Beach Protection Authority Queensland

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SUPPLEMENTARY ANALYSIS OF WAVE DATA SOUTH EAST QUEENSLAND

SEPTEMBER 1989

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DATE: SEPTEMBER, 1989

REPORT NO B.P.A. 15

STORAGE

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3391

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This report has been prepared by the Coastal Management Program 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 wave 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.

SEPTEMBER 1989

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WAVE DATA RECORDING PROGRAMME

SOUTH EAST QUEENSLAND

1.0 INTRODUCTION

This report summarizes the primary analysis of wave data collected in the South East Queensland region at the Brisbane, Gold Coast and Kirra wave recording stations. In addition brief details of the recording equipment, the method of handling raw data and the type of analysis employed are provided.

A more detailed report on the Brisbane station titled "Wave Data Recording Program Brisbane Region - Report No. W09.1" was published by the Beach Protection Authority in January 1985 covering the period 30th October, 1976 to 30th June, 1983 and is available for purchase from the Harbours Marine Shop, Ground Floor, Mineral House, 41 George Street, Brisbane.

2.0 RECORDING EQUIPMENT

All wave recording installations operated by the Authority employ the "Waverider" system developed by Datawell b.v. of the Netherlands.

The systems utilise a buoy mounted accelerometer to follow the water surface movements and transmit a frequency modulated analogue signal of these water level movements to a shore based receiver (WAREP). The WAREP receiver provides a paper chart of the recording and relays the analogue signal to an ANMA analogue recorder or DIMA digital recorder.

3.0 WAVE RECORDING AND ANALYSIS PROCEDURES

Initially for Brisbane two recordings of water levels each of 20 minutes duration were made each day with the timing of the recordings set at 0300 hours and 1500 hours respectively. From February 1, 1979 there have been four recordings per day each of 20 minutes duration at 0300 hours, 0900 hours, 1500 hours and 2100 hours.

For the Gold Coast and Kirra there have been four recordings per day each at 20 minutes duration at 0300 hours, 0900 hours, 1500 hours and 2100 hours.

During cyclonic events or other periods of severe wave action the recording frequency may be increased to 8 times daily. Twenty minute records are still maintained at such times.

Digitization of the ANMA analogue data tapes for Brisbane October 30, 1976 to January 31, 1979 was carried out at the Brisbane office and the digital records held on 9 track digital tapes compatible with the computing facilities available to the Authority. In this process the analogue tapes produced in the field were sampled electronically at half second intervals and this information together with necessary administration information was transferred to the digital tape by a digitizer which was specifically developed for this purpose.

Data recorded on Dima digital recording unit at Brisbane, Gold Coast and Kirra automatically has the Julian day of the year and the time inserted at the start of each record. The data is stored on digital cassettes which are translated via a Memodyne M80 Data Translator and used in computer programs developed by the Beach Protection Authority.

Routine and spectral analysis of digital wave data was performed by a

computer program to obtain the following parameters:

1.	Significant Wave Height (Hsig)	The average of the highest one third of waves in the record.
2.	Peak Energy Period (Tp)	The wave period corresponding to the peak of the energy density spectrum.

These parameters are the basis for the summary plots and tables attached to this report.

4.0 DATA LOSSES

Data losses can be divided into three categories - losses due to recording equipment failure, losses during routine processing and losses as a result of spurious data produced by twisted accelerometer cables within the Waverider buoy.

Losses in the first two categories are usually non-recoverable. Data produced when accelerometer cables are twisted, however, are generally recoverable. The twisting of the cables causes a low frequency component to be added to the analogue wave data at the recording stage. When analysis is carried out, the component is easily detected and may be eliminated during data editing following the completion of routine processing and spectral analysis of data.

5.0 WAVE CLIMATE

The wave climate presented in this report is based on statistical analyses of the parameters obtained from the recorded wave data. The wave recordings at a site are considered to be consistent throughout the entire recording period, even though the buoys may be moored in slightly different positions. This is based on the fact that the buoys are located in relatively the same depth of water and in areas with the same bathymetry.

Computer programs developed by the Authority provide statistical information on percentage of time occurrence for wave heights and periods. The result of this analyses is presented in Tables 1 to 13 and Figure 1.

6.0 DATA PRESENTATION

No attempt has been made to interpret the recorded data for design purposes or to apply corrections for refraction, diffraction and shoaling to obtain equivalent deep water waves. Before any use is made of this data it is therefore necessary to note the exact location of the buoy and the water depth in which the buoy was moored. This data is shown on Summary Sheets 1, 2 and 3 "Details of the Wave Recorder Installation". The data herein presented does not include any information on wave directions. The "Waverider" recording system which is utilised by the Authority is designed to record vertical movements of the water surface only and any wave directions must be assigned to the individual wave records by other means.

In addition to the above Summary Sheets the following tables and figures are presented to complete this report.

Table 1: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All Data, All Directions.

Table 2: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All January Data, All Directions.

Table 3: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All February Data, All Directions.

Table 4: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All March Data, All Directions.

Table 5: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All April Data, All Directions.

Table 6: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All May Data, All Directions.

Table 7: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All June Data, All Directions.

Table 8: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All July Data, All Directions.

Table 9: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All August Data, All Directions.

Table 10: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All September Data, All Directions.

Table 11: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All October Data, All Directions.

Table 12: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All November Data, All Directions.

Table 13: Wave Statistics - Brisbane; Wave Period (Tp)/Wave Height (Hsig) Occurrences, All December Data, All Directions.

Figure 1: Percentage (of time) Exceedance of Wave Heights (Hsig) for All Wave Periods Brisbane, Gold Coast and Kirra (25/8/88 to 30/6/89).

SUMMARY SHEET 1

DETAILS OF WAVE RECORDER INSTALLATION

Region: Brisbane

Buoy Location:

Co-ordinates: 153°37'00 East 27°24'00 South

Description: 7 kms North-East from Point Lookout.

Water Depth at Buoy: 68 metres relative to Australian Height Datum

Location of Recording Station:	Queensland Government Hydraulics Laboratory or Point Lookout Surf Life Saving Club
Period of Data Collection:	October 30, 1976 to June 30, 1989
Normal Recording Interval:	Two twenty minute records daily at 0300 and 1500 hours (30-10-76 to 31-1-79). Four twenty minute records daily at 0300, 0900, 1500, and 2100 hours (1-2-79 to 30-6-89).
Total No. of Records Analysed:	11887

SUMMARY SHEET 2

DETAILS OF WAVE RECORDER INSTALLATION

Region: Gold Coast

Buoy Location:

Co-ordinates: 153°26'29" East 27°57'54" South

Description: 1.35 kms North of Main Beach Surf Life Saving Club 1250 m offshore

Water Depth at Buoy: 15.5 metres relative to Australian Height Datum

Location of Recording Station: Gold Coast City Council Chambers

Period of Data Collection: February 20, 1987 to
June 30, 1989
(Data analysed August 25, 1988 to June 30, 1989)

Normal Recording Interval: Four twenty minute records daily at 0300, 0900, 1500 and 2100 hours.

Total No. of Records Analysed: 1201

SUMMARY SHEET 3

DETAILS OF WAVE RECORDER INSTALLATION

Region: Kirra

Buoy Location:

Co-ordinates: 153°31'42" East 28°09'30" South

Description: 1.5 kms North-North-West of Kirra Point

Water Depth at Buoy: 16 metres relative to Australian Height Datum

Location of Recording Station: Gold Coast City Council Chambers

Period of Data Collection: August 25, 1988 to June 30, 1989

Normal Recording Interval: Four twenty minute records daily at 0300, 0900, 1500 and 2100 hours.

Total No. of Records Analysed: 1131

TABLE 1

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20	.76	*	*	*	*	*	*	*	.76
.20 .40	1.74	*	.50	*	.25	*	.25	*	2.74
.40 .60	.25	2.03	8.62	20.18	26.38	5.87	.75	*	64.09
.60 .80	*	25.90	45.34	89.23	101.19	25.72	1.50	*	288.88
.80 1.00	.24	38.94	82.73	231.13	210.04	51.25	1.50	.25	616.09
1.00 1.20	*	31.38	105.46	280.40	229.95	42.11	1.00	*	690.30
1.20 1.40	*	14.90	102.15	254.88	221.11	34.41	.75	*	628.20
1.40 1.60	*	2.60	85.93	194.56	181.05	33.87	.75	*	498.76
1.60 1.80	*	*	61.14	167.82	137.98	28.89	1.87	*	397.70
1.80 2.00	*	*	35.12	136.48	106.06	20.99	*	*	298.66
2.00 2.20	*	*	17.98	94.63	76.51	18.11	*	*	207.22
2.20 2.40	*	*	7.60	81.83	48.19	12.11	1.61	*	151.34
2.40 2.60	*	*	3.11	65.78	46.16	6.87	*	*	121.92
2.60 2.80	*	*	.75	34.96	26.77	8.39	1.37	*	72.24
2.80 3.00	*	*	*	20.45	21.51	9.58	*	*	51.55
3.00 3.20	*	*	*	12.14	10.12	4.75	*	*	27.01
3.20 3.40	*	*	*	3.51	9.63	4.37	.38	*	17.89
3.40 3.60	*	*	*	2.63	10.00	1.88	.25	*	14.76
3.60 3.80	*	*	*	3.75	7.82	1.62	*	*	13.19
3.80 4.00	*	*	*	.87	4.53	1.87	*	*	7.28
4.00 4.20	*	*	*	.25	3.39	1.24	.25	*	5.13
4.20 4.40	*	*	*	*	2.87	.75	*	*	3.62
4.40 4.60	*	*	*	*	3.49	.50	*	*	3.99
4.60 4.80	*	*	*	*	2.25	*	*	*	2.25
4.80 5.00	*	*	*	*	.50	*	*	*	.50
5.00 5.20	*	*	*	*	1.12	*	*	*	1.12
5.20 5.40	*	*	*	*	.50	1.00	*	*	1.50
5.40 5.60	*	*	*	*	*	.25	*	*	.25
5.60 5.80	*	*	*	*	*	*	*	*	.00
5.80 6.00	*	*	*	*	*	*	*	*	.00
6.00 6.20	*	*	*	*	.25	*	*	*	.25
TOTALS	2.99	115.76	556.43	1695.48	1489.63	316.42	12.23	.25	4189.19

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 2

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL JANUARY DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20									.00
.20 .40									.00
.40 .60		.53	.25	3.44	.75				4.97
.60 .80		1.53	2.24	7.85	5.90	2.09			17.52
.80 1.00		4.10	9.66	23.18	9.90	2.12			48.94
1.00 1.20		3.12	13.06	30.27	15.35	1.87			63.92
1.20 1.40		1.78	11.89	33.10	10.47	2.38			59.11
1.40 1.60		.22	6.97	23.56	9.58	3.25			42.71
1.60 1.80			4.34	20.63	16.89	2.25			45.12
1.80 2.00			.63	14.90	11.85	.75			29.62
2.00 2.20			2.25	9.74	7.48	.50	.75		20.22
2.20 2.40				9.60	3.40				14.25
2.40 2.60				7.09	2.75		.75		9.84
2.60 2.80				4.32	4.23				9.30
2.80 3.00				1.84	1.12	.50			2.97
3.00 3.20				.75	1.26				2.51
3.20 3.40				.25	.75	.25			1.00
3.40 3.60					.63				.88
3.60 3.80					1.06				1.06
3.80 4.00					.25				.25
4.00 4.20						.24			.24
4.20 4.40					.75				.75
4.40 4.60									.00
4.60 4.80									.00
4.80 5.00									.00
5.00 5.20									.00
5.20 5.40									.00
5.40 5.60									.00
5.60 5.80									.00
5.80 6.00									.00
TOTALS	.00	11.29	51.28	190.51	104.38	16.21	1.50	.00	375.16

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 3

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL FEBRUARY DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20	•	•	•	•	•	•	•	•	.00
.20 .40	•	•	•	•	•	•	•	•	.00
.40 .60	•	.50	.25	•	.50	•	•	•	1.25
.60 .80	•	1.63	5.13	6.37	3.00	.25	•	•	16.38
.80 1.00	•	1.25	6.24	20.39	5.62	1.50	•	•	35.00
1.00 1.20	•	.88	4.13	18.43	15.85	•	•	•	39.28
1.20 1.40	•	.62	2.74	23.73	15.37	•	•	•	42.47
1.40 1.60	•	.50	4.49	21.44	19.14	•	•	•	45.57
1.60 1.80	•	•	3.52	17.98	8.28	.25	•	•	30.03
1.80 2.00	•	•	2.37	19.21	8.71	1.25	•	•	31.55
2.00 2.20	•	•	•	13.23	13.79	.50	•	•	27.52
2.20 2.40	•	•	•	14.44	2.96	.50	•	•	17.91
2.40 2.60	•	•	•	11.63	4.98	•	•	•	16.60
2.60 2.80	•	•	•	4.47	1.48	.62	•	•	6.57
2.80 3.00	•	•	•	4.25	4.40	.87	•	•	9.52
3.00 3.20	•	•	•	3.25	1.88	1.25	•	•	6.38
3.20 3.40	•	•	•	.13	.75	•	•	•	.88
3.40 3.60	•	•	•	.88	.50	.38	•	•	1.75
3.60 3.80	•	•	•	•	.75	•	•	•	.75
3.80 4.00	•	•	•	•	1.00	.63	•	•	1.62
4.00 4.20	•	•	•	•	.50	•	•	•	.50
4.20 4.40	•	•	•	•	.63	•	•	•	.63
4.40 4.60	•	•	•	•	•	•	•	•	.00
4.60 4.80	•	•	•	•	•	•	•	•	.00
4.80 5.00	•	•	•	•	•	•	•	•	.00
5.00 5.20	•	•	•	•	•	•	•	•	.00
5.20 5.40	•	•	•	•	•	•	•	•	.00
5.40 5.60	•	•	•	•	•	•	•	•	.00
5.60 5.80	•	•	•	•	•	•	•	•	.00
5.80 6.00	•	•	•	•	•	•	•	•	.00
TOTALS	.00	5.37	28.87	179.83	110.08	8.00	.00	.00	332.15

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 4

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL MARCH DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20	•	•	•	•	•	•	•	•	.00
.20 .40	•	•	•	•	•	•	•	•	.00
.40 .60	•	•	•	.75	1.24	•	•	•	1.99
.60 .80	•	.50	2.87	4.01	2.51	.24	•	•	10.12
.80 1.00	•	.75	3.25	22.61	13.98	2.76	•	•	43.35
1.00 1.20	•	1.76	3.77	20.51	15.82	1.99	•	•	43.85
1.20 1.40	•	1.11	4.52	21.34	18.75	1.89	•	•	47.62
1.40 1.60	•	•	9.21	17.33	18.44	2.50	•	•	47.48
1.60 1.80	•	•	4.37	18.88	19.00	3.01	•	•	45.27
1.80 2.00	•	•	3.15	20.02	6.26	2.37	•	•	31.79
2.00 2.20	•	•	.87	14.52	8.08	.73	•	•	24.21
2.20 2.40	•	•	1.88	9.15	4.37	1.25	•	•	16.65
2.40 2.60	•	•	•	10.48	4.19	1.00	•	•	15.67
2.60 2.80	•	•	•	3.87	2.05	1.00	.62	•	7.55
2.80 3.00	•	•	•	3.24	1.02	.75	•	•	5.01
3.00 3.20	•	•	•	1.51	1.62	•	•	•	3.14
3.20 3.40	•	•	•	.25	.50	•	•	•	.75
3.40 3.60	•	•	•	.25	•	.25	.25	•	.75
3.60 3.80	•	•	•	.50	.50	.38	•	•	1.38
3.80 4.00	•	•	•	•	•	•	•	•	.00
4.00 4.20	•	•	•	•	•	•	.25	•	.25
4.20 4.40	•	•	•	•	•	•	•	•	.00
4.40 4.60	•	•	•	•	.50	•	•	•	.50
4.60 4.80	•	•	•	•	.25	•	•	•	.25
4.80 5.00	•	•	•	•	•	•	•	•	.00
5.00 5.20	•	•	•	•	•	•	•	•	.00
5.20 5.40	•	•	•	•	•	•	•	•	.00
5.40 5.60	•	•	•	•	•	•	•	•	.00
5.60 5.80	•	•	•	•	•	•	•	•	.00
5.80 6.00	•	•	•	•	•	•	•	•	.00
TOTALS	.00	4.12	33.88	169.24	119.07	20.11	1.12	.00	347.56

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 5

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL APRIL DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20	•	•	•	•	•	•	•	•	.00
.20 .40	•	•	•	•	•	•	•	•	.00
.40 .60	•	•	•	.50	1.00	•	•	•	1.50
.60 .80	•	.50	.75	5.25	6.37	1.25	•	•	14.12
.80 1.00	•	1.75	4.38	19.50	11.14	3.50	•	•	40.26
1.00 1.20	•	.75	4.13	20.24	13.03	5.25	•	•	43.41
1.20 1.40	•	.25	3.00	19.64	24.22	1.50	•	•	48.61
1.40 1.60	•	•	6.62	16.20	17.52	2.88	•	•	43.20
1.60 1.80	•	•	8.75	13.42	15.97	4.13	•	•	42.26
1.80 2.00	•	•	2.25	10.87	14.12	1.00	•	•	28.24
2.00 2.20	•	•	1.49	9.28	10.02	1.25	•	•	22.04
2.20 2.40	•	•	1.23	7.63	9.49	3.00	•	•	21.35
2.40 2.60	•	•	•	5.84	5.50	1.75	•	•	13.09
2.60 2.80	•	•	•	3.13	5.76	.50	•	•	9.39
2.80 3.00	•	•	•	1.87	3.72	2.37	•	•	7.96
3.00 3.20	•	•	•	.37	1.50	•	•	•	1.87
3.20 3.40	•	•	•	•	2.13	.50	•	•	2.63
3.40 3.60	•	•	•	.25	2.88	•	•	•	3.13
3.60 3.80	•	•	•	.75	.75	•	•	•	1.50
3.80 4.00	•	•	•	•	.89	.50	•	•	1.38
4.00 4.20	•	•	•	•	.50	.50	•	•	1.00
4.20 4.40	•	•	•	•	.25	•	•	•	.25
4.40 4.60	•	•	•	•	1.00	•	•	•	1.00
4.60 4.80	•	•	•	•	.75	•	•	•	.75
4.80 5.00	•	•	•	•	•	•	•	•	.00
5.00 5.20	•	•	•	•	.50	•	•	•	.50
5.20 5.40	•	•	•	•	.50	•	•	•	.50
5.40 5.60	•	•	•	•	•	.25	•	•	.25
5.60 5.80	•	•	•	•	•	•	•	•	.00
5.80 6.00	•	•	•	•	•	•	•	•	.00
6.00 6.20	•	•	•	•	.25	•	•	•	.25
TOTALS	.00	3.25	32.59	134.75	149.72	30.11	.00	.00	350.43

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 6

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL MAY DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	TOTALS
.00 .20									.00
.20 .40									.00
.40 .60					1.75	1.75	.75		4.25
.60 .80		1.00	.50	3.75	5.12	1.75			12.13
.80 1.00		.50	1.12	13.88	19.60	1.63			36.73
1.00 1.20			5.00	16.99	21.99	3.75	.50		47.73
1.20 1.40		.25	7.37	16.50	25.75	4.00			54.36
1.40 1.60		.25	9.37	11.37	18.73	2.63	.50		42.35
1.60 1.80			6.00	11.25	13.63	2.50			33.87
1.80 2.00			4.62	11.87	13.12	1.50			31.12
2.00 2.20			3.25	8.62	8.14	1.50			21.50
2.20 2.40			1.50	8.62	6.00	2.00			18.12
2.40 2.60				8.99	6.25	.50			15.74
2.60 2.80				4.25	5.51				9.76
2.80 3.00				2.37	3.88	.75			7.00
3.00 3.20				.88	1.50	.38			2.75
3.20 3.40				.25	1.75	1.50			3.50
3.40 3.60					1.88	.50			2.38
3.60 3.80				1.25	2.26				3.51
3.80 4.00					.63	.25			.88
4.00 4.20					.51	.50			1.01
4.20 4.40					.75	.50			1.25
4.40 4.60					.25				.25
4.60 4.80					.25				.25
4.80 5.00									.00
5.00 5.20									.00
5.20 5.40						.50			.50
5.40 5.60									.00
5.60 5.80									.00
5.80 6.00									.00
TOTALS	.00	2.00	38.74	120.83	159.24	28.37	1.75	.00	350.94

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS.
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 7

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL JUNE DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20	*	*	*	*	*	*	*	*	.00
.20 .40	*	*	*	*	*	*	*	*	.00
.40 .60	*	*	.25	2.00	5.37	1.50	*	*	9.12
.60 .80	*	1.75	*	2.75	11.25	4.13	*	*	19.87
.80 1.00	*	1.00	2.00	12.49	20.50	5.25	*	*	41.23
1.00 1.20	*	.50	4.25	17.52	25.12	3.25	.25	*	50.89
1.20 1.40	*	.25	3.26	11.10	23.73	3.62	*	*	41.96
1.40 1.60	*	*	4.51	9.38	22.87	6.62	.75	*	44.13
1.60 1.80	*	*	3.00	11.38	15.00	2.50	*	*	31.88
1.80 2.00	*	*	3.12	8.99	10.88	1.12	*	*	24.12
2.00 2.20	*	*	.25	6.99	6.75	4.37	*	*	18.36
2.20 2.40	*	*	.25	7.89	5.00	.75	*	*	13.89
2.40 2.60	*	*	1.12	7.36	6.61	1.50	*	*	16.60
2.60 2.80	*	*	*	3.74	2.00	1.51	*	*	7.25
2.80 3.00	*	*	*	1.25	1.50	1.74	*	*	4.49
3.00 3.20	*	*	*	.75	.50	1.12	*	*	2.37
3.20 3.40	*	*	*	.50	1.26	.50	*	*	2.26
3.40 3.60	*	*	*	*	1.50	.25	*	*	1.75
3.60 3.80	*	*	*	.38	.50	.25	*	*	1.13
3.80 4.00	*	*	*	.25	.77	.50	*	*	1.52
4.00 4.20	*	*	*	.25	*	*	*	*	.25
4.20 4.40	*	*	*	*	.25	.25	*	*	.50
4.40 4.60	*	*	*	*	.50	.50	*	*	1.00
4.60 4.80	*	*	*	*	*	*	*	*	.00
4.80 5.00	*	*	*	*	*	*	*	*	.00
5.00 5.20	*	*	*	*	.63	*	*	*	.63
5.20 5.40	*	*	*	*	*	.50	*	*	.50
5.40 5.60	*	*	*	*	*	*	*	*	.00
5.60 5.80	*	*	*	*	*	*	*	*	.00
5.80 6.00	*	*	*	*	*	*	*	*	.00
TOTALS	.00	3.50	22.02	104.96	162.49	41.73	1.00	.00	335.70

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 8

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL JULY DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20									.00
.20 .40									.00
.40 .60		.50	2.99	1.00	4.63	1.01			7.14
.60 .80		4.50	5.75	6.86	11.25	4.12			29.73
.80 1.00	.24	3.00	8.25	14.62	24.38	7.76	.25		56.00
1.00 1.20		1.25	9.88	26.13	19.73	7.37	.25		62.98
1.20 1.40		1.75	9.39	22.59	21.36	5.89			61.48
1.40 1.60		.25	4.75	12.87	16.10	5.75			44.36
1.60 1.80			4.88	16.63	8.88	5.49	.25		36.00
1.80 2.00			2.25	10.98	7.49	4.27			27.62
2.00 2.20			.25	6.00	4.87	1.38			14.51
2.20 2.40			.63	4.25	3.75	1.37	.86		10.48
2.40 2.60				4.75	4.37	.25			10.00
2.60 2.80				3.00	2.00	1.38			6.37
2.80 3.00				1.75	2.25				4.00
3.00 3.20				.75	.50	.25			1.50
3.20 3.40				.89	.50	1.25			2.64
3.40 3.60				.26					.26
3.60 3.80				.50	.25				.50
3.80 4.00				.25	.25				.50
4.00 4.20									.25
4.20 4.40					.99				.00
4.40 4.60					.50				.99
4.60 4.80									.50
4.80 5.00									.00
5.00 5.20									.00
5.20 5.40									.00
5.40 5.60									.00
5.60 5.80									.00
5.80 6.00									.00
TOTALS	.24	11.25	49.01	134.10	134.05	47.54	1.61	.00	377.80

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 9

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL AUGUST DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20									.00
.20 .40			.50		.25				.75
.40 .60			1.25	3.00	2.37	.74			7.36
.60 .80		.50	3.88	13.50	13.50	3.50			34.87
.80 1.00		1.25	4.36	21.12	18.26	6.64	.50	.25	52.38
1.00 1.20		1.12	5.76	29.13	22.61	4.63	.50		63.74
1.20 1.40		.50	5.00	19.36	17.51	5.12	.25		47.74
1.40 1.60		.50	5.62	16.24	13.79	4.88			41.03
1.60 1.80			2.13	13.25	13.48	3.01	.25		32.11
1.80 2.00			3.25	9.25	11.63	3.87			28.00
2.00 2.20			1.25	5.50	6.25	4.51			17.51
2.20 2.40				6.62	3.85	1.49			11.96
2.40 2.60				2.76	6.00	.50			9.25
2.60 2.80				.94	.25	1.50			2.69
2.80 3.00				.63	1.12	.50			2.25
3.00 3.20				1.75		.50			2.25
3.20 3.40						.25			.25
3.40 3.60									.00
3.60 3.80									.00
3.80 4.00									.00
4.00 4.20									.00
4.20 4.40									.00
4.40 4.60									.00
4.60 4.80									.00
4.80 5.00									.00
5.00 5.20									.00
5.20 5.40									.00
5.40 5.60									.00
5.60 5.80									.00
5.80 6.00									.00
TOTALS	.00	3.87	32.99	143.04	130.87	41.64	1.50	.25	354.16

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 10

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL SEPTEMBER DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20									.00
.20 .40							.25		.25
.40 .60			2.25	2.50	2.75	.87			8.37
.60 .80		5.00	6.12	11.24	20.13	5.36	1.50		49.35
.80 1.00		4.12	10.25	17.83	20.64	9.00	.75		62.58
1.00 1.20		4.62	12.75	14.93	19.57	5.77			57.64
1.20 1.40		2.76	9.25	14.13	19.48	3.64			49.25
1.40 1.60		.25	6.38	11.12	10.24	3.63	.37		31.61
1.60 1.80			5.38	7.37	12.12	2.01			27.27
1.80 2.00			5.36	4.25	6.36	2.51			18.49
2.00 2.20			1.00	2.87	5.49	1.25			10.62
2.20 2.40			.75	1.00	2.74	.50			5.00
2.40 2.60				1.25	1.12	.49			2.87
2.60 2.80				1.25	.75	.76			2.76
2.80 3.00				.75	.75	1.25			2.75
3.00 3.20				.25	.50	.50			1.25
3.20 3.40				.37	.50	.38	.38		1.63
3.40 3.60					.50				.50
3.60 3.80					.50				.50
3.80 4.00									.00
4.00 4.20									.00
4.20 4.40									.00
4.40 4.60									.00
4.60 4.80					.25				.25
4.80 5.00									.00
5.00 5.20									.00
5.20 5.40									.00
5.40 5.60									.00
5.60 5.80									.00
5.80 6.00									.00
TOTALS	.00	16.76	59.49	91.13	124.40	37.90	3.25	.00	332.93

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 11

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL OCTOBER DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20	.26								.26
.20 .40	1.74								1.74
.40 .60	.25	.25	1.75	2.75	1.25				6.25
.60 .80		4.37	8.74	9.14	7.17	3.25			32.67
.80 1.00		5.24	11.87	17.40	18.97	5.13			58.60
1.00 1.20		5.50	14.48	26.26	15.36	5.11			66.71
1.20 1.40		1.75	13.88	23.49	16.20	5.63			60.94
1.40 1.60		.26	6.13	14.24	13.25	2.00			35.88
1.60 1.80			6.39	13.88	6.49	1.50			28.26
1.80 2.00			1.75	7.26	5.75				14.76
2.00 2.20			1.99	6.87	.89	.25			10.00
2.20 2.40			.50	1.74	2.26				4.50
2.40 2.60			.24	1.99	1.12				3.35
2.60 2.80				.25	.75				1.00
2.80 3.00				.25	.50				.75
3.00 3.20				.25	.49				.74
3.20 3.40					.62				.62
3.40 3.60					1.12				1.12
3.60 3.80									.00
3.80 4.00					.50				.50
4.00 4.20									.00
4.20 4.40									.00
4.40 4.60									.00
4.60 4.80									.00
4.80 5.00									.00
5.00 5.20									.00
5.20 5.40									.00
5.40 5.60									.00
5.60 5.80									.00
5.80 6.00									.00
TOTALS	2.25	17.37	67.72	125.77	92.69	22.86	.00	.00	328.66

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 12

BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL NOVEMBER DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	TOTALS
.00 .20									.00
.20 .40									.00
.40 .60			.75	1.25	1.25				3.25
.60 .80		.63	5.01	8.13	4.99	1.88			20.63
.80 1.00		7.98	9.11	24.34	20.77	2.50			64.69
1.00 1.20		6.26	17.00	29.99	19.38	1.38			74.01
1.20 1.40		1.13	17.61	23.34	12.12				54.20
1.40 1.60			8.12	22.04	9.62	.25			40.03
1.60 1.80			6.76	11.50	3.23	.75			22.23
1.80 2.00			1.51	9.14	3.50	.38			14.52
2.00 2.20			1.25	7.13	1.52	.87			10.77
2.20 2.40			.75	3.99	.37				5.10
2.40 2.60			.25	2.88	1.63	.25			5.01
2.60 2.80			.75	2.01	.87	.50			4.13
2.80 3.00				.50	1.00	.48			1.98
3.00 3.20				1.00	.37				1.37
3.20 3.40					.38				.38
3.40 3.60				.25	.50				.75
3.60 3.80					1.00	1.00			2.00
3.80 4.00				.38					.38
4.00 4.20					1.13				1.13
4.20 4.40									.00
4.40 4.60									.00
4.60 4.80									.00
4.80 5.00									.00
5.00 5.20									.00
5.20 5.40									.00
5.40 5.60									.00
5.60 5.80									.00
5.80 6.00									.00
TOTALS	.00	15.99	68.87	147.85	83.62	10.23	.00	.00	326.55

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES

TABLE 13

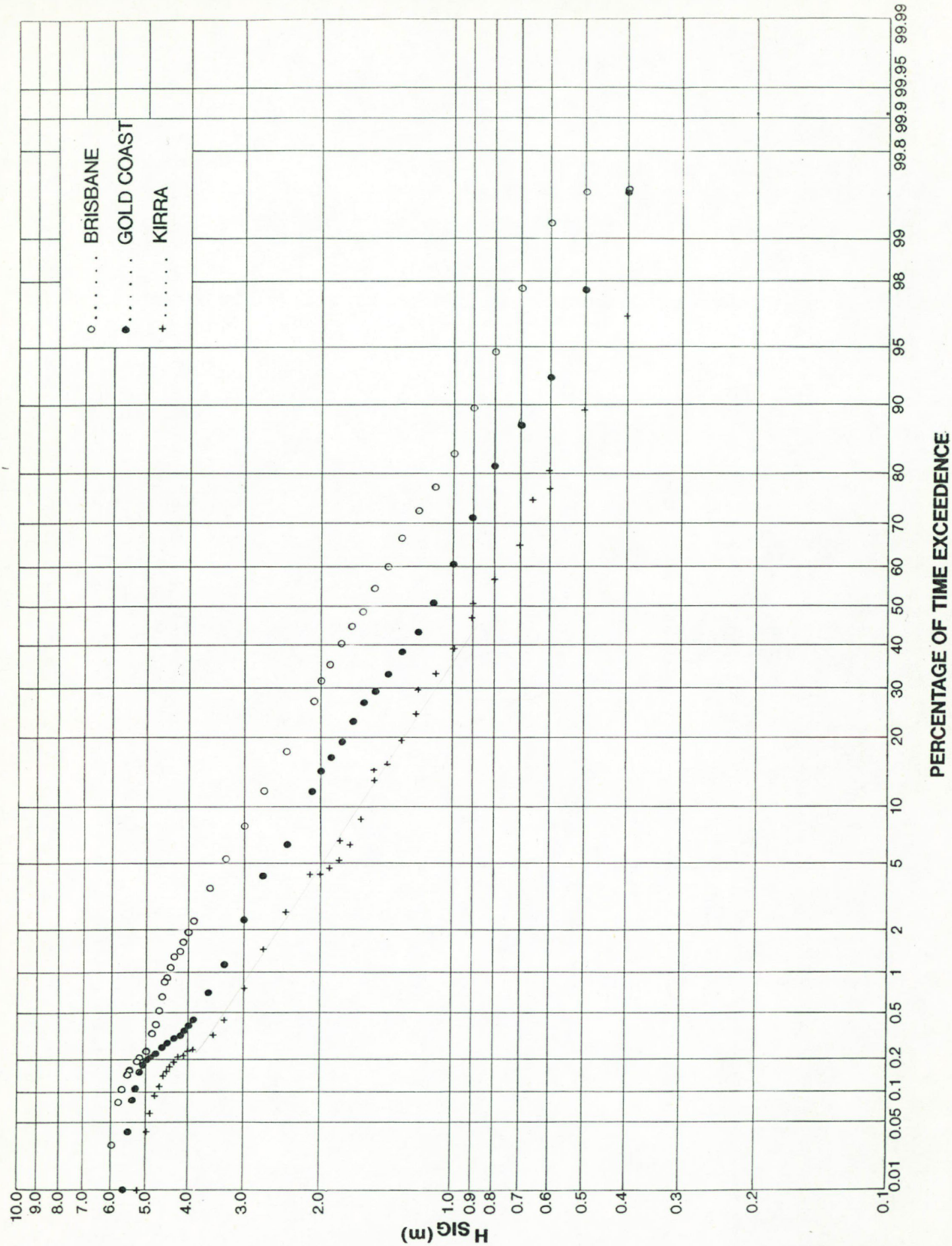
BRISBANE WAVE STATISTICS

WAVE PERIOD/WAVE HEIGHT OCCURRENCES

ALL DECEMBER DATA, ALL DIRECTIONS

WAVE HEIGHT (METRES)	WAVE PERIOD (SECONDS)								TOTALS
	0 - 2.99	3 - 4.99	5 - 6.99	7 - 8.99	9 - 10.99	11 - 12.99	13 - 14.99	> 14.99	
.00 .20	.50								.50
.20 .40									.00
.40 .60		.25	1.88	3.00	3.52				8.64
.60 .80		3.99	7.12	10.38	9.98				31.47
.80 1.00		8.00	14.75	23.78	26.30	3.50			76.32
1.00 1.20		5.62	12.88	30.01	26.14	1.50			76.15
1.20 1.40		2.75	13.74	26.55	16.16	1.25			60.46
1.40 1.60		.38	9.12	18.76	11.78	.37			40.40
1.60 1.80			5.75	11.65	5.00	.50	.50		23.39
1.80 2.00			2.23	9.74	6.39	.48			18.84
2.00 2.20			2.12	3.87	3.23	.75			9.98
2.20 2.40			.50	6.89	4.00	.75			12.14
2.40 2.60			.88	.75	1.64	.62			3.89
2.60 2.80				3.73	1.12	.62			5.48
2.80 3.00				1.75	.25	.88			2.88
3.00 3.20				.62		.25			.87
3.20 3.40				.87	.50				1.37
3.40 3.60				.75	.50	.25			1.50
3.60 3.80				.38	.50				.88
3.80 4.00					.25				.25
4.00 4.20					.50				.50
4.20 4.40					.25				.25
4.40 4.60					.25				.25
4.60 4.80					.25				.25
4.80 5.00					.50				.50
5.00 5.20									.00
5.20 5.40									.00
5.40 5.60									.00
5.60 5.80									.00
5.80 6.00									.00
TOTALS	.50	20.99	70.97	153.48	119.01	11.71	.50	.00	377.16

VALUES IN THE ABOVE TABLE ARE DURATIONS IN DAYS
THE AVERAGE WEIGHTED DIRECTION FOR THIS SECTOR = 0. DEGREES



PERCENTAGE (OF TIME) EXCEEDENCE OF WAVE HEIGHTS (Hsig) FOR ALL WAVE PERIODS

25th August 1988 to 30th June 1989

Wave Data Recording Programme
South East Queensland

Figure

Figure 1

Beach Protection Authority
Queensland

HARBOURS MARINE
Caring for our coast