

OCEANOGRAPHICAL OBSERVATIONS  
IN THE PACIFIC OCEAN IN 1963  
H.M.A.S. *GASCOYNE*  
Cruise G 5/63

OCEANOGRAPHICAL CRUISE REPORT  
NO. 31

DIVISION OF FISHERIES AND OCEANOGRAPHY  
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL  
RESEARCH ORGANIZATION, AUSTRALIA 1967

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MELBOURNE, 1967

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When citing this report, abbreviate as follows:  
CSIRO Aust. Oceanogr. Cruise Rep. No. 31

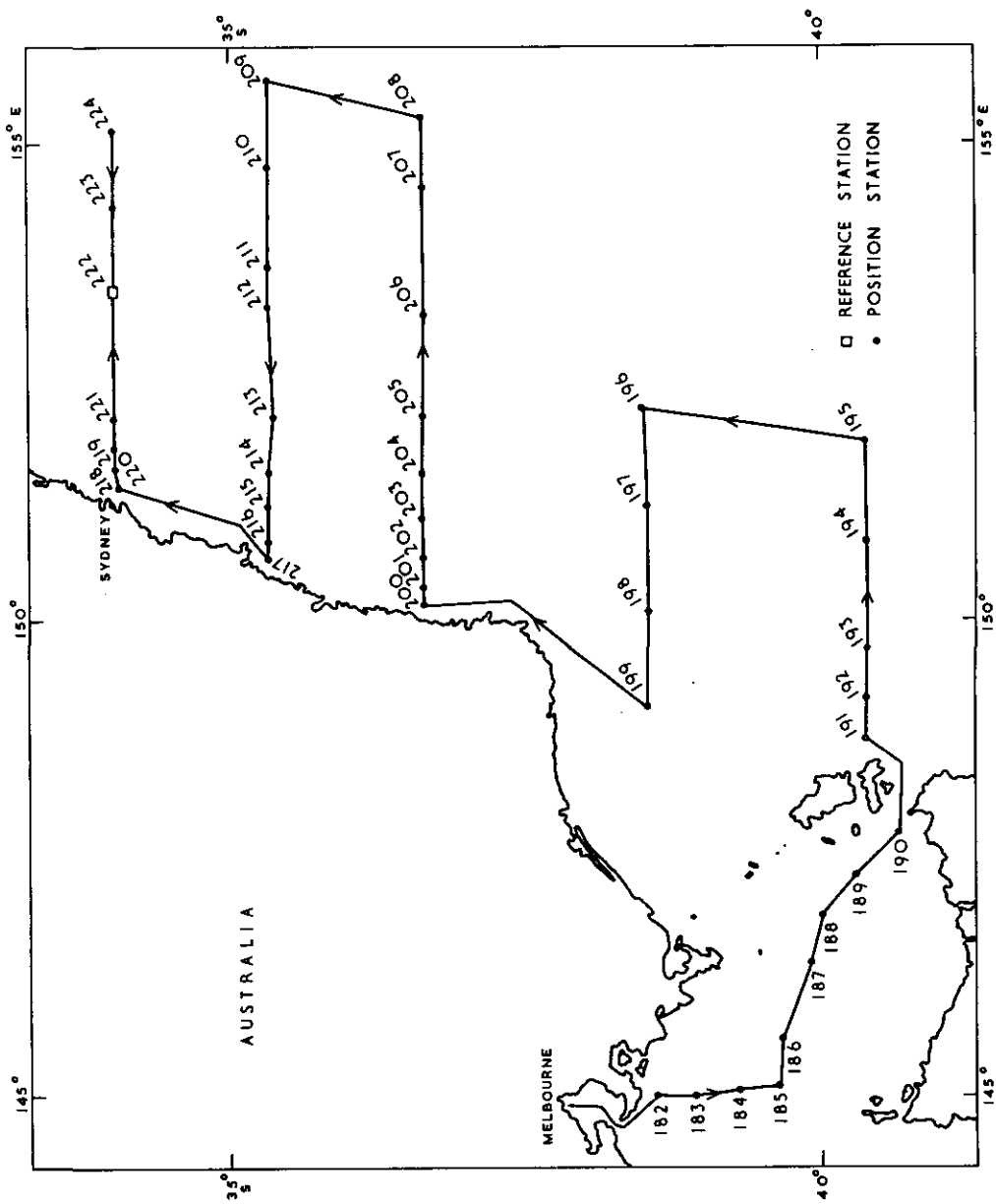


Fig. 1 Track chart

# OCEANOGRAPHICAL CRUISE REPORT

No. 31

Oceanographical Observations in the Pacific Ocean in 1963

H.M.A.S. Gascoyne

Cruise G5/63

November 7 - 15, 1963

## I. INTRODUCTION

This report records the data for the fifth cruise in 1963 of H.M.A.S. Gascoyne, Royal Australian Navy oceanographical frigate, in the Pacific Ocean.

### Objectives

These were - to examine the hydrological environment during the tuna fishing season on the east coast of Australia, in particular the distribution of cold and warm waters known to mix on these fishing grounds; to examine the structure of the East Australian Current system off the New South Wales coast; and to examine the structure of the water column along sections in Bass Strait for comparison with previous measurements.

### Itinerary

The cruise began at Melbourne on November 7, worked a series of stations off the Victorian, Tasmanian, and New South Wales coasts, and ended in Sydney on November 15. The Reference Station off Sydney at 34°S., 153°20'E. was worked on November 14.

### Scientific Personnel

D. Vaux (Cruise Leader)  
R. Bradley  
K. Fleming  
W. Hedge  
L. Olsen  
J. Prothero

Salinity, oxygen, inorganic phosphate, and total phosphorus determinations were done in the ship's laboratory by K. Fleming and J. Prothero. The data were processed under the direction of

W. Hedge, with computer programmes designed by A.D. Crooks. The track chart was prepared by R. Breach.

Accuracy of cruise data is the responsibility of the cruise leader D. Vaux.

## II. WORK ACCOMPLISHED

Forty-three stations were worked (G5/182/63 - G5/224/63). Surface hydrology samples were collected at 43 stations, and subsurface hydrology samples at 42 stations.

TABLE 1

### WORK DONE AT EACH STATION

Stn No.	Hydrology Surface to Depth (m)	Stn No.	Hydrology Surface to Depth (m)
182	60	204	1500
183	55	205	1500
184	55	206	1400
185	60	207	1500
186	70	208	1500
187	75	209	1500
188	60	210	1500
189	60	211	0
190	30	212	1500
191	60	213	1500
192	1500	214	1500
193	1500	215	1500
194	1400	216	175
195	1500	217	100
196	1500	218	125
197	1500	219	330
198	1500	220	1500
199	1500	221	1500
200	100	222	4400
201	320	223	1400
202	1500	224	1500
203	1500		

### III. METHOD OF COLLECTION AND ANALYSIS OF SAMPLES

#### 1. Physics

Temperature.- Water temperatures were taken with deep-sea reversing thermometers. Two protected thermometers were used at each depth, together with an unprotected thermometer on all but the upper six Nansen water bottles. Differences between corrected protected thermometer readings were generally less than 0.03 deg C, and the mean values listed in this report are considered accurate to  $\pm 0.03$  deg C.

Thermometric Depth.- Depth calculations were made by the second method described by La Fond (1951), plotting thermometric depth against the difference between thermometric and wire depths. Depths are considered accurate to  $\pm 5$  m at depths less than 200 m,  $\pm 10$  m at depths between 200 and 400 m, and within about 2% at depths from 400 to 1500 m.

Sigma-t.- Sigma-t values were calculated, by computer, from temperature and salinity values, using the equations of Knudsen (La Fond 1951).

#### 2. Chemistry

Salinity.- A chlorinity-temperature meter of the conductivity type (Hamon 1956) was used on board the vessel to estimate chlorinity, which was subsequently converted to salinity by the relation

$$\text{Salinity} = 0.03 + 1.805 \times \text{Chlorinity.}$$

Dissolved Oxygen.- A version of the standard Winkler method was used to determine the amount of dissolved oxygen in the seawater 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. Duplicate titrations were made on approximately every tenth sample. Saturation values, given as ml/l, were calculated by computer using the simpler of the equations given by Richards and Corwin (1956) -

$$O_2 (\% \text{ Satn.}) = \frac{O_2 (\text{ml/l}) \times (33.5 + T^\circ\text{C}) \times 100}{332.4 - (1.854 \times S\text{‰})} \cdot$$

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 hydrochloric acid, which was kept under paraffin. The reagents were automatically dispensed by 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 commenced 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 without any correction for salt error and are precise to  $\pm 10\%$  for values less than 0.5 µg-atom/l and  $\pm 5\%$  for higher values. To correct for salt effects, the results given can be multiplied by 1.15.

Total Phosphorus.- 100 ml samples were drawn from the Nansen bottles into 150 ml Pyrex conical flasks, 0.2 ml of 72% perchloric acid was added and digestion at 200°-250°C carried out immediately on a sand tray. After evaporation of water, heating was continued until fuming of the salt residue commenced. The samples were then allowed to cool and 100 ml of distilled water and 2 drops of 2% w/v phenolphthalein were added. If alkaline, perchloric acid was added until a slight acidity persisted. The flasks were allowed to stand for about 24 hr to allow the salts to dissolve. Phosphate was then determined as described above for inorganic phosphate. Results are given as µg-atom/l, without salt correction. To correct for salt effects, the results given can be multiplied by 1.15.

#### REFERENCES

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- HAMON, B.V. (1956).- A portable temperature-chlorinity bridge for estuarine investigations and seawater analysis. J. scient. Instrum. 33, 329-33.



JACOBSEN, J.P., ROBINSON, R.J., and THOMPSON, T.G. (1950).- A review of the determination of dissolved oxygen in seawater by the Winkler method. Publs scient. Ass. Oceanogr. phys. 11.

LA FOND, E.C. (1951).- Processing oceanographic data. U.S. Navy Hydrogr. Off. Publ. No. 614.

RICHARDS, F.A., and CORWIN, N. (1956).- Some oceanographic applications of the solubility of oxygen in sea-water. Limnol. Oceanogr. 1, 263-7.

THOMPSON, T.G., and ROBINSON, R.J. (1939).- Notes on the determination of dissolved oxygen in seawater. J. mar. Res. 2, 1-8.

U.S. NAVY HYDROGRAPHIC OFFICE (1955).- Instruction manual for oceanographic observations. Publ. No. 607.

#### IV. DATA SHEETS

The data were processed in a C.D.C. 3600 Computer. Explanations of the headings for each part are given at the beginning of the surface hydrology listing.

**DATA**  
**PART 1**  
**HYDROLOGY**  
**SURFACE SAMPLES**

EXPLANATION OF HEADINGSParts 1 and 2Hydrology

STATION	Gives the station identification. For example, G5/182/63 signifies the 182nd station worked by <u>Gascoyne</u> in 1963, on her 5th 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. Zone Time throughout the cruise was Eastern Australian Standard Time, G.M.T. + 10 hr, Code K
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. 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. Hydrogr. Office (1955)
VIS.	Visibility is coded using Table 4 in U.S. Hydrogr. Office (1955)
SEA DIR. AMT.	Sea direction and amount are coded using Tables 5 and 8 in U.S. Hydrogr. Office (1955)
SWELL DIR. AMT.	Sea swell direction and amount are coded using Tables 6 and 8 in U.S. Hydrogr. Office (1955)
BAROM., and ATMOS. PRESSURE	Atmospheric pressure given in millibars

WIRE ANGLES	Wire angles are measured at the surface and expressed in degrees for each cast
CAST 1 CAST 2 CAST 3	
CAST	The cast number corresponding to the wire angle is shown
DEPTH	Actual 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 and TOTAL P	Given in µg-atom/l

\* and \*\*\* Indicate no data available

CRUISE STATION NUMBER	YR.	MTM.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN. AMT.	SEA DN. AMT.	SWELL DN. AMT.	WEA.	VIS.	BAROM.	
5	182	63	11	8	0730	K 38	40 S 145	00 E 14.0	35.62	19	7	19	4	7	1018.0
5	183	63	11	8	0945	K 39	00 S 145	00 E 14.0	35.66	19	4	19	4	6	1019.8
5	184	63	11	8	1150	K 39	19 S 145	02 E 14.1	35.61	19	3	19	1	6	1020.0
5	185	63	11	8	1400	K 39	38 S 145	03 E 14.2	35.57	18	2	18	1	6	1020.0
5	186	63	11	8	1700	K 39	38 S 145	23 E 13.8	35.43	32	2	32	1	8	1019.3
5	187	63	11	8	1945	K 39	55 S 146	39 E 13.7	35.52	32	2	32	0	6	1020.2
5	188	63	11	8	2140	K 40	00 S 146	50 E 13.6	35.59	29	4	29	0	6	1021.0
5	189	63	11	8	2359	K 40	20 S 147	18 E 13.5	35.61	29	3	29	0	6	1021.0
5	190	63	11	8	0230	K 40	39 S 147	44 E 14.2	35.46	35	1	35	0	6	1018.5
5	191	63	11	9	0730	K 40	20 S 148	45 E 14.6	35.44	32	5	32	0	7	1020.0
5	192	63	11	9	0905	K 40	20 S 149	10 E 15.2	35.46	30	5	30	1	7	1020.0
5	193	63	11	9	1200	K 40	20 S 149	46 E 14.8	35.46	30	5	30	9	7	1019.2
5	194	63	11	9	1705	K 40	20 S 150	56 E 15.6	35.48	30	5	30	1	7	1016.5
5	195	63	11	9	2125	K 40	20 S 151	56 E 15.6	35.48	30	6	30	1	7	1018.9
5	196	63	11	10	0645	K 38	30 S 152	15 E 15.1	35.61	28	2	28	1	7	1024.5
5	197	63	11	10	1130	K 38	30 S 151	13 E 17.2	35.59	13	2	13	1	7	1026.0
5	198	63	11	10	1630	K 38	30 S 150	07 E 16.2	35.53	12	2	12	1	6	1024.5
5	199	63	11	10	2110	K 38	30 S 149	04 E 16.4	35.44	04	2	04	1	7	1025.0
5	200	63	11	10	0750	K 36	41 S 150	10 E 18.0	35.50	00	1	00	1	7	1024.0
5	201	63	11	11	0855	K 36	41 S 150	21 E 17.5	35.50	01	3	01	1	6	1023.5
5	202	63	11	11	1040	K 36	40 S 150	07 E 16.8	35.52	02	2	02	1	6	1022.0
5	203	63	11	11	1310	K 36	40 S 151	42 E 16.8	35.57	02	2	02	1	9	1021.7
5	204	63	11	11	1600	K 36	40 S 151	36 E 17.1	35.57	02	2	02	1	9	1022.7
5	205	63	11	11	1900	K 36	40 S 152	09 E 16.2	35.61	02	1	02	1	7	1023.0
5	206	63	11	12	0005	K 36	40 S 153	11 E 17.2	35.53	01	4	01	1	8	1024.0
5	207	63	11	12	0455	K 36	40 S 154	27 E 16.8	35.53	01	4	01	1	8	1025.0
5	208	63	11	12	0845	K 36	40 S 155	14 E 17.6	35.55	00	3	00	6	6	1023.8
5	209	63	11	12	1545	K 35	20 S 154	39 E 18.2	35.55	02	2	02	3	9	1023.9
5	210	63	11	12	2030	K 35	20 S 154	40 E 18.1	35.53	02	2	02	0	8	1023.9
5	211	63	11	12	0115	K 35	20 S 153	59 E 18.1	35.53	00	5	00	4	8	1002.0
5	212	63	11	13	0400	K 35	20 S 153	05 E 18.1	35.41	00	6	00	1	8	1019.9
5	213	63	11	13	1000	K 35	20 S 152	07 E 18.1	35.41	00	6	00	1	6	1021.0
5	214	63	11	13	1310	K 35	20 S 151	37 E 18.9	35.43	00	6	00	1	6	1012.7
5	215	63	11	13	1545	K 35	21 S 151	16 E 18.1	35.46	01	7	01	4	7	1011.3
5	216	63	11	13	1810	K 35	21 S 150	52 E 18.5	35.53	02	5	02	4	7	1009.0
5	217	63	11	13	1915	K 35	20 S 150	40 E 16.9	35.44	02	5	02	0	7	1009.5
5	218	63	11	14	0330	K 34	00 S 151	27 E 18.8	35.46	00	3	00	1	7	1010.0
5	219	63	11	14	0440	K 34	00 S 151	39 E 18.9	35.44	01	3	01	1	7	1012.0
5	220	63	11	14	0620	K 34	00 S 151	51 E 18.9	35.50	01	3	01	1	7	1013.0
5	221	63	11	14	0930	K 34	00 S 152	08 E 18.4	35.52	01	3	01	1	7	1015.0

PROPERTY DOUBT-UL

CRUISE NUMBER	STATION NUMBER	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN, AMT,	SEA DN, AMT,	SWELL DN, AMT,	WEA.	VIS.	BAROM.	
5	222	63	11	14	1400	K 34	00 S 153	28 E 21.8	35.46	24	4	24	2	34	4	7	1014.0
5	223	63	11	14	1930	K 34	00 S 154	20 E 22.3	35.43	16	5	16	3	35	1	5	1017.0
5	224	63	11	14	2335	K 34	00 S 155	05 E 19.4	35.35	20	1	00	0	34	1	6	1019.0

**DATA**  
**PART 2**  
**HYDROLOGY**  
**SUBSURFACE SAMPLES**

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 182/63 8/11/63 0730 K 38 40 S 145 00 E

SONIC AIR TEMP. WIND ANEM. CLOUD SWELL ATMOS. WIRE ANGLES  
 DEPTH WET DRY DIR. SP. HEIGHT TYPE AMT. VIS. DIR. AMT. DIR. AMT. PRESSURE CAST1 CAST2 CAST3  
 77 8,9 12.8 19 7 11 8 6 6 7 19 3 19 4 1018.0 0 \* \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	14.03	35.620	26.68	5.76	103	0.12	***	***
1	10	14.05	35.620	26.67	5.76	103	0.07	***	***
1	20	14.04	***	***	5.74	***	0.09	***	***
1	30	14.03	35.640	26.69	5.76	103	0.09	***	***
1	40	14.03	35.640	26.69	5.76	103	0.09	***	***
1	50	14.05	35.660	26.70	5.76	103	0.07	***	***
1	60	14.04	35.660	26.71	5.75	103	0.09	***	***



STATION G 5/ 183/63 DATE 8/11/63 TIME 0945 K LATITUDE 39 00 S LONGITUDE 145 00 E

SONIC ATR TEMP. WIND ANEM. CLOUD SWELL ATMOS. WIRE ANGLES  
 DEPTH KFT DRY DIR, SP. HEIGHT TYPE AMT. VIS. DIR, AMT. DIR, AMT. PRESSURE CAST1 CAST2 CAST3

70	10.0	12.6	19	4	11	6	3	6	19	3	20	4	1019.8	0	*	*
CST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG, P	TOTAL	P	NITRATE						
1	0	13.99	35.660	26.72	5.77	103	0.06	***		***						17
1	10	14.00	35.680	26.73	5.76	103	0.09	***		***						
1	20	13.99	35.660	26.72	5.77	103	0.07	***		***						
1	30	13.99	35.640	26.70	5.80	103	0.07	***		***						
1	40	13.98	35.640	26.70	5.62	104	0.08	***		***						
1	55	13.96	35.640	26.71	5.78	103	0.07	***		***						

STATION G 5/ 194/63 DATE 8/11/63 TIME 1150 K LATITUDE 39 19 S LONGITUDE 145 02 E

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

70 9.4 12.2 19 3 11 \* \* \* 6 19 2 19 1 1020.0 0 \* \*

CST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	14.08	35.610	26.66	5.73	102	0.07	***	***
1	10	14.01	35.610	26.67	5.77	103	0.08	***	***
1	20	14.00	35.610	26.68	5.78	103	0.14	***	***
1	30	13.99	35.610	26.68	5.82	104	0.17	***	***
1	40	13.99	35.610	26.68	5.78	103	0.12	***	***
1	55	13.98	35.590	26.66	5.78	103	0.12	***	***

STATION G 5/ 195/63 DATE 8/11/63 TIME 1400 K LATITUDE 39 38 S LONGITUDE 145 03 E

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

66 13.3 15.6 18 2 11 \* 0 \* 7 18 2 18 1 1020.0 0 \* \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NIHA'E
1	0	14.19	35.570	26.60	5.78	103	0.05	***	***
1	10	13.98	35.570	26.65	5.81	104	0.06	***	***
1	20	13.94	35.590	26.67	5.87	105	0.06	***	***
1	30	13.92	35.590	26.68	5.87	104	0.07	***	***
1	40	13.91	35.590	26.68	5.86	104	0.08	***	***
1	50	13.92	35.590	26.68	5.87	104	0.14	***	***
1	60	13.89	35.570	26.67	5.85	104	0.12	***	***

STATION G 5/ 186/63 DATE 8/11/63 TIME 1700 K LATITUDE 39 38 S LONGITUDE 145 39 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 CAST1 CAST2 CAST3

81 9.4 12.8 32 2 11 \* 0 8 32 2 24 1 1019.3 0 \* \*

CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	INORG. P	TOTAL P	NITRATE
1	0	13.77	35.430	26.59	5.90	105	0.20	***	***
1	10	13.53	35.440	26.64	5.90	104	0.24	***	***
1	20	13.37	35.460	26.69	5.89	104	0.17	***	***
1	30	13.30	35.430	26.68	5.92	104	0.17	***	***
1	40	13.32	35.440	26.69	5.87	103	0.13	***	***
1	50	13.27	35.440	26.70	5.87	103	0.17	***	***
1	70	12.48	35.530	26.93	5.50	95	0.28	***	***

STATION

DATE

TIME

LATITUDE

LONGITUDE

G 5/ 187/63

8/11/63

1945 K

39 55 S

146 23 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 CAST1 CAST2 CAST3

82 8,9 12,8 32 2 11 \* \* \* 6 32 2 \* 0 1020.2 0 \* \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	13.65	35.520	26.68	5.87	104	0.06	***	***
1	10	13.62	35.480	26.65	5.87	104	0.05	***	***
1	20	13.43	35.500	26.71	5.84	103	0.06	***	***
1	30	13.41	35.500	26.71	5.87	103	0.05	***	***
1	40	13.39	35.500	26.72	5.86	103	0.06	***	***
1	50	13.38	35.520	26.74	5.85	103	0.09	***	***
1	75	12.74	35.520	26.87	5.48	95	0.17	***	***

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 188/63 8/11/63 2140 K 40 00 S 146 50 E

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

75 10.6 13.3 29 4 11 \* \* \* 6 29 2 \* 0 1021.0 0 \* \* \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
1	0	13.62	35.590	26.74	5.84	103	0.06	***	***
1	10	13.55	35.570	26.74	5.87	104	0.06	***	***
1	20	13.47	35.550	26.74	5.81	102	0.05	***	***
1	30	13.43	35.550	26.75	5.88	104	0.07	***	***
1	40	13.42	35.550	26.75	5.82	102	0.07	***	***
1	50	13.42	35.570	26.77	5.81	102	0.08	***	***
1	60	13.40	35.570	26.77	5.78	102	0.08	***	***

STATION G 5/ 189/63 DATE 8/11/63 TIME 2359 K LATITUDE 40 20 S LONGITUDE 147 18 E

SONIC AIR TEMP. WIND DIR, SP. ANEM. HEIGHT TYPE AMT, CLOUD VIS, SEA DIR, AMT. SWELL DIR, AMT. ATMOS. PRESSURE WIRE ANGLES  
 DEPTH MET DRY DIR, SP. HEIGHT TYPE AMT, CLOUD VIS, SEA DIR, AMT. SWELL DIR, AMT. ATMOS. PRESSURE CAS11 CAS12 CAST3

70 10.6 13.3 29 3 11 \* \* \* 6 29 2 \* 0 .1021.0 0 \* \* \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
1	0	13.49	35.590	26.77	5.82	103	0.13	***	***
1	10	13.49	35.570	26.75	5.87	104	0.09	***	***
1	20	13.49	35.590	26.77	5.90	104	0.06	***	***
1	30	13.42	35.570	26.77	5.92	104	0.10	***	***
1	40	13.43	35.610	26.80	5.87	103	0.10	***	***
1	50	13.44	35.590	26.78	5.84	103	0.09	***	***
1	60	13.43	35.610	26.80	5.84	103	0.10	***	***

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 190/63 9/11/63 0230 K 40 39 S 147 44 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  
 40 8,9 12,8 35 1 11 \* 0 \* 0 7 35 2 \* 0 1018,5 0 \* \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
1	0	14.18	35,460	26,52	5,64	101	0,07	***	***
1	10	14.16	35,460	26,53	5,71	102	0,10	***	***
1	20	14.13	35,500	26,56	5,69	102	0,10	***	***
1	30	14.07	35,500	26,58	5,70	102	0,15	***	***



STATION G 5/ 191763 DATE 9/11/63 TIME 0730 K LONGITUDE 148 45 E  
 LATITUDE 40 20 S

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

84 10.6 13.9 32 5 11 8 2 7 32 2 99 9 1020.0 5 \* \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INCRG, P	TOTAL P	NITRAIE
1	0	14.60	35.440	26.42	5.64	102	0.18	***	***
1	10	14.59	35.430	26.41	5.67	102	0.18	***	***
1	20	14.49	35.440	26.44	5.69	102	0.20	***	***
1	30	14.24	35.390	26.46	5.67	101	0.22	***	***
1	40	14.05	35.390	26.50	5.64	101	0.30	***	***
1	50	13.99	35.390	26.51	5.59	100	0.32	***	***
1	60	13.97	35.390	26.51	5.58	99	0.30	***	***

STATION G 5/ 192/63 DATE 9/11/63 TIME 0905 K LATITUDE 40 20 S LONGITUDE 149 10 E

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

2243 11.7 15.0 30 5 11 8 5 7 30 3 14 1 1020.0 15 0 \*

CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	INORG. P	TOTAL P	NIIRA'E
2	0	15.18	35.460	26.30	5.64	103	0.18	***	***
2	25	15.17	35.430	26.28	5.67	103	0.18	***	***
2	50	15.17	35.440	26.29	5.64	103	0.20	***	***
2	75	14.25	35.410	26.47	5.35	96	0.33	***	***
2	100	13.84	35.410	26.56	5.28	94	0.45	***	***
2	150	13.05	35.300	26.63	5.18	90	0.54	***	***
2	200	12.21	35.160	26.69	4.89	84	0.74	***	***
2	300	10.79	34.960	26.80	4.78	79	0.80	***	***
1	490	9.25	34.780	26.92	5.01	80	0.99	***	***
1	690	7.08	34.540	27.07	4.39	66	1.50	***	***
1	890	5.59	34.470	27.21	4.21	61	1.66	***	***
1	1090	4.47	34.490	27.35	3.97	56	1.82	***	***
1	1290	3.63	34.520	27.46	3.76	52	1.93	***	***
1	1490	2.94	34.600	27.59	3.56	48	1.99	***	***

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 193763 9/11/63 1200 K 40 20 S 149 46 E

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

4131 11.1 13.9 30 5 11 7 8 7 50 3 99 9 1019.2 5 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	14.81	35.460	26.39	5.74	104	0.40	***	***
2	25	14.81	35.440	26.37	5.76	104	0.38	***	***
2	50	14.80	35.460	26.39	5.74	104	0.29	***	***
2	75	13.60	35.350	26.56	5.24	92	0.51	***	***
2	100	12.99	35.260	26.61	5.01	87	0.57	***	***
2	150	12.01	35.160	26.73	5.01	85	0.65	***	***
2	200	11.50	35.080	26.76	5.35	90	0.65	***	***
2	300	10.40	34.920	26.84	5.35	88	0.80	***	***
1	500	9.18	34.760	26.92	4.94	79	1.05	***	***
1	700	7.27	34.560	27.06	4.40	67	1.35	***	***
1	900	5.57	34.450	27.19	4.37	64	1.57	***	***
1	1100	4.16	34.470	27.37	4.14	58	1.78	***	***
1	1300	3.46	34.520	27.48	3.69	51	1.94	***	***
1	1500	2.92	34.580	27.58	3.60	49	2.00	***	***

STATION G 5/ 194/63 DATE 9/11/63 TIME 1705 K LATITUDE 40 20 S LONGITUDE 150 56 E

SONIC AIR TEMP. WIND ANEM. CLOUD VIS. SEA SWELL ATMOS. WIRE ANGLES  
 DEPTH MET DRY DIR, SP. HEIGHT TYPE AMT. DIR, AMT. DIR, AMT. PRESSURE CAS11 CAST2 CAST3

4552 11,1 13,9 30 5 11 9 8 7 30 3 30 1 1016.5 10 10 \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
2	0	15.64	35.480	26.22	5.65	104	0.29	***	***
2	25	15.58	35.460	26.21	5.64	104	0.28	***	***
2	50	15.45	35.480	26.26	5.58	102	0.28	***	***
2	75	14.40	35.430	26.45	5.13	92	0.48	***	***
2	100	13.97	35.430	26.54	5.18	92	0.50	***	***
2	150	13.38	35.350	26.60	5.13	90	0.54	***	***
2	200	12.53	35.250	26.70	5.09	88	0.63	***	***
2	300	10.95	35.010	26.81	4.72	78	0.83	***	***
1	481	8.81	34.720	26.95	4.69	74	1.22	***	***
1	665	7.07	34.520	27.05	4.33	65	1.44	***	***
1	849	5.50	34.450	27.20	4.32	63	1.72	***	***
1	1034	4.68	34.490	27.33	5.18	74	1.84	***	***
1	1216	3.68	34.520	27.46	3.86	53	1.97	***	***
1	1399	3.10	34.520	27.52	3.62	49	2.01	***	***

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 195/63 9/11/63 2125 K 40 20 S 151 56 E

SONIC AIR TEMP. WIND ANEM, CLOUD SEA SWELL ATMOS. WIRE ANGLES  
 DEPTH NET DRY DIR, SP, HEIGHT TYPE AMT, VIS, DIR, AMT, DIR, AMT, PRESSURE CAST1 CAST2 CAST3  
 4726 12.8 14.4 28 6 11 9 8 7 30 2 30 1 1019.9 0 0 \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
2	0	15.64	***	***	5.50	***	0.18	***	***
2	25	15.64	***	***	5.42	***	0.19	***	***
2	50	15.65	***	***	5.48	***	0.18	***	***
2	75	15.60	***	***	5.36	***	0.24	***	***
2	100	14.94	***	***	5.29	***	0.35	***	***
2	150	14.04	***	***	5.28	***	0.38	***	***
2	200	13.25	***	***	5.24	***	0.47	***	***
2	300	11.48	***	***	4.83	***	0.77	***	***
1	495	9.21	***	***	4.98	***	1.00	***	***
1	691	7.70	***	***	4.42	***	1.44	***	***
1	890	6.15	***	***	4.26	***	1.75	***	***
1	1090	4.98	***	***	4.16	***	1.75	***	***
1	1290	3.64	***	***	3.98	***	1.81	***	***
1	1490	3.23	***	***	3.56	***	2.13	***	***

STATION: G 5/ 196/63 DATE: 10/11/63 TIME: 0645 K LATITUDE: 38 30 S LONGITUDE: 152 15 E

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

4610 12.2 13.9 15 2 11 9 7 7 23 2 23 1 1024.5 0 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	15.13	35.610	26.43	5.76	105	0.14	***	***
2	25	15.11	35.570	26.40	5.87	107	0.21	***	***
2	50	14.91	35.460	26.36	5.98	101	0.20	***	***
2	75	13.44	35.430	26.65	5.29	93	0.48	***	***
2	100	13.00	35.340	26.67	5.13	89	0.52	***	***
2	150	12.38	35.250	26.73	4.97	85	0.56	***	***
2	200	11.92	35.210	26.79	5.12	87	0.72	***	***
2	300	11.30	35.120	26.83	5.18	87	0.73	***	***
1	500	8.89	34.700	26.92	5.18	82	0.89	***	***
1	700	7.70	34.630	27.05	4.49	69	1.37	***	***
1	900	5.95	34.490	27.18	4.23	62	1.71	***	***
1	1100	4.81	34.520	27.34	4.09	58	1.85	***	***
1	1300	3.85	34.560	27.47	3.77	52	2.02	***	***
1	1500	3.24	34.610	27.57	3.50	48	2.04	***	***

- PROPERTY DOUBTFUL

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 19/1965 10/11/65 1130 K 38 30 S 151 13 E

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

4581 13.9 15.6 13 2 11 6 8 7 13 2 19 1 1026.0 0 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRA <sup>TE</sup>
2	0	17.15	35.590	25.95	5.47	104	0.30	***	***
2	25	17.15	35.610	25.97	5.36	102	0.28	***	***
2	50	17.14	35.610	25.97	5.38	102	0.28	***	***
2	75	17.10	35.610	25.98	5.35	102	0.26	***	***
2	100	17.06	35.610	25.99	5.32	101	0.28	***	***
2	150	16.06	35.520	26.15	5.04	94	0.42	***	***
2	200	15.39	35.480	26.27	5.02	92	0.47	***	***
2	300	13.21	35.340	26.63	5.02	88	0.62	***	***
1	500	10.72	34.960+	26.81	5.05	83	0.88	***	***
1	700	8.45	34.670+	26.97	4.56	71	1.31	***	***
1	900	6.57	34.520	27.12	4.25	63	1.53	***	***
1	1100	5.22	34.510	27.28	4.13	60	1.83	***	***
1	1300	4.16	34.520	27.41	3.87	54	1.99	***	***
1	1500	3.43	34.580	27.53	3.58	49	1.99	***	***

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\* PROPERTY INTERPOLATED

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 198/63 10/11/63 1630 K 38 30 S 150 07 E

SONIC AIR TEMP. WIND ANEM, CLOUD VIS, SEA SWELL ATMOS, WIRE ANGLES  
 DEPTH WFT DRY DIR, SP, HEIGHT TYPE AMT, DIR, AMT, PRESSURE CAST1 CAST2 CAST3  
 3466 13.5 17.2 12 2 11 6 4 6 12 2 17 1 1024.5 5 0 \*

CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	14.19	35.530	26.13	5.63	105	0.13	***	***
2	25	15.88	35.520	26.19	5.65	105	0.12	***	***
2	50	15.84	35.520	26.20	5.54	103	0.12	***	***
2	75	15.82	35.520	26.21	5.54	103	0.09	***	***
2	100	14.41	35.430	26.45	5.03	90	0.29	***	***
2	150	12.95	35.320	26.67	4.95	86	0.50	***	***
2	200	12.01	35.170	26.74	4.96	84	0.50	***	***
2	300	10.40	34.970	26.88	4.88	80	0.70	***	***
1	497	8.60	34.720	26.98	4.62	73	1.05	***	***
1	696	6.39	34.540	27.16	4.28	64	1.38	***	***
1	895	4.95	34.510	27.31	4.07	58	1.44	***	***
1	1095	4.09	34.540	27.43	3.79	53	1.43	***	***
1	1295	3.37	34.580	27.54	3.61	50	1.52	***	***
1	1495	2.81	***	***	3.56	***	1.52	***	***



STATION 0 5/ 199/63 DATE 10/11/63 TIME 2110 K LATITUDE 38 30 S LONGITUDE 149 04 E

SONIC AIR TEMP. WIND DIR. SP. WIND ANEM. CLOUD VIS. SEA SWELL ATMOS. WIRE ANGLES  
 DEPTH NET DRY DIR. SP. HEIGHT TYPE AMT. DIR. AMT. DIR. AMT. PRESSURE CAST# CAST# CAST#

2261 14.4 16.7 04 2 11 \* 0 7 04 2 17 1 1025.0 5 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	16.44	35.440	26.00	5.67	106	0.08	***	***
2	25	16.11	35.440	26.08	5.65	105	0.08	***	***
2	50	15.43	35.430	26.22	5.55	102	0.09	***	***
2	75	14.64	35.410	26.38	5.30	96	0.12	***	***
2	100	14.07	35.390	26.49	5.18	92	0.23	***	***
2	150	13.22	35.320	26.61	5.13	90	0.43	***	***
2	200	12.28	35.210	26.72	5.02	86	0.44	***	***
2	300	11.26	35.060+	26.79	5.08	85	0.62	***	***
1	500	8.59	34.670	26.94	4.66	73	0.98	***	***
1	700	6.67	34.470	27.07	4.32	65	1.24	***	***
1	900	5.39	34.490	27.25	4.12	60	1.34	***	***
1	1100	4.30	34.510+	27.39	3.86	54	1.47	***	***
1	1300	3.18	34.540	27.52	3.58	49	1.53	***	***
1	1500	2.91	34.670	27.65	3.49	47	1.53	***	***

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\* PROPERTY INTERPOLATED

STATION G 5/ 200/63 DATE 11/11/63 TIME 0750 K LATITUDE 36 41 S LONGITUDE 150 10 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 CAS11 CAS12 CAS13

112 15.0 16.7 00 1 11 \* \* \* 7 00 0 13 1 1024.0 0 \* \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
1	0	18.01	35.500	25.67	5.41	105	0.10	***	***
1	10	17.99	35.520	25.69	5.38	104	0.11	***	***
1	20	17.84	35.590	25.78	5.35	103	0.07	***	***
1	30	17.73	35.520	25.75	5.27	101	0.07	***	***
1	40	17.03	35.440	25.86	5.31	101	0.17	***	***
1	50	16.12	35.340	26.00	5.45	101	0.20	***	***
1	75	13.90	35.280	26.44	5.01	89	0.47	***	***
1	100	13.76	35.280	26.47	4.80	85	***	***	***

STATION G 5/ 201/63 DATE 11/11/63 TIME 0855 K LATITUDE 36 41 S LONGITUDE 150 21 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  
 DEPTH MET DRY DIR, SP. HEIGHT CAST1 CAST2 CAST3

CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INCRG. P	TOTAL P	NITRATE				
384	15.6	18.3	11	1	6	01	2	16	1	1023.6	5	*	*
1	0	19.13	35.500	25.64	5.53	107	0.09	***	***	***	***	***	35
1	25	18.03	35.530	25.69	5.24	101	0.14	***	***	***	***	***	***
1	50	16.72	***	***	5.17	***	0.19	***	***	***	***	***	***
1	75	15.63	35.440	26.19	4.89	90	0.42	***	***	***	***	***	***
1	100	15.46	35.460	26.24	5.06	93	0.32	***	***	***	***	***	***
1	150	14.11	35.260	26.38	4.37	78	0.57	***	***	***	***	***	***
1	200	13.29	35.230	26.53	4.54	80	0.67	***	***	***	***	***	***
1	320	11.75	35.080	26.72	4.83	82	0.71	***	***	***	***	***	***

STATION 6 5/ 202/63 DATE 11/11/63 TIME 1040 K LATITUDE 36 40 S LONGITUDE 150 42 E

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

4114 17.8 20.0 .02 2 11 \* \* 6 02 2 16 1 1023.5 0 0 \*

CST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	17.46	35.590	25.87	5.55	106	0.05	***	***
2	25	16.95	35.590	26.00	5.56	105	0.06	***	***
2	50	16.45	35.500	26.05	5.31	99	0.12	***	***
2	75	15.72	35.480	26.20	5.25	97	0.17	***	***
2	100	15.79	35.480	26.18	5.16	95	0.31	***	***
2	150	14.37	35.410	26.44	4.95	89	0.37	***	***
2	200	13.29	35.320	26.60	4.71	83	0.52	***	***
2	300	11.72	35.080	26.72	4.67	79	0.76	***	***
2	500	9.12	34.740	26.92	4.77	76	1.07	***	***
1	700	7.26	34.600	27.09	4.37	66	1.40	***	***
1	500	5.72	34.510	27.22	4.22	62	1.58	***	***
1	1100	4.65	34.520	27.36	4.02	57	1.78	***	***
1	1300	3.69	34.600	27.52	3.67	51	1.97	***	***
1	1500	3.00	34.610	27.60	3.55	48	2.02	***	***

STATION G 5/ 203/63 DATE 11/11/63 TIME 1310 K LATITUDE 36 40 S LONGITUDE 151 07 E

SONIC AIR TEMP. WIND ANEM. CLOUD VIS, SEA SWELL ATMOS. WIRE ANGLES  
 DEPTH KEY DRY DIR, SP. HEIGHT TYPE AMT. DIR, AMT. DIR, AMT. PRESSURE CAST1 CAST2 CAST3  
 4590 18.3 20.0 02 3 11 \* \* 6 02 2 16 1 1022.0 5 0 \*

CST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE
2	0	16.83	35.520	25.97	5.73	108	0.07	***	***
2	25	16.41	35.520	26.07	5.80	109	0.07	***	***
2	50	16.16	35.520	26.13	5.66	105	0.10	***	***
2	75	15.94	35.530	26.19	5.49	102	0.18	***	***
2	100	15.80	35.520	26.21	5.53	102	0.16	***	***
2	150	14.19	35.410	26.48	5.15	92	0.43	***	***
2	200	13.62	35.390	26.59	5.12	90	0.46	***	***
2	300	12.15	35.190	26.73	4.85	83	0.66	***	***
1	500	9.35	34.780	26.91	4.89	78	0.95	***	***
1	700	7.80	34.600	27.01	4.38	67	1.27	***	***
1	900	6.06	34.490	27.16	4.31	64	1.52	***	***
1	1100	4.75	34.510	27.34	4.01	57	1.64	***	***
1	1300	3.86	34.560	27.47	3.78	53	1.89	***	***
1	1500	3.16	34.610	27.58	3.53	48	1.77	***	***

STATION G 5/ 204/63 DATE 11/11/63 TIME 1600 K LATITUDE 36 40 S LONGITUDE 151 36 E

SONIC AIR TEMP. WIND DIR, SP. ANEM. HEIGHT CLOUD VIS, DIR, AMT, SEA SWELL DIR, AMT, ATMOS. WIRE ANGLES  
 DEPTH WET DRY 18,9 02 2 11 \* 0 \* 0 7 02 2 18 1 1021.7 2 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	INORG. P	TOTAL P	NITRATE
2	0	17.06	35.570	25.95	5.62	107	0.14	***	***
2	25	16.78	35.570	26.02	5.63	106	0.14	***	***
2	50	16.43	35.530	26.07	5.37	101	0.18	***	***
2	75	16.00	35.520	26.16	5.33	99	0.28	***	***
2	100	15.74	35.520	26.23	5.12	95	0.40	***	***
2	150	14.75	35.440	26.38	4.73	86	0.53	***	***
2	200	13.76	35.370	26.54	4.70	83	0.57	***	***
2	200	12.11	35.160	26.71	4.52	77	0.76	***	***
1	500	9.95	34.880	26.89	4.66	76	0.95	***	***
1	700	7.92	34.670	27.05	4.52	70	1.32	***	***
1	900	6.09	34.520	27.18	4.21	62	1.57	***	***
1	1100	4.79	34.520	27.34	3.93	56	1.78	***	***
1	1300	3.90	34.580	27.48	3.70	52	1.87	***	***
1	1500	3.15	34.610	27.58	3.49	48	1.89	***	***

STATION G 5/ 205/63 DATE 11/11/63 TIME 1900 K LATITUDE 36 40 S LONGITUDE 152 09 E

SONIC AIR TEMP. WIND ANEM. CLOUD SEA SWELL ATMOS. WIRE ANGLES  
 DEPTH MET DRY DIR, SP, HEIGHT TYPE AMT, DIR, AMT, DIR, AMT, PRESSURE CAST1 CAST12 CASTS

4665 17.2 19.4 02 1 11 \* 0 9 02 1 17 1 1022.7 5 0 \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	16.20	35.610	26.19	5.85	109	0.17	***	***
2	25	15.73	35.590	26.28	5.80	107	0.10	***	***
2	50	15.55	35.590	26.32	5.63	104	0.11	***	***
2	75	15.45	35.590	26.34	5.55	102	0.13	***	***
2	100	15.40	35.570	26.34	5.50	101	0.12	***	***
2	150	14.24	35.480	26.52	4.98	89	0.47	***	***
2	200	13.08	35.410	26.71	5.04	88	0.46	***	***
2	300	11.95	35.190	26.77	4.90	83	0.62	***	***
1	500	9.41	34.850	26.95	4.68	75	0.97	***	***
1	700	7.62	34.630	27.06	4.48	69	1.40	***	***
1	900	4.02	34.540	27.21	4.22	62	1.58	***	***
1	1100	4.74	34.580	27.39	3.99	57	1.77	***	***
1	1300	3.74	34.600	27.52	3.69	51	1.95	***	***
1	1500	3.10	34.650	27.62	3.48	47	1.96	***	***

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 206/63 12/11/63 0005 K 36 40 S 153 11 E

SONIC AIR TEMP. WIND ANEM. CLOUD VIS. SEA SWELL ATMOS. WIRE ANGLES  
 DEPTH MET DRY DIR, SP. HEIGHT TYPE AMT. DIR, AMT. DIR, AMT. PRESSURE CAST1 CAST2 CAST3  
 4663 15.6 17.2 02 2 11 0 0 7 02 2 17 1 1023.0 20 0 \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN X SAT,	INORG. P	TOTAL P	NITRATE
2	0	17.17	35.570	25.93	5.47	104	0.10	***	***
2	25	16.97	35.530	25.95	5.52	105	0.08	***	***
2	50	16.83	35.550	25.99	5.36	101	0.08	***	***
2	75	16.77	35.530	25.99	5.34	101	0.12	***	***
2	100	16.43	35.520	26.07	5.24	98	0.19	***	***
2	150	15.74	35.480	26.19	5.12	95	0.28	***	***
2	200	14.87	35.430	26.35	4.78	87	0.50	***	***
2	300	12.64	35.190	26.63	4.60	79	0.71	***	***
1	458	10.07	34.810	26.81	4.69	76	0.98	***	***
1	642	7.90	34.600	27.00	4.39	68	1.32	***	***
1	830	6.42	34.510	27.13	4.24	63	1.58	***	***
1	1017	5.18	34.490	27.27	4.05	58	1.80	***	***
1	1206	4.07	34.510	27.41	3.74	52	1.87	***	***
1	1394	3.30	34.580	27.54	3.49	48	2.08	***	***



STATION G 5/ 207/63 DATE 12/11/63 TIME 0455 K LATITUDE 36 40 S LONGITUDE 154 27 E

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

4297	16.7	18.3	01	4	11	*	0	8	02	2	17	1	1024.0	0	0	*
CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE							
2	0	14.83	35.530	25.98	5.58	105	0.12	***	***							
2	25	14.44	35.520	26.06	5.64	106	0.17	***	***							
2	50	15.97	35.460	26.13	5.43	101	0.16	***	***							
2	75	15.85	35.480	26.17	5.42	100	0.29	***	***							
2	100	15.60	35.440	26.19	5.34	98	0.29	***	***							
2	150	14.08	35.390	26.49	5.13	91	0.51	***	***							
2	200	13.39	35.350	26.60	5.18	91	0.61	***	***							
2	300	11.76	35.160	26.78	4.89	83	0.78	***	***							
1	493	9.18	34.740	26.91	4.60	73	1.23	***	***							
1	685	7.53	34.580	27.03	4.43	68	1.57	***	***							
1	880	5.89	34.450	27.15	4.09	60	1.67	***	***							
1	1080	4.66	34.470	27.31	3.90	55	1.88	***	***							
1	1280	3.77	34.540	27.47	3.65	51	2.02	***	***							
1	1480	3.12	34.580	27.56	3.45	47	2.12	***	***							

STATION G 5/ 208/63 DATE 12/11/63 TIME 0845 K LATITUDE 36 40 S LONGITUDE 155 14 E

SONIC AIR TEMP. WIND. ANEM. CLOUD VIS. SEA SWELL ATMOS. WIRE ANGLES  
 DEPTH MET DAY DIR, SP, HEIGHT TYPE AMY, DIR, AMT. DIR, AMT. PRESSURE CAST1 CAST2 CAST3

4755 16,7 17,8 02 3 35 \* \* 6 02 2 19 1 1025,0 10 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	17.56	35.550	25.82	5.34	102	0.17	***	***
2	25	16.69	35.530	26.01	5.54	104	0.16	***	***
2	50	16.58	35.500	26.01	5.35	101	0.21	***	***
2	75	15.60	35.460	26.21	5.12	94	0.31	***	***
2	100	14.99	35.430	26.32	4.86	88	0.50	***	***
2	150	13.78	35.260	26.45	4.37	77	0.67	***	***
2	200	13.12	35.250	26.58	4.66	81	0.73	***	***
2	300	11.38	34.990	26.72	4.44	74	0.90	***	***
1	500	8.76	34.670	26.92	4.43	70	1.21	***	***
1	700	7.04	34.540	27.07	4.21	64	1.54	***	***
1	900	5.55	34.470	27.21	4.14	60	1.67	***	***
1	1100	4.62	34.490	27.34	3.91	56	1.94	***	***
1	1300	3.67	34.520	27.46	3.63	50	1.98	***	***
1	1500	3.03	34.580	27.57	3.51	48	1.97	***	***



STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 210/63 12/11/63 2030 K 35 20 S 154 40 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 CAST1 CAST2 CAST3

4114 17.8 20.6 02 2 11 \* 0 9 02 2 03 1 1023.9 5 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	14.10	35.530	25.67	5.50	106	0.19	***	***
2	25	17.28	35.530	25.87	5.58	106	0.17	***	***
2	50	17.16	35.520	25.89	5.27	100	0.20	***	***
2	75	16.36	35.480	26.05	4.78	89	0.41	***	***
2	100	16.03	35.460	26.11	4.78	89	0.39	***	***
2	150	15.11	35.410	26.28	4.46	81	0.53	***	***
2	200	13.82	35.280	26.46	4.37	77	0.66	***	***
2	300	11.90	35.080	26.69	4.39	75	0.80	***	***
1	500	9.23	34.740	26.90	4.43	71	1.10	***	***
1	700	7.08	34.540	27.07	4.28	65	1.43	***	***
1	900	5.61	34.490	27.22	4.16	61	1.69	***	***
1	1100	4.61	34.510	27.35	3.95	56	1.88	***	***
1	1300	3.70	34.580	27.50	3.62	50	2.01	***	***
1	1500	3.07	34.610	27.59	3.47	47	2.03	***	***

STATION DATE TIME LATITUDE LONGITUDE

G 5/ 212/63 13/11/63 0400 K 35 20 S 153 15 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 CAST1 CAST2 CAST3

4663 18.9 21.7 01 5 11 6 2 8 00 3 00 1 1019.9 30 0 \*

CAST DEPTH TEMP. SALINITY SIGMA-T OXYGEN OXYGEN % SAT. INORG. P TOTAL P NITRATE

2	0	22.48	35.410	24.41	4.77	100	0.14	***	***
2	25	22.48	35.410	24.41	4.73	99	0.14	***	***
2	50	21.13	35.500	24.86	4.81	99	0.16	***	***
2	75	20.04	35.530	25.17	4.70	94	0.22	***	***
2	100	19.43	35.550	25.35	4.50	89	0.28	***	***
2	150	18.46	35.550	25.60	4.37	85	0.42	***	***
2	200	17.09	35.520	25.91	4.26	81	0.42	***	***
2	300	13.74	35.300	26.49	4.60	81	0.67	***	***
2	400	11.33	34.970	26.71	4.43	74	0.86	***	***
1	523	9.53	34.760	26.86	4.46	72	1.07	***	***
1	701	7.50	34.520	26.99	4.27	65	1.47	***	***
1	891	5.96	34.470	27.16	4.15	61	1.61	***	***
1	1084	4.72	34.470	27.31	3.91	56	1.67	***	***
1	1280	3.85	34.510	27.43	3.68	51	1.95	***	***
1	1480	3.12	34.580	27.56	3.42	47	***	***	***

STATION G 5/ 213/63 DATE 13/11/63 TIME 1000 K LATITUDE 35 20 S LONGITUDE 152 07 E

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

4682 19.4 22.2 00 6 11 6 2 6 00 3 00 1 1021.0 30 5 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	22.14	35.430	24.52	4.83	101	0.14	***	***
2	25	21.23	35.530	24.85	3.79	78	0.30	***	***
2	50	18.61	35.530	25.54	3.95	77	0.44	***	***
2	75	17.83	35.530	25.74	4.28	82	0.46	***	***
2	100	17.26	35.500	25.85	4.24	81	0.49	***	***
2	150	15.83	35.410	26.12	4.23	78	0.59	***	***
2	200	14.30	35.280	26.36	4.24	76	0.63	***	***
2	300	11.84	35.070	26.69	4.54	77	0.86	***	***
1	472	9.30	34.740	26.89	4.65	74	1.21	***	***
1	670	7.34	34.540	27.03	4.38	67	1.35	***	***
1	870	5.75	34.470	27.19	4.25	62	1.59	***	***
1	1070	4.54	34.470	27.33	4.24	60	1.77	***	***
1	1270	3.71	34.510	27.45	3.71	51	2.01	***	***
1	1470	3.00	34.560	27.56	3.55	48	2.08	***	***

STATION G 5/ 214/63 DATE 13/11/63 TIME 1310 K LATITUDE 35 20 S LONGITUDE 151 37 E

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

4663 19,4 21,1 02 7 11 \* 0 7 00 3 01 4 1012.7 10 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INDRG. P	TOTAL P	NITRATE
2	0	18.89	35.610	25.53	5.45	107	0.14	***	***
2	25	18.35	35.590	25.65	5.45	106	0.15	***	***
2	50	17.84	35.570	25.77	5.28	102	0.17	***	***
2	75	15.91	35.430	26.12	4.53	84	0.24	***	***
2	100	14.88	35.350	26.29	4.29	78	0.64	***	***
2	150	12.86	35.160	26.56	4.41	77	0.86	***	***
2	200	11.76	35.050	26.69	4.55	77	0.84	***	***
2	300	10.22	34.870	26.83	4.58	75	1.04	***	***
1	500	8.11	34.610	26.97	4.53	70	1.30	***	***
1	700	6.03	34.510	27.18	4.30	63	1.43	***	***
1	900	5.13	34.510	27.29	4.17	60	1.65	***	***
1	1100	4.13	34.510	27.41	3.84	54	1.79	***	***
1	1300	3.41	34.560	27.52	3.61	50	1.89	***	***
1	1500	2.87	34.610	27.61	3.59	49	2.02	***	***

STATION G 5/ 215/63 DATE 13/11/63 TIME 1545 K LATITUDE 35 21 S LONGITUDE 151 16 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 CAST1 CAST2 CAST3

2651 18.9 21.7 01 6 11 5 4 7 01 3 00 4 1011.3 0 0 \*

CAST	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRA:E
2	0	18.09	35.460	25.62	5.58	108	0.23	***	***
2	25	17.26	35.480	25.84	5.65	108	0.23	***	***
2	50	15.21	35.440	26.28	5.05	92	0.43	***	***
2	75	14.44	35.410	26.43	5.12	92	0.51	***	***
2	100	13.80	35.350	26.52	4.97	88	0.63	***	***
2	150	12.92	35.250	26.62	4.81	84	0.63	***	***
2	200	12.16	35.160	26.70	4.86	83	0.65	***	***
2	300	11.18	35.080	26.82	4.88	82	0.86	***	***
1	500	8.56	34.670	26.95	4.56	72	1.32	***	***
1	700	6.66	34.520	27.11	4.30	64	1.53	***	***
1	900	5.19	34.430	27.22	4.11	59	1.81	***	***
1	1100	4.19	34.510	27.40	3.79	53	1.84	***	***
1	1300	3.36	34.560	27.52	3.60	49	1.95	***	***
1	1500	2.87	34.600	27.60	3.51	48	2.02	***	***



STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 216/63 13/11/63 1810 K 35 21 S 150 52 E

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

185	19.2	21.7	02	5	11	5	4	7	02	3	00	1	1009.0	0	*	*
CST	DEPTH	TEMP.	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE						
1	0	18.48	18.48	35.930	25.58	5.48	107	0.16	***	***						
1	25	18.42	18.42	35.520	25.58	5.49	107	0.16	***	***						
1	50	15.85	15.85	35.500	26.18	5.18	96	0.38	***	***						
1	75	15.11	15.11	35.440	26.31	4.94	90	0.45	***	***						
1	100	14.06	14.06	35.340	26.45	4.46	79	0.57	***	***						
1	150	12.64	12.64	35.170	26.62	4.62	80	0.79	***	***						
1	175	12.57	12.57	35.210	26.66	4.63	83	0.79	***	***						

STATION G 5/ 217/6J DATE 13/11/6J TIME 1915 K LATITUDE 35 20 S LONGITUDE 150 40 E

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

119 19.4 21.7 02 3 11 5 8 7 02 2 00 1 1009.5 0 \* \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	16.85	35.440	25.91	5.58	105	0.21	***	***
1	10	16.86	35.440	25.90	5.72	108	0.23	***	***
1	20	16.75	35.440	25.93	5.48	103	0.26	***	***
1	30	15.98	35.430	26.10	5.35	99	0.24	***	***
1	40	15.58	35.410	26.18	5.20	96	0.42	***	***
1	50	15.21	35.460	26.30	5.10	93	0.44	***	***
1	75	14.26	35.370	26.43	4.62	83	0.65	***	***
1	100	13.43	35.300	26.56	4.74	83	0.71	***	***

STATION G 5/ 218/63 DATE 14/11/63 TIME 0330 K LATITUDE 34 01 S LONGITUDE 151 27 E

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

137 18.9 20.0 00 1 11 4 5 7 01 2 01 1 1010.0 2 \* \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	18.84	35.460	25.43	5.31	104	0.22	***	***
1	25	16.59	35.390	25.93	4.55	85	0.50	***	***
1	50	15.24	35.430	26.27	4.42	81	0.58	***	***
1	75	14.06	35.370	26.48	4.45	79	0.70	***	***
1	100	13.58	35.340	26.56	4.48	79	0.68	***	***
1	125	12.76	35.250	26.65	4.46	77	0.78	***	***

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 219/63 14/11/63 0440 K 34 00 S 151 39 E

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

348 18.5 20.0 01 3 11 6 5 7 03 2 07 1 1012.0 2 \* \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	18.92	35.440	25.40	5.24	103	0.24	***	***
1	25	18.43	35.500	25.56	5.35	104	0.27	***	***
1	50	16.05	35.460	26.11	4.86	90	0.51	***	***
1	75	14.83	35.410	26.34	4.66	84	0.69	***	***
1	100	13.60	35.320	26.54	4.38	77	0.65	***	***
1	150	12.76	35.260	26.66	4.71	82	0.77	***	***
1	200	12.59	35.250	26.69	4.74	82	0.82	***	***
1	330	10.13	34.920	26.89	4.80	78	1.12	***	***

STATION G 5/ 220/63 DATE 14/11/63 TIME 0620 K LATITUDE 34 00 S LONGITUDE 151 51 E

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

1609 19.4 21.1 33 2 11 0 5 7 34 2 05 1 1013.0 0 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRAIE
2	0	18.90	35.500	25.45	5.38	106	0.30	***	***
2	25	18.59	35.500	25.52	5.38	105	0.33	***	***
2	50	17.31	35.480	25.83	5.08	97	0.37	***	***
2	75	15.35	35.440	26.25	4.98	91	0.54	***	***
2	100	14.76	35.460	26.40	4.99	90	0.63	***	***
2	150	13.00	35.300	26.64	4.51	79	0.91	***	***
2	200	11.71	35.140	26.77	4.54	77	1.03	***	***
2	300	10.01	34.870	26.87	4.58	74	1.11	***	***
1	500	8.19	34.650	26.99	4.51	70	1.61	***	***
1	700	6.41	34.510	27.13	4.22	63	***	***	***
1	900	5.09	34.490	27.28	4.06	58	***	***	***
1	1100	4.04	34.520	27.42	3.76	53	1.90	***	***
1	1300	3.29	34.540+	27.51	3.53	48	1.99	***	***
1	1500	2.83	34.560	27.57	3.53	48	1.96	***	***

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\* PROPERTY INTERPOLATED

STATION DATE TIME LATITUDE LONGITUDE  
 6 5/ 221763 14/11/63 0930 K 34 00 S 152 08 E

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

45/2 20.0 22.2 33 2 11 6 8 7 34 2 04 1 1015.0 5 0 \*

CAS1	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	CXYGFN % SAT,	INORG. P	TOTAL P	NITRATE
2	0	18.40	35.520	25.59	5.47	107	0.19	***	***
2	25	18.18	35.460	25.60	5.48	106	0.21	***	***
2	50	17.08	35.440	25.85	5.52	105	0.25	***	***
2	75	15.59	35.440	26.20	5.08	94	0.34	***	***
2	100	15.15	35.430	26.29	4.86	89	0.34	***	***
2	150	13.46	35.230	26.50	4.47	79	0.66	***	***
2	200	12.39	35.100	26.61	4.40	76	0.78	***	***
2	300	10.32	34.870	26.81	4.33	71	1.11	***	***
1	500	7.90	34.600	26.99	4.43	68	1.36	***	***
1	700	6.03	34.450	27.14	4.34	64	1.51	***	***
1	900	5.14	34.450	27.24	4.06	58	1.67	***	***
1	1100	3.88	34.520	27.44	3.71	52	1.71	***	***
1	1300	3.31	34.560	27.53	3.54	49	1.92	***	***
1	1500	2.68	34.630	27.64	3.57	48	2.03	***	***

STATION 6 5/ 222/63 DATE 14/11/63 TIME 1400 K LATITUDE 34 00 S LONGITUDE 153 28 E

SONIC AIR TEMP. WIND ANEM. CLOUD SWELL ATMOS. WIRE ANGLES  
 DEPTH MET DRY DIR, SP. HFIGHT TYPE AMT. VIS. DIR, AMT. DIR, AMT. PRESSURE CAST1 CAST2 CAST3

CAS1	DEPTH	TEMP,	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT,	INORG. P	TOTAL P	NITRATE						
4663	21,1	23,3	4	11	5	8	7	24	2	34	4	1014,0	10	15	*
3	0	21,81	35,460	24,64	4,92	102	0,25	0,50	***						
3	25	21,80	35,440	24,63	4,95	103	0,25	***	***						
3	50	21,78	35,440	24,63	4,92	102	0,27	0,56	***						
3	75	21,70	35,430	24,65	4,84	100	0,21	***	***						
3	100	21,02	35,500	24,89	4,68	96	0,27	0,56	***						
3	150	20,21	35,530	25,13	4,80	97	0,34	***	***						
3	200	19,33	35,570	25,39	4,45	88	0,37	0,60	***						
3	300	17,37	35,530	25,85	4,34	83	0,46	0,68	***						
2	495	13,33	35,250	26,54	4,47	78	0,56	0,94	***						
2	691	9,47	34,790	26,90	4,45	71	0,84	1,32	***						
2	887	7,29	34,520	27,02	4,33	66	1,38	1,65	***						
2	1082	5,65	34,450	27,18	4,20	61	1,63	1,82	***						
2	1277	4,44	34,470	27,34	3,88	55	1,75	2,00	***						
2	1477	3,66	34,520	27,46	3,59	50	1,83	2,07	***						
1	1990	2,52	34,643	27,66	3,62	49	2,03	2,04	***						
1	2488	2,09	34,708	27,75	4,02	53	1,93	2,08	***						
1	2985	1,68	34,735	27,81	4,31	57	1,88	1,99	***						
1	3465	1,31	34,729	27,85	4,40	57	1,76	2,01	***						
1	3965	1,23	34,721	27,83	4,48	58	1,67	2,07	***						
1	4385	1,16	34,727	27,84	4,48	58	1,67	2,09	***						

STATION DATE TIME LATITUDE LONGITUDE  
 G 5/ 223/63 14/11/63 1930 K 34 00 S 154 20 E

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

4590 18.3 19.4 16 5 11 9 8 5 16 3 35 1 1017.0 10 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	22.28	35.430	24.49	4.87	102	0.21	***	***
2	25	22.23	35.440	24.51	4.87	102	0.28	***	***
2	50	22.03	35.460	24.58	4.98	104	0.28	***	***
2	75	21.43	35.530	24.80	4.94	102	0.28	***	***
2	100	20.72	35.570	25.02	4.94	101	0.30	***	***
2	150	19.27	35.550	25.39	4.56	90	0.34	***	***
2	200	18.55	35.550	25.57	4.65	91	0.41	***	***
2	300	15.43	35.350	26.16	4.06	74	0.70	***	***
1	468	11.91	35.080	26.69	4.51	77	0.89	***	***
1	648	9.05	34.720	26.91	4.61	73	1.07	***	***
1	834	7.26	34.520	27.03	4.36	66	1.54	***	***
1	1020	5.61	34.510	27.24	4.20	61	1.80	***	***
1	1210	4.38	34.520	27.39	3.90	55	1.92	***	***
1	1410	3.59	34.540	27.48	3.65	50	***	***	***



STATION G 5/ 224/63 DATE 14/11/63 TIME 2335 K LATITUDE 34 00 S LONGITUDE 155 05 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 CAST1 CAST2 CAST3

4737 17.2 18.9 20 1 11 6 3 6 00 0 34 1 1019.0 10 0 \*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	19.41	35.350	25.20	5.24	104	0.17	***	***
2	25	19.35	35.500	25.33	5.22	103	0.17	***	***
2	50	18.97	35.500	25.43	5.24	103	0.18	***	***
2	75	16.29	35.430	26.03	4.13	77	0.56	***	***
2	100	14.89	35.350	26.28	4.26	77	0.68	***	***
2	150	12.59	35.080	26.56	4.13	71	0.78	***	***
2	200	11.37	34.970	26.70	4.26	71	0.85	***	***
2	300	9.75	34.810	26.87	4.38	71	1.12	***	***
1	494	7.67	34.560	27.00	4.33	66	1.46	***	***
1	690	6.17	34.490	27.15	4.25	63	1.48	***	***
1	888	5.09	34.490	27.28	4.08	59	1.71	***	***
1	1085	4.08	34.520	27.42	3.79	53	1.84	***	***
1	1282	3.46	34.580	27.53	3.52	48	1.84	***	***
1	1461	2.98	34.610	27.60	3.50	48	1.92	***	***

## 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.
29. Oceanographical observations in the Pacific Ocean in 1963. H.M.A.S. *Gascoyne* Cruise G4/63.
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.
34. Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. *Gascoyne* Cruise G2/64.
46. Oceanographical observations in the Indian Ocean in 1965. H.M.A.S. *Gascoyne* Cruise G5/65.