

9295

WIRE DRAG

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 ... WIRE DRAG
Field No. ... RH 20-4-71 WD
Office No. ... H-9295

LOCALITY

State .. DELAWARE
General Locality . APPROACHES TO DELAWARE BAY
Locality EAST OF INDIAN RIVER INLET

1971-72

CHIEF OF PARTY

M. N. ... WALTER & JAMES COLLINS

LIBRARY & ARCHIVES

DATE ... OCT 1, 1973

9295

WIRE DRAG

HYDROGRAPHIC TITLE SHEET

H-9295

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.

RH 20-4-71WD

State DELAWARE

General locality APPROACHES TO DELAWARE BAY

Locality EAST OF INDIAN RIVER INLET
~~CAPE HENLOPEN TO DELAWARE TRAFFIC LANE~~

Scale 1:20,000 Date of survey 10 MAY to 28 JUNE 1971
21 APRIL 1972

Instructions dated 4 MAY 1971 Amended by Change No. 1 dated 11 June 1971 Project No. OPR-480WD

Vessel NOAA SHIPS RUDE & HECK

Chief of party LCDR MERRITT N. WALTER & CDR JAMES COLLINS

Surveyed by G.R. SCHAEFER, A.Y. BRYSON, M.M. ETHERIDGE, S.H. MANZO, B.L. WESCOTT

Soundings taken by echo sounder, hand lead, ~~xxx~~

Graphic record scaled by NA

Graphic record checked by NA

Plotted by CALCOMP PLOTTER (End buoy parties only) Automated plot by ATLANTIC MARINE CENTER

Drag strips sub-divided by: B.J. Stephenson

Soundings in ~~XXXXX~~ fathoms feet at MLW ~~XXXX~~

REMARKS:

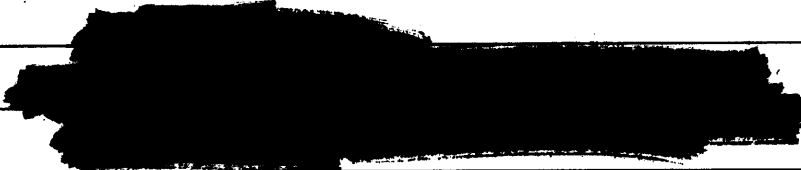
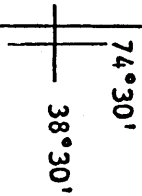
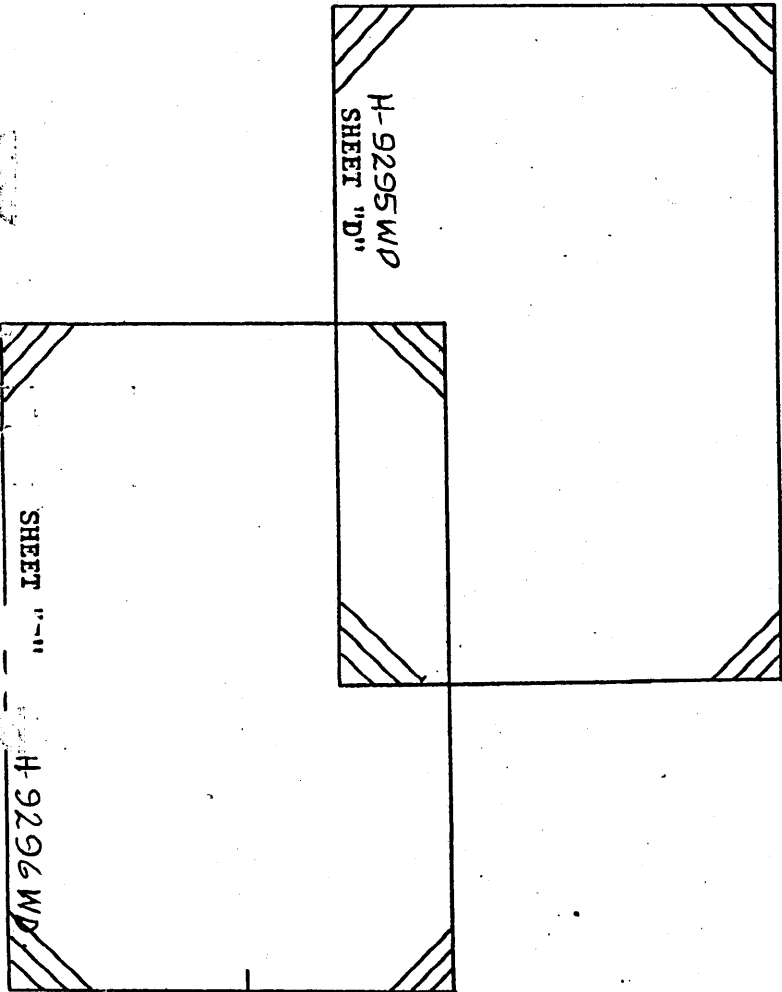
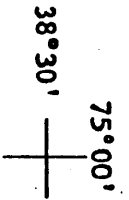
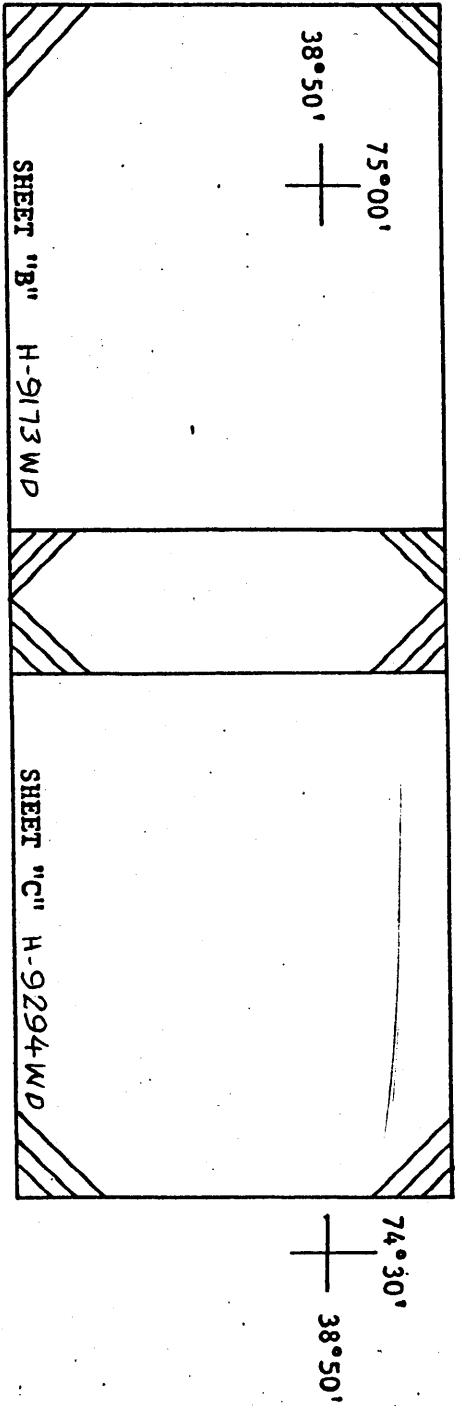


Chart 21
1219
1109
1000

Applied to stds 3-22-74
COB

INDEX OF SHEETS



*All Sheets 36 X 54
1:20,000

The sheets were controlled in the following manner: Sheet C used CHAP (Red) and COTTON PATCH II (Green) for all 1970 work and used CHAP (Red) and FEN (Green) for all 1972 work; Sheet D used CHAP (Red) and COTTON PATCH II (Green) for all work; Sheet E used CHAP (Red) and FEN (Green) for all work.

Upon completion of the surveys, all three stations were dismantled and only COTTON PATCH II is recoverable - a disc remains. No discs were left at CHAP or FEN.

A listing of all signals used is given in Attachment I.

- D. DATE OF SURVEY: - Dragging for OPR-480 on SHEET "C" began on 1 October 1970 and stopped on 23 October 1970. Operations on sheet "C" were resumed on 6 June 1972 and completed on 27 June 1972.

H-9295 W.D.

Sheet "D" was begun on 10 May 1971 and stopped on 28 June 1971. Sheet "D" was resumed and completed on 21 April 1972.

Sheet "E" was begun on 25 April 1972 and completed on 24 May 1972.

- E. TIDAL REDUCERS - Preliminary reduction of each days data was made using predicted tides for the standard gauge at Breakwater Harbor, Lewes, Delaware (LAT. 38°47'N, LONG 75°06'W).

The predicted tides were corrected for time with respect to Breakwater Harbor as follows:

- 1) For Sheet "C", during 1970, a -40 minute corrector was applied to the time of both high and low water.
- 2) For Sheet "C", during 1972, and for Sheets "D" and "E", a -43 minute corrector was applied to the time of high water and a -38 minute corrector was applied to the time of low water. These are the standard time correctors listed for Five Fathom Bank, based on Breakwater Harbor.

The predicted tides were not corrected for height with respect to Breakwater Harbor.

Actual tidal data for 1970 and 1971 work has been furnished by the Rockville Office from the standard tide gauge at Breakwater Harbor. Tidal data for 1972 have been requested through the Rockville Office and will be forwarded. This smooth tidal data consists of hourly heights, the actual determining of smooth tide correctors and the smooth tide tape will be done by the processing office at AMC.

- F. JUNCTIONS - Sheet "C" junctions with sheet "B" (RH-20-2-70). Sheets "D" and "E" junction with each other.

H-9295 W.D. H-9296 W.D.

DESCRIPTIVE REPORT
TO ACCOMPANY
WIRE DRAG FIELD NUMBERS
~~RH-20-3-70 Sheet "C"~~
RH-20-4-71 Sheet "D" (H-9295 WD.)
~~RH-20-3-72 Sheet "E"~~
PROJECT OPR-480
DELAWARE BAY ENTRANCE
1970-1972
LCDR MERRITT N. WALTER
CDR JAMES COLLINS
NOAA SHIPS RUDE & HECK

A. AUTHORITY - This project was authorized under Project Instructions OPR-480 -- Wire Drag and Wire Sweep, Delaware Bay Entrance, ~~dated 25 June 1970; Amendment to Instructions dated 6 July 1970; Amendment to Instructions dated 13 July 1970; Memorandum to Director, AMC dated 16 October 1970; and subsequently superseded by Project Instructions dated 4 May 1971 and Amendment to Instructions dated 11 June 1971.~~ ✓

B. CHARACTER AND LIMITS OF THE WORK - The purpose of this project was to clear the sea lanes, including the buffer zones, off the entrance to Delaware Bay. This report covers Field Numbers RH-20-3-70, ✓ RH-20-4-71, ✓ and RH-20-3-72 ✓ (Sheets "C", "D", and "E" respectively). (H-9294 WD) (H-9295 WD) (H-9296 WD) ✓

The locality of the survey, covered by C&GS Chart 1219 is as follows: Sheet "C" is used to cover the eastern portion of the Cape Henlopen to Five Fathom Bank sea lane from latitude 38°52'N to 38°43'N and from longitude 74°50'W to 74°32'W. Sheets "D" and "E" were used to cover the Cape Henlopen to Delaware Lightship sea lanes: Sheet "D" covers the northwestern portion from latitude 38°41'N to 38°33'N and from longitudes 74°57'W to 74°40'W and Sheet "E" covers the southeastern portion from latitude 38°34'N to 38°25'N and from longitude 74°49'W to 74°31'W.

The entire survey was conducted on a scale of 1:20,000 using Raydist DR-S Navigational control. The effective depths covered by the survey are as follows: Sheet "C" had a minimum of 37 feet and a maximum of 75 feet; Sheet "D" had a minimum of 31 feet and a maximum of 80 feet; Sheet "E" had a minimum of 51 feet and a maximum of 80 feet. 78

C. CONTROL AND SHORELINE - Raydist control was utilized at all times on all three sheets. The Raydist was operating on a frequency of 3300.4 KHZ thus giving a lane width of 45.39904 meters. There was no shoreline on any of the sheets. ✓

Three Raydist shore stations - CHAP, COTTON PATCH II, and FEN were utilized to get adequate control for the three sheets. CHAP - (located on Cape Henlopen) was always used as the RED station. COTTON PATCH II (located south of Rehoboth Beach) and FEN (located on Fenwick Island) were both used as GREEN stations.

(~~Green~~ BLUE)

G. SPLITS: 1) SHEET "C": - There is one split on Sheet "C", directly west of "FA" buoy located at LAT 38°47'17"N LONG 74°45'32"W. This area was inaccessible due to numerous fishpots which were never moved. ✓

2) ^{H-9295 WD.} SHEET "D": ~~There is one small split on sheet "D" lying just outside the project limits at LAT 38°33'33"N LONG 74°47'42"W. This might affect the necessary overlap requirements.~~ There were two groundings that were not cleared, both were charted shoal areas. They are located at:

1) LAT 38°40'47"N LONG 74°55'20"W

2) LAT 38°40'59" N LONG 74°51'23"W

Area not claimed - sections of strip rejected

Sheet "E": There is one small split on sheet "E", just south of "LSD" Buoy. The split is located at LAT 38°27'12"N LONG 74°35'18"W:

H. GROUNDINGS AND SHOALS - See Attachment II. ✓

I. GENERAL NOTES: - Morning and evening RAYDIST calibrations at Lewes, Delaware were made by running the Lewes West Oil Factory Chimney - Fort Miles Observation Tower #8 range and turning the right angle to Harbor of Refuge Lighthouse.

When the ships docked at Cape May, New Jersey, calibration was accomplished in one of three ways: 1) Running the Cape May Harbor range and turning the right angle to the Loran Tower (STATION #755) 2) Running the Cape May Harbor range and turning the left angle to the Cape May Coast Guard West Tank (higher of two tanks, STATION #753) and 3) Taking a three point fix with a check angle using the following objects: Cape May Lighthouse (STATION #756) Cape May Coast Guard West Tank (STATION #753), LORAN TOWER (STATION #755), and Cape May Municipal Water Tank (STATION #750). The three point fixes were solved by computer on the WHITING. ✓

In addition to daily calibrations, frequent lane count checks were made on navigation buoys whenever practicable.

The distance from the Raydist antenna to the end buoy varied as follows: for a 800 ft. towline 265 meters and for a 1000 ft. towline 326 meters. The following occurrences should be noted when verifying these surveys:

SHEET C - On C day, (5 October 1970) 200 feet of extra wire was put out in the section between buoys #10 and #11, causing that section to be 800 feet instead of the regular 600 foot sections that were used that day.

D and E days, (6 and 8 October 1970) were spent doing reconnaissance hydrography, this should not be used for charting.

All work from 15 October 1970 through 23 October 1970 was rejected.

On N Day (19 June 1972), HECKS (End Vessel) gyro repeater went out between fixes 56N and 65N causing errors in bearings. The errors were corrected in the following manner: positions of both ships were plotted

using Raydist, and the bearing from the HECK to the RUDE was determined from these plotted positions. A corrector was determined by comparing this bearing with the bearing read on the gyro repeater when shooting the RUDE. This same corrector was applied to bearings taken from the HECK to the FAR buoy.

On Q Day, (26 June 1972) RUDE (Guide Vessel) lost three GREEN lanes after the work day ended, but while on the way to anchor out. On R day, (27 June 1972) in the morning before work began, RUDE went to "FA" buoy and set in the lane count that was previously determined for "FA" buoy. The RUDE then went on to normal drag operations. That same evening, after completing the days work, but prior to calibration the RUDE again lost lanes. This can all be verified by the sawtooth records. Accordingly, we have used the morning calibration on Q day for both Q and R days. The correctors for the RUDE are: -0.2 Red, -0.4 Green.

H-9295 WD
~~SHEET D~~ - On E Day (14 May 1971) at Fix 40E, F buoy broke loose causing the towline to be effectively lengthened by 600 feet or approximately 187 meters. ~~An 800 ft. towline was being used, thus the distance from the Raydist Antenna to the End buoy was originally 265 meters.~~ From fix 40E through 58E, this distance is now ⁴⁴⁸462 meters from the HECK (E.V.) antenna. ^{to buoy 12} On F Day (17 May 1972) at fix 50F, the HECKS (E.V.) Raydist failed, so single vessel control was utilized from fix 50F through 52F.

On N Day (1 June 1971) the HECK (E.V.) gained seven Green lanes prior to beginning work. This is verified by sawtooth record.

On AA Day (22 June 1971) the HECK (E.V.) Raydist failed, single vessel control was utilized on both strips I and II.

SHEET E: - A Day (25 April 1972) Sections N-1 and 15-F were rejected due to excessive lift. This was caused by strain on the end buoys while towing perpendicular to the current. As the current shifted more in the direction of the drag, the excessive lift subsided.

B Day (27 April 1972) HECKS (E.V.) Raydist was erratic, three red lanes were lost during the strip while green functioned properly. Since the green lanes represented the width measurement in the strip, the strip was claimed. Adjacent strips were run with double overlap insuring good coverage.

- J. CURRENTS - Drag strips planned with the use of C&GS Tidal Current and Tide Tables gave satisfactory results for wire drag. No other observations as to currents were made.
- K. DISCREPANCIES AND COMPARISON WITH PREVIOUS SURVEYS AND CHARTS - There was no item investigation on any of these sheets, so no comparisons are made as to location of wrecks.

The survey does agree with past surveys in the following manner: drag depths were planned using previous charts and generally the depths indicated by these charts were correct - many of our groundings were anticipated by using depths from previous charts.

- L. ✓ PERSONNEL & EQUIPMENT: - During the entire period covered by these three sheets, the RUDE & HECK acted as Guide Vessel and End Vessel respectively. The RUDE & HECK launches equipped with Raytheon DE-723 Fathometers were alternated as drag tenders. During calm weather, the RUDE & HECK skiffs were used as drag tenders. ✓

Bearings to end buoys and to opposite vessel were made on the Sperry Gyro Repeaters. Course headings are now recorded on every fix only. This differs from past policy of recording every 10° course change. It is felt that recording the course at each fix adequately defines the route followed by the ship.

Standard wire drag equipment was used throughout the survey.

Officers onboard during work on OPR-480 were:

1970-71 LCDR Merritt N. Walter, LT G.R. Schaefer, LTJG A.Y. Bryson, ENS. M.M. Ethridge. CDR James Collins also worked part of 1971 season.

1972 CDR James Collins, LCDR L.E. Pickens, LT A.Y. Bryson, LTJG M.M. Ethridge, ENS S.H. Manzo, ENS B.L. Wescott.

- M. ✓ MISCELLANEOUS - All work done on sheet C in 1970 was done on 60th meridian time. Sheet C was completed in 1972 using GMT. Sheets D and E use only GMT throughout the project. ✓

Four days were spent diving on the wreck "VENTURE" located near Breakwater Harbor but not on any of these boatsheets. The location was known from previous years, but a least depth was difficult to get with a leadline because of heavy currents. The wreck was relocated using sextant fixes and a least depth determined by using the "Bryson Gauge". The final results achieved on 3 May 1972 are: LAT 38°48'09"N, LONG 75°07'21"W with a least depth of 15.2 feet (already corrected for smooth tides.) The data for this work was included in the accordion folders for both sheet D and sheet E as well as in the daily journals for sheets D and E.

- N. ✓ RECOMMENDATIONS - The survey is considered adequate with respect to the wire drag requested. ✓

APPROVAL SHEET

All records of this survey prior to smooth plotting are hereby approved. The 1971-72 field work was personally supervised by the undersigned and the boat sheet and records were inspected daily. This survey is considered complete and adequate for charting. No additional field work is recommended.



CDR James Collins
Commanding Officer
NOAA Ships RUDE & HECK

LIST OF ATTACHMENTS

- I CONTROL SIGNALS

- II A.) GROUNDINGS AND HANGS - SHEET C
B.) GROUNDINGS AND HANGS - SHEET D (H-9295 W.D.)
C.) GROUNDINGS AND HANGS - SHEET E

- III FLOATING AIDS TO NAVIGATION

- IV A.) STATISTICS - SHEET C
B.) STATISTICS - SHEET D (H-9295 W.D.)
C.) STATISTICS - SHEET E

- V A.) DAILY RAYDIST CORRECTORS - SHEET C
B.) DAILY RAYDIST CORRECTORS - SHEET D (H-9295 W.D.)
C.) DAILY RAYDIST CORRECTORS - SHEET E

- VI ELECTRONIC CALIBRATION DATA

ATTACHMENT I

A. RAYDIST
CONTROL SIGNALS

STATION NAME	LATITUDE	LONGITUDE	REMARKS
CHAP	38°47'29.9108"N	75°05'23.9437"W	Located on Cape Henlopen - Not recoverable
COTTON PATCH II	38°34'46.64106"N	75°03'33.77434"W	Located South of Rehoboth - Recoverable by disc.
FEN	38°27'13.0889"N	75°03'13.2264"W	Located on Fenwick Island - Not Recoverable

B. CONTROL SIGNALS

NAME	STATION	SOURCE	YEAR	REMARKS
FACT	LEWES WEST OIL FACTORY CHIMNEY	G-13691	1962	LEWES RANGE
OBS 8	FT. MILES OBSERVATION TOWER #8	G-13691	1962	
HARB	HARBOR OF REFUGE LIGHT HOUSE	G-3016	1927	LEWES RIGHT OBJECT
REAR RAN	CAPE MAY HARBOR REAR RANGE	*SEE NOTE BELOW		CAPE MAY RANGE
FRONT RA	CAPE MAY HARBOR FRONT RANGE	*SEE NOTE BELOW		
755	LORAN TOWER (CAPE MAY U.S. COAST GUARD ELECTRONICS MAST I)	G-12973	1962	CAPE MAY RIGHT OBJ.
753	CAPE MAY COAST GUARD WEST TANK (TALLER TANK OF TWO)	G-10824	1969	CAPE MAY
756	CAPE MAY LIGHT HOUSE	G-1447	1957	CALIBRATION
750	CAPE MAY MUNICIPAL WATER TANK	G-12973	1962	OBJECTS

*NOTE: DATA CONCERNING THE LOCATION OF CAPE MAY RANGE HAS BEEN INCLUDED ALONG WITH OTHER DATA THAT HAS BEEN TRANSMITTED TO AMC FOR VERIFICATION. THE LOCATIONS ARE:

NAME	LATITUDE	LONGITUDE
REAR RANGE	38°57'31.285"N	74°52'42.660"W
FRONT RANGE	38°57'14.807"N	74°52'56.305"W

✓

ATTACHMENT II

GROUNDINGS AND HANGS

SHEET D H-9295 WP.

POS. NO. & DAY LETTER	BUOY NO.	LAT.	LONG.	GROUND EFF. DEPTH	CLEAR BY STRIP	CLEAR EFF. DEPTH	CHART DEPTH	REMARKS
✓ 80-83A	9-11	38°36'28"	74°44'54"	45-50 46	H-2	2 42	47	CHARTED SHOAL
✓ 59B	10	38°37'26"	74°48'52" ⁰	77				BUOY "DB" HANG N to 5
✓ 11-20E	N-3 Vicinity of	38°38'11"	74°48'08" ⁶	60-55 56	A-1	52	54	CHARTED SHOAL
✓ 30-58E	N-3 Vicinity of	38°39'25" ^{40' 00"}	74°49'22" ^{50' 00"}	58 5	A-1	38-52	60 46	CHARTED SHOAL
Rejected 8-15G	2-7	38°38'10"	74°48'30"	52	A-1	52	60	TWO ADJAC- ENT INCLIN- ED SECTIONS CAUSED DEEP UPRIGHT WIT SHOAL EFF. DEPTH CL
✓ 33G	7-8	38°37'56"	74°50'48"	70 69	W-1	9 62	72 to 90 77.5	N to 5 WRECK 5' OFF BOTTOM
✓ 21-23H	5-7	38°37'10" ^{07"}	74°47'37"	56-67 66	Q-1 L-1	49-59 62	54-67	CHARTED SHOAL
✓ 23-26K	N-2	38°36'13"	74°46'50"	66	R-1	61	63	CHARTED SHOAL
✓ 9M	3-4	38°37'26"	74°48'51"	78 7				BUOY "DB" HANG
Rejected 7-9Q	7-8	38°37'10"	74°47'37"	61	Q-1	59	54	CHARTED SHOAL
disregard 15-20Q	7-8	38°37'20"	74°48'00"	59-60	H-1 E1	66 61 75	66	PHANTOM SHOAL
✓ 26-27R	5-6 Vicinity of	38°36'43"	74°46'59"	53-61	Y-II	54 3	58	CHARTED SHOAL CL N to 5
✓ 31T 28	11-12	38°34'52" ¹	74°44'52" ⁴	55	U-I	54	60-62	WRECK
✓ 1-3Y	7	38°40'47" ⁵	74°55'20"	52-61	Not cleared	55-64	59	CHARTED SHOAL
✓ 14-7AA	N-24 Vicinity of	38°40'59" ^{1 00"}	74°51'23" ^{30"}	77	Not cleared		80-77	CHARTED SHOAL

ATTACHMENT III

FLOATING AIDS TO NAVIGATION

~~A. SHEET C~~

NAME	LATITUDE	LONGITUDE
Buoy "LSFF"	38°47'25"N	74°35'25"W
Buoy "FA"	38°47'23"N	74°44'12"W

B. SHEET D H-9295 WD

NAME	LATITUDE	LONGITUDE
Buoy "DB"	38°37'26"N	74°48'52"W
Buoy "DA"	38°32'27"N	74°41'55"W (Transferred from H-9296 WD (1971-72))

~~C. SHEET E~~

NAME	LATITUDE	LONGITUDE
BUOY "LSD"	38°27'22"N	74°35'12"W

NOTE: These locations were determined by taking RAYDIST readings at the site of each buoy.

ATTACHMENT IV

STATISTICS

SHEET D H-9295 WP

DATE	DAY LETTER	STRIP	VOL NO.	POSITIONS	L.N.M.	S.N.M.
10 MAY 71	A	I	I	105	7.62	9.71
11 MAY 71	B	I	I	59	4.7	6.0
12 MAY 71	C	I	I	29	1.3	1.8
13 MAY 71	D	TESTER VOLUME				
14 MAY 71	E	I	I & II	58	3.8	3.1
17 MAY 71	F	I	II	31	2.0	2.0
	F	II	II	220		
18 MAY 71	G	I	II	16	1.1	0.8 Rejected
	G	II	II	17	0.8	1.5
19 MAY 71	H	I	II	27	2.4	1.7
	H	II	II	9	0.9	0.6
21 MAY 71	J	I	II	56	4.5	5.4
24 MAY 71	K	I	II & III	576	4.8	5.3
26 MAY 71	L	I	III	35	2.0	2.2
27 MAY 71	M	I	III	09	0.7	0.4
1 JUN 71	N	I	III	36	2.3	2.5
2 JUN 71	P	I	III	384	3.6	3.0
3 JUN 71	Q	I	IV	11	1.1	0.6 Rejected
	Q	II	IV	22	1.0	1.1
4 JUN 71	R	I	IV	55	3.7	3.1
7 JUN 71	S	I	IV	55	4.3	5.2
		II	IV	10	0.5	0.2
8 JUN 71	T	I	IV	33	1.9	2.9
9 JUN 71	U	I	IV & V	53	4.2	5.5
10 JUN 71	V	TESTER VOLUME				
11 JUN 71	W	I	V	48	3.5	3.2
17 JUN 71	X	TESTER VOLUME				
18 JUN 71	Y	I	V	28	2.4	3.1
		II	V	11	1.4	0.8
21 JUN 71	Z	I	V	23	1.8	1.3
22 JUN 71	AA	I	V	18	1.3	0.7
		II	V	37	2.8	2.4
23 JUN 71	BA	I	VI	20	1.6	1.0
24 JUN 71	CA	I	VI	56	5.0	5.9
28 JUN 71	DA	I	VI	11	1.1	0.3
21 APR 72	EA	I	I	13	0.9	0.6
		II	I	51	3.4	4.4
TOTALS					22 84.42	69 88.31

ATTACHMENT V

DAILY RAYDIST CORRECTORS
SHEET D
1971-72

DATE	DAY LETTER	RUDE		HECK	
		RED	GREEN	RED	GREEN
5-10-71	A	-0.2	+0.2	-0.2	+0.4
5-11	B	+0.2	-6.9	+0.1	+0.4
5-12	C	+0.1	+0.6	0.0	-0.5
5-13	D	VENTURE			
5-14	E	+0.1	+0.5	-1.9	-0.4
5-17	F	-0.2	+0.4	-0.3	-0.5
5-18	G	0.0	-0.6	-0.1	+0.5
5-19	H	+0.1	+0.6	0.0	-0.1
					Prior to calibration HECK added 0.5 on green.
5-21	J	-1.0	-0.6	-1.2	-0.4
5-24	K	+0.2	-0.1	+0.1	+0.4
5-26	L	+0.1	-0.1	+0.2	-0.8
5-27	M	+0.2	+0.5	+0.2	0.0
6-1	N	+0.1	+0.2	0.0	-7.0
					Prior to L. ^{gamed} B. lost 7 lanes
6-2	P	+0.1	-0.5	+0.1	-1.0
6-3	Q	+0.1	-0.6	+0.1	0.0
6-4	R	+0.1	+0.1	RAYDIST OUT	
		to cal. RUDE added 0.1 Red 0.5 Green			
6-7	S	+0.2	0.0	0.0	+0.7
6-8	T	0.0 +0.2	-0.2 +0.1	+0.2 0.0	+0.1 -0.2
6-9	U	+0.3	+0.1	0.0	-0.2
6-10	V	VENTURE			
6-11	W	+0.1	+0.7	-0.1	-0.4
6-17	X	VENTURE			
6-18	Y	+0.4	+0.2	+0.1	+0.7
6-21	Z	+0.3	+0.2	+0.1	-0.1
6-22	AA	+0.3	+0.1	SINGLE VESSEL CONTROL	
6-23	BA	-0.2 +0.1	-0.5 -0.1	+1.0 -0.2	-1.0 -0.5
6-24	CA	+0.2	+0.5	-0.1	-0.6
6-28-71	DA	+0.4	-1.0	0.0	-0.7
21 APRIL 72	EA	-0.3 +0.4	+0.1 -0.1	+0.4 -0.3	-0.1 +0.1



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

Date: 25 July 1972

Reply to
Attn of:

Subject: Lewes, Delaware Tidal Data

To: Director, Atlantic Marine Center
Attn: CAM3

The enclosed tidal data for Lewes, Delaware for April and May 1972 is to be included with data transmitted on 14 July 72 for OPR-480. Include 1 copy each for sheets RH-20-3-70, RH-20-4-71, and RH-20-3-72.
(H-9295 W.D.)

James Collins
James Collins
Commanding Officer
NOAA Ships RUDE & HECK

Envelope

⑤
②

Pipe line

6/2/75

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): Lewes, Delaware

Period: May 10-June 28, 1971 and April 21, 1972

HYDROGRAPHIC SHEET: H-9295 WD

OPR: 480 WD

Locality: Cape Henlopen to Delaware Traffic Lane

Plane of reference (mean ~~lower~~ low water): 2.5 ft.

Height of Mean High Water above Plane of Reference is 4.1 ft.

Remarks: Recommended zoning:

Apply - 67 minutes time correction to Lewes.

The following revisions to tide correctors were entered into the volume by the Tide Branch
1. CA day (vol. 6) Positions 44-54 revised to -0.5
55-58 " " -1.0

James R. Hubbard

Chief, Tides Branch
for



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

Date: July 18, 1972

File to
file of: C3312-228-NOAAD

Subject: Lewes, Delaware Tidal Data

To: Commanding Officer
NOAA Ships RUDE & HECK

Enclosed are copies of hourly heights for Breakwater Harbor, Lewes, Delaware for the months of April and May 1972. The June 1972 marigram is not yet available for processing.

Time corrections for the three working areas are as follows:

1. Eastern section of the Cape Henlopen-Five Fathom Bank sea lanes, 40-55 minutes earlier than Lewes. 47.5
2. Northwestern section of the Cape Henlopen-Delaware sea lanes, 40-55 minutes earlier than Lewes.
3. Southeastern section of the Cape Henlopen-Delaware sea lanes, 60-75 minutes earlier than Lewes. 67.5

Should you wish to compute or check time correction, paragraphs 253 and 254 of the Manual of Tide Observations are used.

Saul C. Berkman

Saul C. Berkman
Acting Chief
Processing Section
Tides Branch
Oceanographic Division

Enclosures

VERIFICATION OF SMOOTH TIDES

SURVEY H- 9295

PLANE OF REFERENCE
 TIME MERIDIAN
 HEIGHT DATUM ON STAFFS

MLW OR MEEW *Zulu used for*
75 W Hourly heights 00 Smooth tides
 1. 2.54 2. 3.

TIDE STATIONS	POSITION	TYPE GAGE	TIME CORR.		HEIGHT CORR. *	
			H.W.	L.W.	H.W.	L.W.
1. Breakwater Harbor, Lewes, Del	Ø 38 47' Y 75 06'	standard	-0.67	-0.67	0.0	0.0
2.	Ø Y		- 67 min - 67 min			
3.	Ø Y					

HOURLY HRIGHTS FROM ROCKVILLE OFFICE
 FROM FIELD MARIGRAMS

VERIFIED BY: Rockville office

TIDE ZONING NOT APPLICABLE
 BY COMPUTER
 FROM TWO OR MORE GAGES

LIMITS AND DESCRIPTION OF ZONING METHODS

TIDE CORRECTIONS COMPILED BY COMPUTER
 MANUALLY

VERIFIED BY: BJS
 VERIFIED BY:

HEIGHT OF MHW ABOVE PLANE OF REFERENCE Vols.

TIDE CORRECTIONS VERIFIED ON SOUNDING BY: BJS

DATE OF VERIFICATION 2/26/73

*OR RATIO

EXAMINED & APPROVED

ATLANTIC MARINE CENTER

PROJECTION PARAMETERS

POLYCONIC OR MODIFIED TRANSVERSE MERCATOR

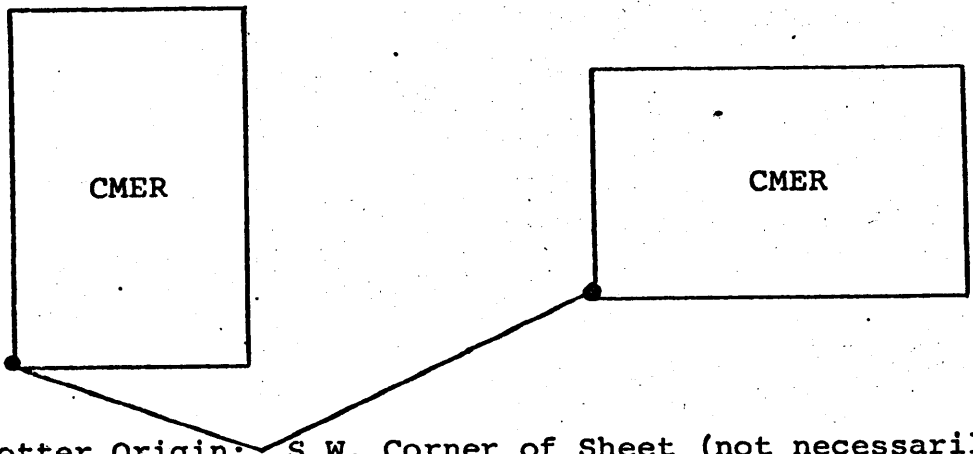


- 1. Project No. OPR-480
- 2. Reg. No. H-9295 WD
- 3. Field No. RH-20-1-71
- 4. Requested By VERIFICATION
- 5. Ship or Office _____
- 6. Date Required ASAP

- 7. Polyconic Modified Transverse Mercator
- 8. Central Meridian of Projection 74 ° 48 ' 00 "
- 9. Survey Scale: 1: 20,000

- 10. Size of Sheet (check one):
 36 x 54 36 x 60 Other Specify _____

- 11. Sheet Orientation (check one):
 NYX = 1 NYX = 0
 N N



- 12. Plotter Origin: S.W. Corner of Sheet (not necessarily a grid intersection)
 Latitude 38 ° 31 ' 40 "
 Longitude 74 ° 56 ' 50 "

- 13. G.P.'s of triangulation and/or signals attached
- 14. Material Desired: Tracing Paper Mylar
 Smooth Sheet Other Specify _____

15. Remarks: _____

Object # OPR-480 2. Reg. # H-9295 WD 3. Field # RH-20-4-71

.. Type of Control: RAYDIST (Hi-Fix, Raydist, EPI, etc.)

5. Frequency 3300.4 ^{KHz} (for conversion of electronic lanes to meters)

6. Mode of Operation (check one):

Range-Range

Range-Visual

Range One (R₁)
Station I.D. CHAP
Range Two (R₂)
Station I.D. COTTON PATCH II

Lat. 38° 17' 29.9108"
Long. 75° 05' 23.9473"
Lat. 38° 34' 46.64106"
Long. 75° 03' 33.77434"

Hyperbolic (3-station)

Hyper-Visual

Slave One
Station I.D. _____
Master
Station I.D. _____
Slave Two
Station I.D. _____

Lat. _____° _____' _____"
Long. _____° _____' _____"
Lat. _____° _____' _____"
Long. _____° _____' _____"
Lat. _____° _____' _____"
Long. _____° _____' _____"

7. Location of Survey:

Range-Range Imagine an observer is standing at R₁ Station and looking directly at R₂ (check one):

Survey area is to observer's Right A=β

Survey area is to observer's Left A=1

Hyperbolic Looking from survey area toward Master Station:

Slave One must be to observer's Left;

Slave Two must be to observer's Right.

8. This form is submitted as an aid in preparing a boat sheet.

This form applies to all data on this survey.

This form applies to part of the data on this survey.

Vessel EDP #	From Time Day	To Time Day	Position Numbers (inclusive)
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____

9. Remarks: _____

GEOGRAPHIC NAMES

H-9295 W.D.

Name on Survey	<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">A ON CHART NO. 1219</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">B ON PREVIOUS SURVEY NO.</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">C ON U.S. QUADRANGLE MAPS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">D FROM LOCAL INFORMATION</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">E ON LOCAL MAPS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">F P.O. GUIDE OR MAP</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">G RAND McNALLY ATLAS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">H U.S. LIGHT LIST</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">K</div> </div>											
	A	B	C	D	E	F	G	H	K			
ATLANTIC OCEAN	X											1
Delaware Bay	X											2
Indian River Inlet	X											3
												4
												5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved by
 Ches. G. Harrington
 Staff Geographer
 29 May 1974

FORM C&GS-946
 (REV. 11-65)
 (PREP. BY
 HYDROGRAPHIC
 MANUAL 20-2,
 6-94, 7-13)

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

HYDROGRAPHIC SURVEY STATISTICS
 HYDROGRAPHIC SURVEY NO. H-9295WD

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET & A&D Sheet		1	BOAT SHEETS		2	
DESCRIPTIVE REPORT		1	OVERLAYS			
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAMERS						1
VOLUMES	14 WIRE DRAG & 3 TENDER RECORDS					2000
BOXES						1
T-SHEET PRINTS (List)						
NA						
SPECIAL REPORTS (List)						
NA						

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				2230
POSITIONS CHECKED			10	183
POSITIONS REVISED			1	40
DEPTH SOUNDINGS REVISED			NA	NA
DEPTH SOUNDINGS ERRONEOUSLY SPACED			NA	NA
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED			NA	NA
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS			0	NA
JUNCTIONS			6	
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS			0	NA
PROCESSING RECORDS & LOGGING	83		0	
TRANS. & SUB-DIV. W.D. STRIPS	154	64	86	
TOTALS	237	64	92	

PRE-VERIFICATION BY B. J. STEPHENSON	BEGINNING DATE 2-23-73	ENDING DATE 6-12-73
VERIFICATION BY B. T. DAVIS	BEGINNING DATE 8-1-73	ENDING DATE 8-20-73
REVIEW BY <i>K. W. Wellman</i>	BEGINNING DATE 5-20-75	ENDING DATE 7-3-75

Checked: P. R. ENGLE

OFFICE OF MARINE SURVEYS AND MAPS
MARINE SURVEYS DIVISION
HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-9295 W.D.

FIELD NO. RH-20-4-71 WD

Delaware, Approaches to Delaware Bay, East of Indian River Inlet

SURVEYED: May 10 - June 28, 1971; April 21, 1972

SCALE: 1:20,000

PROJECT NO.: OPR-480

SOUNDINGS: Wire Drag

CONTROL: Raydist
(Range-Range)

Chief of Party	M. N. Walter
.....	J. Collins
Surveyed by	G. R. Schaefer
.....	A. Y. Bryson
.....	M. M. Ethridge
.....	S. H. Manzo
.....	B. L. Wescott
Automated Plot by	Calcomp Plotter 618 (AMC)
Drag Strips Subdivided by	B. J. Stephenson
Verified by	B. J. Stephenson
.....	B. T. Davis
Reviewed by	K. W. Wellman
.....	July 3, 1975
Inspected by	D. R. Engle

A. Purpose of the Survey

The purpose of this survey is to clear the sea lanes, including buffer zones, off the entrance to Delaware Bay.

B. Shoreline and Control

No shoreline is shown on this offshore survey.

The source of control for this survey is adequately described in the Descriptive Report.

C. Junctions

An adequate junction was effected with H-6342 W.D. (1938) on the northeast. The junction with H-9296 W.D. (1972) on the south was considered during the review of that survey. No other wire drag surveys junction with the present survey.

D. Comparison with Hydrographic Surveys

A comparison between H-6272 (1937) and the present survey reveals a 68-foot sounding in latitude $38^{\circ}38.86'$, longitude $74^{\circ}49.08'$ in conflict with a cleared depth of 70 feet on the present survey. This sounding is considered disproved by the deeper cleared depth on the present survey and should therefore be disregarded in future charting. There are no other conflicts between the present survey and H-6272 (1937).

Effective depths on the present survey are in agreement with H-9175 (1970) and H-9136 (1970).

E. Comparison with Chart 12214 (formerly 1219), latest print date March 8, 1975

1. Hydrography

There are no conflicts between the charted soundings and the effective wire drag depths on the present survey.

Attention is directed to the following:

a. The nondangerous submerged wreck charted in latitude $38^{\circ}34.50'$, longitude $74^{\circ}41.50'$ originates with the Navy Wreck List of 1957. It was cleared to an effective depth of 54 feet on the present survey.

b. The wreck and cleared depth of 54 feet charted in latitude $38^{\circ}34.90'$, longitude $74^{\circ}44.90'$ originates with the verified smooth sheet of the present survey. During review, however, its position was revised. The charted position should be revised to agree with the reviewed smooth sheet of the present survey.

2. Aids to Navigation

The aids to navigation on the present survey are in substantial agreement with their charted positions and adequately mark the intended feature.

F. Condition of Survey

1. Field Work

The field work is satisfactory.

2. Records

The records are complete.

3. Descriptive Report

The Descriptive Report is complete and comprehensive.

4. Field Plotting

The survey is accurately and neatly smooth plotted.

G. Compliance with Project Instructions

This survey adequately complies with the Project Instructions.

H. Additional Field Work

This is a good wire drag survey and no additional field work is recommended. However, during future wire drag work in the area, the wreck discussed in section E.1.a. above should be located and the least depth of water over it should be determined.

I. Miscellaneous

1. The verifier failed to obtain the tide note (form 712) thus necessitating an examination of the survey records by the Tides Branch as a condition to its acquisition during review. As a consequence of the reexamination, tide correctors were revised as indicated on the tide note (form 712) in the Descriptive Report, necessitating appropriate revisions to the smooth and A&D sheets.

2. Buoy "DA" was not located on the present survey. It was transferred to the present survey from H-9296 W.D. (1972).

Examined and Approved:

A. J. Patril
Chief
Marine Surveys Division

Robert C. Munson
Associate Director
Office of Marine Survey
and Maps

74° 40'

38° 40'

9176

F.E.No.9
W.D.
1950

F.E.No.9
W.D.
1950

6344

9175

6342
W.D.

9295
W.D.

6349

4944

9296
W.D.

Number

- 4858
- 4859
- 4870
- 4875
- 4939
- 4940
- 4942
- 4944
- 5349
- 5350
- 6224
- 6264
- 6272
- 6342 W.D.
- 6344
- 6345
- 7035
- F.E.No.9: SOWD
- F.E.No.1: S1 W.D.
- F.E.No.2: S1 W.D.
- F.E.No.12: S1
- 8596 AW
- 8710
- 9173 W.D.

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. M-9295 W.D.

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
1219	5-27-74	Ralph B. Ross	Full Part Before After Verification Review Inspection Signed Via Drawing No. 39 - Revised wrecks (2)
1000	7-11-74	J. Bailey	Full Part Before After Verification Review Inspection Signed Via Drawing No. 51 Exam. for critical corr. Revised wrecks (2)
1109	12-27-74	D. Napier	Full Part Before After Verification Review Inspection Signed Via Drawing No. Exam for CRITICAL CORR. Appd (2) Wrecks
1219	11/9/76	Paul L. France	Full Part Before After Verification Review Inspection Signed Via Drawing No. Removed non-dangerous wreck from chart and applied 1541 in same position
1109	12/21/76	Joseph Prime	Full Part Before After Verification Review Inspection Signed Via Drawing No. Applied corrections thru 1219
13003	2-14-80	Ed Martin	^A Full Part Before After Verification Review Inspection Signed Via Drawing No. 61 Apply Adequately Applied, no further processing required, after exam
			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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