

OCEANOGRAPHICAL STATION LIST

VOLUME 57

INVESTIGATIONS BY F.V. *ESTELLE STAR* IN
WESTERN AUSTRALIAN WATERS IN 1961

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

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AUSTRALIA

MELBOURNE, 1968

CONTENTS

	Page
I. INTRODUCTION	3
II. WORK ACCOMPLISHED	3
III. METHOD OF COLLECTION AND ANALYSIS OF SAMPLES	3
1. Physics	3
2. Chemistry	5
REFERENCES	5
IV. TRACK CHARTS	7
V. DATA SHEETS	19
Hydrology - Surface Samples	21

When citing this station list, abbreviate as follows:
CSIRO Aust. Oceanogr. Stn. List 57.

OCEANOGRAPHICAL STATION LIST

VOLUME 57

Investigations by F.V. Estelle Star
in Western Australian Waters in 1961

I. INTRODUCTION

In July 1961, F.V. Estelle Star, a tuna boat, was chartered by the Commonwealth Government to undertake a survey for tuna in Western Australian waters. The survey was financed from the Fisheries Development Trust Account, and was planned and carried out by the Fisheries Division, Department of Primary Industry, and the Division of Fisheries and Oceanography. A detailed account of the survey is given by Hynd and Vaux (1963).

This report records the hydrological data collected during the 10 cruises made by Estelle Star during 1961 (E1/61-E10/61). Some trolling and tagging data are given also. Track charts and station positions are shown in Figures 1-10.

II. WORK ACCOMPLISHED

Table 1 gives details of time, number of stations occupied, and work done on each cruise. Hydrological work was limited to sampling the surface waters for temperature and salinity. Meteorological observations were made at three-hourly intervals throughout the vessel's sea time and at all stations.

On Cruises E1-E8/61, the work was carried out by Mr R. Bradley; Mr K. Godfrey was responsible for the sampling programme on the remaining two cruises.

III. METHOD OF COLLECTION AND ANALYSIS OF SAMPLES

1. Physics

Temperature.—While the vessel was underway, sea-surface temperature was measured continuously by a thermograph. On station, a fisherman's thermometer, graduated to 0.1 degF and accurate to ± 0.5 degF, was used (Vaux 1961). The temperatures obtained were converted to degrees C for the data-listing in this report.

Bathythermographs.—A 200-ft bathythermograph was used at selected stations, and the slides obtained were digitized according to the method of the U.S. National Oceanographic Data Centre (1964). The results were transferred to punched cards and computer listings are held at Cronulla.

TABLE 1

DETAILS OF CRUISES AND WORK DONE

Cruise	Dates	Number of Stations Occupied	BT	Hydrology	Southern Bluefin	
					1	2
E1/61	Aug. 1-11	39		39		
E2/61	Aug. 15-23	38		25	21	21
E3/61	Aug. 27-Sept. 9	55	3	51	4	4
E4/61	Sept. 12-21	58	3	50	23	14
E5/61	Sept. 22-Oct. 2	41	2	37	19	19
E6/61	Oct. 3-5	25	5	22	13	13
E7/61	Oct. 10-16	30	1	26	114	55
E8/61	Oct. 20-Nov. 8	83	2	81	25	21
E9/61	Nov. 12-24	82	6	67	2	1
E10/61	Dec. 4-9	51		49	15	14

BT Bathythermographs

Hydrology Number of surface samples collected

Southern 1 Number of southern bluefin tuna trolled

Bluefin 2 Number of southern bluefin tuna tagged

2. Chemistry

Salinity.—During periods in port, 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 about $\pm 0.05\%$.

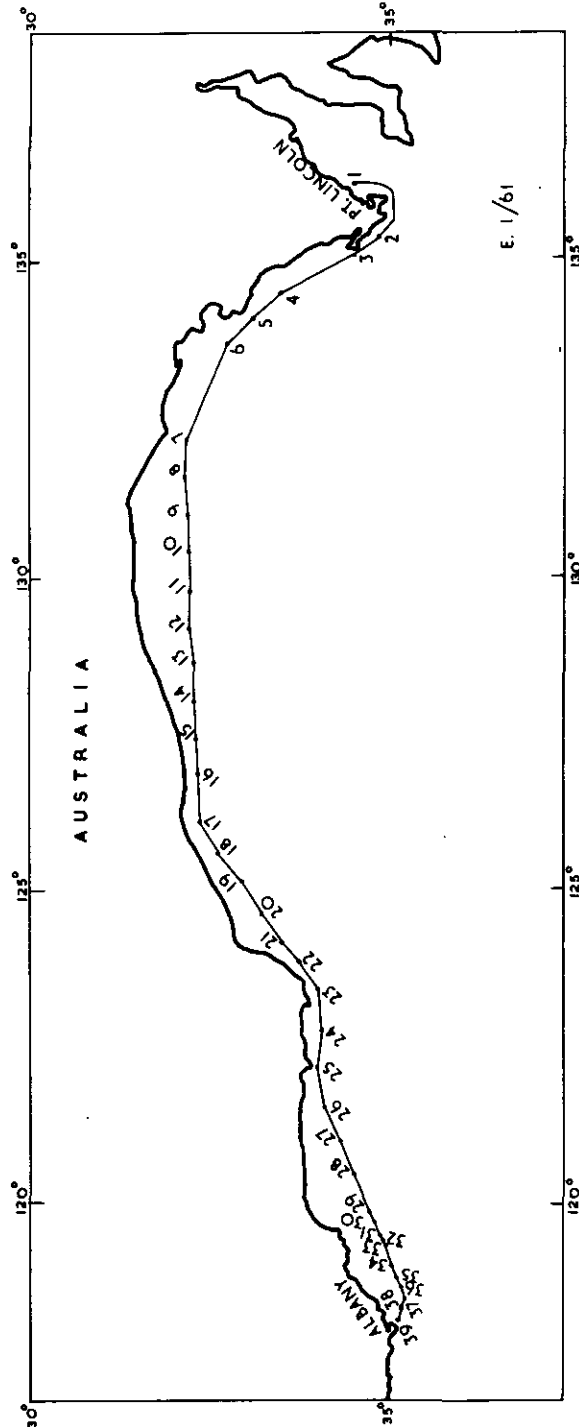
REFERENCES

- HAMON, B.V. (1956).—A portable temperature-chlorinity bridge for estuarine investigations and seawater analysis. J. scient. Instrum. 33, 329-33.
- HYND, J.S., and VAUX, D. (1963).—Report of a survey for tuna in Western Australian waters. CSIRO Aust. Div. Fish. Oceanogr. Rep. 37.
- U.S. NATIONAL OCEANOGRAPHIC DATA CENTRE (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. Newsl. 20(11), 19.

IV. TRACK CHARTS

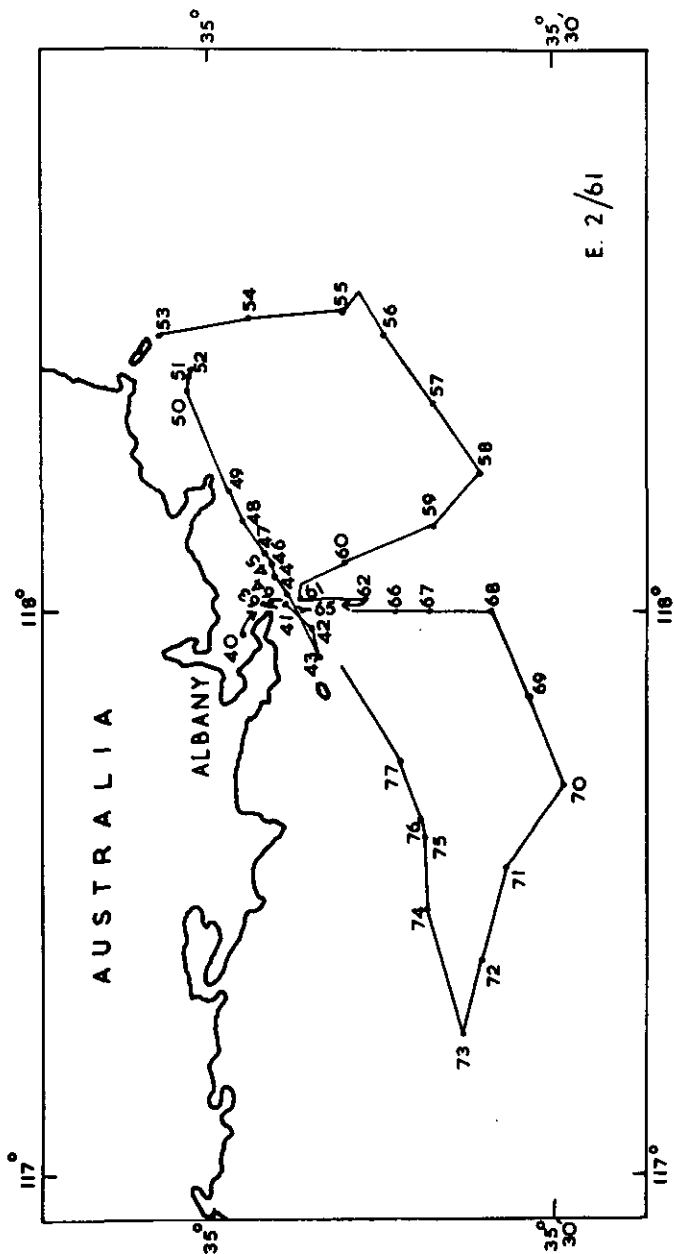
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 1/61 - August 1-11, 1961



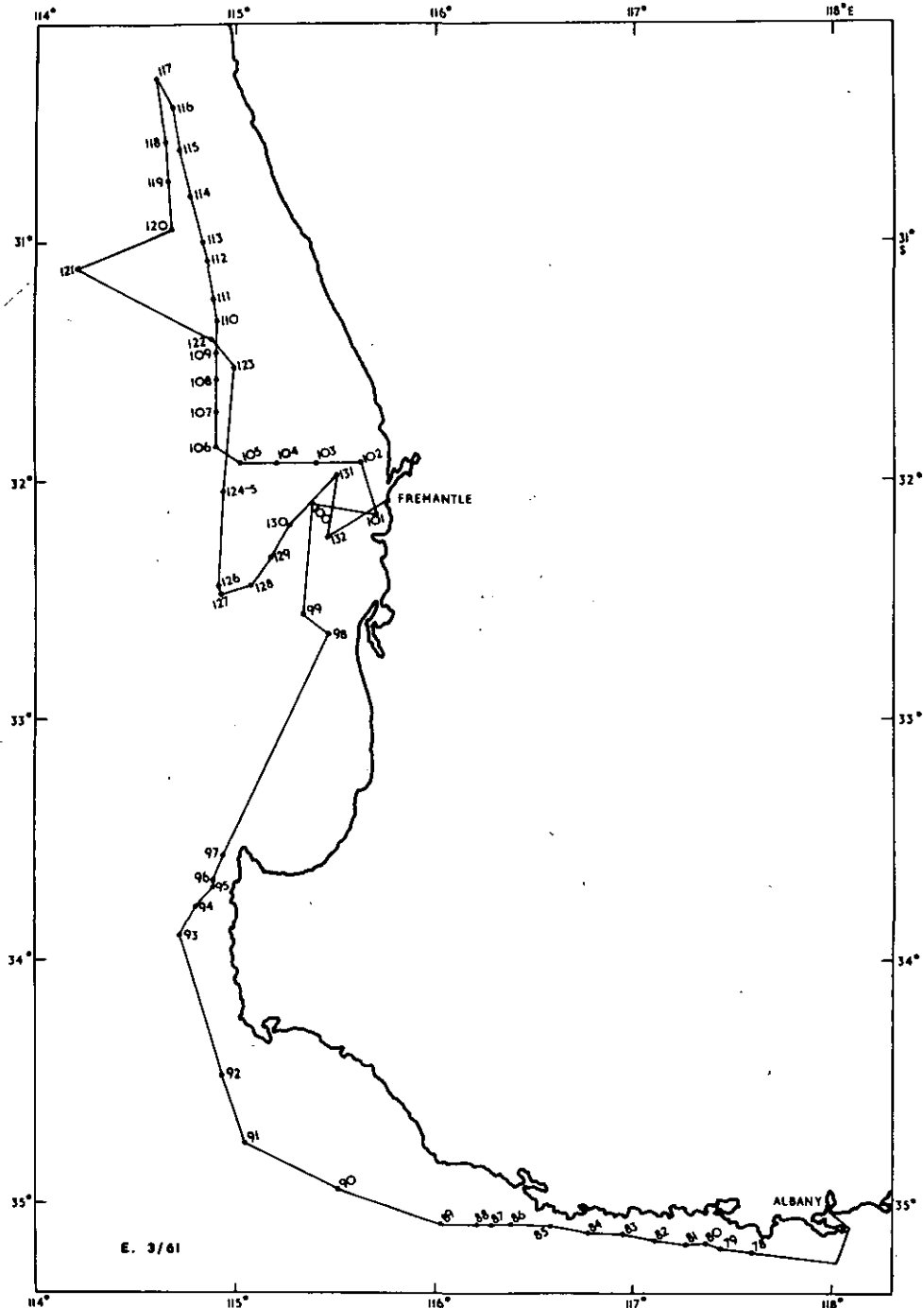
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 2/61 - August 15-23, 1961



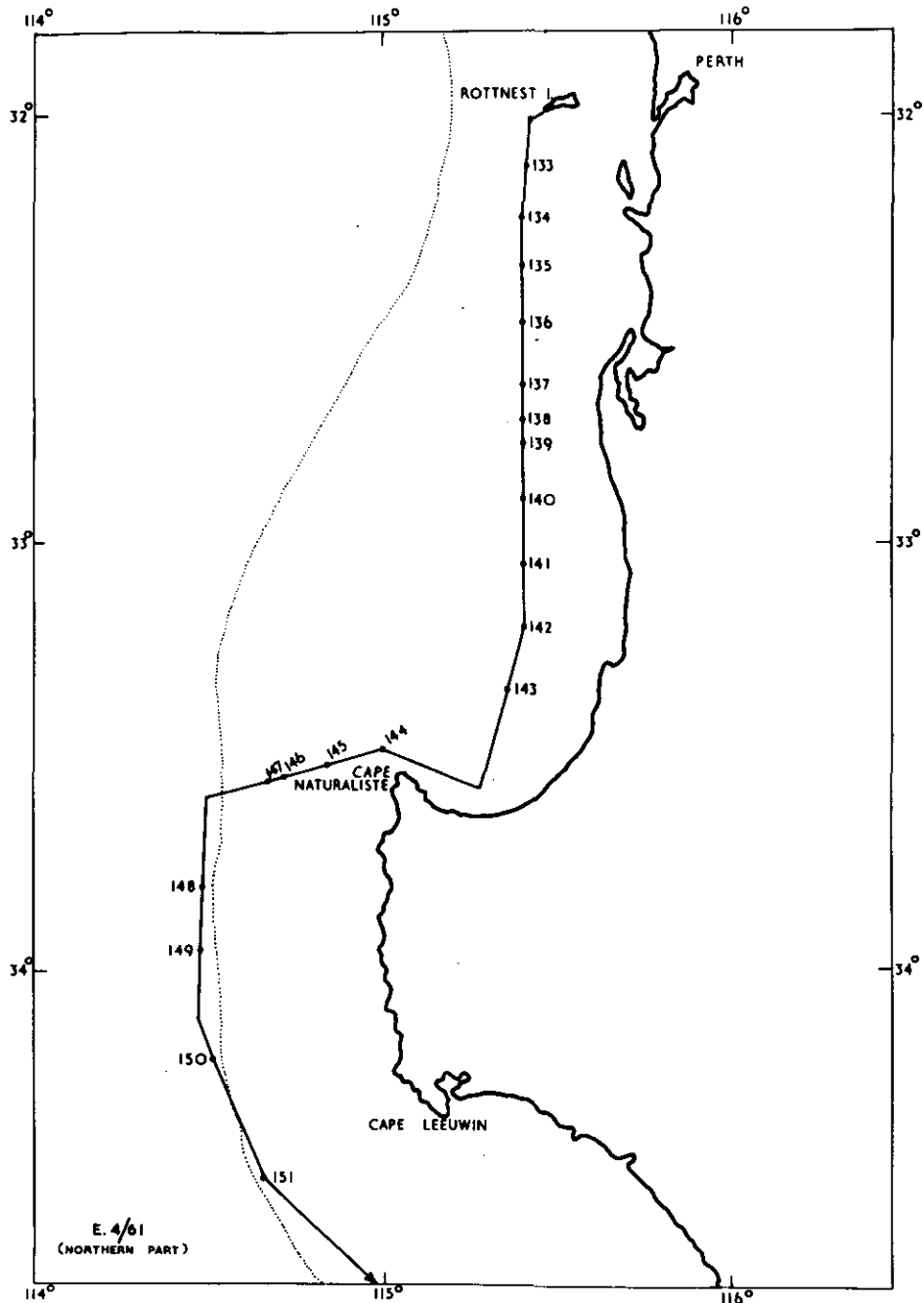
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 3/61 - August 27 - September 9, 1961



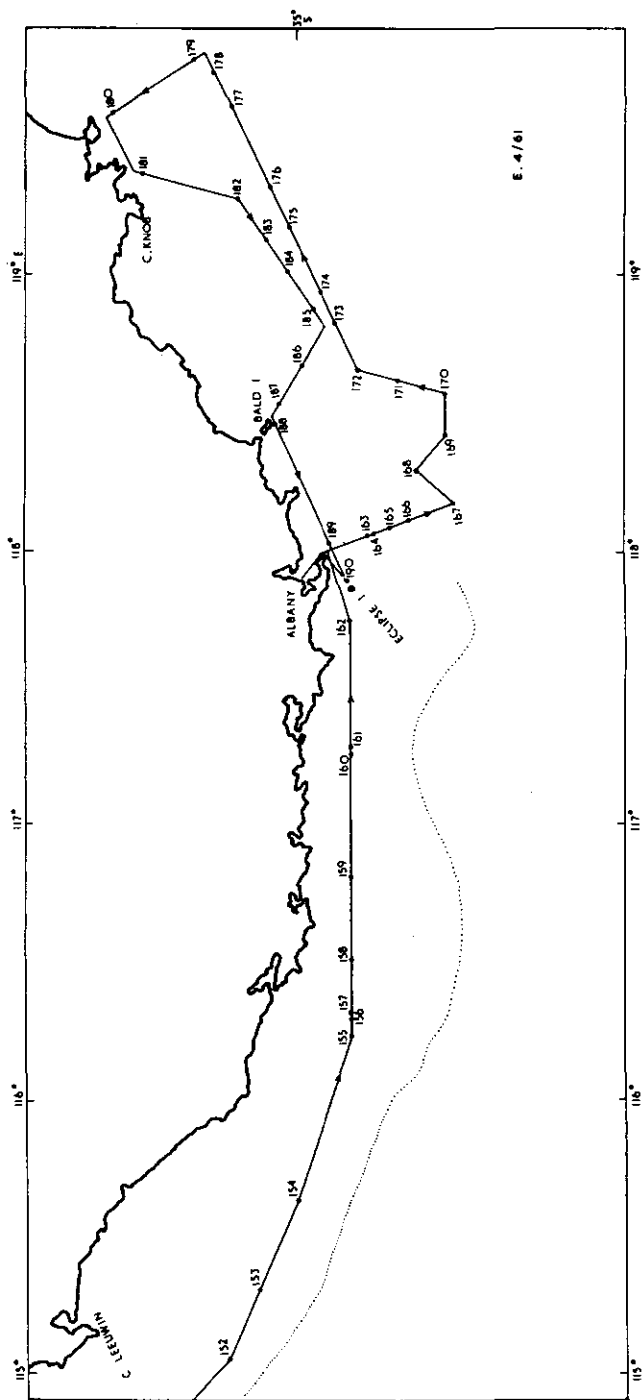
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 4/61 - September 12-21, 1961



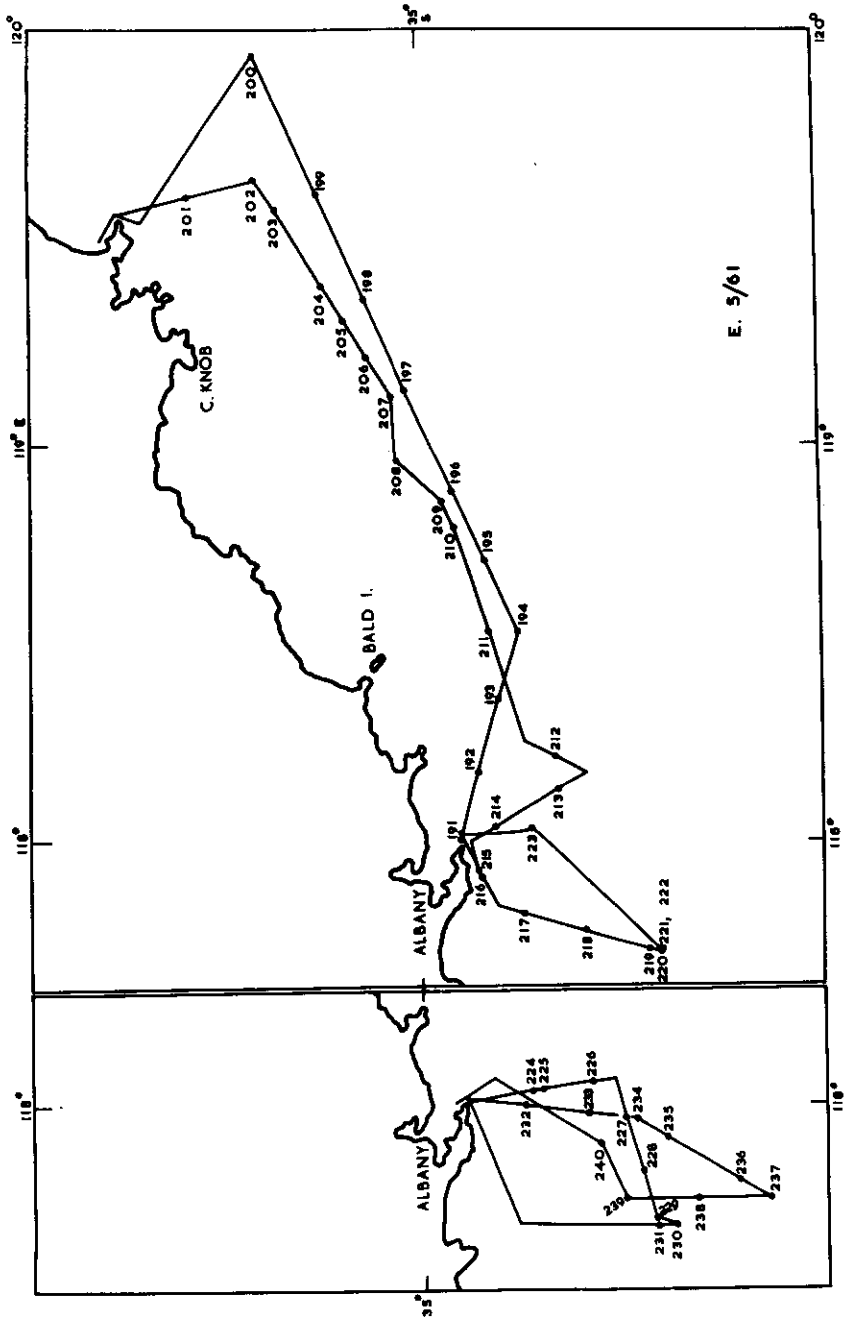
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 4/61 - September 12-21, 1961



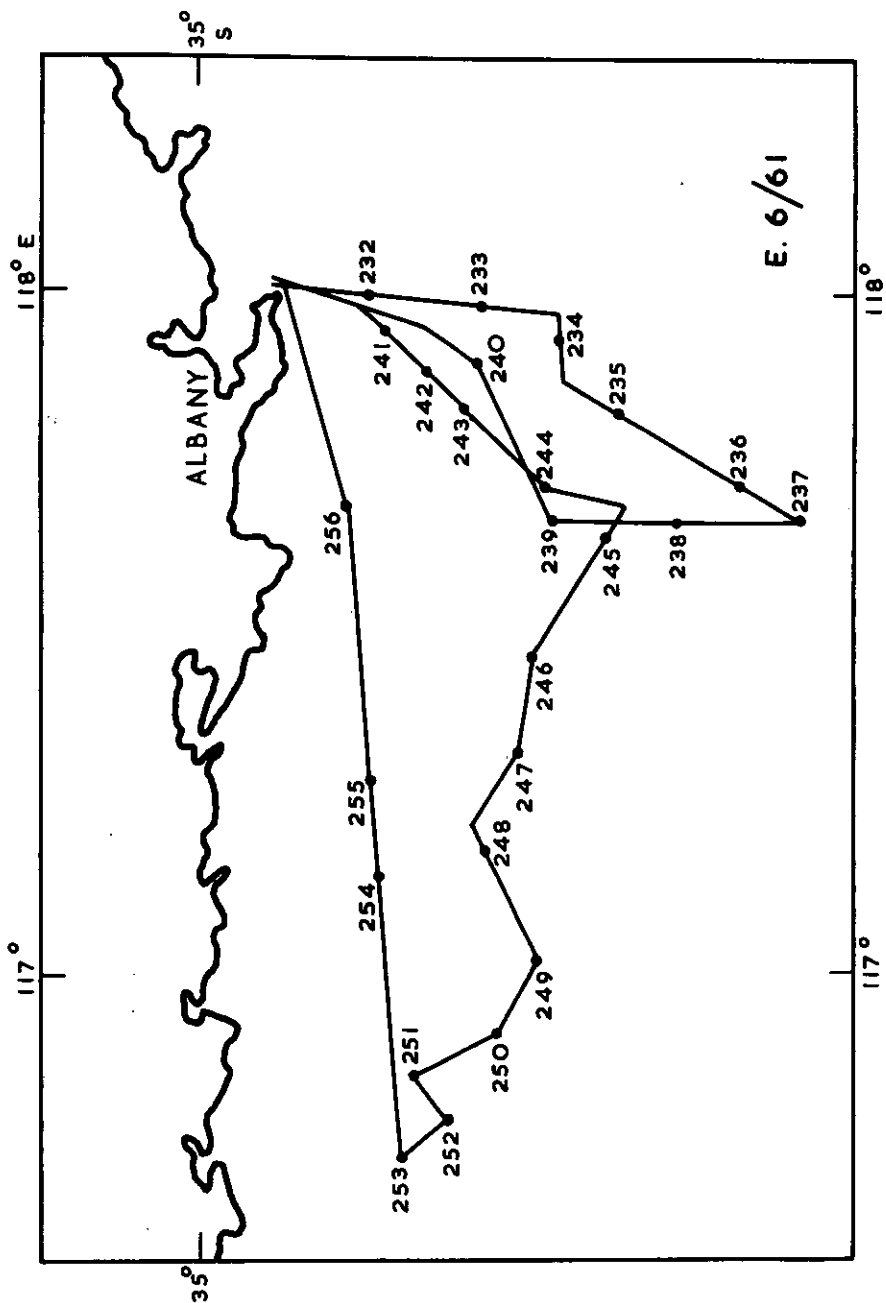
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 5/61 - September 22 - October 2, 1961



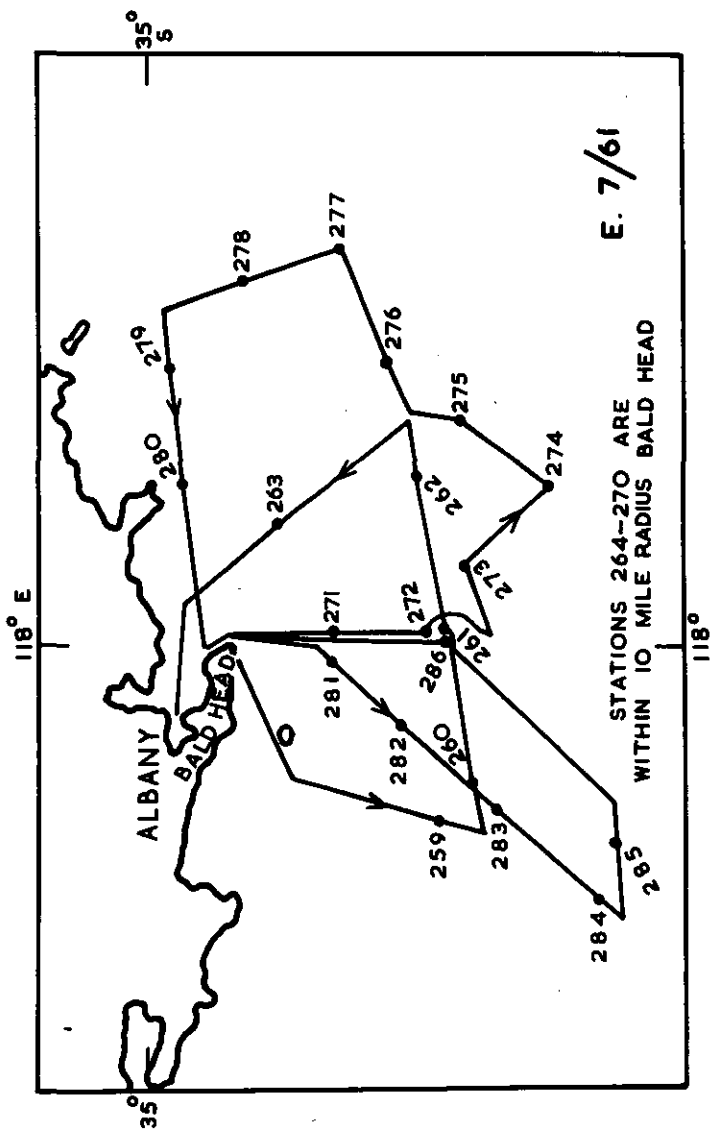
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 6/61 - October 3-5, 1961



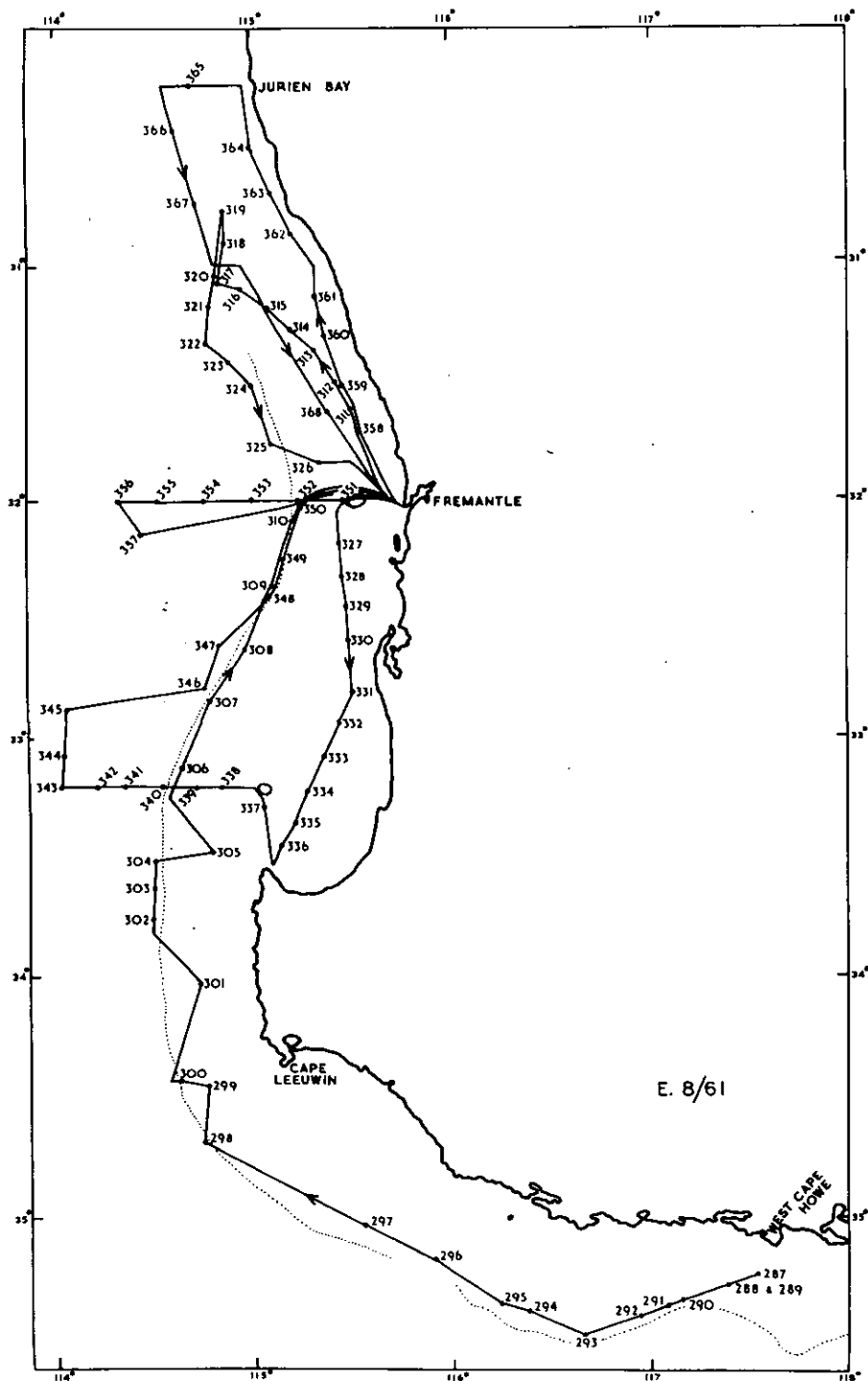
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 7/61 - October 10-16, 1961



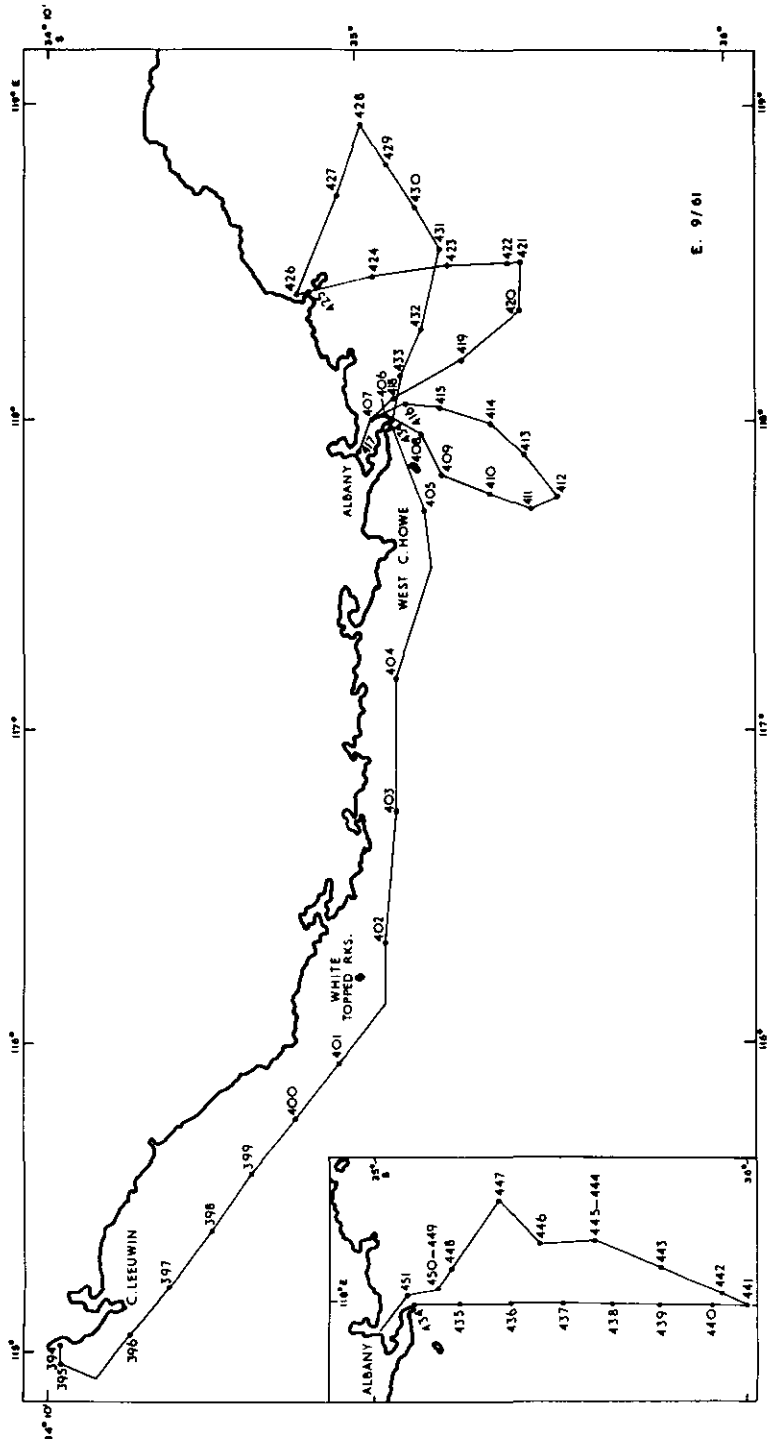
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 8/61 - October 20 - November 8, 1961



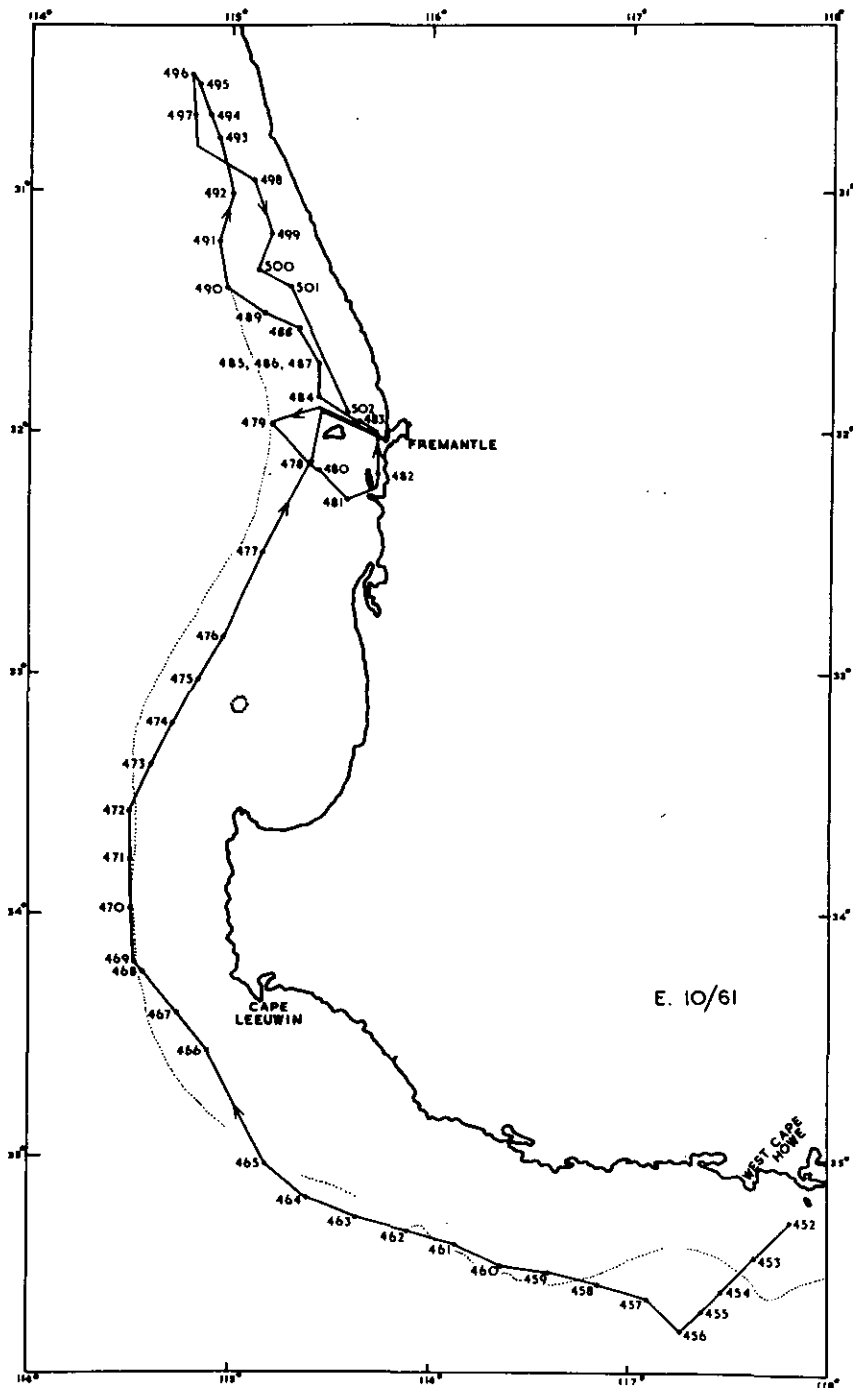
F.V. ESTELLE STAR

SUMMARY OF CRUISE E 9/61 - November 12-24, 1961



F.V. ESTELLE STAR

SUMMARY OF CRUISE E 10/61 - December 4-19, 1961



V. DATA SHEETS

The data were processed in a C.D.C. 3600 Computer. An explanation of the headings used is given at the beginning of the listing.

DATA
HYDROLOGY
SURFACE SAMPLES

EXPLANATION OF HEADINGS

Hydrology

TIME Z	Time is given in Zone Time. The code letter used for the time zone follows the time. Zone Times during the cruises were Central Australian Standard Time, GMT +9½ hr, Code J, and Western Australian Standard Time, GMT +8 hr, Code H
LATITUDE LONGITUDE	Given in degrees and minutes
TEMP.	Sea temperatures recorded in °C
SALINITY	Given in parts per thousand
WIND DN. AMT.	Wind direction and amount are coded using Tables 8 and 9 in U.S. Navy Hydrogr. Office (1955)
SEA DN. AMT.	Sea direction and amount are coded using Tables 5 and 8 in U.S. Navy Hydrogr. Office (1955)
SWELL DN. AMT.	Sea swell direction and amount are coded using Tables 6 and 8 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)
BAROM.	Atmospheric pressure given in millibars

A blank indicates no data available

VESSEL NUMBER	CRUISE NUMBER	STATION	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	SEA AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.	SAMPLING METHOD
17	1	1	61	8	1	2010	J	34	42 S 135	54 E 13.2	36.06	27	2					02	7		1
17	1	2	61	8	2	1505	J	34	53 S 135	21 E 15.9	36.06	18	4	18	3	19	3	02	7	1025.0	1
17	1	3	61	8	2	1831	J	34	33 S 135	04 E 15.2	35.93	16	2	18	2	19	1	02	8	1026.0	1
17	1	4	61	8	3	0705	J	33	33 S 134	28 E 15.2	35.95	13	1	12	2	18	1	02	7	1032.0	1
17	1	5	61	8	3	1016	J	33	09 S 134	04 E 15.1	36.06	11	3	11	2	19	1	02	8	1035.0	1
17	1	6	61	8	3	1334	J	32	48 S 133	39 E 15.4	36.22	10	4	11	2	19	1	02	8	1035.0	1
17	1	7	61	8	4	0635	J	32	15 S 132	11 E 15.4	36.51	05	4	05	1	14	2	02	8	1034.0	1
17	1	8	61	8	4	1004	J	32	15 S 131	35 E 16.0		04	5	04	3	17	2	02	8	1034.0	1
17	1	9	61	8	4	1325	J	32	16 S 130	59 E 16.2	36.22	04	4	04	3	17	2	01	8	1034.0	1
17	1	10	61	8	4	1638	J	32	17 S 130	24 E 16.0	36.15	04	3	05	3	17	2	01	8	1032.0	1
17	1	11	61	8	4	2038	J	32	18 S 129	49 E 15.7	36.13	04	3	05	3	17	2	01	8	1032.0	1
17	1	12	61	8	4	2355	J	32	18 S 129	13 E 15.6	36.17	00	4	00	2	17	2	00	8	1029.0	1
17	1	13	61	8	5	0338	J	32	20 S 128	37 E 15.5	36.17	00	5	01	2	16	1	02	8	1025.0	1
17	1	14	61	8	5	0646	J	32	21 S 128	02 E 14.9	36.20	00	5	00	2	16	1	02	8	1025.0	1
17	1	15	61	8	5	0955	J	32	21 S 127	26 E 14.3	36.24	00	5	01	2			02	8	1025.0	1
17	1	16	61	8	5	1322	J	32	22 S 126	51 E 14.5	36.18	00	6	00	2			02	8	1024.0	1
17	1	17	61	8	5	1630	H	32	22 S 126	05 E 15.1	36.08	28	2	28	3			02	8	1025.0	1
17	1	18	61	8	5	1955	H	32	40 S 125	36 E 15.3	36.00	18	5	18	4			02	8	1025.0	1
17	1	19	61	8	5	2315	H	32	58 S 125	08 E 15.6	35.90	18	1	18	4			00	8	1025.0	1
17	1	20	61	8	6	0220	H	33	15 S 124	39 E 15.5	35.81	06	4	06	2			01	8	1025.0	1
17	1	21	61	8	6	0545	H	33	32 S 124	10 E 15.7	35.77	06	4	06	2			01	8	1025.0	1
17	1	22	61	8	6	0906	H	33	46 S 123	51 E 15.7	35.77	06	4	06	3	18	1	01	8	1025.0	1
17	1	23	61	8	6	1225	H	34	02 S 123	24 E 16.2	35.75	04	4	04	2	18	1	01	8	1021.0	1
17	1	24	61	8	6	1550	H	34	06 S 122	48 E 16.3	35.73	99	1	00	0	00	0	02	8	1018.0	1
17	1	25	61	8	7	1000	H	34	02 S 122	11 E 15.8	35.75	27	6	27	3	00	0	02	8	1015.0	1
17	1	26	61	8	10	0944	H	34	08 S 121	32 E 15.8		00	3	00	1	00	0	03	8	1026.0	1
17	1	27	61	8	10	1307	H	34	20 S 121	00 E 16.5	35.62	00	4	00	2	19	2	02	8	1025.0	1
17	1	28	61	8	10	1633	H	34	31 S 120	26 E 17.2	35.73	01	2	01	1	19	2	02	8	1022.0	1
17	1	29	61	8	10	1945	H	34	42 S 119	53 E 15.2	35.62	03	3	03	3	19	2	20	5	1022.0	1
17	1	30	61	8	10	2100	H	34	47 S 119	41 E 15.6	35.66	03	4	03	3	19	2	20	5	1019.0	1
17	1	31	61	8	10	2200	H	34	51 S 119	30 E 15.2	35.57	03	4	03	3	19	2	20	5	1019.0	1
17	1	32	61	8	10	2300	H	34	54 S 119	21 E 15.8	35.50	03	2	03	3	19	2	20	5	1019.0	1
17	1	33	61	8	11	0000	H	34	58 S 119	10 E 15.4	35.61	03	2	03	3	19	2	03	8	1019.0	1
17	1	34	61	8	11	0100	H	35	02 S 119	00 E 15.7	35.62	03	2	03	3	19	2	03	8	1019.0	1
17	1	35	61	8	11	0200	H	35	06 S 118	50 E 16.8	35.70	35	1	35	1	21	1	02	8	1018.0	1
17	1	36	61	8	11	0300	H	35	10 S 118	40 E 17.2	35.71	35	1	35	1	21	1	02	8	1018.0	1
17	1	37	61	8	11	0400	H	35	12 S 118	29 E 17.2	35.70	35	4	35	1	21	1	02	8	1016.0	1
17	1	38	61	8	11	0500	H	35	09 S 118	19 E 17.0	35.66	35	4	35	1	21	1	02	8	1016.0	1
17	1	39	61	8	11	0600	H	35	07 S 118	09 E 16.9	35.64	35	4	35	1	21	1	02	8	1014.0	1
17	2	40	61	8	15	2108	H	35	03 S 117	54 E 12.4	33.08	99	0	00	0	00	0	03	7	1019.0	1

VESSEL	CRUISE NUMBER	STATION	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND		SEA		SWELL		WEA.	VIS.	BAROM.	SAMPLING METHOD
												DN.	AMT.	DN.	AMT.	DN.	AMT.				
17	2	41	61	8	18	0710	H	35 07 S	118 01 E	13.2		99	0	00	0	00	0	01	8	1016.0	1
17	2	42	61	8	18	0725	H	35 09 S	117 58 E			30	2	30	3	22	4	01	8	1016.0	1
17	2	43	61	8	18	0750	H	35 10 S	117 55 E	16.8	35.50	30	4	30	3	22	4	01	8	1016.0	1
17	2	44	61	8	18	0825	H	35 07 S	118 02 E			30	4	30	3	22	4	01	8	1016.0	1
17	2	45	61	8	18	0840	H	35 06 S	118 04 E			30	4	30	3	22	4	01	8	1016.0	1
17	2	46	61	8	18	0848	H	35 06 S	118 05 E			30	4	30	3	22	4	01	8	1016.0	1
17	2	47	61	8	18	0853	H	35 05 S	118 06 E			30	4	30	3	22	4	01	8	1016.0	1
17	2	48	61	8	18	0923	H	35 03 S	118 10 E			30	4	30	3	22	4	01	8	1016.0	1
17	2	49	61	8	18	0935	H	35 02 S	118 13 E			30	4	30	3	22	4	01	8	1016.0	1
17	2	50	61	8	18	1116	H	34 58 S	118 24 E			30	4	30	3	22	4	01	8	1016.0	1
17	2	51	61	8	18	1122	H	34 58 S	118 25 E	16.4	35.50	30	4	30	3	22	4	01	8	1015.0	1
17	2	52	61	8	18	1122	H	34 58 S	118 25 E			30	4	30	3	22	4	01	8	1015.0	1
17	2	53	61	8	20	0930	H	34 56 S	118 29 E	16.3	35.48	30	3	30	1	19	4	03	8	1023.0	1
17	2	54	61	8	20	1030	H	35 04 S	118 31 E	17.0	35.59	30	3	30	1	19	4	01	8	1023.0	1
17	2	55	61	8	20	1130	H	35 12 S	118 32 E	17.3	35.68	23	3	23	3	20	7	01	8	1023.0	1
17	2	56	61	8	20	1230	H	35 16 S	118 29 E	17.1	35.68	23	3	23	3	20	7	01	8	1023.0	1
17	2	57	61	8	20	1330	H	35 20 S	118 22 E	16.5	35.62	23	3	23	3	20	7	01	8	1023.0	1
17	2	58	61	8	20	1430	H	35 24 S	118 15 E	15.2	35.52	27	3	27	3	20	7	03	8	1022.0	1
17	2	59	61	8	20	1530	H	35 20 S	118 09 E	17.4	35.64	27	3	27	3	20	7	03	8	1022.0	1
17	2	60	61	8	20	1630	H	35 12 S	118 05 E	17.4	35.64	27	3	27	3	20	7	03	8	1023.0	1
17	2	61	61	8	21	0600	H	35 08 S	118 01 E	17.2	35.61	20	3	20	3	20	4	01	8	1021.0	1
17	2	62	61	8	21	0700	H	35 14 S	118 01 E	17.4	35.61	20	3	20	3	20	4	01	8	1021.0	1
17	2	63	61	8	21	0935	H	35 07 S	118 01 E			30	6	30	4	20	4	18	6	1023.0	1
17	2	64	61	8	21	1000	H	35 07 S	118 01 E			30	6	30	4	20	4	18	6	1023.0	1
17	2	65	61	8	21	1010	H	35 08 S	118 00 E	16.9	35.48	30	4				18	7	1024.0	1	
17	2	66	61	8	22	0900	H	35 17 S	118 00 E	17.5	35.59	11	3	11	2	20	4	03	8	1027.0	1
17	2	67	61	8	22	0920	H	35 19 S	118 00 E			11	3	11	2	20	4	03	8	1027.0	1
17	2	68	61	8	22	1000	H	35 25 S	118 00 E	16.5	35.62	11	3	11	2	20	4	03	8	1027.0	1
17	2	69	61	8	22	1100	H	35 28 S	117 51 E	16.4	35.62	05	4	05	3	20	2	03	8	1027.0	1
17	2	70	61	8	22	1200	H	35 30 S	117 42 E	16.9	35.64	05	4	05	3	20	2	03	8	1027.0	1
17	2	71	61	8	22	1300	H	35 26 S	117 33 E	17.5	35.66	05	4	05	3	20	2	03	8	1027.0	1
17	2	72	61	8	22	1400	H	35 24 S	117 23 E	17.7	35.66	05	1	05	3	20	4	01	8	1026.0	1
17	2	73	61	8	22	1500	H	35 22 S	117 15 E	17.7	35.61	05	1	05	3	20	4	01	8	1026.0	1
17	2	74	61	8	22	1600	H	35 19 S	117 28 E	17.8	35.64	05	1	05	3	20	4	01	8	1026.0	1
17	2	75	61	8	22	1700	H	35 19 S	117 36 E	17.3	35.59	06	5	06	4		9	03	8	1025.0	1
17	2	76	61	8	22	1710	H	35 18 S	117 38 E			06	5	06	4		9	03	8	1025.0	1
17	2	77	61	8	22	1800	H	35 17 S	117 44 E	17.0	35.55	06	5	06	4		9	03	8	1025.0	1
17	3	78	61	8	27	0900	H	35 11 S	117 36 E	16.7		21	3	21	2	23	4	18	7	1023.0	1
17	3	79	61	8	27	1000	H	35 10 S	117 26 E	17.3	35.59	21	3	21	2	23	4	18	7	1023.0	1
17	3	80	61	8	27	1025	H	35 10 S	117 21 E			21	3	21	2	23	4	18	7	1023.0	1

VESSEL	CRUISE NUMBER	STATION	YR.	MH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND		SEA		SWELL		WEA.	VIS.	BAROM.	SAMPLING METHOD
												DN.	AMT.	DN.	AMT.	DN.	AMT.				
17	J	81	61	8	27	1100	H	35 09	S 117 16	E 17.4	35.59	99	0	99	0	23	4	02	8	1023.0	1
17	J	82	61	8	27	1200	H	35 08	S 117 06	E 17.4		99	0	99	0	23	4	02	8	1023.0	1
17	J	83	61	8	27	1300	H	35 07	S 116 57	E 17.4	35.59	99	0	99	0	23	4	02	8	1023.0	1
17	J	84	61	8	27	1400	H	35 07	S 116 46	E 17.4	35.61	27	1	99	0	24	4	02	8	1022.0	1
17	J	85	61	8	27	1500	H	35 05	S 116 35	E 17.5	35.61	27	1	99	0	24	4	02	8	1022.0	1
17	J	86	61	8	27	1600	H	35 05	S 116 23	E 17.6	35.61	27	1	99	0	24	4	02	8	1022.0	1
17	J	87	61	8	27	1628	H	35 05	S 116 18	E		05	2	99	0	24	4	02	8	1022.0	1
17	J	88	61	8	27	1700	H	35 05	S 116 13	E 17.6	35.57	05	2	99	0	24	4	02	8	1022.0	1
17	J	89	61	8	27	1800	H	35 05	S 116 02	E 17.5		05	2	99	0	24	4	02	8	1022.0	1
17	J	90	61	8	27	2100	H	34 57	S 115 31	E 17.8	35.64	07	3	07	2	24	4	02	8	1022.0	1
17	J	91	61	8	27	2400	H	34 45	S 115 03	E 18.2	35.57	07	3	07	2	24	4	02	8	1022.0	1
17	J	92	61	8	28	0300	H	34 28	S 114 56	E 18.1	35.57	07	4	07	3	24	4	02	8	1020.0	1
17	J	93	61	8	28	0800	H	33 54	S 114 44	E 18.3		05	4	05	4	27	1	03	8	1014.0	1
17	J	94	61	8	28	0900	H	33 47	S 114 48	E 17.7	35.50	03	6	03	4	27	1	03	8	1014.0	1
17	J	95	61	8	28	1000	H	33 41	S 114 54	E 17.2	35.44	03	6	03	4	27	1	03	8	1014.0	1
17	J	96	61	8	28	1010	H	33 40	S 114 54	E		03	6	03	4	27	1	03	8	1014.0	1
17	J	97	61	8	28	1100	H	33 34	S 114 57	E 16.4	35.46	03	6	03	5	27	1	03	8	1010.0	1
17	J	98	61	9	1	0001	H	32 39	S 115 29	E 17.0	35.48	33	2	33	2	24	4	01	8	1020.0	1
17	J	99	61	9	1	0300	H	32 34	S 115 21	E 18.2	35.48	34	4	34	2	27	3	03	8	1020.0	1
17	J	100	61	9	1	0600	H	32 06	S 115 24	E 18.8	35.44	34	4	34	2	27	3	03	8	1020.0	1
17	J	101	61	9	5	2355	H	32 12	S 115 44	E 15.7	34.27	09	1	99	0	99	0	01	8	1023.0	1
17	J	102	61	9	6	0730	H	31 56	S 115 38	E 16.8	35.35	99	0	99	0	99	0	01	8	1022.0	1
17	J	103	61	9	6	0830	H	31 56	S 115 25	E 16.4	35.39	99	0	99	0	99	0	01	8	1022.0	1
17	J	104	61	9	6	0930	H	31 56	S 115 13	E 19.5	35.41	06	2	06	1	28	2	01	8	1022.0	1
17	J	105	61	9	6	1030	H	31 56	S 115 02	E 19.6	35.46	06	2	06	1	28	2	01	8	1022.0	1
17	J	106	61	9	6	1130	H	31 52	S 114 55	E 19.6	35.46	07	3	07	2	28	2	01	8	1021.0	1
17	J	107	61	9	6	1230	H	31 43	S 114 55	E 19.7	35.44	07	3	07	2	28	2	01	8	1021.0	1
17	J	108	61	9	6	1330	H	31 35	S 114 55	E 20.0	35.46	07	3	07	2	28	2	01	8	1021.0	1
17	J	109	61	9	6	1430	H	31 28	S 114 55	E 19.9	35.50	99	0	99	1	28	2	00	8	1022.0	1
17	J	110	61	9	6	1530	H	31 20	S 114 55	E 19.8	35.50	99	0	99	1	28	2	00	8	1022.0	1
17	J	111	61	9	6	1600	H	31 15	S 114 54	E 19.8	35.46	99	0	99	1	28	2	00	8	1022.0	1
17	J	112	61	9	6	1715	H	31 05	S 114 52	E 19.8	35.52	20	3	20	1	22	5	00	8	1018.0	1
17	J	113	61	9	6	1800	H	31 00	S 114 51	E 19.6	35.50	20	3	20	1	22	5	00	8	1018.0	1
17	J	114	61	9	7	0001	H	30 48	S 114 47	E 19.8	35.52										1
17	J	115	61	9	7	0600	H	30 37	S 114 43	E 19.8	35.44										1
17	J	116	61	9	7	0800	H	30 26	S 114 41	E 19.8	35.44	27	3	26	1	21	2	02	8	1019.0	1
17	J	117	61	9	7	0900	H	30 19	S 114 36	E 19.7	35.41	27	3	26	1	21	2	02	8	1019.0	1
17	J	118	61	9	7	1100	H	30 35	S 114 39	E 19.9	35.44	23	3	23	1	23	2	01	8	1018.0	1
17	J	119	61	9	7	1200	H	30 44	S 114 40	E 19.7	35.48	23	3	23	1	23	2	01	8	1018.0	1
17	J	120	61	9	7	1300	H	30 57	S 114 41	E 20.0	35.52	23	3	23	1	23	2	01	8	1018.0	1

VESSEL	CRUISE NUMBER	STATION	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND		SEA		SWELL		WEA.	VIS.	BAROM.	SAMPLING METHOD		
												DN.	AMT.	DN.	AMT.	DN.	AMT.						
17	J	121	61	9	7	1500	H	31	10 S	114	43 E	19.6	35.48	19	3	21	2	23	2	03	8	1019.0	1
17	J	122	61	9	7	1700	H	31	25 S	114	54 E	19.5	35.46	19	3	21	2	23	2	03	8	1019.0	1
17	J	123	61	9	7	1800	H	31	32 S	115	00 E	19.6	35.43	25	2	99	1	22	2	03	8	1020.0	1
17	J	124	61	9	7	2400	H	32	03 S	114	57 E	19.0	35.52	25	2					03	8	1020.0	1
17	J	125	61	9	8	0001	H	32	03 S	114	57 E	18.8	35.52	25	2							1021.0	1
17	J	126	61	9	8	0600	H	32	27 S	114	55 E	19.0	35.46	99	1	99	9	24	5	03	8	1021.0	1
17	J	127	61	9	8	0830	H	32	29 S	114	56 E	19.4	35.44	04	2	04	1	24	5	03	8	1024.0	1
17	J	128	61	9	8	0930	H	32	27 S	115	05 E	19.4	35.44	04	2	04	1	24	5	03	8	1024.0	1
17	J	129	61	9	8	1030	H	32	20 S	115	11 E	19.3	35.43	04	2	04	1	24	5	03	8	1024.0	1
17	J	130	61	9	8	1130	H	32	12 S	115	17 E	19.4	35.44	04	2	04	1	24	5	03	8	1024.0	1
17	J	131	61	9	8	1400	H	31	58 S	115	31 E			04	2	04	1	24	5	03	8	1024.0	1
17	J	132	61	9	8	1915	H	32	15 S	115	28 E	16.4	34.76	22	1	99	0	99	0	01	8	1023.0	1
17	4	133	61	9	12	0900	H	32	07 S	115	26 E	18.0	35.30	16	3	16	3	22	4	01	8	1024.0	1
17	4	134	61	9	12	1000	H	32	14 S	115	25 E	17.5	35.35	16	3	16	3	22	4	01	8	1024.0	1
17	4	135	61	9	12	1100	H	32	21 S	115	25 E	18.4	35.39	16	3	16	2	22	4	01	8	1022.0	1
17	4	136	61	9	12	1200	H	32	29 S	115	25 E	18.0	35.43	16	3	16	2	22	4	01	8	1022.0	1
17	4	137	61	9	12	1305	H	32	38 S	115	25 E	18.8	35.43	16	3	16	2	22	4	01	8	1022.0	1
17	4	138	61	9	12	1340	H	32	43 S	115	25 E			14	3	14	2	22	4	02	8	1023.0	1
17	4	139	61	9	12	1400	H	32	46 S	115	25 E	18.2	35.43	14	3	14	2	22	4	02	8	1023.0	1
17	4	140	61	9	12	1500	H	32	54 S	115	25 E	17.8	35.43	14	3	14	2	22	4	02	8	1023.0	1
17	4	141	61	9	12	1600	H	33	03 S	115	25 E	17.3	35.44	14	3	14	2	22	4	02	8	1023.0	1
17	4	142	61	9	12	1700	H	33	12 S	115	24 E	16.6	35.43	11	2	12	2	24	2	02	8	1025.0	1
17	4	143	61	9	12	1800	H	33	21 S	115	24 E	16.5	35.26	11	2	12	2	24	2	02	8	1025.0	1
17	4	144	61	9	13	0830	H	33	29 S	115	00 E	18.2	35.46	06	5	06	5	24	2	00	8	1028.0	1
17	4	145	61	9	13	0930	H	33	32 S	114	50 E	18.6	35.46	06	5	06	5	24	2	00	8	1028.0	1
17	4	146	61	9	13	1015	H	33	34 S	114	43 E			06	5	06	3	24	2	01	8	1027.0	1
17	4	147	61	9	13	1030	H	33	35 S	114	40 E	18.5	35.48	06	5	06	3	24	2	01	8	1027.0	1
17	4	148	61	9	13	1230	H	33	48 S	114	29 E	18.5	35.53	06	5	06	3	24	2	01	8	1027.0	1
17	4	149	61	9	13	1345	H	33	57 S	114	29 E	17.2	35.59	99	1	07	1	24	2	01	8	1026.0	1
17	4	150	61	9	13	1545	H	34	12 S	114	31 E	17.9	35.62	99	1	07	1	24	2	01	8	1026.0	1
17	4	151	61	9	13	1800	H	34	29 S	114	40 E	17.7	35.57	16	3	16	2	24	2	00	8	1026.0	1
17	4	152	61	9	14	0000	H	34	47 S	115	03 E	17.6	35.57	15	4								1
17	4	153	61	9	14	0300	H	34	53 S	115	18 E	17.7	35.61	15	4								1
17	4	154	61	9	14	0600	H	35	00 S	115	38 E	17.8	35.57	09	6	09	4	16	2	01	8	1028.0	1
17	4	155	61	9	14	0900	H	35	10 S	116	14 E	17.8	35.53	09	5	09	4	16	2	01	8	1029.0	1
17	4	156	61	9	14	0915	H	35	10 S	116	17 E			09	5	09	4	16	2	01	8	1029.0	1
17	4	157	61	9	14	0920	H	35	10 S	116	18 E			09	5	09	4	16	2	01	8	1029.0	1
17	4	158	61	9	14	1020	H	35	10 S	116	31 E	17.8	35.53	09	5	09	4	16	2	01	8	1029.0	1
17	4	159	61	9	14	1200	H	35	10 S	116	49 E	17.7	35.55	09	4	09	3	16	2	01	8	1027.0	1
17	4	160	61	9	14	1500	H	35	09 S	117	16 E	17.0	35.46	09	6	09	4	16	2	01	8	1026.0	1

VESSEL	CRUISE NUMBER	STATION	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND		SEA		SWELL		WEA.	VIS.	BAROM.	SAMPLING METHOD	
												DN.	AMT.	DN.	AMT.	DN.	AMT.					
17	4	161	61	9	14	1515	H 35	09 S	117	17 E			09	6	09	4	16	2	01	8	1026.0	1
17	4	162	61	9	14	1800	H 35	10 S	117	45 E	16.5	35.39	09	5	09	5	16	2	02	8	1027.0	1
17	4	163	61	9	19	0900	H 35	13 S	118	05 E	17.2	35.48	18	3	18	5	22	2	03	8	1031.0	1
17	4	164	61	9	19	0910	H 35	14 S	118	05 E			18	3	18	3	22	2	03	8	1031.0	1
17	4	165	61	9	19	0930	H 35	17 S	118	07 E			18	3	18	3	22	2	03	8	1031.0	1
17	4	166	61	9	19	1000	H 35	21 S	118	09 E	17.1	35.62	18	3	18	3	22	2	03	8	1031.0	1
17	4	167	61	9	19	1100	H 35	29 S	118	14 E	16.9	35.64	24	3	24	2	22	4	02	8	1031.0	1
17	4	168	61	9	19	1200	H 35	23 S	118	21 E	16.5	35.61	24	3	24	2	22	4	02	8	1031.0	1
17	4	169	61	9	19	1300	H 35	28 S	118	28 E	15.9	35.52	24	3	24	2	22	4	02	8	1031.0	1
17	4	170	61	9	19	1400	H 35	28 S	118	37 E	16.2	35.53	24	2	24	1	22	4	02	8	1031.0	1
17	4	171	61	9	19	1500	H 35	20 S	118	40 E	15.1	35.43	24	2	24	1	22	4	02	8	1031.0	1
17	4	172	61	9	19	1600	H 35	13 S	118	42 E	16.1	35.52	24	2	24	1	22	4	02	8	1031.0	1
17	4	173	61	9	19	1700	H 35	08 S	118	52 E	17.3	35.62	23	3	23	2	22	4	03	8	1031.0	1
17	4	174	61	9	19	1800	H 35	05 S	119	00 E	17.1	35.62	23	3	23	2	22	4	03	8	1031.0	1
17	4	175	61	9	19	2100	H 34	59 S	119	13 E	16.8	35.61	23	3	23	2	22	4	02	8	1031.0	1
17	4	176	61	9	19	2300	H 34	55 S	119	22 E	17.0	35.61										1
17	4	177	61	9	20	0300	H 34	48 S	119	40 E	16.2	35.57										1
17	4	178	61	9	20	0500	H 34	45 S	119	47 E	16.9	35.61	23	2	23	1	22	4	02	8	1032.0	1
17	4	179	61	9	20	0615	H 34	41 S	119	50 E	16.8	35.57	23	2	23	1	22	4	02	8	1032.0	1
17	4	180	61	9	20	0800	H 34	27 S	119	38 E	16.3	35.50	14	2					02	8	1033.0	1
17	4	181	61	9	20	1100	H 34	34 S	119	22 E	16.9	35.55	99	1	99	1	20	2	02	8	1033.0	1
17	4	182	61	9	20	1300	H 34	50 S	119	17 E	17.4	35.53	99	1	99	1	20	2	02	8	1033.0	1
17	4	183	61	9	20	1400	H 34	56 S	119	08 E	17.7	35.55	99	1	99	1	21	4	03	8	1032.0	1
17	4	184	61	9	20	1500	H 35	00 S	119	01 E	17.2	35.48	99	1	99	1	21	4	03	8	1032.0	1
17	4	185	61	9	20	1630	H 35	05 S	118	53 E	17.0	35.53	99	1	99	1	21	4	03	8	1032.0	1
17	4	186	61	9	21	0800	H 35	02 S	118	41 E	16.4	35.53	02	3	02	1	20	2	03	8	1030.0	1
17	4	187	61	9	21	0900	H 34	58 S	118	33 E	17.2	35.52	02	3	02	1	20	2	03	8	1030.0	1
17	4	188	61	9	21	1000	H 34	57 S	118	27 E	17.3	35.52	02	3	02	1	20	2	03	8	1030.0	1
17	4	189	61	9	21	1230	H 35	07 S	118	00 E			99	1	99	1	20	2	01	8	1026.0	1
17	4	190	61	9	21	1300	H 35	11 S	117	54 E	17.7	35.48	99	1	99	1	20	2	01	8	1026.0	1
17	5	191	61	9	22	1235	H 35	08 S	118	03 E			04	3	04	1	24	4	00	8	1017.0	1
17	5	192	61	9	22	1330	H 35	09 S	118	12 E	18.2	35.61	04	3	04	1	24	4	00	8	1017.0	1
17	5	193	61	9	22	1430	H 35	11 S	118	22 E	18.2	35.55	07	3	07	2	24	4	00	8	1014.0	1
17	5	194	61	9	22	1530	H 35	13 S	118	32 E	18.1	35.59	07	3	07	2	24	4	00	8	1014.0	1
17	5	195	61	9	22	1655	H 35	09 S	118	43 E	17.7	35.59	07	3	07	2	24	4	01	8	1012.0	1
17	5	196	61	9	22	1800	H 35	05 S	118	53 E	16.6	35.53	07	3	07	2	24	4	01	8	1012.0	1
17	5	197	61	9	22	2100	H 34	59 S	119	09 E	16.1	35.53	07	3	07	2	24	4	03	8	1012.0	1
17	5	198	61	9	23	0001	H 34	54 S	119	23 E	16.8	35.55	99	1	07	2	22	4	02	8	1012.0	1
17	5	199	61	9	23	0300	H 34	48 S	119	39 E	16.0	35.55	29	2	29	1	22	2	02	8	1012.0	1
17	5	200	61	9	23	0600	H 34	41 S	119	58 E	17.0	35.55	29	4	29	3	22	2	02	8	1012.0	1

VESSE.	CRUISE NUMBER	STATION	YR.	MO.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN. AMT.	SEA DN. AMT.	SWELL DN. AMT.	WEA.	VIS.	BAROM.	SAMPLING METHOD		
17	5	201	61	9	25	0800	H 34	31 S 119	38 E 16.8	35.53	99	1	99	1	18	2	03	8	1032.0	1
17	5	202	61	9	25	0900	H 34	39 S 119	41 E 16.8	35.70	99	1	99	1	18	2	03	8	1032.0	1
17	5	203	61	9	25	1000	H 34	41 S 119	36 E 17.8	35.71	99	1	99	1	18	2	03	8	1032.0	1
17	5	204	61	9	25	1200	H 34	48 S 119	25 E 15.9	35.61	09	2	09	1	18	2	03	8	1032.0	1
17	5	205	61	9	25	1300	H 34	51 S 119	20 E 16.7	35.66	09	2	09	1	18	2	03	8	1032.0	1
17	5	206	61	9	25	1400	H 34	54 S 119	14 E 16.8	35.66	09	1	99	1	18	2	01	8	1029.0	1
17	5	207	61	9	25	1500	H 34	58 S 119	07 E 16.0	35.61	09	1	99	1	18	2	01	8	1029.0	1
17	5	208	61	9	25	1600	H 34	58 S 118	58 E 17.5	35.68	09	1	99	1	18	2	01	8	1029.0	1
17	5	209	61	9	25	1700	H 35	05 S 118	52 E 16.6	35.66	09	1	99	1	18	2	01	8	1029.0	1
17	5	210	61	9	25	1800	H 35	06 S 118	49 E 16.5	35.66	09	1	99	1	18	2	01	8	1029.0	1
17	5	211	61	9	26	0001	H 35	10 S 118	33 E 17.2	35.68	99	1	99	1	18	2	01	8	1027.0	1
17	5	212	61	9	26	0930	H 35	18 S 118	14 E 17.4	35.73	03	5	03	3	99	1	01	8	1024.0	1
17	5	213	61	9	26	0930	H 35	17 S 118	08 E 17.4	35.73	04	5	04	3	20	2	02	8	1024.0	1
17	5	214	61	9	26	1030	H 35	09 S 118	03 E 17.5	35.79	06	2	06	1	21	2	02	8	1020.0	1
17	5	215	61	9	26	1100	H 35	09 S 118	00 E 17.4	35.57	06	2	06	1	21	2	02	8	1020.0	1
17	5	216	61	10	1	0855	H 35	10 S 117	56 E		28	6	28	3	23	4	02	8	1023.0	1
17	5	217	61	10	1	1000	H 35	13 S 117	49 E 17.5	35.59	28	6	28	3	23	4	02	8	1023.0	1
17	5	218	61	10	1	1100	H 35	20 S 117	46 E 17.6	35.77	27	5	27	3	23	4	18	4	1022.0	1
17	5	219	61	10	1	1200	H 35	28 S 117	44 E 17.3	35.77	27	5	27	3	23	4	18	4	1022.0	1
17	5	220	61	10	1	1210	H 35	30 S 117	43 E		27	5	27	3	23	4	18	7	1022.0	1
17	5	221	61	10	1	1500	H 35	30 S 117	43 E 17.3	35.79	27	4	27	3	23	4	18	8	1021.0	1
17	5	222	61	10	1	1600	H 35	28 S 117	44 E 17.3	35.77	27	4	27	3	23	4	18	8	1021.0	1
17	5	223	61	10	1	1745	H 35	14 S 118	02 E 17.6	35.71	28	5	28	3	23	4	18	8	1021.0	1
17	5	224	61	10	2	0800	H 35	14 S 118	02 E 17.6	35.71	23	3	23	2	21	4	03	8	1021.0	1
17	5	225	61	10	2	0818	H 35	16 S 118	03 E		23	3	23	2	21	4	03	8	1021.0	1
17	5	226	61	10	2	0900	H 35	22 S 118	04 E 17.4	35.77	23	3	23	2	21	4	03	8	1021.0	1
17	5	227	61	10	2	1000	H 35	26 S 117	58 E 17.4	35.79	23	3	23	2	21	4	03	8	1021.0	1
17	5	228	61	10	2	1100	H 35	29 S 117	50 E 17.4	35.77	20	2	20	2	21	4	02	8	1020.0	1
17	5	229	61	10	2	1200	H 35	27 S 117	43 E 17.4	35.77	20	2	20	2	21	4	02	8	1020.0	1
17	5	230	61	10	2	1255	H 35	32 S 117	42 E 15.6	35.57	20	2	20	2	21	4	02	8	1020.0	1
17	5	231	61	10	2	1400	H 35	30 S 117	43 E 17.5	35.77	21	4	21	2	21	4	03	8	1020.0	1
17	6	232	61	10	3	0800	H 35	13 S 118	00 E 17.6	35.75	19	2	19	2	21	7	02	8	1025.0	1
17	6	233	61	10	3	0900	H 35	21 S 117	59 E 17.6	35.79	19	2	19	2	21	7	02	8	1025.0	1
17	6	234	61	10	3	1000	H 35	27 S 117	56 E 17.5	35.77	19	2	19	2	21	7	02	8	1025.0	1
17	6	235	61	10	3	1200	H 35	31 S 117	91 E 15.4		22	3	22	2	21	7	03	8	1025.0	1
17	6	236	61	10	3	1330	H 35	40 S 117	46 E 15.2	35.57	22	3	22	2	21	7	03	8	1025.0	1
17	6	237	61	10	3	1400	H 35	44 S 117	43 E 15.3	35.57	19	3	19	2	21	7	02	8	1026.0	1
17	6	238	61	10	3	1500	H 35	35 S 117	43 E 15.3	35.55	19	3	19	2	21	7	02	8	1026.0	1
17	6	239	61	10	3	1700	H 35	26 S 117	43 E 17.7	35.77	99	1	19	2	21	7	03	8	1026.0	1
17	6	240	61	10	3	1800	H 35	22 S 117	54 E 17.7	35.79	99	1	19	2	21	7	03	8	1026.0	1

VESSEL	CRUISE NUMBER	STATION	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	AMT.	SEA DN.	AMT.	SWELL DN.	AMT.	WEA.	VIS.	BAROM.	SAMPLING METHOD
17	6	241	61	10	4	0800	H 35	14 S 117	57 E 17.6	35.73	99	1	99	1	21	4	03	8	1030.0	1	
17	6	242	61	10	4	0825	H 35	17 S 117	54 E		99	1	99	1	21	4	03	8	1030.0	1	
17	6	243	61	10	4	0900	H 35	20 S 117	50 E 17.7	35.77	99	1	99	1	21	4	03	8	1030.0	1	
17	6	244	61	10	4	1000	H 35	26 S 117	43 E 18.2	35.84	99	1	99	1	21	4	03	8	1030.0	1	
17	6	245	61	10	4	1100	H 35	31 S 117	39 E 18.2	35.81	99	1	99	1	21	4	02	8	1028.0	1	
17	6	246	61	10	4	1200	H 35	26 S 117	29 E 16.6	35.75	99	1	99	1	21	4	02	8	1028.0	1	
17	6	247	61	10	4	1300	H 35	25 S 117	20 E 17.7	35.79	99	1	99	1	21	4	02	8	1028.0	1	
17	6	248	61	10	4	1400	H 35	22 S 117	13 E 17.8	35.79	22	3	22	1	21	2	01	8	1027.0	1	
17	6	249	61	10	4	1500	H 35	26 S 117	04 E 17.5	35.81	22	3	22	1	21	2	01	8	1027.0	1	
17	6	250	61	10	4	1515	H 35	24 S 117	02 E		22	3	22	1	21	2	01	8	1027.0	1	
17	6	251	61	10	4	1600	H 35	21 S 116	55 E 17.7	35.82	22	3	22	1	21	2	01	8	1027.0	1	
17	6	252	61	10	4	1700	H 35	16 S 116	52 E 18.2	35.77	22	3	22	1	21	2	01	8	1027.0	1	
17	6	253	61	10	4	1800	H 35	18 S 116	48 E 18.1	35.75	22	3	22	1	21	2	01	8	1027.0	1	
17	6	254	61	10	5	0815	H 35	13 S 117	09 E		05	4	05	3	21	2	01	8	1025.0	1	
17	6	255	61	10	5	0900	H 35	13 S 117	17 E 17.8	35.81	05	4	05	3	21	2	01	8	1025.0	1	
17	6	256	61	10	5	1200	H 35	11 S 117	42 E 17.4	35.66	07	5	07	4	21	2	03	8	1023.0	1	
17	7	257	61	10	10	0930	H 35	11 S 117	51 E 17.7	35.70	07	4	07	2	18	2	01	8	1024.0	1	
17	7	258	61	10	10	1100	H 35	22 S 117	47 E		07	4	07	3	18	2	02	8	1021.0	1	
17	7	259	61	10	10	1130	H 35	23 S 117	46 E		07	4	07	3	18	2	02	8	1021.0	1	
17	7	260	61	10	10	1200	H 35	25 S 117	48 E 17.3	35.75	07	4	07	3	18	2	02	8	1021.0	1	
17	7	261	61	10	10	1315	H 35	24 S 118	01 E 17.7	35.75	07	4	07	3	18	2	02	8	1021.0	1	
17	7	262	61	10	10	1500	H 35	21 S 118	15 E 17.7	35.77	07	4	07	3	18	2	01	8	1019.0	1	
17	7	263	61	10	10	1715	H 35	10 S 118	10 E 17.7	35.71	07	5	07	3	18	2	01	8	1016.0	1	
17	7	264	61	10	11	0715	H 35	10 S 118	00 E 17.3	35.62	07	4	07	3	18	2	03	8	1011.0	1	
17	7	265	61	10	11	0900	H 35	10 S 118	00 E 17.6	35.73	08	4	08	3	18	2	03	8	1011.0	1	
17	7	266	61	10	11	1110	H 35	10 S 118	00 E		11	4	11	2	18	2	02	8	1009.0	1	
17	7	267	61	10	11	1200	H 35	10 S 118	00 E 17.6	35.64	11	4	11	2	18	2	02	8	1009.0	1	
17	7	268	61	10	11	1450	H 35	10 S 118	00 E 17.8	35.75	08	2	08	3	18	2	17	7	1008.0	1	
17	7	269	61	10	11	1530	H 35	10 S 118	00 E		08	2	08	3	18	2	17	7	1008.0	1	
17	7	270	61	10	12	0720	H 35	10 S 118	00 E 17.2	35.61	32	2	99	1	18	2	01	8	1010.0	1	
17	7	271	61	10	15	0700	H 35	14 S 118	01 E 17.5	35.75	25	2	25	1	20	2	02	8	1025.0	1	
17	7	272	61	10	15	0800	H 35	21 S 118	01 E 17.6	35.77	01	2	99	1	20	2	03	8	1025.0	1	
17	7	273	61	10	15	0900	H 35	25 S 118	07 E 17.4	35.77	01	2	99	1	20	2	03	8	1025.0	1	
17	7	274	61	10	15	1010	H 35	30 S 118	14 E 17.0	35.79	01	2	99	1	20	2	03	8	1025.0	1	
17	7	275	61	10	15	1100	H 35	24 S 118	20 E 17.2	35.79	04	3	04	2	20	2	02	8	1023.0	1	
17	7	276	61	10	15	1200	H 35	18 S 118	25 E 17.4	35.79	04	3	04	2	20	2	02	8	1023.0	1	
17	7	277	61	10	15	1300	H 35	13 S 118	25 E 17.5	35.79	04	3	04	2	20	2	02	8	1023.0	1	
17	7	278	61	10	15	1400	H 35	05 S 118	32 E 17.8	35.79	09	3	09	2	20	2	01	8	1021.0	1	
17	7	279	61	10	15	1500	H 35	02 S 118	26 E 17.8	35.77	09	3	09	2	20	2	01	8	1021.0	1	
17	7	280	61	10	15	1600	H 35	04 S 118	14 E 17.6	35.70	09	3	09	2	20	2	01	8	1021.0	1	

VESSEL	CRUISE NUMBER	STATION	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN. AMT.	SEA DN. AMT.	SWELL DN. AMT.	WEA.	VIS.	BAROM.	SAMPLING METHOD		
17	7	281	61	10	16	0730	H 35	14 S 117	59 E 17.5	35.73	28	3	28	1	99	1	10	7	1014.0	1
17	7	282	61	10	16	0830	H 35	20 S 117	54 E 17.8		25	5	25	3	99	1	02	8	1013.0	1
17	7	283	61	10	16	0940	H 35	26 S 117	47 E 17.6	35.81	25	5	25	3	99	1	02	8	1013.0	1
17	7	284	61	10	16	1100	H 35	33 S 117	38 E 15.6	35.61	27	5	27	3	99	1	02	8	1012.0	1
17	7	285	61	10	16	1200	H 35	35 S 117	44 E 15.5	35.97	27	5	27	3	99	1	02	8	1012.0	1
17	7	286	61	10	16	1400	H 35	23 S 118	00 E 17.6	35.77	28	6	28	4	99	1	03	8	1012.0	1
17	8	287	61	10	20	0900	H 35	15 S 117	33 E 17.3	35.64	34	3	34	2	19	4	03	8	1027.0	1
17	8	288	61	10	20	1010	H 35	18 S 117	23 E 17.5	35.73	34	3	34	2	19	4	03	8	1027.0	1
17	8	289	61	10	20	1100	H 35	22 S 117	12 E 17.5	35.75	28	4	28	2	18	4	03	8	1026.0	1
17	8	290	61	10	20	1120	H 35	22 S 117	10 E		28	4	28	2	18	4	03	8	1026.0	1
17	8	291	61	10	20	1200	H 35	24 S 117	05 E 17.6	35.75	28	4	28	2	18	4	03	8	1026.0	1
17	8	292	61	10	20	1450	H 35	29 S 116	48 E 17.3	35.79	28	3	28	2	18	4	03	8	1026.0	1
17	8	293	61	10	20	1500	H 35	32 S 116	39 E 17.5	35.73	28	3	28	2	18	4	03	8	1026.0	1
17	8	294	61	10	20	1700	H 35	25 S 116	23 E 17.6	35.77	29	4	29	2	18	4	02	8	1025.0	1
17	8	295	61	10	20	1800	H 35	21 S 116	14 E 17.7	35.75	29	4	29	2	18	4	02	8	1025.0	1
17	8	296	61	10	20	2100	H 35	13 S 115	54 E 17.8	35.73	30	4	30	3	18	4	02	8	1024.0	1
17	8	297	61	10	21	0001	H 35	04 S 115	34 E 17.8	35.75										1
17	8	298	61	10	21	0600	H 34	43 S 114	47 E 16.8	35.75	24	3	24	1	23	4	03	8	1024.0	1
17	8	299	61	10	21	0800	H 34	29 S 114	47 E 18.2	35.71	24	3	24	2	23	2	02	8	1026.0	1
17	8	300	61	10	21	0850	H 34	29 S 114	40 E 18.3	35.71	24	3	24	2	23	2	02	8	1026.0	1
17	8	301	61	10	21	1200	H 34	04 S 114	45 E 18.8	35.75	99	1	99	1	23	4	02	8	1027.0	1
17	8	302	61	10	21	1400	H 33	46 S 114	30 E 19.2	35.75	23	2	99	1	23	4	01	8	1027.0	1
17	8	303	61	10	21	1500	H 33	38 S 114	30 E 19.4	35.75	23	2	99	1	23	4	01	8	1027.0	1
17	8	304	61	10	21	1600	H 33	32 S 114	30 E 19.1	35.71	23	2	99	1	23	4	01	8	1027.0	1
17	8	305	61	10	21	1800	H 33	29 S 114	48 E 18.9	35.73	18	4	18	2	23	4	01	8	1027.0	1
17	8	306	61	10	22	0700	H 33	08 S 114	39 E 18.8	35.71	11	4	11	3	21	7	02	8	1026.0	1
17	8	307	61	10	22	0900	H 32	50 S 114	47 E 18.8	35.70	13	5	13	4	21	7	01	8	1028.0	1
17	8	308	61	10	22	1100	H 32	36 S 114	58 E 19.0	35.70	14	3	14	2	21	4	00	8	1027.0	1
17	8	309	61	10	22	1300	H 32	22 S 115	06 E 19.1	35.66	14	3	14	2	21	4	00	8	1027.0	1
17	8	310	61	10	22	1500	H 32	05 S 115	13 E 19.2	35.68	17	2	16	2	21	4	01	8	1026.0	1
17	8	311	61	10	25	0800	H 31	38 S 115	30 E 19.0	35.62	07	3	07	1	25	2	01	8	1023.0	1
17	8	312	61	10	25	0900	H 31	31 S 115	26 E 18.8	35.61	07	3	07	1	25	2	01	8	1023.0	1
17	8	313	61	10	25	1000	H 31	25 S 115	20 E 19.1	35.55	07	3	07	1	25	2	01	8	1023.0	1
17	8	314	61	10	25	1100	H 31	20 S 115	13 E 19.9	35.62	99	1	99	1	25	2	00	8	1021.0	1
17	8	315	61	10	25	1200	H 31	13 S 115	04 E 20.8	35.66	99	1	99	1	25	2	00	8	1021.0	1
17	8	316	61	10	25	1300	H 31	09 S 114	58 E 21.5	35.61	99	1	99	1	25	2	00	8	1021.0	1
17	8	317	61	10	25	1400	H 31	05 S 114	51 E 21.6	35.57	99	1	99	1	25	2	01	8	1020.0	1
17	8	318	61	10	25	1530	H 30	55 S 114	51 E 21.1	35.61	99	1	99	1	25	2	01	8	1020.0	1
17	8	319	61	10	25	1630	H 30	47 S 114	52 E 20.8	35.61	09	3	99	1	25	2	00	8	1019.0	1
17	8	320	61	10	26	0800	H 31	03 S 114	49 E 20.2	35.59	99	1	99	1	20	2	01	8	1019.0	1

VESSEL	CRUISE NUMBER	STATION	YR.	MTN.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.	SAMPLING METHOD
17	8	321	61	10	26	0845	H 31	08 S 114	48 E 20.3	35.59	99	1	99	1	20	2	01	8	1019.0	1	
17	8	322	61	10	26	1000	H 31	20 S 114	46 E 20.3	35.61	99	1	99	1	20	2	01	8	1019.0	1	
17	8	323	61	10	26	1100	H 31	25 S 114	53 E 20.6	35.64	27	2	99	1	20	2	01	8	1019.0	1	
17	8	324	61	10	26	1200	H 31	30 S 115	00 E 21.3		27	2	99	1	20	2	01	8	1019.0	1	
17	8	325	61	10	26	1400	H 31	46 S 115	06 E 20.0	35.66	27	3	27	2	20	2	02	8	1019.0	1	
17	8	326	61	10	26	1600	H 31	51 S 115	21 E 19.7	35.68	27	3	27	2	20	2	03	7	1019.0	1	
17	8	327	61	10	30	0800	H 32	10 S 115	27 E 18.5	35.70	12	3	12	1	21	2	01	8	1022.0	1	
17	8	328	61	10	30	0900	H 32	19 S 115	28 E 18.2	35.66	12	3	12	1	21	2	01	8	1022.0	1	
17	8	329	61	10	30	1000	H 32	27 S 115	29 E 18.5	35.70	12	3	12	1	21	2	01	8	1022.0	1	
17	8	330	61	10	30	1100	H 32	35 S 115	30 E 18.2	35.52	99	1	99	1	21	2	02	8	1022.0	1	
17	8	331	61	10	30	1200	H 32	49 S 115	33 E 18.5	35.55	99	1	99	1	21	2	02	8	1022.0	1	
17	8	332	61	10	30	1300	H 32	57 S 115	29 E 18.9	35.70	99	1	99	1	21	2	02	8	1022.0	1	
17	8	333	61	10	30	1400	H 33	05 S 115	24 E 18.5	35.64	26	2	26	1	99	1	01	8	1021.0	1	
17	8	334	61	10	30	1500	H 33	14 S 115	20 E 19.0	35.66	26	2	26	1	99	1	01	8	1021.0	1	
17	8	335	61	10	30	1600	H 33	22 S 115	15 E 18.3	35.71	26	2	26	1	99	1	01	8	1021.0	1	
17	8	336	61	10	30	1700	H 33	28 S 115	11 E 18.2	35.75	21	4	21	1	99	1	01	8	1021.0	1	
17	8	337	61	10	31	0800	H 33	18 S 115	03 E 18.0	35.71	99	1	99	1	99	1	01	8	1020.0	1	
17	8	338	61	10	31	1030	H 33	13 S 114	51 E 19.2	35.71	99	1	99	1	99	1	01	8	1020.0	1	
17	8	339	61	10	31	1130	H 33	13 S 114	43 E 19.9	35.75	99	1	99	1	99	1	01	8	1019.0	1	
17	8	340	61	10	31	1230	H 33	13 S 114	32 E 20.0	35.73	99	1	99	1	99	1	01	8	1019.0	1	
17	8	341	61	10	31	1330	H 33	13 S 114	21 E 19.5	35.77	99	1	99	1	99	1	01	8	1019.0	1	
17	8	342	61	10	31	1430	H 33	13 S 114	11 E 19.5	35.77	27	2	27	1	19	2	01	8	1018.0	1	
17	8	343	61	10	31	1530	H 33	13 S 114	01 E 19.9	35.79	27	2	27	1	19	2	01	8	1018.0	1	
17	8	344	61	10	31	1630	H 33	05 S 114	02 E 19.9	35.75	27	2	27	1	19	2	01	8	1018.0	1	
17	8	345	61	10	31	1800	H 32	53 S 114	03 E 19.7	35.73	27	3	27	1	19	2	02	8	1018.0	1	
17	8	346	61	11	1	0730	H 32	48 S 114	45 E 19.2	35.71	26	2	26	1	99	1	03	8	1016.0	1	
17	8	347	61	11	1	0900	H 32	37 S 114	48 E 19.3	35.68	27	2	27	1	99	1	02	8	1017.0	1	
17	8	348	61	11	1	1030	H 32	25 S 115	04 E 19.4	35.71	27	2	27	1	99	1	02	8	1017.0	1	
17	8	349	61	11	1	1200	H 32	15 S 115	09 E 19.8	35.70	23	2	23	1	99	1	03	8	1017.0	1	
17	8	350	61	11	1	1330	H 32	02 S 115	15 E 19.9	35.64	23	2	23	1	99	1	03	8	1017.0	1	
17	8	351	61	11	4	0730	H 32	00 S 115	28 E 19.9	35.70	25	1	99	1	25	4	01	8	1019.0	1	
17	8	352	61	11	4	0900	H 32	00 S 115	14 E 20.2	35.70	25	1	99	1	25	4	01	8	1019.0	1	
17	8	353	61	11	4	1030	H 32	00 S 115	00 E 20.0	35.73	27	4	27	2	25	4	02	8	1019.0	1	
17	8	354	61	11	4	1200	H 32	00 S 114	46 E 20.1	35.70	27	4	27	2	25	4	02	8	1019.0	1	
17	8	355	61	11	4	1330	H 32	00 S 114	32 E 20.6	35.66	27	4	27	3	25	4	02	8	1019.0	1	
17	8	356	61	11	4	1500	H 32	00 S 114	19 E 20.2	35.68	27	4	27	3	25	4	02	8	1018.0	1	
17	8	357	61	11	4	1630	H 32	10 S 114	26 E 19.7	35.73	25	5	25	3	25	4	18	7	1019.0	1	
17	8	358	61	11	6	0730	H 31	43 S 115	33 E 18.8	35.73	11	4	11	2	23	2	01	8	1026.0	1	
17	8	359	61	11	6	0900	H 31	31 S 115	26 E 19.0	35.59	11	4	11	2	23	2	01	8	1027.0	1	
17	8	360	61	11	6	1030	H 31	19 S 115	20 E 19.2	35.61	17	2	17	1	23	2	01	8	1026.0	1	

VESSEL	CRUISE NUMBER	STATION	YR.	MH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND		SEA		SWELL		WEA.	VIS.	BAROM.	SAMPLING METHOD
												DN.	AMT.	DN.	AMT.	DN.	AMT.				
17	8	361	61	11	6	1200	H 31	08 S 115	15 E 19.6	35.68	17	2	17	1	23	2	01	8	1026.0	1	
17	8	362	61	11	6	1315	H 30	53 S 115	12 E 19.6	35.68	17	3	17	1	23	2	01	8	1026.0	1	
17	8	363	61	11	6	1500	H 30	42 S 115	06 E 19.8	35.77	18	5	18	3	23	4	01	8	1024.0	1	
17	8	364	61	11	6	1630	H 30	30 S 115	00 E 19.8	35.81	18	5	18	3	23	4	01	8	1024.0	1	
17	8	365	61	11	7	1200	H 30	15 S 114	41 E 19.5	35.77	18	4	18	2	22	4	01	8	1023.0	1	
17	8	366	61	11	7	1500	H 30	27 S 114	37 E 19.5	35.75	18	5	18	4	22	4	01	8	1022.0	1	
17	8	367	61	11	7	1800	H 30	45 S 114	42 E 19.6	35.71	18	6	18	4	22	4	01	8	1022.0	1	
17	8	368	61	11	8	1208	H 31	38 S 115	24 E 20.0	35.79	17	3	17	2	21	2	01	7	1023.0	1	
17	8	369	61	11	8	1330	H 31	45 S 115	33 E		17	3	17	2	21	2	01	7	1023.0	1	
17	9	370	61	11	12	1500	H 32	03 S 115	45 E		23	3					00	8	1019.0	1	
17	9	371	61	11	12	2100	H 32	16 S 115	43 E 19.4	35.53	14	3	14	1	00	0	00	6	1019.0	1	
17	9	372	61	11	12	0400	H 32	16 S 115	43 E 19.3	35.48	14	2	00	0	00	0	00	9	1019.0	1	
17	9	373	61	11	13	0600	H 32	12 S 115	44 E		14	1	14	1	00	0	01	6	1019.0	1	
17	9	374	61	11	14	0530	H 31	59 S 115	26 E 18.5	35.68										1	
17	9	375	61	11	14	0600	H 32	03 S 115	24 E		11	1	12	2	14	1	00	8	1020.0	1	
17	9	376	61	11	14	0700	H 32	09 S 115	19 E 19.4	35.68										1	
17	9	377	61	11	14	0830	H 32	19 S 115	11 E 19.5	35.70										1	
17	9	378	61	11	14	0900	H 32	23 S 115	10 E		14	4	14	3	14	1	00	8	1022.0	1	
17	9	379	61	11	14	1000	H 32	26 S 115	10 E 19.6	35.70										1	
17	9	380	61	11	14	1130	H 32	42 S 115	09 E 19.2	35.82										1	
17	9	381	61	11	14	1200	H 32	46 S 115	09 E		14	4	14	3	14	1	00	8	1021.0	1	
17	9	382	61	11	14	1300	H 32	57 S 115	08 E 19.2	35.71										1	
17	9	383	61	11	14	1430	H 33	03 S 115	07 E 19.1	35.71										1	
17	9	384	61	11	14	1500	H 33	05 S 115	07 E		14	2	14	1	14	1	00	7	1022.0	1	
17	9	385	61	11	14	1600	H 33	12 S 115	06 E 18.9	35.71										1	
17	9	386	61	11	14	1730	H 33	22 S 115	06 E 19.0	35.82										1	
17	9	387	61	11	14	1800	H 33	27 S 115	05 E		14	2	14	1	14	1	00	7	1022.0	1	
17	9	388	61	11	14	2100	H 33	32 S 115	03 E		16	3	16	1	16	1	00	9	1022.0	1	
17	9	389	61	11	15	0600	H 33	30 S 115	03 E 18.5	35.75	07	5	05	2	09	2	01	7	1026.0	1	
17	9	390	61	11	15	0730	H 33	32 S 114	58 E 18.5	35.77										1	
17	9	391	61	11	15	0900	H 33	44 S 114	57 E 18.7	35.79	05	3	05	1	05	1	00	8	1026.0	1	
17	9	392	61	11	15	1030	H 33	56 S 114	57 E 18.9	35.79										1	
17	9	393	61	11	15	1200	H 34	08 S 114	59 E 19.0	35.84	20	3	20	1	18	1	00	8	1025.0	1	
17	9	394	61	11	15	1500	H 34	12 S 115	02 E 19.0	35.86	20	2	20	0	23	1	01	7	1025.0	1	
17	9	395	61	11	16	1200	H 34	12 S 114	58 E 19.4	35.84	16	1	16	1	18	1	01	6	1018.0	1	
17	9	396	61	11	16	1330	H 34	24 S 115	03 E 19.0	35.84										1	
17	9	397	61	11	16	1500	H 34	30 S 115	13 E 18.9	35.84	14	3	14	2	14	2	01	7	1016.0	1	
17	9	398	61	11	16	1630	H 34	43 S 115	24 E 18.6	35.81										1	
17	9	399	61	11	16	1800	H 34	43 S 115	35 E 18.4	35.84	14	3	14	3	14	3	01	6	1017.0	1	
17	9	400	61	11	16	1930	H 34	51 S 115	45 E 18.5	35.79										1	

VESSE-	CRUISE NUMBER	STATION	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND		SEA		SWELL		WEA.	VIS.	BAROM.	SAMPLING METHOD	
												DN.	AMT.	DN.	AMT.	DN.	AMT.					
17	9	401	61	11	16	2100	H 34	58 S	115	56 E	18.6	35.79	14	2	14	1	14	2	01	6	1016.0	1
17	9	402	61	11	16	2400	H 35	06 S	116	19 E	17.8	35.79										1
17	9	403	61	11	17	0300	H 35	07 S	116	45 E	17.9	35.79										1
17	9	404	61	11	17	0600	H 35	07 S	117	11 E	17.9	35.73	07	2	07	2	11	3	02	6	1011.0	1
17	9	405	61	11	17	0900	H 35	12 S	117	43 E	18.1	35.73	09	3	09	2	07	4	02	7	1011.0	1
17	9	406	61	11	17	1200	H 35	06 S	118	01 E	18.3	35.73	09	5	09	3	08	4	02	6	1010.0	1
17	9	407	61	11	19	0600	H 35	03 S	117	56 E			36	1	00	0	00	0	02	6	1010.0	1
17	9	408	61	11	19	0800	H 35	12 S	117	53 E	18.0	35.73										1
17	9	409	61	11	19	0900	H 35	15 S	117	50 E	17.8	35.75	33	1	34	1	23	1	02	7	1010.0	1
17	9	410	61	11	19	1000	H 35	23 S	117	47 E	17.8	35.75										1
17	9	411	61	11	19	1100	H 35	30 S	117	43 E	18.0	35.75										1
17	9	412	61	11	19	1200	H 35	31 S	117	46 E	17.9	35.57	23	2	08	1	18	1	80	6	1010.0	1
17	9	413	61	11	19	1300	H 35	27 S	117	55 E	17.6	35.50										1
17	9	414	61	11	19	1400	H 35	22 S	118	00 E	17.9	35.59										1
17	9	415	61	11	19	1500	H 35	14 S	118	02 E	17.9	35.71	23	3	23	1	24	1	03	6	1009.0	1
17	9	416	61	11	19	1600	H 35	08 S	118	02 E	18.1	35.73										1
17	9	417	61	11	21	0600	H 35	03 S	117	54 E			27	1	00	0	00	0	02	3	1021.0	1
17	9	418	61	11	21	0730	H 35	07 S	118	04 E	17.8	35.66	23	2	23	2	23	2	80	7	1022.0	1
17	9	419	61	11	21	0900	H 35	18 S	118	12 E	17.6	35.70	23	3	23	2	23	2	01	7	1019.0	1
17	9	420	61	11	21	1030	H 35	27 S	118	21 E	17.8	35.70	23	3	23	2	23	2	01	7	1023.0	1
17	9	421	61	11	21	1200	H 35	27 S	118	30 E	17.8	35.73	23	3	23	2	23	2	01	7	1023.0	1
17	9	422	61	11	21	1330	H 35	25 S	118	30 E	17.2	35.61	24	2	24	1	24	2	02	7	1023.0	1
17	9	423	61	11	21	1500	H 35	15 S	118	30 E	18.2	35.70	23	2	23	1	23	2	01	7	1023.0	1
17	9	424	61	11	21	1630	H 35	03 S	118	28 E	18.2	35.70	23	3	23	2	23	2	01	7	1024.0	1
17	9	425	61	11	21	1800	H 34	52 S	118	24 E	18.3	35.71	23	1	00	0	00	0	01	7	1023.0	1
17	9	426	61	11	22	0600	H 34	53 S	118	37 E	18.0	35.68	27	1	27	1	23	1	01	7	1026.0	1
17	9	427	61	11	22	0730	H 34	57 S	118	43 E	18.0	35.70	27	1	27	1	23	1	01	7	1026.0	1
17	9	428	61	11	22	0900	H 35	01 S	118	57 E	17.9	35.71	29	1	29	1	29	1	01	7	1025.0	1
17	9	429	61	11	22	1030	H 35	05 S	118	49 E	17.9	35.70	25	3	25	2	27	2	02	6	1023.0	1
17	9	430	61	11	22	1200	H 35	10 S	118	41 E	17.9	35.70	25	3	25	2	25	2	03	6	1023.0	1
17	9	431	61	11	22	1330	H 35	14 S	118	33 E	17.9	35.70	25	4	25	2	25	3	03	6	1023.0	1
17	9	432	61	11	22	1500	H 35	21 S	118	18 E	17.9	35.68	25	4	25	2	25	3	01	7	1023.0	1
17	9	433	61	11	22	1630	H 35	08 S	118	09 E	17.9	35.70	25	4	25	2	24	3	01	7	1023.0	1
17	9	434	61	11	23	0730	H 35	06 S	118	01 E			18	2	18	2	18	1	03	7	1027.0	1
17	9	435	61	11	23	0830	H 35	14 S	118	00 E	18.0	35.70	18	1	18	2	18	2	03	7	1027.0	1
17	9	436	61	11	23	0930	H 35	22 S	118	00 E	18.4	35.71										1
17	9	437	61	11	23	1030	H 35	30 S	118	00 E	18.4	35.70										1
17	9	438	61	11	23	1130	H 35	38 S	118	00 E	18.5	35.77										1
17	9	439	61	11	23	1230	H 35	42 S	118	00 E	16.3	35.28	18	1	18	1	19	2	01	7	1027.0	1
17	9	440	61	11	23	1330	H 35	54 S	118	00 E	15.3	35.05										1

VESSEL	CRUISE NUMBER	STATION	YR.	MO.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN. AMT.	SEA DN. AMT.	SWELL DN. AMT.	WEA.	VIS.	BAROM.	SAMPLING METHOD	
17	9	441	61	11	23	1430	H 36	00 S 118	00 E 16.4	16.4	35.35							1	
17	9	442	61	11	23	1500	H 35	56 S 118	02 E			23	2	23	1	19	2	01 7 1027.0	1
17	9	443	61	11	23	1630	H 35	46 S 118	07 E	17.9	35.57	23	1	23	1	19	2	01 7 1027.0	1
17	9	444	61	11	23	1800	H 35	35 S 118	12 E	18.6	35.71	23	1	23	1	19	2	01 7 1027.0	1
17	9	445	61	11	23	1930	H 35	35 S 118	12 E			05	1	00	0	23	2	01 7 1027.0	1
17	9	446	61	11	24	0600	H 35	26 S 118	11 E	18.1	35.71	09	2	09	1	23	2	03 6 1026.0	1
17	9	447	61	11	24	0730	H 35	18 S 118	17 E	18.2	35.71	09	3	09	2	23	2	03 7 1026.0	1
17	9	448	61	11	24	0900	H 35	10 S 118	06 E	18.1	35.68	09	3	09	2	23	2	03 7 1026.0	1
17	9	449	61	11	24	0930	H 35	12 S 118	06 E	18.0									1
17	9	450	61	11	24	1030	H 35	12 S 118	06 E			09	3	09	2	23	2	03 7 1026.0	1
17	9	451	61	11	24	1200	H 35	06 S 118	01 E			09	4	09	2	23	1	01 7 1026.0	1
17	10	452	61	12	4	0600	H 35	16 S 117	49 E	18.4	35.97	25	1	25	1	23	4	02 7 1025.0	1
17	10	453	61	12	4	0730	H 35	25 S 117	37 E	18.3	35.91								1
17	10	454	61	12	4	0900	H 35	33 S 117	27 E	16.3	35.37	23	2	20	1	24	4	02 7 1025.0	1
17	10	455	61	12	4	0950	H 35	39 S 117	20 E	17.0									1
17	10	456	61	12	4	1030	H 35	42 S 117	16 E	18.5	35.84								1
17	10	457	61	12	4	1200	H 35	34 S 117	04 E	18.8		23	2	23	1	24	3	02 7 1025.0	1
17	10	458	61	12	4	1330	H 35	32 S 116	49 E	19.4	35.86								1
17	10	459	61	12	4	1500	H 35	30 S 116	33 E	19.1	35.82	23	2	23	2	24	3	02 7 1024.0	1
17	10	460	61	12	4	1630	H 35	23 S 116	21 E	18.9	35.82								1
17	10	461	61	12	4	1800	H 35	20 S 116	05 E	19.0	35.90	25	2	23	2	24	3	03 7 1024.0	1
17	10	462	61	12	4	1930	H 35	17 S 115	54 E	19.0	35.84								1
17	10	463	61	12	4	2100	H 35	15 S 115	45 E	17.6	35.81								1
17	10	464	61	12	4	2400	H 35	11 S 115	27 E	17.2	35.75								1
17	10	465	61	12	5	0300	H 35	02 S 115	12 E	18.8	35.86								1
17	10	466	61	12	5	0600	H 34	44 S 114	52 E	18.8	35.82	14	4	14	2	14	5	02 7 1026.0	1
17	10	467	61	12	5	0730	H 34	33 S 114	41 E	18.8	35.73								1
17	10	468	61	12	5	0900	H 34	25 S 114	32 E	19.1	35.82	14	4	14	2	14	5	01 7 1026.0	1
17	10	469	61	12	5	1030	H 34	12 S 114	32 E	18.8	35.91								1
17	10	470	61	12	5	1200	H 33	59 S 114	31 E	18.8	35.88	14	5	14	3	14	5	02 8 1026.0	1
17	10	471	61	12	5	1330	H 33	47 S 114	31 E	19.0	35.86								1
17	10	472	61	12	5	1500	H 33	35 S 114	30 E	19.4	35.84	14	6	14	3	14	5	01 8 1023.0	1
17	10	473	61	12	5	1630	H 33	24 S 114	38 E	18.7	35.90	14	5	14	3	14	5	00 7 1021.0	1
17	10	474	61	12	5	1800	H 33	14 S 114	44 E	19.2	35.90								1
17	10	475	61	12	5	1930	H 33	02 S 114	50 E	18.7	35.86								1
17	10	476	61	12	5	2100	H 32	51 S 114	57 E	19.4	35.84	14	4	14	3	14	5	00 7 1021.0	1
17	10	477	61	12	5	2400	H 32	27 S 115	10 E	19.2	35.82								1
17	10	478	61	12	6	0300	H 32	06 S 115	25 E	19.0	36.17								1
17	10	479	61	12	12	0600	H 31	59 S 115	35 E	20.0	35.32	08	1	00	0	17	1	01 7 1015.0	1
17	10	480	61	12	12	0900	H 32	12 S 115	36 E	21.0	35.88	08	1	00	0	17	1	01 7 1015.0	1

VESSE.	CRUISE NUMBER	STATION	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND			SEA			SWELL			WEA.	VIS.	BAROM.	SAMPLING METHOD
												DN.	AMT.	DN.	AMT.	DN.	AMT.	DN.	AMT.	DN.				
17	10	481	61	12	12	1200	H 32	09 S	115 26 E	20.9	36.06	27	3	27	1	17	1	00	7	1015.0	1			
17	10	482	61	12	17	2000	H 32	04 S	115 45 E	20.4	35.97	12	1	00	0	00	0	00	7	1022.0	1			
17	10	483	61	12	18	0600	H 31	57 S	115 39 E	20.9	35.95	12	2	11	1	11	1	00	7	1022.0	1			
17	10	484	61	12	18	0730	H 31	52 S	115 34 E	19.9	35.86	12	3	12	2	12	1	00	7	1022.0	1			
17	10	485	61	12	18	0815	H 31	47 S	115 30 E													1		
17	10	486	61	12	18	0830	H 31	44 S	115 28 E													1		
17	10	487	61	12	18	0900	H 31	43 S	115 27 E	20.1	35.79	12	3	12	2	12	1	00	8	1022.0	1			
17	10	488	61	12	18	1030	H 31	34 S	115 20 E	20.2	35.68	12	2	12	1	12	2	00	8	1023.0	1			
17	10	489	61	12	18	1200	H 31	31 S	115 09 E	20.6	35.82	14	2	14	1	16	2	00	8	1022.0	1			
17	10	490	61	12	18	1330	H 31	25 S	114 59 E	20.0	35.75	14	3	14	2	16	2	00	8	1021.0	1			
17	10	491	61	12	18	1500	H 31	13 S	114 58 E	20.6	35.81	16	3	16	2	18	2	00	8	1020.0	1			
17	10	492	61	12	18	1630	H 31	01 S	115 01 E	20.8	35.86	17	3	17	2	18	3	00	8	1018.0	1			
17	10	493	61	12	18	1800	H 30	47 S	114 56 E	21.2	35.91	17	4	17	2	18	3	00	8	1018.0	1			
17	10	494	61	12	18	2100	H 30	41 S	114 51 E	21.1	35.84											1		
17	10	495	61	12	18	2400	H 30	33 S	114 50 E	20.5	35.95											1		
17	10	496	61	12	19	0300	H 30	31 S	114 48 E	20.5	35.77											1		
17	10	497	61	12	19	0600	H 30	41 S	114 51 E	20.2		08	2	10	2	14	3	00	7	1015.0	1			
17	10	498	61	12	19	0900	H 30	57 S	115 10 E	21.1	35.93	07	2	07	2	09	3	01	8	1016.0	1			
17	10	499	61	12	19	1100	H 31	11 S	115 11 E	22.2	35.90											1		
17	10	500	61	12	19	1200	H 31	19 S	115 08 E	21.8	35.86	16	2	16	1	20	2	01	8	1015.0	1			
17	10	501	61	12	19	1500	H 31	36 S	115 18 E	21.2		16	2	16	1	20	1	01	8	1014.0	1			
17	10	502	61	12	19	1800	H 31	55 S	115 33 E	21.5		16	2	16	1	20	1	01	8	1012.0	1			

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 plantological 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

OCEANOGRAPHICAL STATION LISTS

(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 Rottneest 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