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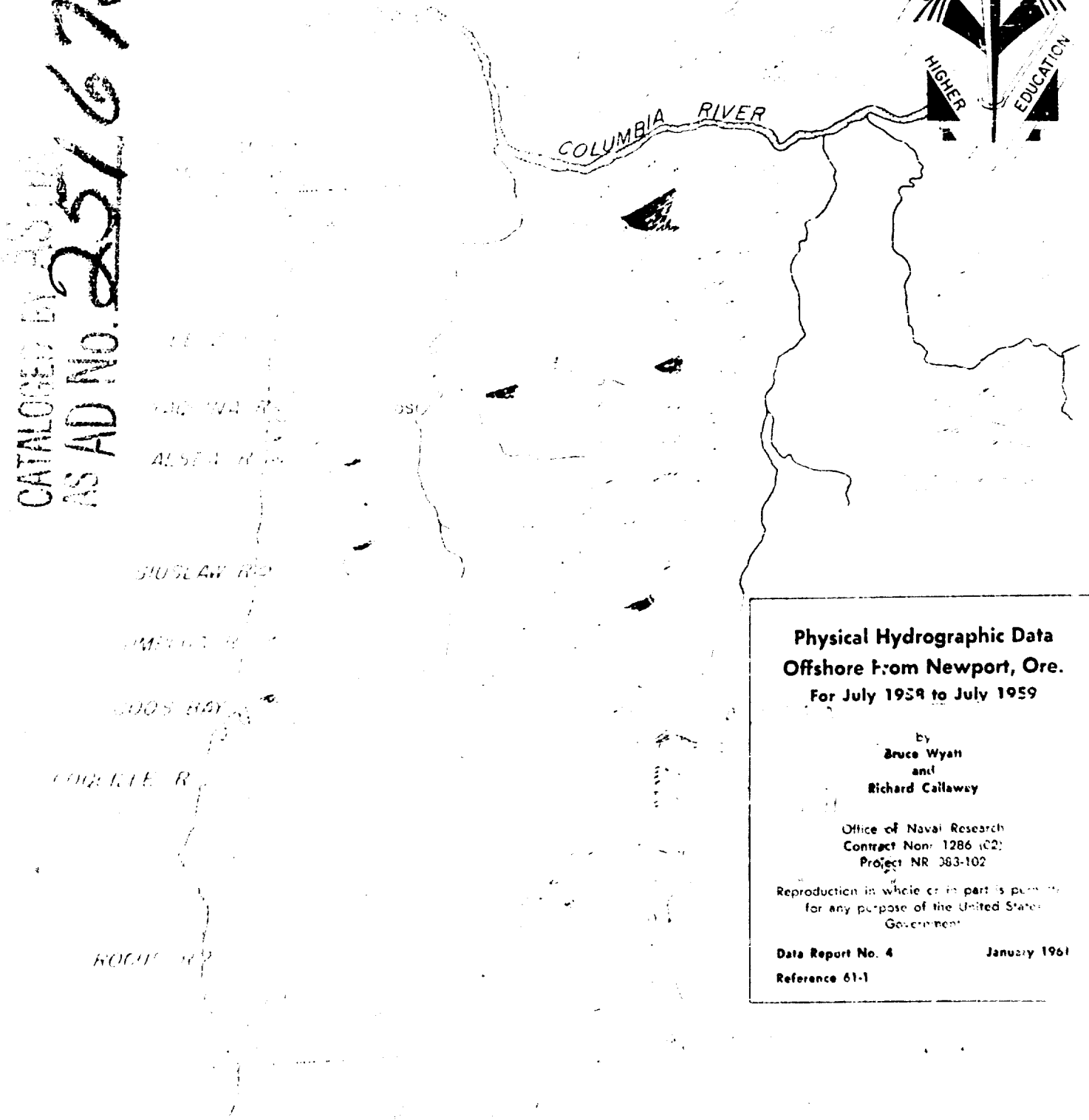

Physical Hydrographic Data Offshore From Newport, Ore.

For July 1958 to July 1959

by
Bruce Wyatt
and
Richard Callaway

Office of Naval Research
Contract Nonr 1286 (02)
Project NR 083-102

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Data Report No. 4 **January 1961**
Reference 61-1

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Department of Oceanography

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Corvallis, Oregon

PHYSICAL HYDROGRAPHIC DATA OFFSHORE FROM NEWPORT, OREGON, FOR JULY 1958 TO JULY 1959

by

Bruce Wyatt

and

Richard Callaway

Data Report No. 4

Office of Naval Research
Contract Nonr 1286 (02)
Project NR 083-102

671 800

Reference 61-1
January 1961

Wayne V. Burt
Chairman

INTRODUCTION

The Department of Oceanography at Oregon State College initiated an oceanographic survey of the Oregon coast on July 1, 1958. The purpose of this report is to present salinity, temperature, and oxygen data collected for the interval from July 1958 to July 1959, and to present a preliminary interpretation of the results.

PROCEDURE

Coast Guard vessels of 40 and 52 feet in length stationed at Newport and commanded by BMI McAdams and BMI Dwyer were used to make surveys at the stations which were located at five mile intervals, from the intersections of the south jetty of Yaquina Bay and the beach to 25 miles offshore, (Figure 1). Samples from the surface, 50 and 100 feet were obtained at each station with the aid of a Frautschy or Kemmerer bottle. Generally the wire angles were negligible. However, an additional four feet of wire was payed out with wire angles between 5° and 10°. Temperatures were taken on deck with a bucket thermometer. Although no tests were made, the accuracy of the temperature measurements was estimated as 0.2°C. Salinity and oxygen samples were analyzed in the laboratory by standard methods.

INDICATIONS OF WATER MASS CHARACTERISTICS OFF NEWPORT, OREGON

Upwelled water has a relatively high salinity, and a relatively low temperature and dissolved oxygen content. Early indications show that during part of the summer a narrow band of upwelling exists to at least five miles and possibly to 15 miles offshore from Newport. Salinities of 33.31°/oo, 32.70°/oo, and 32.63°/oo were present at stations 1, 2, and 3 off Newport in August, 1958 (Table 1). Similar values were obtained during the September and October cruises at these same stations (Table 1 and Figures 4 and 5). Associated with these high salinities, relatively low temperatures were recorded (Station 1, July, 15.2°C., Station 1, August, 10.9°C., Station 1, September, 11.4°C.,) further sustantiating the presence of upwelling, Figure 4 and Table 1.

According to Reid, Roden and Wyllie (1956), the California current system at its upper latitudes should have a minimum salt content of about 32.5°/oo. Lower salinity water might result from the influence of the Columbia River or other coastal runoff. Surface salinity values at Station 3 (15 mile station) for July and September were 29.00°/oo, and 31.92°/oo respectively, (Figures 3 and 4 and Table 1), indicating the possible presence of Columbia River water. Salinity and temperature results obtained during cruises made in November, January, March, and April are more difficult to interpret. More extensive observations made by the U. S. Coast and Geodetic Survey R/V EXPLORER in February of 1960 and by Oregon State College Department of Oceanography should provide indications of winter circulation off the Oregon coast.

DISTRIBUTION OF PROPERTIES

Survey data are presented graphically. Figure 2 is a vertical time section of temperature, salinity, and dissolved oxygen at the 10 mile station off Newport. Figures 3 through 8 are vertical sections of salinity, dissolved oxygen, sigma t, and temperature for stations occupied from July 1, 1958 to June 2, 1959. Observations used to construct curves are presented in Table 1.

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U. S. Hydrographic Office (1955). Instruction Manual for Oceanographic Observations. H. O. Pub. 607. pp. 1 - 210.

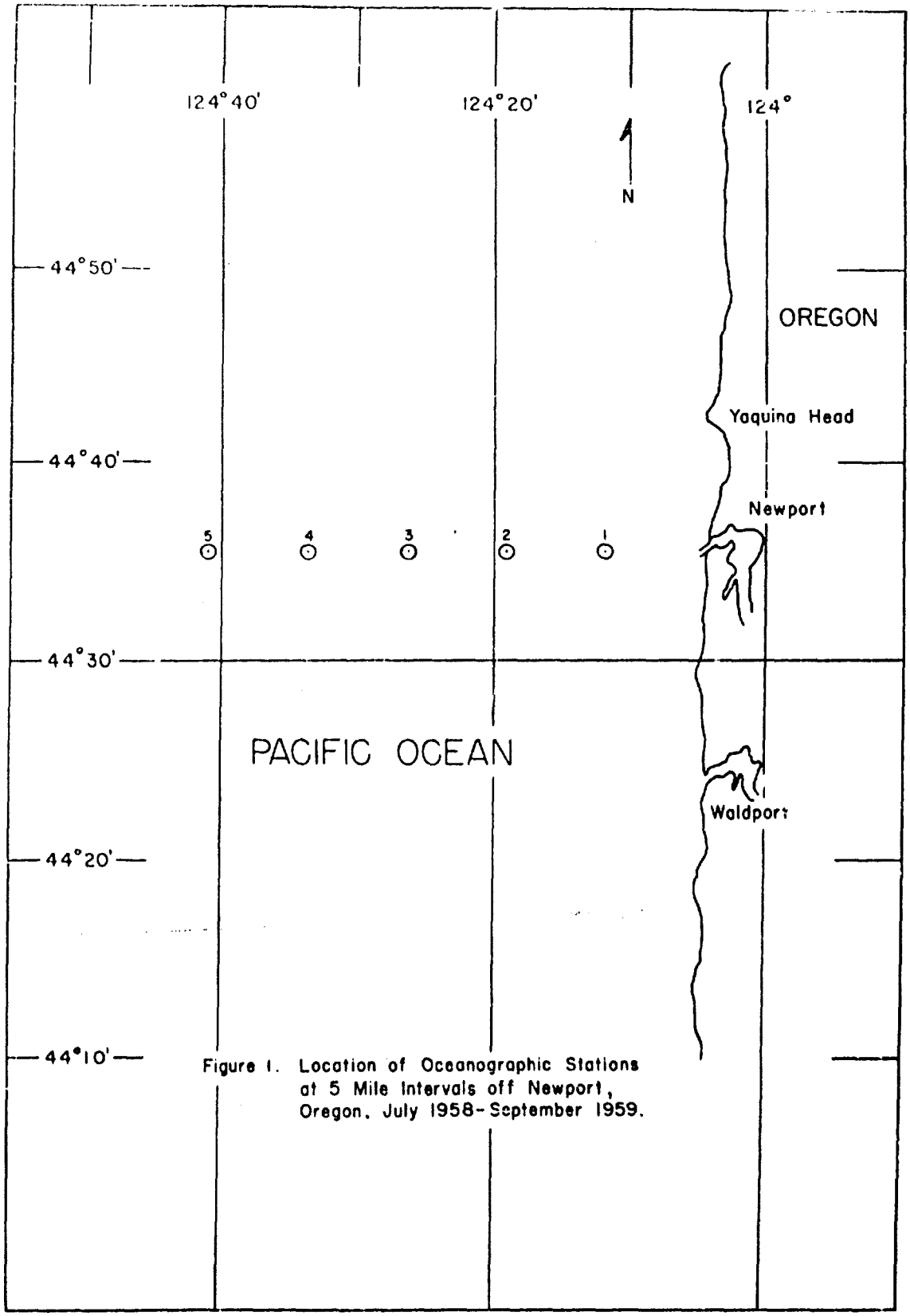

Figure 1. Location of Oceanographic Stations at 5 Mile Intervals off Newport, Oregon, July 1958-September 1959.

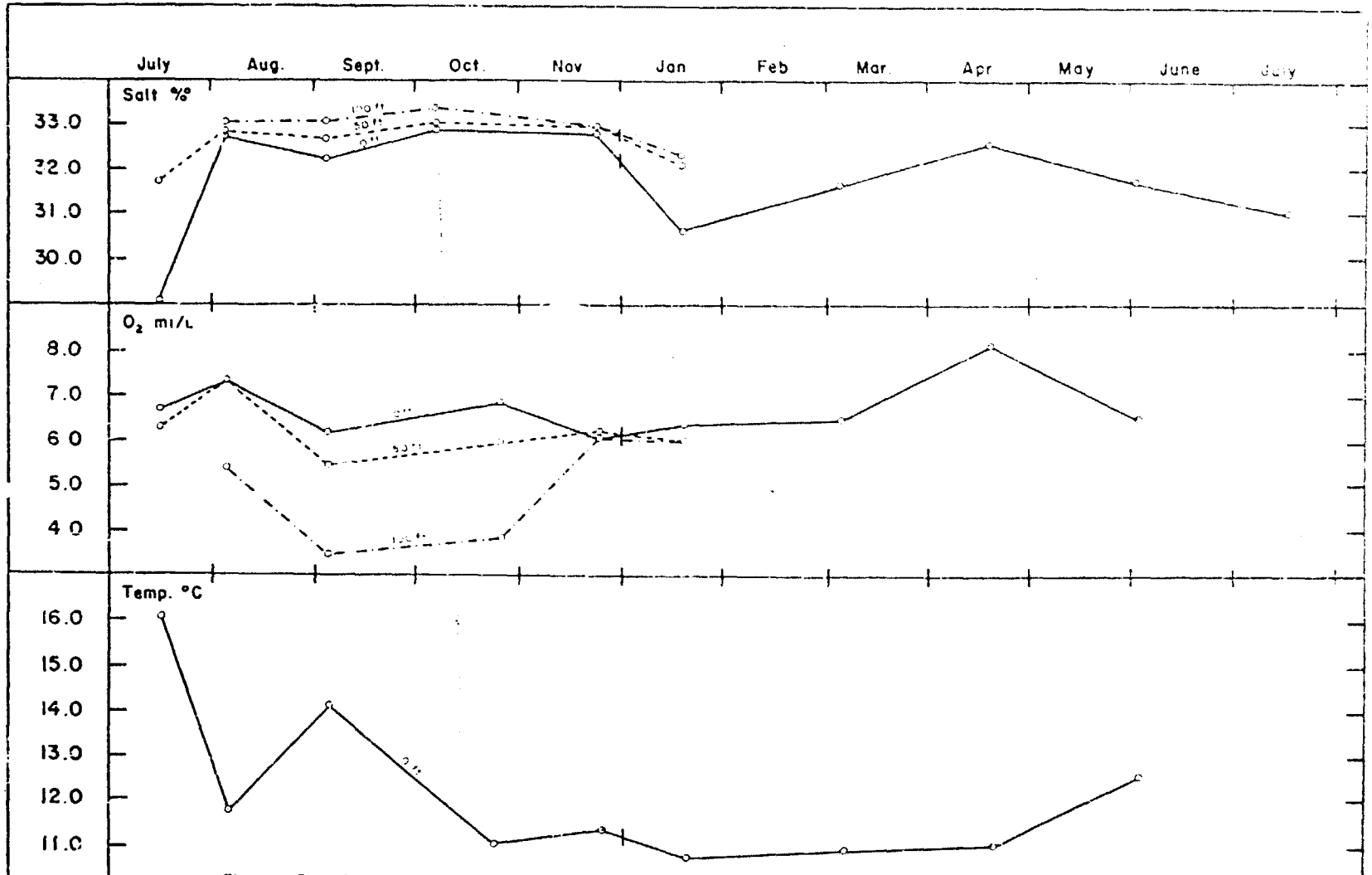

Figure 2. Observations of Salinity, Dissolved Oxygen, and Temperature at Station 2, Ten Miles West of Newport, Oregon, Taken from July 1958 to July 1959.

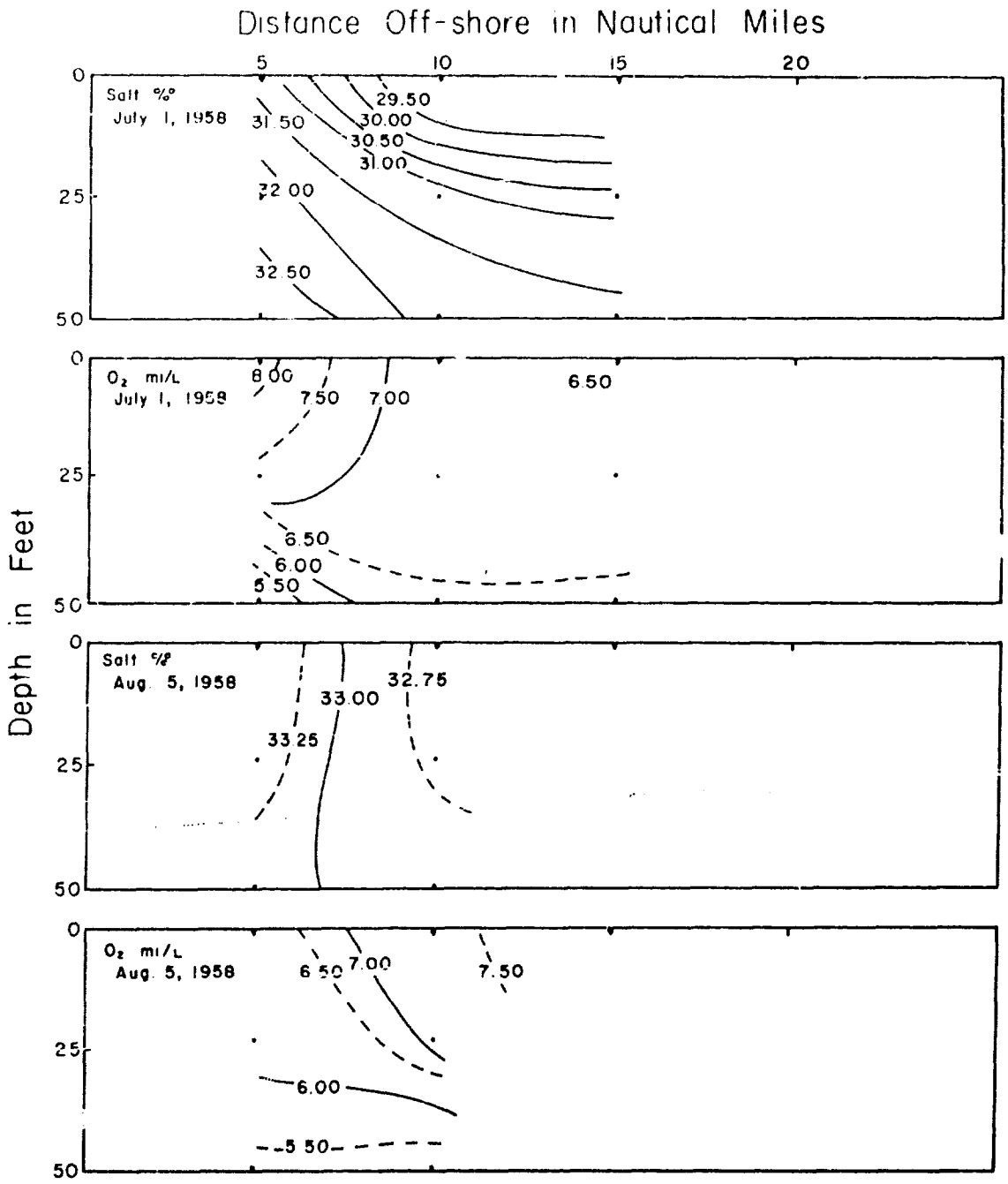

Figure 3. Vertical Distribution of Salinity and Dissolved Oxygen at Three Stations West of Newport, Oregon on July 1, 1958 and August 5, 1958.

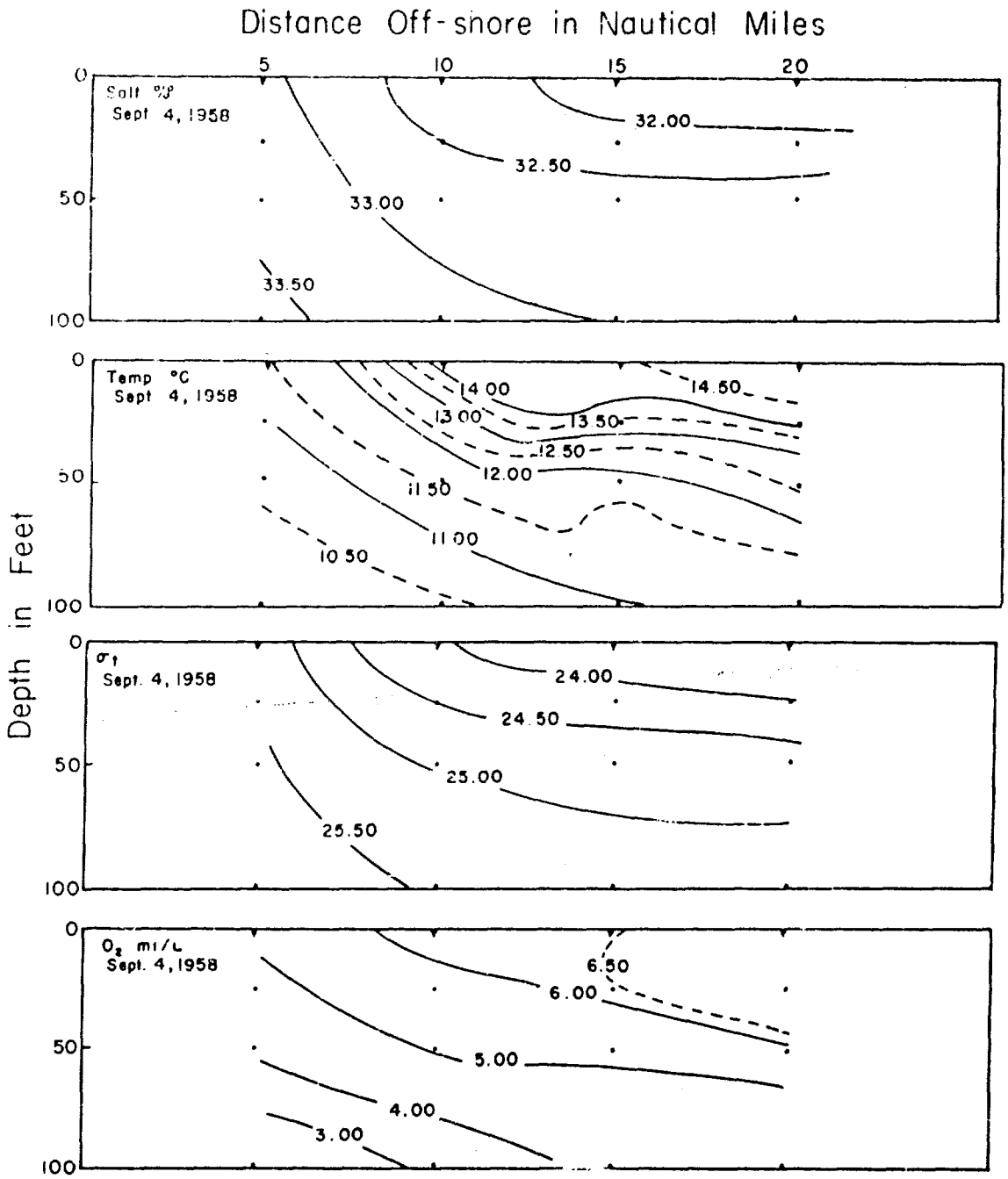

Figure 4. Vertical Distribution of Salinity, Temperature, σ_t, and Dissolved Oxygen at Four Stations West of Newport, Oregon, on September 4, 1958.

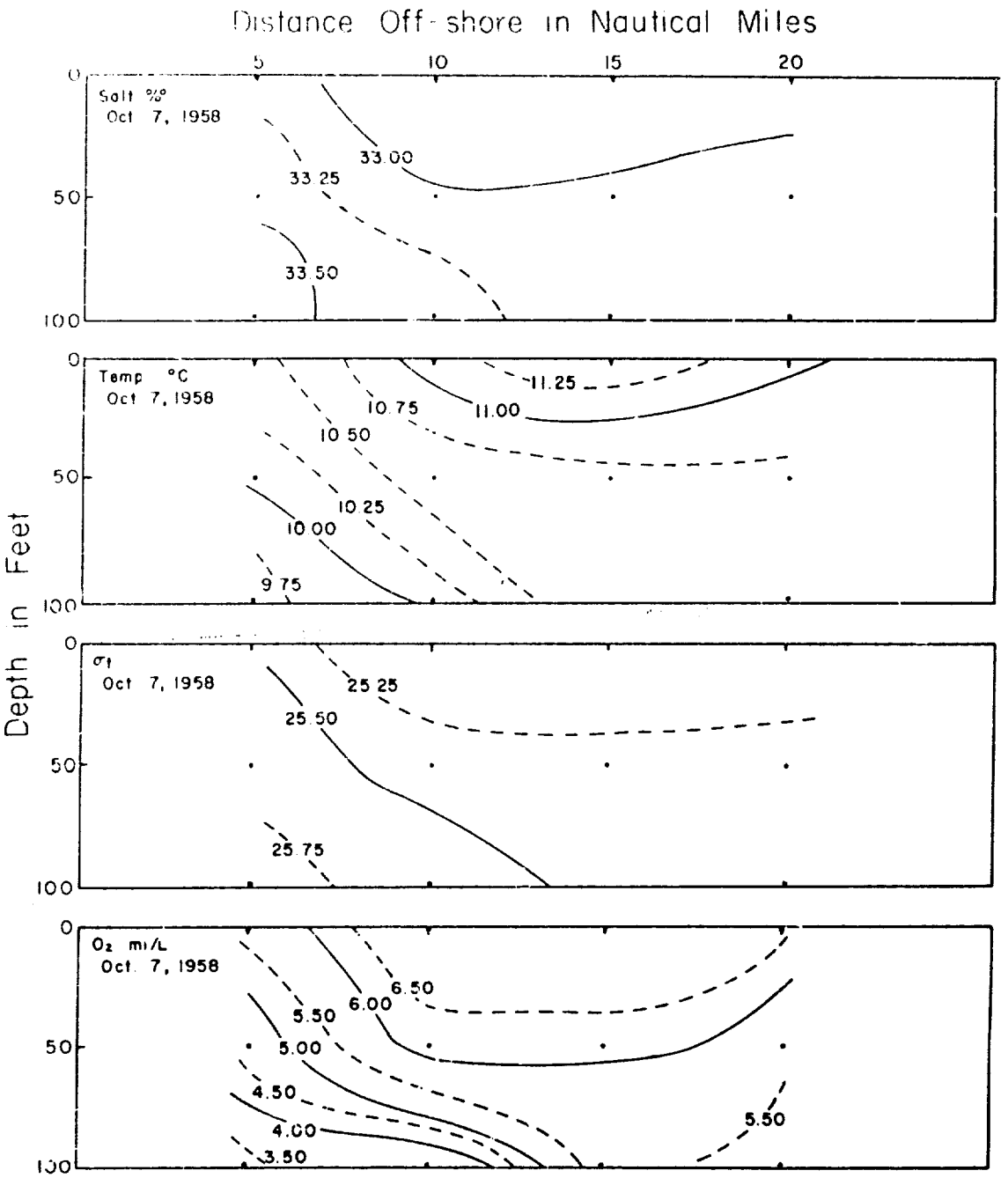

Figure 5. Vertical Distribution of Salinity, Temperature, σ_t, and Dissolved Oxygen at Four Stations West of Newport, Oregon, on October 7, 1958.

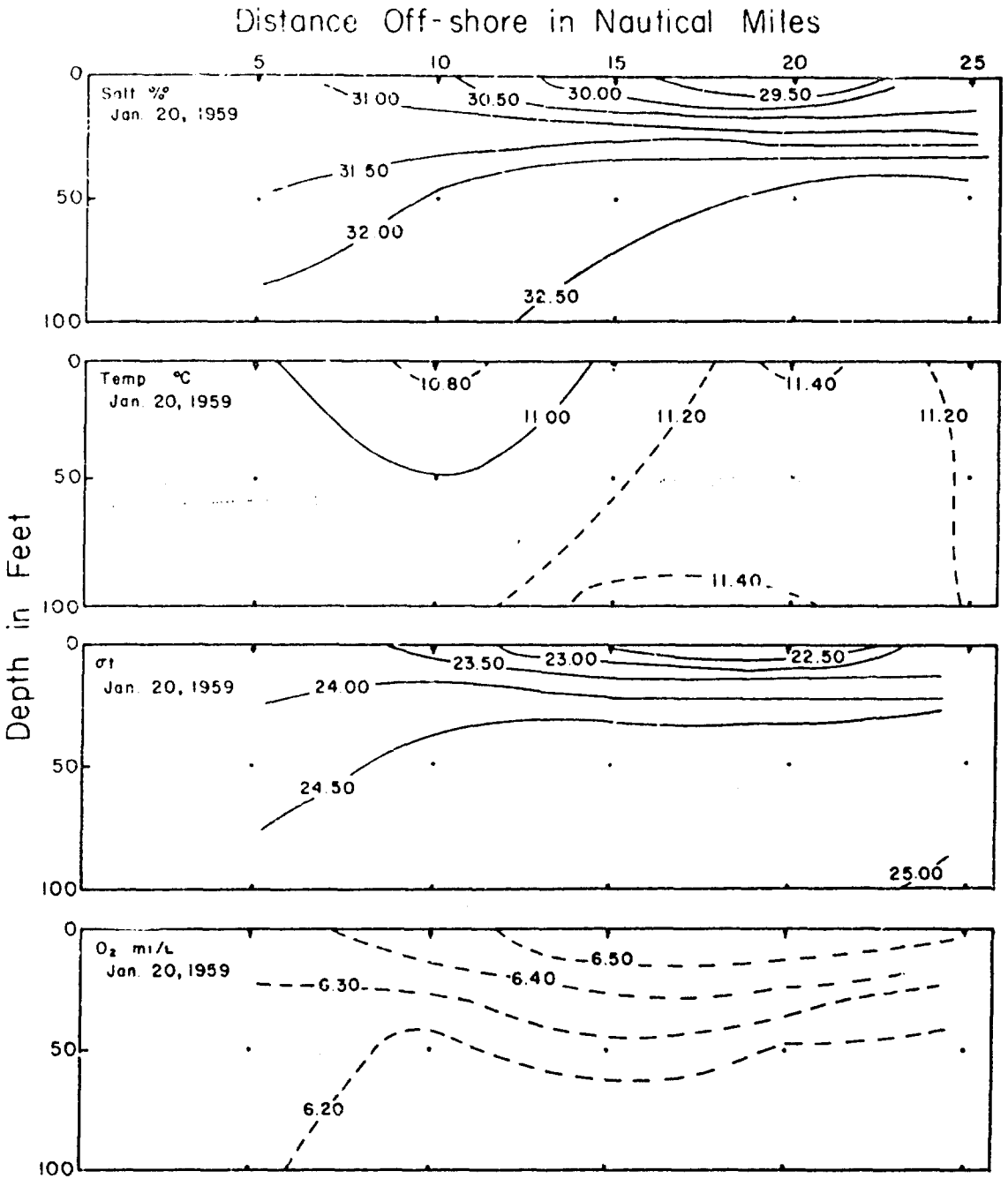

Figure 6. Vertical Distribution of Salinity, Temperature, σ_t, and Dissolved Oxygen at Five Stations West of Newport, Oregon, on January 20, 1959.

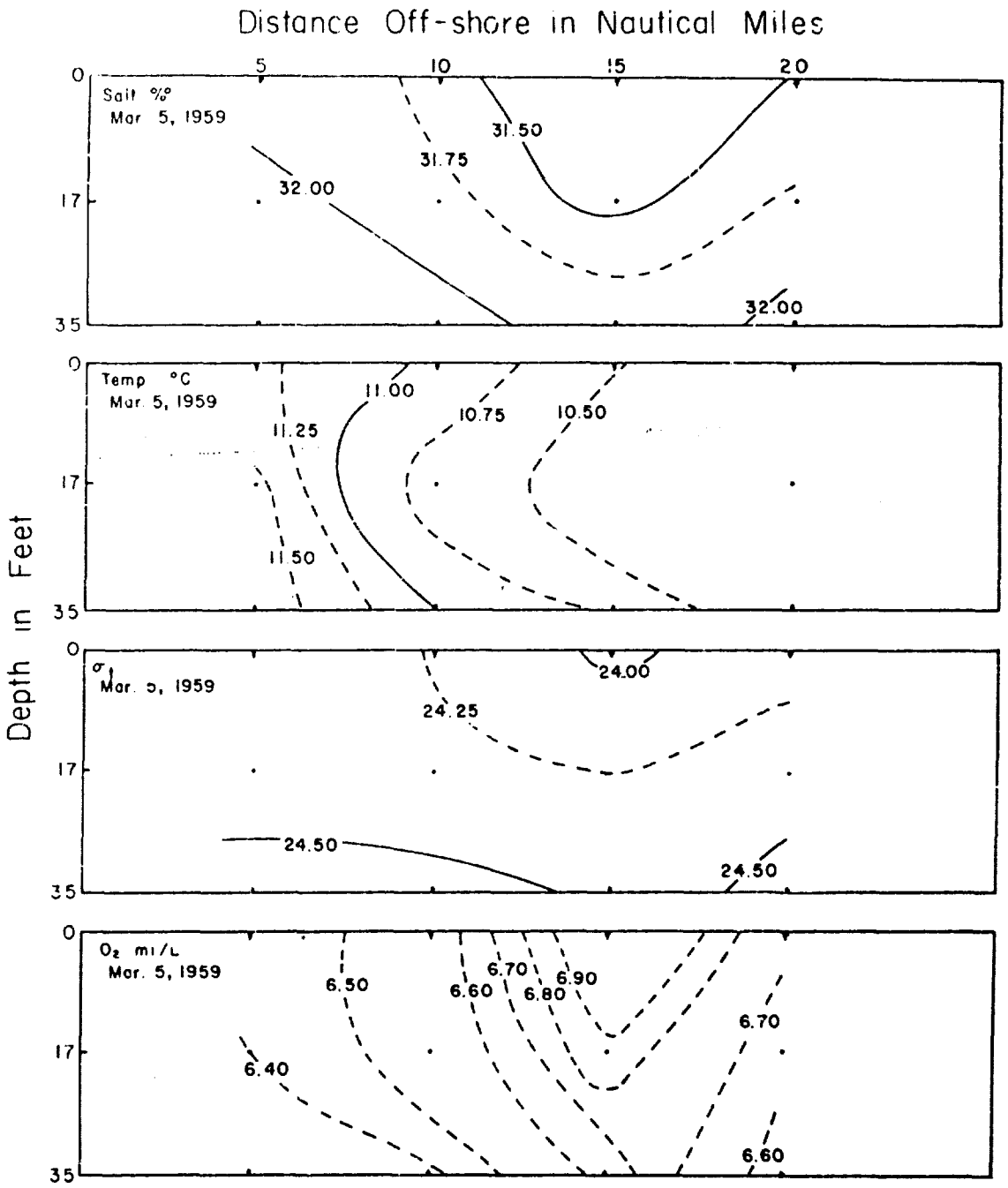

Figure 7. Vertical Distribution of Salinity, Temperature, σ_t, and Dissolved Oxygen at Four Stations West of Newport, Oregon, on March 5, 1959.

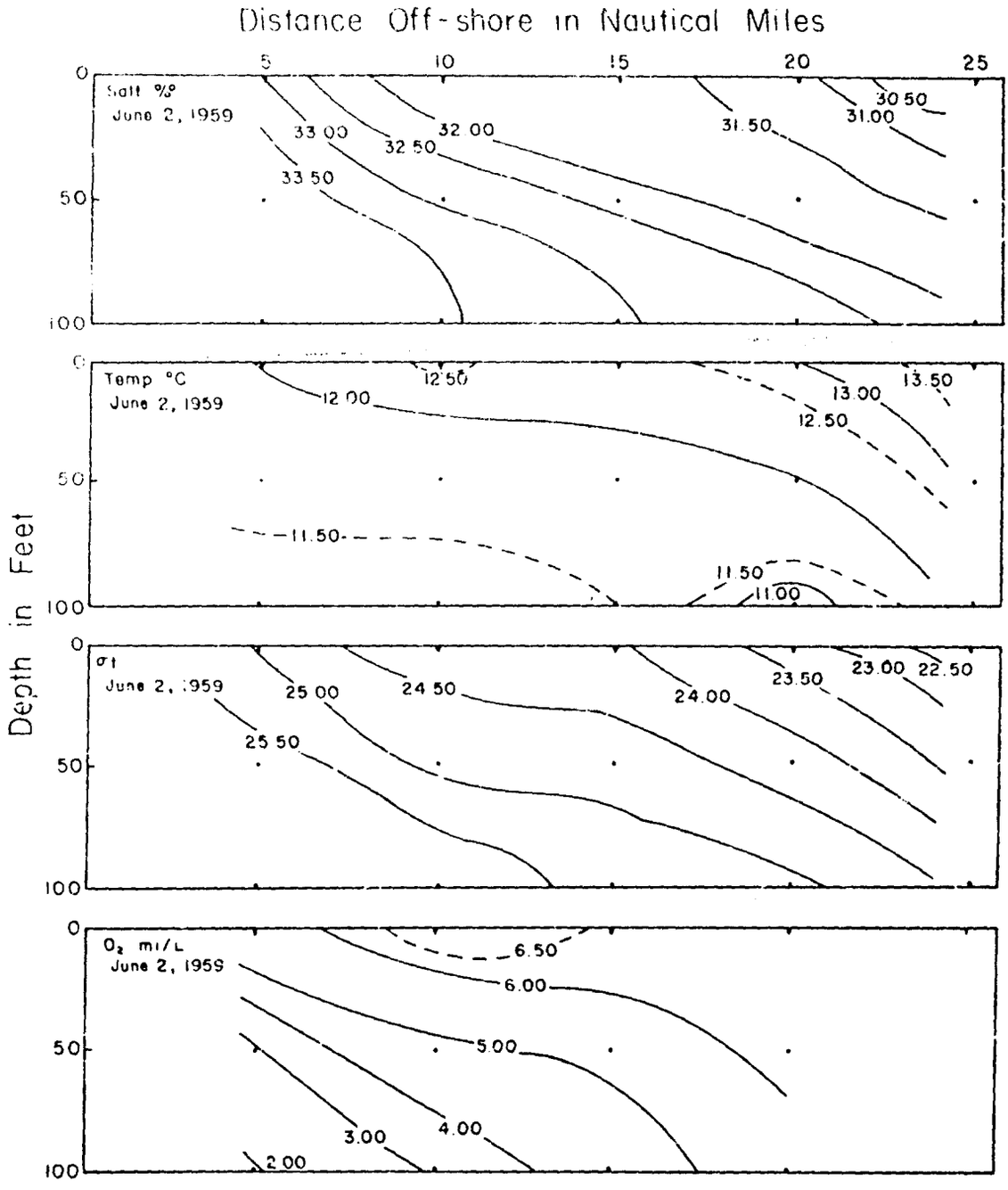

Figure 8. Vertical Distribution of Salinity, Temperature, σ_t, and Dissolved Oxygen at Five Stations West of Newport, Oregon, on June 2, 1959.

[illegible] 1. [illegible] of Salinity, Temperature, Sigma t, and Dissolved Oxygen Taken from Five Stations Located at Five Mile Intervals West of Newport, Oregon from July 1, 1958, to June 2, 1959.

Station 1 — 44° [illegible] N
Date [illegible] — 124° 10.9' W
Time 0955 PST — Depth 29 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	[illegible]	8.14	31.51	
25		7.24	32.30	
50		5.03	32.92	

Station 2 — 44° 35.8' N
Date 8-5-58 — 124° 17.8' W
Time 1130 PST — Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.9	7.27	32.70	
50		7.30	32.72	
100		5.31	32.88	

Station 2 — 44° 35.8' N
Date 7-1-58 — 124° 17.8' W
Time 1030 PST — Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	16.1	6.77	29.19	
25		6.71	31.27	
50		6.30	31.80	

Station 3 — 44° 35.8' N
Date 8-5-58 — 124° 24.8' W
Time 1155 PST — Depth 37 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	12.6	7.99	32.63	

Station 3 — 44° 35.8' N
Date 7-1-58 — 124° 24.8' W
Time 1135 PST — Depth 37 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	17.4	6.46	29.00	
25		6.68	30.73	
50		6.46	31.71	

Station 1 — 44° 35.8' N
Date 9-4-58 — 124° 10.9' W
Time 0955 PST — Depth 29 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.4	5.30	33.15	25.29
25	10.8	4.50	33.26	25.48
50	10.6	4.17	33.37	25.60
100	10.1	2.74	33.69	25.93

Station 1 — 44° 35.8' N
Date 8-5-58 — 124° 10.9' W
Time 1100 PST — Depth 29 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	10.9	6.35	33.31	
50		6.22	33.28	
100		5.40	33.21	

Station 2 — 44° 35.8' N
Date 9-4-58 — 124° 17.8' W
Time 1030 PST — Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	14.1	6.13	32.27	24.08
25	12.7	5.86	32.45	24.50
50	11.9	5.45	32.65	24.81
100	10.4	3.54	33.06	25.39

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Station 3 — 44° 35.8' N
Date [illegible] — 124° 24.6' W
Time 1120 PST — Depth 37 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	[illegible]	[illegible]	31.92	23.75
25	13.1	[illegible]	[illegible]	24.21
50	11.6	5.69	32.59	24.86
100	10.9	[illegible]	32.32	25.20

Station 3 — 44° 35.8' N
Date 10-7-58 — 124° 24.8' W
Time 1235 PST — Depth 37 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.4	6.76	32.92	25.11
50	10.7	6.09	33.03	25.31
100		5.74	33.06	

Station 4 — 44° 35.8' N
Date [illegible] — 124° [illegible] W
Time 1200 PST — Depth [illegible] fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	14.7	[illegible]	31.87	23.65
25	14.4	6.56	32.91	23.74
50	12.3	6.64	32.66	24.74
100	11.2	4.73	33.04	25.24

Station 4 — 44° 35.8' N
Date 10-7-58 — 124° 31.7' W
Time 1310 PST — Depth 79 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.0	6.53	32.92	25.18
50	10.6	5.65	33.10	25.39
100	10.5	5.29	33.15	25.44

Station 1 — 44° 35.8' N
Date 10-7-58 — 124° 10.9' W
Time 1115 PST — Depth 29 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	10.4	5.53	33.21	25.51
50	10.1	4.62	33.48	25.77
100	9.7	3.47	33.60	25.92

Station 1 — 44° 35.8' N
Date 11-24-58 — 124° 17.8' W
Time 1120 PST — Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.5	6.20	32.41	24.70
50	11.9	6.11	32.57	24.75
100	12.1	6.02	32.68	24.79

Station 2 — 44° 35.8' N
Date 10-7-58 — 124° 17.8' W
Time 1200 PST — Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.1	6.88	32.95	25.16
50	10.6	6.09	33.01	25.32
100	10.0	3.82	33.31	25.66

Station 2 — 44° 35.8' N
Date 11-24-58 — 124° 17.8' W
Time 1200 PST — Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.4	6.08	32.86	25.06
50	11.6	6.17	32.92	25.11
100	11.8	6.08	32.92	25.08

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Station 1 — 44° 35.8' N
Date 1-20-59 — 124° 10.9' W
Time 1105 PST — Depth 29 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.0	5.32	31.27	23.90
50	11.0	6.23	31.55	24.12
100	11.1	6.26	32.38	24.74

Station 2 — 44° 35.8' N
Date 1-20-59 — 124° 17.8' W
Time 1145 PST — Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	10.8	6.47	30.66	23.46
50	11.0	6.17	32.14	24.57
100	11.0	6.17	32.39	24.77

Station 3 — 44° 35.8' N
Date 1-20-59 — 124° 24.8' W
Time 1215 PST — Depth 37 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.0	6.59	29.52	22.55
50	11.2	6.29	32.47	24.80
100	11.5	6.17	32.79	24.99

Station 4 — 44° 35.8' N
Date 1-20-59 — 124° 31.7' W
Time 1245 PST — Depth 79 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.4	6.56	29.42	22.41
50	11.3	6.17	32.61	24.89
100	11.4	6.17	32.68	24.92

Station 5 — 44° 35.8' N
Date 1-20-59 — 124° 38.6' W
Time 1330 PST — Depth 147 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.1	6.53	30.32	23.15
50	11.2	6.17	32.57	24.87
100	11.2	6.14	32.75	25.01

Station 1 — 44° 35.8' N
Date 3-5-59 — 124° 10.9' W
Time 1100 PST — Depth 29 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.2	6.47	31.91	24.36
17	11.6	6.41	32.09	24.43
35	11.5	6.32	32.25	24.57

Station 2 — 44° 35.8' N
Date 3-5-59 — 124° 17.8' W
Time 1130 PST — Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.0	6.53	31.73	24.25
17	10.6	6.55	31.87	24.44
35	11.0	6.38	32.14	24.57

Station 3 — 44° 35.8' N
Date 3-5-59 — 124° 24.8' W
Time 1200 PST — Depth 37 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	10.5	6.94	31.27	23.99
17		6.91	31.29	
35	10.7	6.62	31.94	24.47

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Station [illegible] 44° [illegible]' N
Date [illegible] 124° 31.7' W
Time 1230 PST Depth 79 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	10.5	6.76	31.49	24.15
17	[illegible]	6.[illegible]	31.23	24.32
35	10.5	6.59	32.07	24.51

Station 4 44° 35.8' N
Date 4-21-59 124° 31.7' W
Time 1230 PST Depth 79 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.0	5.59	31.47	24.06
17	11.2		31.49	24.03
35	10.9	6.73	32.03	24.50

Station 1 44° 35.8' N
Date 4-21-59 124° 10.9' W
Time 1100 PST Depth 29 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.1	8.23		
17	11.0	7.59		
35	11.1	7.79		

Station 5 44° 35.8' N
Date 4-21-59 124° 38.6' W
Time 1300 PST Depth 147 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.8	5.06	30.93	23.49
17	11.5	6.94	31.17	23.74
35	11.2	6.44	31.42	23.98

Station [illegible] 44° [illegible]' N
Date [illegible] 124° 17.8' W
Time 1125 PST Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.1	8.23	32.5[illegible]	
17	11.2	7.67	32.5[illegible]	
35	11.1	8.56	32.95	

Station 1 44° 35.8' N
Date 6-2-59 124° 10.9' W
Time 1045 PST Depth 29 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	12.0	5.36	33.24	25.24
50	11.8	2.71	33.7[illegible]	25.6[illegible]
100	11.5	1.95	33.86	25.82

Station 3 44° 35.8' N
Date 4-21-59 124° 24.8' W
Time 11[illegible] PST Depth 37 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	11.0	6.82	32.09	24.53
17	11.1	6.70	32.14	24.57
35	10.6	6.67	32.27	24.75

Station 2 44° 35.8' N
Date 6-2-59 124° 17.8' W
Time 1125 PST Depth 42 fathoms

Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	12.5	6.55	31.80	24.04
50	11.8	4.67	32.80	24.94
100	11.0	2.99	3[illegible].51	25.64

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Station [illegible]		[illegible]° [illegible]' N		
Date [illegible]		124° 24.8' W		
Time 1200 PST		Depth 12 fathoms		
Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	[illegible]	6.40	31.78	24.09
50	[illegible]	5.33	32.45	24.65
100	[illegible]	4.14	33.[illegible]	25.17

Station 4		44° 37.8'		
Date 6-2-59		124° 31.7' W		
Time 1225 PST		Depth 79 fathoms		
Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	13.0	6.48	31.17	23.38
50	12.0	6.20	31.94	24.24
100	10.5	5.88	32.72	25.11

Station 5		44° 35.8' N		
Date 6-2-59		124° 31.7' W		
Time 1305 PST		Depth 79 fathoms		
Depth feet	Temp. (°C)	O_2 ml/l	Salinity °/oo	σ_t
0	13.5		30.03	22.48
50	13.0		31.06	23.37
100	12.0		32.35	24.58

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[illegible]

September 15, 1960

[illegible]

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