

H10675

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

*Type of Survey* Hydrographic/Side Scan Sonar

*Field No.* WH-10-2-96

*Registry No.* H10675

### LOCALITY

*State* New York-New Jersey

*General Locality* Lower Bay

*Locality* Vicinity of Sandy Hook

1996-97

CHIEF OF PARTY  
LCDR D.A. Cole

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

REGISTER NO.

H-10675

**HYDROGRAPHIC TITLE SHEET**

**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.

RU-10-2-96

State New York - New Jersey

General locality Lower Bay

Locality Vicinity of Sandy Hook

Scale 1:10,000

Date of survey 12 April 1996 - 26 June 1997

Instructions dated 04 March 1996, 27 February 1997

Project No. OPR-C399-RU-97

Vessel NOAA Ship RUDE, EDP 9040  
*5-590*

Chief of party Lieutenant Commander David A. Cole, NOAA

Surveyed by CDR De Bow; LCDR DA Cole; LTs Thacker, Klay, Evjen, Riley; LTJGs Hill, Walker

Soundings taken by: (echo sounder, hand lead, pole) Raytheon DSF-6000N echo sounder, SEABAT 9001/3

Graphic record scaled by Officers (listed above,) ST MT Lathrop, ST CA Neely, RL Keane.

Graphic record checked by Officers (listed above,) MTL, CAN

Protracted by \_\_\_\_\_

Automated plot by HP DesignJet 2500 CP

Verification by Atlantic Hydrographic <sup>Branch</sup> Personnel

Soundings in (fathoms, feet, or meters at MLW or MLLW) ~~meters~~ <sup>feet</sup> at MLLW

**REMARKS:**

All times recorded in UTC.

The DSF-6000N echosounder was used as the primary sounding instrument.

The Edgetech Model 272 towfish was used to acquire 200% side scan coverage.

The SEABAT 9001 and 9003 shallow water multibeam sonar systems were employed for item investigations and 100% multibeam coverage.

Notes in the original Descriptive Report were made in red during office processing  
AWOIS/SURF 4/6/99 SJ!

# NOAA Ship RUDE: January - July 1997 Data Flowchart

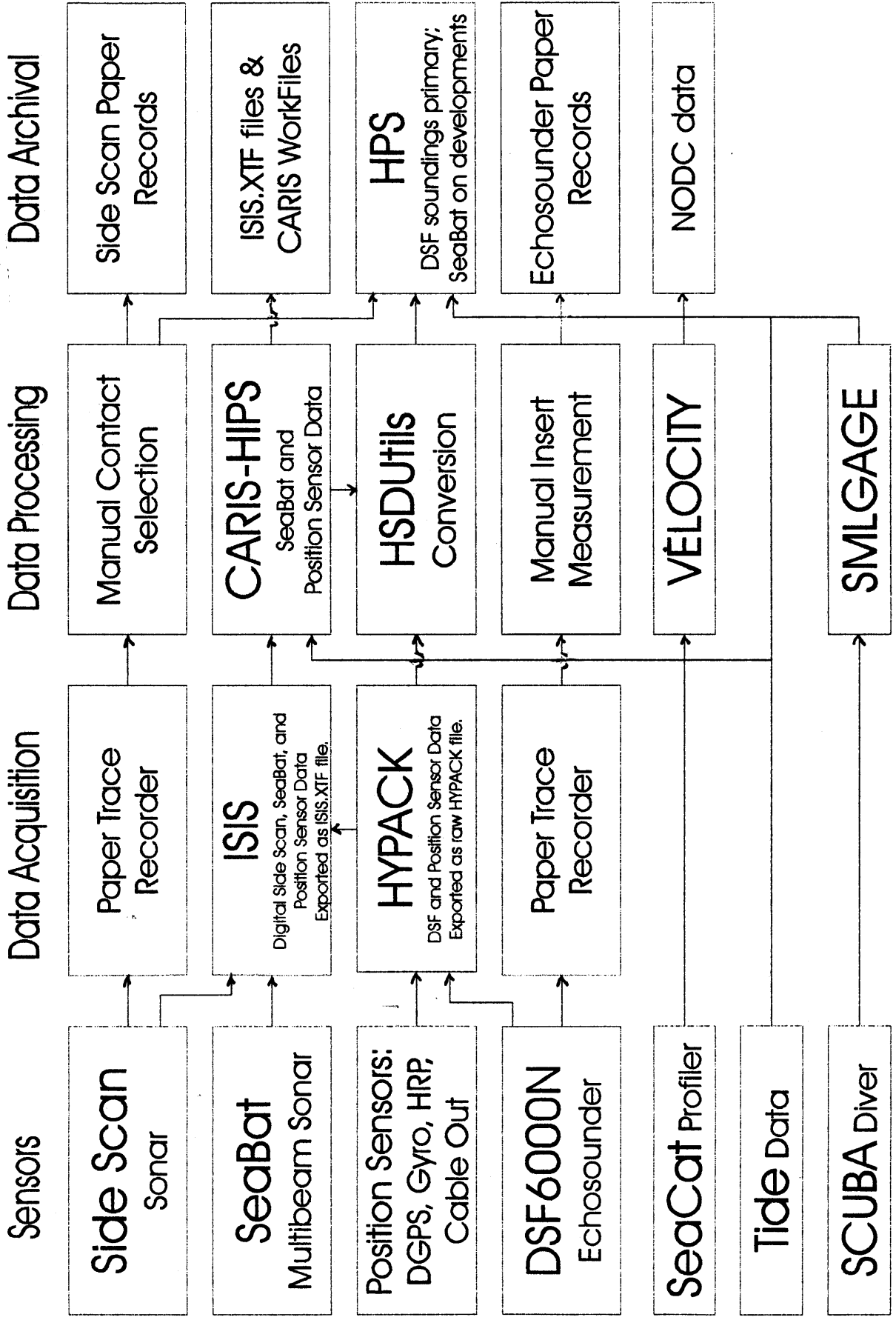


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\* Filed with the original field records

**A. PROJECT**

A.1 This survey was conducted in accordance with Hydrographic Project Instructions OPR-C399-RU, Approaches to New York Harbor, New York.

A.2 The original instructions are dated March 4, 1996.

A.3 There has been one amendment to the instructions:  
Change #1, dated February 27, 1997.

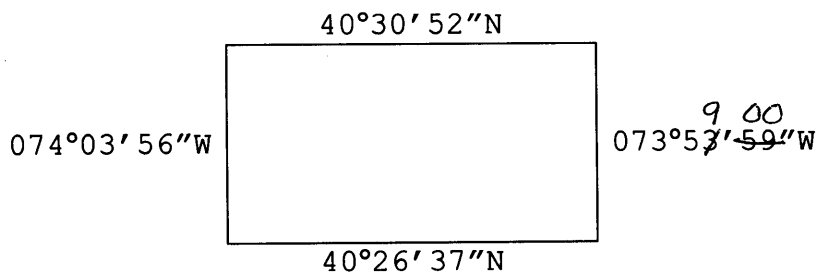
A.4 This Descriptive Report covers the navigable area survey conducted on sheet "C" of project OPR-C399-RU in the Lower Bay, as specified in the Project Instructions.

A.5 This survey responds to requests from the U.S. Coast Guard, the Port Authority of New York and New Jersey, and the United Pilots Benevolent Associations of New York and New Jersey (Sandy Hook Pilots) to survey the approaches to New York Harbor including the Lower Bay, which is heavily used by a variety of deep-draft vessels, such as tankers, freighters, and barges. The average draft of the vessels is between 32 and 38 feet, with maximum drafts of up to 42 feet. The area was last surveyed by the Coast and Geodetic Survey between 1939 and the mid-1980s.

**B. AREA SURVEYED**

B.1 This survey covers an in-shore area in Lower Bay, in the vicinity of Sandy Hook, including Sandy Hook Bay.

B.2 The survey is comprised of one sheet with the following approximate boundaries:



B.3 Data acquisition for this survey began on April 12, 1996 (DN 103) and ended on June 26, 1997 (DN 177).

### C. SURVEY VESSELS

C.1 All hydrography, side-scan and multibeam investigations were conducted from NOAA Ship RUDE, S-590, EDP# 9040.

C.2 During RUDE's December 1996 dry-dock period, the ship was outfitted with a new pivoting armature to carry the transducer head for the Reson SeaBat 9003 shallow-water multibeam sonar system. This armature was mounted on the port side, approximately amidships. Since the transducers were not designed for permanent deployment, the arm was rotated into the down, or operating, position only during times of data acquisition. This replaced the previous armature, which was outfitted with the Reson SeaBat 9001. SeaBat 9001 data acquired during mainscheme side scan in 1996 were archived on tape. No developments were done in 1996, and no 1996 SeaBat data were processed.

### D. AUTOMATED DATA ACQUISITION AND PROCESSING *See Also the Evaluation Report*

D.1a The following HDAPS software versions were used for data processing in 1996. These data were converted to Hydrographic Processing System (HPS) format in January 1997.

<b>Program</b>	<b>Version</b>	<b>Program</b>	<b>Version</b>
BACKUP	2.00	INVERSE	2.02
BLKEDIT	2.03	LSTAWOIS2	3.11
CARTO	2.17	MAINMENU	1.30
CLASSIFY	2.14	MAN_DATA	3.05
CONTACT	2.51	NEWPOST	6.13
CONVERT	3.67	PLOTALL	2.37
DAS_SURV	6.83	PREDICT	2.01
DP	2.19	PRESURV	7.14
EXCESS	4.33	QUICK	2.09
FILESYS	3.46	REAPPLY	2.13
GRAFEDIT	1.10	ZOOMEDIT	2.36

D.1b Coastal Oceanographics' **HYPACK for Windows** (Version 5.9 in 1996, 6.4a in 1997) was used for data acquisition on this survey. The following HPS software versions were used for data processing:

ABSTRACT.PRG	19970314	GRIDS.PRG	19970218	READTIDE.PRG	19970218
ACADX.PRG	19970212	GRIDX.EXE	19950512	REAPPLY.PRG	19970218
ADDFLD.PRG	19970212	GROUPDPS.EXE	19960520	SCARSX.PRG	19970218
APPTIDE.PRG	19970331	HEADCHK.EXE	19940614	SEGMENT.FMT	19940713
ASCTIDE.BAK	19970401	HPSLIB.BAK	19970211	SNDXTRAC.PRG	19970218
ASCTIDE.PRG	19970401	HPSLIB.PRG	19970321	SND LIST.PRG	19970218
BLK EDIT.BAK	19970129	IDF2CAD.PRG	19970218	SYS MNU.BAK	19970127
BLK EDIT.PRG	19970212	IDF MAKR.PRG	19970218	SYS MNU.PRG	19970325
BROWSER.PRG	19970218	KILL.EXE	19950209	TARGX.PRG	19970218
BROW DAT.PRG	19970218	LIST DAT.BAK	19960624	TBL MNU.BAK	19970307
CC EXCEP.PRG	19970218	LIST DAT.PRG	19970318	TBL MNU.PRG	19970307
CONTACT.FMT	19950614	LIST MNU.PRG	19970218	TIDECHEK.PRG	19970218
CONTACT2.FMT	19950614	LOADRAY.PRG	19970205	TIDED LB.PRG	19970326
CONTMAPX.PRG	19970218	LPICK.PRG	19970314	TIDE FX.PRG	19970326
CONT FND.PRG	19970414	MAINMENU.BAK	19970210	TIDE MNU.PRG	19970218
CONT GRP.PRG	19970218	MAINMENU.PRG	19970210	UTIL MNU.PRG	19970218
CONT MNU.BAK	19970218	MAKEPRJ2.PRG	19951205	UTM2GEO.PRG	19970218
CONT MNU.PRG	19970314	MAKETBLS.PRG	19970218	UTM GEO.PRG	19970218
CONT PUR.PRG	19970218	MAKE PRJ.BAK	19970218	XYZ.PRG	19960531
CONV DAT.PRG	19970317	MAKE PRJ.PRG	19970225	ZONE MNU.PRG	19970326
CPTTIDES.PRG	19970326	MANU DAT.FMT	19950313	ZOOMEDIT.EXE	19970305
CPTZONES.PRG	19950326	MANU DAT.PRG	19970218		
CSTAT.FMT	19940712	MAPINFOX.PRG	19970218		
DATA.FMT	19950629	MERGE.PRG	19970212		
DATA GET.BAK	19970212	NEWNAME.PRG	19970218		
DATA GET.PRG	19970212	OFFSET.FMT	19940720		
DET ABS.BAK	19970218	PC2HARIS.PRG	19970218		
DET ABS.PRG	19970325	PICKER.OLD	19941027		
DIAG MNU.PRG	19970218	PICKER.PRG	19970212		
DPASGAGE.PRG	19950326	PLOTFTR.PRG	19970325		
DPAS MNU.PRG	19970326	PLOTINIT.OLD	19970218		
DP PRINT.PRG	19970218	PLOTINIT.PRG	19970218		
EDITALL.PRG	19970218	PLOTTER.FMT	19940506		
EDITDATA.PRG	19970318	PLOT CNT.PRG	19970218		
EDIT MNU.PRG	19970218	PLOT DP.PRG	19970218		
EDSTAT.PRG	19970317	PLOT LL.PRG	19970218		
FEDIT.PRG	19970218	PLOT MNU.BAK	19970218		
FIELDMNU.BAK	19960925	PLOT MNU.PRG	19970321		
FIELDMNU.PRG	19970328	PLOT MTM.PRG	19970218		
FILE MGR.PRG	19970218	PLOT SND.BAK	19970218		
FIND DP.PRG	19970218	PLOT SND.PRG	19970321		
FIX.PRG	19970218	PLOT SWA.PRG	19970318		
FLDCNLST.PRG	19970313	PLOT TRK.PRG	19970321		
FRAME.PRG	19970218	PRETIDE.FMT	19940506		
FTRLIST.PRG	19970218	PROJECTS.FMT	19960911		
GAGE MNU.PRG	19970326	QUIKEDIT.BAK	19970218		
GEO2UTM.PRG	19970218	QUIKEDIT.PRG	19970316		
GEO UTM.PRG	19970218	READDPAS.BAK	19970207		
GETVERS.EXE	19940613	READDPAS.PRG	19970326		
GET PROJ.BAK	19970303	README.PRG	19970207		
GET PROJ.PRG	19970303	READNAUT.BAK	19970305		
GRAFEDIT.EXE	19970305	READNAUT.PRG	19970328		
GRAFEDIT.OLD	19970129	READNAUT.TXT	19970328		

D.2 The SEABIRD SBE-19 sound velocity profiler unit was utilized with SEASOFT 3.3M and SEACAT 2.0 ('96) and 3.00 ('97) software. The program VELOCITY (Version 2.11, 9/21/94, and version 3.00, 2/26/97) was used to process the acquired data and calculate velocity corrections.

D.3 Triton Corporation's ISIS software (Versions 2.11 and 2.14 in 1996, 2.34 and 2.35 in 1997) was used to acquire SeaBat multibeam and digital side scan sonar data. SeaBat data were processed on the CARIS-HIPS (version 4.2.7) system, and depths were generated for each multibeam investigation and later entered into HPS via the HSDUtils Convert program.

The conversion software to translate HYPACK data into HDAPS- and HPS-compatible formats was supplied by NOAA's Hydrographic Surveys Division. The HSDUtils CONVERT program was revised numerous times during the course of the survey. Data acquired during the 1996 season were originally processed in HDAPS and converted to HPS format by the Atlantic Hydrographic Branch in January 1997. All further processing was conducted using HPS.

Final plots were created in MapInfo, a PC-based GIS package, with assistance from HPS-MI MapInfo tools supplied by HSD. These tools produced depth, track and swath plots from HPS data, and allowed plotting on a HP750C DesignJet plotter. Data could also be overlaid on a raster image of the applicable chart.

## **E. SONAR EQUIPMENT**

E.1 RUDE conducted all side scan sonar operations using an Edgetech Model 260TH image-corrected side scan sonar recorder and a 100 kHz Model 272 towfish. Additionally, all side scan sonar data were recorded digitally using the Triton ISIS software and archived in the Extended Triton Format (XTF) files.

E.2 The side scan towfish used a 50° vertical beam width tilted down 20° from horizontal.

E.3 The 100 kHz sonar frequency was used throughout the survey.

E.4 a. The 50-meter range scale was used at a line spacing of 80 meters (except in Sandy Hook Channel, where due to the depth of water, the 75-meter range scale was used at a line spacing of 120 meters) to obtain complete area 200% coverage and provide optimal contact resolution. Data acquired with an EPE of 15 or greater were either rejected or smoothed during post-processing, so the maximum line spacing was never exceeded.



b. Confidence checks were obtained whenever features such as buoys or sand waves were encountered. These features were routinely annotated on the sonar records on a daily basis.

c. Two hundred percent side scan coverage was completed for this survey. Holiday coverage was run to fill in any gaps. All coverage was checked with on-screen zoomable coverage displays in MapInfo to ensure proper overlap between adjoining lines.

d. Side scan lines with degraded data returns were rejected and rerun as holidays to ensure 200% side scan coverage throughout the survey.

e. The towfish was deployed exclusively from the stern.

E.5 Sonar records were monitored on-line and reviewed by two persons during processing to identify contacts. Contact offsets and shadow heights were measured on sonar paper records, checked, and entered into the HPS Contact Table to compute contact heights and positions.

E.6 All side scan contacts with HPS-computed heights of one meter or greater, all contacts located inside channels, and all contacts with a "manmade" appearance were deemed significant and subsequently investigated with SeaBat multibeam developments.

## **F. SOUNDING EQUIPMENT**

F.1 The primary sounding instrument for this survey was a **Raytheon Model 6000N** Digital Survey Echosounder (DSF-6000N, s/n A107). Both high (100 kHz) and low (24 kHz) frequency sounding data were recorded during data acquisition. Only high frequency DSF soundings were selected and examined.

Using **HYPACK**, high frequency DSF soundings were automatically selected at the beginning, end, and every 50 meters along survey lines. Echograms were monitored on-line and reviewed by two persons during processing to verify selected soundings and identify additional sounding inserts. Insert offsets and depths were measured on the echograms, checked, and entered into HPS.

Supplemental soundings on item developments were acquired with a **Reson SeaBat 9003** shallow-water multibeam sonar system. The **SeaBat** sonar employs a Mills Cross transducer configuration. A can-shaped projector on the forward end of the sensor emits a 455 kHz fan-shaped sonar pulse. Return echoes are received through 40 independent beams, each sampling a 3° crosstrack by 1.5° alongtrack footprint. Measurements are repeated 13 times

per second, forming a continuous swath of multibeam coverage along the vessel trackline. The effective swath width is approximately 2.5 times the water depth.

**SeaBat** depth data were displayed using **ISIS** during acquisition and processed with **CARIS-HIPS** Data Cleaning programs. Digital multibeam depth profiles were visually reviewed and fliers were identified and manually flagged as rejected; no SeaBat quality flags were used to automatically reject data. Vessel navigation data from DGPS and attitude data from heave, roll, pitch, and gyro sensors were similarly displayed and manually cleaned. Navigation data were additionally checked with a 2.5 knot speed jump detector. For this survey, the outer three beams on each side of the swath (beam numbers 1, 2, 3, 38, 39 and 40) were not used, reducing the effective swath width to 102° (3°x 34 beams). Proper overlap between multibeam sonar coverage lines was verified in **MapInfo** using a swath width assumption of 100°.

After hydrographer review and cleaning, the depth, navigation, and attitude data were merged with sound velocity, tide, and vessel configuration data to compute the true depth and position of each sonar footprint. These processed data were excessed by selecting shoal soundings at a nominal density of 3 meters x 3 meters and evaluated by the hydrographer in CARIS Workfile Processing. Finally, the CARIS Workfile soundings were shoal-biased excessed at 15 meters X 15 meters and transferred into HPS (using HSDUtils) and MapInfo databases.

F.2 The diver least depths were acquired with a NOAA MOD3 pressure gage (s/n 68336). The least depths were computed using SMLGAGE and entered into HPS as detached positions.

F.3 There were no observed faults in sounding equipment that affected the accuracy or quality of the data.

## **G. CORRECTIONS TO SOUNDINGS**

G.1 a. The velocity of sound through water was measured using a Sea-Bird SBE 19 Seacat Profiler (s/n 1251) calibrated December 27, 1996. Velocity casts were conducted weekly without exception in accordance with the Project Instructions. During periods of multibeam item investigation, casts were taken more frequently in accordance with the Interim Guidance of April 8, 1997. Seacat Data Quality Assurance Tests were conducted after each respective velocity cast to ensure that the unit was operating within tolerance.

Sound velocity data applied to DSF data were processed using program VELOCITY. Computed velocity correctors were entered into the HDAPS or HPS sound velocity table and re-applied during post-processing to both high and low frequency soundings. Multibeam sound velocity and refraction correctors were generated through the REFRACT algorithm within CARIS-HIPS.

The following velocity casts supplied correctors for this survey:

<b>Cast Number</b>	<b>Day Number</b>	<b>Year</b>	<b>Applied to Days</b>
3	103	1996	103
4	104	1996	104
6	113	1996	116, 117
8	120	1996	120, 121, 123
10	130	1996	130, 131
12	136	1996	136, 137
15	149	1996	149 - 151
17	155	1996	Not Used
18	156	1996	155-158
22	172	1996	171
26	182	1996	182, 183
27	096	1997	Not Used
28	096	1997	96 - 99, 101
30	103	1997	104
32	106	1997	106, 107
33	110	1997	110
35	112	1997	112 - 115
36	119	1997	119 - 121
38	125	1997	124 - 129
40	132	1997	132, 134
42	135	1997	135
43	139	1997	138
45	143	1997	141, 142
46	147	1997	147, 149, 150
49	152	1997	152
50	155	1997	155 - 157
51	160	1997	160
55	164	1997	164
56	166	1997	166
58	169	1997	169
59	170	1997	170
60	171	1997	171
61	177	1997	177

b. DSF-leadline direct comparisons were conducted on May 21, 1996 (DN 142) and June 5, 1997 (DN 156). Leadline and DSF soundings compared satisfactorily. DSF and SeaBat soundings also compared satisfactorily. See Separate IV for data records.

c. Sensor offsets and transducer static drafts were measured during the December 1994 and 1996 dry-dock periods. The 1994 offset measurements were applied to all 1996 field season data through the HDAPS Offset Table #1. The 1996 offset measurements were applied to all 1997 field season data through HPS Offset Table #2 and the CARIS-HIPS Vessel Configuration File. See Separate IV\* for data records.

d. Transducer dynamic draft was measured on January 25, 1996, and February 20, 1997. The 1996 measurements were applied to all 1996 field season data through the HDAPS Offset Table #1. The 1997 measurements were applied to all 1997 field season data through HPS Offset Table #2 and the CARIS-HIPS Vessel Configuration File. See Separate IV\* for data records.

e. Heave, roll, and pitch data were acquired with a **TSS Model 335B Motion Sensor** (s/n 542). A preseason checkout of the sensor was successfully conducted in accordance with the TSS-335B Operating Manual. Heave data were applied to DSF vertical beam data. Heave, pitch, and roll data were applied to SeaBat multibeam data.

f. Vessel heading data were acquired with a Sperry Mark 32 Gyrocompass (s/n 224). Heading data were used to compute the multibeam transducer azimuth and position.

g. Multibeam heave, pitch, roll, and heading sensor data were adjusted using biases as determined during a patch test completed on April 02, 1997. See the CARIS-HIPS Vessel Configuration File in Separate III\* for data records.

G.2 No unusual or unique methods or instruments were used to correct echo soundings.

G.3 The tidal datum for this project is Mean Lower Low Water. The operating tide station at Sandy Hook, NJ (853-1680) served both as direct control for datum determination and as the reference station for predicted tides. Data for predicted tides were provided on floppy disk before the start of the project. These data were obtained from Table 2 of the East Coast of North and South America Tide Predictions and applied to the digital tide data using HDAPS software.

\* Data filed with the original field records

Tidal correctors were applied during post-processing using HDAPS predicted tide tables in 1996, and HPS predicted-tide tables in 1997. Field sounding plots showed some tidal anomalies in the form of banding. A comparison of real tide data, acquired from the AOS website, with predicted tides revealed clear deviations during times of high winds. The verified real tides were then applied to both single and multibeam data in HPS with the Apply Smooth Tides routine, eliminating the tidal banding. New plots were generated after application of verified tides. Verified tides are applied to fixes only in HPS, not all sounding data.

Tide zoning for this project is consistent with the Project Instructions. Direct tides (with no time and range correctors) were used for this survey.

A request for smooth tides was mailed on August 3, 1997.

*Approved tides & zoning were applied during office processing*  
G.4 The MOD3 pressure gage was calibrated on November 15, 1996. See Separate IV for data records. \*

G.5 No significant systematic errors were detected.

***In HPS, only tide reapplication processing is permissible on multibeam data. If necessary, all other vertical correctors and horizontal offsets should be reapplied to multibeam data using CARIS software. However, if tide reapplication is necessary, it should be done to the entire CARIS multibeam dataset to ensure the correct least depths are identified for transfer to HPS.***

**H. CONTROL STATIONS** *see also the Evaluation Report*

The horizontal datum for this survey is the North American Datum of 1983 (NAD 83). No horizontal control stations were used or established for this survey.

## **I. HYDROGRAPHIC POSITION CONTROL**

I.1 This survey was conducted exclusively using the Global Positioning System (GPS) corrected by the U.S. Coast Guard Differential GPS reference station network. Differential correctors were supplied from USCG radiobeacon transmitters, precluding the need for shore-based horizontal control stations.

I.2 Accuracy requirements were met as specified by the Hydrographic Manual and Field Procedures Manual (FPM).

*\* Data filed with original field records*

I.3 Differential GPS Equipment:

<u>Unit A</u>	<u>Unit B</u>
Ashtech GPS Sensor	Ashtech GPS Sensor
s/n 700417B1083	s/n 700417B1003
Firmware Version 1E89D-P	Firmware Version 1E89D-P
Magnavox MX50R	Magnavox MX50R
DGPS Receiver s/n 078	DGPS Receiver s/n 160
	Changed out 5/5/96 s/n 080

Correctors were received from the Montauk NY, Sandy Hook NJ, and Cape Henry VA beacons. Sandy Hook was used whenever possible.

I.4 Daily performance checks were conducted using the Shipboard Data Integrity Monitor program ("**SHIPDIM**", Version 2.1), in accordance with section 3.4.5 of the FPM. See SHIPDIM PERFORMANCE CHECKS in Separate III\* for daily system checks.

I.5 Calibration data are not required for differential GPS.

I.6 a. There were no unusual methods used to operate or calibrate electronic positioning equipment.

b. There were no positioning equipment malfunctions.

c. No systematic errors were detected which required adjustments.

d. The maximum allowed HDOP value of 3.33 was never exceeded.

e. The horizontal positions of the DSF vertical beam echo sounding data acquired in 1996 were corrected for GPS antenna offsets during field processing using HDAPS. **Horizontal positions of the DSF vertical beam echo sounding data acquired in 1997 were not corrected for GPS antenna offsets during field processing.** Offsets are located in HPS Offset Table #2, but are not applied. The horizontal inverse distance between the DSF transducer and the GPS antenna is approximately 2.3 meters. CARIS-HIPS applied antenna-to-SeaBat transducer offsets from the Vessel Configuration File during processing. Copies of Offset Tables #1 and #2 and the Vessel Configuration File are contained in Separate III.\*

f. Offset and layback distances for the A-frame (tow point) are located in HDAPS Offset Table #1 and HPS Offset Table #2, and were applied during post-processing. These offsets, along with the cable length, towfish height, and depth of water, were used by the HDAPS and HPS systems to compute the towfish position.

\* Data filed with original field records

**J. SHORELINE**

No shoreline investigation was required for this survey.

**K. CROSSLINES**

A combined total of 17 nautical miles of crosslines was acquired for this survey, representing 8% of the 217 nautical miles of the first 100% side scan mainscheme coverage.

An excessed screen plot of mainscheme soundings, superimposed with crosslines, was used to conduct mainscheme-to-crossline comparisons. Soundings at intersections were compared to all other soundings within a 5 mm (50 meter) radius. Based on this procedure, agreement between mainscheme and crossline soundings was found to be excellent. The majority of compared soundings fell within one foot (0.3m) of each other, with only an occasional difference of two feet (0.5 m) noted.

**L. JUNCTIONS *See also the Evaluation Report***

L.1 H-10675 junctions with one contemporary survey. H-10686, a 1:10,000 scale survey completed by RUDE in 1996, abuts the eastern edge. (1996)

L.2 The overall agreement of all junctions was excellent: the average difference in soundings was less than 2 feet (0.5 m).

**M. COMPARISON WITH PRIOR SURVEYS *See also the Evaluation Report***

A comparison with prior surveys will be performed by the Atlantic Hydrographic Branch as part of the office verification process.

**N. ITEM INVESTIGATION REPORTS**

Eight AWOIS items and several other significant items were investigated during this survey. Results of these investigations are summarized below:

b. Deepening trends were seen on the eastern edge of Flynn's Knoll where sand waves have migrated.

**P. ADEQUACY OF SURVEY** *See also the Evaluation Report*

This survey is complete and fully adequate to supersede prior survey data in common areas.

**Q. AIDS TO NAVIGATION**

Non-Floating

Positions were taken on 2 non-floating aids to navigation located in the boundaries of this survey. Positions on these two range markers were calculated using reciprocal side scan sonar records, picking the markers off as contacts. Each marker showed clearly on two separate records (100 and 200 percent coverage), and positions were computed in the HPS Contact Utilities routine. Calculated averages for each had less than 5 meters standard deviation. Positions were entered into HPS as detached positions, fix #'s 150 and 151.

A comparison was made between the detached positions, the 1997 edition of Light List, Volume I (positions in decimal minutes), and the largest scale chart of the area. Neither non-floating aid was found to deviate from its charted position by more than a few meters. Both non-floating aids adequately serve the apparent purpose for which they were established.

Floating

Detached positions were taken on 44 floating aids to navigation located in, or near, the boundaries of this survey. A comparison was made between the detached positions and the largest scale chart of the area. No floating aid was found to deviate from its published or charted position by more than a few meters. All floating aids adequately serve the apparent purpose for which they were established.



**R. STATISTICS**

**R.1 a.** Number of Positions . . . . .56586  
**b.** Lineal Nautical Miles of Sounding Lines: 569.67  
    with the Use of Side Scan . . . . . 486.19  
    without the Use of Side Scan . . . . .83.48

**R.2 a.** Square Nautical Miles of Hydrography  
    per 100% of Coverage . . . . . 9.12  
**b.** Days of Production . . . . . 61  
**c.** Detached Positions . . . . . 55  
**d.** Bottom Samples . . . . . 31  
**e.** Tide Stations . . . . . 1  
**g.** Velocity Casts. . . . .32  
**j.** SeaBat Item Investigations . . . . .288

**S. MISCELLANEOUS** *see also The Evaluation Report*

S.1 a. No evidence of silting was found during this survey.  
b. No anomalous tidal current conditions were found during this survey. Some anomalous tides occurred during weather events.

S.2 Thirty-one (31) bottom samples were obtained during this survey. As directed by the Project Instructions, all bottom samples were inspected and recorded, but not submitted to the Smithsonian Institution.

**T. RECOMMENDATIONS** *see also section P. of the Evaluation Report*

T.1 Additional field work should be considered on contact 3946.2P, a spoil pile which passed directly under the ship and towfish yielding a least depth of 16' during mainscheme side scan sonar. Item was not further investigated.

T.2 The hydrographer is aware of no construction or dredging that will affect results of this survey.

T.3 No further investigation of the survey area is recommended.

**U. REFERRAL TO REPORTS**

There are no referrals to this report.

This report and the accompanying field sheets are respectfully submitted.

*Jonathan Klay*

Jonathan M. Klay, LT, NOAA

**APPENDIX I**

DANGER TO NAVIGATION REPORTS

Two Danger to Navigation reports were submitted for this survey. Eight separate items were reported as Dangers to Navigation. Reports are attached. See Section N for detailed investigation reports.



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**Office of NOAA Corps Operations**  
**NOAA Ship RUDE S-590**  
**439 W. York Street**  
**Norfolk, VA 23510-1114**

June 25, 1997

Commander  
 First Coast Guard District  
 Aids to Navigation Office  
 408 Atlantic Avenue  
 Boston, Massachusetts 02110-3350

**REPORT OF DANGERS TO NAVIGATION, SURVEY H-10675**

Dear Sir:

The NOAA Ship RUDE is conducting hydrographic surveys in the vicinity of Sandy Hook, Lower Bay, approaches to New York. During the course of survey H-10675, four uncharted obstructions were found which merit immediate publication in the Local Notice to Mariners.

These items were discovered during hydrographic development using a Raytheon DSF-6000N echo sounder, a Reson SEABAT 9003 shallow-water multibeam sonar, and/or a diver investigation with a least depth gauge. Geographic positions were obtained through the Differential Global Positioning System beacon at Sandy Hook.

The items are described in the following table and on the attached chartlets. All information is preliminary and subject to office review. The depths have been reduced to Mean Lower Low Water (MLLW) by applying predicted tide corrections. The horizontal datum is NAD 83.

CHARTS AFFECTED:				
Chart 12324, 28 Ed, 03/01/97, 1:40,000		Chart 12401, 04 Ed, 10/28/95, 1:15,000		
Chart 12327, 90 Ed, 12/21/96, 1:40,000		Chart 12402, 05 Ed, 09/16/95, 1:15,000		
#	DEPTH (MLLW)	CHARTS	LATITUDE (NAD83)	LONGITUDE (NAD83)
A	14 ft	12327, 12401, 12402	40° 30' 49.78" N	074° 02' 02.31" W
B	15 ft	12327, 12401, 12402	40° 30' 33.26" N	074° 01' 16.30" W
C	15 ft	12327, 12401, 12324	40° 29' 06.53" N	074° 00' 46.87" W
D	16 ft	12327, 12401, 12324	40° 28' 51.45" N	074° 03' 10.68" W

Contact either of the following personnel for further information:

Commanding Officer, NOAA Ship RUDE  
 439 West York Street, Norfolk, VA 23510-1145  
 917-833-4279

Chief, Atlantic Hydrographic Branch  
 439 W. York Street, Norfolk, VA 23510-1145  
 757-441-6746

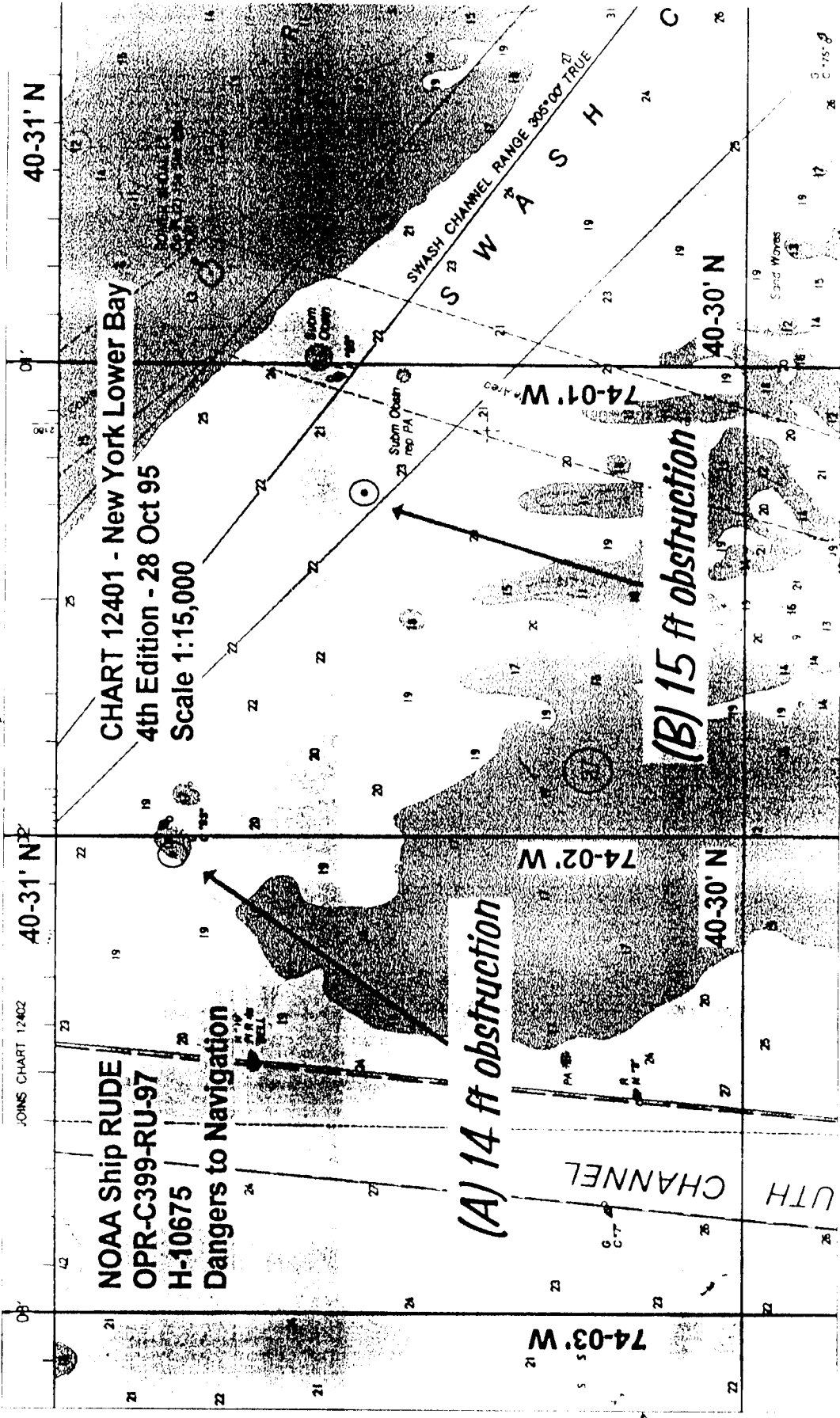
Sincerely,

David A. Cole, LCDR, NOAA  
 Commanding Officer, NOAA Ship RUDE

Attachment

cc: Atlantic Hydrographic Branch  
 Nautical Data Section  
 DMA-HTC





40-31' N

CHART 12401 - New York Lower Bay  
4th Edition - 28 Oct 95  
Scale 1:15,000

40-31' N

NOAA Ship RUDE  
OPR-C399-RU-97  
H-10675  
Dangers to Navigation

*(A) 14 ft obstruction*

*(B) 15 ft obstruction*

SWASH CHANNEL RANGE 305°00' TRUE

UTH CHANNEL

74-03' W

74-02' W

74-01' W

40-30' N

40-30' N

40-31' N

Sand Waves

C-7S

C-7

C-7

C-7R

Subm Obstr  
rep PA

Subm Obstr  
rep PA

Subm Obstr  
rep PA

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Subm Obstr  
rep PA





**U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of NOAA Corps Operations  
NOAA Ship RUDE S-590  
439 W. York Street  
Norfolk, VA 23510-1114**

October 15, 1997

Commander  
First Coast Guard District  
Aids To Navigation Office  
408 Atlantic Avenue  
Boston, Massachusetts 02110-3350

**REPORT OF DANGER TO NAVIGATION**

Dear Sir:

The NOAA Ship RUDE has recently completed a hydrographic survey of the approaches to New York Harbor:

Hydrographic Survey Registry No.... H-10675  
State..... New York  
General Locality..... Lower Bay  
Sublocality..... Vicinity of Sandy Hook  
Project Number..... OPR-C399-RU-97

During the course of multibeam sonar operations, several obstructions were discovered to have least depths shoaler than the depths currently shown on charts of the area. This new depth information merits immediate publication in the Local Notice to Mariners. The updated depths affect the following charts:

Chart 12324, Sandy Hook to Little Egg Harbor      28 ed, 01 Mar 1997  
Chart 12327, New York Harbor                              91 ed, 19 Apr 1997  
Chart 12401, New York Lower Bay, Southern Part,      04 ed, 28 Oct 1995  
Chart 12402, New York Lower Bay, Northern Part,      05 ed, 16 Sep 1995

DEPTH*	LATITUDE (NAD83)	LONGITUDE (NAD83)	CHARTS AFFECTED
16 ft	40° 30' 37.225" N	074° 03' 44.925" W	12327, 12401, 12402 ✓
17 ft	40° 30' 15.869" N	074° 03' 14.856" W	12327, 12401, 12402 ✓
40 ft	40° 28' 56.530" N	073° 59' 36.011" W	12324, 12327, 12401 ✓
16 ft	40° 27' 38.082" N	074° 03' 36.618" W	12324, 12327, 12401 ✓

\* Updated depths are reduced to feet at MLLW using predicted tides and should be viewed as preliminary information, subject to office review.

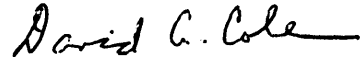


Contact either of the following personnel for further information:

Commanding Officer  
NOAA Ship RUDE (917) 833-4279  
439 West York Street  
Norfolk, VA 23510-1145

Chief, Atlantic Hydrographic Branch  
Atlantic Marine Center (757) 441-6746  
439 West York Street  
Norfolk, VA 23510-1145

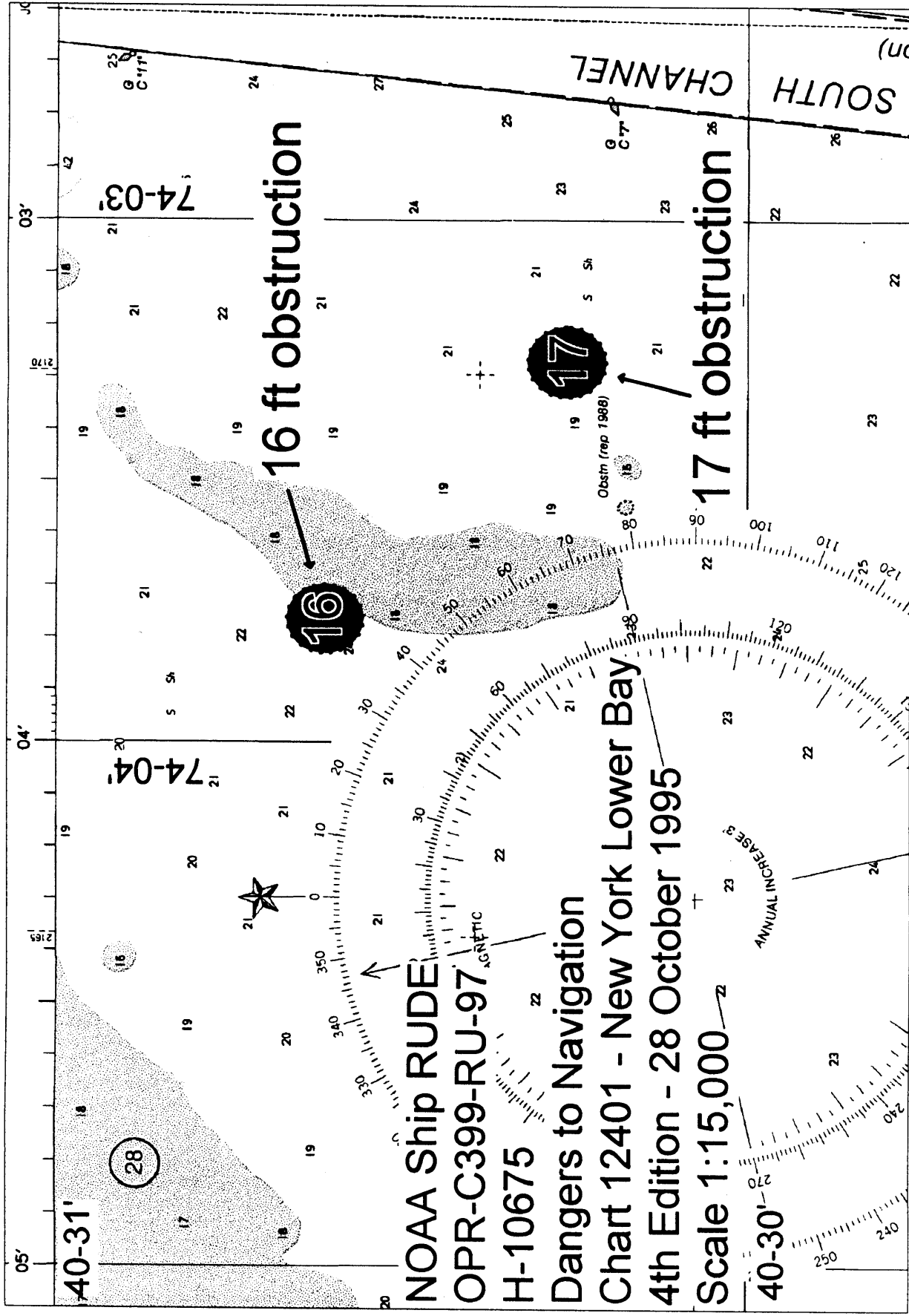
Sincerely,



David A. Cole, LCDR, NOAA  
Commanding Officer, NOAA Ship RUDE

Attachment  
cc: AHB, NIMA





40-31'

28

74-04'

74-03'

16 ft obstruction

16

17

17 ft obstruction

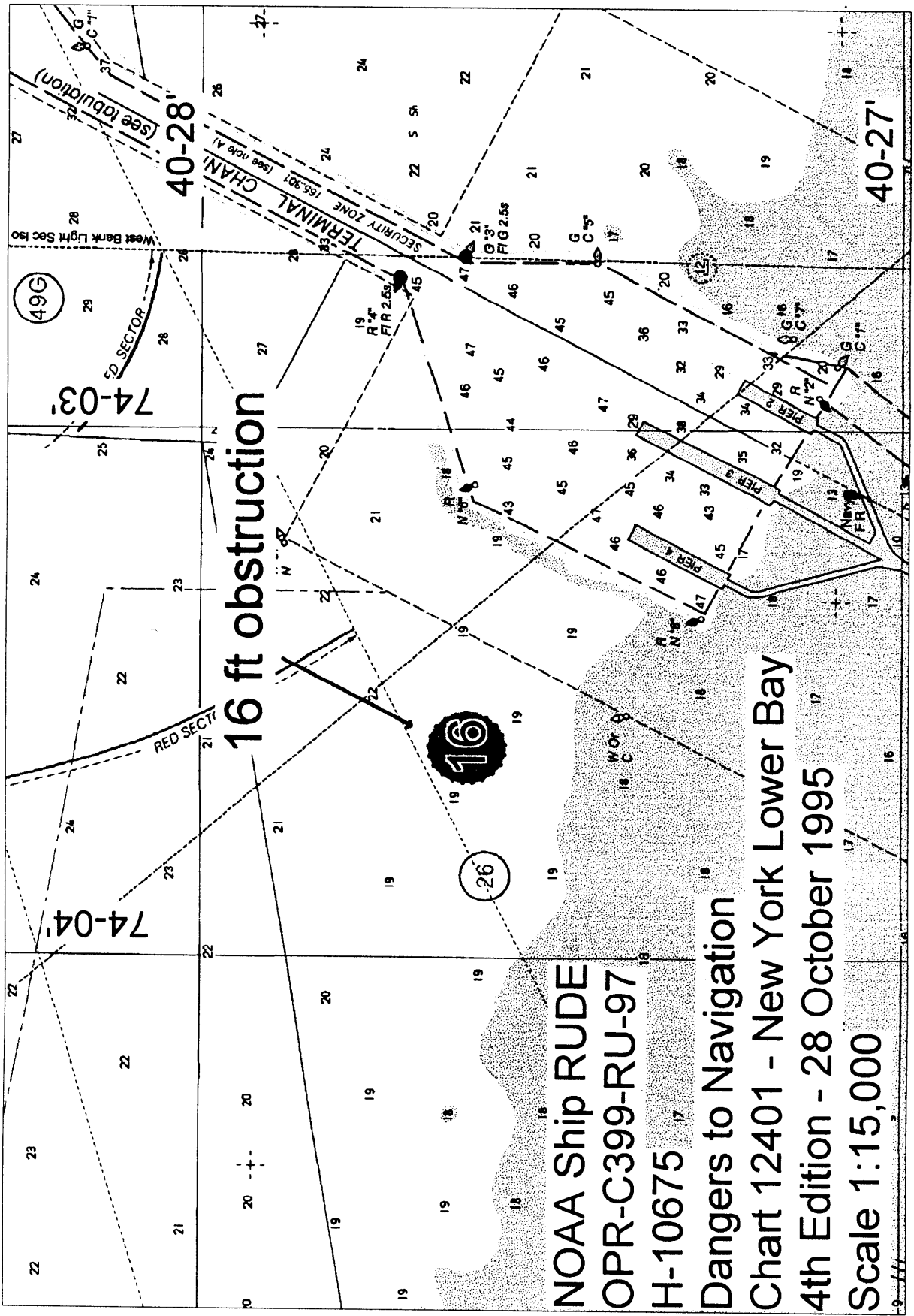
NOAA Ship RUDE  
OPR-C399-RU-97  
H-10675  
Dangers to Navigation  
Chart 12401 - New York Lower Bay  
4th Edition - 28 October 1995  
Scale 1:15,000

40-30'

ANNUAL INCREASE 3'

SOUTH CHANNEL





16 ft obstruction

16

26

NOAA Ship RUDE  
 OPR-C399-RU-97  
 H-10675

Dangers to Navigation  
 Chart 12401 - New York Lower Bay  
 4th Edition - 28 October 1995  
 Scale 1:15,000

74-03  
 49G  
 (see tabulation)

74-04  
 RED SECT

40-28  
 TERMINAL CHAN  
 SECURITY ZONE  
 165.301 (see note A)

40-27

Work Bank Light Sec Iso

Work Bank Light Sec Iso

Work Bank Light Sec Iso

Work Bank Light Sec Iso

## APPENDIX II

### NON-FLOATING AIDS AND LANDMARKS FOR CHARTS

Two non-floating aids are located in the boundaries of survey H-10675. Positions on these two rangemarkers were calculated using reciprocal side scan sonar records, picking the markers off as contacts. Each marker showed clearly on two separate records (100 and 200 percent coverage), and positions were computed in the HPS Contact Utilities routine. Calculated averages for each had less than 5 meters standard deviation. Positions were entered into HPS as detached positions (fix # 150 and 151).

NE marker 6s "Iso R"	40°29'18.29"	073°59'24.16"
SW marker "Q"	40°29'15.06"	073°59'35.46"

9 landmarks were positioned within the confines of survey H-10675. See supplemental correspondence to OPR-C399-RU-96, Landmarks and Nonfloating Aids to Navigation Report.

**APPENDIX III**

LIST OF HORIZONTAL CONTROL STATIONS

No horizontal control stations were needed for this survey since Differential GPS was employed exclusively for all positioning control. The geographic positions for the three Differential GPS radio beacons used during this survey are as follows:

Beacon	General Location
Cape Henlopen, DE	038°47'N 075°05'W
Montauk Point, NY	41°04'N 071°51'W
Sandy Hook, NJ	40°28'N 074°00'W

**APPENDIX VII**

APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H-10675

Field operations contributing to the accomplishment of this Navigable Area survey were conducted under my direct supervision with frequent personal checks of progress and adequacy. All field sheets and reports were reviewed in their entirety and all supporting records were checked as well.

This survey was completed with 200% side scan sonar coverage and is more than adequate to supersede ALL prior surveys in common areas. The survey is considered complete and adequate for nautical charting.

*David A. Cole*

---

David A. Cole, LCDR, NOAA  
Commanding Officer  
NOAA Ship RUDE

As noted in Section T.1, further work may be warranted on AWOIS 9710 (fix3945.1), and the Investigation Report for Fix 10631. Both of these features appear to have been ensonified near-nadir during the mainscheme DSF-6000N coverage. Processing of the existing mainscheme SEABAT data for these features may yield adequate coverage for least depth determination, thus eliminating the need for additional field work.

*David A. Cole*

AWOIS No. 1631

Item Description: Wreck Anne D II

Source: LNM25/75

AWOIS Least Depth:

Required Investigation: Full, 200% SSS, 1000m radius

Charts Affected: 12401, 12327, 12326, 12324

Investigation

Date (s)/DN (s): DN 99, 103, 104, 106, 110, 113, 116, 119, 124, 129, 141, 142, 164, 169, 170

Position Numbers: See Development Abstract in Separate VI.\*

Positioned Determined by: DGPS

Lat. 40° 29' 18.38" Long. 73° 58' 52.49"

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003 during 38 contact investigations.

The AWOIS center was at the eastern sheet limit. Side-scan sonar did not show any contacts resembling the AWOIS description in the western half of the search radius. Shoalest depth found was 22' (6.7m), 980m NW of the AWOIS position, on contacts 1090.2S and 17288.0S. These items are rocky dredge spoils that rise 5' (1.6m) above the surrounding bottom. Least depth position: 2 fixes 2261T, 5794Q

A 24'3 (7.4m) depth was found 200m NW of the center, on a dredge spoil pile which rises 6' (1.9m) above the surrounding bottom. Least depth position: fix 1104T ✓

Charting Recommendation

Hydrographer recommends removing the wreck symbol with the label "PA", and charting the representative depths from the present survey. Data from this survey should be used to supersede all prior surveys. *Concur*

\*\*\*\*\*

COMPILATION NOTES

This AWOIS item was also investigated on sheet H-10686 in 1996. No features identified as the AWOIS item were found during the 1996 investigation.

\* Data filed with original field records

Delete PA #:

AWOIS No. 2452

Item Description: Obstruction

Source: LNM49/72

AWOIS Least Depth: Unknown

Required Investigation: Full, 200% SSS, 500m radius

Charts Affected: 12401, 12327, 12326

Lat 40° 30' 29.78"  
Long 74° 01' 01.4"

Investigation

Date (s)/DN (s): DN 103, 113, 138, 147, 157, 160

Position Numbers: See Development Abstract in Separate VI.\*

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003 during 25 contact investigations. The AWOIS position is located in an area of scattered debris; all contacts with heights greater than 1 m or appearing manmade were developed.

Investigation of Side Scan contact 1182.4S/17139.4P with SeaBat yielded a least depth of 14' (4.5m), 370m WNW of the reported position. Sonargrams showed a manmade obstruction with two distinct peaks. Diver investigation found two large stone blocks rising 6' (1.9m) above the bottom. Submitted as danger to navigation. Least Depth Position: fix ~~22305.1~~ 23450+1  
Lat 40° 30' 33.327"N, Long 74° 01' 16.346"W

Investigation of contact 1383.8P with SeaBat yielded a least depth of 17' (5.4m), 420m NW of the center. Sonargrams showed an indistinct mound. Least Depth Position: fix 55107.

Charting Recommendation

Hydrographer recommends charting the new 14 foot sounding surrounded by the danger curve and blue tinting, and labeled ~~Obstn~~ "Obstn". Hydrographer recommends removal of the blue tint surrounded by the danger curve and the label "Subm Obstn rep PA". Data from this survey should be used to supersede all prior surveys. Concur

\*\*\*\*\*

Chart 14: RK

COMPILATION NOTES

Delete 15: Obstn  
Delete 15: Subm Obstn  
rep PA

\* Data filed with original<sup>4</sup> field records



AWOIS No. 2457

Item Description: Wreck (2<sup>3</sup>/<sub>A</sub>' Speedboat)

Source: LNM39/75

AWOIS Least Depth: Unknown

Required Investigation: Full, 200% SSS, 1000m radius

Charts Affected: 12401, 12327, 12326, 12324

-----

Investigation

Date (s)/DN (s): DN 128, 155

Position Numbers: 21140-345, 23250-260, 49830-51220, 64860-<sup>880</sup>

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters during mainscheme hydrography, and SeaBat 9003 during 13 contact investigations. Approximately 2/3 of the search area was covered, the eastern section being too shoal. No contacts resembling the AWOIS description were found with side-scan. All contacts greater than 1 meter in height or appearing manmade were developed with SeaBat.

-----

Charting Recommendation

Hydrographer recommends charting the representative depths from the present survey where covered. Data from this survey should be used to supersede all prior surveys. *Concur w/clarification*

*Retain as charted*

\*\*\*\*\*

COMPILATION NOTES

AWOIS No. 9710

Item Description: Obstruction  
Source: LNM8/88  
AWOIS Least Depth: Unknown  
Required Investigation: Full, 400% SSS, 250m radius  
Charts Affected: 12401, 12327, 12326, 12324  
-----

Investigation

Date (s)/DN (s): DN 121, 128, 155, 156  
Position Numbers: 3650, 10000, 21200, 50200  
Positioned Determined by: DGPS  
Lat 40° 30' 12" N, Long 74° 03' 31" W

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters during mainscheme hydrography, and SeaBat 9003 during 5 contact investigations. Multibeam development of contacts 3781.lp, 10176.lp, and 10176.3s, over a 5' (1.4m) high ridge-like feature, yielded the least depth of 15' (4.6 m), 90m east of the reported position. Least depth position: fix ~~50238~~. 21216+1  
A least depth of 16' (5.0m) was found on contact 3946.2P, 150m south of the AWOIS, during mainscheme side scan. The object rises 3' (1.0m) above the bottom. Sonargrams show a 15m diameter spoil pile. Item was discovered during review, and should be considered for further investigation. Least depth position: fix 3945.1.

Charting Recommendation

Hydrographer recommends removal of the charted 16' sounding, the adjacent danger curve, and the label "Obstn (rep 1988)", and charting the new 15' and 16' soundings surrounded by the 18' contour line and blue tinting. Data from this survey should be used to supersede all prior surveys. *Concur*

\*\*\*\*\*

COMPILATION NOTES

*Delete ∴ Obstn (rep 1988)*

AWOIS No. 9716

Item Description: Obstruction, hang at 16 feet

Source: H833WD/56

AWOIS Least Depth: 14' cleared

Required Investigation: S2, 200m

-----

Investigation

Date (s)/DN (s): Same as AWOIS 2452

Positioned Determined by: DGPS

Lat 40° 30' 39.98"N, Long 74° 00' 58.5"W

Investigation Summary: This AWOIS item lies completely within AWOIS 2452, and was investigated concurrently. Two side scan sonar contacts were found and investigated with SeaBat within the search radius. No sign of the obstruction was noted. Least depth found was 22 feet at the edge of Romer Shoal.

-----

Charting Recommendation

Hydrographer recommends removing the 14' wire drag sounding, and the surrounding blue tint and danger curve, and charting the representative depths from the present survey. Data from this survey should be used to supersede all prior surveys.

CONCUR

\*\*\*\*\*

COMPILATION NOTES

Delete 14' Obstrn

AWOIS No. 9755

Item Description: Obstruction, hang at 18 feet  
Source: H-6994WD/44  
AWOIS Least Depth: 16' cleared  
Required Investigation: Full, 200% SSS, 100m radius  
Charts Affected: 12401, 12327, 12324

-----

Investigation

Date (s)/DN (s): DN 123, 156, 157, 101, 104, 114, 115

Position Numbers: 5269-72, 11605-9, 11645-50, 14236-41,  
14459-63, 18508-12, 18525-30

Positioned Determined by: DGPS

*Lat 40° 27' 45.78" N, Lon 74° 01' 02.7" W*

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters during mainscheme hydrography. No side scan contacts were logged within the search radius.

----- ]

Charting Recommendation

Hydrographer recommends removal of the 16' wire drag sounding and the surrounding blue tint and danger curve, and charting the representative depths from the present survey. Data from this survey should be used to supersede all prior surveys. *CONCUR*

\*\*\*\*\*

COMPILATION NOTES

*Delete : 16:*

AWOIS No. 9756

Item Description: Obstruction, hang at 13 feet

Source: H-6994WD/44

AWOIS Least Depth: 12' cleared

Required Investigation: Full, 200% SSS, 100m radius

Charts Affected: 12401, 12327, 12324

Investigation

Lat 40° 27' 17.78"N  
Lon 74° 02' 42.3"W

Date (s)/DN (s): DN 125

Position Numbers: 20646-20654

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat during one contact investigation within AWOIS radius. Investigation of side scan contact 17863.9P/19073.0S, 170m south of the AWOIS position, with SeaBat yielded a least depth of 13' (3.9m). This contact appears manmade and approximately 3m long on sonargrams. 13' Least depth position: fix 44869.

Charting Recommendation

Hydrographer recommends removal of the 12' wire drag sounding and the surrounding danger curve, and charting the 13' sounding surrounded by the danger curve, labeled "Obstn". The 13' contact is likely the AWOIS item. Data from this survey should be used to supersede all prior surveys. *Concur*

\*\*\*\*\*

COMPILATION NOTES

Delete :12:

Chart :13: Obstn at Lat 40° 27' 12.38"N  
Lon 74° 02' 41.62"W

AWOIS No. 9757

Item Description: Obstruction  
Source: FE-330SS/89  
AWOIS Least Depth: 16' cleared  
Required Investigation: Full, 200% SSS, 100m radius  
Charts Affected: 12401, 12327, 12324

---

Investigation

Date (s)/DN (s): DN 112, 130

Position Numbers: 6667-6670, 6789-6792, 15126-15129, 15190-15194 ✓

Positioned Determined by: DGPS

Lat. 40° 27' 12.4" N  
Lon. 74° 01' 54" W

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters during mainscheme hydrography. No side-scan contacts were logged within the search radius.

---

Charting Recommendation

Hydrographer recommends removal of the 16' wire drag sounding and the surrounding blue tint and danger curve, and charting the representative depths from the present survey. Data from this survey should be used to supersede all prior surveys. *Concur*

\*\*\*\*\*

COMPILATION NOTES

*Delete file*

**Contact 1663.6P**

Contact Position: 40°30'50.368"N, 074°02'07.228"W  
Charts Affected: 12401, 12327

---

Investigation

Date (s)/DN (s): DN 132  
Position Numbers: 21513-21518, 21547-21567  
Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003. Investigation with SeaBat yielded a least depth of 15' (4.8m) on a 20m diameter mound of spoil. Reported as Danger to Navigation.  
Least depth position: fix 21547.†  
Lat. 40°30'50.45"N  
Lon. 74°02'06.85"W

---

Charting Recommendation

Hydrographer recommends charting the 15' sounding surrounded by the 18' contour line and blue tinting.

*Concur*

\*\*\*\*\*

COMPILATION NOTES

✓

*Delete 114. Obstrn*

Contact 17380.5S

Contact Position: 40°30'49.876"N, 074°02'02.262"W

Charts Affected: 12401, 12327

---

Investigation

Date (s)/DN (s): 132

Position Numbers: 21529-21540

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003. Investigation with SeaBat yielded a least depth of 14' (4.4m) on a 15m by 20m rocky spoil pile. Reported as danger to navigation. Least depth position: fix 53546.

---

Charting Recommendation ✓

Hydrographer recommends charting a 14' sounding surrounded by the danger curve and blue tinting, and labeled "Obstn". *Do not concern*  
\*\*\*\*\*

COMPILATION NOTES

Chart 14 foot L.D. at lat 40° 30' 49.78" N  
Lon. 74° 02' 02.31" W  
Delete '14: Obstn



CONTACT 5676.3P

Item Description: Wreck

Contact Position: 40°27'55.267"N, 074°02'42.907"W

Charts Affected: 12401, 12327, 12324

-----  
Investigation

Date (s)/DN (s): 06May97, DN126

Position Numbers: 6962-6974, 20759-20773

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003. Investigation with SeaBat yielded a least depth of 26' (8.1m). Sonargrams showed a large rectangular manmade obstruction. Diver investigation (DN 112, see Separate VI)\*found a barge with surrounding scour, about 8 feet (2.4m) total height in scour, but otherwise nearly level with surrounding bottom.

Least Depth Position: fix ~~20765.1. 501~~

-----  
Charting Recommendation

Hydrographer recommends charting the 26 foot sounding with the label "WK". *Concur*

\*\*\*\*\*

COMPILATION NOTES

*chart 26 WK*

*at Lat 40° 27' 55.27"*

*Lon 74° 02' 42.91"*

✓

*\* Data filed with original field records*

**CONTACT 15497.5S**

Item Description: Spoil Pile

Contact Position: 40°29'06.462"N, 074°00'47.280"W

Charts Affected: 12401, 12327, 12324

---

Investigation

Date (s)/DN (s): 09May97/DN129

Position Numbers: 21380-21387

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003. Investigation with SeaBat yielded a least depth of 16' (5.1m), and DSF-6000N a least depth of 16' (4.8m). Sonargrams showed a large dredge spoil pile. Reported as Danger to Navigation. Least depth position: fix 8434.1.

---

Charting Recommendation ✓

Hydrographer recommends charting the 1<sup>5</sup> foot sounding surrounded by the 18' contour line and blue tinting. *do not concur*  
*no change in charting is recommended*  
\*\*\*\*\*

COMPILATION NOTES

CONTACT 15242.5P

Item Description: Obstruction

Contact Position: 40°27'38.043"N, 074°03'36.720"W

Charts Affected: 12401, 12327, 12324

---

Investigation

Date (s)/DN (s): 06May97/DN126

Position Numbers: 20807-20809

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003. Investigation with SeaBat yielded a least depth of 16' (5.1m) on a contact rising 3' (0.8m) above the surrounding bottom. Sonargrams showed a 2m x 4m manmade object. Reported as Danger to Navigation. Least depth position: fix 20807.1.

---

Charting Recommendation ✓

Hydrographer recommends charting the 16 foot sounding with the label "OBSTN". *Concur*

\*\*\*\*\*

COMPILATION NOTES

*No change in charting is recommended*

CONTACTS 3407.2S & 9726.3P

Item Description: Shoal

Contact Position: 40°28'51.205"N, 074°03'11.807"W

Charts Affected: 12401, 12327, 12324

---

Investigation

Date (s)/DN (s): DN128, 177

Position Numbers: 21054-71, 23928-64

Positioned Determined by: DGPS ✓

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003. Investigation with SeaBat yielded a least depth of 17' (5.4m) on a contact rising 5' (1.5m) above the surrounding bottom. Sonargrams showed a ridge-like feature. Reported as Danger to Navigation. Least depth position: fix ~~3406.1~~. 9725.1

---

Charting Recommendation

Hydrographer recommends charting the 17 foot sounding with the surrounding 18' contour line and blue tinting. *Concur*

\*\*\*\*\*

COMPILATION NOTES

*Delete 16: Obstr*

CONTACT 9821.5S

Item Description: Obstruction

Contact Position: 40°30'15.87"N, 074°03'14.86"W

Charts Affected: 12401, 12327, 12324

-----  
Investigation

Date (s)/DN (s): DN 104, 117, 128, 150, 151

Position Numbers: 3456-8, 3502-4, 9820-2

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters, and SeaBat 9003. Investigation with SeaBat yielded a least depth of 17' (5.3m) on a contact rising 4' (1.1m) above the surrounding bottom.

Reported as Danger to Navigation. Least depth position: fix 50152.

-----  
Charting Recommendation

Hydrographer recommends charting the 17 foot sounding with the surrounding danger curve and the lettering "Obstn".

*CONCUR*

\*\*\*\*\*

COMPILATION NOTES

*No change in charting is recommended*

Fix 10631+1

Item Description: Sounding

Contact Position: 40°30'37.23"N, 074°03'44.93"W

Charts Affected: 12401, 12327, 12324

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Investigation

Date (s)/DN (s): DN 121, 156

Position Numbers: 4150-2, 4300-4303

Positioned Determined by: DGPS

Investigation Summary: Investigated using 200% side scan sonar at a line spacing of 40 meters. Mainscheme echo sounder yielded a least depth of 16' (4.9m) on a spike rising 3' (0.9m) above the surrounding bottom. Feature was found during shipboard review and was not investigated. Reported as Danger to Navigation.

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Charting Recommendation

Hydrographer recommends charting the 16 foot sounding with the surrounding danger curve and the lettering "Obstn". *Concur*

\*\*\*\*\*

COMPILATION NOTES

*No change in charting is recommended*

As with the easterly adjoining survey H-10686 (OPR-C399-RU-96), numerous uncharted contacts were identified and investigated in Swash Channel. The most significant are summarized in the following table.

fix	Contact	least depth	height	type
67818	16651.1S	19' (6.0m)	3' (0.9m)	Obstruction
1535 +1	1536.0S	19' (5.9m)	5' (1.5m)	Obstruction
54930	16130.3P	22' (6.9m)	3' (1.0m)	Dredge Spoil
21601	1678.4P	18' (5.5m)	3' (0.9m)	Dredge Spoil
22293 +1	1425.5S	18' (5.7m)	4' (1.1m)	Dredge Spoil
22327 +1	1692.8P	18' (5.6m)	4' (1.1m)	<del>Obstruction</del>
22793 +2	1373.3S	18' (5.7m)	4' (1.2m)	Obstruction
<del>59621</del>	17002.2S	19' (5.9m)	4' (1.1m)	Obstruction
22896 +1	1049.0P	18' (5.7m)	5' (1.4m)	Dredge Spoil
22864 +1	18755.8P	16' (5.0m)	6' (1.7m)	Dredge Spoils
59980 /	1936.8P	18' (5.5m)	4' (1.4m)	<del>Obstruction</del>
22875 +1	2051.8S	16' (5.0m)	7' (2.0m)	Dredge Spoil
61006	1064.3S	19' (6.0m)	6' (1.8m)	Obstn, dive on dn134
61711	17463.1S	20' (6.2m)	4' (1.2m)	Dredge Spoil
22739 +1	18791.2S	20' (6.3m)	5' (1.6m)	Dredge Spoil
58489	1080.4P	21' (6.4m)	4' (1.4m)	Obstruction
59115	1796.0S	20' (6.3m)	5' (1.4m)	Obstruction
58247	1125.1P	22' (6.6m)	4' (1.4m)	Obstruction
22677 +1	18856.3S	22' (6.7m) 6	4' (1.3m)	Dredge Spoil
57679	1094.7P	24' (7.3m)	5' (1.6m)	<del>Obstruction</del>
<del>57790</del>	17051.8S	24' (7.4m)	5' (1.6m)	Dredge Spoil

22590 +1

Due to the density of these items, the hydrographer recommends these items be charted as soundings, with a general notation on the chart describing the area as having numerous obstructions.

**O. COMPARISON WITH THE CHART** *See also the Evaluation Report*

O.1 Five charts are affected by this survey:

Chart 12326

"Approaches to New York, Fire Island Light to Sea Girt"  
44<sup>th</sup> Ed. 01 February 1997  
Scale: 1:80,000

Chart 12327

"New York Harbor"  
92<sup>nd</sup> Ed. 20 December 1997  
Scale: 1:40,000

Chart 12324 SC

"Sandy Hook to Little Egg Harbor"  
28<sup>th</sup> Ed. 01 March 1997  
Scale: 1:40,000

Chart 12401

"New York Lower Bay, Southern Part"  
5<sup>th</sup> Ed. 25 October 1997  
Scale: 1:15,000

Chart 12402

"New York Lower Bay, Northern Part"  
6<sup>th</sup> Ed. 08 November 1997  
Scale: 1:15,000

O.2 Two Danger to Navigation reports were submitted for this survey. Eight separate items were reported as Dangers to Navigation. Reported depths were calculated with predicted tides. See appendix I\*for reports.\**Appended to This report*

O.3 The overall correlation between charted soundings and survey depths is excellent, with average differences of approximately one foot in flat and slightly sloping areas and no more than two to three feet in areas with irregular bottoms, except where noted in Sections N and O.4.

O.4 a. The correlation between charted shoal areas and corresponding soundings from this survey is good. Areas of sand waves in southern Swash Channel and northeast Flynn's Knoll show considerable movement of these features since the area was last surveyed. Surveyed depths were up to 6 feet deeper than the charted depths where sand waves have migrated onto the shoal. Shoaling also was found along the southern edge of Sandy Hook Channel at False Hook shoal, near the southeastern sheet limit.



N/CS33-22-99

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY  
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ORDINARY MAIL  AIR MAIL

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LETTER TRANSMITTING DATA

TO:

CHIEF, DATA CONTROL GROUP, N/CS3x1  
NOAA/NATIONAL OCEAN SERVICE  
STATION 6815, SSMC3  
1315 EAST-WEST HIGHWAY  
SILVER SPRING, MARYLAND 20910-3282

DATE FORWARDED

APRIL 1, 1999

NUMBER OF PACKAGES

ONE TUBE

**NOTE:** A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

H10675

NEW YORK - NEW JERSEY, LOWER BAY, VICINITY OF SANDY HOOK

(ONE) TUBE CONTAINING THE FOLLOWING:

- 1 SMOOTH SHEET FOR SURVEY H10675
- 1 ORIGINAL DESCRIPTIVE REPORT
- 1 DRAWING HISTORY FORMS (NOAA FORM #76-71)  
FOR CHART #12401
- 1 H-DRAWING FOR NOS CHART 12401
- 2 COMPOSITE DRAWING FOR NOS CHART 12401

FROM: (Signature)

ROBERT R. HILL

RECEIVED THE ABOVE

(Name, Division, Date)

Return receipted copy to:

ATLANTIC HYDROGRAPHIC BRANCH  
N/CS33  
439 WEST YORK STREET  
NORFOLK, VA 23510-1114

04/01/99

HYDROGRAPHIC SURVEY STATISTICS  
REGISTRY NUMBER: H10675

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		56586
NUMBER OF SOUNDINGS		56586
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	68	04/28/98
VERIFICATION OF FIELD DATA	231	12/15/98
EVALUATION AND ANALYSIS	19	
FINAL INSPECTION	36	11/25/98
COMPILATION	182	03/31/99
TOTAL TIME	578	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		03/02/99



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SERVICE

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE:** September 25, 1997

**HYDROGRAPHIC BRANCH:** Atlantic

**HYDROGRAPHIC PROJECT:** OPR C399-RU

**HYDROGRAPHIC SHEET:** H-10675

**LOCALITY:** Approaches to New York Harbor, N.Y.

**TIME PERIOD:** April 12 - July 1, 1996 and  
April 6 - June 26, 1997

**TIDE STATION USED:** 853-1680 Sandy Hook, N.J.  
Lat. 40° 28.0'N Lon. 74° 00.6'W


**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 m  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.481 m

**REMARKS:** RECOMMENDED ZONING

Use zone(s) identified as: SH1, SH2 & SH3

Refer to attachment(s) for zoning information.

**Note:** Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time.

  
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**CHIEF, TIDAL ANALYSIS BRANCH**



GEOGRAPHIC NAMES

H-10675

Name on Survey	<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">A ON CHART NO. 12401</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>										
	AMBROSE CHANNEL	X		X							
CHAPEL HILL SOUTH CHANNEL	X		X								2
FALSE HOOK	X		X								3
FALSE HOOK CHANNEL	X		X								4
FLYNNS KNOLL	X		X								5
LOWER BAY (title)	X		X								6
NEW JERSEY (title)	X		X								7
NEW YORK (title)	X		X								8
ROMER SHOAL	X		X								9
SANDY HOOK	X		X								10
SANDY HOOK BAY	X		X								11
SANDY HOOK CHANNEL (East)	X										12
SWASH CHANNEL	X		X								13
TERMINAL CHANNEL	X		X								14
											15
											16
											17
											18
											19
											20
											21
											22
											23
											24
											25

Approved:

*Dennis J. Pendergast*  
Chief Geographer  
JUL 14 1998

**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT FOR H10675 (1996-97)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

**D. AUTOMATED DATA ACQUISITION AND PROCESSING**

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System  
NADCON, version 2.10  
SiteWorks, version 2.1  
MicroStation, version 5.0  
I/RAS B, version 5.01

The smooth sheet was plotted using an Hewlett Packard DesignJet 2500CP plotter.

**H. CONTROL STATIONS**

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). The smooth sheet has been annotated with ticks showing the computed mean shift between the North American Datum of 1983 (NAD 83) and the North American Datum of 1927 (NAD 27).

To place the survey on the NAD 27 datum, move the projection lines 0.386 seconds (11.895 meters or 1.19 mm at the scale of the survey) north in latitude and 1.497 seconds (35.269 meters or 3.53 mm at the scale of the survey) east in longitude.

**L. JUNCTIONS**

H10686 (1996) to the east

A standard junction was effected between the present survey and the junctional survey.

There are no other junctional surveys to the north, south, or west. Present survey depths are in harmony with the charted hydrography to the north, south, and west.

**M. COMPARISON WITH PRIOR SURVEYS**

A comparison with prior surveys was not performed during office processing in accordance with section 4. of the memorandum titled, "Changes to Hydrographic Survey Processing", dated May 24, 1995.

- O. COMPARISON WITH CHARTS 12324 (28<sup>th</sup> Edition, Mar. 1/97)**  
12326 (44<sup>th</sup> Edition, Feb. 1/97)  
12327 (92<sup>nd</sup> Edition, Dec. 20/97)  
12401 ( 5<sup>th</sup> Edition, Oct. 25/97)  
12402 ( 6<sup>th</sup> Edition, Nov. 8/97)

**1. Hydrography**

The charted hydrography originates with prior surveys and other miscellaneous sources. An adequate comparisons is made in sections N. and O. of the Descriptive Report. Attention is directed to the following:

a. An uncharted rock with a least depth of 19 feet, in Latitude 40°29'57.98"N, Longitude 074°00'13.47"W was located by the present survey. It is recommended that a 19 ft rock surrounded by a danger curve be charted in Latitude 40°29'57.98"N, Longitude 074°00'13.47"W.

b. A charted note, Shoaling to 16 ft reported July 1983, in the vicinity of Latitude 40°27'14"N, Longitude 074°01'00"W, originates with an unknown source and is shown on NOS chart 12401. It is recommended that the charted note be removed from the chart and the present survey depths be charted.

c. A charted note, 28 ½ FT NOV 1993, in the vicinity of Latitude 40°28'37"N, Longitude 074°02'36"W, originates with an unknown source and is shown on NOS chart 12401. It is recommended that the charted note be removed from the chart and the present survey depths be charted.

**Controlling Depths**

There are no conflicts between the present survey depths and the controlling depths of Sandy Hook Channel, Chapel Hill South Channel, Terminal Channel, and Sandy Hook Channel (East). Attention is directed to the following:

Conflicts exist with the charted controlling depths in the vicinity of Raritan Bay East Channel from Longitude 74°02'18"W to Longitude 74°02'24"W. The present survey shows depths of

34 to 35 feet with a controlling depth of 36 feet.

An uncharted 40 foot depth (12<sup>2</sup> m), in Latitude 40°28'56.53"N, Longitude 73°59'36.01"W, in Sandy Hook Channel (East), was located by the field unit and was reported by the hydrographer as a danger to navigation. This depth is noted in the tabulation on the current edition of chart 12401 (5<sup>th</sup> Edition, Oct. 25, 1997). No change in the charted note is recommended.

Except where noted in this report, the present survey is adequate to supersede the charted hydrography in the common area.

**P. ADEQUACY OF SURVEY**

This is an adequate hydrographic/side scan sonar survey; no additional work is recommended.

**S. MISCELLANEOUS**

Chart compilation using the present survey data was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compiled data will be forwarded to Hydrographic Survey Division, Silver Springs, Maryland upon completion of the project.

The following NOS Chart was used for compilation of the present survey:

12401 (5<sup>th</sup> Edition, Oct. 25, 1997)

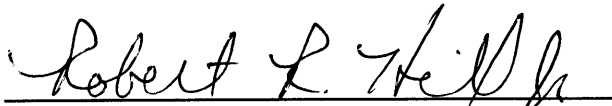
Richard W. Blevins  
Richard W. Blevins  
Cartographer  
Verification of Field Data  
Evaluation and Analysis



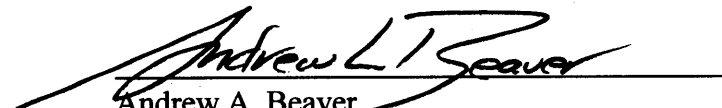
APPROVAL SHEET  
H-10675

**Initial Approvals:**

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproof of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

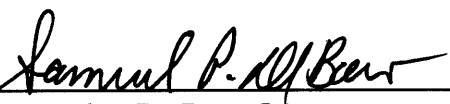
 Date: 3/1/99  
Robert R. Hill Jr.  
Cartographer  
Atlantic Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

 Date: 3/2/99  
Andrew A. Beaver  
LCDR, NOAA  
Chief, Atlantic Hydrographic Branch

\*\*\*\*\*

**Final Approval:**

Approved:  Dated: APR 23 1999  
Samuel P. De Bow, Jr.  
Commander, NOAA  
Chief, Hydrographic Surveys Division



