

UNIVERSITY OF CALIFORNIA    SCRIPPS INSTITUTION OF OCEANOGRAPHY

# data report

PHYSICAL AND CHEMICAL DATA

CCOFI Cruise 5503  
(MLR 70)  
8-22 March 1955

and

CCOFI Cruise 5504  
(MLR 71)  
5-22 April 1955

SIO Reference 59-37  
1 May 1959

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(MLR 71)  
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Sponsored by

Marine Research Committee

SIO Reference 59-37  
1 May 1959

Approved for distribution:

  
Roger Revelle, Director

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## INTRODUCTION

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

The data are tabulated at observed depths, and the interpolated and computed values are tabulated at standard depths 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.

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<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.

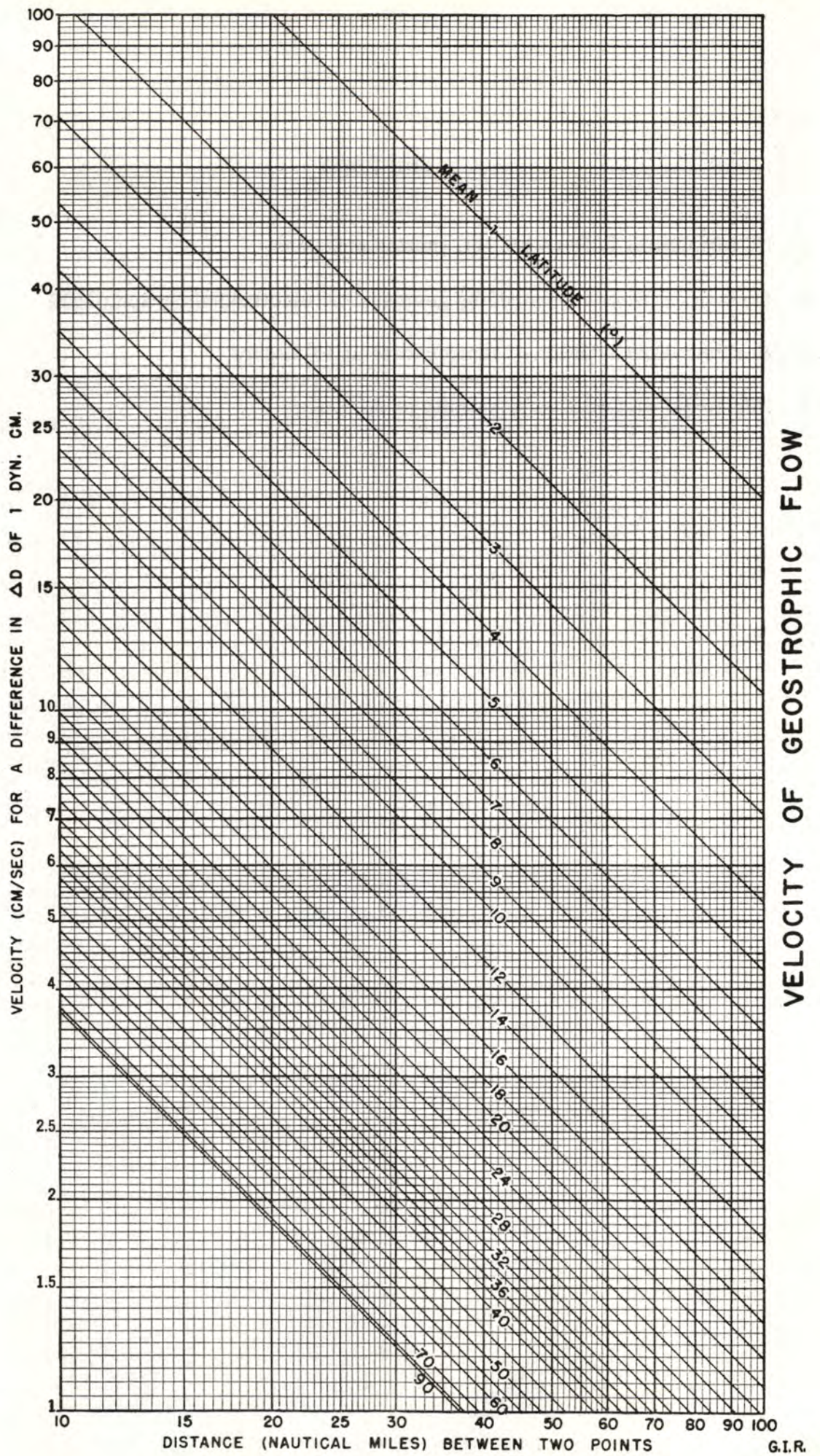
Values which are not drawn through because they seem to be in error without apparent reason are indicated by one of the following notations.

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).

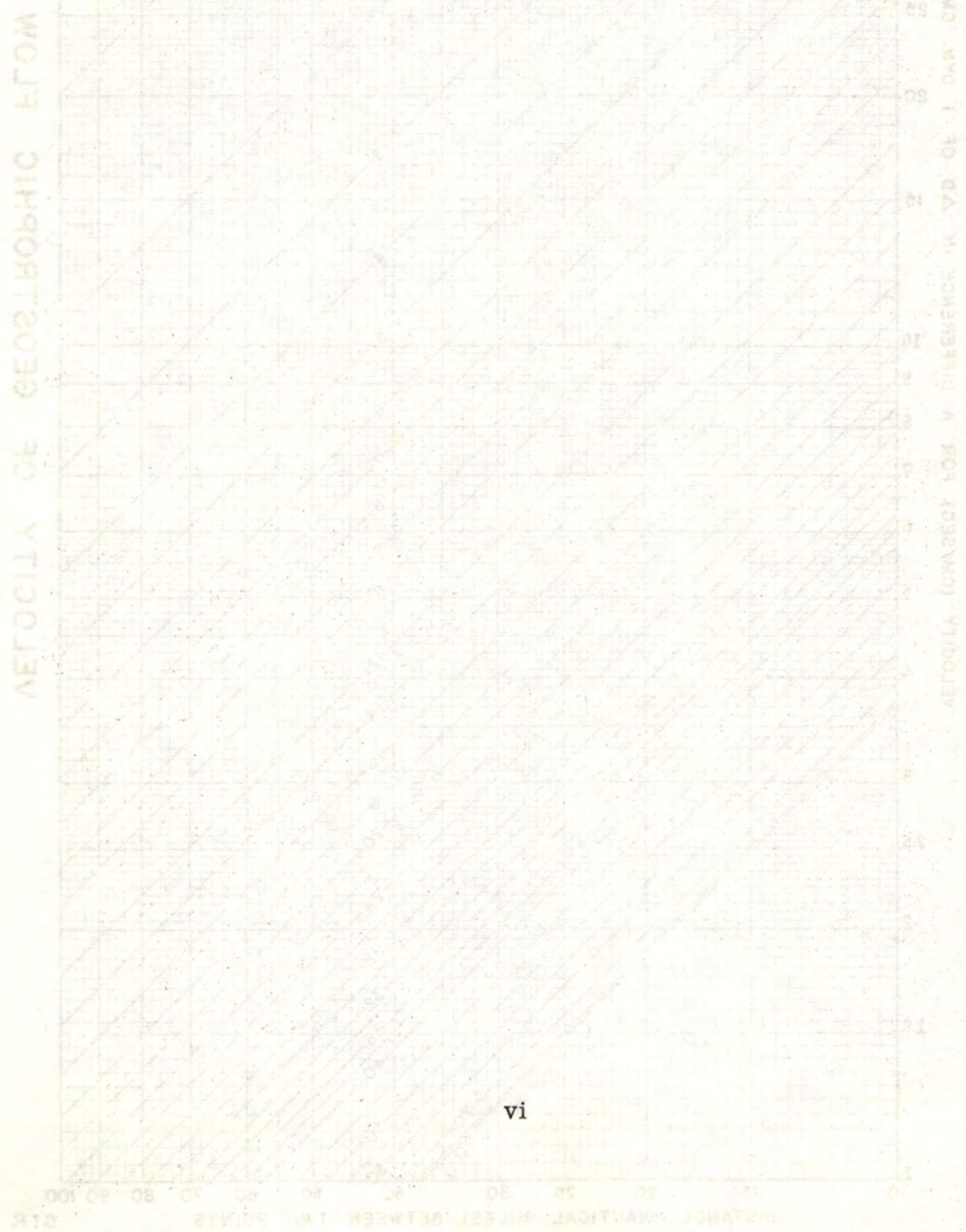
## FORMAT

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 5503 data is numbered 48 and the first page of the Cruise 5504 is numbered 56.



FIGURES

1. CCOFI Cruise 5503 (MLR 70), 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



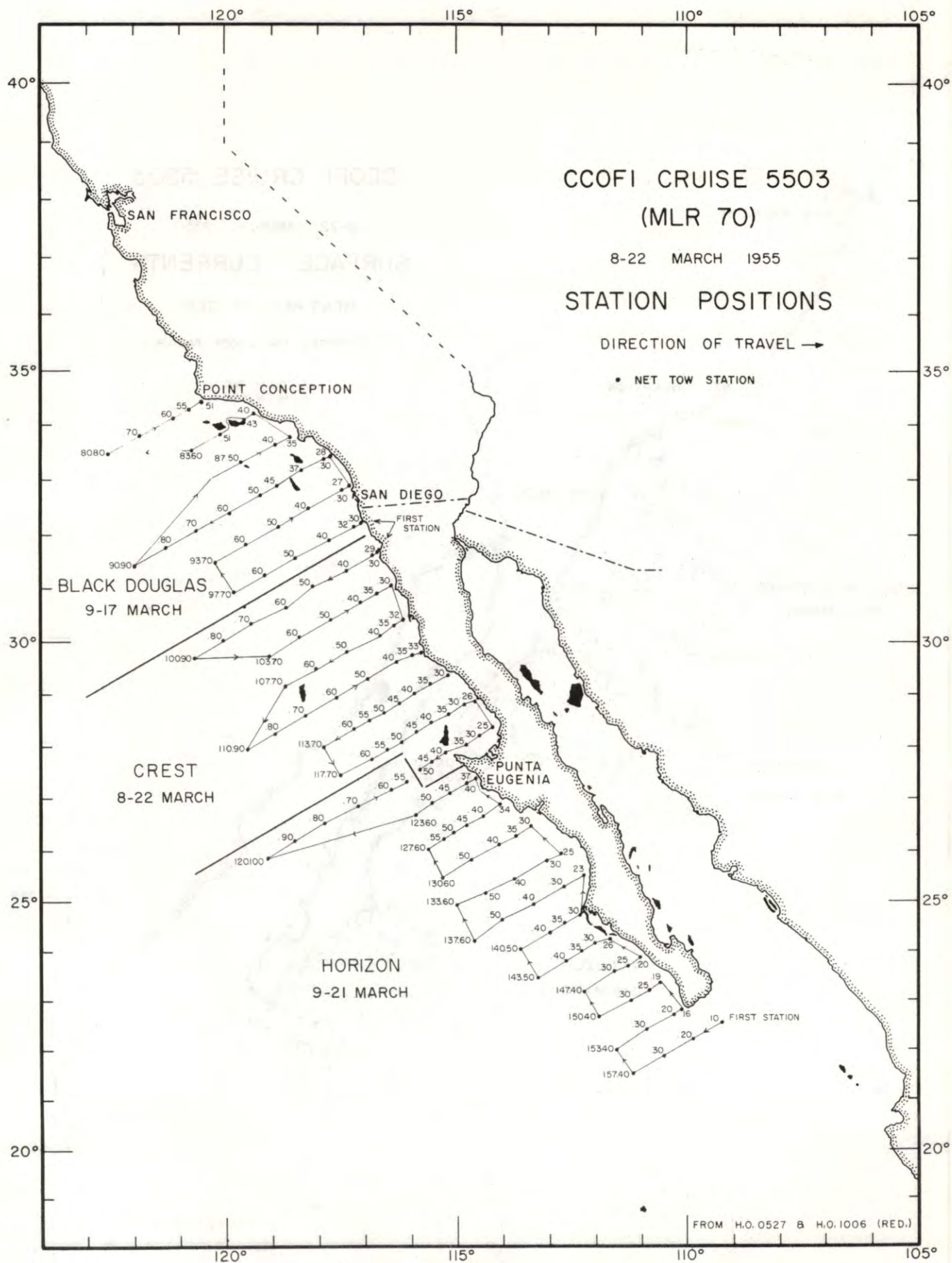


FIGURE 1



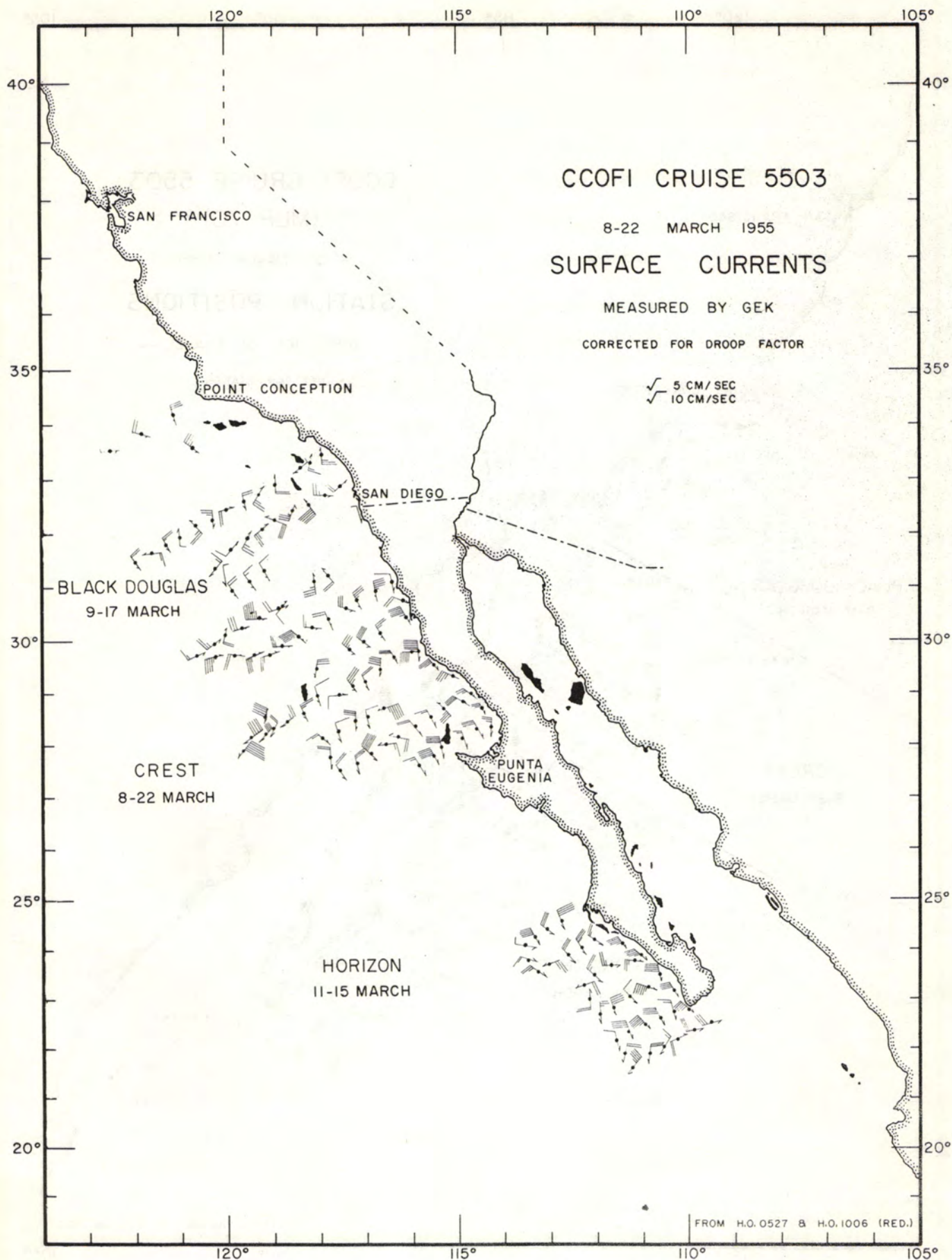


FIGURE 2

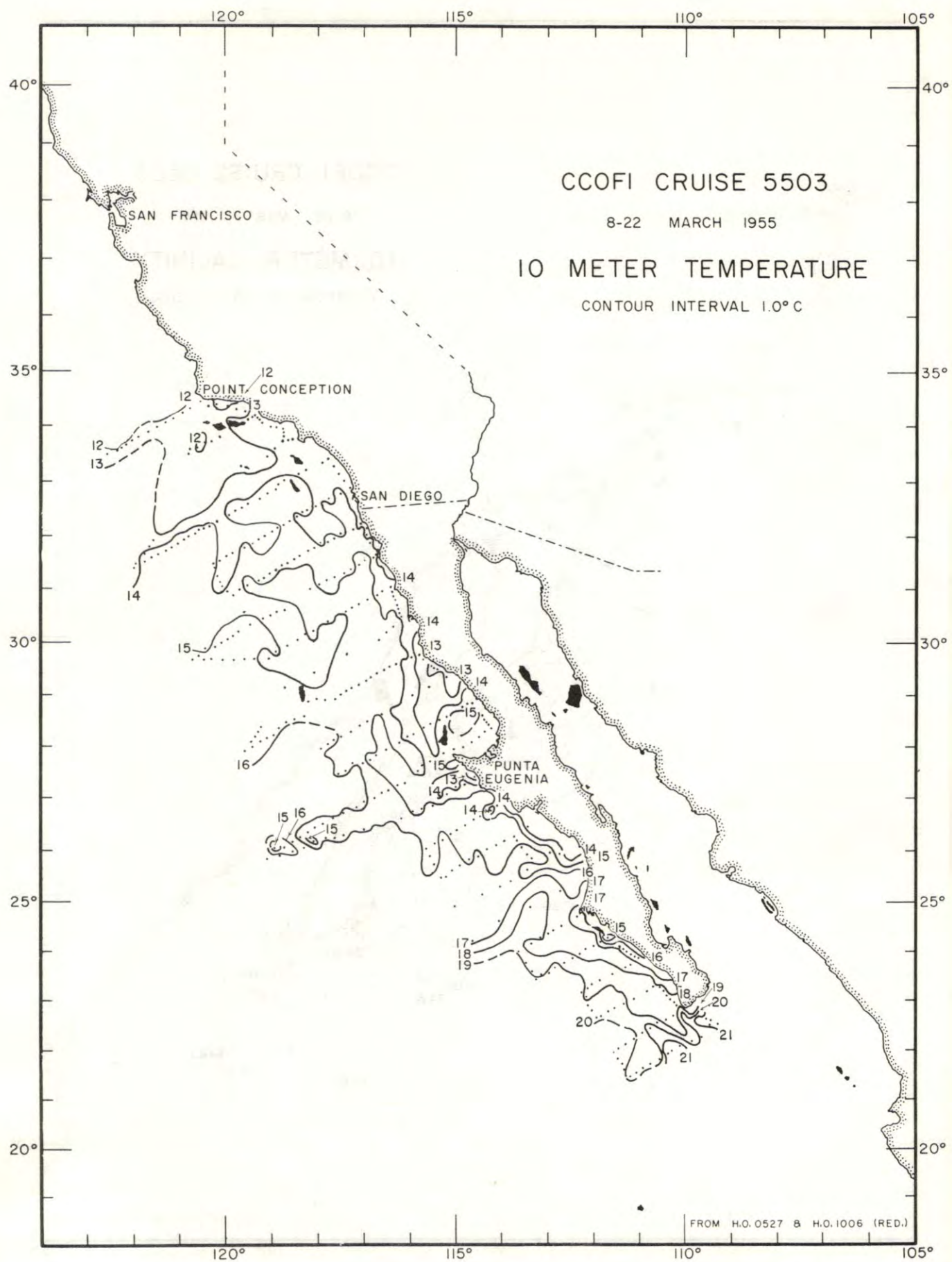


FIGURE 3

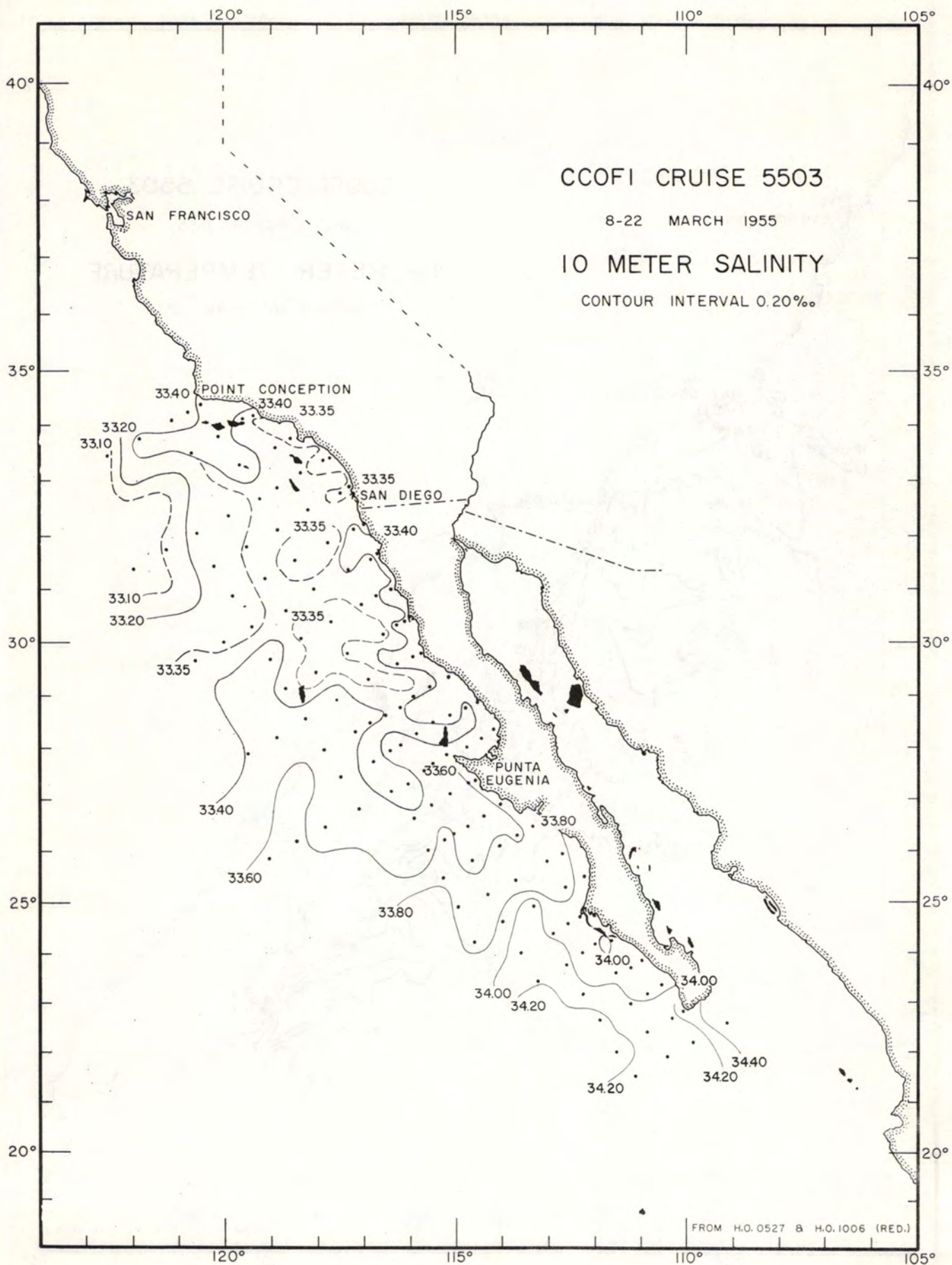


FIGURE 4

PERSONNEL  
Cruise 5503

SHIPS' CAPTAINS

Davis, Laurence E., R/V Crest  
Forster, Charles W., R/V Black Douglas  
Hopkins, Marvin F., R/V Horizon

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

R/V Black Douglas

Thraillkill, James R., Fishery Research Biologist, U. S. Fish and Wildlife Service  
Wolf, Robert S., Fishery Research Biologist, U. S. Fish and Wildlife Service

R/V Crest

Watson, Frank H., Fishery Aid, U. S. Fish and Wildlife Service  
Reith, A. Dougall, Marine Technician

R/V Horizon

Taft, Bruce A., Fishery Research Biologist, U. S. Fish and Wildlife Service  
Vorobiov, Alexander V., Fishery Aid, U. S. Fish and Wildlife Service

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters	
						Dir	Force			T	S
80.51-B	III-17	0655	34°26.0'	120°32.0'	100	330°	4	clear	rough	12.92	33.41
80.55-B	17	0430	34°19.0'	120°48.0'	450	320°	3	clear	rough	12.16	33.36
80.60-B	17	0125	34°09.0'	121°09.0'	1180	320°	3	clear	rough	12.32	33.26
80.70-B	16	2050	33°49.0'	121°51.0'	1500	330°	3	clear	rough	12.58	33.40
80.80-B	16	1550	33°29.0'	122°32.0'	2200	300°	5	partly cloudy	very rough	12.44	33.07
83.40-B	15	1650	34°14.0'	119°22.0'	13	090°	1	haze	rough	13.18	33.39
83.43-B	15	1820	34°08.0'	119°34.0'	150	270°	1	partly cloudy	moderate	13.02	33.36
83.51-B	15	2300	33°52.0'	120°08.5'	100	280°	5	clear	moderate	12.44	33.42
83.60-B	16	0400	33°34.0'	120°45.0'	850	280°	5	clear	rough	12.47	33.42
87.35-B	15	1145	33°50.0'	118°37.5'	400	300°	1	cloudy	moderate	14.11	33.34
87.40-B	15	0900	33°40.0'	118°58.5'	460	060°	1	partly cloudy	slight	13.50	33.36
87.50-B	14	2135	33°20.0'	119°39.5'	35	280°	6	cloudy	very rough	12.52	33.48
90.28-B	11	1115	33°28.5'	117°46.5'	38	calm		cloudy	slight	14.28	33.34
90.30-B	11	1245	32°24.0'	117°55.0'	340	calm		cloudy	slight	14.11	33.34
90.37-B	11	1640	33°11.0'	118°23.0'	640	270°	1	overcast	moderate	13.47	33.36
90.45-B	11	2045	32°54.5'	118°56.0'	930	230°	1	partly cloudy	moderate	14.38	33.32
90.50-B	11	2325	32°44.5'	119°16.5'	120	240°	1	partly cloudy	rough	14.32	33.37
90.60-B	12	0440	32°25.0'	119°57.0'	450	240°	1	clear	moderate	14.28	33.32

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
90.70-B	III-12	1000	32°04.0'	120°39.0'	2100	240°	1	drizzle	moderate	14.48	33.24a)
90.80-B	12	1550	31°45.0'	121°19.0'	2100	340°	3	overcast	rough	14.18	33.13
90.90-B	12	2100	31°25.0'	121°59.0'	2100	360°	2	partly cloudy	moderate	13.48	33.05
93.27-B	11	0645	32°56.0'	117°19.0'	35	calm		drizzle	slight	13.82	33.35
93.30-B	11	0515	32°50.0'	117°31.0'	450	180°	3	rain	moderate	14.20	33.33
93.40-B	11	0000	32°30.0'	118°12.5'	940	180°	4	rain	moderate	14.31	33.38
93.50-B	10	1930	32°10.0'	118°53.0'	640	140°	3	rain	slight	13.96	33.38
93.60-B	10	1330	31°50.0'	119°34.0'	1250	180°	3	rain	slight	14.06	33.35
93.70-B	10	0812	31°29.0'	120°14.0'	2080	180°	3	cloudy	moderate	14.52	33.29
97.30-B	9	0500	32°15.0'	117°08.0'	30	-	1	partly cloudy	slight	13.60	33.38
97.32-B	9	0635	32°11.0'	117°17.0'	740	140°	2	partly cloudy	slight	14.48	33.41
97.40-B	9	1050	31°56.0'	117°50.0'	500	140°	1	partly cloudy	slight	14.34	33.32
97.50-B	9	1605	31°35.0'	118°31.0'	1470	140°	1	partly cloudy	slight	14.26	33.34
97.60-B	9	2055	31°15.0'	119°11.0'	2000	270°	2	partly cloudy	slight	14.58	33.38
97.70-B	10	0230	30°55.0'	119°51.0'	2050	180°	2	partly cloudy	slight	14.44	33.31
100.29-C	9	0415	31°42.0'	116°43.5'	-	-	-	missing	missing	14.05b)	33.46
100.30-C	9	0500	31°40.0'	116°47.5'	207	170°	2	partly cloudy	slight	14.46	33.40

a) Mean value of 33.21 and 33.27‰.

b) Alternate value, 13.35°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
100.40-C	III-9	0930	31°21.0'	117°26.5'	1120	140°	1	partly cloudy	smooth	14.64	33.40
100.50-C	9	1345	31°01.0'	118°07.0'	950	180°	1	partly cloudy	slight	15.52a)	33.39
100.60-C	10	1915	30°38.5'	118°42.0'	1640	200°	2	cloudy	moderate	14.85b)	33.39
100.70-C	11	0040	30°21.5'	119°26.0'	2000	220°	4	cloudy	moderate	15.34c)	33.32
100.80-C	11	0540	30°02.0'	120°03.5'	2200	240°	3	cloudy	moderate	15.18	33.33
100.90-C	11	1050	29°41.5'	120°40.5'	2150	240°	3	partly cloudy	rough	15.26	33.36
103.30-C	12	1630	31°04.0'	116°25.0'	40	320°	3	partly cloudy	moderate	14.51d)	33.40
103.35-C	12	1323	30°54.0'	116°47.5'	1110	320°	3	partly cloudy	moderate	14.40	33.40
103.40-C	12	1030	30°44.5'	117°08.0'	900	340°	3	partly cloudy	moderate	15.32	33.36
103.50-C	12	0600	30°25.0'	117°45.5'	1450	310°	3	clear	moderate	15.08	33.31
103.60-C	12	0040	30°05.5'	118°23.5'	1900	280°	2	partly cloudy	moderate	14.76	33.35
103.70-C	11	1936	29°43.5'	119°03.0'	2000	330°	3	partly cloudy	rough	14.64	33.47
107.32-C	12	2145	30°25.0'	116°11.0'	133	210°	3	partly cloudy	moderate	15.04	33.39
107.35-C	12	2340	30°20.0'	116°23.0'	1020	330°	4	partly cloudy	rough	15.41	33.40
107.40-C	13	0230	30°07.5'	116°42.0'	1510	330°	5	cloudy	rough	15.56	33.32

a) Alternate value, 15.39°C.

b) Alternate value, 14.71°C.

c) Alternate value, 15.17°C.

d) Alternate value, 14.38°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
107.50-C	III-13	0750	29°50.0'	117°23.5'	1600	220°	5	overcast	rough	15.44	33.36
107.60-C	13	1330	29°27.5'	118°03.0'	1900	350°	4	overcast	rough	15.50	33.33
107.70-C	14	0815	29°11.0'	118°43.0'	1750	340°	5	overcast	rough	15.50	33.37
110.33-C	16	1820	29°49.0'	115°52.0'	58	320°	3	partly cloudy	rough	13.90	33.42
110.35-C	16	1645	29°46.0'	116°00.0'	800	340°	4	partly cloudy	rough	14.58	33.44
110.40-C	16	1340	29°39.0'	116°21.5'	1400	330°	3	partly cloudy	very rough	15.11	33.43
110.50-C	16	0755	29°18.0'	117°00.0'	1750	320°	4	clear	rough	15.39	33.34
110.60-C	16	0238	28°56.0'	117°37.5'	1950	330°	4	clear	rough	15.42	33.46
110.70-C	15	0720	28°37.0'	118°18.0'	1800	320°	5	clear	high	15.47	33.46
110.80-C	14	2352	28°16.5'	118°57.5'	2150	350°	6	cloudy	very rough	15.48	33.44
110.90-C	14	1830	27°57.5'	119°32.0'	2300	010°	4	partly cloudy	very rough	15.52	33.40
113.30-C	17	0339	29°23.0'	115°17.5'	30	320°	4	clear	rough	12.95	33.59
113.35-C	17	0702	29°12.0'	115°39.0'	800	350°	5	clear	very rough	13.33a)	33.36
113.40-C	17	1045	29°02.0'	115°58.5'	400	350°	5	cloudy	very rough	14.76	33.39
113.45-C	17	1430	28°52.0'	116°18.0'	1175	350°	4	cloudy	high	15.10	33.39
113.50-C	17	1750	28°40.0'	116°36.0'	2200	350°	5	cloudy	high	15.18	33.40
113.55-C	17	2320	28°31.5'	116°56.5'	1950	340°	5	partly cloudy	rough	15.20	33.42
113.60-C	18	0108	28°22.0'	117°15.0'	2050	010°	4	partly cloudy	rough	15.32	33.42

a) Alternate value, 13.63°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
113.70-C	III-18	0530	28°02.0'	117°55.0'	1930	360°	3	clear	rough	16.03a)	33.54
117.26-C	20	0220	28°55.0'	114°40.0'	45	300°	3	clear	moderate	14.45	33.51
117.30-C	20	0025	28°48.0'	114°56.0'	54	280°	4	clear	moderate	14.14	33.36
117.35-C	19	2145	28°38.0'	115°15.5'	106	300°	4	partly cloudy	rough	14.82	33.52
117.40-C	19	1825	28°28.0'	115°35.5'	400	320°	3	cloudy	moderate	13.60b)	33.44
117.45-C	19	0045	28°18.0'	115°55.0'	1800	320°	2	partly cloudy	rough	14.96c)	33.34
117.50-C	18	2140	28°07.5'	116°16.0'	2250	320°	2	partly cloudy	rough	15.34	33.47
117.55-C	18	1835	27°58.0'	116°33.0'	2400	320°	3	cloudy	moderate	14.90	33.44
117.60-C	18	1550	27°48.0'	116°53.0'	1900	360°	4	cloudy	rough	14.79	33.38
117.70-C	18	1030	27°27.5'	117°33.0'	2000	360°	4	partly cloudy	rough	15.86	33.48
120.25-C	20	0710	28°23.5'	114°16.0	35	330°	4	partly cloudy	moderate	14.42	33.55
120.30-C	20	0945	28°14.0'	114°35.0'	52	300°	3	clear	moderate	14.50	-
120.35-C	20	1227	28°03.0'	114°54.0'	45	340°	4	partly cloudy	moderate	14.74d)	33.49
120.40-C	20	1528	27°56.5'	115°20.0'	42	320°	4	cloudy	moderate	14.07e)	33.50
120.45-C	20	1750	27°44.0'	115°34.0'	1400	320°	3	partly cloudy	moderate	14.69	33.56

a) Alternate value, 16.20°C.

b) Alternate value, 13.08°C.

c) Alternate value, 14.82°C.

d) Alternate value, 14.33°C.

e) Alternate value, 14.31°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
120.50-C	III-20	2030	27°32.5'	115°52.5'	2200	310°	4	overcast	rough	15.42	33.43
120.55-H	21	0130	27°20.5'	116°08.0'	2025	310°	4	overcast	rough	14.74	33.38
120.60-H	20	2300	27°11.5'	116°28.0'	2055	310°	4	cloudy	moderate	15.26	33.38
120.70-H	20	1830	26°52.5'	117°10.0'	2025	320°	4	partly cloudy	rough	16.60	33.46
120.80-H	20	1400	26°32.0'	117°53.5'	2100	310°	4	partly cloudy	rough	15.88	33.48
120.90-H	20	0950	26°13.0'	118°30.5'	2250	320°	4	clear	rough	16.18	33.66
120.100-H	20	0530	25°53.0'	119°06.5'	2300	320°	4	clear	moderate	16.44	33.61
123.37-H	19	0300	27°24.0'	114°39.5'	40	290°	2	partly cloudy	slight	12.98	33.65
123.40-H	19	0440	27°18.0'	114°51.5'	210	320°	3	missing	moderate	14.44	33.60
123.45-H	19	0715	27°05.5'	115°14.0'	2300	330°	4	missing	moderate	14.62	33.48
123.50-H	19	0950	26°54.0'	115°35.0'	1775	300°	4	missing	rough	14.98	33.52
123.55-H	19	1155	26°43.0'	115°56.0'	2100	300°	4	missing	slight	14.98	33.40
123.60-H	19	1420	26°34.5'	116°14.0'	2125	320°	4	partly cloudy	moderate	15.32	33.42
127.34-H	18	2250	26°55.0'	114°07.0'	47	250°	2	partly cloudy	moderate	14.88	33.62
127.40-H	18	2015	26°42.0'	114°30.0'	1600	320°	3	partly cloudy	moderate	15.06	33.51
127.45-H	18	1730	26°32.0'	114°51.0'	1750	330°	3	partly cloudy	moderate	15.40	33.53
127.50-H	18	1450	26°23.5'	115°10.0'	2115	310°	2	partly cloudy	rough	15.65	33.52
127.55-H	18	1310	26°17.0'	115°20.5'	1800	330°	2	partly cloudy	rough	16.07	33.63
127.60-H	18	1020	26°05.5'	115°40.0'	1950	320°	4	clear	rough	15.88	33.48

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
130.30-H	III-17	1520	26°30.0'	113°27.5'	40	310°	4	cloudy	moderate	13.82	33.69
130.35-H	17	1920	26°17.5'	113°44.5'	150	360°	4	cloudy	rough	15.40	33.58
130.40-H	17	2150	26°10.5'	114°08.0'	1200	300°	6	cloudy	very rough	15.64	33.63
130.50-H	18	0220	25°52.0'	114°47.0'	1980	300°	5	cloudy	very rough	15.76	33.56
130.60-H	18	0620	25°31.5'	115°20.0'	2150	320°	5	clear	rough	16.78	33.72
133.25-H	17	0950	25°59.0'	112°49.5'	45	310°	6	partly cloudy	very rough	14.72	33.79
133.30-H	17	0740	25°50.0'	113°09.0'	500	290°	4	partly cloudy	rough	16.22	33.73
133.40-H	17	0230	25°29.0'	113°50.0'	1200	320°	6	cloudy	rough	16.36	33.68
133.50-H	16	2220	25°13.5'	114°26.0'	2060	330°	6	cloudy	rough	16.36	33.68
133.60-H	16	1740	24°59.0'	115°05.5'	1800	320°	5	partly cloudy	rough	16.80	33.79
137.23-H	15	1950	25°32.0'	112°19.0'	40	290°	4	partly cloudy	rough	16.78	33.84
137.30-H	15	2300	25°20.5'	112°45.0'	1250	320°	5	cloudy	moderate	16.98	33.78
137.40-H	15	0255	24°59.0'	113°26.0'	850	330°	5	clear	moderate	18.14	34.01
137.50-H	16	0750	24°39.5'	114°03.5'	1050	300°	5	clear	rough	16.66	33.85
137.60-H	16	1245	24°16.5'	114°40.0'	-	300°	5	missing	rough	16.92	33.78
140.30-H	15	1500	24°45.5'	112°24.5'	60	320°	4	partly cloudy	moderate	16.92	33.84
140.35-H	15	1210	24°32.5'	112°45.5'	750	290°	4	partly cloudy	moderate	17.20	33.91
140.40-H	15	0940	24°25.5'	113°02.0'	1850	340°	4	partly cloudy	rough	17.90	33.98
140.50-H	15	0445	24°05.0'	113°39.5'	1855	320°	4	cloudy	moderate	18.89	34.16

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
143.26-H	III-14	1200	24°19.0'	111°47.0'	38	290°	3	clear	slight	14.58	34.04
143.30-H	14	0430	24°11.0'	112°03.0'	128	320°	2	cloudy	rough	17.18	33.85
143.35-H	14	1710	24°01.0'	112°21.0'	375	320°	4	partly cloudy	moderate	17.10	33.85
143.40-H	14	1940	23°50.5'	112°41.0'	1400	320°	4	partly cloudy	rough	18.54	34.04
143.50-H	15	0000	23°30.0'	113°18.0'	1590	290°	3	cloudy	moderate	19.16	34.19
147.20-H	14	0700	23°56.5'	111°04.5'	80	300°	4	clear	moderate	16.11	33.89
147.25-H	14	0400	23°46.0'	111°22.5'	180	290°	4	clear	moderate	17.96	33.92
147.30-H	14	0150	23°38.5'	111°39.0'	195	340°	4	partly cloudy	very rough	18.08	33.96
147.40-H	13	2050	23°16.5'	112°18.0'	1825	320°	5	partly cloudy	very rough	19.14	34.08
150.19-H	13	0450	23°23.5'	110°39.0'	110	300°	5	clear	moderate	17.32	33.94
150.25-H	13	0810	23°11.5'	110°59.0'	770	320°	4	clear	rough	18.48	33.96
150.30-H	13	1110	23°02.0'	111°20.0'	1550	320°	6	partly cloudy	very rough	19.01	34.01
150.40-H	13	1610	22°41.0'	112°00.0'	1850	320°	5	partly cloudy	rough	19.74	34.22
153.16-H	12	2220	22°54.0'	110°04.0'	60	290°	3	clear	moderate	18.44	34.29
153.30-H	12	1600	22°27.0'	110°59.0'	1700	320°	4	clear	moderate	19.42	34.05
153.40-H	12	1045	22°03.5'	111°36.0'	1800	320°	4	clear	moderate	20.22	34.29
157.10-H	11	1530	22°35.0'	109°18.0'	1650	040°	3	clear	slight	21.61	34.56
157.20-H	11	2000	22°17.5'	109°57.0'	1750	320°	4	clear	moderate	19.13	34.03
157.30-H	12	0050	21°56.0'	110°34.5'	1225	240°	3	clear	moderate	19.86	34.08
157.40-H	12	0530	21°34.0'	111°15.0'	1800	270°	3	clear	moderate	19.82	34.16

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

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