

CORRECTIONS MADE:

STATION POSITIONS #8

UNIVERSITY OF CALIFORNIA SCRIPPS INSTITUTION OF OCEANOGRAPHY

data report

PHYSICAL AND CHEMICAL DATA

CCOFI CRUISE 5709 (MLR 100)

4-21 September 1957

CCOFI CRUISE 5710 (MLR 101)

4 October - 8 November 1957

CCOFI CRUISE 5711 (MLR 102)

16-25 November 1957

CCOFI CRUISE 5712 (MLR 103)

12-20 December 1957

SIO Reference 58-64

15 September 1958

ERRATA

PHYSICAL AND CHEMICAL DATA

CCOFI Cruises 5701 and 5702
SIO Reference 58-22

CCOFI Cruises 5703 and 5704
SIO Reference 58-24

CCOFI Cruises 5705 and 5706
SIO Reference 58-33

CCOFI Cruises 5707 and 5708
SIO Reference 58-63

Please replace the last sentence of the second paragraph
of the INTRODUCTION with the following:

"The presentation of data in this report does not constitute
publication; however, the data contained in this report
have been carefully edited and no modification should be
necessary before final publication. "

UNIVERSITY OF CALIFORNIA
SCRIPPS INSTITUTION OF OCEANOGRAPHY

PHYSICAL AND CHEMICAL DATA

CCOFI CRUISE 5709

(MLR 100)

4-21 September 1957

CCOFI CRUISE 5710

(MLR 101)

4 October - 8 November 1957

CCOFI CRUISE 5711

(MLR 102)

16-25 November 1957

CCOFI CRUISE 5712

(MLR 103)

12-20 December 1957

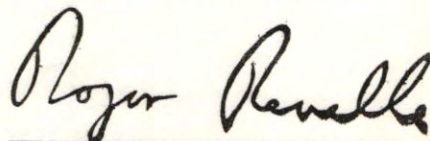
Sponsored by

Marine Research Committee

SIO Reference 58-64

15 September 1958

Approved for distribution:



Roger Revelle, Director

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CRUISE 5709

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DISTRIBUTION LIST 315

INTRODUCTION

The data presented in this report were collected on Cruises 100, 101, 102 and 103 of the California Cooperative Oceanic Fisheries Investigations. The R/V Black Douglas of the U. S. Fish and Wildlife Service and the R/V Stranger of the Scripps Institution of Oceanography participated in Cruise 100; the R/V Stranger and R/V Paolina-T of the Scripps Institution, in Cruise 101; the R/V Orca of the Scripps Institution, in Cruise 102; the R/V Paolina-T and R/V Stranger, in Cruise 103.

The data are tabulated at observed depths, and the interpolated and computed values are tabulated at standard depths. They 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 modification should be necessary before final publication.

The stations occupied in the Gulf of California are based on a special grid; therefore, they will appear in each report following the data obtained in the normal station pattern. In each group stations are listed in numerical order. The designation "G" in the station number is used to denote Gulf of California stations.

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 . 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

^{1/}

Klein, Hans T. A new technique for processing physical oceanographic data. (MS). Contribution from the Scripps Institution of Oceanography, New Series, No. 000.

value. The time is the time of messenger release. When more than one cast was made on a station, each messenger time and wire angle is given in the order of increasing depth of casts. A line is left blank between the observed data of each cast.

FOOTNOTES

In addition to standard 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 1957 volume, the first page of Cruise 5709 is numbered 251; Cruise 5710, 260; Cruise 5711, 301; Cruise 5712, 307.

FIGURES

1. CCOFI Cruise 5709 (MLR 100), station positions
2. Horizontal distribution of temperature at 10 meters
3. Horizontal distribution of salinity at 10 meters

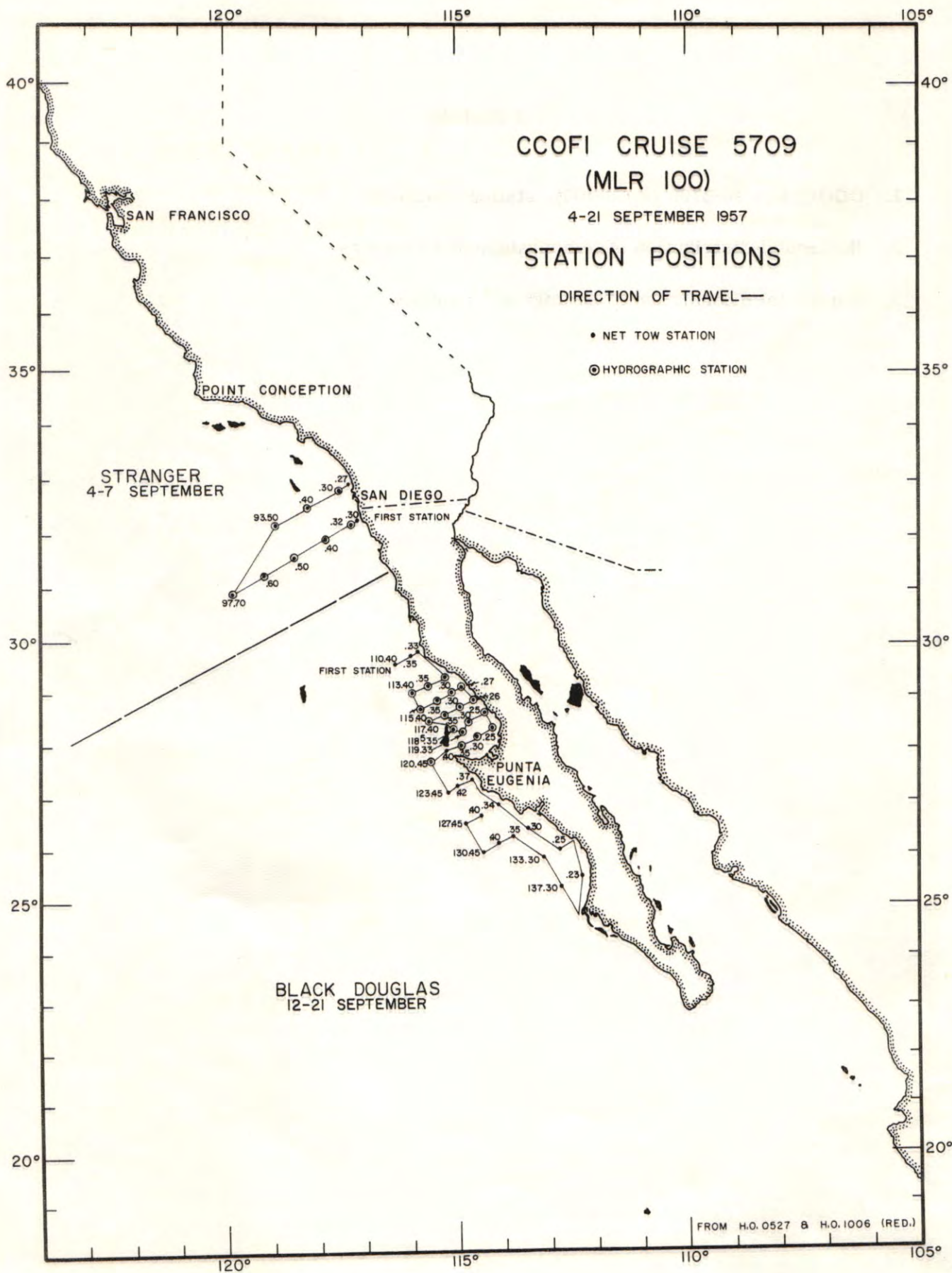


FIGURE 1

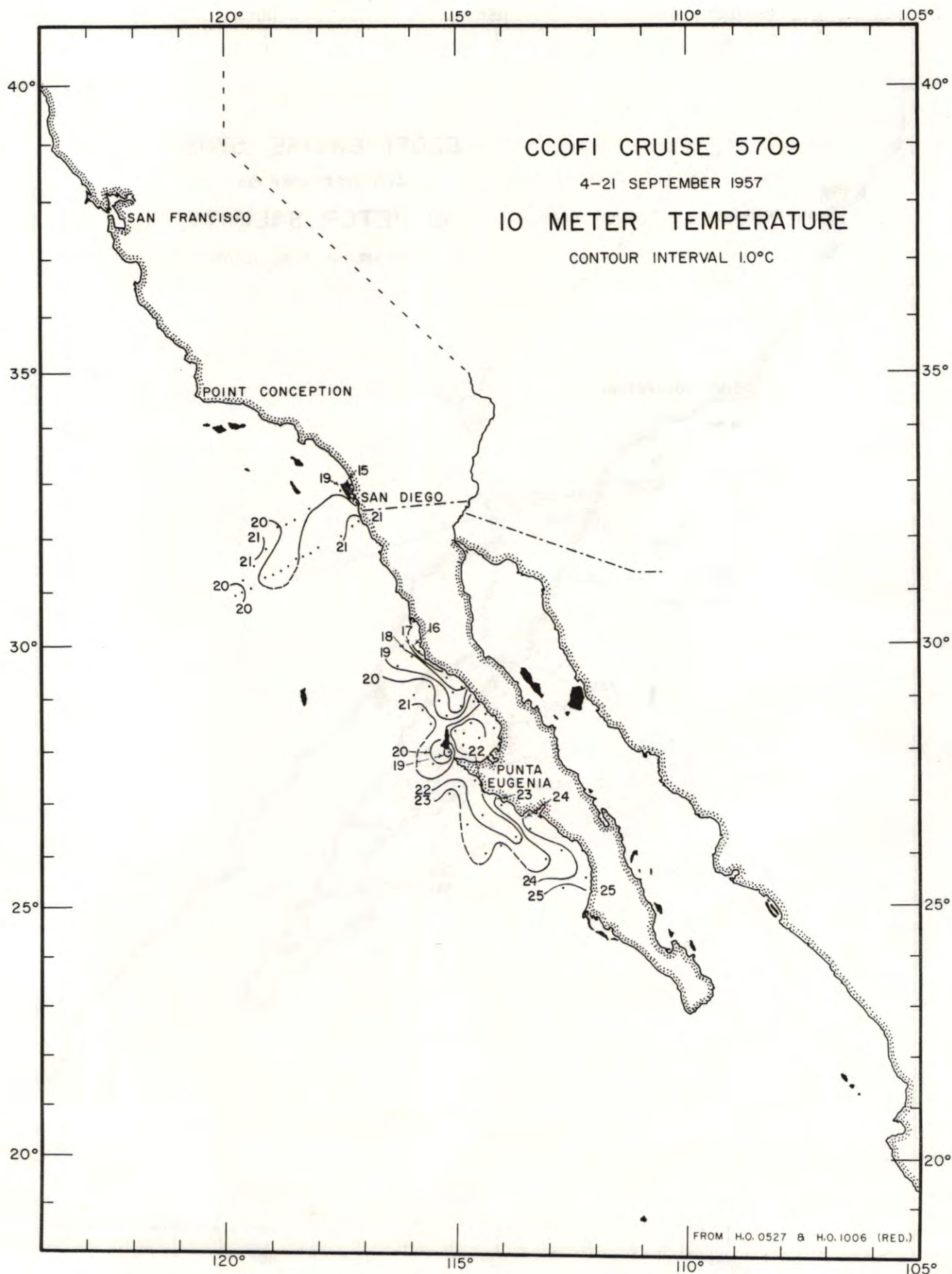


FIGURE 2

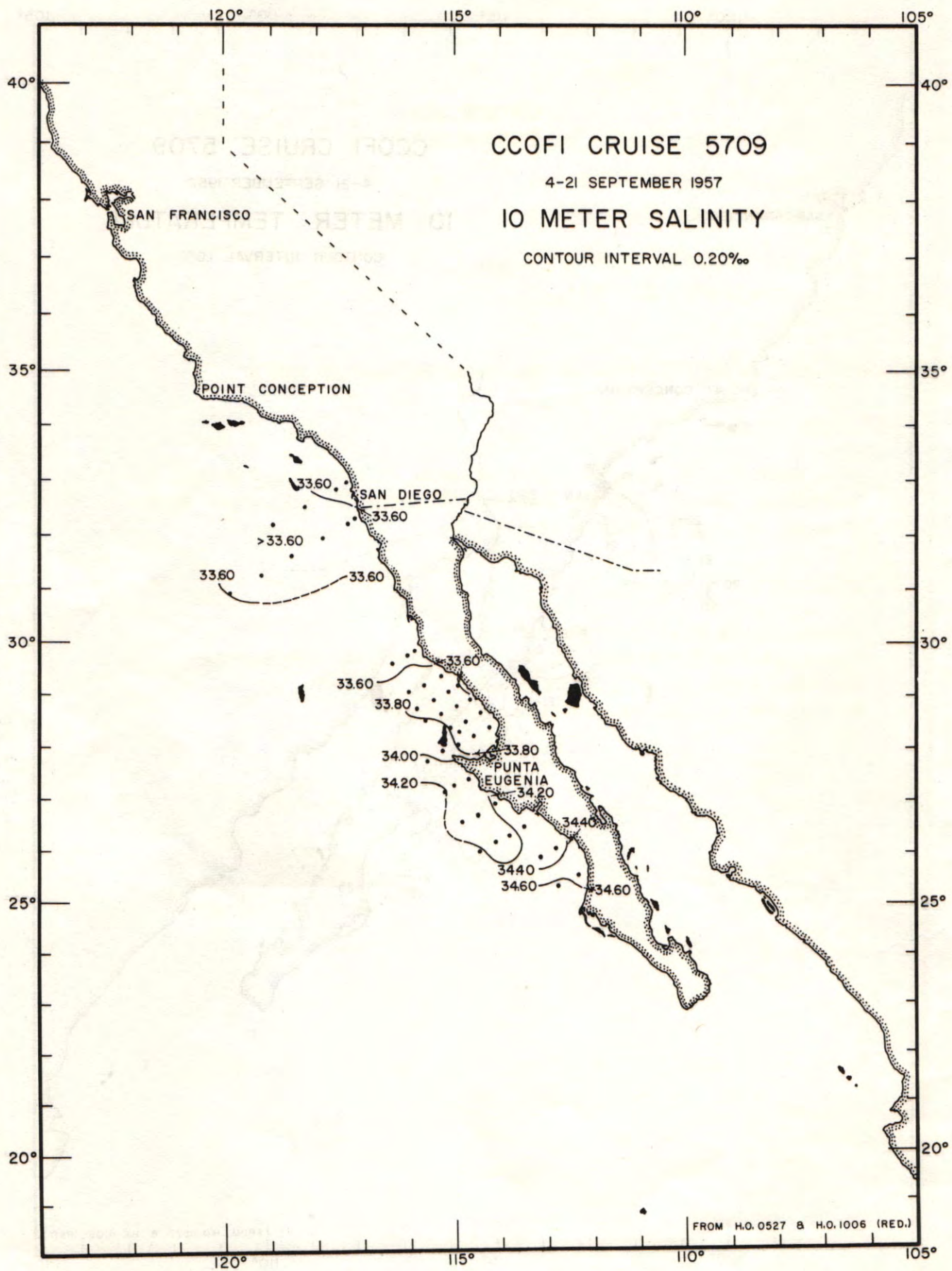


FIGURE 3

CRUISE 5709
PERSONNEL

SHIPS' CAPTAINS

Forster, Charles W., R/V Black Douglas
Smith, Charles H., R/V Stranger

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

R/V Black Douglas

Wolf, Robert S., Fishery Research Biologist, U. S. Fish and Wildlife Service
MacGregor, John S., Fishery Research Biologist, U. S. Fish and Wildlife Service
Brennan, Robert E., Marine Technician

R/V Stranger

Brown, Daniel M., Senior Marine Technician
Bower, Donald R., Fishery Aid, U. S. Fish and Wildlife Service
Froerer, Arthur I., Marine Technician
Wyllie, John G., Senior Laboratory Technician

OBSERVED				INTERPOLATED				COMPUTED		
Z	T	S	O ₂	Z	T	S	O ₂	σ _t	δ _T	ΔD
m	°C	‰	ml/L	m	°C	‰	ml/L	g/L	10 ⁻⁵ cm ³ /g	dyn. m

SIO
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5709

STRANGER; September 6, 1957; 1605 GCT; 32°50'N, 117°31.5'W; sounding, 430 fm; wind, 300°, force 2; weather, overcast; sea, moderate; wire angle, 00°.

93.30

0	19.99	33.58	5.90	0	19.99	33.58	5.90	23.70	420	0.00
10	18.65	33.53	5.90	10	18.65	33.53	5.90	24.01	391	0.04
30	14.26	33.35	6.44	20	15.48	33.39	6.31	24.65	330	0.08
40	13.32	33.40	6.16	30	14.26	33.35	6.44	24.88	308	0.11
50	12.36	33.38	5.74	50	12.36	33.38	5.74	25.29	269	0.17
60	11.66	33.38	5.29	75	11.39	33.46	4.58	25.53	246	0.23
69	11.63	33.46	4.63	100	10.40	33.61	3.67	25.82	218	0.29
83	10.80	33.47	4.54	150	10.35	33.92	2.37	26.07	195	0.39
100p	10.40	33.61	3.67	200	10.26	34.16	1.85	26.28	175	0.49
126p	10.50	33.84	2.60	250	9.81	34.32	1.19	26.48	156	0.57
164p	10.14	33.95	2.34	300	8.34	34.23	1.33	26.64	141	0.65
228p	9.54	34.19	1.60	400	7.24	34.29	0.70	26.85	121	0.78
309p	8.11	34.22	1.34							
421p	7.12	34.31	0.61							

STRANGER; September 6, 1957; 1049 GCT; 32°30'N, 118°12.5'W; sounding, 554 fm; wind, 350°, force 2; weather, cloudy; sea, moderate; wire angle, 01°.

9340

0	19.80	33.68	5.25	0	19.80	33.68	5.25	23.83	408	0.00
10	19.82	33.68	5.39	10	19.82	33.68	5.39	23.82	409	0.04
30	14.01	33.40	6.20	20	16.20	33.47	6.00	24.54	340	0.08
40	13.12	33.40	6.21	30	14.01	33.40	6.20	24.96	300	0.11
50	12.19	33.39	5.56	50	12.19	33.39	5.56	25.33	265	0.17
60	11.76	33.40	4.76	75	10.71	33.46	4.72	25.65	235	0.23
70	10.96	33.44	4.96	100	10.16	33.60	3.72	25.86	215	0.29
84	10.45	33.50	4.14	150	9.51	34.01	2.30	26.29	174	0.38
98	10.18	33.60	3.78	200	9.41	34.23	1.40	26.47	157	0.47
113	9.96	33.69	3.36	250	9.17	34.26	1.22	26.54	151	0.55
136	9.52	33.91	2.64	300	8.76	34.27	1.10	26.61	144	0.62
164	9.50	34.10	1.90	400	7.51	34.25	0.90	26.78	128	0.76
195	9.43	34.21	1.44	500	6.70	34.27	0.52	27.02	105	0.89
243	9.20	34.26	1.26							
317	8.59	34.27	1.06							
411	7.40	34.25	0.87							
537	6.46	34.29	0.40							

STRANGER; September 6, 1957; 0503 GCT; 32°10'N, 118°53'W; sounding, 855 fm; wind, 310°, force 4; weather, cloudy; sea, moderate; wire angle, 05°.

93.50

0	20.07	33.69	5.33	0	20.07	33.69	5.33	23.77	414	0.00
10	20.06	33.69	5.28	10	20.06	33.69	5.28	23.77	414	0.04
30	18.74 ^{a)}	33.60	5.74	20	20.04	33.69	5.29	23.77	414	0.08
40	14.80	33.40	6.19	30	18.74	33.60	5.74	24.03	389	0.12
50	13.29	33.42	5.75	50	13.29	33.42	5.75	25.13	284	0.19
59	12.69	33.44	5.02	75	11.27	33.47	4.55	25.56	244	0.26
69	11.67	33.48	4.61	100	9.91	33.56	3.91	25.87	214	0.31
83	10.78	33.46	4.47	150	9.26	33.92	2.67	26.25	178	0.42
97	10.02	33.54	3.96	200	9.12	34.19	1.57	26.48	156	0.50
111	9.59	33.61	3.72	250	8.35	34.19	1.43	26.61	144	0.58
134	9.36	33.81	3.06	300	8.08	34.26	1.00	26.70	135	0.65
161	9.22	33.95	2.42	400	7.40	34.31	0.57	26.85	121	0.78
193	9.21	34.18	1.61	500	6.51	34.28	0.57	26.94	112	0.90
238	8.42	34.18	1.45							
313	8.00	34.28	0.89							
406	7.36	34.32	0.57							
530	6.21	34.26	0.57							

a) Mean value between 18.68° and 18.81°.

SIO

CCOFI
5709

OBSERVED				INTERPOLATED				COMPUTED		
Z	T	S	O ₂	Z	T	S	O ₂	σ_t	δ_T	ΔD
m	°C	‰	ml/L	m	°C	‰	ml/L	g/L	$10^{-5} \text{cm}^3/\text{g}$	dyn. m

97.32

STRANGER; September 4, 1957; 2357 GCT; 32°11.5'N, 117°16.5'W; sounding, 750 fm; wind, 330°, force 5; weather, partly cloudy; sea, moderate; wire angle, 25°.

0	21.36	33.72	5.22	0	21.36	33.72	5.22	23.44	445	0.00
8	21.35	33.69	5.19	10	21.33	33.69	5.19	23.43	446	0.04
27	19.75	33.61	5.42	20	20.65	33.65	5.29	23.58	432	0.09
40	15.67	33.39	5.95	30	19.02	33.57	5.53	23.94	398	0.13
49	13.87	33.40	6.08	50	13.84	33.40	6.08	25.01	296	0.20
58	12.69	33.35	5.70	75	11.40	33.38	5.00	25.46	253	0.27
67	11.95	33.36	5.34	100	11.11	33.68	3.40	25.75	225	0.33
83	11.19	33.40	4.76	150	9.72	33.82	2.92	26.10	192	0.43
95	11.05	33.58	4.07	200	10.11	34.16	1.53	26.30	173	0.53
108	11.14	33.78	2.98	250	9.40	34.22	1.37	26.36	168	0.61
128	10.82	33.91	2.13	300	8.68	34.26	1.25	26.62	143	0.69
153	9.60	33.82	2.96	400	7.58	34.31	0.64	26.82	124	0.83
187	10.20	34.13	1.61	500	6.75	34.31	0.42	26.94	113	0.95
234	9.66	34.20	1.40							
307	8.59	34.27	1.23							
401	7.56	34.31	0.64							
535	6.47	34.31	0.37							

97.40

STRANGER; September 5, 1957; 0458 GCT; 31°55'N, 117°50.5'W; sounding, 850 fm; wind, 320°, force 5; weather, cloudy; sea, slight; wire angle, 12°.

0	20.88	33.64	5.25	0	20.88	33.64	5.25	23.52	438	0.00
10	20.88	33.66	5.21	10	20.88	33.66	5.21	23.54	436	0.04
30	20.22	33.63 ^{a)}	5.37	20	20.67	33.65	5.27	23.58	432	0.09
44	15.54	33.44	6.06	30	20.22	33.63	5.37	23.67	423	0.13
53	14.40	33.42	6.20	50	14.86	33.43	6.15	24.81	315	0.20
63	12.84	33.40	5.87	75	11.40	33.42	4.97	25.49	250	0.27
73	11.56	33.41	5.04	100	10.33	33.55	4.19	25.78	223	0.34
91	10.50	33.49	4.38	150	9.18	33.83	3.07	26.19	183	0.44
105	10.25	33.57	4.09	200	8.49	34.01	2.43	26.44	160	0.52
119	9.88	33.64	3.62	250	7.79	34.10	1.85	26.62	143	0.60
142	9.28	33.80	3.18	300	7.33	34.15	1.46	26.72	133	0.67
169	8.97	33.89	2.86	400	6.52	34.20	0.88	26.88	118	0.80
205	8.40	34.02	2.34	500	5.99	34.29	0.46	27.02	105	0.92
255	7.70	34.11	1.81							
334	7.04	34.17	1.25							
433	6.28	34.22	0.74							
570	5.81	34.35	0.31							

97.50

STRANGER; September 5, 1957; 1011 GCT; 31°35.5'N, 118°30'W; sounding, 1075 fm; wind, 320°, force 3; weather, cloudy; sea, rough; wire angle, 02°.

0	20.00	33.77	5.26	0	20.00	33.77	5.26	23.84	407	0.00
10	19.97	33.77	5.28	10	19.97	33.77	5.28	23.85	406	0.04
30	19.45	33.71	5.39	20	19.81	33.75	5.30	23.88	403	0.08
45	13.32	33.39	6.42	30	19.45	33.71	5.39	23.94	398	0.12
55	11.90	33.35	5.43	50	12.40	33.36	5.91	25.26	272	0.19
64	11.55	33.40	5.12	75	10.89	33.40	4.58	25.58	242	0.25
74	10.95	33.40	4.66	100	10.15	33.54	3.90	25.81	220	0.31
93	10.23	33.48	4.03	150	9.39	33.87	2.17	26.19	183	0.41
107	10.03	33.59	3.72	200	9.00	34.12	1.91	26.45	159	0.50
121	9.84	33.66	3.41	250	8.50	34.23	1.38	26.62	143	0.58
144	9.56	33.86	2.08	300	7.59	34.20	1.16	26.73	133	0.65
172	8.66	33.91	2.54	400	6.53	34.22	0.54	26.89	118	0.78
210	9.07	34.18	1.69	500	6.07	34.28	0.37	27.00	107	0.90
261	8.32	34.23	1.33							
339	6.96	34.18	0.94							
440	6.35	34.25	0.47							
579	5.63	34.33	0.26							

a) Loose bottle cap; value falls on property curve.

OBSERVED				INTERPOLATED				COMPUTED		
Z	T	S	O ₂	Z	T	S	O ₂	σ _t	δ _T ₃	ΔD
m	°C	‰	ml/L	m	°C	‰	ml/L	g/L	10 ⁻⁵ cm/g	dyn. m

STRANGER; September 5, 1957; 1518 GCT; 31°15.5'N, 119°10.5'W; sounding, 1950 fm; wind, 300°, force 4; weather, cloudy; sea, moderate; wire angle, 03°.

97.60

0	19.39	33.69	5.39	0	19.39	33.69	5.39	23.95	397	0.00
10	19.39	33.69	5.29	10	19.39	33.69	5.29	23.95	397	0.04
30	19.39	33.70	5.34	20	19.39	33.70	5.32	23.95	397	0.08
40	18.54	33.64	5.59	30	19.39	33.70	5.34	23.96	396	0.12
50	12.45	33.45	6.53	50	12.45	33.45	6.53	25.32	266	0.18
59	11.30	33.42	4.63	75	10.43	33.53	3.83	25.75	225	0.25
68	10.68	33.49	4.02	100	9.62	33.69	3.30	26.01	200	0.30
83	10.17	33.57	3.62	150	8.73	33.93	2.63	26.35	169	0.39
97	9.72	33.66	3.36	200	8.20	34.06	2.07	26.53	152	0.48
111	9.34	33.80	3.11	250	7.67	34.11	1.71	26.65	140	0.55
134	8.96	33.89	2.85	300	7.20	34.15	1.28	26.74	131	0.62
162	8.60	33.96	2.49	400	6.59	34.24	0.55	26.91	116	0.75
194	8.22	34.05	2.10	500	6.05	34.30	0.35	27.01	106	0.86
242	7.79	34.10	1.79							
316	7.01	34.17	1.14							
411	6.53	34.25	0.52							
535	5.86	34.32	0.29							

STRANGER; September 5, 1957; 1919 GCT; 30°55'N, 119°50'W; sounding, 2000+ fm; wind, 320°, force 3; weather, overcast; sea, moderate; wire angle, 18°.

97.70

0	19.26	33.56	5.39	0	19.26	33.56	5.39	23.89	403	0.00
9	19.13	33.60	5.40	10	19.12	33.60	5.40	23.95	397	0.04
28	18.44	33.63	5.36	20	18.76	33.63	5.37	24.05	387	0.08
38	18.22	33.59	5.59	30	18.42	33.63	5.38	24.14	379	0.12
47	17.64	33.58	5.62	50	17.33	33.56	5.68	24.35	358	0.19
57	16.64	33.49	5.82	75	13.21	33.31	6.03	25.07	290	0.27
65	13.90	33.24	5.93	100	11.57	33.35	5.18	25.45	254	0.34
79	12.99	33.33	6.04	150	9.78	33.67	3.24	25.97	204	0.46
92	12.24	33.33	5.69	200	8.79	33.92	2.65	26.33	170	0.56
105	11.18	33.36	4.85	250	8.10	34.05	2.14	26.54	151	0.64
127	10.28	33.38	3.28	300	7.51	34.13	1.49	26.68	137	0.71
151	9.76	33.68	3.23	400	6.59	34.21	0.86	26.87	119	0.84
181	9.11	33.85	2.87	500	(5.61)	(34.23)	(0.53)	(27.02)	(105)	(0.96)
223	8.42	33.99	2.43							
292	7.60	34.12	1.60							
379	6.76	34.20	0.93							
495	5.68	34.23	0.55							

BLACK DOUGLAS; September 13, 1957; 0116 GCT; 29°22.5'N, 115°17.5'W; sounding, 31 fm; wind, 300°, force 6; weather, clear; sea, rough; wire angle, 02°.

113.30

0	17.8	33.71	5.78	0			5.78			
10	17.74	33.68	5.84	10			5.84			
29	16.61	33.68	5.53	20			5.72			

BLACK DOUGLAS; September 13, 1957; 0455, 0512 GCT; 29°12'N, 115°39'W; sounding, 600 fm; wind, 320°, force 5; weather, clear; sea, very rough; wire angle, 04°, 04°.

113.35

0	20.0	33.66	5.44	0	20.0	33.66	5.44	23.74	436	
				10	20.0	33.71	5.44	23.80	411	
9	20.02	33.72	5.44	20	20.0	33.65	5.44	23.74	436	
24	20.0	33.64	5.48	30	20.0	33.63	5.70	23.74	436	
38	18.4	33.56	6.08	50	16.0	33.50	6.07	24.61	334	
46	17.0	33.50	6.09	75	13.1	33.44	5.70	25.18	279	
56	15.0	33.51	6.03	100	11.8	33.57	4.39	25.54	245	
66	-	33.46	6.07	150	10.2	33.95	2.73	26.12	190	
76	13.08	33.44	5.61	200	9.8	34.24	1.69	26.41	162	
84	13.9	33.46	5.11	250	9.5	34.28	1.41			
94	12.1	33.53	4.65							
115	11.1	33.68	3.64							
144	10.17	33.88	2.85							
190	9.9	34.22	1.86							
237	9.58	34.27	1.34							
283	8.17	34.14	1.86							

SIO

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5709

OBSERVED				INTERPOLATED				COMPUTED		
Z	T	S	O ₂	Z	T	S	O ₂	σ_t	δ_T	ΔD
m	°C	‰	ml/L	m	°C	‰	ml/L	g/L	$10^5 \text{ cm}^3/\text{g}$	dyn. m

113.40

BLACK DOUGLAS; September 13, 1957; 0855 GCT; 29°02'N, 115°58.5'W; sounding, 900 fm; wind, 290°, force 5; weather, clear; sea, rough; wire angle, 05°.

0	21.2	33.79	5.19	0	21.2	33.79	5.19	23.55	435
9	21.18	33.77 ^{a)}	5.20	10	21.2	33.77	5.21	23.53	437
23	21.2	33.71	5.33	20	21.2	33.72	5.30	23.49	440
37	21.2	33.73	5.79	30	21.2	33.72	5.54	23.49	440
46	20.2	33.57	5.95	50	18.7	33.52	5.96	23.99	394
55	17.9	33.51	6.01	75	14.4	33.50	5.60	24.96	301
63	17.0	33.53	6.14	100	11.3	33.48	4.96	24.56	244
72	15.12	33.49	5.79	150	9.8	33.83	3.04	26.10	192
80	13.5	33.51	5.34	200	9.2	34.20	1.97	26.49	155
88	12.4	33.49	5.21	250	9.1		1.09		
108	10.7	33.49	4.64						
134	10.22	33.78	3.44						
176	9.5	34.05	2.47						
221	9.13	34.22	1.56						
265	9.05	34.20u	0.86						

115.27

BLACK DOUGLAS; September 13, 1957; 2147 GCT; 29°11'N, 114°55.5'W; sounding, 39 fm; wind, 300°, force 5; weather, clear; sea, rough; wire angle, 04°.

0	20.2	33.71	5.41	0			5.41		
9	18.28	33.61	5.80	10			5.85		
23	-	33.58	6.00	20			6.00		
38	-	33.61	5.51	30			5.94		
48	-	33.74	4.77	50			4.61		
57	14.08	33.76	3.98						

115.30

BLACK DOUGLAS; September 13, 1957; 1927, 1953, 2007 GCT; 29°05'N, 115°08'W; sounding, 52 fm; wind, 300°, force 4; weather, clear; sea, rough; wire angle, 03°, 03°, 02°.

0	19.4	33.68	5.52	0			5.52		
				10			5.56		
10	-	33.69	5.56	20			5.70		
25	-	33.59	5.77	30			4.75		
39	-	33.94	3.16	50			2.63		
				75			2.17		
49	-	34.05	2.61						
58	-	33.82	3.37						
68	-	33.84	2.94						
77	12.84	34.00	1.90						

115.35

BLACK DOUGLAS; September 13, 1957; 1645 GCT; 28°55'N, 115°27.5'W; sounding, 600 fm; wind, 320°, force 5; weather, cloudy; sea, rough; wire angle, 06°.

0	19.8	33.68	5.47	0	19.8	33.68	5.47	23.82	409
9	19.82	33.69	5.45	10	19.8	33.68	5.44	23.82	409
23	19.8	33.70	5.46	20	19.8	33.69	5.43	23.83	408
37	17.7	33.70	5.76	30	19.8	33.70	5.55	23.84	407
47	15.9	33.90	4.54	50	15.7	33.94	4.20	25.03	294
55	15.4	33.99	3.71	75	14.5	33.98	2.96	25.32	266
65	14.9	34.07	2.94	100	13.6	34.07	1.80	25.56	243
74	14.51	33.98	2.97	150	12.2	34.17	1.37	25.92	209
82	14.2	34.05	2.36	200	10.6	34.22	1.21	26.25	178
92	13.9	34.12	1.97	250	10.1	34.36	1.73	26.46	158
114	13.2	33.99	1.59						
141	12.41	34.14	1.41						
187	10.27	34.09	1.10						
233	10.2	34.36	1.85						
283	9.60	34.35	0.92						

a) Possible evaporation; value falls on property curve.

OBSERVED				INTERPOLATED				COMPUTED		
Z	T	S	O ₂	Z	T	S	O ₂	σ_t	δ_T	ΔD
m	°C	‰	ml/L	m	°C	‰	ml/L	g/L	10 ⁻⁵ cm ³ /g	dyn. m

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BLACK DOUGLAS; September 13, 1957; 1225 GCT; 28°45'N, 115°47'W; sounding, 750 fm; wind, 300°, force 5; weather, clear; sea, very rough; wire angle, 10°.

11540

0	21.2	33.77	5.51	0	21.2	33.77	5.51	23.51	439
9	21.23	33.72	5.30	10	21.2	33.72	5.29	23.48	442
23	21.2	33.74	5.26	20	21.2	33.72	5.26	23.49	441
37	21.2	33.73	-	30	21.2	33.73	5.26	23.49	441
47	20.2	33.66	5.46	50	19.5	33.62	5.58	23.86	405
56	18.3	33.53	5.91	75	15.18	33.46	5.99	24.77	318
65	16.8	33.46	6.11	100	11.0	33.46	4.68	25.59	240
75	15.18	33.46	5.99	150	10.3	33.93	2.90	26.10	192
84	13.7	33.48	5.36	200	9.9	34.21	1.55	26.37	166
93	12.0	33.49	4.84	250	9.4	34.30	1.31	26.52	152
115	10.2	33.52	4.34						
141	10.26	33.84 ^{a)}	3.26						
184	10.2	34.18	1.63						
229	9.60	34.28	1.49						
273	9.29	34.35	1.05						

BLACK DOUGLAS; September 14, 1957; 0026 GCT; 28°55.5'N, 114°40.5'W; sounding, 39 fm; wind, 300°, force 5; weather, clear; sea, moderate; wire angle, 14°.

11726

0	20.8	33.72	5.23	0			5.23
9	20.48	33.78	5.47	10			5.50
23	-	33.70	6.00	20			5.96
37	-	33.64	5.77	30			5.95
47	-	33.78	4.74	50			5.62
56	14.81	33.73	4.36	75			3.93

BLACK DOUGLAS; September 14, 1957; 0235 GCT; 28°48'N, 114°56.5'W; sounding, 56 fm; wind, 280°, force 5; weather, clear; sea, rough; wire angle, 12°.

11730

0	19.2	33.68	5.65	0			5.65
9	19.08	33.69	5.39	10			5.37
23	-	33.61	5.10	20			5.15
37	-	33.45	4.90	30			4.99
47	-	33.78	4.83	50			4.79
56	-	33.91	4.71	75			3.93
65	-	33.82	4.55				
75	-	33.92	3.93				
84	14.24	33.95	2.69				

BLACK DOUGLAS; September 14, 1957; 0545 GCT; 28°38'N, 115°16'W; sounding, 125 fm; wind, 300°, force 5; weather, clear; sea, very rough; wire angle, missing.

11735

0	19.7	33.68	5.56	0	19.7	33.68	5.56	23.85	406
8	19.69	33.67	5.52	10	19.7	33.67	5.51	23.85	406
22	19.6	33.69	5.44	20	19.6	33.69	5.44	23.88	403
34	19.4	33.72	5.65	30	19.5	33.72	5.56	23.94	398
43	18.7	33.70	5.85	50	17.5	33.80	5.92	24.49	346
52	17.4	33.86	5.92	75	16.3	34.05	4.48	24.96	301
60	16.9	34.01	5.61	100	14.4	33.99	3.81	25.34	264
68	16.54	34.02	5.17	150	11.7	34.08	2.43	25.94	207
76	16.3	34.06	4.45	200	10.4		(1.57)		
84	16.1	34.14	4.32						
103	13.3	34.04r	3.66						
124	13.16	33.96	2.82						
157	11.4	34.10	2.32						
193	10.61	34.31	1.66						
231	9.00	-	-						

a) Loose bottle cap; value falls on property curve.

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OBSERVED				INTERPOLATED				COMPUTED		
Z	T	S	O ₂	Z	T	S	O ₂	σ_t	δ_T	ΔD
m	°C	‰	ml/L	m	°C	‰	ml/L	g/L	$10^5 \text{ cm}^3/\text{g}$	dyn. m

11740

BLACK DOUGLAS; September 14, 1957; 0842 GCT; 28°28'N, 115°35.5'W; sounding, 400 fm; wind, 310°, force 5; weather, clear; sea, rough; wire angle, 10°.

0	21.5	33.80	5.54	0	21.5	33.80	5.54	23.49	441
9	21.46	33.82	5.50	10	21.4	33.82	5.50	23.50	440
23	20.8	33.88	5.49	20	21.4	33.85	5.48	23.53	437
38	18.6	33.87	5.60	30	19.5	33.87	5.54	24.07	385
47	17.7	33.82	5.48	50	17.5	33.84	5.33	24.52	343
56	17.1	33.94	4.47	75	16.14	34.07	3.10	25.02	295
65	16.5	34.05	3.44	100	14.2	34.00	2.16	25.40	259
75	16.14	34.07	3.10	150	12.5	34.07	1.74	25.78	222
84	16.1	34.01	3.25	200	9.8	33.90	2.06	26.15	187
93	15.3	34.13	2.25	250	9.9	34.37	1.20	26.50	155
115	13.4	34.01	2.03						
151	12.70	34.07	1.68						
186	11.4	33.98	2.25						
232	9.96	34.29	1.40						
277	9.56	34.40	0.98						

118525

BLACK DOUGLAS; September 14, 1957; 1905 GCT; 28°40.5'N, 114°25.5'W; sounding, 45 fm; wind, 300°, force 5; weather, clear; sea, rough; wire angle, 06°.

0	21.3	33.78	5.57	0	5.57
9	-	33.78	5.62	10	5.62
23	-	33.77	5.40	20	5.45
38	-	33.78	5.29	30	5.36
48	-	33.78	4.94	50	4.90
57	-	33.75	4.68		
67	13.30	33.62	4.05		

118530

BLACK DOUGLAS; September 14, 1957; 1637 GCT; 28°30.5'N, 114°45.5'W; sounding, 60 fm; wind, 320°, force 5; weather, partly cloudy; sea, moderate; wire angle, 08°.

0	22.2	33.80	5.37	0	5.37
9	22.18	33.79	5.48	10	5.48
23	-	33.82	5.59	20	5.56
38	-	33.68	5.68	30	5.62
48	-	33.66	5.60	50	5.60
57	-	33.63	5.64	75	5.04
67	-	33.73	5.88	100	(3.58)
76	-	-	4.88		
85	-	33.68	4.41		
98	14.58	33.87	3.66		

118535

BLACK DOUGLAS; September 14, 1957; 1230 GCT; 28°20.5'N, 115°05'W; sounding, 65 fm; wind, 300°, force 5; weather, clear; sea, rough; wire angle, 08°.

0	22.4	33.80	5.23	0	5.23
9	-	33.79	5.22	10	5.22
23	-	33.78	5.21	20	5.21
38	-	33.76	5.50	30	5.31
47	-	33.68	5.57	50	5.30
57	-	33.94	4.55	75	4.55
66	-	33.77	4.54	100	(3.28)
76	-	33.73	4.54		
85	-	33.73	4.27		
95	14.18	33.83	3.51		

OBSERVED				INTERPOLATED				COMPUTED		
Z	T	S	O ₂	Z	T	S	O ₂	σ_t	δ_T	ΔD
m	°C	‰	ml/L	m	°C	‰	ml/L	g/L	$10^5 \text{cm}^3/\text{g}$	dyn. m

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BLACK DOUGLAS; September 14, 1957; 1415 GCT; 28°19'N, 114°53'W; sounding, 60 fm; wind, 320°, force 5; weather, partly cloudy; sea, rough; wire angle, 07°.

119.33

0	22.6	33.80	5.10	0			5.10			
9	22.44	33.78	5.08	10			5.08			
23	-	33.78	5.10	20			5.10			
38	-	33.80	5.10	30			5.10			
48	-	33.86	5.18	50			5.19			
57	-	33.79	5.26	75			5.39			
67	-	33.77	5.11							
76	-	33.75	5.46							
86	-	33.87	5.71							
95	14.42	33.64	3.85							

BLACK DOUGLAS; September 14, 1957; 2142 GCT; 28°23'N, 114°15'W; sounding, 29 fm; wind, 290°, force 5; weather, partly cloudy; sea, rough; wire angle, 00°.

120.25

0	21.3	33.77	5.47	0			5.47			
9	21.22	33.75	5.60	10			5.61			
28	-	33.73	5.67	20			5.67			
48	14.75	33.62	4.89	30			5.65			

BLACK DOUGLAS; September 15, 1957; 0025 GCT; 28°13'N, 114°34'W; sounding, 52 fm; wind, 320°, force 5; weather, partly cloudy; sea, rough; wire angle, 15°.

120.30

0	22.1	33.78	5.42	0			5.42			
9	22.04	33.75	5.45	10			5.46			
23	-	-	5.54	20			5.54			
37	-	33.69	5.65	30			5.60			
46	-	33.63	5.79	50			5.86			
56	-	33.62	5.90	75			(4.70)			
65	-	33.62	5.72							
74	16.56	33.88	4.80							

BLACK DOUGLAS; September 15, 1957; 0341 GCT; 28°03'N, 114°54'W; sounding, 47 fm; wind, 320°, force 4; weather, clear; sea, moderate; wire angle, 13°.

120.35

0	22.4	33.78	5.39	0			5.39			
9	22.40	33.78	5.30	10			5.30			
23	-	33.78	5.34	20			5.32			
37	-	33.78	5.40	30			5.38			
47	-	33.80	5.30	50			5.31			
56	-	33.69	5.36							
65	19.72	33.69	5.43							

BLACK DOUGLAS; September 15, 1957; 0855 GCT; 27°43'N, 115°33'W; sounding, 1100 fm; wind, 300°, force 6; weather, partly cloudy; sea, rough; wire angle, 20°.

120.45

0	20.1	34.04	5.77	0	20.1	34.04	5.77	24.02	390	
9	20.12	34.02	5.84	10	20.1	34.02	5.85	24.01	391	
23	17.9	33.93	5.94	20	18.4	33.97	5.92	24.40	354	
36	16.5	33.75	5.84	30	16.4	33.65	5.94	24.66	330	
45	16.6	34.09	4.25	50	16.3	34.08	3.86	25.00	297	
54	16.0	34.07	3.50	75	14.9	34.19	2.62	25.37	261	
62	15.5	34.08	3.02	100	14.3	34.27	1.50	25.58	242	
71	14.92	34.15	2.77	150	14.2	34.50	1.35	25.78	222	
80	15.0	34.22	2.40	200	11.4	34.41	1.02	26.26	177	
88	14.7	34.27	1.66	250	10.5	34.52	0.54	26.51	154	
108	14.3	34.32	1.46							
134	14.34	34.43	1.39							
175	11.8	34.27	1.27							
218	11.18	34.51	0.83							
261	10.61	34.56	0.44							

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters		50 Meters	
						Dir	Force			T	S	T	S
110.33-B	12	2045	29°50.5'	115°52.0'	47	310°	3	cloudy	rough	15.95	33.51	14.16	33.57
110.35-B	12	1930	29°46.5'	116°00.0'	600	310°	3	cloudy	very rough	18.01	33.58	16.07	33.50
110.40-B	12	1645	29°36.5'	116°19.5'	1200	300°	4	cloudy	very rough	19.25	33.57	14.84	33.57
120.40-B	15	0550	27°56.5'	115°14.0'	20	320°	5	clear	rough	21.98	33.95	-	-
123.37-B	15	1840	27°24.0'	114°40.0'	40	310°	6	clear	rough	21.68	34.16	17.02	33.85
123.42-B	15	1620	27°16.0'	115°00.5'	800	320°	6	partly cloudy	very rough	22.86	34.19	16.42	33.66
123.45-B	15	1330	27°08.0'	115°13.0'	2250	320°	6	partly cloudy	rough	23.33	34.20	16.14	33.66
127.34-B	15	2315	26°55.5'	114°06.5'	44	300°	6	clear	rough	23.26	34.25	18.48	34.11
127.40-B	21	0630	26°43.5'	114°29.5'	1600	310°	6	clear	very rough	21.24	34.06	17.04	33.73
127.45-B	21	0320	26°33.5'	114°48.5'	1800	330°	6	partly cloudy	very rough	22.71	34.06	22.67	34.05
130.30-B	16	2030	26°28.5'	113°29.0'	42	300°	5	clear	rough	24.36	34.31	17.92	34.14
130.35-B	20	1515	26°18.5'	113°48.5'	200	330°	5	cloudy	rough	21.26	34.15	19.98	34.07
130.40-B	20	1920	26°09.0'	114°06.5'	1200	310°	6	cloudy	very rough	23.46	34.16	16.38	33.68
130.45-B	20	2200	25°59.0'	114°25.5'	2000	320°	6	partly cloudy	very rough	22.38	34.23	16.42	33.85
133.25-B	17	0118	26°05.0'	112°48.0'	45	300°	5	clear	rough	23.26	34.37	18.46	34.22
133.30-B	20	1025	25°54.5'	113°07.5'	80	340°	5	clear	rough	22.74	34.36	18.35	33.95

TEMPERATURE AND SALINITY AT 10 AND 50 METERS (NET-TOW STATIONS)

Station	Date	Time GCT	Latitude North	Longitude West	Sounding (fm)	Wind		Weather	Sea	10 Meters		50 Meters	
						Dir	Force			T	S	T	S
137.23-B	17	1615	25°34.0'	112°18.5'	39	310°	6	clear	very rough	24.08	34.51	21.09	34.15
137.30-B	20	0230	25°20.0'	112°44.5'	200	320°	6	clear	rough	25.43	34.65	18.22	33.94
93.27-S	7	1755	32°56.0'	117°19.0'	120	140°	1	overcast	slight	15.08	33.35	12.38	33.37
97.30-S	4	2215	32°15.0'	117°08.5'	30	330°	5	partly cloudy	moderate	21.18	33.63	12.68	33.44

TEMPERATURE AND SALINITY AT 10 AND 50 METERS (NET-TOW STATIONS)

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Villa Obregon, D. F.
Mexico

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

Mr. Hans T. Klein
University of California
Scripps Institution of Oceanography
La Jolla, California

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Code 2235
U. S. Navy Electronics Laboratory
San Diego 52, California

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University of California
Scripps Institution of Oceanography
La Jolla, California

Mr. Seth Gordon, Director
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926 J Street
Sacramento 14, California

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

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University of California
Scripps Institution of Oceanography
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Chief of Naval Research
Office of Naval Research
Geophysics Branch
Washington 25, D. C.

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

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

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

Director
Norwegian Polar Institute
Observatorieggt 1
Oslo, Norway

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

Librarian
Pacific Oceanic Fishery Investigations
P. O. Box 3830
Honolulu 12, T. H.

Mr. Don Powell
U. S. Fish and Wildlife Service
2725 Montlake Boulevard
Seattle 2, Washington

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

Mr. Joseph L. Reid, Jr.
University of California
Scripps Institution of Oceanography
La Jolla, California

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Bingham Oceanographic Foundation
Yale University
New Haven, Connecticut

Mr. Gunnar I. Roden
University of California
Scripps Institution of Oceanography
La Jolla, California

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Inter-American Tropical Tuna Commission
c/o Scripps Institution of Oceanography
La Jolla, California

Mr. O. E. Sette, Chief
Ocean Research
U. S. Fish and Wildlife Service
450-B Jordan Hall
Stanford, California

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

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

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

Dr. Roger Revelle
University of California
Scripps Institution of Oceanography
La Jolla, California

Mrs. Margaret K. Robinson
University of California
Scripps Institution of Oceanography
La Jolla, California

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

Mr. Richard A. Schwartzlose
University of California
Scripps Institution of Oceanography
La Jolla, California

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

Miss Margaret Storey, Librarian
Natural History Museum
Stanford, California

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

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

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

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Friday Harbor, Washington

Director
University of Washington
School of Fisheries
Seattle 4, Washington

Mr. Richard C. Vetter
Geophysics Branch
Office of Naval Research
Washington 25, D. C.

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

U. S. Hydrographic Office
Navy Department
Washington 25, D. C.
Attn: Mr. John Lyman

University of California
Department of Zoology
Berkeley 4, California

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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
U. S. Fish and Wildlife Service
734 Jackson Place, N. W.
Washington 25, D. C.

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

Mr. John G. Wyllie (20)
University of California
Scripps Institution of Oceanography
La Jolla, California

Dr. Warren S. Wooster
University of California
Scripps Institution of Oceanography
La Jolla, California

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