

*Milkes*

PHYSICAL AND CHEMICAL DATA REPORT

UNIVERSITY OF CALIFORNIA    SCRIPPS INSTITUTION OF OCEANOGRAPHY

# data report

PHYSICAL AND CHEMICAL DATA

CalCOFI Cruise 6610  
8-27 October 1966

Special Cruise 6611  
10-13 November 1966

and

CalCOFI Cruise 6612  
2-19 December 1966

SIO Reference 69-2

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Sponsored by  
Marine Research Committee

SIO Reference 69-2

Approved for distribution:

*William A. Nierenberg*  
W. A. Nierenberg, Director

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## INTRODUCTION

The data in this report were collected on Cruises 6610 and 6612 of the California Cooperative Fisheries Investigations (CalCOFI) program by the RV David Starr Jordan of the Bureau of Commercial Fisheries and the RV Alexander Agassiz of the Scripps Institution of Oceanography. Data from Special Cruise 6611 by the RV Alexander Agassiz are also included in this report. The first two figures in this cruise-numbering system represent the year of the cruise; the last two figures, the month. The cruises preceding these in the series are 6601, 6602, 6604, 6605 and 6606 all of which appear in SIO Ref. 68-3; and 6607, 6608, 6609 and Special Cruise 6608 all of which appear in SIO Ref. 68-21.

These data were collected in part by personnel of and processed completely by the Data Collection and Processing Group (DCPG, MLR), Scripps Institution of Oceanography.

### TABULATED DATA

On Cruises ~~6610 and 6612~~ the Nansen-bottle-cast data are tabulated at observed depths; the values at standard depths are computer interpolations according to a modified Rattray technique<sup>1/</sup>, except that some property values at standard depths have been determined from consideration of other information such as bathythermograph traces and adjacent stations. These property values were entered in the "observed" columns to prevent instabilities or to indicate features not covered by the hydrographic cast. The values are indicated by notations (see FOOTNOTES).

Special Cruise 6611 was for a study of oxygen minimums in Santa Barbara Basin. Standard depth values of temperature and salinity were read from STD recordings.

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<sup>1/</sup>Rattray, Maurice (1962). Interpolation errors and oceanographic sampling. Deep-Sea Res. 9: 25-37.

The data tabulated are of the same type as have previously appeared in these reports; the column headings from the computer are explained as follows:

Z	Depth in meters	
T	Temperature	°C
S	Salinity	‰
OXY	Oxygen	ml/L
PHO	Phosphate	µg at/L
SIL	Silicate	µg at/L
NIT	Nitrite	µg at/L
D*T	$\delta_T$	cl/ton
SIG*T	$\sigma_t$	g/L
DD	$\Delta D$	dyn. m

## STANDARD PROCEDURES

### Hydrographic Casts

The observed data have been plotted and then evaluated using the method described by Klein.<sup>2/</sup> This involves consideration of their variation as functions of density or depth and their relation to each other, and comparison with concurrent bathythermograph observations and with previous or adjacent observations. The 125-meter level was introduced into the integration to obtain greater accuracy in the determination of  $\Delta D$ .

To indicate degree of accuracy, temperatures are recorded in tenths of a degree when obtained by bucket thermometer, thermograph, or bathythermograph, while temperatures from reversing thermometers are recorded in hundredths of a degree. The salinity values obtained by salinometer are recorded to three decimal places, provided they meet accepted standards. The values recorded "have a reproducibility of  $\pm 0.004\%$  salinity at the 95 per cent probability level, and a probable accuracy of  $\pm 0.01\%$  salinity or better at the same level of probability."<sup>3/</sup> The values are recorded to two decimal places when only one determination per sample was obtained, or where there is doubt concerning the accuracy of a particular sample, or of all samples on a station. The accuracy of all samples obtained by salinometer and recorded to two decimal places is believed to be equal to or better than those obtained by manual titration.

A hyphen is used to indicate a missing observed value. The time is the time of messenger release. When more than one bottle cast was made on station, messenger times and wire angles are given in order in increasing depth, and a significant change in position during a multiple cast is listed similarly. Multiple casts are indicated by a letter

<sup>2/</sup>Klein, Hans T. A new technique for processing physical oceanographic data. MS.  
<sup>3/</sup>Quotation from Department of Oceanography, University of Washington, Tech. Rep. No. 66, UW Ref. 60-18, October 1960.



following all observed depths of each cast except the cast originating at the surface. Footnotes corresponding to each letter explain the type of cast.

On stations where more than one cast was lowered, slight discrepancies in the property values may be noted. These may be caused by changes in geographical position, real changes with time, slight errors in measurement or a combination of these factors. Values at standard depths in the area of these discrepancies may be determined from reconciliation of the plotted observed values and entered in the "observed" columns with notations.

#### In situ Salinity/Temperature/Depth Recorder

The manufacturer of the STD claims for the temperature an accuracy of  $\pm 0.05^{\circ}\text{C}$  on all ranges with repeatability of  $\pm 0.01^{\circ}\text{C}$  and for the salinity an accuracy of  $\pm 0.03\text{‰}$  on all ranges with repeatability of  $\pm 0.01\text{‰}$ .<sup>4/</sup> Except for the depth range corresponding to the steepest part of the thermocline, where the salinity trace appears to fluctuate more widely than the bottle samples can confirm, the results of this cruise support the manufacturer's claims.

For Special Cruise 6611 the temperature was accepted without correction, but  $-0.09\text{‰}$  was applied to all salinity values.

#### FOOTNOTES

In addition to footnotes, three special notations are used without footnotes because their meaning is always the same.

Values which are not used in interpolation because they seem to be in error without apparent reason are indicated by the following notation.

u: uncertain value

Values at standard levels of depth entered in the observed columns to limit machine interpolations may have either of the following notations.

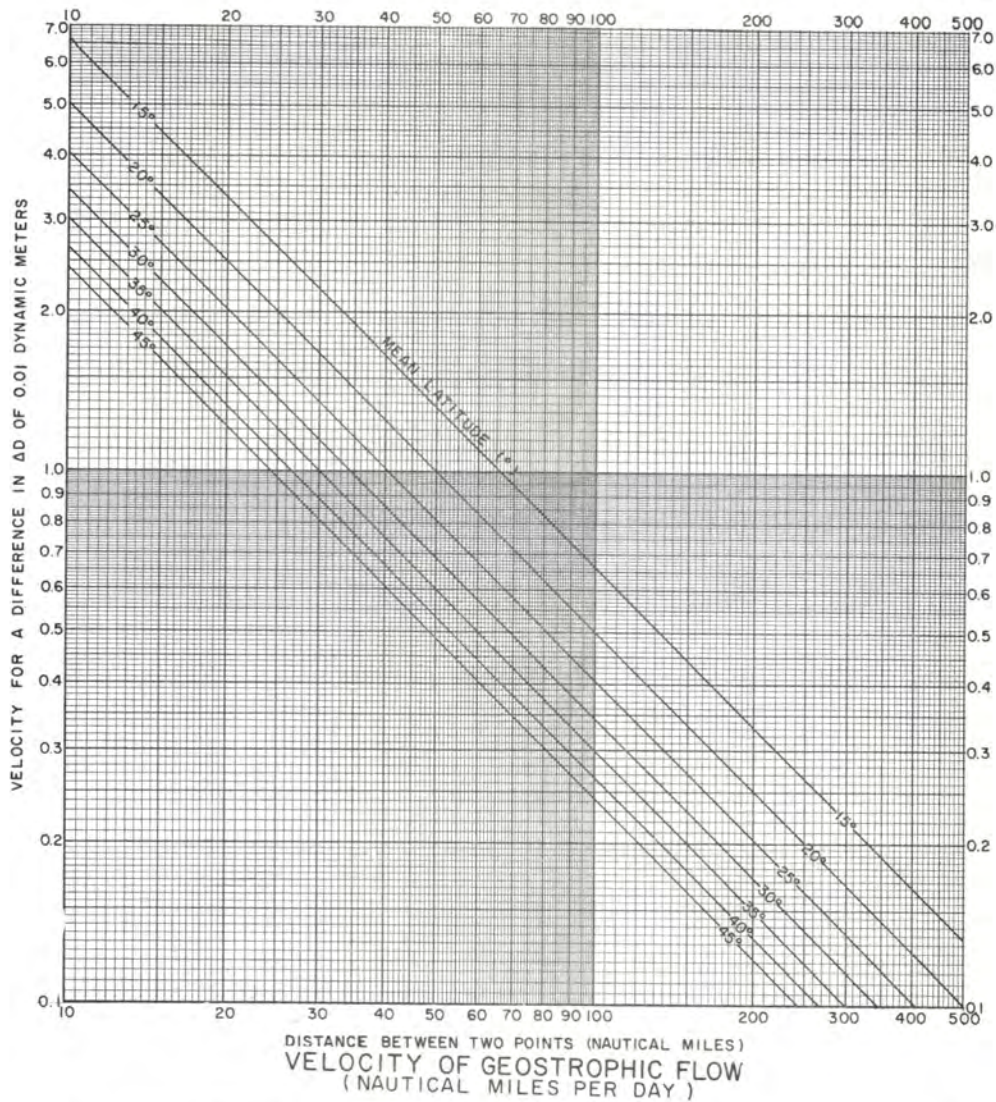
k: a value determined from another measurement such as a bathythermogram or STD recording.

g: a value determined from considerations such as stability or previous or surrounding stations.

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<sup>4/</sup> In situ Salinity/Temperature/Depth Monitoring and Recording System, Model 9006, Tech. Rep. No. 102, HYTECH Marine Products, The Bissett-Berman Corporation.





cm/sec	0	1	2	3	4	5	6	7	8	9
0	<i>KNOTS</i> 0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.17	
	<i>NM/DAY</i>	0.47	0.93	1.40	1.86	2.33	2.80	3.26	3.73	4.20
10	0.19	0.21	0.23	0.25	0.27	0.29	0.31	0.33	0.35	0.37
	4.66	5.13	5.59	6.06	6.53	6.99	7.46	7.93	8.39	8.86
20	0.39	0.41	0.43	0.45	0.47	0.49	0.51	0.52	0.54	0.56
	9.32	9.79	10.26	10.72	11.19	11.66	12.12	12.59	13.05	13.52
30	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.74	0.76
	13.99	14.45	14.92	15.38	15.85	16.32	16.78	17.25	17.72	18.18
40	0.78	0.80	0.82	0.84	0.85	0.87	0.89	0.91	0.93	0.95
	18.65	19.11	19.58	20.05	20.51	20.98	21.45	21.91	22.38	22.84
50	0.97	0.99	1.01	1.03	1.05	1.07	1.09	1.11	1.13	1.15
	23.31	23.78	24.24	24.71	25.17	25.64	26.11	26.57	27.04	27.51
60	1.17	1.18	1.20	1.22	1.24	1.26	1.28	1.30	1.32	1.34
	27.98	28.44	28.90	29.37	29.84	30.30	30.77	31.24	31.70	32.17
70	1.36	1.38	1.40	1.42	1.44	1.46	1.48	1.50	1.52	1.53
	32.63	33.10	33.57	34.03	34.50	34.96	35.43	35.90	36.36	36.83
80	1.55	1.57	1.59	1.61	1.63	1.65	1.67	1.69	1.71	1.73
	37.30	37.76	38.23	38.69	39.16	39.63	40.09	40.56	41.03	41.49
90	1.75	1.77	1.79	1.81	1.83	1.85	1.86	1.88	1.90	1.92
	41.96	42.42	42.89	43.36	43.82	44.29	44.76	45.22	45.69	46.15
100	1.94	1.96	1.98	2.00	2.02	2.04	2.06	2.08	2.10	2.12
	46.62	47.09	47.55	48.02	48.48	48.95	49.42	49.88	50.35	50.82

CONVERSION TABLE  
(CENTIMETERS / SECOND - KNOTS - NAUTICAL MILES / DAY)

1 cm/sec = 0.019 kts = 0.466 NAUTICAL MILES / DAY  
 1 kt = 24 NAUTICAL MILES / DAY = 51.48 cm/sec  
 1 NAUTICAL MILE / DAY = 0.042 kts = 2.14 cm/sec

FIGURES  
Cruise 6610

1. CalCOFI Cruise 6610, station positions
2. Horizontal distribution of dynamic height anomaly (0 over 500 d-bar)
3. Horizontal distribution of dynamic height anomaly (200 over 500 d-bar)
4. Horizontal distribution of temperature at 10 meters
5. Horizontal distribution of salinity at 10 meters
6. Horizontal distribution of thermosteric anomaly at 10 meters



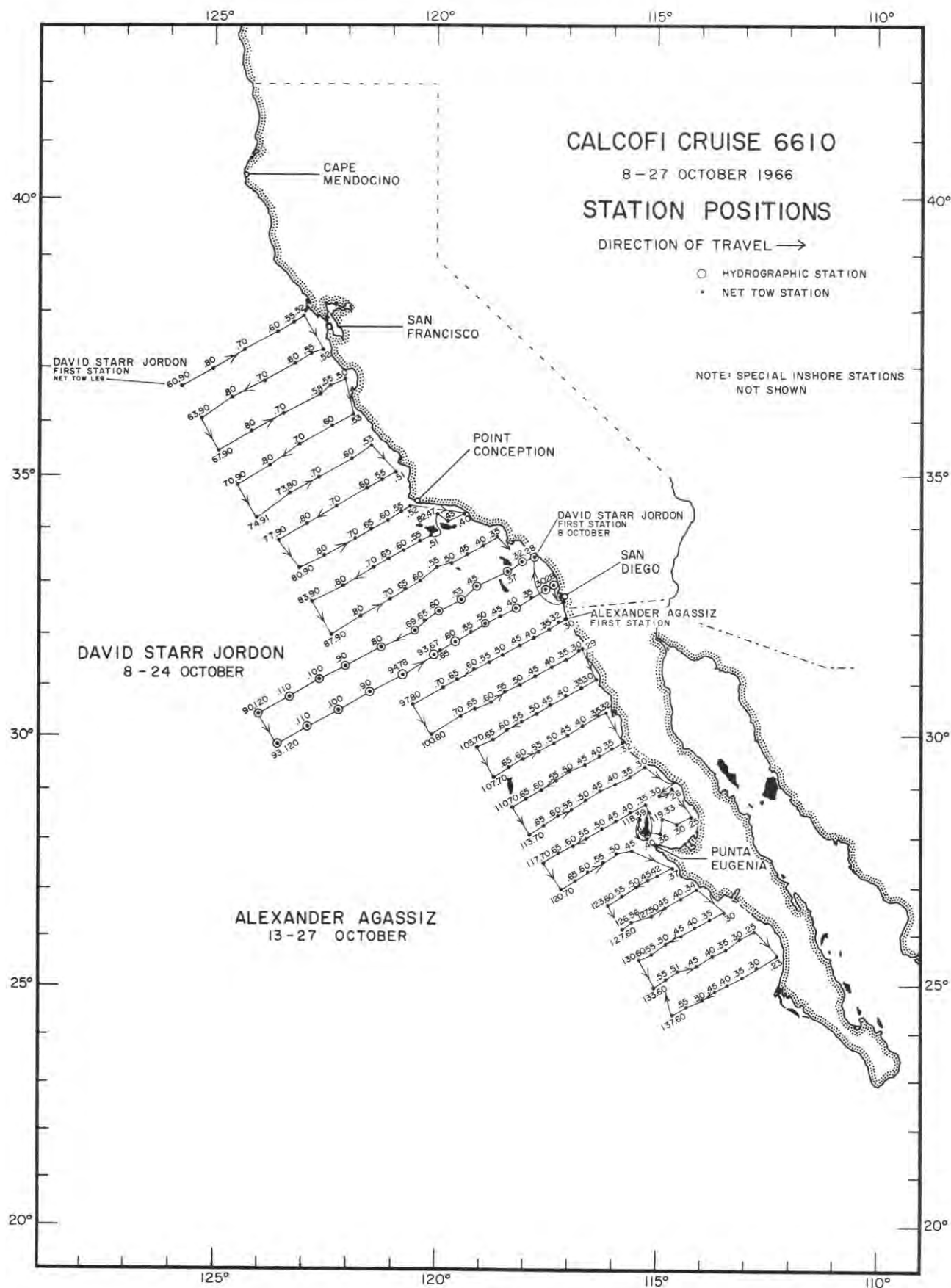


FIGURE 1

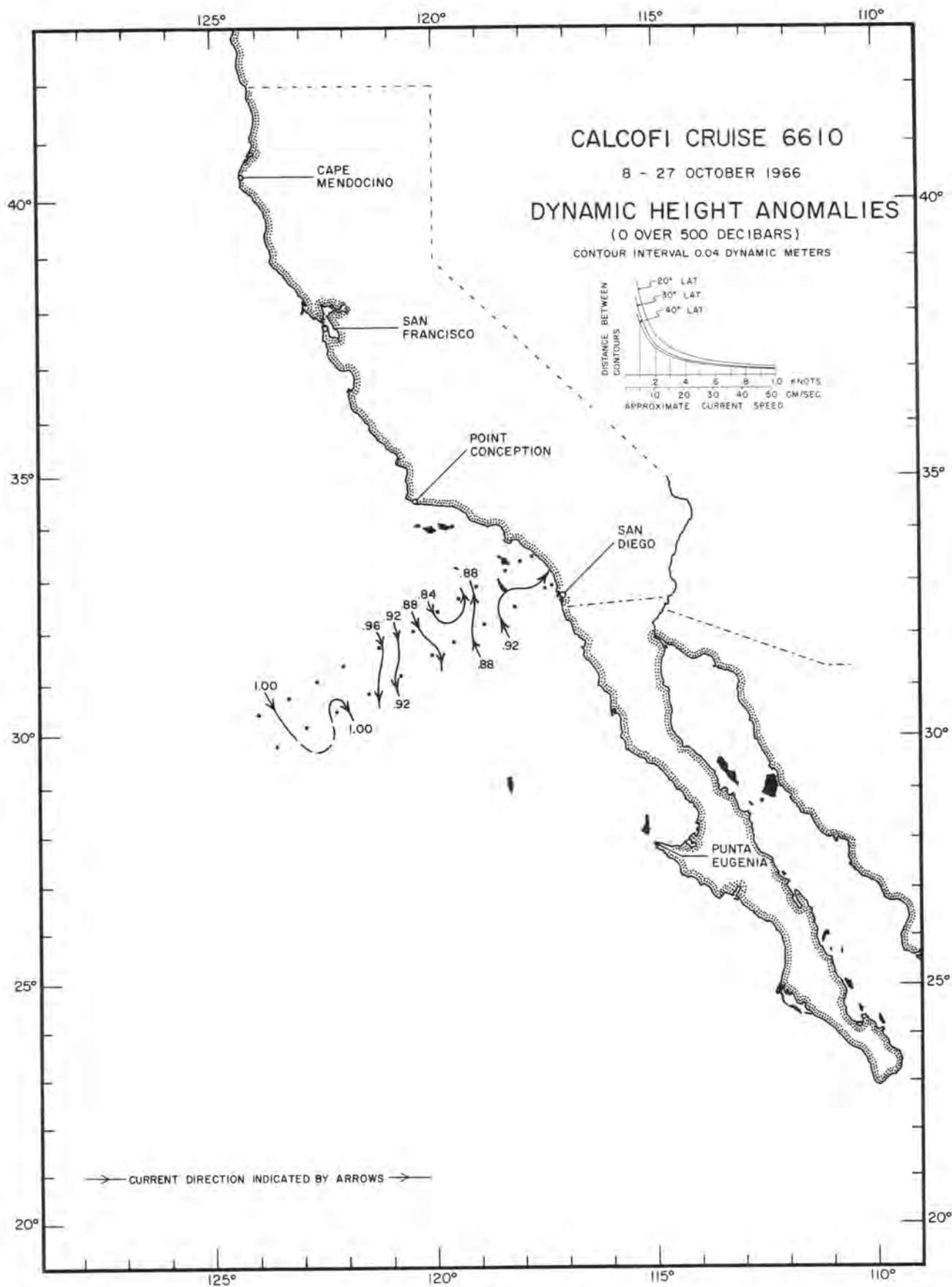


FIGURE 2



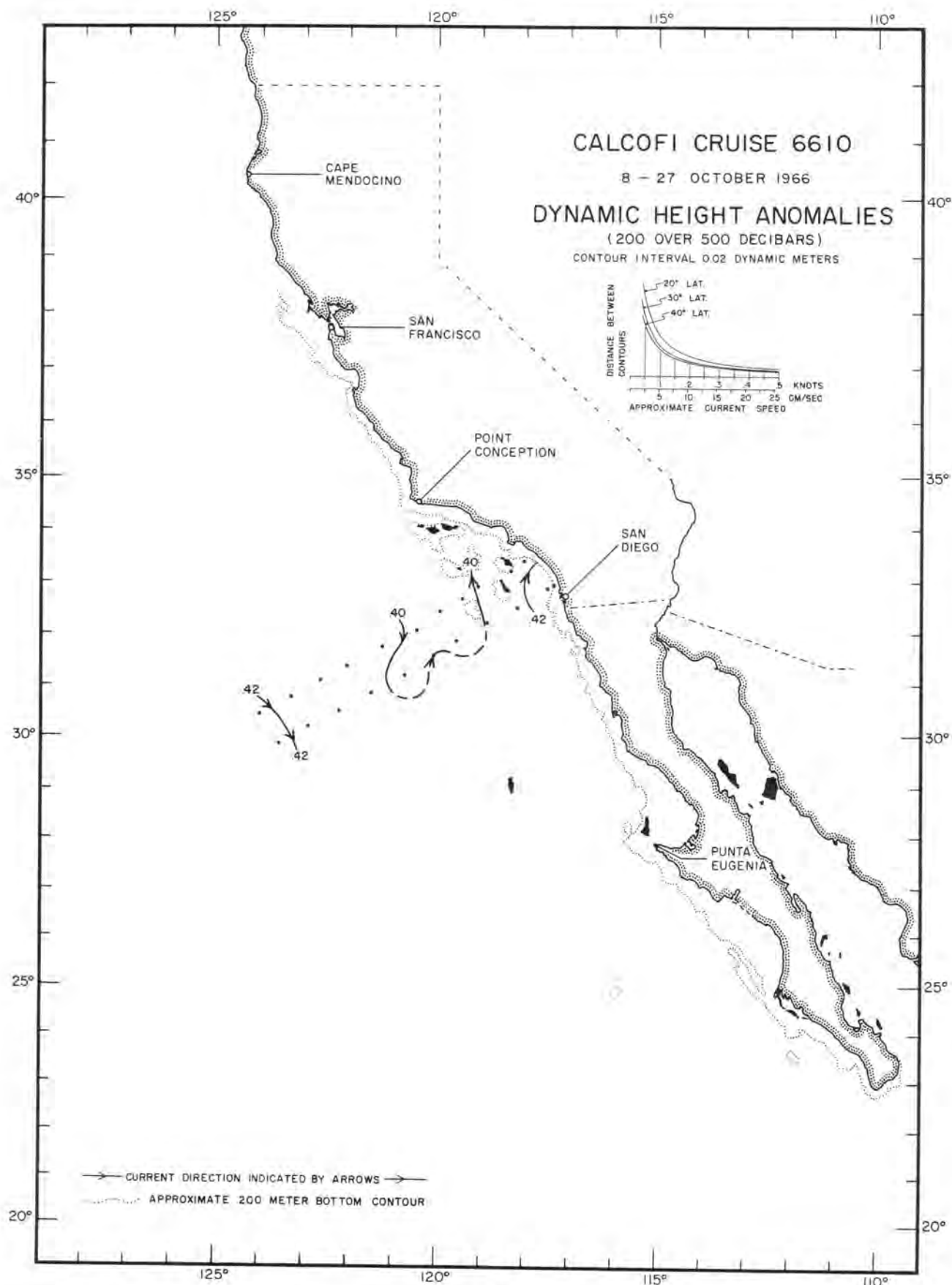


FIGURE 3

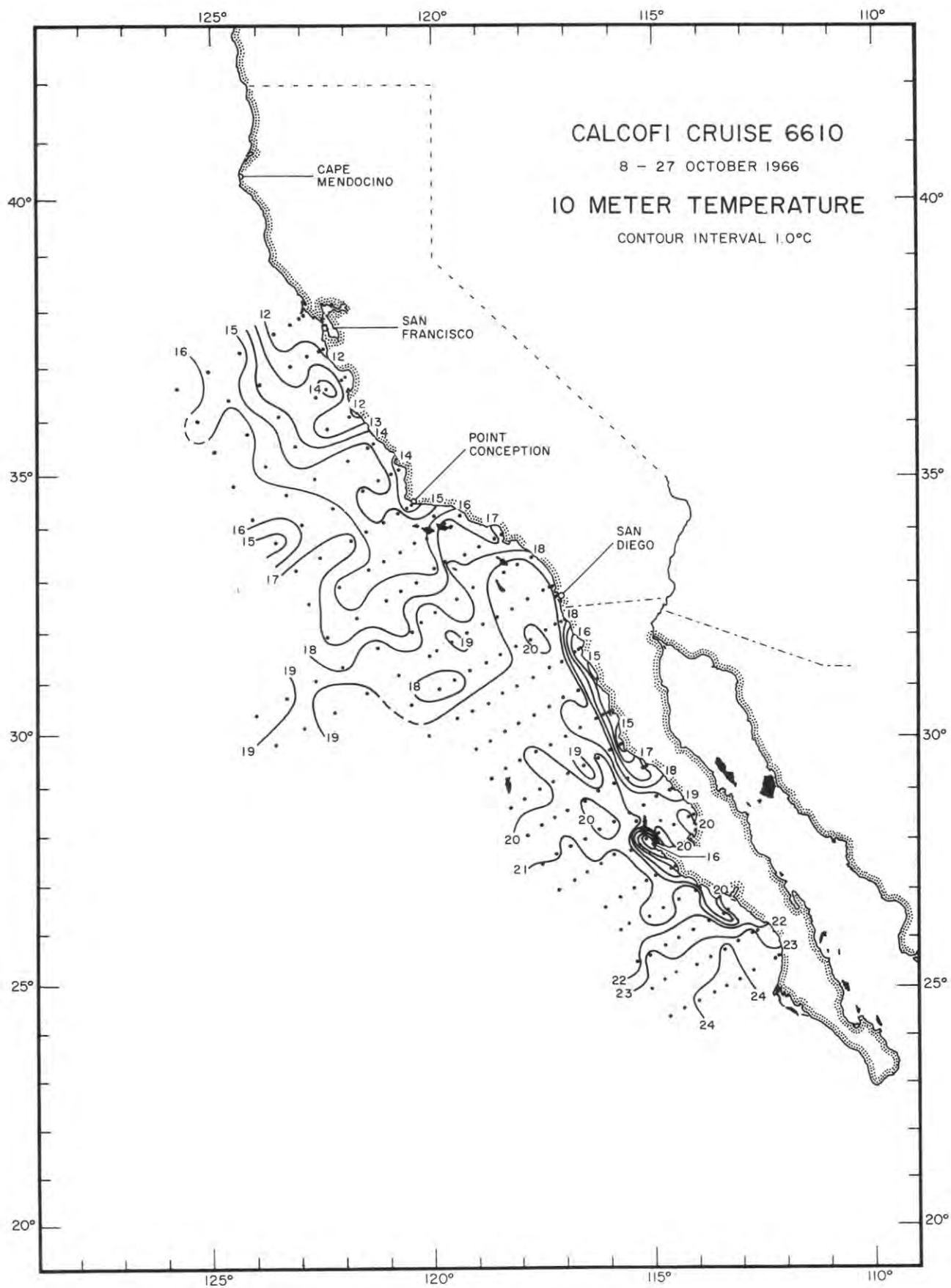


FIGURE 4



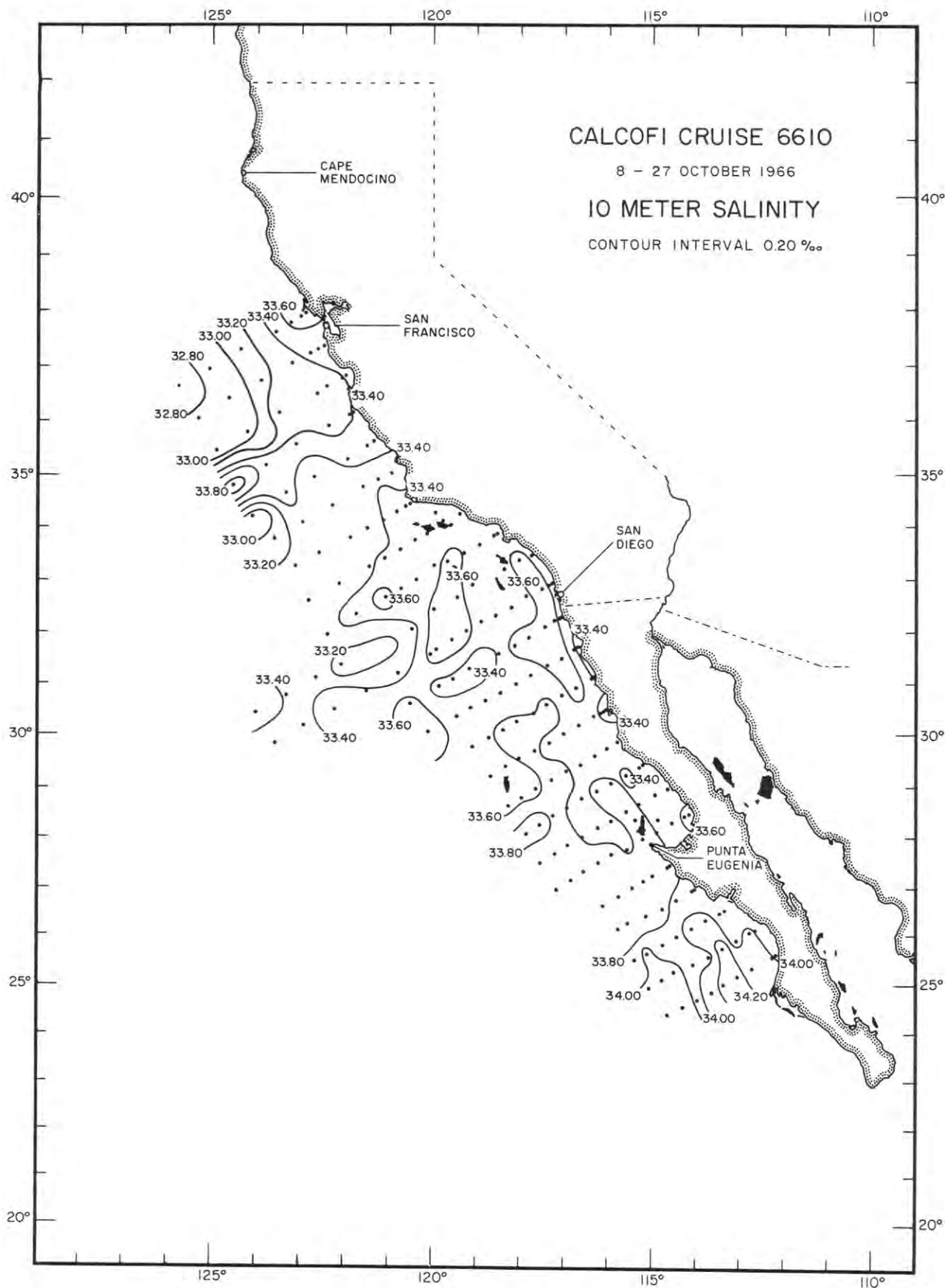


FIGURE 5

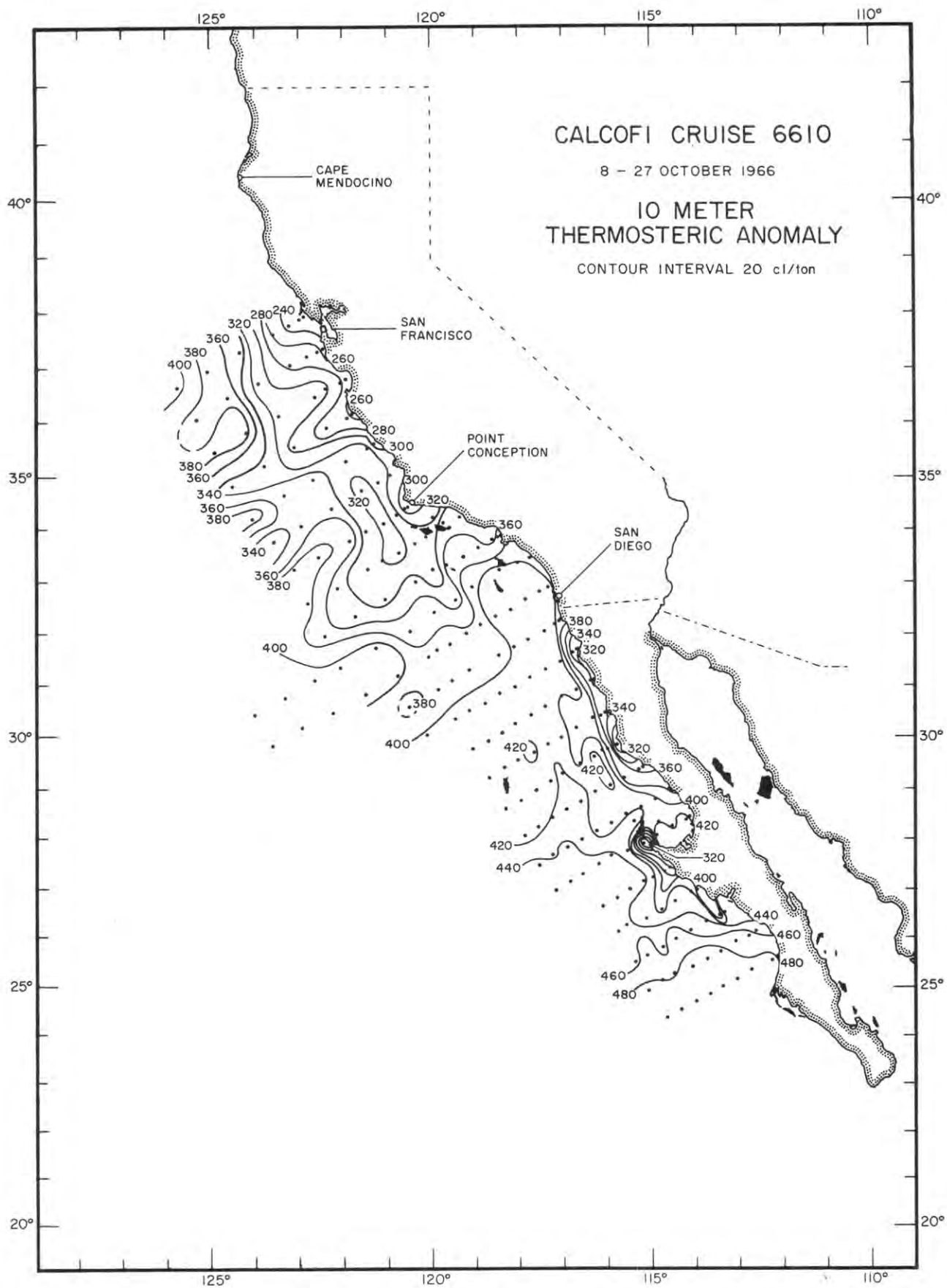


FIGURE 6



PERSONNEL  
Cruise 6610

SHIPS' CAPTAINS

Davis, Laurence E., RV Alexander Agassiz  
Forster, Charles W., RV David Starr Jordan

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

RV Alexander Agassiz

Mauck, William W., Marine Technician (in charge)  
Kellogg, Durrant, Marine Technician  
Palmer, Don H., Marine Technician  
Reeder, David G., Biological Technician, Bureau of Commercial Fisheries

RV David Starr Jordan

Counts, Robert C., Bureau of Commercial Fisheries (in charge)  
\*Anderson, George C., Marine Technician  
\*Baker, Martha, Hopkins Marine Station  
\*Bryan, Walter R., Senior Marine Technician  
\*Graham, Jery B., Electronics Technician  
Kalin, George, Physical Science Technician (Physics), Bureau of Commercial Fisheries  
\*Kellogg, Durrant, Marine Technician  
\*Kruse, Michael, Biological Technician, Fisheries, Bureau of Commercial Fisheries  
\*Kirk, Patricia, Physical Science Technician, Bureau of Commercial Fisheries  
\*\*Leong, Roderick, Fishery Biologist, General, Bureau of Commercial Fisheries  
\*Mauck, William W., Marine Technician  
\*Mead, Richard V., Principal Marine Technician  
\*Michel, Fred A., Jr., Marine Technician  
\*O'Connell, Charles, Dr., Fishery Biologist (Research), Bureau of Commercial Fisheries  
\*Owen, Robert W., Fishery Biologist, Bureau of Commercial Fisheries  
\*Palmer, Don H., Marine Technician  
\*Reeder, David, Biological Technician, Bureau of Commercial Fisheries  
\*Schumacher, Norman, Oceanographer, Bureau of Commercial Fisheries  
\*Shuey, Ray, Physical Science Technician, Bureau of Commercial Fisheries

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\*Lines 90 and 93 only.

\*\*Part II only.

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH								
Z	T	S	OXY	PHO	SIL	NTT	D*†	Z	T	S	OXY	SIG*†	D*†	DD		
90.28	CALCOFI CRUISE 6610								90.28							
DAVID STARR JORDAN, OCTOBER 8 1966, 0757 GMT, 33 28.5N 117 46.5W, SOUNDING 200 FM, WIND CALM, WEATHER MISSING, SEA CALM, WIRE ANGLE 03.																
0	19.00	33.57	5.42	-	-	-	396.7	0	19.00	33.570	5.42	23.95	396.7	0		
10	18.85	33.56	6.01	-	-	-	393.8	10	18.85	33.560	6.01	23.98	393.8	.040		
30	14.32	33.42	6.29	-	-	-	304.2	20	16.78	33.493	6.25	24.43	350.9	.077		
44	12.64	33.39	5.58	-	-	-	274.1	30	14.32	33.420	6.29	24.92	304.2	.110		
61	12.10	33.47	4.80	-	-	-	258.3	50	12.36	33.411	5.28	25.31	267.2	.167		
75	11.66	33.53	4.41	-	-	-	246.0	75	11.66	33.530	4.41	25.53	246.0	.232		
90	11.34	33.57	4.18	-	-	-	237.5	100	11.06	33.623	3.92	25.71	228.7	.291		
111	10.72	33.69	3.63	-	-	-	218.1	125	10.31	33.760	3.43	25.95	206.0	.346		
135	10.05	33.81	3.32	-	-	-	198.2	150	9.84	33.897	3.07	26.14	188.5	.396		
166	9.68	33.98	2.82	-	-	-	179.7	200	9.17	34.061	2.57	26.38	165.8	.487		
199	9.18	34.06	2.58	-	-	-	166.0	250	8.65	34.133	1.97	26.52	152.6	.568		
234	8.81	34.10	2.21	-	-	-	157.5	300	8.20	34.191	1.39	26.63	141.7	.644		
274	8.41	34.18	1.63	-	-	-	145.6	400	7.12	34.240	.73	26.83	123.2	.783		
318	8.02	34.20	1.26	-	-	-	138.6									
357	7.54	34.22	1.05	-	-	-	130.4									

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH								
Z	T	S	OXY	PHO	SIL	NTT	D*†	Z	T	S	OXY	SIG*†	D*†	DD		
90.32	CALCOFI CRUISE 6610								90.32							
DAVID STARR JORDAN, OCTOBER 8 1966, 1035 GMT, 33 20.5N 118 03W, SOUNDING 400 FM, WIND CALM, WEATHER OVERCAST, SEA CALM, WIRE ANGLE 02.																
0	20.10	33.70	5.62	-	-	-	414.3	0	20.10	33.700	5.62	23.77	414.3	0		
10	19.76	33.66	5.78	-	-	-	408.7	10	19.76	33.660	5.78	23.82	408.7	.041		
30	14.93	33.46	6.30	-	-	-	313.7	20	17.52	33.558	6.18	24.31	362.8	.080		
40	13.55	33.43	5.97	-	-	-	288.3	30	14.93	33.460	6.38	24.82	313.7	.114		
50	12.00	33.36	5.32	-	-	-	264.6	50	12.00	33.360	5.32	25.34	264.6	.172		
64	11.30	33.46	4.38	-	-	-	244.9	75	10.89	33.579	4.00	25.71	229.2	.234		
79	10.76	33.62	3.92	-	-	-	223.9	100	10.13	33.705	3.69	25.94	207.2	.289		
99	10.15	33.70	3.70	-	-	-	208.0	125	9.69	33.846	3.33	26.12	189.8	.339		
124	9.70	33.84	3.35	-	-	-	190.4	150	9.42	33.970	2.97	26.27	176.3	.385		
144	9.49	33.95	3.03	-	-	-	179.0	200	8.83	34.047	2.65	26.42	161.8	.472		
174	9.12	34.02	2.81	-	-	-	168.1	250	8.62	34.131	2.00	26.52	152.3	.552		
203	8.81	34.05	2.62	-	-	-	161.2	300	8.02	34.143	1.64	26.62	142.9	.628		
233	8.81	34.13	2.1	-	-	-	155.3	400	7.17	34.246	.79	26.82	123.5	.767		
272	8.30	34.12	1.93	-	-	-	148.5	500	6.37	34.291	.45	26.97	109.8	.891		
331	7.76	34.18	1.29	-	-	-	136.4	600	5.82	34.364	.43	27.09	97.7	1.002		
405	7.13	34.25	.76	-	-	-	122.7									
479	6.52	34.28	.45	-	-	-	112.5									
558	6.02	34.33	.44	-	-	-	102.7									

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH								
Z	T	S	OXY	PHO	SIL	NTT	D*†	Z	T	S	OXY	SIG*†	D*†	DD		
90.37	CALCOFI CRUISE 6610								90.37							
DAVID STARR JORDAN, OCTOBER 8 1966, 1426 GMT, 33 11N 118 22.5W, SOUNDING 430 FM, WIND CALM, WEATHER OVERCAST, SEA MODERATE, WIRE ANGLE 07.																
0	19.70	33.64	5.71	-	-	-	408.7	0	19.70	33.640	5.71	23.82	408.7	0		
10	19.05	33.49	5.69	-	-	-	403.7	10	19.05	33.490	5.69	23.88	403.7	.041		
30	16.11	33.35	6.23	-	-	-	346.6	20	17.71	33.397	5.94	24.14	378.9	.080		
40	14.70	33.34	6.30	-	-	-	317.8	30	16.11	33.350	6.23	24.48	346.6	.116		
50	14.00	33.37	5.99	-	-	-	301.5	50	14.00	33.370	5.99	24.95	301.5	.181		
64	12.46	33.38	5.41	-	-	-	271.5	75	11.83	33.441	4.97	25.43	255.6	.251		
79	11.66	33.47	4.82	-	-	-	250.5	100	10.62	33.620	4.03	25.79	221.6	.311		
99	10.66	33.61	4.06	-	-	-	223.0	125	9.79	33.843	3.33	26.10	191.6	.364		
123	9.83	33.83	3.37	-	-	-	193.2	150	9.42	33.969	2.93	26.26	176.5	.410		
143	9.52	33.94	3.02	-	-	-	180.2	200	8.82	34.098	2.22	26.46	157.8	.496		
172	9.14	34.04	2.66	-	-	-	166.9	250	8.49	34.178	1.67	26.58	147.0	.574		
201	8.81	34.10	2.2	-	-	-	157.5	300	8.09	34.220	1.19	26.67	138.0	.647		
230	8.61	34.15	1.94	-	-	-	150.8	400	7.21	34.260	.75	26.83	123.0	.784		
269	8.37	34.20	1.42	-	-	-	143.6	500	6.59	34.293	.48	26.94	112.4	.908		
326	7.83	34.23	1.07	-	-	-	133.7									
401	7.20	34.26	.75	-	-	-	122.8									
474	6.77	34.28	.53	-	-	-	115.7									
552	6.17	34.33	.41	-	-	-	104.5									

A) THE OBSERVED SALINITY VALUES FOR ALL HYDROGRAPHIC CASTS ON THIS CRUISE HAVE BEEN LISTED ONLY TO HUNDREDS BECAUSE OF DIFFICULTY IN OPERATION OF THE SALINOMETER. STANDARD DEPTH LEVELS APPEAR IN THOUSANDS BECAUSE OF MACHINE INTERPOLATION. THE SALINITY SAMPLES FOR NET TOW STATIONS HAVE THE USUAL ACCURACY SINCE THEY WERE DETERMINED AFTER THE CRUISE ON A DIFFERENT SALINOMETER.

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH							
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD	
90.45	CALCOFI CRUISE 6610														90.45
DAVID STARR JORDAN, OCTOBER 8 1966, 1920 GMT, 32 54.5N 118 55W, SOUNDING 925 FM, WIND CALM, WEATHER OVERCAST, SEA SLIGHT, WIRE ANGLE 04.															
0	19.12	33.53	5.54	-	-	-	402.5	0	19.12	33.530	5.54	23.89	402.5	0	
11	18.92	33.53	5.60	-	-	-	397.7	10	18.96	33.531	5.59	23.93	398.6	.040	
31	17.05	33.48	5.91	-	-	-	357.9	20	18.53	33.513	5.71	24.03	389.5	.080	
40	14.48	33.34	6.11	-	-	-	313.3	30	17.23	33.488	5.89	24.32	361.4	.117	
51	13.40	33.36	5.65	-	-	-	290.6	50	13.44	33.352	5.71	25.05	292.0	.183	
65	12.50	33.49	4.88	-	-	-	264.1	75	11.90	33.527	4.52	25.49	250.5	.251	
79	11.65	33.54	4.39	-	-	-	245.1	100	10.17	33.715	3.50	25.94	207.1	.309	
99	10.20	33.71	3.52	-	-	-	208.0	125	9.66	33.827	3.20	26.11	190.8	.359	
124	9.69	33.82	3.22	-	-	-	191.7	150	9.13	33.975	2.71	26.32	171.6	.405	
143	9.24	33.95	2.81	-	-	-	175.1	200	8.57	34.057	2.32	26.47	157.2	.489	
173	8.86	34.02	2.49	-	-	-	164.2	250	7.99	34.121	1.73	26.61	144.1	.566	
203	8.54	34.06	2.30	-	-	-	156.5	300	7.49	34.155	1.33	26.71	134.6	.638	
231	8.19	34.10	1.93	-	-	-	148.4	400	6.85	34.236	.65	26.86	120.0	.771	
272	7.78	34.14	1.54	-	-	-	139.7	500	6.22	34.311	.29	27.00	106.5	.890	
331	7.20	34.17	1.13	-	-	-	129.6								
404	6.83	34.24	.62	-	-	-	119.5								
479	6.34	34.30	.32	-	-	-	108.8								
556	5.94	34.33	.32	-	-	-	101.7								

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH							
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD	
90.53	CALCOFI CRUISE 6610														90.53
DAVID STARR JORDAN, OCTOBER 8 1966, 2342 GMT, 32 39N 119 28.5W, SOUNDING 730 FM, WIND 290 FORCE 4, WEATHER OVERCAST, SEA ROUGH, WIRE ANGLE 15.															
0	17.50	33.64	5.79	-	-	-	356.4	0	17.50	33.640	5.79	24.37	356.4	0	
10	17.24	33.64	5.81	-	-	-	350.5	10	17.24	33.640	5.81	24.43	350.5	.035	
29	14.94	33.56	5.52	-	-	-	306.6	20	16.16	33.604	5.75	24.66	329.1	.069	
39	13.87	33.52	4.92	-	-	-	288.0	30	14.84	33.555	5.46	24.91	304.8	.101	
53	11.94	33.54	4.51	-	-	-	250.3	50	12.34	33.529	4.59	25.40	258.3	.158	
67	10.95	33.64	3.88	-	-	-	225.7	75	10.51	33.698	3.62	25.87	214.1	.217	
91	9.86	33.81	3.23	-	-	-	195.2	100	9.60	33.872	3.04	26.16	186.5	.268	
110	9.38	33.93	2.88	-	-	-	178.8	125	9.14	33.972	2.76	26.31	172.0	.313	
130	9.08	33.98	2.73	-	-	-	170.4	150	8.91	34.022	2.55	26.39	164.8	.356	
149	8.92	34.02	2.56	-	-	-	165.1	200	8.48	34.086	2.13	26.50	153.6	.437	
177	8.64	34.06	2.30	-	-	-	157.9	250	8.02	34.174	1.53	26.64	140.5	.512	
211	8.40	34.10	2.04	-	-	-	151.4	300	7.66	34.218	1.09	26.73	132.2	.583	
240	8.10	34.16	1.64	-	-	-	142.7	400	6.96	34.269	.68	26.87	119.0	.714	
288	7.74	34.21	1.18	-	-	-	133.9	500	6.25	34.327	.32	27.01	105.7	.833	
341	7.39	34.24	.83	-	-	-	126.9	600	5.84	34.350	.37	27.08	99.0	.943	
422	6.80	34.28	.65	-	-	-	116.1								
506	6.22	34.33	.31	-	-	-	105.1								
589	5.87	34.35	.34	-	-	-	99.4								

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH							
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD	
90.60	CALCOFI CRUISE 6610														90.60
DAVID STARR JORDAN, OCTOBER 9 1966, 0318 GMT, 32 25N 119 57.5W, SOUNDING 470 FM, WIND 320 FORCE 3, WEATHER MISSING, SEA ROUGH, WIRE ANGLE 18.															
1	18.21	33.63	5.63	-	-	-	373.6	0	18.21	33.630	5.63	24.19	373.6	0	
11	18.18	33.63	5.67	-	-	-	372.9	10	18.18	33.630	5.66	24.20	372.9	.037	
20	18.17K	33.63	G	-	-	-	372.6	20	18.17	33.630	5.87	24.20	372.6	.075	
29	16.39	33.57	5.95	-	-	-	336.7	30	16.13	33.559	5.93	24.63	331.9	.110	
39	13.91	33.47	5.60	-	-	-	292.4	50	12.38	33.470	4.91	25.35	263.4	.170	
50	12.38K	33.47	G	-	-	-	263.4	75	10.40	33.660	3.69	25.86	215.0	.230	
53	12.10	33.47	4.71	-	-	-	258.3	100	9.53	33.833	3.16	26.14	188.3	.281	
67	10.94	33.58	3.99	-	-	-	229.9	125	9.19	33.953	2.87	26.29	174.1	.327	
91	9.66	33.80	3.29	-	-	-	192.8	150	9.00	34.013	2.65	26.37	166.8	.370	
109	9.47	33.86	3.07	-	-	-	185.3	200	8.35	34.100	2.03	26.54	150.7	.451	
128	9.14	33.97	2.83	-	-	-	172.1	250	7.86	34.180	1.34	26.67	137.9	.525	
147	9.02	34.01	2.66	-	-	-	167.3	300	7.41	34.232	.90	26.78	127.8	.594	
175	8.76	34.04	2.49	-	-	-	161.2	400	6.65	34.275	.49	26.92	114.6	.720	
208	8.22	34.12	1.87	-	-	-	147.4	500	6.27	34.311	.25	27.00	107.1	.837	
236	7.99	34.16	1.52	-	-	-	141.1								
284	7.55	34.22	.97	-	-	-	130.5								
334	7.14	34.25	.81	-	-	-	122.8								
415	6.56	34.28	.42	-	-	-	113.1								
497	6.28	34.31	.25	-	-	-	107.3								
578	6.02	34.33	.34	-	-	-	102.7								



INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH									
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD			
90.69								CALCOFI CRUISE 6610								90.69	
DAVID STARR JORDAN, OCTOBER 11 1966, 1716 GMT, 32 02N 120 29W, SOUNDING 2000 FM, WIND 290 FORCE 2, WEATHER OVERCAST, SEA ROUGH, WIRE ANGLE 08.																	
0	17.04	33.25	5.76	-	-	-	374.4	0	17.04	33.250	5.76	24.18	374.4	0			
11	17.02	33.25	5.76	-	-	-	374.0	10	17.03	33.249	5.75	24.19	374.2	.037			
20	16.85K	33.26	G	-	-	-	369.4	20	16.85	33.260	5.97	24.24	369.4	.075			
31	15.32	33.41	6.10	-	-	-	325.5	30	15.46	33.395	6.09	24.66	329.5	.110			
41	15.19	33.49	5.76	-	-	-	316.9	50	14.60	33.410	5.77	24.85	310.6	.174			
50	14.60K	33.41	G	-	-	-	310.6	75	10.96	33.320	5.38	25.50	249.4	.244			
56	12.16	33.09	5.82	-	-	-	287.4	100	9.95	33.551	4.03	25.85	215.8	.303			
70	11.24	33.27	5.61	-	-	-	257.9	125	9.37	33.754	3.31	26.11	191.6	.354			
95	10.08	33.50	4.28	-	-	-	221.6	150	8.92	33.866	3.18	26.26	176.6	.401			
115	9.63	33.69	3.44	-	-	-	200.4	200	8.31	34.005	2.71	26.47	157.1	.486			
134	9.15	33.60	3.27	-	-	-	184.9	250	7.55	34.039	2.27	26.61	144.0	.563			
154	8.88	33.88	3.16	-	-	-	174.9	300	6.81	34.046	1.90	26.72	133.7	.635			
184	8.52	33.98	2.91	-	-	-	162.1	400	6.27	34.167	.80	26.88	117.8	.765			
216	8.08	34.02	2.51	-	-	-	152.8	500	5.78	34.248	.40	27.01	106.0	.883			
245	7.64	34.04	2.30	-	-	-	145.2	600	5.29	34.321	.29	27.12	94.9	.990			
295	6.84	34.04	1.97	-	-	-	134.5										
349	6.63	34.12	1.22	-	-	-	125.9										
431	6.04	34.19	.64	-	-	-	113.4										
515	5.72	34.26	.37	-	-	-	104.3										
599	5.30	34.32	.29	-	-	-	95.0										

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH									
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD			
90.80								CALCOFI CRUISE 6610								90.80	
DAVID STARR JORDAN, OCTOBER 9 1966, 1253 GMT, 31 41.5N 121 17W, SOUNDING 2050 FM, WIND 340 FORCE 3, WEATHER PARTLY CLOUDY, SEA ROUGH, WIRE ANGLE 19.																	
0	18.18	33.14	5.38	-	-	-	408.5	0	18.18	33.140	5.38	23.83	408.5	0			
10	18.12	33.15	5.61	-	-	-	406.4	10	18.12	33.150	5.61	23.85	406.4	.041			
20	18.13K	33.15	G	-	-	-	406.6	20	18.13	33.150	5.62	23.85	406.6	.081			
28	18.13	33.15	5.61	-	-	-	406.6	30	18.11	33.179	5.63	23.87	404.1	.122			
37	18.02	33.28	5.74	-	-	-	394.6	50	16.29	33.220	6.12	24.34	360.0	.199			
51	16.11	33.21	6.15	-	-	-	356.9	75	13.03	33.204	6.07	25.02	295.0	.281			
65	13.91	33.20	6.13	-	-	-	312.2	100	11.66	33.324	5.42	25.37	261.2	.351			
88	12.30	33.24	5.95	-	-	-	278.9	125	9.82	33.469	4.36	25.81	219.9	.412			
106	11.32	33.37	5.12	-	-	-	251.9	150	9.40	33.707	3.65	26.06	195.6	.464			
124	9.86	33.46	4.39	-	-	-	221.1	200	8.51	33.967	3.15	26.41	163.0	.556			
142	9.50	33.63	3.96	-	-	-	202.8	250	7.88	34.035	2.37	26.56	148.8	.636			
170	9.16	33.87	3.01	-	-	-	179.8	300	7.18	34.070	1.76	26.68	136.7	.709			
202	8.47	33.97	3.17	-	-	-	162.1	400	6.28	34.152	.90	26.87	119.1	.842			
229	8.13	34.01	2.72	-	-	-	154.3	500	5.76	34.228	.40	27.00	107.1	.961			
277	7.54	34.06	1.97	-	-	-	142.3										
327	6.78	34.08	1.55	-	-	-	130.8										
407	6.25	34.16	.84	-	-	-	118.2										
490	5.81	34.22	.43	-	-	-	108.4										
571	5.37	34.29	.28	-	-	-	98.0										

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH									
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD			
90.90								CALCOFI CRUISE 6610								90.90	
DAVID STARR JORDAN, OCTOBER 9 1966, 1808 GMT, 31 21N 122 02W, SOUNDING 2200 FM, WIND 320 FORCE 4, WEATHER OVERCAST, SEA ROUGH, WIRE ANGLE 06.																	
0	17.99	33.14	5.45	-	-	-	404.1	0	17.99	33.140	5.45	23.87	404.1	0			
11	17.98	33.14	5.67	-	-	-	403.9	10	17.98	33.140	5.66	23.87	403.9	.040			
20	17.98K	33.14	G	-	-	-	403.9	20	17.98	33.140	5.67	23.88	403.9	.081			
30	17.98K	33.14	G	-	-	-	403.9	30	17.98	33.140	5.67	23.88	403.9	.121			
31	17.98	33.14	5.67	-	-	-	403.9	50	16.30	33.180	6.11	24.30	363.2	.198			
41	17.21	33.16	5.88	-	-	-	384.8	75	13.67	33.225	6.16	24.91	305.6	.282			
50	16.30K	33.18	G	-	-	-	363.2	100	11.85	33.173	5.77	25.22	275.6	.355			
56	15.32	33.24	6.22	-	-	-	337.9	125	10.36	33.290	5.06	25.58	241.7	.421			
70	14.04	33.24	6.19	-	-	-	311.9	150	9.78	33.599	3.99	25.92	209.5	.478			
96	12.19	33.17	5.86	-	-	-	282.0	200	8.94	33.916	3.16	26.30	173.1	.575			
115	10.71	33.20	5.36	-	-	-	254.1	250	8.18	34.047	2.53	26.52	152.2	.659			
136	10.13	33.42	4.67	-	-	-	228.4	300	7.58	34.135	1.52	26.68	137.3	.733			
155	9.67	33.66	3.76	-	-	-	203.3	400	6.72	34.220	.67	26.86	119.5	.867			
184	9.18	33.85	3.21	-	-	-	181.6	500	6.04	34.255	.44	26.98	108.5	.987			
218	8.68	33.97	3.10	-	-	-	165.2	600	5.37	34.290	.34	27.09	98.0	1.097			
247	8.22	34.04	2.60	-	-	-	153.3										
296	7.62	34.13	1.56	-	-	-	138.2										
350	7.14	34.18	1.14	-	-	-	128.0										
433	6.46	34.24	.42	-	-	-	114.8										
516	5.94	34.26	.43	-	-	-	106.9										
601	5.36	34.29	.34	-	-	-	97.9										

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH															
Z	T	S	OXY	PHU	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD									
90.100								CALCOFI CRUISE 6610								90.100							
DAVID STARR JORDAN, OCTOBER 9 1966, 2250 GMT, 31 05N 122 39W, SOUNDING 2300 FM, WIND 330 FORCE 4, WEATHER OVERCAST, SEA ROUGH, WIRE ANGLE 11.																							
0	18.95	33.34	5.58	-	-	-	412.2	0	18.95	33.340	5.58	23.79	412.2	0									
10	18.93	33.34	5.56	-	-	-	411.7	10	18.93	33.340	5.56	23.79	411.7	.041									
20	18.93K	33.35 G	-	-	-	-	411.0	20	18.93	33.350	5.57	23.80	411.0	.082									
30	18.94	33.36	5.60	-	-	-	410.5	30	18.94	33.360	5.60	23.81	410.5	.124									
39	16.64	33.28	6.16	-	-	-	363.3	50	15.01	33.273	6.21	24.66	329.1	.198									
54	14.60	33.27	6.21	-	-	-	320.9	75	12.65	33.196	5.90	25.09	288.5	.275									
67	13.18	33.20	6.03	-	-	-	298.1	100	11.38	33.290	5.27	25.40	258.9	.344									
92	11.84	33.25	5.52	-	-	-	269.9	125	10.43	33.531	4.29	25.75	225.1	.405									
111	10.83	33.37	4.88	-	-	-	243.6	150	9.73	33.736	3.66	26.03	198.6	.459									
130	10.32	33.59	4.09	-	-	-	218.9	200	8.70	33.964	3.09	26.37	166.0	.552									
149	9.76	33.73	3.67	-	-	-	199.5	250	8.24	34.062	2.37	26.52	152.0	.633									
178	9.09	33.88	3.35	-	-	-	178.0	300	7.77	34.135	1.65	26.65	140.0	.709									
209	8.58	33.99	2.97	-	-	-	162.2	400	6.86	34.235	.78	26.86	120.3	.844									
238	8.34	34.04	2.56	-	-	-	155.0	500	5.72	34.210	.62	26.98	108.2	.965									
286	7.93	34.12	1.82	-	-	-	143.2	600	5.22	34.287	.42	27.11	96.6	1.074									
339	7.34	34.17	1.25	-	-	-	131.4																
421	6.70	34.25	.67	-	-	-	117.1																
505	5.68	34.21	.61	-	-	-	107.6																
588	5.24	34.27	.45	-	-	-	98.1																

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH															
Z	T	S	OXY	PHU	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD									
90.110								CALCOFI CRUISE 6610								90.110							
DAVID STARR JORDAN, OCTOBER 10 1966, 0353 GMT, 30 45N 123 19W, SOUNDING 2175 FM, WIND 330 FORCE 4, WEATHER OVERCAST, SEA MODERATE, WIRE ANGLE 11.																							
0	19.02	33.40 A	5.57	-	-	-	409.5	0	19.02	33.400	5.57	23.82	409.5	0									
11	19.04	33.39	5.67	-	-	-	410.7	10	19.04	33.391	5.67	23.80	410.7	.041									
30	19.03	33.39	5.59	-	-	-	410.5	20	19.04	33.389	5.65	23.80	410.7	.082									
39	19.04	33.39	5.58	-	-	-	410.7	30	19.03	33.390	5.59	23.81	410.5	.123									
54	15.70	33.28	6.31	-	-	-	343.0	50	16.70	33.312	6.10	24.31	362.4	.201									
68	14.35	33.26	6.35	-	-	-	316.6	75	13.45	33.260	6.25	24.98	298.9	.284									
75	13.45K	33.26 G	-	-	-	-	298.9	100	11.30	33.319	5.25	25.44	255.3	.354									
92	11.90	33.26	5.70	-	-	-	270.2	125	10.03	33.572	4.17	25.85	215.6	.413									
112	10.56	33.44	4.58	-	-	-	233.9	150	9.52	33.770	3.62	26.09	192.8	.465									
131	9.86	33.63	4.03	-	-	-	208.5	200	8.72	33.953	3.09	26.36	167.0	.556									
150	9.52	33.77	3.62	-	-	-	192.8	250	8.06	34.031	2.54	26.53	151.7	.638									
178	9.07	33.88	3.30	-	-	-	177.7	300	7.35	34.069	1.91	26.66	139.0	.713									
210	8.57	33.98	3.00	-	-	-	162.8	400	6.74	34.214	.72	26.86	120.3	.848									
239	8.21	34.02	2.68	-	-	-	154.7	500	5.83	34.249	.39	27.00	106.4	.964									
286	7.55	34.06	2.08	-	-	-	142.5	600	5.21	34.326	.22	27.14	93.6	1.078									
338	6.88	34.10	1.46	-	-	-	130.6																
421	6.66	34.25	.53	-	-	-	116.6																
503	5.80	34.25	.38	-	-	-	106.0																
586	5.27	34.31 A	.24	-	-	-	95.4																

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH															
Z	T	S	OXY	PHU	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD									
90.120								CALCOFI CRUISE 6610								90.120							
DAVID STARR JORDAN, OCTOBER 10 1966, 0904 GMT, 30 25N 124 00W, SOUNDING 2300 FM, WIND 330 FORCE 2, WEATHER OVERCAST, SEA ROUGH, WIRE ANGLE 01.																							
1	19.24	33.48	5.54	-	-	-	409.0	0	19.24	33.480	5.54	23.82	409.0	0									
11	19.24	33.48	5.52	-	-	-	409.0	10	19.24	33.480	5.52	23.82	409.0	.041									
20	19.24K	33.48 G	-	-	-	-	409.0	20	19.24	33.480	5.50	23.82	409.0	.082									
30	19.24K	33.48 G	-	-	-	-	409.0	30	19.24	33.480	5.52	23.82	409.0	.123									
31	19.24	33.48	5.52	-	-	-	409.0	50	18.12	33.450	5.86	24.08	384.5	.202									
50	18.12K	33.45 G	-	-	-	-	384.5	75	15.78	33.455	6.04	24.63	331.8	.292									
61	16.90	33.43	6.08	-	-	-	358.2	100	13.82	33.421	5.67	25.03	294.2	.371									
70	16.14	33.45	6.17	-	-	-	340.0	125	12.70	33.570	5.56	25.37	261.9	.442									
84	15.12	33.45	5.76	-	-	-	318.4	150	10.78	33.592	4.83	25.74	226.3	.503									
98	13.88	33.40	5.65	-	-	-	297.0	200	9.09	33.889	3.95	26.25	177.4	.606									
113	13.64	33.57	5.77	-	-	-	279.8	250	8.34	33.994	3.48	26.45	158.4	.692									
125	12.70K	33.57 G	-	-	-	-	261.9	300	7.50	34.023	2.90	26.60	144.5	.770									
138	11.66	33.54	5.19	-	-	-	245.3	400	6.41	34.125	1.18	26.83	122.7	.909									
157	10.34	33.64	4.63	-	-	-	215.5	500	5.68	34.216	.49	26.99	107.2	1.030									
185	9.45	33.82	4.15	-	-	-	188.0	600	5.18	34.289	.32	27.11	96.0	1.138									
215	8.81	33.94	3.79	-	-	-	169.4																
245	8.42	33.99	3.52	-	-	-	159.9																
296	7.56	34.02	2.98	-	-	-	145.6																
350	6.84	34.07	1.87	-	-	-	132.3																
433	6.18	34.16	.87	-	-	-	117.3																
518	5.57	34.23	.42	-	-	-	104.8																
602	5.17	34.29	.32	-	-	-	95.8																

A) THE SALINITY BOTTLE NUMBERS WERE NOT ENTERED ON THE ORIGINAL DATA SHEET. SINCE STANDARD HANDLING PROCEDURES WERE USED, THESE SALINITY VALUES ARE ASSUMED TO BE IN THE CORRECT ORDER.



INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH									
Z	T	S	OXY	PHU	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD			
93.28								CALCOFI CRUISE 6610								93.28	
DAVID STARR JORDAN, OCTOBER 12 1966, 2054 GMT, 32 54.5N 117 22W, SOUNDING 325 FM, WIND 280 FORCE 3, WEATHER OVERCAST, SEA MODERATE, WIRE ANGLE 10.																	
0	19.48	33.59	-	-	-	-	406.9	0	19.48	33.590	-	23.84	406.9	0			
10	19.38	33.58	-	-	-	-	405.2	10	19.38	33.580	-	23.86	405.2	.041			
30	15.34	33.37	-	-	-	-	328.8	20	17.56	33.476	-	24.23	369.8	.079			
44	13.62	33.36	-	-	-	-	294.8	30	15.34	33.370	-	24.66	328.8	.114			
54	13.16	33.37	-	-	-	-	285.3	50	13.32	33.363	-	25.08	288.7	.176			
68	12.24	33.43	-	-	-	-	263.8	75	11.78	33.481	-	25.47	251.9	.244			
82	11.38	33.54	-	-	-	-	240.4	100	10.78	33.703	-	25.82	218.2	.304			
98	10.83	33.69	-	-	-	-	219.9	125	10.39	33.810	-	25.98	203.7	.357			
122	10.42	33.80	-	-	-	-	205.0	150	10.08	33.902	-	26.10	191.9	.407			
141	10.22	33.86	-	-	-	-	197.3	200	9.43	34.051	-	26.33	170.6	.500			
170	9.76	33.99	-	-	-	-	180.3	250	8.71	34.092	-	26.47	156.6	.583			
199	9.45	34.05	-	-	-	-	170.9	300	8.31	34.184	-	26.61	143.8	.661			
230	8.92	34.06	-	-	-	-	162.1	400	7.27	34.245	-	26.81	124.9	.801			
269	8.56	34.13	-	-	-	-	151.6	500	6.42	34.301	-	26.97	109.8	.925			
327	8.06	34.22	-	-	-	-	137.6										
380	7.36	34.23	-	-	-	-	127.2										
439	7.02	34.27	-	-	-	-	119.7										
497	6.46	34.30	-	-	-	-	110.3										

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH									
Z	T	S	OXY	PHU	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD			
93.30								CALCOFI CRUISE 6610								93.30	
DAVID STARR JORDAN, OCTOBER 12 1966, 1857 GMT, 32 50.5N 117 31W, SOUNDING 450 FM, WIND 270 FORCE 2, WEATHER OVERCAST, SEA SLIGHT, WIRE ANGLE 03.																	
1	19.94	33.64	5.54	-	-	-	414.6	0	19.94	33.640	5.54	23.76	414.6	0			
10	19.94K	33.64	G	-	-	-	414.6	10	19.94	33.640	5.58	23.76	414.6	.041			
11	19.94	33.64	5.59	-	-	-	414.6	20	18.45	33.520	5.92	24.05	387.2	.082			
20	18.45K	33.52	G	-	-	-	387.2	30	15.05	33.277	6.24	24.66	329.5	.118			
31	14.73	33.26	6.27	-	-	-	324.2	50	13.41	33.393	5.85	25.09	288.3	.180			
41	14.05	33.39	6.15	-	-	-	301.1	75	11.67	33.497	4.57	25.51	248.6	.247			
51	13.33	33.39	-	-	-	-	287.0	100	10.82	33.695	3.70	25.81	219.5	.306			
65	12.06	33.39	5.13	-	-	-	263.5	125	10.41	33.854	3.14	26.01	200.8	.359			
80	11.54	33.56	4.30	-	-	-	241.7	150	10.11	33.982	2.84	26.16	186.4	.408			
101	10.79	33.70	3.68	-	-	-	218.5	200	9.51	34.110	2.27	26.36	167.5	.499			
126	10.40	33.86	3.12	-	-	-	200.2	250	8.92	34.134	2.14	26.47	156.5	.582			
145	10.20	33.97	2.87	-	-	-	188.8	300	8.35	34.187	1.68	26.60	144.3	.659			
175	9.66	34.02	2.72	-	-	-	176.5	400	7.39	34.249	.86	26.79	126.2	.801			
203	9.50	34.12	2.22	-	-	-	166.5	500	6.54	34.299	.42	26.95	111.3	.926			
233	9.18	34.13	2.18	-	-	-	160.9										
272	8.58	34.14	2.04	-	-	-	151.1										
330	8.16	34.24	1.26	-	-	-	137.6										
405	7.32	34.25	.84	-	-	-	125.3										
479	6.70	34.29	.49	-	-	-	114.1										
556	6.14	34.32	.30	-	-	-	104.9										

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH									
Z	T	S	OXY	PHU	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD			
93.40								CALCOFI CRUISE 6610								93.40	
DAVID STARR JORDAN, OCTOBER 12 1966, 1341 GMT, 32 30N 118 11.5W, SOUNDING 950 FM, WIND 290 FORCE 3, WEATHER OVERCAST, SEA ROUGH, WIRE ANGLE 10.																	
1	19.20	33.50	5.50	-	-	-	406.6	0	19.20	33.500	5.50	23.85	406.6	0			
11	19.11	33.47	5.51	-	-	-	406.6	10	19.14	33.473	5.50	23.84	407.1	.041			
30	17.80K	33.44	G	-	-	-	377.9	20	18.65	33.455	5.69	23.95	396.8	.081			
32	16.62	33.36	6.01	-	-	-	357.1	30	17.80	33.440	5.95	24.15	377.9	.120			
41	15.15	33.29	6.18	-	-	-	330.7	50	14.05	33.337	5.97	24.91	305.1	.188			
56	13.53	33.39	5.76	-	-	-	290.9	75	12.71	33.456	5.41	25.27	270.6	.261			
72	12.92	33.44	5.57	-	-	-	275.6	100	11.01	33.590	4.13	25.70	230.4	.324			
97	11.16	33.58	4.19	-	-	-	233.7	125	10.20	33.735	3.60	25.95	206.2	.379			
118	10.34	33.67	3.84	-	-	-	213.3	150	9.66	33.938	3.03	26.20	182.5	.428			
138	9.98	33.86	3.17	-	-	-	193.4	200	9.19	34.122	2.26	26.42	161.7	.516			
158	9.46	33.98	2.96	-	-	-	176.3	250	8.53	34.155	2.00	26.55	149.2	.596			
190	9.31	34.12	2.27	-	-	-	163.6	300	8.18	34.217	1.42	26.65	139.6	.670			
223	8.88	34.13	2.22	-	-	-	156.3	400	7.24	34.256	.77	26.82	123.7	.808			
254	8.48	34.16	1.96	-	-	-	148.2	500	6.52	34.299	.43	26.95	111.1	.932			
303	8.16	34.22	1.38	-	-	-	139.1	600	5.84	34.346	.29	27.08	99.3	1.045			
355	7.62	34.24	1.01	-	-	-	130.0										
439	6.95	34.27	.61	-	-	-	118.8										
523	6.36	34.31	.38	-	-	-	108.3										
608	5.79	34.35	.29	-	-	-	98.4										



## INPUT

## OUTPUT AT STANDARD LEVELS OF DEPTH

Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD			
93.50								CALCOFI CRUISE 6610								93.50	
DAVID STARR JORDAN, OCTOBER 12 1966, 0800 GMT, 32 11N 118 52.5W, SOUNDING 720 FM, WIND 360 FORCE 3, WEATHER OVERCAST, SEA ROUGH, WIRE ANGLE 00.																	
1	18.67	33.43	5.31	-	-	-	399.0	0	18.67	33.430	5.31	23.93	399.0	0			
11	18.23	33.41	5.66	-	-	-	390.0	10	18.29	33.413	5.63	24.01	391.2	.040			
31	16.30	33.33	5.97	-	-	-	352.2	20	17.32	33.372	5.85	24.21	371.8	.078			
41	16.11	33.32	6.00	-	-	-	348.8	30	16.39	33.334	5.96	24.40	353.9	.114			
56	12.65	33.15	5.81	-	-	-	291.9	50	14.08	33.213	5.92	24.81	314.7	.181			
70	12.15	33.24	5.45	-	-	-	276.1	75	11.94	33.268	5.33	25.28	270.3	.255			
95	10.78	33.40	4.82	-	-	-	240.5	100	10.40	33.500	4.67	25.73	226.8	.317			
100	10.40K	33.50	G	-	-	-	226.8	125	9.89	33.703	4.07	25.98	203.6	.372			
115	10.16	33.63	4.24	-	-	-	213.3	150	9.12	33.871	3.57	26.24	179.2	.420			
135	9.58	33.77	3.92	-	-	-	193.7	200	8.38	34.017	2.86	26.47	157.3	.506			
155	8.98	33.90	3.45	-	-	-	174.9	250	7.87	34.105	1.91	26.61	143.5	.583			
184	8.58	33.99	3.10	-	-	-	162.2	300	7.74	34.176	1.30	26.69	136.4	.655			
217	8.18	34.04	2.57	-	-	-	152.7	400	6.78	34.247	.58	26.88	118.4	.788			
247	7.88	34.10	1.96	-	-	-	144.0	500	6.19	34.301	.35	27.00	106.8	.907			
295	7.78	34.17	1.35	-	-	-	137.4	600	5.63	34.350	.25	27.11	96.6	1.016			
349	7.22	34.22	.85	-	-	-	126.1										
432	6.55	34.26	.48	-	-	-	114.4										
516	6.10	34.31	.33	-	-	-	105.1										
599	5.64	34.35	.25	-	-	-	96.7										

93.60

## CALCOFI CRUISE 6610

93.60

DAVID STARR JORDAN, OCTOBER 12 1966, 0244 GMT, 31 50N 119 34W, SOUNDING 1100 FM, WIND 330 FORCE 4, WEATHER OVERCAST, SEA VERY ROUGH, WIRE ANGLE 18.

1	19.01	33.72	5.49	-	-	-	386.0	0	19.01	33.720	5.49	24.06	386.0	0
11	19.00	33.72	5.51	-	-	-	385.8	10	19.00	33.720	5.51	24.06	385.8	.039
20	19.00K	33.72	G	-	-	-	385.8	20	19.00	33.720	5.44	24.06	385.8	.077
30	19.00	33.72	5.51	-	-	-	385.8	30	19.00	33.720	5.51	24.06	385.8	.116
38	14.65	33.59	5.88	-	-	-	298.4	50	12.56	33.601	4.58	25.42	257.1	.180
55	11.90	33.64	3.87	-	-	-	242.2	75	10.49	33.719	3.19	25.89	212.1	.239
67	10.88	33.69	3.35	-	-	-	220.8	100	9.79	33.824	2.94	26.09	193.0	.291
91	10.02	33.78	3.04	-	-	-	200.0	125	9.28	33.951	2.54	26.27	175.6	.337
109	9.59	33.87	2.83	-	-	-	186.5	150	8.86	34.019	2.32	26.39	164.3	.380
127	9.24	33.96	2.50	-	-	-	174.4	200	8.14	34.085	1.99	26.56	148.8	.460
145	8.95	34.01	2.34	-	-	-	166.3	250	7.64	34.136	1.51	26.67	138.1	.534
172	8.50	34.05	2.27	-	-	-	156.6	300	7.22	34.179	1.11	26.76	129.2	.603
204	8.10	34.09	1.94	-	-	-	147.9	400	6.42	34.200	.71	26.89	117.3	.731
232	7.84	34.12	1.67	-	-	-	142.0	500	5.84	34.277	.27	27.02	104.4	.848
279	7.35	34.16	1.27	-	-	-	132.3							
330	7.06	34.20	.91	-	-	-	125.5							
409	6.34	34.20	.69	-	-	-	116.3							
489	5.90	34.27	.30	-	-	-	105.7							
570	5.45	34.31	.25	-	-	-	97.5							

93.67

## CALCOFI CRUISE 6610

93.67

DAVID STARR JORDAN, OCTOBER 11 1966, 2156 GMT, 31 35N 120 02.5W, SOUNDING 2050 FM, WIND 300 FORCE 2, WEATHER OVERCAST, SEA ROUGH, WIRE ANGLE 18.

0	18.62	33.63	5.52	-	-	-	383.2	0	18.62	33.630	5.52	24.09	383.2	0
10	18.58	33.63	5.51	-	-	-	382.3	10	18.58	33.630	5.51	24.10	382.3	.038
20	18.53K	33.63	G	-	-	-	381.1	20	18.53	33.630	5.55	24.11	381.1	.077
29	18.03	33.60	5.64	-	-	-	371.5	30	17.80	33.592	5.66	24.26	366.8	.114
38	15.89	33.53	5.80	-	-	-	328.8	50	14.92	33.518	5.51	24.87	309.2	.182
48	15.16	33.53	5.57	-	-	-	313.3	75	10.88	33.220	5.26	25.43	255.5	.253
61	13.28	33.41	5.27	-	-	-	284.6	100	10.18	33.556	4.07	25.81	219.2	.313
75	10.88	33.22	5.26	-	-	-	255.5	125	9.44	33.776	3.33	26.11	191.1	.364
94	10.35	33.48	4.35	-	-	-	227.5	150	8.88	33.901	3.12	26.30	173.3	.411
117	9.70	33.73	3.44	-	-	-	198.6	200	8.37	34.018	2.63	26.47	157.1	.495
135	9.14	33.82	3.26	-	-	-	183.2	250	7.87	34.094	1.90	26.60	144.3	.572
163	8.74	33.96	3.00	-	-	-	166.8	300	7.23	34.107	1.55	26.71	134.6	.644
189	8.50	34.01	2.68	-	-	-	159.6	400	6.54	34.195	.84	26.87	119.1	.776
217	8.17	34.03	2.54	-	-	-	153.3	500	5.95	34.279	.37	27.01	105.6	.895
253	7.84	34.10	1.84	-	-	-	143.5	600	5.37	34.365	-.07	27.15	92.4	1.000
308	7.13	34.11	1.50	-	-	-	133.1							
377	6.68	34.18	1.05	-	-	-	122.0							
446	6.26	34.23	.53	-	-	-	113.0							
520	5.84	34.30	.37	-	-	-	102.7							

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH								
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD		
94.78								CALCOFI CRUISE 6610								94.78 A)
DAVID STARR JORDAN, OCTOBER 11 1966, 1124 GMT, 31 11.5N 120 45.5W, SOUNDING 2050 FM, WIND 350 FORCE 2, WEATHER MISSING, SEA ROUGH, WIRE ANGLE 20.																
1	18.47	33.32	5.54	-	-	-	402.2	0	18.47	33.320	5.54	23.89	402.2	0		
10	18.47	33.32	5.50	-	-	-	402.2	10	18.47	33.320	5.50	23.89	402.2	.040		
20	18.47K	33.32	G	-	-	-	402.2	20	18.47	33.320	5.65	23.89	402.2	.081		
28	17.06	33.20	5.84	-	-	-	378.5	30	16.85	33.213	5.89	24.20	372.8	.119		
38	16.10	33.29	6.06	-	-	-	350.8	50	14.48	33.219	6.17	24.73	322.2	.189		
47	14.93	33.24	6.19	-	-	-	329.8	75	12.00	33.170	5.66	25.19	278.6	.265		
61	13.00	33.16	5.96	-	-	-	297.7	100	10.67	33.364	4.79	25.58	241.4	.330		
75	12.00	33.17	5.66	-	-	-	278.6	125	9.43	33.758	3.48	26.10	192.3	.385		
95	11.01	33.28	5.09	-	-	-	253.3	150	9.00	33.927	3.02	26.30	173.2	.431		
116	9.70	33.65	3.83	-	-	-	204.5	200	8.36	34.042	2.35	26.49	155.2	.515		
134	9.26	33.84	3.23	-	-	-	183.6	250	7.94	34.144	1.52	26.63	141.7	.591		
161	8.86	33.96	2.93	-	-	-	168.6	300	7.50	34.221	.89	26.76	129.9	.661		
188	8.48	34.02	2.52	-	-	-	158.6	400	6.54	34.301	.36	26.95	111.3	.787		
216	8.22	34.07	2.11	-	-	-	151.1	500	6.06	34.329	.26	27.04	103.2	.901		
253	7.92	34.15	1.47	-	-	-	140.9									
308	7.43	34.23	.81	-	-	-	128.2									
379	6.72	34.29	.41	-	-	-	114.3									
451	6.22	34.32	.27	-	-	-	105.8									
527	6.04	34.33	.26	-	-	-	102.9									

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH								
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD		
93.90								CALCOFI CRUISE 6610								93.90
DAVID STARR JORDAN, OCTOBER 11 1966, 0546 GMT, 30 50.5N 121 30W, SOUNDING 2250 FM, WIND 280 FORCE 2, WEATHER MISSING, SEA SLIGHT, WIRE ANGLE 07.																
1	19.04	33.42	5.58	-	-	-	408.6	0	19.04	33.420	5.58	23.83	408.6	0		
11	19.05	33.41	5.48	-	-	-	409.5	10	19.05	33.411	5.49	23.82	409.5	.041		
32	18.97	33.40	5.46	-	-	-	408.3	20	19.02	33.405	5.35	23.82	409.3	.082		
41	16.51	33.27	6.07	-	-	-	361.2	30	18.98	33.401	5.42	23.83	408.5	.123		
50	15.60K	33.29	G	-	-	-	340.1	50	15.60	33.290	6.12	24.54	340.1	.198		
56	15.08	33.30	6.13	-	-	-	328.5	75	13.70	33.340	5.96	24.99	297.9	.278		
70	14.06	33.32	6.04	-	-	-	306.4	100	12.51	33.423	5.45	25.29	269.3	.350		
75	13.70K	33.34	G	-	-	-	297.9	125	11.05	33.462	4.99	25.59	240.5	.414		
95	12.79	33.41	5.55	-	-	-	275.4	150	9.85	33.625	4.14	25.93	208.7	.471		
114	11.70	33.45	5.18	-	-	-	252.6	200	8.69	33.966	3.03	26.38	165.6	.566		
134	10.55	33.47	4.79	-	-	-	231.5	250	8.04	34.044	2.35	26.54	150.4	.647		
153	9.74	33.66	4.01	-	-	-	204.4	300	7.43	34.057	2.09	26.64	141.0	.722		
183	8.96	33.91	3.24	-	-	-	173.8	400	6.40	34.127	1.20	26.83	122.4	.859		
215	8.50	33.99	2.87	-	-	-	161.1	500	5.63	34.210	.52	27.00	106.9	.980		
243	8.13	34.04	2.40	-	-	-	152.0	600	5.25	34.307	.29	27.12	95.4	1.087		
292	7.52	34.05	2.17	-	-	-	142.8									
344	6.95	34.10	1.64	-	-	-	131.5									
427	6.16	34.14	1.02	-	-	-	118.6									
510	5.57	34.22	.47	-	-	-	105.6									
593	5.26	34.30	.30	-	-	-	96.1									

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH								
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD		
93.100								CALCOFI CRUISE 6610								93.100
DAVID STARR JORDAN, OCTOBER 11 1966, 0017 GMT, 30 30N 122 14W, SOUNDING 2225 FM, WIND 260 FORCE 3, WEATHER CLOUDY, SEA VERY ROUGH, WIRE ANGLE 08.																
0	19.72	33.55	5.49	-	-	-	415.7	0	19.72	33.550	5.49	23.75	415.7	0		
10	19.68	33.54	5.47	-	-	-	415.5	10	19.68	33.540	5.47	23.75	415.5	.042		
20	19.69K	33.56	G	-	-	-	414.2	20	19.69	33.560	5.47	23.77	414.2	.083		
30	19.73	33.60	5.48	-	-	-	412.3	30	19.73	33.600	5.48	23.79	412.3	.125		
55	16.40	33.32	6.11	-	-	-	355.1	50	17.15	33.373	5.99	24.25	368.0	.203		
64	15.87	33.37	6.13	-	-	-	340.0	75	14.86	33.446	6.12	24.82	313.4	.288		
73	14.96	33.44	6.13	-	-	-	315.8	100	13.83	33.492	5.84	25.08	289.1	.364		
88	14.44	33.46	6.06	-	-	-	303.7	125	11.93	33.435	5.31	25.41	257.9	.433		
104	13.58	33.50	5.75	-	-	-	283.8	150	10.18	33.602	4.49	25.85	215.8	.493		
128	11.68	33.43	5.23	-	-	-	253.8	200	8.98	33.900	3.72	26.28	174.9	.593		
147	10.32	33.58	4.59	-	-	-	219.6	250	8.21	34.023	2.87	26.50	154.4	.677		
171	9.52	33.74	3.89	-	-	-	195.0	300	7.50	34.083	1.99	26.65	140.0	.753		
200	8.98	33.90	3.72	-	-	-	174.9	400	6.44	34.150	1.12	26.85	121.3	.889		
229	8.56	33.98	3.33	-	-	-	162.7	500	5.73	34.222	.52	26.99	107.2	1.009		
267	7.93	34.05	2.49	-	-	-	148.5									
325	7.21	34.10	1.71	-	-	-	134.9									
400	6.44	34.15	1.12	-	-	-	121.3									
473	5.88	34.20	.65	-	-	-	110.7									
551	5.51	34.27	.33	-	-	-	101.1									

A) THE UNUSUAL NUMBER FOR THIS STATION RESULTS FROM THE CAST BEING LOWERED SO FAR FROM THE DESIRED POSITION FOR 93.80.

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH								
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD		
93.110								CALCOFI CRUISE 6610							93.110	
DAVID STARR JORDAN, OCTOBER 10 1966, 1854 GMT, 30 09.5N 122 55W, SOUNDING 1925 FM, WIND 340 FORCE 2, WEATHER OVERCAST, SEA VERY ROUGH, WIRE ANGLE 04.																
2	18.78	33.29	5.62	-	-	-	411.8	0	18.78	33.290	5.62	23.79	411.8	0		
12	18.78	33.28	5.59	-	-	-	412.5	10	18.78	33.281	5.59	23.79	412.4	.041		
33	18.74	33.28	5.60	-	-	-	411.5	20	18.77	33.280	5.59	23.79	412.2	.083		
42	17.98	33.27	5.81	-	-	-	394.4	30	18.75	33.280	5.60	23.79	411.7	.124		
52	16.76	33.26	6.13	-	-	-	367.4	50	17.03	33.262	6.07	24.19	373.4	.203		
66	14.56	33.25	6.39	-	-	-	321.5	75	13.56	33.242	6.39	24.94	302.3	.287		
80	13.10	33.24	6.37	-	-	-	293.7	100	11.54	33.260	5.45	25.34	263.8	.359		
100	11.54	33.26	5.45	-	-	-	263.8	125	10.37	33.438	4.65	25.69	230.9	.421		
127	10.30	33.46	4.59	-	-	-	228.2	150	9.58	33.766	3.69	26.08	194.0	.475		
147	9.66	33.74	3.70	-	-	-	197.2	200	8.65	33.973	3.70	26.39	164.5	.566		
176	9.00	33.91	3.63	-	-	-	174.4	250	7.75	34.029	3.13	26.57	147.6	.646		
205	8.58	33.98	3.70	-	-	-	163.0	300	7.06	34.060	2.22	26.69	135.9	.719		
235	8.04	34.02	3.37	-	-	-	152.2	400	6.30	34.182	.92	26.89	117.1	.851		
274	7.34	34.04	2.70	-	-	-	141.1	500	5.57	34.247	.49	27.03	103.5	.967		
331	6.81	34.09	1.69	-	-	-	130.4									
406	6.26	34.19	.88	-	-	-	116.0									
481	5.66	34.23	.56	-	-	-	105.9									
559	5.42	34.32	.30	-	-	-	96.4									

INPUT								OUTPUT AT STANDARD LEVELS OF DEPTH								
Z	T	S	OXY	PHO	SIL	NIT	D*T	Z	T	S	OXY	SIG*T	D*T	DD		
93.120								CALCOFI CRUISE 6610							93.120	
DAVID STARR JORDAN, OCTOBER 10 1966, 1356 GMT, 29 49N 123 35W, SOUNDING 2175 FM, WIND 350 FORCE 1, WEATHER MISSING, SEA VERY ROUGH, WIRE ANGLE 07.																
0	18.82	33.32	5.62	-	-	-	410.5	0	18.82	33.320	5.62	23.80	410.5	0		
10	18.82	33.31	5.56	-	-	-	411.3	10	18.82	33.310	5.56	23.80	411.3	.041		
30	18.82	33.30	5.63	-	-	-	412.0	20	18.81	33.293	5.58	23.79	412.2	.082		
40	18.90	33.36	5.64	-	-	-	409.6	30	18.82	33.300	5.63	23.79	412.0	.124		
50	17.68	33.55	6.07	-	-	-	367.1	50	17.68	33.550	6.07	24.26	367.1	.202		
64	16.16	33.44	6.20	-	-	-	341.2	75	15.35	33.440	6.21	24.71	323.8	.289		
79	15.12	33.45	6.20	-	-	-	318.4	100	14.34	33.503	6.10	24.98	298.6	.367		
97	14.43	33.48	6.13	-	-	-	302.1	125	13.42	33.615	5.67	25.26	272.3	.439		
122	13.72	33.63	5.75	-	-	-	277.0	150	11.02	33.571	4.95	25.68	231.9	.503		
142	11.62	33.53	5.20	-	-	-	245.3	200	9.30	33.864	4.28	26.20	182.4	.608		
171	9.92	33.74	4.41	-	-	-	201.3	250	8.39	33.989	3.72	26.44	159.5	.696		
199	9.32	33.86	4.29	-	-	-	183.0	300	7.58	34.010	3.07	26.58	146.6	.775		
229	8.74	33.96	4.01	-	-	-	166.8	400	6.54	34.140	1.19	26.83	123.3	.915		
267	8.12	34.00	3.46	-	-	-	154.9	500	5.85	34.208	.56	26.97	109.7	1.037		
327	7.18	34.02	2.71	-	-	-	140.5									
400	6.54	34.14	1.19	-	-	-	123.3									
473	6.02	34.19	.68	-	-	-	113.1									
551	5.54	34.24	.45	-	-	-	103.7									



DATA AT NET TOW STATIONS												
Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 METERS		
						Dir	Force			T °C	S ‰	$\delta_T$ cl/ton
60.50-J	X-16	1825	37°57.0'	122°53.0'	25	280°	4	clear	moderate	11.02	33.671	225
60.52-J	16	1715	37°54.0'	123°01.5'	41	330°	3	clear	rough	11.32	33.655	231
60.55-J	16	1440	37°47.0'	123°15.0'	65	330°	4	clear	rough	11.56	33.611	238
60.60-J	16	1240	37°37.0'	123°37.0'	875	330°	4	missing	very rough	11.68	33.421	255
60.70-J	16	0741	37°17.0'	124°21.0'	2155	330°	7	cloudy	very rough	15.40	33.097	350
60.80-J	16	0237	36°56.5'	125°04.0'	2250	330°	5	cloudy	very rough	15.94	32.898	376
60.90-J	15	2140	36°38.5'	125°47.0'	2250	330°	6	cloudy	missing	16.68	32.672	409
63.50-J	16	2200	37°23.5'	122°28.0'	15	310°	4	clear	moderate	11.63	33.570	243
63.52-J	16	2318	37°18.5'	122°36.5'	47	310°	5	clear	slight	12.48	33.524	262
63.55-J	17	0055	37°13.0'	122°50.0'	155	310°	4	clear	moderate	12.56	33.480	266
63.60-J	17	0250	37°03.0'	123°12.0'	1400	320°	4	clear	moderate	12.29	33.235	279
63.70-J	17	0735	36°42.5'	123°55.0'	2150	340°	5	clear	rough	13.76	33.191	310
63.80-J	17	1200	36°26.0'	124°39.0'	2300	350°	5	missing	very rough	15.95	32.905	376
63.90-J	17	1530	36°03.0'	125°20.0'	2450	350°	5	cloudy	very rough	15.70	32.850	374
67.48-J	18	1440	36°53.0'	121°56.0'	20	090°	2	clear	moderate	12.66	33.508	265
67.50-J	18	1330	36°48.0'	122°05.0'	55	090°	3	missing	moderate	12.65	33.315	280
67.55-J	18	1125	36°39.0'	122°26.0'	1240	350°	3	missing	rough	14.12	33.383	303
67.58-J	18	0950	36°30.0'	122°39.0'	1500	350°	3	clear	rough	13.65	33.257	303
67.70-J	18	0445	36°08.0'	123°29.5'	1950	340°	4	missing	rough	14.20	33.279	312

Station	Date	Time GCT	DATA AT NET TOW STATIONS							10 METERS		
			Latitude	Longitude	Sounding	Wind		Weather	Sea	T	S	$\delta_T$
			North	West	(fm)	Dir	Force			°C	‰	cl/ton
67.80-J	X-18	0045	35°48.0'	124°12.0'	2200	360°	4	partly cloudy	very rough	16.36	32.887	386
67.90-J	17	1950	35°27.5'	124°56.0'	2150	360°	5	cloudy	very rough	16.30	32.914	383
70.51-J	18	1940	36°11.5'	121°44.0'	140	-	1	partly cloudy	slight	12.00	33.562	250
70.53-J	18	2040	36°06.5'	121°54.0'	585	-	1	partly cloudy	slight	12.25	33.372	268
70.60-J	18	2355	35°53.0'	122°22.5'	1700	310°	4	partly cloudy	moderate	12.44	33.373	272
70.70-J	19	0400	35°33.0'	123°06.0'	2050	330°	3	missing	moderate	14.13	33.471	297
70.80-J	19	0755	35°10.0'	123°48.0'	2200	330°	3	missing	moderate	15.71	33.467	330
70.90-J	19	1229	34°48.0'	124°30.0'	2300	330°	3	clear	moderate	16.70	33.840	324
73.50-J	20	0934	35°37.0'	121°17.0'	52	300°	3	fog	moderate	13.54	33.459	286
73.53-J	20	0735	35°31.5'	121°28.5'	400	280°	3	clear	slight	15.38	33.453	324
73.60-J	20	0445	35°17.5'	121°58.0'	1350	280°	3	missing	moderate	15.86	33.465	332
73.70-J	20	0035	34°58.0'	122°40.0'	2200	300°	3	cloudy	moderate	15.85	33.277	346
73.80-J	19	2055	34°39.0'	123°19.5'	2250	300°	3	cloudy	moderate	16.28	33.434	344
74.91-J	19	1628	34°11.5'	124°04.0'	2350	300°	3	cloudy	moderate	16.37	32.895	385
77.48-J	20	1355	35°08.5'	120°43.5'	17	-	1	fog	slight	13.52	-	
77.51-J	20	1515	35°02.0'	120°56.5'	155	270°	1	missing	slight	14.77	33.324	320
77.55-J	20	1725	34°54.5'	121°13.0'	310	280°	2	missing	slight	15.70	33.392	335
77.60-J	20	1945	34°44.5'	121°34.0'	440	280°	3	missing	moderate	14.66	33.327	318
77.70-J	20	2330	34°24.0'	122°16.0'	2175	330°	4	partly cloudy	moderate	16.20	33.247	356

DATA AT NET TOW STATIONS										10 METERS		
Station	Date	Time GCT	Latitude		Sounding (fm)	Wind		Weather	Sea	T °C	S ‰	$\delta_T$ cl/ton
			North	West		Dir	Force					
77.80-J	X-21	0445	34°04.0'	122°57.0'	2250	330°	4	partly cloudy	moderate	16.12	33.335	348
77.90-J	21	0830	33°45.5'	123°35.0'	2185	340°	5	missing	rough	14.50	33.069	333
80.51-J	22	0840	34°26.0'	120°32.5'	55	340°	2	missing	rough	13.57	33.465	286
80.52-J	23	0730	34°24.5'	120°36.5'	160	330°	5	missing	very rough	13.98	33.456	295
80.55-J	23	0545	34°19.0'	120°48.0'	400	330°	6	missing	high	15.48	33.517	321
80.60-J	22	0135	34°09.0'	121°09.0'	1200	330°	6	clear	high	15.01	33.411	319
80.65-J	21	2330	33°59.0'	121°30.0'	1800	320°	7	clear	high	15.32	33.342	330
80.70-J	21	2015	33°47.0'	121°51.0'	2000	340°	7	partly cloudy	high	17.40	33.328	377
80.80-J	21	1605	33°29.0'	122°32.0'	2150	340°	6	missing	rough	17.70	33.350	382
80.90-J	21	1150	33°15.0'	123°08.0'	2200	350°	6	missing	rough	17.63	33.307	384
82.47-J	22	1140	34°15.0'	119°59.0'	310	360°	1	missing	slight	15.40	33.529	318
83.40-J	22	1500	34°14.0'	119°22.0'	12	060°	3	missing	slight	16.70	33.510	348
83.43-J	22	1630	34°08.0'	119°34.0'	130	090°	2	missing	moderate	17.08	33.514	356
83.51-J	22	2059	33°52.0'	120°08.5'	57	280°	3	missing	rough	16.06	33.536	332
83.55-J	22	2347	33°45.0'	120°22.5'	650	330°	4	partly cloudy	very rough	15.72	33.533	325
83.60-J	23	0205	33°34.0'	120°45.0'	800	330°	4	partly cloudy	very rough	15.17	33.523	314
83.65-J	23	0415	33°24.0'	121°06.0'	2000	330°	5	missing	very rough	15.48	33.537	320
83.70-J	23	0615	33°14.5'	121°26.0'	2000	340°	6	missing	very rough	15.18	33.287	331
83.80-J	23	1040	32°54.0'	122°08.0'	2150	340°	4	missing	very rough	15.70	33.241	346

Station	Date	Time GCT	DATA AT NET TOW STATIONS				10 METERS			T °C	S ‰	$\delta_T$ cl/ton
			Latitude North	Longitude West	Sounding (fm)	Wind Dir Force	Weather	Sea				
83.90-J	X-23	1445	32°35.5'	122°50.0'	2250	340° 4	partly cloudy	very rough	17.78	33.324	386	
87.33-J	24	1955	33°54.0'	118°29.5'	28	- 1	clear	slight	17.34	33.524	361	
87.35-J	24	1900	33°50.0'	118°37.5'	300	- 1	clear	slight	16.94	33.491	355	
87.40-J	24	1645	33°40.0'	118°58.0'	485	- 1	clear	slight	17.35	33.483	364	
87.45-J	24	1425	33°30.0'	119°19.0'	520	300° 1	clear	moderate	17.80	33.592	367	
87.50-J	24	1215	33°20.0'	119°39.5'	40	270° 1	clear	moderate	18.02	33.637	369	
87.55-J	24	1003	33°15.0'	120°00.0'	505	240° 2	missing	moderate	15.85	33.516	329	
87.60-J	24	0740	33°00.0'	120°21.5'	400	- 1	missing	moderate	16.72	33.571	344	
87.65-J	24	0540	32°49.5'	120°41.5'	2000	- 1	missing	moderate	16.61	33.588	340	
87.70-J	24	0330	32°39.5'	121°02.0'	2050	- 1	missing	moderate	16.62	33.621	338	
87.80-J	23	2314	32°19.5'	121°43.0'	2160	020° 3	clear	moderate	16.70	33.570	343	
87.90-J	23	1845	31°57.5'	122°24.0'	2250	340° 4	clear	rough	16.88	33.274	369	
90.65-J	9	0600	32°15.0'	120°18.0'	2000	320° 3	missing	rough	18.22	-		
93.27-J	12	0945	32°56.0'	117°19.0'	51	280° 3	partly cloudy	moderate	18.92	33.501	400	
93.35-J	12	1612	32°40.5'	117°51.5'	365	290° 3	overcast	slight	19.88	33.592	416	
93.45-J	12	1102	32°20.0'	118°32.0'	700	310° 3	overcast	moderate	19.08	33.455	407	
93.55-J	12	0538	32°01.0'	119°13.5'	1150	310° 4	overcast	moderate	18.83	33.662	386	
93.65-J	11	2340	31°40.0'	119°53.5'	2050	300° 4	overcast	very rough	18.80	33.695	383	



Station	Date	Time GCT	DATA AT NET TOW STATIONS							10 METERS		
			Latitude	Longitude	Sounding	Wind		Weather	Sea	T	S	$\delta_T$
			North	West	(fm)	Dir	Force			°C	‰	cl/ton
97.29-G	X-13	2340	32°17.0'	117°04.5'	-	-	-	missing	missing	18.50	33.508	389
97.30-G	14	0025	32°16.0'	117°06.5'	32	300°	4	clear	moderate	18.76a)	33.555	392a)
97.32-G	14	0120	32°12.0'	117°15.0'	746	270°	4	clear	moderate	19.93	33.661	413
97.35-G	14	0400	32°05.5'	117°27.5'	660	320°	4	clear	rough	19.58	33.631	406
97.40-G	14	0645	31°55.0'	117°49.5'	750	340°	4	clear	rough	20.00	33.648	416
97.45-G	14	0911	31°46.0'	118°09.0'	820	330°	3	missing	moderate	19.60	33.656	405
97.50-G	14	1325	31°35.0'	118°30.0'	1326	340°	2	missing	slight	18.12	33.411	387
97.55-G	14	1615	31°25.5'	118°50.0'	1375	340°	4	missing	rough	18.10	-	
97.60-G	14	1830	31°17.0'	119°10.0'	1986	040°	3	missing	very rough	18.27	33.368	394
97.65-G	14	2120	31°05.0'	119°31.5'	1780	050°	3	clear	very rough	17.78	33.378	382
97.70-G	15	0005	30°55.0'	119°51.0'	1920	030°	3	clear	very rough	17.94	33.335	389
97.80-G	15	0440	30°35.0'	120°31.0'	2150	270°	3	clear	very rough	18.23	33.657	372
100.29-G	16	1111	31°42.0'	116°44.5'	144	070°	2	clear	slight	15.05	33.395	321
100.30-G	16	1019	31°41.0'	116°46.5'	218	360°	2	clear	slight	15.35	33.411	326
100.35-G	16	0755	31°27.5'	117°05.0'	610	320°	5	clear	very rough	19.87	33.678	410
100.40-G	16	0530	31°20.5'	117°25.0'	1080	300°	4	clear	very rough	19.48	33.611	406
100.45-G	16	0300	31°10.0'	117°46.0'	448	300°	5	clear	very rough	19.22	33.473	409

a) Alternate values: 18.62°C; 389 cl/ton.

Station	Date	Time GCT	DATA AT NET TOW STATIONS				10 METERS			T °C	S ‰	$\delta_T$ cl/ton
			Latitude North	Longitude West	Sounding (fm)	Wind Dir Force	Weather	Sea				
100.50-G	X-16	0015	30°59.0'	118°07.0'	941	330° 4	clear	very rough	19.16	33.452	409	
100.55-G	15	2148	30°49.0'	118°27.5'	1360	320° 5	partly cloudy	rough	19.26	33.486	409	
100.60-G	15	1905	30°38.5'	118°47.5'	1400	320° 4	partly cloudy	rough	19.38	33.552	408	
100.65-G	15	1640	30°30.5'	119°07.5'	2000	360° 4	clear	rough	19.40	33.562	407	
100.70-G	15	1401	30°21.0'	119°28.0'	2061	340° 4	clear	rough	19.38	33.561	407	
100.80-G	15	0924	30°01.0'	120°06.5'	2144	340° 2	clear	slight	19.63	33.646	407	
103.29-G	16	1545	31°07.0'	116°21.0'	-	- -	missing	missing	14.80	33.384	317	
103.30-G	16	1615	31°06.0'	116°24.5'	-	- -	missing	missing	16.48	33.453	347	
103.35-G	16	1830	30°55.5'	116°45.0'	985	280° 4	partly cloudy	very rough	19.90	33.679	411	
103.40-G	16	2137	30°46.5'	117°05.5'	935	040° 5	clear	very rough	19.03	33.542	400	
103.45-G	17	0012	30°35.5'	117°24.7'	1264	360° 4	clear	very rough	19.65	33.629	408	
103.50-G	17	0230	30°25.0'	117°44.5'	1180	040° 3	clear	moderate	19.70	33.600	412	
103.55-G	17	0505	30°15.0'	118°05.0'	1306	360° 3	clear	moderate	19.76	33.626	411	
103.60-G	17	0715	30°05.5'	118°24.0'	1870	010° 3	missing	moderate	19.69	33.615	410	
103.65-G	17	0928	29°56.0'	118°44.0'	1660	340° 4	clear	moderate	19.68	33.597	412	
103.70-G	17	1148	29°46.5'	119°04.0'	1886	360° 3	clear	moderate	19.26	33.533	406	
107.31-G	18	1207	30°28.0'	116°07.0'	24	100° 3	clear	slight	15.99	33.383	342	
107.32-G	18	1126	30°25.5'	116°11.0'	214	100° 2	clear	slight	16.26	33.394	347	
107.35-G	18	0933	30°22.5'	116°21.5'	925	260° 2	clear	slight	18.04	33.498	380	

Station	Date	Time	DATA AT NET TOW STATIONS							10 METERS		
			Latitude	Longitude	Sounding	Wind		Weather	Sea	T	S	$\delta_T$
			North	West		Dir	Force					
107.40-G	X-18	0655	30°10.5'	116°43.0'	1379	020°	4	missing	moderate	18.26	33.513	383
107.45-G	18	0435	30°00.5'	117°01.5'	953	350°	2	missing	moderate	19.62	33.576	412
107.50-G	18	0200	29°49.5'	117°21.0'	1321	360°	3	partly cloudy	very rough	19.78	33.551	417
107.55-G	17	2329	29°40.0'	117°41.0'	1706	350°	3	clear	very rough	20.12	33.603	422
107.60-G	17	2059	29°30.5'	118°01.0'	1929	320°	4	clear	very rough	19.97	33.616	417
107.65-G	17	1835	29°22.0'	118°21.0'	1530	360°	3	clear	rough	19.24	33.509	407
107.70-G	17	1600	29°11.0'	118°41.0'	1320	360°	3	clear	very rough	19.45	33.504	412
110.32-G	18	1615	29°52.0'	115°48.0'	15	280°	3	clear	rough	14.42	33.411	307
110.35-G	18	1745	29°45.5'	116°00.5'	670	220°	3	clear	moderate	18.86	33.507	398
110.40-G	18	1947	29°35.5'	116°19.5'	1256	250°	4	clear	rough	20.14	33.552	426
110.45-G	18	2202	29°26.0'	116°39.5'	346	330°	3	clear	rough	18.81	33.469	400
110.50-G	19	0021	29°17.5'	116°58.5'	1630	270°	4	clear	rough	20.27	33.662	422
110.55-G	19	0255	29°07.0'	117°19.0'	1818	330°	4	clear	slight	20.14	33.665	417
110.60-G	19	0515	28°55.0'	117°38.0'	1906	350°	4	clear	slight	19.71	33.552	415
110.65-G	19	0740	28°43.0'	117°58.0'	1900	350°	3	clear	slight	19.78	33.588	414
110.70-G	19	0943	28°36.5'	118°17.0'	1904	130°	3	clear	slight	19.42	33.487	406
113.29-G	20	1029	29°24.0'	115°13.0'	15	310°	4	missing	slight	17.07	33.486	358
113.30-G	20	0926	29°22.0'	115°18.0'	34	340°	3	missing	slight	16.84	33.469	354
113.35-G	20	0630	29°12.0'	115°38.5'	700	270°	3	missing	slight	17.39	33.391	372



Station	Date	Time GCT	DATA AT NET TOW STATIONS						10 METERS			
			Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	T °C	S ‰	$\delta_T$ cl/ton
						Dir	Force					
113.40-G	X-20	0410	29°02.0'	115°56.5'	1020	320°	3	fog	slight	20.16	33.620	422
113.45-G	20	0150	28°53.5'	116°17.0'	1069	340°	3	clear	moderate	20.10	33.668	417
113.50-G	19	2336	28°43.0'	116°36.5'	1922	290°	4	clear	moderate	19.99	33.548	422
113.55-G	19	2113	28°32.0'	116°56.5'	1810	350°	3	clear	moderate	20.31	33.590	428
113.60-G	19	1850	28°22.5'	117°15.0'	1928	040°	4	clear	moderate	20.48	33.750	421
113.65-G	19	1720	28°12.5'	117°35.5'	2040	340°	3	clear	moderate	20.78	33.948	414
113.70-G	19	1352	28°01.0'	117°52.5'	1792	030°	3	clear	moderate	20.68	33.881	416
117.25-G	20	1715	28°58.0'	114°36.5'	17	220°	1	partly cloudy	moderate	18.06	33.507	379
117.26-G	20	1630	28°56.0'	114°41.5'	40	310°	2	partly cloudy	moderate	18.56	33.524	390
117.30-G	20	1440	28°48.0'	114°56.5'	55	270°	3	partly cloudy	moderate	19.18	33.548	403
117.35-G	22	1115	28°38.0'	115°15.5'	126	320°	3	missing	slight	19.97	33.599	419
117.40-G	22	1330	28°28.0'	115°35.5'	546	010°	3	cloudy	moderate	20.00	33.630	417
117.45-G	22	1552	28°17.5'	115°56.0'	1612	310°	2	partly cloudy	moderate	19.94	33.582	419
117.50-G	22	1805	28°08.0'	116°15.0'	2172	330°	2	partly cloudy	rough	19.80	33.543	418
117.55-G	22	2030	27°57.5'	116°36.0'	2320	350°	3	cloudy	very rough	20.54	33.593	433
117.60-G	22	2230	27°48.0'	116°53.0'	1931	320°	4	cloudy	very rough	21.19	33.686	443
117.65-G	23	0045	27°37.5'	117°13.0'	1984	320°	3	partly cloudy	very rough	20.94	33.651	439
117.70-G	23	0307	27°27.5'	117°33.0'	1975	330°	2	partly cloudy	slight	21.01	33.650	441
118.39-G	21	1402	28°18.5'	115°24.0'	144	240°	4	cloudy	moderate	20.56	33.630	431

Station	Date	Time GCT	DATA AT NET TOW STATIONS							10 METERS		
			Latitude North	Longitude West	Sounding (fm)	Wind Dir	Force	Weather	Sea	T °C	S ‰	$\delta_T$ cl/ton
119.33-G	X-21	0707	28°19.0'	114°53.0'	58	300°	5	missing	slight	19.82	33.545	418
120.24-G	21	0220	28°24.0'	114°11.5'	21	330°	2	missing	slight	19.80	33.610	413
120.25-G	21	0249	28°22.5'	114°15.0'	30	360°	3	missing	slight	20.32	33.608	426
120.30-G	21	0453	28°13.0'	114°34.0'	50	100°	2	missing	slight	19.90	33.583	418
120.35-G	21	0910	28°03.0'	114°54.0'	44	080°	3	missing	slight	20.44	33.619	429
120.40-G	21	1115	27°56.5'	115°14.0'	24	040°	2	missing	slight	15.84	33.650	319
120.45-G	23	1935	27°42.0'	115°32.0'	1362	340°	3	clear	very rough	20.17	33.592	424
120.50-G	23	1653	27°38.5'	115°55.0'	2246	020°	3	partly cloudy	rough	21.05	33.659	441
120.55-G	23	1442	27°28.5'	116°12.0'	2216	030°	4	cloudy	rough	21.02	33.642	442
120.60-G	23	1230	27°17.5'	116°31.5'	2021	340°	4	missing	moderate	21.43	33.724	447
120.65-G	23	0945	27°06.0'	116°51.0'	2030	320°	3	missing	moderate	21.61	33.736	450
120.70-G	23	0712	26°55.0'	117°11.0'	2072	010°	4	partly cloudy	slight	21.52	33.719	449
123.36-G	24	0040	27°25.5'	114°36.0'	27	280°	1	clear	rough	17.90	33.721	360
123.37-G	24	0120	27°24.0'	114°40.0'	39	290°	2	clear	rough	18.38	33.703	372
123.42-G	24	0335	27°14.0'	114°59.0'	1028	310°	4	clear	slight	20.66	33.614	434
123.45-G	24	0515	27°08.0'	115°11.0'	2232	310°	3	clear	slight	21.40	33.765	443
123.50-G	24	0738	26°57.5'	115°29.5'	1772	330°	4	clear	slight	21.41	33.770	443
123.55-G	24	0959	26°47.0'	115°48.5'	1910	320°	3	clear	slight	21.60	33.761	448
123.60-G	24	1230	26°37.0'	116°06.5'	2032	340°	4	clear	slight	21.27	33.687	445

Station	Date	Time GCT	DATA AT NET TOW STATIONS				10 METERS					
			Latitude North	Longitude West	Sounding (fm)	Wind Dir Force	Weather	Sea	T °C	S ‰	$\delta_T$ cl/ton	
127.33-G	X-25	0540	26°57.5'	114°02.5'	36	250°	2	clear	smooth	19.92	33.839	400
127.34-G	25	0453	26°55.5'	114°06.5'	41	300°	3	clear	smooth	21.15	33.889	427
127.40-G	25	0206	26°43.0'	114°29.0'	1774	290°	3	clear	slight	21.30	33.861	433
127.45-G	25	0048	26°32.5'	114°48.5'	1662	300°	3	clear	rough	20.06	33.621	419
127.50-G	24	2120	26°23.5'	115°08.0'	1982	310°	3	clear	rough	20.63	33.606	434
126.56-G	24	1829	26°14.5'	115°35.0'	2032	330°	2	clear	rough	21.28	33.700	444
127.60-G	24	1607	26°07.0'	115°48.5'	2024	340°	2	partly cloudy	moderate	21.28	33.719	443
130.28-G	25	1004	26°33.0'	113°21.0'	31	010°	3	clear	smooth	21.22	33.927	427
130.30-G	25	1109	26°29.0'	113°29.0'	43	010°	2	clear	smooth	19.82	33.846	397
130.35-G	25	1406	26°19.0'	113°48.0'	238	300°	1	clear	moderate	22.78	34.103	455
130.40-G	25	1625	26°08.5'	114°08.5'	1294	300°	3	clear	moderate	22.56	34.040	454
130.45-G	25	2037	25°58.5'	114°28.5'	1860	300°	3	clear	rough	22.94	33.974	469
130.50-G	25	2246	25°49.0'	114°47.5'	1894	310°	3	clear	rough	22.32	33.931	455
130.55-G	26	0105	25°38.0'	115°08.5'	2020	310°	3	clear	rough	23.28	34.038	474
130.60-G	26	0300	25°29.0'	115°24.0'	2050	320°	3	clear	slight	21.91	33.858	450
133.23-G	27	0159	26°08.5'	112°40.0'	39	300°	3	clear	slight	22.01	33.873	451
133.25-G	27	0056	26°05.0'	112°48.0'	45	270°	3	clear	moderate	23.09	34.020	470
133.30-G	26	2240	25°55.0'	113°07.0'	120	260°	3	clear	moderate	23.09	33.978	472
133.35-G	26	2020	25°43.5'	113°26.0'	471	270°	1	clear	rough	24.19	34.262	483



Station	Date	Time GCT	DATA AT NET TOW STATIONS						10 METERS		
			Latitude North	Longitude West	Sounding (fm)	Wind Dir Force	Weather	Sea	T °C	S ‰	$\delta_T$ cl/ton
133.40-G	X-26	1751	25°33.0'	113°45.5'	1509	320° 4	clear	moderate	23.58	33.897	493
133.45-G	26	1535	25°23.0'	114°05.0'	1852	320° 4	clear	moderate	23.40	33.919	486
133.51-G	26	1210	25°16.0'	114°31.0'	1941	320° 3	clear	slight	23.59	34.078	479
133.55-G	26	0950	25°06.0'	114°47.5'	2046	320° 3	clear	slight	23.59	34.056	480
133.60-G	26	0724	24°55.0'	115°05.0'	2027	310° 3	clear	smooth	23.75	34.040	487
137.22-G	27	0607	25°36.0'	112°15.0'	30	330° 2	clear	slight	23.19	34.000	474
137.23-G	27	0647	25°33.5'	112°18.5'	40	250° 2	clear	slight	23.56	34.003	484
137.30-G	27	0939	25°19.0'	112°44.5'	224	260° 3	clear	slight	23.56	34.013	483
137.35-G	27	1159	25°08.0'	113°03.0'	816	290° 3	clear	slight	24.32	34.252	487
137.40-G	27	1420	25°00.0'	113°23.5'	1612	300° 3	clear	rough	24.62	34.268	495
137.45-G	27	1640	24°50.5'	113°39.5'	1882	310° 3	partly cloudy	rough	24.36	34.127	497
137.50-G	27	1858	24°41.0'	113°59.0'	1984	310° 2	partly cloudy	rough	24.06	33.993	499
137.55-G	27	2111	24°30.0'	114°20.0'	1905	310° 3	partly cloudy	rough	23.91	34.054	490
137.60-G	27	2311	24°20.0'	114°39.5'	1905	320° 2	clear	rough	23.83	34.071	487

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