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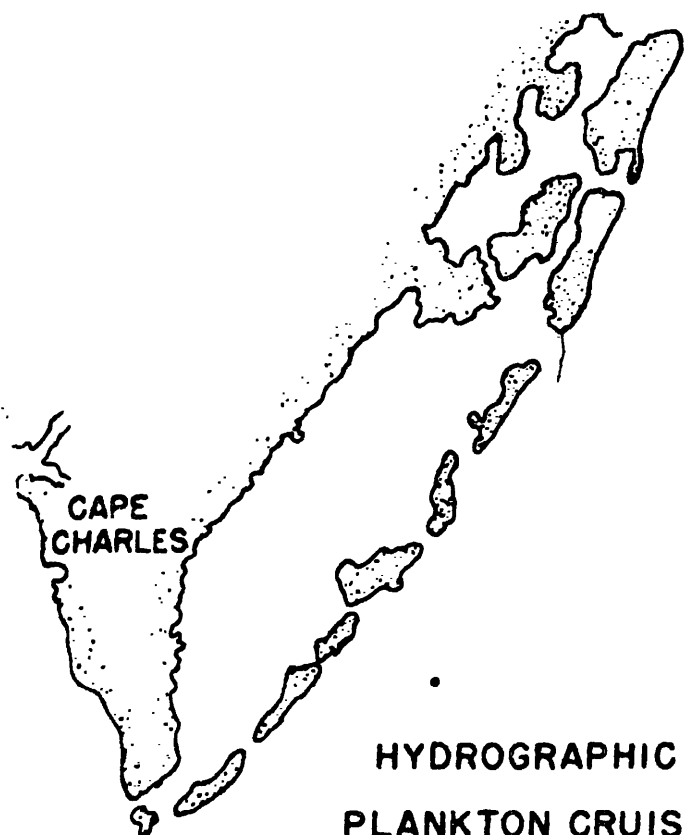
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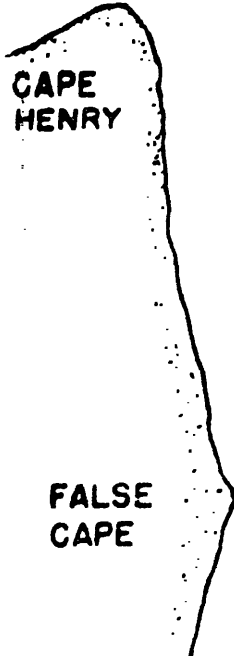
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J.T. ALLEN



HYDROGRAPHIC DATA FROM THE ATLANTIC
 PLANKTON CRUISES OF THE R/V PATHFINDER
 DECEMBER 1959 - DECEMBER 1960

CB-0



VIRGINIA FISHERIES LABORATORY
 SPECIAL SCIENTIFIC REPORT NO. 18
 1961

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A SUMMARY OF HYDROGRAPHIC STATION DATA FROM THE ATLANTIC
PLANKTON CRUISES OF THE R/V PATHFINDER

December 1959 - December 1960

The data included in this report have resulted from a series of monthly offshore cruises conducted by the Ichthyology Research Section. The cruises were made to obtain information on the distribution and abundance of pelagic eggs and larvae of fishes. Since the biological results will be reported in a series of separate papers (Joseph, Massmann and Norcross, 1961), it was felt that the raw hydrographic data should be made available in a single source.

The area covered is approximately 2500 square nautical miles of the neritic zone within the 20-fathom contour. The shore line encompasses the mouth of Chesapeake Bay and extends from False Cape on the south to Wachapreague Inlet on the north. Within this area are 22 stations arranged in four transects of four stations and two transects of three stations. Three additional stations are within lower Chesapeake Bay. The location and depth of each station is given in Table 1.

Surface and bottom temperatures and water samples were obtained at each station. Wind velocities were estimated and wind direction obtained from compass bearings. Temperatures were taken by means of a cable-mounted thermistor developed by Chesapeake Bay Institute. Surface and bottom water samples were returned to the laboratory where salinities were determined by titration. The untreated hydrographic data are summarized in Table 2.

Isothermal and isohaline patterns for surface and bottom waters are included in figures 1-12. Since stations are separated by intervals of 10 nautical miles and could not be sampled synoptically, the construction of patterns must depend on a liberal interpretation of the data.

Six standard surface drift bottles provided by Woods Hole Oceanographic Institution were released on each of the 22 offshore stations and station CB-0, during all of the twelve cruises. Drift bottle recoveries are not included in this report.

Although a span of 13 months is covered, data are reported for only 12 months. During October and November of 1960 the Pathfinder was out of service for repairs. In November a trawler was chartered for the cruise, but no cruise was attempted in October.

The distribution of this report does not constitute publication, and the data are subject to revision.

Literature Cited

1961. Joseph, E. B., W. H. Massmann and J. J. Norcross.
Investigations of inner continental shelf waters off lower Chesapeake Bay. Part I - General introduction and hydrography. Chesapeake Science (In press).

Edwin B. Joseph
William H. Massmann
John J. Norcross
13 February 1961

Table 1
Designation and Location of Stations

Designation	Location				Depth in feet
	N. °	Lat. '	W. °	Long. '	
CB-0	37	01	76	03	50
CB-10	37	08	76	11	40
CB-20	37	15	76	22	60
640 I	36	40	75	47	66
640 II	36	40	75	35	60
640 III	36	40	75	22	66
640 IV	36	40	75	10	120
650 I	36	50	75	47	56
650 II	36	50	75	35	48
650 III	36	50	75	22	72
650 IV	36	50	75	10	72
700 I	37	00	75	47	48
700 II	37	00	75	35	64
700 III	37	00	75	22	96
700 IV	37	00	75	10	114
710 I	37	10	75	47	20
710 II	37	10	75	35	54
710 III	37	10	75	22	84
710 IV	37	10	75	10	102
720 II	37	20	75	35	42
720 III	37	20	75	22	82
720 IV	37	20	75	10	82
730 II	37	30	75	35	36
730 III	37	30	75	22	82
730 IV	37	30	75	10	96

Table 2
Station Hydrographic Data

Station No.	Date	Time	Salinity		Temperature		Wind	
			Surf.	Bot.	Surf.	Bot.	Dir.	Force*
<u>December 1959</u>								
CB-20	12- 7-59	1515	23.9	24.3	8.28	8.90	NW	7
CB-10	12- 7-59	1700	26.5	26.7	7.67	7.89	NW	7
CB-0	12- 8-59	1045	23.4	26.0	7.92	-	SW	4
640 I	12- 8-59	1415	30.95	31.29	12.23	-	SW	2
640 II	12- 8-59	1545	32.68	33.19	11.62	12.00	W	2
640 III	12- 8-59	1715	32.68	33.19	11.2	11.4	W	3
640 IV	12- 9-59	0540	33.57	29.07	12.80	12.72	SW	4
650 I	12- 8-59	1245	27.3	30.43	9.30	11.0	SW	4
650 II	12- 8-59	1750	30.61	31.82	11.02	11.40	W	3
650 III	12- 8-59	1830	32.00	32.50	11.38	11.80	NW	4
650 IV	12- 9-59	0410	33.21	33.57	12.01	12.5	SW	4
700 I	12- 8-59	2225	26.09	29.72	9.00	10.80	W	3
700 II	12- 8-59	2315	30.10	32.01	10.20	11.50	W	4
700 III	12- 9-59	0115	-	33.21	11.84	12.20	SW	4
700 IV	12- 9-59	0240	33.21	33.73	12.18	12.80	SW	4
710 I	12- 9-59	1315	28.71	-	8.63	10.01	SW	3
710 II	12- 9-59	1230	28.21	-	8.96	10.33	SW	2
710 III	12- 9-59	1110	29.07	-	8.83	11.34	SW	2
710 IV	12- 9-59	0945	-	-	11.63	12.00	SW	2
720 II	12-10-59	2400	27.48	31.98	8.30	11.17		0
720 III	12-10-59	2240	30.95	32.66	9.03	11.40		0
720 IV	12-10-59	2115	32.36	33.21	11.21	12.18		0
730 II	12-10-59	1710	31.76	31.65	9.1	9.0	NE	1
730 III	12-10-59	1840	32.36	32.52	11.58	11.96	NE	1
730 IV	12-10-59	2000	33.04	32.86	11.24	11.27		0
<u>January 1960</u>								
CB-20	1-12-60	0630	18.24	18.59	5.59	6.47	NE	2
CB-10	1-12-60	0815	19.47	19.81	5.48	7.23	NE	3
CB-0	1-12-60	1015	29.23	29.43	7.58	7.64	NE	4
640 I	1-12-60	1335	29.40	28.07	7.13	7.94	NE	3
640 II	1-12-60	1515	32.00	32.00	8.40	8.42	E	3
640 III	1-12-60	1650	32.68	32.18	9.00	9.07	NE	3
640 IV	1-12-60	1835	33.21	33.21	9.91	9.91	E	3
650 I	1-13-60	0115	30.44	32.18	7.60	8.15	S	5
650 II	1-12-60	2335	31.83	33.03	8.25	8.22		
650 III	1-12-60	2150	33.21	32.86	8.69	8.79	E	3
650 IV	1-12-60	2015	32.52	32.68	9.62	9.71	E	3

* Beaufort Scale

Table 2 continued

Station No.	Date	Time	Salinity		Temperature		Wind	
			Surf.	Bot.	Surf.	Bot.	Dir.	Force*
<u>January 1960 continued</u>								
700 I	1-19-60	0700	29.42	30.28	7.31	8.07	SW	6
700 II	1-25-60	1220	31.65	32.18	6.48	6.43	N	3
700 III	1-24-60	1845	32.86	33.55	6.95	6.97	NW	3
700 IV	1-24-60	1640	32.68	32.68	7.35	7.69	NW	3
710 I	1-25-60	0930	31.13	30.79	4.14	4.15	N	3
710 II	1-25-60	1050	31.47	31.47	5.76	5.76	N	3
710 III	1-24-60	1950	31.83	32.34	6.47	6.47	NW	3
710 IV	1-24-60	1505	32.52	32.34	7.69	7.69	NW	3
720 II	1-23-60	1530	32.00	31.13	5.66	5.66	NW	5
720 III	1-24-60	0930	32.18	31.83	6.45	6.50	NW	2
720 IV	1-24-60	1315	32.52	32.18	6.92	6.99	NW	2
730 II	1-23-60	1200	31.49	31.49	5.20	5.17	NW	5
730 III	1-23-60	1345	32.18	32.01	6.25	6.27	NW	4
730 IV	1-24-60	1145	32.00	32.34	6.07	6.07	NW	3
<u>February 1960</u>								
CB-20	2-15-60	1310	19.98	20.34	4.42	4.72	NW	4
CB-10	2-15-60	1415	19.45	19.98	4.48	4.32	NW	3
CB-0	2-15-60	1530	20.34	21.56	4.60	4.42	NW	3
640 I	2-16-60	0815	28.19	29.74	5.46	6.58	W	3
640 II	2-16-60	0945	29.40	30.95	5.70	6.40	W	3
640 III	2-16-60	1115	30.64	32.50	5.97	7.92	Calm	0
640 IV	2-16-60	1245	32.34	33.21	7.22	7.79	Calm	0
650 I	2-16-60	1905	25.41	30.26	4.85	5.45	Calm	0
650 II	2-16-60	1730	31.65	31.65	5.42	5.97	S	2
650 III	2-16-60	1545	31.47	31.65	6.55	6.45		
650 IV	2-16-60	1415	31.83	32.34	6.89	6.99	Calm	0
700 I	2-16-60	2030	24.02	30.26	5.11	5.74	S	2
700 II	2-16-60	2200	24.90	31.47	4.37	6.02	Calm	0
700 III	2-16-60	2330	31.82	32.16	5.88	6.82	Calm	0
700 IV	2-16-60	0115	33.19	32.32	6.82	7.11	Calm	0
710 I	2-17-60	0700	24.87	26.44	4.44	5.28	SE	2
710 II	2-17-60	0530	25.75	31.29	4.55	5.81	S	2
710 III	2-17-60	0405	31.82	32.16	6.20	7.14	-	-
710 IV	2-17-60	0230	32.66	32.50	6.72	8.12	Calm	0
720 II	2-17-60	0900	30.95	30.95	5.38	5.51	S	3
720 III	2-17-60	1020	31.13	31.13	5.86	6.59	S	2
720 IV	2-17-60	1145	30.61	32.50	6.08	7.20	Calm	0
730 II	2-17-60	1620	30.62	31.47	5.17	5.19	-	-
730 III	2-17-60	1450	30.79	32.00	5.64	6.00	SE	2
730 IV	2-17-60	1320	32.00	32.68	6.47	6.43	SE	2

Table 2 continued

Station No.	Date	Time	Salinity		Temperature		Wind	
			Surf.	Bot.	Surf.	Bot.	Dir.	Force*
<u>March 1960</u>								
CB-20	3-14-60	1230	18.24	18.40	2.22	1.61	NW	3
CB-10	3-14-60	1350	19.11	25.59	1.78	1.44	NE	2
CB-0	3-14-60	1525	28.55	28.03	2.29	1.28	Calm	0
640 I	3-15-60	0630	30.28	29.07	2.36	2.70	NE	3
640 II	3-15-60	0812	31.83	30.97	2.93	2.96	NE	4
640 III	3-15-60	0945	32.52	32.01	3.67	3.57	NE	4
640 IV	3-15-60	1120	32.52	32.01	3.95	3.78	NE	4
650 I	3-15-60	1712	29.76	30.28	2.67	2.30	NE	2
650 II	3-15-60	1600	30.97	30.44	2.70	2.40	NE	4
650 III	3-15-60	1420	31.65	31.49	3.15	2.97	NE	4
650 IV	3-15-60	1245	32.18	31.65	3.80	3.62	NE	4
700 I	3-15-60	1902	29.94	29.76	2.23	2.13	NE	3
700 II	3-15-60	2045	30.28	30.28	1.94	2.17	NE	3
700 III	3-15-60	2220	32.18	31.49	3.29	3.25	NE	3
700 IV	3-15-60	2400	32.18	32.18	3.57	3.59	NE	3
710 I	3-16-60	0600	30.81	29.42	1.71	1.76	E	4
710 II	3-16-60	0430	30.97	29.42	1.98	1.97	NE	4
710 III	3-16-60	0305	31.83	31.49	3.02	3.02	NE	4
710 IV	3-16-60	0130	32.36	31.49	2.90	3.06	NE	4
720 II	3-16-60	0840	29.42	28.89	1.55	1.51	E	3
720 III	3-16-60	1013	31.39	31.39	2.70	2.71	NE	5
720 IV	3-16-60	1125	32.36	32.01	2.94	3.02	NE	5
730 II	3-18-60	1415	28.71	28.71	2.23	2.17	NE	4
730 III	3-18-60	1245	30.28	29.42	1.89	2.04	NE	4
730 IV	3-18-60	1125	31.65	31.29	2.49	2.37	NE	3
<u>April 1960</u>								
CB-20	4-11-60	1440	17.21	13.50	10.99	9.76	SW	4
CB-10	4-11-60	1545	15.97	17.74	10.91	8.57	ESE	4
CB-0	4-11-60	1750	17.39	24.25	8.30	7.53	ESE	5
640 I	4-14-60	0750	22.61	30.26	9.07	5.00	SW	4
640 II	4-14-60	0615	26.29	31.65	8.94	5.68	SE	3
640 III	4-14-60	0445	28.53	32.34	9.61	6.27	SE	3
640 IV	4-14-60	0310	30.44	32.86	8.74	7.34	S	3
650 I	4-14-60	0935	22.45	31.47	8.90	5.75	SW	3
650 II	4-13-60	2245	26.46	31.65	8.70	4.95	SE	4
650 III	4-14-60	0025	28.03	28.37	9.72	5.69	SE	4
650 IV	4-14-60	0145	31.47	32.34	8.26	7.02	S	4
700 I	4-12-60	0940	26.87	30.70	7.65	6.88	WSW	5
700 II	4-13-60	2105	30.10	32.18	8.44	5.58	SE	4
700 III	4-13-60	1935	31.83	32.34	7.17	5.41	S	2
700 IV	4-13-60	1800	32.34	33.03	7.11	6.74	SE	2

Table 2 continued

Station No.	Date	Time	Salinity		Temperature		Wind	
			Surf.	Bot.	Surf.	Bot.	Dir.	Force*
<u>April 1960 continued</u>								
710 I	4-12-60	1110	30.44	30.97	7.79	7.76	WSW	5
710 II	4-12-60	1245	30.44	30.97	6.52	4.50	SW	4
710 III	4-13-60	1505	32.00	32.68	7.30	5.80	Calm	0
710 IV	4-13-60	1630	31.31	33.03	7.24	6.49	SE	3
720 II	4-12-60	1420	30.44	31.65	7.30	6.07	SW	4
720 III	4-13-60	1200	30.97	32.34	7.09	5.05	SE	2
720 IV	4-13-60	1335	31.83	32.68	7.15	5.41	Calm	0
730 II	4-12-60	1610	30.10	31.47	8.03	7.59	SW	3
730 III	4-13-60	0945	31.83	32.00	6.67	5.27	SE	2
730 IV	4-13-60	1020	30.97	32.34	7.33	5.46	E	2
<u>May 1960</u>								
CB-20	5-16-60	1400	16.13	16.47	18.63	17.21	W	1
CB-10	5-16-60	1515	16.47	19.29	19.86	16.54	W	1
CB-0	5-16-60	1710	19.83	27.81	16.45	13.87	Calm	0
640 I	5-17-60	0830	21.92	32.01	17.92	10.36	Calm	0
640 II	5-17-60	1010	24.56	32.20	18.43	10.50	Calm	0
640 III	5-17-60	1140	29.60	32.20	18.39	10.08	N	1
640 IV	5-17-60	1310	30.99	32.54	17.95	8.76	N	1
650 I	5-17-60	0707	19.83	29.76	17.70	11.34	Calm	0
650 II	5-17-60	1740	27.52	31.69	20.00	11.38	SE	3
650 III	5-17-60	1613	28.39	32.20	19.12	10.82	SE	2
650 IV	5-17-60	1455	31.15	31.83	18.64	10.05	Calm	0
700 I	5-17-60	1950	25.08	31.33	16.91	12.24	SE	3
700 II	5-17-60	2123	30.81	31.83	17.24	10.22	N	4
700 III	5-17-60	2305	31.49	31.83	15.79	7.72	N	4
700 IV	5-18-60	0040	31.33	33.22	16.05	7.31	SE	4
710 I	5-18-60	0650	30.46	30.62	18.47	16.03	S	2
710 II	5-18-60	0530	28.73	30.12	16.71	11.65	S	4
710 III	5-18-60	0355	30.28	31.83	16.79	8.33	S	3
710 IV	5-18-60	0220	31.49	32.20	15.53	8.06	SE	3
720 II	5-18-60	0840	30.99	31.33	17.30	12.77	NW	2
720 III	5-18-60	1010	30.81	32.01	17.65	8.99	SW	2
720 IV	5-18-60	1145	30.46	31.83	17.30	8.50	NW	2
730 II	5-18-60	1615	31.65	31.15	16.60	11.81	NW	3
730 III	5-18-60	1445	30.46	30.99	17.27	8.64	NW	3
730 IV	5-18-60	1315	30.46	32.01	17.12	9.04	NW	2
<u>June 1960</u>								
CB-20	6-20-60	1453	14.79	18.21	25.64	23.72	E	3
CB-10	6-20-60	1605	16.77	22.89	25.53	22.60	E	2
CB-0	6-20-60	1800	22.51	29.11	24.15	19.72	E	2

Table 2 continued

Station No.	Date	Time	Salinity		Temperature		Wind	
			Surf.	Bot.	Surf.	Bot.	Dir.	Force*
<u>June 1960 continued</u>								
640 I	6-21-60	0738	30.25	31.29	21.13	17.48	NE	5
640 II	6-22-60	1245	29.98	31.29	22.36	16.03	NE	4
640 III	6-22-60	1408	30.09	31.48	21.87	15.59	E	3
640 IV	6-22-60	1530	30.25	32.00	23.09	14.14	E	3
650 I	6-21-60	0605	24.09	30.52	23.29	20.53	E	5
650 II	6-22-60	1130	29.29	30.09	22.14	17.03	ENE	4
650 III	6-22-60	1825	29.73	31.29	22.97	13.33	E	2
650 IV	6-22-60	1650	29.73	32.18	22.56	11.00	E	3
700 I	6-22-60	0840	29.37	31.71	21.08	18.35	NE	3
700 II	6-22-60	0955	28.49	32.00	22.42	16.34	NE	3
700 III	6-22-60	1950	29.19	32.36	22.88	13.97	E	3
700 IV	6-22-60	2130	29.37	32.52	23.07	10.43	SE	3
710 I	6-23-60	0205	29.37	30.94	22.21	21.31	SW	3
710 II	6-24-60	0840	29.37	32.97	23.48	14.87	SW	3
710 III	6-23-60	0035	28.84	29.01	22.63	16.60	SW	3
710 IV	6-22-60	2300	30.94	32.27	22.50	10.64	SE	3
720 II	6-23-60	0415	29.37	31.48	21.92	19.70	SE	3
720 III	6-23-60	0540	31.12	31.75	22.00	13.28	SE	3
720 IV	6-23-60	0705	31.48	32.27	21.28	12.71	SE	3
730 II	6-23-60	1135	31.12	31.29	21.26	18.71	SW	4
730 III	6-23-60	1010	30.94	31.89	21.94	15.94	SSW	4
730 IV	6-23-60	0850	31.26	31.71	21.57	11.87	S	3
<u>July 1960</u>								
CB-20	7-19-60	1445	18.60	25.26	27.31	22.77	SW	2
CB-10	7-19-60	1645	19.65	28.91	26.74	21.00	SW	3
CB-0	7-19-60	1830	23.51	29.27	25.70	20.29	SE	3
640 I	7-20-60	0805	28.22	32.56	24.28	16.63	SW	4
640 II	7-20-60	0930	31.17	32.90	25.50	17.70	SW	3
640 III	7-20-60	1025	30.64	32.72	25.25	14.67	SW	3
640 IV	7-20-60	1230	30.30	32.56	25.68	10.87	SW	3
650 I	7-20-60	0515	26.67	31.44	25.17	16.00	SW	4
650 II	7-20-60	1805	31.69	32.90	26.00	15.92	Calm	0
650 III	7-20-60	1600	32.72	34.11	25.92	13.83	SW	3
650 IV	7-20-60	1415	31.17	32.56	25.81	10.41	SW	2
700 I	7-20-60	2015	27.54	29.78	24.22	15.72	Calm	0
700 II	7-20-60	2145	28.91	34.11	26.30	13.37	SE	2
700 III	7-20-60	2325	33.58	34.11	26.00	12.01	SE	2
700 IV	7-21-60	0120	32.21	33.58	25.60	9.19	NNE	3
710 I	7-21-60	0715	31.51	32.56	23.25	18.76	NE	4
710 II	7-21-60	0555	29.61	32.90	25.38	14.30	NE	4
710 III	7-21-60	0425	30.30	33.93	25.57	12.04	NE	4
710 IV	7-21-60	0250	32.21	33.93	25.71	10.73	NNE	3

Table 2 continued

Station No.	Date	Time	Salinity		Temperature		Wind	
			Surf.	Bot.	Surf.	Bot.	Dir.	Force*
<u>July 1960 continued</u>								
720 II	7-21-60	2325	29.27	34.27	24.87	15.09	E	4
720 III	7-22-60	0105	30.82	32.38	25.34	12.16	SE	3
720 IV	7-22-60	0745	31.69	36.49	24.80	13.08	SE	2
730 II	7-22-60	0317	30.17	31.00	23.46	17.78	Calm	0
730 III	7-22-60	0450	29.54	-	25.18	13.97	E	2
730 IV	7-22-60	0615	30.48	32.38	25.03	11.86	Calm	0
<u>August 1960</u>								
CB-20	8-15-60	1600	10.0	21.19	28.52	25.60	SE	2
CB-10	8-15-60	1720	17.56	28.26	28.30	24.73	SE	4
CB-0	8-15-60	1905	21.78	22.66	26.96	26.63	W	4
640 I	8-16-60	0635	28.44	31.55	26.38	19.55	-	2
640 II	8-16-60	0805	29.31	32.41	26.49	18.71	N	3
640 III	8-16-60	0950	22.99	32.41	26.38	19.15	SW	2
640 IV	8-16-60	1115	32.59	31.89	26.25	14.35	NE	3
650 I	8-16-60	0505	25.46	31.89	26.21	17.96	SSW	3
650 II	8-16-60	1600	31.55	31.89	26.10	16.90	N	4
650 III	8-16-60	1415	32.57	33.28	26.57	14.92	NE	4
650 IV	8-16-60	1240	34.45	32.92	26.12	13.33	NE	4
700 I	8-29-60	1845	28.75	31.71	25.51	23.81	SE	3
700 II	8-29-60	1955	30.32	32.21	24.55	22.95	SE	3
700 III	8-29-60	2140	32.92	31.87	24.30	19.71	SE	3
700 IV	8-29-60	2315	32.92	33.08	23.99	14.39	SE	3
710 I	8-30-60	0550	31.35	31.35	24.60	24.06	S	2
710 II	8-30-60	0400	31.69	31.69	24.13	22.46	S	2
710 III	8-30-60	0230	29.27	30.84	23.83	21.61	S	3
710 IV	8-30-60	0050	30.14	32.21	23.81	17.16	S	3
720 II	8-30-60	0730	31.17	31.35	24.95	23.48	SW	3
720 III	8-30-60	0900	31.85	31.00	24.19	22.61	SW	3
720 IV	8-19-60	1300	32.75	31.18	23.92	19.43	-	-
730 II	8-19-60	0850	31.02	32.57	23.30	23.13	SW	8
730 III	8-19-60	1020	31.55	32.05	23.43	22.98	SW	5
730 IV	8-19-60	1145	31.89	31.22	23.46	20.47	SW	8
<u>September 1960</u>								
CB-20	9-19-60	1435	17.54	19.31	25.98	23.93	SE	3
CB-10	9-19-60	1600	19.47	22.11	24.28	24.15	SE	3
CB-0	9-19-60	1750	24.38	22.99	24.33	23.64	SE	3
640 I	9-20-60	0730	25.65	30.30	23.96	23.60	S	4
640 II	9-20-60	0905	29.94	30.12	23.83	23.11	SW	3
640 III	9-20-60	1035	30.12	28.91	23.76	20.62	SW	4
640 IV	9-20-60	1320	31.67	31.85	23.47	17.80	SW	2

Table 2 continued

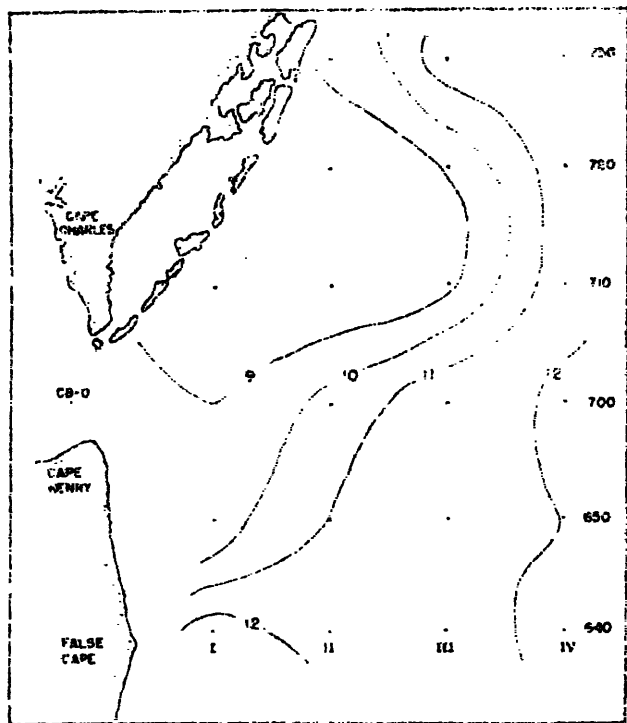
Station No.	Date	Time	Salinity		Temperature		Wind	
			Surf.	Bot.	Surf.	Bot.	Dir.	Force*
<u>September 1960 continued</u>								
650 I	9-20-60	0600	25.08	30.12	23.98	24.04	S	4
650 II	9-20-60	1825	29.94	30.46	24.68	22.56	SE	2
650 III	9-20-60	1650	31.57	31.85	24.58	20.67	SW	2
650 IV	9-20-60	1545	30.64	32.20	24.25	18.14	S	2
700 I	9-20-60	2115	28.04	28.21	24.90	23.73	SW	2
700 II	9-20-60	2235	30.12	30.64	24.00	22.84	SW	2
700 III	9-21-60	0005	31.51	31.67	23.53	22.80	N	3
700 IV	9-21-60	0145	31.17	31.51	22.94	18.58	N	2
710 I	9-23-60	1000	29.60	29.94	23.18	23.10	E	4
710 II	9-23-60	1125	30.30	30.12	23.10	23.05	E	4
710 III	9-21-60	0450	33.58	30.12	23.20	21.62	NE	2
710 IV	9-21-60	0330	31.67	33.58	23.06	21.48	NE	2
720 II	9-23-60	1600	29.78	30.64	23.33	23.17	E	5
720 III	9-23-60	1430	31.85	31.85	21.37	21.14	E	5
720 IV	9-24-60	1240	30.81	30.64	20.38	20.22	NE	4
730 II	9-24-60	0810	29.78	30.12	22.77	22.77	NE	4
730 III	9-24-60	0950	31.67	30.81	21.72	21.72	NE	4
730 IV	9-24-60	1115	29.07	30.64	21.37	21.25	NE	4
710 III	9-23-60	1300	30.46	31.67	22.39	21.30	E	5
<u>November 1960</u>								
CB-20	11-16-60	1658	19.43	20.97	12.90	12.77	Calm	0
CB-10	11-16-60	1830	17.27	20.79	12.93	12.69	SW	2
CB-0	11-16-60	2005	25.30	24.94	12.72	12.77	Calm	0
640 I	11-18-60	0800	30.44	30.81	14.45	15.07	NW	4
640 II	11-18-60	1000	28.73	29.45	14.24	14.10	NW	4
640 III	11-18-60	1130	32.66	31.94	15.04	15.26	NW	4
640 IV	11-18-60	1325	32.30	31.35	17.58	18.29	NW	5
650 I	11-18-60	2000	32.66	30.99	-	-	NW	5
650 II	11-18-60	1820	31.17	32.48	-	-	NE	7
650 III	11-18-60	1700	32.66	31.76	-	-	NE	7
650 IV	11-18-60	1545	32.30	31.76	14.76	15.26	NE	7
700 I	11-18-60	0520	30.08	30.26	13.82	14.01	NW	4
700 II	11-18-60	0330	30.99	30.81	13.78	14.44	NW	4
700 III	11-18-60	0145	28.73	29.90	14.54	15.08	NE	4
700 IV	11-17-60	2325	33.03	29.27	15.20	15.55	NW	3
710 I	11-17-60	1615	30.32	30.50	13.00	13.21	E	2
710 II	11-17-60	1745	29.96	29.96	14.68	14.33	NW	2
710 III	11-17-60	1940	32.66	32.66	14.84	14.80	NE	2
710 IV	11-17-60	2140	32.30	32.48	14.64	15.74	NE	1
720 II	11-17-60	0545	30.99	31.35	13.60	14.01	Calm	0
720 III	11-17-60	0720	31.71	32.30	13.93	14.37	SE	2
720 IV	11-17-60	0850	32.66	30.08	14.31	14.83	SE	2

Table 2 continued

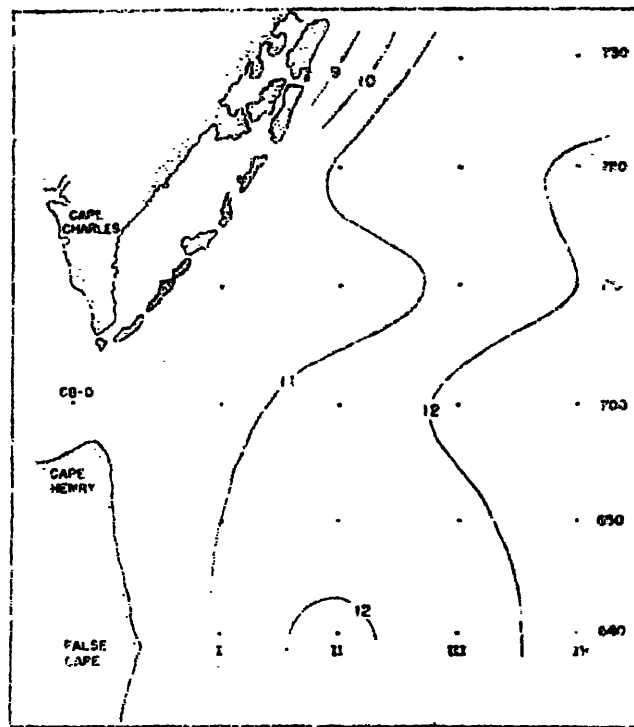
Station No.	Date	Time	Salinity		Temperature		Wind	
			Surf.	Bot.	Surf.	Bot.	Dir.	Force*
<u>November 1960 continued</u>								
730 II	11-17-60	1320	30.50	31.35	13.21	13.21	SE	4
730 III	11-17-60	1145	31.94	31.53	13.99	14.29	SE	4
730 IV	11-17-60	1010	31.76	31.76	14.10	14.17	E	4
<u>December 1960</u>								
CB-20	12-14-60	1340	19.88	23.13	4.74	4.45	W	4
CB-10	12-14-60	1455	26.5	26.7	4.50	5.44	W	4
CB-0	12-14-60	1630	25.30	24.94	5.45	5.90	W	4
640 I	12-19-60	0655	32.84	33.57	5.80	7.84	SW	3
640 II	12-19-60	0805	32.30	31.50	8.20	8.47	SW	3
640 III	12-19-60	0915	33.39	32.66	9.51	9.57	SW	3
640 IV	12-19-60	1025	33.57	33.03	10.36	10.47	SW	4
650 I	12-19-60	0535	32.62	30.91	8.05	8.34	SW	3
650 II	12-19-60	1355	32.48	31.04	9.11	9.11	W	4
650 III	12-19-60	1245	32.66	31.76	9.48	9.66	W	5
650 IV	12-19-60	1140	33.57	32.84	9.75	10.35	W	4
700 I	12-19-60	0415	30.00	30.20	7.76	7.79	SW	2
700 II	12-19-60	1525	33.39	33.39	9.13	9.18	W	4
700 III	12-19-60	1615	34.11	32.48	9.61	9.66	W	4
700 IV	12-19-60	1605	33.03	33.57	10.11	10.79	W	4
710 I	12-15-60	0650	30.30	30.50	7.48	7.55	S	2
710 II	Not sampled							
710 III	Not sampled							
710 IV	12-19-60	1745	33.03	32.30	9.90	10.49	W	5
720 II	12-15-60	0835	31.35	30.98	8.06	9.10	S	3
720 III	12-15-60	1530	31.71	32.30	9.54	10.35	S	5
720 IV	12-15-60	1410	32.65	30.03	10.36	10.73	S	4
730 II	12-15-60	1000	30.48	31.25	6.76	7.71	S	4
730 III	12-15-60	1125	31.94	31.53	9.24	9.91	S	4
730 IV	12-15-60	1245	31.75	31.73	10.18	11.07	S	4

List of Figures

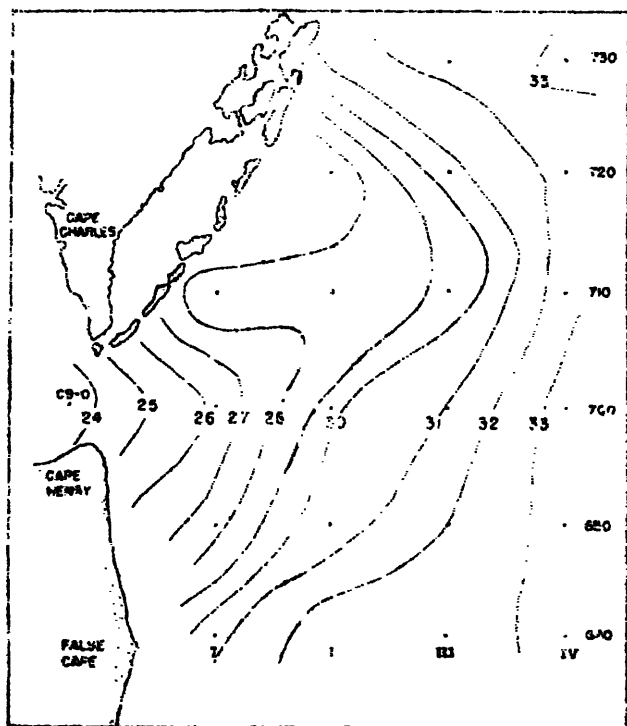
- Figure 1 - Temperature and Salinity Patterns - December 1959
- Figure 2 - Temperature and Salinity Patterns - January 1960
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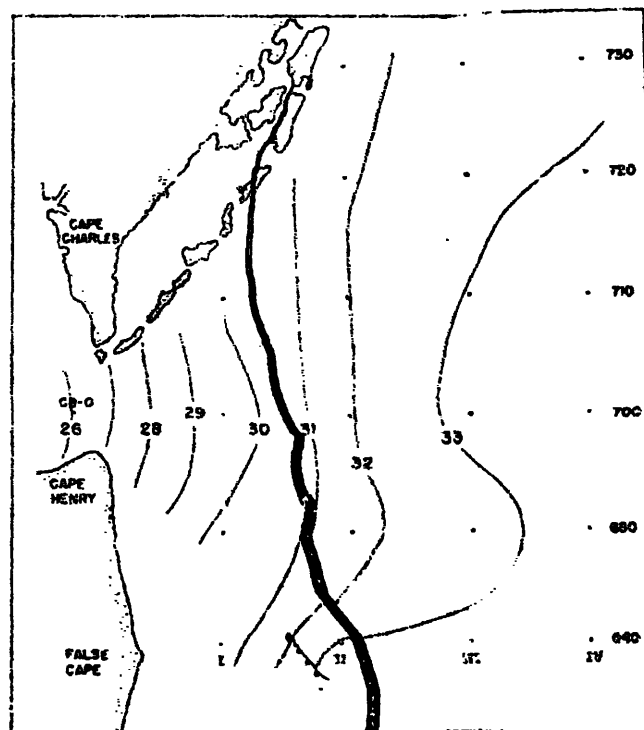
SURFACE TEMPERATURE



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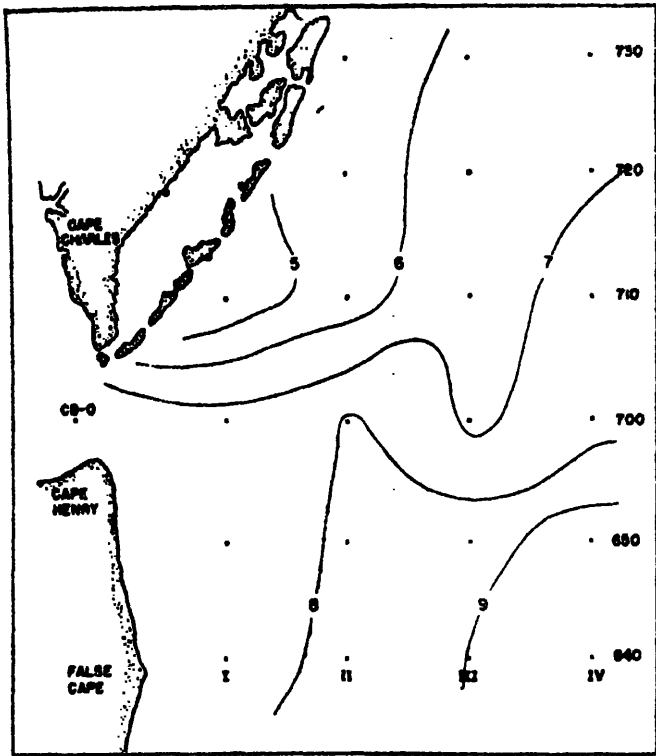


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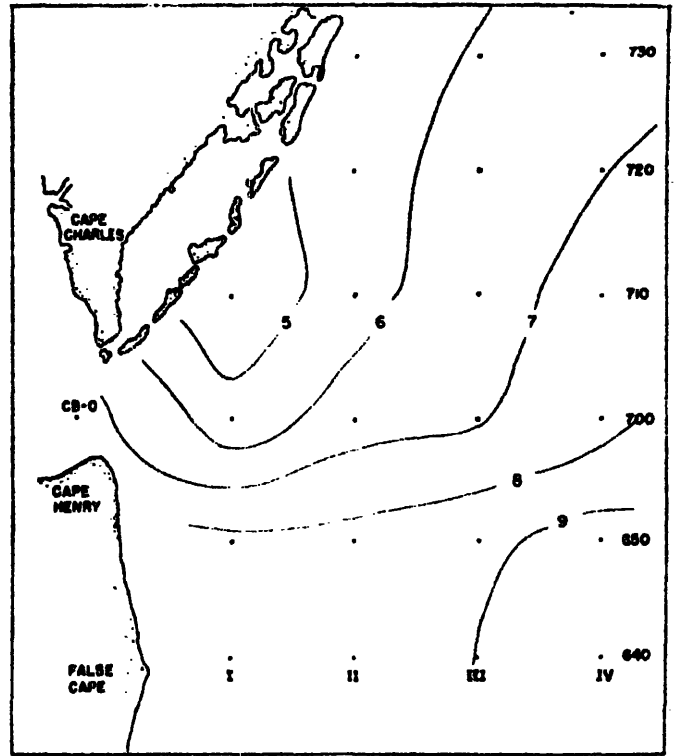


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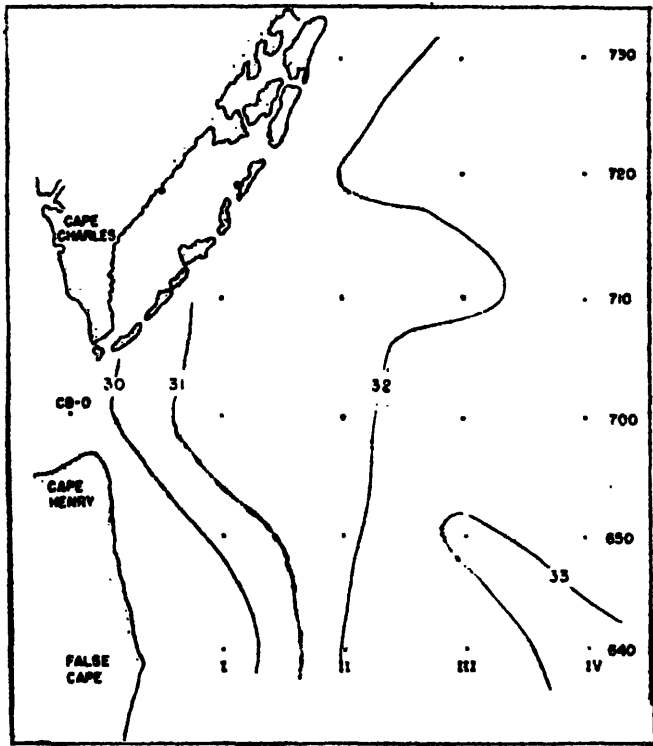
FIGURE 1



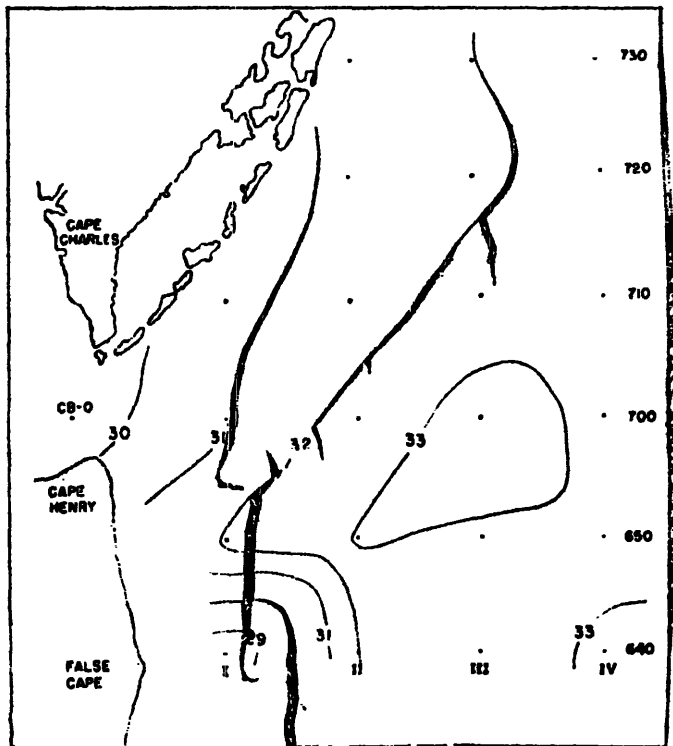
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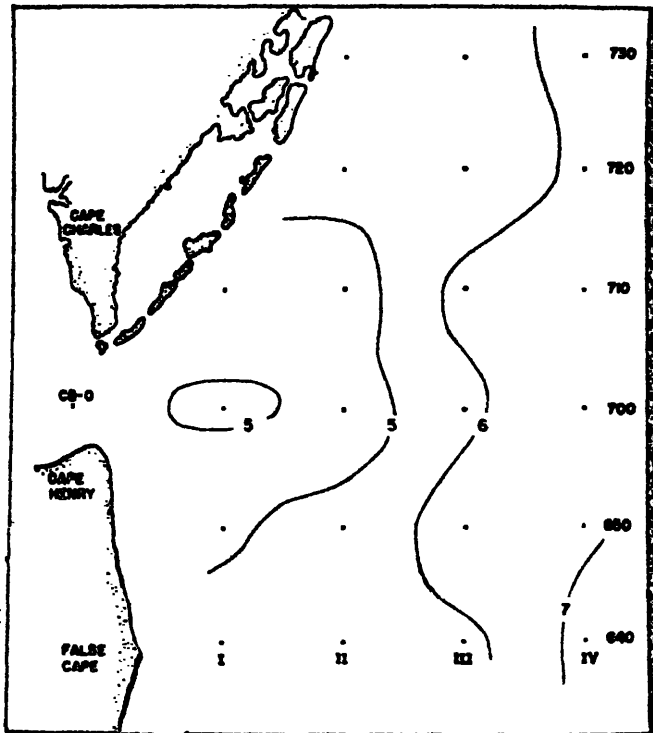


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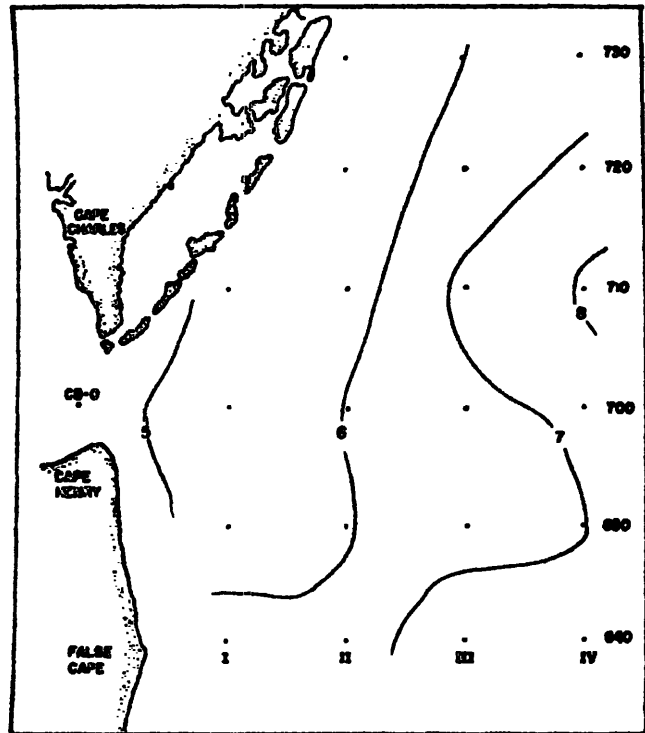


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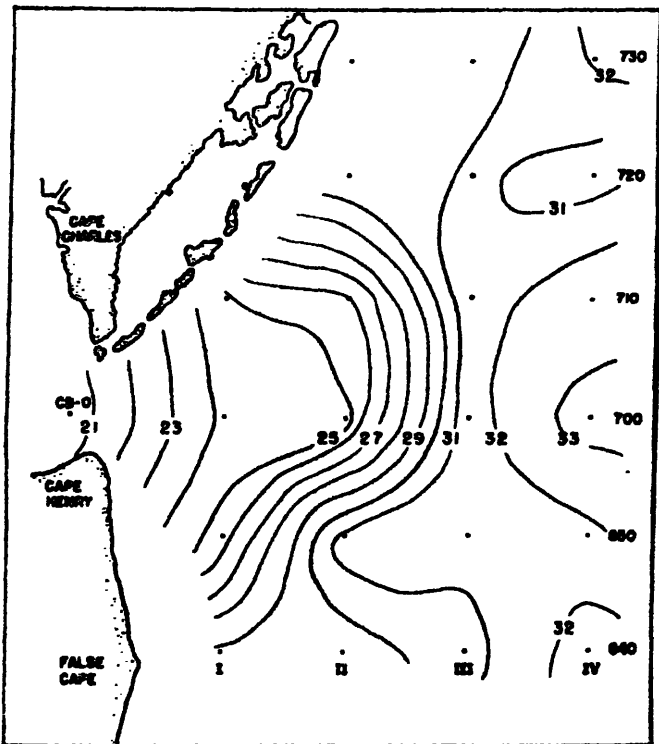
FIGURE 2



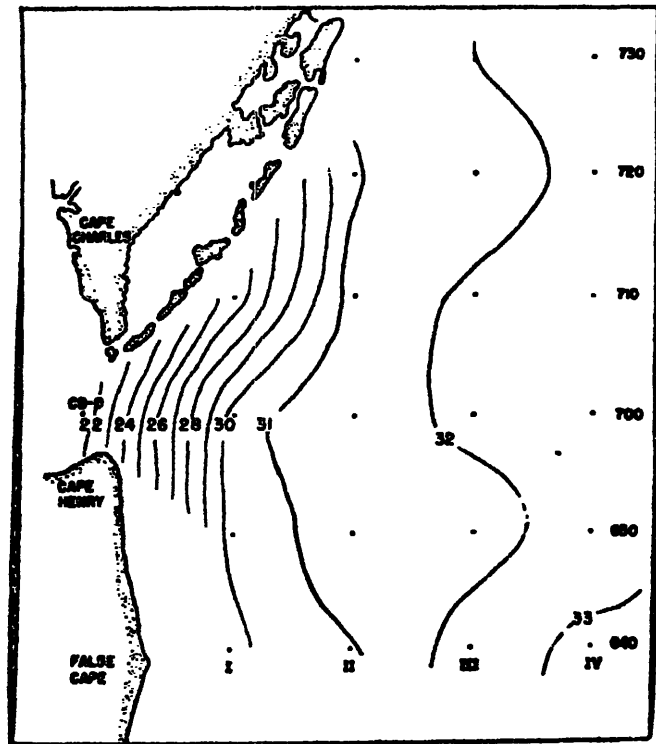
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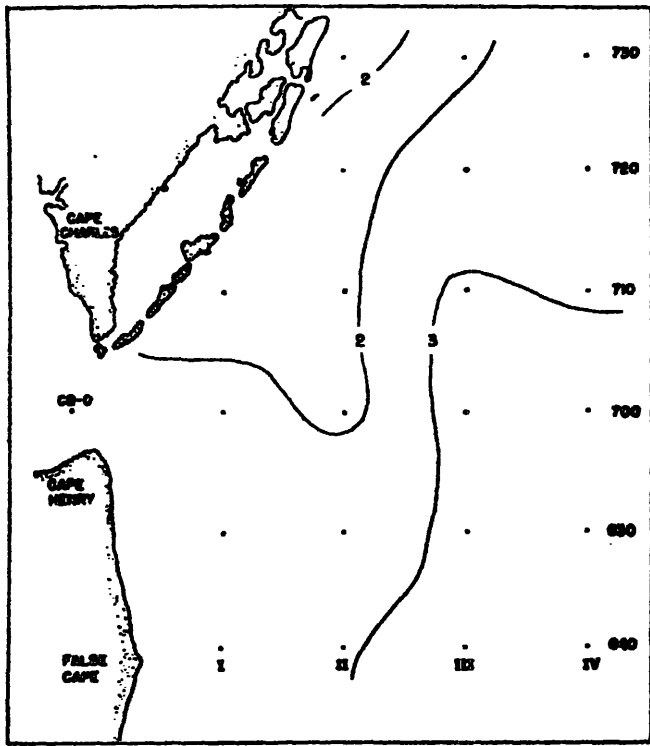


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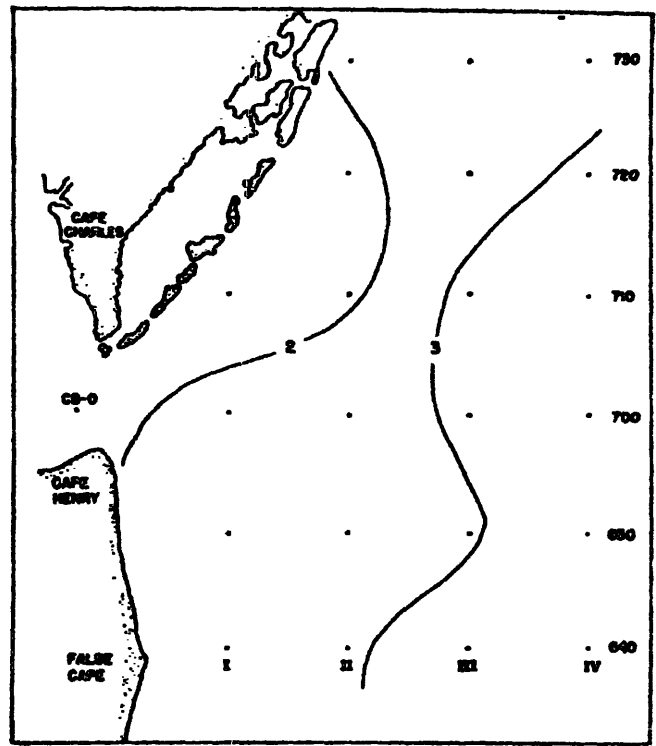


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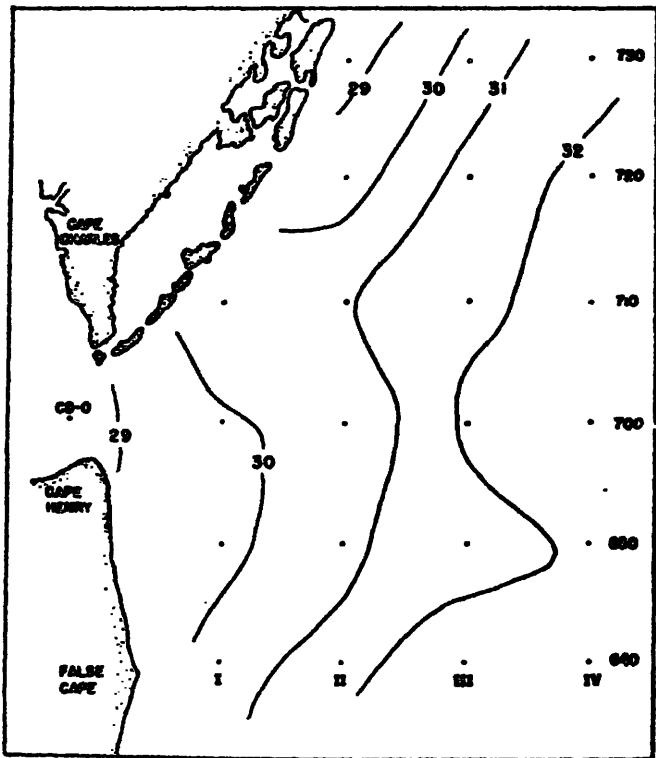
FIGURE 3



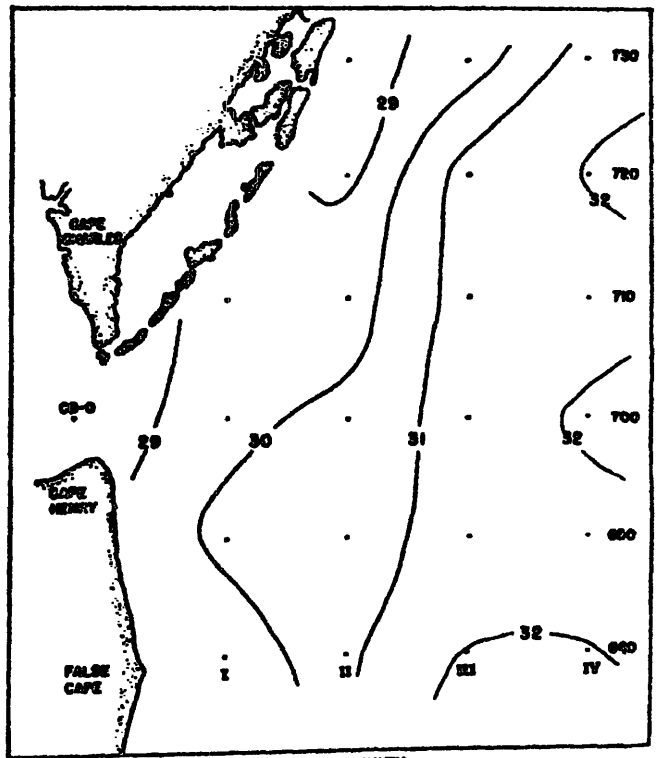
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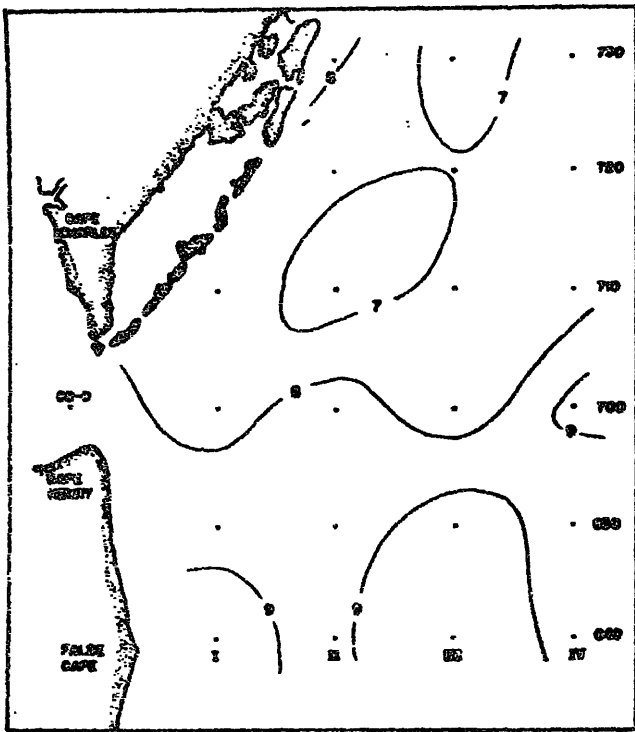


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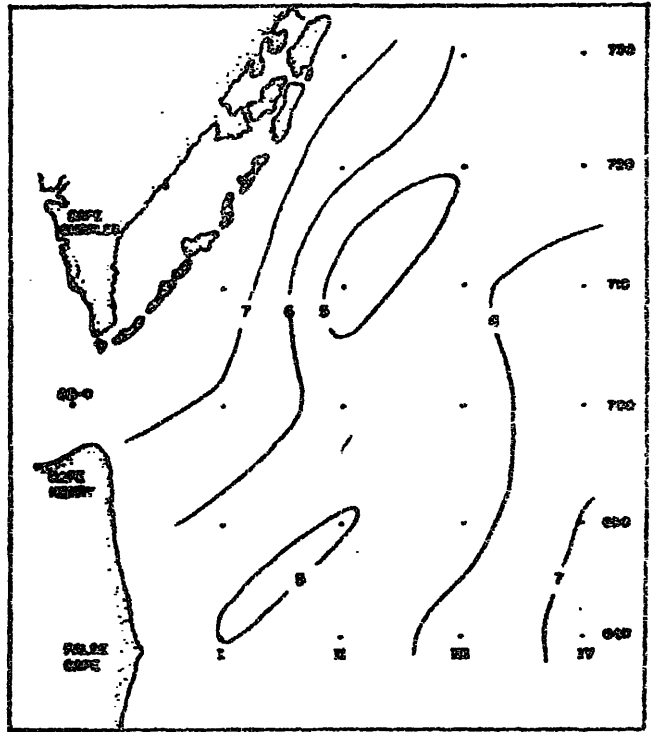


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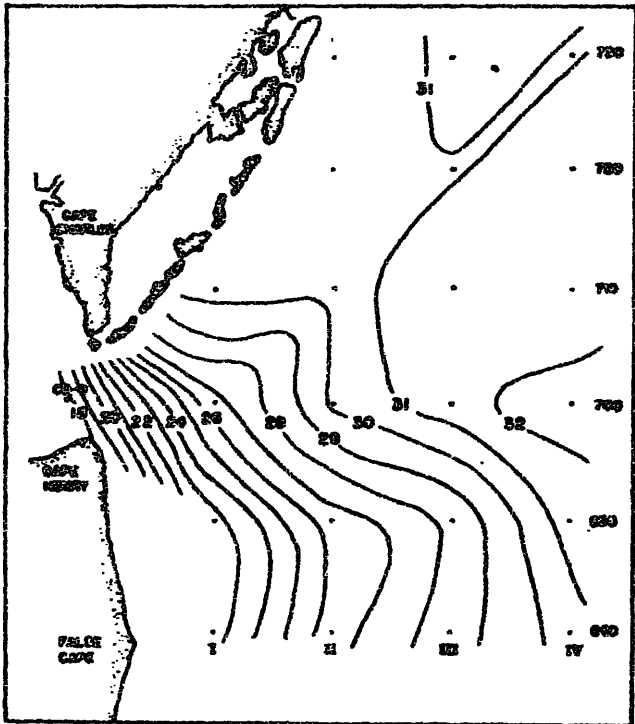
FIGURE 4



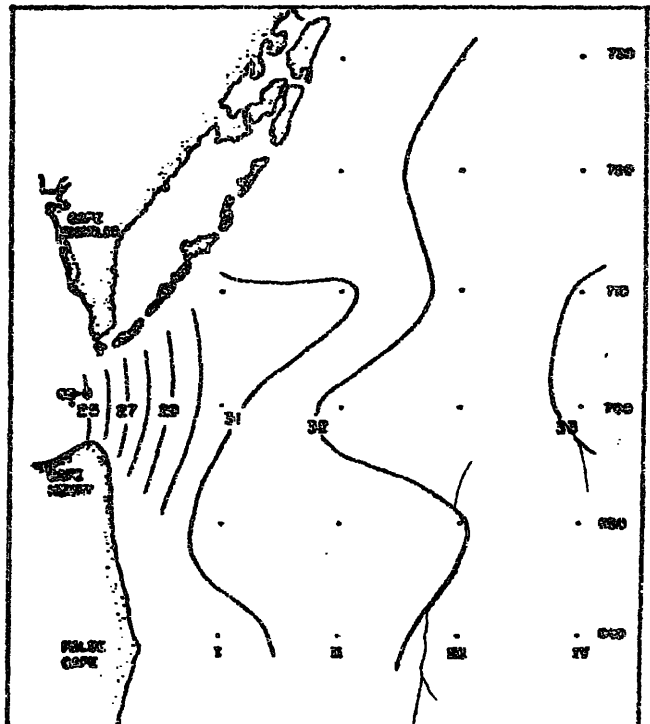
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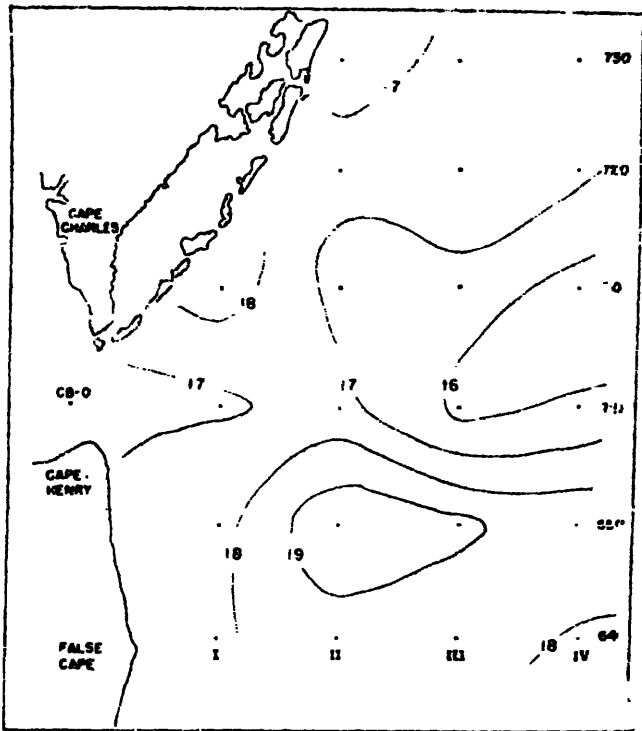


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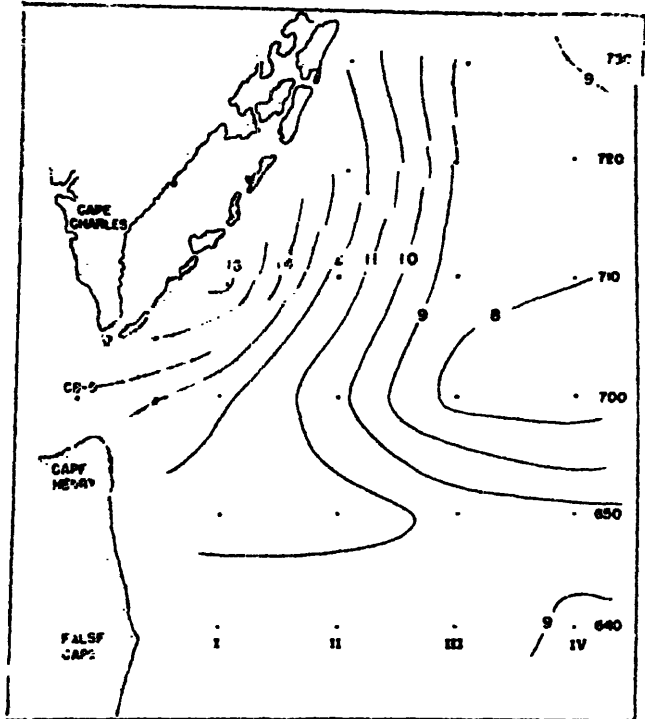


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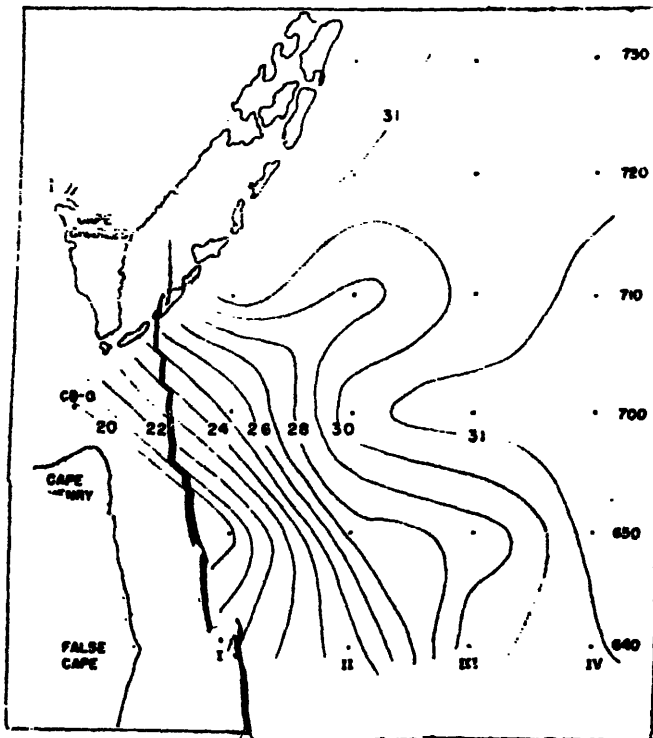
FIGURE 5



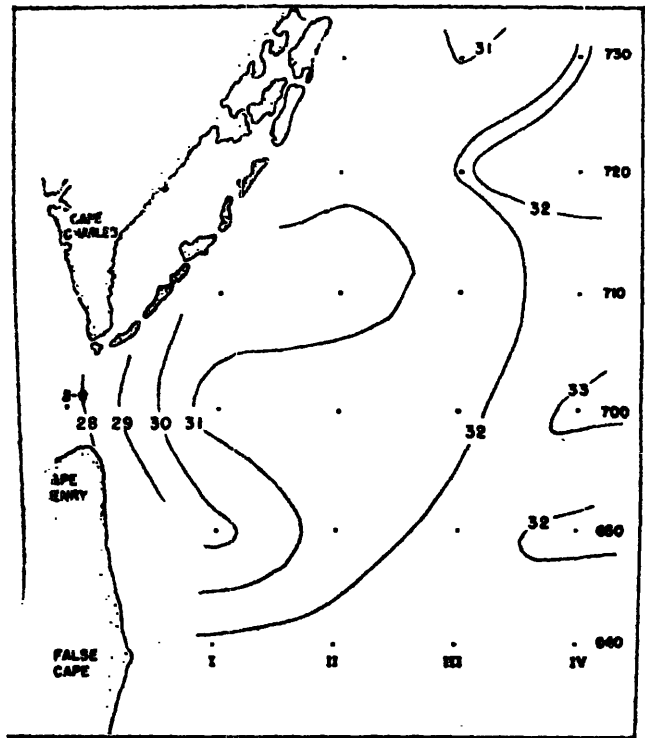
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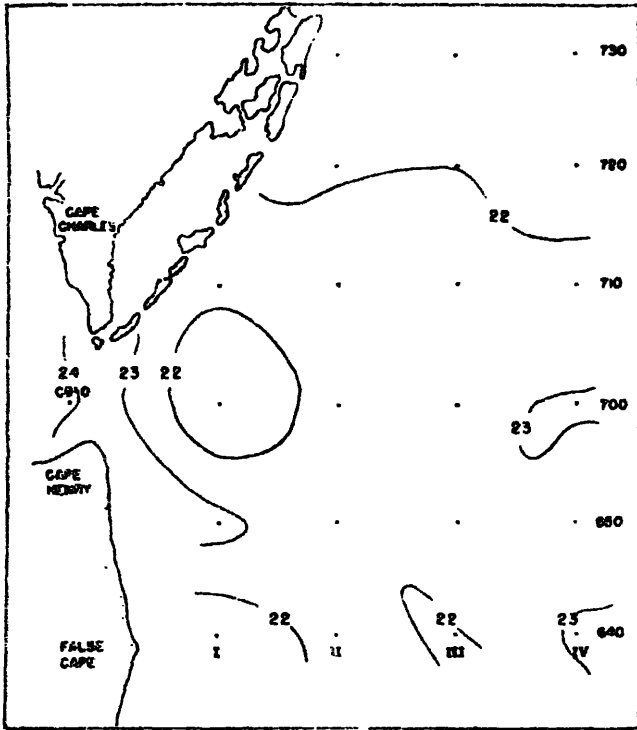


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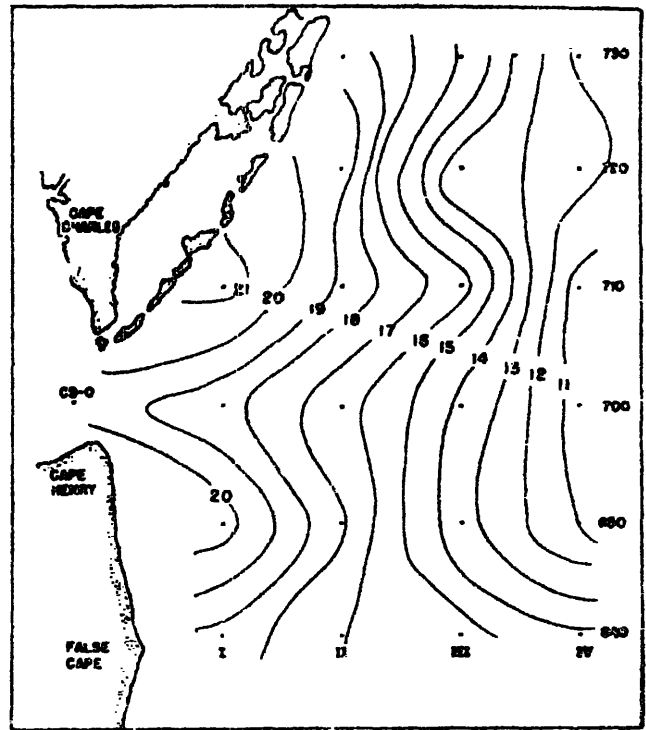


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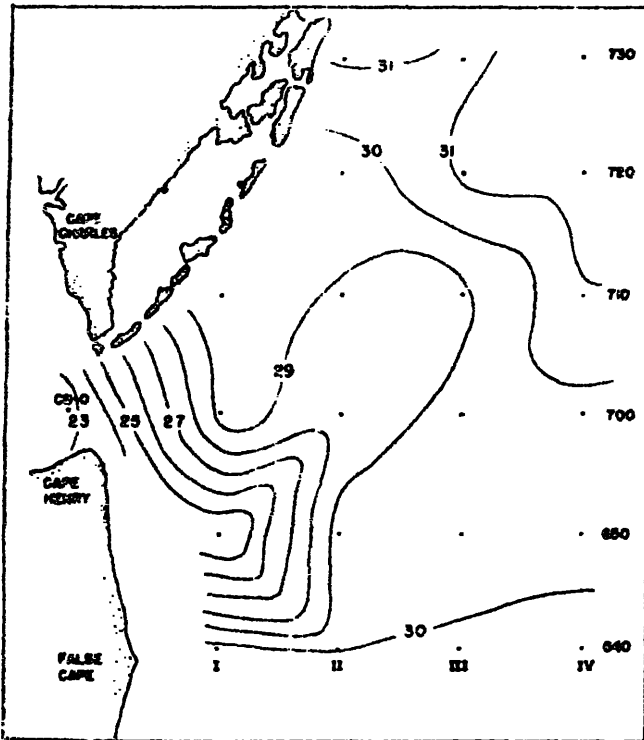
FIGURE 6



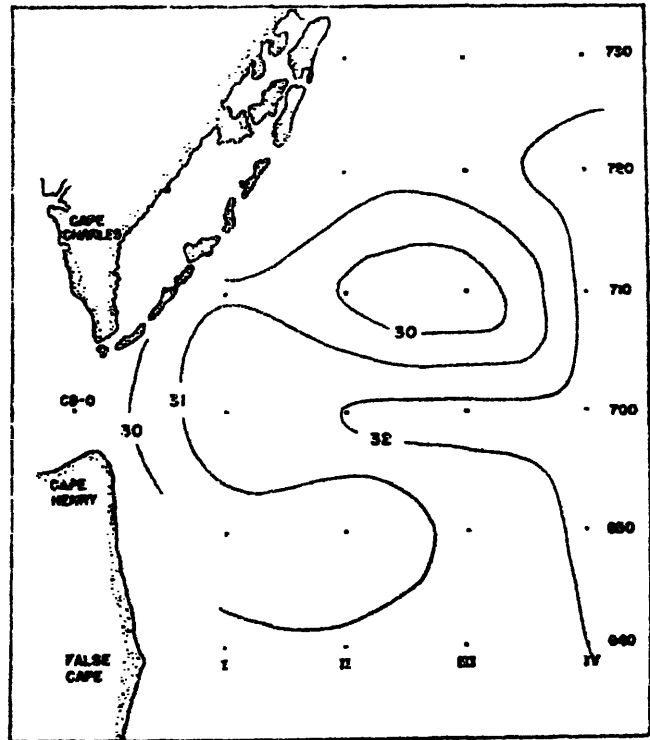
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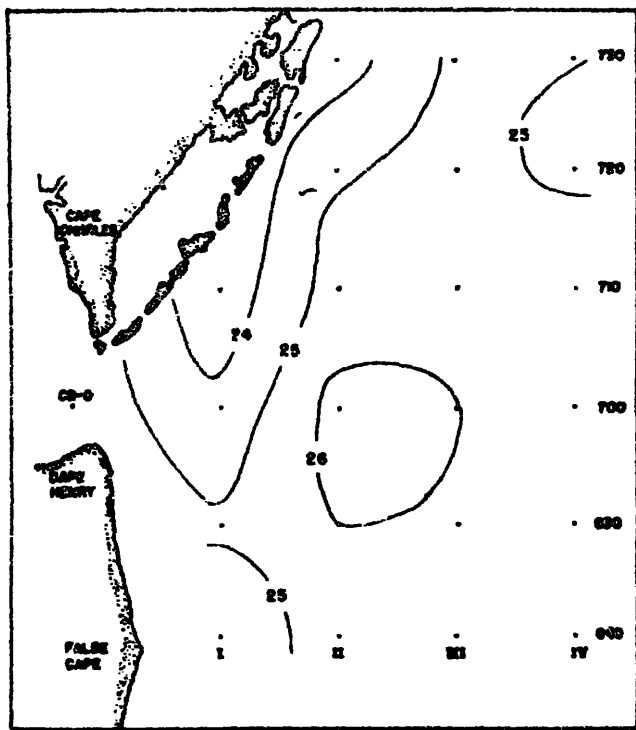


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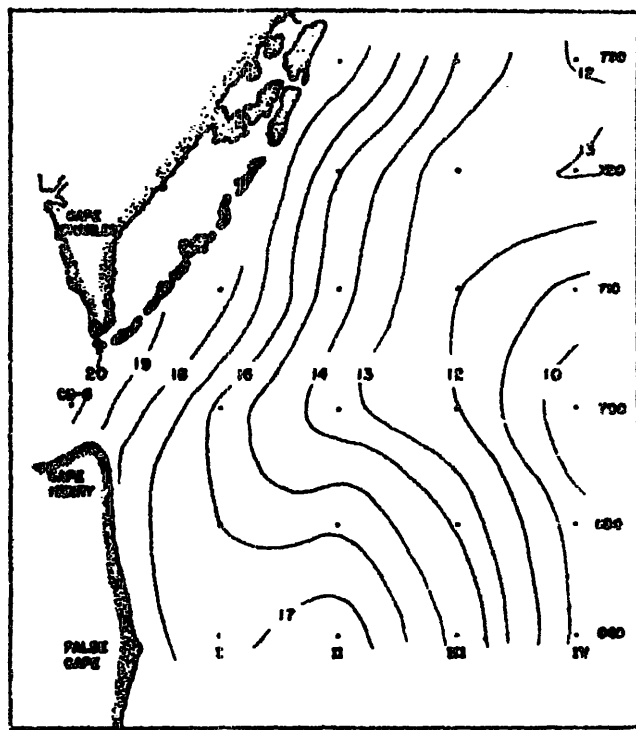


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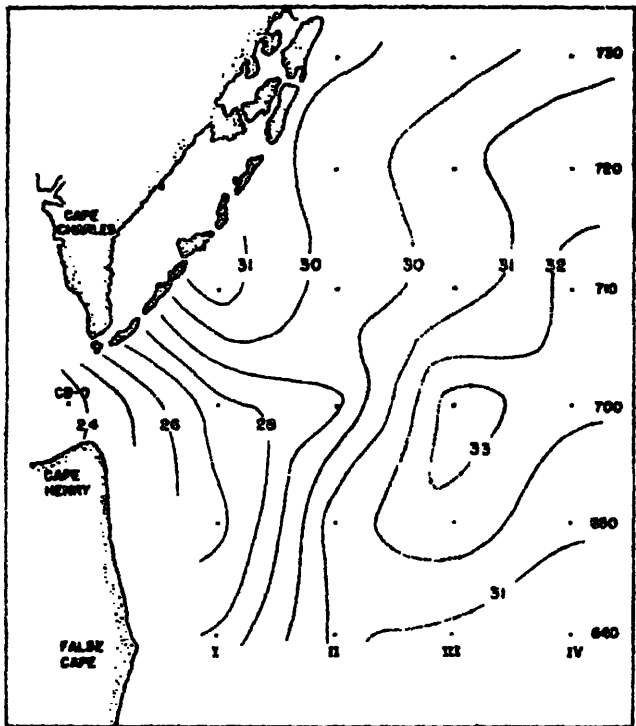
FIGURE 7



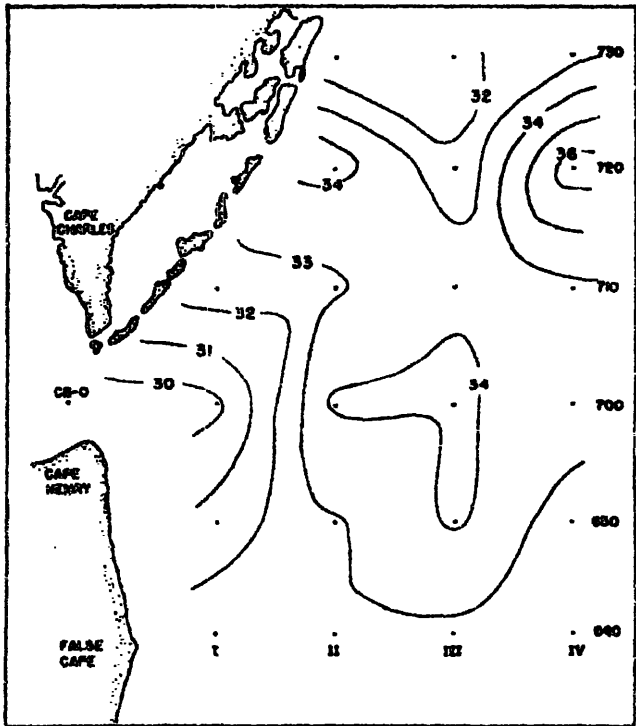
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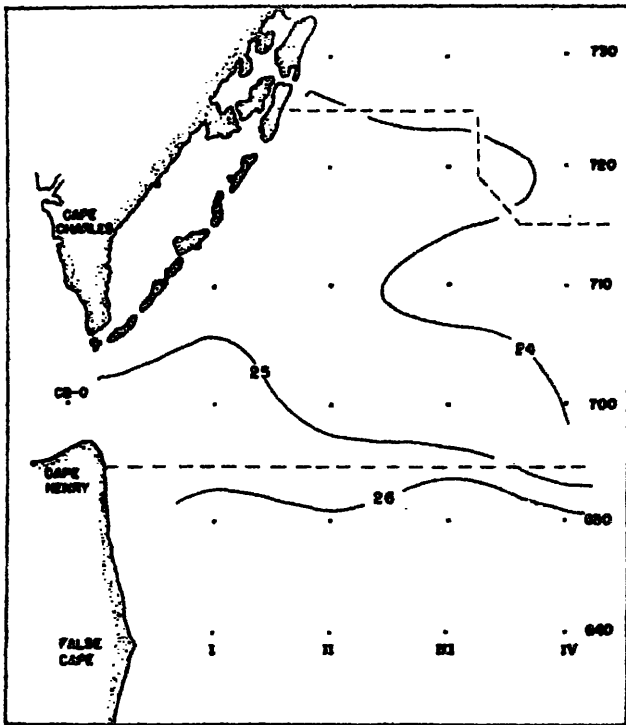


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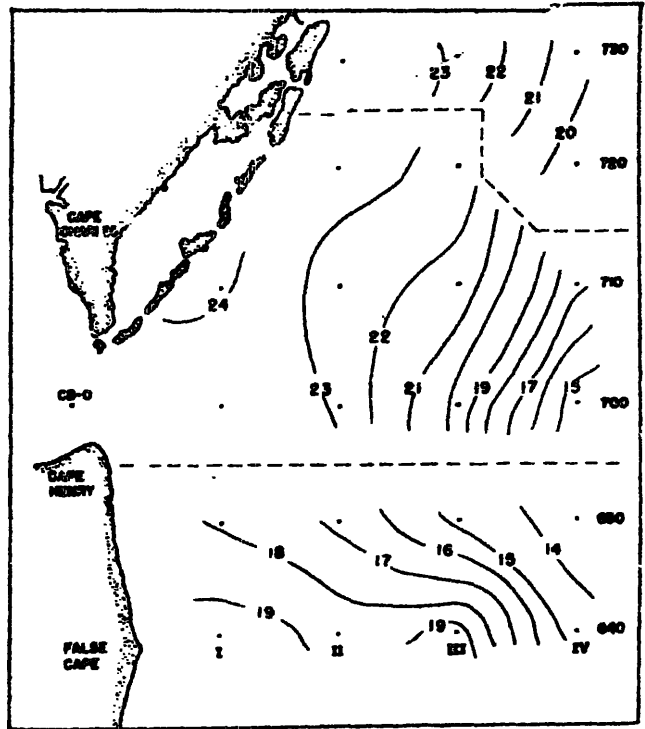


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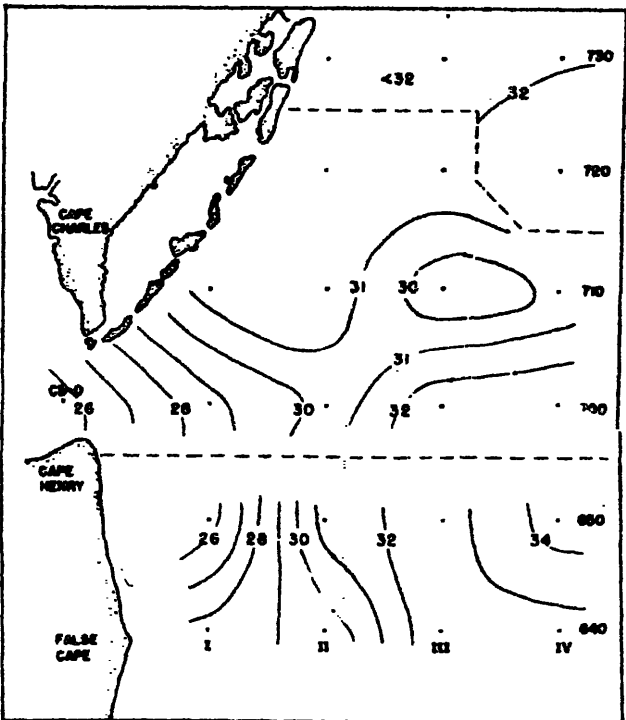
FIGURE 8



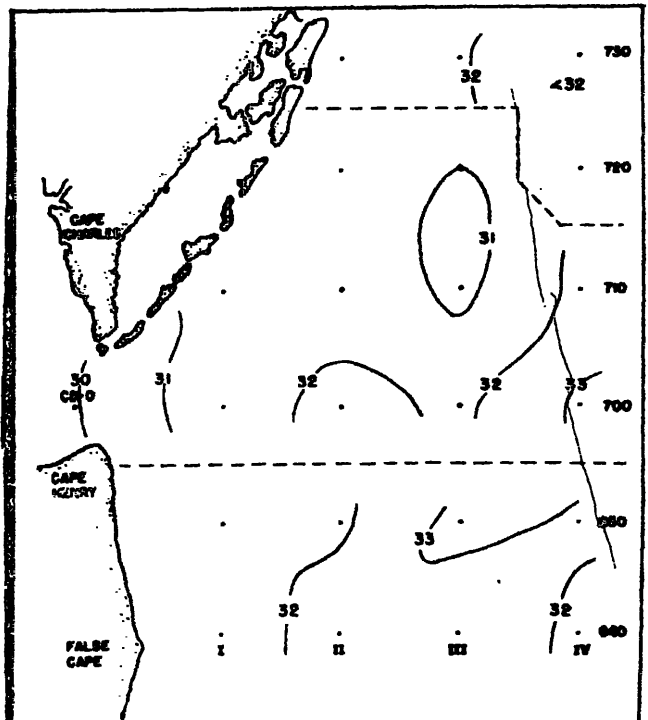
SURFACE TEMPERATURE



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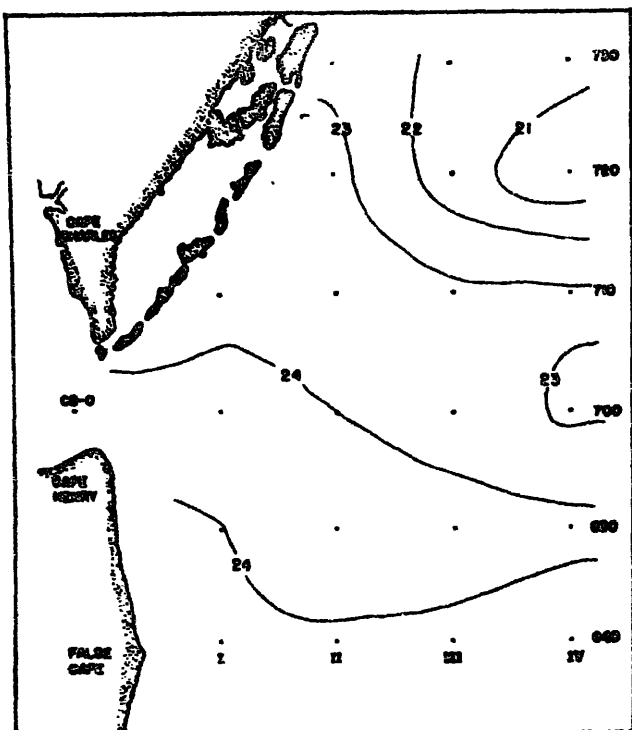


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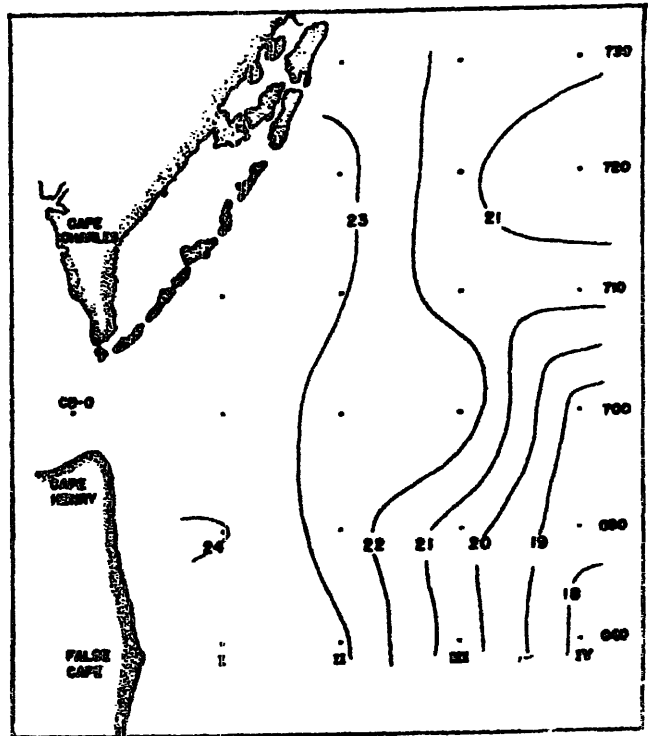


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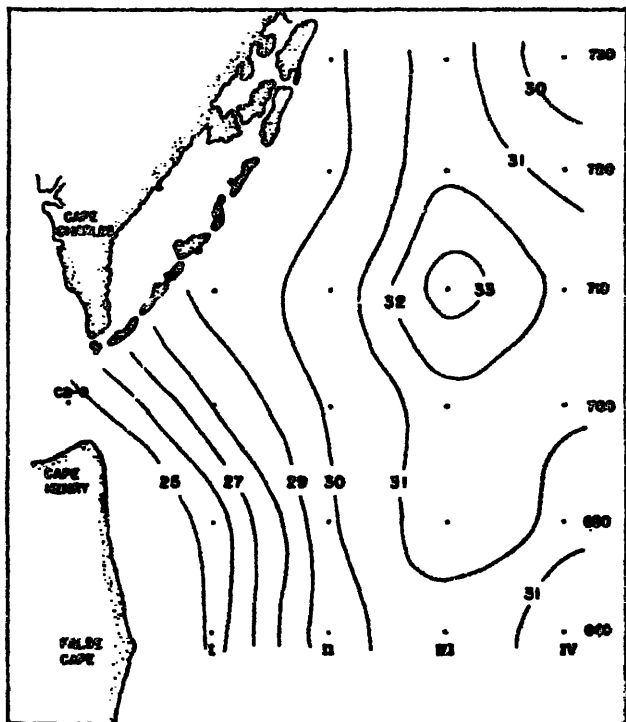
FIGURE 9



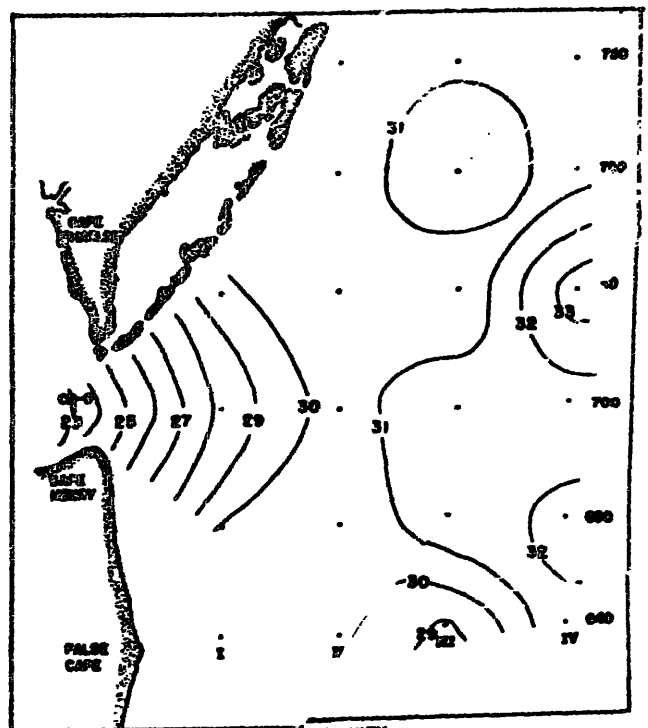
SURFACE TEMPERATURE



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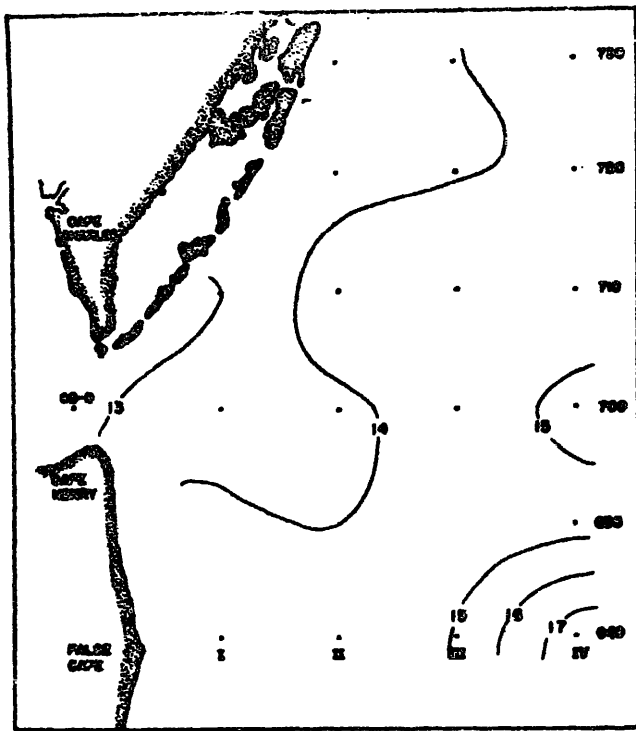


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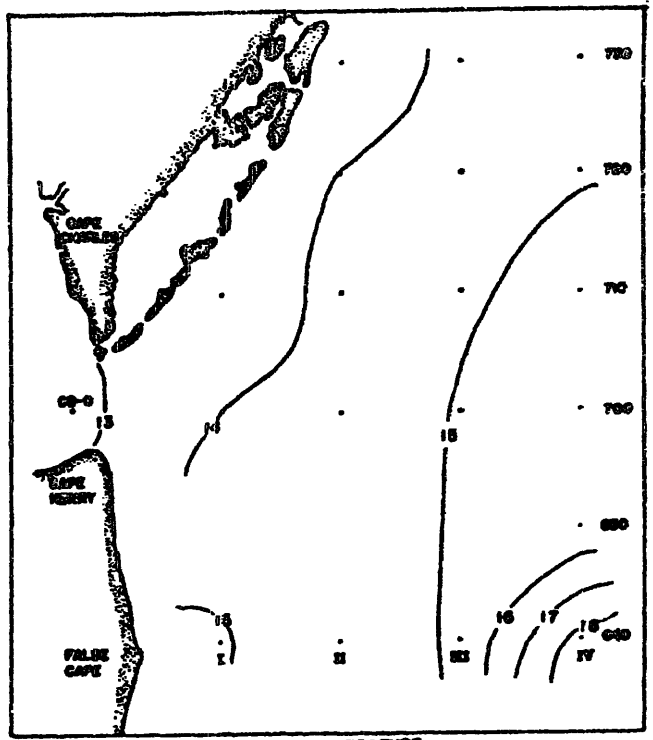


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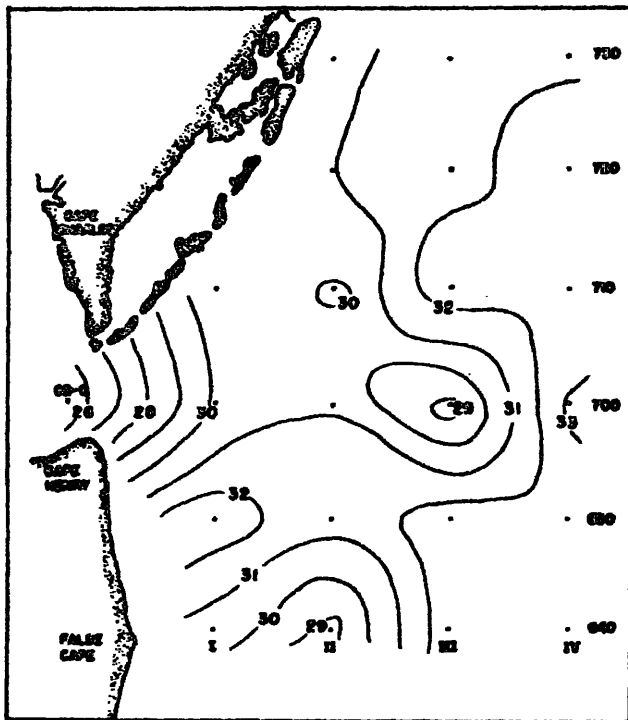
FIGURE 10



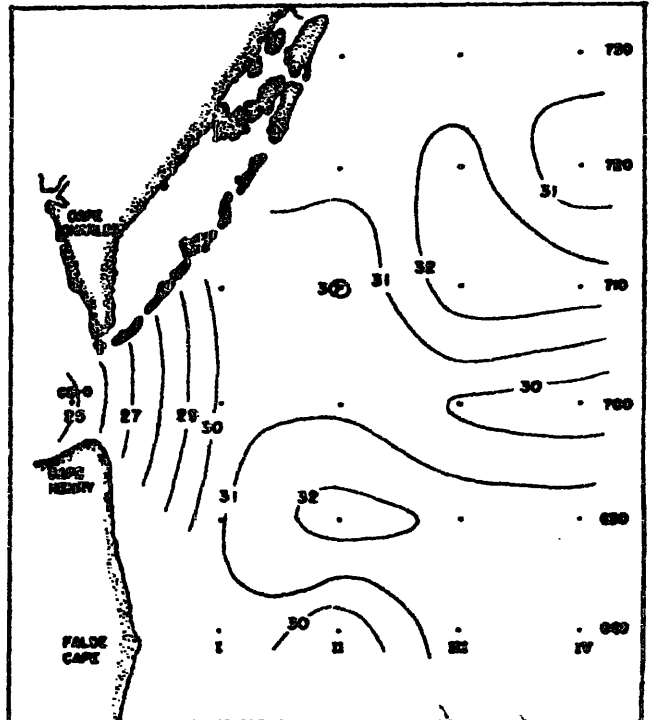
SURFACE TEMPERATURE



BOTTOM TEMPERATURE

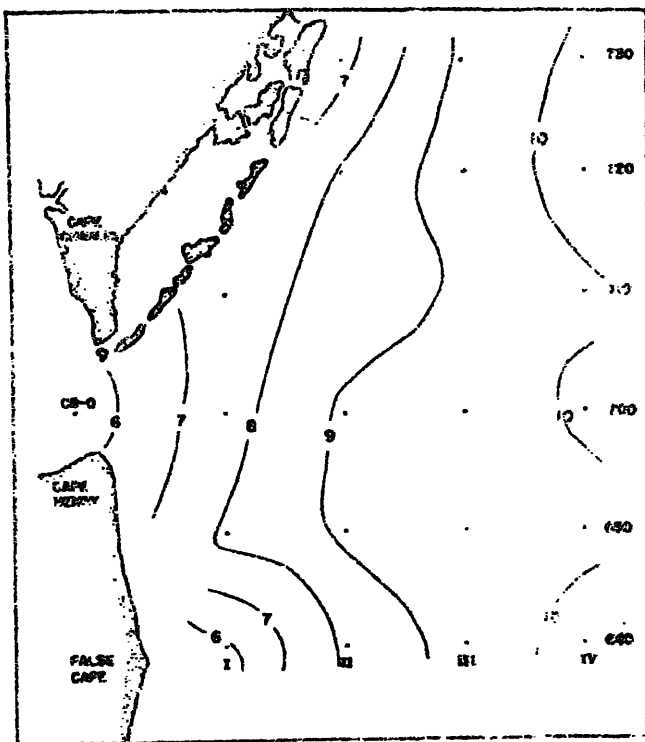


SURFACE SALINITY

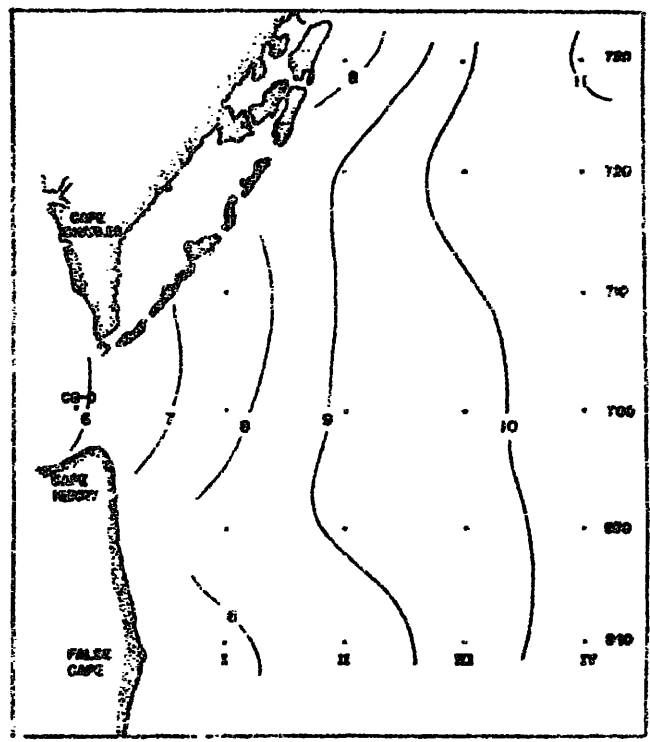


BOTTOM SALINITY

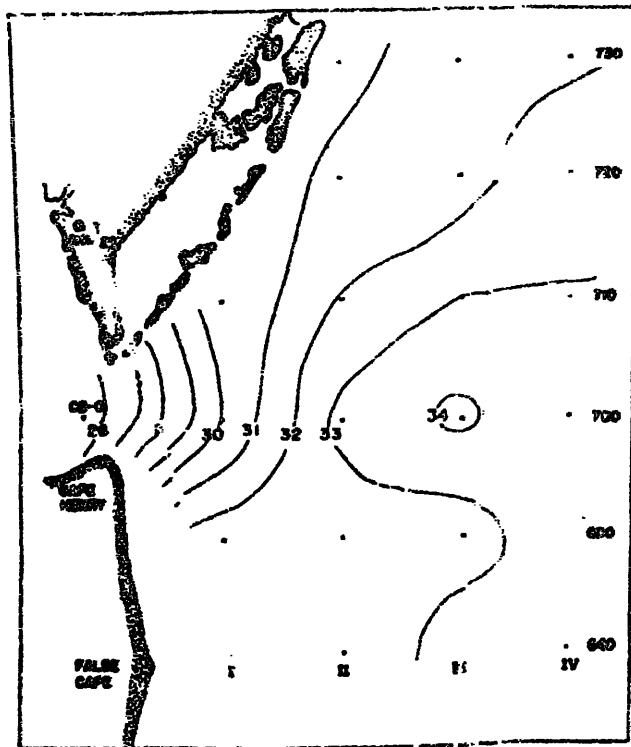
FIGURE 11



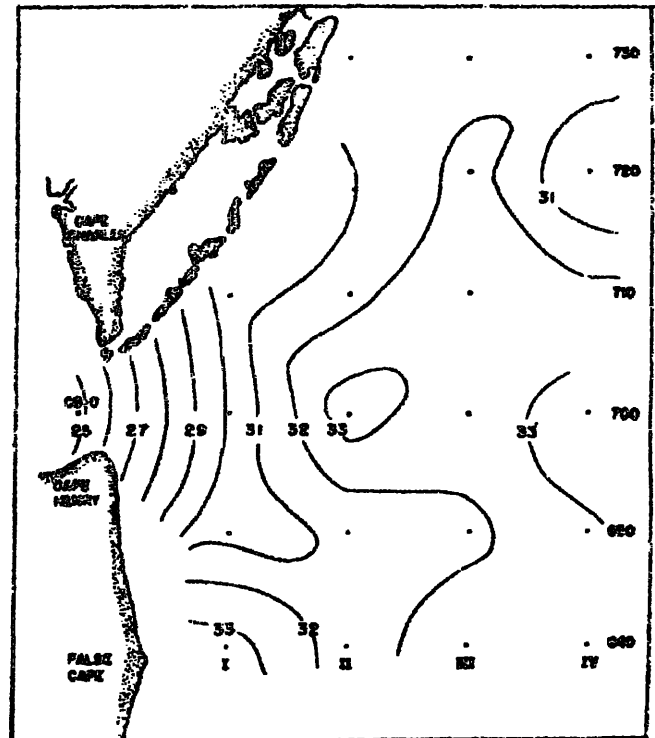
SURFACE TEMPERATURE



BOTTOM TEMPERATURE



SURFACE SALINITY



BOTTOM SALINITY

FIGURE 12

SUPPLIES FOR BAY AND RIVER CRUISES

FISH DEPARTMENT

Log Books _ Plankton, ICTI, Trawl and Length Frequency

RS-5 or ICTI

Salinity Bottles

Water Bottles

Meter Nets

Meter Net Frames

Iron Frame

Meter Net Caps

Plankton Bottles

Formalin

Sorting Pans

Tooth Brush

Trawls

Trawl Boards

Measuring Boards

Sorting Table

Mulford Nets

Mulford Box

Food

Gallon Jars

Lab Equipment

Gear For Crab Trawl Surveys

Trawl nets (2)
Trawl doors (2) and shackles (4)
Bridle and shackles (3)
Safety line and float
Cull board
Buckets
Crab measuring box
Record sheets
Current drag, large, with weight
Current drag, small
Inclinometer
Winches
RS-5 Salinometer
Line and weight for salinometer
Water sampling bottle
Water bottles
Thermistor
Thermistor weight
Foul weather gear
Timer
Screw driver
Adjustable wrench
waterproof tape
Marking pencil