

OCEANOGRAPHICAL OBSERVATIONS
IN THE INDIAN OCEAN IN 1966
H.M.A.S. *DIAMANTINA*
Cruise Dm1/66

OCEANOGRAPHICAL CRUISE REPORT
NO. 53

DIVISION OF FISHERIES AND OCEANOGRAPHY
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL
RESEARCH ORGANIZATION, AUSTRALIA 1969

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AUSTRALIA

MELBOURNE, 1969

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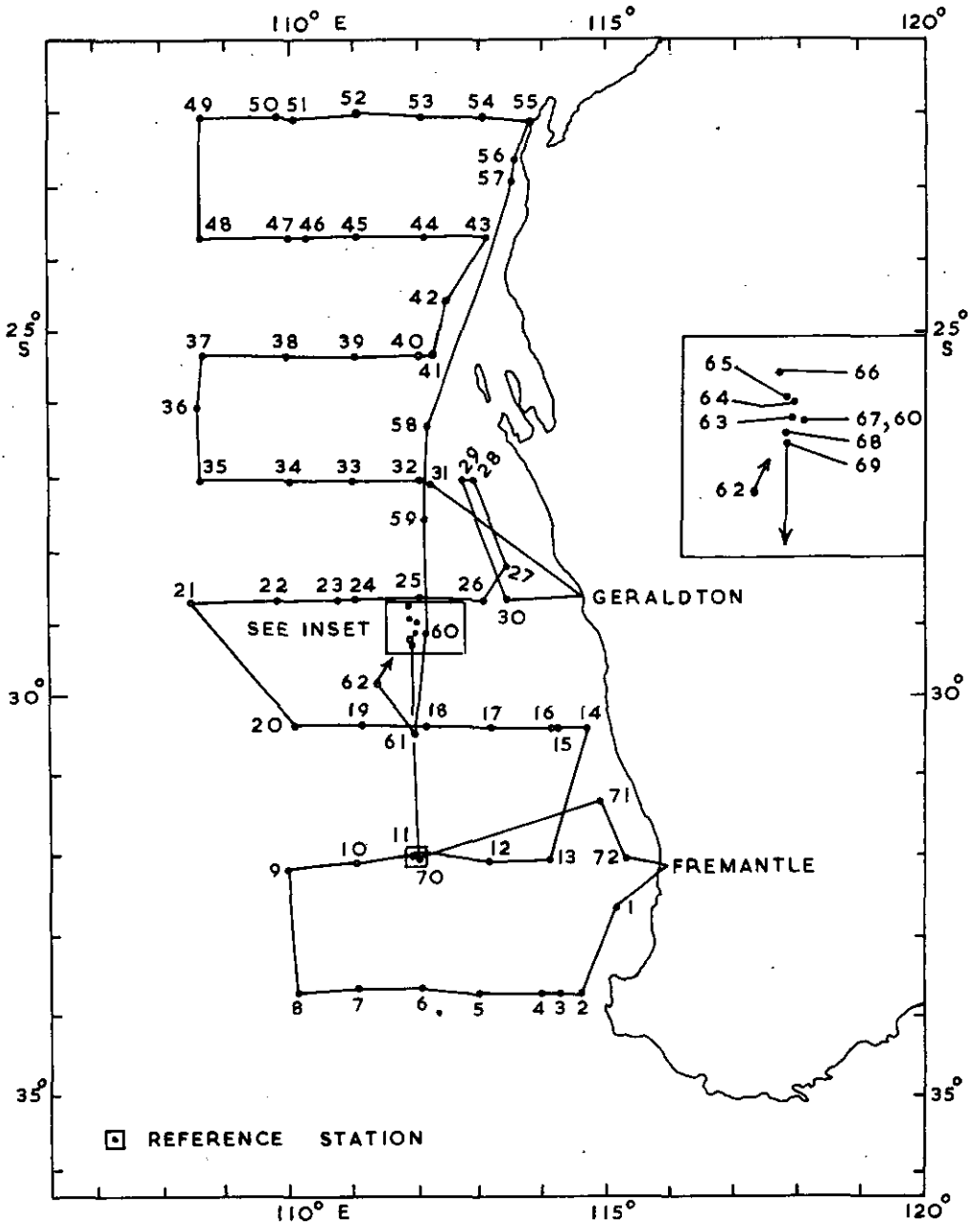


Fig. 1. Track chart Cruise Dm, 1/66

OCEANOGRAPHICAL CRUISE REPORT

No. 53

Oceanographical Observations in the Indian Ocean in 1966

H.M.A.S. Diamantina

Cruise Dm1/66

March 3-21, 1966

I. INTRODUCTION

This report records the data collected during the first cruise in 1966 of H.M.A.S. Diamantina, Royal Australian Navy oceanographical frigate.

Objectives

To study the distribution and growth of the larval stages of the western crayfish (Panulirus longipes cygnus).

To examine the hydrological conditions and circulation of the water masses off the Western Australian coast.

Itinerary

The cruise began at Fremantle on March 3 and worked a series of east-west and north-south sections north to Geraldton. From Geraldton a further series of sections was worked to the north, and then a series of stations south to Fremantle; the cruise ended at Fremantle on March 21 (Fig. 1).

Scientific Personnel

T.R. Cowper (Cruise Leader)

F.N. Davies

N. Dyson

J.L. Klye

L.R. Thomas

Hydrological samples were collected and salinity, oxygen, and phosphate analyses were done in the ship's laboratory by F.N. Davies, N. Dyson, and J.L. Klye. Nitrate analyses were done at Cronulla by J. Klye. Zooplankton and micronekton samples were collected by L.R. Thomas.

The data were processed under the direction of W. Hedge, using computer programmes designed by A.D. Crooks. The track

chart was prepared for publication by R. Breach.

II. WORK ACCOMPLISHED

Seventy-two stations were worked (Dm1/1/66-Dm1/72/66). Surface and subsurface hydrology samples were collected at 58 stations. Bathythermograph casts were made at 46 stations. Zooplankton samples were collected at 24 stations, and micronekton samples at 20 stations.

TABLE 1

WORK DONE AT EACH STATION

Stn No.	BT	Hydrology Surface to Depth (m)	Zooplankton	Micronekton
1		50		
2		175		
3			+	+
4	+	1300		
5	+	1500		
6	+	1500		
7	+	1500		
8	+	1500	+	+
9	+	1500		
10	+	1500		
11	+	4900	+	+
12	+	1500		
13	+	1500		
14		170		
15			+	+
16	+	1500		
17	+	1500		
18	+	1500		
19	+	1500		
20	+	1500	+	+
21	+	1500		
22	+	1500		
23			+	+
24	+	1500		
25	+	1500		
26	+	1300		
27		175		
28		175		
29	+		+	+
30		175		

Stn No.	BT	Hydrology Surface to Depth (m)	Zooplankton	Micronekton
31			+	
32	+	900		
33	+	1500		
34	+	1500		
35	+	1500		
36			+	+
37	+	1500		
38	+	1500		
39	+	1500		
40	+	600	+	+
41		175		
42		150		
43		175		
44	+	1200		
45	+	1500		
46			+	+
47	+	1500		
48	+	1500		
49	+	1500		
50			+	
51	+	1500		
52	+	1500		
53	+	1500		
54	+	1400		
55		175		
56			+	+
57		175		
58	+	500		
59			+	
60			+	
61			+	+
62			+	+
63			+	+
64	+	500	+	+
65	+	1500	+	+
66	+	1500	+	+
67	+	1500	+	+
68	+	1500	+	+
69	+	1500	+	+
70	+	4500		
71		170		
72		175		

BT Bathythermograms

III. METHODS OF COLLECTION AND ANALYSIS OF SAMPLES

1. Physics

Temperature.—Water temperatures were taken with deep-sea reversing thermometers: protected thermometers with a range of -2° to 30°C , and unprotected thermometers with a range of either -2° to 30°C or -4° to 60°C . Temperatures are considered accurate to ± 0.03 degC.

Bathythermograms.—A 900-ft bathythermograph was used at the stations indicated in Table 1. Slides were digitized according to the method of the U.S. National Oceanographic Data Center (1964), and the results were transferred to punched cards.

Thermometric Depth.—Depth calculations were made by the method described by Pollak (1950) and are considered accurate to ± 15 m at depths greater than 1000 m, and to 1% at depths less than 1000 m.

Sigma-t.—Sigma-t values were computed from temperature and salinity values using the equations of Knudsen (La Fond 1951).

2. Chemistry

Salinity.—Salinity was measured on board with an inductive salinometer (Brown and Hamon 1961).

Dissolved Oxygen.—A version of the standard Winkler method was used to determine the amount of dissolved oxygen in the sea-water samples. The version used is a modification of that described by Thompson and Robinson (1939) and differs in some respects from the revision by Jacobsen, Robinson, and Thompson (1950). Potassium iodate was used as the iodometric standard, and the reagents necessary to fix the oxygen in solution were used at different concentrations (Rochford 1963).

Saturation values were computed using the simpler of the equations given by Richards and Corwin (1956) -

$$\text{O}_2 (\% \text{ Satn.}) = \frac{\text{O}_2 (\text{ml/l}) \times (33.5 + T^{\circ}\text{C}) \times 100}{332.4 - (1.854 \times S\text{‰})} .$$

Inorganic Phosphate.—The method of Atkins (1923) was used with 1 ml molybdate reagent (300 ml 10% w/v ammonium molybdate and 100 ml 50% v/v sulphuric acid) and 0.1 ml 1% w/v stannous chloride diluted afresh from a 40% stock solution in hydro-

chloric acid, which was kept under paraffin. The reagents were dispensed automatically by a piston dispenser.

Standard phosphate solutions were made up in distilled water. At air temperatures less than 25°C, analyses were carried out in batches of 10; readings were begun within 10 min of adding reagents, and completed within 10 min. At air temperatures greater than 25°C, batches of 6 were analysed; readings were begun within 5 min of adding reagents, and completed within 7 min. Each batch was compared with a distilled water blank and a 0.65 µg-atom/l standard in a Hilger Spekker absorptiometer, using 4 cm cells and Ilford 608 filters. Each day a complete calibration was made using standards up to 3.25 µg-atom/l. Results are given as µg-atom/l with no correction for salt error and are precise to +10% for values less than 0.5 µg-atom/l and ±5% for higher values. To correct for salt effects the results given should be multiplied by 1.15.

Nitrate.—After collection, water samples were stored in 50 ml plastic bottles and preserved with 0.5 ml of saturated HgCl₂. Nitrate was determined at Cronulla by the strychnidine method (Rochford 1947). The reagent was prepared by adding 0.64 g of strychnidine to a litre of nitrate-free sulphuric acid. Five ml of this reagent were added, without agitation, to 5 ml of sea-water or standard nitrate solution previously cooled to approx. 5°C. The standards were made up in artificial sea-water preserved with 10 ml/l of saturated HgCl₂. The standards and samples were allowed to stand undisturbed for 18 hr to develop the colour. The solutions were read in a Unicam SP 600 spectrophotometer at a wavelength of 530 nm using a 5 mm cell. Solutions with an absorbance greater than that of the standard corresponding to 7.1 µg-atom/l were diluted with a mixture of equal volumes of artificial sea-water and sulphuric acid before reading. Results are given in µg-atom/l.

3. Zooplankton

Two identical N70 plankton nets were towed parallel to the vessel, from a boom mounted in the forward part of the vessel with one net at the surface and the other weighted to operate at 2-5 m below the surface. After 30 min of fishing, the plankton nets were lifted, the contents washed down to the buckets using a salt-water hose, then the buckets replaced and the nets released to take a second haul of 30 min duration. The ship's speed was maintained at 2½-3 kt throughout these operations. No flowmeters were used.

Samples were concentrated in the ship's laboratory and stored in neutralised 10% formalin in plastic bottles. At Perth,

samples were examined for crayfish larvae.

4. Micronekton

Horizontal Tows.—Horizontal tows were made for 1 hr with a pair of 5-ft Isaacs-Kidd midwater trawls, scaled down versions of the 6-ft trawl (King and Iversen 1962; Aron 1960), attached to a single wire, one net being set to fish at half the depth of the other.

No flowmeters were used; both nets were fitted with a depth recorder (Hamon, Tranter, and Heron 1963). The nets were streamed astern while the ship's speed was $2\frac{1}{2}$ -3 kt. Speed was then increased to 5 kt and the nets lowered as rapidly as possible, winch speed being regulated to avoid over-running the wire. The amount of wire paid out was varied according to the depths at which samples were desired. The winch was stopped when the required length of wire had been paid out. After towing the trawl for 55 min at $2\frac{1}{2}$ -3 kt, a messenger was dropped which released the bridle of the upper midwater trawl and also released a second messenger to the lower net, and after a further 5 min the net was winched aboard.

Collection of Samples.—Each net was washed from outside into the bucket, which was then removed from the net. Each net was checked for organisms caught in the meshes (e.g. leptocephali), and these were removed. Samples were stored in neutralized 10% formalin in plastic bottles; large organisms were stored separately. At Perth, samples were examined for crayfish larvae.

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IV. DATA

Hydrology data were processed in a C.D.C. 3600 Computer. An explanation of headings used is given at the beginning of the relevant part.

DATA

PART 1

HYDROLOGY

SURFACE SAMPLES

EXPLANATION OF HEADINGS

Parts 1 and 2Hydrology

STATION	Gives the station identification. For example, Dm1/1/66 signifies the 1st station worked by <u>Diamantina</u> in 1966, on her 1st cruise for that year
DATE	Given as day/month/year
TIME	Given in Zone Time, and is the time at the beginning of the first cast. The code letter for the time zone follows the time. Zone Time throughout the cruise was Western Australian Standard Time, GMT +8 hr, Code H
LATITUDE LONGITUDE	Given in degrees and minutes
SONIC DEPTH	Given in metres, measured at standard sound velocity of 800 fm (1463 m) per second
AIR TEMP. WET DRY	Air temperatures recorded from wet and dry bulb thermometers in °C
WIND DIR. SP.	Wind direction and speed are coded using Tables 8 and 9 in U.S. Navy Hydrogr. Office (1955)
ANEM. HEIGHT	The average height of the anemometer above sea level, given in metres
CLOUD TYPE AMT.	Cloud type and amount are coded using Tables 2 and 3 in U.S. Navy Hydrogr. Office (1955)
WEA.	Weather is coded using Table 1 in U.S. Navy Hydrogr. Office (1955)
VIS.	Visibility is coded using Table 4 in U.S. Navy Hydrogr. Office (1955)
SEA DIR. AMT.	Sea direction and amount are coded using Tables 5 and 8 in U.S. Navy Hydrogr. Office (1955)

SWELL DIR. AMT.	Sea swell direction and amount are coded using Tables 6 and 8 in U.S. Navy Hydrogr. Office (1955)
BAROM. or ATMOS. PRESSURE	Atmospheric pressure given in millibars
WIRE ANGLES CAST1 CAST2 CAST3	Wire angles are measured at the surface and expressed in degrees for each cast
CAST	Gives the cast number corresponding to the wire angle as shown
DEPTH	Sampling depth given in metres
TEMP.	Sea temperatures recorded in °C
SALINITY	Given in parts per thousand
SIGMA-T	Sigma-t to 2 decimal places
OXYGEN	Given in ml/l
OXYGEN % SAT.	Oxygen percentage saturation
INORG. P	Inorganic phosphorus given in µg-atom P/l
TOTAL P	Total phosphorus given in µg-atom P/l
NITRATE	Given in µg-atom N/l

*, ***, or a blank indicate no data available

CRUISE STATION NUMBER	YR.	MTH.	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND		SEA	SWELL	WEA.	VIS.	BAROM.		
									DN.	AMT.						DN.	AMT.
1	66	3	3	1405	H 32	44 S 115	08 E	21.8	35.84	17	6	17	4	19	1	18	1010.2
1	66	3	3	1930	H 33	37 S 114	31 E	21.8	35.90	18	5	18	3	22	1	19	960.1
1	66	3	3	2100	H 33	38 S 114	12 E			16	5	16	3	21	1	20	1030.2
1	66	3	4	0001	H 33	38 S 113	58 E	21.0	35.92	14	4	14	3	25	4	19	950.1
1	66	3	4	0511	H 33	38 S 112	00 E	20.2	35.87	14	4	13	3	20	1	21	950.3
1	66	3	4	1030	H 33	36 S 112	00 E	19.4	35.77	19	3	19	3	24	1	19	960.3
1	66	3	4	1530	H 33	36 S 111	00 E	19.9	35.90	16	4	16	3	23	4	18	980.2
1	66	3	4	2000	H 33	39 S 110	06 E	19.6	35.91	03	2	21	1	21	1	20	1040.0
1	66	3	5	0530	H 32	11 S 109	59 E	20.5	35.94	19	2	19	2	13	1	16	960.1
1	66	3	5	1040	H 32	03 S 111	00 E	22.4	35.93	17	3	17	3	14	1	15	1020.3
1	66	3	5	1500	H 31	56 S 111	46 E	21.3	35.93	24	2	18	2	18	1	12	950.1
1	66	3	6	0530	H 32	04 S 113	03 E	21.4	35.92	20	5	19	5	21	1	14	990.2
1	66	3	6	1012	H 32	00 S 114	02 E	22.0	35.85	25	5	24	3	26	1	15	960.2
1	66	3	6	1910	H 30	22 S 114	36 E	22.7	35.67	17	3	17	2	23	1	18	1020.1
1	66	3	6	2105	H 30	22 S 114	11 E			17	3	17	2	23	1	18	990.1
1	66	3	6	2325	H 30	22 S 114	04 E	22.2	35.98	17	3	17	2	23	1	18	1020.1
1	66	3	7	0427	H 30	22 S 113	09 E	22.7	35.76	19	4	18	2	18	1	17	1040.2
1	66	3	7	0917	H 30	22 S 112	13 E	21.3	35.92	18	4	19	3	22	1	20	1030.1
1	66	3	7	1513	H 30	22 S 111	05 E	22.0	35.87	16	4	19	2	19	1	19	1040.2
1	66	3	7	2030	H 30	22 S 110	02 E	21.8	35.86	17	4	18	3	23	1	20	1030.2
1	66	3	8	0830	H 28	38 S 108	22 E	20.8	35.94	13	4	13	3	23	4	20	1031.6
1	66	3	8	1630	H 28	38 S 109	47 E	22.3	35.90	14	6	14	3	14	1	16	980.3
1	66	3	8	2100	H 28	38 S 110	43 E			16	6	16	4	99	4	16	990.1
1	66	3	8	2350	H 28	38 S 111	80 E	23.2	35.69	14	7	14	3	18	1	15	1010.1
1	66	3	9	0512	H 28	36 S 111	59 E	22.6	35.84	14	6	14	3	14	1	14	1000.2
1	66	3	9	1030	H 28	40 S 113	00 E	23.3	35.64	16	4	16	3	18	1	13	1020.2
1	66	3	9	1355	H 28	11 S 113	18 E	23.2	35.69	21	3	21	2	21	1	12	950.2
1	66	3	9	2000	H 26	58 S 112	50 E	22.7	35.72	19	3	18	3	19	1	14	1010.3
1	66	3	9	2050	H 26	58 S 112	43 E			18	4	20	3	20	1	12	960.3
1	66	3	10	0650	H 28	37 S 113	27 E	22.2	35.70	16	2	16	2	19	1	14	980.2
1	66	3	11	2230	H 27	07 S 112	12 E			19	3	19	2	21	1	15	1020.2
1	66	3	12	0000	H 27	00 S 112	00 E	23.3	35.69	17	3	17	3	21	1	15	1020.2
1	66	3	12	0455	H 27	00 S 110	55 E	23.6	35.59	17	2	17	2	20	1	15	1040.2
1	66	3	13	0840	H 27	00 S 110	00 E	23.4	35.55	19	3	19	2	23	4	15	960.0
1	66	3	12	1615	H 27	00 S 108	36 E	21.6	35.83	17	3	19	0	19	1	16	990.2
1	66	3	13	2130	H 26	00 S 108	32 E			15	2	15	2	22	1	16	1010.2
1	66	3	13	0230	H 25	12 S 108	38 E	23.9	35.35	15	2	15	2	22	1	16	980.2
1	66	3	13	0900	H 25	13 S 109	55 E	23.4	35.51	14	5	14	3	16	1	15	980.2
1	66	3	13	1420	H 25	14 S 111	00 E	24.6	35.55	15	5	15	3	18	1	15	980.1
1	66	3	13	1930	H 25	16 S 111	97 E	24.3	35.50	18	4	18	3	18	1	14	1020.6

CRUISE NUMBER	STATION NUMBER	YR.	MTH.	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	SEA DN.	SWELL DN.	VIS.	WEA.	BAROM.	
																AMT.
1	41	66	3	13	2315	H 25	16 S 112	14 E 23.4	35.51	16	3	18	3	12	6	980.6
1	42	66	3	14	0300	H 24	30 S 112	27 E 24.4	35.45	17	3	18	3	13	8	980.1
1	43	66	3	14	0800	H 23	40 S 113	02 E 23.5	35.33	14	4	17	3	15	8	1000.1
1	44	66	3	14	1230	H 23	39 S 112	01 E 24.3	35.36	21	3	17	3	16	8	980.6
1	45	66	3	14	1745	H 23	38 S 111	00 E 24.8	35.53	15	6	17	3	14	8	990.2
1	46	66	3	14	2100	H 23	36 S 110	15 E								
1	47	66	3	14	2340	H 23	36 S 110	00 E 24.7	35.45	14	4	17	4	16	8	1010.0
1	48	66	3	15	0620	H 23	37 S 108	35 E 24.4	35.66	17	6	14	3	13	8	
1	49	66	3	15	1435	H 22	05 S 108	33 E 25.2	35.51	13	3	13	1	13	8	1040.2
1	50	66	3	15	2100	H 22	01 S 109	48 E		15	5	15	3	16	8	1030.2
1	51	66	3	15	2230	H 22	00 S 110	01 E 25.0	35.51	16	4	16	3	14	8	960.2
1	52	66	3	16	0350	H 21	57 S 111	00 E 26.6	35.35	16	4	16	3	13	8	1040.0
1	53	66	3	16	0900	H 22	01 S 112	00 E 26.3	35.35	15	4	15	3	13	8	1020.0
1	54	66	3	16	1430	H 22	05 S 113	00 E 26.4	35.36	10	2	20	2	11	8	960.2
1	55	66	3	16	1850	H 22	07 S 113	48 E 27.3	35.62	00	0	24	2	10	8	1010.1
1	56	66	3	16	2100	H 22	34 S 113	32 E		19	2	18	0	12	8	960.0
1	57	66	3	17	0015	H 22	50 S 113	28 E 26.6	35.38	20	2	21	1	12	8	960.2
1	58	66	3	17	1445	H 26	11 S 112	09 E 24.1	35.62	20	3	20	2	12	8	1042.0
1	59	66	3	17	2100	H 27	28 S 112	05 E		18	6	18	1	14	7	1030.4
1	60	66	3	18	0430	H 29	03 S 112	03 E		17	6	18	1	13	7	950.2
1	61	66	3	18	1100	H 30	23 S 111	58 E		17	4	17	3	18	8	1040.2
1	62	66	3	18	1500	H 29	47 S 111	22 E		18	4	18	3	16	8	1020.2
1	63	66	3	18	1930	H 29	02 S 111	58 E		15	4	15	2	16	8	960.1
1	64	66	3	18	2100	H 28	58 S 111	59 E 22.5	35.85	15	5	15	3	17	8	990.3
1	65	66	3	19	0145	H 28	56 S 111	56 E 22.5	35.84	17	6	17	3	14	5	990.2
1	66	66	3	19	0730	H 28	38 S 111	42 E 22.4	35.86	14	5	18	3	14	8	950.3
1	67	66	3	19	1330	H 29	07 S 112	07 E 22.6	35.76	15	5	15	3	12	8	1010.2
1	68	66	3	19	1930	H 29	14 S 111	52 E 22.6	35.78	15	5	15	3	13	7	1020.2
1	69	66	3	20	0200	H 29	17 S 111	50 E 22.8	35.78	15	5	15	3	11	8	1010.3
1	70	66	3	20	1640	H 32	00 S 111	48 E 20.8	35.96	15	6	15	3	14	8	960.2
1	71	66	3	21	0855	H 31	15 S 114	58 E 22.2	35.75	16	5	16	1	12	8	980.2
1	72	66	3	21	1227	H 32	00 S 115	18 E 22.1	35.77	14	2	14	2	14	8	1041.4

DATA
PART 2
HYDROLOGY
DEEP STATIONS

STATION		DATE	TIME	LATITUDE		LONGITUDE								
LM 1/		3/ 3/66	1405 H	32 44 S	115 08 E									
SONIC DEPTH	AIR TEMP.	WIND DIR. SP.	ANEM. HEIGHT	CLOUD TYPE	AMT.	VIS. DIR. AMT.	SEA SWELL DIR. AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1 CAST2 CAST3					
05	14.9	21.0	17	6	15	1	7	1	19	1	1018.1	0	*	*
CAST DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INDRG. P	TOTAL P	NITRATE						
1	0	21.77	24.94	5.07	101	0.12	***	0.2						
1	10	21.74	24.95	4.99	100	0.12	***	0.1						
1	20	21.73	24.95	5.00	100	0.13	***	0.1						
1	30	21.73	24.95	5.01	100	0.14	***	0.1						
1	40	20.77	25.19	4.97	96	0.14	***	0.1						
1	50	20.72	25.21	4.92	97	0.14	***	0.1						

STATION	DATE	TIME	LATITUDE		LONGITUDE				
DM 1/	2/66	1930 H	33	37 S	114	31 E			
SONIC AIR TEMP, WIND ANEM. CLOUD SWELL ATMOS. WIRE ANGLES									
DEPTH	WET DRY	DIR. SP.	DIR. AMT.	SEA DIR. AMT.	DIR. AMT.	PRESSURE			
183	19.4	18.3	18	5	7	1A 3			
						22 1			
						1032.6			
						10			
						*			
						*			
CAST DEPTH TEMP. SALINITY SIGMA-T OXYGEN OXYGEN % SAT. INCRS. P TOTAL P NITRATE									
1	0	21.83	35.902	24.97	5.02	101	0.09	***	0.1
1	10	21.83	35.902	24.97	5.01	100	0.09	***	0.1
1	20	21.82	35.899	24.97	5.01	100	0.09	***	0.1
1	30	21.82	35.899	24.97	5.02	101	0.09	***	0.0
1	40	21.62	35.901	25.03	5.02	100	0.10	***	0.1
1	50	21.39	35.913	25.10	5.07	101	0.10	***	0.1
1	75	17.87	35.762	25.90	5.44	101	0.17	***	0.1
1	100	16.85	35.768	26.16	5.24	95	0.28	***	0.1
1	125	15.93	35.714	26.33	5.29	94	0.28	***	0.3
1	150	15.37	35.657	26.41	5.17	91	0.31	***	1.0
1	175	15.12	35.627	26.45	5.19	91	0.35	***	1.4

STATION	DATE	TIME	LATITUDE	LONGITUDE					
DM 1/	4/66	0001 H	33 38 S	113 59 E					
SONIC AIR TEMP.	WIND	ANEM.	CLOUD	SEA	VIS.	DIR. AMT.	SWELL	ATMOS.	WIRE ANGLES
DEPTH WET DRY	DIR. SP.	HEIGHT	TYPE	AMT.	DIR. AMT.	DIR. AMT.	DIR. AMT.	PRESSURE	CAST1 CAST2 CAST3
1362 16;7 20;0	14 4	15	8 3	8	14 3	25 1	1019.5	5	* *
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	21.01	35.924	25.21	5.07	100	0.07	***	0.4
1	25	20.33	35.890	25.37	5.16	101	0.08	***	0.0
1	50	19.99	35.857	25.44	5.18	100	0.09	***	0.3
1	75	18.96	35.784	25.65	5.38	102	0.13	***	0.3
1	100	14.98	35.497	26.38	5.79	101	0.21	***	0.1
1	150	12.69	35.218	26.64	5.44	91	0.47	***	3.3
1	200	12.20	35.192	26.72	5.49	90	0.52	***	4.3
1	299	10.57	34.933	26.82	5.70	91	0.69	***	7.9
1	492	9.04	34.685	26.88	5.58	86	0.96	***	17.5
1	686	7.52	34.516	26.99	4.87	72	1.25	***	22.7
1	880	4.91	34.390	27.22	4.46	62	1.62	***	34.6
1	1073	3.89	34.468	27.40	3.71	51	1.87	***	36.1
1	1267	3.45	34.541	27.50	3.43	46	1.88	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE					
DM 1/	5/66	0511 H	33 38 S	112 58 E					
3566	17:8 19,4	4 15 4 5 7 13 3 20 1	1021,5	5 * *					
SONIC AIR TEMP,	WIND	ANEM,	CLOUD	WIRE ANGLES					
DEPTH WFT DRY	DIR. SP.	HEIGHT	TYPE AMT.	CAST1 CAST2 CAST3					
CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
1	0	20:18	35,870	25,40	5,19	101	0,11	***	0,4
1	24	20:15	35,868	25,40	5,20	101	0,09	***	0,4
1	48	20:14	35,867	25,40	5,19	101	0,11	***	0,3
1	73	16:25	35,873	26,15	5,80	104	0,20	***	0,1
1	97	14:35	35,462	26,49	5,59	96	0,27	***	0,3
1	145	12,98	35,313	26,66	5,43	91	0,46	***	3,3
1	194	12,08	35,169	26,72	5,21	90	0,56	***	5,2
1	291	10:61	34,941	26,82	5,65	90	0,75	***	8,2
1	484	9,07	34,696	26,89	5,60	86	1,03	***	13,0
1	678	7,79	34,541	26,97	4,99	74	1,32	***	19,9
1	872	5,28	34,400	27,19	4,20	63	1,73	***	27,7
1	1067	3:84	34,438	27,38	4,02	55	1,99	***	30,5
1	1263	3:26	34,507	27,49	3,71	50	2,02	***	33,9
1	1462	2:93	34,586	27,58	3,60	48	2,02	***	34,6

STATION

DM 1/ 6/66

DATE

4/ 3/66

TIME

1030 H

LATITUDE

33 36 S

LONGITUDE

112 00 E

SONIC AIR TEMP, WIND
DEPTH WET DRY DIR, SP.

2640 16.7 19.4 19 3

ANEM. HEIGHT CLOUD
TYPE AMT.

15 6 2

VIS. SEA
DIR, AMT.

8 19 3

SMELL DIR, AMT. PRESSURE
ATMOS.

24 1 1019.6

WIRE ANGLES
CAST1 CAST2 CAST3

0 * *

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	19.38	35.774	25.53	5.24	100	0.13	***	0.3
1	25	19.36	35.769	25.53	5.26	100	0.12	***	0.3
1	49	19.32	35.770	25.54	5.26	100	0.13	***	0.3
1	74	17.83	35.691	25.86	5.54	103	0.16	***	0.1
1	99	14.96	35.531	26.41	5.78	101	0.22	***	0.2
1	148	13.14	35.313	26.63	5.45	92	0.43	***	2.7
1	198	12.46	35.235	26.70	5.45	90	0.53	***	4.2
1	297	10.81	34.962	26.80	5.62	90	0.73	***	8.3
1	495	8.99	34.673	26.88	5.50	84	1.03	***	15.9
1	692	7.47	34.514	26.99	4.86	72	1.39	***	24.9
1	890	4.85	34.381	27.22	4.52	63	1.77	***	32.8
1	1088	3.76	34.434	27.38	4.02	55	1.94	***	36.9
1	1286	3.10	34.514	27.51	3.78	51	2.03	***	37.3
1	1483	2.86	34.590	27.59	3.65	49	2.03	***	36.1

STATION	DATE	TIME	LATITUDE	LONGITUDE					
DM 1/	7/66	1530 H	53 36 S	111 00 E					
SONIC AIR TEMP	WIND	ANEM.	CLOUD	SEA	ATMOS.	WIRE ANGLES			
DEPTH WFT DRY	DIR, SP.	HEIGHT	TYPE	DIR, AMT.	DIR, AMT., PRESSURE	CAST1 CAST2 CAST3			
2240	15.8 18.9	16 4	3 1	8 16 3	23 1 1018.8	10 * *			
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	19.90	35.901	25.49	5.19	100	0.12	***	0.4
1	25	19.83	35.896	25.51	5.20	100	0.10	***	0.2
1	49	19.51	35.883	25.58	5.23	100	0.11	***	0.1
1	74	18.44	35.794	25.79	5.41	102	0.13	***	0.2
1	99	15.34	35.637	26.41	5.38	95	0.27	***	0.6
1	148	13.85	35.443	26.58	5.43	93	0.36	***	1.8
1	197	12.60	35.250	26.69	5.48	91	0.49	***	4.1
1	296	10.71	34.956	26.81	5.63	90	0.69	***	8.5
1	494	9.19	34.714	26.88	5.63	87	0.93	***	14.4
1	691	7.68	34.531	26.97	4.96	74	1.25	***	22.0
1	888	4.93	34.395	27.23	4.45	62	1.65	***	30.9
1	1086	3.59	34.441	27.40	3.99	54	1.86	***	34.6
1	1283	3.10	34.523	27.52	3.73	50	1.89	***	37.1
1	1481	2.84	34.606	27.61	3.62	48	1.92	***	37.3

STATION	DATE	TIME	LATITUDE		LONGITUDE				
DM 1/	8/66	2000 H	33	39 S	110	06 E			
SONIC AIR TEMP.	WIND	ANEM.	CLOUD	SEA	ATMOS.	WIRE ANGLES			
DRY	DIR, SP.	HEIGHT	TYPE	DIR, AMT.	PRFSSURE	CAST1 CAST2 CAST3			
11.7	17.2 03 2	15	* 0	* * *	1020.4	5 * *			
2633									
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INDRG. P	TOTAL P	NITRATE
1	0	19.58	35.909	25.58	5.20	100	0.12	***	0.2
1	24	19.48	35.903	25.61	5.22	100	0.11	***	0.3
1	49	19.42	35.901	25.62	5.22	100	0.12	***	0.2
1	74	17.56	35.754	25.98	5.49	101	0.16	***	0.1
1	98	15.92	35.699	26.32	5.41	97	0.20	***	0.1
1	147	14.57	35.558	26.51	5.26	91	0.37	***	1.5
1	196	13.29	35.353	26.63	5.39	91	0.45	***	2.8
1	295	11.45	35.072	26.77	5.59	91	0.65	***	6.7
1	492	9.23	34.711	26.87	5.49	85	1.01	***	15.5
1	689	8.05	34.557	26.94	5.13	77	1.25	***	22.0
1	867	5.21	34.396	27.19	4.47	63	1.72	***	32.4
1	1066	3.76	34.436	27.36	3.97	54	1.93	***	35.8
1	1285	3.32	34.517	27.49	3.64	49	2.00	***	36.9
1	1485	2.91	34.578	27.58	3.63	48	1.98	***	36.9

STATION	DATE	TIME	LATITUDE		LONGITUDE						
DM 1/	9/66	0530 H	32	11 S	109	59 E					
SONIC AIR TEMP.	WIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE	AMT.	VIS. DIR, AMT.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
5035	15:0 20:0	19 2	2 3	2 3	8 19 2	13 1	1016,6	10	*	*	
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE		
1	0	20,45	35,941	25,38	5,10	100	0,11	***	0,4		
1	24	20,46	35,943	25,38	5,13	100	0,11	***	0,3		
1	49	20,47	35,941	25,37	5,11	100	0,11	***	0,1		
1	73	17,30	35,768	26,05	5,39	99	0,19	***	0,1		
1	97	16,07	35,716	26,30	5,52	99	0,20	***	0,1		
1	146	14,45	35,557	26,54	5,28	91	0,41	***	1,6		
1	196	13,43	35,413	26,64	5,39	91	0,45	***	2,9		
1	294	11,40	35,075	26,78	5,54	90	0,67	***	7,2		
1	490	9,35	34,728	26,87	5,55	86	0,99	***	14,4		
1	686	7,77	34,537	26,96	4,95	74	1,33	***	22,1		
1	862	4,94	34,394	27,22	4,41	62	1,80	***	31,6		
1	1078	3,66	34,447	27,40	3,89	53	2,03	***	36,1		
1	1275	3,20	34,532	27,52	3,59	48	2,07	***	36,1		
1	1474	2,92	34,605	27,60	3,51	47	2,08	***	34,3		

STATION	DATE	TIME	LATITUDE	LONGITUDE					
DM 1/ 10/66	5/ 3/66	1040 H	32 03 S	111 00 E					
SONIC DEPTH	AIR TEMP, DIR, SP.	WIND DIR, SP.	CLOUD TYPE AMT.	ANEM. HEIGHT	VIS. DIR, AMT.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1 CAST2 CAST3
5011	17.2 17.8 17 3	15 8 8	8 8	7 17 3	14 1	1015.2	5 * *		
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	22.40	35.931	24.83	5.01	102	0.10	***	0.3
1	25	21.16	35.932	25.18	5.02	99	0.10	***	0.3
1	47	21.10	35.934	25.20	5.04	100	0.10	***	0.1
1	71	17.85	35.750	25.90	5.28	98	0.17	***	0.1
1	95	16.61	35.729	26.18	5.15	93	0.24	***	0.6
1	143	15.02	35.587	26.44	5.20	91	0.33	***	1.3
1	192	13.89	35.456	26.58	5.32	91	0.38	***	2.2
1	290	11.59	35.090	26.75	5.49	89	0.61	***	6.4
1	485	9.39	34.733	26.86	5.54	86	0.89	***	13.4
1	681	7.11	34.496	27.03	4.79	70	1.33	***	23.5
1	878	4.51	34.398	27.28	4.26	59	1.71	***	32.0
1	1074	3.70	34.475	27.42	3.69	50	1.89	***	34.6
1	1273	3.22	34.551	27.53	3.49	47	1.89	***	34.6
1	1471	2.89	34.606	27.60	3.53	47	1.88	***	35.0

STATION	DATE	TIME	LATITUDE		LONGITUDE								
DM 1/	12/86	0530 H	32	04 S	113	03 E							
SONIC AIR TEMP,	WIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE	AMT,	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES					
DEPTH WET DRY	14.4 16.3 20 5	15	8	6	6	19	3	21	1	1012.5	10	*	*
4755													
CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG, P	TOTAL P	NITRATE				
1	0	21.44	35.923	25.09	5.01	100	0.11	***	0.4				
1	25	21.44	35.924	25.09	5.01	100	0.12	***	0.3				
1	50	21.21	35.914	25.15	5.04	100	0.12	***	0.2				
1	74	18.07	35.787	25.88	5.48	102	0.20	***	0.1				
1	99	16.32	35.707	26.23	5.52	99	0.21	***	0.8				
1	149	14.77	35.592	26.50	5.27	92	0.35	***	1.4				
1	198	13.55	35.416	26.62	5.37	91	0.44	***	3.0				
1	297	11.62	35.104	26.76	5.47	89	0.65	***	7.9				
1	494	9.21	34.708	26.88	5.51	85	1.02	***	15.0				
1	688	7.80	34.545	26.97	4.98	74	1.34	***	22.1				
1	861	4.62	34.399	27.26	4.31	60	1.86	***	34.3				
1	1074	3.83	34.491	27.42	3.56	48	2.09	***	38.3				
1	1269	3.37	34.552	27.51	3.42	46	2.08	***	39.4				
1	1466	3.00	34.605	27.59	3.48	46	2.08	***	37.2				

STATION	DATE	TIME	LATITUDE		LONGITUDE				
DM 1/	6/ 3/66	1012 H	32	00 S	114	02 E			
SONIC AIR TEMP.	WIND DIR, SP.	CLOUD TYPE	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1 CAST2 CAST3			
DEPTH WET DRY	14.4 18.3 25 5	15 8 3	7 24 3 26 1	1014.9	10	* *			
4297	14.4 18.3 25 5	15 8 3	7 24 3 26 1	1014.9	10	* *			
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	22.03	35.855	24.88	5.00	101	0.12	***	0.3
1	24	22.04	35.854	24.88	4.96	100	0.11	***	0.2
1	49	22.00	35.874	24.90	4.94	99	0.10	***	0.2
1	74	18.35	35.783	25.80	5.45	102	0.15	***	0.1
1	98	17.06	35.770	26.11	5.36	98	0.18	***	0.1
1	148	15.62	35.677	26.37	5.18	92	0.28	***	1.2
1	197	14.36	35.522	26.53	5.27	91	0.35	***	1.9
1	295	12.12	35.163	26.71	5.42	89	0.55	***	5.7
1	493	9.26	34.720	26.88	5.49	85	0.96	***	15.4
1	690	7.52	34.520	26.99	4.88	72	1.29	***	25.0
1	867	4.49	34.417	27.29	4.12	57	1.81	***	35.7
1	1084	3.87	34.466	27.40	3.55	48	1.96	***	39.0
1	1261	3.30	34.493	27.47	3.51	47	1.98	***	39.4
1	1478	3.03	34.538	27.54	3.41	46	1.98	***	39.0

STATION	DATE	TIME	LATITUDE		LONGITUDE									
DM 1/	14/66	1910 H	30	22 S	114	36 E								
SONIC DEPTH	AIR TEMP.	WIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE	AMT.	VIS. DIR, AMT.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3		
183	16.1	20.0	17	3	15	7	18	3	23	1	1015.6	0	*	*
CASST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE					
1	0	22.75	35.746	24.59	4.90	100	0.15	***	0.4					
1	25	22.76	35.742	24.58	4.90	100	0.12	***	0.5					
1	50	22.72	35.737	24.59	4.89	100	0.12	***	0.2					
1	65	21.11	35.642	24.97	4.63	91	0.25	***	0.7					
1	75	20.58	35.602	25.08	4.43	87	0.28	***	1.1					
1	85	20.48	35.654	25.15	4.71	92	0.26	***	0.7					
1	100	19.72	35.675	25.37	4.78	92	0.25	***	0.8					
1	125	18.90	35.732	25.62	4.81	91	0.27	***	0.8					
1	150	18.21	35.764	25.82	4.89	91	0.25	***	0.8					
1	170	17.94	35.766	25.89	4.93	92	0.25	***	0.8					

STATION	DATE	TIME	LATITUDE	LONGITUDE					
UM 1/ 16/66	6/ 3/66	2325 H	30 22 S	114 04 E					
SONIC AIR TEMP, WIND	ANEM, CLOUD	SEA	SWELL	ATMOS,	WIRE ANGLES				
DEPTH WET DRY DIR, SP,	HEIGHT TYPE AMT,	VIS, DIR, AMT,	DIR, AMT,	PRESSURE	CAST1 CAST2 CAST3				
3585 16.1 19.4 17 3	15 6 6	8 17 2	23 1	1018.9	10 * *				
CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
1	0	22.20	35.896	24.86	4.95	100	0.10	***	0.4
1	24	22.23	35.893	24.85	4.95	100	0.10	***	0.2
1	48	19.28	35.781	25.56	5.38	103	0.12	***	0.3
1	73	17.29	35.765	26.05	5.39	99	0.19	***	0.1
1	97	16.33	35.741	26.26	5.18	93	0.26	***	0.5
1	146	15.24	35.650	26.44	5.15	91	0.32	***	1.2
1	194	14.40	35.546	26.54	5.21	90	0.41	***	3.1
1	292	12.13	35.185	26.73	5.48	90	0.61	***	5.5
1	488	9.46	34.747	26.87	5.49	85	0.98	***	15.0
1	684	7.92	34.560	26.96	5.03	75	1.31	***	20.9
1	880	4.81	34.397	27.24	4.37	61	1.84	***	32.8
1	1078	3.91	34.475	27.40	3.65	50	2.09	***	36.5
1	1276	3.44	34.554	27.51	3.36	45	2.15	***	36.8
1	1474	3.13	34.602	27.58	3.36	45	2.16	***	36.5

STATION	DATE	TIME	LATITUDE	LONGITUDE					
DM 1/ 17/66	7/ 3/66	0427 H	30 22 S	113 09 E					
SONIC AIR TEMP, WIND ANEM. CLOUD SWELL ATMOS. WIRE ANGLES	DEPTH WET DRY DIR, SP, HEIGHT TYPE AMT.	VIS. SEA DIR, AMT, DIR, AMT.	OXYGEN OXYGEN % SAT, INORG, P	CAST1 CAST2 CAST3					
4846	16.1 19.4 19 4 15 6 9	7 18 2 18 1 1017.4		5 * *					
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG, P	TOTAL P	NITRATE
1	0	22.71	35.765	24.62	4.88	99	0.11	***	0.4
1	24	22.70	35.761	24.62	4.92	100	0.10	***	0.5
1	48	22.58	35.826	24.70	4.92	100	0.11	***	0.3
1	73	19.68	35.644	25.36	4.52	87	0.28	***	1.1
1	97	18.43	35.764	25.77	5.00	94	0.22	***	0.4
1	146	16.53	35.749	26.22	5.20	94	0.25	***	0.5
1	195	15.21	35.642	26.44	5.24	92	0.31	***	1.1
1	294	12.37	35.223	26.71	5.45	90	0.55	***	5.1
1	491	9.50	34.753	26.86	5.56	86	0.93	***	13.4
1	688	8.20	34.581	26.94	5.17	78	1.17	***	20.6
1	886	5.13	34.405	27.21	4.41	62	1.68	***	30.6
1	1084	3.99	34.475	27.39	3.65	50	1.92	***	33.5
1	1282	3.40	34.539	27.50	3.46	47	1.98	***	36.5
1	1481	2.99	34.595	27.59	3.53	47	1.97	***	36.5

STATION	DATE	TIME	LATITUDE		LONGITUDE				
DM 1/	18/66	0917 H	30	22 S	112	13 E			
4938	16.1 19.4	18 4	15	8 5	8 19 3	22 1 1020.3			
SONIC AIR TEMP,	WIND	ANEM.	CLOUD	SEA	SWELL	ATMOS.	WIRE ANGLES		
DEPTH WET DRY	DIR, SP.	HEIGHT	TYPE	DIR, AMT,	DIR, AMT,	PRESSURE	CAST1 CAST2 CAST3		
1	0	35.925	25.14	5.03	100	0.12	*** 0.3		
1	25	35.925	25.15	5.03	100	0.09	*** 0.7		
1	49	35.925	25.15	5.02	100	0.09	*** 0.4		
1	74	35.774	25.38	5.13	99	0.12	*** 0.3		
1	99	35.770	26.00	5.44	100	0.18	*** 0.2		
1	148	35.692	26.38	5.25	93	0.28	*** 0.7		
1	197	35.545	26.56	5.30	91	0.38	*** 2.1		
1	296	35.181	26.74	5.49	90	0.61	*** 6.5		
1	494	34.747	26.87	5.53	86	0.98	*** 12.8		
1	691	34.540	26.98	4.96	74	1.36	*** 21.8		
1	888	34.413	27.23	4.39	61	1.75	*** 31.3		
1	1086	34.466	27.39	3.73	51	2.01	*** 35.0		
1	1283	34.525	27.50	3.63	49	2.00	*** 36.1		
1	1480	34.606	27.60	3.53	47	1.95	*** 36.1		
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG, P	TOTAL P	NITRATE

STATION	DATE	TIME	LATITUDE	LONGITUDE												
DM 1/ 19/66	7/ 3/66	1513 H	30 22 S	111 05 E												
SONIC AIR TEMP.	WIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE	AMT.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3						
5312	19.4	15.6	16	4	15	8	7	2	19	2	19	1	1019.1	0	*	*
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN %	SAT.	INORG. P	TOTAL P	NITRATE						
1	0	22.01	35.867	24.89	4.96	100		0.11	***	0.6						
1	25	22.01	35.864	24.89	4.97	100		0.10	***	0.4						
1	49	21.99	35.864	24.90	4.97	100		0.10	***	0.2						
1	74	19.81	35.721	25.38	5.09	98		0.19	***	0.3						
1	99	18.43	35.776	25.78	5.07	95		0.20	***	0.3						
1	148	16.69	35.765	26.19	5.10	92		0.31	***	1.0						
1	197	15.12	35.639	26.46	5.21	91		0.34	***	1.5						
1	296	12.76	35.287	26.68	5.42	90		0.53	***	4.4						
1	494	9.51	34.755	26.86	5.51	85		0.98	***	13.0						
1	691	7.93	34.559	26.96	5.06	76		1.32	***	21.1						
1	889	4.88	34.408	27.24	4.26	59		1.86	***	33.5						
1	1087	3.92	34.482	27.40	3.61	49		2.07	***	35.0						
1	1284	3.48	34.560	27.51	3.34	45		2.14	***	36.5						
1	1482	3.01	34.606	27.59	3.46	46		2.14	***	35.7						

STATION	DATE	TIME	LATITUDE		LONGITUDE				
DM 1/	20/66	2030 H	30	22 S	110	02 E			
SONIC AIR TEMP,	WIND	ANEM.	CLOUD	VIS.	SEA	SWELL	ATMOS.	WIRE ANGLES	
DEPTH WET DRY	DIR, SP.	HEIGHT	TYPE AMT,	DIR, AMT,	DIR, AMT,	DIR, AMT,	PRESSURE	CAST1 CAST2 CAST3	
5303	17.8 20.0	17 4	6 8	7 18 3	23 1	1020.4	10	* *	
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	21.84	35.858	24.93	4.96	99	0.20	***	0.6
1	24	21.85	35.861	24.93	4.96	99	0.18	***	0.4
1	48	21.86	35.860	24.93	4.95	99	0.17	***	0.3
1	71	19.94	35.720	25.34	5.07	98	0.17	***	0.2
1	95	18.75	35.751	25.68	5.07	96	0.30	***	0.2
1	143	16.73	35.755	26.18	5.17	94	0.31	***	0.6
1	191	15.32	35.658	26.43	5.18	91	0.56	***	1.3
1	.288	12.61	35.252	26.68	5.35	89	0.59	***	5.0
1	481	9.68	34.778	26.85	5.55	86	0.93	***	12.8
1	674	7.98	34.558	26.95	5.04	75	1.25	***	21.6
1	868	4.71	34.414	27.27	4.16	58	1.80	***	33.4
1	1063	4.25	34.542	27.42	3.05	42	2.03	***	35.4
1	1260	4.08	34.601	27.48	2.75	38	2.07	***	36.5
1	1459	3.27	34.582	27.55	3.36	45	2.02	***	36.5

STATION	DATE	TIME	LATITUDE	LONGITUDE								
DM 1/ 21/66	8/ 3/66	0R30 H	28 38 S	108 22 E								
SONIC WFT DEPTH	AIR TEMP, DRY	WIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE	AMT,	SEA DIR, AMT,	VIS.	SWELL DIR, AMT,	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
5303	18.9	20.6	13	4	15	8	8	8	1020.3	35	*	*
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE			
1	0	20.80	35.940	25.28	5.04	99	0.16	***	0.4			
1	18	20.65	35.932	25.32	5.09	100	0.29	***	0.4			
1	38	19.05	35.838	25.67	5.37	102	0.18	***	0.3			
1	57	18.02	35.802	25.90	5.49	102	0.20	***	0.3			
1	75	16.55	35.766	26.23	5.52	100	0.20	***	0.2			
1	115	15.26	35.676	26.45	5.21	92	0.37	***	1.2			
1	155	14.40	35.569	26.56	5.23	90	0.44	***	2.1			
1	236	12.47	35.234	26.70	5.34	88	0.61	***	5.2			
1	402	9.67	34.778	26.85	5.52	86	0.97	***	13.4			
1	570	8.41	34.605	26.92	5.25	79	1.20	***	18.6			
1	742	6.16	34.447	27.12	4.51	65	1.60	***	28.4			
1	917	4.32	34.411	27.31	4.11	57	1.89	***	32.8			
1	1098	3.72	34.513	27.45	3.42	46	2.01	***	35.4			
1	1288	3.27	34.578	27.54	3.35	45	2.05	***	37.2			

STATION	DATE	TIME	LATITUDE		LONGITUDE			
DM 1/ 22/66	8/ 3/66	1630 H	28	38 S	109	47 E		
SONIC AIR TEMP, WIND	ANEM, CLOUD	VIS, SEA	SWELL	ATMOS.	WIRE ANGLES			
DEPTH WFT DRY DIR, SP, DIR, SP, DIR, AMT, DIR, AMT, PRESSURE	TYPE AMT, TYPE AMT, DIR, AMT, DIR, AMT, PRESSURE	DIR, AMT, DIR, AMT, DIR, AMT, PRESSURE	DIR, AMT, DIR, AMT, DIR, AMT, PRESSURE	DIR, AMT, DIR, AMT, DIR, AMT, PRESSURE	CAS1 CAS2 CAS1 CAS2	CAS1 CAS2 CAS1 CAS2		
5541 19.4 21.7 14 6 15	* 7	8 14 3 14 1	14 1	1016.8	20	* *		
CST DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
1 0	22.33	35.904	24.83	4.94	100	0.10	***	0.3
1 22	22.32	35.904	24.83	4.96	100	0.09	***	0.3
1 44	22.33	35.903	24.83	4.94	100	0.09	***	0.2
1 66	19.01	35.812	25.66	5.42	103	0.16	***	0.2
1 88	17.23	35.791	26.08	5.33	98	0.19	***	0.3
1 131	15.61	35.697	26.39	5.23	93	0.31	***	1.1
1 175	14.39	35.548	26.54	5.30	92	0.40	***	1.7
1 263	12.59	35.260	26.69	5.40	90	0.55	***	4.9
1 441	9.70	34.784	26.85	5.50	86	0.97	***	14.4
1 621	8.20	34.585	26.94	5.18	78	1.26	***	19.5
1 806	5.43	34.416	27.18	4.42	62	1.74	***	29.8
1 992	4.32	34.491	27.39	3.48	48	2.07	***	33.8
1 1182	3.69	34.556	27.49	3.21	44	2.15	***	35.7
1 1375	3.22	34.605	27.57	3.30	44	2.15	***	35.7

STATION		DATE		TIME		LATITUDE		LONGITUDE	
DM 1/ 24/66		8/ 3/66		2350 H		28 38 S		111 00 E	
SONIC	AIR TEMP.	WIND	ANEM.	CLOUD	SEA	SWELL	ATMOS.	WIRE	ANGLES
DEPTH	WET DRY	DIR. SP.	HEIGHT	TYPE	DIR. AMT.	DIR. AMT.	PRESSURE	CAST1	CAST2 CAST3
5571	20.0 21.1	14 7	15	8 2	7 14 3	16 1	1015.1	5	* *
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	23.22	35.692	24.41	4.18	100	0.13	***	0.3
1	24	23.24	35.685	24.40	4.86	100	0.13	***	0.3
1	48	23.11	35.700	24.45	4.86	100	0.13	***	0.3
1	72	19.37	35.750	25.52	5.25	100	0.17	***	0.1
1	95	18.28	35.791	25.83	5.09	95	0.24	***	0.0
1	143	16.69	35.773	26.20	4.99	90	0.30	***	1.1
1	191	14.64	35.590	26.52	5.20	90	0.40	***	2.1
1	286	12.60	35.260	26.69	5.38	89	0.55	***	5.2
1	477	9.61	34.773	26.86	5.52	86	0.93	***	14.9
1	668	7.87	34.558	26.97	5.01	75	1.27	***	21.6
1	859	5.06	34.421	27.23	4.24	59	1.71	***	32.4
1	1050	4.32	34.503	27.40	3.43	47	1.95	***	37.1
1	1241	3.69	34.575	27.50	3.13	42	1.99	***	38.6
1	1432	3.16	34.613	27.58	3.32	44	1.97	***	38.6

STATION	DATE	TIME	LATITUDE		LONGITUDE				
UM 1/ 25/66	9/ 3/66	0512 H	28	36 S	111	59 E			
SONIC AIR TEMP, WIND ANEM, CLOUD	VIS, SEA SWELL	DIR, AMT, DIR, AMT, SWELL	ATMOS, WIRE ANGLES						
DEPTH WFT DRY DIK, SP, HEIGHT TYPE AMT.	DIR, AMT, DIR, AMT, DIR, AMT, SWELL	DIR, AMT, DIR, AMT, SWELL	ATMOS, WIRE ANGLES						
4828 20:6 21.7 14 6 15 4 1	7 14 3 14 1	1014.0	10	*	*	*			
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	22.64	35.842	24.69	5.03	102	0.13	***	0.4
1	23	22.63	35.840	24.70	4.91	100	0.12	***	0.5
1	47	22.65	35.840	24.69	4.88	99	0.11	***	0.4
1	70	19.27	35.783	25.57	5.51	101	0.18	***	0.1
1	93	18.11	35.789	25.87	5.19	97	0.18	***	0.1
1	140	16.68	35.757	26.19	5.11	93	0.27	***	0.7
1	166	15.18	35.638	26.44	5.18	91	0.36	***	1.4
1	280	12.44	35.231	26.70	5.40	89	0.59	***	5.2
1	470	9.13	34.699	26.88	5.50	85	1.02	***	14.3
1	663	6.99	34.489	27.04	4.74	69	1.48	***	25.9
1	856	4.60	34.429	27.29	3.98	55	1.89	***	31.6
1	1051	4.13	34.534	27.42	3.14	43	2.11	***	37.1
1	1256	3.50	34.556	27.51	3.30	45	2.04	***	36.4
1	1443	3.05	34.606	27.59	3.44	46	2.03	***	36.0

STATION		DATE		TIME		LATITUDE		LONGITUDE	
DM 1/ 26/66		9/ 3/66		1030 H		28 40 S		113 00 E	
SONIC DEPTH	AIR TEMP,	WIND DIR, SP,	ANFM. HEIGHT	CLOUD TYPE	AMT,	SEA DIR, AMT,	SWELL DIR, AMT,	ATMOS. PRESSURE	WIRE ANGLES CAST1 CAST2 CAST3
1463	21.1	22.2	16 4	15	* 0	7 16 3	18 1	1013.2	0 * *
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INCRG. P	TOTAL P	NITRATE
1	0	23.29	35.644	24.36	4.82	99	0.10	***	0.4
1	25	23.06	35.672	24.45	4.85	99	0.10	***	0.3
1	50	22.37	35.839	24.77	4.92	100	0.08	***	0.2
1	74	19.35	35.759	25.53	5.24	100	0.14	***	0.1
1	99	18.18	35.778	25.84	5.06	94	0.18	***	0.3
1	146	16.30	35.736	26.26	5.03	90	0.29	***	1.0
1	197	14.88	35.609	26.48	5.22	91	0.33	***	1.5
1	296	12.07	35.171	26.73	5.44	89	0.60	***	5.9
1	493	9.13	34.693	26.88	5.45	84	1.05	***	14.9
1	691	6.90	34.483	27.05	4.66	68	1.49	***	24.1
1	868	4.64	34.499	27.34	3.32	46	2.04	***	37.5
1	1065	4.30	34.567	27.43	2.04	39	2.14	***	37.5
1	1263	3.56	34.586	27.52	3.15	43	2.14	***	35.3

STATION	DATE	TIME	LATITUDE	LONGITUDE		
DM 1/ 27/66	9/ 3/66	1355 H	28 11 S	113 18 E		
SONIC AIR TEMP.	WIND	CLOUD	SWELL	ATMOS.	WIRE ANGLES	
DEPTH WFT DRY DIR. SP.	ANEM. HEIGHT	TYPE AMT.	DIR. AMT.	PRESSURE	CAST1 CAST2 CAST3	
183 23.9 25.0 21 3	15 * 0	* 0	21 1	1012.5	10 * *	
VIS.	SEA	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
DIR. AMT.	DIR. AMT.	DIR. AMT.	DIR. AMT.	DIR. AMT.	DIR. AMT.	DIR. AMT.
7 21 2 21 1	21 2 21 1	21 2 21 1	21 1	1012.5	10	*
4.62	4.83	4.82	99	0.10	***	0.5
4.83	4.82	4.79	99	0.12	***	0.4
4.82	4.79	4.78	98	0.12	***	0.4
4.78	4.70	4.51	97	0.17	***	0.2
4.70	4.15	4.15	97	0.17	***	0.2
4.15	4.70	4.70	95	0.17	***	0.3
4.70	25.34	25.34	90	0.27	***	0.9
4.68	25.72	25.72	88	0.29	***	2.1
4.69	25.85	25.85	87	0.31	***	0.9
						1.1
						1.1
						1.2

STATION	DATE	TIME	LATITUDE		LONGITUDE						
183	9/ 3/66	2000 H	26	58 S	112	50 E					
SOUND	AIR TEMP,	WIND	ANEM.	CLOUD	VIS,	SEA	DIR.	AMT.	SWELL	ATMOS.	WIRE ANGLES
DEPTH	WET DRY	DIR, SP.	HEIGHT	TYPE	DIR, AMT.	DIR, AMT.	DIR, AMT.	DIR, AMT.	DIR, AMT.	PRESSURE	CAS12 CAS13
183	20.6 22.8	19 3	15	6 2	7	14 3	19 3	19 3	1014.1	0	* *
CAS1	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN %	SAT,	INORG, P	TOTAL P	NITRATE	
1	0	22.74	35.720	24.57	4.90	100		0.15	***	0.4	
1	10	22.75	35.715	24.57	4.91	100		0.13	***	0.3	
1	20	22.70	35.717	24.58	4.92	100		0.14	***	0.3	
1	30	22.58	35.720	24.62	4.92	100		0.15	***	0.2	
1	40	22.52	35.716	24.64	4.88	99		0.15	***	0.1	
1	50	22.52	35.715	24.63	4.66	99		0.15	***	0.2	
1	75	21.91	35.610	24.73	4.53	91		0.24	***	0.6	
1	100	19.99	35.667	25.29	4.95	96		0.18	***	0.4	
1	125	19.08	35.721	25.57	4.84	92		0.25	***	0.6	
1	150	18.51	35.748	25.73	4.76	89		0.26	***	0.9	
1	175	18.21	35.767	25.82	4.73	86		0.28	***	1.0	

STATION	DATE	TIME	LATITUDE	LONGITUDE		
DM 1/ 30/66	10/ 3/66	0650 H	28 37 S	113 27 E		
SONIC AIR TEMP. WIND ANEM. CLOUD	VIS. SEA S ^w ELL ATMOS.					
DEPTH WFT DRY SP. DIR. SP. HEIGHT TYPE AMT.	DIR. AMT. DIR. AMT. DIR. AMT. PRESSURE			WIRE ANGLES		
143 19.4 21.7 16 2 15 6 8	7 19 2 19 1 1014.8			0 * *		
CAS# DEPTH TEMP.	SALINITY SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1 0 22.18	35.696 24.72	4.76	96	0.20	***	0.2
1 10 22.09	35.685 24.73	4.74	95	0.20	***	0.3
1 20 22.06	35.681 24.74	4.73	95	0.20	***	0.4
1 30 22.04	35.680 24.74	4.71	95	0.20	***	0.4
1 40 21.97	35.678 24.76	4.74	95	0.20	***	0.4
1 50 21.97	35.679 24.76	4.73	95	0.20	***	0.3
1 75 21.62	35.646 24.83	4.62	92	0.22	***	0.6
1 100 20.23	35.657 25.22	4.86	94	0.21	***	0.3
1 125 19.50	35.727 25.47	4.99	96	0.21	***	0.2
1 150 18.72	35.734 25.67	4.70	89	0.30	***	1.1
1 175 17.75	35.770 25.94	4.66	86	0.32	***	0.8

STATION	DATE	TIME	LATITUDE		LONGITUDE				
PM 1/ 32/66	12/ 3/66	0000 H	27	00 S	112	00 E			
SONIC AIR TEMP.	WIND DIR, SP.	WIND DIR, AMT.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1 CAST2 CAST3			
DEPTH WET DRY	HEIGHT	TYPE	AMT.	AMT.					
1007	19.4 21.7	17 3	15	8 8	3 3	21 1 1015.2 5 * *			
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	23.26	35.687	24.40	4.83	99	0.11	***	0.3
1	25	23.26	35.687	24.40	4.82	99	0.11	***	0.3
1	49	22.98	35.752	24.53	4.87	100	0.11	***	0.2
1	74	20.16	35.712	25.24	5.11	99	0.13	***	0.1
1	99	18.84	35.753	25.66	4.98	94	0.20	***	0.4
1	144	17.61	35.801	26.00	4.93	91	0.25	***	0.9
1	197	16.03	35.729	26.32	5.05	90	0.29	***	1.2
1	295	11.89	35.127	26.73	5.37	88	0.61	***	6.0
1	491	7.89	34.565	26.97	5.01	75	1.23	***	19.3
1	685	5.20	34.444	27.23	3.98	56	1.74	***	31.3
1	878	4.78	34.528	27.35	3.04	42	1.99	***	34.2

STATION	DATE	TIME	LATITUDE	LONGITUDE										
DM 1/ 33/66	12/ 3/66	0455 H	27 00 S	110 55 E										
SONIC. AIR TEMP.	WIND DIR, SP.	WIND DIR, SP.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES								
DEPTH WET DRY	17 21.7	17 2	15 8	8 8	7 20	1 20 1	1015.4	10	*	*				
3931	17.8	21.7	17	2	15	8	8	7	20	1	1015.4	10	*	*
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE					
1	0	23.58	35.589	24.23	4.82	100	0.12	***	0.4					
1	24	23.58	35.584	24.23	4.85	100	0.10	***	0.4					
1	47	23.59	35.583	24.22	4.82	100	0.10	***	0.4					
1	71	20.49	35.750	25.22	5.31	104	0.13	***	0.2					
1	94	19.38	35.777	25.53	5.29	101	0.14	***	0.1					
1	142	17.74	35.790	25.96	4.87	90	0.27	***	0.9					
1	189	16.44	35.752	26.24	4.88	88	0.34	***	1.6					
1	284	13.80	35.469	26.61	5.26	90	0.46	***	3.6					
1	472	9.91	34.819	26.85	5.52	86	0.92	***	11.3					
1	661	7.22	34.515	27.03	4.77	70	1.45	***	22.6					
1	850	5.01	34.510	27.31	3.26	46	2.01	***	35.3					
1	1042	4.53	34.572	27.41	2.75	38	2.20	***	36.4					
1	1233	4.01	34.599	27.49	2.80	38	2.10	***	35.7					
1	1424	3.30	34.603	27.56	3.24	44	2.09	***	37.5					

STATION DM 1/ 54766 DATE 12/ 3/66 TIME 0940 H LATITUDE 27 00 S LONGITUDE 110 00 E

SONIC DEPTH	AIR TEMP, WIND DIR, SP.	WIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE	AMT.	VIS.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	CAST1	CAST2	CAST3	CAST4	CAST5	CAST6	WIRE ANGLES
5852	20.0 23.9 19 3	3	35	8	8	8	19 2	23 4	1015.6	5	*	*	*	*	*	*
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN	OXYGEN	OXYGEN % SAT.	INCRG. P	TOTAL P	NITRATE					
1	0	23.35	35.554	24.27	4.84	4.84	100	100	0.11	***	0.6					
1	24	23.30	35.548	24.28	4.83	4.83	99	99	0.11	***	0.6					
1	47	20.21	35.702	25.26	5.23	5.23	102	102	0.11	***	0.2					
1	71	18.80	35.773	25.68	5.22	5.22	99	99	0.13	***	0.2					
1	95	17.64	35.801	25.99	4.94	4.94	91	91	0.25	***	0.8					
1	142	16.09	35.729	26.31	4.98	4.98	89	89	0.32	***	1.5					
1	169	15.03	35.642	26.48	5.19	5.19	91	91	0.41	***	1.8					
1	264	12.62	35.270	26.70	5.37	5.37	89	89	0.56	***	4.5					
1	473	9.58	34.764	26.86	5.47	5.47	85	85	0.98	***	13.8					
1	662	7.64	34.540	26.99	4.92	4.92	73	73	1.40	***	21.9					
1	851	4.90	34.426	27.25	4.09	4.09	57	57	1.88	***	31.6					
1	1039	4.09	34.524	27.42	3.22	3.22	44	44	2.14	***	35.7					
1	1232	3.58	34.572	27.51	3.17	3.17	43	43	2.19	***	37.1					
1	1430	3.13	34.624	27.60	3.28	3.28	44	44	2.19	***	37.1					

STATION	DATE	TIME	LATITUDE		LONGITUDE				
DM 1/ 39/66	12/ 3/66	1615 H	27	00 S	108	56 E			
SONIC AIR TEMP.	WIND	VIS.	SEA	SWELL	ATMOS.	WIRE ANGLES			
DEPTH WET DRY	DIR, SP.	DIR, AMT,	DIR, AMT,	DIR, AMT,	PRESSURE	CAST1 CAST2 CAST3			
5550	17.8 21.7	17 3	15	7 8	19 0 19 1	1016.9 15 * *			
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	21.80	35.833	24.93	4.96	99	0.07	***	0.1
1	23	21.73	35.831	24.94	5.02	100	0.08	***	0.1
1	46	21.47	35.838	25.02	5.05	100	0.08	***	0.1
1	69	19.36	35.793	25.55	5.20	99	0.12	***	0.0
1	92	17.95	35.803	25.92	5.05	94	0.20	***	0.3
1	138	16.39	35.760	26.26	5.03	91	0.26	***	0.9
1	184	15.06	35.641	26.47	5.13	90	0.33	***	1.3
1	277	12.62	35.274	26.70	5.33	89	0.53	***	3.5
1	463	9.64	34.776	26.86	5.48	85	0.88	***	10.1
1	648	7.97	34.567	26.96	5.02	75	1.19	***	16.7
1	832	4.95	34.436	27.26	4.00	56	1.79	***	31.2
1	1019	4.45	34.549	27.40	2.93	40	2.03	***	37.2
1	1211	3.98	34.590	27.48	2.86	39	2.04	***	37.2
1	1407	3.50	34.601	27.54	3.12	42	2.04	***	37.2

STATION	DATE	TIME	LATITUDE		LONGITUDE				
Dm 1/ 37/66	13/ 3/66	0230 H	25	12 S	108	38 E			
SONIC AIR TEMP,	WIND	ANEM,	CLOUD	SEA	ATMOS,	WIRE ANGLES			
DEPTH WFT DRY	DIR, SP,	HEIGHT	TYPE	DIR, AMT,	PRESSURE	CAST1 CAST2 CAST3			
3748 18,3 21,7 15 2	15 2	15 2	6 8	7 15 2	22 1	1016,1 10 * *			
CST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG, P	TOTAL P	NITRATE
1	0	23,85	35,347	23,97	4,77	99	0,09	***	0,3
1	25	23,85	35,347	23,97	4,78	99	0,09	***	0,2
1	49	22,24	35,759	24,75	5,09	103	0,07	***	0,1
1	74	19,33	35,747	25,52	5,18	99	0,25	***	0,0
1	98	18,23	35,789	25,84	5,26	98	0,13	***	0,2
1	147	16,41	35,773	26,26	5,08	92	0,27	***	0,8
1	196	14,96	35,623	26,48	5,12	90	0,36	***	2,3
1	295	12,56	35,266	26,71	5,30	88	0,57	***	6,0
1	491	9,58	34,765	26,86	5,45	85	0,94	***	14,0
1	685	7,36	34,520	27,01	4,81	71	1,39	***	24,1
1	876	4,94	34,501	27,31	3,30	46	1,96	***	36,5
1	1062	4,63	34,588	27,41	2,59	36	2,13	***	37,9
1	1260	4,19	34,607	27,48	2,64	36	2,07	***	37,9
1	1460	3,60	34,615	27,54	2,95	40	2,05	***	39,3

STATION		DATE		TIME		LATITUDE		LONGITUDE							
DM 1/ 41/66		13/ 3/66		2315 H		25 16 S		112 14 E							
SONIC DEPTH	AIR TEMP, WET	WIND DIR, SP.	HIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE	AMT.	VIS. DIR, AMT.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3		
183	19.4	21.7	16	6	6	3	6	18	3	18	1	1012.R	0	*	*
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE						
1	0	23.37	35.508	24.23	4.79	99	0.11	***	0.2						
1	10	23.37	35.509	24.23	4.80	99	0.11	***	0.3						
1	20	23.39	35.509	24.23	4.81	99	0.11	***	0.3						
1	30	23.37	35.509	24.23	4.78	98	0.11	***	0.1						
1	40	23.30	35.505	24.25	4.79	98	0.11	***	0.2						
1	50	23.17	35.496	24.28	4.67	96	0.12	***	0.1						
1	75	22.86	35.468	24.35	4.59	94	0.18	***	0.3						
1	100	20.60	35.423	24.94	4.18	82	0.38	***	2.2						
1	125	19.89	35.536	25.22	4.32	83	0.38	***	1.5						
1	150	19.39	35.606	25.40	4.47	85	0.32	***	1.6						
1	175	19.08	35.646	25.51	4.55	86	0.32	***	1.4						

STATION	DATE	TIME	LATITUDE	LONGITUDE					
DM 1/ 42/66	14/ 3/66	0300 H	24 30 S	112 27 E					
SUNIC AIR TEMP, WIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE AMT.	VIS. DIR. AMT.	SEA DIR. AMT.	SWELL DIR. AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
174 17.2	22.2	17 4	15 6 3	8 17 3	18 1	1013.8	10	*	*
CAST DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE	
1 0	24.37	35.447	23.89	4.72	99	0.11	***	0.1	
1 10	24.38	35.444	23.89	4.74	99	0.11	***	0.1	
1 20	24.38	35.444	23.88	4.72	99	0.11	***	0.0	
1 30	24.38	35.444	23.89	4.71	99	0.11	***	0.3	
1 40	24.36	35.443	23.89	4.70	98	0.11	***	0.1	
1 50	24.36	35.443	23.89	4.72	99	0.17	***	0.3	
1 75	24.24	35.429	23.91	4.72	99	0.12	***	0.0	
1 100	23.25	35.404	24.19	4.85	100	0.14	***	0.1	
1 125	21.35	35.530	24.82	4.92	98	0.17	***	0.1	
1 150	19.88	35.523	25.21	4.25	H2	0.34	***	2.0	

STATION	DATE	TIME	LATITUDE	LONGITUDE					
UM 1/	43/66	0800 H	23 40 S	113 02 E					
SONIC AIR TEMP.	WIND	ANEM.	CLOUD	VIS.	SEA	SWELL	ATMOS.	WIRE ANGLES	
DEPTH WPT DRY	DIR, SP.	HEIGHT	TYPE	AMT.	DIR, AMT.	DIR, AMT.	PRESSURE	CAS11 CAS12 CAS13	
187	18.3 21.1	14 4	1 2	1 2	8 18 5	18 1	1015.0	5 * *	
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	23.52	35.335	24.06	4.69	97	0.16	***	0.2
1	10	23.50	35.329	24.06	4.70	97	0.15	***	0.4
1	20	23.52	35.329	24.05	4.70	97	0.15	***	0.1
1	30	23.51	35.329	24.06	4.70	97	0.15	***	0.1
1	40	23.47	35.336	24.07	4.69	97	0.15	***	0.3
1	50	23.19	35.314	24.14	4.57	94	0.18	***	0.4
1	75	21.71	35.267	24.52	4.04	80	0.36	***	1.9
1	100	21.38	35.280	24.62	3.97	79	0.41	***	2.5
1	125	20.59	35.361	24.90	3.92	76	0.43	***	2.8
1	150	19.50	35.474	25.27	4.03	77	0.45	***	3.7
1	175	19.32	35.531	25.36	4.15	79	0.42	***	3.0

STATION	DATE	TIME	LATITUDE		LONGITUDE				
UM 1/	44/66	1230 H	23	39 S	112	01 E			
1280	22.2 23.9	21 5	8	17 3	17 4	15 * *			
SONIC AIR TEMP,	WIND	AMEN,	CLOUD	SEA	SWELL	ATMOS,	WIRE ANGLES		
DEPTH WET DRY	DIR, SP,	HEIGHT	TYPE AMT,	DIR, AMT,	DIR, AMT,	PRESSURE	CAST1 CAST2 CAST3		
CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG, P	TOTAL P	NITRATE
1	0	24.28	35.364	23.85	4.77	100	0.12	***	0.1
1	23	24.23	35.366	23.87	4.80	100	0.11	***	0.1
1	46	23.55	35.475	24.15	4.71	97	0.16	***	0.2
1	69	21.35	35.370	24.70	4.44	88	0.26	***	0.4
1	92	20.89	35.394	24.84	4.24	83	0.31	***	1.3
1	136	19.50	35.568	25.35	4.16	80	0.39	***	2.9
1	181	18.60	35.675	25.66	4.38	82	0.39	***	2.2
1	270	16.17	35.665	26.24	4.83	87	0.40	***	2.4
1	446	9.72	34.801	26.86	5.35	63	0.94	***	13.5
1	627	6.44	34.529	27.14	3.83	55	1.74	***	27.7
1	815	5.61	34.592	27.30	2.50	35	2.09	***	34.7
1	1007	5.02	34.619	27.39	2.28	32	2.18	***	37.7
1	1104	4.49	34.625	27.46	2.43	34	2.23	***	37.5

STATION	DATE	TIME	LATITUDE	LONGITUDE					
UM 1/	44/66	1745 H	23 38 S	111 00 E					
SONIC AIR TEMP.	WIND DIR, SP.	CLOUD TYPE AMT.	VIS. SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1 CAST2 CAST3			
4480	20,0 23,9 15 6	15 6 3	8 17 3	17 1	1014,9	5 * *			
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	24,76	35,531	23,83	4,76	101	0,12	***	0,5
1	25	24,77	35,528	23,83	4,74	100	0,12	***	0,2
1	50	24,66	35,541	23,87	4,74	100	0,11	***	0,3
1	74	22,53	35,318	24,33	5,10	103	0,12	***	0,2
1	99	20,87	35,514	24,94	4,86	95	0,19	***	0,3
1	148	19,62	35,660	25,38	4,69	90	0,23	***	0,8
1	198	18,39	35,747	25,76	4,61	86	0,30	***	1,9
1	296	14,76	35,548	26,46	4,89	85	0,47	***	3,6
1	492	9,93	34,832	26,85	5,46	85	0,88	***	12,1
1	688	7,18	34,525	27,04	4,66	68	1,41	***	23,5
1	882	5,34	34,585	27,33	2,54	36	2,06	***	35,8
1	1074	4,73	34,618	27,33	2,37	33	2,15	***	37,3
1	1270	4,16	34,636	27,50	2,50	34	2,12	***	37,0
1	1466	3,62	34,651	27,57	2,78	38	2,12	***	37,0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
UM 1/ 47/66	14/ 3/66	2340 H	23 36 S	110 00 E					
SONIC AIR TEMP.	WIND	ANEM.	CLOUD	SEA	ATMOS.	WIRE ANGLES			
DEPTH WET DRY	DIR, SP.	HEIGHT	TYPE	DIR, AMT,	DIR, AMT, PRESSURE	CAST1 CAST2 CAST3			
5413 21, 1 24, 4	14 5	15	* 0	8 14 4	17 1 1016.1	10 * *			
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	24.70	35.448	23.79	4.70	99	0.13	***	0.5
1	24	24.68	35.443	23.79	4.72	99	0.11	***	0.4
1	48	24.67	35.438	23.79	4.72	99	0.12	***	0.3
1	72	24.67	35.438	23.79	4.73	100	0.11	***	0.3
1	96	21.94	35.254	24.45	4.20	84	0.26	***	0.3
1	144	20.07	35.493	25.14	4.13	80	0.40	***	3.2
1	192	18.44	35.702	25.72	4.38	82	0.36	***	2.7
1	289	15.30	35.628	26.41	4.92	87	0.42	***	2.9
1	482	10.30	34.890	26.83	5.46	86	0.87	***	11.9
1	675	7.89	34.576	26.98	4.91	73	1.31	***	23.5
1	869	5.65	34.568	27.28	2.76	39	2.03	***	31.7
1	1064	4.81	34.605	27.41	2.47	34	2.19	***	37.3
1	1239	4.23	34.631	27.49	2.49	34	2.19	***	40.4
1	1455	3.63	34.630	27.55	2.73	37	2.15	***	38.1

STATION		DATE		TIME		LATITUDE		LONGITUDE	
DM 1/ 49/66		15/ 3/66		1435 H		22 05 S		108 33 E	
SOMIC AIR TEMP, WIND		ANEM, CLOUD		VIS, SEA		Swell		WIRE ANGLES	
DEPTH WET DRY, SP.		HEIGHT TYPE AMT,		DIR, AMT, DIR, AMT,		ATMOS. PRESSURE		CAST1 CAST2 CAST3	
2743	21.7 25.0	13 5	6 3	8 13 3	13 1	1013.4	5	*	*
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG, P	TOTAL P	NITRATE
1	0	25.19	35.510	23.69	4.67	99	0.11	***	0.3
1	24	25.15	35.508	23.70	4.67	99	0.11	***	0.3
1	48	24.57	35.555	23.91	4.74	100	0.09	***	0.3
1	72	22.16	35.522	24.59	5.10	103	0.13	***	0.2
1	96	20.10	35.540	25.16	4.65	90	0.25	***	0.5
1	144	18.82	35.655	25.59	4.28	81	0.37	***	2.2
1	192	17.12	35.686	26.03	4.41	81	0.44	***	3.5
1	288	14.22	35.513	26.55	5.10	88	0.44	***	3.5
1	481	9.87	34.811	26.85	5.47	85	0.89	***	12.1
1	674	7.47	34.538	27.01	4.74	70	1.36	***	22.3
1	866	5.33	34.565	27.31	2.73	38	2.04	***	35.5
1	1061	4.65	34.606	27.42	2.48	34	2.14	***	38.1
1	1256	3.90	34.619	27.52	2.75	37	2.12	***	36.6
1	1453	3.35	34.639	27.59	3.02	41	2.10	***	38.1

STATION DATE TIME LATITUDE LONGITUDE
 DM 1/ 53/66 16/ 3/66 0900 H 22 01 S 112 00 E

SONIC AIR TEMP. WIND ANEM. CLOUD VIS. SEA SWELL ATMOS. WIRE ANGLES
 DEPTH WFT DAY DIR. SP. HEIGHT TYPE AMT. DIR. AMT. DIR. AMT. PRESSURE CAST1 CAST2 CAST3
 4975 23.3 26.1 15 4 15 15 3 18 1 1013.2 5 * *

CAS	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	26.33	35.352	23.22	4.58	99	0.09	***	0.4
1	25	26.28	35.348	23.23	4.60	100	0.09	***	0.4
1	49	26.28	35.346	23.23	4.60	100	0.09	***	0.2
1	74	23.16	35.199	24.06	4.71	96	0.16	***	0.1
1	98	21.35	35.230	24.59	3.79	75	0.45	***	3.5
1	147	19.68	35.445	25.20	3.83	73	0.47	***	4.7
1	196	18.68	35.625	25.60	4.11	77	0.42	***	4.0
1	295	14.52	35.496	26.48	4.84	84	0.49	***	4.7
1	491	9.55	34.775	26.87	5.19	81	0.99	***	13.9
1	687	6.40	34.533	27.15	3.59	52	1.72	***	30.4
1	884	5.41	34.608	27.34	2.29	32	2.12	***	38.1
1	1080	4.67	34.617	27.43	2.37	33	2.18	***	38.5
1	1276	4.03	34.636	27.45	2.56	35	2.15	***	38.1
1	1472	3.44	34.656	27.59	2.84	38	2.13	***	38.9

STATION		DATE	TIME	LATITUDE		LONGITUDE			
UM 1/ 55/66		16/ 3/66	1850 H	22	07 S	113	48 E		
SONIC	AJR	TRMP.	WIND	SEA	SWELL	ATMOS.	WIRE ANGLES		
LEPTH	WFT	DRY	DIR, SP.	DIR, AMT.	DIR, AMT.	PRESSURE	CAST1	CAST2	CAST3
183	25.6	50.6	00	0	*	0	1010.1	0	*
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INDRG. P	TOTAL P	NITRATE
1	0	27.27	35.621	23.12	4.60	102	0.18	***	0.3
1	10	27.22	35.618	23.14	4.59	101	0.13	***	0.3
1	20	26.71	35.544	23.24	4.58	100	0.17	***	0.4
1	30	26.61	35.513	23.25	4.60	100	0.18	***	0.3
1	40	26.46	35.518	23.30	4.58	100	0.18	***	0.2
1	50	26.38	35.512	23.32	4.51	98	0.19	***	0.2
1	75	25.71	35.419	23.46	4.35	93	0.28	***	0.3
1	100	25.21	35.391	23.59	4.18	89	0.30	***	0.9
1	125	23.09	35.201	24.06	3.80	78	0.50	***	2.9
1	150	22.83	35.193	24.15	3.77	77	0.52	***	3.7
1	175	22.21	35.193	24.32	3.72	75	0.54	***	4.2

STATION	DATE	TIME	LATITUDE		LONGITUDE				
DM 1/ 57/66	17/ 3/66	0015 H	22	50 S	113	28 E			
SONIC AIR TEMP,	WIND	ANEM.	CLOUD	VIS.	SEA	SWELL	ATMOS.	WIRE ANGLES	
DEPTH WET DRY	DIR, SP.	HEIGHT	TYPE	DIR, AMT,	DIR, AMT,	DIR, AMT,	PRESSURE	CAS11 CAS22 CAS3	
183 23.3 31.1	20 2	15 * 0	* 0	8 20 2	21 1	1012.6	15	* *	
CAS1	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	26.60	35.384	23.15	4.58	100	0.10	***	0.3
1	10	26.52	35.382	23.18	4.58	100	0.09	***	0.4
1	20	26.43	35.373	23.20	4.60	100	0.09	***	0.2
1	30	26.39	35.361	23.20	4.61	100	0.09	***	0.2
1	40	25.37	35.255	23.44	4.63	99	0.10	***	1.1
1	50	24.36	35.175	23.69	4.85	101	0.14	***	0.2
1	75	23.52	35.144	23.91	4.63	95	0.18	***	0.2
1	100	22.55	35.158	24.20	3.80	77	0.43	***	3.4
1	125	21.90	35.147	24.38	3.65	73	0.50	***	4.7
1	150	21.34	35.259	24.62	3.91	77	0.43	***	3.3

STATION DM 1/ 58/66 DATE 17/ 3/66 TIME 1445 H LATITUDE 26 11 S LONGITUDE 112 09 E

SONIC AIR TEMP, WIND ANEM. CLOUD VIS. SEA ATMOS. WIRE ANGLES
 DEPTH WET DRY DIR, SP. HEIGHT TYPE AMT. DIR, AMT. DIR, AMT. PRESSURE CAST1 CAST2 CAST3

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN & SAT.	INORG. P	TOTAL P	NITRATE							
612	23,1	25,0	20	3	15	*	0	8	20	2	20	1	1012,4	5	*	*
1	0	24,12	35,620	24,10	4,80	100	0,09	***	0,5							
1	25	23,71	35,622	24,22	4,84	100	0,07	***	0,5							
1	50	23,55	35,622	24,27	4,86	100	0,07	***	0,3							
1	75	21,20	35,744	25,02	5,21	103	0,09	***	0,2							
1	100	19,22	35,740	25,55	5,00	95	0,16	***	0,4							
1	150	18,10	35,801	25,88	5,02	94	0,21	***	0,5							
1	200	17,02	35,789	26,13	4,96	91	0,23	***	1,5							
1	300	14,50	35,567	26,54	5,24	91	0,35	***	2,4							
1	500	9,23	34,721	26,86	5,45	84	0,89	***	16,6							

STATION	DATE	TIME	LATITUDE		LONGITUDE						
DM 1/	64/66	2100 H	28	58 S	111	59 E					
SONIC AIR TEMP.	WIND DIR, SP.	ANEM. HEIGHT	CLOUD TYPE	AMT.	VIS. DIR, AMT.	SEA DIR, AMT.	SWELL DIR, AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
5249	18.9 21.1 15 5	15 5	8 2	8 2	8 15 3	16 1	1017.9	15	0	*	
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG, P	TOTAL P	NITRATE		
1	0	22.53	35.846	24.73	4.93	100	0.09	***	0.3		
1	25	22.50	35.845	24.74	4.91	100	0.09	***	0.4		
1	50	22.52	35.843	24.73	4.88	99	0.09	***	0.4		
2	60	22.50	35.843	24.74	4.90	99	0.09	***	0.4		
2	70	22.44	35.842	24.75	4.91	100	0.09	***	0.4		
1	75	20.51	35.761	25.22	5.18	101	0.10	***	0.3		
2	80	20.72	35.772	25.18	5.16	101	0.13	***	0.3		
2	90	19.60	35.772	25.47	5.27	101	0.14	***	0.3		
1	97	18.75	35.784	25.70	5.26	99	0.14	***	0.2		
2	124	17.40	35.792	26.04	5.14	94	0.20	***	0.3		
1	146	16.67	35.766	26.20	5.06	92	0.28	***	0.6		
1	194	14.98	35.613	26.47	5.17	90	0.31	***	1.8		
1	291	12.21	35.195	26.72	5.41	89	0.59	***	6.0		
1	486	8.90	34.674	26.90	5.40	83	1.06	***	17.7		

STATION	DATE	TIME	LATITUDE	LONGITUDE						
DM 1/ 66/66	19/ 3/66	0730 H	28 38 S	111 42 E						
SONIC AIR TEMP.	WIND	ANEM.	CLOUD	SEA	VIS.	DIR. AMT.	DIR. AMT.	SWELL	ATMOS.	WIRE ANGLES
DEPTH WFT DRY	DIR. SP.	HEIGHT	TYPE	AMT.	DIR. AMT.	DIR. AMT.	AMT.	DIR. AMT.	PRESSURE	CAST1 CAST2 CAST3
5303 19.4 21.1	14 5	15	8 5	18 3	18 1	1014.5	5	0	*	
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE	
2	0	22.41	35.859	24.77	4.91	99	0.03	***	0.4	
2	25	22.41	35.859	24.77	4.90	99	0.03	***	0.3	
2	50	22.43	35.859	24.77	4.93	100	0.04	***	0.3	
2	75	20.50	35.787	25.25	5.21	102	0.06	***	0.4	
2	100	18.27	35.785	25.82	5.12	96	0.15	***	0.3	
2	115	17.85	35.791	25.93	5.10	95	0.17	***	0.3	
2	135	17.00	35.777	26.13	5.08	93	0.19	***	0.9	
2	150	16.60	35.752	26.20	5.09	92	0.22	***	1.5	
2	200	15.09	35.626	26.45	5.16	90	0.30	***	1.6	
1	293	12.30	35.199	26.70	5.41	89	0.52	***	5.8	
1	487	9.00	34.681	26.89	5.48	84	0.97	***	18.7	
1	681	6.86	34.481	27.05	4.68	68	1.47	***	21.1	
1	875	4.50	34.448	27.32	3.80	52	1.85	***	31.4	
1	1069	3.94	34.532	27.44	3.23	44	2.02	***	27.4	
1	1267	3.45	34.573	27.52	3.26	44	2.05	***	34.8	
1	1473	3.06	34.622	27.60	3.34	45	2.01	***	35.0	

STATION		DATE		TIME		LATITUDE		LONGITUDE																	
DM 1/ 67/66		19/ 3/66		1330 H		29 07 S		112 07 E																	
SONIC AIR TEMP.		WIND		ANEM.		CLOUD		SEA		VIS.		DIR.		AMT.		SWELL		ATMOS.		WIRE ANGLES					
DEPTH		DRY		SP.		HEIGHT		TYPE		AMT.		TYPE		AMT.		DIR.		AMT.		CAST1		CAST2		CAST3	
5212	20.0	22.8	15	5	15	2	0	8	15	3	15	1	1012.1	15	10	*	*	*	*	*	*	*	*	*	*
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN %	SAT.	INORG. P	TOTAL P	NITRATE															
2	0	22.84	35.760	24.57	4.86	99		0.07	***	0.5															
2	25	22.80	35.759	24.59	4.88	100		0.05	***	0.3															
2	50	22.58	35.794	24.65	4.88	99		0.05	***	0.4															
2	75	19.01	35.775	25.63	5.21	99		0.10	***	0.3															
2	100	17.94	35.788	25.91	5.10	95		0.17	***	0.3															
2	150	15.98	35.723	26.33	5.13	92		0.25	***	1.1															
2	200	14.44	35.601	26.49	5.19	91		0.30	***	2.0															
2	250	13.48	35.404	26.62	5.29	90		0.40	***	2.9															
1	282	12.75	35.290	26.69	5.40	90		0.48	***	4.4															
1	376	10.77	34.958	26.80	5.53	88		0.72	***	9.3															
1	471	9.63	34.776	26.86	5.53	86		0.87	***	13.6															
1	663	8.04	34.575	26.95	5.11	77		1.25	***	19.3															
1	855	4.87	34.420	27.25	4.31	60		1.76	***	30.4															
1	1050	4.15	34.509	27.40	3.35	46		2.01	***	35.8															
1	1244	3.68	34.566	27.50	3.18	43		2.04	***	35.0															
1	1442	3.17	34.596	27.57	3.35	45		2.08	***	35.0															

STATION	DATE	TIME	LATITUDE		LONGITUDE				
DM 1/ 66/66	19/ 3/66	' 1930 H	29	14 S	111	52 E			
SONIC AIR TEMP.	WIND	SEA	SWELL		WIRE ANGLES				
DEPTH WFT	DIR. SP.	DIR. AMT.	DIR. AMT.	ATMOS. PRESSURE	CAST1	CAST2			
5267	18.9 21.1	15 5	7 15 3 16 1	1013.2	15	5 *			
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	22.63	35.784	24.65	4.86	99	0.03	***	0.0
2	24	22.61	35.785	24.66	4.87	99	0.03	***	0.0
2	34	22.54	35.789	24.68	4.89	99	0.04	***	0.1
2	39	22.23	35.785	24.77	4.92	99	0.04	***	0.3
2	48	21.08	35.737	25.05	5.00	99	0.08	***	0.1
2	73	19.26	35.743	25.54	5.03	96	0.13	***	0.5
2	97	17.91	35.778	25.91	5.08	94	0.15	***	0.6
2	146	15.82	35.704	26.35	5.17	92	0.23	***	1.1
2	194	14.37	35.542	26.55	5.22	90	0.34	***	2.4
1	284	12.54	35.253	26.70	5.38	89	0.49	***	5.2
1	477	9.60	34.773	26.86	5.53	86	0.87	***	12.5
1	671	7.63	34.536	26.98	4.89	73	1.30	***	21.7
1	866	4.57	34.428	27.29	4.03	56	1.76	***	29.5
1	1062	4.27	34.551	27.42	3.01	41	2.00	***	34.4
1	1260	3.81	34.572	27.42	3.07	42	2.02	***	34.8
1	1458	3.38	34.589	27.54	3.21	43	1.98	***	36.1

STATION	DATE	TIME	LATITUDE		LONGITUDE				
UM 1/ 69/66	20/ 3/66	0200 H	29	17	111	50 E			
SONIC AIR TEMP.	WIND DIR, SP.	WIND DIR, SP.	SEA DIR. AMT.	SWELL DIR. AMT.	ATMOS. PRESSURE	WIRE ANGLES			
DEPTH WET DRY	ANEM. HEIGHT	CLOUD TYPE AMT.	VIS.	DIR. AMT.	CAS1 CAS2	CAS1 CAS2			
5212 19.4 21.1	15 5	8 2	8	15 3	12 1	1011.1 20 20 *			
CAS1	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	22.63	35.779	24.65	4.88	99	0.06	***	0.5
2	24	22.62	35.781	24.65	4.89	99	0.03	***	0.4
2	43	22.50	35.786	24.69	4.89	99	0.03	***	0.3
2	48	22.20	35.790	24.78	4.92	99	0.05	***	0.3
2	53	21.31	35.766	25.01	4.99	99	0.07	***	0.2
2	72	19.55	35.719	25.45	4.98	95	0.16	***	1.8
2	96	18.16	35.775	25.84	5.08	95	0.15	***	0.5
2	144	16.61	35.747	26.20	5.17	94	0.19	***	0.6
2	192	15.22	35.639	26.43	5.24	92	0.26	***	1.2
1	271	13.05	35.339	26.66	5.36	90	0.47	***	4.0
1	458	9.80	34.804	26.85	5.50	86	0.85	***	14.3
1	644	8.25	34.589	26.93	5.15	78	1.18	***	20.2
1	831	4.81	34.414	27.25	4.20	58	1.74	***	27.8
1	1018	4.46	34.537	27.39	3.02	42	2.06	***	34.2
1	1213	4.00	34.566	27.46	2.98	41	2.11	***	35.7
1	1409	3.55	34.583	27.52	3.13	42	2.09	***	36.1

STATION	DATE	TIME	LATITUDE	LONGITUDE					
DM 1/ 70/66	20/ 3/66	1640 H	32 00 S	111 48 E					
SONIC AIR TEMP, WIND	ANEM, CLOUD	VIS, SEA	SWELL	ATMOS,	WIRE ANGLES				
DEPTH WET DRY DIR, SP, HEIGHT	TYPE AMT,	DIR, AMT, DIR, AMT, PRESSURE	DIR, AMT,	CAST1 CAST2 CAST3					
5029 20.0 22.2 15 6 6 15 3 8 15 3 15 1 1014.6				0 0 0					
CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INDRG, P	TOTAL P	NITRATE
4	0	20.84	35.964	25.29	5.05	99	0.08	***	0.7
4	25	20.79	35.964	25.30	5.05	99	0.07	***	0.7
4	50	20.75	35.963	25.31	5.06	99	0.08	***	0.3
4	75	20.70	35.962	25.32	5.07	100	0.08	***	0.4
4	100	17.40	35.752	26.01	5.39	99	0.17	***	0.3
4	150	15.41	35.659	26.41	5.22	92	0.30	***	1.3
4	200	13.78	35.439	26.59	5.32	91	0.40	***	3.1
4	250	12.58	35.241	26.68	5.41	90	0.51	***	4.4
4	300	11.48	35.068	26.76	5.49	89	0.64	***	7.8
2	391	9.84	34.800	26.84	5.52	86	0.90	***	11.9
2	489	8.84	34.648	26.89	5.42	83	1.05	***	16.0
2	587	8.03	34.561	26.95	5.10	76	1.25	***	22.5
2	685	6.36	34.447	27.09	4.60	66	1.57	***	26.7
2	734	5.61	34.412	27.16	4.48	63	1.70	***	30.2
2	783	5.07	34.394	27.21	4.41	62	1.73	***	33.4
2	832	4.57	34.397	27.27	4.29	59	1.89	***	35.3
2	881	4.26	34.413	27.31	4.14	57	1.91	***	31.9
2	930	4.01	34.440	27.36	3.87	53	2.00	***	33.8
3	952	3.96	34.449	27.37	3.81	52	1.98	***	34.6
3	1047	3.63	34.491	27.44	3.63	49	2.05	***	35.2
3	1142	3.45	34.522	27.48	3.52	47	2.13	***	37.6
3	1237	3.25	34.541	27.52	3.54	47	2.11	***	37.6
3	1332	3.00	34.567	27.56	3.62	48	2.09	***	27.6
3	1426	2.96	34.597	27.59	3.53	47	2.09	***	34.6
3	1900	2.33	34.710	27.73	3.64	48	2.03	***	35.0
3	2090	2.17	34.723	27.76	3.70	48	2.00	***	33.1
1	2133	2.15	34.726	27.76	3.69	48	2.00	***	34.6
1	2313	2.01	34.729	27.78	3.63	50	1.98	***	35.3
1	2495	1.92	34.735	27.79	3.91	51	1.98	***	33.8
1	2678	1.79	34.729	27.79	4.04	52	1.97	***	33.8
1	2908	1.66	34.730	27.80	4.12	53	1.91	***	34.6
1	3145	1.53	34.729	27.81	4.17	54	1.96	***	33.6
1	3631	1.30	34.724	27.82	4.29	55	1.91	***	33.4
1	4114	1.19	34.718	27.83	4.45	57	1.89	***	32.7

STATION	DATE	TIME	LATITUDE		LONGITUDE								
DM 1/	71/66	0855 H	31	15 S	114	58 E							
SONIC DEPTH	AIR TEMP.	WIND DIR.	SP.	WIND DIR.	SEA DIR.	AMT.	SKELL. DIR.	AMT.	ATMOS. PRESSURE	WIRE ANGLES			
179	18.9	21.7	16	5	15	4	1	16	2	1012.8	0	*	*
CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE				
1	0	22.20	35.746	24.75	4.89	99	0.12	***	0.6				
1	10	22.19	35.745	24.75	4.87	98	0.11	***	17.3				
1	20	22.22	35.745	24.74	4.89	99	0.11	***	0.6				
1	30	22.21	35.744	24.74	4.89	99	0.11	***	0.4				
1	40	22.20	35.744	24.75	4.87	98	0.11	***	0.4				
1	50	22.22	35.744	24.74	4.89	99	0.11	***	0.3				
1	75	21.93	35.738	24.82	4.82	97	0.15	***	0.8				
1	100	21.78	35.733	24.86	4.80	96	0.17	***	0.7				
1	125	20.00	35.724	25.33	4.84	94	0.19	***	1.7				
1	150	19.24	35.725	25.53	4.87	93	0.22	***	1.1				
1	170	18.28	35.729	25.60	4.87	92	0.22	***	1.0				

STATION	DATE	TIME	LATITUDE	LONGITUDE							
UM 1/ 72/66	21/ 3/66	1227 H	32 00 S	115 18 E							
SONIC AIR TEMP.	WIND DIR.	SP.	WIND DIR.	SEA DIR.	VIS.	SWELL DIR.	AMT.	ATMOS. PRESSURE	WIRE ANGLES		
DEPTH WFT	DRY	14	2	15	0	0	2	1014.4	5	*	*
183	20.0	21.1	14	2	15	0	2	1014.4	5	*	*
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE		
1	0	22.07	35.770	24.80	4.90	99	0.13	***	0.5		
1	10	22.05	35.769	24.81	4.92	99	0.13	***	0.6		
1	20	22.01	35.767	24.82	4.90	98	0.11	***	0.7		
1	30	21.98	35.767	24.82	4.89	98	0.12	***	0.9		
1	40	21.96	35.767	24.83	4.87	98	0.13	***	0.4		
1	50	21.96	35.766	24.83	4.89	98	0.12	***	0.5		
1	75	21.61	35.775	24.93	4.83	96	0.13	***	0.8		
1	100	20.20	35.624	25.20	4.47	87	0.29	***	2.5		
1	125	19.75	35.760	25.42	5.03	97	0.16	***	0.9		
1	150	19.16	35.730	25.55	4.87	93	0.23	***	1.0		
1	175	18.65	35.754	25.71	4.92	93	0.22	***	0.9		

DATA

PART 3

CRAYFISH LARVAE

EXPLANATION OF HEADINGS

Part 3Crayfish Larvae

STN	Gives the station number
DATE	Given as day/month/year
LATITUDE LONGITUDE	Given in degrees and minutes
TIME	Given in Zone Time, and is the time at the beginning of the tow. The code letter for the time zone follows the time. Zone Time throughout the cruise was Western Australian Standard Time, GMT +8 hr, Code H
DURATION	Duration of tow given in minutes
DEPTH	Sampling depth given in metres

A blank indicates no crayfish larvae in sample

SURFACE AND SUBSURFACE PLANKTON SAMPLES

STN	DATE	LATITUDE	LONGITUDE	TIME	DURATION	DEPTH	PHYLLOSOMA							
							Panulirus longipes cygnus Stages		Other Panulirids		Scyllarids			
							I	II	III	IV	V	VI	VII	VIII
3	3/3/66	33 37.5 S.	114 12 E.	2250 H	30	0				1	2	1		15
				2220 H	30	0				2	1			7
				2235 H	30	15?			3	4	1			9
8	4/3/66	33 37 S.	110 06 E.	2120 H	30	0					2			1
				2120 H	50	3								
11	5/3/66	31 56.2 S.	110 46.2 E.	2320 H	30	0					6	1		13
				2325 H	30	2-3					5	7		9
15	6/3/66	30 21.5 S.	114 11.0 E.	2120 H	30	0			3	1	16	2		2
				2155 H	30	0		1			8	9		
				2125 H	30	2-4			2	8	20	14		1
				2200 H	50	2-4			1	12	35	4		2
20	7/3/66	30 21.5 S.	110 05 E.	2205 H	30	0					3	6		1
				2240 H	30	0					3	13	11	2
				2200 H	30	3-5					12	11		2
				2245 H	30	3-5					7	18	25	1
23	8/3/66	28 38 S.	110 42.5 E.	2120 H	30	0					1	5		
				2155 H	30	0								
				2125 H	30	2-5								
				2200 H	30	2-5					1	2		

SURFACE AND SUBSURFACE PLANKTON SAMPLES

STN	DATE	LATITUDE	LONGITUDE	TIME	DURATION	DEPTH	PHYLLOSOMA														
							Pamulirus longipes cygnus Stages							Other Pamulirids			Scyllarids				
							I	II	III	IV	V	VI	VII								
60	18/3/66	29 03 S.	112 03 E.	0440 H	30	0	5	4	10	3											
				0442 H	30	2-5	5	7	2												
61	18/3/66	30 23 S.	111 58 E.	1113 H	30	0								1							
				1115 H	30	2-5	1	1	1												
62	18/3/66	29 47 S.	111 22 E.	1510 H	30	0								13	16	4					
				1512 H	30	2-5								2	4	14	5				
63	18/3/66	29 02 S.	111 58 E.	1950 H	30	0								4							
64	18/3/66	28 58 S.	111 59 E.	2325 H	30	0								6	11	7	4				
	19/3/66			0002 H	30	0								1	5	1					
	18/3/66			2327 H	30	2-5								12	12						
	19/3/66			0005 H	30	2-5								7	15						
65	19/3/66	28 56 S.	111 56 E.	0310 H	30	0								2	30	62					
				0348 H	30	0								14	45	45					
				0312 H	30	2-5								3							
				0346 H	30	2-5								1							
66	19/3/66	28 38 S.	111 42 E.	0950 H	30	0								1							
				0915 H	30	3-5								1							

SURFACE AND SUBSURFACE PLANKTON SAMPLES

STN	DATE	LATITUDE	LONGITUDE	TIME	DURATION	DEPTH	PHYLLOSOMA													
							<u>Panulirus longipes cygnus</u> Stages							Other Panulirids	Scyllarids					
							I	II	III	IV	V	VI	VII							
67	19/3/66	29 07 S.	112 07 E.	1530 H	30	0														
				1600 H	30	0														
				1500 H	30	3-5	3													
68	19/3/66	29 14 S.	111 52 E.	1530 H	30	3-5			1					2						
				2102 H	30	0)*														
				2140 H	30	0)	1	3	14	19									82	
				2100 H	30	3-5)*														
69	20/3/66	29 17 S.	111 50 E.	2210 H	30	3-5)				7	68	5								
				0303 H	30	0)*														
				0340 H	30	0)														
				0305 H	30	4-5)*														
				0342 H	30	4-5)														

* Catches pooled

MIDWATER TRAWL SAMPLES

STN	DATE	LATITUDE	LONGITUDE	TIME	DURATION	DEPTH	PHYLOSOMA							PUERULUS
							Panulirus longipes		Panulirus cygnus		Stages		Panulirids	
							I	II	III	IV	V	VI	VII	
64	18/3/66	28 58 S.	111 59 E.	2400 H	60	75-80								1
65	19/3/66	28 56 S.	111 56 E.	0330 H	60+	160-0		1	2					
66	19/3/66	28 38 S.	111 42 E.	0935 H	80?	60-0	2	4	26	35	1		2	
67	19/3/66	29 07 S.	112 07 E.	1530 H	60	135		1	4	1				
68	19/3/66	29 14 S.	111 52 E.	2120 H	60	40		1	1	2				
69	20/3/66	29 17 S.	111 50 E.	0325 H	60	80?		1	5					
					60	50-55			4	5				
					60	190		1	6					

OCEANOGRAPHICAL CRUISE REPORTS

1. Oceanographical observations in the Indian Ocean in 1959. H.M.A.S. *Diamantina* Cruises Dm1/59 and Dm2/59.
2. Oceanographical observations in the Indian Ocean in 1960. H.M.A.S. *Diamantina* Cruise Dm1/60.
3. Oceanographical observations in the Indian Ocean in 1960. H.M.A.S. *Diamantina* Cruise Dm2/60.
4. Oceanographical observations in the Indian Ocean in 1960. H.M.A.S. *Diamantina* Cruise Dm3/60.
5. Oceanographical observations in the Pacific Ocean in 1960. H.M.A.S. *Gascoyne* Cruises G1/60 and G2/60.
6. Oceanographical observations in the Pacific Ocean in 1960. H.M.A.S. *Gascoyne* Cruise G3/60.
7. Oceanographical observations in the Indian Ocean in 1961. H.M.A.S. *Diamantina* Cruise Dm1/61.
8. Oceanographical observations in the Pacific Ocean in 1961. H.M.A.S. *Gascoyne* Cruise G1/61.
9. Oceanographical observations in the Indian Ocean in 1961. H.M.A.S. *Diamantina* Cruise Dm2/61.
10. Oceanographical observations in the Indian and Pacific Oceans in 1961. H.M.A.S. *Gascoyne* Cruise G2/61.
11. Oceanographical observations in the Indian Ocean in 1961. H.M.A.S. *Diamantina* Cruise Dm3/61.
12. Oceanographical observations in the Pacific Ocean in 1961. H.M.A.S. *Gascoyne* Cruise G3/61.
13. Oceanographical observations in the Pacific Ocean in 1962. H.M.A.S. *Gascoyne* Cruise G1/62.
14. Oceanographical observations in the Indian Ocean in 1962. H.M.A.S. *Diamantina* Cruise Dm1/62.
15. Oceanographical observations in the Indian Ocean in 1962. H.M.A.S. *Diamantina* Cruise Dm2/62.
16. Oceanographical observations in the Pacific and Indian Oceans in 1962. H.M.A.S. *Gascoyne* Cruises G2/62 and G3/62.
17. Oceanographical observations in the Indian Ocean in 1962. H.M.A.S. *Gascoyne* Cruise G4/62.
18. Oceanographical observations in the Indian Ocean in 1962. H.M.A.S. *Diamantina* Cruise Dm3/62.
19. Oceanographical observations in the Pacific Ocean in 1962. H.M.A.S. *Gascoyne* Cruise G5/62.
20. Oceanographical observations in the Indian Ocean in 1962. H.M.A.S. *Diamantina* Cruise Dm4/62.
21. Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. *Gascoyne* Cruise G1/63.
22. Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. *Gascoyne* Cruise G2/63.
23. Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. *Diamantina* Cruise Dm1/63.
24. Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. *Diamantina* Cruise Dm2/63.
25. Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. *Diamantina* Cruise Dm3/63.
26. Oceanographical observations in the Pacific Ocean in 1963. H.M.A.S. *Gascoyne* Cruise G3/63.
29. Oceanographical observations in the Pacific Ocean in 1963. H.M.A.S. *Gascoyne* Cruise G4/63.
30. Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. *Diamantina* Cruise Dm6/63.
31. Oceanographical observations in the Pacific Ocean in 1963. H.M.A.S. *Gascoyne* Cruise G5/63.
32. Oceanographical observations in the Pacific Ocean in 1964. H.M.A.S. *Gascoyne* Cruise G1/64.
33. Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. *Diamantina* Cruise Dm1/64.
34. Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. *Gascoyne* Cruise G2/64.

OCEANOGRAPHICAL CRUISE REPORTS

(Continued)

35. Oceanographical observations in the Indian and Pacific Oceans in 1964. H.M.A.S. *Gascoyne* Cruise G3/64.
36. Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. *Diamantina* Cruise Dm2/64.
38. Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. *Diamantina* Cruise Dm4/64.
39. Oceanographical observations in the Pacific Ocean in 1964. H.M.A.S. *Gascoyne* Cruise G4/64.
40. Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. *Diamantina* Cruise Dm5/64.
41. Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. *Gascoyne* Cruise G5/64.
42. Oceanographical observations in the Pacific Ocean in 1964. H.M.A.S. *Gascoyne* Cruise G6/64.
43. Oceanographical observations in the Indian Ocean in 1965. H.M.A.S. *Gascoyne* Cruise G2/65.
44. Oceanographical observations in the Pacific Ocean in 1965. H.M.A.S. *Gascoyne* Cruise G3/65.
45. Oceanographical observations in the Pacific Ocean in 1965. H.M.A.S. *Gascoyne* Cruise G4/65.
46. Oceanographical observations in the Indian Ocean in 1965. H.M.A.S. *Gascoyne* Cruise G5/65.
49. Oceanographical observations in the Indian Ocean in 1965. H.M.A.S. *Diamantina* Cruise Dm2/65.
51. Oceanographical observations in the Indian Ocean in 1965. H.M.A.S. *Diamantina* Cruise Dm3/65.
53. Oceanographical observations in the Indian Ocean in 1966. H.M.A.S. *Diamantina* Cruise Dm1/66.
54. Oceanographical observations in the Indian Ocean in 1966. H.M.A.S. *Diamantina* Cruise Dm2/66.