

8760

Diag. Cht. No. 1209-3.

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE  
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION  
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. WH-10-1-63 Office No. H-8760

LOCALITY

State Massachusetts

General locality Coast of Massachusetts

Locality South Shore of Nantucket I.

1963

CHIEF OF PARTY

H. R. Lippold, Jr.

LIBRARY & ARCHIVES

DATE September 4, 1964

0928

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-8760

Field No. WH 10-1-63

State MASSACHUSETTS

General locality COAST OF MASSACHUSETTS

Locality SOUTH SHORE OF NANTUCKET ISLAND

Scale 1:10,000 Date of survey 8/11/63 to 10/4/63

Instructions dated 11 Mar. & 19 June 1963

Vessel SHIP WHITING

Chief of party H.R. LIPPOLD, JR.

Surveyed by F.J. TUCKER, JR., J. COLLINS, J.W. BRICKER, F.P. KAPINOS & D.G. HICKERSON

Soundings taken by ~~fathometer~~ graphic recorder, hand lead, etc

Fathograms scaled by FIELD PARTY

Fathograms checked by FIELD PARTY & NORFOLK PROCESSING UNIT

Protracted by HARRY R. SMITH

Soundings penciled by HARRY R. SMITH

Soundings in ~~fathoms~~ feet at MLW ~~MKKW~~ are true depths.

REMARKS:

DESCRIPTIVE REPORT TO ACCOMPANY  
HYDROGRAPHIC SURVEY H-8760  
FIELD No. WH-10-1-63

Nantucket Sound, Massachusetts

Scale 1:10,000  
Ship WHITING

H. R. Lippold, Jr., Comdg 1963

Surveyed by:

LCDR H.R. Lippold, Jr.  
LCDR F.J. Tucker, Jr.  
LT J. Collins  
LTJG J.W. Bricker  
LTJG F.P. Kapinos  
ENS D.G. Hickerson

A. PROJECT

Authority for this survey is contained in revised instructions for Project OPR-369, dated 11 March 1963, and amended 19 June 1963. ✓

B. AREA SURVEYED

The area this sheet covers is from the south coast of Nantucket Island to roughly three miles south of the island between longitudes 70° 04' and 70° 13'. Hydrography started on the eleventh of August and was completed on the fourth of October. The junctioning surveys are H-8450 (1:20,000--1958) on the east and H-6446 (1:40,000--1939) to the south. ✓

The following are the prior surveys of the area: ✓

<u>Registry No.</u>	<u>Scale</u>	<u>Date Conducted</u>
H-445	1:40,000	1854
H-2040	1:10,000	1890
H-2052	1:20,000	1890
H-2093	1:10,000	1891
H-2094	1:10,000	1891
H-1942	1:20,000	1889

### C. SOUNDING VESSEL

The sounding vessels used were the Ship WHITING, using purple capital day-letters, Launch No. 1, using blue lower-case day-letters, and Launch No. 2, using red lower-case day-letters. ✓

### D. SOUNDING EQUIPMENT

All depths were determined with the Raytheon DE-723 fathometer. The serial number for each unit is as follows: WHITING--213, Launch No. 1--250, and Launch No. 2--251. Both launches sounded in water from six to forty feet deep, and the ship in water from thirty to eighty feet deep. Corrections to launch soundings were derived from bar checks, which were averaged for the entire season. Corrections to ship soundings were derived from a combination of leadline comparisons and of serial temperatures and salinities. It will be noted that for shallow depths launch soundings are roughly two feet deeper than corrected soundings. This is due to the fact that the initial was set too deep. ✓

### E. SMOOTH SHEET

The smooth sheet was constructed by ruling machine in the Washington Office and will be turned over to the Norfolk Processing Office for smooth plotting. ✓

### F. CONTROL

All hydrography was controlled by three-point fixes. Ninety percent of the ship hydrography was controlled by one fix, which consisted of two triangulation stations and one photogrammetrically-located signal. Most of the launch work was controlled by signals that had been located photogrammetrically, with the exception of signals RAG and SAM, which were located by sextant cuts. The location of photo-hydro signals was determined from radial plotting on manuscripts T-11220, T-11222 and T-11223 and then transferring the locations to the boat sheets. A photogrammetrist from Party 6420 was assigned to the project by Washington. ✓

### G. SHORELINE

The shoreline was transferred from blue-line manuscripts T-11220, T-11222, and T-11223, and has not been field- ✓

verified. The low-water line was not defined because of a small tidal range and the presence of large breakers near the water line. *Part of structure compiled from P.S. 820 (1966).*

#### H. CROSSLINES

Crosslines were run to the extent of seven per cent, with generally one-foot discrepancy or less. It was noted that in areas of jagged bottom there were some instances of larger disagreement. In addition, there was an ever-present 3- to 5-foot swell, making fathogram interpretation difficult.

#### I. JUNCTIONS

The junctions made with H-8450<sup>(1950)</sup> and H-6446<sup>(1939)</sup> agreed within one foot, with the exception that in the southeast corner of the sheet there were larger disagreements which could not be explained. *Butt junction made with H-6446*

#### J. COMPARISON WITH PRIOR SURVEYS

There were no pre-survey review items on this sheet. Detailed comparison was made with prior surveys H-2093 and H-2094 (1:10,000--1891). There was no agreement between the two surveys, due in part to the fact that the projections did not match. By adjusting the projections as best possible, it appears that there has been a recession of the coastline, making the new soundings much deeper in general than those on the prior survey; in some cases there is a ten-foot difference.

The conclusion reached is that this survey should be accepted and the prior survey ignored, since the area has obviously eroded a great deal.

#### K. COMPARISON WITH THE CHART

Comparison with charted soundings is the same as with prior surveys.

#### L. ADEQUACY OF SURVEY

This survey is complete and adequate, and should supersede all prior surveys.

#### M. AIDS TO NAVIGATION

There are no fixed or floating aids to navigation within the limits of this survey.

N. STATISTICS

	<u>Number of Positions</u>	<u>Nautical Miles of Sounding Line</u>	
Ship	1019	195.6	
Launch No. 1	1238	159.8	
Launch No. 2	713	90.8	
	<u>2970</u>	<u>446.2</u>	
Square nautical miles covered by hydrography . .			17.5
Number of bottom samples . . . . .			78

Respectfully submitted,



James Collins  
LT, C&GS

## TIDE NOTE

*Not in survey area*  
The tide gage used to reduce the soundings on this survey was located at Katama Bay, Chappaquiddick Island, Lat.  $41^{\circ} 21' 16''$  N., Long.  $70^{\circ} 28' 12''$  W. Mean low water above the staff zero was 2.3 feet for all hydro days except the ship's "F" day, 4 October 1963, which was 2.1 feet above staff zero.

The tide gage was inoperative 9 September, hydro day "E" for the ship and "k" day for Launch No. 1. Inferred tides were requested from Washington to reduce the soundings for this day.

Time meridian  $60^{\circ}$  West was used at the tide station and for all records. A minus two-hour time correction on a 1.5 ratio is applied to tides on the Katama Bay gage.

## LIST OF SIGNALS

Name Used in Hydrographic Survey	Origin of Station
ABE . . . . .	T-11223
BAG . . . . .	T-11223
CAT . . . . .	T-11223
CUP-DOG . . . . .	T-11222 <i>T-11222</i>
DOME . . . . .	T-11223
EGO . . . . .	T-11222
FIG . . . . .	T-11222
GAS . . . . .	T-11222
HAT . . . . .	T-11222
IDA . . . . .	T-11222
JAY . . . . .	T-11222
KEY . . . . .	T-11222
LEO . . . . .	T-11222
MAG . . . . .	T-11220
NEW . . . . .	T-11220
PAL . . . . .	T-11220
QUO . . . . .	Nantucket Id, East Consolan Tower, 1956
RAG . . . . .	Vol. 8, Page 37
SAL . . . . .	T-11220
SAM . . . . .	Vol. 9, Page 59
TOW . . . . .	Nantucket Id, West Consolan Tower, 1956
USE . . . . .	T-11220
VAL . . . . .	T-11220

ABSTRACT OF VELOCITY CORRECTIONS  
 OPR-369 H-8760 (WH-10-1-63)

Depth    Corr'n  
up to

Ship WHITING

20.0	ft.	+0.4	ft.
27.5		+0.6	
36.0		+0.8	
43.5		+0.0	
52.0		+1.2	
59.5		+1.4	
67.5		+1.6	
75.1		+1.8	
83.0		+2.0	

Launch 2

10.6	ft.	-2.2
12.6		-2.0
15.8		-1.8
21.8		-1.6
28.4		-1.4
33.8		-1.2
38.4		-1.0
42.8		-0.8
50.0		-0.6
59.5		-0.4
67.5		-0.2
80.2		0.0

Depth    Corr'n  
up to

Launch 1

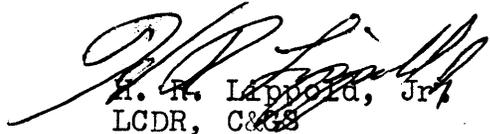
7.8	ft.	-2.2	ft.
8.8		-2.0	
10.6		-1.8	
12.6		-1.6	
15.6		-1.4	
18.8		-1.2	
23.2		-1.0	
28.2		-0.8	
34.0		-0.6	
40.2		-0.4	
50.4		-0.2	
59.0		0.0	
66.5		+0.2	
74.0		+0.4	

SETTLEMENT & SQUAT CORRECTION  
 LAUNCH 1 & LAUNCH 2

<u>Speed (RPM)</u>	<u>Corr'n (FT.)</u>
0000-1000	0.0
1000-2400	+0.2
2400-----	0.0

APPROVAL SHEET

The boat sheet and records for the area surveyed are complete and approved; the boat sheet and sounding volumes were examined daily during the survey. The area surveyed is complete and adequate for charting.



H. R. Lippold, Jr.  
LCDR, C&GS  
Commanding Ship WHITING

NORFOLK RECORDS PROCESSING UNIT  
ADDENDUM  
To Accompany

HYDROGRAPHIC SURVEY H-8760 (WH 10-1-63)

GENERAL

This appears to be an excellent basic survey except for the lack of development lines over shoal areas to delineate least depths. Soundings are in reasonably good agreement at crossings considering the fact that most of the work was done in wave action, sometimes amounting to from 5 to 8 feet, in an area of irregular bottom interspersed with sandwaves. Because of this wave action a considerable amount of time and effort was spent scanning and rescanning the fathograms in an effort to bring soundings at crossings into agreement, to distinguish sandwaves from wave action, and to arrive at realistic least depths in shoal areas. However, it is recommended that a review be made of the scanning on critical soundings before any preliminary charting is done.

CONTROL

Photo-hydro stations were transferred to the smooth sheet from Cronaflex prints of T-11220, T-11222 & T-11223. These prints were forwarded, upon request, to Ship Whiting on June 5, 1964.

Respectfully submitted,

  
Hugh L. Proffitt  
Cartographer

Norfolk, Va.  
Sept. 1, 1964



GEOGRAPHIC NAMES  
Survey No. H-8760

Name on Survey	A On Chart No.	B On previous survey No.	C On U. S. quadrangle Maps	D From local information	E On local Maps	F P. O. Guide or Map	G Rand McNally Atlas	H U. S. Light List	K	
Atlantic Ocean										1
Nantucket I.										2
Sunside										3
Miacomet Rip										4
Approved										5
10-8-64										6
<i>A. J. Wright</i>										7
										8
										9
										10
										11
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										27

HYDROGRAPHIC SURVEY STATISTICS  
HYDROGRAPHIC SURVEY NO. 8760

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	BOAT SHEETS (3 parts) <i>Destroyed</i>		1	
DESCRIPTIVE REPORT		1	OVERLAYS			
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES	15					
CAHIERS						
VOLUMES	14					
BOXES						
T-SHEET PRINTS (List)						
SPECIAL REPORTS (List)						

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				2970
POSITIONS CHECKED				200
POSITIONS REVISED		0		
DEPTH SOUNDINGS REVISED		102		
DEPTH SOUNDINGS ERRONEOUSLY SPACED		8		
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		0		
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		24		
JUNCTIONS		64		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		20		
SPECIAL ADJUSTMENTS		?		
ALL OTHER WORK		240		
<b>TOTALS</b>		<b>373</b>	<b>120</b>	
PRE-VERIFICATION BY	BEGINNING DATE		ENDING DATE	
VERIFICATION BY	BEGINNING DATE		ENDING DATE	
REVIEW BY	BEGINNING DATE		ENDING DATE	
	July 16 68		Oct 9 68	
			Jan 7, 1969	

OFFICE OF HYDROGRAPHY AND OCEANOGRAPHY

MARINE CHART DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8760

FIELD NO. WH-10-1-63

Massachusetts--Coast of Massachusetts--South Shore of  
Nantucket Island

SURVEYED: August 11, 1963, through October 4, 1963

SCALE: 1:10,000

PROJECT NO.: OPR-369

SOUNDINGS: DE-723 Fathometer

CONTROL: Sextant angles  
on shore signals

Chief of Party.....	H. R. Lippold, Jr.
Surveyed by.....	H. R. Lippold, Jr.
.....	F. J. Tucker, Jr.
.....	J. Collins
.....	J. W. Bricker
.....	F. P. Kapinos
.....	D. G. Hickerson
Protracted by.....	H. R. Smith (AMC)
Soundings Plotted by.....	H. R. Smith
Verified and Inked by.....	J. H. Cosgrove
Reviewed by.....	G. K. Myers
.....	Date: January 7, 1969
Inspected by.....	R. H. Carstens

1. Description of the Area

This is an inshore survey off the southern coast of Nantucket Island, extending approximately to lat. 41° 11'N., between longitudes 70°04'W. and 70°13'W. The area surveyed is generally irregular being characterized by finger shoals and sand ridges extending in a westerly direction. The major feature is Miacomet Rip which has least depths of 8-11 feet, and extends offshore about one and one-half miles.

In isolated instances, steep sand ridges occur in deep depths, as for example in lat. 41°11.8, long. 70°04.9 where 67-ft. soundings appear among 80-ft. depths. In the vicinity of lat. 41°13', long. 70°10', 35 to 34 ft. spots rise among bottom depths of 45-50 feet.

The coastline along the island is relatively flat with breakers observed in 10-foot depths immediately off-shore. The bottom is covered with fine sand.

## 2. Control and Shoreline

The origin of control is adequately covered in Part "F" of the Descriptive Report.

The shoreline originates with reviewed photogrammetric manuscripts T-11222 (1954-61), T-11223B (1954-61), and revision survey RS-820 (1964).

## 3. Hydrography

A. Considering the character of the bottom in this area, the depths at crossings are in good agreement.

B. The usual depth curves were adequately delineated. The 36-foot depth curve was added to more adequately delineate the bottom configuration.

C. The investigation of least depths and delineation of the bottom are considered adequate except in areas west of lat.  $41^{\circ}12.2'$ , long.  $70^{\circ}05.0'$  and lat.  $41^{\circ}13.2'$ , long.  $70^{\circ}08.3'$  where indications of sand ridges are sparsely developed.

## 4. Condition of the Survey

The field plotting, sounding records, and the Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual except for the following:

a. The hydrographer in a "Special Report on Corrections to Echo Soundings" states that, "there is a draft correction and machine error correction that was determined by a series of vertical casts", during survey operations by the ship. The records accompanying this survey reveal only a few vertical casts had been taken simultaneously during the operation of DE-723 Fathometer No. 213. More recorded survey data pertaining to this correction would have been desirable.

b. There are no positive statements of phase corrections in the records.

- c. Information regarding settlement and squat of the ship was not specifically mentioned.
- d. Information regarding the weather or state of seas was not furnished in the ship records.
- e. Rescanning of fathograms in some instances was required by the reviewer in order to delineate depth curves more adequately.

## 5. Junctions

Adequate junctions were made with H-8450 (1958) on the west and H-8845 (1965) on the east. A butt junction was made with the prior survey H-6446 (1939) on the south, where differences of 2-4 feet occurred in some areas probably because of changes in the bottom.

## 6. Comparison With Prior Surveys

### A. H-445 (1854) 1:40,000

The smaller scale of the prior survey and its lack of development prevent a detailed comparison with the present survey; however, a comparison of depths at Miacomet Rip, called Weedweeder Shoal on the prior survey, reveals a shift of one-half mile to the eastward in the inshore portion of the Rip. The shoal ridges on the Rip were not revealed by the sparse soundings on the prior survey. In other areas, changes are variable and are 10-12 ft. shoaler or deeper than present depths. The high water line near Miacomet Rip has accreted about 125 meters and to the eastward and westward the high water line has receded as much as 250 to 300 meters.

It is noted that the color given to bottom characteristics in deep depths on the present survey is usually brown where the prior survey showed a grey color.

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

- B. H-1941 (1889) 1:40,000
- H-1942 (1889) 1:20,000
- H-2040 (1890) 1:10,000
- H-2041 (1890) 1:40,000

B.	H-2052	(1890)	1:20,000
	H-2081	(1891)	1:40,000
	H-2093	(1890)	1:10,000
	H-2094	(1891)	1:10,000

These prior surveys taken together cover the present survey in the common area. Since 1890, significant erosion has taken place alongshore. Here, the high water line has migrated northward about 100 to 200 meters. In the area of lat.  $41^{\circ}14.5'$ , long.  $70^{\circ}05.8'$  accretion is evident for a distance of one-half mile alongshore. A deepening of depths by 5-10 feet has occurred in the immediate vicinity of the eroded coast because of alongshore currents and wave action. For a distance one-half to one mile from the marginal eroded zone, depths have increased by 3 to 5 feet. However, in greater depths of 60-70 feet, little change of the bottom has occurred.

At the Miacomet Rip, the crest of the sand ridge has progressively migrated eastward indicating strong easterly currents in this vicinity. The finger ridges to the west have deepened 3 to 4 ft. and have also receded eastwardly. The 26 charted in lat.  $41^{\circ}13.35$ , long.  $70^{\circ}07.7$  from H-1942 falls in a present deep of over 40 ft. and should be disregarded for charting.

Along the eastern edge of this survey in depths of 50 feet, variable changes have taken place. In a major portion of this area a deepening as much as 6 feet has occurred. To the north variable differences of 2-3 feet exist. These changes are attributed to current action and other natural causes. Severe storms are well known in this area and have contributed significantly to the changes.

C. H-6446 (1939) 1:40,000

This prior survey overlaps the outer limits of the present survey. A comparison of prior and present depths indicates good agreement, except in the immediate vicinities of lat.  $41^{\circ}12.2$ , long.  $70^{\circ}09.15'$  and lat.  $41^{\circ}10.75'$ , long.  $70^{\circ}05.5'$ , where depths have deepened 3 to 5 feet.

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

7. Comparison With Charts 265 (latest print date 01-15-68)  
1209 (latest print date 11-06-67)

A. Hydrography

The charted hydrography originates with the previously discussed surveys which require no further consideration, supplemented by partial application of depths from the unverified smooth sheet of the present survey. Examination of the records and fathograms during review of the present survey revealed that the 45-foot depth charted at lat.  $41^{\circ}12.89'$ , long.  $70^{\circ}11.92'$  was erroneously scanned from the fathograms and should be revised to a depth of 55 feet. Soundings charted in the vicinity of Miacomet Rip from prior surveys no longer portray actual conditions and should be revised.

The present survey is adequate to supersede the charted hydrography in the common area.

B. Aids to Navigation

No aids to navigation exist in the area surveyed.

8. Compliance With Project Instructions

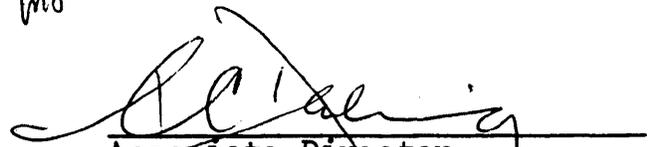
This survey adequately complies with the Project Instructions.

9. Additional Field Work

This survey is considered to be a very good basic survey and no additional hydrography in this changeable area is recommended.

*Ex. Revised info*  
 Examined and Approved:

  
 Chief  
 Marine Chart Division

  
 Associate Director  
 Hydrography and Oceanography

TIDE NOTE FOR HYDROGRAPHIC SHEET

9/25/64

Nautical Chart Division: R. H. Carstens

Plane of reference approved in  
14 volumes of sounding records for

HYDROGRAPHIC SHEET 8760

Locality: Nantucket Sound

Chief of Party: H. R. Lippold, Jr.

Plane of reference is mean low water

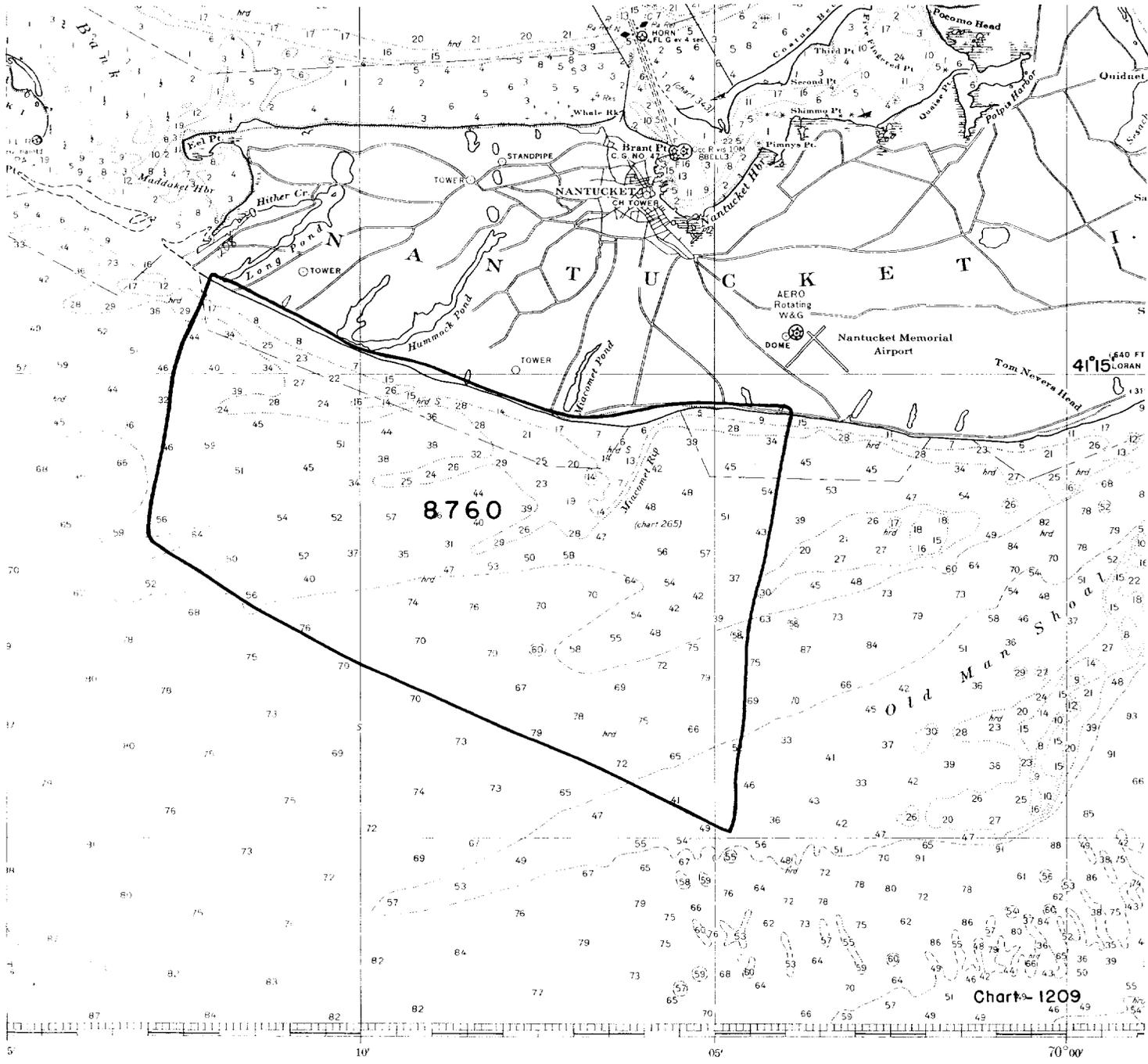
Tide Station Used (Form C&GS-681): Katama Bay, Chappaquiddick Island

Height of Mean High Water above Plane of Reference is as follows:

1.8 ft.

Remarks

*J. M. Simmons*  
Chief, Tides and Currents Branch



RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8760

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
<del>1209</del>	<del>10-8-64</del>	<del>J. T. Gallahan</del>	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>add 6 soundings &amp; revised 18 &amp; 30' soundings</i> <i>Considered Not applied - Application too scanty/REE</i>
1000	11-17-64	H. J. Keeler	<del>Full Part Before</del> Verification Review Inspection Signed Via Drawing No. No correction
265	4-26-65	J. T. Gallahan	<del>Full Part Before</del> After Verification Review Inspection Signed Via Drawing No. #3 - <i>extensive revision appld especially in Miacomet Rip area.</i>
1209	12-6-65	J. T. Gallahan	<del>Full Part Before</del> After Verification Review Inspection Signed Via Drawing No. #32 - <i>revision in area of Miacomet Rip</i> <i>appld thru Drawg. 265 #3</i>
1107	12-6-65	J. T. Gallahan	Full Part Before After Verification Review Inspection Signed Via Drawing No. 19 - <i>addd few soundings revise depth curve</i> <i>appld thru Drawg. 1209</i>
1108	7-1-66	<i>M. H. Hall</i>	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>Partly appld, appl. thru</i> <i>CHT 1107 Drawg. 19.</i>
1209	10-16-69	J. Beeler	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>permitted review</i> <i>directly without applying to larger scale</i> <i>first (cht 265) one sounding in review. ("45" to "53")</i>
1209	6-25-70	B. Fernandez	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>Fwd until fully appld. to Cht. 265</i>
70	7-20-70	J. Stuart	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>hold until applied to large</i> <i>scale charts</i>
1108	1-5-71	B. Fernandez	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>Fwd until appld. to large scale chts</i>
265	3-3-71	S. McKellar	Fully appl'd after Verification, review & inspection.
1107	3-23-71	S. McKellar	Fully applied after Verification, review, & inspection thru 265. (Dwg #7)
1209	5-25-71	K. GEAN	FULLY APPLIED AFTER VER, REV & INSPECTION THRU CHART # 265 DWG # 7
1107	8-31-71	K. GEAN	REAPPLIED AFTER VER; REV & INSP THRU CHART 1209 DWG # 38

