UNIVERSITY OF CALIFORNIA SCRIPPS INSTITUTION OF OCEANOGRAPHY

data report

PHYSICAL AND CHEMICAL DATA

CCOFI Cruise 5607
6-25 July 1956

CCOFI Cruise 5608
7-19 August 1956

CCOFI Cruise 5609
5-17 September 1956

CCOFI Cruise 5610
27 September - 5 October 1956

CCOFI Cruise 5611
30 October - 5 November 1956

SIO Reference 60-35
27 April 1960

UNIVERSITY OF CALIFORNIA

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CCOFI CRUISE 5607
6-25 July 1956

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CCOFI CRUISE 5610
27 September - 5 October 1956

CCOFI CRUISE 5611
30 October - 5 November 1956

Sponsored by

Marine Research Committee

SIO Reference 60-35
27 April 1960

Approved for distribution:

Roger Revelle

Roger Revelle, Director

CONTENTS

INTRODUCTION

The data presented in this report were collected on the eighty-sixth, eighty-seventh, eighty-eighth, eighty-nineth and ninetieth consecutive cruises of the California Cooperative Oceanic Fisheries Investigations program. The R/V Black Douglas of the U. S. Fish and Wildlife Service participated in all five cruises; the R/V Paolina-T of the Scripps Institution participated in Cruise 5607; the R/V Orca of the Scripps Institution participated in Cruises 5607, 5610 and 5611.

The data are tabulated at observed depths; the interpolated and computed values 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

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.

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

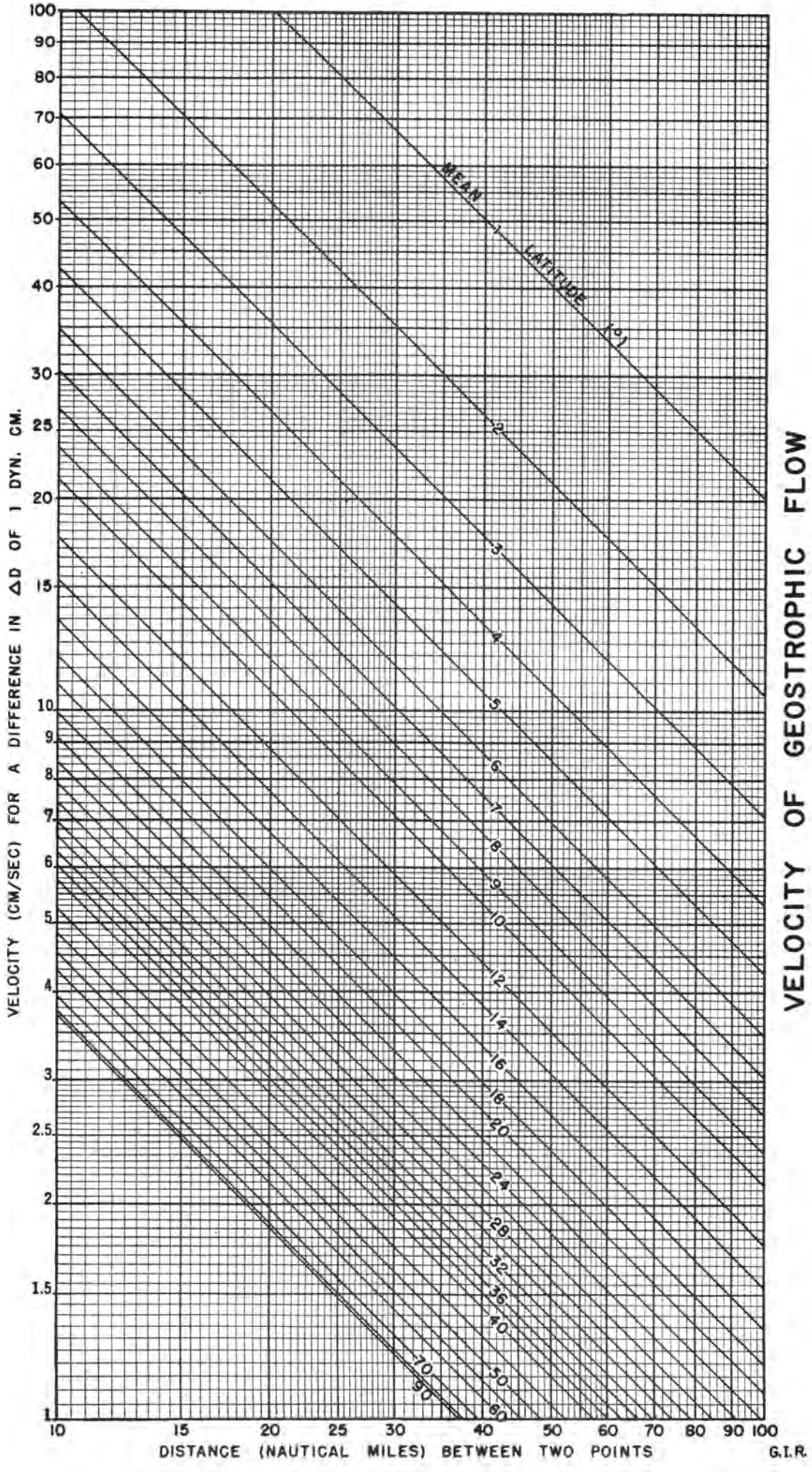
Values which are not drawn through because they seem to be in error without apparent reason are indicated by one of the following notations.

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 1956 volume, the first page of the Cruise 5607 data is numbered 193; 5608, 204; 5609, 209; 5610, 214; 5611, 217.


VELOCITY OF GEOSTROPHIC FLOW
VELOCITY (CM/SEC) FOR A DIFFERENCE IN ΔD OF 1 DYN. CM.
DISTANCE (NAUTICAL MILES) BETWEEN TWO POINTS
MEAN LATITUDE (°)
1
2
3
4
5
6
7
8
9
10
12
14
16
18
20
24
28
32
36
40
50
60
70
90
100
90
80
70
60
50
40
30
25
20
15
10
9
8
7
6
5
4
3
2.5
2
1.5
1
10
15
20
25
30
40
50
60
70
80
90
100
G.I.R.

FIGURES

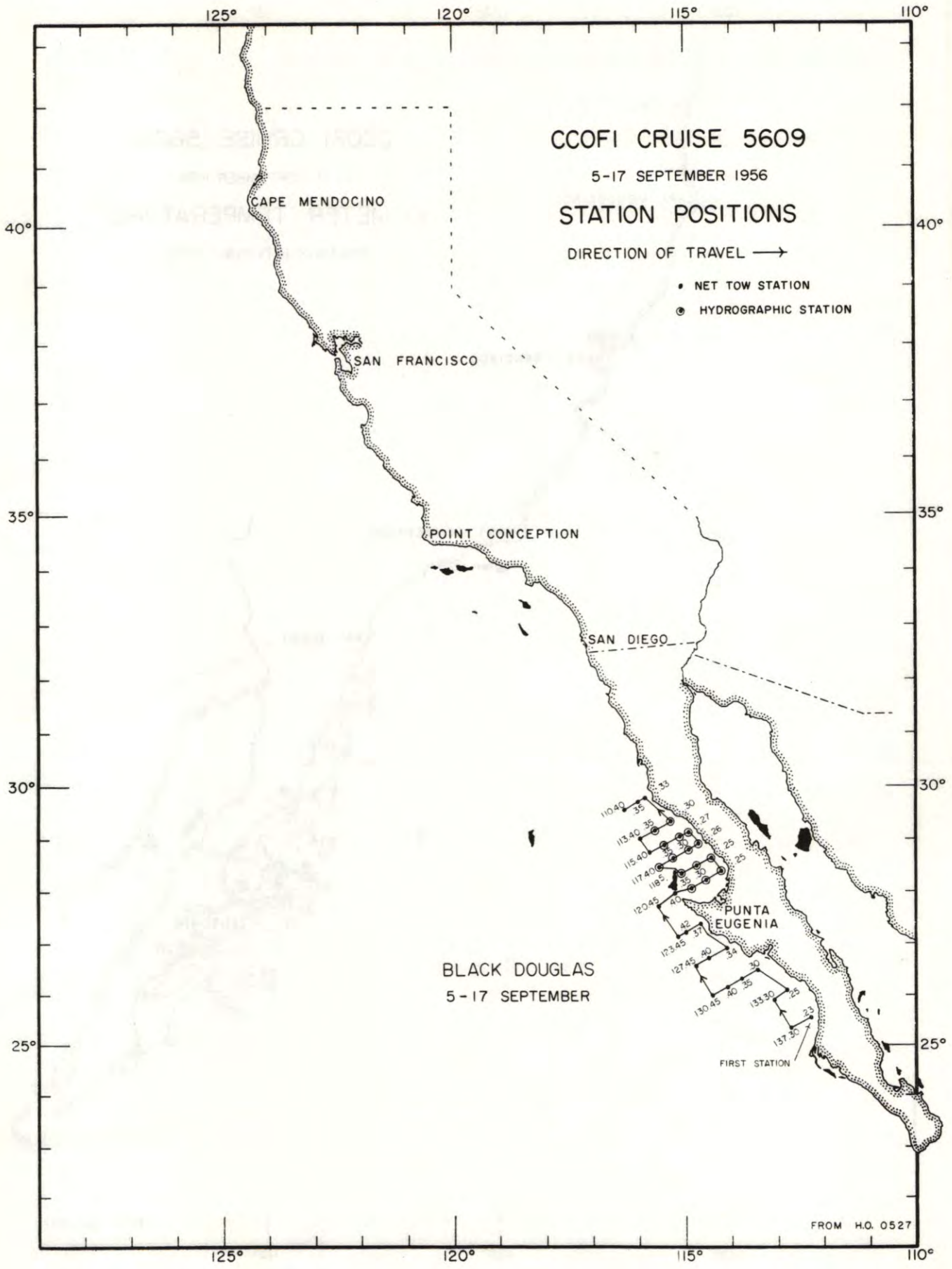

CCOFI CRUISE 5609
5-17 SEPTEMBER 1956
STATION POSITIONS
DIRECTION OF TRAVEL
NET TOW STATION
HYDROGRAPHIC STATION
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
BLACK DOUGLAS
5-17 SEPTEMBER
FIRST STATION
FROM H.O. 0527
125°
120°
115°
110°
40°
35°
30°
25°

FIGURE 1

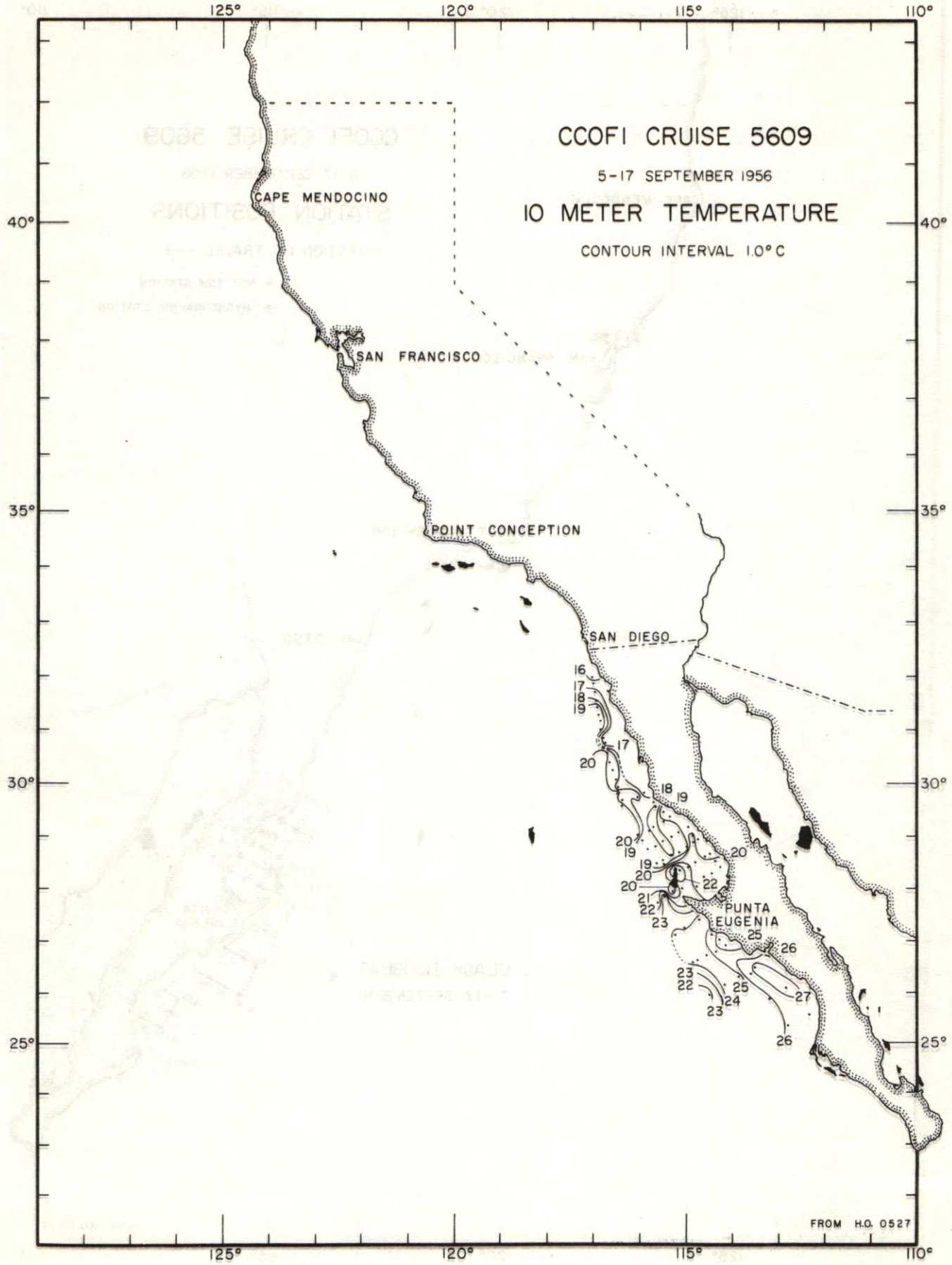

CCOFI CRUISE 5609
5-17 SEPTEMBER 1956
10 METER TEMPERATURE
CONTOUR INTERVAL 1.0° C
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
125°
120°
115°
110°
40°
35°
30°
25°
FROM H.O. 0527

FIGURE 2

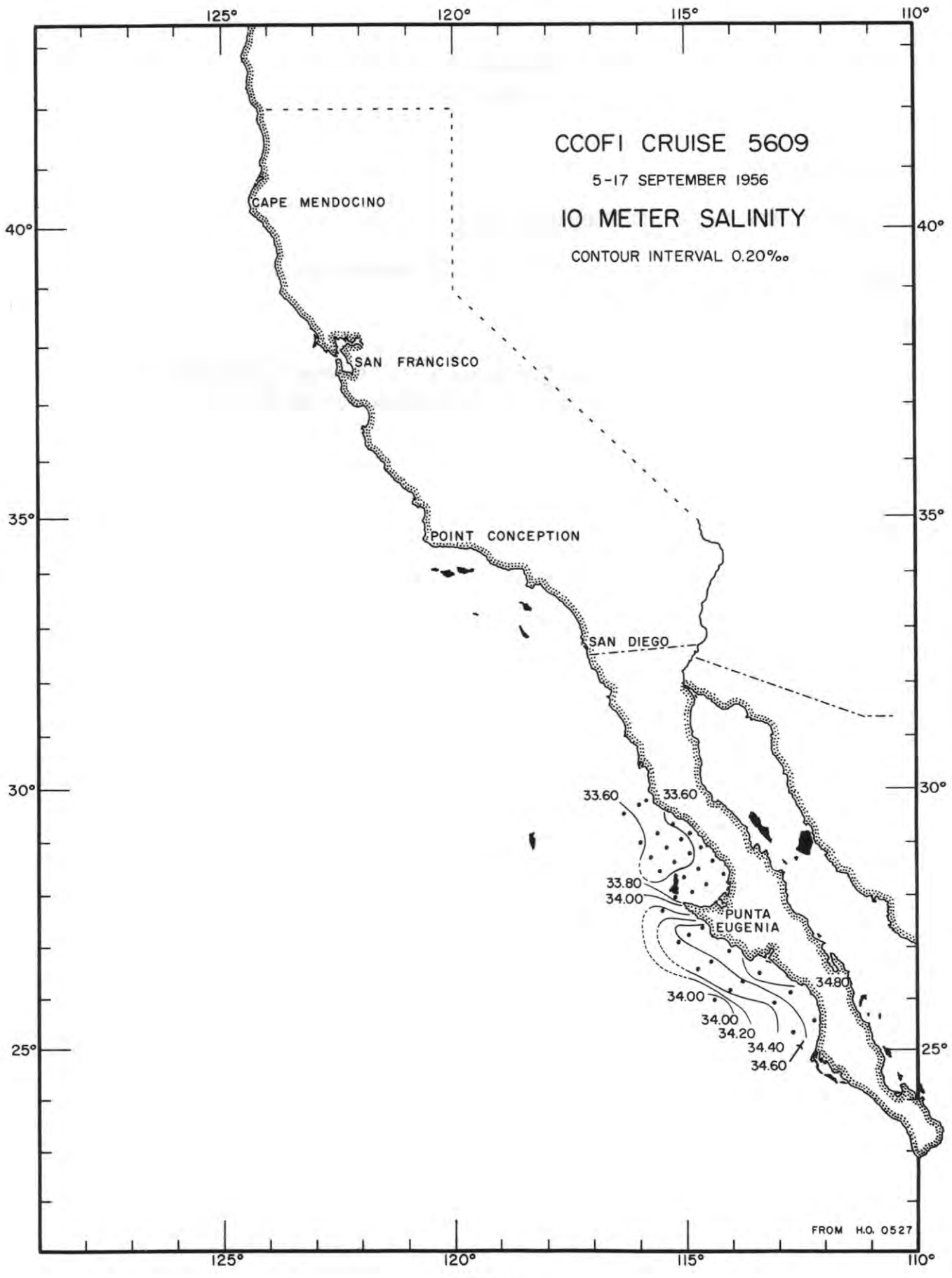

CCOFI CRUISE 5609
5-17 SEPTEMBER 1956
10 METER SALINITY
CONTOUR INTERVAL 0.20‰
CAPE MENDOCINO
SAN FRANCISCO
POINT CONCEPTION
SAN DIEGO
PUNTA EUGENIA
33.60
33.60
33.80
34.00
34.80
34.00
34.00
34.20
34.40
34.60
125°
120°
115°
110°
40°
35°
30°
25°
FROM H.O. 0527

FIGURE 3

PERSONNEL
Cruise 5609

SHIP'S CAPTAIN

Forster, Charles W., R/V Black Douglas

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

R/V Black Douglas

Wolf, Robert S., Fishery Research Biologist, U. S. Fish and Wildlife Service
Vorobiov, Alexander V., Fishery Aid, U. S. Fish and Wildlife Service

OBSERVED					INTERPOLATED				COMPUTED		
Z m	T °C	S ‰	O_2 ml/L	δT_3 10^{-5} cm/g	Z m	T °C	S ‰	O_2 ml/L	σ_t g/L	δT_3 10^{-5} cm/g	ΔD dyn. m
BLACK DOUGLAS; September 16, 1956; 1958 GCT; 29°22.5'N, 115°17.5'W; sounding, 30 fm; wind, 310°, force 1; weather, clear; sea, slight; wire angle, 02°.											113.30
0	21.56	33.64	456		0	21.56	33.64		23.33	456	
10	19.73	33.62	410		10	19.73	33.62		23.80	410	
30	(16.4)a)	33.53	(340)		20	(17.0)	33.54		(24.41)	(353)	
50	13.42	33.49	282		30	(16.4)	33.53		(24.54)	(340)	
					50	13.42	33.49		25.16	282	
BLACK DOUGLAS; September 16, 1956; 1650 GCT; 29°12'N, 115°39'W; sounding, 700 fm; wind, calm; weather, clear; sea, slight; wire angle, 00°.											113.35
0	19.60	33.51	416		0	19.60	33.51		23.75	416	
10	17.79	33.51	371		10	17.79	33.51		24.22	371	
30	(16.0)	33.49	(334)		20	(16.6)	33.50		(24.48)	(346)	
50	(12.2)	33.49	(258)		30	(16.0)	33.49		(24.61)	(334)	
75	(11.3)	33.50	(242)		50	(12.2)	33.49		(25.41)	(258)	
100	11.63	33.81	226		75	(11.3)	33.50		(25.58)	(242)	
					100	11.63	33.81		25.75	226	
BLACK DOUGLAS; September 16, 1956; 0355 GCT; 29°11'N, 114°55'W; sounding, 40 fm; wind, 280°, force 2; weather, cloudy; sea, slight; wire angle, 00°.											115.27
0	20.78	33.65	435		0	20.78	33.65		23.55	435	
10	19.19	33.64	396		10	19.19	33.64		23.96	396	
30	(16.1)	33.56	(330)		20	(17.6)	33.60		(24.32)	(362)	
50	14.03	33.50	293		30	(16.1)	33.56		(24.65)	(330)	
					50	14.03	33.50		25.04	293	
BLACK DOUGLAS; September 16, 1956; 0535 GCT; 29°05'N, 115°08'W; sounding, 51 fm; wind, 270°, force 2; weather, cloudy; sea, slight; wire angle, 00°.											115.30
0	19.78	33.55	416		0	19.78	33.55		23.75	416	
10	18.56	33.55	392		10	18.56	33.55		24.00	392	
30	(16.4)	33.46	(345)		20	(17.4)	33.50		24.29	(365)	
50	(15.4)	33.55	(317)		30	(16.4)	33.46		(24.50)	(345)	
75	14.78	33.47	309		50	(15.4)	33.55		(24.79)	(317)	
					75	14.78	33.47		24.88	309	
BLACK DOUGLAS; September 16, 1956; 0832 GCT; 28°55'N, 115°27.5'W; sounding, 600 fm; wind, calm; weather, clear; sea, slight; wire angle, 02°.											115.35
0	18.58	33.54	389		0	18.58	33.54		24.03	389	
10	17.96	33.55	373		10	17.96	33.55		24.20	373	
30	(14.9)	33.51	(308)		20	(16.4)	33.54		(24.54)	(340)	
50	(13.0)	33.49	(274)		30	(14.9)	33.51		(24.88)	(308)	
75	(11.6)	33.63	(238)		50	(13.0)	33.49		(25.24)	(274)	
100	10.92	33.74	217		75	(11.6)	33.63		(25.62)	(238)	
					100	10.92	33.74		25.84	217	

a) The hydrographic casts on this cruise were made with four, five or six Nansen bottles, only three of which contained reversing thermometers. The temperature values for the remaining bottles were obtained from bathythermogram readings although the traces were very wide and much below the usual standards.

SIO
CCOFI
5609

OBSERVED					INTERPOLATED				COMPUTED		
Z m	T °C	S ‰	O_2 ml/L	δT_3 10^{-5} cm/g	Z m	T °C	S ‰	O_2 ml/L	σ_t g/L	δT_3 10^{-5} cm/g	ΔD dyn. m
117.26	BLACK DOUGLAS; September 16, 1956; 0106 GCT; 28°56'N, 114°41'W; sounding, 40 fm; wind, 320°, force 1; weather cloudy; sea, slight; wire angle, 02°.										
0	21.37	33.66		450	0	21.37	33.66		23.40	450	
10	19.96	33.65		414	10	19.96	33.65		23.77	414	
30	(16.3)a)	33.56		(335)	20	(17.5)	33.58		(24.33)	(360)	
50	12.28	33.53		258	30	(16.3)	33.56		(24.60)	(335)	
					50	12.28	33.53		25.41	258	
117.30	BLACK DOUGLAS; September 15, 1956; 2303 GCT; 28°48'N, 114°56.5'W; sounding, 55 fm; wind, 320°, force 1; weather, cloudy; sea, moderate; wire angle, 01°.										
0	20.32	33.48		435	0	20.32	33.48		23.54	435	
10	18.30	33.51		384	10	18.30	33.51		24.08	384	
30	(14.5)	33.42		(308)	20	(16.0)	33.46		(24.58)	(336)	
50	(13.4)	33.46		(283)	30	(14.5)	33.42		24.89	(308)	
75	11.77	33.51		248	50	(13.4)	33.46		(25.15)	(283)	
					75	11.77	33.51		25.51	248	
117.35	BLACK DOUGLAS; September 15, 1956; 2026 GCT; 28°38'N, 115°16'W; sounding, 125 fm; wind, calm; weather, cloudy; sea, slight; wire angle, 00°.										
0	19.32	33.53		407	0	19.32	33.53		23.83	407	
10	17.96	33.51		376	10	17.96	33.51		24.17	376	
30	(17.0)	33.53		(353)	20	(17.5)	33.52		(24.28)	(365)	
50	(12.7)	33.53		(265)	30	(17.0)	33.53		(24.41)	(353)	
75	(11.8)	33.77		(232)	50	(12.7)	33.53		(25.34)	(265)	
100	11.18	33.94		207	75	(11.8)	33.77		(25.69)	(231)	
					100	11.18	33.94		25.95	207	
117.40	BLACK DOUGLAS; September 15, 1956; 1730 GCT; 28°28'N, 115°35.5'W; sounding, 380 fm; wind, 320°, force 2; weather, cloudy; sea, moderate; wire angle, 05°.										
0	18.24	33.52		382	0	18.24	33.52		24.10	382	
10	18.16	33.51		380	10	18.16	33.51		24.13	380	
30	(15.8)	33.48		(330)	20	(17.3)	33.50		(24.32)	(362)	
50	(14.0)	33.45		(298)	30	(15.8)	33.48		(24.65)	(330)	
75	(12.4)	33.53		(260)	50	(14.0)	33.45		(24.99)	(298)	
100	11.67	33.78		239	75	(12.4)	33.53		(25.39)	(260)	
					100	11.67	33.78		25.61	239	
118^5.25	BLACK DOUGLAS; September 15, 1956; 0745 GCT; 28°40.5'N, 114°25.5'W; sounding, 48 fm; wind, 300°, force 1; weather, missing; sea, slight; wire angle, 10°.										
0	21.00	33.68		439	0	21.00	33.68		23.50	439	
10	19.68	33.67		430	10	19.68	33.67		23.60	430	
30	(16.2)	33.77		(318)	20	(17.7)	33.74		(24.40)	(354)	
49	(13.1)	33.51		(274)	30	(16.2)	33.77		(24.78)	(318)	
74	12.53	33.62		255	50	(13.1)	33.52		(25.25)	(273)	
					75	(12.5)	(33.63)		(25.46)	(254)	

a) See footnote, page 209.

OBSERVED					INTERPOLATED				COMPUTED		
Z m	T °C	S ‰	O_2 ml/L	$\delta_{T}{}^{-5}{}_{3}$ 10^{-5} cm/g	Z m	T °C	S ‰	O_2 ml/L	σ_t g/L	$\delta_{T}{}^{-5}{}_{3}$ 10^{-5} cm/g	ΔD dyn. m

BLACK DOUGLAS; September 15, 1956; 1035 GCT; 28°30.5'N, 114°45.5'W; sounding, 62 fm; wind, 140°, force 2; weather, clear; sea, slight; wire angle, 05°. 1185.30

0	20.58	33.72	425	0	20.58	33.72	23.65	425	
10	20.60	33.68	428	10	20.60	33.68	23.62	428	
30	(20.6)a)	33.66	(430)	20	(20.6)	33.67	(23.61)	(429)	
50	(17.8)	33.62	(365)	30	(20.6)	33.66	(23.60)	(430)	
75	(13.2)	33.46	(279)	50	(17.8)	33.62	(24.29)	(365)	
100	11.94	33.62	244	75	(13.2)	33.46	(25.19)	(279)	
				100	11.94	33.62	25.56	244	

BLACK DOUGLAS; September 15, 1956; 1338 GCT; 28°20.5'N, 115°05'W; sounding, 67 fm; wind, variable, force 1; weather, cloudy; sea, rough; wire angle, 03°. 1185.35

0	22.19	33.73	466	0	22.19	33.73	23.22	466	
10	22.20	33.79	463	10	22.20	33.79	23.26	463	
30	(19.7)	33.64	(408)	20	(21.1)	33.72	(23.51)	(438)	
50	(15.3)	33.49	(319)	30	(19.7)	33.64	(23.82)	(408)	
75	(13.7)	33.68	(272)	50	(15.3)	33.49	(24.77)	(319)	
100	11.48	33.80	223	75	(13.7)	33.68	(25.27)	(272)	
				100	11.48	33.80	25.77	223	

BLACK DOUGLAS; September 15, 1956; 0425 GCT; 28°23'N, 114°14.5'W; sounding, 30 fm; wind, 300°, force 2; weather, cloudy; sea, moderate; wire angle, 02°. 120.25

0	20.79	33.68	433	0	20.79	33.68	23.57	433	
10	20.40	33.71	421	10	20.40	33.71	23.70	421	
40	(16.4)	33.53	(340)	20	(18.6)	33.64	(24.11)	(382)	
50	14.06	33.48	294	30	(17.8)	33.59	(24.27)	(366)	
				50	14.06	33.48	25.03	294	

BLACK DOUGLAS; September 15, 1956; 0132 GCT; 28°13'N, 114°34'W; sounding, 52 fm; wind, 320°, force 3; weather, cloudy; sea, moderate; wire angle, 07°. 120.30

0	20.76	33.70	430	0	20.76	33.70	23.60	430	
10	20.66	33.70	428	10	20.66	33.70	23.62	428	
30	(19.8)	33.69	(407)	20	(19.9)	33.64	(23.77)	(414)	
50	(16.9)	33.69	(339)	30	(19.8)	33.69	(23.84)	(407)	
74	14.33	33.49	299	50	(16.9)	33.69	(24.55)	(339)	
				75	(14.3)	(33.49)	(24.99)	(298)	

BLACK DOUGLAS; September 14, 1956; 2232 GCT; 28°03'N, 114°54'W; sounding, 45 fm; wind, 320°, force 3; weather, partly cloudy; sea, rough; wire angle, 05°. 120.35

0	21.30	33.74	442	0	21.30	33.74	23.48	442	
10	(21.2)	33.77	(438)	10	(21.2)	33.77	(23.51)	(438)	
30	(21.0)	33.71	(436)	20	(21.1)	33.74	(23.52)	(437)	
50	(19.8)	33.64	(411)	30	(21.0)	33.71	(23.53)	(436)	
75	13.87	33.50	290	50	(19.8)	33.64	(23.80)	(411)	
				75	13.87	33.50	25.08	290	

a) See footnote, page 209.

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

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind Dir	Wind Force	Weather	Sea	10 Meters T	10 Meters S
110.33-B	IX-17	0100	29°50.5'	115°52.0'	50	330°	2	clear	moderate	17.20	33.46
110.35-B	17	0240	29°46.5'	116°00.0'	550	270°	2	clear	slight	19.72	33.51
110.40-B	17	0610	29°36.5'	116°19.5'	1300	270°	2	clear	slight	20.42	33.64
113.40-B	16	1400	29°02.0'	115°59.0'	1100	calm		clear	slight	20.15	33.65
115.40-B	16	1100	28°45.0'	115°47.0'	770	calm		partly cloudy	slight	18.60	33.56
120.40-B	14	1950	27°56.5'	115°14.0'	21	300°	4	partly cloudy	moderate	19.86	33.68
120.45-B	14	1640	27°43.0'	115°33.0'	1100	320°	4	partly cloudy	rough	21.78	34.28
123.37-B	14	0430	27°24.0'	114°39.5'	40	300°	3	clear	rough	24.02	34.65
123.42-B	14	0730	27°14.0'	114°59.5'	1000	330°	6	clear	very rough	23.99	34.70
123.45-B	14	0950	27°08.0'	115°11.0'	2100	320°	5	clear	very rough	24.14	34.58
127.34-B	13	2235	26°55.5'	114°06.0'	41	300°	3	clear	rough	24.78	34.67
127.40-B	13	1930	26°43.5'	114°29.5'	1900	320°	6	clear	rough	24.46	34.54
127.45-B	13	1625	26°33.5'	114°48.5'	1800	330°	5	clear	rough	24.30	34.51
130.30-B	12	1300	26°29.0'	113°29.0'	45	320°	3	clear	rough	27.06	34.91
130.35-B	13	0340	26°19.0'	113°48.5'	250	300°	5	clear	rough	24.78	34.60
130.40-B	13	0655	26°09.0'	114°07.5'	1200	300°	4	clear	moderate	24.30	34.56
130.45-B	13	1000	25°59.0'	114°25.5'	2000	320°	4	clear	moderate	21.94	33.90
133.25-B	12	0650	26°04.5'	112°48.0'	45	290°	3	clear	rough	27.26	34.76
133.30-B	12	0340	25°54.5'	113°07.5'	110	280°	4	clear	moderate	25.93	34.45

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind Dir	Wind Force	Weather	Sea	10 Meters T	10 Meters S
137.23-B	IX-11	1600	25°34.0'	112°18.5'	42	280°	3	clear	moderate	26.70	34.67
137.30-B	11	1900	25°20.0'	112°45.5'	135	290°	4	clear	moderate	26.10	34.56

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