

OCEANOGRAPHICAL STATION LIST

Volume 43

Oceanic Investigations in Eastern Australia,
H.M.A. Ships *Queenborough*, *Quickmatch*, and *Warrego*, 1958

Compiled by A. D. Crooks



Division of Fisheries and Oceanography
Commonwealth Scientific and Industrial
Research Organization, Australia

1960

OCEANOGRAPHICAL STATION LIST

OCEANIC INVESTIGATIONS IN EASTERN AUSTRALIA,
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I. INTRODUCTION

The Department of the Navy gave permission for scientists from this Laboratory to accompany H.M.A. Ships *Queenborough* and *Quickmatch* to carry out an oceanographical survey of the Tasman Sea as an International Geophysical Year project. The ships left Sydney on March 24, travelled by Brisbane to Noumea, thence to Auckland and Wellington, and returned to Sydney on April 26, 1958. The ships travelled together; H.M.A.S. *Queenborough* did a regular hydrology cast to 1000 m and a 900 ft bathythermograph lowering, and H.M.A.S. *Quickmatch* did a phytoplankton net tow and carbon fixation determinations with $^{14}\text{CO}_2$, at all stations (located at approximately 100 mile intervals).

Two scientists accompanied H.M.A.S. *Warrego* on a routine cruise, from April 18 to 26, 1958, when they took surface hydrology and phytoplankton samples between Coff's Harbour and Darwin.

The cooperation of the Navy is gratefully acknowledged, and the interest and assistance of the officers and men of the ships are greatly appreciated.

II. METHODS AND UNITS

(a) Hydrology

(i) *Temperature*.—Temperatures were taken with deep sea reversing thermometers and corrected for mercury expansion effects and index error. Depths were determined from differences in the readings of protected and unprotected thermometers.

(ii) *Salinity*.—In this volume salinity has been recorded in preference to chlorinity and it is expressed in parts per thousand. Chlorinity is first determined using a temperature-chlorinity meter (Hamon 1956), and is then converted to salinity using Knudsen's tables (1948).

(iii) *Oxygen*.—Dissolved oxygen determinations were carried out according to Winkler's method as modified by Thompson and Robinson (1939). The values are reported as ml/l. Oxygen saturation values were calculated using the nomograph of Richards and Corwin (1956).

(iv) *Sigma-t*.—*Sigma-t* was calculated using a monograph constructed from information issued by U.S. Navy Hydrographic Office (La Fond 1951).

(v) *Phosphate P*.—Inorganic phosphate determinations were made using Atkins's (1923) modification of Denigès's original method. Stannous chloride was

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used as the reductant. Distilled water standards were used and no salt error correction was applied. Other forms of phosphorus were converted to orthophosphate by Robinson's (1941) digestion method, prior to the determination of total phosphorus.

(b) *Phytoplankton*

Water samples were taken with a plastic sampler. In the laboratory the samples were centrifuged, and the phytoplankton examined and counted in two size groups, above and below 30 μ . The counts are given as log numbers per litre for each sampling depth. The symbol * in data sheets indicates numbers too few to count.

(c) *Pigments*

Water samples were taken with a plastic sampler and filtered within 1 or 2 hr through millipore filters. The filters were placed in envelopes and stored in metal vacuum desiccators over silica gel. The analyses were carried out using the method given by Humphrey (1960).

(d) *CO₂ Uptake*

Measurements of photosynthetic CO₂ uptake by marine phytoplankton were made by the ¹⁴C method described by Jitts (1957). Incubation was done in a fluorescent light bath with a constant illumination of about 1100 ft candles. The period of incubation in the light bath is given in hours.

Depth from which the sample was taken is given in meters below the surface.

Activity is in counts per minute corrected for background. All counts were taken to 10,000 counts, or 5 min, whichever occurred first, and are corrected for counter instability by reference to a count of a known ¹⁴C standard sample (labelled "Perspex") either directly preceding or following the unknown sample. Counts were made with a windowless Geiger counter with an efficiency of about 40 per cent.

"Light" is the activity of the sample in the clear tube after incubation and filtration. "Dark" is the activity of the sample from the dark tube. "Net" is the light activity less the dark activity. "Production" is the rate of uptake of CO₂ calculated by means of the formula:

$$\frac{\text{Net Activity}}{\text{Added Activity}} \times 90 \times \frac{12}{44} \times \frac{1000}{\text{Period of Incubation}}$$

The CO₂ content is assumed to be 90 mg/l. The activity added was 6.17 × 10⁶ counts/min. The production is given in mg C/m³ per hr.

The rates of production per m² column of water at each station are calculated by using the formula:

$$\frac{1}{1000} \left\{ \frac{25}{2} (a+b) + \frac{25}{2} (b+c) + \frac{50}{2} (c+d) \right\},$$

where a , b , c , and d are the rates of production at 0, 25, 50, and 100 m respectively. To obtain the daily rate of production from light bath incubation measurements (mg C/hr/m^3), the formula is multiplied by the factor 10, assuming as a rough approximation that the daily rate is 10 times the hourly rate.

(e) Light Penetration

Measurements of light penetration were made by the method described by Jitts (1959). Time recorded is Eastern Australian Standard Time; depth is in metres. Percentage surface light is the average of two readings taken while lowering and raising the photometer. Depth of penetration of 1 per cent. surface light is given in metres and was obtained by extrapolation of the curve of the measurements at the various depths. Solar altitude was calculated for the time of commencement of the measurements, using published data in nautical almanacs and "Tables of Computed Altitude and Azimuth".

III. PERSONNEL

Aboard H.M.A.S. *Queenborough* the sampling and much of the analyses of hydrological samples were carried out by Messrs. Davies and Rochford. Aboard H.M.A.S. *Quickmatch* the phytoplankton samples were collected and examined by Mr. E. J. F. Wood. The samples for CO_2 uptake studies were taken and processed by Mr. H. R. Jitts, who also made the light penetration observations. The counting of these samples was done by Messrs N. Dyson and D. Llewellyn. Aboard H.M.A.S. *Warrego* Mr. C. Walker was responsible for collecting hydrological samples and Mr. L. Crosby for the collection of phytoplankton. Misses F. Luce and R. Weidenhofer and Mrs. E. Wood processed the data under the direction of Mr. A. D. Crooks. Mrs. D. Schmitzer prepared the typed sheets.

IV. REFERENCES

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1958.11.58

"Queenborough"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 26.11.58

TIME: 1515

STATION NO.: Q.1

LATITUDE: 31°00' S.

LONGITUDE: 158°13' E.

0	24.75	35.66	23.93	4.69	95					
25	24.65	35.64	23.95	4.79	97					0.23
50	24.22	35.64	24.08	4.84	97					0.39
75	22.25	35.64	24.65	5.11	100					0.23
90	21.29	35.64	24.92	4.93	94					0.23
182	18.67	35.61	25.59	4.61	85					0.23
275	17.13	35.53	25.91	4.44	79					0.45
472	13.08	35.17	26.53	4.25	71					0.42
										0.48

DATE: 31.11.58

TIME: 1700

STATION NO.: Q.2

LATITUDE: 26°22' S.

LONGITUDE: 154°30' E.

0	27.22	35.34	22.92	4.49	95	0.23	0.06
25	27.28	35.34	22.90	4.41	93	0.26	0.10
49	27.11	35.34	22.96	4.29	91	0.23	0.16
73	25.02	35.46	23.70	3.85	79	0.29	0.13
97	23.62	35.57	24.21	3.57	71	0.39	0.06
147	21.38	35.62	24.88	3.60	69	0.52	0.03
196	19.93	35.61	25.26	4.03	75	0.52	0.03
294	15.93	35.32	26.02	3.57	62	0.74	0.06
410	12.80	35.03	26.47	3.91	64	0.97	0
628	8.34	34.63	26.95	4.41	66	1.29	0
865	5.80	34.49	27.19	4.35	62	1.65	0

H.M.A.S. "Quickmatch"

CO₂ UPTAKE

INCUBATION		Depth	ACTIVITY			PRODUCTION	
Method	Period		Light	Dark	Net	mgC/m ³	gC/day/m ²

DATE: 26.111.58 TIME: 1425 STATION NO.: Q.1
LATITUDE: 31°00' S. LONGITUDE: 158°13' E.

Bath	4 hrs	0			0.05	0.05
		25			0.06	
		50			0.06	
		100			0.01	

DATE: 31.111.58 TIME: 1710 STATION NO.: Q.2
LATITUDE: 26°22' S. LONGITUDE: 154°30' E.

Bath	4 hrs	0			0.05	0.12
		25			0.05	
		50			0.21	
		100			0.10	

H.M.A.S. "Quickmatch"

PIGMENTS

LIGHT PENETRATION

Depth	Chlorophyll			Astacin	Non Astacin	Time	Depth	Percentage Surface Light
	a	b	c					

DATE: 26.111.58

TIME: 1500

LATITUDE: 31°00' S.

LONGITUDE: 158°13'

DEPTH 1% S.L.: 122

SOLAR ALT.: 27°

0	100
10	80
20	59
30	47
40	45
50	36
60	25
70	15
80	14

H.M.A.S. "Quickmatch"

PIGMENTS					PHYTOPLANKTON				
Depth	Chlorophyll			Astacin	Non Astacin	Depth	1-5 μ	5-15 μ	>15 μ
	a	b	c						

DATE: 26.11.58 TIME: 1425 STATION NO.: Q.1
 LATITUDE: 31°00' S. LONGITUDE: 158°13' E.

0	0.20	0.10	0.53	0.16	0.04	0	6.78		0.70
25	0.28	0.32	2.28	0.59		20		*	0.70
50	0.21	0.07	1.01	0.21		50	5.30	*	0.70

DATE: 31.11.58 TIME: 1710 STATION NO.: Q.2
 LATITUDE: 26°22' S. LONGITUDE: 154°30' E.

0	0.31	0.19	1.39	0.23		0	5.71	*	2.04
25	0.23	0.12	0.83	0.17	0.02	20	5.08	*	*
50	0.31	0.14	1.27	0.19		50	*	2.30	2.20

H.M.A.S. "Queenborough"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	NO
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DATE: 1.iv.58

TIME: 0505

STATION NO.: 1

LATITUDE: 25°32' S.

LONGITUDE: 156°40'

0	24.94	35.75	23.95	4.69	96		0.19	0.42		
22	24.93	35.77	23.96	4.63	94		0.23	0.19		
45	24.85	35.75	23.97	4.69	96		0.23	0.10		
67	24.66	35.77	24.04	4.67	95		0.23	0.10		
90	21.63	35.62	24.81	4.82	93		0.23	0.10		
135	19.47	35.59	25.37	4.18	78		0.39	0.06		
180	18.66	35.59	25.57	4.34	80		0.42	0.10		
270	16.62	35.48	25.99	4.15	73		0.48	0		
442	12.94	35.12	26.51	4.18	69		0.87	0		
673	8.02	34.61	26.99	4.18	62		1.32	0.35		
902	5.91	34.49	27.18	4.18	60		1.55	0.45		

DATE: 1.iv.58

TIME: 1700

STATION NO.: Q

LATITUDE: 24°53' S.

LONGITUDE: 159°02'

0	26.33	35.48	23.31	4.68	98		0.19	0.32		
25	26.24	35.48	23.34	4.52	94		0.19	0.19		
50	24.66	35.59	23.91	4.78	97		0.19	0.16		
75	23.09	35.59	24.37	4.72	93		0.23	0.06		
100	21.30	35.61	24.90	4.35	83		0.29	0.23		
150	19.62	35.59	25.33	3.69	69		0.45	0.16		
200	18.43	35.55	25.60	4.11	75		0.48	0.13		
500	11.67	34.97	26.65	4.29	69		1.00	0		
750	6.85	34.51	27.07	4.49	65		1.55	0		
1000	4.85	34.51	27.32	4.11	57		1.84	0		

H.M.A.S. "Quickmatch"

CO₂ UPTAKE

INCUBATION		Depth	ACTIVITY			PRODUCTION	
Method	Period		Light	Dark	Net	mgC/m ³	gC/day/m ²

DATE: 1.iv.58 TIME: 0510 STATION NO.: Q.3
 LATITUDE: 25°32' S. LONGITUDE: 156°40' E.

Bath	4 hrs	0			0.16	0.20
		25			0.16	
		50			0.18	
		100			0.29	

DATE: 1.iv.58 TIME: 1710 STATION NO.: Q.4
 LATITUDE: 24°53' S. LONGITUDE: 159°02' E.

Bath	4 hrs	0			0.07	0.12
		25			0.09	
		50			0.07	
		100			0.23	

H.M.A.S. "Quickmatch"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	1-5 μ	5-15 μ	>15 μ
	a	b	c						

DATE: 1.iv.58

TIME: 0510

STATION NO.: Q.3

LATITUDE: 25°32' S.

LONGITUDE: 156°40' E.

0	0.10	0.03	0.22	0.09	0.01	0	4.30	*	*
25	0.13	0.08	0.53	0.15		20	4.70	*	2.30
50	0.11	0.03	0.35	0.09		50	4.30	*	*

DATE: 1.iv.58

TIME: 1710

STATION NO.: Q.4

LATITUDE: 24°53' S.

LONGITUDE: 159°02' E.

0	0.10	0.03	0.22	0.09		0	6.80	*	*
25	0.12	0.09	0.57	0.17		20	6.31	4.00	*
50	0.09	0.05	0.22	0.10		50	6.70	*	*

H.M.A.S. "Queenborough"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	NO ₃ -N
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DATE: 2.iv.58

TIME: 0501

STATION NO.: Q.5

LATITUDE: 23°55' S.

LONGITUDE: 161°53' E.

0	26.91	35.70	23.29	4.61	97		0.16	0.23		
25	26.85	35.68	23.29	4.58	96		0.19	0.23		
50	26.19	35.75	23.56	4.63	96		0.16	0.13		
75	23.32	35.59	24.30	4.99	99		0.16	0.26		
100	22.12	35.61	24.67	4.90	95		0.10	0.32		
150	20.37	35.61	25.15	4.42	83		0.26	0.16		
200	19.15	35.61	25.47	4.44	82		0.26	0.16		
300	17.36	35.52	25.84	4.42	79		0.45	0.16		
500	12.64	35.05	26.51	4.34	71		0.87	0		
750	7.21	34.54	27.05	4.42	65		1.29	0		
1000	4.92	34.49	27.30	4.25	59		1.71	0.03		

DATE: 2.iv.58

TIME: 1700

STATION NO.: Q.6

LATITUDE: 23°00' S.

LONGITUDE: 164°19' E.

0	27.18	35.68	23.18	4.63	98		0.23	0.10		
19	27.18	35.68	23.18	4.67	99		0.23	0.29		
38	27.12	35.68	23.21	4.48	95		0.19	0.06		
60	24.33	35.61	24.03	4.58	92		0.16	0.03		
68	23.63	35.66	24.27	4.93	98		0.16	0.13		
80	22.42	35.61	24.58	4.09	80		0.19	0.10		
164	19.78	35.62	25.31	4.52	84		0.35	0		
434	13.59	35.16	26.41	4.22	71		0.84	0		
683	7.75	34.58	27.00	4.37	65		1.42	0		
930	5.19	34.49	27.27	4.15	58		1.74	0		

H.M.A.S. "Quickmatch"

CO₂ UPTAKE

INCUBATION		Depth	ACTIVITY			PRODUCTION	
Method	Period		Light	Dark	Net	mgC/m ³	gC/day/m

DATE: 2.iv.58 TIME: 0510 STATION NO.: Q.1
LATITUDE: 23°55' S. LONGITUDE: 161°53' E

Bath	4 hrs	0				0.24	0.1
		25				0.17	
		50				0.06	
		100				0.15	

DATE: 2.iv.58 TIME: 1710 STATION NO.: Q.6
LATITUDE: 23°00' S. LONGITUDE: 164°19' E

Bath	4 hrs	0				0.05	0.0
		25				0.07	
		50				0.05	
		100				0.09	

H.M.A.S. "Quickmatch"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	1-5 μ	5-15 μ	>15 μ
	a	b	c						

DATE: 2.iv.58
 LATITUDE: 23°55' S.

TIME: 0510

STATION NO.: Q.5.
 LONGITUDE: 161°53' E.

0	0.09	0.03	0.36	0.08	0.01	0	5.34	*	*
25	0.08	0.04	0.29	0.07	0.01	20	4.70	*	*
50	0.11	0.05	0.53	0.11	0	50	6.52	*	*

DATE: 2.iv.58
 LATITUDE: 23°00' S.

TIME: 1715

STATION NO.: Q.6.
 LONGITUDE: 164°19' E.

0	0.08	0.02	0.30	0.04	0.05	0	4.47	4.30	*
25	0.08	0.07	0.43	0.08	0.04	20	5.00	4.90	*
50	0.06		0.14	0.04	0.06	50	5.48	4.30	*

H.M.A.S. "Quickmatch"

PIGMENTS

LIGHT PENETRATION

Depth	Chlorophyll			Astacin	Non Astacin	Time	Depth	Percentage Surface Light
	a	b	c					

DATE: 2.iv.58

TIME: 1200

LATITUDE: 23°22' S.

LONGITUDE: 163°14' E.

DEPTH 1% S.L.: 210 m

SOLAR ALT.:

0	100
10	87
20	82
30	74
40	58
50	59
60	48
70	48
80	32

H.M.A.S.

"Queenborough"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	NO ₃ -N
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DATE: 8.iv.58

TIME: 1700

STATION NO.: Q.7

LATITUDE: 24°00' S.

LONGITUDE: 166°40' E.

0	25.84	35.77	23.68	4.34	90		0.19	0.03		
21	25.90	35.77	23.66	4.67	97		0.26	0		
41	25.70	35.77	23.73	4.63	96		0.29	0		
62	23.26	35.66	24.38	5.15	102		0.26	0		
84	22.01	35.66	24.73	5.15	100		0.23	0		
128	20.07	35.62	25.24	4.79	92		0.32	0		
174	19.14	35.61	25.47	4.47	83		0.42	0.10		
264	17.84	35.55	25.75	3.41	62		0.48	0.03		
461	12.92	35.10	26.51	4.47	74		1.00	0		
710	7.09	34.52	27.05	4.49	66		1.58	0		
960	5.07	34.47	27.27	4.25	60		1.81	0		

DATE: 9.iv.58

TIME: 0500

STATION NO.: Q.8

LATITUDE: 26°21' S.

LONGITUDE: 167°06' E.

0	24.19	35.77	24.19	4.84	97		0.13	0.23		
20	24.27	35.77	24.16	4.69	95		0.16	0.06		
38	23.98	35.77	24.25	4.78	96		0.13	0.10		
56	23.94	35.77	24.26	4.82	97		0.10	0.13		
76	23.78	35.75	24.29	4.78	95		0.16	0.06		
116	19.95	35.70	25.32	4.93	92		0.23	0.23		
158	18.85	35.61	25.54	4.61	85		0.26	0.19		
248	16.98	35.52	25.93	4.63	82		0.45	0.10		
332	16.02	35.43	26.09	4.47	78		0.48	0		
555	10.86	34.88	26.73	4.31	68		0.97	0		
795	7.10	34.51	27.04	4.67	68		1.32	0.03		

H.M.A.S. "Quickmatch"

CO₂ UPTAKE

INCUBATION		Depth	ACTIVITY			PRODUCTION	
Method	Period		Light	Dark	Net	mgC/m ³	gC/day/m ²

DATE: 8.iv.58

TIME: 1710

STATION NO.: Q.7

LATITUDE: 24°00' S.

LONGITUDE: 166°40' E.

Bath	4 hrs	0			0.05	0.08
		25			0.08	
		50			0.06	
		100			0.14	

DATE: 9.iv.58

TIME: 0505

STATION NO.: Q.8

LATITUDE: 26°21' S.

LONGITUDE: 167°06' E.

Bath	4 hrs	0			0.16	0.22
		25			0.22	
		50			0.18	
		100			0.32	

H.M.A.S. "Quickmatch"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	1-5 μ	5-15 μ	>15 μ
	a	b	c						

DATE: 8.iv.58
 LATITUDE: 24°00' S.

TIME: 1710

STATION NO.: Q.7.
 LONGITUDE: 166°40' E.

0	0.11	0.05	0.20	0.07	0.03	0	5.30	4.00	*
25	0.12	0.09	0.07	0.12		20	6.00	5.06	*
50	0.10	0.03	0.08	0.07	0.08	50	6.04	5.70	*

DATE: 9.iv.58
 LATITUDE: 26°21' S.

TIME: 0505

STATION NO.: Q.8.
 LONGITUDE: 167°06' E.

0	0.09	0.01	0.14	0.03	0.03	0	5.90	*	*
25	0.17	0.07	0.77	0.11		20	5.78	4.90	*
50	0.10	0.07	0.43	0.09		50	5.60	5.30	*

H.M.A.S. "Queenborough"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	NC
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DATE: 9.iv.58

TIME: 2315

STATION NO.:

LATITUDE: 29°37' S.

LONGITUDE: 168°26'

0	22.35	35.73	24.70	4.87	95		0.16	0.13		
20	22.46	35.73	24.67	4.87	95		0.13	0.13		
42	22.34	35.73	24.70	4.82	94		0.13	0.13		
65	22.30	35.71	24.69	4.87	95		0.06	0.13		
88	21.10	35.70	25.01	5.02	96		0.13	0.29		
135	18.85	35.62	25.55	4.96	91		0.23	0.10		
182	17.75	35.57	25.79	4.78	86		0.29	0.06		
281	16.72	35.52	25.99	4.82	88		0.48	0.13		
435	13.43	35.16	26.44	4.47	75		0.74	0.03		
670	9.53	34.78	26.88	4.48	68		1.03	0		
913	6.87	34.54	27.10	4.42	64		1.42	0		

DATE: 10.iv.58

TIME: 0627

STATION NO.: Q.

LATITUDE: 30°40' S.

LONGITUDE: 169°33'

0	22.39	35.73	24.69	5.04	98		0.13	0.19		
23	22.96	35.75	24.53	4.93	97		0.13	0.19		
45	22.38	35.75	24.70	4.93	96		0.13	0.16		
68	22.30	35.71	24.69	4.95	96		0.16	0.10		
91	20.29	35.66	25.20	5.07	95		0.19	0.13		
137	18.42	35.61	25.65	5.04	92		0.26	0.06		
182	17.52	35.55	25.83	4.75	85		0.39	0		
272	16.37	35.50	26.06	4.63	82		0.48	0.03		
438	13.12	35.14	26.53	4.41	73		0.68	0.06		
680	8.96	34.69	26.89	4.43	67		1.10	0		
927	6.37	34.52	27.15	4.47	65		1.42	0.06		

H.M.A.S. "Quickmatch"

CO₂ UPTAKE

9
E.

INCUBATION		Depth	ACTIVITY			PRODUCTION	
Method	Period		Light	Dark	Net	mgC/m ³	gC/day/m ²

DATE: 9.iv.58 TIME: 2315 STATION NO.: Q.9
LATITUDE: 29°37' S. LONGITUDE: 168°26' E.

Bath	4 hrs	0			0.01	0.05
		25			0.04	
		50			0.03	
		100			0.11	

DATE: 10.iv.58 TIME: 0635 STATION NO.: Q.10
LATITUDE: 30°40' S. LONGITUDE: 169°33' E.

Bath	4 hrs	0			0.11	0.21
		25			0.16	
		50			0.16	
		100			0.38	

H.M.A.S. "Quickmatch"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	1-5 μ	5-15 μ	>15 μ
	a	b	c						

DATE: 9.iv.58
 LATITUDE: 29°37' S.

TIME: 2315

STATION NO.: Q.9.
 LONGITUDE: 168°26' E.

0	0.09	0.02	0.28	0.05	0.02	0	5.60	5.34	2.10
25	0.16	0.10	0.80	0.13		20	5.91	4.00	1.69
50	0.05	0	0.20	0.04	0.01	50	5.30	5.30	*

DATE: 10.iv.58
 LATITUDE: 30°40' S.

TIME: 0635

STATION NO.: Q.10.
 LONGITUDE: 169°33' E.

0	0.15	0.08	0.72	0.10		0	5.25	5.78	*
25	0.10	0.06	0.54	0.07		20	5.28	5.47	*
50	0.08	0.02	0.19	0.03	0.02	50	5.30	5.36	*

H.M.A.S. "Quickmatch"

PIGMENTS

LIGHT PENETRATION

Depth	Chlorophyll			Astacin	Non Astacin	Time	Depth	Percentage Surface Light
	a	b	c					

DATE: 10.iv.58

TIME: 1200

LATITUDE: 31°29' S.

LONGITUDE: 170°18' E.

DEPTH 1% S.L.: 172 m

SOLAR ALT.: 51°

0	100
10	88
20	75
30	61
40	52
50	40
60	37
70	28
80	20

H.M.A.S. "Queenborough"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	NO ₃ -N
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DATE: 10.iv.58

TIME: 1700

STATION NO.: Q.11

LATITUDE: 30°25' S.

LONGITUDE: 171°18' E.

0	22.33	35.70	24.66	5.02	98		0.19	0.16		
23	22.43	35.70	24.64	4.96	97		0.16	0.23		
46	21.99	35.53	24.64	5.04	97		0.23	0.03		
70	18.96	35.53	25.46	4.60	85		0.39	0.10		
93	17.45	35.50	25.81	4.17	75		0.55	0		
140	16.34	35.43	26.01	4.33	76		0.61	0		
187	15.42	35.39	26.20	4.47	77		0.61	0		
283	14.36	35.28	26.34	4.52	88		0.74	0		
470	10.86	34.94	26.77	4.44	70		0.97	0		
712	7.90	34.61	27.01	4.30	64		1.32	0		
960	5.78	34.52	27.22	4.20	60		1.61	0.06		

DATE: 11.iv.58

TIME: 0507

STATION NO.: Q.12

LATITUDE: 34°02' S.

LONGITUDE: 173°03' E.

0	19.71	35.44	25.19	5.22	97		0.19	0.10		
25	19.75	35.43	25.17	5.27	98		0.19	0.19		
45	17.55	35.32	25.64	5.10	92		0.26	0		
50	16.69	35.28	25.82	4.95	87		0.45	0.03		
75	15.64	35.26	26.05	4.84	84		0.48	0.26		
90	15.18	35.25	26.14	4.72	81		0.42	0.26		
100	15.00	35.26	26.20	4.75	82		0.45	0.19		
200	12.94	35.14	26.53	4.63	77		0.65	0		
447	9.82	34.81	26.86	4.38	68		0.94	0.23		
683	7.92	34.65	27.03	4.38	65		1.13	0.32		
950	5.82	34.52	27.22	4.17	59		1.39	0.19		

H.M.A.S. "Quickmatch"

CO₂ UPTAKE

INCUBATION		Depth	ACTIVITY			PRODUCTION	
Method	Period		Light	Dark	Net	mgC/m ³	gC/day/m ²

DATE: 10.iv.58

TIME: 1715

STATION NO.: Q.11

LATITUDE: 32°25' S.

LONGITUDE: 171°18' E.

Bath	4 hrs	0				
		25				0.16
		50				0.68
		100				

DATE: 11.iv.58

TIME: 0505

STATION NO.: Q.12

LATITUDE: 34°02' S.

LONGITUDE: 173°03' E.

Bath	4 hrs	0			1.23	0.57
		25			1.43	
		50			0.12	
		100			0.07	

H.M.A.S. "Quickmatch"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	1-5 μ	5-15 μ	>15 μ
	a	b	c						

DATE: 10.iv.58

TIME: 1715

STATION NO.: Q.11.

LATITUDE: 30°25' S.

LONGITUDE: 171°18' E.

0	0.08	0.01	0.02	0.02	0.05	0	5.31	*	*
25	0.09	0.01	0.14	0.03	0.02	20	5.40	3.60	2.30
50	0.28	0.06	0.22	0.04	0.07	50	5.57	4.00	3.79

DATE: 11.iv.58

TIME: 0507

STATION NO.: Q.12.

LATITUDE: 34°02' S.

LONGITUDE: 173°03' E.

0	0.31	0.06	0.55	0.04	0.09	0	5.32	*	4.90
25	0.32	0.13	0.71	0.09	0.06	20	5.48	*	4.84
50	0.36	0.08	0.43	0.03	0.12	50	5.75	*	4.48

H.M.A.S. "Queenborough"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	NO ₃ -N
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DATE: 23.iv.58

TIME: 1318

STATION NO.: Q.13

LATITUDE: 38°46' S.

LONGITUDE: 166°55' E.

0	16.32	35.01	25.71	5.55	97		0.19	0.23		
24	16.37	35.03	25.70	5.67	100		0.19	0.23		
48	16.27	35.01	25.72	5.58	98		0.19	0.16		
71	16.27	35.03	25.73	5.55	97		0.19	0.23		
96	13.76	35.17	26.39	5.27	89		0.39	0.35		
144	12.95	35.16	26.54	5.22	86		0.61	0.10		
192	12.56	35.14	26.61	5.10	84		0.65	0.13		
288	11.45	34.96	26.68	4.81	77		0.84	0.10		
460	9.77	34.76	26.82	4.63	72		1.13	0		
703	7.93	34.56	26.96	4.72	70		1.35	0		
950	6.10	34.47	27.14	4.35	62		1.61	0		

DATE: 23.iv.58

TIME: 2030

STATION NO.: Q.14

LATITUDE: 38°17' S.

LONGITUDE: 165°08' E.

0	17.06	35.21	25.68	5.46	97		0.19	0.06		
25	17.05	35.19	25.67	5.48	98		0.23	0.06		
50	17.02	35.19	25.67	5.47	97		0.19	0.10		
100	14.58	35.34	26.34	5.01	85		0.48	0.19		
150	13.47	35.25	26.50	5.01	84		0.55	0.13		
250	11.91	35.10	26.70	5.18	84		0.68	0		
500	8.79	34.67	26.91	4.78	73		1.16	0.10		
750	7.20	34.52	27.03	4.60	68		1.35	0.06		
1000	5.50	34.47	27.22	4.30	61		1.61	0.03		

H.M.A.S. "Quickmatch"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	<30 μ	>30 μ
	a	b	c					

DATE: 24.iv.58
 LATITUDE: 37°20' S.

TIME: 0510

STATION NO.: Q.15
 LONGITUDE: 162°54' E.

0	0.23	0.08	0.36	0.05	0.54
25	0.25	0.17	0.55	0.11	0.02
50	0.42	0.13	0.57	0.09	0.08

DATE: 24.iv.58
 LATITUDE: 36°49' S.

TIME: 1700

STATION NO.: Q.16
 LONGITUDE: 159°44' E.

0	0.15	0.04	0.43	0.05	0.02
25	0.24	0.04	0.38	0.05	0.06
50	0.24	0.02	0.31	0.04	0.06

H.M.A.S. "Quickmatch"

PIGMENTS

LIGHT PENETRATION

Depth	Chlorophyll			Astacin	Non Astacin	Time	Depth	Percentage Surface Light
	a	b	c					

DATE: 24.iv.58

TIME: 1200

LATITUDE: 37°13' S.

LONGITUDE: 161°11' E.

DEPTH 1% S.L.: 110 m

SOLAR ALT.: 39°

0	100
10	80
20	61
30	48
40	46
50	33
60	25
70	15
80	7.5

H.M.A.S. "Queenborough"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	NO ₃ -N
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DATE: 25.iv.58

TIME: 0500

STATION NO.: Q.17

LATITUDE: 35°51' S.

LONGITUDE: 156°36' E.

0	21.85	35.61	24.74	4.93	95		0.19	0.13		
25	21.93	35.59	24.70	4.93	95		0.23	0.10		
50	21.77	35.61	24.77	4.90	94		0.26	0.26		
75	19.75	35.61	25.31	4.31	81		0.39	0.10		
100	19.38	35.61	25.41	4.37	81		0.42	0.03		
150	17.98	35.53	25.70	4.22	77		0.52	0		
200	16.92	35.48	25.91	4.15	74		0.61	0		
300	14.88	35.43	26.34	4.93	85		0.55	0		
438	12.95	35.21	26.59	4.99	83		0.68	0		
671	8.77	34.67	26.91	4.52	68		1.19	0		
940	6.45	34.52	27.14	4.34	63		1.55	0		

DATE: 25.iv.58

TIME: 1700

STATION NO.: Q.18

LATITUDE: 34°45' S.

LONGITUDE: 153°46' E.

0	24.61	35.52	23.87	4.72	96		0.23	0.10		
22	24.65	35.52	23.86	4.72	96		0.19	0.10		
45	24.60	35.52	23.87	4.66	94		0.19	0.13		
68	24.62	35.50	23.85	4.66	94		0.19	0.13		
92	23.32	35.57	24.29	4.04	80		0.29	0.13		
139	20.17	35.55	25.15	4.17	78		0.42	0		
186	18.43	35.57	25.62	4.24	78		0.52	0		
283	16.06	35.41	26.07	4.17	73		0.74	0		
438	12.77	35.16	26.57	4.87	80		0.71	0		
669	8.62	34.63	26.91	4.38	66		1.29	0		
912	6.52	34.49	27.10	4.34	63		1.65	0		

H.M.A.S. "Quickmatch"

CO₂ UPTAKE

INCUBATION		Depth	ACTIVITY			PRODUCTION	
Method	Period		Light	Dark	Net	mgC/m ³	gC/day/m ²

DATE: 25.iv.58 TIME: 0500 STATION NO.: Q.17.
LATITUDE: 35°51' S. LONGITUDE: 156°36' E.

Bath	4 hrs	0			1.83	1.56
		25			1.96	
		50			2.23	
		100			0	

DATE: 25.iv.58 TIME: 1700 STATION NO.: Q.18
LATITUDE: 34°45' S. LONGITUDE: 153°46' E.

Bath	4 hrs	0			0.34	0.40
		25			0.75	
		50			0.45	
		100				

H.M.A.S. "Quickmatch"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	<30 μ	>30 μ
	a	b	c					

DATE: 25.iv.58
 LATITUDE: 35°51' S.

TIME: 0500

STATION NO.: Q.17
 LONGITUDE: 156°36' E.

0	0.65	0.05	0.43	0.05	0.16
25	0.67	0.10	0.90	0.12	0.16
50	0.43	0.06	0.47	0.06	0.09

DATE: 25.iv.58
 LATITUDE: 34°45' S.

TIME: 1700

STATION NO.: Q.18
 LONGITUDE: 153°46' E.

0	0.24	0.04	0.16	0.03	0.05
25	0.18	0.06	0.18	0.03	0.04
50	0.17	0.04	0.19	0.03	0.04

H.M.A.S. "Quickmatch"

PIGMENTS

LIGHT PENETRATION

Depth	Chlorophyll			Astacin	Non Astacin	Time	Depth	Percentage Surface Light
	a	b	c					

DATE: 25.iv.58

TIME: 1200

LATITUDE: 35°13' S.

LONGITUDE: 155°06' E.

DEPTH 1% S.L.: 98 m

SOLAR ALT.: 41°

0	100
10	79
20	58
30	42
40	25
50	16.3
60	11.2
70	4.8
80	2.8

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 18.iv.58

TIME: 1725

STATION NO.: W.1

LATITUDE: 22°04' S.

LONGITUDE: 153°54' E.

0	26.07	35.44	23.37	4.63	96					0.32
25	26.17	35.43	23.33	4.38	91					0.35
50	26.10	35.44	23.33	4.63	96					0.32
75	26.05	35.44	23.38	4.54	94					0.39
100	22.13	35.59	24.65	3.86	75					0.42
114	21.90	35.61	24.73	4.08	79					0.45
154	20.40	35.62	25.15	3.95	75					0.45
244	17.06	35.46	25.87	3.95	70					0.58

DATE: 19.iv.58

TIME: 0605

STATION NO.: W.2

LATITUDE: 19°55' S.

LONGITUDE: 154°00' E.

0	27.05	35.44	23.06	4.60	97					0.32
25	27.08	35.44	23.05	4.52	95					0.29
50	27.00	35.44	23.07	4.57	96					0.32
75	27.05	35.25	22.92	4.43	93					0.32
100	24.95	35.30	23.61	4.69	95					0.32
138	23.78	35.39	24.03	4.08	81					0.52
184	22.40	35.59	24.57	3.89	76					0.52
276	19.34	35.59	25.40	3.98	74					0.61
368	16.81	35.44	25.91	3.98	71					0.68
460	13.24	35.05	26.45	3.89	65					0.90

H.M.A.S. "Warrego"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	<30 μ	>30 μ
	a	b	c					

DATE: 18.iv.58

TIME: 1725

STATION NO.: W.1

LATITUDE: 22°04' S.

LONGITUDE: 153°54' E.

0	5.81	3.35
20	5.78	3.50
50	0	2.44

DATE: 19.iv.58

TIME: 0605

STATION NO.: W.2

LATITUDE: 19°55' S.

LONGITUDE: 154°00' E.

0	5.17	3.01
20	5.54	3.09
50	0	2.11

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 19.iv.58
 LATITUDE: 17°30' S.

TIME: 2040

STATION NO.: W.3
 LONGITUDE: 152°49' E.

0	27.50	35.30	22.81	4.49	95					0.81
25	27.34	35.28	22.85	4.52	96					0.29
50	27.42	35.28	22.82	4.52	96					0.32
75	27.45	35.32	22.84	4.52	96					0.32
100	26.08	35.46	23.38	4.63	96					0.32
150	24.40	35.50	23.92	4.75	96					0.32
200	22.95	35.53	24.37	4.14	81					0.32
300	20.29	35.61	24.62	3.98	75					0.42
400	17.65	35.48	25.74	3.98	72					0.58
500	14.26	35.53	26.55	3.98	67					0.74

DATE: 20.iv.58
 LATITUDE: 16°00' S.

TIME: 1015

STATION NO.: W.4
 LONGITUDE: 150°55' E.

0	27.56	35.12	22.66	4.54	96					0.32
25	27.57	35.12	22.65	4.52	96					0.35
50	27.55	35.12	22.66	4.52	96					0.32
75	25.98	35.37	23.35	4.69	97					0.35
100	24.59	35.52	23.88	4.20	85					0.42
150	23.80	35.52	24.12	4.12	82					0.39
170	22.92	35.64	24.17	3.67	73					0.68
200	21.91	35.70	24.80	3.55	69					0.66
400	17.45	35.46	25.77	3.86	69					0.68
500	11.83	35.01	26.65	3.89	63					0.97

H.M.A.S. "Warrego"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	<30 μ	>30 μ
	a	b	c					

DATE: 19.iv.58
 LATITUDE: 17°30' S.

TIME: 2040

STATION NO.: W.3
 LONGITUDE: 152°49' E.

0	5.87	3.31
20	6.15	3.33
50	5.40	1.48

DATE: 20.iv.58
 LATITUDE: 16°00' S.

TIME: 1015

STATION NO.: W.4
 LONGITUDE: 150°55' E.

0	6.13	3.18
20	6.20	3.48
50	0	0.90

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 20.1v.58

TIME: 2010

STATION NO.: W.5

LATITUDE: 15°30' S.

LONGITUDE: 149°12' E.

0	28.40	35.07	22.34	4.47	96					0.35
25	28.00	35.08	22.48	4.41	94					0.29
50	27.30	35.26	22.84	4.66	99					0.35
75	26.25	35.43	23.31	4.63	96					0.45
100	25.32	35.46	23.62	4.38	90					0.71
132	24.16	35.52	24.01	4.31	87					0.42
177	22.55	35.62	24.56	3.60	70					0.48
268	18.96	35.57	25.48	3.64	67					0.65
361	14.75	35.19	26.19	3.79	65					0.84
458	10.63	34.79	26.68	3.58	57					1.19

DATE: 23.1v.58

TIME: 1300

STATION NO.: W.6

LATITUDE: 13°47' S.

LONGITUDE: 144°59' E.

0	28.00	34.61	22.13	4.47	95					0.35
10	28.33	34.61	22.02	4.49	96					0.26
18	28.21	34.65	22.09	4.38	94					0.58

H.M.A.S. "Warrego"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	<30 μ	>30 μ
	a	b	c					

DATE: 20.1v.58

TIME: 2010

STATION NO.: W.5

LATITUDE: 15°30' S.

LONGITUDE: 149°12' E.

0	0	1.46
20	0	1.67
50	0	0.95

DATE: 23.1v.58

TIME: 1300

STATION NO.: W.6

LATITUDE: 13°47' S.

LONGITUDE: 144°59' E.

0	5.00	1.52
20	4.69	1.15
50	0	0

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 24.iv.58

TIME: 0615

STATION NO.: W.7

LATITUDE: 10°32' S.

LONGITUDE: 142°30' E.

0	29.10	33.87	21.22	4.37	94					0.35
10	29.12	33.87	21.21	4.38	95					0.35
17	29.12	33.87	21.21	4.31	93					0.26

DATE: 24.iv.58

TIME: 1400

STATION NO.: W.8

LATITUDE: 10°36' S.

LONGITUDE: 141°55' E.

0	29.20	32.74	20.33	4.43	95					0.35
13	29.12	32.72	20.35	4.43	95					0.32

DATE: 25.iv.58

TIME: 0810

STATION NO.: W.9

LATITUDE: 10°55' S.

LONGITUDE: 139°12' E.

0	28.91	33.78	21.21	4.69	101					0.35
25	28.52	34.02	21.51	3.92	84					0.42
50	28.04	34.20	21.81	2.19	46					0.77

H.M.A.S. "Warrego"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	<30 μ	>30 μ
	a	b	c					

DATE: 24.iv.58

TIME: 0615

STATION NO.: W.7

LATITUDE: 10°32' S.

LONGITUDE: 142°30' E.

0	5.40	3.11
20	5.54	3.02
50	0	0

DATE: 24.iv.58

TIME: 1400

STATION NO.: W.8

LATITUDE: 10°36' S.

LONGITUDE: 141°55' E.

0	6.37	3.56
20	0	0
50	0	0

DATE: 25.iv.58

TIME: 0810

STATION NO.: W.9

LATITUDE: 10°55' S.

LONGITUDE: 139°12' E.

0	6.06	6.23
20	0	6.39
50	0	0

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 25.iv.58 TIME: 1635 STATION NO.: W.10
 LATITUDE: 10°54' S. LONGITUDE: 137°39' E.

0	28.60	34.22	21.67	4.60	99					0.23
25	28.20	34.25	21.79	4.43	94					0.29
50	27.95	34.22	21.85	3.60	76					0.45

DATE: 26.iv.58 TIME: 0610 STATION NO.: W.11
 LATITUDE: 10°45' S. LONGITUDE: 135°11' E.

0	29.20	34.43	21.59	4.24	92					0.32
25	29.31	34.43	21.56	4.17	91					0.42
45	29.30	34.43	21.56	4.14	90					0.29

DATE: 26.iv.58 TIME: 2210 STATION NO.: W.12
 LATITUDE: 10°43' S. LONGITUDE: 131°58' E.

0	29.30	34.36	21.51	4.27	93					0.45
25	29.33	34.34	21.49	4.30	94					0.42
50	29.37	33.60	21.67							0.52

H.M.A.S. "Warrego"

PIGMENTS

PHYTOPLANKTON

Depth	Chlorophyll			Astacin	Non Astacin	Depth	<30 μ	>30 μ
	a	b	c					

DATE: 25.iv.58

TIME: 1635

STATION NO.: W.10

LATITUDE: 10°54' S.

LONGITUDE: 137°39' E.

0	6.37	4.75
20	6.30	3.76
50	0	0

DATE: 26.iv.58

TIME: 0610

STATION NO.: W.11

LATITUDE: 10°45' S.

LONGITUDE: 135°11' E.

0	5.92	3.53
20	6.38	3.79
50	0	0

DATE: 26.iv.58

TIME: 2210

STATION NO.: W.12

LATITUDE: 10°43' S.

LONGITUDE: 131°58' E.

0	0.30	0.04	0.26	0.08	0.12	0	6.08	3.50
20	0.19	0.04	0.37	0.12	0.01	20	6.09	3.60
						50	0	0

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 16.iv.58

TIME: 0600

STATION NO.: W.1

LATITUDE: 32°11' S.

LONGITUDE: 152°45' E.

0 23.00 35.26

DATE: 16.iv.58

TIME: 1100

STATION NO.: W.2

LATITUDE: 31°17' S.

LONGITUDE: 153°05' E.

0 24.00 35.16

DATE: 16.iv.58

TIME: 1600

STATION NO.: W.3

LATITUDE: 30°52' S.

LONGITUDE: 153°03' E.

0 24.30 35.41

DATE: 16.iv.58

TIME: 2230

STATION NO.: W.4

LATITUDE: 29°43' S.

LONGITUDE: 153°30' E.

0 24.10 34.92

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 17.iv.58

TIME: 0230

STATION NO.: W.5

LATITUDE: 29°01' S.

LONGITUDE: 153°40' E.

0 24.15 34.90

DATE: 17.iv.58

TIME: 0700

STATION NO.: W.6

LATITUDE: 28°10' S.

LONGITUDE: 153°43' E.

0 25.45 35.17

DATE: 17.iv.58

TIME: 1000

STATION NO.: W.7

LATITUDE: 27°40' S.

LONGITUDE: 153°48' E.

0 25.70 35.39

DATE: 17.iv.58

TIME: 1400

STATION NO.: W.8

LATITUDE: 27°02' S.

LONGITUDE: 153°52' E.

0 25.65 35.41

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P.	Org. P.	Part. P.	Total P.
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DATE: 17.iv.58
LATITUDE: 26°11' S.

TIME: 1800

STATION NO.: W.9
LONGITUDE: 153°44' E.

0 25.55 35.21

DATE: 17.iv.58
LATITUDE: 25°18' S.

TIME: 2200

STATION NO.: W.10
LONGITUDE: 153°34' E.

0 26.20 35.26

DATE: 18.iv.58
LATITUDE: 24°40' S.

TIME: 0200

STATION NO.: W.11
LONGITUDE: 153°36' E.

0 26.70 35.25

DATE: 18.iv.58
LATITUDE: 24°00' S.

TIME: 0600

STATION NO.: W.12
LONGITUDE: 153°43' E.

0 26.20 35.21

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 18.iv.58
LATITUDE: 23°19' S.

TIME: 1000

STATION NO.: W.13
LONGITUDE: 153°48' E.

0 26.65 35.25

DATE: 18.iv.58
LATITUDE: 22°35' S.

TIME: 1400

STATION NO.: W.14
LONGITUDE: 153°54' E.

0 26.60 35.34

DATE: 18.iv.58
LATITUDE: 21°24' S.

TIME: 2200

STATION NO.: W.16
LONGITUDE: 154°00' E.

0 26.75 35.30

DATE: 19.iv.58
LATITUDE: 19°00' S.

TIME: 1400

STATION NO.: W.18
LONGITUDE: 153°25' E.

0 27.20 35.34

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S ^o / _{oo}	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 20.iv.58

TIME: 0800

STATION NO.: W.20

LATITUDE: 16°15' S.

LONGITUDE: 151°13' E.

0 27.75 35.21

DATE: 20.iv.58

TIME: 1400

STATION NO.: W.22

LATITUDE: 15°35' S.

LONGITUDE: 150°20' E.

0 28.10 35.12

DATE: 21.iv.58

TIME: 0700

STATION NO.: W.24

LATITUDE: 16°00' S.

LONGITUDE: 147°15' E.

0 28.20 35.03

DATE: 21.iv.58

TIME: 1300

STATION NO.: W.25

LATITUDE: 16°15' S.

LONGITUDE: 146°10' E.

0 27.25 34.02

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S ^o / _{oo}	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 22.iv.58

TIME: 1500

STATION NO.: W.26

LATITUDE: 16°47' S.

LONGITUDE: 145°49' E.

0 26.70 31.11

DATE: 22.iv.58

TIME: 1700

STATION NO.: W.27

LATITUDE: 16°30' S.

LONGITUDE: 145°39' E.

0 26.75 32.23

DATE: 22.iv.58

TIME: 2300

STATION NO.: W.28

LATITUDE: 15°16' S.

LONGITUDE: 144°24' E.

0 26.75 31.55

DATE: 23.iv.58

TIME: 0800

STATION NO.: W.29

LATITUDE: 14°04' S.

LONGITUDE: 144°18' E.

0 27.75 32.63

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 23.iv.58

TIME: 1200

STATION NO.: W.30

LATITUDE: 13°47' S.

LONGITUDE: 144°59' E.

0 28.50 34.34

DATE: 23.iv.58

TIME: 1700

STATION NO.: W.31

LATITUDE: 12°55' S.

LONGITUDE: 143°35' E.

0 28.55 34.16

DATE: 23.iv.58

TIME: 2000

STATION NO.: W.32

LATITUDE: 12°20' S.

LONGITUDE: 143°20' E.

0 28.30 33.68

DATE: 24.iv.58

TIME: 0900

STATION NO.: W.34

LATITUDE: 10°35' S.

LONGITUDE: 142°06' E.

0 29.25 33.13

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S ^o / _{oo}	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 24.iv.58
LATITUDE: 10°36' S.

TIME: 1130

STATION NO.: W.35
LONGITUDE: 141°55' E.

0 29.20 32.68

DATE: 24.iv.58
LATITUDE: 10°49' S.

TIME: 2300

STATION NO.: W.36
LONGITUDE: 140°56' E.

0 29.45 32.12

DATE: 25.iv.58
LATITUDE: 10°55' S.

TIME: 0730

STATION NO.: W.37
LONGITUDE: 139°16' E.

0 29.00 33.87

DATE: 25.iv.58
LATITUDE: 10°55' S.

TIME: 1100

STATION NO.: W.38
LONGITUDE: 138°36' E.

0 28.70 34.00

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 25.1v.58

TIME: 1330

STATION NO.: W.39

LATITUDE: 10°55' S.

LONGITUDE: 138°05' E.

0 29.00 34.18

DATE: 25.1v.58

TIME: 2200

STATION NO.: W.41

LATITUDE: 10°45' S.

LONGITUDE: 136°44' E.

0 29.25 34.13

DATE: 26.1v.58

TIME: 0900

STATION NO.: W.43

LATITUDE: 10°43' S.

LONGITUDE: 134°35' E.

0 29.25 34.22

DATE: 26.1v.58

TIME: 1200

STATION NO.: W.44

LATITUDE: 10°42' S.

LONGITUDE: 133°59' E.

0 29.55 34.27

H.M.A.S. "Warrego"

HYDROLOGY

Depth	Temp.	S‰	σ_t	O ₂	O ₂ %	pH	Inorg. P	Org. P	Part. P	Total P
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DATE: 26.iv.58

TIME: 1500

STATION NO.: W.45

LATITUDE: 10°42' S.

LONGITUDE: 133°24' E.

0 29.60 34.36

DATE: 26.iv.58

TIME: 1800

STATION NO.: W.46

LATITUDE: 10°42' S.

LONGITUDE: 132°45' E.

0 29.30 34.31

DATE: 27.iv.58

TIME: 0700

STATION NO.: W.48

LATITUDE: 11°54' S.

LONGITUDE: 131°25' E.

0 29.80 33.55

DATE: 27.iv.58

TIME: 0900

STATION NO.: W.49

LATITUDE: 12°05' S.

LONGITUDE: 131°03' E.

0 30.20 34.25