

# OCEANOGRAPHICAL STATION LIST

VOLUME 48

OCEANIC INVESTIGATIONS IN EASTERN AUSTRALIAN WATERS,  
*F.R.V. DERWENT HUNTER, 1959*

DIVISION OF FISHERIES AND OCEANOGRAPHY  
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL  
RESEARCH ORGANIZATION, AUSTRALIA 1961

## CORRIGENDUM

## OCEANOGRAPHIC STATION LIST—VOL. 41

Page 4: With reference to (c) *CO<sub>2</sub> Uptake*—

The values for the added activities of the <sup>14</sup>C stock solutions used in the measurements of CO<sub>2</sub> uptake reported here have been redetermined by the liquid scintillation counting method described by Jitts and Scott (1961). These new values are considerably higher than those given. To use the improved standardization values the data for production given in this volume should be multiplied by the relevant factor given in the following table:

Cruise (No.)	<sup>14</sup> C (Stock No.)	Activity (counts/min ÷ 10 <sup>6</sup> )		Correction Factor
		Old Value	New Value	
3-5	3	6.17	10.66	0.58
7-15	4	4.51	9.72	0.46
16-18	5	0.393	0.94	0.42
20	6	3.85	9.10	0.42

*Reference:*

JITTS, H. R., and SCOTT, B. D. (1961).—The determination of zero-thickness activity in Geiger counting of C<sup>14</sup> solutions used in marine productivity studies. *Limn. Oceanogr.* 6: 116-23.

## CORRIGENDUM

## OCEANOGRAPHIC STATION LIST—VOL. 42

Pages 4–5: With reference to (d)  $CO_2$  Uptake—

The values for the added activities of the  $^{14}C$  stock solutions used in the measurements of  $CO_2$  uptake have been redetermined by the liquid scintillation counting method described by Jitts and Scott (1961). These new values are considerably higher than those given. To use these improved standardization values the data for production given in this volume should be multiplied by a factor as follows:

Data	Added Activity (counts/min $\div 10^6$ )		Correction Factor
	Old Value	New Value	
(1) All data except (2)	6.17	10.66	0.58
(2) Data for December 9	0.393	0.94	0.42

## Reference:

JITTS, H. R., and SCOTT, B. D. (1961).—The determination of zero-thickness activity in Geiger counting of  $C^{14}$  solutions used in marine productivity studies. *Limn. Oceanogr.* 6: 116–23.

## CORRIGENDUM

## OCEANOGRAPHIC STATION LIST—VOL. 43

Page 4: The value of  $6.17 \times 10^6$  counts/min given for the added activity of  $^{14}C$  solution used in the measurements of  $CO_2$  uptake has been redetermined as  $10.66 \times 10^6$  counts/min by the liquid scintillation counting described by Jitts and Scott (1961). To use the improved standardization value the data for production given in this volume should be multiplied by 0.58.

## Reference:

JITTS, H. R., and SCOTT, B. D. (1961).—The determination of zero-thickness activity in Geiger counting of  $C^{14}$  solutions used in marine productivity studies. *Limn. Oceanogr.* 6: 116–23.

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Volume 48

Oceanic Investigations in Eastern Australian Waters,  
*F.R.V. Derwent Hunter, 1959*

Compiled by A. D. Crooks



Division of Fisheries and Oceanography  
Commonwealth Scientific and Industrial  
Research Organization, Australia  
Melbourne 1961

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MELBOURNE

1964

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OCEANIC INVESTIGATIONS IN EASTERN AUSTRALIAN WATERS,  
F.R.V. DERWENT HUNTER, 1959

Compiled by A. D. CROOKS

## I. INTRODUCTION

The results of observations made on 15 cruises of the Division's Fisheries Research Vessel *Derwent Hunter* during 1959 are reported. Cruises DH1/59, 2/59, 3/59, 6/59, and 8/59 were designed to study the East Australian Current; cruises DH5/59, 7/59, and 10/59 were concerned with primary production; DH11/59-15/59 were cruises to study the effect of certain oceanographical conditions on tuna distribution. (See Fig. 1.)

## II. METHODS AND UNITS

In all cases reported the time is in Eastern Australian Standard Time (Time Zone K). Wind force is reported according to Beaufort's scale. Sea observations have been coded following the instructions issued by the United States Navy Hydrographic Office (1955).

### (a) Hydrology

For most stations more than one wire angle is recorded. In these cases, the first is the wire angle appropriate to the deep cast, 500-1500 m, and the second is that of the shallow cast, 0-250 m. Where a third wire angle is given, an extra cast has been necessary owing to failure of some part of the equipment such as a thermometer.

(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 by 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 by using the nomograph of Richards and Corwin (1956).

(iv) *Sigma-t*.—Sigma-*t* was calculated using a nomograph constructed from information issued by the United States Navy Hydrographic Office (La Fond 1951).

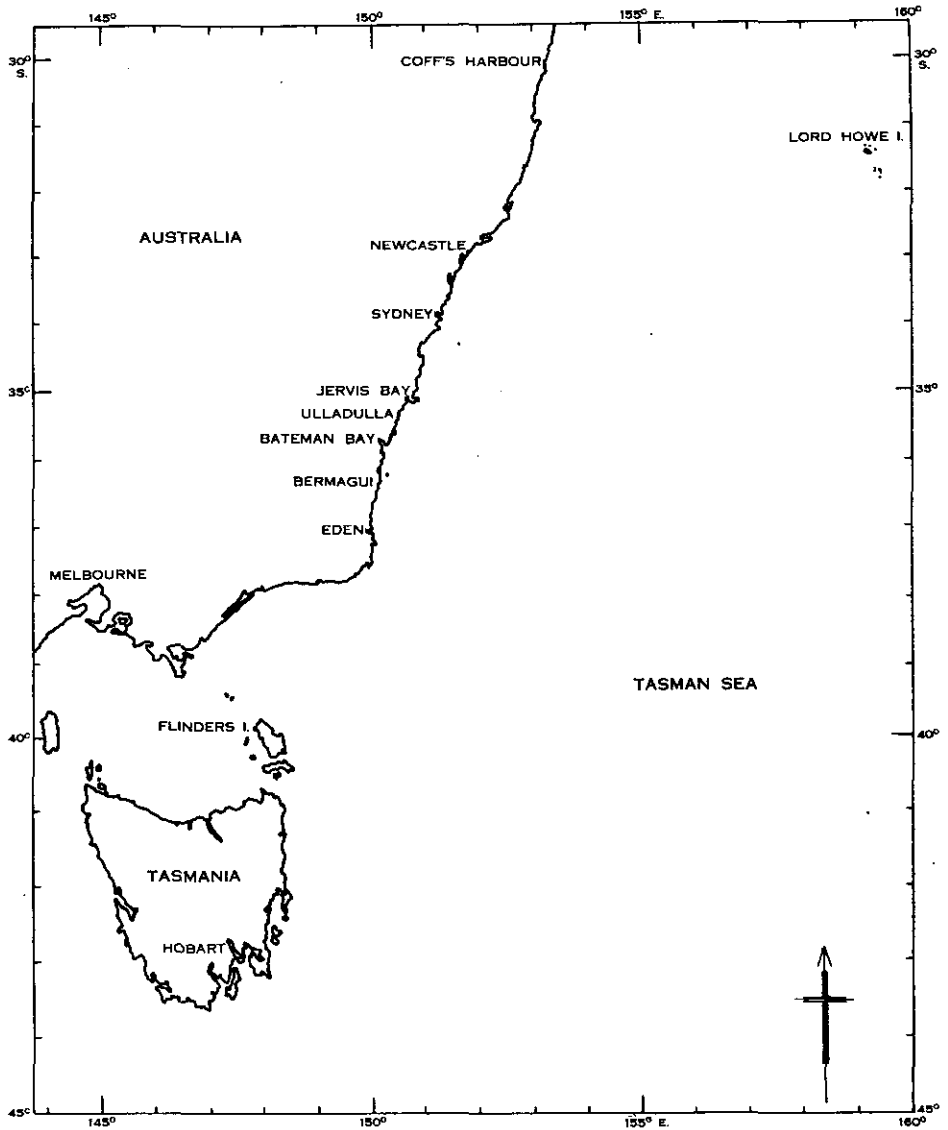


Fig. 1.—Map showing area in which F.R.V. *Derwent Hunter* worked during 1959.

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

Water samples were taken with a plastic sampler and filtered at once through millipore filters. The filters were placed in envelopes and stored in metal vacuum desiccators over silica gel. The analyses were carried out within one month of collection using the method of Richards with Thompson (1952). The details and justification of the method used are given in Humphrey (1960). The asterisk \* indicates negative values.

(c) *Primary Production*

Measurements of photosynthetic CO<sub>2</sub> uptake by marine phytoplankton were made by the <sup>14</sup>C method described by Jitts (1957).

Incubation was done either *in situ* where the samples were resuspended in the ocean at the depths from which they were taken, or in a fluorescent light bath with a constant illumination of about 1100 ft candles. The period of incubation for the *in situ* samples was from sunrise to sunset (all day) or from sunrise to local noon (half day). The period of incubation in the light bath is given in hours.

Depth from which the sample was taken is given in metres 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 <sup>14</sup>C 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%.

"Light" is the activity of the sample in the clear tube after incubation and filtration. "Dark" is the activity of the sample from the duplicate dark tube. "Net" is the light activity less the dark activity. "Production" is the rate of uptake of CO<sub>2</sub> calculated by means of the formula:

$$\frac{\text{Net Activity}}{\text{Added Activity}} \times \frac{90}{1} \times \frac{12}{44} \times \frac{1000}{\text{Period of Incubation}}$$

The CO<sub>2</sub> content is assumed to be 90 mg/l. The added activities used during the cruises reported in this volume were as follows:

Cruise (No.)	<sup>14</sup> C (Stock No.)	Activity (counts/min)
2	5	0.94 × 10 <sup>6</sup>
6-8	6	9.10 × 10 <sup>6</sup>

These activities were determined by the liquid scintillation counting method described by Jitts and Scott (1961).

For *in situ* samples the production is given in mg C/m<sup>3</sup> per day. For samples incubated in a light bath the production is given in mg C/m<sup>3</sup> per hour.



The estimation of the rates of production per m<sup>2</sup> column of water at each station is made by use of 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<sup>3</sup>), the formula is multiplied by the factor 10, assuming as a rough approximation that the daily rate is 10 times the hourly rate.

### III. PERSONNEL

The sampling has been the responsibility of Messrs. R. Bradley, F. Davies, N. Dyson, W. Prothero, and J. Staniforth. The laboratory analyses of salt water samples have been carried out at the Cronulla laboratory by Messrs. G. Dal Pont, F. Davies, W. Prothero, and C. Walker. The pigment determinations were made by Mr. M. Wootton. Preparation of ampoules of <sup>14</sup>C and the counting of samples were carried out by Messrs. N. Dyson and B. D. Scott. Mrs. E. Wood, and Misses F. Luce and R. Weidenhofer have been responsible for processing and Mrs. D. Schmitzer for the preparation of typed sheets under the general direction of Mr. A. D. Crooks.

### IV. REFERENCES

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F.R.V. "Derwent Hunter" Cruise 1 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 4.ii.59                      TIME: 1905                      STATION NO.: 1  
 LATITUDE: 34°07' S.                      LONGITUDE: 151°23' E.  
 WIND: FORCE 2                      WIRE ANGLE: 35°  
                     DIRECTION NE.

0	25.18	35.66	4.79	104	23.81	0.30
16	21.36	35.59	4.77	98	24.87	0.33
36	17.11	35.48	4.50	85	25.87	0.69
59	15.90	35.43	4.35	81	26.12	0.93
82	14.94	35.37	4.44	81	26.29	0.68
130	12.27	35.12	4.61	79	26.65	0.90

DATE: 4.ii.59                      TIME: 2122                      STATION NO.: 2  
 LATITUDE: 34°09' S.                      LONGITUDE: 151°30' E.  
 WIND: FORCE 3                      WIRE ANGLE: 42°  
                     DIRECTION NE.

0	24.87	35.66	4.84	105	23.90	0.38
15	24.69	35.62	4.43	96	23.92	0.25
30	20.17	35.61	4.56	91	25.21	0.75
45	18.27	35.53	4.07	79	25.64	0.69
64	17.25	35.48	3.89	74	25.84	0.79
104	14.54	35.30			26.32	0.85
144	12.87	35.19	4.84	84	26.59	0.78
188	12.12	35.10	4.44	76	26.66	0.88

F.R.V. "Derwent Hunter" Cruise 1 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 4.11.59 TIME: 2346 STATION NO.: 3  
 LATITUDE: 34°12' S. LONGITUDE: 151°36' E.  
 WIND: FORCE 4 WIRE ANGLE: 45°, 35°  
 DIRECTION NE.

0	24.85	35.64	4.84	105	23.88	0.44
21	24.27	35.61	4.89	105	24.04	0.41
44	21.32	35.59	4.74	97	24.86	0.47
67	18.56	35.52	4.07	79	25.54	0.64
79	16.74	35.44			25.93	0.76
120	13.99	35.26	4.35	77	26.40	0.88
161	12.37	35.08	4.40	76	26.60	0.41
240	10.37	34.87	4.43	73	26.80	1.08
402	8.54	34.65	4.53	72	26.92	1.38
613	6.91	34.54	4.44	67	27.07	1.34

DATE: 5.11.59 TIME: 0400 STATION NO.: 4  
 LATITUDE: 34°18' S. LONGITUDE: 151°46' E.  
 WIND: FORCE 3 WIRE ANGLE: 25°, 27°  
 DIRECTION N.

0	24.02	35.53	4.96	106	24.05	0.42
25	23.31	35.53	4.88	103	24.26	0.38
50	20.35	35.55	4.29	86	25.12	0.48
75	17.44	35.44	3.97	76	25.76	0.76
100	15.61	35.35	4.13	76	26.12	0.77
150	13.38	35.21	4.50	79	26.50	0.89
200	12.29	35.10	4.71	81	26.63	0.87
300	10.48	34.88	4.43	73	26.79	1.03
500	7.89	34.60	4.57	70	26.99	1.29
700	6.14	34.47	4.40	65	27.13	1.53
900	5.00	34.49	4.29	62	27.29	1.73
1100	4.03	34.54	3.85	54	27.43	1.70
1300	3.17	34.56	3.67	51	27.53	1.82
1500	2.87	34.61	3.67	50	27.60	1.79

F.R.V. "Derwent Hunter" Cruise 1 1959

Depth (m)	Temp. °C	S ‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 5.11.59                      TIME: 1000                      STATION NO.: 5  
 LATITUDE: 35°30' S.                      LONGITUDE: 152°09' E.  
 WIND: FORCE 2                      WIRE ANGLE: 30°, 25°  
 DIRECTION N.

0	24.55	35.59	4.74	102	23.94	0.42
24	24.34	35.59	4.74	102	24.01	0.49
48	22.31	35.59	4.79	100	24.60	0.47
70	19.11	35.57	4.47	88	25.45	0.59
93	17.82	35.52	4.32	83	25.73	0.60
139	15.72	35.35	4.07	75	26.10	0.86
186	13.37	35.19	4.29	75	26.49	0.80
274	11.22	34.96	4.40	74	26.72	0.96
412	8.79	34.65	4.43	70	26.90	1.22
562	7.13	34.54	4.40	67	27.05	1.41
705	6.01	34.47	4.26	63	27.14	1.50
858	5.06	34.47	4.16	60	27.26	1.63
1037	4.08	34.51	3.94	55	27.40	1.78
1220	3.53	34.56	3.94	55	27.49	1.69

F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 2.iii.59 TIME: 1740 STATION NO.: 6  
 LATITUDE: 34°07' S. LONGITUDE: 151°24' E.  
 WIND: FORCE 4 WIRE ANGLE: 27°  
 DIRECTION S.

0	23.75	35.41	4.99	106	24.04	0.50
22	21.00	35.39			24.82	0.42
45	16.17	35.41			26.04	0.86
67	15.03	35.30	3.99	73	26.20	0.94
112	14.23	35.17	4.24	74	26.29	1.07

DATE: 2.iii.59 TIME: 1945 STATION NO.: 7  
 LATITUDE: 34°08' S. LONGITUDE: 151°30' E.  
 WIND: FORCE 4 WIRE ANGLE: 25°  
 DIRECTION S.

0	23.67	35.37	5.15	109	24.04	0.41
22	18.57	35.48	4.58	89	25.52	0.75
46	16.39	35.37	3.96	74	25.96	0.81
69	14.62	35.28	4.28	77	26.29	0.86
92	(14.50)	35.28	3.99		(26.48)	0.78
138	12.36	35.12	4.55	78	26.64	0.99
184	11.71	35.05	4.58	77	26.71	0.79
230	9.96	34.85	4.58	75	26.86	1.09

F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
DATE: 2.iii.59		TIME: 2255		STATION NO.: 8		
LATITUDE: 34°08' S.		LONGITUDE: 151°36' E.				
WIND: FORCE 4		WIRE ANGLE: 31°				
DIRECTION S.						
0	23.54	35.48	5.12	108	24.16	0.55
21	19.88	35.46	4.69	93	25.16	0.43
41	16.42	35.37	4.04	76	25.95	0.63
62	15.07	35.28	4.07	74	26.18	0.77
85	13.91	35.26	4.47	80	26.42	0.96
130	12.16	35.07	4.44	76	26.63	0.96
177	11.26	34.96	4.47	75	26.72	0.99
275	10.01	34.83	4.49	73	26.84	1.00

DATE: 3.iii.59		TIME: 0615		STATION NO.: 9		
LATITUDE: 34°12' S.		LONGITUDE: 151°37' E.				
WIND: FORCE 3		WIRE ANGLE: 32°				
DIRECTION S.						
0	22.75	35.34	5.20	109	24.29	0.43
22	19.73	35.52	4.07	81	25.26	0.65
44	19.66	35.46	3.92	78	25.23	0.74
67	14.11	35.21	4.11	73	26.34	0.87
89	12.88	35.10	4.24	74	26.52	0.96
134	11.56	34.94	4.04	68	26.64	1.09
179	10.59	34.85	4.11	68	26.75	1.20
269	9.47	34.76	4.44	71	26.87	1.32
449	8.12	34.60	4.47	69	26.95	1.17
630	6.83	34.49	4.38	66	27.04	1.40
867	5.66	34.49	4.24	62	27.20	1.48
1008	4.94					

## CO<sub>2</sub> UPTAKE

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

DATE: 2.iii.59                      TIME: 2200                      STATION NO.: 8  
 LATITUDE: 34°08' S.                      LONGITUDE: 151°36' E.

Bath	4 hrs	0	43	166	0	0	0.24
		25	88	7	81	0.53	
		50	45	8	37	0.24	
		100	25	15	10	0.07	

DATE: 3.iii.59                      TIME: 1010                      STATION NO.: 9  
 LATITUDE: 34°12' S.                      LONGITUDE: 151°37' E.

Bath	4 hrs	0	186	20	166	1.09	0.50
		25	181	3	178	1.16	
		50	26	4	22	0.14	
		100	16	4	12	0.08	

PIGMENTS

LIGHT PENETRATION

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

DATE: 2.iii.59

TIME: 2200

STATION NO.: 8

LATITUDE: 34°08' S.

LONGITUDE: 151°36' E.

0	0.41	0.14	1.08	0.28	*
25	1.85	0.37	*	0.27	0.32
50	0.23	0.09	0.18	0.12	*
100	0.21	0.04	0.37	0.27	*



F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 3.iii.59 TIME: 1800 STATION NO.: 10  
 LATITUDE: 34°31' S. LONGITUDE: 152°08' E.  
 WIND: FORCE 5 WIRE ANGLE: 43°, 33°  
 DIRECTION SE.

0	26.87	35.57	4.54	102	23.20	0.43
25	26.86	35.57	4.57	102	23.20	0.47
50	23.15	35.64	4.04	85	24.39	0.53
75	23.43	35.59	3.76	80	24.28	0.63
100	18.64	35.52	3.76	74	25.53	0.72
150	16.96	35.41	3.92	74	25.85	0.76
196	14.80	35.23	3.95	71	26.22	0.86
200	14.55	35.23	3.81	69	26.27	0.86
321	12.04	35.03	4.27	73	26.63	1.46
476	10.13	34.81	4.44	73	26.80	1.33
489	9.56	34.76	4.44	71	26.86	1.36
550	8.91	34.70	4.44	70	26.91	
605	8.13	34.60	4.44	69	26.95	1.47
650	7.93	34.58	4.44	69	26.96	1.29

DATE: 4.iii.59 TIME: 1227 STATION NO.: 11  
 LATITUDE: 35°07' S. LONGITUDE: 153°08' E.  
 WIND: FORCE 5 WIRE ANGLE: 5°, 2°  
 DIRECTION ESE.

0	26.44	35.64	4.55	101	23.39	0.36
25	26.46	35.64	4.58	102	23.38	0.33
50	24.59	35.66	4.47	96	23.36	0.42
75	21.67	35.68	3.77	78	24.85	0.66
100	20.01	35.66	3.99	80	25.30	0.72
150	18.44	35.59	3.96	77	25.63	0.58
200	16.42	35.39	3.84	72	25.97	0.77
300	13.98	35.26	4.34	77	26.42	0.86
500	9.54	34.76	4.37	70	26.86	1.28
700	7.53	34.60	4.37	67	27.04	1.44
900	5.96	34.49	4.28	63	27.16	1.60
1052	4.86	34.58	4.08	59	27.38	2.01
1244	4.08	34.54	3.77	53	27.43	1.87
1436	3.55	34.49	3.53	49	27.43	1.78

F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 5.iii.59 TIME: 1012 STATION NO.: 12  
 LATITUDE: 34°39' S. LONGITUDE: 156°09' E.  
 WIND: FORCE 4 WIRE ANGLE: 5°,10°  
 DIRECTION E.

0	24.55	35.35	4.71	101	23.75	0.32
25	22.47	35.77	4.90	102	24.69	0.30
50	21.64	35.71	4.69	96	24.89	0.32
75	21.66	35.71	5.07	104	24.88	0.37
100	18.24	35.59	5.20	101	25.68	0.39
150	15.20	35.41	4.54	83	26.25	0.76
200	13.23	35.16	4.38	77	26.49	0.92
300	10.48	34.90	4.41	73	26.81	1.17
500	7.98	34.60	4.44	69	26.98	1.52
700	6.25	34.52	4.33	64	27.15	1.84
900	4.75	34.47	4.07	58	27.30	2.11
1100	3.88	34.52	3.81	53	27.43	2.17
1300	3.25	34.58	3.66	51	27.54	2.24
1500	2.83	34.63	3.60	49	27.61	2.14

DATE: 5.iii.59 TIME: 2235 STATION NO.: 13  
 LATITUDE: 34°38' S. LONGITUDE: 157°05' E.  
 WIND: FORCE 3 WIRE ANGLE: 12°,11°  
 DIRECTION NE.

0	23.38	35.70	4.78	101	24.38	0.63
25	22.83	35.71	4.93	104	24.54	0.35
50	22.03	35.79	5.02	104	24.84	0.47
75	19.04	35.57	5.18	102	25.47	
100	16.44	35.44	4.37	82	26.00	0.63
150	14.46	35.32	4.47	80	26.36	0.78
200	13.15	35.23	4.66	81	26.56	0.68
300	11.55	35.07	4.64	78	26.75	0.95
500	8.86	34.70	4.58	73	26.92	1.30
700	7.04	34.56	4.42	67	27.09	1.23
900	5.62	34.49	4.24	62	27.21	1.67
1100	4.64	34.51	4.02	58	27.35	1.77
1300	3.55	34.56	3.77	52	27.49	1.62
1500	3.04	34.61	3.74	51	27.59	2.12

F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 6.iii.59 TIME: 1030 STATION NO.: 14  
 LATITUDE: 34°43' S. LONGITUDE: 158°02' E.  
 WIND: FORCE 3 WIRE ANGLE: 30°, 25°  
 DIRECTION ENE.

0	22.65	35.64	4.93	103	24.54	0.22
23	22.25	35.64	4.93	102	24.66	0.21
47	22.42	35.61	5.15	107	24.59	0.25
71	18.36	35.44	5.53	107	25.54	0.25
96	16.24	35.44	4.60	86	26.05	0.43
145	14.50	35.32	4.47	80	26.35	0.72
194	13.80	35.32	4.90	87	26.50	0.66
290	12.25	35.14	5.18	89	26.67	0.75
464	9.88	34.79	4.70	76	26.83	0.97
650	8.07	34.63	4.47	70	26.99	1.35
842	6.38	34.47	4.28	64	27.10	1.52
1025	5.26	34.45	4.15	60	27.22	1.54
1222	4.29	34.52	4.24	60	27.39	1.39
1421	3.59	34.51	3.90	54	27.45	1.65

DATE: 7.iii.59 TIME: 0430 STATION NO.: 16  
 LATITUDE: 34°28' S. LONGITUDE: 157°00' E.  
 WIND: FORCE 1 WIRE ANGLE: 8°, 5°  
 DIRECTION W.

0	22.53	35.55	4.93	103	24.51	0.21
25	22.50	35.66	4.90	102	24.61	0.27
50	21.81	35.68	5.04	104	24.81	0.30
75	18.18	35.50	4.99	97	25.63	0.34
100	16.74	35.43	4.55	86	25.92	0.50
150	14.48	35.32	4.39	79	26.35	0.88
200	12.56	35.12	4.28	74	26.59	0.96
300	9.49	34.76	4.42	71	26.87	1.27
500	7.34	34.52	4.42	67	27.00	1.49
700	5.79	34.49	4.34	64	27.19	1.63
900	4.73	34.49	4.06	58	27.31	1.94
1100	3.84	34.51	3.51	49	27.42	1.81
1300	3.21	34.58	3.68	51	27.54	1.81
1500	2.75	34.60	3.56	49	27.60	1.94

F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 7.iii.59 TIME: 1957 STATION NO.: 18  
 LATITUDE: 33°41' S. LONGITUDE: 155°59' E.  
 WIND: FORCE 3 WIRE ANGLE: 15°, 32°  
 DIRECTION N.

0	24.90	35.77	4.75	103	23.98	0.33
21	24.58	35.75	4.70	101	24.06	0.34
42	24.54	35.75	4.66	100	24.07	0.28
65	24.25	35.75	4.70	101	24.16	0.34
87	23.28	35.73	4.47	95	24.44	0.39
131	22.00	35.68	4.44	92	24.76	0.52
196	20.44	35.66	4.24	86	25.18	0.56
290	19.18	35.62	4.42	87	25.47	0.53
486	14.85	35.32	4.37	79	26.28	0.76
681	10.20	34.81	4.28	70	26.79	1.18
878	7.50	34.54	4.37	67	27.00	1.40
1082	5.98	34.47	4.28	63	27.15	1.61
1282	4.73	34.49	4.02	58	27.31	1.79
1482	3.72	34.51	3.68	51	27.43	2.02

DATE: 8.iii.59 TIME: 1450 STATION NO.: 19  
 LATITUDE: 33°08' S. LONGITUDE: 154°52' E.  
 WIND: FORCE 6 WIRE ANGLE:  
 DIRECTION N.

0	24.90	35.77			23.98	
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F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 9.iii.59 TIME: 2103 STATION NO.: 20  
 LATITUDE: 31°29' S. LONGITUDE: 153°00' E.  
 WIND: FORCE 2 WIRE ANGLE: 5°  
 DIRECTION S.

0	23.50	35.44	4.96	105	24.14	
10	23.57	35.44	4.99	106	24.12	0.46
20	23.06	35.39	4.99	105	24.24	0.54
30	23.50	35.39	4.28	91	24.10	0.75
40	16.61	35.34	4.06	76	25.89	0.85
50	14.78	35.25	4.06	73	26.24	0.98

DATE: 10.iii.59 TIME: 0907 STATION NO.: 21  
 LATITUDE: 30°19' S. LONGITUDE: 153°16' E.  
 WIND: FORCE 3 WIRE ANGLE: 10°  
 DIRECTION SE.

0	22.58	35.43	4.99	104	24.40	0.54
10	22.32	35.46	4.85	101	24.49	0.56
20	22.40	35.55	5.08	106	24.54	0.59
30	21.04	35.57	4.31	88	24.94	0.74
40	19.60	35.52	3.58	71	25.30	0.94
50	18.44	35.46	3.53	69	25.53	0.95

F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 11.iii.59                      TIME: 2111                      STATION NO.: 22  
 LATITUDE: 30°28' S.                      LONGITUDE: 153°28' E.  
 WIND: FORCE 5                      WIRE ANGLE: 60°  
       DIRECTION SE.

0      26.65      35.70                      23.39                      0.52

DATE: 12.iii.59                      TIME: 0650                      STATION NO.: 23  
 LATITUDE: 30°43' S.                      LONGITUDE: 154°02' E.  
 WIND: FORCE 5                      WIRE ANGLE: 60°,50°  
       DIRECTION SE.

0	27.00	35.62	4.66	104	23.20	0.87
20	26.43	35.61	4.60	102	23.39	0.34
40	26.35	35.61	4.30	95	23.40	0.34
60	25.85	35.70	4.44	98	23.64	0.34
82	24.75	35.71	4.44	96	23.97	0.34
104	24.10	35.82	4.78	103	24.25	0.36
128	23.19	35.71	4.14	87	24.44	0.45
173	20.83	35.68	4.33	88	25.09	0.57
296	16.90	35.48	4.17	79	25.93	0.64
465	13.22	35.19	4.49	79	26.52	0.79
474	12.65	35.17	4.69	81	26.62	0.79
528	10.95	35.01	4.44	74	26.81	0.95
614	9.05	34.72	4.41	70	26.91	1.11
652	7.27	34.56	4.41	67	27.05	1.34

F.R.V. "Derwent Hunter" Cruise 2 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 12.iii.59 TIME: 1900 STATION NO.: 24.  
 LATITUDE: 30°35' S. LONGITUDE: 154°58' E.  
 WIND: FORCE 6 WIRE ANGLE: 45°,45°  
 DIRECTION SSE.

0	24.82	35.66	4.78	104	23.92	0.32
22	24.36	35.66	4.81	103	24.06	0.32
44	23.76	35.75	4.75	101	24.30	0.32
68	23.20	35.77	4.60	97	24.48	0.32
92	22.10	35.75	4.60	95	24.79	0.34
120	21.20	35.70	4.49	92	25.01	0.44
138	20.25	35.62	3.92	79	25.19	0.65
188	18.90	35.59	4.01	79	25.52	0.62
323	15.48	35.39	4.14	76	26.18	0.69
464	12.42	35.16	4.63	80	26.65	0.75
636	9.17	34.72	4.49	72	26.89	0.59
794	7.51	34.69	4.44	68	27.12	1.07
956	6.07	34.49	4.27	63	27.15	1.46
1122	4.99	34.52	4.07	59	27.32	1.65

DATE: 13.iii.59 TIME: 0610 STATION NO.: 25  
 LATITUDE: 30°22' S. LONGITUDE: 155°51' E.  
 WIND: FORCE 5 WIRE ANGLE: 45°  
 DIRECTION SE.

134	15.52	35.39	4.47	82	26.16	0.77
276	11.67	35.08	4.60	78	26.74	0.88
438	9.84	34.79	4.24	69	26.84	1.18
614	7.97	34.61	4.38	68	26.99	1.46

F.R.V. "Derwent Hunter" Cruise 3 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 11.iv.59 TIME: 1635 STATION NO.: 28  
 LATITUDE: 24°37' S. LONGITUDE: 153°36' E.  
 WIND: FORCE 4 WIRE ANGLE: 20°

DIRECTION SE.

0	25.88	35.62			23.56	0.66
25	25.91	35.70	4.79	106	23.62	0.40
50	25.83	35.70	4.65	102	23.64	0.35
75	24.78	35.66	4.54	98	23.92	0.33
100	21.34	35.66	4.09	84	24.94	0.56
150	19.82	35.64	4.03	80	25.33	0.53
200	18.45	35.62	4.59	89	25.65	0.65
300	15.85	35.41	4.32	80	26.12	0.68
386	13.02	35.10	4.13	72	26.48	1.00
483	10.70	34.85	4.22	70	26.73	1.12
677	7.62	34.56	4.48	69	26.99	1.53
874	5.93	34.51	4.48	66	27.18	1.54
1071	4.80	34.51	4.13	59	27.33	1.76
1269	3.94	34.58	3.94	55	27.47	1.66
1466	3.75	34.58	3.66	51	27.49	1.86

DATE: 12.iv.59 TIME: 0103 STATION NO.: 30  
 LATITUDE: 24°13' S. LONGITUDE: 154°03' E.  
 WIND: FORCE 4 WIRE ANGLE: 35°

DIRECTION SE.

0	25.28	35.66			23.77	0.34
25	25.34	35.64			23.74	0.35
50	25.39	35.66			23.74	0.43
75	23.36	35.66			24.35	0.46
100	21.68	35.64			24.82	0.68
150	18.54	35.55			25.58	0.55
200	16.91	35.44			25.89	0.76
300	13.51	35.14			26.41	0.99
352	11.44	34.92			26.64	1.17
442	9.59	34.72			26.82	1.10
624	7.09	34.54			27.06	1.49
808	5.96	34.63			27.27	1.23
993	4.97	34.47			27.28	1.84
1181	4.10	34.56			27.44	1.77
1370	3.74	34.56			27.47	1.99



F.R.V. "Derwent Hunter" Cruise 3 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 12.iv.59 TIME: 0921 STATION NO.: 31  
 LATITUDE: 24°53' S. LONGITUDE: 154°28' E.  
 WIND: FORCE 4 WIRE ANGLE: 27°  
 DIRECTION SE.

0	26.37	35.66			23.43	0.35
25	26.30	35.64	4.99	111	23.44	0.21
50	26.37	35.64	4.68	104	23.42	0.30
75	26.07	35.62	4.70	104	23.49	0.26
100	24.66	35.64	4.55	98	23.94	0.44
150	21.56	35.68	3.98	82	24.88	0.55
200	18.60	35.53	3.94	77	25.55	0.71
300	14.44	35.23	4.18	75	26.29	0.87
368	12.27	35.03	4.22	72	26.58	1.00
461	10.17	34.79	4.35	71	26.78	1.22
648	7.42	34.56	4.54	70	27.02	1.51
837	6.00	34.52	4.38	65	27.18	1.52
1029	4.92	34.51	4.14	60	27.32	1.76
1222	4.09	34.54	3.88	55	27.43	1.86
1417	3.64	34.56	3.56	50	27.48	2.08

DATE: 12.iv.59 TIME: 1729 STATION NO.: 32  
 LATITUDE: 23°28' S. LONGITUDE: 155°02' E.  
 WIND: FORCE 5 WIRE ANGLE: 40°, 30°  
 DIRECTION SE.

0	26.31	35.64			23.44	0.43
22	26.34	35.62			23.41	0.32
43	26.44	35.62			23.38	0.33
64	26.23	35.66			23.48	0.23
86	25.15	35.66			23.80	0.37
129	22.51	35.68			24.61	0.43
174	21.40	35.70			24.94	0.54
267	17.76	35.53			25.75	0.67
344	15.84	35.43			26.13	0.78
434	13.15	35.12			26.47	0.96
618	8.50	34.67			26.95	1.21
808	6.29	34.56			27.17	1.55
999	5.22	34.49			27.25	1.84
1194	3.85	34.63			27.52	1.89
1394	3.37	34.60			27.54	1.89

F.R.V. "Derwent Hunter" Cruise 3 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 19.iv.59                      TIME: 1553                      STATION NO.: 33  
 LATITUDE: 26°58' S.                      LONGITUDE: 158°50' E.  
 WIND: FORCE 4                      WIRE ANGLE: 10°, 8°  
                     DIRECTION E.

0	25.79	35.75	4.68	103	23.68	0.35
25	25.86	35.71	4.52	100	23.63	0.34
50	25.78	35.71	4.60	101	23.66	0.25
75	25.00	35.70	4.52	98	23.88	0.33
100	21.75	35.66	4.56	94	24.81	0.54
144	19.40	35.57	3.88	77	25.38	0.66
192	17.71	35.52	4.12	72	25.75	0.56
287	13.92	35.21	4.16	74	26.37	0.90
381	12.15	35.07	4.25	73	26.63	0.99
474	10.52	34.87	4.38	72	26.77	1.11

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 9.v.59                      TIME: 1209                      STATION NO.: 41  
 LATITUDE: 34°09' S.                      LONGITUDE: 151°24' E.  
 WIND: FORCE 2                      WIRE ANGLE 10°  
       DIRECTION S.

0	22.76	35.81	5.04	106	24.64	0.47
22	22.67	35.81	4.93	103	24.67	0.35
45	22.31	35.81	4.96	103	24.77	0.42
68	21.65	35.75	4.70	97	24.92	0.41
114	18.40	35.55	4.37	85	25.62	0.57

DATE: 9.v.59                      TIME: 1349                      STATION NO.: 42  
 LATITUDE: 34°10' S.                      LONGITUDE: 151°31' E.  
 WIND: FORCE 2                      WIRE ANGLE 22°  
       DIRECTION S.

0	22.37	35.79	4.84	101	24.74	0.43
23	22.30	35.81	5.01	104	24.77	0.43
47	21.11	35.79	4.99	102	25.09	0.43
70	20.43	35.79	4.99	101	25.28	0.43
94	20.30	35.73	4.92	99	25.28	0.34
143	18.08	35.57	4.33	84	25.71	0.63
191	16.64	35.50	4.27	80	26.01	0.66
239	15.11	35.34	4.38	80	26.22	0.75

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 9.v.59 TIME: 1515 STATION NO.: 43  
 LATITUDE: 34°10' S. LONGITUDE: 151°37' E.  
 WIND: FORCE 3 WIRE ANGLE: 27°,12°  
 DIRECTION S.

0	20.10	35.75	5.05	101	25.35	0.30
25	20.14	35.75	5.09	102	25.34	0.54
50	20.00	35.73	4.93	99	25.36	0.48
75	19.78	35.70	4.76	95	25.38	0.41
100	19.01	35.64	4.37	86	25.53	0.56
150	16.98	35.46	4.31	81	25.89	0.57
168	16.56	35.46	4.25	80	25.99	0.65
253	13.76	35.28	4.52	80	26.47	0.76
420	10.80	34.94	4.42	73	26.78	1.03
647	7.76	34.60	4.42	68	27.02	1.68

DATE: 11.v.59 TIME: 1510 STATION NO.: 45  
 LATITUDE: 34°37' S. LONGITUDE: 153°55' E.  
 WIND: FORCE 4 WIRE ANGLE: 30°,25°  
 DIRECTION SE.

0	19.80	35.77	5.09	102	25.42	0.38
22	19.85	35.75	5.05	101	25.40	0.43
43	19.70	35.75	5.00	100	25.44	0.43
65	19.73	35.73	4.97	99	25.41	0.76
86	17.44	35.52	4.13	79	25.82	0.49
130	14.92	35.37	4.42	80	26.30	0.68
172	13.56	35.26	4.45	79	26.49	0.83
260	11.93	35.07	4.45	76	26.67	0.96
440	9.30	34.78	4.42	71	26.92	1.28
628	7.42	34.58	4.35	67	27.04	1.52
795	5.82	34.51			27.20	1.67
970	4.91	34.49			27.29	1.84
1160	4.11	34.54			27.42	1.92
1350	3.51	34.58			27.50	2.08

## CO<sub>2</sub> UPTAKE

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

DATE: 11.v.59

TIME: 0600

STATION NO.: 45

LATITUDE: 34°37' S.

LONGITUDE: 153°55' E.

<u>In situ</u>	1 day	0	464	165	299	0.80	0.16
		25	68	141	0	0	
		50	1219	54	1165	3.12	
		100	688	132	556	1.49	

DATE: 11.v.59

TIME: 0600

STATION NO.: 45

LATITUDE: 34°37' S.

LONGITUDE: 153°55' E.

Bath	4 hrs	0	771	101	670	0.45	0.32
		25	852	13	839	0.56	
		50	506	11	495	0.33	
		100	33	41	0	0	

PIGMENTS

LIGHT PENETRATION

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

DATE: 11.v.59

TIME: 0630

STATION NO.: 45

LATITUDE: 34°37' S.

LONGITUDE: 153°55' E.

0	0.49	0.15	1.16	0.25	*
25	0.45	0.15	0.83	0.22	0
50	0.28	0.08	0.66	0.02	0
100	0.20	0.06	0.86	0.29	*

## CO<sub>2</sub> UPTAKE

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

DATE: 11.v.59

TIME: 1200

STATION NO.: 45

LATITUDE: 34°37' S.

LONGITUDE: 153°55' E.

Bath	4 hrs	0	1349	13	1336	0.89	0.60
		25	1373	31	1342	0.90	
		50	1056	6	1050	0.70	
		100	53	43	10	0.01	

PIGMENTS

LIGHT PENETRATION

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

DATE: 11.v.59

TIME: 1200

STATION NO.: 45

LATITUDE: 34°37' S.

LONGITUDE: 153°55' E.

0	0.51	0.19	1.03	0.35	*	
25	0.52	0.17	0.63	0.28		0
50	0.62	0.23	0.95	0.31	*	
100	0.33	0.14	0.45	0.12		0.03



F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 12.v.59 TIME: 0718 STATION NO.: 46  
 LATITUDE: 35°06' S. LONGITUDE: 154°42' E.  
 WIND: FORCE 3 WIRE ANGLE: 0,0  
 DIRECTION SE.

0	20.90	35.81	4.91	100	25.17	0.38
25	20.90	35.81	4.91	100	25.17	0.32
50	20.80	35.81	4.86	99	25.19	0.35
75	20.13	35.71	4.43	89	25.30	0.40
100	19.11	35.61	4.29	84	25.48	0.49
150	16.52	35.46	4.10	77	26.00	0.66
200	13.68	35.25	4.02	71	26.47	0.75
300	10.52	34.88	4.35	72	26.78	1.14
500	7.94	34.61	4.32	67	26.99	1.41
700	6.21	34.51	4.10	61	27.15	1.79
900	5.40	34.49			27.23	1.62
1100	4.13	34.51	3.68	52	27.39	1.96
1300	3.54	34.58	3.62	50	27.51	1.94
1500	3.20	34.60	3.39	47	27.55	1.99

DATE: 12.v.59 TIME: 2030 STATION NO.: 47  
 LATITUDE: 35°31' S. LONGITUDE: 155°55' E.  
 WIND: FORCE 4 WIRE ANGLE: 25°,17°  
 DIRECTION SE.

0	21.08	35.84	4.97	101	25.14	0.32
23	20.37	35.81	5.09	103	25.32	0.37
46	20.10	35.77	5.00	100	25.36	0.37
70	20.06	35.75	4.89	98	25.36	0.43
94	20.03	35.75	4.89	98	25.36	0.37
141	17.49	35.52	4.29	82	25.81	0.48
186	15.30	35.39	4.33	79	26.22	0.75
280	12.65	35.16	4.59	79	26.60	0.85
470	9.16	34.76	4.32	69	26.92	1.15
660	7.56	34.58	4.32	66	27.03	1.53
845	6.18	34.52	4.25	63	27.16	1.68
1038	5.20	34.49	4.03	58	27.26	1.76
1235	4.21	34.54	3.82	54	27.40	1.83
1430	3.44	34.58	3.65	51	27.53	2.02

## CO<sub>2</sub> UPTAKE

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

DATE: 12.v.59                      TIME: 0700                      STATION NO.: 46  
 LATITUDE: 35°06' S.                      LONGITUDE: 154°42' E.

Bath	4 hrs	0	1268	78	1191	0.80	0.60
		25	1373	20	1354	0.91	
		50	1101	46	1056	0.71	
		100	67	(5)	62	0.04	

DATE: 12.v.59                      TIME: 1915                      STATION NO.: 47  
 LATITUDE: 35°31' S.                      LONGITUDE: 155°55' E.

Bath	4 hrs	0	367	(15)	353	0.24	0.53
		25	247	(10)	236	0.16	
		50	1050	(40)	1009	0.68	
		100	1293	(45)	1248	0.84	

PIGMENTS

LIGHT PENETRATION

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

DATE: 12.v.59  
 LATITUDE: 35°06' S.

TIME: 0730

STATION NO.: 46  
 LONGITUDE: 154°42' E.

0	0.42	0.13	0.69	0.16	0.04
25	0.50	0.12	0.39	0.09	0.13
50	0.54	0.11	0.60	0.11	0.13
100	0.24	0.12	0.67	1.06	0.06

DATE: 12.v.59  
 LATITUDE: 35°31' S.

TIME: 1930

STATION NO.: 47  
 LONGITUDE: 155°55' E.

0	0.30	0.12	0.74	0.16	*
25	1.33	0.20	1.50	0.23	0.18
50	0.57	0.11	0.63	0.17	0.02
100	0.87	0.15	0.64	0.15	0.15

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 13.v.59                      TIME: 1316                      STATION NO.: 48  
 LATITUDE: 35°46' S.                      LONGITUDE: 156°39' E.  
 WIND: FORCE 4                      WIRE ANGLE: 20°,20°  
       DIRECTION SE.

0	21.22	35.84	4.80	98	25.09	0.35
25	21.20	35.84	4.91	100	25.10	0.32
50	21.18	35.83	5.16	105	25.10	0.43
75	21.18	35.83	4.96	101	25.10	0.38
100	21.18	35.83	4.80	98	25.10	0.31
150	19.05	35.61	4.50	89	25.49	0.48
200	16.10	35.46	4.15	77	26.10	0.66
300	13.25	35.23	4.43	78	26.54	0.77
500	10.01	34.85	4.45	72	26.85	1.17
700	7.81	34.60	4.40	68	27.00	1.41
900	6.15	34.52	4.22	63	27.15	1.60
1100	4.91	34.49	3.99	57	27.29	1.81
1300	3.98	34.58	3.80	53	27.46	2.04
1500	3.41	34.61	3.74	52	27.54	1.93

DATE: 14.v.59                      TIME: 0815                      STATION NO.: 49  
 LATITUDE: 34°08' S.                      LONGITUDE: 158°37' E.  
 WIND: FORCE 4                      WIRE ANGLE: 25°,5°  
       DIRECTION SE.

0	22.14	35.84	4.92	102	24.84	0.31
20	22.13	35.84	4.90	102	24.84	0.55
41	21.43	35.81	4.90	102	25.02	0.37
63	20.58	35.73	4.86	98	25.19	0.35
86	19.87	35.68	4.63	92	25.36	0.34
130	19.05	35.61	4.44	87	25.49	0.42
176	17.52	35.50	4.16	79	25.78	0.63
370	15.08	35.35	4.38	79	26.22	0.68
465	11.53	34.99	4.54	76	26.69	0.96
660	8.71	34.67	4.46	70	26.92	1.28
838	7.00	34.51	4.27	65	27.04	1.41
1024	5.73	34.43	4.17	61	27.15	1.75
1210	4.73	34.51	3.95	57	27.34	1.93
1218	4.70	34.52	3.57	51	27.35	2.04

## CO<sub>2</sub> UPTAKE

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

DATE: 13.v.59                      TIME: 0550                      STATION NO.: 48  
 LATITUDE: 35°46' S.                      LONGITUDE: 156°39' E.

<u>In situ</u> 1 day	0	435	19	416	1.11	0.13
	25	1259	76	1183	3.17	
	50	390	47	343	0.92	
	100	12	22	0	0	

DATE: 13.v.59                      TIME: 0600                      STATION NO.: 48  
 LATITUDE: 35°46' S.                      LONGITUDE: 156°39' E.

Bath 4 hrs	0	1083	59	1024	0.68	0.55
	25	1162	51	1111	0.74	
	50	1197	89	1108	0.74	
	100	61	44	16	0.01	

PIGMENTS

LIGHT PENETRATION

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

DATE: 13.v.59

TIME: 0630

STATION NO.: 48

LATITUDE: 35°46' S.

LONGITUDE: 156°39' E.

0	0.59	0.18	0.87	0.20	0.05
25	0.58	0.18	0.78	0.20	0.04
50	0.50	0.13	0.63	0.18	0.05
100	0.20	0.11	0.53	0.27	0.10

## CO<sub>2</sub> UPTAKE

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

DATE: 13.v.59

TIME: 1140

STATION NO.: 48

LATITUDE: 35°46' S.

LONGITUDE: 156°39' E.

Bath	4 hrs	0	1453	85	1368	0.92	0.63
		25	1022	52	970	0.65	
		50	1394	67	1327	0.89	
		100	258	20	238	0.16	

PIGMENTS

LIGHT PENETRATION

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

DATE: 13.v.59

TIME: 1200

STATION NO.: 48

LATITUDE: 35°46' S.

LONGITUDE: 156°39' E.

0	0.39	0.08	0.43	0.06	0.10
25	0.53	0.10	0.55	0.06	0.18
50	0.46	0.09	0.45	0.03	0.15
100	0.45	0.17	0.69	0.06	0.11



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Depth (m)	Temp. °C	S ‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 14.v.59 TIME: 2200 STATION NO.: 50  
 LATITUDE: 33°58' S. LONGITUDE: 157°11' E.  
 WIND: FORCE 2 WIRE ANGLE: 10°, 20°  
 DIRECTION SE.

0	22.82	35.82	4.78	100	24.64	0.32
22	22.77	35.88	4.90	103	24.69	0.30
46	22.70	35.88	4.86	102	24.71	0.32
70	22.36	35.84	4.72	98	24.78	0.34
94	21.03	35.71	4.30	88	25.05	0.41
142	19.60	35.68	4.46	88	25.41	0.45
190	18.58	35.62	4.30	84	25.62	0.95
289	16.19	35.44	4.20	78	26.06	0.73
488	11.37	34.97	4.24	71	26.71	1.03
688	8.08	34.63	4.44	72	26.99	1.38
888	6.42	34.49	4.30	64	27.10	1.60
1083	5.26	34.49	4.00	58	27.25	1.84
1280	4.17	34.56	3.83	54	27.43	1.84
1477	3.96	34.56	3.55	50	27.45	1.92

DATE: 15.v.59 TIME: 0810 STATION NO.: 51  
 LATITUDE: 33°50' S. LONGITUDE: 156°10' E.  
 WIND: FORCE 3 WIRE ANGLE: 0, 8°  
 DIRECTION SE.

0	21.14	35.81	4.89	100	25.09	0.42
25	21.06	35.81	5.03	102	25.11	0.41
50	20.64	35.77	4.91	99	25.21	0.41
75	20.34	35.75	4.94	100	25.29	0.35
100	19.34	35.62	4.37	86	25.43	0.54
150	18.61	35.62	4.29	84	25.61	0.44
200	16.73	35.55	4.10	77	26.02	0.60
300	14.04	35.21	4.25	76	26.35	0.62
500	9.63	34.79	4.29	69	26.85	1.19
700	6.89	34.58	4.32	65	27.11	1.53
900	5.54	34.49	4.16	61	27.21	1.83
1100	4.52	34.51	3.82	54	27.35	1.71
1263	3.98	34.58	3.54	50	27.46	2.04
1300	3.89	34.60	3.72	52	27.50	1.95

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 15.v.59 TIME: 1966 STATION NO.: 52  
 LATITUDE: 33°26' S. LONGITUDE: 155°11' E.  
 WIND: FORCE 2 WIRE ANGLE: 0,0  
 DIRECTION S.

0	22.02	35.81	4.96	103	24.85	0.37
25	22.06	35.82	4.93	102	24.85	0.34
50	22.02	35.82	4.77	99	24.85	0.33
75	22.03	35.82	4.80	100	24.85	0.23
100	22.02	35.81	4.86	101	24.85	0.32
150	22.03	35.81	4.80	100	24.84	0.37
200	19.93	35.68	4.29	86	25.34	0.52
300	17.90	35.57	4.25	82	25.75	0.59
500	12.57	35.16	4.52	78	26.62	0.88
700	8.82	34.70	4.55	72	26.93	1.36
888	6.82	34.52	4.38	66	27.07	1.53
1086	5.31	34.49	4.22	61	27.24	1.77
1284	4.11	34.56	3.85	54	27.43	1.92
1482	3.50	34.58	3.59	50	27.51	1.95

DATE: 16.v.59 TIME: 0540 STATION NO.: 53  
 LATITUDE: 33°04' S. LONGITUDE: 154°23' E.  
 WIND: FORCE 2  
 DIRECTION SW.

0	22.41	35.84	4.92	103	24.76	0.42
25	22.47	35.82	4.90	102	24.74	0.32
50	22.42	35.82	4.66	97	24.74	0.31
75	22.37	35.82	4.72	98	24.76	0.31
100	22.29	35.84	4.72	98	24.80	0.33
150	20.74	35.70	4.17	84	25.13	0.46
200	19.50	35.66	4.20	83	25.43	0.53
300	17.68	35.55	4.17	80	25.79	0.53
500	12.46	35.14	4.34	75	26.63	0.94
700	8.78	34.70	4.39	69	26.94	1.28
889	7.05	34.54	4.36	66	27.06	1.70
1082	5.74	34.49	4.16	61	27.19	1.70
1282	4.61	34.58	3.98	57	27.40	1.68
1482	3.58	34.54	3.64	51	27.47	1.91

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE; 16.v.59                      TIME; 1745                      STATION NO.; 54  
 LATITUDE; 32°50' S.                      LONGITUDE; 153°18' E.  
 WIND; FORCE 2                      WIRE ANGLE; 40°,30°  
 DIRECTION S.

0	21.94	35.81	4.84	100	24.88	0.30
15	22.05	35.81	4.86	101	24.84	0.34
34	21.95	35.82	4.84	100	24.87	0.43
51	22.05	35.81	4.81	100	24.84	0.41
67	22.04	35.81	4.74	98	24.84	0.45
100	20.32	35.71	4.62	93	25.25	0.42
134	18.75	35.59	4.24	83	25.55	0.52
200	15.33	35.32	4.13	76	26.15	0.87
412	9.97	34.84	4.45	72	26.85	1.14
472	9.35	34.76	4.56	73	26.90	1.07
580	8.37	34.61	4.45	70	26.93	1.43
613	8.40	34.63	4.51	71	26.93	1.30
680	7.53	35.60	4.40	67	27.04	1.43
850	6.31	34.47	4.27	64	27.10	1.73

DATE; 17.v.59                      TIME; 0110                      STATION NO.; 55  
 LATITUDE; 32°49' S.                      LONGITUDE; 153°00' E.  
 WIND; FORCE 2                      WIRE ANGLE; 10°,8°  
 DIRECTION SW.

0	22.00	35.82	4.68	97	24.87	0.32
17	20.90	35.77	5.04	102	25.14	0.43
34	20.10	35.73	4.27	86	25.34	0.43
54	20.10	35.73	4.78	96	25.34	0.43
72	20.08	35.73	5.02	101	25.34	0.38
112	18.74	35.52	4.11	80	25.50	0.64
157	16.10	35.43	4.30	80	26.08	0.70
244	12.87	35.16	4.45	77	26.56	0.84
434	9.48	34.78	4.40	71	26.88	1.10
624	7.65	34.61	4.45	68	27.03	1.28
900	6.21	34.51	4.21	63	27.14	1.62
1100	5.10	34.49	4.14	60	27.27	1.90
1300	4.11	34.54	3.83	54	27.42	1.82
1500	3.14	34.58	3.55	49	27.55	2.11

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 17.v.59                      TIME: 0909                      STATION NO.: 56  
 LATITUDE: 32°48' S.                      LONGITUDE: 152°19' E.  
 WIND: FORCE 2                      WIRE ANGLE: 0  
       DIRECTION SW.

0	21.48	35.68	4.89	100	24.14	0.35
10	21.05	35.66	4.89	100	24.24	0.32
20	20.88	35.64	5.04	102	25.03	0.35
30	20.88	35.64	4.91	100	25.04	0.54
40	20.80	35.66	4.96	101	25.08	0.27
50	20.75	35.66	4.89	99	25.09	0.27

DATE: 17.v.59                      TIME: 2215                      STATION NO.: 57  
 LATITUDE: 31°28' S.                      LONGITUDE: 153°00' E.  
 WIND: FORCE 3                      WIRE ANGLE: 0  
       DIRECTION SE.

0	21.86	35.71	4.80	99	24.82	0.36
10	21.80	35.70			24.83	0.41
20	21.81	35.70	4.96	102	24.82	0.43
30	21.86	35.68	4.86	100	24.80	0.47
40	21.61	35.68	4.26	88	24.86	0.47

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 18.v.59                      TIME: 1915                      STATION NO.: 58  
 LATITUDE: 30°20' S.                      LONGITUDE: 153°13' E.  
 WIND: FORCE 2                      WIRE ANGLE: 0  
       DIRECTION N.

0	21.65	35.93	4.64	96	25.04	0.52
10	21.73	35.84	4.94	102	24.95	0.32
20	21.64	35.82	4.91	101	24.96	0.36
30	21.66	35.82	4.86	100	24.95	0.39
40	21.60	35.79	4.71	97	24.95	0.44
50	20.91	35.70	4.43	90	25.08	0.60

DATE: 19.v.59                      TIME: 0100                      STATION NO.: 59  
 LATITUDE: 30°26' S.                      LONGITUDE: 153°29' E.  
 WIND: FORCE 2                      WIRE ANGLE: 5°,8°  
       DIRECTION NE.

0	21.85	35.84	4.94	102	24.93	0.37
23	21.81	35.84	4.96	102	24.94	0.37
45	21.81	35.84	5.02	104	24.94	0.43
67	21.81	35.84	5.00	103	24.94	0.43
90	21.65	35.79	5.00	103	24.95	0.38
135	19.01	35.62	4.47	88	25.51	0.51
180	17.64	35.55	4.31	83	25.80	0.68
270	14.02	35.30	4.59	82	26.43	0.86
450	10.03	34.83	4.44	72	26.84	1.30
632	8.40	34.56	4.46	70	26.88	1.52
843	5.98	34.49	4.12	61	27.16	1.46
1030	4.89	34.49	4.02	58	27.30	1.75
1217	4.15	34.54	3.80	54	27.42	1.62
1404	3.13	34.58	3.45	48	27.55	1.95

F.R.V. "Derwent Hunter"

Cruise 6

1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 19.v.59                      TIME: 1000                      STATION NO.: 60  
 LATITUDE: 30°30' S.                      LONGITUDE: 154°01' E.  
 WIND: FORCE 2                      WIRE ANGLE: 5°,0  
       DIRECTION NE.

0	22.29	35.79	4.82	100	24.76	0.43
22	22.22	35.77	4.99	104	24.76	0.36
45	22.22	35.77	4.82	100	24.76	0.42
67	21.80	35.70	4.50	93	24.83	0.45
90	20.56	35.75	4.91	99	25.21	0.38
138	17.10	35.53	3.91	74	25.91	0.60
183	14.43	35.34	3.91	70	26.38	0.76
276	12.26	35.08	4.15	71	26.62	0.97
468	9.04	34.69	4.32	69	26.89	1.34
666	6.59	34.49	4.32	65	27.08	1.56
900	5.26	34.49	4.06	59	27.25	1.73
1100	4.21	34.51	3.72	53	27.37	2.04
1300	3.61	34.56	3.53	49	27.48	2.01
1500	2.88	34.61	3.42	47	27.59	2.03

DATE: 19.v.59                      TIME: 2030                      STATION NO.: 61  
 LATITUDE: 30°46' S.                      LONGITUDE: 155°00' E.  
 WIND: FORCE 3                      WIRE ANGLE: 12°,5°  
       DIRECTION N.

0	22.97	35.79	4.81	101	24.56	0.32
25	22.96	35.79	4.85	102	24.56	0.35
50	22.91	35.79	4.79	101	24.58	0.32
75	21.23	35.70	4.43	92	25.00	0.41
100	19.50	35.62	4.40	87	25.39	0.43
150	17.01	35.50	4.21	80	25.91	0.48
200	14.73	35.30	4.06	73	26.28	0.79
300	12.02	35.07	4.28	73	26.66	1.10
500	9.20	34.74	4.42	71	26.90	1.32
700	7.01	34.52	4.37	66	27.05	1.44
900	5.62	34.51	4.31	63	27.22	1.73
1100	4.52	34.51	4.02	57	27.35	1.87
1300	3.85	34.56	3.77	54	27.46	1.99
1500	3.09	34.58	3.65	50	27.55	2.00

## CO<sub>2</sub> UPTAKE

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

DATE: 19.v.59                      TIME: 1210                      STATION NO.: 60  
 LATITUDE: 30°30' S.                      LONGITUDE: 154°01' E.

Bath	4 hrs	0	1003	210	793	0.53	0.34
		25	639	139	500	0.34	
		50	848	81	767	0.51	
		100	62	120	0	0	

DATE: 19.v.59                      TIME: 1950                      STATION NO.: 61  
 LATITUDE: 30°46' S.                      LONGITUDE: 155°00' E.

Bath	5 hrs	0	331	91	240	0.13	0.09
		25	288	112	176	0.09	
		50	338	69	269	0.14	
		100	69	94	0	0	

PIGMENTS

LIGHT PENETRATION

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

DATE: 19.v.59

TIME: 1245

STATION NO.: 60

LATITUDE: 30°30' S.

LONGITUDE: 154°01' E.

0	0.44	0.11	0.73	0.11	0.06
25	0.40	0.10	0.65	0.08	0.08
50	0.57	0.11	0.78	0.09	0.11
100	0.18	0.09	0.31	0.05	0.06

DATE: 19.v.59

TIME: 2000

STATION NO.: 61

LATITUDE: 30°46' S.

LONGITUDE: 155°00' E.

0	0.31	0.07	0.30	0.08	0.04
25	0.36	0.06	0.42	0.05	0.09
50	0.37	0.09	0.41	0.04	0.11
100	0.12	0.11	0.14	0.05	0.02



## CO<sub>2</sub> UPTAKE

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

DATE: 20.v.59                      TIME: 0600                      STATION NO.: 62  
 LATITUDE: 31°00' S.                      LONGITUDE: 155°52' E.

<u>In situ</u>	1 day	0	821	88	733	1.96	0.07
		25		144		0	
		50	456	65	391	1.05	
		100	139	86	53	0.14	

DATE: 20.v.59                      TIME: 0600                      STATION NO.: 62  
 LATITUDE: 31°00' S.                      LONGITUDE: 155°52' E.

Bath	4½ hrs	0	652	125	527	0.33	0.39
		25	562	58	504	0.32	
		50	742	70	672	0.42	
		100	346	104	242	0.15	

PIGMENTS

LIGHT PENETRATION

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

DATE: 20.v.59

TIME: 0645

STATION NO.: 62

LATITUDE: 31°00' S.

LONGITUDE: 155°52' E.

0	0.30	0.09	0.32	0.06	0.06
25	0.28	0.09	0.28	0.05	0.07
50	0.37	0.11	0.52	0.08	0.09
100	0.33	0.11	0.43	0.06	0.08

## CO<sub>2</sub> UPTAKE

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

DATE: 20.v.59

TIME: 1330

STATION NO.: 62

LATITUDE: 31°00' S.

LONGITUDE: 155°52' E.

Bath	4 hrs	0	1061	51	1010	0.68	0.49
		25	1062	31	1031	0.69	
		50	850	42	808	0.54	
		100	252	65	187	0.13	

PIGMENTS

LIGHT PENETRATION

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

DATE: 20.v.59

TIME: 1430

STATION NO.: 62

LATITUDE: 31°00' S.

LONGITUDE: 155°52' E.

0	0.26	0.11	0.61	0.11	0.03
25	0.40	0.13	0.75	0.11	0.11
50	0.41	0.15	0.47	0.09	0.11
100	0.24	0.14	0.63	0.12	0

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 21.v.59                      TIME: 0900                      STATION NO.: 63  
 LATITUDE: 31°38' S.                      LONGITUDE: 158°28' E.  
 WIND: FORCE 3                      WIRE ANGLE: 55°,45°  
                     DIRECTION S.

0	21.35	35.77	5.15	105	25.00	0.42
23	21.26	35.81	5.00	102	25.05	0.42
46	21.20	35.81	5.20	106	25.07	0.40
70	21.20	35.81	5.30	108	25.07	0.34
93	21.20	35.81	5.29	108	25.07	0.32
120	21.20	35.81	4.94	101	25.07	0.42
141	21.20	35.81	5.36	110	25.07	0.39
180	21.20	35.81	4.89	100	25.07	0.40
330	17.15	35.50	4.31	82	25.88	0.64
400	14.81	35.28	4.73	85	26.25	0.84
480	13.41	35.23	4.44	78	26.50	0.86
520	11.61	35.03	4.75	80	26.70	0.90
650	10.10	34.90	4.55	74	26.88	1.12
790	7.76	34.60	4.53	70	27.01	1.41

DATE: 23.v.59                      TIME: 1500                      STATION NO.: 64  
 LATITUDE: 31°32' S.                      LONGITUDE: 159°22' E.  
 WIND: FORCE 5                      WIRE ANGLE: 20°,0  
                     DIRECTION W.

0	20.95	35.84	4.78	97	25.18	0.37
21	20.99	35.86	4.78	97	25.18	0.32
43	20.93	35.82	4.72	96	25.16	0.32
65	21.03	35.82	4.57	93	25.14	0.32
88	21.09	35.82	4.69	96	25.13	0.34
132	20.98	35.82	4.78	97	25.15	0.42
176	19.71	35.66	4.24	84	25.37	0.45
263	17.94	35.55	4.11	79	25.73	0.54
437	13.46	35.23	4.41	78	26.49	0.83

## CO<sub>2</sub> UPTAKE

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

DATE: 21.v.59                      TIME: 1800                      STATION NO.: 63  
 LATITUDE: 31°38' S.                      LONGITUDE: 158°28' E.

Bath	4 hrs	0	702	99	603	0.40	0.37
		25	756	78	678	0.45	
		50	628	121	507	0.34	
		100	540	71	469	0.32	

DATE: 23.v.59                      TIME: 0520                      STATION NO.: 64  
 LATITUDE: 31°32' S.                      LONGITUDE: 159°22' E.

<u>In situ</u>	1 day	0	567	489	78	0.21	0.88
		25	892	214	678	1.81	
		50	641	239	402	1.08	
		100	333	496	0	0	

PIGMENTS

LIGHT PENETRATION

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

DATE: 21.v.59  
 LATITUDE: 31°38' S.

TIME: 0900

STATION NO.: 63  
 LONGITUDE: 158°28' E.

0	0.40	0.16	0.05	0.11	0.06
25	0.39	0.16	0.65	0.12	0.06
50	0.42	0.16	0.81	0.11	0.06
100	0.44	0.18	1.15	0.33	*

DATE: 23.v.59  
 LATITUDE: 31°32' S.

TIME: 0630

STATION NO.: 64  
 LONGITUDE: 159°22' E.

0	0.47	0.24	1.16	0.21	*
25	0.33	0.14	0.52	0.11	0.02
50	0.37	0.18	0.74	0.12	0.04
100	0.37	0.18	0.95	0.14	0.03

## CO<sub>2</sub> UPTAKE

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

DATE: 23.v.59                      TIME: 0540                      STATION NO.: 64  
 LATITUDE: 31°32' S.                      LONGITUDE: 159°22' E.

Bath	4 hrs	0	708	94	614	0.41	0.47
		25	989	75	914	0.61	
		50	794	193	601	0.40	
		100	711	35	676	0.45	

DATE: 23.v.59                      TIME: 1145                      STATION NO.: 64  
 LATITUDE: 31°32' S.                      LONGITUDE: 159°22' E.

Bath	4 hrs	0	1692	76	1616	1.08	0.36
		25	355	53	302	0.20	
		50	309	77	232	0.16	
		100	745	61	684	0.46	



PIGMENTS

LIGHT PENETRATION

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

DATE: 23.v.59

TIME: 1120

STATION NO.: 64

LATITUDE: 31°32' S.

LONGITUDE: 159°22' E.

0	0.35	0.16	0.73	0.21	0.01
25	0.38	0.15	0.68	0.18	0.03
50	0.36	0.15	0.84	0.18	0.03
100	0.38	0.16	0.81	0.20	0

F.R.V. "Derwent Hunter" Cruise 6 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 24.v.59 TIME: 1855 STATION NO.: 65  
 LATITUDE: 32°41' S. LONGITUDE: 157°38' E.  
 WIND: FORCE WIRE ANGLE: 40°, 35°  
 DIRECTION

0	22.64	35.84	4.79	100	24.70	0.33
20	22.62	35.86	4.85	102	24.72	0.28
38	22.62	35.86	4.55	95	24.72	0.31
61	22.51	35.86	4.82	101	24.75	0.28
80	22.49	35.86	4.79	100	24.76	0.31
120	22.40	35.86	4.76	99	24.78	0.30
160	20.35	35.68	4.18	84	25.22	0.43
238	18.75	35.62	4.31	84	25.58	0.43
408	14.85	35.35	4.25	77	26.29	0.65
593	10.47	34.85			26.77	
810	7.78	34.61	4.37	67	27.00	1.37
990	6.21	34.51	4.22	63	27.14	1.67
1140	5.25	34.56	4.02	58	27.31	0.74
1200	5.21	34.58	3.73	54	27.34	1.81

DATE: 25.v.59 TIME: 0512 STATION NO.: 66  
 LATITUDE: 32°23' S. LONGITUDE: 156°34' E.  
 WIND: FORCE 5 WIRE ANGLE: 45°  
 DIRECTION S.

0	20.46	35.77	4.84	98	25.26	0.43
200	16.75	35.52	4.10	77	25.99	0.55
400	10.85	35.08			26.88	0.94

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 4.vi.59 TIME: 1814 STATION NO.: 68  
 LATITUDE: 34°06' S. LONGITUDE: 151°21' E.  
 WIND: FORCE WIRE ANGLE: 5°  
 DIRECTION

0	19.58	35.77	5.02	100	25.48	0.34
25	19.54	35.79	5.02	100	25.51	0.41
50	19.54	35.75	4.95	98	25.48	0.44
75	19.69	35.75	4.95	99	25.44	0.42
125	18.01	35.52	4.13	80	25.68	0.57

DATE: 4.vi.59 TIME: 2035 STATION NO.: 69  
 LATITUDE: 34°11' S. LONGITUDE: 151°28' E.  
 WIND: FORCE WIRE ANGLE: 5°  
 DIRECTION

0	19.37	35.71	4.95	98	25.49	0.32
25	19.44	35.73	4.95	98	25.49	0.31
50	19.35	35.75	4.95	98	25.53	0.40
75	19.44	35.75	4.89	97	25.51	0.41
100	19.50	35.75	4.93	98	25.49	0.43
150	18.27	35.61	4.35	84	25.69	0.53
200	15.47	35.39	4.13	76	26.18	0.69
250	14.26	35.19	4.38	78	26.30	0.80

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 4.vi.59 TIME: 2310 STATION NO.: 70  
 LATITUDE: 34°13' S. LONGITUDE: 151°35' E.  
 WIND: FORCE WIRE ANGLE: 15°,5°  
 DIRECTION

0	19.72	35.81	4.90	98	25.48	0.37
25	19.84	35.79	4.96	99	25.43	0.37
50	19.78	35.79	4.90	98	25.44	0.43
75	19.74	35.79	4.90	98	25.45	0.34
100	19.63	35.75	4.90	97	25.45	0.35
150	17.80	35.57	4.27	82	25.77	0.68
170	16.58	35.52	4.08	77	26.04	0.67
259	13.48	35.25	4.44	78	26.51	0.76
450	9.17	34.76	4.30	69	26.93	1.22
697	6.93	34.56	4.27	65	27.10	1.54

DATE: 5.vi.59 TIME: 0600 STATION NO.: 71  
 LATITUDE: 34°17' S. LONGITUDE: 151°51' E.  
 WIND: FORCE WIRE ANGLE: 15°,35°  
 DIRECTION

0	19.55	35.77	5.02	100	25.49	0.41
25	19.62	35.77	4.95	99	25.47	0.34
50	19.54	35.77	4.77	95	25.49	0.34
75	19.46	35.77	4.83	96	25.51	0.37
100	19.31	35.77	4.25	84	25.55	0.35
150	18.82	35.66	4.49	88	25.59	0.36
200	15.66	35.48	4.13	76	26.21	0.67
300	12.79	35.19	4.49	78	26.60	0.88
500	9.30	34.87	4.38	70	26.99	1.10
700	6.81	34.54	4.25	64	27.09	1.54
900	5.37	34.52	4.06	59	27.27	1.71
1100	4.20	34.52	3.74	53	27.39	1.89
1300	3.58	34.61	3.62	50	27.53	2.04
1500	2.78	34.65	3.36	46	27.64	2.04

PIGMENTS

LIGHT PENETRATION

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

DATE: 5.vi.59

TIME: 0440

STATION NO.: 71

LATITUDE: 34°17' S.

LONGITUDE: 151°51' E.

0	0.55	0.21	0.71	0.12	0.07
25	0.58	0.24	0.61	0.11	0.10
50	0.55	0.23	0.77	0.26	*
100	0.33	0.15	0.50	0.08	0.06

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 5.vi.59 TIME: 1345 STATION NO.: 72  
 LATITUDE: 34°22' S. LONGITUDE: 152°18' E.  
 WIND: FORCE 4 WIRE ANGLE: 35°,27°  
 DIRECTION N.

0	19.69	35.81	4.96	99	25.49	0.45
21	19.76	35.84	4.96	99	25.49	0.53
42	19.32	35.81	4.66	92	25.58	0.41
52	17.90	35.59	4.24	82	25.76	0.52
83	16.85	35.53	4.20	79	25.98	0.56
124	15.45	35.41	4.34	80	26.20	0.68
165	14.04	35.30			26.43	0.78
248	11.89	35.08	4.34	74	26.69	1.04
414	9.22	34.76	4.34	69	26.91	1.21
605	7.19	34.60	4.34	66	27.09	1.54
686	6.39	34.56			27.16	1.44
845	5.22	34.51	3.95	57	27.27	1.63
1002	4.44	34.58	3.83	54	27.42	1.65
1164	3.62	34.58	3.50	49	27.50	2.00

DATE: 6.vi.59 TIME: 0920 STATION NO.: 73  
 LATITUDE: 34°13' S. LONGITUDE: 154°00' E.  
 WIND: FORCE WIRE ANGLE: 45°,20°  
 DIRECTION

0	18.98	35.79	5.18	102	25.65	0.37
21	19.06	35.77	5.09	100	25.61	0.58
39	18.98	35.77	5.03	99	25.64	0.46
57	19.07	35.75	4.96	98	25.60	0.49
74	18.88	35.75	4.94	97	25.65	0.58
109	17.44	35.75	4.91	94	26.00	0.49
145	15.82	35.44	4.40	81	26.15	0.63
215	14.13	35.30	4.35	78	26.41	0.84
355	11.90	35.12	4.94	84	26.72	0.88
496	9.06	34.76	4.40	70	26.94	1.37
531	8.78	34.76	4.37	69	26.99	1.29
667	7.73	34.60	4.40	68	27.02	1.37
809	6.64	34.58	4.23	64	27.15	1.62
965	5.27	34.49	4.04	67	27.25	1.80

## CO<sub>2</sub> UPTAKE

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

DATE: 6.vi.59

TIME: 0600

STATION NO.: 73

LATITUDE: 34°13' S.

LONGITUDE: 154°00' E.

<u>In situ</u>	1 day	0	1288	436	852	2.28	
		25	1200	367	833	2.23	
		50	210	21	189	0.50	
		100	34	46			

DATE: 6.vi.59

TIME: 0615

STATION NO.: 73

LATITUDE: 34°13' S.

LONGITUDE: 154°00' E.

Bath	4 hrs	0	1481	68	1413	0.95	0.61
		25	1641	71	1570	1.05	
		50	784	19	765	0.51	
		100	253	16	237	0.16	

PIGMENTS

LIGHT PENETRATION

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

DATE: 6.vi.59

TIME: 0630

STATION NO.: 73

LATITUDE: 34°13' S.

LONGITUDE: 154°00' E.

0	0.54	0.18	0.53	0.10	0.07
25	0.60	0.26	0.97	0.14	0.05
50	0.58	0.25	0.78	0.10	0.08
100	0.19	0.15	0.26	0.10	0.02



## CO<sub>2</sub> UPTAKE

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

DATE: 6.vi.59                      TIME: 1145                      STATION NO.: 73  
 LATITUDE: 34°13' S.                      LONGITUDE: 154°00' E.

Bath	4 hrs	0	1718	49	1669	1.12	0.65
		25	1688	23	1665	1.11	
		50	875	36	839	0.56	
		100	146	38	108	0.71	

DATE: 6.vi.59                      TIME: 1640                      STATION NO.: 73  
 LATITUDE: 34°13' S.                      LONGITUDE: 154°00' E.

Bath	4 hrs	0	1472	36	1436	0.96	0.61
		25	1481	16	1465	0.98	
		50	1026	77	949	0.63	
		100	99	54	45	0.03	

PIGMENTS

LIGHT PENETRATION

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

DATE: 6.vi.59

TIME: 1145

STATION NO.: 73

LATITUDE: 34°13' S.

LONGITUDE: 154°00' E.

0	0.38	0.20	0.55	0.04	0.08
25	0.40	0.23	0.36	0.05	0.09
50	0.35	0.24	0.39	0.10	0.34
100	0.08	0.11	0.38	0.09	*

DATE: 6.vi.59

TIME: 1655

STATION NO.: 73

LATITUDE: 34°13' S.

LONGITUDE: 154°00' E.

0	0.48	0.18	0.48	0.07	0.10
25	0.51	0.17	0.57	0.09	0.07
50	0.55	0.20	0.78	0.14	0.04
100	0.58	0.18	0.46	0.12	0.06

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 7.vi.59 TIME: 0644 STATION NO.: 74  
 LATITUDE: 34°53' S. LONGITUDE: 155°27' E.  
 WIND: FORCE 2  
 DIRECTION N.

0	18.70	35.73	4.96	97	25.68	0.50
25	18.74	35.75	4.91	96	25.68	0.35
50	18.36	35.73	5.03	98	25.76	0.37
75	18.10	35.73	4.94	96	25.82	0.35
100	17.74	35.64	4.95	95	25.84	0.46
150	16.18	35.48	4.60	86	26.10	0.60
200	13.73	35.26	4.39	78	26.46	0.91
300	11.78	35.08	4.72	80	26.72	1.04
500	9.81	34.72	4.50	73	26.78	1.22
700	7.17	34.54	4.39	67	27.05	1.59
900	5.56	34.51	4.08	60	27.23	1.76
1100	4.46	34.51	3.73	53	27.36	1.97
1300	4.02	34.56	3.55	50	27.45	2.01
1500	3.00	34.60	3.43	47	27.58	2.21

DATE: 7.vi.59 TIME: 1910 STATION NO.: 75  
 LATITUDE: 35°25' S. LONGITUDE: 156°02' E.  
 WIND: FORCE 0  
 DIRECTION WIRE ANGLE: 15°, 10°

0	19.44	35.79	4.99	99	25.53	0.49
23	19.52	35.79	4.93	98	25.52	0.44
46	19.43	35.79	4.87	97	25.53	0.53
69	19.27	35.79	4.87	96	25.57	0.43
93	18.82	35.75	4.81	94	25.66	0.58
139	18.40	35.70	4.81	94	25.73	0.56
186	15.60	35.44	4.23	78	26.20	0.80
281	13.29	35.26	4.83	85	26.55	0.86
477	10.62	34.90	4.58	76	26.78	1.18
677	7.83	34.60	4.23	65	27.00	1.62
764	7.03	34.63	4.36	66	27.14	1.62
936	5.79	34.51	4.03	59	27.20	1.72
1111	4.80	34.56	3.91	56	27.37	1.86
1290	3.65	34.56	3.60	50	27.48	2.01

## CO<sub>2</sub> UPTAKE

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

DATE: 7.vi.59

TIME: 0600

STATION NO.: 74

LATITUDE: 34°53' S.

LONGITUDE: 155°27' E.

Bath	4 hrs	0	1346	143	1203	0.81	0.41
		25	942	25	917	0.61	
		50	571	16	555	0.37	
		100	189	102	87	0.06	

DATE: 7.vi.59

TIME: 1800

STATION NO.: 75

LATITUDE: 35°25' S.

LONGITUDE: 156°02' E.

Bath	4 hrs	0	429	25	404	0.27	0.26
		25	570	132	438	0.29	
		50	615	101	514	0.34	
		100	145	12	133	0.09	

PIGMENTS

LIGHT PENETRATION

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

DATE: 7.vi.59

TIME: 0615

STATION NO.: 74

LATITUDE: 34°53' S.

LONGITUDE: 155°27' E.

0	0.43	0.14	0.49	0.38	*
25	0.42	0.08	0.52	0.08	0.04
50	0.24	0.11	0.41	0.08	0.02
100	0.18	0.04	0.34	0.10	0.01

DATE: 7.vi.59

TIME: 1845

STATION NO.: 75

LATITUDE: 35°25' S.

LONGITUDE: 156°02' E.

0	0.44	0.15	0.65	0.10	0.09
25	0.40	0.14	0.16	0.01	0.14
50	0.37	0.09	0.28	0.02	0.10
100	0.15	0.06	0.19	0.12	*

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 8.vi.59 TIME: 0905 STATION NO.: 76  
 LATITUDE: 35°36' S. LONGITUDE: 156°34' E.  
 WIND: FORCE 2  
 DIRECTION N.

0	19.11	35.79	5.02	99	25.62	0.39
25	19.16	35.79	5.02	99	25.60	0.39
50	19.06	35.75	4.84	95	25.60	0.39
75	18.82	35.73	4.20	83	25.65	0.32
100	17.56	35.55	4.38	84	25.82	0.37
150	15.80	35.46	3.89	72	26.17	0.56
200	14.49	35.34	3.79	68	26.36	0.68
300	12.32	35.14	4.84	83	26.65	0.96
500	9.68	35.14	4.52	73	27.14	1.04
700	7.23	34.74	4.66	71	27.20	1.04
872	5.78	34.52	4.20	62	27.21	1.78
1069	4.72	34.51	3.95	57	27.34	1.92
1267	4.08	34.58	3.83	54	27.47	1.97
1464	3.45	34.58	3.50	49	27.52	2.09

DATE: 9.vi.59 TIME: 0845 STATION NO.: 77  
 LATITUDE: 34°35' S. LONGITUDE: 157°51' E.  
 WIND: FORCE 1  
 DIRECTION N. WIRE ANGLE: 7°

0	18.96	35.71	5.07	100	25.60	0.35
25	17.92	35.70	4.89	94	25.84	0.30
50	17.66	35.68	4.89	94	25.90	0.31
75	17.04	35.57	4.60	88	25.96	0.43
100	15.96	35.44	4.13	76	26.12	0.59
150	14.74	35.32	4.13	75	26.29	0.71
200	13.66	35.28	4.43	78	26.49	0.79
300	11.95	35.08	4.49	76	26.68	0.96
500	9.19	34.70	4.38	70	26.87	1.39
700	6.76	34.54	4.25	64	27.10	1.65
900	5.56	34.51	4.25	62	27.31	1.67
1100	4.42	34.51	3.78	54	27.37	2.00
1300	4.22	34.58	3.59	51	27.45	1.90
1500	2.97	34.61	3.41	47	27.59	2.07

## CO<sub>2</sub> UPTAKE

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

DATE: 8.vi.59                      TIME: 0530                      STATION NO.: 76  
 LATITUDE: 35°36' S.                      LONGITUDE: 156°34' E.

<u>In situ</u>	1 day	0	1782	95	1687	4.52	0.18
		25	1287	138	1149	3.08	
		50	493	85	408	1.09	
		100	106	83	23	0.06	

DATE: 8.vi.59                      TIME: 0530                      STATION NO.: 76  
 LATITUDE: 35°36' S.                      LONGITUDE: 156°34' E.

Bath	4 hrs	0	1513	114	1399	0.94	0.60
		25	1143	23	1120	0.75	
		50	1159	14	1145	0.76	
		100	195	137	58	0.04	

PIGMENTS

LIGHT PENETRATION

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

DATE: 8.vi.59

TIME: 0630

STATION NO.: 76

LATITUDE: 35°36' S.

LONGITUDE: 156°34' E.

0	0.39	0.09	0.30	0	0.13
25	0.49	0.16	0.17	0.04	0.11
50	0.48	0.18	0.48	0.08	0.07
100	0.63	0.23	0.45	0.12	0.07



## CO<sub>2</sub> UPTAKE

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

DATE: 8.vi.59                      TIME: 1200                      STATION NO.: 76  
 LATITUDE: 35°36' S.                      LONGITUDE: 156°34' E.

Bath	4 hrs	0	1726	30	1696	1.13	0.77
		25	2174	166	2008	1.34	
		50	1279	28	1251	0.84	
		100	42	53			

DATE: 8.vi.59                      TIME: 1700                      STATION NO.: 76  
 LATITUDE: 35°36' S.                      LONGITUDE: 156°34' E.

Bath	4 hrs	0	942	60	882	0.59	
		25	1045	551	494	0.33	
		50	674	2784			
		100	32	21	11	0.01	

PIGMENTS

LIGHT PENETRATION

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

DATE: 8.vi.59

TIME: 1200

STATION NO.: 76

LATITUDE: 35°36' S.

LONGITUDE: 156°34' E.

0	0.50	0.22	0.38	0.13	0.05
25	0.54	0.17	0.60	0.04	0.16
50	0.48	0.21	0.44	0.07	0.09
100	0.12	0.07	0.49	0.34	*

DATE: 8.vi.59

TIME: 1715

STATION NO.: 76

LATITUDE: 35°36' S.

LONGITUDE: 156°34' E.

0	0.41	0.19	0.32	0.09	0.05
25	0.43	0.21	0.51	0.15	0.04
50	0.39	0.18	0.97	0.91	0.04
100	0.16	0.14	0.86	0.33	*

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 9.vi.59 TIME: 2115 STATION NO.: 78  
 LATITUDE: 33°57' S. LONGITUDE: 156°58' E.  
 WIND: FORCE 3 WIRE ANGLE: 30°, 32°  
 DIRECTION W.

0	20.88	35.82	4.84	98	25.17	0.44
21	20.96	35.84	4.90	100	25.16	0.33
42	20.68	35.82	4.78	97	25.23	0.55
63	20.76	35.81	4.78	97	25.20	0.55
84	20.51	35.82	4.66	94	25.28	0.44
127	20.62	35.82	4.78	97	25.26	0.53
170	19.93	35.73	4.38	88	25.36	0.57
256	18.46	35.64	4.17	81	25.66	0.60
439	13.83	35.26	4.08	72	26.44	0.82
624	9.77	34.81	4.00	65	26.87	1.19
805	7.27	34.56	4.34	66	27.05	1.42
992	5.90	34.49	4.08	60	27.16	1.63
1187	5.02	34.52	3.95	57	27.30	1.89
1384	3.84	34.56	3.55	50	27.47	2.10

DATE: 10.vi.59 TIME: 0800 STATION NO.: 79  
 LATITUDE: 33°20' S. LONGITUDE: 156°08' E.  
 WIND: FORCE  
 DIRECTION

0	20.61	35.84	5.04	102	25.28	0.38
16	20.70	35.82	5.04	102	25.22	0.35
34	20.64	35.84	4.91	99	25.26	0.39
41	20.74	35.82	4.91	100	25.21	0.36
68	20.64	35.82	4.91	99	25.24	0.38
104	20.80	35.82	4.91	100	25.19	0.37
140	20.72	35.82	4.71	96	25.22	0.44
209	19.16	35.68	4.50	89	25.52	0.54
357	15.50	35.39	4.18	77	26.17	0.77
486	11.46	35.08	4.43	75	26.77	0.96
494	11.20	34.97	4.47	75	26.74	1.12
610	9.45	34.76	4.41	71	26.88	1.32
734	7.89	34.72	4.45	69	27.08	1.33
860	6.27	34.51	4.30	64	27.15	1.70

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 10.vi.59 TIME: 1943 STATION NO.: 80  
 LATITUDE: 33°00' S. LONGITUDE: 154°59' E.  
 WIND: FORCE 3 WIRE ANGLE: 45°,33°  
 DIRECTION S.

0	19.37	35.77	5.10	101	25.54	0.55
15	19.41	35.79	5.10	101	25.54	0.46
32	19.41	35.79	4.99	99	25.54	0.44
48	19.46		4.87	97		
64	19.35	35.79	4.93	98	25.55	0.58
98	19.25	35.77	4.69	93	25.56	0.44
130	19.13	35.77	4.69	93	25.59	0.50
194	18.58	35.73	4.81	94	25.70	0.53
329	14.16	35.46	4.23	76	26.63	0.77
467	10.81	34.94	4.41	73	26.78	1.10
638	8.55	34.72	4.30	68	26.98	1.24
779	7.20	34.56	4.30	65	27.06	1.30
921	6.40		4.30	64		1.30
1063	4.62	34.49	4.17	60	27.33	1.62

DATE: 11.vi.59 TIME: 0550 STATION NO.: 81  
 LATITUDE: 32°48' S. LONGITUDE: 154°05' E.  
 WIND: FORCE 3 WIRE ANGLE: 30°,22°  
 DIRECTION S.

0	21.08	35.91	4.99	101	25.19	0.40
19	21.18	35.88	4.93	101	25.14	0.24
38	20.98	35.88	4.87	99	25.20	0.39
57	21.08	35.84	4.84	99	25.14	0.33
75	20.93	35.82	4.81	98	25.15	0.33
112	20.86	35.82	4.81	98	25.18	0.40
151	19.17	35.66	4.23	84	25.50	0.53
230	17.91	35.61	4.20	81	25.78	0.48
391	13.39	35.28	4.30	76	26.55	0.79
557	10.18	34.87	4.36	71	26.84	1.13
778	7.54	34.69	4.36	67	27.11	1.32
956	5.87	34.52	4.23	62	27.20	1.63
1142	4.83	34.56	4.03	58	27.37	1.72
1337	3.86	34.56	3.69	52	27.46	1.82

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 11.vi.59 TIME: 1640 STATION NO.: 82  
 LATITUDE: 32°42' S. LONGITUDE: 153°12' E.  
 WIND: FORCE 1 WIRE ANGLE: 0,0  
 DIRECTION S.

0	21.30	35.82	4.99	102	25.06	0.32
25	21.29	35.84	4.99	102	25.08	0.32
50	21.29	35.84	4.87	100	25.08	0.32
75	20.82	35.82	4.87	99	25.19	0.44
100	20.30	35.81	4.84	98	25.34	0.34
150	18.33	35.57	4.17	81	25.64	0.32
200	16.65	35.50	4.11	77	26.00	0.65
300	14.01	35.28	4.36	78	26.42	0.75
500	9.91	34.83	4.36	71	26.86	1.15
700	6.76	34.52	4.30	65	27.08	1.42
900	5.26	34.54	4.03	58	27.30	1.58
1100	4.30	34.52	3.72	53	27.37	1.80
1300	3.82	34.61	3.54	50	27.51	1.83
1500	3.00	34.63	3.45	47	27.60	1.91

DATE: 12.vi.59 TIME: 0147 STATION NO.: 83  
 LATITUDE: 32°53' S. LONGITUDE: 152°56' E.  
 WIND: FORCE WIRE ANGLE: 7°,7°  
 DIRECTION

0	20.34	35.82	4.93	99	25.33	0.34
22	20.36	35.84	4.81	97	25.34	0.46
45	20.32	35.84	4.87	98	25.35	0.44
68	20.31	35.82	4.84	98	25.33	0.55
92	20.34	35.82	4.87	98	25.33	0.31
138	18.02	35.53	4.14	80	25.69	0.55
186	15.63	35.44	4.03	74	26.19	0.71
283	13.36	35.21	4.36	77	26.50	0.89
477	10.16	34.88	4.36	71	26.85	1.10
673	7.70	34.70	4.36	67	27.10	1.25
867	6.36	34.52	4.17	62	27.14	1.52
1067	5.01	34.52	3.91	56	27.31	1.78
1267	3.76	34.58	3.57	50	27.49	1.79
1467	3.11	34.61	3.52	48	27.57	1.99

F.R.V. "Derwent Hunter" Cruise 8 1959

Depth (m)	Temp. °C	S ‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P (μg.at/l)
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DATE: 12.vi.59                      TIME: 1855                      STATION NO.: 84  
 LATITUDE: 31°28' S.                      LONGITUDE: 153°02' E.  
 WIND: FORCE  
       DIRECTION

0	19.93	35.82	4.90	98	25.42	0.40
10	20.12	35.82	4.90	98	25.38	0.35
20	20.01	35.82	4.84	97	25.40	0.47
30	20.07	35.81	4.90	98	25.39	0.47
40	20.06	35.82	4.79	96	25.39	0.44
50	19.91	35.82	4.96	99	25.43	0.56

F.R.V. "Derwent Hunter" Cruise 11 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 1.ix.59                      TIME: 0920                      STATION NO.: 91  
 LATITUDE: 33°20' S.                      LONGITUDE: 152°44' E.  
 WIND: FORCE 2                      WIRE ANGLE:  
       DIRECTION N.

0	19.35	35.75			25.52	
25	19.35	35.75			25.52	
50	19.35	35.75			25.52	
75	19.25	35.75			25.54	
100	19.10	35.73			25.57	
150	16.90	35.64			26.06	
200	16.50	35.62			26.13	
300	13.80	35.26			26.44	
500	9.82	34.78			26.82	

DATE: 4.ix.59                      TIME: 0845                      STATION NO.: 92  
 LATITUDE: 34°05' S.                      LONGITUDE: 151°52' E.  
 WIND: FORCE 2                      WIRE ANGLE: 10°  
       DIRECTION ESE.

0	19.00	35.77			25.62	
25	18.95	35.77			25.63	
50	19.10	35.77			25.60	
75	19.00	35.77			25.62	
100	19.10	35.77			25.60	
150	18.90	35.73			25.62	
200	18.75	35.71			25.64	
300	16.65	35.50			26.00	
500	11.35	35.10			26.80	

F.R.V. "Derwent Hunter" Cruise 11 1959

Depth (m)	Temp. °C	S ‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 5.1x.59                      TIME: 0830                      STATION NO.: 93  
 LATITUDE: 34°50' S.                      LONGITUDE: 152°18' E.  
 WIND: FORCE 2                      WIRE ANGLE;  
 DIRECTION W.

0	18.91	35.77			25.64	
25	18.88	35.77			25.65	
50	18.05	35.77			25.85	
75	18.80	35.77			25.67	
100	18.80	35.77			25.67	
150	18.75	35.91			25.79	
200	18.70	35.73			25.67	
300	18.60	35.71			25.68	
500	12.65	35.05			26.51	

DATE: 6.1x.59                      TIME: 0820                      STATION NO.: 95  
 LATITUDE: 35°20' S.                      LONGITUDE: 151°38' E.  
 WIND: FORCE 3                      WIRE ANGLE;  
 DIRECTION NE.

0	17.33	35.81			25.32	
25	17.20	35.62			26.04	
50	16.20	35.55			26.17	
75	15.70	35.52			26.24	
100	15.70	35.53			26.25	
125	15.72	35.50			26.22	
150	15.05	35.50			26.36	
175	14.45	35.44			26.44	
200	13.81	35.37			26.53	
300	12.10	35.03			26.61	
400	12.90	35.37			26.71	
500	7.25	35.26			27.60	



F.R.V. "Derwent Hunter" Cruise 11 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 6.ix.59 TIME: 0830 STATION NO.: 97  
 LATITUDE: 36°10' S. LONGITUDE: 151°34' E.  
 WIND: FORCE 4 WIRE ANGLE:  
 DIRECTION S.

0	16.40	35.71			26.23	
25	16.25	35.61			26.19	
50	14.95	35.48			26.36	
75	13.87	35.26			26.42	
100	13.60	35.19			26.42	
150	12.85	35.19			26.59	
200	12.25	35.08			26.62	
300	11.00	34.97			26.77	
500	8.60	34.58			26.87	

DATE: 8.ix.59 TIME: 0835 STATION NO.: 98  
 LATITUDE: 36°33' S. LONGITUDE: 150°38' E.  
 WIND: FORCE 1 WIRE ANGLE:  
 DIRECTION

0	17.22	35.62			25.97	
25	16.80	35.59			26.04	
50	15.60	35.52			26.26	
75	15.35	35.52			26.31	
100	14.95	35.48			26.36	
150	13.90	35.37			26.50	
200	13.60	35.32			26.51	
300	11.95	35.01			26.62	
500	8.78	34.60			26.86	

F.R.V. "Derwent Hunter" Cruise 11 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 9.ix.59                      TIME: 0935                      STATION NO.: 99  
 LATITUDE: 37°16' S.                      LONGITUDE: 151°12' E.  
 WIND: FORCE 2                      WIRE ANGLE:  
       DIRECTION NE.

0	17.78	35.62			25.82	
25	17.70	35.61			25.83	
50	17.25	35.61			25.94	
75	16.70	35.61			26.08	
100	16.70	35.48			25.98	
150	16.15	35.50			26.12	
200	15.30	35.25			26.11	
300	12.70	35.14			26.57	
500	7.60	34.78			27.18	

DATE: 12.ix.59                      TIME: 0915                      STATION NO.: 104  
 LATITUDE: 37°10' S.                      LONGITUDE: 150°36' E.  
 WIND: FORCE 3                      WIRE ANGLE: 30°  
       DIRECTION S.

0	17.18	35.71			26.03	
25	17.12	35.71			26.04	
50	16.90	35.66			26.07	
75	17.05	35.71			26.06	
100	17.05	35.70			26.05	
150	15.80	35.62			26.30	
200	14.75	35.55			26.47	
300	13.60	35.44			26.61	
500	10.05	34.87			26.87	

F.R.V. "Derwent Hunter" Cruise 11 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 15.ix.59                      TIME: 1150                      STATION NO.: 105  
 LATITUDE: 35°38' S.                      LONGITUDE: 150°58' E.  
 WIND: FORCE 1                      WIRE ANGLE:  
       DIRECTION

0	17.82	35.75			25.90	
25	17.82	35.75			25.90	
50	16.93	35.66			26.05	
75	16.50	35.66			26.16	
100	14.55	35.48			26.45	
150	13.00	35.25			26.59	
200	11.95	35.14			26.72	
300	10.80	34.99			26.82	
500	13.65	34.72			26.05	

DATE: 16.ix.59                      TIME: 0910                      STATION NO.: 108  
 LATITUDE: 35°00' S.                      LONGITUDE: 151°35' E.  
 WIND: FORCE 1                      WIRE ANGLE:  
       DIRECTION S.

0	18.90	35.79			25.65	
25	18.70	35.77			25.69	
50	18.65	35.71			25.67	
75	18.40	35.75			25.76	
100	18.35	35.79			25.79	
150	17.10	35.68			26.03	
200	15.85	35.59			26.27	
300	11.80	35.17			26.77	
500	9.00	34.72			26.92	

F.R.V. "Derwent Hunter"

Cruise 11

1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> % sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 17.1x.59

TIME: 0400

STATION NO.: 111

LATITUDE: 34°06' S.

LONGITUDE: 152°30' E.

WIND: FORCE 6

WIRE ANGLE: 30°

DIRECTION S.

0	18.70	35.82			25.74	
25	18.70	35.82			25.74	
50	18.85	35.82			25.70	
75	18.75	35.82			25.72	
100	17.15	35.82			26.11	
150	18.65	35.82			25.74	
200	18.65	35.82			25.74	
300	18.60	35.82			25.75	
500	13.60	35.34			26.53	

F.R.V. "Derwent Hunter" Cruise 13 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 10.x.59                      TIME: 1152                      STATION NO.: 129  
 LATITUDE: 39°17' S.                      LONGITUDE: 148°56' E.  
 WIND: FORCE 3                      WIRE ANGLE:  
                     DIRECTION N.

10	15.00	35.61			26.45	
20	14.80	35.57			26.46	
30	14.70	35.57			26.49	
40	14.70	35.57			26.49	
50	14.60	35.57			26.51	
75	14.20	35.48			26.53	
100	14.00	35.41			26.50	
125	13.70	35.39			26.56	
150	13.20	35.34			26.61	
175	12.90	35.26			26.61	
200	12.70	35.26			26.65	
250	12.20	35.16			26.68	
300	12.00					

F.R.V. "Derwent Hunter" Cruise 15 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> ‰ sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 26.xi.59 TIME: 1200 STATION NO.: 169  
 LATITUDE: 42°18' S. LONGITUDE: 148°36' E.  
 WIND: FORCE WIRE ANGLE:  
 DIRECTION

0	14.80					
10	14.80	35.37			26.31	
20	14.70	35.37			26.34	
30	14.60	35.35			26.34	
40	14.40	35.35			26.39	
50	14.00	35.16			26.32	
75	13.80	35.12			26.33	
100	12.20	35.08			26.63	
125	11.50	35.03			26.73	
150	11.20	35.01			26.76	
175	11.00	34.96			26.76	
200	10.80	34.94			26.78	
250	10.30	34.79			26.75	
300	10.00					

DATE: 4.xii.59 TIME: 0900 STATION NO.: 173  
 LATITUDE: 43°08' S. LONGITUDE: 148°18' E.  
 WIND: FORCE 3 WIRE ANGLE:  
 DIRECTION NNE.

0	13.90					
10	13.60	35.10			26.36	
20	13.50	35.10			26.38	
30	13.40	35.10			26.40	
40	13.30	35.10			26.42	
50	13.00	35.07			26.46	
75	12.20	35.05			26.60	
100	12.00					
125	11.60	35.01			26.69	
150	11.40	34.97			26.70	
175	11.00	34.96			26.76	
200	10.80					
250	10.50					
300	10.00					

F.R.V. "Derwent Hunter" Cruise 15 1959

Depth (m)	Temp. °C	S‰	O <sub>2</sub> ml/l	O <sub>2</sub> o/o sat.	σ <sub>t</sub>	Total P μg.at/l
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DATE: 9.xii.59

TIME: 0730

STATION NO.: 180

LATITUDE: 36°58' S.

LONGITUDE: 150°32' E.

WIND: FORCE 2

WIRE ANGLE:

DIRECTION NW.

0	19.60					
10	19.60	35.34			25.13	
20	19.60	35.34			25.13	
30	19.60	35.34			25.13	
40	18.50	35.46			25.51	
50	17.00	35.43			25.86	
75	15.50	35.37			26.15	
100	14.00					
125	14.00	35.37			26.48	
150	13.40	35.37			26.60	
175	13.00	35.16			26.52	
200	12.40	35.10			26.60	
250	11.90	35.01			26.63	
300	11.00					

## OCEANOGRAPHICAL STATION LISTS

1. Hydrological and planktological observations by F.R.V. *Warreen* in south-eastern Australian waters, 1938-39
2. Hydrological and planktological observations by F.R.V. *Warreen* in south-eastern Australian waters, 1940-42
3. Hydrological and planktological observations by F.R.V. *Warreen* in south-western Australian waters, 1947-50
4. Onshore hydrological investigations in eastern Australia, 1942-50
5. Estuarine hydrological investigations in eastern Australia, 1940-50. Queensland: Nerang and Coomera Rivers, Moreton Bay and Brisbane River, Logan River, Dunwich Oyster Lease; New South Wales: Richmond River, Clarence River, Macleay River, Hastings River, Manning River, Port Stephens, Tilligerry Creek, Hawkesbury River
6. Estuarine hydrological investigations in eastern Australia, 1940-50. New South Wales: Middle Harbour and Port Jackson, Georges River-Botany Bay
7. Estuarine hydrological investigations in eastern Australia, 1940-50. New South Wales: Port Hacking, Lake Illawarra, Shoalhaven River, Jervis Bay, Clyde River, Moruya River, Tuross River, Wagonga Inlet; Victoria: Port Phillip; Tasmania: Tamar River, Derwent River, Huon River, D'Entrecasteaux Channel, Pittwater, Lake Dobson (freshwater), Penna Dam (freshwater)
8. Hydrological investigations in south-western Australia, 1944-50
9. Records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1942-50. Queensland: Logan River; New South Wales: Richmond River, Clarence River, Macleay River, Hastings River, Manning River, Port Stephens, Hawkesbury River, Georges River, Port Hacking, Clyde River, Tuross River; Tasmania: Tamar River, Derwent River
10. Records of twenty-four hourly hydrological observations at Shell Point, Georges River, New South Wales, 1942-50
11. Analyses of bottom deposits in eastern Australia, 1946-50
12. Estuarine hydrological investigations in eastern and south-western Australia, 1951
13. Analysis of bottom deposits in eastern and south-western Australia, 1951 and records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1951
14. Onshore hydrological investigations in eastern and south-western Australia, 1951
15. Estuarine hydrological investigations in eastern and south-western Australia, 1952
16. Analysis of bottom deposits in eastern and south-western Australia, 1952 and records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1952
17. Onshore hydrological investigations in eastern and south-western Australia, 1952
18. Onshore hydrological investigations in eastern and south-western Australia, 1953
19. Onshore planktological investigations in eastern Australia, 1945-54
20. Surface sampling in the Tasman Sea, 1953
21. Estuarine hydrological investigations in eastern and south-western Australia, 1953
22. Further onshore planktological investigations in eastern Australia, 1945-54
23. Planktological investigations made by F.R.V. *Derwent Hunter* in eastern Australian waters, 1952-54
24. Onshore hydrological investigations in eastern and south-western Australia, 1954
25. Surface sampling in the Tasman Sea, 1954
26. Estuarine hydrological investigations in eastern and south-western Australia, 1954



## OCEANOGRAPHICAL STATION LISTS

(Continued)

27. Onshore and oceanic hydrological investigations in eastern and south-western Australia, 1955
28. Surface sampling in the Tasman and Coral Seas, 1955
29. Estuarine hydrological investigations in eastern and south-western Australia, 1955
30. Onshore and oceanic hydrological investigations in eastern and south-western Australia, 1956
31. Surface sampling in the Tasman and Coral Seas and the south-eastern Indian Ocean, 1956
32. Estuarine hydrological investigations in eastern and south-western Australia, 1956
33. Coastal hydrological investigations in eastern and south-western Australia, 1957
34. Coastal hydrological investigations at Port Hacking, New South Wales, 1957
35. Coastal hydrological investigations at Eden, New South Wales, 1957
36. Surface sampling in the Tasman and Coral Seas, 1957
37. Hydrological investigations from F.R.V. *Derwent Hunter*, 1957
38. Coastal hydrological investigations in the New South Wales tuna fishing area, 1958
39. Surface sampling in the Coral and Tasman Seas, 1958
40. Coastal hydrological investigations in south-eastern Australia, 1958
41. Oceanic investigations in eastern Australian waters, F.R.V. *Derwent Hunter*, 1958
42. Coastal investigations at Port Hacking, New South Wales, 1958
43. Oceanic investigations in eastern Australia, H.M.A. Ships *Queenborough*, *Quickmatch*, and *Warrego*, 1958
44. Oceanic observations in Antarctic waters, M.V. *Magga Dan*, 1959
45. Coastal hydrological investigations in eastern Australia, 1959
46. Coastal hydrological investigations in the New South Wales tuna fishing area, 1959
47. Coastal investigations at Port Hacking, New South Wales, 1959
48. Oceanic investigations in eastern Australian waters, F.R.V. *Derwent Hunter*, 1959