

9578

Diag. Cht. No. 1219-2

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC
Field No. WH-20-3-75
Office No. H-9578

LOCALITY

State DELAWARE
General Locality S.E. APPROACH TO DELAWARE BAY
Locality OFF BETHANY BEACH

1975

CHIEF OF PARTY
Robert A. Trauschke

LIBRARY & ARCHIVES

DATE March 15, 1978

☆ U.S. GOV. PRINTING OFFICE: 1976-689-441

Area 2

Charts

12214 (1219)

12200 (1109)

13003

12216 (41)

HYDROGRAPHIC TITLE SHEET

H-9578

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

FIELD NO.

WH-20-3-75

State Delaware

General locality Southwest Approach to Delaware Bay
~~Delaware Coast~~

Locality Inshore limits to 15 miles offshore at ^{off} Bethany Beach, Delaware

Scale 1:20,000 Date of survey October-November 1975

Instructions dated _____ Project No. OPR-516-WH-75

Vessel WHITING ²⁹³⁹ ~~(H)~~

Chief of party Robert A. Trauschke, Cdr., NOAA
D.E. Sheehan, D.W. Yensen, J. Polak, K. Perrin, J. Bennett

Surveyed by Ships Officers D.E. Sheehan, R.A. Trauschke

Soundings taken by echo sounder, ~~hand-lead, pole~~

Graphic record scaled by Ships personnel

Graphic record checked by Ships personnel

Protracted by _____ Automated plot by Cal-Comp 618 AMC
WHITING systems

Verification by R.R. Hill

Soundings in fathoms feet at MLW MLLW

REMARKS: ~~THIS SURVEY IS NOT COMPLETE~~

The velocity corrections provided with this survey (H4578) were found to be in error and were not applied.

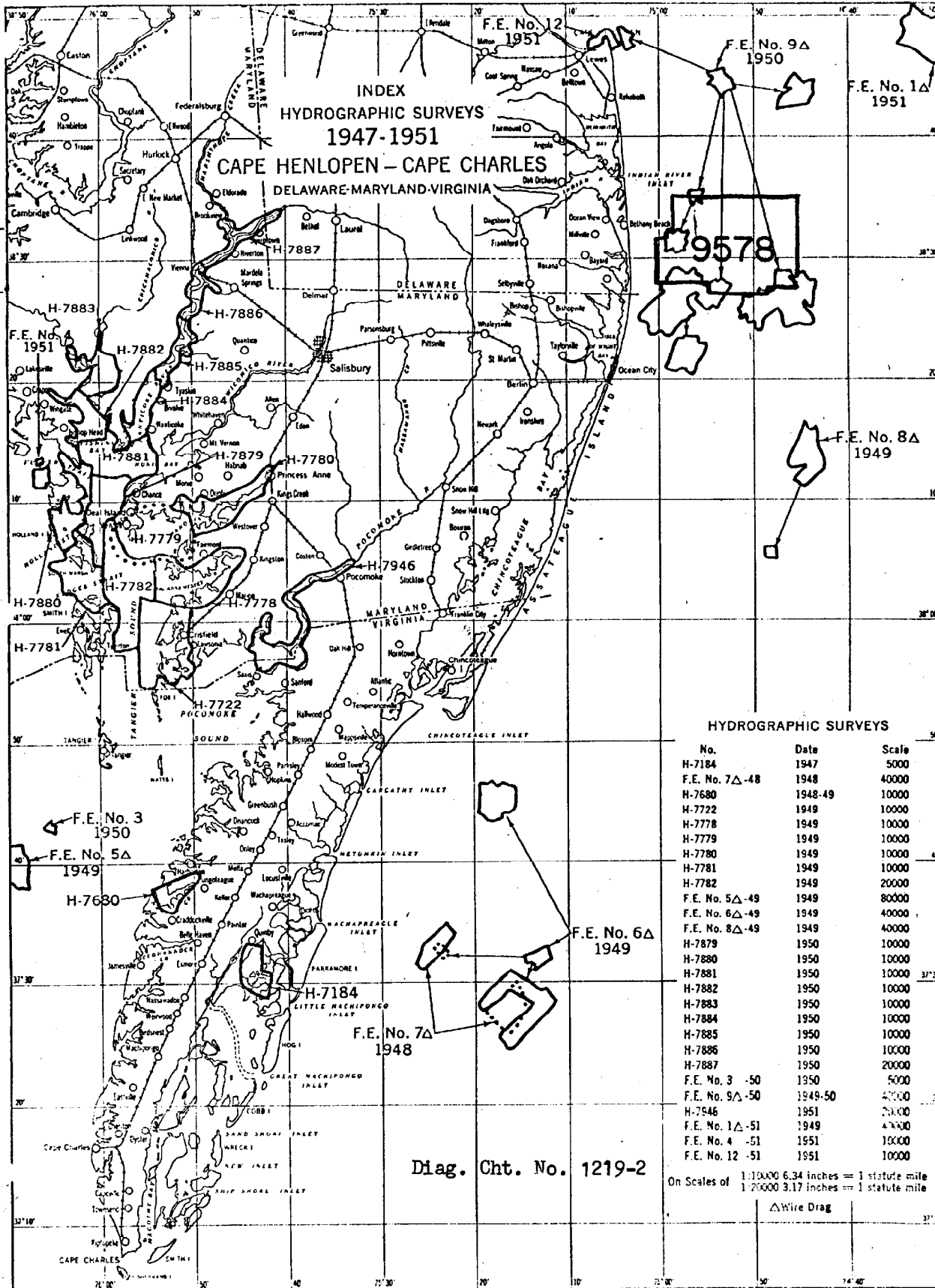
Velocity correction from a junction survey (H-9639)⁽¹⁹⁷⁶⁾ were used
The Nansen Cast Data used to form these correctors, was obtained in the same general area and about the same time in the year, the following year. (also see page #4)

GFI

SWW 9/10/92

DEPARTMENT OF COMMERCE
U. S. Coast and Geodetic Survey
Washington, D. C.

Hydrographic Index No. 69



INDEX
HYDROGRAPHIC SURVEYS
1947-1951
CAPE HENLOPEN - CAPE CHARLES
DELAWARE-MARYLAND-VIRGINIA

HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-7184	1947	5000
F.E. No. 7Δ-48	1948	40000
H-7680	1948-49	10000
H-7722	1949	10000
H-7778	1949	10000
H-7779	1949	10000
H-7780	1949	10000
H-7781	1949	10000
H-7782	1949	20000
F.E. No. 5Δ-49	1949	80000
F.E. No. 6Δ-49	1949	40000
F.E. No. 8Δ-49	1949	40000
H-7879	1950	10000
H-7880	1950	10000
H-7881	1950	10000
H-7882	1950	10000
H-7883	1950	10000
H-7884	1950	10000
H-7885	1950	10000
H-7886	1950	10000
H-7887	1950	20000
F.E. No. 3 -50	1950	5000
F.E. No. 9Δ-50	1949-50	40000
H-7946	1951	20000
F.E. No. 1Δ-51	1949	40000
F.E. No. 4 -51	1951	10000
F.E. No. 12 -51	1951	10000

Diag. Cht. No. 1219-2

On Scales of 1:100000 6.34 inches = 1 statute mile
1:200000 3.17 inches = 1 statute mile

△ Wire Drag

OPR 516

DESCRIPTIVE REPORT

HYDROGRAPHIC SURVEY NO. H-9578

FIELD SHEET NO. WH 20-3-75

OCTOBER-NOVEMBER, 1975

NOAA SHIP WHITING

ROBERT A. TRAUSCHKE, CDR, NOAA, COMDG.

Approved to stds 5/11/78
TRB.

A. PROJECT:

H-9578

This hydrographic survey WH 20-3-75 was conducted under Project Instructions OPR 516-MI-PE, WH-75, 76, Atlantic Seaboard area project (ASAP), Delmarvance phase, dated ~~August~~ ^{October 1,} 18, 1975. No changes, supplements, or amendments to these instructions were issued during the field season.

This survey was accomplished in accordance with the Provisional Hydrographic manual and Hydrographic Manual during the period October 8 through November ³ (Julian days 281 through 307), 1975.

B. AREA SURVEYED:

This survey H-9⁵~~8~~78 extends from the inshore safe navigation limits to approximately 15 miles offshore of the Delaware coast at Bethany Beach, Delaware.

The area surveyed as part of WH 20-3-75 is located from approximately 2.3 miles from the beach to approximately 15 miles offshore and is defined by the following points:

- | | | |
|----|-----------|-----------|
| 1) | 38°36'30" | 74°45'00" |
| 2) | 38°28'00" | 74°45'00" |
| 3) | 38°28'00" | 74°54'30" |
| 4) | 38°28'30" | 74°54'30" |
| 5) | 38°28'30" | 75°00'30" |
| 6) | 38°32'00" | 75°00'30" |
| 7) | 38°32'00" | 74°58'30" |
| 8) | 38°36'00" | 74°58'30" |

A total of 916 nautical miles and 96 square miles of hydrography were accomplished in completing this portion of WH 20-3-75. *H-9578*

C. SOUNDING VESSEL:

All soundings on hydrographic survey WH 20-3-75^{*H-9578*} were obtained by NOAA Ship WHITING (CSS 29), vessel number 2930. The following table is a summary of all data compiled on this survey:

<u>Julian Date</u>	<u>Number of Positions</u>	<u>Surveying Vessel</u>	<u>Fath. No.</u>
281	216	2930	1055
282	116	2930	1055
289	338	2930	1055
290	510	2930	1055
291	533	2930	1055
292	314	2930	1055
293	111	2930	1055
296	135 ^{<i>(25)</i>}	2930	1055
303	44	2930	1055
307	5	2930	1055

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS:

All soundings were obtained in feet. Analog records of depth were obtained using a Ross model 5000 fineline serial No. 1055 fathometer. Phase comparisons of the fathometer were checked whenever possible. *11*

Corrections to echo soundings were made by visual comparison of the analog trace versus digital printouts. In cases where the instrument initial on the analog trace appeared off, the phase comparison that was taken was checked. If the phase comparison was good, the digitized depths were considered to be more correct than the analog trace. Scanning was accomplished by compensating the analog trace for the amount the initial was off. As a result, no correction was entered on the TC/II tape for the segments of time when the fathometer initial appeared off.

Error
Records were rescaned & revised by field unit
Cdr Trauschke
2/15/75
~~Digitized~~ Digitized depths obtained should be taken as correct - only correct for wave ~~action in~~ scanning loss records.

Final field plotting was accomplished using predicted tides at Breakwater Harbor, Delaware. Average tidal zone correctors of -1 hour 18 minutes and 0.98 were applied to time and range of tide respectively. A complete discussion on the use of these tides is given in the "FIELD TIDE NOTE" at the end of this text.

Velocity corrections were applied during final field plotting to obtain temperature and salinity readings to complete velocity corrections. A TDC cast was taken on October 21, 1975. However the computations performed indicated the Martek unit used to obtain the TDC readings was not operating properly. As a result, velocity corrections could not be obtained from this cast. Instead, numerous lead line comparisons were taken at various depths within the survey limits of OPR-516-75. The results of the lead line comparisons were plotted vs. depth to obtain a velocity correction graph.

Note

- 4 -

The velocity ~~was~~ in error for this survey (H-9578). Velocity table #1 from H-9639 (MI-40-2-76) will be used for this survey

The resulting graph as well as all lead line comparisons and the TDC cast are included in the Appendix "Corrections to Echo Soundings" at the end of this text.

GFT

It was noted the resulting velocity corrections were quite large for the depth of water in which the survey was performed.

However, because of the close proximity of Delaware Bay to the working grounds, it was reasonable to expect cold water exiting the bay to produce such corrections.

Settlement and squat corrections were not applied during final field plot. Proper corrections for settlement and squat were instead applied to the TC/TI tape which is included in the survey package as sent to the Atlantic Marine Center. A listing of the TC/TI tape is included in Appendix "Correction to Echo Soundings" following this text.

E. HYDROGRAPHIC SHEETS:

The hydrographic sheets on survey WH 20-3-75^{H-9578} were constructed by the WHITING's automated system using PDP-8E computer and Complot drum plotter.

For convenience in plotting, survey WH 20-3-75^{H-9579} was divided into two (2) final field plots at latitude 38°31'00"N. These two sheets, WH 20-3N-75 and WH 20-3S-75^{H-9578} were plotted at a scale of 1:20,000 on a modified transverse mercator projection.

The Northern portion of Isle of Wight Shoal was plotted separately at a scale of 1:10,000 as well as the other small shoal on the boatsheet.

The projection parameters for WH 20-3N-75 and WH 20-3S-75^{H-4578} and the development areas are included in the Appendix "Hydrographic Sheet Projection and Electronic Control Parameter" at the end of this text.

F. CONTROL STATIONS:

All stations used for control were either traverse stations of 2nd and 3rd order accuracy. No visual sextant calibration was taken. Instead, Del Norte electronic positioning system was used to calibrate Raydist electronic positioning system. The stations used for Del Norte and Raydist sites were:

<u>Name</u>	<u>Type</u>	<u>Use</u>	<u>Pattern</u>	<u>Accuracy</u>
H-1-AMC-75VA	Traverse Triangulation	Raydist	2	3rd
O.C. Coast Guard Lookout tower	Intersection	Del Norte	B/A	3rd
Fenwick I. Lighthouse	Intersection	Del Norte	B/D	3rd
North Raydist	Traverse	Raydist	1	3rd
Cotton Patch 2	Triangulation	Del Norte	C	2nd

Stations North Raydist and H-1-AMC-75VA were established by Atlantic Marine Center personnel. The other stations were established by Rockville personnel and recovered by AMC personnel. A list of all stations and their geodetic positions is given in the Appendix of this report.

G. HYDROGRAPHIC POSITION CONTROL:

Electronic Hastings/Raydist positioning system operating at a frequency of 3292.40 KHZ was used for all positioning of the Ship WHITING during survey WH 20-3-75.

The Raydist system was frequently calibrated using direct meter readings from Del Norte equipment.

The Del Norte equipment had been calibrated previously so that all readings were true distances from the ship to the remote station site.

Rates (in meters) were taken from three Del Norte sites while simultaneously recording the pattern readings from the Raydist. By utilizing program AM300, three positions for the ship were obtained by using two of the three Del Norte rates obtained. These three positions were then converted to Raydist lanes and compared against the recorded values to determine the electronic pattern correctors. A list of all pattern correctors

and calibrations is given in Appendix "Abstracts of Corrections to Electronic Position Control".

Raydist provided very good control on this project with strong signals being received at all times.

H. SHORELINE:

Although this survey, H-9578 extends to the inshore limits of safe navigation, the portion of hydrography accomplished on WH 20-3-75^{H-9578} extended only as far west as 2.3 miles from the beach

In addition, no shoreline manuscripts were provided for the Ship WHITING and as a result, no shoreline appears on the final field plot.

Shoreline should be included on the boatsheet when hydrography is completed by launch work.

I. CROSSLINES: *See Verifier's Report*

Approximately 78 miles or 8.5 percent of the hydrography run on survey WH 20-3-75^{H-9578} was crosslines. In general, the crosslines agreed well with main scheme hydrography. A maximum discrepancy of 2 feet in 75 feet of water was found in all those comparisons observed. No pattern of discrepancy was revealed in comparison of the soundings.

J. JUNCTIONS: See Verifier's Report

This survey WH 20-4-75^{H-9579} did not junction with any contemporary ? H 9579 S?
survey. It did however junction to the north with survey H-9136.

Survey H-9136 is a 1:20,000 scale survey conducted in 1970. All soundings were in feet.

Junction soundings with prior survey H-9136 were consistently 1 to 2 feet deeper on survey WH 20-3-75, H-9578

It was considered these deeper depths were the result of inaccurate velocity corrections.

Velocity corrections computed from results of TDC or Nansen casts should be obtained when the work on this survey is completed to determine the accuracy of the velocity corrections used in plotting the final field sheet of WH20-3-75, H-9578 ✓

No other prior survey junctions were available to the Ship WHITING for comparison of soundings.

K. COMPARISON WITH PRIOR SURVEYS: See Verifier's Report

No prior surveys of the area surveyed by WH 20-3-75^{H-9578} were made available to the Ship WHITING although prior surveys of the area do exist (in particular H-8596; 1961-1963). Copies of these surveys should be obtained from the Office of Marine Charting and Mapping, Rockville, Maryland, and the comparisons made before plotting the smooth sheet of WH 20-3-75^{H-9578}.

It is recommended that a TDC or Nansen cast be conducted in the area of WH 20-3-75^{H-4578} when work is resumed on survey H-9578. This will help verify the accuracy of the velocity corrections used in plotting the final field sheet of WH 20-3-75^{H-9578}.

N. AIDS TO NAVIGATION:

All aids to navigation within the survey limits were verified as to position on the chart and description in the light list. There were no discrepancies noted.

O. STATISTICS:

The following is a summary of all hydrography accomplished on survey WH 20-3-75^{H-9578}:

Sounding Vessel - #2930

Miles of hydrography - 916

Square nautical miles of hydrography - 96

Number of positions - 2371

Number of bottom samples - 56

Number of leadline comparisons - 5

Number of TDC casts - 1

P. MISCELLANEOUS:

This survey is not complete. Survey H-9578 extends from the inshore safe navigation limits to a point 15 miles offshore. The WHITING accomplished only that portion of the hydrography eastward of 2.3 miles from the beach in completing WH 20-3-75^{H-9578}.

Bottom samples were taken in accordance with project instructions and the Hydrographic Manual. Bottom characteristics were primarily well graded, coarse brown sand and broken shells with some traces grey sand and black mud.

No presurvey review items were noted within the survey limits of WH 20-3-75^{H-9578}.

Q. RECOMMENDATIONS:

It is recommended that the findings of survey WH 20-3-75^{H-9578} not be incorporated into the charting program until the survey H-9578 is completed. This will allow a more reliable velocity correction graph to be determined than the leadline used on WH 20-3-75^{H-9578}.

R. AUTOMATED DATA PROCESSING: *This survey is considered complete; the inshore portion has been accomplished by H-9714 (PE-20-4-77); however this survey H-9714 has not been processed to a point where an evaluation can be made.*
The following programs were used in the automated processing of the final field sheets of survey.

- RK 111 - Real time Range Range plot 8/7/74
- RK 201 - Grid and Lattice plot 4/18/75
- RK 211 - Non Real time Range Range plot 8/16/74
- RK 300 - Utility Package 5/22/75
- RK 500 - Predicted tides Generator 11/10/72
- AM 602 - Elinore 5/21/74

S. REFERENCE TO REPORTS:

None

APPROVAL SHEET

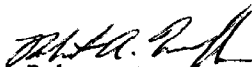
Submitted by



Alan J. Potok
Lt. (jg), NOAA

Supervision of field and office work on this hydrographic survey was continuous on a day to day basis to ensure completeness of the survey and that all work was done in accordance with the instructions.

Approved/Forwarded



Robert A. Trauschke
Cdr., NOAA
Commanding Officer, NOAA Ship WHITING

SIGNAL TAPE LISTING

100	37	51	48335	075	22	06156	H-1-AMC-VA-75
106	38	19	30836	075	05	18229	Ocean City C.G. Lookout Tower
110	38	27	04478	075	03	19186	Fenwick Island Lighthouse
112	38	34	46022	075	03	32620	North Raydist
113	38	34	46641	075	03	33774	Cotton Patch 2

H-9639 Vel Table #1

Vel.

***** TAPEMARK *****
000149 0000 0001 000 222000 040276

000176 0001
000202 0002
000225 0003
000249 0004
000274 0005
000300 0006
000327 0007
000352 0008
000381 0009
000408 0010
000435 0011
000470 0012
000504 0013
000537 0014
000573 0015
000610 0016
000646 0017
000687 0018
000727 0019
000766 0020
000808 0021
000852 0022
000866 0023
000912 0024
000945 0025
001005 0026
001070 0027
001130 0028
001195 0029
001255 0030
001325 0031
001395 0032
001455 0033
001520 0034
001575 0035
001630 0036
001685 0037
001740 0038
999999 0038

*This Vel. Table was used in
the plotting of Vel on
H-9578
GFT*

***** TAPEMARK *****
***** TAPEMARK *****
***** TAPEMARK *****

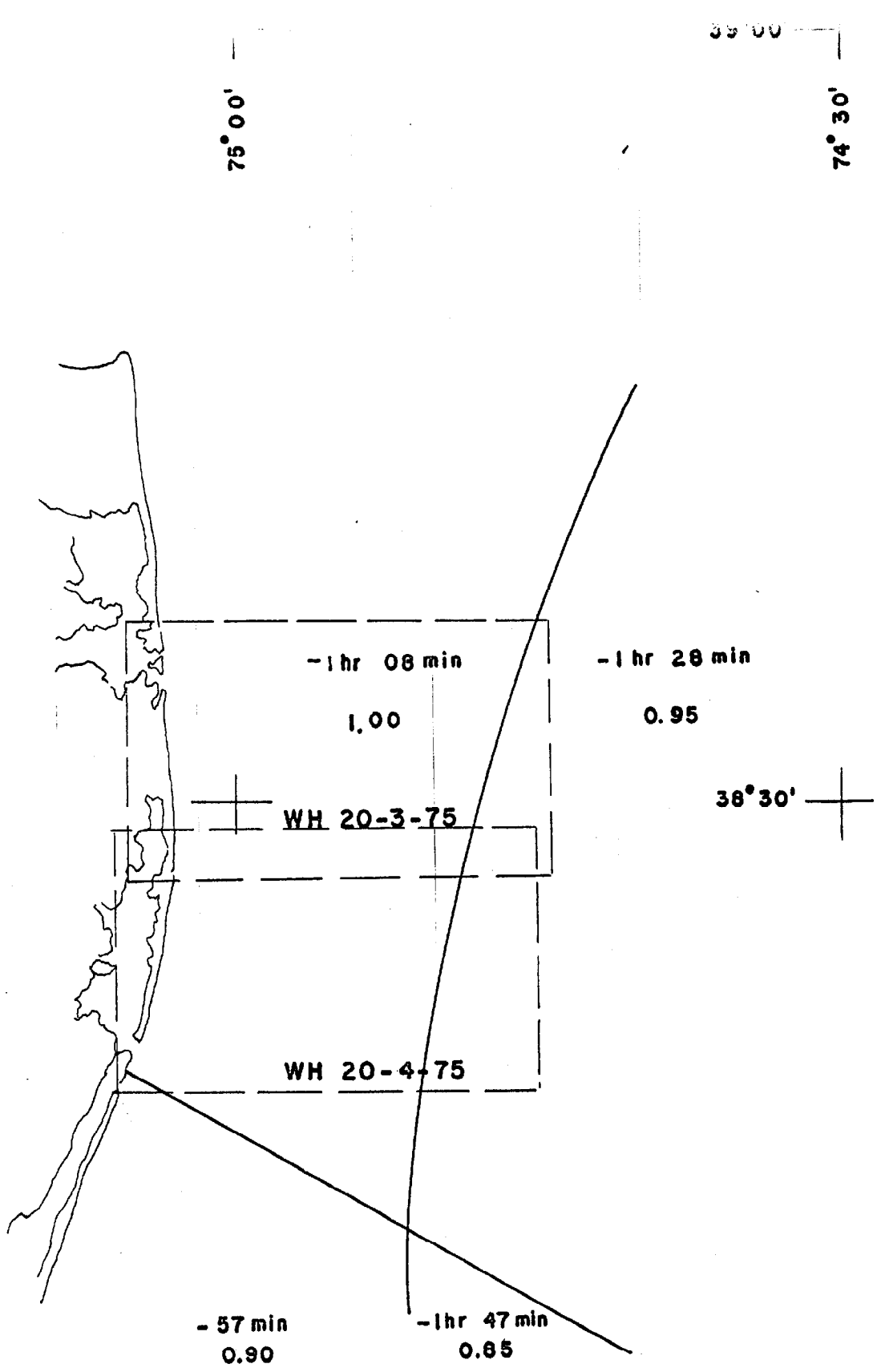
7

6

5

4

Final field plotting of boatsheets accomplished on OPR 516-WH-75 was done using predicted tides. Predicted tides at Breakwater Harbor, Delaware were corrected for time (-1 hr 18 min.) and range (0.98) to the survey area. Suggested tidal zoning was received with project instructions. In addition, hourly predicted heights were for Breakwater Harbor were received from Rockville, Maryland. A formatted tape and listing of these hourly heights was made and is submitted with the surveys.



OPR 516
 SUGGESTED TIDAL ZONING
 BASED ON BREAKWATER HARBOR, DEL.

4/29/76

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): Ocean City, Maryland

Period: October 8 - November 3, 1975

HYDROGRAPHIC SHEET: H-9578

OPR: 516

Locality: Offshore, east of Bethany Beach, Delaware

Plane of reference (mean ~~lower~~ low water): 4.18 ft.

Height of Mean High Water above Plane of Reference:

3.4 ft. Ocean City

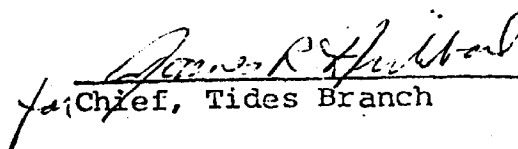
Remarks: Recommended zoning:

Time correction

-10 min.

Range ratio

x1.03


Chief, Tides Branch

GEOGRAPHIC NAMES

H-9578

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 GRAND McNALLY ATLAS H U.S. LIGHT LIST K										
	A	B	C	D	E	F	G	H	K		
FENWICK SHOAL											1
BETHANY BEACH (title)											2
											3
											4
											5
											6
											7
											8
											9
											10
											11
											12
											13
											14
											15
											16
											17
											18
											19
										APPROVED	20
										<i>Chas. E. Harcourt</i>	21
										STAFF GEOGRAPHER -C3x8	22
										7 APRIL 1978	23
											24
											25

APPROVAL SHEET
FOR
SURVEY H-9578

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~has not~~ been made. A new final sounding printout has/~~has not~~ been made.
- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Provisional Hydrographic Manual. Exceptions are listed in the Verifier's Report.

Date: March 1, 1978

Signed: Mr. R. L. Sander

Title: Chief, Verification Branch

Reg. No. H-9578

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey the following shall be completed:

CARDS CORRECTED

DATE _____ TIME REQ'D _____ INITIALS _____

REMARKS:

*Soundings plotted on smooth sheet not logged
in quadrant between positions 1950-1952.*

Positions 1943-1952 rejected. RWD 4/79

*31 ft sounding @ Lat. $38^{\circ}28.23'$, Long $74^{\circ}54.27'$
put in excess. SKH 12/11/79*

Reg. No. _____

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE _____ TIME REQ'D _____ INITIALS _____

REMARKS:

H-9578

Items for Future Presurvey Reviews

The 62-foot sounding charted at latitude 38°29.31', longitude 74°47.3' from H-5349 (1933) should be specifically investigated in the future. This sounding may represent the remains of a previously charted wreck that was deleted by a 1933 report (CL410/33).

<u>Position Index</u>		<u>Bottom Change</u>	<u>Use</u>	<u>Resurvey</u>
<u>Lat.</u>	<u>Long.</u>	<u>Index</u>	<u>Index</u>	<u>Cycle</u>
382	0745	2	6	25 years
383	0745	2	6	25 years
382	0750	3	2	50 years
383	0750	2	6	25 years

HYDROGRAPHIC SURVEY STATISTICS

H-9578

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION	AMOUNT		
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS	X 2 parts		
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS. ARC, EXCESS	2		
DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS SOURCE DOCUMENTS
ENVELOPES	X		1			
CAHIERS	1					
VOLUMES	1					
BOXES			1-smooth & misc. data			1-sawtooth rec. & raw data

T-SHEET PRINTS (List) 3-junction strips

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	TOTALS
POSITIONS ON SHEET			2371
POSITIONS CHECKED		240	
POSITIONS REVISED		4	
SOUNDINGS REVISED		420	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		1	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	2		
VERIFICATION OF CONTROL		5	
VERIFICATION OF POSITIONS		40	
VERIFICATION OF SOUNDINGS	5	75	
COMPILATION OF SMOOTH SHEET		35	
APPLICATION OF TOPOGRAPHY		0	
APPLICATION OF PHOTOBATHYMETRY		0	
JUNCTIONS		5	
COMPARISON WITH PRIOR SURVEYS & CHARTS		17	
VERIFIER'S REPORT		24	
OTHER		27	
TOTALS	7	228	235

Pre-Verification by F. Saunders	Beginning Date 12/29/75	Ending Date 12/30/75
Verification by F. Saunders, L. Cram, R. Hill	Beginning Date 05/17/76	Ending Date 02/10/78
Verification Check by R. D. Sanocki	Time (Hours) 8	Date 02/13/78
Marine Center Inspection by Hydrographic Inspection Team, AMC	Time (Hours) 23	Date 02/15/78
Quality Control Inspection by <i>G.K. [Signature]</i>	Time (Hours) 29	Date 04/6/78
Requirements Evaluation by D.J. Hill	Time (Hours) 3	Date 04/24/78

PASSED RHC

ATLANTIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO. H-9578

FIELD NO. WH-20-3-75

Delaware, Southeast Approach to Delaware Bay, Offshore of
Bethany Beach

SURVEYED: October 8 through November 3, 1975

SCALE: 1:20,000

PROJECT NO.: OPR-516

SOUNDINGS: Ross 5,000 Fineline

CONTROL: Raydist
(Range-Range)

Chief of Party	R. Trauschke
Surveyed by	A. Theberge
.....	D. Yeager
.....	A. Potok
.....	K. Perrin
.....	J. Bennett
.....	D. Terry
.....	J. Gofus
Automated Plot by	CALCOMP-618 Plotter (AMC)
Verified and Inked by	R. Hill <i>R. Hill</i>
	February 22, 1978

1. Introduction

a. During verification of this survey (H-9578) velocity correctors were found to be unusually large for this area. A comparison was made with velocity correctors from other surveys conducted in the general vicinity. The results of the comparison showed the present survey's velocity correctors to be in error.

To continue the processing of the present survey by this office, velocity correctors were used from MT. MITCHELL survey H-9639 (table #1 of MI-40-2-76). This survey (H-9639) junctions with the present survey, and the data used to create the velocity correctors (table #1) were obtained in the same general area.

b. The projection parameters and the electronic control parameters have been revised and noted in the Descriptive Report.

2. Control and Shoreline

a. The source of control is adequately described under Sections F and G of the Descriptive Report.

b. There is no shoreline on this survey.

3. Hydrography See Q.C. Report H-9727(1977)

a. Depths at crossings were considered adequate for the majority of this survey. ~~However, in the vicinity of latitude 38° 36.35', longitude 74° 45.7', differences of up to 11 feet were noted.~~ The probable cause for these differences was attributed to the existence of sand waves in the area.

To further solidify this conclusion, a special investigation was conducted in this area by the NOAA Ship PEIRCE, at a scale of 1:5,000. The hydrographic data obtained from this investigation shows the bottom configuration in this vicinity to be very irregular and these irregularities may be attributed to the differences encountered at crossings.

b. The standard depth curves were adequately delineated, with the inclusion of brown curves to further define the bottom configuration.

c. The development of the bottom configuration and the investigation of least depths is considered adequate, with the following exceptions:

(1) A charted shoal in the vicinity of latitude 38° 29.3', longitude 74° 47.3' where a depth of 62 feet arises from present survey depths of 74 to 89 feet. The development in this area is not adequate to verify or disprove the shoal.

(2) The development of the bottom in the vicinity of latitude 38° 36', longitude 74° 45.5', where depths of less than 65 feet occur, is not adequate to portray existing irregularities in the area. The 200 meter sounding line spacing used in the western half of this survey would have been appropriately used here.

4. Condition of Survey

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the Provisional Hydrographic Manual, except as follows:

A problem was encountered during verification of electronic correctors for this survey. Differences were found between the Descriptive Report's electronic control corrector abstract, the electronic corrector tapes applied, and the electronic calibration forms. These differences could not be resolved by the verifier and were presented to the field unit responsible. Final determination of electronic correctors was made by the

Ship WHITING's personnel. The corrector abstract listed in the Descriptive Report was designated as the proper corrections for application to the smooth sheet.

5. Junctions

Adequate junctions were effected with the following surveys:

H-9136 (1970) 1:20,000 to the north
 H-9639 (1976) 1:40,000 to the east
 H-9629 (1976) 1:40,000 to the southeast
 H-9579 (1975) 1:20,000 to the south

*junction effected
 with H-9764 (1978)
 during quality control
 of that survey. GKM
 12/79*

Surveys in the ^{North eastern} southwestern, and western junctional areas of the present survey have not yet been received. Junctions in these areas have been deferred and will be completed by the Quality Control Branch, C352, pending processing and transmittal of data.

6. Comparison With Prior Surveys

a. H-4093 (1919) 1:40,000
 H-4164 (1920) 1:40,000
 H-4951 (1929) 1:20,000
 H-5349 (1933) 1:20,000
 H-6272 (1937) 1:40,000

A comparison with the above prior surveys and the present survey revealed relatively minor to significant differences in depths. Different methods of sounding and position control were used by the above surveys and in part differences with the findings of the present survey may be attributed to them. However, a detailed comparison with each above survey reveals the following:

H-4093 - A comparison with this prior survey reveals general depth differences of +2 feet, with shoaler depths mostly on the present survey. There is one instance of an unsupported depth 5 feet shoaler than the present survey and located at latitude 38° 34' 58", longitude 74° 55' 47". This depth was probably read off one fathom in error on the prior survey.

H-4164 - Generally depths were two to three feet deeper than present survey depths. However, depths in the vicinity of latitude 38° 28.5', longitude 74° 59.7', on a shoal, are up to five feet shoaler than the present survey. These differences are attributed to bottom change in this area. Development of this shoal on the present survey is adequate to disprove the lesser depths of five feet on the prior survey. *Quality Control Report*

H-4951 - This prior survey is in fair agreement with the present survey. Depth differences are ± 3 feet.

H-5349 - This comparison reveals prior survey depths to 15 feet shoaler in areas of irregular bottom, and spotty agreement in other areas. These differences may be attributed to sounding methods - "flashing white light fathometer" of the 1933 survey. The inadequate development of these irregular bottom areas fail to verify or disprove the existence of these shoal features. Four depths from this prior survey are being brought forward to supplement the present survey:

See Quality Control Rep.

77 feet - latitude $38^{\circ} 31' 10''$, longitude $74^{\circ} 46' 57''$
 74 feet - latitude $38^{\circ} 29' 49''$, longitude $74^{\circ} 46' 52''$
 62 feet - latitude $38^{\circ} 29' 18''$, longitude $74^{\circ} 47' 17''$
 68 feet - latitude $38^{\circ} 28' 25''$, longitude $74^{\circ} 47' 36''$

H-6272 - ~~This prior survey reveals variable differences of up to 10 feet, but~~ generally the present survey was two to three ^{four} feet deeper, with isolated differences of up to six feet shoaler. These differences are attributed to a combination of changes in the bottom configuration due to natural processes and differences in survey methods and equipment. ~~An unresolved difference in the vicinity of latitude $38^{\circ} 30.7'$, longitude $74^{\circ} 48.6'$ exists.~~ Depths from this prior survey (H-6272) were brought forward to supplement the present survey in this area. *See Quality Control Rep.*

- b. H-9296 ⁽¹⁹⁷²⁾ WD
 H-9295 ⁽¹⁹⁷¹⁻⁷²⁾ WD
 H-6341 ⁽¹⁹³⁸⁾ WD
F.E. No. 9 (1950) WD

H-9296 WD - This wire drag survey covers a portion of the north-eastern section of the present survey. No conflicts between present depths and effective wire drag depths were encountered.

H-9295 WD - This wire drag survey covers a portion of the present survey area. No conflicts between present depths and effective wire drag depths were encountered. A charted Presurvey Review wreck cleared by 54 feet, in the vicinity of latitude $38^{\circ} 34.9'$, longitude $74^{\circ} 44.9'$, was inadequately developed on the present survey and a hang depth of 55 feet is being brought forward to supplement the present survey.

H-6341 WD - This wire drag survey covers a portion of the present survey and no conflicts were encountered.

F.E. No. 9 (1950) WD - A comparison with this wire drag survey reveals depths to three feet shoaler than effective depths of

drag in the vicinity of wreck investigation, located at latitude $38^{\circ} 31.5'$, longitude $74^{\circ} 58.6'$. These shoaler depths are attributed to natural changes in the area. *Also, F.E. Desc. Report states that part of ground was dragged along the bottom.*

7. Comparison With Chart 12214 (28th Edition, March 8, 1975)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys and requires no further consideration.

Attention is directed to the following:

- (1) Two nondangerous sunken wrecks charted in latitude $38^{\circ} 30.1'$, longitude $74^{\circ} 47.0'$ and latitude $38^{\circ} 36.0'$, longitude $74^{\circ} 58.3'$, originate with an unknown source. The existence of these wrecks was neither verified or disproved by the present survey and should be retained as charted unless subsequent information indicates otherwise. *The 74 charted at lat. $38^{\circ} 30.1'$, long. $74^{\circ} 47.0'$ is considered to have been transferred in error from H-5349.*
- (2) The obstruction, fish haven charted in the vicinity of latitude $38^{\circ} 36.5'$, longitude $74^{\circ} 58^{\circ} 3'$, originates with an unascertainable source, and has neither been verified or disproved by the present survey and should be retained as charted.

(3) The sunken wreck, cleared by 54 feet charted in the vicinity of latitude $38^{\circ} 34.9'$, longitude $77^{\circ} 44.9'$, originates with survey H-9295 WD of 1972. No indication of this wreck was found by the present survey. The charted cleared wreck should be retained as charted.

b. Aids to Navigation

The charted aids to navigation adequately mark the features intended.

8. Compliance With Instructions

This survey complies with the Project Instructions.

9. Additional Field Work

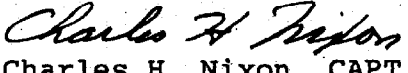
This is a good basic survey. Additional field work is not recommended.


Inspection Report
H- 9578


Any verification errors regarding procedures and presentation of survey data detected during inspection by the Hydrographic Inspection Team have been corrected before submission for administrative approval. HIT comments regarding quality of field work, compliance with instructions, and adequacy of the survey have been incorporated within the Verifier's Report.

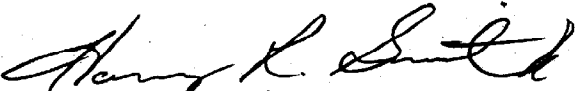
Examined and Approved:
Hydrographic Inspection Team
Date:


Robert A. Trauschke, CDR, NOAA
Chief, Processing Division

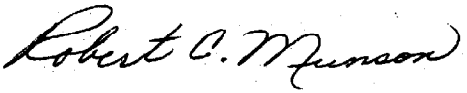

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RADM, NOAA
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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C352/GKM

April 6, 1978

TO: *A. J. Patrick*
A. J. Patrick
Chief, Marine Surveys Division

FROM: *G. K. Myers*
G. K. Myers
Chief, Quality Control Branch

SUBJECT: Quality Control Report for H-9578 (1975), Delaware, Southeast Approach to Delaware Bay, Off Bethany Beach

Survey H-9578 was inspected to evaluate the accuracy and adequacy of the survey with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, decisions and actions by the verifier, and cartographic presentation of data.

The adequacy of the junction with H-9639 (1976) on the east will be evaluated during the quality control of that survey.

In general, the present survey was found to conform to National Ocean Survey standards and requirements except as discussed in the Verifier's Report, the HIT Report, and as follows:

1. An adequate junction with H-9629 (1976) on the southeast was effected. However, depth curves within the overlapping area were not drawn by the verifier to coincide. Also, two soundings transferred from H-9578 were plotted in error.
2. About 50 machine plotted soundings on the smooth sheet were excessed during quality evaluation without harming the delineation of the bottom. These soundings obliterated other depths, overlapped intersecting projection lines, or were too closely spaced. These conditions caused true depths in many areas to be unidentifiable.
3. No bottom samples were obtained by the hydrographer over the areas of shoal depths in the immediate vicinities of latitude $38^{\circ}28.5'$, longitude $74^{\circ}54.1'$, latitude $38^{\circ}28.6'$, longitude $74^{\circ}55.25'$, and latitude $38^{\circ}26.65'$, longitude $74^{\circ}59.7'$. Bottom characteristics from the prior surveys were brought forward to supplement present hydrography in these areas during verification and quality evaluation.



4. The vicinity of the shoal located at latitude 38°28.6', longitude 74°59.65' should have been developed by additional lines preferably on the axis of this feature. (See Hydrographic Manual--section 1.4.3.)
5. In some cases, time lines marking positions on the fathogram for the present survey were 2 to 5 mm in width. These broad marks resulted in the loss of the bottom trace on the fathograms.
6. The 77-foot sounding at latitude 38°30.67', longitude 74°48.63' was rescanned and changed to 75 feet during quality control. This sounding is in better agreement with the 73- and 74-foot depths brought forward in this area from H-6272 during verification.
7. The following remarks supplement or supersede comments pertaining to prior survey comparisons stated in the Verifier's Report.

H-4164

A comparison between the prior and present surveys reveals significant differences in depths. Generally, present depths are 1 to 5 feet shoaler than prior soundings in depths of less than 70 feet on the present survey, while in deeper areas soundings are 5 to 10 feet less than prior depths. The differences are attributed largely to the methods of surveying. A bottom characteristic was carried forward from the prior survey to supplement present hydrography.

H-5349

The 77- and 74-foot soundings carried forward from the prior survey were removed during quality control. A 79- and 77-foot sounding located about 350 meters northwest of the prior soundings, respectively fall on the present survey. In addition, the uncharted 68-foot sounding is considered to have been read in error from the flashing light fathometer as present depths are 10 feet deeper than prior depths in close proximity to this sounding.

The aforementioned present depths are considered sufficient to adequately show the existence of lesser depths in these areas.

The 62-foot sounding charted at latitude 38°29.31', longitude 74°47.3' is discussed in the Descriptive Report of H-5349. A statement has been made to the effect that this sounding position may represent the location of a reported wreck previously charted about 3/4 mile to the south-southwest. The wreck was removed from the chart based on a 1933 report (CL410/33).

cc:
C351

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. 9578

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
12216 (411)	10-5-78	<i>Richard H. Hoyer</i>	Full Part Before After Verification Review Inspection Signed Via Drawing No. 26
12211 (1220)	10-6-78	<i>Richard H. Hoyer</i>	Full Part Before After Verification Review Inspection Signed Via Drawing No. 39
1219 (12214)	10/1/78	<i>Bill Wambell</i>	Full Part Before After Verification Review Inspection Signed Via Drawing No. 43
1219 (12214)	5/21/79	<i>Bill Wambell</i>	<i>Reprinted</i> Full Part Before After Verification Review Inspection Signed Via Drawing No. 43, Line of suds was deleted by Quality Control after Quality Control inspection
12200 (1109)	6/28/79	<i>Bill Wambell</i>	Full Part Before After Verification Review Inspection Signed Via Drawing No. 45
13003 (1000)	7/19/80	<i>Barbara Loeb</i>	Full Part Before After Verification Review Inspection Signed Via Drawing No. #57 Applied thru reduction of chart 12200 #45
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
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