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**Watertable heights and
salinity in coastal barriers:
Field measurements**

P. NIELSEN and C.J.VOISEY

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WATERTABLE HEIGHTS AND SALINITY IN COASTAL BARRIERS: FIELD MEASUREMENTS

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Abstract

Comprehensive measurements of watertable heights, and salinity structure are presented from North Bribie Island and Moreton Island both situated in South Eastern Queensland, Australia. Water levels in shore normal transects of stilling wells were monitored at regular intervals across Bribie Island and on the beach face of Moreton Island for differing durations. Salinity profiles were measured along similar shore normal transects and topography surveys were undertaken. These measurements define characteristics of the water table due to waves, the tide and rainfall. For the narrowest barrier the wave generated watertable overheight on the ocean side is shown to drive a steady groundwater flow towards the main land. In this situation the freshwater lens is very thin.

In the wider barrier, there is a net outflow of fresh water towards the ocean but the groundwater is salty on top near the high water mark.

The salinity profiles show typically a very gradual change with depth. That is, there is no sharp interface. The freshwater lens is very dynamic; the total freshwater volume varies by more than a factor of 2 in response to varying wave heights and rainfall.

CONTENTS

- 1. INTRODUCTION**
- 2. FIELD TRIP CALENDAR**
- 3. EXPERIMENTAL EQUIPMENT AND METHODS**
 - 3.1 Piezometer Wells and Watertable Monitoring
 - 3.2 Surveying of Well Levels and Topography
 - 3.3 Salinity Profile Measurement
 - 3.4 Beachface Characteristics
- 4. BRIBIE ISLAND CONCLUSIONS**
- 5. MORETON ISLAND CONCLUSIONS**
- 6. TABULATED RESULTS**
 - 6.1 Watertable data
 - 6.2 Salinity data
 - 6.3 Topographical data
 - 6.4 Rainfall data
 - 6.5 Wave and Tide data
- 7. LIST OF SYMBOLS**
- 8. ACKNOWLEDGEMENTS**
- 9. REFERENCES**

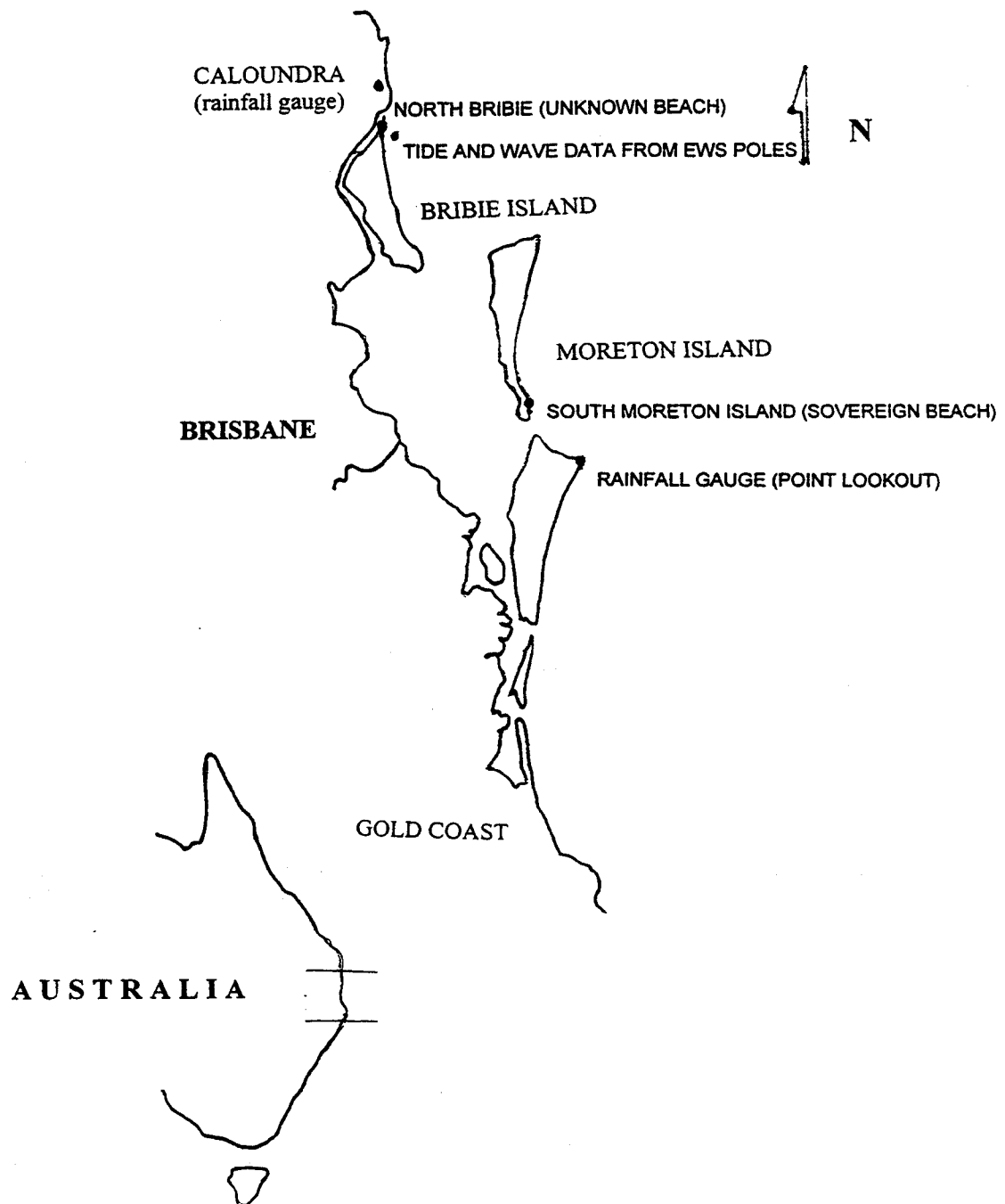


Figure 1
Location of watertable monitoring exercises and other data collection points
(Plan drawing from Kang et al., 1994)

1. INTRODUCTION

North Bribie Island (latitude $26^{\circ} 49.6' \text{ S}$, longitude $153^{\circ} 08' \text{ E}$) and South Moreton Island (latitude $27^{\circ} 17.055' \text{ S}$, longitude $153^{\circ} 25.239' \text{ E}$) on the Southeast Coast of Queensland were the locations for a number of watertable monitoring exercises (see figure 1). These sites were chosen because they are approximately two-dimensional (allowing cross-sectional representation) and are composed of homogeneous sand. This allows for the use of a simplified mathematical model in the analysis of data. Figure 2 describes the system being monitored at the Bribie Island site.

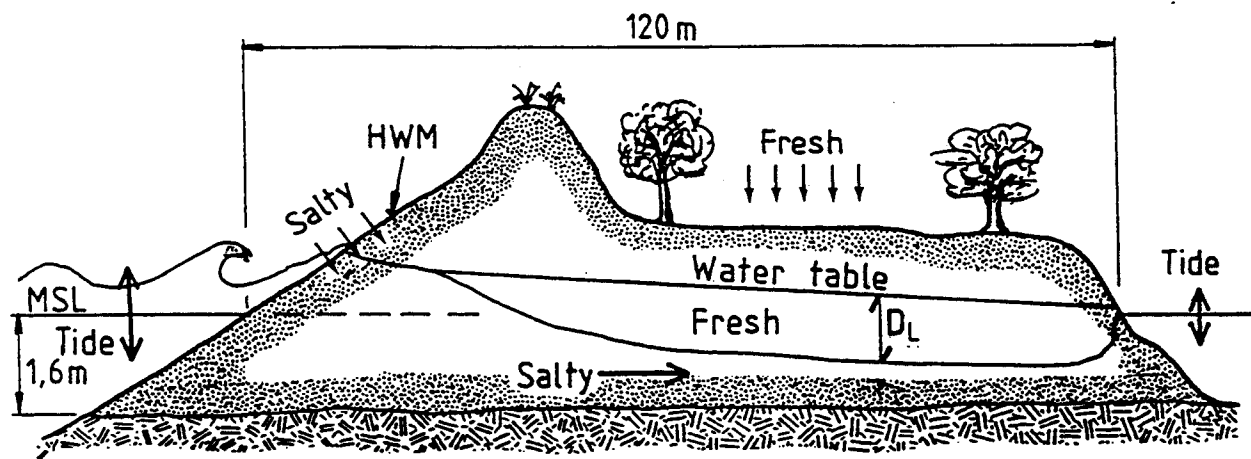


Figure 2: Characteristics of the Narrow Barrier observed at North Bribie Island

The data collected include; watertable levels in shorenormal transects of stilling wells at regular time intervals, topography of the beach and island profile, and salinity profile measurements along the transect. Also included are rainfall, wave height and tide level statistics from the locations shown on figure 1.

2. FIELD TRIP CALENDAR

At North Bribie Island an unnamed beach was the site of all measurements in the period November 1993 to July 1997 and South Moreton Island on Sovereign Beach was the site for a set of measurements in December 1997. Outlined below are the field trip sources and dates in order of the time of measurement. Each tabulated data set in this report can be identified by the letter ranking below.

- (a) Kang (1996), 9-10 November 1993
- (b) Mathews and Bojorge Salmeron (1994), 14 July 1994
- (c) Mathews and Bojorge Salmeron (1994), 9 August 1994
- (d) Kang (1996), 29-30 September 1994
- (e) Mathews and Bojorge Salmeron (1994), 30 September 1994
- (f) Howard and Dunn (1995), 21-22 September 1995
- (g) Howard and Dunn (1995), 6 October 1995
- (h) Nilsen and Hall (1996), 28 March 1996
- (i) Nilsen and Hall (1996), 28 May 1996
- (j) Pollard and Learoyd (1997), 20 March 1997
- (k) Pollard and Learoyd (1997), 9 July 1997
- (l) Pollard and Learoyd (1997), 25 July 1997
- (m) Nielsen and Voisey (1997), 15 December 1997 (Moreton Island)

3. EXPERIMENTAL EQUIPMENT AND METHODS

3.1 Piezometer Wells and Watertable Monitoring

PVC pipes approximately 30-40mm in diameter were used as piezometers to monitor the ground water fluctuations. These were placed with the use of a 70mm auger to penetrate to the watertable. The wells were placed at low tide so they would not dry up during any stage of the level monitoring. The distance between the wells was measured with a tape measure relative to a temporary benchmark. Clear polycarbonate tubes attached to star pickets were used in the surf zone and were measured from a ruler attached to the side. For the PVC wells monitoring was carried out with a conduction probe commonly known as a dip meter shown figure 3.

Figure 3: Conduction probe used to measure watertable levels



The accuracy of the dip meter measurements is in the order of $\pm 10\text{mm}$. Measurements were made at hourly intervals for a majority of the field trips although some trips had 20 and 30 minute intervals where more people were available to help. A variety of different transects of measurement were used. Some covered the whole narrow island barrier in a spread out transect, some covered in detail the beach face with wells only a few metres apart and others covered the area behind the main dune in more detail. Not all field trips included measurements of watertable fluctuations with time but the piezometers were used to measure the average watertable profile for use in salinity profile measurements.

Early measurements (Nov. 1993, Sept. 1994) show that the watertable heights are very uniform in the shore parallel direction at the Bribie Island site (see figure 4). This reinforces the assumption that the narrow barrier of Bribie Island can be approximated as a two dimensional system.

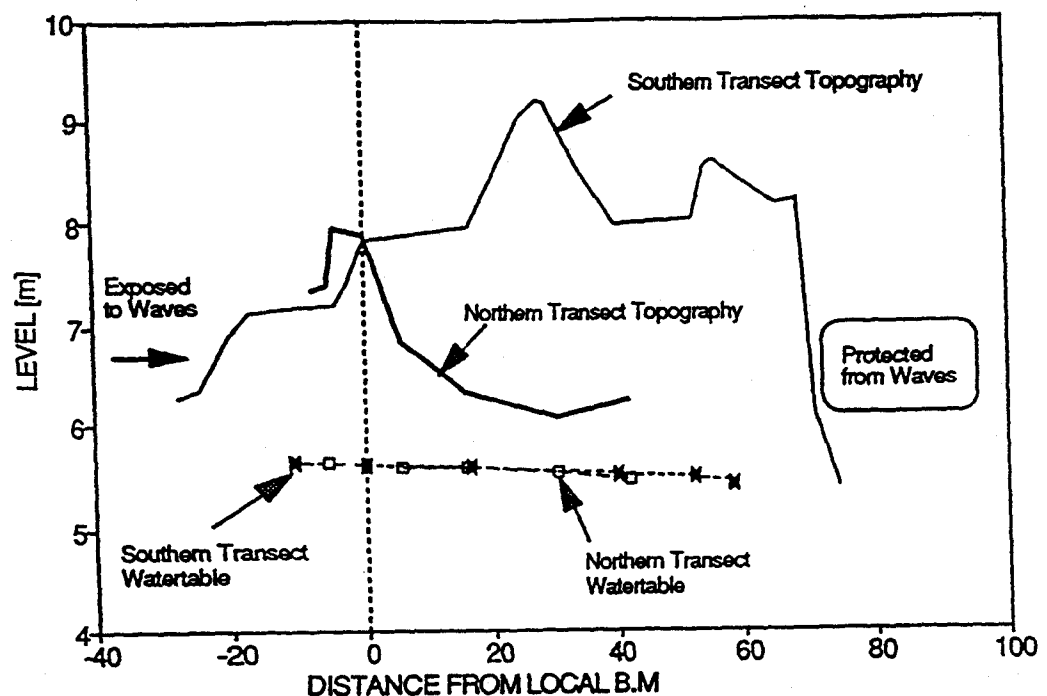


Figure 4: Northern and Southern transects, Bribie Island, showing watertable uniformity Kang & Nielsen (1994)

3.2 Surveying of Wells and Topography

The topography of the narrow barriers were surveyed to differing extents for each of the field trips. Well top levels were surveyed at the start of each experiment relative to a chosen benchmark with intermediate surveys undertaken when required. Well spacing was measured directly using a measuring tape and well tops were used as local datum for all watertable and salinity measurements.

Bribie site:

Due to the remoteness of the field site the only common permanent benchmark used was the bottom edge of a concrete slab on a close by navigational beacon. A variety of temporary benchmarks were used from this point. In 1995 the AHD level of the navigational beacon was estimated by the use of a clear poly-carbonate well in deep water compared to local measurements of the tide AHD level. This approximation was used to tie all field measurements from Bribie Island together with a common approximate AHD level. All surveys post 1995, inclusive, were relative to this benchmark. This is the benchmark just behind the main dune where all horizontal locations are measured from for all Bribie Island data in this report (shown figure 5). The relative levels of this benchmark and the concrete slab on the navigational beacon are 1.421m and 6.338m AHD(Australian Height Datum), respectively.



Figure 5: Photograph of benchmark used to tie field trips together, taken from behind the main dune towards the ocean.

Since some of the field trips had no indication of horizontal location relative to any known point, the scarp at the landward side of the Island was assumed to be relatively unchanged and the location of the transects were fitted to other field trip topographies to give a reasonable indication of location relative to the current benchmark.

Moreton site:

For the Moreton Island site all levels and horizontal distances were tied together using a temporary benchmark which was not positioned relative to AHD.

The high tide mark was measured and is shown in plots giving some indication of relative levels.

3.3 Salinity profile measurement

Salinity profiles were measured with stainless steel spears, like the one shown in figure 7, that were driven to different levels below the watertable. The depth was measured and a sample was taken and tested for total dissolved solids assumed to be salt concentration. This was compared to a sample of seawater taken from the surf. Then the spear was driven approximately another 0.2m down and the 'old' water was removed with a small bailer or suction device. Then another sample was taken and tested. This process continued until the samples became as saline as the seawater or until the spear could not be driven any further. This process continued along the specified shorenormal transect with more measurements in areas of rapid change.

The Moreton Island salinity measurements used a different method when measuring salinity. Stainless steel spears were driven in close groups at differing depths in a transect shown in figure 6. The samples were collected as before for each spear, without changing the level, so the change of salinity for each of the given depths was measured with time.



Figure 6: Transect of stainless steel spears used to measure salinity on Sovereign Beach south Moreton Island.

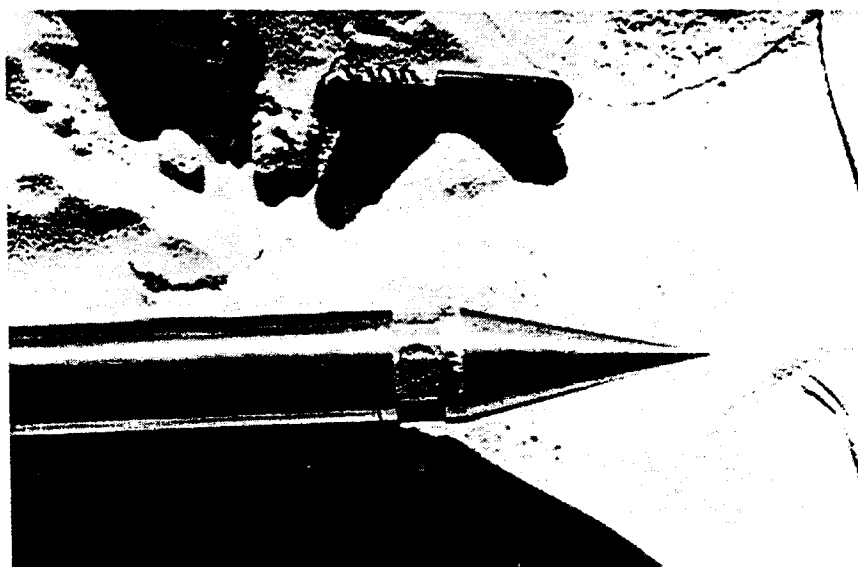


Figure 7 Stainless steel spears with permeable mesh near the point used for collecting salinity samples.

The fresh water lens thickness DL defined in results was derived from the following assumptions in figure 8. The fresh water present at the top of the watertable, measured in the field, was condensed into a assumed representative block of depth DL.

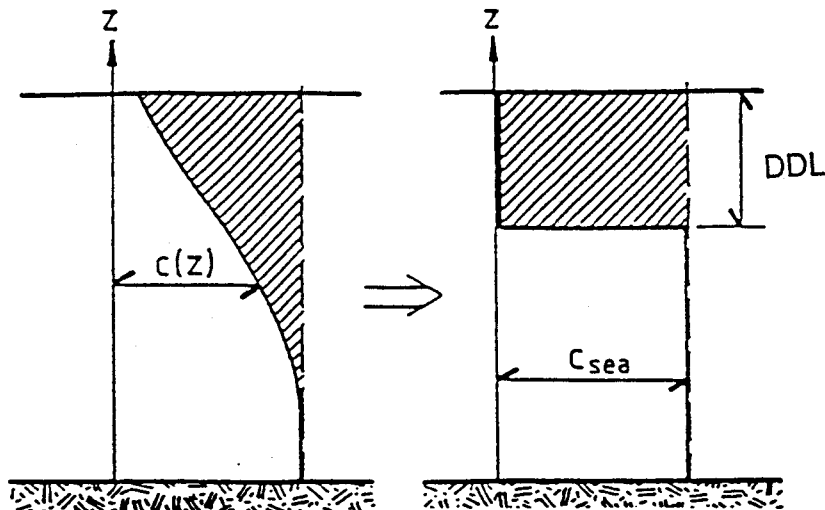


Figure 8:

(a) Actual salinity profile. (b) Equivalent depth of fresh water lens DL.

The Displacement Thickness, DDL, is described as the equivalent depth of fresh water for each sample taken.

The displacement DDL, is defined by:

$$DDL = \frac{1}{C_s} \int_0^h (C_s - C) dz$$

C_s - sea water salt concentration

C - sample salt concentration

h - depth to impermeable layer

(Nilsen 1996)

The fresh water lens thickness, DDL, was calculated incrementally for each sample then summed to find the total estimated freshwater lens depth DL for each salinity profile taken.

An Important feature of the measured salinity profiles is that the salinity change is very gradual. There is no sharp interface (see figure 9).

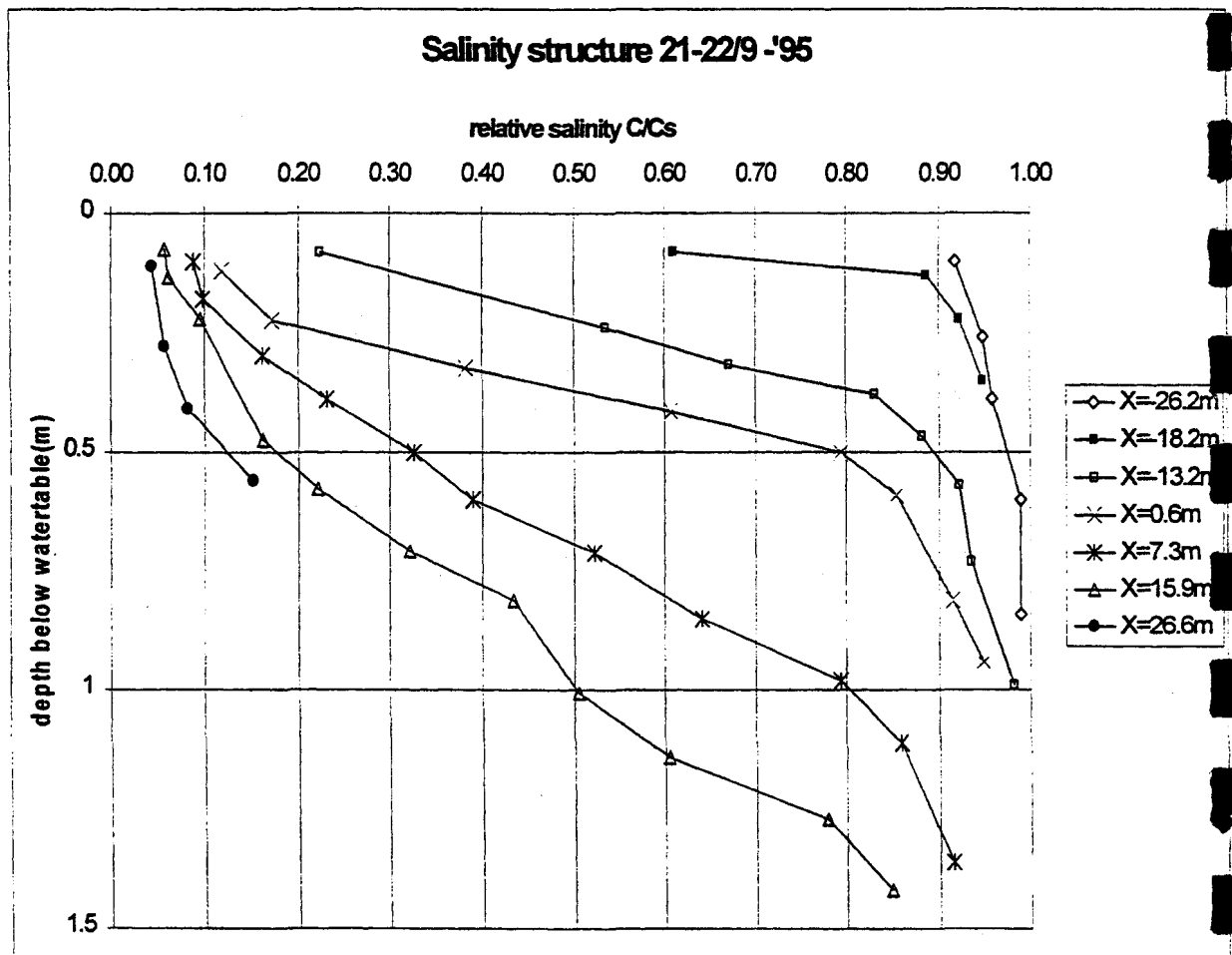


Figure 9: A typical salinity profile from Bribie Island
(see Figure 4 for origin of X)

3.4 Beachface Characteristics

Kang(1996) made measurements of Beachface characteristics that were not undertaken on other field trips. They are briefly described below:

- a) SWL- Sea Water Level: the water level at the deepest ocean side well that was not overtopped.
- b) SL - Shoreline: is defined as the intersection between the mean water surface and the sand surface found by interpolation.
- c) G\D – The Glassy/Dry Boundary: The seaward extreme of the seepage face exit point over a few wave periods. Defined by the interface between dull sand and highly reflective sand. It defines the intersection between the watertable and the beachface.
- d) R.L. – Runup Limit: At the end of each measuring cycle the highest point on the beachface reached by any wave in the cycle.

4. BRIBIE ISLAND CONCLUSIONS

An overheight due to wave action existed on the ocean side of the barrier which provided a driving head for salt water movement in the landward direction which appeared to cause salt poisoning of some trees. This agrees with research from NSW Public works at the Palm Beach narrow barrier shown in figure 10 where a similar characteristic overheight was measured.

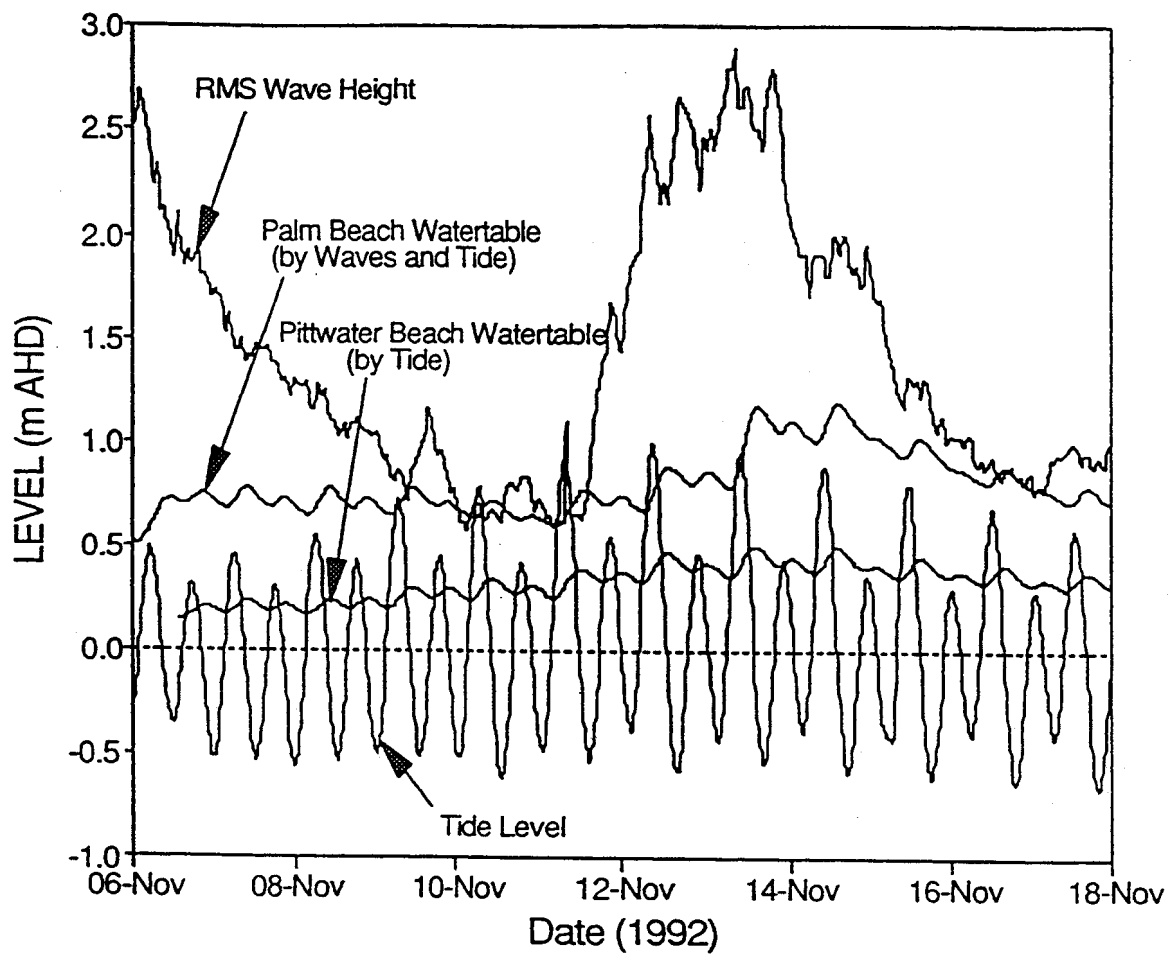


Figure 10: Field data showing the significant lifting of the watertable due to waves and tides. Palm Beach is exposed to waves but Pittwater Beach is sheltered from waves.

(Courtesy of New South Wales Public Works)

The fresh water lens is shown to vary significantly in depth across the Island due to wave conditions and rainfall received. See figure 11.

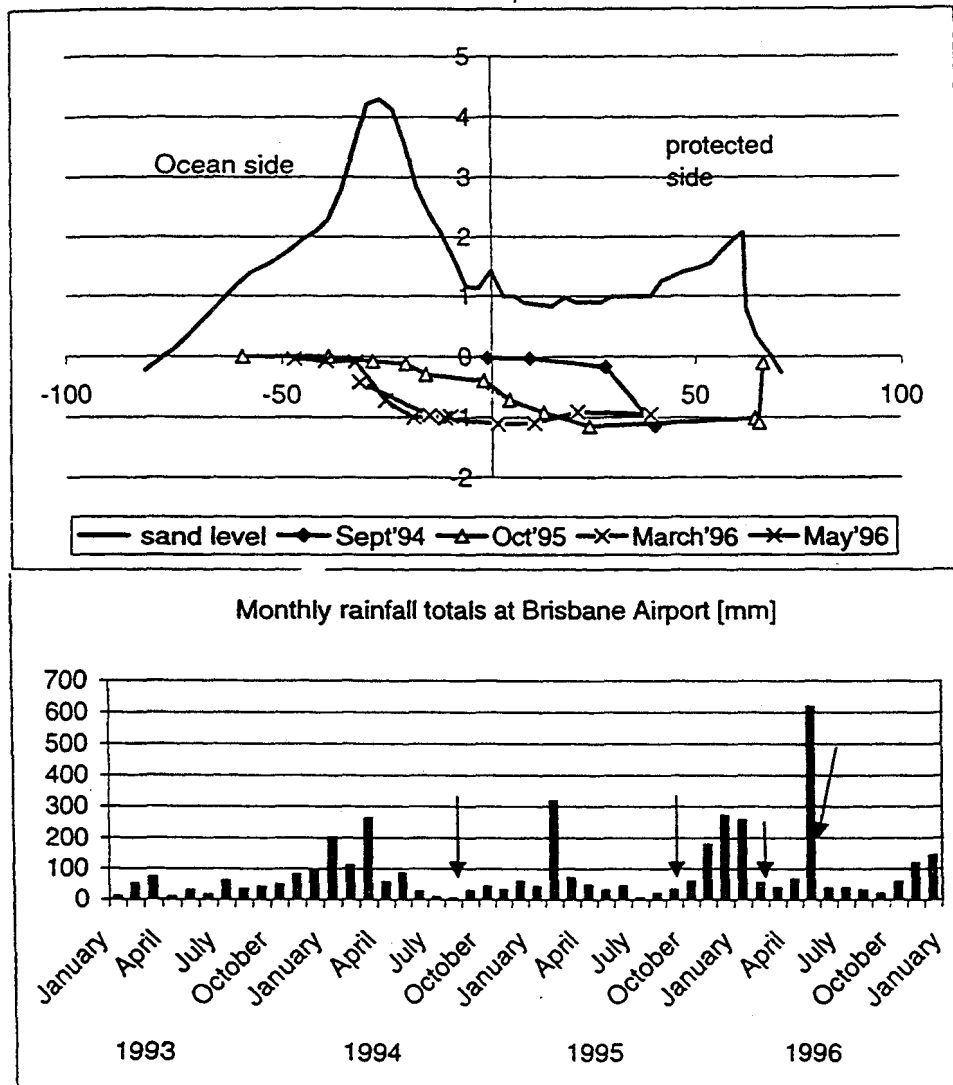


Figure 11: Fresh water lens profiles for a number of field trips against narrow barrier topography and rainfall for the period.

5. MORETON ISLAND CONCLUSIONS

The Moreton Island site was much wider than the Bribie site (~1km) and subsequently was much higher above sea level behind the fore-dune area.

The Moreton Island site described a fluctuation in the watertable due to waves and the tide that was similar to that at the Bribie Island site. However the wider Moreton Island barrier did not show an overheight in the watertable driven by waves. It showed slight oceanward gradient in the watertable, which is closer to the watertable expected on the mainland.

A narrow barrier somewhere between the two measuring sites (~500m width) should reach an equilibrium between waves and tide versus freshwater outflow giving a relatively flat gradient in the watertable, provided vegetation population and climate conditions are similar.

The salinity profile from Moreton Island (p54) described a bulge of fresh water flowing towards the ocean underneath a salty layer near the high water mark that moves backwards and forwards with the tidal cycle.

6. TABULATED RESULTS

6.1 WATERTABLE DATA

Watertable level changes over equal time intervals are plotted along with average sand levels at the base of the wells.

Table (A1) WATERTABLE LEVELS IN WELLS; UNNAMED BEACH,NORTH BRIBIE ISLAND, 29-30 SEPT.1994
RESEARCH KANG(1996)

Well no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Dist. from B.M. [m]	-30.5	-38.3	-45.5	-49.9	-54.6	-59.3	-62.3	-65.3	-68.2	-71.3	-74.3	-77.4	-80.2	-83.2	-86.8	-90.1	-99.1	-114						
Ave.sand level [m]	5.79	5.52	5.10	5.07	4.83	4.58	4.46	4.35	4.29	4.17	4.07	3.92	3.82	3.73	3.64	3.57	3.19	2.636						
Time	Horns	Ts	WATERTABLE LEVEL [m]																		S.W.L	S.L	G/D	R.L
[EST]	[m]	[sec]																			[m]	[m]	[m]	[m]
1130 29/9/94	1.30	10.23	3.72	3.75	3.73	3.72	3.71	3.71	3.71	3.70	3.70	3.72	3.71	3.81	3.79	3.78	3.78	3.72	3.57	3.49	3.49	3.77		
1200	1.35	10.09	3.72	3.74	3.72	3.72	3.72	3.72	3.73	3.73	3.74	3.76	3.79	3.83	3.83	3.77	3.77	3.74	3.61	3.58	3.58	3.83		
1230	1.20	9.31	3.72	3.73	3.73	3.75	3.74	3.78	3.75	3.77	3.78	3.82	3.91	3.92	3.88	3.78	3.78	3.78	3.69	3.68	3.68	3.89	3.93	4.22
1300	1.05	8.53	3.72	3.73	3.74	3.74	3.75	3.77	3.79	3.80	3.82	3.89	3.98	3.97	3.90	3.84	3.82	3.81	3.79	3.74	3.74	4.00	4.16	4.18
1330	1.09	8.32	3.72	3.74	3.75	3.76	3.77	3.81	3.83	3.85	3.91	4.10	4.09	4.01	3.98	3.91	3.87	3.87	3.87	3.85	3.85	4.13	4.23	4.31
1400	1.13	8.10	3.73	3.75	3.78	3.80	3.81	3.86	3.88	3.94	4.05	4.09	4.08	4.07	4.02	4.00	3.99	3.99	3.94		3.94	4.08	4.15	4.34
1430	1.12	8.03	3.72	3.77	3.79	3.82	3.83	3.90	3.96	4.09	4.20	4.19	4.14	4.09	4.05	4.04	4.03	4.02	4.01		4.01	4.17	4.23	4.47
1500	1.10	7.96	3.74	3.78	3.82	3.85	3.89	3.97	4.11	4.28	4.28	4.23	4.17	4.10	4.08	4.05	4.05	4.05	4.04		4.04	4.25	4.45	4.50
1530	1.09	7.72	3.77	3.81	3.85	3.88	3.92	4.04	4.16	4.33	4.28	4.23	4.17	4.09	4.05	4.05	4.05	4.05	4.04		4.04	4.28	4.28	4.47
1600	1.08	7.48	3.79	3.83	3.88	3.91	3.96	4.20	4.20	4.21	4.25	4.22	4.18	4.08	4.04	4.05	4.04	4.05	4.04		4.04	4.22	4.36	4.31
1630	1.06	7.71	3.79	3.84	3.89	3.92	3.98	4.10	4.15	4.21	4.25	4.22	4.16	4.08	4.03	4.02	4.02	4.00	3.98		3.98	4.22	4.25	4.25
1700	1.04	7.94	3.78	3.84	3.89	3.95	3.98	4.07	4.11	4.13	4.20	4.21	4.13	4.04	3.98	3.94	3.93	3.93	3.92	3.85	3.85	4.17	4.33	4.41
1730	1.05	7.06	3.80	3.85	3.90	3.93	3.97	4.04	4.07	4.08	4.11	4.10	4.11	4.02	3.93	3.88	3.88	3.88	3.85	3.78	3.78	4.07	3.97	4.29
1800	1.07	6.18	3.80	3.85	3.90	3.93	3.97	4.01	4.01	4.02	4.00	3.97	3.95	3.97	3.89	3.81	3.73	3.70	3.68		3.68	3.94	3.85	3.99
1830	1.12	6.17	3.82	3.86	3.90	3.92	3.94	3.98	4.00	3.99	3.98	3.95	3.92	3.89	3.86	3.80	3.70	3.62	3.59		3.59	3.87	3.85	
1900	1.17	6.16	3.85	3.88	3.90	3.90	3.92	3.98	3.97	3.97	3.95	3.92	3.88	3.83	3.80	3.78	3.70	3.60	3.52		3.52	3.78	3.84	4.25
1930	1.25	5.92	3.82	3.84	3.88	3.88	3.90	3.93	3.93	3.92	3.91	3.88	3.85	3.79	3.78		3.64	3.57	3.42		3.42	3.80	3.70	3.93
2000	1.33	5.67	3.80	3.84	3.87	3.87	3.89	3.91	3.92	3.91	3.90	3.85	3.82	3.77	3.73		3.64	3.57	3.39		3.32	3.59	3.59	3.91
2030	1.40	5.91	3.80	3.84	3.86	3.87	3.85	3.88	3.89	3.89	3.88	3.84	3.79	3.74	3.69		3.63	3.54	3.31	3.21	3.21	3.43	3.46	3.53
2100	1.47	6.14	3.80	3.83	3.85	3.85	3.84	3.88	3.88	3.87	3.88	3.82	3.83	3.73	3.69		3.62	3.56	3.30	3.17	3.17	3.56	3.65	3.67
2130	1.47	6.11	3.81	3.83	3.85	3.85	3.84	3.88	3.87	3.86	3.84	3.82	3.77	3.71	3.66		3.60	3.55	3.30	3.13	3.13	3.37	3.57	3.76

Table (A1) Continued

:: 2200	1.48	6.08 :	3.81	3.83	3.85	3.84	3.83	3.87	3.85	3.85	3.83	3.81	3.76	3.70	3.65	3.80	3.55	3.29	3.13 :	3.13	3.42	3.48	3.69 ::		
:: 2230	1.51	6.06 :	3.80	3.82	3.84	3.83	3.83	3.85	3.84	3.83	3.82	3.79	3.75	3.70	3.65	3.59	3.54	3.29	3.11 :	3.11	3.41	3.48	3.70 ::		
:: 2300	1.55	6.03 :	3.80	3.82	3.84	3.82	3.82	3.84	3.83	3.81	3.80	3.77	3.74	3.69	3.65	3.59	3.55	3.31	3.13 :	3.13	3.43	3.48	3.70 ::		
:: 2330	1.50	6.13 :	3.80	3.82	3.83	3.81	3.81	3.84	3.82	3.80	3.79	3.77	3.73	3.69	3.65	3.57	3.58	3.31	:	3.17	3.44	3.59	3.78 ::		
:: 0000 30/9/94	1.44	6.24 :	3.79	3.81	3.82	3.80	3.80	3.82	3.80	3.78	3.78	3.74	3.72	3.68	3.68	3.63	3.57	3.35	:	3.22	3.45	3.59	3.78 ::		
:: 0030	1.43	6.01 :	3.79	3.79	3.82	3.80	3.79	3.81	3.80	3.78	3.77	3.74	3.72	3.69	3.67	3.64	3.59	3.35	:	3.27	3.47	3.64	3.79 ::		
:: 0100	1.42	5.78 :	3.78	3.79	3.82	3.80	3.79	3.81	3.82	3.78	3.77	3.75	3.73	3.70	3.68	3.68	3.60	3.40	:	3.33	3.50	3.68	3.86 ::		
:: 0130	1.37	5.88 :	3.78	3.79	3.82	3.79	3.79	3.80	3.79	3.78	3.78	3.78	3.75	3.73	3.71	3.76	3.69	3.62	3.43	:	3.38	3.62	3.71	3.80 ::	
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:: 0230	1.38	6.30 :	3.77	3.79	3.81	3.78	3.78	3.81	3.82	3.81	3.82	3.85	3.85	3.87	3.88	3.78	3.73	3.68	3.58	:	3.59	3.78		4.03 ::	
:: 0300	1.40	6.62 :	3.78	3.79	3.80	3.79	3.79	3.82	3.84	3.82	3.84	3.85	3.88	3.88	3.89	3.79	3.75	3.70	3.65	:	3.65	3.79		3.94 ::	
:: 0330	1.38	6.32 :	3.78	3.79	3.80	3.79	3.80	3.83	3.85	3.85	3.87	3.90	3.95	3.93	3.91	3.80	3.75	3.71	3.69	:	3.69	3.91	4.09	4.19 ::	
:: 0400	1.36	6.07 :	3.77	3.79	3.81	3.80	3.81	3.84	3.86	3.86	3.88	3.93	3.99	3.95	3.93	3.83	3.78	3.73	3.69	:	3.69	3.94	4.05	4.12 ::	
:: 0430	1.36	6.22 :	3.78	3.79	3.81	3.81	3.82	3.85	3.87	3.87	3.89	3.89	3.89	3.91	3.92	3.83	3.71	3.68	3.64	:	3.64	3.92	3.88	4.13 ::	
:: 0500	1.38	6.37 :	3.78	3.79	3.81	3.81	3.82	3.85	3.88	3.88	3.88	3.90	3.93	3.93	3.92	3.83	3.70	3.67	3.64	:	3.62	3.92	3.81	4.15 ::	
:: 0530	1.25	6.49 :	3.78	3.79	3.81	3.81	3.82	3.84	3.85	3.85	3.87	3.88	3.88	3.84	3.87	3.82	3.72	3.64	3.60	3.54 :	3.54	3.85	3.80	4.08 ::	
:: 0600	1.13	6.61 :	3.77	3.79	3.80	3.80	3.81	3.83	3.83	3.83	3.85	3.84	3.83	3.83	3.86	3.79	3.68	3.59	3.52	3.42 :	3.42	3.73	3.81	4.08 ::	
:: 0630	1.12	6.39 :	3.77	3.78	3.80	3.79	3.80	3.81	3.81	3.81	3.82	3.80	3.80	3.78	3.76		3.68	3.54	3.44	3.35 :	3.35	3.68	3.62	3.99 ::	
:: 0700	1.11	6.18 :	3.77	3.78	3.79	3.78	3.79	3.79	3.79	3.79	3.79	3.78	3.75	3.70	3.68		3.58	3.52	3.31	3.26 :	3.26	3.52	3.51	3.85 ::	
:: 0730	1.10	6.28 :	3.76	3.78	3.79	3.78	3.78	3.79	3.78	3.77	3.77	3.74	3.72	3.67	3.62		3.54	3.47	3.27	3.19 :	3.19	3.37	3.31	3.74 ::	
:: 0800	1.08	6.37 :	3.76	3.77	3.78	3.77	3.77	3.78	3.78	3.78	3.78	3.75	3.73	3.70	3.68	3.81		3.53	3.48	3.27	3.15 :	3.12	3.37	3.45	3.81 ::
:: 0830	0.99	6.28 :	3.76	3.77	3.78	3.77	3.76	3.77	3.78	3.75	3.74	3.72	3.68	3.64	3.60		3.50	3.44	3.25	3.13 :	3.03	3.34	3.49	3.59 ::	
:: 0900	0.92	6.19 :	3.76	3.76	3.77	3.76	3.75	3.76	3.76	3.74	3.73	3.70	3.67	3.63			3.47	3.41	3.22	3.04 :	3.01	3.31	3.25	3.53 ::	
:: 0930	0.91	6.09 :	3.75	3.76	3.77	3.75	3.75	3.75	3.75	3.73	3.72	3.69	3.66	3.62			3.45	3.39	3.22	3.00 :	3.00	3.30	3.23	3.45 ::	
:: 1000	0.89	5.99 :	3.75	3.76	3.77	3.75	3.75	3.75	3.75	3.74	3.72	3.71	3.68	3.65	3.61		3.48	3.41	3.23	3.05 :	3.02	3.32	3.23	3.50 ::	
:: 1030	0.86	6.06 :	3.74	3.75	3.76	3.75	3.74	3.74	3.73	3.71	3.70	3.67	3.63	3.59			3.47	3.42	3.25	3.08 :	3.08	3.33	3.40	3.53 ::	
:: 1100	0.83	6.12 :	3.74	3.75	3.76	3.74	3.74	3.74	3.72	3.71	3.69	3.67	3.63	3.59			3.46	3.43	3.28	3.12 :	3.12	3.35		::	
:: 1130	0.81	6.10 :	3.74	3.75	3.75	3.74	3.73	3.73	3.71	3.70	3.68	3.66	3.63	3.59			3.49	3.45	3.30	3.19 :	3.19	3.37	3.41	3.65 ::	
:: 1200	0.78	6.08 :	3.74	3.75	3.75	3.73	3.72	3.72	3.71	3.69	3.67	3.65	3.63	3.59			3.51	3.49	3.33	3.25 :	3.25	3.41	3.51	3.64 ::	
:: 1230	0.85	6.40 :	3.74	3.74	3.74	3.72	3.71	3.71	3.71	3.69	3.68	3.66	3.65	3.63	3.62		3.64	3.55	3.43	3.37 :	3.37	3.59	3.66	3.81 ::	
:: 1300	0.92	6.75 :	3.74	3.73	3.74	3.72	3.71	3.72	3.72	3.71	3.71	3.70	3.71	3.72	3.77	3.83	3.70	3.62	3.59	3.53 :	3.53	3.75	3.82	4.00 ::	

Table (D1) WATERTABLE LEVELS IN WELLS; UNNAMED BEACH, NORTH BRIBIE ISLAND, 9-10 NOV. 1993
RESEARCH KANG(1996)

Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Dist. from B.M.	-9.8	-25	-31.7	-34.5	-37	-39.4	-41.8	-44.3	-46.8	-49.4	-51.9	-61.7	-68.2	-79	-100	
Av. sand level			2.81	2.81	2.49	2.38	2.17	1.97	1.82	1.63	1.20	0.94	0.91	0.57	0.40	
Time (EST)	WATERTABLE LEVELS (m)															
																S.W.L. S.L. G/D R.L.
1400 9/11-93		0.99	0.99	1.01	1.02	1.04	1.08	1.09	1.12	1.23	1.30	1.25	1.25			1.25 1.28 1.55 1.70
1420		0.99	1.01	1.02	1.04	1.08	1.08	1.11	1.15	1.32	1.31	1.27	1.27			1.27 1.31 1.55 1.78
1440		1.00	1.03	1.05	1.07	1.09	1.11	1.18	1.24	1.42	1.38	1.35	1.35			1.35 1.39 1.55 1.94
1500		1.01	1.06	1.08	1.10	1.13	1.17	1.25	1.43	1.54	1.42	1.42	1.40			1.40 1.50 1.70 2.21
1520		1.04	1.08	1.12	1.14	1.19	1.24	1.37	1.57	1.59	1.48	1.45	1.45			1.45 1.57 1.70 2.13
1540		1.05	1.10	1.13	1.18	1.21	1.29	1.48	1.81	1.59	1.48	1.45	1.45			1.45 1.57 1.82 2.13
1600		1.07	1.11	1.15	1.19	1.25	1.34	1.51	1.63	1.60	1.47	1.45	1.45			1.45 1.58 1.82 1.97
1620		1.08	1.13	1.18	1.22	1.28	1.38	1.55	1.64	1.60	1.48	1.44	1.48			1.48 1.58 1.65 2.13
1640		1.10	1.15	1.20	1.24	1.31	1.40	1.54	1.62	1.59	1.42	1.42	1.39			1.39 1.58 1.70 2.09
1700		1.11	1.17	1.21	1.25	1.32	1.39	1.50	1.58	1.54	1.37	1.38	1.38			1.38 1.48 1.70 2.09
1720		1.12	1.18	1.22	1.28	1.33	1.39	1.48	1.54	1.53	1.37	1.38	1.35			1.35 1.47 1.88 1.92
1740	1.05	1.14	1.19	1.23	1.27	1.33	1.39	1.47	1.51	1.52	1.38	1.35	1.33	1.32		1.33 1.45 1.80 1.85
1800	1.05	1.14	1.20	1.24	1.27	1.32	1.37	1.43	1.44	1.39	1.20	1.10	1.09	1.25		1.09 1.19 1.29 1.70
1820		1.14	1.19	1.23	1.25	1.28	1.32	1.38	1.35	1.28	1.00	0.97	0.85	1.03		0.85 0.93 1.11 1.44
1840		1.14	1.19	1.23	1.24	1.28	1.29	1.33	1.31	1.28	1.02	1.00	0.97	0.97		0.75 1.00 1.20 1.38
1900	1.08	1.15	1.18	1.21	1.22	1.24	1.27	1.29	1.28	1.23	1.04	0.97	0.87	0.92	0.92	0.65 0.88 0.99 1.38
1920		1.15	1.19	1.21	1.21	1.23	1.25	1.28	1.25	1.21	1.08	0.95	0.83	0.84	0.99	0.58 0.83 0.94 1.15
1940		1.15	1.18	1.19	1.20	1.21	1.23	1.24	1.22	1.18	1.04	0.93	0.80	0.78	0.90	0.52 0.79 0.84 0.94
2000		1.14	1.16	1.18	1.18	1.20	1.21	1.22	1.20	1.16	1.02	0.90	0.79	0.70	0.54	0.50 0.75 0.91 0.93
2020		1.14	1.16	1.17	1.17	1.18	1.19	1.20	1.18	1.13	1.00	0.88	0.77	0.65	0.55	0.48 0.69 0.77 0.91
2040		1.13	1.15	1.16	1.18	1.17	1.18	1.17	1.16	1.11	0.99	0.88	0.77	0.63	0.58	0.48 0.67 0.57 0.87
2100		1.13	1.14	1.15	1.15	1.15	1.18	1.18	1.13	1.10	0.97	0.88	0.75	0.60	0.50	0.44 0.62 0.57 0.82
2120		1.12	1.13	1.14	1.14	1.14	1.14	1.14	1.11	1.09	0.95	0.83	0.71	0.58	0.41	0.41 0.48 0.52 0.57
2140		1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.10	1.07	0.94	0.83	0.70		0.37	0.37 0.41 0.52 0.58
2200		1.11	1.12	1.13	1.12	1.13	1.12	1.12	1.10	1.06	0.92	0.80	0.68		0.34	0.34 0.37 0.51 0.53
2220		1.11	1.11	1.12	1.11	1.12	1.11	1.10	1.08	1.05	0.92	0.80	0.67		0.34	0.34 0.38 0.50 0.57
2240		1.10	1.10	1.11	1.10	1.10	1.09	1.08	1.08	1.03	0.22	0.78	0.68		0.34	0.34 0.36 0.51 0.58
2300		1.10	1.09	1.10	1.09	1.09	1.08	1.07	1.05	1.01	0.89	0.77	0.65		0.38	0.38 0.38 0.50 0.54
2320		1.09	1.09	1.09	1.09	1.08	1.07	1.08	1.03	1.01	0.88	0.77	0.68		0.38	0.38 0.42 0.51 0.54
2340		1.09	1.08	1.09	1.08	1.07	1.08	1.05	1.02	1.00	0.88	0.78	0.68		0.38	0.38 0.48 0.53 0.58
0000 10/11-93		1.08	1.08	1.08	1.07	1.07	1.08	1.04	1.02	1.00	0.89	0.78	0.68		0.44	0.44 0.50 0.57 0.63
0020		1.07	1.07	1.07	1.08	1.08	1.05	1.04	1.01	0.99	0.90	0.81	0.75	0.58		0.50 0.58 0.57 0.84
0040		1.07	1.07	1.07	1.08	1.05	1.04	1.03	1.01	0.98	0.90	0.83	0.79	0.63		0.57 0.68 0.81 0.91
0100		1.08	1.08	1.08	1.05	1.05	1.03	1.02	1.00	0.98	0.90	0.83	0.79	0.63		0.64 0.68 0.83 0.91
0120		1.08	1.05	1.08	1.04	1.04	1.03	1.02	0.99	0.97	0.91	0.84	0.79	0.65		0.68 0.71 0.87 0.92
0140		1.08	1.05	1.05	1.04	1.03	1.02	1.01	0.99	0.97	0.91	0.87	0.81	0.68		0.71 0.75 0.91 0.94
0200		1.05	1.05	1.05	1.04	1.03	1.02	1.01	0.99	0.98	0.99	0.96	0.91	0.99	0.99	0.77 0.91 1.13 1.29

Table (D1) Continued

0220		1.05	1.05	1.05	1.04	1.04	1.03	1.03	0.93	1.02	1.07	0.99	1.02	1.00	1.00	0.84	0.97	1.11	1.35
0240		1.05	1.05	1.05	1.05	1.07	1.05	1.05	1.04	1.05	1.17	1.02	1.03	0.94	0.94	0.90	0.99	1.28	1.47
0300	1.04	1.05	1.05	1.08	1.08	1.08	1.08	1.08	1.08	1.10	1.18	1.10	1.09	0.99		0.97	1.11	1.29	1.50
0320		1.07	1.11	1.08	1.07	1.08	1.09	1.09	1.08	1.13	1.17	1.08	1.08	1.01		1.01	1.04	1.29	1.54
0340		1.08	1.07	1.08	1.08	1.09	1.09	1.11	1.11	1.13	1.20	1.11	1.12	1.05		1.04	1.08	1.35	1.54
0400	1.03	1.07	1.07	1.09	1.09	1.11	1.11	1.14	1.16	1.10	1.26	1.23	1.22			1.12	1.25	1.41	1.74
0420		1.08	1.09	1.11	1.11	1.12	1.15	1.17	1.21	1.30	1.25	1.21	1.20	1.17		1.20	1.23	1.41	1.60
0440		1.08	1.10	1.12	1.13	1.14	1.16	1.19	1.23	1.36	1.29	1.27	1.28	1.19		1.28	1.30	1.50	1.70
0500	1.04	1.09	1.11	1.12	1.15	1.17	1.18	1.22	1.29	1.41	1.32	1.30	1.29	1.25		1.27	1.35	1.54	1.82
0520		1.10	1.13	1.16	1.16	1.19	1.20	1.24	1.30	1.39	1.28	1.24	1.23	1.24		1.21	1.30	1.47	1.78
0540		1.11	1.14	1.16	1.17	1.19	1.21	1.25	1.32	1.30	1.24	1.18	1.15	1.20		1.15	1.24	1.41	1.63
0600	1.05	1.11	1.14	1.16	1.17	1.20	1.20	1.26	1.25	1.27	1.22	1.10	1.09	1.13		1.09	1.22	1.32	1.60
0620		1.12	1.14	1.16	1.16	1.19	1.20	1.22	1.24	1.25	1.23	1.12	1.12	1.09		1.05	1.23	1.35	1.54
0640		1.12	1.14	1.17	1.17	1.20	1.19	1.21	1.23	1.24	1.20	1.05	1.04	1.05		1.01	1.20	1.20	1.50
0700		1.12	1.15	1.18	1.17	1.18	1.18	1.20	1.21	1.21	1.21	1.04	1.03	1.02		0.98	1.21	1.20	1.47
0720	1.07	1.12	1.14	1.15	1.16	1.16	1.16	1.18	1.18	1.17	1.07	1.04	1.02	0.91		0.95	1.05	0.97	1.44
0740		1.12	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.16	1.04	0.93	0.92	0.84	0.96	0.90	0.92	0.93	1.14
0800		1.11	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.13	1.02	0.93	0.91	0.77	0.91	0.85	0.92	0.94	1.04
0820	1.07	1.11	1.12	1.12	1.12	1.13	1.12	1.13	1.13	1.12	1.02	0.92	0.90	0.69	0.82	0.82	0.90	0.94	0.94
0840	1.07	1.10	1.11	1.11	1.11	1.11	1.10	1.11	1.11	1.09	1.00	0.91	0.83	0.68	0.78	0.72	0.76	0.76	0.94
0900		1.10	1.11	1.10	1.10	1.10	1.09	1.10	1.09	1.08	0.98	0.89	0.79	0.62	0.87	0.83	0.87	0.60	0.94
0920		1.09	1.10	1.09	1.08	1.09	1.09	1.08	1.08	1.08	0.98	0.85	0.74	0.60	0.58	0.58	0.62	0.57	0.68
0940		1.08	1.09	1.08	1.08	1.08	1.07	1.07	1.06	1.05	0.94	0.83	0.72	0.58	0.58	0.55	0.58	0.57	0.65
1000	1.08	1.07	1.08	1.07	1.07	1.07	1.06	1.06	1.05	1.03	0.92	0.81	0.70	0.57	0.54	0.54	0.57	0.58	0.62
1020		1.07	1.08	1.08	1.08	1.08	1.05	1.05	1.04	1.01	0.91	0.79	0.67		0.50	0.50	0.54	0.55	0.57
1040		1.07	1.08	1.08	1.08	1.08	1.05	1.05	1.03	1.01	0.90	0.79	0.68		0.52	0.52	0.54	0.55	0.60
1100	1.05	1.06	1.08	1.05	1.05	1.05	1.04	1.04	1.02	1.00	0.90	0.78	0.68		0.57	0.51	0.55	0.57	0.59
1120		1.05	1.04	1.04	1.05	1.03	1.02	1.02	1.00	0.99	0.89	0.80	0.71	0.58	0.59	0.51	0.58	0.57	0.65
1140		1.05	1.04	1.04	1.03	1.02	1.01	1.01	0.99	0.87	0.88	0.79	0.70	0.58	0.64	0.54	0.58	0.59	0.67
1200	1.03	1.04	1.04	1.03	1.03	1.02	1.01	1.01	0.98	0.96	0.89	0.80	0.72	0.60	0.68	0.58	0.61	0.67	0.67
1220		1.04	1.04	1.03	1.03	1.02	1.00	1.00	0.98	0.98	0.88	0.80	0.72	0.60	0.68	0.59	0.61	0.57	0.67
1240		1.04	1.03	1.02	1.02	1.01	0.99	0.99	0.97	0.95	0.89	0.84	0.80	0.61	0.75	0.65	0.88	0.87	0.93
1300	1.02	1.03	1.03	1.02	1.02	1.01	0.99	0.99	0.97	0.96	0.92	0.89	0.90	0.62	0.85	0.70	0.88	0.94	0.84
1320		1.03	1.02	1.02	1.02	1.01	1.00	0.99	0.97	0.97	0.95	0.93	0.92	0.69	0.94	0.72	0.92	0.94	1.04
1340		1.03	1.02	1.02	1.01	1.01	1.00	0.98	0.99	1.00	0.97	0.96	0.76			0.75	0.97	0.94	1.20
1400	1.01	1.03	1.02	1.02	1.03	1.02	1.01	1.01	1.01	1.02	1.11	1.03	1.01	0.83		0.83	1.06	1.20	1.29
1420	1.01	1.02	1.02	1.03	1.03	1.03	1.04	1.04	1.06	1.22	1.09	1.05	0.91			0.91	1.21	1.26	1.38
1440		1.03	1.03	1.04	1.04	1.05	1.06	1.07	1.07	1.13	1.23	1.16	1.12	0.99		0.99	1.22	1.26	1.45
1500	1.01	1.03	1.05	1.06	1.06	1.08	1.09	1.11	1.14	1.23	1.27	1.21	1.19	1.08		1.08	1.26	1.45	1.63

Table (F1) WATERTABLE LEVELS IN WELLS; UNNAMED BEACH, NORTH BRIBIE ISLAND, 21-22 Sept.1995
 RESEARCH HOWARD AND DUNN(1995)

Well No.	1	2	3	4	5	6	7	8	9	10
Dist. from B.M. [m]	-58.2	-34.2	-16.7	-8.4	3.2	12.4	40.8	54.9		
Av. Sand level [m]	1.65	1.85	3.00	1.76	1.07	0.81	1.13	1.61		
Time [EST]	WATERTABLE LEVELS [m]									
11:00 21/9-95	0.24	0.21	0.15	0.16	0.13	0.11	0.04			
12:00	0.23	0.21	0.15	0.15	0.12	0.11	0.03			
13:00	0.20	0.19	0.16	0.14	0.12	0.10	0.00			
14:00	0.19	0.18	0.15	0.13	0.10	0.09	-0.01			
15:00	0.19	0.17	0.14	0.12	0.09	0.07	-0.03			
16:00	0.25	0.15	0.13	0.12	0.09	0.07	-0.01			
17:00	0.34	0.20	0.13	0.12	0.09	0.08	0.03			
18:00	0.44	0.23	0.15	0.14	0.10	0.09	0.07			
19:00	0.53	0.26	0.16	0.15	0.12	0.11	0.11			
20:00	0.56	0.27	0.17	0.16	0.13	0.13	0.13			
21:00	0.52	0.28	0.19	0.17	0.15	0.14	0.14			
22:00	0.46	0.29	0.19	0.18	0.16	0.15	0.15			
23:00	0.42	0.29	0.20	0.18	0.16	0.16	0.15			
0:00 22/9-95	0.38	0.28	0.21	0.19	0.17	0.17	0.14			
1:00	0.34	0.27	0.21	0.19	0.17	0.16	0.12			
2:00	0.31	0.26	0.21	0.19	0.17	0.16	0.10			
3:00	0.28	0.25	0.21	0.19	0.16	0.16	0.08			
4:00	0.27	0.24	0.20	0.18	0.16	0.15	0.07			
5:00	0.30	0.24	0.19	0.18	0.15	0.14	0.07			
6:00	0.36	0.25	0.20	0.18	0.15	0.14	0.08			
7:00	0.42	0.27	0.20	0.18	0.16	0.15	0.10	0.10		
8:00	0.44	0.28	0.21	0.19	0.16	0.16	0.12	0.11		
9:00	0.41	0.29	0.21	0.20	0.17	0.16	0.13	0.10		
10:00	0.36	0.28	0.22	0.20	0.17	0.16	0.12	0.07		

Table (F1) Continued

11:00	0.33	0.28	0.22	0.20	0.17	0.16	0.10	0.04
12:00	0.29	0.26	0.21	0.19	0.17	0.15	0.08	0.02
13:00	0.27	0.24	0.21	0.19	0.16	0.15	0.07	-0.01
14:00	0.25	0.23	0.20	0.18	0.15	0.14	0.04	-0.04
15:00	0.22	0.22	0.19	0.17	0.14	0.13	0.03	-0.06
16:00	0.24	0.21	0.18	0.16	0.13	0.12	0.02	-0.04
17:00	0.32	0.23	0.17	0.16	0.13	0.12	0.04	

Table (G1) WATERTABLE LEVELS IN WELLS; UNNAMED BEACH, NORTH BRIBIE ISLAND, 6 Oct. 1995
RESEARCH HOWARD AND DUNN(1995)

Well No.	1	2	3	4	5	6	7	8	9	10
Dist. from B.M. [m]	-60.81	-40.1	-8.4	40.8	54.9	62.8	65.3			
Av. Sand level [m]	1.39	1.85	1.76	1.13	1.61	0.77	0.27			
Time [EST]	WATERTABLE LEVELS [m]									
9:30 6/10/95	0.32	0.28	0.26	0.16	0.16	0.15	0.15			
10:30	0.33	0.29	0.24	0.16	0.14	0.11	0.11			
11:30		0.28	0.24	0.15	0.11	0.09	0.07			
12:30		0.27	0.24	0.14	0.09	0.04	0.01			
13:30		0.26	0.25	0.11	0.05	-0.02	-0.05			
14:30		0.24	0.22	0.09	0.01	-0.05	-0.10			
15:30		0.22	0.20	0.06	-0.02	-0.07	-0.10			

Table (J1) WATERTABLE LEVELS IN WELLS; UNNAMED BEACH, NORTH BRIBIE ISLAND, 20 March 1997
RESEARCH POLLARD AND LEAROYD(1997)

Well No.	1	2	3	4	5	6	7	8	9	10
Dist. from B.M. [m]	-69.2	-41.6	-27.2	-13.6	4.45	28.2	47	60	73	
Av. Sand level [m]	0.51	2.13	4.21	2.25	1.00	0.94	1.39	1.98	-0.48	
Time [EST]	WATERTABLE LEVELS [m]									
10:00 20/3-97	0.52	0.59		0.44	0.37	0.29	0.24	0.25	0.24	
11:00	0.46	0.58	0.52	0.45	0.37	0.29	0.26	0.24	0.18	
12:00		0.55	0.52	0.45	0.38	0.29	0.23	0.21	0.10	
13:00	0.30	0.53	0.51	0.45	0.37	0.28	0.21	0.17	0.01	
14:00	0.27	0.50	0.49	0.44	0.37	0.26	0.18	0.17	-0.08	
15:00	0.27	0.49	0.48	0.46	0.36	0.26	0.15	0.24	-0.12	
16:00	0.34	0.46	0.45	0.44	0.34	0.22	0.11	0.22	-0.09	
17:00	0.63	0.43	0.44	0.43	0.33	0.21	0.11	0.24	-0.04	

Table (K1) WATERTABLE LEVELS IN WELLS; UNNAMED BEACH, NORTH BRIBIE ISLAND, 9 July 1997
RESEARCH POLLARD AND LEAROYD(1997)

Well No.	1	2	3	4	5	6	7	8	9	10
Dist. from B.M. [m]	-137.4	-59.45	-35.95	-14.8	1.7	20.9	45.9	58	70.1	
Av. Sand level [m]	-0.80	0.77	2.41	2.35	1.02	0.89	1.36	1.85	-0.16	
Time [EST]	WATERTABLE LEVELS [m]									
10:00 9/7/97	0.17	0.32	0.31	0.28	0.24	0.16	-0.08	0.00	-0.09	
10:30	0.23	0.34	0.31	0.29	0.25	0.17	-0.01	0.03	-0.05	
11:00	0.16	0.35	0.31	0.28	0.24	0.17	0.03	0.05	-0.01	
11:30	0.10	0.36	0.31	0.28	0.24	0.17	0.07	0.06	0.00	
12:00	0.08	0.35	0.31	0.28	0.23	0.17	0.09	0.06	0.00	
12:30	0.05	0.33	0.31	0.27	0.23	0.17	0.09	0.07	0.00	
13:00	-0.09	0.31	0.31	0.27	0.23	0.17	0.09	0.06	-0.02	
13:30	-0.17	0.29	0.30	0.27	0.22	0.16	0.09	0.03	-0.06	
14:00	-0.28	0.28	0.30	0.27	0.23	0.16	0.09	0.02	-0.10	
14:30	-0.39	0.27	0.30	0.27	0.22	0.16	0.08	0.01	-0.12	
15:00	-0.46	0.26	0.29	0.26	0.22	0.15	0.07	0.00	-0.13	
15:30		0.25	0.29	0.26	0.22	0.15	0.06	-0.01	-0.15	
16:00		0.24	0.28	0.25	0.21	0.14	0.04	-0.04	-0.19	
16:30		0.22	0.27	0.24	0.21	0.14	0.03	-0.05	-0.22	
17:00		0.22	0.27	0.24	0.20	0.13	0.02	-0.06	-0.24	

Table (L1) WATERTABLE LEVELS IN WELLS; UNNAMED BEACH, NORTH BRIBIE ISLAND, 25 July 1997

RESEARCH

POLLARD AND LEAROYD(1997)

Well No.	1	2	3	4	5	6	7	8	9	10
Dist. from B.M. [m]	-58	-43	-19	0	27	45.5	64	70		
Av. Sand level [m]	1.00	1.69	3.05	1.06	0.90	1.35	0.52	-0.15		
Time [EST]	WATERTABLE LEVELS [m]									
8:30 25/7-97	0.41	0.40								
9:30	0.41	0.42	0.35				-0.03	-0.15		
10:30	0.40	0.42	0.35	0.31	0.19	0.10	0.00	-0.06		
11:30	0.45	0.44	0.35	0.31	0.18	0.11	0.06	0.06		
12:30	0.51	0.46	0.36	0.31	0.19	0.14	0.12	0.12		
13:30	0.53	0.48	0.36	0.31	0.21	0.17	0.16	0.15		
14:30	0.49	0.48	0.37	0.32	0.21	0.18	0.17	0.11		
15:30	0.44	0.46	0.37	0.32	0.22	0.17	0.12	0.05		
16:30	0.38	0.43	0.35	0.32	0.23	0.16	0.22	-0.01		
17:00	0.28	0.43	0.35	0.32	0.22	0.14	0.15	-0.03		

Table (M1) WATERTABLE LEVELS IN WELLS; SOUTHERN END, MORETON ISLAND, 15 December 1997
RESEARCH: NIELSEN AND VOISEY (1997)

Well No.	1	2	3	4	5	6	7	
Dist. From B.M. [m]	-14.4	-9.7	-5	0	14	32.4	73.5	
Av. Sand level [m]								
Time [EST]	WATERTABLE LEVELS [M]							R.L. [m]
7.00 15/12-97				1.1				1.2
7.50				1.115	1.14			1.6
8.00				1.135	1.15			1.68
8.50		1.15		1.16	1.16			1.67
9.00		1.19	1.18	1.18	1.17			1.91
9.25		1.2	1.18	1.2	1.18			1.22
9.50	1.44	1.22	1.19	1.2	1.18			1.6
9.75	1.47	1.24	1.21	1.21	1.19			1.56
10.00	1.35	1.24	1.22	1.22	1.19	1.21		1.42
10.25	1.32	1.24	1.22	1.22	1.19	1.21		1.53
10.50	1.3	1.24	1.22	1.22	1.2	1.21		1.51
11.00	1.26	1.23	1.22	1.23	1.2	1.22	1.24	1.1
11.50	1.23	1.22	1.22	1.23	1.21	1.22	1.24	0.82
12.00	1.19	1.19	1.2	1.22	1.21	1.22	1.24	0.69
12.50	1.16	1.17	1.19	1.21	1.21	1.23	1.24	0.49
13.00	1.14	1.16	1.18	1.21	1.21	1.23		0.38
13.50		1.14	1.16	1.2	1.2	1.23	1.24	0.09
14.00		1.13	1.15	1.18	1.2	1.23		-0.02
14.50	1.07	1.11	1.14	1.17	1.19	1.23	1.24	-0.15
15.00								
15.50	1.03	1.09	1.11	1.15	1.18	1.22	1.24	-0.5
16.00	1.02	1.08	1.12	1.14	1.18	1.23		-0.38
16.30	1.01	1.07	1.1	1.13	1.17			

6.2 SALINITY DATA

Salinity data includes tabulated values of relative concentration and increments of displacement thickness, DDL, at varying distances below the watertable.

Results also include salinity profile plots for each of the data sets. The Moreton Island data describes concentration as a function of time and an average salinity profile.

Definitions:

C/Cs Ratio of salt concentration of sample to that of local sea water

DDL Estimated incremental displacement thickness of freshwater
 lens for each sample

TDS or Cond Total Dissolved Salts concentration (g/L) also defined as

Zwt-Z depth of sample below top of watertable

Table (C2) Salinity data

DAT 9/8 -'94

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Mathews and Bojorge Salmeron (1994)

X = -10m				X = 0m				X = 15m				X = 26.8m			
Zwt-Z	Cond	C/Cs	DDL	Zwt-Z	Cond	C/Cs	DDL	Zwt-Z	Cond	C/Cs	DDL	Zwt-Z	Cond	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
-0.2	12.6	0.24	-0.18	-0.2	2.2	0.04	-0.20	-0.2	1.8	0.03	-0.20	-0.20	1.7	0.03	-0.20
-0.4	49	0.92	-0.08	-0.4	2.4	0.05	-0.19	-0.4	1.7	0.03	-0.19	-0.40	0.3	0.01	-0.20
-0.6	51	0.96	-0.01	-0.6	2.6	0.05	-0.19	-0.6	1.8	0.03	-0.19	-0.60	0.5	0.01	-0.20
-0.8	51.5	0.97	-0.01	-0.8	13.2	0.25	-0.17	-0.8	2.4	0.05	-0.19	-0.80	0.6	0.01	-0.20
-1.6	extrap	1.00	-0.01	-1	43	0.81	-0.09	-1.6	extrap	0.09	-0.75	-1.00	1	0.02	-0.20
		DL =	-0.29 m	-1.2	53	1.00	-0.02			DL =	-1.52 m	-1.20	2.1	0.04	-0.19
				-1.4	51	0.96	0.00					-1.60	extrap	0.08	-0.38
				-1.6	extrap	1	0.00							DL =	-1.56 m
						DL =	-0.87 m								

Salinity structure 9/8 - '94

relative salinity C/Cs

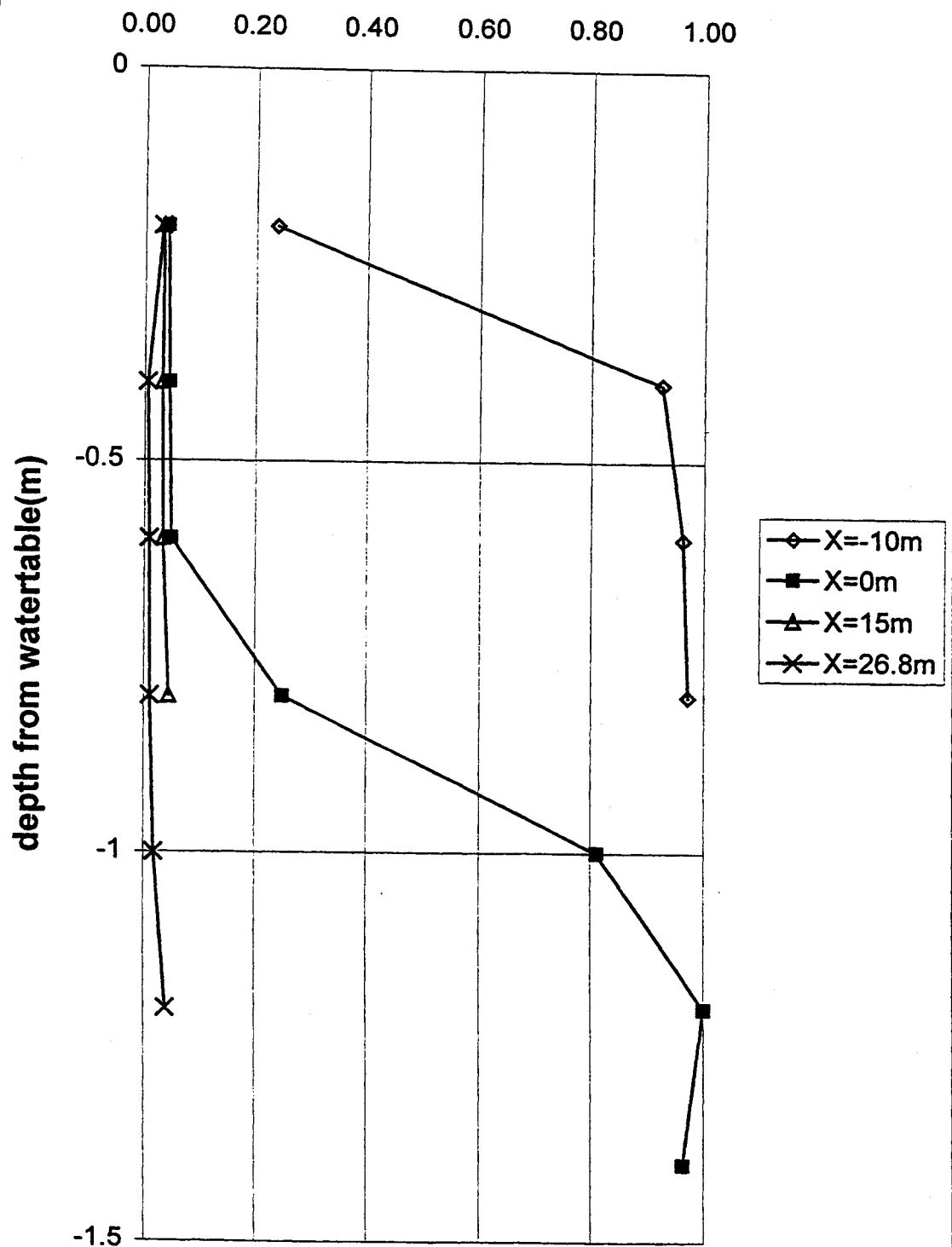


Table (E2) Salinity data

DAT 30/9 -'94

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Mathews and Bojorge Salmeron (1994)

X = -7.3m				X = 3.1m				X = 22.5m				X = 33.8m			
Zwt-Z	Cond	C/Cs	DDL	Zwt-Z	Cond	C/Cs	DDL	Zwt-Z	Cond	C/Cs	DDL	Zwt-Z	Cond	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
-0.05	49.7	0.94	-0.03	-0.05	47.7	0.90	-0.03	-0.1	16.3	0.31	-0.08	-0.95	14.35	0.27	-0.82
-0.11	51.8	0.98	0.00	-0.15	49.4	0.93	-0.01	-0.3	44	0.83	-0.09	-1.05	19.7	0.37	-0.07
-0.18	51.1	0.96	0.00	-0.25	52.1	0.98	0.00	-0.5	50.7	0.96	-0.02	-1.16	23.1	0.44	-0.07
-0.26	52	0.98	0.00	-0.4	52.4	0.99	0.00	-0.7	51.6	0.97	-0.01	-1.31	28.9	0.55	-0.08
-0.37	52.9	1.00	0.00	1.6 extrap		1.00	0.01	1.6 extrap		1	0.03	-1.44	34.4	0.65	-0.05
1.6 extrap		1.00	0.00									-1.6	34.1	0.64	-0.06
		DL =	-0.03 m			DL =	-0.03 m					-1.77	5.91	0.11	
												-1.93	6.38	0.12	
												-2.23	5.1	0.10	
														DL =	-1.14 m

Salinity structure 30/9 - '94

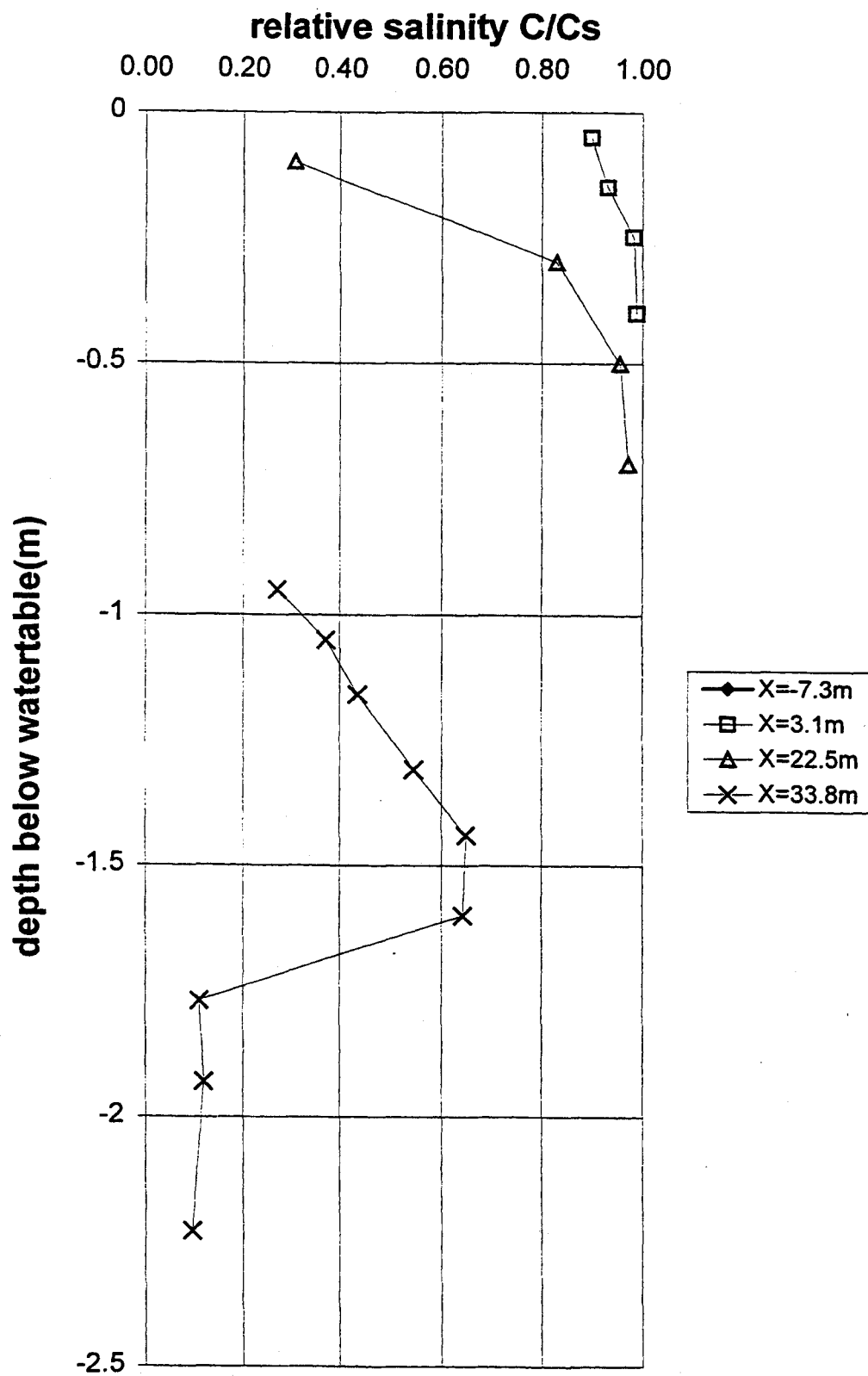


Table (F3) Salinity data

DAT 21-22/9 - '95

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Howard and Dunn (1995)

X = -55.2m depth TDS (m) (g/L) 0.125 29.2 DL= 0 m	X = -26.2m depth TDS C/Cs DDL (m) (g/L) (-) (m) 0.1 27.1 0.92 0.05 0.26 28 0.95 0.01 0.39 28.3 0.96 0.01 0.6 29.2 0.99 0.01 0.84 29.2 0.99 0.00 1.6 extrap 0.99 0.01 DL= 0.09 m	X = -18.2m depth TDS C/Cs DDL (m) (g/L) (-) (m) 0.08 18 0.61 0.06 0.13 26.2 0.89 0.01 0.22 27.2 0.92 0.01 0.35 28 0.95 0.01 1.6 extrap 1 0.03 DL= 0.12 m	X = -13.2m depth TDS C/Cs DDL (m) (g/L) (-) (m) 0.08 6.6 0.22 0.07 0.24 15.8 0.54 0.10 0.32 19.8 0.67 0.03 0.38 24.5 0.83 0.01 0.47 26 0.88 0.01 0.57 27.2 0.92 0.01 0.73 27.6 0.94 0.01 0.99 29 0.98 0.01 1.6 extrap 1 0.01 DL= 0.27 m
X=-36.2 depth TDS (m) (g/L) 0.14 29.2 DL = 0 m			
X = 0.6m depth TDS C/Cs DDL (m) (g/L) (-) (m) 0.12 3.5 0.12 0.11 0.23 5.1 0.17 0.09 0.33 11.3 0.38 0.07 0.42 17.9 0.61 0.05 0.50 23.4 0.79 0.03 0.59 25.2 0.85 0.02 0.81 27 0.92 0.03 0.94 28 0.95 0.01 1.60 extrap 1.00 0.02 DL= 0.41 m	X = 7.3m depth TDS C/Cs DDL (m) (g/L) (-) (m) 0.1 2.6 0.09 0.10 0.18 2.9 0.10 0.07 0.3 4.8 0.16 0.10 0.39 6.8 0.23 0.07 0.5 9.6 0.33 0.08 0.6 11.5 0.39 0.06 0.71 15.4 0.52 0.06 0.85 18.9 0.64 0.06 0.98 23.4 0.79 0.04 1.11 25.3 0.86 0.02 1.36 27 0.92 0.03 1.6 extrap 0.97 0.01 DL= 0.71 m	X = 15.85m depth TDS C/Cs DDL (m) (g/L) (-) (m) 0.08 1.7 0.06 0.07 0.14 1.8 0.06 0.06 0.22 2.8 0.09 0.08 0.48 4.8 0.16 0.22 0.58 6.5 0.22 0.08 0.71 9.5 0.32 0.09 0.81 12.8 0.43 0.07 1.01 14.9 0.51 0.10 1.14 17.8 0.60 0.06 1.27 23 0.78 0.04 1.42 25 0.85 0.03 1.60 extrap 0.93 0.02 DL= 0.93 m	X = 26.6m depth TDS C/Cs DDL (m) (g/L) (-) (m) 0.11 1.3 0.04 0.11 0.28 1.7 0.06 0.16 0.41 2.4 0.08 0.12 0.56 4.5 0.15 0.13 1.6 extrap 0.65 0.62 DL= 1.15 m

Salinity structure 21-22/9 -'95

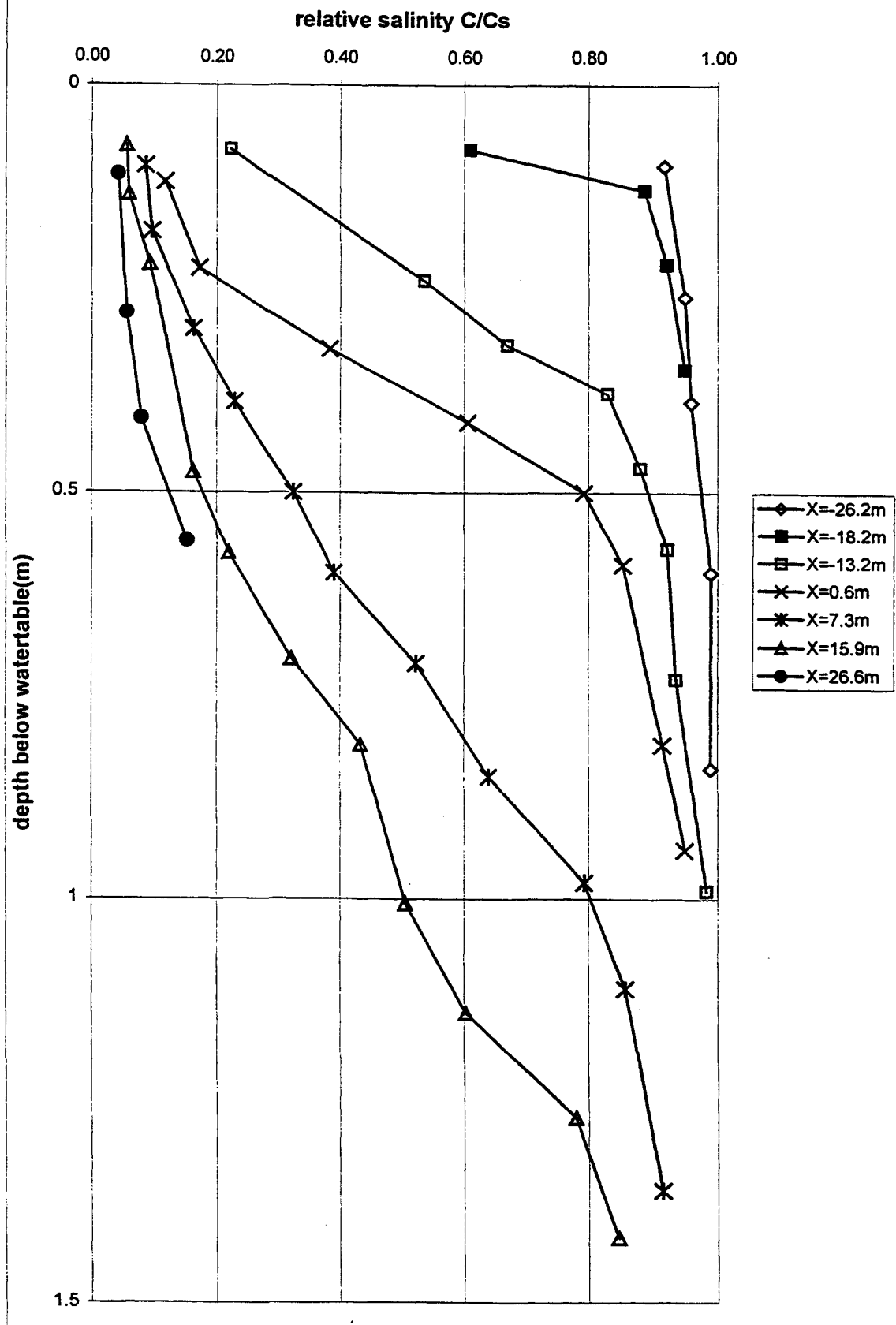


Table (G3) Salinity data

DAT 6/10 - '95

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Howard and Dunn (1995)

X = -58m				X = -39m				X = -29m				X = -21m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	-		(m)	(g/L)	-		(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.13	29.2	0.99		0.14	29.2	0.99		0.1	27.1	0.92	0.05	0.08	18	0.61	0.06
		DL=	0 m			DL=	0 m	0.26	28	0.95	0.01	0.13	26.2	0.89	0.01
								0.39	27.9	0.95	0.01	0.22	27.2	0.92	0.01
								0.6	29.2	0.99	0.01	0.35	28	0.95	0.01
								0.84	29.2	0.99	0.00	1.6 extrap		1.00	0.03
										DL=	0.08 m			DL=	0.12 m
X = -16m				X = -2m				X = 4.5m				X = 13m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.08	6.6	0.22	0.07	0.12	3.5	0.12	0.11	0.1	3.4	0.12	0.09	0.08	1.7	0.06	0.07
0.24	15.8	0.54	0.10	0.23	5.1	0.17	0.09	0.18	2.9	0.10	0.07	0.14	1.8	0.06	0.06
0.32	19.8	0.67	0.03	0.33	11.3	0.38	0.07	0.3	4.8	0.16	0.10	0.22	2.8	0.09	0.08
0.38	24.5	0.83	0.01	0.42	17.9	0.61	0.05	0.39	6.8	0.23	0.07	0.48	4.8	0.16	0.22
0.47	26	0.88	0.01	0.50	23.4	0.79	0.03	0.5	9.6	0.33	0.08	0.58	6.5	0.22	0.08
0.57	27.2	0.92	0.01	0.59	25.2	0.85	0.02	0.6	11.5	0.39	0.06	0.71	9.5	0.32	0.09
0.73	27.6	0.94	0.01	0.81	27	0.92	0.03	0.71	15.4	0.52	0.06	0.81	12.8	0.43	0.07
0.99	27.7	0.94	0.02	0.94	28.6	0.97	0.01	0.85	18.9	0.64	0.06	1.01	14.9	0.51	0.10
1.6 extrap		0.95	0.03	1.6 extrap		1.00	0.01	0.98	23.4	0.79	0.04	1.14	17.8	0.60	0.06
		DL=	DL= m			DL=	0.40 m	1.11	25.3	0.86	0.02	1.27	23	0.78	0.04
								1.36	27	0.92	0.03	1.42	25	0.85	0.03
								1.6 extrap		0.97	0.01	1.6 extrap		0.93	0.02
										DL=	0.71 m			DL=	0.92 m

Table (G3) Continued

X = 24m				X = 64.5m				X = 65.5m				X = 65.5m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.11	1.5	0.05	0.11	0.08	1.1	0.04	0.08	0.07	0.7	0.02	0.07	0.09	27.2	0.92	0.05
0.28	1.7	0.06	0.16	0.18	2.4	0.08	0.09	0.16	1	0.03	0.09	1.6 extrap	1.00	0.06	
0.41	2.4	0.08	0.12	0.3	2.5	0.08	0.11	0.39	1.4	0.05	0.22	DL=			0.11 m
0.56	4.5	0.15	0.13	0.48	5.3	0.18	0.16	0.64	5	0.17	0.22				
1.6 extrap		0.65	0.62	0.7	9.8	0.33	0.16	0.92	11.3	0.38	0.20				
		DL=	1.15 m	0.87	12.8	0.43	0.10	1.04	14	0.47	0.07				
				1.08	15.1	0.51	0.11	1.2	16.8	0.57	0.08				
				1.6 extrap		0.70	0.20	1.26	17.5	0.59	0.03				
						DL=	1.02 m	1.6 extrap		0.73	0.12				
										DL=	1.09 m				

Salinity structure 6/10 - '95

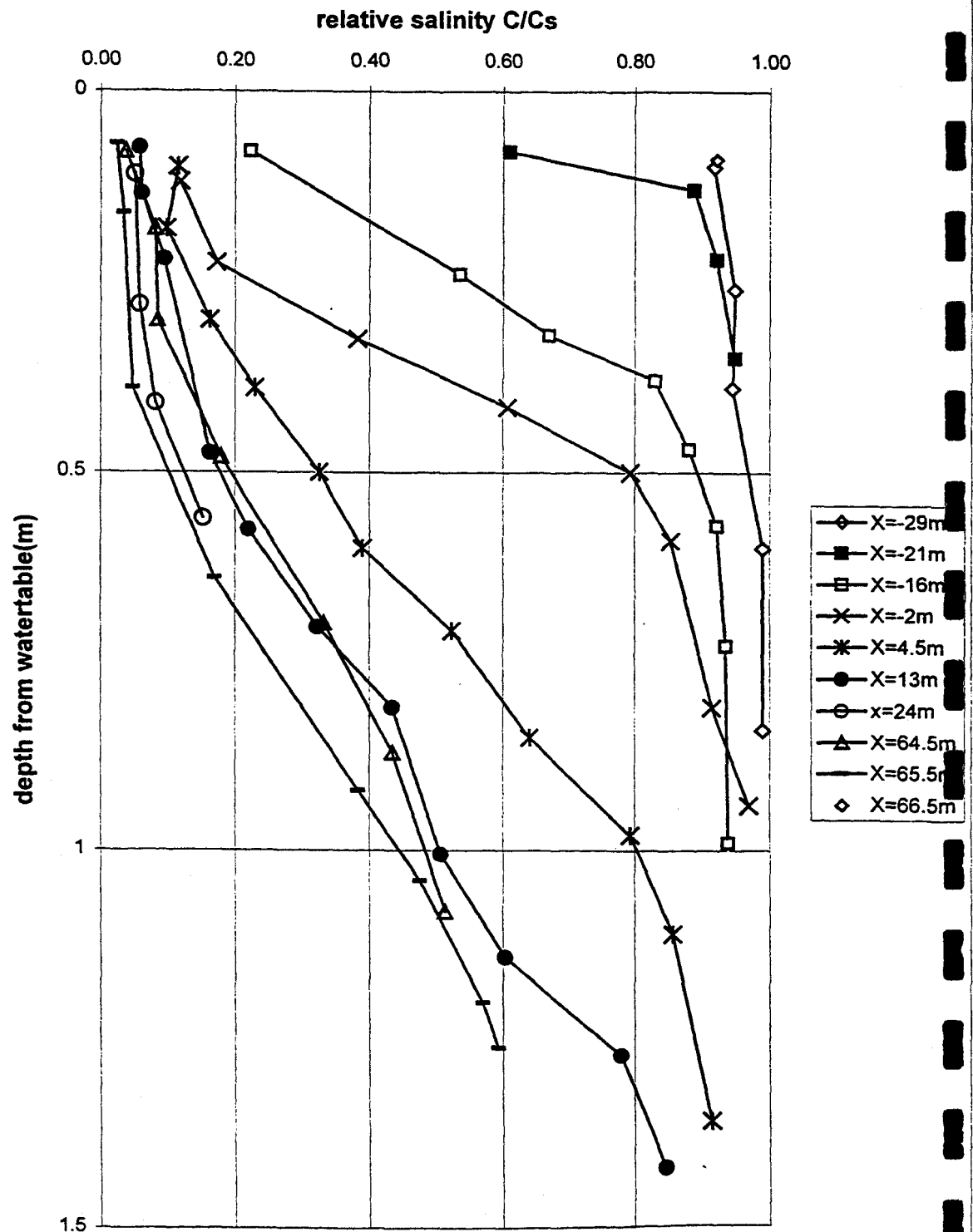


Table (H2) Salinity data

DAT 28/3 - '96

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Nilsen and Hall (1996)

X = -32m				X = -15m				X = -11.4m				X = 1.5m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.25	14.11	0.48	0.19	0.09	1.72	0.06	0.09	0.07	1.76	0.06	0.07	0.08	1.87	0.06	0.08
0.34	15.82	0.54	0.04	0.26	1.78	0.06	0.16	0.13	1.55	0.05	0.06	0.19	2.33	0.08	0.10
0.5	21.94	0.74	0.06	0.5	2.16	0.07	0.22	0.28	1.74	0.06	0.14	0.32	2.95	0.10	0.12
0.88	24.54	0.83	0.08	0.78	10.18	0.35	0.22	0.5	2.24	0.08	0.21	0.46	4.02	0.14	0.12
1.6 extrap		1.00	0.06	1.1	17.46	0.59	0.17	0.69	7.41	0.25	0.16	0.59	5.22	0.18	0.11
		DL=	0.43 m	1.6 extrap		0.98	0.11	0.9	13.3	0.45	0.14	0.71	6.58	0.22	0.10
						DL=	0.97 m	1.02	15.52	0.53	0.06	0.83	8.01	0.27	0.09
								1.24	19.82	0.67	0.09	0.96	10.21	0.35	0.09
								1.34	20.84	0.71	0.03	1.09	13.97	0.47	0.08
								1.45	21.64	0.73	0.03	1.22	15.22	0.52	0.07
								1.56	22.68	0.77	0.03	1.60 extrap		0.64	0.16
								1.6 extrap		0.78	0.01			DL=	1.11 m
										DL=	1.01 m				

X = 10.6m				X = 21.2m				X = 39m							
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)				
0.28	1.61	0.05	0.27	0.05	1.9	0.06	0.05	0.15	1.98	0.07	0.14				
0.43	2.27	0.08	0.14	0.08	1.74	0.06	0.03	0.37	3.66	0.12	0.20				
0.55	3.44	0.12	0.11	0.2	2.48	0.08	0.11	0.5	6.06	0.21	0.11				
0.72	6	0.20	0.14	0.5	5.46	0.19	0.26	1.6 extrap		0.89	0.50				
0.87	9.46	0.32	0.11	0.73	10.32	0.35	0.17			DL=	0.95 m				
1.03	12.59	0.43	0.10	0.9	15.1	0.51	0.10								
1.16	15.9	0.54	0.07	1.2	22.18	0.75	0.11								
1.32	18.36	0.62	0.07	1.6 extrap		0.80	0.09								
1.44	19.96	0.68	0.04			DL=	0.91 m								
1.59	21.78	0.74	0.04												
1.6 extrap		0.74	0.00												
		DL=	1.10 m												

Salinity structure 28/3 - '96

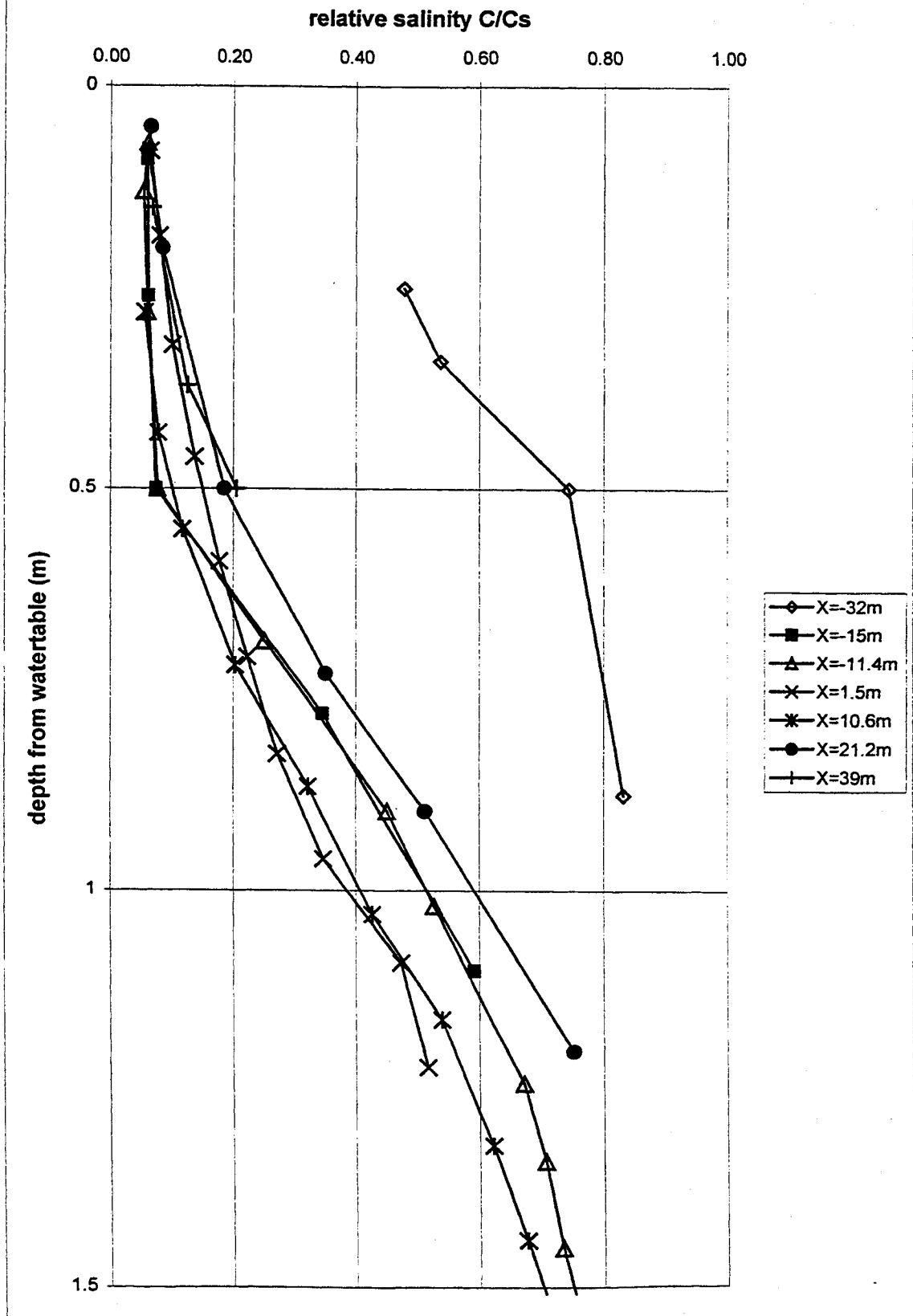


Table (I2) Salinity data

DAT 28/5 - '96

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Nilsen and Hall (1996)

X = -47m				X = -39.8m				X = -32.9m				X = -26m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.07	26.16	0.99	0.04	0.06	26.14	0.99	0.03	0.12	25	0.94	0.06	0.07	2	0.08	0.07
0.24	26.44	1.00	0.00	0.24	26.94	1.02	0.00	0.22	25.66	0.97	0.00	0.15	1.57	0.06	0.07
1.6 extrap		1.00	0.00	0.34	26.8	1.01	0.00	0.40	25.56	0.96	0.01	0.26	3.48	0.13	0.10
		DL=	0.04 m	0.62	25.6	0.97	0.00	0.64	25.82	0.97	0.01	0.34	5.71	0.22	0.07
				0.82	26.72	1.01	0.00	0.90	25.74	0.97	0.01	0.46	8.28	0.31	0.09
				1.06	25.82	0.97	0.00	1.09	26.04	0.98	0.00	0.58	10.22	0.39	0.08
				1.6 extrap		0.90	0.04	1.6 extrap		1.01	0.00	0.68	12.62	0.48	0.06
						DL=	0.07 m			DL=	0.09 m	0.80	16.01	0.60	0.06
												0.88	18.24	0.69	0.03
												0.94	19.72	0.74	0.02
												1.03	21.16	0.80	0.02
												1.16	22.08	0.83	0.02
												1.6 extrap		0.95	0.05
														DL=	0.72 m

X = -19m				X = -10m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.16	3.15	0.12	0.15	0.22	2.54	0.10	0.21
0.53	3.57	0.13	0.32	0.29	2.76	0.10	0.06
0.76	8.23	0.31	0.18	0.38	2.81	0.11	0.08
1.09	13.52	0.51	0.19	0.57	2.76	0.10	0.17
1.29	17.32	0.65	0.08	0.72	3.39	0.13	0.13
1.6 extrap		0.88	0.07	0.89	10.1	0.38	0.13
		DL=	1.00 m	1.1	16.83	0.64	0.10
				1.6 extrap		1.00	0.09
						DL=	0.98 m

Salinity structure 28/5 - '96

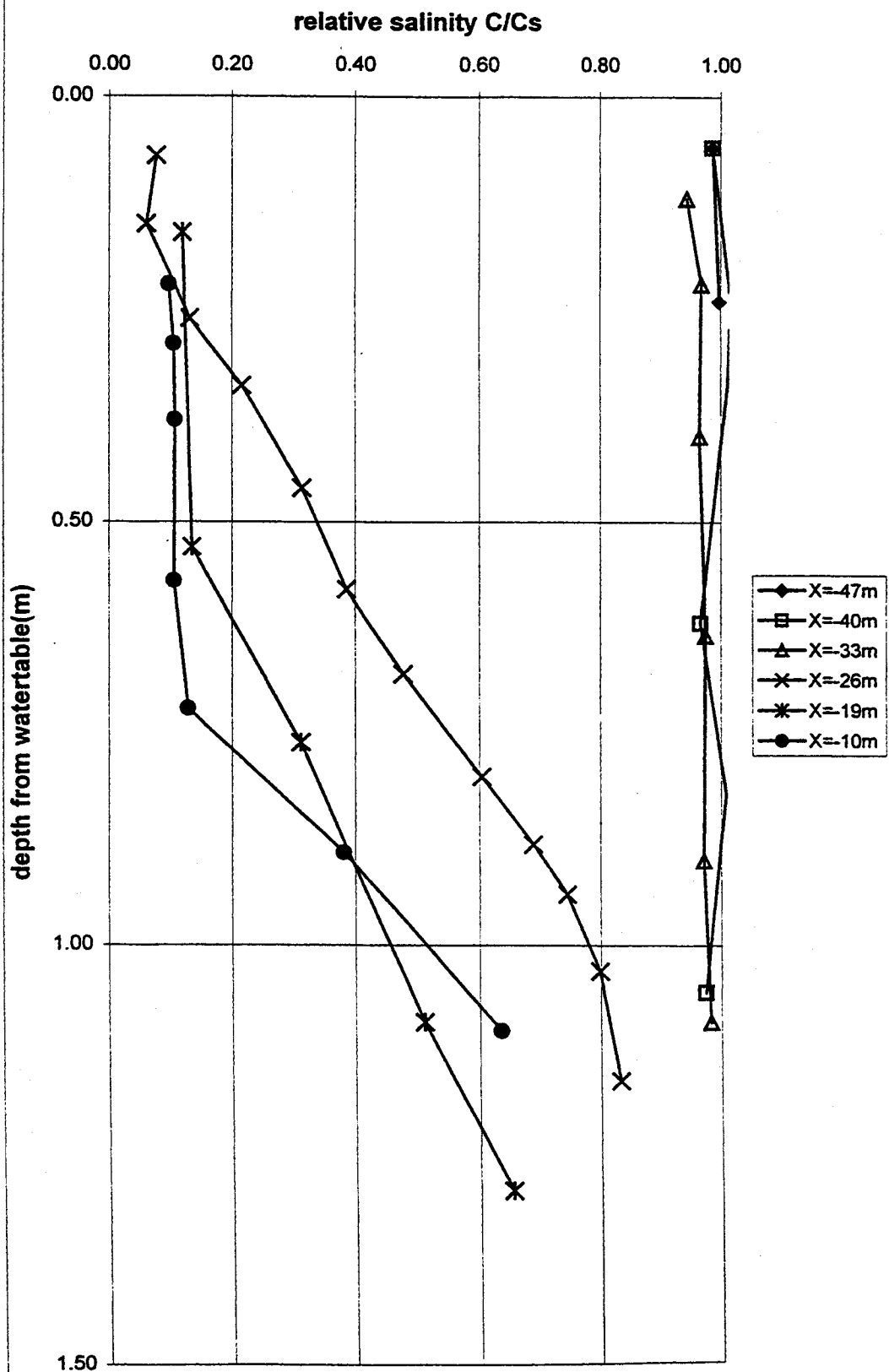


Table (J3) Salinity data

DAT 20/3 -'97

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Pollard and Learoyd (1997)

X=-33m				X=-18.8m				X=-15m				X=-10m			
Zwt-Z	TDS	C/Cs	DDL	Zwt-Z	TDS	C/Cs	DDL	Zwt-Z	TDS	C/Cs	DDL	Zwt-Z	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.41	7.66	0.265	0.36	0.47	9.78	0.34	0.39	0.13	0.137	0.00	0.13	0.05	14.02	0.49	0.04
0.5	10.66	0.369	0.06	0.65	19.14	0.66	0.09	0.32	12.44	0.43	0.15	0.18	14.44	0.50	0.07
0.77	23.58	0.816	0.11	0.74	24.16	0.84	0.02	0.44	18.5	0.64	0.06	0.3	15.4	0.53	0.06
1.6 Extrap		1	0.08	0.85	26.5	0.92	0.01	0.57	28.02	0.97	0.03	0.47	15.96	0.55	0.08
		DL=	0.60 m	1.6 Extrap		1	0.03	0.74	28.2	0.98	0.00	0.79	28.86	1.00	0.07
						DL=	0.55 m	1.6 Extrap		1.007	0.01	1.6 Extrap		1	0.00
										DL=	0.37 m			DL=	0.31 m

X=-5m				X=0m				X=10.7m				X=21.3m			
Zwt-Z	TDS	C/Cs	DDL	Zwt-Z	TDS	C/Cs	DDL	Zwt-Z	TDS	C/Cs	DDL	Zwt-Z	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.35	17.74	0.61	0.24	0.23	0.153	0.01	0.23	0.17	7.92	0.27	0.15	0.17	5.96	0.21	0.15
0.42	15.67	0.54	0.03	0.32	9.54	0.33	0.07	0.22	7.54	0.26	0.04	0.55	19.58	0.68	0.21
0.66	21.79	0.75	0.08	0.4	15.48	0.54	0.05	0.32	10.68	0.37	0.07	0.75	25.4	0.88	0.04
0.74	23.97	0.83	0.02	0.56	18.91	0.65	0.06	0.41	17	0.59	0.05	0.87	26.32	0.91	0.01
0.8	27.3	0.94	0.01	0.61	20.9	0.72	0.02	0.5	21.48	0.74	0.03	0.97	26.32	0.91	0.01
1.6 Extrap		1	0.02	0.87	23.71	0.82	0.06	0.59	23.92	0.83	0.02	1.6 Extrap		0.911	0.06
		DL=	0.40 m	0.96	24.35	0.84	0.02	0.71	24.72	0.86	0.02			DL=	0.49 m
				1	25.25	0.87	0.01	0.88	25.19	0.87	0.02				
				1.6 Extrap		1	0.04	1.6 Extrap		0.94	0.07				
						DL=	0.55 m			DL=	0.46 m				

Table (J2) Continued

X=40m				X=63m				X=60.4m			
Zwt-Z	TDS	C/Cs	DDL	Zwt-Z	TDS	C/Cs	DDL	Zwt-Z	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.19	8.7	0.30	0.16	0.14	2.34	0.081	0.13	0.08	2.36	0.08	0.08
0.3	11.56	0.40	0.07	0.27	1.62	0.056	0.12	0.27	2.66	0.09	0.17
0.5	14.5	0.50	0.11	0.38	2.32	0.08	0.10	0.38	8.38	0.29	0.09
0.56	17.44	0.60	0.03	0.55	5.78	0.2	0.15	0.48	8.5	0.29	0.07
1.6 Extrap		1	0.21	0.73	11.18	0.387	0.13	1.6 Extrap		1	0.40
	DL=		0.58 m	0.84	15.7	0.543	0.06		DL=		0.81 m
				1.6 Extrap		1	0.17				
					DL=		0.864 m				

Salinity structure 20/3 - '97

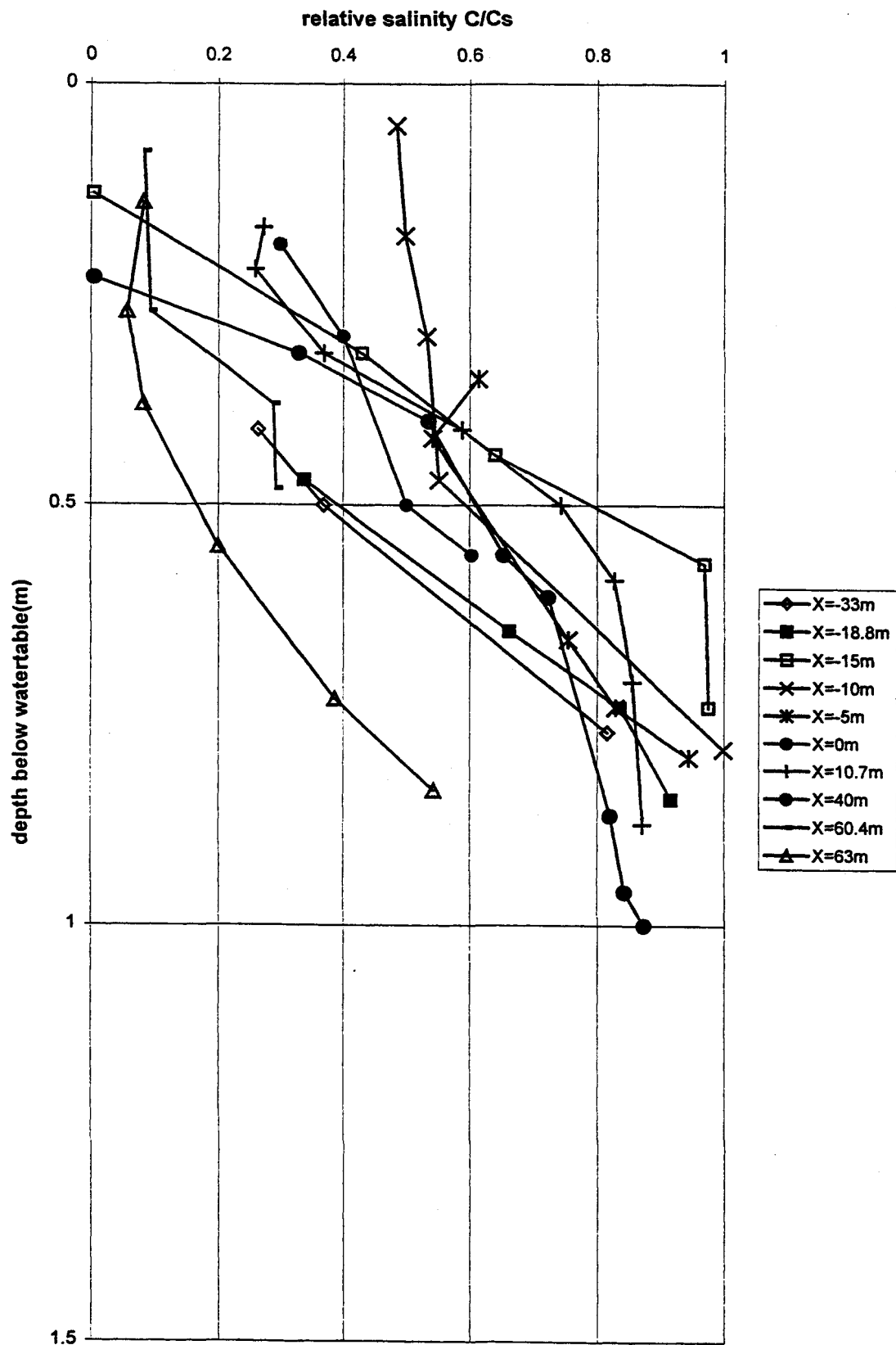


Table (K3) Salinity data

DAT 9/7-'97

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Pollard and Learoyd (1997)

X= -42.5m				X= -26.6m				X= -18.9m				X = -14.7m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.1	13.42	0.46	0.08	0.1	2.53	0.09	0.10	0.38	2.23	0.08	0.36	0.22	2.02	0.07	0.21
1.6	extrap	1.00	0.40	0.32	5.22	0.18	0.19	0.50	2.65	0.09	0.11	0.34	2.51	0.09	0.11
		DL=	0.48 m	0.54	17.63	0.61	0.13	0.65	7.79	0.27	0.12	0.51	3.55	0.12	0.15
				1.6	extrap	1.00	0.21	0.80	14.04	0.49	0.09	0.73	9.27	0.32	0.17
						DL=	0.63 m	1.6	extrap	1.00	0.21	0.98	17.02	0.59	0.14
										DL=	0.90 m	1.18	19.17	0.66	0.07
												1.4	22.76	0.79	0.06
												1.56	25.5	0.88	0.03
												1.82	26.68	0.92	0.03
														DL=	0.97 m
X = -9.9m				X = -5.1m				X = -2.76m				X = 10.7m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.33	2.41	0.08	0.32	0.27	2.4	0.08	0.26	0.41	3.24	0.11	0.39	0.92	5.33	0.18	0.84
0.44	2.97	0.10	0.10	0.37	2.27	0.08	0.09	0.70	5.04	0.17	0.25	1.05	9.11	0.32	0.10
0.59	4.18	0.14	0.13	0.51	2.78	0.10	0.13	0.84	7.75	0.27	0.11	1.46	6.57	0.23	0.30
0.72	6.57	0.23	0.11	0.6	3.47	0.12	0.08	0.91	10.12	0.35	0.05	1.78	13.72	0.47	0.21
0.82	13.72	0.47	0.06	0.69	4.13	0.14	0.08	0.88	12.44	0.43	-0.02	1.82	16.83	0.58	0.02
1.07	16.83	0.58	0.12	0.78	5.51	0.19	0.07	1.01	22.4	0.78	0.05			DL=	1.46 m
1.6	extrap	0.81	0.16	0.91	6.89	0.24	0.10	1.30	19.48	0.67	0.08				
		DL=	1.00 m	0.98	9.11	0.32	0.05	1.6	extrap	1.00	0.05				
				1.06	10.43	0.36	0.05			DL=	0.95 m				
				1.16	11.88	0.41	0.06								
				1.6	extrap	1.00	0.13								
						DL=	1.11 m								

Table (K3) Continued

X= -35.95m				X= -49.2m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.28	6.23	0.22	0.25	0.09	27.58	0.95	0.05
0.38	17.18	0.59	0.06	0.15	27	0.93	0.00
0.82	14.02	0.49	0.20	1.6	extrap	1.00	0.05
1.6	extrap	1.00	0.20			DL=	0.10 m
		DL=	0.71 m				

Salinity structure 9/7-'97

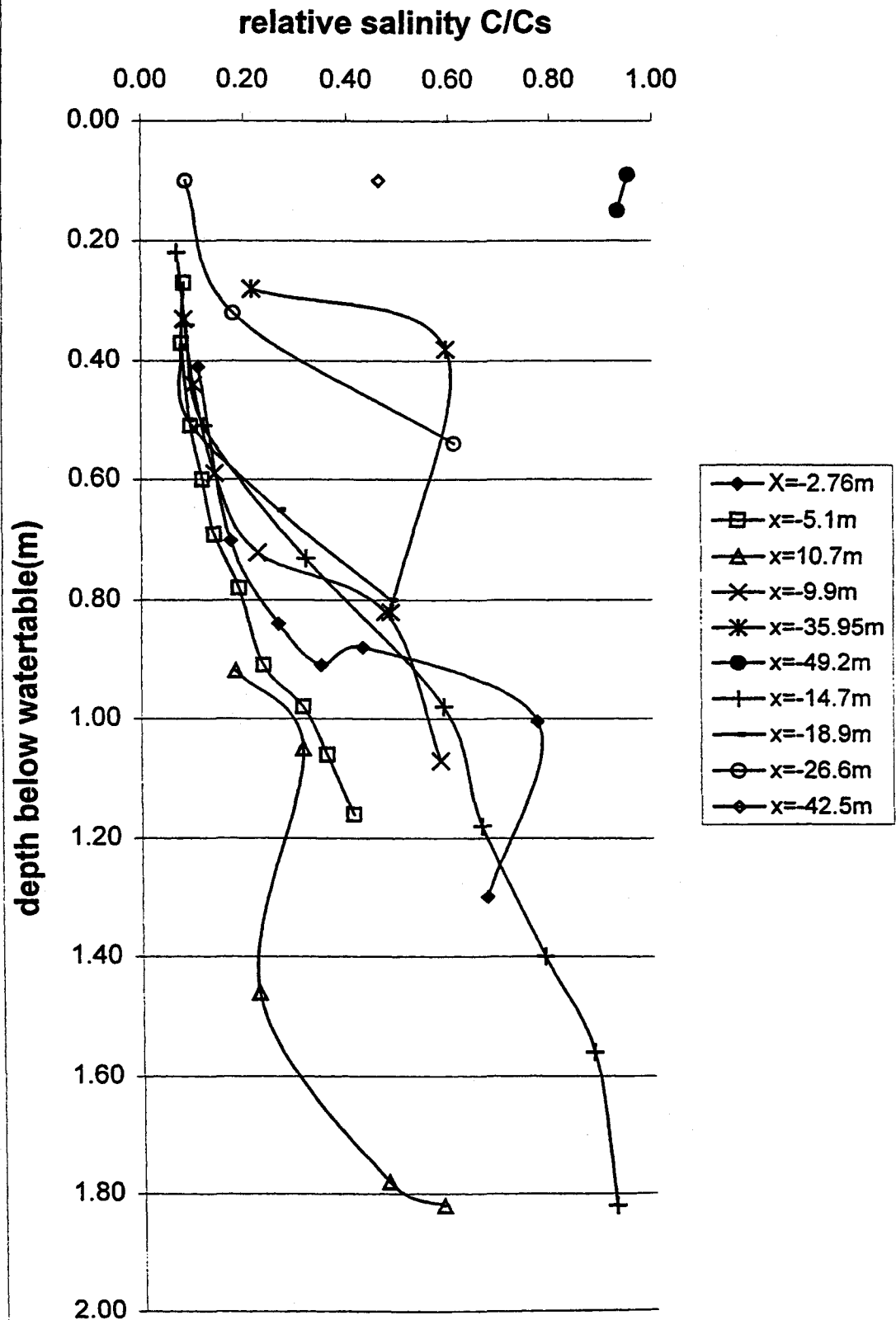


Table (L3) Salinity data

DAT 25/7-'97

LOCATION:

Unnamed beach, North Bribie Island

RESEARCH:

Pollard and Learoyd (1997)

X= -63.6m				X= -58.1m				X= -50m				X= -42.5m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.11	28.6	0.98	0.06	0.2	28.6	0.98	0.10	0.26	30	1.00	0.13	0.17	26.62	0.92	0.09
0.21	29.74	1.00	0.00	0.26	29.74	1.00	0.00	0.42	29.2	1.00	0.00	0.49	30.12	1.00	0.01
0.49	29.78	1.00	0.00	0.36	29.78	1.00	0.00	1.09	30.04	1.00	0.00	0.64	29.22	1.00	0.00
1.6 extrap		1.00	0.00	1.6 extrap		1.00	0.00	1.6 extrap		1.00	0.00	1.6 extrap		1.00	0.00
		DL=	0.06 m			DL=	0.10 m			DL=	0.13 m			DL=	0.11 m
X= -37.7m				X= -32.2m				X= -22.3m				X= -13.25m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.15	18.5	0.64	0.10	0.14	7.8	0.27	0.12	0.09	3.14	0.11	0.09	0.3	3.83	0.13	0.28
0.41	29.26	1.00	0.05	0.23	14.99	0.52	0.05	0.43	3.23	0.11	0.30	0.62	11.7	0.41	0.23
0.78	29.62	1.00	0.00	0.43	22.06	0.76	0.07	0.52	7.14	0.25	0.07	0.99	19.93	0.70	0.17
1.6 extrap		1.00	0.00	0.68	27.08	0.93	0.04	0.59	13.54	0.47	0.04	1.16	23.78	0.83	0.04
		DL=	0.15 m	1.19	28.14	0.97	0.03	0.81	19.35	0.68	0.09	1.39	25.06	0.88	0.03
				1.32	28.98	1.00	0.00	1.2	25.16	0.88	0.09	1.6 extrap		0.92	0.02
				1.6 extrap		1.00	0.00	1.35	27.08	0.95	0.01			DL=	0.77 m
						DL=	0.32 m	1.6 extrap		1.00	0.01				
										DL=	0.71 m				

Table (L3) Continued

X= -4.2m				X= 5.5m				X= 27.7m				X= 64m			
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)
0.48	3.69	0.13	0.45	0.12	1.25	0.04	0.12	0.2	2.94	0.10	0.19	0.1	2.51	0.09	0.10
0.91	13.58	0.47	0.30	0.34	2.91	0.10	0.20	0.49	4.66	0.16	0.25	0.46	4.23	0.15	0.32
1.23	23.42	0.82	0.11	0.58	5.84	0.20	0.20	0.86	9.24	0.32	0.28	0.84	8.27	0.29	0.30
1.47	27.62	0.96	0.03	0.73	8.78	0.31	0.11	1.1	15.19	0.53	0.14	1.13	12.21	0.43	0.19
1.7	30.34	1.00	0.00	0.97	9.28	0.32	0.16	1.49	18.87	0.66	0.16	1.6 extrap		0.65	0.22
1.8	30.38	1.00	0.00	1.6 extrap		0.37	0.41	1.6 extrap		0.69	0.04			DL=	1.11 m
		DL=	0.89 m			DL=	1.21 m			DL=	1.05 m				

X= 66.25m				X= 68.5m											
depth	TDS	C/Cs	DDL	depth	TDS	C/Cs	DDL								
(m)	(g/L)	(-)	(m)	(m)	(g/L)	(-)	(m)								
0.74	18.47	0.64	0.50	0.54	29.2	1.00	0.27								
1.6 extrap		1.00	0.15	0.71	28.04	1.00	0.00								
		DL=	0.65 m	1.6 extrap		1.00	0.00								
						DL=	0.27 m								

Salinity structure 25/7-'97

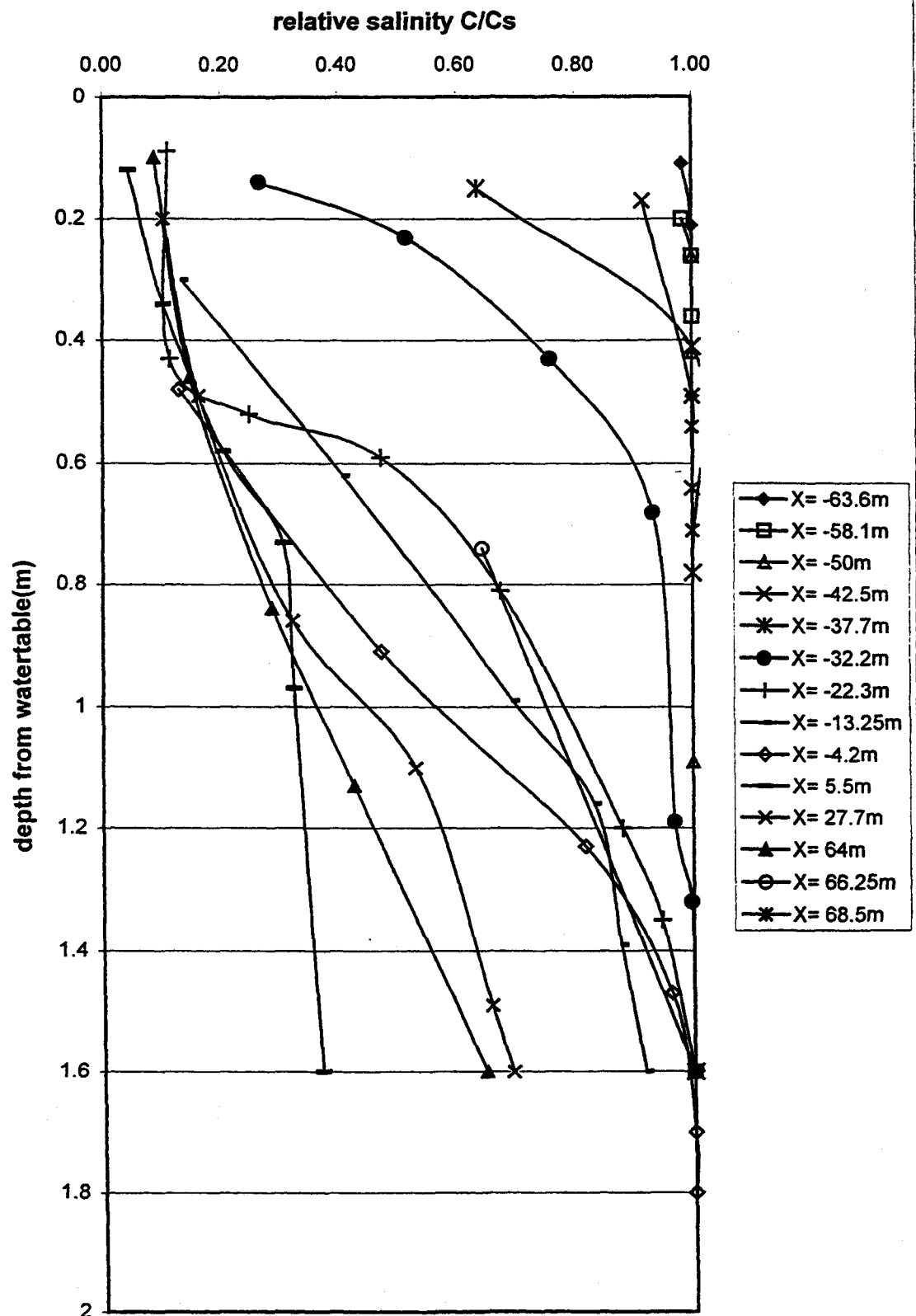


Table (M2) Salinity data

DATE 15/12 - 97'

LOCATION: Southern end, Moreton Island

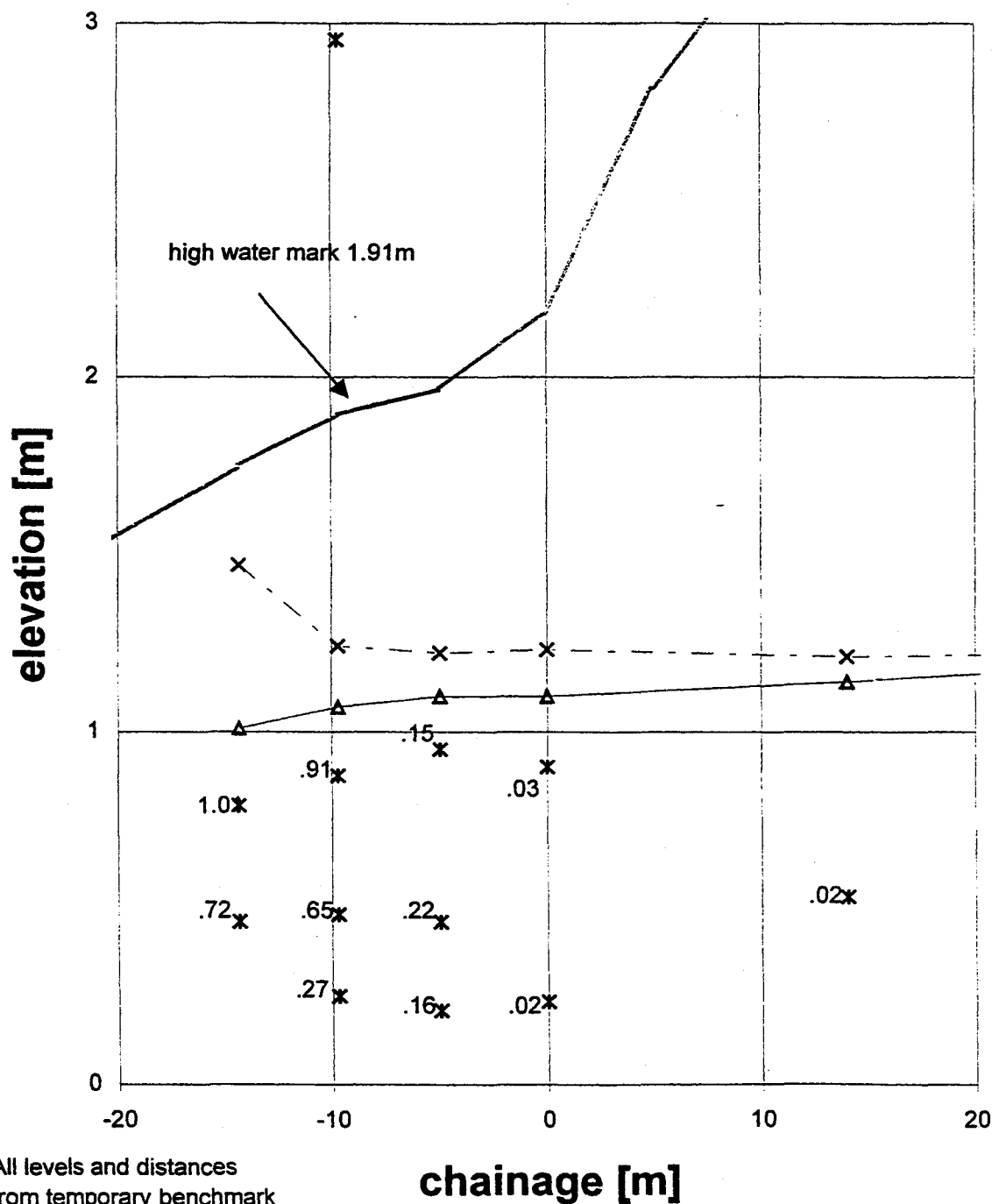
RESEARCH: Nielsen and Voisey (1997)

x=-14.4m z=.79m			X=-9.7m Z=0.88m			X=-5m Z=0.95m			X=0m Z=0.90m		
time	TDS	C/Cs	time	TDS	C/Cs	time	TDS	C/Cs	time	TDS	C/Cs
10.25	30.04	1.06	10.07	28.1	0.99	9.23	4.03	0.14	11.8	0.94	0.03
11.15	28.22	0.99	11.53	26.78	0.94	10.48	3.68	0.13	12.88	1.03	0.04
12.4	27.62	0.97	12.33	25.68	0.90	11.7	3.65	0.13	13.78	0.93	0.03
13.13	27.98	0.99	13.08	24.92	0.88	12.25	4.11	0.14	14.72	1.04	0.04
14.12	29.22	1.03	13.95	25.54	0.90	13	4.21	0.15	15.78	0.9	0.03
14.97	28.82	1.01	14.9	26.1	0.92	13.92	4.29	0.15	16.8	0.87	0.03
16.1	28.36	1.00	16	24.62	0.87	14.82	4.08	0.14	Avg		0.03
17.05	29.04	1.02	17.02	23.92	0.84	15.88	4.76	0.17			
Avg		1.01	Avg		0.91	16.92	4.67	0.16			
						Avg		0.15			
X=-14.4m Z=0.46m			X=-9.7m Z=0.48m			X=-5m Z=0.46m			X=0m Z=0.24m		
time	TDS	C/Cs	time	TDS	C/Cs	time	TDS	C/Cs	time	TDS	C/Cs
10.16	19.88	0.70	10.13	17.16	0.60	9.15	8.91	0.31	8.75	0.3	0.01
11.2	18.33	0.65	11.5	18.78	0.66	10.43	8.25	0.29	12	0.93	0.03
12.47	18.27	0.64	12.33	19.6	0.69	11.7	6.73	0.24	12.92	0.26	0.01
13.2	19.75	0.70	13.05	19.16	0.67	12.23	5.92	0.21	13.85	0.35	0.01
14.05	22.74	0.80	14.02	18.53	0.65	12.95	5.53	0.19	14.87	0.53	0.02
14.93	24.32	0.86	14.88	18.08	0.64	13.85	5.11	0.18	15.75	0.45	0.02
16.08	22.7	0.80	16	17.72	0.62	14.8	5.15	0.18	16.72	0.52	0.02
17.08	16.94	0.60	16.97	17.81	0.63	15.92	5.14	0.18	Avg		0.02
Avg		0.72	Avg		0.65	16.88	5.52	0.19			
						Avg		0.22			

Table (M2) Continued

X=-9.7m			Z=0.25m	X=-5m			Z=0.21m	X=14m			Z=0.53m
time	TDS	C/Cs		time	TDS	C/Cs		time	TDS	C/Cs	
9.98	5.46	0.19		9.1	7.21	0.25		9.33	0.58	0.02	
11.4	7.29	0.26		10.37	5.82	0.20		12.55	0.53	0.02	
12.33	6.87	0.24		11.58	4.82	0.17		Avg		0.02	
13.02	9.45	0.33		12.2	5	0.18					
13.98	8.85	0.31		12.92	4.67	0.16					
14.85	8.14	0.29		13.88	4.15	0.15					
15.93	7.95	0.28		14.77	3.85	0.14					
16.97	7.93	0.28		15.83	3.33	0.12					
Avg		0.27		16.83	2.96	0.10					
				Avg		0.16					

Moreton Island 15/12-97, Southern site.



6.3 TOPOGRAPHICAL DATA

The surveyed topography with average watertable levels and salt/fresh interface are presented as a data set for each field trip where available. A full transect survey across Bribie Island site, ocean to Pumicestone passage, was undertaken on the 20th March 1997 and this topography is overlaid on each Bribie Island data set.

TABLE (A3)

Topography data

DATE: 9-10/11-93' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Kang (1996)

Topography	
XB	sand
(m)	(m)
-31.7	2.81
-34.5	2.61
-37	2.49
-39.4	2.36
-41.8	2.17
-44.3	1.97
-46.8	1.82
-49.4	1.63
-51.9	1.20
-61.7	0.94
-68.2	0.91
-79	0.57
-100.2	0.40

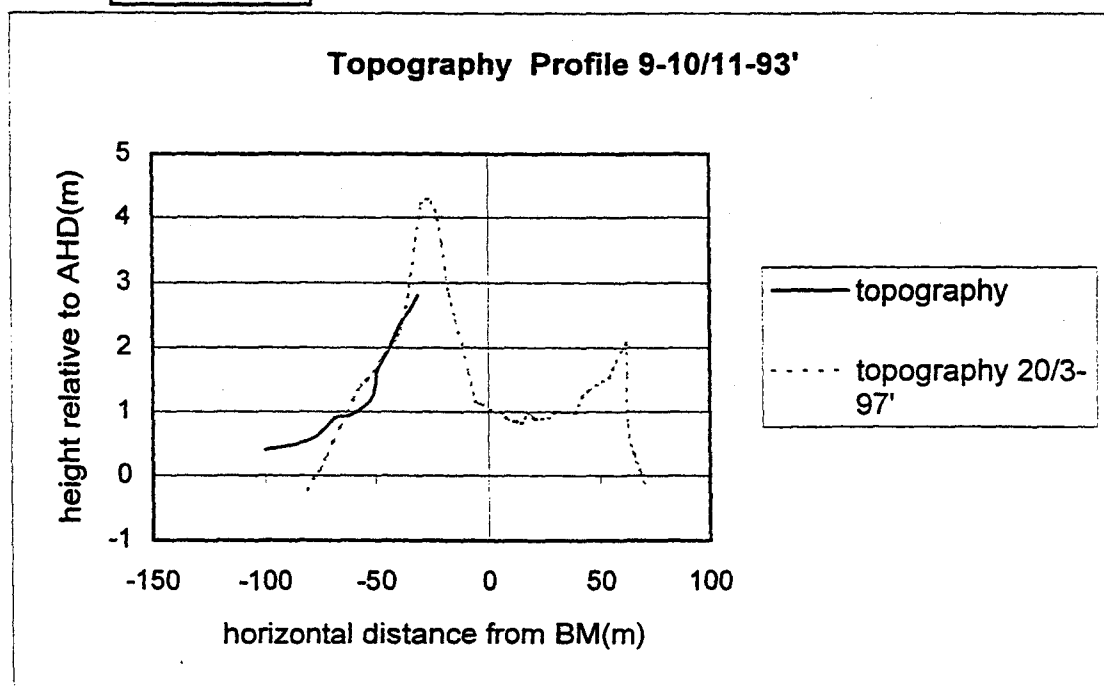


TABLE (B3)

Topography and Average Water Table data

DATE: 16:15, 14/7-94' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Mathews and Bojorge Salmeron (1994)

Water Table data			Topography	
XB (m)	av. WT (m)	fresh (m)	XB (m)	sand (m)
-21.5	0.43		-21.5	2.17
-10	0.39		-10	1.63
0	0.38		0	1.12
15	0.33		15	0.82
26.8	0.27		26.8	1.02

Topography and Average Water Table Profiles 14/7-94'

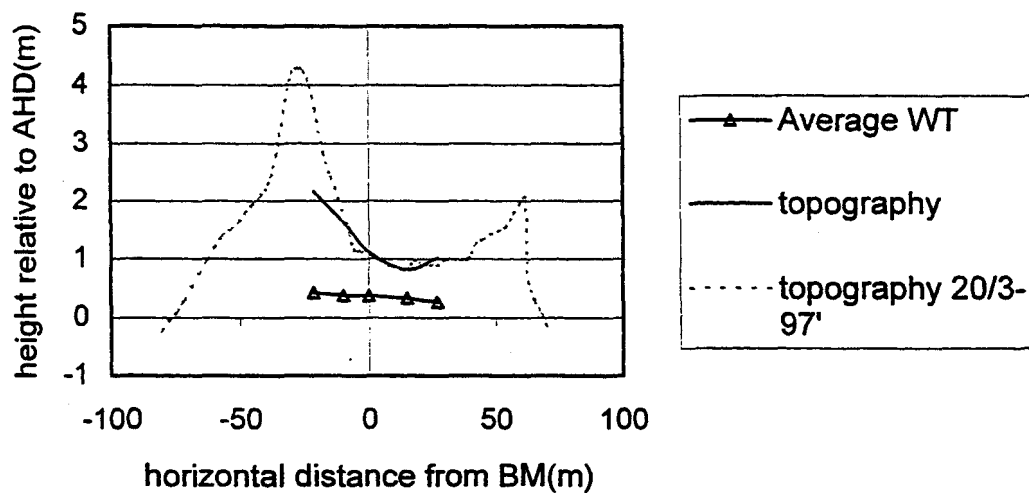


TABLE (C3)

Topography and Average Water Table data

DATE: 10:30, 9/8-94' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Mathews and Bojorge Salmeron (1994)

Water Table data			Topography	
XB	av. WT	fresh	XB	sand
(m)	(m)	(m)	(m)	(m)
-61.5	0.30	0.30	-61.2	-0.16
-37	0.81	0.81	-55.1	0.35
-10	0.38	0.09	-44.8	1.16
0	0.33	-0.54	-37.7	1.57
15	0.29	-1.23	-21.5	2.33
26.8	0.23	-1.33	-10	1.63
			0	1.12
			15	0.82
			26.8	1.02

Topography, Average water table and fresh lens profiles 9/8-94'

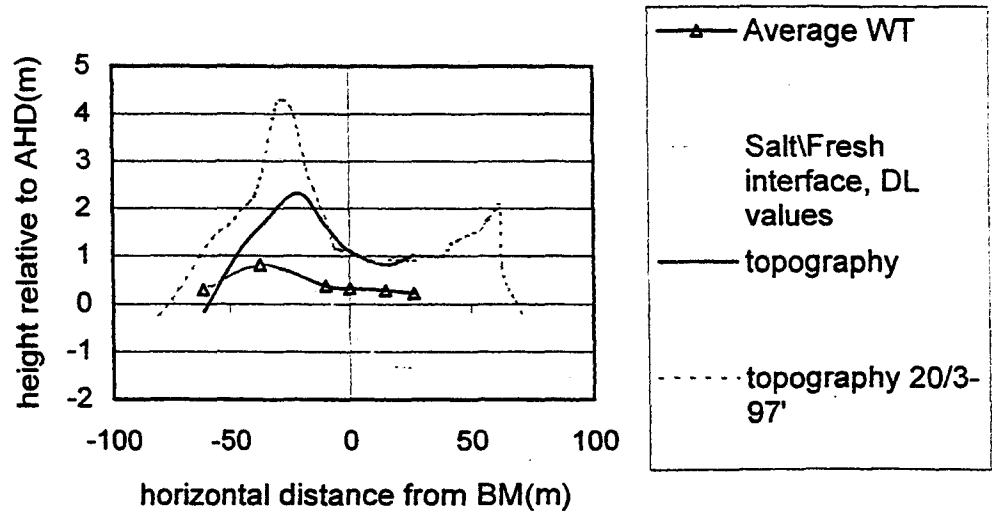


TABLE (D3)

Topography data

DATE: 29-30/9-94' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Kang (1996)

Topography			
XB	sand	XB	sand
(m)	(m)	(m)	(m)
-30.47	1.77	-71.28	0.15
-38.27	1.50	-74.32	0.05
-45.46	1.08	-77.35	-0.10
-49.85	1.05	-80.21	-0.20
-54.58	0.81	-83.24	-0.29
-59.28	0.54	-86.84	-0.38
-62.28	0.44	-90.09	-0.45
-65.29	0.33	-99.13	-0.83
-68.22	0.27	-114	-1.38

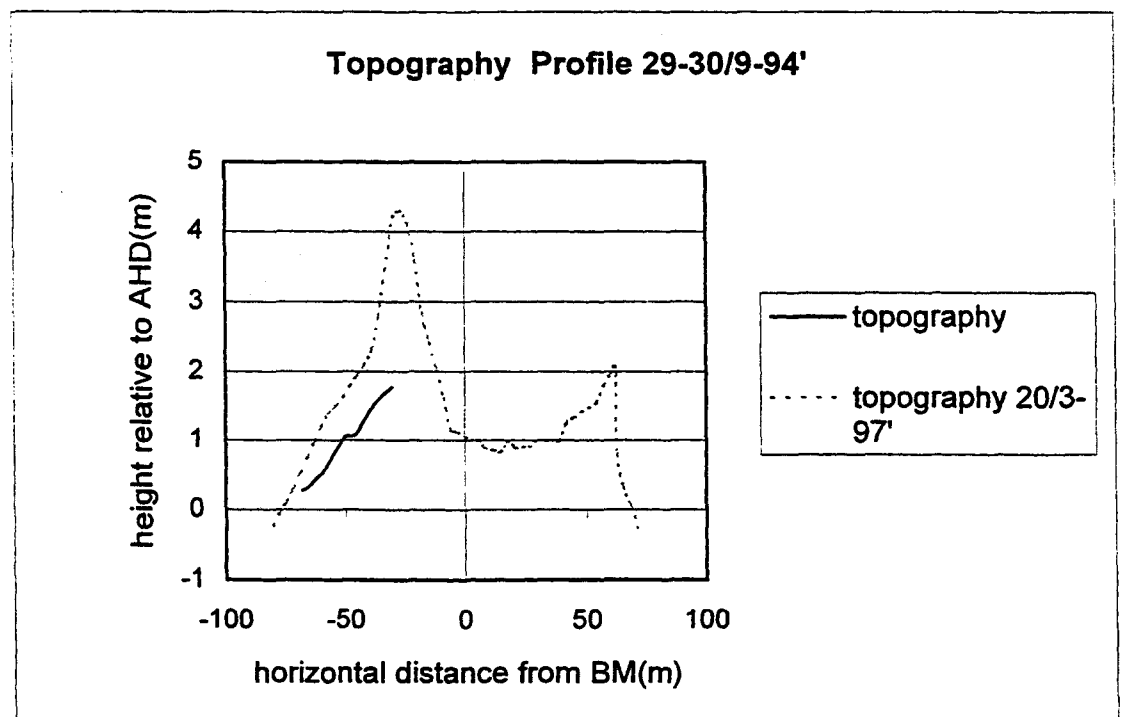


TABLE (E3)

Topography and Average Water Table data

DATE: 14:20, 30/9-94' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Mathews and Bojorge Salmeron (1994)

Water Table data			Topography	
XB (m)	av. WT (m)	fresh (m)	XB (m)	sand (m)
-7.3	0.38	0.35	-11.2	1.06
3.1	0.36	0.33	-7.3	1.24
22.5	0.31	0.14	-4.1	1.28
33.8	0.28	-0.86	3.1	1.10
			8.2	1.02
			16.4	0.98
			22.5	0.90
			29.4	0.94
			33.8	1.04
			39.3	1.13
			47.4	1.21

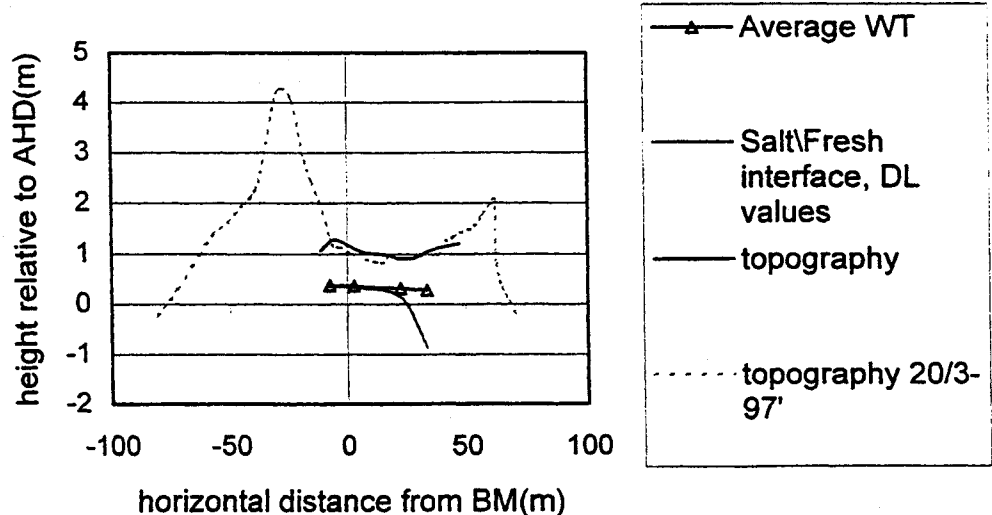
Topography, Average Water Table and fresh water lens profiles 30/9-94'

TABLE (F3)

Topography and Average Water Table data

DATE: 21-22/9-95' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Howard and Dunn (1995)

Water Table data			Topography			
XB (m)	av. WT (m)	fresh (m)	XB (m)	sand (m)	XB (m)	sand (m)
-55.2	0.32	0.32	-88.20	0.22	-23.20	2.90
-36.2	0.25	0.25	-83.20	0.25	-20.20	3.27
-26.2	0.22	0.13	-78.20	0.49	-16.70	3.00
-18.2	0.19	0.07	-73.20	0.83	-8.40	1.76
-13.2	0.18	-0.09	-68.20	1.17	-1.40	1.05
0.6	0.15	-0.26	-63.20	1.52	3.20	1.07
7.3	0.14	-0.57	-58.20	1.65	12.40	0.81
15.85	0.12	-0.80	-53.20	1.66	40.80	1.13
26.6	0.10	-1.05	-48.20	1.81	54.90	1.61
			-43.20	1.89	62.50	2.08
			-38.20	1.83	62.80	0.77
			-34.20	1.85	65.30	0.27
			-33.20	1.93	67.30	0.02
			-28.20	2.20		

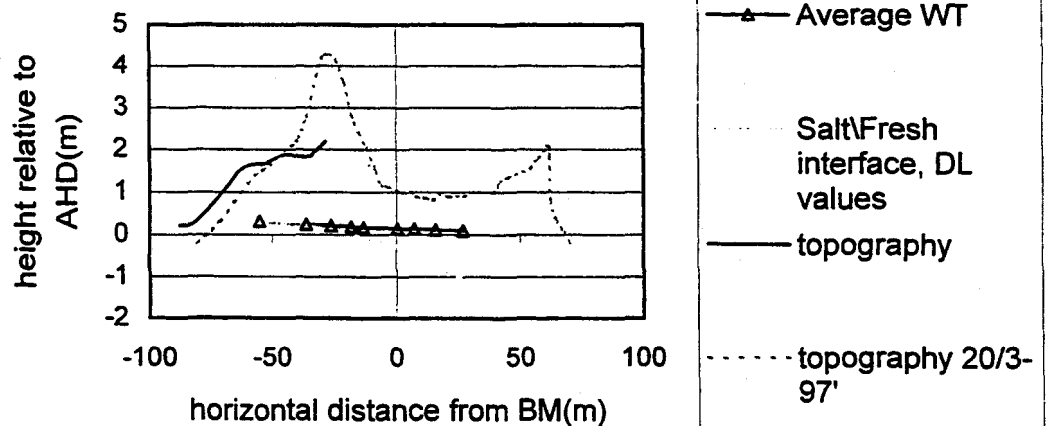
Topography, Average Water Table and Fresh lens Profiles 21-22/9-95'

TABLE (G3)

Topography and Average Water Table data

DATE: 6/10-95' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Howard and Dunn (1995)

Water Table data			Topography	
XB (m)	av. WT (m)	fresh (m)	XB (m)	sand (m)
-59	0.32	0.32	-60.81	1.39
-39	0.26	0.26	-40.1	1.85
-29	0.25	0.17	-8.4	1.76
-21	0.25	0.13	40.8	1.13
-16	0.24	-0.06	54.9	1.61
-2	0.22	-0.18	62.8	0.77
4.5	0.21	-0.50	65.3	0.27
13	0.19	-0.73		
24	0.16	-0.99		
64.5	0.02	-1.00		
65.5	0.01	-1.08		
66.5	0.00	-0.11		

**Topography, Average Water Table and Fresh lens Profiles
6/10-95'**

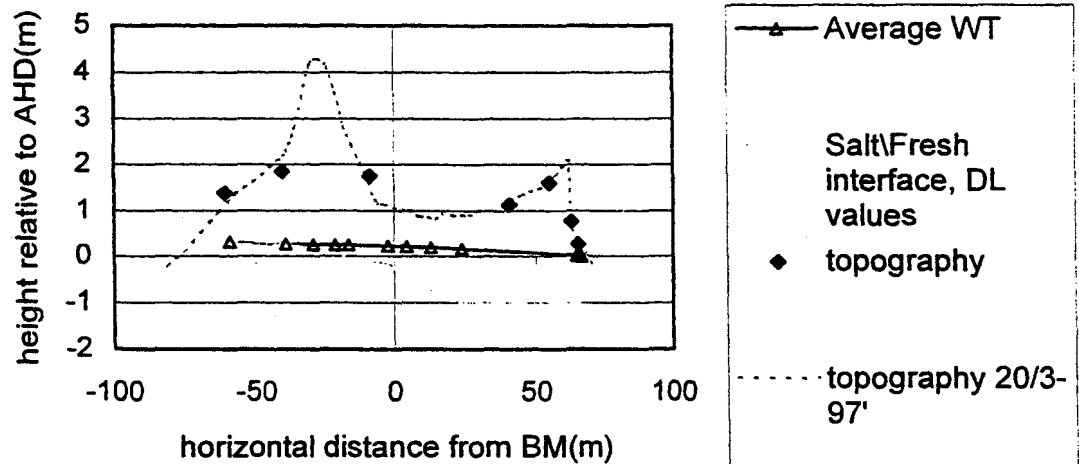


TABLE (H3)

Topography and Average Water Table data

DATE: 28/3-96' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Nilsen and Hall (1996)

Water Table data			Topography					
XB	av. WT	fresh	XB	sand	XB	sand	XB	sand
(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
-32	0.46	0.03	-66	1.13	-44	2.43	-22	3.3
-15	0.44	-0.53	-64	1.27	-42	2.61	-20	3.07
-11.4	0.42	-0.59	-62	1.38	-40	2.96	-18	2.79
1.5	0.37	-0.74	-60	1.47	-38	3.25	-14	2.25
10.6	0.31	-0.79	-58	1.56	-36	3.33	-12	1.97
21.2	0.23	-0.68	-56	1.65	-34	3.3	-10	1.82
39	0.13	-0.82	-54	1.69	-32	3.23	-8	1.51
			-52	1.77	-30	3.29	-6	1.19
			-50	1.86	-28	3.59	-4	1.16
			-48	1.98	-26	3.61	-2	1.1
			-46	2.14	-24	3.74	0	1.16

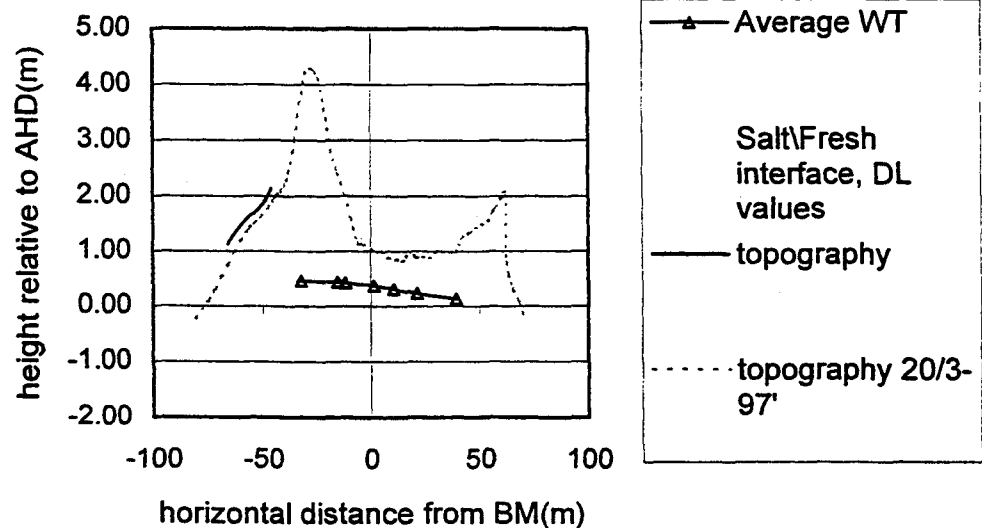
Topography, Average Water Table and Fresh lens Profiles 28/3-96'

TABLE (I3)

Topography and Average Water Table data

DATE: 28/5-96' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Nilsen and Hall (1996)

Water Table data			Topography			
XB (m)	av. WT (m)	fresh (m)	XB (m)	sand (m)	XB (m)	sand (m)
-47	0.19	0.15	-89.8	-1.02	-19	2.87
-39.8	0.32	0.25	-79.8	-0.65	-10	1.26
-32.9	0.36	0.27	-69.8	-0.39	0	1.14
-26	0.35	-0.37	-59.8	-0.03	1.5	1.04
-19	0.36	-0.64	-54.8	0.21	12.7	0.81
-10	0.32	-0.66	-49.8	0.51	40.6	1.03
			-47	0.70	52	1.44
			-44.8	0.88	60.1	2.06
			-39.8	1.27	62	2.08
			-35.9	1.66	62.1	0.78
			-32.9	2.01	69.1	0.00
			-25.9	3.57		

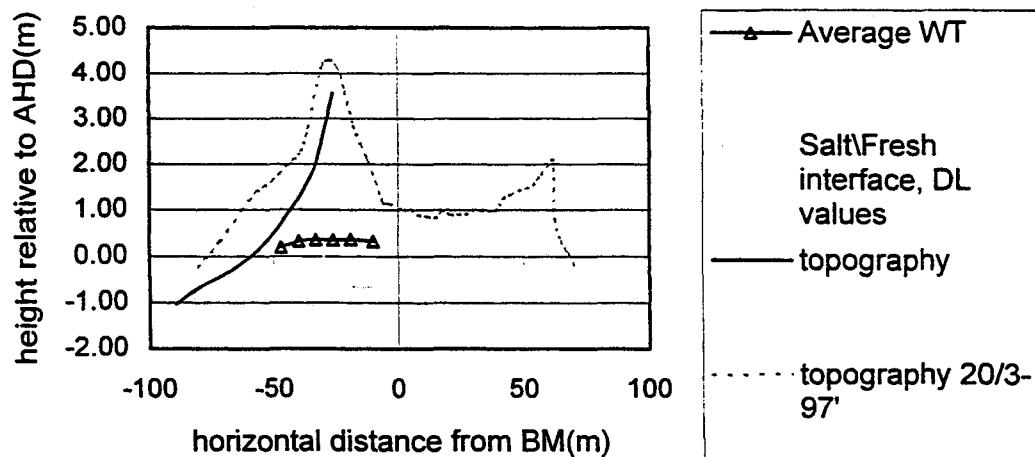
Topography, Average Water Table and Fresh lens Profiles 28/5-96'

TABLE (J3)

Topography and Average Water Table data

DATE: 20/3-97' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Pollard and Learoyd (1997)

Water Table data			Topography							
XB (m)	av. WT (m)	fresh (m)	XB (m)	sand (m)	XB (m)	sand (m)	XB (m)	sand (m)	XB (m)	sand (m)
-33	0.50	-0.10	-81	-0.23	-42	2.08	3	1.00	42	1.25
-18.8	0.46	-0.09	-78	-0.06	-39	2.28	6	1.00	45	1.33
-15	0.45	0.08	-75	0.10	-36	2.78	8	0.89	48	1.42
-10	0.43	0.12	-72	0.31	-30	4.20	12	0.86	51	1.47
-5	0.40	0.00	-69	0.53	-27	4.29	15	0.82	54	1.55
0	0.38	-0.17	-66	0.75	-24	4.12	18	0.98	57	1.78
10.7	0.33	-0.13	-63	0.98	-21	3.59	21	0.89	60	1.98
21.3	0.29	-0.20	-60	1.19	-18	2.84	24	0.90	62	2.08
40	0.21	-0.37	-57	1.39	-15	2.42	27	0.90	62.5	0.80
60.4	0.22	-0.41	-54	1.50	-12	2.05	30	1.00	65	0.33
63	0.18	-0.69	-51	1.62	-9	1.62	33	0.99	68	0.07
			-48	1.77	-6	1.17	36	0.99	71	-0.26
			-45	1.94	-3	1.12	39	0.99		

Topography, Average Water Table and Fresh lens Profiles 20/3-97'

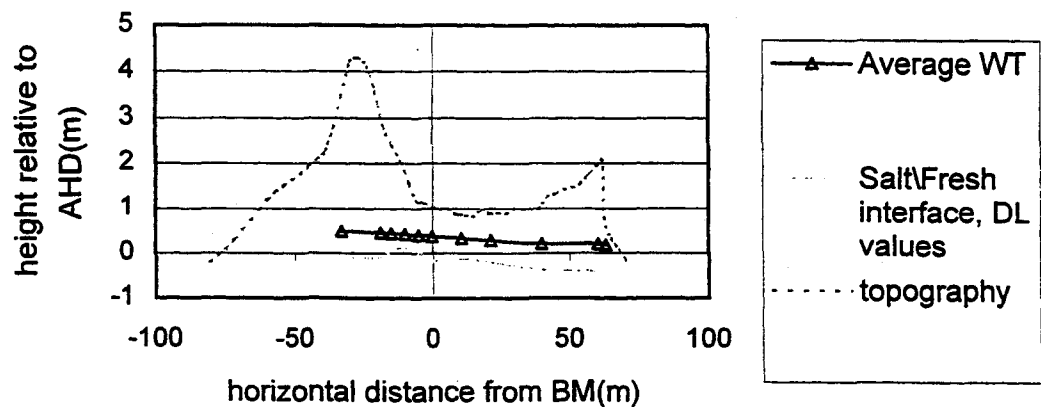


TABLE (K3)

Topography and Average Water Table data

DATE: 9/7-97' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Pollard and Learoyd (1997)

Water Table data			Topography			
XB (m)	av. WT (m)	fresh (m)	XB (m)	sand (m)	XB (m)	sand (m)
-49.2	0.30	0.20	-137.5	-0.80	-56	0.99
-42.5	0.30	-0.18	-127.3	-0.80	-52	1.23
-36.0	0.30	-0.41	-118.4	-0.81	-47	1.44
-26.6	0.28	-0.35	-109.5	-0.61	-43	1.78
-18.9	0.27	-0.63	-100.5	-0.46	-38	2.21
-14.7	0.27	-0.70	-92	-0.28	-34	2.61
-9.9	0.25	-0.75	-83	-0.09	-29	3.42
-5.1	0.24	-0.87	-74	0.17	-25	4.37
-2.8	0.24	-0.71	-69	0.35	-20	3.59
10.7	0.19	-1.27	-65	0.53	-15	2.38
			-60	0.74	-9	1.35

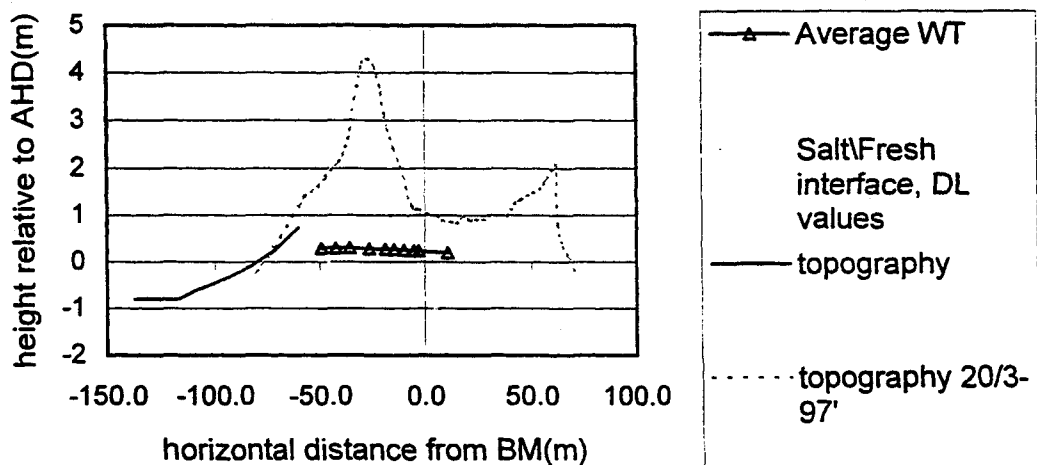
Topography, Average Water Table and Fresh lens Profiles 9/7-97'

TABLE (L3)

Topography and Average Water Table data

DATE: 25/7-97' [EST]

LOCATION: Unnamed beach, North Bribie Island

RESEARCH: Pollard and Learoyd (1997)

Water Table data			Topography	
XB (m)	av. WT (m)	fresh (m)	XB (m)	sand (m)
-63.6	0.43	0.37	-114	-0.46
-58.1	0.43	0.33	-104	-0.26
-50.0	0.44	0.31	-94	-0.08
-42.5	0.44	0.33	-84	0.06
-37.7	0.42	0.27	-74	0.35
-32.2	0.40	0.08	-64	0.74
-22.3	0.37	-0.34	-54	1.16
-13.3	0.35	-0.42	-49	1.39
-4.2	0.32	-0.57	-44	1.61
5.5	0.29	-0.92	-39	2.00
27.7	0.20	-0.85	-34	2.59
64.0	0.10	-1.01	-29	3.24
66.3	0.08	-0.57	-24	4.42
68.5	0.05	-0.22	-19	3.05

**Topography, Average Water Table and Fresh lens Profiles
25/7-97'**

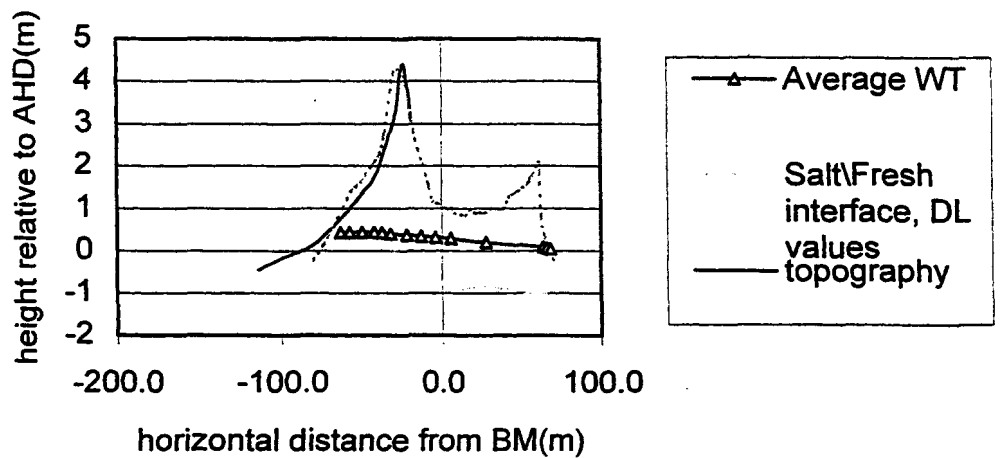


TABLE (M3)

Topography and Average Water Table data

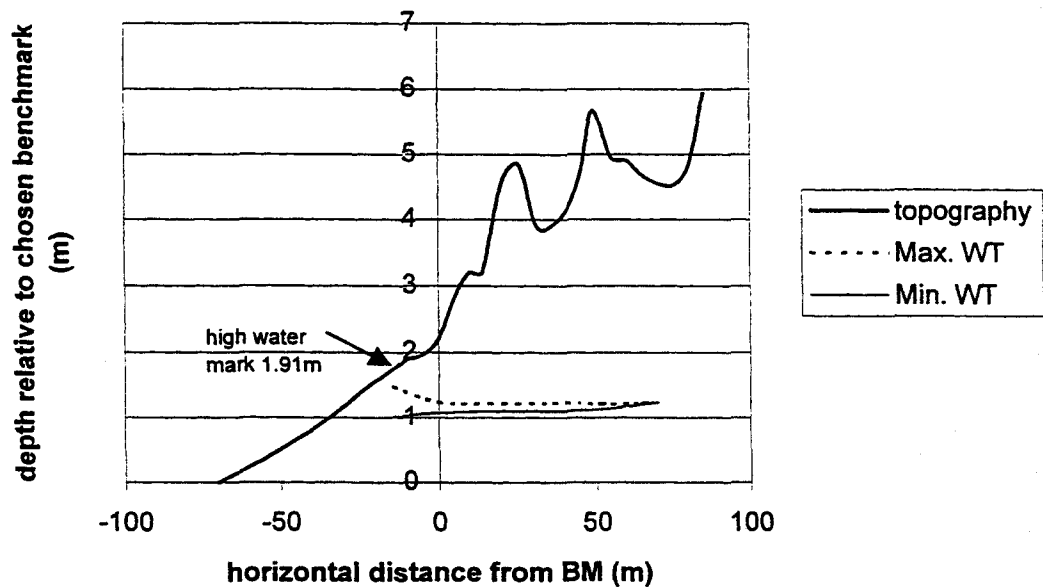
DATE 15/12-97' (temporary benchmark)

LOCATION: Southern end, Moreton Island

RESEARCH: Nielsen and Voisey (1997)

Water Table data			Topography			
XB (m)	Min. WT	Max. WT	XB (m)	sand (m)	XB (m)	sand (m)
-14.4	1.01	1.47	-70	0.00	25	4.86
0	1.07	1.24	-60	0.24	30	3.96
20	1.1	1.22	-50	0.51	33	3.84
40	1.1	1.23	-40	0.81	40	4.12
55	1.14	1.21	-30	1.17	45	4.73
65	1.205	1.225	-25	1.38	49	5.67
70	1.24	1.24	-14.4	1.75	55	4.96
			-9.7	1.89	60	4.90
			-5	1.97	65	4.68
			0	2.19	70	4.55
			5	2.82	75	4.52
			10	3.21	80	4.82
			14	3.21	85	5.95
			20	4.59		

Topography and Water Table Profiles 15/12-97'



6.4 RAINFALL DATA

Rainfall data from Caloundra is included between January 1993 to October 1997 as an indication of Bribie Island rainfall. An Indication of Moreton Island rainfall is taken from Point Lookout, North Stradbroke Island between September and December 1997. Locations are shown on figure 1

Daily Rainfall Data for CALOUNDRA (CALOUNDRA WATER TREAT)

Site No. 40496 Latitude: 26.79 S Longitude: 153.13 E Elevation: 50 metres Commenced: 1972 Last recorded: 1997
 PRECIPITATION (mm)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
JAN 1993	0.0	0.0	0.0	0.0	0.0	48.2	21.2	0.0			27.8	21.8	42.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6	0.0	0.0	0.0	2.0	181.4	
FEB 1993	2.1	0.0	0.0	0.0	0.0	6.0	0.0	44.6	1.5	0.0	0.0	0.0	0.0	12.0	5.0	3.0	5.9	4.1	15.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			101.4	
MAR 1993	0.0	0.0	0.0	3.0	0.0	21.1	0.1	0.0	0.0	0.0	64.0	41.0	0.0	24.0	18.0	25.0	68.0	36.0	10.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0				4.0	316.2	
APR 1993	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	19.0	0.0	0.0	0.0	17.0		12.0										18.0	2.0	79.0	
MAY 1993	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	7.0	0.0	9.0	49.0
JUN 1993	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	15.0	
JUL 1993	30.0	2.0	4.0	0.0	0.0	0.0	1.0	4.0	0.0	8.0	18.0	34.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	1.0	1.0	17.0	0.0	0.0	0.0	0.0	124.0
AUG 1993	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	28.0	22.0	2.0	27.0	0.0	76.0	6.0	163.0
SEP 1993	5.0	0.0	15.0	0.0	4.0	10.0	12.0	0.0	0.0	0.0	0.0	0.0	2.0	8.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	11.0	0.0	4.0	1.0	0.0	0.0	0.0	111.0	
OCT 1993	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	1.0	2.6	2.2	0.0		11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		54.0	88.0	
NOV 1993	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	50.2	11.0	0.0	0.0	0.0	0.0	0.0	0.0	117.4
DEC 1993	0.0	0.0	0.0	0.0	0.0	5.4	5.2	7.2	74.2	4.4	2.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	31.0	0.0	0.0	19.0	0.0	0.0	0.0	0.0	161.4
JAN 1994	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	2.8	0.0	0.0	16.0	0.0	44.8	2.0	0.0	58.0	23.2	3.4	0.0	0.0	0.0	13.4	10.6	0.0	24.6	0.0	15.4	226.0
FEB 1994	14.8	1.2	22.0	8.2	28.6	1.0	2.0	0.0	0.0	10.8	6.0	0.0	6.8	8.0	3.4	0.0	0.0	0.0	6.6	21.8	0.0	12.2	0.0	2.8	0.0	0.0	0.0	0.0				158.0
MAR 1994	52.6	60.0	195.0	50.8	18.8	4.0	9.0	0.0	0.0	16.6	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	6.8	11.2	18.0	28.8	11.0	0.0	14.0	29.4	6.8	3.4	10.6	12.0	563.6	
APR 1994	43.2	0.0	0.0	8.4	20.4	10.4	5.4	0.0	8.6	1.4	0.0	23.0	0.0	0.0	0.0	0.0	2.0	5.6	0.0	1.2	7.4	33.0	0.0	1.6	0.0	3.4	2.4	2.0	0.0	35.0	214.4	
MAY 1994	26.2	9.4	0.0	2.6	2.6	6.4	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	50.6	116.2
JUN 1994	8.2	2.2	0.0	4.8	1.0	0.0	7.0	0.6	1.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.8	
JUL 1994	0.0	0.0	29.0	0.0	2.2	0.0	0.0	5.6	0.0	13.0	3.4	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	57.6
AUG 1994	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	33.6	10.0	0.0	0.0	0.0	0.0	0.0	11.4	0.0	0.0	0.0	59.6
SEP 1994	18.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.2	
OCT 1994	0.0	0.0	0.0	0.0	0.0	0.0		9.0	0.0	0.0	0.0	0.0	7.2	7.4	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	12.0	1.4	0.0	0.0	0.0	0.0	0.0	9.6	0.8	48.4
NOV 1994	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.6
DEC 1994	0.0	0.0	0.0	97.0	0.0	0.0	0.0	0.0	0.0	41.8	15.4	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	164.0
JAN 1995	0.0	0.0	10.2	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.6	3.2	36.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	76.2
FEB 1995	0.0	0.0	0.0	0.0	0.0	0.0	49.6	0.0	5.0	0.0	0.0	0.0	68.6	51.6	182.0	1.6		4.0	4.0	37.0	0.0	0.0	0.0	0.0	13.0	2.0		13.0			431.4	
MAR 1995	0.0	0.0	0.0	0.0	0.0	0.0	15.0	2.6	0.0	0.0		28.0	0.0	0.0	0.0	17.0			3.0	0.0	0.0	0.0	0.0			50.6	28.4	26.4	0.0	0.0	171.0	
APR 1995	0.0	0.0	43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	14.8	29.0	20.2	4.8	0.0	0.0	0.0	0.0	1.2	11.0	0.0	0.0	8.0	16.0	1.8	0.0	23.2		184.4
MAY 1995	0.0	7.0	0.0	0.0	0.0	0.0	0.0	15.0	2.4	4.2	1.0	1.0	2.8	0.0	0.0	0.0	0.0	4.2	16.0	16.0	8.0	28.6	0.0	2.6	6.6	0.0	0.0	0.0	0.0	2.4	0.0	117.8
JUN 1995	1.0	0.0	4.2	32.4	15.0	22.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.6	2.8	2.4	0.0	0.0	6.0	0.0	102.8	
JUL 1995	0.0	0.0	0.0	0.0	0.0	1.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5
AUG 1995	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	10.6	15.8	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.4	8.2	0.0	0.0	51.4
SEP 1995	0.0	0.0	0.0	10.6	0.0	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	2.2	0.0	0.0	2.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.0
OCT 1995	0.0	0.0	0.0	5.0	0.0	0.0	0.0	8.0	42.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	1.6	0.0	0.0	13.4	15.4	0.0	0.0	0.0	0.0	92.2
NOV 1995	4.4	0.0	0.0	0.0	0.0	10.6	14.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	8.2	4.0	0.0	0.0	4.2	7.6	19.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.2

Daily Rainfall Data for CALOUNDRA (CALOUNDRA WATER TREAT)

Site No. 40496

Latitude: 26.79 S

Longitude: 153.13 E

Elevation: 50 metres

Commenced: 1972

Last recorded: 1997

PRECIPITATION (mm)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
DEC 1995	0.0	3.0	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0	35.0	0.0	0.0	0.0	0.0	2.4	0.0	19.0	0.0	0.0	0.0	0.0	71.0	0.0	0.0	0.0	0.0	26.0	0.0	0.0	162.8
JAN 1996	0.0	4.0	0.0	33.0	13.0	0.0	0.0	0.0	19.0	83.4	0.8	0.0	3.2	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	18.0	33.0	0.0	6.0	0.0	0.0	0.0	0.0	215.2
FEB 1996	0.0	2.0	0.0	0.0	7.2	5.6	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	14.0	0.0	0.0	13.0	2.4	0.0	0.0	15.6	2.0	2.8	6.2	7.0	39.8	0.0	13.0			132.0
MAR 1996	3.0	0.0	0.0	0.0	0.0	42.0	1.0	0.0	0.0	0.0	6.2	3.0	1.4	0.0	0.0	0.0	0.0	0.0	8.0	0.0	2.0	5.0	0.0	0.0	7.0	31.0	7.0	4.8	2.2	16.0	0.0	139.6
APR 1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.0	2.0	0.0	0.0	0.0	13.0	7.0	0.0		52.4
MAY 1996	44.0	84.0	25.0	0.0	24.0	56.0	47.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	36.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	341.0
JUN 1996		22.0	5.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	24.0	0.0	17.0	49.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	153.0
JUL 1996	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		15.4	0.0	0.0	0.0	19.4
AUG 1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0
SEP 1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0		25.8
OCT 1996	0.0	0.0	0.0	0.0	0.0	0.0	3.0	8.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	13.2	0.0	0.0	0.0	0.0	0.0	0.0	35.0	68.2
NOV 1996	0.0	3.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	11.2	13.8	0.0	4.4	53.6	0.0	0.0	0.0	0.0	0.0	0.0	96.0
DEC 1996	0.0	0.0	0.0	0.0	2.4	0.0	0.0	18.0	30.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	2.8	81.4
JAN 1997	19.0	0.0	0.0	3.4	0.0	2.8	0.0	0.0	0.0	0.0	10.8	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	15.0	0.0	0.0	17.0	7.0	22.2	8.6	13.4	5.0	0.0	130.8
FEB 1997	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.4	0.0	0.0	0.0	6.6	6.0	1.0	14.4	0.0	0.0	0.0	0.0	0.0	0.0	7.0	10.6			74.4	
MAR 1997	0.0	0.0	0.0	0.0	33.6	130.6	2.0	0.0	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	14.0	2.2	0.0	0.0	0.0	3.8	200.4
APR 1997	22.6	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	6.6	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	16.6	13.4	38.0	12.0	28.8		159.4
MAY 1997	21.0	24.0	10.8	22.6	54.0	19.4	15.4	2.2	22.2	0.0	0.0	0.0	0.0	0.0	0.0	11.4	64.2	0.0	0.0	0.0	0.0	0.0	0.0	18.4	10.6	0.0	0.0	0.0	0.0	0.0	0.0	296.2
JUN 1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	8.4	0.0	13.4	0.0	0.0	8.6	0.0	0.0	6.2	0.0	38.0	
JUL 1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	7.4	0.0	0.0	4.4	11.4	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.4	0.0	6.2	0.0	0.0	0.0	57.0
AUG 1997	0.0	0.0	0.0	0.0	0.0	15.4	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.4
SEP 1997	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	1.4	0.0	0.0	9.0	0.0	0.0	0.0	0.0	9.4	0.0		29.4
OCT 1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.6	12.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	71.8

Daily Data for NORTH STRADBROKE ISLAND (POINT LOOKOUT)

Site Number 040209 Latitude 27°26'10"S Longitude 153°32'44"E Elevation 50 metres Opened Feb 1997 Still Open

Precipitation to 9am (mm)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Avg	Max	Min	Total	Nbr
Sep 1997	0.2	0.2	1.1	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	2.2	8.5	0.2	0.0	0.0	0.0	0.4	2.4	2.5	0.9	0.0	0.0	17.6	13.7	0.1	0.0	0.0	2.7	1.6	1.8	17.6	0.0	55.0	30	
Oct 1997	0.0	0.0	0.0	0.0	0.0	0.0	0.6	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.4	14.0	0.4	2.0	3.1	0.9	0.0	0.0	0.0	0.0	6.8	0.0	2.6	28.6	0.0	81.8	31
Nov 1997	0.0	0.0	0.0	0.2	13.4	46.6	50.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	22.3	1.2	9.8	0.0	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	50.2	0.0	146.0	30	
Dec 1997	18.6	0.0	0.0	0.0	0.0	0.0	0.0	5.7	6.7	8.6	7.6	0.7	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	7.1	7.0	0.0	0.6	2.6	18.6	0.0	72.0	28	

6.5 WAVE AND TIDAL DATA

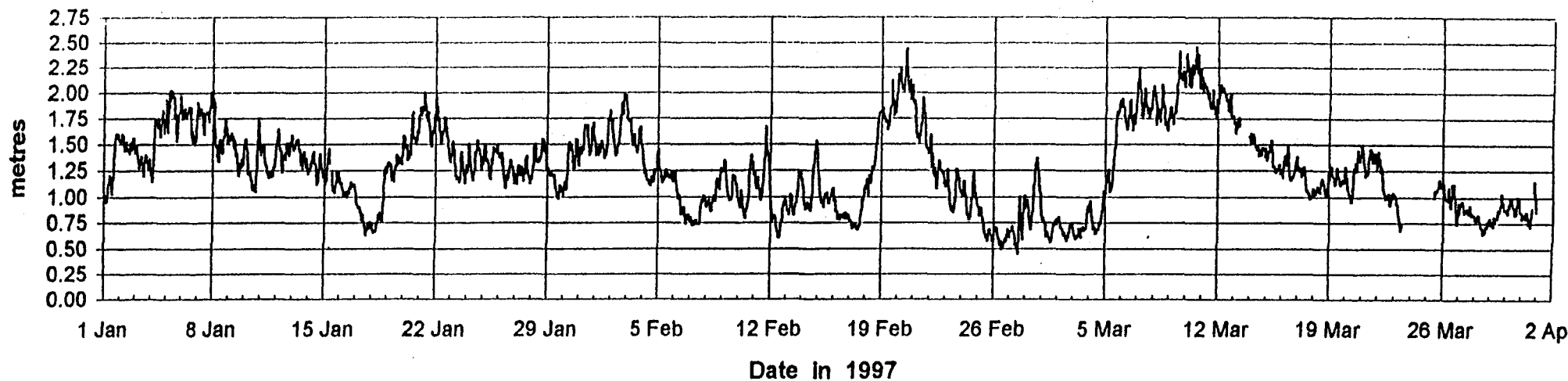
Wave and tide data is taken from an EWS pole on Navigational Beacon NW1 shown on figure 1. Significant wave height and period – Total Wave (sea wave +swell) and tide levels are given for 1997. The conversion factor for the tidal measurements is 0m AHD = 0.99m LAT at Mooloolaba.

AHD = Australian Height datum

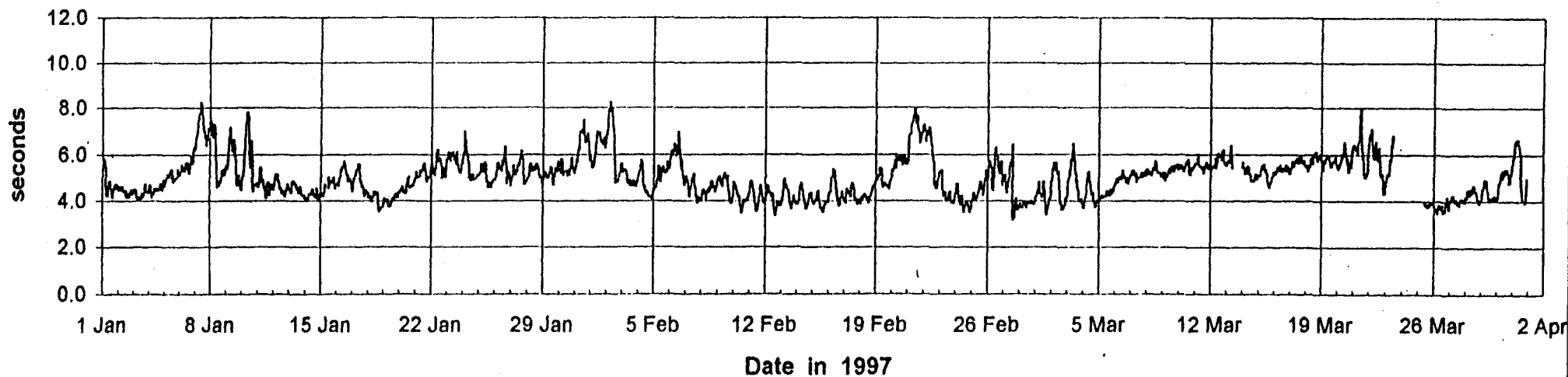
LAT = Lowest Astronomical Tide at Mooloolaba.

PORT OF BRISBANE Beacon NW1

Significant Wave Height - Total Wave



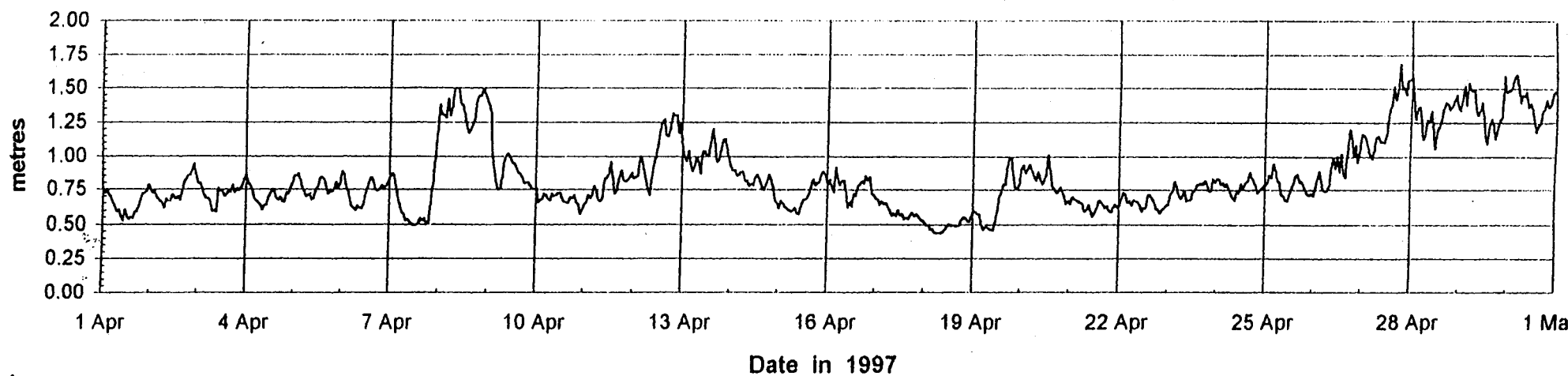
74



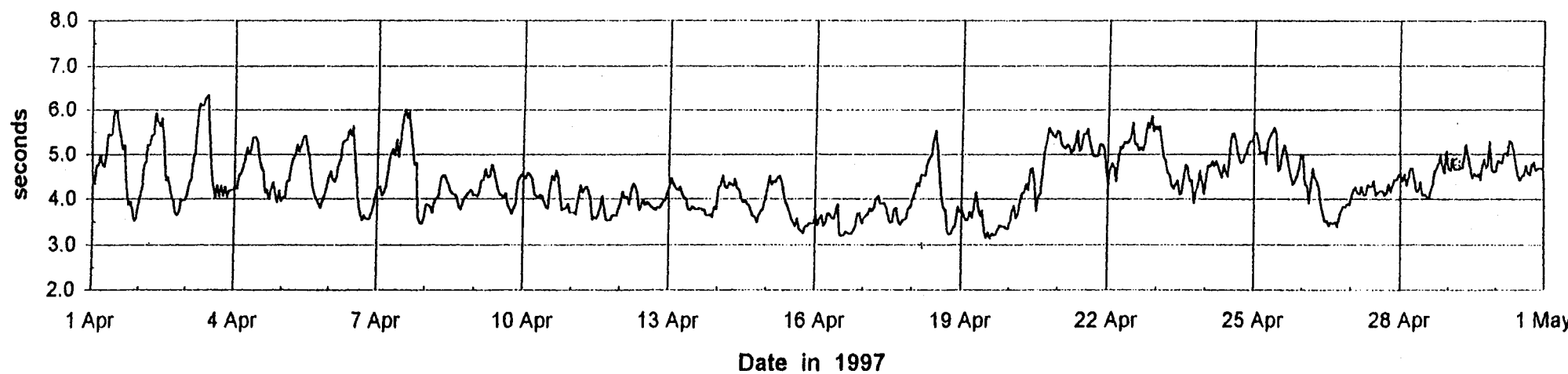
Significant Wave Period - Total Wave

PORT OF BRISBANE Beacon NW4

Significant Wave Height - Total Wave



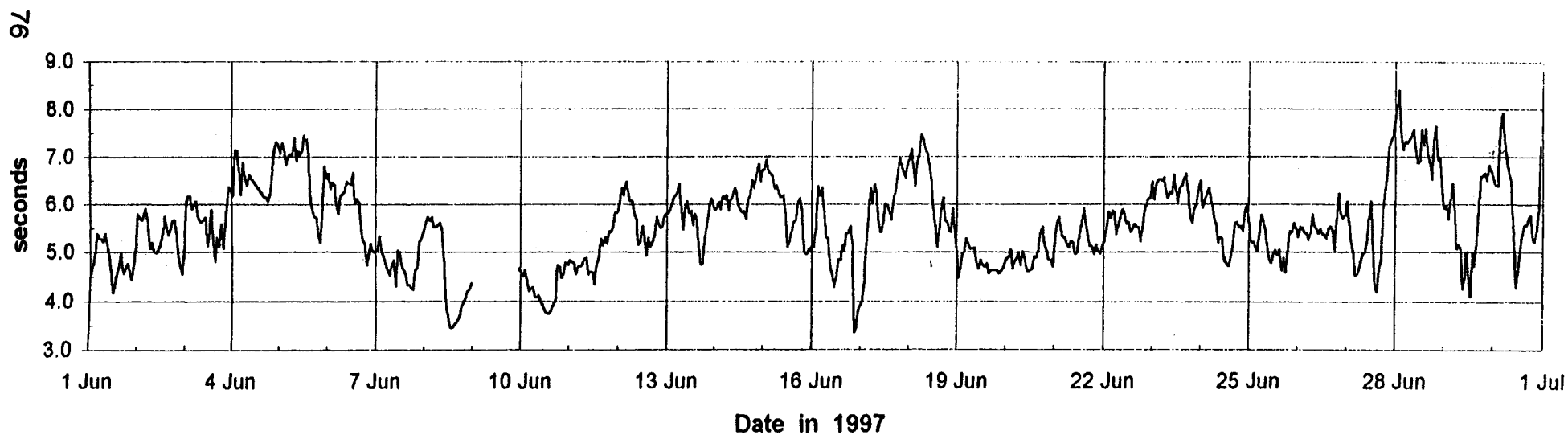
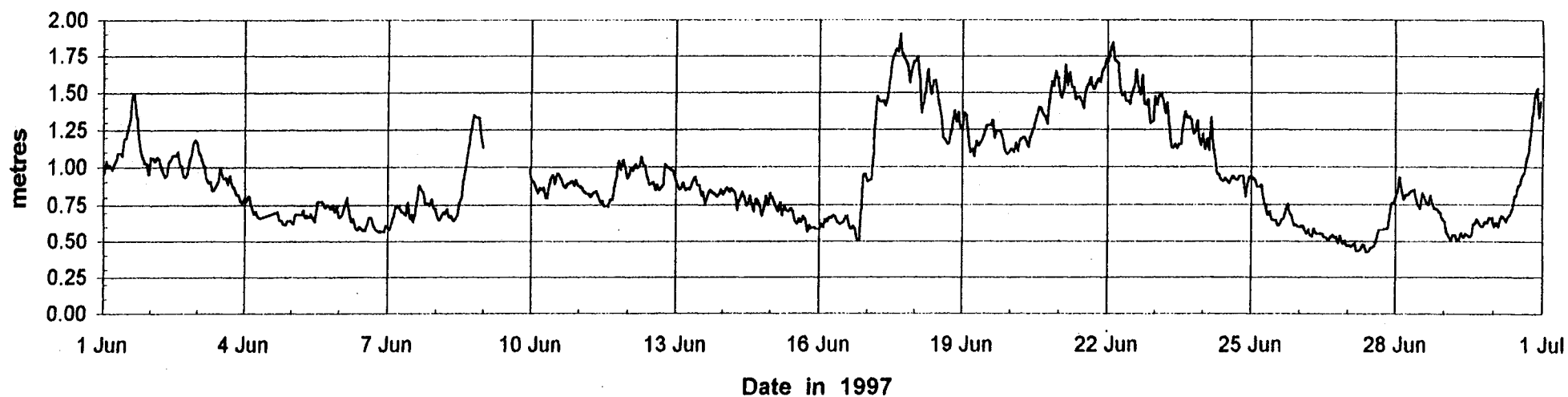
75



Significant Wave Period - Total Wave

PORT OF BRISBANE Beacon NW1

Significant Wave Height - Total Wave



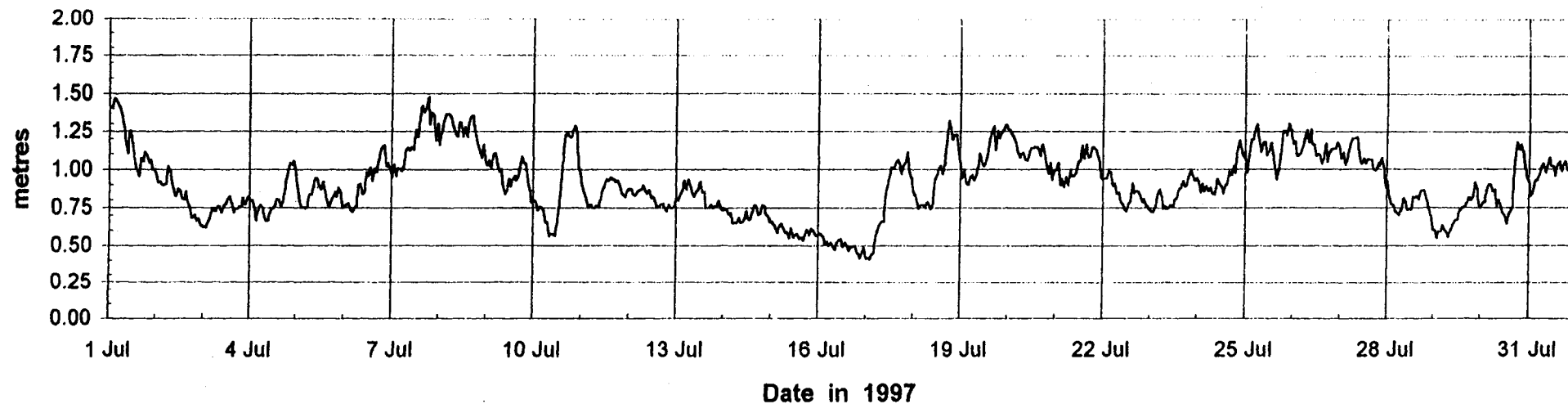
Significant Wave Period - Total Wave



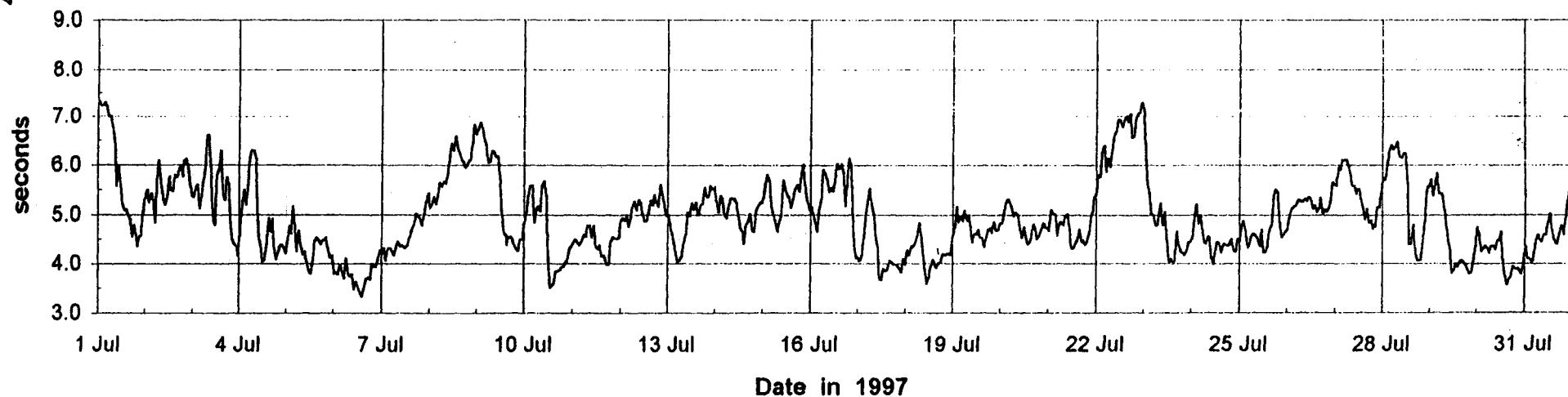
PORT OF BRISBANE Beacon NW1

July 9

Significant Wave Height - Total Wave



77



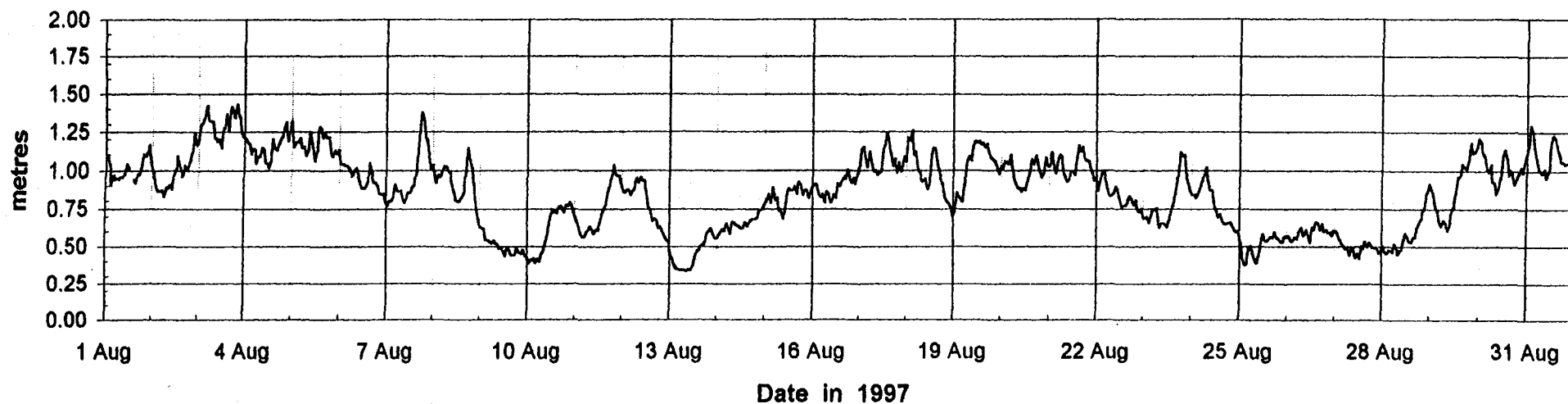
Significant Wave Period - Total Wave

PORT OF BRISBANE

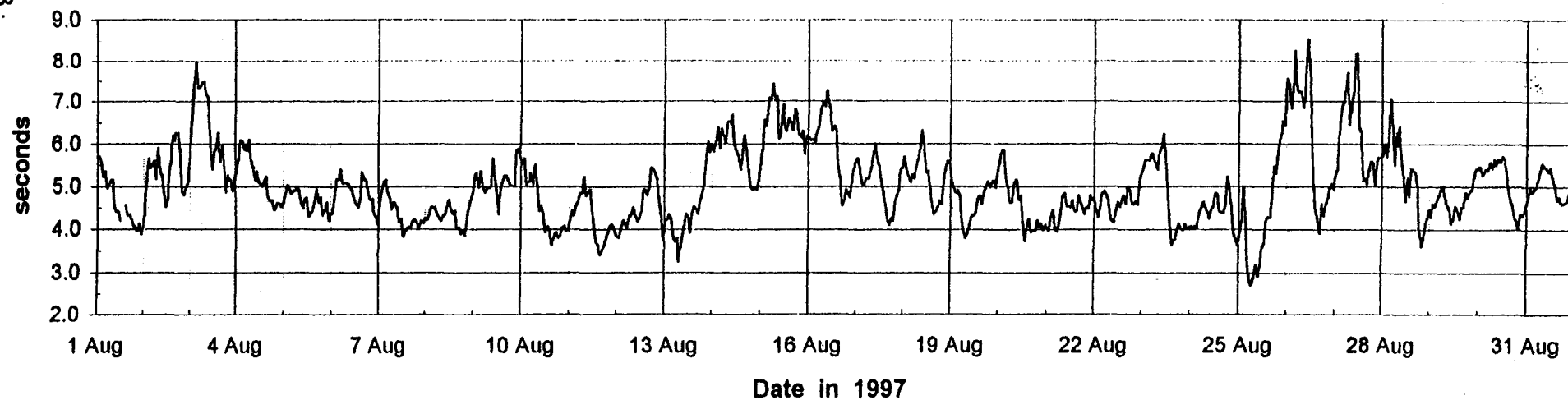
Beacon NW1

August 97

Significant Wave Height - Total Wave



78.

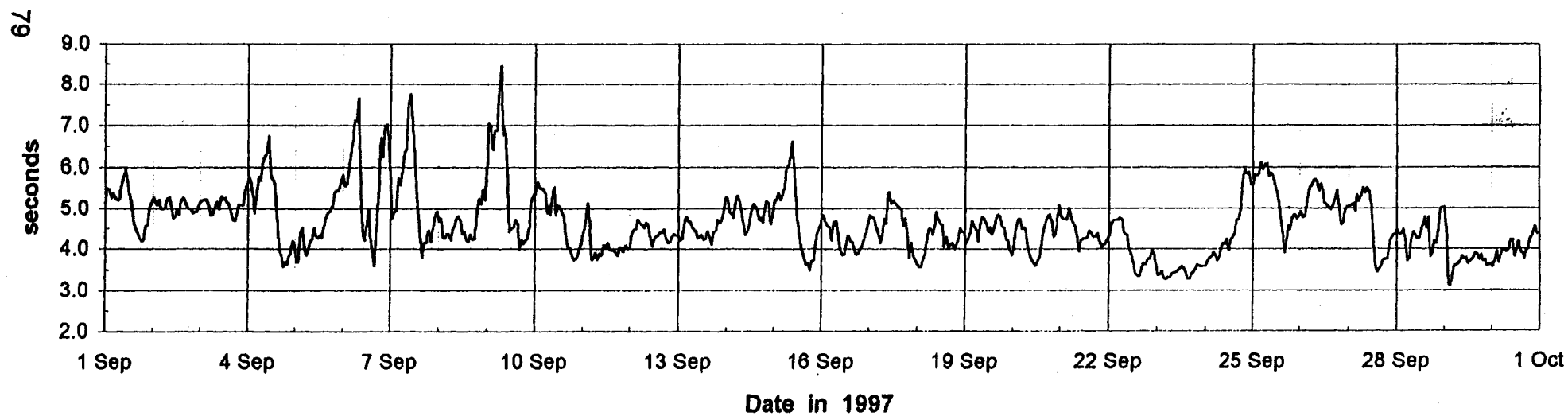
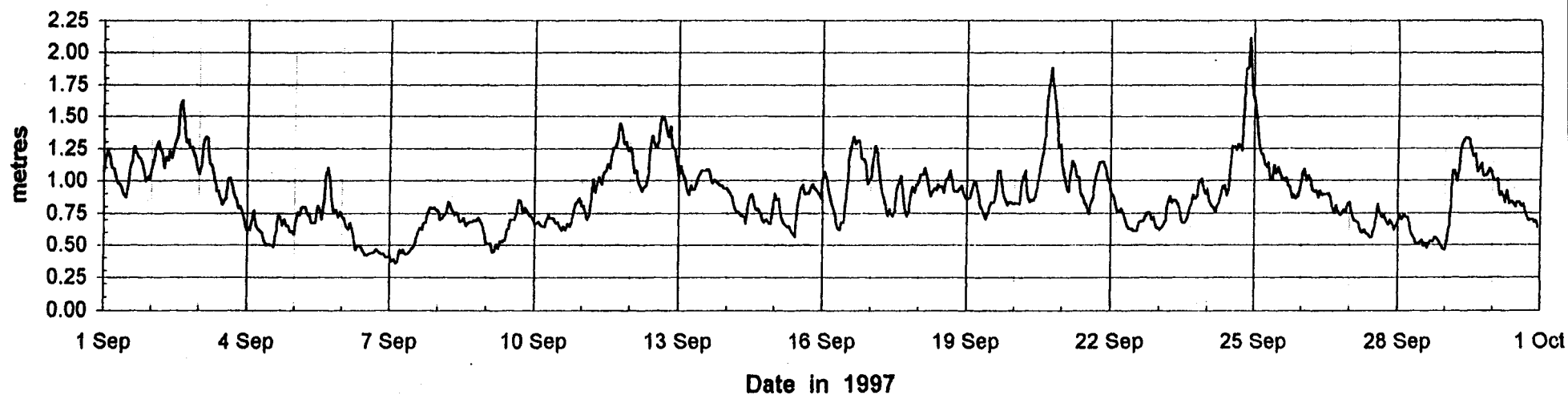


Significant Wave Period - Total Wave

PORT OF BRISBANE Beacon NW1

September 1997

Significant Wave Height - Total Wave



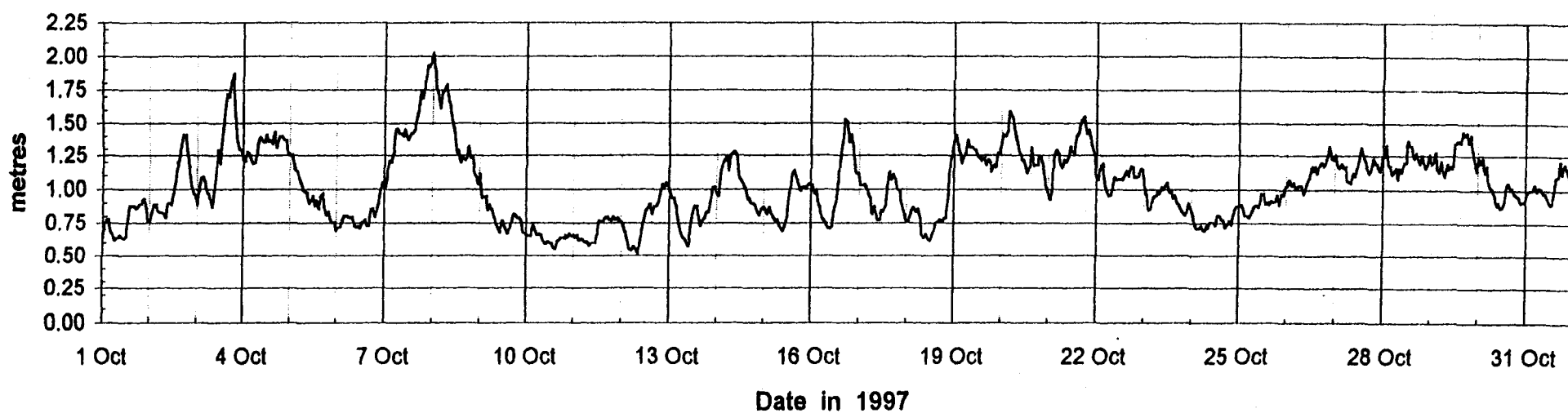
Significant Wave Period - Total Wave

PORT OF BRISBANE

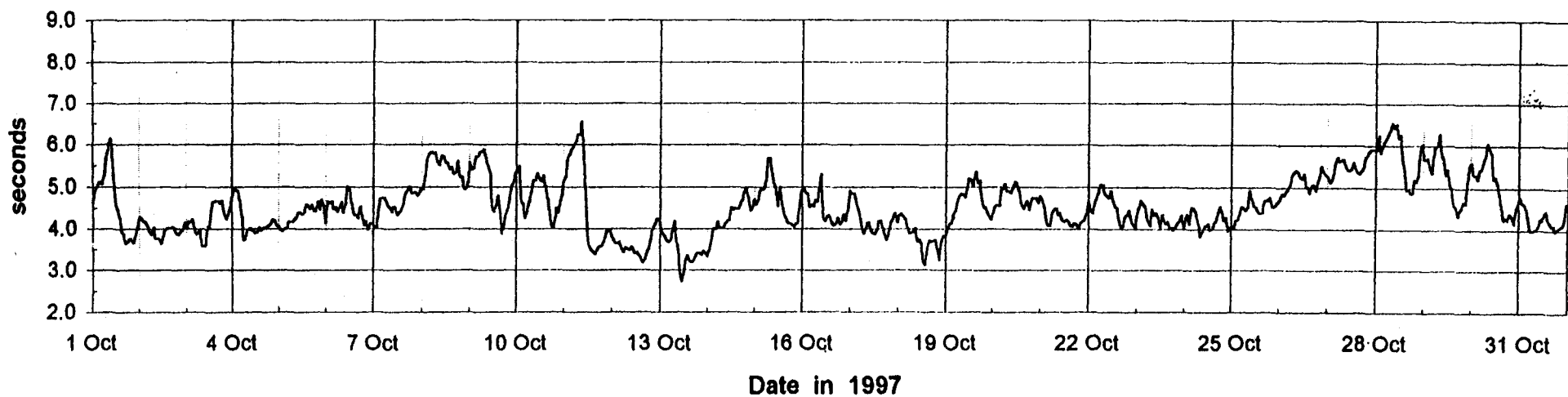
Beacon NW1

October 97

Significant Wave Height - Total Wave



08



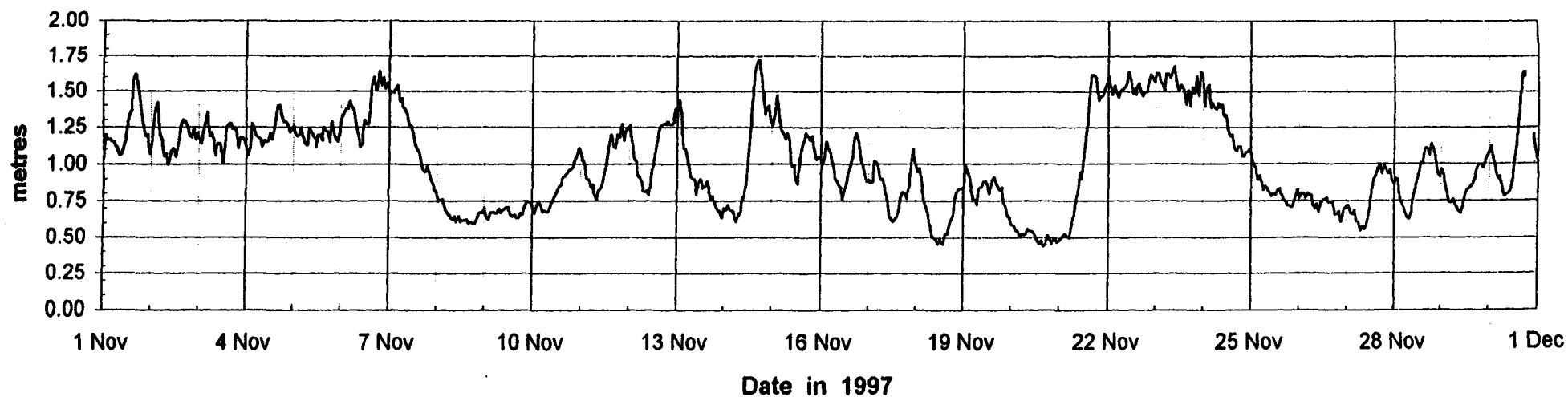
Significant Wave Period - Total Wave

PORT OF BRISBANE

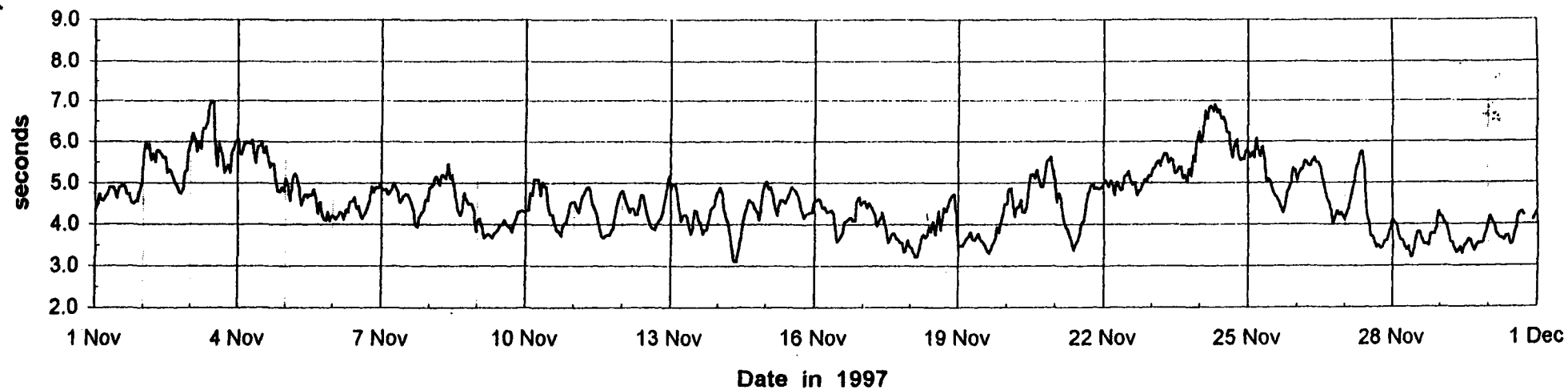
Beacon NW1

November 97

Significant Wave Height - Total Wave



81



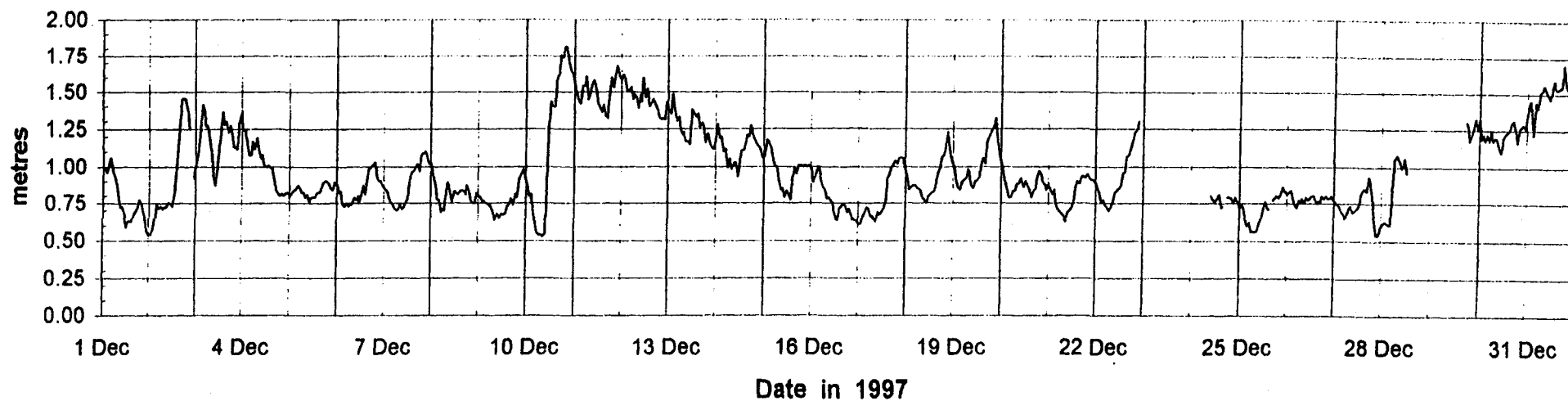
Significant Wave Period - Total Wave

PORT OF BRISBANE

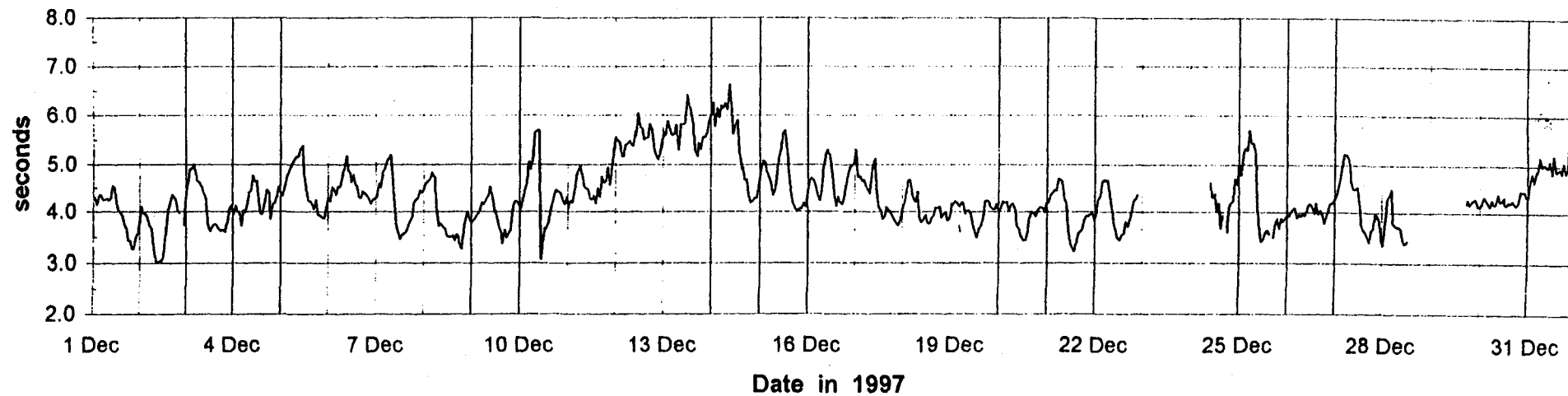
Beacon NW1

December 97

Significant Wave Height - Total Wave



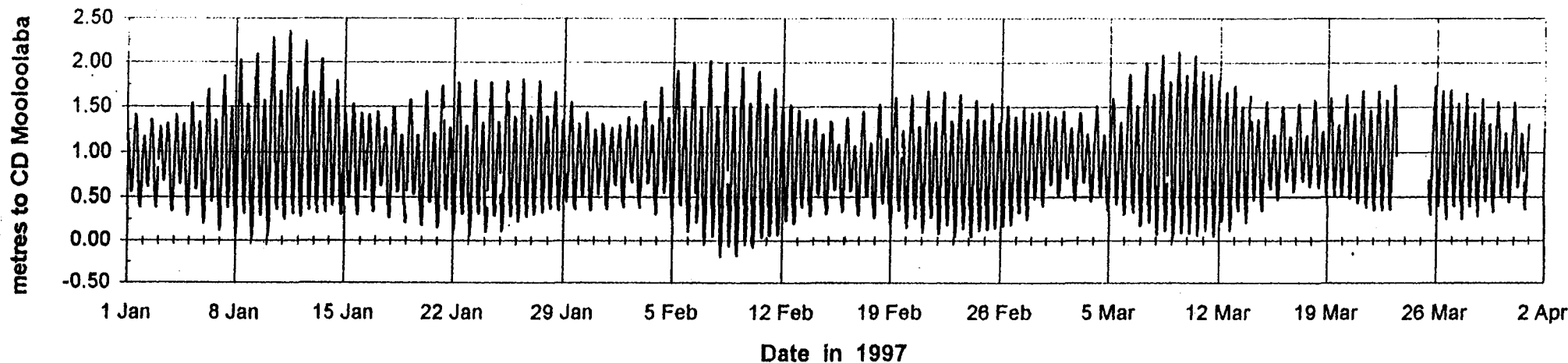
82



Significant Wave Period - Total Wave

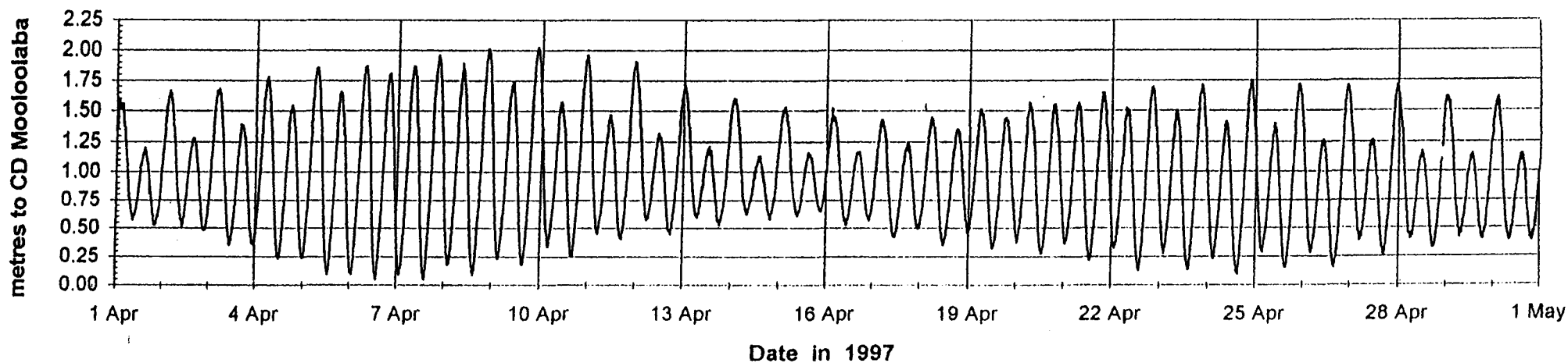
PORT OF BRISBANE Beacons NW1 & NW4

Recorded Tide - Beacon NW1



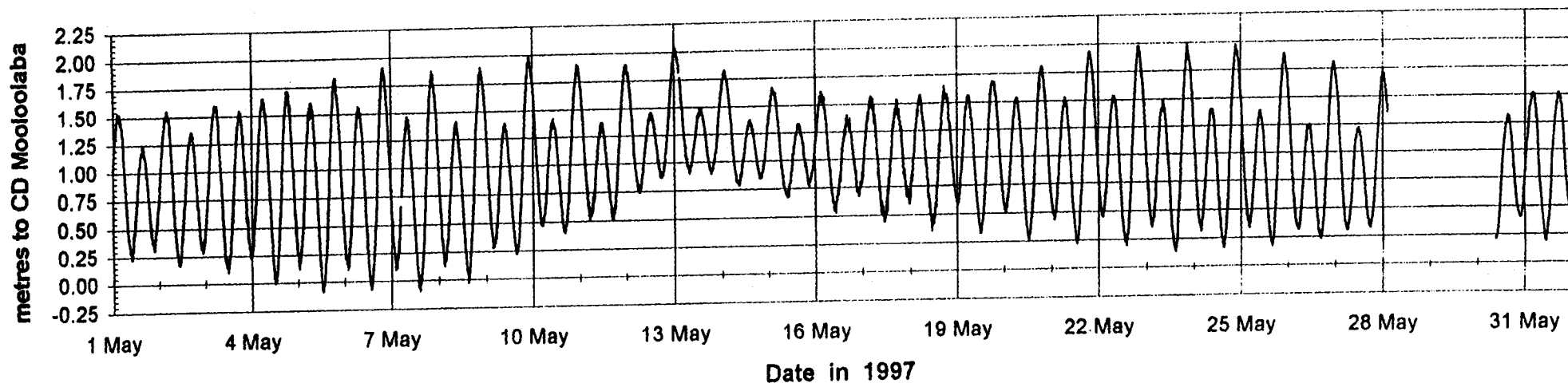
PORT OF BRISBANE Beacons NW1 & NW4

Recorded Tide - Beacon NW1



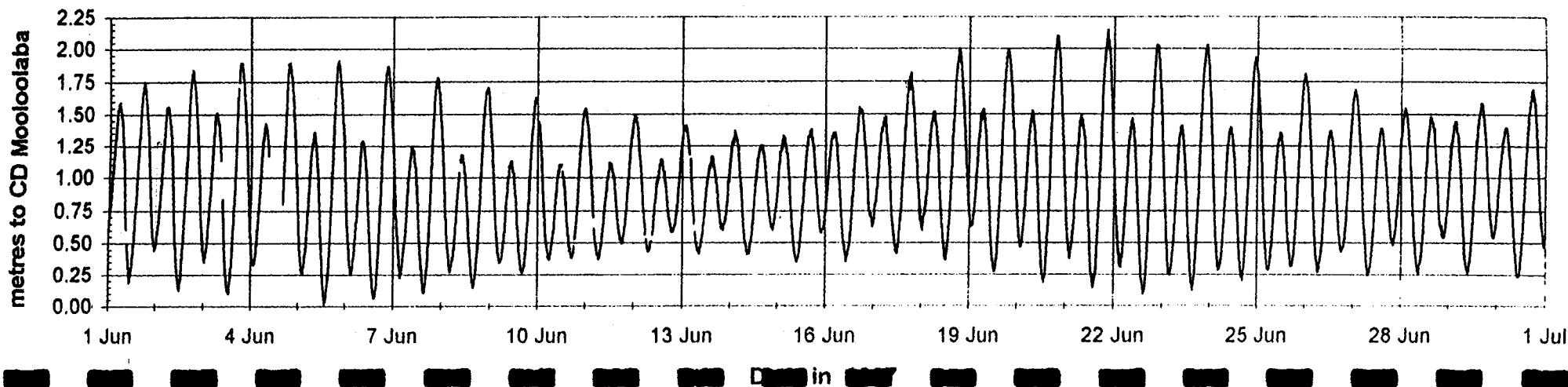
PORT OF BRISBANE Beacons NW1 & NW4

Recorded Tide - Beacon NW1



PORT OF BRISBANE Beacons NW1 & NW4

Recorded Tide - Beacon NW1

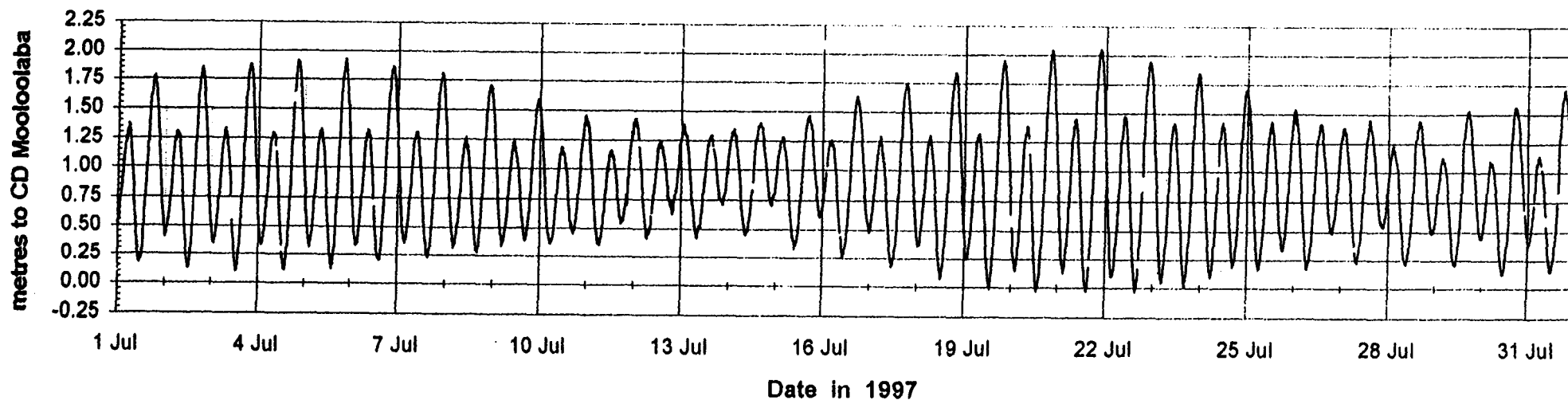


PORT OF BRISBANE

Beacons NW1 & NW4

July 97

Recorded Tide - Beacon NW1



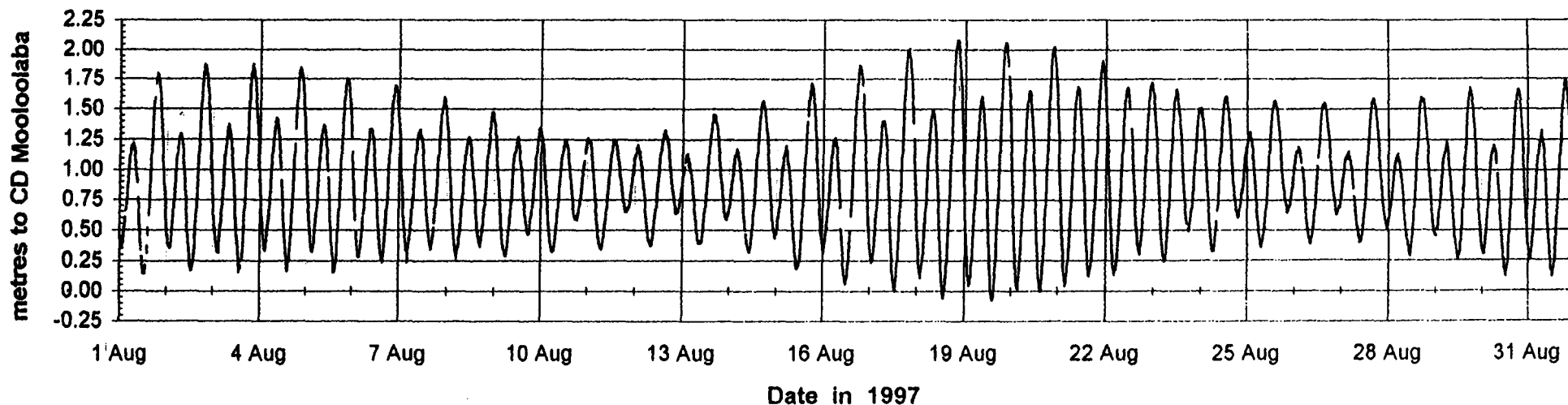
98

PORT OF BRISBANE

Beacons NW1 & NW4

August 97

Recorded Tide - Beacon NW1

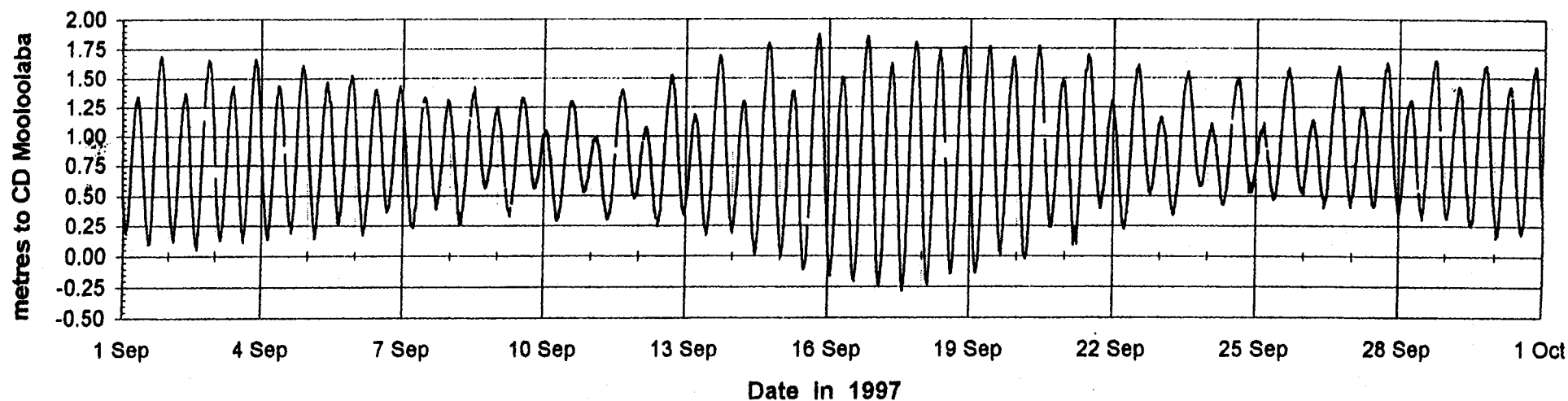


PORT OF BRISBANE

Beacons NW1 & NW4

September 97

Recorded Tide - Beacon NW1

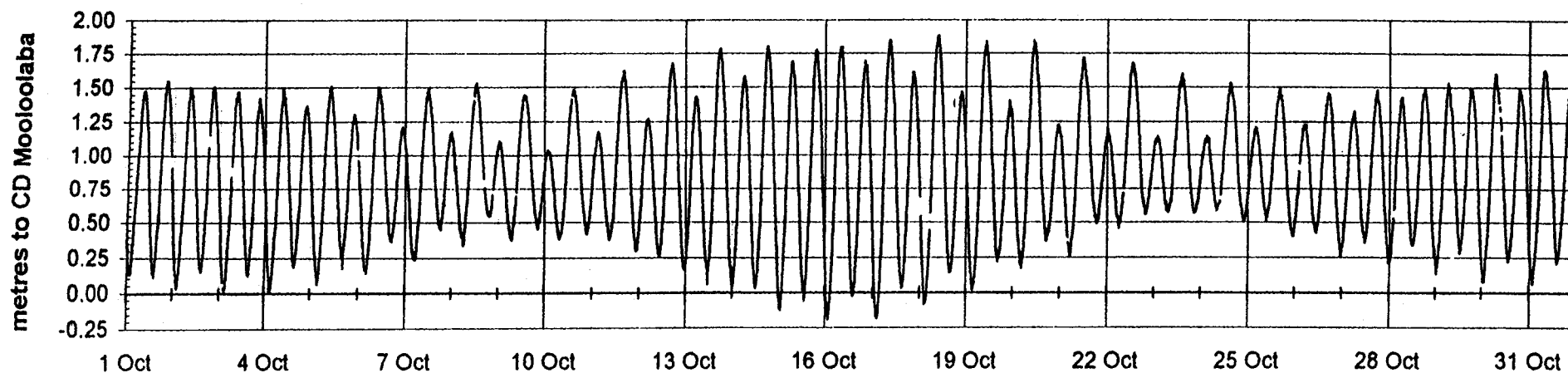


PORT OF BRISBANE

Beacons NW1 & NW4

October 97

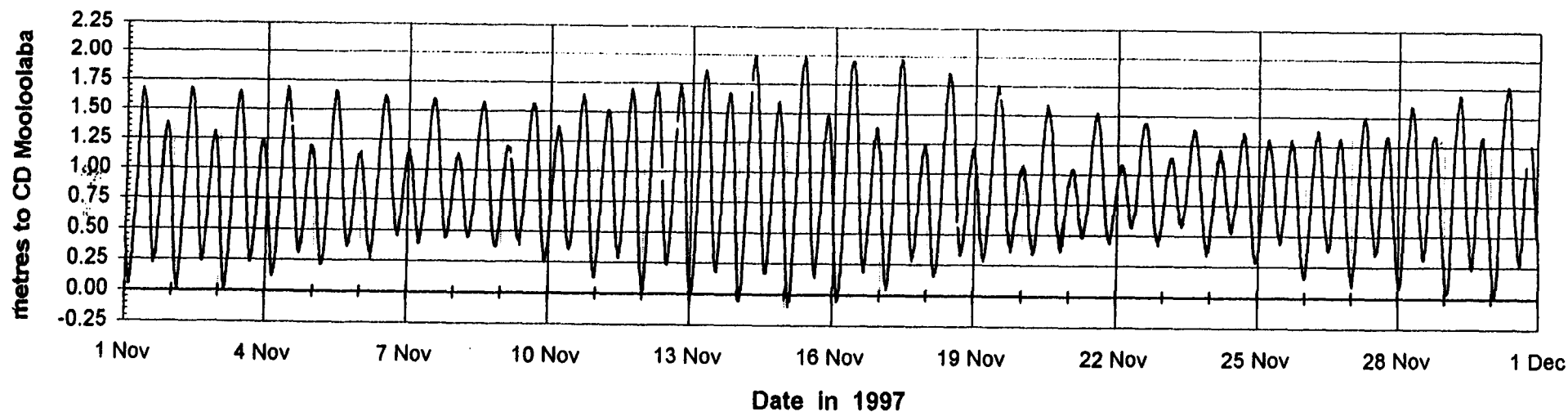
Recorded Tide - Beacon NW1



PORT OF BRISBANE Beacons NW1 & NW4

November 97

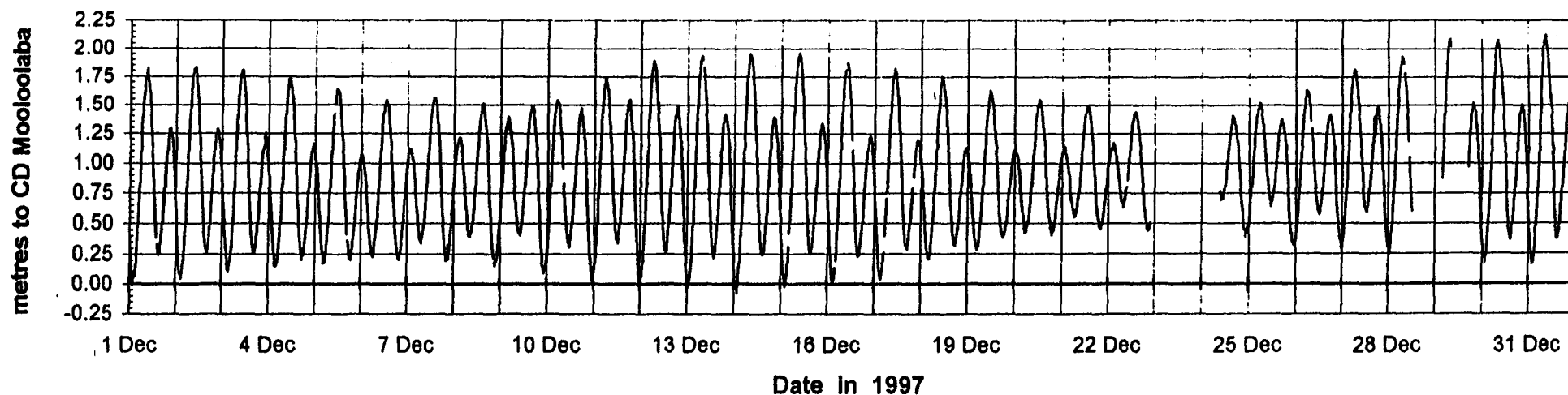
Recorded Tide - Beacon NW1



PORT OF BRISBANE Beacons NW1 & NW4

December 97

Recorded Tide - Beacon NW1



7. LIST OF SYMBOLS

AHD	Australian Height Datum
av. WT	Average watertable level along the transect
C	Dissolved salts concentration of sample
Cs	Dissolved salts concentration of sea water
C/Cs	Ratio of salt concentration of sample to that of local sea water
DDL	Estimated incremental displacement thickness of freshwater lens for each sample
DL	Estimated total depth of freshwater lens defined by sum of DDL values.
EST	Eastern Standard Time
extrap	value extrapolated to the nominal depth of the impermeable layer -1.6m.
fresh	Estimated position of salt/fresh interface derived from DL calculations relative to AHD.

G\D The Glassy/Dry boundary: The seaward extreme of the seepage face exit point over a few wave periods. Defined by the interface between dull looking sand and highly reflective glassy looking sand. It defines the intersection between the instantaneous watertable and the beachface.

H_{oms} Offshore Root Mean Squared Wave Height in metres

h depth of water table to impermeable layer

R.L. Runup Limit: The highest point on the beachface reached by any wave in-between two sets of watertable measurements.

SWL Sea Water Level: the water level at the deepest ocean side well that was not overtopped.

SL Shoreline: is defined as the intersection between the mean water surface and the sand surface found by interpolation between piezometer wells.

sand level of sand surface surveyed along the transect

T_s Period of Significant Waves in seconds

TDS or Cond Total Dissolved Salts concentration (g/L) also defined as conductivity.

X or XB Horizontal distance from current benchmark. Landward direction positive.

Zwt-Z depth of sample below top of watertable

8. ACKNOWLEDGEMENTS

Thanks must go to Bribie and Moreton Island National Parks and Wildlife for allowing special access to the measuring sites, the Bureau of Meteorology for their rainfall data and The Port of Brisbane Corporation for tide and wave data. The writers are also grateful to the many volunteers who assisted in the data collection process.

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