

Date	Station 1	Station 2	Station 3	Station 4
20 Mar 74	2	1	2	8
3 Apr 74	19	2	0	14
17 Apr 74	2	1	3	4
1 May 74	2	3	1	11
15 May 74	8	6	10	9
29 May 74	5	6	10	5
12 Jun 74	5	1	2	10
25 Jun 74	19	20	25	107
9 Jul 74	12	43	11	18
24 Jul 74	6	6	21	34
20 Aug 74	52	62	27	19
10 Sep 74	54	44	45	60
24 Sep 74	81	43	27	50
10 Oct 74	35	41	57	88
22 Oct 74	10	5	9	3
5 Nov 74	15	24	27	48
19 Nov 74	22	32	14	11
3 Dec 74	20	36	15	4
16 Dec 74	9	9	7	9
10 Jan 75	61	46	42	59
21 Jan 75	14	22	27	15
4 Feb 75	25	18	1	5
18 Mar 75	11	13	20	13



APPENDIX 16

ORGANISMS COLLECTED IN  
PRELIMINARY HARD BOTTOM SAMPLES

PLANT KINGDOM

Phylum Chlorophyta

- Anadyomene stellata
- Caulerpa cupressoides
- Caulerpa microphysa
- Caulerpa racemosa
- Chamaedoris peniculum
- Cladophora fuliginosa
- Cladophoropsis macromeres
- Cladophoropsis membranacea
- Cladophoropsis sp.
- Dictyosphaeria cavernosa
- Halimeda discoidea
- Halimeda sp.
- Penicillus capitatus
- Penicillus dumetosus
- Udotea sp.
- Unidentified chlorophyta

Phylum Phaeophyta

- Dictyopteris delicatula
- Dictyopteris justei
- Dictyopteris plagiogramma
- Dictyopteris membranacea
- Dictyopteris sp.
- Dictyota dentata
- Dictyota sp.
- Padina sp.
- Pocokiella variegata
- Sargassum sp.
- Spatoglossum schroederi
- Styopodium zonale
- Zonaria tournefortii

Phylum Rhodophyta

- Amansia multifida
- Amphiroa fragilissima
- Amphiroa rigida
- Amphiroa rigida
- Amphiroa sp.
- Asparagopsis taxiformis
- Botryocladia occidentalis
- Botryocladia pyriformis
- Bryothamnion seaforthii
- Bryothamnion triquetum

	C/29 Aug 73	C/10 Oct 73	B/10 Oct 73	B/21 Oct 73	B(40)/29 Aug 73	B(50)/29 Aug 73	B(70)/29 Aug 73	D/10 Oct 73	D/21 Oct 73	G/10 Oct 73	X/30 Aug 73	F/10 Oct 73	Tr5/20 Dec 73	Tr6/22 Jan 74	J/26 Mar 74	K/9 Apr 74
<u>Anadyomene stellata</u>				X	X					X						X
<u>Caulerpa cupressoides</u>	X															
<u>Caulerpa microphysa</u>		X				X								X		X
<u>Caulerpa racemosa</u>	X															
<u>Chamaedoris peniculum</u>			X	X			X		X			X	X	X	X	X
<u>Cladophora fuliginosa</u>				X												
<u>Cladophoropsis macromeres</u>									X							
<u>Cladophoropsis membranacea</u>	X															
<u>Cladophoropsis sp.</u>			X													
<u>Dictyosphaeria cavernosa</u>				X					X							
<u>Halimeda discoidea</u>				X						X		X	X			X
<u>Halimeda sp.</u>										X						
<u>Penicillus capitatus</u>			X			X										X
<u>Penicillus dumetosus</u>												X				
<u>Udotea sp.</u>												X				X
Unidentified chlorophyta	X												X			
<u>Dictyopteris delicatula</u>	X			X			X		X				X	X		X
<u>Dictyopteris justei</u>												X	X			
<u>Dictyopteris plagiogramma</u>												X	X			X
<u>Dictyopteris membranacea</u>												X	X			X
<u>Dictyopteris sp.</u>										X						X
<u>Dictyota dentata</u>						X			X			X	X	X		X
<u>Dictyota sp.</u>												X				X
<u>Padina sp.</u>																X
<u>Pocokiella variegata</u>					X											X
<u>Sargassum sp.</u>																X
<u>Spatoglossum schroederi</u>												X		X		X
<u>Styopodium zonale</u>																X
<u>Zonaria tournefortii</u>												X				
<u>Amansia multifida</u>	X	X	X		X		X			X	X	X	X	X	X	X
<u>Amphiroa fragilissima</u>													X			
<u>Amphiroa rigida</u>	X															
<u>Amphiroa rigida</u>																
<u>Amphiroa sp.</u>							X									X
<u>Asparagopsis taxiformis</u>	X															
<u>Botryocladia occidentalis</u>												X		X		X
<u>Botryocladia pyriformis</u>													X			
<u>Bryothamnion seaforthii</u>		X			X					X	X	X	X	X	X	X
<u>Bryothamnion triquetum</u>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Appendix 16 continued

	C/29 Aug 73	C/10 Oct 73	B/10 Oct 73	B/21 Oct 73	B(40)/29 Aug 73	B(50)/29 Aug 73	B(70)/29 Aug 73	D/10 Oct 73	D/21 Oct 73	G/10 Oct 73	X/30 Aug 73	F/10 Oct 73	Tr5/20 Dec 73	Tr6/22 Jan 74	J/26 Mar 74	K/9 Apr 74
<u>Ceramium</u> sp.	X				X											
<u>Champia</u> parvula					X			X								
<u>Champia</u> salicornoides								X							X	
<u>Chondria</u> sedifolia														X	X	X
<u>Cladophoropsis</u> membranacea	X															
<u>Coelarthrum</u> albertisii																
<u>Corallina</u> cubensis					X					X	X			X	X	X
<u>Corallina</u> sp.		X					X									
<u>Corallina</u> subulata	X				X	X						X	X	X	X	X
<u>Cryptonemia</u> bengryi							X			X	X			X		
<u>Cryptonemia</u> crenulata											X	X				
<u>Cryptonemia</u> luxurians	X	X	X					X			X			X	X	X
<u>Cryptonemia</u> sp.					X											
<u>Dictyurus</u> occidentalis	X	X	X	X				X		X	X			X	X	X
<u>Digenia</u> simplex		X	X		X			X	X		X	X				X
<u>Enantiocladia</u> duperreyi		X	X		X			X	X		X	X		X	X	X
<u>Galaxaura</u> marginata												X				X
<u>Galaxaura</u> marginata													X			X
<u>Gelidiella</u> acerosa	X		X							X	X					X
<u>Gracilaria</u> curtissiau																X
<u>Gracilaria</u> debilis					X						X					X
<u>Gracilaria</u> ferox		X		X							X			X		X
<u>Gracilaria</u> sp.				X				X							X	X
<u>Gracilaria</u> verrucosa				X				X			X	X				X
<u>Hildenbrandia</u> prototypus	X	X												X	X	X
<u>Hypnea</u> sp.				X										X		X
<u>Jania</u> adherens		X	X	X	X			X	X							X
<u>Jania</u> rubens	X															X
<u>Jania</u> sp.							X			X			X	X	X	X
<u>Laurencia</u> intricata					X					X	X	X		X	X	X
<u>Laurencia</u> poitei				X						X	X	X		X	X	X
<u>Laurencia</u> sp.	X						X			X	X	X				X
<u>Thuretia</u> borneti												X			X	X
<u>Vidalia</u> obtusiloba														X		X
Phylum Spermatophyta																
<u>Halophila</u> baillonis						X										
<u>Syringodium</u> sp.		X	X													
<u>Thalassia</u> testudinum	X	X	X	X				X		X						
ANIMAL KINGDOM																
Phylum Porifera																
<u>Anthosigmella</u> varians			X													
<u>Callispongia</u> sp.	X															X

Appendix 16 continued

Callyspongia vaginalis  
Cliona sp.  
 Family craniellidae  
 Family hymeniacidonidae  
Geodia papyracea  
Geodia sp.  
Haliclona sp.  
Ircinia fasciculata  
Ircinia sp.  
Microciona sp.  
Najax sp.  
 Order choristida  
 Order halichondrina  
Verongia sp.  
 Unidentified sponge

Phylum Cnidaria

Class Anthozoa

Pseudopterogorgia acerosa  
Pseudopterogorgia rigida  
Pterogorgia sp.  
Isaurus tuberculatus

Phylum Nemertea

Phylum Sipunculoidea

Phylum Echiuroidea

Phylum Annelida

Class Polychaeta

Alentia sp.  
Arabella sp.  
Diopatra sp.  
Eunicea rubra  
Eunice sp.  
Eurythoe complanata  
 Family aphroditidae  
 Family maldanidae  
 Family nereidae  
 Family opheliidae  
 Family sabellidae  
 Family syllidae  
 Family terebellidae

	C/29 Aug 73	C/10 Oct 73	B/10 Oct 73	B/21 Oct 73	B(40)/29 Aug 73	B(50)/29 Aug 73	B(70)/29 Aug 73	D/10 Oct 73	D/21 Oct 73	G/10 Oct 73	X/30 Aug 73	F/10 Oct 73	Tr5/20 Dec 73	Tr6/22 Jan 74	J/26 Mar 74	K/9 Apr 74
<u>Callyspongia vaginalis</u>											X					X
<u>Cliona sp.</u>	X															X
Family craniellidae				X											X	X
Family hymeniacidonidae																X
<u>Geodia papyracea</u>								X								X
<u>Geodia sp.</u>										X						
<u>Haliclona sp.</u>								X								
<u>Ircinia fasciculata</u>					X									X	X	X
<u>Ircinia sp.</u>								X		X						
<u>Microciona sp.</u>				X						X						
<u>Najax sp.</u>				X												
Order choristida	X															X
Order halichondrina											X					X
<u>Verongia sp.</u>										X						X
Unidentified sponge												X		X		X
<u>Pseudopterogorgia acerosa</u>															X	X
<u>Pseudopterogorgia rigida</u>								X								X
<u>Pterogorgia sp.</u>								X								X
<u>Isaurus tuberculatus</u>				X	X		X									
Phylum Nemertea	X		X						X		X					
Phylum Sipunculoidea											X					
Phylum Echiuroidea											X					
Phylum Annelida																
Class Polychaeta																
<u>Alentia sp.</u>									X							
<u>Arabella sp.</u>		X	X				X	X			X					
<u>Diopatra sp.</u>															X	
<u>Eunicea rubra</u>		X	X	X				X	X	X		X		X		
<u>Eunice sp.</u>								X		X		X		X		X
<u>Eurythoe complanata</u>		X														
Family aphroditidae								X				X		X		
Family maldanidae								X				X		X		
Family nereidae		X	X	X				X		X		X		X		
Family opheliidae										X		X		X		
Family sabellidae			X	X								X		X		
Family syllidae			X	X				X		X		X		X		
Family terebellidae		X						X								

Appendix 16 continued

	C/29 Aug 73	C/10 Oct 73	B/10 Oct 73	B/21 Oct 73	B(40)/29 Aug 73	B(50)/29 Aug 73	B(70)/29 Aug 73	D/10 Oct 73	D/21 Oct 73	G/10 Oct 73	X/30 Aug 73	F/10 Oct 73	Tr5/20 Dec 73	Tr6/22 Jan 74	J/26 Mar 74	K/9 Apr 74
<u>Lyonsia beana</u>										X						
<u>Modiolus americanus</u>			X											X		
<u>Modulus modulus</u>	X															
<u>Musculus lateralis</u>	X															
<u>Papyridea semisulcata</u>	X						X									
<u>Petricola lapicida</u>												X				
<u>Pinctada radiata</u>												X				
Class Cephalopoda																
Octopus sp.								X								
Phylum Arthropoda																
Class Crustacea																
Subclass Malacostraca																
Order Stomatopoda																
<u>Gonodactylus oerstedii</u>									X							
Order Amphipoda																
Family gammaridea	X							X	X		X			X		
Order Tanaidacea							X		X		X					
Order Isopoda																
<u>Alcirona insularis</u>							X									
<u>Cirolana parva</u>		X					X				X					
<u>Dynameneia perforata</u>	X															
<u>Erichsonella filiformis</u>	X							X						X		
Family anthuridae									X			X		X		
<u>Paracereis caudata</u>	X															
<u>Paracereis sp.</u>		X														
Order Decapoda																
Suborder Natantia																
Section Caridea																
<u>Alpheus amblyonyx</u>							X									
<u>Alpheus normanni</u>								X	X							

Appendix 16 continued

Alpheus sp.  
Automate gardineri  
 Family processidae  
Latreutes parvulus  
Processa bermudensis  
Sicyonia brevirostris  
Synalpheus latastei  
Synalpheus rathbunae

Suborder Reptantia

Section Anomura

Calcinus tibicen  
Clibanarius sp.  
Clibanarius tricolor  
Dardanus venosus  
 Family paguridae (juv)  
Pachycheles pilosus  
Pagurus sp.  
Petrolisthes galathinus  
Petrolisthes jugosus  
 Unidentified hermit

Section Brachyura

Acanthonyx petiverii  
Actaea rufopunctata nodosa  
Epialtus bituberculatus  
Epialtus dilatatus  
Epialtus sp.  
Euprognatha rastellifera  
Eurypanopeus sp.  
 Family majidae  
 Family Pinnotheridae  
 Family Xanthidae  
Menaethiops portoricensis  
Micropanope sp.  
Microphrys antillensis  
Microphrys bicornutus  
Microphrys sp.  
Mithrax forceps  
Mithrax ruber  
Mithrax sp.  
Pachygrapsus gracilis  
Panopeus sp.  
Pilumnus caribaeus  
Pilumnus pannosus

	C/29 Aug 73	C/10 Oct 73	B/10 Oct 73	8/21 Oct 73	B(40)/29 Aug 73	B(50)/29 Aug 73	B(70)/29 Aug 73	D/10 Oct 73	D/21 Oct 73	G/10 Oct 73	X/30 Aug 73	F/10 Oct 73	Tr5/20 Dec 73	Tr6/22 Jan 74	J/26 Mar 74	K/9 Apr 74
<u>Alpheus</u> sp.				X												
<u>Automate gardineri</u>			X													
Family processidae								X								
<u>Latreutes parvulus</u>								X								
<u>Processa bermudensis</u>								X								
<u>Sicyonia brevirostris</u>												X				
<u>Synalpheus latastei</u>								X		X						
<u>Synalpheus rathbunae</u>								X								
<u>Calcinus tibicen</u>													X	X		
<u>Clibanarius</u> sp.								X								
<u>Clibanarius tricolor</u>								X								
<u>Dardanus venosus</u>														X	X	
Family paguridae (juv)												X				
<u>Pachycheles pilosus</u>										X						
<u>Pagurus</u> sp.								X								
<u>Petrolisthes galathinus</u>									X							
<u>Petrolisthes jugosus</u>									X							
Unidentified hermit													X			
<u>Acanthonyx petiverii</u>													X		X	
<u>Actaea rufopunctata nodosa</u>										X						
<u>Epialtus bituberculatus</u>		X	X													
<u>Epialtus dilatatus</u>	X	X							X			X	X			
<u>Epialtus</u> sp.												X				
<u>Euprognatha rastellifera</u>						X										
<u>Eurypanopeus</u> sp.												X				
Family majidae									X				X			
Family Pinnotheridae									X				X			
Family Xanthidae	X								X			X	X			
<u>Menaethiops portoricensis</u>												X		X		X
<u>Micropanope</u> sp.							X									
<u>Microphrys antillensis</u>	X	X								X						
<u>Microphrys bicornutus</u>										X						
<u>Microphrys</u> sp.	X												X			
<u>Mithrax forceps</u>							X									
<u>Mithrax ruber</u>	X															
<u>Mithrax</u> sp.	X	X					X	X	X	X		X	X	X		X
<u>Pachygrapsus gracilis</u>						X										
<u>Panopeus</u> sp.												X				
<u>Pilumnus caribaeus</u>										X						
<u>Pilumnus pannosus</u>												X				

Appendix 16 continued

	C/29 Aug 73	C/10 Oct 73	B/10 Oct 73	B/21 Oct 73	B (40)/29 Aug 73	B (50)/29 Aug 73	B (70)/29 Aug 73	D/10 Oct 73	D/21 Oct 73	G/10 Oct 73	X/30 Aug 73	F/10 Oct 73	Tr5/20 Dec 73	Tr6/22 Jan 74	J/26 Mar 74	K/9 Apr 74
<u>Pilumnus sayi</u>										X						
<u>Stenocionops furcata</u>													X			
<u>Xanthodius denticulatus</u>	X															
Unidentified brachyura	X															
Phylum Echinodermata																
Class Ophiuroidea																
Family amphiuridae																
<u>Ophiocoma echinata</u>			X	X				X	X	X		X				
<u>Ophiocoma pumila</u>								X	X			X				
<u>Ophiothrix angulata</u>								X								
<u>Ophiothrix brachyactis</u>									X							
<u>Ophiozona impressa</u>				X								X				
Class Echinoidea																
<u>Eucidaris tribuloides</u>		X	X					X				X				
<u>Lytechinus variegatus</u>															X	
Phylum Chordata																
Subphylum Urochordata																
Class ascidiacea																
<u>Eudistoma sp.</u>	X								X							
Subphylum vertebrata																
Family clinidae																
<u>Paraclinus sp.</u>												X				

APPENDIX 17

ORGANISMS COLLECTED FROM  
PERMANENT SAMPLING STATIONS

	K n=19 8/21 1974	K(s) n=15 9/11 1974	K n=16 12/4 1974	K(s) n=14 12/5 1974	K n=15 4/22 1975	K(s) n=15 4/23 1975
ALGAE*						
Phylum Chlorophyta						
<u>Anadyomene stellata</u>	.5	.0	.2		2.8	1.5
<u>Avrainvillea sp.</u>					.1	.3
<u>Caulerpa microphysa</u>	4.5	1.7	1.1		1.0	.3
<u>Chamaedoris peniculum</u>	1.7	.3	.6	.6	7.3	1.5
<u>Cladophora sp.</u>	+					
<u>Halimeda discoidea</u>	2.8	1.8	.1	.6	2.7	2.5
Phylum Phaeophyta						
<u>Dictyopteris delicatula</u>	.2		.8	.3	1.8	.4
<u>D. justei</u>	.2		.1		6.2	
<u>D. plagiogramma</u>	11.0	.8	.1		7.4	
<u>Dictyota sp.</u>	.3	.9	.3		8.8	.1
<u>D. divaricata</u>	+	.9				
<u>D. dentata</u>	1.0					
<u>Dilophus alternans</u>	.1					
<u>Pocokiella variegata</u>	.2	.2				
<u>Sargassum sp.</u>	2.4	.9		.1		
Phylum Rhodophyta						
<u>Agardhiella tenera</u>					1.1	
<u>Amansia multifida</u>	68.1	2.3	11.7	5.5	17.9	1.8
<u>Amphiroa sp.</u>	2.0	3.5	+	+	+	
<u>A. rigida</u>	7.5		1.1	1.5	2.5	1.9
<u>Botryocladia occidentalis</u>	4.3	+	.5		.4	+
<u>Bryothamnion seaforthii</u>	26.9		.1	2.1		2.3
<u>B. triquetum</u>	13.6	6.2	1.3	.8	.7	
<u>Champia salicornoides</u>	+					
<u>Chondria sp.</u>	.3		+		.6	.2
<u>Chrysamenia enteromorpha</u>	+					
<u>Coelarthum albertisii</u>	1.3	.1	1.1			
<u>Corallina spp.</u>	38.0	41.2	15.1	13.9	125.4	71.6
<u>Corynomorpha clavata</u>	.8					
<u>Cryptonemia bengryi</u>				2.3	3.6	.4
<u>Dictyurus occidentalis</u>	1.3		.8			
<u>Galaxaura marginata</u>	1.5		.4		.8	
<u>Gelidium pussillum</u>						.8
<u>Gracilaria sp.</u>	9.9	.2	.4	.1	6.4	.2
<u>Halimeda floridans</u>	1.9			.2	.8	
<u>Hildenbrandia prototypus</u>	2.5	1.6	+	1.9	2.2	1.0

\*Values represent dry weight

## Appendix 17 (continued)

	K n=19 8/21 1974	K(s) n=15 9/11 1974	K n=16 12/4 1974	K(s) n=14 12/5 1974	K n=15 4/22 1975	K(s) n=15 4/23 1975
Phylum Mollusca						
Class Amphineura						
<u>Acanthanochitona sp. A</u>	1					
Class Scaphopoda						
<u>Dentalium antillarum</u> Orbigry	3		4			
Class Gastropoda						
<u>Anachis mangelioides</u> Reeve	6					
<u>A. puchella</u> Blainville	2	1	1			
<u>Balcis conoidea</u> Kurtz and Stimpson	1					
<u>Cerithiopsis crystallinum</u> Dall	1			1		
<u>Collumbella mercatoria</u> Linne	2					
<u>Conus daucus</u> Hwass	3					
<u>C. jaspideus</u> Gmelin	3					
<u>C. juliae</u> Clench			1			
<u>Drillia interpleura</u> Dall and Simpson	11	2	1			
<u>D. ponciana</u> Dall and Simpson			1			
<u>Enginia turbinella</u> Kiener	1					
<u>Eulima conoidea</u> Kurtz and Stimpson		1				
<u>Jaspidella blanesi</u> Gmelin					1	
<u>Latica marochiensis</u> Kiener	1					
<u>Latirus virginiensis</u> Abbott	1	2				
<u>Mangelia quadrilineata</u> C. B. Adams		1	1			
<u>M. bioconica</u> C. B. Adams	2					
<u>M. bartletti</u> Dall						
<u>Mathilda barbadensis</u> Dall	1					
<u>Marginella hematita</u> Kiener	2	1				
<u>M. denticulata</u> Conrad		1				
<u>Mitrella fenestrata</u> C. B. Adams	1	1	1			
<u>Modulus modulus</u> Linne	3	1	2			
<u>Nassarius albus</u> Say		1				
<u>Persicula pulcherrima</u> Gaskoin	9	1	1	1		
<u>Pyrene ovulata</u> Lamark	5		1			
<u>Rissoina multicostata</u> C. B. Adams		1				
<u>R. cancellata</u> Philipi		1				
<u>Strombus gigas</u> Linne	2					
<u>S. raninus</u> Gmelin	1					
<u>Tricolia affinis</u> C. B. Adams	1					
<u>Triphora ornata</u> Deshayes	1					
<u>Trivia pediculus</u> Linne		1				
<u>Vexillum sp. A</u>					3	
<u>Vexillum hanleyi</u> Dohrn	14	4			6	
Class Pelecypoda						
<u>Arca imbricata</u> Bruguiere					1	
<u>Arcopsis adamsi</u> Dall					1	





## Appendix 17 (continued)

	K	K(s)	K	K(s)	K	K(s)
	n=19	n=15	n=16	n=14	n=15	n=15
	8/21	9/11	12/4	12/5	4/22	4/23
	1974	1974	1974	1974	1975	1975
Order Amphipoda						
<u>Corophiidae</u> sp. A		3	5	5		
<u>Gammaridae</u> spp.	145	42	22	42		
Order Decapoda						
Suborder Natantia						
Section Caridea						
<u>Alpheus</u> sp. A		3				
<u>A. armatus</u> Rathbun						
<u>A. bahamensis</u> Rathbun						
<u>A. formosus</u> Gibbes						
<u>Brachycarpus biunguiculatus</u> Lucas						
<u>Discias atlanticus</u> Gurney	2					
<u>Latreutes</u> sp. A					1	
<u>Lysmata</u> sp.						
<u>Ogyrides yaquiensis</u> Armstrong						
<u>Periclimenaeus</u> sp. A	2		1	1		
<u>Periclimenes americanus</u> Kingsley	3		1	4		
<u>P. pedersoni</u> Chase						
<u>Pontonia miserabilis</u> Holthuis			1			
<u>Pontonia</u> sp. A			14	1		
<u>Processa</u> sp. A	1					
<u>P. bermudensis</u> Rankin	4	1				
<u>Salmoneus ortmanni</u> Rankin			1	4		
<u>Synalpheus</u> spp. (?juveniles)				4		
<u>Synalpheus bousfieldi</u> Chace	23	19	29	8		
<u>S. sanctithomae</u> Coutiere				1		
<u>Thor manningi</u> Chace	1					
<u>Trachycaris restrictus</u> A. Milne-Edwards		1				
Suborder Reptantia						
Section Anomura						
<u>Dardanus venosus</u> H. Milne-Edwards	1					
<u>Pagurus</u> spp. (?juveniles)	2		1	2		
<u>Pagurus miamensis</u> Provenzano	4	3	16	5		
<u>Petrolisthes amoenis</u> Guerin						
Section Brachyura						
<u>Acanthonyx petiverii</u> H. Milne-Edwards	1					
<u>Actaea sulcata</u> Rathbun		1	1			

## Appendix 17 (continued)

	K n=19 8/21 1974	K(s) n=15 9/11 1974	K n=16 12/4 1974	K(s) n=14 12/5 1974	K n=15 4/22 1975	K(s) n=15 4/23 1975
<u>Calappa flammea</u> Herbst						
<u>Eucinetops blakiana</u> Rathbun		1				
<u>Eurypanopeus sp. A</u>			2			
<u>Herbstia depressa</u> Stimpson				1		
<u>Hexapanopeus caribbaeus</u> Stimpson		4				
<u>Lissa bicarinata</u> Aurivillius	1					
<u>Lithadia granulosa</u> A. Milne-Edwards	1					
<u>Menaethiops portoricensis</u> Rathbun				1		
<u>Microphrys bicornutus</u> A. Milne-Edwards	3					
<u>M. antillensis</u> Rathbun			2			
<u>Mitrax forceps</u> A. Milne-Edwards	1	1	3			
<u>?Ovalipes guadulpensis</u> Saussure		1				
<u>Pilumnus reticulatus</u> Rathbun		4		1		
<u>Podochela grossipes</u> Stimpson		2	1			
<u>Stenorynchus seticornis</u> Herbst						
<u>Thyrolambrus astroides</u> Rathbun	1		1			
Phylum Bryozoa						
Bryozoan type A	+	+	5	5	2	
Bryozoan type D	+	+	1	3	4	1
Phylum Echinodermata						
Class Asteroidea						
<u>Astropectin duplicatus</u> Gray	1					
<u>Peltaster planus</u> Verill	1					
Class Ophiuroidea						
<u>Amphiodia pulchella</u> Lyman						
<u>Amphiura sp. A</u>		1				
<u>Amphiura palmeri</u>	2					
Amphiuridae sp. B	2	1				
Amphiuridae sp. D	2	3				
<u>Ophiocoma echinata</u> Lamark						
<u>O. pulmila</u> Lutken	8	3	1			
<u>O. riisei</u> Lutken		2				
<u>Ophiocnida scabriuscula</u> Lutken	1					
<u>Ophioderma sp. A</u>	4	2		2		
<u>O. phoenium</u> H. L. Clark	1	1				
<u>O. squamosissimum</u> Lutken						
<u>Ophiolepis paucispina</u> Say		1	1	1		
<u>Ophiomyxa flaccida</u> Say	1					
<u>Ophionereis reticulata</u> Say	1		2	2		
<u>Ophiostigma isacanthum</u> Say	11	12	8	4		

Appendix 17 (continued)

	K n=19 8/21	K(s) n=15 9/11	K n=16 12/4	K(s) n=14 12/5	K n=15 4/22	K(s) n=15 4/23
<u>Ophiothrix angulata</u> Say	5		3	3		
<u>O. orstedii</u> Lutken	3	1	2			
<u>O. suensonii</u> Lutken	11					
Class Echinoidea						
<u>Eucidaris tribuloides</u> Lamark	5	5	4	2		
Phylum Chordata						
Subphylum Urochordata						
Class Ascidiacea						
Didemnidae type A	+	+	6	5	7	1
<u>Herdmania momus</u> Savigny	1					
<u>Microcosmus helleri</u> Herdman			1			

## APPENDIX 18

## LIST OF FISHES OBSERVED IN THE ISLOTE AREA

Scientific Name	Common English Name	Common Spanish Name
ORECTOLOBIDAE <u>Ginglymostoma cirratum</u> *	nurse shark	gata
CARCHARHINIDAE <u>Rhizoprionodon porosus</u>	Atlantic sharpnose shark	tiburón
DASYATIDAE <u>Dasyatis americana</u> *	southern stingray	raya
MORINGUIDAE <u>Moringa edwardsi</u>	spaghetti eel	
XENCONGRIDAE <u>Kaupichthys nuchalis</u> <u>Kaupichthys diodontis</u>	false moray false moray	morena morena
MURAENIDAE <u>Enchelycore</u> sp. <u>Gymnothorax funebris</u> <u>Gymnothorax moringa</u> <u>Gymnothorax</u> sp. <u>Gymnothorax vicinus</u> *	chestnut moray green moray spotted moray moray eel purplemouth moray	morena congre morena morena morena
OPHICHTHIDAE <u>Myrichthys oculatus</u> <u>Myrophis punctatus</u> <u>Sphagebranchus ophioneus</u>	goldspotted eel speckled worm eel surf eel	culebra de mar culebra de mar culebra de mar
CLUPEIDAE <u>Harengula humeralis</u> <u>Jenkinsia lamprotaenia</u> *	redeal sardine dwarf herring Atlantic thread herring	machuelo mijua plumilla
SYNODONTIDAE <u>Saurida suspicio</u> <u>Synodus foetens</u> <u>Synodus saurus</u> <u>Synodus synodus</u>	suspicious lizardfish inshore lizardfish bluestripe lizardfish red lizardfish	iguana iguana iguana iguana
ANTENNARIIDAE <u>Antennarius multiocellatus</u>	longlure frogfish	zapo
OPHIDIIDAE <u>Lepophidium profundorum</u> <u>Ogilbia</u> sp. <u>Parophidion schmidti</u>	cusck-eel brotula dusky cusck-eel	
EXOCOETIDAE <u>Cypselurus heterurus</u>	Atlantic flyingfish	volador
BELONIDAE <u>Tylosurus acus</u>	agujon	agujon

Appendix 18 (continued)

Scientific Name	Common English Name	Common Spanish Name
<b>HOLOCENTRIDAE</b>		
<u>Holocentrus ascensionis</u>	squirrelfish	gallo, candil, candelero
<u>Holocentrus rufus</u>	longspine squirrelfish	gallo, candil, candelero
<u>Holocentrus vexillarius</u>	dusky squirrelfish	gallo, candil, candelero
<u>Myripristis jacobus</u>	blackbar soldierfish	gallo ojón, candil, gallo
<u>Plectrypops retrospinis</u>	cardinal soldierfish	gallo, candil
<b>AULOSTOMIDAE</b>		
<u>Aulostomus maculatus</u>	trumpetfish	corneta
<b>FISTULARIIDAE</b>		
<u>Fistularia tabacaria</u>	bluespotted cornetfish	flauta
<b>SYNGNATHIDAE</b>		
<u>Hippocampus reidi</u>	longsnout seahorse	caballo de mar
<u>Micrognathus crinitus</u>	insular pipefish	caballo de mar
<u>Micrognathus ensenadae</u>	harlequin pipefish	caballo de mar
<u>Micrognathus vittatus</u>	banded pipefish	caballo de mar
<u>Syngnathus dunkeri</u>	pugnose pipefish	caballo de mar
<b>SERRANIDAE</b>		
<u>Alphesthes afer</u>	mutton hamlet	cabrilla
<u>Cephalopholis fulva</u>	coney	mantequilla
<u>Epinephelus adscensionis*</u>	rock hind	mero chesno, juagil
<u>Epinephelus guttatus</u>	red hind	mero
<u>Epinephelus striatus</u>	nassau grouper	mero
<u>Serranus baldwini</u>	lantern bass	
<u>Serranus flaviventris*</u>	two spot bass	
<u>Serranus tigrinus*</u>	harlequin bass	
<b>GRAMMISTIDAE</b>		
<u>Pseudogrammus gregoryi</u>	reef bass	jabón
<u>Rypticus bistrispinus</u>	freckled soapfish	jabón
<u>Rypticus saponaceus</u>	greater soapfish	jabón
<u>Rypticus subbifrenatus</u>	spotted soapfish	jabón
<b>GRAMMIDAE</b>		
<u>Gramma loreto</u>	fairy basslet	
<b>PRIACANTHIDAE</b>		
<u>Priacanthus arenatus</u>	bigeye	cordován
<u>Priacanthus cruentatus</u>	glasseye snapper	cordován
<b>APOGONIDAE</b>		
<u>Apogon maculatus</u>	flamefish	
<u>Apogon quadrisquamatus</u>	sawcheek cardinalfish	
<u>Apogon sp.</u>	cardinalfish	
<b>BRANCHIOSTEGIDAE</b>		
<u>Malacanthus plumieri</u>	sand tilefish	guilochó
<b>ECHENEIDAE</b>		
<u>Echeneis naucrates</u>	sharksucker	remora, pega

Appendix 18 (continued)

Scientific Name	Common English Name	Common Spanish Name
<b>CARANGIDAE</b>		
<u>Caranx bartholomaei</u> *	yellow jack	medregal
<u>Caranx crysos</u>	blue runner	cojinua
<u>Caranx ruber</u>	bar jack	güira negra
<u>Decapterus macarellus</u>	mackerel scad	caballa
<u>Decapterus sp.*</u>	scad	caballa
<u>Elagatis bipinnulata</u> *	rainbow runner	cobia
<u>Seriola dumerili</u> *	greater amberjack	champanta
<u>Trachinotus sp.*</u>	pompano	pompano, palometa
<b>LUTJANIDAE</b>		
<u>Lutjanus analis</u> *	mutton snapper	sama
<u>Lutjanus apodus</u>	schoolmaster	pargo
<u>Lutjanus cyanopterus</u> *	cupera	pargo
<u>Lutjanus jocu</u>	dog snapper	pargo
<u>Lutjanus mahogani</u>	manogany snapper	manchego
<u>Lutjanus synagris</u>	lane snapper	manchego
<u>Ocyurus chrysurus</u>	yellowtail snapper	colirubia
<u>Rhomboplites aurorubens</u>	vermillion snapper	besugo
<b>GERREIDAE</b>		
<u>Eucinostomus jonesii</u>	slender mojarra	moniama
<u>Eucinostomus melanopterus</u>	flagfin mojarra	mojarra
<b>POMADASYIDAE</b>		
<u>Anisotremus surinamensis</u>	black margate	vieja
<u>Anisotremus virginicus</u>	porkfish	vieja
<u>Haemulon aurolineatum</u>	tomtate	mula
<u>Haemulon carbonarium</u>	Caesar grunt	cachicata prieta
<u>Haemulon chrysargyreum</u>	smallmouth grunt	cachiquita
<u>Haemulon flavolineatum</u>	French grunt	cachicata
<u>Haemulon melanurum</u> *	cottonwick	arrayado
<u>Haemulon plumieri</u>	white grunt	cachicata
<u>Haemulon sciurus</u>	bluestriped grunt	cachicata
<b>SPARIDAE</b>		
<u>Calamus bajonado</u>	jolthead porgy	
<u>Calamus penna</u>	sheepshead porgy	
<b>SCIAENIDAE</b>		
<u>Equetus acuminatus</u>	high-hat	
<u>Odontoscion dentex</u>	reef croaker	
<u>Umbrina coroides</u>	sand drum	zapatero
<b>MULLIDAE</b>		
<u>Mulloidichthys martinicus</u>	yellow goatfish	salmonete
<u>Pseudupeneus maculatus</u>	spotted goatfish	salmonete
<b>PEMPHERIDAE</b>		
<u>Pempheris schomburgki</u> *	glassy sweeper	

## Appendix 18 (continued)

Scientific Name	Common English Name	Common Spanish Name
EPHIPPIDAE		
<u>Chaetodipteus faber</u>	Atlantic spadefish	mariposa
CHAETONDONTIDAE		
<u>Chaetodon sedentarius</u> *	reef butterflyfish	mariposa
<u>Chaetodon striatus</u>	banded butterflyfish	mariposa
<u>Holacanthus ciliaris</u>	queen angelfish	cagona
<u>Holacanthus tricolor</u>	rock beauty	mariposa
<u>Pomacanthus arcuatus</u> *	gray angelfish	cagona
<u>Pomacanthus paru</u>	French angelfish	cagona prieta
POMACENTRIDAE		
<u>Abudefduf saxatilis</u>	sergeant major	chopa
<u>Chromis cyaneus</u>	blue chromis	chopa
<u>Chromis multilineatus</u> *	brown chromis	chopa
<u>Microspathodon crysurus</u>	yellowtail damselfish	chopa
<u>Pomacentrus fuscus</u>	dusky damselfish	chopa
<u>Pomacentrus partitus</u>	bicolor damselfish	chopa
<u>Pomacentrus planifrons</u> *	threespot damselfish	chopa
CIRRHITIDAE		
<u>Amblycirrhitus pinos</u>	redspotted hawkfish	
LABRIDAE		
<u>Bodianus rufus</u>	Spanish hogfish	capitán
<u>Clepticus parrai</u> *	creole wrasse	
<u>Doratonotus megalepis</u>	dwarf wrasse	
<u>Halichoeres bivittatus</u> *	slippery dick	doncella
<u>Halichoeres garnoti</u>	yellowhead wrasse	doncella
<u>Halichoeres maculipinna</u>	clown wrasse	doncella
<u>Halichoeres pictus</u> *	rainbow wrasse	doncella
<u>Halichoeres poeyi</u>	blackear wrasse	doncella
<u>Halichoeres radiatus</u> *	puddingwife	doncella
<u>Hemipteronotus martinicensis</u>	rosy razorfish	doncella
<u>Hemipteronotus novacula</u> *	pearly razorfish	doncella
<u>Hemipteronotus splendens</u>	green razorfish	doncella
<u>Thalassoma bifasciatum</u>	bluehead	doncella
SCARIDAE		
<u>Scarus coeruleus</u> *	blue parrotfish	cotorro
<u>Scarus croicensis</u> *	striped parrotfish	cotorro
<u>Sparisoma aurofrenatum</u> *	redband parrotfish	cotorro
<u>Sparisoma chrysopterygum</u>	redtail parrotfish	cotorro
SPHYRAENIDAE		
<u>Sphyrnaea barracuda</u>	great barracuda	picua
POLYNEMIDAE		
<u>Polydactylus virginicus</u>	barbu	barbú
DACTYLOSCOPIIDAE		
<u>Dactyloscopus tridigitatus</u>	sand stargazer	
<u>Girella rubrocinctus</u>	saddle stargazer	



## Appendix 18 (continued)

Scientific Name	English Common Name	Spanish Common Name
<b>OPISTHOGNATHIDAE</b>		
<u>Opisthognathus aurifrons*</u>	yellowhead jawfish	
<u>Opisthognathus whitehursti</u>	dusky jawfish	
<b>CLINIDAE</b>		
<u>Labrisomus bucciferus</u>	puffcheek blenny	chupa piedra
<u>Labrisomus haitiensis</u>	longfin blenny	chupa piedra
<u>Labrisomus nuchipinnis</u>	hairy blenny	chupa piedra
<u>Malacoctenus aurolineatus</u>	goldline blenny	chupa piedra
<u>Malacoctenus erdmani</u>	imitation blenny	chupa piedra
<u>Malacoctenus triangulatus</u>	saddled blenny	chupa piedra
<u>Malacoctenus versicolor</u>	barfin blenny	chupa piedra
<u>Paraclinus fasciatus*</u>	banded blenny	chupa piedra
<u>Paraclinus grandicomis</u>	horned blenny	chupa piedra
<u>Paraclinus nigripinnis</u>	blackfin blenny	chupa piedra
<u>Starksia lepicoelia</u>	blackcheek blenny	chupa piedra
<b>BLENNIIDAE</b>		
<u>Hypleurochilus aequipinnis</u>	oyster blenny	chupa piedra
<u>Ophioblennius atlanticus</u>	redlip blenny	chupa piedra
<b>CALLIONYMIDAE</b>		
<u>Callionymus bairdi</u>	lancer dragonet	
<b>GOBIIDAE</b>		
<u>Barbulifer antennatus</u>	barbulifer	
<u>Bathygobius soporator</u>	frillfin goby	chupa piedra
<u>Gobiosoma evelynae*</u>	sharknose goby	chupa piedra
<b>ACANTHURIDAE</b>		
<u>Acanthurus bahianus</u>	ocean surgeon	barbero
<u>Acanthurus chirurgus*</u>	doctorfish	barbero
<u>Acanthurus coeruleus</u>	blue tang	médico, barbero
<b>SCOMBRIDAE</b>		
<u>Scomberomorus regalis</u>	cero	macarela
<b>SCORPAENIDAE</b>		
<u>Neomerinthe beanorum</u>	scorpionfish	rascasio
<u>Scorpaena bergi</u>	goosehead scorpionfish	rascasio
<u>Scorpaena grandicornis*</u>	plumed scorpionfish	rascasio
<u>Scorpaena plumieri</u>	spotted scorpionfish	rascasio
<b>BOTHIDAE</b>		
<u>Bothus lunatus</u>	peacock flounder	tapa coño
<u>Bothus maculiferus</u>	maculated flounder	tapa coño
<u>Bothus ocellatus</u>	eyed flounder	tapa coño
<u>Syacium micrurum</u>	channel flounder	tapa coño
<b>BALISTIDAE</b>		
<u>Aluterus schoepfi*</u>	orange filefish	peje puerco
<u>Balistes capriscus</u>	gray triggerfish	peje puerco azul o verde
<u>Balistes vetula</u>	queen triggerfish	peje puerco azul
<u>Cantherhines macrocerus</u>	white spotted filefish	peje puerco
<u>Cantherhines pullus</u>	orange spotted filefish	peje puerco

Appendix 18 (continued)

Scientific Name	Common English Name	Common Spanish Name
<u>Melichthys niger</u>	black durgon	peje puerco negro
<u>Monacanthus ciliatus</u>	fringe filefish	peje puerco
OSTRACIIDAE		
<u>Lactophrys bicaudalis</u>	spotted trunkfish	caja de muerto
<u>Lactophrys polygona</u>	honeycomb cowfish	cafa de muerto
<u>Lactophrys triqueter</u>	smooth trunkfish	cafa de muerto
TETRADONTIDAE		
<u>Canthigaster rostrata</u>	sharpnose puffer	tamboril
<u>Sphoeroides spengleri</u> *	bandtail puffer	tamboril
Unidentified		
DIODONTIDAE		
<u>Diodon holocanthus</u> *	balloonfish	guanábano
<u>Diodon hystrix</u>	porcupinefish	guanábano

APPENDIX 19

MONTHLY TALLY OF SPECIES CAUGHT (NUMBERS INDICATE NUMBER OF FISH COLLECTED)

Species	AUG	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
RHIZOPRIONODON POROSUS	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	3
MORINGUA EDWARDSI	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
KAUPICHTHYS DIODONTIS	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
KAUPICHTHYS NUCHALIS	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
ENCHELYCORE SP.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	3
GYMNOTHORAX FUNERBIS	0	0	0	0	0	2	1	0	2	2	0	0	0	0	1	0	8
GYMNOTHORAX MORINGA	0	0	0	0	0	0	1	0	9	0	0	0	0	0	0	0	10
GYMNOTHORAX SP.	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2
MYRICHTHYS OCULATUS	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
SPHAGEBRANCHUS OPHIONEUS	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
MYROPHIS PUNCTATUS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
HARENGULA HUMERALIS	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
OPISTHONEMA OGLINUM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
SYNODUS FOETENS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
SYNODUS SAURUS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
SYNODUS SYNODUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
SAURIDA SUSPICIO	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
ANTENNARIUS MULTIOCELLATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
LEPOPHIDIUM PROFUNDORUM	0	0	0	0	0	0	0	0	5	0	0	0	0	0	1	0	4
OGILBIA SP.	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	5
PAROPHIODION SCHMIDTI	0	0	0	0	0	0	15	0	3	0	0	0	0	0	0	0	3
CYSELURUS HETERURUS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TYLOSURUS ACUS	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
HOLOCENTRUS VEXILLARIUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
HOLOCENTRUS ASCENSIONIS	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	34
HOLOCENTRUS RUFUS	0	0	0	0	0	0	0	0	0	0	1	3	5	0	0	0	124
MYRIPRISTIS JACOBUS	0	0	0	0	0	0	4	2	0	0	1	0	0	0	0	0	12
PLECTRYPOPS RETROSPINIS	0	0	0	0	0	17	1	1	0	0	0	0	0	0	0	0	22
AULOSTOMUS MACULATUS	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3
FISTULARIA TABACARIA	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
MICROGNATHUS CRINITUS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
MICROGNATHUS ENSENADAE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
MICROGNATHUS VITTATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
SYNGNATHUS DUNCKERI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
HIPPOCAMPUS REIDI	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1
NEOMEFRINTHE BEANORUM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
SCORPAENA BERGI	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	11
SCORPAENA PLUMIERI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1







APPENDIX 20

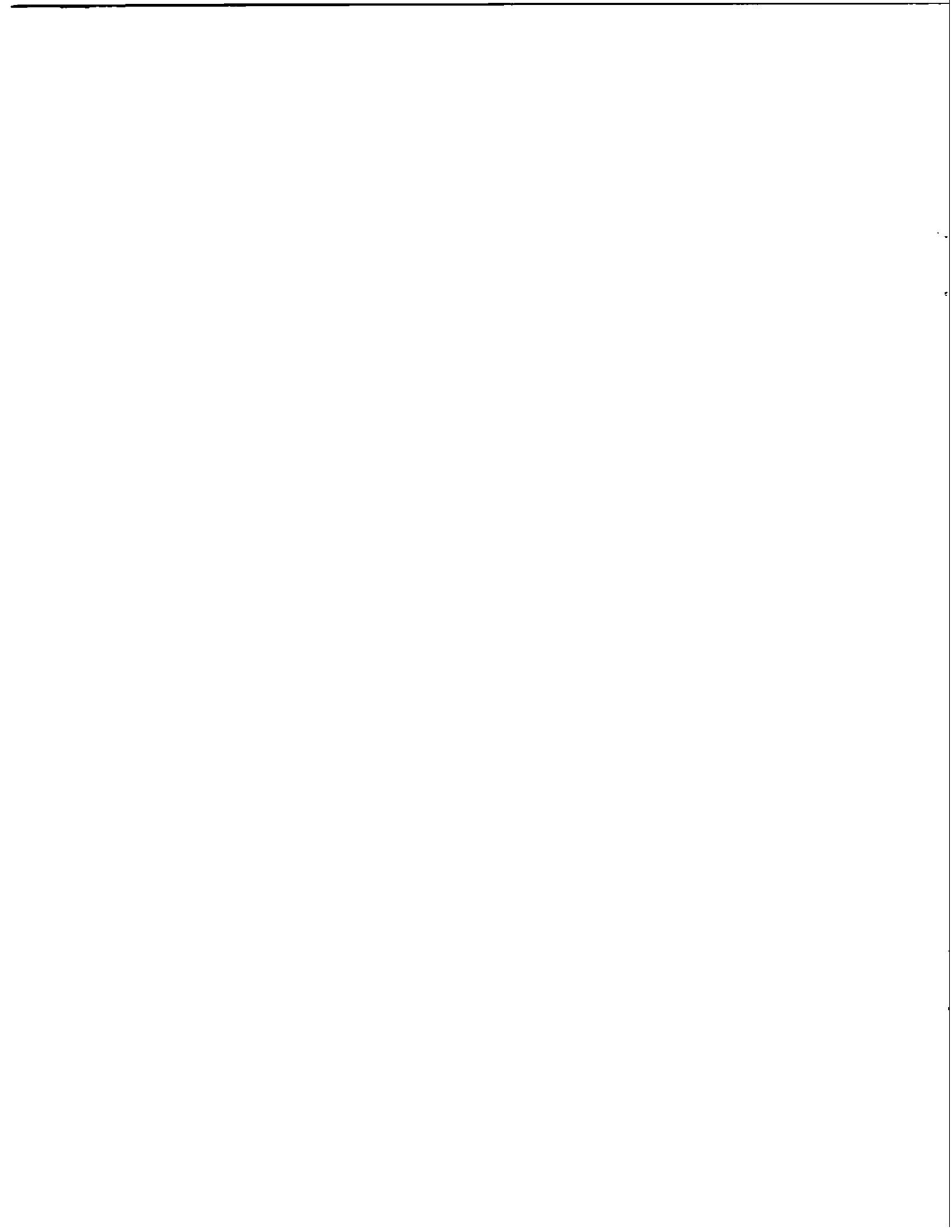
MONTHLY TALLY OF SPECIES CAUGHT ON ALGAL MAT (NUMBERS INDICATE NUMBER OF FISH COLLECTED)

SPECIES	AUG	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
RHIZOPRIONODON POROSUS	0	1	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0
MORINGUA EDWARDSI	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
ENCHELYCORE SP.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GYMNOTHORAX FUNERBIS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
GYMNOTHORAX MORINGA	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
GYMNOTHORAX SP.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MYROPHIS PUNCTATUS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
SYNODUS FOETANS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SYNODUS SYNODUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTENNARIUS MULTIOCELLATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OGILBIA SP.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PAROPHIODION SCHMIDTI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOLOGENTRUS VEXILLARIUS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
HOLOGENTRUS ASCENSIONIS	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	13
HOLOGENTRUS RUFUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MYRIPRISTIS JACOBUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLECTRYPOPS RETROSPINIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AULOSTOMUS MACULATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MICROGNATHUS CRINITUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MICROGNATHUS ENSENADAE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MICROGNATHUS VITTATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HIPPOCAMPUS REIDI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCORPAENA BERGI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCORPAENA PLUMIERI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALPHESTES AFER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CEPHALOPHOLIS FULVA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPINEPHELUS GUTTATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPINEPHELUS STRIATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SERRANUS BALDWINI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RYPTICUS BISTRIPINUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RYPTICUS SUBBIFRENATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRILACANTHUS ARENATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APOGON SP.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MALACANTHUS PLUMIERI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CARANX CRYOSOS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0









APPENDIX 21

MONTHLY TALLY OF SPECIES CAUGHT ON ROCK OUTCROPS (NUMBERS INDICATE NUMBER OF FISH COLLECTED)

	AUG	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	TOTAL
<u>Kaupichthys diodontis</u>	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
<u>Kaupichthys nuchalis</u>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<u>Enchelychore sp.</u>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
<u>Gymnothorax funebris</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Gymnothorax moringa</u>	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	9
<u>Myrichthys oculatus</u>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
<u>Sphagebranchus ophioneus</u>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<u>Antennarius multiocellatus</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Lepophidium profundorum</u>	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	5
<u>Ogilbia sp.</u>	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
<u>Paraphidion schmidti</u>	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	4
<u>Holocentrus ascensionis</u>	0	0	0	0	0	9	0	0	0	0	0	1	0	0	0	10
<u>Holocentrus rufus</u>	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	6
<u>Myripristis jacobus</u>	0	0	0	0	0	14	1	0	0	0	0	0	0	0	0	15
<u>Syngnathus dunckeri</u>	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
<u>Neomerinthe beanorum</u>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
<u>Alphesthes afer</u>	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	6
<u>Cephalopholis fulva</u>	0	0	0	0	0	12	26	0	19	1	0	0	0	0	0	58
<u>Epinephelus guttatus</u>	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
<u>Epinephelus striatus</u>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
<u>Serranus baldwini</u>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
<u>Pseudogamma gregoryi</u>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
<u>Rypticus bistrispinus</u>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<u>Rypticus saponaceus</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Rypticus subbifrenatus</u>	0	0	0	0	0	0	4	0	0	0	0	0	2	0	0	6
<u>Gramma loreto</u>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
<u>Priacanthus arenatus</u>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<u>Priacanthus cruentatus</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Apogon maculatus</u>	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2
<u>Apogon quadrisquamatus</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Caranx crysos</u>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
<u>Lutjanus jocu</u>	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
<u>Lutjanus mahogani</u>	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
<u>Lutjanus synagris</u>	0	0	0	0	0	17	0	0	0	0	0	5	0	0	0	22
<u>Rhomboplites aurorubens</u>	0	0	0	0	0	126	0	0	0	0	0	86	0	0	0	212
<u>Anisotremus surinamensis</u>	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2
<u>Anisotremus virginicus</u>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1

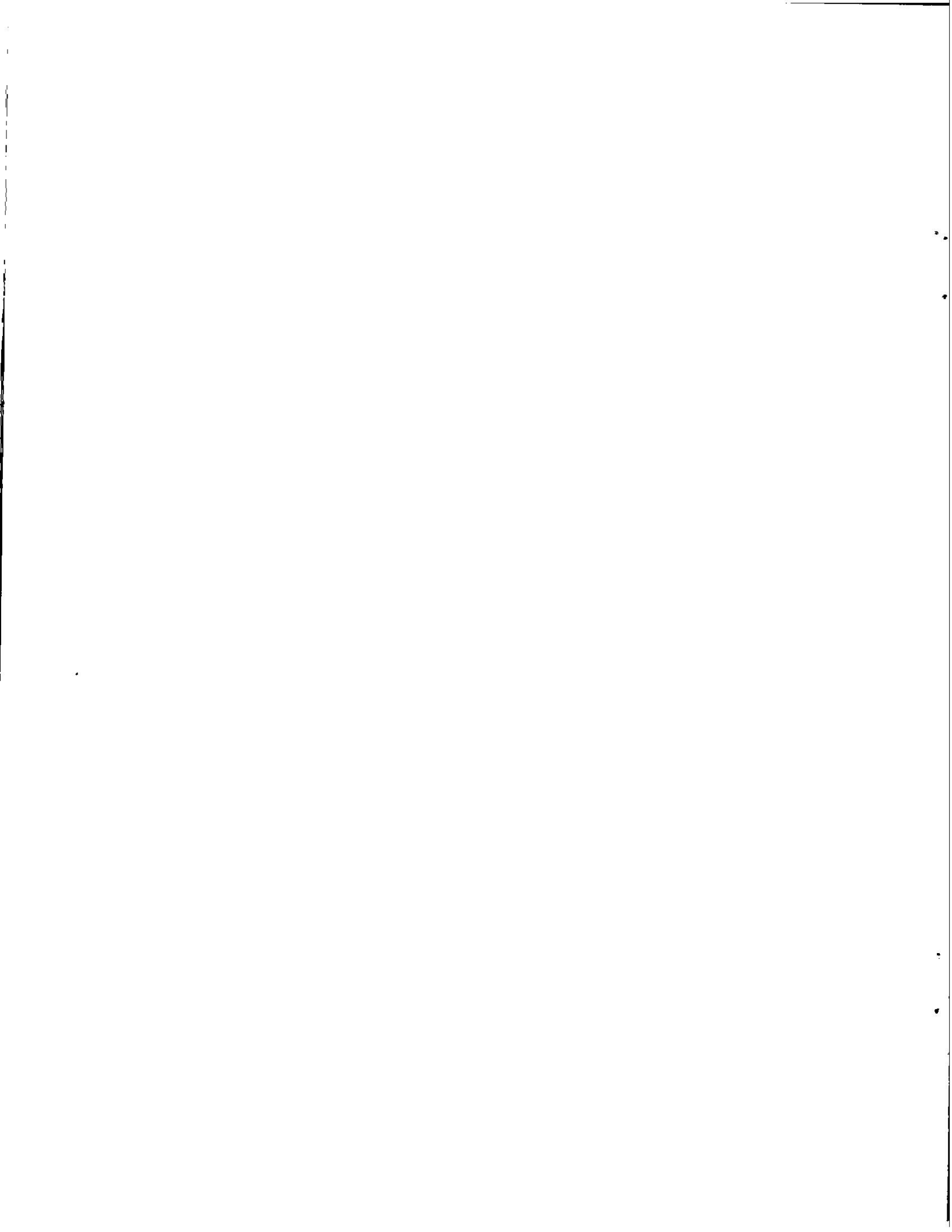
Appendix 21 (continued)

	AUG	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	TOTAL
<u>Haemulon aurolineatum</u>	0	0	0	0	0	172	0	0	0	0	0	0	0	0	0	172
<u>Haemulon carbonarium</u>	0	0	0	0	0	0	18	0	0	1	0	0	0	0	0	19
<u>Haemulon chrysargyreum</u>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
<u>Haemulon flavolineatum</u>	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	4
<u>Pseudupeneus maculatus</u>	0	0	0	0	0	3	2	0	0	0	0	2	0	0	0	8
<u>Mulloidichthys martinicus</u>	0	0	0	0	0	14	0	0	0	0	0	3	0	0	0	17
<u>Chaetodon striatus</u>	0	0	0	0	0	2	0	0	0	0	0	0	2	3	0	7
<u>Holocentrus tricolor</u>	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	4
<u>Pomacanthus paru</u>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<u>Abudefduf saxatilis</u>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<u>Chromis cyanea</u>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
<u>Pomacentrus fuscus</u>	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
<u>Pomacentrus partitus</u>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<u>Amblycirrhitus pinos</u>	0	0	0	0	0	0	15	0	0	0	0	0	4	0	0	19
<u>Bodianus rufus</u>	0	0	0	0	0	0	7	0	0	0	0	0	2	0	0	9
<u>Halichoeres garnoti</u>	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	3
<u>Halichoeres maculipinna</u>	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
<u>Halichoeres poeyi</u>	0	0	0	0	0	0	5	0	3	0	0	0	0	0	0	8
<u>Thalassoma bifasciatum</u>	0	0	0	0	0	0	4	0	22	0	0	0	1	0	0	27
<u>Sparisoma chrysopterum</u>	0	0	0	0	0	0	14	0	2	0	0	0	0	0	0	16
<u>Opistognathus whitehursti</u>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
<u>Dactyloscopus tridigitatus</u>	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
<u>Gillellus rubrocinctus</u>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<u>Ophioblennius atlanticus</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Labrisomus bucciferus</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Labrisomus haitiensis</u>	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	17
<u>Labrisomus nuchipinnis</u>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
<u>Malacoctenus aurolineatus</u>	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	17
<u>Malacoctenus erdmani</u>	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
<u>Malacoctenus versicolor</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Paraclinus nigripinnis</u>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<u>Starksia lepicoelia</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Callionymus bairdiella</u>	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
<u>Barbulifer antennatus</u>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
<u>Acanthurus bahianus</u>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<u>Acanthurus coeruleus</u>	0	0	0	0	0	0	4	0	23	1	0	0	0	3	0	35
	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4

Appendix 21 (continued)

	AUG	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	TOTAL
<u>Cantherhines pullus</u>	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6
<u>Lactophrys bicaudalis</u>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
<u>Lactophrys triqueter</u>	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
<u>Tetraodontidae, unident.</u>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
<u>Canthigaster rostrata</u>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
<u>Diodon hystrix</u>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
<u>Empty gear</u>	0	0	0	1	7	1	0	2	0	0	0	1	0	1	0	13

Number of species captured = 80      Total # of fishes = 832



APPENDIX 22

MONTHLY TALLY OF SPECIES CAUGHT ON SAND (NUMBERS INDICATE NUMBER OF FISH COLLECTED)

SPECIES	AUG	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
RHIZOPRIONODON POROSUS	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
KAUPICHTHYS DIODONTIS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
ENCHELYCORE SP.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
GYMNOTHORAX FUNEBRIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GYMNOTHORAX SP.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
HARENGULA HUMERALIS	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
OPISTHONEMA OGLINUM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
SYNODUS SAURUS	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
SAURIDA SUSPICIO	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
PAROPHIDION SCHMIDTI	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
CYPSELURUS HETERURUS	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
TYLOSURUS ACUS	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
HOLOCENTRUS ASCENIONIS	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
HOLOCENTRUS RUFUS	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
AULOSTOMUS MACULATUS	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
FISTULARIA TABACARIA	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
ALPHESTES AFER	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
CEPHALOPHOLIS FULVA	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
PRIACANTHUS ARENATUS	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ECHENIS NAUCRATES	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
CARANX CRYOSUS	3	0	0	0	0	0	0	0	0	85	0	7	0	0	0	0	95
CARANX RUBER	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	4
DECAPTERUS MACARELLUS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
LUTJANUS MAHOGANI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LUTJANUS SYNAGRIS	0	0	0	0	0	4	18	22	15	21	0	14	0	0	0	0	99
OGYRUS CHRYSURUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RHOMBOPLITES AURORUBENS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EUCHINOSTOMUS JONESII	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
EUCHINOSTOMUS MELANOPTERUS	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
HAEMULON AUROLINEATUM	0	0	0	0	0	13	1	0	0	0	0	0	0	0	0	0	14
HAEMULON CHRYSARGYREUM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HAEMULON FLAVOLINEATUM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HAEMULON PLUMIERI	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
ODONTOSCION DENTEX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UMBRINA COROIDES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSEUDUPENEUS MACULATUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





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