

COASTAL OBSERVATION PROGRAMME - ENGINEERING (COPE)
TRINITY BEACH - MULGRAVE SHIRE
FOR THE YEARS 1981 TO 1989
REPORT NO. C27.1

Beach Protection Authority

December 1989

This report was prepared by the Coastal Management Programme of the Department of Harbours and Marine on behalf of the Beach Protection Authority.

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

REPORT NO.:- C27.1

TITLE:- Report - Coastal Observation Programme - Engineering (COPE),
Trinity Beach - Mulgrave Shire

DATE:- December 1989

TYPE OF REPORT:- Technical Memorandum

PREPARED BY:- Coastal Management Programme of the
Department of Harbours and Marine on behalf
of the Beach Protection Authority.

ISSUING ORGANISATION:- Beach Protection Authority
G.P.O. BOX 2595
BRISBANE QLD 4001
AUSTRALIA

DISTRIBUTION:- Public Distribution

ABSTRACT:-

This report provides a summary of primary analyses of COPE data on wind, wave and beach processes observed at Trinity Beach in the Shire of Mulgrave on the north Queensland coast. The data was recorded by volunteer observers during the period November 1981 to June 1989. The Beach Protection Authority wishes to thank Mr & Mrs K. Snowdon in the recording of data at the COPE Station. The information published is considered representative of the long term conditions. The station was still active at November 1989.

OTHERS AVAILABLE IN THIS SERIES:-

Coastal Observation Programme - Engineering (COPE), Machans Beach -
Mulgrave Shire, (Report C01.1).

Coastal Observation Programme - Engineering (COPE), Baffle Creek -
Miriam Vale Shire, (Report C02.1).

Coastal Observation Programme - Engineering (COPE), Flying Fish Point -
Johnstone Shire, (Report C03.1).

Coastal Observation Programme - Engineering (COPE), Woodgate - Isis
Shire, (Report C04.1).

Coastal Observation Programme - Engineering (COPE), Shelly Beach -
Landsborough Shire, (Report C05.1).

Coastal Observation Programme - Engineering (COPE), Eurong -
Maryborough City, (Report C06.1).

Coastal Observation Programme - Engineering (COPE), Lammermoor
Beach - Livingstone Shire, (Report C07.1).

Coastal Observation Programme - Engineering (COPE), Noah Creek -
Douglas Shire, (Report C08.1).

Coastal Observation Programme - Engineering (COPE), Cardwell -
Cardwell Shire, (Report C09.1).

Coastal Observation Programme - Engineering (COPE), Surfers Paradise -
City of Gold Coast, (Report C10.1).

Coastal Observation Programme - Engineering (COPE), Mission Beach -
Johnstone Shire, (Report C11.1).

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).

Coastal Observation Programme - Engineering (COPE), Shingly Beach -
Proserpine Shire, (Report C14.1).

Coastal Observation Programme - Engineering (COPE), Yeppoon -
Livingstone Shire, (Report C15.1).

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

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

Coastal Observation Programme - Engineering (COPE), Currigee - City of
Gold Coast, (Report C18.1).

Coastal Observation Programme - Engineering (COPE), Newell Beach -
Douglas Shire, (Report C19.1)

Coastal Observation Programme - Engineering (COPE), Maroochydore -
Maroochy Shire, (Report C20.1)

Coastal Observation Programme - Engineering (COPE), Theodolite Creek -
Isis Shire, (Report C21.1)

Coastal Observation Programme - Engineering (COPE), Burleigh Heads -
City of Gold Coast, (Report 22.1)

Coastal Observation Programme - Engineering (COPE), Bramston Beach and
Bramston Beach North - Mulgrave Shire, (Report C23.1)

Coastal Observation Programme - Engineering (COPE), Kings Beach - City
of Caloundra, (Report C24.1)

Coastal Observation Programme - Engineering (COPE), Rainbow Beach -
Widgee Shire, (Report C25.1)

Coastal Observation Programme - Engineering (COPE), Hull Heads -
Cardwell Shire, (Report C26.1)

REFERENCES:

1. ROBINSON, D.A. AND JONES, C.M.

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.

CONTENTS

	Page
1.0 INTRODUCTION	1
1.1 The Programme	1
1.2 Site Selection	1
1.3 Instrumentation	1
1.4 Observers	1
1.5 Accuracy	1
1.6 Presentation of Data	2
2.0 STATION PARTICULARS	2
2.1 Location	2
2.2 Observers	2
2.3 Observed Parameters	2
2.4 Tidal Information	3
2.5 Description of Beach	3
2.6 Meteorological Events	4
2.7 Supervision of Station	4
3.0 DATA	4
3.1 General	5
3.2 Wind	5
3.3 Waves	5
3.4 Longshore Current	6
3.5 Beach Profile Parameters	6
3.6 Monthly Beach Profiles	6
4.0 ATTACHMENTS	
Tables (see over for List of Tables)	
Figures (see over for List of Figures)	

LIST OF TABLES

Table No.	Title	
1	Monthly and Annual Wave Parameters Summary	1981
2	Monthly and Annual Wave Parameters Summary	1982
3	Monthly and Annual Wave Parameters Summary	1983
4	Monthly and Annual Wave Parameters Summary	1984
5	Monthly and Annual Wave Parameters Summary	1985
6	Monthly and Annual Wave Parameters Summary	1986
7	Monthly and Annual Wave Parameters Summary	1987
8	Monthly and Annual Wave Parameters Summary	1988
9	Monthly and Annual Wave Parameters Summary	1989

LIST OF FIGURES

Figure No.	Title	
1.1	Site Plan (Aerial Photograph)	
1.2	Locality Plan	
2.1	Observation Form	
2.2	Methods for Recording Wave Parameters	
3	Wind Data	
4	Wave Height Percentage Exceedance	
5	Percentage Occurrence of Wave Height and Wave Period	
6	Wave Direction Analysis	
7	Surf Zone Width - Morning	1981
8	Surf Zone Width - Morning	1982
9	Surf Zone Width - Morning	1983
10	Surf Zone Width - Morning	1984
11	Surf Zone Width - Morning	1985
12	Surf Zone Width - Morning	1986
13	Surf Zone Width - Morning	1987
14	Surf Zone Width - Morning	1988
15	Surf Zone Width - Morning	1989
16	Littoral Currents - Morning	1981
17	Littoral Currents - Morning	1982
18	Littoral Currents - Morning	1983
19	Littoral Currents - Morning	1984
20	Littoral Currents - Morning	1985
21	Littoral Currents - Morning	1986
22	Littoral Currents - Morning	1987
23	Littoral Currents - Morning	1988
24	Littoral Currents - Morning	1989
25	Beach Profile Parameters (Foreshore Slope)	1981
26	Beach Profile Parameters	1982
27	Beach Profile Parameters	1983
28	Beach Profile Parameters	1984
29	Beach Profile Parameters	1985
30	Beach Profile Parameters	1986
31	Beach Profile Parameters (Sand Level at Pole)	1986
32	Beach Profile Parameters	1987
33	Beach Profile Parameters	1988
34	Beach Profile Parameters	1989
35	Monthly Beach Profiles	1982
36	Monthly Beach Profiles	1983
37	Monthly Beach Profiles	1984
38	Monthly Beach Profiles	1985
39	Monthly Beach Profiles	1986
40	Monthly Beach Profiles	1987
41	Monthly Beach Profiles	1986
42	Monthly Beach Profiles	1987
43	Monthly Beach Profiles	1988
44	Monthly Beach Profiles	1989

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

The COPE observers are supplied with a basic kit of recording instruments including:-

- 30 metre tape, wind meter, stop watch, 2.0 metre measuring sticks, recording forms and fluorescent dye.

A graduated reference pole was installed on the beach in June 1982, 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 and Local Authority 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 nine year period 1981 to 1989 in a useful statistical form. No attempt has been made to interpret the observed data.

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

Trinity Beach is located within the Shire of Mulgrave and lies approximately ten kilometres north of Cairns on the north Queensland coast. It is a one point five kilometre stretch of coastline, bounded by Taylor Point to the north and Earl Hill to the south. The location of the Trinity Beach COPE station is shown in Figures 1.1 and 1.2.

2.2 Observers

This station has been operated by volunteer observers, Mr & Mrs K. Snowdon (1981-1989), and were continuing to observe at date of publication.

2.3 Observed Parameters

The observers at this station recorded a morning observation between 7.00 am and 10.00 am.

This station has recorded:

- Wave Period
- Wave Height
- Wave Direction
- Wave Type
- Surf Zone Width
- Presence of Offshore Bar
- Wind Speed
- Wind Direction
- State of Tide
- Distance to Fixed Contour
- Fixed Contour Elevation
- Distance to Vegetation Line
- Sand Level at C.O.P.E. Reference Pole
- Foreshore Slope
- Longshore Current Speed
- Longshore Current Direction
- Distance from Shoreline to Dye Patch (Recorded from February 1986)

In addition a sand sample was collected at the station each month, and since June 1982, a profile of the beach has usually been recorded monthly.

2.4 Tidal Information

Tidal information for Trinity Beach is presented below. Datum is Low Water Datum.

M.H.W.S.	2.39 metres
M.H.W.N.	1.70 metres
M.S.L.	1.48 metres
M.L.W.N.	1.25 metres
M.L.W.S.	0.57 metres

Tidal information was obtained from the 1989, Queensland Tide Tables.

2.5 Description of the Beach

The beach at the Trinity Beach COPE Station exhibits the following characteristics:-

- Typical beach slopes: Foreshore slope is in the range 1 in 6 to 1 in 14 ($10^{\circ} - 4^{\circ}$).
- Beach width: Varied from 20 to 30 metres measured from the seaward toe of the frontal dune to Low Water Mark over the eight year period (1982-1989).
- D50 sand size: 0.63 mm averaged over eight years (1982-1989).
- Adjoining Landform: Recently accreted frontal beach ridge backed by an esplanade roadway and car parking area.

- Vegetation: The frontal beach ridge is well vegetated with a ground cover, consisting of goat's foot convolvulus (Ipomoea pes-caprae), pineapple sedge (Cyperus pedunculatus), wild jack bean (Canavalia rosea), tropical beach grass (Thuarea involuta), beach bean (Vigna marina), guinea grass (Panicum maximum) and para grass (Brachiaria mutica). Tree species present include horsetail she-oak (Casuarina equisetifolia var. incana), beach almonds (Terminalia spp.), ball nut (Calophyllum inophyllum), young coconut palms (Cocos nucifera) and brown salwood (Acacia crassicarpa).

2.6 Meteorological Events

The following cyclones were recorded by the Brisbane Bureau of Meteorology as having tracks within 500 kilometres of Trinity Beach between November 1981 and June 1989. It is considered that the following meteorological events may have had some effect on the condition of Trinity Beach.

Cyclone Abigail	22/01/82 - 05/02/82
Cyclone Dominic	05/04/82 - 14/04/82
Cyclone Des	16/01/83 - 19/01/83
Cyclone Elinor	12/02/83 - 03/03/83
Cyclone Fritz	10/12/83 - 13/12/83
Cyclone Grace	13/01/84 - 20/01/84
Cyclone Ingrid	20/02/84 - 25/02/84
Cyclone Jim	05/03/84 - 09/03/84
Cyclone Kathy	16/03/84 - 22/03/84
Cyclone Lance	04/04/84 - 07/04/84
Cyclone Monica	26/12/84 - 28/12/84
Cyclone Nigel	14/01/85 - 18/01/85
Cyclone Odette	17/01/85 - 20/01/85
Cyclone Pierre	18/02/85 - 24/02/85
Cyclone Tanya	29/03/85 - 01/04/85
Cyclone Vernon	21/01/86 - 24/01/86
Cyclone Winifred	27/01/86 - 06/02/86
Cyclone Alfred	02/03/86 - 08/03/86
Cyclone Manu	21/04/86 - 27/04/86
Cyclone Charlie	21/02/88 - 01/03/88
Cyclone Delilah	28/12/88 - 02/01/89
Cyclone Aivu	31/03/89 - 05/04/89
Cyclone Meena	04/05/89 - 09/05/89

2.7 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 of the reference pole for this station has been carried out by the Mulgrave Shire Council and the Authority wishes to thank the Council for its assistance in all matters associated with the COPE project. Maintenance of the pole has been carried out by the Authority's Cope Field Officer.

3.0 DATA

3.1 General

COPE data for this station for the nine year period November 1981 to June 1989 is presented on the attached figures. The data has been analysed statistically and/or smoothed to reveal long term averages or trends. A brief description of each of the observed parameters is given below with the relevant figure references.

3.2 Wind

The observer recorded the wind speed at the beach using a hand held wind meter at 1.5 metres above beach level. Prior to February 1986 wind direction was estimated to the nearest compass sector. After this time wind direction is recorded in degrees by compass.

A summary of annual wind speed and direction percentage occurrences are shown as a wind rose in Figure 3. Where applicable, morning and afternoon readings as well as the overall average are shown.

Wind speed was recorded in miles per hour (m.p.h.) rather than knots after February 1986. The recordings are converted from (m.p.h.) to knots for Figure 3.

3.3 Waves

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

Recordings of maximum wave height and method used to obtain wave height were introduced into the programme from February 1986. Wave type and state of tide were discontinued at this time.

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

Wave direction was recorded in degrees of a compass from March 1986. The direction recorded was then converted to a sector (see following paragraph regarding sector system).

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° is the beach alignment to the left of the observer when facing seaward, and at the Trinity Beach COPE station this direction is approximately 335° 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 4).
- (b) the percentage occurrence of various combinations of wave heights and periods and directions (Figure 5 and Figure 6).
- (c) surf zone width with an indication of the existence or otherwise of an offshore bar (Figure 7 to Figure 15).
- (d) tabulation of the occurrence of various wave heights, periods, types and directions (Tables 1 to 9).

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 16 to Figure 24). Mean upcoast and downcoast components and the overall annual means are also presented.

3.5 Beach Profile Parameters

Beach profile parameters were measured until 1983 using an Abney level, tape measure and a reference pole. These include:

- Distance from reference pole to the fixed contour.
- Elevation of the fixed contour.
- Distance from reference pole to the vegetation line.
- The foreshore slope.

Since 1983 profiles have been recorded using a measuring stick, the reference pole, and a line of sight to the horizon.

Sand level at the reference pole was formally recorded from February 1986 and the measurement of foreshore slope was discontinued at this time.

Changes in these parameters with time indicate how the beach moves in response to varying wave attack. Plots of these parameters are shown in Figure 25 to Figure 34.

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 Figure 35 to Figure 42.

TABLE 1
MONTHLY AND ANNUAL
MEAN WAVE HEIGHT/MEAN WAVE PERIOD AND WAVE TYPE/WAVE DIRECTION
OCCURRENCES

Trinity Beach

No. of Observations: 93

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	-	-	-	-	-	-	-	-	-	-	-	-	-
FEBRUARY	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	-	-	-	-	-	-	-	-	-	-	-
AUGUST	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPTEMBER	-	-	-	-	-	-	-	-	-	-	-	-	-
OCTOBER	4.3	0.47	9.4	9.4	-	81.2	-	6.3	6.3	3.1	71.9	12.4	-
NOVEMBER	5.0	0.36	-	-	-	100.0	-	16.7	33.3	20.0	30.0	-	-
DECEMBER	5.9	0.24	3.2	-	-	96.8	-	3.2	25.8	12.9	38.7	19.4	-
WHOLE YEAR	5.1	0.36	4.2	3.1	0.0	92.7	0.0	8.7	21.8	12.0	46.9	10.6	0.0

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

Trinity Beach

No. of Observations: 365

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	7.2	0.21	-	-	-	96.8	3.2	6.5	16.1	22.6	41.9	12.9	-
FEBRUARY	6.7	0.32	17.9	-	-	82.1	-	3.6	7.1	7.1	42.9	39.3	-
MARCH	7.5	0.34	12.9	-	-	87.1	-	-	6.5	-	64.5	29.0	-
APRIL	8.5	0.60	-	-	6.7	93.3	-	-	-	-	46.7	53.3	-
MAY	9.1	0.49	22.6	-	-	77.4	-	-	-	12.9	29.0	58.1	-
JUNE	7.4	0.40	33.3	-	-	66.7	-	-	-	3.3	30.0	66.7	-
JULY	7.9	0.40	6.5	6.5	-	87.0	-	-	3.2	9.7	16.1	71.0	-
AUGUST	8.1	0.57	-	-	-	100.0	-	-	-	-	71.0	29.0	-
SEPTEMBER	7.1	0.38	16.7	-	-	83.3	-	3.3	10.0	26.7	50.0	10.0	-
OCTOBER	6.8	0.45	29.0	-	-	71.0	-	6.5	25.8	9.7	41.9	16.1	-
NOVEMBER	7.7	0.59	20.0	-	-	80.0	-	-	16.7	13.3	53.3	16.7	-
DECEMBER	5.8	0.31	74.2	-	-	25.8	-	22.6	12.9	3.2	51.6	9.7	-
WHOLE YEAR	7.5	0.42	19.4	0.5	0.6	79.2	0.3	3.5	8.2	9.0	44.9	34.3	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

Trinity Beach

No. of Observations: 365

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	6.6	0.34	77.4	-	-	22.6	-	6.5	32.3	6.5	38.7	16.0	-
FEBRUARY	8.1	0.46	32.1	3.6	-	64.3	-	-	3.6	21.4	75.0	-	-
MARCH	7.2	0.44	19.4	-	-	80.6	-	12.9	16.1	12.9	54.8	3.3	-
APRIL	6.1	0.42	13.3	-	-	86.7	-	-	10.0	10.0	76.7	3.3	-
MAY	6.1	0.47	-	-	-	93.5	6.5	-	9.7	6.5	58.0	25.8	-
JUNE	6.0	0.47	-	-	-	100.0	-	-	3.3	-	66.7	30.0	-
JULY	5.9	0.44	19.4	-	-	80.6	-	-	-	9.7	61.3	29.0	-
AUGUST	6.1	0.50	3.2	-	-	96.8	-	-	6.5	32.3	38.7	22.5	-
SEPTEMBER	5.8	0.40	-	-	-	100.0	-	-	33.3	36.7	23.3	6.7	-
OCTOBER	5.3	0.33	9.7	-	-	90.3	-	16.1	25.8	29.0	25.8	3.3	-
NOVEMBER	6.2	0.31	40.0	-	-	60.0	-	20.0	26.7	33.3	16.7	3.3	-
DECEMBER	6.2	0.42	16.1	-	-	83.9	-	12.9	6.5	6.5	61.3	12.8	-
WHOLE YEAR	6.3	0.42	19.2	0.3	0.0	80.0	0.5	5.7	14.5	17.1	49.7	13.0	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

Trinity Beach

No. of Observations: 366

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	6.5	0.19	29.0	--	--	71.0	--	6.5	9.7	19.4	45.2	19.2	--
FEBRUARY	6.5	0.38	17.2	--	--	82.8	--	--	6.9	13.8	75.9	3.4	--
MARCH	5.7	0.33	6.5	--	--	93.5	--	--	6.5	3.2	64.5	25.8	--
APRIL	6.4	0.47	6.7	--	--	93.3	--	3.3	3.3	--	46.7	46.7	--
MAY	6.4	0.54	--	--	--	100.0	--	--	--	12.9	54.8	32.3	--
JUNE	6.7	0.50	20.0	--	--	80.0	--	--	--	10.0	60.0	30.0	--
JULY	6.7	0.33	67.7	--	--	32.3	--	--	6.5	22.6	54.8	16.1	--
AUGUST	6.8	0.31	51.6	--	--	48.4	--	--	19.4	22.6	54.8	3.2	--
SEPTEMBER	7.0	0.33	70.0	--	--	30.0	--	3.3	36.7	43.3	16.7	--	--
OCTOBER	6.5	0.38	32.3	--	--	67.7	--	9.7	3.2	12.9	61.3	12.9	--
NOVEMBER	6.4	0.37	53.3	--	--	46.7	--	16.7	30.0	3.3	40.0	10.0	--
DECEMBER	6.4	0.32	74.2	--	--	25.8	--	9.7	54.8	12.9	22.6	--	--
WHOLE YEAR	6.5	0.37	35.8	0.0	0.0	64.2	0.0	4.1	14.7	14.7	49.8	16.7	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

Trinity Beach

No. of Observations: 360

Year 1985

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	6.4	0.39	63.3	-	-	36.7	-	-	32.3	16.1	51.6	-	-
FEBRUARY	6.7	0.51	22.2	-	-	77.8	-	11.1	22.2	7.4	55.6	3.7	-
MARCH	7.0	0.41	51.6	-	-	48.4	-	-	6.5	35.5	54.8	3.2	-
APRIL	6.8	0.42	40.0	-	-	60.0	-	-	-	20.0	80.0	-	-
MAY	7.4	0.65	25.8	-	-	74.2	-	-	3.2	6.5	90.3	-	-
JUNE	7.5	0.51	60.0	-	-	40.0	-	-	3.3	10.0	86.7	-	-
JULY	7.6	0.44	63.0	-	-	37.0	-	-	-	37.0	63.0	-	-
AUGUST	7.8	0.53	38.7	-	-	61.3	-	-	29.0	41.9	29.1	-	-
SEPTEMBER	7.3	0.40	80.0	-	-	20.0	-	3.3	13.3	30.0	46.7	6.7	-
OCTOBER	6.8	0.49	83.9	-	-	16.1	-	19.4	25.8	12.9	35.4	6.5	-
NOVEMBER	6.7	0.34	96.7	-	-	3.3	-	13.3	43.3	23.3	20.1	-	-
DECEMBER	6.3	0.28	96.8	-	-	3.2	-	3.2	61.3	19.4	16.1	-	-
WHOLE YEAR	7.0	0.45	60.2	0.0	0.0	39.8	0.0	4.2	20.0	21.7	52.4	1.7	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

Trinity Beach

No. of Observations: 364

Year 1986

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	6.5	0.44	71.0	-	-	29.0	-	3.2	32.3	19.4	38.7	6.4	-
FEBRUARY	5.7	0.28	95.0	-	-	5.0	-	13.8	24.1	20.7	31.0	10.4	-
MARCH	5.2	0.44	-	-	-	-	-	-	-	6.5	3.2	90.3	-
APRIL	5.9	0.50	-	-	-	-	-	-	-	6.9	6.9	86.2	-
MAY	6.5	0.39	-	-	-	-	-	-	3.2	-	25.8	71.0	-
JUNE	6.5	0.35	-	-	-	-	-	-	-	3.3	23.3	73.4	-
JULY	6.9	0.43	-	-	-	-	-	-	9.7	32.3	16.1	41.9	-
AUGUST	7.0	0.39	-	-	-	-	-	3.3	26.7	16.7	10.0	43.3	-
SEPTEMBER	6.8	0.28	-	-	-	-	-	10.0	10.0	26.7	40.0	13.3	-
OCTOBER	6.8	0.26	-	-	-	-	-	6.5	29.0	38.7	19.4	6.4	-
NOVEMBER	6.9	0.32	-	-	-	-	-	10.0	16.7	36.7	20.0	16.6	-
DECEMBER	6.9	0.31	-	-	-	-	-	3.2	41.9	22.6	32.3	-	-
WHOLE YEAR	6.5	0.36	83.0	0.0	0.0	17.0	0.0	4.2	16.1	19.2	22.2	38.3	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 DIRECTION OCCURRENCES

Trinity Beach

No. of Observations: 360

Year 1987

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Direction					
			Wave Direction					
			1	2	3	4	5	Calm
JANUARY	5.7	0.12	-	26.7	40.0	13.3	20.0	-
FEBRUARY	6.5	0.32	-	3.6	10.7	57.1	28.6	-
MARCH	6.8	0.22	-	9.7	19.4	29.0	41.9	-
APRIL	7.5	0.36	-	-	3.4	62.1	34.5	-
MAY	7.2	0.28	-	-	9.7	32.3	58.0	-
JUNE	7.6	0.26	-	-	10.3	24.1	65.6	-
JULY	7.1	0.26	-	3.4	3.4	24.1	69.1	-
AUGUST	7.1	0.23	-	10.0	26.7	26.7	36.6	-
SEPTEMBER	7.2	0.34	-	-	3.4	55.2	41.4	-
OCTOBER	6.9	0.21	32.3	32.3	29.0	6.4	-	-
NOVEMBER	6.7	0.23	6.5	25.8	32.3	29.0	6.4	-
DECEMBER	6.8	0.33	9.7	6.5	29.0	35.5	19.3	-
WHOLE YEAR	6.9	0.26	4.0	9.9	18.1	32.9	35.1	0.0

TABLE 8
MONTHLY AND ANNUAL
MEAN WAVE HEIGHT/MEAN WAVE PERIOD AND WAVE DIRECTION OCCURRENCES

Trinity Beach

No. of Observations: 343

Year 1988

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Direction					
			Wave Direction					
			1	2	3	4	5	Calm
JANUARY	6.9	0.33	-	6.5	12.9	25.8	54.8	-
FEBRUARY	6.7	0.28	3.4	13.8	13.8	44.8	24.2	-
MARCH	6.6	0.36	-	12.9	-	67.7	19.4	-
APRIL	6.8	0.25	-	19.0	-	14.3	66.7	-
MAY	7.0	0.32	-	-	4.5	4.5	91.0	-
JUNE	7.4	0.31	-	-	3.7	7.4	88.9	-
JULY	7.5	0.40	-	-	9.7	32.3	58.0	-
AUGUST	7.7	0.34	-	-	6.5	29.0	64.5	-
SEPTEMBER	8.1	0.31	-	10.3	10.3	24.1	55.3	-
OCTOBER	7.3	0.25	-	6.9	17.2	34.5	41.4	-
NOVEMBER	7.4	0.22	10.0	23.3	23.3	40.0	3.4	-
DECEMBER	7.3	0.25	16.1	9.7	41.9	16.1	16.2	-
WHOLE YEAR	7.2	0.30	2.5	8.5	12.0	28.4	48.6	0.0

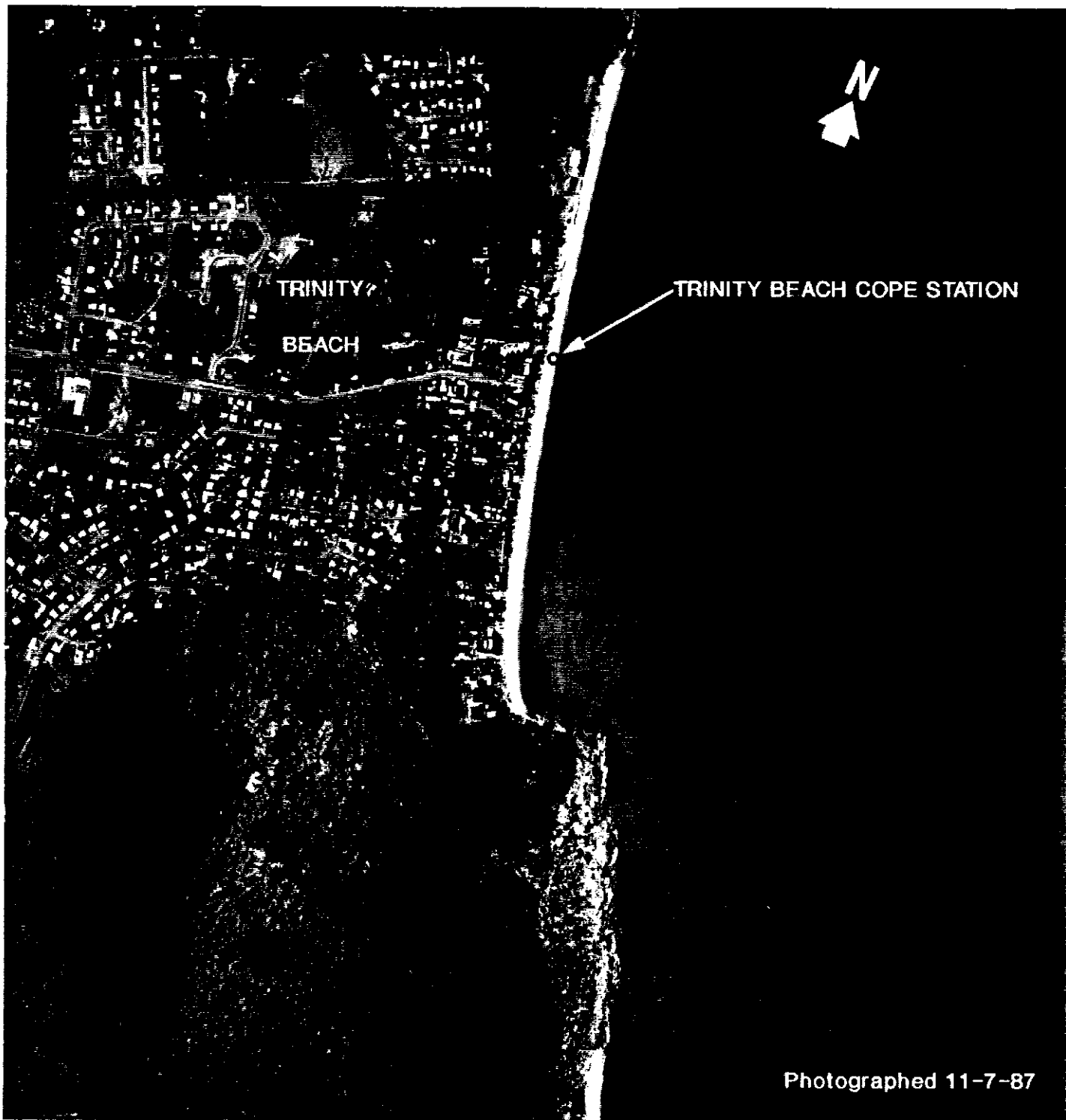
TABLE 9
MONTHLY AND ANNUAL
MEAN WAVE HEIGHT/MEAN WAVE PERIOD AND WAVE DIRECTION OCCURRENCES

Trinity Beach

No. of Observations: 177

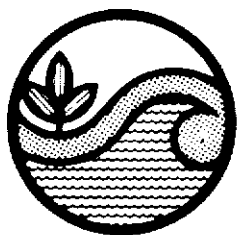
Year 1989

MONTH	MEAN WAVE PERIOD (secs)	MEAN WAVE HEIGHT (metres)	Percentage Occurrence - Wave Direction					
			Wave Direction					
			1	2	3	4	5	Calm
JANUARY	7.0	0.23	3.3	26.7	10.0	20.0	40.0	-
FEBRUARY	6.9	0.24	10.7	17.9	10.7	39.3	21.4	-
MARCH	6.5	0.26	-	3.3	6.7	43.3	46.7	-
APRIL	7.3	0.33	-	-	6.7	60.0	33.3	-
MAY	7.3	0.30	-	-	3.3	43.3	53.4	-
JUNE	7.2	0.27	-	-	-	31.0	69.0	-
WHOLE YEAR	7.0	0.27	2.3	8.0	6.2	39.5	44.0	0.0



Photographed 11-7-87

100 0 100 200 300 400 500 metres
Scale 1:12 000 approx.



Beach Protection Authority

SITE PLAN
TRINITY BEACH COPE STATION

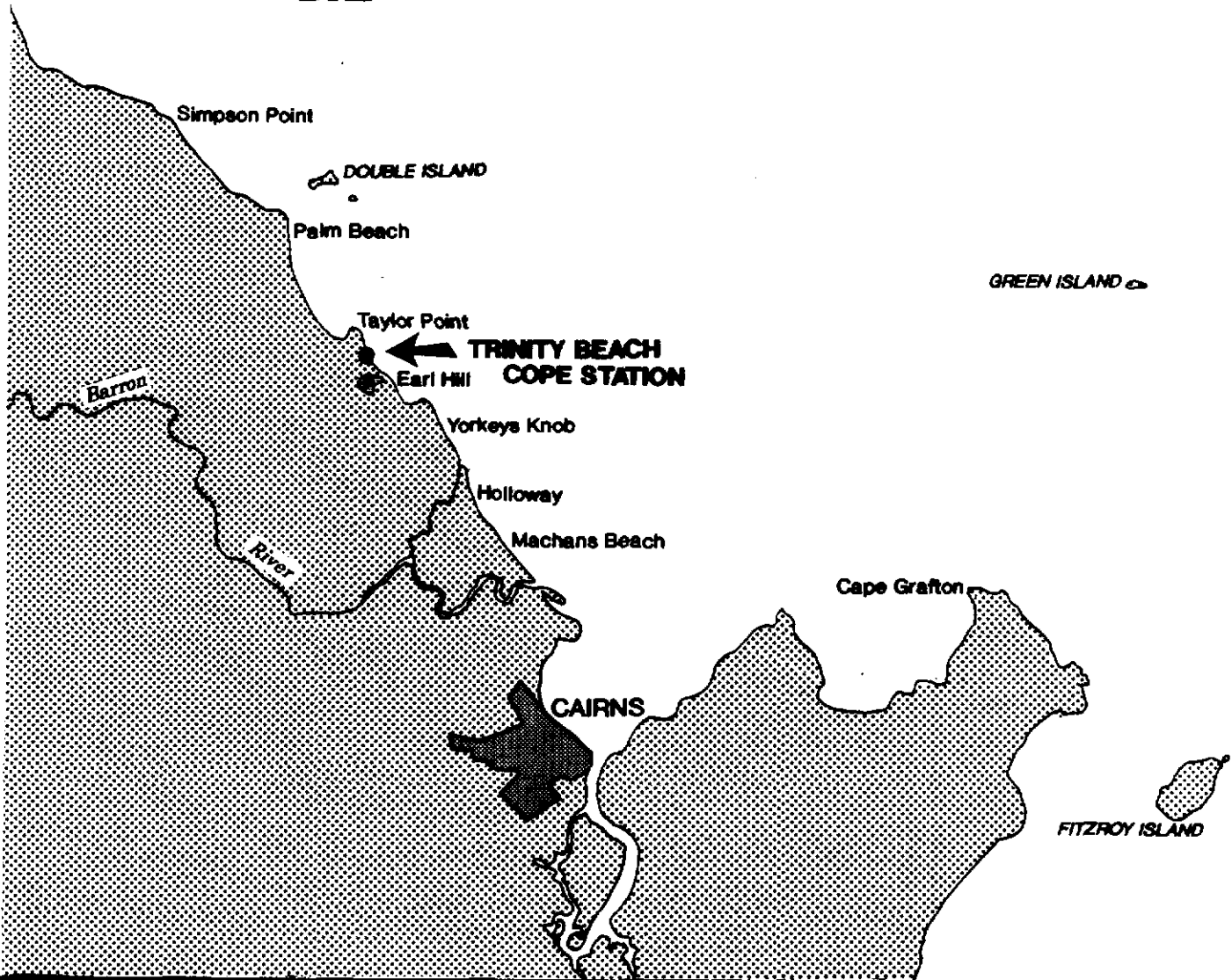
COPE
Trinity Beach

Figure 1.1
C 27.1

TRINITY



BAY



Beach Protection Authority
Queensland

LOCALITY PLAN

COPE
Trinity Beach
Figure
1.2
C 27.1





COASTAL OBSERVATION PROGRAMME - ENGINEERING

COPE

RECORD ALL DATA CAREFULLY AND LEGIBLY

SITE NUMBER					DAY	MONTH	YEAR	TIME							
1	2	3	4	5	6	7	8	10	11	Record time using 24 hour system	12	13	14	15	
(i) WAVE HEIGHT (AVERAGE) Record the best estimate of the average breaking wave height to the nearest tenth of a metre. If less than 0.1 record as 0.0 and go directly to Section (ii).					16	17	WAVE HEIGHT (MAXIMUM) Record the best estimate of the maximum breaking wave height during the entire observation period to the nearest tenth of a metre.					18	19		
WAVE HEIGHT METHOD Record the method that you used to obtain wave height. Record 1 if visual estimate Record 2 if measured with COPE sticks Record 3 if measured by COPE pole					20	WAVE PERIOD Record the time in seconds for eleven (11) wave crests to pass a stationary point just seaward of the surf zone.					21	22	23		
WAVE DIRECTION Determine the direction that the waves are entering the surf zone using the compass provided and record the direction in degrees.					24	25	26	SURF ZONE WIDTH Record the time in seconds for a wave of average height to traverse the surf zone from break point to final run-up on the beach.					27	28	29
(ii) CURRENT SPEED Measure in metres the distance that the centre of the dye patch is observed to move during a one (1) minute period; if no long shore movement record 000.					30	31	32	CURRENT DIRECTION When the observer faces the sea 0 — no long shore movement L — dye moves to the left R — dye moves to the right					33		
DISTANCE FROM SHORE Record the distance in metres from the shore to where the current measurements were commenced.					34	35	OFFSHORE BAR Is an off-shore bar causing the waves to break? 1—yes 0—no					36			
(iii) WIND SPEED Record wind speed to the nearest m.p.h. If calm record 00 and go directly to Section (iv).					37	38	WIND DIRECTION Determine the direction that the wind is coming from using the compass provided and record the direction in degrees.					39	40	41	
(iv) FIXED CONTOUR ELEVATION Record the elevation of the fixed contour.					42	43	DISTANCE TO FIXED CONTOUR Record the distance, to the nearest metre, from the reference post to the fixed contour. Distances landward of the reference post are negative. e.g. 009 measures 9 metres seaward (No sign); —07 measures 7 metres landward. (Minus sign)					44	45	46	
(v) DISTANCE TO THE VEGETATION Record the distance from the reference post to the average vegetation line. Distances landward of the reference post are negative.					47	48	49	SAND LEVEL AT POLE Record to nearest tenth of a metre.					50	51	
(vi) SAND SAMPLE If sample taken then record 1. Otherwise leave blank. 52					PLEASE PRINT Please check the form for completeness SITE NAME _____ OBSERVER _____ REMARKS: _____ _____ _____ Make any additional remarks, computations or sketches on the reverse side of this form. (for office use only) 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 _____										

F 402—(J181/24)—Govt. Printer, Qld.



OBSERVATION FORM

COPE
Trinity Beach

Figure
2.1
C 27.1



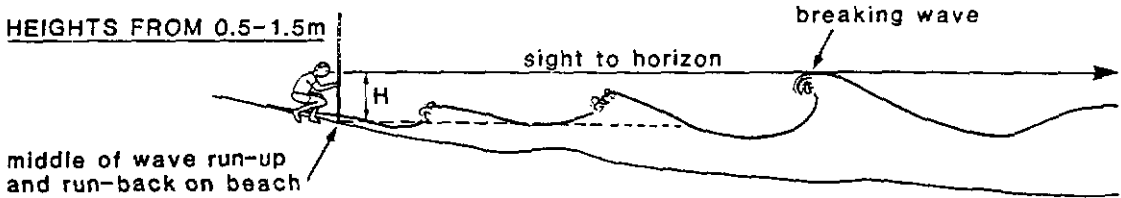
WAVE HEIGHT AND DIRECTION INSTRUCTIONS

METHOD 1 VISUAL ESTIMATION

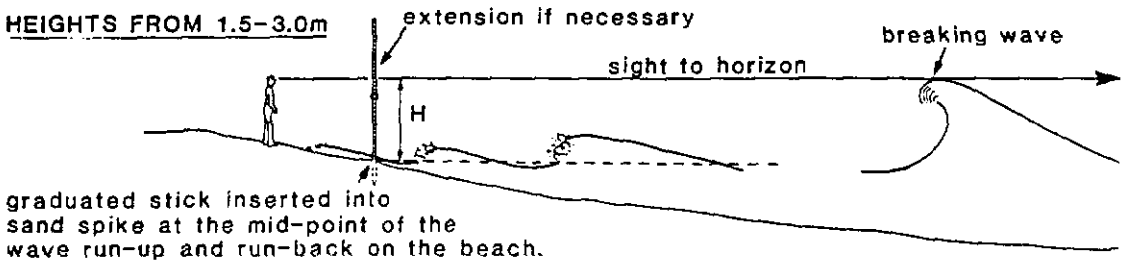
This method should only be used where the waveheights are below 0.5 and it is not practicable to use the preferred Method 2.

METHOD 2

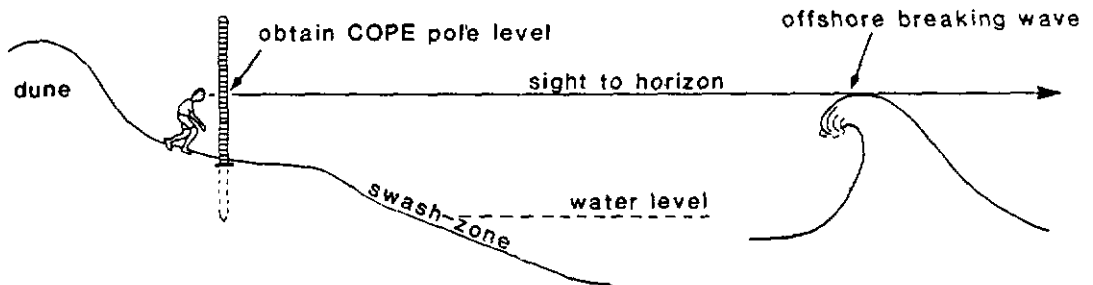
HEIGHTS FROM 0.5-1.5m



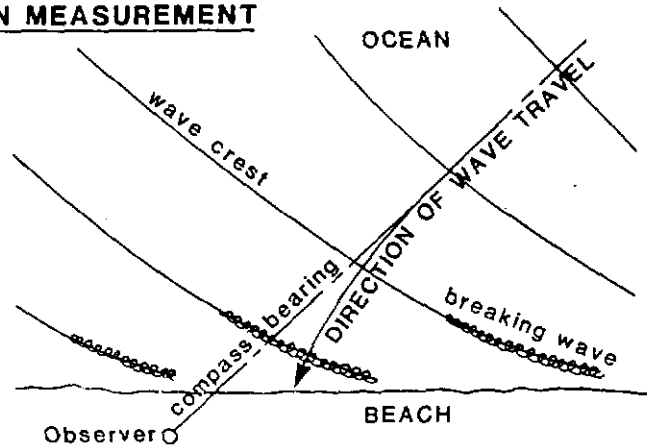
HEIGHTS FROM 1.5-3.0m



METHOD 3 FOR WAVES OVER 3m



WAVE DIRECTION MEASUREMENT



Beach Protection Authority
Queensland

METHODS FOR RECORDING WAVE PARAMETERS

COPE
Trinity Beach

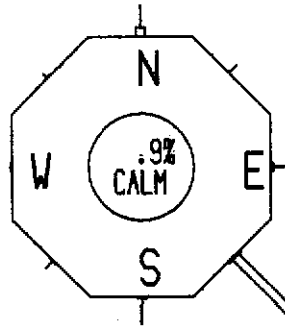
Figure

2.2

C 27.1



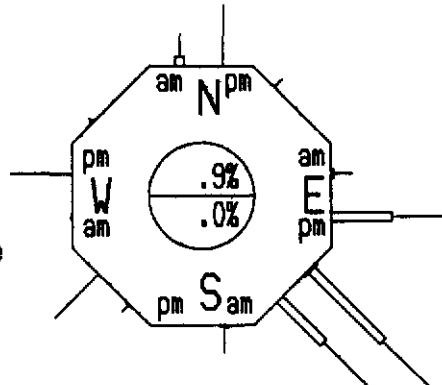
ALL OBSERVATIONS



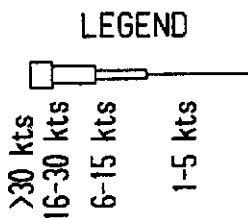
Total No. of Observations : 2757

MORNING - AFTERNOON OBSERVATIONS

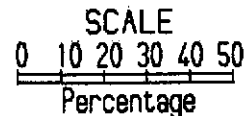
NOTES :
 Figures in Central Circle
 Represent Percentage
 of CALM Observations.
 Upper Figure for AM
 Lower Figure for PM



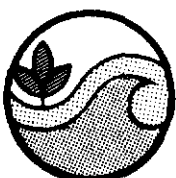
No. of Morning Observations : 2750
 No. of Afternoon Observations : 7



Mean Time :- Morning Obs : 0845 hrs
 Mean Time :- Afternoon Obs : 1502 hrs



WIND DATA - NOV 1981 to JUNE 1989



Beach Protection Authority
 Queensland

WIND DATA

COPE
 Trinity Beach

Figure

3

C 27.1

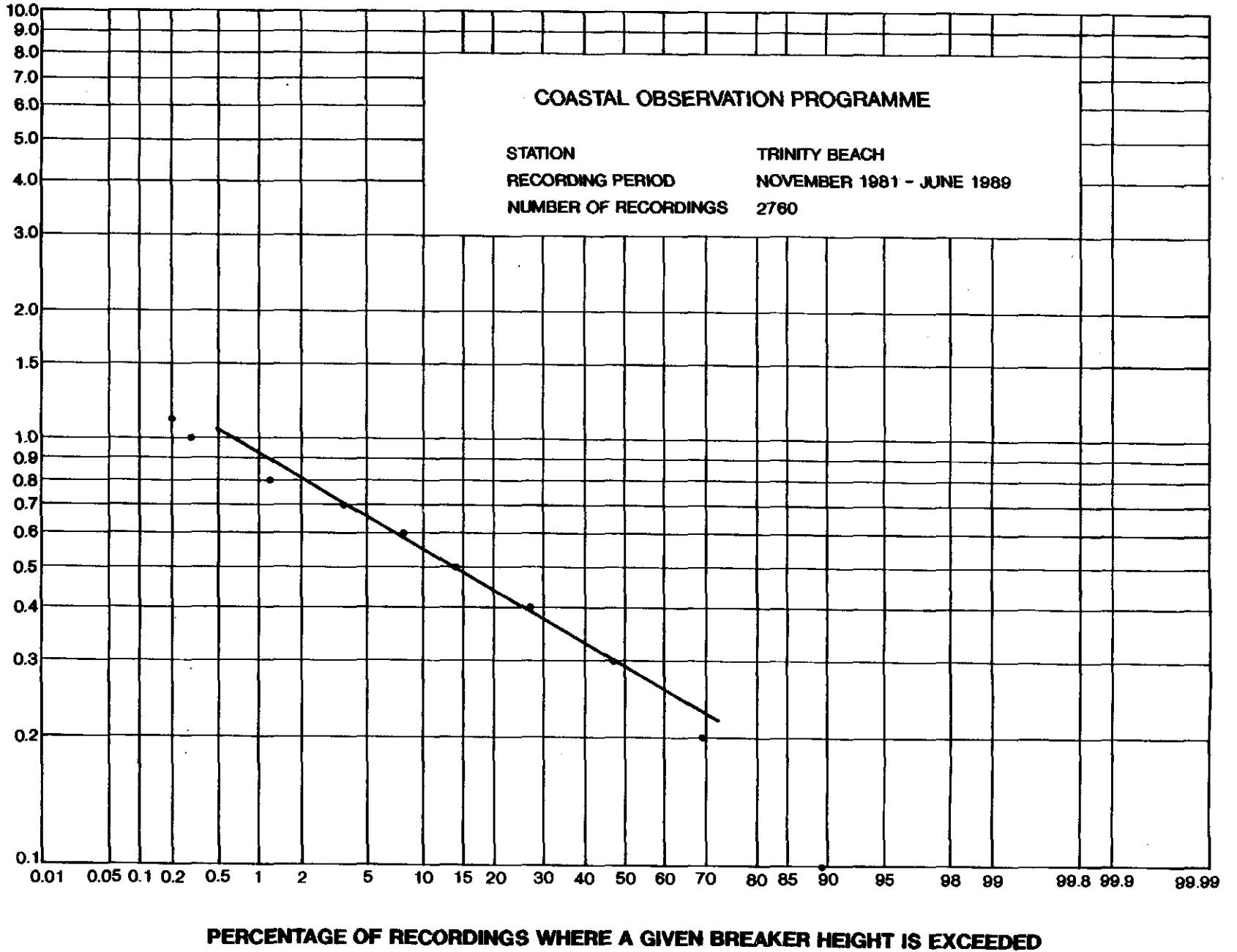


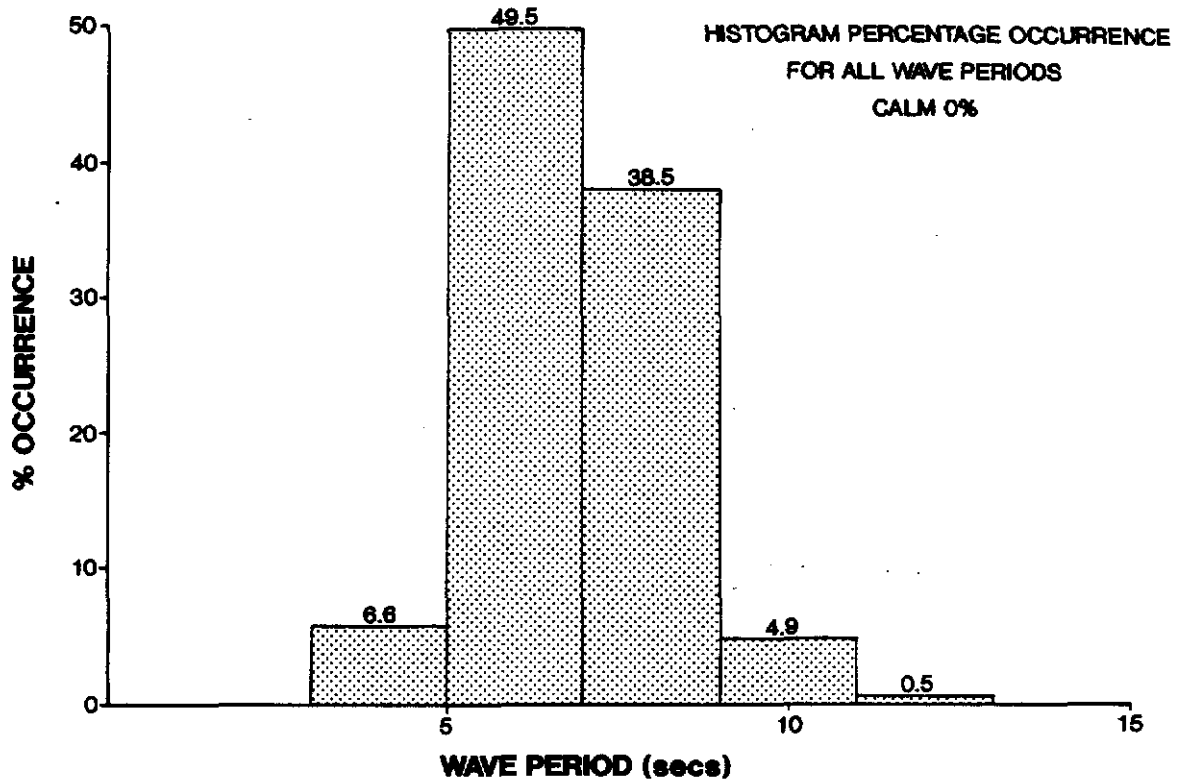
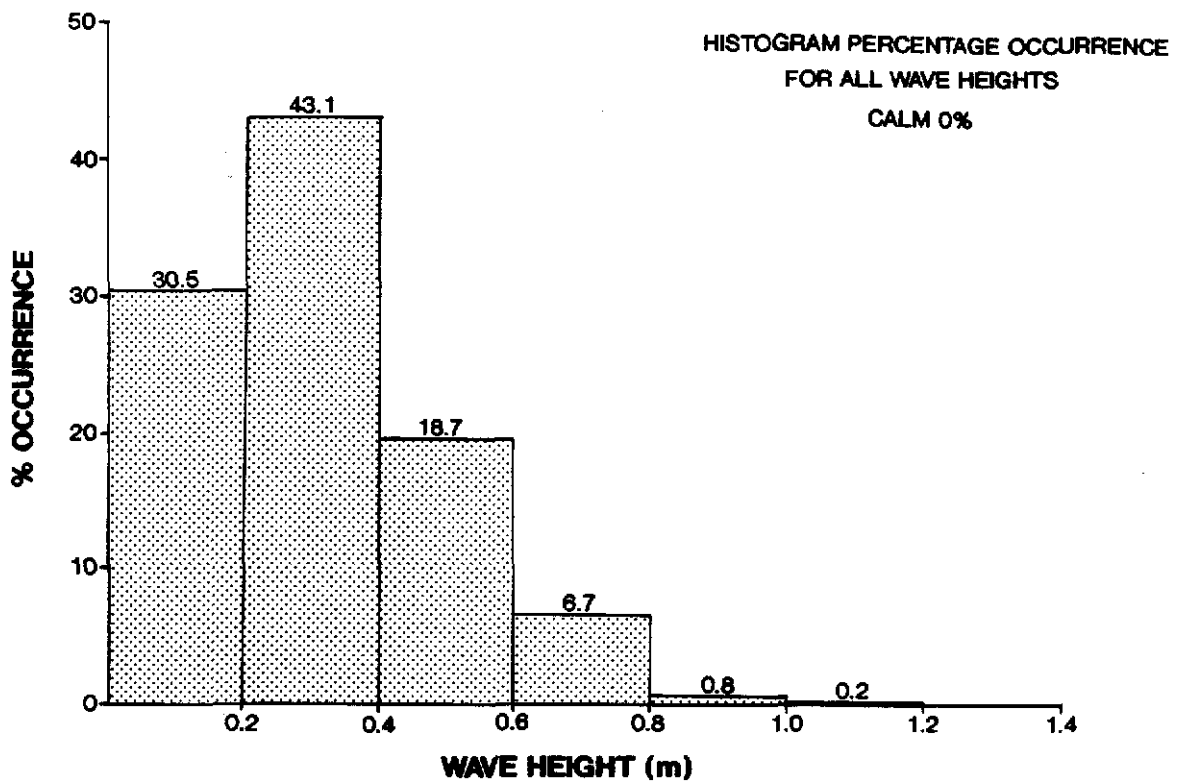


WAVE HEIGHT PERCENTAGE EXCEEDANCE

COPE
Trinity Beach
Figure
4
C 27.1

BREAKER WAVE HEIGHT (metres)





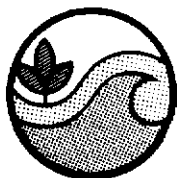
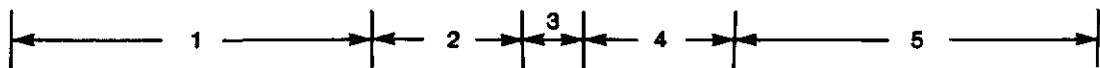
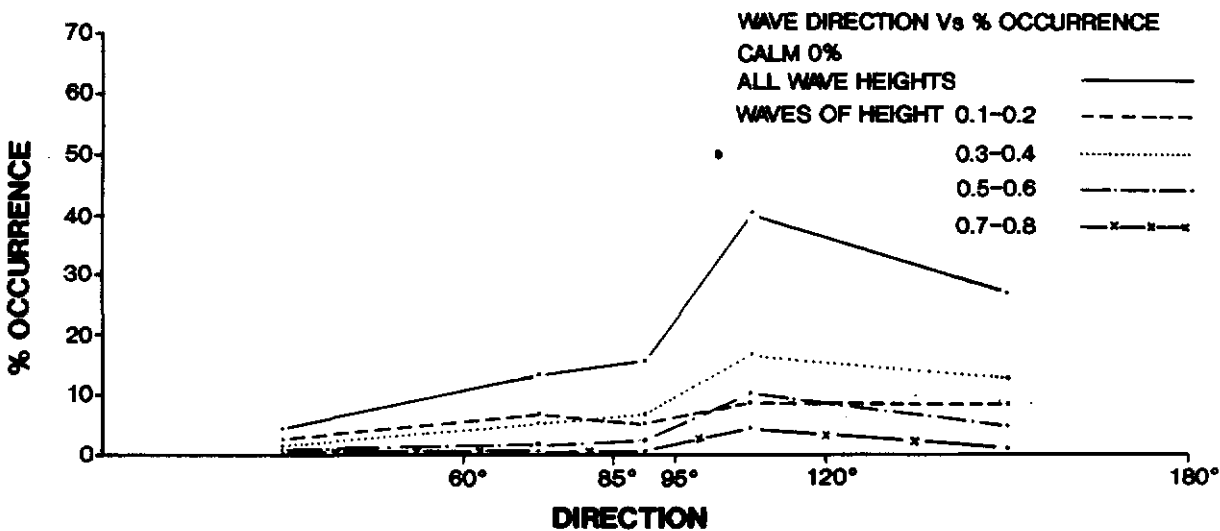
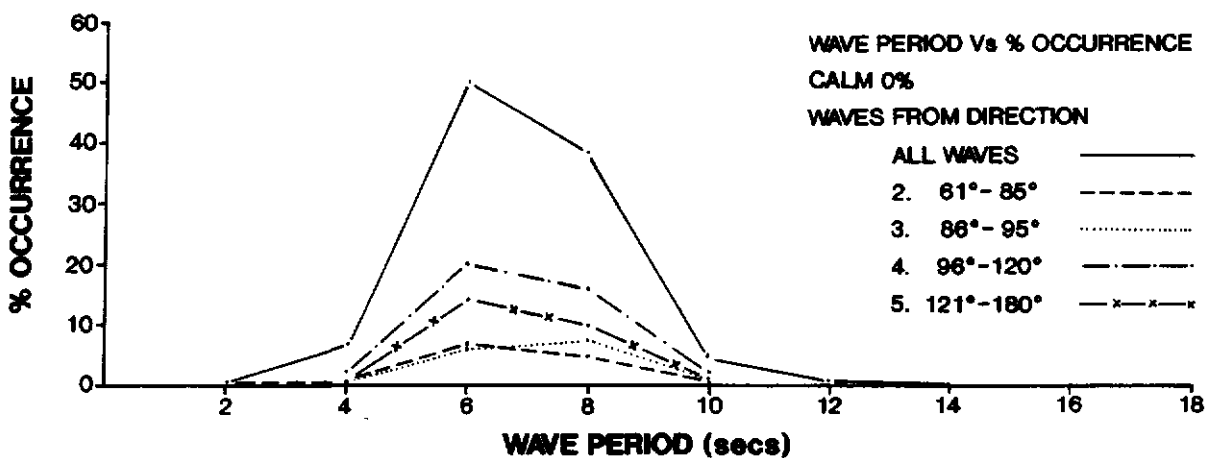
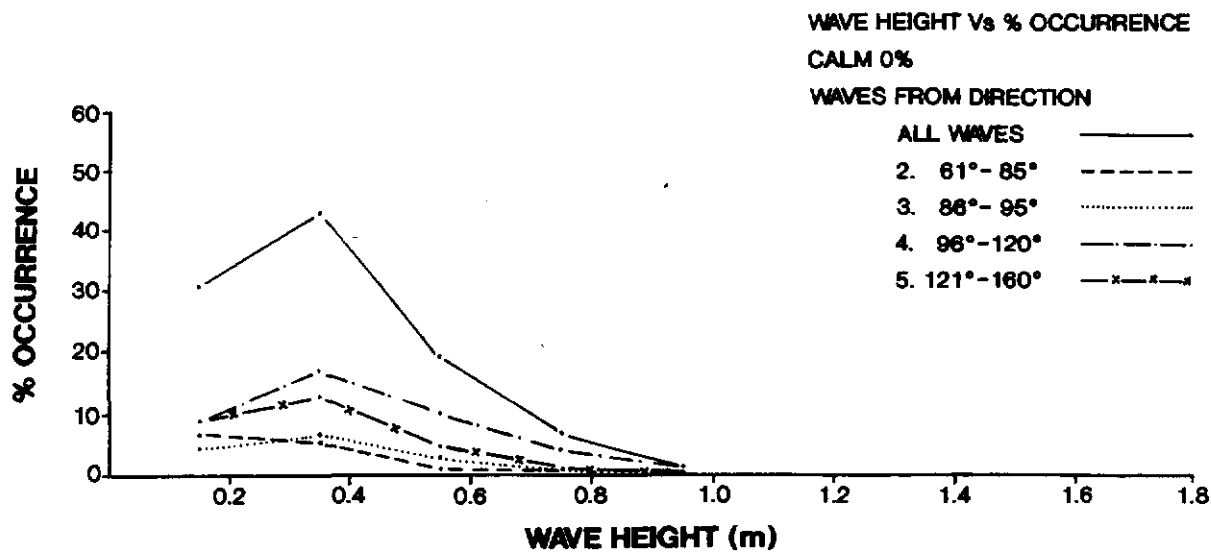
Beach Protection Authority
Queensland

**PERCENTAGE OCCURRENCE OF WAVE HEIGHT
AND WAVE PERIOD**

COPE
Trinity Beach

Figure
5
C 27.1

HARBOURS MARINE
Consultants



Beach Protection Authority
Queensland

WAVE DIRECTION ANALYSIS

ALL DATA

COPE
Trinity Beach

Figure

6

C 27.1



HARBOURS MARINE

Coastal Services



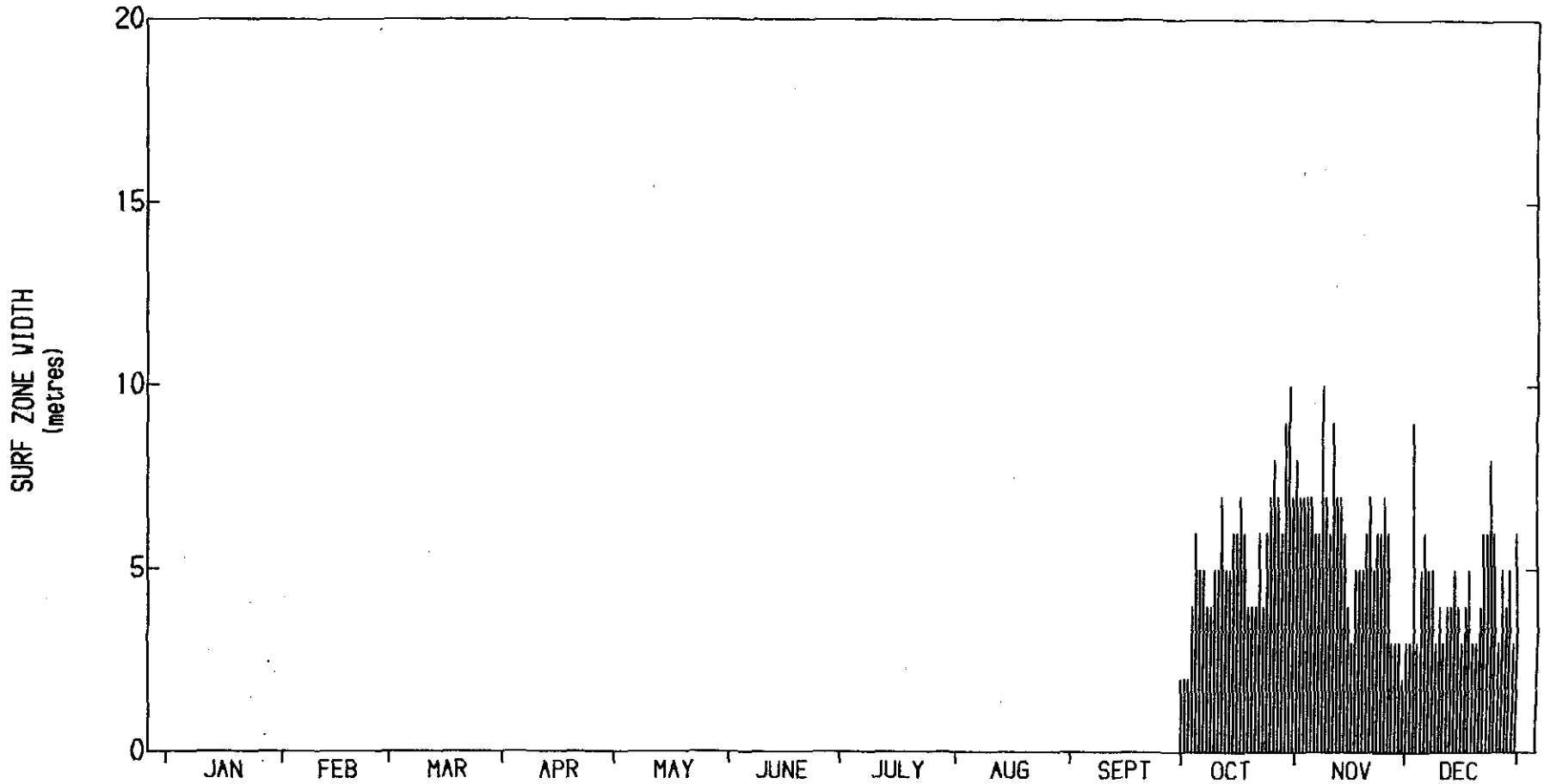
SURF ZONE WIDTH - MORNING 1981

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



SURF ZONE WIDTH SUMMARY - 1981

No. of Observations : 92

MORNING OBSERVATIONS

Mean Surf Zone Width = 5.3 m



Figure
7
C 27.1

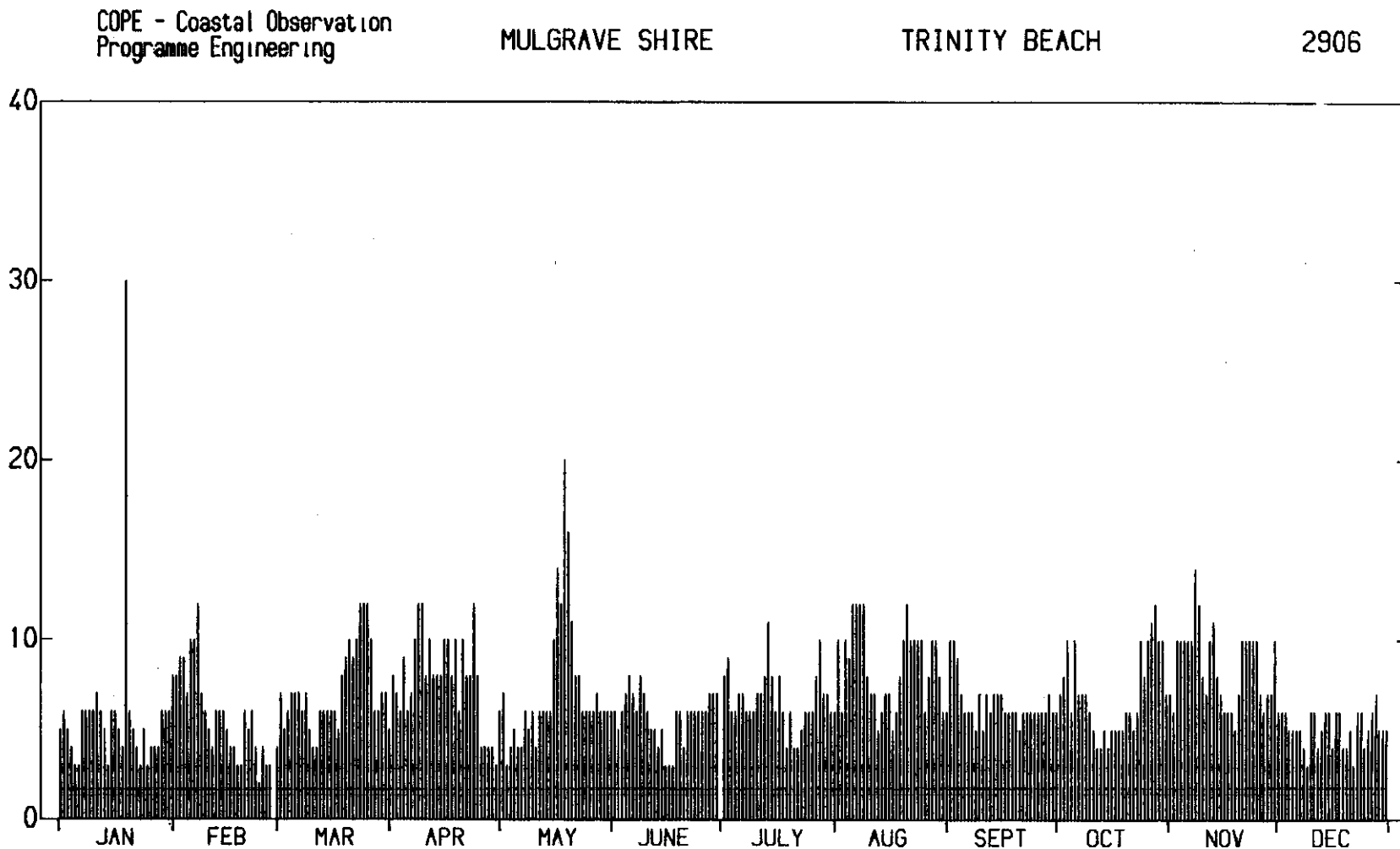
Trinity Beach

COPE



SURF ZONE WIDTH - MORNING 1982

SURF ZONE WIDTH
(metres)



SURF ZONE WIDTH SUMMARY - 1982

No. of Observations : 365

MORNING OBSERVATIONS

Mean Surf Zone Width = 6.8 m

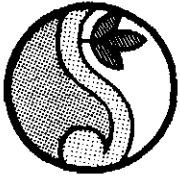
COPE

Trinity Beach

Figure

8

C 27.1



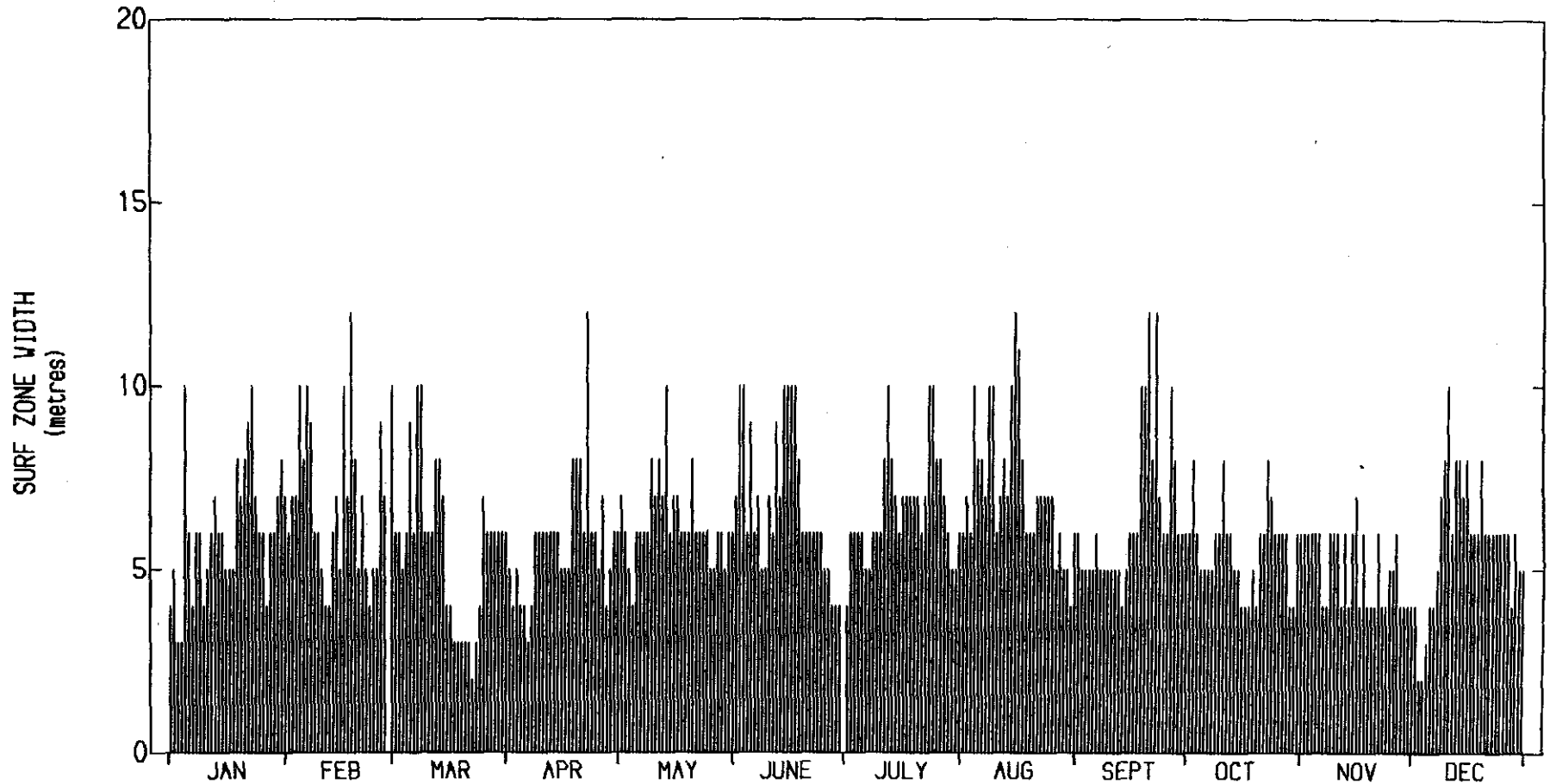
SURF ZONE WIDTH - MORNING 1983

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



SURF ZONE WIDTH SUMMARY - 1983

No. of Observations : 365

MORNING OBSERVATIONS

Mean Surf Zone Width = 6.2 m





SURF ZONE WIDTH - MORNING 1984

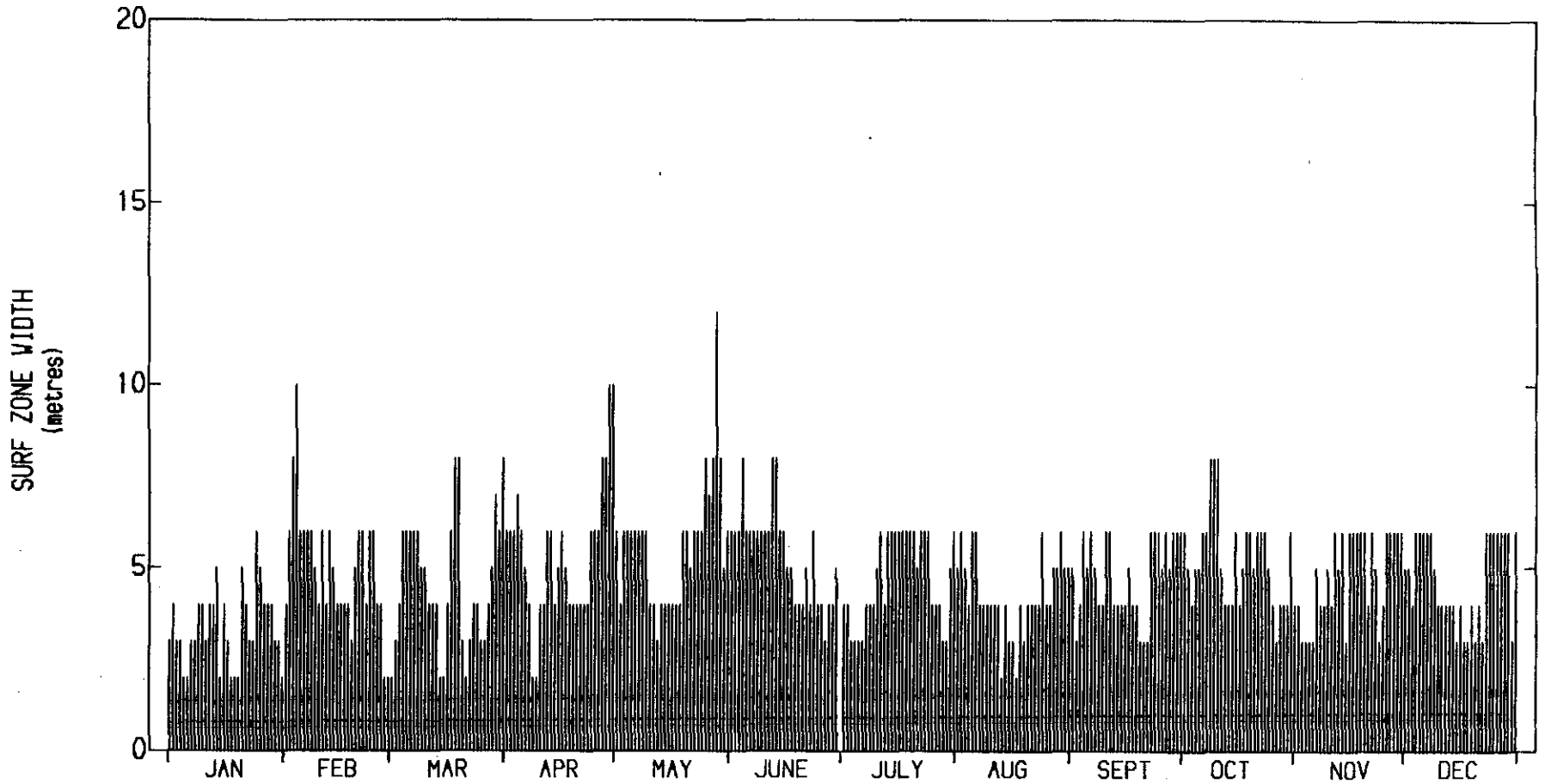
COPE
Trinity Beach
Figure
10
C 27.1

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



SURF ZONE WIDTH SUMMARY - 1984

No. of Observations : 366

MORNING OBSERVATIONS

Mean Surf Zone Width = 4.8 m



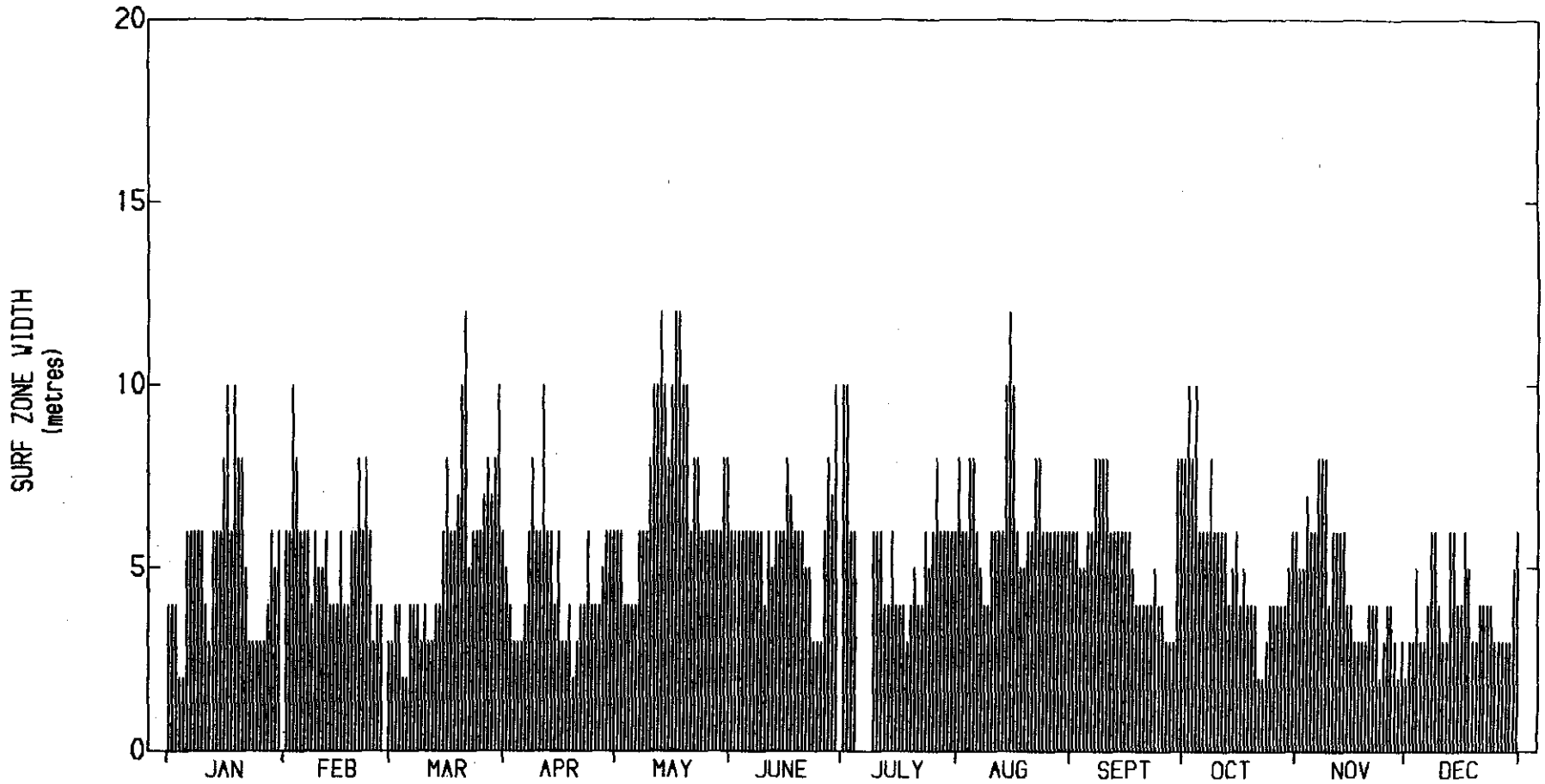
SURF ZONE WIDTH - MORNING 1985

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



SURF ZONE WIDTH SUMMARY - 1985

No. of Observations : 360

MORNING OBSERVATIONS

Mean Surf Zone Width = 5.5 m



Trinity Beach
Figure
11
C27.1

COPE



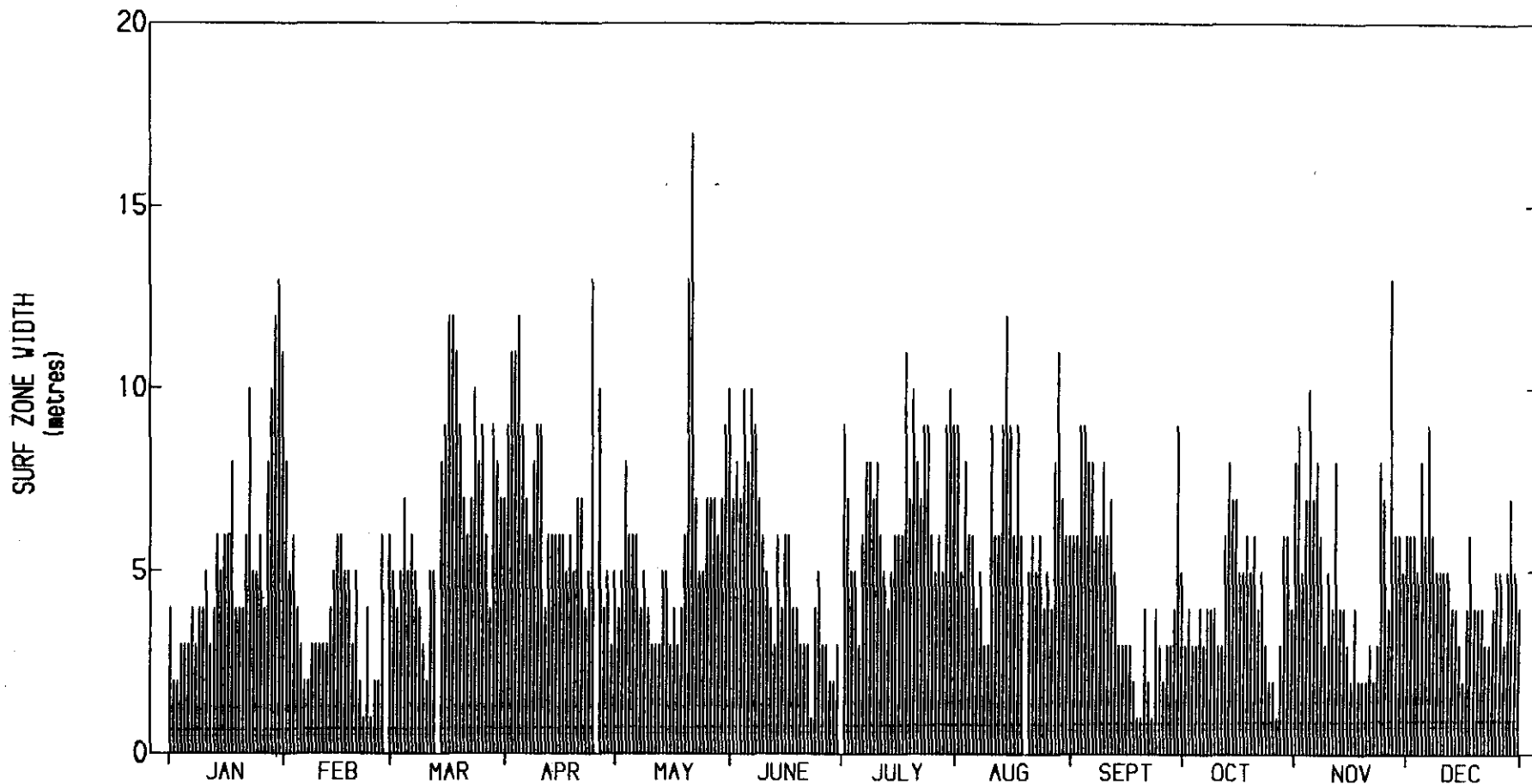
SURF ZONE WIDTH - MORNING 1986

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



SURF ZONE WIDTH SUMMARY - 1986

No. of Observations : 362

MORNING OBSERVATIONS

Mean Surf Zone Width = 5.6 m



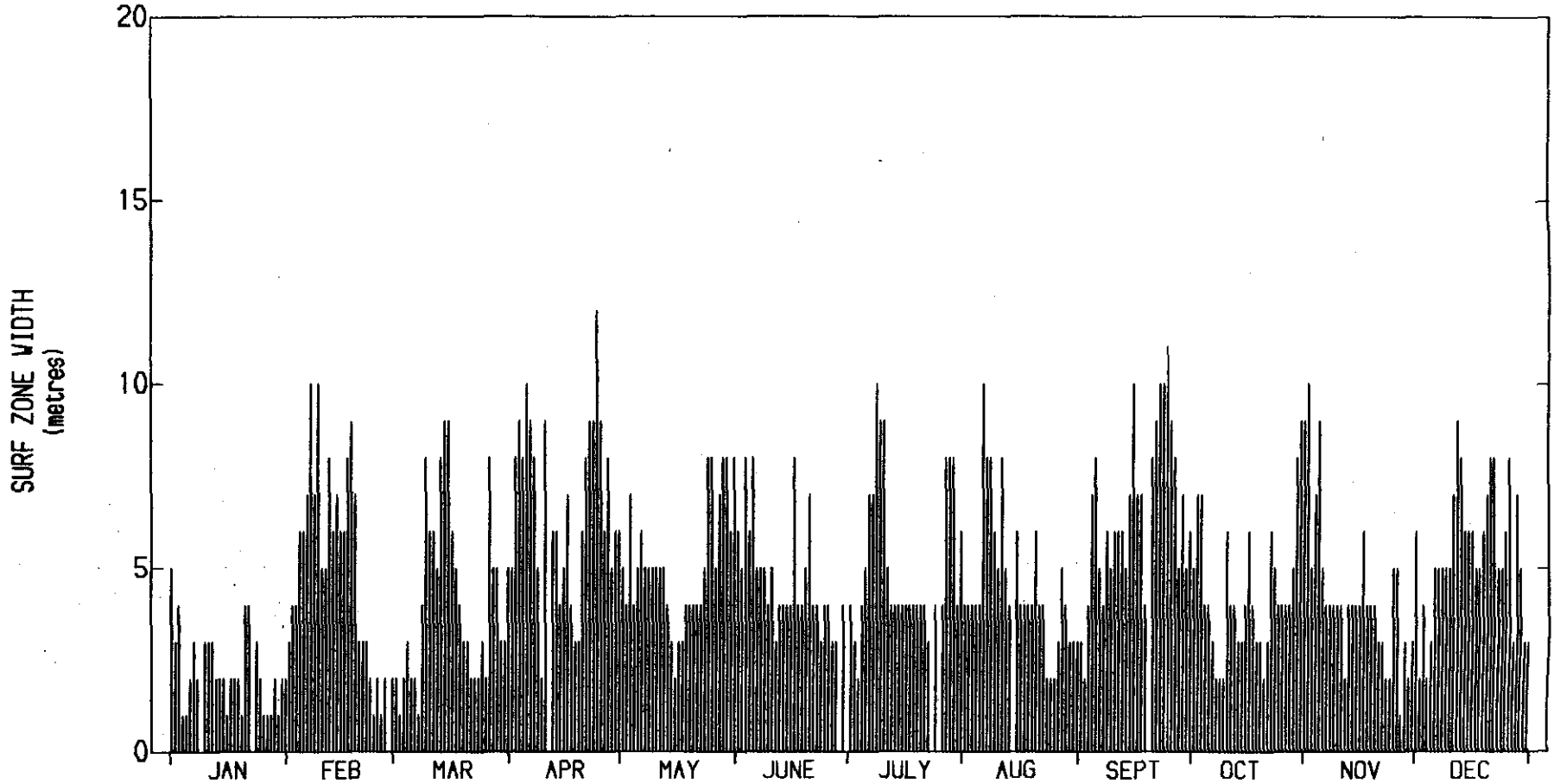
SURF ZONE WIDTH - MORNING 1987

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



SURF ZONE WIDTH SUMMARY - 1987

No. of Observations : 358

MORNING OBSERVATIONS

Mean Surf Zone Width = 4.9 m



Figure
13
C 27.1

COPE
Trinity Beach



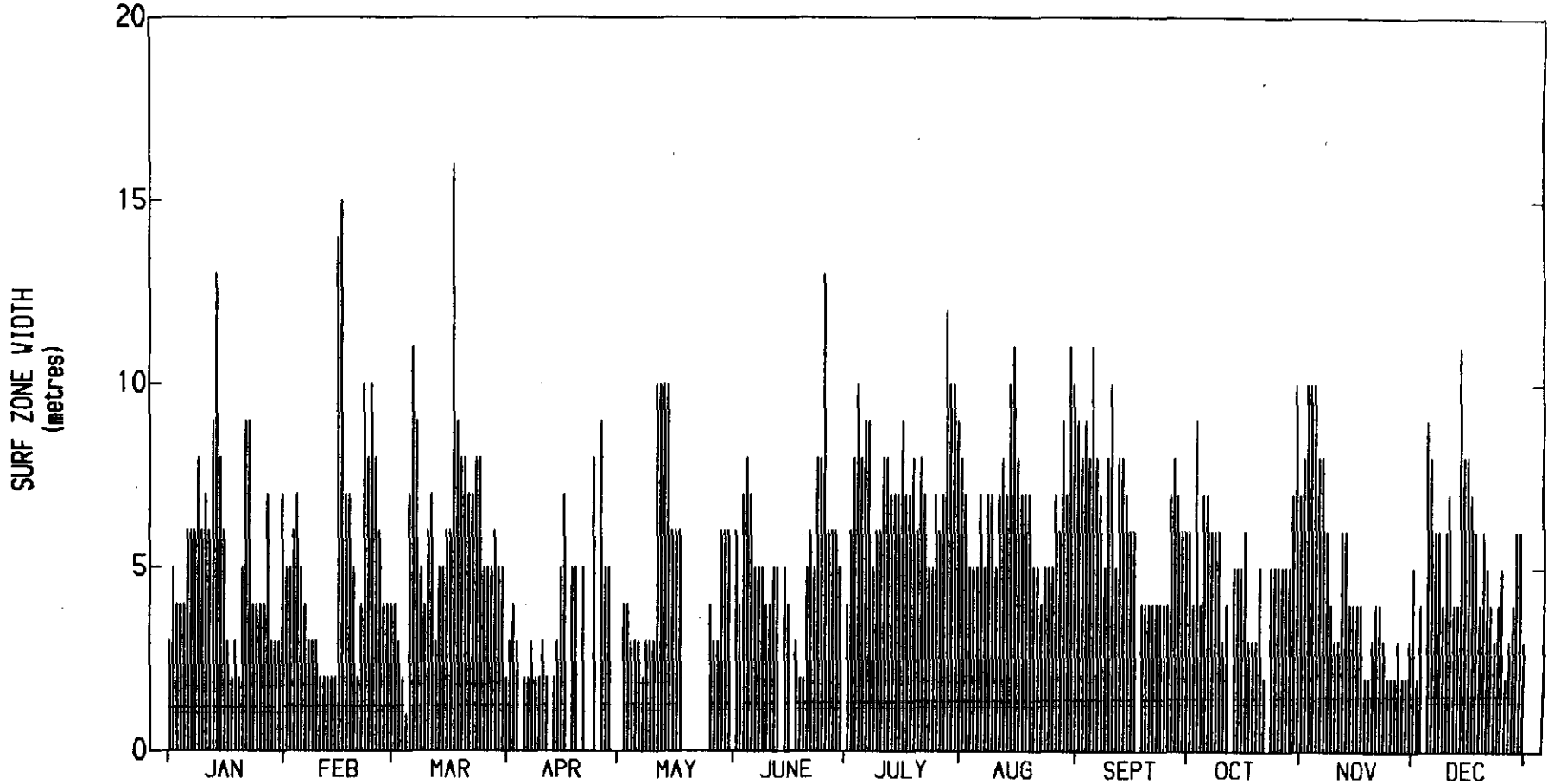
SURF ZONE WIDTH - MORNING 1988

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



SURF ZONE WIDTH SUMMARY - 1988

No. of Observations : 342

MORNING OBSERVATIONS

Mean Surf Zone Width = 5.7 m



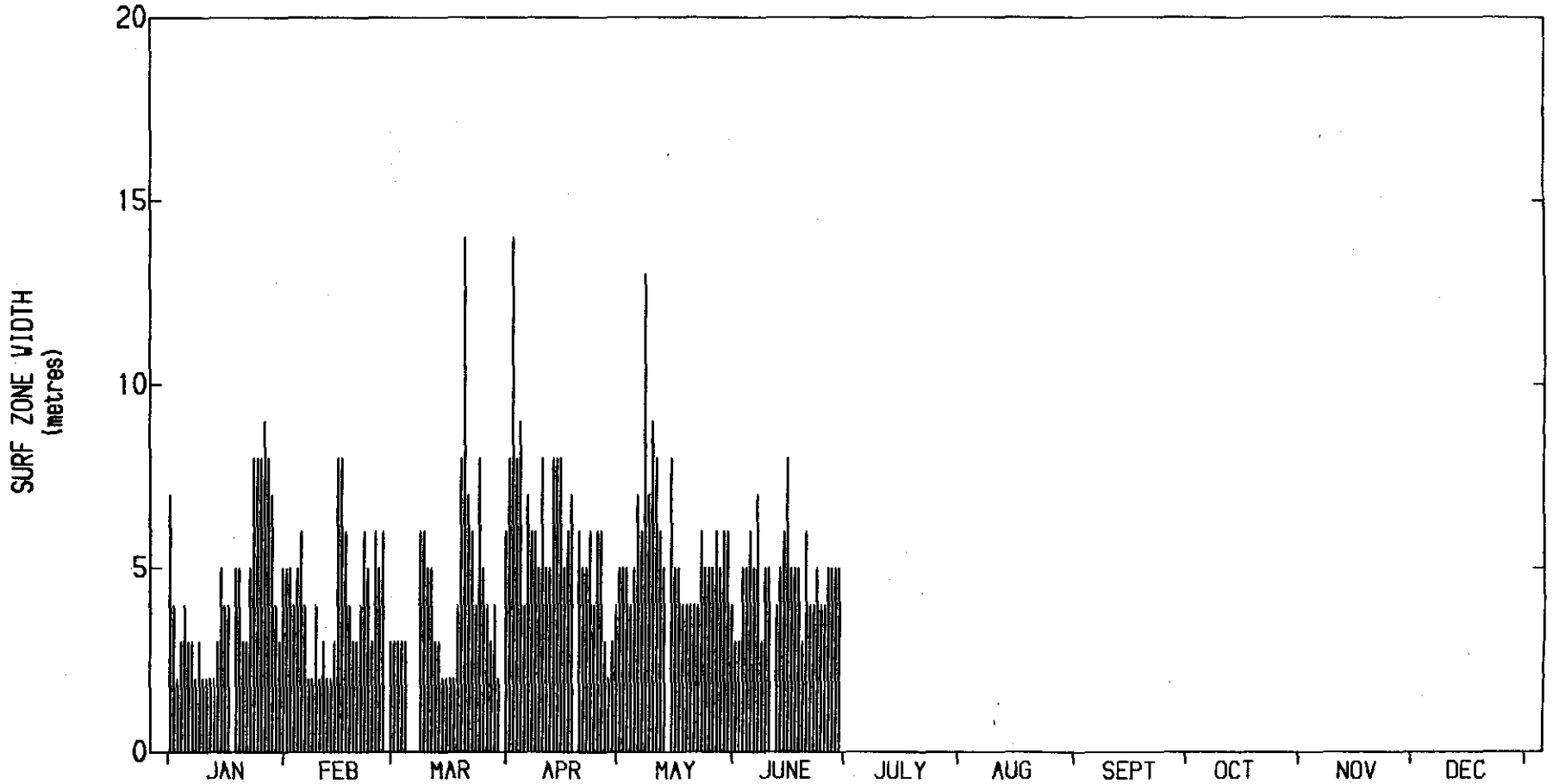
SURF ZONE WIDTH - MORNING 1989

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



SURF ZONE WIDTH SUMMARY - 1989

No. of Observations : 173

MORNING OBSERVATIONS

Mean Surf Zone Width = 5.0 m



Figure
15
C 27.1

COPE
Trinity Beach



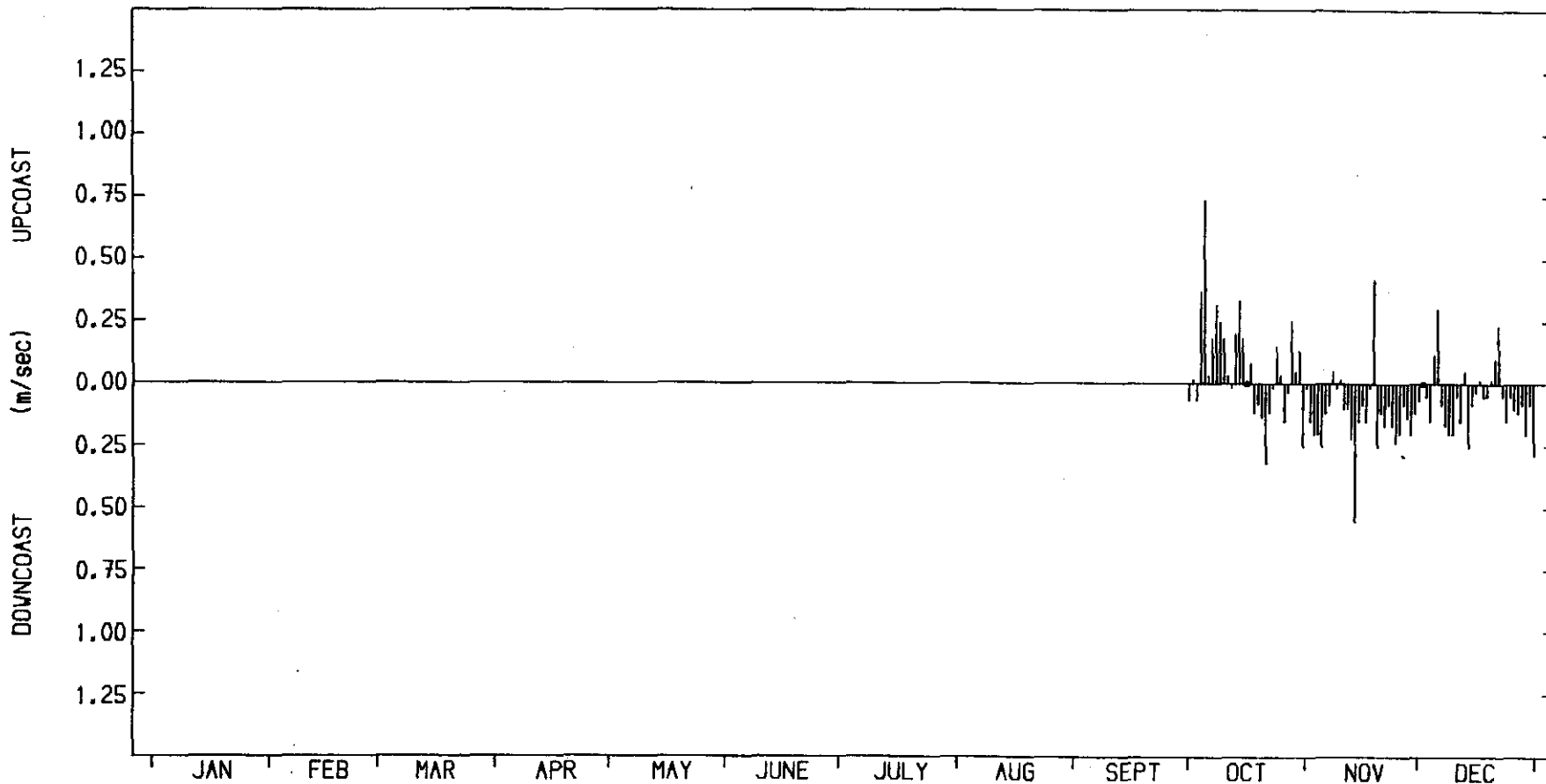
LITTORAL CURRENTS - MORNING 1981

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1981

Mean Vel = -0.037 m/sec (down)

Mean Upcoast Vel = $.173$ m/sec

Mean Downcoast Vel = $.133$ m/sec

MORNING OBSERVATIONS - (92 recordings)



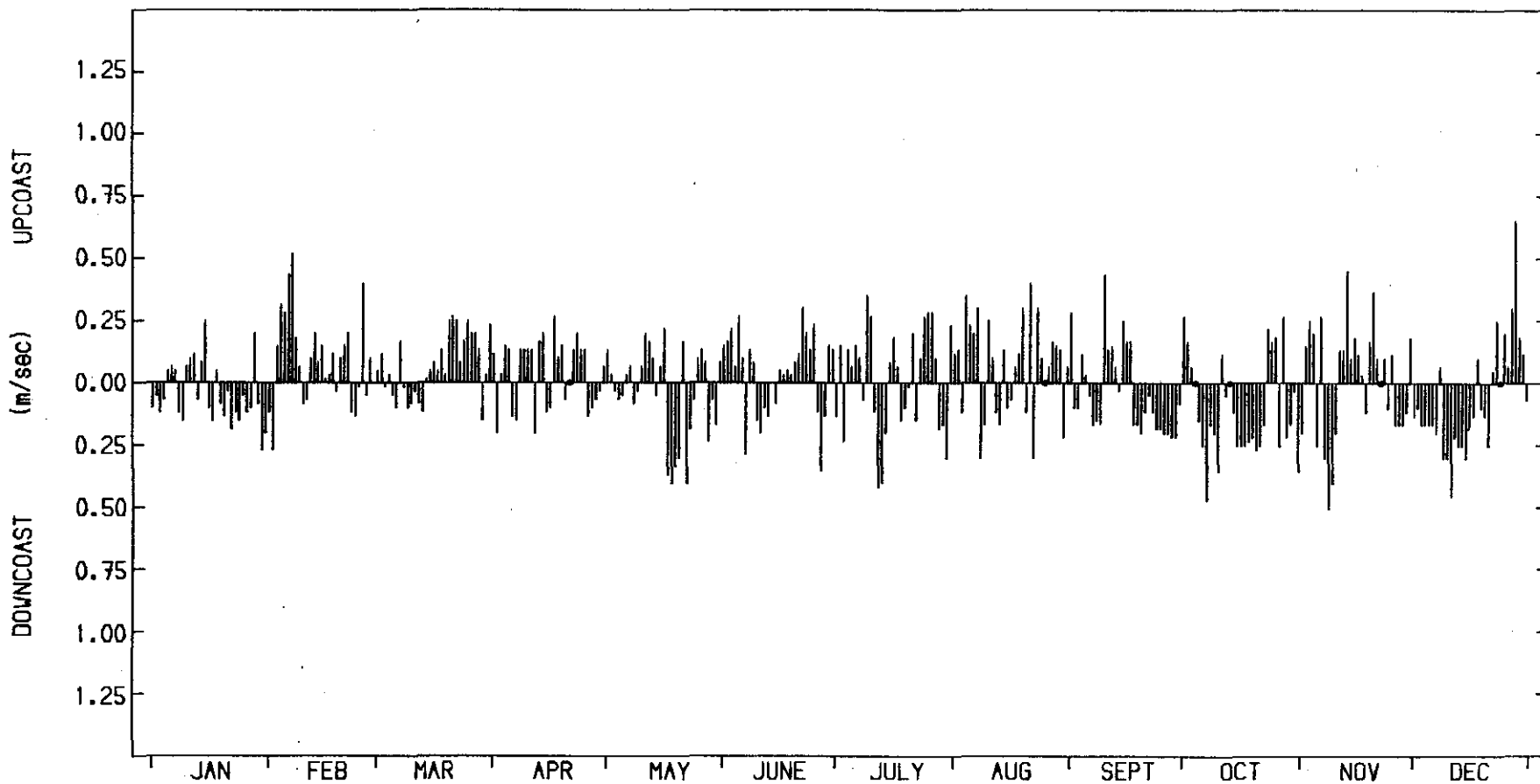
LITTORAL CURRENTS - MORNING 1982

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1982

Mean Vel = .003 m/sec (up)

Mean Upcoast Vel = .158 m/sec

Mean Downcoast Vel = .163 m/sec

MORNING OBSERVATIONS - (364 recordings)

COPE

Trinity Beach

Figure

17

C27.1



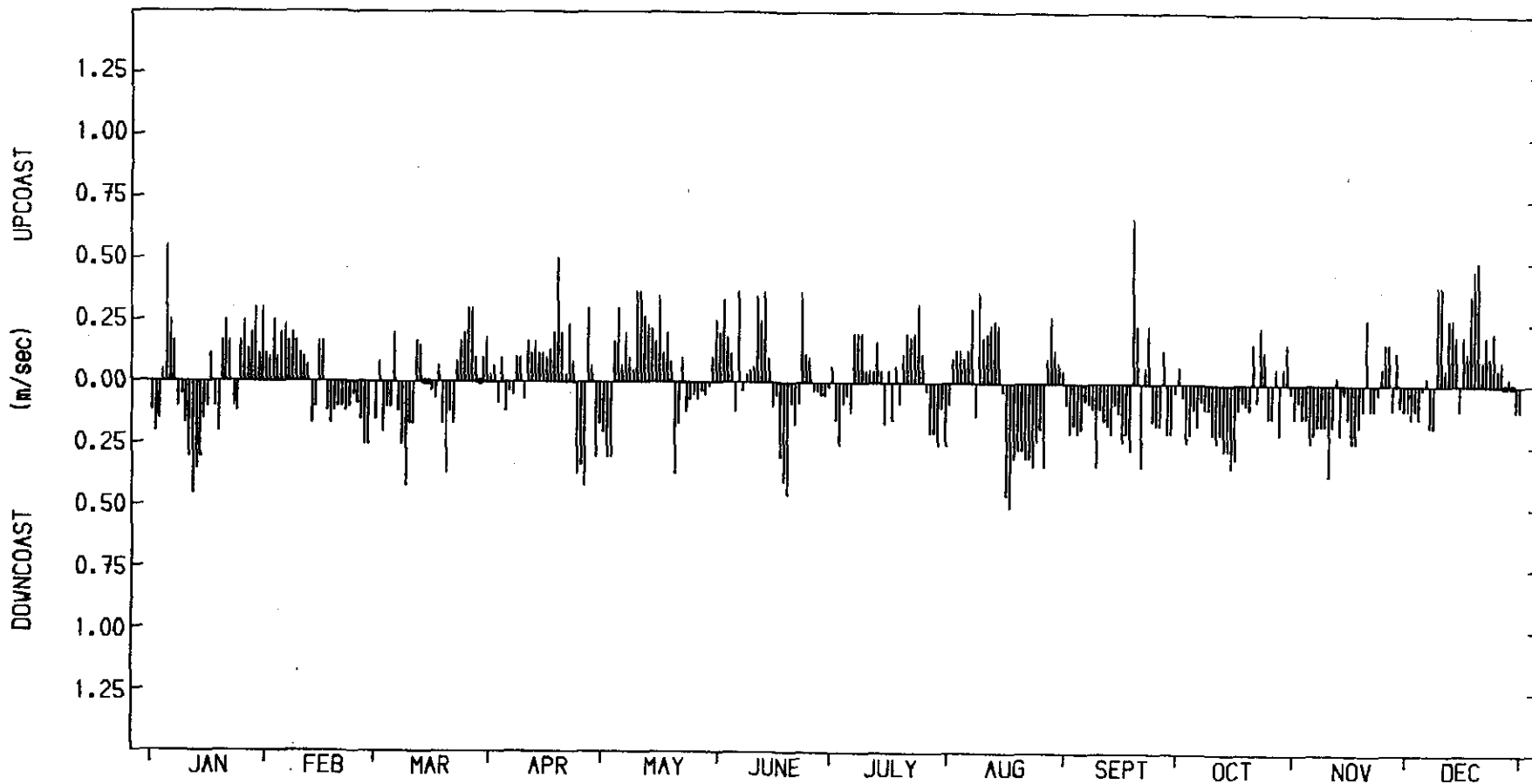
LITTORAL CURRENTS - MORNING 1983

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1983

Mean Vel = $-.005$ m/sec (down)

Mean Upcoast Vel = $.177$ m/sec

Mean Downcoast Vel = $.163$ m/sec

MORNING OBSERVATIONS - (365 recordings)





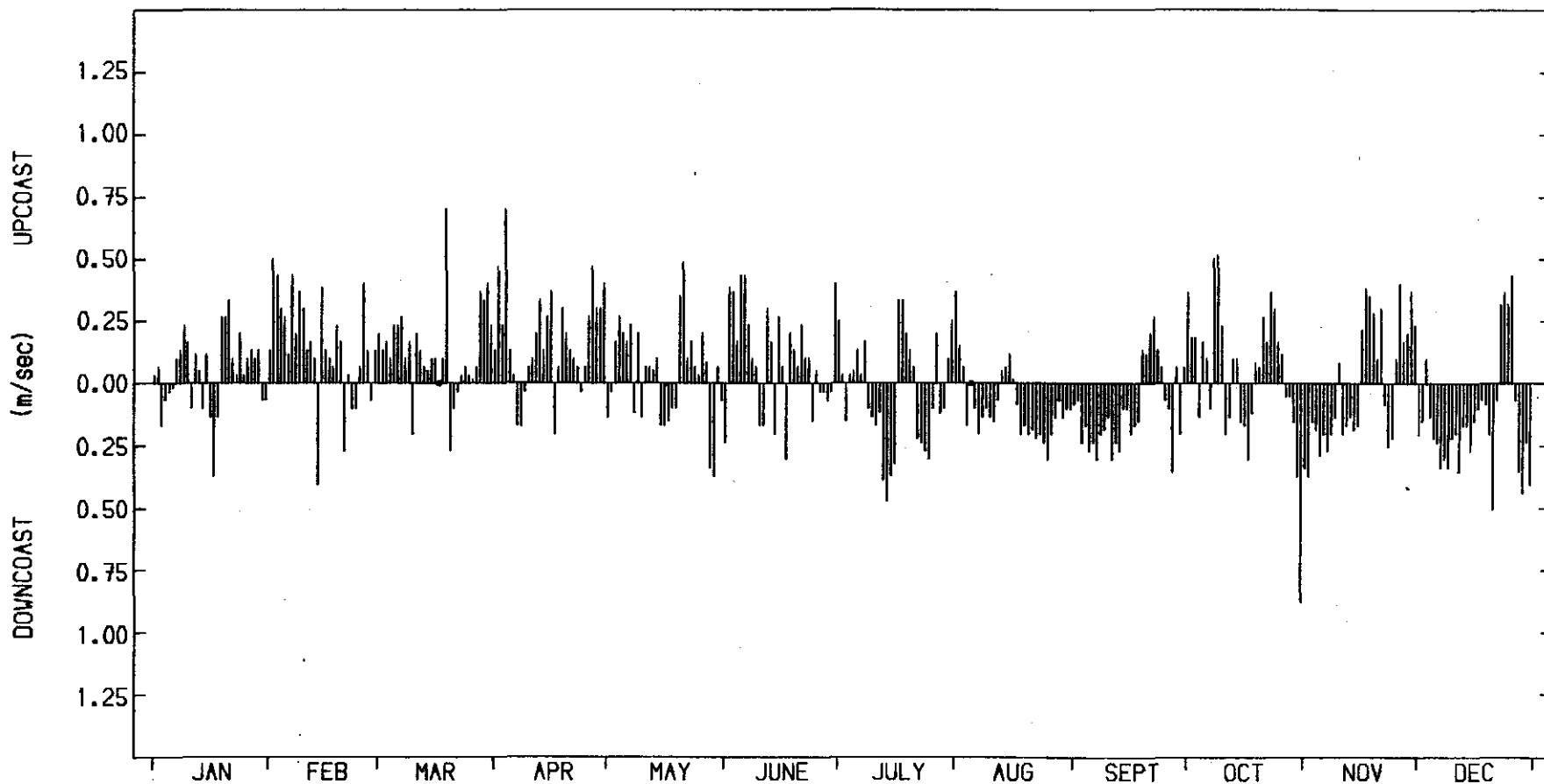
LITTORAL CURRENTS - MORNING 1984

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1984

Mean Vel = .024 m/sec (up)

Mean Upcoast Vel = .193 m/sec

Mean Downcoast Vel = .183 m/sec

MORNING OBSERVATIONS - (366 recordings)





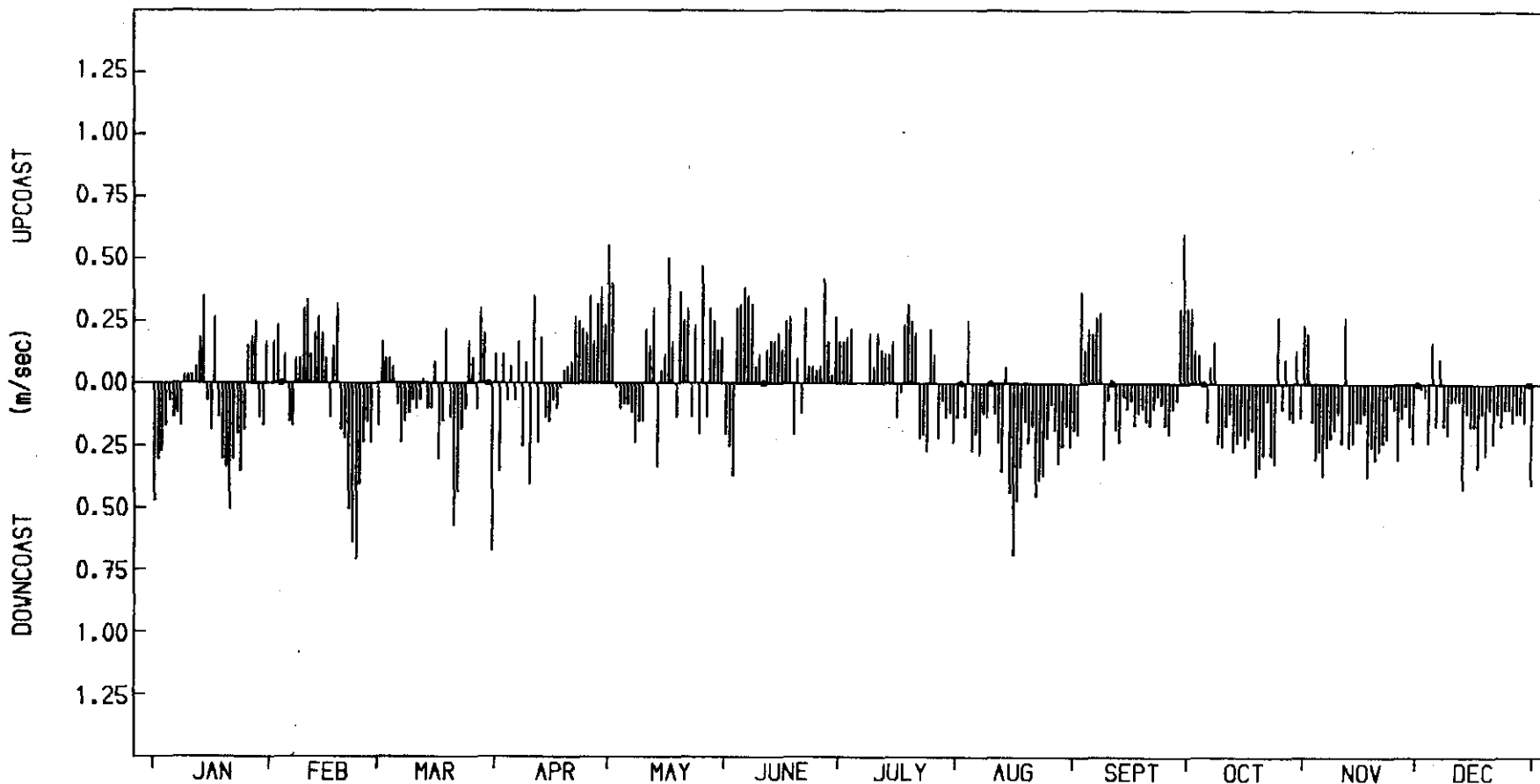
LITTORAL CURRENTS - MORNING 1985

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1985

Mean Vel = $-.043$ m/sec (down)

Mean Upcoast Vel = $.200$ m/sec

Mean Downcoast Vel = $.202$ m/sec

MORNING OBSERVATIONS - (360 recordings)

COPE

Trinity Beach

Figure

20

C 27.1



HARBOURS MARINE
Cape Kennedy



LITTORAL CURRENTS - MORNING 1986

Trinity Beach
Figure
21
C 27.1

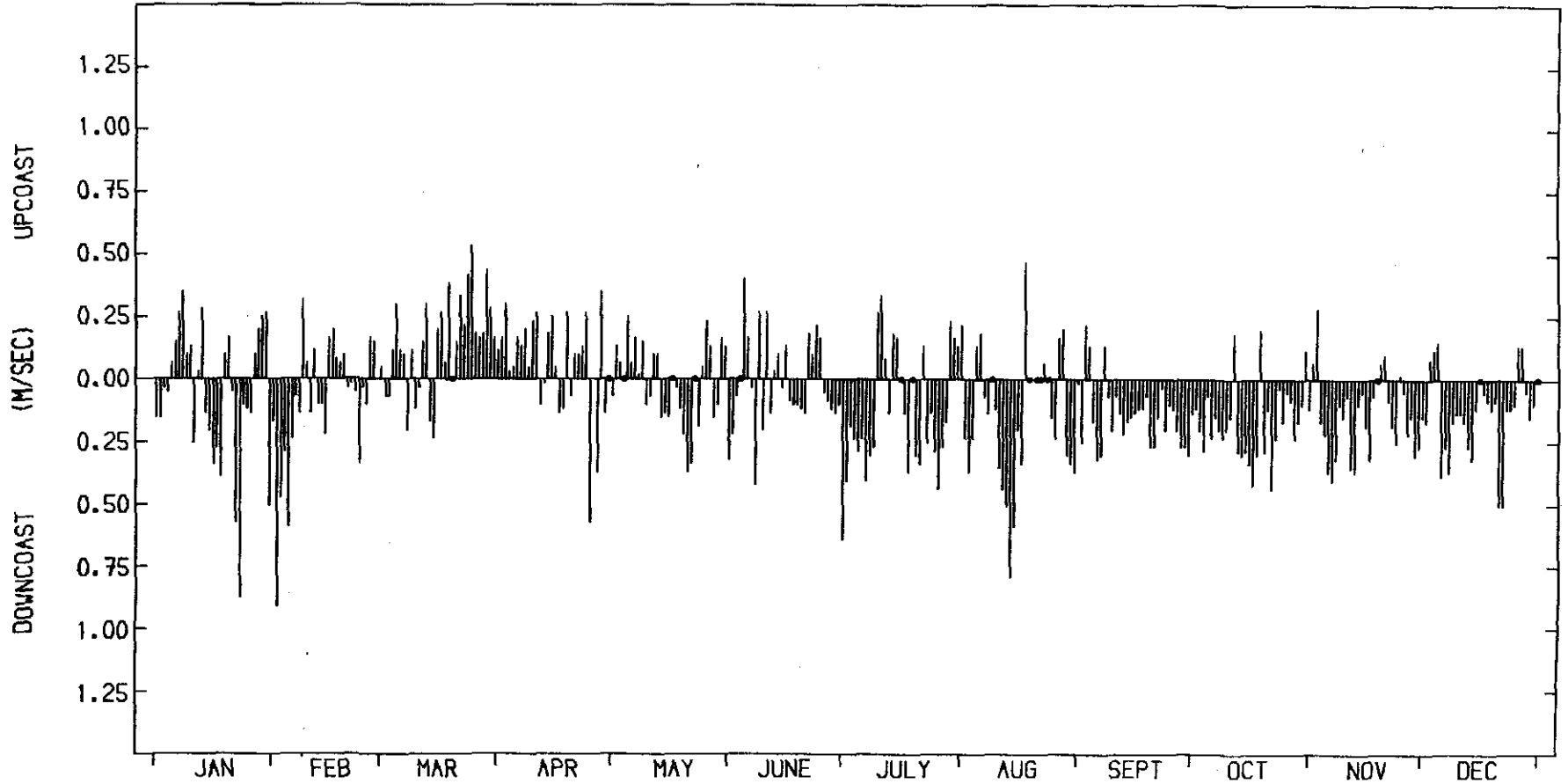
COPE

COPE - COASTAL OBSERVATION
PROGRAMME ENGINEERING

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1986

MEAN VEL = -.069 M/SEC (DOWN)

MEAN UPCAST VEL = .174 M/SEC

MEAN DOWNCAST VEL = .209 M/SEC

MORNING OBSERVATIONS - (363 RECORDINGS)



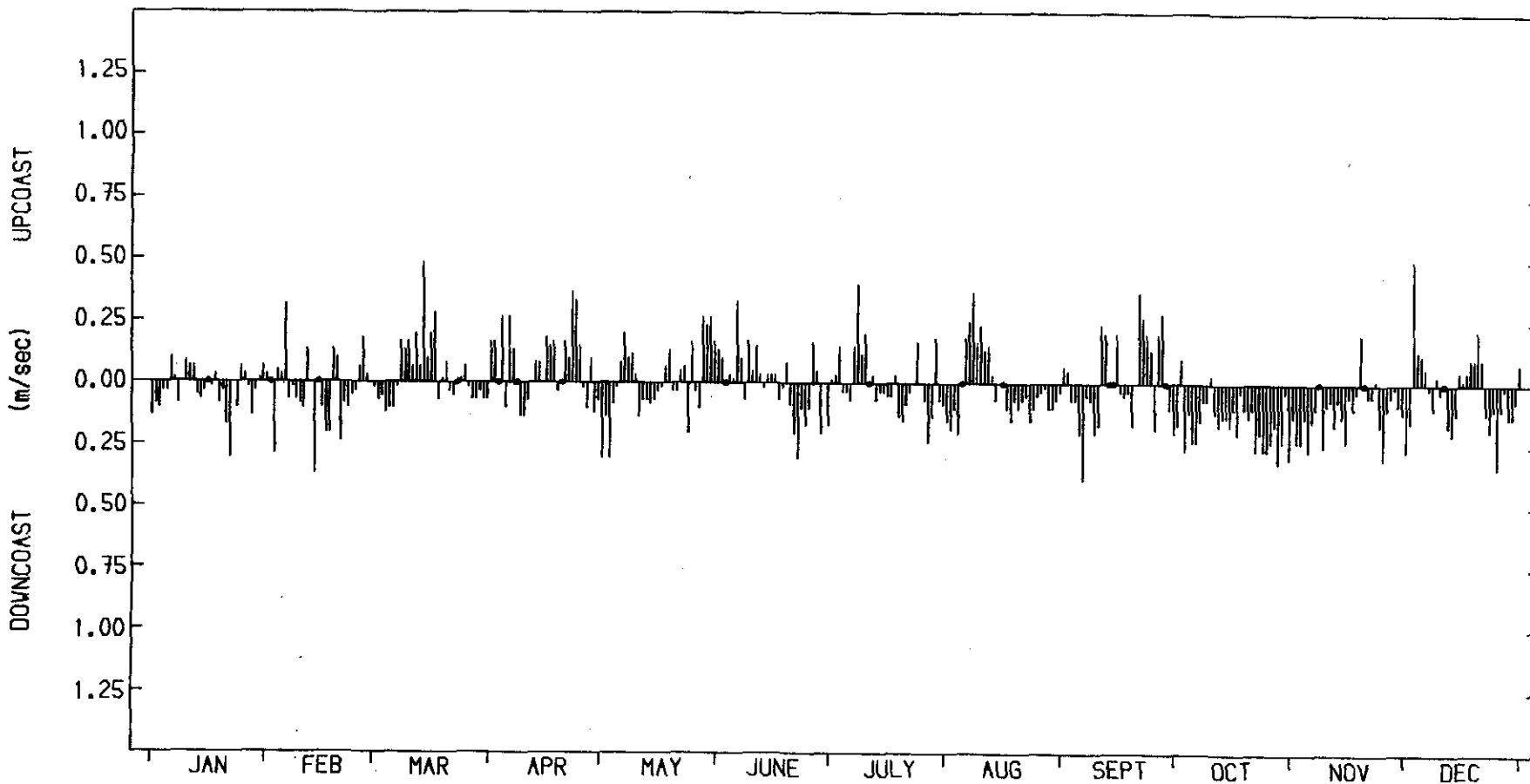
LITTORAL CURRENTS - MORNING 1987

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1987

Mean Vel = -.020 m/sec (down)

Mean Upcoast Vel = .134 m/sec

Mean Downcoast Vel = .115 m/sec

MORNING OBSERVATIONS - (357 recordings)



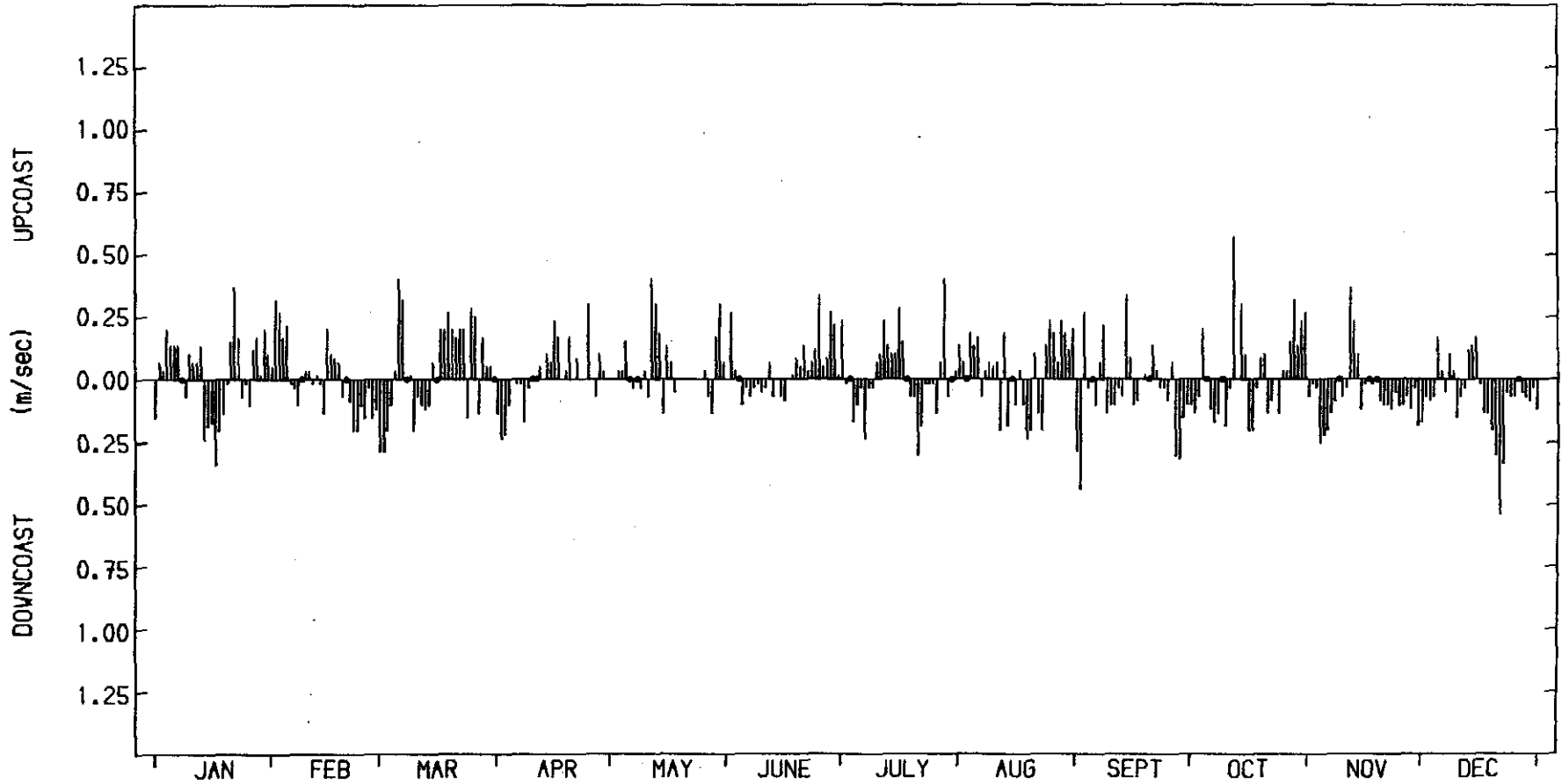
LITTORAL CURRENTS - MORNING 1988

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1988

Mean Vel = .007 m/sec (up)

Mean Upcoast Vel = .144 m/sec

Mean Downcoast Vel = .114 m/sec

MORNING OBSERVATIONS - (343 recordings)



Figure
23
C 27.1

Trinity Beach

COPE



LITTORAL CURRENTS - MORNING 1989

Figure
24
C 27.1

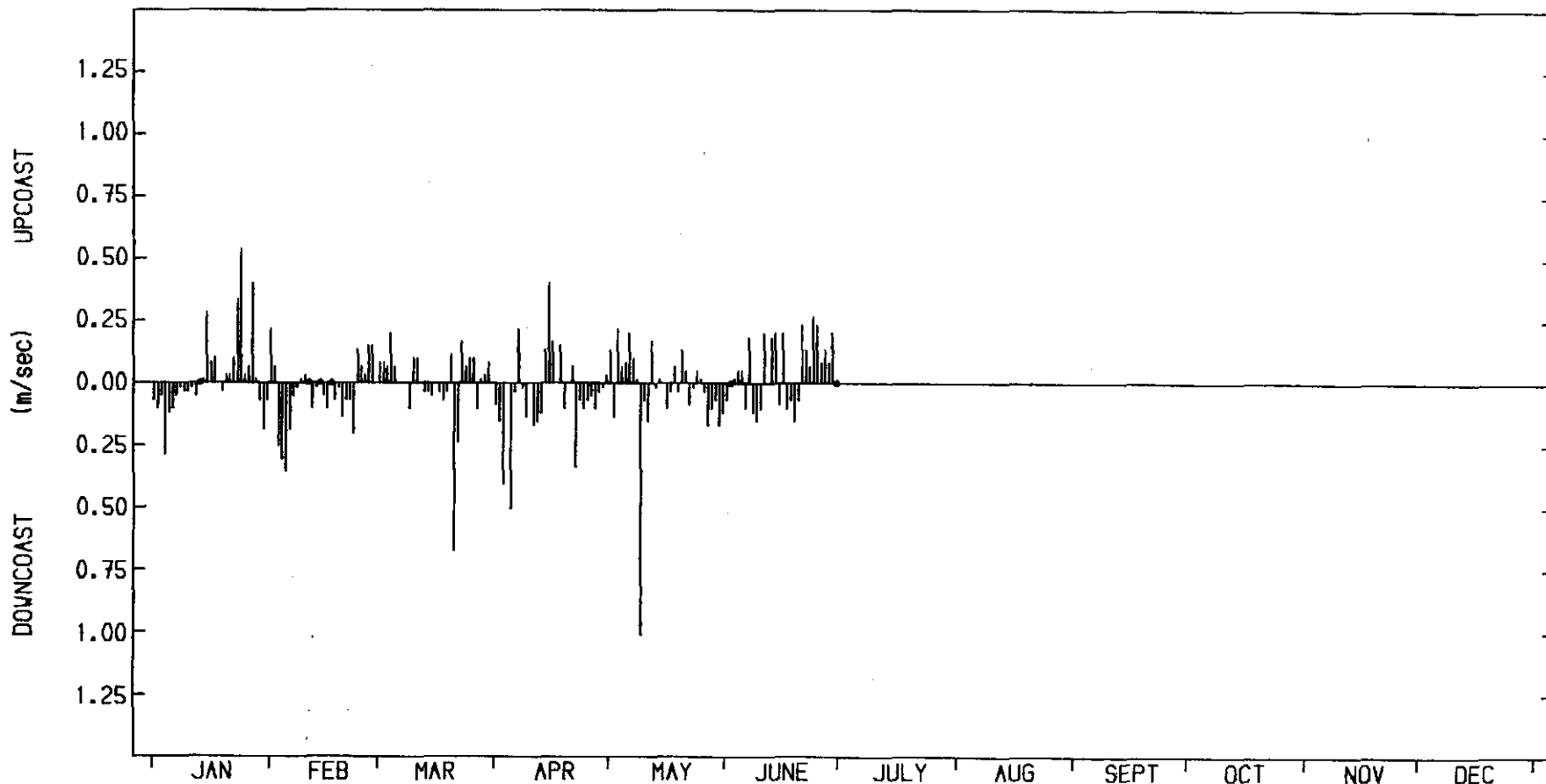
COPE
Trinity Beach

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



LITTORAL CURRENT SUMMARY - 1989

Mean Vel = $-.007$ m/sec (down)

Mean Upcoast Vel = $.124$ m/sec

Mean Downcoast Vel = $.120$ m/sec

MORNING OBSERVATIONS - (168 recordings)



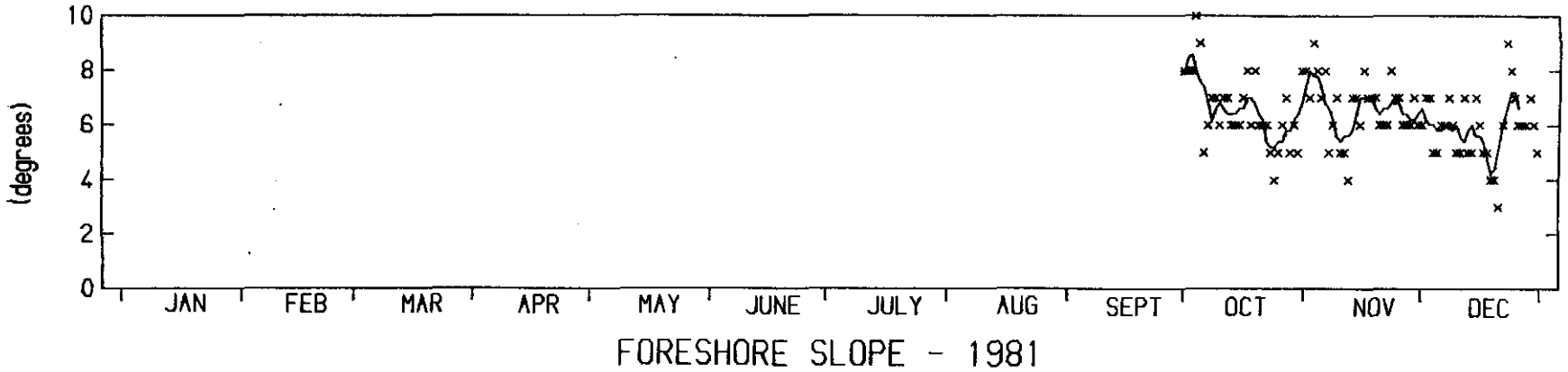
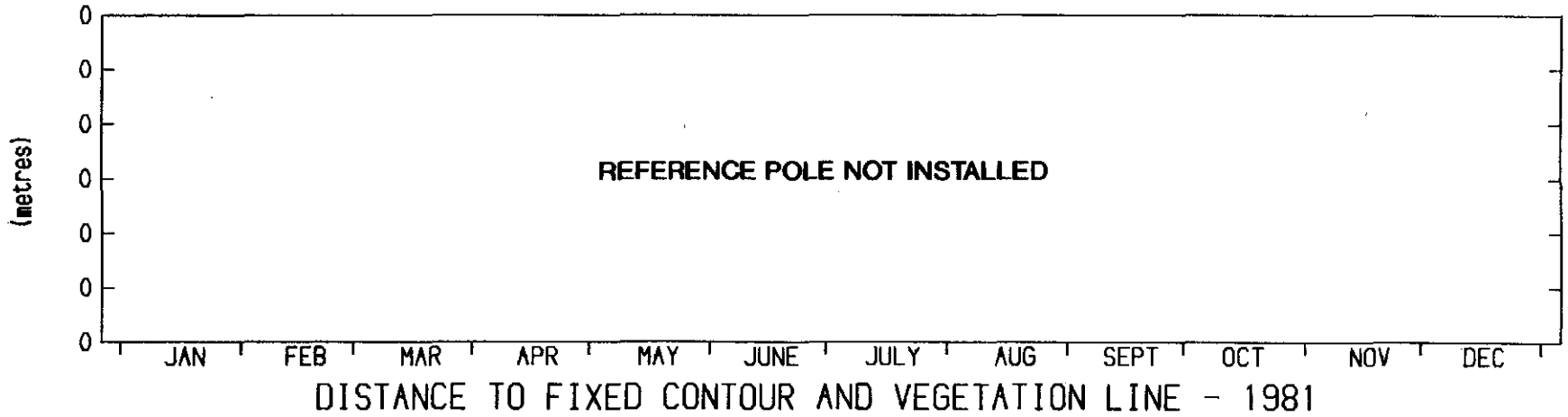
BEACH PROFILE PARAMETERS - 1981

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



Five Day Moving Average

No. of Observations : 92

COPE

Trinity Beach

Figure

25

C 27.1



BEACH PROFILE PARAMETERS - 1982



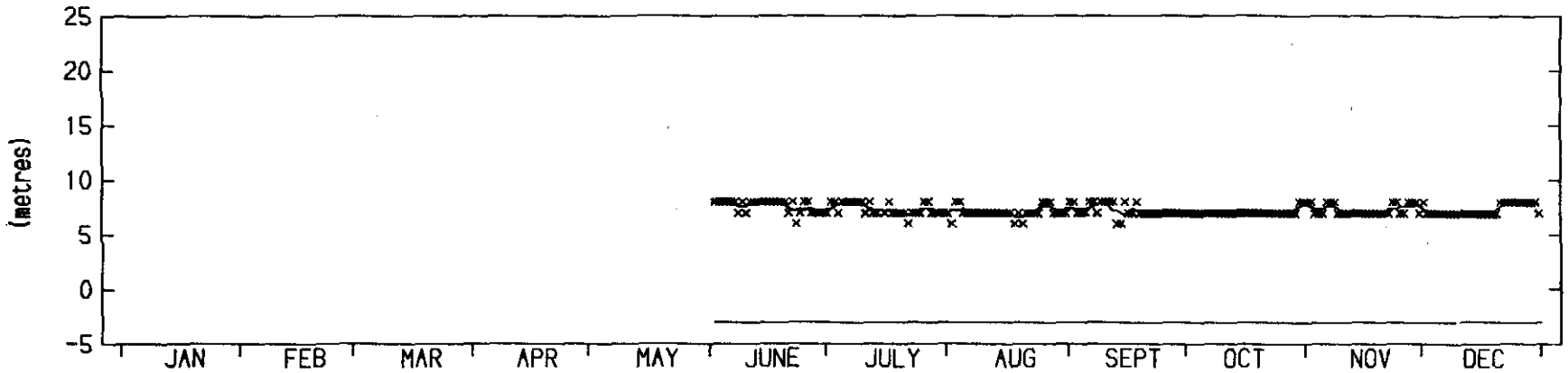
COPE
Trinity Beach
Figure
26
C 27.1

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

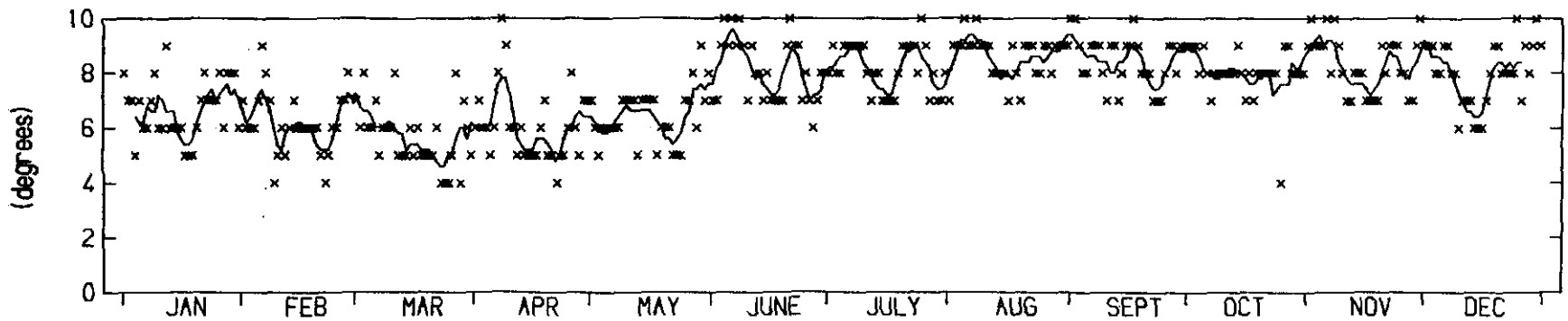
TRINITY BEACH

2906



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1982

xxxx Indicates Distance to Fixed Contour : 212 Observations Fixed Contour Level is approx 1.5 m above AHD
— Indicates Distance to Vegetation Line : 212 Observations



FORESHORE SLOPE - 1982

Five Day Moving Average

No. of Observations : 365



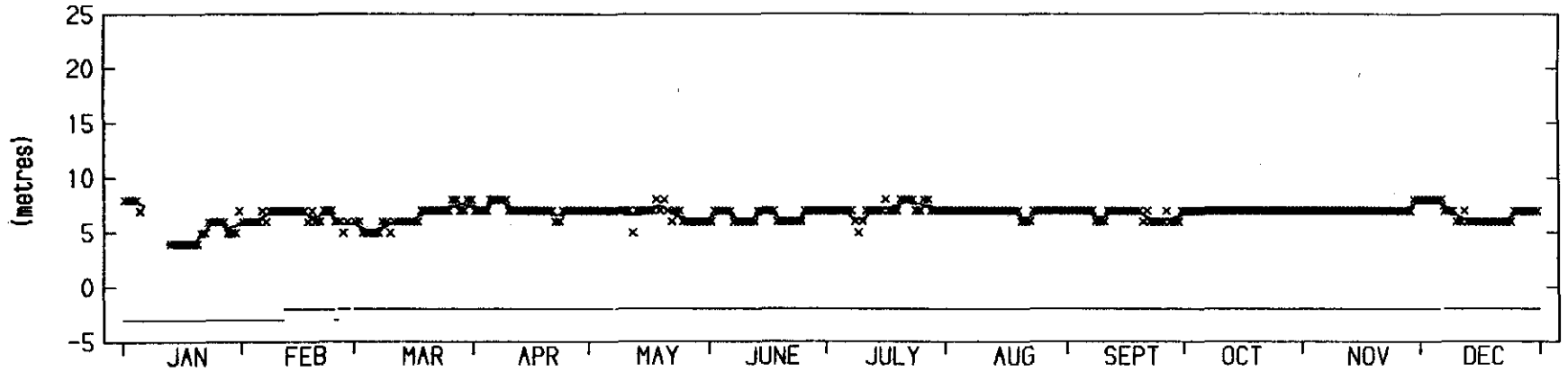
BEACH PROFILE PARAMETERS - 1983

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

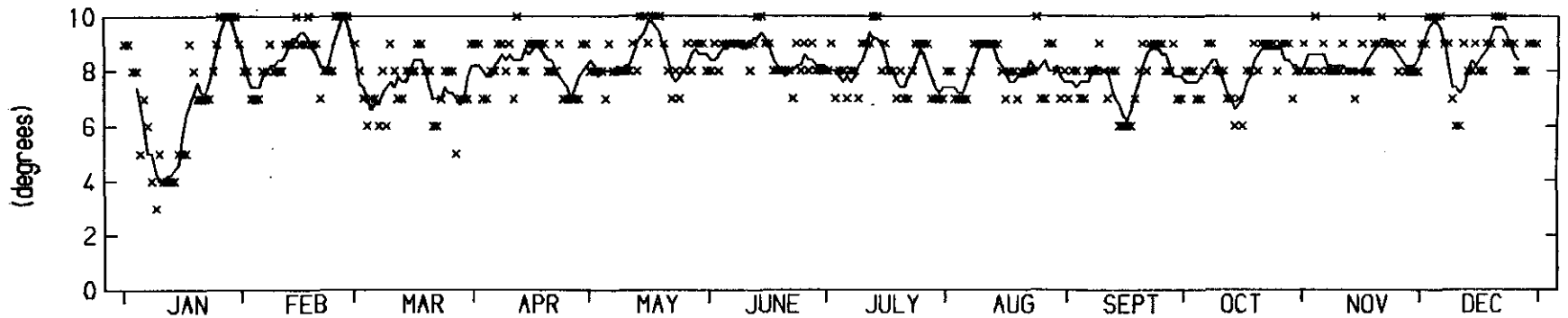
TRINITY BEACH

2906



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1983

xxxx Indicates Distance to Fixed Contour : 358 Observations Fixed Contour Level is approx 1.5 m above AHD
— Indicates Distance to Vegetation Line : 363 Observations



FORESHORE SLOPE - 1983

Five Day Moving Average

No. of Observations : 365



Trinity Beach
Figure
27
C 27.1

COPE



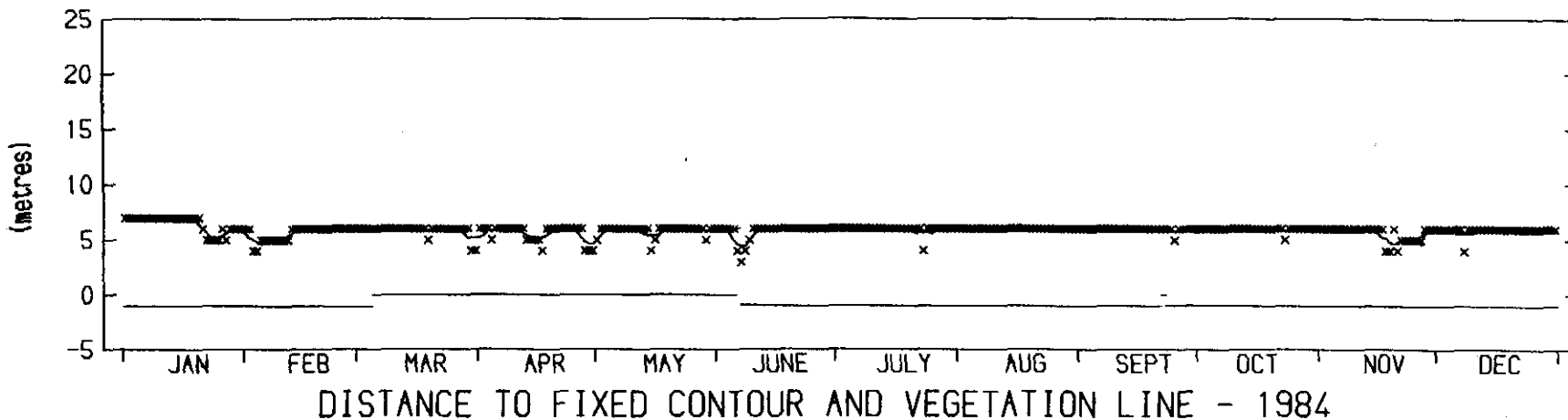
BEACH PROFILE PARAMETERS - 1984

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

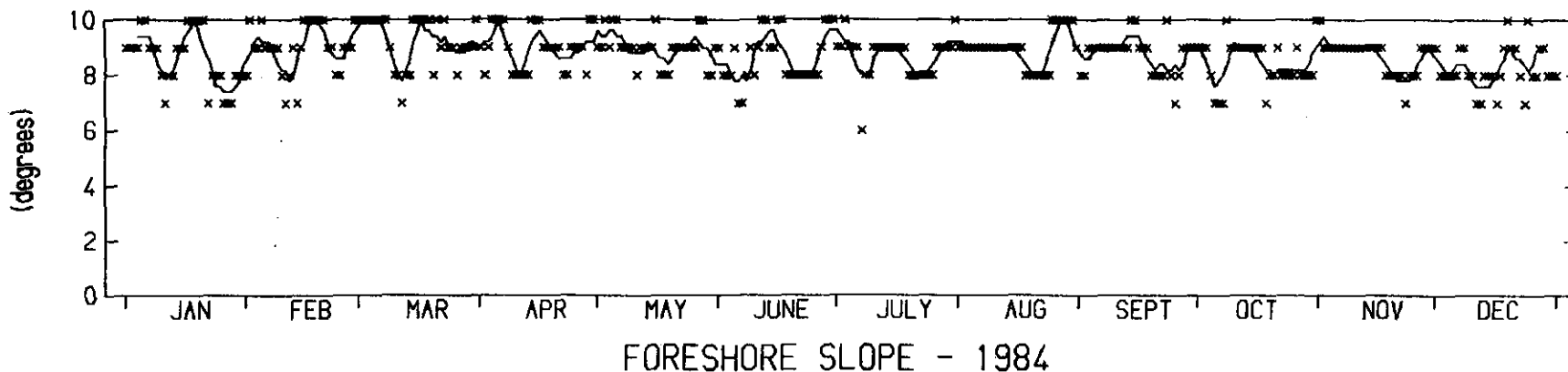
TRINITY BEACH

2906



xxxx Indicates Distance to Fixed Contour : 366 Observations
— Indicates Distance to Vegetation Line : 366 Observations

Fixed Contour Level is approx 1.5 m above AHD



Five Day Moving Average

No. of Observations : 366



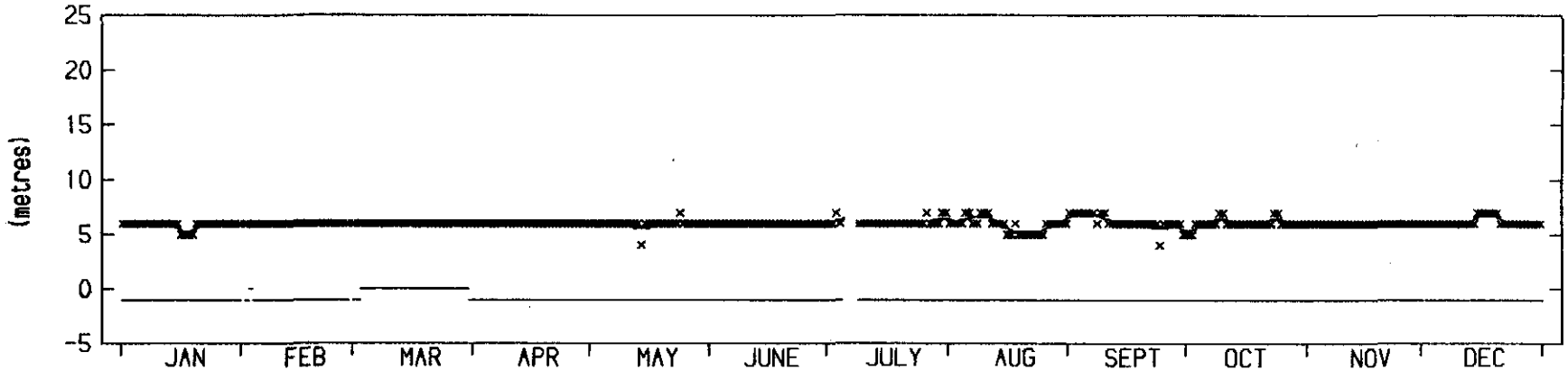
BEACH PROFILE PARAMETERS - 1985

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

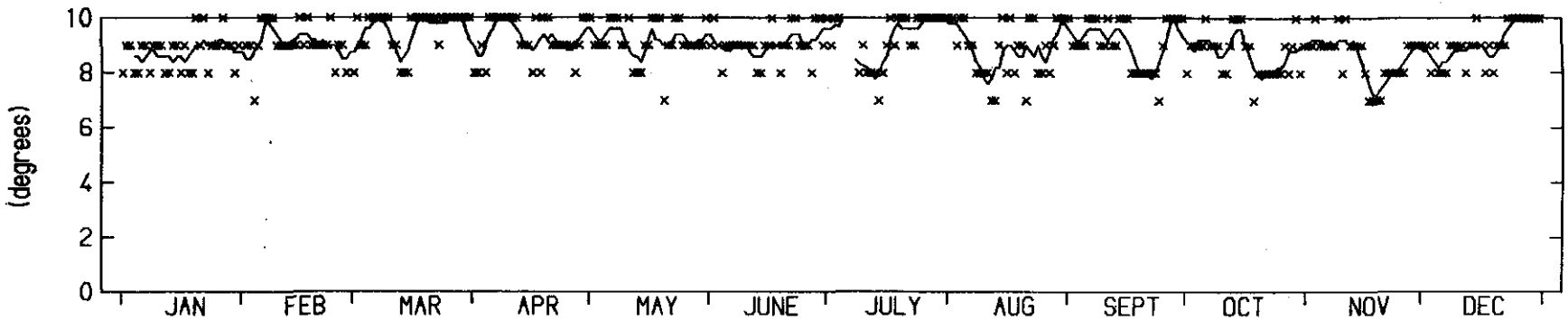
TRINITY BEACH

2906



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1985

xxxx Indicates Distance to Fixed Contour : 360 Observations Fixed Contour Level is approx 1.5 m above AHD
— Indicates Distance to Vegetation Line : 360 Observations



FORESHORE SLOPE - 1985

Five Day Moving Average

No. of Observations : 360



**BEACH PROFILE PARAMETERS
(FORESHORE SLOPE) - 1986**

Trinity Beach
Figure
30
C 27.1

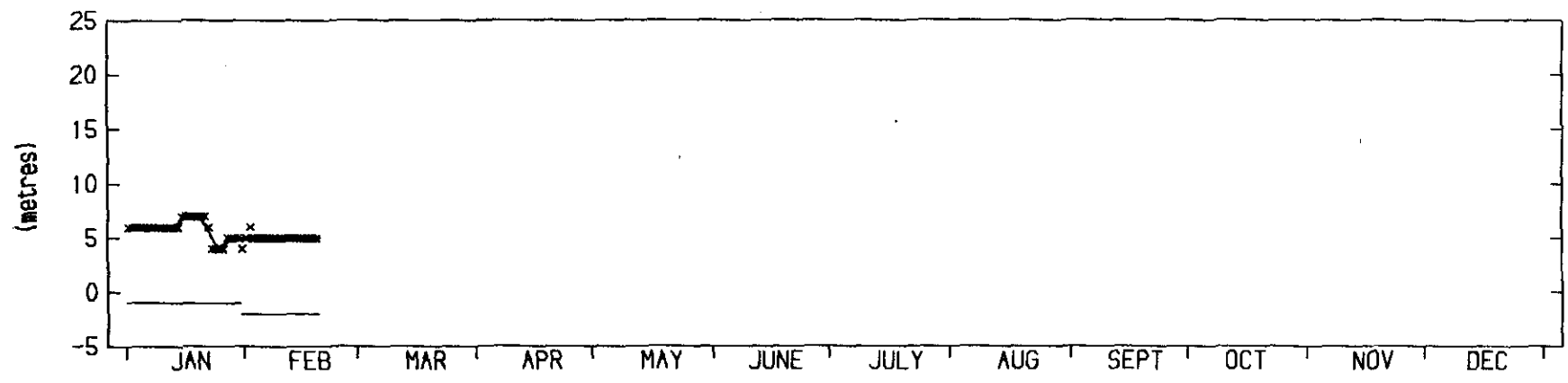
COPE

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

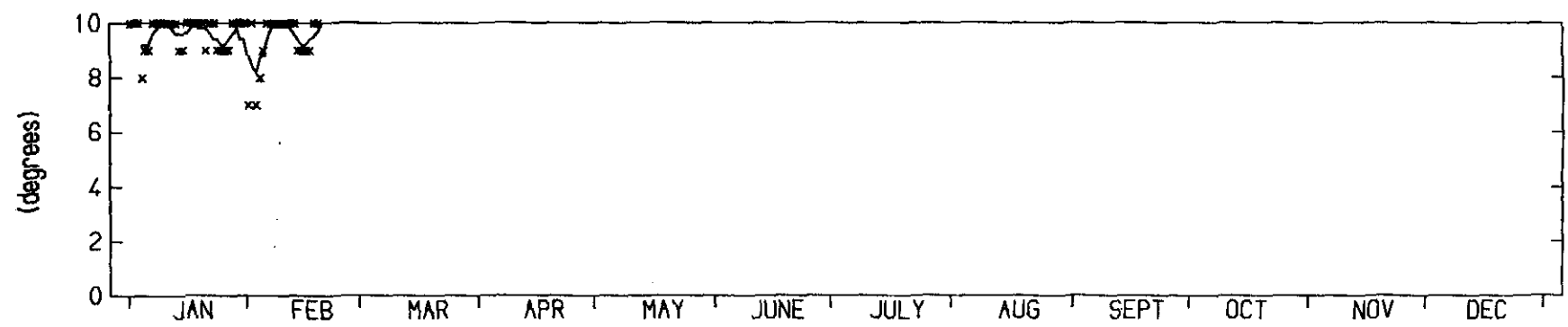
TRINITY BEACH

2906



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1986

xxxxx Indicates Distance to Fixed Contour : 50 Observations
 — Indicates Distance to Vegetation Line : 50 Observations
 Fixed Contour Level is approx 1.5 m above AHD



FORESHORE SLOPE - 1986

Five Day Moving Average

No. of Observations : 50



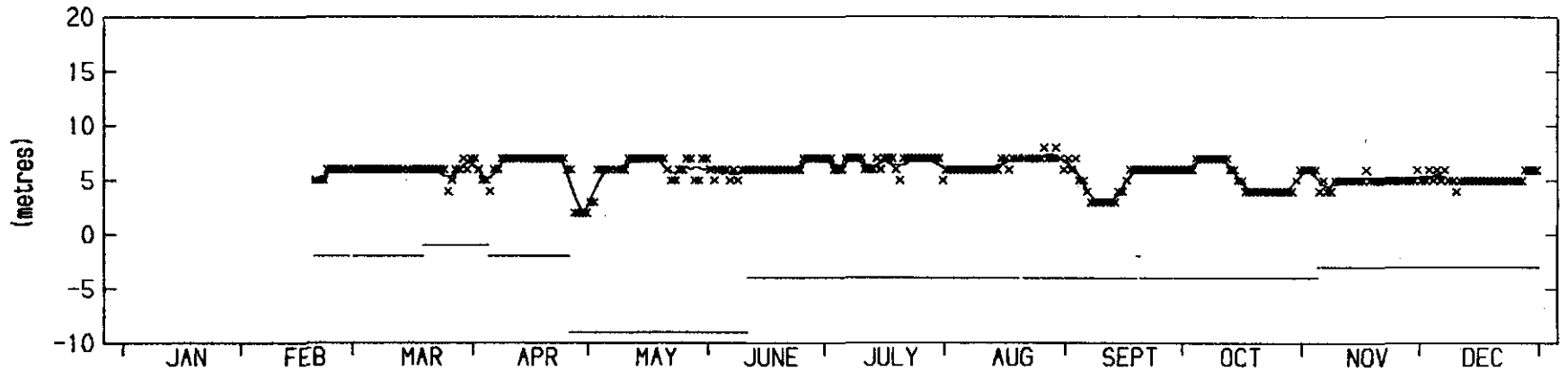
**BEACH PROFILE PARAMETERS
(SAND LEVEL AT POLE) - 1986**

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

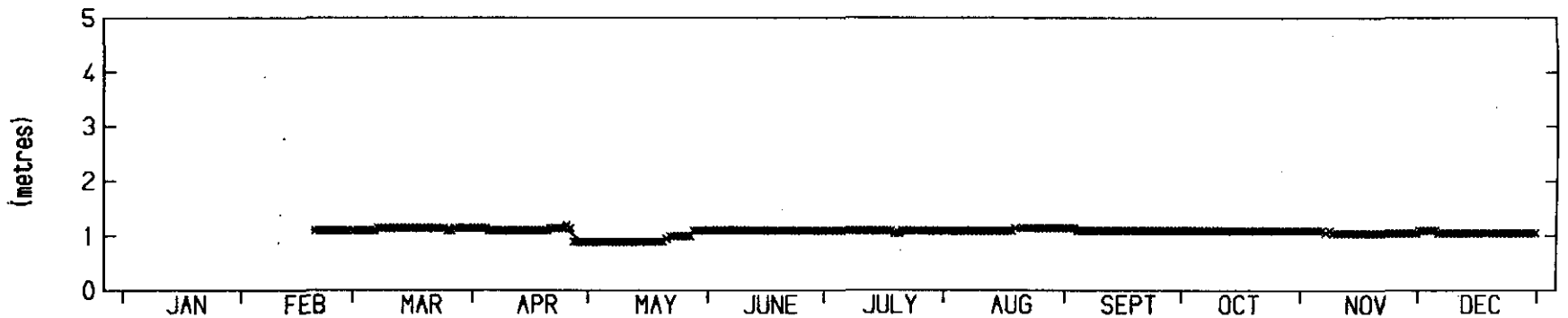
TRINITY BEACH

2906



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1986

xxxxxx Indicates Distance to Fixed Contour : 312 Observations Fixed Contour Level is approx 1.5 m above AHD
 ——— Indicates Distance to Vegetation Line : 314 Observations



SAND LEVEL AT POLE - 1986

∩ Five Day Moving Average

No. of Observations : 314



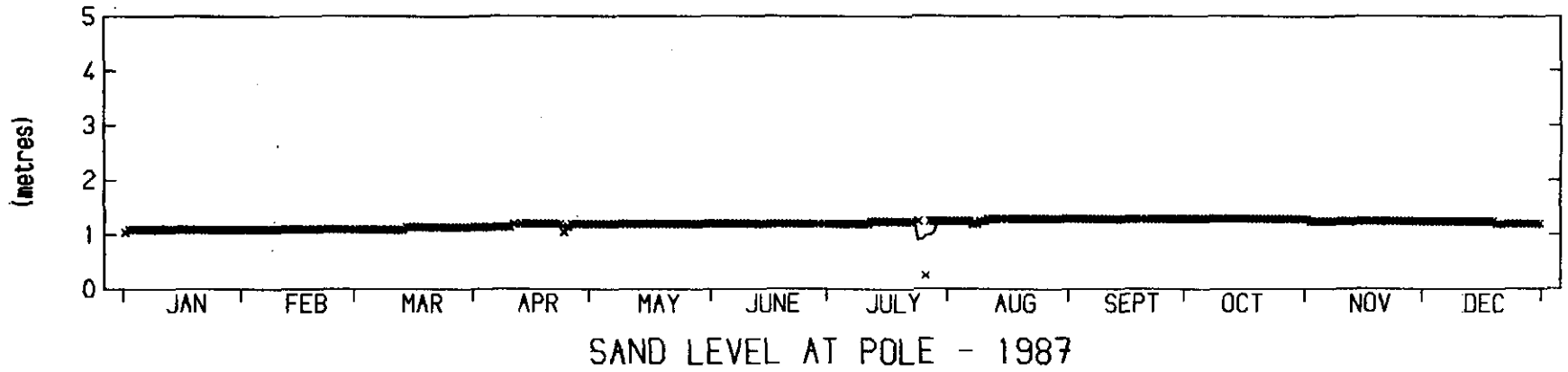
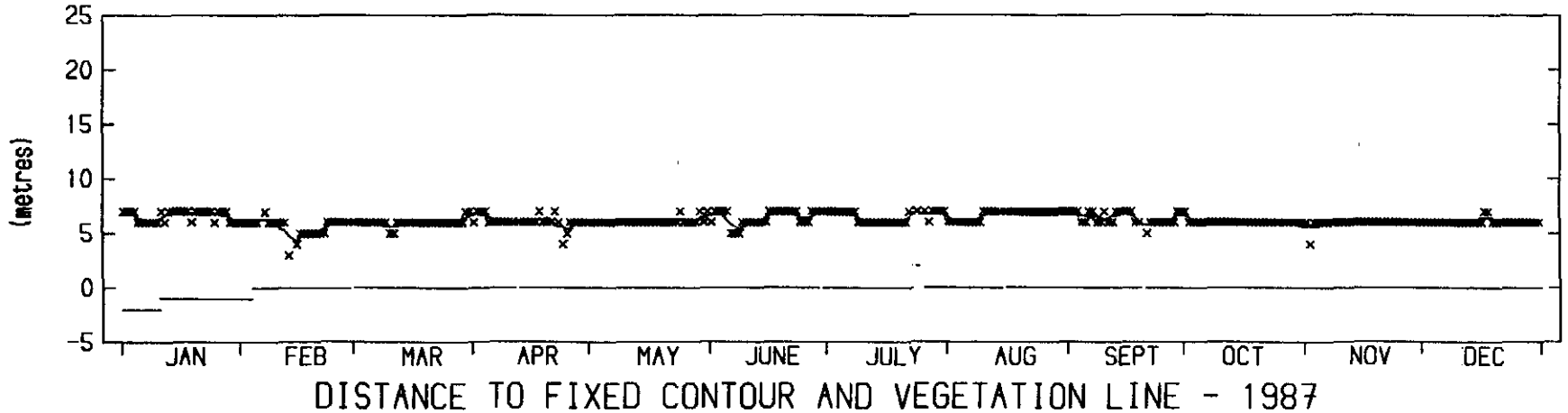
BEACH PROFILE PARAMETERS - 1987

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

TRINITY BEACH

2906



No. of Observations : 359



BEACH PROFILE PARAMETERS - 1988

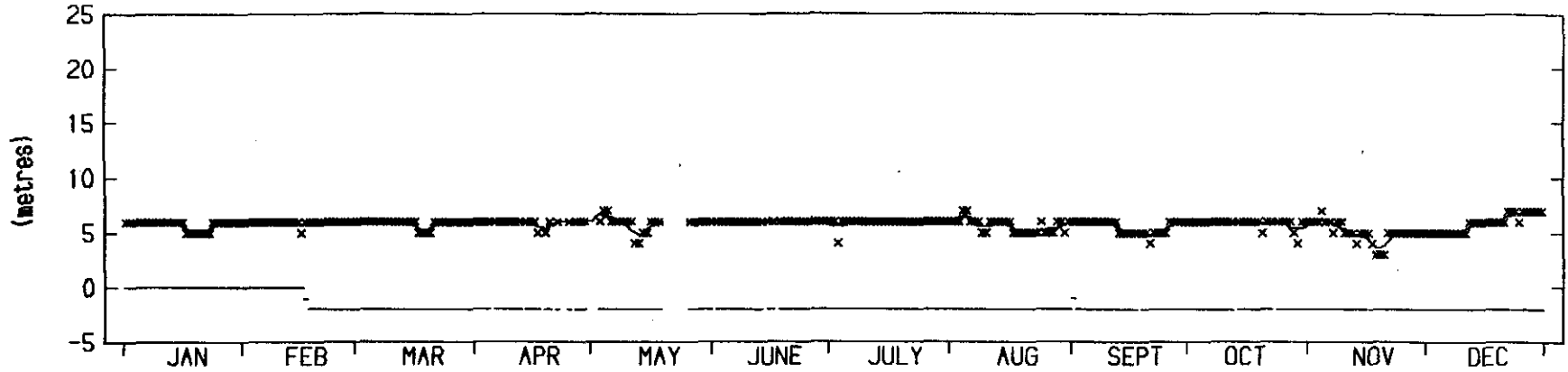
COPE
Trinity Beach
Figure
33
C 27.1

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

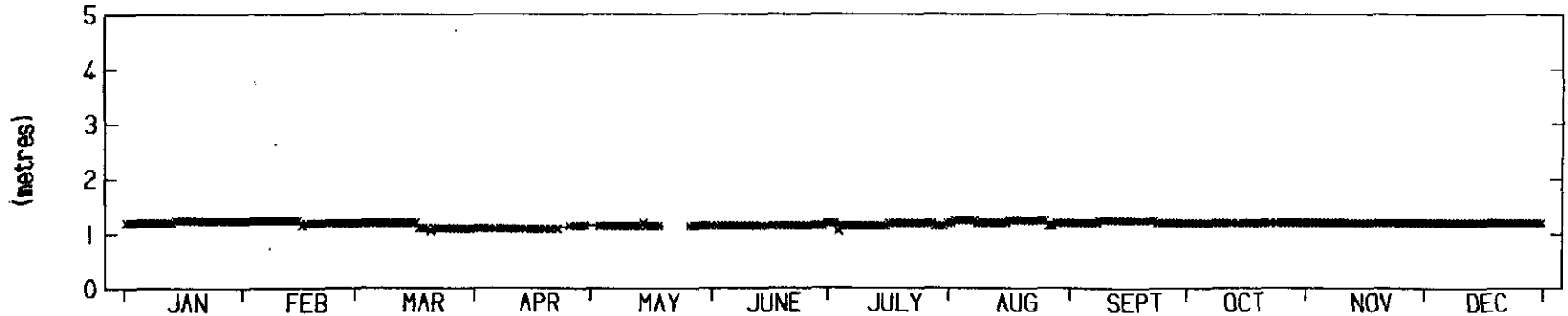
TRINITY BEACH

2906



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1988

xxxxx Indicates Distance to Fixed Contour : 343 Observations
 — Indicates Distance to Vegetation Line : 343 Observations
 Fixed Contour Level is approx 1.5 m above AHD



SAND LEVEL AT POLE - 1988

Five Day Moving Average

No. of Observations : 343



BEACH PROFILE PARAMETERS - 1989

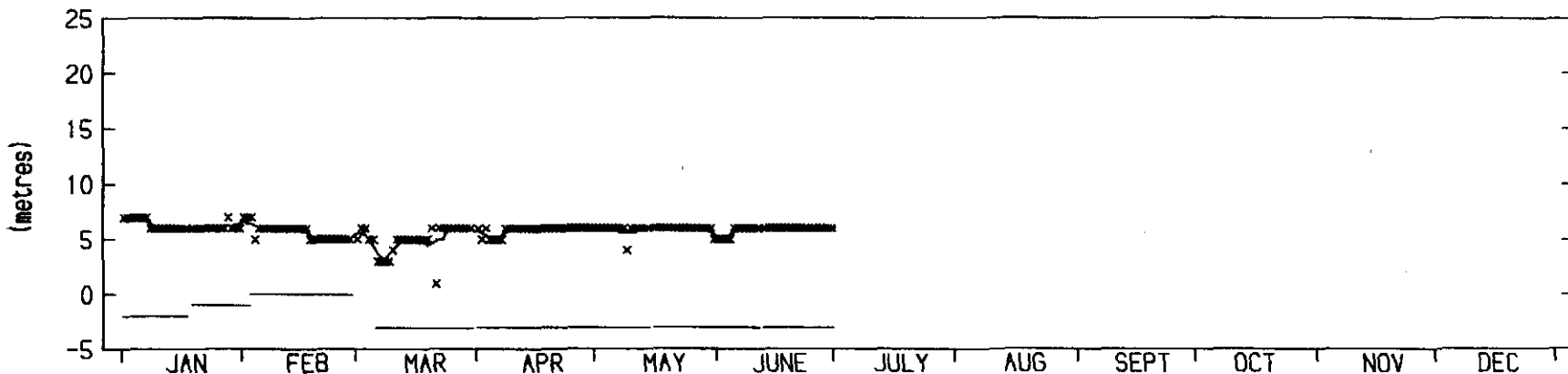
Trinity Beach
COPE
Figure
34
C 27.1

COPE - Coastal Observation
Programme Engineering

MULGRAVE SHIRE

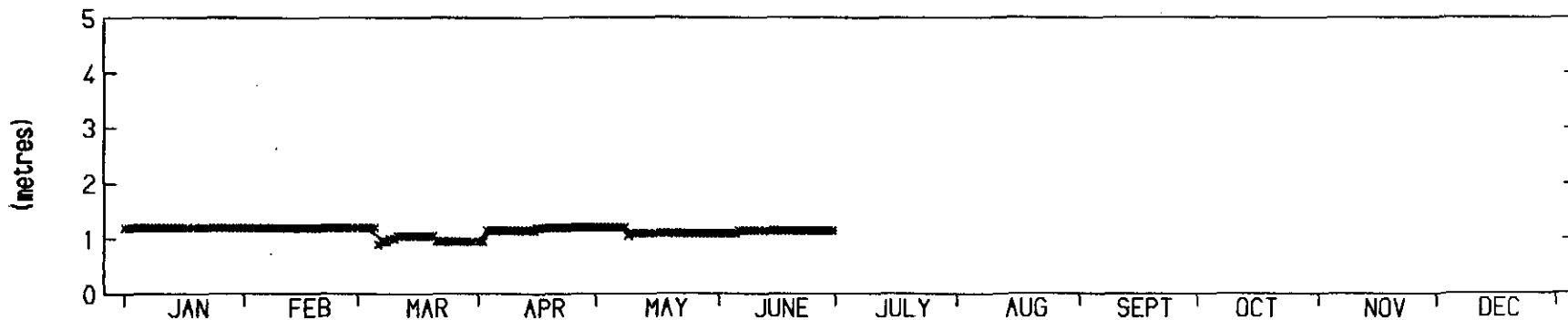
TRINITY BEACH

2906



DISTANCE TO FIXED CONTOUR AND VEGETATION LINE - 1989

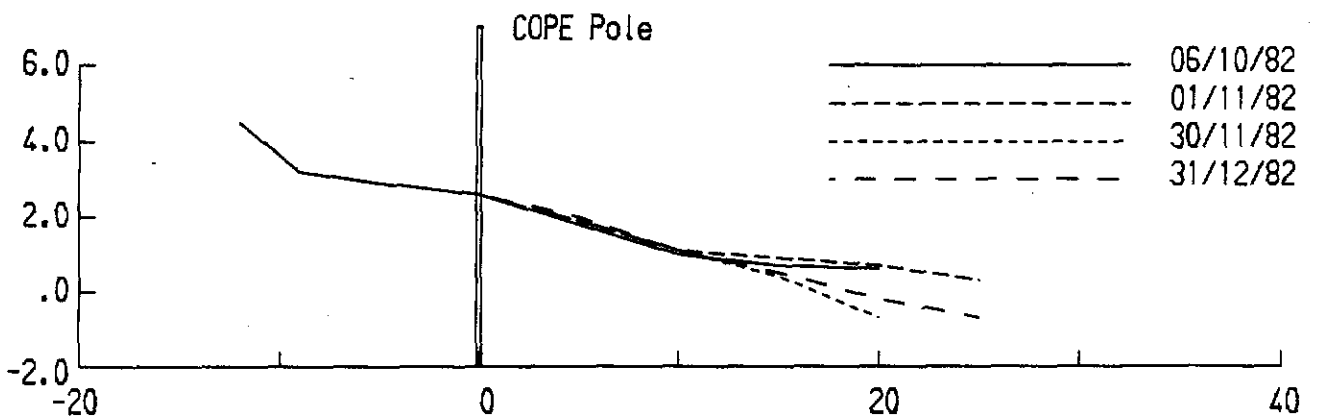
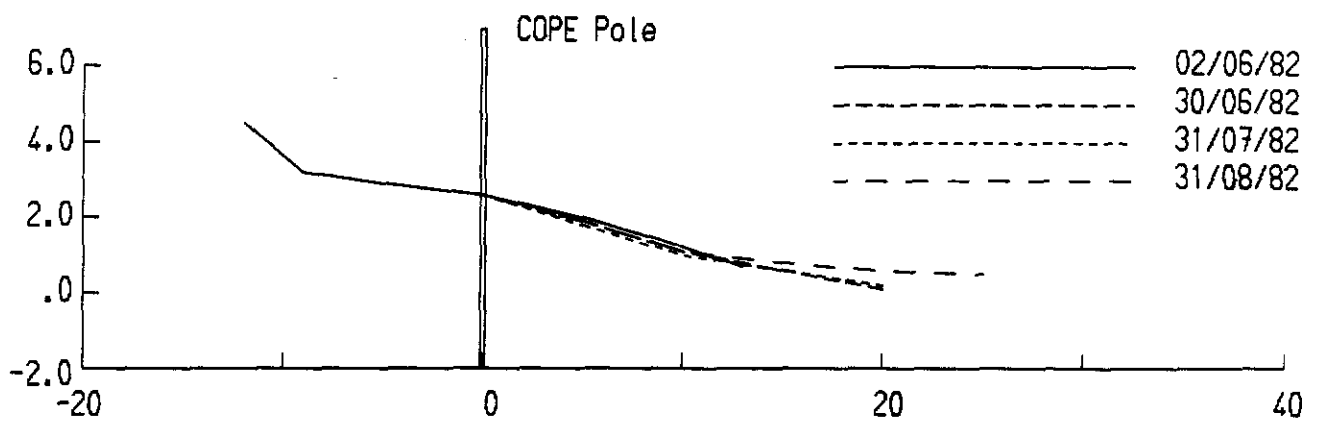
xxxx Indicates Distance to Fixed Contour : 177 Observations
 ——— Indicates Distance to Vegetation Line : 172 Observations
 Fixed Contour Level is approx 1.5 m above AHD



SAND LEVEL AT POLE - 1989

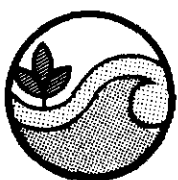
∨ Five Day Moving Average

No. of Observations : 177



Level Datum is A.H.D.

Distances and Levels are measured in Metres



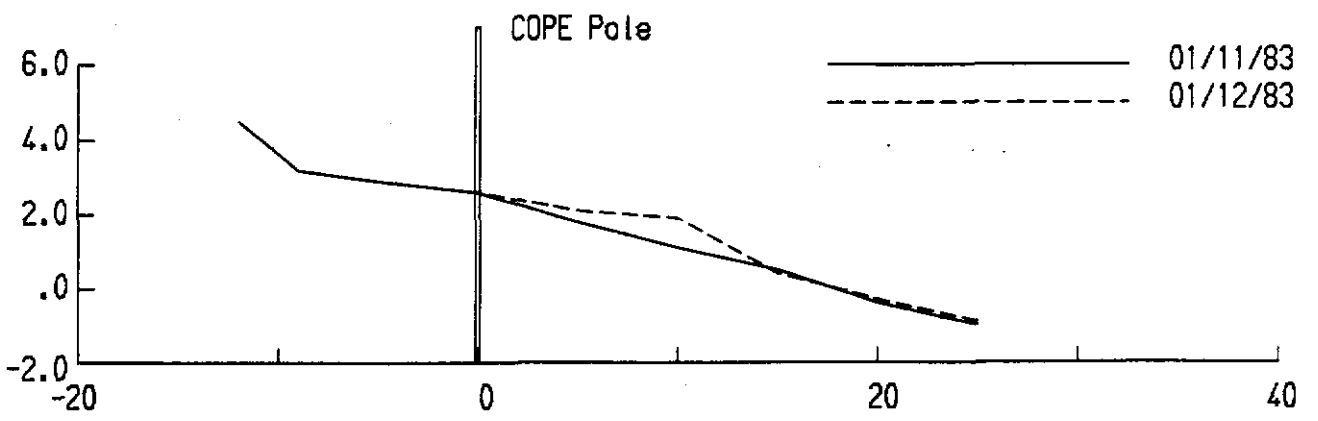
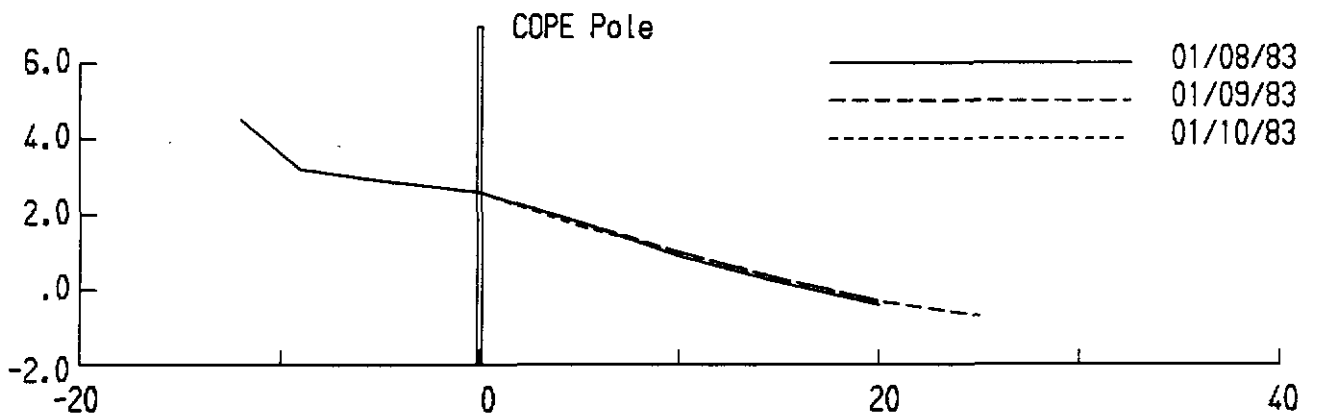
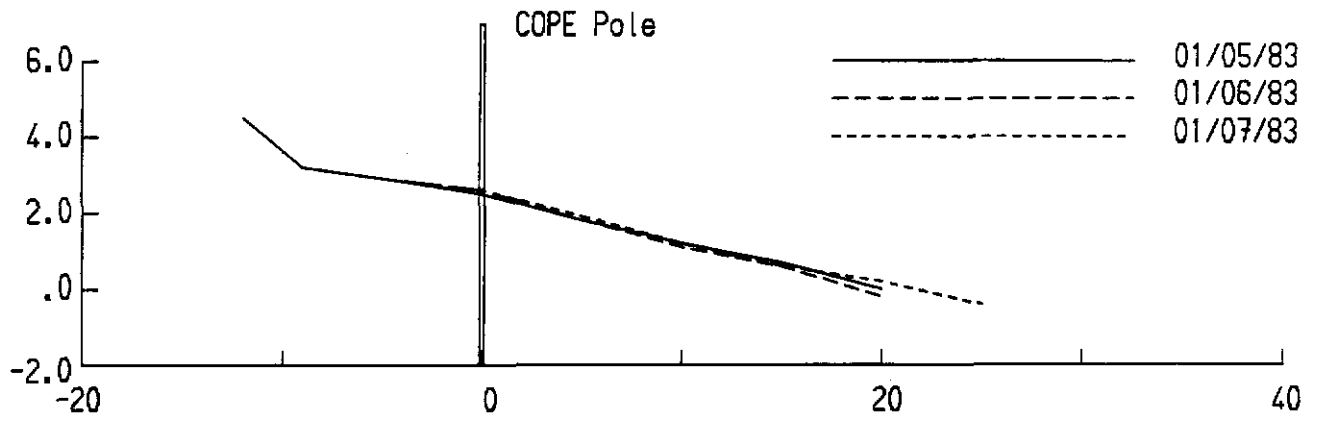
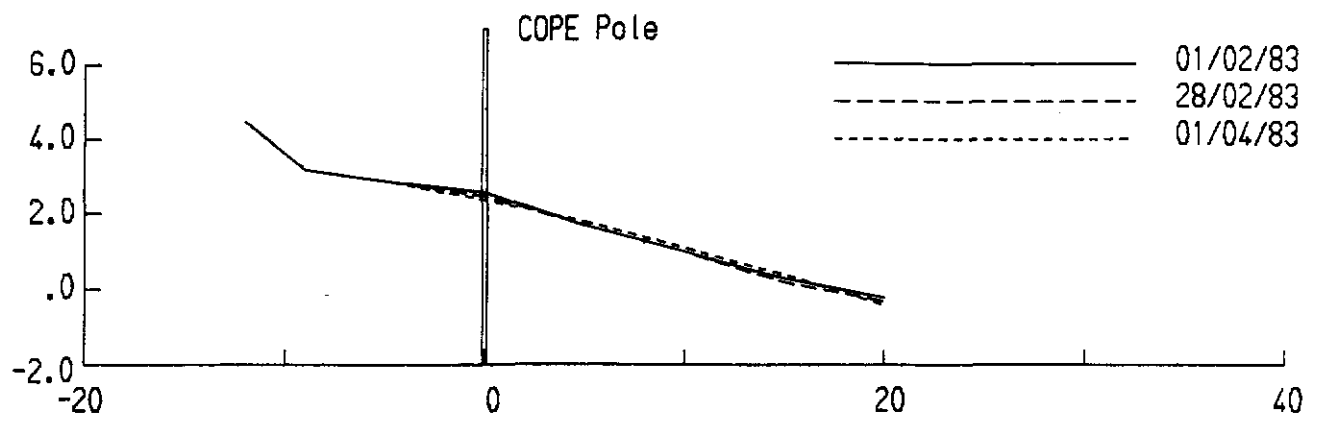
Beach Protection Authority
Queensland

MONTHLY BEACH PROFILES

COPE
Trinity Beach

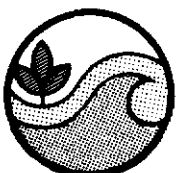
Figure
35
C 27.1

HARBOURS MARINE
Cartography



Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority
Queensland

MONTHLY BEACH PROFILES

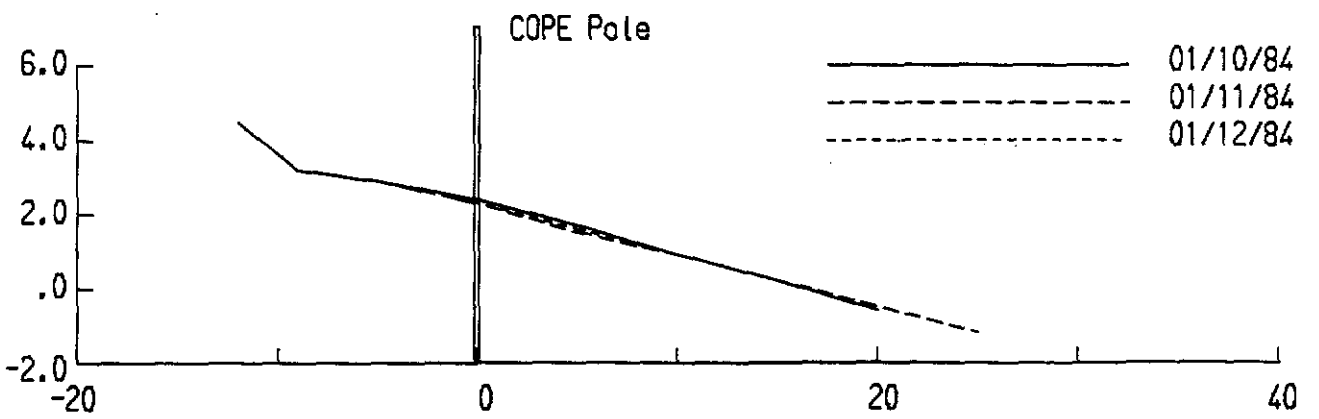
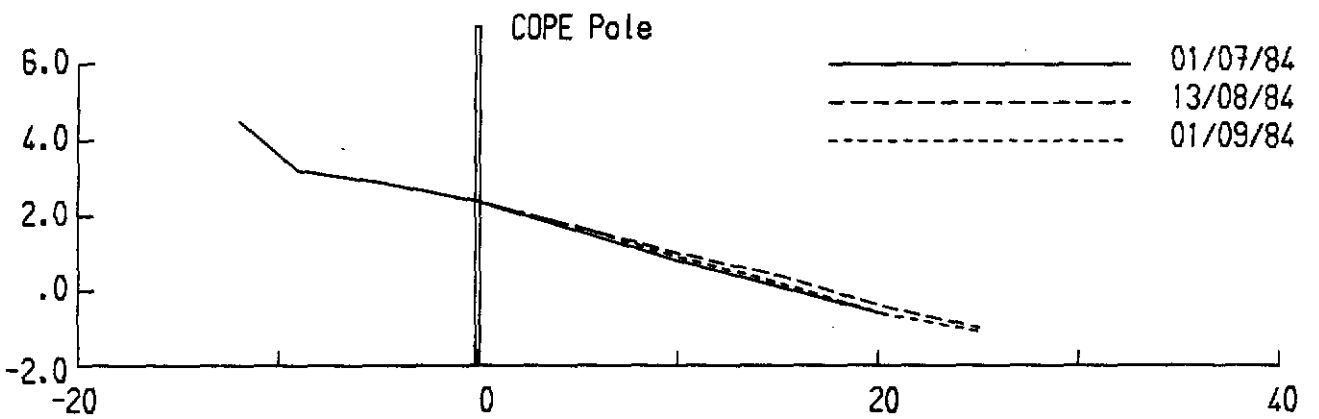
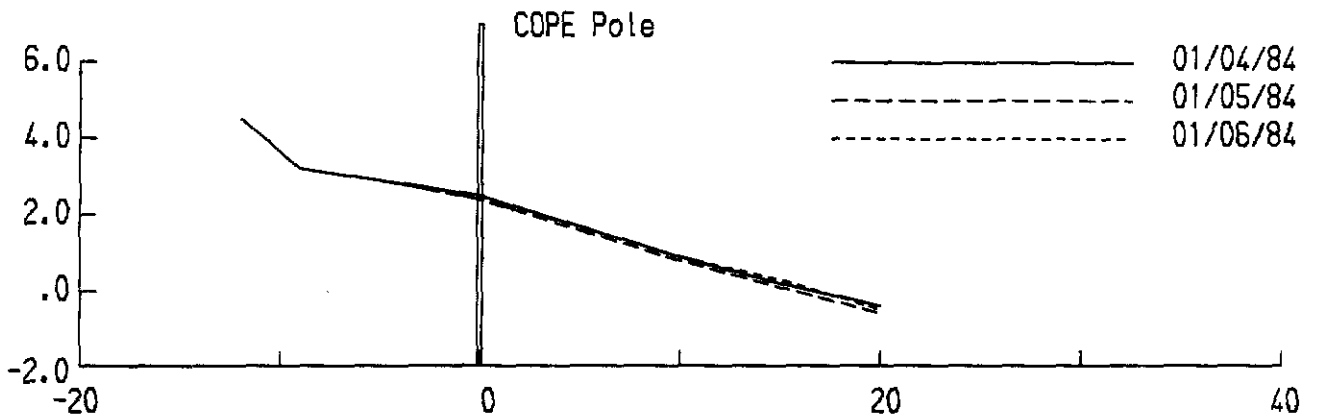
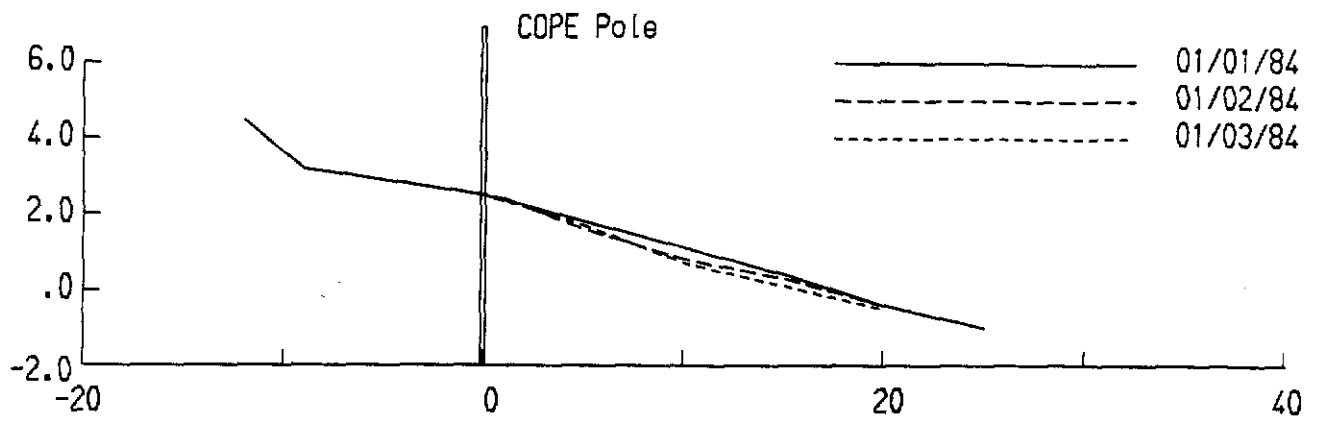
COPE
Trinity Beach

Figure

36

C 27.1





Level Datum is A.H.D.

Distances and Levels are measured in Metres



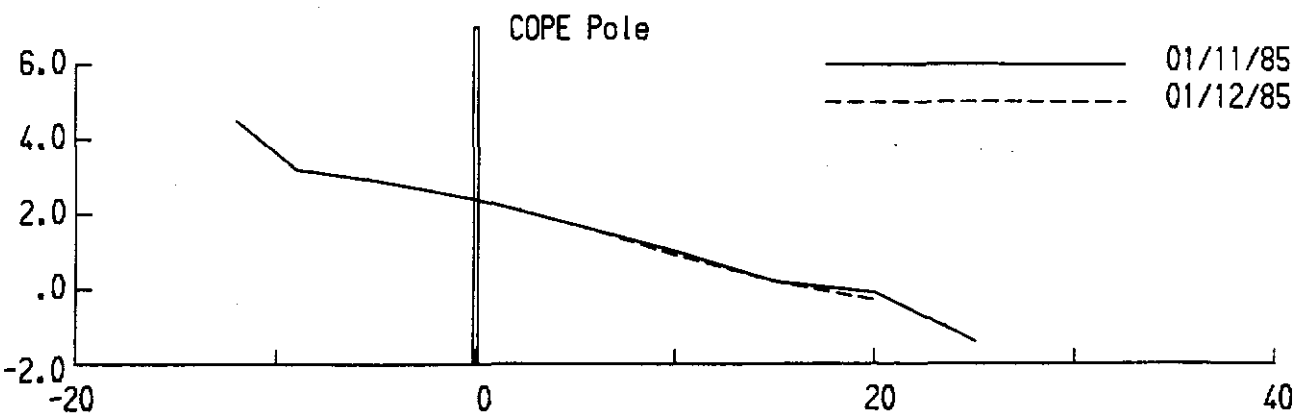
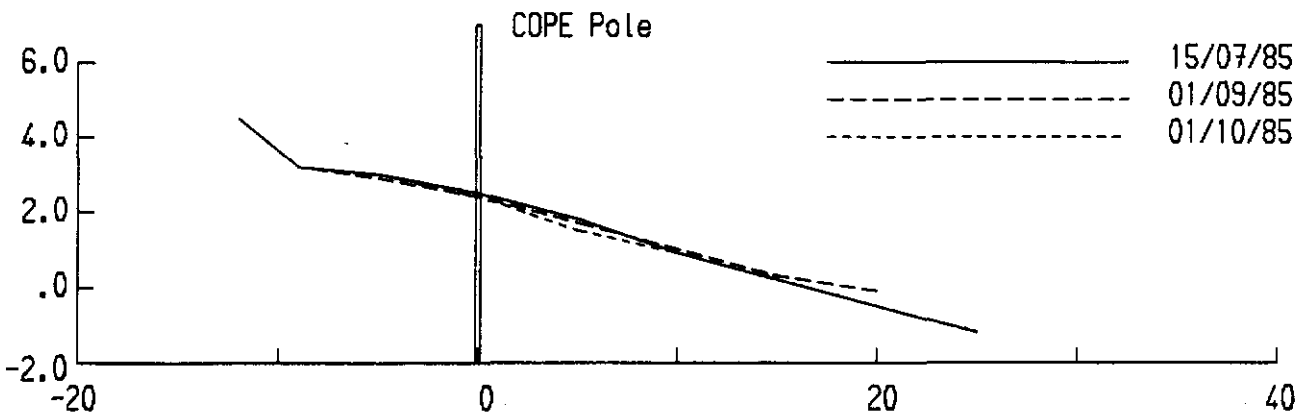
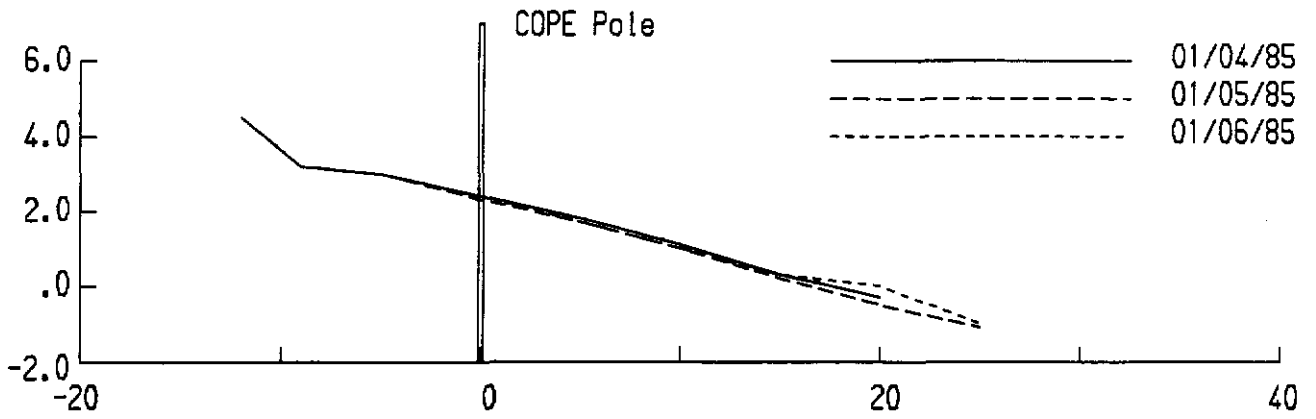
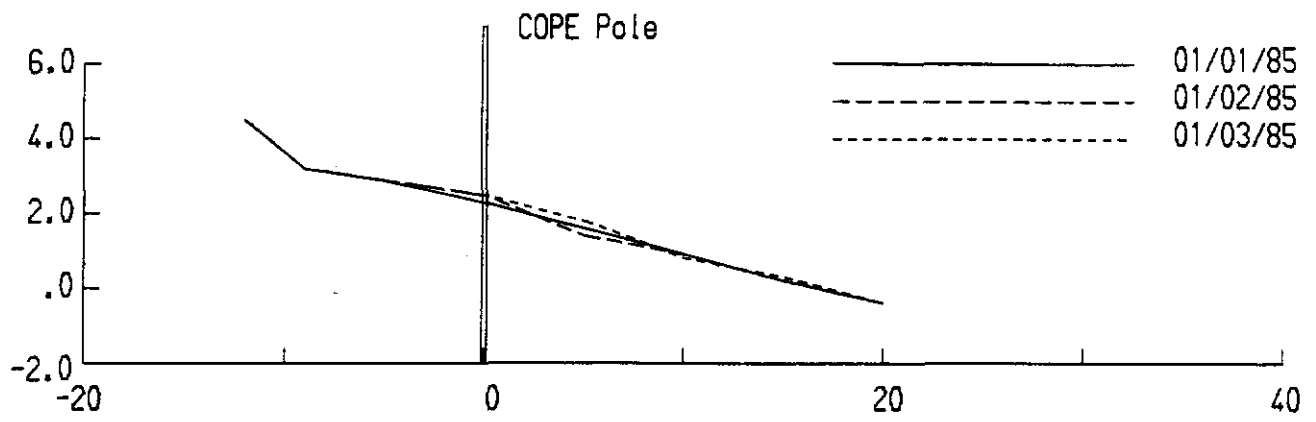
Beach Protection Authority
Queensland

MONTHLY BEACH PROFILES

COPE
Trinity Beach

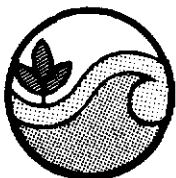
Figure
37
C 27.1

HARBOURS MARINE
Engineering



Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority
Queensland

MONTHLY BEACH PROFILES

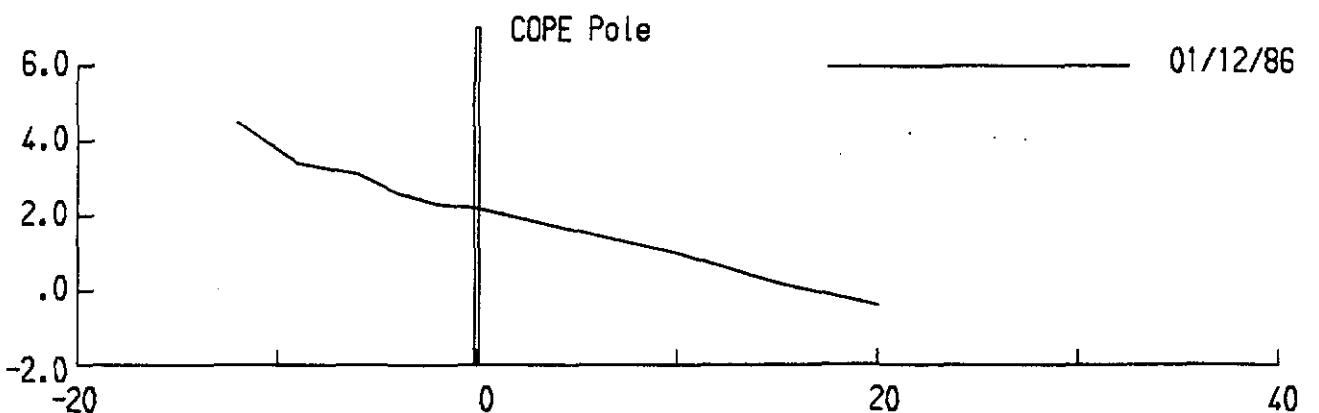
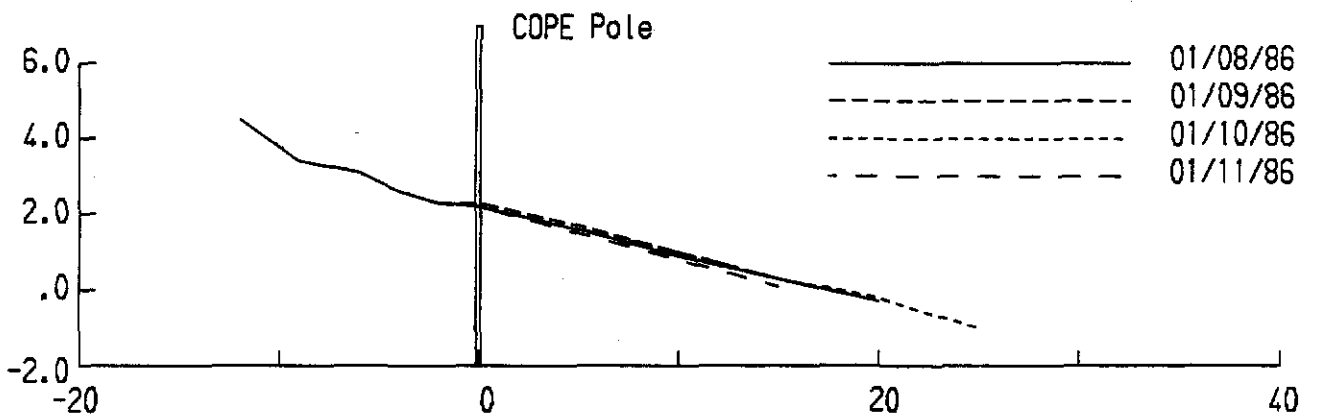
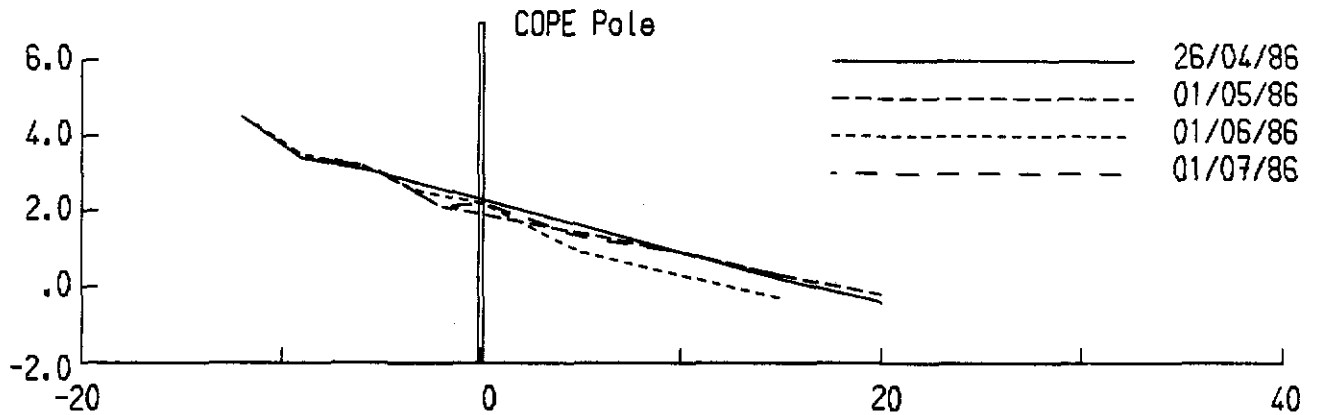
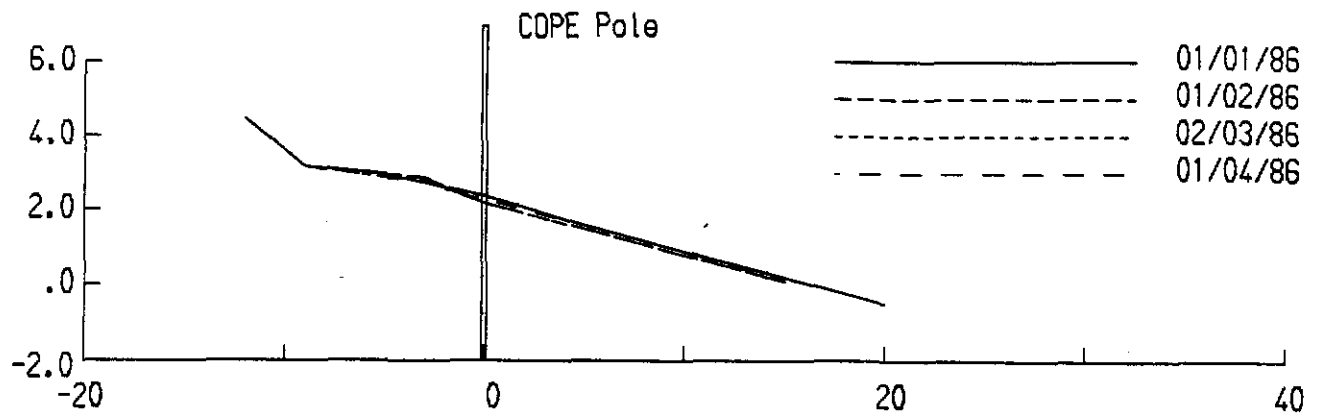
COPE
Trinity Beach

Figure

38

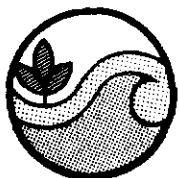
C 27.1





Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority
Queensland

MONTHLY BEACH PROFILES

COPE
Trinity Beach

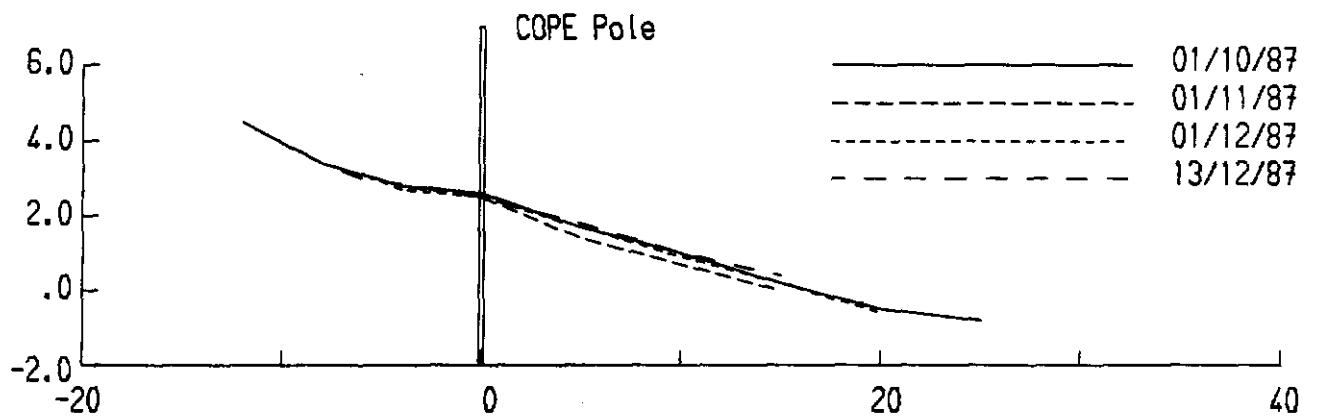
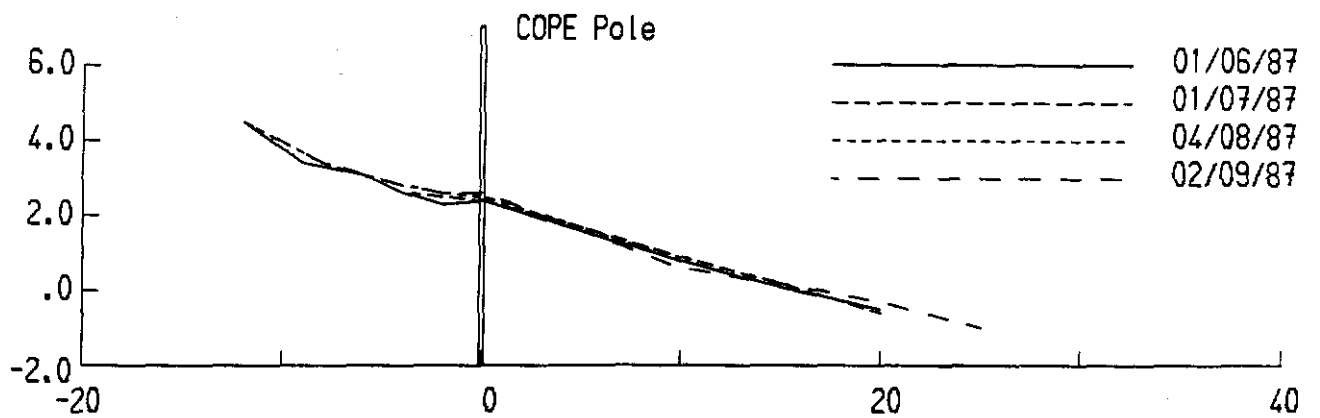
Figure

39

C 27.1

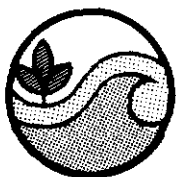


HARBOURS MARINE
Construction



Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority
Queensland

MONTHLY BEACH PROFILES

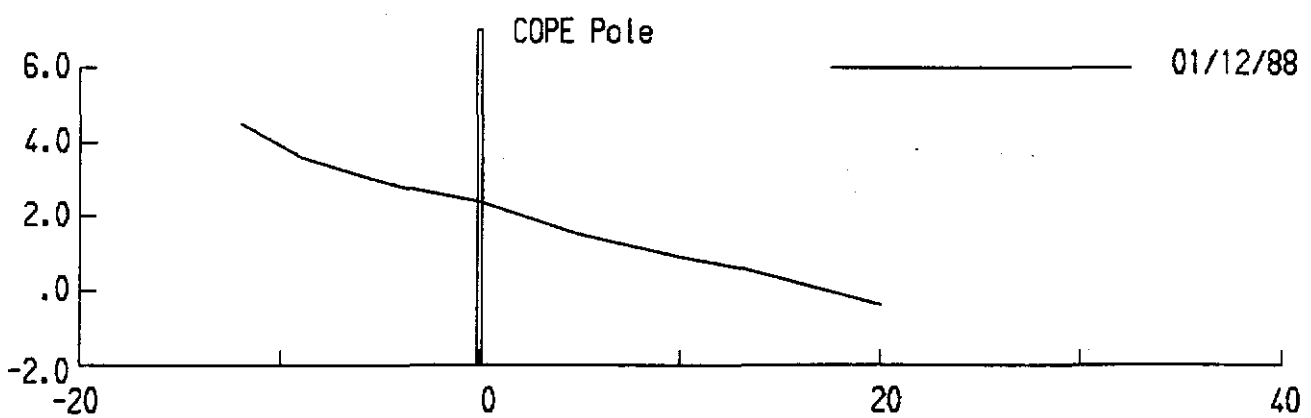
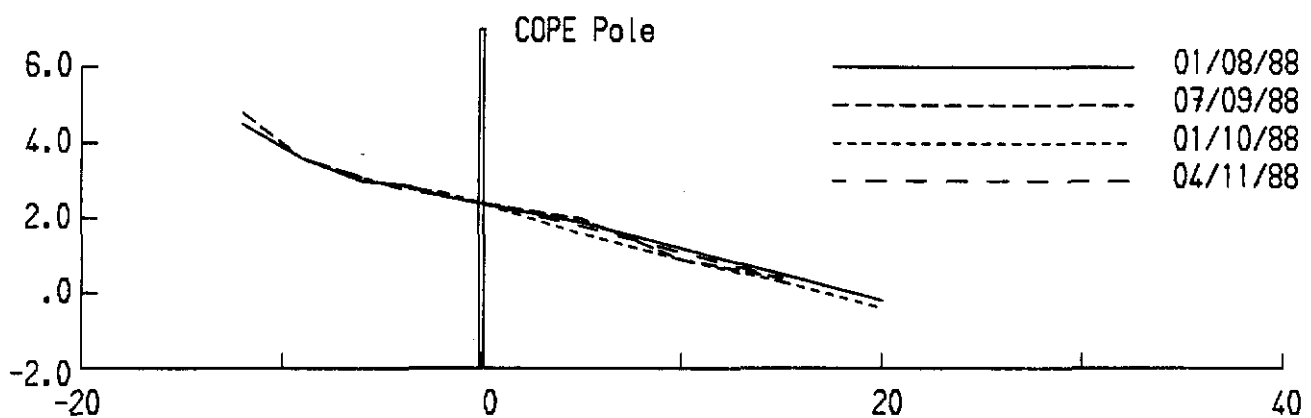
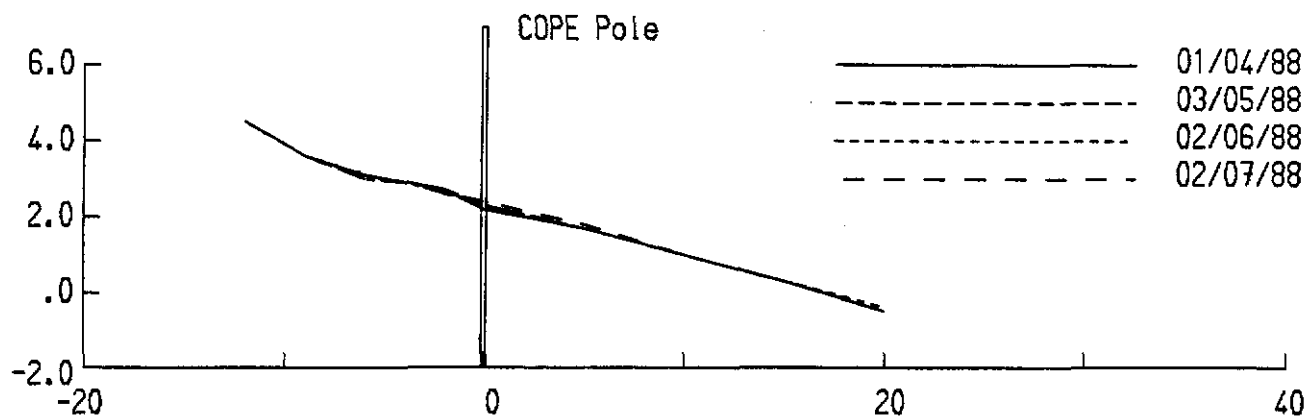
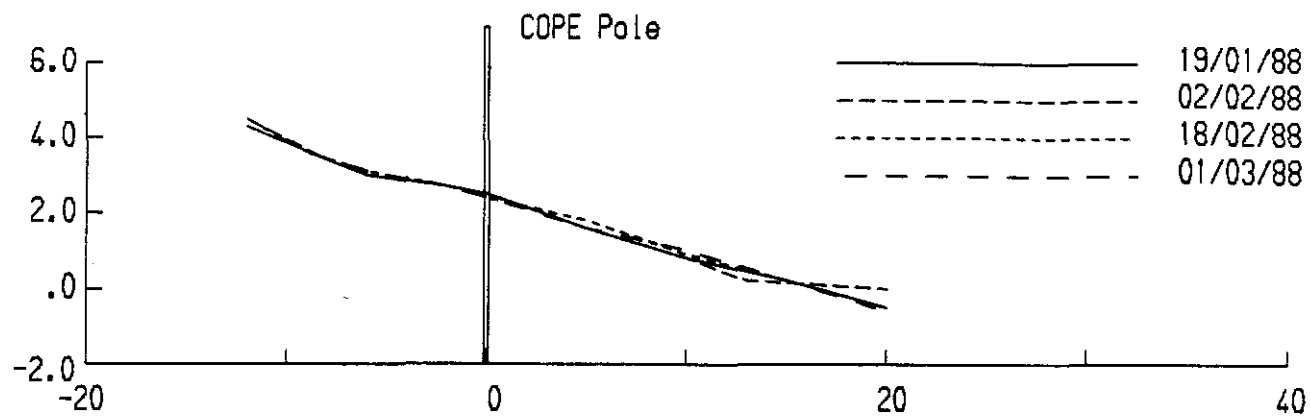
COPE
Trinity Beach

Figure

40

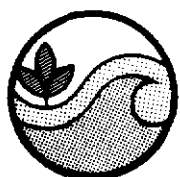
C 27.1

HARBOURS MARINE
Quangtrung



Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority
Queensland

MONTHLY BEACH PROFILES

COPE
Trinity Beach

Figure

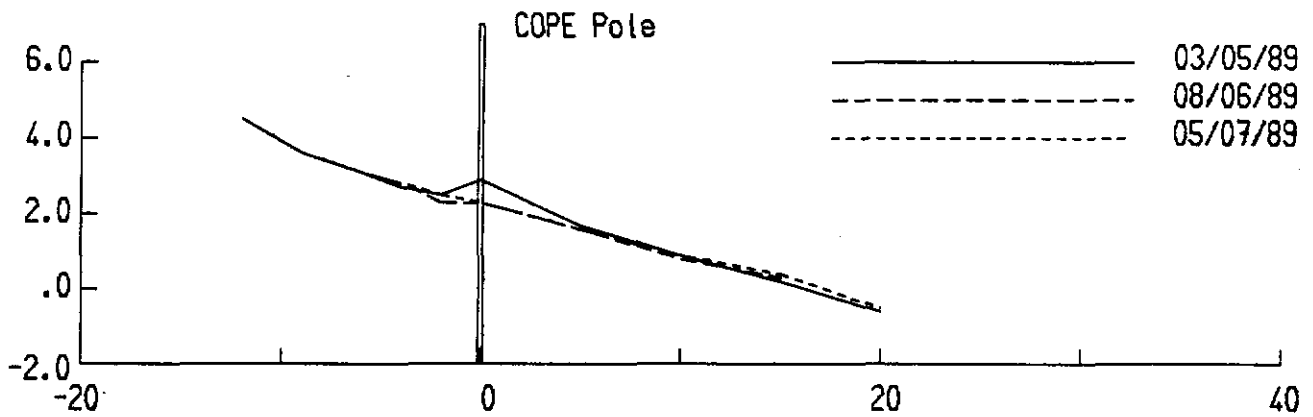
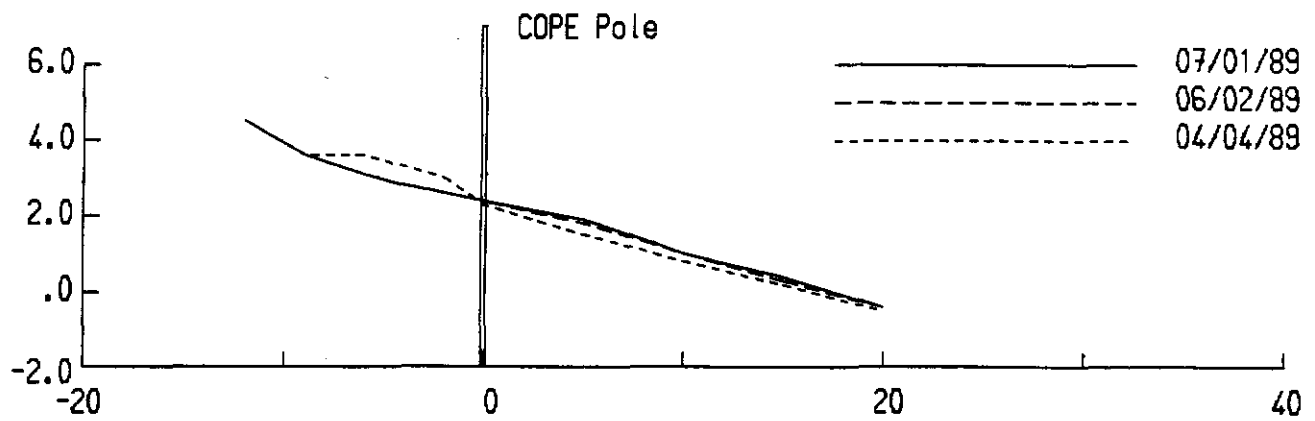
41

C 27.1



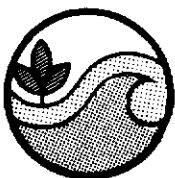
HARBOURS MARINE

Quality Marine



Level Datum is A.H.D.

Distances and Levels are measured in Metres



Beach Protection Authority
Queensland

MONTHLY BEACH PROFILES

COPE
Trinity Beach

Figure

42

C 27.1

HARBOURS MARINE
Coastal Services