

UNIVERSITY OF CALIFORNIA SCRIPPS INSTITUTION OF OCEANOGRAPHY

data report

PHYSICAL AND CHEMICAL DATA

CCOFI Cruise 6005
13-29 May 1960

SIO Reference 62-7
18 August 1961

UNIVERSITY OF CALIFORNIA
SCRIPPS INSTITUTION OF OCEANOGRAPHY

PHYSICAL AND CHEMICAL DATA

CCOFI CRUISE 6005

13-29 May 1960

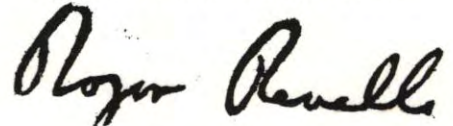
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Marine Research Committee

SIO Reference 62-7

18 August 1961

Approved for distribution:



Roger Revelle, Director

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INTRODUCTION

The data presented in this report were collected by the R/V Black Douglas of the Bureau of Commercial Fisheries and the R/V Orca of the Scripps Institution of Oceanography on Cruise 6005 of the California Cooperative Oceanic Fisheries Investigations program. The first two figures in this cruise numbering system represent the year of the cruise; the last two figures, the month. In the case of quarterly cruises the last figures are hyphenated. The cruises preceding this one in the series are 5911 and 5912 (Scripps Institution report, SIO Ref. 61-21) and 6001 (SIO Ref. 61-23), 6002 (SIO Ref. 62-3), 6003 (SIO Ref. 62-5) and 6004 (SIO Ref. 62-6).

The data are tabulated at observed depths; the interpolated and computed values are tabulated at standard depths and are accompanied by charts of horizontal distribution. The presentation of data in this report does not constitute publication; however, the data contained in this report have been carefully edited and no modifications should be necessary before final publication.

STANDARD PROCEDURES

Processing of the data was carried out using the method described by Klein.^{1/} Certain approximations have been introduced for the determination of the integrated pressure terms which may result in errors whose maximum values are less than 0.5 dynamic centimeter at 0 over 200 decibars, 1.0 dynamic centimeter at 0 over 500 decibars, and 2.0 dynamic centimeters at 0 over 1000 decibars. The 125-meter level was introduced into the integration to obtain greater accuracy in the determination of ΔD .

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 third decimal place has been offset to emphasize that the accuracy of the observations is not to one unit in that place, but that the values recorded "have a reproducibility of $\pm 0.004\%$ salinity at the 95 percent probability level, and a probable accuracy of $\pm 0.01\%$ salinity or better at the same level of probability."^{2/} The values are recorded to two decimal places when

^{1/}Klein, Hans T. A new technique for processing physical oceanographic data. MS.

^{2/}Quotation from Department of Oceanography, University of Washington, Tech. Rep. No. 66, UW Ref. 60-18, October 1960.

obtained by chlorinity titration, or by salinometer where 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.

Extrapolated values and values interpolated between remote observations are entered within parentheses. A hyphen is used to indicate a missing observed value. The time is the time of messenger release. When more than one cast was made on a station, messenger times and wire angles are given in the order of increasing depth. A line is left blank between the observed data of each cast.

On stations where more than one cast is lowered, the various property curves may not agree perfectly. This discrepancy may be caused by changes in geographical position, real property changes with time, slight error in measurement, or a combination of these factors. Stations with overlapping casts have the following footnote: Overlapping casts; reconciliation of property curves when necessary.

FOOTNOTES

Laboratory personnel, before titrating the salinity samples, note any possible imperfections in the sealing of the bottles as follows:

Loose bottle cap: The cap is definitely loose so that it could be moved with very little applied pressure. The salinity values obtained from these samples may be usable depending on time and/or conditions of storage.

Possible evaporation: Either the cap was sealed with less than usual pressure, the bottle edge chipped, the rubber washer cracked, or the bale broke on opening, etc.

Use of the above values in interpolation depends upon consistency with other values of salinity and other properties, and these footnotes are supplemented with "falls on property curve" or "does not fall on property curve," depending upon whether the property curve was drawn through the value or not.

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

To indicate a premature or a delayed reversal of the water-sampling device which results in certain depth and property errors, the following notation is used.

p: pretrip or posttrip.

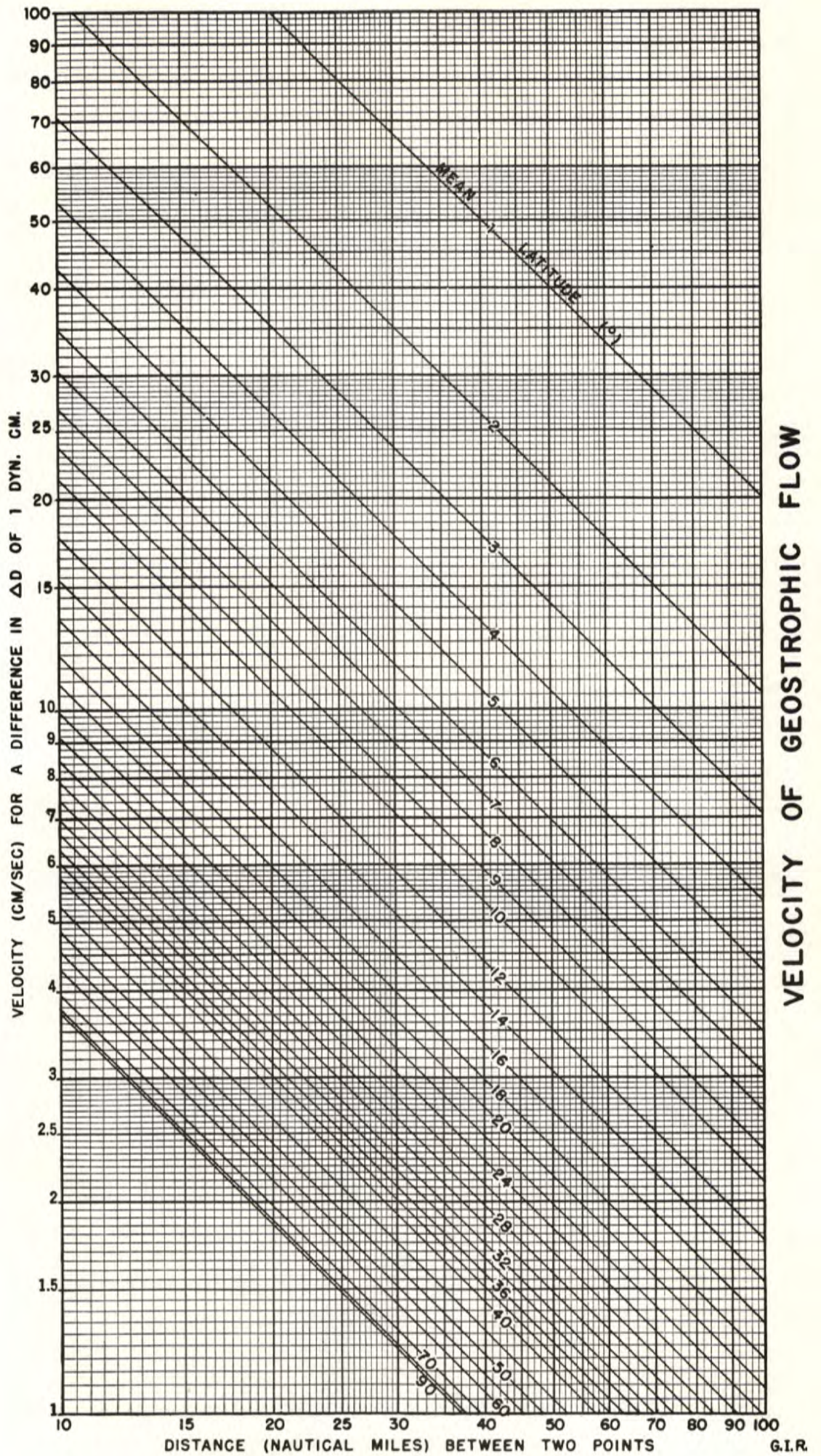
Values which are not drawn through because they seem to be in error without apparent reason are indicated by one of the following notations.

r: rejected value (value seems to be definitely wrong),

u: uncertain value (value may be correct; occasionally it can influence the drawing of the property curve).

FORMAT

These data are typed in the format of the University of California Press publication, Oceanic Observations of the Pacific. So that these pages can be used as copy for the 1960 volume, the first page of Cruise 6005 data is numbered 228.



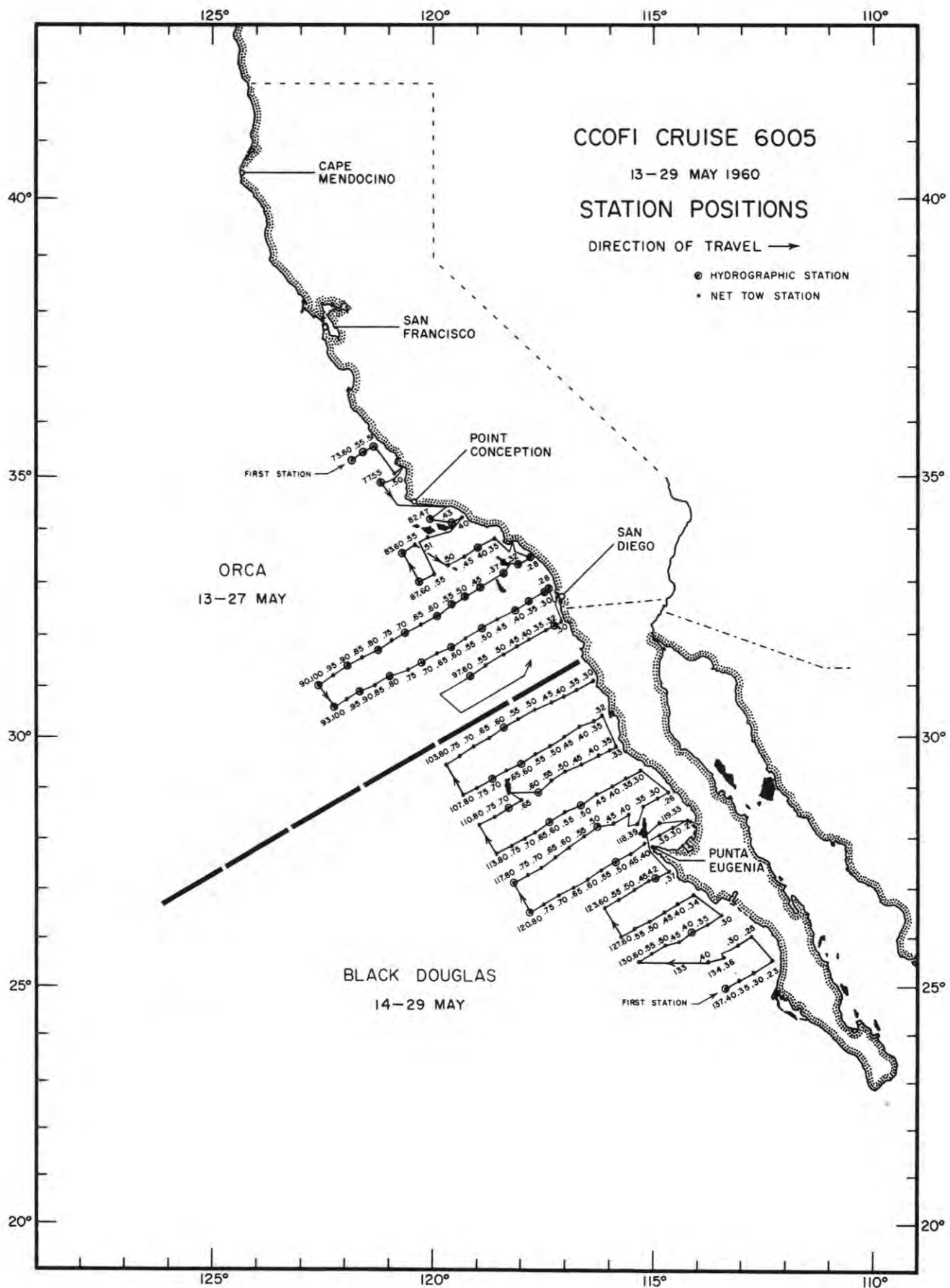


FIGURE 1

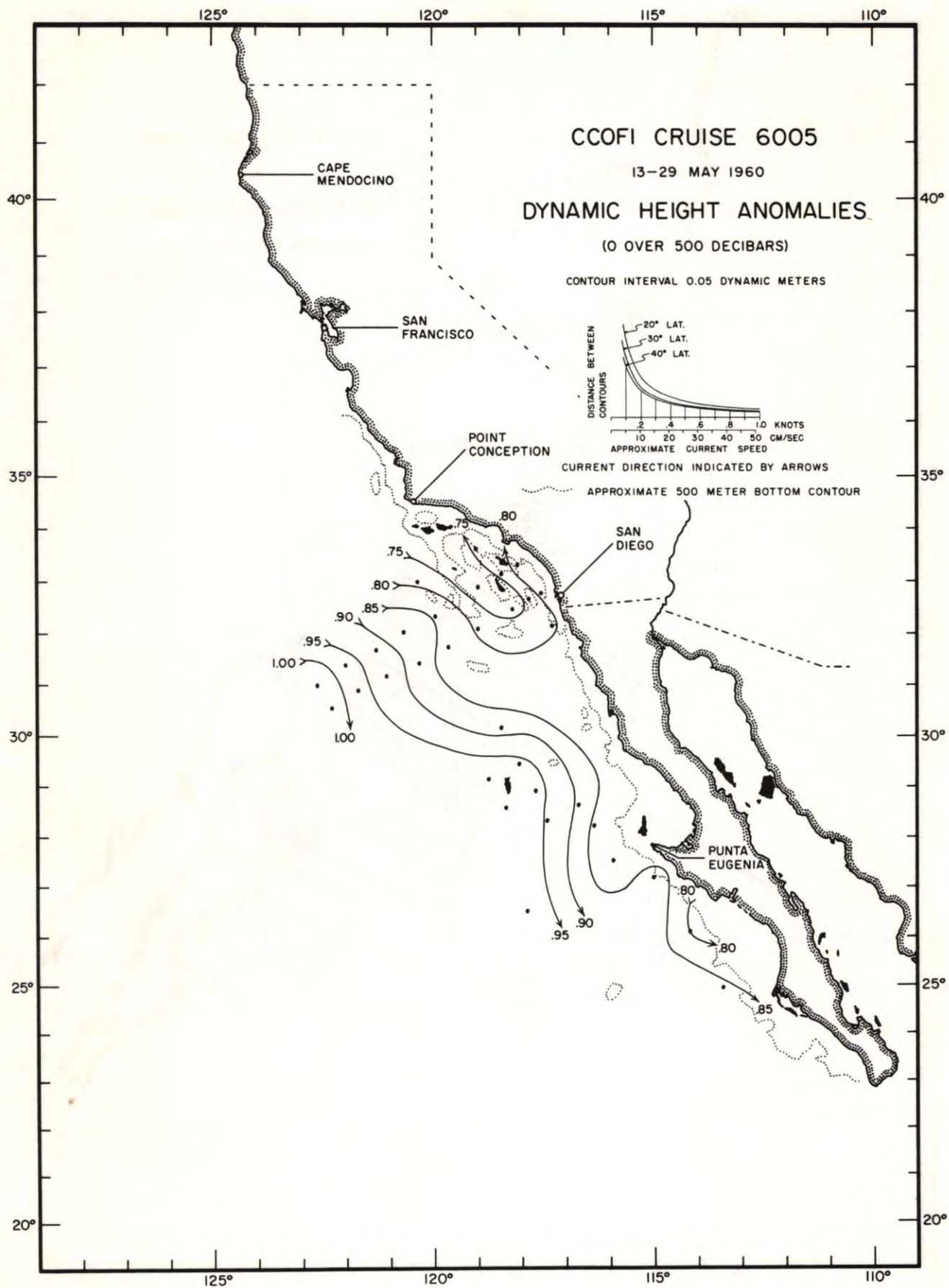


FIGURE 2

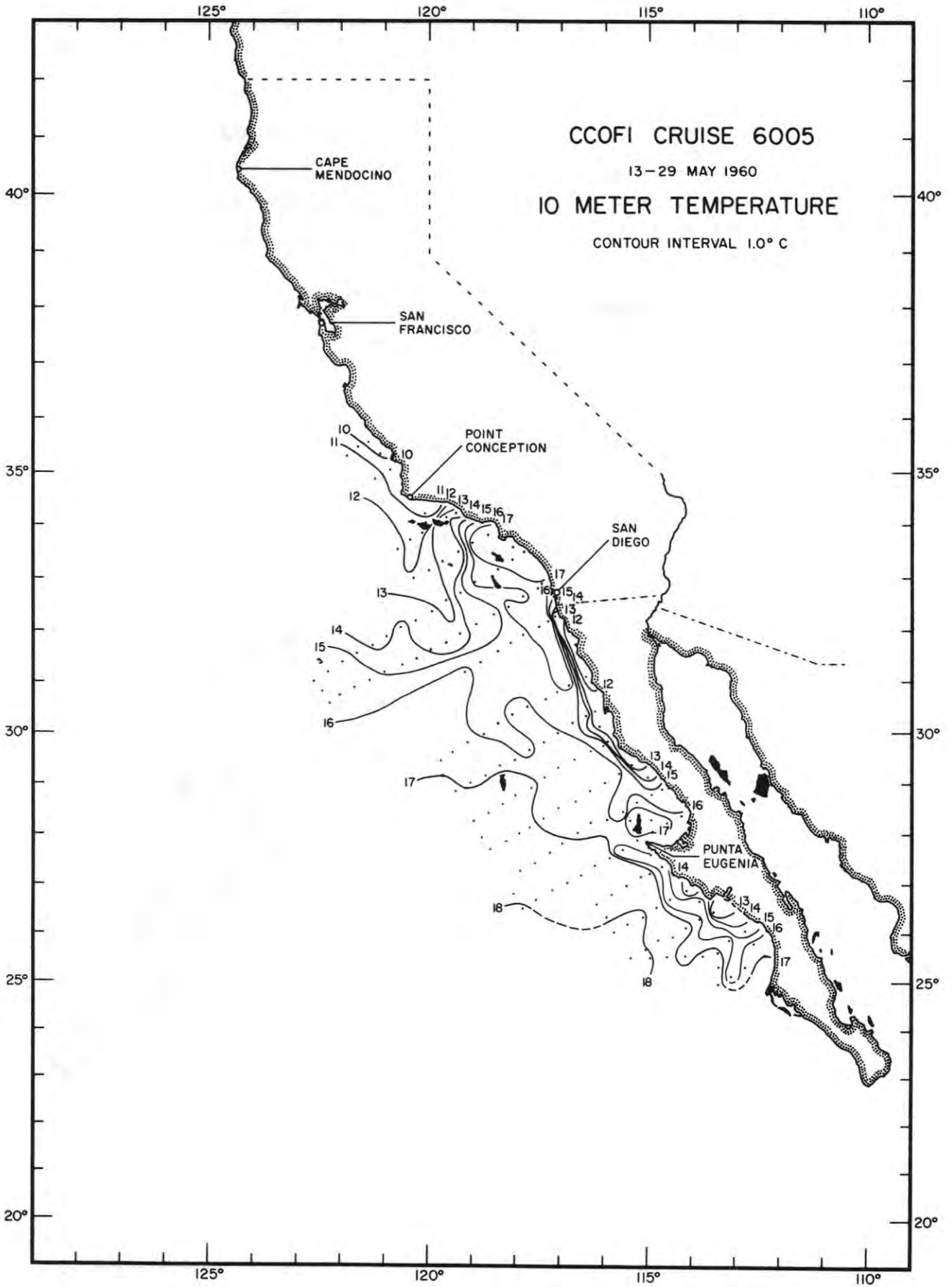


FIGURE 3

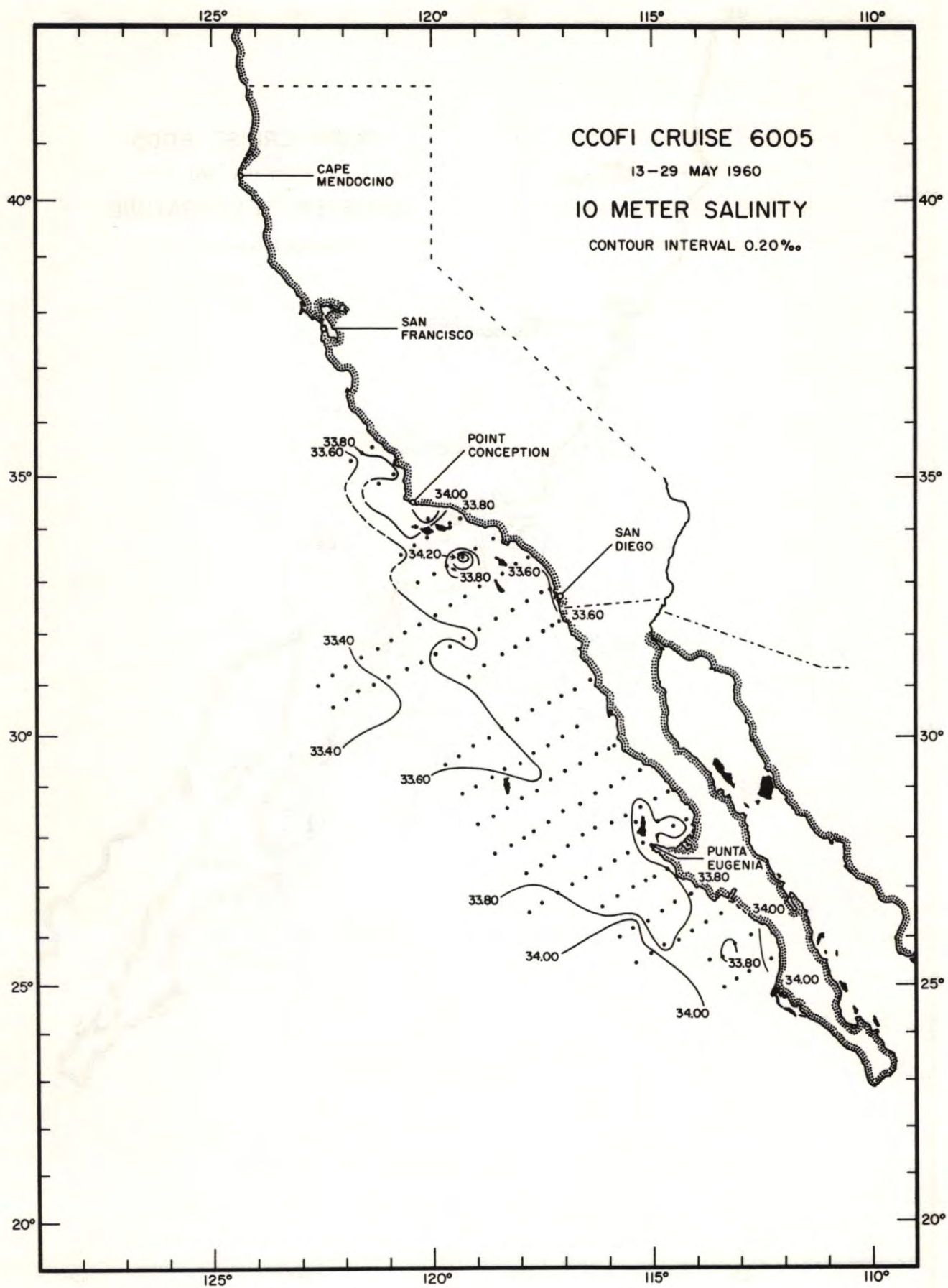


FIGURE 4

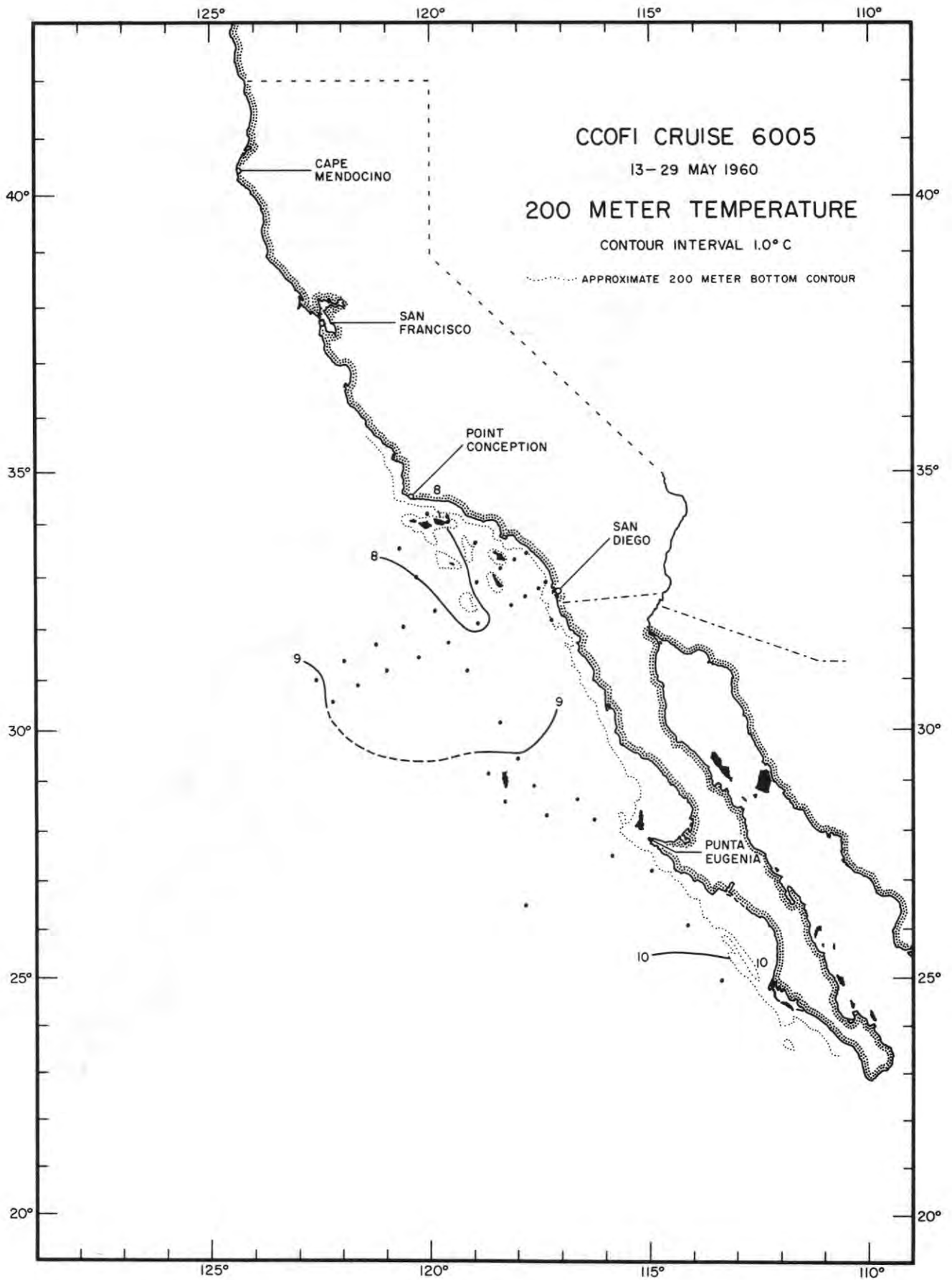


FIGURE 5

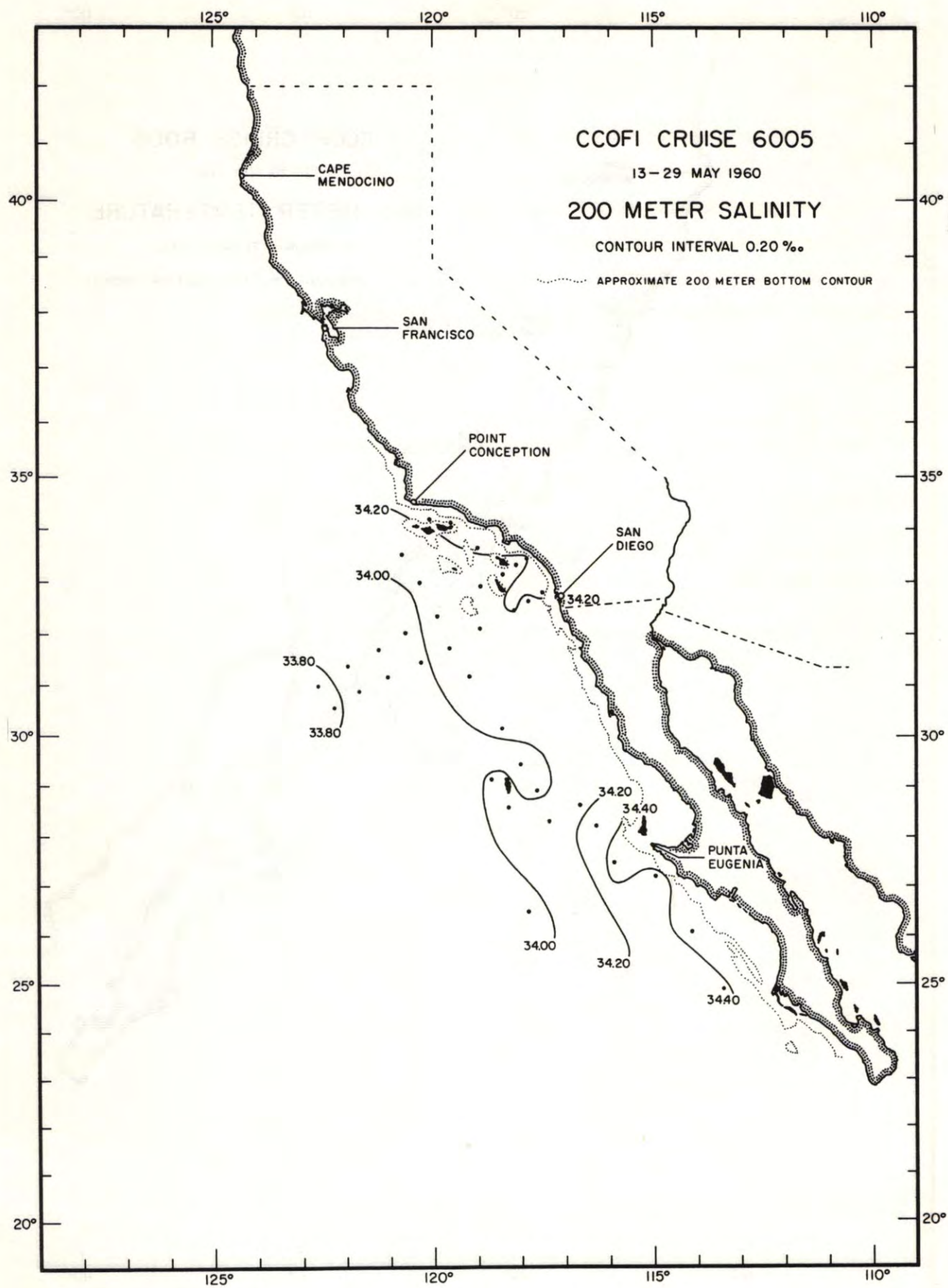


FIGURE 6

PERSONNEL

SHIPS' CAPTAINS

Forster, Charles W., R/V Black Douglas

Hopkins, Marvin F., R/V Orca

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

R/V Black Douglas

Bottom, Kenneth S., Marine Technician

Perkins, Herbert C., Fishery Aid, Bureau of Commercial Fisheries

R/V Orca

Hester, Arthur W., Marine Technician

*Fisher, Oliver L., Marine Technician

*Lawson, Jan B., Senior Marine Technician

Leong, Roderick J. H., Fishery Research Biologist

*Lines 90 and 93 only.

SIO

CCOFI
6005

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

82.47

ORCA; May 18, 1960; 1733 GCT; 34°13.5'N, 120°02.5'W; sounding, 330 fm; wind, 290°, force 6; weather, clear; sea, very rough; wire angle, 04°.

2	10.28	34.04	4.74	185	0	(10.28)	(34.04)	(4.74)	(26.18)	(185)	(0.00)
12	9.88	34.07	4.16	177	10	10.08	34.05	4.44	26.22	181	0.02
23	8.46	34.15	1.32	149	20	8.54	34.15	1.40	26.55	150	0.03
33	8.34	34.21	1.15	142	30	8.37	34.19	1.19	26.60	144	0.05
47	8.28	34.18	1.10	144	50	8.25	34.17	1.10	26.60	144	0.08
62	8.22	34.14	1.06	146	75	8.13	34.20	1.06	26.65	140	0.11
86	8.07	34.21	1.04	139	100	7.99	34.22	1.00	26.68	137	0.15
105	7.98	34.22	0.99	136	125	7.90	34.22	0.90	26.70	135	0.18
124	7.91	34.22	0.90	135	150	7.72	34.22	0.86	26.72	133	0.22
142	7.76	34.22	0.87	134	200	7.54	34.25	0.78	26.77	128	0.28
172	7.67	34.23	0.83	132	250	7.30	34.23	0.68	26.79	126	0.35
206	7.52	34.25	0.78	128	300	7.07	34.28	0.52	26.86	120	0.41
234	7.38	34.23	0.71	127							
283	7.14	34.25	0.56	123							
336	6.92	34.34	0.46	113							
412	6.62	34.29	0.39	113							
487	6.46	34.28	0.24	112							
561	6.30	34.29	0.25	109							

83.43

ORCA; May 18, 1960; 2126 GCT; 34°08.5'N, 119°34'W; sounding, 138 fm; wind, 260°, force 3; weather, partly cloudy; sea, rough; wire angle, 00°.

1	16.07	33.68	5.95	322	0	(16.07)	(33.68)	(5.95)	(24.74)	(322)	(0.00)
11	13.83	33.68	5.88	276	10	13.85	33.68	5.88	25.22	276	0.03
31	12.50	33.80	5.59	241	20	13.40	33.71	5.83	25.34	265	0.06
51	11.25	33.78	3.92	221	30	12.58	33.80	5.61	25.57	243	0.08
76	10.19	33.77	3.25	203	50	11.26	33.78	3.95	25.80	221	0.13
101	9.41	33.95	2.49	178	75	10.23	33.77	3.28	25.98	204	0.18
124	8.46	34.17	1.46	147	100	9.43	33.95	2.49	26.25	178	0.23
164	8.36	34.22	1.36	142	125	8.44	34.18	1.45	26.58	147	0.27
204	8.16	34.21	1.22	140	150	8.38	34.22	1.37	26.62	143	0.31
					200	8.18	34.21	1.27	26.65	140	0.38

83.60

ORCA; May 20, 1960; 0248 GCT; 33°33.5'N, 120°41'W; sounding, 620 fm; wind, 320°, force 3; weather, clear; sea, high; wire angle, 41°.

0	12.80	33.56	5.79	264	0	12.80	33.56	5.79	25.34	264	0.00
9	12.80	33.55	5.81	265	10	12.79	33.55	5.81	25.34	265	0.03
24	12.53	33.55	5.74	260	20	12.64	33.55	5.78	25.37	262	0.05
46	12.09	33.55	5.36	252	30	12.42	33.55	5.67	25.40	258	0.08
53	12.01	33.58	5.49	249	50	12.04	33.57	5.45	25.50	250	0.13
64	11.82	33.59	5.49	244	75	11.58	33.68	5.74	25.67	233	0.19
74	11.59	33.68	5.75	234	100	9.69	33.72	3.71	26.03	199	0.24
84	11.34	33.69	5.54	228	125	8.90	33.88	2.95	26.28	175	0.29
98	9.78	33.71	3.76	201	150	8.45	33.98	2.72	26.43	161	0.34
109	9.30	33.78	3.56	189	200	7.93	34.09	2.13	26.59	145	0.41
126	8.88	33.89	2.91	174							
144	8.54	33.95	2.78	164							
162	8.30	34.02	2.54	156							
192	8.00	34.09	2.24	146							
225	7.76	34.08	1.92	144							
337p	6.70	34.16	1.30	124							
419p	6.12	34.25	0.61	110							

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

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ORCA; May 20, 1960; 1544 GCT; 33°40'N, 118°58.5'W; sounding, 515 fm; wind, 240°, force 1; weather, clear; sea, moderate; wire angle, 04°.

87.40

1	17.26	33.65	5.67	350	0	(17.26)	(33.65)	(5.67)	(24.44)	(350)	(0.00)
12	17.00	33.66	5.85	344	10	17.04	33.66	5.83	24.50	345	0.03
33	11.68	33.64	4.47	238	20	15.00	33.65	5.39	24.96	301	0.07
43	11.18	33.66	4.03	228	30	11.99	33.64	4.57	25.56	244	0.09
53	10.46	33.71	3.48	212	50	10.70	33.68	3.65	25.82	218	0.14
68	9.78	33.78	3.15	196	75	9.59	33.82	3.00	26.12	190	0.19
82	9.42	33.86	2.85	184	100	9.16	33.94	2.57	26.29	175	0.24
102	9.12	33.95	2.52	173	125	8.88	34.02	2.18	26.40	164	0.28
126	8.86	34.03	2.16	163	150	8.63	34.14	1.59	26.53	152	0.32
145	8.68	34.13	1.66	153	200	8.19	34.22	1.28	26.65	140	0.40
175	8.44	34.18	1.41	146	250	7.83	34.24	1.07	26.72	133	0.46
204	8.16	34.22	1.27	139	300	7.43	34.26	0.86	26.80	126	0.53
234	7.97	34.23	1.15	135	400	6.62	34.33	0.49	26.96	110	0.65
273	7.63	34.25	0.97	130	500	6.12	34.35	0.35	27.04	103	0.76
333	7.18	34.27	0.75	122							
406	6.56	34.33	0.47	109							
480	6.24	34.34	0.38	105							
560	5.74	34.38	0.26	95							

ORCA; May 19, 1960; 1933 GCT; 33°01'N, 120°19'W; sounding, 410 fm; wind, 180°, force 3; weather, clear; sea, high; wire angle, 14°.

87.60

3	12.22	33.75	5.60	240	0	(12.22)	(33.75)	(5.60)	(25.60)	(240)	(0.00)
11	12.04	33.71	5.69	239	10	12.05	33.71	5.68	25.60	240	0.02
31	11.94	33.75	5.64	235	20	11.98	33.73	5.66	25.63	237	0.05
60	11.94	33.75	5.62	235	30	11.95	33.75	5.64	25.65	235	0.07
70	11.55	33.69	5.17	233	50	11.94	33.75	5.63	25.65	235	0.12
85	9.96	33.68	3.73	206	75	11.49	33.69	5.09	25.68	232	0.18
99	9.34	33.75	3.27	191	100	9.33	33.76	3.24	26.11	191	0.23
113	9.03	33.84	3.04	180	125	8.82	33.90	2.88	26.30	173	0.28
135	8.63	33.93	2.74	167	150	8.54	33.93	2.74	26.38	166	0.32
155	8.51	33.93	2.73	166	200	8.00	34.02	2.30	26.53	151	0.40
183	8.20	33.99	2.47	157	250	7.50	34.12	1.62	26.68	137	0.47
211	7.88	34.04	2.24	149	300	7.09	34.17	1.15	26.78	128	0.54
240	7.60	34.11	1.73	140	400	6.53	34.28	0.60	26.94	113	0.66
288	7.18	34.16	1.25	130	500	5.98	34.31	0.44	27.04	103	0.78
341	6.84	34.23	0.76	120	600	(5.21)	(34.38)		(27.18)	(90)	(0.88)
422	6.42	34.29	0.58	110							
506	5.94	34.31	0.41	103							
589	5.30	34.37	0.27	91							

ORCA; May 21, 1960; 1652 GCT; 33°29'N, 117°48'W; sounding, 310 fm; wind, 220°, force 1; weather, cloudy; sea, moderate; wire angle, 06°.

90.28

1	18.66	33.66	6.01	382	0	(18.66)	(33.66)	(6.01)	(24.10)	(382)	(0.00)
11	17.64	33.64	6.00	360	10	17.90	33.64	6.00	24.28	366	0.04
31	11.57	33.62	4.33	238	20	13.85	33.62	5.19	25.18	280	0.07
42	10.64	33.72	3.52	215	30	11.68	33.62	4.39	25.60	240	0.10
52	10.42	33.79	3.24	205	50	10.47	33.79	3.29	25.94	207	0.14
67	10.14	33.76	3.04	203	75	9.98	33.78	2.98	26.03	199	0.19
81	9.83	33.80	2.95	196	100	9.34	33.91	2.76	26.24	180	0.24
100	9.34	33.91	2.76	180	125	9.13	34.05	2.12	26.38	166	0.28
122	9.14	34.04	2.19	167	150	8.94	34.12	1.85	26.47	157	0.32
141	9.01	34.10	1.91	161	200	8.56	34.20	1.44	26.59	146	0.40
170	8.74	34.16	1.73	152	250	8.24	34.28	1.08	26.69	136	0.47
198	8.57	34.20	1.47	146	300	7.73	34.27	0.91	26.76	129	0.54
225	8.44	34.25	1.21	141	400	(7.05)	(34.30)	(0.63)	(26.88)	(118)	(0.67)
265	8.12	34.29	1.00	133							
322	7.50	34.27	0.83	126							
394	7.10	34.30	0.63	119							

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OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

90.32

ORCA; May 21, 1960; 1940 GCT; 33°21'N, 118°03.5'W; sounding, 420 fm; wind, direction missing, force 1; weather, partly cloudy; sea, moderate; wire angle, 06°.

1	18.67	33.66	5.56	383	0	(18.67)	(33.66)	(5.56)	(24.10)	(383)	(0.00)
11	17.62	33.61	5.65	361	10	17.63	33.61	5.65	24.32	362	0.04
32	13.30	33.54	6.42	275	20	17.07	33.59	5.74	24.44	350	0.07
41	11.94	33.58	4.76	247	30	13.41	33.54	6.43	25.20	277	0.10
52	11.35	33.61	3.96	235	50	11.44	33.61	4.08	25.63	237	0.16
67	10.42	33.66	3.53	215	75	10.23	33.69	3.50	25.91	210	0.21
82	10.10	33.71	3.49	206	100	9.58	33.80	3.13	26.10	192	0.26
101	9.56	33.80	3.11	191	125	9.19	33.91	2.61	26.26	177	0.31
124	9.20	33.91	2.62	178	150	8.71	33.98	2.70	26.39	164	0.35
144	8.77	33.96	2.83	167	200	8.12	34.09	1.91	26.56	148	0.43
173	8.55	34.07	2.02	156	250	7.90	34.21	1.29	26.69	136	0.50
203	8.06	34.09	1.90	147	300	7.54	34.24	1.00	26.76	129	0.57
232	8.00	34.18	1.48	140	400	6.78	34.25	0.65	26.88	118	0.70
272	7.75	34.23	1.11	132	500	6.04	34.32	0.43	27.04	104	0.82
331	7.34	34.24	0.86	126							
405	6.74	34.25	0.63	117							
479	6.16	34.31	0.46	105							
559	5.75	34.33	0.34	99							

90.37

ORCA; May 22, 1960; 1047 GCT; 33°10.5'N, 118°23.5'W; sounding, 680 fm; wind, 200°, force 1; weather, clear; sea, rough; wire angle, 05°.

2	16.52	33.66	5.76	333	0	(16.52)	(33.66)	(5.76)	(24.62)	(333)	(0.00)
12	16.52	33.63	5.74	335	10	16.52	33.63	5.75	24.60	335	0.03
32	12.84	33.59	5.57	263	20	15.90	33.62	5.77	24.73	323	0.07
42	11.82	33.56	4.77	247	30	12.87	33.59	5.56	25.35	264	0.10
52	11.42	33.58	4.51	238	50	11.50	33.57	4.56	25.60	240	0.15
68	10.48	33.65	3.80	217	75	10.02	33.66	3.71	25.93	208	0.20
83	9.56	33.78	3.63	193	100	9.37	33.88	3.00	26.20	182	0.25
103	9.34	33.89	2.92	181	125	9.25	33.97	2.56	26.29	174	0.30
126	9.24	33.97	2.54	174	150	8.82	34.08	1.97	26.45	159	0.34
146	8.86	34.08	1.98	160	200	8.16	34.16	1.68	26.62	143	0.42
175	8.60	34.10	1.85	154	250	7.58	34.18	1.25	26.71	134	0.49
204	8.08	34.17	1.63	142	300	7.28	34.26	0.90	26.82	124	0.55
234	7.68	34.16	1.37	137	400	6.50	34.34	0.41	26.91	108	0.67
273	7.48	34.22	1.14	130	500	5.89	34.35	0.31	27.08	100	0.78
333	7.04	34.29	0.62	118							
405	6.46	34.34	0.40	107							
481	6.00	34.35	0.32	101							
561	5.57	34.34	0.27	96							

90.45

ORCA; May 22, 1960; 1557 GCT; 32°55'N, 118°56.5'W; sounding, 950 fm; wind, 310°, force 3; weather, clear; sea, very rough; wire angle, 07°.

2	16.18	33.74	5.76	320	0	(16.18)	(33.74)	(5.76)	(24.76)	(320)	(0.00)
11	16.18	33.68	5.77	324	10	16.18	33.68	5.77	24.72	324	0.03
32	10.87	33.72	4.25	218	20	16.13	33.68	5.75	24.73	323	0.06
42	10.26	33.74	3.74	207	30	10.92	33.72	4.28	25.82	219	0.09
58	9.70	33.79	3.08	194	50	9.97	33.76	3.40	26.02	200	0.13
73	9.22	33.86	2.94	181	75	9.19	33.87	2.93	26.22	181	0.18
97	8.82	33.97	2.44	167	100	8.79	33.99	2.40	26.38	165	0.22
117	8.65	34.04	2.30	159	125	8.60	34.08	2.15	26.48	156	0.27
136	8.52	34.11	1.90	152	150	8.40	34.13	1.75	26.56	149	0.30
156	8.34	34.14	1.69	148	200	8.07	34.19	1.36	26.66	140	0.38
185	8.20	34.19	1.41	142	250	7.52	34.20	0.95	26.74	131	0.45
220	7.83	34.19	1.25	137	300	7.15	34.23	0.81	26.82	124	0.51
250	7.52	34.20	0.95	131	400	6.54	34.30	0.54	26.96	111	0.63
299	7.15	34.23	0.81	124	500	5.90	34.33	0.31	27.06	101	0.74
354	6.84	34.25	0.66	119	600	5.46	34.37	0.28	27.15	93	0.84
436	6.27	34.33	0.44	105							
521	5.80	34.33	0.29	100							
607	5.42	34.38	0.29	92							

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

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ORCA; May 22, 1960; 1858 GCT; 32°44.5'N, 119°16'W; sounding, 61 fm; wind, 310°, force 5; weather, clear; sea, very rough; wire angle, 17°.

90.50

2	14.75	33.69	5.74	293	0	(14.75)	(33.69)	(5.74)	(25.04)	(293)	(0.00)
11	14.72	33.68	5.78	293	10	14.73	33.68	5.78	25.04	293	0.03
16	14.72	33.67	5.74	294	20	14.08	33.70	5.56	25.19	279	0.06
21	13.71	33.71	5.47	271	30	10.16	33.73	3.56	25.96	206	0.08
30	10.16	33.73	3.56	206	50	9.28	33.82	2.96	26.18	185	0.12
49	9.32	33.82	2.98	186	75	(8.93)	(34.05)	(2.66)	(26.40)	(163)	(0.16)
73	8.96	34.03	2.66	165							

ORCA; May 22, 1960; 2157 GCT; 32°35'N, 119°34.5'W; sounding, 280 fm; wind, 310°, force 5; weather, clear; sea, high; wire angle, 38°.

90.55

1	12.45	33.67	5.73	250	0	(12.45)	(33.68)	(5.73)	(25.49)	(250)	(0.00)
11	12.43	33.65	5.74	251	10	12.44	33.66	5.74	25.48	251	0.02
27	12.42	33.68	5.79	249	20	12.42	33.67	5.77	25.49	250	0.05
42	12.44	33.68	5.81	249	30	12.42	33.68	5.79	25.50	249	0.08
59	12.40	33.71	5.76	246	50	12.43	33.69	5.80	25.51	248	0.12
77	10.74	33.64	4.50	222	75	11.00	33.64	4.70	25.74	226	0.18
93	9.83	33.65	3.64	207	100	(9.56)	(33.67)	(3.45)	(26.01)	(201)	(0.24)

ORCA; May 23, 1960; 0135, 0215 GCT; 32°22'N, 119°54'W; sounding, 740 fm; wind, 310°, force 5; weather, clear; sea, high; wire angle, 42°, 44°.

90.60

1	13.18	33.60	5.98	269	0	(13.18)	(33.60)	(5.98)	(25.29)	(269)	(0.00)
10	13.18	33.61	5.99	268	10	13.18	33.61	5.99	25.30	268	0.03
28	13.18	33.60	5.97	269	20	13.18	33.60	5.97	25.29	269	0.05
50	13.12	33.60	5.85	267	30	13.18	33.60	5.96	25.29	269	0.08
58	13.04	33.58	5.89	267	50	13.12	33.60	5.85	25.31	267	0.13
73	12.90	33.63	5.88	261	75	12.89	33.62	5.88	25.38	261	0.20
84	12.82	33.60	5.89	262	100	11.60	33.59	5.05	25.58	241	0.26
93	12.48	33.58	5.70	257	125	9.96	33.71	3.90	25.98	204	0.32
112	10.60	33.60	4.46	223	150	9.13	33.83	3.23	26.20	183	0.37
125	9.96	33.71	3.90	204	200	8.40	34.02	2.67	26.47	157	0.46
143	9.26	33.79	3.36	187	250	7.78	34.09	1.95	26.62	144	0.53
165	8.90	33.92	3.03	172	300	7.24	34.14	1.42	26.72	133	0.60
185	8.58	33.98	2.78	163	400	6.44	34.27	0.74	26.95	112	0.73
218	8.18	34.06	2.56	151	500	5.86	34.34	0.39	27.07	100	0.84
258	7.68	34.09	1.80	142							
357	6.71	34.22	0.97	119							
437	6.24	34.31	0.59	107							
505	5.82	34.34	0.38	99							

ORCA; May 23, 1960; 0827 GCT; 32°03'N, 120°37'W; sounding, 2220 fm; wind, 310°, force 5; weather, clear; sea, high; wire angle, 15°.

90.70

2	14.06	33.52	5.78	292	0	(14.06)	(33.52)	(5.78)	(25.05)	(292)	(0.00)
12	14.06	33.53	5.80	291	10	14.06	33.53	5.79	25.06	291	0.03
36	14.06	33.50	5.79	293	20	14.06	33.52	5.80	25.05	292	0.06
65	13.98	33.51	5.77	291	30	14.06	33.50	5.79	25.04	293	0.09
74	13.80	33.49	5.63	289	50	14.04	33.50	5.78	25.05	292	0.15
94	12.54	33.53	5.10	262	75	13.75	33.49	5.59	25.09	288	0.22
109	12.01	33.50	4.97	254	100	12.47	33.54	5.07	25.38	260	0.29
122	11.15	33.62	4.60	230	125	10.97	33.64	4.50	25.74	226	0.35
151	9.57	33.76	3.64	194	150	9.60	33.76	3.65	26.07	195	0.40
171	9.05	33.82	3.28	182	200	8.46	33.98	2.62	26.42	162	0.49
201	8.45	33.98	2.62	161	250	7.88	34.07	1.91	26.58	147	0.57
235	8.08	34.03	2.12	152	300	7.38	34.17	1.34	26.74	132	0.64
264	7.70	34.11	1.70	141	400	6.35	34.23	0.81	26.92	114	0.77
312	7.25	34.18	1.23	130	500	5.82	34.32	0.43	27.06	101	0.88
376	6.55	34.21	0.91	118	600	5.44	34.37	0.28	27.14	93	0.99
475	5.92	34.31	0.49	103							
564	5.58	34.34	0.32	96							
639	5.30	34.42	0.24	87							

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OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

90.80

ORCA; May 23, 1960; 1443, 1513 GCT; 31°43.5'N, 121°14.5'W; sounding, 2150 fm; wind, 320°, force 4; weather, partly cloudy; sea, very rough; wire angle, 23°, 30°.

1	13.88	33.48	5.70	291	0	(13.88)	(33.48)	(5.70)	(25.06)	(291)	(0.00)
11	13.90	33.48	5.74	292	10	13.90	33.48	5.74	25.06	291	0.03
29	13.88	33.46	5.76	293	20	13.89	33.46	5.75	25.04	292	0.06
57	13.60	33.44	5.68	288	30	13.87	33.46	5.76	25.04	292	0.09
66	13.56	33.43	5.68	288	50	13.68	33.45	5.69	25.08	290	0.15
80	13.26	33.48	5.63	279	75	13.36	33.45	5.64	25.14	283	0.22
94	13.22	33.51	5.68	276	100	13.12	33.51	5.65	25.24	274	0.29
108	12.42	33.48	5.32	264	125	11.71	33.50	4.95	25.50	249	0.35
130	11.47	33.51	4.82	244	150	10.67	33.63	4.36	25.79	221	0.41
148	10.76	33.62	4.41	224	200	8.87	33.90	3.01	26.30	173	0.51
176	9.34	33.77	3.39	190	250	8.23	34.02	2.27	26.49	155	0.60
203	8.82	33.91	2.93	172	300	7.58	34.10	1.62	26.66	140	0.68
231	8.50	33.98	2.53	162	400	6.61	34.21	0.71	26.88	119	0.81
277	7.83	34.07	1.83	146	500	6.01	34.30	0.38	27.02	105	0.92
328	7.30	34.14	1.33	133							
393	6.66	34.21	0.71	119							
473	6.16	34.27	0.44	109							
555	5.72	34.38	0.28	95							

90.90

ORCA; May 23, 1960; 2142 GCT; 31°23'N, 121°57.5'W; sounding, 2300 fm; wind, 320°, force 4; weather, partly cloudy; sea, very rough; wire angle, 17°.

1	15.61	33.31	5.70	339	0	(15.61)	(33.31)	(5.70)	(24.56)	(339)	(0.00)
11	15.29	33.28	5.84	335	10	15.31	33.28	5.83	24.60	335	0.03
28	15.22	33.28	5.82	333	20	15.23	33.28	5.82	24.62	333	0.07
58	15.18	33.30	5.81	330	30	15.22	33.28	5.82	24.62	333	0.10
82	13.84	33.30	5.98	303	50	15.20	33.28	5.81	24.63	332	0.17
96	13.38	33.35	5.79	291	75	13.90	33.28	5.96	24.90	306	0.25
111	12.29	33.34	5.53	271	100	13.15	33.35	5.72	25.11	287	0.32
134	10.80	33.45	4.77	237	125	11.40	33.39	5.13	25.47	252	0.39
153	9.54	33.60	4.19	206	150	9.70	33.57	4.29	25.91	210	0.45
181	9.02	33.81	3.54	182	200	8.71	33.87	3.34	26.30	173	0.55
210	8.52	33.89	3.21	169	250	7.88	33.98	2.74	26.52	153	0.63
239	7.99	33.96	2.83	156	300	7.39	34.03	2.13	26.62	143	0.71
288	7.52	34.02	2.28	145	400	6.49	34.11	1.08	26.81	125	0.85
341	6.88	34.05	1.52	134	500	5.92	34.25	0.53	26.99	107	0.97
422	6.34	34.14	0.92	121	600	(5.60)	(34.35)	(0.33)	(27.11)	(96)	(1.08)
506	5.89	34.26	0.50	106							
590	5.61	34.34	0.33	97							

90.100

ORCA; May 24, 1960; 0352 GCT; 30°01'N, 122°35.5'W; sounding, 2375 fm; wind, 320°, force 2; weather, partly cloudy; sea, high; wire angle, 12°.

1	15.95	33.26	5.77	350	0	(15.95)	(33.26)	(5.77)	(24.44)	(350)	(0.00)
11	15.90	33.24	5.79	350	10	15.91	33.24	5.79	24.44	350	0.04
31	15.55	33.22	5.79	344	20	15.71	33.22	5.79	24.47	347	0.07
61	15.54	33.24	5.78	343	30	15.56	33.22	5.79	24.50	344	0.10
69	15.54	33.29	5.75	339	50	15.54	33.23	5.78	24.52	343	0.17
85	15.10	33.17	5.81	338	75	15.25	33.21	5.79	24.56	339	0.26
99	15.04	33.35	5.89	324	100	15.03	33.35	5.89	24.71	324	0.34
114	14.02	33.31	5.77	306	125	13.38	33.33	5.64	25.05	292	0.42
137	12.64	33.36	5.47	276	150	11.53	33.38	5.11	25.44	255	0.49
156	11.04	33.40	4.92	245	200	9.05	33.77	3.87	26.17	186	0.60
184	9.54	33.60	4.38	206	250	8.22	33.93	3.19	26.42	162	0.69
213	8.78	33.86	3.58	175	300	7.45	33.99	2.54	26.58	146	0.77
242	8.33	33.92	3.26	164	400	6.45	34.12	1.12	26.83	123	0.91
292	7.58	33.98	2.68	149	500	5.82	34.22	0.57	26.98	108	1.03
345	6.86	34.06	1.80	133	600	(5.30)	(34.29)	(0.38)	(27.11)	(97)	(1.14)
427	6.28	34.15	0.89	119							
511	5.74	34.23	0.52	107							
595	5.32	34.29	0.38	97							

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

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ORCA; May 26, 1960; 0821 GCT; 32°53'N, 117°22.5'W; sounding, 267 fm; wind, 250°, force 1; weather, clear;
sea, moderate; wire angle, 15°.

93.28

1	17.72	33.67	5.56	359	0	(17.72)	(33.67)	(5.56)	(24.34)	(359)	(0.00)
11	16.96	33.60	5.60	347	10	16.98	33.60	5.60	24.47	347	0.04
30	12.41	33.55	4.89	258	20	15.47	33.56	5.50	24.79	317	0.07
49	10.49	33.61	3.95	220	30	12.41	33.55	4.89	25.40	258	0.10
73	9.70	33.82	2.98	192	50	10.47	33.63	3.87	25.82	218	0.14
98	9.36	33.87	2.79	182	75	9.66	33.83	2.95	26.11	191	0.20
121	9.16	34.00	2.17	170	100	9.34	33.88	2.76	26.21	182	0.24
160	9.03	34.20	1.70	154	125	9.16	34.02	2.08	26.36	168	0.29
200	8.70	34.18	1.35	150	150	9.06	34.16	1.81	26.47	157	0.33
249	8.40	34.23	1.09	142	200	8.70	34.18	1.35	26.55	150	0.41
298	8.22	34.29	0.80	135	250	8.39	34.23	1.08	26.64	141	0.48
400	7.28	34.27	0.69	123	300	8.20	34.29	0.79	26.70	135	0.55
					400	7.28	34.27	0.69	26.83	123	0.68

ORCA; May 26, 1960; 0553 GCT; 32°49'N, 117°30.5'W; sounding, 580 fm; wind, 240°, force 1; weather, clear;
sea, moderate; wire angle, 14°.

93.30

1	16.95	33.66	5.53	343	0	(16.95)	(33.66)	(5.53)	(24.52)	(343)	(0.00)
11	16.68	33.64	5.64	338	10	16.70	33.64	5.64	24.56	339	0.03
30	13.11	33.56	5.79	270	20	16.00	33.61	5.69	24.70	325	0.07
40	12.53	33.60	4.83	256	30	13.11	33.56	5.79	25.28	270	0.10
54	11.54	33.62	4.09	237	50	11.83	33.61	4.25	25.57	243	0.15
69	10.55	33.68	3.81	216	75	10.33	33.71	3.69	25.91	210	0.20
93	9.80	33.79	3.36	196	100	9.63	33.81	3.28	26.10	192	0.26
113	9.31	33.84	3.13	184	125	9.04	33.90	2.83	26.27	176	0.30
130	8.94	33.93	2.64	172	150	8.78	33.99	2.32	26.39	165	0.34
150	8.78	33.99	2.32	165	200	8.90	34.22	1.42	26.54	150	0.42
179	8.92	34.14	1.80	156	250	8.44	34.25	1.12	26.64	141	0.50
212	8.86	34.25	1.27	147	300	7.96	34.26	0.91	26.72	133	0.57
241	8.56	34.25	1.18	142	400	7.09	34.30	0.58	26.88	118	0.70
289	8.04	34.26	0.98	135	500	6.29	34.32	0.41	27.00	107	0.82
344	7.60	34.31	0.72	125	600	(5.60)	(34.33)	(0.34)	(27.10)	(98)	(0.92)
424	6.84	34.29	0.54	116							
508	6.23	34.32	0.40	106							
593	5.66	34.33	0.34	98							

ORCA; May 26, 1960; 0205 GCT; 32°39.5'N, 117°50'W; sounding, 480 fm; wind, 310°, force 3; weather, clear;
sea, rough; wire angle, 10°.

93.35

1	16.25	33.75	5.74	321	0	(16.25)	(33.75)	(5.74)	(24.75)	(321)	(0.00)
11	15.82	33.71	5.80	314	10	15.87	33.71	5.79	24.81	315	0.03
31	11.46	33.69	4.66	231	20	14.00	33.70	5.34	25.21	277	0.06
40	10.93	33.67	4.23	223	30	11.52	33.69	4.67	25.68	232	0.09
55	10.33	33.63	4.17	216	50	10.52	33.64	4.20	25.82	218	0.13
70	9.92	33.72	3.58	203	75	9.74	33.76	3.52	26.05	197	0.18
94	9.10	33.86	3.43	180	100	9.08	33.93	3.13	26.29	174	0.23
114	9.04	34.05	2.46	165	125	8.95	34.08	2.08	26.43	161	0.27
133	8.88	34.10	1.88	158	150	8.78	34.14	1.82	26.50	154	0.31
152	8.76	34.14	1.81	154	200	8.40	34.15	1.58	26.57	147	0.39
182	8.36	34.10	1.70	151	250	8.09	34.25	1.02	26.70	135	0.46
215	8.41	34.20	1.46	144	300	7.51	34.28	1.05	26.80	126	0.53
246	8.13	34.25	1.01	136	400	6.70	34.29	0.60	26.93	114	0.65
293	7.59	34.28	1.09	127	500	6.00	34.33	0.40	27.05	102	0.76
348	7.08	34.27	0.72	121	600	(5.50)	(34.44)	(0.35)	(27.19)	(89)	(0.86)
430	6.48	34.31	0.56	110							
514	5.90	34.34	0.38	100							
598	5.51	34.43	0.35	89							

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OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ_T	Z	T	S	O ₂	σ_t	δ_T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

93.40

ORCA; May 25, 1960; 2258 GCT; 32°30'N, 118°09'W; sounding, 1000 fm; wind, 340°, force 4; weather, clear; sea, very rough; wire angle, 23°.

1	16.54	33.75	5.68	327	0	(16.54)	(33.75)	(5.68)	(24.68)	(327)	(0.00)
10	16.46	33.72	5.71	327	10	16.46	33.72	5.71	24.68	327	0.03
29	12.08	33.66	4.98	244	20	16.19	33.71	5.70	24.73	322	0.07
38	11.28	33.64	4.60	231	30	12.02	33.66	4.95	25.57	243	0.09
52	10.36	33.66	3.88	214	50	10.44	33.65	3.98	25.84	217	0.14
65	9.87	33.77	3.30	198	75	9.54	33.88	2.94	26.18	185	0.19
89	9.28	33.95	2.64	176	100	9.17	33.95	2.49	26.29	174	0.24
108	9.08	33.95	2.40	173	125	8.86	34.02	2.13	26.40	164	0.28
125	8.86	34.02	2.13	164	150	8.59	34.10	1.76	26.50	154	0.32
142	8.64	34.07	1.89	157	200	8.13	34.20	1.21	26.66	140	0.39
168	8.48	34.15	1.56	149	250	7.64	34.30	0.89	26.80	126	0.46
199	8.14	34.20	1.22	140	300	7.12	34.30	0.71	26.87	119	0.52
225	7.83	34.30	0.96	128	400	6.38	34.33	0.47	27.00	107	0.64
269	7.50	34.30	0.84	124	500	5.77	34.37	0.38	27.11	96	0.74
317	6.96	34.30	0.67	117							
391	6.44	34.33	0.49	108							
468	5.92	34.36	0.41	99							
547	5.63	34.39	0.32	93							

93.50

ORCA; May 25, 1960; 1640 GCT; 32°08'N, 118°53'W; sounding, 880 fm; wind, 340°, force 4; weather, clear; sea, very rough; wire angle, 13°.

1	14.69	33.70	5.80	291	0	(14.69)	(33.70)	(5.80)	(25.06)	(291)	(0.00)
11	14.68	33.71	5.83	291	10	14.68	33.71	5.83	25.06	291	0.03
30	14.56	33.69	5.83	289	20	14.64	33.70	5.83	25.07	290	0.06
41	13.99	33.69	5.76	278	30	14.56	33.69	5.83	25.08	289	0.09
55	12.74	33.75	5.62	249	50	13.20	33.73	5.70	25.39	259	0.14
70	11.72	33.75	4.81	231	75	11.22	33.75	4.40	25.78	222	0.20
94	9.33	33.80	3.02	187	100	9.12	33.85	2.87	26.22	180	0.25
113	8.76	33.93	2.66	169	125	8.59	33.96	2.48	26.39	164	0.30
132	8.52	33.97a)	2.39	163	150	8.45	34.00	2.29	26.44	160	0.34
152	8.44	34.00a)	2.28	160	200	7.77	34.07	1.74	26.60	144	0.42
181	7.96	34.05	1.92	148	250	7.53	34.17	1.07	26.71	134	0.49
215	7.68	34.09	1.61	142	300	7.24	34.24	0.80	26.81	125	0.55
244	7.56	34.16	1.11	135	400	6.51	34.28	0.48	26.94	112	0.68
292	7.30	34.23	0.83	126	500	5.81	34.33	0.29	27.07	100	0.78
347	6.84	34.26	0.60	118	600	(5.42)	(34.36)	(0.25)	(27.14)	(93)	(0.89)
429	6.32	34.29	0.41	109							
512	5.74	34.34	0.28	98							
595	5.43	34.36	0.25	94							

93.60

ORCA; May 25, 1960; 0920 GCT; 31°46.5'N, 119°35.5'W; sounding, 1900 fm; wind, 300°, force 3; weather, clear; sea, very rough; wire angle, 10°.

1	13.44	33.66	5.70	269	0	(13.44)	(33.66)	(5.70)	(25.29)	(269)	(0.00)
11	13.42	33.66	5.74	269	10	13.42	33.66	5.73	25.29	269	0.03
31	13.17	33.69	5.67	262	20	13.20	33.69	5.68	25.36	263	0.05
40	13.04	33.68	5.65	260	30	13.18	33.69	5.67	25.37	262	0.08
55	13.00	33.68	5.57	259	50	13.02	33.68	5.64	25.38	260	0.13
70	11.78	33.57	4.87	245	75	11.42	33.57	4.65	25.60	239	0.19
94	10.56	33.62	4.04	220	100	10.31	33.64	3.88	25.86	215	0.25
134	9.12	33.83	3.07	182	125	9.38	33.78	3.24	26.12	190	0.30
153	8.88	33.89	2.89	174	150	8.92	33.88	2.93	26.28	175	0.35
183	8.52	33.97	2.50	163	200	8.24	34.02	2.25	26.49	155	0.43
217	7.94	34.05	2.00	148	250	7.54	34.07	1.77	26.64	141	0.51
247	7.57	34.07	1.78	142	300	7.10	34.10	1.51	26.72	133	0.58
296	7.12	34.09	1.53	134	400	6.67	34.27	0.73	26.92	115	0.71
351	6.94	34.27	0.94	118	500	5.96	34.32	0.39	27.04	103	0.82
433	6.44	34.27	0.51	112	600	5.37	34.36	0.25	27.15	93	0.92
517	5.86	34.33	0.36	101							
601	5.36	34.36	0.25	92							

a) Salinity samples at 132 and 152 meters appear to have been reversed; they are assumed to be listed in correct order.

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

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ORCA; May 25, 1960; 0237 GCT; 31°28'N, 120°15'W; sounding, 2200 fm; wind, 320°, force 3; weather, clear; sea, very rough; wire angle, 10°.

93.70

1	14.37	33.51	5.94	298	0	(14.37)	(33.51)	(5.94)	(24.99)	(298)	(0.00)
11	14.04	33.48	5.99	295	10	14.07	33.48	5.98	25.02	295	0.03
31	13.83	33.52	6.01	287	20	13.93	33.49	6.00	25.06	291	0.06
40	13.80	33.49	6.02	289	30	13.84	33.52	6.01	25.10	288	0.09
55	12.49	33.48	5.47	265	50	12.62	33.48	5.51	25.32	267	0.14
70	12.40	33.53	5.47	260	75	12.26	33.54	5.41	25.43	256	0.21
94	11.42	33.60	4.87	237	100	11.20	33.61	4.71	25.68	232	0.27
114	10.67	33.64	4.34	221	125	10.37	33.66	4.11	25.87	214	0.33
133	10.12	33.68	3.93	209	150	9.50	33.80	3.41	26.12	190	0.38
152	9.42	33.81	3.33	188	200	8.37	33.99	2.73	26.45	159	0.47
181	8.64	33.92	3.11	168	250	7.84	34.05	2.05	26.58	147	0.54
215	8.18	34.04	2.38	153	300	7.37	34.11	1.66	26.68	137	0.62
245	7.90	34.05	2.09	148	400	6.39	34.19	0.85	26.89	117	0.75
292	7.45	34.10	1.73	138	500	5.84	34.30	0.47	27.04	103	0.86
347	6.84	34.15	1.17	126	600	(5.42)	(34.35)	(0.33)	(27.14)	(94)	(0.97)
428	6.21	34.22	0.70	113							
512	5.78	34.31	0.44	101							
598	5.43	34.35	0.33	94							

ORCA; May 24, 1960; 2011 GCT; 31°12'N, 120°59.5'W; sounding, 2300 fm; wind, 320°, force 2; weather, partly cloudy; sea, very rough; wire angle, 13°.

93.80

1	14.92	33.48	5.90	312	0	(14.92)	(33.48)	(5.90)	(24.84)	(312)	(0.00)
11	14.78	33.48	5.87	309	10	14.79	33.48	5.87	24.87	309	0.03
31	14.52	33.44	5.94	307	20	14.66	33.47	5.90	24.88	308	0.06
60	13.79	33.48	5.84	290	30	14.53	33.44	5.94	24.89	307	0.09
69	13.64	33.46	5.85	288	50	14.02	33.47	5.85	25.02	295	0.15
84	13.30	33.48	5.54	280	75	13.55	33.46	5.80	25.11	286	0.23
98	12.94	33.45	5.45	275	100	12.89	33.45	5.42	25.24	274	0.30
114	12.25	33.45	5.06	263	125	11.54	33.47	4.62	25.51	248	0.36
136	10.52	33.55	4.11	225	150	9.69	33.65	3.96	25.98	204	0.42
155	9.50	33.69	3.91	198	200	8.67	33.91	3.39	26.34	170	0.52
183	8.89	33.85	3.57	177	250	8.21	34.02	2.55	26.49	155	0.60
211	8.54	33.93	3.28	166	300	7.72	34.11	1.88	26.64	141	0.68
240	8.34	34.00	2.69	158	400	6.90	34.20	1.04	26.83	123	0.81
287	7.74	34.08	2.02	143	500	6.43	34.31	0.39	26.98	109	0.93
341	7.70	34.20	1.35	134	600	(5.83)	(34.43)		(27.14)	(93)	(1.04)
419	6.72	34.20	0.94	121							
501	6.42	34.31	0.39	109							
584	5.93	34.42	0.24	95							

ORCA; May 24, 1960; 1410 GCT; 30°54'N, 121°39'W; sounding, 2200 fm; wind, 320°, force 2; weather, partly cloudy; sea, very rough; wire angle, 15°.

93.90

1	15.37	33.26	5.63	337	0	(15.37)	(33.26)	(5.63)	(24.58)	(337)	(0.00)
10	15.36	33.28	5.65	336	10	15.36	33.28	5.65	24.60	336	0.03
30	15.16	33.35	5.64	326	20	15.28	33.31	5.65	24.64	332	0.07
59	14.88	33.40	5.67	317	30	15.16	33.35	5.64	24.69	326	0.10
68	14.82	33.40	5.67	316	50	14.95	33.39	5.66	24.76	319	0.16
83	14.64	33.41	5.68	311	75	14.78	33.40	5.67	24.81	315	0.24
97	14.11	33.49	5.62	295	100	14.01	33.49	5.63	25.04	293	0.32
112	13.58	33.49	5.43	284	125	12.50	33.48	4.99	25.34	264	0.39
135	11.15	33.48	4.45	241	150	10.13	33.65	3.86	25.90	211	0.45
154	9.95	33.69	3.73	205	200	8.90	33.86	3.06	26.27	176	0.55
183	9.15	33.79	3.25	186	250	8.22	34.02	2.40	26.49	155	0.64
212	8.75	33.92	2.92	170	300	7.25	34.05	2.00	26.66	139	0.71
241	8.39	34.00	2.49	159	400	6.32	34.14	0.97	26.86	120	0.85
289	7.36	34.04	2.11	141	500	5.78	34.21	0.48	26.98	108	0.96
343	6.93	34.11	1.34	130	600	(5.39)	(34.32)	(0.36)	(27.11)	(96)	(1.07)
425	6.11	34.16	0.84	116							
509	5.74	34.22	0.47	107							
593	5.42	34.31	0.36	97							

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OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

93.100

ORCA; May 24, 1960; 0823 GCT; 30°35'N, 122°14'W; sounding, 2300 fm; wind, 320°, force 2; weather, partly cloudy; sea, very rough; wire angle, 23°.

1	15.77	33.24	5.60	347	0	(15.77)	(33.24)	(5.60)	(24.47)	(347)	(0.00)
10	15.74	33.26	5.59	345	10	15.74	33.26	5.59	24.49	345	0.03
29	15.62	33.25	5.62	343	20	15.67	33.25	5.61	24.50	344	0.07
58	15.60	33.25	5.59	343	30	15.62	33.25	5.62	24.52	343	0.10
68	15.57	33.24	5.59	343	50	15.60	33.25	5.60	24.52	343	0.17
82	15.20	33.26	5.59	334	75	15.48	33.24	5.59	24.54	341	0.26
96	14.68	33.30	5.72	321	100	14.72	33.34	5.71	24.78	318	0.34
110	14.92	33.57	5.56	305	125	13.79	33.49	5.37	25.09	288	0.42
133	12.92	33.44	5.26	275	150	11.36	33.44	5.01	25.52	247	0.49
151	11.26	33.44	4.99	246	200	8.99	33.78	3.69	26.17	184	0.60
180	9.68	33.64	4.06	205	250	8.18	33.94	2.99	26.44	160	0.68
209	8.74	33.84	3.52	175	300	7.48	34.04	1.99	26.62	143	0.76
237	8.35	33.91	3.21	165	400	6.70	34.16	0.88	26.83	123	0.90
284	7.70	34.02	2.23	147	500	6.11	34.27	0.35	26.98	108	1.02
336	7.14	34.08	1.51	135	600	(5.22)	(34.29)		(27.11)	(96)	(1.13)
417	6.60	34.18	0.76	121							
499	6.12	34.27	0.35	108							
583	5.39	34.29	0.29	98							

93.30

ORCA; May 13, 1960; 2235 GCT; 32°45'N, 117°27'W; sounding, 300 fm; wind, 170°, force 2; weather, cloudy; sea, rough; wire angle, 01°.^{a)}

1	19.18	33.61 0	5.01	398							
6	19.14	33.61 0	5.10	397							
11	17.14	33.57 5	5.79	353							
16	15.22	33.58 0	5.42	311							
21	13.55	33.58 5	5.40	277							
26	12.72	33.58 5	4.91	261							
31	11.99	33.58 5	5.12	248							
36	11.49	33.61 0	4.66	237							
41	11.08	33.63 5	3.49	229							
46	10.77	33.63 5	3.37	223							
51	10.46	33.62 5	3.55	219							
56	10.30	33.65 5	3.44	214							
61	10.18	33.66 5	3.41	211							
66	9.99	33.69 5	3.37	206							
71	9.90	33.74 5	3.15	201							
76	9.85	33.76 5	3.02	198							
82	9.78	33.77 5	3.01	196							
86	9.66	33.81 0	2.85	192							

97.32

ORCA; May 26, 1960; 1615 GCT; 32°12'N, 117°16'W; sounding, 790 fm; wind, direction missing, force 1; weather, partly cloudy; sea, moderate; wire angle, 12°.

1	18.01	33.68	5.57	365	0	(18.01)	(33.68)	(5.57)	(24.28)	(365)	(0.00)
11	16.50	33.62	5.71	335	10	16.65	33.63	5.70	24.56	338	0.04
30	13.14	33.53	5.51	273	20	13.85	33.52	5.65	25.10	287	0.07
41	12.22	33.62	4.52	250	30	13.14	33.53	5.51	25.25	273	0.09
51	11.26	33.64	3.77	231	50	11.30	33.64	3.78	25.68	231	0.14
64	10.38	33.69	3.69	212	75	9.94	33.74	3.48	26.01	201	0.20
80	9.90	33.82	3.30	195	100	9.50	33.94	2.91	26.23	180	0.25
100	9.50	33.94	2.91	180	125	9.07	33.99	2.63	26.33	170	0.29
122	9.13	33.98	2.65	171	150	8.73	34.05	2.47	26.44	160	0.33
142	8.80	34.03	2.56	163	200	8.33	34.14	1.76	26.57	148	0.41
172	8.59	34.09	2.19	155	250	8.23	34.29	1.15	26.70	135	0.48
202	8.32	34.14	1.75	147	300	7.75	34.29	0.89	26.77	128	0.55
231	8.33	34.23	1.37	141	400	6.88	34.29	0.64	26.90	117	0.68
270	8.05	34.30	1.02	132	500	6.23	34.36	0.38	27.04	103	0.79
329	7.44	34.27	0.78	126							
401	6.87	34.29	0.64	116							
474	6.40	34.34	0.41	106							
553	5.86	34.38	0.32	97							

236

a) Shakedown station.

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

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ORCA; May 27, 1960; 0956 GCT; 31°12.5'N, 119°09.5'W; sounding, 2070 fm; wind, 300°, force 6; weather, clear; sea, very rough; wire angle, 43°.

97.60

2	16.37	33.62	5.41	333	0	(16.37)	(33.62)	(5.41)	(24.62)	(333)	(0.00)
10	16.36	33.63	5.43	332	10	16.36	33.63	5.43	24.64	332	0.03
29	16.36	33.60	5.44	334	20	16.36	33.61	5.44	24.62	333	0.07
35	16.37	33.62	5.41	333	30	16.36	33.60	5.44	24.61	334	0.10
46	15.02	33.58	5.65	307	50	14.60	33.53	5.65	24.95	302	0.16
58	13.57	33.50	5.61	283	75	12.50	33.45	5.15	25.32	267	0.23
76	12.32	33.45	5.07	264	100	10.98	33.57	4.41	25.69	231	0.30
91	11.71	33.57	4.65	244	125	9.62	33.73	3.89	26.04	198	0.35
104	10.68	33.58	4.31	226	150	9.13	33.86	3.68	26.23	180	0.40
126	9.60	33.73	3.88	197	200	8.78	34.02	2.37	26.41	163	0.49
148	9.17	33.85	3.73	182							
177	8.82	33.93	2.90	170							
200	8.78	34.02	2.37	163							
235	8.25	34.09	1.90	150							

BLACK DOUGLAS; May 14, 1960; 0300 GCT; 32°09'N, 117°12.5'W; sounding, 600 fm; wind, 240°, force 2; weather; overcast; sea, rough; wire angle, 07°. ^{a)}

97.431⁸
2

0	17.10	33.62	5.11	349							
10	16.47	33.62	5.44	335							
25	14.27	33.58	5.87	292							
30	13.81	33.53	5.57	286							
35	13.32	33.55	5.37	275							
40	12.99	33.54	5.08	270							
45	12.70	33.54	5.02	264							
50	12.32	33.54	4.84	257							
55	12.13	33.58	4.64	251							
60	11.83	33.56	4.58	247							
65	11.62	33.58	4.51	242							
70	11.34	33.59	4.41	236							
75	11.04	33.62	4.29	229							
85	10.10	33.70	3.93	207							
96	9.73	33.83	3.30	191							
105	9.44	33.91	3.21	181							
115	9.21	33.95	3.18	175							
125	9.42	34.05	2.37	171							

BLACK DOUGLAS; May 28, 1960; 1113 GCT; 30°11'N, 118°25'W; sounding, 1600 fm; wind, 300°, force 5; weather, partly cloudy; sea, very rough; wire angle, 25°.

103.60

1	15.32	33.58	5.58	313	0	(15.32)	(33.58)	(5.58)	(24.83)	(313)	(0.00)
10	15.32	33.60	5.79	312	10	15.32	33.60	5.79	24.84	312	0.03
28	14.93b)	33.62	5.90	302	20	15.32	33.61	5.81	24.85	311	0.06
37	14.48	33.61	5.90	294	30	14.80	33.62	5.90	24.97	299	0.09
51	14.08	33.60	5.84	286	50	14.09	33.60	5.85	25.11	286	0.15
64	14.02	33.57	5.71	287	75	14.00	33.57	5.65	25.10	287	0.22
86	12.42	33.53	4.96	260	100	11.33	33.55	4.53	25.61	239	0.29
106	10.92	33.57	4.36	231	125	10.27	33.69	3.74	25.90	211	0.35
124	10.28	33.69	3.75	211	150	9.53	33.87	3.17	26.17	185	0.40
142	9.72	33.84	3.23	191	200	8.72	34.06	2.21	26.45	159	0.48
170	8.92	33.93	3.03	172	250	8.04	34.15	1.82	26.63	142	0.56
201	8.71	34.06	2.19	159	300	7.26	34.20	1.52	26.78	128	0.63
228	8.42	34.13	1.80	150	400	6.69	34.26	0.67	26.90	116	0.76
275	7.58	34.18	1.78	134	500	6.08	34.36	0.32	27.06	101	0.87
326	7.04	34.22	1.17	124							
407	6.67	34.27	0.62	115							
489	6.14	34.35	0.33	103							
574	5.61	34.40	0.29	92							

a) Shakedown station.

b) Alternate value, 14.73°C, not used in interpolation.

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OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

107.60

BLACK DOUGLAS; May 27, 1960; 0621 GCT; 29°29'N, 118°00'W; sounding, 1820 fm; wind, 320°, force 4; weather, partly cloudy; sea, rough; wire angle, 25°.

0	16.52	33.50	5.15	345	0	16.52	33.50	5.15	24.50	345	0.00
9	16.52	33.49	5.09	346	10	16.52	33.49	5.10	24.49	345	0.03
28	16.44	33.55	5.49	340	20	16.48	33.52	5.29	24.52	343	0.07
38	16.34	33.58	5.52	335	30	16.43	33.56	5.50	24.57	338	0.10
51	16.18	33.55	5.57	334	50	16.20	33.55	5.56	24.61	334	0.17
64	15.57	33.56	5.65	320	75	15.08	33.50	5.74	24.82	314	0.25
86	14.58	33.44	5.76	308	100	13.90	33.57	5.34	25.12	285	0.33
103	13.75	33.60	5.24	280	125	12.32	33.65	4.87	25.50	249	0.40
121	12.55	33.64	4.95	254	150	10.92	33.73	4.45	25.82	218	0.45
138	11.59	33.71	4.66	232	200	9.01	33.95	3.48	26.31	172	0.55
163	10.12	33.76	4.19	204	250	8.36	34.12	2.18	26.55	149	0.64
192	9.20	33.92	3.64	177	300	7.51	34.11	1.80	26.67	138	0.71
218	8.67	34.01	3.00	162	400	6.68	34.26	0.90	26.90	116	0.84
260	8.22	34.14	2.00	146	500	6.43	34.38	0.38	27.03	104	0.96
308	7.40	34.11	1.77	137							
384	6.68	34.23	1.06	118							
465	6.67	34.36	0.48	108							
548	6.04	34.40	0.30	98							

107.70

BLACK DOUGLAS; May 27, 1960; 1210 GCT; 29°11'N, 118°41'W; sounding, 1600 fm; wind, 320°, force 4; weather, missing; sea, rough; wire angle, 25°.

1	16.84	33.64	5.49	342	0	(16.84)	(33.64)	(5.49)	(24.53)	(342)	(0.00)
9	16.87	33.64	5.24	342	10	16.86	33.64	5.25	24.52	342	0.03
29	16.67	33.64	5.54	338	20	16.79	33.64	5.41	24.55	340	0.07
38	16.63	33.64	5.51	337	30	16.67	33.64	5.54	24.57	338	0.10
50	16.54	33.66	5.52	334	50	16.54	33.66	5.52	24.61	334	0.17
63	16.41	33.62	5.48	333	75	16.29	33.61	5.50	24.64	331	0.25
86	15.04	33.52	5.61	312	100	14.80	33.64	5.51	24.99	298	0.33
103	14.74	33.68	5.46	294	125	13.31	33.69	5.05	25.34	264	0.40
121	13.66	33.69	5.13	271	150	11.57	33.72	4.57	25.70	230	0.47
139	12.16	33.72	4.75	241	200	9.30	34.01	3.68	26.31	172	0.57
165	10.75	33.73	4.44	216	250	8.37	34.06	2.76	26.50	154	0.65
196	9.42	34.02	3.80	173	300	7.52	34.12	1.85	26.67	138	0.73
222	8.74	33.94	3.19	168	400	6.61	34.24	0.91	26.89	117	0.86
266	8.12	34.11	2.42	147	500	5.94	34.30	0.44	27.03	104	0.98
317	7.30	34.14	1.63	133							
393	6.66	34.23	0.97	118							
475	6.09	34.28	0.52	107							
558	5.70	34.34	0.33	98							

110.60

BLACK DOUGLAS; May 25, 1960; 1908 GCT; 28°56.5'N, 117°38'W; sounding, 1780 fm; wind, 340°, force 6; weather, partly cloudy; sea, very rough; wire angle, 18°.

0	17.14	33.71	5.33	343	0	17.14	33.71	5.33	24.51	343	0.00
9	17.10	33.73	5.35	341	10	17.10	33.73	5.35	24.54	341	0.03
28	17.10	33.73	5.38	341	20	17.10	33.73	5.37	24.54	341	0.07
57	17.07	33.74	5.45	339	30	17.10	33.73	5.39	24.54	341	0.10
66	15.94	33.66	5.69	320	50	17.07	33.74	5.42	24.55	340	0.17
80	14.94	33.66	5.51	300	75	15.24	33.66	5.61	24.90	306	0.25
94	14.18	33.68	5.04	282	100	13.93	33.68	4.86	25.20	277	0.33
108	13.51	33.68	4.64	269	125	11.84	33.72	4.06	25.64	236	0.39
131	11.62	33.75	3.93	229	150	11.20	33.91	3.03	25.91	210	0.45
149	11.22	33.91	3.05	210	200	9.75	33.96	2.90	26.22	181	0.55
177	10.91	34.04	2.18	196	250	8.40	34.05	2.38	26.48	156	0.63
205	9.42	33.95	3.08	178	300	7.83	34.10	1.76	26.62	143	0.71
232	8.78	34.02	2.68	163	400	6.99	34.22	0.89	26.83	123	0.85
279	7.94	34.07	2.01	147	500	6.18	34.28	0.50	26.98	108	0.97
331	7.66	34.16	1.34	137							
411	6.87	34.23	0.84	121							
494	6.20	34.27	0.53	109							
578	5.95	34.39	0.28	97							

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

SIO
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6005

BLACK DOUGLAS; May 25, 1960; 0614 GCT; 28°36.5'N, 118°18'W; sounding, 1890 fm; wind, 340°, force 4; weather, clear; sea, moderate; wire angle, 12°.

110.70

0	17.48	33.75	5.17	348	0	17.48	33.75	5.17	24.46	348	0.00
10	17.48	33.75	5.39	348	10	17.48	33.75	5.39	24.46	348	0.03
29	16.98	33.74	5.52	337	20	17.42	33.75	5.44	24.48	347	0.07
39	16.88	33.70	5.56	338	30	16.97	33.74	5.53	24.58	337	0.10
54	16.60	33.69	5.56	333	50	16.70	33.69	5.56	24.61	334	0.17
69	15.87	33.71	5.81	315	75	15.42	33.70	5.73	24.90	306	0.25
92	14.24	33.66	5.17	285	100	13.60	33.68	4.66	25.27	271	0.32
112	13.38	33.70	4.48	265	125	11.60	33.73	4.00	25.70	230	0.39
130	11.10	33.75	3.93	220	150	10.76	33.77	3.73	25.88	213	0.44
150	10.76	33.77	3.73	213	200	9.87	34.09	1.90	26.28	175	0.54
178	9.36	33.82	3.82	187	250	9.89	34.40	0.97	26.52	152	0.63
212	10.16	34.22	1.31	170	300	9.17	34.42	0.65	26.66	139	0.70
241	9.98	34.38	1.02	155	400	8.80	34.39	0.38	26.85	121	0.84
289	9.38	34.43	0.66	142	500	7.75	34.38	0.28	26.99	108	0.96
343	8.38	34.38	0.61	130	600	(6.01)	(34.40)	(0.22)	(27.10)	(97)	(1.07)
424	7.55	34.39	0.35	118							
508	6.66	34.38	0.28	107							
594	6.05	34.40	0.22	98							

BLACK DOUGLAS; May 24, 1960; 0407 GCT; 28°40'N, 116°40'W; sounding, 2200 fm; wind, 320°, force 6; weather, partly cloudy; sea, very rough; wire angle, 10°.

113.50

0	16.42	33.67	5.56	330	0	16.42	33.67	5.56	24.65	330	0.00
10	16.42	33.66	5.49	331	10	16.42	33.66	5.49	24.64	331	0.03
29	16.44	33.66	5.68	331	20	16.43	33.66	5.58	24.64	331	0.07
39	16.34	-	5.73	-	30	16.43	33.66	5.68	24.64	331	0.10
53	15.32	33.60	5.75	311	50	15.74	33.63	5.75	24.77	319	0.16
68	13.68	33.57	5.46	281	75	12.50	33.57	4.83	25.40	258	0.24
92	11.76	33.62	4.33	241	100	11.44	33.65	4.18	25.67	233	0.30
111	11.07	33.69	4.05	224	125	10.61	33.75	3.73	25.89	212	0.36
130	10.45	33.78	3.56	207	150	9.88	33.90	3.11	26.14	189	0.41
149	9.90	33.90	3.12	189	200	9.40	34.14	2.13	26.41	163	0.50
177	9.49	33.99	2.65	176	250	8.81	34.24	1.37	26.58	147	0.58
211	9.30	34.18	1.91	159	300	8.34	34.34	1.08	26.72	133	0.65
240	8.88	34.23	1.39	149	400	7.17	34.33	0.64	26.89	117	0.78
287	8.51	34.31	1.25	137	500	6.22	34.38	0.38	27.05	102	0.89
339	7.86	34.38	0.76	123	600	(5.76)	(34.42)	(0.29)	(27.15)	(93)	(1.00)
422	6.90	34.31	0.57	115							
506	6.18	34.38	0.37	101							
590	5.78	34.42	0.29	93							

BLACK DOUGLAS; May 24, 1960; 1001 GCT; 28°20'N, 117°22'W; sounding, 2000 fm; wind, 340°, force 6; weather, missing; sea, very rough; wire angle, 25°.

113.60

1	16.52	33.66	5.55	333	0	(16.52)	(33.66)	(5.55)	(24.62)	(333)	(0.00)
10	16.52	33.67	5.49	332	10	16.52	33.67	5.49	24.63	332	0.03
28	16.53	33.66	5.48	333	20	16.52	33.67	5.49	24.62	333	0.07
55	16.48	33.66	5.46	332	30	16.53	33.66	5.47	24.62	333	0.10
64	16.28	33.71	5.45	324	50	16.49	33.66	5.46	24.63	332	0.17
77	14.82	33.58	5.83	303	75	15.30	33.62	5.72	24.87	309	0.25
90	13.84	33.60	5.26	281	100	13.02	33.59	5.00	25.32	266	0.32
103	12.76	33.59	4.94	261	125	11.52	33.62	4.48	25.62	237	0.38
125	11.52	33.62	4.48	237	150	10.24	33.72	4.01	25.93	208	0.44
142	10.74	33.68	4.08	219	200	9.44	34.10	2.00	26.37	167	0.54
168	9.60	33.91	3.81	184	250	8.67	34.18	1.73	26.56	149	0.62
195	9.50	34.08	2.07	169	300	8.09	34.25	1.23	26.69	136	0.69
221	9.13	34.16	1.84	158	400	7.28	34.34	0.64	26.88	118	0.82
265	8.44	34.20	1.64	145	500	6.35	34.35	0.43	27.02	105	0.94
315	7.98	34.27	1.09	132							
394	7.34	34.34	0.65	119							
474	6.52	34.33	0.52	109							
559	6.02	34.40	0.24	97							

S10
CCOFI
6005

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

117.50

BLACK DOUGLAS; May 22, 1960; 1333 GCT; 28°15'N, 116°17'W; sounding, 2200 fm; wind, 320°, force 3; weather, partly cloudy; sea, rough; wire angle, 20°.

1	16.60	33.68	4.85	333	0	(16.60)	(33.68)	(4.85)	(24.62)	(333)	(0.00)
10	16.60	33.68	5.72	333	10	16.60	33.68	5.72	24.62	333	0.03
29	16.58	33.66	5.54	334	20	16.59	33.66	5.60	24.61	334	0.07
38	16.38	33.67	5.51	329	30	16.57	33.66	5.54	24.61	334	0.10
52	14.06	33.57	5.47	288	50	14.50	33.58	5.47	25.01	296	0.16
66	12.50	33.58	4.49	258	75	12.16	33.64	4.19	25.52	247	0.23
87	11.84	33.75	3.95	233	100	10.69	33.82	3.24	25.93	208	0.29
106	10.50	33.84	3.11	203	125	9.96	33.90	2.81	26.12	190	0.34
123	9.97	33.88	2.84	192	150	9.78	34.11	2.01	26.31	172	0.39
140	10.02	34.07	2.18	179	200	9.36	34.31	1.33	26.55	150	0.47
166	9.51	34.14	1.89	165	250	8.88	34.42	0.68	26.70	135	0.54
196	9.44	34.32	1.38	151	300	8.40	34.43	0.55	26.79	127	0.61
222	8.87	34.29	1.14	144	400	7.63	34.45	0.27	26.92	115	0.73
266	8.88	34.47	0.57	131	500	6.61	34.44	0.26	27.05	102	0.84
316	8.22	34.42	0.53	125							
394	7.70	34.45	0.27	115							
475	6.84	34.44	0.27	105							
559	6.20	34.45	0.23	96							

117.80

BLACK DOUGLAS; May 21, 1960; 1903 GCT;^{a)} 27°08'N, 118°10.5'W; sounding, 2000 fm; wind, 320°, force 4; weather, overcast; sea, rough; wire angle, 20°.

409	6.62	34.19 5	0.78	120							
412	6.65	34.19 5	0.83	121							
415	6.60	34.19 5	0.80	120							
439	6.51	34.25 0	0.55	115							
442	6.50	34.25 0	0.53	114							
446	6.50	34.26 0	0.50	114							
471	6.34	34.28 5	0.44	110							
473	6.34	34.28 5	0.40	110							
476	6.35	34.28 5	0.37	110							
501	6.23	34.31 5	0.30	106							
504	6.24	34.31 0	0.33	107							
506	6.22	34.31 5	0.32	106							
531	6.08	34.33 0	0.29	103							
534	6.08	34.32 5	0.27	104							
537	6.02	34.33 0	0.27	103							
561	5.90	34.34 0	0.21	100							
564	5.87	34.33 5	0.26	100							
568	5.84	34.34 0	0.24	100							

120.50

BLACK DOUGLAS; May 20, 1960; 2155 GCT; 27°33'N, 115°52.5'W; sounding, 2100 fm; wind, 320°, force 4; weather, cloudy; sea, rough; wire angle, 04°.

0	17.40	33.75	5.39	346	0	17.40	33.75	5.39	24.48	346	0.00
10	17.23	33.77	5.42	341	10	17.23	33.77	5.42	24.52	341	0.03
30	14.78	33.58	5.63	302	20	16.21	33.69	5.53	24.72	323	0.07
40	14.18	33.64	5.41	285	30	14.78	33.58	5.63	24.95	302	0.10
55	12.76	33.62	4.65	259	50	13.28	33.63	4.95	25.30	268	0.16
70	11.53	33.64	4.24	236	75	11.35	33.66	4.06	25.69	231	0.22
95	11.13	33.96	2.68	205	100	11.13	33.99	2.64	25.99	203	0.27
115	10.48	34.07	2.38	186	125	10.09	34.08	2.30	26.24	179	0.32
135	9.82	34.12	2.13	172	150	9.88	34.24	1.70	26.40	164	0.36
154	9.88	34.27	1.58	162	200	9.65	34.47	0.71	26.62	143	0.44
184	9.80	34.46	0.82	146	250	9.35	34.52	0.35	26.71	135	0.51
220	9.48	34.47	0.61	140	300	8.57	34.48	0.26	26.80	126	0.58
249	9.36	34.52	0.35	135	400	7.54	34.45	0.20	26.93	113	0.70
299	8.58	34.48	0.27	126	500	6.51	34.46	0.18	27.08	99	0.82
353	8.08	34.47	0.22	120	600	5.85	34.46	0.16	27.17	91	0.92
438	7.10	34.44	0.21	108							
524	6.30	34.47	0.18	95							
609	5.80	34.46	0.16	90							

240

a) Test cast.

OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

SIO

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6005

BLACK DOUGLAS; May 21, 1960; 1345 GCT; 26°32.5'N, 117°49'W; sounding, 2000+ fm; wind, 320°, force 3; weather, cloudy; sea, moderate; wire angle, 15°.

120.80

2	18.25	33.81	5.36	361	0	(18.25)	(33.81)	(5.36)	(24.32)	(361)	(0.00)
10	18.23	33.82	5.46	360	10	18.23	33.82	5.46	24.33	360	0.04
30	18.01	33.82	5.48	355	20	18.02	33.82	5.48	24.38	356	0.07
39	17.99	33.84	5.50	353	30	18.01	33.82	5.48	24.38	355	0.11
53	17.12	33.75	5.63	340	50	17.24	33.77	5.62	24.54	341	0.18
68	16.28	33.68	5.70	326	75	15.91	33.67	5.70	24.77	319	0.26
91	15.20	33.66	5.67	304	100	14.99	33.67	5.62	24.97	300	0.34
110	13.53	33.63	4.98	273	125	12.41	33.66	4.44	25.49	251	0.41
130	12.18	33.70	4.28	243	150	11.45	33.78	3.97	25.76	224	0.47
148	11.54	33.78	3.99	225	200	9.31	33.97	3.09	26.28	175	0.57
175	9.90	33.83	3.54	194	250	8.40	34.03	2.70	26.47	157	0.66
207	9.12	34.00	2.99	170	300	8.07	34.19	1.58	26.65	140	0.73
235	8.56	33.98	2.98	163	400	7.32	34.32	0.61	26.86	120	0.87
281	8.18	34.13	2.02	146	500	6.30	34.34	0.36	27.02	105	0.98
332	7.88	34.27	1.07	132	600	(5.72)	(34.39)		(27.13)	(94)	(1.09)
415	7.18	34.33	0.54	118							
498	6.32	34.34	0.38	105							
583	5.79	34.38	0.27	96							

BLACK DOUGLAS; May 19, 1960; 1505 GCT; 27°15'N, 114°58'W; sounding, 800 fm; wind, 320°, force 3; weather, overcast; sea, moderate; wire angle, 20°.

123.42

1	17.24	33.74	5.31	343	0	(17.24)	(33.74)	(5.31)	(24.52)	(343)	(0.00)
10	17.23	33.74	5.39	343	10	17.23	33.74	5.39	24.52	343	0.03
34	15.87	33.60	5.60	323	20	17.22	33.74	5.41	24.52	343	0.07
42	15.24	33.66	5.85	306	30	17.20	33.73	5.43	24.52	342	0.10
57	14.62	33.66	5.29	292	50	14.85	33.66	5.56	24.99	297	0.17
71	13.74	33.64	4.98	276	75	13.20	33.65	4.71	25.32	266	0.24
93	11.68	33.68	4.04	235	100	11.30	33.73	3.73	25.76	225	0.30
109	10.82	33.79	3.35	212	125	10.32	33.86	2.97	26.03	199	0.35
129	10.24	33.87	2.92	197	150	10.18	34.10	2.30	26.24	179	0.40
156	10.13	34.15	2.15	174	200	9.64	34.36	1.30	26.53	151	0.48
181	9.57	34.25	1.68	158	250	9.42	34.49	0.65	26.68	138	0.56
216	9.70	34.43	0.84	146	300	8.94	34.49	0.37	26.75	131	0.63
243	9.48	34.49	0.67	139	400	7.72	34.48	0.28	26.94	113	0.75
289	9.05	34.48	0.41	133	500	6.77	34.46	0.28	27.05	102	0.87
348	8.42	34.54	0.31	119	600	6.19	34.49	0.32	27.15	93	0.97
442	7.20	34.45	0.27	109							
529	6.61	34.47	0.29	99							
603	6.16	34.49	0.33	92							

BLACK DOUGLAS; May 17, 1960; 2348 GCT; 26°09'N, 114°07'W; sounding, 1150 fm; wind, 310°, force 5; weather, partly cloudy; sea, very rough; wire angle, 08°.

130.40

0	17.40	33.86	5.35	338	0	17.40	33.86	5.35	24.57	338	0.00
10	17.40	33.87	5.35	337	10	17.40	33.87	5.35	24.58	337	0.03
30	14.54	33.72	5.08	287	20	17.39	33.88	5.35	24.59	336	0.07
39	13.50	33.89	3.94	254	30	14.54	33.72	5.08	25.10	287	0.10
54	12.38	33.89	3.30	233	50	12.69	33.89	3.45	25.62	238	0.15
69	11.65	34.02	2.12	210	75	11.52	34.05	2.97	25.96	206	0.21
93	11.17	34.11	1.76	195	100	11.07	34.15	1.66	26.12	191	0.26
113	10.84	34.27	1.23	177	125	10.64	34.28	1.23	26.30	173	0.30
133	10.48	34.28	1.24	171	150	10.10	34.31	1.14	26.41	162	0.35
152	10.07	34.31	1.13	162	200	9.74	34.42	0.76	26.57	148	0.42
182	10.02	34.42	0.74	153	250	9.16	34.47	0.67	26.70	135	0.50
216	9.43	34.42	0.78	143	300	8.47	34.45	0.39	26.80	126	0.56
246	9.22	34.47	0.70	136	400	7.60	34.48	0.28	26.95	112	0.69
295	8.52	34.45	0.41	127	500	6.62	34.44	0.27	27.05	102	0.80
349	8.00	34.46	0.31	119	600	5.99	34.49	0.20	27.17	91	0.90
433	7.30	34.48	0.27	108							
519	6.48	34.43	0.27	101							
604	5.96	34.49	0.20	90							

241

S10

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OBSERVED				COMPUTED	INTERPOLATED				COMPUTED		
Z	T	S	O ₂	δ _T	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	cl/ton	m	°C	‰	ml/L	g/L	cl/ton	dyn m

137.40

BLACK DOUGLAS; May 16, 1960; 0402 GCT; 25°00'N, 113°23.5'W; sounding, 1200 fm; wind, 300°, force 5; weather, clear; sea, rough; wire angle, 07°.

1	17.73	33.84	5.27	347	0	(17.73)	(33.84)	(5.27)	(24.47)	(347)	(0.00)
11	17.71	33.90	5.36	342	10	17.72	33.90	5.36	24.52	343	0.03
31	16.98	33.81	5.45	332	20	17.51	33.88	5.40	24.56	339	0.07
41	15.82	33.74	5.52	312	30	17.02	33.81	5.45	24.62	333	0.10
57	14.85	33.80	4.99	287	50	15.20	33.77	5.28	25.00	297	0.16
70	13.33	33.85	4.07	253	75	12.91	33.86	3.83	25.55	244	0.23
95	11.28	33.87	2.93	215	100	11.20	33.92	2.69	25.92	210	0.29
115	10.98	34.05	2.02	196	125	10.73	34.09	1.94	26.14	189	0.34
134	10.50	34.11	1.92	183	150	10.29	34.16	1.86	26.27	176	0.39
154	10.22	34.18	1.84	174	200	10.16	34.40	0.93	26.47	157	0.47
183	9.78	34.24	1.48	162	250	10.20	34.60	0.21	26.63	142	0.55
218	10.76	34.61	0.25	151	300	9.65	34.63	0.11	26.74	131	0.62
248	10.22	34.60	0.21	143	400	8.17	34.55	0.12	26.92	115	0.75
297	9.69	34.63	0.11	132	500	7.02	34.51	0.11	27.05	102	0.86
351	8.87	34.60	0.12	122	600	6.31	34.52	0.16	27.16	92	0.96
435	7.70	34.52	0.12	110							
521	6.86	34.51	0.11	100							
604	6.28	34.52	0.16	92							

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
73.51-O	V-15	2000	35°34.5'	121°20.5'	220	320°	6	clear	very rough	9.51	33.91
73.55-O	15	1800	35°28.0'	121°34.0'	500	320°	6	partly cloudy	high	10.06	33.80
73.60-O	15	1520	35°18.5'	121°50.0'	450	330°	6	overcast	high	11.62	33.53
77.50-O	16	0030	35°04.0'	120°52.0'	85	300°	5	clear	very rough	10.64	33.70
77.55-O	16	1830	34°53.5'	121°12.0'	325	330°	5	partly cloudy	very rough	11.68	33.81
83.40-O	18	2320	34°14.0'	119°21.5'	12	260°	3	partly cloudy	rough	13.02	33.68
83.51-O	19	0525	33°52.0'	120°07.5'	60	260°	6	clear	very rough	11.98	33.73
83.55-O	20	0525	33°43.0'	120°23.5'	700	320°	4	clear	very rough	11.64	33.78
87.35-O	20	1820	33°49.5'	118°37.0'	460	240°	1	clear	moderate	17.23	33.66
87.45-O	20	1240	33°30.5'	119°18.0'	100	280°	3	clear	rough	13.34	34.22
87.50-O	20	1000	33°19.5'	119°39.5'	45	320°	3	clear	very rough	13.10	33.80
87.55-O	19	1610	33°09.5'	119°57.5'	630	300°	3	clear	high	12.34	33.76
90.65-O	23	0517	32°12.0'	120°16.5'	2000	310°	5	partly cloudy	high	13.94	33.48
90.75-O	23	1125	31°53.0'	120°56.0'	2500	310°	5	partly cloudy	very rough	13.98	33.49
90.85-O	23	1825	31°33.0'	121°37.5'	2100	320°	2	clear	high	14.80	33.46
90.95-O	24	0059	31°12.5'	122°16.0'	2300	330°	3	partly cloudy	high	15.32	33.21
93.45-O	25	2000	32°18.0'	118°32.0'	850	340°	4	clear	very rough	14.54	33.68
93.55-O	25	1252	31°56.0'	119°17.5'	900	300°	3	clear	very rough	13.46	33.55
93.65-O	25	0609	31°38.0'	119°54.0'	2100	320°	3	clear	very rough	13.64	33.62

TEMPERATURE AND SALINITY AT 10 METERS (NET-TOW STATIONS)

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
93.75-O	V-24	2354	31°20.5'	120°34.0'	2200	320°	3	partly cloudy	very rough	14.42	33.46
93.85-O	24	1654	31°01.5'	121°20.5'	2180	320°	2	partly cloudy	very rough	15.28	33.30
93.95-O	24	1100	30°44.0'	121°58.0'	2350	310°	2	partly cloudy	very rough	15.33	33.26
97.30-O	26	1440	32°15.0'	117°08.5'	35	260°	1	clear	moderate	12.41	33.61
97.35-O	26	1820	32°06.5'	117°28.0'	680	-	1	clear	moderate	16.24	33.62
97.40-O	26	2114	31°56.0'	117°50.0'	800	280°	2	partly cloudy	rough	15.69	33.64
97.45-O	26	2352	31°46.0'	118°08.5'	650	300°	4	partly cloudy	rough	15.72	33.62
97.50-O	27	0230	31°37.5'	118°24.0'	800	320°	5	partly cloudy	very rough	15.90	33.71
97.55-O	27	0615	31°23.0'	118°49.5'	600	240°	4	partly cloudy	very rough	15.40	33.64
103.30-B	29	0335	31°06.0'	116°24.5'	40	300°	3	overcast	moderate	11.48	33.71
103.35-B	29	0130	30°56.0'	116°45.0'	900	300°	3	overcast	rough	16.07	33.73
103.40-B	28	2240	30°48.5'	117°04.5'	1000	290°	3	overcast	rough	15.78	33.71
103.45-B	28	2040	30°41.0'	117°20.0'	800	320°	3	overcast	rough	15.54	33.68
103.50-B	28	1700	30°32.5'	117°43.5'	800	320°	5	cloudy	very rough	16.20	33.66
103.55-B	28	1400	30°21.0'	118°05.0'	1600	320°	5	cloudy	very rough	16.46	33.64
103.65-B	28	0800	29°59.0'	118°44.0'	1800	320°	6	partly cloudy	very rough	15.97	33.59
103.70-B	28	0505	29°49.0'	119°05.0'	1600	320°	6	partly cloudy	very rough	16.68	33.53
103.75-B	28	0200	29°36.5'	119°26.5'	1300	320°	6	partly cloudy	very rough	16.80	33.58
103.80-B	27	2330	29°27.0'	119°42.0'	2000	320°	6	cloudy	very rough	16.77	33.58

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
107.32-B	V-26	1515	30°26.0'	116°11.0'	220	270°	3	overcast	moderate	12.25	-
107.35-B	26	1645	30°20.0'	116°22.5'	900	270°	3	cloudy	rough	14.19	-
107.40-B	26	1915	30°12.5'	116°42.5'	1390	270°	3	partly cloudy	rough	15.60	33.68
107.45-B	26	2145	30°01.0'	117°02.5'	750	290°	5	partly cloudy	rough	16.44	33.75
107.50-B	27	0030	29°50.5'	117°22.0'	1400	320°	4	cloudy	rough	16.56	33.74
107.55-B	27	0310	29°41.0'	117°42.0'	1700	320°	4	partly cloudy	rough	15.68	33.65
107.65-B	27	0910	29°21.0'	118°21.0'	1600	320°	4	missing	rough	16.74	33.57
107.75-B	27	1510	29°01.5'	119°01.0'	1800	320°	5	cloudy	very rough	16.98	33.66
107.80-B	27	1740	28°51.5'	119°20.5'	1960	320°	6	cloudy	very rough	17.08	33.68
110.33-B	26	0940	29°50.0'	115°52.0'	50	340°	5	cloudy	rough	13.08	33.74
110.35-B	26	0840	29°46.0'	116°00.0'	700	320°	5	cloudy	rough	15.08	33.67
110.40-B	26	0630	29°39.0'	116°17.0'	1320	330°	6	cloudy	very rough	16.14	33.68
110.45-B	26	0340	29°29.0'	116°40.0'	550	330°	6	partly cloudy	very rough	16.35	33.73
110.50-B	26	0050	29°20.0'	117°01.0'	1420	340°	6	clear	very rough	16.44	33.73
110.55-B	25	2220	29°09.0'	117°21.0'	1850	340°	6	clear	very rough	16.68	33.61
110.65-B	25	0920	28°46.0'	117°59.0'	1800	340°	5	missing	rough	17.30	33.73
110.75-B	25	0305	28°26.0'	118°37.0'	2000	340°	4	partly cloudy	rough	17.40	33.75
110.80-B	25	0030	28°16.5'	118°57.5'	2000	320°	5	partly cloudy	very rough	17.54	33.74
113.30-B	23	1645	29°22.0'	115°18.0'	35	270°	4	partly cloudy	rough	12.81	33.78

TEMPERATURE AND SALINITY AT 10 METERS (NET-TOW STATIONS)

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
113.35-B	V-23	1900	29°12.0'	115°39.0'	600	300°	6	overcast	very rough	16.16	33.62
113.40-B	23	2150	29°03.0'	115°57.5'	1000	300°	6	clear	very rough	16.80	33.67
113.45-B	24	0055	28°53.0'	116°19.0'	1100	310°	6	partly cloudy	very rough	16.33	33.66
113.55-B	24	0645	28°33.0'	117°01.0'	1800	320°	6	missing	very rough	16.62	33.67
113.65-B	24	1235	28°08.0'	117°42.0'	2000	340°	6	cloudy	very rough	17.44	33.75
113.70-B	24	1440	28°02.0'	117°55.0'	2000	330°	5	cloudy	very rough	17.36	33.73
113.75-B	24	1700	27°52.5'	118°14.0'	1900	320°	5	cloudy	very rough	17.38	33.73
113.80-B	24	1930	27°42.0'	118°33.5'	2000	320°	5	partly cloudy	very rough	17.36	33.73
117.26-B	23	1145	28°56.0'	114°41.5'	42	320°	4	missing	moderate	15.26	33.77
117.30-B	23	0950	28°48.0'	114°56.5'	55	320°	4	missing	rough	15.22	33.65
117.35-B	23	0700	28°38.0'	115°16.0'	110	320°	4	missing	rough	16.84	33.82
117.40-B	22	2115	28°28.0'	115°35.5'	450	320°	3	partly cloudy	rough	15.16	33.64
117.45-B	22	1855	28°18.0'	115°56.0'	1780	320°	3	partly cloudy	rough	16.28	33.69
117.55-B	22	1000	28°03.0'	116°37.0'	1700	320°	4	missing	rough	16.68	33.64
117.60-B	22	0700	27°51.0'	116°56.0'	1800	330°	5	missing	rough	17.12	33.69
117.65-B	22	0400	27°39.0'	117°14.5'	1800	360°	4	partly cloudy	rough	17.40	33.69
117.70-B	22	0105	27°28.0'	117°32.5'	1900	360°	5	cloudy	rough	17.70	33.68
117.75-B	21	2200	27°17.5'	117°52.0'	2000	340°	4	cloudy	rough	17.43	33.66
118.39-B	23	0415	28°18.5'	115°23.5'	130	320°	3	missing	rough	17.36	33.82

TEMPERATURE AND SALINITY AT 10 METERS (NET-TOW STATIONS)

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
119.33-B	V-20	0640	28°19.0'	114°53.0'	60	270°	5	missing	rough	17.11	33.80
120.25-B	20	1030	28°22.5'	114°15.0'	30	320°	3	missing	moderate	16.12	33.78
120.30-B	20	1300	28°13.0'	114°34.0'	52	320°	2	partly cloudy	moderate	17.10	33.85
120.35-B	20	1500	28°03.0'	114°54.0'	47	320°	2	clear	rough	17.00	33.80
120.40-B	20	1710	27°56.5'	115°14.0'	21	270°	4	clear	rough	16.98a)	33.89
120.45-B	20	1930	27°43.0'	115°33.0'	1100	280°	3	cloudy	rough	15.94	33.74
120.55-B	21	0100	27°23.0'	116°12.0'	1900	320°	4	overcast	very rough	17.46	33.69
120.60-B	21	0315	27°13.0'	116°30.5'	2000	320°	4	partly cloudy	very rough	17.44	33.68
120.65-B	21	0545	27°03.0'	116°50.5'	2000	320°	3	missing	rough	17.84	33.76
120.70-B	21	0810	26°53.0'	117°10.0'	2000	320°	3	missing	rough	17.26	33.80
120.75-B	21	1045	26°42.5'	117°30.0'	2000	320°	3	partly cloudy	moderate	17.75	33.82
123.37-B	19	1920	27°24.0'	114°40.0'	36	280°	3	clear	rough	15.48	33.80
123.45-B	19	1210	27°12.0'	115°08.5'	1700	320°	4	overcast	moderate	17.32	33.68
123.50-B	19	0935	27°01.0'	115°28.5'	2000	320°	4	overcast	moderate	17.46	33.72
123.55-B	19	0700	26°49.0'	115°49.0'	1960	270°	4	overcast	rough	17.68	33.77
123.60-B	19	0420	26°38.5'	116°09.0'	2000	300°	4	overcast	rough	17.25	33.65
127.34-B	18	1030	26°55.0'	114°06.5'	45	300°	4	overcast	rough	13.18	33.88

a) Alternate value, 16.44°C.

TEMPERATURE AND SALINITY AT 10 METERS (NET-TOW STATIONS)

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Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
127.40-B	V-18	1300	26°43.5'	114°29.0'	1500	320°	4	overcast	rough	15.66	33.71
127.45-B	18	1545	26°33.0'	114°48.5'	1600	320°	3	overcast	rough	17.61	33.74
127.50-B	18	1815	26°22.0'	115°07.0'	1760	320°	3	overcast	rough	18.04	33.78
127.55-B	18	2030	26°13.5'	115°27.0'	1800	300°	4	cloudy	moderate	18.63	34.02
127.60-B	18	2300	26°03.5'	115°46.5'	1900	300°	4	cloudy	rough	18.87	34.05
130.30-B	18	0500	26°29.0'	113°29.0'	40	310°	5	clear	high	12.70	33.96
130.35-B	18	0225	26°19.0'	113°48.0'	200	310°	6	clear	high	16.50	33.86
130.45-B	17	2030	25°58.5'	114°26.5'	1750	310°	5	cloudy	very rough	17.36	33.89
130.50-B	17	1830	25°53.0'	114°44.0'	1680	320°	5	cloudy	very rough	17.69	33.77
130.55-B	17	1625	25°43.0'	115°02.0'	1880	320°	4	overcast	very rough	18.47	34.04
130.60-B	17	1355	25°32.0'	115°22.0'	1850	320°	5	overcast	very rough	18.64	34.13
133.25-B	16	1740	26°04.5'	112°48.0'	43	280°	4	partly cloudy	rough	14.79	33.95
133.30-B	16	2020	25°54.5'	113°07.5'	105	280°	5	clear	rough	16.12	33.80
133.40-B	17	0215	25°34.5'	113°45.5'	1300	310°	6	partly cloudy	very rough	17.60	33.93
134.36-B	16	2340	25°38.0'	113°25.0'	65	290°	6	partly cloudy	very rough	17.65a)	33.80
137.23-B	16	1235	25°34.0'	112°19.0'	40	310°	5	partly cloudy	rough	17.00	34.04
137.30-B	16	0915	25°20.0'	112°46.0'	190	320°	5	partly cloudy	very rough	16.40	33.81
137.35-B	16	0645	25°10.0'	113°04.5'	560	300°	5	clear	very rough	15.80	33.82

a) Alternate value, 17.49°C.

TEMPERATURE AND SALINITY AT 10 METERS (NET-TOW STATIONS)

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