

# OCEANOGRAPHICAL STATION LIST

Volume 47

Coastal Investigations at Port Hacking,  
New South Wales, 1959

Compiled by A. D. Crooks



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

Printed by C.S.I.R.O., Melbourne

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COASTAL INVESTIGATIONS AT PORT HACKING, NEW SOUTH WALES, 1959

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## I. INTRODUCTION

The data presented in this volume were obtained from the weekly working of two stations off Port Hacking by F.R.V. *Jay Bee*. The position of the Port Hacking 50 m station is latitude 34°05'S. and longitude 151°13'E. and the depth of water is between 50 and 60 m. The Port Hacking 100 m station is in latitude 34°05'30''S. and longitude 151°15'30''E. and the depth of water is between 100 and 120 m.

## II. METHODS AND UNITS

### (a) *Hydrology*

Temperatures were taken with deep sea reversing thermometers. No corrections have been applied to the readings.

Chlorinities are expressed in parts per mille (‰) and they were measured with a temperature-chlorinity meter (Hamon 1956).

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

Dissolved oxygen was determined by Winkler's method as modified by Thompson and Robinson (1939). The values are reported as ml/l. Oxygen saturation values were calculated from the nomograph of Richards and Corwin (1956).

Hydrogen ion samples were kept separately in 1 oz reagent bottles, and pH was measured by glass electrode, using a Cambridge pH meter.

Inorganic orthophosphate was determined by taking 100 ml of the sea-water sample, adding 1 ml Denigès's reagent (2.5% ammonium molybdate in 37.5% v/v sulphuric acid), mixing, standing for 3-5 min, and adding 0.1 ml of 1% stannous chloride dihydrate solution, then swirling the flask after this addition. The absorption due to the reduced phosphomolybdate was measured 10 min later in a Spekker absorptiometer, using an Ilford 608 filter.

Total phosphate was determined by placing 100 ml of the sea-water sample in an Erlenmeyer flask, adding 0.2 ml of 70% A.R. perchloric acid, and slowly evaporating to dryness on a sand-bath. The residue was then dissolved in 100 ml of distilled water and two drops of phenolphthalein added. If necessary the solution was adjusted to a slight pink with *N* ammonium hydroxide, and the orthophosphate was estimated as described above for inorganic phosphate. Calibration was effected by using potassium dihydrogen phosphate standards in distilled water. The values

obtained for the sea-water samples and given here should be multiplied by 1.1 if it is wished to correct for salt error.

A blank space means that no sample or insufficient sample was available for analysis.

Particulate phosphorus was taken as the difference between the total phosphate as determined above and the total phosphate (perchloric acid digestion) in an aliquot centrifuged for 30 min at 12,800 g.

Dissolved organic phosphorus was taken as the difference between the values for inorganic phosphate and total phosphate in a centrifuged sample. All values are expressed as microgram atoms of phosphorus per litre.

Nitrate was estimated by the reduced strychnine method. The strychnine reagent was prepared by reducing strychnine sulphate with amalgamated zinc in hydrochloric acid under carbon dioxide (Rochford 1947). This reagent was diluted with nitrate-free concentrated sulphuric acid for use, the proportions being usually one volume of reagent to three volumes of acid. To 5 ml of sea-water sample were added 0.1 ml of concentrated hydrochloric acid and 5 ml of dilute strychnine reagent; this was mixed and left standing for about 1 hr to develop colour. Its absorption was then measured in a Spekker absorptiometer, using an Ilford 602 filter. Sodium nitrate was used as a standard.

#### (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 20  $\mu$ . The counts are given as log numbers per litre for each sampling depth. The organism most numerous in each sample has been listed as dominant.

#### (c) *Pigments*

Water samples were taken with a plastic sampler and stored in white opaque plastic bottles for 2-3 hr until they were filtered in the laboratory. Full details of the method of extraction are given by Humphrey (1960). The asterisk \* indicates a negative value.

#### (d) *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  $^{14}\text{C}$  standard sample (labelled "Perspex") either directly preceding or following the unknown sample. Counts were made with a windowless Geiger counter.

"Light" is the activity in counts per minute 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  $\text{CO}_2$  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  $\text{CO}_2$  content is assumed to be 90 mg/l. The activity added was  $9.11 \times 10^6$  counts/min. This value has been determined by the liquid scintillation counting method described by Jitts and Scott (1961). For *in situ* samples the production is given in  $\text{C/m}^3$  per day. For samples incubated in a light bath the production is given in  $\text{mg C/m}^3$  per hour.

The values in g C/day/ $\text{m}^2$  column of water at each station are calculated by the formula:

$$\frac{1}{1000} \left\{ \frac{10(a+b)}{2} + \frac{10(b+c)}{2} + \frac{30(c+d)}{2} \right\}$$

where  $a$ ,  $b$ ,  $c$ , and  $d$  are the rates of production at 0, 10, 20, and 50 m respectively. To obtain the daily rate of production from light bath incubation measurements ( $\text{mg C/hr/m}^3$ ), the value 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% surface light is given in metres and was obtained by extrapolation of the curve of the measurements at 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

F.R.V. *Jay Bee* was the Laboratory's launch, based on Cronulla, from which the operations reported here were carried out. The vessel was operated and maintained by Mr. G. Reid (Launchmaster). The scientist-in-charge was Mr. B. S. Newell. Sampling was the responsibility of Messrs R. Bradley, G. Dal Pont, F. Davies,

N. Dyson, and M. Wootton. The hydrological laboratory analyses were carried out by Messrs G. Dal Pont, F. Davies, W. Prothero, and C. Walker. The phytoplankton samples were collected by M. R. Desrosieres and the counts of phytoplankton were made by him and Mr E. J. F. Wood. The routine pigment determinations were made by Mr. M. Wootton. Preparation of ampoules of  $^{14}\text{C}$  and the counting of samples were done by Messrs N. Dyson, D. Llewellyn, and B. D. Scott. Under the general direction of Mr. A. D. Crooks, Misses F. Luce and R. Weidenhofer and Mrs. E. Wood have been responsible for processing the data, and Mrs. D. Schmitzer for the preparation of typed sheets.

#### IV. REFERENCES

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STATION: Port Hacking 50 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 7.1.59 TIME: 0955

0	21.50	19.73	24.87	4.99	102	8.27	0.20	0.19	0.04	0
10	21.50	19.74	24.89	5.01	103	8.27	0.29	0	0.12	0
20	21.40	19.73	24.90	5.01	102	8.27	0.26	0.15	0.02	0
30	21.50	19.74	24.89	4.99	102	8.23	0.22	0.23	0.12	0
40	21.40	19.73	24.90	5.01	102	8.22	0.21	0.26	0.12	0
50	21.40	19.71	24.88	5.04	103	8.22	0.22	0.06	0.13	0

DATE: 12.1.59 TIME: 0956

0	21.70	19.79	24.89	4.90	101	8.23	0.22	0.20	0	0
10	21.55	19.79	24.93	4.84	99	8.22	0.22	0.28	0.02	0
20	21.95	19.77	24.80	4.84	100	8.22	0.20	0.26	0.15	0
30	21.00	19.74	25.02	4.92	100	8.21	0.22	0.20	0.19	0
40	21.05	19.74	25.01	4.87	98	8.21	0.23	0.38	0.06	0
50	19.55	19.69	25.35	4.28	85	8.17	0.50	0.21	0	2.8

DATE: 19.1.59 TIME: 1014

0	22.80	19.72	24.49	5.00	105	8.26	0.17	0.42	0	0
10	21.75	19.72	24.79	4.95	102	8.25	0.19	0.31	0	0
20	20.60	19.72	25.11	4.87	98	8.24	0.20	0.24	0	0
30	19.20	19.66	25.38	4.95	97	8.23	0.30	0.41	0.07	0.6
40	17.65	19.63	25.73	4.37	84	8.22	0.53	0.29	0.06	3.2
50	16.65	19.61	25.95	4.12	77	8.18	0.65	0.24	0	6.4

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 7.1.59

0	0.19	0.08	0.01	0.02	0.11
10	0.82	0.04	0.61	0.11	0.35
20	0.61	0.03	0.60	0.11	0.23
30	0.61	0.08	0.54	0.12	0.20
40	0.55	0.04	0.60	0.12	0.13
50	0.57	0.10	0.78	0.32	0.11

DATE: 12.1.59

0	0.14	0.04	0.16	0.03	0.04
10	0.15	0.01	0.17	0.06	0.07
20	0.19	0.05	0.27	0.08	0.07
30	0.23	0.07	0.37	0.10	0.05
40	0.23	0.04	0.40	0.08	0.08
50	0.13	0.04	0.29	0.10	0.02

DATE: 19.1.59

0	0.07	0.02	0.17	0	0
10	0.08	*	0.11	0	0.01
20	0.12	0.03	0.23	0	0
30	0.21	0.05	0.41	0.01	0.01
40	0.15	0.04	0.15	0.07	0
50	0.06	0.01	0.12	0.06	*



STATION: Port Hacking 50 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 29.1.59 TIME: 0950

0	21.85	19.68	24.71			8.28	0.17	0.09	0.11	0
10	21.90	19.68	24.70	4.88	101	8.26	0.13	0.17	0.07	0
20	21.70	19.67	24.74	4.95	102	8.23	0.15	0.22	0.04	0
30	21.50	19.67	24.79	4.90	100	8.24	0.16	0.21	0.02	0
40	18.75	19.64	25.48	4.33	85	8.21	0.48	0	0.07	4.4
50	17.90	19.64	25.68	4.21	81	8.18	0.53	0	0.08	7.0

DATE: 2.11.59 TIME: 0951

0	21.65	19.63	24.69	4.73	97	8.20	0.34	0.13	0.12	0.2
10	20.50	19.68	25.08	4.78	96	8.21	0.30	0.27	0	0.2
20	18.80	19.62	25.43	4.38	86	8.06	0.51	0.16	0.04	2.4
30	18.40	19.62	25.53	4.17	81	8.00	0.56	0.09	0.10	5.0
40	17.10	19.61	25.84	4.01	76	8.06	0.66	0.11	0.02	10.6
50	16.05	19.59	26.06	4.14	77	8.09	0.70	0.09	0.02	14.0

DATE: 10.11.59 TIME: 0945

0	21.00	19.64	24.89	5.28	107	8.26	0.27	0.14	0.04	0.2
10	20.95	19.64	24.90	5.20	105	8.21	0.13	0.34	0	0
20	20.65	19.63	24.96	5.20	105	8.20	0.22	0.27	0.10	0.2
30	19.65	19.63	25.23	5.09	101	8.21	0.25	0.37	0	0.4
40	19.20	19.62	25.30	4.91	97	8.16	0.31			1.6
50	17.10	19.59	25.81	4.37	83	8.17	0.31	0.38	0	1.8

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 29.1.59

0	0.53	0.05	0.48	0.08	0.16
10	0.92	0.07	0.82	0.10	0.28
20	0.96	0.07	0.80	0.11	0.28
30	1.40	0.06	1.36	0.15	0.32
40	0.53	0.05	0.67	0.12	0.09
50	0.73	0.07	0.94	0.15	0.13

DATE: 2.11.59

0	1.30	0.08	1.40	0.12	0.33
10	0.41	0.08	0.57	0.09	0.16
20	0.67	0.07	0.41	0.12	0.14
30	0.49	0.09	0.47	0.51	*
40	0.34	0.06	0.36	0.08	0.05
50	0.23	0.07	0.36	0.08	0.03

DATE: 10.11.59

0	2.09	0.05	1.58	0.14	0.75
10	2.02	0	1.49	0.16	0.72
20	2.27	0.07	1.79	0.17	0.68
30	4.97	0.02	3.76	0.34	1.12
40	6.40	0.16	4.14	0.37	1.35
50	4.59	0.02	2.78	0.27	1.03

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 10.11.59

0	5.40	6.51	6.79	Leptocylindrus danicus
20	5.48	6.59	6.81	Leptocylindrus danicus
50	5.74	6.93	6.97	Leptocylindrus danicus

STATION: Port Hacking 50 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 16.11.59      TIME: 1029

0	19.25	19.59	25.29	5.45	107	8.26	0.20	0.66	0.18	0.2
10	17.75	19.57	25.62	5.03	97	8.25	0.39	0.23	0	1.8
20	15.40	19.57	26.17	3.85	71	8.21	0.76	0.02	0.36	6.8
30	14.10	19.53	26.40	4.13	74	8.18	0.76	0.29	0	7.2
40	14.65	19.49	26.22	4.16	75	8.13	0.84	0.02	0.06	8.2
50	13.30	19.48	26.49	4.29	75	8.10	0.84	0	0.06	6.6

DATE: 23.11.59      TIME: 1119

0	21.25	19.39	24.47	5.23	106	8.29	0.19	0.04	0.29	0
10	21.15	19.44	24.56	5.18	105	8.26	0.11	0.35	0.15	0
20	21.10	19.44	24.58	5.18	105	8.27	0.11	0.18	0.15	0
30	20.80	19.44	24.65	5.02	101	8.24	0.11	0.48	0.04	0
40	20.20	19.44	24.82	4.96	99	8.23	0.19	0.44	0.13	0
50	19.45	19.46	25.04	4.75	94	8.18	0.28	0.18	0.09	0.6

DATE: 2.11.59      TIME: 1152

0	22.85	19.46	24.11	5.04	106	8.20	0.18	0.26	0.14	0
10	21.90	19.46	24.38	5.12	105	8.20	0.18	0.28	0.04	0
20	19.05	19.51	25.20	4.49	88	8.20	0.44	0.20	0	1.0
30	18.25	19.53	25.43	4.27	83	8.16	0.54	0.18	0.12	1.8
40	16.90	19.57	25.82	3.98	75	8.14	0.66	0.08	0.08	4.4
50	15.85	19.57	26.07	3.92	72	8.12	0.71	0.03	0.10	5.6

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 16.ii.59

0	4.40	0.05	5.11	0.38	0.69
10	5.58	*	3.91	0.40	1.02
20	0.81	0.06	0.72	0.12	0.12
30	0.38	0.10	0.62	0.15	0
40	0.35	0.06	0.41	0.10	0.03
50	0.37	0.08	0.50	0.12	0.02

DATE: 23.ii.59

0	0.79	0.09	0.67	0.08	0.23
10	1.13	0.05	0.87	0.12	0.41
20	0.75	0.05	0.56	0.14	0.28
30	0.58	0.11	0.64	0.12	0.12
40	0.47	0.07	0.50	0.12	0.09
50	0.61	0.06	0.81	0.15	0.09

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 16.11.59

0	5.85	5.93	6.92	Leptocylindrus danicus
20	4.40	5.10	6.87	Leptocylindrus danicus
50	3.70	4.08	6.65	Leptocylindrus danicus

DATE: 23.11.59

0	5.48	6.19	7.72	Prorocentrum micans
20	5.40	6.08	7.05	Asterionella japonica
50	5.48	6.35	7.49	Thalassiosira aestivalis

DATE: 2.iii.59

0	5.81	6.18	7.30	Asterionella japonica
20	4.70	6.13	7.18	Small dinoflagellates
50	4.30	5.48	7.00	

STATION: Port Hacking 50 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 9.iii.59      TIME: 0946

0	22.65	19.51	24.24	5.31	111	8.28	0.09	0.33	0	0.2
10	20.75	19.56	24.84	5.17	104	8.28	0.12	0.28	0.04	0
20	17.95	19.59	25.60	4.17	80	8.25	0.44	0.02	0.21	3.2
30	16.75	19.58	25.88	3.86	73	8.20	0.67	0	0.15	9.2
40	16.00	19.57	26.04	3.98	74	8.18	0.67	0	0.11	10.0
50	15.40	19.55	26.14	3.98	73	8.16	0.73	0.17	0	2.8

DATE: 18.iii.59      TIME: 0950

0	21.90	19.54	24.50	5.02	103	8.32	0.13	0.23	0.02	0.2
10	21.85	19.58	24.56	4.93	101	8.25	0.17	0.19	0.06	0
20	22.20	19.59	24.48	5.04	104	8.25	0.13	0.39	0.13	0.2
30	21.80	19.60	24.62	4.95	102	8.26	0.17	0.27	0.11	6.0
40	22.00	19.60	24.55	5.02	104	8.27	0.15	0.31	0.02	0.2
50	20.50	19.60	24.96	4.66	94	8.28	0.22	0.45	0.13	2.0

DATE: 23.iii.59      TIME: 1131

0	24.40	19.79	24.11	4.78	103	8.18	0.18	0.06	0.04	0.2
10	24.30	19.79	24.14	4.78	103	8.14	0.19	0.17	0.04	0
20	24.25	19.77	24.12	4.75	102	8.14	0.19	0.17	0.04	0
30	22.80	19.69	24.45	4.54	95	8.20	0.28	0.14	0.04	1.0
40	20.40	19.64	25.05	4.17	84	8.17	0.48	0.16	0	4.4
50	18.10	19.60	25.57	3.95	76	8.15	0.50	0	0.06	8.4

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 9.iii.59

0	0.50	0.09	0.38	0.07	0.17
10	0.63	0.57	2.33	0.17	0.52
20	1.79	0.29	1.19	0.20	0.49
30	1.26	0.22	1.00	0.01	0.38
40	0.77	0.08	0.78	0.08	0.21
50	0.25	0.05	0.48	0.09	0.02

DATE: 18.iii.59

0	0.71	0.12	0.56	0.06	0.03
10	0.60	0.15	0.86	0.15	0.17
20	0.58	0.12	0.75	0.14	0.19
30	0.63	0.09	0.73	0.13	0.20
40	0.56	0.16	0.71	0.12	0.17
50	0.53	0.17	0.91	0.14	0.13

DATE: 23.iii.59

0	0.15	0.02	0.22	0.05	0.01
10	0.20	0	0.58	0.06	0.08
20	0.49	0.09	0.60	0.07	0.23
30	1.07	0.18	0.89	0.15	0.28
40	0.55	0.22	1.12	0.26	*
50	1.05	0.25	1.62	0.32	0.25



STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 9.iii.59

0	5.10	5.98	7.75	Thalassiosira aestivalis
20	5.30	6.40	7.82	Pyramidomonads
50	5.40	5.90	6.70	

DATE: 18.iii.59

0		6.18	6.85	Schroederella
20	5.00	5.85	6.70	Chrysonomads
50	5.30	5.70	6.94	

DATE: 23.iii.59

0	5.00	5.00	7.19	Nitzschia closterium
20	5.00		7.39	Chrysophyceae
50	4.30	4.30	7.43	Gymnodinium

STATION: Port Hacking 50 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 3.iv.59 TIME: 1026

0	20.85	19.42	24.62	4.55	92	8.24	0.45	0.15	0.12	3.8
10	20.40	19.57	24.94	4.44	89	8.21	0.45	0.07	0.12	4.0
20	18.45	19.60	25.52	4.01	78	8.19	0.61	0.03	0.14	9.0
30	17.40	19.59	25.74	3.89	74	8.17	0.69	0.15	0.16	9.8
40	16.70	19.57	25.87	3.95	74	8.12	0.68	0	0.16	13.4
50	16.00	19.55	26.01	3.92	73	8.12	0.75	0.19	0.10	13.4

DATE: 6.iv.59 TIME: 1136

0	20.20	19.53	24.94	5.30	106	8.22	0.32	0.10	0.08	0.4
10	20.00	19.54	25.01	5.96	119	8.21	0.34	0.22	0.02	0.2
20	18.00	19.58	25.57	3.95	76	8.18	0.65	0.09	0.10	5.0
30	17.40	19.58	25.72	4.01	76	8.15	0.67	0.11	0.04	9.4
40	17.15	19.58	25.78	4.01	76	8.14	0.68	0	0.12	9.2
50	16.60	19.56	25.88	3.95	74	8.14	0.75	0.01	0.08	8.2

DATE: 13.v.59 TIME: 1025

0	21.55	19.81	24.95	3.78	78	8.24	0.16			0
10	21.50	19.81	24.96	4.40	90	8.24	0.23	0.23	0.02	0
20	21.42	19.81	24.99	4.35	89	8.21	0.22	0.20	0.02	0
30	21.12	19.79	25.05	4.94	101	8.19	0.26	0.20	0.06	0.2
40	21.05	19.79	25.07	4.96	101	8.19	0.24	0.35	0.02	0.2
50	20.60	19.76	25.15	3.94	80	8.20	0.34	0.08	0.04	0.6

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 3.iv.59

0	5.00	6.70	7.09	Chaetoceros
20	5.78	5.70	6.76	Flagellates
50		6.70	6.72	Algae (Chlorophyceae)

DATE: 6.iv.59

0	5.95	6.60	7.40	Microflagellates
20	5.70	6.95	7.27	Microflagellates
50	3.30		7.02	Microflagellates

DATE: 13.v.59

0	5.32	5.51	8.11	Skeletonema costatum
20	5.00	5.28	8.00	Leptocylindrus danicus
50		4.51	8.00	

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 3.iv.59

0	0.60	0.14	0.86	0.08	0.07
10	0.60	0.14	0.68	0.09	0.13
20	0.35	0.10	0.44	0.08	0.07
30	0.26	0.08	0.62	0.08	0.04
40	0.20	0.09	0.47	0.08	0.02
50	0.12	0.08	0.38	0.08	0.01

DATE: 6.iv.59

0	3.86	0.19	2.73	0.18	1.85
10	0.73	0.11	0.75	0.10	0.30
20	0.34	0.10	0.42	0.06	0.15
30	0.25	0.09	0.47	0.04	0.10
40	0.84	0.14	0.79	0.08	0.33
50	0.19	0.14	0.50	0.13	0.02

DATE: 13.v.59

0	0.69	0.16	1.17	0.11	0.21
10	0.65	0.13	0.63	0.06	0.29
20	0.60	0.13	0.73	0.08	0.22
30	0.55	0.09	0.88	0.06	0.24
40	0.65	0.15	2.05	0.21	0.17
50	0.51	0.06	0.72	0.10	0.21

STATION: Port Hacking 50 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 18.v.59 TIME: 1008

0	21.05	19.81	25.09	3.91	80	8.28	0.21	0.31	0.10	0
10	21.00	19.76	25.05	3.97	81	8.27	0.19	0.39	0	0
20	21.00	19.87	25.19	3.72	63	8.27	0.19	0.33	0	0.6
30	20.55	19.77	25.18	4.49	91	8.28	0.22	0.36	0.04	0.4
40	20.90	19.75	25.29	4.16	83	8.23	0.31	0.35	0	1.4
50	20.10	19.77	25.31	4.07	82	8.23	0.32	0.46	0	1.2

DATE: 28.v.59 TIME: 0954

0	19.40	19.77	25.48	5.10	101	8.22	0.28	0.24	0	0.4
10	19.40	19.71	25.40	5.10	101	8.23	0.30	0.12	0.16	0.2
20	19.45	19.78	25.48	5.05	100	8.23	0.32	0.30	0.02	0.4
30	19.38	19.78	25.50	5.10	101	8.22	0.32	0.30	0	0.4
40	19.30	19.79	25.53	5.05	100	8.22	0.32	0.30	0	0.4
50	19.20	19.78	25.55	5.10	101	8.20	0.34	0.28	0	0.4

DATE: 2.vi.59 TIME: 1017

0	19.15	19.74	25.51	5.27	104	8.32	0.21	0.25	0.08	0.2
10	19.00	19.74	25.55	5.27	104	8.32	0.26	0.20	0.02	0.2
20	19.05	19.74	25.53	5.27	104	8.31	0.26	0.14	0.08	0.4
30	19.00	19.76	25.57	5.15	101	8.30	0.26	0.20	0	0.4
40	19.00	19.76	25.57	5.10	100	8.29	0.30	0.22	0.10	0.4
50	18.95	19.76	25.58	5.00	98	8.27	0.34	0.20	0.04	0.6

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 18.v.59

0	0.87	0.19	0.63	0.07	0.33
10	0.70	0.19	1.56	0.21	0.17
20	0.82	0.19	1.08	0.12	0.25
30	0.53	0.11	0.71	0.13	0.13
40	0.57	0.14	1.47	0.20	0.08
50	0.34	0.13	0.97	0.17	0.03

DATE: 28.v.59

0	1.23	0.13	0.82	0.14	0.34
10	1.00	0.20	0.60	0.08	0.39
20	1.26	0.13	0.56	0.09	0.41
30	1.13	0.29	1.29	0.18	0.33
40	1.11	0.25	1.59	0.26	0.33
50	1.02	0.30	1.39	0.28	0.33

DATE: 2.vi.59

0	1.03	0.29	0.84	0.22	0.34
10	0.90	0.23	0.67	0.12	0.33
20	0.94	0.24	0.92	0.20	0.28
30	0.85	0.22	0.69	0.16	0.25
40	0.75	0.25	1.03	0.19	0.14
50	0.71	0.25	0.90	0.19	0.15

STATION: Port Hacking 50m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 18.v.59

0	5.40	5.46	6.60	Guinardia flaccida
20	6.60	5.59	6.72	Chaetoceros coarctatum
50	5.23	5.29	6.59	Chaetoceros affine

DATE: 28.v.59

0	3.59	5.80	6.60	Nitzschia seriata
20	3.47	5.78	6.78	Nitzschia closterium
50	3.31	6.28	6.43	Rhizosolenia stolterforthii

DATE: 2.vi.59

0	5.00	5.24	6.48
20	4.70	5.13	6.42
50	5.23	5.30	6.45

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 20.v.59

0	0.55	0.12	0.61	0.10	0.19
10	0.43	0.13	0.80	0.13	0.12
20	0.38	0.11	0.63	0.10	0.12
30	0.20	0.09	0.65	0.11	0.01
40	0.19	0.10	0.70	0.09	0.03
50	0.16	0.03	0.56	0.08	0.02

DATE: 21.v.59

0	0.45	0.17	0.49	0.08	0.13
10	0.44	0.12	0.43	0.06	0.17
20	0.52	0.15	0.42	0.08	0.21
30	0.46	0.14	0.62	0.11	0.12
40	0.61	0.17	1.06	0.19	0.97
50	0.38	0.22	0.92	0.19	0.01



STATION: Port Hacking 50 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 8.vi.59 TIME: 1005

0	18.80	19.74	25.60	5.15	101	8.32	0.30	0.16	0.02	
10	18.90	19.75	25.59	5.15	101	8.32	0.30	0.14	0.06	
20	18.50	19.74	25.67	5.15	100	8.30	0.30	0.20	0.11	
30	18.60	19.74	25.64	5.10	100	8.28	0.27	0.15	0.06	
40	18.60	19.74	25.64	5.02	98	8.27	0.32	0.29	0.06	
50	18.50	19.74	25.67	5.20	101	8.25	0.33	0.11	0.23	

DATE: 16.vi.59 TIME: 1000

0	18.15	19.79	25.82	5.20	101	8.31	0.31			
10	18.15	19.78	25.81	5.15	100	8.30	0.32	0.34	0.05	
20	18.10	19.78	25.82	5.15	100	8.30	0.25	0	0.06	
30	18.10	19.78	25.82	5.09	98	8.29	0.31	0	0.16	
40	18.12	19.78	25.82	5.11	99	8.27	0.30	0.10	0.03	
50	18.02	19.79	25.85	5.11	99	8.23	0.27	0.07	0.06	

DATE: 22.vi.59 TIME: 0958

0	18.00	19.79	25.85	5.11	99	8.29	0.30	0.01	0.21	
10	17.95	19.78	25.85	5.15	99	8.25	0.27	0.11	0.02	
20	18.00	19.79	25.85	5.09	98	8.25	0.31			
30	18.00	19.78	25.84	5.06	98	8.23	0.30			
40	17.95	19.78	25.85	5.04	97	8.23	0.30			
50	17.95	19.78	25.85	5.02	97	8.23	0.32			

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 8.vi.59

0	0.88	0.27	0.82	0.15	0.23
10	0.96	0.37	1.72	0.21	0.20
20	0.84	0.26	0.78	0.11	0.23
30	0.86	0.63	0.91	0.17	0.18
40	0.75	0.28	0.43	0.12	0.17
50	0.67	0.25	0.66	0.20	0.21

DATE: 16.vi.59

0	0.59	0.18	0.86	0.06	0.17
10	0.65	0.18	0.90	0.11	0.06
20	0.62	0.20	0.74	0.07	0.17
30	0.60	0.19	0.72	0.06	0.16
40	0.70	0.34	1.27	0.22	0.11
50	0.72	0.30	1.27	0.17	0.13

DATE: 22.vi.59

0	0.62	0.17	0.84	0.07	0.18
10	0.62	0.21	1.04	0.23	0.05
20	0.61	0.11	0.82	0.11	0.18
30	0.56	0.20	0.68	0.12	0.12
40	0.53	0.16	0.99	0.07	0.16
50	0.58	0.21	1.31	0.10	0.17

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 8.vi.59

0	4.48	5.86	6.40	Chryomonads
20	4.67	6.08	7.30	Dinoflagellates
50	4.51	6.02	7.20	Leptocylindrus danicus

DATE: 16.vi.59

0	0	4.18	6.00	Microflagellates
20	4.00	5.08	6.08	
50	0	4.78	6.15	

DATE: 22.vi.59

0	4.48	5.29	6.81	Cryptomonads
20	0	5.76	6.86	Gymnodinium
50	0	5.53	7.09	Gymnodinium

STATION: Port Hacking 50 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 1.vii.59      TIME: 1012

0	17.60	19.78	25.94	5.32	102	8.32	0.30	0.24	0	0.6
10	17.60	19.76	25.92	5.29	101	8.22	0.32	0.13	0.05	0.8
20	17.70	19.76	25.89	5.29	101	8.26	0.30	0.07	0	0.6
30	17.60	19.75	25.90	5.32	102	8.24	0.29	0	0.18	0.6
40	17.55	19.76	25.93	5.46	105	8.24	0.31	0	0.07	0.6
50	17.50	19.74	25.92	5.36	102	8.20	0.34	0.08	0.22	0.8

DATE: 6.vii.59      TIME: 1040

0	17.70	19.76	25.91	5.15	99	8.13	0.34	0.14	0.04	0.2
10	17.60	19.79	25.96	5.32	102	8.01	0.32	0.20	0.04	0.4
20	17.55	19.77	25.94	5.29	101	8.01	0.41	0.09	0.11	0.4
30	17.35	19.76	25.98	5.21	99	7.99	0.32	0.20	0.06	0.6
40	17.45	19.77	25.97	5.32	102	7.97	0.24	0.28	0.04	0.6
50	17.45	19.74	25.93	5.29	101	7.97	0.31	0.21	0.13	0.4

DATE: 13.vii.59      TIME: 1010

0	17.30	19.81	26.05	5.25	100	8.32	0.30	0.18	0.06	0.6
10	17.20	19.80	26.07	5.18	99	8.32	0.25	0.25	0.02	0.6
20	17.25	19.82	26.08	5.21	99	8.29	0.27	0.18	0.09	0.6
30	17.15	19.79	26.06	5.35	102	8.27	0.31	0.23	0.04	0.4
40	17.18	19.79	26.06	5.32	101	8.26	0.28	0.26	0.04	0.6
50	17.10	19.76	26.04	5.15	98	8.25	0.32	0.22	0.09	0.8

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 1.vii.59

0	0.69	0.11	1.10	0.07	0.25
10	0.63	0.13	0.86	0.07	0.26
20	0.87	0.24	0.70	0.11	0.23
30	1.13	0.30	0.89	0.14	0.19
40	0.59	0.19	0.87	0.08	0.21
50	0.60	0.19	0.81	0.06	0.23

DATE: 6.vii.59

0	0.93	0.26	0.87	0.07	0.28
10	0.81	0.19	0.80	0.07	0.23
20	0.92	0.22	0.90	0.07	0.26
30	1.09	0.27	0.93	0.08	0.31
40	1.78	0.32	1.36	0.13	0.44
50	1.57	0.33	1.19	0.14	0.35

DATE: 13.vii.59

0	0.49	0.14	0.83	0.11	0.07
10	0.48	0.15	0.61	0.10	0.10
20	0.49	0.14	0.58	0.11	0.10
30	0.50	0.11	0.97	0.09	0.13
40	0.65	0.27	1.63	0.21	0.05
50	0.55	0.12	1.07	0.11	0.14

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 1.vii.59

0	0	5.61	6.72	Cryptomonads
20	0	5.82	7.24	Cryptomonads
50	0	5.58	6.10	Cryptomonads

DATE: 6.vii.59

0	5.18	5.32	6.27	Diatoms
20	0	6.68	6.94	Chrysomonads
50	0			

DATE: 13.vii.59

0	4.00	4.48	4.97	Rhizolenia delicatula
20	5.23	5.32	5.10	Nitzschia seriata
50	4.90	5.08	6.88	Peridinium pellucidum

STATION: Port Hacking 50 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 28.vii.59 TIME: 1015

0	16.60	19.58	25.91	5.50	103	8.26	0.26	0.36	0.08	0.4
10	16.60	19.58	25.91	5.66	106	8.26	0.28	0.30	0.18	0.6
20	16.90	19.63	25.92	5.36	101	8.26	0.27	0.35	0	0.6
30	16.90	19.62	25.91	5.66	107	8.26	0.30	0.26	0.10	0.4
40	16.85	19.61	25.91				0.35	0.33	0	
50	17.20	19.67	25.91	5.88	112	8.24	0.30	0.32	0	0.4

DATE: 30.vii.59 TIME: 1015

0	16.35	19.54	25.90	5.43	101	8.30	0.29	1.16	0.28	0.8
10	16.30	19.51	25.90	5.46	102	8.29	0.28	0.26	0.22	0.6
20	16.85	19.64	25.93	5.24	99	8.24	0.32	0.22	0.13	0.4
30	16.90	19.68	25.98	5.19	98	8.22	0.30	0.35	0.04	0.6
40	16.85	19.70	26.01	5.11	96	8.21	0.31	0.30	0.10	0.4
50	16.90	19.70	26.01	5.11	97	8.21	0.32	0.29	0.15	0.6

DATE: 3.viii.59 TIME: 1016

0	18.80	19.80	25.68	4.96	97	8.30	0.21	0.43	0	0
10	17.60	19.68	25.81	5.24	100	8.29	0.29	0.38	0	0.4
20	17.25	19.66	25.88	5.19	99	8.29	0.29	0.47	0.06	0.4
30	17.20	19.66	25.88	5.24	100	8.27	0.29	0.45	0.02	0.2
40	17.05	19.66	25.93	5.19	98	8.26	0.30	0.13	0.05	0.2
50	16.85	19.65	25.94	5.11	96	8.25	0.32	0.13	0.07	0.4

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 28.vii.59

0	0.63	0.25	0.67	0.24	*
10	0.73	0.22	0.57	0.25	*
20	0.57	0.15	0.89	0.14	0.11
30	0.30	0.10	0.46	0.10	0.04
40	0.51	0.18	1.04	0.21	0
50	0.55	0.16	0.72	0.19	0.04

DATE: 30.vii.59

0	1.42	0.36	1.72	0.20	0.38
10	1.34	0.18	0.74	0.06	0.47
20	0.80	0.10	0.53	0.07	0.27
30	0.43	0.15	0.87	0.14	0.06
40	0.38	0.15	1.08	0.15	0.02
50	0.33	0.15	0.81	0.15	0.02

DATE: 3.viii.59

0	0.64	0.20	0.82	0.08	0.22
10	0.84	0.24	0.91	0.11	0.25
20	0.70	0.22	0.65	0.06	0.22
30	0.54	0.18	0.61	0.13	0.12
40	0.45	0.13	0.52	0.09	0.10
50	0.39	0.14	0.55	0.15	0.09



STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 28.vii.59

0	4.48	5.34	7.30	<i>Nitzschia seriata</i>
20	4.85	5.34	7.26	
50	0	5.08	7.70	

STATION: Port Hacking 50 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 10.viii.59 TIME: 0959

0	17.30	19.75	25.98	5.10	97	8.35	0.28	0.22	0.02	0.6
10	17.33	19.76	25.98	5.17	99	8.26	0.30	0.09	0.06	0.6
20	17.35	19.75	25.96	5.20	99	8.26	0.31	0.19	0.02	0.8
30	17.30	19.75	25.98	5.20	99	8.21	0.31	0.16	0.05	0.8
40	17.08	19.75	26.04	5.22	99	8.19	0.34	0.18	0.02	0.6
50	16.91	19.73	26.05	5.10	96	8.18	0.34	0.13	0.03	0.8

DATE: 21.viii.59 TIME: 1003

0	17.75	19.80	25.93	5.25	101	8.30	0.25	0.25	0.10	0.2
10	17.75	19.80	25.93	5.25	101	8.30	0.25	0.22	0.15	0
20	17.70	19.80	25.94	5.42	104	8.30	0.26	0.36	0	0
30	17.70	19.80	25.94	5.25	101	8.30	0.26	0.36	0	0.2
40	17.70	19.80	25.94	5.22	100	8.29	0.25	0.35	0	0
50	17.45	19.79	25.99	5.14	98	8.27	0.33	0.29	0	0.2

DATE: 25.viii.59 TIME: 1018

0	17.68	19.72	25.85	5.25	101	8.24	0.34	0.18	0.03	0.2
10	17.50	19.73	25.91	5.22	100	8.25	0.33	0.17	0.11	0.2
20	17.15	19.69	25.93	4.83	92	8.23	0.44	0.13	0.16	2.0
30	16.85	19.66	25.97	4.72	89	8.24	0.48	0.11	0.14	3.8
40	16.50	19.64	26.02	4.62	87	8.22	0.54	0.15	0.17	4.0
50	16.15	19.63	26.09	4.46	83	8.20	0.56	0.07	0.12	5.8

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 10.viii.59

0	0.70	0.22	0.87	0.11	0.20
10	0.76	0.21	0.66	0.09	0.24
20	0.75	0.22	0.69	0.09	0.23
30	0.74	0.17	0.95	0.12	0.17
40	0.58	0.16	0.75	0.09	0.15
50	0.41	0.17	0.64	0.12	0.05

DATE: 21.viii.59

0	0.52	0.06	2.21	0.40	0.12
10	0.51	0.20	0.99	0.08	0.11
20	0.44	0.16	1.18	0.09	0.09
30	0.33	0.14	0.74	0.07	0.05
40	0.44	0.14	1.42	0.16	0.04
50	0.34	0.11	0.84	0.09	0.06

DATE: 25.viii.59

0	0.85	0.24	1.10	0.04	0.33
10	0.93	0.20	0.95	0.07	0.31
20	0.38	0.17	0.65	0.11	0.08
30	0.31	0.21	0.31	0.13	0.02
40	0.28	0.04	0.76	0.16	0.04
50	0.46	0.26	1.12	0.23	*

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 10.viii.59

0	5.30	5.53	6.51	Thalassiosira rotula
20	5.48	5.61	6.52	Nitzschia seriata
50	4.40	4.93	6.33	

DATE: 21.viii.59

0	0	4.70	6.30	Nitzschia seriata
20	0	5.00	6.00	Nitzschia seriata
50	0	4.70	5.54	

DATE: 25.viii.59

0		5.20	6.65	Chrysomonads
20		4.48	6.70	
50		4.78	6.40	Dinoflagellates

STATION: Port Hacking 50 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 2.ix.59      TIME: 1015

0	16.90	19.65	25.95	5.02	95	8.29	0.38	0.34	0.21	2.2
10	16.90	19.65	25.95	5.02	95	8.25	0.40	0.30	0.07	1.8
20	16.95	19.65	25.93	5.06	96	8.25	0.40	0.25	0.09	1.8
30	16.90	19.65	25.95	4.96	94	8.23	0.39	0.24	0.04	2.6
40	16.85	19.64	25.94	4.91	93	8.23	0.41	0.26	0.12	3.0
50	16.80	19.64	25.95	5.02	95	8.20	0.42	0.28	0.16	2.4

DATE: 7.ix.59      TIME: 1002

0	17.20	19.60	25.80	5.60	106	8.22	0.26	0.39	0.02	0
10	17.00	19.60	25.85	5.60	106	8.22	0.29	0.19	0.08	0
20	16.30	19.61	26.03	4.96	92	8.23	0.48	0.17	0.04	2.0
30	15.90	19.61	26.12	4.58	85	8.23	0.58	0.18	0.06	4.0
40	15.30	19.60	26.23	4.49	82	8.22	0.69	0.18	0.06	6.8
50	15.50	19.58	26.16	4.49	82	8.21	0.71	0.14	0.06	5.6

DATE: 14.ix.59      TIME: 1000

0	17.00	19.57	25.80	5.68	107	8.26	0.39	0.34	0.11	0.2
10	16.50	19.59	25.95	5.50	103	8.24	0.35	0.28	0.19	0.2
20	15.70	19.60	26.15	4.67	86	8.20	0.65	0.17	0.10	4.6
30	15.80	19.63	26.17	4.82	89	8.18	0.64	0.14	0.14	3.8
40	16.10	19.62	26.09	4.79	89	8.17	0.81	0	0.07	0
50	16.00	19.61	26.10	4.79	89	8.17	0.73	0.09	0.06	4.0

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 2.ix.59

0	1.05	0.28	0.83	0.07	0.44
10	1.08	0.16	0.82	0.09	0.37
20	1.03	0.32	1.01	0.10	0.34
30	0.97	0.09	0.94	0.10	0.33
40	0.92	0.21	0.60	0.10	0.30
50	0.96	0.18	1.09	0.09	0.29

DATE: 7.ix.59

0	0.87	0.20	1.01	0.14	0.14
10	1.15	0.21	0.90	0.13	0.28
20	0.68	0.12	0.94	0.16	0.08
30	0.30	0.15	0.50	0.10	0.01
40	0.21	0.09	0.32	0.07	0.02
50	0.26	0.11	0.39	0.09	0.01

DATE: 14.ix.59

0	2.91	0.38	2.56	0.17	0.84
10	2.61	0.27	1.51	0.25	0.50
20	0.84	0.15	1.12	0.17	0.19
30	0.39	0.15	0.52	0.17	0.04
40	0.23	0.08	0.32	0.11	*
50	0.35	0.13	0.65	0.15	0

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 2.ix.59

0	5.60	5.75	6.48	Prorocentrum
20	5.48	5.64	6.70	Prorocentrum
50	4.70	4.94	6.00	Prorocentrum

DATE: 7.ix.59

0	0	3.48	5.70	Dead algal material
20	0	3.18	6.18	
50	0	0	6.08	

DATE: 14.ix.59

0	5.30	5.43	6.35	Skeletonema costatum
20	4.48	0	5.70	Nitzschia seriata
50	4.30	4.40	6.70	Rhizosolenia stolterforthii

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 3.ix.59

0	5.15	0.52	3.30	0.21	1.26
10	4.93	0.28	2.78	0.19	1.24
20	4.36	0.26	2.59	0.18	1.10
30	3.13	0.46	2.10	0.20	0.80
40	1.58	0.25	0.81	0.07	0.49
50	1.26	0.12	0.90	0.10	0.36

DATE: 4.ix.59

0	2.92	0.34	2.62	0.21	0.46
10	3.57	0.56	2.33	0.24	0.59
20	4.36	0.76	2.31	0.26	0.08
30	3.58	0.69	2.48	0.25	0.64
40	2.97	0.54	2.07	0.21	0.55
50	2.42	0.51	1.87	0.18	0.35

DATE: 8.ix.59

0	4.99	0.54	3.01	0.23	1.09
10	6.00	0.55	3.73	0.33	1.28
20	6.19	0.73	3.48	0.33	1.45
30	5.08	1.15	2.54	0.33	1.09
40	5.59	0.84	3.24	0.34	1.28
50	0.68	0.15	1.32	0.19	0.08



STATION: Port Hacking 50 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 23.ix.59 TIME: 1004

0	15.95	19.65	26.17	5.54	103	8.32	0.32	0.28	0.08	0
10	15.92	19.65	26.17	5.54	103	8.30	0.32	0.21	0.07	0
20	15.97	19.65	26.17	5.48	101	8.29	0.31	0.31	0.10	0
30	15.97	19.65	26.17	5.35	99	8.26	0.31	0.35	0.04	0
40	15.83	19.65	26.19	5.51	102	8.26	0.32	0.28	0.04	0
50	15.28	19.62	26.27	5.25	96	8.25	0.43	0.25	0.17	0.6

DATE: 28.ix.59 TIME: 1007

0	16.90	19.70	26.01	5.55	105	8.42	0.23	0.28	0.11	0
10	16.82	19.70	26.04	5.55	105	8.37	0.27	0.22	0.02	0
20	16.80	19.69	26.04	5.47	103	8.31	0.23	0.28	0.04	0
30	16.70	19.69	26.05	5.65	106	8.31	0.21	0.32	0.02	0
40	16.60	19.68	26.06	5.76	108	8.27	0.18	0.25	0.10	0
50	16.50	19.67	26.07	5.76	108	8.27	0.21	0.47	0.22	0

DATE: 7.x.59 TIME: 1020

0	16.60	19.73	26.12	5.57	105	8.51	0.30	0.06	0.05	0
10	16.50	19.72	26.14	5.57	104	8.49	0.21	0.11	0.04	0
20	16.45	19.72	26.15	5.57	104	8.50	0.28	0.11	0.07	0
30	16.50	19.72	26.14	5.20	98	8.42	0.24	0.10	0.02	0
40	16.43	19.71	26.14	5.57	104	8.33	0.34	0.09	0.12	0
50	16.43	19.71	26.14	4.80	90	8.29	0.28	0.22	0.02	0

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 23.ix.59

0	4.34	0.48	3.52	0.30	0.95
10	3.82	0.38	1.96	0.26	0.83
20	3.85	0.37	2.32	0.26	0.84
30	3.76	0.33	2.14	0.31	0.71
40	4.65	0.38	2.42	0.33	0.89
50	3.54	0.35	1.97	0.27	0.69

DATE: 28.ix.59

0	1.18	0.07	1.51	0.10	0.38
10	1.52	0.15	1.95	0.18	0.43
20	1.46	*	1.50	0.12	0.49
30	1.46	0.06	1.42	0.14	0.42
40	1.40	0.04	1.49	0.13	0.37
50	1.31	0	1.48	0.12	0.35

DATE: 7.x.59

0	1.24	0.23	1.93	0.22	0.12
10	1.20	0.17	1.36	0.17	0.17
20	0.97	0.22	1.47	0.20	0.09
30	0.88	0.19	1.17	0.18	0.07
40	0.52	0.12	1.01	0.19	*
50	0.43	0.11	0.93	0.17	*

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 23.ix.59

0	5.60	5.18	6.60	<i>Thalassiosira rotula</i>
20	5.70	5.40	6.65	<i>Asterionella japonica</i>
50	5.93	5.00	6.93	<i>Ditylum brightwellii</i>

DATE: 28.ix.59

0	5.00	5.00	6.40	Naked dinoflagellates
20	5.00	5.48	6.02	
50	5.35	5.18	6.10	

STATION: Port Hacking 50 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 12.x.59 TIME: 1030

0	17.50	19.68	25.84	5.65	108	8.53	0.22	0.18	0	0
10	17.10	19.64	25.88	5.60	106	8.39	0.28	0	0.14	0
20	16.50	19.68	26.10	5.11	96	8.30	0.39	0.20	0	1.2
30	16.34	19.66	26.09	4.99	93	8.24	0.46	0	0.13	2.0
40	15.27	19.66	26.34	5.70	104	8.22	0.29	0.23	0.09	0.2
50	14.50	19.59	26.40	4.76	86	8.19	0.67	0.11	0.02	6.6

DATE: 19.x.59 TIME: 1050

0	18.17	19.74	25.76	5.33	103	8.53	0.19	0.19	0.06	0
10	17.60	19.72	25.86	4.25	82	8.40	0.22	0.20	0.10	0
20	17.28	19.70	25.93	5.40	103	8.37	0.22	0.26	0.15	0
30	17.79	19.69	25.79	5.50	106	8.36	0.24	0.22	0.04	0
40	17.17	19.70	25.95	5.47	104	8.37	0.27	0.21	0.11	0.2
50	16.80	19.69	26.04	5.33	100	8.37	0.32	0.29	0.02	0.2

DATE: 26.x.59 TIME: 1025

0	17.46	18.99	24.90	5.46	103	8.19	0.27	0.15	0.04	0
10	17.17	19.35	25.48	5.30	100	8.26	0.23	0.19	0.08	0
20	16.97	19.61	25.87	4.89	92	8.15	0.33	0.17	0	0
30	16.67	19.64	26.00	4.86	91	8.15	0.39	0.03	0.02	0.8
40	14.74	19.60	26.35	4.75	86	8.17	0.62	0.03	0.04	5.0
50	14.58	19.59	26.38	4.57	82	8.12	0.62	0.01	0	5.8

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 26.x.59

0	7.42	0.02	6.11	0.62	2.33
10	4.67	0	4.21	0.36	1.34
20	0.40	0.04	0.76	0.16	0.04
30	0.30	0.02	0.56	0.13	*
40	0.30	0.03	0.38	0.16	*
50	0.29	0.02	0.60	0.14	*

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 12.x.59

0	6.18	6.40	6.72	Prorocentrum
20	5.90	5.85	6.86	Chaetoceros lorenzianum
50	0	0	6.49	Asterionella japonica

DATE: 19.x.59

0	5.65	6.04	6.54	Prorocentrum
20	5.30	5.48	6.27	Schroederella
50	5.40	4.70	6.30	Asterionella japonica

DATE: 26.x.59

0	6.00	5.70	6.42	Prorocentrum micans
20	5.00	5.60	6.60	Schroederella delicatula
50		5.00	6.54	Schroederella delicatula

STATION: Port Hacking 50 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE: 2.xi.59		TIME: 1000								
0	18.05	19.26	25.11	5.99	115	8.41	0.21	0.20	0.22	0
10	17.74	19.40	25.39	5.77	110	8.35	0.21	0.33	0.04	0
20	17.50	19.40	25.45	5.67	108	8.30	0.23	0.20	0.02	0
30	17.20	19.47	25.61	5.48	104	8.28	0.33	0.28	0.02	0.4
40	16.85	19.49	25.73	5.35	101	8.25	0.40	0.05	0.18	1.2
50	16.50	19.47	25.79	5.11	96	8.20	0.44	0.23	0.17	1.0

DATE: 10.xi.59		TIME: 1000								
0	18.20	19.43	25.33	5.58	108	8.28	0.17	0.28	0.16	0
10	18.10	19.45	25.37	4.78	92	8.30	0.17	0.26	0.15	0
20	18.10	19.48	25.41	5.49	106	8.29	0.21	0.11	0.13	0
30	16.90	19.47	25.69	5.49	103	8.30	0.19	0.22	0.15	0
40	16.60	19.48	25.53	5.25	100	8.31	0.21	0.24	0.05	2.6
50	16.40	19.57	25.95	4.62	86	8.30	0.50	0.11	0.21	0

DATE: 16.xi.59		TIME: 1015								
0	19.00	19.53	25.25	5.31	104	8.27	0.14	0.29	0.26	0
10	18.98	19.50	25.21	5.43	106	8.25	0.16	0.25	0.04	0
20	18.95	19.52	25.25	5.40	106	8.22	0.18	0.25	0.02	0
30	18.60	19.50	25.32	5.30	103	8.23	0.22	0.21	0.15	0
40	17.35	19.50	25.62	4.75	90	8.21	0.38	0.20	0.09	1.2
50	16.20	19.54	25.96	4.57	85	8.19	0.52	0.24	0.06	3.0

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 2.xi.59

0	2.45	0.04	2.01	0.22	0.58			
10	1.47	0.02	1.17	0.17	0.38			
20	0.54	0.02	0.52	0.15	0.11			
30	0.09	0.06	0.14	0.09	0.04			
40	0.12	0.07	0.49	0.17	*			
50	0.14	0.09	0.60	0.15	0			

DATE: 16.xi.59

0	0.51	0.06	0.69	0.12	0.13			
10	0.34	0.05	0.15	0.08	0.10			
20	0.44	0.08	0.77	0.13	0.11			
30	0.41	0.09	0.81	0.12	0.11			
40	0.29	0.07	0.43	0.09	0.06			
50	0.22	0.04	0.38	0.07	0.02			



STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 2.xi.59

0	5.30	6.70	7.80	Prorocentrum micans
20				
50	5.60	5.48	6.78	

DATE: 10.xi.59

0		5.80		Microflagellates
20				
50				

DATE: 16.xi.59

0		5.60		Microflagellates
20		5.57		
50		5.81		

STATION: Port Hacking 50 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 24.xi.59 TIME: 0945

0	19.80	19.45	24.93			8.29	0.19	0.34	0.08	0
10	19.30	19.47	25.08	5.91	118	8.25	0.21	0.30	0.02	0
20	18.50	19.52	25.36	5.25	102	8.22	0.29	0.26	0	0
30	17.20	19.54	25.71			8.22	0.48	0.09	0.04	0.5
40	16.10	19.56	26.00	4.68	87	8.23	0.54	0	0.11	3.8
50	15.20	19.55	26.18	4.40	80	8.23	0.64	0.13	0.12	6.0

DATE: 30.xi.59 TIME: 1125

0	18.50	19.47	25.30	5.45	106		0.28	0.29	0.16	0
10	16.05	19.53	25.97	4.24	79		0.55	0.24	0.02	2.4
20	15.20	19.53	26.15	4.30	78		0.66	0	0.34	7.2
30	14.18	19.53	26.38	4.30	77		0.74	0.13	0.17	7.8
40	13.90	19.51	26.40	2.88	51		0.74	0	0.26	8.4
50	13.90	19.51	26.40	4.30	76		0.85	0.08	0.09	6.6

DATE: 7.xii.59 TIME: 1120

0	20.15	19.57	25.00	5.38	108	8.28	0.18	0.39	0	0
10	19.25	19.54	25.20	5.25	104	8.27	0.25	0.47	0.07	0
20	16.05	19.58	26.10	4.40	82	8.25	0.57	0.26	0.09	4.0
30	15.30	19.57	26.20	4.23	77	8.20	0.75	0	0.19	4.2
40	14.45	19.55	26.34	4.10	74	8.18	0.95	0.09	0.05	7.0
50	14.25	19.54	26.39	4.16	75	8.16	0.96	0.11	0.04	7.2

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 24.xi.59

0	0.87	0.03	0.96	0.13	0.30
10	1.86	0.05	1.45	0.17	0.56
20	2.30	0.07	1.49	0.17	0.64
30	1.26	0.09	1.26	0.15	0.35
40	1.05	0.13	0.86	0.12	0.30
50	0.31	0.08	0.47	0.10	0.05

DATE: 30.xi.59

0	5.36	0	3.96	0.26	1.06
10	3.03	*	1.67	0.17	0.59
20	1.67	0.01	1.06	0.14	0.28
30	0.80	0.05	0.85	0.15	0.08
40	0.29	0.04	0.59	0.10	0.03
50	0.32	0.05	0.52	0.13	0.02

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 24.xi.59

0		6.22		Microflagellates
20		5.68		
50		5.44		

DATE: 30.xi.59

0	6.38	5.60	6.20	Rhizosolenia stolterforthii
20	5.60	5.30	5.78	Leptocylindrus danicus
50	0	0	6.34	Schroederella delicatula

STATION: Port Hacking 50 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE:	15.xii.59		TIME:	1248						
0	20.80	19.58	24.86	5.42	110	8.24	0.22	0.19	0.14	0
10	20.50	19.60	24.96	5.20	105	8.23	0.21	0.36	0.13	0
20	20.40	19.60	24.99	5.10	103	8.22	0.13	0.32	0.12	0
30	20.30	19.60	25.02	5.08	102	8.22	0.21	0.07	0.21	0
40	19.60	19.59	25.17	5.07	101	8.22	0.22	0.16	0.37	0.6
50	17.20	19.57	25.76	4.51	86	8.23	0.52	0.08	0.17	2.8

DATE:	21.xii.59		TIME:	1015						
0	20.55	19.63	25.00	4.91	99	8.27	0.28	0.29	0	
10	20.30	19.63	25.06	5.04	101	8.24	0.27	0.30	0.05	
20	19.60	19.63	25.25	4.99	99	8.23	0.35	0.37	0	
30	16.73	19.60	25.92	4.80	90	8.25	0.55	0.26	0.08	
40	15.30	19.56	26.20	3.57	65	8.19	0.82	0.18	0.07	
50	15.00	19.57	26.27	3.94	71	8.17	0.88	0	0.18	

DATE:	29.xii.59		TIME:	1048						
0	21.80	19.67	24.70	4.90	101	8.27	0.13	0.28	0	0
10	21.50	19.64	24.75	4.84	99	8.27	0.13	0.36	0.08	0
20	20.20	19.58	25.02	5.10	102	8.27	0.17	0.47	0.04	0
30	18.30	19.57	25.48	4.84	93	8.26	0.37	0.36	0.02	1.2
40	16.90	19.56	25.81	4.56	86	8.26	0.43	0.46	0	3.4
50	15.80	19.55	26.06	4.39	81	8.24	0.54	0.42	0.04	6.8

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 15.xii.59

0	1.02	0.20	0.80	0.11	0.41
10	1.19	0.19	1.04	0.09	0.43
20	0.87	0.17	0.77	0.09	0.26
30	0.62	0.13	0.68	0.08	0.21
40	0.70	0.15	0.60	0.09	0.20
50	0.56	0.11	0.55	0.11	0.13

DATE: 21.xii.59

0	0.62	0.11	0.85	0.09	0.20
10	0.84	0.09	0.86	0.09	0.28
20	0.85	0.13	0.68	0.08	0.27
30	0.88	0.11	1.02	0.13	0.27
40	0.48	0.06	0.70	0.13	0.07
50	0.50	0.06	0.68	0.21	0.04

DATE: 29.xii.59

0	0.15	*	0.52	0.06	0.08
10	1.64	0.20	1.58	0.09	0.48
20	2.45	*	1.98	0.12	0.74
30	1.66	0.14	1.55	0.15	0.45
40	0.96	0.19	0.96	0.11	0.24
50	0.68	0.10	0.84	0.07	0.13

STATION: Port Hacking 50 m LAT. 34°05' S. LONG. 151°13' E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 15.xii.59

0	5.54
20	5.54
50	0

Prorocentrum micans  
Microflagellates

STATION: Port Hacking 100m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 8.1.59 TIME: 0955

0	21.80	19.76	24.83	4.93	102	8.35	0.19	0.18	0.02	0.02
10	21.50	19.73	24.87	4.99	102	8.35	0.19	0.39	0.08	0
20	21.20	19.71	24.93	5.06	103	8.30	0.21	0.18	0.04	0
30	21.00	19.70	24.96	5.04	102	8.26	0.21	0.16	0.14	0
40	20.90	19.69	25.10	5.01	102	8.26	0.23	0.28	0.02	0
50	20.70	19.70	25.05	5.01	101	8.28	0.22	0.21	0.16	0
75	16.80	19.54	25.81	3.86	73	8.27	0.60	0.17	0.02	1.20
100	13.20	19.46	26.47	4.41	77	8.25	0.62	0.01	0.12	1.60

DATE: 13.1.59 TIME: 1040

0	22.95	19.81	24.55	4.76	100	8.27	0.17	0.40	0.04	0
10	22.70	19.81	24.62	4.82	101	8.26	0.20	0.28	0.15	0
20	22.00	19.79	24.81	4.90	101	8.26	0.19	0.40	0.04	0
30	20.45	19.74	25.16	5.00	101	8.25	0.19	0.40	0.04	0
40	19.50	19.72	25.39	4.58	91	8.23	0.51	0.20	0.02	1.6
50	18.60	19.71	25.61	4.52	88	8.22	0.39	0.44	0	1.6
75	17.75	19.67	25.76	4.23	81	8.17	0.52	0.16	0	3.4
100	17.65	19.68	25.80	4.09	78	8.17	0.54	0.32	0.02	4.8



LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 8.1.59

0	0.33	0.16	0.96	0.14	0.06			
10	0.56	0.16	1.29	0.24	0.09			
20	0.87	0.11	1.26	0.23	0.23			
30	0.80	0.10	0.81	0.16	0.23			
40	0.50	0.06	0.69	0.11	0.17			
50	0.59	0.11	1.01	0.28	0.21			
75	0.28	0.06	0.40	0.10	0.04			
100	0.39	0.07	0.35	0.17	0.07			

DATE: 13.1.59

0	0.10	*	0.17	0.02	0.04			
10	0.11	0.05	0.18	0.05	0.03			
20	0.22	0.06	0.32	0.05	0.11			
30	0.16	0.04	0.32	0.41	0.75			
40	0.08	0.09	0.41	0.12	0			
50	0.04	0.09	0.53	0.15	*			
75	0.04	0.06	0.18	0.07	*			
100	0.08	0.14	0.31	0.01	0			

STATION: Port Hacking 100 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 20.1.59 TIME: 1100

0	23.20	19.72	24.38	4.87	103	8.26	0.13	0.37	0.05	0
10	22.85	19.72	24.48	4.90	103	8.25	0.13	0.25	0.08	0
20	22.70	19.72	24.52	4.92	103	8.23	0.12	0.34	0.02	0
30	21.20	19.72	24.95	5.07	103	8.23	0.14	0.45	0	0
40	18.80	19.66	25.49	5.12	100	8.24	0.19	0.61	0.02	0
50	17.40	19.62	25.78	4.16	79	8.18	0.53	0.31	0.06	5.6
75	16.25	19.59	26.02	4.16	77	8.15	0.70	0.29	0.08	8.6
100	15.05	19.57	26.24	4.37	79	8.16	0.70	0.16	0.15	7.8

DATE: 30.1.59 TIME: 1013

0	23.00	19.71	24.42	4.80	101	8.30	0.25	0.13	0	0.2
10	22.85	19.71	24.46	4.86	102	8.30	0.24	0.08	0.07	0.2
20	22.80	19.71	24.47	4.88	102	8.24	0.20	0.19	0	0.2
30	21.35	19.65	24.80	5.07	103	8.24	0.18	0.23	0.02	0.2
40	19.90	19.62	25.14	4.83	96	8.28	0.26	0.27	0	0.4
50	18.20	19.64	25.61	4.35	84	8.25	0.47	0	0.12	3.6
75	16.20	19.61	26.05	4.15	77	8.22	0.62	0.03	0.14	7.0
100	15.50	19.58	26.16	4.27	78	8.18	0.69	0	0.10	8.8

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 20.1.59

0	0.19	0.07	0.19	0.13	0.08			
10	0.11	0.15	0.16	0.04	0.04			
20	0.10	0.02	0.15	0.03	0.05			
30	0.11	0.03	0.26	0.02	0.06			
40	1.14	0.31	1.56	0.18	0.14			
50	0.36	0.11	0.51	0.11	0.01			
75	0.12	0.04	0.32	0.10	*			
100	0.10	0.05	0.34	0.08	0			

DATE: 30.1.59

0	0.33	0.07	0.39	0.08	0.10			
10	0.25	0.05	0.44	0.09	0.05			
20	0.34	0.12	0.69	0.13	0.04			
30	1.98	0.17	2.40	0.29	0.31			
40	2.04	0.22	2.45	0.31	0.30			
50	0.54	0.08	0.85	0.15	0.06			
75	0.32	0.07	0.63	0.20	*			
100	0.32	0.10	0.78	1.39	0			

STATION: Port Hacking 100m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 3.11.59 TIME: 1009

0	22.65	19.66	24.45	4.83	101	8.24	0.17	0.17	0.12	0.2
10	20.70	19.71	25.07	4.97	101	8.22	0.17	0.27	0.18	0.2
20	19.80	19.69	25.28	4.86	97	8.23	0.19	0.19	0.08	0.2
30	18.45	19.67	25.59	4.70	91	8.23	0.29	0.23	0.02	0.8
40	17.80	19.64	25.71	4.04	78	8.17	0.49	0.19	0.14	7.0
50	17.15	19.60	25.82	3.86	73	8.14	0.58	0.16	0.14	9.6
75	15.00	19.54	26.21			8.13	0.72	0.10	0.04	17.2
100	11.60	19.35	26.65	4.35	73	8.12	0.86	0.04	0.22	25.8

DATE: 11.11.59 TIME: 1010

0	20.45	19.64	25.04	5.53	111	8.26	0.17	0.25	0.02	0.2
10	20.40	19.64	25.05	5.37	108	8.24	0.18	0.36	0.04	0
20	19.60	19.63	25.25	4.90	97	8.23	0.24	0.30	0.08	0.8
30	18.20	19.62	25.58	4.68	91	8.22	0.41	0.27	0.04	8.8
40	17.75	19.61	25.68	4.64	89	8.17	0.43	0.03	0.26	6.8
50	16.85	19.61	25.90	4.44	84	8.16	0.53	0.15	0.16	9.2
75	15.50	19.58	26.16	4.23	78	8.16	0.62	0.22	0.04	11.4
100	12.25	19.43	26.64	4.26	73	8.17	0.79	0.03	0.18	15.4

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 3.11.59

0	0.27	0.03	0.11	0.01	0.23
10	0.18	0.01	0.17	0.05	0.11
20	0.44	0.11	0.95	0.15	0.09
30	0.30	0.07	0.27	0.09	0.08
40	0.18	0.01	0.38	0.07	0.02
50	0.12	0.02	0.42	0.10	*
75	0.12	0.01	0.38	0.09	*
100	0.11	0.05	0.35	0.11	*

DATE: 11.11.59

0	1.65	0.01	1.30	0.11	0.49
10	2.22	0.09	1.89	0.24	0.51
20	3.22	*	2.08	0.20	0.67
30	3.93	0.07	2.29	0.29	0.92
40	2.28	0.03	1.48	0.27	0.48
50	1.55	0.06	1.14	0.26	0.24
75	0.26	0.03	0.36	0.08	0.05
100	0.19	0.06	0.47	0.14	0.01

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 11.11.59

0	5.18	6.72	7.01	Leptocylindrus danicus
20	5.54	7.05	7.24	Leptocylindrus danicus
50	5.00	6.96	7.18	Leptocylindrus danicus

STATION: Port Hacking 100 m

### 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.i.59

TIME: 0500

<u>In situ</u> $\frac{1}{2}$ day	0	754	28	726	0.39	0.08
	10	89	18	71	0.04	
	20	7096	29	7067	3.78	
	50	245	12	233	0.12	

STATION: Port Hacking 100 m

### 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: 4.11.59

TIME: 0445

<u>In situ</u>	1 day	0	1550	62	1488	3.98	0.07
		10	761	37	724	1.94	
		20	552	24	528	1.42	
		50	61	13	48	0.13	



STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE:	17.11.59		TIME:	1006						
0	20.80	19.63	24.93			8.28	0.24	0.10	0	0.2
10	20.55	19.63	24.99			8.28	0.30	0.16	0.10	0
20	19.50	19.61	25.25			8.27	0.37	0.29	0.04	0
30	18.15	19.63	25.61			8.24	0.41	0.65	0	0
40	17.80	19.62	25.68			8.24	0.77	0.13	0.34	6.0
50	16.25	19.60	26.03			8.16	0.86	0.05	0.29	7.6
75	14.45	19.54	26.34			8.15	0.86	0.06	0.24	6.8
100	13.80	19.50	26.42			8.18	0.88	0.02	0.08	7.4

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 17.11.59

0	0.84	0.05	0.88	0.08	0.26			
10	2.19	0.04	1.84	0.13	0.56			
20	3.12	0.14	2.20	0.20	0.70			
30	6.87	0	4.44	0.25	1.49			
40	7.95	*	4.85	0.42	1.51			
50	3.23	0.06	1.79	0.20	0.68			
75	0.71	0.11	0.84	0.12	0.17			
100	0.25	0.10	0.56	0.10	0			

STATION: Port Hacking 100m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 17.11.59

0	5.54	6.18	6.54	Schroederella delicatula
20	5.74	6.54	6.75	Asterionella japonica
50	6.00	6.22	6.18	Nitzschia seriata

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 24.11.59      TIME: 0954

0	21.70	19.36	24.30	5.11	105	8.22	0.06	0.41	0.15	0
10	21.35	19.46	24.54	5.11	104	8.22	0.11	0.39	0.06	0
20	20.50	19.48	24.80	4.98	100	8.22	0.13	0.45	0.08	0
30	20.45	19.47	24.80	5.02	101	8.21	0.11	0.36	0.15	0
40	17.75	19.50	25.52	4.46	85	8.26	0.44	0.22	0.12	2.4
50	17.10	19.59	25.81	4.05	77	8.24	0.53	0.17	0.06	4.8
75	14.80	19.51	26.21	4.02	73	8.18	0.67	0	0.38	9.0
100	14.60	19.49	26.24	3.98	72	8.14	0.77	0	0.12	9.0

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 24.11.59

0	1.46	0.13	1.40	0.11	0.38
10	0.71	0.10	0.46	0.11	0.28
20	0.91	0.15	0.54	0.12	0.32
30	0.62	0.05	0.75	0.14	0.10
40	0.65	0.05	0.75	0.14	0.06
50	0.47	0.07	0.56	0.11	0.05
75	0.25	0.03	0.36	0.15	*
100	0.26	0.06	0.50	0.10	0.01

STATION: Port Hacking 100m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
DATE: 24.ii.59				
0	5.90	6.22	6.40	Asterionella japonica
20	5.00	5.48	6.82	Asterionella japonica
50	5.18	5.30	6.78	Asterionella japonica

STATION: Port Hacking 100 m

### 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: 25.11.59

TIME: 0500

<u>In situ</u>	$\frac{1}{2}$ day	0	588	716	0	0	
		10	594	147	447	2.39	
		20	83	562	0	0	
		50	1833	4	1849	9.90	

DATE: 25.11.59

TIME: 0500

Bath	4 hrs	0	7300	353	6947	4.65	0.49
		10	2367	87	2280	1.52	
		20	780	58	722	0.48	
		50	118	10	108	0.07	

STATION: Port Hacking 100 m

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.iii.59                      TIME: 0500

<u>In situ</u> $\frac{1}{2}$ day	0	4327	36	4291	22.98	
	10		87			
	50	1376				

DATE: 13.iii.59                      TIME: 0500

Bath	4 hrs	0	4952	106	4846	3.24	1.03
		10	3907	44	3863	2.59	
		50	1792	135	1657	1.11	



STATION: Port Hacking 100m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 4.111.59      TIME: 1039

0	22.30	19.64	24.52	4.96	103	8.32	0.17	0.23	0	0
10	22.30	19.64	24.52	5.10	106	8.16	0.17	0.08	0	0
20	22.15	19.63	24.55	5.07	105	8.25	0.18	0.20	0.02	0
30	18.80	19.60	25.40	4.24	83	8.15	0.39	0.05	0.17	3.0
40	17.40	19.60	25.75	4.08	78	7.96	0.56	0.03	0.10	4.8
50	16.60	19.59	25.93	3.89	73	7.97	0.62	0	0.18	9.2
75	14.50	19.54	26.32	4.11	74	7.98	0.74	0	0.20	4.2
100	13.60	19.49	26.44	4.20	74	7.92	0.76	0.02	0.14	13.8

DATE: 10.111.59      TIME: 1135

0	22.40	19.57	24.39	5.11	106	8.26	0.30	0.11	0	0.2
10	22.30	19.57	24.42	5.15	107	8.26	0.28	0.05	0.04	0.4
20	22.10	19.57	24.48	5.15	107	8.26	0.23	0.22	0.05	0.2
30	18.10	19.60	25.58	4.66	90	8.26	0.47	0	0.09	2.8
40	16.90	19.60	25.87	3.94	75	8.19	0.73	0.07	0	8.0
50	15.90	19.58	26.08	4.08	75	8.19	0.75	0	0.03	8.8
75	14.50	19.52	26.30	4.35	78	8.18	0.82	0	0.11	10.8
100	13.40	19.48	26.48	4.22	74	8.18	0.90	0	0.13	13.2

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 4.111.59

0	0.39	0.02	0.38	0.02	0.20			
10	0.42	0.06	0.41	0.07	0.21			
20	1.06	0.12	0.82	0.13	0.44			
30	1.40	0.25	1.34	0.10	0.55			
40	0.53	0.12	0.58	0.11	0.15			
50	0.42	0.07	0.51	0.10	0.14			
75	0.16	0.06	0.23	0.18	*			
100	0.16	0.08	0.33	0.11	*			

DATE: 10.111.59

0	0.34	0.07	0.43	0.08	0.13			
10	0.33	0.06	0.36	0.09	0.14			
20	0.59	0.08	0.48	0.10	0.24			
30	2.06	0.29	1.35	0.15	0.64			
40	1.51	0.19	1.14	0.13	0.50			
50	0.67	0.08	0.72	0.06	0.02			
75	0.19	0.09	0.63	0.10	*			
100	0.12	0.08	0.52	0.11	*			

STATION: Port Hacking 100m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 4.111.59

0	4.40	6.70	6.60
20	4.18	7.00	6.88
50	4.00	6.70	6.35

DATE: 10.111.59

0	4.00	5.48	6.29	Chrysophyceae
20	0	5.95	6.46	Cryptomonads
50	0	5.00	6.11	

STATION: Port Hacking 100 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE:	19.iii.59	TIME:	1000								
0	23.90	19.70	24.14	4.72	95	8.11	0.02	0.35	0	0.2	
10	23.35	19.67	24.26	4.75	100	8.18	0.06	0.21	0	0	
20	23.65	19.59	24.06	4.84	103	8.06	0.09	0.24	0	0	
30	21.60	19.55	24.59	4.75	97	8.07	0.20	0.15	0.08	0.6	
40	21.60	19.55	24.59	4.66	95	8.06	0.20	0.23	0	0.8	
50	21.75	19.55	24.54	4.66	95	8.01	0.20	0.21	0.06	0.8	
75	17.90	19.59	25.62	3.88	75	8.02	0.56	0.06	0.02	13.6	
100	15.40	19.54	26.12	3.83	70	8.05	0.76	0.04	0.09	8.6	

DATE:	24.iii.59	TIME:	1046								
0	23.15	19.66	24.31	4.93	104	8.16	0.10	0.17	0.11	0.2	
10	22.20	19.60	24.49	4.95	102	8.13	0.11	0.20	0.07	0.2	
20	21.20	19.60	24.78	4.78	97	8.12	0.21	0.15	0.02	0.6	
30	20.95	19.61	24.86	4.69	95	8.09	0.22	0.18	0	0.6	
40	20.55	19.61	24.96	4.44	89	8.05	0.29	0.13	0.04	0	
50	19.60	19.60	25.19	4.30	85	8.07	0.40	0.04	0.02	0.6	
75	18.60	19.60	25.45	3.95	77	8.08	0.52	0	0.07	3.0	
100	17.80	19.59	25.64	4.01	77	8.09	0.66	0	0.09	4.0	

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 19.iii.59

0	0.30	0.06	0.11	0.07	0.16			
10	0.44	0.09	0.53	0.10	0.21			
20	0.72	0.12	0.80	0.17	0.23			
30	0.69	0.14	0.85	0.16	0.22			
40	0.50	0.10	0.52	0.14	0.14			
50	0.48	0.11	0.72	0.13	0.13			
75	0.09	0.03	0.40	0.12	*			
100	0.21	0.15	0.98	0.18	*			

DATE: 24.iii.59

0	0.57	0.20	1.29	0.20	0.06			
10	0.34	0.08	0.41	0.06	0.13			
20	0.51	0.14	0.91	0.10	0.16			
40	0.46	0.10	0.69	0.10	0.15			
50	0.42	0.12	0.73	0.08	0.13			
75	0.29	0.08	0.43	0.13	0.04			
100	0.29	0.10	0.77	0.19	0.01			

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 19.11.59

0	5.30	0	7.54	Chrysophyceae
20	5.30	5.00	7.40	Chlamydomonads
50	5.00	5.00	7.60	

STATION: Port Hacking 100 m

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.v.59                      TIME: 0540

<u>In situ</u>	1 day	0	2459	166	2293	6.14	0.25
		10	4018	54	3964	10.61	
		20	2085	102	1983	5.31	
		50	91	7	84	0.22	

DATE: 6.v.59                      TIME: 0540

Bath	2 hrs	0		138			
		10	5045	129	4916	6.58	
		20	2	2	0	0	
		50	1213	55	1158	1.55	

STATION: Port Hacking 100m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE:	31.11.59		TIME:	1055						
0	23.00	19.50	24.13	4.84	101	8.25	0.24	0.14	0.04	0.2
10	22.60	19.59	24.37	4.73	99	8.25	0.29	0	0.11	0.6
20	22.17	19.68	24.83	4.61	95	8.23	0.30	0.08	0.07	0.2
30	20.97	19.66	24.93	4.44	82	8.20	0.39	0.03	0.02	2.0
40	20.00	19.67	25.19	4.57	91	8.22	0.42	0	0.02	0.2
50	18.73	19.62	25.45	4.14	81	8.21	0.57	0	0	5.6
75	16.40	19.55	25.92	3.86	72	8.19	0.62	0	0.01	7.2
100	14.83	19.49	26.18	3.95	71	8.16	0.77	0	0.07	11.0

DATE:	14.v.59		TIME:	1100						
0	21.40	19.79	24.97	4.99	102	8.23	0.20	0.20	0.12	0
10	21.40	19.80	24.98	4.99	102	8.23	0.24	0.16	0.29	0
20	21.40	(19.80)	(24.98)	4.99	(102)	8.22				
30	21.40	19.80	24.98	4.96	102	8.21	0.19	0.19	0.11	0
40	21.40	19.80	24.98	5.02	103	8.20	0.29	0.09	0	0.2
50	21.40	19.81	24.99	4.96	102	8.20	0.19	0.12	0.38	0
75	19.81	19.73	25.34	4.64	93		0.36	0.07	0.09	0
100	17.62	19.66	25.78	4.13	79	8.19	0.57	0	0.12	5.4



LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 31.111.59

0	0.76	0.18	0.74	0.12	0.27			
10	0.51	0.07	0.56	0.08	0.16			
20	0.43	0.08	0.31	0.06	0.17			
30	0.44	0.29	0.61	0.11	0.12			
40	0.53	0.11	0.98	0.15	0.14			
50	0.44	0.11	0.95	0.13	0.09			
75	0.38	0.17	1.22	0.16	0.02			
100	0.14	0.08	0.51	0.07	*			

DATE: 14.v.59

0	0.76	0.18	0.90	0.10	0.30			
10	0.82	0.18	0.69	0.08	0.34			
20	0.78	0.10	0.69	0.07	0.31			
30	0.77	0.15	0.68	0.29	0.18			
40	0.72	0.17	0.98	0.12	0.27			
50	0.70	0.13	0.97	0.10	0.27			
75	0.17	0.08	0.36	0.06	0.03			
100	0.16	0.09	0.70	0.12	*			

STATION: Port Hacking 100 m LAT. 34°05'30" S, LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 31.11.59

0	5.30	0	6.12	Chryomonads
20				
50	5.00	0	6.89	

DATE: 14.v.59

0	4.70	5.21	8.00	Skeletonema
20	0	5.06	8.00	Microflagellates
50	0	4.89	8.00	

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 19.v.59 TIME: 1030

0	20.60	19.78	25.18	4.91	99	8.24	0.25	0.20	0.04	0.2
10	20.55	19.77	25.18	4.91	99	8.23	0.32	0.13	0.02	0.2
20	20.72	19.77	25.14	4.85	98	8.18	0.24	0.16	0.07	0.4
30	20.60	19.77	25.16	4.82	97	8.20	0.32	0.06	0.05	0.6
40	20.45	19.76	25.19	4.70	95	8.21	0.37	0	0.06	1.0
50	19.70	19.73	25.37	4.45	88	8.20	0.41	0.02	0.04	2.6
75	18.55	19.67	25.57	4.35	85	8.19	0.53	0.05	0	6.0
100	17.65	19.66	25.77	4.23	81	8.17	0.54	0	0.13	6.6

DATE: 29.v.59 TIME: 1003

0	19.72	19.81	25.44	5.15	103	8.31	0.23	0.16	0.08	0.2
10	19.70	19.80	25.44	5.05	101	8.31	0.25	0.25	0.04	0.2
20	19.50	19.79	25.48	5.00	99	8.27	0.31	0.25	0.04	0.2
30	19.53	19.79	25.47	5.00	99	8.27	0.32	0.11	0.02	0.6
40	19.52	19.79	25.47	4.94	98	8.27	0.30	0.03	0	0.4
50	19.55	19.78	25.45	5.05	100	8.25	0.27	0.16	0.09	0.4
75	19.50	19.78	25.47	5.00	99	8.24	0.30	0.07	0	0.4
100	19.15	19.74	25.51	4.82	95	8.25	0.35	0.23	0.20	1.2

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 19.v.59

0	0.84	0.18	1.08	0.17	0.25			
10	0.78	0.15	1.15	0.23	0.22			
20	0.77	0.16	0.62	0.08	0.25			
30	0.74	0.11	1.16	0.15	0.18			
40	0.65	0.15	0.85	0.15	0.16			
50	0.30	0.06	0.52	0.08	0.08			
75	0.12	0.07	0.25	0.06	0.01			
100	0.28	0.19	1.49	0.31	*			

DATE: 29.v.59

0	0.94	0.25	1.38	0.17	0.23			
10	0.86	0.25	1.09	0.21	0.23			
20	0.84	0.24	1.06	0.21	0.18			
30	0.73	0.23	1.20	0.15	0.18			
40	0.70	0.23	0.99	0.20	0.14			
50	0.74	0.24	1.17	0.19	0.15			
75	0.62	0.29	1.23	0.25	0.05			
100	0.55	0.26	1.28	0.29	0.11			

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 29.v.59

0	5.65	5.78	6.90	<i>Nitzschia seriata</i>
20	5.36	5.68	6.00	Chrysomonads
50	4.85	5.00	6.86	

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 3.vi.59      TIME: 1040

0	19.45	19.75	25.44	5.15	102	8.30	0.23	0.26	0	0.2
10	19.35	19.75	25.47	5.10	101	8.26	0.23	0.22	0	0.4
20	19.35	19.75	25.47	5.07	100	8.25	0.26	0.26	0.02	0.2
30	19.50	19.75	25.43			8.25	0.23	0.18	0.02	0.2
40	19.40	19.74	25.44	5.05	100	8.24	0.27	0.29	0.06	0.4
50	19.45	19.74	25.43	5.10	101	8.24	0.27	0.21	0	0.8
75	19.20	19.74	25.50	5.15	102	8.24	0.28	0.15		0.4
100	18.08	19.69	25.71	4.47	86	8.23	0.50	0	0.20	0.8

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 3.vi.59

0	0.42	0.11	0.38	0.06	0.15			
10	0.58	0.18	0.52	0.06	0.22			
20	0.62	0.13	0.65	0.09	0.21			
30	0.60	0.14	0.71	0.08	0.21			
40	0.60	0.14	0.71	0.11	0.18			
50	0.47	0.14	0.59	0.16	0.07			
75	0.42	0.10	0.55	0.09	0.10			
100	0.24	0.10	0.43	0.14	0.03			

STATION: Port Hacking 100 m

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: 3.vi.59

TIME: 0530

<u>In situ</u>	1 day	0	1025	115	910	2.43	0.11
		10	537	27	510	1.37	
		20	1307	181	1126	3.02	
		50	715	250	465	1.24	

DATE: 3.vi.59

TIME: 0530

Bath	4 hrs	0	1101	48	1053	0.71	0.38
		10	900	94	806	0.54	
		20	1233	61	1172	0.79	
		50	1447	114	1333	0.89	



LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 3.vi.59

DEPTH 1% S.L.: 61 m  
SOLAR ALT.: 17°

0810

0	100
10	58
20	30
30	13
40	5.8
50	2.7
60	1.1
70	.5

DEPTH 1% S.L.: 67 m  
SOLAR ALT.: 34°

1000

0	100
10	59
20	41
30	18
40	9.8
50	4.7
60	1.9
70	.8

STATION: Port Hacking 100m

### 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: 3.vi.59

TIME: 1135

Bath	4 hrs	0	2564	73	2491	1.66	0.56
		10	2615	64	2551	1.71	
		20	531	27	504	0.34	
		50	2490	64	2426	1.63	

DATE: 3.vi.59

TIME: 1630

Bath	4 hrs	0	1067	61	1006	0.67	0.31
		10	1138	25	1113	0.74	
		20	880	56	824	0.55	
		50	949	65	884	0.59	

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 3.vi.59

DEPTH 1% S.L.: 70 m

SOLAR ALT.: 39°

1200

0	100
10	75
20	49
30	29
40	17
50	6.4
60	3.6
70	1.1

DEPTH 1% S.L.: 81 m

SOLAR ALT.: 29°

1420

0	100
10	68
20	37
30	24
40	12
50	6.9
60	4.1
70	2.1

STATION: Port Hacking 100m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
DATE: 3.vi.59				
0	4.48	5.38	6.78	<i>Nitzschia seriata</i>
20	4.65	5.43	6.86	Chryomonads
50	4.91	4.71	6.73	Dinoflagellates

STATION: Port Hacking 100m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 9.vi.59 TIME: 0959

0	18.90	19.74	25.57	5.09	100	8.29	0.23	0.20	0.15	
10	18.90	19.75	25.59	5.04	99	8.27	0.24	0.21	0	
20	18.80	19.76	25.62	5.01	98	8.25	0.31	0.03	0.09	
30	18.80	19.76	25.62	5.09	100	8.23	0.31	0.12	0.02	
40	18.75	19.76	25.63	5.15	101	8.23	0.25	0.06	0.07	
50	18.70	19.75	25.63	4.95	97	8.23	0.37	0.06	0.04	
75	18.70	19.76	25.63	5.02	98	8.22	0.31	0.09	0.03	
100	18.55	19.76	25.68	5.15	101	8.22	0.30	0.10	0	

DATE: 17.vi.59 TIME: 1018

0	18.25	19.81	25.81	5.20	101	8.32	0.30	0.01	0.09	
10	18.15	19.79	25.82	5.17	100	8.30	0.34	0.06	0.03	
20	18.20	19.79	25.81	5.11	99	8.28	0.30	0.08	0.05	
30	18.30	19.78	25.77	5.09	99	8.27	0.32	0.11	0	
40	18.20	19.78	25.81	5.11	99	8.26	0.30	0.10	0.05	
50	18.20	19.78	25.81	5.11	99	8.26	0.31	0.07	0.07	
75	18.15	19.78	25.81	5.11	99	8.25	0.32	0.04	0.08	
100	18.05	19.78	25.84	5.11	99	8.25	0.34	0.04	0.11	

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 9.vi.59

0	1.03	0.25	1.14	0.09	0.29
10	0.79	0.29	1.18	0.15	0.20
20	0.57	0.14	0.44	0.03	0.08
30	0.78	0.19	0.86	0.15	0.20
40	0.75	0.25	0.74	0.13	0.50
50	0.74	0.23	0.69	0.13	0.22
75	0.69	0.27	1.22	0.15	0.13
100	0.87	0.23	0.69	0.14	0.25

DATE: 17.vi.59

0	0.61	0.21	0.92	0.11	0.10
10	0.45	0.12	0.52	0.06	0.14
20	0.46	0.13	0.57	0.08	0.13
30	0.52	0.16	0.97	0.08	0.12
40	0.63	0.24	1.47	0.18	0.05
50	0.40	0.14	0.59	0.07	0.10
75	0.31	0.15	0.53	0.08	0.04
100	0.43	0.18	0.52	0.14	0.09

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 9.vi.59

0	4.61	5.89	6.30	Microflagellates
20	4.59	6.08	6.60	Microflagellates
50	4.43	6.16	6.78	Microflagellates

DATE: 17.vi.59

0	4.00	5.52	6.60	Cryptomonads
20	0	5.48	6.43	Gymnodinium
50	4.18	5.26	6.08	

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 23.vi.59 TIME: 1037

0	18.10	19.78	25.82	5.17	100	8.34	0.31	0.04	0	
10	18.00	19.78	25.84	5.11	99	8.27	0.32	0.13	0.05	
20	18.00	19.78	25.84	5.11	99	8.24	0.32	0.20	0.05	
30	18.00	19.79	25.85	5.11	99	8.26	0.29	0.21	0.02	
40	18.10	19.78	25.82	5.09	98	8.24	0.27	0.23	0.04	
50	18.05	19.78	25.83	5.09	98	8.23	0.23	0.27	0.26	
75	18.00	19.78	25.84	5.09	98	8.23	0.23	0.22	0.07	
100	17.50	19.75	25.93	4.85	93	8.24	0.39	0	0.20	

DATE: 2.vii.59 TIME: 1022

0	18.05	19.77	25.82	5.32	103	8.26	0.25	0.12	0.06	0.4
10	18.00	19.77	25.83	5.21	101	8.23	0.26	0	0.15	0.4
20	18.00	19.78	25.84	5.29	102	8.22	0.28	0.01	0.14	0.4
30	18.00	19.77	25.83	5.25	101	8.20	0.24	0.11	0.10	0.4
40	18.05	19.77	25.82	5.29	102	8.19	0.24	0.11	0.12	0.4
50	17.95	19.77	25.84	5.18	100	8.19	0.28	0.05	0.04	0.6
75	17.50	19.74	25.92	5.04	96	8.20	0.29	0.14	0.13	1.4
100	16.15	19.76	26.27	5.32	99	8.22	0.26	0.15	0.04	0.4



LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 23.vi.59

0	0.51	0.18	0.62	0.05	0.17
10	0.58	0.29	1.28	0.15	0.11
20	0.47	0.17	0.76	0.07	0.18
30	0.53	0.18	1.13	0.10	0.13
40	0.45	0.11	0.68	0.03	0.19
50	0.43	0.14	0.80	0.05	0.16
75	0.43	0.14	0.56	0.06	0.14
100	0.54	0.26	1.52	0.26	*

DATE: 2.vii.59

0	0.70	0.26	0.69	0.06	0.26
10	0.66	0.20	0.51	0.07	0.24
20	0.76	0.24	0.64	0.08	0.24
30	0.84	0.30	0.67	0.08	0.27
40	0.55	0.25	0.59	0.08	0.17
50	0.53	0.23	0.61	0.07	0.19
75	0.26	0.14	0.97	0.09	0.04
100	0.19	0.07	0.84	0.11	*

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
DATE: 23.vi.59				
0	4.30	5.62	6.40	Nitzschia closterium
20	0	5.88	7.00	Gymnodinium
50	0	5.52	6.95	Cryptomonads

DATE: 2.vii.59				
0	0	5.82	6.93	Cryptomonads
20	5.08	5.69	7.10	Gymnodinium
50	4.90	5.38	6.80	

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 7.vii.59 TIME: 1030

0	17.65	19.79	25.94	5.39	103	8.20	0.28	0.22	0.06	0.2
10	17.62	19.80	25.96	5.35	103	8.18	0.32	0.11	0.09	1.0
20	17.60	19.81	25.98	5.32	102	8.16	0.26	0.17	0.04	0.4
30	17.65	19.79	25.94	5.32	102	8.16	0.25	0.25	0.04	0.4
40	17.60	19.81	25.98	5.29	102	8.16	0.24	0.35	0.01	0
50	17.60	19.77	25.93	5.32	102	8.16	0.24	0.32	0.06	0.4
75	16.65	19.68	26.05	5.00	94	8.18	0.42	0.22	0.12	2.8
100	15.45	19.60	26.21	4.59	84	8.19	0.55	0.25	0.07	7.0

DATE: 14.vii.59 TIME: 1025

0	17.52	19.79	25.98	5.32	102	8.40	0.26	0.36	0.08	0
10	17.60	19.78	25.94	5.36	103	8.31	0.34	0.24	0.04	0.2
20	17.50	19.77	25.95	5.29	101		0.29	0.27	0.02	0.2
30	17.60	19.77	25.94	5.29	101	8.26	0.29	0.18	0.13	0.2
40	17.30	19.78	26.02	5.48	105	8.20	0.28	0.28	0.06	0.2
50	17.20	19.76	26.02	5.21	99	8.20	0.30	0.22	0.12	0.4
75	17.12	19.75	26.03	5.29	101	8.19	0.34	0.24	0.08	0.4
100	16.60	19.69	26.08	4.86	91	8.18	0.44	0.26	0.04	2.8

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 7.vii.59

0	0.88	0.27	0.86	0.08	0.27
10	0.76	0.20	0.87	0.05	0.28
20	0.85	0.27	1.02	0.20	0.13
30	0.84	0.22	0.63	0.08	0.26
40	0.81	0.28	1.47	0.17	0.11
50	1.00	0.28	0.67	0.16	0.20
75	0.65	0.26	0.45	0.13	0.17
100	0.16	0.07	0.51	0.14	0.13

DATE: 14.vii.59

0	0.62	0.28	0.57	0.07	0.13
10	0.79	0.27	0.52	0.08	0.23
20	0.83	0.25	0.47	0.09	0.22
30	0.77	0.09	1.05	0.10	0.19
40	0.63	0.08	0.91	0.09	0.16
50	0.61	0.07	0.83	0.12	0.11
100	0.34	0.15	0.82	0.11	0.02

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 7.vii.59

0	5.30	6.38	7.57	<i>Nitzschia closterium</i>
20	5.00	6.78	8.00	<i>Leptocylindrus danicus</i>
50	5.00	5.95	7.40	

DATE: 14.vii.59

0	4.00	5.62	6.88	<i>Nitzschia seriata</i>
20	4.30	5.65	6.10	
50	0	5.95	6.76	

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE:	23.vii.59		TIME:	1105						
0	18.10			5.11					0.15	2.0
10	17.90	19.75	25.83	5.00	96				0.18	
20	18.00	19.76	25.83	5.25	101	8.31			0	0.6
30	18.10	19.74	25.77	4.94	96				0.32	1.0
40	18.10	19.75	25.78	4.94	96	8.28	0.33	0.11	0	0.2
50	17.80	19.73	25.83	4.96	95	8.26	0.23	0.31	0	1.0
75	17.10	19.72	25.99	4.89	93	8.25	0.40	0.14	0.11	1.4
100	16.70	19.70	26.06	4.62	87	8.24	0.48	0.24	0	3.8

DATE:	29.vii.59		TIME:	1101						
0	17.15	19.73	25.97	5.30	101	8.30	0.26	0.20	0.04	0.2
10	17.00	19.71	25.98	5.26	100	8.30	0.29	0.19	0.09	0.2
20	17.00	19.69	25.98	5.30	100	8.29	0.29	0.23	0.03	0.4
30	16.95	19.68	25.96	5.30	100	8.28	0.30	0.25	0.06	0.4
40	16.95	19.71	26.00	5.30	100	8.28	0.29	0.15	0.04	0.4
50	16.92	19.74	26.07	5.30	100	8.27	0.26	0.14	0.04	0.4
75	16.90	19.70	26.02	5.20	98	8.26	0.32	0.14	0.09	0.4
100	16.60	19.68	26.07	4.90	92	8.26	0.44			1.6

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 23.vii.59

0	0.57	0.19	0.97	0.12	0.10
10	0.57	0.17	1.06	0.08	0.17
20	0.48	0.18	0.55	0.08	0.16
30	0.62	0.25	1.58	0.17	0.09
40	0.57	0.24	0.81	0.09	0.17
50	0.55	0.17	0.54	0.06	0.22
75	0.31	0.14	0.70	0.14	0.02
100	0.26	0.09	1.01	0.14	0.02

DATE: 29.vii.59

0	0.67	0.25	0.65	0.08	0.27
10	0.77	0.25	0.62	0.11	0.32
20	0.71	0.21	0.56	0.10	0.27
30	0.70	0.21	0.54	0.11	0.26
40	0.51	0.17	0.34	0.12	0.17
50	0.48	0.19	0.47	0.11	0.17
75	0.45	0.13	0.52	0.07	0.16
100	0.16	0.06	0.47	0.13	*

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 29.vii.59

0	4.60	5.42	7.18
20	4.30	6.04	7.06
50	4.00	5.24	7.08

*Nitzschia seriata*  
*Chrysochromulina*



STATION: Port Hacking 100m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE:	4.viii.59		TIME:	1030						
0	18.35	19.80	25.78	4.31	84	8.30	0.22	0.43	0.04	0
10	18.35	19.80	25.78	5.24	102	8.28	0.21	0.33	0	0
20	18.20	19.78	25.80	5.12	99	8.27	0.24	0.32	0	0.4
30		19.76		5.23		8.26	0.24	0.28	0	0.2
40	17.55	19.74	25.89	5.15	98	8.25	0.26	0.27	0	0.4
50	17.28	19.72	25.94			8.25	0.37	0.28	0.02	1.2
75	16.44	19.68	26.09	4.66	87	8.25	0.50	0.43	0	3.2
100		19.66		4.61		8.23	0.56	0.39	0	3.8

DATE:	11.viii.59		TIME:	1032						
0	18.60	19.80	25.72	5.06	99	8.29	0.26	0.40	0	0.2
10	18.60	19.80	25.72	4.98	97	8.29	0.25	0.29	0.09	0.2
20	18.60	19.80	25.72	4.92	96	8.29	0.24	0.34	0.03	0.4
30	18.60	19.80	25.72	4.49	88	8.27	0.24	0.34	0	0.4
40	18.50	19.80	25.74	4.83	94	8.26	0.27	0.31	0	0.4
50	17.95	19.76	25.83	5.10	98	8.25	0.27	0.31	0	0.4
75	16.95	19.72	26.00	5.08	96	8.24	0.34	0.23	0	0.8
100	16.60	19.70	26.08	4.83	91	8.24	0.45	0.13	0	2.2

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 4.viii.59

0	1.05	0.22	0.94	0.11	0.35
10	0.94	0.16	0.74	0.09	0.32
20	0.85	0.17	1.25	0.17	0.16
30	0.41	0.18	0.23	0.07	0.14
40	0.38	0.23	0.33	0.10	0.06
50	0.29	0.07	0.32	0.08	0.08
75	0.20	0.06	0.47	0.08	0.02
100	0.20	0.06	0.45	0.10	0.02

DATE: 11.viii.59

0	0.63	0.14	0.95	0.09	0.21
10	0.53	0.15	0.62	0.04	0.25
20	0.53	0.11	0.73	0.06	0.22
30	0.54	0.14	0.86	0.11	0.21
40	0.53	0.13	0.84	0.07	0.21
50	0.56	0.14	0.90	0.08	0.23
75	0.35	0.03	0.17	0.03	0.22
100	0.21	0.08	*	0.01	0.13

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 4.viii.59

0	5.60	5.54	6.80	<i>Thalassiosira rotula</i>
20	5.78	5.89	6.57	<i>Nitzschia seriata</i>
50	5.62	4.94	6.42	<i>Chaetoceros secundum</i>

STATION: Port Hacking 100m

HYDROLOGY

Depth	Temp.	Cl‰	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE: 20.viii.59		TIME: 1033								
0	18.10	19.80	25.84	5.29	102	8.27	0.23	0.21	0.08	0
10	18.05	19.80	25.85	5.29	102	8.27	0.32	0.14	0.02	0
20	17.92	19.79	25.87	5.29	102	8.26	0.25	0.21	0.04	0
30	17.95	19.79	25.86	5.32	103	8.25	0.26	0.16	0.08	0
40	17.90	19.79	25.88	5.29	102	8.26	0.24	0.20	0.02	0
50	17.90	19.79	25.88	5.29	102	8.25	0.30	0.18	0.07	0
75	17.78	19.79	25.91	5.29	104	8.25	0.30	0.18	0	0
100	17.55	19.77	25.94	5.22	100	8.25	0.35	0.26	0.02	0

DATE: 26.viii.59		TIME: 1035								
0	17.15	19.64	25.86	5.08	96	8.15	0.49	0.14	0.07	2.8
10	17.00	19.65	25.92	4.83	91	8.14	0.52	0.22	0.10	3.4
20	16.95	19.65	25.93	4.80	91	8.14	0.52	0.08	0.10	3.0
30	16.80	19.63	25.93	4.72	89	8.13	0.56	0.04	0.10	3.6
40	16.58	19.64	26.00	4.77	89	8.13	0.56	0.07	0.08	3.2
50	16.60	19.64	26.00	4.83	91	8.11	0.56	0.09	0.04	3.0
75	16.26	19.62	26.05	5.32	99	8.10	0.57	0.06	0.17	4.0
100	13.76	19.48	26.39	5.32	94	8.04	0.79	0.05	0.02	10.6

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 20.viii.59

0	0.79	0.15	1.13	0.06	0.28
10	0.88	0.16	0.91	0.04	0.36
20	0.98	0.15	1.25	0.11	0.29
30	0.77	0.21	1.10	0.16	0.30
40	0.66	0.12	0.84	0.06	0.30
50	0.50	0.16	0.93	0.08	0.22
75	0.34	0.20	1.03	0.11	0.02
100	0.33	0.18	1.21	0.14	0.05

DATE: 26.viii.59

0	0.73	0.22	0.62	0.08	0.23
10	0.70	0.09	0.73	0.06	0.23
20	0.47	0.16	0.57	0.06	0.14
30	0.37	0.15	1.12	0.15	0.07
40	0.24	0.02	0.86	0.12	0.09
50	0.29	0.07	0.89	0.13	0.06
75	0.29	0.13	0.91	0.12	0.02
100	0.14	0.06	0.42	0.09	0.01

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 20.viii.59

0	0	5.42		Detrital material
20	0	4.86	5.08	Chrysochromulina
50	0	4.61	6.20	

DATE: 26.viii.59

0	0	0	6.88	
20	0	0	6.32	
50	0	0	5.18	

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 1.ix.59 TIME: 0950

0	17.20	19.62	25.82	5.50	104	8.28	0.30	0.37	0.17	0
10	17.00	19.63	25.90	5.14	97	8.20	0.33	0.25	0.07	0.6
20	16.90	19.64	25.93	4.96	94	8.20	0.40	0.39	0.14	1.6
30	16.90	19.64	25.93	4.79	90	8.14	0.45	0.18	0.02	2.6
40	16.95	19.63	25.90	4.82	91	8.12	0.48	0.22	0.09	2.6
50	16.85	19.64	25.94	4.49	85	8.10	0.50	0.17	0.03	3.0
75	15.40	19.57	26.17	4.79	88	8.12	0.54	0.25	0.07	5.2
100	13.00	19.47	26.53	4.61	80	8.07	0.77	0.16	0.09	9.8

DATE: 9.ix.59 TIME: 1100

0	17.25	19.63	25.83	5.69	108	8.30	0.20	0.30	0.15	0
10	17.20	19.65	25.86	5.85	111	8.30	0.32	0.14	0.10	0
20	17.20	19.65	25.86	5.80	110	8.27	0.39	0.07	0.19	0
30	17.00	19.65	25.92	5.69	108	8.27	0.31	0.12	0.22	0
40	16.80	19.65	25.96	5.34	101	8.26	0.42	0.27	0.07	0.4
50	16.60	19.63	25.99	5.15	97	8.26	0.41	0.22	0.11	1.6
75	16.10	19.62	26.09	4.73	88	8.23	0.62	0.08	0.07	5.0
100	15.60	19.55	26.10	4.44	82	8.21	0.71	0.08	0.14	6.4

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 1.ix.59

0	6.00	0.44	5.35	0.42	1.54			
10	4.43	0.40	2.86	0.22	1.08			
20	2.43	0.25	1.83	0.14	0.64			
30	1.44	0.31	0.43	0.17	0.32			
40	0.81	0.30	0.33	0.20	0.08			
50	0.46	0.18	0.01	0.16	0.04			
75	0.33	0.03	0.91	0.10	0.02			
100	0.23	0.07	1.13	0.16	*			

DATE: 9.ix.59

0	4.84	0.32	3.10	0.17	1.15			
10	4.45	0.23	2.71	0.36	0.90			
20	4.19	0.32	2.71	0.25	0.92			
30	5.43	0.29	2.67	0.33	1.19			
40	4.74	0.42	2.49	0.25	1.04			
50	2.58	0.26	1.83	0.39	0.34			
75	0.78	0.20	1.41	0.14	0.09			
100	0.91	0.17	0.68	0.14	0.20			



STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 1.ix.59

0	6.00	6.96	6.70	Prorocentrum
20	6.11	6.99	6.85	Thalassiosira aestivalis
50	0	4.78	5.85	Nitzschia seriata

DATE: 9.ix.59

0	5.30	5.65	6.70	Skeletonema costatum
20	5.60	5.86	6.79	Nitzschia seriata
50	5.36	5.82	6.10	

LATITUDE: 34°05' S.

LONGITUDE: 151°13' E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 10.ix.59

0	4.14	0.41	3.71	0.42	0.08
10	3.31	0.30	2.38	0.31	0.63
20	3.51	0.37	2.74	0.43	0.54
30	3.64	0.39	1.67	0.28	0.78
40	2.17	0.20	1.33	0.31	0.42
50	1.75	0.16	1.23	0.33	0.29

DATE: 11.ix.59

0	0.91	0.18	1.09	0.10	0.18
10	1.34	0.24	0.98	0.21	0.11
20	3.10	0.41	1.72	0.36	0.33
30	1.91	0.22	1.66	0.23	0.24
40	1.60	0.17	1.78	0.28	0.13
50	2.16	0.39	2.26	0.45	0.18

STATION: Port Hacking 100 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
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DATE: 16.ix.59      TIME: 1105

0	17.90	19.62	25.65	5.56	107	8.34	0.25	0.25	0.13	0
10	17.15	19.62	25.83	5.39	102	8.32	0.30	0.22	0.03	0
20	16.95	19.61	25.87	5.53	105	8.29	0.35	0.51	0.13	0
30	15.47	19.61	26.20	4.51	83	8.30	0.70	0.10	0.10	3.4
40	15.48	19.60	26.20	4.45	82	8.26	0.68	0.14	0.19	4.6
50	15.25	19.60	26.24	4.36	80	8.24	0.70	0.10	0.14	4.8
75	15.20	19.60	26.25	4.45	81	8.20	0.74	0.03	0.15	4.6
100	15.13	19.60	26.27	4.58	83	8.19	0.70	0.02	0.05	4.2

DATE: 24.ix.59      TIME: 1052

0	16.80	19.70	26.04	5.59	105	8.32	0.23	0.32	0.13	0
10	16.60	19.70	26.09	5.52	104	8.29	0.24	0.29	0.05	0
20	16.80	19.71	26.05	5.57	105	8.27	0.25	0.24	0.06	0
30	16.55	19.70	26.10	5.55	104	8.27	0.25	0.35	0.19	0
40	16.60	19.70	26.09	5.52	104	8.26	0.27	0.16	0.17	0
50	16.55	19.70	26.10	5.50	103	8.26	0.26	0.25	0.04	0
75	15.80	19.65	26.20	5.50	102	8.27	0.30	0.74	0.22	0.4
100	15.50	19.63	26.24	5.37	99	8.26	0.36	0.26	0.17	0

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

Depth	Chlorophyll			Astacin	Non Astacin	Time	Depth	Percentage Surface Light
	a	b	c					
DATE:	16.ix.59							
0	2.26	0.20	1.99	0.15	0.59			
10	4.28	0.25	2.60	0.26	1.06			
20	5.78	0.24	3.17	0.31	1.39			
30	1.17	0.18	0.91	0.17	0.21			
40	1.01	0.06	0.46	0.12	0.24			
50	0.46	0.09	0.38	0.09	0.07			
75	0.36	0.07	0.39	0.08	0			
100	0.14	0.08	0.23	0.08	*			

DATE:	24.ix.59				
0	1.70	0.26	1.55	0.12	0.55
10	1.59	0.26	1.16	0.16	0.49
20	1.90	0.34	1.68	0.18	0.51
30	1.98	0.45	1.94	0.21	0.54
40	2.07	0.39	1.08	0.18	0.52
50	2.06	0.55	2.24	0.32	0.37
75	1.68	0.26	1.72	0.20	0.30
100	1.84	0.26	1.15	0.15	0.36

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 16.ix.59

0	5.00	4.30	6.40	Chaetoceros secundum
20	5.40	4.48	6.88	Nitzschia seriata
50	4.15	3.78	6.30	Lauderia annulata

DATE: 24.ix.59

0	5.40	4.70	6.34	Schroederella
20	5.70	5.30	6.10	Chrysomonads
50	5.18	4.40	6.10	Melosira moniliformis

STATION: Port Hacking 100m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE:	29.ix.59		TIME:	1037						
0	16.85	19.73	26.07	5.51	104	8.37	0.21	0.32	0.02	0
10	16.80	19.73	26.08	5.56	105	8.33	0.22	0.36	0.06	0
20	16.80	19.72	26.07	5.56	105	8.28	0.22	0.12	0.05	0.8
30	16.75	19.73	26.09	5.51	104	8.27	0.21	0.15	0.05	0
40	16.75	19.73	26.09	5.45	103	8.27	0.23	0.20	0.07	0
50	16.78	19.73	26.09	5.38	101	8.28	0.23	0.07	0.02	0
75	16.55	19.71	26.11	5.25	98	8.29	0.30	0.11	0.02	0.2
100	15.78	19.66	26.22	5.19	96	8.28	0.37	0.15	0.03	1.0

DATE:	8.x.59		TIME:	1048						
0	17.01	19.72	26.02	5.66	107	8.36	0.23	0.09	0.16	0
10	16.70	19.72	26.09	5.66	107	8.36	0.30	0.11	0.09	0
20	16.62	19.73	26.11	5.65	106	8.31	0.29	0.12	0.11	0
30	16.53	19.72	26.13	5.31	100	8.25	0.35	0.04	0.02	0
40	16.42	19.72	26.16	5.37	101	8.25	0.39	0	0.04	0
50	16.49	19.71	26.13	5.50	103	8.25	0.35	0.01	0.03	0
75	16.42	19.72	26.16	5.52	103	8.23	0.39	0.02	0.05	0
100	16.27	19.71	26.18	5.31	99	8.23	0.44	0	0.08	0

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 29.ix.59

0	1.33	0.28	1.30	0.14	0.32
10	1.24	0.28	1.17	0.19	0.28
20	1.51	0.35	1.17	0.19	0.34
30	1.43	0.34	1.24	0.17	0.31
40	1.58	0.32	1.37	0.13	0.40
50	1.39	0.32	1.32	0.16	0.34
75	0.43	0.14	0.65	0.12	0.06
100	0.31	0.10	0.57	0.11	0.03

DATE: 8.x.59

0	0.93	0	1.11	0.17	0.26
10	1.10	0.05	1.07	0.08	0.32
20	0.58	0.08	0.64	0.09	0.14
30	0.36	0.09	0.75	0.09	0.07
40	0.42	0.12	0.97	0.15	0.04
50	0.40	0.09	0.59	0.09	0.09
75	0.31	0.11	1.04	0.14	*
100	0.24	0.06	0.53	0.08	0.01

STATION: Port Hacking 100m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 29.ix.59

0	6.13		6.54	Skeletonema costatum
20	5.85		6.68	Schroederella delicatula
50	6.11		6.74	Bacteriastrium hyalinum

DATE: 8.x.59

0	5.18	5.85	6.70	Chaetoceros secundum
20	5.93	5.81	6.75	Skeletonema costatum
50	5.18	5.40	6.60	Chrysomonads



STATION: Port Hacking 100 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE: 27.x.59		TIME: 1030								
0	18.12	19.54	25.49	4.60	89	8.28	0.21	0	0	0
10	18.01	19.52	25.47	5.46	105	8.26	0.22	0.15	0.04	0
20	17.27	19.56	25.72	4.62	88	8.26	0.25	0.14	0.04	0
30	17.24	19.62	25.81	3.32	63	8.25	0.32	0.09	0.02	0
40	16.97	19.64	25.91	4.54	86	8.24	0.34	0.07	0.04	0.2
50	15.96	19.63	26.15	4.80	89	8.23	0.43	0	0.02	2.6
75	14.51	19.57	26.34	4.57	82	8.22	0.63	0.04	0.13	5.2
100	13.97	19.54	26.43	4.50	80	8.19	0.68	0.10	0.09	6.8

DATE: 3.xi.59		TIME: 0930								
0	18.85	19.30	24.98	5.71	112	8.39	0.19	0.16	0.08	0
10	18.60	19.43	25.20	5.59	109	8.35	0.20	0.19	0.24	0
20	17.65	19.38	25.39	5.31	102	8.30	0.29	0.16	0.03	0
30	17.50	19.50	25.59	5.05	96	8.24	0.31	0.10	0.09	0.6
40	15.60	19.51	26.05	4.50	83	8.29	0.59	0	0.10	3.6
50	15.00	19.59	26.30	4.45	81	8.27	0.62	0.05	0.04	5.0
75	14.20	19.54	26.38	4.43	79	8.26	0.69	0.07	0.11	6.4
100	13.85	19.52	26.41	4.35	77	8.21	0.79	0.03	0.15	5.6

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 27.x.59

0	0.64	0.12	0.94	0.23	0.16			
10	0.89	0.18	0.72	0.11	0.27			
20	0.57	0.13	1.10	0.18	0.12			
30	0.27	0.11	0.81	0.13	0			
40	0.24	0.07	0.56	0.09	0.01			
50	0.20	0.08	0.59	0.17	0.01			
75	0.17	0.06	0.45	0.14	*			
100	0.13	0.05	0.36	0.07	0			

DATE: 3.xi.59

0	2.06	0.11	1.46	0.18	0.54			
10	2.69	0.11	1.77	0.28	0.59			
20	1.99	0.15	1.61	0.23	0.49			
30	2.09	0.07	1.92	0.20	0.53			
40	0.34	0.01	0.33	0.10	0.05			
50	0.33	0.04	0.74	0.12	0.01			
75	0.16	*	0.51	0.05	0.03			
100	0.17	0.02	0.49	0.08	0.05			

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 27.x.59

0	5.30	5.74	6.30	Prorocentrum micans
20	5.11	6.11	6.70	Schroederella delicatula
50	5.00	5.30	6.18	

DATE: 3.xi.59

0	5.60	6.30	6.40	Prorocentrum micans
20	5.60	6.10	6.40	
50	5.00	5.90	6.10	

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE: 13.xi.59		TIME: 1000								
0	18.55	19.37	25.14	5.11	99	8.29	0.25	0.23	0.19	0
10	18.10	19.48	25.41	5.43	105	8.26	0.20	0.21	0.02	0
20	18.10	19.49	25.42	5.35	103	8.26	0.21	0.20	0.13	0
30	18.30	19.55	25.45	5.40	105	8.23	0.22	0.21	0	0
40	17.40	19.58	25.73	4.65	89	8.22	0.32	0.22	0.13	0.6
50	16.22	19.62	26.07	4.60	86	8.22	0.59	0.28	0.02	3.8
75	14.90	19.56	26.25	4.51	82	8.22	0.65	0	0.19	5.8
100	13.65	19.49	26.43	4.55	81	8.22	0.77	0.10	0.02	6.4

DATE: 17.xi.59		TIME: 1020								
0	19.40	19.09	24.55	5.55	109		0.14	0.25	0.04	0
10	19.60	19.62	25.22	4.04	80	8.37	0.16	0.21	0.02	0
20	19.60	19.64	25.26	5.35	106	8.26	0.16	0.23	0.04	0
30	19.54	19.59	25.20	5.10	101	8.23	0.18	0.19	0.04	0
40	18.80	19.57	25.36	5.29	104	8.17	0.21	0.24	0.02	0
50	17.45	19.57	25.69	4.83	92	8.13	0.37	0.20	0.08	0.4
75	15.25	19.51	26.13	4.45	81	8.09	0.63	0.12	0.04	4.0
100	13.75	19.52	26.44	4.56	81	8.10	0.67	0.08	0.12	6.0

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 13.xi.59

0	1.39	0.03	1.64	0.13	0.36			
10	0.99	0.15	1.13	0.18	0.14			
20	0.82	0.11	1.18	0.13	0.13			
30	1.09	0.09	1.81	0.22	0.17			
40	0.84	0.11	1.21	0.17	0.14			
50	0.51	0.10	1.10	0.12	0.06			
75	0.27	0.16	0.64	0.16	*			
100	0.10	0.03	0.25	0.06	0.01			

DATE: 17.xi.59

0	1.07	0.15	0.70	0.16	0.30			
10	0.38	0.10	0.19	0.07	0.15			
20	0.26	0.08	0.41	0.06	0.08			
30	0.40	0.08	0.51	0.15	0.08			
40	0.53	0.12	0.63	0.10	0.15			
50	0.79	0.09	0.90	0.12	0.18			
75	0.35	0	0.28	0.07	0.09			
100	0.11	*	0.36	0.07	0			

STATION: Port Hacking 100 m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 13.xi.59

0		5.40
20		5.30
50	4.70	5.93

Prorocentrum micans  
Rhizosolenia alata

DATE: 17.xi.59

0		6.02
20		5.52
50		5.40

Microflagellates

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE: 26.xi.59		TIME: 1023								
0	20.60	19.37	24.61	5.45	110	8.12	0.19	0.11	0.05	0
10	19.80	19.55	25.07	5.45	109	8.16	0.16			0
20	19.30	19.58	25.25	5.32	105	8.13	0.17	0.18	0.06	0
30	17.15	19.60	25.81	4.56	87		0.39	0.18	0.16	0.6
40	15.60	19.58	26.15	4.30	79	8.14	0.61	0	0.06	4.6
50	14.80	19.57	26.28	4.23	76	8.05	0.67	0.06	0.08	5.6
75	13.80	19.56	26.49	4.35	77	7.96	0.65	0.04	0.06	5.4
100	13.60	19.54	26.50	4.10	72	8.01	0.68	0.17	0.02	5.0

DATE: 1.xii.59		TIME: 1025								
0	20.40	19.46	24.79	5.38	108		0.21	0.01	0.19	0
10	16.80	19.54	25.82	5.02	94		0.45	0.18	0.22	0.2
20	16.40	19.55	25.92	4.74	88		0.57	0.06	0.14	1.2
30	15.60	19.55	26.10	4.04	74		0.80	0	0	5.8
40	14.90	19.54	26.18	3.91	71		0.85	0	0.17	6.6
50	14.40	19.53	26.32	3.85	69		0.90	0	0	6.2
75	13.85	19.52	26.43	4.40	78		0.81	0	0.06	4.2
100	13.70	19.51	26.45	4.85	86		0.86	0	0.09	5.2

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 26.xi.59

0	0.62	0.04	0.68	0.14	0.15
10	0.61	0.05	0.48	0.11	0.15
20	0.88	0.12	0.59	0.15	0.18
30	1.11	0.13	1.08	0.13	0.30
40	0.54	0.04	0.60	0.05	0.17
50	0.31	0.03	0.37	0.07	0.07
75	0.19	0.02	0.26	0.08	0.01
100	0.12	0.04	0.08	0.07	0.01

DATE: 1.xii.59

0	0.39	0.11	0.46	0.11	0.15
10	4.11	*	3.44	0.31	0.91
20	3.17	*	1.81	0.22	0.71
30	4.94	*	3.75	0.30	1.23
40	0.78	*	0.48	0.09	0.17
50	0.44	0.04	0.52	0.10	0.05
75	0.18	0.03	0.30	0.04	0.01
100	0.18	0.03	0.31	0.04	0.01



STATION: Port Hacking 100m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 26.xi.59

0	0	5.48	5.95	Microflagellates
20	0	5.60	6.02	
50	0	5.24	5.48	

DATE: 1.xii.59

0	5.88	0	6.60	Leptocylindrus danicus
20	6.04	0	6.81	Schroederella delicatula
50	5.30	0	6.42	

STATION: Port Hacking 100 m

### HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE:	9.xii.59		TIME:	1044						
0	20.70	19.53	24.80	5.25	106	8.31	0.22	0.12	0.14	0
10	21.00	19.69	24.96	5.13	104	8.28	0.23	0.17	0	0
20	20.30	19.58	24.98	5.45	109	8.27	0.28	0.17	0	0
30	19.70	19.53	25.06	5.32	106	8.27	0.29	0.08	0.05	0
40	17.20	19.55	25.73	4.80	91	8.25	0.52	0	0	2.0
50	16.10	19.56	26.00	4.23	78	8.22	0.63	0.06	0.14	4.4
75	14.50	19.54	26.32	4.04	73	8.21	0.76	0	0.04	6.6
100	13.80	19.57	26.49	4.10	73	8.21	0.49	0	0.15	2.6

DATE:	15.xii.59		TIME:	1103						
0	21.90	19.71	24.75	5.02	104	8.27	0.24	0	0.08	0
10	21.60	19.69	24.80	5.02	103	8.26	0.23	0.04	0.10	0
20	21.00	19.67	24.92	5.20	106	8.26	0.21	0.05	0.06	0
30	20.50	19.62	24.99	5.58	113	8.26	0.19	0.20	0.08	0
40		19.57		5.49		8.26	0.23	0.07	0.17	0
50	18.30	19.55	25.45	4.96	96	8.26	0.35	0.04	0.03	0
75	15.20	19.52	26.14	3.83	70	8.24	0.67	0	0	5.0
100	14.70	19.53	26.27	3.66	66	8.20	0.87			7.0

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 9.xii.59

0	0.28	0.08	0.52	0.07	0.09			
10	0.12	0.04	0.17	0.05	0.06			
20	0.21	0.14	0.49	0.08	0.05			
30	0.20	0.02	0.54	0.07	0.05			
40	1.00	0.06	1.36	0.10	0.43			
50	0.99	0.06	1.37	0.16	0.28			
75	0.20	0.04	0.39	0.09	*			
100	0.42	0.07	0.68	0.14	0.01			

DATE: 15.xii.59

0	0.13	0.05	0.44	0.03	0.05			
10	0.19	0.09	0.65	0.07	0.02			
20	0.47	0.06	0.51	0.05	0.23			
30	0.52	0.14	0.84	0.11	0.14			
40	0.99	0.16	1.14	0.12	0.34			
50	1.38	0.25	1.49	0.20	0.44			
75	0.14	0.05	0.39	0.04	0.04			
100	0.06	0.03	0.19	0.04	0			

STATION: Port Hacking 100m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 15.xii.59

0	5.00
20	5.30
50	4.70

Microflagellates

STATION: Port Hacking 100 m

HYDROLOGY

Depth	Temp.	Cl <sup>o</sup> /oo	$\sigma_t$	O <sub>2</sub>	O <sub>2</sub> %	pH	Inorg. P	Org. P	Part. P	NO <sub>3</sub> -N
DATE:	22.xii.59			TIME:	1103					
0	21.30	19.60	24.75	5.02	102	8.26	0.18	0.16	0.09	0
10	20.95	19.61	24.85	5.05	102	8.25	0.18	0.16	0	0
20	20.95	19.62	24.87	5.08	103	8.24	0.17	0.17	0.06	0
30	20.00	19.63	25.13	5.08	102	8.23	0.18	0.16	0	0
40		19.60		4.30		8.23	0.49	0.15	0.05	3.4
50	15.10	19.56	26.29	3.54	64	8.22	0.78	0.04	0.03	10.2
75	14.55	19.56	26.33	4.23	76	8.17	0.66	0.08	0.05	6.0
100	14.35	19.56	26.37	4.25	76	8.16	0.68	0.12	0	8.4

LATITUDE: 34°05'30" S.

LONGITUDE: 151°15'30" E.

PIGMENTS

LIGHT PENETRATION

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

DATE: 22.xii.59

0	0.16	0.04	0.89	0.10	0.01			
10	0.12	*	0.96	0.07	0.02			
20	0.16	0.04	0.90	0.08	0			
30	0.24	0.10	0.30	0.12	0.03			
40	0.64	0.11	0.69	0.07	0.17			
50	0.55	0.15	0.88	0.12	0.10			
75	0.07	*	0.63	0.29	*			
100	0.06	0.01	0.47	0.10	*			

STATION: Port Hacking 100m LAT. 34°05'30" S. LONG. 151°15'30" E.

PHYTOPLANKTON

Depth	< 20 $\mu$	> 20 $\mu$	Total Particles	Dominant Organisms
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DATE: 22.xii.59

0	5.10
20	5.48
50	5.48

Microflagellates

## 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