

8096

Diag. Cht: No. 1206-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. ECFP-1252 Office No. H-8096

LOCALITY

State Massachusetts

General locality Newburyport

Locality Merrimack River & Outer Coast

194 53-54

CHIEF OF PARTY

Clarence R. Reed

LIBRARY & ARCHIVES

DATE August 22, 1955

B-1870-1 (1)

8096

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

REGISTER NO. H-3096

Field No. ECFP-1253

State Massachusetts

General locality Newburyport, ~~Mass.~~

Locality Merrimack River and Outer Coast adjoining.

Scale 1:10,000 Date of survey 7/14 - 10/19/53 &

Instructions dated 6 March 1953 5/19 - 11/2/54

Vessel East Coast Field Party

Chief of party Clarence R. Reed

Surveyed by R.R. Noble, L.D. Kelley & C.E. Horne

Soundings taken by ~~fathometer~~, graphic recorder, hand lead, ~~wire~~ sounding pole

Fathograms scaled by Party personnel

Fathograms checked by L.D. Kelley & Norfolk Processing Office

Protracted by A.K. Schugeld

Soundings penciled by A.K. Schugeld

Soundings in ~~fathoms~~ feet at MLW ~~XXXXX~~
and are true depths

REMARKS: Additional hydrography is to be executed on this sheet in
the summer of 1954.

This folder contains the Descriptive Report for the 1953 Season only.

Handwritten initials

NOTES FOR DESCRIPTIVE REPORT TO ACCOMPANY

Hydrographic Sheet No. H-8096 , (FIELD NO ECFP 1253)

Merrimack River and Outer Coast Adjoining

EAST COAST FIELD PARTY

CLARENCE R. REED, CHIEF OF PARTY

PROJECT CS-355

1953

SCALE 1:10,000

* * * * *

PROJECT This survey was accomplished under instructions dated 6 March, 1953, calling for a modern hydrographic survey of coastal regions of New Hampshire and northern Massachusetts.

SURVEY LIMITS The survey on Sheet H-8096, (FIELD NO. ECFP 1253) covers an area bounded by the shoreline of the Parker and Plum Island Rivers from Latitude $42^{\circ}45'$ to the Merrimack River, the Merrimack from Longitude 55° to the Atlantic Ocean, and a band one to one and a half miles wide along the outer coast from Latitude $42^{\circ}45'$ to Latitude $42^{\circ}51'$. Junctions were made with contemporary surveys on Sheets H-8095 (FIELD NO. ECFP 1153) and H-8097, (FIELD NO. ECFP 1353) and prior Survey H-7140. Work commenced on 14 July, 1953 and stopped 19 October, 1953. Bad weather prohibited completion of this sheet.

VESSELS AND EQUIPMENT Aluminum Launch #168 was used primarily for the Survey. The launch operated from a mooring at Newburyport.

All echo soundings were with graphic recorders Nos. 138 SPX and 67. The transducers were mounted inboard.

Launch #82 was used for obtaining some splits in strong currents. The same sounding equipment was used.

TIDES AND CURRENTS The tide note is attached to this report. Two current stations were occupied by the USC&GSS GILBERT using Roberts current meters and buoys. Current Data is to be furnished the Division of Tides and Currents by the Ship GILBERT.

SMOOTH SHEET The smooth sheet is to be plotted by the Norfolk Processing Office.

CONTROL STATIONS The control consisted mainly of triangulation and photogrammetric stations. The latter were transferred from Air-Photo Compilation Sheets T-11150, T-11151 and T-11152 & T-11153. Where (1952-54) hydrographic stations were necessary, their positions were determined by sextant fixes using cuts.

SHORELINE AND TOPOGRAPHY The shoreline and topographic detail were transferred from Air-Photo Compilation Sheets T-11150, T-11151, T-11152 and T-11153. Any inaccuracies were resolved in the field and sketched directly on the boat sheet.

SOUNDINGS The depths were measured with graphic recorders, sounding pole and hand lead. Bottom samples were obtained from armed hand leads.

CONTROL OF HYDROGRAPHY The sounding lines of this survey were controlled by the three-point-sextant-fix method. There were no unusual jumps when changing control stations.

ADEQUACY OF SURVEY This survey is considered complete and adequate to supersede prior surveys only on the outer coast and that portion of the Merrimack River east of Longitude 70°-50.5'. Junctions with contemporary surveys are satisfactory as depth curves can be drawn and there are no holidays. Bad weather prohibited completion of work in remaining areas of the Sheet. (*Work completed in 1954*)

CROSSLINES Sufficient crosslines in the completed areas were run as prescribed.

COMPARISON WITH PRIOR SURVEYS A comparison with prior Surveys Nos. H-292, H-4897, H-3357 and H-594 showed some discrepancies in sandy areas. These are due to the continually shifting sand. Those items mentioned in the Preliminary Review as prepared by the Division of Charts were investigated and are listed below with all discrepancies found in completed work. *Review, par. 5.*

COMPARISON WITH CHARTS CHARTS NOS. 331 AND 1206

LATITUDE	LONGITUDE	CHART	1953 SURVEY	REMARKS
42°-48.7	70°-47.5 ⁴	30	3 ⁶	Item 4 Prelim Review. Drift sounding and splits failed to give evidence of a 30 ft. sounding. It is recommended the 3 ⁶ sounding be charted. <i>Review, par. 6 A.</i>
42°-48.9	70°-48.1	11	8-9 14	Item 5 Prelim Review. Although it is deeper at this position at present, shifting sands may soon change this. The controlling depth is 6 ft. to Merrimack River which is found at the following positions.
<i>4-6 ft shoals almost surround entrance</i>				
42°-48.85	70°-47.80	---	6 ✓	Entrance to Merrimack River shoalest soundings. It is recommended these soundings be applied to the chart.
42°-48.89	70°-47.81	---	6 ✓	
42°-49.02	70°-47.90	---	86	Item 6 Prelim Review. A 10' shoal lying NW-SE lies to the NE of this position. Some shifting of sand bars may be expected. <i>Review, par. 6 A.</i>
42°-49.03	70°-47.96	---	85	
42°-49.47	70°-48.45 ⁶	12	16-17	Item 7 Prelim Review. Shoalest sounding obtained. It is recommended that the following soundings NE of this position be charted to supersede this 16' sounding. <i>Review, par. 5</i>
42°-50.68	70°-48.55	16	24-26 27	

LATITUDE	LONGITUDE	CHART	1953 SURVEY	REMARKS
42°-50.76	70°-48.41	---	16	Shoalest sounding. ✓
42°-50.87	70°-48.46	---	12 14	Shoalest sounding. These shoals were developed by sounding lines and drift sounding. Hand lead soundings were obtained at these positions of rocky bottom. ✓
42°-49.18	70°-47.3 3 3	43	42 43	Item 14 Prelim Review. Shoalest sounding. ✓
42°-49.13	70°-49.49	11	146	Item 8 Prelim Review. Shoalest sounding. It is recommended the 11' sounding be deleted. ✓ <i>Review, pars 5</i>
42°-49.10	70°-50.25	8	9' 90m.NE. 10-11	Shoalest sounding, by fathometer investigation. (Pres. depths adequate for charting)
42°-48.7	70°-51.5	---	---	Item 9 Prelim Review. Numerous rocks were located in the vicinity of Gangway Rock, including South Pier, which is in ruins and awash at low water. Further investigation should be made upon resumption of survey. Items 10 & 13 of Prelim Review were not investigated due to bad weather not permitting completion of project.
42°-49.2	70°-49.4	Rocks awash	same	<i>See Desc. Report of 1954 work</i> <u>This survey shows these rocks as having a location to the south of charted rocks.</u> Areas to east of these rocks have shoaler soundings than charted soundings but this is attributed to shifting sands and erosion of soil in the Merrimack River. Changes in river entrance are due to shifting sands caused by tide rips and wind. ✓

It is recommended that the soundings of this survey supersede prior charted soundings as listed and all new shoals be added.

COAST PILOT NOTES A separate report was submitted to the Coast Pilot Section on 23 October 1953.

AIDS TO NAVIGATION Floating aids to navigation were located as follows: (See Processing Office list of floating aids)

LATITUDE	LONGITUDE	BUOY AND NO.	DEPTH	DATE
		(S-L FL W) "NP"		
42 -48.48	70 -46.92	Whistle	7268	7/27/53
42 48.30 79	70 -47.72 5	Bell #1	24	7/27/53
42 -49.07	70 -48.26	Red Ref 2	20	8/14/53
42 -49.16	70 -49.38	F1 Red "4"	17	7/24/53
42 -49.20	70 -48.72	F1 W "1B"	29	8/3/53
42 -49.10	70 -49.45	Can "3"	16	7/24/53
42 -49.08	70 -49.35	Can "5"	8	8/7/53
42 -49.17	70 -50.07	Nun "6"	15	8/7/53

LATITUDE	LONGITUDE	BUOY AND NO.	DEPTH	DATE
42°-49.03	70°-50.39	Can "7" Ref	15	10/16/53
42°-49.94	70°-50.84	Nun "8 ref "	14	10/16/53
42°-48.79	70°-51.37	Can 9 ref	15	10/16/53
42°-48.78	70°-51.53	Can "9A"	20	10/16/53
42°-48.82	70°-51.95	Nun "8A"	13	10/16/53

LAND MARKS There are no additional landmarks to report.

GEOGRAPHIC NAMES No changes or additions to geographic names found.

MISCELLANEOUS Extreme caution should be used in entering the Merrimack River from the outer coast. An onshore wind and ebb tide cause tide rips which make small craft difficult to maneuver. Once inside follow buoys in sequence using range lights at Newburyport only after passing North Pier.

A dredging project proceeding during the time of sounding lines at the Merrimack River Entrance placed considerable fill on the east beach of Plum Island. In the fall towards the end of field season it was noticed that some of this fill had washed toward the river entrance. It may be possible that this action will make the controlling depth of the entrance less at a future date than that obtained at the time of survey.

The breakwaters at Merrimack River Entrance are awash only in rough weather. The charted rock awash at the end of north jetty could not be found and is presumed to be end of jetty. (noted in Review, par. 5(3))

Respectfully submitted

Lionel D. Kelley

Lionel D. Kelley
ENS. USC&GS

Approved and forwarded

Clarence R. Reed

Clarence R. Reed, CDR, USC&GS
Chief of Party

TIDAL NOTE TO ACCOMPANY

Hydrographic Sheet H-8096 , (FIELD NO. ECFP 1253)

Observations were obtained at two tide stations where portable automatic gages were maintained. The gage at the Merrimack River Entrance was used to reduce all soundings except those west of Longitude $70^{\circ}-50.3$ in the Merrimack River. The gage at Newburyport, was used to reduce the soundings west of Longitude $70^{\circ}-50.3$. Planes of references were furnished by the Washington Office or computed from elevations of previous tidal Bench Marks.

STATION	LATITUDE	LONGITUDE	MLW ON STAFF
Merrimack River Ent.	$42^{\circ}-49.01$	$70^{\circ}-49.24$	+3.2
Newburyport	$42^{\circ}-48.86$	$70^{\circ}-52.42$	+2.2

FATHOMETER CORRECTIONS

PROJECT CS-355

Hydrographic Survey Sheet H-8096, (FIELD NO. ECFP 1253)

The corrections tabulated below are based on an initial set at zero on the fathogram. Where the initial varies from zero on the fathogram INDEX CORRECTIONS must be entered in the sounding volumes.

Launch 168

FATHOMETER NO: ¹³⁹~~138~~ SPX

23 July - 20 August 1953

Launch No. 168

Correction	Depth	
	From	To
A Range		
+0.2	3.0	22.5
0.0	22.6	34.5
-0.2	34.6	41.5
-0.4	41.6	47.6
-0.6	47.7	55.0
B Range		
-3.4	40.0	48.8
-3.6	48.9	52.5
-3.8	52.6	67.0
-4.0	67.1	77.0
-4.2	77.1	87.0
-4.4	87.1	90.0

*C-scale -
Bar phase
-4.4 -2.6 = -7.0*

*Thru-out.
H.L.P*

FATHOMETER NO. 67

14 August - 14 October 1953

Launch No. 168

Correction	Depth	
	From	To
A Range		
+0.2	0.0	10.0
0.0	10.1	23.5
-0.2	23.6	32.0
-0.4	32.1	37.5
-0.6	37.6	42.5
-0.8	42.6	48.5
-1.0	48.6	55.0
B Range		
-0.6	35.0	36.5
-0.8	36.6	41.0
-1.0	41.1	46.0
-1.2	46.1	51.0
-1.4	51.1	56.0

FATHOMETER NO. 67

B Range (Cont'd)	From	To
-1.6	56.1	61.0
-1.8	61.1	66.0
-2.0	66.1	71.0
-2.2	71.1	76.0
-2.4	76.1	81.0
-2.6	81.1	86.0
-2.8	86.1	91.0

Launch 82 Fathometer 138 ✓
see H-8091 for reductions

Bar check graphs are filed with H-8092.

STATISTICS TO ACCOMPANY

Hydrographic Sheet H-8096 , (FIELD NO. 1253)

DATE	DAY LTR.	VOL. NO.	LEAD LINES	NO. OF POSITIONS	STAT MI OF SDG.	
7/23/53	a	168 139	1	0	33	5.2
7/24/53	b		1	2	153	18.5
7/27/53	c		1&2	1	141	21.1
7/28/53	d		2&3	5	201	28.8
7/29/53	e		3	1	115	17.1
7/30/53	f		3&4	0	151	16.6
7/31/53	g		4	0	106	17.9
8/3/53	h		4&5	17	151	18.2
8/4/53	j		5	0	95	12.5
8/5/53	k		5	0	22	3.0
8/6/53	l	139	6	0	172	26.7
8/7/53	m	138	6&7	9	163	22.5
8/11/53	n	139	7	0	65	6.5
8/14/53	p		6, 7&8	1	186	26.5
8/20/53	q		6, 7	0	76	13.1
9/25/53	r		6, 7	0	54	4.8
9/28/53	s		6, 7	2	72	6.4
10/1/53	t		6, 7	4	37	2.9
10/15/53	a	(1ch. 82) 10	138	0	63	5.7
10/16/53	b	" "	10	9	162	19.5
10/19/53	c	" "	10	15	13	0.0
TOTALS				66	2231	293.5

Total Area in sq. stat. mi. 10.1 sq. stat. mi.

LIST OF SIGNALS
H-8096

TRIANGULATION STATIONS

BEACH	SALISBURY BEACH, CATHOLIC CHURCH, 1912
BURY	NEWBURYPORT AERO BEACON, 1953
CATH	PLUM ISLAND CATHOLIC CHURCH, 1928
HIGH	NEWBURYPORT HIGH SCHOOL CUPOLA, 1943
JEAN	SALISBURY BEACH, YELLOW CUPOLA, RED ROOF, 1928
MIKE	NEWBURYPORT, WATER TANK, 1943
NORTH	NEWBURYPORT NORTH CHURCH, 1886
PIER	NORTH PIER DAYBEACON, 1953
PIPE	NEWBURYPORT STANDPIPE, 1943
PLUM	MID PLUM, 1953
POLA	PLUM ISLAND COAST GUARD, CUPOLA, 1943
PORT	NEWBURYPORT LIGHTHOUSE, 1912-41
RANG	NEWBURYPORT UPPERHARBOR INNER RANGE BEACON, 1953
RING	RINGS ISLAND, 1953
ROCK	BLACK ROCK DAYBEACON (BUTLERS TOOTHPICK, 1889)
SAND	SAND, 1943
TACK	NEWBURYPORT POWER STACK, 1943.
TRAN	MERRIMACK RIVER ENTRANCE LEADING LIGHT, 1953
UNIT	NEWBURYPORT PLEASANT ST. UNITARIAN CHURCH SPIRE, 1850

TOPOGRAPHIC STATIONS

T-11150

Age	Beg	Dry	Fox	Kim	Raw	Sly	Wag	Car	End	Gal	Lag
Riv	Tal	Wes	Con	Fig	Fix	Jog	Moo	Sid	Til	Wig	

T-11151

Abe	Dol	Him	Pol	Sino	Bag	Gam	Jap	Pre	Tank	Cab	Gin
Man	Pup	Use	Dog	Hat	Par	Ram	Sal				

T-11152

Ale	Cot	Fir	Ivv	Nay	She	Zag	Bid	Cub	Fly	Joe	Not
Sil	Zig	Bon	Dan	Gab	Ray	Pot	Top	Sol	Boy	Dig	Gor
Lin	Red	Two	Cam	Egg	Hal	Met	Ric	Win			

T-11153

Bar	Mad	Nor	Nut	Pig							
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HYDROGRAPHIC STATIONS

Bob	Vol. 11, pg. 69	Mop	Vol. 5, pg. 50 & 51
Cat	Vol. 3, pg. 61 & 65	Mud	Vol. 11, pg. 69
Fiv	Vol. 12, pg. 45	One	Vol. 12, pg. 45
For	Vol. 12, pg. 45	Rag	Vol. 12, pg. 45
Gus	Vol. 5, pg. 50	Roc	Vol. 11, pg. 30 & 31
	Vol. 6, pg. 60	Sam	Vol. 11, pg. 41
Jon	Vol. 15, pg. 10	Sun	Vol. 11, pg. 69
Kid	Vol. 5, pg. 50 & 51		Vol. 12, pg. 14
Les	Vol. 12, pg. 45	Tre	Vol. 12, pg. 45
Mis	Vol. 12, pg. 14	Why	Vol. 11, pg. 31

STATION 191
 SECTION (Location)
 FOR COUNCIL FOR FISHERIES

Names	Latitude	Longitude	Depth in Ft.	Pos. No.	Date of Location
Merrimack River Lighted Buoy 4	42° 49.11'	70° 49.35'	17	107b	7/24/53
Merrimack River Buoy 3	42° 49.08'	70° 49.48'	16	108b	7/24/53
Newburyport Entrance, Bell Buoy 1	42° 48.79'	70° 47.75'	24	1c	7/27/53
Newburyport Bar Lighter Whistle Buoy N. P.	42° 48.48'	70° 46.92'	68	2c	7/27/53
Merrimack River Buoy 5	42° 49.08'	70° 49.84'	12	162m	8/7/53
Merrimack River Buoy 6	42° 49.18'	70° 50.07'	17	163m	8/7/53
Newburyport Harbor North Jetty Buoy 2	42° 49.05'	70° 48.25'	18	1p	8/14/53
Merrimack River Lighted Buoy 1B <i>26 457 p 71</i>	42° 49.20'	70° 48.72'	29	1h	8/3/53
Merrimack River Buoy 8A <i>1114 p 71</i>	42° 48.81'	70° 51.94'	11	1b	10/16/53
Merrimack River Buoy 9A	42° 48.78'	70° 51.54'	20	2b	10/16/53
Merrimack River Shoal Buoy 9	42° 48.79'	70° 51.38'	12	3b	10/16/53
Merrimack River Buoy 8	42° 48.93'	70° 50.84'	13	4b	10/16/53
Merrimack River Buoy 7	42° 49.01'	70° 50.40'	15	5b	10/16/53
Parker River Buoy 14	42° 45.49'	70° 49.65'	10	70e	5/28/54
Parker River Buoy 13	42° 45.39'	70° 49.32'	2	1k	6/18/54
Parker River Wadchannel Buoy 12	42° 45.18'	70° 48.71'	6	72e	5/28/54
Plum Island Sound Buoy 10	42° 44.67'	70° 49.18'	10	66f	5/31/54
Plum Island Sound Buoy 8	42° 44.38'	70° 48.95'	9	67f	5/31/54
Plum Island Sound Buoy 11	42° 44.95'	70° 48.83'	5	129f	5/31/54
Plum Island Sound Buoy 9	42° 44.73'	70° 49.23'	20	30j	6/10/54

Name	Latitude	Longitude	Depth in Ft.	Pos. No.	Date of Location
Channel Buoy 15 <i>Temp bk buoy</i>	42° 45.58'	70° 49.93'	5	26H	6/8/54
R & B Channel Buoy	42° 47.08'	70° 48.79'	10	47H	6/21/54
Buoy 21	42° 47.05'	70° 48.79'	- $\frac{1}{2}$	48H	6/21/54
Buoy 23	42° 46.91'	70° 48.76'	-1	49H	6/21/54
Buoy 24	42° 46.82'	70° 48.67'	1	50H	6/21/54
Buoy 25	42° 46.67'	70° 48.89'	$\frac{1}{2}$	55H	6/21/54
Buoy 28 <i>Temp. red buoy</i>	42° 46.22'	70° 48.89'	-1	62H	6/21/54
Buoy 30 <i>Temp red buoy</i>	42° 46.15'	70° 49.09'	5	63H	6/21/54
Buoy 13	42° 47.78'	70° 49.23'	1	52n	6/30/54
$\frac{1}{2}$ Buoy 14	42° 47.71'	70° 49.07'	$\frac{1}{2}$	53n	6/30/54
Buoy 15	42° 47.64'	70° 48.95'	1	54n	6/30/54
Buoy 16	42° 47.59'	70° 48.87'	1	55n	6/30/54
Buoy 18	42° 47.39'	70° 48.72'	1	56n	6/30/54
Buoy 19	42° 47.16'	70° 48.62'	$\frac{1}{2}$	57n	6/30/54
Buoy 37 <i>temporary bk buoy</i>	42° 45.21'	70° 48.72'	5	8q	7/2/54
Buoy 35 <i>temp bk buoy</i>	42° 45.59'	70° 48.95'	2	9q	7/2/54
Buoy 33 <i>Temp bk buoy</i>	42° 45.79'	70° 48.83'	-1	10q	7/2/54
Buoy 32 <i>Temp. red buoy</i>	42° 45.88'	70° 48.89'	0	11q	7/2/54
Buoy 31 <i>Temp bk buoy</i>	42° 46.06'	70° 49.11'	0	12q	7/2/54
Buoy 27 <i>Temp bk buoy</i>	42° 46.39'	70° 48.92'	0	13q	7/2/54

Name	Latitude	Longitude	Depth in Ft.	Pos. No.	Date of Location
Buoy 11	42 47.93'	70 49.41'	1	65r	7/7/54
Buoy 10	42 48.01'	70 49.48'	1	66r	7/7/54
Buoy 8	42 47.96'	70 49.71'	1	67r	7/7/54

APPROVAL SHEET

HYDROGRAPHIC SURVEY H-8096

The records and boat sheets for Hydrographic Survey
H-8096 have been inspected by me and are approved.

Clarence R. Reed

Clarence R. Reed
CDR, USC&GS
OinC, East Coast Field Party

ADDENDUM
To Accompany

HYDROGRAPHIC SURVEY H-8096 (Field No. ECFP-1253)

FATHOGRAMS

Approximately 10% of the fathograms were rescanned with a ^{*}reducing template. This scanning was mainly done in areas of irregular bottom where some peaks and deeps had been missed in the original work. All soundings scanned with a reducing template were recorded in the "office" column in red pencil.

** incorporating
corrections*

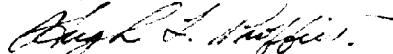
DISCREPANCIES

Lat. 42-50.08, Long. 70-54.82 The five foot handlead sounding after position 19c (brown) was not smooth plotted. This sounding appears questionable as it falls in mid-channel. *Rejection concurred in*

The following positions were not smooth plotted as they could not be reconciled with surrounding hydrography:

73 & 74f (red) vol. 4 } *Rejection concurred in*
44c (purple) vol. 12

Respectfully submitted,


Hugh L. Proffitt
Cartographer.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET (AMENDED 1954)

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

REGISTER NO. H-8096

Field No. ECFP-1253

State Massachusetts

General locality Newburyport, ~~Mass.~~

Locality Merrimack River and Outer Coast ~~adjoining.~~

Scale 1:10,000 Date of survey 7/14 - 10/19/53
5/19 - 11/2/54

Instructions dated 6 March 1953- letter dated 4/2/54. Subject: Additional Field Work in areas surveyed in 1953
(see also supplemental instructions dated 1/29/54, and

Vessel East Coast Field Party

Chief of party Clarence R. Reed

Surveyed by R. B. Noble, L.D. Kelley & C. E. Horne

Soundings taken by ~~fathometer~~, graphic recorder, hand lead, ~~xxx~~ sounding pole

Fathograms scaled by Party personnel

Fathograms checked by L. D. Kelley, R. B. Noble, & C. E. Horne

Protracted by A. K. Schugeld

Soundings penciled by A.K. Schugeld

Soundings in ~~fathoms~~ feet at MLW ~~MLLWS~~

REMARKS: This survey started in 1953 and completed in 1954.

ADDITIONAL NOTES FOR DESCRIPTIVE REPORT

To Accompany Hydrographic Sheet H-8096 (Field No. ECFP 1253)

Merrimack River and Outer Coast Adjoining

EAST COAST FIELD PARTY

CLARENCE R. REED, CHIEF OF PARTY

PROJECT CS-355

1953 & 1954

SCALE 1:10,000

* * * * *

PROJECT The additional work of this survey was accomplished under instructions dated 6 March 1953, supplemental instructions dated 29 January 1954, and a letter dated 2 April 1954 (Subject: Additional Field Work in Areas Surveyed in 1953.)

Vessels & Equipment The additional work of this survey was accomplished with launch CS-82 and a catamaran both of which were operated from moorings at Newburyport and the Parker River.

The catamaran consisted of two aluminum skiffs (one 16' the other 14') held rigidly parallel to one another approximately $1\frac{1}{2}$ ' apart by bolts to two 2" X 6" planks and a 2" X 4" which were laid across the skiffs.

Echo soundings in launch CS-82 were obtained with graphic recorders No. 119S and No. 77 with the transducers mounted inboard. Graphic recorder No. 119S was also used in the catamaran. For the catamaran, the transducers were mounted in a fish which was secured between the skiffs.

TIDES AND CURRENTS The tide note is attached to this report. No additional current stations were occupied.

CONTROL STATIONS The 1953 control was recovered and used to complete the survey. Where additional hydrographic stations were necessary, their positions were determined by sextant fixes and cuts from sextant fixes.

COMPARISON WITH CHARTS NOS. 331 & 1206 Item 3, of the preliminary review was noted and a copy of Mr. Bailey's survey of the Plum Island River was obtained and used for reference.

Item 9 of the preliminary review - The 4' rock in 12' depths shown at Lat. $42^{\circ} 48.68'$ Long. $70^{\circ} 51.52'$ was searched for several times at low water and no trace of it was found. There were no swirls or boils in that area when the current was running that would indicate a rock. *Review, par. 6A.*

Item 10 of the preliminary review - The $4\frac{1}{2}'$ sounding at Lat. $42^{\circ} 49.60'$ Long. $70^{\circ} 53.42'$ was investigated and a reduced sounding of 4.4' was found. The 8' sounding at Lat. $42^{\circ} 49.43'$ Long. $70^{\circ} 53.07'$ was investigated and a reduced sounding of 6.0' was found. (6 charted)

Item 13 of the preliminary review - Sounding lines in both 1953 & 1954 revealed 5' depths extending out from the coal wharf at Lat. $42^{\circ} 48.78'$ Long. $70^{\circ} 52.10'$ which should replace the 6' charted sounding. (4 charted)

The bridge shown as under construction at Lat. $42^{\circ} 50.1'$ Long. $70^{\circ} 54.7'$ has now been completed and should be charted as such. Information regarding the position and direction of this bridge is recorded in Vol. 12 pg. 14* pos. 42c, and Vol. 15 pg. 53* pos. 10n of the sounding volumes. It is a four lane divided highway bridge, 35m wide.

An uncharted rock ledge, part of which bares ^{3.0}~~2.6~~' at MLW was *charted* found at Lat. 42° 49.93' Long. 70° 53.68' and it should be charted.

A detached position investigation of swirls in the current at Lat. 42° 49.71' Long. 70° 53. 50' revealed a 5.6' uncharted sounding ✓ on rock.

Two uncharted rocks were found at Lat. 42° 49.20' Long. 70° 52.52'. ✓ These rocks bare 3.4' at MLW. (*charted*)

AIDS TO NAVIGATION Floating aids to navigation were located and are noted in the sounding volumes.

Respectfully submitted,

Charles E Horne

Charles E. Horne CR
ENS., USC&GS

Approved and forwarded - with added notes below.

Clarence R. Reed

Clarence R. Reed
CDR, USC&GS
Chief of Party

Additional Notes - A double rock bare 4 feet at mean low water was located at Latitude 42° 46.14', Longitude 70° 49.12'. The two peaks of this rock ledge are ten meters apart, as noted on page 67 of Volume 6 (1954). Hydrographic Survey H-3357 and Chart 1206 show 2 rocks one hundred meters apart at this point. Mr. D.C. Bailey's survey verifies the fact that the northeasterly of the two charted rocks does not exist. Mr. Bailey terms the existing rock "Tonys Ledges". A copy of his survey in two sheets is forwarded with the boat sheet. *Review, par. 5(4)*
filed as Bp. 52639

The 3½ foot sounding above the bridge at Newburyport (Item 10 of Chart Division Preliminary Review) was searched ✓ for intensively with a closely spaced system of lines run on ranges. No evidence of the shoal sounding was obtained and

*3½' removed from
cht 331 - direction
H.R.E
8/24/55
H72*

it is believed to be non-existent. The source should be re-examined carefully to be sure that the left side of a figure $8\frac{1}{2}$ has not been smudged or faded to appear as $3\frac{1}{2}$. It is recommended that the $3\frac{1}{2}$ foot sounding be removed from the chart. ✓ *3 1/2 removed from Cht. per Chief of Branch*

The rock awash discussed under Item 9 of Chart Division Preliminary Review is non-existent. A search on "s" day, Launch 82, Volume 16(1954) pages 48-56 and on "a" day with a catamaran, Volume 16(1954), page 57 showed no evidence of the rock. Some false soundings which would reduce to plus 0.6 foot were obtained on "s" day. However, no evidence of any rock could be found on "a" day when the area was searched intensively at low water. The Chief of Party accompanied the hydrographer in the catamaran on this last day and, altho the tide was 0.6 foot, the swift current at the time would have shown a ripple or swirl over a rock even tho it had been well below the surface. The surface of the water was perfectly smooth. It is recommended that this rock awash be removed from the chart. $\phi 42^{\circ}48.68'$ $\lambda 70^{\circ}51.52'$ ✓

*Concur; See
Review, par. 6 A.*

Additional Notes approved

Clarence R. Reed

Clarence R. Reed
Chief of Party

SUPPLEMENTAL TIDE NOTE

To Accompany Hydrographic Sheet H-8096(Field No. ECFP 1253)

Portable automatic tide gages were maintained at Newburyport, Plum Island River Bridge, and the Old Town Country Club on the Parker River. Planes of reference were furnished by the Washington Office or computed from elevations of previous bench marks.

<u>STATION</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>	<u>MLW ON STAFF</u>
Newburyport	42° 48.86	70° 52.42	+2.2
Plum Island River Bridge	42° 47.84'	70° 49.32'	+2.7
Parker River	42° 45.7'	70° 50.5	+1.8

SUPPLEMENTAL FATHOMETER CORRECTIONS

PROJECT CS-355

Hydrographic Survey Sheet H-8096 (Field No. ECFP 1253)

The corrections listed below are based on an initial set at zero on the fathogram. Where the initial varies from zero on the fathogram, index corrections must be entered in the sounding volumes.

FATHOMETER NO. 119S

19 May - 8 June 1954
Launch CS-82

Correction	A RANGE	Depth	
		From	To
+0.4		0.0	5.8
+0.2		5.9	7.8
0.0		7.9	18.0
+0.2		18.1	31.4
+0.4		31.5	43.6
+0.6		43.7	Limit of A Range

FATHOMETER NO. 119S

10 June - 2 July 1954
Launch CS-82

Correction	Depth	
	From	To
0.0	0.0	30.0
-0.2	30.2	37.0
-0.4	37.2	43.0
-0.6	43.2	49.0
-0.8	49.2	Limit of A Range

FATHOMETER NO. 77

7 July - 8 July 1954
Launch CS-82

Correction	Depth	
	From	To
0.0	0.0	5.0
+0.2	5.2	18.0
0.0	18.2	27.0
-0.2	27.2	36.0
-0.4	36.2	45.0
-0.6	45.2	Limit of A Range

FATHOMETER CORRECTIONS CONTINUED

FATHOMETER NO. 119S

23 July - 26 July 1954

Catamaran

Correction

Depth

+ 0.8

0.0 to limit of A Range

SUPPLEMENTAL STATISTICS

To Accompany Hydrographic Sheet H-8096 (Field No. ECFP 1253)

DATE 1954	DAY LTR.	VOL. NO.	LEAD LINES	NO. OF POS.	STAT. MI. OF SDG. LINE
LAUNCH CS-82					
May 19	a	82 119 1 11	3	105	11.1
" 20	b	1 11	0	129	13.7
" 25	c	2 12	3	77	6.8
" 26	d	2 12	1	60	6.4
" 28	e	2 12	1	103	8.8
" 31	f	3 13	0	132	15.3
June 3	g	3 13-14	0	127	15.6
" 8	h	4 14	0	26	3.1
" 10	j	4 14	1	30	3.1
" 18	k	82 119 4 14	0	117	13.1
" 21	l	4 15	7	63	4.3
" 29	m	5 15	0	4	—
" 30	n	5 15	14	57	3.4
July 1	p	5 15	5	5	—
" 2	q	6 16	6	45	2.9
" 7	r	82 77 6 16	4	115	11.7
" 8	s	6 16	0	33	3.0

DATAMARAN

July 23	a	e 119 6 16	0	20	0.8
" 26	b	6 16	0	30	1.9

TOTALS 45 1278 125.0

Total area in sq. stat. mi. 4.5

SKIEF

Oct 28	c	17	23
Nov 2	d	18	27

total 1328

APPROVAL SHEET FOR 1954 ADDITIONAL
WORK ON HYDROGRAPHIC SURVEY H-8096 (ECFP-1253)

The 1954 records and boat sheets for Hydrographic
Survey H-8096 (ECFP-1253) have also been inspected by
me and are approved.

Clarence R. Reed

Clarence R. Reed
CDR, USC&GS
CinC, East Coast Field Party

GEOGRAPHIC NAMES

Survey No. H - 8096

Name on Survey	Source									
	A	B	C	D	E	F	G	H	K	
	On Chart No.	On previous survey No.	On U. S. quadrangle Maps	From local information	On local Maps	P. O. Guide or Map	Rand McNally Atlas	U. S. Light List		
Massachusetts			(for title)						BGN	1
Merrimack River ✓									"	2
Black Rock Creek ✓										3
The Basin ✓										4
Newburyport ✓										5
Salisbury Point ✓										6
Flum Island River ✓										7
Flum Island										8
Parker River										9
Flum Island Sound										10
Mud Creek										11
										12
										13
										14
										15
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										24
										25
										26
										27

Names approved 9-8-55.
L. H. Clark, Jr.

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8096

Records accompanying survey:

Boat sheets ...; sounding vols. ...; wire drag vols.;
bomb vols.; graphic recorder rolls ... Env.,
special reports, etc. ... Smooth Sheet, & Descriptive Report.....
.....

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet		3559
Number of positions checked		150
Number of positions revised		5
Number of soundings revised (refers to depth only)		25
Number of soundings erroneously spaced		
Number of signals erroneously plotted or transferred		
Topographic details	Time	25
Junctions	Time	40
Verification of soundings from graphic record	Time	20

Verification by *J. I. Sullivan* Total time 320 hrs. Date Feb. 29, 1956

Reviewed by *J. A. Winsmore* Time 56 Date 12 Mar. 1956

R.H.C.
by JAS

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~DIVISION OF HYDROGRAPHY AND TOPOGRAPHY~~

12 September 1955

Division of Charts: R. H. Carstens

Plane of reference approved in
18 volumes of sounding records for

HYDROGRAPHIC SHEET 8096

Locality Mass. (Merrimack River to Plum Island River)

Chief of Party: C. R. Reed in 1953 - 1954

Plane of reference is mean low water, reading

- 2.2 ft. on tide staff at Newburyport, Mass.
- 14.0 ft. below B. M. 1 (1953)
- 3.2 ft. on tide staff at Plum Island (North End)
- 14.4 ft. below B. M. 1 (1953)
- 1.8 ft. on tide staff at Newbury Old Town
- 10.2 ft. below B. M. 1 (1954)
- 2.7 ft. on tide staff at Plum Island Highway Bridge
- 9.4 ft. below B. M. 2 (1954)

Height of mean high water above plane of reference is as follows:

- Newburyport: 7.8 ft.
- Plum Island (N. end): 8.3 ft.
- Newbury Old Town: 8.8 ft.
- Plum Island Hwy. Bridge: 8.0 ft.

Condition of records satisfactory except as noted below:

NOTE: Tide reducers for the positions listed below have been revised in red and verified:

Volume	Positions
5	1 - 22k
6	1 - 20 1
	29 - 33 1
	142 - 172 1
15	1 - 4m



Branch

Acting Chief, ~~Division of~~ Tides and Currents.

DIVISION OF CHARTS
REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-8096

FIELD NO. ECFP-1253

Massachusetts, Newburyport, Merrimack River and Outer Coast

Project No. CS-355

Surveyed - July-October 1953 and
May-November 1954

Scale 1:10,000

Soundings:

Control:

808 Fathometer
Hand lead
Pole

Sextant fixes on
shore signals

Chief of Party - C. R. Reed
Surveyed by - R. B. Noble, L. D. Kelley and C. E. Horne
Protracted by - A. K. Schugeld
Soundings plotted by - A. K. Schugeld
Verified and inked by - J. T. Gallahan
Reviewed by - T. A. Dinsmore 22 March 1956
Inspected by - R. H. Carstens

1. Shoreline and Signals

The shoreline and signals originate with reviewed air-photographic surveys T-11150, T-11151, T-11152 and T-11153 of 1952-54. The fixes for the supplementary hydrographic signals are recorded in the sounding volumes of the present survey.

2. Sounding Line Crossings

Depths at crossings are in very good agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately delineated. The low-water curve was determined where practicable.

Numerous rocks and sharp bottom irregularities occur within the Merrimack River and entrance area. Of particular note are the 6- and 8-ft. rocky shoals which rise abruptly from greater surrounding depths in lat. $42^{\circ}49.42'$, long. $70^{\circ}53.05'$, and lat. $42^{\circ}49.15'$, long. $70^{\circ}49.80'$, respectively. Along the outer coast, the bottom is fairly smooth except for minor irregularities and the prominent 14- and 16-ft. shoals in lat. $42^{\circ}50.87'$, long. $70^{\circ}48.45'$, and lat. $42^{\circ}50.73'$, long. $70^{\circ}48.40'$.

4. Junctions with Contemporary Surveys

Adequate junctions were effected with H-7140 (1947) on the east and H-8095 (1953-54) on the south. Because of minor differences of 1-3 ft. (see par. 7c) between the depths on the present survey and H-7140 on the east, a butt junction was made with that survey. Overlapping hydrography on H-7140 is superseded by present-survey depths.

The junction with H-8097 (1953-54) on the north will be considered in the review of that survey.

5. Comparison with Prior Surveys

H-292 (1851), 1:10,000	H-1395 (1878), 1:5,000
H-594 (1857), 1:20,000	H-3356 (1911-12), 1:10,000
H-627 (1857-85), 1:20,000	H-3357 (1911-12), 1:10,000
<u>H-1069 (1870), 1:10,000</u>	<u>H-4897 (1928), 1:10,000</u>

These prior surveys taken together cover the area of the present survey. A comparison of the prior and present surveys reveals appreciable changes in the bottom. The most conspicuous changes have occurred in the Merrimack River, entrance area and along the inshore portion of the outer coastal area south of the entrance. In the latter area, shoals have apparently shifted freely. The shoal uncovering 2 ft. at M.L.W. in lat. $42^{\circ}48.57'$, long. $70^{\circ}48.37'$, on the present survey falls in depths of 14-16 ft. on H-4897 (1928). Conversely, a long shoal immediately eastward in 1928 has since partially eroded. Prior depths of 4-6 ft. in lat. $42^{\circ}48.65'$, long. $70^{\circ}48.10'$ are supplanted by present depths of 12-15 ft. Prior depths of 9-12 ft. in lat. $42^{\circ}48.30'$, long. $70^{\circ}48.30'$, are now superseded by a shoal ridge uncovering at M.L.W. and farther southward in lat. $42^{\circ}47.93'$, long. $70^{\circ}48.32'$, the southern tip of a prior 3-to 6-ft. shoal has since eroded to depths of 12-18 ft.

Considerable shoaling has occurred immediately outside of the entrance. The 5 to 6-ft. shoals surrounding the entrance on the present survey are not apparent on the prior surveys. H-4897 (1928) which is well developed in the subject area shows least depths of 7-8 ft.

Major shoaling within the Merrimack River is exemplified in lat. $42^{\circ}49.08'$, long. $70^{\circ}49.32'$, where prior depths of 35 ft. are now superseded by maximum depths of 20 ft. In this locality the axis of the natural channel has shifted southward as much as 200 meters. Other major changes in the river bottom which include the shifting of shoals and channel are too numerous to describe.

Periodic dredging in the Merrimack River and entrance together with the dumping of spoil along the outer coast are considered to be partially responsible for the bottom changes noted. Changes in the river entrance are also attributed to shifting sands caused by river and ocean currents.

Specific mention is made of the following discrepancies:

(1) The 16-ft sounding charted in lat. $42^{\circ}50.68'$, long. $70^{\circ}48.55'$, from H-292 (1851) should be disregarded. Falling in depths of about 24 ft. on the present survey, the prior sounding is probably 1 fm. in error or out of position. The 16-ft. shoal 220 meters northeastward on the present survey is adequate for charting. The present development is adequate to disprove the prior sounding in its charted position.

(2) The 11-ft sounding charted in lat. $42^{\circ}49.13'$, long. $70^{\circ}49.49'$, from H-4897 (1928) should be disregarded. Falling in depths of 16 ft. on the present survey the position of the prior sounding is questioned in the records of H-4897. A comparison of prior and present depths reveals radical bottom changes in the locality. A 9-ft. sounding 70 meters eastward on the present survey adequately reveals shoaling in the locality.

(3) The rock awash charted at the end of the north jetty in lat. $42^{\circ}49.13'$, long. $70^{\circ}48.23'$, originates with H-4897 (1928). The hydrographer states that the rock was not found on the present survey and presumes it to be actually the end of the rock jetty.

(4) The two rocks awash charted in the vicinity of lat. $42^{\circ}46.14'$, long. $70^{\circ}49.12'$ on Chart 1206, originate with H-3357 (1911-12). The southwesterly rock was verified by the present survey which described it as having two peaks ten meters apart. The hydrographer states that the northeasterly rock does not exist and cites Mr. D. C. Bailey's survey of Plum Island River in 1950 (Bp. 52639) as further verification of this fact. The northeasterly rock should be disregarded as it falls in an area now uncovering 2 ft. at M.L.W.

The present survey is adequate to supersede the prior surveys within the common area.

6. Comparison with Chart 331 (latest print date 9/19/55)
Chart 1206 (latest print date 8/1/55)

A. Hydrography

Charted hydrography originates principally with the previously discussed surveys, supplemented by numerous surveys by the Corps of Engineers and partial application of the

present survey prior to verification and review. Numerous revisions have been made to the smooth-sheet depths on the present survey during verification. Of particular note are the 12- and 34-ft. soundings charted in lat. $42^{\circ}50.87'$, long. $70^{\circ}48.45'$, and lat. $42^{\circ}48.74'$, long. $70^{\circ}47.32'$, respectively, which have been subsequently revised to 14 and 36 ft. during verification of the present survey.

The following discrepancies are noted:

- (1) The 12-ft. sounding charted in lat. $42^{\circ}49.47'$, long. $70^{\circ}48.46'$, from a beach erosion survey of 1931 by the Massachusetts Department of Public Works (Bp. 25951) should be disregarded. Falling in present depths of 16-17 ft., indications point to a shifting of sand bars in this locality. The present survey shows 9-ft. depths on a sand ridge about 75 meters eastward which is adequate for charting.
- (2) The 30-ft. sounding charted in lat. $42^{\circ}48.7'$, long. $70^{\circ}47.54'$, from Corps of Engineers survey in 1940 (Bp. 35076) falls in smooth-bottom depths of 36 ft. on the present survey. Development on the present survey which included split lines and drift sounding failed to reveal any detached shoal indications. The 30-ft. sounding is considered to be 1 fm. in error and should be disregarded.
- (3) The rock awash charted in lat. $42^{\circ}48.68'$, long. $70^{\circ}51.52'$, was applied to the chart between 1897 and 1908 from an unidentified source. The locality was searched intensively on several occasions at low water on the present survey with no indications of a rock found. The Chief of Party who accompanied the hydrographer during the final search states that the swift current at the time would have shown a ripple or swirl over a rock even though well below the surface. The surface of the water was perfectly smooth. The Chief of Party believes the rock to be nonexistent and recommends its removal from the chart. Other rocks immediately northward adequately reveal the dangers in the locality.
- (4) Lunt Rock in lat. $42^{\circ}49.22'$, long. $70^{\circ}50.16'$, is erroneously charted as a high-water feature. Both the prior and present surveys show it as a low-water feature. To the eastward, the high-water rocks charted as Black Rks. have lost their identity because of land accretion; however, there are rocks awash in the vicinity of Black Rocks Daybeacon.

(5) The rock awash charted in lat. $42^{\circ}45.52'$, long. $70^{\circ}49.77'$, on Chart 1206 originates with Mr. D. C. Bailey's survey of 1950 (Bp. 52639). Neither the prior nor present hydrographic or topographic surveys by this Bureau show any indication of a rock in the above locality. However, in view of the high stage of tide (5-7 ft.) during which the locality was sounded on the present survey, it is deemed advisable to retain the charted rock.

Except for information charted from sources subsequent to the present survey and as noted in the preceding paragraph, the present survey supersedes the charted information.

B. Aids to Navigation

Inasmuch as most of the floating aids to navigation located on the present survey have been subsequently changed in character or position, a detailed comparison with the latest chart would serve no useful purpose.

The fixed aids to navigation located on the present survey are in substantial agreement with the charted aids and adequately serve the purpose intended.

7 Condition of Survey

(a) The sounding records are complete; the Descriptive Report covers all matters of importance.

(b) The smooth plotting was accurately done. Approximately ten percent of the fathograms were rescanned in the Processing Office. The additional scanning was largely confined to areas of irregular bottom where the field scanning had failed to record peaks and deeps occurring at uneven time intervals.

(c) As noted in paragraph 4, minor differences of 1-3 ft. were found in some localities where the hydrography on the present survey overlapped that on H-7140 (1947) on the east. An examination of the records of both surveys produced no conclusive solution to the cause of the discrepancies. The discrepancies are probably due to one or a combination of several causes such as instrumental errors, bottom changes or minor irregularities in the bottom. Occurring in depths of 50-80 ft., the discrepancies are considered of little importance. They have been largely eliminated by effecting a butt junction between the two surveys whereby the larger-scale present survey supersedes the overlapping portions of the earlier offshore survey.

8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions.

9. Additional Field Work

This is a basic survey and no additional field work is required. ✓

Examined and Approved:

Wallace A. Bruder

W. A. Bruder
Asst. Chief, Nautical Chart Branch

E. R. McCarthy

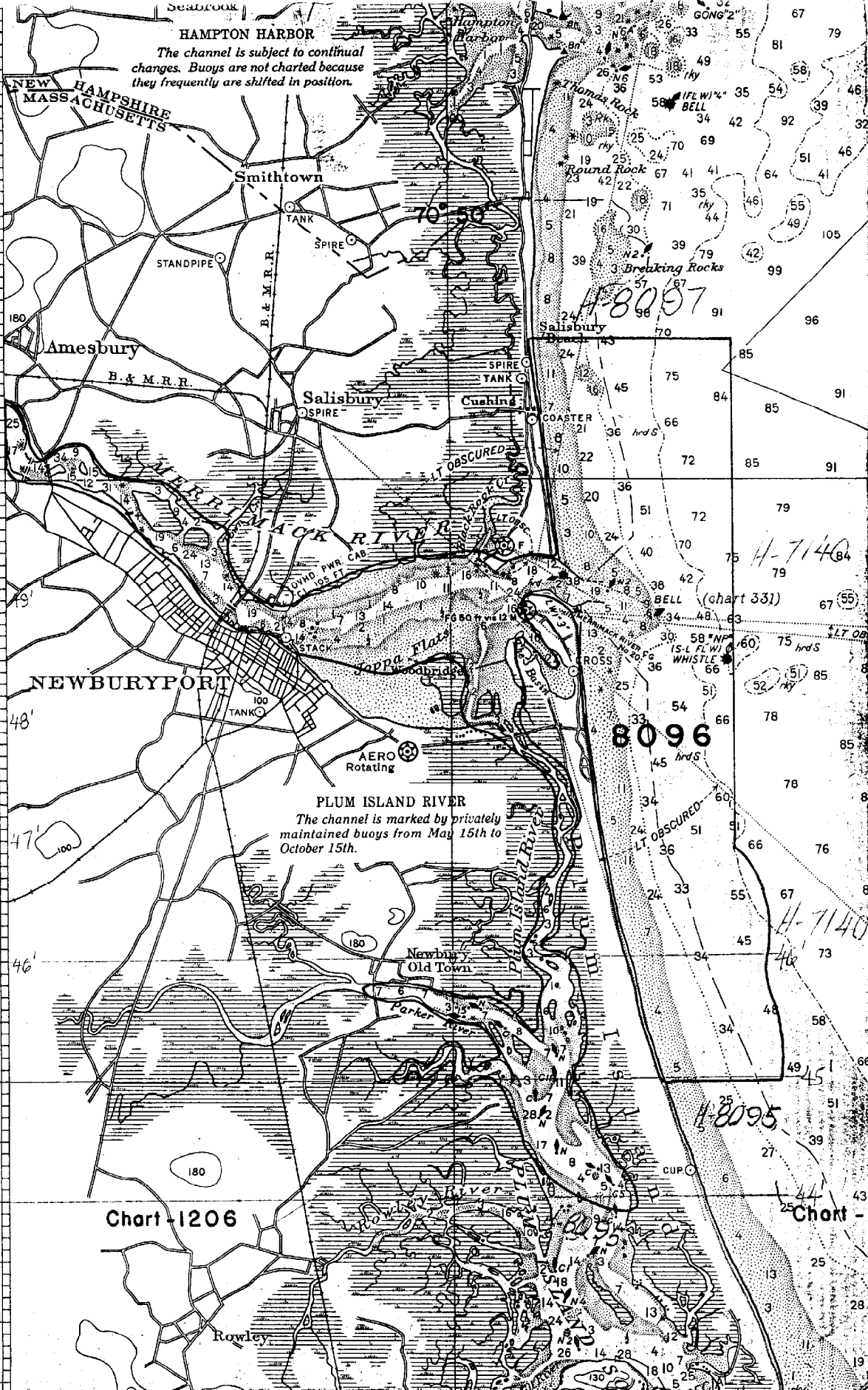
E. R. McCarthy
Chief, Chart Division

J. C. Bull

J. C. Bull
Chief, Hydrography Branch

Earl O. Heaton

Earl O. Heaton
Chief, Division of Coastal Surveys



42° 50'

Chart - 1206

Chart -

