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# OCEANOGRAPHICAL STATION LIST

of Investigations made by the Division of Fisheries,  
Commonwealth Scientific and Industrial Research  
Organization, Australia

## Volume 2

Hydrological and Planktological Observations

by F.R.V. Warreen in South-eastern

Australian Waters, 1940-42

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH  
ORGANIZATION, AUSTRALIA  
MELBOURNE 1951

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# OCEANOGRAPHICAL STATION LIST

OBSERVATIONS MADE BY F.R.V. *WARREEN* IN SOUTH-EASTERN  
AUSTRALIAN WATERS 1940-42

## I. INTRODUCTION

THE DATA published in this volume were collected by F.R.V. *Warreen* in the period 1940-42. Commencing in August 1940, a biannual series of midsummer, midwinter oceanographical cruises along the east Australian coastline from Cape Byron to Hobart was planned. At approximately 60-mile intervals along the coastline a series of six stations, the first three along the 30-, 55-, and 80-fathom contours and the remaining three at 10-mile intervals east of the 80-fathom station, was worked as a section line. The location of these section lines is shown in Table 1.

TABLE 1

Section No.	Location	Latitude
1	East of Cape Pillar	43° 13' S.
2	East of Maria Is.	42° 35' S.
3	East of St. Helen's	41° 20' S.
4	East of Babel Is.	39° 37' S.
5	East of Twofold Bay	37° 14' S.
6	East of Montague Is.	36° 19' S.
7	East of Jarvis Bay	35° 12' S.
8	East of Port Hacking	34° 10' S.
9	East of Norah Head	33° 17' S.
10	East of Port Stephens	32° 43' S.
11	East of Port Macquarie	31° 26' S.
12	East of Smoky Cape	30° 55' S.
13	East of Coffs Harbour	30° 17' S.
14	East of Cape Byron	28° 38' S.

Owing to the increase in war tempo and difficulties in maintaining a research vessel at sea, the midsummer 1942 cruise could not be completed. F.R.V. *Warreen* was handed over to the R.A.N. for war service in September 1942.

## II. HYDROLOGICAL OBSERVATIONS

(i) *Temperature*.—From January 1940, duplicate side-mounted reversing thermometers were used on all cruises of F.R.V. *Warreen*. In this volume of oceanographical data the temperatures are expressed as means of the duplicate readings after all corrections have been applied. Table 2 lists

the differences between the corrected duplicate readings in 0.01°C. intervals.

According to these data, 96 per cent. of the mean temperatures listed had a divergence of  $\pm 0.015^\circ\text{C}$ . from their duplicate components, and it is probable that this figure expresses the accuracy of single reading temperatures taken by F.R.V. *Warreen* prior to 1940.

(ii) *Salinity*.—Salinities were determined by Knudsen's adaptation of the Mohr technique for the estimation of chlorides (Oxner and Knudsen 1920). Standard bulb pattern Knudsen burettes and 10-ml. tap pipettes were used for the titration in yellow light. Copenhagen standard sea-water, with later supplies from Woods Hole, U.S.A., was used as a chloride reference solution.

TABLE 2

Difference (°C.)	No Readings	Percentage of All Readings
0.00	569	48
0.01	202	17
0.02	270	23
0.03	93	8
0.04	11	1
0.05	35	3
0.06	3	—
0.07	1	—
0.08	2	—
1,186		

(iii) *Depths*.—The depths given are either length of sampling cable reeled out or adjusted depths, assuming a constant deviation whenever a stray angle of more than  $10^\circ$  at the surface was noted. No unprotected thermometers were used.

(iv) *Phosphate P*.—Phosphate P was determined by Atkins's (1923) modification of the method of Denigès. A colour comparator of the Seiwel (1935) pattern was used. Phosphate P determinations were made as soon as possible after collection; values are reported as  $\mu\text{g. PO}_4\text{P/l.}$  and have not been corrected for salt error. The probable error of these determinations is of the order of  $\pm 1.5 \text{ PO}_4\text{P units.}$

(v) *Nitrate N*.—Nitrate N was determined by Harvey's reduced strychnine reagents. Details of the method followed by the C.S.I.R.O. Division of Fisheries for the preparation and use of this reagent are given by Rochford (1947). Nitrate N values are reported as  $\mu\text{g. NO}_3\text{N/l.}$  and have not been corrected for salt error. The probable error in the determinations is of the order of  $\pm 10 \text{ NO}_3\text{N units.}$

(vi) *Hydrogen Ion*.—The pH determinations were made by the

shipboard use of a Coleman pH electrometer employing a glass electrode. Correction of the shipboard values to *in situ* atmospheric pressure values was carried out by the use of Buch's (1937) formula and tables. The pH values are probably accurate to  $\pm 0.05$  unit.

(vii) *Dissolved Oxygen*.—Dissolved oxygen determinations were carried out according to Winkler's method, as modified by Thompson and Robinson (1939). The oxygen values are reported as ml/l. (20°C.). Oxygen saturated values were calculated by use of Fox's (1907) saturation tables. Dissolved oxygen values are probably accurate to  $\pm 0.05$  ml/l.

### III. PLANKTOLOGICAL OBSERVATIONS

As the records of the observations of fish made on the early cruises of F.R.V. *Warreen* have appeared elsewhere (Blackburn and Tubb 1950), the biological data on these tables have been restricted to a summary of planktological observations.

Two groups of the *Warreen* plankton collections have already been discussed in detail, the pelagic Tunicates by Thompson (1942, 1948) and the Chaetognaths by Thomson (1947).

Plankton hauls were made on the hydrological traverses. At the shelf stations the following hauls were made where practicable:

Vertical haul 50 m. to the surface with N70 net.

Horizontal surface haul for 15 min. with N70 net and N200 net.

Oblique haul 0-50 m. with N70 and N100 net.

At the slope stations the following hauls were made:

Vertical haul, using N70 closing-type net, sampling four depth sections, namely 500-250 m., 250-100 m., 100-50 m., 50-0 m.

Horizontal surface hauls, 15 min., N70 and N200 nets.

Oblique haul, 0-200 m., N70 and N100 nets.

From October 4, 1941 a change was made in the routine of plankton hauls. From October 4, 1941 to June 28, 1942 horizontal hauls only were made and these are shown in the following records as "H 50-0". These would ordinarily have been included as oblique hauls but as the depth of 50 metres was not always checked it was decided to continue to record these hauls as horizontal. From July 17 to July 19, 1942 the hauls were either surface horizontal hauls recorded as "H O" or vertical hauls from 50 metres to the surface recorded as "V".

The following notes refer to each of the columns of planktological observations:

(i) *Type of Gear*.—N50, N70, N100, N200 "Discovery"-type nets were used. A Hardy indicator was used at certain stations though the resulting catches were not studied in detail. The following abbreviations have been used:

V = Vertical haul,

O = Oblique haul,  
H = Horizontal haul.

(ii) *Depth*.—The depth is expressed in metres and gives detail of the depth of oblique hauls and the sections covered in vertical hauls.

(iii) *Duration*.—The duration of oblique and horizontal hauls is given in minutes.

(iv) *Volume*.—The hauls were preserved in formalin and, upon receipt at Cronulla, the volume was determined. It is given in cc.

(v) *Dominant Organism (D.O.)*.—As the catches were being studied a note was made of the animal group which from visual inspection was obviously the main constituent. The following abbreviations have been used:

C = Crustacea,  
Cp = Copepoda,  
Ch = Chaetognatha,  
Co = Coelenterata,  
F = Fish eggs and larvae,  
M = Mollusca,  
T = Tunicata (Thaliaceae, Copelata).

(vi) *Counts*.—A tenth was taken from each of the N70 hauls (see Thompson 1942, p. 9) and, though the hauls contained representatives of many groups, counts were made of only a few. In these lists the numbers are given for only four, listed in column six of the planktological observations under numbers I-IV:

I = Nyctiphanes (Crustacea, Euphausiacea),  
II = Thaliaceae (Tunicata),  
III = Copelata (Tunicata),  
IV = Chaetognatha.

#### IV. PERSONNEL

The programme of work to be done by F.R.V. *Warreen* in 1940-42 was designed after consultation by the Chief of the Division, Dr. H. Thompson, with the research officers—Mr. D. J. Rochford, the oceanographer and hydrologist, Mr. E. J. F. Wood, the bacteriologist, and the fisheries biologists, Dr. D. L. Serventy working on tuna, Mr. M. Blackburn working on clupeoids, and Mr. J. A. Tubb working on Australian salmon and barracouta. The observations and data collected on fish have been incorporated in other publications and, as already noted, are not included in this series.

The hydrology programme was under the direction of Mr. D. J. Rochford, who accompanied the vessel on many of the cruises and directed the laboratory analyses, the results of which appear in this series. The technical work of water sampling and taking temperatures was done by

the Sea-going Technical Officer, Mr. Graham Clarke.

The planktological work was under the direction of Dr. H. Thompson. The hauls were made and the nets and collections cared for by Mr. Graham Clarke, to whose enthusiasm and painstaking accuracy the Division is indebted for the collections made in the early years of the *Warreen's* investigations. When the collections reached the laboratory at Cronulla they were volumed, tented, sorted, counted, and recorded by Miss F. V. Murray.

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## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS							
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>			
1940											
9. i	1/40	34° 55' S. 151° 15' E.	38	0	19.10	19.65	35.50	25.39			
				10	19.00	.64	.48	.39			
				20	17.46	.63	.46	.75			
				30	17.05	.63	.46	.87			
				40	16.04	.62	.44	26.09			
				50	15.31	.59	.39	.22			
	2/40	34° 14' S. 151° 40' E.			0	20.49	19.72	35.62	25.12		
					10	20.14	.72	.62	.21		
					20	20.10	.71	.61	.21		
					30	20.04	.72	.62	.24		
					40	18.41	.69	.57	.63		
					50	17.64	.69	.57	.82		
					100	15.20	.65	.50	26.33		
					150	14.28	.59	.39	.45		
200					13.43	.54	.29	.55			
300					12.09	.46	.16	.71			
11. i	3/40	32° 47' S. 152° 40' E.		0	25.69	19.55	35.31	23.38			
				10	25.69	.55	.31	.38			
				20	25.70	.56	.34	.40			
				30	25.59	.58	.37	.45			
				40	24.31	.64	.48	.93			
				50	23.03	.63	.46	24.30			
				100	20.08	.68	.55	25.16			
				150	18.79	.67	.53	.50			
				200	18.66	.65	.50	.51			
				246	18.01	.67	.53	.70			
				328	16.67	.68	.55	26.03			
				492	14.01	.65	.50	.59			
				4/40	32° 47' S. 152° 14' E.	30	0	19.36	19.61	35.43	25.27
							10	18.58	.62	.44	.47
20	17.83	.58	.37				.61				
30	17.92	.60	.41				.62				
40	16.50	.58	.37				.93				
50	16.04	.59	.39				26.05				

### F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O.D.	Count				
										I	II	III	IV	
			5		N70	H 0	15	200	T		161	156		
			2		N70	V 50-0		30	Cp		84	106		
			5		N70	O 50		60	C		63	87	2	
			7		N100	O 50		100	T		91	3		
			12		N200	H 0	15	350	T		641	1	1	
			15											
			5		N70	H 0	15	50	Cp		3			37
			5		N70	V 50-0		20	Cp					
			4		N70	V100-50		20	Cp		2			3
			5		N70	V250-		10	Cp					7
			4			100								
			8		N70	V500-		20	Cp			2		4
			14			250								
			15		N70	O 200		50	Cp		1	1		15
			15		N100	O 200		50	C		1			11
			17		N200	H 0	15	200	C		14			31
			21											
			26											
			3	0	N70	H 0	15	50	Cp		11	2		150
			1	0	N70	O 0-200		150	Cp		34	14		79
			3	2	N100	O 0-200		200	C		29	1		27
			3	2	N200	H 0	15	50	Ch		6	1		63
			3	0										
			5	0										
			7	4										
			11	92										
			10	90										
			10	45										
			5	54										
			10											
			3		N70	H 0	15	22	Cp		6	30		3
			2		N70	V 50-0		20	Cp		7	146		2
			8		N70	O 0-50		25	Cp		13	182		3
			6		N100	O 0-50		8	T		1	1		1
			16		N200	H 0	15	10	Co		1	1		1
			6											

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$	
1940									
13.1	5/40	32° 52' S. 153° 8' E.	33	0	23.42	19.62	35.44	24.16	
				10	23.42	.62	.44	.16	
				20	20.40	.64	.48	25.03	
				30	19.16	.63	.46	.35	
				40	17.73	.59	.39	.65	
				50	17.20	.59	.39	.78	
	6/40	30° 18' S. 153° 16' E.	30	0	21.80	19.64	35.48	24.65	
				10	21.80	.66	.52	.68	
				20	21.69	.64	.48	.68	
				30	20.25	.61	.43	25.03	
				40	18.75	.60	.41	.41	
				50	18.53	.64	.48	.52	
	14.1	7/40	30° 13' S. 153° 33' E.		0	25.63	19.54	35.30	23.39
					10	25.70	.56	.33	.40
20					25.29	.58	.37	.55	
30					24.27	.61	.43	.90	
40					22.48	.67	.53	24.50	
50					19.80	.66	.52	25.22	
100					19.12	.67	.53	.42	
150					16.05	.58	.37	26.04	
200					15.14	.54	.30	.19	
300					14.37	.49	.21	.29	
400		13.50	.44	.12	.40				
600		11.91	.39	.03	.65				
8/40		31° 9' S. 153° 20' E.		0	25.87	19.53	35.28	23.30	
				10	25.89	.53	.28	.30	
	20			25.86	.54	.30	.32		
	30			25.74	.54	.30	.36		
	40			25.18	.55	.32	.53		
	50			22.64	.62	.44	24.38		
			90	20.38	.64	.48	25.04		
			135	17.46	.64	.48	.79		
			180	15.36	.57	.35	26.18		
			210	15.18	.54	.30	.18		
			280	14.13	.49	.21	.34		
			420	12.27	.41	.07	.60		

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (cc.)	O. D.	Count			
										I.	II	III	IV
			0		N70	H 0	15	50	Cp		38	230	17
			1		N70	V 50-0		10	Cp		70	162	3
			2		N70	O 0-50		30	Cp		171	201	7
			1		N100	O 0-50		10	T		62	14	13
			8		N200	H 0	15	50	Co		5	10	2
			10										
			2		N70	H 0	15	75	Cp				
			1		N70	V 50-0		50	Cp		154	171	3
			1		N70	O 0-50		30	Cp		463	220	4
			2		N100	O 0-50		10	T		31	10	1
			8		N200	H 0	15	5				8	
			10										
			2	0	N70	H 0	15	50	Cp		39	131	72
			3	12	N70	V 250-0		180	Cp		192	74	39
			1	6	N70	V 100-50		40	Cp		32	68	44
			0		N70	V 50-0		20	Cp		58	61	42
			1	11	N70	O 200		200	Cp		463	181	70
			10		N100	O 0-200		150	Cp		57	2	6
			9	94	N200	H 0	15	100	T		277	16	39
			11	45									
			18	87									
			14	155									
			10	111									
			14	175									
			1										
			2										
			2										
			1										
			3										
			3										
			5										
			9										
			13										
			16										
			16										
			20										

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS								
				Depth (m.)	Temp °C.	Cl <sup>o</sup> / <sub>oo</sub>	S <sup>o</sup> / <sub>oo</sub>	σ <sub>t</sub>				
1940												
28. i	9/40	35° 3' S. 151° 8' E.		0	21.19	19.76	35.70	24.99				
				10	21.19	.76	.70	.99				
				20	20.94	.74	.66	25.02				
				30	20.79	.74	.66	.08				
				40	19.82	.73	.64	.31				
				50	18.55	.71	.61	.62				
				100	15.65	.61	.43	26.17				
				150	14.47	.59	.39	.40				
				200	13.70	.63	.46	.62				
				300	12.50	.49	.21	.67				
				400	11.03	.35	34.96	.75				
				600	8.52	.08	.46	.79				
				29. i	10/40	35° 8' S. 150° 50' E.	37	0	20.60	19.74	35.66	25.12
								10	20.55	.74	.66	.13
20	19.99	.71	.61					.24				
30	18.77	.68	.55					.52				
40	17.88	.64	.48					.68				
50	16.42	.64	.48					26.03				
29. i	11/40	36° 13' 30" S. 150° 15' E.	35	0	20.30	19.75	35.68	25.21				
				10	20.26	.75	.68	.22				
				20	20.10	.74	.66	.25				
				30	20.05	.74	.66	.26				
				40	19.48	.73	.64	.40				
				50	19.49	.74	.66	.41				
30. i	12/40	37° 05' S. 150° 03' E.	33	0	19.70	19.75	35.68	25.37				
				10	19.59	.75	.68	.40				
				20	19.49	.73	.64	.40				
				30	19.47	.74	.66	.43				
				40	19.28	.74	.66	.47				
				50	19.24	.73	.64	.47				

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count			
										I	II	III	IV
			1		N70	H 0	15	10	Op	6	274		
			1		N70	V 50-0		50	T	8	74		
			2		N70	V100-50		75	T	9			
			1		N70	V250-100		10	Op	2	6	13	
			2		N70	V500-250		10	Op		1	5	
			5										
			6		N70	O 200		440	T	49	21	3	
			5		N100	O 200		350	T	47	3	4	
			15		N200	H 0		50	F	5	10	4	
			1		N70	H 0	15	250	M	240	123		
			1		N70	V 50-0		300	T	267	29		
			1		N70	O 50		350	T	340	28		
			2		N100	O 50		390	T	798			
			2		N200	H 0	15	420	T	494			
			3										
			1		N70	H 0	15	300	T	162	4	2	
			0		N70	V 50-0		150	T	127	85		
			1		N70	O 50		300	T	303	14	1	
			0		N100	O 50		400	T	552			
			0		N200	H 0	15	400	T	469		1	
			3										
			3		N70	H 0	15	350	T	131			
			0		N70	V 50-0		100	T	41			
			2		N70	O 50		450	T	135			
			3		N100	O 50		400	T	289			
			9		N200	H 0	15	400	T	235			
			4										

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1940								
16. ii	13/40	42° 33' S. 148° 36' E.		0	15.07	19.41	35.07	26.02
				10	14.59	.40	.05	.11
				20	14.39	.39	.03	.14
				30	14.41	.43	.09	.18
				40	14.28	.42	.08	.21
				50	14.23	.41	.07	.21
				100	14.18	.47	.17	.21
				150	13.58	.42	.08	.35
				200	13.02	.53	.28	.62
				300	11.52	.39	.03	.72
				400	10.01	.27	34.81	.82
600	7.80	.10	.51	.93				
18. ii	14/40	43° 14' S. 148° 03' E.	60	0	14.49	19.31	34.88	26.01
				10	14.30	.35	.96	.11
				20	14.24	.36	.97	.14
				30	14.37	.38	35.01	.14
				40	14.24	.36	34.97	.14
				50	13.99	.36	.97	.19
19. ii	15/40	42° 37' S. 148° 12' E.	32	0	14.80	19.43	35.10	26.09
				10	14.90	.43	.10	.09
				20	14.90	.43	.10	.09
				30	14.87	.44	.12	.11
				40	14.85	.44	.12	.11
				50	14.85	.44	.12	.11
21. ii	16/40	39° 55' S. 148° 36' E.	34	0	17.16	19.65	35.50	25.88
				10	16.58	.63	.46	.98
				20	16.44	.63	.46	26.02
				30	16.47	.64	.48	.02
				40	16.38	.64	.48	.04
				50	16.39	.64	.48	.04

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (cct.)	O.D.	Count				
										I	II	III	IV	
			3		N70	H 0	15	200	T		68			2
					N70	V 50-0		150	T		28			
			1		N70	V100-50		5			1			1
			2		N70	V250-100		5	Cp		1			2
			2											
			4		N70	V500-250		10	C		1			4
			3											
			3		N70	O 200		250	T		98			6
			5		N100	O 200		300	T		218			1
			19		N200	H 0	15	250	T		130			
			22											
			29											
			6		N70	H 0	15	120	T		50			1
			4		N70	V 50-0		100	T		18			1
			4		N70	O 50		180	T		130			
			5		N100	O 50		300	T		337			6
			6		N200	H 0	15	900	T		399			2
			8											
			5		N70	H 0	15	150			3		1	
			3		N70	V 50-0		100	T		24		2	2
			4		N70	O 50		180	Cp		82		6	1
			5		N100	O 50		255	T		456			1
			6		N200	H 0	15	100	C		1			
			10											
			5		N70	H 0	15	20	Cp		15			1
			7		N70	V 50-0		10	Cp					2
			4		N70	O 50		20	Cp		4		3	2
			5		N100	O 50		30	C		5			3
			7		N200	H 0	15	120	T		44			1
			6											



## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1940								
21. ii	17/40	39° 26' S. 148° 50' E.		0	19.20	19.77	35.71	25.53
				10	19.00	.78	.73	.60
				20	18.95	.79	.75	.62
				30	18.95	.79	.75	.62
				40	18.89	.78	.72	.62
				50	18.90	.78	.73	.62
				100	17.31	.73	.64	.94
				150	15.99	.68	.55	26.19
				200	15.25	.63	.46	.29
				300	13.79	.54	.30	.48
				400	12.58	.45	.14	.60
				600	9.72	.21	34.70	.79
25. ii	23/40	36° 15' S. 150° 29' E.		0	19.89	19.78	35.73	25.37
				10	19.89	.78	.73	.37
				20	19.90	.78	.73	.37
				30	19.89	.78	.73	.37
				40	19.84	.77	.71	.37
				50	19.89	.78	.73	.37
				100	18.43	.73	.64	.67
				150	16.23	.64	.48	26.08
				200	14.86	.59	.39	.32
				300	13.75	.57	.35	.53
				400	12.27	.48	.19	.70
				600	8.90	.19	34.67	.90
27. ii	24/40	34° 8' 30" S. 151° 36' 30" E.		0	24.50	19.74	35.66	24.01
				10	24.50	.74	.66	.01
				20	24.24	.74	.66	.01
				30	21.12	.69	.57	.91
				40	19.82	.69	.57	25.27
				50	18.80	.67	.53	.50
				100	15.93	.57	.35	26.05
				150	13.78	.47	.17	.39
				200	12.27	.41	.07	.60
				300	10.68	.28	34.83	.72
				400	9.32	.22	.72	.86
				600	7.38	.11	.52	27.01

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (cc.)	O. D.	Count				
										I	II	III	IV	
			0		N70	H 0	15	100	C		22			13
			3		N70	V 50-0		100	Cp		16	3		1
			4		N70	V100-50		10	Cp		1	1		1
			3		N70	V250- 100		10	Cp			1		2
			0											
			1		N70	V500- 250		15	Cp					4
			7											
			5		N70	O 200		375	Cp		112	4		13
			9		N100	O 200		500	T		89			4
			9		N200	H 0	15	230	T		91			9
			13											
			21											
			4		N70	H 0	15	50	Cp		30	96		
			6		N70	V 50-0		10	Cp		5	29		
			7		N70	V100-50		5	Cp		5	9		1
			4		N70	V250- 100		10	Cp		1	2		2
			3											
			7		N70	V500- 250		15	Cp		1			3
			3											
			12		N70	O 200		50	Cp		46	104		6
			14		N100	O 200		75	T		39	1		
			12		N200	H 0	15	50	T		58	7		
			15											
			26											
			0		N70	H 0	15	150	Cp		418	179		47
			2		N70	V 50-0		40	T		192	167		22
			4		N70	V100-50		10	Cp		21	9		2
			2		N70	V250- 100		10	C		2	1		1
			9											
			9		N70	V500- 250		10	Cp		1	1		1
			16											
			18		N70	O 200		200	Cp		746	483		106
			21		N100	O 200		150	T		157	25		24
			21		N200	H 0	15	200	T		301	20		81
			24											
			28											

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>	
1940									
20. iv	25/40	32° 42' S. 152° 19' E.	35	0	20.55	19.63	35.46	24.98	
				10	20.60	.65	.50	25.00	
				20	20.60	.66	.52	.01	
				30	20.54	.66	.52	.02	
				40	20.50	.66	.52	.03	
				50	20.29	.64	.48	.06	
	26/40	32° 34' S. 152° 55' E.			0	22.92	19.57	35.35	24.24
					10	23.19	.72	.62	.37
					20	23.25	.74	.65	.37
					30	23.20	.72	.62	.37
					40	23.24	.73	.64	.37
					50	23.24	.73	.64	.37
					100	21.72	.78	.73	.87
					150	19.42	.74	.66	25.43
200					18.59	.75	.68	.66	
286					16.20	.59	.39	26.02	
21. iv	27/40	31° 08' S. 153° 05' E.	36	0	23.37	19.56	35.34	24.10	
				10	23.40	.57	.35	.10	
				20	23.45	.58	.37	.10	
				30	23.45	.62	.44	.15	
				40	21.85	.63	.46	.60	
				50	21.15	.62	.44	.80	
	28/40	31° 08' S. 153° 20' E.			0	23.92	19.66	35.52	24.08
					10	23.94	.68	.55	.10
					20	23.95	.69	.57	.11
					30	23.84	.69	.57	.15
					40	23.79	.69	.56	.15
					50	23.69	.71	.61	.22
					98	20.57	.73	.64	25.11
					147	18.79	.70	.59	.54
196	17.55	.70	.59	.85					
280	14.62	.54	.30	26.31					
374	11.37	.36	34.97	.71					
560	8.98	.24	.76	.95					

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O.D.	Count			
										I	II	III	IV
			2	2	N70	H 0	15	75	Cp	71	451	37	
			4	2	N70	V 50-0		30	Cp	37	97	44	
			6		N200	H 0	15	100	Cp	53	9	63	
			2	19									
			10	48									
			4	6									
			0	10	N70	H 0	15	100	T	12	181	89	
			3	2	N70	V 50-0		5	Cp	4	74	32	
			0	0	N70	V100-50		5	Cp	1	4	2	
			3	8	N70	V250- 100		5	Cp	1	2	3	
			1	10									
			0	0	N70	O 0-200		50	Cp	5	31	48	
			7		N100	O 0-200		180	T	60	2	24	
			6	93	N200	H 0	15	240	T	204	16	144	
			6	36									
			15	130									
			10	158									
			22	225									
			4	8	N70	H 0	15	125	Cp	303	153	41	
			4	0	N70	V 50-0		30	Cp	59	63	16	
			1	0	N70	O 0		100	T	253	106	18	
			1	2	N100	O 50		220	T				
			2	5	N200	H 0	15	320	T				
			4	20									
	8.30		1	0	N70	V50-0		10	Cp	16	21	14	
	.31		0	0	N70	V100-50		8	Cp	26	41	46	
	.37		0	4	N70	V250- 100		20			7	8	
	.32		0	0									
	.29		0	0	N70	V500- 250		10	Co	41	83	34	
	.32		0	0									
	.21		5	45	N70	H 0	15	100	Cp	8	65	81	
	.22		7	37	N100	O 0-200		150	T	115	4	37	
	.21		7	62	N200	H 0	15	80	T	17	1	17	
	.17		10	108									
	.14		14	225									
	.13		20	330									

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$	
1940									
22. iv	29/40	30° 17' S. 153° 15' 30" E.	32	0	23.50	19.58	35.37	24.09	
				10	21.92	.61	.43	.58	
				20	21.58	.63	.46	.70	
				30	21.48	.63	.46	.73	
				40	21.47	.63	.46	.73	
				50	21.28	.63	.46	.78	
	30/40	30° 18' S. 153° 32' E.			0	24.28	19.67	35.53	23.98
					10	24.14	.68	.55	24.04
					20	24.10	.68	.55	.05
					30	24.05	.67	.53	.05
					40	24.09	.68	.55	.05
					50	24.10	.68	.55	.05
					100	21.07	.70	.59	.93
					150	18.94	.73	.64	25.54
					200	18.01	.70	.59	.74
					300	14.13	.54	.30	26.41
					400	11.58	.38	.01	.70
					600	8.92	.23	34.74	.95
25. iv	31/40	34° 8' S. 151° 32' E.	30	0	23.13	19.65	35.50	24.30	
				10	23.15	.66	.52	.30	
				20	22.80	.66	.52	.39	
				30	22.74	.64	.48	.39	
				40	22.63	.70	.59	.50	
				50	22.35	.70	.59	.58	
				86	20.92	.69	.57	.96	
				128	19.01	.72	.62	25.51	
				172	18.81	.68	.55	.50	
				210	18.71	.68	.55	.53	
				280	17.59	.68	.55	.81	
				420	15.26	.65	.50	26.32	
	32/40	34° 4' S. 151° 14' 30" E.	30		0	19.50	19.69	35.57	25.35
					10	18.98	.71	.61	.37
					20	19.45	.70	.59	.37
					30	18.95	.70	.59	.50
					40	18.90	.69	.57	.50
					50	18.18	.69	.57	.68

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count			
										I	II	III	IV
				8	N70	H 0	15	50	C		39	65	44
				0	N70	V 50-0		50	Cp		83	105	52
				0	N70	0 0-50		130	T		225	270	89
				7	N100	0 0-50		175	T		406	1	54
				2	N200	H 0	15	175	T		388		125
				3									
	8.34		0	0	N70	H 0	15	65	Cp		33	72	108
	.31		0	0	N70	V 50-0		15	Co		49	142	69
	.27		0	0	N70	V 250- 100		10	Cp		3	8	9
	.30		0	0	N70	V500- 250		5	Co		7	10	15
	.34		5	35	N70	0 0-200		100	Cp		50	44	76
			5	38	N100	0 200		140	T		88	5	23
	.32		7	42	N200	H 0	15	160	Co		39		25
	.29		13										
	.23		18	172									
	.17		25	285									
	8.44		1	0	N70	H 0	15	120	Cp		309	85	117
	.40		0	0	N70	0 200		200	T		488	48	73
	.42		0	0	N100	0 200		200	T		398	1	45
	.43		1	0	N200	H 0	15	350	T		610	4	191
	.40		0	38									
			3	25									
			5	51									
			5	48									
			5	46									
	.32		2	50									
	.35		2	57									
	.30		5	93									
			2	5	N70	H 0	15	75	Cp		8	62	98
			3	14	N70	V 50-0		20	Cp		16	7	23
			3	32	N70	0 50		75	Cp		4	77	109
			4	22	N100	0 50		25	C		9		2
			4	22	N200	H 0	15	120	Ch		17	3	186
			5	58									

1.24  
 1.50  
 1.52  
 1.67  
 2.06

13<sup>5</sup>  
67

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS								
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>				
1940												
30. iv	33/40	34° 0' S. 151° 6' E.		0	21.53	19.62	35.44	24.69				
				10	21.54	.61	.43	.69				
				20	21.59	.63	.46	.70				
				30	20.74	.63	.46	.93				
				40	19.10	.66	.52	25.41				
				50	18.62	.74	.66	.64				
				100	15.13	.58	.37	26.25				
				150	14.09	.53	.28	.40				
				200	12.91	.48	.19	.58				
				300	11.85	.40	.05	.67				
				400	9.49	.18	34.65	.67				
				600	7.60	.11	.52	.98				
				1. v	34/40	35° 8' S. 150° 49' E.	33	0	19.05	19.69	35.57	25.47
								10	18.93	.67	.53	.47
20	18.68	.68	.55					.54				
30	18.31	.69	.57					.65				
40	17.77	.66	.52					.74				
35/40	36° 14' S. 150° 15' E.	40	0		18.28	19.62	35.44	25.55				
			10		18.51	.66	.52	.55				
			20		18.55	.68	.55	.57				
			30		18.51	.71	.61	.63				
			40		18.50	.72	.62	.64				
36/40	36° 25' S. 150° 24' E.		0	18.23	19.64	35.48	25.60					
			10	18.28	.65	.50	.60					
			20	18.35	.70	.59	.65					
			30	18.30	.72	.62	.69					
			40	18.25	.71	.61	.69					
			50	18.29								
			100	16.26	.62	.44	26.07					
			150	15.80	.58	.37	.10					
			200	13.45	.50	.23	.49					
			300	12.06	.46	.16	.71					
400	10.62	.32	34.90	.79								
600	8.13	.14	.58	.95								

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O.D.	Count			
										I	II	III	IV
	8.27			10	N70	H 0	15	55	Cp		139	97	34
	.28		2	8	N70	V 50-0		10	T		8	95	11
	.30		3	0	N70	V100-50		10	Co		1	3	1
	.27		4	18	N70	V250-		8				2	1
	.26		8	43		100							
	.21		15	51	N70	V500-		25			1	3	2
	.23		16	102		250							
	.21		24	147	N70	0 200		100	Cp		113	370	128
	.16		22	138	N100	0 200		50	T		134	3	8
	.17		19	107	N200	H 0	15	95	T		413	4	29
	.09		34	250									
	.05		40	282									
			9	18	N70	H 0	15	200	Cp		23	116	16
			5	12	N70	V50-0		40	Cp		20	77	13
			5	5	N70	0 50		120	Cp		199	154	27
			5	15	N100	0 50		30	T		30		4
			7	42	N200	H 0	15	50	T		52	1	6
			12	75									
			2	12	N70	H 0	15	80	Cp		260	530	
			2	10	N70	V 50-0		20	Cp		25	184	11
			2	5	N70	0 50		55	Cp		167	195	11
			2	8	N100	0 50		25	T		7	1	
			2	8	N200	H 0	15	20	T		27	3	4
			7	32									
	8.37		3	3									
	.32		4	7									
	.35		2	4									
	.35		5	4									
	.35		2										
	.35		6										
	.28		15	68									
	.24		13	77									
	.23		15										
	.18		14	137									
	.17		22										
	.16		24										



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1940								
3. v	37/40	37° 05' S. 150° 03' E.	30	0	17.51	19.67	35.53	25.82
				10	17.55	.68	.55	.82
				20	17.65	.69	.57	.82
				30	17.57	.68	.55	.82
				40	17.59	.71	.60	.85
				50	17.64	.71	.61	.85
5. v	38/40	38° 35' S. 149° 26' E.		0	16.87	19.72	35.62	26.04
				10	16.76	.71	.61	.06
				20	16.80			
				30	16.68	.70	.59	.06
				40	16.64	.71	.61	.08
				50	16.26	.68	.55	.13
				100	15.28	.58	.37	.22
				150	13.31	.49	.21	.52
				200	12.68	.51	.25	.66
				300	11.12	.35	34.96	.74
				400	9.73	.26	.79	.85
600	7.93	.17	.63	27.02				
6. v	39/40	39° 20' S. 148° 50' E.		0	16.12	19.69	35.57	26.18
				10	16.15	.70	.59	.18
				20	16.20	.71	.60	.18
				30	16.20			
				40	16.17	.67	.53	.18
				50	16.20	.71	.60	.18
				100	15.79	.65	.50	.20
				150	14.31	.58	.37	.43
				200	13.31	.53	.28	.56
				300	11.49	.40	.05	.74
				400	10.28	.29	34.85	.80
				600	7.84	.14	.58	26.99
					40/40	39° 38' S. 148° 36' E.	33	0
	10	15.77	.66	.52				.21
	20	15.74	.65	.50				.21
	30	15.65	.64	.48				.21
	40	15.36	.64	.48				.28
	50	15.38	.65	.50				.29

### F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
			10		N70	H 0	15	100	Cp		50	653	7
			9	8	N70	V 50-0		10	Cp		1	56	
			10		N70	0 50		125	T				
			8	12	N100	0 50		20	T		23	9	7
			8	9	N200	H 0	15	130	T		83	10	15
			9	21									
	8.29		4	8	N70	H 0	15	80	Cp		10	14	25
	.27		6	5	N70	V 50-0		10	Cp		1	22	11
	.29		6	12	N70	V100-50		10	Cp			1	1
	.32		4		N70	V250-100		10	C			6	10
	.27		6	16									
	.27		11	22	N70	V500-250		10	Cp			5	
	.26		15	68									
	.20		25	130	N70	0 200		85	Cp		2	35	51
	.22		23	187	N100	0 200		100	C		2		5
	.21		27	158	N200	H 0	15	125	Co		4		10
	.20		33	188									
	.23		44	325									
	8.33		8	10	N70	H 0	15	50	Cp		5	39	47
	.32		6	9	N70	V 50-0		40	Cp		7	29	11
	.30		6	8	N70	V100-50		5				1	1
	.30		6	8	N70	V250-100		25					3
	.31		6	9									
	.33		8	10	N70	V500-250		10					
	.32		12	29									
	.26		23	80	N70	0 200		75	Cp			42	52
	.24		29		N100	0 200		90	C		2		14
	.24		34		N200	H 0	15	125	T		16	1	13
	.23		38	162									
	.22		48	225									
			10	18	N70	H 0	15	250	Cp		39		3
			10	15	N70	V 50-0		50	Cp		13	2	6
			10	18	N70	0 50		200	Cp		63	10	43
			10	29	N100	0 50		150	T		85		14
			13	35	N200	H 0	15		T		201		
			14	28									

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1940								
7. v	41/40	42° 23' S. 148° 43' E.		0	15.53	19.63	35.45	26.21
				10	15.60	.63	.46	.21
				20	15.29	.60	.41	.24
				30	15.30	.62	.44	.26
				40	15.18	.60	.41	.27
				50	15.15	.61	.43	.28
				100	14.97	.63	.46	.35
				150	14.48	.55	.32	.34
				200	13.51	.52	.26	.51
	300	11.93	.43	.10	.70			
	400	10.37	.29	34.85	.78			
	600	8.42	.17	.63	.94			
	42/40	42° 50' S. 148° 04' E.	40	0	13.70	19.45	35.14	26.37
				10	13.74	.46	.16	.37
				20	13.76	.46	.16	.37
				30	13.70	.45	.14	.37
				40	13.71	.46	.16	.38
				50	13.74	.46	.16	.38
	8. v	43/40	43° 14' S. 148° 04' E.	55	0	13.20	19.41	35.07
10					13.20	.42	.08	.43
20					13.20	.42	.08	.43
30					13.71	.45	.14	.43
40					13.18	.43	.10	.45
50					13.17	.43	.09	.45
25. v	44/40	37° 09' S. 150° 24' E.		0	17.44	19.74	35.66	25.93
				10	17.43	.74	.66	.93
				20	17.44	.74	.66	.93
				30	17.39	.74	.65	.93
				40	17.38	.73	.64	.93
				50	17.42	.74	.66	.93
				100	17.43	.74	.66	.93
				150	17.35	.72	.62	.93
				200	16.56	.71	.61	26.10
				300	13.82	.60	.41	.56
				400	10.80	.33	34.92	.77
600	9.30	.25	.78	.92				

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
		8.31	9	35	N70	H 0	15	20	Cp			6	4
		.29	10	22	N70	0 200		30	Cp			4	23
		.29	11	26	N100	0 200		50	C				9
		.36	11	55	N200	H 0	15	50	Co		2		1
		.34	10	25									
		.33	10	5									
		.34	9	18									
		.30	15	55									
		.23	29	100									
		.24	26	158									
		.20	35	158									
		.19	43	252									
			12	28	N70	H 0	15	25	Cp			34	19
			12	29	N70	V 50-0		10	Cp				
			11	18	N70	0 50		20	Cp			29	5
			12	32	N100	0 50		25	C				2
			12	18	N200	H 0	15	50	Ch				12
			12	26									
			10	18	N70	H 0	15	15	Cp				10
			10	36	N70	V 50-0		5	Cp				1
			10	22	N70	0 50		15	Cp			9	25
			10	40	N100	0 50		20	M		1		2
			11	32	N200	H 0	15	20	Cp		1		4
			10	93									
				22	N70	H 0	15	25	Cp		14	7	9
				11	N70	0 200		50	Cp		9	83	43
				7	N100	0 200		50	C		3	2	6
				3	N200	H 0	15	50	T		41	2	11
				15									
				48									
				12									
				10									
				58									
				205									
				283									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	$\sigma_t$
1940 3. viii	64/40	32°43' S. 152°18' E.	40	0	17.14	19.64	35.48	25.86
				10	17.23	.65	.50	.86
				20	17.18	.67	.53	.90
				30	17.04	.69	.57	.96
				40	16.96	.68	.55	.96
				50	16.39	.63	.46	26.03
	65/40	32°42' S. 152°30' E.	55	0	18.80	19.67	35.53	25.50
				10	18.81	.67	.53	.50
				20	18.81	.70	.59	.54
				30	18.41	.71	.61	.65
				40	17.65	.69	.57	.81
				50	16.31	.62	.44	26.03
	66/40	32°40' S. 152°39' E.	65	0	18.05	19.67	35.53	25.67
				10	18.03	.66	.52	.67
				20	17.69	.72	.62	.84
				30	16.88	.58	.36	.84
				50	16.11	.70	.59	26.19
				100	15.67	.65	.50	.23
	67/40	32°42' S. 152°58' E.		0	18.63	19.70	35.59	25.58
				10	18.65			
20				17.73	.74	.66	.87	
30				17.49				
40				17.13				
50				16.87	.70	.59	26.01	
100				16.12	.71	.61	.21	
150				15.62	.67	.53	.26	
200				13.66	.55	.32	.52	
300				12.04	.46	.16	.71	
400	10.48	.31	34.88	.79				
600	7.92	.14	.58	.97				

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ NO <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
			3	22	N70	H 0	15	50	Cp		106	380	3
			12	18	N70	V 50-0		25	Cp		8	103	2
			12	44	N70	0 0-50		25	Cp		80	365	7
			12	50	N100	0 0-50		25	T		51	14	6
			8	43	N200	H 0	15	160	T		23	23	1
			14	74									
			7	22									
			5	17									
			12	26									
			5	40									
			14	44									
			23	54									
			8	0									
			8	0									
			7	0									
			7	20									
			8	20									
			11	54									
	8.51		6	0	N70	H 0	15	60	Cp		74	235	24
					N70	0 0-50		40	Cp		26	198	39
	.52		4	19	N70	0 0-200		60	Cp		242	220	9
					N100	0 0-50		25	T		42	4	3
					N100	0 0-200		40	T		19	4	7
	.55		7	20	N200	H 0	15	30	T			7	5
	.54		4	17									
	.50		13	47									
	.40		13	121									
	.48		19	136									
	.43		22	157									
	.44		29	179									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1940								
3. viii	68/40	32° 42' S. 153° 8' E.		0	18.00	19.72	35.62	25.77
				20	17.04	.70	.59	.97
				50	16.82	.72	.62	26.05
				100	16.68	.69	.57	.05
				150	15.72	.67	.53	.24
				200	14.54	.56	.34	.35
				300	12.11	.43	.10	.66
				400	10.42	.34	34.94	.85
				600	8.07	.15	.60	.96
					69/40	32° 42' S. 153° 16' E.		0
20	16.54	.71	35.60					.11
50	16.45	.71	.61					.13
100	16.34	.69	.51					.13
150	14.98	.60	.41					.31
200	13.32	.47	.17					.48
300	10.64	.28	34.83					.73
400	9.13	.21	.70					.89
600	7.07	.12	.54					.97
4. viii	70/40	31° 50' S. 152° 52' E.	35					0
				10	17.63	.65	.50	.76
				20	17.61	.66	.52	.78
				30	17.48	.66	.52	.81
				40	15.84	.52	.26	26.00
				50	15.76	.57	.35	.09
5. viii	71/40	31° 44' S. 153° 3' E.	60	0	17.97	19.65	35.50	25.68
				20	17.97	.65	.50	.68
				40	17.24	.69	.57	.91
				50	16.83	.66	.52	26.02
				80	15.81	.61	.43	.14
				100	13.34	.50	.23	.51
	72/40	31° 44' S. 153° 8' E.	105	0	18.30	19.69	35.56	25.64
				20	18.35	.69	.57	.64
				40	17.14	.64	.48	.86
				50	17.04	.64	.48	.89
				100	15.29	.62	.44	26.26
				150	13.93	.55	.32	.46

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count			
										I	II	III	IV
		8.54	4	0									
		.48	4	5									
		.53	6	19									
		.55	6	22									
		.54	8	85									
		.47	17	60									
		.47	23	127									
		.43	23	146									
		.37	28	192									
		8.51	4	0									
		.52	4	0									
		.47	2	0									
		.53	6	0									
		.46	29	30									
		.40	29	128									
		.38	29	157									
		.40	23	157									
		.33	29	179									
			3	19									
			1										
			0	30									
			0	44									
			3	128									
			3	58									
			1	58									
			3	29									
			0	59									
			0	60									
			0	70									
			0	75									
			8	10									
			4	10									
			13	75									
			15	60									
			18	75									
			22	70									



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>	
1940 5. viii	73/40	31° 43' S. 153° 17' E.		0	18.69	19.63	35.46	25.47	
				20	18.21	.67	.53	.65	
				50	18.13	.69	.57	.69	
				100	16.76	.65	.50	.97	
				150	14.20	.65	.50	26.55	
				200	13.00	.47	.17	.55	
				300	12.29	.46	.16	.67	
				400	10.04	.37	34.99	.95	
	600	8.42	.18	.66	.96				
	74/40	31° 45' S. 153° 26' E.			0	20.21	19.63	35.46	25.10
					20	20.18	.65	.49	.10
					50	19.18	.65	.50	.37
					100	17.78	.69	.57	.78
					150	16.35	.63	.46	26.04
					200	15.22	.55	.32	.18
					300	12.72	.44	.11	.55
					400	10.66	.33	34.92	.79
	600	7.72	.16	.61	27.03				
	75/40	31° 45' S. 153° 35' E.			0	20.90	19.70	35.59	24.98
					20	20.90	.70	.58	.98
					50	19.28	.61	.43	25.37
					100	17.74	.68	.55	.77
					150	16.36	.65	.50	26.06
					200	14.56	.53	.28	.30
300					12.61	.44	.12	.57	
400					10.17	.31	34.88	.84	
600	7.68	.19	.67	27.08					
6. viii	76/40	30° 55' S. 153° 8' E.	35	0	18.70	19.67	35.53	25.51	
				10	18.77	.67	.53	.51	
				20	18.67	.66	.52	.51	
				30	18.42	.68	.55	.61	
				40	18.00	.65	.50	.67	
				50	17.22	.65	.50	.86	

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O D	Count			
										I	II	III	IV
		8.32	4	7	N70	V 50-0		25	Cp		41	96	27
		.27	9	30	N70	V100-50		10	Cp		3	5	6
		.28	8	49	N70	V250-		5	Cp		2	4	3
		.23	17	68		100							
		.24	19	80	N70	V500-		25	Cp		3	8	3
		.17	23	110		250							
		.16	26	110	N70	0 0-200		150	Cp		220	241	123
		.12	31		N70	H 0	15	75	T		233	320	25
		.09	26	192	N100	0 200		125	T		125	10	48
					N200	H 0	15	90	T		88	11	15
		8.39	5	0									
		.36	5	0									
		.35	10	40									
		.32	13	54									
		.28	17	75									
		.26	19	100									
		.26	18	80									
		.20	22	131									
		.11	30	180									
		8.38	4	0									
		.39	3	0									
		.39	3	0									
		.30	8	50									
		.32	8										
		.23	8	110									
		.18	20	145									
		.21	29	157									
		.15	35	203									
			0		N70	V 50-0		25	Cp		130	109	7
			2		N70	H 0	15	75	Cp		532	284	15
			0	0	N200	H 0	15	30	T		92	23	7
			3										
			5										
			11	64									

F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1940 6. viii	77/40	30° 55' S. 153° 12' E.	60	0	18.93	19.64	35.48	25.42
				20	19.00	.65	.50	.42
				40	18.52	.64	.48	.53
				50	18.50	.68	.55	.59
				80	16.37	.64	.48	26.05
				100	15.58	.60	.41	.18
	78/40	30° 55' S. 153° 17' E.	100	0	19.00	19.62	35.44	25.38
				20	19.02	.65	.50	.42
				40	18.56	.62	.44	.48
				50	18.40	.66	.52	.58
				100	16.55	.64	.48	.98
				150	15.08	.57	.35	26.34
79/40	30° 54' S. 153° 26' E.		0	18.97	19.65	35.50	25.43	
			20	18.99	.65	.50	.43	
			50	18.93	.66	.52	.45	
			90	17.88	.65	.50	.72	
			135	16.66	.66	.52	26.01	
			180	15.11	.59	.39	.26	
			258	13.12	.46	.16	.50	
			344	11.10	.38	.01	.79	
			516	8.34	.18	34.65	.96	
80/40	30° 53' S. 153° 35' E.		0	19.35	19.59	35.39	25.24	
			20	19.40	.68	.55	.36	
			50	19.36	.68	.55	.36	
			100	18.46	.65	.50	.56	
			150	16.83	.64	.48	.93	
			200	15.85	.61	.43	26.12	
			258	13.97	.48	.19	.35	
			344	12.47	.43	.10	.59	
			516	9.61	.26	34.79	.86	
			8. viii	81/40	30° 18' S. 153° 16' E.	30	0	19.08
10	19.25	.63					.46	.33
20	19.29	.64					.48	.33
30	19.35	.65					.50	.33
40	18.76	.60					.40	.41
50	18.49	.68					.55	.59

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS														
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count									
										I	II	III	IV						
			4	0															
			2	0															
			12																
			10	54															
			14																
			23																
			6	0															
			4																
			11																
			15	58															
			16	81															
			18																
	8.45		2	0	N70	H 0	15	150	Cp		362	323	60						
	.47		4		N70	0 0-200		150	Cp		607	208	77						
	.43		4	0	N100	0 0-200		90	Cp		94	7	18						
	.35		5		N200	H 0	15	140	Cp		187	10	27						
	.36		9	90															
	.34		14																
	.29		17	98															
	.27		19	146															
	.13		24	168															
	8.50		2	0															
	.50		1																
	.47		4	0															
	.43		6																
	.42		9																
	.39		13	75															
	.36		15	117															
	.29		29	110															
	.20		26	178															
			0	0	N70	H 0	15	120	T		597	227	36						
			0		N70	V 50-0		10	Cp		114	240	5						
			0	0	N70	0 0-50		50	Cp		411	215	8						
			0		N100	0 0-50		25	F		53	6							
			1		N200	H 0	15	35	F		85	14							
			2	10															

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	$\sigma_t$
1940 8. viii	82/40	30° 17' S. 153° 24' E.	60	0	19.25	19.63	35.46	25.33
				20	19.31	.66	.52	.35
				40	19.34	.68	.55	.37
				50	19.22	.68	.55	.40
				80	17.97	.64	.48	.66
				100	15.86	.61	.43	26.13
	83/40	30° 17' S. 153° 29' E.	100	0	19.48	19.60	35.41	25.23
				20	19.55	.62	.44	.23
				40	19.60	.63	.46	.24
				50	19.57	.63	.46	.24
				100	16.49	.62	.44	.98
				150	15.21	.56	.34	26.20
	84/40	30° 15' S. 153° 39' E.		0	20.90	19.64	35.48	24.90
				20	20.89	.64	.47	.90
				50	19.44	.62	.44	25.26
				100	16.46	.66	.52	26.05
				150	14.65	.56	.34	.32
				200	14.04	.48	.19	.34
				300	12.60	.48	.19	.63
				400	10.59	.35	34.96	.83
				600	8.14	.15	.60	.95
	85/40	30° 14' S. 153° 47' E.		0	21.22	19.58	35.37	24.74
				20	21.30	.64	.48	.79
				50	19.45	.64	.48	25.28
				100	16.53	.62	.44	.98
				150	14.61	.52	.26	26.28
				200	13.25	.49	.21	.52
				300	11.64	.39	.03	.69
				400	9.80	.28	34.83	.84
				600	7.77	.14	.58	.99

# F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O D	Count				
										I	II	III	IV	
			0	0										
			0	3										
			0	0										
			0	0										
			6	0										
			9	75										
			3	0										
			13											
			5											
			2	12										
			11	98										
			11	128										
	8.49		0	12										
	.49		0											
	.40		3	37										
	.36		8											
	.40		10											
	.39		13	117										
	.33		11	121										
	.29		13	125										
	.20		18	167										
	8.49		0	0										
	.45		0											
	.41		0	30										
	.35		5											
	.33		7											
	.33		11	180										
	.27		11	180										
	.21		11	180										
	.12		17	192										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1940								
8. viii	86/40	30° 14' S. 153° 56' E.		0	21.25	19.60	35.41	24.75
				20	21.32			
				50	20.37	.62	.44	25.01
				100	18.67	.65	.50	.56
				150	14.78	.52	.26	26.24
				200	12.55	.42	.08	.56
				258	11.86	.40	.05	.66
				344	10.55	.34	34.94	.81
				516	8.35	.14	.58	.90
9. viii	87/40	28° 38' S. 153° 43' E.	30	0	20.13	19.60	35.41	25.06
				10	20.11	.60	.41	.06
				20	19.80	.66	.52	.22
				30	19.66	.63	.46	.22
				40	19.61	.62	.44	.22
				50	19.58	.64	.48	.25
	88/40	28° 38' S. 153° 49' E.	60	0	21.31	19.57	35.35	24.69
				20	21.05	.61	.43	.82
				40	20.93	.59	.39	.82
				50	20.89	.63	.46	.89
				80	19.77	.59	.39	25.14
				100	19.12	.60	.41	.33
	89/40	28° 39' S. 153° 52' E.	100	0	21.89	19.54	35.29	24.48
				20	21.91	.54	.27	.48
				40	21.35	.58	.37	.70
				50	21.45	.60	.41	.70
				100	20.57	.65	.50	25.00
				150	18.40	.68	.55	.61
	90/40	28° 40' S. 154° 00' E.		0	21.28	19.63	35.46	24.78
				20	21.30	.65	.50	.80
				50	21.36	.67	.53	.81
				100	21.36	.71	.61	.87
				150	21.15	.67	.53	.87
				200	19.24	.63	.46	25.33
				300	13.97	.49	.21	26.37
				400	12.02	.41	.07	.65
				600	9.24	.21	34.70	.86

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z N	Net	Depth (m.)	Duration (min.)	Volume (cct.)	O. D.	Count				
										I	II	III	IV	
		8.50	0	0										
		.50	0											
		.47	10	0										
		.38	5											
		.34	10											
		.33	12	136										
		.30	10	128										
		.28	10	128										
		.16	13	179										
			2	5	N70	H 0	15	60	Cp		438	230	23	
			0		N70	V 50-0		60	Cp			205	20	
			0	0	N70	0 0-50		80	T		384	210	30	
			4		N100	0 0-50		50	F		26	4	8	
			2		N200	H 0	15	70	T		47	7	4	
			2	0										
			0	0										
			0	0										
			0	0										
			4											
			8	58										
			5	0										
			5											
			5											
			5	0										
			5	7										
			12	64										
			0	0										
			2											
			2	0										
			2	35										
			5											
			9	100										
			16	112										
			27	150										
			25											



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl‰	S‰	$\sigma_t$	
1940 11. viii	91/40	34° 4' S. 151° 15' E.	30	0	17.40	19.68	35.55	25.86	
				10	17.40	.69	.57	.88	
				20	17.32	.69	.57	.90	
				30	17.35	.70	.59	.90	
				40	16.79	.69	.57	26.02	
				50	14.97	.63	.46	.35	
	92/40	34° 4' S. 151° 24' E.	60	0	17.50	19.67	35.53	25.82	
				20	17.52	.67	.53	.82	
				40	17.26	.67	.53	.88	
				50	17.29	.68	.55	.88	
				80	15.09	.57	.35	26.24	
				100	13.87	.53	.28	.44	
	12. viii	93/40	34° 4' S. 152° 3' E.		0	19.01	19.71	35.60	25.48
					20	19.10	.71	.61	.48
					50	19.12	.72	.62	.48
100					19.15	.72	.62	.48	
150					19.18	.73	.64	.48	
200					18.28	.71	.61	.68	
300					16.37	.65	.50	26.06	
400					13.71	.52	.26	.47	
600					10.54	.34	34.94	.83	
94/40					34° 9' S. 151° 55' E.			0	19.00
	20	19.02	.73	.64				.52	
	50	18.75	.71	.61				.57	
	96	18.54	.70	.59				.60	
	144	18.43	.69	.57				.62	
	160	18.17	.69	.57				.69	
	178	18.02	.71	.61				.75	
	192	17.83	.68	.55				.75	
	260	17.30	.68	.55				.88	
	400	17.30	.70	.59				.91	

# F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (cc.)	D. O.	Count			
										I	II	III	IV
			5	0	N70	H 0	15	80	Cp	715	222	25	
			4		N70	V 50-0		20	Cp	202	150	5	
			4	5	N70	0 50		90	Cp	560	317	14	
			5		N100	0 50		10	T	65	11	2	
			6		N200	H 0	15	25	T	48	7	3	
			14	70									
			5	12									
			4	10									
			3										
			5	10									
			14										
			16	157									
	8.54		5	22									
	.54		5										
	.54		7	17									
	.54		5										
	.50		6										
	.48		11	93									
	.47		13	98									
	.45		19	146									
	.40		25	178									
	8.54		17	18									
	.49		7										
	.53		8	30									
	.52		9										
	.50		10										
	.46		10	40									
	.50		10	30									
	.49		8	48									
	.46		8	20									
	.41		8	20									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	$\sigma_t$
1940								
12. viii	95/40	34° 15' S. 151° 44' E.		0	18.17	19.63	35.46	25.60
				20	18.17	.66	.52	.64
				50	17.99	.66	.52	.69
				100	17.79	.67	.53	.75
				150	17.27	.66	.52	.86
				200	14.83	.60	.41	26.34
				258	14.14	.52	.26	.38
				344	12.99	.52	.26	.62
				516	10.70	.36	34.97	.84
	96/40	34° 20' S. 151° 32' E.	100	0	17.40	19.68	35.55	25.86
				20	17.40	.68	.55	.86
				40	17.39	.69	.57	.88
				50	17.40	.69	.57	.88
				100	16.78	.67	.53	26.00
				150	15.61	.69	.57	.30
19. viii	97/40	35° 7' S. 150° 51' E.	50	0	15.30	19.65	35.50	26.31
				10	15.21	.66	.52	.34
				20	15.10	.65	.49	.34
				30	15.00	.66	.52	.38
				40	14.76	.66	.52	.44
				50	14.48	.66	.52	.50
	98/40	35° 7' S. 150° 57' E.	65	0	15.60	19.67	35.53	26.27
				20	15.46	.67	.53	.30
				40	15.24	.68	.55	.36
				50	15.20	.67	.53	.36
				80	14.62	.66	.52	.47
				100	14.19	.60	.41	.49
20. viii	99/40	35° 7' S. 151° 7' E.	100	0	16.35	19.71	35.61	26.16
				20	15.73	.66	.52	.22
				40	15.65	.66	.52	.24
				50	15.60	.66	.52	.25
				100	14.67	.61	.43	.39
				150	13.63	.59	.39	.58

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
		8.49	10	30	N70	H 0	15	110	Cp		337	115	56
		.50	10		N70	O 200		90	Cp		230	106	114
		.52	10	30	N100	O 200		60	Cp			5	19
		.51	10		N200	H 0	15	100	Cp		135	15	30
		.49	30										
		.47	22	75									
		.38	18	86									
		.27	16	121									
		.26	23	136									
			6	0									
			6	0									
			6										
			7										
			8	18									
			10	19									
			6	37	N70	H 0	15	5	C			1	
			4		N70	V 50-0		5	Cp			9	
			4	37	N70	O 50		15	Cp			9	5
			4		N100	O 50		14	Cp			2	
			5		N200	H 0	15	50			5		
			5	29									
			9	19									
			6	27									
			4										
			6	50									
			6										
			7	127									
			7	0									
			7										
			7										
			8	27									
			13	33									
			13	57									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1940								
20. viii	100/40	35° 7' S. 151° 17' E.		0	16.39	19.67	35.53	26.09
				20	15.91	.65	.50	.17
				50	15.75	.68	.55	.24
				100	14.47	.61	.43	.43
				150	13.80	.57	.35	.52
				200	13.24	.53	.28	.58
				298	11.90	.41	.07	.68
				398	10.81	.34	34.94	.78
				596	9.42	.24	.75	.87
					101/40	35° 6' S. 151° 26' E.		0
20	16.06	.64	.48					.11
50	15.79	.66	.52					.20
100	15.33	.66	.52					.31
150	14.77	.63	.46					.39
200	13.23	.54	.30					.60
300	11.69	.38	.01					.68
400	10.63	.39	.03					.88
600	8.83	.20	34.69					.91
	102/40	35° 6' S. 151° 35' E.						0
				20	16.83	.71	.61	26.04
				50	16.01	.67	.53	.17
				100	15.44	.64	.48	.25
				150	15.07	.67	.53	.38
				200	13.49	.65	.37	.59
				300	11.98	.39	.03	.63
				400	10.49	.29	34.85	.76
				600	7.85	.17	.63	27.02
				21. viii	103/40	36° 16' S. 150° 16' E.	30	0
10	14.47	.65	.50					.49
20	14.50	.66	.52					.49
30	14.45	.65	.49					.49
40	14.04	.63	.46					.55
50	13.58	.62	.44					.63

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (c.c.)	D.O.	Count			
										I	II	III	IV
		8.38	4	22	N70	H 0	15	70	Cp	15	19	56	
		.35	5		N70	V 50-0		5	Cp	1	22	2	
		.33	5	27	N70	V100-50		5	Cp		8	4	
		.27	13		N70	V250-		10	Cp		8	2	
		.28	13			100							
		.29	15	38	N70	V500-		12	Cp		2	7	
		.22	21	110		250							
		.20	25	110	N70	0 0-200		90	Cp	2	108	21	
		.17	32	116	N100	0 0-200		60	F	9	7	5	
					N200	H 0	15	160	Ch	18	4	94	
		8.42	4	20									
			8										
		.42	5	38									
			7										
		.43	8										
			19	67									
		.36	23	104									
		.35	23	93									
		.30	32	104									
		8.35	4	0									
		.35	5										
		.38	5	12									
		.41	7										
		.34	7	10									
		.33	13	64									
		.20	21	64									
		.18	25	117									
		.19	32	122									
			4	22	N70	H 0	15	40	Cp		2	1	
			3		N70	V 50-0		95	Cp		5		
			4	10	N70	0 50		30	Cp			2	
			4		N100	0 50		40	C			2	
			5		N200	H 0	15	140	Cp		8	1	
			7	26									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1940 21. viii	104/40	36° 17' S. 150° 20' E.	60	0	15.11	19.69	35.56	26.40
				20	15.13	.69	.57	.40
				40	15.05	.68	.55	.40
				50	14.79	.67	.53	.45
				80	14.37	.66	.52	.52
				100	14.35	.65	.50	.52
	105/40	36° 18' S. 150° 28' E.	100	0	15.89	19.68	35.55	26.21
				20	15.90	.68	.55	.21
				40	15.59	.66	.52	.25
				50	15.48	.67	.53	.30
				100	14.72	.63	.46	.41
				150	13.75	.62	.44	.59
	106/40	36° 19' S. 150° 36' E.		0	15.88	19.71	35.61	26.26
				20	15.81	.70	.59	.26
				50	15.61	.68	.55	.27
				100	15.31	.63	.46	.27
				150	14.87	.63	.46	.37
				200	13.23	.48	.19	.51
				295	11.93	.39	.03	.64
				393	10.48	.29	34.85	.76
				589	7.94	.15	.60	.98
	107/40	36° 19' S. 150° 46' E.		0	16.24	19.70	35.59	26.16
				20	16.09	.67	.53	.16
				50	15.80	.67	.53	.22
				100	15.38	.67	.53	.31
				150	14.48	.63	.46	.45
				200	13.72	.63	.46	.62
				300	11.82	.41	.07	.69
				400	10.12	.28	34.83	.82
				600	7.67	.14	.58	27.02

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (cc.)	O. D.	Count				
										I	II	III	IV	
			5	33										
			5	49										
			5											
			7	35										
			7											
			7	30										
			5	19										
			5											
			7											
			7	43										
			8	47										
			8	30										
	8.48		7	18	N70	H 0	15	30	Cp			22		
	.45		5		N70	V 50-0		6	Cp			78	8	
	.44		7	37	N70	V100-50		3	Cp			11	5	
	.45		7		N70	V250-		8	Cp			5	5	
	.42		7			100								
	.36		20	75	N70	V500-		40	Cp		1	5	2	
	.30		21	104		250								
	.28		22	135	N70	0 200		75	Cp		1	125	32	
	.11		32	178	N100	0 200		50	F		5	11	7	
					N200	H 0	15	120	Cp		7	2	18	
	8.45		5	9										
	.45		7											
	.37		7	29										
	.38		8											
	.37		8											
	.35		13	41										
	.31		21	104										
	.28		24	145										
	.23		32	167										



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1940								
21. viii	108/40	36° 19' S. 150° 54' E.		0	15.95	19.71	35.61	26.25
				20	15.67	.70	.59	.29
				50	15.40	.67	.53	.31
				100	15.18	.71	.61	.42
				150	14.27	.59	.39	.45
				200	13.65	.53	.28	.49
				300	11.82	.43	.10	.72
				400	9.73	.23	34.74	.81
			600	7.52	.14	.58	27.03	
22. viii	109/40	37° 4' S. 150° 2' E.	30	0	13.29	19.62	35.44	26.69
				10	13.40	.63	.46	.69
				20	13.36	.63	.46	.69
				30	13.11	.64	.48	.76
				40	13.10	.64	.48	.76
				50	13.14	.65	.49	.76
	110/40	37° 3' S. 150° 13' E.	60	0	14.19	19.64	35.48	26.53
				20	14.18	.67	.53	.58
				40	13.46	.62	.43	.64
				50	13.39	.64	.48	.70
80				13.19	.68	.55	.80	
			100	12.88	.64	.48	.80	
111/40	37° 2' S. 150° 23' E.	100	0	15.65	19.68	35.55	26.27	
			20	15.51	.68	.55	.30	
			40	15.15	.68	.55	.38	
			50	14.88	.64	.48	.38	
			100	14.17	.63	.46	.52	
			150	13.40	.62	.44	.67	
112/40	37° 2' S. 150° 32' E.		0	16.17	19.71	35.61	26.19	
			20	15.90	.67	.53	.20	
			50	15.86	.69	.57	.24	
			100	15.18	.63	.46	.30	
			150	14.41	.60	.41	.43	
			200	13.41	.52	.26	.53	
			300	11.63	.41	.07	.72	
			400	10.09	.32	34.89	.87	
			600	7.87	.21	.70	27.08	

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS														
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count									
										I	II	III	IV						
		8.38	6	9															
		.37	5																
		.40	6	26															
		.38	6																
		.36	7																
		.34	8	64															
		.28	15	86															
		.18	22	120															
		.12	28	156															
			3	8	N70	H 0	15	50	Cp										
			4		N70	V 50-0		2	Cp										
			4	8	N70	0 50		90	Cp			2							
			5		N100	0 50		45	C			4							
			5		N200	H 0	15	150	C										11
			7	9															1
			4	20															
			5																
			5																
			7	34															
			8																
			9	12															
			8	18															
			7																
			8																
			10	22															
			10	47															
			11	75															
		8.42	7	22	N70	H 0	15	35	Cp					62					6
		.42	7		N70	V 50-0		8	Cp					21					7
		.43	7	22	N70	V100-50		6	Cp					16					2
		.41	13		N70	V250-		15	Cp					14					15
		.36	13			100													
		.38	17	70	N70	V500-		50	Cp					2					11
		.30	25	75		250													
		.25	25	136	N70	0 200		40	Cp					37					68
		.17	37	168	N100	0 200		60	C					3					4
					N200	H 0	15	100	T					23					16

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	σ <sub>t</sub>
1940								
22. viii	113/40	37° 2' S. 150° 40' E.		0	15.91	19.68	35.55	26.20
				20	15.33	.68	.55	.34
				50	15.08	.64	.48	.34
				100	14.59	.64	.48	.44
				149	14.05	.60	.41	.51
				198	13.54	.58	.37	.59
				298	12.04	.44	.12	.69
				398	10.24	.31	34.88	.83
				596	8.39	.19	.67	.97
	114/40	37° 2' S. 150° 48' E.		0	16.01	19.68	35.55	26.18
				20	15.90	.69	.57	.23
				50	15.28	.64	.48	.29
				100	14.24	.55	.32	.40
				150	13.46	.58	.37	.61
				200	12.95	.50	.23	.61
				300	11.31	.38	.01	.75
				400	9.85	.26	34.79	.84
				600	7.95	.18	.65	.86
24. viii	115/40	38° 14' S. 149° 32' E.	265	0	15.37	19.69	35.57	26.35
				20	15.40	.70	.58	.35
				50	14.87	.63	.46	.38
				93	14.18	.66	.52	.56
				140	14.13	.66	.52	.57
				187	13.99	.63	.46	.57
				215	12.72	.55	.32	.71
				301	11.85	.53	.28	.85
				473	11.86	.57	.35	.90
	116/40	38° 35' S. 149° 15' E.		0	15.06	19.65	35.49	26.35
				20	15.05	.65	.49	.35
				50	14.20	.61	.43	.49
				100	14.06	.61	.43	.52
				149	13.90	.63	.46	.58
				199	13.59	.62	.44	.63
				280	13.12	.57	.35	.66
				374	11.63	.45	.14	.78
				560	8.74	.18	34.65	.90

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (cc.)	D.O.	Count				
										I	II	III	IV	
		8.45	8	10										
		.46	7											
		.46	8	22										
		.47	13											
		.43	13											
		.37	17	57										
		.35	21	94										
		.30	26	104										
		.29	32	156										
		8.41	5	10										
		.41	6											
		.39	7	33										
		.39	13											
		.36	13											
		.37	15	64										
		.30	20	104										
		.25	25	121										
		.14	32	135										
			5	22										
			7											
			10	27										
			10											
			8											
			8	27										
			15	43										
			17	50										
			16	128										
		8.46	7	22										
		.46	8											
		.44	13	41										
		.45	13											
		.46	13											
		.45	13	37										
		.42	16	27										
		.38	21	75										
		.34	26											

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1940								
24. viii	117/40	38° 53' S. 149° 00' E.		0	14.11	19.65	35.50	26.57
				20	14.13	.66	.52	.57
				50	14.11	.66	.52	.58
				100	14.00	.65	.49	.58
				150	13.58	.60	.41	.61
				200	13.26	.56	.33	.62
				300	12.05	.46	.16	.71
				400	11.20	.40	.05	.79
				600	8.46	.19	34.67	.96
					118/40	39° 15' S. 148° 44' E.	225	0
20	13.65	.64	.48					.64
50	13.51	.62	.44					.64
100	13.40	.63	.46					.69
150	13.15	.63	.46					.74
200	12.78	.59	.39					.75
300	12.29	.53	.28					.76
400	11.86	.48	.19					.78
25. viii	119/40	39° 57' S. 148° 34' E.	30	0	12.69	19.60	35.41	26.75
				10	12.66	.57	.35	.75
				20	12.63	.57	.35	.76
				30	12.68	.57	.35	.76
				40	12.62	.59	.39	.79
	50	12.59	.62	.44	.83			
	120/40	39° 57' S. 148° 44' E.	63	0	13.00	19.61	35.43	26.74
				20	12.91	.67	.53	.83
				40	12.70	.63	.46	.83
				50	12.87	.66	.52	.83
80				12.56	.62	.44	.83	
100	12.21	.56	.34	.83				
121/40	39° 57' S. 148° 54' E.	180	0	13.29	19.60	35.40	26.66	
			20	13.27	.59	.39	.66	
			50	13.27	.59	.39	.66	
			86	13.30	.61	.42	.68	
			129	13.17	.59	.39	.68	
			172	13.09	.60	.41	.72	
			258	12.43	.58	.37	.81	
344	12.23	.56	.34	.82				

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count				
										I	II	III	IV	
		8.45	7	40										
		.45	8											
		.45	7	40										
		.44	9											
		.42	11											
		.42	11	59										
		.41	17	57										
		.37	23	90										
		.30	34	133										
		8.41	7	48										
		.41	7											
		.41	7	43										
		.41	8											
		.39	7											
		.37	6	40										
		.37	5	70										
		.36	5	64										
			7	43	N70	H 0	15	25	C					
			7		N70	V 50-0		15	C		4			1
			7	40	N70	0 50		140	C		55			
			7		N100	0 50		210	T		106			
			8		N200	H 0	15	320	T		192			
			7	33										
			7	43										
			7	27										
			7											
			7	48										
			7											
			5	33										
		8.41	8	67										
		.40	7											
		.38	7	49										
		.40	7											
		.40	7											
		.40	8	70										
		.42	7	73										
		.22	8	75										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1940								
29. viii	122/40	43° 10' S. 148° 4' E.	60	0	11.50	19.41	35.07	26.75
				10	11.51	.41	.07	.75
				20	11.55	.42	.08	.75
				30	11.61	.43	.09	.75
				40	11.58	.43	.09	.75
				50	11.55	.42	.08	.75
				100	11.60	.44	.12	.77
30. viii	123/40	43° 10' S. 148° 10' E.	85	0	11.43	19.45	35.14	26.82
				20	11.50	.46	.16	.82
				40	11.50	.47	.17	.84
				50	11.54	.48	.19	.84
				100	11.50	.47	.17	.84
				150	11.52	.47	.17	.84
	124/40	43° 10' S. 148° 20' E.		0	11.90	19.47	35.17	26.76
				20	11.94	.48	.19	.77
				50	11.94	.48	.19	.77
				100	11.80	.50	.22	.82
				150	11.79	.49	.21	.82
				200	11.74	.49	.20	.82
				280	11.72	.49	.20	.82
				374	11.23	.46	.16	.88
				560	8.80	.22	34.72	.95
	125/40	43° 10' S. 148° 32' E.		0	12.60	19.56	35.34	26.75
				20	12.64	.58	.37	.77
				50	12.66	.58	.37	.77
				100	12.66	.58	.37	.77
				150	12.49	.56	.34	.77
				200	12.12	.51	.25	.77
				300	11.34	.42	.08	.79
				400	10.38	.33	34.92	.84
				600	8.16	.16	.61	.97

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count				
										I	II	III	IV	
			4	27	N70	H 0	15	4						4
			4		N70	V 50-0		2	Co					
			4	128	N70	O 50		5				3		11
			4		N100	O 50		4	C					
			5		N200	H 0	15	10	C					1
			6	20										
			6	17										
			13	22										
			8											
			9											
			7	37										
			7	27										
			7	30										
	8.41		13	34	N70	H 0	15	20	Co		1			
	.33		13		N70	V 50-0		2	Co					2
	.32		13	57	N70	V100-50		3	T		4	2		
	.36		13		N70	V250- 100		10	Co					8
	.41		9											
	.40		9	37	N70	V500- 250		50	Cp					7
	.39		9	37										
	.35		10	75	N70	O 0		25	C			10		63
	.36		28	90	N100	O 200		16	Co					3
					N200	H 0	15	40	Co					
	8.46		9	43										
	.44		8											
	.45		8	47										
	.44		8											
	.33		8											
	.44		9	70										
	.39		8	57										
	.39		17	94										
	.37		25	157										



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1940								
30. viii	126/40	43° 10' S. 148° 44' E.		0	12.67	19.55	35.32	26.72
				20	12.68	.55	.32	.72
				50	12.69	.56	.33	.72
				100	12.66	.55	.32	.72
				150	12.61	.54	.30	.72
				200	12.16	.49	.20	.73
				300	11.64	.41	.07	.74
				400	10.02	.29	34.84	.84
				600	8.24	.17	.63	.97
31. viii	127/40	42° 39' S. 148° 17' E.	55	0	11.50	19.41	35.07	26.75
				20	11.50	.41	.07	.75
				40	11.52	.42	.08	.76
				50	11.50	.42	.08	.76
				80	11.51	.44	.12	.79
				100	11.51	.53	.28	.91
128/40	42° 37' S. 148° 29' E.	200	0	11.50	19.44	35.12	26.79	
			50	11.49	.44	.12	.79	
			100	11.50	.44	.12	.79	
			150	11.47	.44	.12	.79	
			200	11.45	.44	.12	.80	
			300	11.48	.45	.14	.81	
129/40	42° 34' S. 148° 37' E.		0	12.50	19.51	35.25	26.69	
			20	12.44	.53	.28	.73	
			50	12.46	.56	.34	.77	
			100	12.43	.56	.34	.78	
			150	12.13	.52	.26	.79	
			200	11.79	.47	.17	.79	
			300	11.28	.44	.12	.84	
			400	10.29	.32	34.89	.84	
600	8.60	.20	.69	.95				

# F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS														
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O D	Count									
										I	II	III	IV						
	8.45		8	37															
	.45		7																
	.45		7	60															
	.45		8																
	.45		8																
	.46		9	93															
	.39		13	121															
	.37		17	145															
	.30		25	253															
			4	12	N70	H 0	15	3	Cp				6	12					
			4	12	N70	V 50-0		2	Cp										
			2		N70	O 50		5	Cp				5	12					
			3	60	N100	O 50		10	C					2					
			4		N200	H 0	15	20	Co										
			4	22															
			5	55															
			4	43															
			5	48															
			5	48															
			5	60															
			5	40															
	8.40		6	71	N70	H 0	15	5	C									8	
	.40		5		N70	V 50-0		1	C				1	1					
	.39		5	67	N70	V100-50		2	Cp				1	1					
	.39		5		N70	V250-		2	Cp				1	1					
	.39		5			100													
	.37		7	103	N70	V500-		8	Cp				2	6					
	.36		9	98		250													
	.33		13	147	N70	O 200		30	Cp				12	47					
	.29		17	158	N100	O 200		20	C			1		9					
					N200	H 0	15	30	Co					9					

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>	
1940  31. viii	130/40	42° 31' S. 148° 48' E.		0	13.16	19.61	35.42	26.71	
				20	13.04	.59	.38	.71	
				50	13.08	.60	.40	.71	
				100	13.08	.60	.41	.71	
				150	12.97	.58	.37	.71	
				200	12.55	.53	.28	.71	
				300	11.66	.41	.07	.72	
				400	10.64	.32	34.90	.79	
				600	8.58	.20	.69	.95	
	131/40	42° 28' S. 148° 58' E.			0	13.16			
					20	13.10			
					50	13.10			
					100	13.02			
					150	13.00			
					200	12.48			
					300	11.93			
					400	10.63			
					600	8.51			
	1. ix	132/40	41° 4' S. 148° 24' E.	30	0	11.54	19.49	35.21	26.86
					10	11.58	.50	.23	.86
					20	11.59	.50	.23	.86
30					11.60	.52	.26	.89	
40					11.59	.52	.26	.89	
50					11.60	.52	.26	.89	
133/40		41° 1' S. 148° 30' E.	60	0	11.99	19.50	35.23	26.79	
				20	11.96	.52	.26	.82	
				40	11.96	.52	.26	.82	
	50	11.97	.52	.26	.82				
	80	11.92	.52	.26	.82				
	100	11.81	.50	.23	.82				

# F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count				
										I	II	III	IV	
		8.42	5	68										
		.43	6											
		.40	6	68										
		.43	6											
		.45	6											
		.38	7	75										
		.39	8	86										
		.28	13	136										
		.22	21	192										
		8.39	8	20										
		.41	10											
		.40	9	41										
		.42	10											
		.42	9											
		.39	11	41										
		.35	11	30										
		.27	17	75										
		.19	25	100										
			5	12	N70	H 0	15	80	C					2
			5		N70	V 50-0		2	Cp					2
			6	12	N70	O 50		15	Cp					23
			7		N100	O 50		15	C					9
			7		N200	H 0	15	50	Co			2		
			7	20										
			7	43										
			7	41										
			7											
			8	47										
			8											
			8	17										

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>	
1940									
1. ix	134/40	40° 59' S. 148° 46' E.		0	12.09	19.49	35.21	26.76	
				20	11.87	.46	.16	.76	
				50	11.68	.44	.12	.76	
				100	11.87	.46	.16	.76	
				150	11.77	.46	.16	.77	
				200	11.70	.46	.16	.78	
				280	11.74	.46	.15	.78	
				374	11.33	.47	.17	.87	
				560	10.00	.32	34.90	.90	
31. x	139/40	33° 57' S. 151° 33' E.		0	20.09	19.67	35.53	25.16	
				10	20.10	.69	.56	.16	
				20	20.09	.67	.53	.16	
				30	20.00	.71	.61	.25	
				40	19.88	.69	.57	.25	
				50	19.79	.69	.57	.27	
				100	18.48	.67	.53	.59	
				150	17.35	.64	.48	.81	
				200	16.01	.63	.46	26.12	
				300	14.64	.57	.35	.34	
				400	12.97	.48	.19	.56	
				600	10.52	.31	34.88	.79	
	140/40	34° 4' 30" S. 151° 16' 30" E.	120	0	19.80	19.70	35.59	25.27	
				20	19.70	.67	.53	.27	
				40	19.41	.67	.53	.34	
				50	19.07	.69	.57	.46	
				100	17.81	.67	.53	.50	
				150	16.10	.58	.37	26.03	
	141/40	34° 3' S. 151° 11' 30" E.	30	0	18.58	19.65	35.50	25.52	
				10	18.17	.62	.44	.58	
				20	17.14	.56	.33	.75	
				30	17.44	.61	.43	.75	
				40	16.78	.59	.39	.88	
				50	16.31	.57	.35	.96	

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS														
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count									
										I	II	III	IV						
		8.42	9	60															
		.42	10																
		.40	10	55															
		.40	10																
		.42	10																
		.42	9	38															
		.42	10	43															
		.42	11	43															
		.37	17	98															
			6	5	N70	H 0	15	80	Cp		7	162	284						
			7	3	N70	V 50-0		6	Cp			6	7						
			8	5	N70	V100-50		5	C				5						
			10	38	N70	V250-		5	Cp				7						
			10	10		100													
			10	5	N70	V500-		10	Cp			1	2						
			13	38		250													
			18	68	N70	O 200		90	Cp		5	120	174						
			21	77	N100	O 200		60	C		6	2	50						
			19	70	N200	H 0	15	280	Cp		28	14	359						
			24	121															
			26	127															
			7	5															
			7	10															
			7	5															
			7	5															
			7	4															
			14	76															
			8	12	N70	H 0	15	10	Cp		38	135	2						
			7	48	N70	V 50-0		6	Cp			7	1						
			9	37	N70	O 50		20	Cp		2	95	1						
			12	70	N100	O 50		20	C				2						
			15	64	N200	H 0	15	20	Co		5	12	4						
			15	10															

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1940								
4. xii	142/40	34° 3' S. 151° 11' 30" E.	35	0	19.99	19.53	35.28	24.99
				10	18.30	.59	.39	25.51
				20	16.44	.63	.46	26.02
				30	16.14	.63	.46	.08
				40	15.47	.59	.39	.18
				50	15.09	.58	.37	.26
5. xii	143/40	33° 57' S. 151° 33' 30" E.		0	19.90	19.71	35.61	25.27
				10	19.67	.68	.55	.29
				20	19.39	.67	.53	.36
				30	19.37	.68	.55	.36
				40	18.68	.67	.53	.53
				50	17.94	.68	.55	.72
				100	14.93	.59	.39	26.30
				150	13.74	.53	.28	.47
				200	12.50	.47	.17	.64
				300	11.09	.37	34.99	.78
				400	9.64	.25	.78	.88
				600	7.36	.14	.58	27.07
	144/40	34° 4' 30" S. 151° 0' 30" E.	100	0	20.94	19.68	35.55	24.94
				20	20.13	.71	.61	25.21
				40	18.38	.69	.57	.64
				50	17.78	.68	.55	.76
				100	14.51	.58	.37	26.39
				150	13.10	.55	.32	.64
1941								
1. i	1/41	32° 42' S. 152° 19' E.	40	0	19.97	19.56	35.33	25.04
				10	19.95	.58	.37	.08
				20	7.75	.62	.44	.69
				30	16.51	.66	.52	26.04
				40	15.82	.58	.37	.10
				50	15.13	.58	.37	.25

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O D	Count				
										I	II	III	IV	
			8	22	N70	V 50-0		5	Cp					1
			12	20	N70	O 50		50	Cp		15	110		26
			25	38	N100	O 50		5	Co			3		
			21	55	N200	H 0		15	C		3	4		8
			19	26	N70	H 0	15	100	Cp		30	17		76
			27	44										
			10	0	N70	V 50-0		8	Cp		4	5		16
			10	0	N70	V100-50		4	Cp		1	1		5
			13	0	N70	V250-		15	Cp		1			5
			9	12		100								
			10	5	N70	V500-		2	C					
			9	18		250								
			21	57	N70	O 200		320	Cp		4	7		48
			22	70	N100	O 200		250	C		32	2		28
			28	80	N200	H 0	15	250	Ch		13			32
			28	92										
			35	121										
			41	128										
			10	26										
			10	7										
			13	9										
			9	52										
			10	46										
			9	59										
			4		N70	H 0	15	15	Cp		1	48		2
			3		N70	V 50-0		5	Cp			5		
			0		N70	O 0-50		20	Cp			230		10
			15		N100	O 0-50		2	Co		1	1		1
			16		N200	H 0	15	5	Co			2		
			12											



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1941								
1. i	2/41	32° 42' S. 152° 32' E.	60	0	18.25	19.62	35.44	25.56
				10	18.12	.60	.41	.58
				20	17.88	.60	.41	.63
				40	17.29	.60	.41	.74
				50	15.87			
				80	14.08	.52	.26	26.39
	3/41	32° 42' S. 152° 45' E.	100	0	21.64	19.70	35.59	24.78
				10	21.59			
				20	21.52	.71	.61	.83
				30	20.74			
				40	20.48	.65	.50	25.03
				50	19.83	.68	.55	.25
				80	18.90			
				100	18.57	.66	.52	.54
				150	17.82	.70	.59	.78
				4/41	32° 42' S. 152° 52' E.		0	24.31
	10	24.34						
	20	24.34	.69				.57	.99
30	24.21							
40	23.24							
50	23.25	.68	.55				24.29	
100	19.75	.70	.59				25.28	
150	18.72	.73	.64				.60	
200	17.48	.68	.55				.83	
280	17.61	.70	.59				.83	
374	15.18	.57	.35				26.22	
560	10.71	.36	34.97				.83	

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z N <sub>2</sub> O <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count				
										I	II	III	IV	
			6	22										
			6											
			6	12										
			12											
				143										
			17	121										
			1	10										
			3	10										
			8											
			11	53										
			11											
			10	68										
			0	10	N70	H 0	15	45	Gp		13	194	35	
					N70	0 0-200		90	Gp		70	220	95	
			0		N100	0 0-200		140	Co		14	18	36	
					N200	H 0	15	30	T					
			0	5										
			3											
			4											
			7	92										
			7	93										
			12	143										
			17	92										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1941								
1.1	5/41	32° 42' S. 153° 2' E.		0	24.27	19.53	35.28	23.79
				10	24.34			
				20	24.22	.63	.46	.94
				30	24.10			
				40	23.10			
				50	22.82	.61	.43	24.32
				100	21.60	.74	.66	.85
				150	19.12	.74	.66	25.51
				200	18.10	.71	.61	.73
				300	16.41	.60	.41	.99
				400	12.64	.44	.12	26.57
600	8.42	.16	34.61	.93				
4.1	6/41	30° 18' S. 153° 16' E.	35	0	19.50	19.67	35.53	25.32
				10	19.35	.71	.61	.42
				20	19.22	.69	.56	.42
				30	19.29	.72	.62	.44
				40	19.05	.68	.55	.45
				50	19.04	.68	.55	.45
	7/41	30° 18' S. 153° 22' E.	50	0	20.74	19.67	35.53	24.99
				10	20.74	.69	.57	25.02
				20	20.60	.69	.57	.05
				40	20.45	.69	.57	.09
				50	20.18	.70	.59	.17
80	19.86	.66	.52	.21				
5.1	8/41	30° 18' S. 153° 29' E.	100	0	23.69	19.69	35.56	24.20
				10	23.70			
				20	23.55	.69	.57	.22
				30	23.35			
				40	22.58	.70	.59	.51
				50	21.56	.69	.57	.79
				80	20.98			
				150	19.56	.69	.57	25.33
				17.54	.58	.37	26.15	

# F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	N NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count				
										I	II	III	IV	
			0	10										
			3											
			0	0										
			2											
			4											
			7	88										
			12	100										
			12	123										
			22	220										
			11	17	N70	H 0	15	20	Cp			305		
			10		N70	V 50-0		4	Cp			21		
			11	29	N70	0 0-50		25	Cp			168	9	
			10		N100	0 0-50		80						
			12	39	N200	H 0	15	2	Co			6	2	
			15	35										
			7	5										
			7											
			7	11										
			7											
			10	45										
			10	64										
			7	8										
			13	0										
			7	45										
			10											
			14	68										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS							
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$			
1941											
5. i	9/41	30° 18' S. 153° 33' E.		0	24.10	19.68	35.54	24.04			
				10	24.10						
				20	24.10	.67	.53	.04			
				30	24.08						
				40	23.64						
				50	21.38	.73	.64	.89			
				76	19.87	.75	.68	25.33			
				114	18.66	.72	.62	.60			
				152	17.61	.64	.48	.75			
				210	16.96	.64	.48	.90			
				280	15.48	.57	.35	26.15			
				420	10.86	.36	34.97	.61			
				10/41	30° 18' S. 153° 45' E.		0	24.19	19.68	35.55	24.01
							10	24.14			
	20	24.09				.71	.61	.09			
	30	24.10									
	40	23.89									
	50	22.22				.69	.57	.61			
	100	20.08				.73	.64	25.23			
	150	19.03				.74	.66	.54			
	200	17.91				.73	.64	.80			
	258	15.85				.67	.53	26.21			
	344	13.42				.51	.25	.51			
	516	9.62				.25	34.77	.85			
	11/41	30° 18' S. 153° 57' E.					0	24.21	19.66	35.52	23.98
							10	24.09			
				20	23.99	.64	.48	24.02			
				30	24.03						
				40	23.44						
				50	22.18	.70	.59	.63			
				100	19.84	.70	.59	25.27			
				150	18.47	.72	.62	.65			
				200	17.56	.68	.55	.82			
				288	15.19	.58	.37	26.24			
				384	12.46	.47	.17	.65			
				577	8.97	.19	34.66	.87			

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NON	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count			
										I	II	III	IV
			4	14	N70	H 0	15	70	Cp		191	133	29
			0		N70	0 200		75	Cp		65	217	106
					N100	0 200		70	T		70	9	15
					N200	H 0	15	80	T		176	10	12
			4	23									
			4										
			6										
			14	88									
			9	95									
			11	125									
			25	102									
			3	17									
			0										
			0										
			0										
			5										
			9	88									
			10	105									
			12	142									
			27	220									
			7	2									
			0										
			1	5									
			6										
			6										
			7	68									
			13	91									
			17	100									
			25	162									

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS						
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>		
1941										
6.1	12/41	28° 41' S. 153° 44' E.	30	0	22.50	19.66	35.52	24.48		
				10	22.40	.66	.52	.51		
				20	19.76	.68	.55	25.22		
				30	19.91	.67	.53	.22		
				40	18.56	.70	.59	.60		
				50	17.97	.64	.48	.66		
	13/41	28° 41' S. 153° 49' E.	50	0	23.15	19.71	35.61	24.37		
				10	23.20	.73	.64	.37		
				20	21.72	.71	.61	.78		
				40	19.08	.70	.59	25.47		
				50	18.76	.69	.57	.54		
				80	16.99	.68	.55	.95		
	14/41	28° 41' S. 153° 53' E.	100	0	24.50	19.64	35.48	23.87		
				10	24.55					
				20	24.52	.63	.45	.87		
				30	23.58					
				40	21.05	.70	.59	24.94		
				50	20.23	.71	.61	25.18		
80				18.46						
100				17.86	.70	.59	.78			
150				16.43	.65	.50	26.05			
15/41				28° 41' S. 153° 59' E.		0	24.61	19.67	35.53	23.86
						10	24.60			
						20	24.56	.68	.55	.89
	30	22.62								
	40	20.94								
	50	20.24	.70			.59	25.16			
	100	17.89	.65			.50	.70			
	150	16.72	.65			.50	.98			
	200	15.75	.60			.41	26.14			
	300	15.50	.56			.34	.14			
400	11.51	.38	.01	.71						
600	8.41	.18	34.65	.95						

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
				7	5	N70	H 0	15	40	Cp	112	306	6
				15		N70	V 50-0		10	Cp	42	134	3
				8	5	N70	0 0-50		25	Cp	185	170	20
				10		N100	0 0-50		3	Co	2	1	1
				12	70	N200	H 0	15	20	Co	14	7	5
				15	82								
				4	10								
				4									
				5	37								
				10									
				13	95								
				13	91								
				13	6								
				9	11								
				15									
				16	82								
				16	105								
				2	2	N70	H 0	15	45	Cp	3	25	22
						N70	V 50-0		20	Cp	7	54	28
				3		N70	V100-50		8	Cp	1	3	4
						N70	V250- 100		5	Cp	1	8	3
				11	80	N70	V500- 250		10	Cp		17	1
				11									
				8		N70	0 0-200		100	Cp	37	271	68
				22	105	N100	0 0-200		75	C	5	7	9
				17	132	N200	H 0	15	50	Co	15	9	5
				29	172								
				24	205								



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	σ <sub>t</sub>	
1941 6. i	16/41	28° 41' S. 154° 9' E.		0	25.04	19.65	35.49	23.71	
				10	24.79				
				20	24.67	.64	.48	.81	
				30	24.72				
				40	21.86				
				50	20.10	.69	.57	25.18	
				100	17.68	.65	.50	.75	
				150	16.01	.59	.39	26.06	
				200	14.56	.56	.34	.34	
				300	12.60	.43	.10	.57	
	400	10.59	.37	34.99	.86				
	600	7.95	.14	.58	.97				
	17/41	28° 41' S. 154° 18' E.			0	25.21	19.68	35.55	23.73
					10	24.59			
					20	24.54	.68	.55	.89
					30	24.55			
					40	24.38			
					50	21.08	.65	.50	24.87
					100	17.94	.63	.46	25.66
					150	16.11	.58	.37	26.03
200					14.71	.51	.25	.23	
290					13.17	.52	.26	.58	
8. i	18/41	30° 56' S. 153° 8' E.	35	0	20.67	19.70	35.58	25.04	
				10	20.29	.70	.59	.14	
				20	19.55	.69	.57	.34	
				30	19.53	.69	.57	.34	
				40	19.23	.68	.55	.40	
				50	18.98	.68	.55	.47	

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ O <sub>3</sub> Σ	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count				
										I	II	III	IV	
			5	18										
			13											
			20	65										
			9											
			11											
			11	123										
			26	172										
			18	157										
			25	275										
			3	12										
			0											
				25										
			12											
			14											
				91										
			17	123										
			26	200										
			26	220										
			6	0	N70	H 0	15	5	Cp		4	74	2	
			6		N70	V 50-0		10	Cp		6	233	7	
			13	17	N70	O 0-50		20	Cp		53	214	12	
			10		N100	O 50		6	C		2	2	1	
			15	58	N200	H 0	15	2	Co		2	80		
			14	58										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1941								
8.1	19/41	30° 57' S. 153° 18' E.	100	0	24.49	19.65	35.50	23.89
				10	24.46			
				20	23.64	.63	.46	24.11
				30	22.88			
				40	21.50	.70	.59	.82
				50	20.51	.71	.61	25.11
				80	19.85			
				100	19.46	.70	.59	.37
				150	17.72	.67	.53	.76
	20/41	30° 59' S. 153° 22' E.		0	24.47	19.65	35.49	23.88
				10	24.39			
				20	24.19	.71	.61	24.07
				30	23.70			
				40	22.86			
				50	20.74	.71	.61	25.05
				93	19.52	.46	.50	.29
				140	18.78	.57	.59	.54
				187	17.30	.66	.52	.85
				258	16.26	.65	.50	26.09
				344	13.99	.49	.21	.37
				516	10.00	.30	34.86	.86
	21/41	31° 00' S. 153° 32' E.		0	24.59	19.68	35.54	23.90
				10	24.54			
				20	23.20	.71	.61	24.36
				30	23.19			
				40	23.09			
				50	21.31	.71	.61	.92
				100	19.50	.69	.57	25.35
				150	18.51	.73	.64	.65
				200	17.12	.67	.53	.91
				288	14.65	.60	.41	26.38
				384	12.41	.44	.12	.61
				577	9.40	.23	34.74	.87

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS														
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count									
										I	II	III	IV						
			3	0															
			10	5															
			7																
			10	0															
			11																
			10	52															
			5	0	N70	H 0	15	30	Cp		15	57	5						
					N70	V 50-0		10	Cp		6	43	7						
			5		N70	V100-50		4	Cp		2	48	39						
					N70	V250- 100		3	Cp		3	28	26						
			4	0	N70	V500- 250		4	Cp		1	36	17						
			10		N70	0 0-200		150	Cp		55	83	67						
			8	20	N100	0 200		50	T		37	10	19						
			12	87	N200	H 0	15	60	T		73	3	3						
			12	113															
			25	168															
			8	0															
			3																
			6	0															
			7																
			8																
			6	64															
			17	62															
			11	112															
			25	145															

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1941								
8.1	22/41	31° 1' S. 153° 39' E.		0	24.07	19.69	35.56	24.07
				10	24.02			
				20	23.24	.68	.55	.30
				30	23.10			
				40	22.99			
				50	22.83	.68	.55	.41
				100	19.86	.72	.62	25.29
				150	18.96	.71	.61	.52
				200	18.01	.69	.57	.72
				258	15.91	.61	.43	26.11
				344	13.75	.55	.32	.59
				516	9.77	.30	34.87	.90
				9.1	23/41	31° 51' S. 152° 51' E.	35	0
10	17.44	.59	.39					.72
20	17.40	.58	.37					.73
30	16.98	.59	.39					.83
40	16.78	.62	.44					.92
24/41	31° 51' S. 152° 58' E.	50	0		21.00	19.64	35.48	24.87
			10		20.39	.67	.53	25.08
			20		18.23	.67	.53	.64
			40		17.58	.66	.52	.78
			50		17.56	.65	.50	.78
25/41	31° 51' S. 153° 7' E.	110	0		24.35	19.65	35.49	23.92
			10		24.40			
			20		23.99	.66	.52	24.05
			30		22.98			
			40		22.39	.66	.52	.51
	50	20.83	.74	.66	25.06			
	80	19.81						
	100	19.33	.75	.68	.47			
	150	17.20	.67	.53	.89			

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O D	Count				
										I	II	III	IV	
			2	25										
			3											
			4	8										
			7											
			4											
			7	53										
			12	50										
			13	75										
			24	133										
			14	0	N70	V 50-0			8	Cp			1	
			22		N70	H 0	15		30	Cp				
			17	68	N70	0 0-50			45	Cp				17
			15		N100	0 0-50			5	Cp	2			3
			18	134	N200	H 0	15		4	Cp				1
			16	80										
			6	0										
			7											
			11	48										
			14											
			15	40										
			15	62										
			9	0										
			6	0										
			7											
			7	3										
			10											
			14	58										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1941								
9. i	26/41	31° 57' S. 153° 16' E.		0	24.35	19.64	35.48	23.91
				10	24.40			
				20	23.95	.68	.55	24.08
				30	23.30			
				40	23.13			
				50	23.03	.61	.43	.27
				100	19.85	.71	.61	25.29
				150	18.92	.70	.59	.51
				200	18.00	.69	.57	.73
				280	15.13	.60	.41	26.28
				374	12.96	.45	.14	.52
560	7.83	.20	34.69	27.07				
11. i	27/41	34° 3' S. 151° 24' E.	60	0	20.49	19.60	35.40	24.95
				10	20.52	.60	.41	.95
				20	20.56	.61	.43	.95
				40	18.59	.66	.52	25.54
				50	17.87	.66	.52	.71
				80	15.59	.59	.39	26.16
				28/41	34° 3' S. 151° 32' E.	100	0	20.80
	10	20.81						
	20	19.52	.72	.62			.38	
	30	18.80						
	40	17.86	.66	.52			.72	
	50	16.93	.66	.52			.94	
	80	15.36						
	100	14.53	.62	.44	26.43			
150	12.91	.49	.21	.59				

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	N NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (cc.)	D.	Count			
										I	II	III	IV
			4	0	N70	H 0	15	30	Cp		67	50	37
					N70	0 0-200		50	Cp		10	43	77
			3		N100	0 0-200		50	Cp		12	2	4
					N200	H 0	15	75	T		73	6	5
			4	0									
			17										
			7										
			6	38									
			10	91									
			14	123									
			33	180									
			9	0									
			6	0									
			7	0									
			7	0									
			7	0									
			17	75									
			7	0									
			9	0									
			9										
			9	18									
			27										
			23	133									



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp. °C.	Cl <sup>o</sup> /oo	S <sup>o</sup> /oo	σ <sub>t</sub>	
1941									
11. i	29/41	33° 59' S. 151° 40' E.		0	20.90	19.71	35.60	24.99	
				10	20.92				
				20	18.25	.69	.57	25.66	
				30	18.19				
				40	17.62				
				50	16.44	.72	.62	26.14	
				100	14.53	.57	.35	.36	
				150	13.56	.56	.34	.55	
				200	12.64	.49	.21	.64	
		300	11.83	.42	.08	.69			
		400	9.41	.27	34.81	.92			
		600	7.36	.11	.52	27.01			
		30/41	33° 54' S. 151° 50' E.		0	20.83	19.58	35.37	24.84
				10	20.79				
				20	20.65	.64	.48	.96	
				30	20.02				
				40	17.97				
				50	16.95	.66	.52	25.94	
				100	14.51	.60	.41	26.41	
				150	13.60	.54	.30	.52	
				200	13.35				
		300	11.09	.39	.03	.80			
		400	9.85	.27	34.81	.85			
		600	8.01	.15	.60	.97			
		31/41	33° 51' S. 151° 58' E.		0	21.10	19.68	35.55	24.90
				10	21.10				
				20	20.59	.68	.55	25.04	
	30			19.63					
	40			18.82					
	50			17.60	.69	.57	.83		
	96			14.74	.60	.41	26.56		
	144			13.65	.58	.37	.56		
	192			13.23	.57	.35	.63		
	280			12.30	.51	.25	.73		
	374			10.49	.33	34.92	.82		
	560	8.16	.15	.60	.95				

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
			5	0	N70	H 0	15	500	T		276	2	
					N70	V 50-0		300	T		74		2
			5		N70	V100-50		200	T		25	3	2
					N70	V250- 100		80	Cp		48		3
			0	25	N70	V500- 250		50	Cp			4	8
			17										
			9		N70	O 200		450	T		125	4	
			17	104	N100	H 0	15	550	T		287		
			17	123	N100	O 200		400	T		210	3	
			20	142									
			23	180									
			0	0									
			3										
			7	0									
			12										
			17										
			11	81									
			17	125									
			21	172									
			30	215									
			2	22									
			5	20									
			4	13									
			8										
			17										
			10	80									
			14	133									
			17	157									
			26	228									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1941								
11. i	32/41	34° 3' S. 151° 17' E.		0	20.91	19.59	35.39	24.83
				10	20.95	.60	.40	.83
				20	20.65	.63	.46	.95
				30	20.54	.60	.41	.95
				40	19.72	.64	.48	25.22
				50	17.96	.64	.47	.67
16. i	33/41	35° 7' S. 150° 51' E.	35	0	21.00	19.55	35.32	24.75
				10	20.26	.58	.37	.99
				20	18.19	.67	.53	25.65
				30	17.30	.64	.48	.82
				40	15.84	.64	.48	26.17
				50	14.36	.55	.32	.37
	34/41	35° 8' S. 150° 57' E.	50	0	21.38	19.56	35.34	24.66
				10	21.16	.67	.53	.87
				20	20.74	.69	.57	25.01
				40	18.39	.66	.52	.59
				50	17.18	.65	.50	.87
				80	15.19	.61	.43	26.27
	35/41	35° 10' S. 151° 5' E.	100	0	21.69	19.66	35.52	24.71
				10	21.64			
				20	21.64	.66	.52	.72
				30	21.48			
				40	19.04	.64	.48	25.39
				50	17.68	.65	.50	.75
				80	16.47			
				100	15.43	.58	.36	26.18
				150	13.04	.53	.28	.62

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (cc.)	O. D.	Count				
										I	II	III	IV	
			5	0	N70	H 0	15	75	Cp		36	152		2
			3		N70	V 50-0		10	T		4	208		4
			6	35	N70	O 50		40	T		26	414		1
			7		N100	H 0	15	40	T		16	4		
			7	25	N100	O 50		10	Co		9			
			6	62										
			7	0	N70	H 0	15	15	Cp		6	55		
			4		N70	V 50-0		2	Cp			41		1
			13	10	N70	O 50		15	Cp		13	135		
			14		N100	O 50		50	Co		3	1		
			11	52	N200	H 0	15	150	Co		10	1		
			20	80										
			5	5										
			7											
			5	0										
			3											
			5	5										
			14	80										
			8	0										
			4	0										
			6											
			7	0										
			12											
			13	87										

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl‰	S‰	$\sigma_t$
1941								
16. i	36/41	35° 13' S. 151° 10' E.		0	22.21	19.69	35.56	24.60
				10	21.94			
				20	21.89	.65	.50	.64
				30	21.87			
				40	20.40			
				50	18.23	.71	.61	25.70
				100	15.04	.59	.39	26.28
				150	13.61	.49	.21	.45
				200	12.52	.44	.11	.59
				300	10.87	.34	34.94	.77
				400	9.84	.27	.81	.85
				600	7.80	.13	.55	.97
	37/41	35° 16' S. 151° 19' E.		0	22.30	19.69	35.57	24.59
				10	21.53			
				20	21.21	.72	.62	.92
				30	21.20			
				40	20.45			
				50	17.94	.64	.48	25.66
				100	15.39	.56	.34	26.16
				150	14.01	.54	.30	.43
				200	13.07	.53	.28	.61
				300	11.06	.39	.03	.80
				400	9.45	.32	34.90	.99
				600	7.54	.21	.70	27.13
	38/41	35° 18' S. 151° 29' E.		0	22.35	19.69	35.57	24.57
				10	21.03			
				20	20.39	.67	.53	25.08
				30	20.07			
				40	19.07			
				50	18.17	.73	.64	.73
				100	14.99	.55	.32	26.23
				150	13.87	.57	.35	.50
				200	13.14	.50	.23	.56
				300	11.48	.39	.03	.72
				400	10.10	.31	34.88	.86
				600	7.80	.12	.54	.96

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count				
										I	II	III	IV	
			3	10	N70	H 0	15	75	Cp		47	12		
					N70	V 50-0		100	T		132	2	2	
			4	8	N70	V100-50		4	Cp		1	1		
					N70	V250-100		2	Cp		1	2	1	
			2	0	N70	V500-250		5	Cp		1	2	3	
			6	98										
			17		N70	0 200		375	T		327	3	3	
			12	87	N100	0 200		200	T		285		1	
			22	116	N200	H 0	15	300	T		257		1	
			22	190										
			30	220										
			1	3										
			1	0										
			3	20										
			13	64										
			12											
			21	70										
			14	98										
			17	125										
			20	163										
			0	8										
			1	5										
			11	55										
			12	80										
			13											
			14											
			18	108										
			24	115										
			28	174										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	σ <sub>t</sub>
1941								
18. i	39/41	37° 6' S. 150° 2' E.	35	0	19.74	19.65	35.49	25.19
				10	19.84	.62	.44	.19
				20	18.03	.60	.41	.60
				30	17.26	.60	.41	.79
				40	15.63	.59	.39	26.15
				50	15.19	.58	.37	.24
	40/41	37° 6' S. 150° 11' E.	50	0	19.88	19.64	35.48	25.17
				10	19.98	.66	.52	.17
				20	20.00	.66	.52	.17
				40	16.31	.62	.44	26.03
				50	15.23	.63	.46	.29
				80	13.65	.53	.28	.49
	41/41	37° 6' S. 150° 22' E.	140	0	20.60	19.63	35.46	24.96
				10	21.00			
				20	21.10	.72	.62	.96
				30	20.85			
				40	20.98	.70	.59	.96
				50	19.20	.66	.52	25.37
80				16.40				
100				15.55	.61	.43	26.19	
150				14.34	.57	.35	.40	
42/41				37° 6' S. 150° 27' E.		0	21.27	19.70
	10	21.34						
	20	21.36	.72			.62	.88	
	30	21.25						
	40	21.25						
	50	18.76	.71			.61	25.57	
	100	15.66	.68			.55	26.26	
	150	13.94						
	200	13.22	.53			.28	.58	
	295	11.89	.42			.08	.69	
	393	10.24	.32	34.90	.85			
	589	8.10	.16	.61	27.08			

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (cc.)	D.O.	Count				
										I	II	III	IV	
				5	N70	H 0	15	250	T		286			2
				7	N70	V 50-0		70	T		205	3		6
				8	N70	0 50		175	T		246			9
				10	N100	0 50		330	T		341			1
				11	N200	H 0	15	450	T		446			
				11										
				7										
				7										
				12										
				14										
				16										
				7										
				4										
				5										
				13										
				20										
				13										
				0	N70	H 0	15	300	T		307	25		1
					N70	0 200		350	T		417	8		5
				4	N100	0 200		380	T		471	3		
					N200	H 0	15	400	T		455			1
				2										
				8										
				13										
				9										
				14										
				20										
				30										



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1941								
18. i	43/41	37° 6' S. 150° 37' E.		0	20.52	19.69	35.57	25.07
				10	20.65			
				20	20.64	.71	.61	.07
				30	20.56			
				40	20.58			
				50	18.67	.67	.53	.53
				100	15.99	.59	.39	26.06
				150	14.23	.57	.35	.44
				200	13.17			
				280	11.79	.40	.05	.68
				374	9.99	.27	34.81	.83
				560	7.70	.12	.54	.98
	44/41	37° 6' S. 150° 48' E.		0	21.12	19.69	35.56	24.90
				10	21.15			
				20	21.14	.69	.56	.90
				30	21.08			
				40	21.52			
				50	18.83	.61	.43	25.41
				100	15.64	.63	.46	26.20
				150	14.45	.54	.30	.34
				200	13.22	.54	.30	.60
				300	11.36	.37	34.99	.72
				400	9.96	.29	.85	.85
				600	7.76	.12	.54	.97
19. i	45/41	38° 35' S. 149° 35' E.		0	18.56	19.62	35.44	25.48
				10	18.74			
				20	18.60	.63	.46	.49
				30	18.55			
				40	17.54			
				50	16.56	.62	.44	.97
				100	13.96	.57	.35	26.48
				150	13.09	.52	.26	.60
				200	12.37	.48	.19	.67
				300	10.98	.40	.05	.83
				400	9.49	.23	34.74	.85
				600	7.54	.13	.55	27.01

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count				
										I	II	III	IV	
			1	0										
			0	0										
			3	18										
			8	58										
			10											
			10	80										
			12	88										
			21	163										
			25	180										
			11	17										
			5	11										
			2	2										
			9	82										
			5											
			11	91										
			17	133										
			24	173										
			22	162										
			4	0										
			4	2										
			4	11										
			9	40										
			17											
			12	78										
			12	105										
			24	174										
			24	195										

# F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1941								
20.1	46/41	39° 57' S. 148° 37' E.	38	0	18.81	19.65	35.49	25.46
				10	18.85	.66	.52	.47
				20	17.93	.65	.50	.69
				30	17.74	.63	.46	.71
				40	16.92	.64	.48	.92
				50	15.98	.60	.41	26.07
	47/41	39° 57' S. 148° 52' E.	220	0	18.63	19.69	35.57	25.57
				10	18.70			
				20	18.31	.70	.59	.66
				30	18.00			
				40	16.52	.68	.55	26.07
				50	15.84	.66	.52	.20
				80	14.48			
				100	13.56	.57	.35	.57
				150	13.04	.56	.34	.67
	48/41	39° 57' S. 148° 59' E.		0	18.66	19.69	35.56	25.26
				10	18.76			
				20	18.70	.69	.57	.55
				30	17.91			
				40	17.02			
				50	16.61	.61	.43	.95
				93	14.05	.56	.34	26.45
				140	12.84	.56	.34	.70
				187	11.69	.43	.10	.74
				258	10.65	.38	.01	.87
				344	9.16	.22	34.72	.89
				516	7.74	.11	.52	.95

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count				
										I	II	III	IV	
			3	23	N70	H 0	15	250	Op		81			
			5		N70	V 50-0		350	T		2	1	1	
			4	20	N70	0 50		400	T		3	1		
			12		N100	0 50		300	T		10	1	1	
			6	36	N200	H 0	15	375	T		9			
			5	48										
			5	0										
			7	0										
			8											
			13	19										
			15											
			11	91										
			2	2	N70	H 0	15	80	T		113			
					N70	0 200		500	T		6	1		
			1	2	N100	0 200		510	T		9	1		
					N200	H 0	15	350	T		17			
			1	0										
			12	68										
			17											
			12	133										
			14	125										
			17	145										
			21	168										

F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>	
1941									
20. i	49/41	39° 57' S. 149° 10' E.		0	18.87	19.68	35.55	25.49	
				10	18.90				
				20	18.90	.68	.54	.49	
				30	18.80				
				40	17.89				
				50	16.87	.67	.53	.97	
				86	14.16	.57	.35	26.44	
				129	12.85	.50	.23	.61	
				172	11.76	.48	.19	.80	
		258	10.27	.33	34.92	.84			
		344	9.03	.21	.70	.89			
		516	6.97	.10	.50	27.05			
		50/41	39° 57' S. 149° 21' E.		0	18.70	19.65	35.50	25.48
				10	18.75				
				20	18.88	.68	.55	.48	
				30	18.67				
				40	18.30				
				50	17.08	.68	.55	.93	
				100	15.01	.58	.37	26.27	
	150			13.03	.52	.26	.60		
	200			11.43	.37	34.99	.70		
	280			9.80	.28	.83	.87		
	374	8.85	.19	.67	.90				
	560	6.87	.12	.53	27.08				
21. i	51/41	41° 15' S. 148° 25' E.	42	0	15.80	19.48	35.18	25.96	
				10	15.35	.41	.07	.96	
				20	15.30	.42	.08	.96	
				30	15.20	.41	.07	26.00	
				40	15.21	.41	.07	.00	
				50	14.69	.43	.10	.14	
		52/41	41° 16' S. 148° 33' E.	60	0	17.95	19.71	35.61	25.77
	10				18.10	.74	.65	.77	
	20				17.14	.57	.35	.77	
	40				15.25	.41	.07	.99	
	50				13.85	.46	.16	26.35	
	80				13.39	.47	.17	.47	

### F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count				
										I	II	III	IV	
			3	0										
			4	0										
			4	0										
			10	68										
			14											
			12	91										
			17	145										
			25	228										
			28	310										
			2	0										
			1	0										
			1	0										
			7	67										
			10											
			21	163										
			28	212										
			28	228										
			28	233										
			9	0	N70	H 0	15	400	Cp		1		2	
			4		N70	V 50-0		6	Cp		2		8	
			7	5	N70	O 50		5	C		1			2
			6		N100	O 50		75	C		2			
			7	18	N200	H 0	15	350	T		4			
			10	25										
				0										
				18										
				50										
				55										

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATION <sup>c</sup>				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1941								
21.1	53/41	41° 18' S. 148° 40' E.	150	0	18.38	19.66	35.52	25.60
				10	18.29			
				20	18.30	.65	.50	.60
				30	18.26			
				40	18.28	.72	.62	.70
				50	17.69	.63	.46	.72
				80	15.77			
	100	14.23		.58	.37	26.45		
	150	13.20		.52	.26	.58		
	54/41	41° 20' S. 148° 47' E.		0	18.14	19.66	35.52	25.64
				10	18.06			
				20	18.04	.70	.59	.72
				30	18.00			
				40	17.99			
				50	17.96	.73	.64	.78
100			14.24	.60	.41	26.47		
150			13.42	.55	.32	.56		
200			12.71	.51	.25	.65		
300			10.87	.34	34.94	.77		
400			9.69	.24	.76	.83		
600			8.41	.19	.67	.97		
55/41			41° 22' S. 148° 58' E.	0	18.29	19.69	35.56	25.64
	10	17.84						
	20	17.85		.66	.52	.71		
	30	17.74						
	40	16.93		o				
	50	15.49		.61	.43	26.20		
	100	14.06		.62	.44	.52		
	150	13.60		.62	.44	.62		
	200	13.00		.54	.30	.64		
	300	11.78		.44	.12	.74		
	400	10.49		.36	34.97	.87		
	600	8.42		.18	.64	.94		

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O D	Count				
										I	II	III	IV	
			12	11										
			6	17										
				20										
			20											
			6	53										
			17	2	N70	H 0	15	30	Op		2			2
					N70	V 50-0		4	Op		1			1
			3	18	N70	V100-50		3	Op					2
					N70	V250-100		6	Op		1	1		3
			3	33	N70	V500-250		8	Op		1			4
			8	105										
			17		N70	0 200		120	Op					1
			12	52	N100	0 200		44	T		7			
			28	125	N200	H 0	15	120	M		33			
			30	137										
			31	133										
			1	5										
			4	68										
			4	45										
			10	62										
			9											
			10	81										
			15	91										
			21	162										
			32	162										



## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl <sup>o</sup> /oo	S <sup>o</sup> /oo	σ <sub>t</sub>
1941								
21. i	56/41	41° 24' S. 149° 9' E.		0	17.85	19.69	35.56	25.75
				10	17.63			
				20	17.64	.71	.61	.84
				30	17.59			
				40	17.58			
				50	17.39	.69	.57	.87
				100	14.53	.62	.44	26.42
				150	13.63	.59	.39	.58
				200	13.00	.55	.32	.65
				300	11.63	.52	.26	.88
				400	10.60	.39	.03	.88
600	8.51	.19	34.67	.95				
22. i	57/41	42° 42' S. 148° 13' E.	45	0	15.25	19.41	35.07	25.98
				10	15.25	.41	.07	.98
				20	14.94	.40	.05	26.03
				30	14.89	.45	.14	.12
				40	14.59	.44	.12	.17
				50	14.64	.45	.13	.17
	58/41	42° 42' S. 148° 21' E.	60	0	15.17	19.38	35.01	25.96
				10	14.85	.48	.19	26.17
				20	14.25	.41	.07	.21
				40	13.93	.38	.01	.23
				50	13.75	.38	.01	.27
				80	13.45	.42	.08	.38
	59/41	42° 42' S. 148° 28' E.	280	0	14.80	19.44	35.12	26.12
				10	14.75			
				20	14.70	.42	.08	.12
				30	14.67			
				40	14.60	.44	.12	.17
				50	14.34	.41	.07	.18
80				12.65				
100				12.62	.49	.21	.65	
150				11.45	.39	.03	.73	

F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count				
										I	II	III	IV	
			4	6										
			11	0										
			3	0										
			7	70										
			10	88										
			10	98										
			14	116										
			14	152										
			24											
			7	0	N70	H 0	15	350	Co					1
			8		N70	V 25-0		20	Co		1			1
			8	0	N70	O 50		75	Co		1	4		2
			10		N100	O 50		350	T		10			
			7	2	N200	H 0	15	400	Co		2			1
			11	2										
			8	0										
			7											
			3	26										
			10											
			8	18										
			9	55										
			4	2										
			6	2										
			5											
			7	2										
			13											
			11	116										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	$\sigma_t$	
1941									
22. i	60/41	42° 42' S. 148° 34' E.		0	15.37	19.53	35.28	26.11	
				10	15.19				
				20	15.20	.49	.21	.11	
				30	15.28				
				40	15.19				
				50	14.84	.49	.21	.19	
				100	12.37	.45	.14	.64	
				150	11.49	.45	.14	.81	
				200	10.82	.36	34.97	.81	
		300	9.54	.21	.70	.81			
		400	8.63	.15	.60	.87			
		600	7.45	.10	.51	.98			
		61/41	42° 42' S. 148° 45' E.		0	16.14	19.50	35.23	25.90
				10	15.81				
				20	15.74	.54	.30	26.05	
				30	15.72				
				40	15.59				
				50	15.51	.51	.25	.06	
				100	13.99	.56	.34	.46	
	150			12.93	.54	.30	.65		
	200			11.61	.42	.08	.74		
	295	10.13	.27	34.81	.80				
	393	9.10	.22	.72	.90				
	589	7.46	.12	.54	27.01				
	62/41	42° 42' S. 148° 55' E.		0	16.54	19.60	35.41	25.95	
			10	16.09					
			20	15.79	.53	.28	26.02		
			30	15.80					
			40	15.53					
			50	15.36	.57	.35	.18		
			100	13.41	.56	.34	.69		
			150	12.13	.49	.21	.74		
			200	11.13	.39	.03	.79		
	295	10.08	.32	34.90	.87				
	393	9.03	.23	34.74	.93				
	589	7.41	.12	.54	27.02				

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (cc.)	D.O.	Count				
										I	II	III	IV	
			4	3	N70	H 0	15	4	Op					1
					N70	V 50-0		50	T		2			1
			4	64	N70	V100-50		40	Op		1			1
					N70	V250-100		5	Op		1			3
			4	2	N70	V500-250		50	Op			1		4
			10	0										
			8		N70	0 200		450	T		19			
			14	116	N100	0 200		500	T		35			
			21	125										
			23	134										
			29	148										
			3	5										
			4	2										
			2	8										
			8	55										
			10											
			6	133										
			22	190										
			23											
			28	190										
			4	2										
			4	0										
			4	0										
			8	52										
			12											
			9	92										
			14	150										
			22	113										
			20	162										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1941								
31. i	63/41	36° 16' S. 150° 16' E.	35	0	19.18	19.66	35.51	25.39
				10	18.12	.62	.44	.60
				20	16.98	.61	.43	.86
				30	16.88	.63	.46	.91
				40	15.64	.59	.39	26.14
				50	14.81	.61	.43	.36
	64/41	36° 17' S. 150° 22' E.	100	0	20.90	19.66	35.52	24.92
				10	20.86			
				20	20.34	.66	.52	25.07
				30	20.30			
				40	18.92	.64	.48	.42
				50	16.88	.63	.46	.91
				80	15.51			
				100	14.02	.60	.41	26.52
				150	13.66	.58	.37	.57
	65/41	36° 18' S. 150° 28' E.		0	20.96	19.71	35.60	24.97
				10	20.84			
				20	20.65	.67	.53	25.01
				30	20.64			
				40	20.58			
				50	20.50	.68	.55	.06
				93	16.45	.64	.48	26.02
				140	14.78	.66	.52	.43
				187	13.91	.62	.44	.56
				258	12.98	.53	.28	.62
				344	10.84	.37	34.99	.81
				516	9.61	.28	.83	.90

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
			2	2	N70	H 0	15	60	Cp	109	11	2	
			3		N70	V 50-0		6	Cp	8	1	1	
			5	20	N70	0 50		70	Cp	125	23	13	
					N100	0 50		45	T	117	1		
			8	60	N200	H 0	15	280	T	262			
			7	28									
			4	0									
			3	0									
			10										
			3	20									
			16										
			17	110									
			0	0	N70	H 0	15	15	M	6	4		
					N70	V 50-0		5	C	1	3	1	
			1	2	N70	V100-50		15	T	4		1	
					N70	V250-100		100	C	3	4	7	
			0	2	N70	V500-250		6	C	1	1	1	
			5	8									
			7		N70	0 200		120	Cp	26	32	10	
			8	95	N100	0 200		70	C	6	2	1	
			8	91	N200	H 0	15	50	M	8	4		
			15	122									
			25	173									

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>	
1941									
31. i	66/41	36° 22' S. 150° 38' E.		0	21.65	19.70	35.59	24.77	
				10	21.13				
				20	20.94	.70	.59	.97	
				30	20.92				
				40	20.87				
				50	19.67	.70	.59	25.31	
				100	18.12	.70	.59	.70	
	150	16.40		.66	.52	26.06			
	200	14.33		.58	.37	.42			
	280	13.50		.58	.37	.59			
	374	12.44		.52	.26	.72			
	560	9.31		.23	34.74	.88			
		67/41		36° 23' S. 150° 48' E.	0	21.47	19.71	35.60	24.83
					10	20.96			
20			20.64		.70	.59	25.05		
30			20.62						
40			20.57						
50			19.36		.72	.62	.42		
100			18.56		.69	.57	.58		
150		17.69	.69	.57	.80				
200		16.87	.66	.52	.95				
295		14.82	.59	.39	26.32				
393		13.57	.56	.34	.55				
589		11.01	.39	.02	.79				
4. x		68/41	35° 7' S. 150° 49' E.	30	0	15.90	19.65	35.50	26.17
					10	15.94	.69	.57	.22
	20				15.48	.65	.50	.27	
	30				15.23	.64	.48	.31	
	40				15.21	.64	.48	.31	
	50				14.73	.62	.44	.38	
6. x	69/41	37° 19' 15" S. 150° 7' E.	52	0	13.69	19.62	35.44	26.61	
				10	13.45	.63	.45	.66	
				20	13.40	.61	.43	.66	
				30	13.39	.63	.45	.68	
				40	13.30	.61	.43	.68	
				50	13.04	.63	.46	.76	

# F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> -T	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count				
										I	II	III	IV	
			0	18										
			0	0										
			2	0										
			8	22										
			8											
			12	63										
			11	87										
			22'	134										
			22	175										
			2	25										
			1	18										
			1	9										
			4	53										
			6											
			7	80										
			8	70										
			17	105										
			18	155										
5.25	92		7	15	N70	H 50-0	30	110	Co		36	11	13	
.42	94		5	27	N100	H 50-0	30	30			2			
.50	95		7	30										
.17	88		7	48										
.07	88		7	33										
			7	33										
6.00	100		4	0	N70	H 50-0	30	520	C					
5.73	95		5	0	N100	H 50-0	30	510	C			3	3	
.92	98		4	0										
.75	95		7	0										
.99	99		5	0										
.90	97		5	0										



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	σ <sub>t</sub>
1941								
9. x	72/41	35° 3' S. 151° 8' E.		0	18.60	19.75	35.68	25.65
				10	18.60	.77	.71	.78
				20	18.14	.76	.69	.78
				30	18.10	.75	.68	.78
				40	17.96	.75	.68	.82
				50	17.83	.75	.68	.84
				100	14.46	.59	.39	26.41
				150	13.26	.51	.25	.55
				200	12.84	.58	.37	.73
				300	12.54	.54	.30	.74
				400	11.55	.51	.25	.88
				600	9.90	.36	34.97	.97
8. xi	74/41	37° 4' S. 150° 4' E.	37	0	14.90	19.64	35.48	26.38
				10	14.84	.64	.48	.39
				20	14.76	.63	.46	.40
				30	14.59	.62	.44	.42
				40	14.36	.62	.43	.46
				50	14.31	.64	.48	.51
13. xi	76/41	36° 29' 30" S. 150° 40' E.		0	18.34	19.74	35.66	25.71
14. xi	77/41	35° 58' S. 150° 20' E.	60	0	17.30	19.66	35.52	25.85
16. xi	78/41	37° 19' S. 150° 24' E.		0	17.50	19.67	35.53	25.82
				10	17.65	.69	.57	.82
				20	16.82			
				30	16.59	.65	.50	26.01
				40	16.26	.64	.48	.09
				50	15.76	.62	.44	.16
				100	14.52	.60	.41	.41
				150	13.60	.58	.37	.55
				200	12.89	.57	.35	.70
				300	12.03	.51	.25	.79
				400	10.75	.37	34.99	.83
				600	8.14	.14	.58	.94

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> P	Z O <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (cc.)	D.O.	Count			
										I	II	III	IV
5.43	99		6	11	N70	H 50-0	30	30	Op		15	16	5
.18	94		7	8	N100	H 50-0	15	75	Op		28	3	1
.19	93		9	5									
.23	94		9	10									
.23	94		6	8									
.31	95		6	11									
4.65	79		13	82									
.42	74		15	98									
.84	80		14	75									
5.04	83		10	70									
.28	85		13	75									
4.97	77		21	147									
5.80	99		8	3	N70	H 50-0	30	580	Op		265		8
.85	100		5	5									
.75	98		6	3									
.65	96		2	0									
.65	96		5	0									
.60	95		7	8									
			4		N70	H 50-0	30	340	Op		143	24	24
					N100	H 50-0	30	220	T		316		
			4		N70	H 50-0	30	260	Op		231	67	11
					N100	H 50-0	30	140	T		149		2
5.54	98		3	4									
.59	100		3	0									
.68				0									
.75	101		6	3									
.65	99		5	5									
			5	3									
.20	88		7	18									
.47	91		9	27									
.43	90		7	45									
.16	85		9	71									
.03	79		13	111									
4.55	68		15	212									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1941 16. xi	79/41	36° 16' S. 150° 17' E.	40	0	18.30	19.71	35.61	25.68
26. xi	80/41	36° 15' S. 150° 16' E.	45	0	17.77	19.66	35.52	25.74
				10	17.48	.67	.53	.83
				20	14.94	.58	.37	26.29
				30	14.78	.60	.41	.35
				40	14.57	.60	.41	.40
				50	14.53	.63	.46	.50
27. xi	81/41	35° 8' S. 150° 0' E.	35	0	19.52	19.70	35.59	25.35
				10	18.96	.67	.53	.46
				20	17.99	.66	.52	.69
				30	15.95	.61	.43	26.10
				40	15.28	.59	.39	.23
				50	14.60	.59	.37	.37
	82/41	35° 8' 30" S. 151° 19' 30" E.		0	19.29	19.76	35.70	25.50
				10	18.84	.76	.70	.61
				20	18.52	.77	.71	.70
				30	18.49	.76	.70	.70
				40	18.44	.75	.67	.70
				50	17.68	.77	.71	.91
				100	15.86	.64	.48	26.16
				150	14.70	.60	.41	.37
				200	13.90	.64	.48	.59
				295	12.05	.46	.16	.71
				393	10.31	.32	34.90	.84
				589	7.84	.12	.54	.96

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (cc.)	O. D.	Count			
										I	II	III	IV
			1		N70	H 50-0	30	450	T	953	12	24	
					N100	H 50-0	30	350	T	450	1	2	
5.78	104		2	8	N70	H 50-0	30	390	Op	462	30	4	
.86	104		6	0	N100	H 50-0	30	500	T	711			
.03	86		7	42									
4.90	84		9	32									
5.08	87		9	42									
.20	88		8	32									
5.47	100		1	0	N70	H 50-0	30	55	Op	6	54	1	
.50	100		6	0	N100	H 50-0	30	60	T		2		
.56	100		6	0									
4.78	84		9	33									
.66	81		13	55									
.60	78		13	59									
5.47	100		4	3	N70	H 50-0	30	390	T	140	18	13	
.52	100		3	0	N100	H 50-0	30	550	M	148			
.56	103		3	0									
.50	102		4	0									
.46	101		5	0									
.43	101		3	0									
4.63	80		9	48									
.80	89		13	42									
.97	92		8	45									
.95	81		15	77									
.93	78		16	117									
.65	85		18	146									

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1941								
2. xii	83/41	36° 18' S. 150° 25' E.		0	18.65	19.79	35.75	25.70
				10	18.59	.79	.75	.71
				20	18.60	.79	.75	.71
				30	18.40	.76	.70	.72
				40	18.54	.78	.73	.72
				50	18.40	.76	.70	.72
				100	16.72	.66	.52	.99
				150	15.43	.68	.55	26.31
				200	13.68	.56	.34	.53
				300	12.01	.46	.16	.62
400	10.41	.35	34.96	.86				
600	7.95	.16	.61	27.00				
11. xii	84/41	35° 21' S. 150° 37' E.	50	0	18.25	19.70	35.59	25.68
				10	17.83	.70	.59	.78
				20	17.69	.69	.57	.81
				30	17.62	.69	.57	.82
				40	17.33	.69	.57	.89
				50	17.21	.68	.55	.90
16. xii	85/41	36° 15' S. 150° 28' E.		0	19.05	19.77	35.71	25.57
				10	18.73	.77	.71	.65
				20	18.69	.77	.71	.66
				30	18.69	.77	.71	.66
				40	18.69	.77	.71	.66
				50	18.62	.77	.71	.68
				100	15.16	.65	.50	26.34
				150	14.12	.62	.44	.52
				200	13.38	.58	.37	.62
				295	11.77	.41	.07	.70
				393	10.55	.41	.07	.93
				589	8.69	.24	34.76	27.00
					86/41	36° 15' S. 150° 16' E.	50	0
10	17.90	.67	.53					.73
20	17.13	.64	.48					.86
30	16.69	.64	.48					.97
40	16.09	.61	.43					26.07
50	15.60	.60	.41					.17

## F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
5.42	99		3	3	N70	H 50-0	30	580	T				
.42	98		5	0	N100	H 50-0	30	220	T		198		2
.38	98		1	0									
.42	98		3	0									
.42	99		3	0									
.35	97		1	0									
4.58	90		9	36									
			7	8									
.78	78		15	62									
.92	80		17	80									
.81	76		23	77									
.67	70		25	188									
5.58	101		1	3	N70	H 50-0	30	265	Cp		660	59	10
.56	100		4	0									
.60	101		2	0									
.58	100		5	0									
.48	98		5	5									
.38	96		5	3									
5.41	99		1	3	N70	H 50-0	30	360	M		5	6	4
.53	101		3	0									
.48	100		1	0									
.44	99		3	0									
.46	100		3	0									
.40	98		3	0									
.43	94		3	48									
.12	87		8	48									
.23	87		7	32									
4.80	77		15	160									
.90	77		14	122									
.74	72		23	83									
5.50	100		6	3	N70	H 50-0	30	100	Cp		100	250	12
.55	99		3	0									
.40	95		7	5									
.12	90		8	30									
4.91	86		8	30									
.90	86		6	36									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl <sup>o</sup> /∞	S <sup>o</sup> /∞	σ <sub>t</sub>
1941								
18. xii	87/41	35° 08' S. 150° 50' E.	40	0	18.53	19.68	35.55	25.58
				10	18.49	.68	.55	.59
				20	18.49	.68	.55	.59
				30	17.40	.63	.46	.79
				40	15.23	.59	.39	26.24
				50	14.69	.58	.37	.35
19. xii	88/41	35° 12' S. 151° 5' E.		0	19.17	19.72	35.62	25.57
				10	18.60	.72	.62	.63
				20	18.39	.73	.64	.68
				30	18.29	.76	.69	.68
				40	17.88	.69	.57	.76
				50	16.55	.65	.50	26.02
				100	14.56	.62	.44	.42
				150	13.92	.59	.39	.52
				200	13.42	.59	.39	.62
				300	11.91	.46	.16	.74
				400	10.46	.34	34.94	.84
				600	8.02	.15	.60	.97
21. xii	89/41	34° 5' S. 151° 40' E.		0	21.19	19.78	35.73	25.02
				10	21.09	.77	.71	.02
				20	20.70	.77	.71	.13
				30	20.70	.77	.71	.13
				40	20.56	.79	.75	.20
				50	19.77	.76	.70	.37
				100	17.85	.71	.61	.79
				150	16.49	.64	.48	26.01
				200	14.26	.57	.35	.42
				300	11.16	.36	34.97	.75
				400	9.62	.26	.79	.87
				600	7.68	.14	.58	27.01
	90/41	34° 05' S. 151° 17' E.	40	0	20.29	19.65	35.50	25.07
				10	19.07	.65	.50	.40
				20	17.35	.59	.39	.74
				30	16.59	.58	.37	.93
				40	16.13	.58	.37	26.02
				50	15.29	.56	.34	.19

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (cc.)	O.D.	Count				
										I	II	III	IV	
5.63	102		1	0										
.60	102		2	0										
.60	102		3	0										
.60	100		4	3										
4.82	84		6	62										
.75	81		11	55										
5.50	100		1	8	N70	H 50-0	30	250	T		574			134
.55	101		1	8	N100	H 50-0	30	180	T		357			28
.65	103		3	16										
.59	101		2	8										
.63	101		1	3										
.80	102		1	5										
.05	86		8	44										
.03	84		11	48										
.30	88		10	58										
.02	80		15	72										
4.77	75		17	115										
.50	67		26	148										
5.10	97		1	0	N100	H 50-0	30	50	T		67			2
.20	98		1	0										
.17	97		1	0										
.10	96		2	0										
.10	96		1	5										
.05	94		1	0										
4.84	89		7	37										
.49	79		12	62										
.26	72		14	83										
.55	88		21	123										
.60	71		23	115										
.47	66		28	154										
5.42	101		1	0	N70	H 50-0	30	49	Op					
.65	104		1	3										
4.57	81		6	18										
.32	75		10	58										
.01	70		10	68										
3.96	68		15	80										



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS					
				Depth (m.)	Temp °C.	Cl <sup>o</sup> /oo	S <sup>o</sup> /oo	σ <sub>t</sub>	
1942									
2. i	1/42	33° 16' S. 152° 21' E.		0	22.50	19.84	35.84	24.72	
				10	21.54	.80	.77	.92	
				20	21.39	.78	.73	.96	
				30	21.31	.78	.73	.98	
				40	20.00	.75	.68	25.29	
				50	19.44	.78	.73	.48	
				100	17.04	.78	.53	.93	
		150	15.38	.60	.41	26.21			
		200	13.83	.58	.37	.53			
		300	11.35	.37	34.99	.72			
		400	10.52	.32	.90	.80			
		600	7.90	.14	.58	.98			
		2/42	33° 15' S. 152° 31' E.		0	22.74	19.81	35.79	24.62
					10	21.50	.79	.75	.94
				20	21.48	.83	.82	25.00	
				30	21.39	.81	.79	.00	
				40	20.81	.81	.79	.16	
				50	19.33	.77	.71	.49	
				100	17.13	.67	.53	.91	
		150	15.54	.63	.46	26.22			
		200	14.35	.57	.35	.40			
		300	12.29	.44	.12	.64			
		400	9.88	.26	34.79	.82			
		600	7.72	.11	.52	.96			
3. i		3/42	32° 44' S. 152° 18' E.		0	21.45	19.75	35.68	24.89
					10	21.42	.74	.66	.89
				20	19.87	.69	.57	25.25	
				30	19.83	.69	.57	.26	
				40	17.71	.65	.50	.74	
				50	16.67	.61	.43	.93	
4. i	4/42	31° 51' S. 152° 51' E.		0	21.36	19.72	35.62	24.88	
				10	20.63	.73	.64	25.09	
				20	18.00	.67	.53	.69	
				30	18.05	.68	.54	.69	
				40	17.24	.62	.44	.80	
				50	16.12	.60	.41	26.05	

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO.-P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
5.05	98	8.28	0	16	N70	H 50-0	30	200	Cp		250	1	6
.09	97	.33	1	2	N100	H 50-0	30	90	T		45		
.13	98	.31	0	0									
.06	96	.34	2	0									
.26	98	.36	0	0									
.20	96	.35	3	2									
4.56	81	.29	7	38									
.33	75	.23	8	81									
.80	81	.23	8	81									
.39	69	.17	12	138									
.59	72	.16	14	157									
.43	66	.20	17	182									
5.05	97	8.42	0	2									
.08	97	.39	0	2									
.04	96	.43	0	2									
.09	97	.40	0	2									
.16	97	.39	0	2									
.35	99	.38	0	2									
4.38	78	.32	7	55									
.59	79	.30	9	59									
.52	77	.25	9	72									
.74	77	.22	12	102									
.42	66	.16	17	167									
.48	67	.08	16	167									
5.15	99	8.23	0	0	N70	H 50-0	30	40	Cp		4	82	3
.18	99	.20	0	0									
.36	100	.23	0	0									
4.32	81	.20	0	0									
.89	88	.17	0	0									
.45	78	.16	3	21									
5.32	101	8.19	0	0	N70	H 50-0	30	37	Cp		48		9
.30	99	.21	0	3									
4.17	75	.14	7	54									
.15	84	.14	8	54									
.07	72	.13	8	75									
3.86	68	.09	11	92									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS							
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$			
1942											
4. i	5/42	31° 50' S. 153° 10' E.		0	24.84	19.82	35.81	24.02			
				20	23.04	.82	.81	.55			
				40	21.87	.80	.77	.85			
				60	21.08	.77	.71	25.07			
				100	19.33	.74	.66	.45			
				150	18.09	.71	.61	.73			
	5. i	6/42	31° 51' S. 153° 20' E.		0	23.98	19.86	35.88	24.32		
					10		.86	.88			
					20	23.10	.86	.88	.58		
					30	23.07	.86	.88	.59		
					40	22.95	.87	.90	.64		
					50	22.36	.83	.82	.75		
					100	19.69	.74	.66	25.36		
					150	18.63	.74	.66	.63		
				200	18.02	.69	.57	.72			
				300	15.80	.62	.44	26.14			
				400	13.80	.50	.23	.42			
				600	8.46	.18	34.65	.94			
5. i				7/42	30° 55' S. 153° 9' E.		0	21.68	19.73	35.64	24.79
							10	21.59	.70	.59	.79
		20	21.49			.71	.61	.84			
		30	20.88			.75	.68	25.05			
		40	19.86			.71	.61	.28			
		50	19.09			.70	.59	.46			
	8/42	30° 55' S. 153° 17' E.		0	24.10	19.82	35.81	24.24			
				20	22.98	.85	.86	.61			
				40	21.55	.81	.79	.95			
				60	20.51	.77	.71	25.18			
				100	18.74	.74	.66	.60			
				150	16.90	.65	.50	.93			

# F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	NO <sub>3</sub> -N	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count				
										I	II	III	IV	
4.73	97	8.24	3	8										
5.00	99	.25	1	2										
.09	98	.26	0	0										
.00	96	.26	1	0										
4.72	88	.26	2	12										
.60	84	.24	5	32										
4.83	96	8.17	0	0										
.90		.23	0	0										
.99	98	.22	0	0										
5.00	99	.24	0	2										
4.98	98	.24	0	0										
5.08	99	.23	2	0										
4.89	91	.24	2	3										
.71	86	.22	5	18										
.72	86	.23	5	28										
.30	75	.20	10	84										
.32	72	.13	12	110										
.45	67	.08	23	197										
5.45	105	8.19	0	0	N70	H 50-0	30	32	Cp		34	302	24	
.48	106	.21	0	0										
.56	107	.20	0	0										
.40	102	.23	0	0										
4.67	87	.18	2	6										
.10	75	.13	5	38										
4.73	97	8.20	2	2										
.96	98	.21	2	8										
5.06	97	.23	4	10										
4.97	94	.22	5	6										
.86	89	.22	6	27										
.42	78	.13	9	65										

F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	σ <sub>t</sub>
1942								
5.1	9/42	30° 55' S. 153° 26' E.		0	24.60	19.83	35.82	24.10
				10	24.08	.85	.86	.28
				20	23.08	.85	.86	.58
				30	22.93	.87	.90	.65
				40	22.23	.83	.82	.79
				50	21.17	.78	.73	25.02
				100	18.99	.74	.66	.54
				150	18.26	.71	.61	.69
				200	17.13	.65	.50	.88
				300	14.53	.54	.30	26.32
				400	12.85	.44	.12	.53
	600	9.99	.35	34.96	.93			
7.1	10/42	30° 17' S. 153° 16' E.		0	20.99	19.80	35.77	24.75
				10	20.22	.80	.77	.76
				20	19.91	.79	.75	25.21
				30	19.59	.77	.71	.35
				40	19.18	.74	.66	.72
		50	18.91	.66	.52	.92		
	11/42	30° 16' S. 153° 29' E.		0	22.30	19.73	35.64	25.00
				20	22.19	.73	.64	.20
				40	20.52	.71	.61	.27
				60	19.86	.72	.62	.36
				100	18.27	.72	.62	.46
		150	17.01	.72	.62	.53		
	12/42	30° 15' S. 153° 39' E.		0	23.42	19.82	35.81	24.44
				10	22.79	.80	.77	.59
				20	22.55	.85	.86	.73
			30	22.56	.85	.86	.73	
			40	22.08	.83	.82	.83	
			50	21.11	.76	.70	25.01	
			100	18.73	.73	.64	.59	
			150	17.81	.70	.59	.88	
			200	15.86	.61	.43	26.12	
			300	13.88	.50	.23	.40	
	400	11.62	.36	34.97	.66			
	600	8.23	.14	.58	.93			

F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O D	Count			
										I	II	III	IV
5.33	108	8.26	1	2	N70	H 50-0	30	90	Cp		68	7	18
4.81	97	.30	2	2	N100	H 50-0	30	50	C		12	1	2
.95	97	.33	2	2									
5.00	98	.31	0	2									
.08	99	.31	0	2									
.05	96	.31	2	6									
4.73	87	.30	5	33									
.97	91	.29	4	15									
.49	81	.24	8	52									
.35	74	.23	12	130									
.42	72	.18	13	138									
.46	69	.10	19	147									
5.18	98	8.22	3	0	N70	H 50-0	30	40	Cp		156	386	17
4.90	92	.19	2	8									
.71	88	.22	3	12									
.14	77	.20	7	42									
.10	76	.19	7	27									
.14	76	.15	7	39									
5.00	97	8.23	0	8									
.05	98	.27	0	0									
.09	96	.29	0	0									
4.92	92	.29	0	6									
.68	85	.28	6	20									
.45	79	.26	8	42									
4.93	97	8.25	2	0	N70	H 50-0	30	70	Cp		134	314	16
.97	97	.25	0	0									
5.00	98	.25	0	0									
4.93	96	.24	0	0									
5.11	99	.24	0	0									
5.10	97	.24	0	0									
4.74	87	.19	3	18									
.65	84	.20	5	48									
.80	84	.19	12	59									
.30	72	.14	15	91									
.44	71	.13	22	96									
.49	67	.06	32	155									

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1942								
8. i	13/42	28° 39' S. 153° 44' E.		0	22.57	19.80	35.77	24.66
				10	22.58	.81	.79	.66
				20	20.48	.75	.68	25.16
				30	20.00	.73	.64	.26
				40	19.23	.75	.68	.49
				50	18.04	.69	.57	.71
	14/42	28° 46' S. 153° 54' E.		0	23.88	19.86	35.88	24.35
				20	23.74	.84	.84	.37
				40	19.76	.76	.70	25.37
				60	19.65	.75	.68	.38
				100	18.51	.71	.61	.63
				150	17.32	.67	.53	.86
	15/42	28° 48' S. 154° 00' E.		0	23.95	19.85	35.86	24.34
				10	23.90	.85	.86	.45
				20	23.16	.85	.86	.56
			30	22.95	.87	.90	.64	
			40	21.76	.83	.82	.92	
			50	21.13	.81	.79	25.07	
			93	20.14	.73	.64	.22	
			140	17.96	.73	.64	.78	
			187	16.57	.66	.52	.92	
			228	15.39	.58	.37	26.19	
			304	13.54	.52	.26	.50	
	456	9.43	.25	34.78	.89			
11. i	16/42	32° 41' S. 152° 47' E.		0	23.12	19.83	35.82	24.55
				20	23.15	.84	.83	.55
				40	20.76	.77	.71	25.11
				60	20.65	.78	.73	.16
				100	18.49	.68	.55	.58
				150	17.54	.68	.55	.82

# F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	D.O.	Count			
										I	II	III	IV
4.98	97	8.14	2	2	N70	H 50-0	30	80	T		577	320	51
5.04	98	.14	2	0									
.19	97	.16	3	0									
.50	103	.18	3	2									
.01	93	.19	4	2									
4.20	76	.13	10	42									
4.85	96	8.15	3	0									
.85	96	.23	4	2									
5.00	93	.27	6	6									
4.94	92	.25	7	6									
.73	86	.26	8	25									
.60	82	.18	10	40									
4.87	97	8.23	6	2									
.88	97	.29	6	0									
.99	98	.31	4	0									
5.03	99	.29	4	0									
.10	98	.28	3	0									
.05	96	.28	4	12									
4.91	92	.27	6	12									
.55	82	.26	8	39									
.39	77	.21	14	75									
.39	76	.20	13	71									
.34	72	.19	20	106									
.46	69	.15	26	148									
4.93	96	8.19	6	0									
.91	96	.20	5	0									
.92	93	.19	5	2									
.93	93	.19	4	2									
.72	86	.17	7	26									
.41	79	.17	10	31									



## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1942								
11. i	17/42	32° 43' S. 152° 54' E.		0	24.23	19.82	35.81	24.21
				10	24.19	.83	.82	.23
				20	24.17	.82	.81	.23
				30	24.18	.82	.81	.23
				40	23.94	.82	.81	.30
				50	21.54	.74	.66	.86
				100	19.54	.71	.61	25.37
				150	18.20	.67	.53	.65
				200	17.02	.68	.55	.95
				286	14.73	.53	.28	26.26
				384	12.55	.48	.19	.64
				577	9.52	.26	34.79	.89
12. i	18/42	33° 16' S. 151° 43' E.		0	22.03	19.74	35.66	24.72
				10	21.73	.77	.71	.85
				20	21.63	.78	.73	.89
				30	21.66	.77	.71	.89
				40	20.36	.71	.61	25.15
				50	18.09	.66	.52	.66
17. iii	19/42	34° 8' S. 151° 12' 30" E.		0	21.71	19.82	35.81	24.93
				10	21.73	.83	.82	.93
				20	21.58	.80	.77	.93
				30	21.45	.79	.75	.95
				40	18.63	.71	.61	25.49
				50	17.38			
23. iii	20/42	37° 18' S. 150° 5' E.		0	20.02	19.74	35.66	25.28
				10	19.36	.74	.66	.45
				20	19.17	.74	.66	.50
				30	19.12	.73	.63	.50
				40	16.78	.64	.48	.95
				50	15.54	.59	.39	26.17
29. iii	21/42	41° 20' S. 148° 26' E.		0	16.81	19.67	35.53	25.99
				10	16.63	.69	.57	26.06
				20	16.19	.68	.55	.14
				30	16.19	.68	.55	.14
				40	15.97	.64	.48	.14
				50	15.71	.56	.34	.14

### F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z FOZ	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
4.74	95	8.20	6	0	N70	H 50-0	30	100	C		144	211	98
.78	95	.20	5	0									
.77	95	.19	4	0									
.81	97	.20	6	0									
5.14	102	.20	5	0									
4.38	84	.25	6	5									
.03	75	.24	8	32									
.22	76	.25	8	71									
.50	80	.16	8	53									
.15	71	.09	11	91									
.30	70	.05	14	105									
.47	69	.03	21	167									
5.08	97	8.16	7	2	N70	H 50-0	30	45	Cp		6	944	5
.07	97	.20	6	10									
.06	97	.18	7	2									
.05	97	.19	5	10									
.22	98	.21	5	8									
.08	92	.19	6	8									
4.96	96		3	0									
.95	95		4	0									
.95	95			0									
.87	93		2	2									
.67	85		1	18									
5.02			1	2									
5.06	95		1	2									
.11	95		6	8									
.22	95		3	0									
4.98	92		1	7									
.52	79		2	61									
.63	80		10	81									
5.35	94		4	2	N100	H 50-0	30	30	Co		3		3
.29	93		6	18									
.29	92		3	8									
.06	89		7	8									
.06	89		4	16									
.09	88		5	18									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	σ <sub>t</sub>
1942								
18. iv	22/42	39° 46' S. 148° 36' E.		0	15.03	19.62	35.44	26.32
				10	14.94	.61	.43	.33
				20	14.93	.61	.43	.33
				30	15.00	.62	.44	.33
				40	15.00	.63	.46	.34
				50	15.02	.63	.46	.34
25. iv	23/42	42° 32' S. 148° 15' E.		0	13.81	19.39	35.03	26.26
				10	13.81	.39	.03	.26
				20	13.90	.40	.05	.26
				30	13.89	.42	.08	.28
				40	13.94	.42	.08	.28
				50	13.95	.43	.09	.28
	24/42	43° 13' S. 148° 3' E.		0	13.47	19.30	34.87	26.21
				10	13.41	.30	.87	.22
				20	13.40	.30	.86	.22
				30	13.40	.31	.88	.24
				40	13.33	.30	.87	.24
				50	13.31	.30	.86	.24
13. v	25/42	37° 9' S. 150° 4' E.		0	17.94	19.75	35.68	25.82
				10	17.83	.76	.70	.87
				20	16.97	.68	.55	.96
				30	16.28	.63	.46	26.05
				40	16.54	.67	.53	.05
				50	16.48	.68	.55	.07
14. v	26/42	36° 15' S. 150° 16' E.		0	19.10	19.74	35.66	25.52
				10	19.20	.76	.70	.52
				20	19.23	.77	.71	.52
				30	19.21	.76	.70	.52
				40	18.70	.77	.71	.66
				50	16.94	.65	.50	.93

F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ O <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
5.61	96		8	14	N70	H 50-0	30	70	C		2		
.56	95		14	14									
.50	94		6	14									
.58	104		5	18									
.52	94		6	18									
.57	97		2	14									
5.68	95		8	31	N100	H 50-0	30	40	C				1
.65	94		4	16									
.68	95		7	25									
.68	95		1	25									
.58	94		1	25									
.58	94		7	18									
5.67	94		2	40	N100	H 50-0	30	20	C				2
.72	95		7	33									
.70	94		6	52									
.64	94		6	62									
.63	85		6	44									
.54	92		7	48									
5.34	96		5	7	N70	H 50-0	30	500	Cp		13	10	
.21	94		2	7	N100	H 50-0	30	275	T		21		
.16	92		5	18									
.15	90			8									
.06	89		8	12									
.10	90		5	14									
5.04	93		2	7									
.02	93		8	5									
.07	92		1	11									
.04	93		6	8									
4.95	91		7	18									
.38	78		11	75									

## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	$\sigma_t$
1942								
14.v	27/42	35° 12' S. 150° 47' E.		0	17.77	19.72	35.62	25.82
				10	17.81	.73	.64	.82
				20	17.81	.75	.68	.85
				30	17.83	.76	.69	.85
				40	17.83	.75	.68	.85
				50	17.74	.72	.62	.85
15.v	28/42	34° 5' S. 151° 13' 30" E.		0	18.19	19.73	35.64	25.74
				10	18.26	.75	.68	.74
				20	18.30	.77	.71	.76
				30	18.32	.78	.72	.76
				40	18.26	.76	.70	.76
				50	18.20	.76	.69	.76
9.vi	31/42	37° 2' S. 150° 2' E.		0	15.45	19.69	35.57	26.33
				10	15.47	.70	.59	.33
				20	15.47	.70	.59	.33
				30	15.47	.70	.59	.33
				40	15.25	.66	.51	.35
				50	15.45	.71	.61	.35
10.vi	33/42	36° 15' S. 150° 16' E.		0	16.41	19.75	35.67	26.18
				10	16.38	.68	.54	.18
				20	16.36	.74	.66	.18
				30	16.38	.74	.66	.18
				40	16.03	.69	.57	.19
				50	15.71	.69	.57	.27
11.vi	35/42	35° 8' S. 150° 5' E.		0	17.79	19.69	35.57	25.77
				10	17.80	.71	.61	.80
				20	17.69	.69	.57	.80
				30	17.42	.69	.57	.87
				40	17.23	.70	.59	.92
				50	17.18	.69	.57	.92

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z O <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O.D.	Count			
										I	II	III	IV
5.39	96		5	14									
.27	95		4	8									
.22	94		7	8									
.22	94		6	8									
.24	94		5	11									
4.59	82		4										
5.10	93		8	6									
.05	92		5	11									
.00	91		8	11									
.05	92		4	8									
.03	92		7	8									
.00	91		4	17									
5.59	96		7	11	N70	H 50-0	30	30					
.55	96		5	8	N70	H 50-0	30	50	C		3	64	1
.59	97		10	11									
.58	96		6	17									
.50	95		5	14									
.63	97		7	17									
5.45	95		3	18	N70	H 50-0	30	175	Cp		7	38	89
.37	94		8	17	N100	H 50-0	30	200	C		4		2
.38	94		5	18									
.30	92		6	27									
.32	92		3	17									
.25	91		2	18									
4.97	90		8	44	N70	H 50-0	30	35	C		1	92	4
.96	90		3	31	N100	H 50-0	30	40	C		3		
.95	89		6	31									
5.00	90		9	31									
.00	89		4	37									
.01	90		6	33									

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	σ <sub>t</sub>
1942								
19.vi	39/42	32° 40' S. 150° 20' E.		0	19.11	19.70	35.59	25.45
				10	19.11	.70	.59	.45
				20	19.11	.70	.59	.45
				30	19.12	.72	.62	.48
				40	18.98	.69	.57	.48
				50	18.91	.70	.59	.50
21.vi	42/42	30° 19' S. 153° 17' E.		0	21.23	19.74	35.65	24.93
				10	21.30	.74	.66	.93
				20	21.31	.75	.68	.93
				30	21.31	.75	.68	.93
				40	21.30	.75	.68	.93
				50	20.54	.72	.62	25.11
26.vi	45/42	31° 51' S. 152° 53' E.		0	21.80	19.79	35.75	24.85
				10	21.78	.78	.73	.85
				20	21.74	.78	.73	.86
				30	21.70	.80	.77	.90
				40	20.10	.75	.68	25.26
				50	18.86	.71	.61	.54
28.vi	50/42	34° 4' S. 151° 15' E.		0	18.00	19.74	35.66	25.78
				10	18.04	.74	.66	.78
				20	18.00	.75	.68	.80
				30	18.03	.76	.70	.81
				40	17.96	.75	.68	.81
				50	17.87	.76	.70	.85
17.vii	51/42	34° 6' S. 151° 14' E.		0	17.26	19.72	35.62	25.94
				10	17.29	.72	.62	.94
				20	17.29	.76	.69	.98
				30	16.90	.69	.56	.98
				40	15.80	.62	.44	26.14
				50	15.23	.57	.35	.21

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ ON Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
4.96	92		5	33	N70	H 50-0	30	56	C			344	7
.63	85		8	33									
.95	91		8	28									
5.04	93		6	31									
4.90	90		4	33									
.85	90		4	31									
4.83	92		6	10	N70	H 50-0	30	25	C		4	75	15
.84	92		3	16									
.87	93		8	14									
.78	92		8	8									
.82	92		6	14									
.48	84		1	44									
5.03	96		4	7	N70	H 50-0	30	25	Op		9	65	20
4.93	95		6	7									
.95	95		8	8									
.99	96		3	8									
.38	82		6	48									
.22	77		8	68									
5.31	96		6	14	N70	H 50-0	30	25	Op		4	154	11
.25	94		6	10	N100	H 50-0	30	8	C		3		6
.18	94		8	10									
.28	95		5	14									
.10	92		7	7									
.20	93		6	14									
4.78	86		3	7	N70	H 0	13	20	C			26	
5.11	92		2	17	N70	H 0	15	30	Op		31	730	7
.02	90		2	13	N70	V	4	15	Op		5	192	7
4.71	84		3	30	N100	H 0	15	20			2	11	
.46	78		6	20									
.26	74		8	36									



## F.R.V. Warreen

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/∞	S°/∞	σ <sub>t</sub>
1942								
17. vii	52/42	34° 6' S. 151° 14' E.		0	17.71	19.74	35.65	25.85
				10	17.68	.73	.64	.85
				20	17.46	.71	.61	.89
				30	17.42	.72	.62	.90
				40	16.28	.67	.53	26.11
				50	15.44	.62	.44	.22
	53/42	34° 6' S. 151° 14' E.		0	17.42	19.73	35.64	25.91
				10	17.55	.75	.67	.91
				20	17.42	.73	.63	.91
				30	16.95	.69	.57	.98
				40	15.78	.58	.37	26.10
				50	15.59	.58	.37	.14
	54/42	34° 6' S. 151° 14' E.		0	18.48	19.69	35.57	25.60
				10	17.81	.75	.68	.84
				20	17.11	.69	.56	.93
				30	17.06	.68	.55	.93
				40	16.32	.63	.46	26.04
				50	15.67	.61	.43	.16
18. vii	55/42	34° 6' S. 151° 14' E.		0	17.56	19.70	35.59	25.84
				10	17.68	.71	.61	.84
				20	17.69	.73	.64	.85
				30	17.19	.75	.68	26.00
				40	16.32	.71	.61	.16
				50	15.68	.61	.43	.16
	56/42	34° 6' S. 151° 14' E.		0	17.88	19.70	35.59	25.76
				10	17.97	.75	.68	.81
				20	17.89	.75	.68	.83
				30	17.42	.71	.61	.90
				40	16.68	.68	.55	26.02
				50	15.53	.59	.39	.17

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub>	Net	Depth (m.)	Duration (min.)	Volume (cc.)	O. D.	Count				
										I	II	III	IV	
5.02	91		2	7	N70	H 0	15	50	Cp		32	788		2
.06	91		2	15	N70	H 0	15	30	Cp		1	93		
.12	92		3	10	N70	V	4	10	C					
.07	91		1	10	N100	H 0	15	10	C			65		1
4.57	83		8	20										
.38	78		8	44										
5.19	93		4	15	N70	H 0	15	60	Cp		16	543		6
.16	93		2	7	N70	H 0	15	40	Cp		2	69		1
.15	93		5	10	N70	V	4	12	Cp		1	64		2
.08	91		4	13	N100	H 0	15	40	C			2		
4.42	77		8	20	N100	H 0	15	40	T			10		
.48	78		9	40										
5.21	95		1	3	N70	V	4	12	C					
.21	94		4	7										
.04	90		4	3										
.04	92		6	7										
4.68	82		7	26										
.52	79		9	17										
5.07	92		4	7	N70	H 0	15	50	Cp		11	232		3
.05	91		3	10	N70	H 0	15	50	Cp		7	110		3
.09	92		3	7	N70	V	4	10	Cp		2	172		1
4.93	89		5	10	N100	H 0	15	30	C			1		
.63	82		9	17	N100	H 0	15	15	T			1		
.41	77		8	30										
4.98	91		3	20	N70	H 0	15	25	Cp		2	65		
5.13	93		4	10	N70	H 0	15	25	C			25		
.13	93		4	7	N70	V	4	10	Cp		3	285		2
.02	90		6	10	N100	H 0	15	30	C					
4.84	86		4	13	N100	H 0	15	35	Cp			6		1
.63	80		8	20										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl°/oo	S°/oo	$\sigma_t$
1942								
18. vii	57/42	34° 6' S. 151° 14' E.		0	18.11	19.73	35.64	25.75
				10	18.16	.74	.66	.75
				20	18.01	.73	.64	.75
				30	17.64	.71	.61	.85
				40	16.73	.66	.52	.98
				50	15.82	.62	.44	26.14
	58/42	34° 6' S. 151° 14' E.		0	17.92	19.72	35.62	25.78
				10	17.98	.74	.66	.80
				20	17.45	.69	.57	.86
				30	17.10	.66	.52	.89
				40	16.83	.62	.44	.93
				50	15.09	.58	.37	26.26
	59/42	34° 6' S. 151° 14' E.		0	17.80	19.69	35.57	25.77
				10	17.82	.73	.64	.82
				20	17.14	.68	.55	.92
				30	15.99	.60	.41	26.08
				40	15.44	.58	.37	.15
				50	15.15	.55	.32	.19
19. vii	60/42	34° 6' S. 151° 14' E.		0	17.03	19.74	35.66	26.00
				10	17.08	.73	.64	.00
				20	16.45	.66	.52	.05
				30	16.90	.74	.65	.05
				40	15.87	.68	.55	.22
				50	15.32	.65	.50	.30
	61/42	34° 6' S. 151° 14' E.		0	17.08	19.72	35.62	25.99
				10	17.04	.72	.62	26.00
				20	16.08	.67	.53	.16
				30	15.58	.66	.52	.25
				40	15.30	.64	.48	.29
				50	15.15	.62	.44	.29

## F.R.V. Warren

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS									
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Σ O <sub>2</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count				
										I	II	III	IV	
5.21	94		3	17	N70	H 0	15	5	T		1	62		
.27	95		1	27	N70	H 0	15	25	T			45		
.22	95		1	7	N70	V	4	25	Cp		4	233		3
4.83	87		4	27	N100	H 0	15	35	C			4		
.83	86		4	17										
.48	82		8	27										
5.23	94		1	4	N70	H 0	15	20	Cp		2	130		
.19	94		2	13	N70	H 0	15	15	Cp		2	42		
4.94	89		3	13	N70	V	4	20	Cp			165		3
.94	88		4	30	N100	H 0	15	10	T			8		
.46	79		9	37										
.36	75		10	58										
5.10	92		3	20	N70	V	4	20	C			57		6
.17	93		4	20										
4.97	89		5	20										
3.62	63		5	37										
4.04	70		8	40										
3.55	61		9	44										
5.00	90		4	20	N70	V	4	5	Cp			61		
.03	90		7	32	N70	H 0	15	150	Cp		21	676		6
4.71	83		7	40	N70	H 0	15	240	Cp		17	290		3
			5	40	N100	H 0	15	80	C					
.48	78		11	37										
.40	76		9	75										
4.98	89		7	20	N70	H 0	15	120	Cp		22	480		2
5.03	90		7	30	N70	H 0	15	150	Cp		12	147		
4.49	78		13	20	N70	V	4	5	Cp		1	46		
.38	76		11	55	N100	H 0	15	30	C					
.38	76		12	34	N100	H 0	15	50	T		1	5		
.37	75		12	30										

## F.R.V. Warren

Date	Station	Position	Sounding (fathoms)	HYDROLOGICAL OBSERVATIONS				
				Depth (m.)	Temp °C.	Cl <sup>o</sup> /∞	S <sup>o</sup> /∞	σ <sub>t</sub>
1942								
19. vii	62/42	34° 6' S. 151° 14' E.		0	17.07	19.71	35.60	25.97
				10	17.05	.70	.59	.97
				20	16.75	.73	.64	26.08
				30	15.59	.67	.53	.27
				40	15.37	.64	.48	.27
				50	15.06	.59	.39	.27
	63/42	34° 6' S. 151° 14' E.		0	16.84	19.72	35.62	26.05
				10	16.63	.73	.64	.10
				20	16.06	.63	.46	.10
				30	15.63	.61	.43	.17
				40	15.32	.64	.48	.28
				50	15.03	.60	.41	.30

# F.R.V. Warreen

HYDROLOGICAL OBSERVATIONS					PLANKTOLOGICAL OBSERVATIONS								
O <sub>2</sub>	O <sub>2</sub> %	pH	PO <sub>4</sub> -P	Z NO <sub>3</sub> Z	Net	Depth (m.)	Duration (min.)	Volume (ccs.)	O. D.	Count			
										I	II	III	IV
5.08	91		7	24	N70	H 0	15	26	Cp		9	510	2
.12	91		8	20	N70	H 0	15	50	Cp		8	670	1
4.88	87		9	30	N70	V	4	10	Cp			79	1
.37	76		12	37	N100	H 0	15	20	Co			13	
.29	74		14	85									
.29	74		14	85									
4.87	87		7	37	N70	V	4	20	Cp			65	2
.82	85		6	20	N70	H 0	15	30	Cp		6	234	1
.55	80		9		N100	H 0	15	25				2	
.37	76		8	70									
.33	75		11										
.27	73		20	96									