O-087

DATA REPORT

OHER – OTEC CRUISE

Compiled and Edited
by

JOSE MANUEL LOPEZ, PHD.

CENTER FOR ENERGY AND ENVIRONMENT RESEARCH
UNIVERSITY OF PUERTO RICO — U.S. DEPARTMENT OF ENERGY

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JULY 30 - AUG. 3, 1980

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INTRODUCTION

The ability to detect the effects of an OTEC plant on the marine environment is dependent upon the magnitude of its effects relative to the scale and intensity of variability (pattern) within this ecosystem. The scale of pattern examined in this study is approximately 10 km^2 which has been estimated to be the area whose alteration by the operation of an OTEC plant can be physically measured. In addition, we studied the structure of the ocean in transects extending 50 km south of the site. The purpose of this cruise was to determine the magnitude of variability to various ecosystem components within and between such areas. Small scale and large scale transects were run to determine the presence of environmental gradients, if any, and the magnitude of between station variability. The cruise was conducted on the R/V CRAWFORD during July 30 through Aug. 3, 1980. This was the fifth cruise in our series of bi-monthly cruises.

METHODS

Hydrographic Data

Hydrocasts were made with 5 liter or 12 liter Niskin bottles usually lowered to depths of 1000 m. Bottles were placed at nominal depths of 0, 10, 25, 50, 75, 100, 150, 200, 250, 300, 400, 500, 650, 800, 1000 m for determinations of temperature, salinity, oxygen, chlorophyll and nutrients (nitrate-nitrite, phosphate, and silicate).

Temperature was measured with paired deep sea reversing thermometers. The thermometers were recently calibrated at the Physical Chemical Oceanographic Data Facility (PCODF) at Scripps Institution of Oceanography and measurements were considered accurate

to 0.01°C. Unprotected thermometers were placed on bottles sampling at depths of 100 meters or greater.

Salinity was determined with a Hytech induction salinometer. Readings are considered accurate to $0.003°/_{oo}$.

Dissolved oxygen was determined by the Winkler method as revised by Carpenter (1965) and modified by Anderson (1971). Measurements are accurate to 0.02 mℓ/ℓ. Nutrients were measured with a Technicon Autoanalyzer using methods described by Strickland and Parsons (1968). Chlorophyll was measured with a Turner Model 111 fluorometer using methods described by Strickland and Parsons (1968).

Station depths were obtained through an E.D.O. Depth Recorder permanently installed on the ship or estimated from a chart, NOS Z6659. Sonic depths obtained in Fathoms were converted to meters but were not corrected for speed of sound variations. Chart depths are indicated by (C) and sonic depths by an (S) besides the number. All depths are in meters.

Densities (σ_+) were calculated from a handbook of Oceanographic Tables (Bialek, 1966).

Station times are given in Greenwich Mean Time (GMT), Plankton Tow Times are in local time. Puerto Rico is 4 hours behind G.M.T.

Net Tows

Zooplankton tows were made with a 75 cm opening-closing net equipped with 202 um mesh. Volume of water filtered was calculated from a flowmeter suspended off center in the mouth of the net.

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HYDROGRAPHIC DATA

R/V CRAWFORD

OTEC CRUISE 8007

STATION: Benchmark

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17.57.6N	65°53.6W	7/30/80	1126 (GMT)	1554 m (s)	90° (Dir)		1	90° (Dir) 4 ft. (Ht) 4s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
1	28.53	35.608	4.51	0.5	<.1	<.1	0.12	0.125	0.413	22.70
10	28.52	35.604	4.52	0.7	<.1	<.1	0.12	0.132	0.466	22.70
22	28.52	35.604	4.53	0.5	<.1	<.1	0.10	0.089	0.350	22.70
47	28.52	35.613	4.53	0.7	<.1	<.1	0.10	0.110	0.422	22.70
67	25.70	36.521	4.59	0.4	<.1	<.1	0.10	0.156	0.950	24.29
88	24.95	36.630	4.67	0.4	<.1	<.1	0.11	0.100	0.569	24.61
104	24.25	36.783	4.74	0.3	<.1	<.1	0.11	0.071	0.368	24.93
128	22.96	36.923	4.48	0.6	0.2	<.1	0.11	0.014	0.182	25.42
175	20.77	36.784	4.29	0.8	1.5	<.1	0.11	0.023	0.128	25.93
210	19.25	36.633	4.29	0.6	3.1	<.1	0.11	0.008	0.039	26.22
252	18.29	36.513	4.4	0.4	4.7	<.1	0.21			26.37
334	17.01	36.331	4.17	0.4	8.6	<.1	0.41			26.55
412	14.95	35.994	3.68	0.5	14.4	0.7	0.70			26.77
560	11.51	35.458	3.08	0.5	23.3	6.3	1.28			27.06
676	9.63	35.197	3.02	0.7	27.7	10.5	1.65			27.19
875	6.75	34.915	3.35	0.5	30.4	17.1	1.99			27.41

R/V CRAWFORD

OTEC CRUISE 8007

STATION: Benchmark

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°57.6N	65°53.6W	7/30/80	2247 (GMT)	1554 m (s)	90° (Dir)		1	90° (Dir) 3 ft. (Ht) 3s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
1	28.68	35.576	4.54	0.6	0.1	0.8	0.12	0.190	0.679	22.62
9	28.68	35.577	4.53	0.2	0.1	0.7	0.12	0.089	0.261	22.62
22	28.62	35.588	4.55	0.5	0.1	0.7	0.10	0.115	0.323	22.65
48	28.54	35.596	4.55	0.5	0.1	0.7	0.10	0.099	0.328	22.69
70	26.36	36.393	4.72	0.4	0.1	<.1	0.10	0.398	0.545	23.99
92	25.26	36.604	4.71	0.4	0.2	<.1	0.10	0.095	0.633	24.49
108	24.02	36.840	4.60	0.5	0.5	<.1	0.10	0.087	0.342	25.05
131	22.79	36.984	4.38	0.6	0.7	<.1	0.10	0.057	0.266	25.52
176	20.07	36.733	4.12	0.5	3.2	<.1	0.16	0.016	0.080	26.08
212	18.79	36.584	4.36	0.5	3.3	<.1	0.14	0.006	0.025	26.30
256	18.01	36.491	4.45	0.6	5.3	<.1	0.23			26.43
343	16.98	36.339	-	0.6	8.2	0.7	0.39			26.56
424	14.27	35.895	3.52	0.6	8.5	1.6	0.40			26.84
559	11.09	35.403	3.05	0.6	24.1	2.0	1.42			27.09
698	8.92	35.116	3.00	-	28.3	10.0	1.78			27.24
905	6.26	34.892	3.54							27.45

R/V CRAWFORD

OTEC CRUISE 8007

STATION: Benchmark

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°57.6N	65°53.6W	7/31/80	0640 (GMT)	1829 m (s)	∿90° (Dir)	10 (Kt)	1	∿90° (Dir) 4 ft. (Ht) 5s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
1	28.47	35.561	4.54	0.4	0.2	<.1	0.11	0.078	0.075	22.68
10	28.47	35.554	4.54	0.5	<.1	<.1	0.13	0.083	0.239	22.68
28	28.48	35.561	4.55	0.4	<.1	<.1	0.11	0.061	0.082	22.68
52	28.14	35.701	4.59	0.4	<.1	<.1	0.11	0.103	0.334	22.90
79	25.97	36.434	4.66	0.5	<.1	<.1	0.11	0.069	0.409	24.14
106	24.66	36.671	4.79	0.8	<.1	<.1	0.09	0.113	0.554	24.73
125	23.75	36.870	-	0.6	0.3	<.1	<.08	0.043	0.253	25.15
156	22.33	36.958	4.24	0.4	1.1	<.1	0.13	0.030	0.180	25.63
200	19.59	36.669	4.24	0.6	3.2	<.1	0.10	0.006	0.058	26.16
242	18.58	36.550	4.51	0.5	3.0	<.1	0.09	0.002	0.019	26.33
288	17.99	36.497	4.62	0.5	4.6	<.1	0.14			26.44
380	16.25	36.222	3.97	1.0	11.1	1.8	0.47			26.65
478	13.57	35.786	3.42	0.8	15.3	4.1	0.69			26.90
623	10.51	35.321	3.02	0.6	25.7	11.1	1.46			27.13
764	7.69	34.975	3.08	0.6	29.0	13.1	1.79			27.32
986	5.75	34.935	3.96	0.6	28.2	21.0	1.80			27.55

R/V CRAWFORD

OTEC CRUISE 8007

STATION: S-1

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°52.5N	65°53.8W	7/31/80	1011 (GMT)	1829 m (s)	S.E. (Dir)	9 (Kt)	1	S.E. (Dir) 3 ft. (Ht) 3s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
1	28.44	35.552	4.51	0.4	0.8	2.3	<.08	0.063	0.271	22.69
10	28.44	35.562	4.51	0.5	0.4	3.7	<.08	0.108	0.347	22.69
29	28.46	35.566	4.51	0.3	0.3	6.5	0.73	0.118	0.370	22.69
54	26.34	36.355	4.59	0.5	0.5	2.7	<.08	0.090	0.520	23.97
82	24.74	36.605	4.85	0.6	0.6	4.2	<.08	0.313	0.975	24.65
110	23.88	36.826	4.69	0.5	0.3	1.1	<.08	0.118	0.459	25.08
130	23.05	36.900	4.50	0.6	0.6	1.1	<.08	0.124	0.502	25.38
163	21.91	36.855	4.38	0.6	2.2	11.6	<.08	0.100	0.375	25.67
215	19.35	36.633	4.35	0.6	1.8	1.1	0.11	0.015	0.083	26.19
258	18.27	36.517	4.44	1.0	3.1	1.1	0.12	0.014	0.053	26.38
307	17.70	36.437	4.42	1.0	5.4	2.2	0.23			26.46
405	15.34	36.064	3.73	0.7	11.2	7.4	0.54			26.73
510	12.70	35.641	3.23	0.7	13.3	7.7	0.71			26.97
662	8.77	35.089	3.00	1.0	20.7	31.6	1.06			27.24
810	6.96	34.931	3.32	0.6	25.9	17.5	1.74			27.39
1041	5.07	34.919	4.26	0.6	21.2	19.1	1.47			27.62

R/V CRAWFORD — OTEC CRUISE 8007 — STATION: S-3

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves			Secchi
				(s)	(Dir)	(Kt)		(Dir)	(Ht)	(Period)	
17°55.8N	65°46.5W	8/1/80	0226 (GMT)	1920 m	∿90°	8	1	∿90°	3 ft.	5s	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.58	35.388	4.29	0.4	0.2	<.1	<.08	0.092	0.255	22.52
10	28.59	35.379	4.52	0.5	0.2	<.1	<.08	0.118	0.316	22.51
25	28.49	35.566	4.53	0.4	0.1	<.1	<.08	0.306	0.708	22.68
56	26.10	36.452	4.74	0.5	0.1	<.1	<.08	0.196	0.558	24.12
81	24.64	36.683	4.79	0.4	0.2	<.1	<.08	0.110	0.795	24.74
106	23.93	36.827	4.61	0.4	0.4	<.1	<.08	0.091	0.480	25.06
126	22.79	36.942	4.42	0.5	0.8	<.1	<.08	0.038	0.268	25.48
156	21.55	36.873	4.27	0.6	1.5	<.1	<.08	0.019	0.184	25.78
212	19.05	36.603	4.44	0.6	3.0	<.1	<.08	0.006	0.039	26.25
257	18.31	36.529	4.51	0.6	4.6	<.1	0.14	0.003	0.030	26.38
313	17.76	36.472	4.75	0.4	4.7	<.1	0.14			26.47
418	15.60	36.109	3.80	0.5	13.0	2.3	0.44			26.71
519	12.16	35.517	3.06	0.6	22.2	7.6	1.14			26.98
675	9.56	35.189	3.02	0.7	24.3	11.5	0.90			27.19
827	*6.92	34.895	3.13	0.6	26.1	16.6	1.54			27.37
1038	5.52	34.929	4.14	1.1	21.4	16.1	1.17			27.58

* Doubtful (7.37)

R/V CRAWFORD

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STATION: S-5

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°57.6N	65°51.9W	7/31/80	2002 (GMT)	1280 m (s)	95° (Dir)		1	95° 2 ft. 3s (Dir) (Ht) (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	29.03	35.581	4.50	0.3	<.1	<.1	<.08	0.106	0.314	22.51
9	28.57	35.575	4.52	0.2	<.1	<.1	<.08	0.110	0.341	22.66
23	28.52	35.570	4.52	0.3	<.1	<.1	<.08	0.083	0.291	22.67
53	28.49	35.572	4.54	0.3	<.1	<.1	<.08	0.087	0.332	22.68
76	25.90	36.495	4.72	0.4	<.1	<.1	<.08	0.279	1.037	24.21
100	24.76	36.679	4.84	0.4	<.1	<.1	<.08	0.250	0.995	24.70
118	24.16	36.822	4.62	0.4	0.11	<.1	<.08	0.169	0.731	24.99
148	22.15	36.939	4.22	0.4	1.0	<.1	0.11	0.037	0.234	25.67
200	18.91	36.601	4.32	0.4	3.3	<.1	0.15	0.006	0.038	26.28
242	18.25	36.529	4.53	0.4	4.0	<.1	0.23	0.010	0.056	26.40
293	17.84	36.474	4.44	0.4	5.3	0.2	0.30			26.46
391	16.32	36.228	3.99	0.5	10.5	1.7	0.56			26.63
428	14.66	35.967	3.70	0.5	14.7	3.6	0.83			26.81
633	10.06	35.265	3.04	0.6	26.1	11.3	1.71			27.17
780	7.37	34.946	3.22	0.6	29.7	17.8	2.06			27.34
990	5.61	34.908	3.89	0.6	27.5	21.0	1.95			27.55

R/V CRAWFORD OTEC CRUISE 8007 STATION: V-1

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
18°04.4N	65°32.6W	8/1/80	0800 (GMT)	24 m (s)	S.E. (Dir)	1 (Kt)	1	S.E. (Dir) 1 ft. (Ht) 3s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.77	35.551	4.44	0.7	<.1	<.1	<.08	0.352	0.912	22.58
15	28.77	35.554	4.49	0.7	<.1	<.1	<.08	0.338	0.887	22.58

R/V CRAWFORD

OTEC CRUISE 8007

STATION: V-3

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
18°01.8N	65°32.6W	8/1/80	0931 (GMT)	1280 m (s)	S.E. (Dir)	4 (Kt)	1	S.E. 1/2 ft. 6s (Dir) (Ht) (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
1	28.53	35.518	4.50	0.6	0.4	<.1	0.13	0.112	0.322	22.63
11	28.53	35.514	4.50	0.5	0.4	<.1	0.13	0.129	0.378	22.63
26	28.53	35.523	4.52	0.4	0.1	<.1	0.13	0.106	0.306	22.63
52	25.95	36.462	4.78	0.4	0.1	<.1	0.12	0.169	0.583	24.17
72	24.88	36.653	4.77	0.8	0.1	<.1	0.12	0.164	0.776	24.65
97	23.97	36.825	4.65	0.4	0.4	0.2	0.12	0.093	0.375	25.05
122	22.91	36.936	4.48	0.5	0.5	<.1	<.08	0.083	0.323	25.45
148	21.74	36.888	4.36	0.6	0.7	<.1	<.08	0.094	0.341	25.74
198	19.33	36.647	4.39	0.5	2.1	<.1	0.13	0.010	0.035	26.21
244	18.17	36.519	4.55	0.7	4.1	<.1	0.19	0.029	0.083	26.41
294	17.73	36.478	4.66	0.4	4.0	<.1	0.19			26.49
391	15.32	36.084	3.85	0.5	10.9	2.2	0.49			26.75
487	14.23	35.895	3.50	0.6	15.4	3.9	0.73			26.85
634	10.20	35.291	3.05	0.7	23.2	11.4	1.43			27.16
785	7.74	34.956	3.05	0.7	24.0	14.8	1.53			27.30
973	6.17	34.975	3.97	0.6	19.5	12.8	1.13			27.53

R/V CRAWFORD

OTEC CRUISE 8007

STATION: V-5

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves			Secchi
				(s)	(Dir)	(Kt)		(Dir)	(Ht)	(Period)	
17°48.5N	65°32.6W	8/1/80	1142 (GMT)	4023 m	84	5	1	S.E.	1 ft.	4s	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
1	28.45	35.206	4.49	0.4	<.1	0.3	<.08	0.083	0.296	22.42
11	28.41	35.322	4.52	0.7	<.1	0.3	<.08	0.154	0.462	22.52
31	28.42	35.568	4.55	0.4	0.1	0.2	<.08	0.173	0.541	22.70
57	26.33	36.400	4.76	0.4	0.1	<.1	<.08	0.319	1.073	24.01
87	25.17	36.653	4.33	0.2	0.8	<.1	<.08	0.180	0.739	24.56
117	24.28	37.009	4.58	0.3	0.2	<.1	<.08	0.102	0.453	25.10
138	23.28	37.039	4.37	0.4	0.8	<.1	0.11	0.056	0.254	25.42
173	20.76	36.761	4.47	0.4	0.8	<.1	0.11	0.047	0.291	25.92
229	18.81	36.583	4.45	0.4	3.2	<.1	0.18	0.011	0.048	26.30
279	17.79	36.466	4.58	0.9	4.8	0.3	0.28	0.007	0.029	26.46
335	16.86	36.315	4.04	1.6	6.0	0.4	0.38			26.57
446	14.13	35.870	3.45	0.5	16.7	5.2	0.95			26.85
563	11.20	35.387	3.00	0.5	23.8	10.6	1.49			27.06
730	8.28	35.048	3.06	0.5	29.0	17.7	1.94			27.29
887	6.70	34.930	3.40	0.5	22.9	16.8	1.54			27.43
1124	4.79	34.942	4.47	0.5		22.3	1.57			27.67

R/V CRAWFORD

OTEC CRUISE 8007

STATION: V-6

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°32.5N	65°32.6W	8/1/80	1745 (GMT)	1737 m (s)	95 (Dir)	6 (Kt)	1	S.E. 2 ft. 3s (Dir) (Ht) (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.80	35.114	4.53	0.5	<.1	0.7	<.08	0.076	0.269	22.24
10	28.50	35.101	4.54	0.4	<.1	0.4	<.08	0.130	0.534	22.33
25	28.45	35.106	4.56	0.8	<.1	0.5	<.08	0.067	0.311	22.35
50	28.05	35.772	4.63	0.4	<.1	<0.1	<.08	0.135	0.601	22.98
70	26.39	36.394	4.71	0.4	<.1	<0.1	<.08	0.325	1.172	23.98
95	25.30	36.587	4.75	0.4	0.3	<0.1	<.08	0.262	0.838	24.47
119	23.91	36.980	4.38	0.4	1.1	<0.1	<.08	0.056	0.221	25.19
145	22.66	36.978	4.21	1.1	1.6	<0.1	0.12	0.033	0.153	25.55
194	20.11	36.734	4.02	0.6	4.0	<.1	0.14	0.008	0.053	26.07
239	18.46	36.530	4.04	0.6	6.3	0.6	0.22	0.007	0.034	26.34
289	16.95	36.314	3.87	0.6	10.0	1.7	0.41			26.55
384	14.47	35.901	3.29	0.6	16.9	4.9	0.80			26.80
479	12.53	35.586	3.15	0.6	20.6	7.6	1.07			26.96
622	9.69	35.213	3.11	0.6	20.6	7.7	1.1			27.19
772	6.78	34.859	3.16	0.7	29.8	21.2	1.92			27.36
957	5.73	34.929	4.03	0.8	26.5	21.4	1.71			27.55

R/V CRAWFORD

OTEC CRUISE 8007

STATION: Pt-6

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°28.0N	65°53.0W	8/1/80	2227 (GMT)	>1500 m (c)	95° (Dir)	6 (Kt)	1	S.E. 2 ft. 3s (Dir) (Ht) (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.83	35.120	4.52	0.7	<.1	0.7	<.08	0.102	0.332	22.23
10	28.72	35.125	4.53	0.6	<.1	0.4	<.08	0.093	0.329	22.27
24	28.48	35.340	4.55	0.6	<.1	0.3	<.08	0.118	0.410	22.51
49	27.65	36.127	4.74	0.6	<.1	<.1	0.52	0.193	0.628	23.38
69	26.55	36.358	4.75	0.6	<.1	<.1	<.08	0.186	0.841	23.90
93	25.53	36.576	4.61	0.7	<.1	<.1	<.08	0.444	1.710	24.39
117	24.15	36.953	4.41	0.6	0.5	<.1	<.08	0.059	0.245	25.09
142	23.18	37.032	4.33	0.6	0.1	<.1	<.08	0.026	0.160	25.44
190	20.55	36.766	4.28	1.1	0.8	<.1	<.08	0.014	0.135	25.98
235	18.69	36.533	3.85	0.6	6.2	0.7	0.30	0.003	0.022	26.29
283	17.40	36.378	4.03	0.7	6.6	0.7	0.33			26.49
377	15.32	36.050	3.55	0.6	14.0	3.6	0.78			26.73
469	12.94	35.668	3.19	0.7	18.6	3.8	1.12			26.94
610	10.11	35.271	3.02	0.8	23.1	11.6	1.47			27.16
759	7.00	34.852	3.13	0.7	30.3	21.0	2.13			27.32
947	5.73	34.892	3.80	0.7	25.3	20.7	1.75			27.52

R/V CRAWFORD

OTEC CRUISE 8007

STATION: Pt-5

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°44.2N	65°53.0W	8/2/80	2111 (GMT)	613 m (s)	∿90 (Dir)	8 (Kt)	1	∿90 (Dir) 2 ft. (Ht) 4s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.68	35.168	4.52	<.2	<.1	<.1	<.08	0.076	0.272	22.32
10	28.60	35.177	4.53	0.9	<.1	<.1	<.08	0.083	0.276	22.35
25	28.47	35.509	4.55	<.2	<.1	<.1	<.08	0.092	0.415	22.64
55	26.81	36.334	4.83	<.2	<.1	<.1	<.08	0.042	0.330	23.80
80	25.56	36.556	4.79	<.1	<.1	<.1	<.08	0.135	0.664	24.36
104	24.62	36.767	4.66	0.2	<.1	<.1	<.08	0.171	0.741	24.81
124	23.51	36.922	4.59	<.1	<.1	<.1	<.08	0.062	0.446	25.26
155	21.83	36.861	4.44	0.4	0.2	<.1	<.08	0.040	0.253	25.70
210	19.65	36.672	4.24	6.2	2.2	<.1	0.11	0.016	0.086	26.15
254	18.67	36.558	4.41	0.5	3.6	<.1	0.11	0.007	0.036	26.31
309	17.04	36.340	4.23	0.3	5.7	<.1	0.27			26.55
414	14.69	35.965	3.59	0.3	9.5	0.7	0.48			26.80
513	11.94	35.615	3.16	0.4	15.4	4.2	0.82			27.10
617	9.81	35.294	3.03	0.7	18.3	7.2	0.92			27.23

R/V CRAWFORD

OTEC CRUISE 8007

STATION: Pt-3

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves			Secchi
								(Dir)	(Ht)	(Period)	
17°56.0N	65°53.0W	8/2/80	0411 (GMT)	1737 m (s)	N.E. (Dir)	5 (Kt)	1	∿90	2 ft.	5s	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.57	35.312	4.51	<.2	0.5	<.1	<.08	0.110	0.295	22.46
10	28.60	35.393	4.51	1.9	0.4	<.1	<.08	0.150	0.406	22.51
25	28.57	35.579	4.53	0.8	0.3	<.1	<.08	0.398	0.828	22.66
56	26.37	36.358	4.61	0.3	0.3	<.1	<.08	0.144	0.494	23.96
80	24.79	36.654	4.80	0.5	0.3	<.1	<.08	0.122	0.616	24.67
105	24.13	36.848	4.63	0.3	0.6	<.1	<.08	0.360	1.000	25.02
125	22.81	36.926	4.45	1.2	0.9	<.1	<.08	0.132	0.411	25.47
156	21.36	36.836	4.38	8.3	1.1	<.1	<.08	0.141	0.396	25.81
211	19.15	36.626	4.41	20.5	2.5	2.00	0.24	0.029	0.080	26.24
256	18.16	36.506	4.47	1.6	3.6	<.1	<.08	0.008	0.023	26.40
312	17.46	36.414	3.83	0.6	4.6	<.1	<.08			26.50
417	15.33	36.063	3.70	0.9	11.8	2.00	0.39			26.73
517	12.22	35.563	3.16	0.5	19.1	6.0	0.86			27.00
673	9.41	35.182	3.04	0.5	19.0	8.7	1.00			27.21
824	7.10	34.929	3.20	0.4	15.3	8.9	0.68			27.37
1035	5.49	34.934	4.15	2.8	14.7	10.8	0.63			27.59

R/V CRAWFORD

OTEC CRUISE 8007

STATION: Pt-1

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°58.2N	65°53.0W	8/2/80	0610 (GMT)	46 m (s)			1		

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.90	35.454	4.50	0.5	0.1	0.6	0.11	0.129	0.363	22.46
10	28.91	-	4.51	0.2	0.1	0.6	0.11	0.151	0.446	-
25	28.53	35.540	4.53					0.095	0.295	22.65

R/V CRAWFORD

OTEC CRUISE 8007

STATION: J-1

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°54.8N	66°16.0W	8/2/80	0908 (GMT)	18 m (s)	S.E. (Dir)	1 (Kt)		S.E. (Dir) 1/2 ft. (Ht) 9s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.90	35.632	4.46	0.5	0.1	<.1	0.11	0.465	1.384	22.59
15	28.92	35.626	4.26	0.5	<.1	<.1	0.11	0.254	1.017	22.58

R/V CRAWFORD

OTEC CRUISE 8007

STATION: J-3

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°48.7N	66°16.0W	8/2/80	1100 (GMT)	823 m (s)	∿90 (Dir)	4 (Kt)	1	S.E. 2 ft. (Dir) (Ht)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
1	28.59	35.550	4.46	0.6	<0.1	0.4	<.08	0.279	0.903	22.63
11	28.60	35.555	4.47	0.7	<.1	0.1	0.10	0.244	0.820	22.63
26	28.62	35.559	4.47	0.6	<.1	0.1	0.10	0.246	0.861	22.63
56	25.94	36.470	4.64	0.7	<.1	<.1	0.08	0.198	0.874	24.18
81	24.79	36.695	4.57	0.7	0.2	<.1	0.08	0.071	0.608	24.70
105	23.71	36.860	4.62	0.8	<.1	<.1	<.08	0.053	0.343	25.15
126	22.87	36.935	4.41	3.7	0.2	<.1	0.08	0.019	0.200	25.46
156	21.69	36.881	4.28	0.8	0.9	<.1	0.1	0.059	0.243	25.75
211	18.70	36.563	4.33	0.7	3.1	<.1	0.17	0.004	0.030	26.31
255	17.96	36.476	4.15	1.2	5.4	0.4	0.29	0.008	0.050	26.43
310	17.51	36.324	4.31	0.8	4.0	<.1	0.20			26.42
415	15.21	36.041	3.64	0.7	6.6	1.0	0.31			26.74
514	11.66	35.474	3.10	0.9	17.6	6.7	0.96			27.04
669	9.35	35.193	3.02	-	22.6	11.1	1.34			27.23

R/V CRAWFORD

OTEC CRUISE 8007

STATION: J-5

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves			Secchi
17°39.7N	66°16.0W	8/2/80	1850 (GMT)	2469 m (s)	90 (Dir)	8 (Kt)	1	105 (Dir)	2 ft. (Ht)	2s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.99	35.603	4.51	0.4	0.1	0.4	0.10	0.093	0.278	22.54
10	28.66	35.590	4.52	0.4	0.1	0.4	0.10	0.056	0.197	22.64
24	28.64	35.597	4.54	0.4	0.1	0.4	0.10	0.042	0.182	22.65
54	28.52	35.596	4.55	0.4	0.1	0.3	0.10	0.120	0.393	22.69
78	25.71	36.530	4.60	0.4	0.2	<.1	<.08	0.433	1.990	24.30
102	24.40	36.724	4.70	0.4	0.2	<.1	<.08	0.090	0.532	24.84
122	23.97	36.950	4.57	0.4	0.3	<.1	<.08	0.045	0.488	25.14
152	22.58	36.922	4.46	0.5	0.5	<.1	0.10	0.118	0.425	25.53
205	19.80	36.686	4.27	0.4	2.0	<.1	0.14	0.027	0.123	26.12
248	18.93	36.583	4.26	0.5	3.7	<.1	0.23	0.055	0.200	26.26
310	16.27	36.218	3.92	0.5	10.4	2.6	0.61			26.64
400	15.03	36.000	3.55	0.5	14.9	4.3	0.83			26.75
438	14.46	35.904	3.46	0.6	15.5	5.2	0.84			26.80
645	9.76	35.221	3.04	0.6	26.5	14.4	1.62			27.18
790	7.52	34.952	3.10	0.6	29.4	20.2	1.89			27.33
995	5.66	34.907	3.89	0.6	28.0	24.3	1.83			27.54

R/V CRAWFORD

OTEC CRUISE 8007

STATION: J-6

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°24.5N	66°16.0W	8/2/80	2232 (GMT)	4115 m (s)	105 (Dir)	8 (Kt)	1	115 (Dir) 2 ft. (Ht) 2s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.78	35.084	4.52	<.2	<.1	0.9	<.08	0.087	0.274	22.22
10	28.76	35.083	4.51	<.2	<.1	0.8	<.08	0.064	0.224	22.23
24	28.54	35.412	4.58	<.2	<.1	0.5	<.08	0.142	0.528	22.55
54	27.93	36.114	4.66	0.2	<.1	0.2	<.08	0.100	0.534	23.28
78	25.93	36.465	4.38	<.2	<.1	0.2	1.00	0.227	1.319	24.18
102	24.64	36.641	-	0.2	1.9	0.2	0.25	0.099	0.471	24.71
122	23.97	36.961	4.35	<.2	0.5	<.1	0.11	0.042	0.035	25.15
152	22.37	36.959	4.11	0.3	<.1	<.1	1.03	0.026	0.103	25.62
206	20.28	36.775	3.95	0.3	3.2	0.2	0.21	0.014	0.074	26.06
248	18.60	36.547	3.99	1.0	3.2	0.2	0.19	0.010	0.044	26.32
300	17.03	36.327	3.83	0.3	9.5	1.8	0.52			26.54
399	14.38	35.877	3.28	0.3	12.1	4.8	0.81			26.80
437	13.41	35.743	3.24	0.4	17.7	6.6	1.08			26.90
644	8.87	35.102	3.28	0.4	28.1	16.1	1.86			27.24
790	7.00	34.934	3.30	0.4	29.0	20.2	2.02			27.39
996	5.45	34.923	4.04	0.5	19.9	17.9	1.35			27.58

R/V CRAWFORD

OTEC CRUISE 8007

STATION: G-6

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves			Secchi
								(Dir)	(Ht)	(Period)	
17°26.5N	66°45.0W	8/3/80	0301 (GMT)	>1500 m (s)	70 (Dir)	10 (Kt)	1	70	3 ft.	4s	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_t
0	28.66	35.165	4.53	0.3	0.1		0.08	0.096	0.309	22.32
9	28.67	35.169	4.53	<.2	<.1		0.10	0.058	0.205	22.32
23	28.55	35.251	4.55	0.2	<.1		0.08	0.114	0.362	22.42
52	27.15	36.257	4.77	0.2	<.1		0.08	0.176	0.666	23.64
76	26.02	36.469	4.74	<.1	<.1		<.08	0.176	0.953	24.15
99	24.98	36.614	4.79	0.3	<.1		<.08	0.254	1.007	24.59
118	24.52	36.816	4.17	0.2	2.0		0.14	0.080	0.406	24.88
147	22.91	37.002	4.20	0.2	1.7		0.14	0.022	0.103	25.50
199	20.36	36.759	3.59	0.3	6.6		0.31	0.010	0.055	26.02
241	18.93	36.595	3.88	0.3	6.7		0.32	0.010	0.043	26.27
290	17.20	36.350	3.74	0.6	8.0		0.35			26.52
381	14.71	35.954	3.45	0.5	12.5	1.6	0.58			26.79
468	12.86	35.664	3.24	0.4	19.0	4.4	0.93			26.95
608	9.78	35.221	3.05	0.5	28.4	12.2	1.59			27.18
747	7.48	34.943	3.06	0.3	32.1	17.9	1.89			27.33
951	5.80	34.902	3.79	0.6	30.7	21.6	1.84			27.52

R/V CRAWFORD

OTEC CRUISE 8007

STATION: G-5

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves			Secchi
								(Dir)	(Ht)	(Period)	
17°41.6N	66°45.0W	8/3/80	0650 (GMT)	>1500 m (s)	∿90 (Dir)	8 (Kt)	1	∿90 (Dir)	2 ft. (Ht)	5s (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.53	35.325	4.52	0.8	0.3	<.1	<.08	0.076	0.299	22.49
9	28.57	35.322	4.52	0.7	0.2	0.2	<.08	0.087	0.275	22.47
28	28.53	35.586	4.54	0.7	0.1	<.1	<.08	0.079	0.255	22.68
53	28.05	35.786	4.60	0.7	0.1	<.1	<.08	0.089	0.376	22.99
81	25.61	36.539	4.52	0.7	0.4	<.1	<.08	0.254	1.576	24.34
109	24.01	36.861	4.65	0.7	0.2	<.1	<.08	0.058	0.434	25.07
129	23.19	36.940	4.51	0.6	0.4	<.1	<.08	0.044	0.273	25.37
162	22.03	36.946	4.17	0.8	1.3	<.1	<.08	0.019	0.160	25.70
214	19.46	36.656	4.25	0.5	2.7	<.1	<.08	0.014	0.079	26.18
259	18.04	36.492	4.50	0.5	3.7	<.1	0.13	0.005	0.023	26.42
307	17.11	36.346	4.06	1.3	8.4	1.0	0.29			26.54
402	15.12	36.035	3.69	0.9	11.3	2.0	0.40			26.76
504	12.68	35.649	3.28	1.7	13.3	3.8	0.52			26.98
655	9.52	35.188	3.20	0.9	24.9	11.7	1.20			27.20
800	7.01	34.919	3.25	1.1	21.3	13.4	1.08			27.37
1030	5.42	34.922	4.07	0.9	23.6	18.4	1.19			27.58

R/V CRAWFORD

OTEC CRUISE 8007

STATION: G-3

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°53.4N	66°45.0W	8/3/80	1012 (GMT)	534 m (c)	~90 (Dir)	4 (Kt)	1	S.E. 1/2 ft (Dir) (Ht)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.52	35.314	4.51	0.2	0.1	<.1	<.08	0.102	0.359	22.48
10	28.51	35.307	4.52	0.2	0.1	<.1	<.08	0.117	0.403	22.48
25	28.52	35.315	4.52	0.4	0.1	<.1	<.08	0.094	0.353	22.48
56	28.43	35.490	4.51	0.2	0.1	<.1	<.08	0.153	0.475	22.64
81	25.15	36.697	4.53	0.4	0.4	<.1	<.08	0.210	1.194	24.60
106	24.33	36.822	4.55	0.5	0.3	<.1	<.08	0.081	0.518	24.94
126	23.47	36.924	4.47	0.7	0.3	<.1	<.08	0.049	0.245	25.27
157	22.49	36.949	4.27	0.4	0.1	<.1	<.08	0.019	0.152	25.58
213	19.14	36.616	4.14	0.3	4.1	<.1	0.17	0.013	0.064	26.24
258	18.30	36.515	4.18	0.4	4.7	<.1	0.17	0.011	0.044	26.37
314	17.35	36.384	4.05	0.8	7.2	<.1	0.27			26.51
420	15.00	36.021	3.61	0.5	13.8	1.64	0.62			26.78
476	14.02	35.860	3.46	0.6	14.7	2.8	0.77			26.86

R/V CRAWFORD

OTEC CRUISE 8007

STATION: G-1

Latitude	Longitude	MO/DAY/YR	Messenger Time	Bottom	Wind	Speed	Weather	Dominant Waves	Secchi
17°56.0N	66°45.0W	8/3/80	1203 (GMT)	<50 to 274	S.E. (Dir)		1	S.E. 2 ft. 7s (Dir) (Ht) (Period)	

Z	T	S	O_2	NH_4-N	N	Si	PO_4-3-P	Chla	Phaeo	σ_+
0	28.61	35.283	4.57	0.9	0.1	0.5	0.11	0.131	0.455	22.43
25	28.63	35.282	4.53	0.7	0.1	<.1	0.08	0.144	0.523	22.42

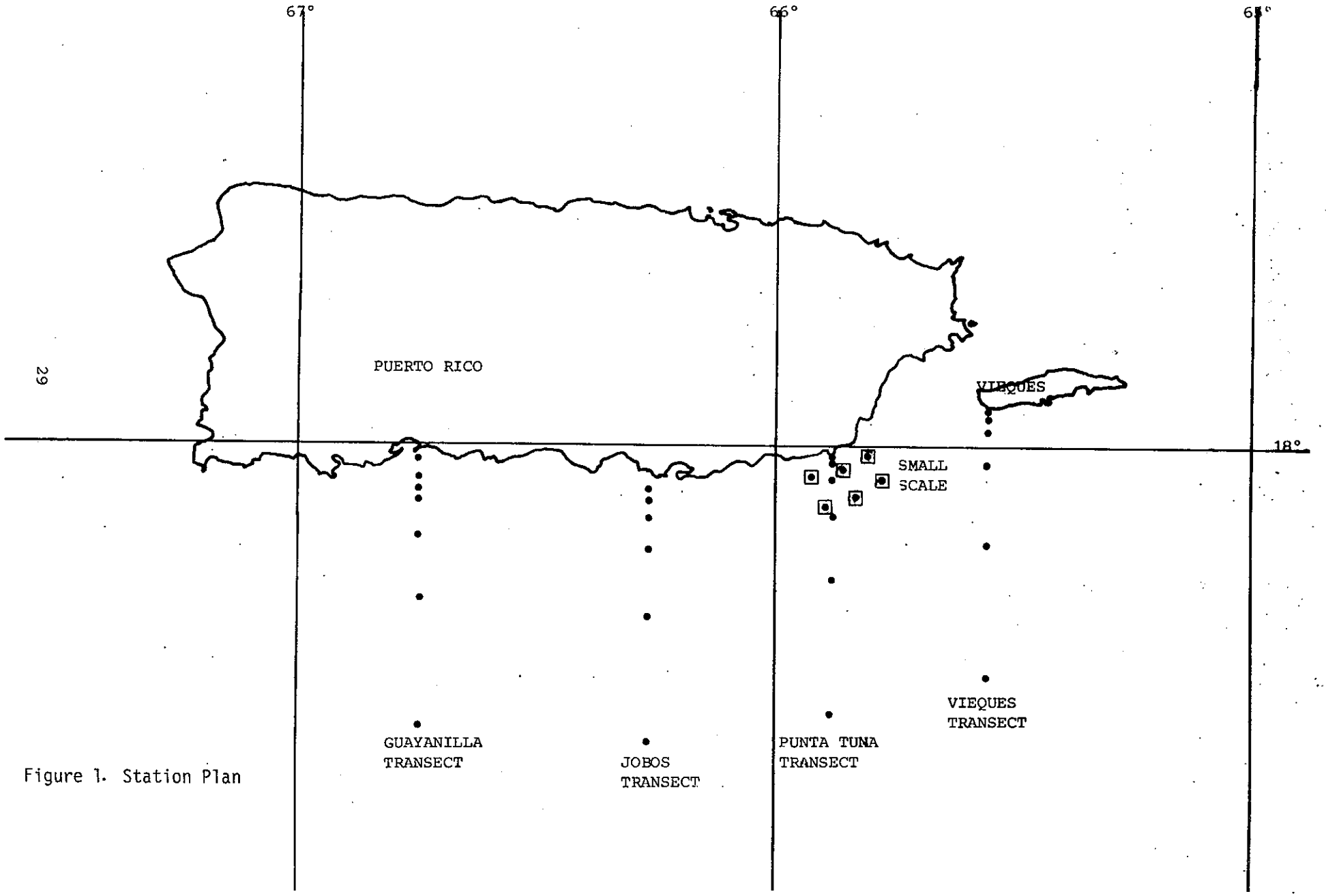
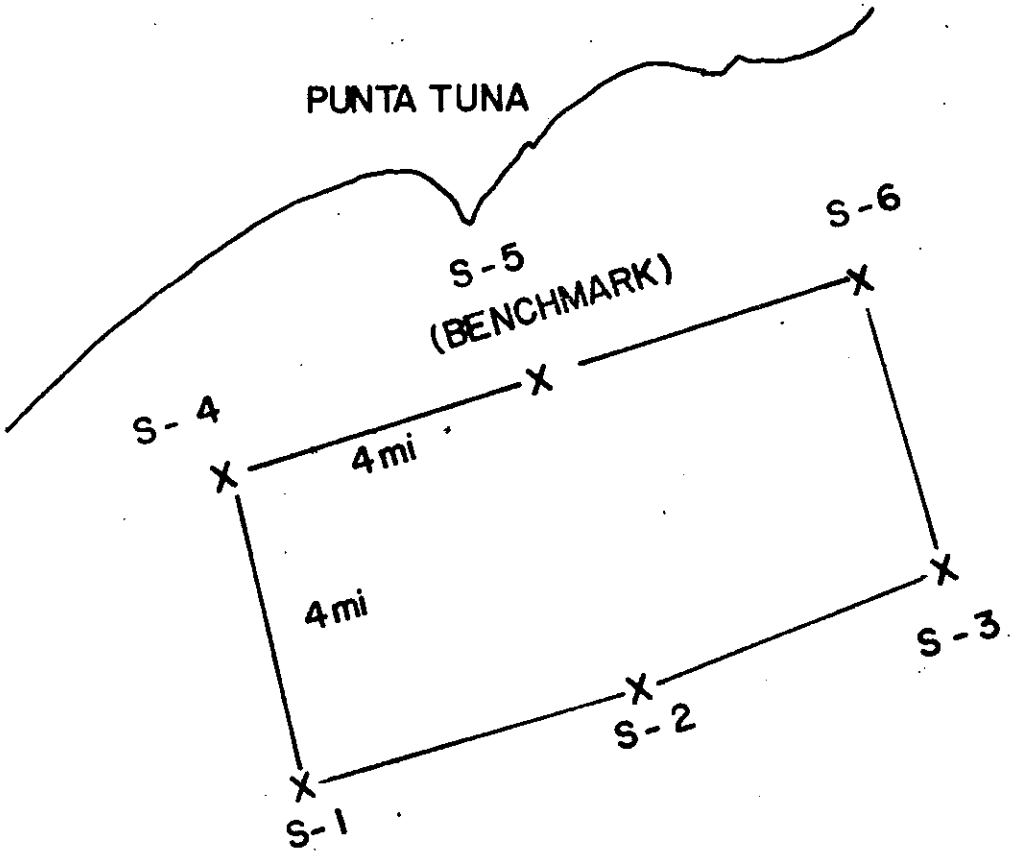


Figure 1. Station Plan

Figure 2. SMALL SCALE STUDY



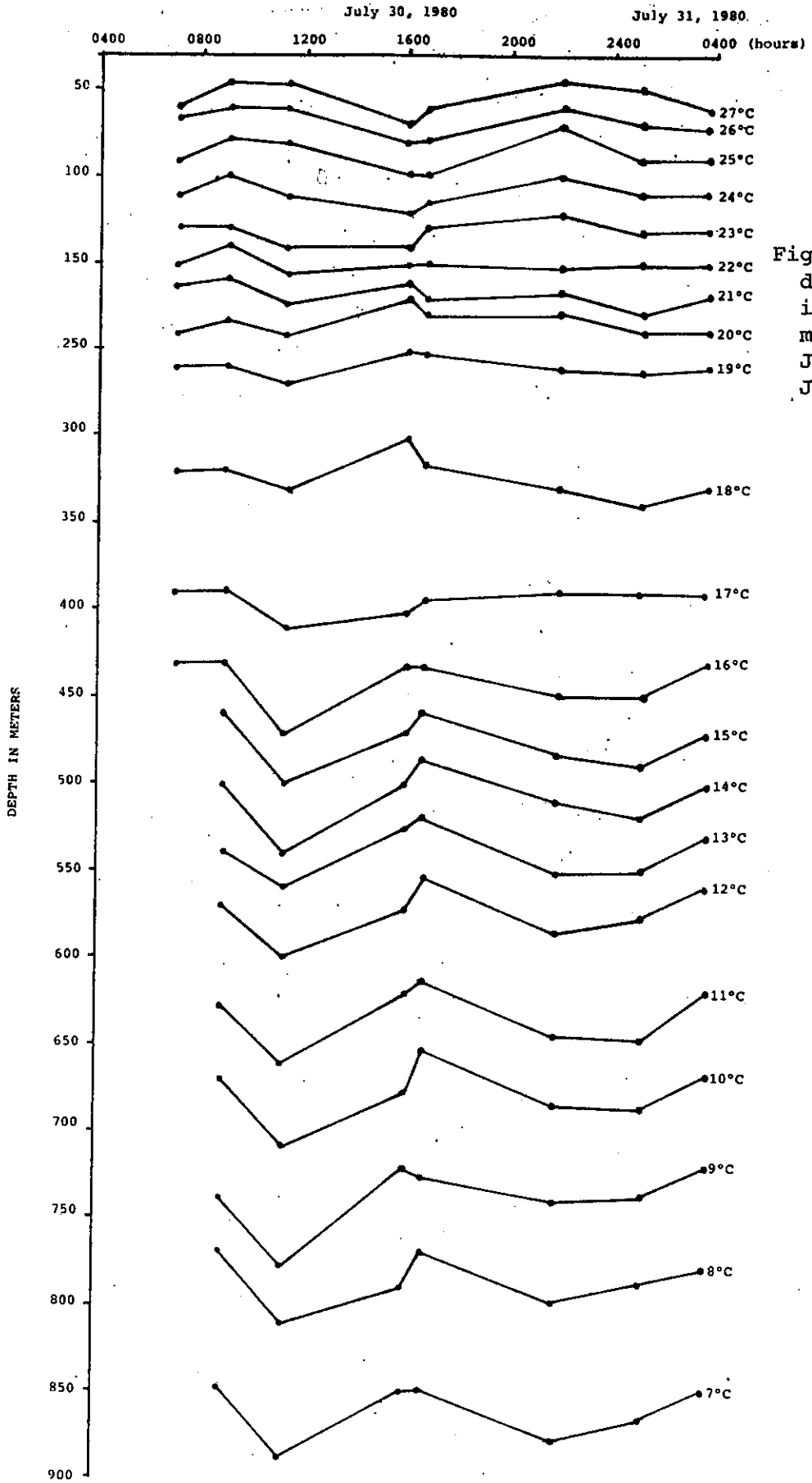


Figure 3. Vertical distribution of isotherms at Benchmark station during July 30 through July 31, 1980.

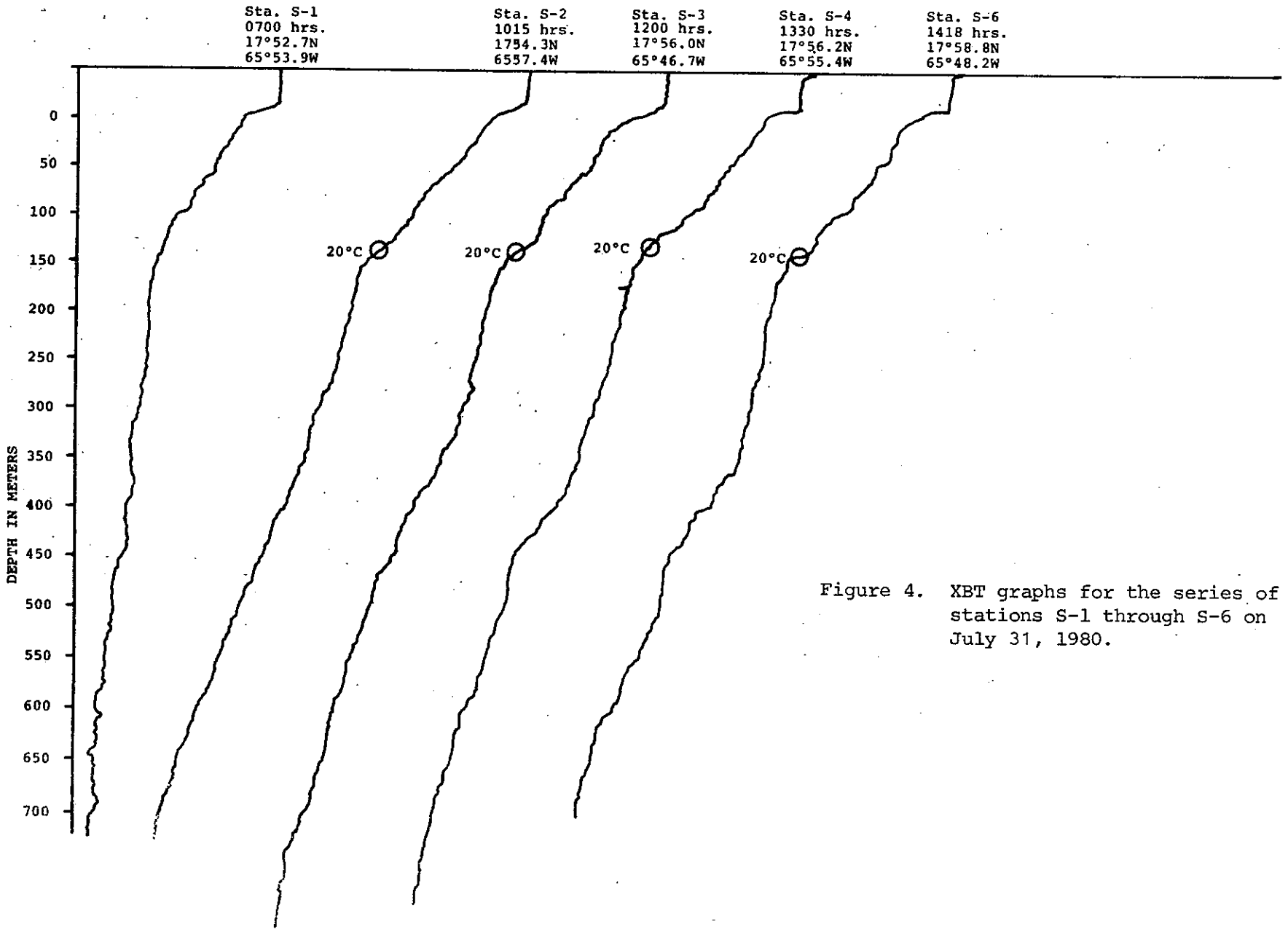


Figure 4. XBT graphs for the series of stations S-1 through S-6 on July 31, 1980.

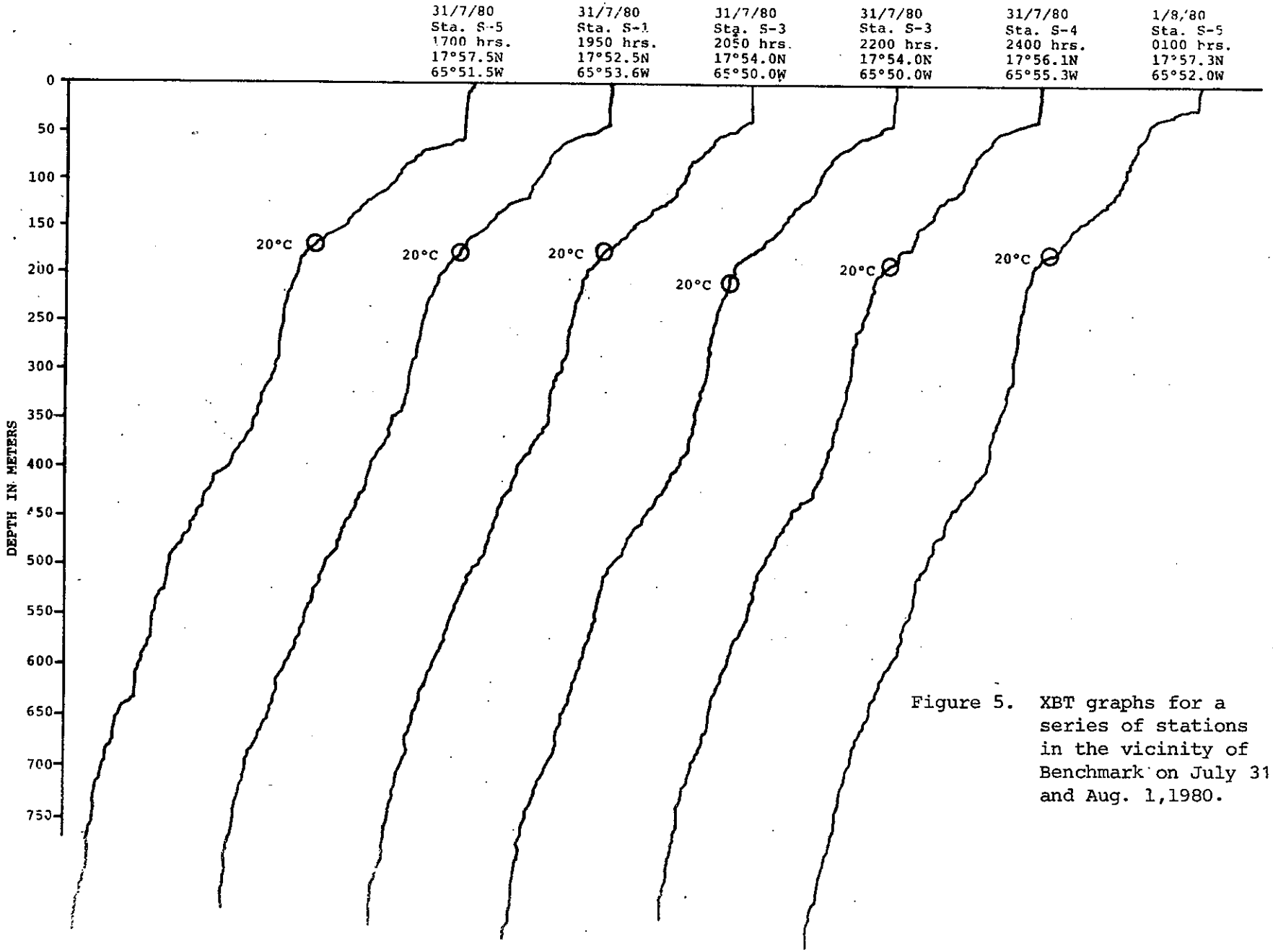


Figure 5. XBT graphs for a series of stations in the vicinity of Benchmark on July 31 and Aug. 1,1980.

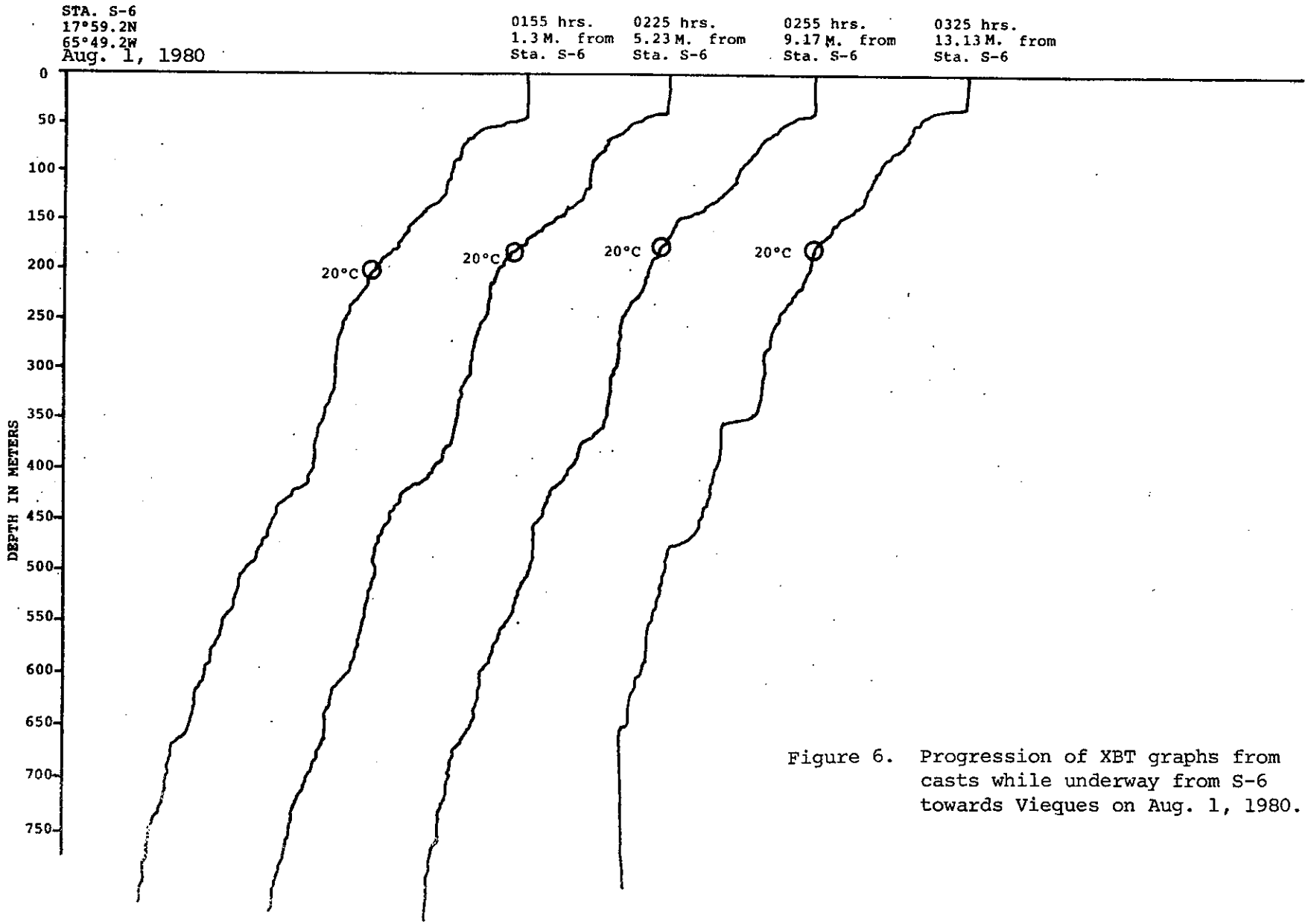


Figure 6. Progression of XBT graphs from casts while underway from S-6 towards Vieques on Aug. 1, 1980.

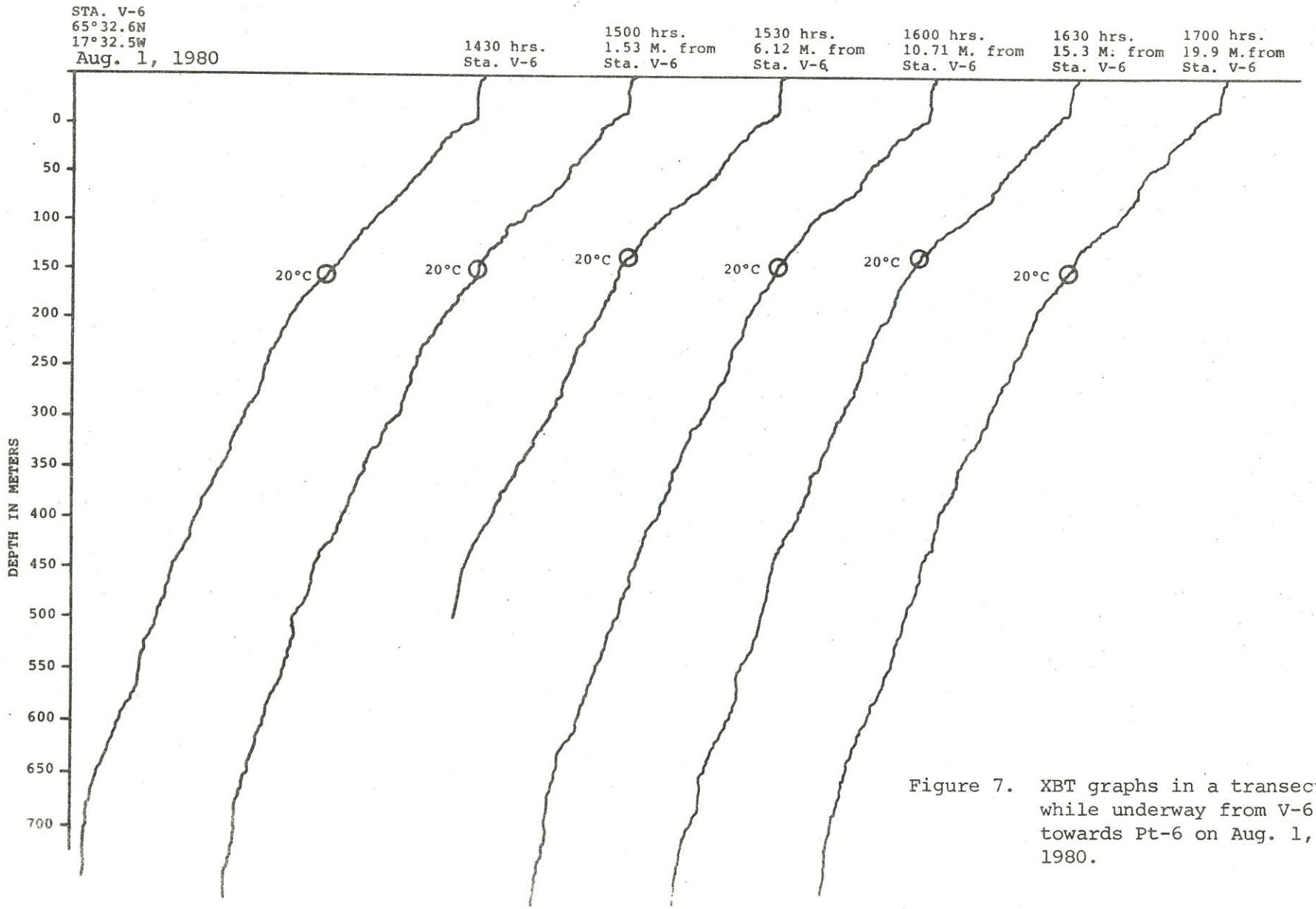


Figure 7. XBT graphs in a transect while underway from V-6 towards Pt-6 on Aug. 1, 1980.

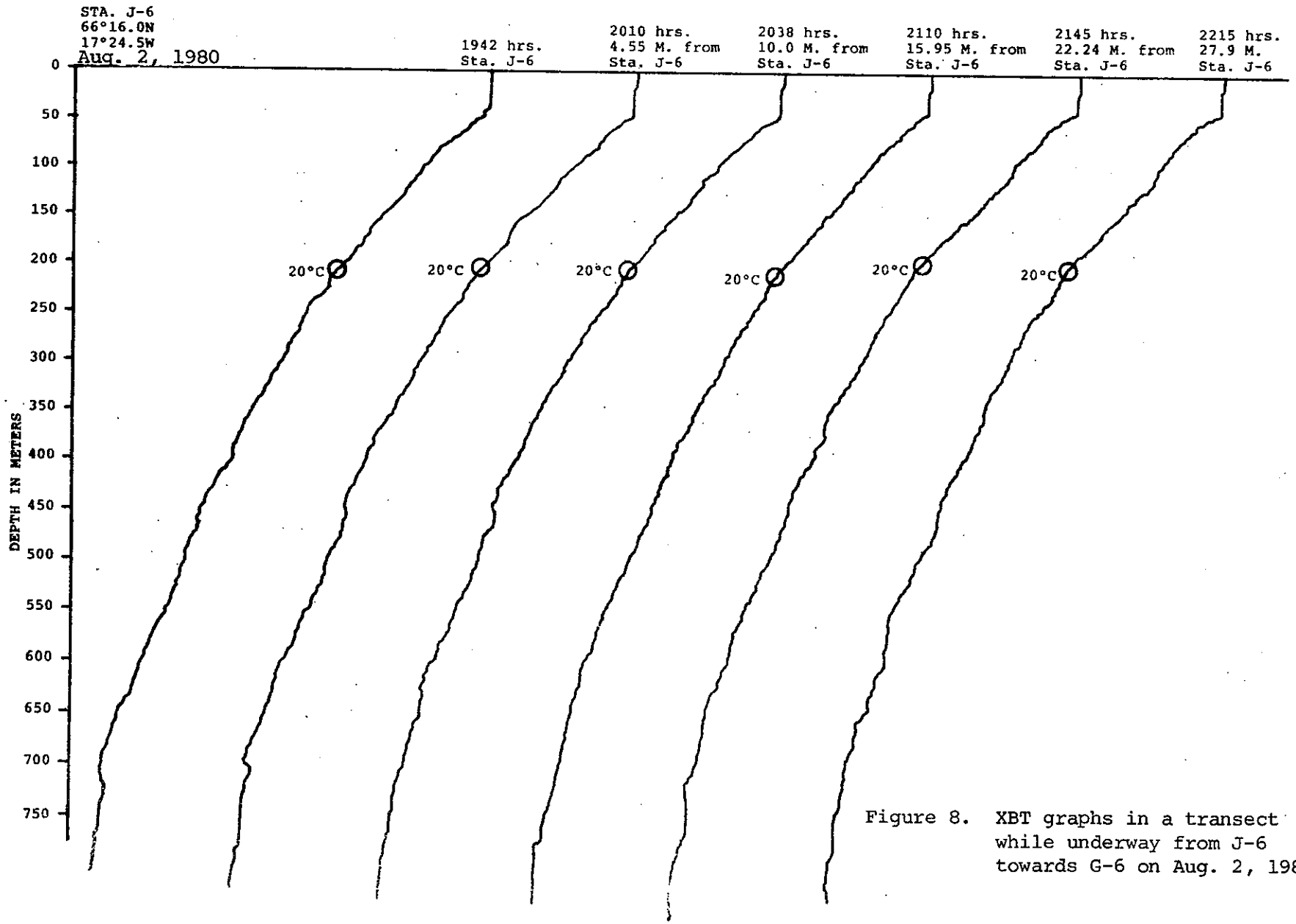


Figure 8. XBT graphs in a transect while underway from J-6 towards G-6 on Aug. 2, 1980.

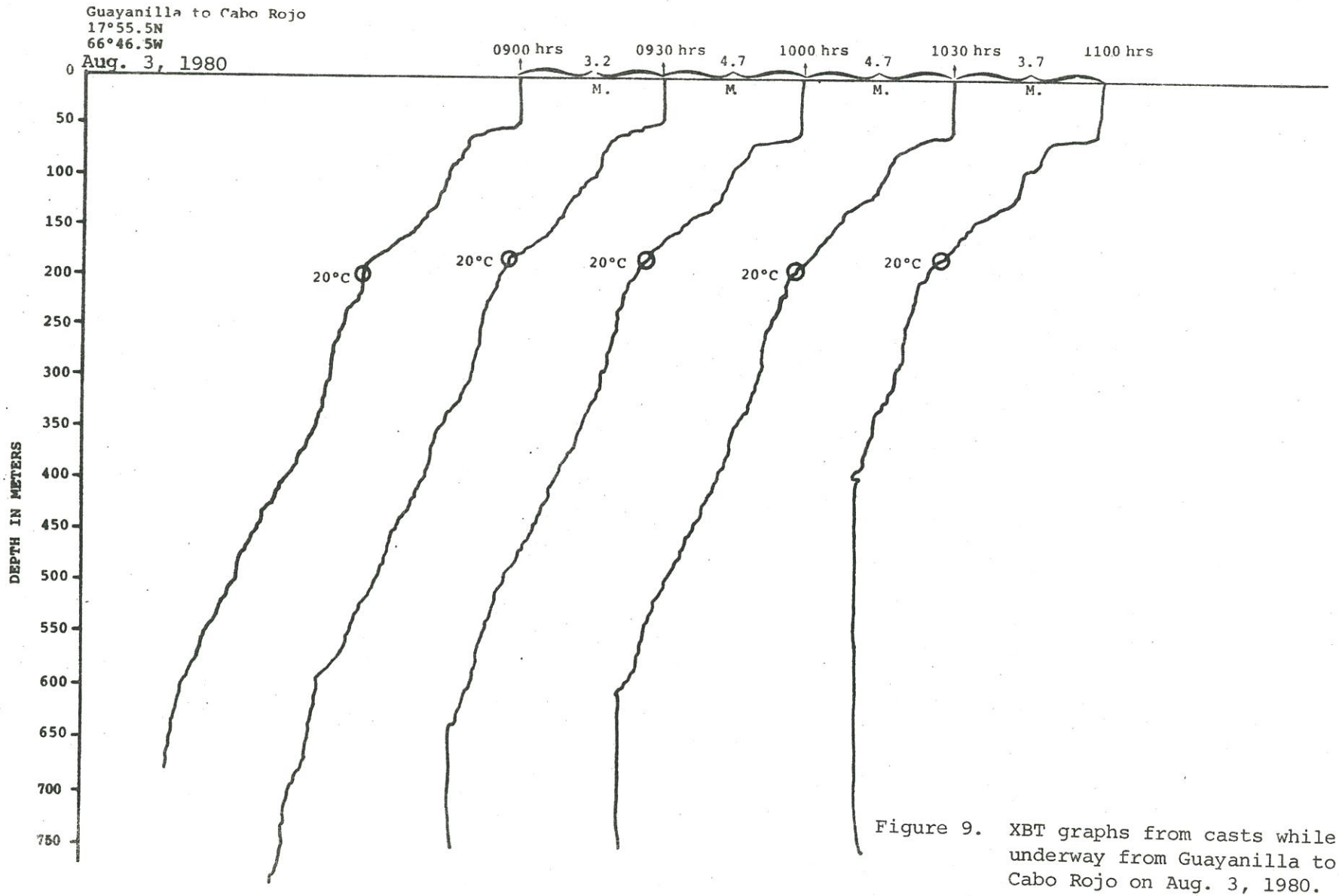


Figure 9. XBT graphs from casts while underway from Guayanilla to Cabo Rojo on Aug. 3, 1980.

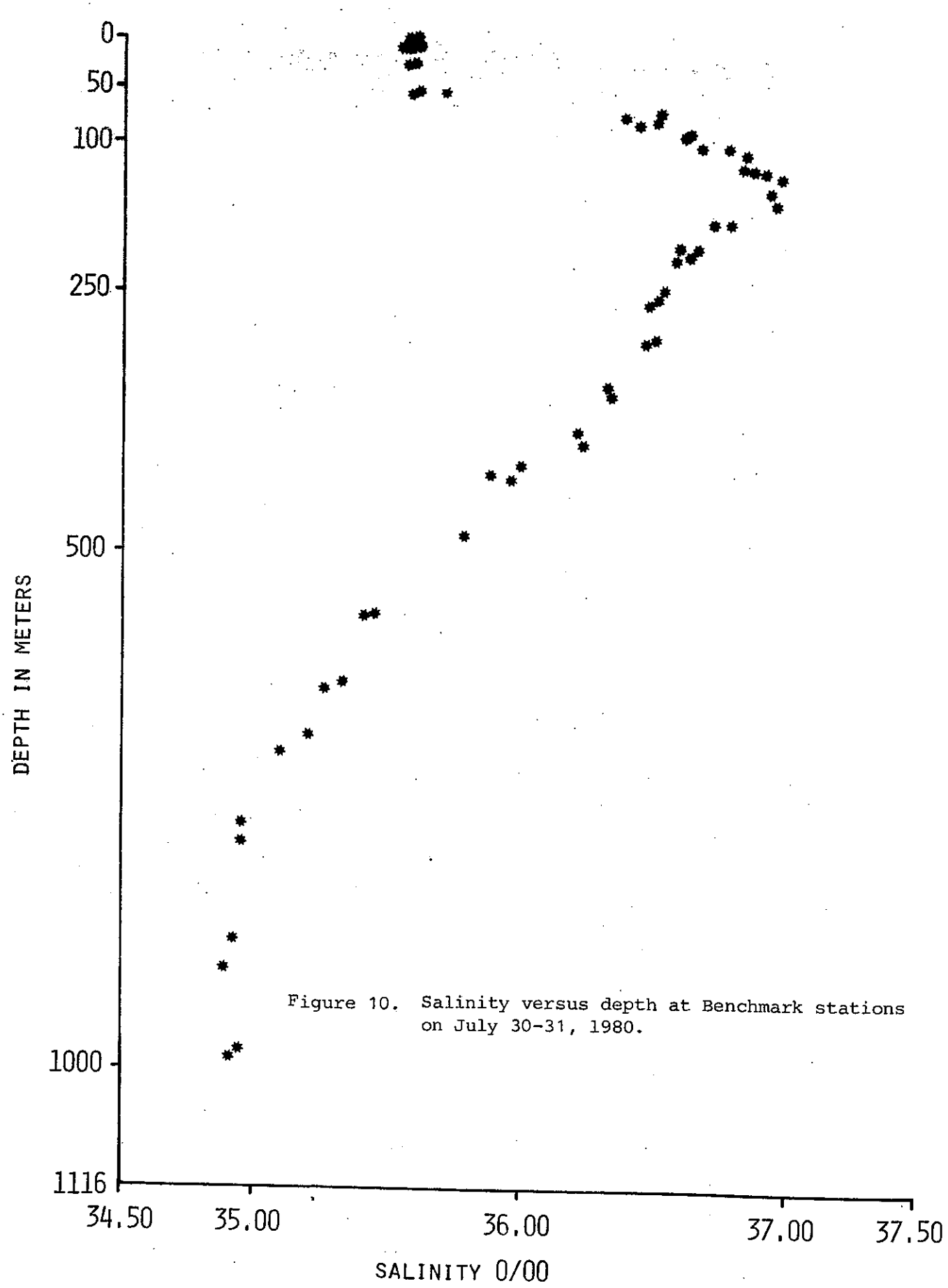


Figure 10. Salinity versus depth at Benchmark stations on July 30-31, 1980.

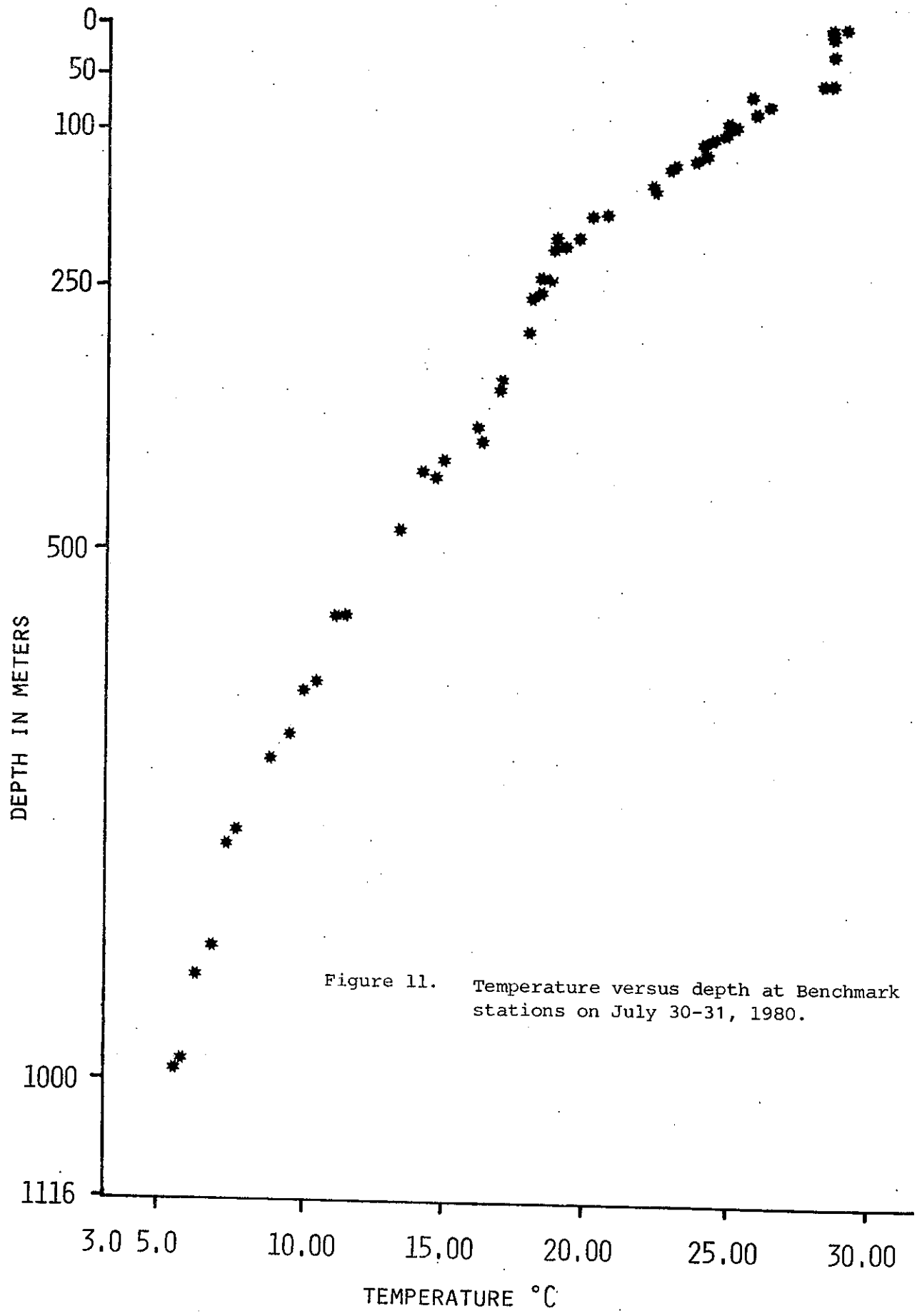


Figure 11. Temperature versus depth at Benchmark stations on July 30-31, 1980.

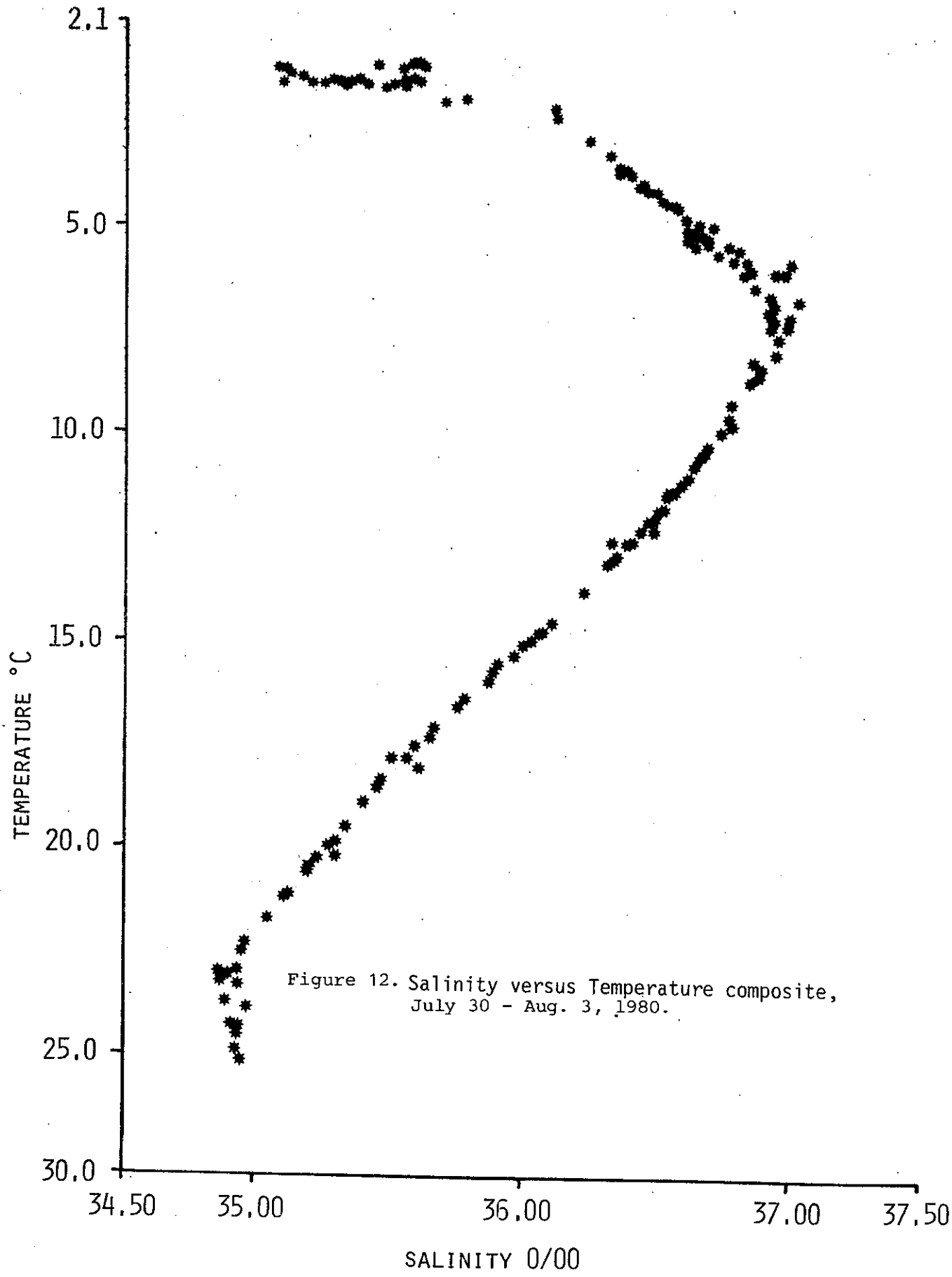


Figure 12. Salinity versus Temperature composite, July 30 - Aug. 3, 1980.

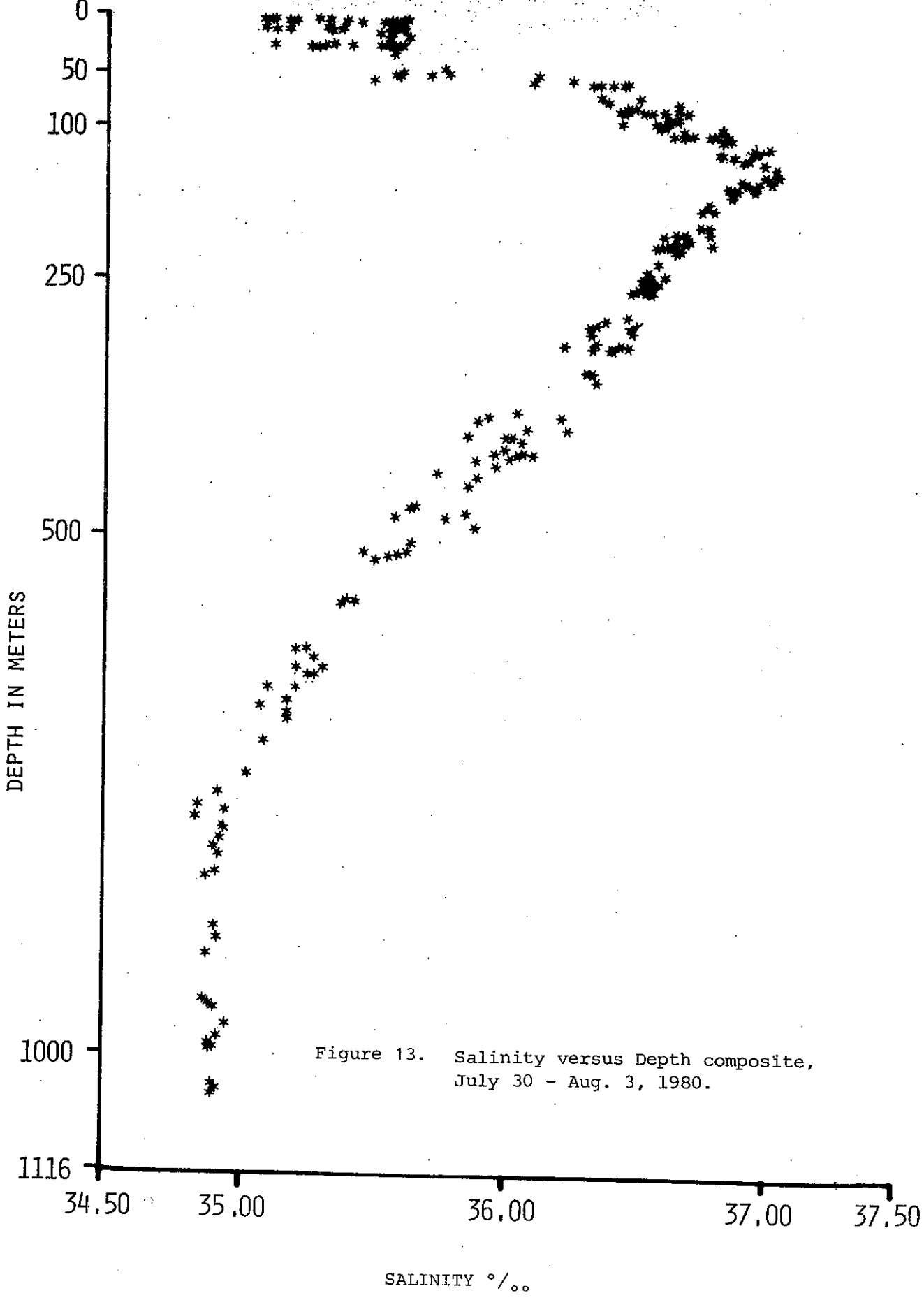


Figure 13. Salinity versus Depth composite, July 30 - Aug. 3, 1980.

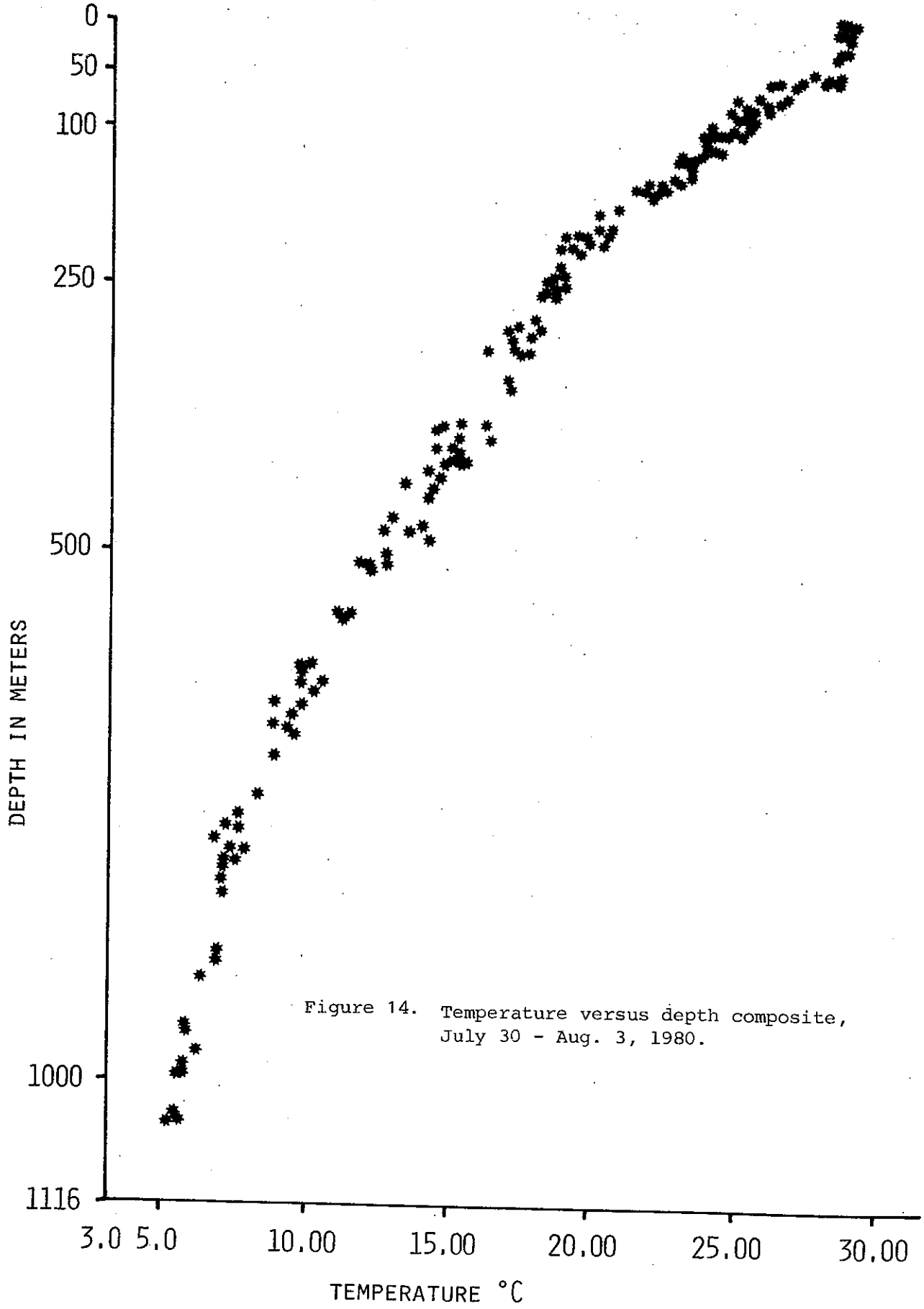


Figure 14. Temperature versus depth composite, July 30 - Aug. 3, 1980.

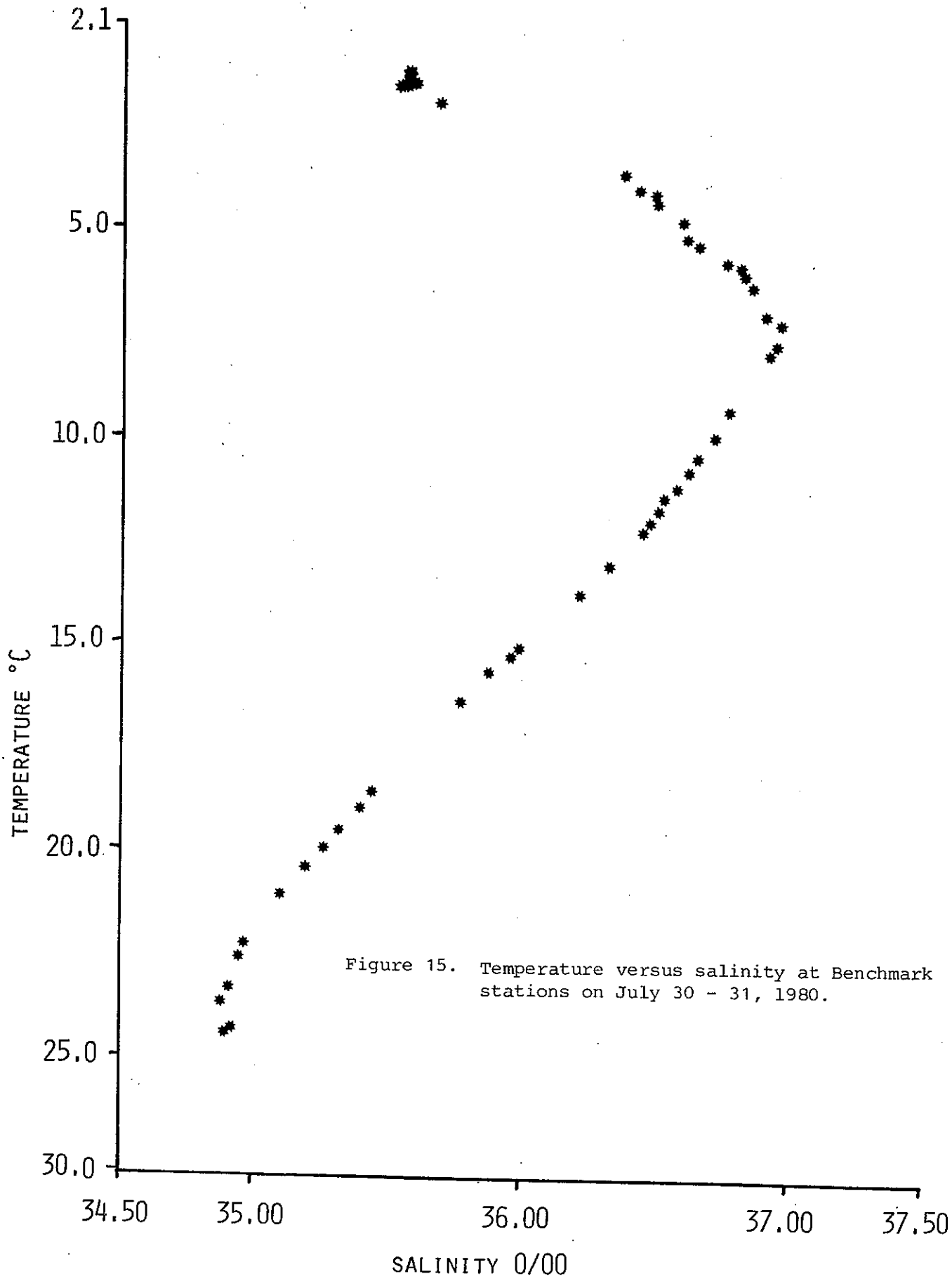


Figure 15. Temperature versus salinity at Benchmark stations on July 30 - 31, 1980.

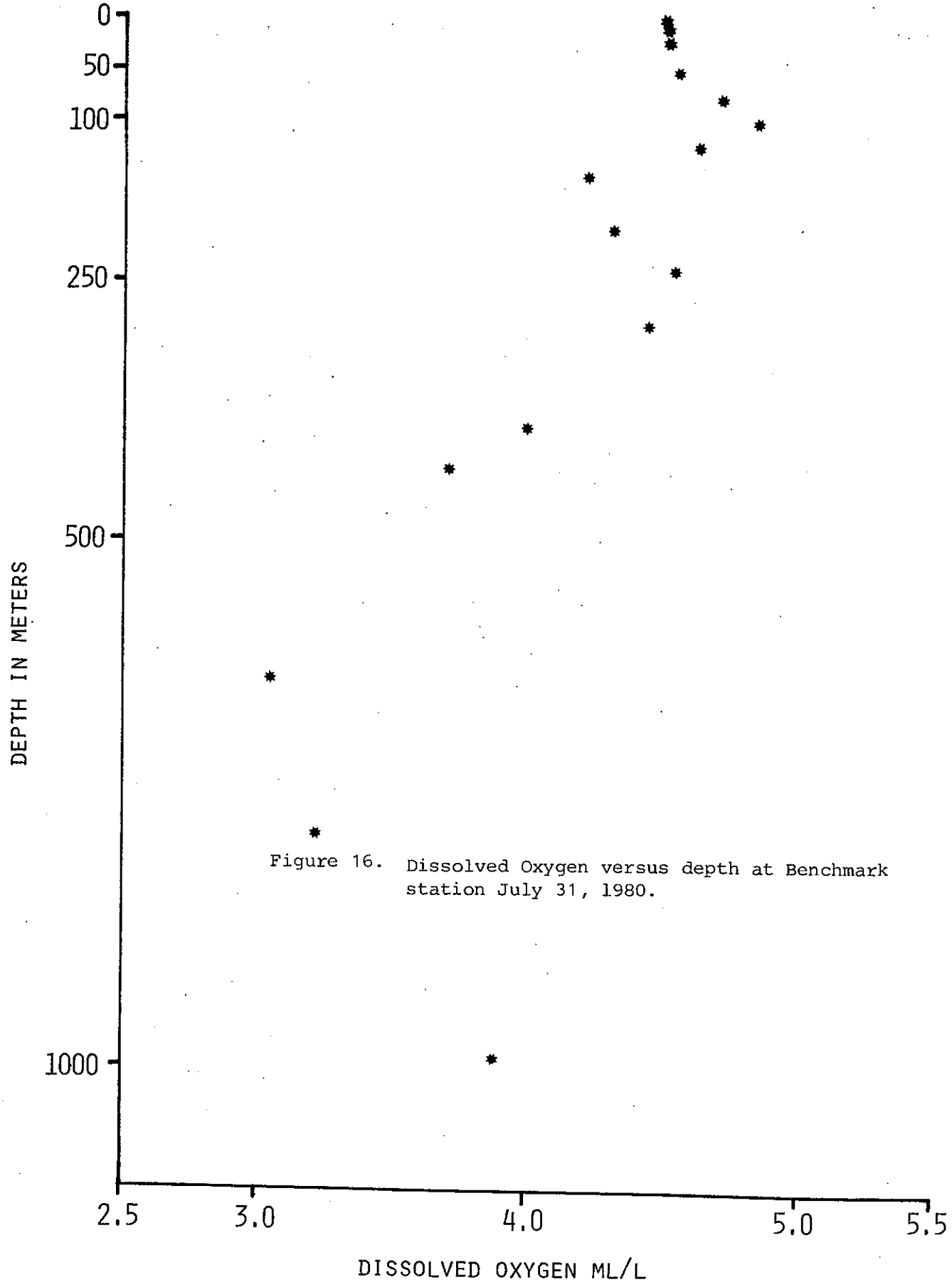


Figure 16. Dissolved Oxygen versus depth at Benchmark station July 31, 1980.

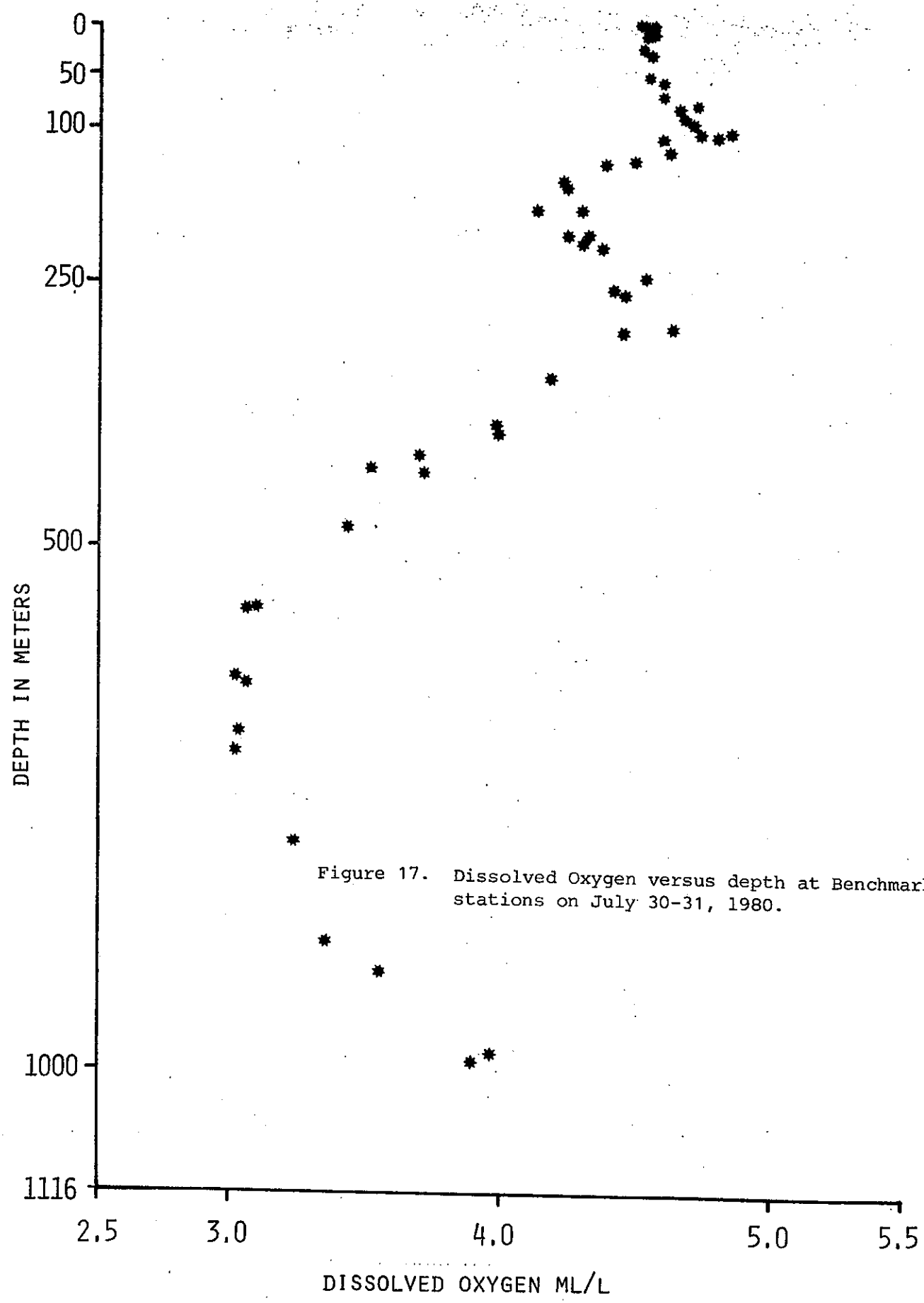


Figure 17. Dissolved Oxygen versus depth at Benchmark stations on July 30-31, 1980.

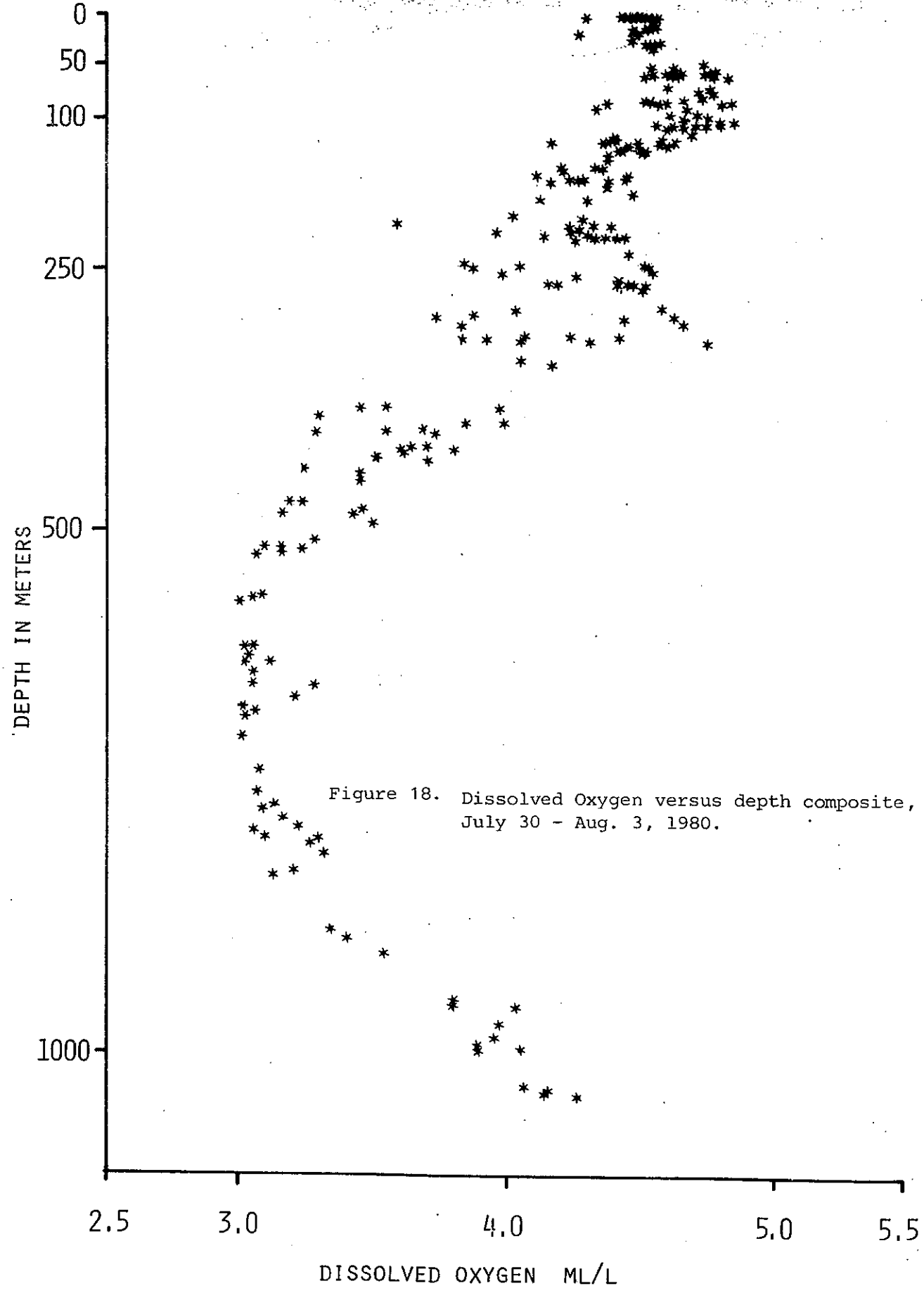


Figure 18. Dissolved Oxygen versus depth composite, July 30 - Aug. 3, 1980.

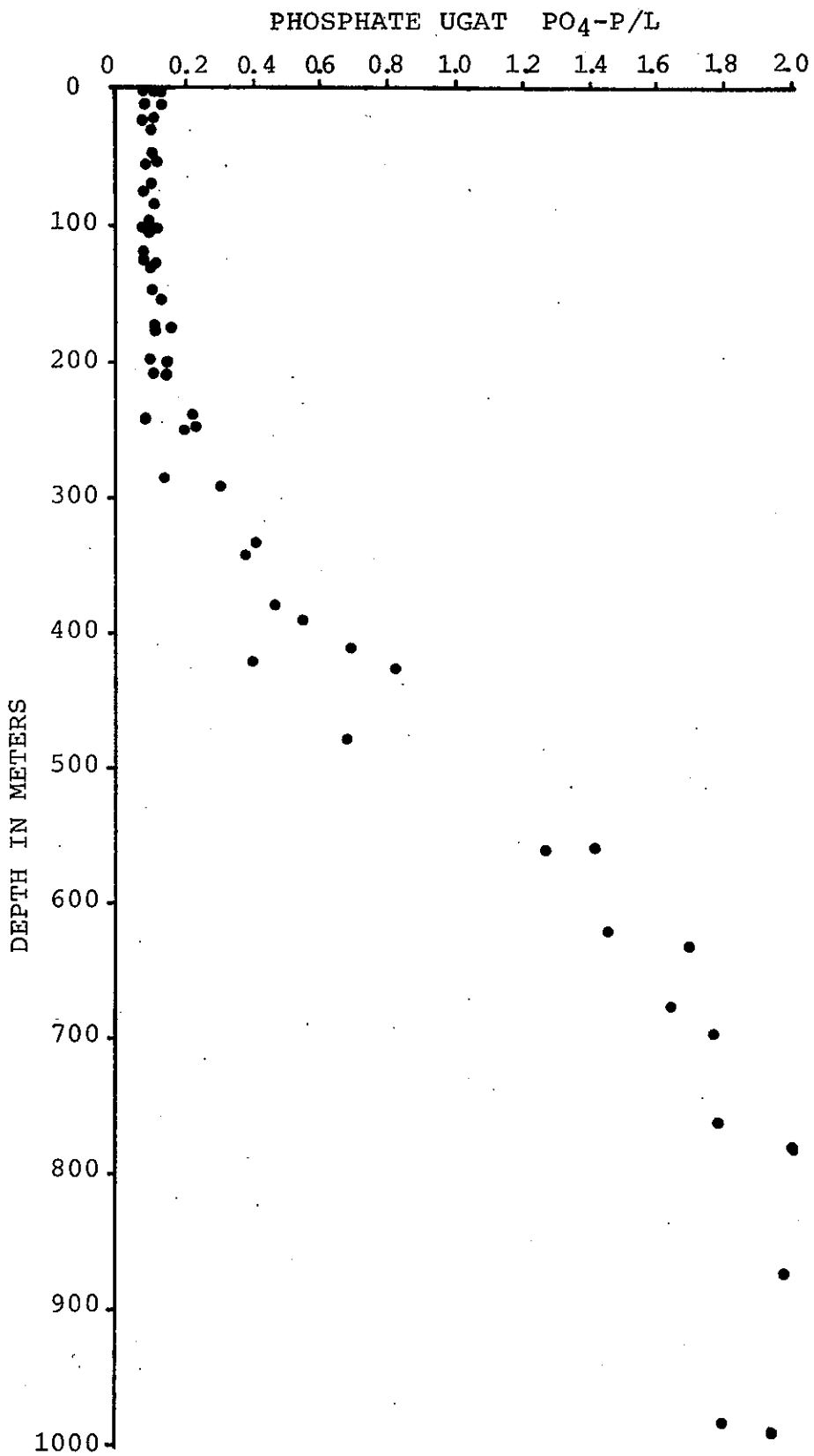


Figure 19. Phosphate versus depth at Benchmark, July 30-31, 1980.

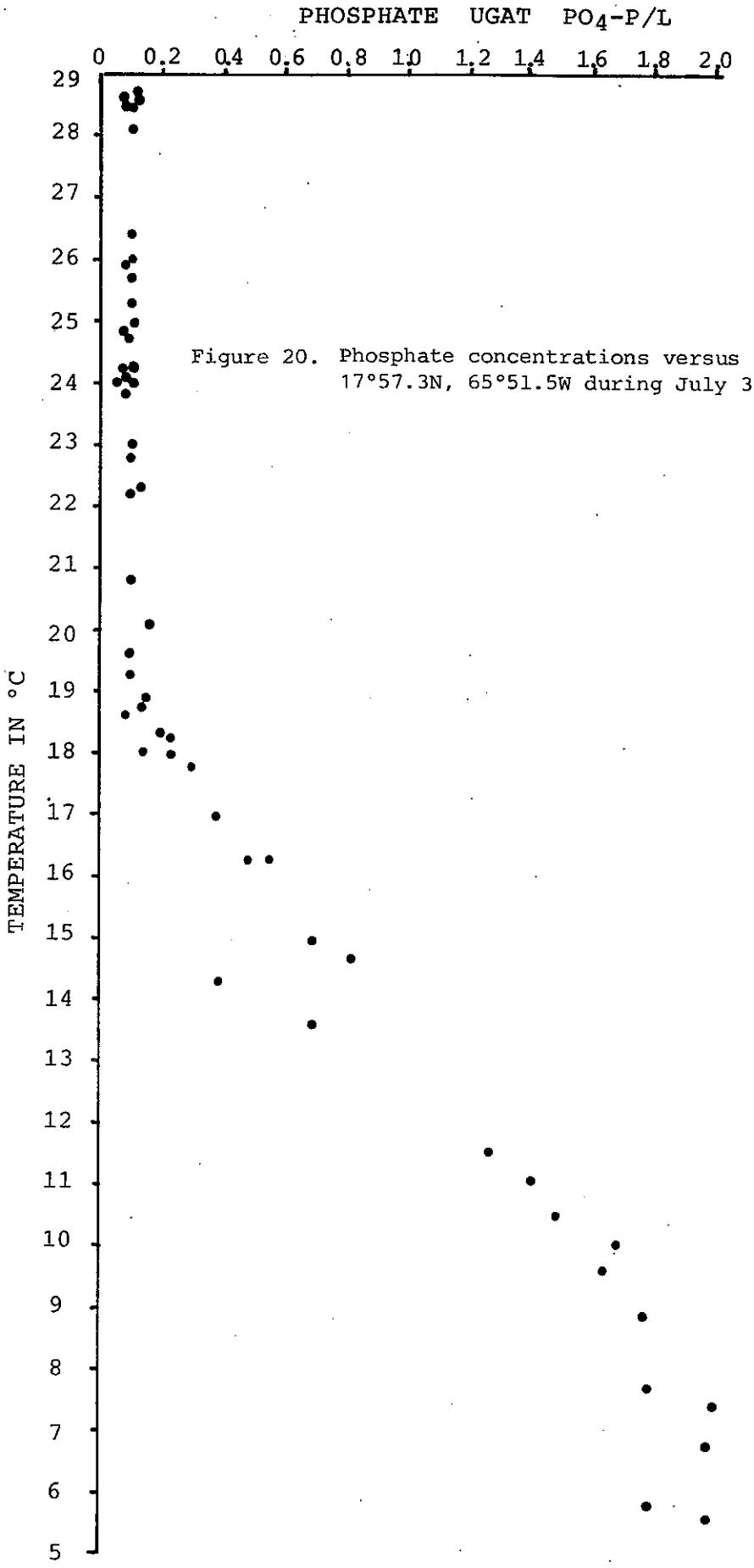


Figure 20. Phosphate concentrations versus temperature at Benchmark 17°57.3N, 65°51.5W during July 30 and 31, 1980.

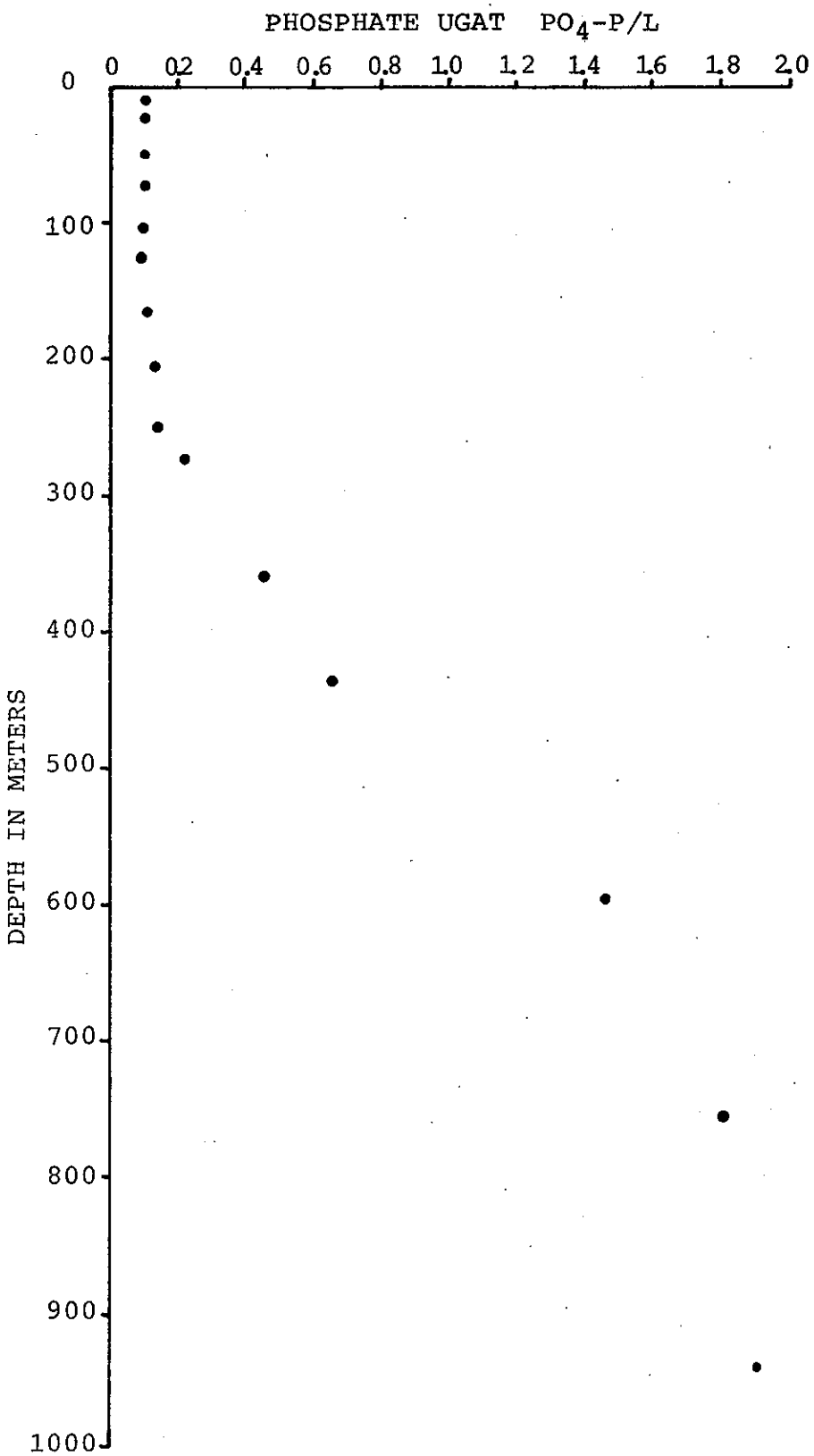


Figure 21. Mean phosphate concentrations versus mean depth at Benchmark 17°57.3N, 65°51.5W during July 30 and 31, 1980.

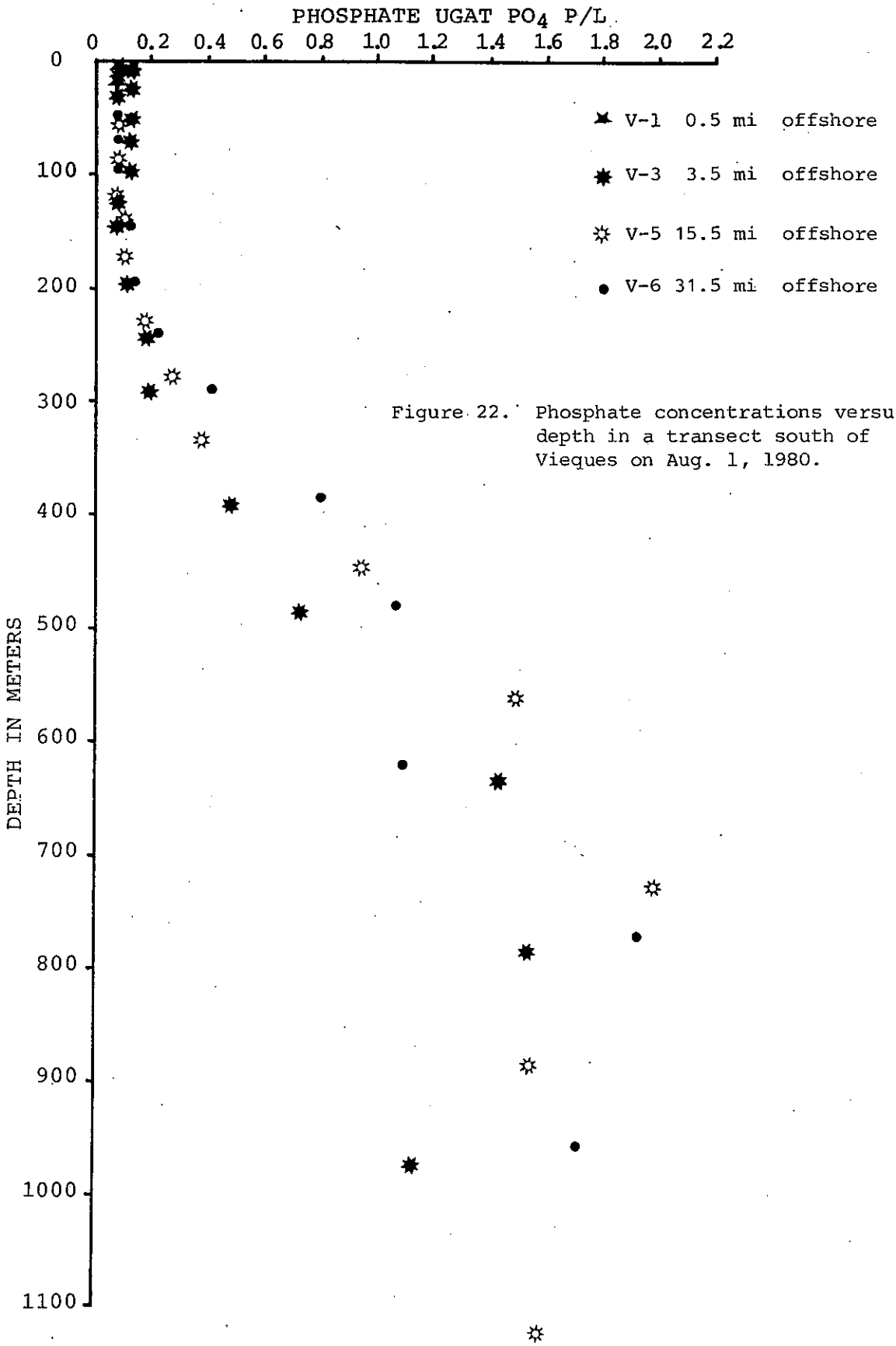


Figure 22. Phosphate concentrations versus depth in a transect south of Vieques on Aug. 1, 1980.

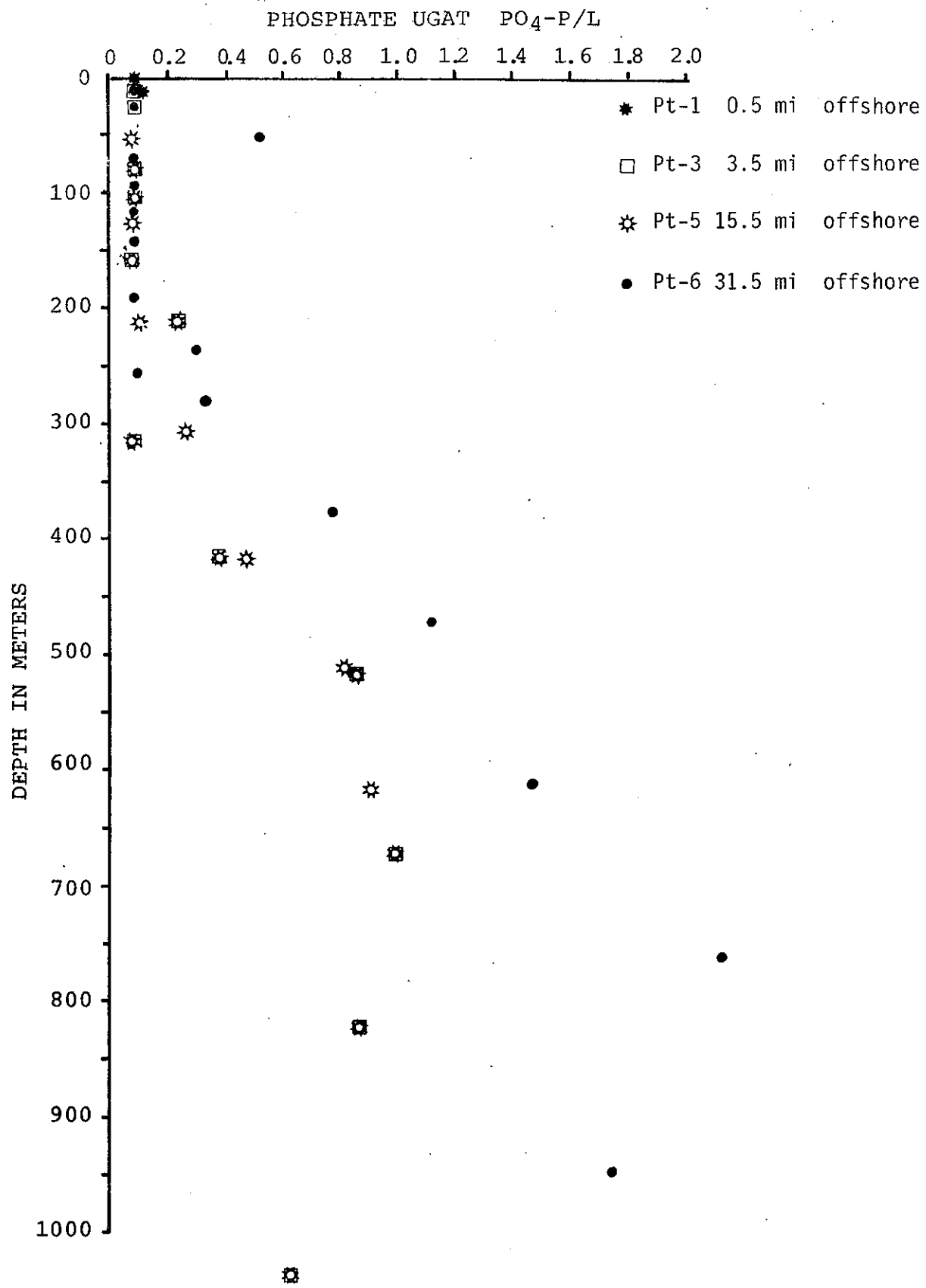


Figure 23. Phosphate concentrations versus depth in a transect south of Punta Tuna, Aug. 1-2, 1980.

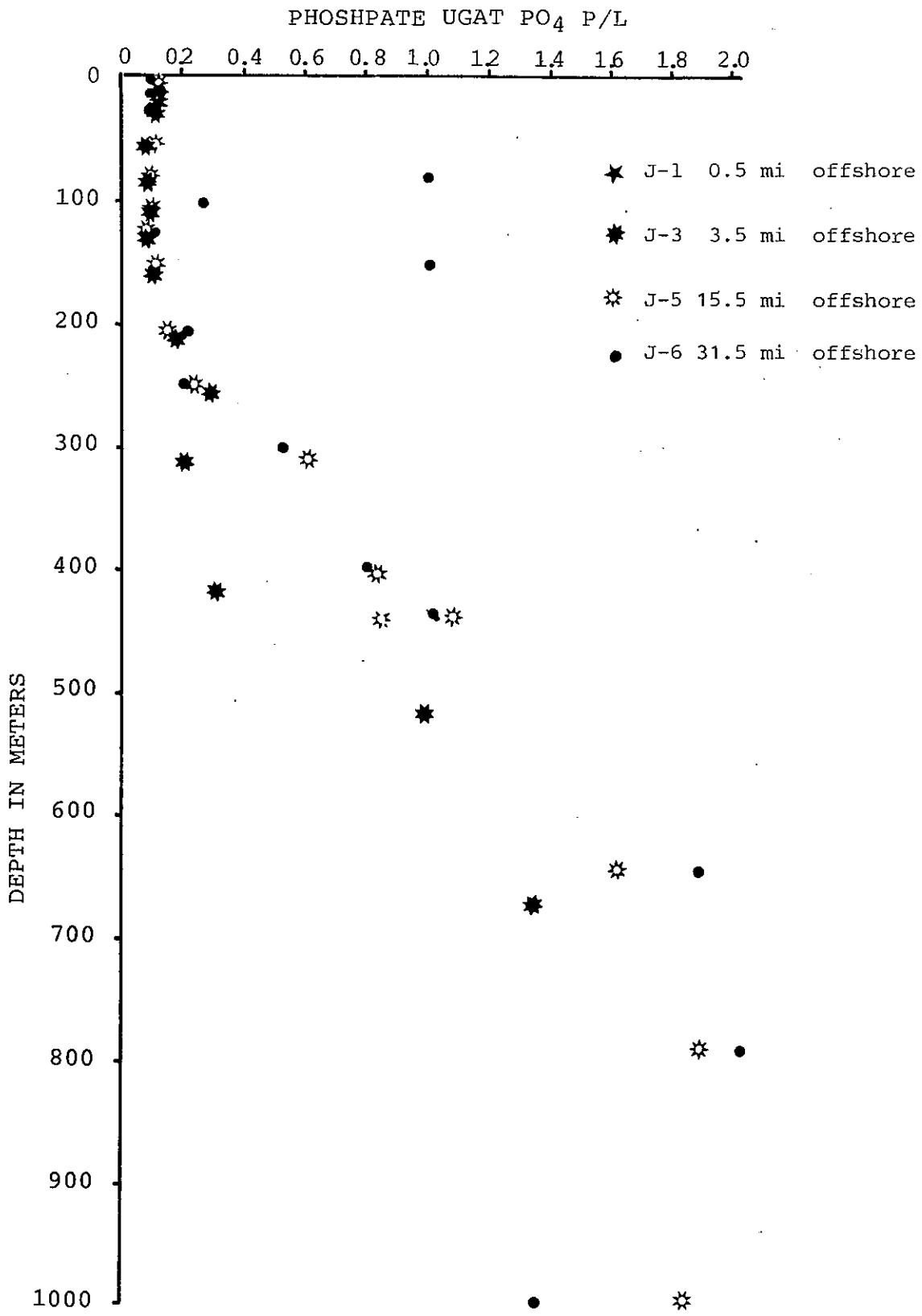


Figure 24. Phosphate concentrations versus depth in a transect south of Jobos Bay on Aug. 2, 1980.

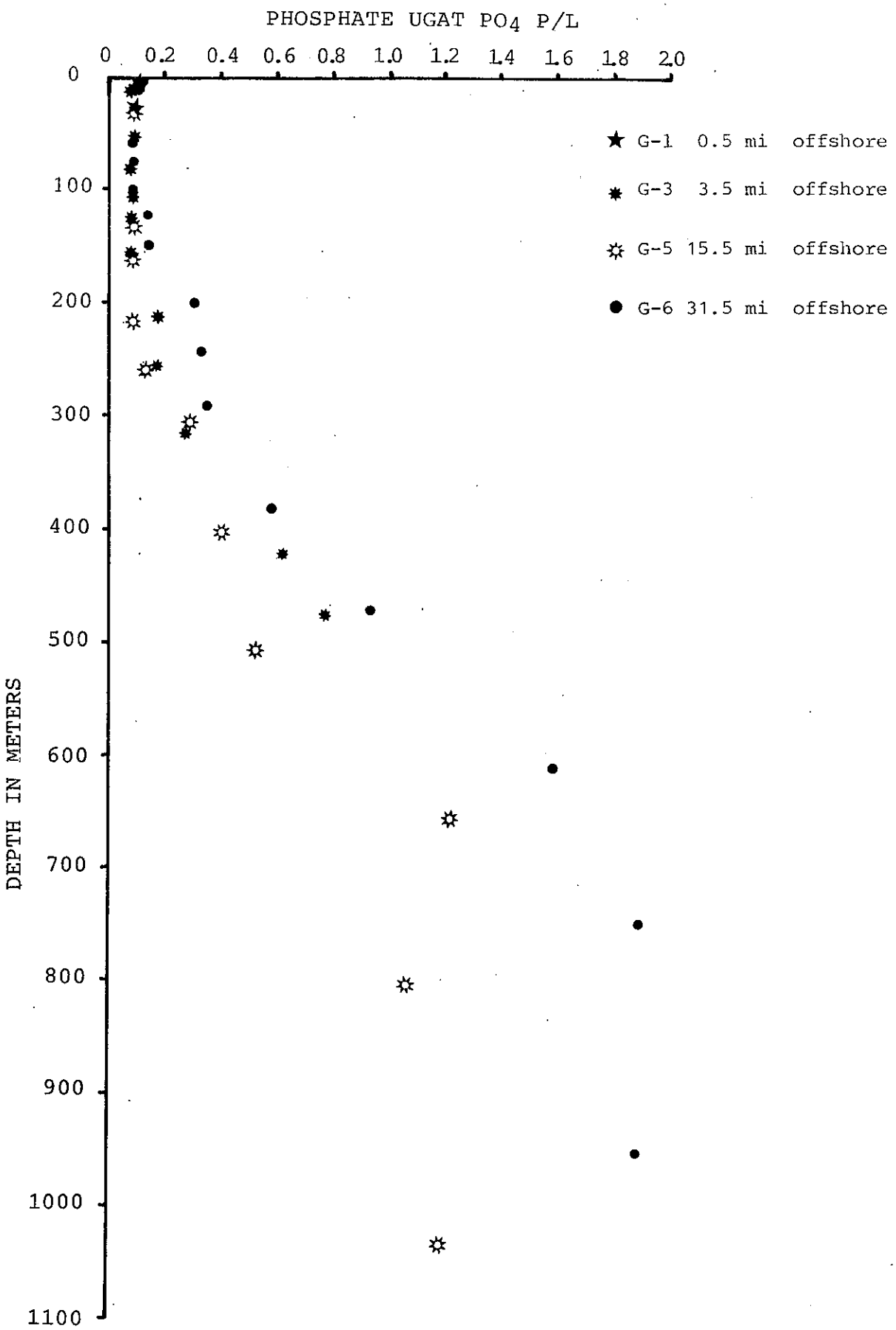


Figure 25. Phosphate concentrations versus depth in a transect south of Guayanilla on Aug. 3, 1980.

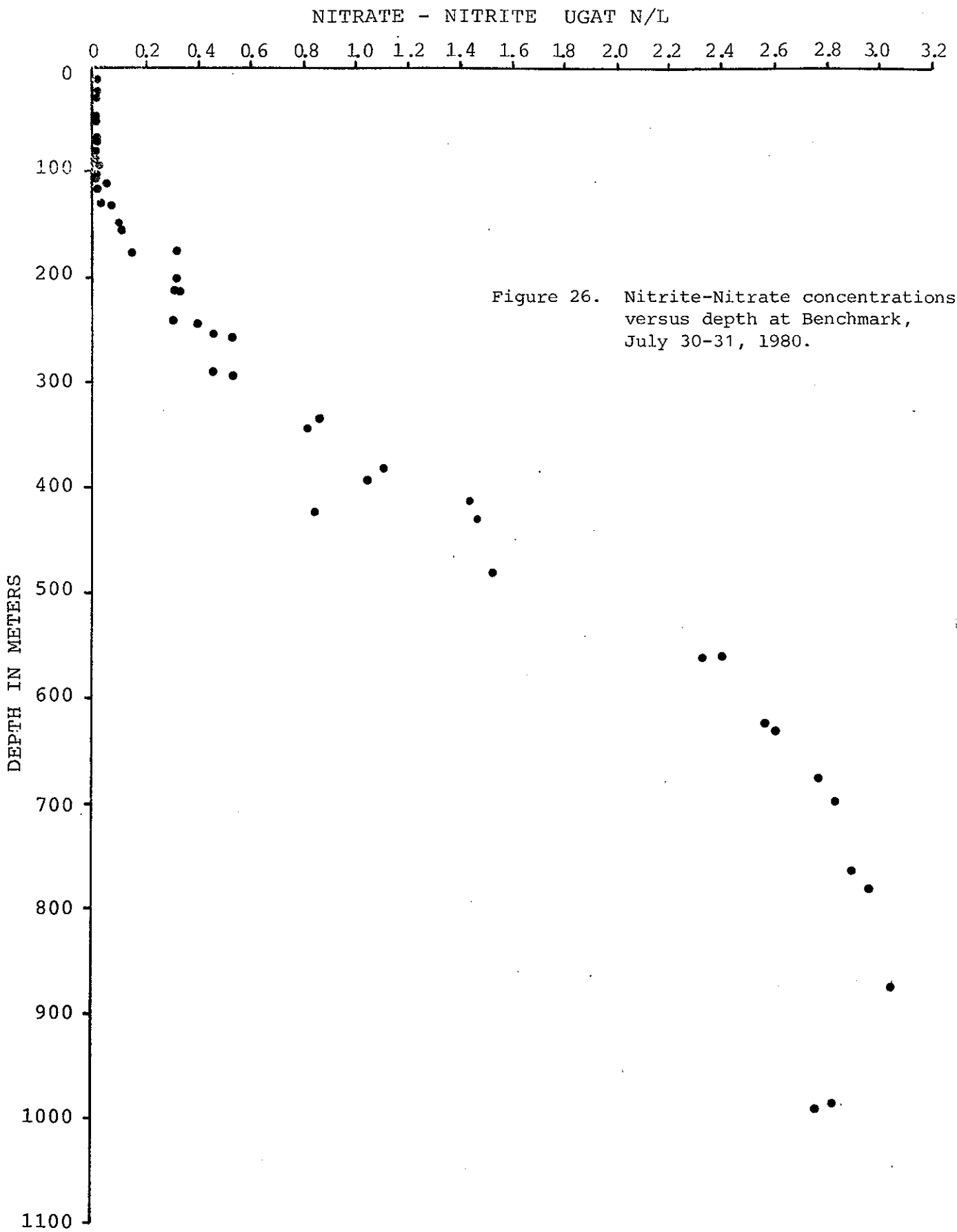


Figure 26. Nitrite-Nitrate concentrations versus depth at Benchmark, July 30-31, 1980.

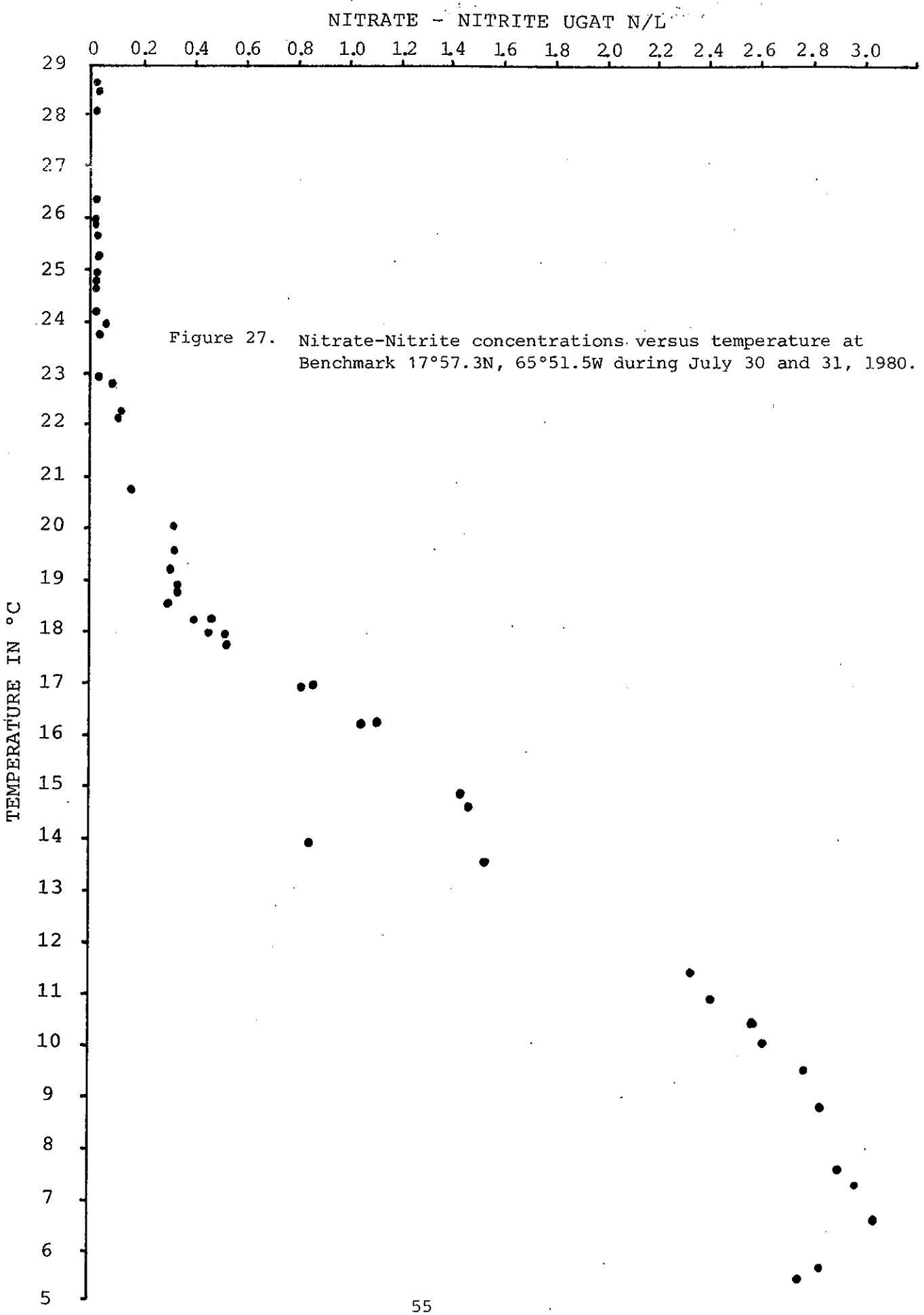


Figure 27. Nitrate-Nitrite concentrations versus temperature at Benchmark 17°57.3N, 65°51.5W during July 30 and 31, 1980.

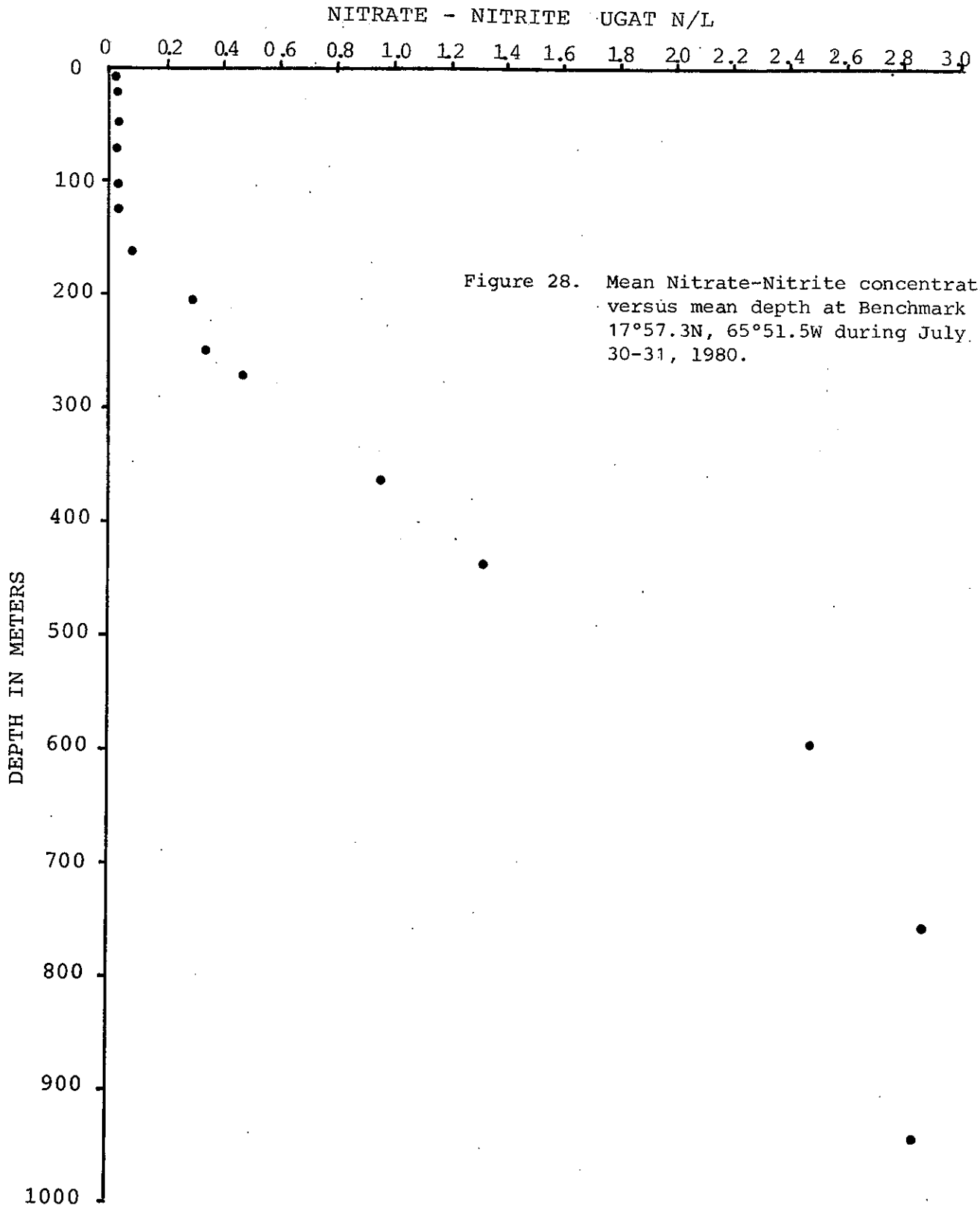


Figure 28. Mean Nitrate-Nitrite concentrations versus mean depth at Benchmark 17°57.3N, 65°51.5W during July 30-31, 1980.

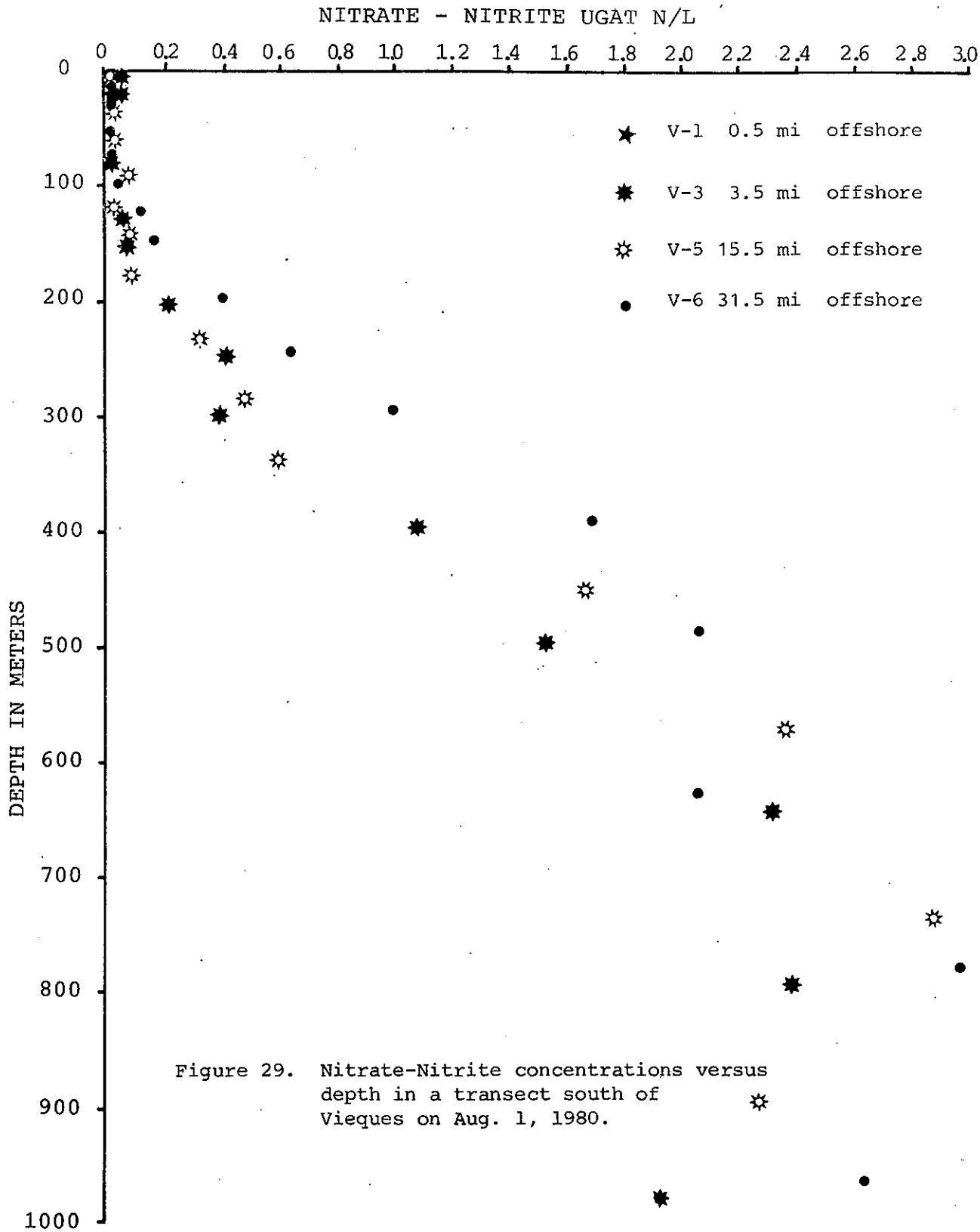


Figure 29. Nitrate-Nitrite concentrations versus depth in a transect south of Vieques on Aug. 1, 1980.

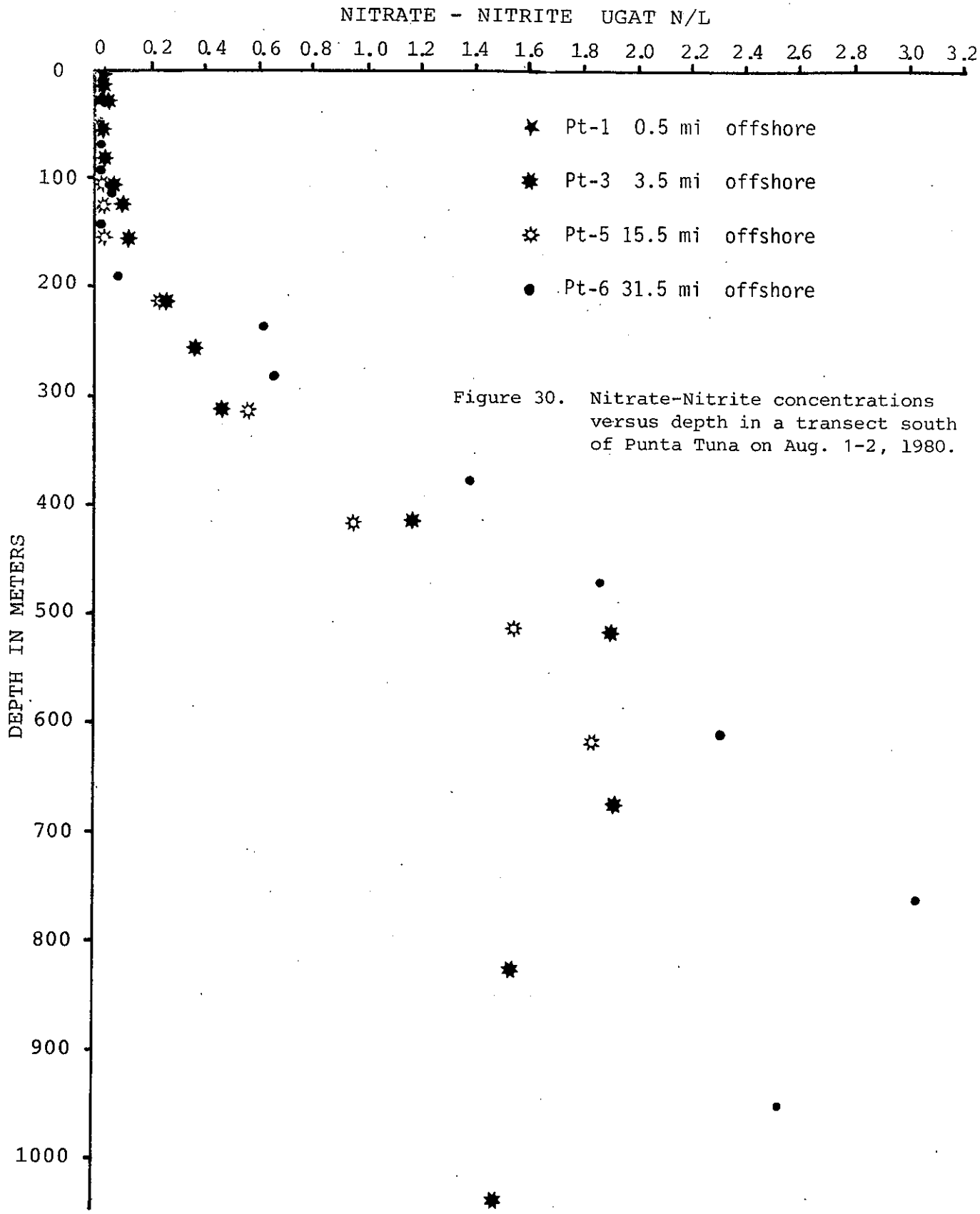


Figure 30. Nitrate-Nitrite concentrations versus depth in a transect south of Punta Tuna on Aug. 1-2, 1980.

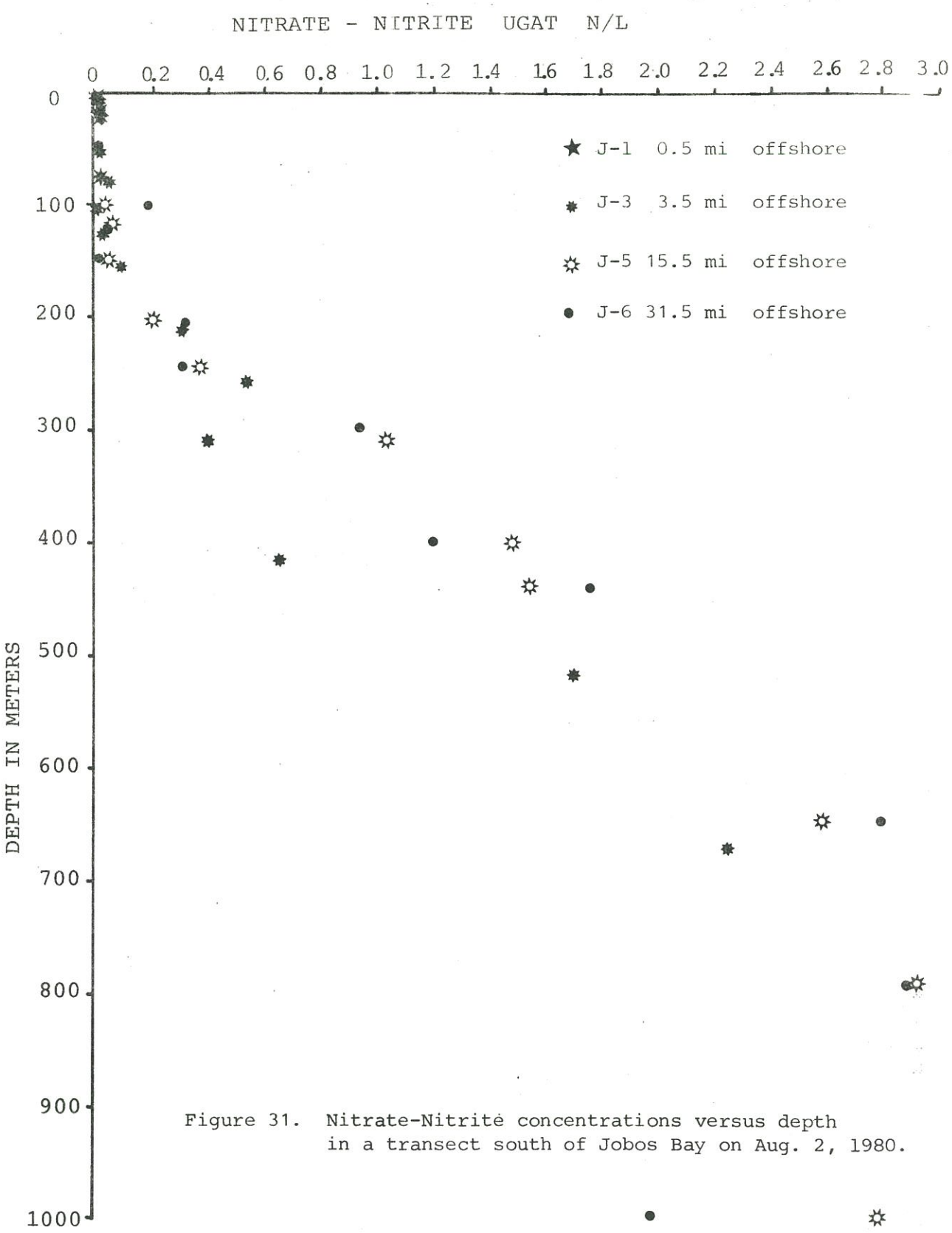


Figure 31. Nitrate-Nitrite concentrations versus depth in a transect south of Jobos Bay on Aug. 2, 1980.

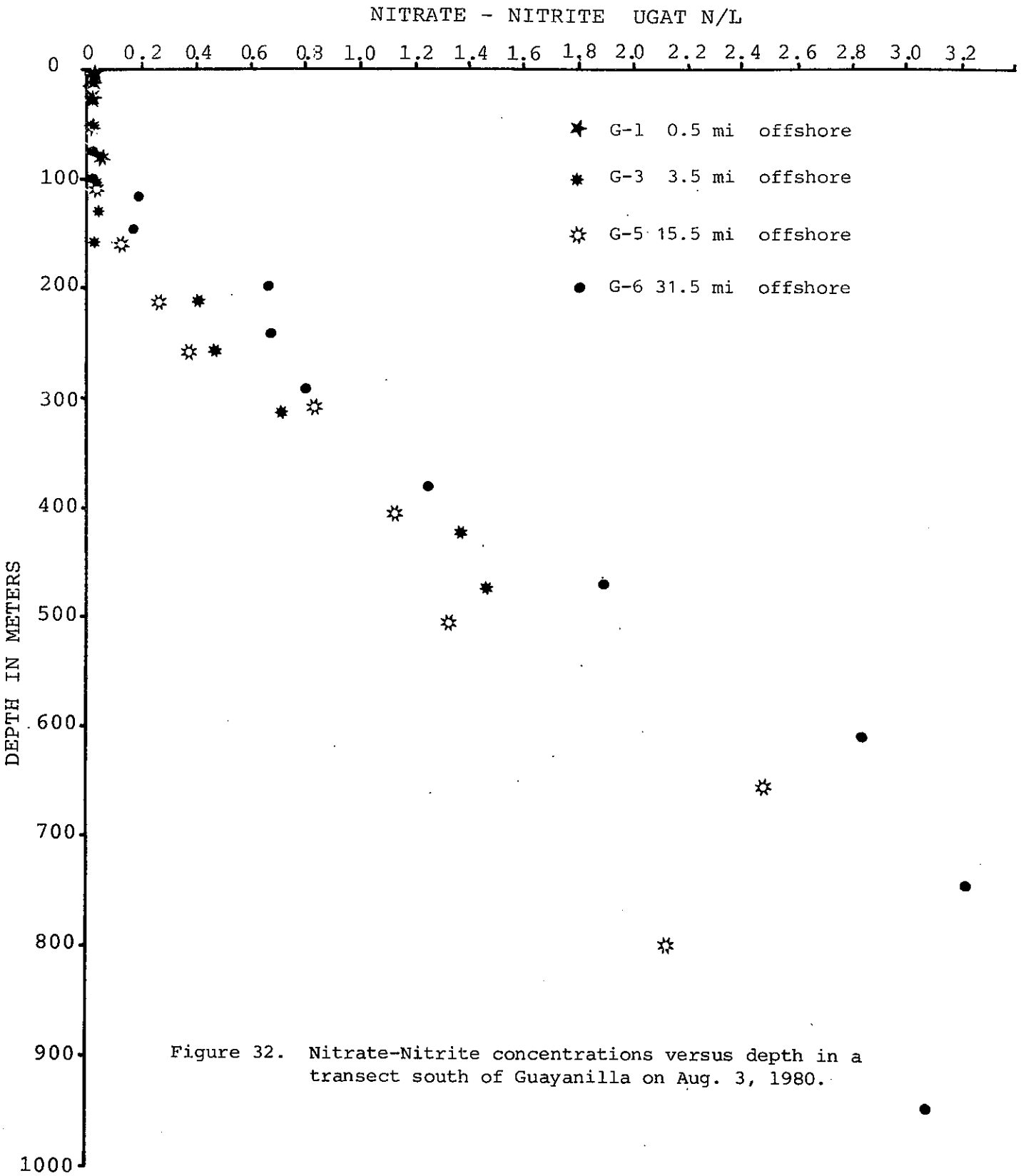


Figure 32. Nitrate-Nitrite concentrations versus depth in a transect south of Guayanilla on Aug. 3, 1980.

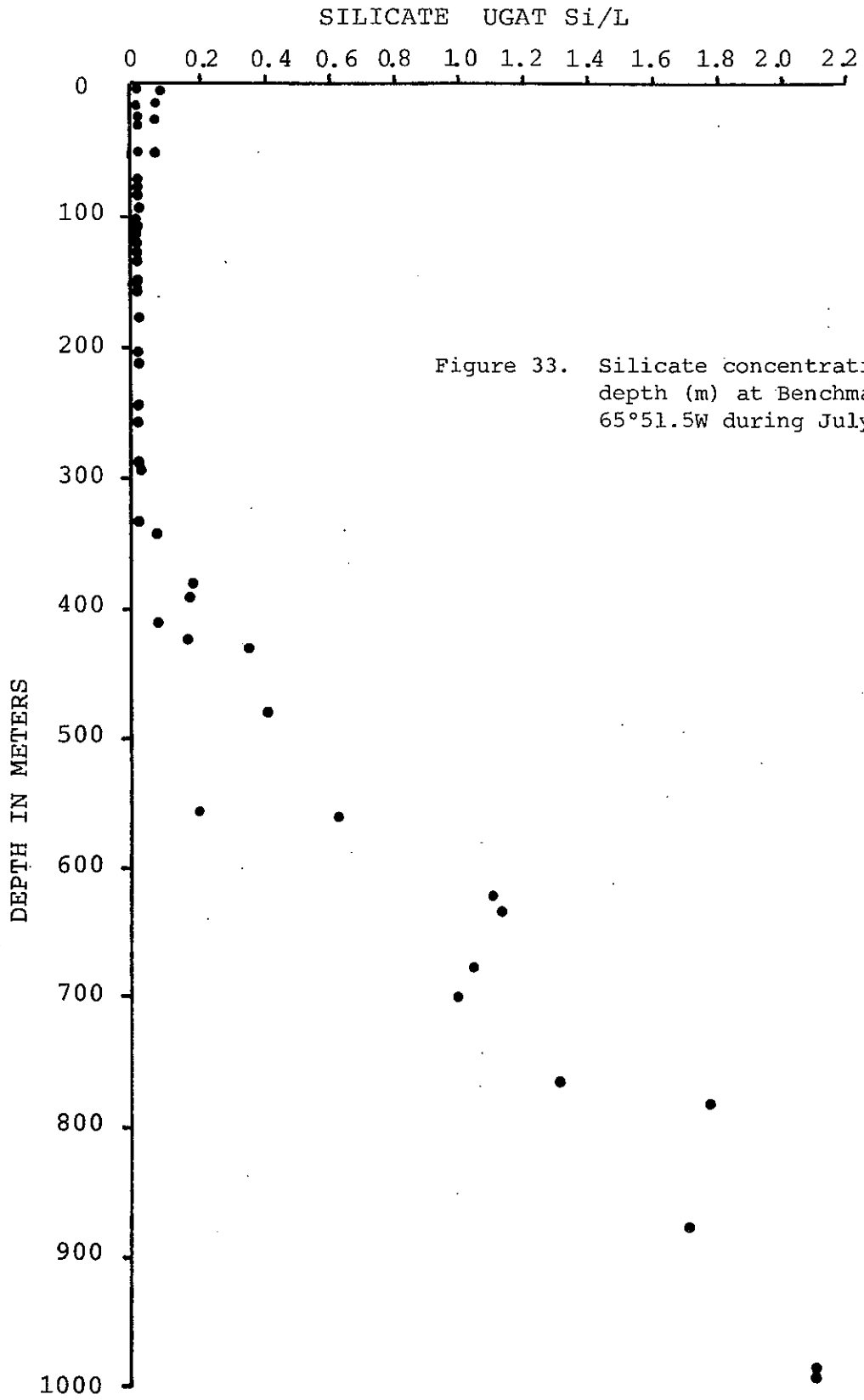


Figure 33. Silicate concentrations versus depth (m) at Benchmark 17°57.3N, 65°51.5W during July 30 and 31, 1980.

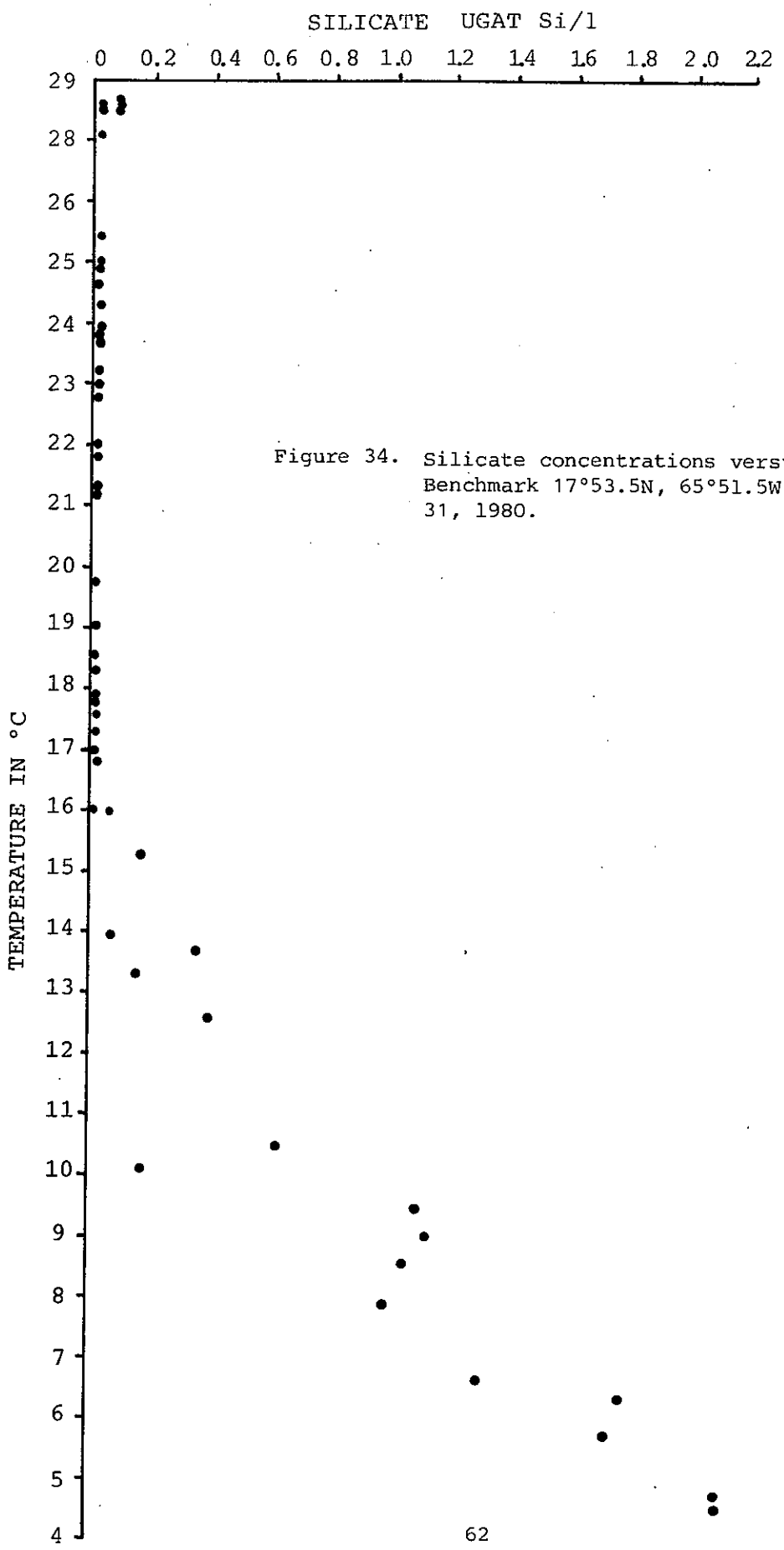


Figure 34. Silicate concentrations versus temperature at Benchmark 17°53.5N, 65°51.5W during July 30 and 31, 1980.

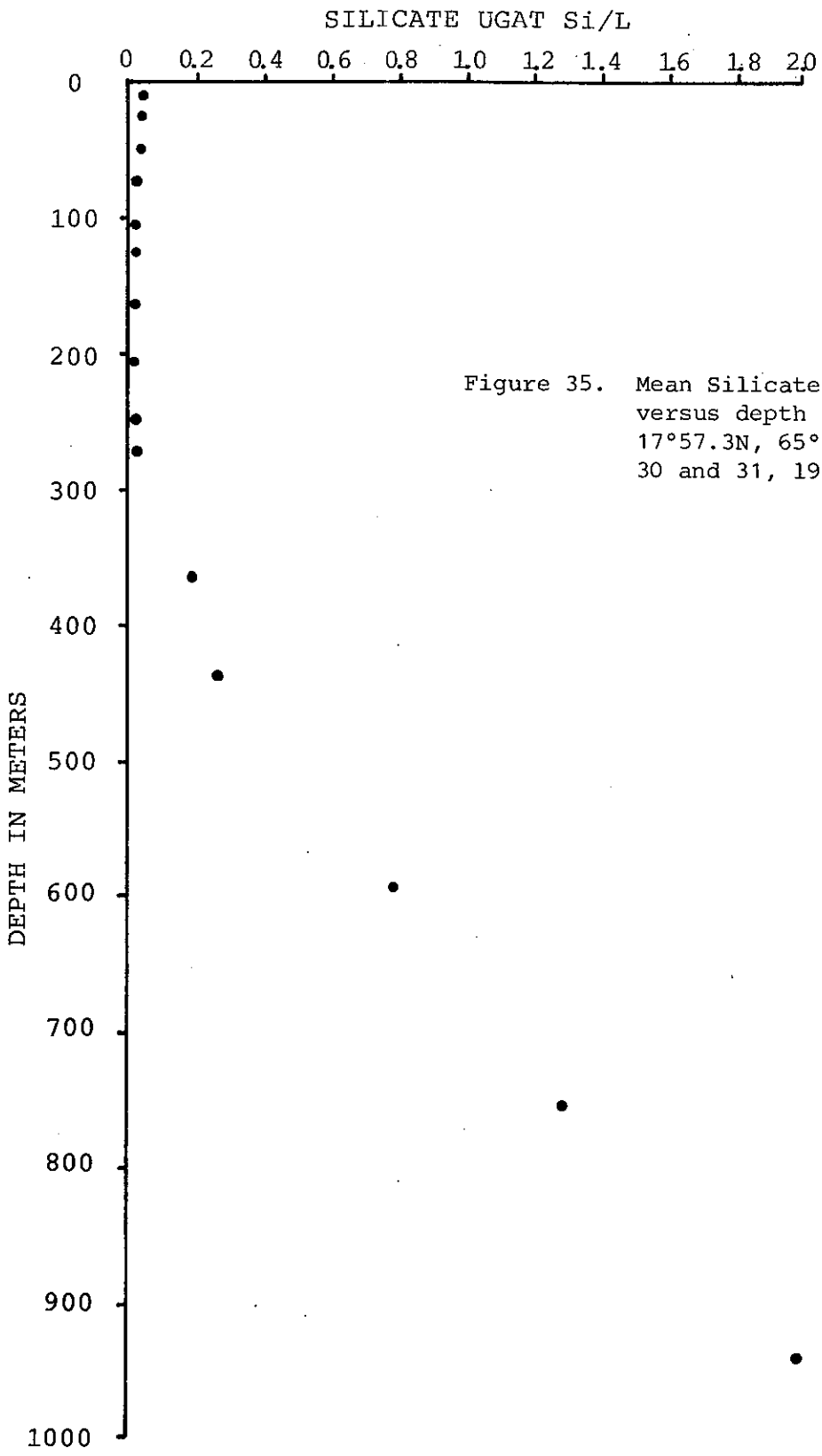


Figure 35. Mean Silicate concentrations versus depth at Benchmark 17°57.3N, 65°51.5W during July 30 and 31, 1980.

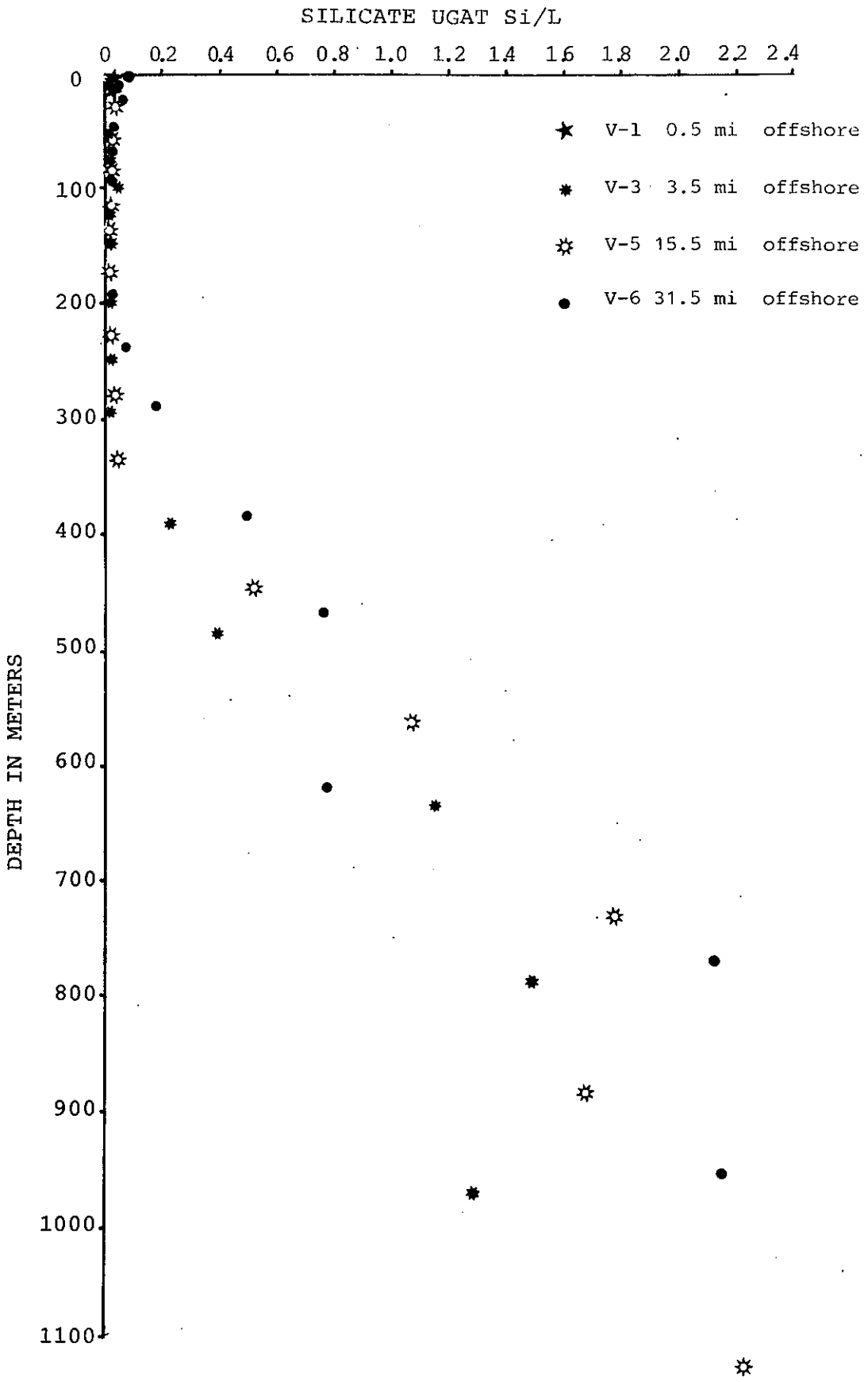


Figure 36. Silicate concentrations versus depth in a transect south of Vieques on Aug. 1, 1980

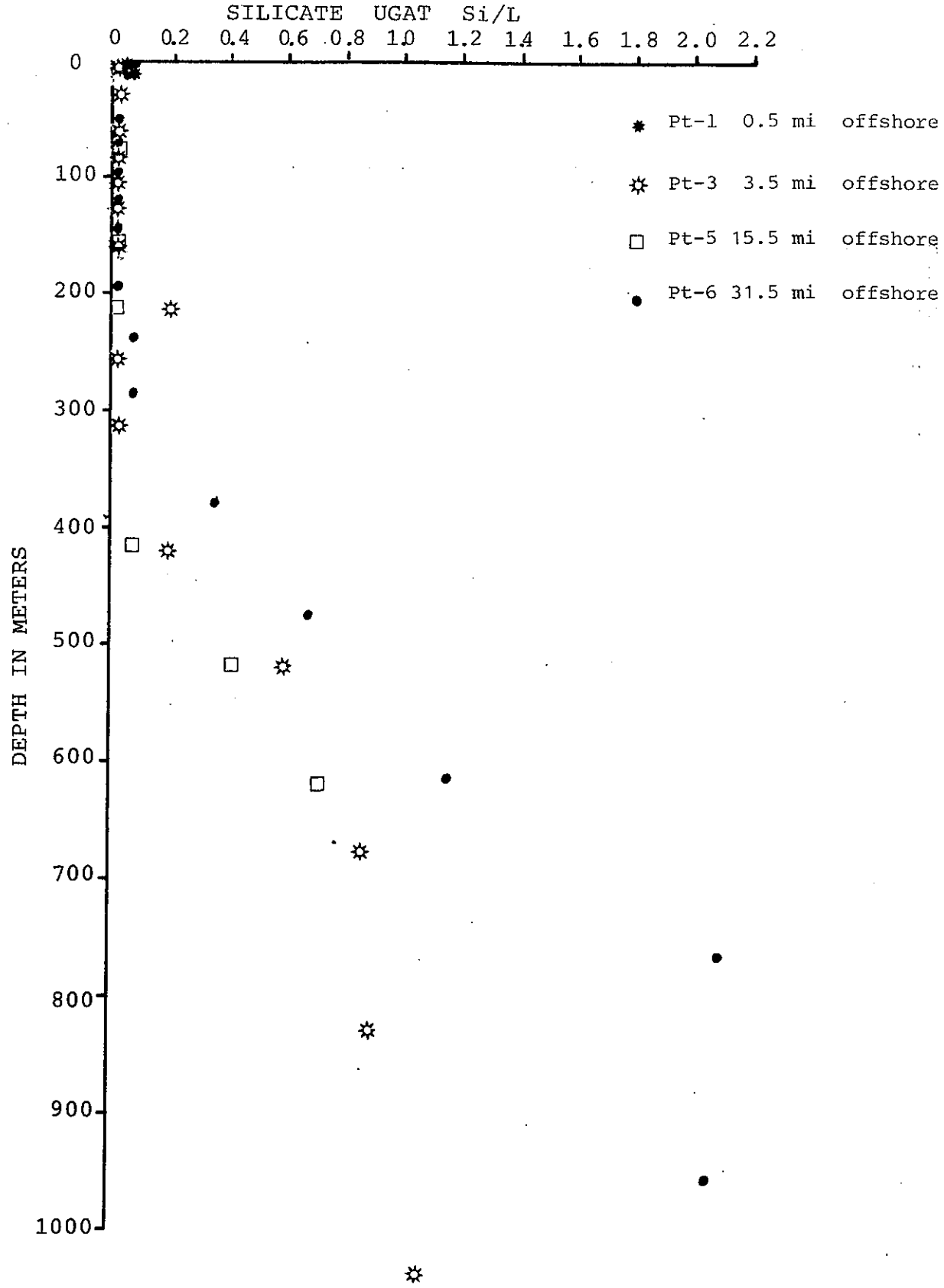


Figure 37. Silicate concentrations versus depth in a transect south of Punta Tuna on Aug. 1 and 2, 1980.

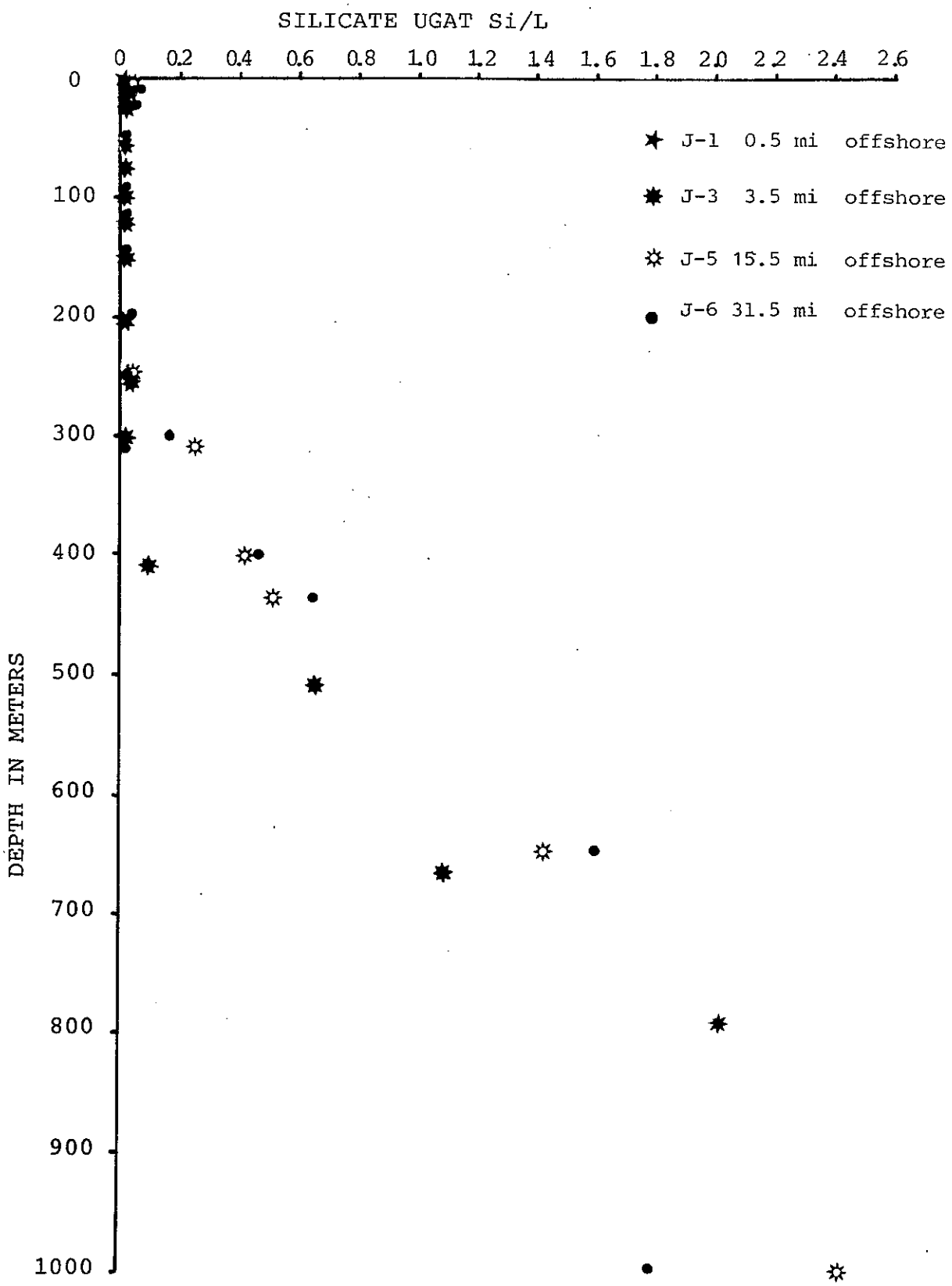


Figure 38. Silicate concentrations versus depth in a transect south of Jobos Bay on Aug. 2, 1980.

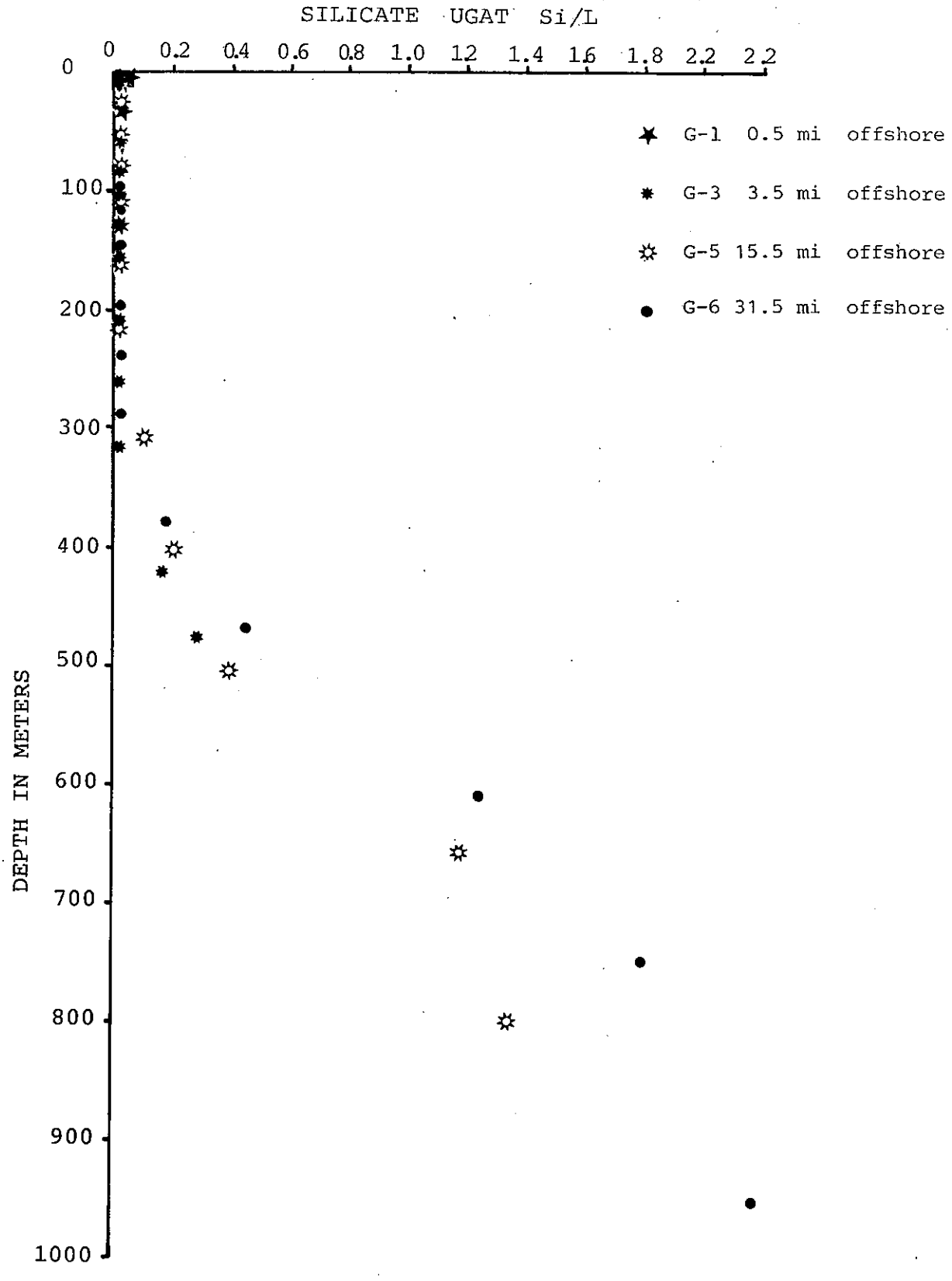


Figure 39. Silicate concentrations versus depth in a transect south of Guayanilla on Aug. 3, 1980.

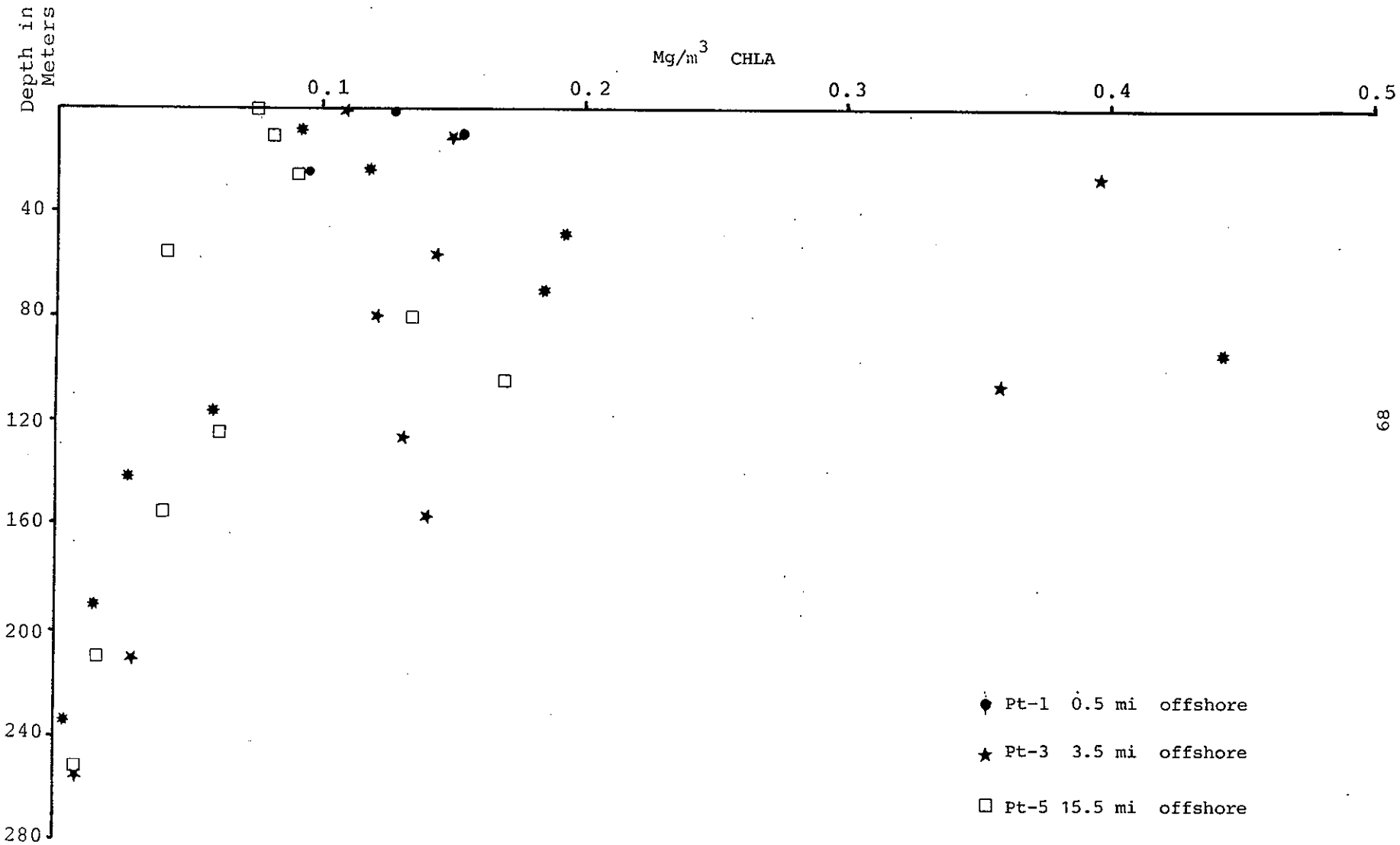


Figure 40. Vertical distribution of chlorophyll in a transect south of Punta Tuna on Aug. 1 and 2, 1980.

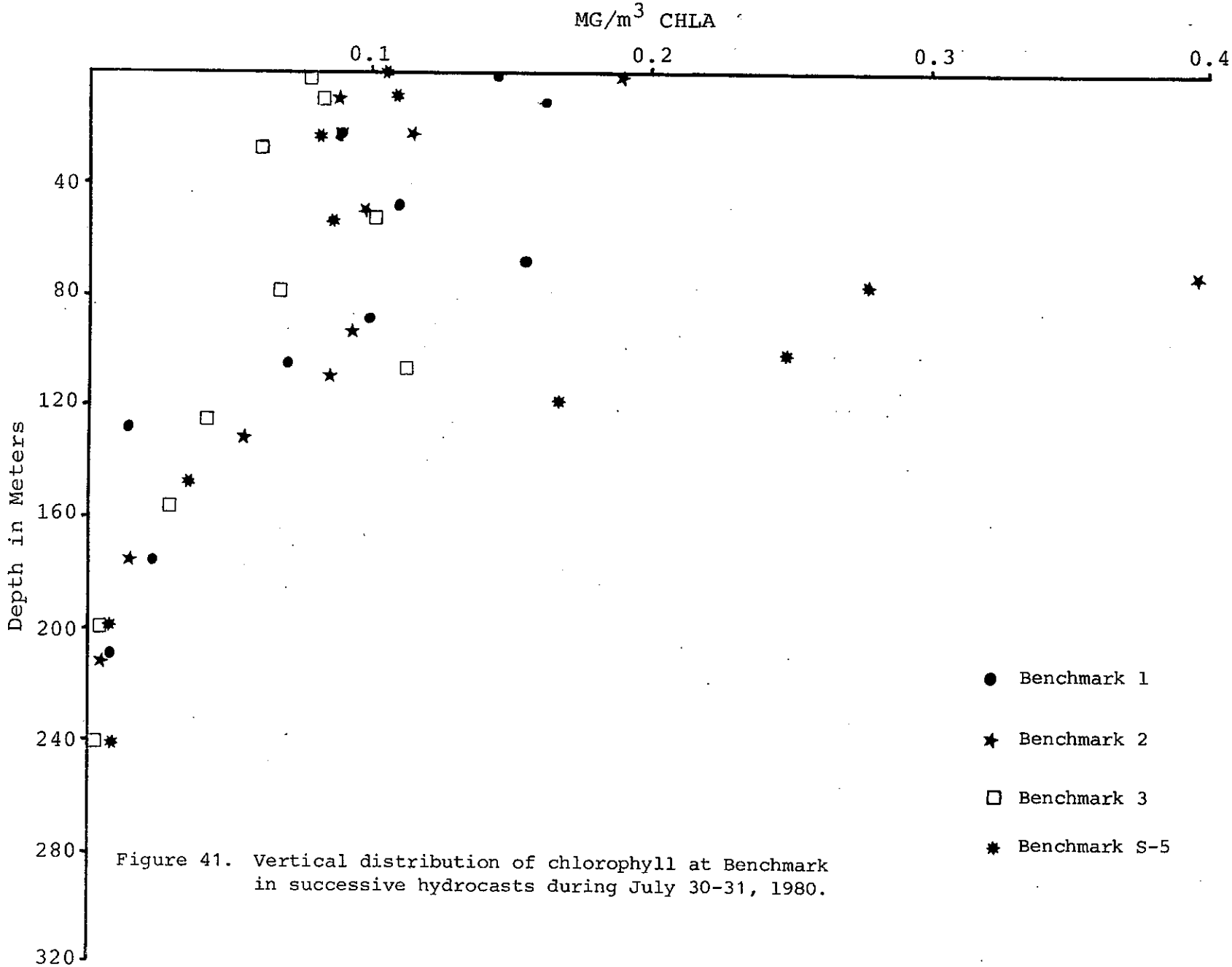


Figure 41. Vertical distribution of chlorophyll at Benchmark in successive hydrocasts during July 30-31, 1980.

ZOOPLANKTON DATA

FIFTH CRUISE

Station	Date	Local Time	Depth (m)	Latitude	Longitude	Water Filtered (m^3)	Tow Length (min)	Biomass (ml/1000 m^3)	Total Copepods (#/m^3)	Total Larvacean (#/m^3)	Total Chaetognaths (#/m^3)	Total Ichthyo-Plankton
Benchmark	7/30/80	0940	100-200	17°57.3N	65°51.5W	607.0	2014	2.1	4.3	0.5	.5	0.33
Benchmark	7/30/80	0940	0-100			361.4	2014	148.0	478.1	79.7	34.9	3.3
Benchmark	7/30/80	1040	200-1000			1032.3	6000	1.8	1.2	.29	.19	0
Benchmark	7/30/80	1210	0-100			215.0	1610	265.0	618.1	189.8	34.9	2.8
Benchmark	7/30/80	1210	100-200			498.0	1610	17.6	26.1	4.8	4.4	-
Benchmark	7/30/80	1508	200-1000			303.0	3915	10.7	17.8	11.9	7.4	-
Benchmark	7/30/80	1616	100-200			406.0	1425	5.2	5.2	0.99	0.25	-
Benchmark	7/30/80	1616	0-100			218.0	1425	280.0	491.3	156.9	30.3	-
Benchmark	7/30/80	1954	200-1000			325.0	3145	25.4	49.8	16.0	4.9	-
Benchmark	7/30/80	2104	0-100			286.0	1730	175.0	600.0	201.4	75.5	2.1
Benchmark	7/30/80	2151	200-1000			790.7	3135	5.2	4.6	0.51	1.3	-
Benchmark	7/30/80	2246	100-200			535.5	1716	11.2	6.1	0.48	0.80	-
Benchmark	7/30/80	2254	0-100			254.0	1716	299.2	871.7	422.8	111.0	7.1
Benchmark	7/30/80	2325	100-200			413.7	1605	2.7	6.0	0.18	0.18	0
Benchmark	7/31/80	0012	200-1000			777.2	3145	7.1	12.6	0.77	1.8	-
Benchmark	7/31/80	0110	100-200			505.2	1730	8.4	7.9	0.79	0.40	-
Benchmark	7/31/80	0135	0-100			278.9	1730	240.2	774.5	290.4	53.8	-
S1	7/31/80	0910	0-100	17°52.7N	65°53.9W	301.4	1508	273.7	784.3	402.1	105.5	-
S2	7/31/80	1018	0-100	17°54.2N	65°50.0W	324.6	1528	169.4	354.9	121.1	30.5	0.92
S3	7/31/80	1107	0-100	17°55.9N	65°46.4W	358.2	1506	156.3	391.1	69.5	26.8	-
S4	7/31/80	1311	0-100	17°56.2N	65°55.4W	327.0	1345	186.5	633.0	211.0	45.9	1.8
Benchmark	7/31/80	1341	0-100	17°57.3N	65°51.5W	340.1	1355	176.4	679.2	155.2	45.9	1.8
S6	7/31/80	1421	0-100	17°58.8N	65°48.2W	350.8	1400	156.8	752.6	179.6	73.5	3.4
S1	7/31/80	1930	0-100	17°52.5N	65°53.6W	346.6	1500	219.3	567.8	204.3	34.6	1.7
S2	7/31/80	2030	0-100	17°54.0N	65°50.0W	366.9	1351	149.9	578.9	117.7	31.1	1.6
S3	7/31/80	2120	0-100	17°55.9N	65°46.4W	413.4	1407	168.7	644.4	81.3	31.9	1.4
S4	8/1/80	0008	0-100	17°56.1N	65°55.3W	306.7	1335	171.1	588.8	115.4	35.2	-
Benchmark	8/1/80	0101	0-100	17°57.3N	65°51.5W	342.8	1415	113.8	512.8	87.5	42.0	5.2
S6	8/1/80	0130	0-100	17°58.8N	65°48.2W	383.9	1436	118.5	424.3	46.1	23.4	2.3
V1	8/1/80	0407	shallow	18°04.4N	65°32.6W	119.4	0400	217.8	1703.5	165.8	55.3	5.0
V2	8/1/80	0423	shallow	18°03.6N	65°32.6W	137.4	0445	134.6	563.3	109.2	54.6	-
V3	8/1/80	0604	0-100	18°01.8N	65°32.7W	385.8	1609	178.8	524.1	136.9	37.3	1.6

FIFTH CRUISE

Station	Clausocalanus furcatus (#/m^3)	Paracalanus parvus (#/m^3)	Calocalanus pavo (#/m^3)	Oithona plumifera (#/m^3)	Temora turbinata (#/m^3)	Undinula vulgaris (#/m^3)	Aliquot (ml)
Benchmark	0.12	0.32	0	0.83	0	.04	50
Benchmark	74.7	16.6	28.2	31.5	0	1.7	2
Benchmark	0.35	0.17	.06	0.41	0	.06	20
Benchmark	273.5	19.5	33.5	39.1	0	19.5	2
Benchmark	1.1	0.48	0	3.7	0	2.5	20
Benchmark	2.4	0.20	1.2	1.4	0	.40	20
Benchmark	1.0	0.10	0	0.39	0	0.10	30
Benchmark	151.4	8.3	13.8	46.8	5.5	5.5	2
Benchmark	3.1	0	0.18	2.0	0	0.55	20
Benchmark	121.7	6.3	12.6	25.2	6.3	21.0	2
Benchmark	0.20	0	.05	0.46	0	0.05	30
Benchmark	0.73	0.17	0	0.73	0	0	40
Benchmark	196.1	33.1	16.5	14.2	16.5	30.7	2
Benchmark	0.15	0	0	0.58	0	0	40
Benchmark	0.46	0	0	0.46	0	0	30
Benchmark	0.40	0	0.08	0.87	0	0.16	30
Benchmark	187.2	12.9	19.4	51.6	19.4	23.7	2
S1	151.3	15.9	35.8	17.9	6.0	8.0	2
S2	44.4	18.5	24.0	35.1	22.2	7.4	2
S3	97.2	8.4	8.4	33.5	10.0	13.4	2
S4	124.8	11.0	23.9	27.5	45.9	42.2	2
Benchmark	93.5	26.5	17.6	38.8	82.9	14.1	2
S6	183.0	12.0	15.4	18.8	13.7	8.6	2
S1	185.2	12.1	8.7	15.6	17.3	3.5	2
S2	158.6	24.5	24.5	39.2	19.6	9.8	2
S3	201.7	11.6	21.8	18.9	14.5	0	2
S4	117.4	13.7	21.5	33.3	39.1	9.8	2
Benchmark	141.8	3.5	17.5	29.8	12.3	0	2
S6	146.9	6.3	25.0	34.4	7.8	7.8	2
V1	432.2	25.1	10.1	5.0	105.5	10.1	2
V2	270.7	13.1	48.0	8.7	34.9	39.3	2
V3	119.8	12.4	9.3	38.9	3.1	15.6	2

FIFTH CRUISE

Station	Date	Local Time	Depth (m)	Latitude	Longitude	Water Filtered (m^3)	Tow Length (min)	Biomass (ml/1000 m^3)	Total Copepods (#/m^3)	Total Larvacean (#/m^3)	Total Chaetognaths (#/m^3)	Total Ichthyo-Plankton
V4	8/1/80	0700	0-100	17°57.7N	65°32.6W	377.0	15.33	172.4	557.0	132.1	23.9	1.6
V5	8/1/80	0841	0-100	17°48.5N	65°32.6W	389.3	16.07	182.4	562.5	148.0	26.2	1.5
V6	8/1/80	1437	0-52	17°32.5N	65°32.8W	411.7	13.00	181.0	690.8	100.6	37.9	-
Pt6	8/1/80	1859	0-100	17°28.0N	65°53.0W	455.5	14.00	164.7	565.1	92.2	31.6	2.6
Pt5	8/1/80	2019	0-100	17°44.2N	65°53.0W	495.0	14.33	144.4	484.8	66.7	30.3	2.4
Pt4	8/1/80	2229	0-100	17°52.0N	65°53.0W	460.3	14.30	195.2	872.0	160.3	75.6	-
Pt3	8/1/80	2309	0-100	17°56.0N	65°53.0W	464.7	15.50	163.5	466.1	125.2	31.0	2.6
Pt2	8/2/80	0128	0-100	17°58.1N	65°53.0W	472.8	16.08	135.4	572.3	101.5	36.8	3.8
Pt1	8/2/80	0123	shallow	17°58.2N	65°53.0W	278.0	08.00	176.2	1122.3	172.7	82.0	-
J1	8/2/80	0516	shallow	17°54.8N	66°16.0W	134.2	05.55	324.1	961.3	292.8	51.4	6.7
J2	8/2/80	0534	shallow	17°53.7N	66°16.1W	132.9	05.35	492.9	1557.6	505.6	81.3	13.5
J3	8/2/80	0730	0-100	17°48.7N	66°16.0W	454.2	16.38	214.7	697.5	175.7	43.6	4.0
J4	8/2/80	0810	0-100	17°47.7N	66°16.0W	453.3	16.06	184.2	640.6	105.9	35.7	1.3
J5	8/2/80	1531	0-100	17°38.7N	66°16.0W	311.5	14.30	160.5	589.4	169.5	44.3	-
J6	8/2/80	1928	0-100	17°24.5N	66°16.0W	408.9	14.30	135.7	412.3	104.2	22.0	-
G6	8/2/80	2352	0-100	17°26.5N	66°45.0W	380.3	15.05	157.8	456.0	115.2	23.7	-
G5	8/3/80	0140	0-100	17°41.6N	66°45.0W	452.5	16.17	168.0	531.7	51.7	22.5	5.3
G4	8/3/80	0415	0-100	17°49.3N	66°45.0W	436.2	16.59	217.8	734.5	81.2	31.6	1.4
G3	8/3/80	0503	0-100	17°53.4N	66°45.0W	284.3	21.09	263.8	869.5	149.8	46.2	-
G2	8/3/80	0643	0-100	17°54.9N	66°45.0W	230.8	17.03	444.1	743.5	462.7	59.8	5.2
G1	8/3/80	0745	shallow	17°56.0N	66°45.0W	124.1	06.30	330.4	1339.2	62.9	29.0	-
G0	8/3/80	0839	shallow	17°58.0N	66°45.7W	145.0	05.20	406.9	1237.0	62.0	95.2	-

FIFTH CRUISE

Station	Clausocalanus furcatus (#/m^3)	Paracalanus parvus (#/m^3)	Calocalanus pavo (#/m^3)	Oithona plumifera (#/m^3)	Temora turbinata (#/m^3)	Undinula vulgaris (#/m^3)	Aliquot (ml)
V4	173.5	15.9	36.6	38.2	17.5	3.2	2
V5	100.2	6.2	20.0	20.0	23.1	3.1	2
V6	102.0	29.1	43.7	48.1	2.9	7.3	2
Pt6	138.3	15.8	19.8	54.0	13.2	11.9	2
Pt5	82.4	18.2	40.0	30.3	8.5	18.2	2
Pt4	153.8	26.1	27.4	19.6	11.7	5.2	2
Pt3	45.2	1.3	6.5	49.1	12.9	5.2	2
Pt2	135.8	12.7	5.1	19.0	21.6	2.5	2
Pt1	295.7	17.3	21.6	8.6	43.2	10.8	2
J1	89.4	13.4	4.5	26.8	80.5	13.4	2
J2	212.2	63.2	13.5	27.1	203.2	36.1	2
J3	174.4	23.8	18.5	21.1	6.6	13.2	2
J4	156.2	25.1	35.7	18.5	15.9	14.6	2
J5	109.8	23.1	25.0	52.0	5.8	11.6	2
J6	58.7	19.1	17.6	67.5	5.9	4.4	2
G6	89.9	22.1	34.7	33.1	4.7	6.3	2
G5	90.2	19.9	29.2	61.0	10.6	14.6	2
G4	239.3	24.8	34.4	16.5	2.8	2.8	2
G3	200.5	35.9	25.3	14.8	16.9	16.9	2
G2	228.8	28.6	36.4	20.8	5.2	26.0	2
G1	319.1	48.3	43.5	58.0	9.7	14.5	2
G0	136.7	57.9	29.0	24.8	12.4	24.8	2

APPENDIX

JULY 1980 CRUISE PLAN 8007

DAY 0		
	1600	Depart Malecón
DAY 1		
	0600	Arrive Benchmark station 17° 57.3N 65° 51.5W XBT Hydrocast (primary productivity), 15 depths
	0800	XBT
	1000	Oblique net tows (0-100, 100-200m)
	1100	Vertical net tow (1000-200m), XBT
	1200	Light profile, secchi
	1300	Oblique net tows (0-100, 100-200m)
	1400	Vertical net tow (1000-200m), XBT
	1500	Oblique net tow (0-100, 100-200m)
	1600	Vertical net tow (1000-200m)
	1700	Hydrocast XBT
	1930	Vertical net tow (100-200m), XBT
	2030	Oblique net tows (0-100, 100-200m)
	2130	Vertical net tow (1000-200m)
	2230	Oblique net tows (0-100, 100-200m)
	2330	Vertical net tow (1000-200m) XBT
DAY 2		
	0030	Oblique net tows (0-100, 100-200m)
	0130	Hydrocast
	0330	XBT
	0530	Begin small scale pattern study Steam for station S-1
	0630	Arrive S-1 17° 52.5N 65° 53.8W Hydrocast at station S-1 (primary productivity)
	0915	Oblique net tow (0-100m) station S-1, XBT
	1000	Steam for station S-2 17° 54.2N 65° 50.2W
	1045	Oblique net tow (0-100m), XBT
	1130	Steam for station S-3 17° 55.8N 65° 46.5W

1215	Oblique net tow (0-100m), XBT
1300	Steam for station S-4 17° 56.0N 65° 55.5W
1345	Oblique net tow (0-100m), XBT
1430	Steam for station S-5 (Benchmark) 17° 57.6N 65° 51.9W
1515	Oblique net tow (0-100m), XBT
1600	Steam for station S-6 17°59.2N 65° 48.2W
1645	Oblique net tow (0-100m), XBT
	Return to benchmark
1730	Hydrocast at benchmark
1930	Begin night series
	Steam for S-1 17° 52.2N 65° 53.8W
2000	Oblique net tow (0-100m), XBT
	Steam for S-2 17° 54.2N 65° 50.2W
2100	Oblique net tow (0-100m), XBT
	Steam for S-3 17° 55.8N 65° 46.5W
2200	Oblique net tow (0-100m), XBT
	Hydrocast
	Steam for S-4 17° 56.0N 65° 55.5W
2400	Oblique net tow (0-100m), XBT
	Steam for S-5 (benchmark) 17° 57.6N 65° 51.9W

DAY 3

0000	Oblique net tow (0-100m), XBT
	Steam for S-6 17° 59.2N 65° 48.2W
0100	Oblique net tow (0-100m), XBT
0200	Steam to Vieques
	Begin large scale study
	XBT's at 30 min. intervals
-0330	XBT (underway)
0345	Arrive station V-1 18° 04.4N 65° 32.6W
	Hydrocast (2 depths)
	Shallow net tow
	Steam for V-2 18° 03.6N 65° 32.6W
	Shallow net tow
0515	Steam for V-3 18° 01.8N 65° 32.6W
	Hydrocast
	Oblique net tow (0-100m)
	Steam for V-4 17° 57.7N 65° 32.6W

0830	Oblique net tow (0-100m)
	Steam for V-5 17° 48.5N 65° 32.6W
	Oblique net tow (0-100m)
1200	Hydrocast
1500	Steam for V-6
	Hydrocast 17° 32.5N 65° 32.6W
	Oblique net tow (0-100m)
	Steam for PT-6
	XBT's at 30 min intervals
2000	Arrive PT-6 17° 28'N 65° 53'W
	Hydrocast net tow
	Oblique net tow (0-100m)
2300	Steam for PT-5
	Arrive PT-5
	Oblique net tow (0-100m) 17° 44.2'N 65° 53'W
	Hydrocast
	Steam for PT-4

DAY 4

0100	Arrive PT-4 17° 52.0N 65° 53'W
	Oblique net tow (0-100m)
	Steam for PT-3 (benchmark)
0200	Arrive PT-3 17° 56.0N 65° 53'W
	Hydrocast
	Oblique net tow (0-100m)
	Steam for PT-2
0430	Arrive PT-2 17° 58.1N 65° 53'W
	Oblique net tow
	Steam for PT-1
0630	Arrive PT-1 17° 58.2'N 65° 53'W
	Shallow hydrocast (2 depths)
	Shallow net tow
	Steam for J-1
0930	Arrive J-1 17° 54.8N 66° 16.N
	Shallow hydrocast (2 depths)
	Shallow net tow
	Steam for J-2

1000	Arrive J-2 17° 53.7'N 66°16.0'W
	Oblique net tow
1055	Steam for J-3
1100	Arrive J-3 17° 51.7'N 66° 16.0N
	Hydrocast
	Oblique net tow (0-100m)
	Steam for J-4
1430	Arrive J-4 17° 47.7N 66° 16.0W
	Oblique net tow (0-100m)
	Steam for J-5
1700	Arrive J-5 17° 39.7N 66° 16.0W
	Hydrocast
	Oblique net tow (0-100m)
	Steam for J-6
1800	Arrive J-6 17° 24.5N 66° 16.0W
	Hydrocast
	Oblique net tow (0-100m)
1930	Depart for G-6
2100	XBT (underway)
2230	Arrive G-6 17° 26.5'N 66° 45'W
	Oblique net tow (0-100m)
	Hydrocast

Day 5

0000	Depart for G-5
0200	Arrive G-5 17° 41.6'N 66° 45'W
	Hydrocast
	Oblique net tow (0-100m)
	Depart for G-4
0430	Arrive G-4 17° 49.3'N 66° 45'W
	Oblique net tow (0-100m)
	Depart for G-3
0600	Arrive G-3 17° 53.4'N 66° 45'W
	Oblique net tow (0-100m)
	Hydrocast
	Depart for G-2
0730	Arrive G-2 17° 54.9'N 66°45'W
	Oblique net tow (0-100m)
	Depart for G-1

0815	Arrive G-1 17°56'N 66° 45'W
	Oblique net tow
	Shallow hydrocast
	Depart G-0
0845	Arrive G-0 17° 58'N 66° 45.7'W
	Oblique net tow
0915	Sail back to G-3
0955	Test comparison between Bongo nets and conventional nets sailing straight west 270°
	Surface tows
	Oblique tows 0-100, 100-200
	Vertical tows 100-200
1200	Depart for Malecon

LIST OF PARTICIPANTS

1.	Juan G. González	-	Chief Scientist
2.	José A. Ramírez	-	Scientist
3.	Eric Hawk	-	Scientist
4.	Jorge García	-	Technician
5.	Jorge Capella	-	Technician
6.	Angel Nazario	-	Technician
7.	Carlos Bonafé	-	Technician
8.	Isabel Rodríguez	-	Technician
9.	Angel Marquez	-	Technician
10.	Terrence Merrigan	-	Technician
11.	Dennis Corales	-	Technician
12.	Alfredo Mercado	-	Technician
13.	Edwin González	-	Technician
14.	Ivan Rosas	-	Technician
15.	Ramón Gomez	-	Technician

WEATHER CODE

0	Clear (no cloud at any level)
1	Partly cloudy (scattered or broken clouds)
2	Continuous layer (s) of cloud (s)
3	Sandstorm, duststorm, or blowing snow
4	Fog, thick dust, or laze
5	Drizzle
6	Rain
7	Snow, or rain and snow mixed
8	Shower (s)
9	Thunderstorm (s)