

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

**Yeppoon – Livingstone Shire**

**For the Years 1976 to 1980**

**Beach Protection Authority**

**February 1985**

All reasonable care and attention has been exercised in the collection, processing and compilation of the COPE data included in this report. However the accuracy and reliability of this information is not guaranteed in any way by the Beach Protection Authority and the Authority accepts no responsibility for the use of this information in any way whatsoever.

## DOCUMENTATION PAGE

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### ABSTRACT:

This report provides a summary of primary analyses of COPE data on wind, wave and beach processes observed at Yeppoon in the Livingstone Shire on the central Queensland coast. The data were recorded by volunteer observer Mr. Keith Sleeman during the period October 1976 to October 1980. The recordings were made daily during the four 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, (Report C 01.1).

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

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

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(Report C 11.1)

Coastal Observation Programme - Engineering (COPE), Urangan - Town of Hervey Bay.  
(Report C 12.1)

Coastal Observation Programme - Engineering (COPE), Noosa Beach - Noosa Shire. (Report  
C 13.1)

Coastal Observation Programme - Engineering (COPE), Shingly Beach - Proserpine Shire.  
(Report C 14.1)

#### 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 four year period 1976 to 1980 in a useful statistical form. No attempt has been made to interpret the observed data.

If this four 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**

Yeppoon Beach is located within the Livingstone Shire and is situated approximately 36 kilometres north east of Rockhampton on the central Queensland coast. It forms part of a 20 kilometre stretch of the coastline between Sandy Point and Wave Point. The town of Yeppoon is immediately adjacent to the COPE Station. The location of the Yeppoon COPE Station is shown in Figure 1.

### **2.2 Observers**

This station has been manned by Mr Keith Sleeman during the period October 1976 to October 1980. Mr Sleeman is a resident of Yeppoon and is employed by Livingstone Shire Council.

### **2.3 Observed Parameters**

The observer at this station usually recorded at 8.00 a.m. daily, but during years 1978 and 1979 he recorded at either 8.00 a.m. or 2.00 p.m.

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 Fixed Contour
- 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 was usually recorded monthly also.

#### 2.4 Tidal Information

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

- M.H.W.S. : 4.1 metres
- M.H.W.N. : 3.2 metres
- M.S.L. : 2.38 metres
- M.L.W.N. : 1.6 metres
- M.L.W.S. : 0.7 metres

#### 2.5 Description of the Beach

The beach at the Yeppoon COPE station has experienced severe erosion and a rock sea wall has been constructed to protect the esplanade. The beach exhibits the following characteristics:-

- Typical beach slopes: foreshore slope is in the range 1 in 30 to 1 in 60 ( $1^{\circ}$  to  $2^{\circ}$ ).
- Beach width: Rock sea wall coincides with high water mark.
- D50 sand size: 0.26 mm averaged over four years.
- Adjoining Landform: The frontal dune has been eroded by the sea. The beach is backed by a top-soiled esplanade protected by a rock sea wall.
- Vegetation: The esplanade has been developed as a grassed parkland with coconut palms (*Cocos nucifera*) and Norfolk Island pine (*Araucaria heterophylla*).

## 2.6 Supervision of Station

The observers were 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 Livingstone Shire 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 four year period October 1976 to October 1980 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 observers 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 <sup>o</sup>	to	60 <sup>o</sup>
Sector 2	-	60 <sup>o</sup>	to	85 <sup>o</sup>
Sector 3	-	85 <sup>o</sup>	to	95 <sup>o</sup>
Sector 4	-	95 <sup>o</sup>	to	120 <sup>o</sup>
Sector 5	-	120 <sup>o</sup>	to	180 <sup>o</sup>

Note: 0<sup>o</sup> 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 12.
- (d) tabulation of the occurrence of various wave heights, periods, types and directions (Tables 1 to 5).

### 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 13 to Figure 19). 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:

- Distance from the reference pole to the 1.5 metre, relative to AHD, fixed contour level, from May 4, 1979 to October 31, 1980.
- 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 23 to 24.

### 3.6 Monthly Beach Profiles

Beach profiles are normally taken at the beginning of each month. However should the beach undergo appreciable erosion or accretion during the month, then the observer is requested to take another beach profile. Monthly beach profiles are shown in Figures 25 to 28.

**TABLE 1.**

MONTHLY AND ANNUAL

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

YEPPON

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														
FEBRUARY														
MARCH														
APRIL														
MAY														
JUNE														
JULY														
AUGUST														
SEPTEMBER														
OCTOBER	5.3	0.25	95.2	-	-	4.8	-	-	66.7	33.3	-	-	-	-
NOVEMBER	4.1	0.19	86.7	13.3	-	-	-	-	46.7	53.3	-	-	-	-
DECEMBER	4.0	0.18	96.7	-	-	-	3.3	-	54.8	41.9	-	-	3.3	-
WHOLE YEAR	4.4	0.20	92.7	4.9	0.0	1.2	1.2	0.0	54.9	43.9	0.0	0.0	1.2	-

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

YEPPON

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	4.5	0.49	79.3	20.7	-	-	-	-	-	50.0	46.7	3.3	-	-
FEBRUARY	4.7	0.58	67.9	32.1	-	-	-	-	-	42.9	57.1	-	-	-
MARCH	4.8	0.52	71.0	29.0	-	-	-	-	-	45.2	54.8	-	-	-
APRIL	4.7	0.36	66.7	33.3	-	-	-	-	-	33.3	66.7	-	-	-
MAY	4.8	0.13	100.0	-	-	-	-	-	-	9.7	90.3	-	-	-
JUNE	4.7	0.12	100.0	-	-	-	-	-	-	14.8	85.2	-	-	-
JULY	4.8	0.17	82.1	17.9	-	-	-	-	-	21.4	78.6	-	-	-
AUGUST	4.6	0.13	100.0	-	-	-	-	-	-	-	100.0	-	-	-
SEPTEMBER	4.7	0.10	100.0	-	-	-	-	-	-	-	100.0	-	-	-
OCTOBER	4.9	0.14	86.2	13.8	-	-	-	-	-	37.9	62.1	-	-	-
NOVEMBER	5.4	0.11	100.0	-	-	-	-	-	-	26.7	73.3	-	-	-
DECEMBER	5.6	0.14	91.7	8.3	-	-	-	-	-	35.5	64.5	-	-	-
WHOLE YEAR	4.9	0.26	85.9	14.1	0.0	0.0	0.0	0.0	0.0	28.7	71.0	0.3	0.0	0.0

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**

YEPPOON

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	5.6	0.27	87.1	9.7	-	3.2	-	-	19.4	80.6	-	-	-
FEBRUARY	5.7	0.18	96.4	3.6	-	-	-	-	14.3	85.7	-	-	-
MARCH	5.7	0.21	73.7	26.3	-	-	-	-	26.3	73.7	-	-	-
APRIL	5.6	0.12	96.7	3.3	-	-	-	-	13.3	86.7	-	-	-
MAY	5.8	0.16	90.3	9.7	-	-	-	-	25.8	67.7	6.5	-	-
JUNE	9.7	0.12	100.0	-	-	-	-	-	3.3	96.7	-	-	-
JULY	9.7	0.26	81.8	18.2	-	-	-	-	24.0	76.0	-	-	-
AUGUST	8.9	0.14	63.6	36.4	-	-	-	-	-	100.0	-	-	-
SEPTEMBER	9.2	0.11	90.9	9.1	-	-	-	-	13.6	86.4	-	-	-
OCTOBER	8.4	0.20	100.0	-	-	-	-	-	-	100.0	-	-	-
NOVEMBER	7.1	0.16	96.7	3.3	-	-	-	3.3	13.3	83.3	-	-	-
DECEMBER	6.5	0.19	86.7	13.3	-	-	-	-	46.7	53.3	-	-	-
WHOLE YEAR	7.1	0.18	89.9	9.8	0.0	0.3	0.0	0.3	19.0	79.9	0.8	0.0	0.0

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

YEPPON

YEAR 1979

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	7.1	0.75	54.8	45.2	-	-	-	-	32.3	67.7	-	-	-
FEBRUARY	6.9	0.33	69.6	30.4	-	-	-	-	-	100.0	-	-	-
MARCH	6.7	0.17	93.1	6.9	-	-	-	3.3	23.4	73.3	-	-	-
APRIL	8.6	0.13	92.0	8.0	-	-	-	-	-	100.0	-	-	-
MAY	7.6	0.14	92.6	7.4	-	-	-	-	-	100.0	-	-	-
JUNE	7.4	0.12	100.0	-	-	-	-	-	-	100.0	-	-	-
JULY	8.1	0.13	100.0	-	-	-	-	17.2	-	82.8	-	-	-
AUGUST	7.3	0.11	90.0	10.0	-	-	-	-	16.1	83.9	-	-	-
SEPTEMBER	6.8	0.10	100.0	-	-	-	-	-	-	100.0	-	-	-
OCTOBER	6.9	0.22	91.7	8.3	-	-	-	-	29.2	70.8	-	-	-
NOVEMBER	6.6	0.12	100.0	-	-	-	-	-	73.3	26.7	-	-	-
DECEMBER	7.4	0.10	100.0	-	-	-	-	-	100.0	-	-	-	-
WHOLE YEAR	7.3	0.22	88.9	11.1	0.0	0.0	0.0	2.1	19.5	78.4	0.0	0.0	0.0

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

YEPPOON

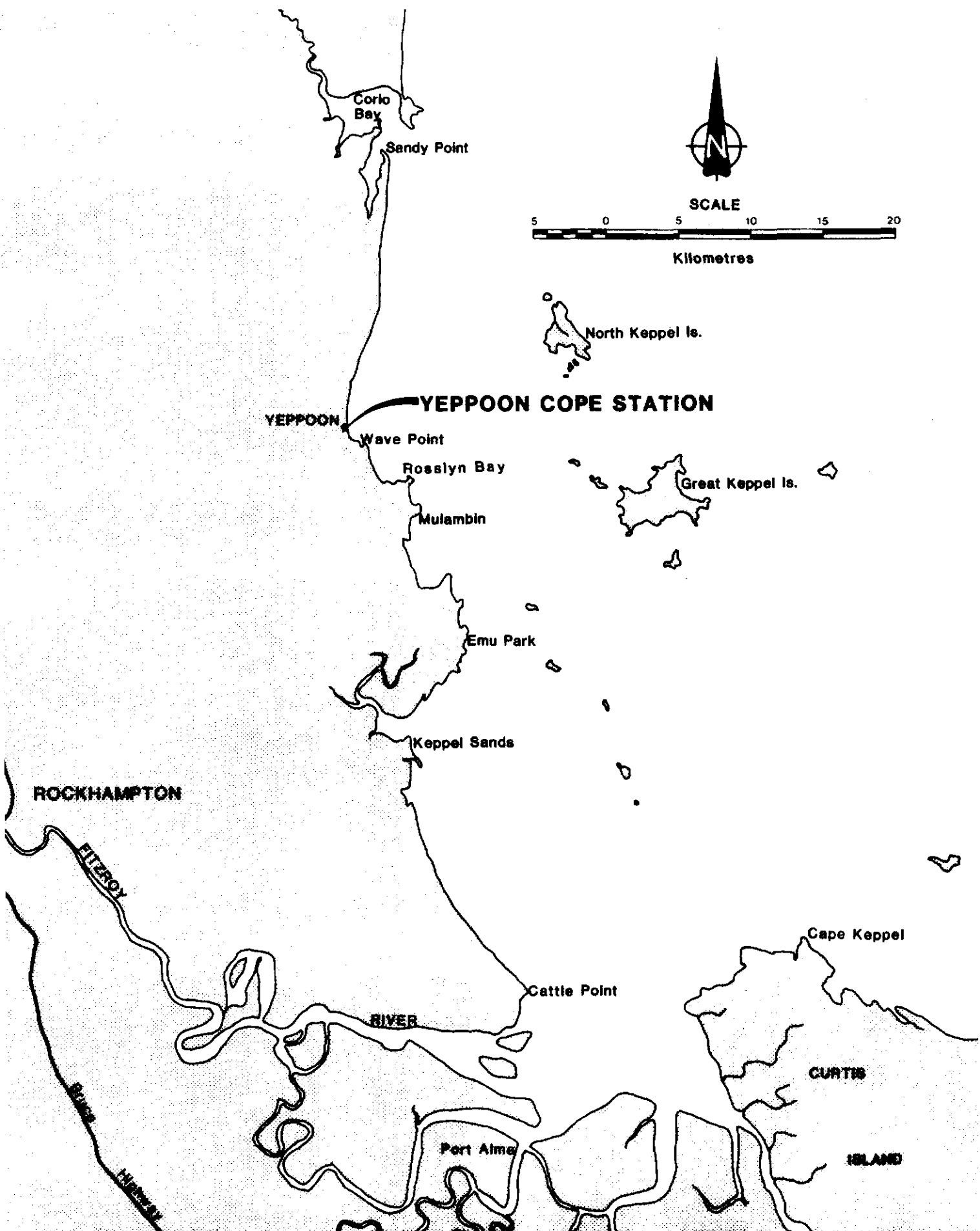
YEAR 1980

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	6.0	0.14	100.0	-	-	0	-	-	-	72.2	27.8	-	-	-
FEBRUARY	8.0	0.66	46.4	50.0	-	3.6	-	-	-	32.1	64.3	-	3.6	-
MARCH	7.4	0.20	93.1	6.9	-	-	-	-	-	3.3	93.4	3.3	-	-
APRIL	7.2	0.17	100.0	-	-	-	-	-	-	-	100.0	-	-	-
MAY	7.5	0.11	100.0	-	-	-	-	-	-	-	100.0	-	-	-
JUNE	7.0	0.12	100.0	-	-	-	-	-	-	-	86.7	13.3	-	-
JULY	7.4	0.11	100.0	-	-	-	-	-	-	-	100.0	-	-	-
AUGUST	6.8	0.13	91.3	8.7	-	-	-	-	-	-	78.3	21.7	-	-
SEPTEMBER	7.2	0.11	100.0	-	-	-	-	-	-	31.3	68.7	-	-	-
OCTOBER	7.5	0.12	90.3	9.7	-	-	-	-	-	45.2	54.8	-	-	-
NOVEMBER														
DECEMBER														
WHOLE YEAR	7.3	0.19	91.6	8.0	0.0	0.4	0.0	0.0	0.0	15.9	79.9	3.8	0.4	0.0

SP – Spilling

PL – Plunging

SP/PL – Combined Spilling and Plunging

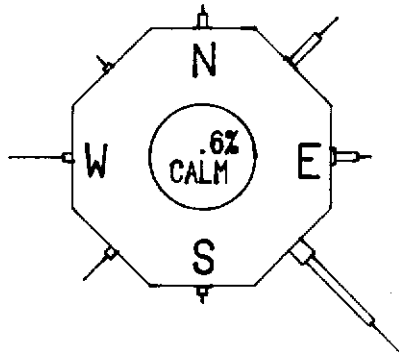


**LOCALITY PLAN**

**COPE**  
Yeppoon

**Figure 1**  
C 15.1

ALL OBSERVATIONS



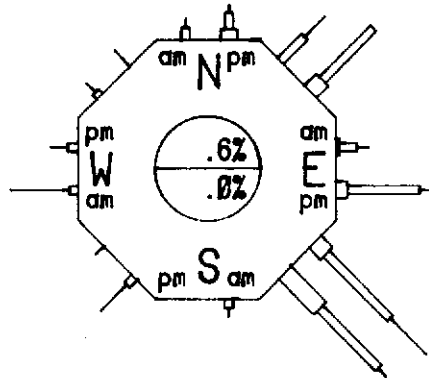
Total No. of Observations : 713

MORNING - AFTERNOON OBSERVATIONS

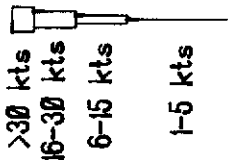
NOTES :

Figures in Central Circle Represent Percentage of CALM Observations.

Upper Figure for AM  
Lower Figure for PM



LEGEND



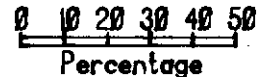
No. of Morning Observations : 636

No. of Afternoon Observations : 77

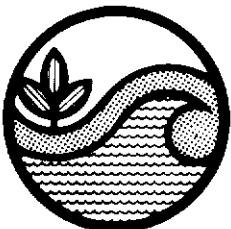
Mean Time :- Morning Obs : 0806 hrs

Mean Time :- Afternoon Obs : 1353 hrs

SCALE



WIND DATA - OCT 1976 to DEC 1980

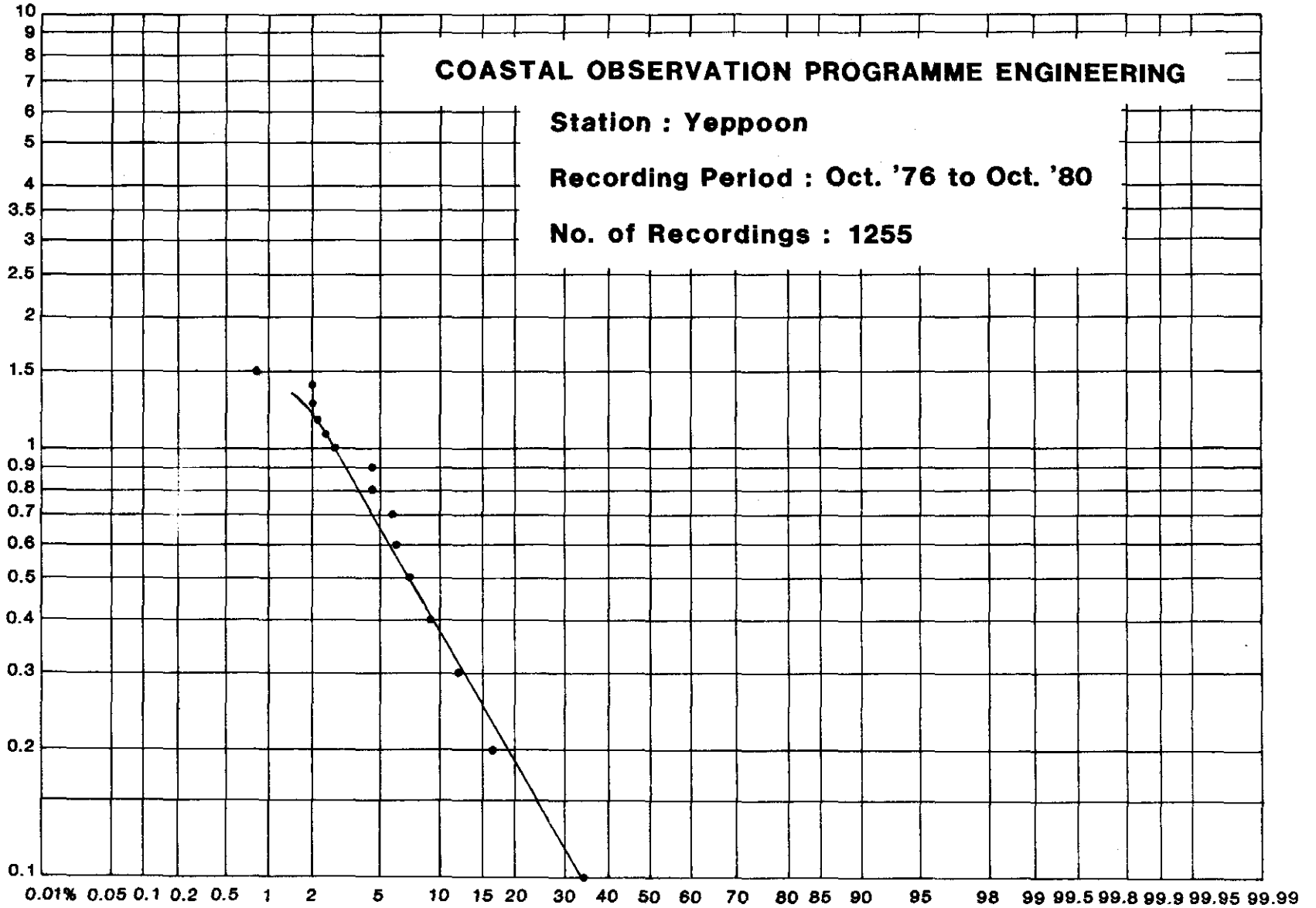




**WAVE HEIGHT % EXCEEDANCE**

**ALL DATA**

**BREAKING WAVE HEIGHT (metres)**



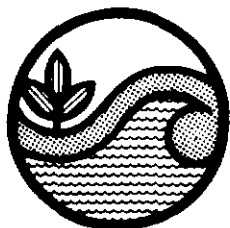
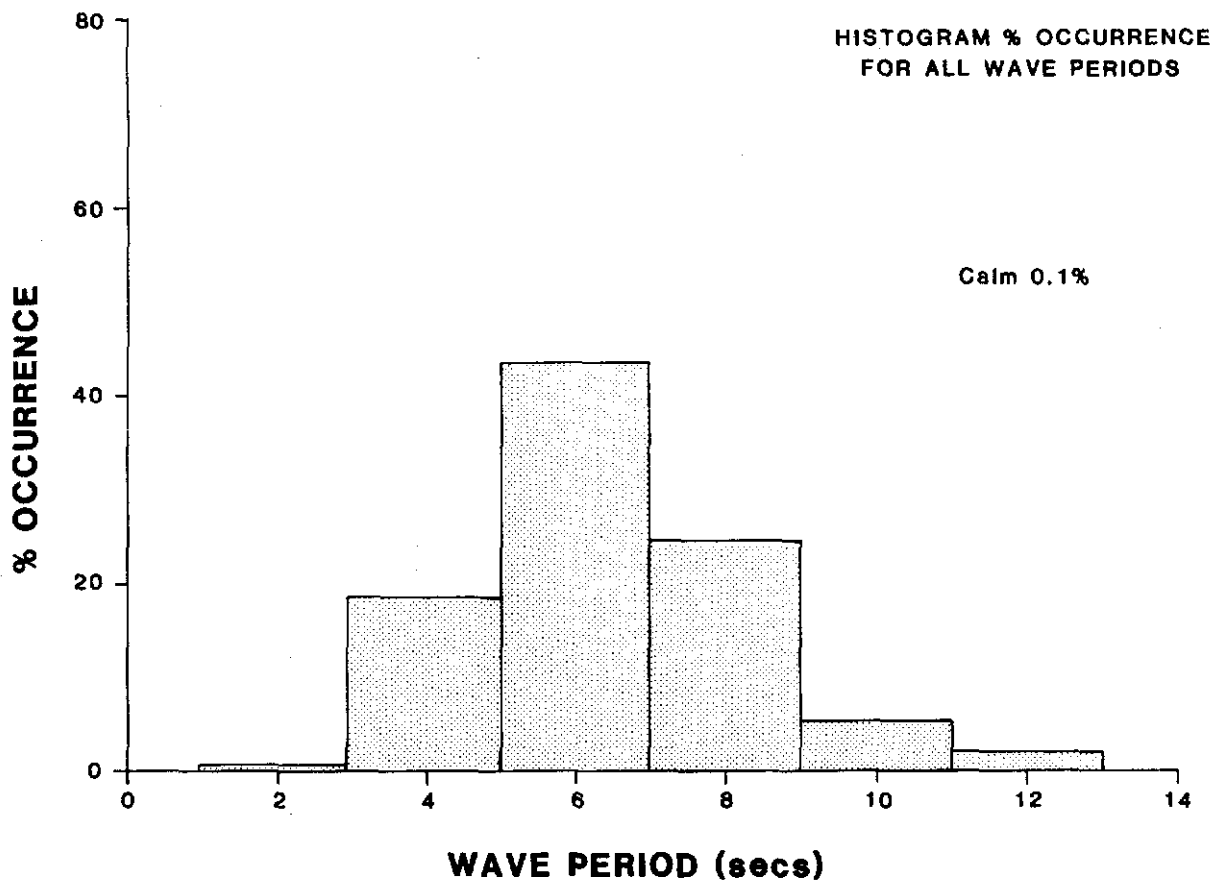
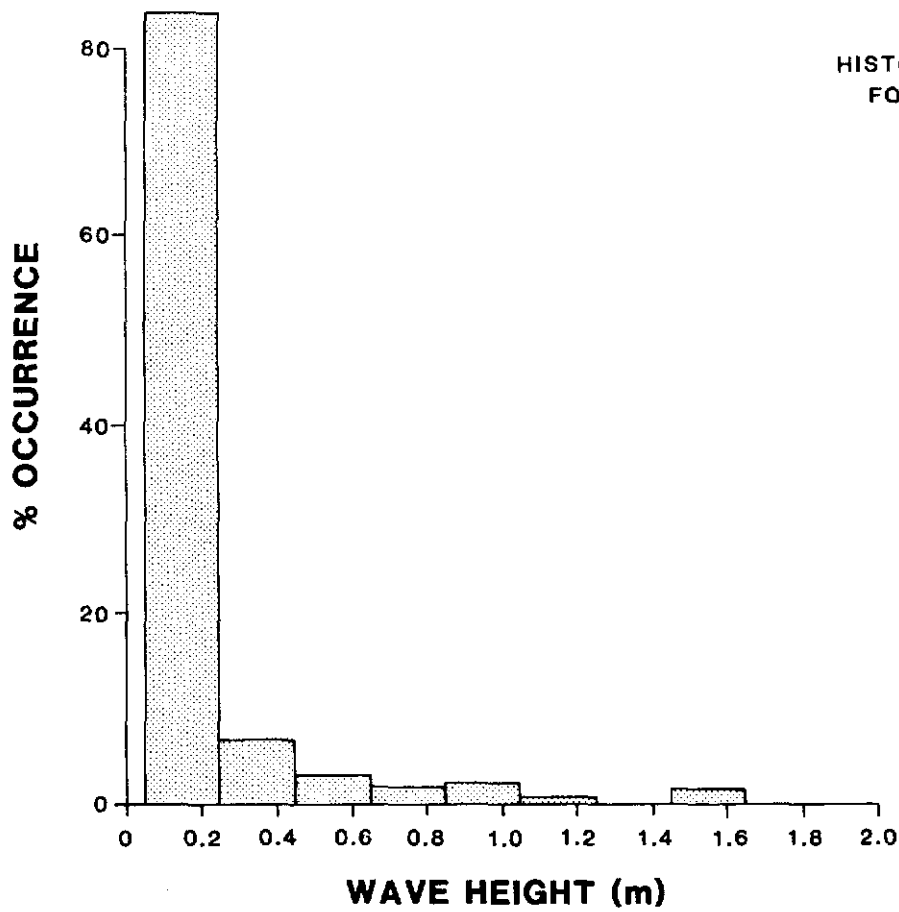
**PERCENTAGE OF RECORDINGS WHERE A GIVEN BREAKER HEIGHT IS EXCEEDED**

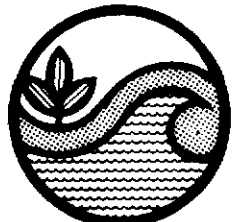
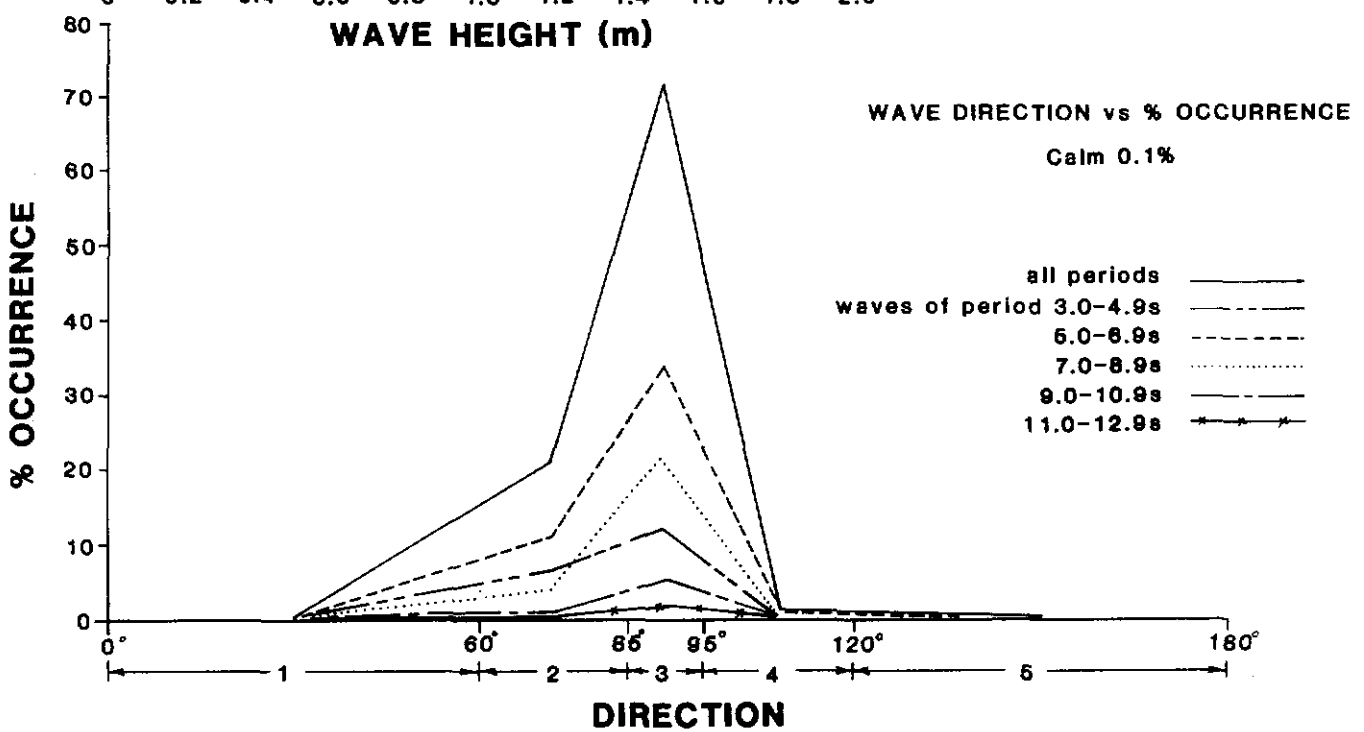
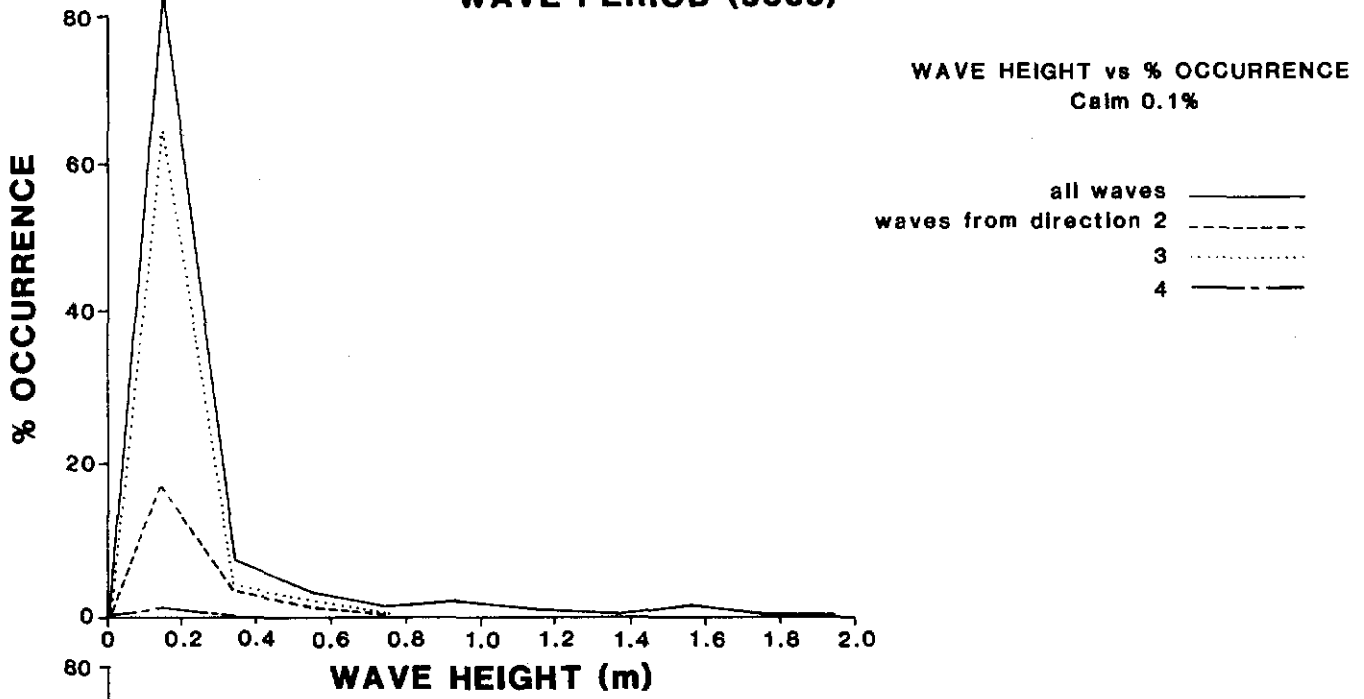
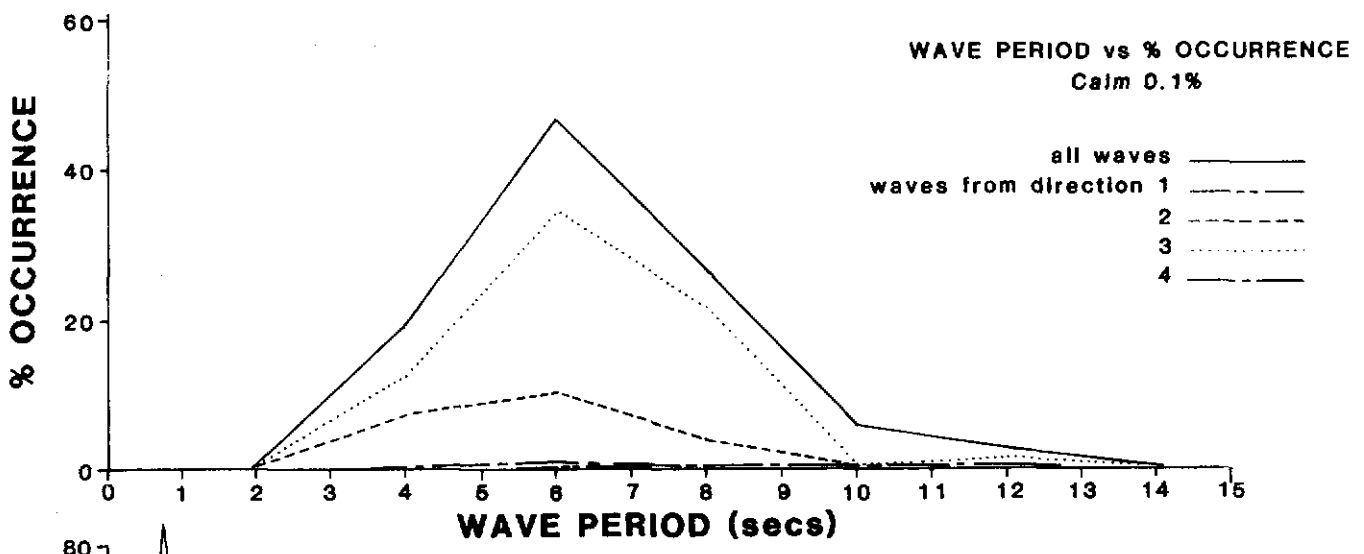
**COPE**

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**Figure 3**

C 15.1



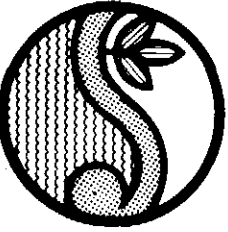


Beach Protection Authority

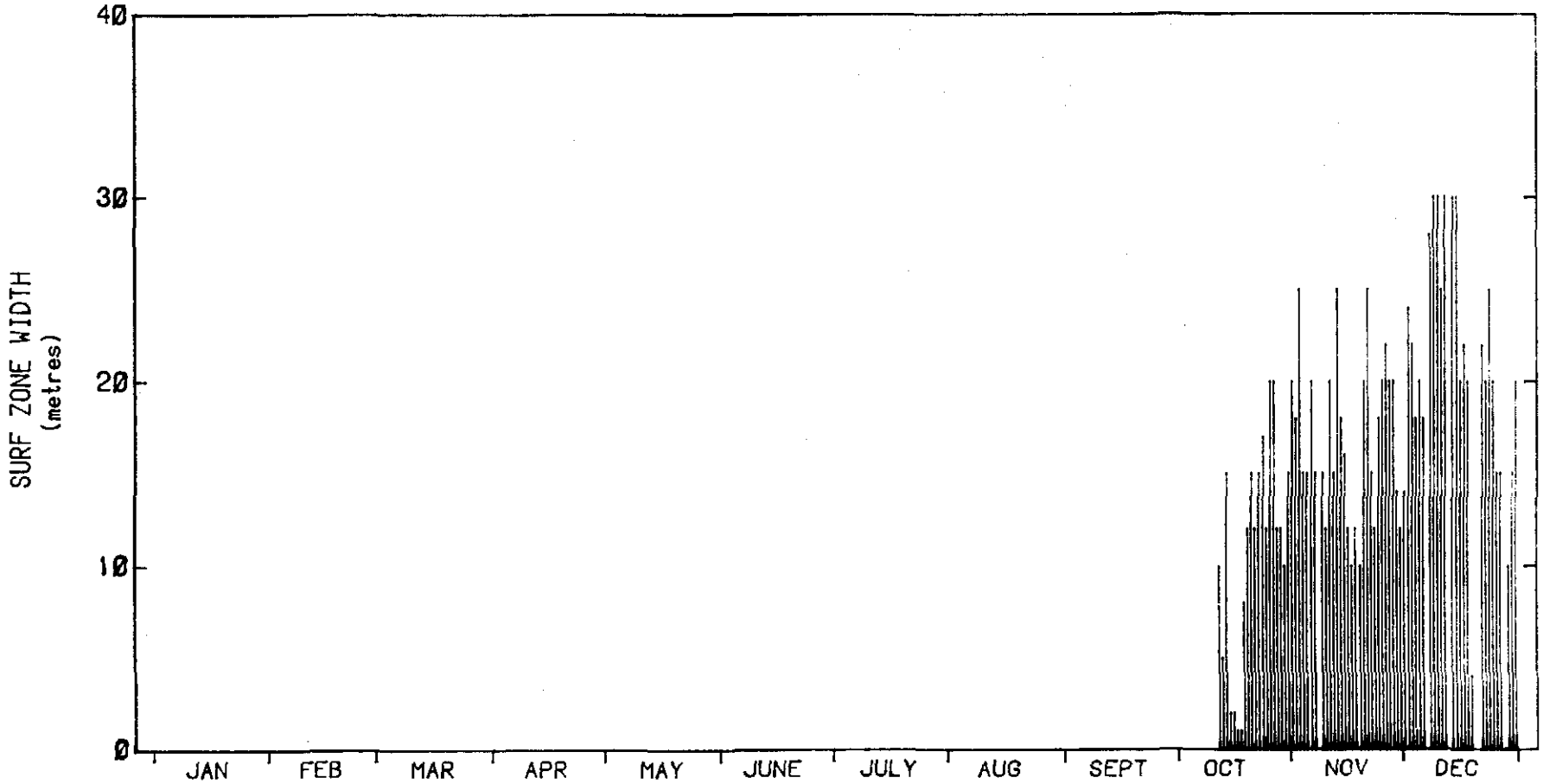
**WAVE DIRECTION ANALYSIS  
ALL DATA**

**COPE**  
Yeppoon

**Figure 5**  
C 15.1



SURF ZONE WIDTH - MORNING 1976



SURF ZONE WIDTH SUMMARY - 1976

No. of Observations : 76

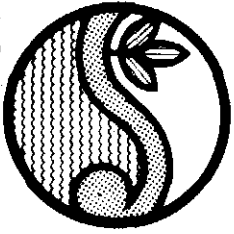
MORNING OBSERVATIONS

Mean Surf Zone Width = 16.5 m

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Figure 6

C 15.1



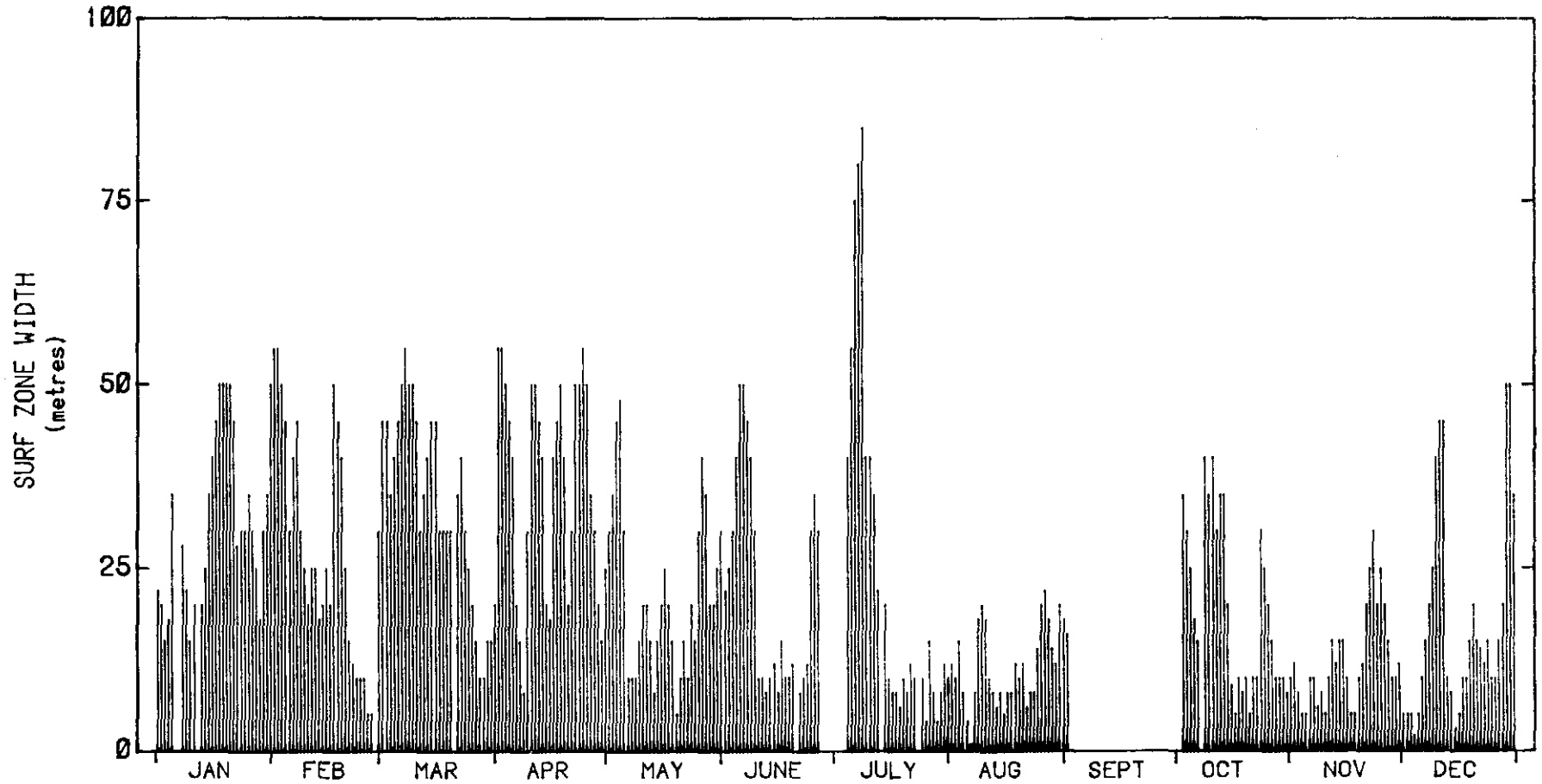
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Programme Engineering

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LIVINGSTONE SHIRE

1984

SURF ZONE WIDTH - MORNING 1977



### SURF ZONE WIDTH SUMMARY - 1977

No. of Observations : 321

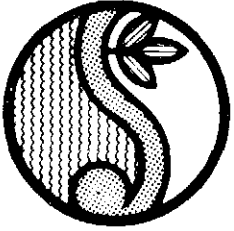
MORNING OBSERVATIONS

Mean Surf Zone Width = 23.5 m

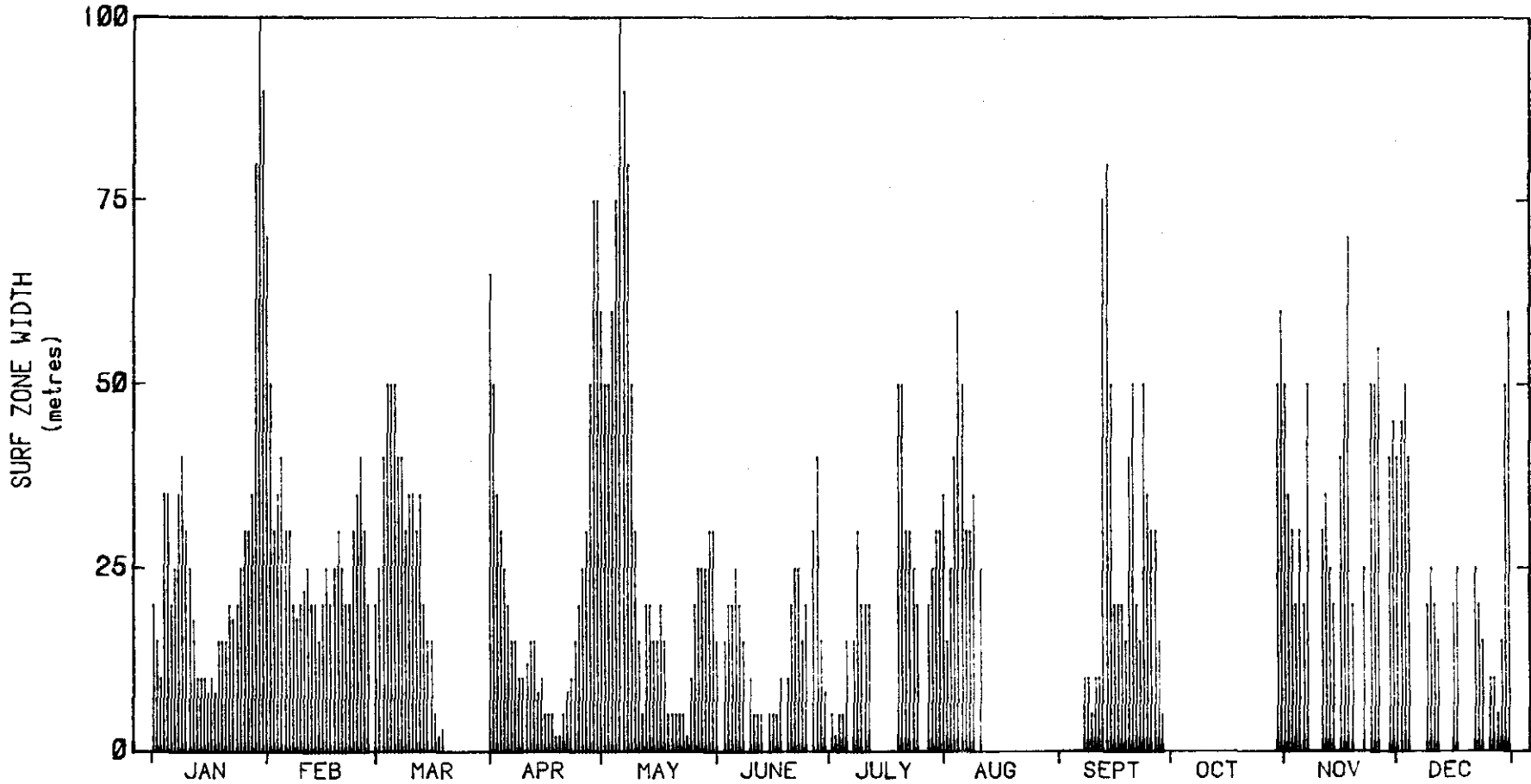
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Figure 7  
C 15.1





SURF ZONE WIDTH - MORNING 1978



SURF ZONE WIDTH SUMMARY - 1978

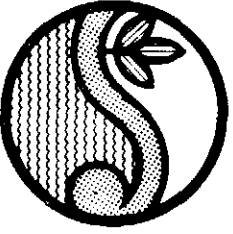
No. of Observations : 259

MORNING OBSERVATIONS

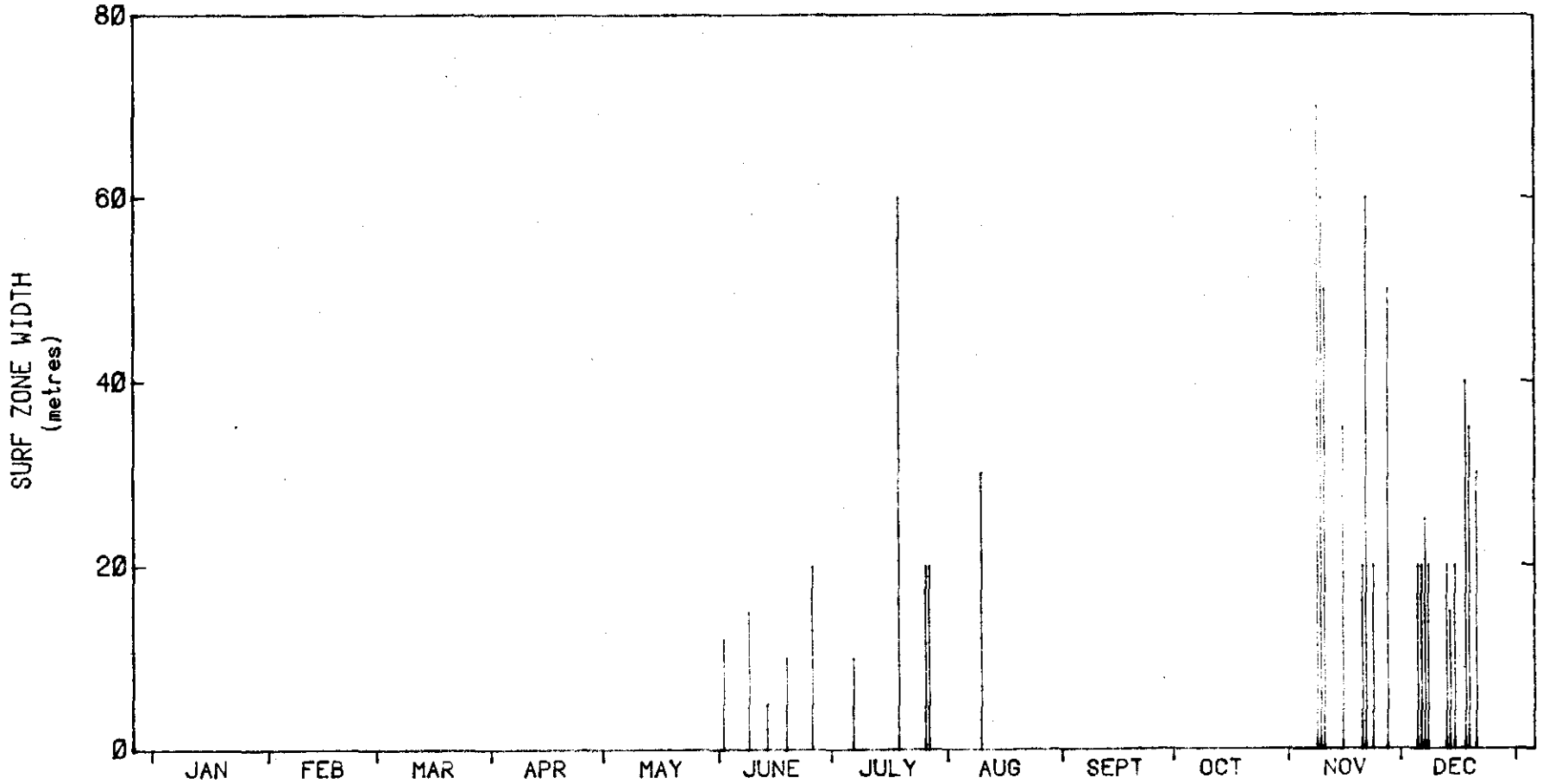
Mean Surf Zone Width = 27.1 m

Figure 8  
C 15.1

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SURF ZONE WIDTH - AFTERNOON 1978



SURF ZONE WIDTH SUMMARY - 1978

No. of Observations : 28

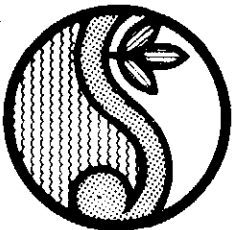
AFTERNOON OBSERVATIONS

Mean Surf Zone Width = 29.0 m

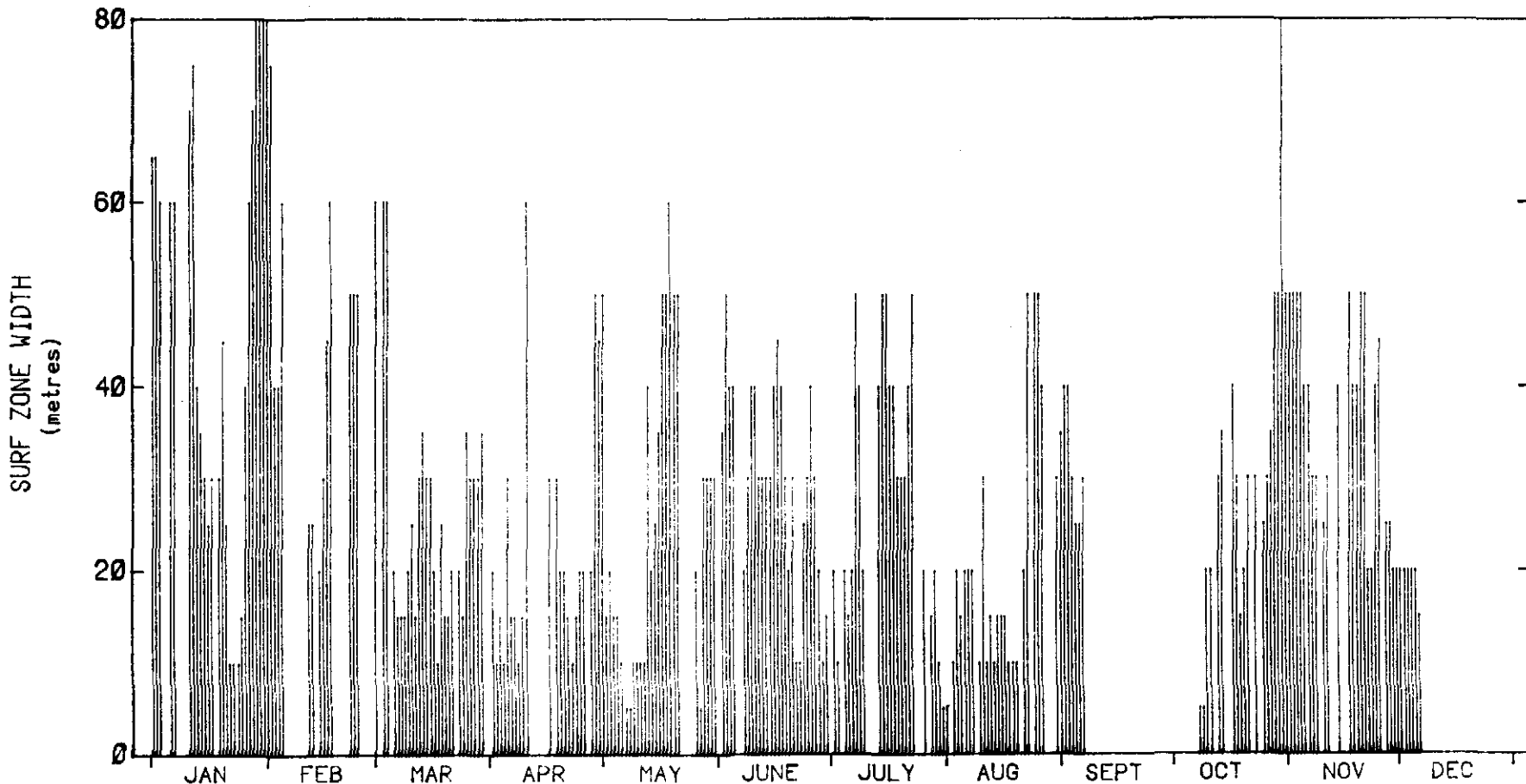
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Figure 9

C 15.1



SURF ZONE WIDTH - MORNING 1979



SURF ZONE WIDTH SUMMARY - 1979

No. of Observations : 247

MORNING OBSERVATIONS

Mean Surf Zone Width = 30.5 m

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Figure 10

C 15.1



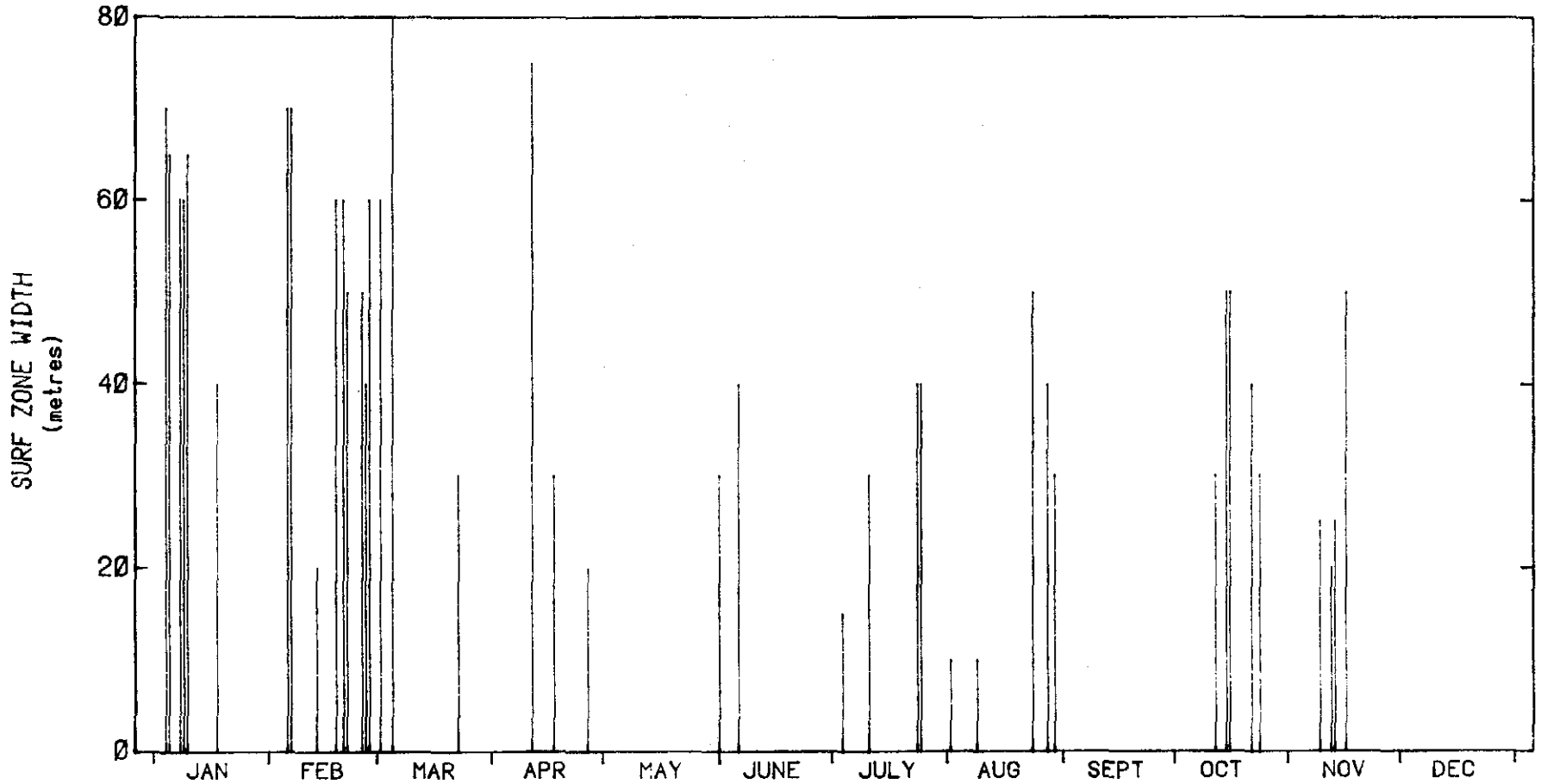
SURF ZONE WIDTH - AFTERNOON 1979

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LIVINGSTONE SHIRE

1604



SURF ZONE WIDTH SUMMARY - 1979

No. of Observations : 41

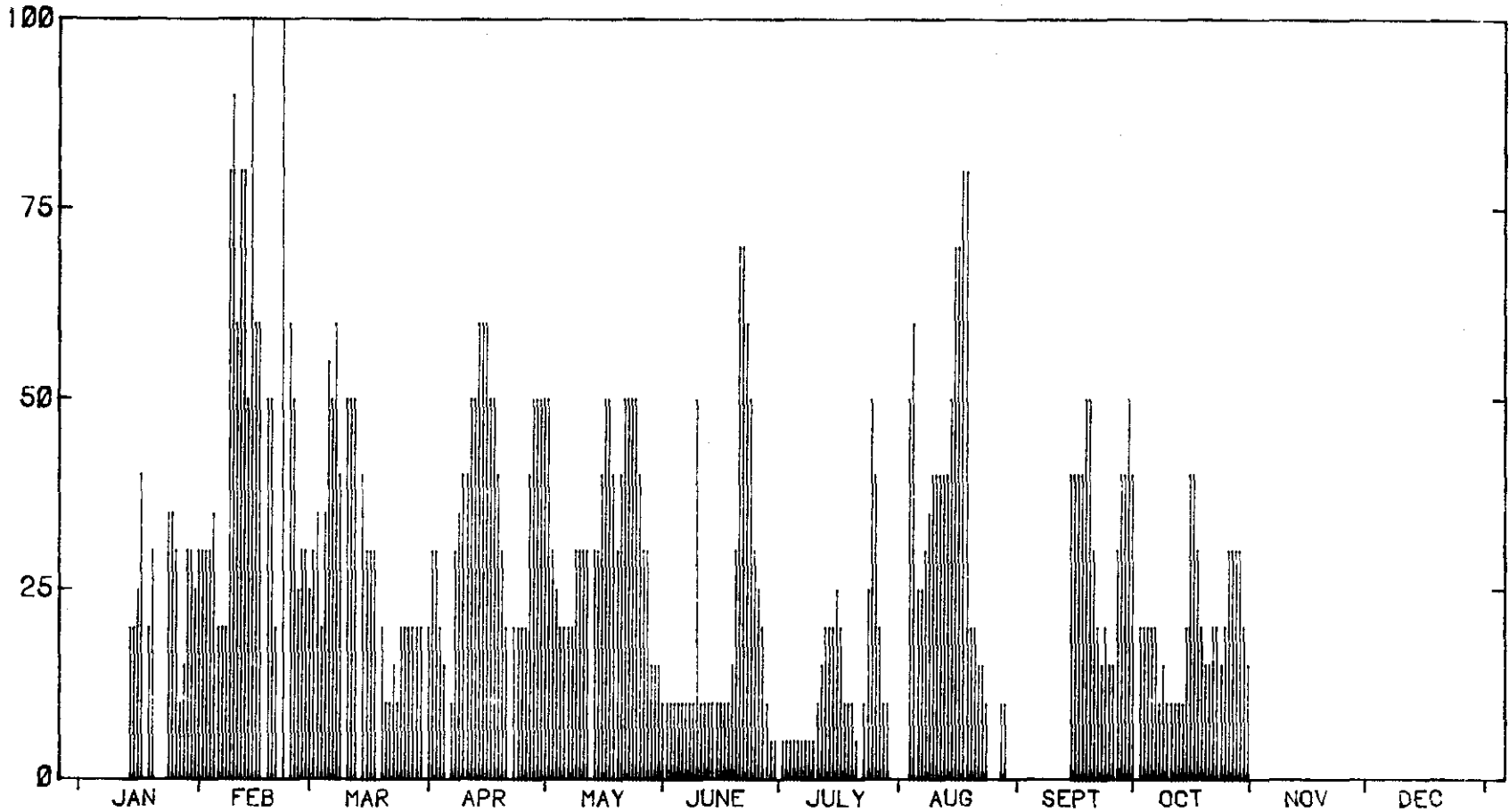
AFTERNOON OBSERVATIONS

Mean Surf Zone Width = 43.7 m

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Figure 11

C 15.1

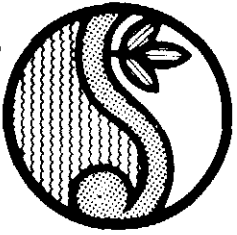


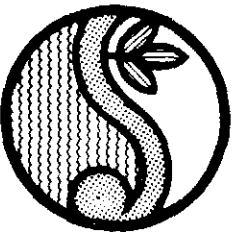
### SURF ZONE WIDTH SUMMARY - 1980

No. of Observations : 253

MORNING OBSERVATIONS

Mean Surf Zone Width = 29.7 m





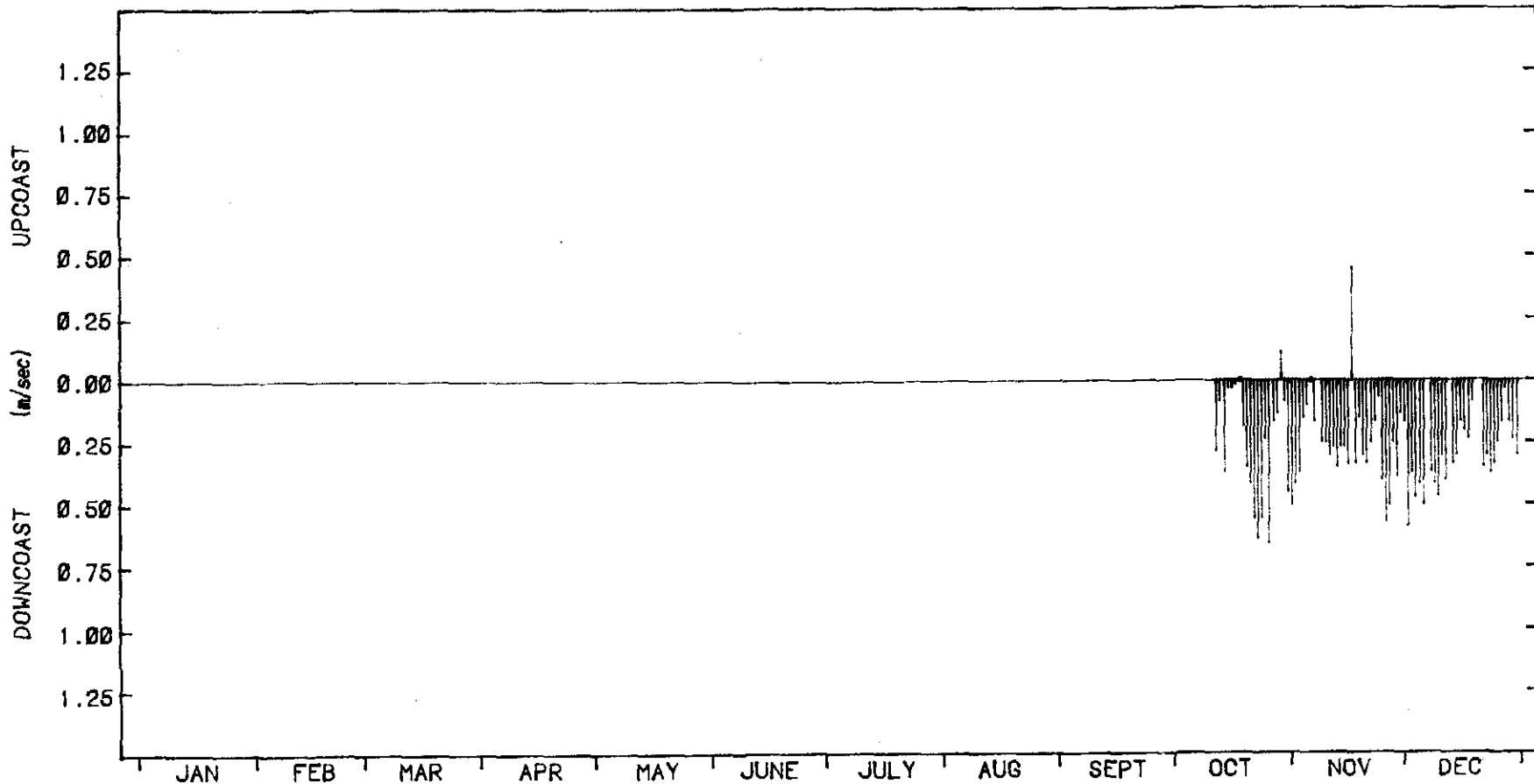
LITTORAL CURRENTS - MORNING 1976

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1604



LITTORAL CURRENT SUMMARY - 1976

Mean Vel = -.273 m/sec (down)

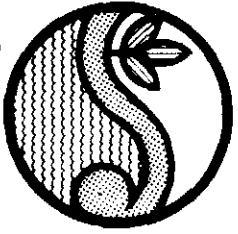
Mean Upcoast Vel = 0.283 m/sec

Mean Downcoast Vel = 0.296 m/sec

MORNING OBSERVATIONS - ( 76 recordings)

Figure 13  
C 15.1

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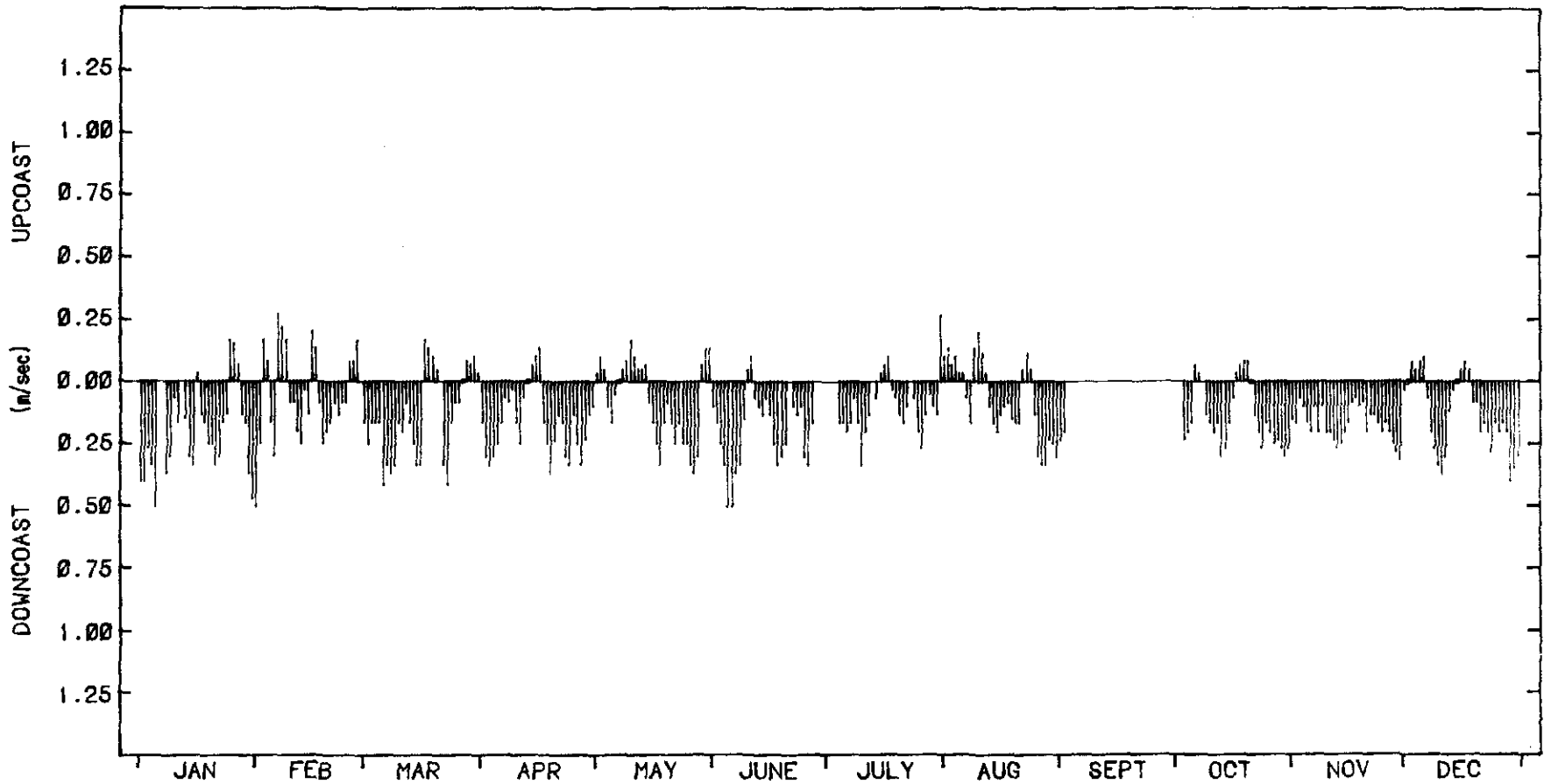
LITTORAL CURRENTS - MORNING 1977

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LITTORAL CURRENT SUMMARY - 1977

Mean Vel = -.134 m/sec (down)

Mean Upcoast Vel = 0.096 m/sec

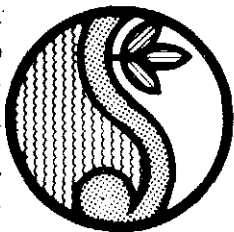
Mean Downcoast Vel = 0.203 m/sec

MORNING OBSERVATIONS - (321 recordings)

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Figure 14

C 15.1



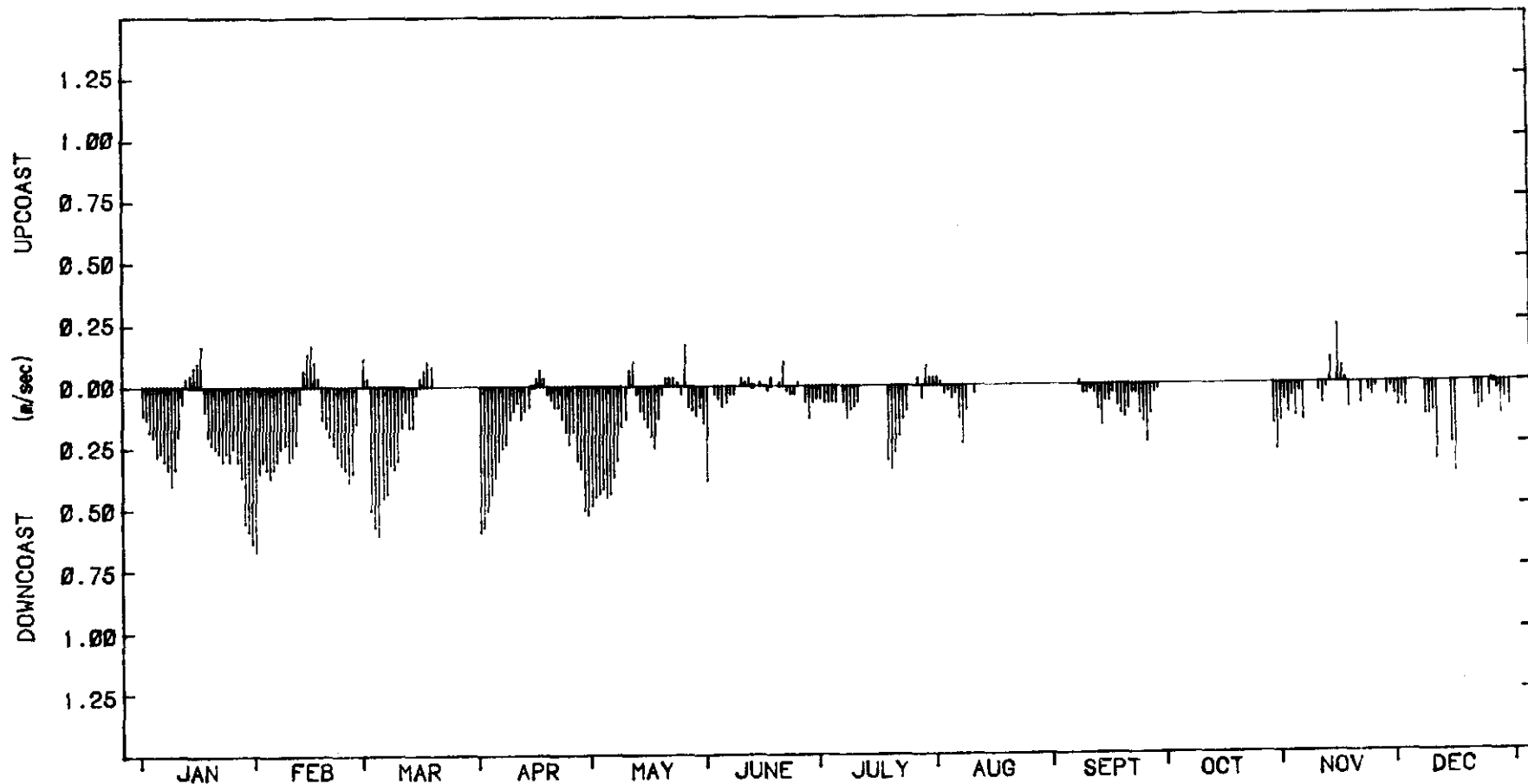
LITTORAL CURRENTS - MORNING 1978

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YEPPOON

1604



LITTORAL CURRENT SUMMARY - 1978

Mean Vel = -.141 m/sec (down)

Mean Upcoast Vel = 0.063 m/sec

Mean Downcoast Vel = 0.188 m/sec

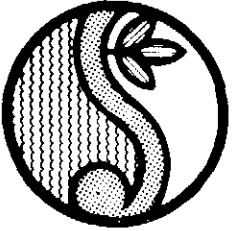
MORNING OBSERVATIONS - (259 recordings)

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Figure 15

C 15.1





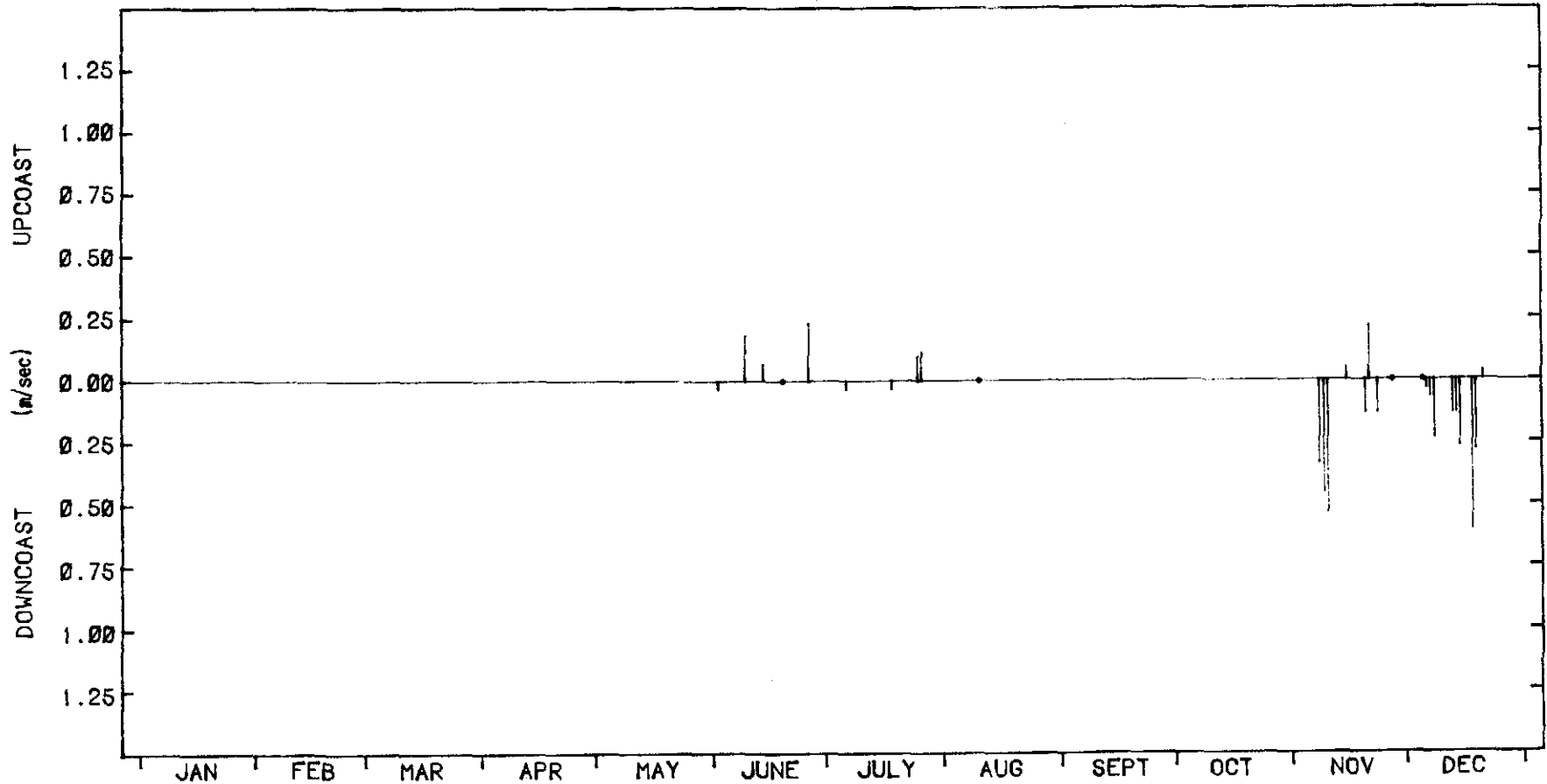
LITTORAL CURRENTS - AFTERNOON 1978

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YEPPOON

1604



LITTORAL CURRENT SUMMARY - 1978

Mean Vel = -.087 m/sec (down)

Mean Upcoast Vel = 0.125 m/sec

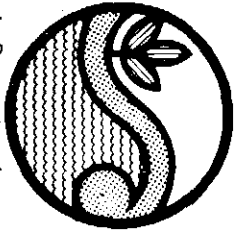
Mean Downcoast Vel = 0.215 m/sec

AFTERNOON OBSERVATIONS - ( 28 recordings)

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Figure 16

C 15.1



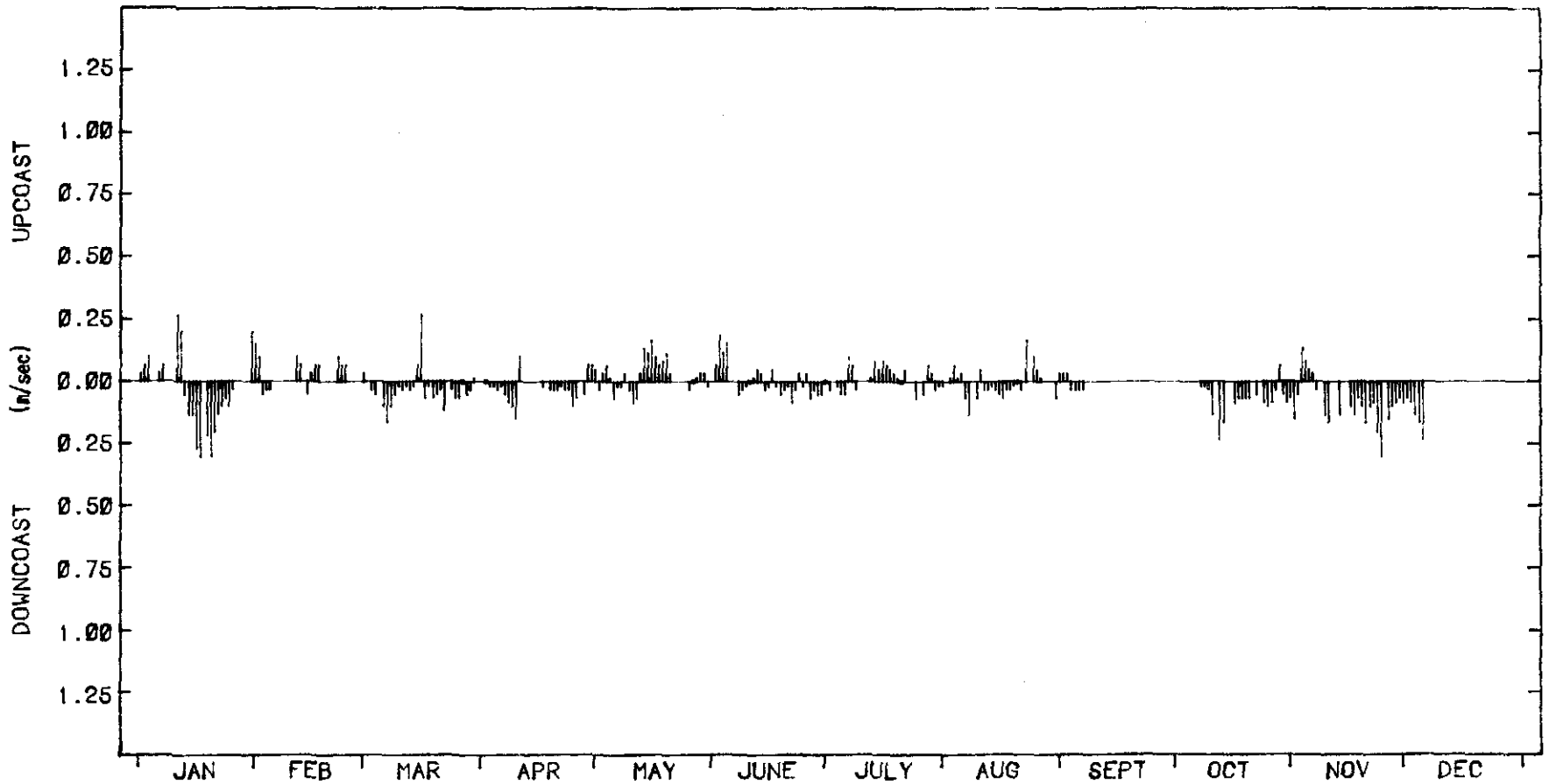
LITTORAL CURRENTS - MORNING 1979

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1604



LITTORAL CURRENT SUMMARY - 1979

Mean Vel = -0.021 m/sec (down)

Mean Upcoast Vel = 0.073 m/sec

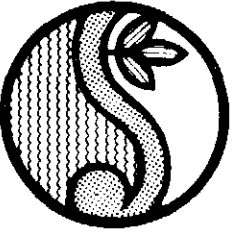
Mean Downcoast Vel = 0.072 m/sec

MORNING OBSERVATIONS - (243 recordings)

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Figure 17

C 15.1



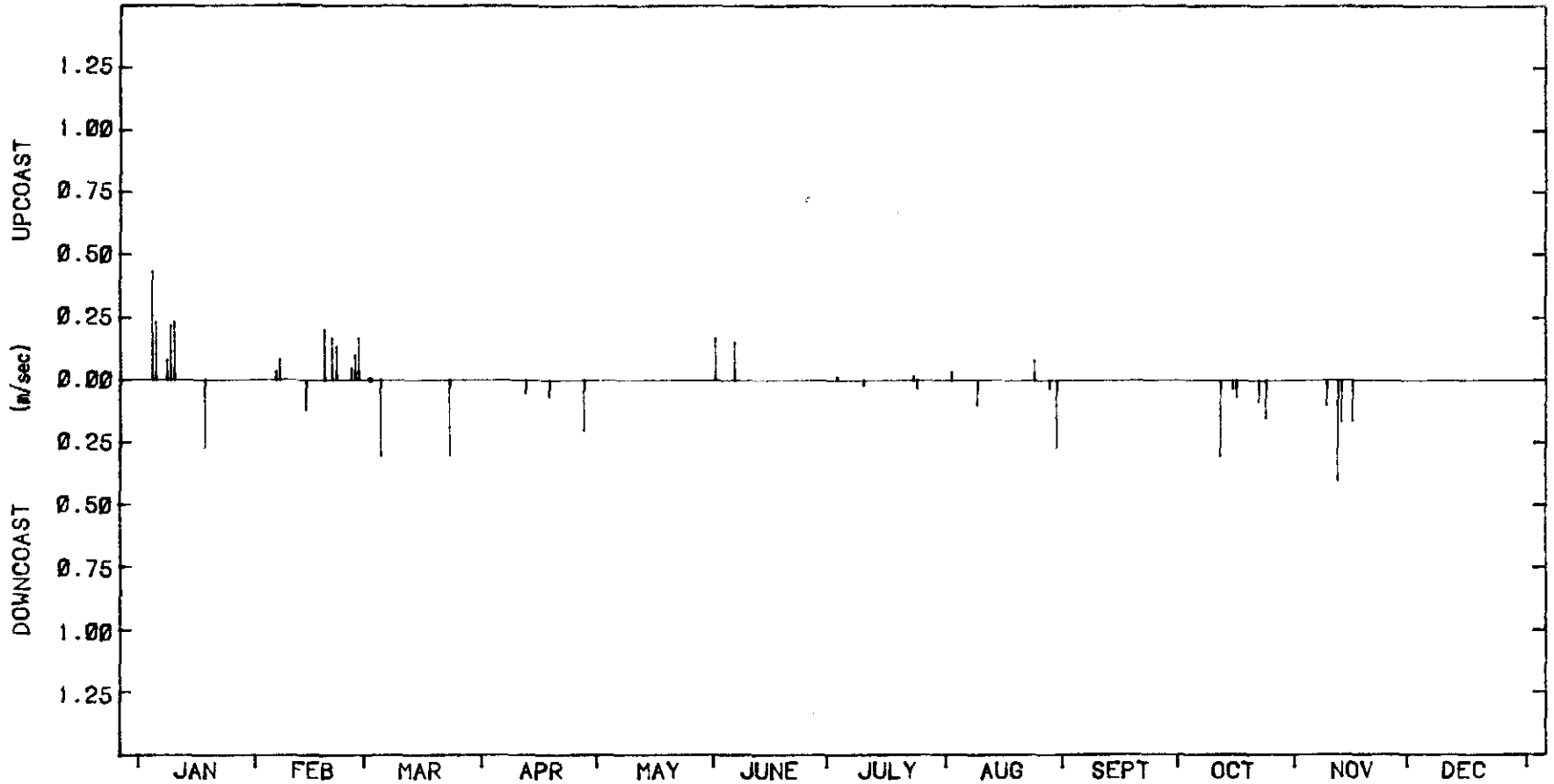
LITTORAL CURRENTS - AFTERNOON 1979

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1604



LITTORAL CURRENT SUMMARY - 1979

Mean Vel = -.015 m/sec (down)

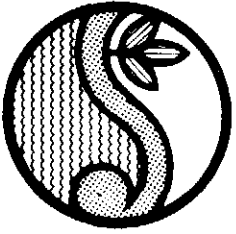
Mean Upcoast Vel = 0.137 m/sec

Mean Downcoast Vel = 0.153 m/sec

AFTERNOON OBSERVATIONS - ( 41 recordings)

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Yepoon

Figure 18  
C 15.1



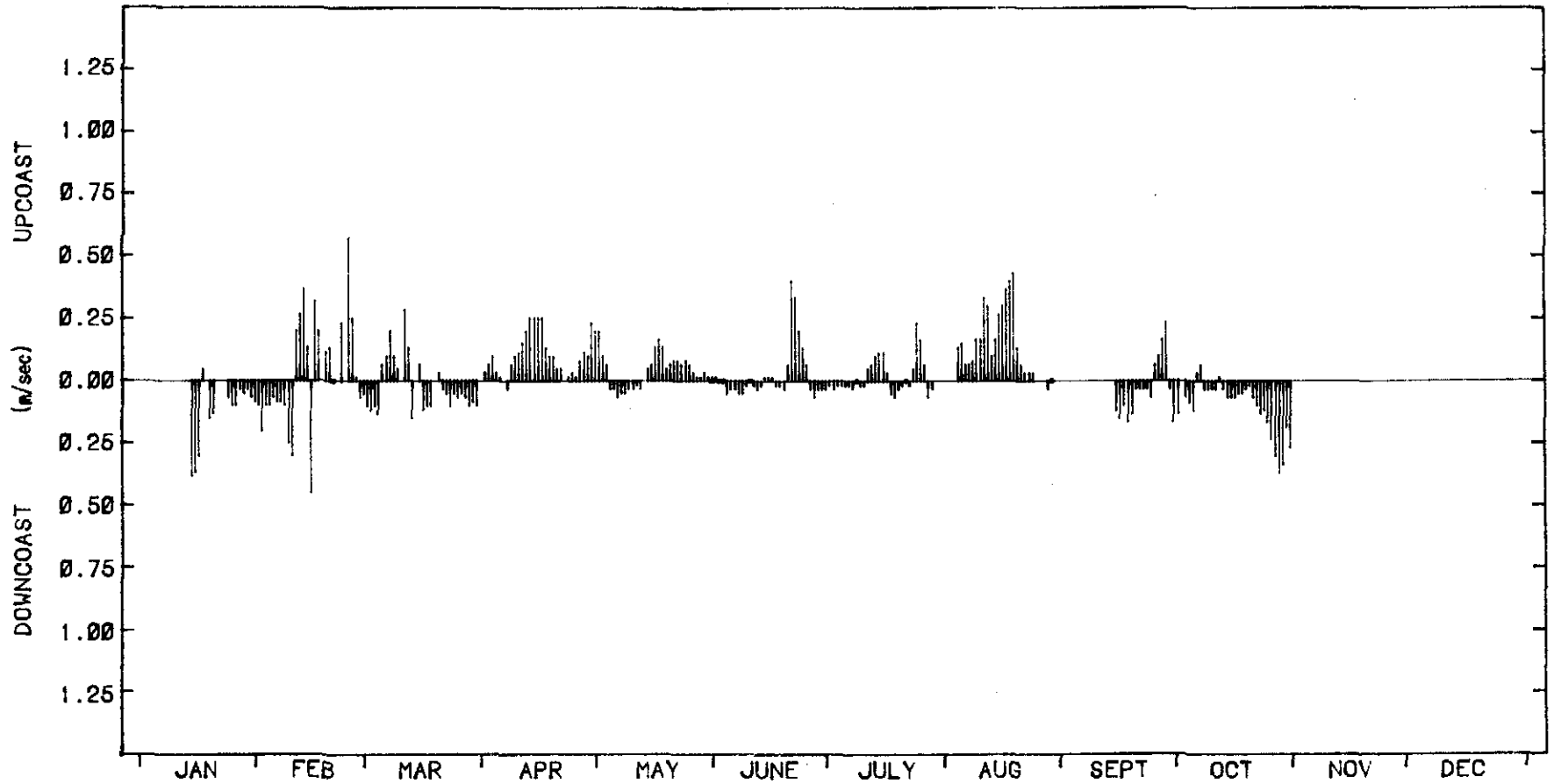
LITTORAL CURRENTS - MORNING 1980

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YEPPOON

1604



LITTORAL CURRENT SUMMARY - 1980

Mean Vel = 0.016 m/sec (up)

Mean Upcoast Vel = 0.130 m/sec

Mean Downcoast Vel = 0.088 m/sec

MORNING OBSERVATIONS - (253 recordings)

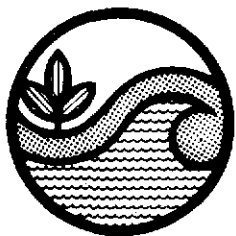
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Figure 19

C 15.1

Values of distances to fixed contour  
and foreshore slope angles were not measured.



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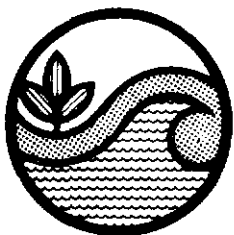
## BEACH PROFILE PARAMETERS - 1976

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**Figure 20**

C 15.1

Values of distances to fixed contour  
and foreshore slope angles were not measured.



Beach Protection Authority

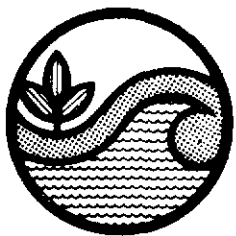
## BEACH PROFILE PARAMETRES - 1977

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**Figure 21**

C 15.1

Values of distances to fixed contour  
and foreshore slope angles were not measured.



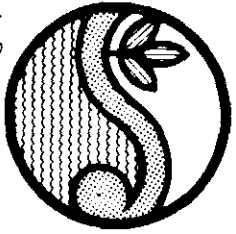
Beach Protection Authority

## BEACH PROFILE PARAMETRES - 1978

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**Figure 22**

C 15.1



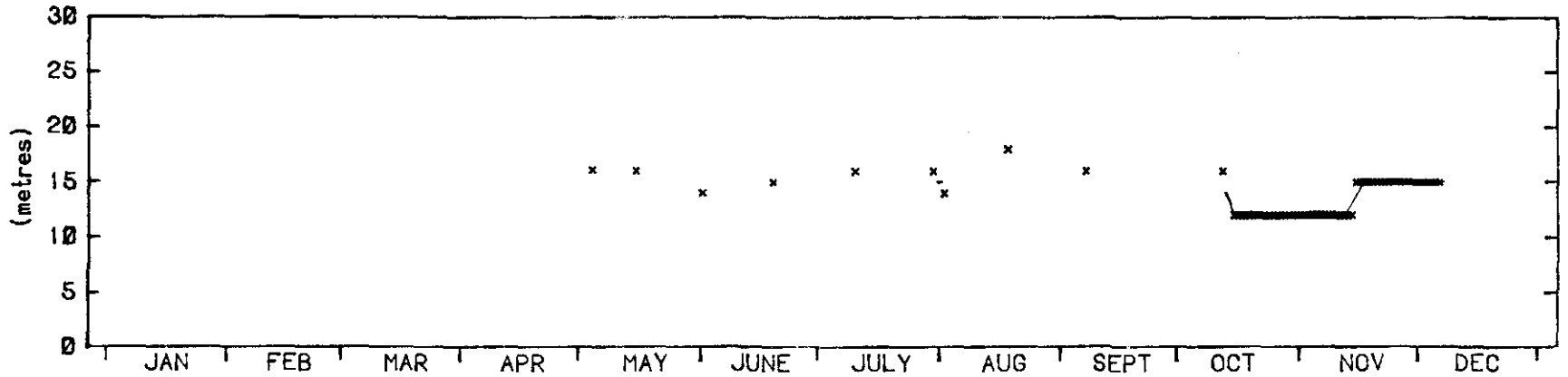
BEACH PROFILE PARAMETERS - 1979

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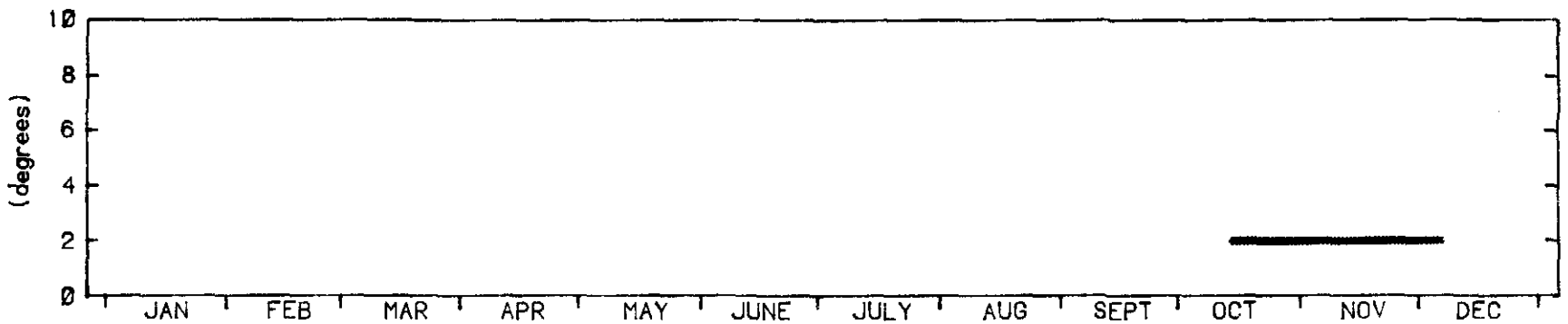
YEPPOON

1984



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1979

Indicates Distance to Fixed Contour : 63 Observations Fixed Contour Level is approx .7 m above A.H.D.



FORESHORE SLOPE - 1979

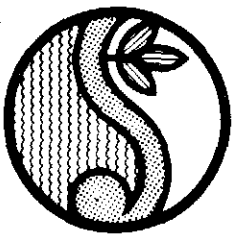
Five Day Moving Average

No. of Observations : 53

Figure 23  
C 15.1

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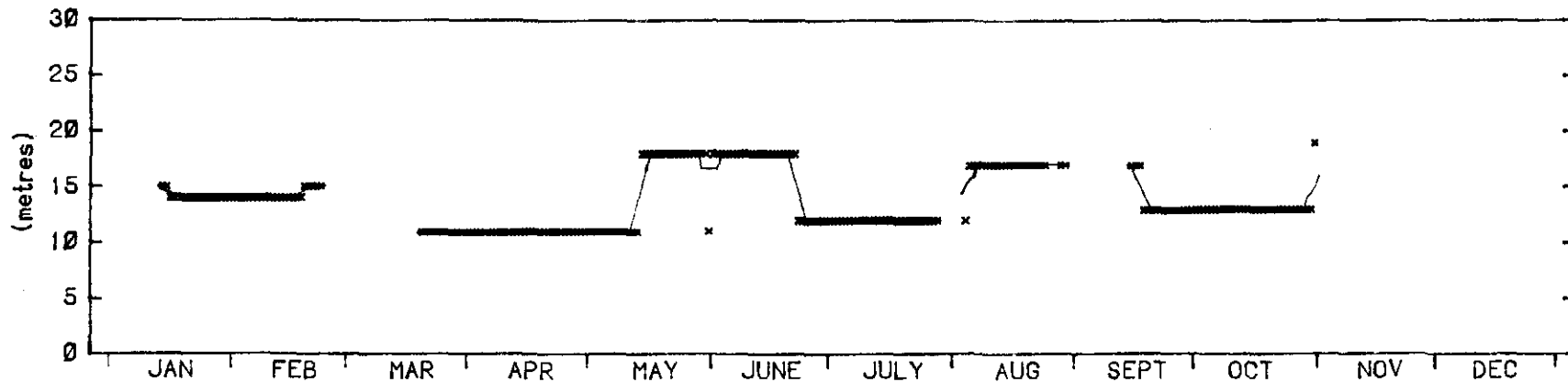
COPE - Coastal Observation  
Programme Engineering

LIVINGSTONE SHIRE

YEPPOON

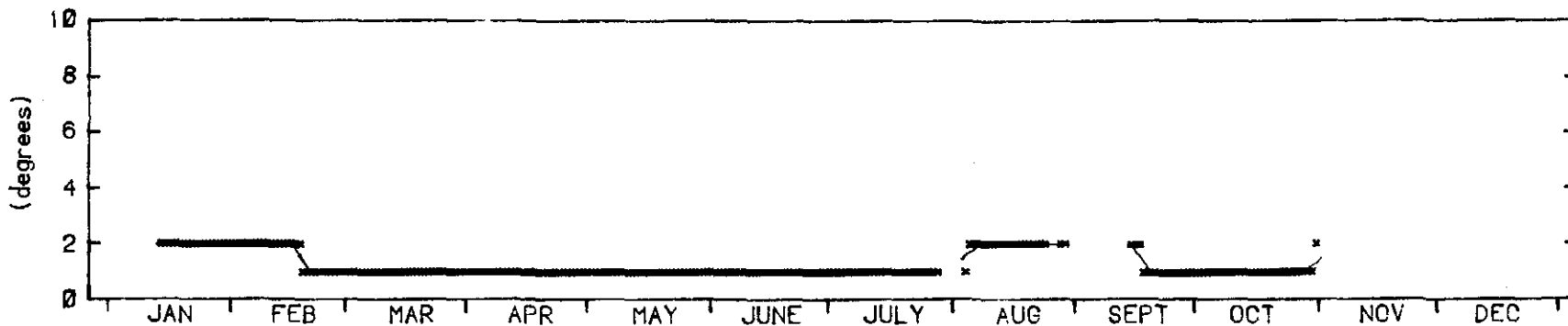
1984

BEACH PROFILE PARAMETERS - 1980



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1980

— Indicates Distance to Fixed Contour : 240 Observations Fixed Contour Level is approx .7 m above A.H.D.



FORESHORE SLOPE - 1980

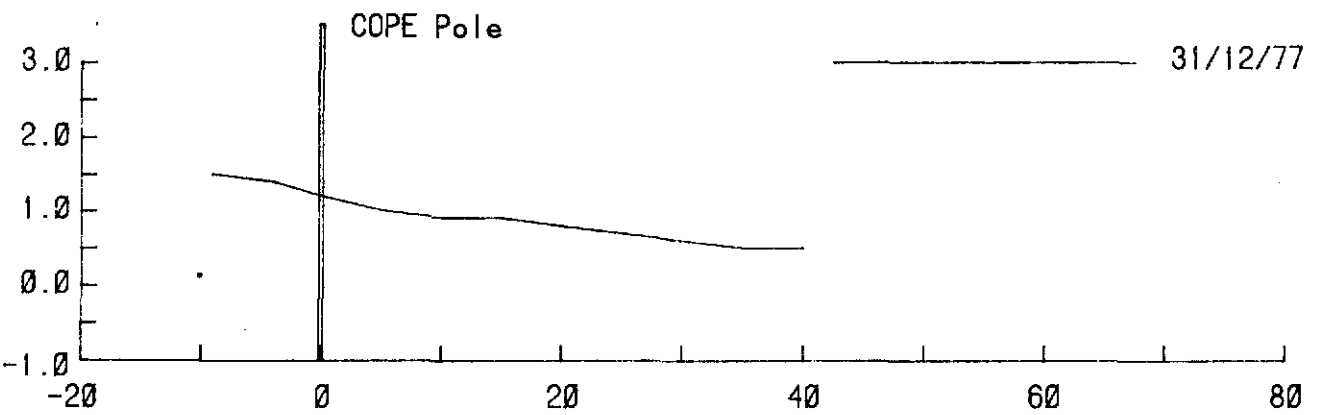
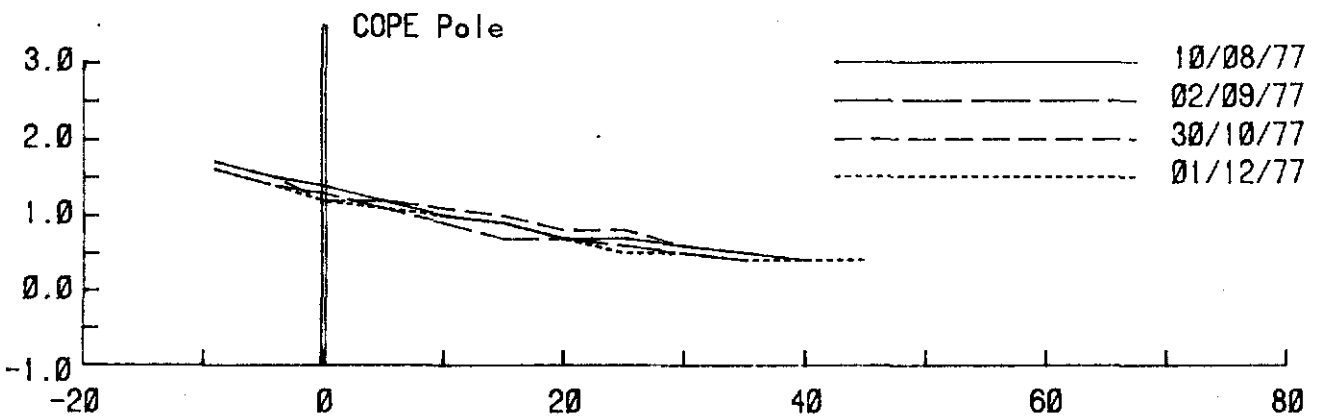
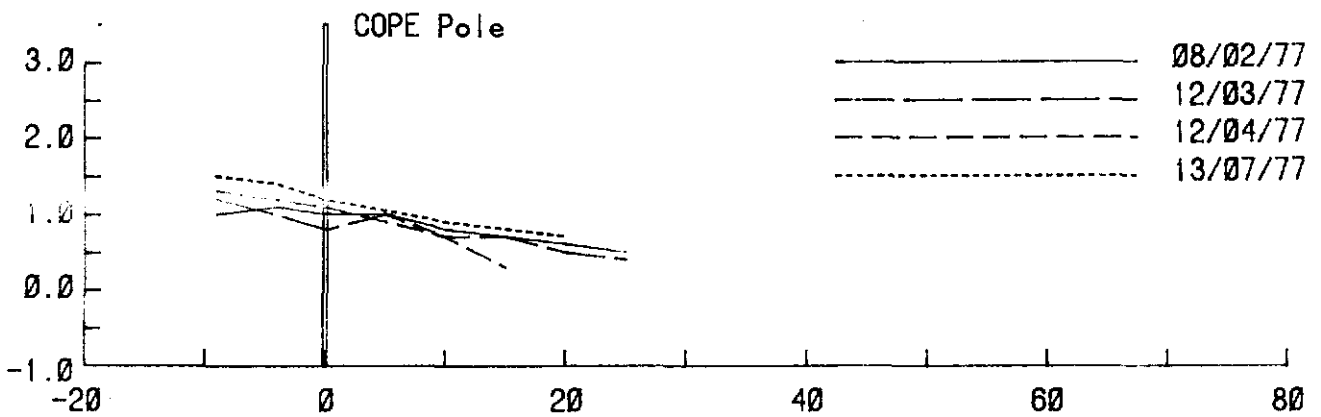
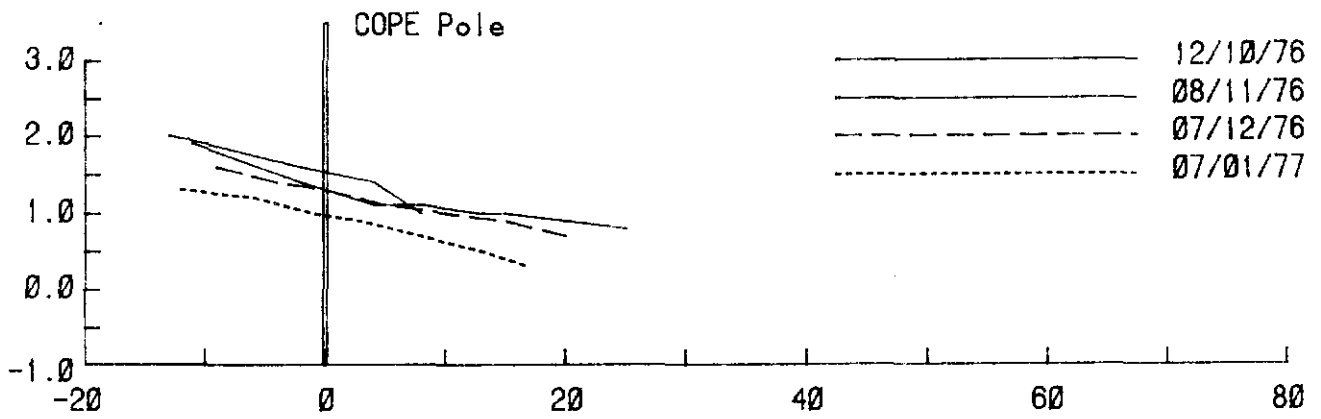
— Five Day Moving Average

No. of Observations : 264

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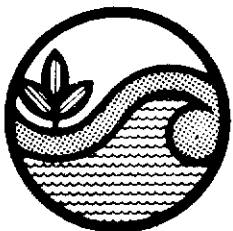
Figure 24

C 15.1



Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority

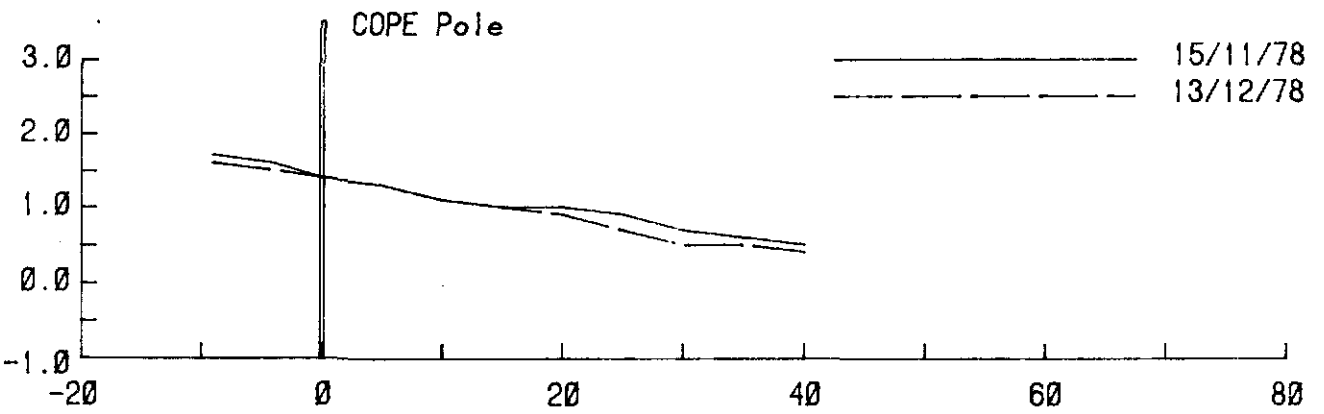
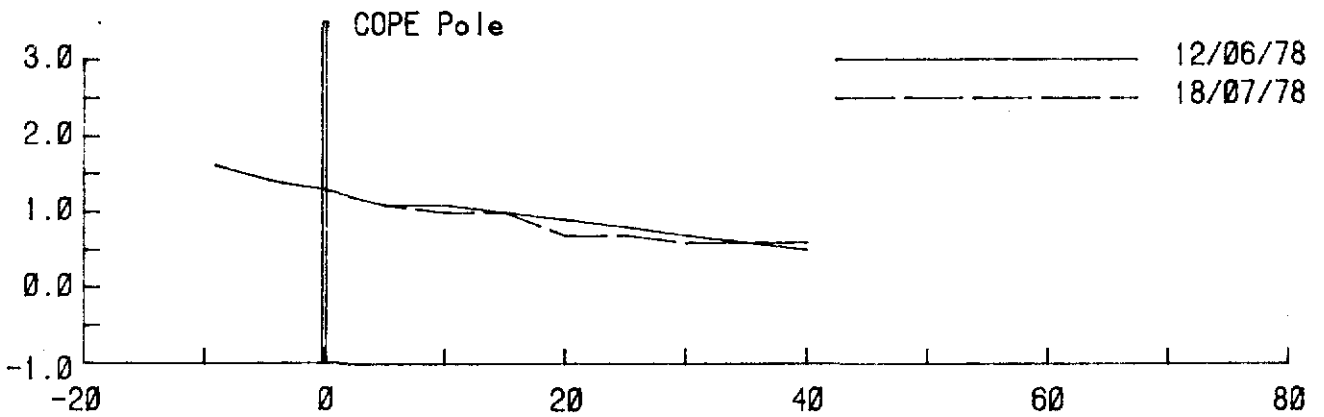
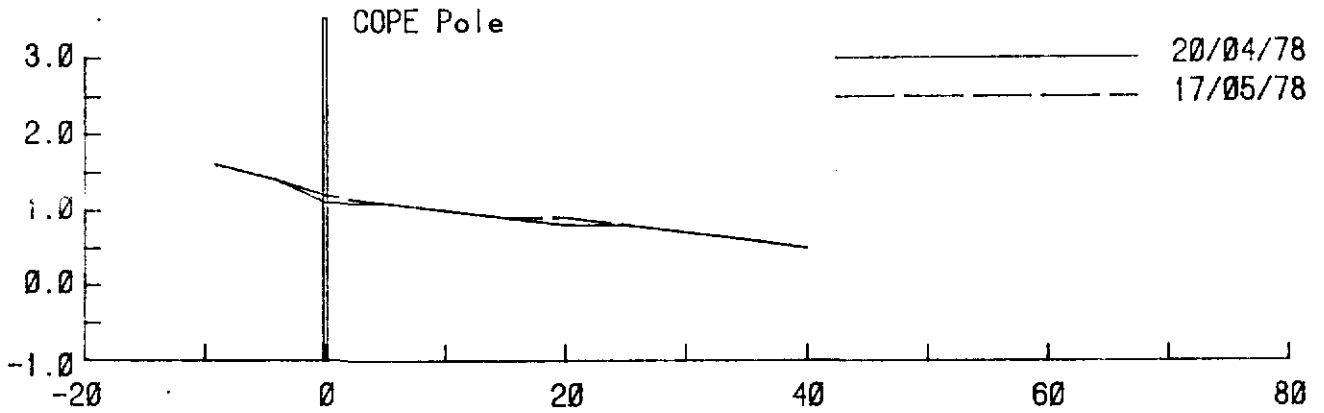
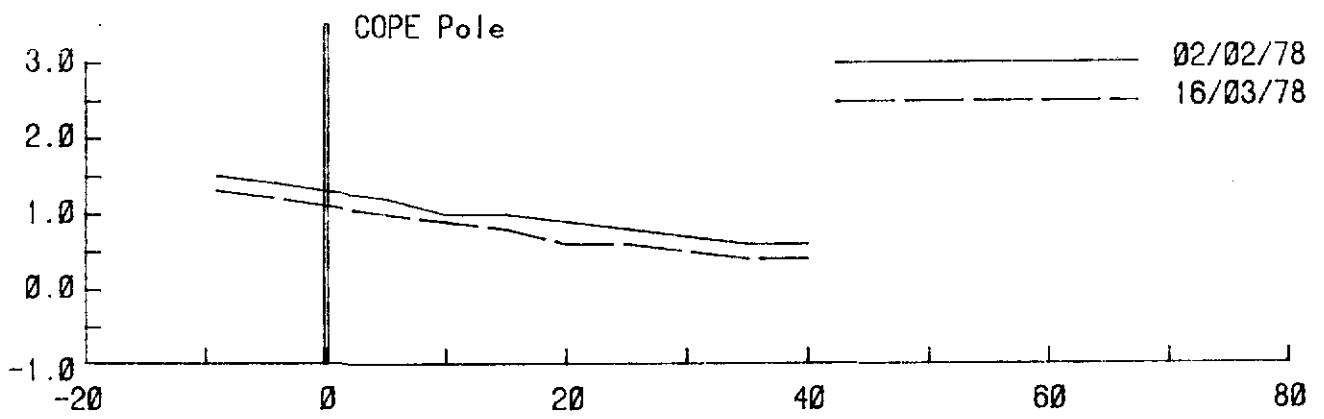
MONTHLY BEACH PROFILES

1976-1977

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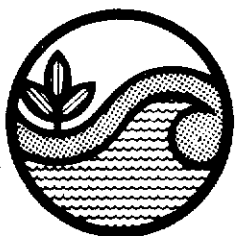
Figure 25

C 15.1



Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority

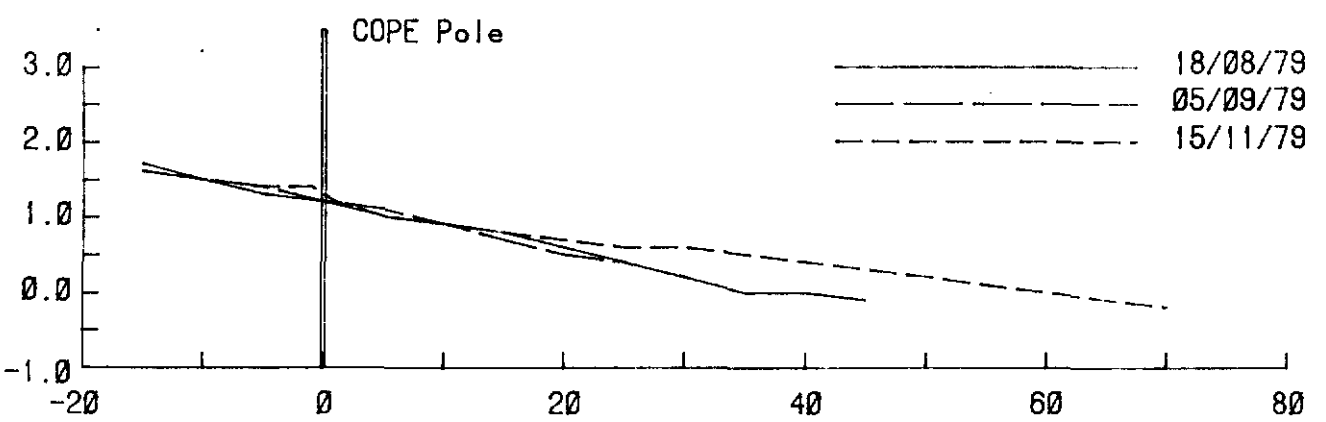
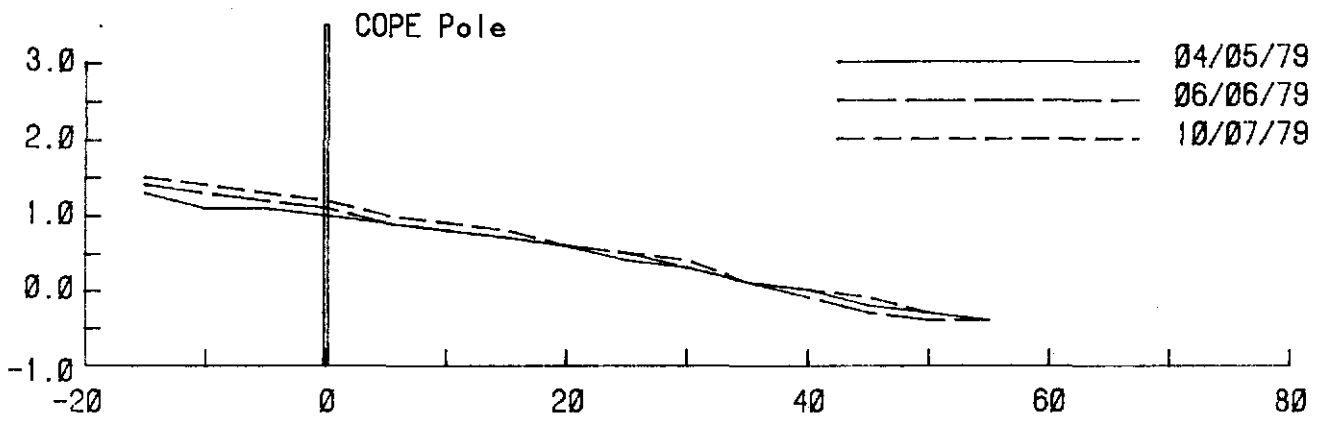
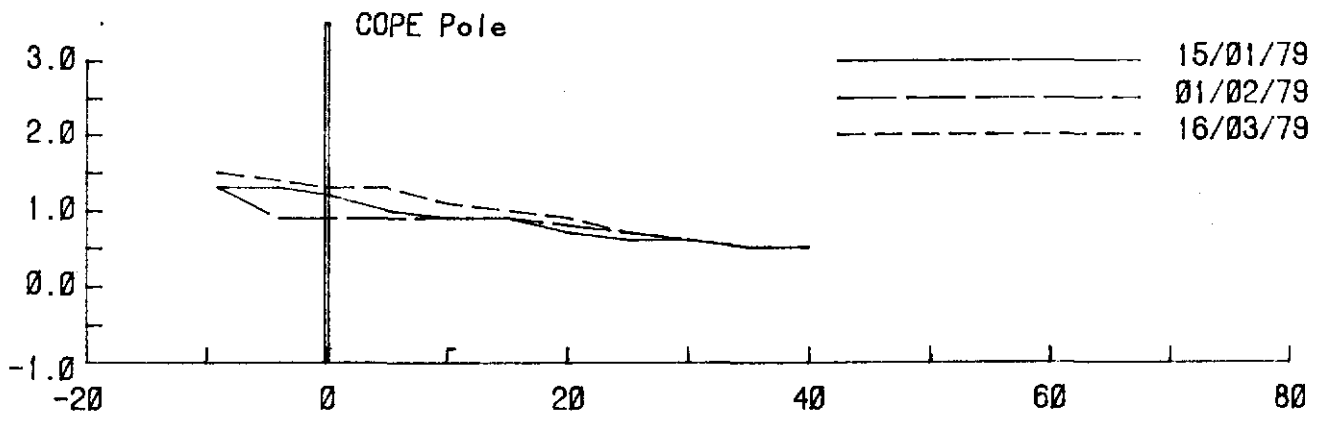
MONTHLY BEACH PROFILES

1978

COPE  
Yeppoon

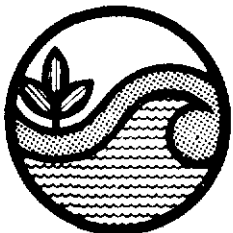
Figure 26

C 15.1



Level Datum is A.H.D.

Distances and Levels are measured in Metres



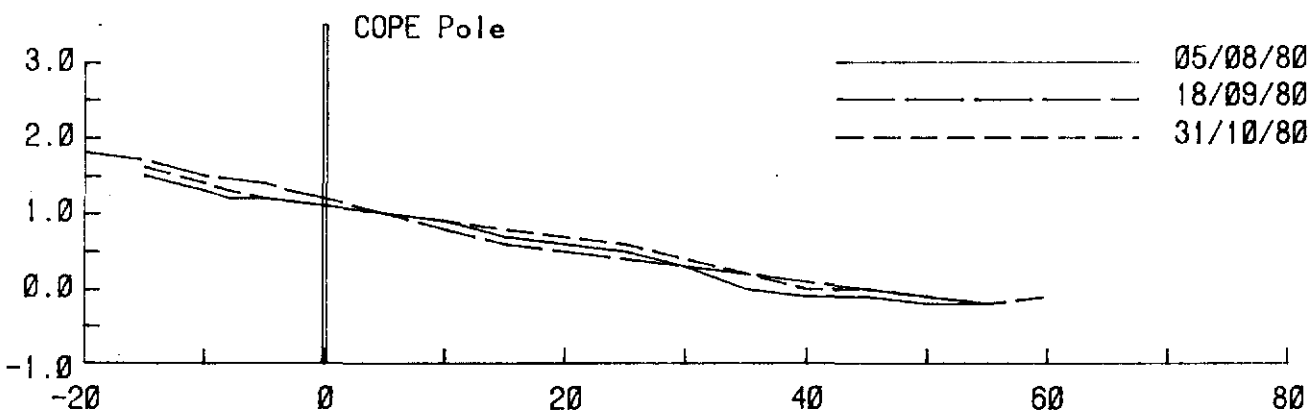
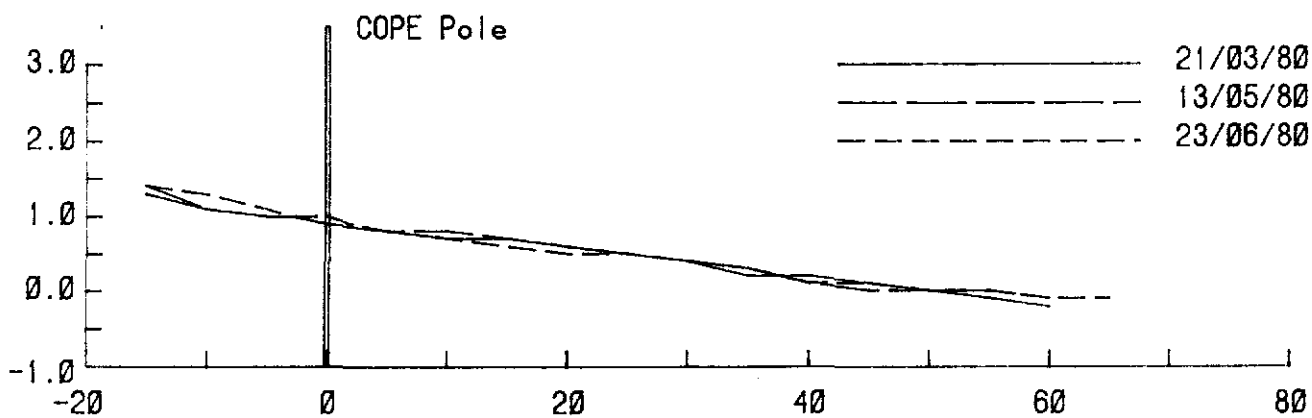
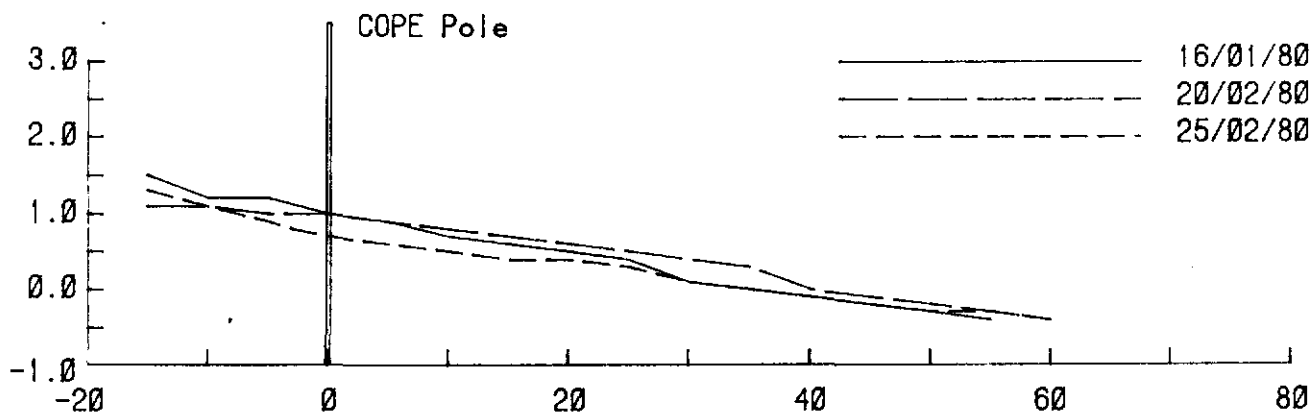
Beach Protection Authority

MONTHLY BEACH PROFILES

1979

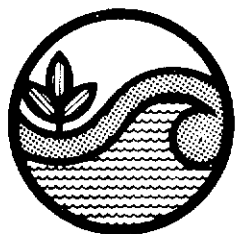
COPE  
Yeppoon

Figure 27  
C 15.1



Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority

MONTHLY BEACH PROFILES

1980

COPE  
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Figure 28  
C 15.1