

# 9136

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-20-4-70  
Office No. HL-9136

### LOCALITY

State Delaware  
General Locality Delaware Bay Entrance  
Locality Rehoboth Beach to Indian River Inlet

19 70

CHIEF OF PARTY

M. J. Umbach

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411 -

9136

**HYDROGRAPHIC TITLE SHEET**

H-9136

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-20-4-70

State Delaware

General locality ~~Rehoboth Beach, Delaware~~ Delaware Bay Entrance

Locality ~~Delaware Bay~~ Rehoboth Beach to Indian River Inlet

Scale 1 : 20,000 Date of survey 19 June 1970-- 9 Sept. 1970

Instructions dated 28 May 1970 Project No. OPR-492

Vessel NOAA Ship Whiting

Chief of party CDR. Melvin J. Umbach

\* DDR. M.J. Umbach, LCDR. J.W. Carpenter, LT. G.L. Boyack, LTJG L.T. Gillman  
Surveyed by LTJG P.L. Campbell, ENS. D.W. Nostrant, CST W.A. Hill

Soundings taken by echo sounder, hand lead, pole Echo Sounder

Graphic record scaled by \* (Ship Personnel)

Graphic record checked by \* AMC Personnel

Protracted by N/A Automated plot by AMC (Calcomp Plotter No. 618)

Soundings penciled by \*

Soundings in fathoms feet at MLW ~~MLW~~ Feet, MLW

REMARKS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Applied to table 7/25/70

CHT  
Hill  
1109  
1219

\_\_\_\_\_

8WW 8/25/72

DESCRIPTIVE REPORT

TO ACCOMPANY

HYDROGRAPHIC SURVEY H-9136

SCALE 1:20,000

19 June 1970 to 9 September 1970

COAST OF DELAWARE

OPR-492

USC&GSS WHITING

CDR. MELVIN J. UMBACH, USESSA, COMMANDING

⑤

A. PROJECT

The USC&GSS WHITING accomplished this survey in accordance with the Project Instructions and First Amendment to Instructions for OPR-492 dated 28 May 1970 and 15 July 1970, respectively.

B. AREA SURVEYED

The area surveyed extends northward from Indian River Inlet, Delaware seven and one-half miles to Rehoboth Beach, Delaware. It extends seaward from the Delaware coast into the Atlantic Ocean seven and one-half miles at Indian River Inlet and three miles off Rehoboth Beach. See the attached sketch showing the boat sheet location.

The survey commenced on 19 June 1970 and was concluded on 9 September 1970.

The boat sheet junctions on the north with ~~H-7035, 1962, scale 1:10,000~~, WH-10-1-70<sup>H-9154</sup> and WH-10-2-70<sup>H-9174</sup>, Launch 1257. It junctions to the east with H-~~6272, 1957~~, scale 1:40,000 and to the south with H-8710, 1962<sup>H-8592 (Am. 6)</sup>, scale 1:10,000 and USC&GSS Chart ~~1219~~, scale 1:80,000. Detached soundings on the boat sheet in blue are from prior surveys H-4093, 1919, scale 1:40,000 and H-4164, 1920, scale 1:40,000.

H-9176(1970) (Wh-10-3-70)  
See section 5 of the Review Report ←

C. SOUNDING VESSEL

The sounding vessels were the USC&GSS WHITING and her two launches WH-1 and WH-2.

D. SOUNDING EQUIPMENT

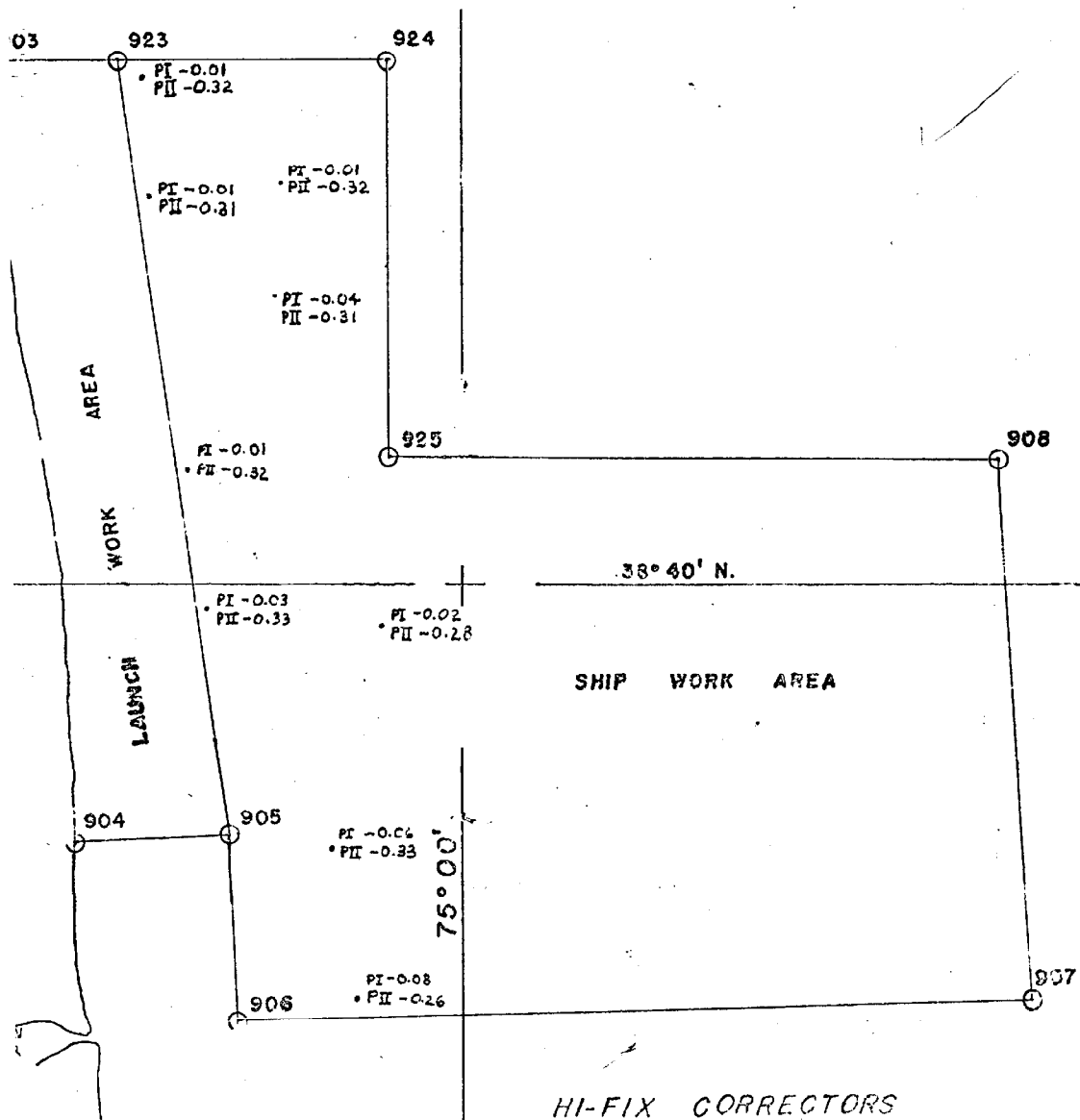
The area offshore more than one mile was surveyed using the Ship WHITING. The two launches surveyed the inshore portion of the boat sheet. (Refer to the boat sheet layout sketch.)

The Ship WHITING used the Ross Digital Depth Sounder number 601. Launch #1, WH-1, used Raytheon DE-723D survey fathometer number 37019. Launch #2, WH-2, used DE-723D survey fathometer number 37018.

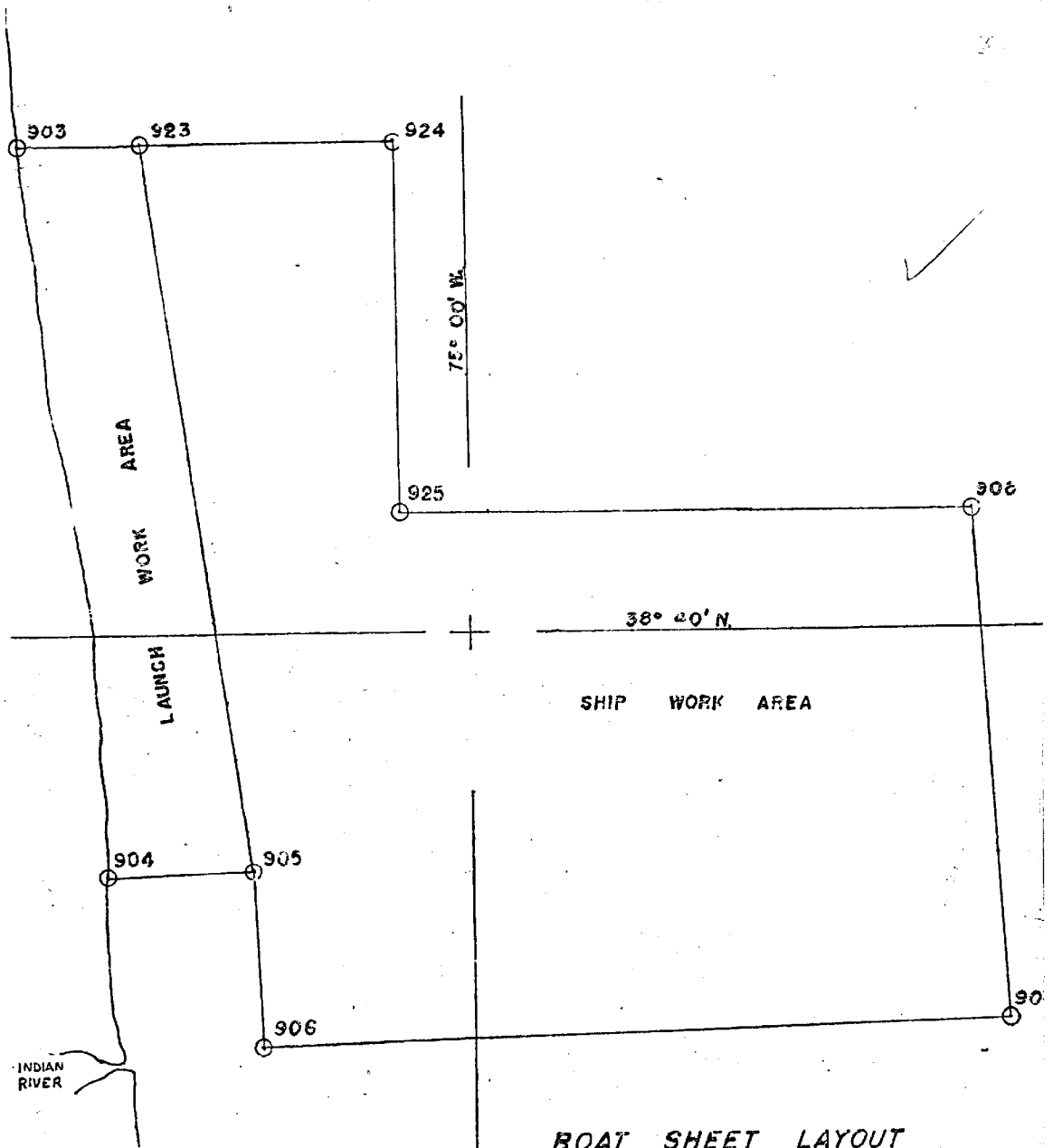
Sounding corrections for the launch's equipment were determined by daily bar checks and lead line comparisons. The launch fathometer operators continually checked for proper initial settings, stylus arm length, sensitivity anomalies, and A-F scale comparisons. The ship's fathometer corrections were determined from TDC casts made on the working grounds in water as deep as that encompassed during the survey.

E. SMOOTH SHEET

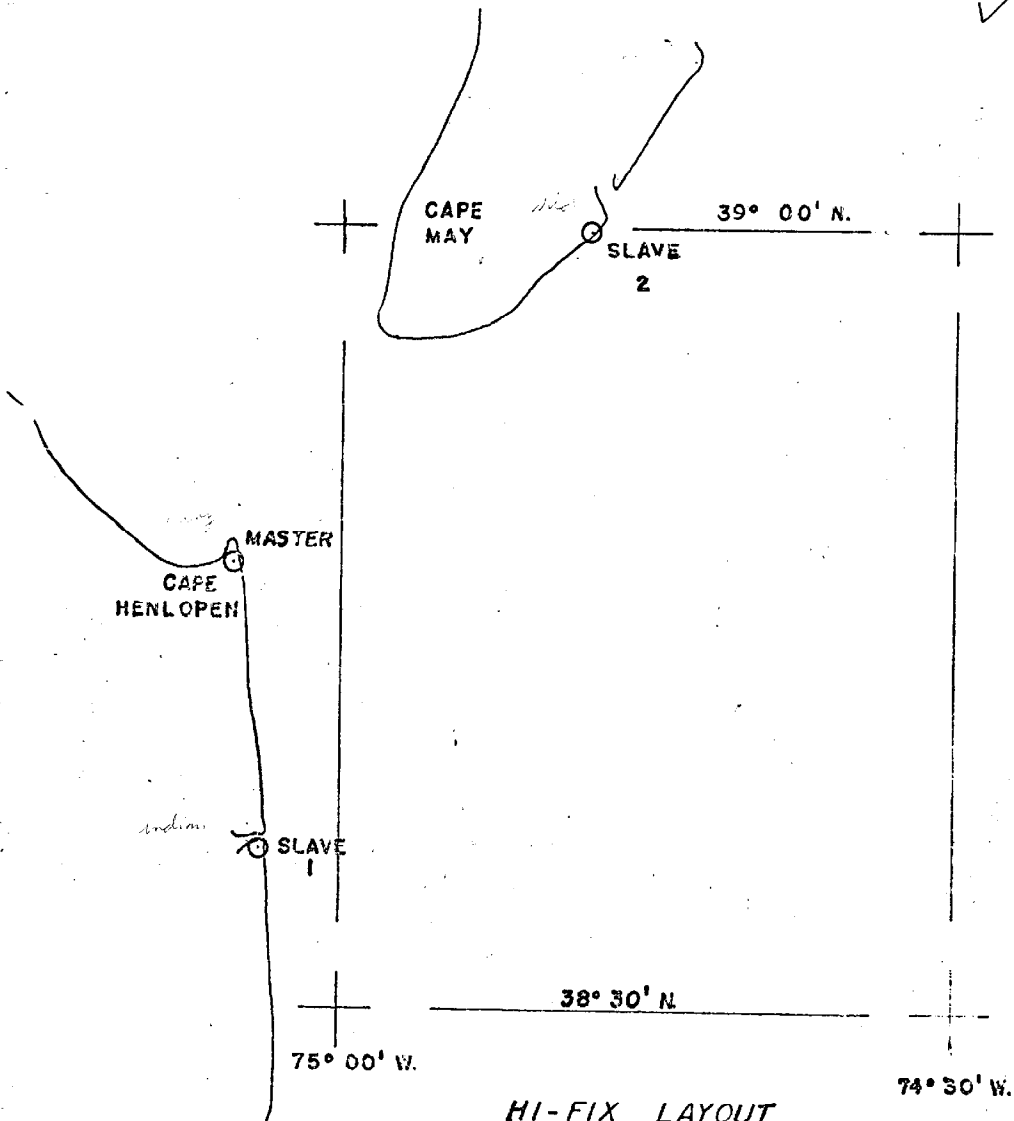
The smooth sheet will be plotted on the computer plotter system



HI-FIX CORRECTORS  
 WH-20-4-70  
 OVERLAY TO C & GS CHART 1219  
 NOAA SHIP WHITING  
 PROJECT OPR-492  
 DELAWARE BAY  
 CDR. M.J. UMBACH, COMDG.



**BOAT SHEET LAYOUT**  
 WH-20-4-70  
 OVERLAY TO C & GS CHART 1219  
 NOAA SHIP WHITING  
 PROJECT OPR-492  
 DELAWARE BAY  
 CDR. M.J. UMBACH, COMDG.



HI-FIX LAYOUT  
 OVERLAY TO C & GS CHART 1109  
 NOAA SHIP WHITING  
 PROJECT OPR-492  
 DELAWARE BAY  
 CDR. M.J. UMBACH, COMDG.

②

at the Atlantic Marine Center, Norfolk, Virginia.

#### F. CONTROL

The Ship WHITING surveyed the offshore portion of the boat sheet. HI-FIX in its hyperbolic mode, electronically controlled the WHITING's position. ✓

Mr. J. D. Shea located the HI-FIX stations using third order methods. Their positions follow:

<u>Station</u>	<u>Name</u>	<u>Latitude</u>	<u>Longitude</u>
Master	Navy	38°47'17.199"N.	75°05'20.839"W.
Slave 1	Indian	38°36'18.672"N.	75°03'41.663"W.
Slave 2	Wild	38°59'41.459"N.	74°47'44.148"W.

(See the HI-FIX station layout sketch) 1799.6 kHz

The Ship's survey personnel calibrated the HI-FIX daily or at any time when discrepancies were suspected by comparing visual and electronic positions.

The Delaware coast extends seaward over the baseline from the master HI-FIX station to slave 1. Numerous calibrations indicated the "land mass" problem in the inshore portion of the boat sheet. The launches conducted the inshore portion of the survey using visual control. Mr. Joseph Wilson's photogrammetry party number 62 located visual signals using third order traverse methods. A list of signals appears in the appendix.

#### G. SHORELINE

Civilians swimming and fishing along the beach prohibited a zero depth curve survey. Fishing and surfing were common during daylight hours, preventing early morning or late afternoon survey of the low water line. The launches did, however, survey six and twelve foot depth curves. See section No. 2 of the Review  
*LWL is close inshore* ✓

Launch personnel located eleven shoreline jetties.

#### H. CROSSLINES

Crossline mileage amounted to 10.0% of the main sounding system of lines. Crosslines and main system lines showed excellent agreement; they checked within one foot. ✓

#### I. JUNCTIONS

All junctions are good to excellent. ✓

#### J. PRESURVEY REVIEW ITEMS

Item 1F, the wreck of the Marion O'Boyle at latitude 38°37.95'N., ✓



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longitude 74°55.55'W. was not found. In accordance with the project instructions, no specific investigation was made. See Review sect. 7-A-1

Item 5, Fish Haven obstruction wreck, latitude 38°36.94'N., longitude 74°55.88'W. with a reported depth of 36 feet was developed at ten meter spacing. The WHITING located the wreck at latitude 38°36'56"N., longitude 74°55'48"W., with a least depth of <sup>59</sup>49 feet in 64 feet of water. The WHITING found it ten seconds prior to fix #5490 on 190 day, 9 July 1970. The fish haven does not exist, and the area near the wreck charts deeper than the surrounding area. The hydrographer recommends the symbol be removed and replaced by 49 wk as indicated on the boat sheet because of the close line spacing. The fish haven indication should not be removed since authorized facilities may dump in that area. Retain as presently charted. See Review sect. 7-A-2

The launches investigated Item 22, the Obstruction Fish Haven charted at latitude 38°38'51"N., longitude 75°03'00"W., splitting it at 25 meter spacing. No indication of the fish haven or obstruction exists. The hydrographer recommends the fish haven remain charted due to the possibility of future dumping in the area. Concur

All but two of the dashed-circled pre-survey review depths in the common area were located, should be considered superseded by the present survey.

*charted in lat. 38°36.78' long. 74°59.75'*

The 39 foot sounding was not located. The WHITING split the area at 25 meter spacing. The area's shoalest depth is of 42<sup>3</sup> feet. ~~occurred at latitude 38°37'43"N., longitude 74°59'39"W. on 192 day, 11 July 1970, 30 seconds before fix #5735.~~ The soundings from positions #5727-5729 and 5734-5735 have been plotted on the boat sheet. The remainder of the information concerning this development is on the electronic master tape. The hydrographer recommends the 39 foot sounding be deleted from the chart. Concur

The WHITING did not locate the 31 foot sounding at latitude 38°40.7'N., longitude 74°58.2'W. A 25 meter spacing development found a shoalest depth of 36<sup>8</sup> feet. This occurred on 192 day, 11 July 1970. No data between positions 5697 and 5726 is plotted because it yields redundant soundings. It remains on the electronic master tape. The hydrographer recommends removal of the 31 foot sounding. Concur

#### K. COMPARISON WITH THE CHART

Good agreement exists between this survey and the charts.

C&GS Chart 1219 shows a wreck at latitude 38°42'00"N., longitude 75°04'00"W. C&GS chart 411, scale 1:40,000 does not indicate a wreck at that position. The wreck is not a pre-survey review item. The area, however, was surveyed at 20 meter spacing. Nothing was found. ~~The hydrographer recommends the deletion of the wreck from all charts.~~ See Review sect. 7-A-1 (Chart 1219 is a wreck chart.)

The wreck charted on C&GS Chart 1219 at latitude 38°41'36"N., longitude 75°00'49"W. is not a pre-survey review item. In accordance with the project instructions, no specific search was made to locate it. The hydrographer recommends that C&GS Chart 411 be corrected to include this wreck. Concur ✓

L. ADEQUACY OF SURVEY

The completeness and adequacy of this survey should supersede any prior surveys for charting purposes. ✓

M. AIDS TO NAVIGATION

The WHITING on 19 June 1970 located Hen & Chicken Shoals Lighted Whistle Buoy LHC at latitude 38°42'26"N., longitude 75°00'00"W. and Indian River Inlet Lighted Gong Buoy 1 at latitude 38°36'34"N., longitude 75°02'46"W. Buoy LHC is shown on H-9176 (1970) ✓

The tower shown on Charts 1219 and 411 at latitude 38°38'41"N., longitude 75°04'04"W. no longer exist and its deletion is recommended. Concur

N. STATISTICS

<u>Vessel</u>	<u>Miles of Sounding Line</u>	<u>No. of Positions (Numbers)</u>	<u>Sq. Mi. Area</u>
WHITING	585.1	1767(4000-5768) No 5261 & 5262	43.4
WHITING		9901-9978 (78 B.S.)	
LCH #1	155.7	769(1000-1773) No 1551-1552, 1241-1243	5.3
LCH #2	44.7	268(2000-2267) 2901-2918(18 B.S.)	1.8

O. REFERENCE TO REPORTS

1. OPR-492 Fathometer Report ✓
2. OPR-492 Hi-Fix Report
3. Fathograms, listings and brush recordings
4. Velocity tables ✓
5. Hi-Fix Correctors
6. Smooth Tide listings
7. List of Signals ✓
8. Parameter tape listing ✓

HYDROGRAPHIC SIGNALS  
OPR-492 1970  
Delaware Bay

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300	38 36 2380	075 03 5304	HAPPY, 1962
301	38 36 3267	075 03 4674	INDIAN RIVER COAST GUARD TOWER, 1962
302	38 37 5525	075 03 5806	
303	38 38 0114	075 04 0246	INDIAN RIVER COAST GUARD CUPOLA, 1909, 1962
304	38 38 3433	075 04 0042	
305	38 37 3769	075 04 0494	
306	38 38 5527	075 04 0019	
308	38 39 2023	075 04 0165	
310	38 39 4499	075 04 0478	
312	38 40 1095	075 04 0828	
313	38 40 2153	075 04 0991	
314	38 40 3645	075 04 1220	
317	38 40 4094	075 04 1740	ROUND, 1962
318	38 41 0080	075 04 1513	
320	38 41 1680	075 04 1728	
322	38 41 3652	075 04 2194	
324	38 41 5991	075 04 2736	
326	38 42 2738	075 04 3180	
328	38 42 5266	075 04 3461	
330	38 43 0657	075 04 3586	
332	38 43 0067	075 04 5767	REHOBOTH BEACH MUN. WATER TANK, 1962
334	38 43 2363	075 04 3918	
336	38 43 5192	075 04 4547	
338	38 44 1410	075 04 4769	
340	38 44 3875	075 04 5057	
342	38 44 5743	075 04 5384	GORDON, 1962
344	38 45 1754	075 04 5528	
346	38 45 3996	075 04 5747	
348	38 45 5525	075 04 5719	

350 38 46 0794 075 05 1224  
 1 38 46 4500 075 05 1088  
 352 38 46 3427 075 05 0570  
 353 38 46 5484 075 05 1238  
 354 38 47 0355 075 05 1439  
 355 38 46 4529 075 07 1280  
 356 38 46 5355 075 07 0011  
 357 38 47 1731 075 05 4284  
 358 38 47 4922 075 06 0124  
 359 38 47 3872 075 05 3047  
 360 38 48 0138 075 07 0127  
 362 38 48 5183 075 05 3398  
 364 38 49 5688 075 06 2200  
 750 38 56 1356 074 54 5599  
 751 38 56 4053 074 54 2234  
 753 38 56 4691 074 53 3541  
 754 38 56 4908 074 53 1119  
 755 38 56 5807 074 52 0247  
 756 38 55 5838 074 57 3876

FORT MILES U S NAVY WATER TANK, 1962

1  
11

FORT MILES OBSERVATION TOWER NO.13,1962

LEWES WEST OIL FACTORY CHIMNEY,1962

FORT MILES OBSERVATION TOWER NO. 8,1962

DELAWARE BREAKWATER LIGHTHOUSE,1927

See note included with signal list in Descr. Rep. for H-9154.

DELAWARE BREAKWATER WEST END LIGHT, 1933

HARBOR OF REFUGE LIGHTHOUSE (NEW) 1927

HARBOR OF REFUGE NORTH END LIGHT,1933,1962

CAPE MAY MUN. WATER TANK,1936,1962

CAPE MAY C G TEL REPEATER TOWER,1962

CAPE MAY C G STATION WEST TANK,1969

CAPE MAY C G TANK, 1952,1962

CAPE MAY U S C G ELECTRONICS MAST 1,1962

CAPE MAY LIGHTHOUSE, 1859-1932

TIDE NOTE



Smooth tides for <sup>H-9136</sup> WH-20-4-70 were obtained from a fixed bubbler tide gauge located at Indian River Inlet, Delaware latitude 38°36'32"N., longitude 75°03'50".

The gauge was installed on 27 May 1970 and maintained by ship's personnel. Mean low water was 2.8 feet on the staff as determined by Tides Division (C3312), Rockville, Maryland.

Hourly heights were scaled by ship's personnel and correctors made by computer, using a parabolic fit program. The time meridian was 75° W and no time or height corrections were applied. A list of smooth tide correctors is included in this report.

FEST=50000  
CLAT=4272000  
CMER=75/00/00  
GRID=60  
PLSCL=20000  
PLAT=38/36/00  
PLON=75/05/30  
MLAT=38/47/17.199  
MLON=75/05/20.839  
S1LAT=38/36/18.672  
S1LON=75/03/41.663  
S2LAT=38/59/41.459  
S2LON=74/47/44.148  
Q=1799.6  
VES=2930  
YR=70

OPR 492

DELAWARE BAY

WH-20-4-70

Ship WHITING

<u>Day</u>	<u>Time</u>	<u>Pattern 1</u>	<u>Pattern 2</u>
170	1410	-0.04	-0.34
	1415	0.00	-0.32
	1435	+0.06	-0.27
	1510	+0.02	-0.28
	1532	-0.18	-0.34
171	0640	-0.11	-0.35
173	1430	-0.06	-0.31
	1435	-0.04	-0.32
	1540	-0.07	-0.38
174	0640	-0.05	-0.35
180	1700	-0.01	-0.32
	1705	+0.01	-0.30
	1715	-0.02	-0.34
	1725	+0.04	-0.31
	1730	-0.07	-0.30
	1745	-0.02	-0.33
	1755	-0.06	-0.34
	1800	-0.06	-0.34
	1805	+0.01	-0.36
	1815	-0.14	-0.38
	1825	-0.10	-0.37
	1830	-0.06	-0.28
	1840	+0.06	-0.33
	1845	-0.10	-0.31
	1850	+0.08	-0.34
1905	+0.04	-0.33	
1910	-0.04	-0.28	
1920	+0.01	-0.31	
1930	+0.06	-0.28	
181	0720	+0.02	-0.32
	1745	-0.02	-0.30
	1750	+0.04	-0.31
182	0800	-0.09	-0.33
	0805	-0.07	-0.33
189	1245	+0.01	-0.29
	1737	-0.07	-0.31
190	1100	+0.15	-0.24
	1105	+0.19	-0.22
191	1030	+0.11	-0.28
	1050	+0.06	-0.28
	1100	+0.06	-0.28

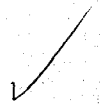
Abstract of HI-FIX Correctors

OPR 492

DELAWARE BAY

WH-20-4-70

Ship WHITING



<u>Day</u>	<u>Time</u>	<u>Pattern 1</u>	<u>Pattern 2</u>
192	0800	+0.14	-0.19
	0810	+0.16	-0.23
	1235	-0.04	-0.27



Project OPR-492

Delaware Bay

CDR. Melvin J. Umbach, Cmdg.

NOAA Ship Whiting

WH-20-5-70 (H-9153)

Ship Days 196, 197, 223, 224, 225,  
Launch 1 222, 258, 259

WH-20-4-70 (H-9136)

Ship Days 170, 171, 173, 174, 181, 182, 189, 190, 191, 192  
Launch 1 171, 172, 173, 174, 182, 188, 189, 210, 252  
Launch 2 171, 172, 174, 182, 208, 210, 217

WH-10-1-70 (H-9154)

Ship Days 313, 314, 316  
Launch 1 193, 194, 195, 203, 204, 217, 219, 220, 221, 230, 231, 234, 236, 237, 238, 239,  
240, 241, 244, 245, 246, 248, 250, 251, 278, 279, 280, 281, 282, 285, 286, 287,  
288, 292, 293, 296, 307, 310, 311, 315, 318, 321, 322, 323,  
Launch 2 195, 203, 204, 217, 219, 220, 221, 230, 231, 236, 237, 241, 242, 243, 244, 246,  
248, 250, 251, 253, 254, 255, 256, 257, 258, 259, 274, 275, 278, 279, 280, 281,  
283, 285, 288, 292, 293, 297, 298, 310, 311, 321, 322

Ship WHITING            1970  
PR 492            Delaware Bay  
VELOCITY USE TABLE

<u>TABLE NUMBER</u>	<u>INSTRUMENT</u>	<u>DAYS (JULIAN)</u>
1	DE723 D	170-175
2	ROSS	170-175
3	DE723 D	176-187
4	ROSS	176-187
5	DE723 D	188-245
6	ROSS	188-245
7	DE723 D	246-269
8	ROSS	246-269
9	DE723 D	270-290
10	ROSS	270-290
11	DE723 D	291-323
12	ROSS	291-323

The DE723 D data was used for the launches, including the High speed Launch. The ROSS data was used for the Ship WHITING.

DELAWARE BAY OPR 492  
VELOCITY CORRECTORS

15

000073 0 0000 0001 000 000000 0000000  
000140 0 0002  
000200 0 0004  
000272 0 0006  
000360 0 0008  
000511 0 0010  
000726 0 0012  
000984 0 0014  
001260 0 0016  
001505 0 0018  
199999 0 0000  
000041 0 0000 0002 000 000000 0000000  
000110 0 0002  
000176 0 0004  
000248 0 0006  
000470 0 0008  
001270 0 0010  
002050 0 0012  
19 99 0 0000  
000060 0 0000 0003 000 000000 0000000  
000090 0 0002  
000220 0 0004  
000305 0 0006  
000385 0 0008  
000470 0 0010  
000550 0 0012  
000630 0 0014  
000710 0 0016  
000790 0 0018  
000875 0 0020  
000960 0 0022  
001040 0 0024  
001120 0 0026  
001205 0 0028  
0012750 0030  
001370 0 0032  
001450 0 0034  
199999 0 0000  
000040 0 0000 0004 000 000000 0000000  
000120 0 0002  
000200 0 0004  
000284 0 0006  
000370 0 0008  
000470 0 0010  
000680 0 0014  
000800 0 0016  
000920 0 0018  
001045 0 0020  
001170 0 0022  
001290 0 0024  
001410 0 0026  
199999 0 0000  
000061 0 0000 0005 000 000000 0000000  
001170 0 0002



000285 0 0004  
 000408 0 0006  
 000534 0 0008  
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 000790 0 0012  
 000917 0 0014  
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 000149 0 0002  
 000261 0 0004  
 000380 0 0006  
 000497 0 0008  
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 000728 0 0012  
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001100 0 0032  
001168 0 0034  
001230 0 0036  
001293 0 0038



001360 0 0040  
001420 0 0042  
199999 0 0000  
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000470 0 0006  
000605 0 0008  
000740 0 0010  
000870 0 0012  
001000 0 0014  
001140 0 0016  
001270 0 0018  
001400 0 0020  
199999 0 0000  
000110 0 0000 0012 000 000000 000000  
000240 0 0002  
000373 0 0004  
000510 0 0006  
000645 0 0008  
000780 0 0010  
000920 0 0012  
00 50 0 0014  
001190 0 0016  
001320 0 0018  
001460 0 0020  
199999 0 0000

APPROVAL SHEET



Respectfully Submitted By

*Pressley L. Campbell*

LTjg Pressley L. Campbell

APPROVED AND FORWARDED

*Melvin J. Umbach*

Melvin J. Umbach  
CDR USESSA

Commanding, USC&GSS WHITING

OCEANOGRAPHIC LOG SHEET JM  
BOTTOM SEDIMENT DATA

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (FEET)	WEIGHT OF SAMI- PLER	AP- PROX. PERCENT TITON	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief, etc.)	OS
		LATITUDE	LONGITUDE								
2901	23 JUN 1970	38° 38' 11.56"	75° 03' 31.69"	23					med br S		
2902	"	38° 38' 44.56"	75° 03' 42.06"	22					fne br S		
2903	"	38° 39' 31.16"	75° 03' 49.06"	19					med br S & SH		
2904	"	38° 40' 10.91"	75° 03' 47.19"	23					fne br S		
2905	"	38° 40' 51.38"	75° 03' 50.56"	33					med br S		
2906	"	38° 41' 31.19"	75° 03' 59.13"	29					fne br S & M		
2907	"	38° 42' 08.91"	75° 04' 02.69"	31					fne br S & SH		
2908	"	38° 42' 50.06"	75° 04' 03.56"	33					crs S, sm l p & M		
2909	"	38° 43' 29.06"	75° 04' 18.94"	29					med br S & SH		
2910	"	38° 43' 59.25"	75° 03' 33.31"	42					crs S & P		
2911	"	38° 43' 21.91"	75° 03' 21.13"	41					crs S & SH		
2912	"	38° 42' 36.50"	75° 03' 06.25"	42					fne br S, P, SH		
2913	"	38° 41' 54.00"	75° 03' 18.38"	33					crs br S & SH		
2914	"	38° 41' 17.97"	75° 03' 12.88"	36					fne br S & SH		
2915	"	38° 40' 37.47"	75° 03' 04.56"	29					fne br S		
2916	"	38° 39' 57.19"	75° 02' 57.88"	32					med S & SH		
2917	"	38° 39' 10.41"	75° 02' 35.25"	30					crs S & P		
2918	"	38° 38' 21.48"	75° 01' 17.01"	26					fne S		

Use more than one line per sample if necessary. If necessary, 75° 03' 38" 21.48" 17.01" 26



WH 20-4-70 - 4-9/36

OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

1 of 5

JSEL	STATION	DATE	SAMPLE POSITION		DEPTH (fathoms)	WEIGHT OF SAMPLER	AP- PROX. TRA- N- SITION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	PATN. I	REMARKS (Unusual conditions, cohesion, etc., cutter, stat. no., type of bottom relief, etc., slope, plain, disposition, etc.)	PATN. II	OBS.
			LATITUDE	LONGITUDE										
	CGGS WHITING													
	PRJ. NO.													
	OPR-492													
	YEAR													
	1970													
	Coast of Delaware													
	CHECKED BY													
	DATE CHECKED													
3901	6/30/70	38	44-00.75	01-58.38	32.4					the br S	82.60		38.97	
3902	"	38	43-09.31	01-58.81	30.4					fine br S	99.68		38.80	
3903	"	38	42-29.19	01-59.75	45.8					bk S, Sh	113.32		38.85	
3904	"	38	41-53.19	01-56.50	42.8					fine br S, Sh	125.85		39.61	
3905	"	38	41-11.75	01-55.06	42.8					fine br S, M	140.25		40.21	
3906	"	38	40-29.91	01-55.94	42.0					fine br S	154.81		40.57	
3907	"	38	39-41.88	01-57.00	45.2					dk br M	169.42		40.96	
3908	"	38	39-14.44	02-00.06	33.2					fine br S	181.02		41.35	
3909	"	38	38-24.53	01-57.88	37.7					crs br S, P	197.92		41.95	
3910	"	38	37-46.06	01-57.13	41.2					br S, lg P	210.37		42.54	
3911	"	38	37-08.25	01-57.38	37.2					med br S	221.59		43.01	
3912	"	38	36-24.38	01-58.13	41.2					crs br S, P, Sh	232.11		43.50	
3913	"	38	36-40.94	00-46.88	39.2					Probably should be St Rt, Sh	221.39		50.54	
3914	"	38	37-19.59	01-05.00	38.5					gy S, P, Sh	214.08		48.35	
3915	"	38	37-58.09	01-03.19	40.6					br S, Sh	203.35		48.26	
3916	"	38	38-38.97	01-10.31	42.8					G, crs S, Sh, M	191.32		47.15	
3917	"	38	39-14.16	01-14.19	44.8					gy S, G, h, Starfish	180.16		46.43	

Use than one line per sample if necessary.

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WH-20-4-70

OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

U.S. DEPARTMENT OF COMMERCE  
ESSA  
COAST AND GEODETIC SURVEY

2 of 5

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Fathom)	WEIGHT OF SPL- PLER	AP- PROX- TR- ITION	LENGTH OF CORE	COLOR OF SED- IMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, deformed cutter, stat. no., type of bottom relief i.e., slope, plain, deposition, etc.)	OBS.	
		LATITUDE	LONGITUDE									
3918	6-30-70	39-57.94	01-08.19	44.1					fne br s fsh	165.64	46.90	
3919		38	75						gy s, M, fsh	153.59	46.54	
3920		40-34.19	01-09.63	50.6					gy s, bk M, sh	139.01	46.20	
3921		41-17.69	01-11.13	50.7					br s, M, P, sh	124.56	45.83	
3922		42-00.72	01-13.56	50.0					fne br s	107.25	44.93	
3923		42-52.16	01-20.44	20.5					fne br s, sh	96.57	49.29	
3924		43-29.91	00-57.13	39.8					bk M, s, sh	85.76	49.93	
3925		44-03.56	00-58.06	54.8					fne br s	85.48	31.30	
3926		43-43.66	02-44.69	28.9					fne br s, sh	100.37	31.61	
3927		42-16.50	02-33.44	42.3					br BKS. sh	116.47	34.17	
3928		41-36.56	02-30.13	39.6					fne br s, sh	130.71	35.25	
3929		41-00.78	02-26.06	38.2					crs / br s sh	143.52	36.36	
3930		40-40.71	00-19.39	56.0					fne br s M	151.46	53.44	
3931		39-56.91	00-14.13	36.8					fne br s M	165.22	53.97	
3932		39-14.72	00-16.56	53.6					crs br s P	178.23	53.57	
3933		38-31.00	00-19.81	45.0					crs br s, sh, PM	191.30	53.16	
3934		37-58.59	00-14.75	43.6					crs / br s sh, P	200.02	53.86	

more than one line per sample if necessary.

WH-20-4-70

OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

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3 of 5

SSEL	STRESS WHITING	PROJ. NO.		YEAR	CHECKED BY	DATE CHECKED	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dried, cutter, size, no., type of bottom roller, etc.)	OBS. INIT.
		OPR. 492	1970						
RIAL NO.	DATE	SAMPLE POSITION		DEPTH	WEIGHT OF SAM. FLER	AP. PROX. TRAN. TION	LENGTH OF CORE	COLOR OF SEDIMENT	
		LATITUDE	LONGITUDE	(fathoms)					
935	6-30-70	38	75	00-15.44					
		38	75	00-14.50					
936		38	74	59-29.25					
937		38	74	59-23.63					
938		38	74	59-23.63					
939		38	74	59-23.63					
940		38	74	59-23.63					
941		38	74	59-23.63					
942		38	74	59-23.63					
943		38	74	59-23.63					
944		38	74	59-23.63					
945		38	74	59-23.63					
946		38	74	59-23.63					
947		38	74	59-23.63					
948		38	74	59-23.63					
949		38	74	59-23.63					
950		38	74	59-23.63					
951		38	74	59-23.63					

Coast of Delaware

Note: Show one title per sample if necessary.

USCG/IM-DC 37019-P56

OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

WH. 20-4-70

SECTION: C&GS WHITING  
PROJ. NO.: OPR-492  
YEAR: 1970  
CHECKED BY: *Cost of Delaware*  
DATE CHECKED:

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Feet)	WEIGHT OF SAM- PLER	AP- PROX. TRAN- SECTION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, consistency, density, odor, etc.; type of bottom felt; etc.)	OBS. INIT.
		LATITUDE	LONGITUDE								
952	6-30-70	38-16.66	57-40.44	57.6					5ft br s, sh, P	198.93	72.01
953		38	74						5ft qy s, br oz	190.13	72.97
954		38-37.78	57-38.38	59.5					5ft qy s	181.30	73.81
955		38	74						5ft qy s	170.76	75.66
956		39-20.78	57-32.38	54.4					fine qy s, sh	161.31	77.05
957		39-28.38	57-30.49	45.4					qy s, sh	152.12	77.69
958		40-34.41	57-33.81	50.4					br s, M	151.49	85.01
959		38	74						qy s, M	162.58	83.01
960		39-07.94	56-45.38	54.3					qy s, sh, M	172.12	81.85
961		38	74						qy s	183.38	80.21
962		38-16.97	56-46.25	57.5					qy s, sh, P	189.88	79.38
963		37-45.34	56-46.31	61.5					qy s, sh, P	197.26	78.52
964		38	74						qy s, sh, P Probably should be St	203.04	77.76
965		37-06.47	56-45.88	57.6					crs dk qy s, sh, P	198.66	83.97
966		36-33.34	56-46.31	58.5					crs lt br s, P	192.62	84.98
967		38	74						br s, sh	186.03	86.10
968		37-51.00	55-55.50	63.6					crs br s, sh	178.73	87.68

Note: Report one line per sample if necessary.

USCGMMA-DC 37019-P-66

OCEANOGRAPHIC LOG SHEET - M  
BOTTOM SEDIMENT DATA

U.S. DEPARTMENT OF COMMERCE  
ESSA  
COAST AND GEODETIC SURVEY

14-20-4-70

VESSEL: USCGC WHITING  
PROJ. NO.: OPR-492  
YEAR: 1970  
CHECKED BY:  
DATE CHECKED:

Coast of Delaware

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH (Fathoms)	WEIGHT OF SAMPLER	AP. PROX. EXTENSION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief, etc.)	OBS. INT.
		LATITUDE	LONGITUDE								
9969	6-30-76	38 39-11.41	74 55-55.94	58.9					Stk gy cl	169.62	88.96
9970		38 39-55.74	74 55-58.62	57.2					Stk gy cl, sh	159.94	90.81
9971		38 40-33.19	74 55-52.06	56.7					Stk gy ch	151.22	93.19
9972		38 40-32.53	74 54-44.25	70.7					gy cl	150.57	103.51
9973		38 39-59.22	74 55-04.31	64.3					gy ch	157.97	98.59
9974		38 39-11.84	74 54-59.69	67.4					gy ch, br s, P	167.70	96.87
9975		38 38-25.75	74 54-50.56	66.9					gy s, P	176.44	96.04
9976		38 37-46.41	74 55-03.50	66.7					gy s, P	184.36	92.72
9977		38 37-05.25	74 55-00.88	62.2					br s	191.29	91.57
9978		38 36-36.53	74 55-01.75	59.7					br s, P	195.97	90.51

Use more than one line per sample if necessary.

ATLANTIC MARINE CENTER  
APPROVAL SHEET  
FOR  
AUTOMATED SURVEY H- 9136



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.

Date: April 17, 1974

Signed: William L. Jonns  
William L. Jonns  
Title: Chief, Verification Branch

B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic and AMC Manuals. Exceptions are listed in the verifier's report.

Date: April 17, 1974

Signed: C. Dale North Jr.  
C. Dale North Jr. LCDR, NOAA  
Title: Chief, Processing Division

GEOGRAPHIC NAMES

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
Atlantic Ocean												1
Dewey Beach												2
Hen and Chickens Shoal												3
Indian River Inlet												4
Rehoboth Beach												5
												6
												7
												8
												9
												10
												11
												12
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												24
												25

Approved by  
 Char. E. Harrington  
 Staff Geographer  
 3 Oct 1974

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD		
PART I SMOOTH SHEET PREPARATION		
	PREPARED BY/OPERATOR	DATE
A. PLOTTER OPERATOR		
B. DISTORTION MARKS PLOTTED	None	
C. PROJECTION INTERSECTIONS PLOTTED	EDP-AMC	
D. POINTS OF ELECTRONIC CONTROL ARCS PLOTTED	EDP-AMC	
E. OVERLAYS PREPARED BY		
1. POSITION NUMBER	EDP-AMC	
2. EXCESS SOUNDINGS	EDP-AMC	
3. PRELIMINARY SMOOTH PLOT	EDP-AMC	
4. LIST OTHERS		
A.		
B.		
F. SOUNDING SELECTION BY	EDP-AMC	
G. PLOTTER INPUT	PREPARED	
H.	CHECKED	
I. DESCRIPTIVE REPORT ADDENDUMS		
PART II SMOOTH SHEET COMPLETION		
	CARTOGRAPHER	DATE
A. DISTORTION SCALE TICKS IDENTIFIED BY NOTE	None	
B. PROJECTION INTERSECTIONS VERIFIED BY	HRS	3-14-74
C. PROJECTION LINES RULED BY	EDP-AMC	
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED	EDP-AMC HRS	3-14-74
E. OVERLAYS COMPLETED BY		
1. POSITION NUMBER LEADERS ADDED	HRS	4-1-74
2. EXCESS SOUNDING OVERLAY COMPARED	HRS	3-20-74
3. PRELIMINARY SMOOTH PLOTS COMPARED	HRS	3-20-74
4. OTHERS UTILIZED		
A.		
B.		
F. DESCRIPTIVE REPORT ADDENDUM	HRS	4-15-74
G. CONTROL STATIONS VERIFIED	GFT	12-12-72
H. POSITIONS MANUALLY PLOTTED	EJF&HRS	1-31-73, 3-22-74
I. MANUAL PLOT VERIFIED	HRS	3-14-74
J. SHORPLINE APPLIED	HRS	3-18-74
K. POSITION CHARACTERISTICS ADDED	HRS	4-2-74
L. NOTES AND DEPTH CURVES ADDED	HRS	4-15-74



H-9136

File No: D6-2  
Ser. No: 73-60

September 19, 1973

CAM2222

Chief, Tides Branch, C331  
Attention: Mr. Jim Hubbard

Wayne F. Turnacliff, LTJG, NOAA  
Chief, Data Preparation Group

Approval of Tide Application Method

Approval is desired for the method which will be used to apply tides for Surveys H-9136 (WH-20-4-70) and H-9153 (WH-20-5-70).

H-9136

The survey was done entirely in 1970, Julian Days 170 to 252, by the WHITING. A Form 712 dated 9/19/72 states to use Harbor of Refuge Light House Pier for Julian Days 188 to 252. For the remaining Julian Days 170 to 187 we received high and low waters for Lewes, Delaware, with corrections to make the Lewes gage approximate the Harbor of Refuge gage.

The survey will be zoned according to instructions received from L. C. Wharton in a letter dated 3/2/71.

H-9153

The survey was done in two years, 1970 and 1971, by the WHITING. The 1970 portion used the Harbor of Refuge tides, and is zoned according to instructions received from L. C. Wharton in a letter dated 2/10/71. For the 1971 portion the Lewes, Delaware, gage was used. We will make the Lewes, Delaware, gage approximate the Harbor of Refuge gage by applying the same correctors that were used on H-9136. Then, using the adjusted Lewes gage, we can zone the 1971 portion using the same correctors as we did for the 1970 portion.

Since this is not the usual tide application procedure, your approval is requested. Your stamp of approval and signature on this letter should be sufficient.

Enclosures (4)



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

Date: October 4, 1973

Reply to  
Attn of: C3311-73-SIP

Subject: Tide Zone Verification

To: Chief, Data Preparation Group, CAM222

In reply to your request for clarification of various memos concerning the zoning methods applied to Hydrographic Sheets H-9136 and H-9153, (OPR 492) Delaware Bay; revised Form 712's have been enclosed.

*Robert A. Cummings*

Robert A. Cummings  
Technical Assistant  
Oceanographic Division

Enclosures

1C/4/73

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

34

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center

Hourly heights are approved for Form 362

Tide Station Used (NOAA form 77-12): Harbor of Refuge  
Lewes, Delaware

Period: Julian Days 170-252 - 1970

HYDROGRAPHIC SHEET: H-9136

OPR: 492

Locality: Delaware Bay

Plane of reference (mean ~~Lewes~~ low water): Harbor of Refuge 3.2 ft.  
Lewes, Delaware 2.5 ft.

Height of Mean High Water above Plane of Reference is  
Harbor of Refuge 4.0 ft.  
Lewes, Delaware 4.1 ft.

Remarks:

Apply the following corrections to the Lewes, Delaware, data to obtain values for Harbor of Refuge.

<u>Time</u>		<u>Height (feet)</u>	
HW	LW	HW	LW
-0.1	-0.2	-0.1	0.0

- Zoning: 1.) lower sheet limit to latitude  $38^{\circ}45'$   
use -0:30 minutes correction and -0.3 feet for high water - no correction for low water
- 2.) no time or height correction for north of  $38^{\circ}45'$

*Robert A. Cummings*

Chief, Tides Branch



ELECTRONIC CONTROL PARAMETERS

(36)

1. Project # OPR- 492 2. Reg. # H-9136 3. Field # WH-20-4-70

4. Type of Control: HI-FIX (Hi-Fix, Raydist, EPI, etc.)

5. Frequency 1799.6 khz (for conversion of electronic lanes to meters)

6. Mode of Operation (check one):

Range-Range

Range-Visual

Range One (R<sub>1</sub>)  
Station I.D. \_\_\_\_\_  
Range Two (R<sub>2</sub>)  
Station I.D. \_\_\_\_\_

Lat. \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ ''  
Long. \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ ''  
Lat. \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ ''  
Long. \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ ''

Hyperbolic (3-station)

Hyper-Visual

Slave One  
Station I.D. INDIAN  
Master  
Station I.D. NAVY  
Slave Two  
Station I.D. WILZ

Lat. 38 ° 36 ' 18.672 ''  
Long. 75 ° 03 ' 41.663 ''  
Lat. 38 ° 47 ' 17.199 ''  
Long. 75 ° 05 ' 20.839 ''  
Lat. 38 ° 59 ' 41.459 ''  
Long. 74 ° 47 ' 44.148 ''

7. Location of Survey:

Range-Range

Imagine an observer is standing at R<sub>1</sub> Station and looking directly at R<sub>2</sub> (check one):

Survey area is to observer's Right  A=0

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		To		Position Numbers (inclusive)	
	Time	Day	Time	Day		
<u>WHITING</u>	_____	_____	_____	_____	<u>4000</u>	to <u>5768</u>
<u>WHITING</u>	_____	_____	_____	_____	<u>9901</u>	to <u>9978</u>

9. Remarks: \_\_\_\_\_

CAM3-1  
2-18-71

ATLANTIC MARINE CENTER

37

PROJECTION PARAMETERS

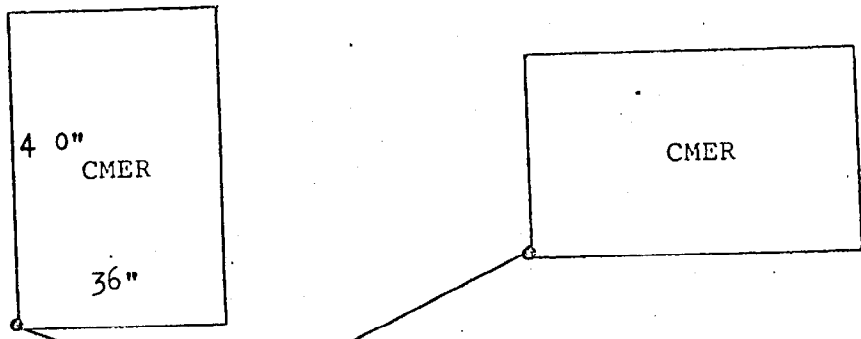
POLYCONIC OR MODIFIED TRANSVERSE MERCATOR

1. Project No. OPR 492 4. Requested By W.L. Jonns  
2. Reg. No. H-9136 5. Ship or Office Verification  
3. Field No. WH-20-4-70 6. Date Required ASAP

7. Polyconic  Modified Transverse Mercator   
8. Central Meridian of Projection 75° 00' 00"  
9. Survey Scale: 1: 20,000

10. Size of Sheet (check one):  
36 x 54  36 x 60  Other  Specify 36" X 40"

11. Sheet Orientation (check one):  
NYX = 1  NYX =  $\phi$    
N N



12. Plotter Origin: S.W. Corner of Sheet (not necessarily a grid intersection)  
Latitude 38° 35' 20"  
Longitude 75° 05' 30"

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

15. Remarks: \_\_\_\_\_

HYDROGRAPHIC SURVEY STATISTICS  
HYDROGRAPHIC SURVEY NO. H-9136

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET & PNO		1	BOAT SHEETS		1 (2 parts)	
DESCRIPTIVE REPORT		1	OVERLAYS		5	
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS SOURCE DOCUMENTS
ENVELOPES	<del>XXXXXXXXXXXXXXXXXXXX</del>					
CANERS	1					
VOLUMES	4					
BOXES			2			

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				2900
POSITIONS CHECKED		300		
POSITIONS REVISED		30		
DEPTH SOUNDINGS REVISED		270		
DEPTH SOUNDINGS ERRONEOUSLY SPACED		30		
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		4	4	
JUNCTIONS		2	26	
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		16	6	
SPECIAL ADJUSTMENTS				
ALL OTHER WORK		209	82	
TOTALS		311	118	

PRE-VERIFICATION BY E. J. Fields, G. F. Trefethen	BEGINNING DATE 1/31/73	ENDING DATE 3/22/74
VERIFICATION BY H. R. Smith <i>Henry R. Smith</i>	BEGINNING DATE 3/14/74	ENDING DATE 4/15/74
REVIEW BY Kenneth W. Wellman <i>Carstens 12 hr 12/1/74 Prof. Farnell O. Toule</i>	BEGINNING DATE 9-25-74 28 hr	ENDING DATE 11-6-74 11/6/74

Reg. No. H-9136

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 9-28-82 TIME REQ'D \_\_\_\_\_ INITIALS JHE

REMARKS:



H-9136

ITEMS FOR FUTURE PRESURVEY REVIEW

The variable pattern of depth differences noted in sect. 6 of the Review is attributed to the combined effects of natural changes of the bottom and the less detailed and less accurate methods employed on the prior surveys.

<u>Position</u>	<u>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>
383	0751	4	2	25 Years
383	0750	3	6	25 Years
384	0751	4	9	10 Years
384	0750	3	9	25 Years

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

REGISTRY NO. H-9136

FIELD NO. WH-20-4-70

Delaware, Delaware Bay Entrance, Rehoboth Beach to  
Indian River Inlet

SURVEYED: June 19 - September 9, 1970

PROJECT NO.: OPR-492

SCALE: 1:20,000

SOUNDINGS: DE-723 (Digital) and Ross  
Digital Depth Sounders

CONTROL: Sextant Fixes on  
Shore Stations and  
Hi-Fix (Hyperbolic  
Mode)

Chief of Party .....	M. J. Umbach
Surveyed by .....	M. J. Umbach
.....	J. W. Carpenter
.....	G. L. Boyack
.....	L. T. Gillman
.....	P. L. Campbell
.....	D. W. Nostrant
.....	W. A. Hill
Automated Plot by .....	Calcomp Plotter #618 (AMC)
Verified and Inked by .....	H. R. Smith
Reviewed by .....	K. W. Wellman
	Date: 11/6/74
Inspected by .....	F. B. Powers

1. Description of the Area

This survey covers a portion of the Delaware Coast from north-east of Indian River Inlet to Rehoboth Beach.

The fine sand and shell bottom slopes sharply from the shore-line to depths of about 20 ft. Finger ridges of sand trending in a northeasterly direction extend into depths of about 45 ft. Hen and Chickens Shoal, trending in a southeasterly direction, extends into the northern portion of the survey area. These factors together with sand waves contribute to the irregularity of the bottom.

## 2. Control and Shoreline

The origin of control is given in Part F of the Descriptive Report.

The shoreline originates with advanced photogrammetric surveys TP-00121 and TP-00180 of 1970. Revisions appearing in red in the vicinity of lat.  $38^{\circ}42.71'$ , long.  $75^{\circ}04.50'$  are by the hydrographer.

## 3. Hydrography

A. Depths at crossings are, in general, in good agreement. Minor differences of 1 to 2 feet are attributed to sea conditions and minor irregularities on the bottom.

B. The usual depth curves are adequately delineated. Brown and supplemental curves were added to emphasize important bottom features. The low-water line was not defined because of civilian activity in the area. However, it falls close inshore in the area.

C. The development of the bottom configuration and the investigation of least depths are considered adequate.

## 4. Condition of the Survey

The sounding records, automated plotting and the Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual, supplemented by the Instruction Manual-Automated Hydrographic Surveys with the following exceptions:

A. The coordinates for the reference station in box no. 42 were incorrect and no determination of the status of the reference station was made during verification.

B. The source of shoreline information is not included in section F or G of the Descriptive Report.

5. Junctions

An adequate junction was effected with H-9154 (1970) on the northwest. Differences of 2-6 feet in the junctions between the present survey, H-8596 (1961-63) on the south and H-8710 on the southwest are believed caused by natural changes over the eight-year period. These differences necessitated a butt junction with H-8596 and a partial butt junction with H-8710. The junctions with H-9175 (1970) and H-9176 (1970) on the northeast were considered in their respective reviews. No contemporary surveys junction with the present survey on the southeast and east. Present depths are in general harmony with charted depths in this area.

6. Comparison with Prior Surveys

- A. H-101 (1844) 1:400,000
- H-670 (1859) 1:400,000

Portions of the above surveys cover the area of the present survey. The sparse development and small scale of these prior surveys offer no adequate basis for comparison with the present survey.

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

- B. H-149 (1844) 1:20,000      H-1633 (1884) 1:40,000
- H-151 (1844) 1:40,000      H-1697 (1886) 1:40,000
- H-212 (1848) 1:40,000

These prior surveys cover the area of the present survey. A comparison between the present and prior surveys reveals a variable pattern of depth differences ranging from indications of 1 to 12 ft. deeper and 2 to 5 ft. shoaler depths with a concomitant shifting of the depth curves in the survey area. These depth differences are attributed to natural changes in the bottom and the less detailed and less accurate methods employed on the prior surveys.

The general position of the portion of Hen and Chickens Shoal falling on the present survey has changed little since the prior surveys although present depths on the crest are 2 to 4 ft. shoaler than prior depths.

The shoreline in the common area has receded approximately 150 to 200 meters since the time of these prior surveys.

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

C.	H-3314 (1911)	1:200,000	H-4164 (1920)	1:40,000
	<u>H-4093 (1919)</u>	<u>1:40,000</u>	<u>H-4942 (1929)</u>	<u>1:20,000</u>

These prior surveys cover the area of the present survey. A comparison between the present and prior surveys reveals depth differences of plus or minus 1 to 6 ft. seaward of the 18 ft. curve and present inshore depths generally 3 to 16 ft. deeper. An exception to this pattern is noted in the vicinity of Rehoboth Beach, between latitudes 38°41.70' and 38°43.20', where the shoreline and inshore depths have remained relatively stable since 1911. These depth differences are attributed to a combination of natural causes and the less accurate methods employed on the prior surveys.

The finger ridges inshore trending in a northeasterly direction have migrated little in position but minor changes have occurred along the crests.

The shoreline, with the exception of that in the vicinity of Rehoboth Beach, has receded approximately 50 to 100 meters since 1929 and some inshore depths have deepened as much as 10 ft.

The following soundings charted from H-4093 fall in depths about 6 feet deeper on the present survey:

- 31 ft. in lat. 38°40.73', long. 74°58.1'
- 39 ft. in lat. 38°37.75', long. 74°59.75'

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These soundings are discredited by the present survey and should be disregarded. Though the prior data is plotted in accordance with recorded information, present sounding profiles cross the vicinity of the shoaler prior depths and reveal no significant irregularities.

The larger scale and more completely developed present survey is adequate to supersede the prior surveys within the common area.

D. H-9295 W.D. (1971-72) 1:20,000

There are no conflicts between present depths and effective depths on this wire-drag survey.

7. Comparison with Chart 411 (latest print date 1-19-74) 1219 (latest print date 5-25-74)

A. Hydrography

The charted hydrography originates with the previously discussed prior surveys which require no further consideration supplemented by the partial application of the boat sheet (Bp 81839) and verified smooth sheet of the present survey, Coast and Geodetic Survey chart letter 514 of 1962, and Corps of Engineers Survey Bp 40275 of 1945.

Attention is directed to the following:

1. The 4 wrecks charted respectively in lat. 38°37.95', long. 74°55.55' (PSR item 1-F); lat. 38°36.75', long. 74°55.00'; lat. 38°41.64', long. 75°00.80' and lat. 38°42.00', long. 75°04.00' on chart 1219 originate with the U.S. Navy Wreck List of 1957. They are not considered disproved by the present survey and should be retained on the chart. The two latter wrecks listed above are not shown on chart 411.

2. The Fish Haven Obstruction wreck (36 ft rep) and adjacent obstruction Fish Haven (auth. min. 50 ft) on chart 1219 in the vicinity of lat. 38°36.36', long. 74°56.6' originates with Corps of Engineers information CL-920 of 1959 and CL-666 of 1970 respectively. These obstructions should be retained as charted.

*36 rep. revised to 36, from CL 485(1949)*

*RHC 5/12/75*

3. The Obstruction Fish Haven charted in lat. 38°38.85', long. 75°03.00' on chart 411 (PSR item 22), originates with Coast and Geodetic Survey information, CL-1470 of 1966. The present survey reveals least depths of 28 ft. in the area.

4. The High Water Line charted between latitudes 38°43.15' and 38°43.99' on chart 411, originates with the USGS Rehoboth Beach Delaware 7½' quad of 1954, photo revised in 1972, subsequent to the present survey. It should be retained on the chart.

5. The 42, 35, 34, 39, and 38 charted between lat. 38°36.7', long. 75°00.5' and lat. 38°36.5', long. 75°01.8' on chart 411 originate with the boat sheet of survey H-8596 (Bp 61313 to 61315). These soundings fall in a changeable area and are superseded by present survey depths.

Except as noted above, the present survey is adequate to supersede the charted hydrography within the common area.

B. Aids to Navigation

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

8. Compliance with Instructions

This survey adequately complies with the Project Instructions.

9. Additional Field Work

This is an excellent basic survey and no additional field work is recommended.

Examined and Approved:

Richard H. Houlton  
Chief  
Marine Chart Division

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

