

H10795

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/Multibeam

Field No. RU-10-2-98

Registry No. H10795

LOCALITY

State Rhode Island

General Locality Block Island Sound

Locality Southwest Ledge and Vicinity

~~1998-1999~~

CHIEF OF PARTY
LCDR J. S. Verlaque

LIBRARY & ARCHIVES

DATE JUL 23 2000

REGISTRY NUMBER:

H10795

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 NUMBER:

RU-10-02-98

State: Rhode Island

General locality: Block Island Sound

Locality: Southwest Ledge and Vicinity

Scale: 1: 10,000 Date of survey: April 7, 1998 – August 26, 1999

Instructions dated: April 14, 1998; Change No. 1 dated May25, 1999 Project Number: OPR-B663-RU-98/99

Vessel: NOAA Ship RUDE

Chief of Party: LCDR J. Verlaque, NOAA

Surveyed by: LCDR J. Verlaque, LCDR D. Cole, LT E. Berkowitz, , LT J. Evjen, PS E. Owens, PS C. Parker, ENS K. Slover, SST K. Callahan, ST S. Rooney, AST M. Chandler

Soundings taken by echo sounder, hand lead-line, or pole: Reson SeaBat 9003 shallow-water sonar system, Odom-Echotrac Echosounder

Graphic record scaled by: RUDE Personnel

Graphic record checked by: RUDE Personnel

Protracted by: N/A Automated plot by: HP 2500CP

Verification by: ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

Soundings in: Feet: Fathoms: Meters: at MLW: MLLW: (*):

Remarks: Field Examination, All times recorded in UTC.

HAND WRITTEN NOTES IN DESCRIPTIVE REPORT WERE MADE DURING OFFICE PROCESSING

AWOIS/SURF 5/31/00 MCR

Progress Sketch

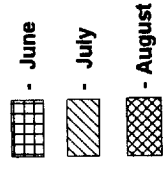
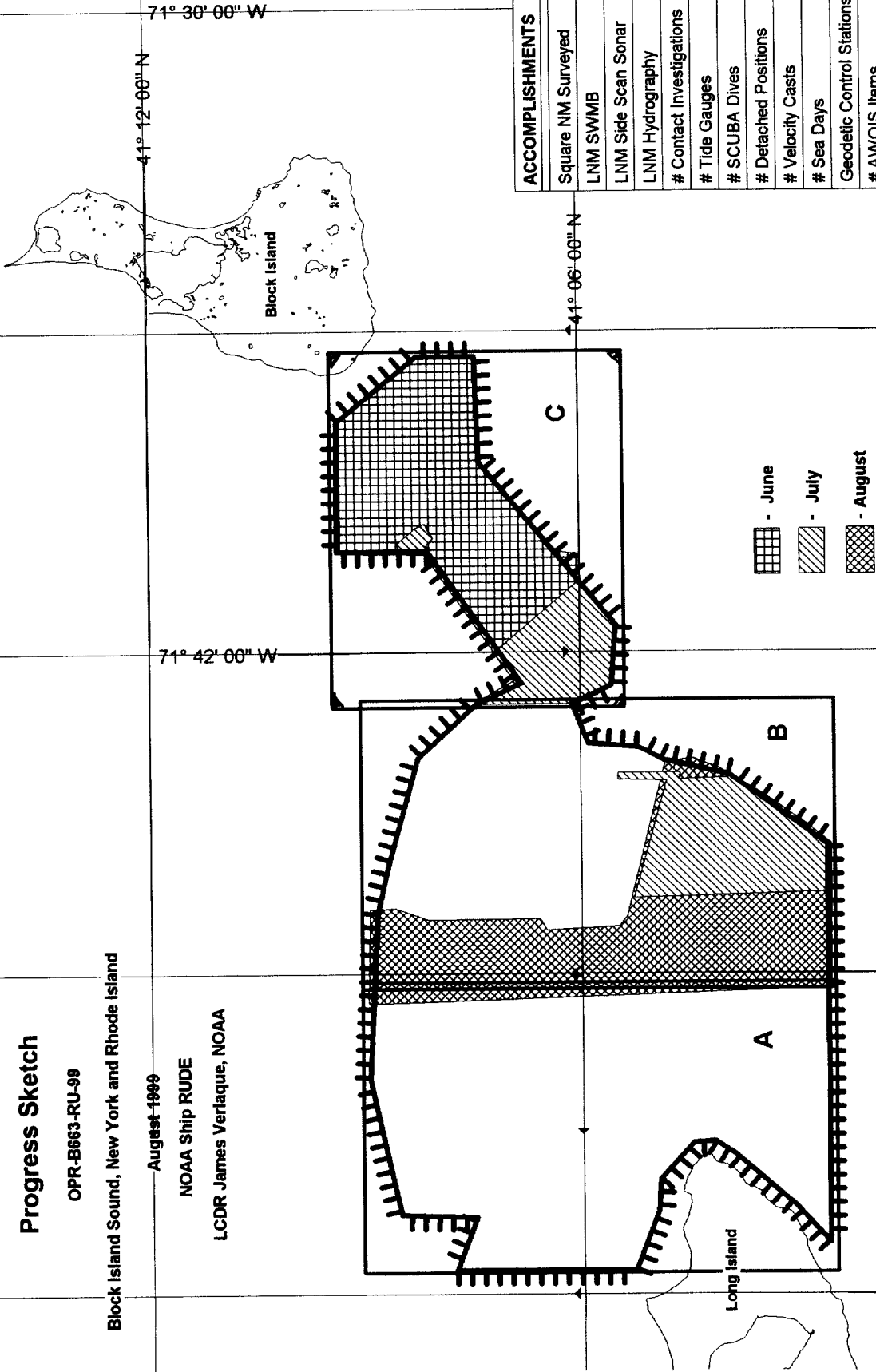
OPR-B663-RU-99

Block Island Sound, New York and Rhode Island

August 1999

NOAA Ship RUDE

LCDR James Verlaque, NOAA



ACCOMPLISHMENTS	June	July	August
Square NM Surveyed	7	6	12
LNM SWMB	226	204	300
LNM Side Scan Sonar	0	51	277
LNM Hydrography	0	0	0
# Contact Investigations	0	0	80
# Tide Gauges	1	0	1
# SCUBA Dives	1	1	1
# Detached Positions	0	1	11
# Velocity Casts	18	23	28
# Sea Days	14	15	23
Geodetic Control Stations	0	0	0
# AWOIS Items	0	1	0
# Bottom Samples	20	0	0

REGISTRY #	Field #	Sheet	Started	Percent Completed	Completed
H-10795	RU-10-2-98	C	4/06/98	100%	08/26/1999
H-10914	RU-10-5-99	B	7/15/99	40%	
		A			

Chart 13215
Scale 1:40,000

DOWNTIME_Hrs	June	July	August
Weather	34	20	35
Electronics	2	0	8
Mechanical	0	0	0
GPS	0	0	0

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SEPARATES - FILED WITH ORIGINAL FIELD RECORDS

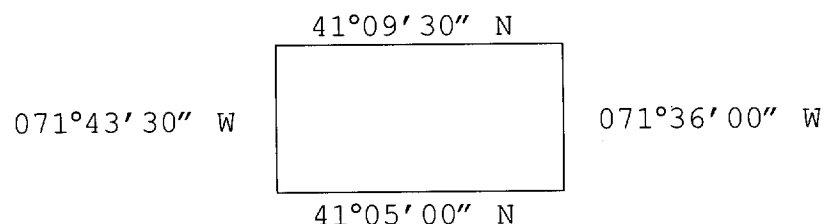
A. PROJECT

- A.1 This survey was conducted in accordance with Hydrographic Project Instructions for OPR-B663-RU, Block Island Sound, Rhode Island and Change No.1. The survey was conducted from NOAA Ship RUDE under the command of LCDR David A. Cole in 1998 and LCDR James S. Verlaque in 1999.
- A.2 The original instructions are dated April 14, 1998.
- A.3 Change No.1 to Hydrographic Project Instructions OPR-B663-RU is dated May 25, 1999.
- A.4 This survey is designated H10795 "Sheet C".
- A.5 This survey was conducted to obtain multibeam and side scan sonar coverage in Block Island Sound, Rhode Island. The project obtained multibeam least depths for numerous side scan sonar contacts that were previously detected by NOAA ship HECK in 1990. The new multibeam hydrography also updates National Ocean Service (NOS) nautical charts in areas last surveyed in 1939 and 1971.

This survey responds to requests from the U.S. Coast Guard and Northeast Pilots Association for updated nautical charts in the southern New England area, which is traversed by tankers, freighters, barges, cruise-line vessels, U.S. Navy vessels, and fishing boats. Tankers in these waters carry hazardous material such as petroleum and various other chemical products. Freighters frequently contain automobiles, various manufactured goods, and scrap metal cargo. The average draft of large vessels is between 32 and 38 feet, with maximum drafts up to 40 feet.

B. AREA SURVEYED

- B.1 Survey H10795 covers an area from the southeast point of Block Island, Rhode Island and extends approximately six nautical miles towards Montauk Point, New York. The approximate boundaries are as follows:



C. SURVEY VESSELS

- C.1 Hydrography, side scan, and multibeam investigations were conducted from NOAA Ship RUDE, S-590, EDP# 9040. General functions include side scan sonar and multibeam sounding operations, velocity of sound determinations, bottom sampling, and navigational aid positioning.
- C.2 The transducer for the multibeam sonar was deployed on a pivoting arm mounted on the port side, approximately amidships. The arm was rotated into the operating position only during times of data acquisition.

D. AUTOMATED DATA ACQUISITION AND PROCESSING *SEE ALSO THE EVALUATION REPORT*

- D.1a Coastal Oceanographics' HYPACK for Windows Version 7.1a (12/02/97) was used for data acquisition on this survey. Post processing included the use of HPTools Version 9.4.0 (04/22/99) for all Hypack data conversion. Data processing was conducted using Hydrographic Processing System (HPS) Version 8.2 (03/02/98) supplied by Atlantic Hydrographic Branch Computer Support Group. MapInfo Version 5.0 (08/18/98) was utilized for data display during the evaluation process and completion of the field sheet. All software versions used for data processing are listed in Appendix H* *DATA FILED WITH ORIGINAL FIELD RECORDS*
- D.1b Triton Corporation's ISIS software versions 3.0 and 3.28 were used to acquire SeaBat multibeam and digital side scan imagery. SeaBat data was processed on the CARIS-HIPS System Version 4.2.7 (01/17/97).
- D.1c The SEABIRD SBE-19 sound velocity profiler unit was utilized with SEASOFT 3.3M (11/27/89) and SEACAT 3.1 (02/25/98) software. The program VELOCWIN Version 4.01 was used to process the acquired data and calculate velocity corrections.
- D.2a Multibeam data (XTF Format) conversion in the CARIS-HIPS System utilized specific selections within the *Convert Triton Isis XTF* program in HDCS.

Selections with CARIS software for 1998 multibeam data included "Ship Nav" from Sensor; "Ship Gyro" from Ship; "Fish Nav" from Sensor; "Fish Gyro" from Ship. Selections with CARIS software for 1998 side scan sonar data entailed selecting "Ship Nav" from Sensor; "Ship Gyro" from Ship; "Fish Nav" from Ship; "Fish Gyro" from

Ship. Data decimation and image correction were not selected during conversion.

Selections with CARIS software for 1999 multibeam and side scan sonar data conversion included "Ship Nav" from Sensor; "Ship Gyro" from Attitude; "Fish Nav" from Ship; "Fish Gyro" from Attitude. Data decimation and image correction was not selected during conversion.

- D.2b SeaBat depth data was monitored using ISIS during acquisition and processed utilizing CARIS-HIPS multibeam 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, pitch, roll, and gyro sensors were displayed and manually cleaned (see Sections G and H).
- D.2c After reviewing and cleaning the data, 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 beam footprint. Work file processing included importing the multibeam depths (selecting "extended no key", "group by beam number", and "line by line thinning"). Processed depths were thinned by utilizing a shoal biased gridding sounding selection of fifteen meters during HIPS-Workfile Creation at a 1:10,000 survey scale. Field sheet soundings used for crossline comparisons in CARIS Workfile Processing included the full density data set (see Section J.2). Finally, the fifteen meter gridded CARIS Workfile Processing soundings were transferred into HPS (using HPTools) and MapInfo databases.
- D.2d Sounding evaluation included the use of a dat file (.dat) which was converted into HPS via HPTools, generating an HPS multibeam only data file for each day of acquisition. Final field sheet selected soundings originate from these HPS multibeam only data files.
- D.2e Final plots were created in MapInfo, a PC-based GIS package, with assistance from HPS-MI MapInfo tools supplied by Hydrographic Survey Division (HSD). These tools produced depth, track and swath plots from HPS data.
- D.2f The total number of multibeam soundings acquired and processed during field evaluation does not reflect the total number of multibeam soundings provided to N/CS33. For transfer to HPS, the sounding density was reduced by selecting a grid size of 15 meters with no sounding

suppression within HIPS. Additional sounding excessing will be conducted during the verification process using HPS.

E. SIDE SCAN SONAR EQUIPMENT

- E.1 All side scan sonar data was acquired with an Edgetech (EG&G) Model 272 towfish and an Edgetech Model 260-TH image-correcting side scan sonar recorder. All side scan data was also recorded digitally using 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 frequency was used throughout the survey.
- E.4a The 75-meter range scale was utilized primarily and the 100-meter range scale was used in areas where the water depth dictated. One hundred and twenty meter line spacing was used to obtain 100% side scan sonar area coverage in addition to the 100% multibeam coverage.
- E.4b Frequent confidence checks were obtained whenever common features such as sand waves or rocks were encountered.
- E.4c One hundred percent side scan sonar coverage was completed for this survey. Holiday lines were run to fill in any gaps. All coverage was checked with on-screen zoomable coverage displays in MapInfo to ensure proper overlap between lines.
- E.4d Any data degraded by towfish instability, thermocline, prop wash, etc., was rejected and reacquired.
- E.4e 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 Numerous side scan contacts with computed heights greater than 10% of depth, or greater than one meter in depths shoaler than 20 meters were recorded within a number of boulder fields in the survey area. Due to the vast number of significant contacts and completion of 100% multibeam sonar coverage, only the most significant contacts and all

contacts which appeared man-made were investigated. All contacts investigated were covered with multibeam sonar coverage. All coverage was checked with on-screen zoomable coverage displays in CARIS-HIPS and MapInfo, and holiday lines were run to fill in any gaps.

F. SOUNDING EQUIPMENT

- F.1a All multibeam sounding data was collected with the single-frequency (455 kHz) Reson SeaBat 9003 (S/N 10496-447020) shallow-water sonar system.
- F.2a Dual-frequency (24 and 100 kHz) vertical beam echo sounding data was acquired with a Raytheon DSF-6000N digital survey echosounder during the 1998 field season (S/N 116N; DN097-DN301). High frequency (100 kHz) vertical beam echo sounding data was acquired with an ODOM-Echotrac digital survey echosounder during the 1999 field season (S/N 9643; DN157-DN238). DSF-6000N and ODOM-Echotrac analog records were recorded and monitored on-line. Anomalous echogram traces were immediately cross-referenced to the ISIS multibeam acquisition display online.
- F.2b Only crossline single-beam data was scanned and edited manually (see section J). Vertical correctors including preliminary unverified tides were applied to the raw single-beam digital soundings (see Section G). The archived HPS fixes of single-beam soundings do not represent the entire character of the seafloor because shoal bias inserts were not selected for all mainscheme single-beam data; graphic records were not scanned for depths edits. **Single-beam data should NOT be included on the final field sheet; all final field soundings originate from multibeam data.**
- F.3 There were no observed faults in sounding equipment that affected the accuracy or quality of the data.
- F.4 One diver investigation was performed for this survey on July 15, 1999 (DN-196). The MOD III pneumatic diver least depth gauge (S/N 68336) was used in approximately fifty-four feet of water while conducting an item investigation on AWOIS 10009. (See section M and *Separates IV for data records).
- F.5a The 9003's combined transmit and receive beams yield forty soundings per ping, each formed from a 3° crosstrack x 1.5° alongtrack bottom footprint. During multibeam data

* DATA FILED WITH ORIGINAL⁵ FIELD RECORDS

processing, the outermost two beams on each side of the swath (beam numbers 1, 2, 39, and 40) were not processed, reducing the effective width to 108°.

- F.5b SeaBat 9003 multibeam data was continuously recorded and served as the primary source for hydrographic digital soundings. Sounding depths ranged from 21 to 127 feet of water, utilizing multibeam range scales of 25, 50 and 100 meters. One hundred percent multibeam coverage was based upon 30 meter line spacing and less in areas where swath coverage was limited by depth. Item investigation line spacing was based upon contact positions for nadir-beam development.
- F.6 Vessel speeds during multibeam data and side scan sonar acquisition were conducted within the standards for side scan operations. When side scan sonar acquisition was not being conducted, multibeam bathymetry data was collected at vessel speeds between 4 and 7 knots; item and contact investigation speeds were generally collected at speeds of 3 to 5 knots. Slower vessel speed increases the data density in the along track coverage over the feature. Ping rate is dependant upon multibeam range scale being utilized and determines the number of pings per unit area of the bottom.
- F.7 Multibeam sonar coverage between lines was determined in **CARIS-HIPS**, utilizing the routine for generating a digital terrain model (DTM). A DTM was created at a sounding density of three meters at survey scale and a resulting *tif*. image was viewed in **MapInfo** to determine any gaps in multibeam swath coverage. Holiday lines were run to fill in any gaps. Multibeam swaths were inclusive of beam numbers three through thirty-eight.

G. CORRECTIONS TO SOUNDINGS *SEE ALSO THE EVALUATION REPORT*

- G.1a Sound velocity and refraction correctors were computed from conductivity, temperature, and depth measurements acquired with SeaBird SBE190 SEACAT Profilers (serial numbers 1251 & 1991). Data quality assurance tests using the CAT program were performed daily. The profiler is calibrated at the beginning and end of each field season. (See*APPENDIX I for data records).

** DATA FILED WITH ORIGINAL FIELD RECORDS*

The following velocity casts were used for this survey:

VELOCITY CAST #	JULIAN DAY #	YEAR
1,2	097	1998
3,4	098	1998
5	103	1998
6	104	1998
7,8	111	1998
9,10,11	112	1998
12,13	117	1998
14,15	118	1998
17,18	119	1998
19,20	120	1998
22,23	124	1998
25,26	134	1998
27	135	1998
28,29	138	1998
30,31,32	139	1998
33,34,35	140	1998
36,37,38	141	1998
39,40	286	1998
41,42	288	1998
43	289	1998
44	296	1998
45,46	299	1998
47,48	300	1998
49,50	301	1998

VELOCITY CAST #	JULIAN DAY #	YEAR
51	157	1999
52,53	158	1999
54,55	165	1999
56,57	166	1999
58,59	173	1999
60,61,62	174	1999
63,64,65	175	1999
66	180	1999
67,68	181	1999
69,70	187	1999
71,72,73	188	1999
74,75,76	189	1999
77,78	193	1999
79	194	1999
80,81	195	1999
82,83	196	1999
84,85	229	1999
86	231	1999
87	238	1999

Sound velocity and refraction effects were applied to the SeaBat data using CARIS-HIPS (incorporating the NOAA Nautical Charting Development Lab REFRACT algorithm). Sound velocity correctors for the vertical beam soundings were computed using VELOCITY and applied to the DSF data in 1998 and the ODOM data in 1999 using HPS.

G.1b DSF-leadline (1998) and ODOM-leadline (1999) direct comparisons were conducted on various dates during the 1998 and 1999 field seasons. Records are provided with H10795 documentation (See*Appendix E).

G.1c Sensor offsets and transducer static drafts were measured during the December 1996 dry-dock period. Sensor offsets were stored in the CARIS-HIPS Vessel Configuration File and HPS Offset Table for use in data processing. See *Separate IV for data records.

G.1d Vessel dynamic draft was measured for NOAA Ship RUDE vessel number 9040 on March 4, 1998 and March 5, 1999 using the Real Time Kinematic on the Fly GPS method.

* DATA FILED WITH ORIGINAL ⁷ FIELD RECORDS

Dynamic draft correctors were stored in the CARIS-HIPS Vessel Configuration File and HPS Offset Tables for use in data processing (See APPENDIX E for data records).

- G.1e Heave, pitch, and roll data were acquired with the SeaPath system. Heave, pitch, and roll data from Seatex Seapath MRU (S/N 0544) were applied to SeaBat multibeam data. Heave data were applied to ODOM vertical beam data.
- G.1f Vessel heading data was acquired with the SeaPath system. Heading data was used to compute multibeam transducer azimuth and position.
- G.1g Multibeam heave, pitch, roll, and heading sensor data was adjusted using biases as determined during patch tests conducted on March 4, 1998 (DN 064), and March 05, 1999 (DN064). See the CARIS-HIPS Vessel Configuration File in Separate I for data records.
- G.2 No unusual or unique methods or instruments were used to correct sounding data.
- G.3 Tide zoning for this survey is consistent with the Project Instructions. Tide correctors were developed by applying time corrections and range correctors to the verified tides at Block Island, RI SW End Tide Gauge (Station 845-9681). Verified tides were computed in CARIS-HIPS and applied to SeaBat multibeam data.

BLOCK ISLAND, RI SOUTHWEST END TIDE GAUGE Reference Number 845-9681						
Zone	BIS1	BIS2	BIS3	BIS4	ATL501	ATL500
Time Corrector	-24 min	-18 min	-6 min	-6 min	-30 min	-30 min
Range Corrector	X 0.97	X 1.02	X 1.00	X 0.95	X 1.02	X 0.97

- G.4 The diver least depth gauge (S/N 68336) was used on July 15, 1999 (DN 196) for dive operations on AWOIS item 10009. (See Section M and ~~*~~Separates IV)
- G.5 No significant systematic errors were detected.
- G.6a The vertical reference surface for this survey is Mean Lower Low Water (MLLW).
- G.6b Tide data was acquired at the Block Island, RI SW End (Station 845-9681) by N/OES231. A request for approved tides was mailed on May 27, 1999. This data will be compared to the verified tide data during verification by N/CS33. (See Section G.6d)

** DATA FILED WITH ORIGINAL FIELD RECORDS*

G.6c Note that multibeam data processing was accomplished using predicted tide values during data acquisition and verified tide values during post processing (downloaded from the OPSD web-site).

Zone Station time and height tidal correctors provided by N/CS31, with the project instructions, were applied to all tidal correctors relative to reference station Block Island, RI SW End Tide Gauge (Station 845-9681).

G.6d **DO NOT REAPPLY ANY CORRECTORS in HPS, including verified smooth tides.** Note that verified tide values have been applied to the entire multibeam data set in CARIS-HIPS prior to conversion to HPS.

Upon receipt of Approved Tides, a comparison should be conducted by The Atlantic Hydrographic Branch (N/CS33) to determine whether tidal reference station(s), tide correction values, or zoning correctors differ from the applied OPSD verified tides.* If tide station(s) and/or tidal data reducers do not differ, no reapplication of approved tides should be conducted in CARIS-HIPS. If tide station(s) and/or tidal data reducers do differ, approved tidal data will supercede these correctors and needs to be applied to the entire multibeam data set in CARIS-HIPS and only Dive Investigation data in HPS. If necessary, all vertical correctors and horizontal offsets should be reapplied to multibeam data using CARIS software only.

* SEE ALSO THE EVALUATION REPORT SECTION G.

H. HYDROGRAPHIC POSITION CONTROL SEE ALSO THE EVALUATION REPORT

H.1 The horizontal reference surface for this survey is the North American Datum of 1983 (NAD 83). No horizontal control stations were established for this survey.

H.2 Positioning for this survey was obtained from the NAVSTAR Global Positioning System (GPS) augmented with the U.S. Coast Guard Differential GPS (DGPS) service. The following USCG reference station beacons were used:

USCG DGPS Radio Beacon Broadcast Sites	Freq KHz	Rate BPS	Latitude N	Longitude W	Range N.M.	Beacon ID #
Moriches, NY	293	100	40°47.4'	072°44.7'	130	803/6
Chatham, MA	325	200	41°40.3'	069°57.0'	95	802/4

H.3 Accuracy requirements were met as specified by the Hydrographic Manual, sections 1.3 and 3.1, and Field Procedures Manual, section 3.4.

H.4 GPS and DGPS signals were acquired with the following hardware equipment:

GPS and DGPS Hardware	SERIAL #
Seatex SeaPath 200	0347
MRU-5	0544
StarLink Model MBA2 DNAV 212	853

H.5 The GPS Horizontal Dilution of Precision (HDOP) was recorded during survey operations and manually checked via the Detailed Data Abstract in HPS, raw data printout, and queried within MapInfo. The calculated maximum allowable HDOP value was rarely exceeded. Anomalous position data were either manually smoothed or flagged "rejected", depending on the extent of the affected data.

Anomalous position data was either manually smoothed or flagged "rejected", depending on the extent of the affected data. Instantaneous vessel speed was automatically cleaned in CARIS with an event tolerance of 1.0 knot to aid in the manual cleaning of multibeam navigation data.

DGPS performance checks were not conducted. The necessity for control checks is eliminated when using the Seatex Seapath 200; quality positioning is supported by the continuous calibration routine inherent of Seapath.

DGPS monitor and scatter plots for USCG beacons are not required as per guidelines mentioned in (FPM 3.2.2.1).

H.6 Calibration data is not required for differential GPS.

H.7a There were no unusual methods used to operate the positioning equipment.

H.7b There were no positioning equipment malfunctions.

H.7c There were no unusual atmospheric conditions noted which might have affected data quality.

H.7d No significant systematic errors were detected.

H.7e Offsets for the GPS antenna were applied from the CARIS-HIPS Vessel Configuration File (VCF) to compute the position of the SeaBat transducer. (See ~~*~~Appendix E for data records)

Horizontal positions of the DSF-6000N and ODOM-Echotrac vertical beam echosounder data were corrected for GPS antenna offsets during field processing. Offsets in Hypack were acquired with the multibeam transducer as the

offset point ("batcentric"). (See*Appendix E for data records)

- H.7f A-frame position (tow point), cable length, towfish height, and depth of water were applied to navigation data to compute the position of the towfish. This correction is applied in HPS via offset table and Reapply Sounding Corrections.

I. SHORELINE

No shoreline exists within the boundaries of survey H10795.

J. CROSSLINES

- J.1 A total of 39.0 NM of crosslines were acquired for this survey, equating to 5.8% of the multibeam and side scan sonar coverage lines.
- J.2 Full density processed Seabat crossline sounding data was compared to a mainscheme data digital terrain model (DTM) surface, gridded at three meters, in CARIS Workfile Processing. The DTM surface was built from processed SeaBat mainscheme soundings. A statistical variance representative of beam numbers 3 through 38 was computed by means of a difference file which allowed the generation of quality control reports (see*Separate V). The average mean difference between **SeaBat crossline and SeaBat mainscheme soundings** is -0.06483 meters and the average standard deviation is 0.27192 based on a total number of 4,250,837 3-D points compared (See*Separate V).

Processed multibeam soundings converted in HPS were compared to the edited single beam DSF and ODOM soundings in MapInfo. Sounding variance between **SeaBat mainscheme and DSF/ODOM crossline soundings** was between zero and two feet with occasional differences of up to five feet where the profile is sloping and irregular.

- J.3 No anomalous crossline comparisons were noted.
- J.4 The mainscheme and crossline data was collected with the same suite of survey equipment.

** DATA FILED WITH ORIGINAL FIELD RECORDS*

K. JUNCTIONS SEE ALSO THE EVALUATION REPORT

This survey junctions with ^{H10914} "Sheet B" of project OPR-B663 which is scheduled for completion by NOAA Ship RUDE during the year 2000 field season. No comparison can be made with survey ~~H10795~~ at this time.

H10914

L. COMPARISON WITH PRIOR SURVEYS SEE ALSO THE EVALUATION REPORT

A comparison with prior surveys is not required when 100 percent side scan sonar coverage and 100 percent multibeam coverage is acquired over the entire survey area. Refer to Section L of NOS Hydrographic Surveys Specifications and Deliverables.

M. ITEM INVESTIGATION REPORTS

AWOIS item 10009 was assigned to survey H10795. Notable results from this development are summarized as follows:

M1.1 AWOIS NO: 10009

Item Description: OBSTRUCTION

Source: H-9258WD/1971

AWOIS Position: Lat. 41°06'54.37" N Long. 071°40'16.71" W

Required Investigation: S2, MB

Radius: 200m

Charts Affected: 13215

INVESTIGATION

Date(s): May 21, 1998 (DN141); July 16, 1999 (DN196)

SWMB Depth Sounding Attributes: 1998 (DN141), Line 016_1540,
Time 15:41:14.57, Profile # 336, Beam #6

HPS Position Number: Fix number 105,998

Investigation Used: S1, SWMB, DI

Survey Position(s): Lat. 41°06'56.93" N Long. 071°40'18.08" W

Position Determined By: Differential GPS

Investigation Summary: AWOIS 10009 was covered with 100% shallow water multibeam (SWMB) and 100% side scan sonar coverage. Side scan sonar contact 5841.4p was developed with additional 100% SWMB coverage to obtain least depth soundings near nadir. On July 16, 1999 (DN196), dive operations were conducted which determined the item as a large rock with an approximate length of thirty feet and width of twenty feet with an estimated height of fifteen feet. With the use of a MOD-III pneumatic depth gauge, divers determined the least depth, corrected with OPSD preliminary unverified tides, to be 38 feet at the survey position. Near nadir SWMB data determined the least depth, corrected with OPSD verified tides to be 37 feet at the survey position.

CHARTING RECOMMENDATION

Recommendation: The hydrographer recommends the removal of the charted "36 ft" least depth known by wire drag. Replace with least depth known to be "37 ft" with surrounding danger curve at the survey position. *CONCUR*

DELETE 36
ADD 37 *RK*

N. COMPARISON WITH THE CHART *SEE ALSO THE EVALUATION REPORT*

N.1 Three charts are affected by this survey:

CHART AFFECTED	EDITION	DATE	CHART SCALE
Chart 13215	16 th Ed.	12 Sep 1998	1 : 40,000
Chart 13205	34 th Ed.	12 Sep 1998	1 : 80,000
Chart 13217	17 th Ed. <i>14</i>	23 Mar 1996	1 : 15,000

N.2 One Danger to Navigation report containing eleven items, dated August 31, 1999, was submitted for this survey.
(See APPENDIX A for records) *SEE ALSO THE EVALUATION REPORT SEC N.2*

N.3a A comparison of surveyed soundings was made to NOS chart 13215 16th Ed., 12 Sep 1998 (1:40,000 scale). Chart 13215 contains charted estimated side scan sonar depths of rocks and obstructions from prior survey H10350. In addition, seven charted soundings with danger curves are located within survey H10795. All of these areas were covered with 100% SWMB, 100% side scan sonar (SSS), and SWMB development. H10795 survey data should supercede all charted depths in these areas.* Positions and sounding data of charted estimated side scan sonar and danger curve depths are listed in the following tables, respectively:

** SEE EVALUATION REPORT SEC N.3a*

Description: 1990 estimated SSS depths	Charted Latitude N	Charted Longitude W	Present Survey Depths	Survey Depth Variance
52ft Rk rep 1990	41°06' 38.95"	071°42' 22.33"	56ft	4ft deeper
56ft Rks rep 1990	41°06' 42.08"	071°42' 11.58"	60ft	4ft deeper
49ft Rks rep 1990	41°07' 20.57"	071°40' 53.25"	53ft	4ft deeper
56ft Rks rep 1990	41°07' 11.27"	071°41' 03.20"	61ft	5ft deeper
42ft Rks rep 1990	41°07' 30.09"	071°40' 38.51"	47ft	5ft deeper
53ft Rk rep 1990	41°07' 00.83"	071°40' 33.19"	54ft	1ft deeper
56ft Rk rep 1990	41°06' 59.61"	071°41' 00.85"	53-59ft	3ft shoaler
43ft Rk rep 1990	41°06' 53.55"	071°40' 50.18"	50-52ft	7-9ft deeper
56ft Rk rep 1990	41°06' 48.05"	071°41' 06.14"	55-60ft	1ft shoaler
58ft Rks rep 1990	41°06' 45.48"	071°40' 38.57"	54-61ft	4ft shoaler
60ft Rks rep 1990	41°06' 42.62"	071°40' 51.51"	62ft	2ft deeper
53ft Rks rep 1990	41°06' 40.69"	071°41' 13.78"	56-62ft	3-9ft deeper
47ft Rk rep 1990	41°06' 31.57"	071°40' 29.07"	51ft	4ft deeper
54ft Rks rep 1990	41°06' 19.34"	071°41' 05.93"	66-68ft	12-14ft deeper
57ft Rks rep 1990	41°06' 18.75"	071°40' 50.95"	57ft	Agreement
46ft Rks rep 1990	41°06' 10.77"	071°40' 41.78"	57-63ft	11-17ft deeper
74ft Rk rep 1990	41°07' 28.21"	071°41' 07.69"	74-76ft	0-2ft deeper
64ft Rks rep 1990	41°05' 57.64"	071°41' 24.11"	77ft	13ft deeper
71ft Rk rep 1990	41°05' 43.14"	071°42' 09.57"	81ft	10ft deeper
81ft Rk rep 1990	41°05' 32.46"	071°41' 31.39"	91ft	10ft deeper

Description: Soundings with danger curve	Charted Latitude N	Charted Longitude W	Present Survey Depths	Survey Depth Variance
36ft Rks	41°07'27.63"	071°40'23.78"	38ft	2ft deeper
45ft Rks	41°07'19.65"	071°40'22.56"	43ft	2ft shoaler
43ft Rks	41°07'17.02"	071°40'38.02"	46ft	3ft deeper
62ft Rks	41°06'18.60"	071°40'34.98"	64ft	2ft deeper
53ft Rk	41°06'10.10"	071°40'22.93"	53ft	Agreement
65ft Rk	41°06'38.26"	071°42'33.10"	66ft	1ft deeper
59ft Rk	41°06'27.91"	071°42'33.65"	59ft	Agreement

The overall agreement between charted soundings and survey depths is good. Most soundings compare between zero and two feet, with occasional differences of four to seven feet. In areas where chart 13215 contains charted estimated side scan sonar depths of rocks from prior survey H10350, sounding variance was four feet shoaler to seventeen feet deeper than charted. Charted soundings with danger curves compare well with survey soundings, varying from two feet shoaler to two feet deeper than charted.

Benthic characteristics within the survey area are comprised of numerous rock and boulder fields. Due to the nature of the seabed, the hydrographer recommends that all notations of "Rks rep 1990", "Rks", and "Boulders" be removed and replaced with the notation "Rky" as the compiler deems necessary. *CONCUR WITH CLARIFICATION*

SEE EVALUATION REPORT SEC N.3a

N.3b No extensive shoaling or deepening trends were found in the survey area.

** SEE EVALUATION REPORT SECTION N.4*

*** SEE EVALUATION REPORT SECTION N.5*

O. ADEQUACY OF SURVEY *SEE ALSO THE EVALUATION REPORT*

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

P. AIDS TO NAVIGATION

P.2 A comparison was made between the side scan sonar scaled survey positions and the largest scale chart of the area. No aid was found to deviate from its charted position by more than its approximate mooring watch circle. Each aid

adequately serves the apparent purpose for which it was established.

Note: Chart 13215, 16th Ed., September 12, 1998 (scale 1:40,000) was used for comparison.

P.3 All aids are properly identified in the Light List.

P.4 Survey H10795 includes a charted cable area in the northeastern region of the project, approximate position of latitude 41°09'22.06" N and longitude 071°38'40.51" W.

Except for the cable area, there were no submarine or overhead pipelines, tunnels, bridges, or ferry routes found in survey H10795.

Q. STATISTICS

1.	c.	Lineal Nautical Miles of Sounding Lines	723.8 NM
2.	a.	Square Nautical Miles of Hydrography	10.3 SQNM
	b.	Days of Production	44
	c.	Detached Positions	1
	d.	Bottom Samples	34
	e.	Tide Stations	1
	f.	Velocity Casts	87
	g.	Dive Item Investigations	1
	h.	SeaBat Item Investigations	72

R. MISCELLANEOUS *SEE ALSO THE EVALUATION REPORT*

R.1 a. No evidence of silting was found during this survey.
b. No unusual submarine features were found during this survey.
c. No evidence of anomalous tides or tidal current conditions were found during this survey.

R.2 Thirty-four bottom samples were taken for survey H10795 and submitted to the Smithsonian Institution.
(See **SEPARATES II* for data records)

** DATA FILED WITH ORIGINAL FIELD RECORDS*

S. RECOMMENDATIONS

No additional field work is required.

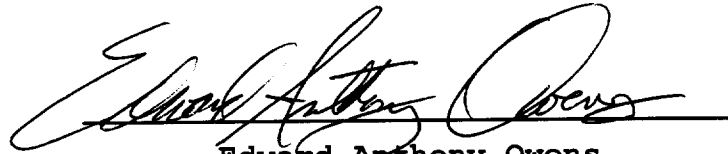
T. REFERRAL TO REPORTS

T.1 Coast Pilot Report. Sent to N/CS261, August 31, 1999.
(~~See Appendix I~~) ATTACHED

T.2 User Evaluation Report. Sent to N/CS31, September 3,
1999. (~~See Appendix I~~) ATTACHED

DANGER TO NAVIGATION REPORT ATTACHED

This report and the accompanying field sheets are respectfully submitted.

A handwritten signature in black ink, appearing to read "Edward Anthony Owens", written over a horizontal line.

Edward Anthony Owens
Physical Scientist, NOAA
Atlantic Hydrographic Branch



UNITED STATES 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

August 31, 1999

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 near Block Island, Rhode Island:

Hydrographic Survey Registry No. H-10795
 State Rhode Island
 General Locality Block Island Sound
 Sublocality Southwest Ledge and Vicinity
 Project Number OPR-B663-RU-98/99

During the course of multibeam sonar operations, eleven dangers to navigation were discovered. This new depth information merits immediate publication in the Local Notice to Mariners. The updated depths affect the following charts:

Chart 13205 34th ed, September 12, 1998
 Chart 13215 16th ed, September 12, 1998
 Chart 13217 14th ed, March 23, 1996

Depth*	Latitude (NAD83)	Longitude (NAD 83)	Charts Affected
26	41 08 17.65 N	071 36 44.58 W	13205 13215 13217
29	41 08 17.05 N	071 37 04.68 W	13205 13215 13217
27	41 08 44.95 N	071 37 17.48 W	13205 13215 13217
36	41 08 36.27 N	071 38 11.59 W	13205 13215 13217
41	41 08 04.82 N	071 38 24.25 W	13205 13215
28	41 07 34.45 N	071 39 01.83 W	13205 13215
27	41 07 15.15 N	071 39 24.13 W	13205 13215
34	41 06 59.11 N	071 39 20.19 W	13205 13215
21	41 07 09.12 N	071 39 50.86 W	13205 13215
21	41 07 09.47 N	071 40 08.94 W	13205 13215
30	41 06 37.25 N	071 39 59.47 W	13205 13215

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

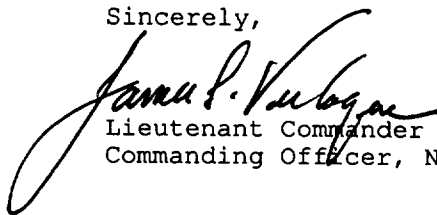


Contact either of the following personnel for further information:

Commanding Officer
NOAA Ship RUDE
439 West York Street
Norfolk, VA 23510-1145
(757) 615-6465

Chief, Atlantic Hydrographic Branch
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-115
(757) 441-6746

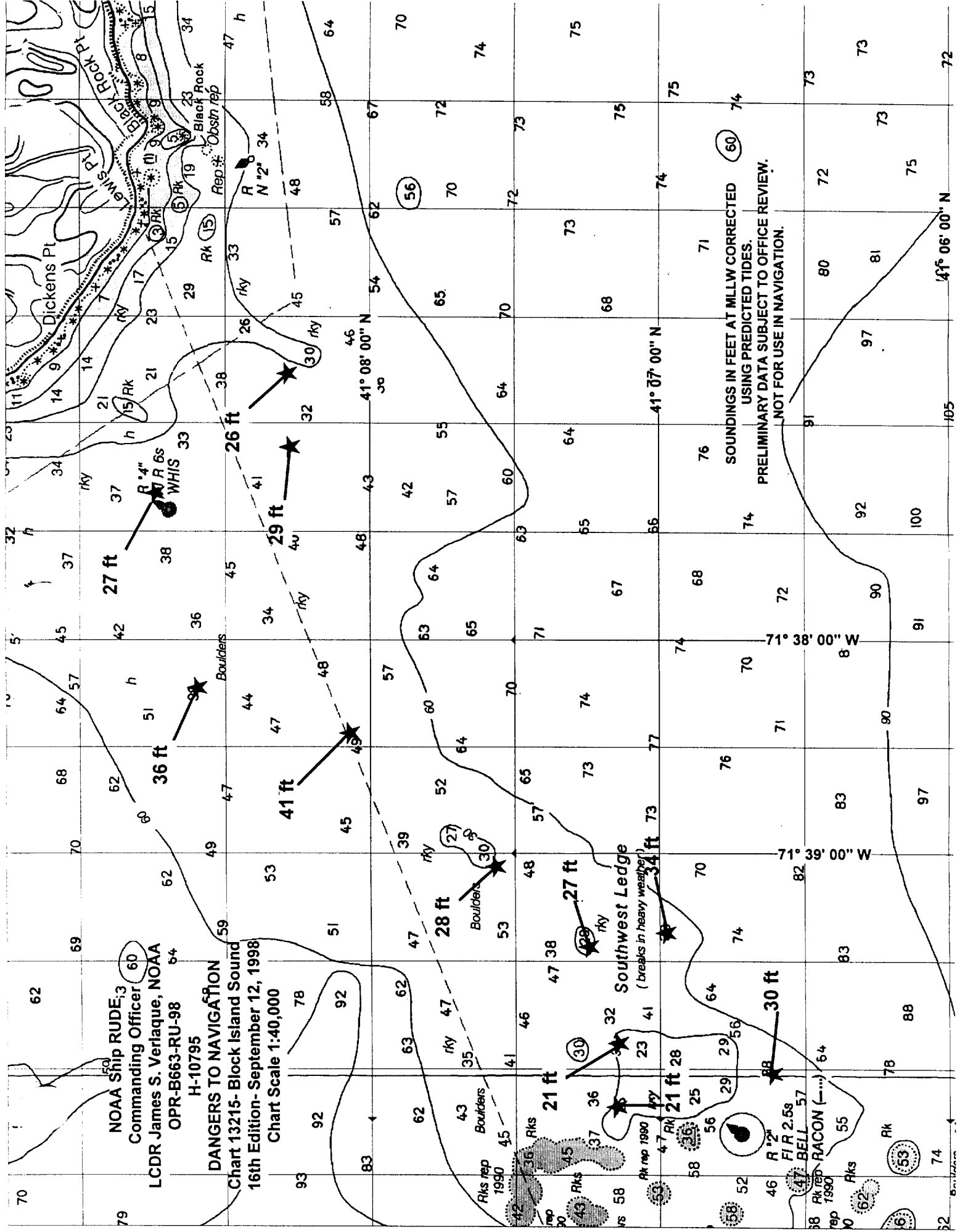
Sincerely,



Lieutenant Commander James S. Verlaque, NOAA
Commanding Officer, NOAA Ship RUDE

Attachment
cc: AHB, NIMA

NOAA Ship RUDE-3
Commanding Officer (60)
LCDR James S. Verlaque, NOAA
OPR-B663-RU-98
H-10795
DANGERS TO NAVIGATION
Chart 13215-Block Island Sound
16th Edition-September 12, 1998
Chart Scale 1:40,000



SOUNDINGS IN FEET AT MLLW CORRECTED
USING PREDICTED TIDES.
PRELIMINARY DATA SUBJECT TO OFFICE REVIEW.
NOT FOR USE IN NAVIGATION.

APPENDIX J

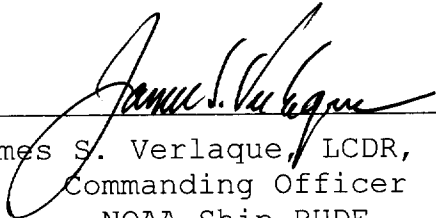
APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H10795

Field operations contributing to the accomplishment of this Navigable Area survey, during 1999, 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. Field operations during 1998 were conducted by LCDR David Cole, NOAA, although 1998 field sheets and reports were reviewed in their entirety and all supporting records were checked under my supervision.

This survey is more than adequate to supersede ALL prior surveys in common areas. This survey is considered complete and adequate for nautical charting.


James S. Verlaque, LCDR, NOAA
Commanding Officer
NOAA Ship RUDE

GEOGRAPHIC NAMES

H-10795

Name on Survey	A ON CHART NO. 13205, 13215 B ON PREVIOUS SURVEY NO. C ON U.S. QUADRANGLE MAPS D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G RAND McNALLY ATLAS H U.S. LIGHT LIST K											
	BLOCK ISLAND SOUND	X		X								
RHODE ISLAND (title)	X		X									2
SOUTHWEST LEDGE	X											3
												4
												5
												6
												7
												8
												9
												10
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												21
												22
												23
												24
												25

Approved
Dennis J. Rowland
 Chief Geographer
 FEB 22 2000



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: October 18, 1999

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-B663-RU-99
HYDROGRAPHIC SHEET: H-10795

LOCALITY: Block Island Sound, RI
TIME PERIOD: April 06, 1998 - August 19, 1999

TIDE STATION USED: 845-9681 Block Island, SW End
Lat. $41^{\circ} 09.8'N$ Lon. $71^{\circ} 36.6'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.845 meters

TIDE STATION USED: 851-0560 Montauk, Fort Pond Bay
Lat. $41^{\circ} 02.9'N$ Lon. $71^{\circ} 57.6'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.704 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: ATL500, ATL501, ATL502, ATL503, BIS1, BIS2, BIS3, BIS4, BIS5, BIS6, BIS10 & BIS11.

Refer to attachments for zoning information.

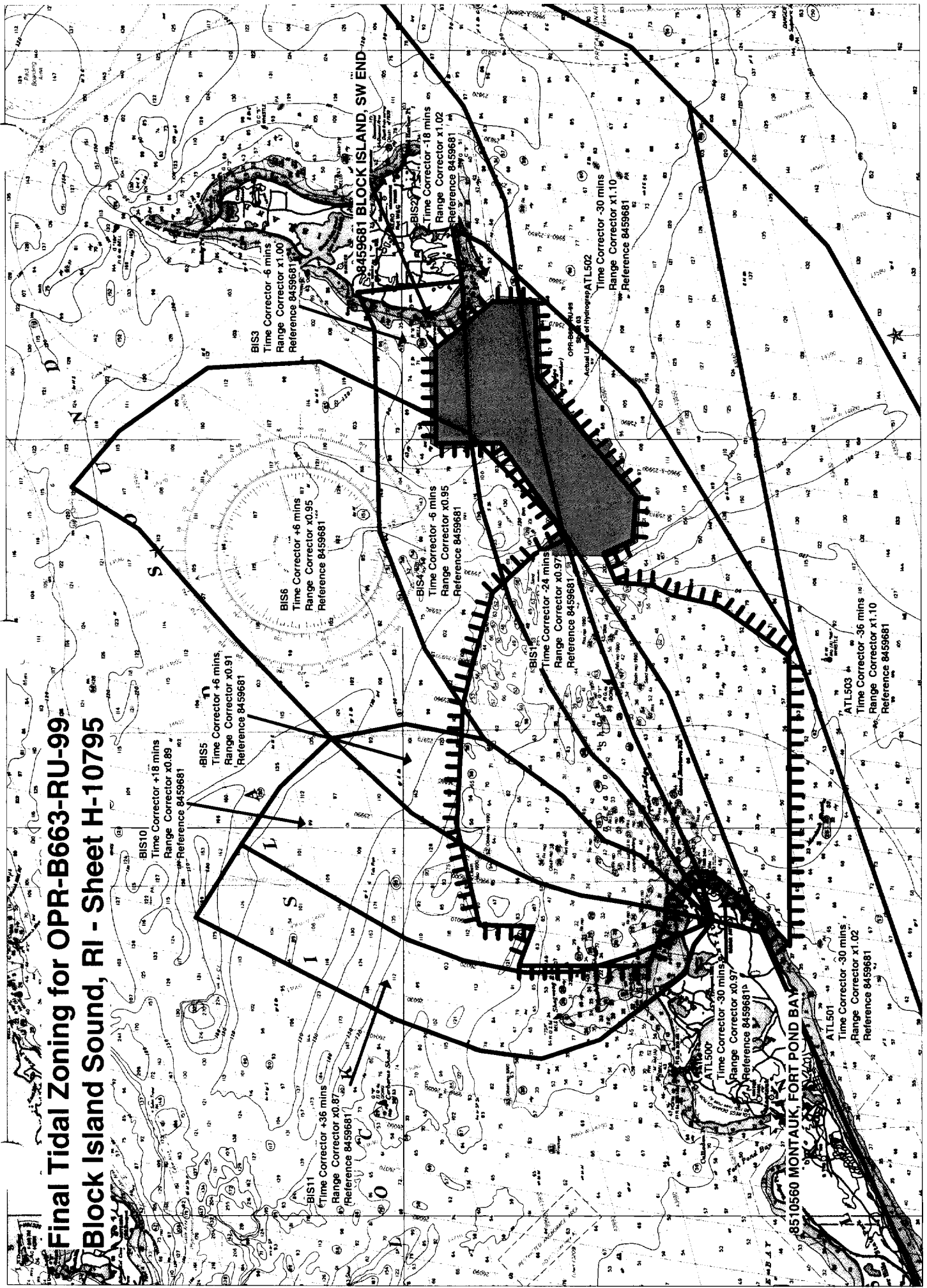
Note 1: Provided time series data are tabulated in metric units (Meters), relative to MLLW and on Greenwich Mean Time.

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector files. For example, tide station one(TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

Thomas V. Yero 10/18/99

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final Tidal Zoning for OPR-B663-RU-99 Block Island Sound, RI - Sheet H-10795



Final tide zone node point locations for OPR-B663-RU-99,
Sheet H-10795.

Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

		Tide Station Order	AVG Time Correction	Range Correction
1)	Zone BIS1			
	-71.705192 41.115149	8459681	-24	0.97
	-71.664448 41.144801	8510560	-102	1.20
	-71.695246 41.141414			
	-71.736123 41.132106			
	-71.772568 41.119445			
	-71.801626 41.106036			
	-71.81245 41.097703			
	-71.825716 41.089676			
	-71.872794 41.067241			
	-71.859884 41.070316			
	-71.850198 41.072614			
	-71.8335 41.078147			
	-71.81235 41.085946			
	-71.793204 41.09253			
	-71.752737 41.103721			
	-71.705192 41.115149			
2)	Zone BIS2			
	-71.595791 41.129797	8459681	-18	1.02
	-71.582706 41.140158	8510560	-102	1.27
	-71.576258 41.150163			
	-71.598718 41.147184			
	-71.613516 41.14667			
	-71.664448 41.144801			
	-71.705192 41.115149			
	-71.666581 41.121985			
	-71.595791 41.129797			
3)	Zone BIS3			
	-71.644981 41.175153	8459681	-6	1.00
	-71.664448 41.144801	8510560	-84	1.24

-71.598718 41.147184
-71.603484 41.180856
-71.619149 41.175596
-71.644981 41.175153

Zone BIS4

-71.664448 41.144801	8459681	-6	0.95
-71.644981 41.175153	8510560	-90	1.17
-71.706107 41.174109			
-71.756657 41.159587			
-71.795375 41.140405			
-71.819855 41.115133			
-71.838547 41.102001			
-71.84512 41.090441			
-71.872794 41.067241			
-71.825716 41.089676			
-71.81245 41.097703			
-71.801626 41.106036			
-71.772568 41.119445			
-71.736123 41.132106			
-71.695246 41.141414			
-71.664448 41.144801			

Zone BIS5

-71.795077 41.189787	8459681	+6	0.91
-71.78888 41.165698	8510560	-78	1.13
-71.795375 41.140405			
-71.819855 41.115133			
-71.838547 41.102001			
-71.84512 41.090441			
-71.872794 41.067241			
-71.865412 41.093921			
-71.862169 41.109646			
-71.856729 41.122973			
-71.845414 41.141396			
-71.827137 41.16376			
-71.795077 41.189787			

Zone BIS6

-71.644981 41.175153	8459681	+6	0.95
-71.633451 41.193131	8510560	-72	1.17
-71.636122 41.229039			
-71.663039 41.257485			
-71.687196 41.272786			
-71.705181 41.251306			
-71.752565 41.220219			

-71.795077 41.189787
-71.78888 41.165698
-71.795375 41.140405
-71.756657 41.159587
-71.706107 41.174109
-71.644981 41.175153

Zone BIS10

-71.795077 41.189787	8459681	+18	0.89
-71.81581 41.206173	8510560	-60	1.10
-71.840515 41.218711			
-71.880918 41.165838			
-71.890014 41.147317			
-71.895237 41.127415			
-71.894803 41.11014			
-71.88719 41.091708			
-71.872794 41.067241			
-71.865412 41.093921			
-71.862169 41.109646			
-71.856729 41.122973			
-71.845414 41.141396			
-71.827137 41.16376			
-71.795077 41.189787			

Zone BIS11

-71.840515 41.218711	8459681	+36	0.87
-71.871772 41.233343	8510560	-48	1.08
-71.915143 41.169817			
-71.928845 41.141838			
-71.932242 41.122259			
-71.924189 41.10358			
-71.903026 41.083331			
-71.895586 41.076426			
-71.883163 41.073438			
-71.872794 41.067241			
-71.88719 41.091708			
-71.894803 41.11014			
-71.895237 41.127415			
-71.890014 41.147317			
-71.880918 41.165838			
-71.840515 41.218711			

5) Zone ATL500

-71.877737 41.051992	8459681	-30	0.97
-71.775441 41.081533	8510560	-108	1.20
-71.705192 41.115149			

-71.752737 41.103721
-71.793204 41.09253
-71.81235 41.085946
-71.8335 41.078147
-71.850198 41.072614
-71.859884 41.070316
-71.872794 41.067241
-71.877737 41.051992

6) Zone ATL501

-71.595791 41.129797	8459681	-30	1.02
-71.644882 41.090697	8510560	-114	1.27
-71.754703 41.040966			
-71.883124 41.007654			
-72.123383 40.946451			
-72.268759 40.91568			
-72.185596 40.950021			
-71.877737 41.051992			
-71.775441 41.081533			
-71.705192 41.115149			
-71.666581 41.121985			
-71.595791 41.129797			

Zone ATL502

-71.754703 41.040966	8459681	-30	1.10
-71.644882 41.090697	8510560	-114	1.36
-71.595791 41.129797			
-71.564619 41.133228			
-71.523675 41.14672			
-71.478508 41.173794			
-71.444331 41.205755			
-71.459135 41.150748			
-71.498845 41.092733			
-71.523707 41.074352			
-71.754703 41.040966			

Zone ATL503

-72.268759 40.91568	8459681	-36	1.10
-72.356515 40.881808	8510560	-120	1.36
-72.469299 40.843402			
-72.674168 40.786672			
-72.833729 40.743293			
-72.700514 40.741575			
-72.558267 40.755313			
-72.169152 40.862713			
-71.854191 40.944919			

-71.699403 40.982158
-71.583646 41.03008
-71.523707 41.074352
-71.754703 41.040966
-71.883124 41.007654
-72.123383 40.946451
-72.268759 40.91568

N/CS33-36-00

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY
(Check):

LETTER TRANSMITTING DATA

- ORDINARY MAIL
- AIR MAIL
- REGISTERED MAIL
- EXPRESS
- GBL (*Give number*)

DATE FORWARDED

5-17-00

NUMBER OF PACKAGES

ONE TUBE

TO:

NOAA / National Ocean Service
 Chief, Data Control Group, N/CS3x1
 SSMC3, Station 6815
 1315 East-West Hwy.
 Silver Spring, MD 20910-3282

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.

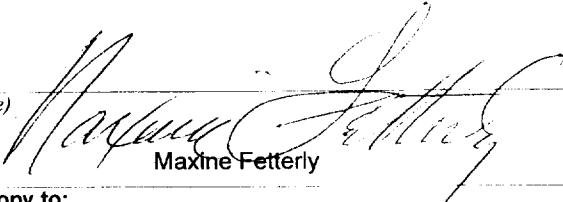
H10795 ORR-B663-RU-98/99

RHODE ISLAND
BLOCK ISLAND

Descriptive Report / Evaluation Report
Drawing History forms 76-71 for NOS Charts 13215 & 13217

- 1 Smooth Sheet
- 2 Mylar H-Drawings
- 3 Paper Composite Plots

FROM: (*Signature*)



Maxine Fetterly

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Maxine Fetterly
 Atlantic Hydrographic Branch
 439 W. York St.
 Norfolk, VA 23510

05/16/2000

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10795

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	361778
NUMBER OF SOUNDINGS	361778

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	12.0	02/08/2000
VERIFICATION OF FIELD DATA	72.0	05/01/2000
QUALITY CONTROL CHECKS	29.0	
EVALUATION AND ANALYSIS	20.5	
FINAL INSPECTION	5.0	03/17/2000
COMPILATION	164.0	05/16/2000
TOTAL TIME	302.5	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		03/21/2000

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10795 (1998-99)**

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
MicroStation 95, version 5.05
I/RAS B, version 5.01
CARIS HIPS/SIPS

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

G. CORRECTIONS TO SOUNDINGS

A comparison between approved tides and zoning with the Center for Operational Oceanographic Products and Services (CO-OPS) verified tides and zoning, was made during office processing. No re-application of tide correctors were required.

H. CONTROL STATIONS

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

To place this survey on the NAD 27, move the projection lines .371 seconds (11.441 meters or 1.14 mm at the scale of the survey) north in latitude, and 1.789 seconds (41.740

meters or 4.17 mm at the scale of the survey) east in longitude.

K. JUNCTIONS

H10914 (1998-99) to the west

A standard junction was not effected between the present survey and H10914 (1998-99). This survey has not been submitted for office processing. Survey depths are in harmony with the charted hydrography to the north, south and east.

L. COMPARISON WITH PRIOR SURVEYS

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

**N. COMPARISON WITH CHART 13205 (35th Edition, Apr 4/99)
13215 (17th Edition, Oct 23/99)
13217 (14th Edition, Mar 23/96)**

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in sections M. and N. of the Descriptive Report. Attention is directed to the following:

N.2. Danger to Navigation

One Danger to Navigation report was submitted to Commander (oan), First Coast Guard District, Boston, Massachusetts for inclusion in the Local Notice to Mariners and to the Marine Chart Division, N/CS3x1, Silver Spring, Maryland. A copy of this report is appended to the Descriptive Report. The following dangerous rocks which originate with the above Danger to Navigation report, have been updated to reflect the application of verified tides. It is recommended that these rocks be added to the chart as shown on the present survey:

<u>Depth Ft/m</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
27/8 ²	41°08'17.65"	71°36'44.58"
29/8 ⁸	41°08'17.05"	71°37'04.68"
28/8 ⁵	41°08'44.95"	71°37'17.48"
36/11	41°08'36.27"	71°38'11.59"
41/12 ⁵	41°08'04.82"	71°38'24.25"
28/8 ⁵	41°07'34.45"	71°39'01.83"
26/7 ⁹	41°07'15.15"	71°39'24.13"
35/10 ⁷	41°06'59.11"	71°39'20.19"
22/6 ⁷	41°07'09.12"	71°39'50.86"
21/6 ⁴	41°07'09.47"	71°40'08.94"
30/9 ¹	41°06'37.25"	71°39'59.47"

N.3a. The following charted rocks originate with prior survey H10350 (1990) and are considered disproved by the present survey:

<u>Depth Ft/m</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
52/15 ⁸	41°06'38.95"	71°42'22.33"
56/17 ¹	41°06'42.08"	71°42'11.58"
49/14 ⁹	41°07'20.57"	71°40'53.25"
56/17 ¹	41°07'11.27"	71°41'03.20"
42/12 ⁸	41°07'30.09"	71°40'38.51"
53/16 ²	41°07'00.83"	71°40'33.19"
56/17 ¹	41°06'59.61"	71°41'00.85"
43/13 ¹	41°06'53.55"	71°40'50.18"
56/17 ¹	41°06'48.05"	71°41'06.14"
58/17 ⁷	41°06'45.48"	71°40'38.57"
60/18 ³	41°06'42.62"	71°40'51.51"
53/16 ²	41°06'40.69"	71°41'13.78"
47/14 ³	41°06'31.57"	71°40'29.07"
54/16 ⁵	41°06'19.34"	71°41'05.93"
57/17 ⁴	41°06'18.75"	71°40'50.95"
46/14	41°06'10.77"	71°40'41.78"
74/22 ⁶	41°07'28.21"	71°41'07.69"
64/19 ⁵	41°05'57.64"	71°41'24.11"
71/21 ⁶	41°05'43.14"	71°42'09.57"
81/24 ⁷	41°05'32.46"	71°41'31.39"
36/11	41°07'27.63"	71°40'23.78"

45/13 ⁷	41°07'19.65"	71°40'22.56"
43/13 ¹	41°07'17.02"	71°40'38.02"
62/18 ⁹	41°06'18.60"	71°40'34.98"
65/19 ⁸	41°06'38.26"	71°42'33.10"
59/18	41°06'27.91"	71°42'33.65"

It is recommended that these rocks and charted notations rocks reported 1990 be deleted from the chart.

4. A charted rock with a depth of 53 feet (16² m), in Latitude 41°06'10.10"N, Longitude 071°40'22.93"W, originates with prior survey H10350 (1990). This rock was located by the hydrographer in Latitude 41°06'09.60"N, Longitude 071°40'23.14"W. It is recommended that the rock be charted as shown on the present survey.

5. The following uncharted rocks were located by the field unit:

<u>Depth Ft/m</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
58/17 ⁷	41°06'23.52"	71°42'34.73"
59/18 ²	41°06'27.28"	71°42'34.64"
34/10 ⁴	41°08'45.21"	71°38'05.44"
38/11 ⁶	41°07'27.90"	71°40'22.60"
38/11 ⁷	41°07'25.62"	71°40'23.77"
32/9 ⁸	41°07'56.78"	71°36'50.36"

It is recommended that these rocks be charted as shown on present survey if chart scale permits.

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

O. ADEQUACY OF SURVEY

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

R. MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

The following NOS Charts were used for compilation of the present survey:

13215 (17th Edition, October 23/99)

13217 (14th Edition, March 23/96)

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H10795

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 disapproval 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.

Maxine Fetterly Date: *8 March 2000*

Maxine Fetterly
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.

Andrew L. Beaver Date: *3/21/00*

Andrew L. Beaver
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: *Samuel P. DeBow, Jr.* Date: *July 23, 2000*

Samuel P. DeBow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

DRAWING HISTORY

REMARKS:

13217

CHART

DRAWING

EDITION

14th

NC RC NE NP RP	To Reproduction Date	Print Date	Notice to Mariners (FWD)	Source Data (FWD)	ITEMS	DATE COMPILED	COMPILER (Signature)	DATE REVIEWED	REVIEWER (Signature)	INFORMATION APPLIED
					1	3/21/00	Maxine Fetterly	3/30/00	Robert Hill	
X	1					4/7/98 to 8/26/99	H10795			Hydrographic Rock Rock Rock Rock Rock Rock
	2									Fully applied all soundings and curves from Smooth Sheet
	3									Add 27 Rock w/ danger curve
	4									Add 29 Rock w/ danger curve
	5									Add 28 Rock w/ danger curve
	6									Add 36 Rock w/ danger curve
	7									Add 34 Rock w/ danger curve
										Add 32 Rock w/ danger curve

DRAWING HISTORY

REMARKS:

NOAA

CHART 13215
DRAWING
EDITION 17th

APPLIED	ITEM NO.	SOURCE OF INFORMATION		DATE		TYPE OF INFORMATION	LOCALITY <i>Lat./Long. and Name</i>	DATE REVIEWED	REVIEWER <i>(Signature)</i>
		FILE NO.	FILE NO.	DATE	AUTH				
X	1	H10795		4/7/98 to 8/26/99	NOS	Hydrographic	41°08'30"N, 071°37'30"W Rhode Island Block Island Sound Southwest Ledge and Vicinity	5/2/00	Robert R. Hill
	2					AWOIS 10009	41°06'54.37"N, 071°40'16.71"W		
	3					AWOIS 10009	41°06'56.93"N, 071°40'18.08"W		
	4					Rock	41°08'17.65"N, 071°36'44.58"W		
	5					Rock	41°08'17.05"N, 071°37'04.68"W		
	6					Rock	41°08'44.95"N, 071°37'17.48"W		
	7					Rock	41°08'36.27"N, 071°38'11.59"W		
	8					Rock	41°08'04.82"N, 071°38'24.25"W		
	9					Rock	41°07'34.45"N, 071°39'01.83"W		
	10					Rock	41°07'15.15"N, 071°39'24.13"W		
	11					Rock	41°06'59.11"N, 071°39'20.19"W		
	12					Rock	41°07'09.12"N, 071°39'50.86"W		
	13					Rock	41°07'09.47"N, 071°40'08.94"W		

NC	To Reproduction
RC	Date
NE	Print Date
NP	Notice to Mariners (FWD)
RP	Source Data (FWD)

APPLIED Part Full	SOURCE OF INFORMATION			TYPE OF INFORMATION	LOCALITY		INFORMATION AP.
	M NO.	FILE NO.	DATE		AUTH	Lat./Long. and Name	
		H10795	4/7/98 to 8/26/99	NOS			
14				Hydrographic			
15				Rock	41°06'37.25"N 071°39'59.47"W	Add 30 Rock w / danger curve	
16				Rock rep	41°06'38.95"N 071°42'22.33"W	Delete 52 Rock w / danger curve and notation rep 1990	
17				Rocks rep	41°06'42.08"N 071°42'11.58"W	Delete 56 Rocks w / danger curve and notation rep 1990	
18				Rocks rep	41°07'20.57"N 071°40'53.25"W	Delete 49 Rocks w / danger curve and notation rep 1990	
19				Rocks rep	41°07'11.27"N 071°41'03.20"W	Delete 56 Rocks w / danger curve and notation rep 1990	
20				Rocks rep	41°07'30.09"N 071°40'38.51"W	Delete 42 Rocks w / danger curve and notation rep 1990	
21				Rock rep	41°07'00.83"N 071°40'33.19"W	Delete 53 Rock w / danger curve and notation rep 1990	
22				Rock rep	41°06'59.61"N 071°41'00.85"W	Delete 56 Rock w / danger curve and notation rep 1990	
23				Rocks rep	41°06'53.55"N 071°40'50.18"W	Delete 43 Rocks w / danger curve and notation rep 1990	
24				Rock	41°06'48.05"N 071°41'06.14"W	Delete 56 w / danger curve	
25				Rock	41°06'45.48"N 071°40'38.57"W	Delete 58 w / danger curve	
26				Rock	41°06'42.62"N 071°40'51.51"W	Delete 60 w / danger curve	
27				Rocks rep	41°06'40.69"N 071°41'13.78"W	Delete 53 Rocks w / danger curve and notation rep 1990	
28				Rock rep	41°06'31.57"N 071°40'29.07"W	Delete 47 Rock w / danger curve and notation rep 1990	
29				Rock	41°06'19.34"N 071°41'05.93"W	Delete 54 w / danger curve	
30				Rocks rep	41°06'18.75"N 071°40'50.95"W	Delete 57 Rocks w / danger curve and notation rep 1990	
31				Rock	41°06'10.77"N 071°40'41.78"W	Delete 46 w / danger curve	
32				Rock rep	41°07'28.21"N 071°41'07.69"W	Delete 74 Rock w / notation rep 1990	
33				Rocks rep	41°05'57.64"N 071°41'24.11"W	Delete 64 Rocks w / danger curve and notation rep 1990	
34				Rock	41°05'43.14"N 071°42'09.57"W	Delete 71 Rock and notation Rk rep 1990	
35				Rock	41°05'32.46"N 071°41'31.39"W	Delete 81 Rock and notation Rk rep 1990	
36				Rocks rep	41°07'27.63"N 071°40'23.78"W	Delete 36 Rocks w / danger curve	
37				Rock	41°07'19.65"N 071°40'22.56"W	Delete 45 w/danger curve	

APPLIED Part	Full	M NO.	SOURCE OF INFORMATION			TYPE OF INFORMATION	LOCALITY		INFORMATION APPL
			FILE NO.	DATE	AUTH		Lat./Long. and Name		
			H10795	4/7/98 to 8/26/99	NOS	Hydrographic			
		37				Rocks	41°07'17.02"N 071°40'38.02"W	Delete 43 Rocks w / danger curve	
		38				Rocks	41°06'18.60"N 071°40'34.98"W	Delete 62 Rocks w / danger curve	
		39				Rock	41°06'38.26"N 071°42'33.10"W	Delete 65 Rock w / danger curve	
		40				Rock	41°06'27.91"N 071°42'33.65"W	Delete 59 Rock w / danger curve	
		41				Rock	41°06'09.60"N 071°40'23.14"W	Revise 53 Rock w / danger curve	
		42				Rocks	41°06'23.52"N 071°42'34.73"W	Add 58 Rocks w / danger curve	
		43				Rocks	41°07'27.90"N 071°40'22.60"W	Add 38 Rocks w / danger curve	
		44				Rock	41°08'45.21"N 071°38'05.44"W	Add 34 Rock w / danger curve	

