OCEANOGRAPHICAL STATION LIST

VOLUME 62

INVESTIGATIONS BY F.V. *ESTELLE STAR* IN
WESTERN AUSTRALIAN WATERS IN 1962

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

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AUSTRALIA

MELBOURNE, 1968

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When citing this station list, abbreviate as follows:
CSIRO Aust. Oceanogr. Stn List 62.

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Investigations by F.V. Estelle Star
in Western Australian Waters in 1962

I. INTRODUCTION

This report records most of the data collected on Cruises E1/62-E10/62, which were made during the second part of a survey for tuna in Western Australian waters. Track charts and station positions are given in Figures 1-10.

Data collected during the first part of the survey are given in CSIRO Aust. (1968), and a detailed account of the survey in Hynd and Vaux (1963).

II. WORK ACCOMPLISHED

Table 1 gives details of time, number of stations occupied, and work done on each cruise. In addition, a tuna longline was used on Cruises E1 and E5/62, and the catches were three big-eye tuna and one lancet fish at Station 12, and one blue-pointer shark at both Station 228 and Station 297.

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.

III. METHOD OF COLLECTION AND ANALYSIS OF SAMPLES

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 $\pm$ 0.5 degF, was used (Vaux 1961). The temperatures obtained were converted to degrees Celsius for the data-listing in this report.

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‰.

TABLE 1

DETAILS OF CRUISES AND WORK DONE

Cruise	Dates	Scientific Personnel	Number of Stations Occupied	Hydrology	Number of Southern Bluefin Tuna Trolled	Number of Southern Bluefin Tuna Tagged
E1/62	Jan. 3-16	K. Godfrey	86	82	20	20
E2/62	Jan.24-Feb. 3	R. Greig	55	46	250	8
E3/62	Feb.12-24	R. Greig	67	52	17	13
E4/62	Mar. 1-23	K. Godfrey	100	93	32	24
E5/62	Mar.27-Apr.23	K. Godfrey	109	71	62	43
E6/62	Apr.27-May 9	J.S. Hynd	66	34	510	510
E7/62	May 10-19	C. Thomas	10	10	260	223
E8/62	May 27-June 20	C. Thomas	27	21	1830	1830
E9/62	June 24-July 5	R. Bradley	14	14	2323	2263
E10/62	July 7-17	R. Bradley	38	35		

Hydrology Number of surface samples collected

REFERENCES

CSIRO AUST. (1968).—Investigations by F.V. Estelle Star in Western Australian waters in 1961. CSIRO Aust. Oceanogr. Stn List 57.

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 1/62 - January 3-16, 1962

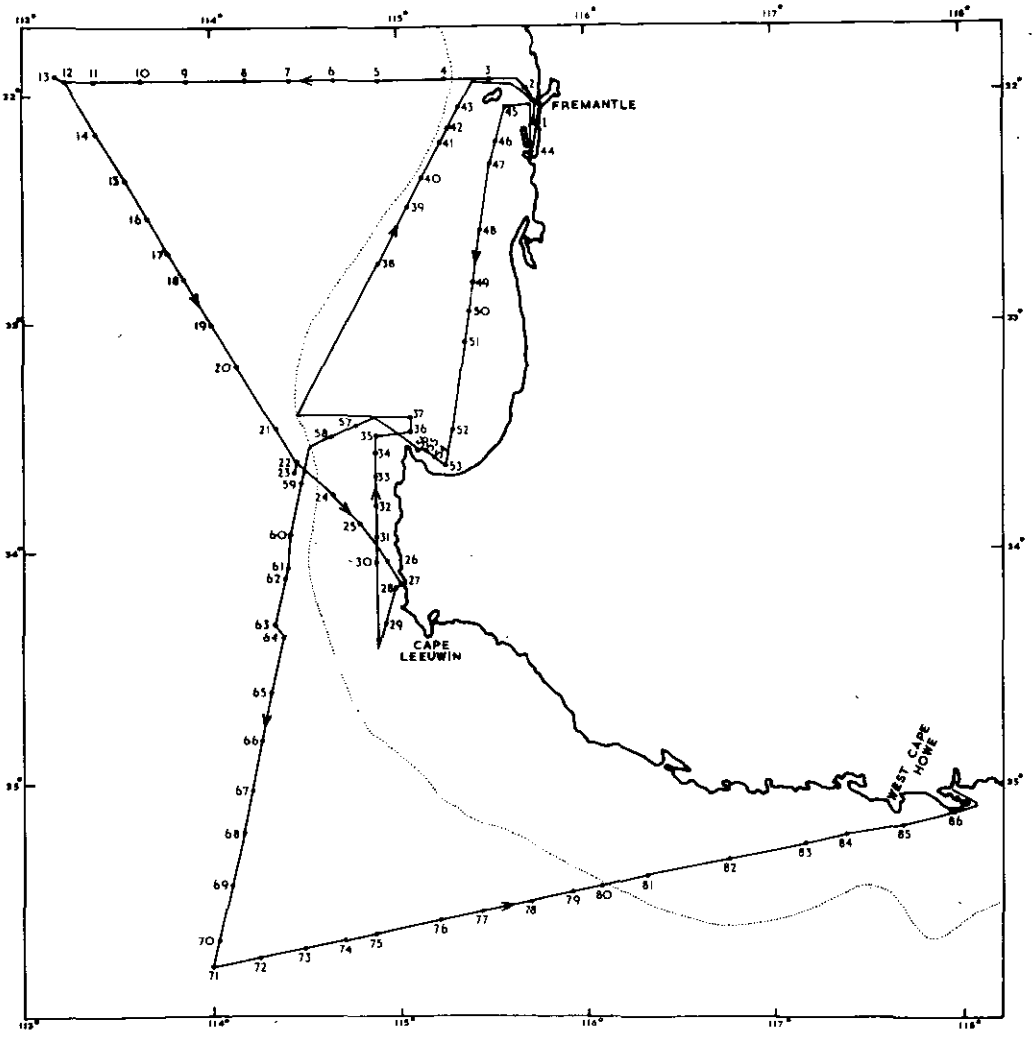

Fig. 1. - Track chart Cruise E 1/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 2/62 - January 23 - February 3, 1962

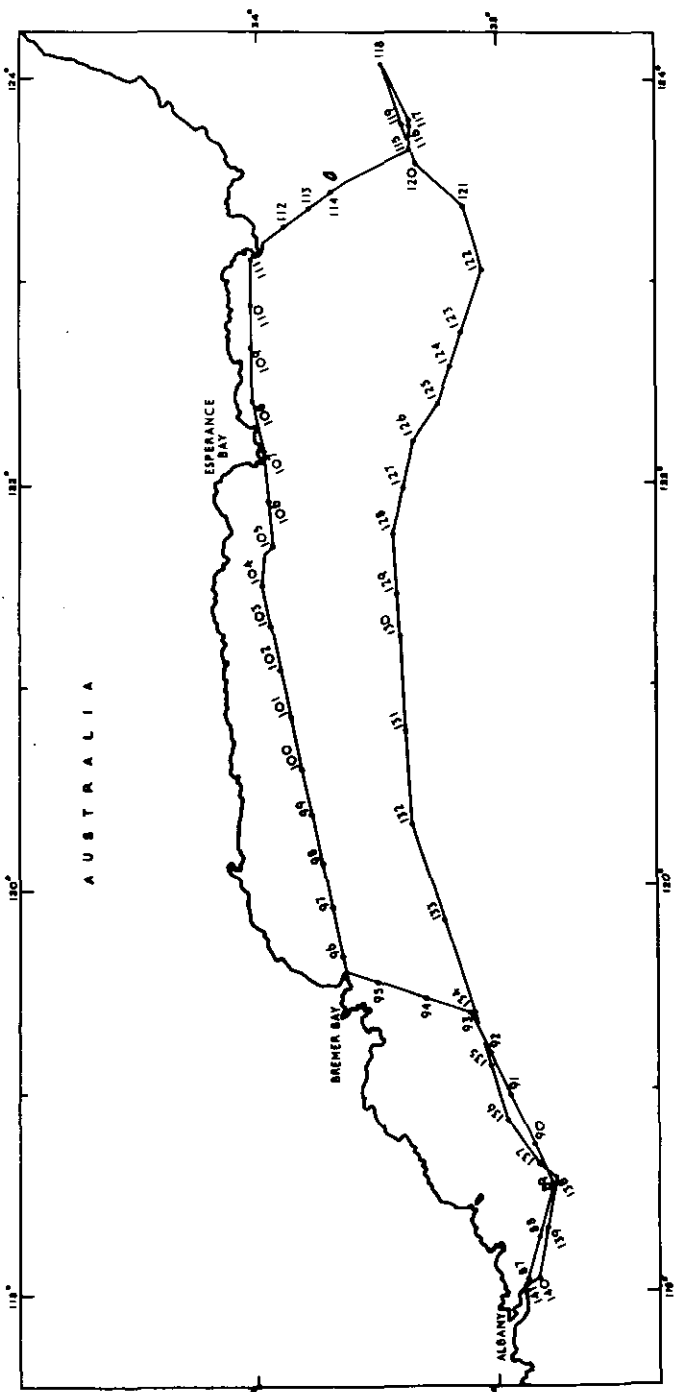

Fig. 2. - Track chart Cruise E 2/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 3/62 - February 12-24, 1962

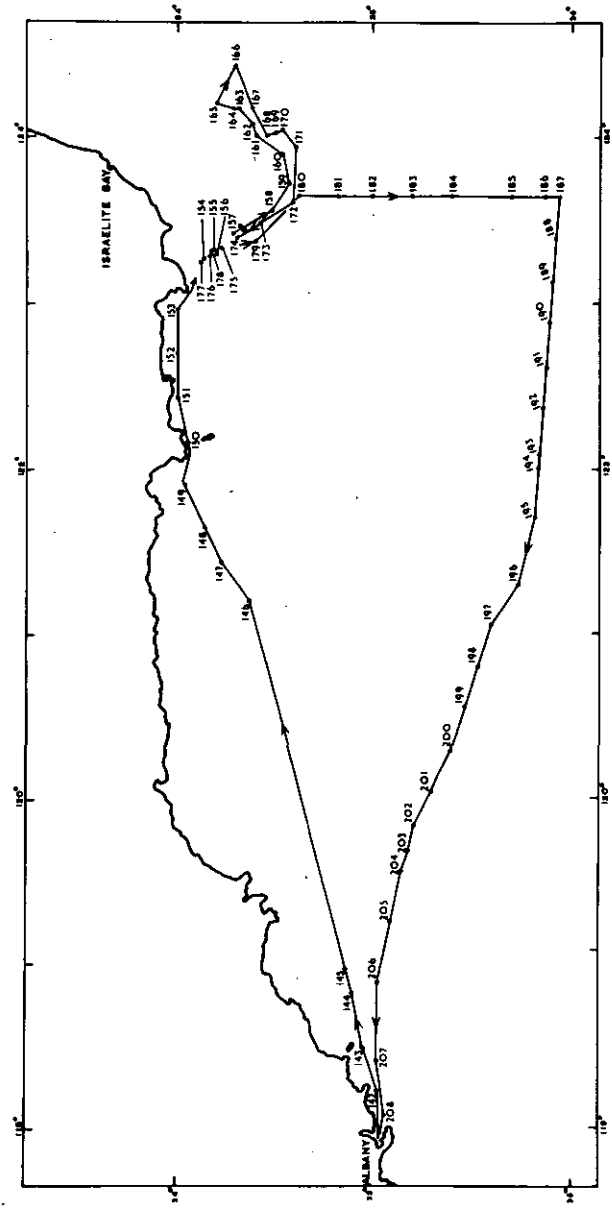

Fig. 3. - Track chart Cruise E 3/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 4/62 - March 1-23, 1962

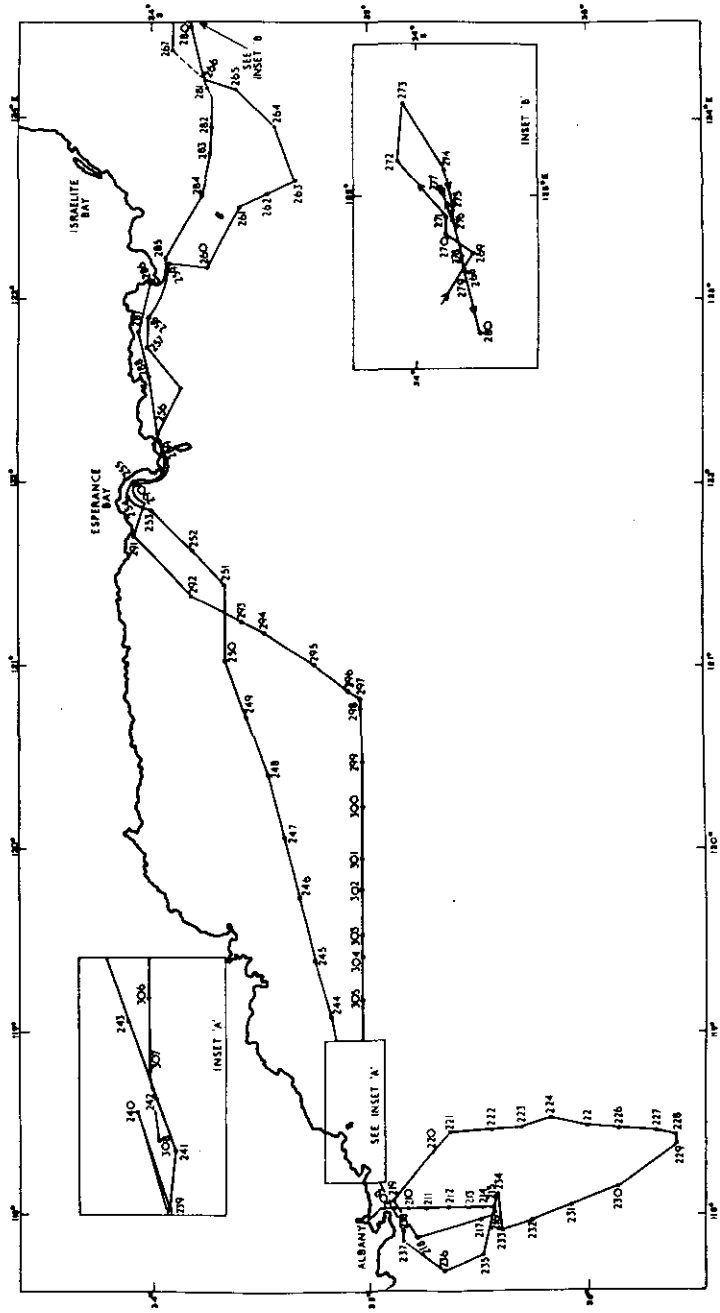

Fig. 4. - Track chart Cruise E 4/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 5/62 - March 27 - April 23, 1962

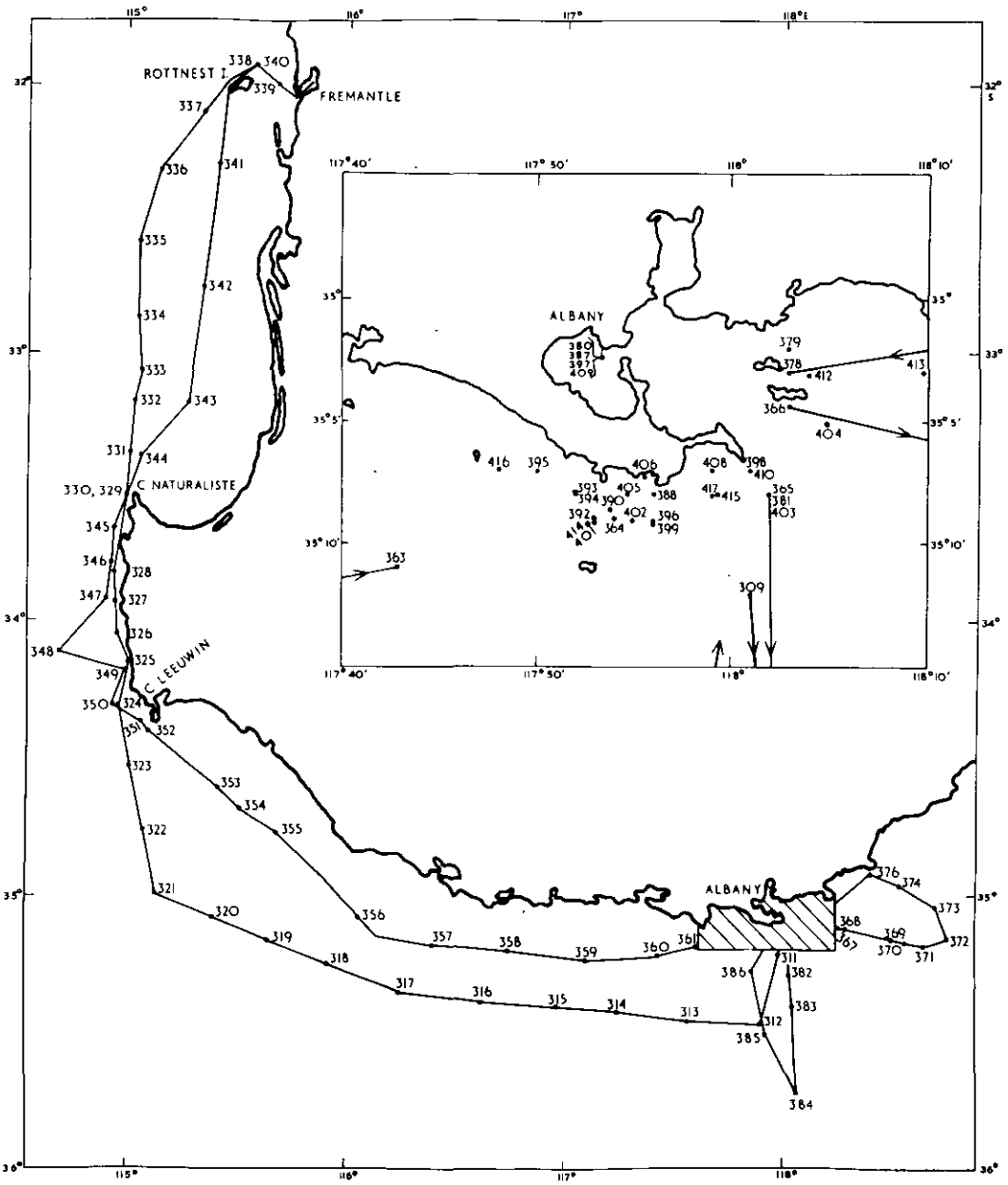

Fig. 5. - Track chart Cruise E 5/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 6/62 - April 27 - May 9, 1962

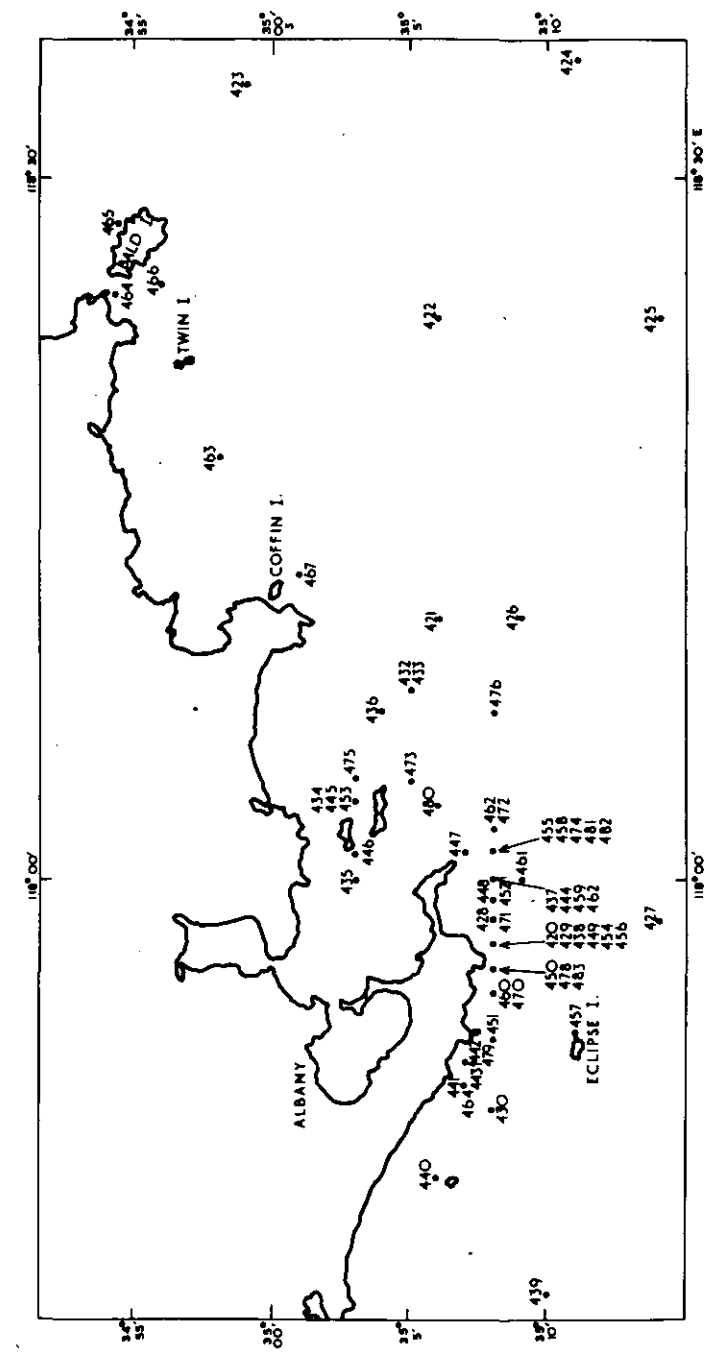

Fig. 6. - Track chart Cruise E 6/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 7/62 - May 10-19, 1962

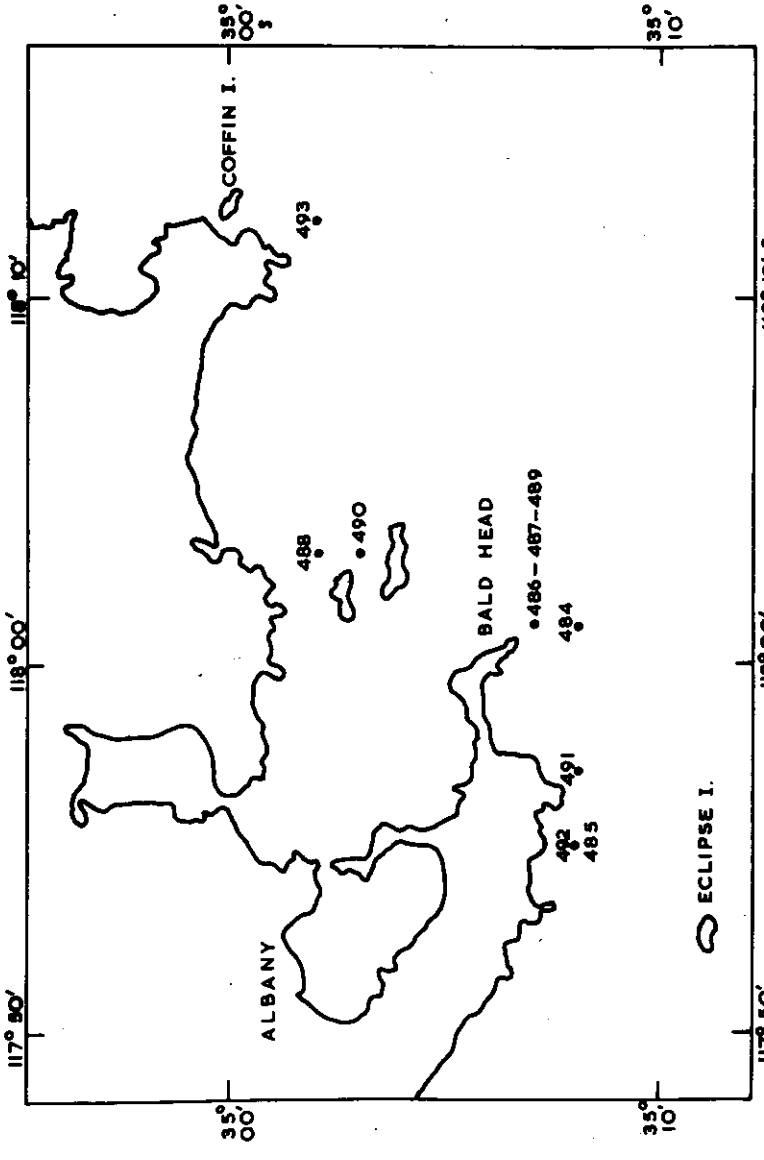

Fig. 7. - Track chart Cruise E 7/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 8/62 - May 27 - June 20, 1962

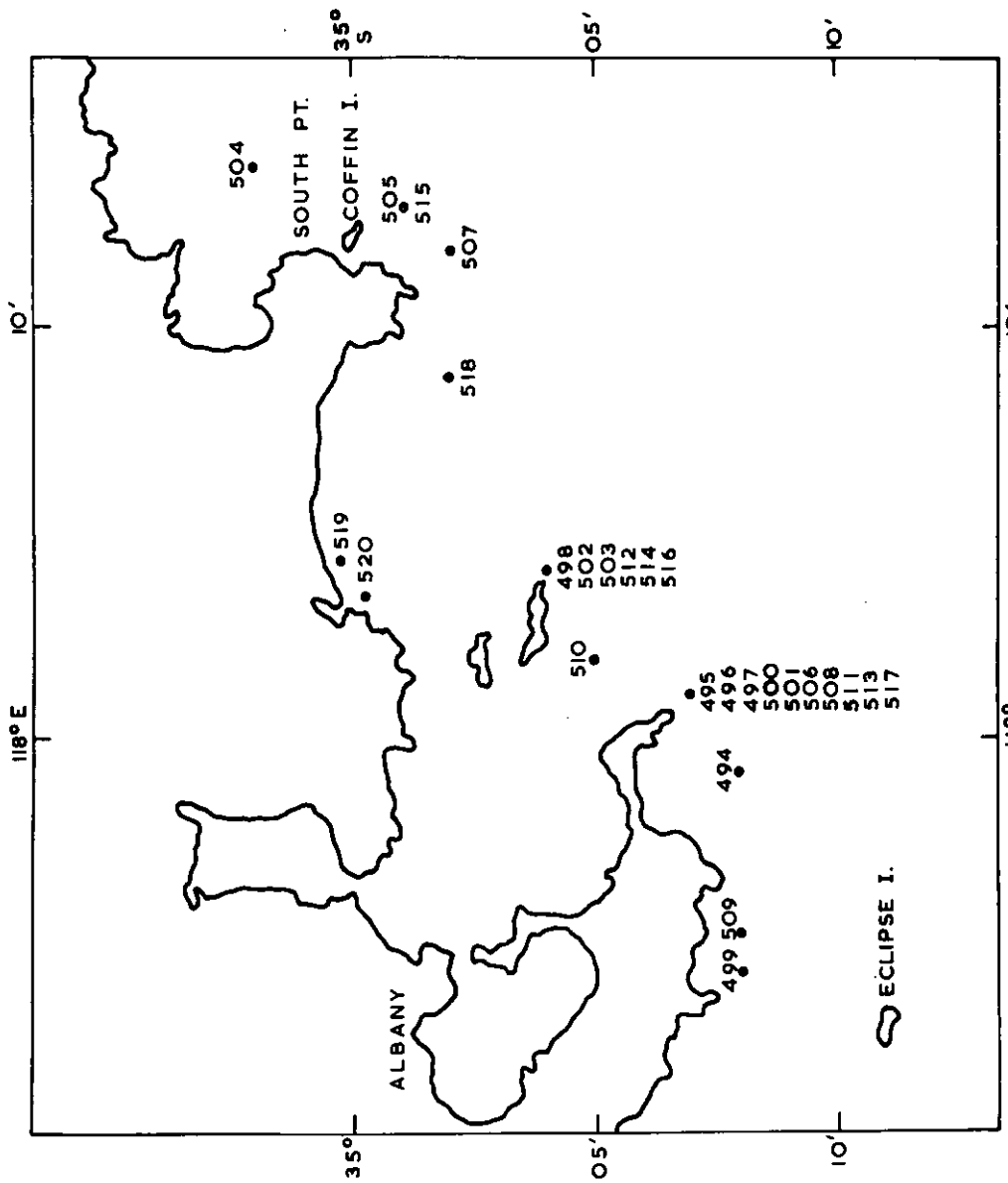

Fig. 8. - Track chart Cruise E 8/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 9/62 - June 24 - July 3, 1962

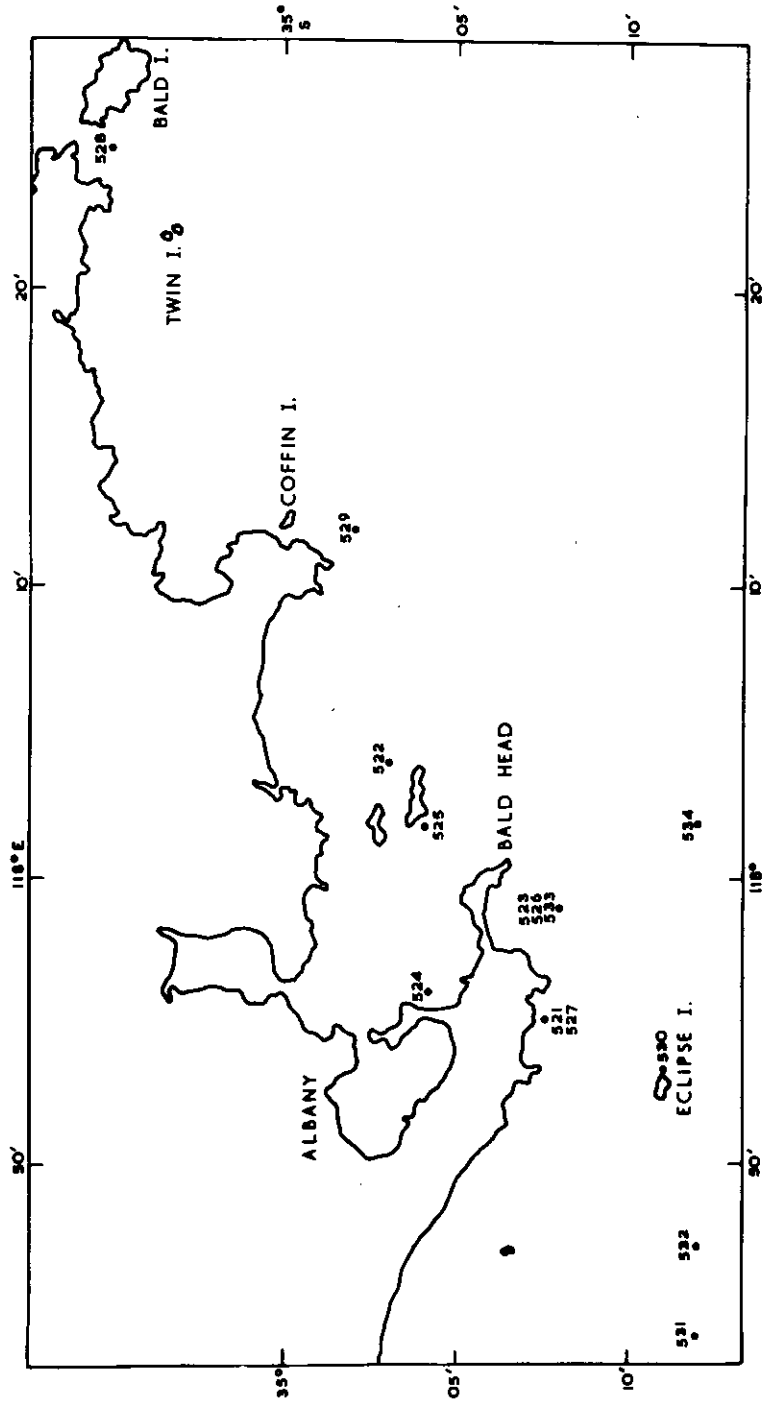

Fig. 9. - Track chart Cruise E 9/62

F.V. ESTELLE STAR

SUMMARY OF CRUISE E 10/62 - July 7-17, 1962

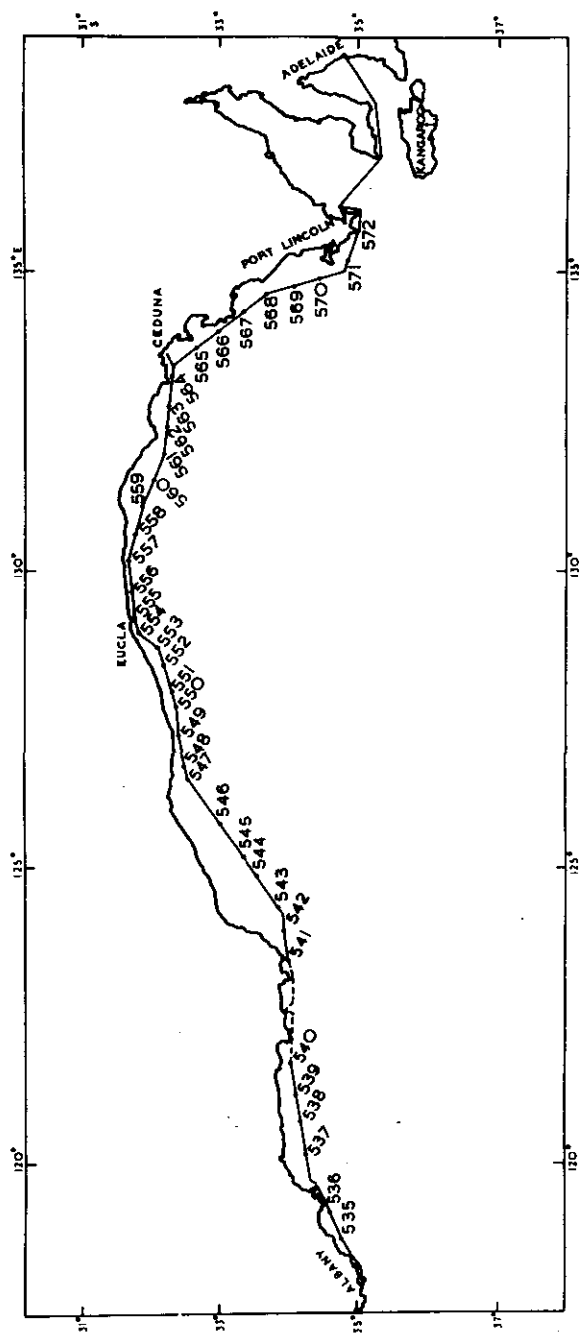

Fig. 10. - Track chart Cruise E 10/62

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

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 Western Australian Standard Time, GMT +8 hr, Code H, and GMT +9 hr, Code I
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	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	1	1	62	1	4	0230	H 32 11 S	115 43 E	22.8	36,31									
17	1	2	62	1	4	1330	H 32 00 S	115 40 E	23.1	36,17	05	1	05	1	00	0	01	8	1019.0
17	1	3	62	1	4	1500	H 31 57 S	115 27 E	22.8	35,95	23	3	23	2	25	1	01	8	1017.0
17	1	4	62	1	4	1630	H 31 57 S	115 11 E	22.4	35,77									
17	1	5	62	1	4	1800	H 31 57 S	114 51 E	22.3	35,77	20	3	20	2	23	2	01	8	1016.0
17	1	6	62	1	4	1930	H 31 57 S	114 39 E	22.2	35,77									
17	1	7	62	1	4	2100	H 31 57 S	114 24 E	22.0	35,81	20	2	20	2	23	2	01	7	1016.0
17	1	8	62	1	4	2230	H 31 57 S	114 10 E	22.0	35,81									
17	1	9	62	1	4	2400	H 31 57 S	113 56 E	21.5	35,84									
17	1	10	62	1	5	0130	H 31 57 S	113 40 E	21.1	35,90									
17	1	11	62	1	5	0330	H 31 57 S	113 24 E	21.5	35,84									
17	1	12	62	1	5	0530	H 31 57 S	113 15 E	21.1	35,99	09	1	09	1	13	2	01	7	1016.0
17	1	13	62	1	5	0900	H 31 57 S	113 15 E			09	2	09	1	13	2	01	8	1016.0
17	1	14	62	1	5	1200	H 32 08 S	113 23 E	21.9	35,99	09	1	09	2	13	2	01	7	1016.0
17	1	15	62	1	5	1330	H 32 18 S	113 27 E	21.8	35,86									
17	1	16	62	1	5	1500	H 32 29 S	113 37 E	21.8	35,81	11	2	11	2	16	2	01	8	1016.0
17	1	17	62	1	5	1630	H 32 39 S	113 45 E	22.0	35,95									
17	1	18	62	1	5	1800	H 32 49 S	113 52 E	22.2	35,84	11	2	11	2	11	2	01	8	1016.0
17	1	19	62	1	5	1930	H 33 00 S	114 00 E	22.1	35,84									
17	1	20	62	1	5	2100	H 33 10 S	114 07 E	22.0	35,81	16	3	16	2	14	2	01	8	1016.0
17	1	21	62	1	5	2400	H 33 32 S	114 23 E	21.9	35,81									
17	1	22	62	1	6	0615	H 33 38 S	114 28 E	21.9	35,77	16	1	16	1	16	1	01	8	1014.0
17	1	23	62	1	6	0700	H 33 38 S	114 28 E	22.1	35,77	16	1	16	1	16	1	01	8	1014.0
17	1	24	62	1	6	1200	H 33 48 S	114 31 E	21.8	35,77	16	1	16	1	16	2	01	7	1014.0
17	1	25	62	1	6	1330	H 33 56 S	114 49 E	21.2	35,77									
17	1	26	62	1	6	1500	H 34 05 S	114 57 E	21.3	35,88	16	3	16	2	16	2	01	8	1014.0
17	1	27	62	1	7	1800	H 34 12 S	115 00 E	21.3	36,11	14	4	14	1	14	1	01	8	1016.0
17	1	28	62	1	8	0730	H 34 12 S	114 59 E	20.5	35,90	14	3	14	2	17	2	01	8	1014.0
17	1	29	62	1	8	0900	H 34 11 S	114 56 E	20.7	35,93	14	4	14	2	17	3	01	8	1014.0
17	1	30	62	1	8	1030	H 33 59 S	114 56 E	20.9	35,90	14	5	14	2	17	3	01	8	1014.0
17	1	31	62	1	8	1135	H 33 52 S	114 57 E											
17	1	32	62	1	8	1200	H 33 49 S	114 57 E	21.7	36,04	18	4	16	2	17	3	01	8	1015.0
17	1	33	62	1	8	1300	H 33 42 S	114 57 E											
17	1	34	62	1	8	1330	H 33 37 S	114 57 E	21.7	35,99	21	4	16	2	17	3	01	8	1015.0
17	1	35	62	1	8	1430	H 33 29 S	114 58 E											
17	1	36	62	1	8	1500	H 33 30 S	115 04 E	20.2	36,06	22	3	22	1	20	3	01	8	1014.0
17	1	37	62	1	8	1900	H 33 28 S	115 03 E	21.7	35,91	12	4	22	2	20	3	01	8	1010.0
17	1	38	62	1	9	0430	H 32 45 S	115 02 E	22.1	35,82									
17	1	39	62	1	9	0600	H 32 36 S	115 06 E	22.0	35,73	14	4	11	2	17	3	01	8	1011.0
17	1	40	62	1	9	0730	H 32 25 S	115 11 E	21.9	35,84									

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	1	41	62	1	9	0900	H 32 16	S 115 25	E 22.3	35.88	18	4	18	2	17	3	01	8	1011.0
17	1	42	62	1	9	0950	H 32 10	S 115 22	E										
17	1	43	62	1	9	1030	H 32 05	S 115 20	E 22.2	35.84	18	3	19	2	18	2	01	8	1011.0
17	1	44	62	1	10	0400	H 32 03	S 115 42	E 23.8	36.18									
17	1	45	62	1	12	1200	H 32 02	S 115 34	E 22.8	36.18	22	4	22	2	20	2	00	7	1013.0
17	1	46	62	1	12	1330	H 32 13	S 115 32	E 23.0	36.08	22	4	22	2	20	2	00	7	1013.0
17	1	47	62	1	12	1500	H 32 22	S 115 29	E 22.9	36.06	22	4	22	2	20	2	00	7	1013.0
17	1	48	62	1	12	1630	H 32 35	S 115 27	E 22.9	36.00	22	4	22	2	20	2	00	7	1012.0
17	1	49	62	1	12	1800	H 32 45	S 115 25	E 22.3	35.93	22	4	22	3	20	3	00	7	1012.0
17	1	50	62	1	12	1930	H 32 54	S 115 24	E 22.0	35.93	22	2	22	2	20	4	01	7	1012.0
17	1	51	62	1	12	2100	H 33 08	S 115 24	E 22.3	35.90									
17	1	52	62	1	12	2400	H 33 29	S 115 22	E 22.2	36.15									
17	1	53	62	1	13	0730	H 33 37	S 115 20	E 23.4	36.44	16	4	16	1	18	1	01	7	1014.0
17	1	54	62	1	13	1200	H 33 36	S 115 18	E 23.9	36.27	24	2	24	1	00	0	00	8	1015.0
17	1	55	62	1	13	1500	H 33 35	S 115 12	E 23.5	36.45	20	3	20	1	00	0	01	8	1013.0
17	1	56	62	1	14	0400	H 33 33	S 115 04	E 21.8	36.15	17	2	17	1	17	1	01	7	1014.0
17	1	57	62	1	14	0900	H 33 31	S 114 50	E 21.0	35.97	23	2	23	2	18	1	01	8	1014.0
17	1	58	62	1	14	1030	H 33 34	S 114 36	E 21.4	35.82	23	2	23	2	18	2	01	8	1014.0
17	1	59	62	1	14	1200	H 33 44	S 114 29	E 21.9	35.77	19	3	19	1	18	2	01	8	1014.0
17	1	60	62	1	14	1330	H 33 56	S 114 25	E 22.2	35.77	19	3	19	1	18	2	01	8	1014.0
17	1	61	62	1	14	1430	H 34 04	S 114 24	E 22.6										
17	1	62	62	1	14	1500	H 34 07	S 114 23	E 22.8	35.71	19	3	19	1	18	2	01	8	1014.0
17	1	63	62	1	14	1630	H 34 19	S 114 20	E 22.8	35.79	20	3	20	1	18	2	01	8	1012.0
17	1	64	62	1	14	1800	H 34 25	S 114 22	E 21.8	36.06	20	2	20	1	18	2	01	8	1012.0
17	1	65	62	1	14	1930	H 34 37	S 114 19	E 21.8	36.06	20	1	20	1	18	2	01	7	1012.0
17	1	66	62	1	14	2100	H 34 49	S 114 16	E 21.5	35.95									
17	1	67	62	1	14	2230	H 35 02	S 114 13	E 21.9	35.88									
17	1	68	62	1	14	2400	H 35 14	S 114 10	E 21.0	35.88									
17	1	69	62	1	15	0130	H 35 27	S 114 06	E 20.3	35.90									
17	1	70	62	1	15	0300	H 35 40	S 114 02	E 21.3	35.88									
17	1	71	62	1	15	0400	H 35 48	S 114 00	E 20.1	35.71	27	2	27	2	24	2	02	7	1008.0
17	1	72	62	1	15	1030	H 35 47	S 114 10	E 21.0	35.90	27	5	27	3	24	3	80	6	1009.0
17	1	73	62	1	15	1200	H 35 45	S 114 25	E 21.1	35.93	27	4	27	2	24	3	18	3	1009.0
17	1	74	62	1	15	1330	H 35 43	S 114 37	E 21.1	35.91	27	4	27	2	24	4	51	6	1009.0
17	1	75	62	1	15	1500	H 35 41	S 114 52	E 21.6	35.82	27	4	27	2	23	4	02	6	1009.0
17	1	76	62	1	15	1630	H 35 39	S 115 08	E 21.4	35.90	27	4	27	2	24	5	01	7	1009.0
17	1	77	62	1	15	1800	H 35 26	S 115 24	E 20.9	35.93	27	4	27	2	24	6	01	7	1009.0
17	1	78	62	1	15	1930	H 35 35	S 115 38	E 21.0	36.00									
17	1	79	62	1	15	2100	H 35 33	S 115 48	E 19.8	35.91									
17	1	80	62	1	15	2400	H 35 30	S 116 09	E 21.2	35.88									

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	1	81	62	1	16	0300	H 35 27	S 116 29	E 19.8	35.88									
17	1	82	62	1	16	0600	H 35 26	S 116 48	E 20.9	35.86	25	5	23	3	23	6	02	7	1010.0
17	1	83	62	1	16	0730	H 35 20	S 117 06	E 19.7	35.91	24	5	23	3	23	7	02	6	1011.0
17	1	84	62	1	16	0900	H 35 16	S 117 23	E 19.7	35.86	23	6	23	3	23	7	02	6	1012.0
17	1	85	62	1	16	1030	H 35 12	S 117 41	E 19.7	35.88	23	6	23	3	23	7	02	6	1012.0
17	1	86	62	1	16	1200	H 35 08	S 117 59	E 19.5	35.86	23	7	23	3	23	7	02	6	1013.0
17	2	87	62	1	24	0400	H 35 07	S 118 01	E 20.0	35.97	14	2	14	2	18	2	03	8	1017.0
17	2	88	62	1	24	0530	H 35 10	S 118 16	E 20.4	35.88									
17	2	89	62	1	24	0700	H 35 14	S 118 31	E 20.2	35.88	18	2	18	2	18	2	01	8	1018.0
17	2	90	62	1	24	0830	H 35 09	S 118 44	E 20.2	35.86									
17	2	91	62	1	24	1000	H 35 03	S 118 57	E 20.4	35.88	18	4	18	3	18	2	01	8	1019.0
17	2	92	62	1	24	1130	H 34 58	S 119 10	E 20.1	35.82									
17	2	93	62	1	24	1300	H 34 54	S 119 22	E 20.3	35.82	18	4	18	3	18	2	01	8	1019.0
17	2	94	62	1	24	1430	H 34 42	S 119 26	E 20.4	35.88									
17	2	95	62	1	24	1600	H 34 31	S 119 31	E 20.4	35.90	14	3	14	3	18	2	03	8	1019.0
17	2	96	62	1	25	0930	H 34 21	S 119 40	E 20.0	35.90	14	3	14	3	18	2	02	8	1019.0
17	2	97	62	1	25	0700	H 34 18	S 119 54	E 19.9	35.95	14	4	14	3	18	2	01	8	1021.0
17	2	98	62	1	25	0830	H 34 16	S 120 08	E 19.9	35.86									
17	2	99	62	1	25	1000	H 34 14	S 120 22	E 19.8	35.84	14	5	14	3	18	2	02	8	1021.0
17	2	100	62	1	25	1130	H 34 12	S 120 35	E 19.5	35.81									
17	2	101	62	1	25	1300	H 34 10	S 120 50	E 19.5	35.81	10	5	10	3	18	2	01	8	1021.0
17	2	102	62	1	25	1430	H 34 07	S 121 04	E 19.7	35.81									
17	2	103	62	1	25	1600	H 34 05	S 121 17	E 19.5	35.84	10	6	10	3	18	2	02	8	1019.0
17	2	104	62	1	25	1730	H 34 02	S 121 30	E 19.2	35.81									
17	2	105	62	1	28	0700	H 34 02	S 121 40	E 19.2	35.79	09	4	09	2	14	2	03	8	1018.0
17	2	106	62	1	28	0830	H 34 02	S 121 56	E 19.3	35.79									
17	2	107	62	1	28	1000	H 34 02	S 122 11	E 19.3	35.79	09	4	09	3	14	2	02	8	1018.0
17	2	108	62	1	28	1130	H 33 59	S 122 24	E 19.2	35.79									
17	2	109	62	1	28	1300	H 33 59	S 122 39	E 19.0	35.77	09	6	09	3	14	2	01	8	1016.0
17	2	110	62	1	28	1430	H 33 59	S 122 52	E 19.2	35.82									
17	2	111	62	1	28	1600	H 34 00	S 123 06	E 18.9	35.81	09	6	09	3	14	2	01	8	1015.0
17	2	112	62	2	1	0500	H 34 07	S 123 15	E		04	2	04	1	18	3	02		1020.0
17	2	113	62	2	1	0600	H 34 11	S 123 18	E										
17	2	114	62	2	1	0700	H 34 18	S 123 16	E		04	2	04	1	18	3	03		1022.0
17	2	115	62	2	1	0930	H 34 38	S 123 39	E		04	2	04	1	18	3	02		1023.0
17	2	116	62	2	1	1030	H 34 38	S 123 47	E										
17	2	117	62	2	1	1130	H 34 38	S 123 38	E 20.2	35.82	04	1	04	1	18	3	02		1023.0
17	2	118	62	2	1	1345	H 34 31	S 124 03	E 20.8	35.88									
17	2	119	62	2	1	1600	H 34 36	S 123 45	E 20.0	35.84	14	2	14	1	18	3	02		1021.0
17	2	120	62	2	1	1800	H 34 40	S 123 34	E 19.8	35.81	14	3	14	1	18	3	02		1020.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	2	121	62	2	1	2400	H 34 52	S 123 21	E 18.9	35.62									
17	2	122	62	2	2	0600	H 34 57	S 123 02	E 19.5	35.79	05	3	05	2	18	3	03		1022.0
17	2	123	62	2	2	0800	H 34 51	S 122 45	E 19.5	35.84	05	3	05	2	18	3	03		1022.0
17	2	124	62	2	2	0900	H 34 49	S 122 35	E 19.6	35.90									
17	2	125	62	2	2	1030	H 34 45	S 122 23	E 19.8	35.88									
17	2	126	62	2	2	1200	H 34 39	S 122 12	E 19.5	35.86	05	4	05	2	18	3	02		1021.0
17	2	127	62	2	2	1330	H 34 37	S 121 58	E 19.9	35.88									
17	2	128	62	2	2	1500	H 34 34	S 121 44	E 19.9	35.88	09	5	09	3	18	2	01		1019.0
17	2	129	62	2	2	1630	H 34 35	S 121 26	E 19.9	35.86									
17	2	130	62	2	2	1800	H 34 36	S 121 14	E 19.7	35.84	09	6	09	3	18	2	01		1018.0
17	2	131	62	2	2	2100	H 34 37	S 120 46	E 20.0	35.88									
17	2	132	62	2	2	2400	H 34 39	S 120 17	E 19.9	35.84									
17	2	133	62	2	3	0300	H 34 47	S 119 50	E 19.4	35.71									
17	2	134	62	2	3	0600	H 34 55	S 119 22	E 19.5	35.71	09	3	09	3	18	2	03		1014.0
17	2	135	62	2	3	0730	H 34 58	S 119 07	E 20.0	35.81									
17	2	136	62	2	3	0900	H 35 03	S 118 51	E 20.4	35.88	04	2	09	3	18	2	03		1015.0
17	2	137	62	2	3	1030	H 35 11	S 118 37	E 20.3	35.82									
17	2	138	62	2	3	1100	H 35 14	S 118 33	E		04	2	09	2	18	2	03		1013.0
17	2	139	62	2	3	1300	H 35 12	S 118 18	E		04	2	09	2	18	2	03	7	1013.0
17	2	140	62	2	3	1445	H 35 09	S 118 04	E		04	2	04	1	18	2	03	7	1011.0
17	2	141	62	2	3	1515	H 35 07	S 118 03	E										
17	3	142	62	2	12	1330	H 35 02	S 118 12	E 20.4	35.75	27	5	27	2	18	2	01	7	1007.0
17	3	143	62	2	12	1500	H 34 58	S 118 28	E 21.0	35.70	27	5	27	2	18	2	01	7	1006.0
17	3	144	62	2	12	1700	H 34 54	S 118 48	E 21.4	35.70	27	6	27	3	18	3	01	6	1005.0
17	3	145	62	2	12	1800	H 34 52	S 118 58	E 21.0	35.68	23	7	23	4	18	3	02	6	1005.0
17	3	146	62	2	13	0600	H 34 21	S 121 12	E 20.0	35.68	18	5	18	3	18	3	02	7	1016.0
17	3	147	62	2	13	0730	H 34 13	S 121 26	E 20.0	35.66	18	4	18	3	18	3	02	7	1017.0
17	3	148	62	2	13	0900	H 34 08	S 121 39	E 19.8	35.64	18	4	18	3	18	3	02	7	1018.0
17	3	149	62	2	13	1030	H 34 02	S 121 53	E 19.6	35.97	18	4	18	3	18	3	02	7	1018.0
17	3	150	62	2	13	1200	H 34 02	S 122 09	E 20.0	35.62	18	3	18	2	18	2	01	7	1018.0
17	3	151	62	2	13	1330	H 34 00	S 122 26	E 19.9	35.62	16	3	16	2	18	2	01	7	1018.0
17	3	152	62	2	13	1500	H 33 59	S 122 41	E 19.9	35.62	14	2	14	1	18	2	01	7	1019.0
17	3	153	62	2	13	1630	H 34 00	S 122 58	E 19.8	35.64	13	2	13	1	18	2	01	7	1019.0
17	3	154	62	2	14	0525	H 34 06	S 123 16	E 19.6		04	5	04	3	18	2	01	7	1018.0
17	3	155	62	2	14	0600	H 34 11	S 123 19	E		04	5	04	3	18	2	01	7	1018.0
17	3	156	62	2	15	0730	H 34 12	S 123 18	E 19.5	35.86	04	2	04	1	14	2	01	7	1015.0
17	3	157	62	2	15	0900	H 34 17	S 123 25	E 20.1	35.95	09	2	09	2	09	2	01	6	1015.0
17	3	158	62	2	15	1030	H 34 29	S 123 33	E 20.4	35.95	09	2	09	2	09	2	01	6	1015.0
17	3	159	62	2	15	1200	H 34 34	S 123 43	E 20.4	35.81	09	3	09	2	09	2	01	6	1014.0
17	3	160	62	2	15	1330	H 34 32	S 123 54	E 20.2	35.82	09	3	09	2	09	2	01	6	1013.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	Z	LATITUDE			LONGITUDE			TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	3	161	62	2	15	1500	H	34	24	S	124	00	E	20.4	35.82	09	4	09	3	09	2	01	7	1012.0
17	3	162	62	2	15	1535	H	34	23	S	124	04	E			09	4	09	3	09	2	01	7	1012.0
17	3	163	62	2	15	1630	H	34	19	S	124	10	E	20.3	35.82	09	4	09	3	09	2	01	7	1012.0
17	3	164	62	2	15	1700	H	34	17	S	124	10	E			09	5	09	4	09	2	01	7	1011.0
17	3	165	62	2	15	1800	H	34	12	S	124	12	E	20.3	35.82	09	5	09	4	09	2	01	7	1011.0
17	3	166	62	2	16	0600	H	34	18	S	124	25	E	20.1	35.84	04	5	04	3	09	3	03	7	1010.0
17	3	167	62	2	16	0730	H	34	23	S	124	10	E	20.0	35.82	04	4	04	3	09	3	03	7	1009.0
17	3	168	62	2	16	0840	H	34	27	S	124	00	E			04	3	04	2	09	3	03	7	1008.0
17	3	169	62	2	16	0900	H	34	30	S	124	01	E	20.2	35.88	04	3	04	2	09	3	03	7	1008.0
17	3	170	62	2	16	0925	H	34	32	S	124	02	E			04	3	04	2	09	3	03	7	1008.0
17	3	171	62	2	16	1030	H	34	36	S	123	56	E	20.3	35.84	04	3	04	2	09	3	03	7	1006.0
17	3	172	62	2	16	1200	H	34	35	S	123	36	E	20.4	35.84	32	3	32	1	09	3	80	6	1007.0
17	3	173	62	2	16	1330	H	34	25	S	123	29	E	20.3	35.90	25	5	25	3	09	2	03	6	1007.0
17	3	174	62	2	16	1420	H	34	18	S	123	24	E			25	5	25	4	09	2	80	6	1008.0
17	3	175	62	2	16	1500	H	34	13	S	123	20	E	19.8	35.84	25	5	25	4	09	2	80	6	1008.0
17	3	176	62	2	16	1535	H	34	10	S	123	17	E			25	5					80	6	1008.0
17	3	177	62	2	21	0520	H	34	07	S	123	15	E			00	0	00	0				7	1026.0
17	3	178	62	2	21	0600	H	34	11	S	123	19	E			18	1	18	1	18	3	03	7	1028.0
17	3	179	62	2	21	0800	H	34	24	S	123	22	E			18	2	18	1	18	3	03	7	1029.0
17	3	180	62	2	21	1015	H	34	37	S	123	39	E			18	1	18	1	18	3	02	7	1029.0
17	3	181	62	2	21	1230	H	34	49	S	123	39	E	20.5	35.84	18	1	18	1	18	3	02	7	1029.0
17	3	182	62	2	21	1400	H	35	00	S	123	39	E			18	1	18	1	18	3	02	7	1028.0
17	3	183	62	2	21	1630	H	35	12	S	123	39	E	19.9	35.88	18	1	18	1	18	3	02	7	1028.0
17	3	184	62	2	21	1800	H	35	24	S	123	39	E			18	1	18	1	18	3	02	7	1028.0
17	3	185	62	2	22	0600	H	35	42	S	123	39	E	18.8	35.62	09	1	09	1	18	2	02	7	1028.0
17	3	186	62	2	22	0730	H	35	52	S	123	39	E	19.0	35.64	00	0	00	0	18	2	02	7	1028.0
17	3	187	62	2	22	0800	H	35	56	S	123	39	E			00	0	00	0	18	2	02	7	1028.0
17	3	188	62	2	22	1000	H	35	55	S	123	23	E	19.6	35.81	00	0	00	0	18	2	02	7	1029.0
17	3	189	62	2	22	1130	H	35	54	S	123	08	E	19.8	35.73	36	1	36	1	18	2	02	7	1029.0
17	3	190	62	2	22	1300	H	35	53	S	122	52	E	19.8	35.73	36	1	36	1	18	2	02	7	1028.0
17	3	191	62	2	22	1430	H	35	52	S	122	37	E	19.3	35.59	09	2	09	1	18	2	02	7	1027.0
17	3	192	62	2	22	1600	H	35	51	S	122	22	E	18.9	35.57	09	2	09	1	18	2	02	7	1027.0
17	3	193	62	2	22	1730	H	35	50	S	122	05	E	19.5	35.77	09	3	09	1	18	2	01	7	1026.0
17	3	194	62	2	22	1800	H	35	50	S	122	00	E			09	3	09	2	18	2	01	7	1026.0
17	3	195	62	2	22	2400	H	35	48	S	121	42	E	18.5	35.52									
17	3	196	62	2	23	0600	H	35	44	S	121	17	E	18.7	35.62	04	4	04	3	18	2	03	7	1022.0
17	3	197	62	2	23	0730	H	35	36	S	121	03	E	18.7	35.61	04	5	04	3	18	2	02	7	1022.0
17	3	198	62	2	23	0900	H	35	32	S	120	47	E	18.7	35.73	04	5	04	3	18	2	01	7	1021.0
17	3	199	62	2	23	1030	H	35	28	S	120	32	E	18.8	35.73	04	5	04	3	18	2	01	7	1020.0
17	3	200	62	2	23	1200	H	35	24	S	120	16	E	19.0	35.70	04	4	04	3	18	2	01	7	1019.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	3	201	62	2	23	1330	H	35 18 S	120 01 E	19.3	35.73	04	4	04	2	18	2	01	7	1018.0
17	3	202	62	2	23	1500	H	35 13 S	119 49 E	19.8	35.77	04	3	04	2	18	2	01	7	1018.0
17	3	203	62	2	23	1630	H	35 11 S	119 40 E	20.6	35.86	04	2	04	1	18	2	01	7	1017.0
17	3	204	62	2	23	1800	H	35 09 S	119 33 E	20.5	35.86	04	1	04	1	18	2	01	7	1017.0
17	3	205	62	2	23	1930	H	35 06 S	119 14 E	20.8	35.82	27	2	27	1	18	2			1017.0
17	3	206	62	2	23	2100	H	35 03 S	118 52 E	20.9	35.93	27	2	27	1	18	2			1017.0
17	3	207	62	2	23	2330	H	35 03 S	118 24 E	20.6	35.91									
17	3	208	62	2	24	0130	H	35 04 S	118 04 E	20.6	35.93									
17	4	209	62	3	2	0730	H	35 06 S	118 01 E	20.4	35.75									
17	4	210	62	3	2	0800	H	35 10 S	118 01 E	20.4	35.75	18	1							
17	4	211	62	3	2	0900	H	35 16 S	118 01 E	20.4	35.86	18	3	18	2	18	3	01	7	1025.0
17	4	212	62	3	2	0945	H	35 22 S	118 01 E	19.5	35.64	18	3							
17	4	213	62	3	2	1030	H	35 26 S	118 01 E	19.7	35.71									
17	4	214	62	3	2	1140	H	35 30 S	118 01 E	19.2	35.64	20	3							
17	4	215	62	3	2	1200	H	35 34 S	118 01 E	19.5	35.68	21	4	21	2	18	3	01	7	1025.0
17	4	216	62	3	2	1330	H	35 35 S	118 00 E	19.5	35.64									
17	4	217	62	3	2	1500	H	35 24 S	117 56 E	19.8	35.68	21	3	21	1	18	2	01	7	1022.0
17	4	218	62	3	2	1630	H	35 13 S	117 52 E	20.7	35.75									
17	4	219	62	3	3	0630	H	35 07 S	118 04 E	20.4	35.75	21	1	21	1	20	2	01	7	1023.0
17	4	220	62	3	3	0730	H	35 14 S	118 17 E	20.2	35.68									
17	4	221	62	3	3	0900	H	35 32 S	118 25 E	19.8	35.73	20	2	20	1	20	2	01	7	1023.0
17	4	222	62	3	3	1050	H	35 34 S	118 27 E	19.8	35.68	20	2							
17	4	223	62	3	3	1200	H	35 42 S	118 27 E	20.1	35.71	22	2	22	1	20	2	02	7	1023.0
17	4	224	62	3	3	1330	H	35 50 S	118 28 E	20.0	35.71	22	2	22	1	20	2	02	7	1022.0
17	4	225	62	3	3	1800	H	36 00 S	118 29 E	19.5	35.71	22	3	22	1	20	2	02	7	1022.0
17	4	226	62	3	4	0600	H	36 08 S	118 27 E	18.9	35.73	24	3	24	1	18	3	01	7	1022.0
17	4	227	62	3	4	0730	H	36 19 S	118 26 E	18.7	35.66									
17	4	228	62	3	4	0900	H	36 24 S	118 26 E			25	3	25	2	18	2	02	7	1022.0
17	4	229	62	3	4	1200	H	36 24 S	118 26 E			25	3	25	2	23	3	02	8	1021.0
17	4	230	62	3	4	1530	H	36 08 S	118 07 E	19.0	35.68	25	2	25	1	13	2	01	7	1021.0
17	4	231	62	3	4	1630	H	35 56 S	118 03 E	19.1	35.64									
17	4	232	62	3	4	1800	H	35 45 S	117 58 E	19.1	35.68	25	2	25	1	23	1	01	8	1021.0
17	4	233	62	3	4	1930	H	35 37 S	117 55 E	19.2	35.68									
17	4	234	62	3	5	0730	H	35 35 S	118 00 E	19.4	35.68	29	2	29	1	23	1	01	8	1021.0
17	4	235	62	3	5	0900	H	35 31 S	117 47 E	20.2	35.81	29	2	29	1	23	1	02	8	1022.0
17	4	236	62	3	5	1030	H	35 20 S	117 42 E	20.7	35.81									
17	4	237	62	3	5	1200	H	35 09 S	117 55 E	20.9	35.79	29	1	29	1	23	1	01	7	1022.0
17	4	238	62	3	5	1330	H	35 09 S	117 55 E	21.0	35.79									
17	4	239	62	3	8	0600	H	35 02 S	118 02 E	20.5	36.02	11	4	11	2	14	3	02	6	1019.0
17	4	240	62	3	8	0730	H	34 56 S	118 24 E	20.4	35.90	11	4	11	2	14	3	02	6	1019.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	4	241	62	3	9	1600	H 35 03	S 118 15	E 20.6	36.04	10	3	10	1	09	1	01	8	1025.0
17	4	242	62	3	9	1800	H 34 58	S 118 25	E 20.5	36.00	10	3	10	1	12	2	01	8	1025.0
17	4	243	62	3	9	2000	H 34 54	S 118 45	E 20.2	35.86									
17	4	244	62	3	9	2200	H 34 50	S 119 05	E 20.1	35.77									
17	4	245	62	3	9	2400	H 34 45	S 119 24	E 19.8	35.77	10	3	10	1	12	2	01	8	1024.0
17	4	246	62	3	10	0200	H 34 41	S 119 44	E 18.9	35.61									
17	4	247	62	3	10	0400	H 34 37	S 120 04	E 19.2	35.61	09	2	09	1	12	2	02	7	1024.0
17	4	248	62	3	10	0600	H 34 32	S 120 24	E 18.8	35.59	08	2	08	2	23	2	02	7	1022.0
17	4	249	62	3	10	0800	H 34 27	S 120 42	E 19.0	35.58	08	2	08	2	23	2	02	7	1022.0
17	4	250	62	3	10	1000	H 34 17	S 121 02	E 19.9	35.84	08	3	08	2	23	2	02	7	1022.0
17	4	251	62	3	10	1200	H 34 21	S 121 17	E 19.9	35.86	08	2	08	2	23	2	02	7	1021.0
17	4	252	62	3	10	1400	H 34 11	S 121 38	E 20.0	35.84	09	3	09	2	10	2	01	6	1017.0
17	4	253	62	3	10	1600	H 34 00	S 121 51	E 19.8	35.77	09	5	09	3	10	3	01	8	1017.0
17	4	254	62	3	11	0800	H 33 54	S 121 57	E 19.8	35.82	11	1	00	0	00	0	02	5	1011.0
17	4	255	62	3	13	0700	H 33 55	S 121 39	E 19.8	35.79	07	3	07	1	09	1	02	5	1022.0
17	4	256	62	3	13	0900	H 34 01	S 122 16	E 19.8	35.82	07	4	07	2	08	2	02	6	1022.0
17	4	257	62	3	13	1100	H 33 59	S 122 45	E 19.8	35.95	09	3	09	2	09	2	02	6	1021.0
17	4	258	62	3	13	1300	H 33 59	S 122 54	E 19.8	35.95	09	5	09	2	09	2	02	6	1020.0
17	4	259	62	3	13	1500	H 34 04	S 123 11	E 19.7	36.49	08	6	08	2	09	2	01	7	1019.0
17	4	260	62	3	16	0900	H 34 11	S 123 20	E 19.7	35.95	17	3	17	1	19	2	01	7	1017.0
17	4	261	62	3	16	1100	H 34 24	S 123 30	E 19.8	36.04	23	3	23	1	23	2	01	7	1017.0
17	4	262	62	3	16	1200	H 34 32	S 123 34	E 20.0	36.06	23	3	23	1	19	2	01	7	1017.0
17	4	263	62	3	16	1300	H 34 39	S 123 38	E 20.1	35.97	23	3	23	1	19	2	01	7	1017.0
17	4	264	62	3	16	1500	H 34 34	S 123 56	E 20.1	35.97	21	3	21	1	19	2	01	8	1017.0
17	4	265	62	3	16	1700	H 34 23	S 124 08	E 19.9	35.95	21	3	21	1	19	2	01	7	1018.0
17	4	266	62	3	16	1800	H 34 15	S 124 11	E 20.1	35.93	21	2	21	1	19	2	01	7	1018.0
17	4	267	62	3	17	0700	H 34 06	S 124 32	E 19.8	36.02	24	3	24	1	25	2	01	7	1020.0
17	4	268	62	3	17	0830	H 34 09	S 124 43	E										
17	4	269	62	3	17	0900	H 34 11	S 124 47	E 19.9	36.00	23	3	23	2	21	2	01	7	1021.0
17	4	270	62	3	17	1000	H 34 06	S 124 51	E 19.9	36.00	23	3	23	2	21	2	01	7	1021.0
17	4	271	62	3	17	1100	H 34 06	S 124 55	E 19.9	36.00	23	2	23	1	21	2	02	7	1021.0
17	4	272	62	3	17	1300	H 33 57	S 125 08	E 20.2	36.00	23	2	23	1	21	2	01	8	1021.0
17	4	273	62	3	17	1500	H 33 58	S 125 21	E 19.9	35.79	23	3	23	1	21	2	01	8	1021.0
17	4	274	62	3	17	1700	H 34 06	S 125 06	E 20.2	36.00	20	2	20	1	20	2	01	8	1021.0
17	4	275	62	3	17	1800	H 34 07	S 124 56	E		20	2	20	1	20	2	01	7	1021.0
17	4	276	62	3	17	1900	H 34 07	S 124 54	E 20.2	36.08	17	1	17	1	18	2	01	7	1021.0
17	4	277	62	3	18	0700	H 34 05	S 125 02	E 20.1	36.04	05	2	05	1	02	2	01	7	1022.0
17	4	278	62	3	18	0900	H 34 09	S 124 47	E 20.0	36.00	05	2	05	1	02	2	01	7	1023.0
17	4	279	62	3	18	1025	H 34 11	S 124 34	E										
17	4	280	62	3	18	1100	H 34 12	S 124 29	E 19.9	36.00	06	2	06	2	04	2	01	8	1023.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	4	281	62	3	18	1300	H 34 15	S 124 10 E	20.1	36.00	06	4	06	2	04	3	01	8	1022.0
17	4	282	62	3	18	1430	H 34 16	S 123 54 E											
17	4	283	62	3	18	1500	H 34 16	S 123 50 E	19.9	36.04	07	4	07	2	04	3	01	6	1022.0
17	4	284	62	3	18	1700	H 34 13	S 123 30 E	19.8	35.97	07	4	07	2	06	3	01	7	1021.0
17	4	285	62	3	18	1900	H 34 04	S 123 13 E	19.9	36.02	08	4	08	3	08	3	01	7	1021.0
17	4	286	62	3	19	0800	H 34 00	S 123 06 E	20.0	36.06	08	5	08	2	08	3	02	7	1020.0
17	4	287	62	3	19	1000	H 33 56	S 122 49 E	20.1	36.02	08	3	08	2	08	1	03	6	1020.0
17	4	288	62	3	19	1200	H 33 59	S 122 34 E	19.9	36.00	27	4	27	2	25	2	61	5	1020.0
17	4	289	62	3	19	1400	H 34 01	S 122 14 E	19.9	36.00	27	1	27	1	25	1	02	6	1020.0
17	4	290	62	3	19	1600	H 33 55	S 122 01 E	19.9	35.91	05	1	05	1	07	1	61	5	1019.0
17	4	291	62	3	21	1500	H 33 55	S 121 43 E	20.2	35.91	16	4	16	2	14	3	01	7	1023.0
17	4	292	62	3	22	0300	H 34 10	S 121 25 E	20.0	36.04	06	2	06	1	23	2	01	7	1024.0
17	4	293	62	3	22	0500	H 34 24	S 121 15 E	19.9	36.02	07	3	07	1	23	2	01	7	1025.0
17	4	294	62	3	22	0600	H 34 31	S 121 10 E	19.8	35.99	07	2	07	1	23	2	01	7	1025.0
17	4	295	62	3	22	0800	H 34 45	S 121 00 E	19.5	35.79	07	2	07	1	23	2	01	8	1026.0
17	4	296	62	3	22	1000	H 34 55	S 120 52 E	19.5	35.79	07	2	07	1	23	2	01	8	1026.0
17	4	297	62	3	22	1100	H 34 58	S 120 49 E			07	2	07	1	23	2	01	8	1026.0
17	4	298	62	3	22	1500	H 34 58	S 120 47 E	19.8	35.79	07	2	07	1	23	2	01	8	1026.0
17	4	299	62	3	22	1700	H 34 58	S 120 28 E	19.8	35.86	07	2	07	1	23	2	01	8	1025.0
17	4	300	62	3	22	1900	H 34 58	S 120 13 E	20.0	35.86	07	2	07	1	23	2	01	7	1025.0
17	4	301	62	3	22	2100	H 34 58	S 119 57 E	19.4	35.82	07	1	07	1	23	2	01	7	1025.0
17	4	302	62	3	23	0100	H 34 58	S 119 47 E	19.3	35.82	07	1	07	1	23	2	01	7	1024.0
17	4	303	62	3	23	0300	H 34 58	S 119 31 E	19.3	35.82	05	2	05	1	23	1	01	7	1024.0
17	4	304	62	3	23	0500	H 34 58	S 119 25 E	19.3	35.79	05	2	05	1	23	1	01	7	1023.0
17	4	305	62	3	23	0700	H 34 58	S 119 10 E	19.5	35.82	06	3	06	2	23	2	01	8	1023.0
17	4	306	62	3	23	0900	H 34 58	S 118 50 E	20.7	35.95	07	4	07	2	23	2	00	8	1023.0
17	4	307	62	3	23	1100	H 34 58	S 118 33 E	20.2	36.02	07	2	07	1	23	3	01	7	1023.0
17	4	308	62	3	23	1300	H 35 00	S 118 17 E	20.3	36.02	07	3	07	1	23	3	01	7	1023.0
17	5	309	62	3	27	0700	H 35 12	S 118 01 E	20.2	36.04	20	3	20	2	18	3	01	7	1020.0
17	5	310	62	3	27	0725	H 35 12	S 118 01 E											
17	5	311	62	3	28	1000	H 35 13	S 117 59 E	20.3	36.00	25	1	25	1	18	3	01	7	1024.0
17	5	312	62	3	28	1200	H 35 28	S 117 54 E	20.3	36.02	25	2	25	1	18	3	01	7	1023.0
17	5	313	62	3	28	1400	H 35 27	S 117 34 E	20.5	35.99	25	2	25	1	18	3	01	7	1022.0
17	5	314	62	3	28	1600	H 35 25	S 117 15 E	20.1	35.99	25	4	25	2	18	3	01	7	1022.0
17	5	315	62	3	28	1800	H 35 24	S 116 58 E	20.1	35.93	25	2	25	1	18	3	01	7	1021.0
17	5	316	62	3	28	2100	H 35 23	S 116 37 E	20.3	35.93	25	2	25	1	18	3	01	7	1021.0
17	5	317	62	3	28	2400	H 35 21	S 116 15 E	20.3	35.93	25	2	25	1	18	3	01	7	1021.0
17	5	318	62	3	29	0300	H 35 15	S 115 55 E	20.5	36.00	25	2	25	2	23	3	01	7	1020.0
17	5	319	62	3	29	0600	H 35 10	S 115 39 E	20.4	36.00	25	3	25	1	23	3	01	7	1020.0
17	5	320	62	3	29	0800	H 35 05	S 115 24 E	20.4	36.00	25	3	25	2	23	3	01	7	1020.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	Z	LATITUDE			LONGITUDE			TEMP.	SALINITY	WIND		SEA		SWELL		WEA.	VIS.	BAROM.
																DN.	AMT.	DN.	AMT.	DN.	AMT.			
17	5	321	62	3	29	1000	H	35	00	S	115	08	E	20.7	35.93	25	3	25	2	23	3	01	7	1020.0
17	5	322	62	3	29	1200	H	34	46	S	115	05	E	20.7	35.91	25	4	25	3	23	3	01	7	1020.0
17	5	323	62	3	29	1400	H	34	32	S	115	01	E	20.7	35.91	24	4	24	3	23	4	01	7	1019.0
17	5	324	62	3	29	1600	H	34	19	S	114	58	E	20.8	35.95	23	3	23	2	23	4	01	7	1020.0
17	5	325	62	3	29	1800	H	34	12	S	115	01	E	20.5	36.02	26	2	26	1	23	2	01	7	1020.0
17	5	326	62	3	30	0800	H	34	03	S	114	58	E	20.6	35.91	99	1	23	1	23	2	01	7	1020.0
17	5	327	62	3	30	0925	H	33	53	S	114	57	E											
17	5	328	62	3	30	1000	H	33	49	S	114	56	E	20.4	36.00	29	1	29	1	26	2	01	7	1020.0
17	5	329	62	3	30	1200	H	33	32	S	115	00	E	20.4	36.00	35	2	35	1	26	2	01	7	1020.0
17	5	330	62	3	30	1400	H	33	31	S	114	59	E	20.7	35.95	34	2	34	1	26	2	01	7	1019.0
17	5	331	62	3	30	1500	H	33	22	S	115	01	E	20.9	35.99	32	2	32	1	26	2	01	7	1019.0
17	5	332	62	3	30	1600	H	33	11	S	115	02	E	20.6	36.04	25	2	25	1	26	2	01	7	1019.0
17	5	333	62	3	30	1800	H	33	04	S	115	04	E	20.5	36.06	23	3	23	2	25	2	01	7	1019.0
17	5	334	62	3	31	0600	H	32	52	S	115	03	E	20.5	36.00	20	2	20	1	24	2	01	7	1019.0
17	5	335	62	3	31	0800	H	32	35	S	115	03	E	22.9	35.79	20	2	20	2	24	2	01	7	1018.0
17	5	336	62	3	31	1000	H	32	19	S	115	09	E	23.0	35.77	19	4	19	3	24	3	01	8	1018.0
17	5	337	62	3	31	1200	H	32	06	S	115	21	E	22.1	35.84	19	3	19	2	24	3	01	6	1018.0
17	5	338	62	3	31	1400	H	31	56	S	115	35	E	22.2	35.81	19	4	19	3	24	3	01	7	1018.0
17	5	339	62	3	31	1500	H	32	00	S	115	40	E	20.5	36.47	19	3	19	2	24	2	01	7	1019.0
17	5	340	62	4	8	2100	H	31	56	S	115	35	E	20.5	35.97	10	2	10	1	23	1	01	7	1020.0
17	5	341	62	4	8	2400	H	32	18	S	115	25	E	20.1	36.00	10	1	10	1	23	1	01	7	1020.0
17	5	342	62	4	9	0300	H	32	45	S	115	21	E	20.4	36.00	10	2	10	1	24	1	01	7	1021.0
17	5	343	62	4	9	0600	H	33	11	S	115	17	E	20.4	36.09	10	2	10	1	25	1	01	7	1022.0
17	5	344	62	4	9	0800	H	33	23	S	115	04	E	20.5	36.09	09	3	10	1	25	1	01	7	1023.0
17	5	345	62	4	9	1000	H	33	39	S	114	56	E	20.4	36.04	08	4	08	3	24	3	01	7	1023.0
17	5	346	62	4	9	1030	H	33	43	S	114	56	E											
17	5	347	62	4	9	1200	H	33	55	S	114	55	E	21.8	36.17	08	3	08	2	24	2	01	8	1023.0
17	5	348	62	4	9	1400	H	34	07	S	114	42	E	22.3	35.93	14	4	14	3	21	3	01	8	1022.0
17	5	349	62	4	9	1600	H	34	11	S	115	00	E	20.3	36.22	14	5	14	3	16	3	01	8	1022.0
17	5	350	62	4	10	0900	H	34	19	S	114	57	E	20.5	36.04	10	5	10	3	12	3	01	7	1022.0
17	5	351	62	4	10	1000	H	34	22	S	115	04	E	21.2	35.91	12	5	12	2	14	2	01	7	1023.0
17	5	352	62	4	10	1200	H	34	24	S	115	06	E	21.2	35.99	12	3	12	2	14	2	01	7	1022.0
17	5	353	62	4	10	1500	H	34	36	S	115	25	E	21.6	35.99	14	2	14	1	11	2	01	7	1021.0
17	5	354	62	4	10	1600	H	34	41	S	115	31	E	21.4	36.00	14	2	14	1	11	2	05	7	1021.0
17	5	355	62	4	10	1800	H	34	46	S	115	41	E	20.2	36.11	14	3	14	2	14	2	05	6	1021.0
17	5	356	62	4	10	2100	H	35	05	S	116	03	E	20.3	36.02	12	3	12	2	12	2	01	6	1021.0
17	5	357	62	4	10	2400	H	35	11	S	116	24	E	20.6	36.04	12	4	12	2	12	3	01	6	1022.0
17	5	358	62	4	11	0300	H	35	12	S	116	45	E	20.2	36.04	10	5	10	3	10	3	01	6	1022.0
17	5	359	62	4	11	0600	H	35	14	S	117	06	E	20.1	36.02	09	4	09	3	09	3	01	6	1023.0
17	5	360	62	4	11	0800	H	35	13	S	117	26	E	20.0	36.04	09	4	09	3	09	3	01	7	1024.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	5	361	62	4	11	0900	H 35 11 S	117 36 E	20.1	36.04	09	5	09	3	09	3	01	7	1025.0
17	5	362	62	4	11	0935	H 35 11 S	117 42 E											
17	5	363	62	4	11	1000	H 35 11 S	117 43 E	20.1	36.02	09	5	09	3	09	3	01	7	1025.0
17	5	364	62	4	11	1100	H 35 09 S	117 54 E	20.1	36.04	09	4	09	3	09	3	01	7	1025.0
17	5	365	62	4	11	1200	H 35 08 S	118 02 E	20.0	36.06	09	4	09	3	09	3	01	7	1025.0
17	5	366	62	4	13	0730	H 35 04 S	118 03 E	19.8	36.09	06	4	06	2	10	2	01	7	1025.0
17	5	367	62	4	13	0900	H 35 06 S	118 12 E			06	4	06	2	10	2	01	7	1025.0
17	5	368	62	4	13	0930	H 35 07 S	118 17 E	20.1	36.06									
17	5	369	62	4	13	1105	H 35 10 S	118 34 E											
17	5	370	62	4	13	1125	H 35 11 S	118 38 E											
17	5	371	62	4	13	1130	H 35 11 S	118 39 E	20.2	36.06									
17	5	372	62	4	13	1200	H 35 09 S	118 45 E			06	4	06	3	10	3	02	7	1025.0
17	5	373	62	4	13	1330	H 35 03 S	118 42 E	20.0	36.08	08	4	08	3	10	3	01	7	1024.0
17	5	374	62	4	13	1500	H 34 57 S	118 32 E			09	4	09	3	10	3	01	7	1024.0
17	5	375	62	4	13	1625	H 34 55 S	118 24 E											
17	5	376	62	4	13	1630	H 34 55 S	118 24 E	20.0	36.86	10	4	10	2	10	3	01	7	1023.0
17	5	377	62	4	14	0600	H 35 00 S	118 12 E			05	1	05	2	10	2	45	1	1024.0
17	5	378	62	4	14	0800	H 35 03 S	118 03 E	20.0	36.06	00	0	00	0	10	3	45	1	1024.0
17	5	379	62	4	14	0900	H 35 02 S	118 03 E			27	1	27	1	09	3	10	3	1021.0
17	5	380	62	4	16	0600	H 35 02 S	117 53 E			00	0	00	0	00	0	45	1	1021.0
17	5	381	62	4	16	0800	H 35 08 S	118 02 E	20.1	36.02	05	1	00	0	05	2	10	2	1021.0
17	5	382	62	4	16	0900	H 35 17 S	118 02 E			27	1	27	1	09	3	01	4	1021.0
17	5	383	62	4	16	1000	H 35 24 S	118 03 E	20.8	35.97	27	1	27	1	09	3	01	5	1021.0
17	5	384	62	4	16	1200	H 35 43 S	118 04 E	21.1	36.00	27	2	27	1	09	3	01	5	1021.0
17	5	385	62	4	16	1400	H 35 31 S	117 56 E	21.1	36.02	27	1	27	1	09	3	01	6	1022.0
17	5	386	62	4	16	1600	H 35 16 S	117 51 E	20.8	36.02	14	1	18	1	09	3	01	6	1022.0
17	5	387	62	4	17	0615	H 35 02 S	117 54 E			18	4	18	3	18	3	02	6	1023.0
17	5	388	62	4	17	0800	H 35 08 S	117 56 E	20.6	36.15	18	4	18	3	18	4	02	6	1023.0
17	5	389	62	4	17	0820	H 35 08 S	117 56 E											
17	5	390	62	4	17	0900	H 35 08 S	117 54 E			18	4	18	3	18	4	02	6	1023.0
17	5	391	62	4	17	0935	H 35 09 S	117 53 E											
17	5	392	62	4	17	1000	H 35 09 S	117 53 E	20.4	36.00	18	4	18	3	18	4	02	6	1023.0
17	5	393	62	4	17	1200	H 35 08 S	117 52 E	20.1	36.06	18	4	18	3	18	4	02	6	1024.0
17	5	394	62	4	17	1300	H 35 08 S	117 52 E			18	6	18	4	18	4	02	6	1024.0
17	5	395	62	4	17	1400	H 35 07 S	117 50 E	20.2	36.00	18	4	18	3	18	4	02	6	1024.0
17	5	396	62	4	17	1445	H 35 09 S	117 56 E											
17	5	397	62	4	19	0600	H 35 02 S	117 53 E			14	4	00	0	00	0	01	6	1021.0
17	5	398	62	4	19	0800	H 35 07 S	118 01 E			14	4	14	2	09	3	02	6	1021.0
17	5	399	62	4	19	0820	H 35 09 S	117 56 E	20.2	36.93									
17	5	400	62	4	19	0830	H 35 09 S	117 53 E											

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	5	401	62	4	19	0900	H 35	09 S 117	53 E			14	4	14	2	09	3	02	7	1021.0
17	5	402	62	4	19	1100	H 35	09 S 117	55 E											
17	5	403	62	4	19	1200	H 35	08 S 118	02 E			14	4	14	2	09	3	02	7	1022.0
17	5	404	62	4	19	1300	H 35	05 S 118	05 E											
17	5	405	62	4	19	1400	H 35	08 S 117	55 E											
17	5	406	62	4	19	1500	H 35	07 S 117	56 E			14	4	14	3	09	3	02	7	1019.0
17	5	407	62	4	19	1515	H 35	07 S 117	56 E											
17	5	408	62	4	19	1600	H 35	07 S 117	59 E			14	5	14	3	16	3	02	7	1019.0
17	5	409	62	4	23	0630	H 35	02 S 117	53 E			36	1	00	0	00	0	01	6	1020.0
17	5	410	62	4	23	0730	H 35	07 S 118	01 E	20.1	36.91	36	2	36	1	18	2	01	6	1020.0
17	5	411	62	4	23	0800	H 35	07 S 118	01 E											
17	5	412	62	4	23	0900	H 35	03 S 118	04 E			05	2	05	2	18	3	01	7	1021.0
17	5	413	62	4	23	1000	H 35	03 S 118	10 E	20.4	36.91	05	3	05	2	18	3	01	7	1021.0
17	5	414	62	4	23	1200	H 35	09 S 118	02 E			05	3	05	2	18	3	01	7	1021.0
17	5	415	62	4	23	1400	H 35	08 S 117	59 E			06	4	06	2	18	3	02	6	1021.0
17	5	416	62	4	23	1500	H 35	07 S 117	58 E			07	4	07	3	18	3	02	6	1021.0
17	5	417	62	4	23	1600	H 35	08 S 117	59 E			09	4	09	3	18	3	02	6	1021.0
17	6	418	62	4	28															
17	6	419	62	4	28															
17	6	420	62	4	28	0900	H 35	08 S 117	57 E	20.4	35,90	32	2	32	1	23	4	00	8	1029.0
17	6	421	62	4	28	1030	H 35	06 S 118	11 E	20.3	35,91	36	2	36	1	23	4	00	8	1028.0
17	6	422	62	4	28	1200	H 35	04 S 118	24 E	20.4	35,91	05	2	05	1	23	4	00	8	1028.0
17	6	423	62	4	28	1330	H 34	59 S 118	34 E	20.4	35,91	09	2	09	1	23	4	00	8	1027.0
17	6	424	62	4	28	1500	H 35	11 S 118	35 E	21.0	35,88	09	2	09	1	23	1	00	8	1026.0
17	6	425	62	4	28	1630	H 35	14 S 118	24 E	20.9	35,88	09	2	09	1	23	1	00	8	1026.0
17	6	426	62	4	28	1800	H 35	09 S 118	11 E	20.6	35,91	09	2	09	1	23	1	00	8	1026.0
17	6	427	62	4	29	0730	H 35	04 S 117	58 E	20.0	35,91	36	1	00	0	00	0	00	8	1026.0
17	6	428	62	4	29	0820	H 35	08 S 117	58 E	20.8	35,91	23	1	23	1	23	1	03	8	1027.0
17	6	429	62	4	29	0845	H 35	08 S 117	57 E	20.6	35,90	23	1	23	1	23	1	03	8	1027.0
17	6	430	62	4	29	1030	H 35	08 S 117	50 E	20.8	35,88	23	4	23	1	23	1	50	6	1026.0
17	6	431	62	4	29	1200	H 35	08 S 117	57 E	20.6	35,90	23	4	23	3	23	1	50	6	1026.0
17	6	432	62	4	29	1345	H 35	05 S 118	08 E	20.6	35,90	23	4	23	3	23	1	50	6	1026.0
17	6	433	62	4	29	1445	H 35	05 S 118	08 E			23	4	23	3	23	1	50	6	1026.0
17	6	434	62	4	29	1540	H 35	03 S 118	03 E	20.2	35,91	23	4	23	3	23	1	50	6	1026.0
17	6	435	62	4	30	0800	H 35	03 S 118	00 E	19.6	35,93	11	4	11	2	11	1	02	8	1029.0
17	6	436	62	4	30	0900	H 35	04 S 118	07 E	20.5	35,90	11	4	11	2	18	4	02	8	1029.0
17	6	437	62	4	30	1005	H 35	08 S 118	00 E			11	4	11	2	18	4	02	8	1029.0
17	6	438	62	4	30	1035	H 35	08 S 117	57 E			11	4	11	2	18	4	02	8	1029.0
17	6	439	62	4	30	1200	H 35	10 S 117	42 E	20.5	35,91	11	4	11	2	18	4	02	8	1029.0
17	6	440	62	4	30	1420	H 35	06 S 117	47 E			09	5	09	3	16	4	02	8	1027.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME Z	LATITUDE	LONGITUDE	TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	6	441	62	4	30	1445	N 35 07	S 117 51 E			09	5	09	3	16	4	02	8	1027.0
17	6	442	62	4	30	1500	N 35 07	S 117 52 E	20.3	35.91	09	5	93	0	16	4	02	8	1027.0
17	6	443	62	4	30	1530	N 35 07	S 117 56 E			09	5	09	3	16	4	01	8	1027.0
17	6	444	62	4	30	1630	N 35 08	S 118 00 E			09	5	09	3	16	4	01	8	1027.0
17	6	445	62	4	30	1800	N 35 03	S 118 03 E	20.0	35.90	09	5	09	3	16	4	01	8	1027.0
17	6	446	62	5	1	0720	N 35 03	S 118 01 E			04	4	09	1	18	1	03	8	1025.0
17	6	447	62	5	1	0820	N 35 07	S 118 01 E			04	4	09	1	18	4	03	8	1025.0
17	6	448	62	5	1	0900	N 35 08	S 118 00 E	19.9	35.91	04	4	09	1	18	4	02	8	1025.0
17	6	449	62	5	1	0930	N 35 08	S 117 57 E			04	4	09	1	18	4	02	8	1025.0
17	6	450	62	5	1	1000	N 35 08	S 117 56 E			04	4	09	1	18	4	02	8	1025.0
17	6	451	62	5	1	1100	N 35 07	S 117 53 E			04	4	09	1	09	1	02	8	1025.0
17	6	452	62	5	1	1200	N 35 11	S 117 53 E	20.0	35.91	04	4	09	1	09	1	02	8	1025.0
17	6	453	62	5	1	1340	N 35 03	S 118 03 E			09	3	09	1	00	0	02	8	1025.0
17	6	454	62	5	1	1515	N 35 08	S 117 57 E	20.2	35.90	09	3	09	3	00	0	01	8	1025.0
17	6	455	62	5	3	0800	N 35 08	S 118 01 E			04	1	04	1	00	0	02	8	1021.0
17	6	456	62	5	3	1000	N 35 08	S 117 57 E			04	1	04	1	00	0	02	8	1021.0
17	6	457	62	5	3	1200	N 35 11	S 117 53 E	20.3	35.93	04	1	04	1	00	0	02	8	1021.0
17	6	458	62	5	3	1330	N 35 08	S 118 01 E			04	1	04	1	22	1	05	7	1021.0
17	6	459	62	5	4	0730	N 35 08	S 118 00 E			36	1	99	1	18	1	10	6	1020.0
17	6	460	62	5	4	0905	N 35 08	S 118 00 E	20.4	35.93	36	1	99	1	18	1	10	6	1020.0
17	6	461	62	5	4	0945	N 35 09	S 118 00 E			36	1	36	1	18	1	02	7	1020.0
17	6	462	62	5	4	1010	N 35 08	S 118 02 E			36	1	36	1	18	1	02	7	1020.0
17	6	463	62	5	4	1200	N 34 58	S 118 18 E	20.6	35.84	00	0	00	0	18	1	02	7	1020.0
17	6	464	62	5	4	1300	N 34 54	S 118 25 E	20.0	35.88	18	1	18	1	18	1	02	7	1020.0
17	6	465	62	5	4	1400	N 34 55	S 118 28 E			22	3	18	2	18	1	02	7	1019.0
17	6	466	62	5	4	1500	N 34 56	S 118 25 E	20.1	35.88	22	3	18	2	18	1	02	7	1019.0
17	6	467	62	5	4	1635	N 35 01	S 118 13 E			22	3	18	3	18	1	02	6	1019.0
17	6	468	62	5	5	0900	N 35 08	S 118 00 E	20.4	35.84	09	3	09	2	22	1	02	6	1023.0
17	6	469	62	5	5	1000	N 35 07	S 117 51 E			09	3	09	2	22	1	01	8	1023.0
17	6	470	62	5	5	1045	N 35 08	S 117 55 E			11	4	11	3	22	1	01	8	1023.0
17	6	471	62	5	5	1115	N 35 08	S 117 58 E			11	4	11	3	22	1	01	8	1023.0
17	6	472	62	5	5	1200	N 35 08	S 118 02 E	20.4	35.84	11	4	11	3	22	1	01	8	1023.0
17	6	473	62	5	5	1300	N 35 05	S 118 04 E			11	4	11	3	22	1	01	8	1023.0
17	6	474	62	5	5	1400	N 35 08	S 118 01 E			11	4	11	3	22	1	01	8	1023.0
17	6	475	62	5	5	1500	N 35 03	S 118 04 E	20.3	35.86	11	4	11	3	22	1	01	8	1023.0
17	6	476	62	5	7	0800	N 35 08	S 118 01 E	20.4	35.86	32	3	32	2	22	1	50	8	1022.0
17	6	477	62	5	7	1000	N 35 03	S 118 04 E			32	2	32	1	00	0	01	8	1022.0
17	6	478	62	5	7	1200	N 35 08	S 117 56 E	20.6	35.86	32	2	32	1	22	1	03	8	1022.0
17	6	479	62	5	7	1300	N 35 07	S 117 52 E			18	2	99	2	18	1	01	8	1022.0
17	6	480	62	5	7	1500	N 35 06	S 118 03 E	20.8	35.86	09	1	99	1	18	1	02	8	1022.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	Z	LATITUDE			LONGITUDE			TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	6	481	62	5	7	1600	H	35	08	S	118	01	E			09	1	09	1	18	1	02	8	1022.0
17	6	482	62	5	8	0900	H	35	08	S	118	01	E	20.4	35.86	11	3	11	2	18	1	02	8	1022.0
17	6	483	62	5	8	1200	H	35	08	S	117	56	E			11	4	11	3	18	1	03	8	1024.0
17	7	484	62	5	10	0825	H	35	07	S	118	01	E	20.3	35.84	45	2	45	1	18	1	02	8	1024.0
17	7	485	62	5	10	1130	H	35	08	S	117	55	E	20.3	35.84	45	1	45	1	18	1	02	8	1025.0
17	7	486	62	5	10	1500	H	35	07	S	118	01	E	20.3	35.84	09	6	09	1	12	1	02	8	1024.0
17	7	487	62	5	12	0900	H	35	07	S	118	01	E	20.7	35.84	32	2	32	1	09	1	01	8	1015.0
17	7	488	62	5	12	1200	H	35	04	S	118	04	E	20.6	35.81	32	1	32	1	09	1	02	8	1015.0
17	7	489	62	5	17	0900	H	35	08	S	118	01	E	20.1	35.88	29	4	29	2	23	7	03	8	1026.0
17	7	490	62	5	17	1200	H	35	03	S	118	03	E	19.8	35.77	32	1	27	2	25	1	50	8	1026.0
17	7	491	62	5	17	1500	H	35	07	S	117	57	E	20.1	35.77	27	4	27	3	22	4	18	8	1025.0
17	7	492	62	5	18	0900	H	35	08	S	117	55	E	20.2	35.77	29	2	29	1	20	1	50	7	1026.0
17	7	493	62	5	18	1200	H	35	02	S	118	12	E	19.8	35.81	32	2	32	1	20	1	02	8	1026.0
17	8	494	62	5	28	0900	H	35	08	S	117	59	E	19.8	35.82	02	5	02	1	21	1	50	8	1003.0
17	8	495	62	5	28	1200	H	35	07	S	118	01	E	19.6	35.81	02	5	02	1	21	1	62	8	997.0
17	8	496	62	5	28	1500	H	35	07	S	118	01	E	18.9	35.81	03	7	03	3	03	1	62	8	993.0
17	8	497	62	6	4	0900	H	35	07	S	118	01	E	19.3	35.73	31	4	31	2	22	2	01	8	1015.0
17	8	498	62	6	4	1200	H	35	04	S	118	04	E	19.2	35.73	27	6	27	2		2	01	8	1018.0
17	8	499	62	6	4	1500	H	35	08	S	117	54	E	19.2	35.71	27	5	27	2	22	2	03	8	1015.0
17	8	500	62	6	5	0900	H	35	07	S	118	01	E	19.5	35.71	02	2	02	2	21	2	01	8	1018.0
17	8	501	62	6	6	1000	H	35	07	S	118	01	E	19.7	35.77	27	2	27	1	27	1	03	8	1018.0
17	8	502	62	6	7	1000	H	35	04	S	118	04	E	19.4	35.71	34	3	34	2	21	1	01	8	1021.0
17	8	503	62	6	7	1530	H	35	04	S	118	04	E	19.4	35.81	29	4	31	2	21	2	01	8	1021.0
17	8	504	62	6	8	0930	H	34	58	S	118	14	E	19.5	35.75	31	3	31	1	21	1	03	8	1021.0
17	8	505	62	6	8	1330	H	35	01	S	118	13	E	19.6	35.75	31	1	31	0	24	0	02	8	1021.0
17	8	506	62	6	10	0920	H	35	07	S	118	01	E	19.4	35.73	31	1	31	0	24	0	02	8	1021.0
17	8	507	62	6	11	0900	H	35	02	S	118	11	E	19.4	35.73	33	3	33	1	24	0	02	8	1011.0
17	8	508	62	6	11	1240	H	35	07	S	118	01	E			31	5	31	2	18	1	02	8	1007.0
17	8	509	62	6	11	1500	H	35	08	S	117	55	E			27	5	27	2	21	1	52	7	1005.0
17	8	510	62	6	14	0930	H	35	05	S	118	02	E	19.4		27	1	27	1			52	6	1011.0
17	8	511	62	6	14	1200	H	35	07	S	118	01	E	19.4	35.73	31	6	31	2	22	1	02	8	1022.0
17	8	512	62	6	14	1500	H	35	04	S	118	04	E	19.4	35.75	31	4	31	2	22	1	50	8	1022.0
17	8	513	62	6	15	0900	H	35	07	S	118	01	E	19.6	35.71	34	4	34	1	24	1	03	8	1020.0
17	8	514	62	6	15	1200	H	35	04	S	118	04	E	19.3	35.73	29	5	29	1			01	8	1019.0
17	8	515	62	6	15	1500	H	35	01	S	118	13	E	19.4	35.73	29	3	29	1	21	1	02	8	1018.0
17	8	516	62	6	19	1000	H	35	04	S	118	04	E			30	4	30	1	24	1	02	8	1020.0
17	8	517	62	6	19	1200	H	35	07	S	118	01	E	19.2	35.52	29	5	29	3	21	3	03	8	1020.0
17	8	518	62	6	20	0900	H	35	02	S	118	09	E			25	4	25	2	18	7	03	8	1022.0
17	8	519	62	6	20	1250	H	34	53	S	118	27	E			25	2	25	2	18	7	50	8	1023.0
17	8	520	62	6	20	1500	H	35	04	S	118	04	E			22	4	22	3	18	5	50	8	1023.0

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	Z	LATITUDE			LONGITUDE			TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	9	521	62	6	24	1015	H	35	07	S	117	55	E	18.9	35.71									
17	9	522	62	6	24	1215	H	35	03	S	118	04	E	19.0	35.71	27	5	27	2	22	1	18	6	1024.0
17	9	523	62	6	25	0940	H	35	08	S	117	59	E	18.9	35.71	27	3	27	1	23	1	01	8	1028.0
17	9	524	62	6	25	2115	H	35	04	S	117	56	E	16.2	35.57	34	2	34	1	00	0	03	7	1026.0
17	9	525	62	6	26	0955	H	35	04	S	118	02	E	18.8	35.66	34	6	34	2	18	1	03	8	1021.0
17	9	526	62	6	27	1200	H	35	09	S	117	59	E	19.0	35.75	29	5	29	2	22	2	01	8	1012.0
17	9	527	62	6	30	1025	H	35	07	S	117	55	E	18.2	35.66	30	3	30	1	00	0	01	8	1030.0
17	9	528	62	7	1	1220	H	34	55	S	118	25	E	18.6	35.70	99	1	99	9	20	2	01	8	1034.0
17	9	529	62	7	1	1520	H	35	02	S	118	12	E	18.8	35.73	99	1	99	1	20	2	01	8	1032.0
17	9	530	62	7	3	0910	H	35	11	S	117	53	E	19.0	35.73	33	2	33	1	23	1	45	6	1032.0
17	9	531	62	7	3	1200	H	35	12	S	117	44	E	19.0	35.71	99	1	99	1	23	1	01	8	1032.0
17	9	532	62	7	4	0907	H	35	12	S	117	47	E	19.2	35.73	06	1	99	1	23	1	00	8	1032.0
17	9	533	62	7	4	1630	H	35	08	S	117	59	E	19.2	35.73	99	1	99	1	23	1	00	8	1030.0
17	9	534	62	7	5	1000	H	35	12	S	118	02	E	19.1	35.73	00	3	00	1	99	1	01	8	1030.0
17	10	535	62	7	7	0900	H	34	47	S	118	40	E	18.4	35.75	32	5	32	1	99	1	03	8	1020.0
17	10	536	62	7	7	1200	H	34	36	S	119	08	E	18.4	35.75	31	6	31	2	99	1	03	8	1020.0
17	10	537	62	7	8	0300	H	34	16	S	120	06	E	18.1	35.75									
17	10	538	62	7	8	0600	H	34	11	S	120	38	E	18.4	35.73									
17	10	539	62	7	8	0900	H	34	06	S	121	10	E	18.4	35.75	18	5	18	2	99	1	03	8	1026.0
17	10	540	62	7	8	1200	H	34	02	S	121	41	E	18.1	35.77	18	5	18	2	99	1	03	8	1025.0
17	10	541	62	7	9	1200	H	33	59	S	123	25	E	17.8	35.91	32	3	32	1	18	1	01	8	1021.0
17	10	542	62	7	9	1500	H	33	55	S	123	56	E	17.6	35.82	05	5	05	2	18	1	01	7	1019.0
17	10	543	62	7	9	1800	H	33	49	S	124	20	E	17.4	35.82	05	6	05	3	18	1	01	8	1019.0
17	10	544	62	7	9	2100	H	33	34	S	124	55	E	17.0	35.86	04	7	04	4	99	1			1019.0
17	10	545	62	7	9	2359	H	33	22	S	125	11	E	17.0	35.88									
17	10	546	62	7	10	0600	H	33	00	S	125	45	E	17.2	35.88									
17	10	547	62	7	10	1200	H	32	32	S	126	25	E	16.7		04	4	02	3	99	1	00	7	1016.0
17	10	548	62	7	10	1500	H	32	27	S	126	41	E	16.2	36.18	02	4	02	2	99	1	00	7	1014.0
17	10	549	62	7	10	1800	H	32	23	S	127	12	E	16.0	36.29	03	2	03	1	99	1	00	7	1014.0
17	10	550	62	7	10	2100	H	32	19	S	127	41	E	16.2	36.24	07	7	07	4	99	1	00	7	1015.0
17	10	551	62	7	10	2359	H	32	15	S	128	01	E	16.5	36.22									
17	10	552	62	7	11	0300	H	32	09	S	128	23	E	16.6	36.29									
17	10	553	62	7	11	0600	H	32	03	S	128	42	E	16.3	36.31	00	4	00	4	99	1	01	7	1015.0
17	10	554	62	7	11	1000	I	31	46	S	128	57	E	15.8	36.53	00	7	00	4	99	1	01	7	1015.0
17	10	555	62	7	11	1130	I	31	42	S	129	07	E	15.4	36.56	01	3	02	3	99	1	01	7	1015.0
17	10	556	62	7	11	1430	I	31	39	S	129	38	E	15.8	36.58	02	3	02	1	99	1	03	8	1012.0
17	10	557	62	7	11	1730	I	31	37	S	130	09	E	15.9	36.62	07	2	07	1	99	1	01	8	1012.0
17	10	558	62	7	11	2030	I	31	44	S	130	37	E	16.0	36.56	07	4	07	2	99	1	01	7	1014.0
17	10	559	62	7	11	2329	I	31	52	S	131	04	E	16.1	36.60									
17	10	560	62	7	12	0230	I	32	01	S	131	30	E	16.8	36.58									

VESSEL	CRUISE	STATION NUMBER	YR.	MTH.	DAY	TIME	Z	LATITUDE			LONGITUDE			TEMP.	SALINITY	WIND DN.	WIND AMT.	SEA DN.	SEA AMT.	SWELL DN.	SWELL AMT.	WEA.	VIS.	BAROM.
17	10	561	62	7	12	0530	I	32	08	S	131	56	E	16.8	36.55									
17	10	562	62	7	12	0830	I	32	12	S	132	23	E	15.7	36.42	07	4	07	1	99	1	03	7	1016.0
17	10	563	62	7	12	1130	I	32	13	S	132	47	E	16.1	36.31	07	4	07	1	99	1	03	7	1018.0
17	10	564	62	7	12	1430	I	32	15	S	133	16	E	14.9		08	1	08	1	99	1	03	8	1017.0
17	10	565	62	7	13	1130	I	32	38	S	133	44	E			08	1	08	1	23	2	01	8	1023.0
17	10	566	62	7	13	1430	I	32	59	S	134	01	E			23	1	23	1	23	2	01	8	1022.0
17	10	567	62	7	13	1730	I	33	20	S	134	20	E			16	1	16	1	23	2	01	8	1022.0
17	10	568	62	7	13	2030	I	33	40	S	134	37	E	15.3		17	1	17	1	23	2	01	8	1024.0
17	10	569	62	7	13	2329	I	34	03	S	134	45	E	15.4										
17	10	570	62	7	14	0230	I	34	27	S	134	53	E	16.4										
17	10	571	62	7	14	0530	I	34	50	S	135	10	E	16.4										
17	10	572	62	7	14	0830	I	34	58	S	135	39	E	16.6		99	1	99	1	20	1	45	8	1027.0

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 obskervations 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 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