

H10900

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Hydrographic/
Type of Survey Side Scan Sonar/Multibeam
Field No. RU-10-4-99
Registry No. H10900

LOCALITY

State New York
General Locality Block Island Sound
Locality Montauk Harbor and Approaches

1999

CHIEF OF PARTY
LCDR J. S. Verlaque

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DATE SEP 27 1999

HYDROGRAPHIC TITLE SHEET

H10900

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-10-4-99

State New York

General locality ~~Long-Island Sound~~ Block

Localities Montauk Harbor and Approaches

Scale 1:10,000

Date of survey 06-01-99 through 06-11-99

Instructions dated 5-25-99

Project No. OPR-B324-RU-99

Vessel NOAA Ship RUDE

Chief of party LCDR James S. Verlaque, NOAA

Surveyed by LCDR Verlaque; LT Berkowitz; RPS Parker; ST Rooney; ST Chandler;

Soundings taken by echo sounder, hand lead, pole Odom Echo-Trac; Innerspace 448; SeaBat 9003

Graphic record scaled by LCDR Verlaque; LT Berkowitz; ENS Slover; RPS Parker; ST Rooney; ST Chandler;

Graphic record checked by LCDR Verlaque; LT Berkowitz; ENS Slover; RPS Parker; ST Rooney; ST Chandler;

Protracted by N/A

Automated plot by (field) Hewlett Packard HP 750C and 2500C DesignJet (Office)

Verification by Atlantic Hydrographic Branch Personnel

Soundings in Meters (*) feet at MLW MLLW (*)

REMARKS All times recorded in UTC.

** Hand written notes in Descriptive Report were made during office processing.*

AWOIS/S-APP 9/23/99 SJ

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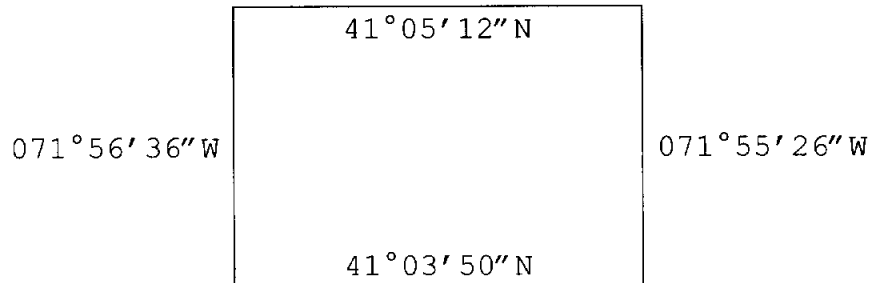
** DATA filed with Field Records.*

A. PROJECT

- A.1 This survey was conducted in accordance with Hydrographic Project Instructions OPR-B324-RU-99, Montauk Harbor and Approaches, New York
- A.2 The original instructions are dated May 25, 1999.
- A.3 There are no amendments to the instructions.
- A.4 This survey is designated registry number H10900.
- A.5 This project responds to a request from the U.S. Coast Guard. With the increase of operations, Coast Guard vessels frequently enter Montauk Harbor, New York for operation logistics and supplies. Montauk Harbor offers a safe haven from poor weather conditions when storm avoidance is required. With this request in mind, NOAA plans including current survey data to Chart 13209 as a new 1:7,500 scale inset of Montauk Harbor and approaches.

B. AREA SURVEYED

- B.1 Survey H10900 encompasses Montauk Harbor and portions of Lake Montauk from the harbor entrance to 0.11 nm south of Star Island. The offshore area covers an area 0.4 nm northward, 0.2 nm westward, and 0.6 nm eastward of the harbor entrance. Survey area covers approximately 2.122 square kilometers or 0.618 square nautical miles.
- B.2 The survey is comprised of one sheet with the following survey boundaries (approximate and not to scale):



- B.3 Data acquisition for this survey began on June 1, 1999 (DN 152) and ended on June 11, 1999 (DN 162).

C. SURVEY VESSELS

- C.1 All H10900 hydrography, side scan, and multibeam investigations were conducted from NOAA Ship *RUDE* (S-590, EDP #9040) and NOAA Launch *0517*. The *RUDE* conducted side scan and multibeam hydrography in the areas from the 18 feet contour seaward toward the offshore survey limits. Launch *517* collected data from the 18 feet contour shoreward and encompassing Montauk Harbor and a portion of Lake Montauk. 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 pole mounted on the port side, approximately amidships. The multibeam transducer was rotated into the water only during times of data acquisition.
- C.3 Survey H10900 is unique in that it contains a mixture of hydrographic data. The *RUDE* collected multibeam sounding data, single beam sounding data, and side scan data; while Launch *517* collected only single beam data. The final sounding data set contains single beam data from Launch *517* and multibeam data from the *RUDE* combined together on one field sheet.

D. AUTOMATED DATA ACQUISITION AND PROCESSING *see also 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 on the HydroSoft CD (version 8.9). MapInfo Version 5.0 (08/18/98) was utilized for data display during the valuation process and completion of the field sheet. All software versions used for data processing are listed in Appendix H. *Data Filed with Field Records.*
- D.1b Triton Corporation's ISIS software Version 4.31 (04/23/99) was used to acquire SeaBat multibeam and digital side scan sonar data. 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 VELWIN Version 4.0 (03/1/99) was used to process the acquired data and calculate velocity corrections.
- D.2a Multibeam and side scan sonar data (XTF Format) conversion within the CARIS-HIPS System entailed specific conversion selections. Conversion selection for origin of sensor information differs between the two types of data. Multibeam data conversion utilized the standard or default selections. Default selections with CARIS software included "Ship Nav" from Sensor; "Ship Gyro" from Attitude; "Fish Nav" from Sensor; "Fish Gyro" from Attitude. Data decimation was not selected and image correction was selected during conversion.

Side scan sonar data conversion entailed selecting "Ship Nav" from Sensor; "Ship Gyro" from Ship or Attitude; "Fish Nav" from Ship; "Fish Gyro" from Ship or Attitude. Data decimation was not selected and image correction was selected during conversion.

- D.2b SeaBat depth data were 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 I).
- D.2c After reviewing 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 beam footprint. Work file processing for survey evaluation included importing the multibeam depths into the WorkFile, selecting "extended no key" and "group by beam number". Processed depths were thinned by shoal bias binning with 3 m X 3 m sounding grid determined by selecting the "Line by Line Binning" method. Soundings were not suppressed; the sounding level yields data points approximately every three meters.

Work file processing for data submission to Atlantic Hydrographic Branch (N/CS33) included binning the same processed multibeam data set at a grid level of 10 meters by 10 meters; this yields soundings approximately every 10 meters and is compatible for HPS sounding density.

CARIS Workfile Processing for cross-data comparisons (see Section J.2) was not conducted due to fact that survey was not 100% multibeam survey. Finally, the CARIS Workfile Processing soundings were transferred into HPS (using HPTools) and MapInfo databases.

D.2d Sounding evaluation included the use of a text file (.txt) created during the multi-beam sounding export process. This text file was used to display the soundings within MapInfo. The dat file (.dat) created during sounding export process was later converted into HPS via HPTools, generating a HPS multibeam only data file for each day of acquisition. Final field sheet selected soundings originate from these HPS multibeam only data files.

The conversion software translating HYPACK data and the suppressed multibeam soundings into HPS compatible format was supplied by NOAA's Atlantic Hydrographic Branch Computer Support Group. The HPTools Version 9.4.0 was used for data conversion and management.

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 and allowed plotting on a HP750C and 2500CP DesignJet plotter. Data could also be overlaid on a raster image of the applicable chart.

D.2f The total number of multibeam soundings used and processed during post processing evaluation does not reflect the total number of multibeam soundings provided to N/CS33. Verification sounding grid size of 10 m at survey scale was selected with no sounding suppression within HIPS. Sounding excessing will be conducted during the verification process using HPS.

E. SONAR EQUIPMENT

E.1 All side scan sonar data were acquired with an Edgetech (EG&G) model 272 towfish (S/N 11904) and an Edgetech Model 260-TH slant-range correcting side scan sonar recorder (S/N 12106). 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 frequency was used throughout the survey.
- E.4a The 75 meter range scale was used with line spacing of 60 meters in deeper areas which allowed operators to maintain proper side scan fish altitude. In areas with shallower depths, the 50 meter range scale was utilized with 40 meter line spacing. Coverage was checked to ensure 200% side scan sonar coverage.
- E.4b Confidence checks were conducted by means of verifying identifiable benthic features. Survey H10900 contains an area with rocks and a buoy block from a navigational aid for these confidence checks. These features were identified from inner to outer limits of the range scale. Graphic record annotations indicate the confidence checks. The hydrographer's confidence in side scan sonar area coverage was continuously verified.
- E.4c Two hundred percent side scan sonar coverage was conducted in the offshore area. 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 lines.
- E.4d The towfish was deployed exclusively from the stern. An electronic cable counter (M/D Totco) was employed to determine the amount of side scan cable deployed.
- 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 computed heights greater than 10% of water depth, or greater than 1.0 meter off the bottom in depths shoaler than 20 meters, and all contacts which appeared man-made were deemed significant. All significant contacts were developed with multibeam sonar coverage.

F. SOUNDING EQUIPMENT

- F.1a Single-frequency (455 kHz) multibeam data were acquired with a Reson SeaBat 9003 (S/N 10496-447020) shallow-water sonar system. The 9003's combined transmit and receive beams yield forty (40) soundings per ping, each formed from a 3° crosstrack x 1.5° alongtrack bottom footprint. During multibeam data processing, the outermost two beams

on each side of the swath (beam numbers 1, 2, 39, and 40) were not processed, reducing the effective swath width to 108° (3° x 36 beams). Proper overlap between multibeam sonar coverage lines was verified using a conservative swath width assumption of 100°.

- F.1b SeaBat 9003 (455 kHz) multibeam data were continuously recorded during data acquisition and served as *RUDE's* primary source for hydrographic digital soundings in the offshore area. Sounding depths ranged from 16 to 70 feet of water, utilizing multibeam range scales of 10, 25, and 50 meters. 200% side scan sonar coverage was based upon 40 and 60 meter line spacing. Line spacing for item investigations were based upon contact position for nadir beam development.
- F.1c Vessel speed during the mainscheme sounding collection consisted of maintaining standards for side scan operations. Multibeam development included vessel speeds between 4 and 7 knots; item and contact investigation speeds were generally slower (3 to 5 kts); slower speeds increase the data density along track over the feature.
- F.2a Dual-frequency (24 and 100 kHz) vertical beam echo sounding data were acquired with a Odom Echo-Trac echosounder. The *RUDE's* Echo-Trac echosounder S/N 9643 was replaced with S/N 9641 on June 9, 1999 (DN 160) and continued operational through survey completion. Echosounder S/N 9643 and S/N 9641 did not record the low frequency; survey data using this echosounder recorded only high frequency returns.
- NOAA Launch 517 used a single vertical beam echosounder. InnerSpace Echosounder Model 448 (S/N 241) was used for all Launch 517's data collection.
- F.2b Single beam echograms were monitored on-line. Anomalous echogram traces were immediately cross-referenced to the ISIS multibeam acquisition display online.
- F.2c Manual edits were made to the Odom Echo-Trac data; only missed depths (9999.9) were edited during field processing of main scheme data. Single beam vertical correctors were applied to the raw single beam digital soundings (see Section G). The archived HPS fixes from the *RUDE's* single beam soundings do not represent the entire character of the seafloor because shoal bias inserts were not selected; graphic records were not scanned for depths edits. Single

beam data collected during crossline comparison were scanned and edited in order to make a valid comparison with mainscheme data. **Echo-Trac data should not be included on the final field sheet; all final field soundings originate from RUDE multibeam data and 517 single beam data.**

- F.3 Diver investigations were performed during this survey for positive identification and correlation of 517 single beam graphic records and the required AWOIS item. There were no depth determinations observed with the MOD III Diver Least Depth Gage.
- F.5 There were no observed faults in sounding equipment that affected the accuracy or quality of the data.

G. CORRECTIONS TO SOUNDINGS

- G.1a Sound velocity correctors were computed from a SeaBird SBE19 SEACAT Profiler (S/N 196723-1251). Data quality assurance tests using the CAT program were performed once a week. The profiler is calibrated at the beginning and end of each field season. See Separate IV for data records. *Data filed with Field Records.*

The following velocity casts were used for this survey:

CAST #	DAY NUMBER
3	152, 153, 154, 155, 156,
5	159
7	161, 162

Sound velocities were applied to the SeaBat data in HIPS (incorporating the Nautical Charting Development Lab REFRACT algorithm). Sound velocity correctors for the vertical beam soundings were computed using VELWIN and applied to the single beam data using HPS.

- G.1b A Single Beam - leadline direct comparison for Launch 517 was conducted during survey H10900. Comparison was conducted on 06/05/99 (DN156). Direct comparison for the RUDE sounding equipment was conducted during the 1999 field season and provided with H10900 documentation listed in Appendix E*. Comparison dates included 04/26/99 (DN116) and 05/03/99 (DN 126).
* *Data filed with Field Records.*

Continuous comparison between single beam and Seabat multibeam depths were monitored during field acquisition. Sounding comparisons are discussed in Section J.

- 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 Transducer dynamic draft was measured for the NOAA Ship *RUDE* on March 5, 1999 (DN 064) during opening calibration "Patch Test" utilizing Real Time Kinematic On The Fly settlement and squat method. Dynamic draft for NOAA Launch 517 was determined using the level method on March 4, 1999 (DN 063). Dynamic draft correctors were stored in the CARIS-HIPS Vessel Configuration File and HPS Offset Table for use in data processing. HPS Offset Table for the *RUDE* is Table 01, while Launch 517 is Table 02. See Separate IV* for data records.
- G.1e NOAA Ship *RUDE's* Heave, pitch, and roll data were acquired with a Seatex Seapath Motion Reference Unit (MRU-5) (S/N 0544). Heave, pitch, and roll data were applied to SeaBat multibeam data; only heave data were applied to vertical single beam data during post processing.
- G.1f Heading data were acquired with Seatex Seapath and applied to determine both multibeam transducer and side scan towfish azimuth and position. Multibeam heave, pitch, roll, and heading sensor data were adjusted using biases as determined during a patch test completed on March 5, 1999 (DN 064). See the CARIS-HIPS Vessel Configuration File in Appendix E* 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. During data collection tide station Fort Pond Bay, New York (8510560) was used as the reference station utilizing predicted tides.

Subordinate tide station Lake Montauk (8510448) was used to provide tide reducers within the prescribed zones and to resolve possible differing tidal characteristics due to topographic and bathymetric features within these zones. Final tide correctors applied to survey data were provided by Oceanographic Products and Services Division (N/CS41) in the form of verified or "smooth tides". Actual tide

* DATA FILED WITH FIELD RECORDS.

data was zoned corrected and tidal values were computed in CARIS-HIPS and HPS for re-application to SeaBat and single beam data. *Approved Tides and Zones were applied During Office Processing.*

- G.4 The diver least depth gage was not used for this survey.
- 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 were acquired at Lake Montauk, New York (Station 8510448) by N/OES231. A request for verified tides was mailed on June 18, 1999. *Approved Tides and Zones were Applied During Office Processing.*
- G.6c Note that multibeam and single beam data processing was accomplished using predicted tide values during acquisition and verified "smooth tide" values during post processing.

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 RadioBeacon Broadcast Site	Freq kHz	Rate BPS	Latitude N	Longitude W	Range nm	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 of 3.86 was rarely exceeded. Anomalous position data were either manually smoothed or flagged "rejected", depending on the extent of the affected data.

DGPS performance checks were not conducted for NOAA Ship *RUDE*. 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.

Performance check was conducted for Launch 517 on 06/21/99 (DN 172). Horizontal positional check consisted of comparing the vessel position to the geographic position of a known first order bench mark. The check station used was "Flamingo 1965", located at 41°04'20.04929"N 071°56'31.06435"W. Results yield error variance of -1.578 meters on the northing axis and -0.7 meters on the easting axis. Inverse from vessel location to check station was 1.8219 meters with azimuth of 208°18'04.1689".

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 are 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 CARIS VCF and HPS DSF offset data records. * *DATA Filed with Field 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 *See also Evaluation Report.*

Shoreline verification was not conducted during this survey. New digital shoreline was not available at the time of survey operations nor post processing comparisons.

J. CROSS COMPARISONS

- J.1 A total of 5.74 nm of crosslines were acquired for this survey; equating to over 7.84% of the total linear miles of hydrography.
- J.2 Caris crossline comparison computations do not work well with surveys that are not 100% multibeam. The gaps between sounding lines of this survey inhibits the comparison of a digital terrain model (DTM) to a checkline file. With this in mind, the hydrographer segregated the survey data by vessel and line classification, then generated a MapInfo table that could be used to make a visual comparison.
- J.3 *RUDE's* mainscheme multibeam soundings compared to cross line multibeam soundings yields excellent agreement. Sounding variance was within one foot.
- J.4 The single-beam mainscheme sounding data acquired by 517 agreed well with 517's cross-line soundings. Sounding variance was within one foot.
- J.5 No anomalous crossline comparisons were noted.
- J.6 The mainscheme and crossline data were collected with the same suite of survey equipment respectively for each vessel used on this survey.

K. JUNCTIONS *SEE ALSO THE EVALUATION REPORT*

Survey H10900 does not junction with any other survey. However, there was a junction area between the two survey platforms. RUDE mainscheme multibeam soundings compared to 517 single beam soundings in the junction area agree within 0 to 1 foot. Soundings with larger discrepancy are due to multibeam line by line binning. These multibeam mainscheme soundings fall between 517's single beams sounding lines and were collected during contact developments.

L. COMPARISON WITH PRIOR SURVEYS *SEE ALSO EVALUATION REPORT.*

A comparison with prior surveys will be performed by N/CS33.

M. ITEM INVESTIGATION REPORTS *SEE ALSO EVALUATION REPORT.*

M.1 Survey H10900 included one AWOIS item within survey limits. AWOIS #10326's target center was located inside Lake Montauk near the Montauk Yacht Club. Survey personnel searched this area during sounding verification and specifically during diver investigation for the AWOIS item.

Sounding investigation consisted of visually identifying benthic features at sounding locations. Divers were able to determine whether the sounding was valid or whether the echo sounder insonified and digitized on grass that covers over 50% of the survey area. Hydrographer investigated over thirty-two specific locations where graphic records required identification of benthic features. Positive identification allowed for final sounding data editing with confidence.

M.2

AWOIS NO: 10326

Item Description: UNKNOWN**Source:** LNM23/89**AWOIS Position:** Lat - 41°04'17" N Lon - 071°55'52"W**Required Investigation:** SD, BD, DI**Charts Affected:** 13209

INVESTIGATION
Date(s)/DN(s): 06/08/99 (DN 159), 06/10/99 (DN 161)**Position Numbers:** FX 5628**Vessel Number:** 0517**Investigation Used:** DI**Water Visibility:** 3.0m**Position Determined By:** DGPS**Investigation Summary:** -----

Search area was investigated by means of present survey data, diver investigation during sounding affirmation, and AWOIS dive investigation. The AWOIS target location is positioned next to a pier at Montauk Lake Yacht Club where the NOAA Ship RUDE is moored. Diver investigation of the area yielded negative results. Sounding investigations by divers in the search area also yielded negative results.

Local information from Mr. Harry Clemenz on 06/08/99 indicated that the present pier system at the Montauk Yacht Club is only 10 to 12 years old. He informed the hydrographer that no dredging occurred during yacht club renovation. Mr. Clemenz indicated that he has been a resident of the area since 1947 and has no knowledge of the wreck and is doubtful of the wreck's existence. Mr. Clemenz can be reached at Box 367, Westlake Road, Montauk, NY 11954 (516-668-2103).

CHARTING RECOMMENDATION

The hydrographer recommends removing the charted wreck (PA) from the chart. *CONFIRM*

Recommended Position: N/A**Recommended Least Depth:** N/A

COMPILATION NOTES

N. COMPARISON WITH THE CHART *see also Evaluation Report.*

N.1 Two charts are affected by this survey:

- Chart 13209, 22nd Ed., 20 September 1997 1:40,000 scale
- Chart 13205, 34th Ed., 12 September 1998 1:80,000 scale

N.2 Chart 13209 has 34 soundings charted within the survey limits. H10900 soundings are the same or shoaler than 33 of the 34 charted soundings in the common area. Chart 13205 has five soundings charted; survey depths agree with 4 of the 5 charted soundings in the common area. Agreement is excellent between zero and one foot. Sounding comparison greater than one foot is discussed in Section N.3.

N.3 A 29 feet sounding positioned at $41^{\circ}01'20''$ ^{5 0}N $071^{\circ}58'12''$ ⁵W on Charts 13205 and 13209 is not supported by survey data. Multibeam development lines with 40 meter line spacing were collected on DN 159. Line spacing and coverage plots from Caris WorkFile indicates that 100% multibeam coverage was acquired over this charted sounding. The hydrographer recommends revising Chart 13205 and 13209 with ^{present} survey soundings common to this area. *CONCUR, see also Evaluation Report.*

N.4 Charted shoreline and features do not compare well with current survey data. The entrance to Montauk Harbor is charted as "10 ft for width of 150 ft". Current depths in the designated channel fairway indicates that the controlling depths or the channel limits require revision. Survey data reveals 7 feet sounding located at $41^{\circ}04'42''$ N $071^{\circ}56'16''$ W and is positioned within the charted channel limits. This area is located on the eastern side of the channel where revision is required. *CONCUR*

N.5 The entrance channel naturally becomes shoaler on either side of the channel when a jetty is present. The controlling depth derived from sounding data conducted in the middle or center of the channel determined by the hydrographer agrees with the charted controlling depth of 10 feet. The east side of the entrance is a shallower slope than the west side. Sounding data indicates a steeper slope on the western channel edge and appears that the channel is offset to the west compared to the charted channel limits.

N.6 The channels within the confines of Lake Montauk and Montauk Harbor are marked with private navigational aids. These buoys are positioned and maintained by the city of Montauk. The charted notes concerning controlling depths

in the following areas necessitate revision:

1. The area to the northwest of Star Island in the general vicinity of 41°04'24"N 071°56'12"W lists 9 feet as controlling depth. Survey data indicates depths between 10 and 14 feet in this area. Shoaler depths do exist in this area but are located close to piers and bulkheads. *See also Evaluation Report.*
 2. The marked channel in the general vicinity of 41°04'12"N 071°56'15"W (west side of Star Island) lists the controlling depth as 8 feet. Survey data indicates that the controlling depths require revision, or the navigational aids require to be relocated. Survey data indicates 4 and 5 feet soundings positioned within the channel limits. When drawing a straight line between the red navigational aids on the west side of this channel, the 4 feet and 5 feet soundings clearly lie on the edge but within the channel limits. *IT IS Recommended That The 8ft Rep. Be revised To 4ft Rep, 1999*
- N.7 All soundings from survey H10900 should supercede charted soundings. *CONCUR*

O. ADEQUACY OF SURVEY *see also Evaluation Report.*

Survey H10900 was completed using single beam hydrography, 200% side scan sonar, and multibeam mainscheme and development hydrography. It is recommended that H10900 should supersede all prior surveys in common areas. *CONCUR*

P. AIDS TO NAVIGATION

- P.1 A comparison was made between the detached positions of navigational aids and the largest scale chart of the area. Private navigational aid Green Can #3 and Green Can #5 charted on the east side of Star Island were found to be off station and charted incorrectly. The private navigational aids appeared to have been relocated since the last survey was conducted.

Navigation Aid	Charted Position	Survey Position
Priv Aid Green Can #3	41°04'09.99"N 071°55'39.40"W	41°04'13.99"N 071°55'40.25"W
Priv Aid Green Can #5	41°03'56.71"N 071°55'36.97"W	41°04'08.548"N 071°55'43.234"W

P.2 Information from the U.S. Coast Guard indicates that navigational aids which are maintained by the Coast Guard include Montauk East Jetty Light #1, West Jetty Light #2, and floating aid RW "M Mo (A).

P.3 All fixed navigational aids located during the survey are tabulated in the Light List, Vol. 1, 1999 and is listed in the following table:

Nav Aid	Light List #	Light List Geographic Position	Survey Position
Montauk East Jetty Light 1	19875	41°04'48"N 071°56'12"W	41°04'46.423"N 071°56'14.238"W
Montauk West Jetty Light 2	19880	41°04'42"N 071°56'18"W	41°04'44.471"N 071°56'20.236"W
Montauk Harbor West Side Day beacon	19890	N/A	41°04'37.527"N 071°56'17.252"W

Each aid adequately serves the apparent purpose for which it was established. *CONCUR*

P.3 There were no submarine or overhead pipelines, cables, tunnels, bridges, or ferry routes found in the survey area.

Q. STATISTICS

Q.1 Lineal Nautical Miles of Sounding Lines. 53.8

Q.2a Square Nautical Miles of Hydrography 0.6

Q.2b Days of Production 8

Q.2d Bottom Samples25

Q.2e Tide Stations. 1

Q.2f Velocity Casts 6

Q.2g SEABAT Item Investigations16

Q.2h Dive Investigations 9

R. MISCELLANEOUS

- R.1 No evidence of silting, unusual submarine features, or magnetic anomalies were detected during this survey.
- R.2 Bottom samples were required as per project instructions and submitted to the Smithsonian Institution.

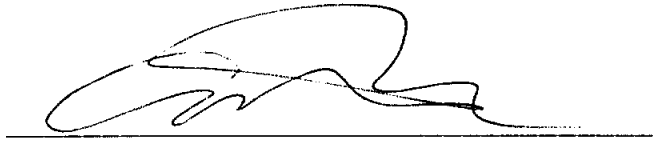
S. RECOMMENDATIONS *see also Section O, of Evaluation Report.*

No additional field work is required.

T. REFERRAL TO REPORTS

A copy of the Coast Pilot Report will be included in the Separates.

This report and the accompanying field sheets are respectfully submitted.



Castle Eugene Parker
 Physical Scientist
 NOAA Ship RUDE

APPENDIX K

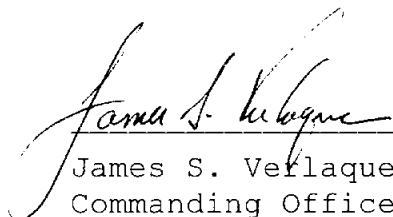
APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H10900

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 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



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: July 7, 1999

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-B324-RU

HYDROGRAPHIC SHEET: H-10900

LOCALITY: Montauk Harbor and Approaches

TIME PERIOD: June 1 - June 11, 1999

TIDE STATION USED: 851-0448 Lake Montauk, NY
Lat. $41^{\circ} 4.4' N$ Lon. $71^{\circ} 56.1' W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.682 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: BIS26, BIS27, BIS28, BIS29, BIS31 &
BIS34.

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.

Thomas V. Mero 7/2/99

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

GEOGRAPHIC NAMES

H-10900

Name on Survey	A 15205, 15209 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							
MONTAUK, LAKE	X		X								2
MONTAUK (pp1)	X		X								3
MONTAUK HARBOR	X		X								4
NEW YORK (title)	X		X								5
STAR ISLAND	X		X								6
											7
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Dennis J. Roseburg
 Chief Hydrographer
 SEP 2 - 1999

09/22/99

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10900

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		14019
NUMBER OF SOUNDINGS		14019
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	0.0	08/17/99
VERIFICATION OF FIELD DATA	91.0	09/10/99
QUALITY CONTROL CHECKS	0.0	
EVALUATION AND ANALYSIS	6.0	
FINAL INSPECTION	18.0	09/10/99
COMPILATION	56.0	09/22/99
TOTAL TIME	171.0	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		09/14/99

REFERENCE NO.

N/CS33-75-99

LETTER TRANSMITTING DATA

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

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

TO:

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

DATE FORWARDED

Sept. 22, 1999

NUMBER OF PACKAGES

1 Box, 1 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.

H10900

Block Island Sound, Montauk Harbor and Approaches

1 Box Containing:

- 1 Original Descriptive Report for H10900
- 1 HISTORY OF CARTOGRAPHIC WORK for H10900 for charts 13209

1 Tube Containing:

- 1 Original Smooth Sheet for H10900
- 1 Paper Composite plot of survey H10900 for chart 13209
- 1 Mylar H-Drawing of H10900 for chart 13209

FROM: (Signature)



Richard H. Whitfield

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch N/CS331
 439 W. York Street
 Norfolk, VA 23510-1114

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10900 (1999)**

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

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). 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 0.366 seconds (11.290 meters or 2.26 mm at the scale of the survey) north in latitude, and 1.750 seconds (40.854 meters or 8.17 mm at the scale of the survey) east in longitude.

I. SHORELINE

Shoreline originates with 1994 stereo source data, revised with 1998 source data Project N499A, Lake Spring, MD. See the "Minute Memo" attached to this report for specific details.

K. JUNCTIONS

There are no junctional surveys to the north, south, east, or west. Present survey depths are in general harmony with the charted depths in the junctional areas.

L. COMPARISON WITH PRIOR SURVEYS

H05326 (1933) 1: 5,000

H05344 (1933) 1:20,000

H06828 (1943) 1: 5,000

A comparison with prior surveys was performed in areas not covered by 200% side scan sonar. In areas with 200% side scan sonar coverage no comparisons were done in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995. The following should be noted:

H05326 (1933) compares favorably with present survey depths and shows a general trend of being 1 to 2 feet (0^3-0^6 m) deeper than the present survey. There are scattered depths 2 to 4 feet (0^6-1^2 m) shoaler than present survey depths. Entering the harbor to the west of Star Island the depths are 2 to 13 feet shoaler in an area that was not developed at the time the prior survey was conducted. To the east of Star Island present survey depths are 1 to 3 feet (0^1-0^9 m) deeper than prior survey depths.

There are numerous shoreline changes in the common area. These changes may be attributed to either natural or cultural changes, differences in the plane of reference, or a combination of these reasons.

H05344 (1933) compares favorably and shows a general trend of being 1 to 3 ft (0^3-0^9 m) deeper than the present survey. There are some scattered soundings that are 2 to 4 feet (0^1-1^2 m) shoaler than the present survey soundings. Changes between the prior and present survey are as follows:

1) There are numerous shoreline changes in the common area. These changes may be attributed to either natural or cultural changes, differences in the plane of reference, or a combination of these listed.

2) A charted 29-ft depth, in Latitude $41^{\circ}05'00''N$, Longitude $71^{\circ}55'12''W$, originates with the prior survey and is considered disproved by the present survey. Present survey depths in the area range from 52 to 56 feet (15^8-17^1 m). It is recommended that the area be charted as shown on the present survey.

3) Uncharted fish stakes, in the vicinity of Latitude $41^{\circ}04'49.5''N$, Longitude $71^{\circ}55'58.5''W$ and Latitude $41^{\circ}04'52.5''N$, Longitude $71^{\circ}55'39.0''W$, originate with the prior

survey and are considered disproved. No change in charting status is recommended.

H06828 (1943) compares favorably and shows a general trend of being 1 to 3 deeper than the present survey. There are some scattered depths 2 to 3 ft (0⁶-0⁹ m) deeper than present survey depths.

Shoreline changes in the common area may be attributed to either natural or cultural changes, differences in the plane of reference, or a combination of these reasons.

The differences between the present and prior surveys can be attributed to cultural development and improved hydrographic surveying methods and equipment.

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

N. COMPARISON WITH CHART 13209 (22nd Edition, Sep 20/97)

Hydrography

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section N. of the Descriptive Report. The following should be noted:

1) A charted pile, in the vicinity of Latitude 41°04'39"N, Longitude 71°56'06"W, is considered disproved. It is recommended that the charted pile be deleted from the chart.

2) The charted notation, 9 FT, 1987-92, in the vicinity of Latitude 41°04'24"N, Longitude 71°56'12"W, is no longer correct. A shoal area with depths to 7 feet (2¹ m), in the vicinity of Latitude 41°04'22.5"N, Longitude 71°56'09.0"W, was located by the present survey. It is recommended that the charted notation be deleted and the area be charted as shown on the present survey.

This survey is considered adequate to supersede the charted hydrography in 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 chart was used for compilation of the present survey:

13209 (22nd Edition, Sep 20/97)

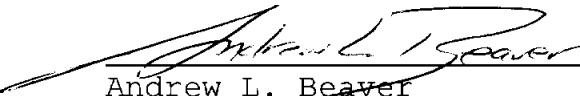
APPROVAL SHEET
H10900 (1999)

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: 9/14/99
Norris A. Wike
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.

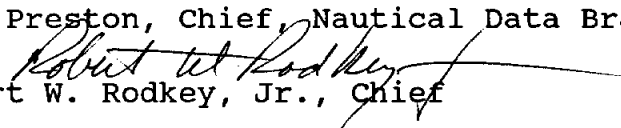

_____ Date: 9/14/99
Andrew L. Beaver
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved:  Date: September 27, 1999
Samuel P. DeBow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

A P P L I C A T I O N S B R A N C H
M I N U T E M E M O

June 21, 1999

To: Lynn Preston, Chief, Nautical Data Branch, MCD, CS
From:  Robert W. Rodkey, Jr., Chief
Subject: Project NY99A, Lake Montauk, NY

Message:

I have approved Project NY99A, Lake Montauk, NY for release. This project was created in response to a charting inquiry for support in generating a new 1:7,500 scale chart inset of the northern part of Lake Montauk. The digital cartographic feature file (dcff) for this project will be posted to the RSD FTP Site in 2 formats: 1. SDDEF file, gc10462.sdf, 2. e00 files, gc10462a.e00 and gc10462p.e00, and an associated e00 format text file, gc10462.txt.

The project consists of one dcff (GC-10462). The dcff was created through stereographic compilation techniques utilizing 1994 source data, and monoscopic comparison utilizing 1998 source data. The predicted circular error is 5 meters. The largest scale NOAA Nautical Chart of the area is 13209. No Chart Maintenance Print was generated for this project.

Attached to this memo you will find: 1. a graphic plot of the dcff contents @ 1:5,000 scale, 2. a page size diagram of dcff contents, 3. a printout of the E00 associated text file, and 4. the originator's copy of the "2-Way Memo".

Please forward this data/information to Mark Friese, Hydrographic Surveys Division, for use in hydrographic survey operations. A standard photogrammetric survey will provide charting data which will supersede this data set for chart inset construction purposes.

For questions on dcff posting to the RSD FTP site, please contact Mark Howard, RSD Data Base Coordinator via phone at 713-2685, x140, via email at Mark.Howard@noaa.gov, or in person at SSMC3 Station 5239.

cc: N/NGS31 - Mark Howard

Attachments

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H10900

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
13209	9/20/99	NORRIS A. WIXE	Full Part Before After Marine Center Approval Signed Via <i>INSET</i>
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
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