

**COASTAL OBSERVATION PROGRAMME-ENGINEERING
(COPE)**

EURONG-MARYBOROUGH CITY

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COASTAL OBSERVATION PROGRAMME - ENGINEERING (COPE)

EURONG - MARYBOROUGH CITY

For the Years 1972 to 1978

Beach Protection Authority

March 1984

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ABSTRACT:

This report provides a summary of primary analyses of COPE data on wind, wave and beach processes observed at Eurong on Fraser Island in Maryborough City in southern Queensland. The data were recorded by volunteer observer the late Mr. Charles Sinclair, assisted by Miss Emily Walk, during the period January 1972 to the end of December 1978. The recordings were made daily during the seven year period and the information published is considered representative and reliable.

OTHERS AVAILABLE IN THIS SERIES:

Coastal Observation Program - Engineering (COPE), Machans Beach - Mulgrave Shire, August 1979 (Report C 01.1).

Coastal Observation Program - Engineering (COPE), Baffle Creek - Miriam Vale Shire, October 1980 (Report C 02.1).

Coastal Observation Program - Engineering (COPE), Flying Fish Point - Johnstone Shire, November 1980 (Report C 03.1).

Coastal Observation Program - Engineering (COPE), Woodgate - Isis Shire, November 1980 (Report C 04.1).

Coastal Observation Programme - Engineering (COPE), Shelly Beach - Landsborough Shire, March 1984 (Report C 05.1).

REFERENCES:

1. ROBINSON D.A. and JONES C.M.

Queensland Volunteer Coastal Observation Program - Engineering (COPE). 3rd Australian Conference on Coastal and Ocean Engineering, Melbourne, April 1979.

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1.0 INTRODUCTION

1.1 The Programme

The Beach Protection Authority requires basic data on the behaviour of Queensland's beaches in order to provide well founded advice on coastal management to local Authorities. The COPE project aims to collect information on wind, waves and beach behaviour in areas where extensive investigations are not practical and where otherwise little or no data exist.

The project is based on the recruitment of volunteer observers who are prepared to record a series of basic parameters once or twice daily for at least a three year period.

1.2 Site Selection

In selecting a site for a COPE station, consideration is given to:-

- (a) the general shoreline configuration and the possibility of extrapolation of data to other adjacent beaches;
- (b) the distribution of stations along Queensland's coastline;
- (c) the need to correlate the COPE data with planned or existing data collection programmes.

1.3 Instrumentation

Each COPE observer is supplied with a basic kit of recording instruments including:-

- 30 metre Tape
- Wind Meter
- Abney Level
- 1.5 metre Sighting Support
- Recording Forms
- Fluorescent Dye.

A graduated reference pole is installed on the beach to serve as the base point for all plan measurements and the control for vertical levelling.

1.4 Observers

The majority of COPE observers are volunteers who may be local business people, local residents or school children. Some stations are manned by Government employees who carry out the observations as part of their official duties.

1.5 Accuracy

Individual observers differ in their subjective assessment of the various parameters recorded as part of the COPE programme. Wave parameters such as type, height, and angle of approach together with surf zone width and the location of the vegetation line all require visual assessment, the accuracy of which will vary from observer to observer and from recording to recording.

Although the Authority is confident that all observers make their observations to the best of their ability and accepts these observations without adjustment, the existence of random and non - random errors in the recorded data is to be expected.

Problems associated with the use of data containing these errors are minimised in two ways. Firstly, regular visits are made to the COPE stations by the Authority's COPE Field Officer to provide a check on any bias introduced into the recordings by incorrect observation procedures. Secondly, it has been found that, with a large number of observations taken on a regular basis, a reasonable assessment can be made of the average climatologies of the observed parameters provided the observation errors are random. A minimum recording period of three years has been adopted for the analysis and publication of the data. Five day moving averages are applied to observations of the various beach width and foreshore slope parameters to smooth out random errors.

For these reasons, the Authority is of the opinion that published COPE data can be used with confidence provided the above inherent limitations are recognised.

1.6 Presentation of Data

The purpose of this report is to present COPE data for the seven year period 1972 to 1978 in a useful statistical form. No attempt has been made to interpret the observed data.

If this seven year period is representative of the long term average meteorological conditions, the wind, wave and beach movement climatologies presented can be regarded as typical. However, this recording period is too short to be representative in terms of the average occurrence of extreme events such as cyclones and floods, and this should be taken into account when consideration is being given to the influence of such events on trends of long term beach behaviour.

2.0 STATION PARTICULARS

2.1 Location

Eurong is located within Maryborough City and is 60 kilometres south of Indian Head on the eastern coast of Fraser Island in southern Queensland. It forms part of a 90 kilometre gently curving stretch of the coastline between Indian Head and North Spit on Fraser Island and lies about 35 kilometres north of Inskip Point. The small settlement of Eurong is immediately adjacent to the COPE station. The location of the Eurong COPE station is shown in Figure 1.

2.2 Observers

This station has been manned by the late Mr. Charles Sinclair, assisted by Miss Emily Walk, during the period January 1972 to December 1978. Mr. Sinclair and Miss Walk were both local residents of Eurong who live near the COPE station.

2.3 Observed Parameters

The observer at this station usually recorded at 9.00 a.m. daily from 1972 to 1976 and from August until December 1978. He recorded at 3.00 p.m. daily during 1977 and from January until August 1978.

This station has recorded:

- Wave Period
- Wave Height
- Wave Angle
- Wave Type
- Surf Zone Width
- Presence of Offshore Bar
- Wind Speed
- Wind Direction
- State of Tide
- Distance to Berm
- Berm Elevation
- Fixed Contour Level
- Distance to Fixed Contour
- Distance to Vegetation
- Foreshore Slope
- Longshore Current Speed
- Longshore Current Direction

In addition, a sand sample was collected at the station each month and a profile of the beach recorded monthly also.

2.4 Tidal Information

Tidal information for this station as presented below is essentially the same as that for Sandy Cape. Datum is Low Water Datum.

M.H.W.S. : 2.1 metres
 M.H.W.N.: 1.7 metres
 M.S.L. : 1.22 metres
 M.L.W.S. : 0.3 metres
 M.L.W.N. : 0.8 metres.

2.5 Description of the Beach

The beach of the Eurong station is a clean sandy beach with a well formed dune system which is still essentially in its natural state with a small residential settlement on the hind dune. It exhibits the following characteristics:-

- Typical beach slopes: foreshore slope 1 in 20.
- Beach width: typically 30 to 40 metres from dune.
- D50 sand size: 0.24 mm averaged over several years.
- Dunal system: main dune 5 to 6 metres above mean sea level, typically with a steep front face as evidence of persistent erosion. The hind dune area is relatively flat at about 5 metres above mean sea level, with higher sand dunes further inland.
- Vegetation: well established Spinifex grass with Casuarina trees and other fore-dune vegetation.

2.6 Supervision of Station

The observer was instructed in the recording program by the COPE Field Officer and the initial instruction period was followed up with visits to the station during the period of recordings presented in this report.

Installation and maintenance of the reference pole for this station has been carried out by the observer Mr. Sinclair. Surveys of the reference pole were carried out by the Burrum Shire Council (now the Maryborough City Council), and the Authority wishes to thank the Council for its assistance in all matters associated with the COPE project.

3.0 DATA

3.1 General

COPE data for this station for the seven year period January 1972 to December 1978 are presented on the attached figures. The data have been analysed statistically and/or smoothed to reveal long term averages or trends. A brief description of each of the observed parameters is given below with the relevant figure references.

3.2 Wind

The observer recorded the wind speed at the beach using a hand held wind meter at 1.5 metres above beach level. Wind direction is estimated to the nearest compass sector.

A summary of annual wind speed and direction percentage occurrences are shown as a wind rose in Figure 2. Where applicable, morning and afternoon readings as well as the overall average are shown.

3.3 Waves

The average breaker height (trough to crest) is usually estimated to the nearest 0.1 metre. From experience this estimate has been found to be comparable with the equivalent deep water significant wave height.

The observer estimates the wave period by recording the time taken for eleven wave crests (the duration of 10 waves) to pass a point.

The wave direction is estimated as one of five direction sectors indicating the angle to the shoreline alignment from which the waves are approaching the beach. These sectors have been selected as:-

Sector 1	-	0°	to	60°
Sector 2	-	60°	to	85°
Sector 3	-	85°	to	95°
Sector 4	-	95°	to	120°
Sector 5	-	120°	to	180°

Note: 0° is the beach alignment to the left of the observer when facing seaward.

Statistical representations of the observed wave data include:-

- (a) the percentage of wave height recordings which exceed any given wave height for all directions combined (Figure 3).

- (b) the percentage occurrence of various combinations of wave heights and periods and directions (Figure 4 and Figure 5).
- (c) surf zone width with an indication of the existence or otherwise of an offshore bar in Figures 6 to 13.
- (d) tabulation of the occurrence of various wave heights, periods, types and directions (Tables 1 to 7).

3.4 Longshore Currents

The observer measured the distance parallel to the shoreline that a dye patch in the surf zone moved in one minute. Current direction is either upcoast or downcoast, upcoast being to the left when facing the sea from the beach.

The readings are converted to a velocity which is plotted on a daily basis (Figure 14 to Figure 21). Mean upcoast and downcoast components and the overall annual means are also presented.

3.5 Beach Profile Parameters

Beach profile parameters were measured using an Abney level, tape measure and reference pole. These include:

- elevation of berm crest relative to A.H.D. and distance from the reference pole to the seaward edge of the berm (from 1/1/72 to 16/3/76 and from 6/11/76 to 31/12/78).
- distance from the reference pole to the 2.5 metre, relative to A.H.D., fixed contour level (from 17/3/76 to 5/11/76).
- distance from reference pole to the vegetation line (usually front face of fore-dune).
- the foreshore slope.

Changes in these parameters with time indicate how the beach moves in response to varying wave attack. Plots of these parameters are shown in Figures 22 to 35 which provide a visual representation of the data.

TABLE 1.

MONTHLY AND ANNUAL

MEAN WAVE HEIGHT /MEAN WAVE PERIOD AND WAVE TYPE / WAVE DIRECTION
OCCURRENCES

YEAR 1972.

MONTH	MEAN WAVE PERIOD (Secs)	MEAN WAVE HEIGHT (Metres)	Percentage Occurrences - Wave Type /Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	10.8	1.89	77.3	22.7	-	-	-	-	27.3	63.6	9.1	-	-
FEBRUARY	12.4	1.60	73.3	26.7	-	-	-	-	20.0	66.7	13.3	-	-
MARCH	9.9	1.68	92.3	7.7	-	-	-	4.2	-	79.2	16.7	-	-
APRIL	10.6	1.67	96.7	3.3	-	-	-	-	-	76.7	23.3	-	-
MAY	11.1	2.07	92.9	7.1	-	-	-	-	28.6	50.0	21.4	-	-
JUNE	11.0	1.79	80.8	19.2	-	-	-	-	-	82.1	17.9	-	-
JULY	10.4	1.33	85.0	15.0	-	-	-	-	5.0	80.0	15.0	-	-
AUGUST	11.8	1.20	85.7	14.3	-	-	-	-	7.1	78.6	14.3	-	-
SEPTEMBER	9.4	1.30	90.0	10.0	-	-	-	-	28.6	57.1	14.3	-	-
OCTOBER	9.6	1.14	82.4	17.6	-	-	-	-	17.6	64.7	17.6	-	-
NOVEMBER	10.0	1.50	69.2	23.1	-	7.7	-	-	16.7	70.8	12.5	-	-
DECEMBER	9.3	.83	100.0	-	-	-	-	-	9.1	90.9	-	-	-
WHOLE YEAR	10.6	1.55	85.6	13.7	-	.7	-	.4	12.7	71.3	15.7	-	-

SP – Spilling

PL – Plunging

SP/PL – Combined Spilling and Plunging

TABLE 2.

MONTHLY AND ANNUAL

MEAN WAVE HEIGHT /MEAN WAVE PERIOD AND WAVE TYPE / WAVE DIRECTION
OCCURRENCES

YEAR 1973.

MONTH	MEAN WAVE PERIOD (Secs)	MEAN WAVE HEIGHT (Metres)	Percentage Occurrences - Wave Type /Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	9.8	1.34	81.0	19.0	-	-	-	-	25.0	70.0	5.0	-	-
FEBRUARY	10.3	1.92	68.2	13.6	-	18.2	-	-	26.1	65.2	8.7	-	-
MARCH	10.4	1.51	95.8	4.2	-	-	-	-	4.2	75.0	20.8	-	-
APRIL	10.0	1.53	100.0	-	-	-	-	-	7.4	81.5	11.1	-	-
MAY	11.5	1.65	80.6	19.4	-	-	-	-	12.9	58.1	29.0	-	-
JUNE	11.0	1.33	66.7	29.2	-	4.2	-	-	-	83.3	16.7	-	-
JULY	10.9	2.05	47.8	-	-	52.2	-	-	21.7	78.3	-	-	-
AUGUST	10.1	1.04	100.0	-	-	-	-	-	-	72.7	27.3	-	-
SEPTEMBER	-	-	-	-	-	-	-	-	-	-	-	-	-
OCTOBER	-	-	-	-	-	-	-	-	-	-	-	-	-
NOVEMBER	-	-	-	-	-	-	-	-	-	-	-	-	-
DECEMBER	9.0	1.23	80.6	-	-	19.4	-	-	16.7	70.0	13.3	-	-
WHOLE YEAR	10.3	1.54	79.4	9.8	-	10.7	-	-	13.1	72.3	14.6	-	-

SP - Spilling

PL - Plunging

SP/PL - Combined Spilling and Plunging

TABLE 3.

MONTHLY AND ANNUAL

MEAN WAVE HEIGHT /MEAN WAVE PERIOD AND WAVE TYPE / WAVE DIRECTION
OCCURRENCES

YEAR 1974.

MONTH	MEAN WAVE PERIOD (Secs)	MEAN WAVE HEIGHT (Metres)	Percentage Occurrences - Wave Type /Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	9.2	1.83	12.9	-	-	87.1	-	-	9.7	90.3	-	-	-
FEBRUARY	10.0	1.49	78.6	3.6	-	17.9	-	-	-	64.3	35.7	-	-
MARCH	11.4	2.00	71.0	-	-	29.0	-	-	16.1	67.7	16.1	-	-
APRIL	10.8	1.35	76.7	-	-	23.3	-	-	-	100.0	-	-	-
MAY	10.8	1.36	54.8	-	-	45.2	-	-	-	80.6	19.4	-	-
JUNE	11.4	1.24	70.6	-	-	29.4	-	-	-	70.6	29.4	-	-
JULY	12.2	1.02	91.7	4.2	-	4.2	-	-	4.2	75.0	20.8	-	-
AUGUST	11.5	1.29	74.2	3.2	-	22.6	-	-	-	80.6	19.4	-	-
SEPTEMBER	11.0	1.01	100.0	-	-	-	-	-	-	80.0	20.0	-	-
OCTOBER	10.6	.97	100.0	-	-	-	-	-	-	87.1	12.9	-	-
NOVEMBER	11.8	1.15	87.5	-	-	12.5	-	-	-	100.0	-	-	-
DECEMBER	10.9	1.04	100.0	-	-	-	-	-	8.0	64.0	28.0	-	-
WHOLE YEAR	10.9	1.34	75.1	.9	-	24.0	-	-	3.5	79.5	17.0	-	-

SP – Spilling

PL – Plunging

SP/PL – Combined Spilling and Plunging

TABLE 4.

MONTHLY AND ANNUAL

MEAN WAVE HEIGHT /MEAN WAVE PERIOD AND WAVE TYPE / WAVE DIRECTION
OCCURRENCES

YEAR 1975.

MONTH	MEAN WAVE PERIOD (Secs)	MEAN WAVE HEIGHT (Metres)	Percentage Occurrences - Wave Type /Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	9.2	1.00	87.1	-	-	12.9	-	-	19.4	67.7	12.9	-	-
FEBRUARY	10.1	1.25	95.5	4.5	-	-	-	-	9.1	63.6	27.3	-	-
MARCH	9.7	1.44	83.9	6.5	-	9.7	-	-	-	74.2	25.8	-	-
APRIL	10.7	1.78	93.3	-	-	6.7	-	-	-	80.0	20.0	-	-
MAY	11.5	1.21	96.8	-	-	3.2	-	-	6.5	80.6	12.9	-	-
JUNE	11.6	1.32	80.0	-	-	20.0	-	-	6.7	63.3	30.0	-	-
JULY	12.0	1.02	87.1	3.2	-	9.7	-	-	16.1	83.9	-	-	-
AUGUST	11.9	1.18	45.2	-	-	54.8	-	-	3.2	80.6	16.1	-	-
SEPTEMBER	11.2	1.29	100.0	-	-	-	-	-	43.8	43.8	12.5	-	-
OCTOBER	9.9	.89	100.0	-	-	-	-	-	14.3	81.0	4.8	-	-
NOVEMBER	10.8	1.29	76.7	-	-	23.3	-	-	3.3	90.0	6.7	-	-
DECEMBER	10.3	1.21	96.3	-	-	3.7	-	-	7.4	85.2	7.4	-	-
WHOLE YEAR	10.8	1.25	85.5	1.2	-	13.3	-	-	9.4	75.8	14.8	-	-

SP – Spilling

PL – Plunging

SP/PL – Combined Spilling and Plunging

TABLE 5.

MONTHLY AND ANNUAL

MEAN WAVE HEIGHT /MEAN WAVE PERIOD AND WAVE TYPE / WAVE DIRECTION OCCURRENCES

YEAR 1976.

MONTH	MEAN WAVE PERIOD (Secs)	MEAN WAVE HEIGHT (Metres)	Percentage Occurrences - Wave Type /Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	10.2	1.55	80.0	-	-	20.0	-	-	6.7	76.7	16.7	-	-
FEBRUARY	10.6	1.67	48.3	-	-	51.7	-	-	10.3	69.0	20.7	-	-
MARCH	11.1	1.62	48.4	-	-	51.6	-	-	3.2	67.7	29.0	-	-
APRIL	10.1	1.38	70.0	-	-	30.0	-	-	-	70.0	30.0	-	-
MAY	9.6	1.47	64.5	-	-	35.5	-	-	3.2	80.6	16.1	-	-
JUNE	10.1	1.20	80.0	-	-	20.0	-	-	3.3	86.7	10.0	-	-
JULY	11.1	1.20	25.8	-	-	74.2	-	-	-	58.1	41.9	-	-
AUGUST	11.7	1.03	74.2	-	-	25.8	-	-	-	77.4	22.6	-	-
SEPTEMBER	11.4	1.07	56.7	-	-	43.3	-	-	-	86.7	13.3	-	-
OCTOBER	10.7	.64	92.6	-	-	7.4	-	-	-	85.2	14.8	-	-
NOVEMBER	11.8	1.02	69.0	-	-	31.0	-	-	10.3	82.8	6.9	-	-
DECEMBER	10.4	.86	90.3	-	-	9.7	-	3.2	32.3	32.3	32.3	-	-
WHOLE YEAR	10.7	1.23	66.4	-	-	33.6	-	.3	5.8	72.5	21.4	-	-

SP - Spilling

PL - Plunging

SP/PL - Combined Spilling and Plunging

TABLE 6.

MONTHLY AND ANNUAL

MEAN WAVE HEIGHT /MEAN WAVE PERIOD AND WAVE TYPE / WAVE DIRECTION
OCCURRENCES

YEAR 1977.

MONTH	MEAN WAVE PERIOD (Secs)	MEAN WAVE HEIGHT (Metres)	Percentage Occurrences - Wave Type /Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	9.7	1.20	60.0	-	-	40.0	-	-	-	63.3	36.7	-	-
FEBRUARY	10.1	1.09	75.0	-	-	25.0	-	-	3.6	92.9	3.6	-	-
MARCH	9.9	1.18	61.3	-	-	38.7	-	-	12.9	74.2	12.9	-	-
APRIL	9.5	1.08	82.8	-	-	17.2	-	-	-	69.0	31.0	-	-
MAY	10.6	1.11	71.0	-	-	29.0	-	-	3.2	83.9	12.9	-	-
JUNE	9.8	.97	73.3	-	-	26.7	-	-	-	80.0	20.0	-	-
JULY	10.1	1.18	46.4	-	-	53.6	-	-	-	67.9	32.1	-	-
AUGUST	10.5	1.06	63.6	-	-	36.4	-	-	-	95.5	4.5	-	-
SEPTEMBER	9.8	1.00	80.0	-	-	20.0	-	-	-	100.0	-	-	-
OCTOBER	10.7	.87	95.7	-	-	4.3	-	-	26.1	73.9	-	-	-
NOVEMBER	9.3	.95	60.0	-	-	40.0	-	-	33.3	56.7	10.0	-	-
DECEMBER	9.6	.90	84.0	-	-	16.0	-	-	12.0	68.0	20.0	-	-
WHOLE YEAR	10.0	1.06	69.9	-	-	30.1	-	-	8.0	75.0	17.0	-	-

SP – Spilling

PL – Plunging

SP/PL – Combined Spilling and Plunging

TABLE 7.

MONTHLY AND ANNUAL

MEAN WAVE HEIGHT /MEAN WAVE PERIOD AND WAVE TYPE / WAVE DIRECTION
OCCURRENCES

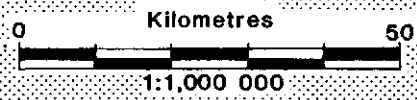
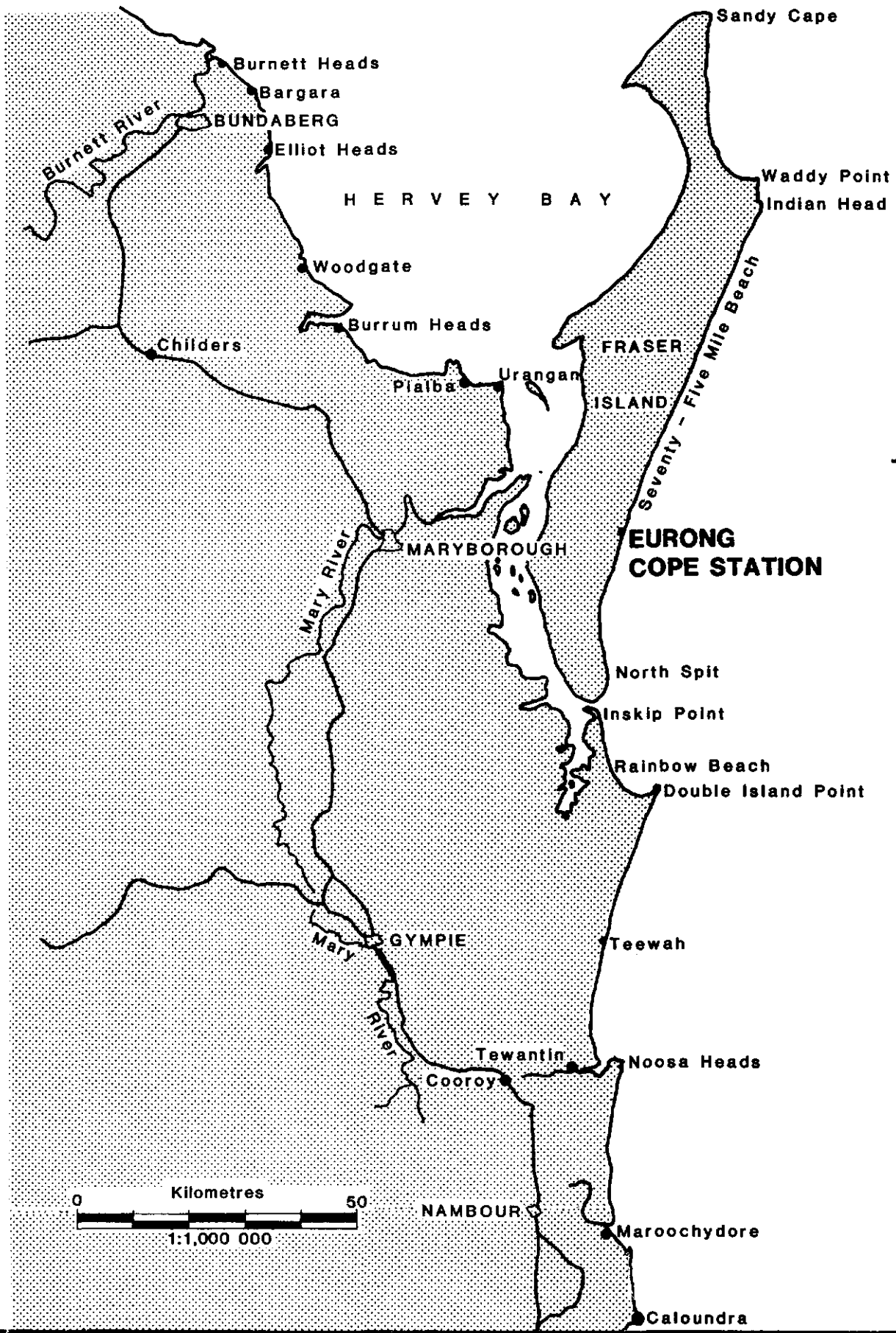
YEAR 1978.

MONTH	MEAN WAVE PERIOD (Secs)	MEAN WAVE HEIGHT (Metres)	Percentage Occurrences - Wave Type /Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	8.1	.84	8.7	-	-	91.3	-	-	-	82.6	17.4	-	-
FEBRUARY	9.0	.70	77.8	-	-	22.2	-	-	-	74.1	25.9	-	-
MARCH	9.9	.77	66.7	-	-	33.3	-	-	-	88.9	11.1	-	-
APRIL	10.3	1.22	47.1	-	-	52.9	-	-	-	52.9	47.1	-	-
MAY	11.1	.92	100.0	-	-	-	-	-	-	94.7	5.3	-	-
JUNE	10.6	1.11	70.8	-	-	29.2	-	-	-	62.5	37.5	-	-
JULY	11.6	1.07	72.7	-	-	27.3	-	-	-	72.7	27.3	-	-
AUGUST	10.7	1.09	56.5	-	-	43.5	-	-	-	65.2	34.8	-	-
SEPTEMBER	10.4	.84	100.0	-	-	-	-	-	-	58.6	41.4	-	-
OCTOBER	9.7	1.16	86.7	-	-	13.3	-	-	-	83.3	16.7	-	-
NOVEMBER	9.6	1.05	80.0	-	-	20.0	-	-	-	90.0	10.0	-	-
DECEMBER	10.3	1.19	44.4	-	-	55.6	-	-	11.1	77.8	11.1	-	-
WHOLE YEAR	10.0	.99	70.5	-	-	29.5	-	-	.4	75.3	24.4	-	-

SP – Spilling

PL – Plunging

SP/PL – Combined Spilling and Plunging

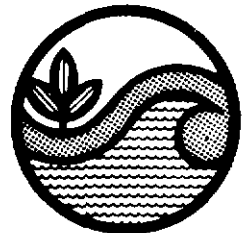


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LOCALITY PLAN

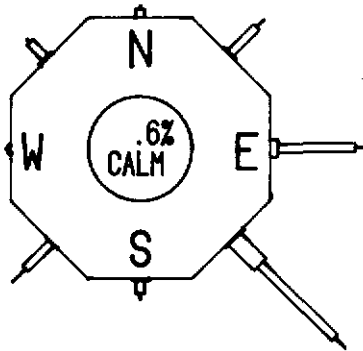
Figure 1

C 06.1



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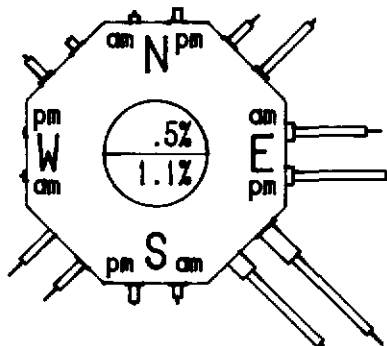
ALL OBSERVATIONS



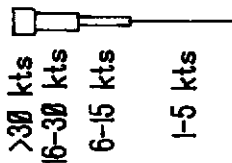
Total No. of Observations : 2072

MORNING - AFTERNOON OBSERVATIONS

NOTES :
 Figures in Central Circle
 Represent Percentage
 of CALM Observations.
 Upper Figure for AM
 Lower Figure for PM



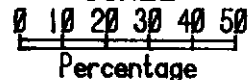
LEGEND



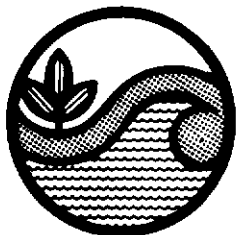
No. of Morning Observations : 1607
 No. of Afternoon Observations : 465

Mean Time :- Morning Obs : 0900 hrs
 Mean Time :- Afternoon Obs : 1500 hrs

SCALE



WIND DATA - JAN 1972 to DEC 1978

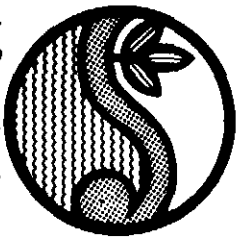


Beach Protection Authority

WIND DATA

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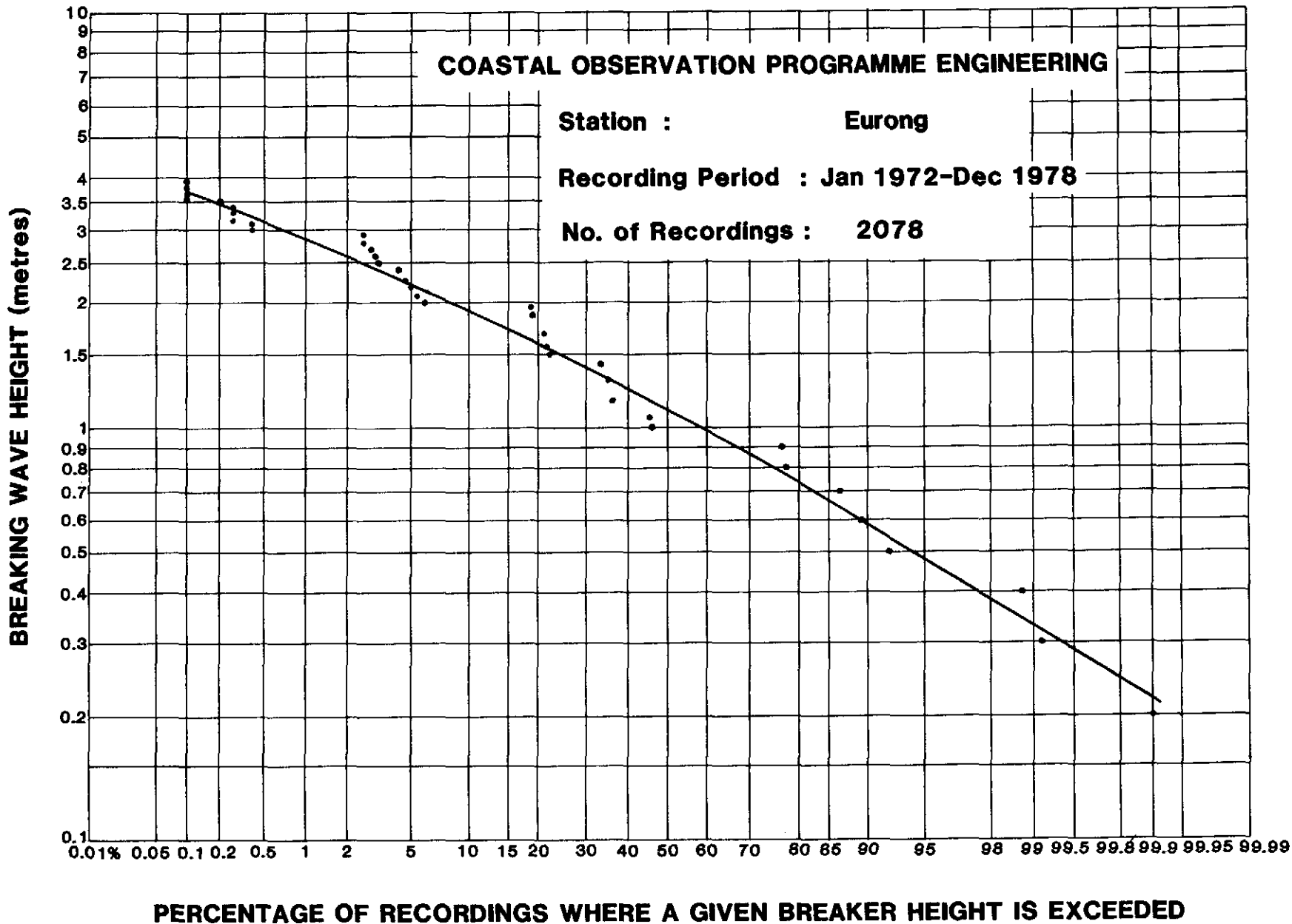
Figure 2
 C 06.1

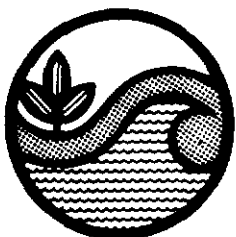
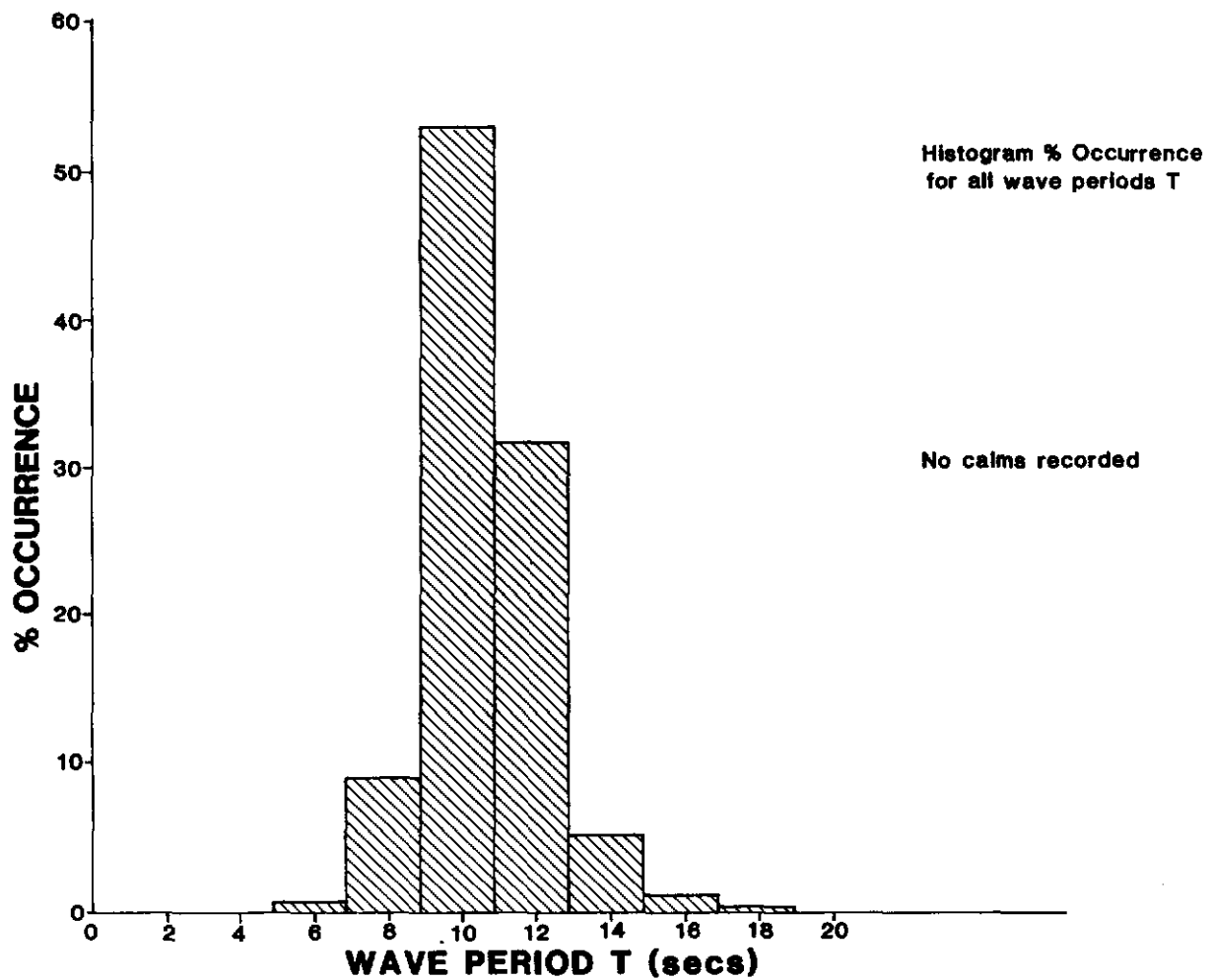
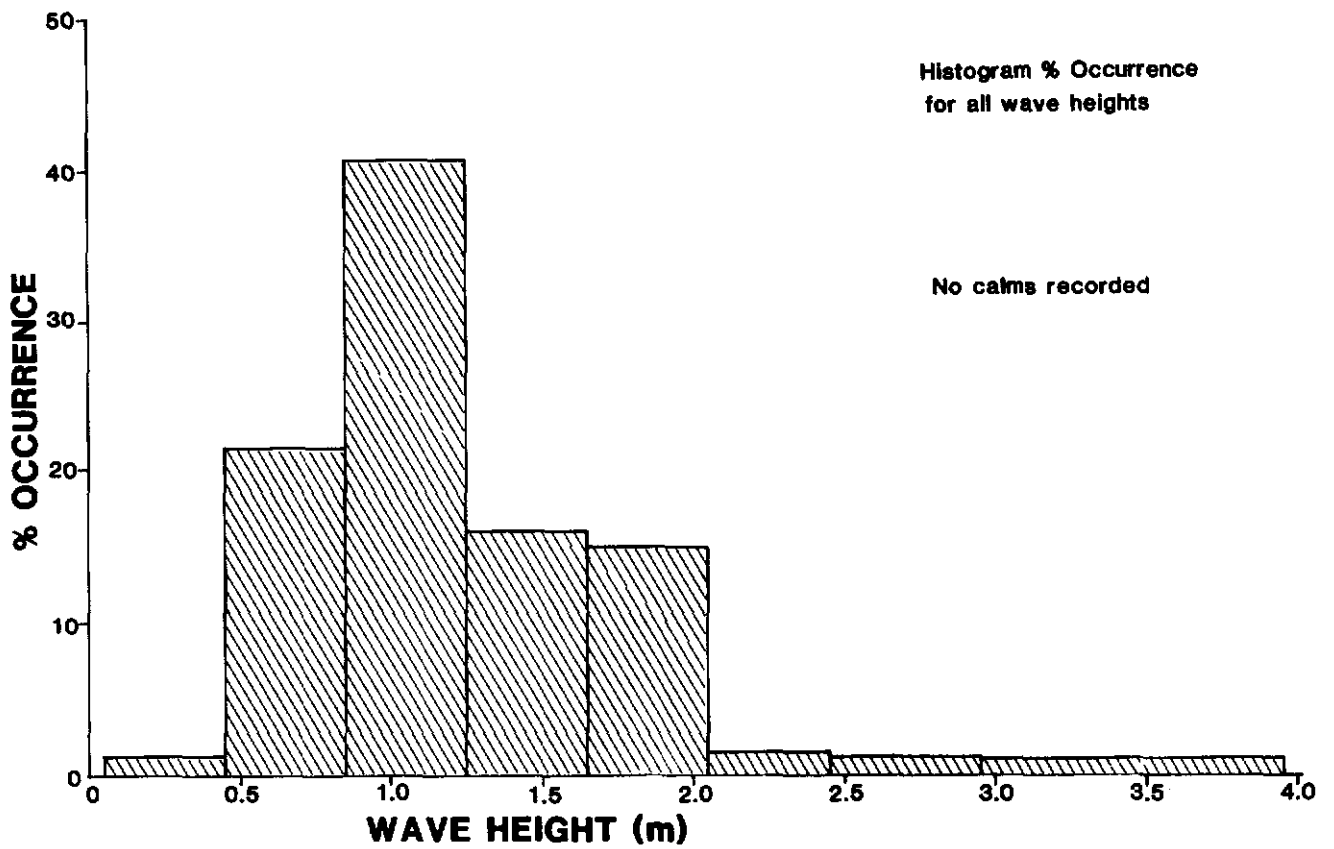


**WAVE HEIGHT % EXCEEDANCE
ALL DATA**

Figure 3
C 06.1

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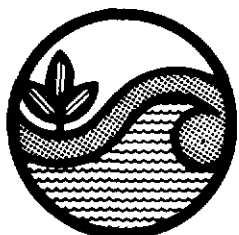
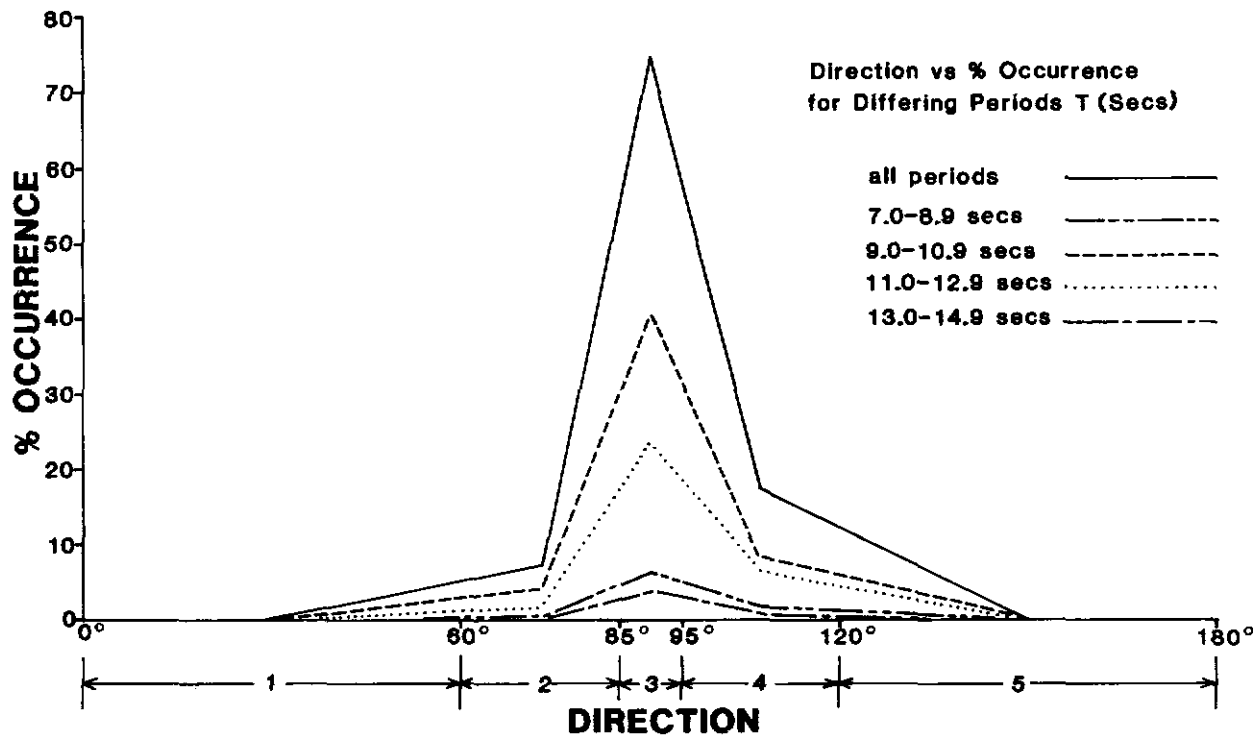
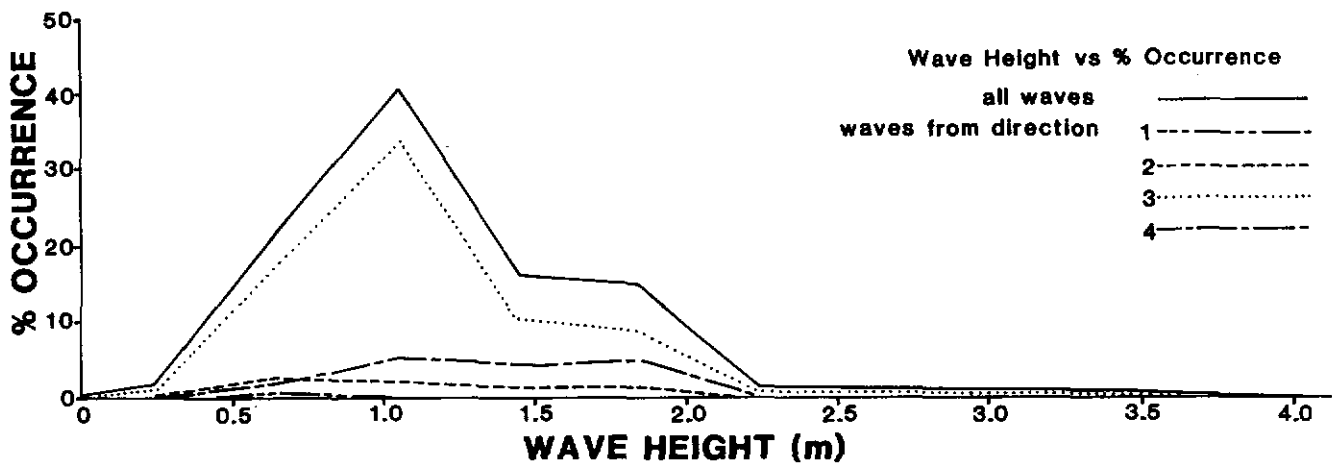
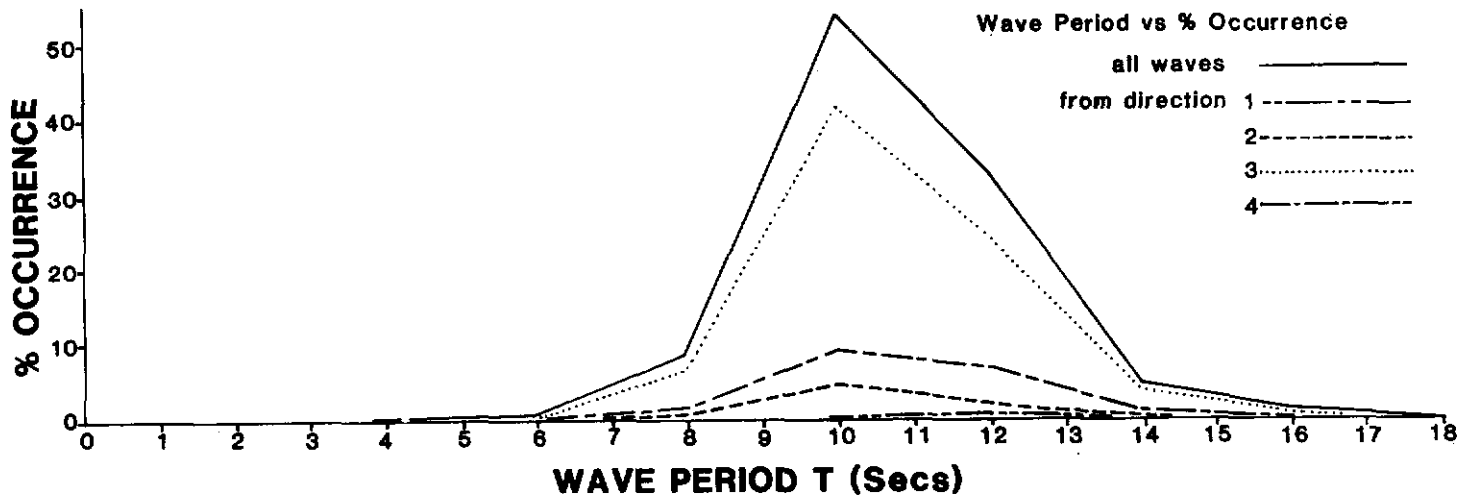


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**WAVE HEIGHT AND PERIOD % OCCURRENCE
ALL DATA**

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Figure 4
C 06.1



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**WAVE DIRECTION ANALYSIS
 ALL DATA**

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Figure 5
 C 06.1



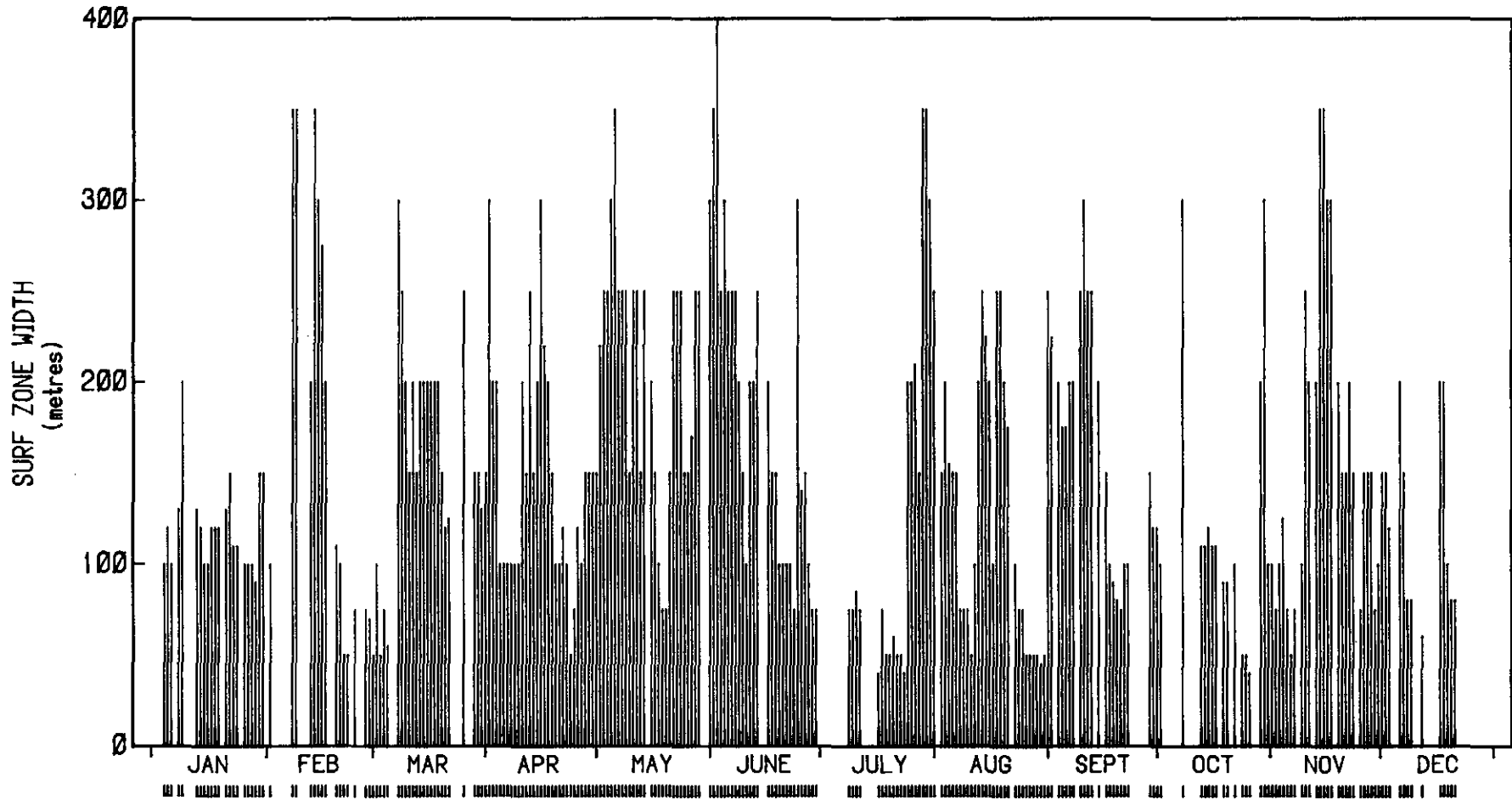
SURF ZONE WIDTH - MORNING 1972

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SURF ZONE WIDTH SUMMARY - 1972

No. of Observations : 273

MORNING OBSERVATIONS

Mean Surf Zone Width = 156.0 m

|| Indicates Offshore Bar Present

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Figure 6

C 06.1



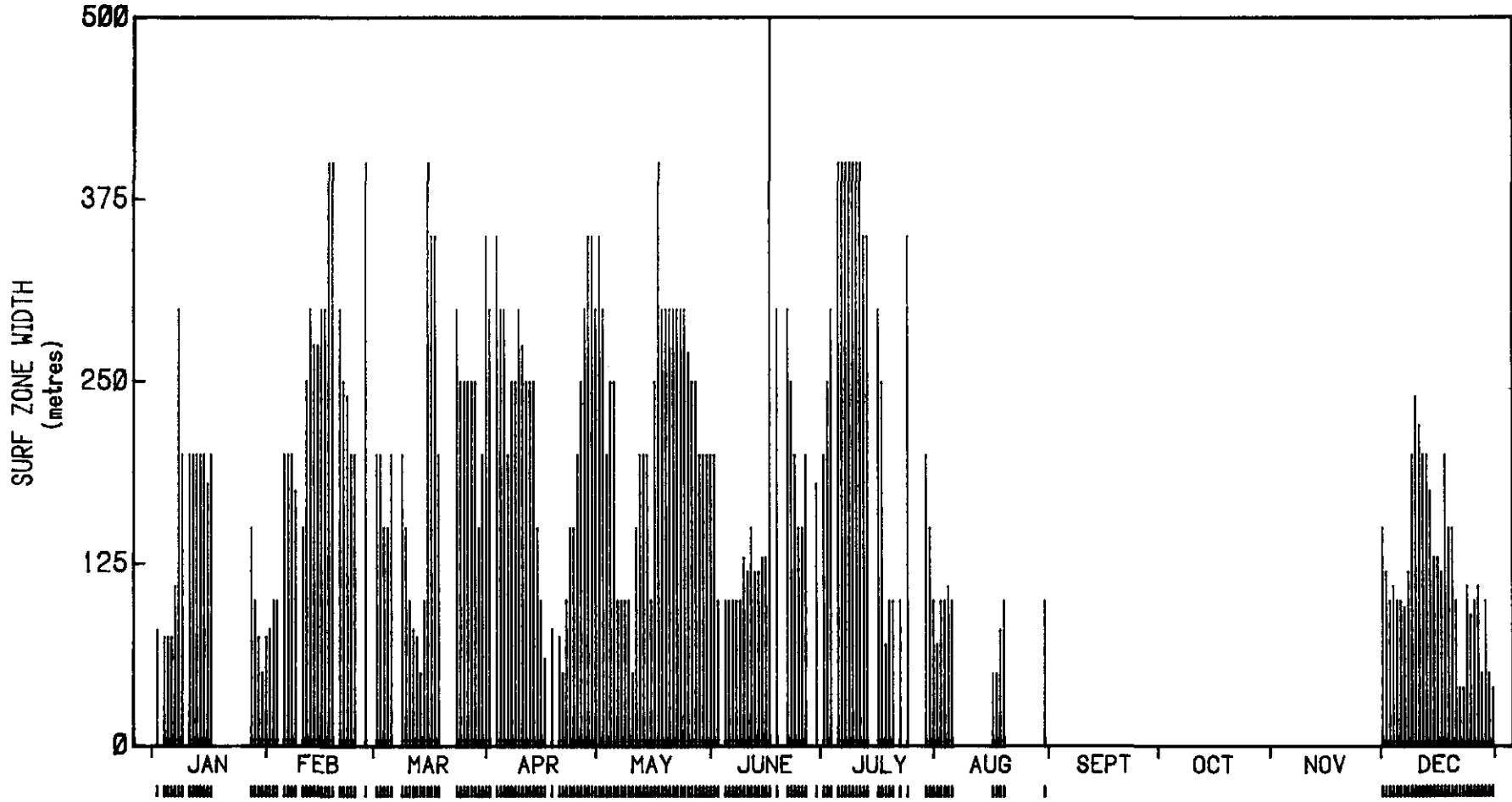
SURF ZONE WIDTH - MORNING 1973

COPE - Coastal Observation Programme Engineering

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MARYBOROUGH CITY

4101



SURF ZONE WIDTH SUMMARY - 1973

No. of Observations : 211

MORNING OBSERVATIONS

Mean Surf Zone Width = 193.2 m

■ Indicates Offshore Bar Present

Figure 7
C 06.1

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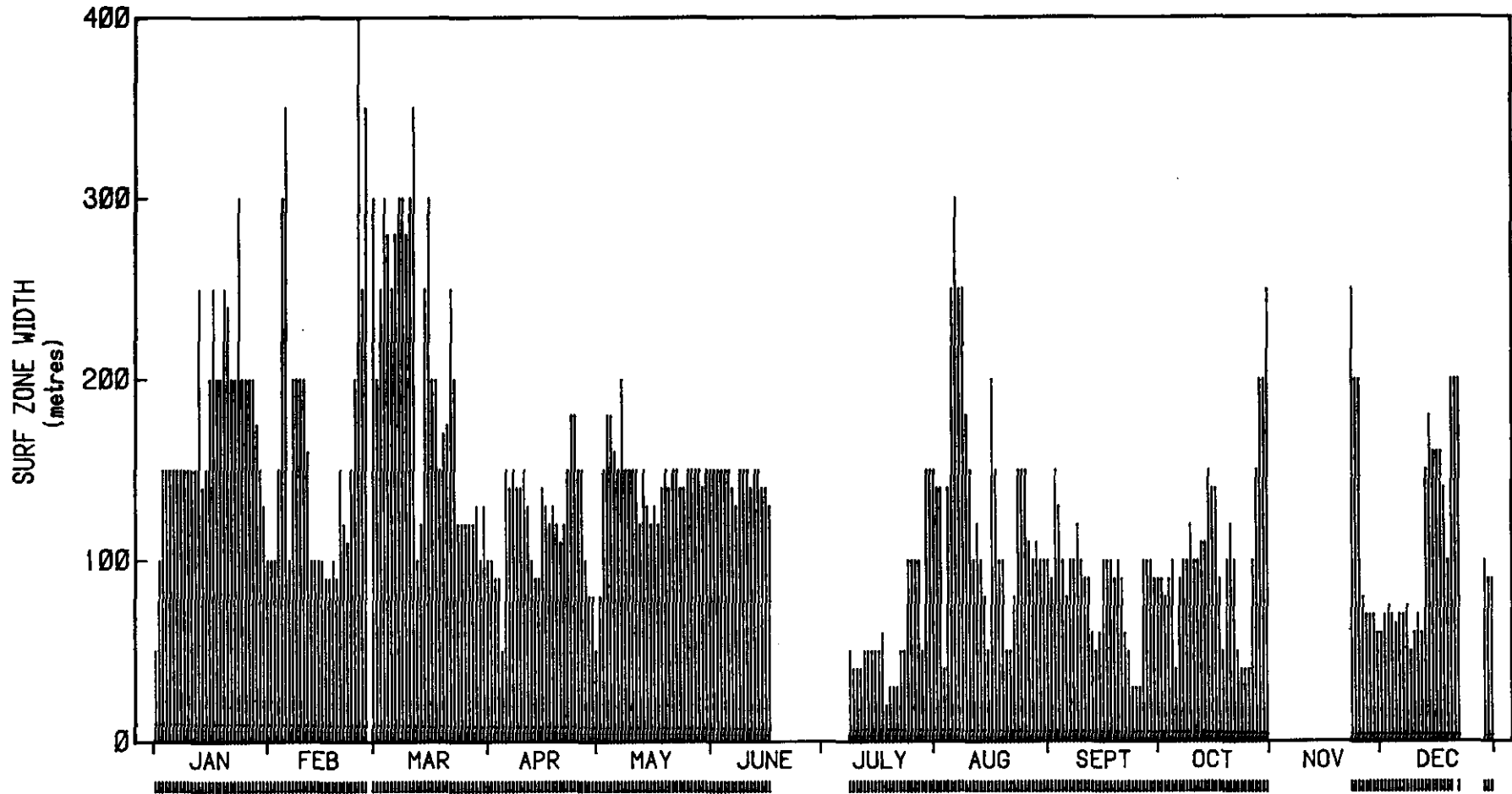
SURF ZONE WIDTH - MORNING 1974

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SURF ZONE WIDTH SUMMARY - 1974

No. of Observations : 317

MORNING OBSERVATIONS

Mean Surf Zone Width = 133.9 m

■ Indicates Offshore Bar Present

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Figure 8

C 06.1



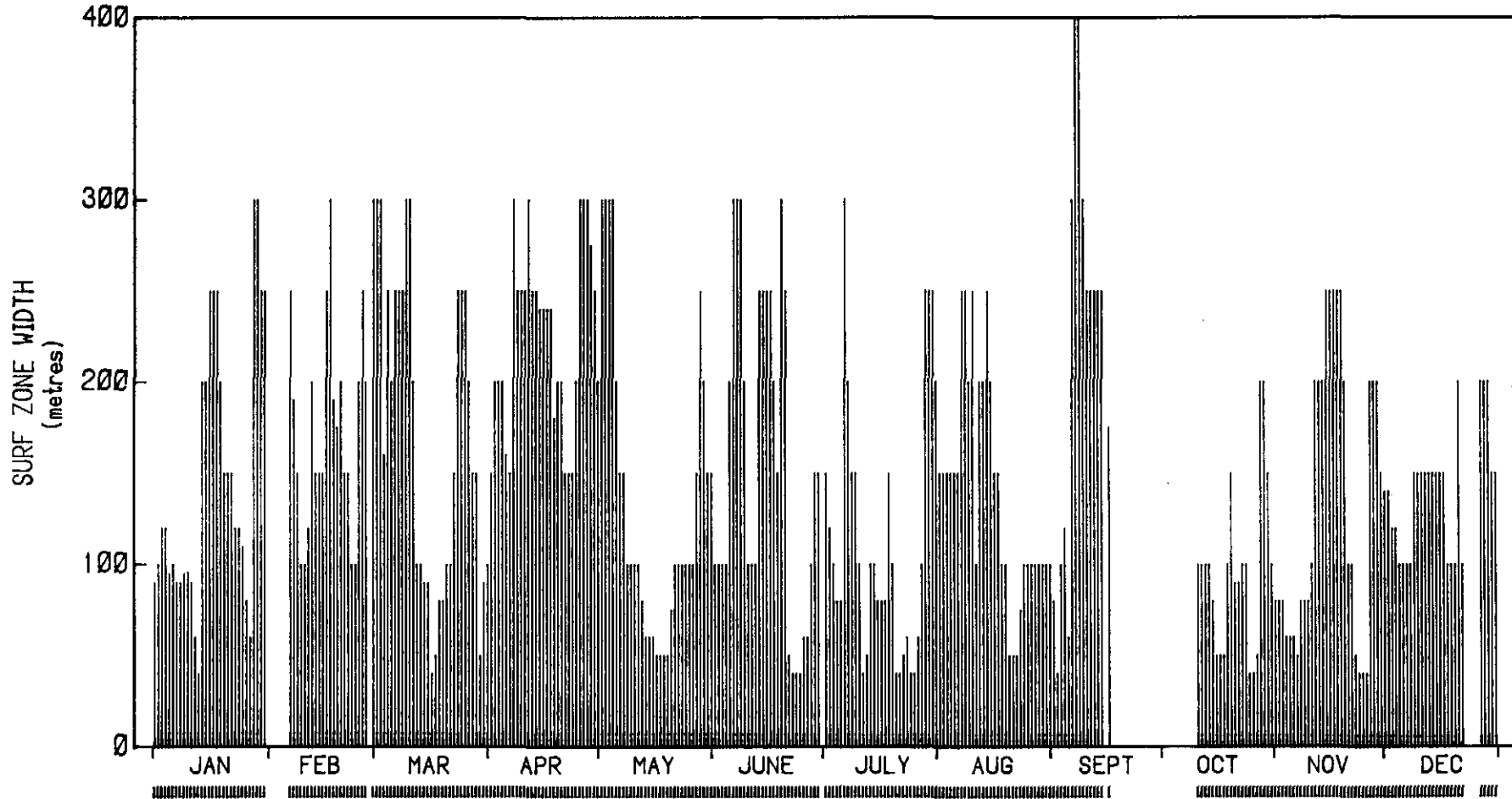
SURF ZONE WIDTH - MORNING 1975

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SURF ZONE WIDTH SUMMARY - 1975

No. of Observations : 331

MORNING OBSERVATIONS

Mean Surf Zone Width = 152.6 m

u Indicates Offshore Bar Present

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Figure 9

C 06.1



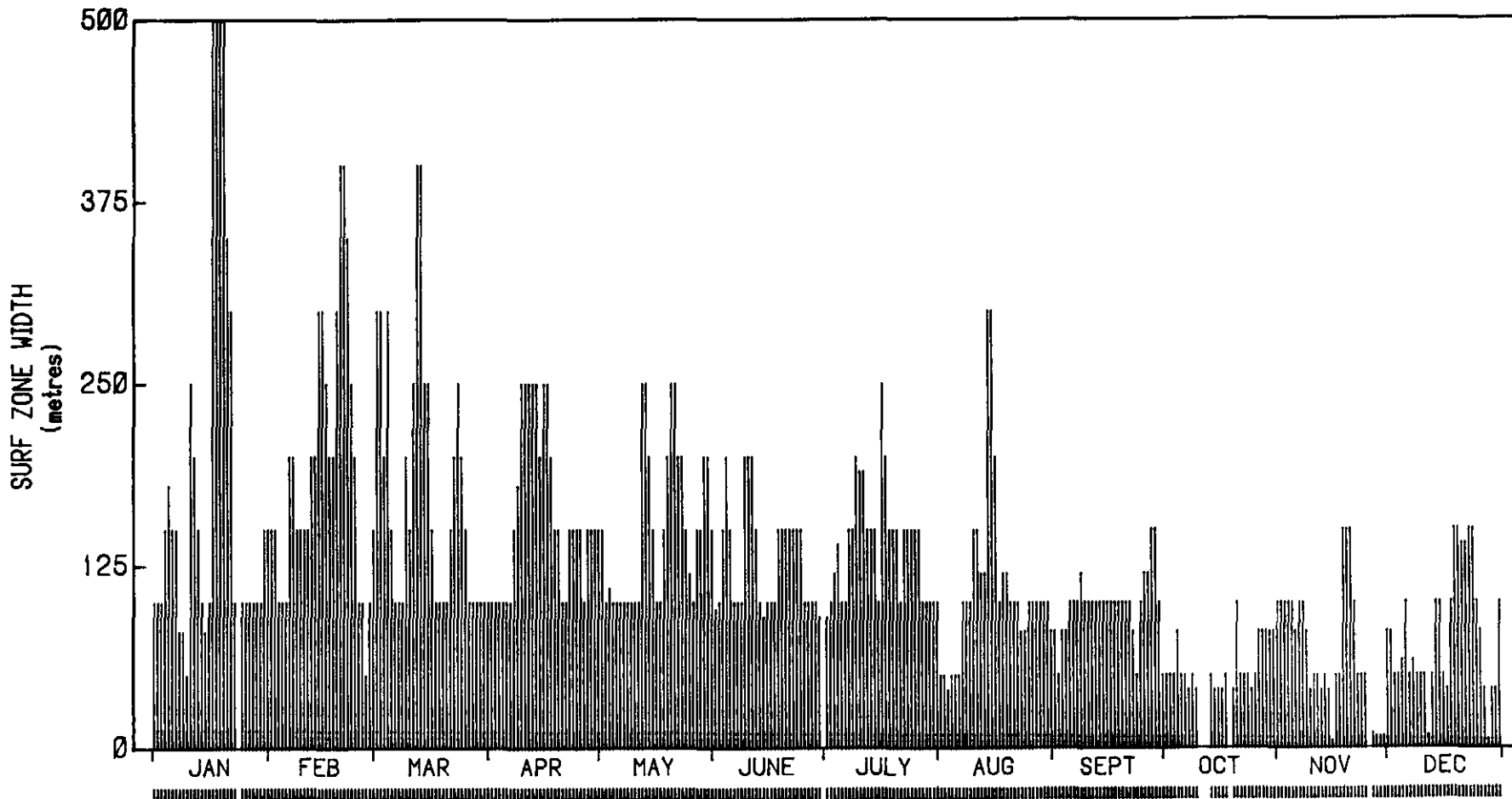
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SURF ZONE WIDTH - MORNING 1976



SURF ZONE WIDTH SUMMARY - 1976

No. of Observations : 360

MORNING OBSERVATIONS

Mean Surf Zone Width = 130.0 m

u Indicates Offshore Bar Present

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Figure 10

C 06.1



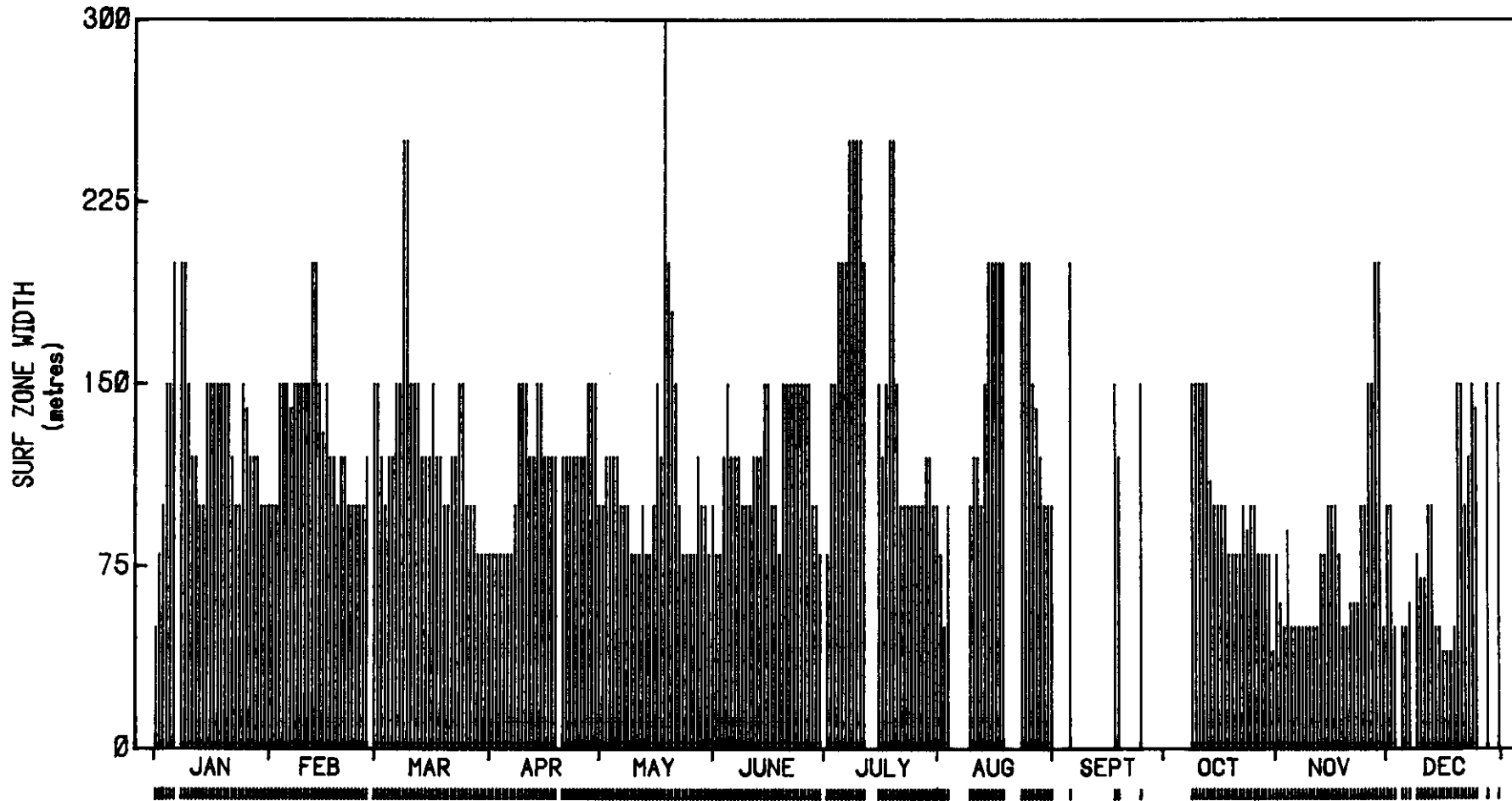
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SURF ZONE WIDTH - AFTERNOON 1977



SURF ZONE WIDTH SUMMARY - 1977

No. of Observations : 312

AFTERNOON OBSERVATIONS

Mean Surf Zone Width = 119.8 m

■ Indicates Offshore Bar Present

Figure 11

C 08.1

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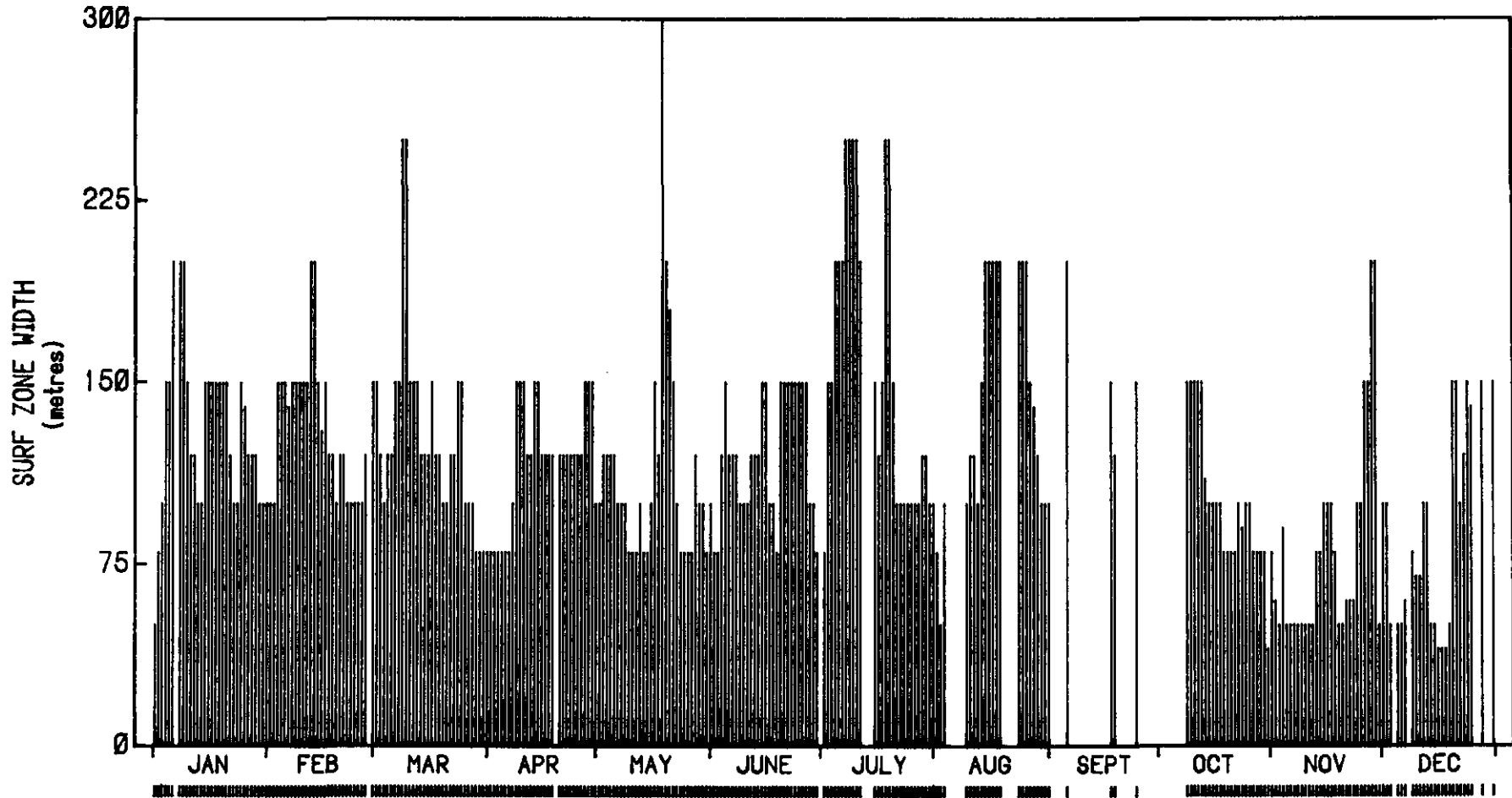
SURF ZONE WIDTH - AFTERNOON 1977

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SURF ZONE WIDTH SUMMARY - 1977

No. of Observations : 312

AFTERNOON OBSERVATIONS

Mean Surf Zone Width = 119.8 m

■ Indicates Offshore Bar Present

Figure 11
C 06.1

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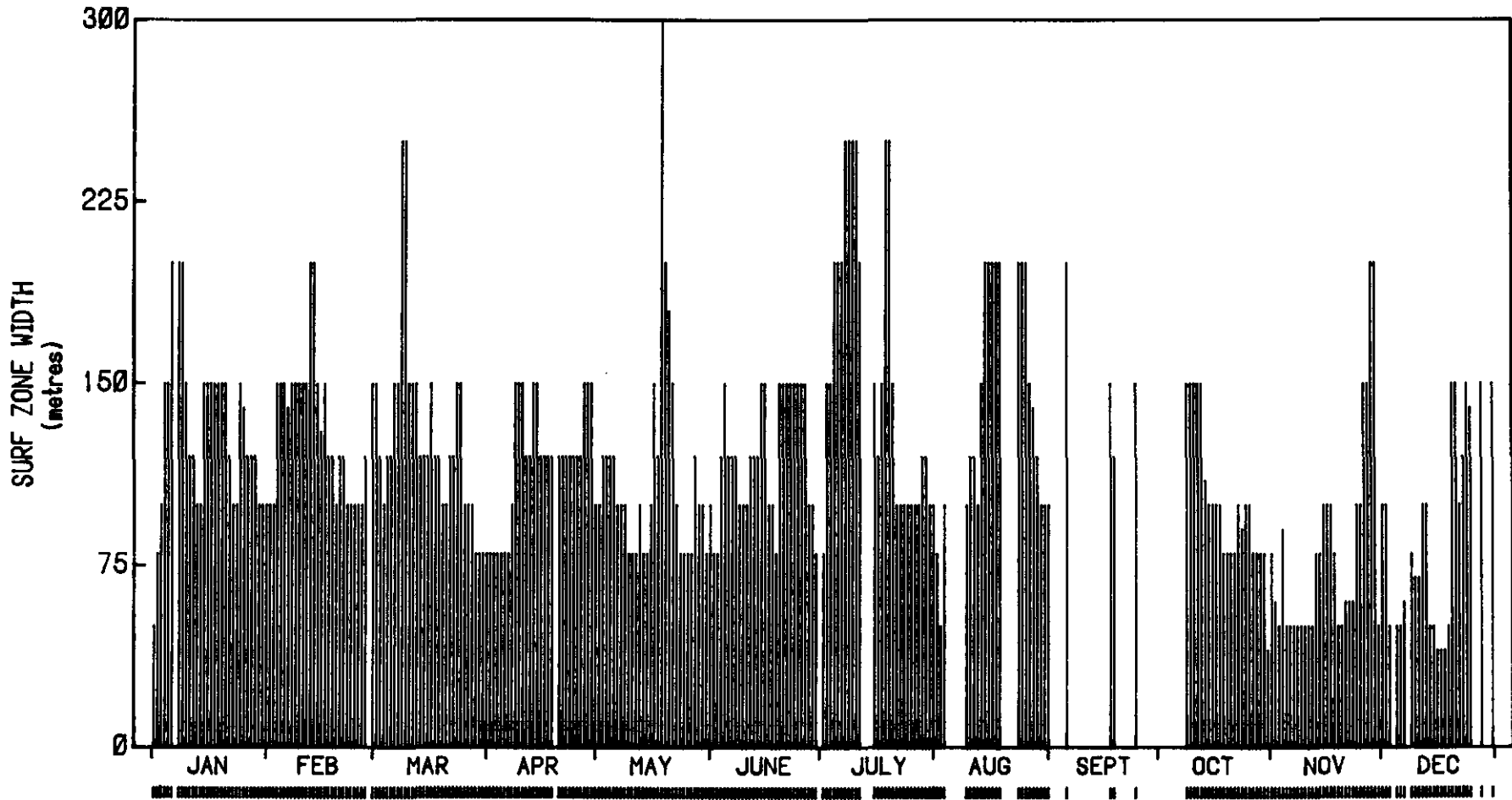
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SURF ZONE WIDTH - AFTERNOON 1977



SURF ZONE WIDTH SUMMARY - 1977

No. of Observations : 312

AFTERNOON OBSERVATIONS

Mean Surf Zone Width = 119.8 m

■ Indicates Offshore Bar Present

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Figure 11

C 06.1



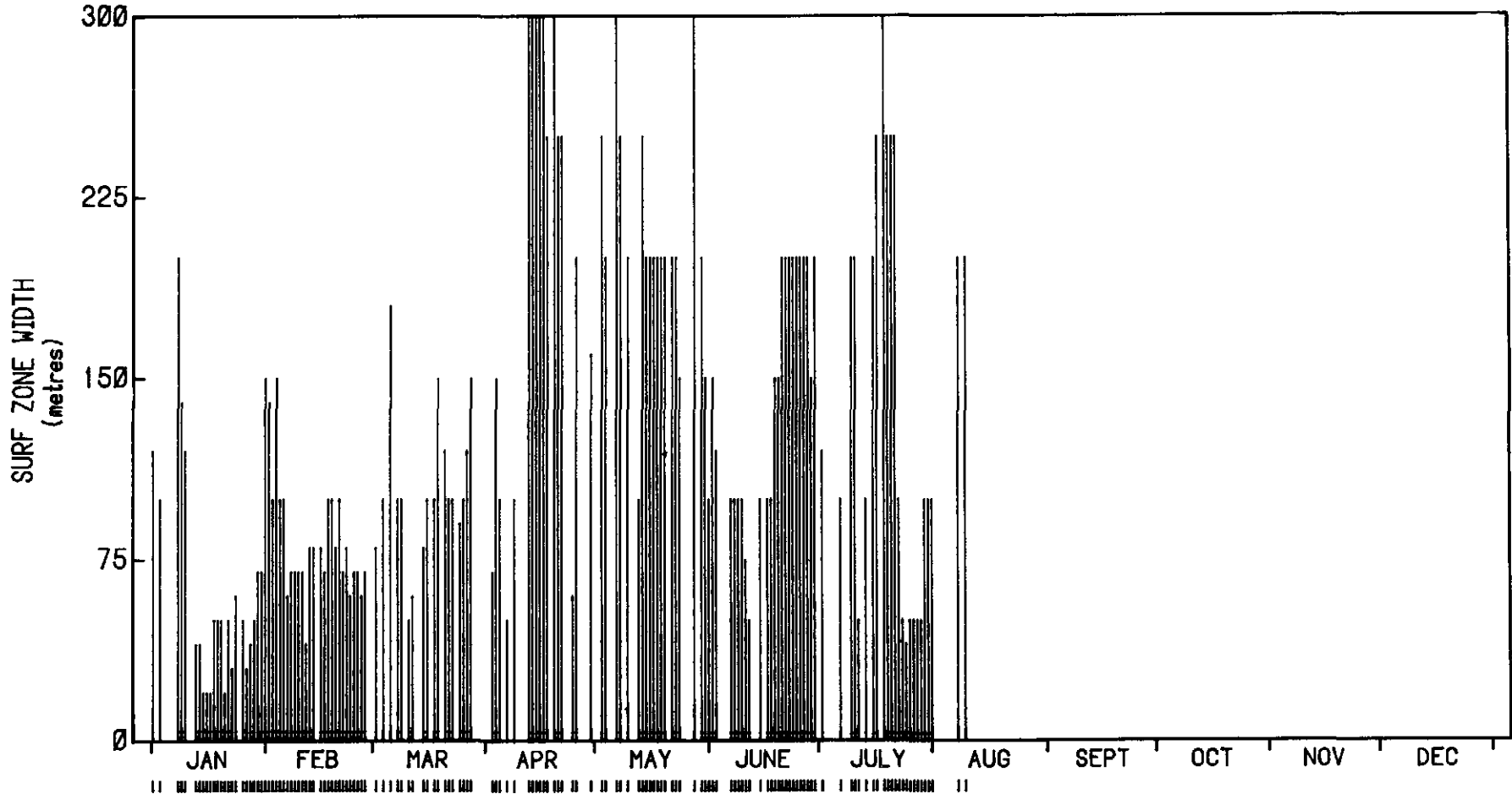
SURF ZONE WIDTH - AFTERNOON 1978
(JANUARY to AUGUST)

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SURF ZONE WIDTH SUMMARY - 1978

No. of Observations : 152

AFTERNOON OBSERVATIONS

Mean Surf Zone Width = 130.3 m

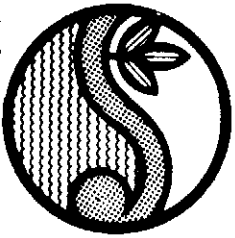
■ Indicates Offshore Bar Present

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Figure 12

C 06.1



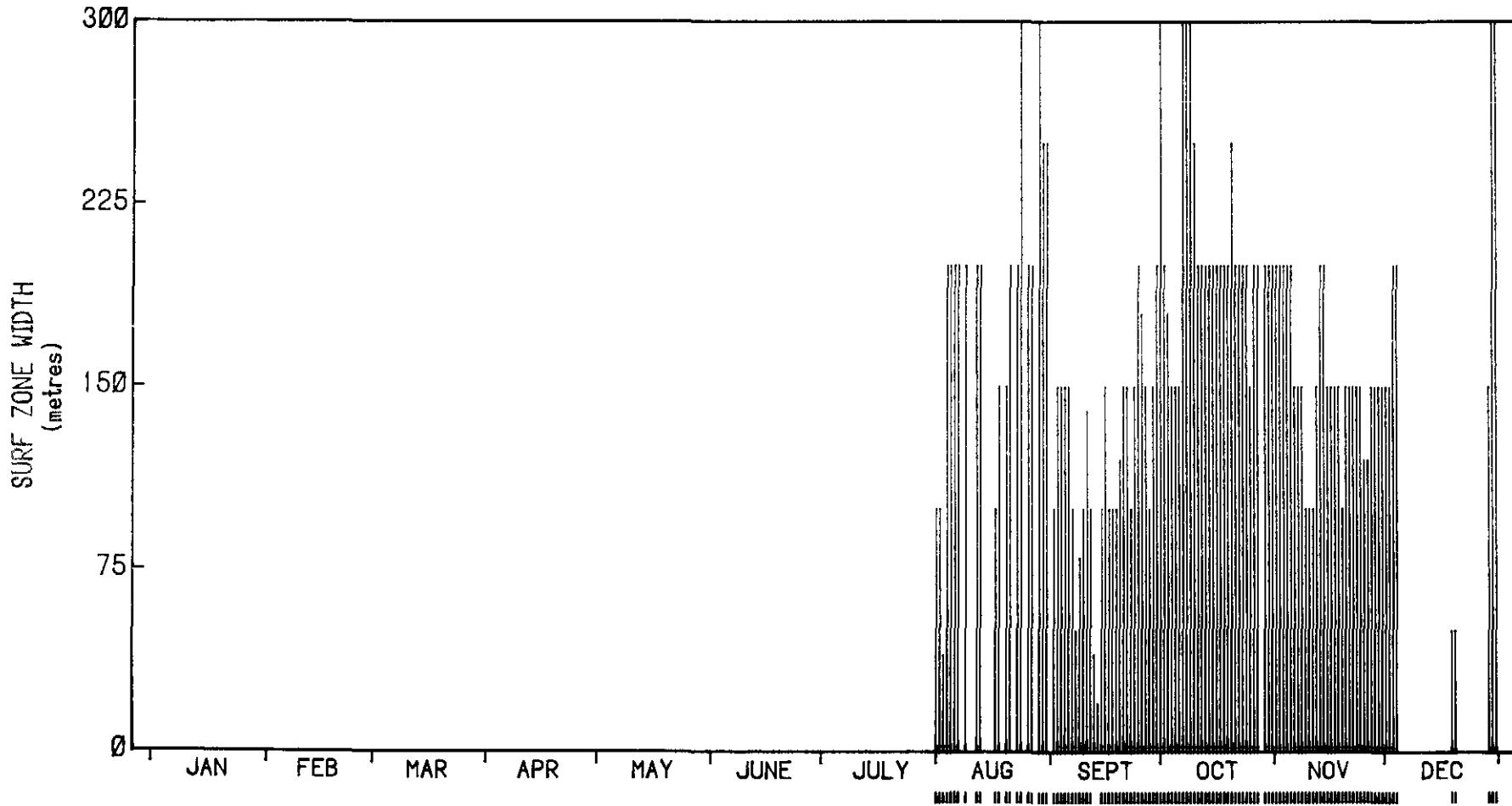
SURF ZONE WIDTH - MORNING 1978
(AUGUST to DECEMBER)

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SURF ZONE WIDTH SUMMARY - 1978

No. of Observations : 119

MORNING OBSERVATIONS

Mean Surf Zone Width = 167.1 m

■ Indicates Offshore Bar Present

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Figure 13
C 06.1



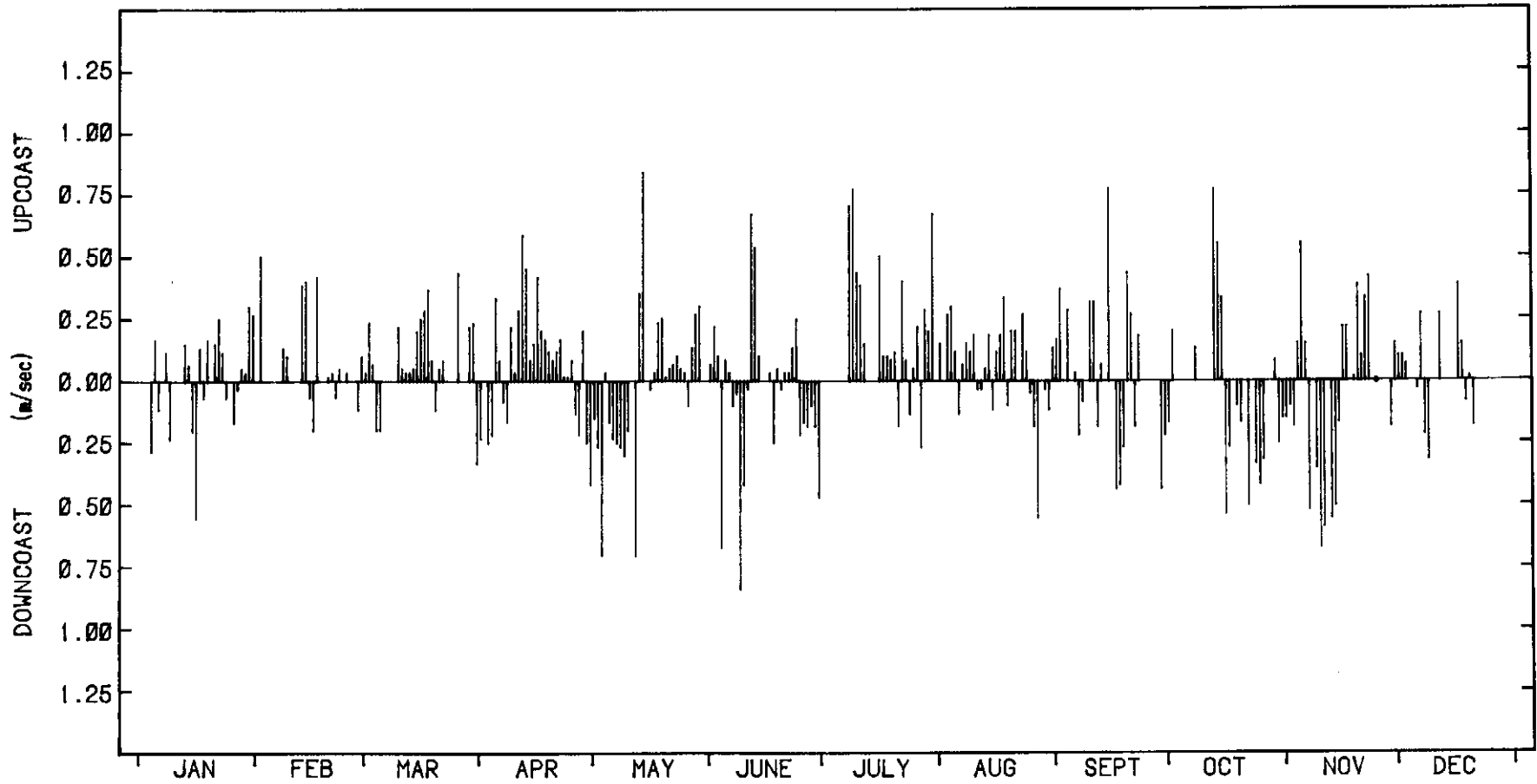
LITTORAL CURRENTS - MORNING 1972

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LITTORAL CURRENT SUMMARY - 1972

Mean Vel = 0.035 m/sec (up)

Mean Upcoast Vel = 0.207 m/sec

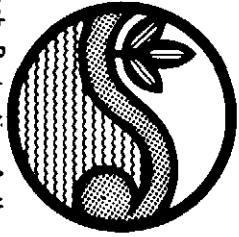
Mean Downcoast Vel = 0.242 m/sec

MORNING OBSERVATIONS - (264 recordings)

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Figure 14

C 06.1



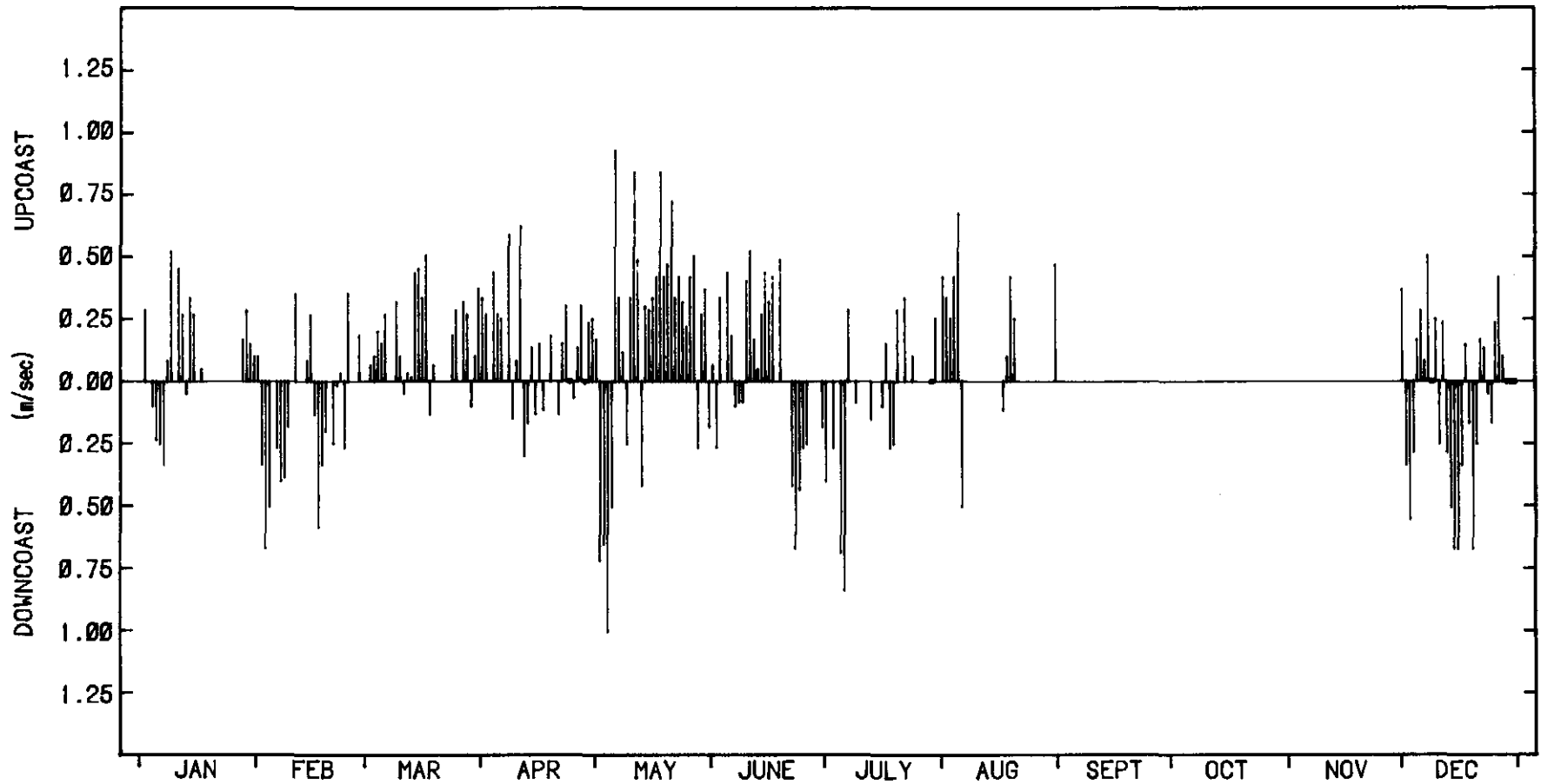
LITTORAL CURRENTS - MORNING 1973

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LITTORAL CURRENT SUMMARY - 1973

Mean Vel = 0.064 m/sec (up)

Mean Upcoast Vel = 0.293 m/sec

Mean Downcoast Vel = 0.311 m/sec

MORNING OBSERVATIONS - (199 recordings)

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Figure 15

C 06.1



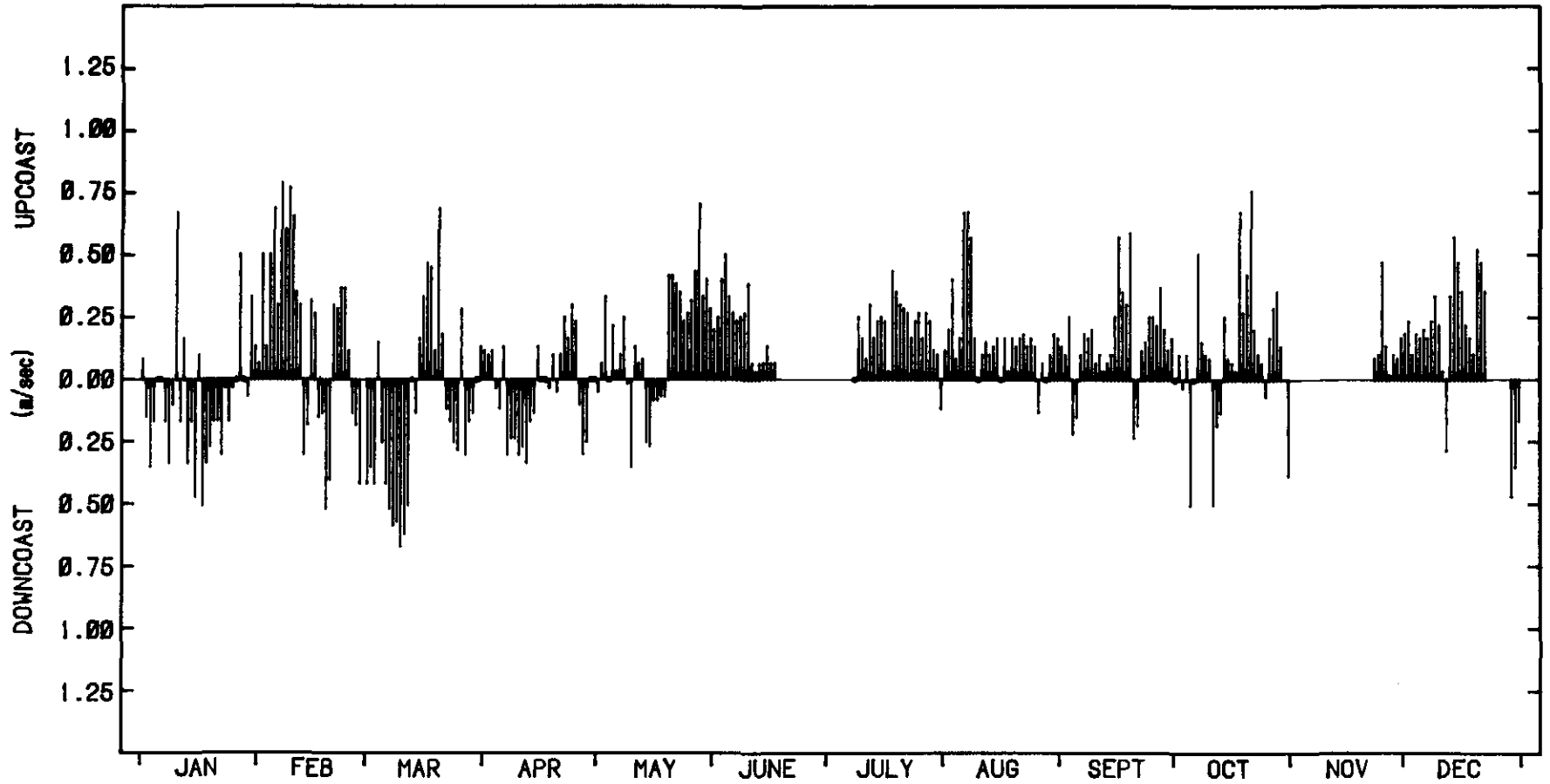
LITTORAL CURRENTS - MORNING 1974

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LITTORAL CURRENT SUMMARY - 1974

Mean Vel = 0.093 m/sec (up)

Mean Upcoast Vel = 0.243 m/sec

Mean Downcoast Vel = 0.246 m/sec

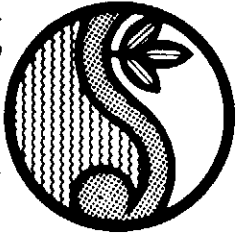
MORNING OBSERVATIONS - (316 recordings)

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Figure 16

C 06.1



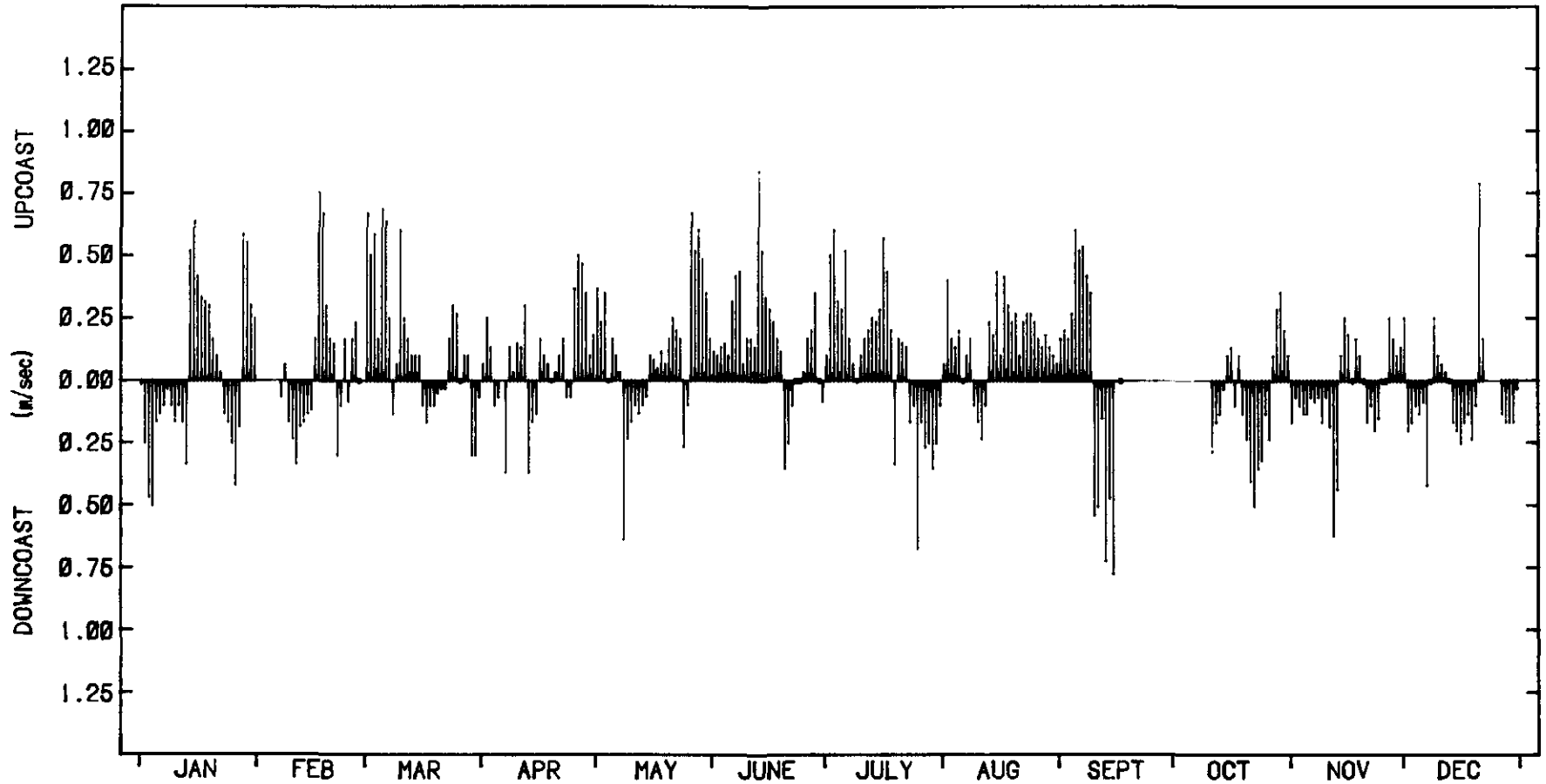
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LITTORAL CURRENTS - MORNING 1975



LITTORAL CURRENT SUMMARY - 1975

Mean Vel = 0.060 m/sec (up)

Mean Upcoast Vel = 0.249 m/sec

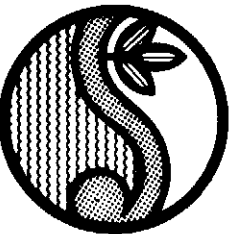
Mean Downcoast Vel = 0.203 m/sec

MORNING OBSERVATIONS - (330 recordings)

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Figure 17

C 06.1



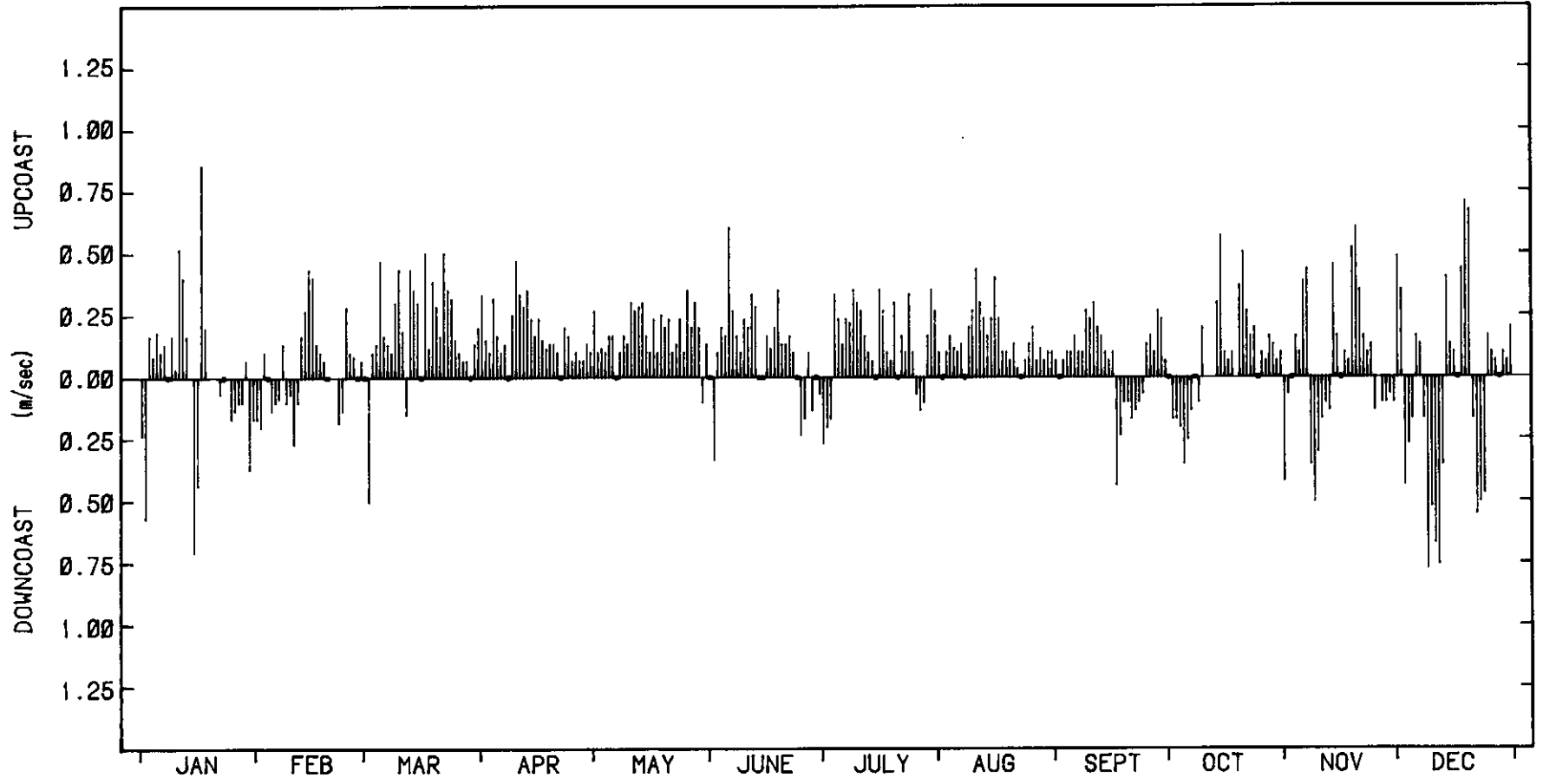
LITTORAL CURRENTS - MORNING 1976

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LITTORAL CURRENT SUMMARY - 1976

Mean Vel = 0.092 m/sec (up)

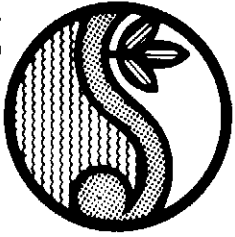
Mean Upcoast Vel = 0.204 m/sec

Mean Downcoast Vel = 0.236 m/sec

MORNING OBSERVATIONS - (354 recordings)

Figure 18
C 06.1

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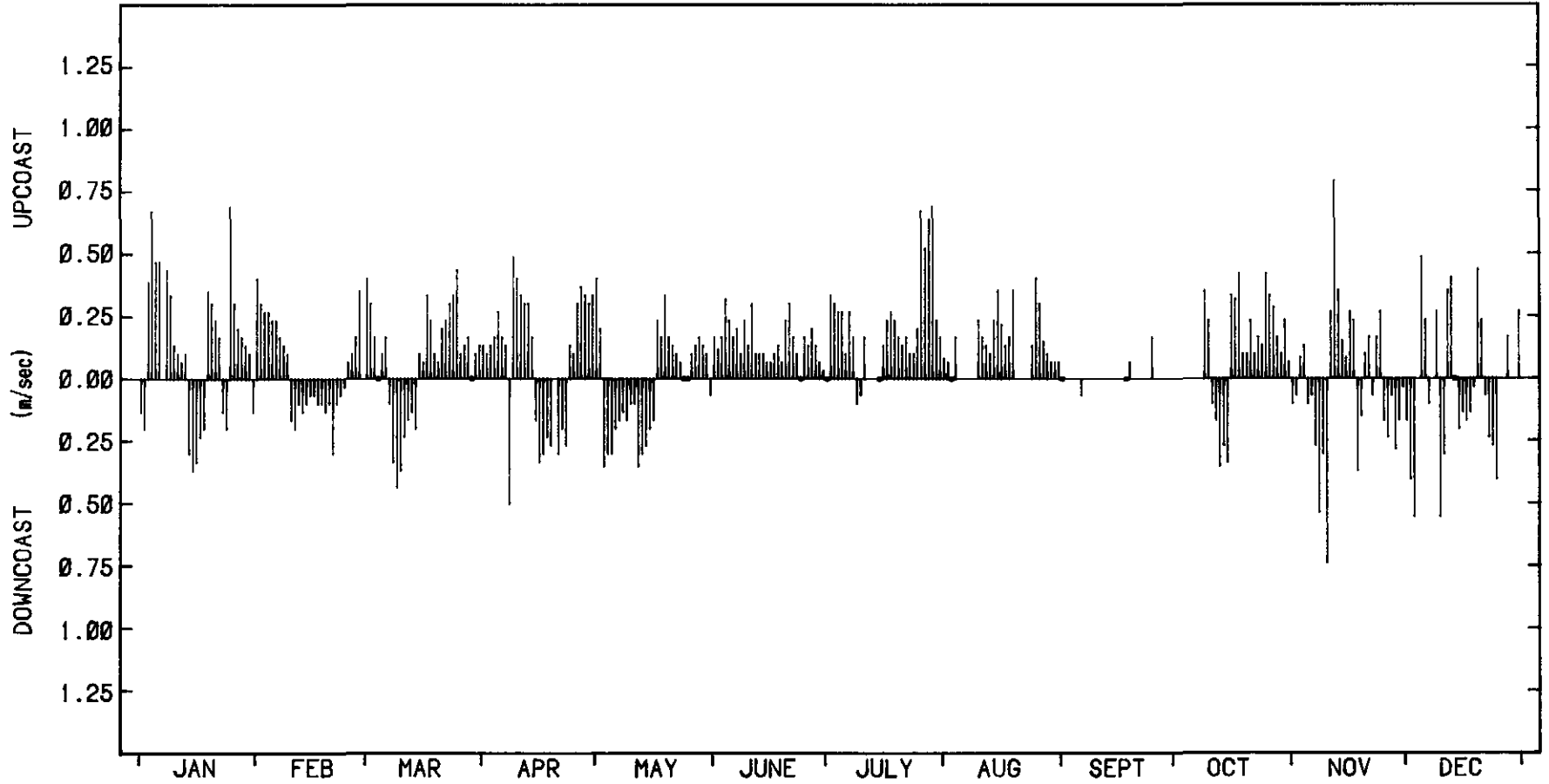
LITTORAL CURRENTS - AFTERNOON 1977

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LITTORAL CURRENT SUMMARY - 1977

Mean Vel = 0.078 m/sec (up)

Mean Upcoast Vel = 0.220 m/sec

Mean Downcoast Vel = 0.212 m/sec

AFTERNOON OBSERVATIONS - (312 recordings)

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Figure 19
C 06.1



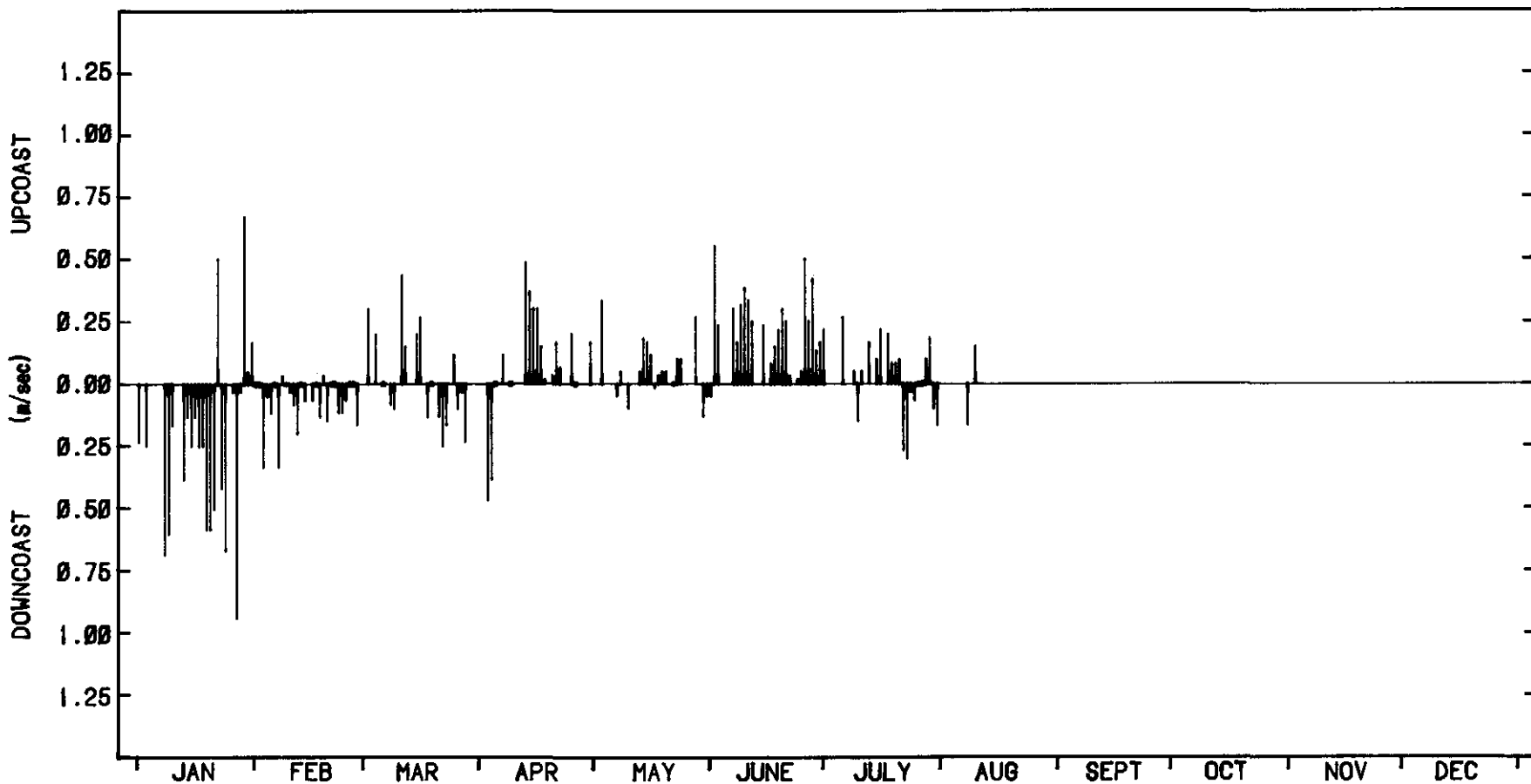
LITTORAL CURRENTS - AFTERNOON 1978
JANUARY to AUGUST

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LITTORAL CURRENT SUMMARY - 1978

Mean Vel = 0.010 m/sec (up)

Mean Upcoast Vel = 0.196 m/sec

Mean Downcoast Vel = 0.218 m/sec

AFTERNOON OBSERVATIONS - (150 recordings)

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Figure 20

C 06.1



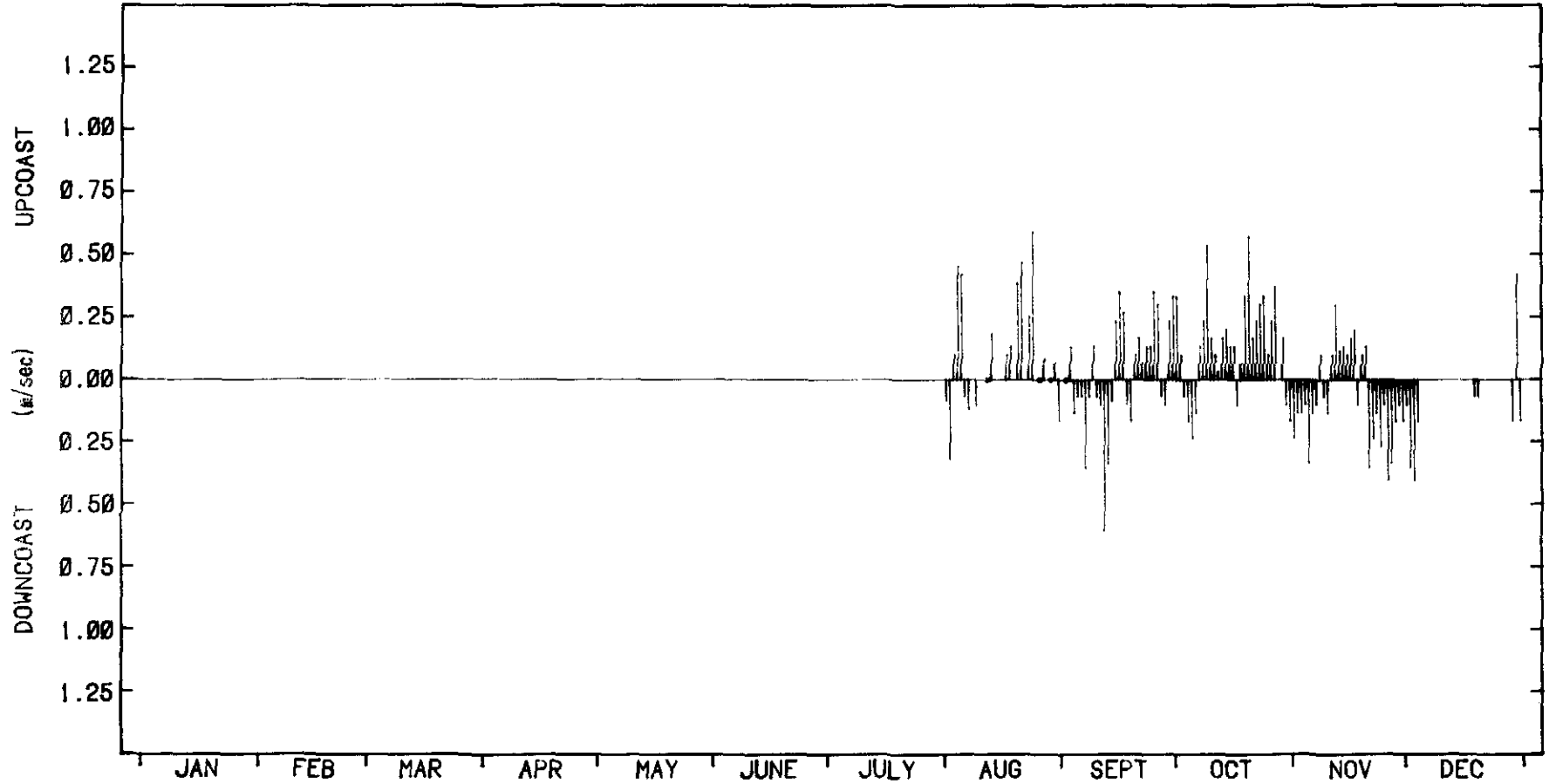
LITTORAL CURRENTS - MORNING 1978
AUGUST to DECEMBER

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LITTORAL CURRENT SUMMARY - 1978

Mean Vel = 0.032 m/sec (up)

Mean Upcoast Vel = 0.219 m/sec

Mean Downcoast Vel = 0.169 m/sec

MORNING OBSERVATIONS - (119 recordings)

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Figure 21

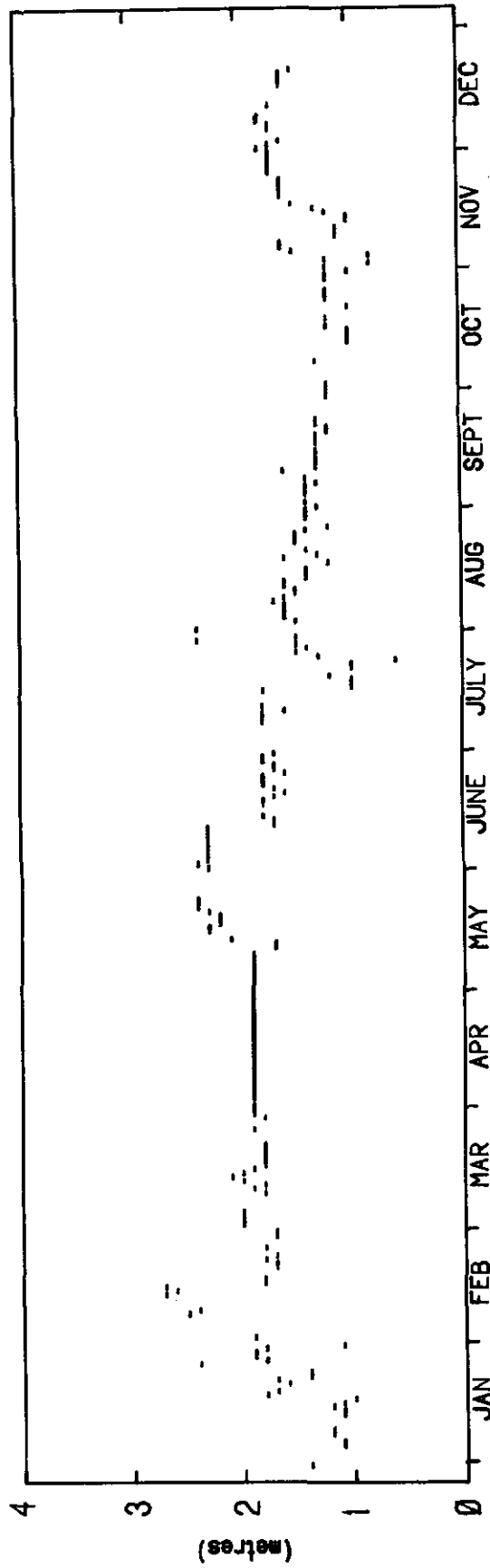
C 06.1

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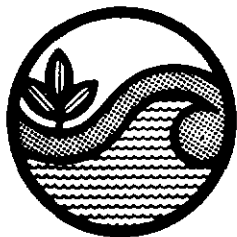
EURONG

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BERM CREST ELEVATION - 1972

No. of Observations : 259

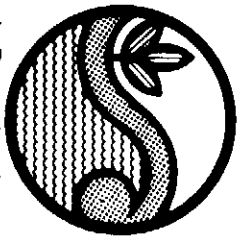


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BERM CREST ELEVATION - 1972

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Figure 22
C 06.1



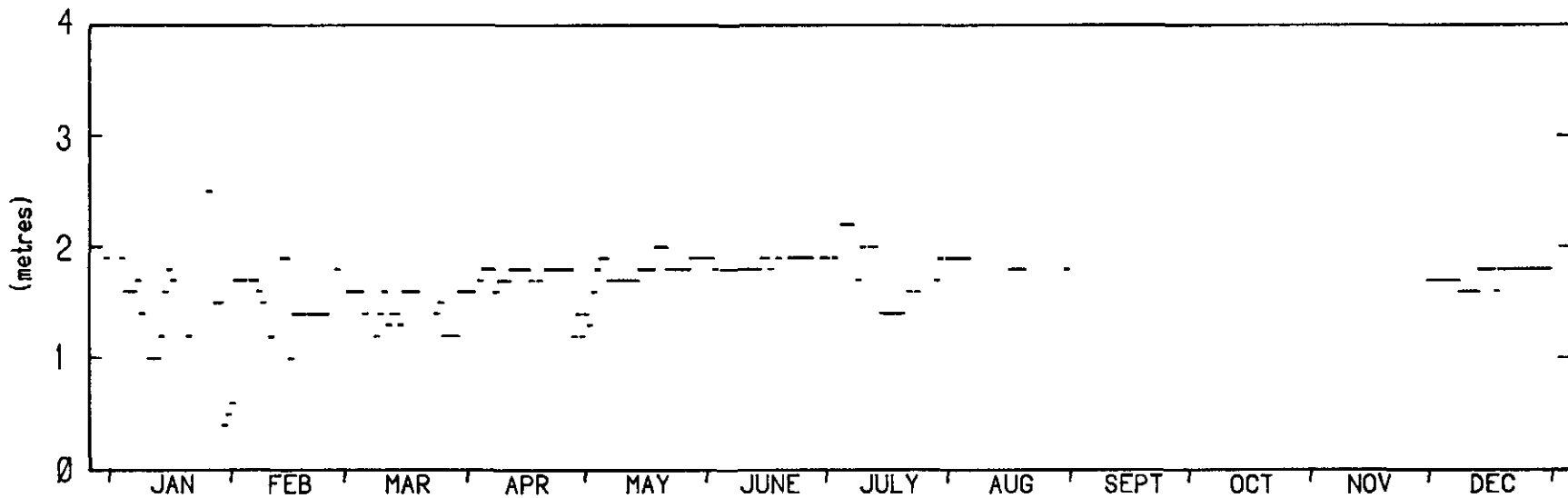
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BERM CREST ELEVATION - 1973



BERM CREST ELEVATION - 1973

No. of Observations : 208

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Figure 23

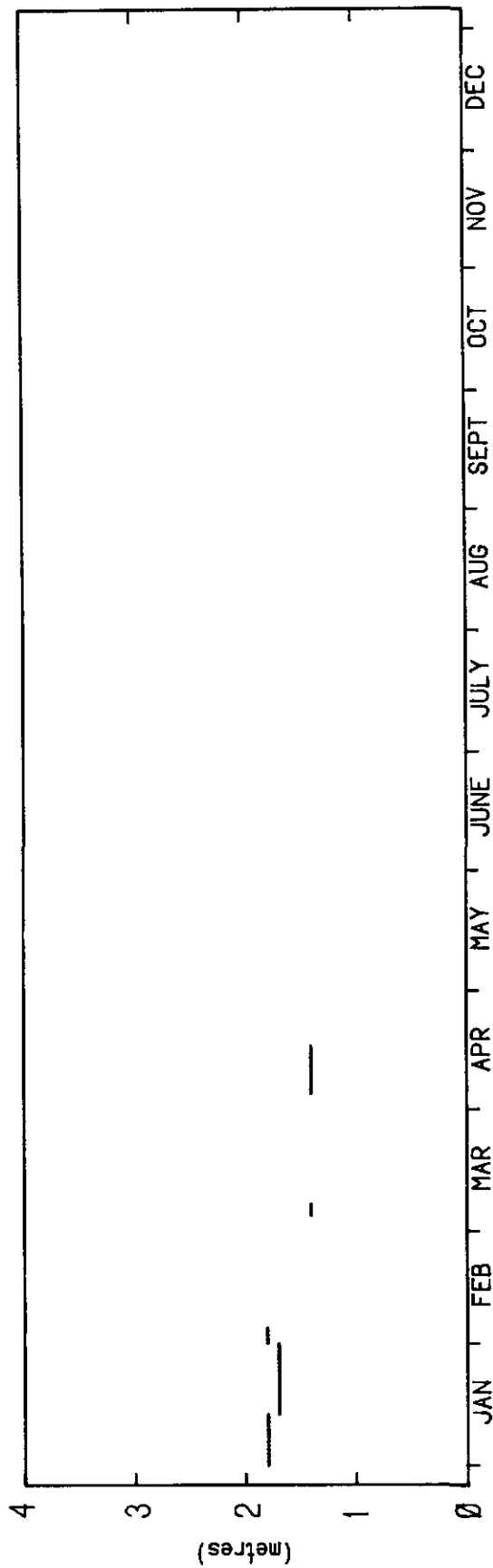
C 06.1

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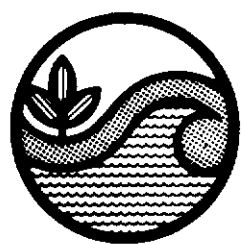
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BERM CREST ELEVATION - 1974

No. of Observations : 50



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BERM CREST ELEVATION - 1974

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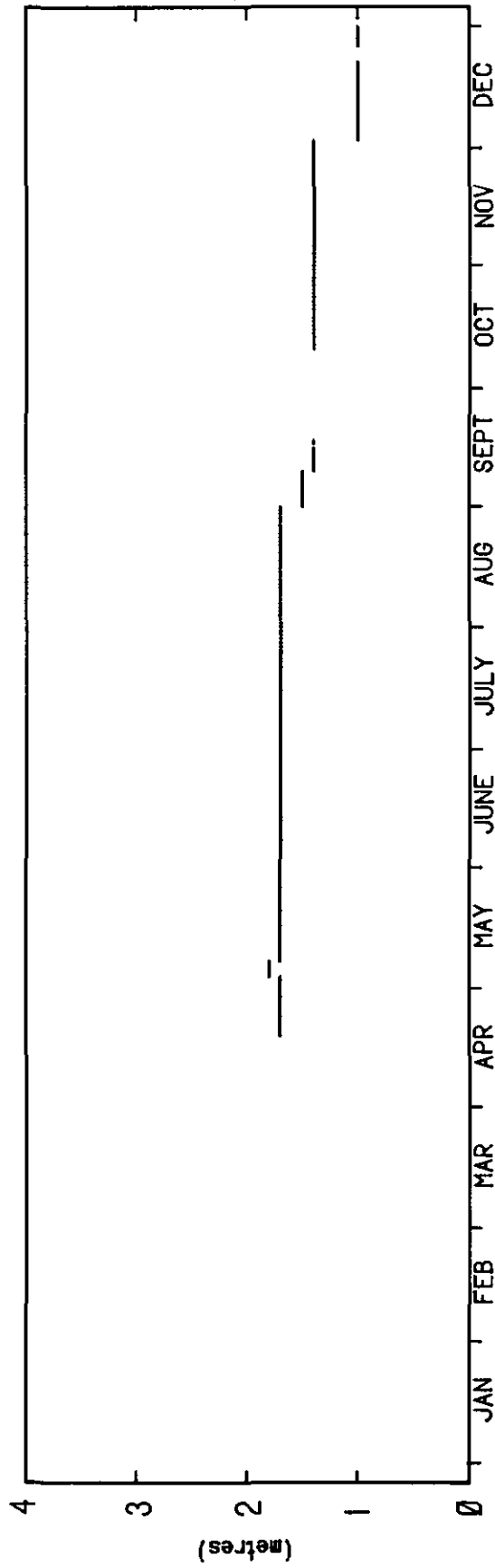
Figure 24
C 06.1

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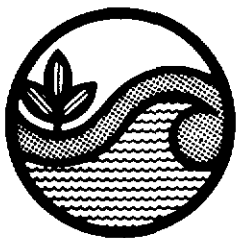
EURONG

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BERM CREST ELEVATION - 1975

No. of Observations : 229

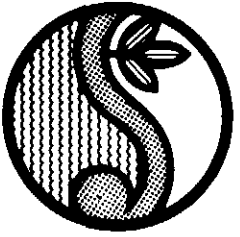


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BERM CREST ELEVATION - 1975

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Figure 25
C 06.1



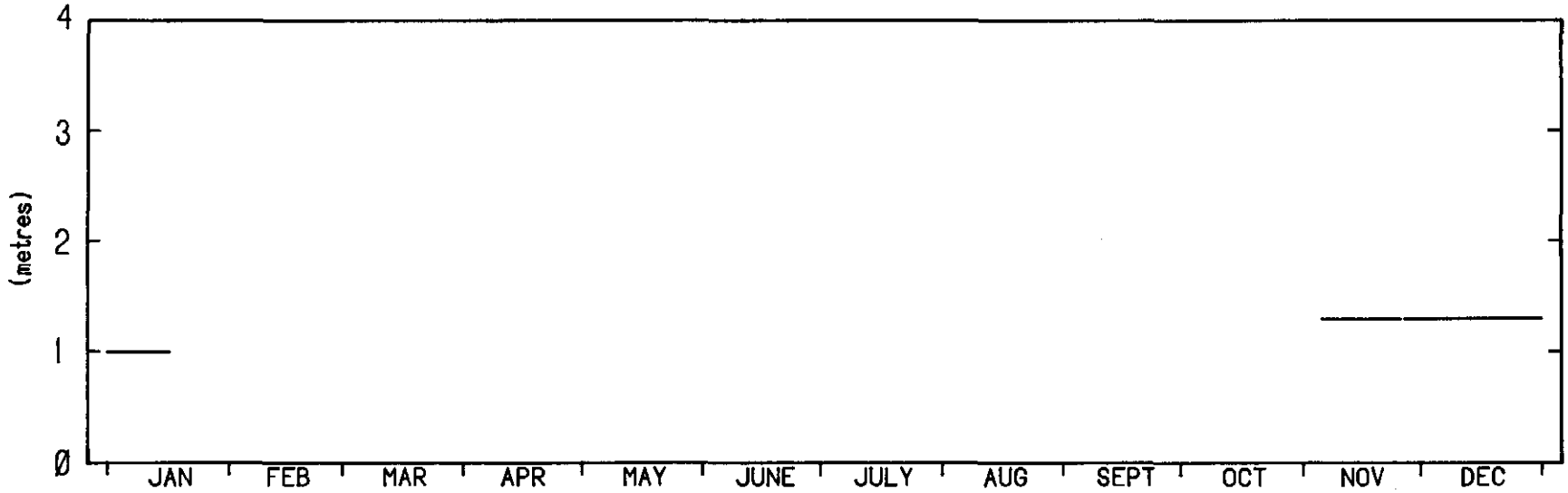
BERM CREST ELEVATION - 1976

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BERM CREST ELEVATION - 1976

No. of Observations : 71

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Figure 26

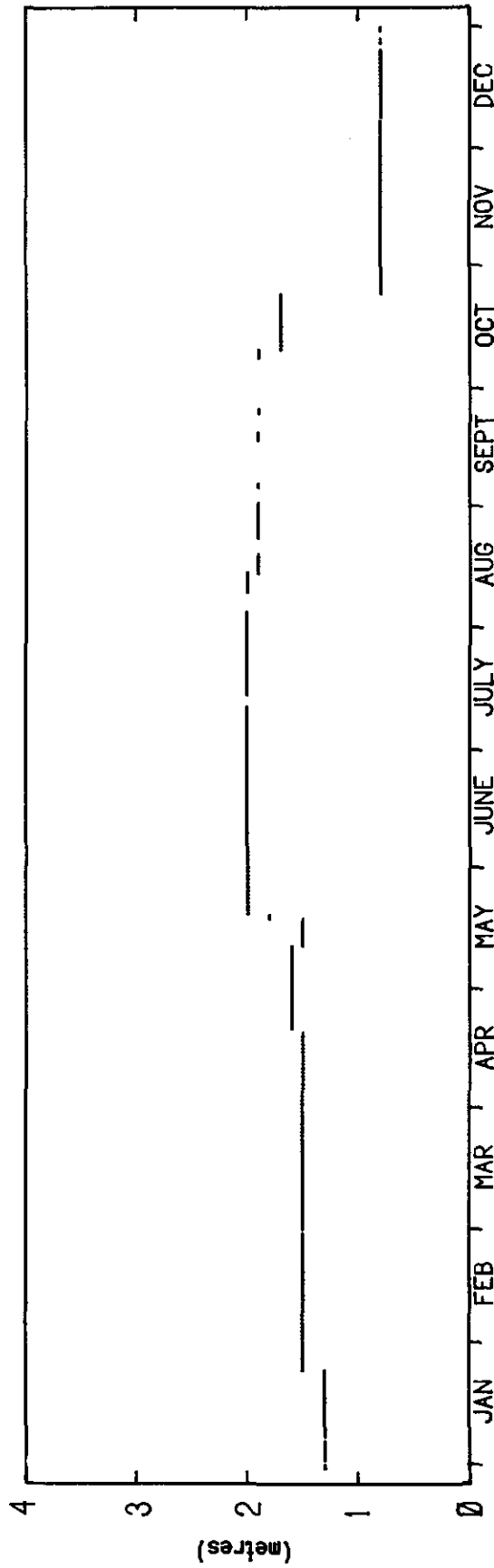
C 06.1

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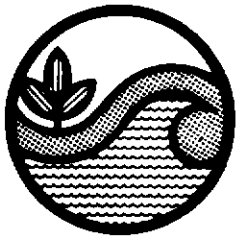
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BERM CREST ELEVATION - 1977

No. of Observations : 312



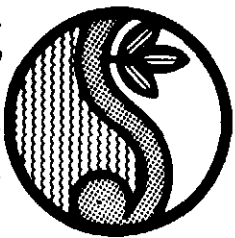
Beach Protection Authority

BERM CREST ELEVATION - 1977

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Figure 27

C 06.1



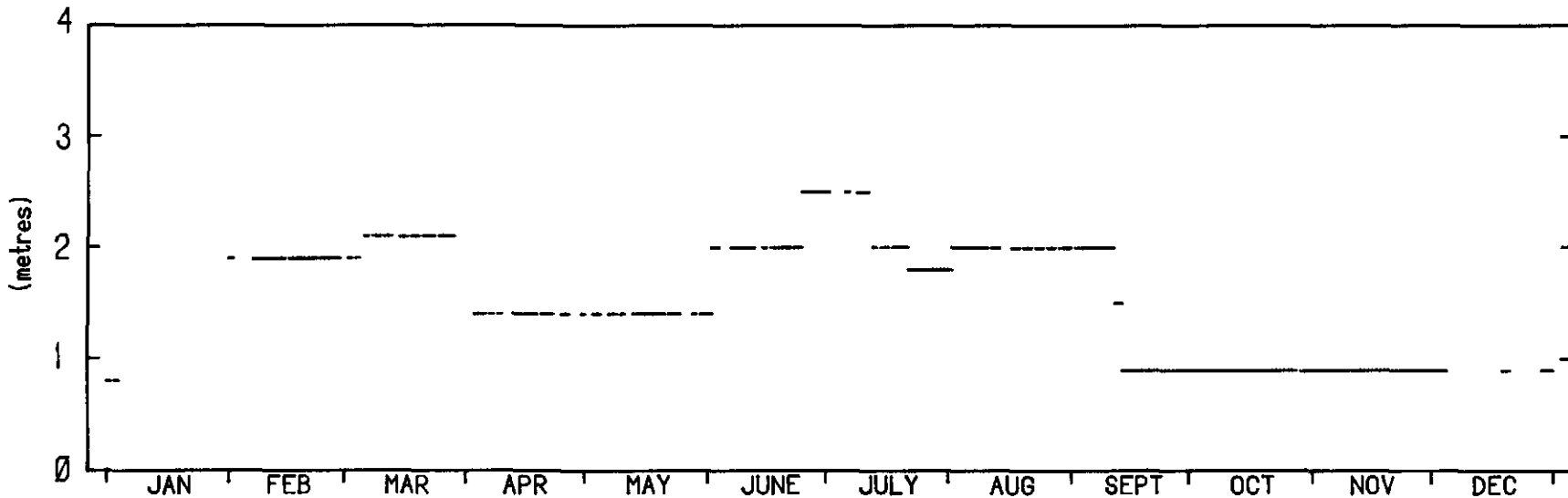
BERM CREST ELEVATION - 1978

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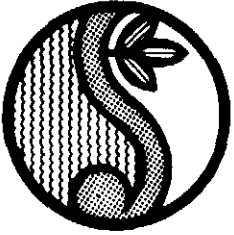
BERM CREST ELEVATION - 1978

No. of Observations : 245

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Figure 28

C 06.1



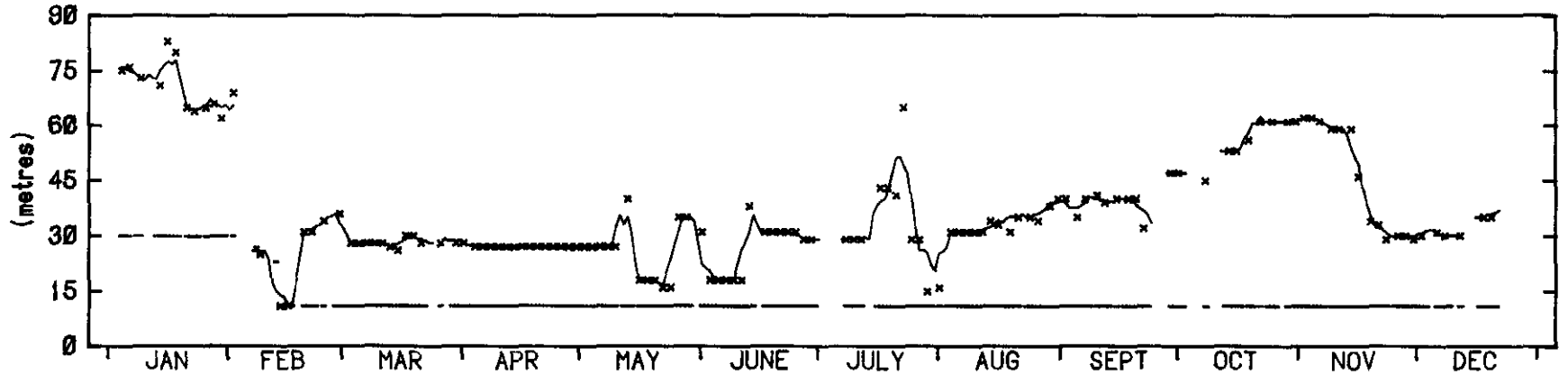
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Programme Engineering

MARYBOROUGH CITY

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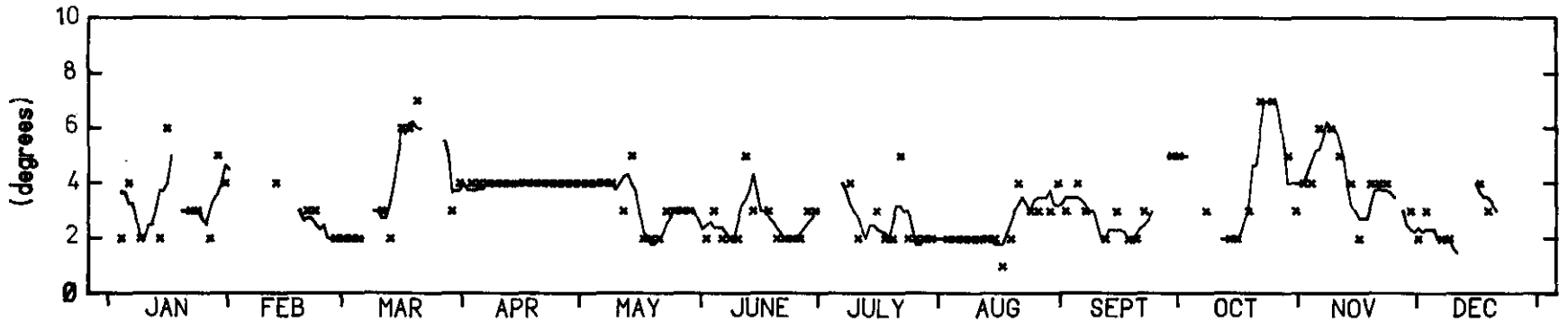
4101

BEACH PROFILE PARAMETERS - 1972



DISTANCE TO BERM AND VEGETATION LINE - 1972

x x x x Indicates Distance to Berm : 270 Observations
 — Indicates Distance to Vegetation Line : 273 Observations



FORESHORE SLOPE - 1972

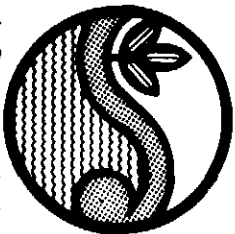
Five Day Moving Average

No. of Observations : 250

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Figure 29

C 06.1



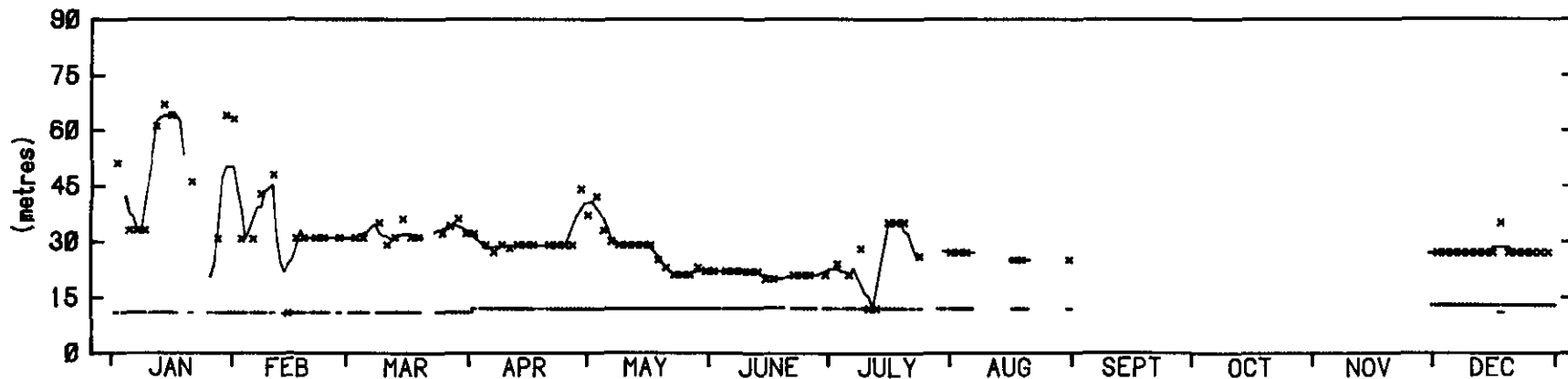
BEACH PROFILE PARAMETERS - 1973

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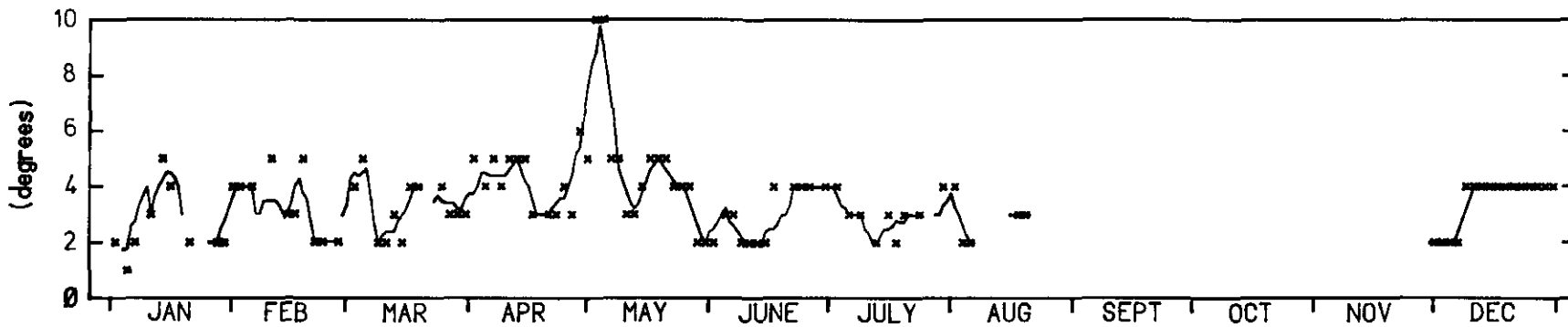
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DISTANCE TO BERM AND VEGETATION LINE - 1973

---x--- Indicates Distance to Berm : 208 Observations
 ——— Indicates Distance to Vegetation Line : 200 Observations



FORESHORE SLOPE - 1973

—x— Five Day Moving Average

No. of Observations : 203

Figure 30
C 06.1

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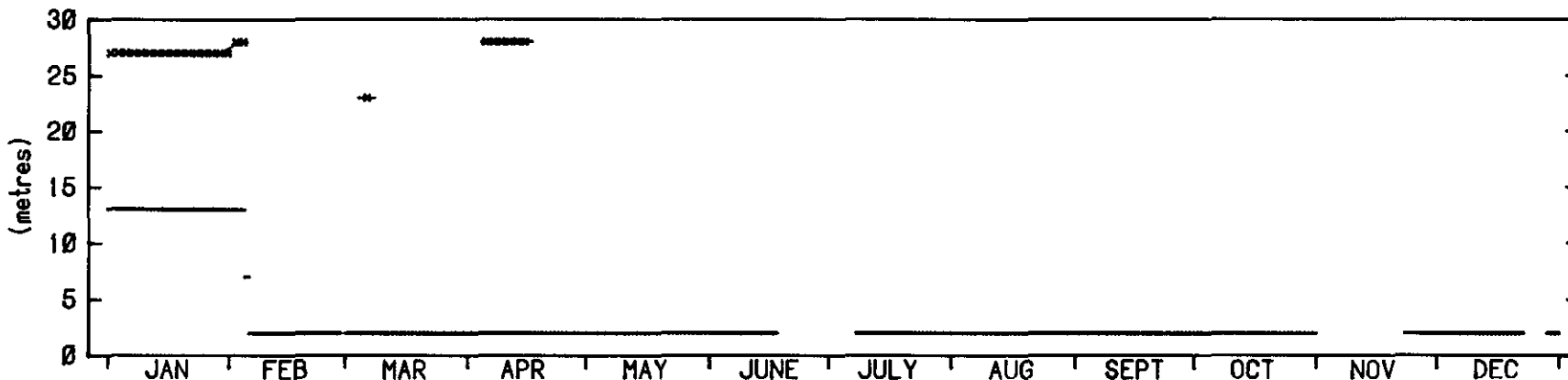
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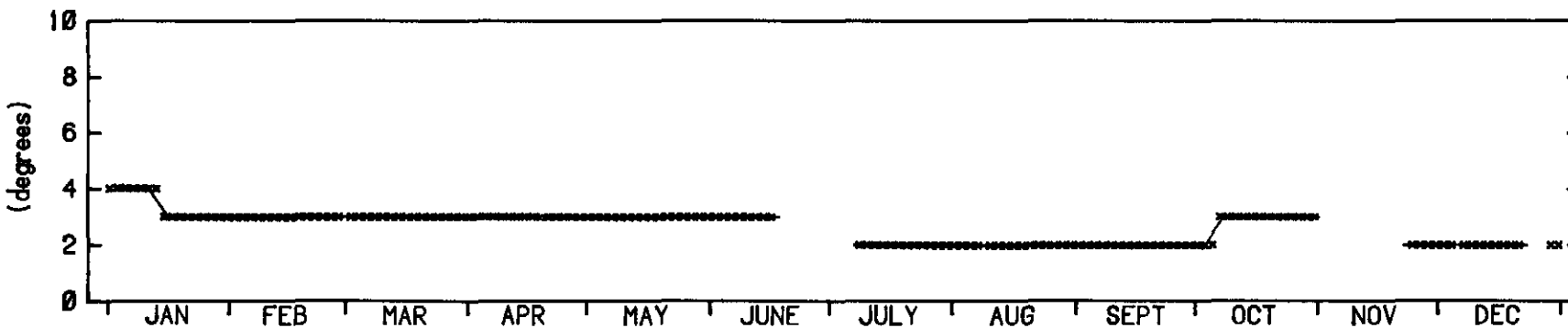
4101

BEACH PROFILE PARAMETERS - 1974



DISTANCE TO BERM AND VEGETATION LINE - 1974

--- Indicates Distance to Berm : 50 Observations
 — Indicates Distance to Vegetation Line : 317 Observations



FORESHORE SLOPE - 1974

— Five Day Moving Average

No. of Observations : 315

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Figure 31

C 06.1



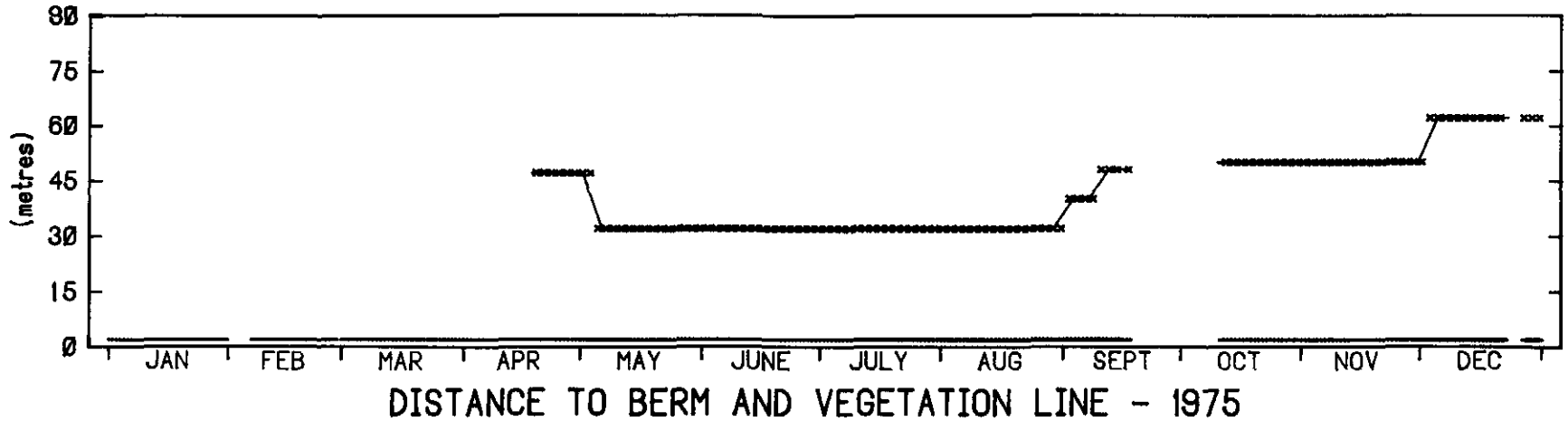
BEACH PROFILE PARAMETERS - 1975

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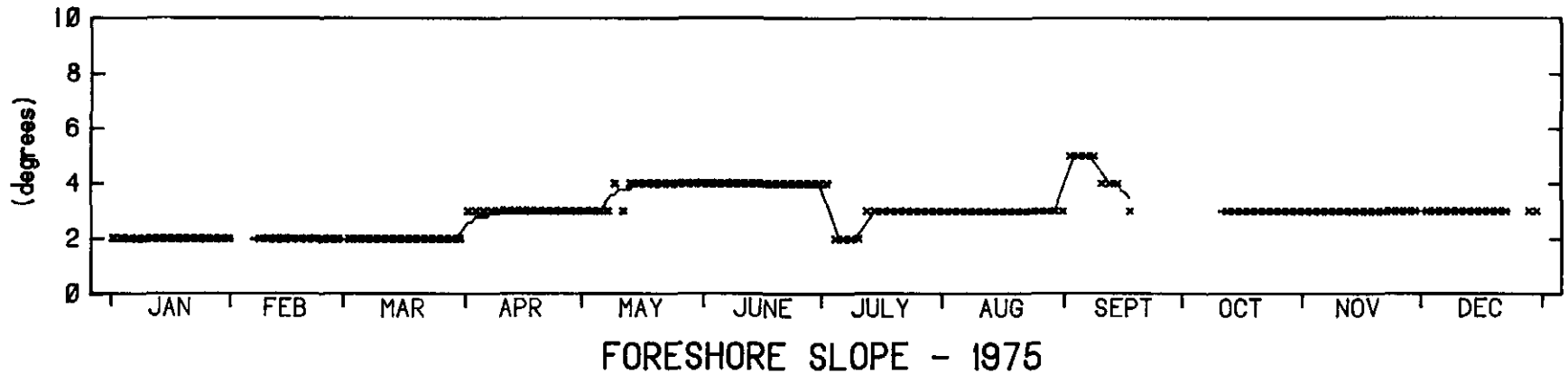
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xxxx Indicates Distance to Berm : 229 Observations
 — Indicates Distance to Vegetation Line : 331 Observations



Five Day Moving Average

No. of Observations : 330

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Figure 32

C 06.1



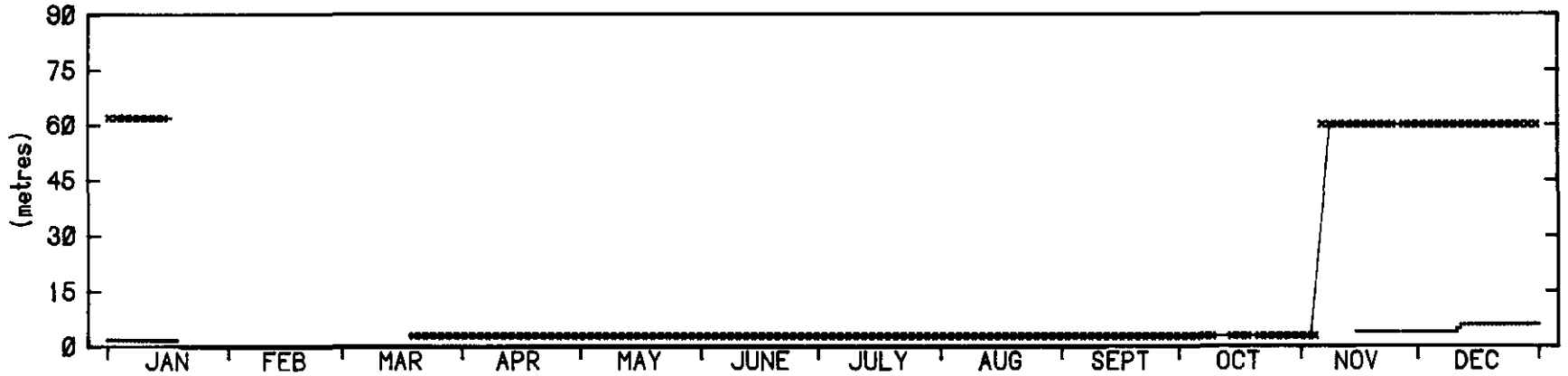
BEACH PROFILE PARAMETERS - 1976

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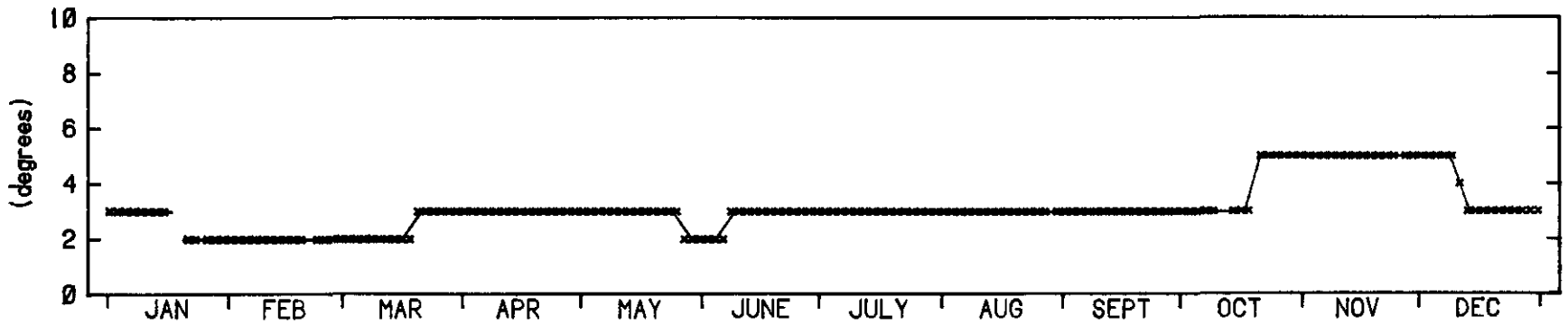
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DISTANCE TO BERM AND VEGETATION LINE - 1976

..... Indicates Distance to Berm : 299 Observations
 ——— Indicates Distance to Vegetation Line : 359 Observations



FORESHORE SLOPE - 1976

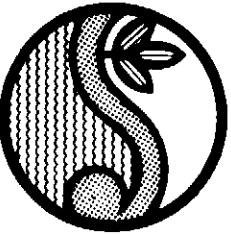
Five Day Moving Average

No. of Observations : 353

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Figure 33

C 06.1



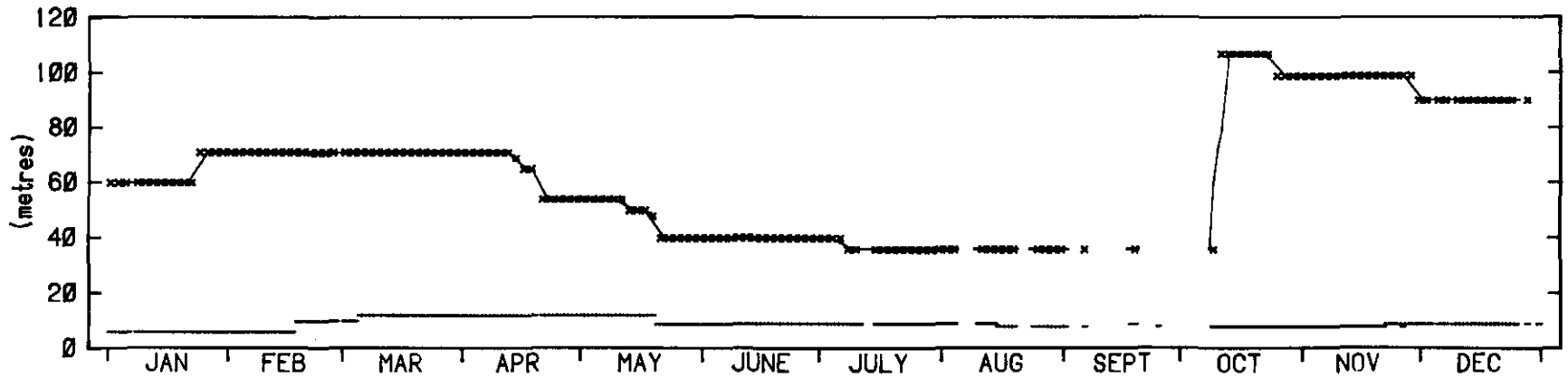
BEACH PROFILE PARAMETERS - 1977

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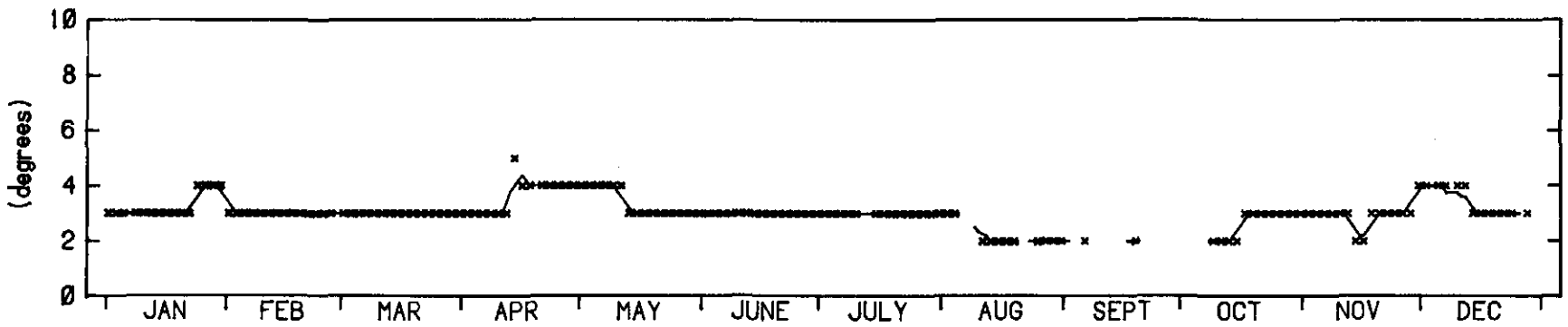
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DISTANCE TO BERM AND VEGETATION LINE - 1977

---x--- Indicates Distance to Berm : 312 Observations
 ——— Indicates Distance to Vegetation Line : 312 Observations



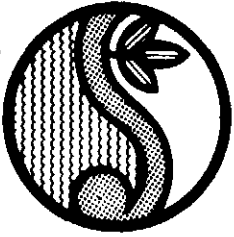
FORESHORE SLOPE - 1977

—x— Five Day Moving Average

No. of Observations : 312

Figure 34
C 06.1

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BEACH PROFILE PARAMETERS - 1978

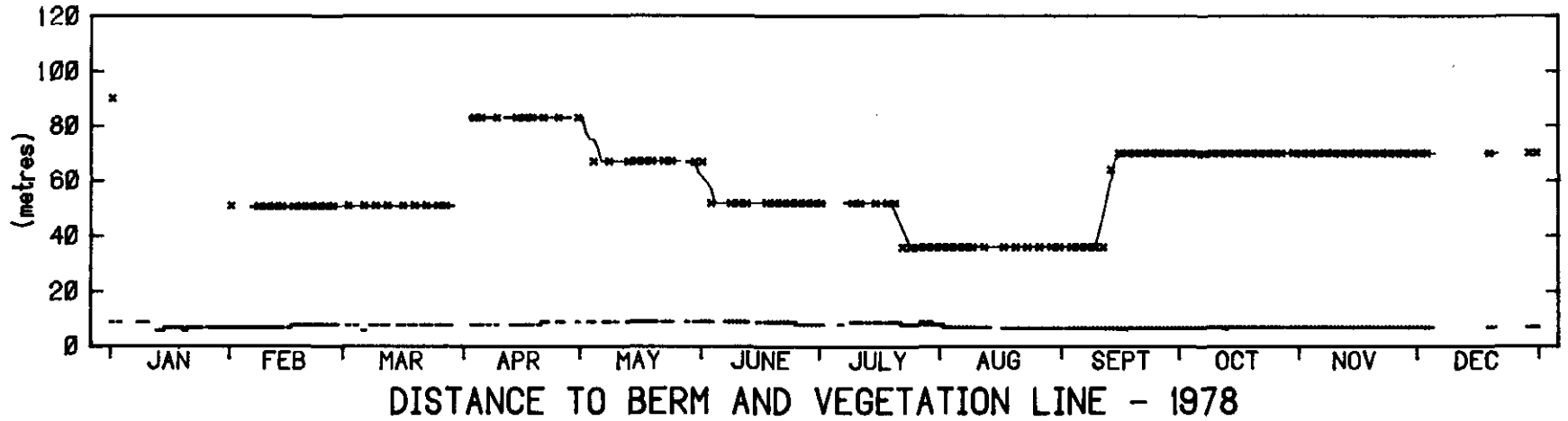
S. R. Hampson, Government Printer, Queensland

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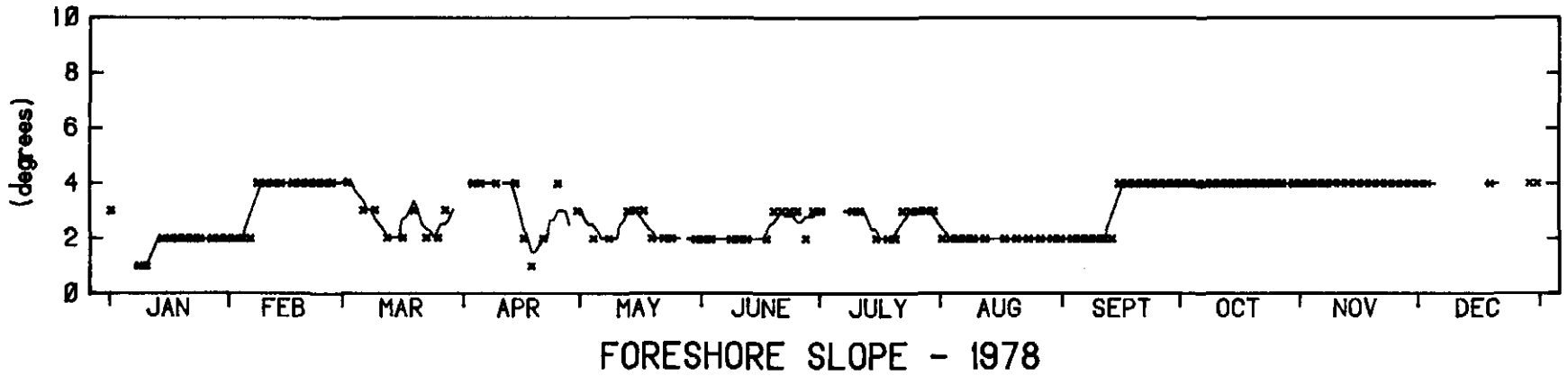
MARYBOROUGH CITY

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---x--- Indicates Distance to Berm : 245 Observations
 — Indicates Distance to Vegetation Line : 271 Observations



—x— Five Day Moving Average

No. of Observations : 271

Figure 35
 C 06.1

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