SPRING WATER TEMPERATURES AND FISHING LOG

Block Island to Cape Hatteras, Delaware Cruise No. 60-7

11-21 May 1960

by

Arthur S. Merrill and Robert L. Edwards

Woods Hole Laboratory

Manuscript Report Number 61-3

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Introduction

The cruise was designed to serve one immediate purpose: to investigate the distribution and abundance of the sea scallop, *Placopecten magellanicus*, along the Middle Atlantic coast. A report of these findings has been prepared and submitted for publication (Merrill, in press).

Much incidental data are taken during a planned research cruise. These valuable data, hydrographical and biological, often remain in basic log form available only to those few who have ready access to files of individual cruises. The purpose of this report is to make available portions of the data taken on the *Delaware* cruise No. 60-7, 11-21 May 1960. This report compiles general information in the form of a fishing log and refines to usable form most of the temperature data collected.

Edwards (in press) reported the water temperatures of an earlier cruise in similiar waters (*Albatross III* cruise No. 126, 21 January-3 February 1959, Nantucket Shoals to Cape Hatteras). Our *Delaware* 60-7 cruise covered many of the same transects. Thus, the temperature data for both cruises can be seasonally compared.

Gear and Operations

Eight transects, usually at depths of 20, 40, 60, and 80 fathoms, were made. In addition, 56 more stations were occupied between the transects as shown in figure 1.

A 30-inch Digby dredge with a 1/2-inch liner was towed at all stations. A 10-foot standard offshore scallop dredge was towed at all transects and at stations between transects when the bottom contents showed suitable bottom for scallops. Fair weather plus round-the-clock operations while cruising easily enabled us to complete operations along the vast stretch of the Middle Atlantic within the period of time predesignated.

Fishing Stations

Table 1 lists in consecutive order the stations made during the cruise. The positions were originally plotted as Loran bearings, later being converted to latitude and longitude. The bottom type was determined by visual examination of the liner contents of the Digby dredge. The dominant forms were noted after examining, ashore, samples of frozen material taken from each station.

The cruise covered a path generally southward from Block Island along the various transect stations until the final transect at Cape Hatteras was completed. On the return trip, areas between transects were fished for additional information. In figure 1, the route traveled south is illustrated by solid lines, the return north by dashed lines. The fishing stations are represented by circles around black dots.

Hydrographic Operations

Hydrographic work included surface temperatures, bathythermograph casts, and the release of surface and bottom drift bottles. The BT was used before or after each dredging station and at regular intervals while steaming as shown by the solid dots in figure 1. Surface and bottom temperatures are listed in table 1.

Table 1.--List of fishing and bathythermograph stations and pertinent data, Delaware Cruise 60-7, May 12-21, 1960

Transect no.	Tow no.	BT no.	Eastern Std. Time Hour	Eastern Std. Time Date	Position Lat.	Position Long.	Depth (fms)	Temp. °F. Surf.	Temp. °F. Bot.	Type dredge[1/]	Bottom type	Dominant forms
0-1	--	17	0600	12	40 33	69 31	33	45.8	41.9	---	-----	------
0-1	--	18	0700	12	40 35	69 45	33	45.2	42.1	---	-----	------
0-1	--	19	0800	12	40 40	69 59	28	45.7	41.8	---	-----	------
0-1	--	20	0900	12	40 44	70 12	23	47.4	43.2	---	-----	------
0-1	--	21	1000	12	40 48	70 21	25	48.7	41.3	---	-----	------
0-1	--	22	1100	12	40 52	70 34	28	48.7	41.4	---	-----	------
0-1	--	23	1200	12	40 56	70 46	28	48.9	40.8	---	-----	------
0-1	--	24	1300	12	40 59	70 58	28	49.5	41.1	---	-----	------
0-1	--	25	1400	12	41 01	71 09	26	49.6	40.5	---	-----	------
1	1	26	1500	12	41 06	71 24	20	50.4	40.8	D & S	Sand & large stone	Sea scallop
1	2	27	1845	12	40 49	71 20	32	49.2	39.6	D & S	Sand & pebble	Starfish
1	3	28	2120	12	40 34	71 12	40	48.8	40.1	D & S	Mud	Starfish
1	4	29	0045	13	40 16	71 03	60	49.9	41.9	D & S	Sand & shell	Starfish & asstd. sm. shell
1	5	30	0230	13	40 10	71 03	80	50.4	39.4	D & S	-----	Starfish
1-2	--	31	0300	13	40 12	71 10	72	49.1	46.6	---	-----	------
1-2	--	32	0400	13	40 12	71 20	50	49.5	41.0	---	-----	------
1-2	--	33	0500	13	40 14	71 32	47	49.8	39.9	---	-----	------
1-2	--	34	0600	13	40 16	71 45	42	50.3	39.1	---	-----	------
1-2	--	35	0700	13	40 18	71 56	35	51.3	39.2	---	-----	------
1-2	--	36	0800	13	40 23	72 08	34	49.2	38.5	---	-----	------
1-2	--	37	0900	13	40 26	72 20	30	51.8	37.9	---	-----	------
1-2	--	38	1000	13	40 29	72 32	24	51.8	38.1	---	-----	------
1-2	--	39	1100	13	40 32	72 42	22	50.1	40.1	---	-----	------
2	1	40	1200	13	40 32	72 46	20	49.9	40.4	D & S	Sand & shell	Sand dollar
2	2	41	1525	13	40 18	72 35	28	52.0	38.9	D & S	Sand & shell	Sand dollar & starfish
2	3	42	1820	13	40 02	72 22	40	51.8	38.4	D & S	Mud, sand & shell	Asstd. sm. shell & starfish
2	4	43	2045	13	39 47	72 07	60	50.1	44.8	D & S	Mud, sand & shell	Starfish & asstd. sm. shell
2	5	44	2205	13	39 44	72 04	80	50.4	50.2	D & S	Mud	Starfish & asstd. sm. shell
2-3	--	45	0001	14	39 42	72 14	68	52.3	49.1	---	-----	------
2-3	--	46	0100	14	39 37	72 26	75	51.1	49.9	---	-----	------
2-3	--	47	0200	14	39 35	72 36	44	52.5	40.2	---	-----	------
2-3	--	48	0300	14	39 33	72 45	36	52.6	39.1	---	-----	------
2-3	--	49	0400	14	39 29	72 58	33	53.0	49.1	---	-----	------
2-3	--	50	0500	14	39 27	73 09	30	52.0	40.1	---	-----	------

Table 1.--List of fishing and bathythermograph stations and pertinent data, Delaware Cruise 60-7, May 12-21, 1960 (Continued)

Transect no.	Tow no.	BT no.	Eastern Std. Time Hour	Eastern Std. Time Date	Position Lat.	Position Long.	Depth (fms)	Temp. °F. Surf.	Temp. °F. Bot.	Type dredge 1/	Bottom type	Dominant forms
3	1	51	0610	14	39 24	73 24	20	53.6	42.1	D & S	Sand & shell	Sand dollar
3	2	52	0745	14	39 19	73 18	30	53.0	40.3	D & S	Sand & shell	Sea scallop & black quahog
3	3	53	1055	14	39 09	73 08	40	53.3	40.1	D & S	Mud, sand & shell	Sea scallop & sm. shell
3	4	54	1330	14	39 02	72 52	61	54.0	47.4	D & S	Mud, sand & shell	Starfish & asstd. shell
3	5	55	1500	14	39 01	72 49	80	53.9	51.1	D & S	-----	Assorted shell
3-4	--	56	1600	14	38 59	72 57	50	54.0	45.1	---	-----	--------
3-4	--	57	1700	14	38 55	73 08	42	53.5	42.0	---	-----	--------
3-4	--	58	1800	14	38 52	73 18	40	53.0	40.0	---	-----	--------
3-4	--	59	1900	14	38 49	73 29	30	53.9	40.1	---	-----	--------
3-4	--	60	2000	14	38 47	73 42	28	54.8	41.9	---	-----	--------
3-4	--	61	2100	14	38 45	73 53	23	54.2	42.9	---	-----	--------
3-4	--	62	2200	14	38 43	74 05	26	55.5	42.9	---	-----	--------
4	1	63	2300	14	38 40	74 17	20	56.1	43.8	D & S	Sand & shell	Sand dollar
4	2	64	0200	15	38 29	74 05	30	53.8	41.8	D & S	Sand & shell	Asstd. shell & sea scallop
4	3	65	0340	15	38 19	73 51	40	52.9	40.0	D & S	Sand & shell	Starfish
4	4	66	0435	15	38 18	73 47	60	53.0	45.2	D & S	Sand & shell	Starfish & asstd. sm. shell
4	5	67	0600	15	38 13	73 42	80	52.4	50.2	D & S	Sand, pebble & mud	Starfish
4-5	--	68	0745	15	38 08	73 56	64	53.1	48.7	---	------	--------
4-5	Alt 1	69	0845	15	38 04	74 07	41	53.0	40.3	D & S	Sand & shell	Assorted shell
4-5	--	70	1005	15	38 03	74 16	34	54.0	41.7	---	------	--------
4-5	Alt 2	71	1105	15	37 59	74 27	28	56.0	42.3	D	Sand & shell	Black quahog
4-5	--	72	1205	15	37 57	74 36	24	57.5	43.8	---	------	--------
4-5	--	73	1300	15	37 53	74 45	18	57.8	41.2	---	------	--------
5	1	74	1345	15	37 51	74 51	18	58.5	45.6	D & S	Sand & shell	Surf clam
5	2	75	1545	15	37 45	74 36	30	58.4	43.2	D & S	------	Starfish
5	3	76	1735	15	37 39	74 24	40	55.8	41.0	D & S	Sand & shell	Starfish
5	4	77	1920	15	37 37	74 19	60	55.0	48.5	D & S	Mud, sand & shell	Assorted shell
5	5	78	2020	15	37 36	74 17	80	56.1	51.0	D & S	Mud, sand & shell	Tube annelid
5-6	--	79	2120	15	37 29	74 26	54	54.5	50.1	---	-----	--------
5-6	Alt 3	80	2245	15	37 24	74 39	35	56.0	42.0	D	Small shell	Razor clam
5-6	--	81	0001	16	37 19	74 49	26	58.0	43.7	---	-----	--------
5-6	Alt 4	82	0125	16	37 11	74 59	20	58.5	45.5	D	Sand & shell	Sand dollar
5-6	--	83	0230	16	37 06	75 04	19	59.0	45.9	---	-----	--------
5-6	--	84	0330	16	37 00	75 12	20	59.5	45.7	---	-----	--------

Table 1.--List of fishing and bathythermograph stations and pertinent data, Delaware Cruise 60-7, May 12-21, 1960 (Continued)

Transect no.	Tow no.	BT no.	Eastern Std. Time Hour	Eastern Std. Time Date	Position Lat.	Position Long.	Depth (fms)	Temp. °F. Surf.	Temp. °F. Bot.	Type dredge 1/	Bottom type	Dominant forms
6	1	85	0410	16	36 56	75 18	17	59.6	46.2	D & S	Sand & shell	Sand dollar & surf clam
6	2	86	0600	16	36 53	74 59	20	59.0	46.7	D & S	Sand & shell	Sand dollar & surf clam
6	3	87	0750	16	36 51	74 45	40	57.1	42.9	D & S	Sand & shell	Asstd. sm. shell
6	4	88	0945	16	36 54	74 38	58	55.2	50.7	D & S	Mud, sand & pebble	Asstd. sm. shell
6	5	89	1125	16	36 52	74 36	80	55.4	51.3	D & S	Mud & coarse sand	Asstd. invertebrates
6-7	Alt 5	90	1255	16	36 44	74 48	35	57.8	43.1	D	Sand & sm. shell	Asstd. sm. shell
6-7	Alt 6	91	1410	16	36 35	74 54	21	57.9	46.8	D	Sand	Sand dollar & starfish
6-7	Alt 7	92	1614	16	36 23	75 07	19	60.0	47.9	D	Sand & shell	Surf clam & cancer crab
6-7	--	93	1700	16	36 18	75 11	17	63.0	48.1	---	-----	--------
7	1	94	1830	16	36 09	75 20	18	61.8	48.2	D & S	Sand & shell	Surf clam & starfish
7	2	95	2015	16	36 11	75 07	20	62.1	49.8	D & S	Sand & shell	Starfish & surf clam
7	3	96	2200	16	36 09	74 55	40	63.6	55.4	D	-----	Starfish & cancer crab
7	4	97	2255	16	36 08	74 49	62	65.3	57.0	D	Sand & shell	Starfish & asstd. sm. shell
7	5	98	2320	16	36 09	74 49	80	66.3	54.6	D	Mud, sand & sm. pebble	Starfish
7-8	--	99	0020	17	36 01	74 51	50	63.9	58.5	---	-----	--------
7-8	Alt 8	100	0130	17	35 54	74 55	36	63.9	59.3	D	Mud & sand	Starfish
7-8	--	101	0230	17	35 49	74 59	27	64.4	51.2	---	-----	--------
7-8	Alt 9	102	0400	17	35 41	75 07	20	63.6	54.7	D	Sand & shell	Surf clam & calico scallop
7-8	--	103	0500	17	35 33	75 08	20	64.1	65.0	---	-----	--------
8	1	104	0615	17	35 25	75 13	14	64.2	69.8	D	Sand & shell	Asstd. invertebrates
8	2	105	0730	17	35 23	75 01	20	68.0	64.1	D	-----	Starfish
8	3	106	0805	17	35 22	74 58	38	70.2	66.4	D	Sand	--------
8	4	107	0835	17	35 22	74 56	58	70.5	60.8	D	Mud	Leathery tube worm
8	5	108	0905	17	35 22	74 55	76	71.0	55.3	D	Mud & stone	--------
8	--	109	0930	17	35 20	74 52	102	71.1	52.7	---	-----	--------
8	--	110	0945	17	35 19	74 51	150	72.3	48.3	---	-----	--------
8	6	--	1000	17	35 20	74 51	250	73.5	--	D	Mud	--------
8-7	Alt 10	111	1150	17	35 33	74 58	24	66.9	66.3	D	Shell	Starfish
8-7	--	112	1255	17	35 43	75 00	26	66.8	52.3	---	-----	--------
8-7	--	113	1400	17	35 53	75 03	22	66.0	52.4	---	-----	--------
8-7	Alt 11	114	1455	17	36 00	75 04	18	63.7	50.8	D	Sand & shell	Surf clam & calico scallop
7	--	115	1600	17	36 09	75 00	20	67.7	51.4	---	-----	--------
7-6	Alt 12	116	1715	17	36 20	74 56	29	63.0	48.1	D	Sand & shell	Starfish & asstd. sm. shell
7-6	Alt 13	117	1855	17	36 30	75 01	18	62.1	49.1	D	Sand & shell	Sand dollar & surf clam
7-6	Alt 14	118	2035	17	36 45	75 07	16	64.1	50.8	D	Sand & shell	Sand dollar

Table 1.--List of fishing and bathythermograph stations and pertinent data, Delaware Cruise 60-7, May 12-21, 1960 (Continued)

Transect no.	Tow no.	BT no.	Eastern Std. Time Hour	Eastern Std. Time Date	Position Lat.	Position Long.	Depth (fms)	Temp. °F. Surf.	Temp. °F. Bot.	Type dredge 1/	Bottom type	Dominant forms
7-6	Alt 15	119	2135	17	36 51	75 05	16	62.9	46.6	D & S	Sand, sm. stone & shell	Surf clam
6-5	Alt 16	120	2240	17	36 59	74 59	24	61.5	45.1	D & S	Coarse sand	--------
6-5	Alt 17	121	0120	18	37 06	74 48	34	60.2	43.1	D & S	Small shell	Starfish
6-5	--	122	0230	18	37 15	74 51	25	59.7	44.2	---	------	--------
6-5	--	123	0330	18	37 23	74 49	25	61.6	44.4	---	------	--------
6-5	Alt 18	124	0545	18	37 34	74 45	30	61.8	43.4	D & S	Sand & shell	Starfish
5	Alt 19	125	0725	18	37 42	74 30	33	60.5	42.4	D	Sand & shell	Asstd. invertebrates
5-4	Alt 20	126	0840	18	37 50	74 24	35	56.1	41.1	D & S	Sand & shell	Sea scallop
5-4	Alt 21	127	1200	18	38 03	74 17	32	57.4	42.0	D	Sand	Sand dollar
5-4	Alt 22	128	1445	18	38 20	74 14	28	60.3	43.7	D & S	Coarse sand & shell	Sea scallop & black quahog
5-4	--	129	1545	18	38 20	74 07	33	58.1	41.7	---	------	--------
4	Alt 23	--	1800	18	38 25	73 56	34	56.9	--	D & S	Sand & shell	Sea scallop & asstd. shell
4-3	Alt 24	131	2055	18	38 32	73 31	46	54.9	40.0	D	Sand & shell	Assorted shell
4-3	--	132	2200	18	38 38	73 43	30	56.2	41.0	---	------	--------
4-3	--	133	2300	18	38 42	73 52	22	57.1	43.5	---	------	--------
4-3	Alt 25	134	2340	18	38 44	73 56	20	57.5	43.8	D	Sand	Sand dollar
4-3	--	135	0035	19	38 46	73 49	20	56.5	43.2	---	------	--------
4-3	Alt 26	135a	0235	19	38 49	73 39	30	54.0	42.0	D & S	Sand & shell	Assorted shell
4-3	--	136	0345	19	38 52	73 32	32	55.0	40.3	---	------	--------
4-3	Alt 27	137	0525	19	38 52	73 23	36	53.0	40.2	D & S	Sand & shell	Assorted shell
4-3	--	138	0630	19	38 58	73 32	36	55.2	43.0	---	------	--------
4-3	Alt 28	139	0740	19	39 03	73 41	23	54.5	44.7	D	Sand	Sand dollar
4-3	Alt 29	140	0940	19	39 04	73 21	32	53.8	40.5	D & S	Sand & shell	Asstd. invertebrates
3	Alt 30	141	1140	19	39 11	73 07	36	55.0	39.8	S	Sand & shell	Starfish
3-2	--	141a	1315	19	39 17	72 58	38	53.3	39.5	---	------	--------
3-2	Alt 31	142	1415	19	39 20	72 52	40	54.3	39.1	D	Sand & shell	Starfish & asstd. sm. shell
3-2	--	143	1500	19	39 25	72 59	33	56.0	39.4	---	------	--------
3-2	Alt 32	144	1635	19	39 29	73 02	37	53.7	40.3	D & S	Sand & shell	Sea scallop
3-2	--	145	1615	19	39 35	73 09	22	60.9	41.9	---	------	--------
3-2	Alt 33	146	1755	19	39 39	73 12	22	56.0	42.1	D	Sand	Sand dollar
3-2	Alt 34	147	1925	19	39 51	73 20	22	60.7	41.9	D & S	Sand & pebble	Sea scallop & sand dollar
3-2	Alt 35	148	2140	19	40 03	73 09	22	56.1	40.8	D	Sand	Sand dollar
3-2	Alt 36	149	2340	19	40 20	73 01	22	55.8	41.1	D	Sand	Sand dollar

Table 1.--List of fishing and bathythermograph stations and pertinent data, Delaware Cruise 60-7, May 12-21, 1960 (Continued)

Transect no.	Tow no.	BT no.	Eastern Std. Time Hour	Eastern Std. Time Date	Position Lat.	Position Long.	Depth (fms)	Temp. °F. Surf.	Temp. °F. Bot.	Type dredge 1/	Bottom type	Dominant forms
3-2	Alt 37	150	0230	20	40 05	72 49	28	55.1	40.2	D & S	Sand	Sand dollar & sea scallop
3-2	Alt 38	151	0430	20	39 49	72 58	36	56.9	39.2	D	------	Starfish
3-2	Alt 39	152	0600	20	39 40	72 49	38	54.2	39.0	D	Sand & sm. shell	Starfish & black quahog
3-2	Alt 40	153	0750	20	39 45	72 28	44	54.2	39.1	D	Mud, sand & sm. shell	Asstd. sm. shell
2	Alt 41	154	0940	20	39 56	72 14	47	54.2	39.7	D	Mud & sand	Starfish
2-1	--	155	1030	20	40 01	72 09	43	53.8	39.8	---	------	--------
2-1	Alt 42	156	1150	20	40 08	72 00	40	54.1	39.8	D	Mud, sand & shell	Asstd. sm. shell
2-1	Alt 43	157	1325	20	40 19	72 09	34	53.9	39.4	D & S	Sand & shell	Black quahog & starfish
2-1	Alt 44	158	1515	20	40 30	72 17	32	55.0	38.7	D	Mud & sand	--------
2-1	Alt 45	159	1700	20	40 43	72 25	20	52.7	40.2	D & S	Sand	Sand dollar
2-1	--	160	1900	20	40 48	72 11	22	54.3	40.5	---	------	--------
2-1	Alt 46	161	1930	20	40 48	72 04	21	54.0	41.8	D & S	Sand	Sand dollar & sea scallop
2-1	Alt 47	162	2140	20	40 40	71 59	28	54.0	40.4	D & S	Sand & shell	Sea scallop & sand dollar
2-1	Alt 48	163	2345	20	40 27	71 53	38	53.9	39.9	D	Mud	--------
2-1	Alt 49	164	0145	21	40 12	71 41	46	53.6	41.1	D	Mud & sand	Starfish
2-1	Alt 50	165	0330	21	40 17	71 23	46	50.8	40.9	D	Mud	Starfish
2-1	--	166	0415	21	40 26	71 27	42	52.7	41.0	---	------	--------
2-1	Alt 51	167	0520	21	40 33	71 31	40	53.0	40.1	D	Mud	--------
2-1	Alt 52	168	0705	21	40 47	71 39	36	54.1	40.2	D	Mud	Starfish
2-1	Alt 53	169	0830	21	40 59	71 44	26	51.2	41.4	D & S	Mud, sand & pebble	Black quahog
2-1	Alt 54	170	1020	21	41 03	71 34	23	55.1	42.3	D	Mud & sand	Asstd. invertebrates
1-0	Alt 55	171	1210	21	41 07	71 23	20	55.9	42.8	S	Rock	No material; dredge damaged
1-0	Alt 56	172	1400	21	41 05	71 20	26	55.0	42.4	S	Rock & shell	Sea scallop
1-0	--	173	1515	21	41 14	71 12	32	55.9	44.1	---	------	--------
1-0	--	174	1615	21	41 19	71 01	18	54.3	46.8	---	------	--------

1/ Type dredge - D = 30" Digby Dredge with 1/2" liner; S = 10' Standard Sea Scallop Dredge with 3" rings.

One hundred seventy-four BT casts were made. The surface and bottom drift bottles released totaled 762. The drift bottle log book was turned over to Mr. Dean Bumpus of the Woods Hole Oceanographic Institution at the completion of the cruise for later analysis of the returns.

Surface and Bottom Temperatures

Surface water temperature isotherms along the Continental Shelf are presented in figure 2. As can be seen, the temperatures, although locally variable, warm appreciably southward. Below Nantucket, the water averages about 45° F., at Cape Hatteras 70° F.

Figure 3 shows the bottom water temperatures to be considerably more uniform in their distribution than those at the surface. At the bottom, temperatures range from an average of about 40° F. near Nantucket to about 70° F. in the shoaler waters near Cape Hatteras. In deeper waters off Cape Hatteras, however, temperatures were less than 50° F.

Temperature Profiles

Temperature profiles are shown for each transect (figures 4, 6, 7, 8, 9, 10, 11, 13). Two additional profiles, oblique to the transects, are also included for further clarification (figures 5, 12). The profiles are presented to enable the reader to quickly interpret any particular vertical water struction, or to compare water columns for the entire area.

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29 August 1961

LIST OF FIGURES

Figure 1.--Cruise track of Delaware cruise 60-7. Solid circles indicate BT drops and open circles are fishing stations. Each transect is identified by name. Route traveled south represented by solid lines, return trip north by dashed lines.

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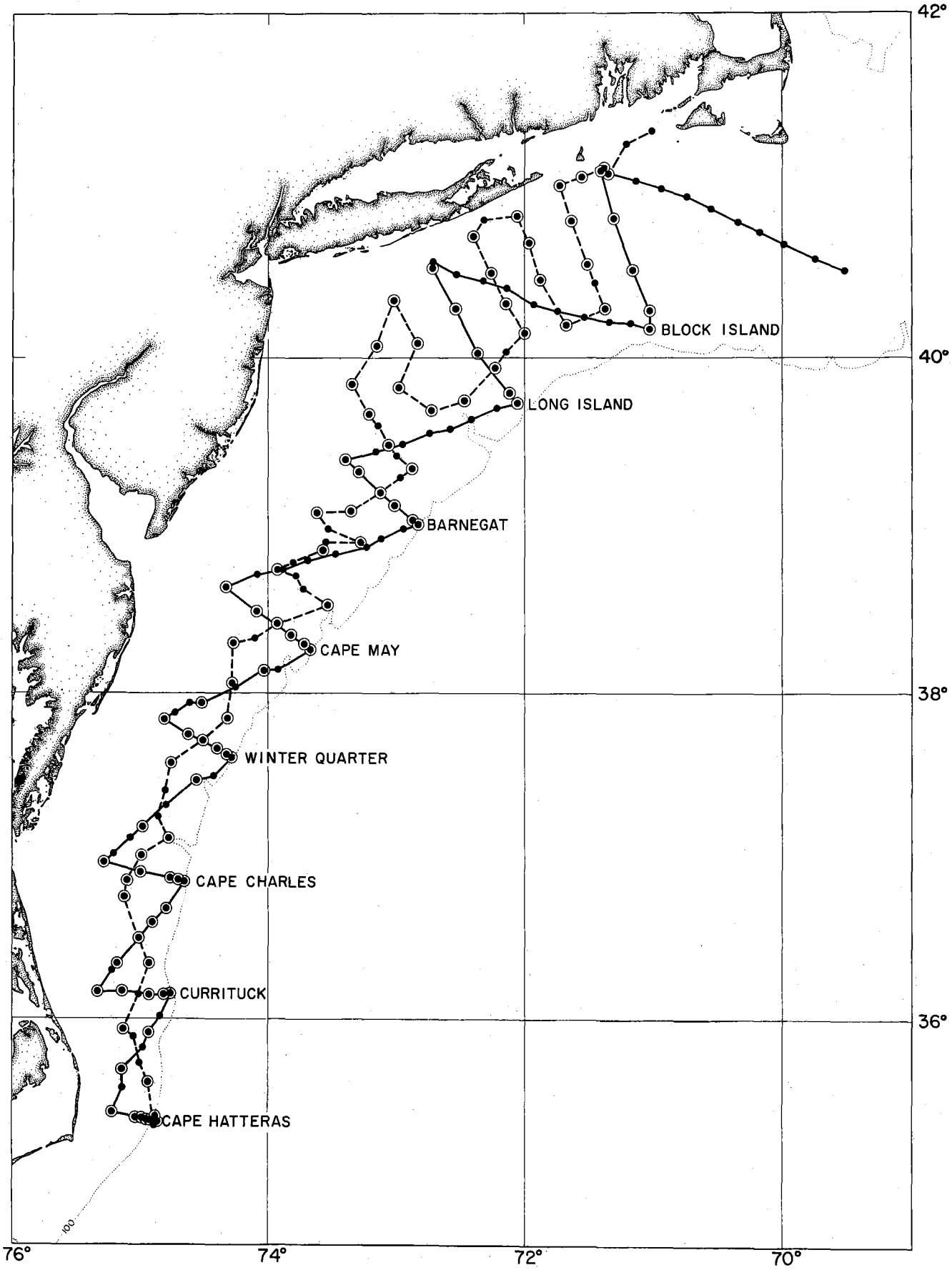
xxxx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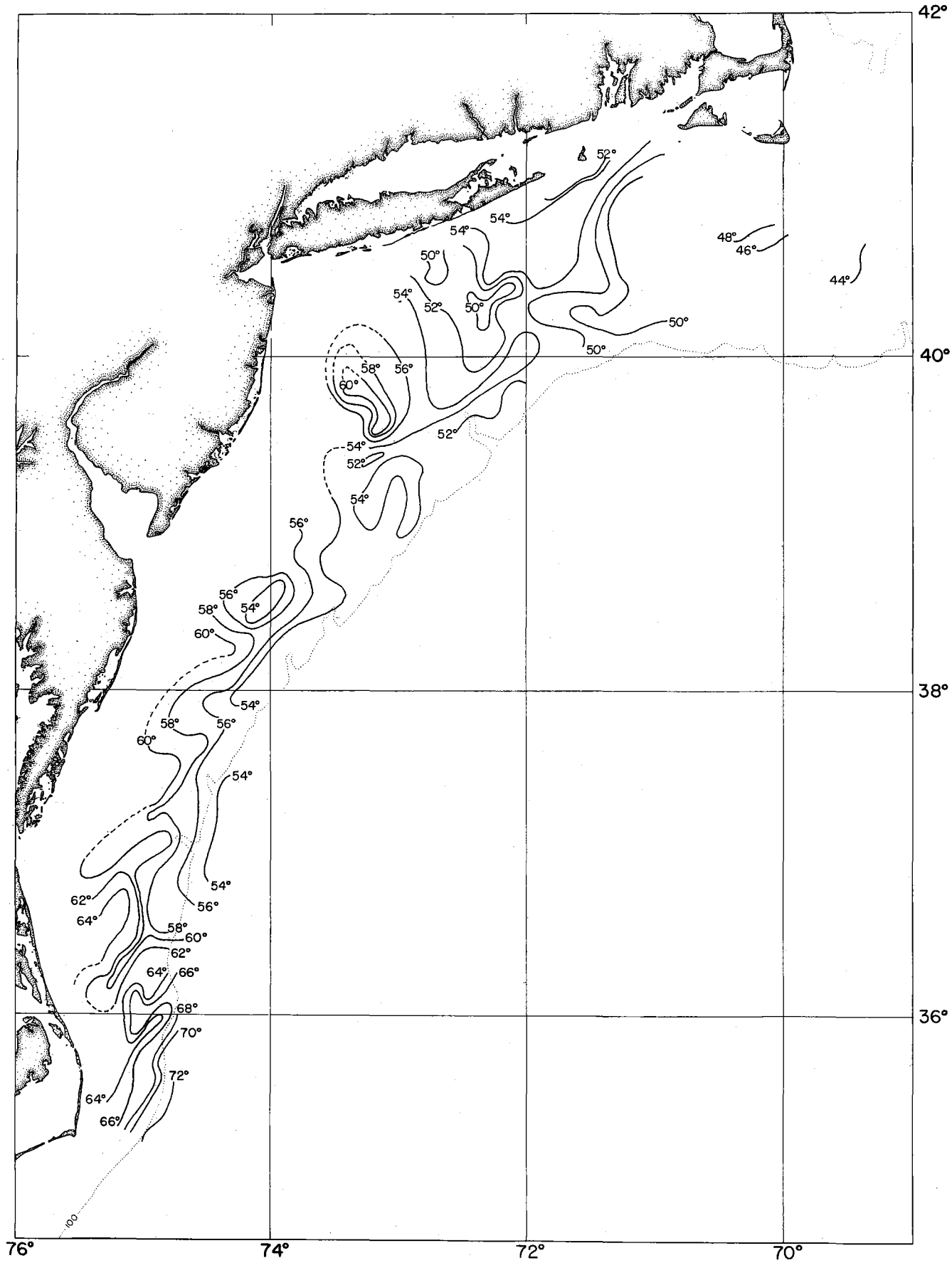
40°
38°
36°
76°
74°
72°
70°
BLOCK ISLAND
LONG ISLAND
BARNEGAT
CAPE MAY
WINTER QUARTER
CAPE CHARLES
CURRITUCK
CAPE HATTERAS
100

FIG. 1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38°
36°
76°
74°
72°
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46°
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56°
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60°
54°
58°
56°
60°
54°
54°
62°
56°
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58°
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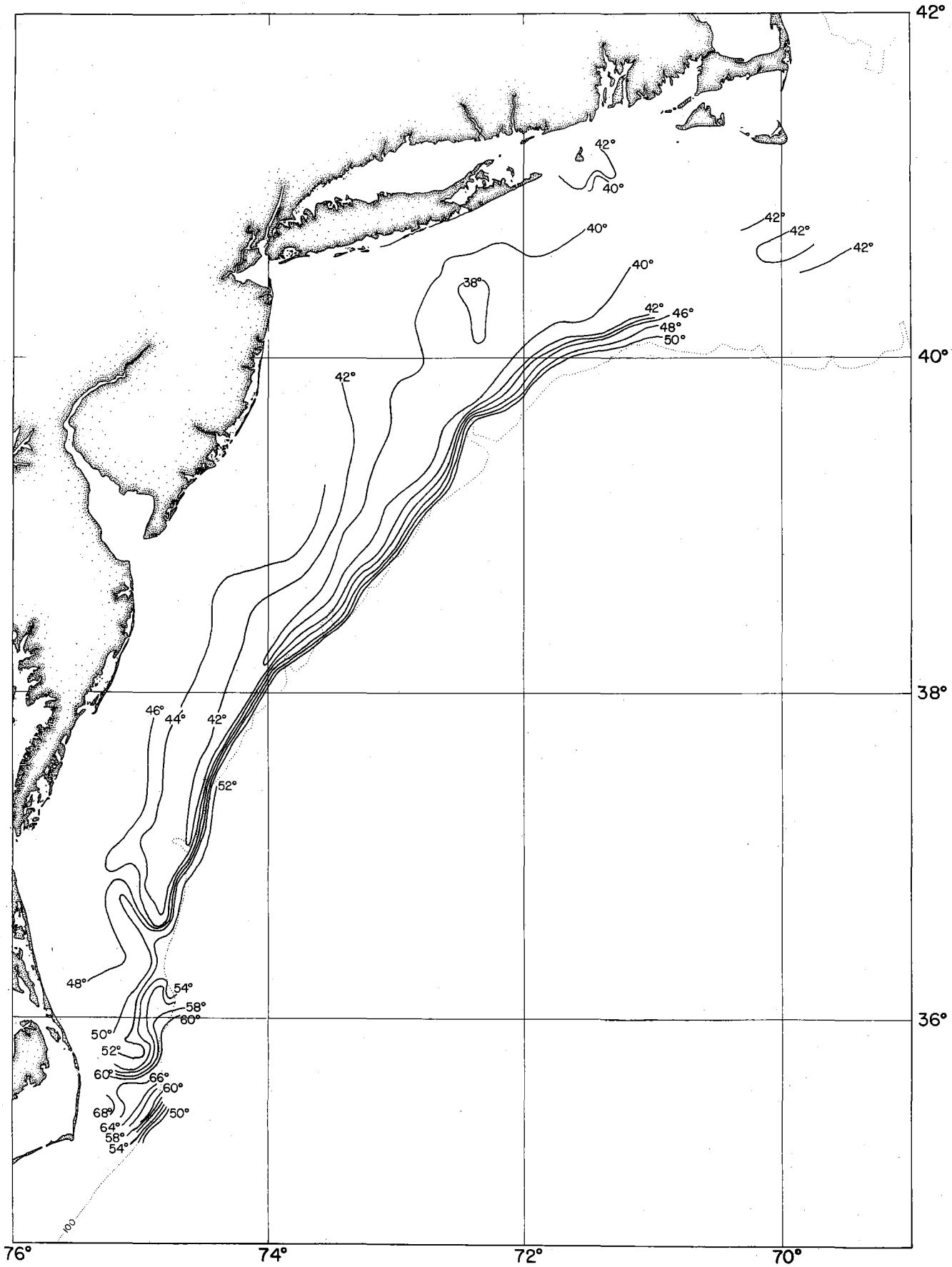
64°
66°
68°
70°
72°
64°
66°
100

FIG. 2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42°
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52°
48°
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54°
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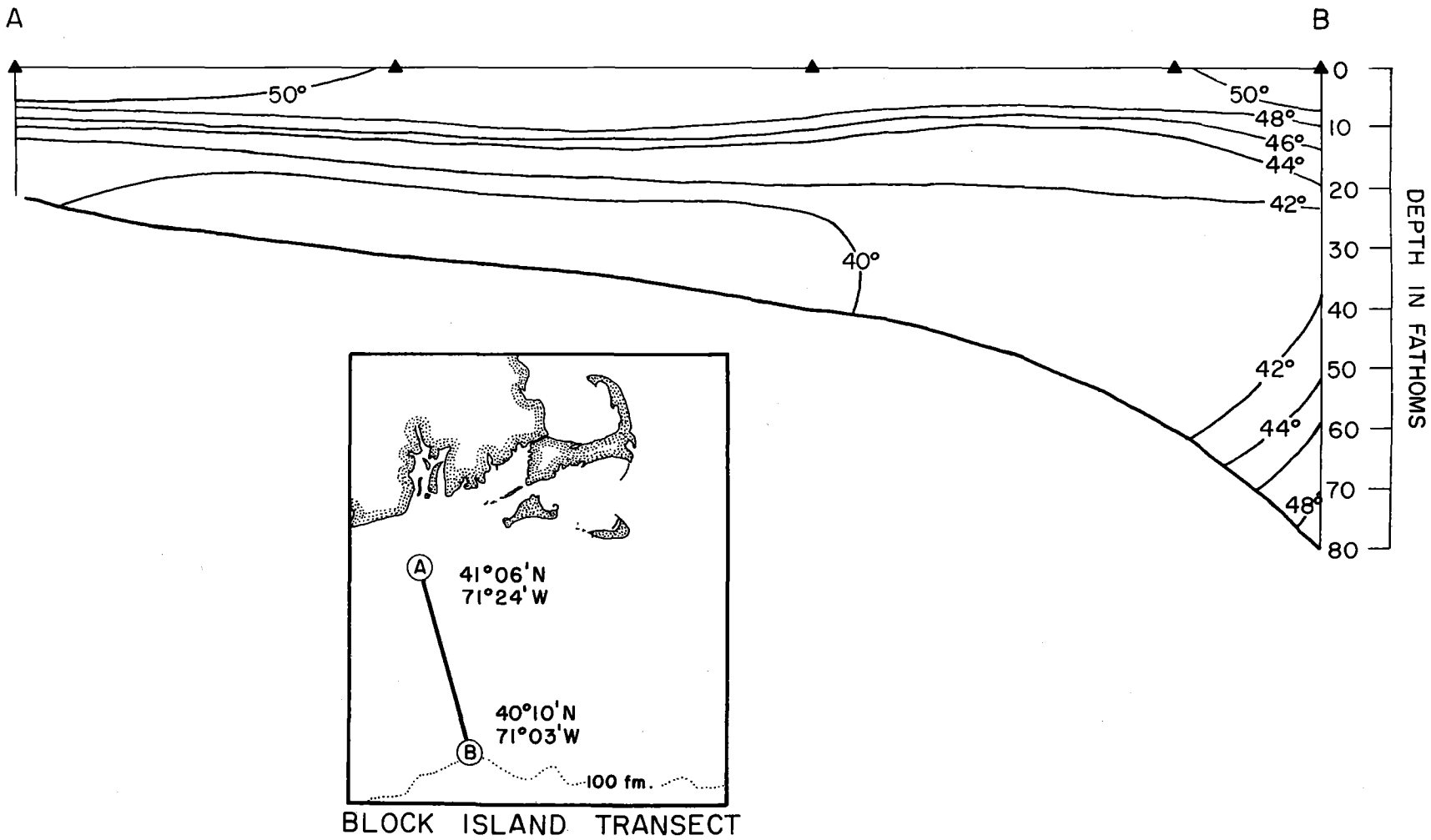
FIG. 3



BLOCK ISLAND TRANSECT

FIG. 4

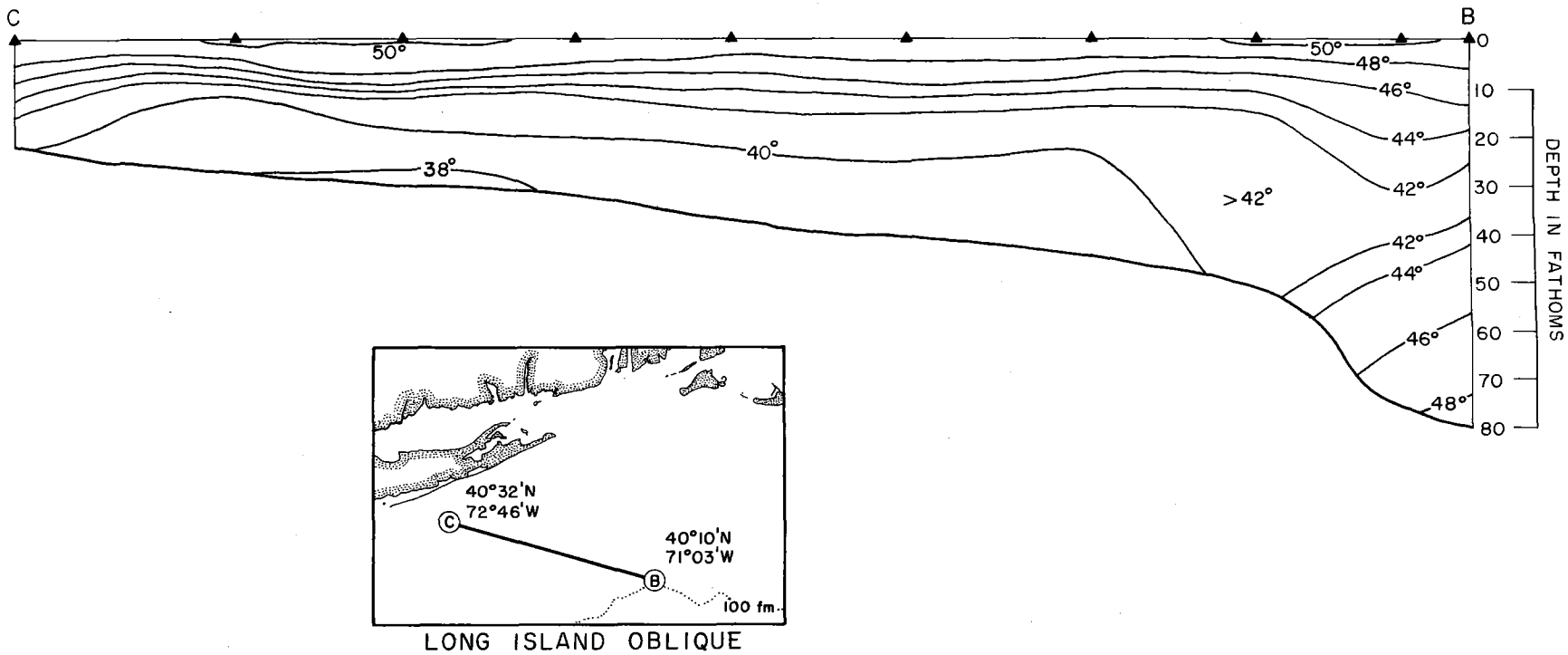

C
B
50°
50°
48°
46°
44°
42°
40°
38°
>42°
42°
44°
46°
48°
0
10
20
30
40
50
60
70
80
DEPTH IN FATHOMS
40°32'N
72°46'W
40°10'N
71°03'W
100 fm.
LONG ISLAND OBLIQUE

FIG. 5

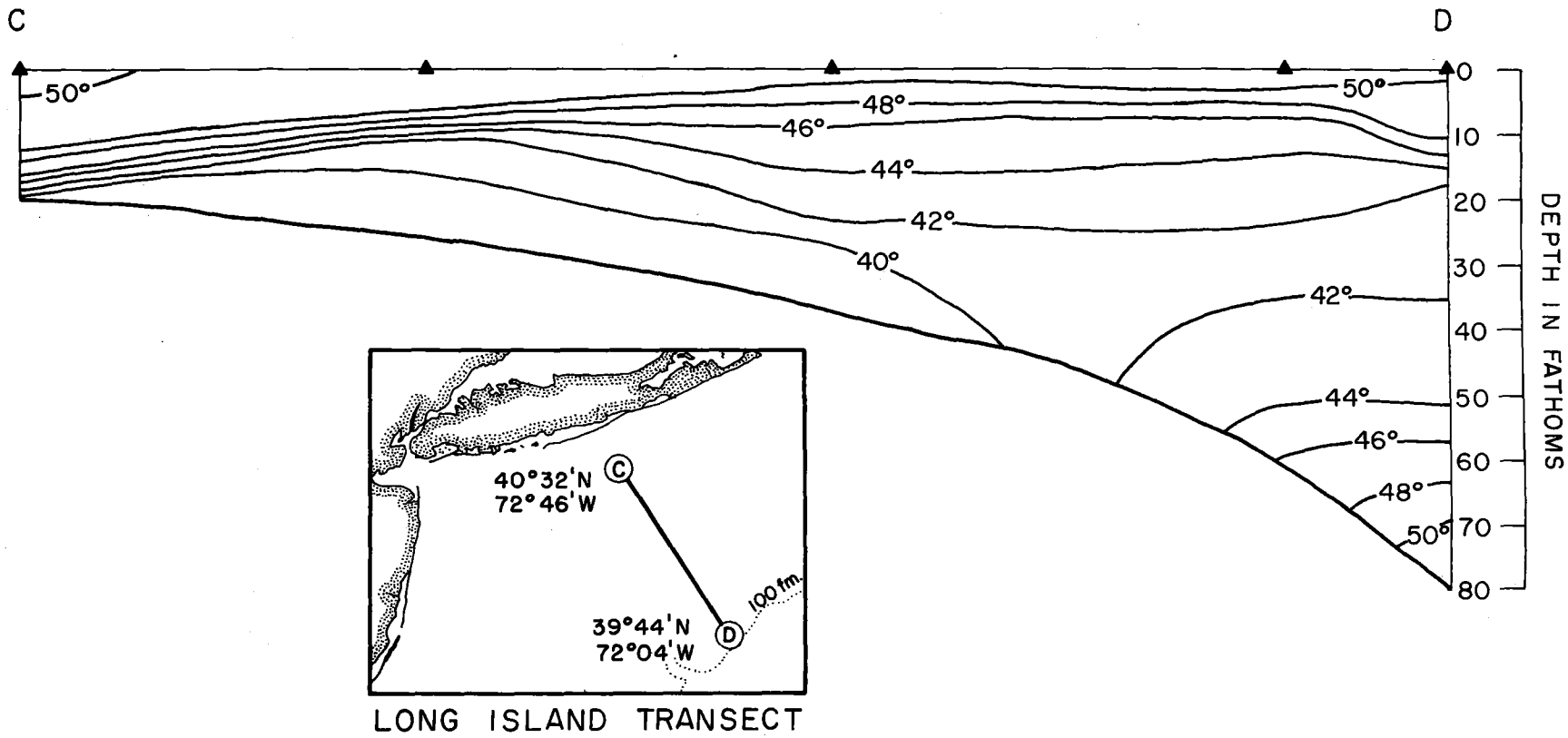
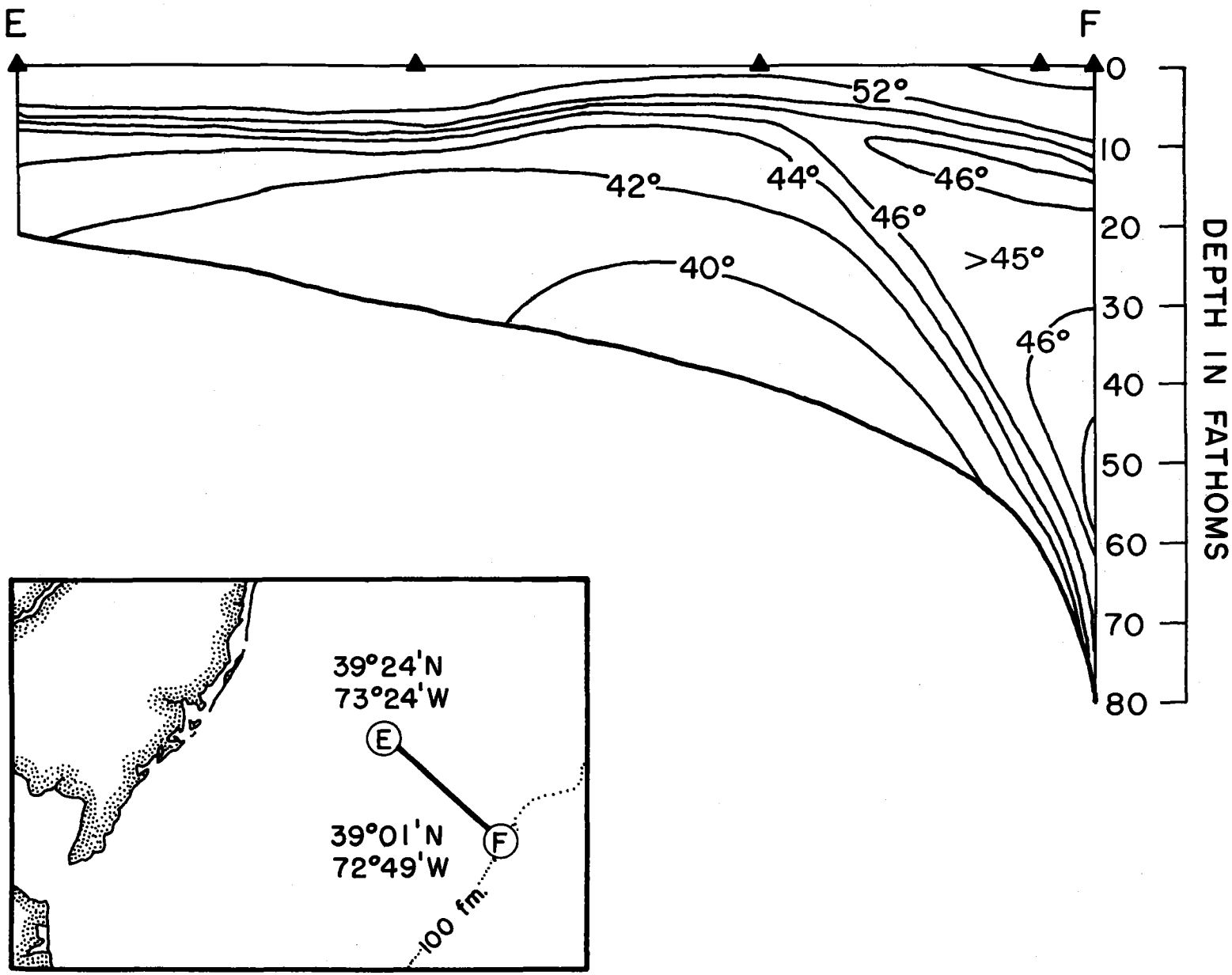
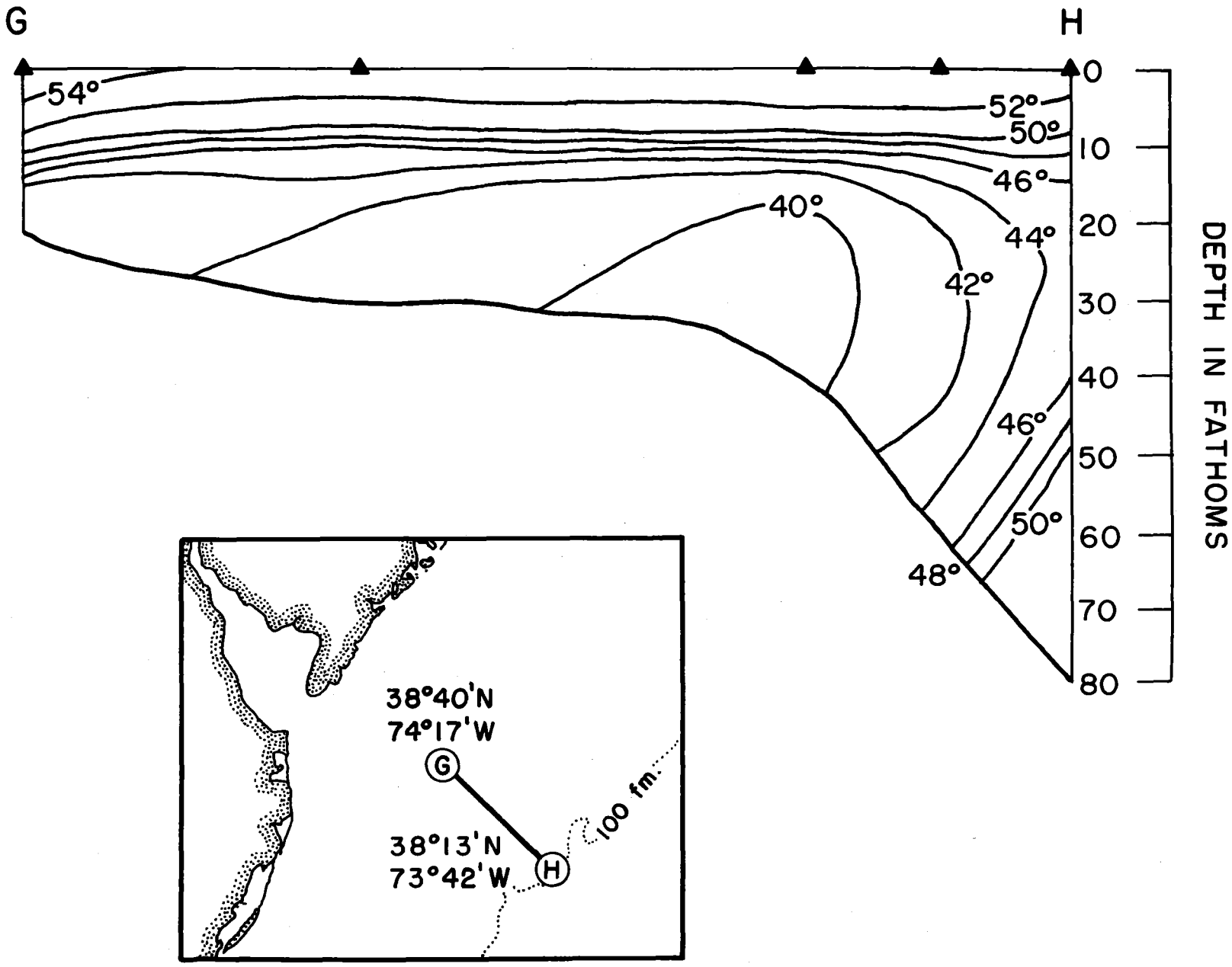

C
D
50°
48°
46°
44°
42°
40°
42°
44°
46°
48°
50°
50°
0
10
20
30
40
50
60
70
80
DEPTH IN FATHOMS
40°32'N
72°46'W
39°44'N
72°04'W
100 fm.
LONG ISLAND TRANSECT

FIG. 6



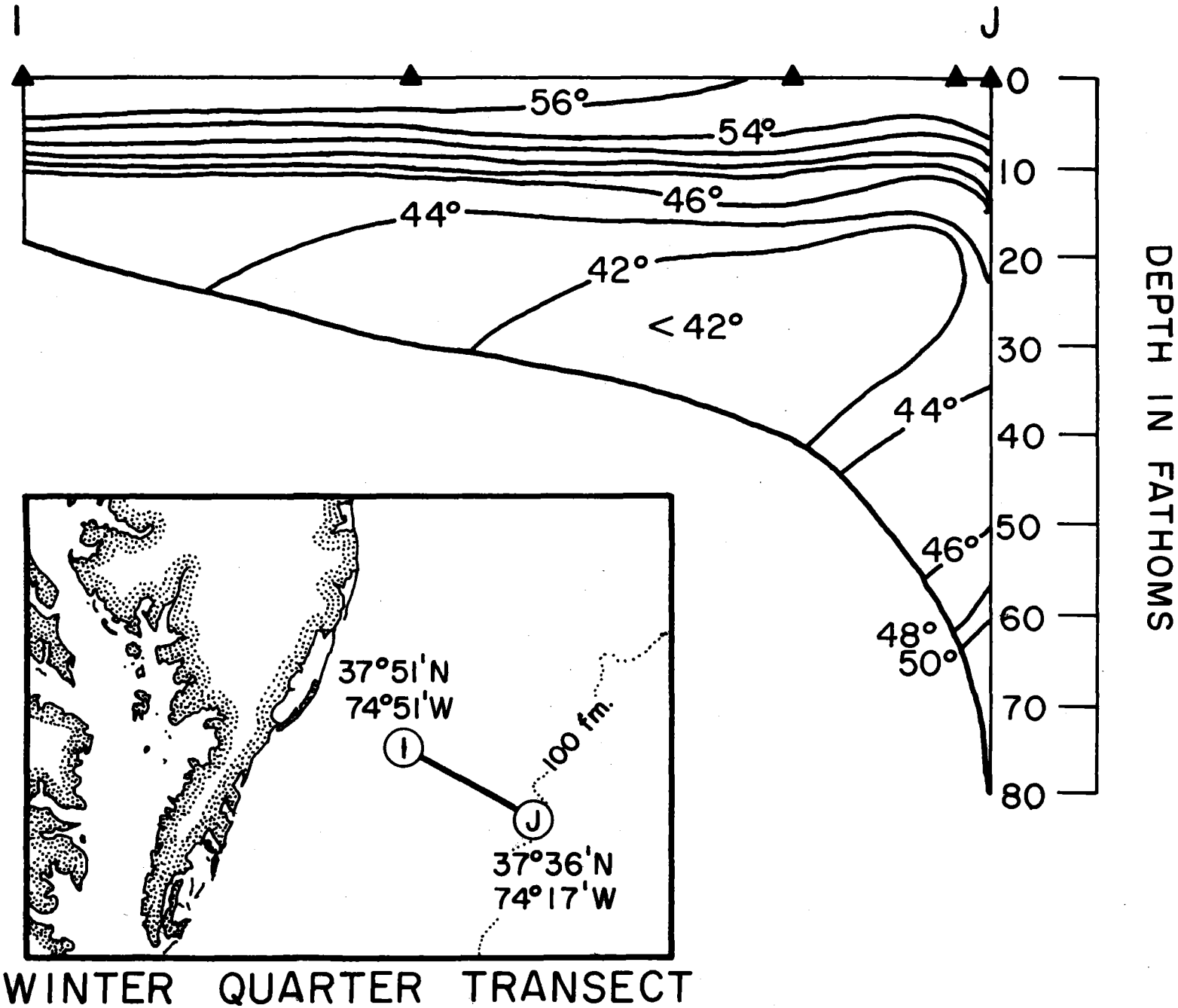
BARNEGAT TRANSECT

FIG.7



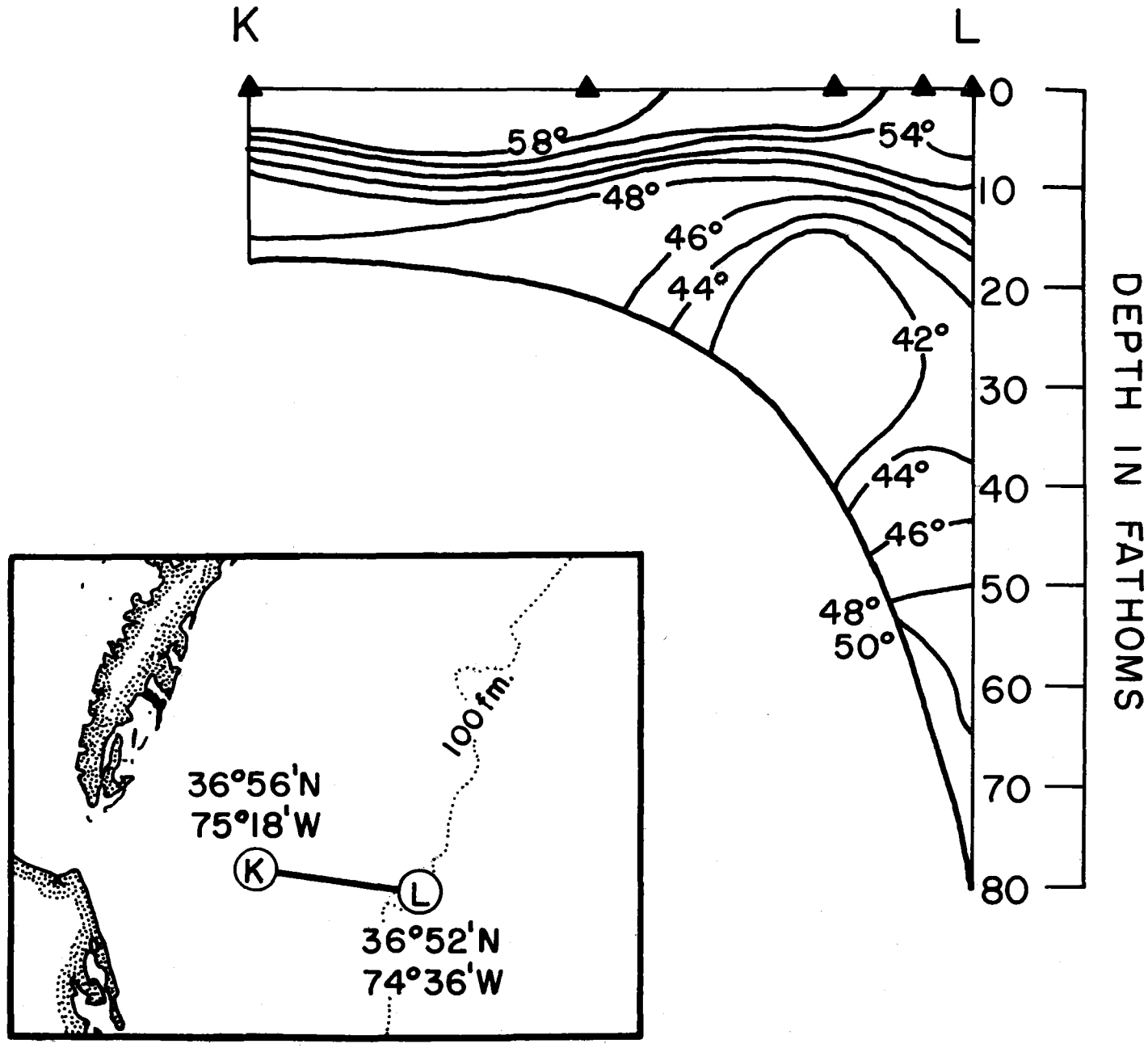
CAPE MAY TRANSECT

FIG. 8



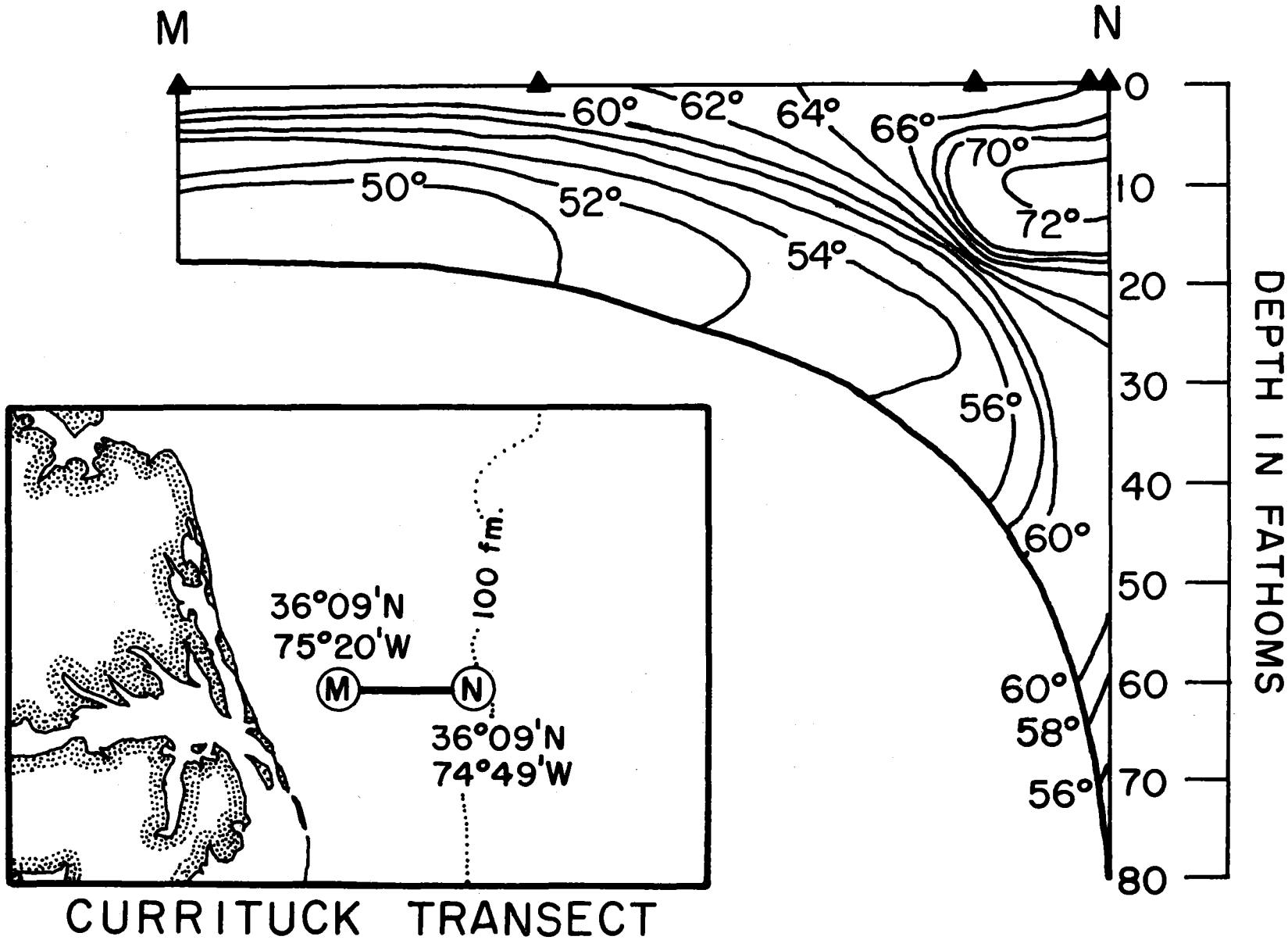
WINTER QUARTER TRANSECT

FIG. 9



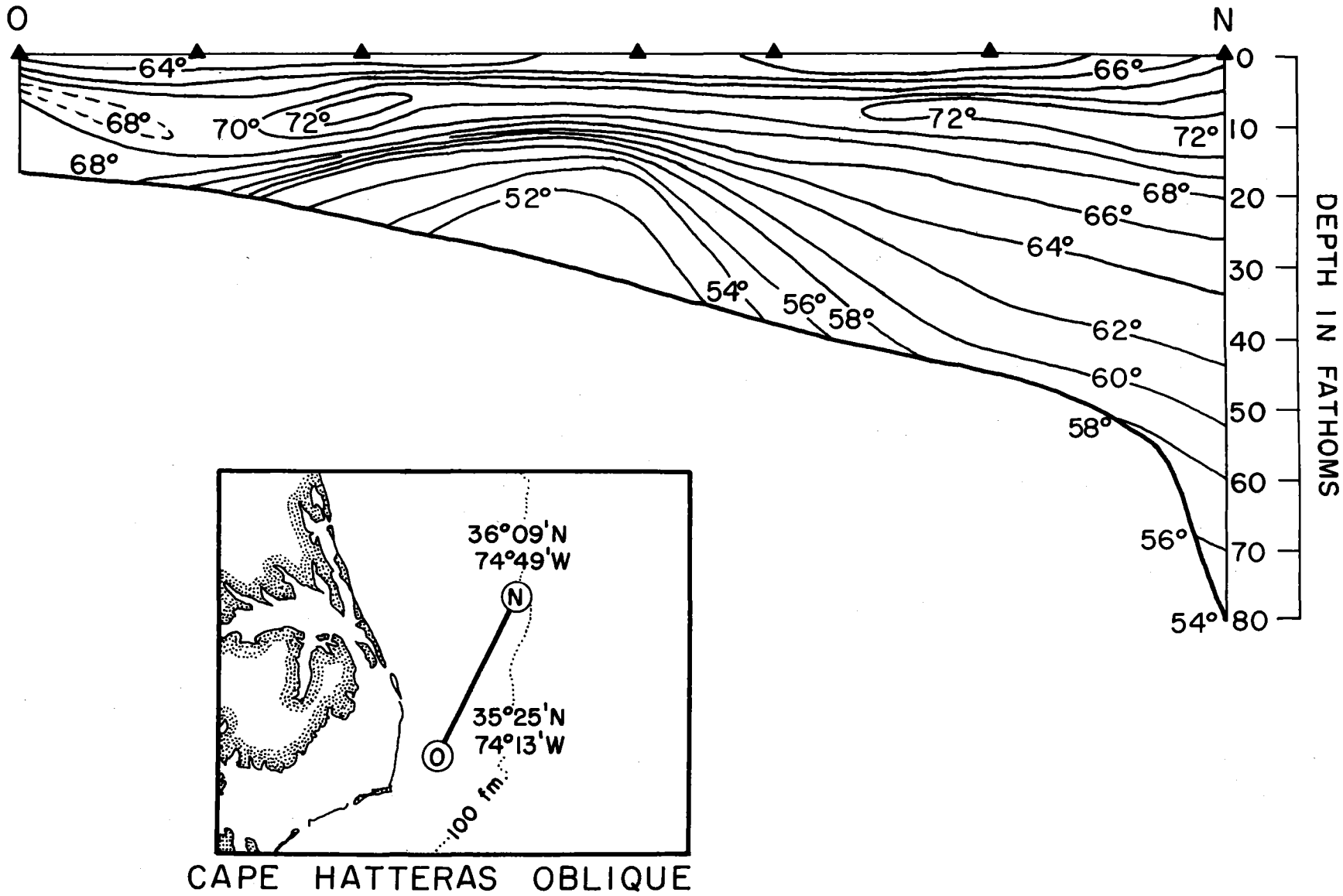
CAPE CHARLES TRANSECT

FIG. 10



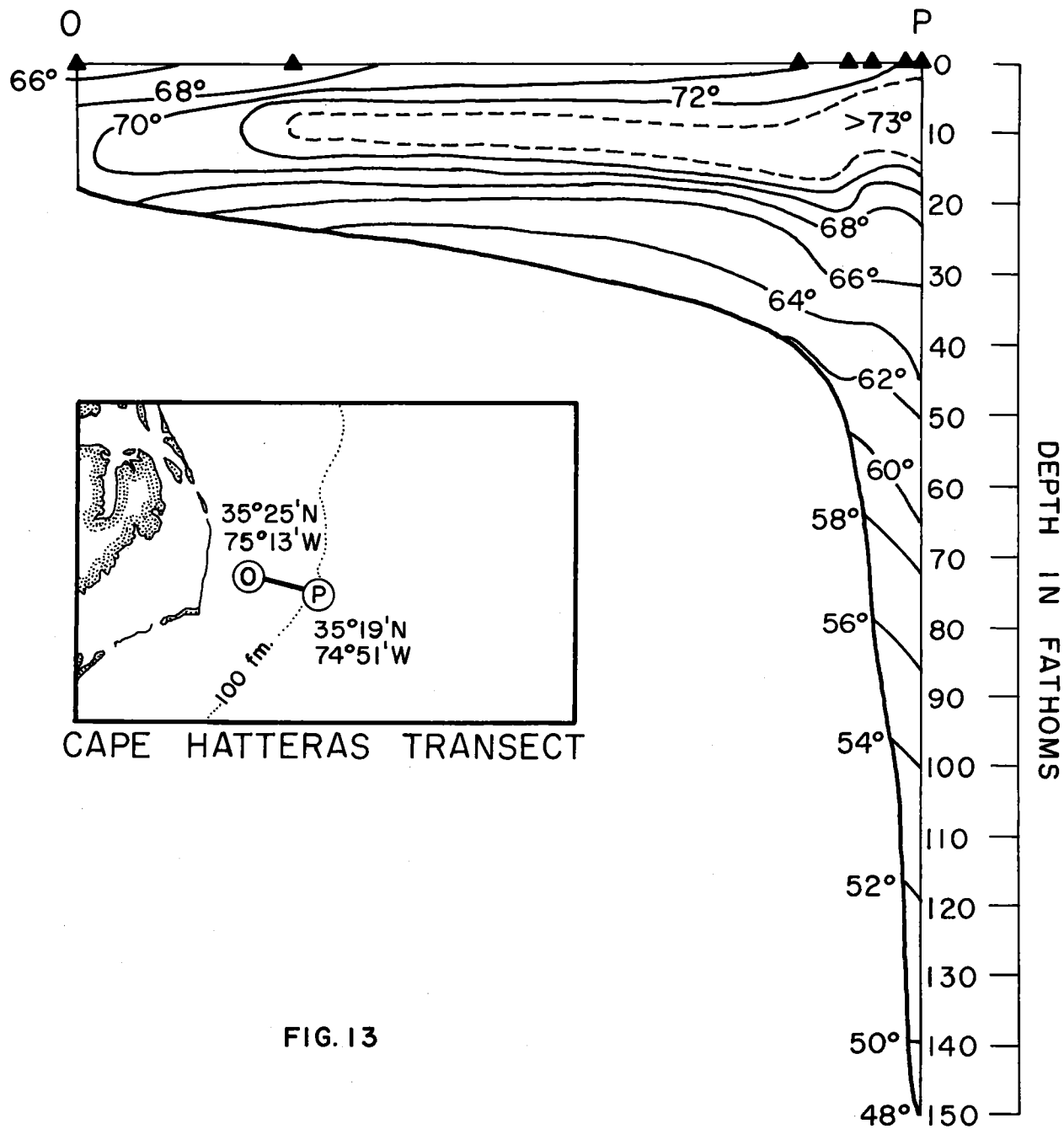
CURRITUCK TRANSECT

FIG. 11



CAPE HATTERAS OBLIQUE

FIG. 12



CAPE HATTERAS TRANSECT

FIG. 13