COASTAL OBSERVATION PROGRAMME - ENGINEERING (COPE)

CURRIGEE - CITY OF GOLD COAST

FOR THE YEARS 1972 TO 1984

REPORT NO. C18.1

Beach Protection Authority

October 1985

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ABSTRACT:-

This report provides a summary of primary analyses of COPE data on wind, wave and beach processes observed at Currigee on South Stradbroke Island, within the City of Gold Coast, in south-east Queensland. The data has been recorded by Beach Protection Authority employees supervised by officer in charge, Mr B. Mason, during the period July 1972 to July 1984. The recordings were made daily during the twelve year period and the information published is considered representative of the long term conditions.

OTHERS AVAILABLE IN THIS SERIES:-

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Coastal Observation Programme - Engineering (COPE), Urangan - Town of Hervey Bay, (Report C12.1).

Coastal Observation Programme - Engineering (COPE), Noosa Beach - Noosa Shire, (Report C13.1).

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Coastal Observation Programme - Engineering (COPE), Bargara - Woongarra Shire, (Report C16.1).

Coastal Observation Programme - Engineering (COPE), Barwell Creek - Livingstone Shire, (Report C17.1).

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Queensland Volunteer Coastal Observation Programme - Engineering (COPE). 3rd Australian Conference on Coastal and Ocean Engineering, Melbourne, April 1977.

2. PATTERSON, D.C. AND BLAIR, R.J.

Visually Determined Wave Parameters - 6th Australian Conference on Coastal and Ocean Engineering, Gold Coast, July 1983.

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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
- 2.0 metre Measuring Stick
- 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 operated 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 twelve year period July 1972 to July 1984 in a useful statistical form. No attempt has been made to interpret the observed data.

If this twelve year period is representative of the long term average meteorological conditions, then the statistics presented on wind, wave and beach movements can be regarded as typical. However, this twelve year period may be considered 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

Currigee is located on the eastern side of South Stradbroke Island in south-east Queensland. It is situated approximately 12 kilometres north of Surfers Paradise and lies within the City of Gold Coast. It forms part of the coastline between Jumpinpin and the Nerang River Entrance. The location of the Currigee COPE Station is shown in Figure 1.

2.2 Observers

This station has been operated by Beach Protection Authority employees from the Authority's Sand Dune Research Station which is located on South Stradbroke Island.

2.3 Observed Parameters

The observers at this station usually recorded once daily at 8.30 a.m. during the twelve year recording period July 1972 to July 1984.

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
- Distance to Vegetation Line
- Foreshore Slope
- Longshore Current Speed
- Longshore Current Direction.

In addition a sand sample was collected at the station each month and since October 1973 a beach profile has usually been recorded monthly.

2.4 Tidal Information

Tidal information for this station as presented below is essentially the same as that for Snapper Rocks off Point Danger. Datum is Low Water Datum.

M.H.W.S. 1.40 metres
M.H.W.N. 1.10 metres
M.S.L. 0.77 metres
M.L.W.N. 0.40 metres
M.L.W.S. 0.10 metres.

A.H.D. is 0.867 metres above Low Water Datum

2.5 Description of the Beach

The beach at Currigee has over the twelve year period experienced several severe storms resulting in frequent cycles of erosion and subsequent accretion. It exhibits the following characteristics:

Typical beach slope: Foreshore slope is in the range 1 in 30 to 1 in 7 (2^{o} - 8^{o}).

- Beach width: Typically 15 to 60 metres measured from the seaward edge of the foredune to low water mark.

- D50 sand size: 0.27 mm averaged over twelve years.

- Adjoining Landform: The dune system at Currigee includes a foredune, secondary dune and hind-dune. The beach has undergone several cycles of erosion and accretion during the twelve year recording period. Erosion scarps due to severe storm wave damage are evident in the foredune and secondary dune.

- Vegetation: The Authority's Sand Dune Research Station has conducted many field trials at Currigee which has resulted in an abundance of dune stabilizing vegetation. The foredune supports well established sand spinifex grass (Spinifex sericeus) and goats foot convolvulus (Ipomoea pes-caprae). The secondary dune and hine-dunes support a woodland of horsetail she-oak (Casuarina equisetifolia var. incana) and Acacia species.

2.6 Supervision of Station

The observers were instructed in the recording programme 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 staff at the Sand Dune Research Station and the Gold Coast City Council. The Authority would like to thank the staff of the Sand Dune Research Station and the Council for their assistance in all matters associated with the COPE project.

3.0 DATA

3.1 General

COPE data for this station for the twelve year period July 1972 to July 1984 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 observers 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^{o} to 60^{o}
Sector 2	-	61^{o} to 85^{o}
Sector 3	-	86^{o} to 95^{o}
Sector 4	-	96^{o} to 120^{o}
Sector 5	-	121^{o} to 180^{o}

Note: 0^{o} is the beach alignment to the left of the observer when facing seaward, and at the COPE station this direction is approximately 10^{o} east of true north.

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 18.

(d) tabulation of the occurrence of various wave heights, periods, types and directions (Tables 1 to 13).

3.4 Longshore Currents

The observers 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 19 to Figure 31). 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.

- Distance from reference pole to the vegetation line.

- 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 32 to 57.

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 58 to 63.

TABLE 1

MONTHLY AND ANNUAL

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

Currigee

Year 1972

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - 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	12.8	1.12	25.0	41.7	-	33.3	-	-	-	58.3	41.7	-	-
AUGUST	13.3	1.10	25.8	32.2	6.5	35.5	-	-	-	100.0	-	-	-
SEPTEMBER	10.0	0.96	3.3	3.3	40.0	53.4	-	-	13.3	83.4	3.3	-	-
OCTOBER	10.5	1.31	24.1	-	-	75.9	-	-	20.7	65.5	13.8	-	-
NOVEMBER	9.7	1.18	33.3	3.3	-	63.4	-	-	6.7	53.3	40.0	-	-
DECEMBER	10.3	0.82	61.3	9.7	16.1	12.9	-	-	9.7	74.2	16.1	-	-
WHOLE YEAR	10.9	1.07	29.4	12.3	11.7	46.6	0.0	0.0	9.2	74.2	16.6	0.0	0.0

SP - Spilling
PL - Plunging
SP/PL - Combined Spilling and Plunging

TABLE 10

MONTHLY AND ANNUAL

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

Currigee **Year 1981**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	8.9	1.67	5.0	5.0	-	90.0	-	-	5.0	95.0	-	-	-
FEBRUARY	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	8.5	1.13	4.5	4.5	-	91.0	-	-	4.5	95.5	-	-	-
APRIL	9.7	1.28	-	-	-	100.0	-	-	6.7	93.3	-	-	-
MAY	10.4	1.61	-	-	-	100.0	-	-	25.0	25.0	50.0	-	-
JUNE	9.0	1.39	-	5.0	-	95.0	-	-	42.9	7.1	50.0	-	-
JULY	9.0	1.26	-	-	-	100.0	-	-	38.9	11.1	50.0	-	-
AUGUST	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPTEMBER	9.6	1.09	-	-	-	100.0	-	-	40.0	-	60.0	-	-
OCTOBER	8.8	1.00	-	-	-	100.0	-	-	50.0	40.0	10.0	-	-
NOVEMBER	9.8	1.36	-	-	-	100.0	-	-	57.1	14.3	28.6	-	-
DECEMBER	9.6	1.26	9.5	-	-	90.5	-	-	28.6	14.3	57.1	-	-
WHOLE YEAR	9.3	1.30	1.9	1.4	0.0	96.7	0.0	0.0	25.2	50.4	24.4	0.0	0.0

SP - Spilling
PL - Plunging
SP/PL - Combined Spilling and Plunging

TABLE 11

MONTHLY AND ANNUAL

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

Currigee **Year 1982**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence – Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	9.4	1.83	-	-	-	100.0	-	-	50.0	-	50.0	-	-
FEBRUARY	9.7	1.54	-	5.3	-	94.7	-	-	33.3	-	66.7	-	-
MARCH	9.1	1.91	9.1	-	-	90.9	-	-	14.3	28.6	57.1	-	-
APRIL	9.7	1.17	11.8	-	-	88.2	-	-	-	-	100.0	-	-
MAY	10.0	1.76	-	-	-	100.0	-	-	-	-	100.0	-	-
JUNE	11.6	1.93	-	-	4.8	95.2	-	-	-	-	100.0	-	-
JULY	10.2	1.55	9.1	-	-	90.9	-	-	-	-	100.0	-	-
AUGUST	9.4	1.61	14.3	-	-	85.7	-	-	-	33.3	66.7	-	-
SEPTEMBER	10.5	1.29	23.8	-	-	76.2	-	-	9.1	-	90.9	-	-
OCTOBER	8.8	1.14	9.5	-	-	90.5	-	-	27.3	-	72.7	-	-
NOVEMBER	8.2	1.24	13.6	13.6	-	72.7	-	-	66.6	16.7	16.7	-	-
DECEMBER	9.4	0.94	-	-	-	100.0	-	-	71.4	14.3	14.3	-	-
WHOLE YEAR	9.7	1.49	7.7	1.6	0.4	90.3	0.0	0.0	24.2	7.6	68.2	0.0	0.0

SP - Spilling
PL - Plunging
SP/PL - Combined Spilling and Plunging

TABLE 12

MONTHLY AND ANNUAL

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

Currigee **Year 1983**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	9.3	1.29	15.8	-	-	84.2	-	-	-	-	100.0	-	-
FEBRUARY	8.7	1.28	5.0	-	-	95.0	-	-	-	16.7	83.3	-	-
MARCH	9.1	1.59	13.0	-	-	87.0	-	-	10.0	10.0	80.0	-	-
APRIL	7.7	1.23	16.7	-	-	83.3	-	-	22.2	-	77.8	-	-
MAY	7.7	0.77	-	-	-	100.0	-	-	21.4	14.3	64.3	-	-
JUNE	8.0	1.39	5.0	-	-	95.0	-	-	-	-	100.0	-	-
JULY	9.0	0.90	-	-	-	100.0	-	-	-	22.2	77.8	-	-
AUGUST	8.8	0.83	-	-	-	100.0	-	-	25.0	25.0	50.0	-	-
SEPTEMBER	7.7	0.80	-	-	-	100.0	-	-	46.2	-	53.8	-	-
OCTOBER	7.1	0.94	-	-	-	100.0	-	-	22.2	33.4	44.4	-	-
NOVEMBER	5.8	1.07	-	-	-	100.0	-	-	69.2	15.4	15.4	-	-
DECEMBER	7.0	1.06	-	-	10.0	90.0	-	-	33.3	-	66.7	-	-
WHOLE YEAR	8.0	1.10	4.5	0.0	0.8	94.7	0.0	0.0	25.2	10.8	64.0	0.0	0.0

SP - Spilling
PL - Plunging
SP/PL - Combined Spilling and Plunging

TABLE 13

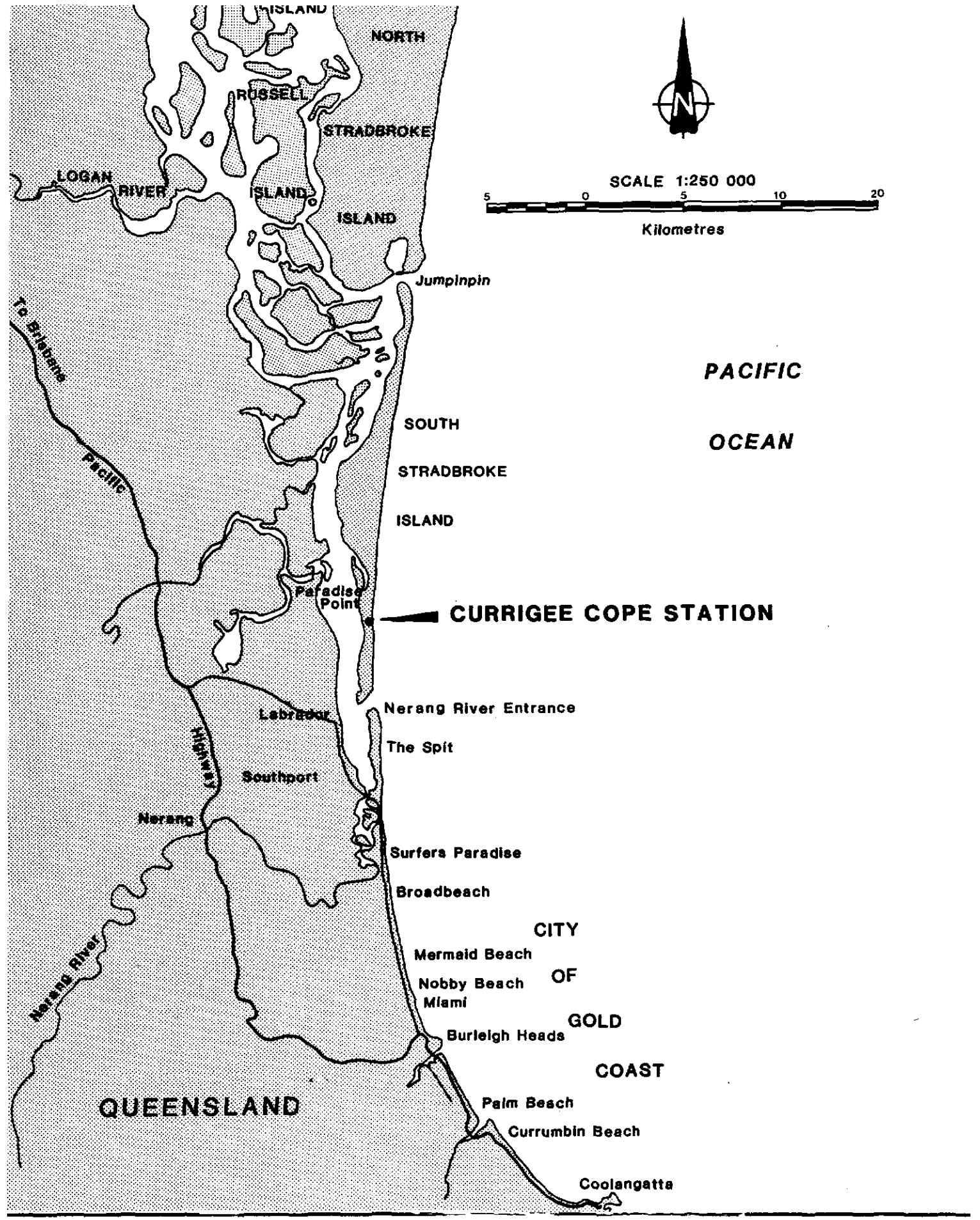
MONTHLY AND ANNUAL

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

Currigee **Year 1984**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	6.9	1.06	-	-	10.0	90.0	-	-	40.0	50.0	10.0	-	-
FEBRUARY	6.7	1.36	9.5	-	-	90.5	-	-	4.8	57.1	38.1	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	7.2	1.50	5.6	-	-	94.4	-	-	-	55.6	44.4	-	-
MAY	7.2	0.98	9.1	-	-	90.9	-	-	4.5	45.5	50.0	-	-
JUNE	6.9	1.02	-	-	-	100.0	-	-	-	50.0	50.0	-	-
JULY	8.2	0.87	9.1	-	-	90.9	-	-	-	59.1	40.9	-	-
AUGUST													
SEPTEMBER													
OCTOBER													
NOVEMBER													
DECEMBER													
WHOLE YEAR	7.2	1.12	5.7	0.0	1.6	92.7	0.0	0.0	8.1	52.9	39.0	0.0	0.0

SP - Spilling
PL - Plunging
SP/PL - Combined Spilling and Plunging



Beach Protection Authority

LOCALITY PLAN

COPE

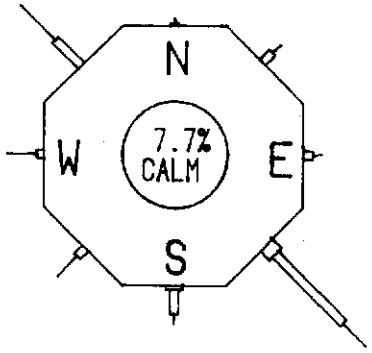
Currigee

Figure 1

C 18.1

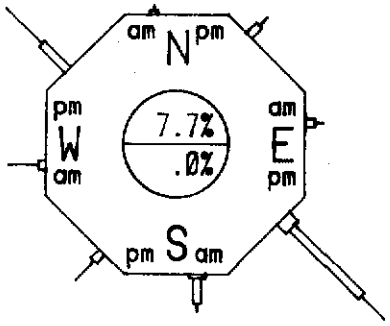
GOLD COAST CITY CURRIGEE 0105

ALL OBSERVATIONS



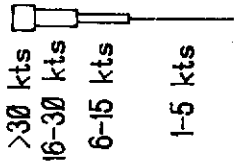
Total No. of Observations : 3148

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 : 3148
No. of Afternoon Observations : 0

Mean Time :- Morning Obs : 0821 hrs
Mean Time :- Afternoon Obs : 0000 hrs

SCALE
0 10 20 30 40 50
Percentage

WIND DATA - JULY 1972 to JULY 1984

Beach Protection Authority

WAVE HEIGHT % EXCEEDANCE

ALL DATA

COPE

Currigee

Figure 3

C 18.1

COPE - COASTAL OBSERVATION PROGRAMME ENGINEERING

Station : Currigee

Recording Period : July '72 to July '84

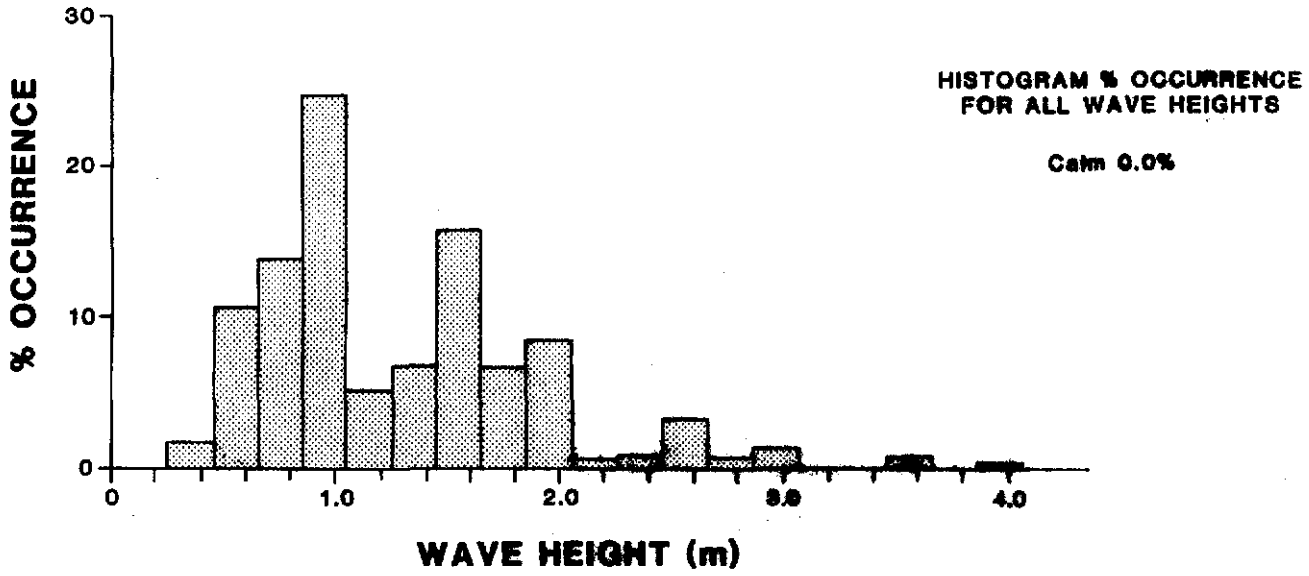
No. of Recordings : 3201

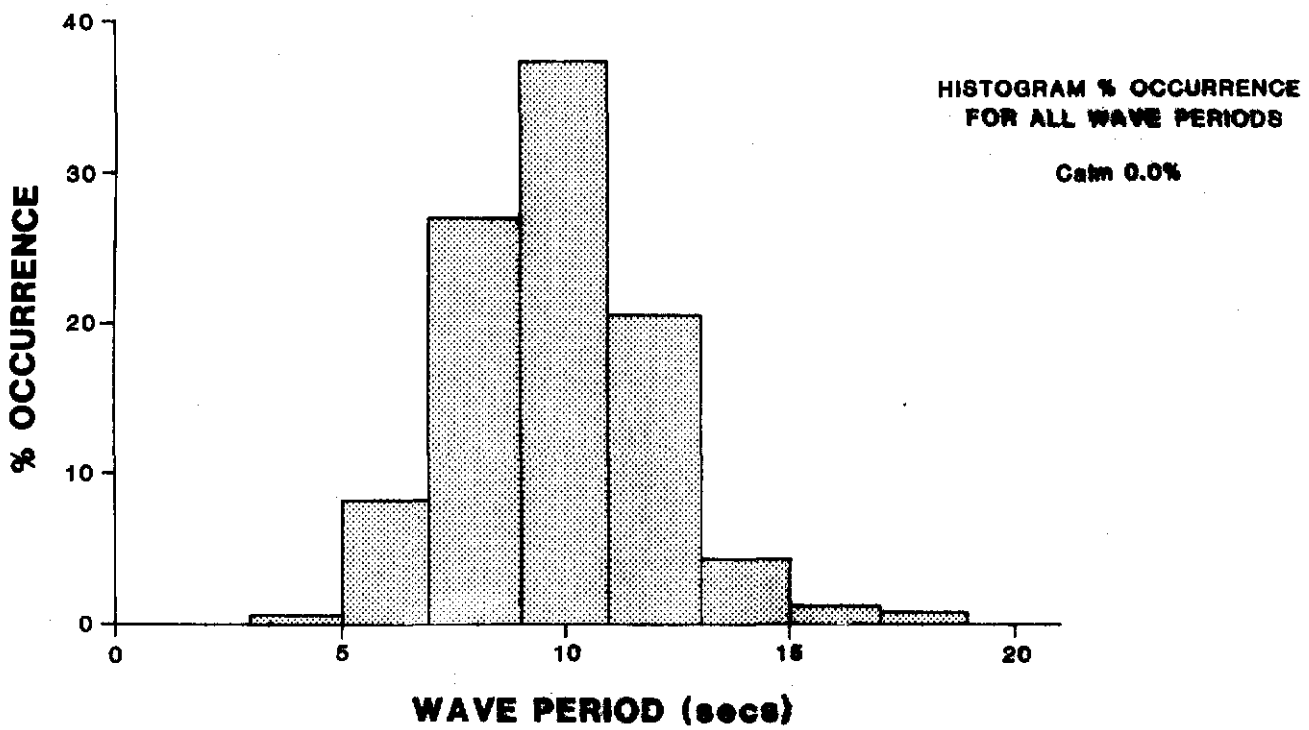
BREAKING WAVE HEIGHT (metres)

10 9 8 7 6 5 4 3.5 3 2.5 2 1.5 1 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1

0.01% 0.05 0.1 0.2 0.5 1 2 5 10 15 20 30 40 50 60 70 80 85 90 95 98 99 99.5 99.8 99.9 99.95 99.99%

PERCENTAGE OF RECORDINGS WHERE A GIVEN BREAKER HEIGHT IS EXCEEDED





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PERCENTAGE OCCURRENCE OF WAVE HEIGHT AND WAVE PERIOD ALL DATA

COPE

Curriqee

Figure 4

C 18.1

TABLE 2

MONTHLY AND ANNUAL

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

Currigee **Year 1973**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	12.0	1.33	67.7	-	-	32.3	-	-	12.9	67.7	12.9	6.5	-
FEBRUARY	10.5	1.72	21.4	17.9	-	60.7	-	-	10.7	71.4	17.9	-	-
MARCH	11.3	1.75	25.8	-	12.9	61.3	-	-	-	77.4	22.6	-	-
APRIL	10.1	1.52	26.7	6.7	-	66.6	-	-	6.7	76.6	16.7	-	-
MAY	10.8	1.36	22.6	-	3.2	74.2	-	-	19.4	54.8	25.8	-	-
JUNE	10.1	1.41	-	-	-	100.0	-	-	-	70.4	29.6	-	-
JULY	8.7	2.13	7.1	-	7.1	85.8	-	-	-	92.9	7.1	-	-
AUGUST	8.4	1.23	32.3	-	-	67.7	-	-	-	77.4	22.6	-	-
SEPTEMBER	9.5	1.30	39.3	7.1	10.7	42.9	-	-	17.8	53.6	28.6	-	-
OCTOBER	9.4	1.52	-	-	19.4	80.6	-	-	22.5	71.0	6.5	-	-
NOVEMBER	9.4	1.33	16.7	-	-	83.3	-	-	10.0	63.3	26.7	-	-
DECEMBER	8.8	1.25	19.4	3.2	-	77.4	-	-	6.5	87.0	6.5	-	-
WHOLE YEAR	9.9	1.48	23.5	2.8	4.5	69.2	0.0	0.0	9.0	72.0	18.5	0.5	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

Currigee **Year 1974**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	8.3	1.82	14.3	-	-	85.7	-	-	14.3	82.1	3.6	-	-
FEBRUARY	9.1	1.41	17.9	32.1	-	50.0	-	-	-	82.1	17.9	-	-
MARCH	8.3	1.87	6.5	-	-	93.5	-	-	6.5	61.2	32.3	-	-
APRIL	9.4	1.28	16.7	-	-	83.3	-	-	-	96.7	3.3	-	-
MAY	9.3	1.41	16.1	-	-	83.9	-	-	-	100.0	-	-	-
JUNE	9.7	1.95	3.3	3.3	-	93.4	-	-	-	93.3	6.7	-	-
JULY	11.0	0.97	29.0	-	-	71.0	-	-	-	80.6	19.4	-	-
AUGUST	10.4	1.51	-	6.5	-	93.5	-	-	6.5	77.4	16.1	-	-
SEPTEMBER	9.9	1.16	23.3	16.7	-	60.0	-	-	-	90.0	10.0	-	-
OCTOBER	9.5	1.02	25.8	-	-	74.2	-	-	3.2	87.1	9.7	-	-
NOVEMBER	8.6	1.53	13.3	3.3	-	83.4	-	-	-	90.0	10.0	-	-
DECEMBER	9.4	1.28	7.7	-	-	92.3	-	-	11.5	57.7	30.8	-	-
WHOLE YEAR	9.4	1.43	14.6	5.0	0.0	80.4	0.0	0.0	3.4	83.4	13.2	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

Currigee **Year 1975**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	8.8	1.21	7.7	-	-	92.3	-	-	11.5	77.0	11.5	-	-
FEBRUARY	9.4	1.90	5.0	-	-	95.0	-	-	5.0	85.0	10.0	-	-
MARCH	9.3	1.76	57.9	-	-	42.1	-	-	26.3	73.7	-	-	-
APRIL	9.4	1.55	33.3	-	-	66.7	-	-	-	100.0	-	-	-
MAY	13.0	1.04	28.6	-	-	71.4	-	-	-	100.0	-	-	-
JUNE	11.3	1.37	4.2	-	-	95.8	-	-	4.2	87.5	8.3	-	-
JULY	12.8	0.96	3.2	-	9.7	87.1	-	-	12.9	77.4	9.7	-	-
AUGUST	13.6	1.20	4.0	-	-	96.0	-	-	4.0	84.0	12.0	-	-
SEPTEMBER	11.3	1.56	10.3	-	-	89.7	-	-	13.8	62.1	24.1	-	-
OCTOBER	10.9	1.23	-	-	-	100.0	-	-	36.7	53.3	10.0	-	-
NOVEMBER	11.7	1.33	-	-	-	100.0	-	-	8.0	84.0	8.0	-	-
DECEMBER	11.2	1.40	-	-	-	100.0	-	-	13.8	65.5	20.7	-	-
WHOLE YEAR	11.0	1.36	10.6	0.0	1.0	88.4	0.0	0.0	12.3	77.1	10.6	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

Currigee **Year 1976**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence – Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	11.1	1.31	–	–	–	100.0	–	–	12.0	84.0	4.0	–	–
FEBRUARY	11.4	1.36	–	–	–	100.0	–	–	18.2	68.2	13.6	–	–
MARCH	11.1	1.51	–	–	–	100.0	–	–	–	65.2	34.8	–	–
APRIL	11.7	1.38	10.5	–	–	89.5	–	–	–	100.0	–	–	–
MAY	12.6	1.56	–	–	–	100.0	–	–	5.0	95.0	–	–	–
JUNE	12.3	1.32	–	–	–	100.0	–	–	9.5	81.0	9.5	–	–
JULY	9.1	1.25	–	–	–	100.0	–	–	4.8	95.2	–	–	–
AUGUST	11.1	0.92	4.8	–	–	95.2	–	–	–	100.0	–	–	–
SEPTEMBER	10.0	1.04	4.8	–	–	95.2	–	–	–	95.2	4.8	–	–
OCTOBER	9.5	0.85	–	–	15.0	85.0	–	–	5.0	95.0	–	–	–
NOVEMBER	8.1	0.72	4.5	–	–	95.5	–	–	–	100.0	–	–	–
DECEMBER	7.2	0.80	9.5	–	4.8	85.7	–	–	9.5	85.7	4.8	–	–
WHOLE YEAR	10.3	1.17	2.7	0.0	1.6	95.7	0.0	0.0	5.5	88.3	6.2	0.0	0.0

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

Currigee **Year 1977**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	8.4	1.31	5.3	-	-	94.7	-	-	5.3	94.7	-	-	-
FEBRUARY	8.5	0.98	10.5	-	-	89.5	-	-	-	100.0	-	-	-
MARCH	8.5	1.38	4.3	-	-	95.7	-	-	-	100.0	-	-	-
APRIL	9.2	1.06	5.6	-	-	94.4	-	-	5.6	94.4	-	-	-
MAY	8.9	1.19	-	-	-	100.0	-	-	-	95.0	5.0	-	-
JUNE	8.8	1.07	-	-	-	100.0	-	-	-	100.0	-	-	-
JULY	8.9	1.07	14.3	-	-	85.7	-	-	-	100.0	-	-	-
AUGUST	8.9	1.22	-	-	-	100.0	-	-	-	100.0	-	-	-
SEPTEMBER	8.8	0.90	18.2	-	-	81.8	-	-	4.5	91.0	4.5	-	-
OCTOBER	7.9	0.66	14.2	-	4.8	81.0	-	-	-	100.0	-	-	-
NOVEMBER	7.8	0.81	22.7	-	-	77.3	-	-	-	95.5	4.5	-	-
DECEMBER	8.1	0.76	30.0	5.0	-	65.0	-	-	-	90.0	10.0	-	-
WHOLE YEAR	8.5	1.03	10.4	0.4	0.4	88.8	0.0	0.0	1.2	96.7	2.1	0.0	0.0

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

Currigee **Year 1978**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence – Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	8.4	0.99	5.0	5.0	-	90.0	-	-	-	100.0	-	-	-
FEBRUARY	8.8	1.29	20.0	5.0	-	75.0	-	-	-	80.0	20.0	-	-
MARCH	10.4	1.52	57.1	-	-	42.9	-	-	-	95.2	4.8	-	-
APRIL	10.0	1.63	44.4	5.6	-	50.0	-	-	5.6	83.3	11.1	-	-
MAY	11.4	1.59	23.8	-	-	76.2	-	-	-	90.5	9.5	-	-
JUNE	11.7	1.14	61.9	-	-	38.1	-	-	28.6	38.1	33.3	-	-
JULY	11.0	1.10	33.3	19.0	4.8	42.9	-	-	19.0	62.0	19.0	-	-
AUGUST	12.4	1.42	12.4	18.8	-	68.8	-	-	12.5	50.0	37.5	-	-
SEPTEMBER	11.3	1.12	-	-	-	100.0	-	-	18.2	63.6	18.2	-	-
OCTOBER	9.3	1.14	22.2	16.7	16.7	44.4	-	-	22.2	44.4	33.4	-	-
NOVEMBER	9.9	1.30	47.4	-	-	52.6	-	-	26.3	52.6	21.1	-	-
DECEMBER	10.6	1.45	61.1	-	-	38.9	-	-	22.2	72.2	5.6	-	-
WHOLE YEAR	10.4	1.31	33.9	5.8	1.8	58.5	0.0	0.0	12.5	70.1	17.4	0.0	0.0

SP - Spilling
PL - Plunging
SP/PL - Combined Spilling and Plunging

TABLE 8

MONTHLY AND ANNUAL

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

Currigee **Year 1979**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	9.8	1.40	5.6	5.6	-	88.8	-	-	11.1	83.3	5.6	-	-
FEBRUARY	9.6	1.61	-	-	-	100.0	-	-	-	100.0	-	-	-
MARCH	11.3	1.25	31.8	-	-	68.2	-	-	-	45.5	54.5	-	-
APRIL	11.4	1.28	22.2	16.7	-	61.1	-	-	5.6	83.3	11.1	-	-
MAY	10.8	1.21	27.3	31.8	-	40.9	-	-	-	50.0	50.0	-	-
JUNE	11.0	1.23	35.0	25.0	-	40.0	-	-	10.0	70.0	20.0	-	-
JULY	9.9	1.38	19.0	9.5	4.8	66.7	-	-	33.3	42.9	23.8	-	-
AUGUST	10.6	1.24	5.3	36.8	-	57.9	-	-	5.3	52.6	42.1	-	-
SEPTEMBER	10.6	0.90	25.0	20.0	-	55.0	-	-	30.0	35.0	35.0	-	-
OCTOBER	10.7	0.85	47.8	4.3	4.3	43.6	-	-	30.4	39.2	30.4	-	-
NOVEMBER	10.0	0.94	42.9	33.3	-	23.8	-	-	38.1	52.4	9.5	-	-
DECEMBER	9.6	0.97	37.5	37.5	-	25.0	-	-	18.8	68.8	12.4	-	-
WHOLE YEAR	10.5	1.18	26.0	18.2	0.9	54.9	0.0	0.0	15.7	58.3	26.0	0.0	0.0

SP - Spilling
PL - Plunging
SP/PL - Combined Spilling and Plunging

TABLE 9

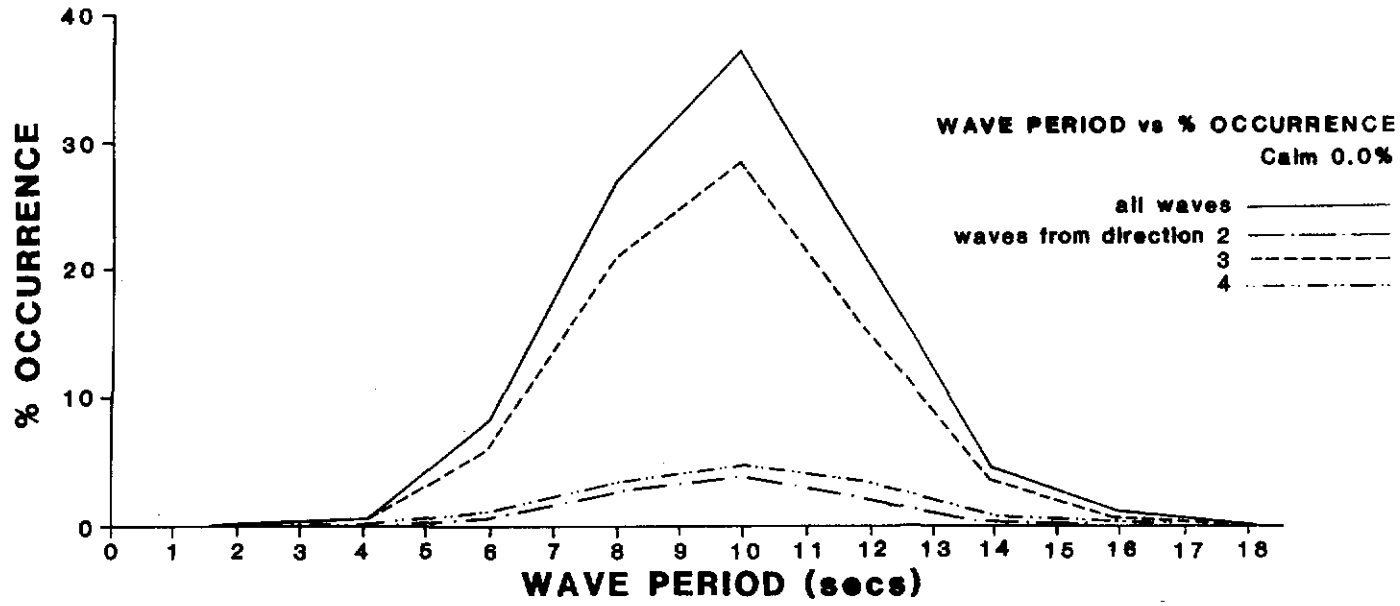
MONTHLY AND ANNUAL

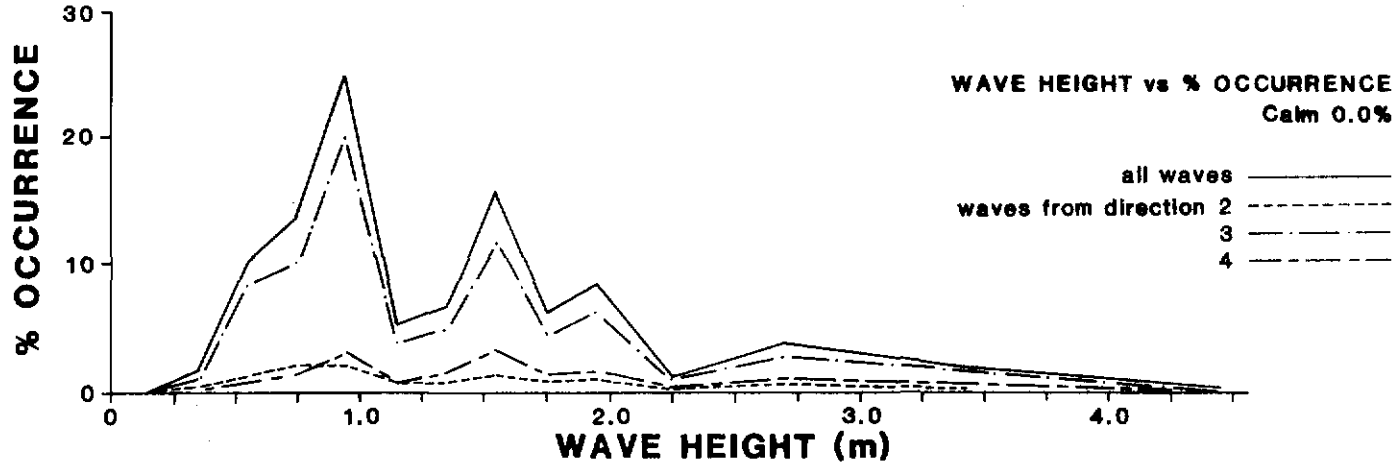
MEAN WAVE HEIGHT/MEAN WAVE PERIOD AND WAVE TYPE/WAVE DIRECTION OCCURRENCES

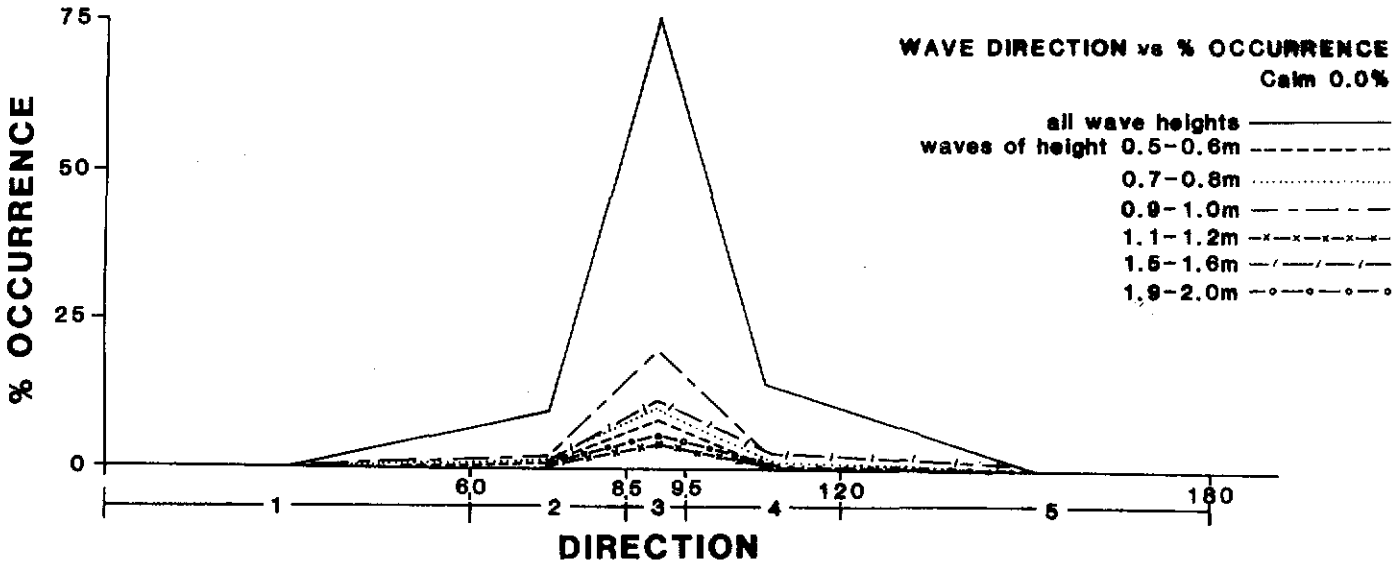
Currigee **Year 1980**

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Type/Wave Direction										
			Wave Type					Wave Direction					
			SP	PL	Surge	SP/PL	Calm	1	2	3	4	5	Calm
JANUARY	10.5	1.13	55.0	25.0	-	20.0	-	-	10.0	70.0	20.0	-	-
FEBRUARY	9.3	2.15	-	-	-	100.0	-	-	-	95.2	4.8	-	-
MARCH	9.1	1.12	30.0	25.0	-	45.0	-	-	10.0	75.0	15.0	-	-
APRIL	9.4	1.11	10.5	26.3	-	63.2	-	-	5.3	57.9	36.8	-	-
MAY	9.4	1.31	35.0	40.0	-	25.0	-	-	28.6	42.8	28.6	-	-
JUNE	10.3	1.22	10.0	40.0	-	50.0	-	-	25.0	35.0	40.0	-	-
JULY	10.5	1.33	8.7	65.2	-	26.1	-	-	8.7	87.0	4.3	-	-
AUGUST	9.0	1.09	10.0	10.0	-	80.0	-	-	25.0	45.0	30.0	-	-
SEPTEMBER	10.1	0.84	45.5	13.6	-	40.9	-	4.5	36.4	36.4	22.7	-	-
OCTOBER	9.2	0.84	21.8	13.0	-	65.2	-	-	43.5	30.4	26.1	-	-
NOVEMBER	9.3	1.11	30.0	-	-	70.0	-	-	35.0	40.0	25.0	-	-
DECEMBER	8.8	1.20	5.2	31.6	-	63.2	-	-	26.3	68.4	5.3	-	-
WHOLE YEAR	9.6	1.20	21.9	24.3	0.0	53.8	0.0	0.4	21.4	56.8	21.4	0.0	0.0

SP - Spilling
PL - Plunging
SP/PL - Combined Spilling and Plunging







Beach Protection Authority

WAVE DIRECTION ANALYSIS
ALL DATA

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Currigee

Figure 5
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

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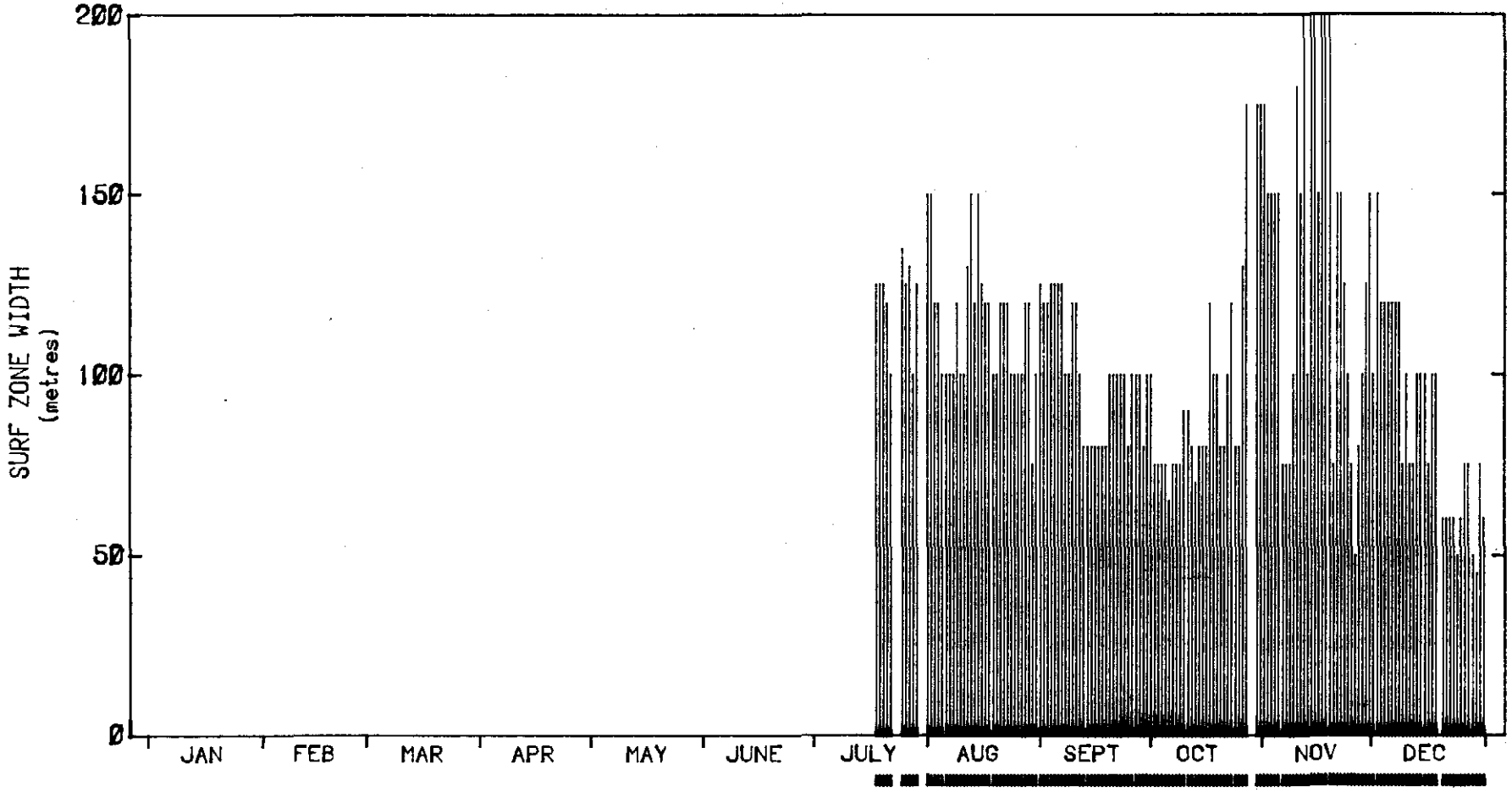
GOLD COAST CITY

0105



SURF ZONE WIDTH SUMMARY - 1972

No. of Observations : 161

MORNING OBSERVATIONS

Mean Surf Zone Width = 107.7 m

■ Indicates Offshore Bar Present

SURF ZONE WIDTH - MORNING 1972

COPE Currigee

Figure 6
C 18.1

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COPE - Coastal Observation Programme Engineering

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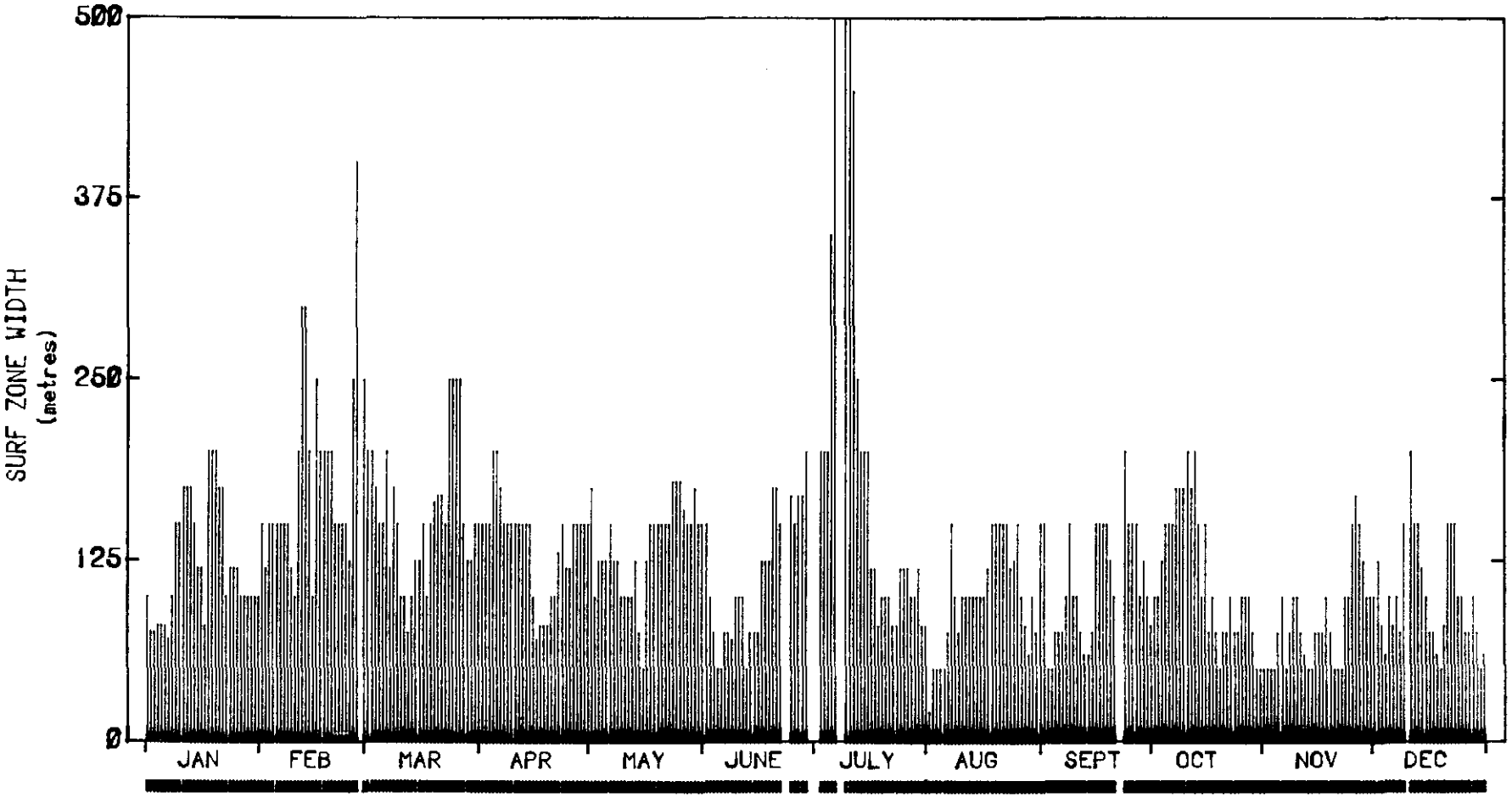

SURF ZONE WIDTH - MORNING 1973

SURF ZONE WIDTH SUMMARY - 1973

No. of Observations : 356

MORNING OBSERVATIONS

Mean Surf Zone Width = 128.9 m

■ Indicates Offshore Bar Present

COPE Currigee

Figure 7
C 18.1

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COPE - Coastal Observation Programme Engineering

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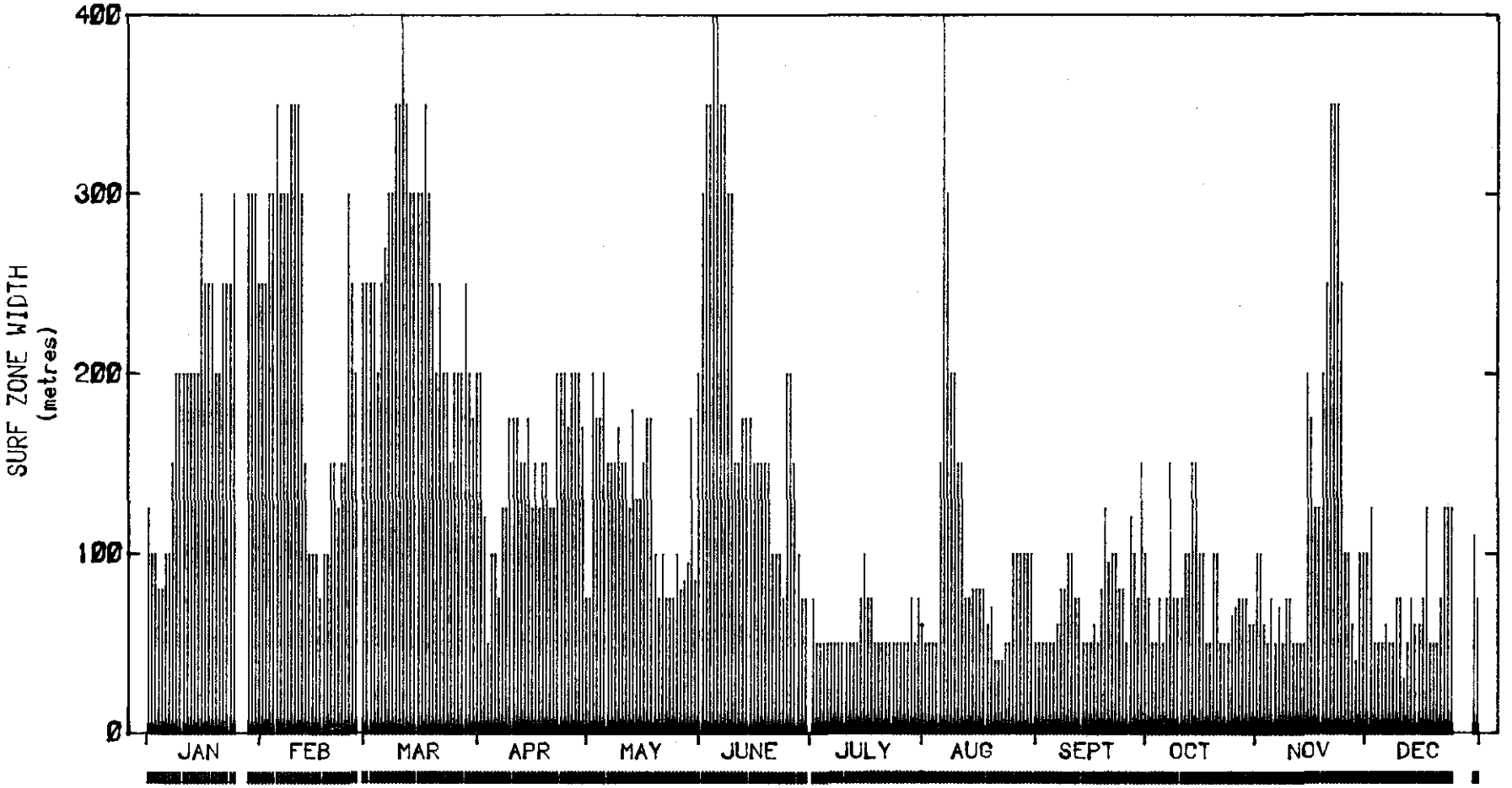
GOLD COAST CITY

0105



SURF ZONE WIDTH SUMMARY - 1974

No. of Observations : 357

MORNING OBSERVATIONS

Mean Surf Zone Width = 140.1 m

■ Indicates Offshore Bar Present

SURF ZONE WIDTH - MORNING 1974

COPE Currigee

Figure 8
C 18.1

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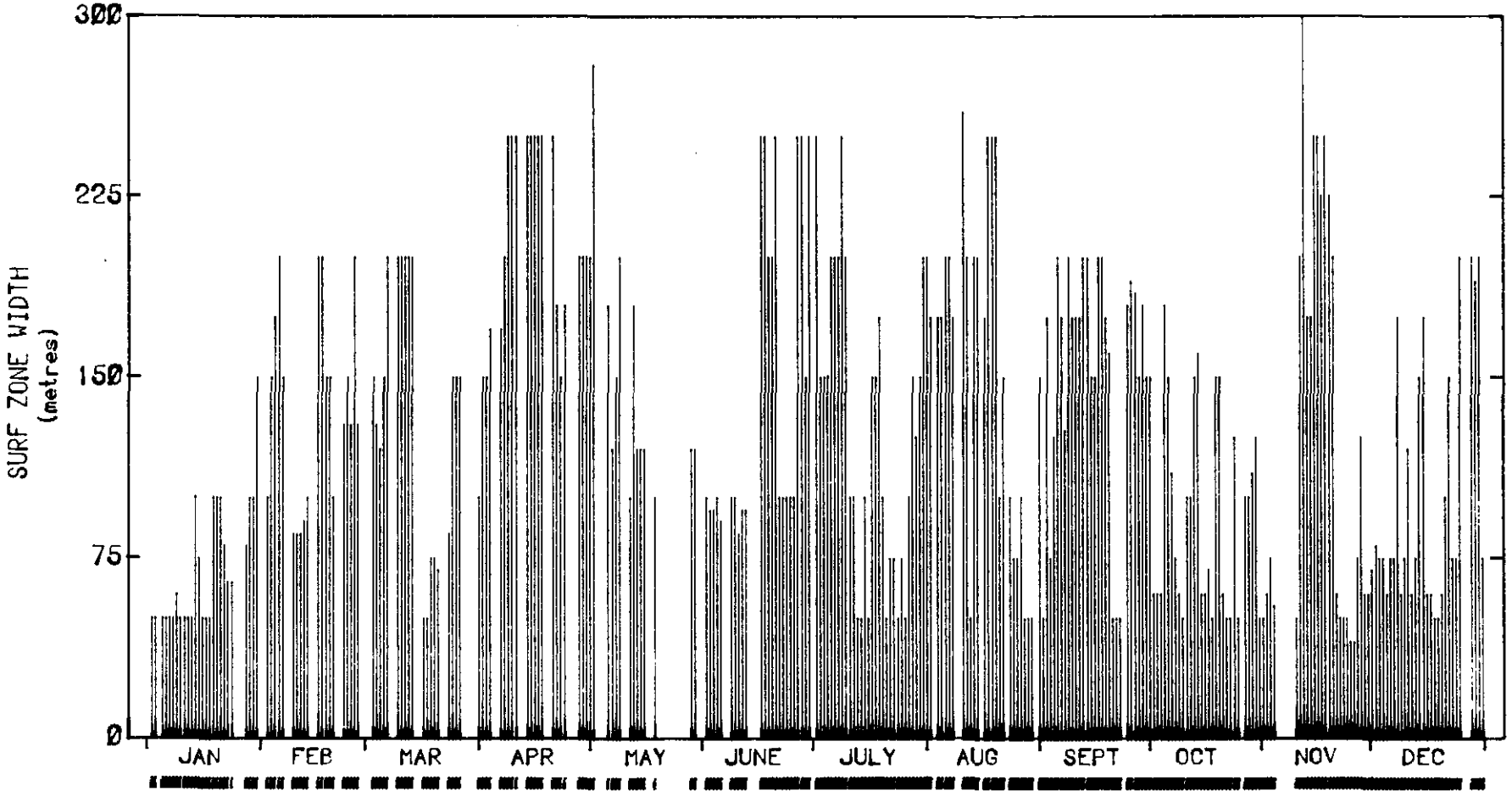

SURF ZONE WIDTH SUMMARY - 1975

No. of Observations : 293

MORNING OBSERVATIONS

Mean Surf Zone Width = 130.7 m

■ Indicates Offshore Bar Present

SURF ZONE WIDTH - MORNING 1975

COPE Currigee

Figure 9
C 18.1

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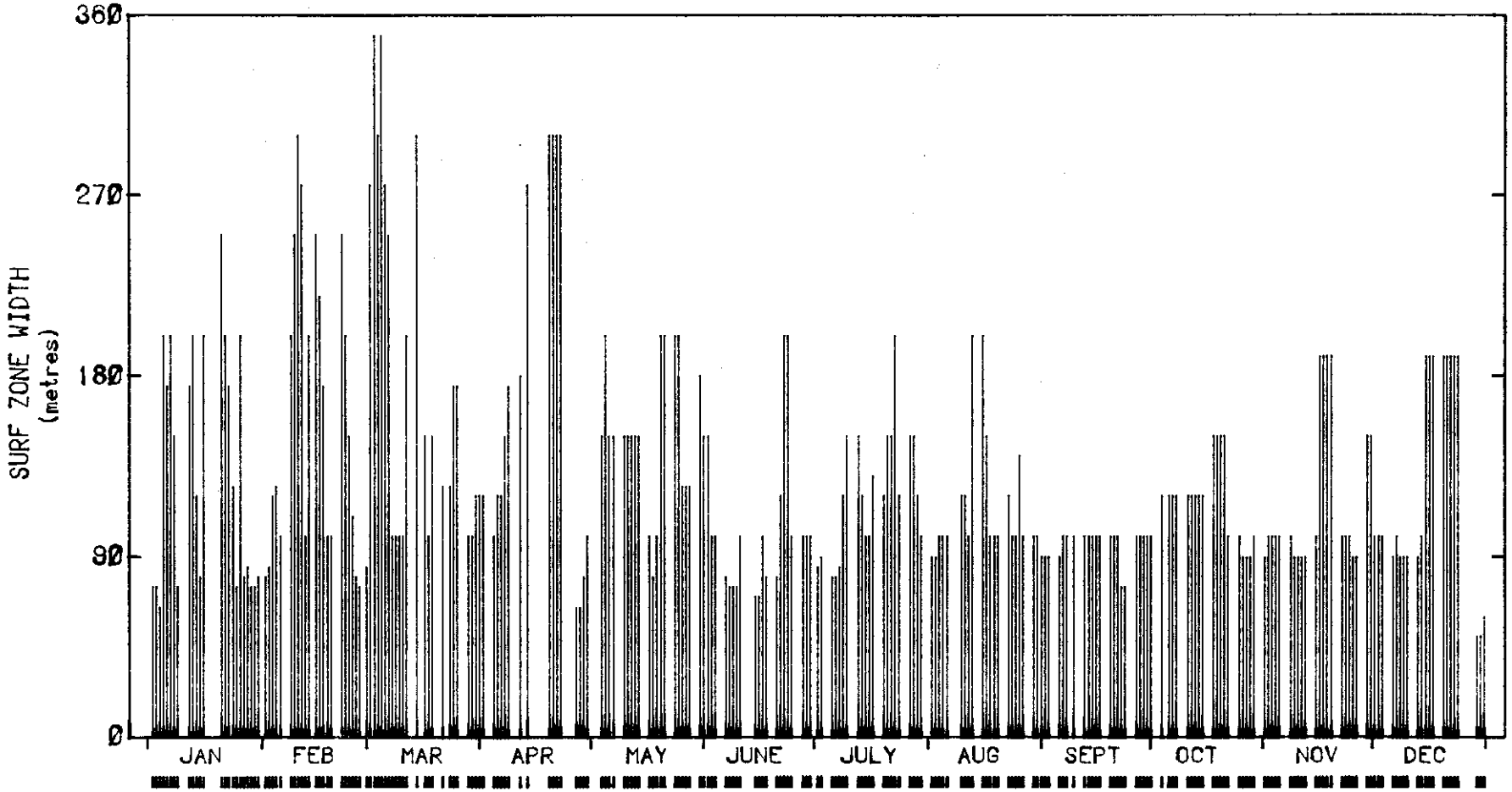
CURRIGEE

GOLD COAST CITY

0105



SURF ZONE WIDTH SUMMARY - 1976

No. of Observations : 254

MORNING OBSERVATIONS

Mean Surf Zone Width = 132.1 m

■ Indicates Offshore Bar Present

SURF ZONE WIDTH - MORNING 1976

COPE Currigee

Figure 10
C 18.1

Beach Protection Authority

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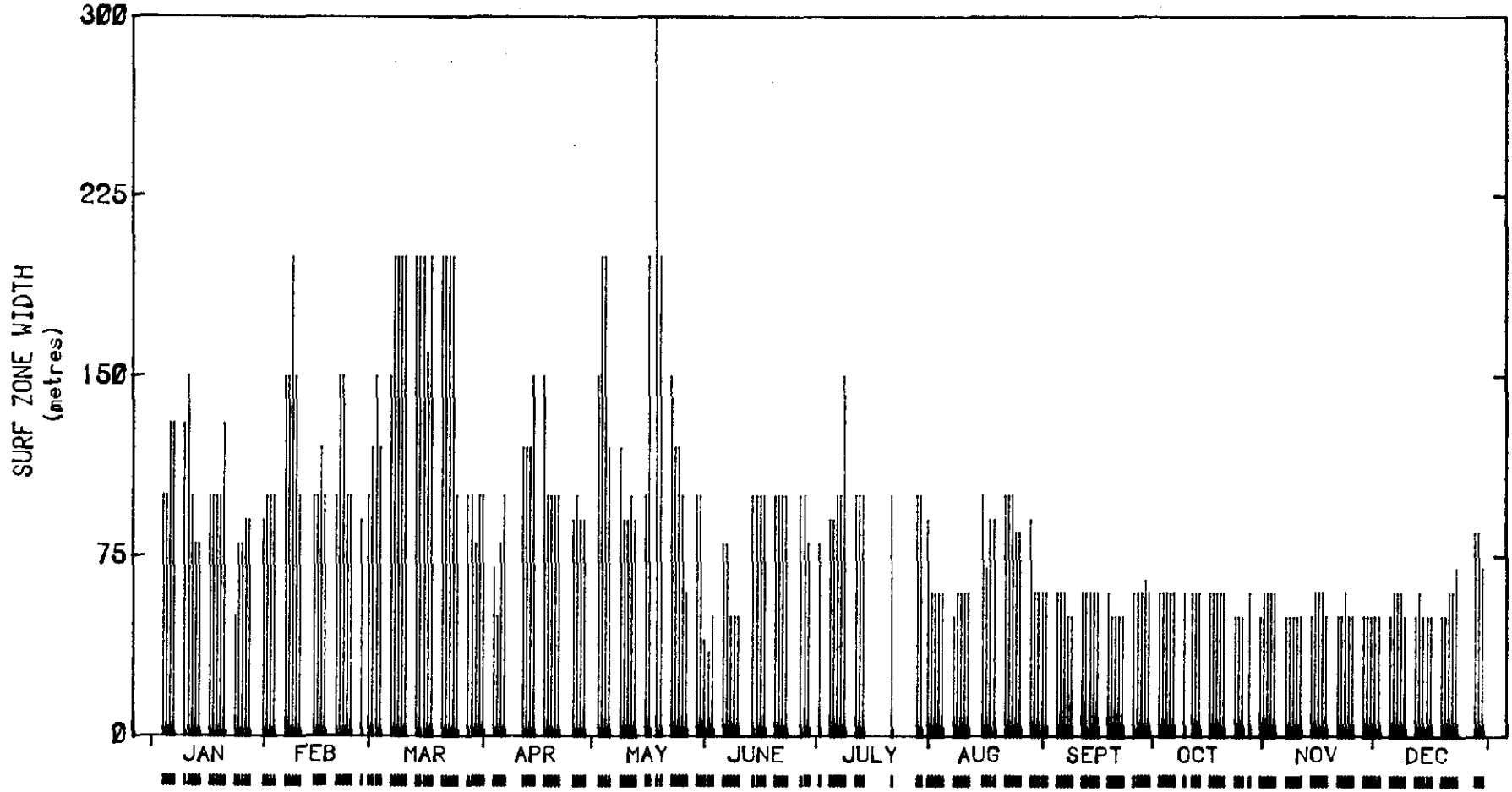
CURRIGEE

GOLD COAST CITY

0105



SURF ZONE WIDTH SUMMARY - 1977

No. of Observations : 235

MORNING OBSERVATIONS

Mean Surf Zone Width = 91.4 m

■ Indicates Offshore Bar Present

SURF ZONE WIDTH - MORNING 1977

COPE Currigee

Figure 11
C 18.1

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SURF ZONE WIDTH - MORNING 1978

COPE
Currigee

Figure 12
C 18.1

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Programme Engineering

CURRIGEE

GOLD COAST CITY

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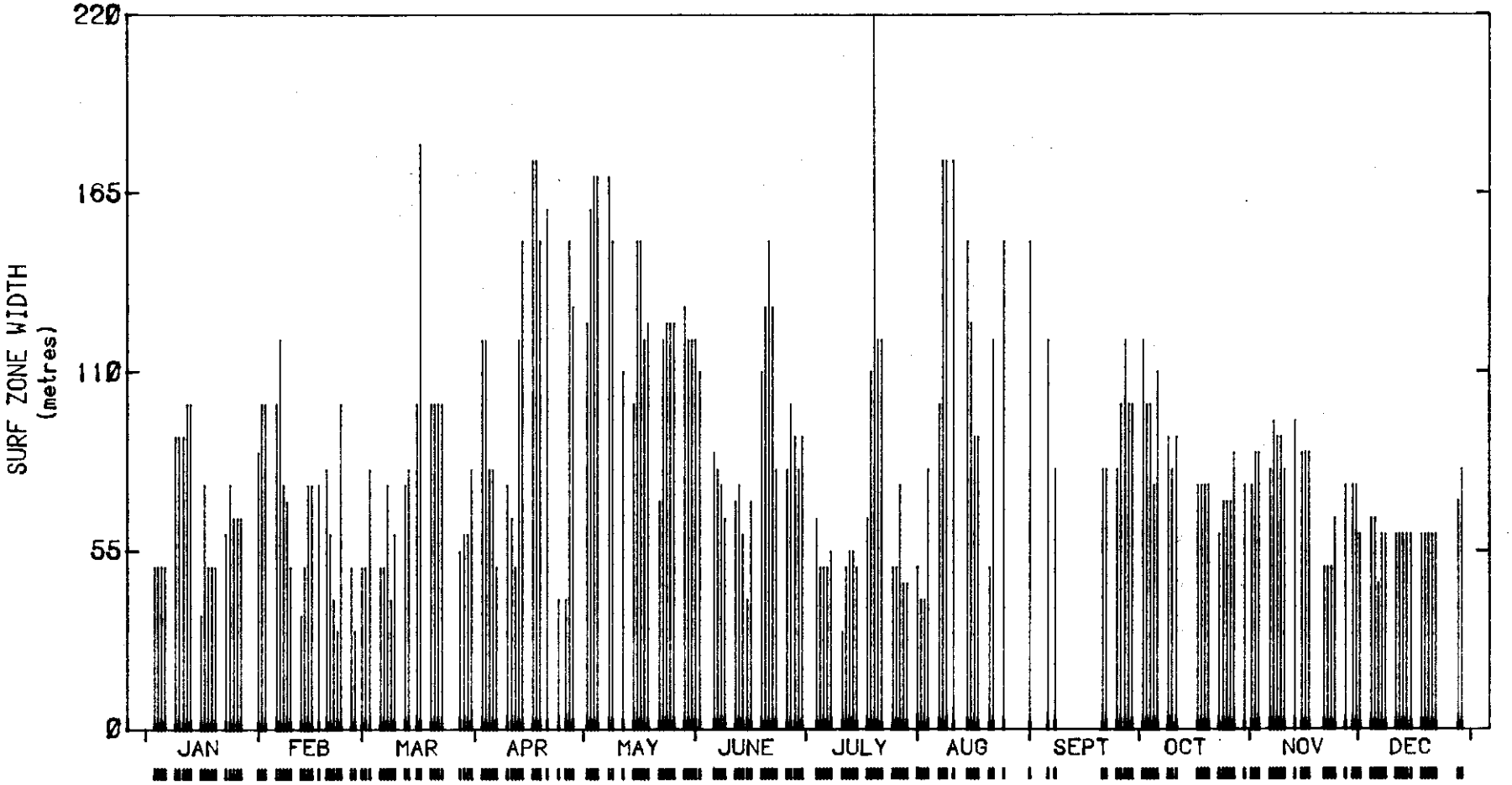

SURF ZONE WIDTH SUMMARY - 1978

No. of Observations : 219

MORNING OBSERVATIONS

Mean Surf Zone Width = 85.9 m

■ Indicates Offshore Bar Present

Beach Protection Authority

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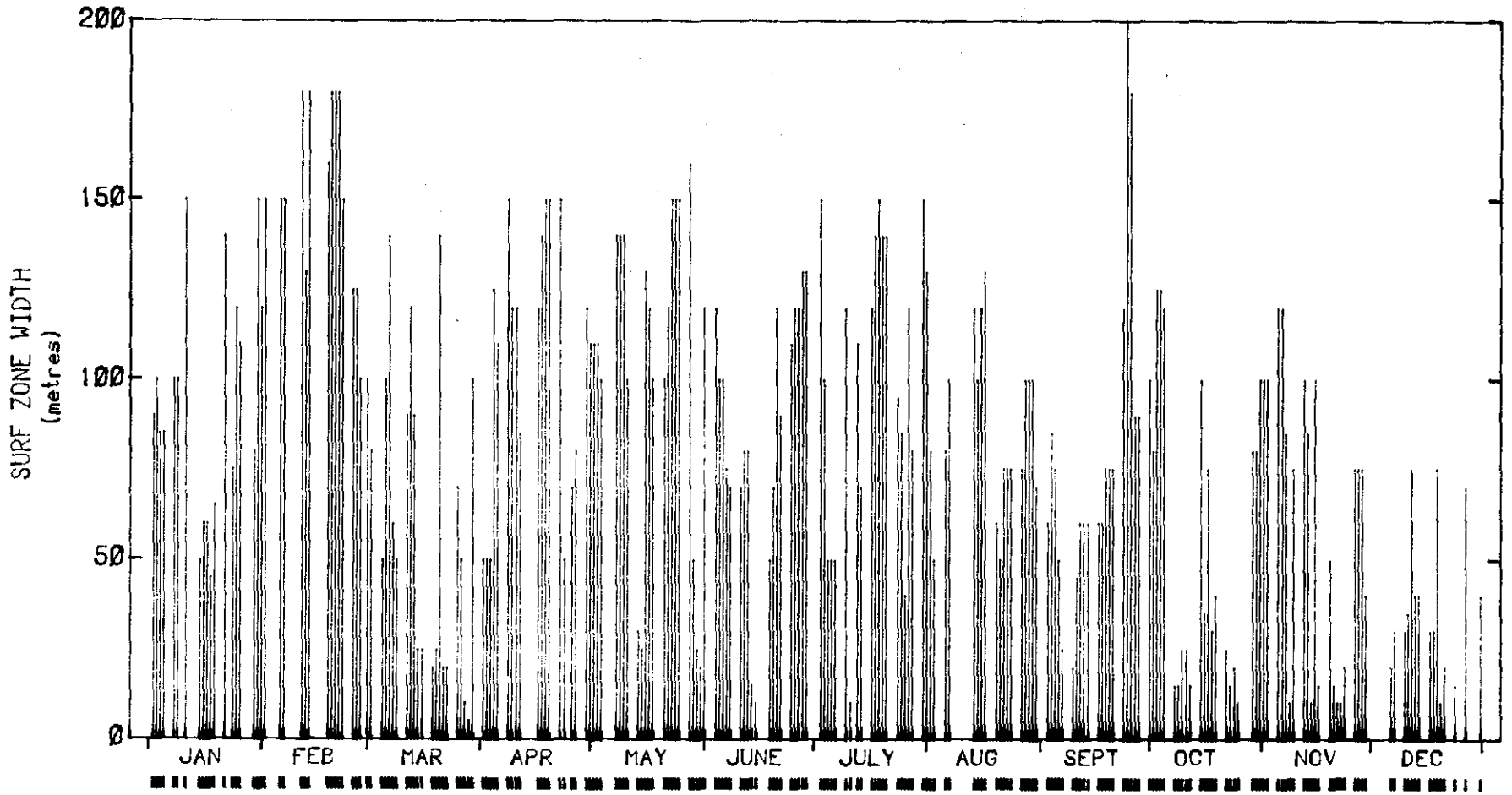
CURRIGEE

GOLD COAST CITY

Ø1Ø5



SURF ZONE WIDTH - MORNING 1979

SURF ZONE WIDTH SUMMARY - 1979

No. of Observations : 233

MORNING OBSERVATIONS

Mean Surf Zone Width = 84.5 m

■ Indicates Offshore Bar Present

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Figure 13
C 18.1

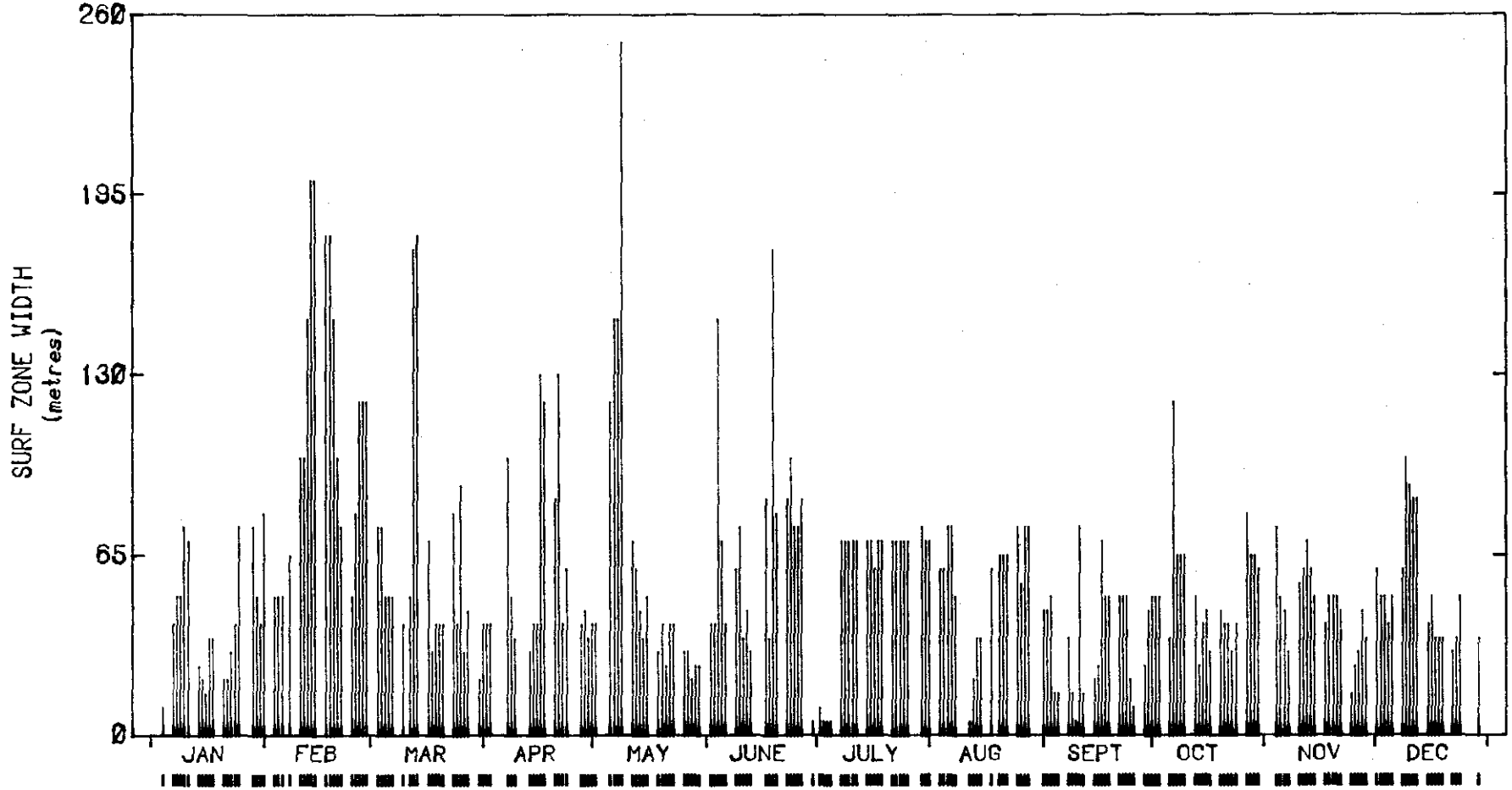
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

CURRIGEE

GOLD COAST CITY

0105



SURF ZONE WIDTH - MORNING 1980

SURF ZONE WIDTH SUMMARY - 1980

No. of Observations : 240

MORNING OBSERVATIONS

Mean Surf Zone Width = 59.1 m

■ Indicates Offshore Bar Present

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Figure 14
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

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GOLD COAST CITY

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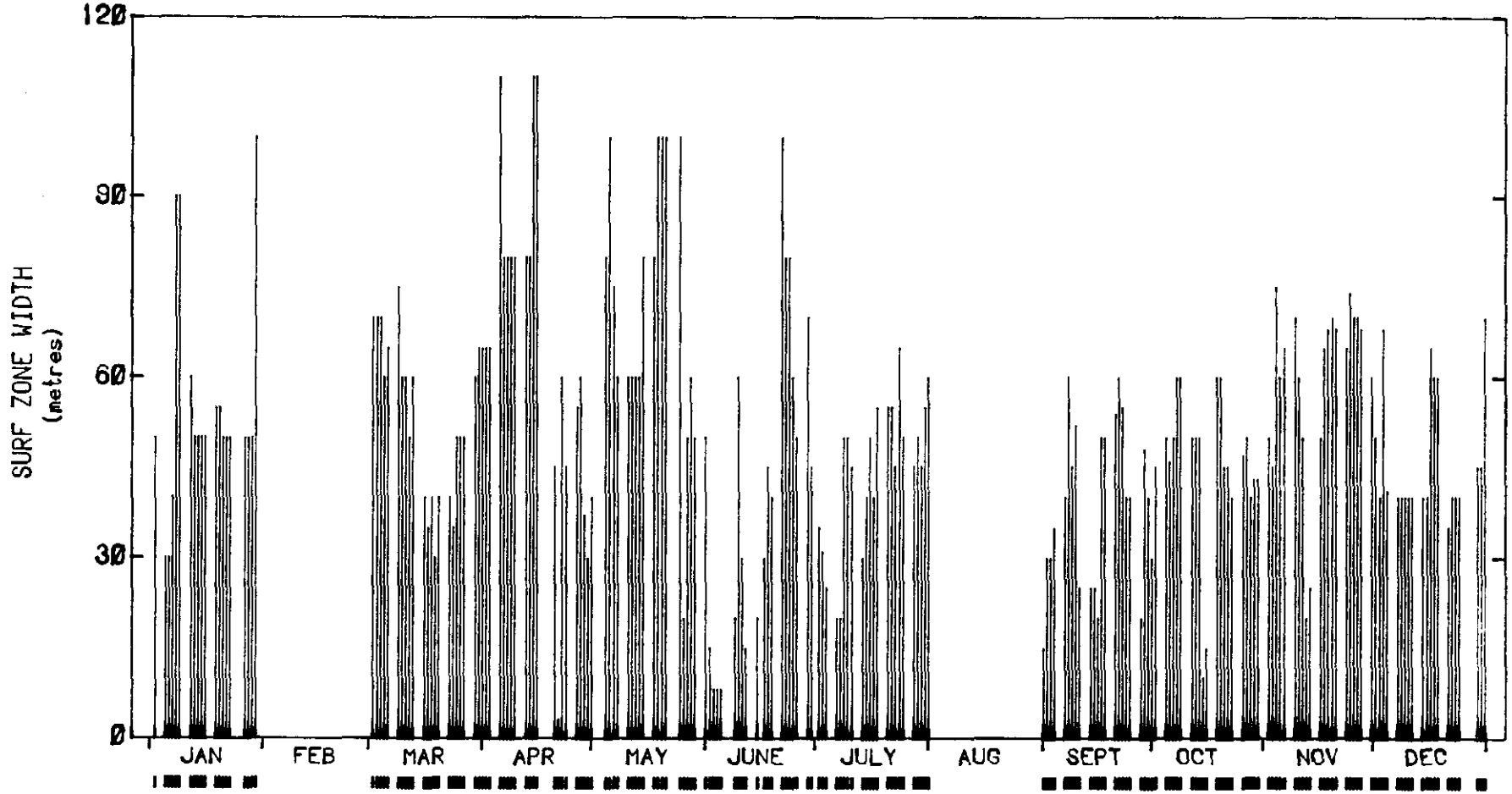

SURF ZONE WIDTH SUMMARY - 1981

No. of Observations : 210

MORNING OBSERVATIONS

Mean Surf Zone Width = 51.8 m

■ Indicates Offshore Bar Present

SURF ZONE WIDTH - MORNING 1981

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Figure 15
C 18.1

Beach Protection Authority

SURF ZONE WIDTH - MORNING 1982

COPE
Currigee

Figure 16
C 18.1

COPE - Coastal Observation Programme Engineering

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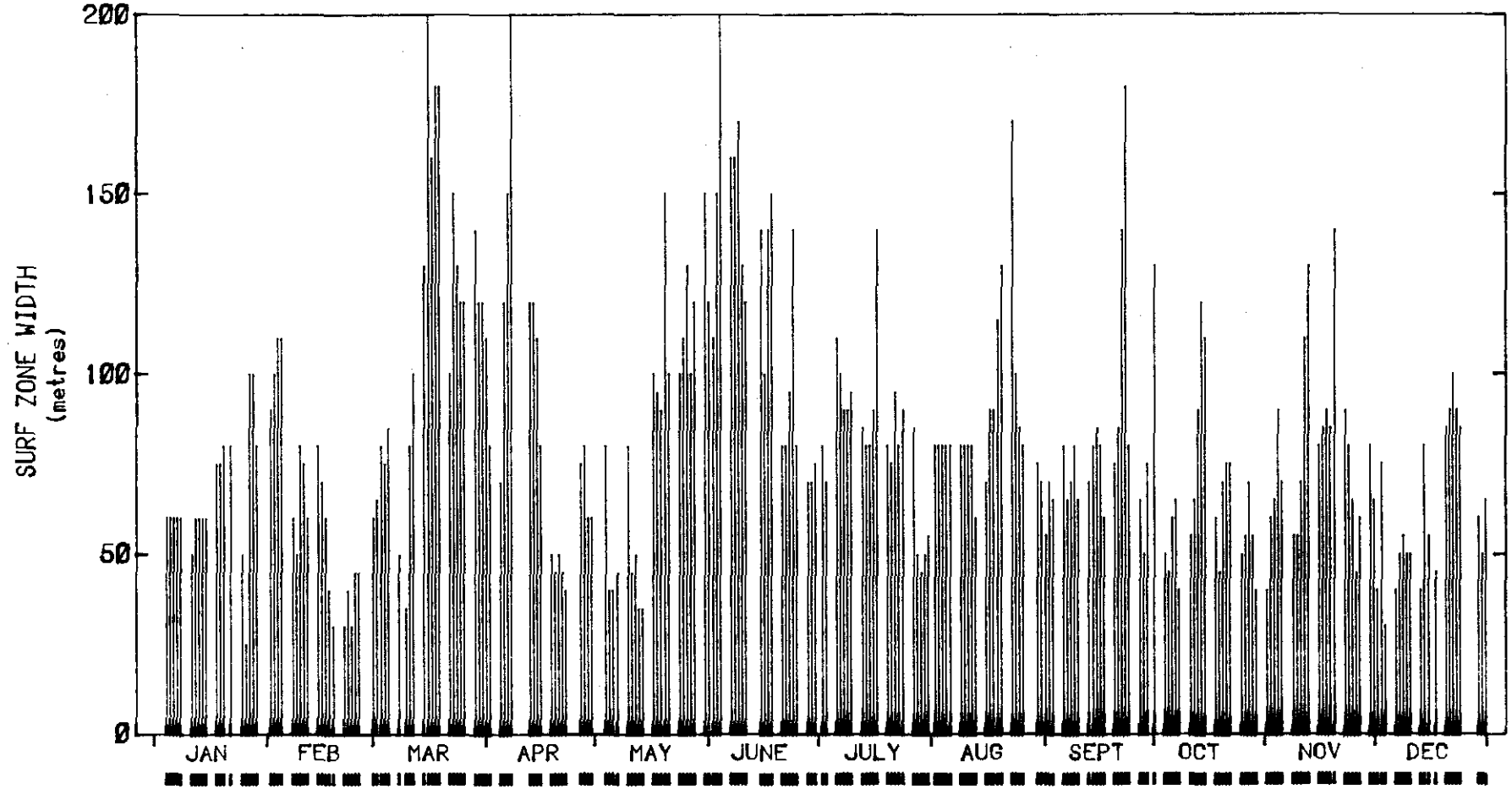
GOLD COAST CITY

Ø105



SURF ZONE WIDTH SUMMARY - 1982

No. of Observations : 247

MORNING OBSERVATIONS

Mean Surf Zone Width = 83.2 m

■ Indicates Offshore Bar Present

Beach Protection Authority

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GOLD COAST CITY

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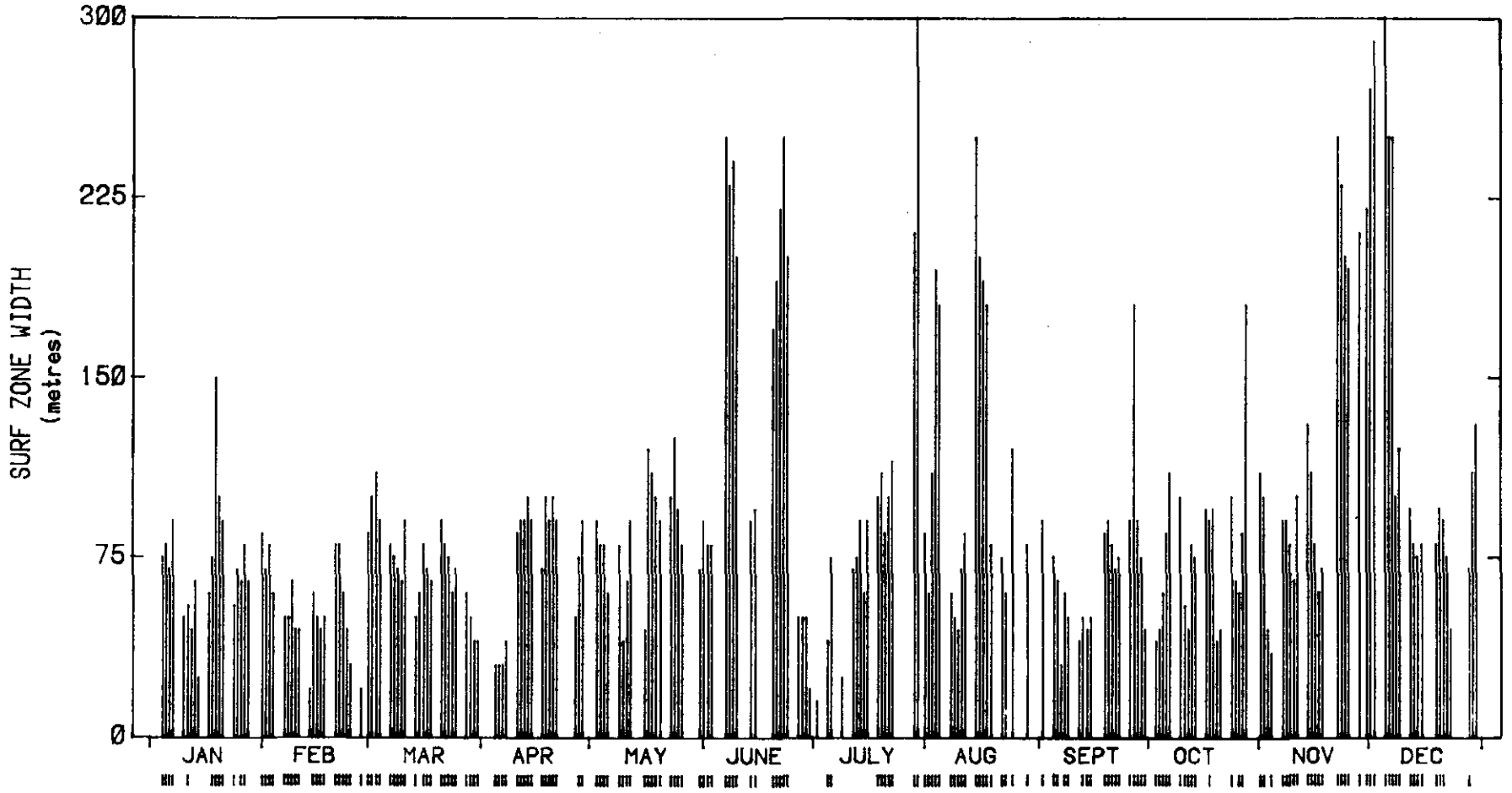

SURF ZONE WIDTH - MORNING 1983

SURF ZONE WIDTH SUMMARY - 1983

No. of Observations : 232

MORNING OBSERVATIONS

Mean Surf Zone Width = 92.8 m

▪ Indicates Offshore Bar Present

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Figure 17
C 18.1

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COPE - Coastal Observation Programme Engineering

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GOLD COAST CITY

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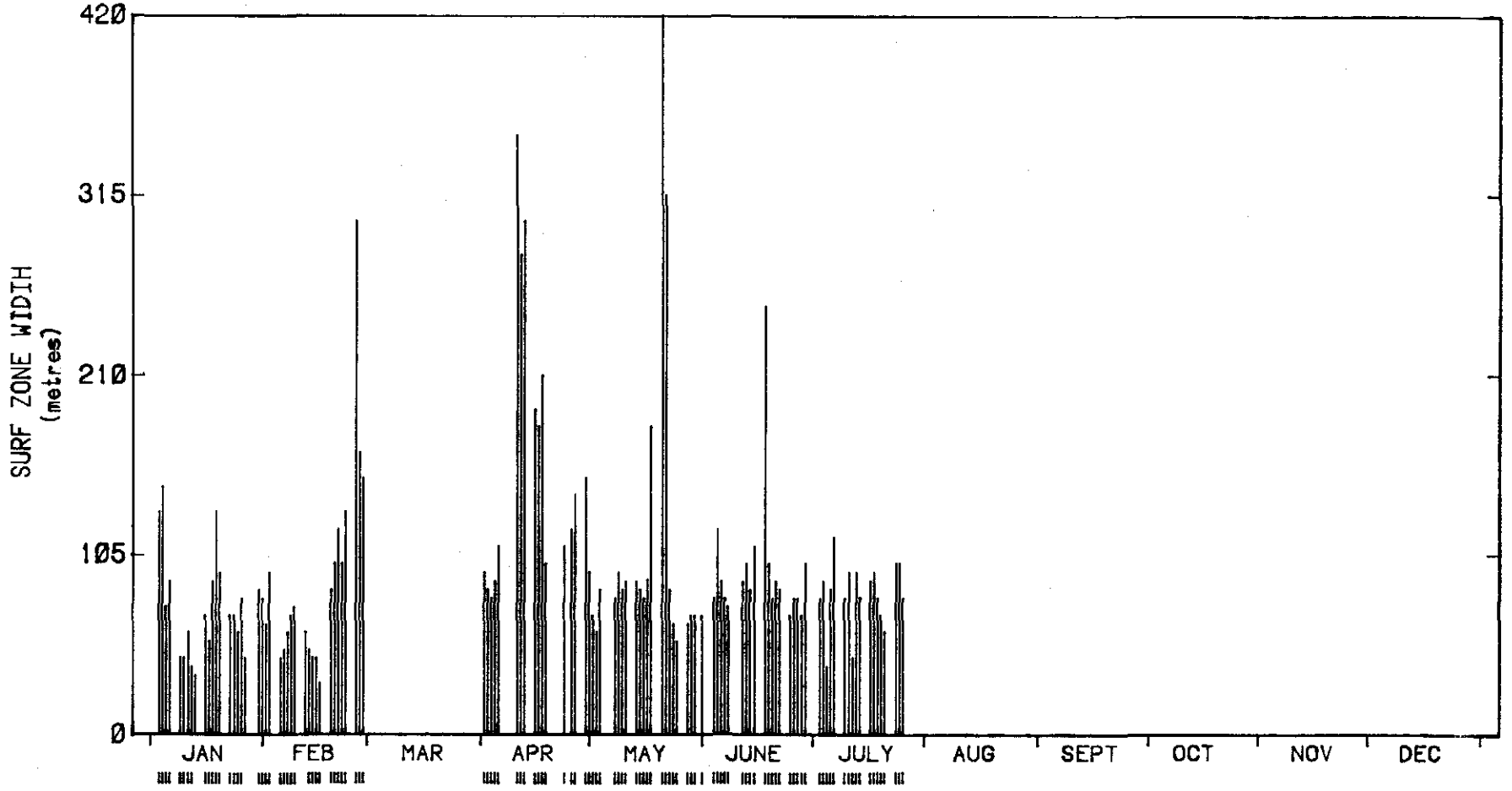

SURF ZONE WIDTH - MORNING 1984

SURF ZONE WIDTH SUMMARY - 1984

No. of Observations : 118

MORNING OBSERVATIONS

Mean Surf Zone Width = 87.8 m

▮ Indicates Offshore Bar Present

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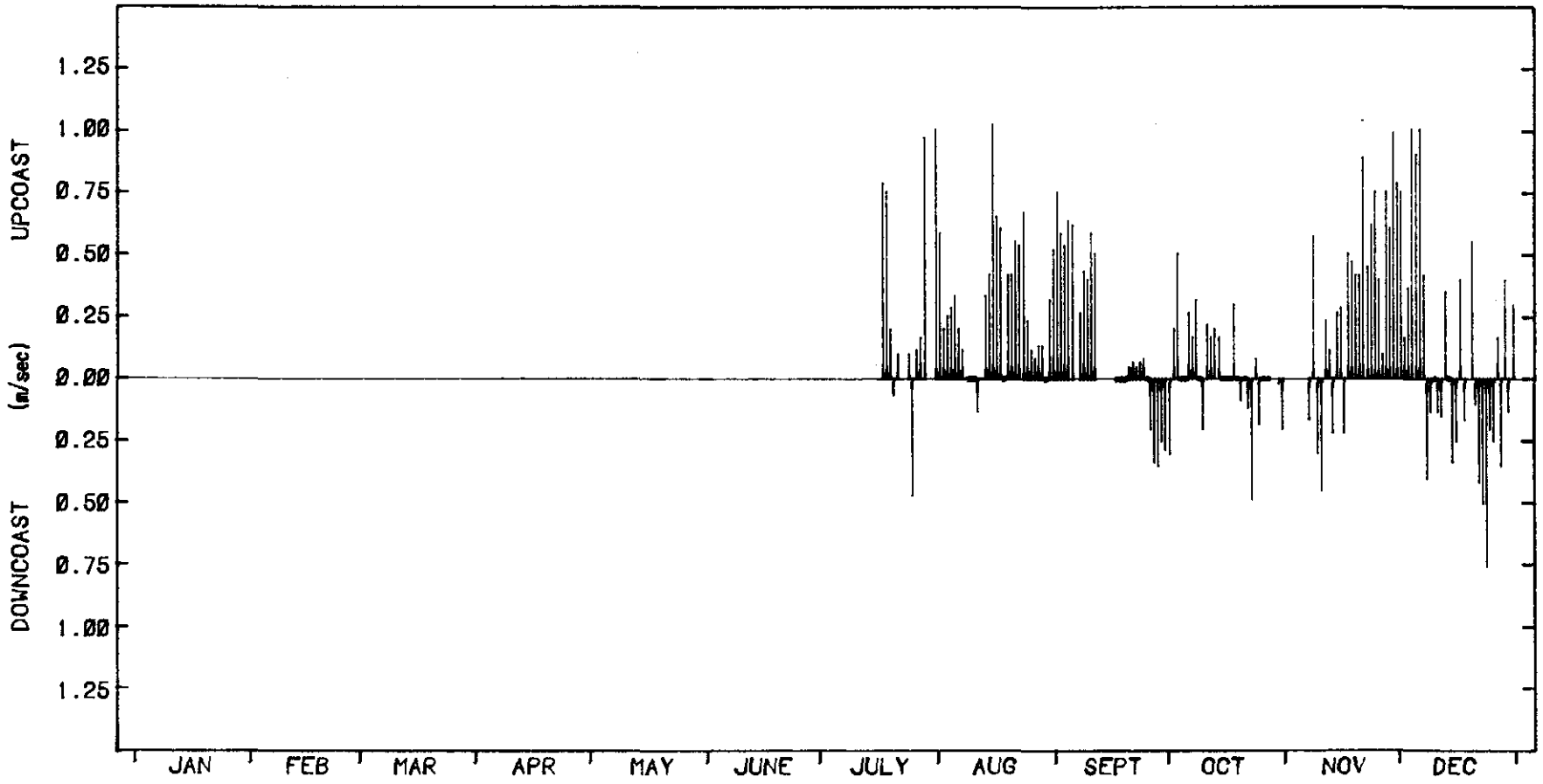
Figure 18
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



LITTORAL CURRENTS - MORNING 1972

LITTORAL CURRENT SUMMARY - 1972

Mean Vel = 0.192 m/sec (up) Mean Upcoast Vel = 0.411 m/sec Mean Downcoast Vel = 0.251 m/sec

MORNING OBSERVATIONS - (149 recordings)

COPE Currigee

Figure 19
C 18.1

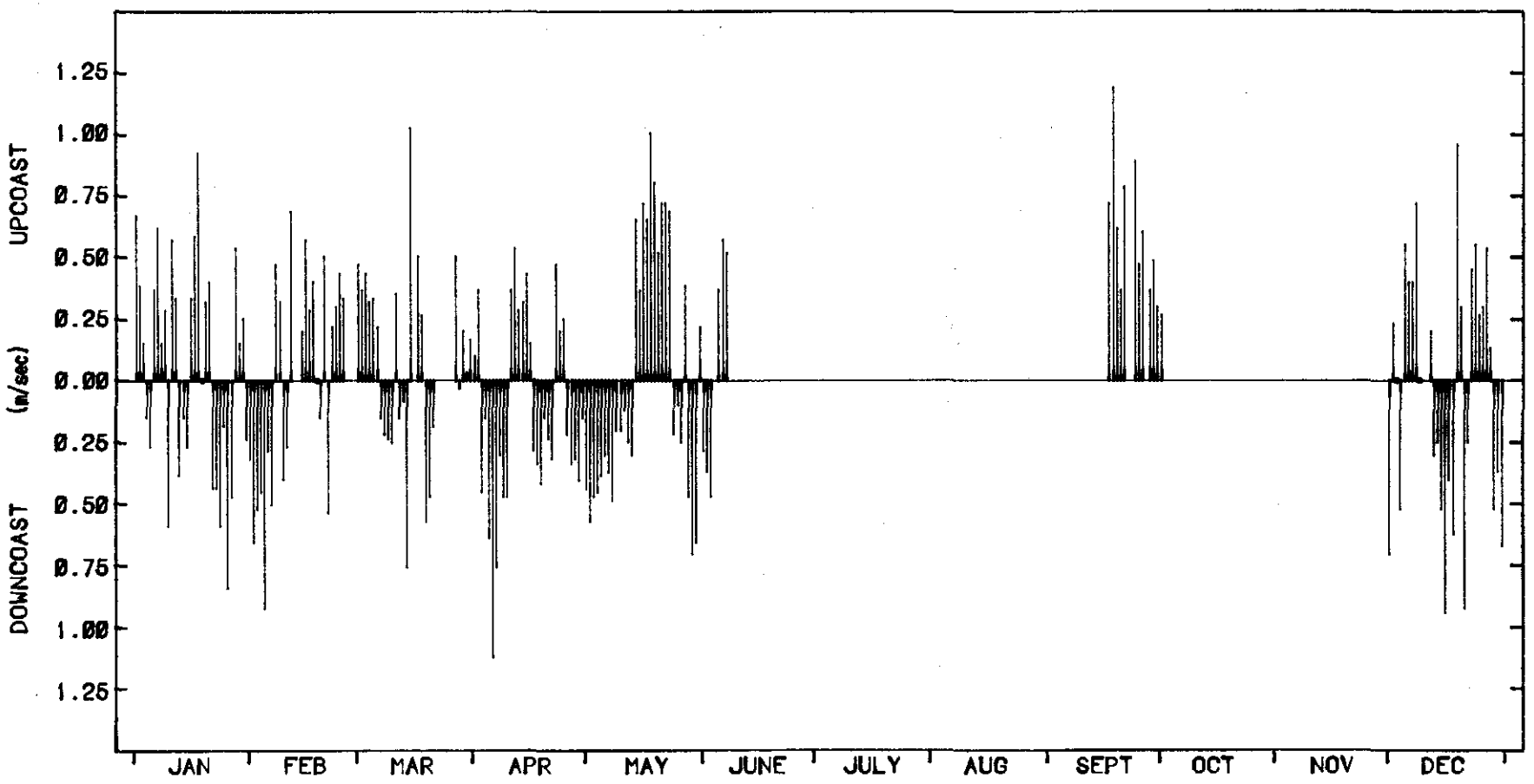
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

Ø105



LITTORAL CURRENT SUMMARY - 1973

Mean Vel = Ø.Ø36 m/sec (up) Mean Upcoast Vel = Ø.444 m/sec Mean Downcoast Vel = Ø.399 m/sec

MORNING OBSERVATIONS - (188 recordings)

LITTORAL CURRENTS - MORNING 1973

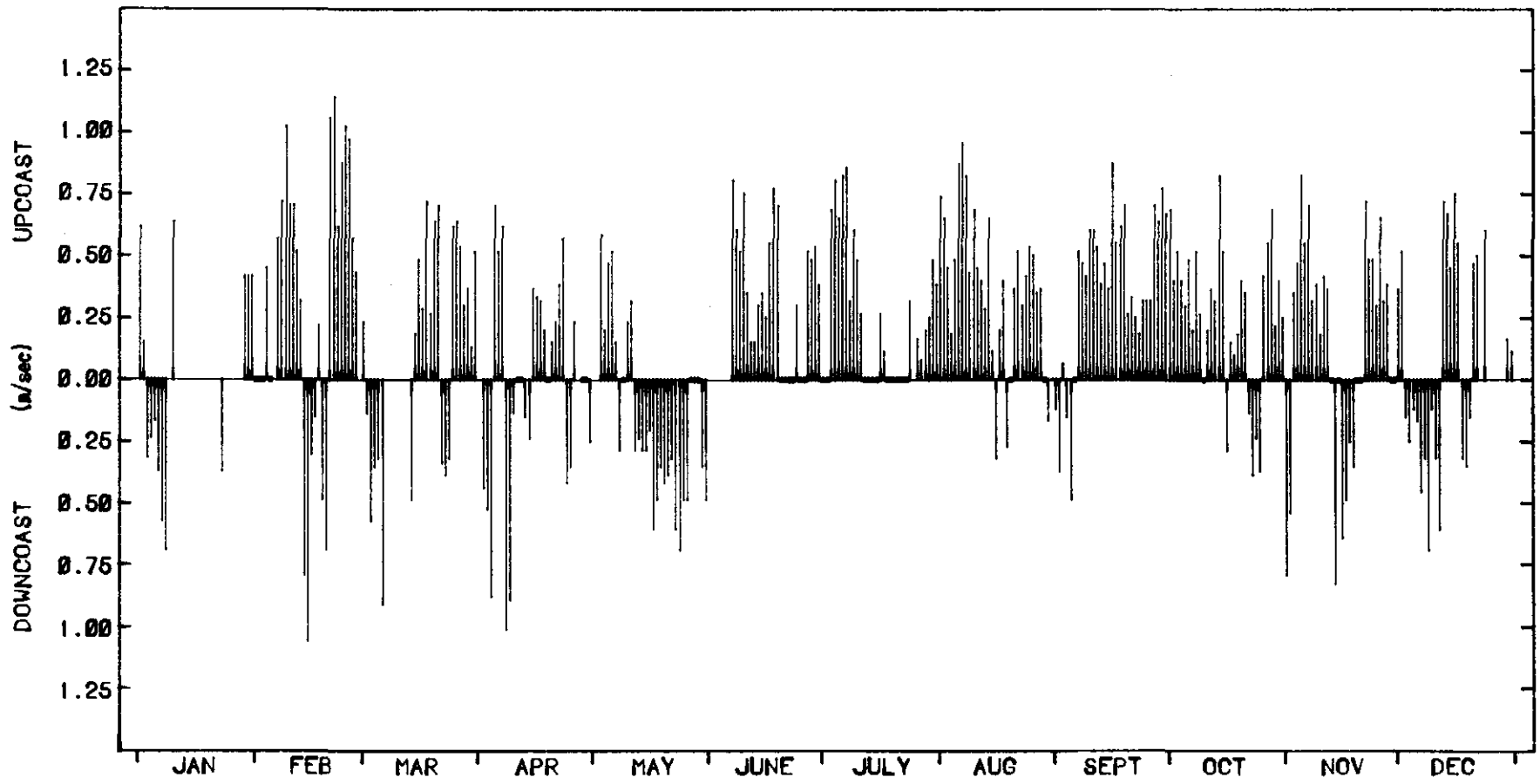
COPE Currigee

Figure 20
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



LITTORAL CURRENTS - MORNING 1974

LITTORAL CURRENT SUMMARY - 1974

Mean Vel = 0.181 m/sec (up) Mean Upcoast Vel = 0.466 m/sec Mean Downcoast Vel = 0.398 m/sec

MORNING OBSERVATIONS - (322 recordings)

COPE Currigee

Figure 21
C 18.1

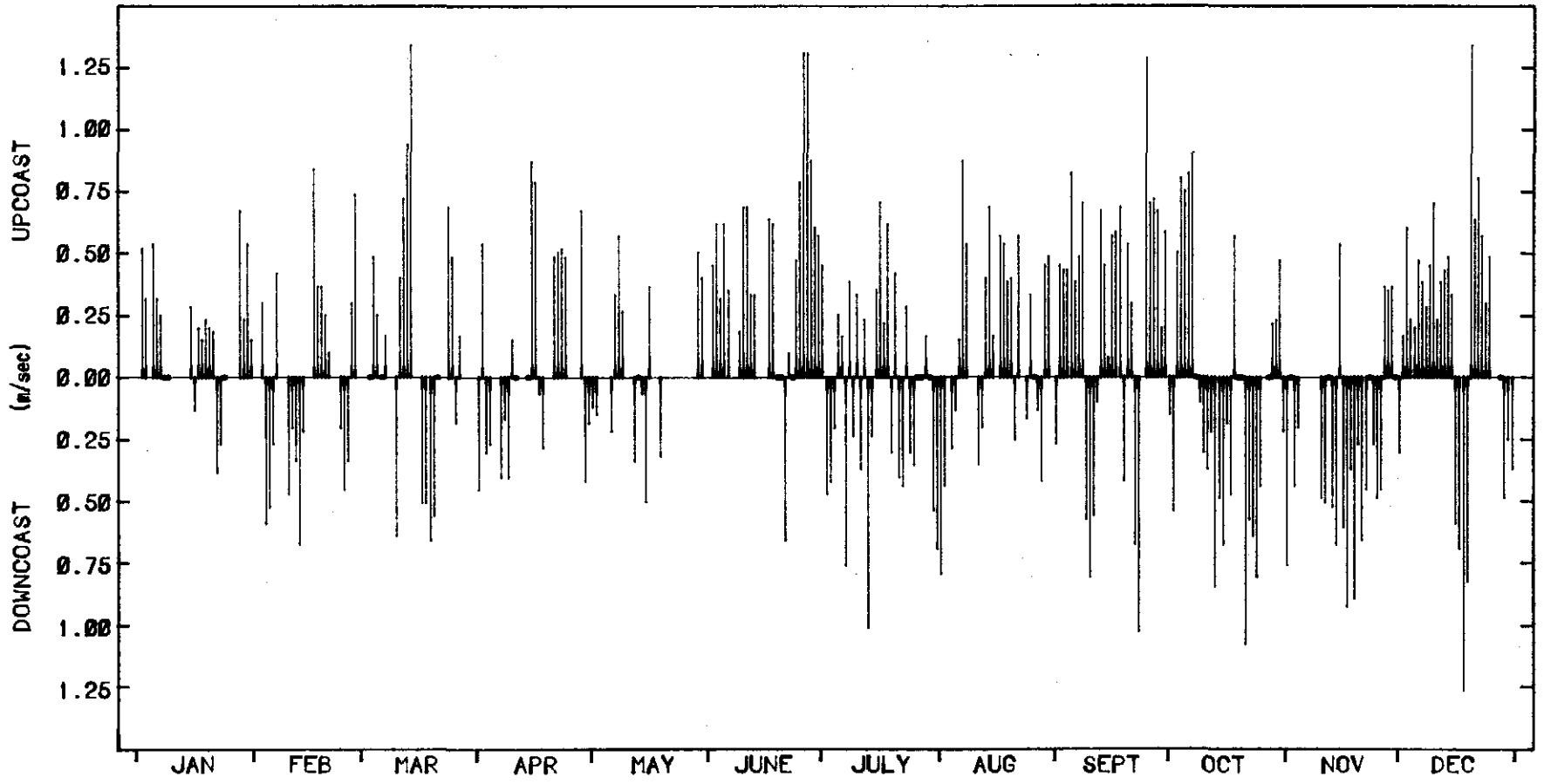
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

0105



LITTORAL CURRENT SUMMARY - 1975

Mean Vel = 0.081 m/sec (up)

Mean Upcoast Vel = 0.483 m/sec

Mean Downcoast Vel = 0.435 m/sec

MORNING OBSERVATIONS - (288 recordings)

LITTORAL CURRENTS - MORNING 1975

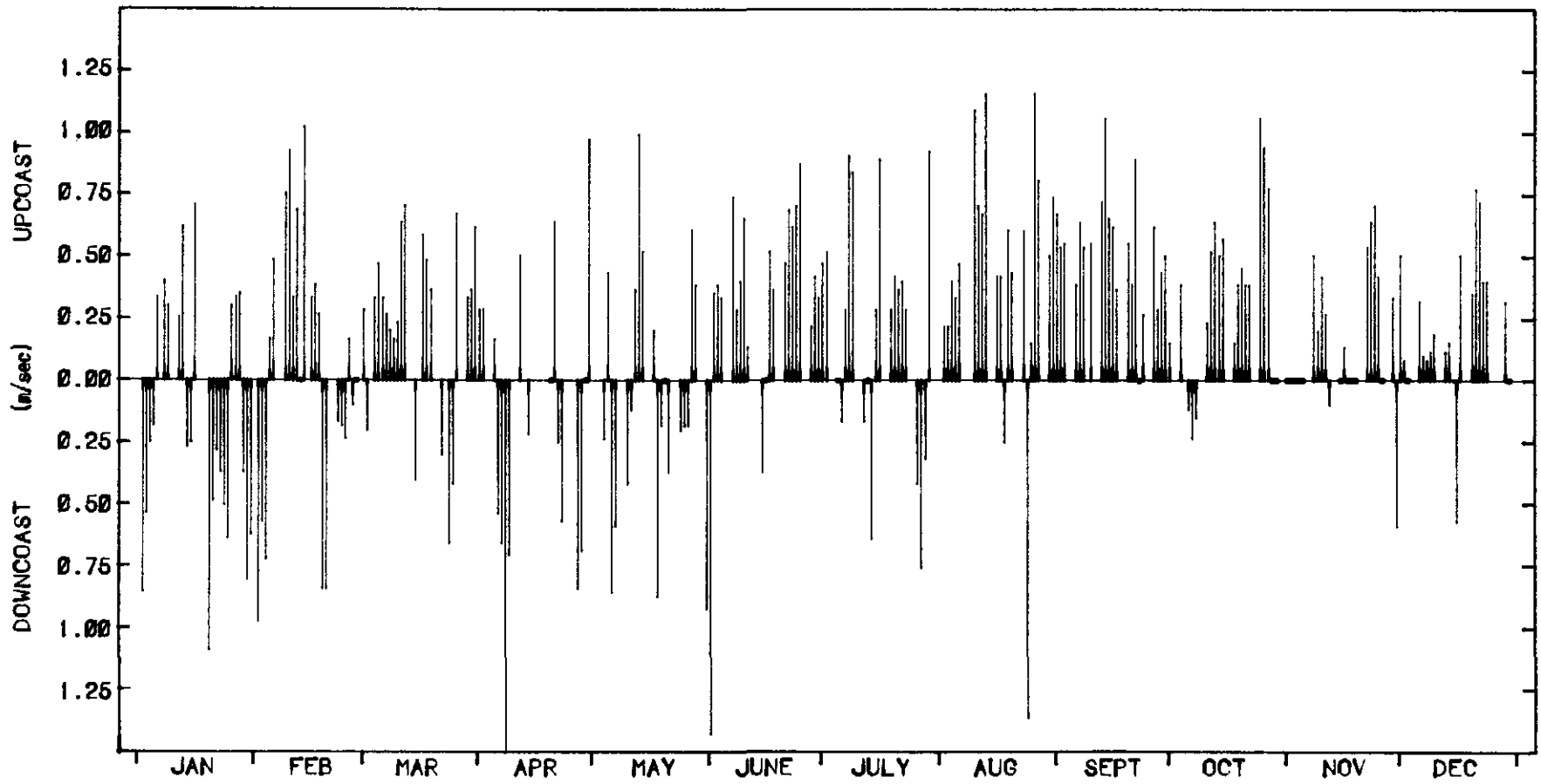
COPE Currigee

Figure 22
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



LITTORAL CURRENT SUMMARY - 1976

Mean Vel = 0.176 m/sec (up) Mean Upcoast Vel = 0.473 m/sec Mean Downcoast Vel = 0.497 m/sec

MORNING OBSERVATIONS - (251 recordings)

LITTORAL CURRENTS - MORNING 1976

COPE Currigee

Figure 23
C 18.1

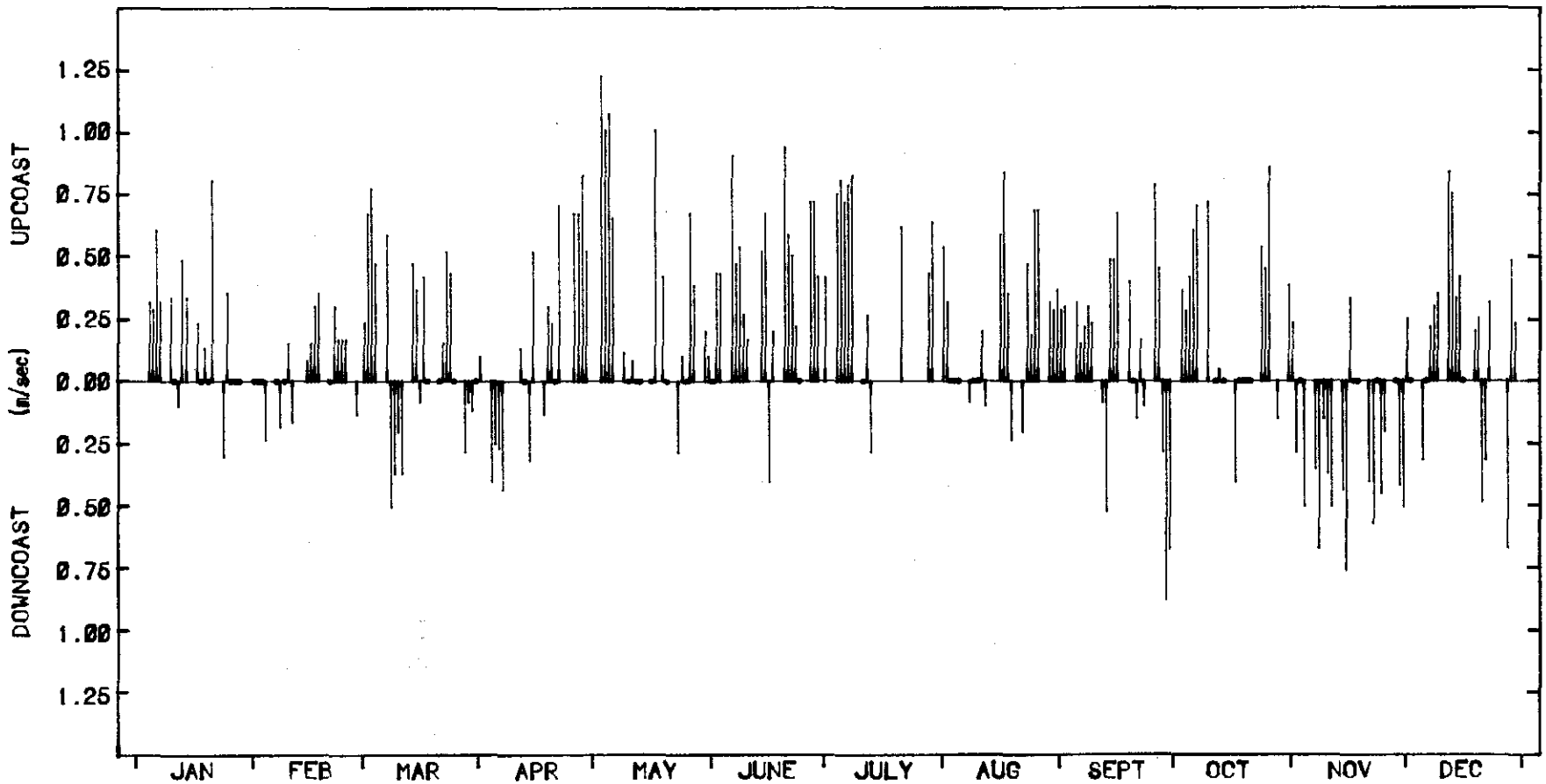
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

Ø105



LITTORAL CURRENT SUMMARY - 1977

Mean Vel = Ø.176 m/sec (up) Mean Upcoast Vel = Ø.444 m/sec Mean Downcoast Vel = Ø.328 m/sec

MORNING OBSERVATIONS - (236 recordings)

LITTORAL CURRENTS - MORNING 1977

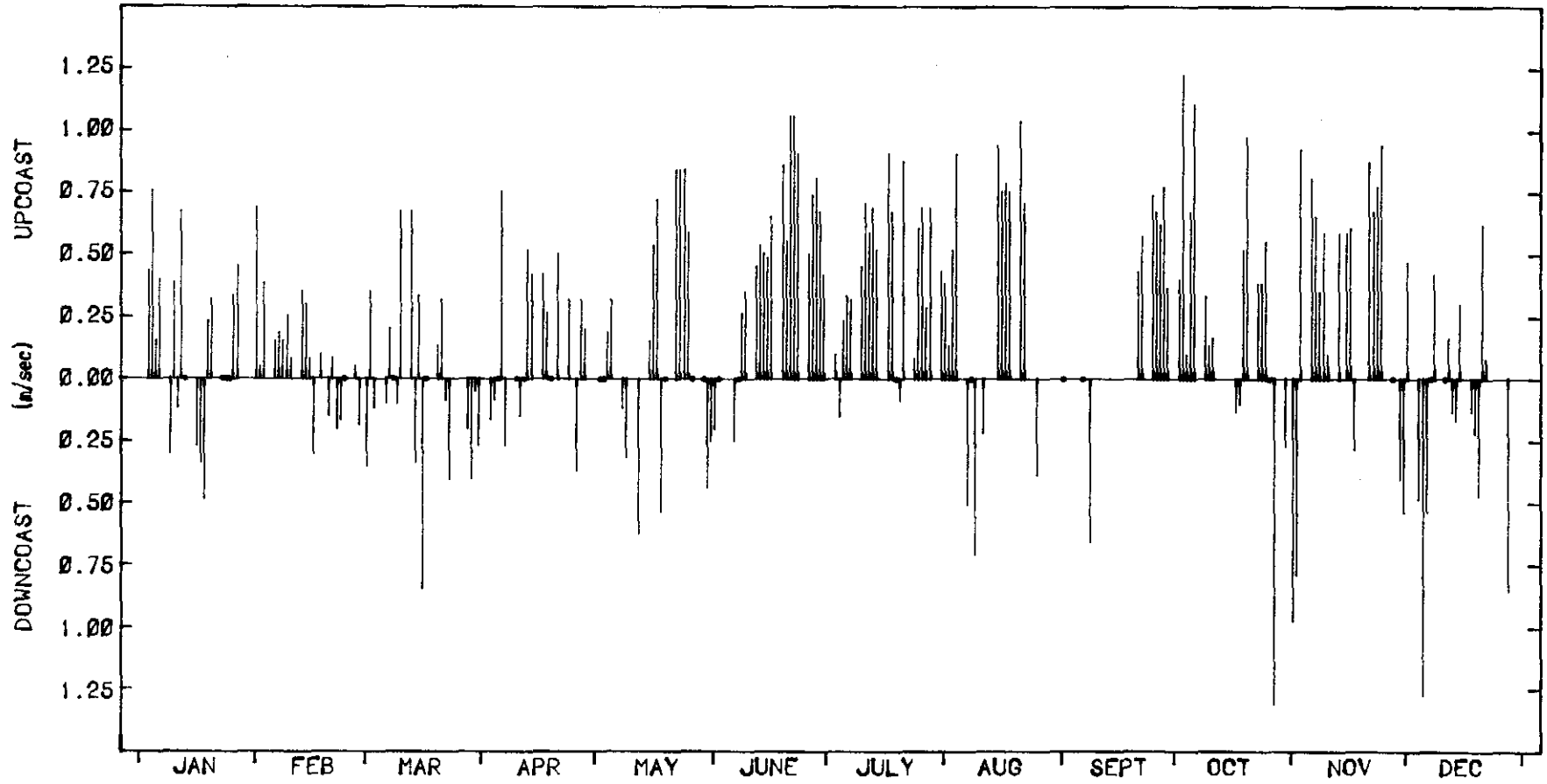
COPE Curlgee

Figure 24
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



LITTORAL CURRENT SUMMARY - 1978

Mean Vel = 0.208 m/sec (up) Mean Upcoast Vel = 0.501 m/sec Mean Downcoast Vel = 0.353 m/sec

MORNING OBSERVATIONS - (219 recordings)

LITTORAL CURRENTS - MORNING 1978

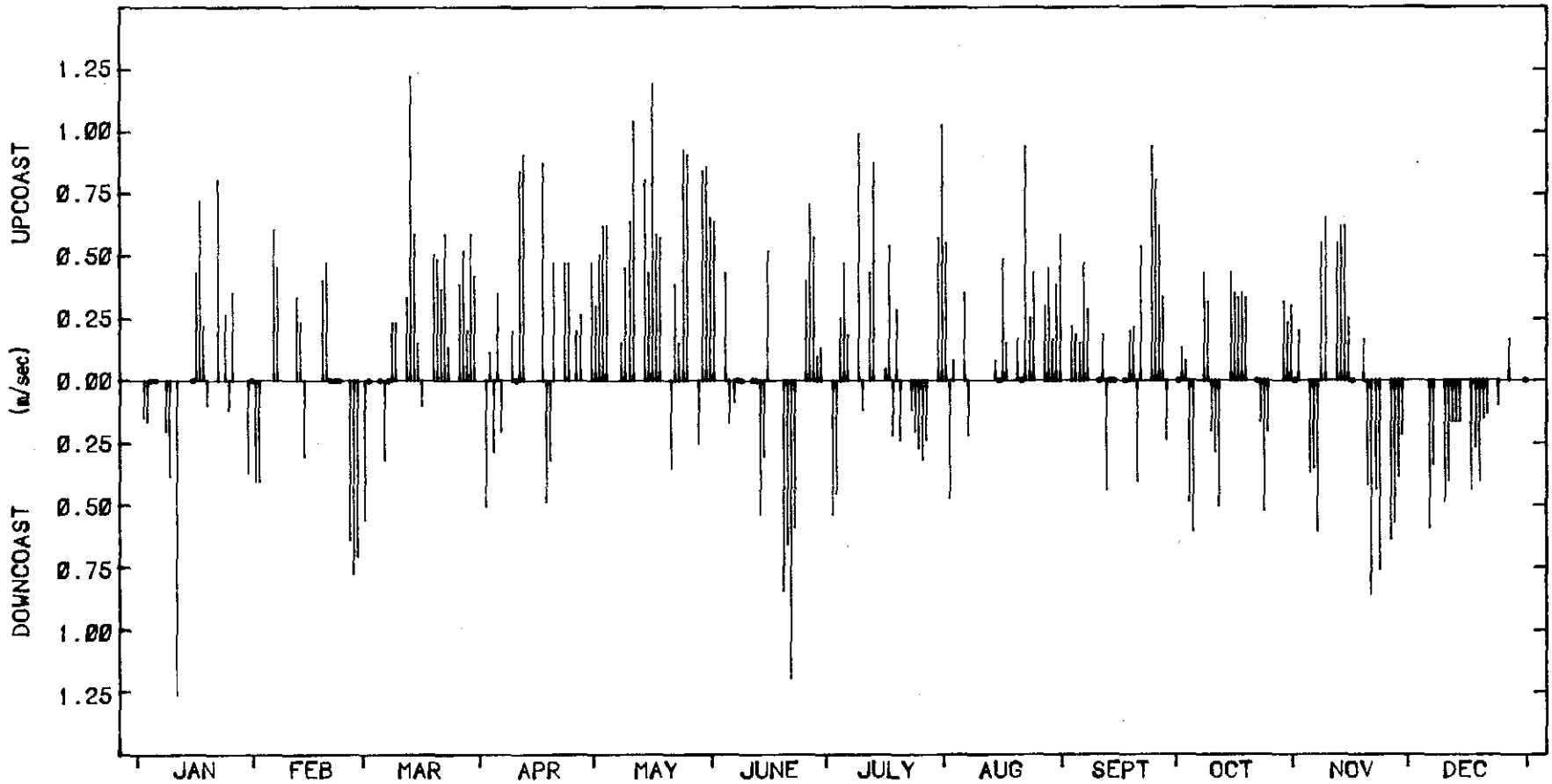
COPE Currigee

Figure 25
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



LITTORAL CURRENT SUMMARY - 1979

Mean Vel = 0.116 m/sec (up) Mean Upcoast Vel = 0.448 m/sec Mean Downcoast Vel = 0.384 m/sec

MORNING OBSERVATIONS - (233 recordings)

LITTORAL CURRENTS - MORNING 1979

COPE Currigee

Figure 26
C 18.1

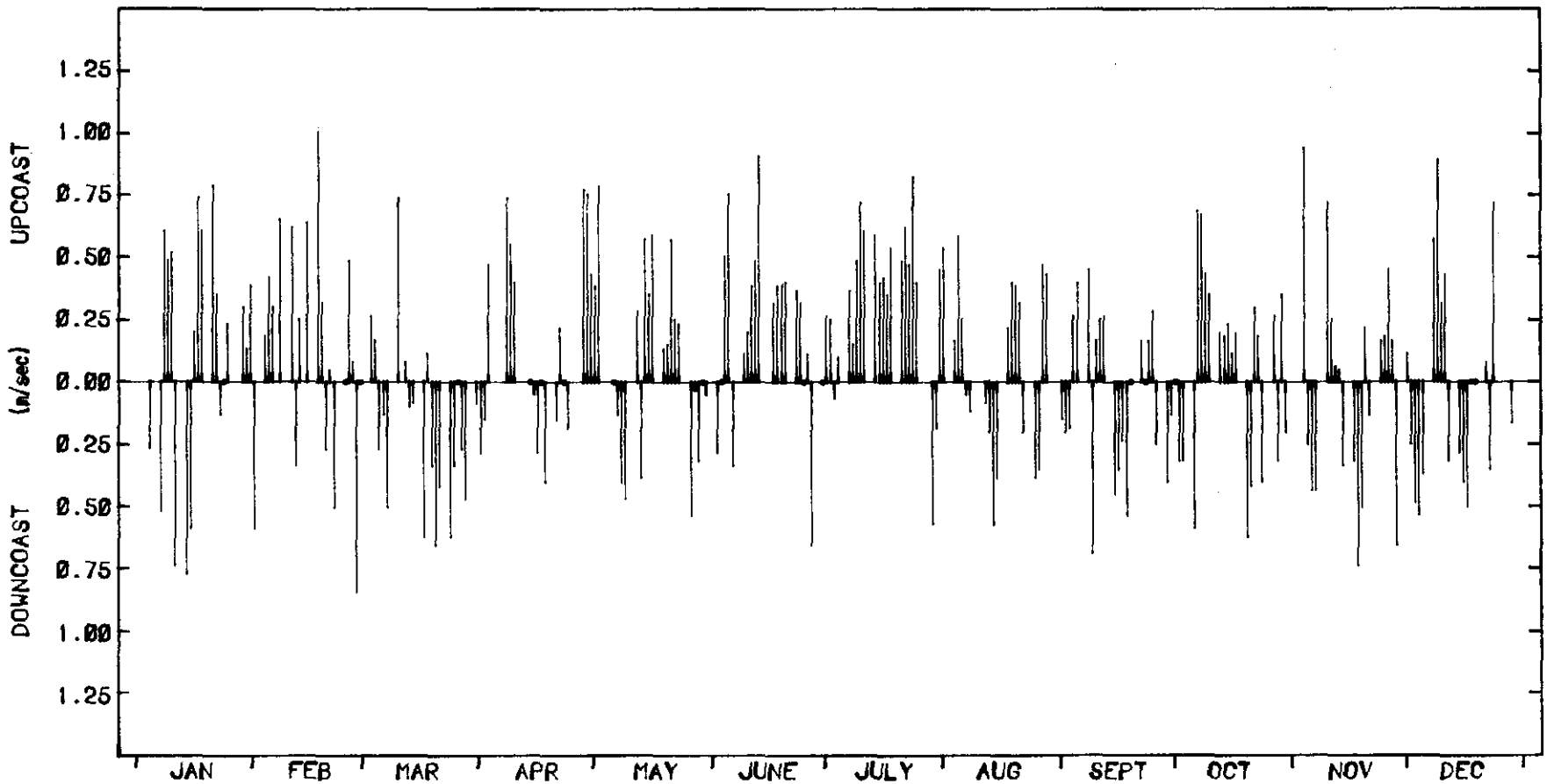
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

Ø105



LITTORAL CURRENTS - MORNING 1980

LITTORAL CURRENT SUMMARY - 1980

Mean Vel = Ø.Ø76 m/sec (up) Mean Upcoast Vel = Ø.392 m/sec Mean Downcoast Vel = Ø.353 m/sec

MORNING OBSERVATIONS - (240 recordings)

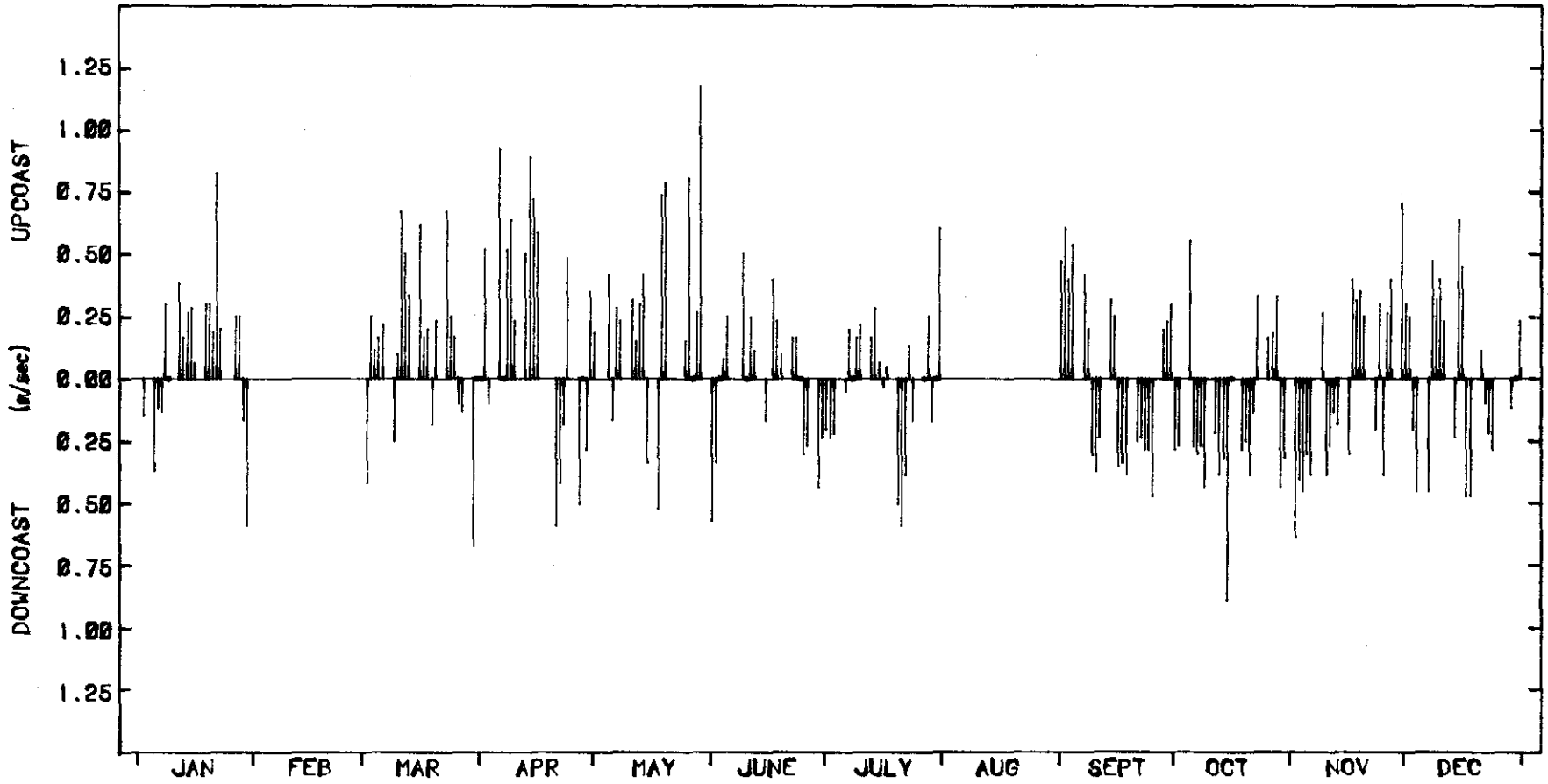
COPE Currigee

Figure 27
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE Ø1Ø5



LITTORAL CURRENTS - MORNING 1981

LITTORAL CURRENT SUMMARY - 1981

Mean Vel = Ø.Ø5Ø m/sec (up) Mean Upcoast Vel = Ø.347 m/sec Mean Downcoast Vel = Ø.311 m/sec

MORNING OBSERVATIONS - (2Ø9 recordings)

COPE Currigee

Figure 28
C 18.1

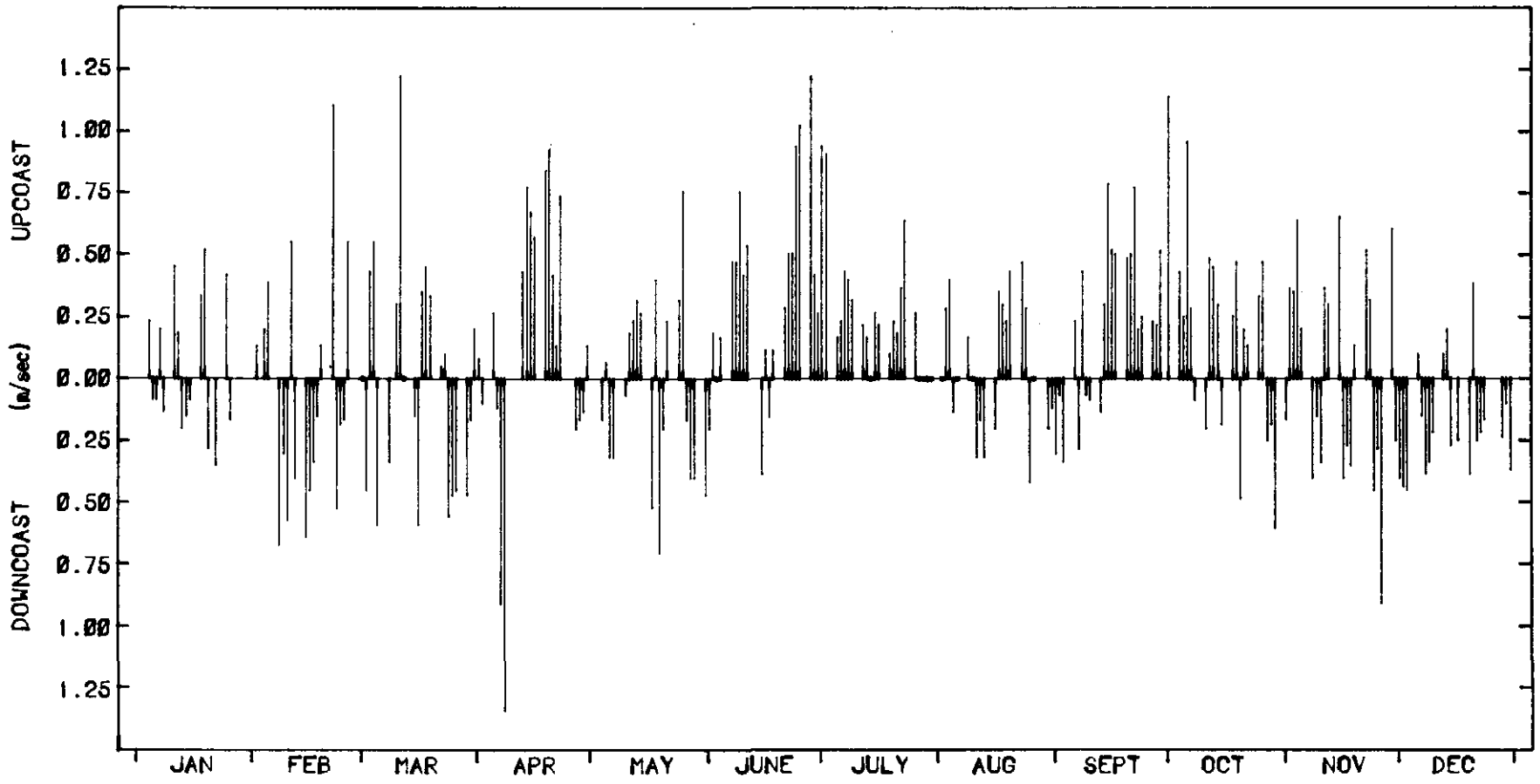
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

Ø105



LITTORAL CURRENT SUMMARY - 1982

Mean Vel = Ø.Ø88 m/sec (up) Mean Upcoast Vel = Ø.4Ø2 m/sec Mean Downcoast Vel = Ø.312 m/sec

MORNING OBSERVATIONS - (243 recordings)

LITTORAL CURRENTS - MORNING 1982

COPE
Currigee

Figure 29
C 18.1

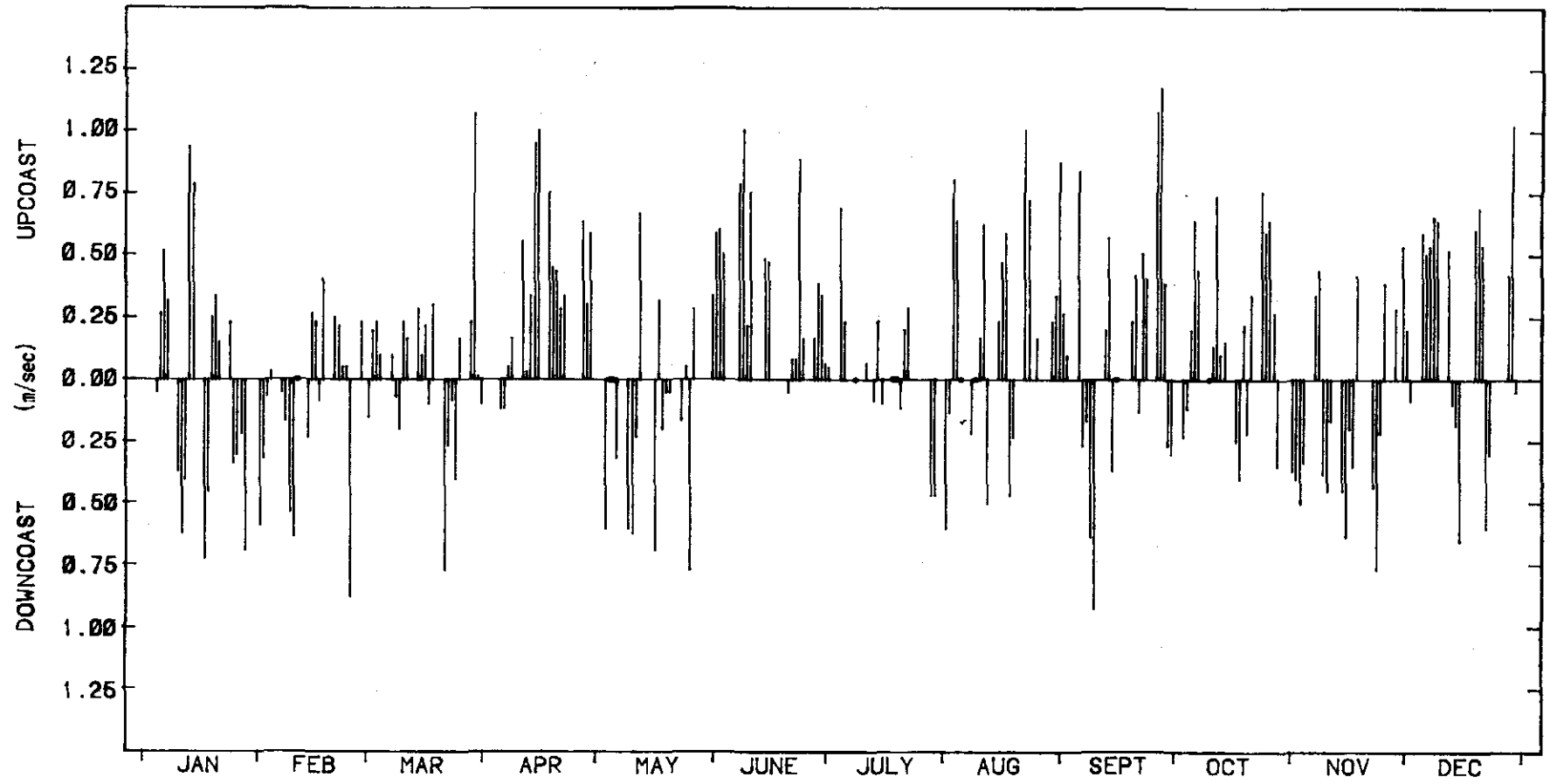
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

0105



LITTORAL CURRENT SUMMARY - 1983

Mean Vel = 0.104 m/sec (up) Mean Upcoast Vel = 0.410 m/sec Mean Downcoast Vel = 0.337 m/sec

MORNING OBSERVATIONS - (231 recordings)

LITTORAL CURRENTS - MORNING 1983

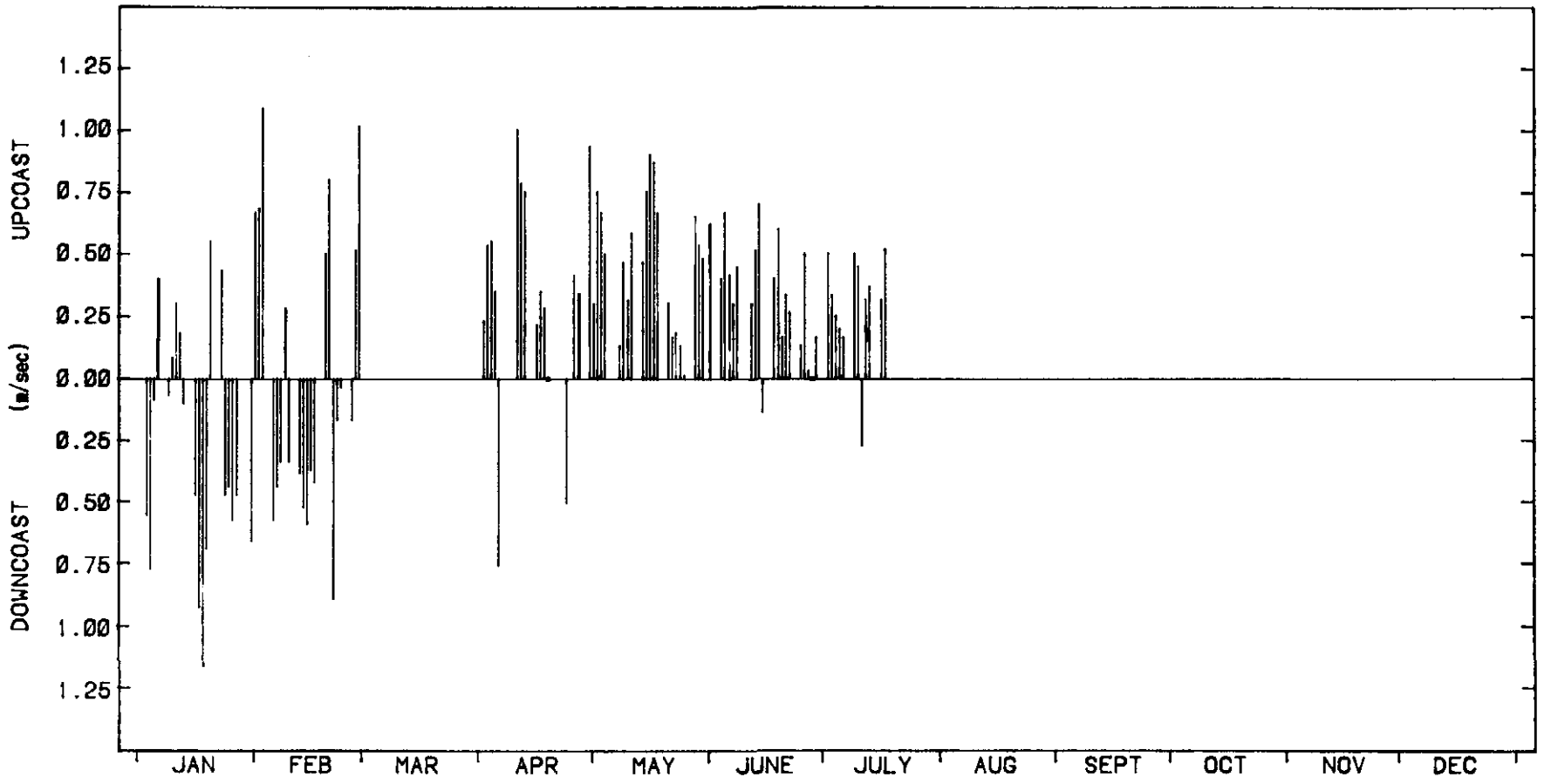
COPE Currigee

Figure 30
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



LITTORAL CURRENT SUMMARY - 1984

Mean Vel = 0.132 m/sec (up) Mean Upcoast Vel = 0.424 m/sec Mean Downcoast Vel = 0.400 m/sec

MORNING OBSERVATIONS - (111 recordings)

LITTORAL CURRENTS - MORNING 1984

COPE
Currigee

Figure 31
C 18.1

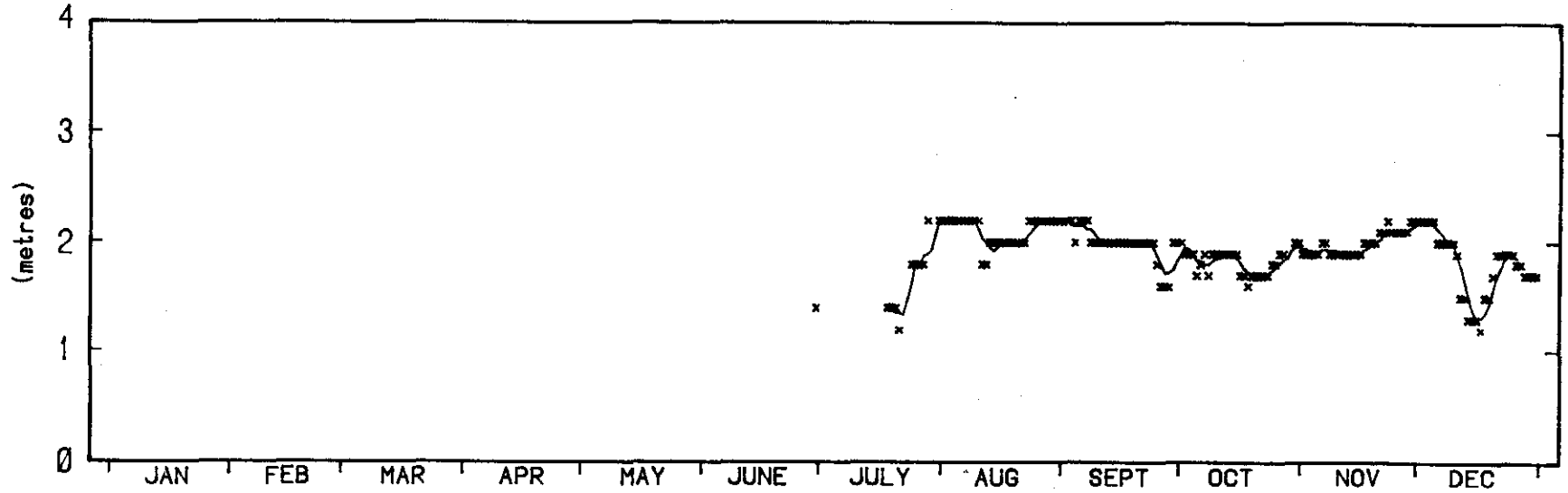
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

0105



BERM CREST ELEVATION - 1972

No. of Observations : 162

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1972

COPE Currigee

Figure 32
C 18.1

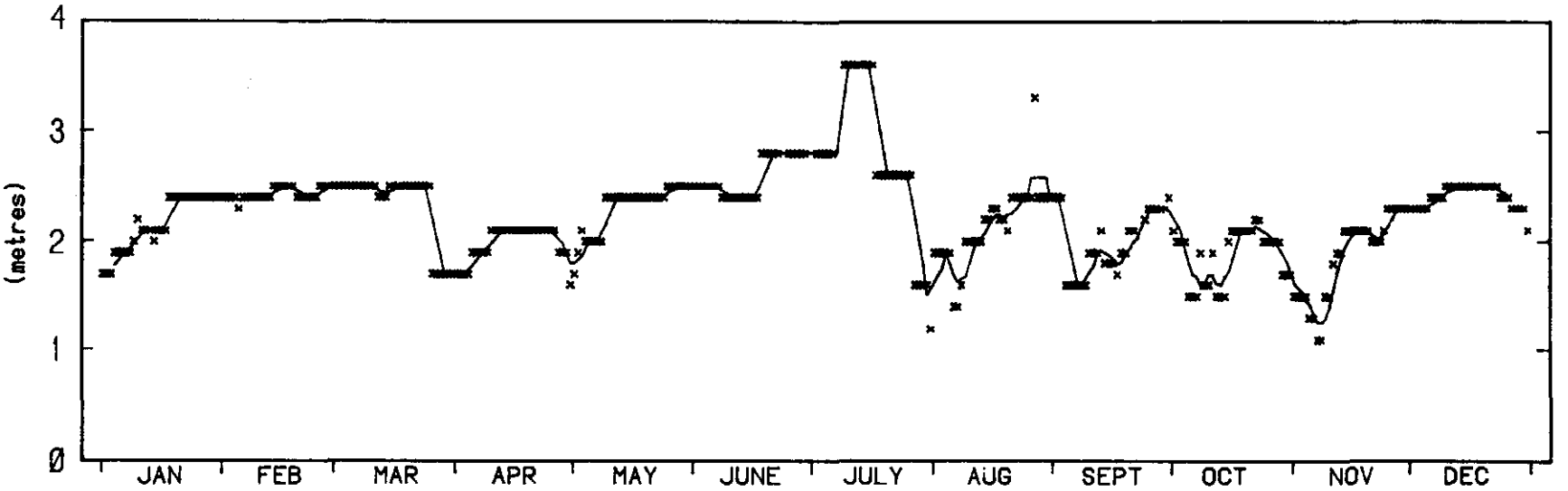
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

Ø1Ø5



BERM CREST ELEVATION - 1973

No. of Observations : 357

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1973

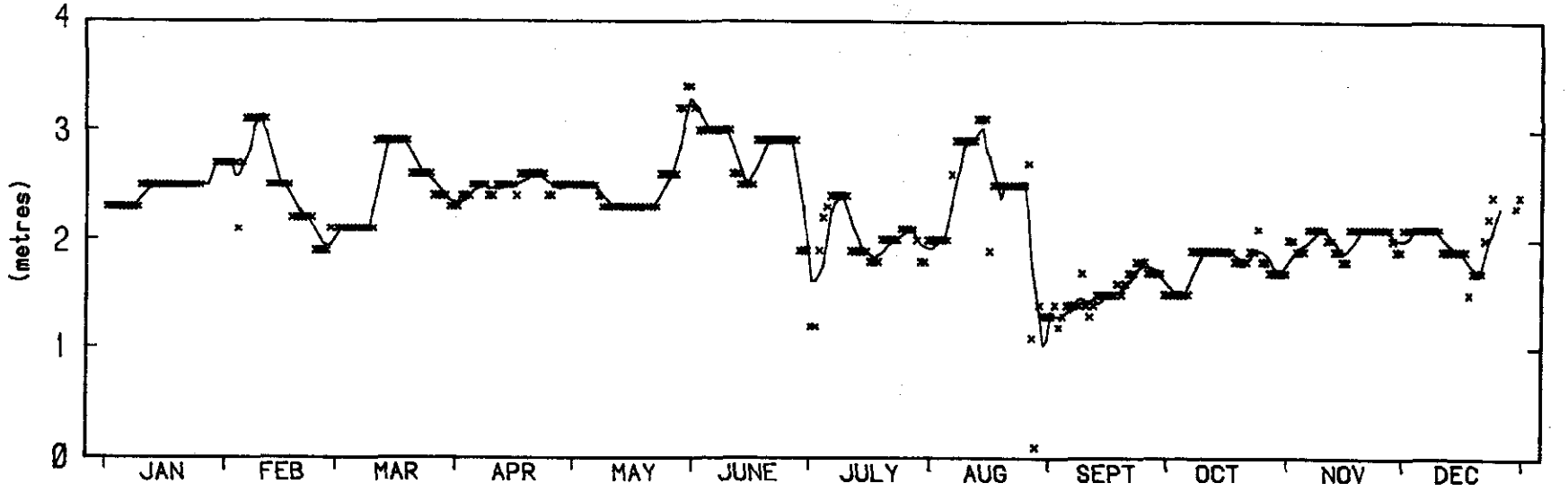
COPE Currigee

Figure 33
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1974

No. of Observations : 357

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1974

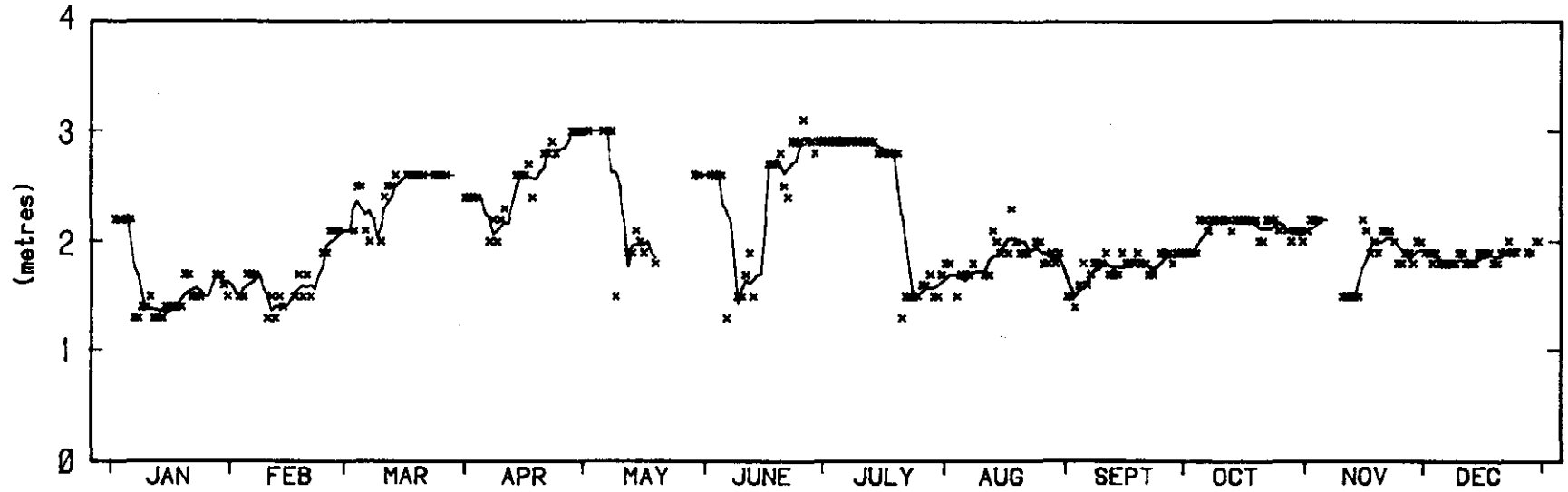
COPE Currigee

Figure 34
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1975

No. of Observations : 293

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1975

COPE Currigee

Figure 35
C 18.1

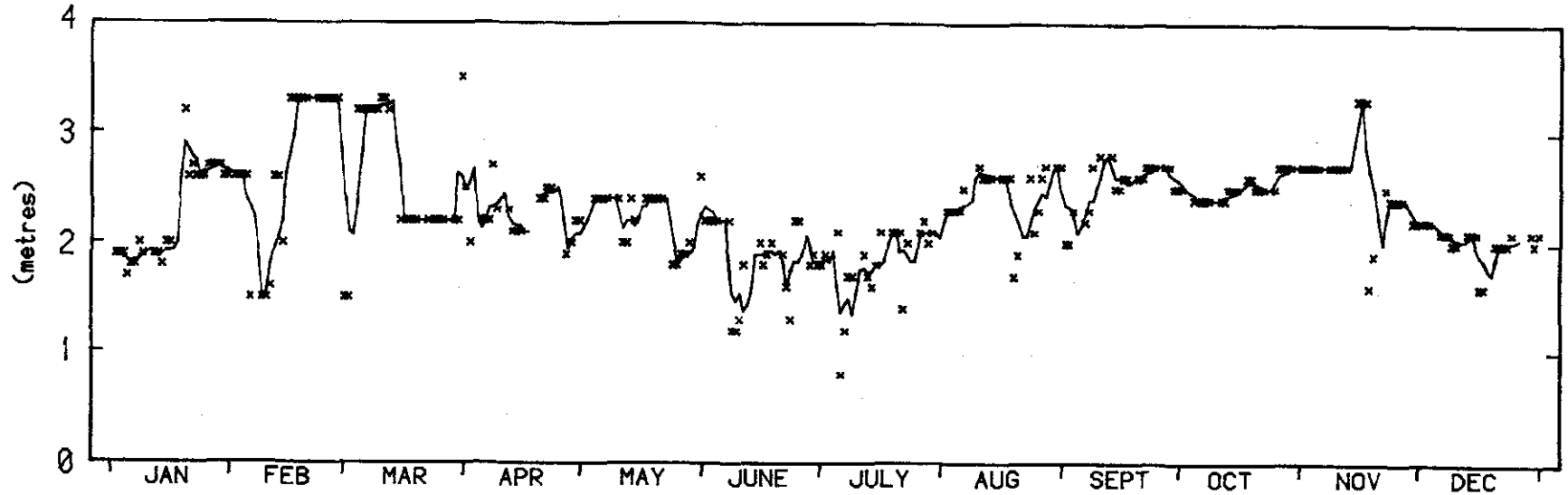
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

0105



BERM CREST ELEVATION - 1976

No. of Observations : 255

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1976

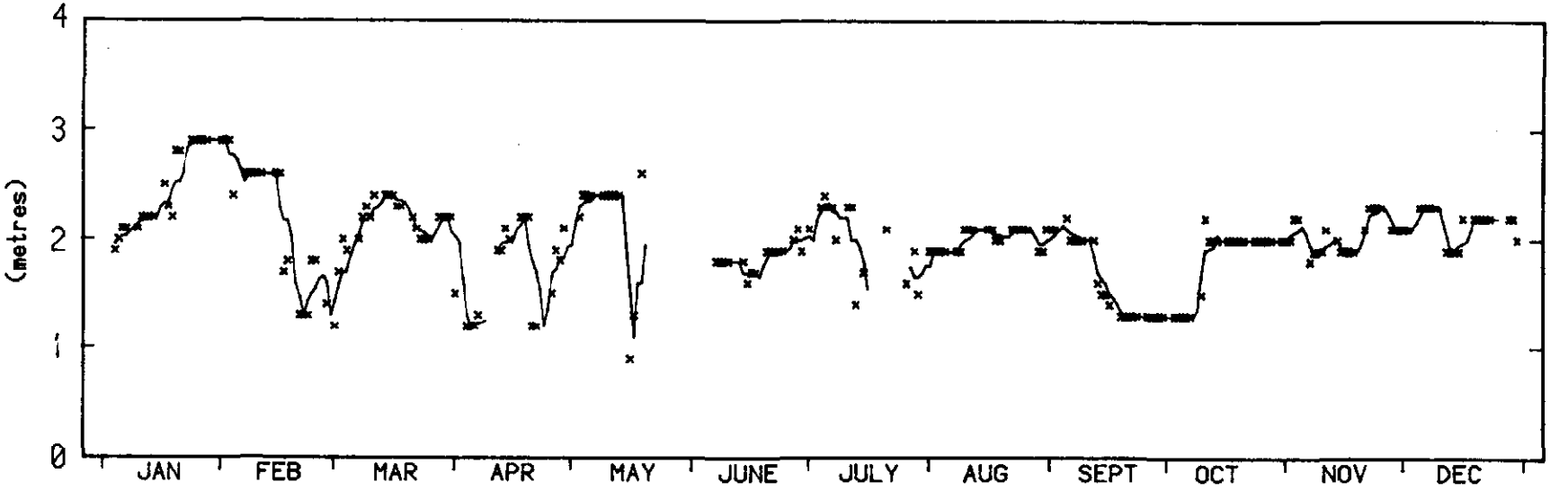
COPE Currigee

Figure 36
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1977

No. of Observations : 228

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1977

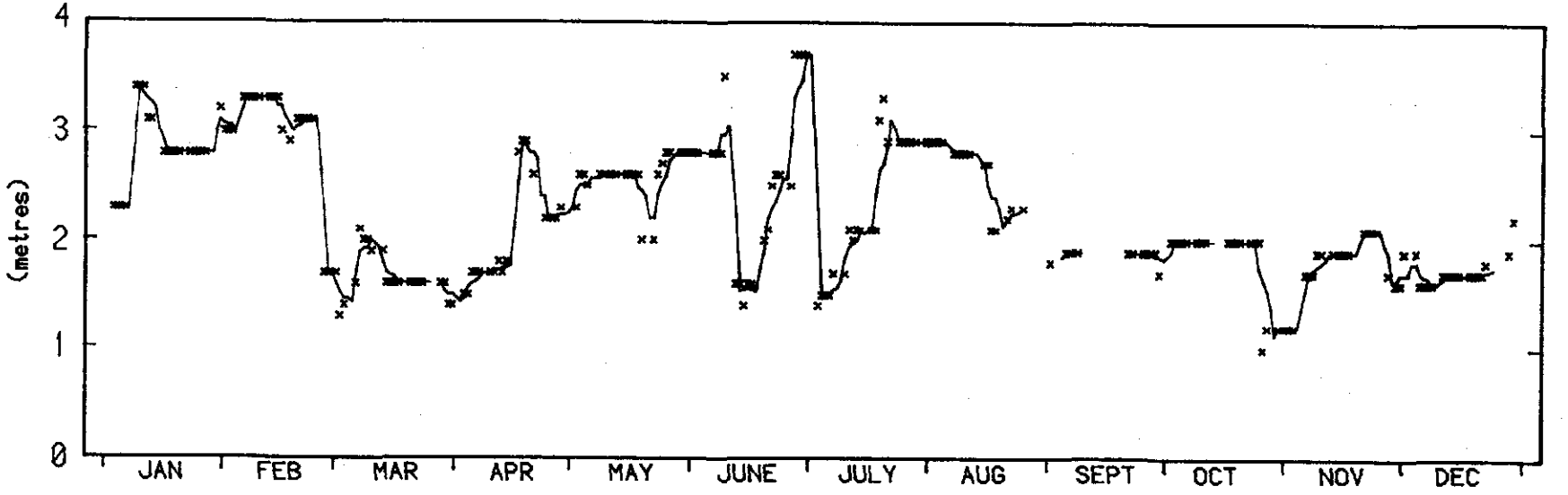
Currigee

Figure 37
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1978

No. of Observations : 224

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1978

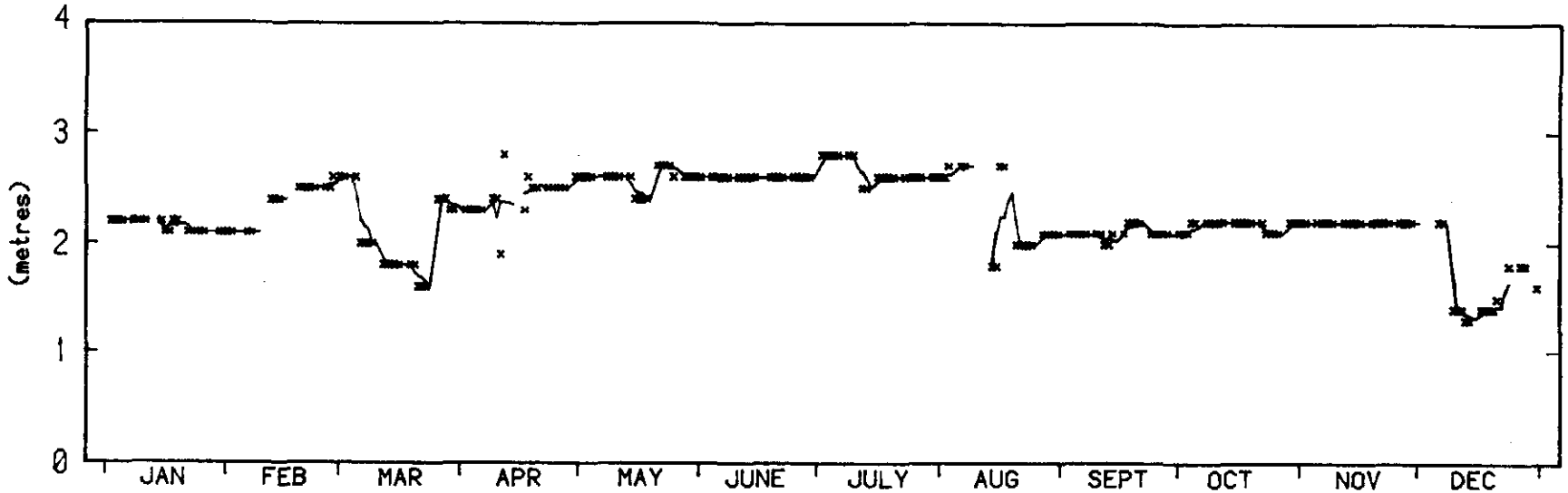
COPE
Currigee

Figure 38
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1979

No. of Observations : 235

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1979

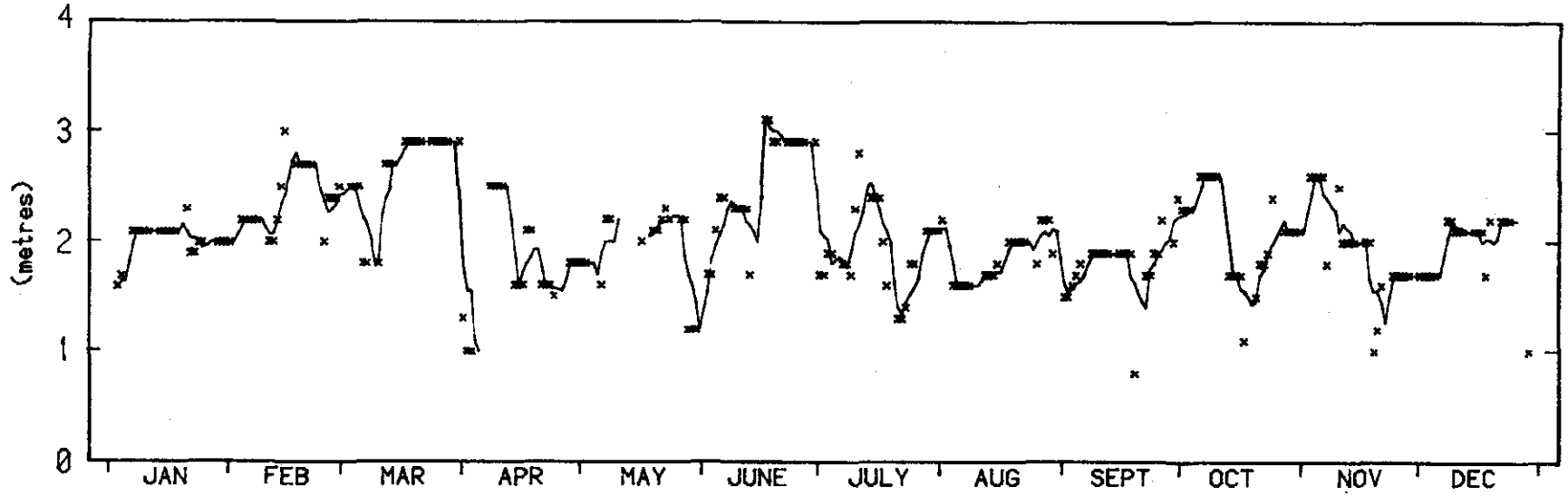
COPE Currigee

Figure 39
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1980

No. of Observations : 243

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1980

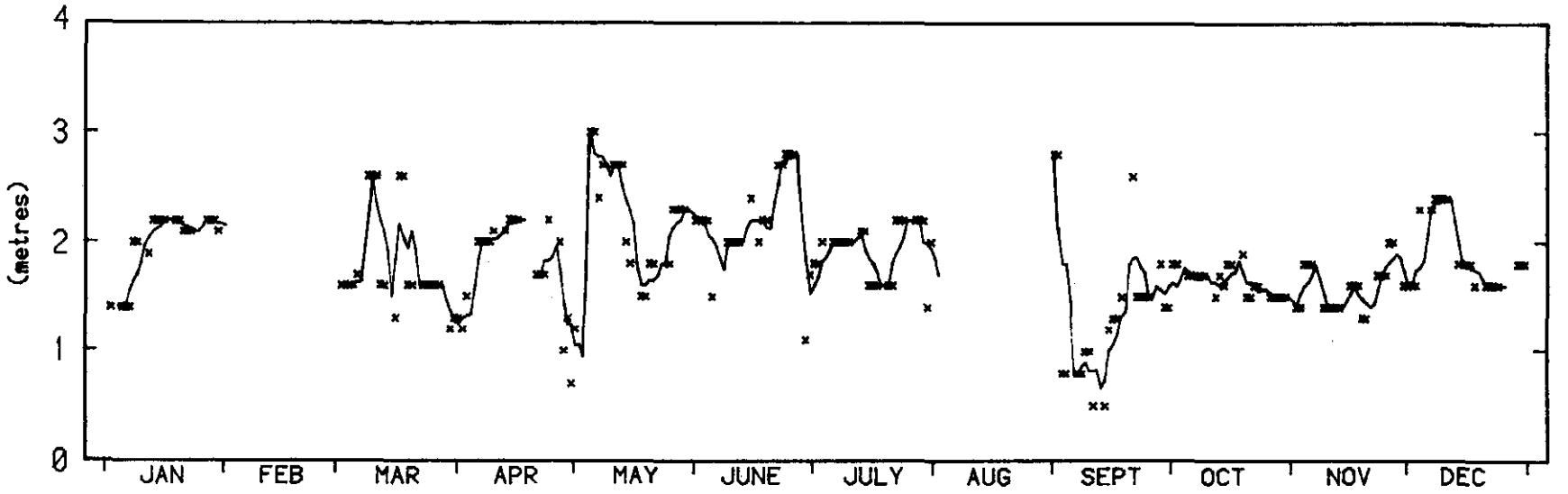
COPE Currigee

Figure 40
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1981

No. of Observations : 210

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1981

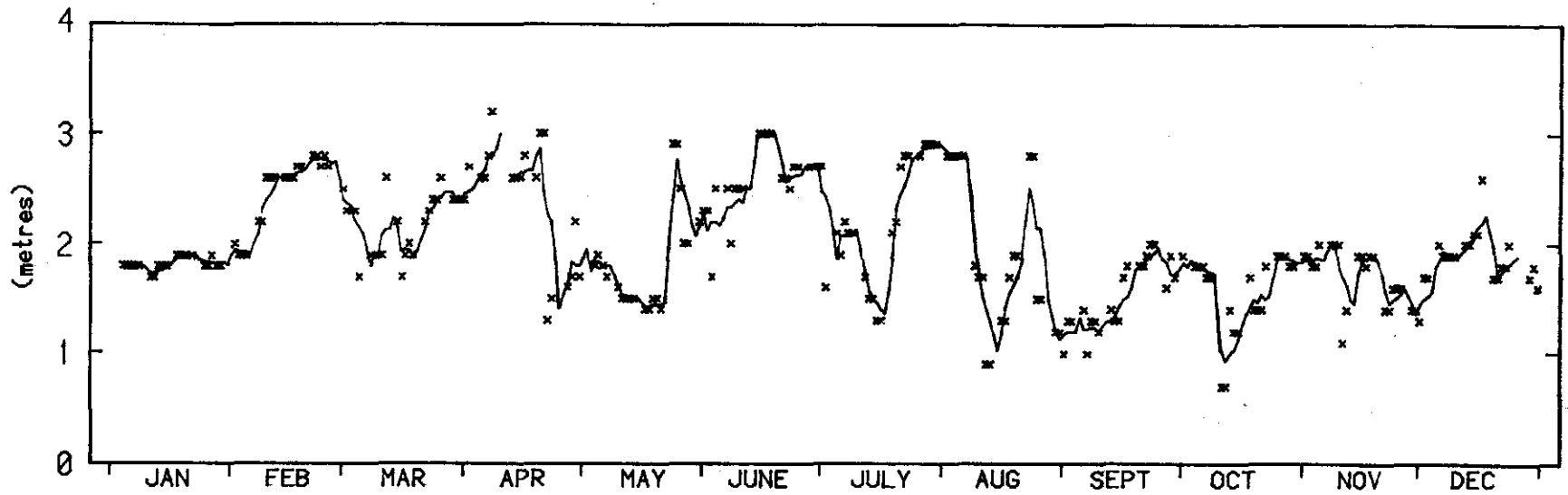
COPE Currigee

Figure 41
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1982

No. of Observations : 248

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1982

COPE Currigee

Figure 42
C 18.1

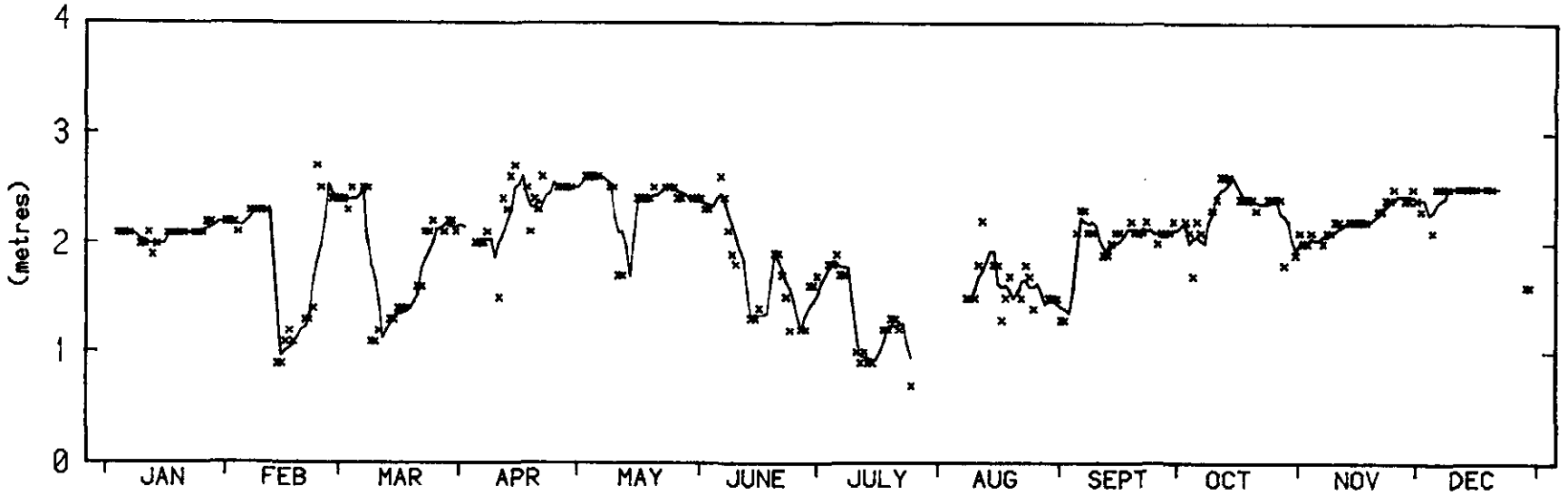
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

0105



BERM CREST ELEVATION - 1983

No. of Observations : 237

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1983

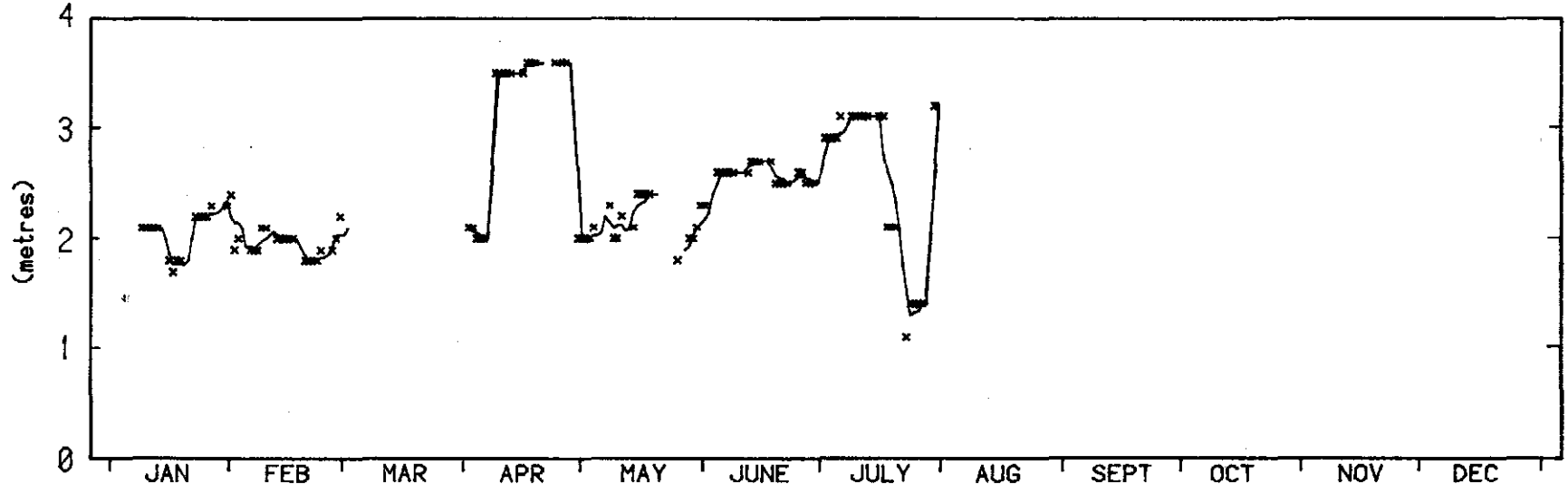
COPE
Currigee

Figure 43
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY CURRIGEE 0105



BERM CREST ELEVATION - 1984

No. of Observations : 123

Indicates Five Day Moving Average

BERM CREST ELEVATION - 1984

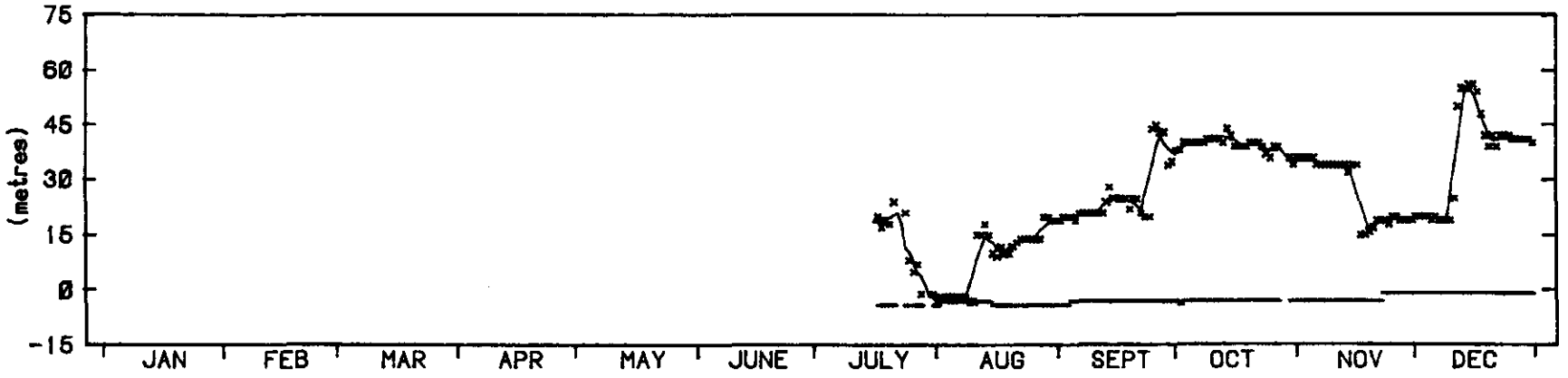
COPE Currigee

Figure 44
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

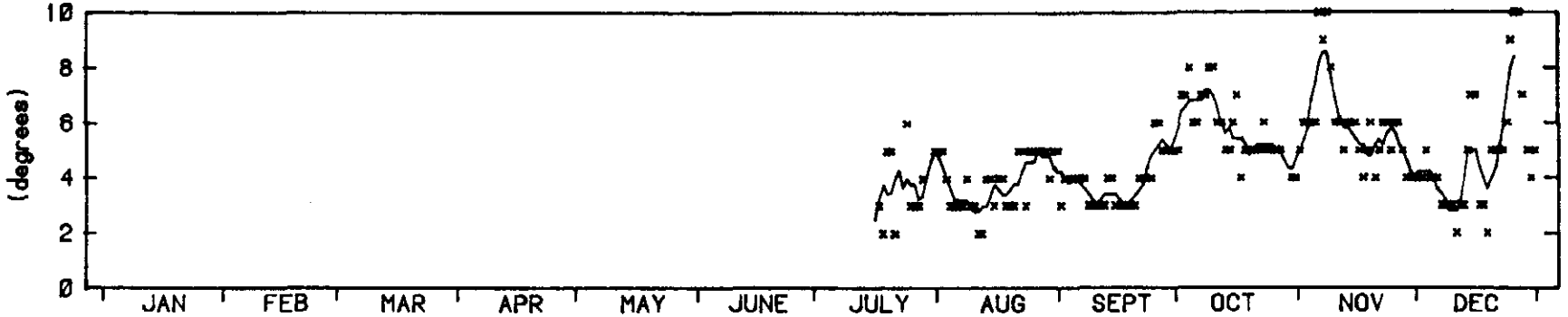
GOLD COAST CITY CURRIGEE 0105



DISTANCE TO BERM AND VEGETATION LINE - 1972

Indicates Distance to Berm : 162 Observations

Indicates Distance to Vegetation Line : 162 Observations



FORESHORE SLOPE - 1972

Five Day Moving Average

No. of Observations : 162

BEACH PROFILE PARAMETERS - 1972

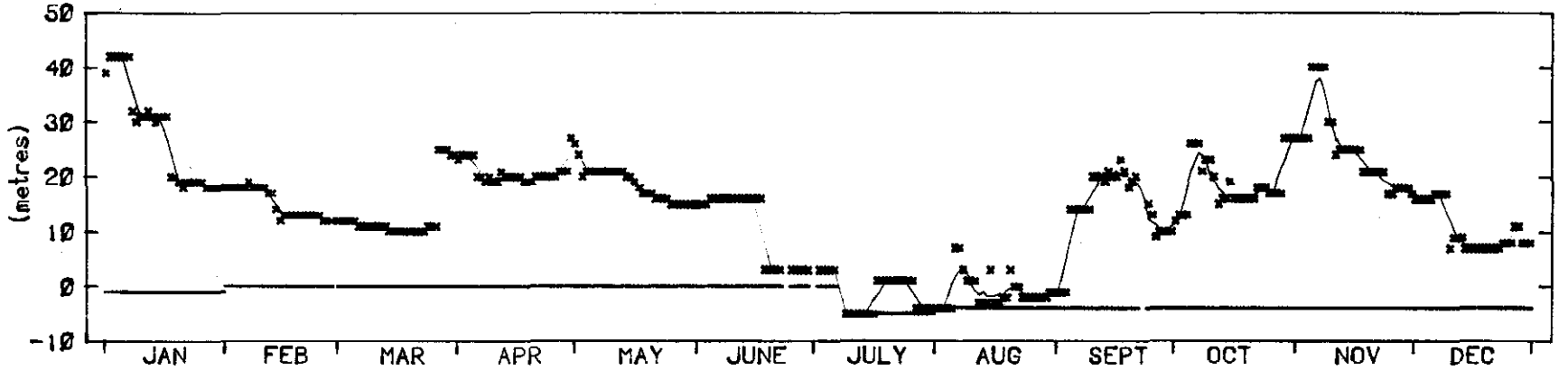
COPE Currigee

Figure 45
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

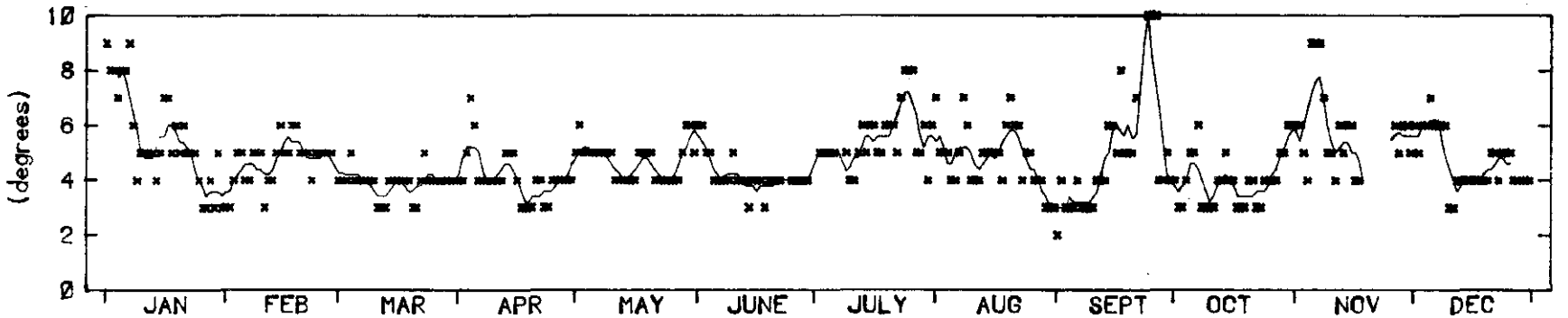
GOLD COAST CITY CURRIGEE 0105



DISTANCE TO BERM AND VEGETATION LINE - 1973

xxxxx Indicates Distance to Berm : 357 Observations

— Indicates Distance to Vegetation Line : 357 Observations



FORESHORE SLOPE - 1973

Five Day Moving Average

No. of Observations : 349

BEACH PROFILE PARAMETERS - 1973

COPE Currigee

Figure 46
C 18.1

Beach Protection Authority

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GOLD COAST CITY

CURRIGEE

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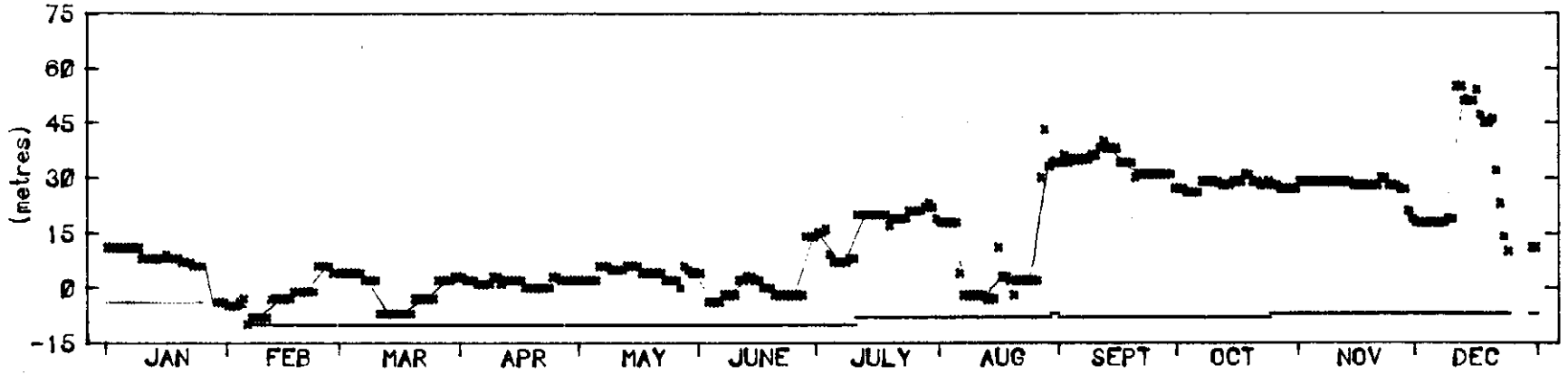
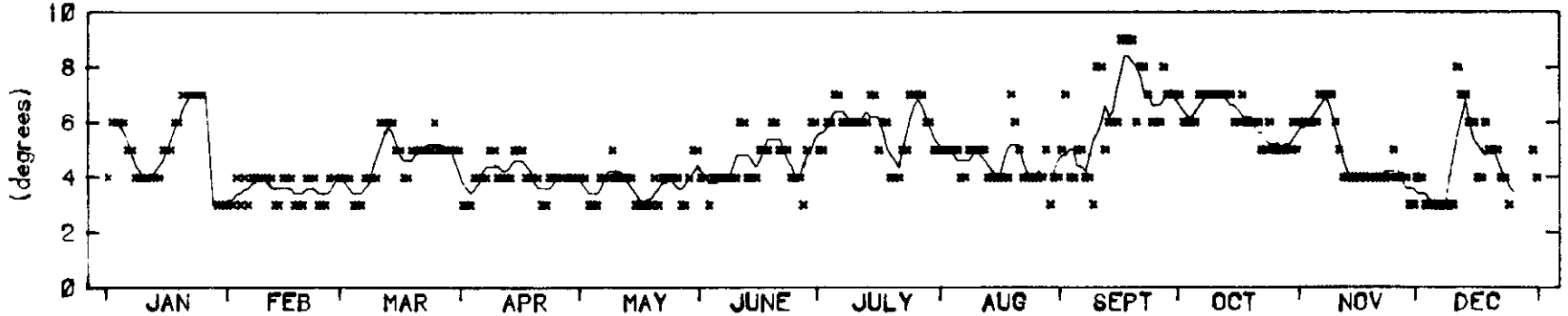


DISTANCE TO BERM AND VEGETATION LINE - 1974

Indicates Distance to Berm : 356 Observations

Indicates Distance to Vegetation Line : 356 Observations



FORESHORE SLOPE - 1974

Five Day Moving Average

No. of Observations : 355

BEACH PROFILE PARAMETERS - 1974

COPE
Currigee

Figure 47
C 18.1

Beach Protection Authority

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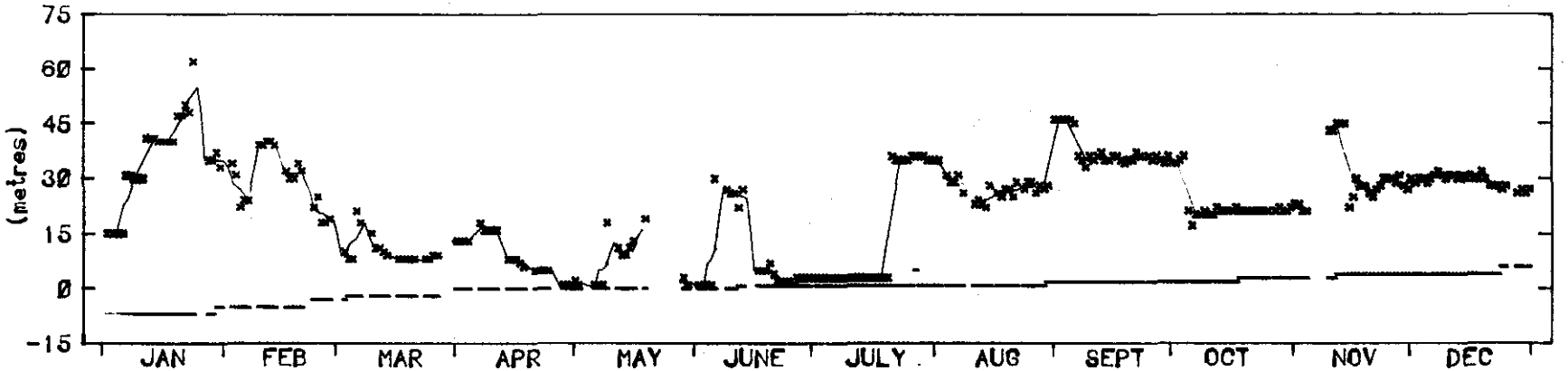
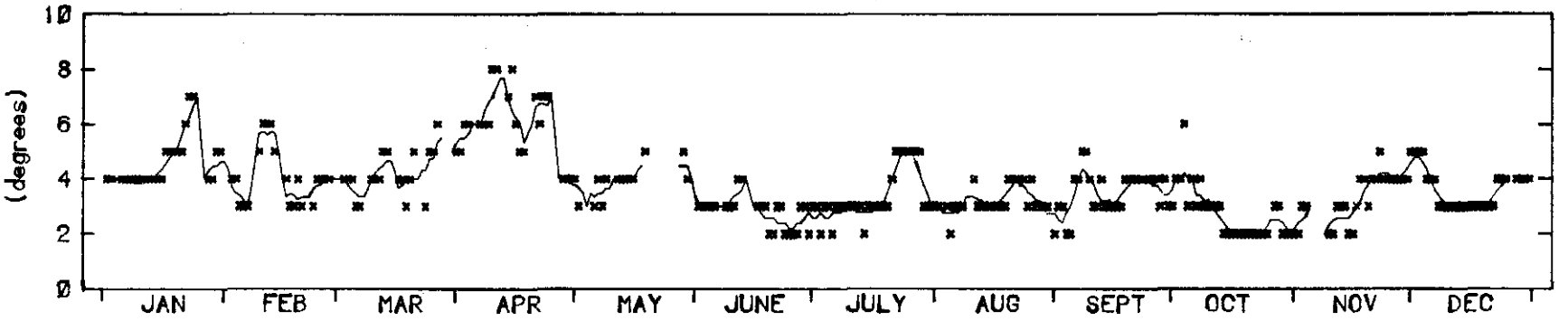
GOLD COAST CITY CURRIGEE Ø105



DISTANCE TO BERM AND VEGETATION LINE - 1975

Indicates Distance to Berm : 293 Observations

Indicates Distance to Vegetation Line : 293 Observations



FORESHORE SLOPE - 1975

Five Day Moving Average

No. of Observations : 292

BEACH PROFILE PARAMETERS - 1975

COPE Currigee

Figure 48
C 18.1

Beach Protection Authority

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GOLD COAST CITY

CURRIGEE

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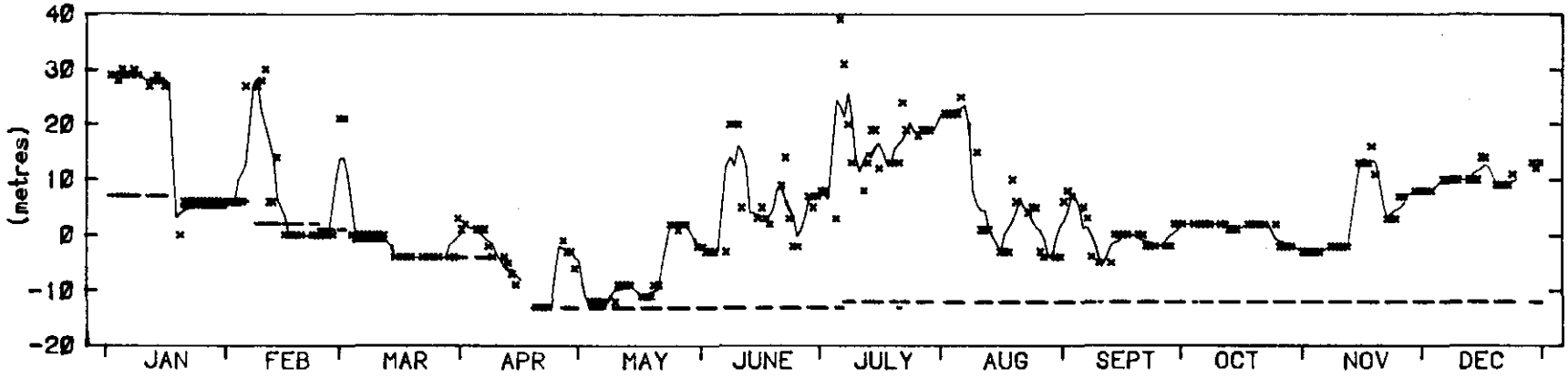
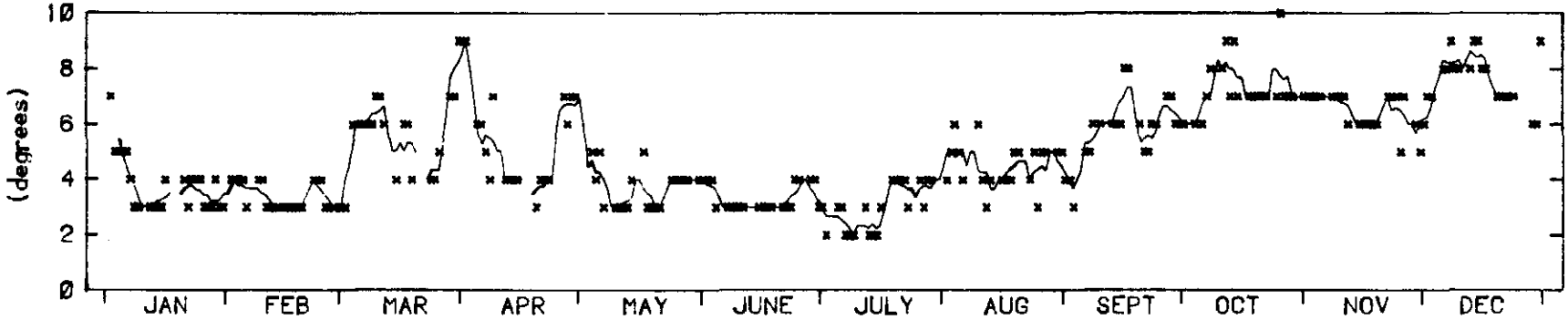


DISTANCE TO BERM AND VEGETATION LINE - 1976

Indicates Distance to Berm : 255 Observations

Indicates Distance to Vegetation Line : 254 Observations



FORESHORE SLOPE - 1976

Five Day Moving Average

No. of Observations : 253

BEACH PROFILE PARAMETERS - 1976

COPE
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Figure 49
C 18.1

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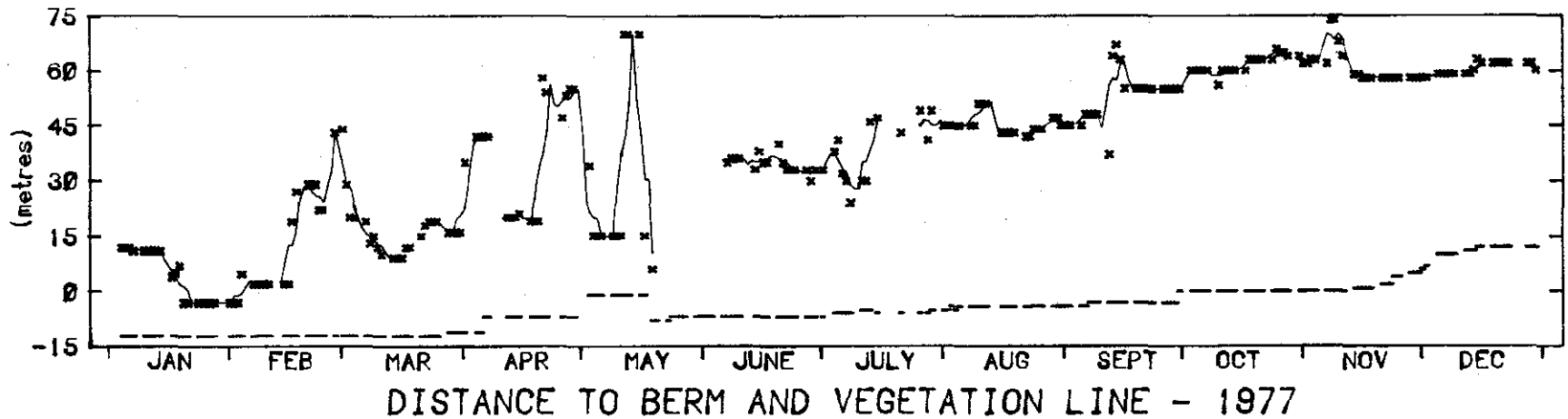
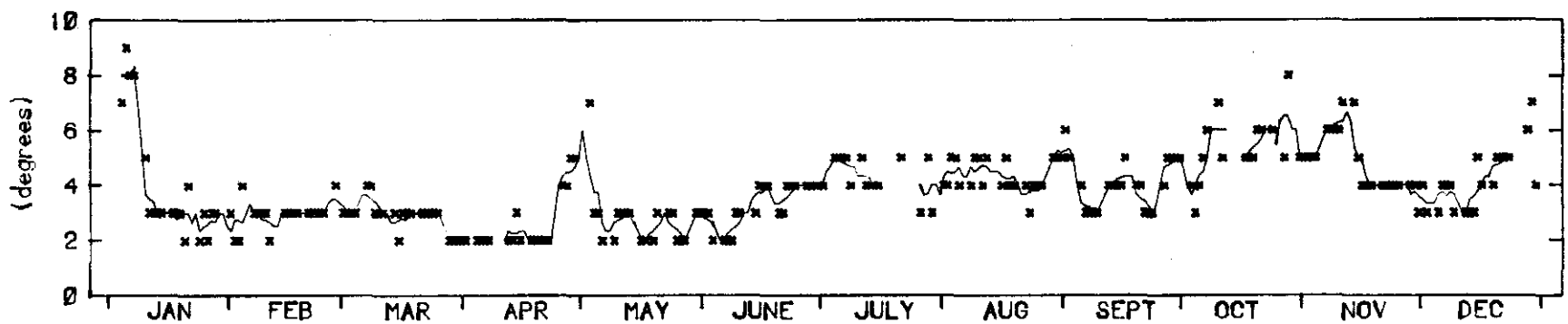
GOLD COAST CITY CURRIGEE 0105



DISTANCE TO BERM AND VEGETATION LINE - 1977

Indicates Distance to Berm : 228 Observations

Indicates Distance to Vegetation Line : 240 Observations



FORESHORE SLOPE - 1977

Five Day Moving Average

No. of Observations : 235

BEACH PROFILE PARAMETERS - 1977

COPE Currigee

Figure 50
C 18.1

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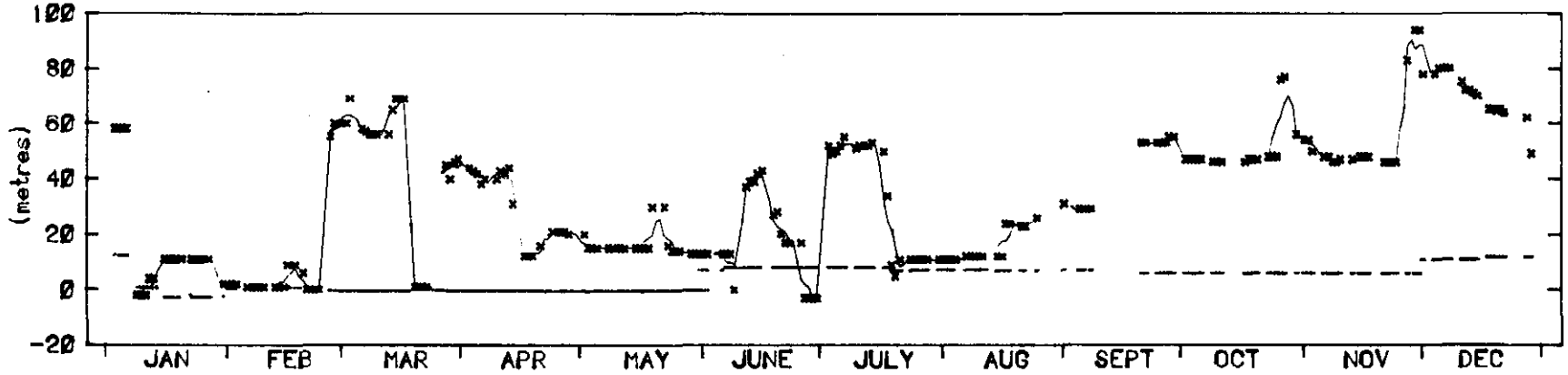
GOLD COAST CITY

CURRIGEE

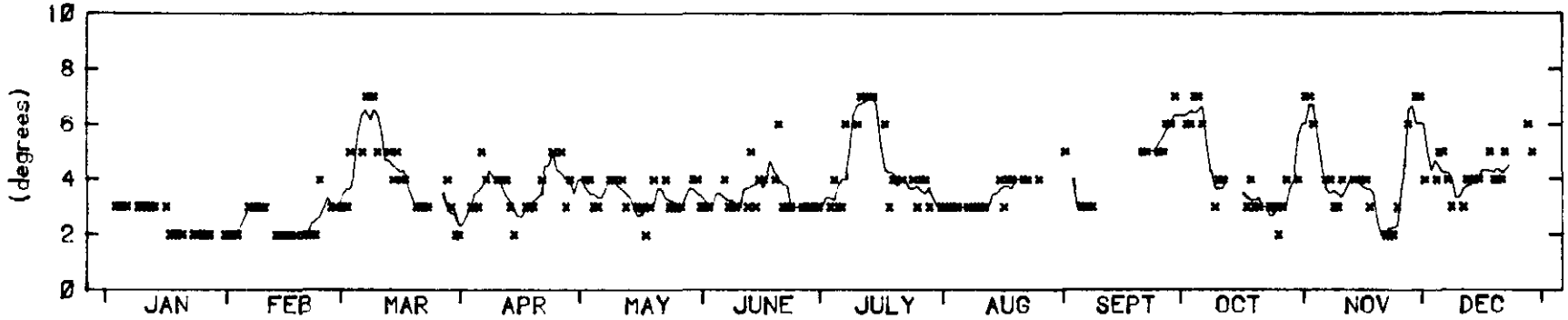
0105



DISTANCE TO BERM AND VEGETATION LINE - 1978

Indicates Distance to Berm : 224 Observations

Indicates Distance to Vegetation Line : 224 Observations



FORESHORE SLOPE - 1978

Five Day Moving Average

No. of Observations : 224

BEACH PROFILE PARAMETERS - 1978

COPE
Currigee

Figure 51
C 18.1

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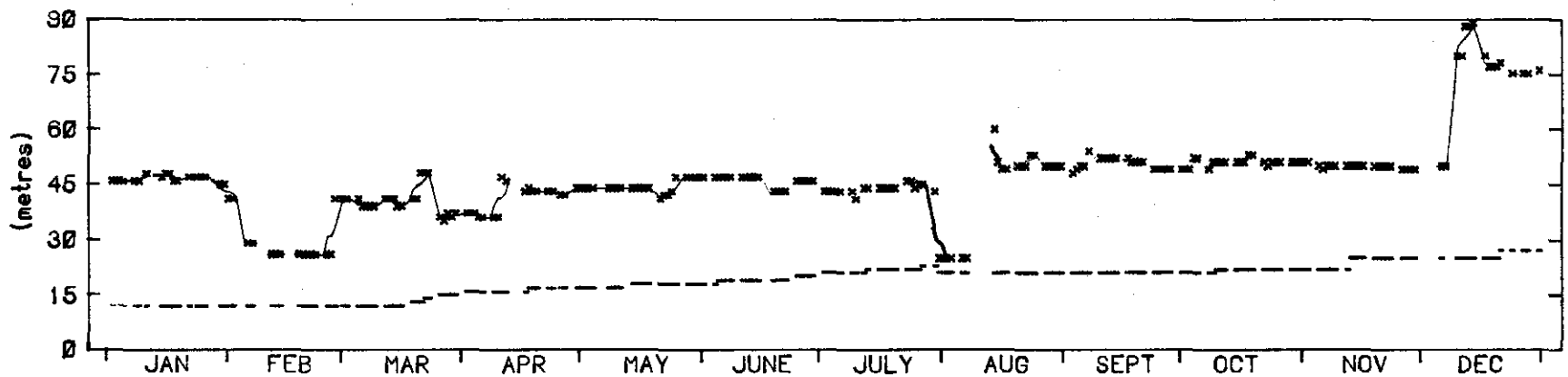
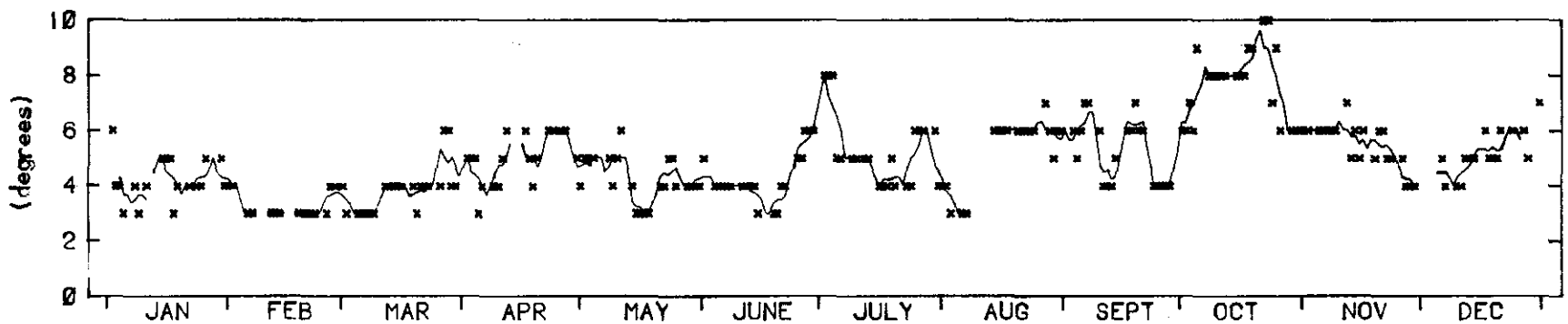
GOLD COAST CITY CURRIGEE 0105



DISTANCE TO BERM AND VEGETATION LINE - 1979

xxxxx Indicates Distance to Berm : 235 Observations

— Indicates Distance to Vegetation Line : 235 Observations



FORESHORE SLOPE - 1979

Five Day Moving Average

No. of Observations : 235

BEACH PROFILE PARAMETERS - 1979

COPE
Currigee

Figure 52
C 18.1

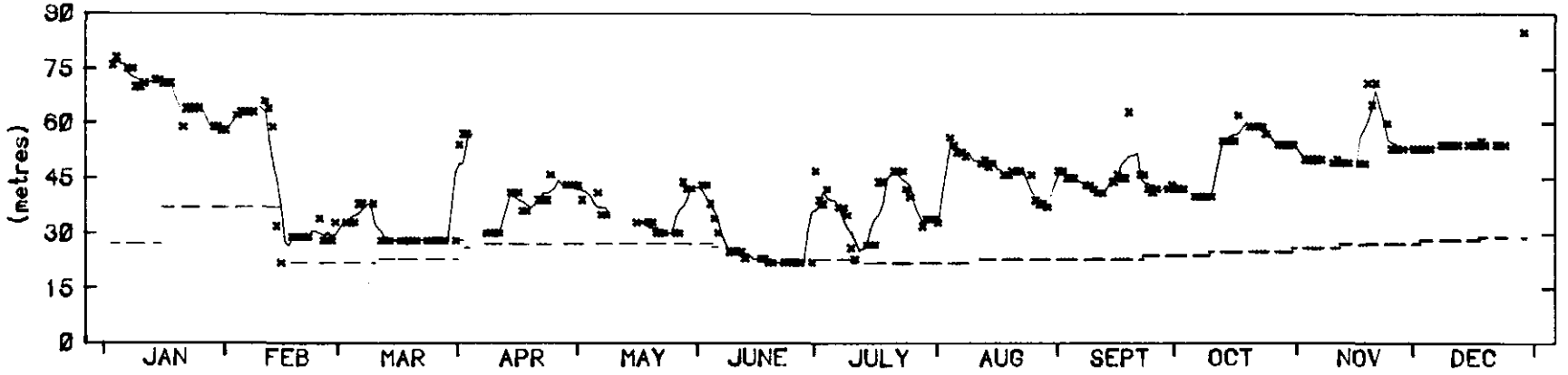
Beach Protection Authority

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

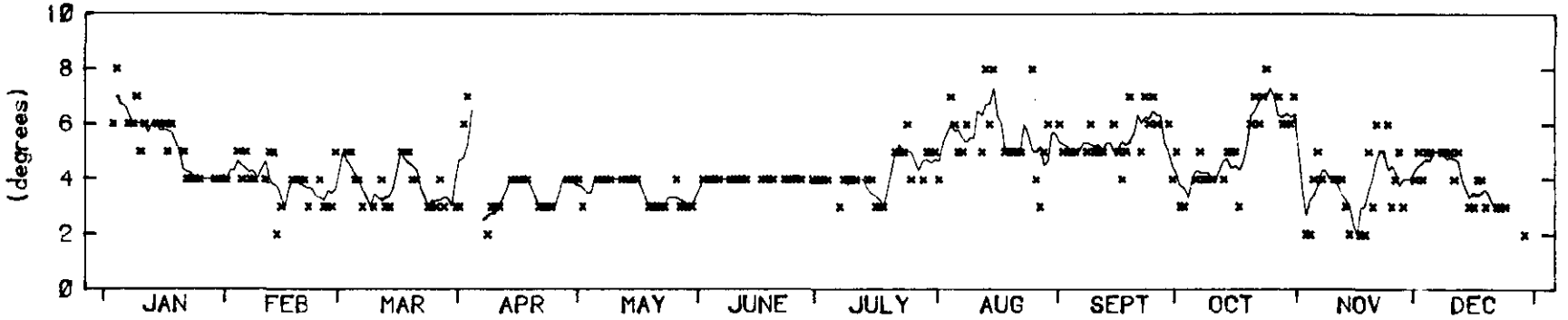
0105



DISTANCE TO BERM AND VEGETATION LINE - 1980

Indicates Distance to Berm : 243 Observations

Indicates Distance to Vegetation Line : 248 Observations



FORESHORE SLOPE - 1980

Five Day Moving Average

No. of Observations : 248

BEACH PROFILE PARAMETERS - 1980

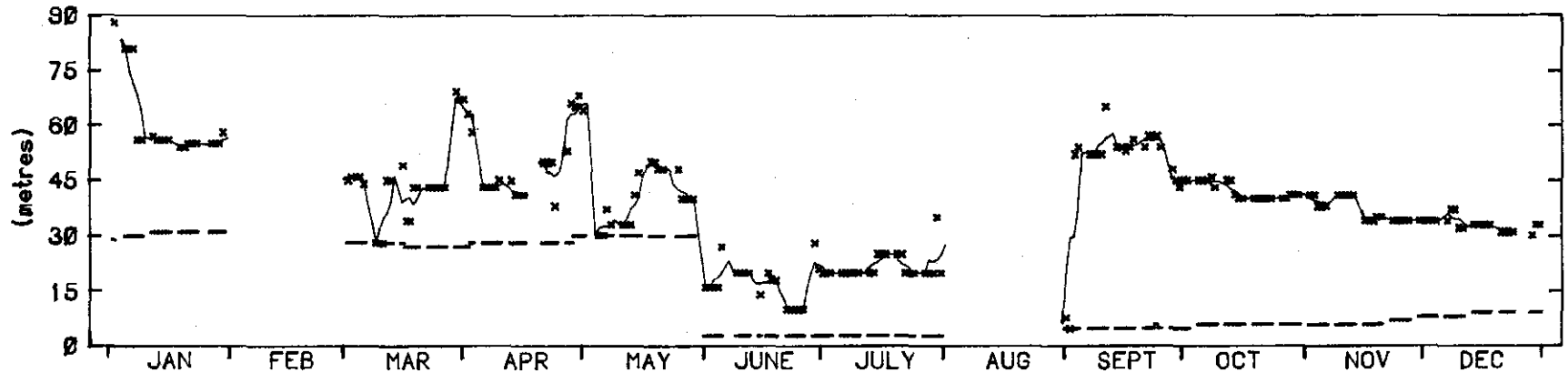
COPE
Currigee

Figure 53
C 18.1

Beach Protection Authority

COPE - Coastal Observation Programme Engineering

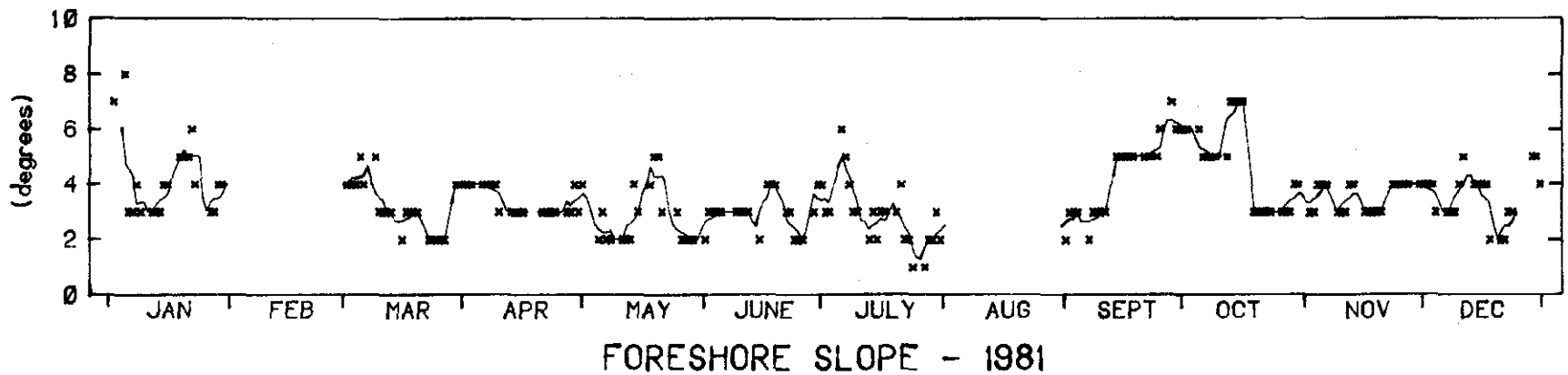
GOLD COAST CITY CURRIGEE 0105



DISTANCE TO BERM AND VEGETATION LINE - 1981

Indicates Distance to Berm : 210 Observations

Indicates Distance to Vegetation Line : 210 Observations



FORESHORE SLOPE - 1981

Five Day Moving Average

No. of Observations : 210

BEACH PROFILE PARAMETERS - 1981

COPE Currigee

Figure 54
C 18.1

Beach Protection Authority

BEACH PROFILE PARAMETERS - 1982

COPE
Currigee

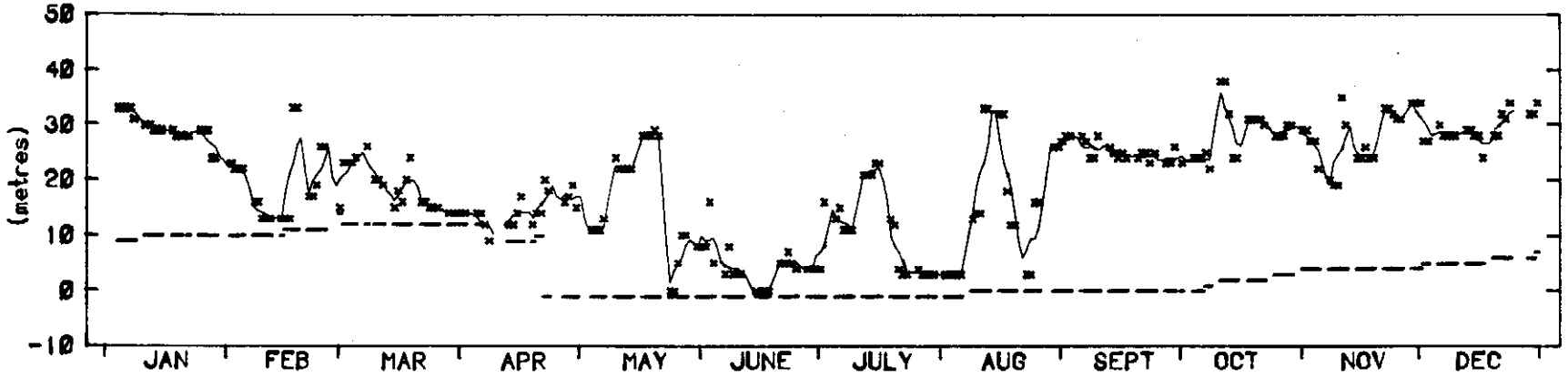
Figure 55
C 18.1

COPE - Coastal Observation Programme Engineering

GOLD COAST CITY

CURRIGEE

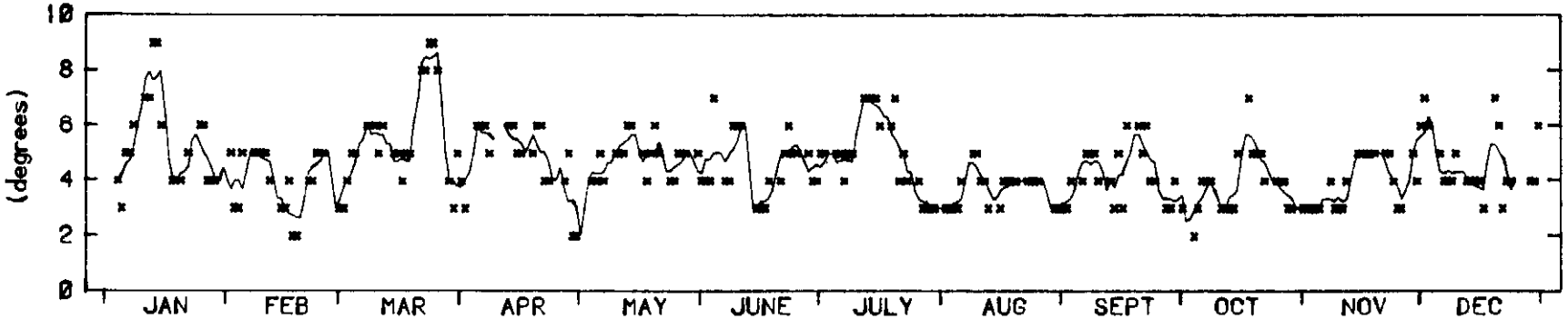
0105



DISTANCE TO BERM AND VEGETATION LINE - 1982

Indicates Distance to Berm : 248 Observations

Indicates Distance to Vegetation Line : 248 Observations



FORESHORE SLOPE - 1982

Five Day Moving Average

No. of Observations : 248

Beach Protection Authority

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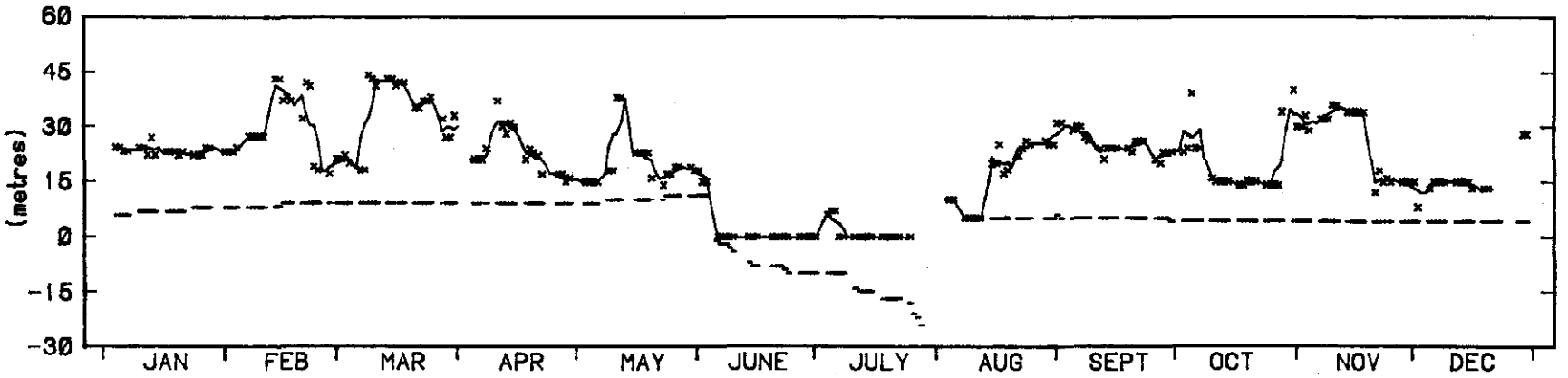
Programme Engineering

GOLD COAST CITY

CURRIGEE

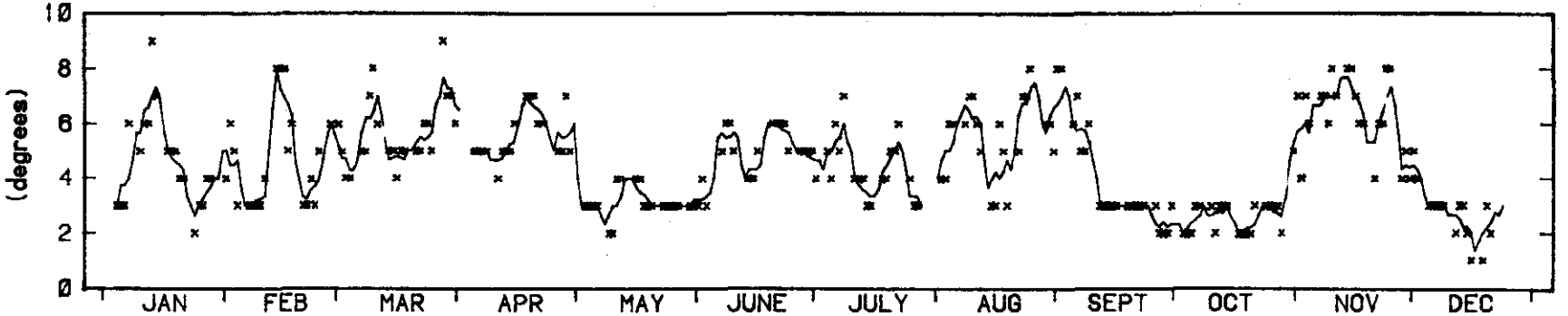
0105



DISTANCE TO BERM AND VEGETATION LINE - 1983

xxxxx Indicates Distance to Berm : 237 Observations

— Indicates Distance to Vegetation Line : 244 Observations



FORESHORE SLOPE - 1983

Five Day Moving Average

No. of Observations : 244

BEACH PROFILE PARAMETERS - 1983

COPE
Currigee

Figure 56
C 18.1

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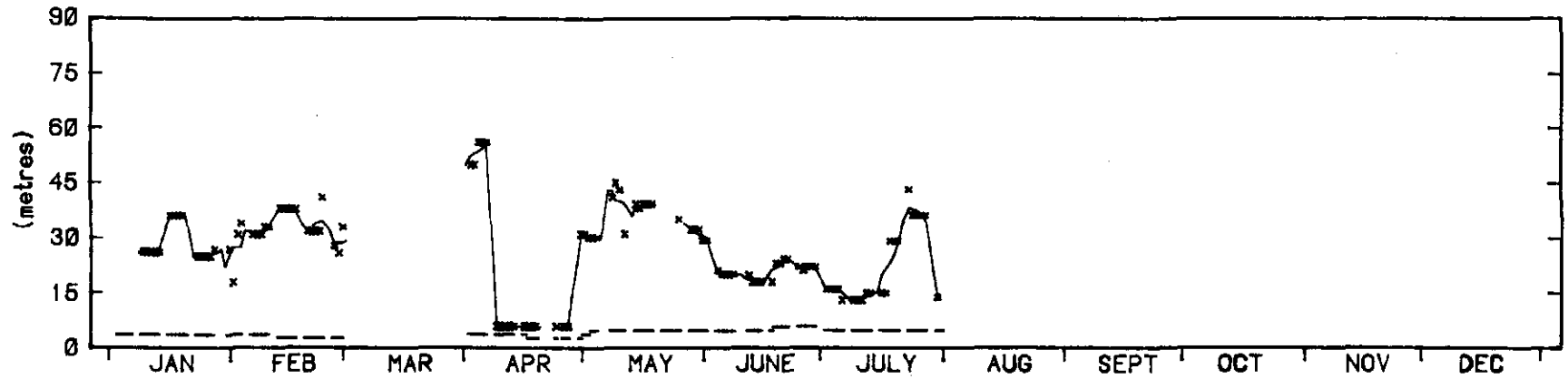
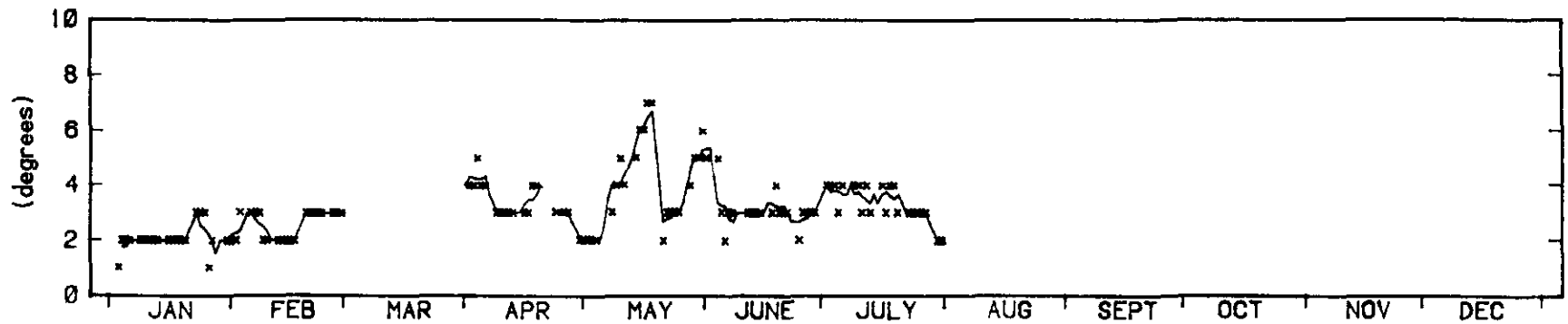
GOLD COAST CITY **CURRIGEE** **0105**



DISTANCE TO BERM AND VEGETATION LINE - 1984

xxxx Indicates Distance to Berm : 114 Observations

— Indicates Distance to Vegetation Line : 123 Observations



FORESHORE SLOPE - 1984

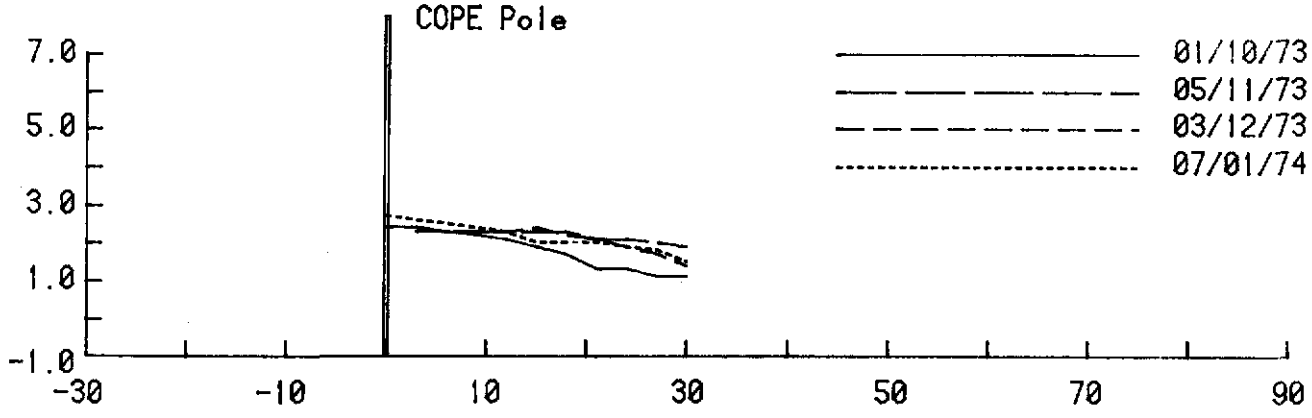
Five Day Moving Average

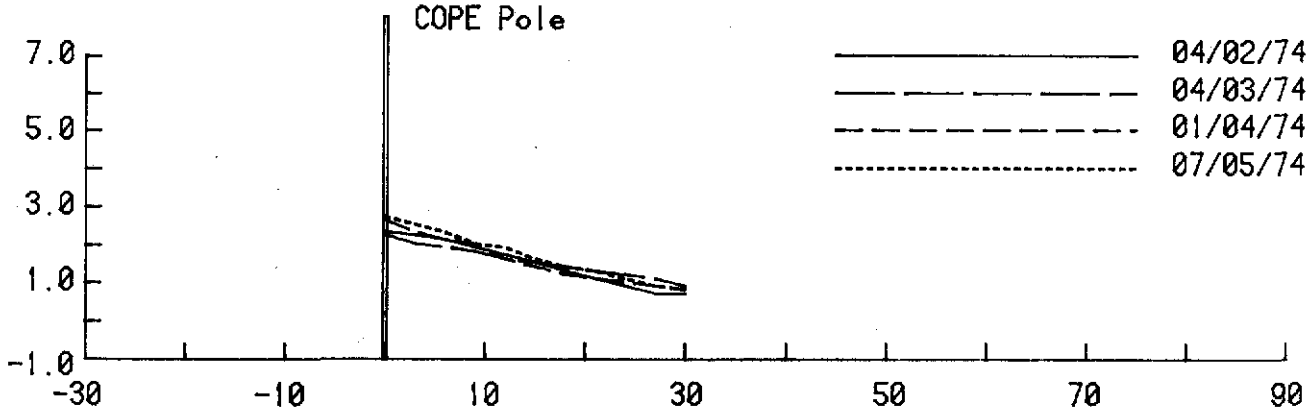
No. of Observations : 123

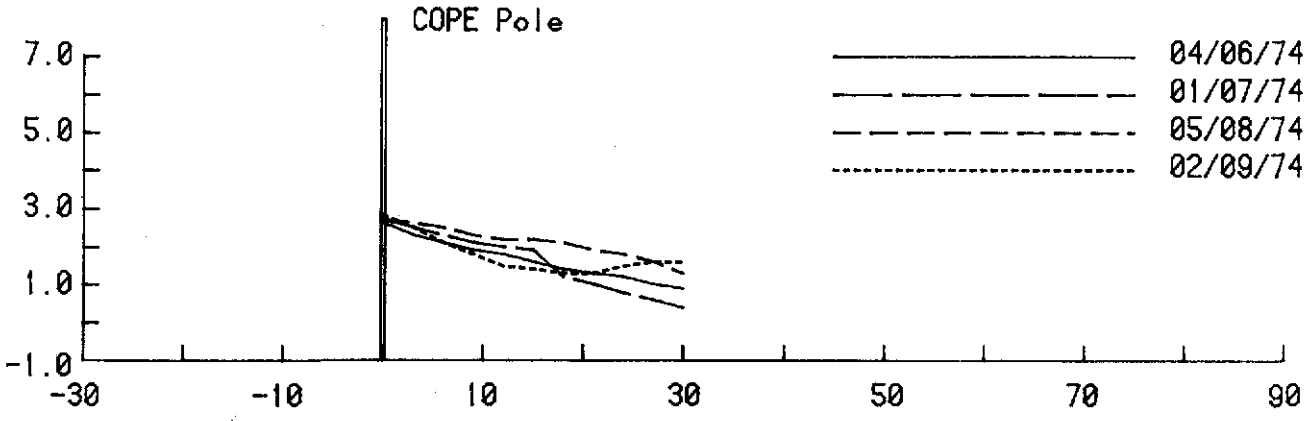
BEACH PROFILE PARAMETERS - 1984

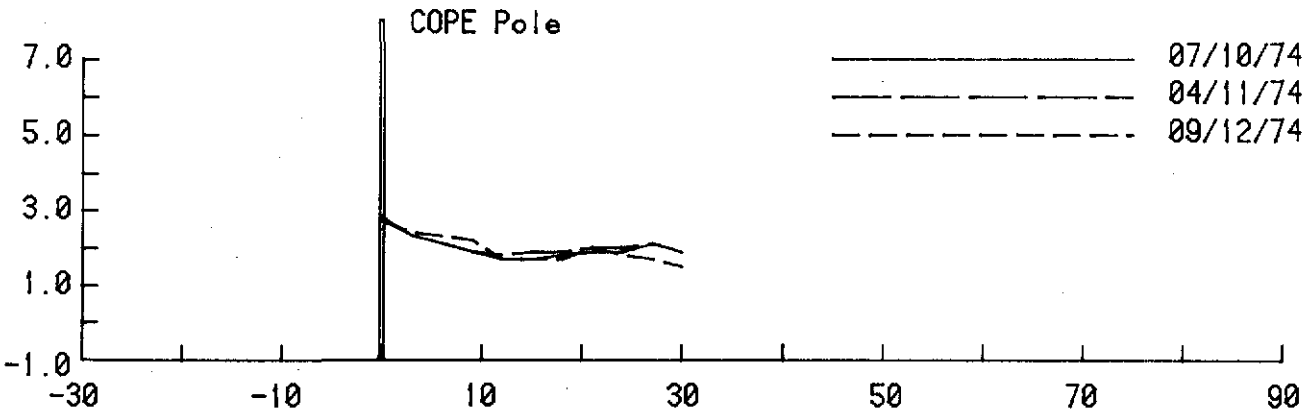
COPE
Currigee

Figure 57
C 18.1









Level Datum is A.H.D.

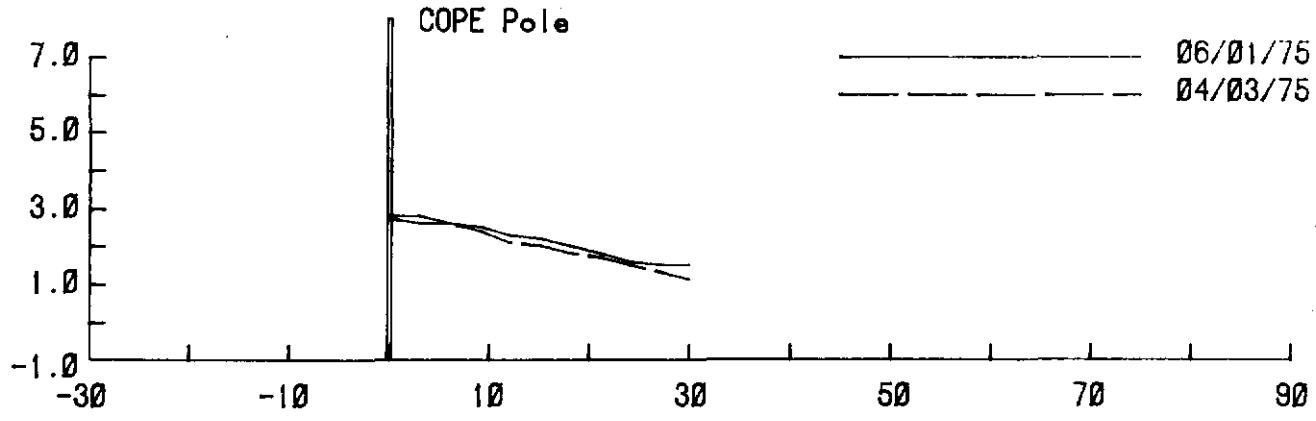
Distances and Levels are measured in Metres

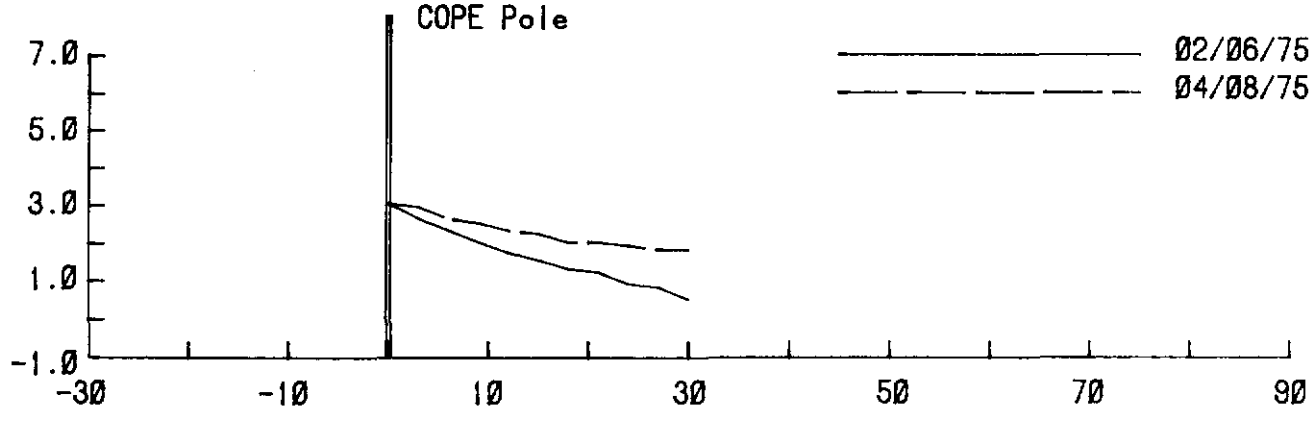
Beach Protection Authority

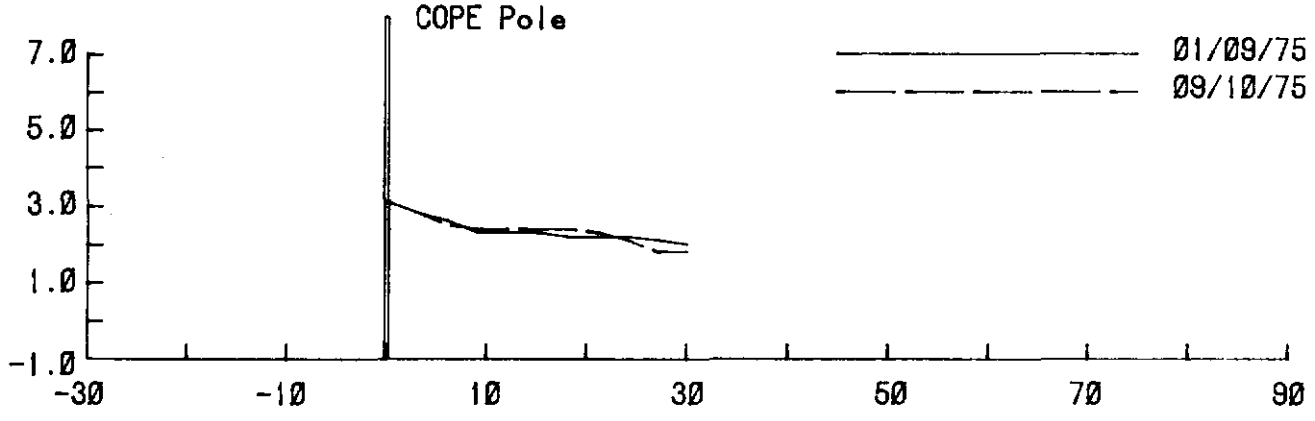
MONTHLY BEACH PROFILES

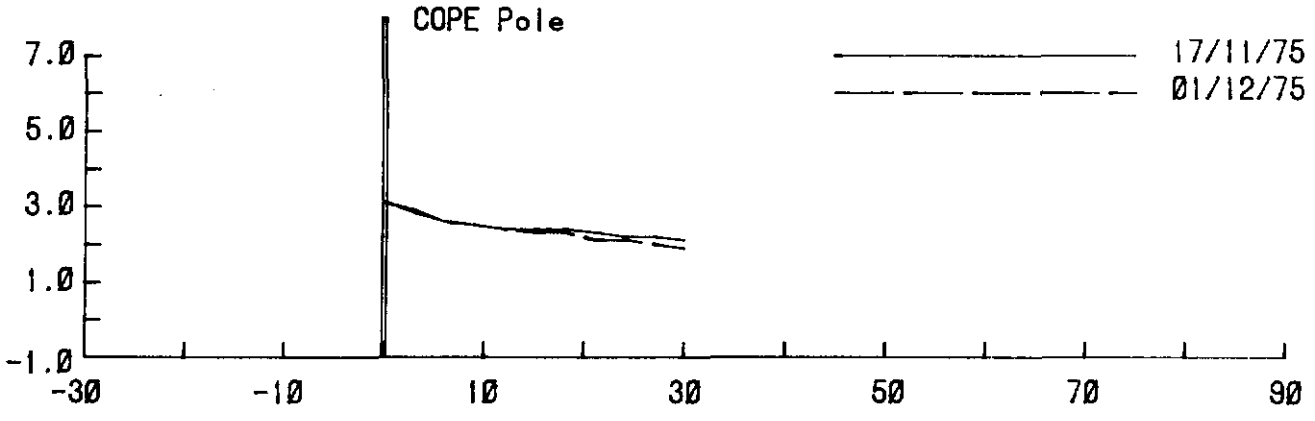
COPE
Currigee

Figure 58
C 18.1









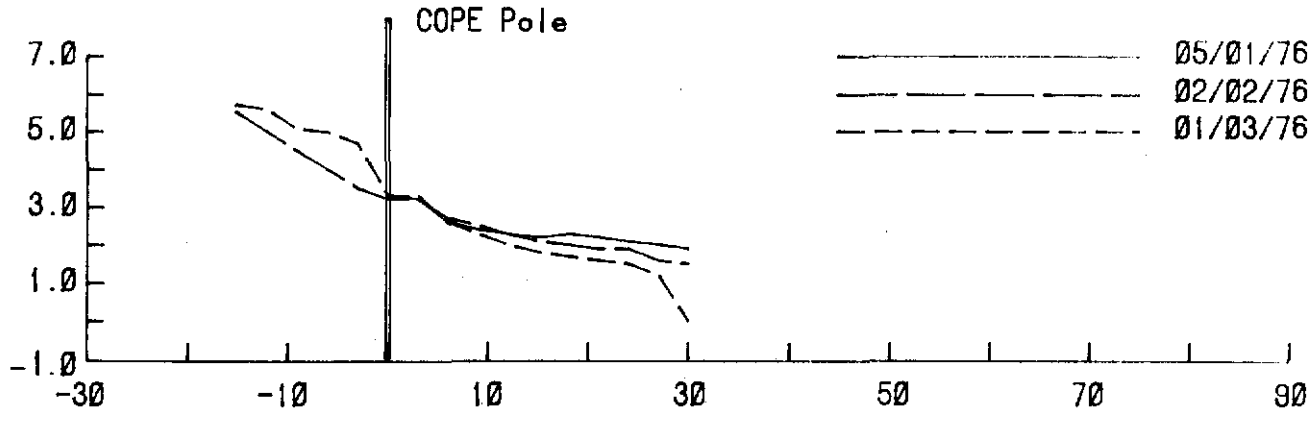
Level Datum is A.H.D. Distances and Levels are measured in Metres

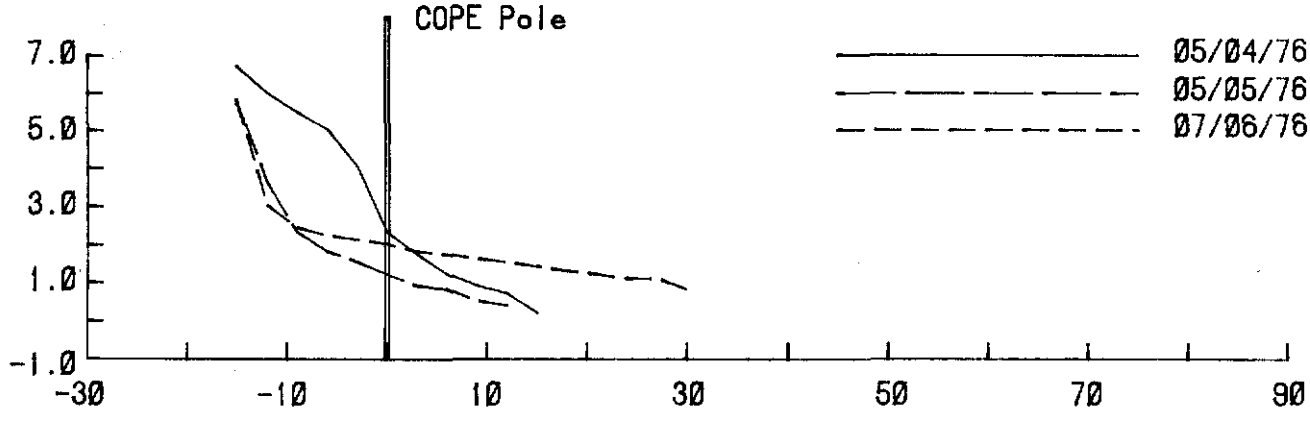
Beach Protection Authority

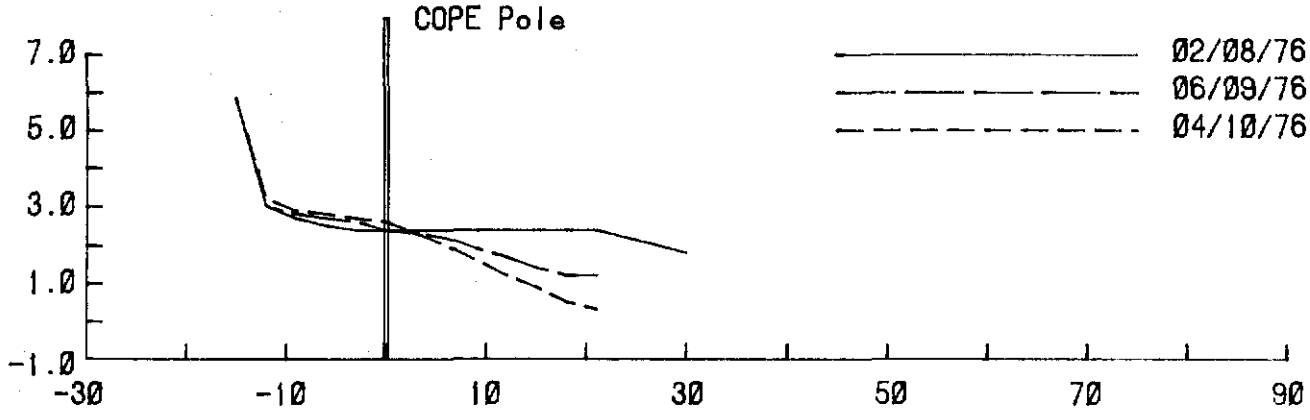
MONTHLY BEACH PROFILES

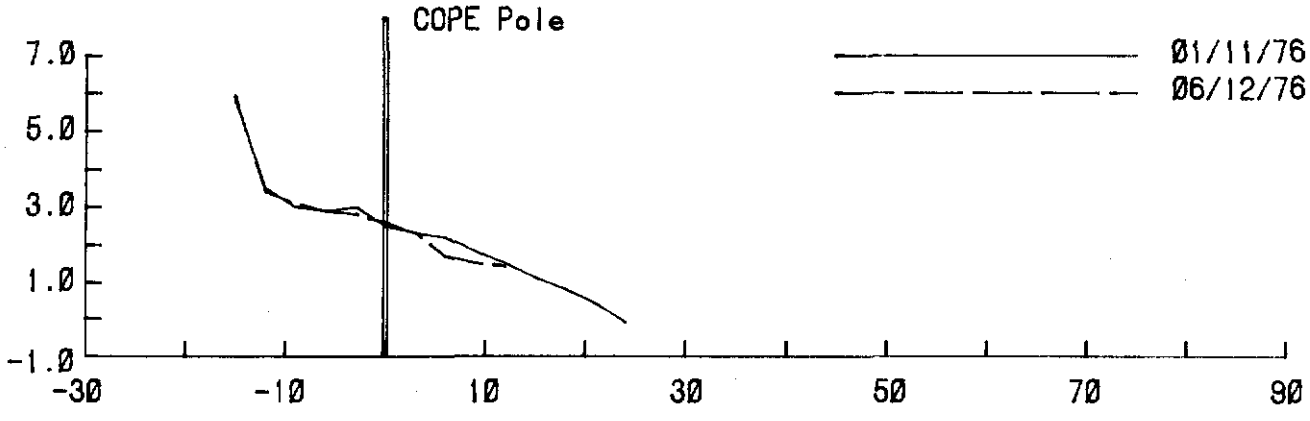
COPE
Currigee

Figure 59
C 18.1









Level Datum is A.H.D.

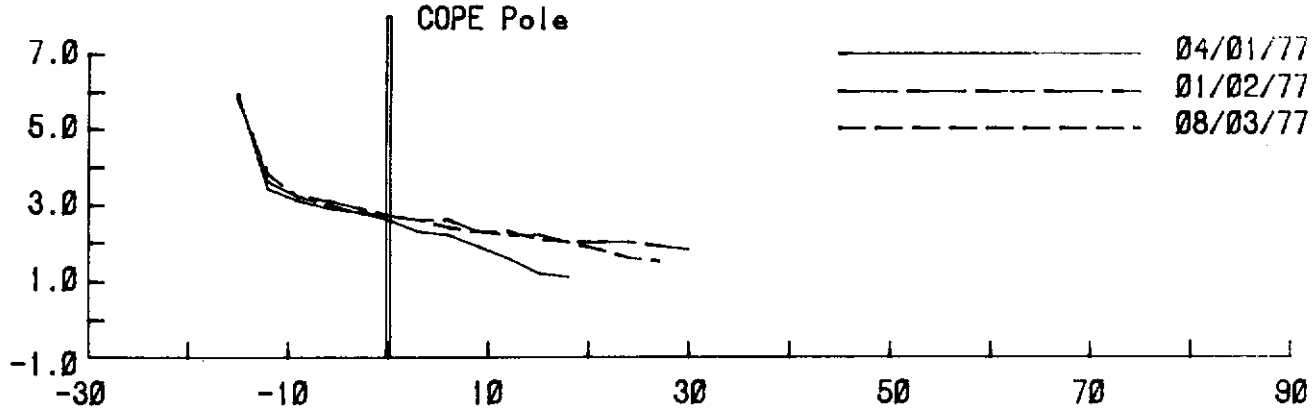
Distances and Levels are measured in Metres

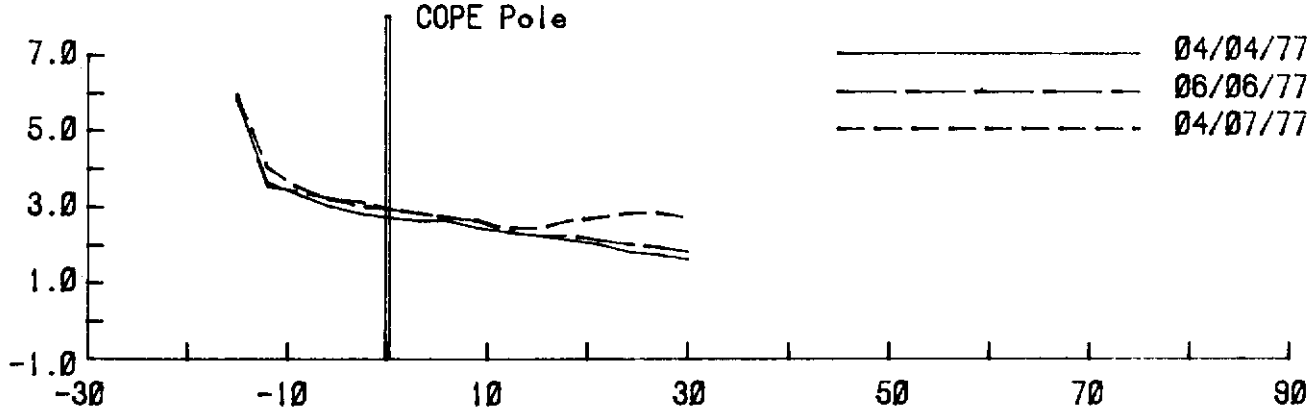
Beach Protection Authority

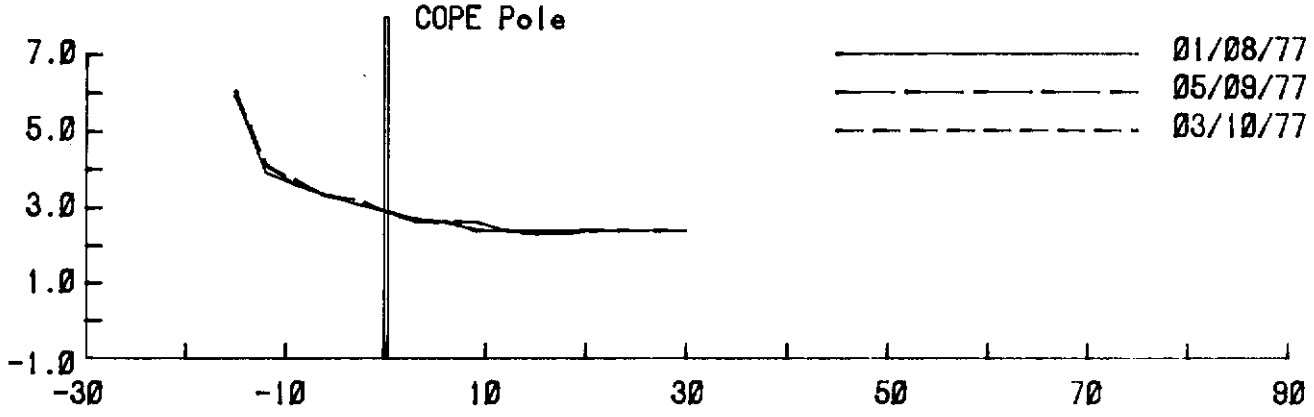
MONTHLY BEACH PROFILES

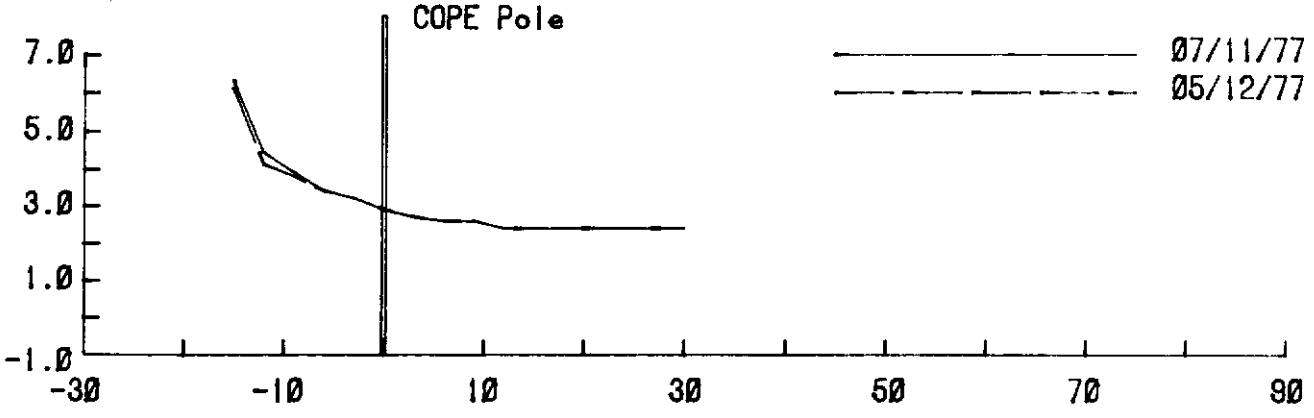
COPE
Currigee

Figure 60
C 18.1









Level Datum is A.H.D.

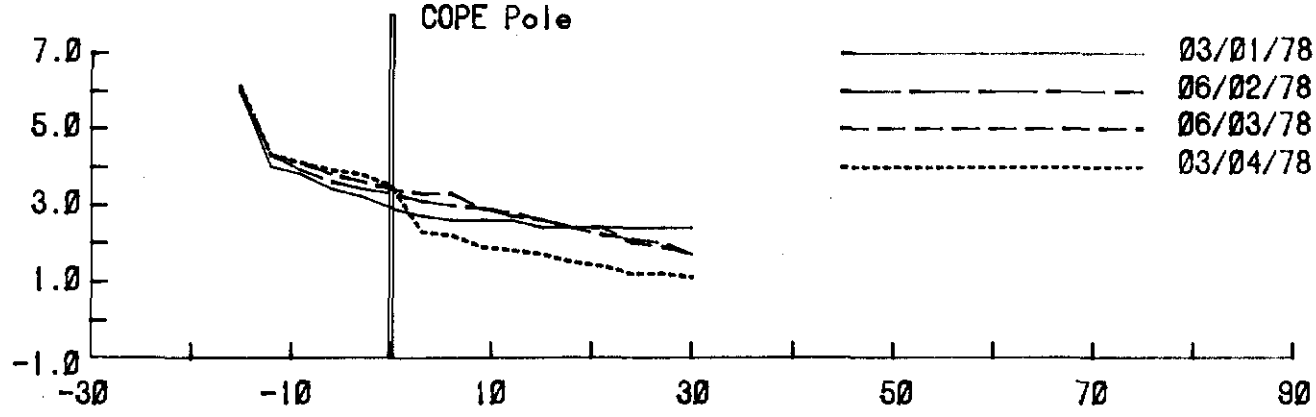
Distances and Levels are measured in Metres

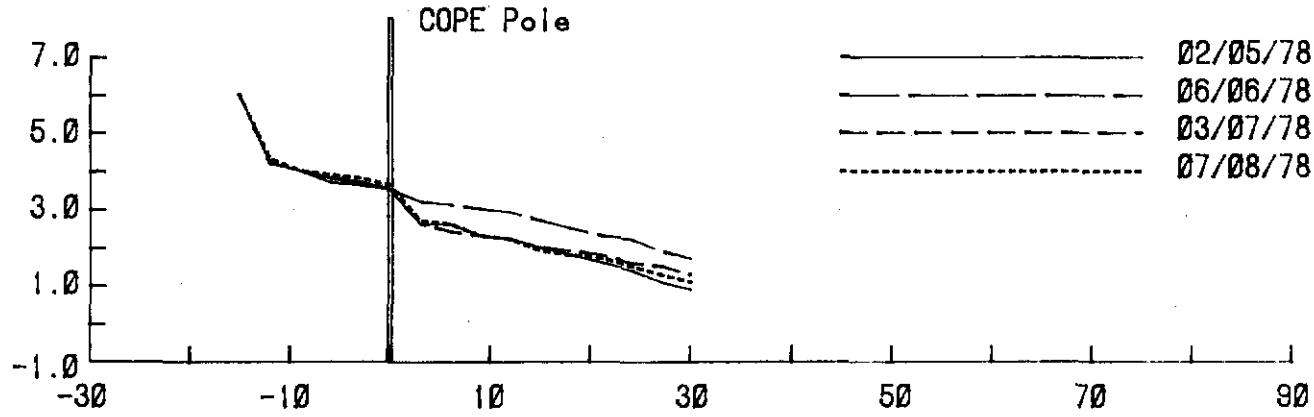
Beach Protection Authority

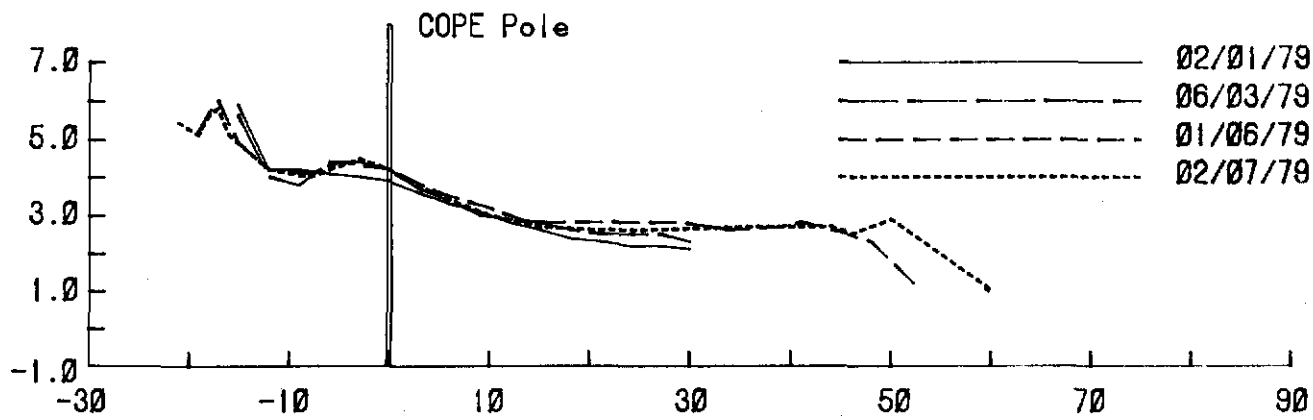
MONTHLY BEACH PROFILES

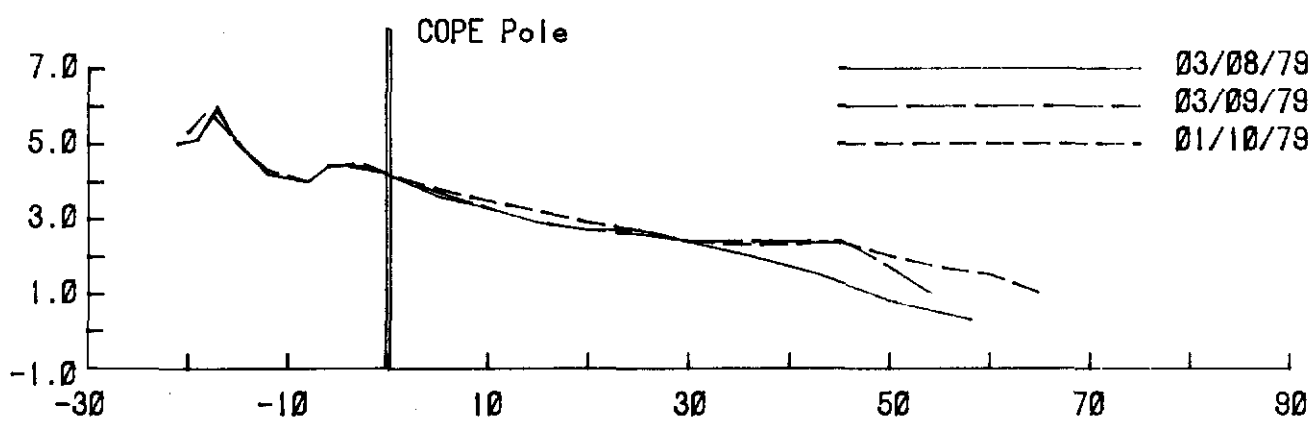
COPE
Currigee

Figure 61
C 18.1









Level Datum is A.H.D.

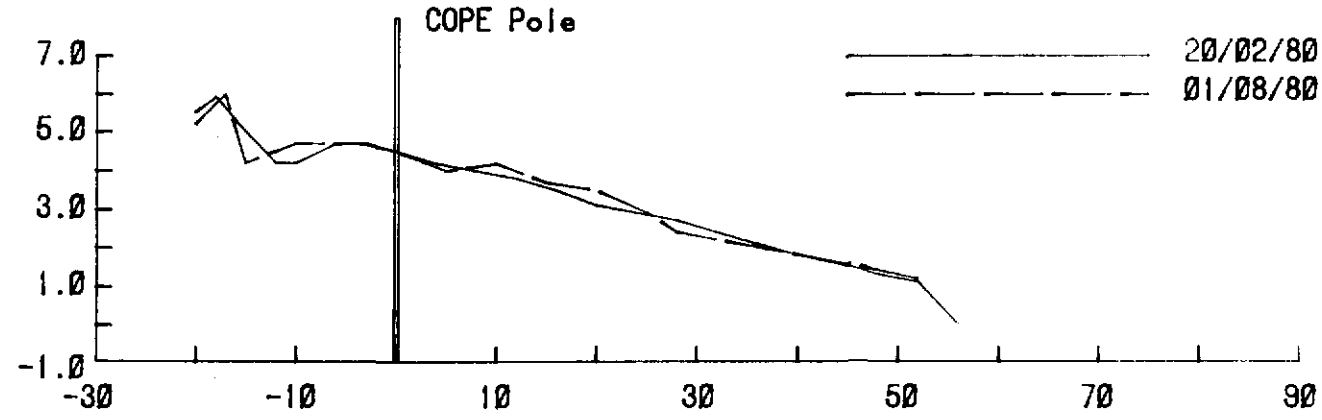
Distances and Levels are measured in Metres

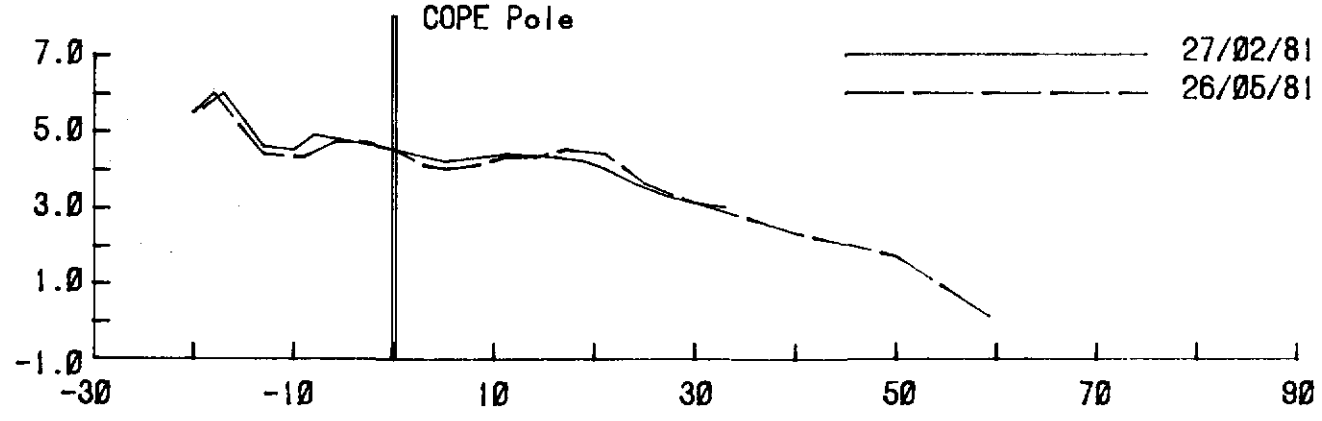
Beach Protection Authority

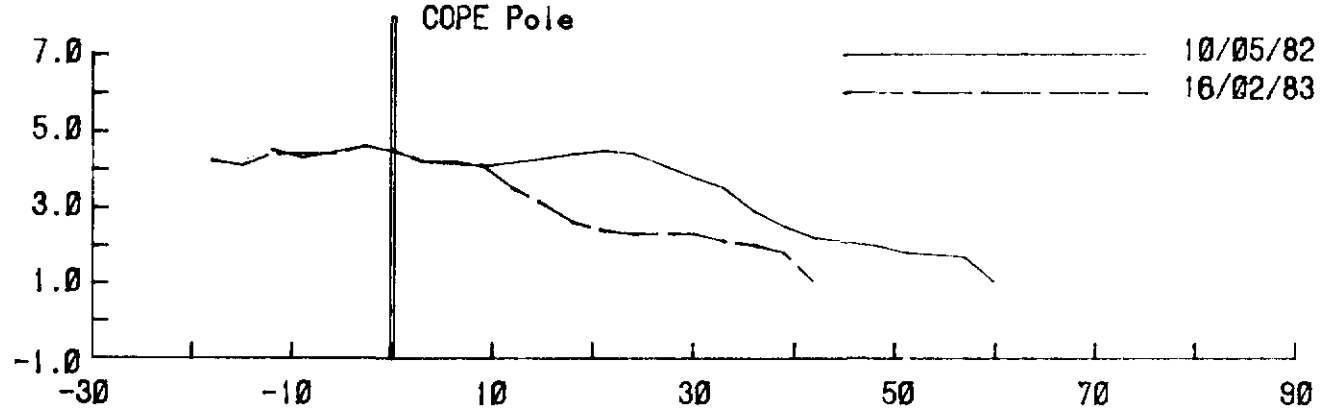
MONTHLY BEACH PROFILES

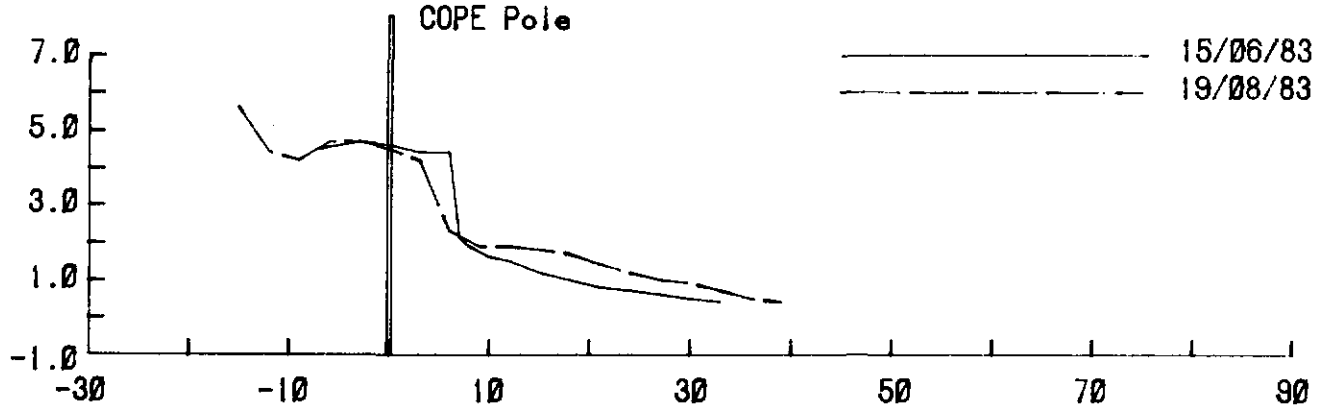
COPE
Currigee

Figure 62
C 18.1









Level Datum is A.H.D.

Distances and Levels are measured in Metres

Beach Protection Authority

MONTHLY BEACH PROFILES

COPE
Currigee

Figure 63
C 18.1