

UNIVERSITY OF CALIFORNIA    SCRIPPS INSTITUTION OF OCEANOGRAPHY

# data report

PHYSICAL AND CHEMICAL DATA  
CCOFI CRUISE 5505  
(MLR 72)  
12 May - 7 June 1955

SIO Reference 59-44  
18 May 1959

UNIVERSITY OF CALIFORNIA  
SCRIPPS INSTITUTION OF OCEANOGRAPHY

PHYSICAL AND CHEMICAL DATA

CCOFI CRUISE 5505

(MLR 72)

12 May - 7 June 1955

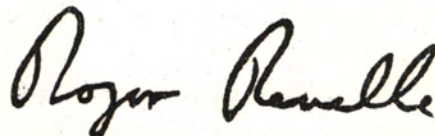
Sponsored by

Marine Research Committee

SIO Reference 59-44

18 May 1959

Approved for distribution:



Roger Revelle, Director

## CONTENTS

List of Figures . . . . .	ii
Introduction . . . . .	iii
Personnel . . . . .	v
Tabulated Data . . . . .	98
Distribution List . . . . .	111

## FIGURES

1. CCOFI Cruise 5505 (MLR 72), station positions
2. Surface currents measured by geomagnetic electrokinetograph (GEK)
3. Horizontal distribution of temperature at 10 meters
4. Horizontal distribution of salinity at 10 meters

## INTRODUCTION

The data presented in this report were collected on the seventy-second consecutive cruise of the California Cooperative Oceanic Fisheries Investigations program. The R/V Black Douglas of the U. S. Fish and Wildlife Service and the R/V Crest of the Scripps Institution participated in this cruise.

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.<sup>1/</sup> 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  $\Delta D$ . The interpolated values at 125 meters are not tabulated.

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. 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.

---

<sup>1/</sup> Klein, Hans T. A new technique for processing physical oceanographic data. MS.

## FOOTNOTES

Footnotes which appear frequently are "loose bottle cap" and "possible evaporation." To avoid any confusion as to their meaning the following explanation is included.

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.

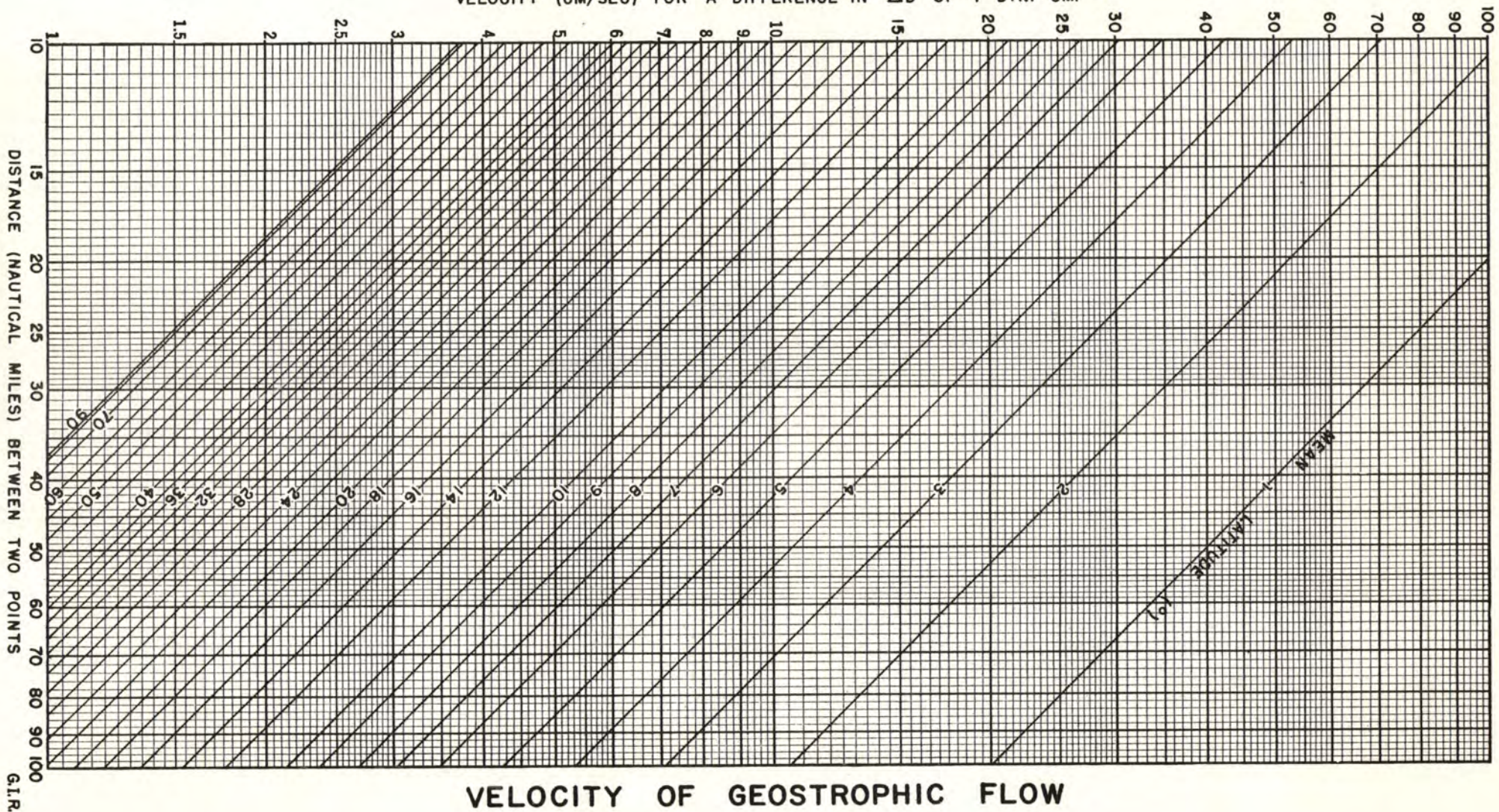
r: rejected value (value seems to be definitely wrong),

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 1955 volume, the first page of the Cruise 5505 data is numbered 98.

VELOCITY (CM/SEC) FOR A DIFFERENCE IN  $\Delta D$  OF 1 DYN. CM.



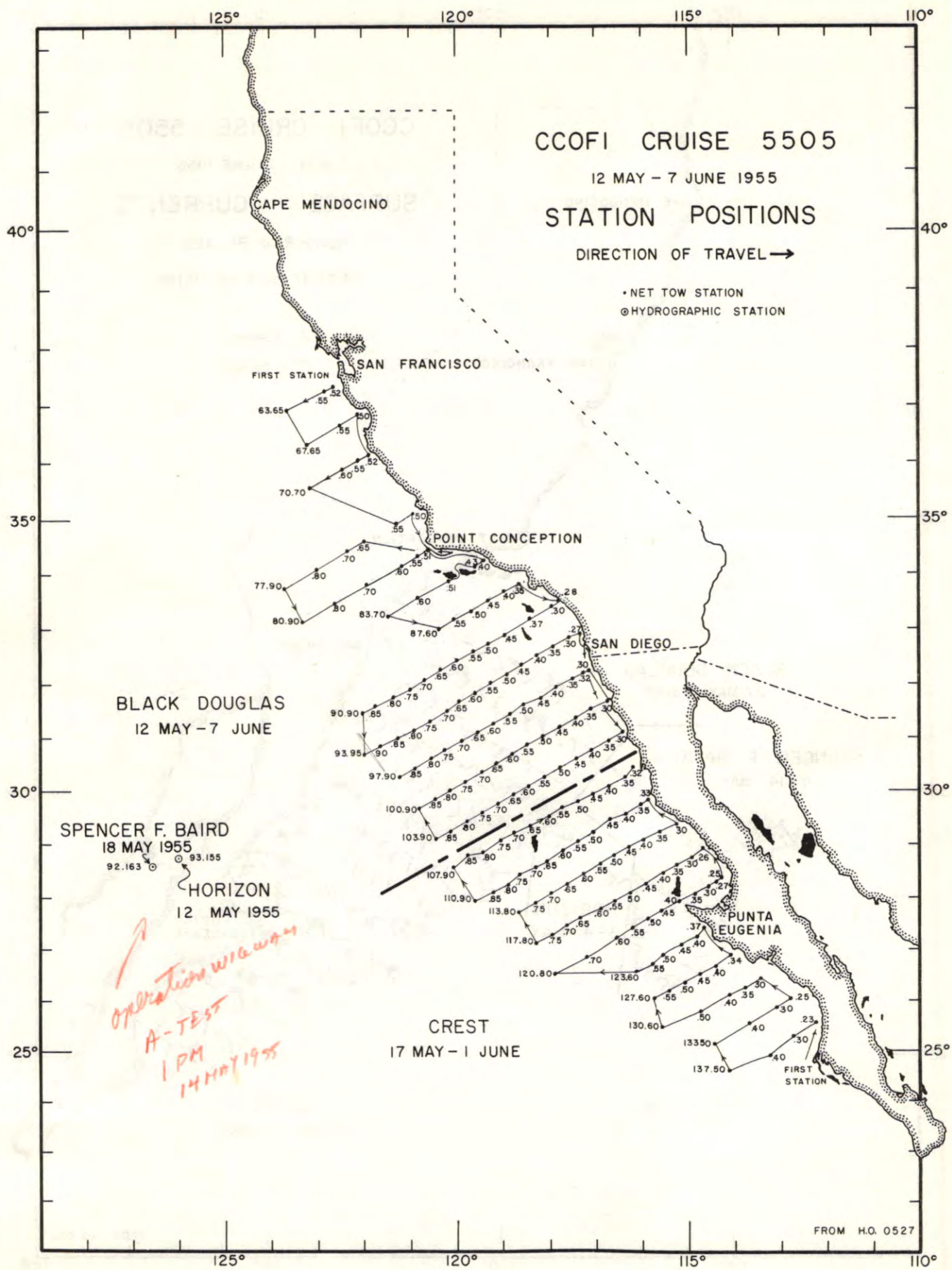


FIGURE 1

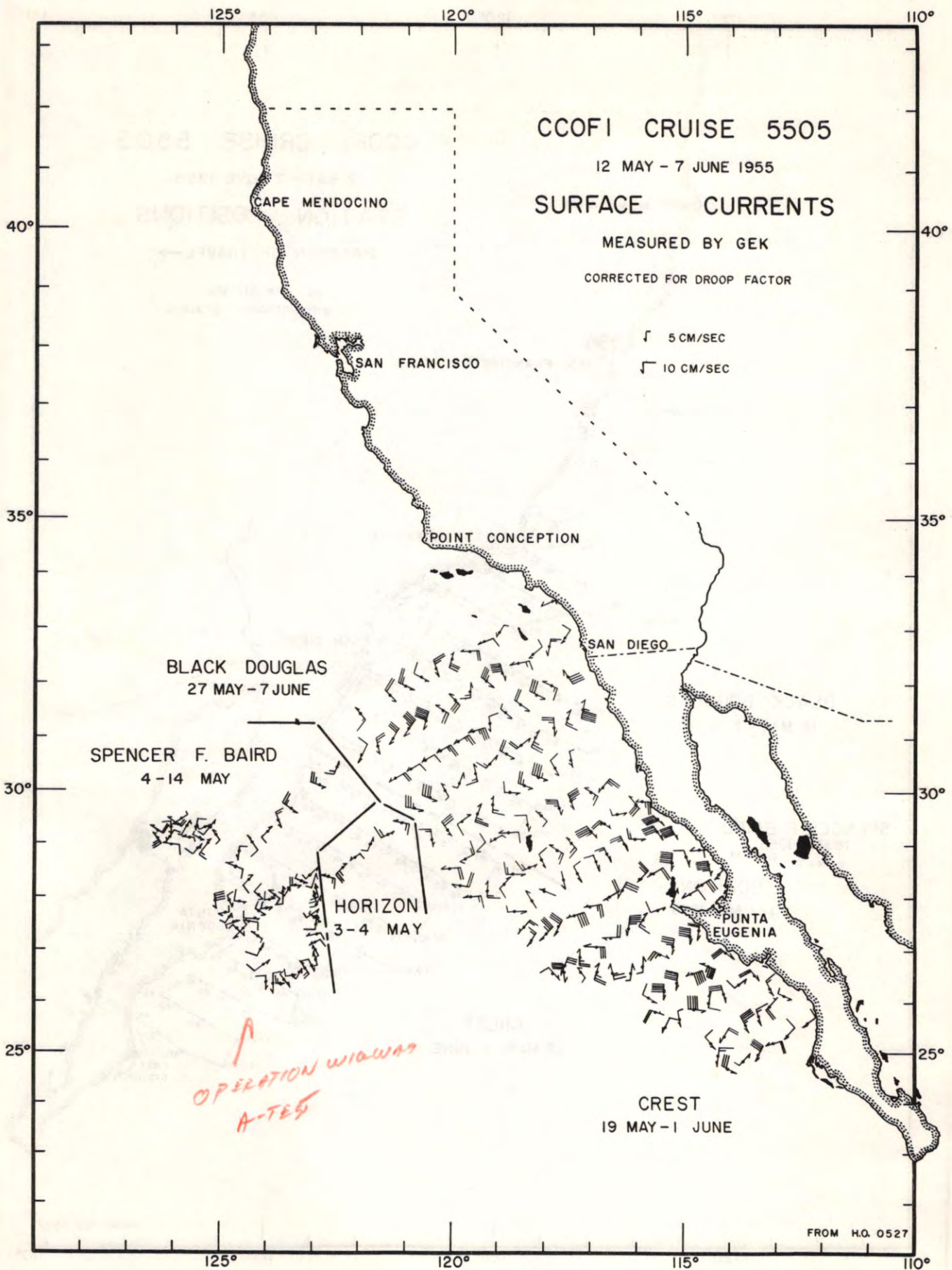


FIGURE 2



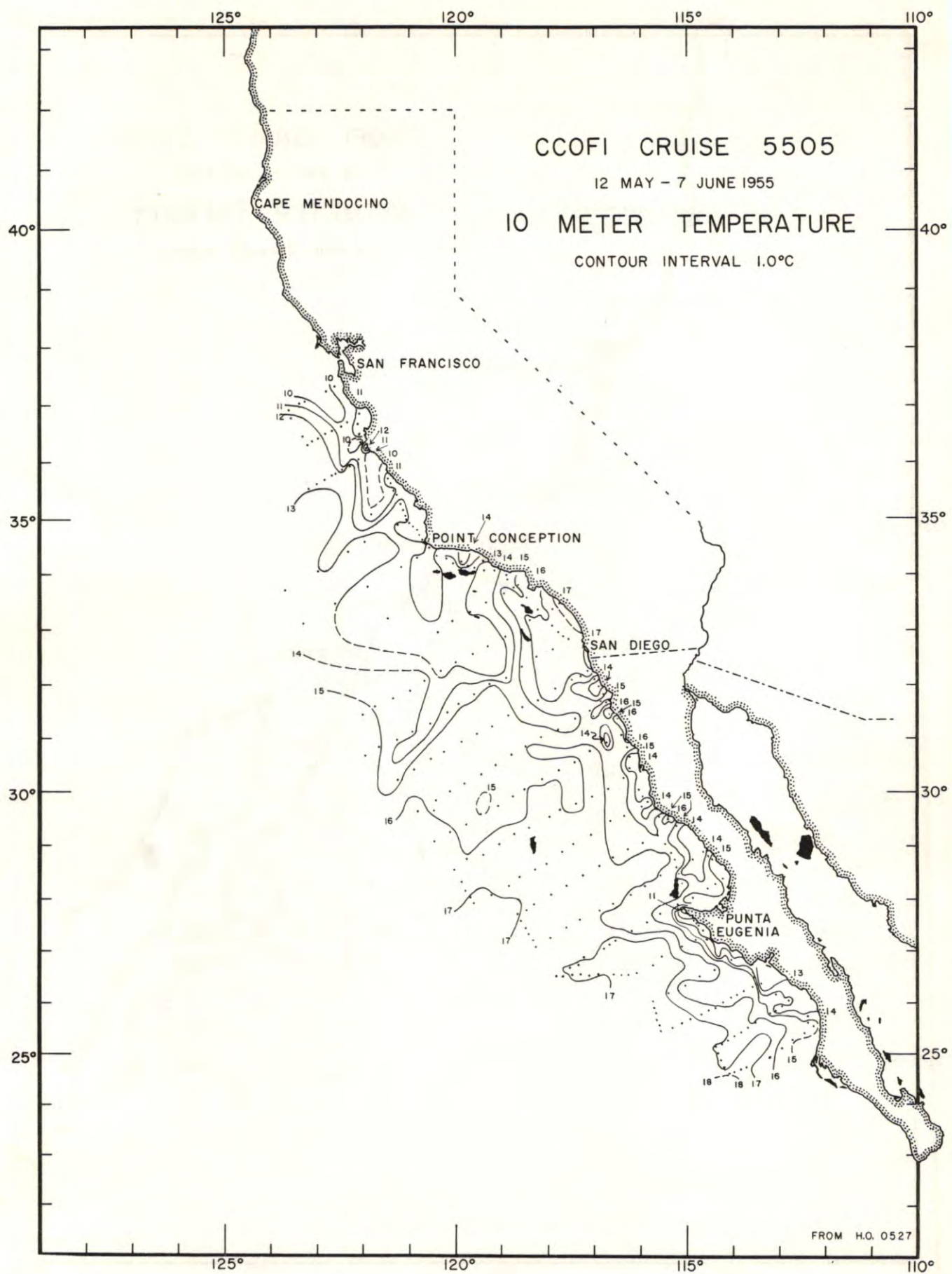


FIGURE 3

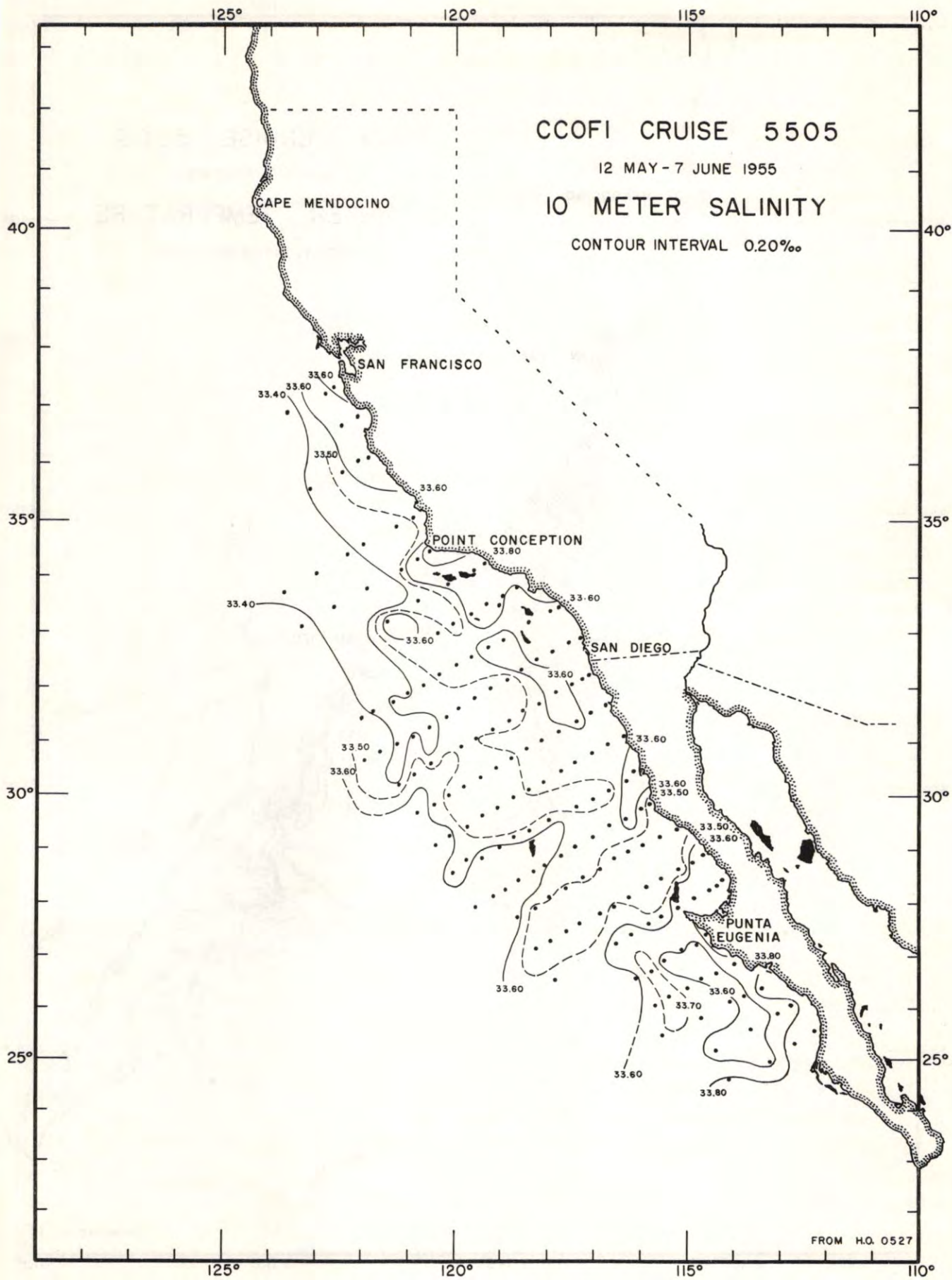


FIGURE 4

PERSONNEL

SHIPS' CAPTAINS

Forster, Charles W. , R/V Black Douglas  
Newbegin, Robert C. , R/V Crest

R/V Crest

Grom, Robert A. , Fishery Aid, U. S. Fish and Wildlife Service  
Brown, Daniel M. , Marine Technician  
Vorobiov, Alexander V. , Fishery Aid, U. S. Fish and Wildlife Service

R/V Black Douglas

MacGregor, John S. , Fisheries Biologist, U. S. Fish and Wildlife Service  
\*Aleem, A. A. , visiting scientist from Egypt  
\*\*Bryer, Bruce A. , Marine Technician  
\*\*Fletcher, Kenneth H. , Marine Technician  
\*\*Hapgood, William F. , Fishery Aid, U. S. Fish and Wildlife Service  
\*\*Hough, Colm, student  
\*\*\*Taft, Bruce A. , Fishery Aid, U. S. Fish and Wildlife Service

---

\*Aleem disembarked at Monterey.

\*\*Hapgood and Hough disembarked at Santa Barbara and Bryer and Fletcher came aboard for the remainder of the cruise.

\*\*\*Taft replaced MacGregor at San Pedro and completed the cruise.

SIO

CCOFI  
5505

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{-5}^3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{-5}^3$	$\Delta D$
m	°C	‰	ml/L	10 <sup>-5</sup> cm/g	m	°C	‰	ml/L	g/L	10 <sup>-5</sup> cm/g	dyn. m

92.163

SPENCER F. BAIRD; May 18, 1955; 2026 GCT; 28°34'N, 126°32'W; sounding, 2450 fm; wind, 340°, force 4; weather, partly cloudy; sea, moderate; wire angle, 20°.

0	16.77				0	16.77					
10	16.70				10	16.70					
49	16.40				20	16.62					
67	16.42				30	16.53					
98	16.32				50	16.40					
134	15.71				75	16.41					
195	10.46				100	16.30					
266	8.36				150	14.10					
362	7.14				200	10.37					
488	6.32				250	8.67					
698	5.00				300	7.89					
1055	3.72				400	6.81					
					500	6.23					
					600	5.57					
					700	4.99					
					800	4.58					
					1000	3.91					

93.155

HORIZON; May 12, 1955; 1810, 1930 GCT; 28°44.5'N, 125°59'W; sounding, 2300 fm; wind, 360°, force 3; weather, overcast; sea, moderate; wire angle, 06°, 11°.

0	16.32	33.78	5.13	320	0	16.32	33.78	5.13	24.76	320	0.00
15	16.29	33.81	5.37	317	10	16.30	33.80	5.30	24.78	318	0.03
30	16.57	33.88	5.49	318	20	16.36	33.83	5.42	24.79	317	0.06
46	16.49	33.91	5.54	314	30	16.57	33.88	5.49	24.78	318	0.10
61	16.50	33.90	5.42	316	50	16.50	33.91	5.48	24.81	315	0.16
76	16.38	33.90	5.50	313	75	16.40	33.90	5.48	24.83	313	0.24
91	16.29	33.85	5.16	314	100	16.18	33.85	5.48	24.84	312	0.32
106	16.14	33.87	5.45	309	150	15.86	33.90	5.42	24.96	301	0.47
116	16.15	33.89	5.31	308	200	12.15	33.54	5.08	25.45	254	0.61
132	16.30	33.97	5.43	306	250	9.60	33.69	4.47	26.02	200	0.73
167	13.45	33.64	5.24	271	300	8.38	33.91	3.37	26.39	165	0.82
					400	6.65	34.02	2.60	26.71	134	0.98
155	15.18	33.75	5.40	297	500	6.06	34.19	0.73	26.93	114	1.11
205	11.79	33.51	5.05	250	600	5.31	34.27	0.46	27.07	100	1.22
254	9.54	33.71	4.43	198	700	4.81	34.32	0.41	27.18	90	1.32
306	8.24	33.93	3.29	162	800	4.43	34.38	0.39	27.26	82	1.42
402	6.62	34.02	2.59	133	1000	3.92	34.51	0.68	27.43	66	1.58
500	6.06	34.19	0.73	114	1200	3.34	34.56	0.92	27.53	57	1.72
601	5.30	34.27	0.45	100	1500	(2.75)	(34.59)	(1.22)	(27.61)	(49)	(1.91)
796	4.44	34.37	0.38	83							
994	3.94	34.51	0.67	67							
1199	3.35	34.56	0.92	57							
1496	2.76	34.59	1.22	49							

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
63.52-B	V-19	1325	37°19.0'	122°36.0'	145	230°	3	clear	slight	10.50	33.42
63.55-B	19	1500	37°13.0'	122°50.0'	160	230°	3	clear	moderate	9.28	33.79
63.65-B	19	2005	36°53.0'	123°32.0'	1900	330°	4	clear	moderate	-	33.30
67.50-B	20	0835	36°49.0'	122°04.5'	50	calm		clear	smooth	11.29	33.72
67.55-B	20	0600	36°39.0'	122°26.0'	1150	330°	2	clear	slight	10.48	33.73
67.65-B	20	0045	36°19.0'	123°09.0'	1900	330°	4	partly cloudy	moderate	12.64	33.41
70.52-B	20	1400	36°08.0'	121°50.0'	370	280°	3	fog	smooth	9.50	33.78
70.55-B	20	1530	36°03.0'	122°02.0'	650	300°	2	clear	moderate	10.38	33.68
70.60-B	20	1810	35°53.0'	122°23.0'	1800	300°	3	fog	moderate	11.11	33.56
70.70-B	20	2300	35°33.0'	123°06.0'	2100	320°	5	overcast	rough	12.26	33.42
77.50-B	22	1010	35°04.0'	120°52.0'	85	310°	1	missing	smooth	10.70	33.53
77.55-B	22	0700	34°55.0'	121°13.0'	320	320°	1	missing	slight	11.88	33.42
77.65-B <sup>01c</sup>	23	0130	34°34.0'	121°55.0'	-	-	-	missing	missing	13.48	33.44a)
77.70-B	23	0445	34°24.0'	122°16.0'	-	-	-	missing	missing	13.10b)	33.31
77.80-B	23	0925	34°05.0'	122°58.0'	-	-	-	missing	missing	13.18	33.34
77.90-B	23	1515	33°44.0'	123°39.0'	-	-	-	missing	missing	13.36	33.37

a) Mean value of 33.40 and 33.48%.

b) Mean value of 12.98 and 13.21°C.

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
80.51-B	V-24	2030	34°27.0'	120°32.0'	-	-	-	missing	missing	11.24a)	33.87
80.55-B	24	1845	34°19.0'	120°48.0'	-	-	-	missing	missing	12.02b)	33.78
80.60-B	24	1340	34°09.0'	121°09.0'	-	-	-	missing	missing	12.28	33.53
80.70-B	24	0810	33°49.0'	121°51.0'	-	-	-	missing	missing	12.80	33.32
80.80-B	24	0220	33°29.0'	122°32.0'	-	-	-	missing	missing	13.07c)	33.31
80.90-B	23	2120	33°09.0'	123°13.0'	-	-	-	missing	missing	13.58	33.42
83.40-B	25	0940	34°14.0'	119°22.0'	-	-	-	missing	missing	12.83	33.67
83.43-B	25	1150	34°08.0'	119°34.0'	-	-	-	missing	missing	12.76	33.67
83.51-B	25	1755	33°52.0'	120°08.5'	-	-	-	missing	missing	12.36	33.61
83.60-B	25	2325	33°34.0'	120°45.0'	-	-	-	missing	missing	11.98d)	33.43
83.70-B	26	0500	33°14.0'	121°26.0'	-	-	-	missing	missing	12.44	33.69
87.35-B	27	1030	33°50.0'	118°38.0'	450	calm		clear	slight	15.72	33.60
87.40-B	27	0650	33°40.0'	118°58.5'	480	calm		clear	calm	15.38	33.60
87.45-B	27	0340	33°30.0'	119°19.0'	915	300°	3	clear	moderate	13.53	33.65

a) Mean value of 11.12 and 11.36°C.

b) Mean value of 11.91 and 12.13°C.

c) Mean value of 12.98 and 13.16°C.

d) Alternate value, 11.80°C.

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
87.50-B	V-27	0030	33°20.0'	119°39.0'	40	300°	6	cloudy	very rough	13.34	33.67
87.55-B	26	2150	33°10.0'	120°01.0'	-	-	-	missing	missing	12.92	33.48
87.60-B	26	1715	33°00.0'	120°21.0'	-	-	-	missing	missing	12.79	33.54
90.28-B	28	0350	33°28.5'	117°46.5'	250	calm		clear	slight	17.36	33.59
90.30-B	28	0550	33°24.5'	117°55.0'	460	180°	1	clear	slight	16.39	33.58
90.37-B	28	0920	33°11.0'	118°23.0'	450	220°	1	clear	slight	16.64	33.57
90.45-B	28	1330	32°55.0'	118°56.0'	950	290°	1	fog	slight	13.30	33.63
90.50-B	28	1700	32°44.0'	119°16.5'	135	290°	1	fog	moderate	12.82	33.66
90.55-B	28	2015	32°34.0'	119°36.5'	650	180°	1	missing	slight	12.14	33.58
90.60-B	28	2320	32°25.0'	119°58.0'	500	290°	1	partly cloudy	moderate	12.79	33.53
90.65-B	29	0230	32°15.0'	120°19.0'	2000	-	1	cloudy	rough	<del>12.82</del>	33.52
90.70-B	29	0545	32°04.0'	120°39.0'	2100	290°	2	missing	slight	14.40	33.42
90.75-B	29	0920	31°54.0'	120°58.0'	2000	270°	2	missing	moderate	<del>14.40</del>	33.40
90.80-B	29	1230	31°45.0'	121°19.0'	2160	300°	2	overcast	moderate	14.82	33.41
90.85-B	29	1550	31°33.0'	121°41.0'	2150	320°	3	partly cloudy	moderate	<del>14.86</del>	33.40
90.90-B	29	1905	31°25.0'	121°59.0'	2150	320°	3	cloudy	moderate	15.18	33.44
93.27-B	31	2045	32°56.0'	117°19.0'	60	270°	2	cloudy	slight	16.72	33.57
93.30-B	31	1810	32°50.0'	117°31.5'	420	280°	2	overcast	slight	16.78	33.58
93.35-B	31	1500	32°40.0'	117°52.0'	325	270°	4	cloudy	moderate	16.56	33.57

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
93.40-B	V-31	1130	32°30.0'	118°13.0'	850	240°	3	missing	moderate	16.30	33.54
93.45-B	31	0815	32°20.0'	118°32.0'	800	330°	4	missing	moderate	15.26	33.60
93.50-B	31	0500	32°10.0'	118°53.5'	740	320°	2	missing	moderate	13.20	33.47
93.55-B	31	0220	32°00.0'	119°14.0'	800	320°	3	cloudy	moderate	15.00	33.41
93.60-B	30	2240	31°50.0'	119°34.0'	1900	330°	3	cloudy	moderate	14.81	33.47
93.65-B	30	1930	31°40.0'	119°55.0'	2050	330°	4	cloudy	rough	<del>14.88a)</del>	33.48
93.70-B	30	1630	31°28.0'	120°10.0'	2000	320°	3	cloudy	moderate	14.75	33.46
93.75-B	30	1240	31°18.0'	120°32.0'	2200	320°	4	drizzle	moderate	<del>13.75</del>	33.33
93.80-B	30	0930	31°09.0'	120°54.0'	2000+	320°	4	drizzle	rough	14.23	33.40
93.85-B	30	0650	30°59.0'	121°14.0'	2150	310°	4	drizzle	moderate	<del>14.06</del>	33.40
93.90-B	30	0330	30°50.0'	121°35.0'	2150	340°	3	cloudy	moderate	14.98	33.42
93.95-B	30	0030	30°41.0'	121°56.0'	2200	330°	3	cloudy	moderate	15.28	33.45
97.30-B	VI-6	0615	32°15.5'	117°09.0'	33	calm		overcast	slight	16.95	33.52
97.32-B	6	0745	32°11.5'	117°17.0'	700	calm		overcast	calm	16.00	33.52
97.35-B	6	0915	32°05.5'	117°29.0'	700	270°	1	overcast	slight	15.64	33.58
97.40-B	6	1230	31°56.0'	117°50.0'	900	300°	2	overcast	moderate	16.38	33.65
97.45-B	6	1540	31°44.0'	118°09.0'	800	280°	2	drizzle	smooth	15.89	33.68

a) Mean value of 14.79 and 14.97°C.

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
97.50-B	VI-6	1820	31°35.5'	118°30.5'	1050	280°	1	cloudy	slight	14.69	33.48
97.55-B	6	2120	31°25.5'	118°49.0'	500	270°	2	cloudy	moderate	15.28	33.45
97.60-B	7	0030	31°15.0'	119°11.0'	2150	280°	3	cloudy	moderate	15.52	33.49
97.65-B	7	0320	31°06.0'	119°30.0'	2000	280°	3	drizzle	moderate	15.32	33.50
97.70-B	7	0630	30°55.0'	119°50.5'	1050	calm		fog	slight	15.40	33.49
97.75-B	7	0920	30°45.0'	120°13.0'	2000	270°	1	drizzle	slight	15.42	33.50
97.80-B	7	1210	30°36.0'	120°31.0'	2200	280°	1	drizzle	slight	15.41	33.48
97.85-B	7	1530	30°25.0'	120°51.0'	1800	280°	2	cloudy	moderate	15.34	33.52
97.90-B	7	1830	30°15.0'	121°11.0'	2000	290°	1	overcast	slight	14.93	33.40
100.29-B	6	0050	31°42.0'	116°43.0'	80	270°	2	overcast	slight	15.61	33.54
100.30-B	5	2350	31°40.5'	116°46.5'	260	300°	1	overcast	slight	16.24	33.58
100.35-B	5	1940	31°31.0'	117°07.0'	700	300°	1	overcast	slight	15.86	33.50
100.40-B	5	1620	31°21.0'	117°27.0'	1000	300°	1	overcast	slight	14.73	33.62
100.45-B	5	1345	31°11.0'	117°46.0'	800	320°	3	overcast	moderate	14.99	33.50
100.50-B	5	1030	31°01.0'	118°07.0'	600	360°	2	cloudy	slight	15.79	33.53
100.55-B	5	0725	30°51.0'	118°27.0'	1400	300°	1	cloudy	slight	15.96	33.52
100.60-B	5	0440	30°41.0'	118°47.5'	1700	300°	1	missing	slight	15.43	33.49
100.65-B	5	0130	30°31.0'	119°07.0'	2000	320°	3	cloudy	moderate	15.86	33.48
100.70-B	4	2215	30°20.5'	119°27.0'	2000	330°	2	cloudy	moderate	15.71	33.49

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

S10  
CCOFI  
5505

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
100.75-B	VI-4	1930	30°10.5'	119°47.0'	1850	320°	1	overcast	slight	15.77	33.48
100.80-B	4	1630	30°01.0'	120°07.0'	2100	310°	2	cloudy	slight	15.54	33.48
100.85-B	4	1355	29°51.0'	120°27.5'	2100	340°	2	overcast	moderate	15.76	33.58
100.90-B	4	1035	29°40.0'	120°47.0'	2000	330°	3	overcast	moderate	16.40a)	33.73
103.30-B	2	1500	31°06.0'	116°25.0'	40	280°	1	cloudy	slight	13.64	33.54
103.35-B	2	1740	30°55.5'	116°45.0'	950	300°	2	partly cloudy	moderate	16.10	33.54
103.40-B	2	2030	30°45.5'	117°05.5'	900	300°	3	partly cloudy	moderate	15.96	33.51
103.45-B	3	0000	30°36.0'	117°25.0'	1000	290°	3	partly cloudy	moderate	15.88	33.56
103.50-B	3	0350	30°25.0'	117°46.0'	1600	300°	2	clear	moderate	15.91	33.58
103.55-B	3	0635	30°16.0'	118°05.0'	1300	-	2	partly cloudy	moderate	15.76	33.52
103.60-B	3	0930	30°06.0'	118°25.5'	1500	300°	3	partly cloudy	moderate	16.00	33.51
103.65-B	3	1220	29°57.0'	118°43.5'	1800	320°	3	partly cloudy	moderate	15.38b)	33.42
103.70-B	3	1615	29°46.0'	119°05.5'	1850	300°	2	partly cloudy	moderate	15.18	33.45
103.75-B	3	1930	29°36.0'	119°25.5'	2400	300°	1	cloudy	slight	14.96	33.44
103.80-B	3	2230	29°26.5'	119°45.5'	2000	300°	2	overcast	moderate	15.65	33.45
103.85-B	4	0200	29°16.0'	120°06.0'	2000	340°	3	cloudy	moderate	16.15	33.65

a) Mean value of 16.31 and 16.50°C.

b) Mean value of 15.29 and 15.47°C.

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
103.90-B	VI-4	0500	29°06.0'	120°25.0'	2050	340°	3	cloudy	moderate	16.36	33.66
107.32-C	1	1400	30°26.0'	116°11.0'	224	340°	4	partly cloudy	rough	13.74	33.61
107.35-C	1	1215	30°17.0'	116°21.0'	1000	330°	3	cloudy	moderate	15.56	33.61
107.40-C	1	0930	30°07.0'	116°41.5'	1550	330°	4	cloudy	moderate	15.82	33.48
107.45-C	1	0620	29°57.5'	117°02.0'	1000	340°	5	cloudy	moderate	16.28	33.49
107.50-C	1	0340	29°49.5'	117°24.0'	1400	340°	4	overcast	moderate	15.66	33.45
107.55-C	1	0050	29°41.0'	117°41.5'	1800	320°	4	cloudy	very rough	16.02	33.53
107.60-C	V-31	2220	29°31.5'	117°59.5'	2000+	330°	4	cloudy	very rough	16.22	33.60
107.65-C	31	1900	29°21.5'	118°23.0'	775	330°	4	cloudy	very rough	16.62	33.54
107.70-C	31	1630	29°13.0'	118°42.5'	1850	330°	5	overcast	very rough	16.62	33.58
107.75-C	31	1335	29°03.5'	119°02.5'	1850	350°	5	overcast	rough	16.63	33.60
107.80-C	31	1055	28°52.0'	119°23.5'	2000	330°	4	overcast	moderate	16.26	33.72
107.85-C	31	0750	28°50.0'	119°42.0'	2050	340°	4	overcast	moderate	16.12	33.52
107.90-C	31	0500	28°31.5'	120°01.0'	2200	340°	4	overcast	very rough	16.53	33.56
110.33-C	29	1645	29°50.5'	115°52.5'	61	330°	2	fog	moderate	14.28	33.45
110.35-C	29	1800	29°46.5'	116°00.0'	600	270°	2	fog	moderate	14.98	33.53
110.40-C	29	2045	29°36.0'	116°21.0'	1450	300°	2	overcast	rough	15.20	33.63
110.45-C	29	2330	29°30.0'	116°41.5'	750	310°	4	overcast	moderate	15.74	33.52
110.50-C	30	0230	29°13.0'	117°02.0'	2100	230°	3	overcast	moderate	16.24	33.58

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
110.55-C	V-30	0510	29°02.0'	117°22.5'	3000	260°	2	cloudy	moderate	16.55	33.58
110.60-C	30	0815	28°52.0'	117°42.5'	2000	240°	3	cloudy	moderate	16.14	33.52
110.65-C	30	1030	28°40.0'	118°02.0'	2100	240°	2	missing	slight	16.85	33.60
110.70-C	30	1310	28°33.5'	118°18.0'	2100+	300°	4	overcast	rough	16.93	33.67
110.75-C	30	1530	28°26.0'	118°36.0'	2150	310°	4	overcast	moderate	16.79	33.63
110.80-C	30	1815	28°14.5'	118°51.0'	2050	320°	4	overcast	moderate	16.82	33.68
110.85-C	30	2045	28°07.0'	119°11.0'	2000	310°	4	cloudy	rough	17.01	33.67
110.90-C	30	2345	27°57.5'	119°33.0'	2000	310°	4	cloudy	rough	17.12	33.68
113.30-C	29	1030	29°22.0'	115°16.0'	36	330°	2	overcast	smooth	14.50	33.45
113.35-C	29	0730	29°13.5'	115°37.5'	700	330°	4	cloudy	rough	15.93	33.42
113.40-C	29	0500	29°06.0'	115°58.5'	1050	340°	4	overcast	slight	15.69	33.44
113.45-C	29	0220	28°58.5'	116°17.0'	1000	320°	4	overcast	moderate	15.63	33.36
113.50-C	28	2335	28°49.0'	116°37.0'	1950	330°	4	overcast	moderate	15.82	33.43
113.55-C	28	2100	28°39.0'	116°55.0'	1950	320°	2	overcast	moderate	16.58	33.49
113.60-C	28	1820	28°27.0'	117°15.5'	2050	330°	3	overcast	moderate	16.59	33.52
113.65-C	28	1500	28°16.5'	117°35.5'	2250	320°	3	overcast	moderate	16.64	33.47
113.70-C	28	1230	28°06.0'	117°56.0'	2000	330°	4	overcast	rough	16.80	33.50
113.75-C	28	0930	27°55.5'	118°16.0'	2000+	330°	4	drizzle	rough	16.74	33.49
113.80-C	28	0630	27°43.0'	118°37.0'	2000	340°	4	missing	rough	17.00	33.63

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
117. 26-C	V-25	1910	28°55.5'	114°41.0'	43	250°	4	cloudy	rough	-	33.64
117. 30-C	25	2155	28°47.5'	114°56.0'	53	280°	4	squalls	rough	13.63	33.68
117. 35-C	26	0050	28°38.0'	115°16.0'	93	290°	5	squalls	rough	15.66	33.44
117. 40-C	27	0340	28°28.0'	115°35.5'	550	240°	2	missing	rough	15.97	33.49
117. 45-C	27	0645	28°18.0'	115°56.0'	2000	320°	4	missing	moderate	15.92	33.44
117. 50-C	27	0930	28°08.0'	116°16.0'	2025	340°	4	missing	moderate	15.82	33.40
117. 55-C	27	1225	27°58.0'	116°36.0'	2000+	350°	4	missing	rough	16.34	33.51
117. 60-C	27	1505	27°48.0'	116°56.5'	2000+	350°	4	overcast	rough	16.06	33.43
117. 65-C	27	1740	27°36.0'	117°19.0'	2000	330°	4	overcast	rough	16.40	33.46
117. 70-C	27	2000	27°28.0'	117°37.5'	2000	340°	3	cloudy	rough	16.06	33.42
117. 75-C	27	2245	27°17.5'	117°56.5'	2000+	340°	4	cloudy	very rough	16.43	33.46
117. 80-C	28	0100	27°08.5'	118°14.0'	2100	340°	-	cloudy	very rough	16.38	33.41
120. 25-C	25	1330	28°23.0'	114°14.5'	32	310°	4	cloudy	moderate	15.83	33.62
120. 27-C	25	1215	28°18.0'	114°24.0'	50	330°	4	drizzle	moderate	14.49	33.65
120. 30-C	25	1030	28°14.0'	114°33.5'	54	350°	4	drizzle	moderate	14.66	33.63
120. 35-C	25	0700	28°03.0'	114°54.0'	47	270°	2	missing	slight	15.08	33.64
120. 40-C	25	0400	27°57.0'	115°14.0'	32	330°	3	overcast	moderate	14.15	33.67
120. 45-C	25	0125	27°45.0'	115°35.0'	1150	320°	4	cloudy	moderate	14.58	33.54
120. 50-C	24	2230	27°34.5'	115°53.0'	2100	320°	3	overcast	moderate	15.58	33.59

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
120.55-C	V-24	1935	27°24.0'	116°12.0'	2000+	320°	4	overcast	rough	15.96	-
120.60-C	24	1655	27°14.0'	116°32.0'	2050	320°	3	overcast	rough	17.20	33.64
120.70-C	24	1130	26°52.5'	117°11.0'	2100	320°	3	missing	slight	16.91	33.56
120.80-C	24	0630	26°32.5'	117°49.5'	2100	320°	4	overcast	slight	16.62	33.55
123.37-C	23	0640	27°24.0'	114°41.0'	39	310°	4	clear	moderate	12.16	33.87
123.40-C	23	0900	27°16.0'	114°51.5'	330	320°	4	clear	rough	14.96	33.56
123.45-C	23	1120	27°05.5'	115°11.5'	2300	310°	3	missing	rough	15.92	33.60
123.50-C	23	1420	26°54.0'	115°31.5'	1900	300°	3	overcast	moderate	17.29	33.56
123.55-C	23	1700	26°43.5'	115°49.5'	1950	330°	4	cloudy	rough	17.64	33.77
123.60-C	23	1955	26°33.0'	116°09.0'	2100	330°	3	cloudy	rough	17.23	33.58
127.34-C	22	2240	26°55.5'	114°07.0'	45	300°	3	clear	rough	13.14	33.69
127.40-C	22	1935	26°41.5'	114°27.5'	1600	300°	2	overcast	rough	16.21	33.58
127.45-C	22	1620	26°31.0'	114°48.0'	1900	290°	2	cloudy	moderate	16.14	33.60
127.50-C	22	1400	26°22.0'	115°07.5'	2000	300°	3	cloudy	moderate	15.70	33.63
127.55-C	22	1045	26°13.0'	115°26.5'	2000	330°	3	cloudy	slight	-	33.79
127.60-C	22	0755	26°04.0'	115°46.0'	2050	330°	4	cloudy	slight	17.64	33.65
130.30-C	21	1100	26°28.5'	113°28.5'	45	290°	2	missing	slight	12.68	33.90
130.35-C	21	1340	26°18.5'	113°48.0'	245	310°	4	overcast	moderate	15.82	33.53
130.40-C	21	1620	26°09.0'	114°06.5'	1240	320°	4	overcast	rough	15.78	33.63

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
130.50-C	V-21	2130	25°49.0'	114°46.0'	1950	320°	3	cloudy	rough	16.78	33.66
130.60-C	22	0220	25°29.0'	115°23.5'	1800	320°	4	cloudy	moderate	17.44	33.67
133.25-C	21	0530	26°04.0'	112°49.0'	46	300°	3	overcast	slight	14.16	33.74
133.30-C	21	0255	25°54.5'	113°07.0'	108	310°	3	overcast	moderate	13.50	33.63
133.40-C	20	2200	25°33.0'	113°40.5'	1800	300°	3	partly cloudy	moderate	16.14	33.58
133.50-C	19	1600	25°11.0'	114°26.0'	2050	330°	3	cloudy	rough	16.98	33.58
137.23-C	19	2130	25°34.0'	112°18.5'	43	290°	4	cloudy	moderate	15.51	33.94
137.30-C	20	0030	25°20.0'	112°43.5'	200	240°	3	cloudy	moderate	15.22	33.84
137.40-C	20	0530	24°59.0'	113°23.0'	1800	300°	3	overcast	smooth	16.14	33.57
137.50-C	20	1115	24°39.0'	114°03.0'	2050	330°	3	cloudy	slight	18.00	33.83

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

## DISTRIBUTION LIST

Mr. D. L. Alverson, Chief  
North Pacific Fisheries Exploration and  
Gear Research  
Bureau of Commercial Fisheries  
2725 Montlake Boulevard  
Seattle 2, Washington

Mr. Thomas S. Austin  
Bureau of Commercial Fisheries  
Biological Laboratory  
P. O. Box 3830  
Honolulu 12, Hawaii

Dr. Rolf Bolin  
Hopkins Marine Station  
Pacific Grove, California

Librarian  
Bureau of Commercial Fisheries  
Biological Laboratory  
P. O. Box 3830  
Honolulu 12, Hawaii

Dr. Wayne V. Burt  
Assoc. Prof. of Oceanography  
School of Science  
Oregon State College  
Corvallis, Oregon

Mr. Ray Cannon  
Ocean Fish Protective Association  
645 N. Serrano Street  
Los Angeles 4, California

Chief, Division of Fisheries  
Commonwealth Scientific and Industrial  
Research Organization  
P. O. Box 21  
Crunulla, N. S. W., Australia

Mr. William Anderson  
Bureau of Commercial Fisheries  
Brunswick, Georgia

Mr. William E. Batzler  
Code 2232  
U. S. Navy Electronics Laboratory  
San Diego 52, California

British Joint Services  
(Navy Staff)  
1910 K Street N. W.  
Washington, D. C.

Mr. J. G. Burnette, Chairman  
Marine Research Committee  
P. O. Box 807  
Los Altos, California

Librarian (4)  
Department of Fish and Game  
California State Fisheries Laboratory  
Terminal Island, California

Mr. Harold B. Clemens, Jr.  
Marine Resources Operations  
California State Fisheries Laboratory  
Terminal Island, California

Dr. G. M. Cresswell  
Department of Earth Sciences  
Stanford Research Institute  
Menlo Park, California



Mr. R. S. Croker, Director  
California Department of Fish and Game  
Marine Fisheries Laboratory Branch  
772 Capitol Avenue  
Sacramento 14, California

Chief  
Division of Biological Research  
U. S. Fish and Wildlife Service  
Bureau of Commercial Fisheries  
Washington 25, D. C.

Dr. Richard H. Fleming  
University of Washington  
Oceanographic Laboratories  
Seattle 5, Washington

Hancock Library of Biology and  
Oceanography  
Allan Hancock Foundation  
University of Southern California  
Los Angeles 7, California

Dr. Robert W. Hiatt  
University of Hawaii  
Honolulu 12, Hawaii

Director  
Instituto de Geofísica  
Torre de Ciencias, 3er piso  
Universidad Nacional Autónoma de  
México  
Villa Obregón, D. F.  
México

Japan Meteorological Agency  
Oceanographical Section  
Tokyo, Japan

Herrn Professor Dr. A. Defant  
Sternwartestrasse 38  
Innsbruck  
Austria

Director of Research  
Fish Commission of Oregon  
Route 1, Box 31A  
Clackamas, Oregon

Dr. Paul M. Fye  
Woods Hole Oceanographic Institution  
Woods Hole, Massachusetts

Mr. John Hawk  
c/o Seafarers' International Union of  
North America  
450 Harrison Street  
San Francisco 5, California

Mr. T. Hirano  
Tokai Regional Fisheries Research  
Laboratory  
Tsukishima  
Tokyo, Japan

Mr. Milton C. James  
Pacific Marine Fishery Commission  
340 State Office Building  
1400 S. W. Fifth Avenue  
Portland 1, Oregon

Dr. H. Kitamura  
Oceanographic Section  
Kobe Marine Observatory  
Kobe, Japan

Dr. E. Koto  
Institute of Fisheries  
Hokkaido University  
Hakodate, Japan

Mr. Joseph Mardesich  
Franco-Italian Packing Company  
Fish Harbor Wharf  
Terminal Island, California

Mr. Jotaro Masuzuwa  
Japan Meteorological Agency  
Oceanographical Section  
Tokyo, Japan

Dr. Hugh J. McLellan  
Atlantic Oceanographic Group  
St. Andrews, New Brunswick  
Canada

Dr. R. C. Miller, Director  
California Academy of Science  
Golden Gate Park  
San Francisco 18, California

National Marine Consultants, Inc.  
2913 De la Vina  
Santa Barbara, California  
Attn: Dr. Richard Kent

Mr. Kenneth S. Norris, Curator  
Marineland of the Pacific  
Portuguese Bend  
Marineland, California

Director  
Norwegian Polar Institute  
Observatorieggt 1  
Oslo, Norway

Dr. E. C. LaFond  
Code 2235  
U. S. Navy Electronics Laboratory  
San Diego 52, California

Mr. John C. Marr  
Bureau of Commercial Fisheries  
Biological Laboratory  
P. O. Box 3830  
Honolulu 12, Hawaii

Dr. J. L. McHugh  
Virginia Fisheries Laboratory  
Gloucester Point, Virginia

Mr. Arthur H. Mendonca  
c/o R. E. Booth Company, Inc.  
280 Battery Street  
San Francisco 11, California

Mr. John V. Morris  
French Sardine Company  
582 Tuna Street  
Terminal Island, California

Mr. A. W. H. Needler, Director  
Pacific Biological Station  
Nanaimo, B. C.  
Canada

Dr. Robert M. Norris  
Department of Physical Sciences  
University of California  
Santa Barbara Campus  
Goleta, California

Chief of Naval Research  
Office of Naval Research  
Geophysics Branch  
Washington 25, D. C.

Dr. Yngve H. Olsen  
Journal of Marine Research  
Yale University  
New Haven, Connecticut

Dr. D. W. Pritchard, Director  
Chesapeake Bay Institute  
The Johns Hopkins University  
121 Maryland Hall  
Baltimore 18, Maryland

Mr. John Radovich  
California Department of Fish and Game  
California State Fisheries Laboratory  
Terminal Island, California

Mr. Don T. Saxby  
California Division  
California Packing Corporation  
2600 Seventh Street  
Berkeley 10, California

Mr. D. Shoji  
Japanese Hydrographic Office  
Tsukiji  
Tokyo, Japan

Mr. Henry M. Stommel  
Woods Hole Oceanographic Institution  
Woods Hole, Massachusetts

Dr. Y. Takenouti  
Oceanographical Section  
Japan Meteorological Agency  
Chuo-ku  
Tokyo, Japan

Department of Oceanography  
Texas A. and M. College  
College Station, Texas

Dr. E. L. Pickard  
Institute of Oceanography  
University of British Columbia  
Vancouver, B. C.  
Canada

Pusan Fisheries College  
Pusan  
Korea

Dr. Gordon A. Riley  
Bingham Oceanographic Foundation  
Yale University  
New Haven, Connecticut

Dr. O. E. Sette, Chief  
Bureau of Commercial Fisheries  
Biological Laboratory  
450-B Jordan Hall  
Stanford, California

Mr. W. E. Stewart  
c/o California State Chamber of  
Commerce  
350 Bush Street  
San Francisco 4, California

Miss Margaret Storey, Librarian  
Natural History Museum  
Stanford, California

Mr. Norman Tebble  
Annelida Section  
British Museum (Natural History)  
Cromwell Road  
London SW7, England

Dr. John P. Tully  
Pacific Oceanographic Group  
P. O. Drawer 6  
Nanaimo, B. C.  
Canada

Dr. M. Uda  
Tokyo University of Fisheries  
Minato-ku  
Tokyo, Japan

Library, Code 2420 (2)  
U. S. Navy Electronics Laboratory  
San Diego 52, California

University of California (2)  
Serials Department  
General Library  
Berkeley 4, California

Librarian  
University of Washington  
Oceanographic Laboratories  
Friday Harbor, Washington

Director  
University of Washington  
School of Fisheries  
Seattle 4, Washington

Mr. Richard C. Vetter  
Secretary to the Committee  
on Oceanography  
National Academy of Sciences  
2101 Constitution Avenue  
Washington 25, D. C.

Dr. Boyd W. Walker  
University of California  
Department of Zoology  
Los Angeles 24, California

Dr. M. Pat Wennekens  
Oceanic Research Division  
(Code 508)  
Naval Ordnance Test Station  
China Lake, California

U. S. Hydrographic Office (2)  
Navy Department  
Washington 25, D. C.  
Attn: Dr. John Lyman

University of California  
Department of Zoology  
Berkeley 4, California

Director  
University of Miami  
Marine Laboratory  
Coral Gables, Florida

Librarian (2)  
University of Washington  
Oceanographic Laboratories  
Seattle 5, Washington

Mr. Gilbert C. Van Camp, Sr.  
772 Tuna Street  
Terminal Island, California

Dr. Lionel A. Walford, Chief  
Atlantic Fishery Oceanographic  
Research Center  
Bureau of Commercial Fisheries  
734 Jackson Place, N. W.  
Washington 25, D. C.

Mr. William E. Warne  
California Department of Fish and Game  
926 J Street  
Sacramento 14, California

Dr. Kozo Yoshida  
Geophysical Institute  
Tokyo University  
Bunkyo-ku  
Tokyo, Japan

Inter-American Tropical Tuna Commission  
(c/o Scripps Institution of Oceanography)

Dr. M. B. Schaefer

Scripps Institution of Oceanography

Dr. Leo D. Berner  
Dr. Maurice Blackburn  
Dr. Edward Brinton  
Mr. Jeffery D. Frautschy  
Mr. John D. Isaacs  
Dr. Martin W. Johnson  
Mr. Hans T. Klein  
Mr. Garth I. Murphy  
Mr. Joseph L. Reid, Jr.  
Dr. Roger Revelle  
Mrs. Margaret K. Riedel  
Mrs. Margaret K. Robinson  
Mr. Gunnar I. Roden  
Mr. Richard A. Schwartzlose  
Dr. Warren S. Wooster  
Mr. Charles G. Worrall (20)  
Library (4)  
Library, SFA

U. S. Bureau of Commercial Fisheries  
(c/o Scripps Institution of Oceanography)

Dr. E. H. Ahlstrom  
Mr. Gerald V. Howard