OCEANOGRAPHICAL STATION LIST

VOLUME 71

INVESTIGATIONS BY F.V. *ESTELLE STAR* IN SOUTH AUSTRALIAN AND NEW SOUTH WALES WATERS IN 1965

DIVISION OF FISHERIES AND OCEANOGRAPHY
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION, AUSTRALIA 1968

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When citing this station list, abbreviate as follows:
CSIRO Aust. Oceanogr. Stn List 71.

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Investigations by F.V. Estelle Star in South Australian and New South Wales Waters in 1965

I. INTRODUCTION

This report records the hydrological data collected during three cruises of F.V. Estelle Star in 1965. Track charts and station positions for Cruises 1 and 2 are given in Figures 1 and 2; there is no track chart for Cruise 3.

II. WORK ACCOMPLISHED

Table 1 gives details of cruise dates, number of stations worked, nature of work, and staff on each cruise.

TABLE 1

DETAILS OF CRUISES AND WORK DONE

Cruise	Dates	Staff	Number of Stations Occupied	Hydrology 1	Hydrology 2	BT
ES1/65	Jan. 27-28	R. Bradley	24	24	0	0
ES2/65	Apr. 25-May 9	R. Bradley	44	44	18	19
ES3/65	Nov. 14-29	L. Brown	90	90	0	0

BT Bathythermographs

Hydrology 1 Number of stations at which surface samples were collected
2 Number of stations at which subsurface samples were collected

III. METHOD OF COLLECTION AND ANALYSIS OF SAMPLES

1. Physics

Temperature.—Surface temperatures were taken by a fisherman's thermometer, graduated to 0.1 degF and accurate to ± 0.5 degF (Vaux 1961). The temperatures were converted to degC for the data listing in this report. The subsurface temperatures were obtained from the bathythermograph.

Bathythermograph.—A 900-ft bathythermograph was used on Cruise 2 as opportunity arose. It was lowered and raised by hand using rope instead of the more usual hydrographic wire. Slides were digitized on board according to the method of the U.S. National Oceanographic Data Center (1964). The results were transferred to punched cards and computer listings produced. The listings are held at Cronulla.

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

2. Chemistry

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

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

Salinities are considered accurate to $\pm$ 0.05‰.

REFERENCES

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

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

U.S. NATIONAL OCEANOGRAPHIC DATA CENTER (1964).—Manual for processing bathythermograph data. Part 1 Instructions for manually digitizing bathythermograph data. Publ. M-3. (U.S. Naval Oceanographic Office : Washington, D.C.)

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

VAUX, D. (1961).—Measurement of sea water temperatures by fishermen. Aust. Fish. Leafl. No. 6.

IV. TRACK CHARTS

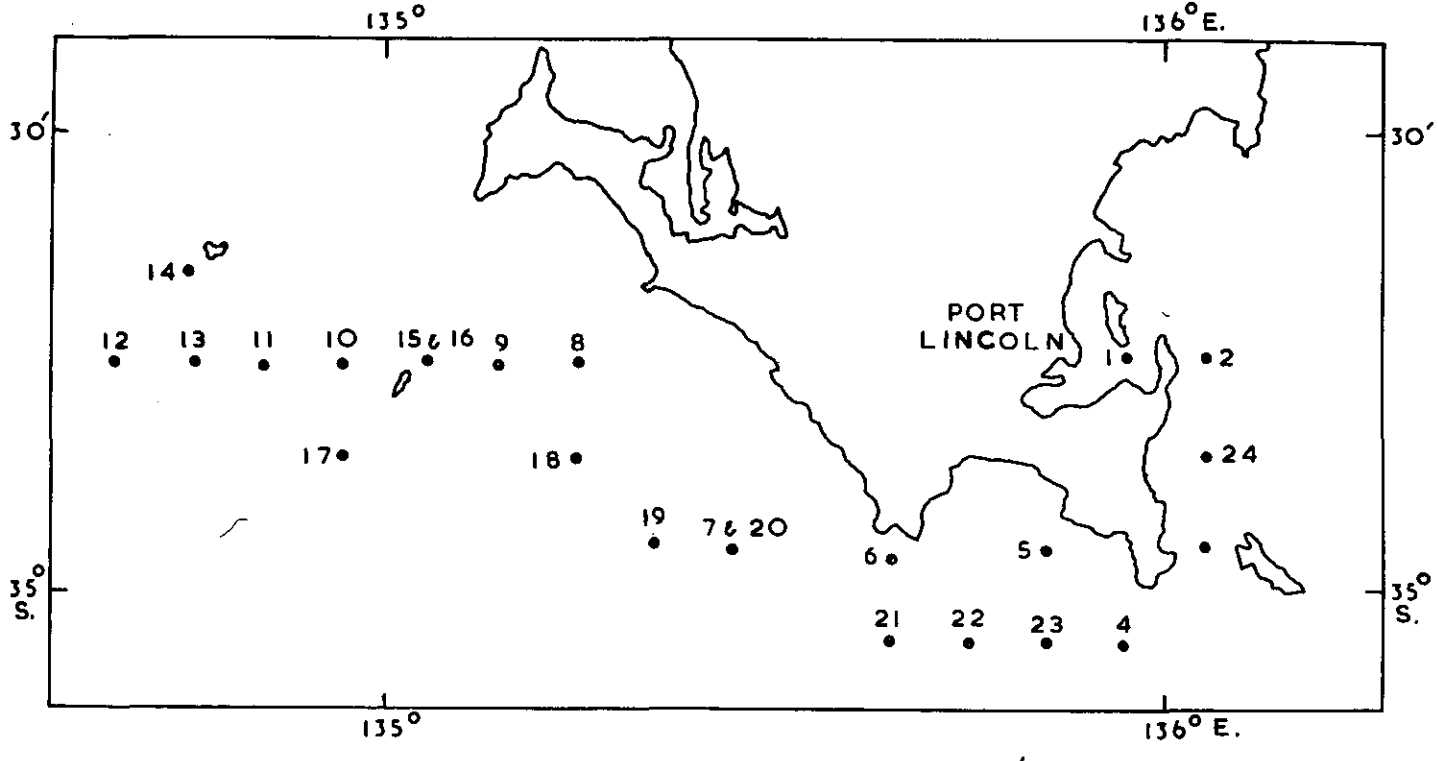

Fig. 1.– Track chart Cruise ES 1/65

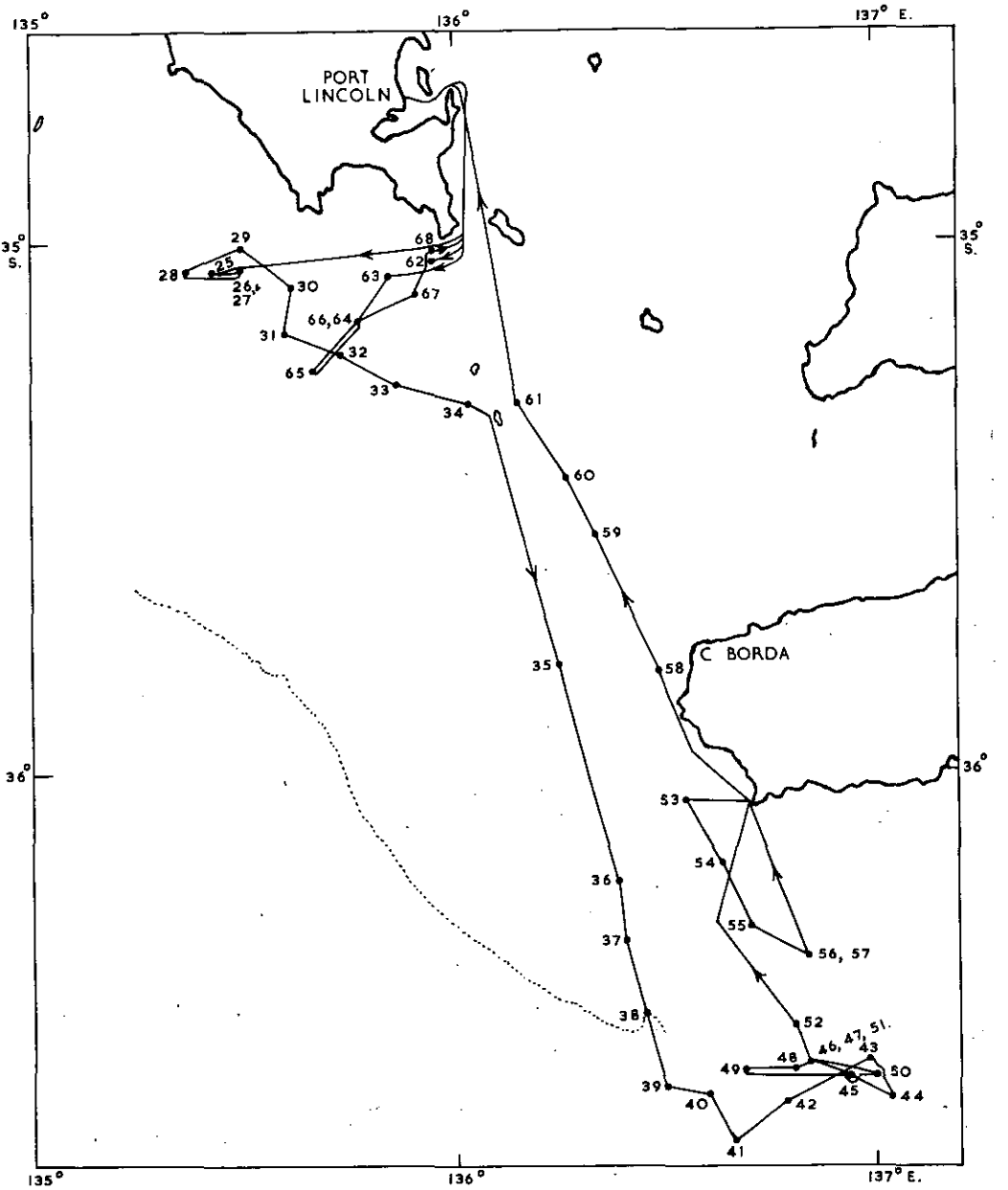

Fig. 2: Track chart Cruise ES 2/65

V. DATA

The data were processed in a C.D.C. 3600 Computer.

EXPLANATION OF HEADINGS

Parts 1 and 2	Hydrology
STATION	Gives the station identification. For example, ES2/26/65 signifies the 26th station worked by Estelle Star in 1965, on her 2nd cruise for that year
DATE	Given as day/month/year
TIME	Given in Zone Time, and is the time at the beginning of the first cast. In Eastern Australian waters times are given in Eastern Australian Standard Time, GMT +10 hr, Code K; in South Australian waters times are given in Central Australian Standard Time, GMT +9½ hr, Code J
LATITUDE LONGITUDE	Given in degrees and minutes
SONIC DEPTH	Given in metres, measured at standard sound velocity of 800 fm (1463 m) per second
AIR TEMP. WET DRY	Air temperatures recorded from wet and dry bulb thermometers in °C
WIND DIR. SP.	Wind direction and speed are coded using Tables 8 and 9 in U.S. Navy Hydrogr. Office (1955)
ANEM. HEIGHT	Average height of the anemometer above sea level, given in feet
CLOUD TYPE AMT.	Cloud type and amount are coded using Tables 2 and 3 in U.S. Navy Hydrogr. Office (1955)
WEA.	Weather is coded using Table 1 in U.S. Navy Hydrogr. Office (1955)
VIS.	Visibility is coded using Table 4 in U.S. Navy Hydrogr. Office (1955)

SEA DIR. AMT.	Sea direction and amount are coded using Tables 5 and 8 in U.S. Navy Hydrogr. Office (1955)
SWELL DIR. AMT.	Sea swell direction and amount are coded using Tables 6 and 8 in U.S. Navy Hydrogr. Office (1955)
BAROM. or ATMOS. PRESSURE	Atmospheric pressure given in millibars
CAST	Gives the cast number
DEPTH	Sampling depth given in metres
TEMP.	Sea temperatures recorded in °C
SALINITY	Given in parts per thousand
SIGMA-T	Sigma-t to 2 decimal places

*, ***, or a blank indicates no data available

DATA

PART 1

HYDROLOGY

SURFACE SAMPLES

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	1	1	65	1	27	0615	J 34 45 S	135 57 E	21.2		06	2							
17	1	2	65	1	27	0700	J 34 45 S	136 03 E	20.4	35.70	06	2							
17	1	3	65	1	27	0800	J 34 57 S	136 03 E	19.0	35.99	08	1							
17	1	4	65	1	27	0900	J 35 03 S	135 57 E	18.7	35.88	04	1							
17	1	5	65	1	27	1000	J 34 57 S	135 51 E	17.8	35.75	04	1							
17	1	6	65	1	27	1100	J 34 57 S	135 39 E	17.5	35.66	02	3							
17	1	7	65	1	27	1200	J 34 57 S	135 27 E	18.3	35.75	04	1							
17	1	8	65	1	27	1300	J 34 51 S	135 18 E	18.2	35.66	00	0							
17	1	9	65	1	27	1400	J 34 45 S	135 09 E	18.3	35.64	07	2							
17	1	10	65	1	27	1500	J 34 45 S	134 57 E	18.6		00	0							
17	1	11	65	1	27	1600	J 34 45 S	134 51 E	18.3	35.46	00	0							
17	1	12	65	1	27	1700	J 34 45 S	134 39 E	18.3	35.41	09	3							
17	1	13	65	1	27	1800	J 34 45 S	134 45 E	18.4		10	3							
17	1	14	65	1	27	1900	J 34 39 S	134 45 E	17.8	35.57	06	5							
17	1	15	65	1	28	0600	J 34 45 S	135 03 E	18.4	35.62	18	2							
17	1	16	65	1	28	0700	J 34 45 S	135 03 E	18.1	35.57	11	3							
17	1	17	65	1	28	0915	J 34 51 S	134 57 E	18.3	35.81	09	4							
17	1	18	65	1	28	1100	J 34 51 S	135 15 E	18.2	35.61	99	1							
17	1	19	65	1	28	1200	J 34 57 S	135 21 E	18.3	35.64	19	4							
17	1	20	65	1	28	1300	J 34 57 S	135 27 E	18.3	35.71	19	3							
17	1	21	65	1	28	1400	J 35 03 S	135 39 E	18.1	35.71	18	2							
17	1	22	65	1	28	1500	J 35 03 S	135 45 E	18.0	35.71	19	3							
17	1	23	65	1	28	1600	J 35 03 S	135 51 E	18.4	35.84	18	2							
17	1	24	65	1	28	1700	J 35 00 S	136 01 E	18.1	35.86	20	3							
17	2	25	65	4	26	0700	J 35 03 S	135 26 E	17.7	35.90	06	3	06	2	18	1	00	7	1024.7
17	2	26	65	4	26	0900	J 35 03 S	135 30 E	17.8	35.88	10	3	10	2	18	1	02	7	1024.7
17	2	27	65	4	26	1000	J 35 03 S	135 30 E	17.5	35.84	08	3	09	2	18	1	02	7	1024.7
17	2	28	65	4	26	1100	J 35 03 S	135 22 E	17.6	35.91	00	0	09	1	18	1	02	7	1024.7
17	2	29	65	4	26	1200	J 35 01 S	135 30 E	17.9	35.88	10	2	10	1	18	1	01	7	1024.7
17	2	30	65	4	26	1400	J 35 05 S	135 37 E	17.7	35.84	10	3	10	1	18	1	01	7	1024.0
17	2	31	65	4	26	1500	J 35 10 S	135 36 E	17.8	35.86	11	3	11	2	18	1	01	7	1023.0
17	2	32	65	4	26	1600	J 35 13 S	135 44 E	17.9	35.88	11	3	11	2	18	1	02	7	1023.0
17	2	33	65	4	26	1700	J 35 16 S	135 52 E	17.6	35.84	11	2	11	2	18	1	02	7	1023.0
17	2	34	65	4	26	1800	J 35 18 S	136 02 E	17.6	35.88	14	2	14	1	18	1	02	7	1022.7
17	2	35	65	4	27	0300	J 35 48 S	136 15 E	17.4	35.82	00	0	00	0	18	1	02	7	1022.4
17	2	36	65	4	27	0600	J 36 12 S	136 23 E	17.6	35.81	00	0	00	0	18	1	03	7	1023.0
17	2	37	65	4	27	0700	J 36 19 S	136 24 E	17.7	35.81	09	1	00	0	14	1	03	7	1023.7
17	2	38	65	4	27	0800	J 36 27 S	136 27 E	17.7	35.88	09	1	00	0	14	1	02	7	1024.7
17	2	39	65	4	27	0900	J 36 35 S	136 30 E	17.7	35.88	09	1	00	0	14	1	02	7	1025.1
17	2	40	65	4	27	1000	J 36 36 S	136 36 E	17.5	35.81	09	1	00	0	14	1	03	7	1025.1

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	2	41	65	4	27	1100	J 36 41 S	136 40 E	17.7	35.81	14	1	00	0	14	1	03	7	1025.1
17	2	42	65	4	27	1200	J 36 37 S	136 47 E	17.3	35.73	00	0	00	0	14	1	03	7	1025.1
17	2	43	65	4	27	1400	J 36 32 S	136 59 E	17.0	35.55	10	1	10	1	14	1	03	7	1025.1
17	2	44	65	4	27	1515	J 36 37 S	137 02 E	17.3	35.64	10	1	10	1	14	1	01	7	1024.0
17	2	45	65	4	27	1600	J 36 34 S	136 56 E	17.2	35.64	05	2	05	1	14	1	02	7	1024.0
17	2	46	65	4	27	1800	J 36 32 S	136 50 E	17.7	35.64	09	2	09	1	14	1	02	7	1024.0
17	2	47	65	4	28	0800	J 36 32 S	136 50 E	17.1	35.64	08	4	08	3	14	1	00	7	1026.1
17	2	48	65	4	28	0915	J 36 33 S	136 48 E	16.8	35.61	06	4	07	3	14	1	02	7	1026.1
17	2	49	65	4	28	1200	J 36 33 S	136 41 E	17.1	35.66	07	3	07	3	14	1	01	7	1026.1
17	2	50	65	4	28	1600	J 36 34 S	137 00 E	17.1	35.79	03	2	04	1	20	1	03	7	1024.7
17	2	51	65	4	28	1700	J 36 32 S	136 50 E	16.6	35.59	05	2	04	1	20	1	01	7	1024.7
17	2	52	65	4	28	1810	J 36 28 S	136 48 E	17.0	35.66	06	4	05	1	20	1	01	7	1024.7
17	2	53	65	4	29	1000	J 36 03 S	136 33 E	17.1	35.77	07	4	07	2	00	0	00	7	1024.4
17	2	54	65	4	29	1100	J 36 10 S	136 38 E	17.3	35.77	07	4	07	2	00	0	00	7	1024.4
17	2	55	65	4	29	1200	J 36 17 S	136 42 E	17.3	35.77	07	3	07	2	00	0	03	7	1024.0
17	2	56	65	4	29	1300	J 36 20 S	136 50 E	17.3	35.79	05	3	07	2	00	0	02	7	1024.0
17	2	57	65	4	29	1815	J 36 20 S	136 50 E	17.1	35.61	05	3	05	1	00	0	00	7	1022.7
17	2	58	65	4	30	0900	J 35 49 S	136 29 E	17.2	35.73	01	2	01	1	25	1	14	7	1022.4
17	2	59	65	4	30	1100	J 35 33 S	136 20 E	17.4	35.81	00	0	00	0	25	1	14	7	1022.4
17	2	60	65	4	30	1200	J 35 26 S	136 16 E	17.6	35.90	00	0	00	0	25	1	14	7	1022.4
17	2	61	65	4	30	1300	J 35 18 S	136 09 E	17.6		36	1	00	0	25	1	00	7	1022.0
17	2	62	65	5	5	0900	J 35 02 S	135 57 E	17.4	35.88	09	3	09	3	18	1	00	7	1022.0
17	2	63	65	5	9	0900	J 35 04 S	135 51 E	17.7	35.88	06	3	06	2	18	2	00	7	1019.0
17	2	64	65	5	9	1000	J 35 08 S	135 46 E	17.7	35.86	06	3	06	2	18	2	03	7	1019.0
17	2	65	65	5	9	1100	J 35 14 S	135 40 E	18.2	35.91	04	4	05	3	18	2	02	7	1017.6
17	2	66	65	5	9	1200	J 35 08 S	135 46 E	17.8	35.88	05	4	05	3	18	2	03	7	1016.6
17	2	67	65	5	9	1300	J 35 06 S	135 55 E	17.9	35.90	06	4	05	3	18	2	02	7	1015.9
17	2	68	65	5	9	1500	J 35 01 S	135 57 E	17.6	35.88	05	4	05	3	18	2	40	7	1014.9
17	3	69	65	11	14	0700	K 37 03 S	150 03 E	15.4	35.43	05	1	05	1			00	7	
17	3	70	65	11	14	0800	K 37 03 S	150 09 E	16.2	35.48	05	1	05	2			00	7	
17	3	71	65	11	14	0900	K 37 03 S	150 21 E	18.8	35.64	05	3	05	2			00	7	1025.4
17	3	72	65	11	14	1000	K 36 51 S	150 21 E	18.8	35.62	05	3	05	2			00	7	1024.7
17	3	73	65	11	14	1100	K 36 45 S	150 21 E	18.8	35.64	05	3	05	2			00	7	1024.7
17	3	74	65	11	14	1200	K 36 57 S	150 09 E	15.7	35.41	05	3	05	2			00	7	1024.7
17	3	75	65	11	14	1300	K 37 03 S	150 03 E	15.7	35.43	05	3	05	2			00	7	1024.7
17	3	76	65	11	15	0730	K 37 03 S	150 03 E	15.6	35.44	05	1	05	1			01	7	1016.9
17	3	77	65	11	15	0830	K 37 03 S	150 15 E	16.6	35.48	05	1	05	1			02	7	1016.9
17	3	78	65	11	15	0930	K 36 45 S	150 21 E	18.3	35.81	05	1	05	1			02	7	1015.9
17	3	79	65	11	15	1030	K 36 39 S	150 21 E	18.7	35.55	05	1	05	1			02	7	1015.2
17	3	80	65	11	15	1130	K 36 33 S	150 21 E	18.9	35.61	05	1	05	1			03	7	1014.9

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	3	81	65	11	15	1230	K 36 27 S	150 21 E	19.3	35.57	05	1	05	1			03	7	1014.2
17	3	82	65	11	15	1330	K 36 27 S	150 27 E	18.9	35.57	05	2	05	1			03	7	1013.5
17	3	83	65	11	15	1430	K 36 21 S	150 27 E	18.8	35.57	05	2	05	1			02	7	1012.5
17	3	84	65	11	15	1530	K 36 21 S	150 33 E	18.5	35.57	05	1	05	2			02	7	1012.2
17	3	85	65	11	15	1630	K 36 21 S	150 33 E	18.9	35.57	05	1	05	2			02	6	1011.2
17	3	86	65	11	15	1730	K 36 21 S	150 21 E	17.8	35.44	05	1	05	2			01	6	1010.8
17	3	87	65	11	15	1830	K 36 27 S	150 15 E	17.4	35.52	05	1	05	2			01	6	1010.5
17	3	88	65	11	16	0930	K 36 27 S	150 15 E	17.2	35.48	05	3	05	3	11	1	03	7	1004.7
17	3	89	65	11	16	1030	K 36 21 S	150 21 E	18.3	35.66	05	2	05	2	11	1	02	7	1004.4
17	3	90	65	11	16	1130	K 36 27 S	150 21 E	18.3	35.55	14	2	05	2	11	1	02	7	1004.4
17	3	91	65	11	16	1230	K 36 33 S	150 09 E	17.6	35.52	18	1	99	2	11	1	03	6	1004.7
17	3	92	65	11	19	0500	K 36 57 S	150 03 E	15.5	35.43	00	0	00	0	16	1	03	7	1018.3
17	3	93	65	11	19	0600	K 36 51 S	150 09 E	16.6	35.57	00	0	00	0	16	1	03	7	1019.0
17	3	94	65	11	19	0700	K 36 45 S	150 21 E	18.3	35.61	34	1	00	0	16	1	02	7	1019.0
17	3	95	65	11	19	0800	K 36 39 S	150 27 E	18.2	35.57	34	1	00	0	16	1	02	7	1019.0
17	3	96	65	11	19	0900	K 36 33 S	150 33 E	18.3	35.62	34	1	34	1	16	1	01	7	1019.0
17	3	97	65	11	19	1000	K 36 27 S	150 33 E	17.8	35.61	34	1	34	1	16	1	01	7	1019.3
17	3	98	65	11	19	1100	K 36 33 S	150 27 E	18.3	35.61	34	1	34	1	16	1	03	7	1019.0
17	3	99	65	11	19	1200	K 36 27 S	150 27 E	18.4	35.61	34	1	34	1	16	1	03	7	1017.9
17	3	100	65	11	19	1300	K 36 15 S	150 27 E	18.3	35.61	05	1	05	1	16	1	01	7	1017.9
17	3	101	65	11	19	1400	K 36 15 S	150 39 E	18.4	35.62	05	1	05	1	16	1	02	7	1017.6
17	3	102	65	11	19	1500	K 36 21 S	150 39 E	18.2	35.61	05	1	05	1	16	1	02	7	1017.9
17	3	103	65	11	19	1600	K 36 21 S	150 33 E	18.4	35.62	05	1	05	1	16	1	02	7	1017.9
17	3	104	65	11	19	1700	K 36 21 S	150 21 E	18.4	35.62	05	1	05	1	16	1	02	7	1017.9
17	3	105	65	11	20	0700	K 36 15 S	150 15 E	17.8	35.53	05	1	05	1	05	1	00	8	1016.9
17	3	106	65	11	20	0800	K 36 15 S	150 21 E	18.2	35.61	05	2	05	1	05	1	02	7	1016.9
17	3	107	65	11	20	0900	K 36 21 S	150 33 E	18.3	35.62	05	2	05	1	05	1	02	7	1016.6
17	3	108	65	11	20	1000	K 36 33 S	150 33 E	18.3	35.61	05	2	05	1	36	1	02	7	1016.9
17	3	109	65	11	20	1100	K 36 33 S	150 27 E	18.3	35.62	05	2	05	1	36	1	02	7	1016.6
17	3	110	65	11	20	1200	K 36 39 S	150 21 E	18.3	35.61	05	2	05	1	36	1	03	7	1016.3
17	3	111	65	11	20	1300	K 36 45 S	150 15 E	18.2	35.59	05	2	05	1	36	1	03	7	1015.2
17	3	112	65	11	20	1400	K 36 51 S	150 09 E	16.1	35.57	05	2	05	1	36	1	03	7	1014.9
17	3	113	65	11	20	1500	K 37 03 S	150 03 E	16.1	35.41	05	2	05	1	36	1	02	6	1014.9
17	3	114	65	11	22	0430	K 37 03 S	150 03 E	15.5	35.90	18	1	18	1	14	1	03	6	1021.3
17	3	115	65	11	22	0530	K 36 57 S	150 03 E	17.1	35.92	14	1	14	1	14	1	91	5	1021.7
17	3	116	65	11	22	0630	K 36 51 S	150 09 E	17.8	35.59	14	1	14	1	14	1	91	5	1021.7
17	3	117	65	11	22	0730	K 36 39 S	150 15 E	18.0	35.61	14	1	14	1	14	1	91	5	1022.0
17	3	118	65	11	22	0830	K 36 33 S	150 21 E	18.1	35.61	14	1	14	1	14	1	91	5	1022.0
17	3	119	65	11	22	0930	K 36 27 S	150 27 E	17.9	35.61	09	1	09	1	14	2	01	5	1022.0
17	3	120	65	11	22	1030	K 36 15 S	150 33 E	18.1	35.73	09	2	09	1	14	2	02	5	1022.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	3	121	65	11	22	1130	K 36 21 S	150 39 E	17.8	35.61	09	2	09	1	14	2	02	5	1021.7
17	3	122	65	11	22	1230	K 36 24 S	150 33 E	18.1	35.61	09	1	09	1	14	1	01	6	1021.7
17	3	123	65	11	22	1330	K 36 21 S	150 21 E	18.2	35.62	09	1	09	1	14	1	02	7	1021.7
17	3	124	65	11	22	1430	K 36 27 S	150 21 E	18.2	35.71	09	1	09	1	14	1	02	7	1020.7
17	3	125	65	11	22	1530	K 36 27 S	150 21 E	18.3	35.68	09	1	09	1	14	1	02	7	1020.3
17	3	126	65	11	22	1630	K 36 27 S	150 15 E	18.2	35.62	09	1	09	1	14	1	02	7	1020.3
17	3	127	65	11	22	1730	K 36 27 S	150 09 E	16.9	35.48	09	1	09	1	14	1	02	7	1020.3
17	3	128	65	11	23	0730	K 36 27 S	150 09 E	17.3	35.53	02	3	02	1	05	1	00	8	1016.6
17	3	129	65	11	23	0830	K 36 27 S	150 21 E	17.9	35.61	36	3	36	1	05	1	02	8	1016.6
17	3	130	65	11	23	0930	K 36 33 S	150 21 E	17.9	35.61	36	3	36	1	05	1	02	8	1016.6
17	3	131	65	11	23	1030	K 36 39 S	150 15 E	17.9	35.61	36	3	36	1	05	1	02	8	1016.6
17	3	132	65	11	23	1130	K 36 51 S	150 09 E	17.7	35.55	36	3	36	1	05	1	02	8	1015.9
17	3	133	65	11	23	1230	K 36 57 S	150 03 E	15.7	35.55	05	3	05	1	05	1	02	8	1032.2
17	3	134	65	11	26	0600	K 37 03 S	150 03 E	15.4	35.55	00	0	00	0	14	1	00	8	1010.5
17	3	135	65	11	26	0700	K 37 03 S	150 09 E	17.1	35.46	32	1	32	1	14	3	01	8	1010.5
17	3	136	65	11	26	0800	K 37 03 S	150 21 E	17.6	35.59	32	1	32	1	14	3	01	8	1011.2
17	3	137	65	11	26	0900	K 36 57 S	150 27 E	17.0	35.57	32	1	32	1	14	3	01	8	1011.9
17	3	138	65	11	26	1000	K 36 51 S	150 33 E	17.3	35.61	32	1	32	1	14	3	01	9	1011.9
17	3	139	65	11	26	1100	K 36 45 S	150 39 E	17.8	35.61	32	1	32	1	14	3	01	9	1012.2
17	3	140	65	11	26	1200	K 36 39 S	150 51 E	18.2	35.64	32	1	32	1	14	3	02	9	1012.2
17	3	141	65	11	26	1300	K 36 33 S	150 51 E	18.3	35.59	00	0	32	1	14	3	02	9	1012.2
17	3	142	65	11	26	1400	K 36 39 S	150 33 E	18.3	35.61	00	0	32	1	14	1	02	9	1011.2
17	3	143	65	11	26	1500	K 36 39 S	150 27 E	18.2	35.57	00	0	32	1	14	1	02	9	1010.8
17	3	144	65	11	26	1600	K 36 45 S	150 21 E	18.3	35.61	14	1	14	2	14	1	03	7	1010.8
17	3	145	65	11	26	1700	K 36 45 S	150 09 E	17.8	35.55	14	2	14	2	14	1	02	6	1010.8
17	3	146	65	11	26	1800	K 36 45 S	150 03 E	15.7	35.34	14	1	14	1	14	1	02	6	1011.2
17	3	147	65	11	27	0700	K 36 51 S	149 57 E	15.6	35.43	14	2	14	1	14	1	00	6	1011.9
17	3	148	65	11	27	0800	K 36 57 S	149 57 E	15.6	35.34	14	2	14	1	14	1	01	6	1012.2
17	3	149	65	11	27	0900	K 36 57 S	150 03 E	15.6	35.34	14	2	14	1	14	1	01	7	1012.5
17	3	150	65	11	29	0530	K 36 57 S	149 57 E	16.1	35.39	05	1	05	1	14	1	00	7	1022.7
17	3	151	65	11	29	0630	K 36 57 S	150 09 E	16.2	35.44	05	2	05	2	14	1	02	7	1022.7
17	3	152	65	11	29	0730	K 36 51 S	150 15 E	17.3	35.57	05	2	05	2	14	1	02	7	1023.0
17	3	153	65	11	29	0830	K 36 45 S	150 21 E	17.1	35.59	05	2	05	2	14	1	02	7	1023.0
17	3	154	65	11	29	0930	K 36 39 S	150 21 E	17.2	35.59									
17	3	155	65	11	29	1030	K 36 45 S	150 15 E	17.2	35.61									
17	3	156	65	11	29	1130	K 36 51 S	150 15 E	17.3	35.61									
17	3	157	65	11	29	1230	K 36 57 S	150 09 E	17.2	35.55									
17	3	158	65	11	29	1330	K 37 03 S	149 57 E	16.4	35.43									

DATA

PART 2

HYDROLOGY

SUBSURFACE SAMPLES

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 26/65	26/ 4/65	0900 J	35 03 S	135 30 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
95	13.4	16.6	10	3	20	1	2	7	10	2	18	1	1024.7	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.80	35.880	26.01	***	***	***	***	***
1	90	17.60	35.840	26.03	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 29/65	26/ 4/65	1200 J	35 01 S	135 30 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
95	14.0	17.6	10	2	20	3	2	7	10	1	18	1	1024.7	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.90	35.880	25.99	***	***	***	***	***
1	80	17.90	35.880	25.99	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 31/65	26/ 4/65	1900 J	35 10 S	135 36 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
91	13.8	16.7	11	3	20	*	9	7	11	2	18	1	1023.0	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.80	35.860	26.00	***	***	***	***	***
1	85	17.20	35.790	26.09	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 34/65	26/ 4/65	1800 J	35 18 S	136 02 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
99	12.9	16.7	14	2	20	*	9	7	14	1	18	1	1022.7	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.60	35.880	26.06	***	***	***	***	***
1	85	17.40	35.990	26.19	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 35/65	27/ 4/65	0300 J	35 48 S	136 15 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
121	12.4	16.2	00	0	20	*	9	7	00	0	18	1	1022.4	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.40	35.820	26.06	***	***	***	***	***
1	115	15.50	35.610	26.35	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 36/65	27/ 4/65	0600 J	36 12 S	136 23 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
102	13.9	15.5	00	0	20	*	9	7	00	0	18	1	1023.0	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.60	35.810	26.01	***	***	***	***	***
1	100	15.40	35.620	26.38	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 39/65	27/ 4/65	0900 J	36 35 S	136 30 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
***	13.0	16.7	09	1	20	6	2	7	00	0	14	1	1025.1	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.70	35.880	26.04	***	***	***	***	***
1	135	15.60	35.640	26.35	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 42/65	27/ 4/65	1200 J	36 37 S	136 47 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
311	13.7	17.3	00	0	20	9	5	7	00	0	14	1	1025.1	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.30	35.730	26.02	***	***	***	***	***
1	135	15.60	35.610	26.33	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 44/65	27/ 4/65	1515 J	36 37 S	137 02 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
439	13.8	16.8	10	1	20	9	3	7	10	1	14	1	1024.0	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.30	35.640	25.95	***	***	***	***	***
1	130	14.90	35.480	26.38	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 46/65	27/ 4/65	1800 J	36 32 S	136 50 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
124	13.0	15.8	09	2	20	9	2	7	09	1	14	1	1024.0	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.70	35.640	25.85	***	***	***	***	***
1	110	15.90	35.640	26.28	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 48/65	28/ 4/65	0915 J	36 33 S	136 48 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
117	11.9	16.1	06	4	20	4	6	7	07	3	14	1	1026.1	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	16.80	35.610	26.05	***	***	***	***	***
1	110	15.20	35.570	26.38	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 49/65	28/ 4/65	1200 J	36 33 S	136 41 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
135	12.9	16.2	07	3	20	4	5	7	07	3	14	1	1026.1	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.10	35.660	26.01	***	***	***	***	***
1	115	15.20	35.660	26.45	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 52/65	28/ 4/65	1810 J	36 28 S	136 48 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
112	11.8	15.0	06	4	20	4	6	7	05	1	20	1	1024.7	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.00	35.660	26.04	***	***	***	***	***
1	105	15.10	35.570	26.41	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 55/65	29/ 4/65	1200 J	36 17 S	136 42 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
102	12.8	16.7	07	3	20	3	1	7	07	2	00	0	1024.0	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.30	35.770	26.05	***	***	***	***	***
1	95	15.70	35.610	26.30	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 57/65	29/ 4/65	1815 J	36 20 S	136 50 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
110	13.7	16.8	05	3	20	*	9	7	05	1	00	0	1022.7	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.10	35.610	25.98	***	***	***	***	***
1	95	16.50	35.570	26.09	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 59/65	30/ 4/65	1100 J	35 33 S	136 20 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
104	15.7	18.3	00	0	20	*	9	7	00	0	25	1	1022.4	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.40	35.810	26.06	***	***	***	***	***
1	95	17.40	35.750	26.01	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 63/65	9/ 5/65	0900 J	35 04 S	135 51 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
90	16.4	17.4	06	3	20	4	3	7	06	2	18	2	1019.0	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.70	35.880	26.04	***	***	***	***	***
1	85	17.40	36.440D	26.54	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
ES 2/ 66/65	9/ 5/65	1200 J	35 08 S	135 46 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2	CAST3
91	16.6	18.1	05	4	20	4	3	7	05	3	18	2	1016.6	*	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	17.80	35.880	26.01	***	***	***	***	***
1	80	17.40	35.860	26.10	***	***	***	***	***

D PROPERTY DOUBTFUL
N PROPERTY INTERPOLATED

OCEANOGRAPHICAL STATION LISTS

1. Hydrological and planktological observations by F.R.V. *Warreen* in south-eastern Australian waters, 1938–39
2. *Hydrological and planktological observations by F.R.V. Warreen in south-eastern Australian* waters, 1940–42
3. Hydrological and planktological observations by F.R.V. *Warreen* in south-western Australian waters, 1947–50
4. Onshore hydrological investigations in eastern Australia, 1942–50
5. Estuarine hydrological investigations in eastern Australia, 1940–50. Queensland: Nerang and Coomera Rivers, Moreton Bay and Brisbane River, Logan River, Dunwich Oyster Lease; New South Wales: Richmond River, Clarence River, Macleay River, Hastings River, Manning River, Port Stephens, Tilligerry Creek, Hawkesbury River
6. Estuarine hydrological investigations in eastern Australia, 1940–50. New South Wales: Middle Harbour and Port Jackson, Georges River–Botany Bay
7. Estuarine hydrological investigations in eastern Australia, 1940–50. New South Wales: Port Hacking, Lake Illawarra, Shoalhaven River, Jervis Bay, Clyde River, Moruya River, Tuross River, Wagonga Inlet; Victoria: Port Phillip; Tasmania: Tamar River, Derwent River, Huon River, D'Entrecasteaux Channel, Pittwater, Lake Dobson (freshwater), Penna Dam (freshwater)
8. Hydrological investigations in south-western Australia, 1944–50
9. Records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1942–50. Queensland: Logan River; New South Wales: Richmond River, Clarence River, Macleay River, Hastings River, Manning River, Port Stephens, Hawkesbury River, Georges River, Port Hacking, Clyde River, Tuross River; Tasmania: Tamar River, Derwent River
10. Records of twenty-four hourly hydrological observations at Shell Point, Georges River, New South Wales, 1942–50
11. Analyses of bottom deposits in eastern Australia, 1946–50
12. Estuarine hydrological investigations in eastern and south-western Australia, 1951
13. Analysis of bottom deposits in eastern and south-western Australia, 1951 and records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1951
14. Onshore hydrological investigations in eastern and south-western Australia, 1951
15. Estuarine hydrological investigations in eastern and south-western Australia, 1952
16. Analysis of bottom deposits in eastern and south-western Australia, 1952 and records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1952
17. Onshore hydrological investigations in eastern and south-western Australia, 1952
18. Onshore hydrological investigations in eastern and south-western Australia, 1953
19. Onshore planktological investigations in eastern Australia, 1945–54
20. Surface sampling in the Tasman Sea, 1953
21. Estuarine hydrological investigations in eastern and south-western Australia, 1953
22. Further onshore planktological investigations in eastern Australia, 1945–54
23. Planktological investigations made by F.R.V. *Derwent Hunter* in eastern Australian waters, 1952–54
24. Onshore hydrological investigations in eastern and south-western Australia, 1954
25. Surface sampling in the Tasman Sea, 1954
26. Estuarine hydrological investigations in eastern and south-western Australia, 1954
27. Onshore and oceanic hydrological investigations in eastern and south-western Australia, 1955
28. Surface sampling in the Tasman and Coral Seas, 1955
29. Estuarine hydrological investigations in eastern and south-western Australia, 1955
30. Onshore and oceanic hydrological investigations in eastern and south-western Australia, 1956
31. Surface sampling in the Tasman and Coral Seas and the south-eastern Indian Ocean, 1956
32. Estuarine hydrological investigations in eastern and south-western Australia, 1956
33. Coastal hydrological investigations in eastern and south-western Australia, 1957
34. Coastal hydrological investigations at Port Hacking, New South Wales, 1957
35. Coastal hydrological investigations at Eden, New South Wales, 1957

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(Continued)

36. Surface sampling in the Tasman and Coral Seas, 1957
37. Hydrological investigations from F.R.V. *Derwent Hunter*, 1957
38. Coastal hydrological investigations in the New South Wales tuna fishing area, 1958
39. Surface sampling in the Coral and Tasman Seas, 1958
40. Coastal hydrological investigations in south-eastern Australia, 1958
41. Oceanic investigations in eastern Australian waters, F.R.V. *Derwent Hunter*, 1958
42. Coastal investigations at Port Hacking, New South Wales, 1958
43. Oceanic investigations in eastern Australia, H.M.A. Ships *Queenborough*, *Quickmatch*, and *Warrego*, 1958
44. Oceanic observations in Antarctic waters, M.V. *Magga Dan*, 1959
45. Coastal hydrological investigations in eastern Australia, 1959
46. Coastal hydrological investigations in the New South Wales tuna fishing area, 1959
47. Coastal investigations at Port Hacking, New South Wales, 1959
48. Oceanic investigations in eastern Australian waters, F.R.V. *Derwent Hunter*, 1959
49. Coastal hydrological sampling Rottnest Island, W.A., and Port Moresby, Papua, during the I.G.Y. (1957–58), and surface sampling in the Tasman and Coral Seas, 1959
50. Surface sampling in the Coral and Tasman Seas, 1960
51. Coastal hydrological investigations in eastern Australia, 1960
52. Coastal investigations at Port Hacking, New South Wales, 1960
53. Coastal hydrological investigations in the New South Wales tuna fishing area, 1960
54. Investigations by F.R.V. *Derwent Hunter* on the eastern Australian tuna grounds in 1961
55. Investigations by F.R.V. *Weerutta* on the South Australian tuna grounds in 1961
56. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1961
57. Investigations by F.V. *Estelle Star* in Western Australian waters in 1961
58. Temperature observations from Australian tuna fishing vessels in 1961
59. Investigations by F.R.V. *Derwent Hunter* on the eastern Australian tuna grounds in 1962
60. Investigations by F.R.V. *Investigator* on the South Australian tuna grounds in 1962
61. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1962
62. Investigations by F.V. *Estelle Star* in Western Australian waters in 1962
63. Temperature and salinity observations from Australian tuna fishing vessels in 1962
64. Investigations by F.R.V. *Investigator* on the South Australian tuna grounds in 1963
65. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1963
66. Temperature and salinity observations from Australian tuna fishing vessels in 1963
67. Investigations by F.R.V. *Investigator* on the South Australian tuna grounds in 1964
68. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1964
69. Temperature and salinity observations from Australian tuna fishing vessels in 1964
70. Investigations by F.R.V. *Investigator* on the South Australian tuna grounds in 1965
71. Investigations by F.V. *Estelle Star* in South Australian and New South Wales waters in 1965
72. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1965
73. Investigations by F.V. *Degei* in Queensland waters in 1965
74. Temperature and salinity observations from Australian tuna fishing vessels in 1965
75. Investigations by F.V. *Degei* in New South Wales, South, and Western Australian waters in 1966
76. Investigations by F.V. *Estelle Star* in South and Western Australian waters in 1966
77. Temperature and salinity observations from Australian tuna fishing vessels in 1966
78. Drift bottle releases and recoveries in Bass Strait and adjacent waters, 1958–1962
79. Drift bottle releases and recoveries in Western Australia, 1956–1957
80. Investigations by F.R.V. *Lancelin* in Western Australian waters in 1963