

H11395

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey: **Hydrographic and
ENC Validation**

Registry Number: **H11395**

LOCALITY

State: New York

General Locality: New York Harbor

Sub-locality: Lower Hudson River

2006

CHIEF OF PARTY
LTJG Jasper D. Schaer, NOAA

LIBRARY & ARCHIVES
DATE: MARCH 2006

HYDROGRAPHIC TITLE SHEET

H11395

INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State: **New York**

General Locality: **New York Harbor**

Sub-Locality: **Lower Hudson River**

Scale: **1:10,000** Date of Survey: **3/17/05 4/05 to 03//06 3/20/06**

Instructions Dated: **01/05/05** Project Number: **S-A911-NRT5-05 OPR-310-NRT5-04, H11395**

Vessel: **NOAA Survey Boat S-3002**

Chief of Party: **LTJG Jasper D. Schaer, NOAA**

Surveyed by: **NOAA Navigation Response Team 5 Personnel**

Soundings by: **Inner Space 455i single beam echosounder**
Kongsberg Simrad EM3000 Multi beam echosounder

Graphic record scaled by: **N/A**

Graphic record checked by: **N/A**

Protracted by: **N/A** Automated Plot: **N/A**

Verification by: **Atlantic Hydrographic Branch Personnel**

Soundings in: **Feet Meters at MLLW**

Red, Bold, Italic notes in the Descriptive Report were made during Office Processing.

Remarks:

- 1) All Times are UTC.**
- 2) This is a Navigable Area Hydrographic Survey.**
- 3) Projection is UTM Zone 18. NAD-83**

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DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SURVEY: OPR-~~B~~310-NRT5-05~~4~~

Scale of Survey: 1:10,000

Year of Survey: 2005-~~2006~~

NOAA Navigation Response Team 5

LTJG Jasper D. Schaer, Team Leader

A. AREA SURVEYED

Hydrographic survey H11395 was conducted in accordance with *Hydrographic Survey Letter Instructions for Field Examination OPR- ~~B~~310-NRT5-05, New York Harbor, New York. *Original instructions dated January 1, 2005.

New York Harbor is a priority in the Marine Chart Division (MCD) for ENC updates, and the Office of Coast Survey's National Survey Plan has identified the Lower Hudson River as a critical survey area. New York is one of the busiest and most vital ports for commerce within the United States, and much of the shipping traffic for Newark Bay in New Jersey crosses New York Harbor. The port's traffic is primarily composed of petroleum, scrap metal and container ships.

For complete survey limits, see the chartlet on the following page.

**Filed with original field records.*

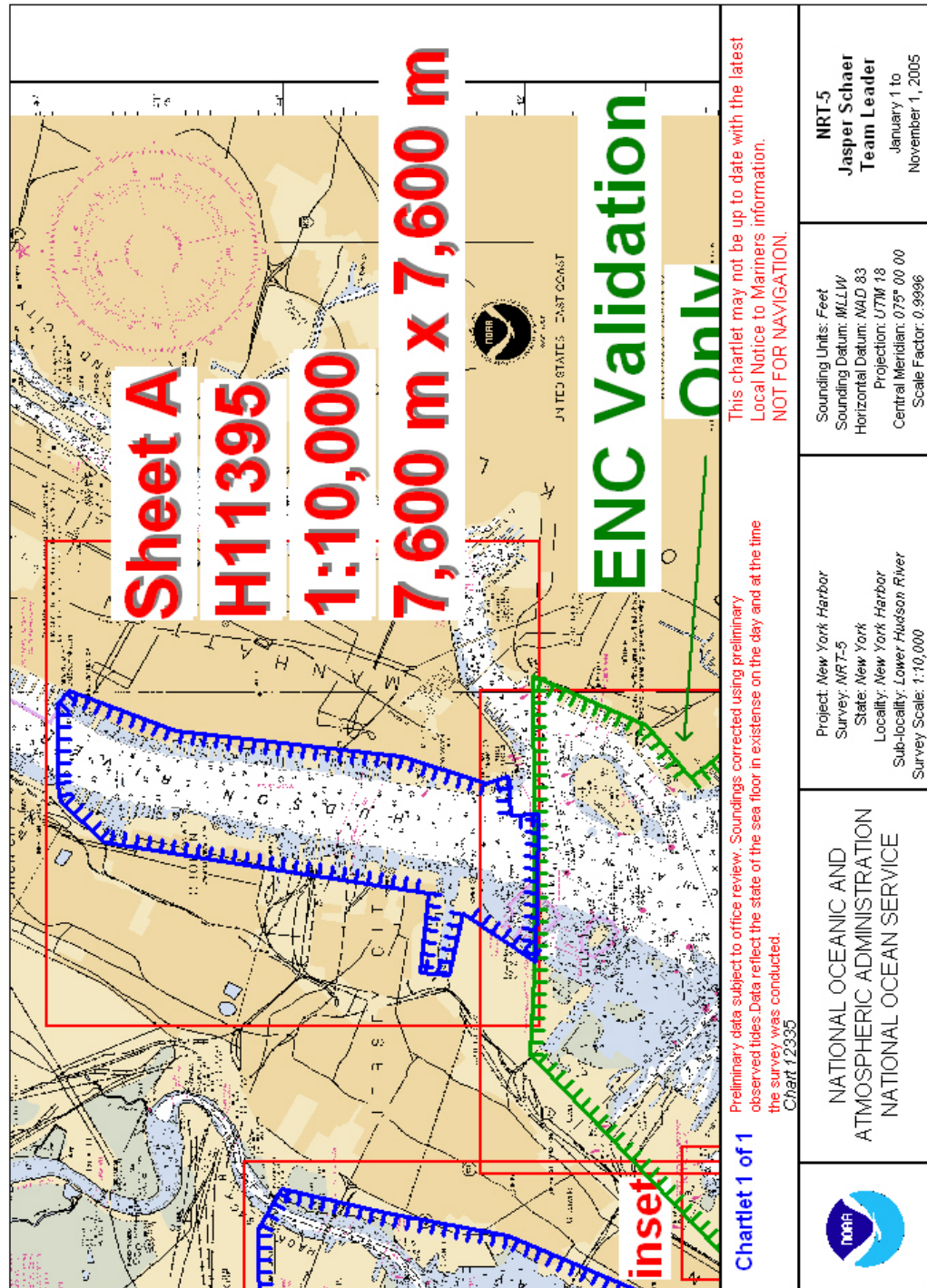


Figure 1: Complete Survey Limits & Data Coverage

B. DATA ACQUISITION AND PROCESSING *See also Evaluation Report.*

EQUIPMENT

Data were acquired by NOAA Survey boat S3002. Vessel S3002 is a 10-meter Sea Ark VC Commander hydrographic survey vessel with an average transducer draft of 1.1 meters

NOAA Survey boat S3002 acquired data with a Multi Beam Echo Sounder (MBES)-Kongsberg Simrad EM3000, a Single Beam Echo Sounder (SBES)-INNERSPACE 455i, and with Side Scan Sonar (SSS) data with a towed KLEIN 3000.

NOAA Survey boat S3002 positioning and attitude data were determined with a TSS POS/MV 4.20 Version 4, a DGPS/GPS-aided inertial navigation system.

Refer to the Data Acquisition and Processing Report (DAPR-Sept 04-Dec 05) for detailed equipment and vessel configuration information. *Concur.*

QUALITY CONTROL

Side Scan Sonar Quality Control

Daily confidence checks were made by observing the outer ranges of the side scan sonar images. No unusual problems were encountered. *Do not concur. SSS data is of poor inadequate quality in most areas. Additionally, significant SSS contacts were not selected nor developed by multibeam. See also Evaluation Report.*

200% SSS bottom coverage was collected for this survey project at 75 m range scale.

Single Beam Quality Control

No unusual events associated with the collection of the Single Beam data for this project. *Concur.*

Refer to this project's *DAPR for detailed discussion of SBES system calibrations, data acquisition, and data processing.

Multi Beam Quality Control

Multi Beam was collect to develop contacts selected by side scan. No unusual events associated with the collection of the Multi Beam data for this project. *Concur with clarification. MB developments were not conducted over many significant SSS contacts that were not selected. See also Evaluation Report.*

Refer to this project's *DAPR for detailed discussion of MBES system calibrations, data acquisition, and data processing.

**Filed with original field records.*

Base Surface

CARIS HIPS BASE (Bathymetry associated with Statistical Error) surfaces, which incorporate each sounding's total error (TPE), were created according to depth intervals. Each finalized BASE surface contains seven layers: depth, uncertainty (using the "greater of the two" options), density, mean standard deviation, shoal, and deep. *Concur with clarification. TPE calculated only for multibeam data. TPE not calculated for vertical beam data (AHB used shoal layer during base surface calculation).*

Depths of 0-15 meters: two finalized 0.75 resolution BASE surface for items investigated:

Mbes_sheetA_3_20_06_final

Sheet A_mbes_contacts_final

Refer to this project's *DAPR for detailed discussion of MBES system calibrations, data acquisition, and data processing.

Crosslines

NOAA Survey boat S3002 collected 11.68 nautical miles of crosslines (about 13.2% of the ~88 nm of mainscheme sonar data). SBES cross lines were compared to SBES data. Overall, cross lines have excellent agreement with data set.

Junctions

There are no junctions for this survey. *Do not concur. Junction analysis is forgone due to inadequacy of survey.*

CORRECTIONS TO ECHO SOUNDING

All methods or instruments used were as described in the project *DAPR. The positions of sound velocity casts are loaded into the survey's PSS as individual "generic position" features (GP's), with the depth versus sound velocity information contained in the remarks.

C. VERTICAL AND HORIZONTAL CONTROL

VERTICAL CONTROL

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) station at The Battery, NY (851-8750) and Sandy Hook, NJ (853-1680) and the Physical Oceanographic Real Time System (PORTS) station at Bergen Point, NY (851-9483) served as datum control for the survey. However, for H11395, The Battery was the only tide station used for preliminary tides because of its close location to the area surveyed. *See also Evaluation Report. *Filed with original field records.*

The preliminary zones and correctors used for this survey are as follows:

Table 1: Preliminary Tide Zones & Correctors

<u>Zone Name</u>	<u>Time Corrector(mins)</u>	<u>Range Ratio</u>	<u>Predicted Reference</u>
NY3	+6	1.00	853-1680
NY9	+6	1.07	853-1680
NY10	+12	1.10	853-1680
NY11	+18	1.13	853-1680
NY13	+12	1.10	853-1680
NY14	-6	1.05	851-9483
NY14A	0	1.03	851-9483
NY15	0	1.01	851-9483
NY15A	+12	1.02	851-9483
NY15B	+18	1.06	851-9483
NY15D	+24	1.05	851-9483
NY16	0	0.98	851-9483
NY17	-6	0.94	851-9483
NY18	-18	1.03	851-8750
NY19	-12	1.03	851-8750
NY20	-6	1.04	851-8750
NY21	0	1.00	851-8750
NY22	+12	0.98	851-8750
HR1	+12	0.98	851-8750
HR2	+24	0.95	851-8750

A Request for Approved Tides letter was sent to N/OPS1 on January 10, 2006 **March 28, 2006**. (Appendix IV). Verified water levels from the N/OPS1 CO-OPS website were downloaded periodically throughout the survey, and applied to all sounding data. Refer to the July 2005 ***DAPR** for a summary of the methods used to determine, evaluate, and apply tide corrections to sounding data. **Concur.**

HORIZONTAL CONTROL

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 18.

Horizontal position was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon stations. Beacons are selected by automatic range mode by the Trimble DSM212L DGPS system. No horizontal control stations were established for this survey.

Horizontal dilution of precision (HDOP) was monitored daily. The observed HDOP values did not exceed 4.00. **Concur.**

***Filed with original field records.**

D. RESULTS AND RECOMMENDATIONS *See also Evaluation Report.*

CHART COMPARISON

There are five charts affected by this survey:

Table 2: Affected Chart

Number	Edition	Date
12327	97	Sept. 1, 2003
12334	67	April 1, 2004
12335	40	Sept. 1, 2003
12337	22	Nov. 15, 1997
12341	26	June 1, 2003

General Agreement with Charted Soundings

Survey area was located within a high traffic area for New York Waterway commuter ferries and water taxis. During survey operations, ferry boat wake was often unavoidable. However, even under these conditions, sounding data was found to be accurate and in agreement with checklines and charted soundings consistently.

Concur.

Dangers to Navigation (Dton's)

There are no Dton's for this survey. ***Concur.***

AWOIS Items

No AWOIS assigned for this survey. ***Do not concur. AWOIS Investigations criteria not completed due to inadequacy of survey.***

Significant Uncharted Features

The item investigation reports describe two non-dangerous, insignificant, uncharted obstruction or features (see in Appendix I-c). ***Concur with clarification. Due to the inadequacies of survey H11395, sufficient data was not provided to determine that uncharted features do not exist within the survey area. It is recommended that the H11395 survey area be reassigned to be surveyed as soon as practical.***

Non-AWOIS Charted Features & Notes

The item investigation reports describe two non-dangerous, insignificant, uncharted obstruction or features (see in Appendix I-d). ***Concur with clarification. Numerous charted features exist in the H11395 "Lower Hudson River" survey area and were not addressed by the survey.***

ADDITIONAL RESULTS

Prior Surveys *See also Evaluation Report.*

Prior surveys of this area are as follows: *Concur with clarification. S-B601-RUS00003 conducted by NOAA Ship Rude in 2003 apparently not in Surdex is the most recent prior survey.*

Table 3: Prior Surveys

<u>Registry #</u>	<u>Scale</u>	<u>Year</u>
H-10938	1:5000	1999
H-09875	1:10000	1980
H-09815	1:10000	1980
H-09874	1:10000	1980
H-11353	1:10000	2004
F-00029	1:5000	1941
F-00231	1:5000	1981
F-00232	1:10000	1980
F-00239	1:15000	1979
F-00349	1:2500	1990
F-00463	1:10000	2000

Aids to Navigation and Other Detached Positions

All identified floating aids to navigation within the survey area are consistent with the chart and serve their intended purpose. The positions of the lighted floating aids to navigation are consistent with the positions published in the *Light List*. *Concur with clarification. Inadequacies of survey H11395 limit the reliability of side scan sonar.*

Bridges and Overhead Cables

There are no bridges or overhead cables in the survey area. *Concur.*

Ferry Routes

There are several ferry routes that cross the survey area in multiple places. No recommendation for ferry route at this time for the survey. *Concur.*

Submarine Cables and Pipelines

There are submarine cables and pipelines within the survey area related to the Holland Tunnel and London Tunnel between New Jersey and Manhattan. New Jersey's PATH train also crosses underneath the bottom surface within the survey area. None of these structures had any visible relief on the bottom surface. *Concur.*

with clarification. Inadequacies of survey H11395 limit the reliability of side scan sonar.

Shoreline

Shoreline data “DPs” was collected by the Trimble backpack will be submitted to the Customer Services Branch via Steve Soherr for ENC chart updates. *Concur.*

E. APPROVAL SHEET**OPR-310-NRT5-05
Lower Hudson River
New York, NY****Survey Registry No. H11395**

Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy. All bathymetry models, this Descriptive Report, and all accompanying records and data are approved.

This survey is adequate to supersede all prior surveys in common areas and for application to the relevant NOS nautical charts.

Also submitted in association with this descriptive report has been a series of reports and data:

- SEPARATES TO ACCOMPANY PROJECT OPR-310-NRT5-05, SHEET A, H11395
- OPR-310-NRT5-05 HORIZONTAL AND VERTICAL CONTROL REPORT(*submitted 12/30/05*)
- JULY-NOVEMBER 2004 DATA ACQUISITION AND PROCESSING REPORT (*submitted 12/30/05*)

Respectfully Submitted:

Bert Ho
Physical Science Technician

Approved and Forwarded:

LTJG Jasper Schaer, NOAA
Team Leader

APPENDIX I: ITEM INVESTIGATION REPORTS

Do to the inadequacies of Survey H11395, only shoaler than charted depths and contours are being submitted within the collection of “modified” H11395 H-Cells.

Following are item investigation reports detailing four groups of features:

- a) DTON *There are no DtoN's for this survey.*
- b) AWOIS *Investigations criteria not completed due to inadequacy of survey.*
- c) Significant Uncharted Features *Due to the inadequacies of survey H11395, sufficient data was not provided to determine that uncharted features do not exist within the survey area. It is recommended that the H11395 survey area be reassigned to be surveyed as soon as practical.*
- d) Non-AWOIS Charted Features & Notes
Numerous charted features exist in the H11395 “Lower Hudson River” survey area and were not addressed by the survey.

APPENDIX II: LIST OF GEOGRAPHIC NAMES

Geographic names as displayed on chart were observed in common usage. The hydrographer has no particular recommendation on geographic names.

Project	LNH_Hydro	LNH_MB	SV_Casts	Bottom_Samp	AWOIS_Items	Tide_Gauge_Inst	DRK	HARB
OPR-B310-NRT	87.77	1.46	20.00	0.00	0.00	0.00	0.00	0.00

APPENDIX IV: TIDES AND WATER LEVELS

1) Field Tide Note

-No tide note for this project.

2) Smooth Tide Request

3) Times of Hydrography

4) Final Tide Note

-No final tide note for this project.

Times of Hydrography for H11395

Year_DOY	Min Time	Max Time
2005_076	14:15:52	18:57:59
2005_077	14:56:06	17:55:59
2005_087	14:49:20	19:44:05
2005_089	15:30:38	16:17:41
2005_305	14:45:14	15:00:42
2006_005	17:24:23	18:31:20
2006_079	16:18:50	17:18:55

**APPENDIX V: SUPPLEMENTAL RECORDS &
CORRESPONDENCES**

V.1. COAST PILOT REPORT, NOAA FORM 77-6

No coast pilot report for this survey was submitted..

V.2. BOTTOM SAMPLE, NOAA FORM 75-44

No bottom samples were acquired during this survey.

**V.3. NONFLOATING AIDS OR LANDMARKS FOR CHARTS, NOAA
FORM 76-40**

No non-floating aids or landmarks were positioned during this survey.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : May 15, 2006

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-B310-NRT5-2005

HYDROGRAPHIC SHEET: H11395

LOCALITY: Lower Hudson River, New York Harbor, NY

TIME PERIOD: March 17 - 30 and November 1 , 2005
January 5 and March 20, 2006

TIDE STATION USED: 851-8750 The Battery, NY

Lat. 40 42.0'N Long. 074 00.9' W

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

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.443 meters


REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-B310-NRT5-2005, H11395, during the time period between March 17, 2005 to March 20, 2006.

Please use the zoning file "B310NRT52005CORP" submitted with the project instructions for B310NRT52005. Zones HR1, HR2 & NY21 are the applicable zones for H11395.

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 on the 1983-2001 National Tidal Datum Epoch (NTDE).



CHIEF, PRODUCT AND SERVICES DIVISION

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT to Accompany
Survey H11395 (1:10,000)**

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.

B. DATA ACQUISITION AND PROCESSING

B.1 DATA PROCESSING

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.

HSTP PYDRO version 8.5 r2356
CARIS HIPS/SIPS version 6.1 SP1
CARIS Bathy Manager version 2.1
DKART INSPECTOR, version 5.0 Build 732 SP1
CARIS HOM version 3.3
CARIS S57 Composer version 1.0

B.2. QUALITY CONTROL

The Atlantic Hydrographic Branch's completed evaluation of Survey H11395 determined that H11395 is inadequate and unsuitable for full application to update the nautical charts. Therefore, Branch processing consisted of limited compilation only in areas where surveyed depths were shoaler than charted. Submission of these compiled areas are through * "modified" H-Cells either as soundings or as suggested depth curves. Reasoning to limited application as follows:

I. Side Scan Sonar (SSS) Quality – The majority of side scan sonar (SSS) data was of uneven substandard image quality and could not be used to reliably distinguish features.

II. Survey Processing Inadequacy – Field Processing of SSS data, including contact selection, was insufficient. Descriptive Report contained inconsistencies and did not address charted features.

III. Incomplete Bathymetry – Bathymetry was sparse in relation to the greatly varying topology. Multibeam or vertical beam developments were not conducted over features or to delineate shoals.

IV. Recent NOAA Survey Exists – Relatively recent NOAA survey S-B601-RU-03 performed by NOAA Ship RUDE in 2003 was conducted in the common area.

V. Chart Agreement – The available bathymetry was in general agreement with the largest scale chart.

B.2.1. “Modified” H-Cell – ** Charted features are not addressed in the compilation, isolated instances of shoal soundings are not within depth areas or metaobjects, survey scale sounding density is provided with only limited sounding and depth curve supersession in mind.*

The AHB source depth grid for the survey’s nautical chart update product entailed the creation of a single grid at two meter resolution for all the multibeam and vertical beam bathymetry. The survey scale selected soundings were extracted from the two meter combined surface. The selected sounding set is slightly more dense than the number of charted depths and is only provided in limited areas where shoaler than charted depths occurred. The chart scale selected soundings are a subset of the survey scale selected soundings at a scale of 1:10,000. The surface model was referenced when selecting the chart scale soundings, to ensure that the selected soundings portrayed the bathymetry within the common area.

The pre-compilation products or components (Stand Alone HOB files (SAHOB)) The SAHOB files included depth curves (DEPCNT), sounding selections (SOUNDG), meta objects (M_COVR, M_QUAL), depth areas (DEPARE) and cartographic Blue Notes. The individual SAHOB files were inserted into one BASE Editor feature layer and exported to S57 format in order to create the H-Cell deliverable.

The completed H-Cell was exported as an File (ENC.000) in S-57 format with all values in metric units. The metric equivalent ENC.000 file was then converted to NOAA chart scale units (ENC_CS.000) with all values measured in feet following NOAA sounding rounding rules.

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

The H11395 CARIS H-Cell final deliverables include the following products:

US511395_CS.000	1:10,000 Scale	H11395 H-Cell with Chart Scale Selected Soundings
US511395_SS.000	1:10,000 Scale	H11395 Selected Soundings (Survey Scale)
US511395_Bluenotes.000	1:10,000 Scale	H11395 Cartographic Notes

B.2.2. Junctions

Junction analysis was not performed due to the inadequacy of survey H11395.

C. VERTICAL AND HORIZONTAL CONTROL

Final vertical correction processing was completed by the field unit/office personnel with no additional correction required by Atlantic Hydrographic Branch. The field unit/office personnel applied verified water levels in conjunction with the preliminary tidal zoning which was accepted and approved by N/OPSI CO-OPS as the final zoning for H11395. Sounding datum is Mean Low Lower Water (MLLW). The operating National Water Level Observation Network (NWLON) station at The Battery, NY (851-8750) and Sandy Hook, NJ (853-1680) and the Physical Oceanographic Real Time System (PORTS) station at Bergen Point, NY (851-9483) served as datum control for the survey. Vertical datum is Mean High Water (MHW)

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 18. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements.

D. RESULTS AND RECOMMENDATIONS

D.1 CHART COMPARISON

12335 (41st Edition, Sep./06)

Corrected through NM 06/12/2007

Corrected through LNM 06/30/2007

Scale 1:10,000

ENC Comparison

US5NY1DM.000 References: Chart 12335

Hudson and East Rivers –

Governors Island to 67th Street

Edition 10

Update Application Date 2007-08-16

Issue Date 2008-03-17

D.1.1 Hydrography

H11395 bathymetry where available was in general agreement with the largest scale chart 12335. Limited H-Cell compilation is only provided in areas where surveyed depths were shoaler than charted depths.

D.2. ADDITIONAL RESULTS

Blue noted charting discrepancies deferred to MCD – Numerous wreck and obstruction features, originating with NOAA Ship RUDE Survey S-B601-RU-03, are charted on ENC US5NY1DM and are not charted on Chart 12335. Additionally, one blue noted charted feature is charted on Chart 12335 and is not charted on ENC US5NY1DM. Recommend resolving these charting discrepancies.

Depth Curves – Five depth curves (DEPCNT) are included in the US511395_CS.000 H-Cell.

D.2.1. Aids to Navigation

Due to the inadequacies of survey H11395, ATON's are not addressed. AHB recommends deferring the charting disposition of these navigational aids to Marine Chart Division, Nautical Data Branch.

D.3. 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. See Section D.1. of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey:

D.4. ADEQUACY OF SURVEY

The present survey is inadequate to fully supersede the charted bathymetry within the common area. However, branch processing determined that the present survey is adequate for limited supersession of the charted bathymetry only in areas where surveyed depths were shoaler than charted. No features are addressed in the US511395_CS.000 H-Cell File or accompanying reports. All charted features including those referenced in the Blue Notes should be retained as charted. Refer to the Descriptive Report for further documentation.

APPROVAL SHEET
H11395

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, representation of critical depths, cartographic symbolization, and verification or disproval of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the Evaluation Report.

All final products have undergone a comprehensive reviews per the Hydrographic surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

Edward A. Owens
Physical Scientist
Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Approved: _____

Shepard Smith
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch