

H12429

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Survey

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H12429

LOCALITY

State(s): New York

General Locality: Block Island Sound

Sub-locality: 5 NM SE of Montauk Pt.

2013

CHIEF OF PARTY
CDR Lawrence T. Krepp, NOAA

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H12429

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(s): **New York**

General Locality: **Block Island Sound**

Sub-Locality: **5 NM SE of Montauk Pt.**

Scale: **20000**

Dates of Survey: **05/04/2013 to 05/08/2013**

Instructions Dated: **02/12/2013**

Project Number: **OPR-B363-TJ-13**

Field Unit: **NOAA Ship *Thomas Jefferson***

Chief of Party: **CDR Lawrence T. Krepp, NOAA**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter**

Verification by: **Atlantic Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

Remarks:

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.

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Descriptive Report to Accompany Survey H12429

Project: OPR-B363-TJ-13

Locality: Block Island Sound

Sublocality: 5 NM SE of Montauk Pt.

Scale: 1:20000

May 2013 - May 2013

NOAA Ship *Thomas Jefferson*

Chief of Party: CDR Lawrence T. Krepp, NOAA

A. Area Surveyed

This survey was conducted in Long Island Sound, 5 NM SE of Montauk Point.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
41° 1" 44.4' N 71° 42" 42' W	41° 1" 33' N 71° 49" 20.4' W

Table 1: Survey Limits

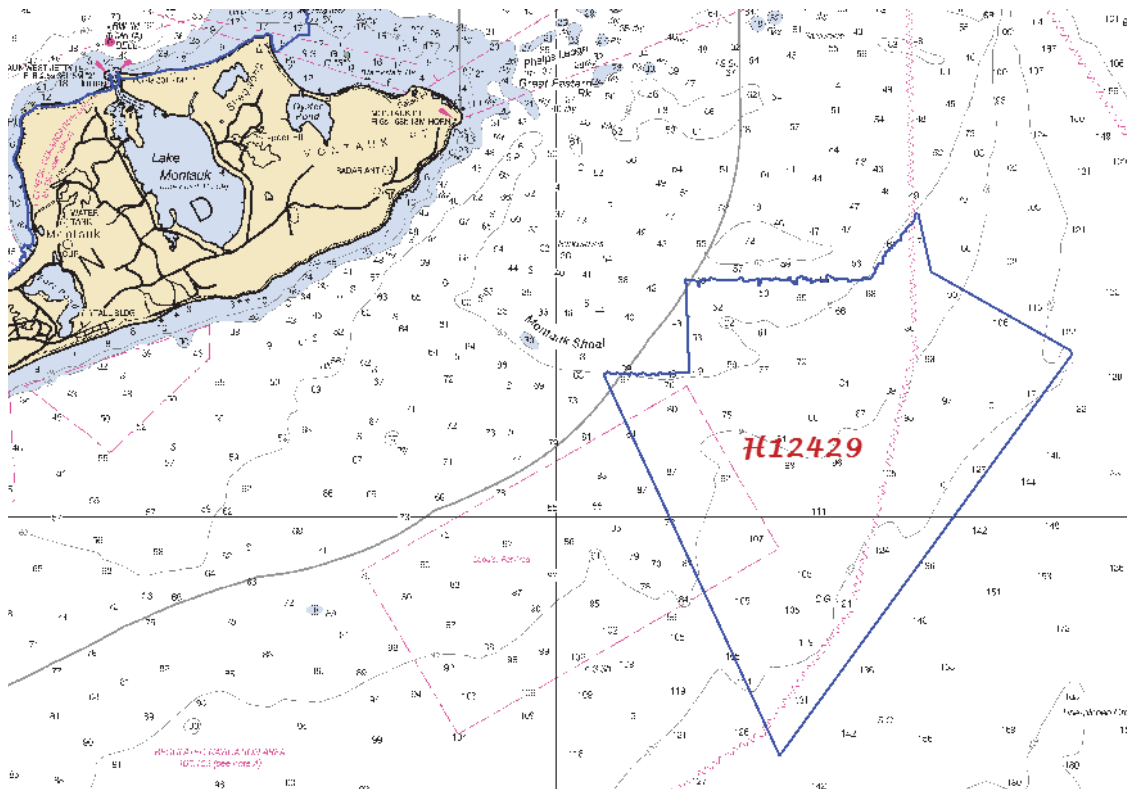


Figure 1: Overview of survey H12429 area.

Survey Limits were acquired in accordance with the requirements in the Project Instructions and the HSSD.

A.2 Survey Purpose

This project is being conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in order to update the nautical charting products and reduce the survey backlog within the area. In addition, data from this project will support the Long Island Sound Seafloor Mapping Initiative in New York state. This project also responds, in part, to the concerns raised by the Northeast Marine Pilots for new hydrographic surveys to support deep draft (60') vessels transiting the areas traffic lanes.

This hydrographic survey was completed as specified by Hydrographic Project Instructions OPR-B363-TJ-13 signed 02/12/13. The survey area is 15.11 SNM located approximately 5 NM Southeast of Montauk, NY.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

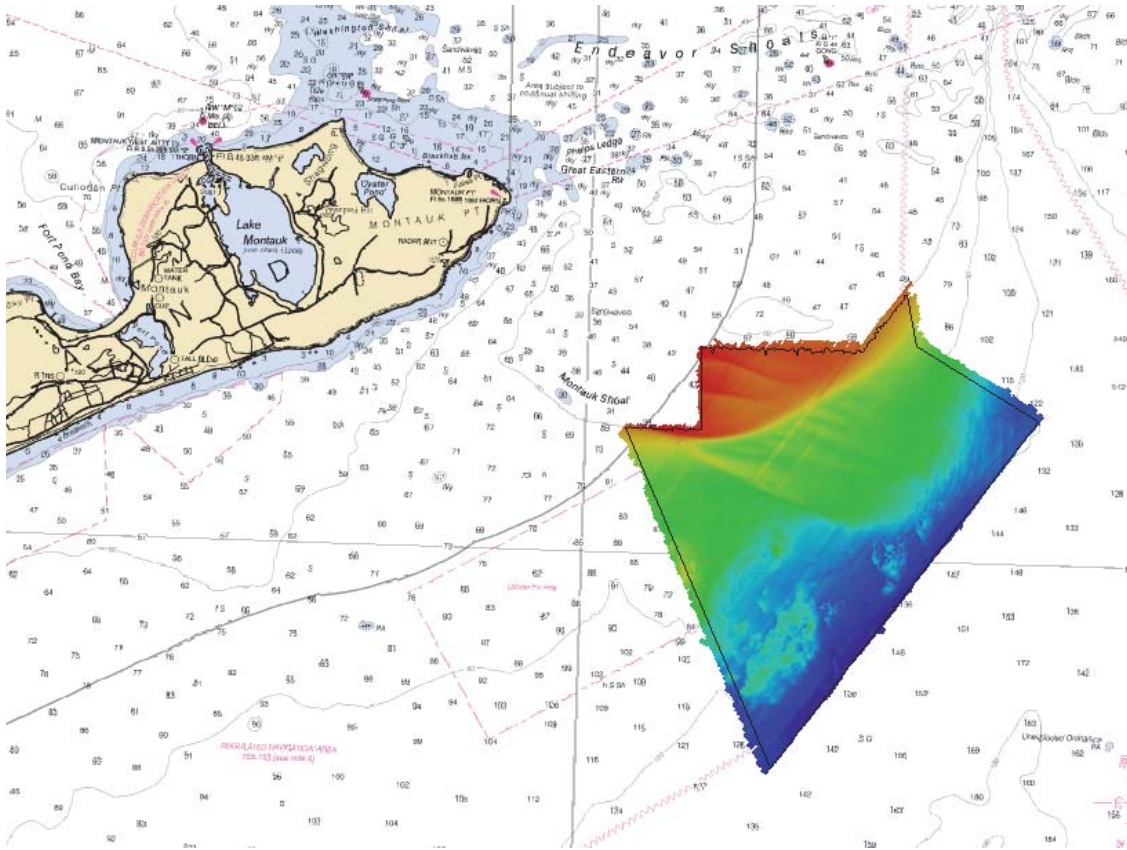


Figure 2: Survey H12429 location and coverage.

Survey Coverage was in accordance with the requirements in the Project Instructions and the HSSD.

A.5 Survey Statistics

The following table lists the mainscheme and crossline acquisition mileage for this survey:

	HULL ID	S222	Total
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	428.94	428.94
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/MBES Combo Mainscheme	0	0
	SBES/SSS Combo Mainscheme	0	0
	MBES/SSS Combo Mainscheme	0	0
	SBES/MBES Combo Crosslines	18.49	18.49
	Lidar Crosslines	0	0
	Number of Bottom Samples		7
Number AWOIS Items Investigated		0	
Number Maritime Boundary Points Investigated		0	
Number of DPs		0	
Number of Items Items Investigated by Dive Ops		0	
Total Number of SNM		15.1	

Table 2: Hydrographic Survey Statistics

The following table lists the specific dates of data acquisition for this survey:

Survey Dates	Julian Day Number
05/04/2013	124
05/05/2013	125
05/06/2013	126
05/07/2013	127
05/08/2013	128

Table 3: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

B.1.1 Vessels

The following vessels were used for data acquisition during this survey:

Hull ID	<i>S222</i>
LOA	208 feet
Draft	15 feet

Table 4: Vessels Used



Figure 3: NOAA Ship Thomas Jefferson

S222 acquired multibeam, sound velocity, attitude data, and bottom samples.

B.1.2 Equipment

The following major systems were used for data acquisition during this survey:

Manufacturer	Model	Type
Reson	Seabat 7125-ROV	MBES
Applanix	POS MV	Positioning and Attitude System
Brooke Ocean	MVP 100	Sound Speed System
Applied Micro Systems	Smart SV&T probe	Sound Speed System
Trimble	SPS351	Positioning System

Table 5: Major Systems Used

Vessel configurations, equipment operations, and data acquisition & processing were consistent with specifications described in the DAPR.

B.2 Quality Control

B.2.1 Crosslines

Crosslines, acquired for this survey, totalled 4.31% of mainscheme acquisition.

The Thomas Jefferson collected 18.48 linear nautical miles of MBES crosslines, comprising 4.31% of mainscheme multibeam bathymetry. Crosslines were compared to mainscheme using a difference surface, created in CARIS BathyData Base. Using the difference surface, every instance of overlap was evaluated. The mean was 0.15 m and the standard deviation was 0.10 m. Survey H12429 complies with section 5.2.4.3 of the HSSD (2012 ed). These values are higher than usual due to complications with ERS processing of mainscheme data. For further discussion of the complications, see section B.2.2 of this report.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0 meters	0.102 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
NOAA Ship Thomas Jefferson	N/A meters/second	1.0 meters/second	0.2 meters/second

Table 7: Survey Specific Sound Speed TPU Values

The method used to calculate Total Propagated Uncertainty values for survey H12429 varied based the process used to apply water level values to the data.

For data processed to the ellipsoid, uncertainty was derived using a combination of a priori values for equipment and vessel characteristics, in combination with real time uncertainties for vessel motion, as well as field assigned values for sound speed uncertainties. The a priori values were set in accordance with the guidance set by Appendix 4 of the FPM (ed 2012). Vessel position and attitude were calculated using IAPPK data. Uncertainties for speed of sound was entered by the field unit in accordance with guidance from Appendix 4 of the FPM

On day number 124, no IAPPK file was recorded for line 124_405_1259. Vessel motion and attitude uncertainties for this line were derived from a priori values noted in Appendix 4 of the FPM. Tidal uncertainties were provided by NOAA's Center for Operational Oceanographic Products and Services (CO-OPS), and were applied to depth soundings using a Tidal Constituent and Residual Interpolator (TCARI) grid. TCARI automatically calculates the error associated with water level interpolation, which is then included in the CARIS HDCS lines. For this reason, no Tidal Uncertainties values were entered into the Tide Value section of the CARIS Compute TPU function. Sound speed uncertainties were entered by the field unit in accordance with guidance from Appendix 4 of the FPM.

Total Propagated Uncertainty was then evaluated to ensure compliance with section 5.1.3 of NOAA's Hydrographic Survey Specification and Deliverables (HSSD). First the maximum allowable uncertainty for

each node was calculated. Second the ratio between actual uncertainty and maximum allowed uncertainty is found for each node. The resulting 'IHO_ratio' layer was filtered using a color map to show any areas where actual uncertainty exceeded the maximum allowed uncertainty. For the 50cm grid 25,547,400 nodes were evaluated and 99.9% were within IHO uncertainty. For the 2m grid 11,482,638 nodes were evaluated and 99.9% were within IHO uncertainty. For the 2m grid 566,610 nodes were evaluated and 99.9% were within IHO uncertainty.

B.2.3 Junctions

Three contemporary junction surveys exist with H12429. Difference surfaces were created in Caris BaseEditor to evaluate general agreement between H21429 and each respective junction survey.

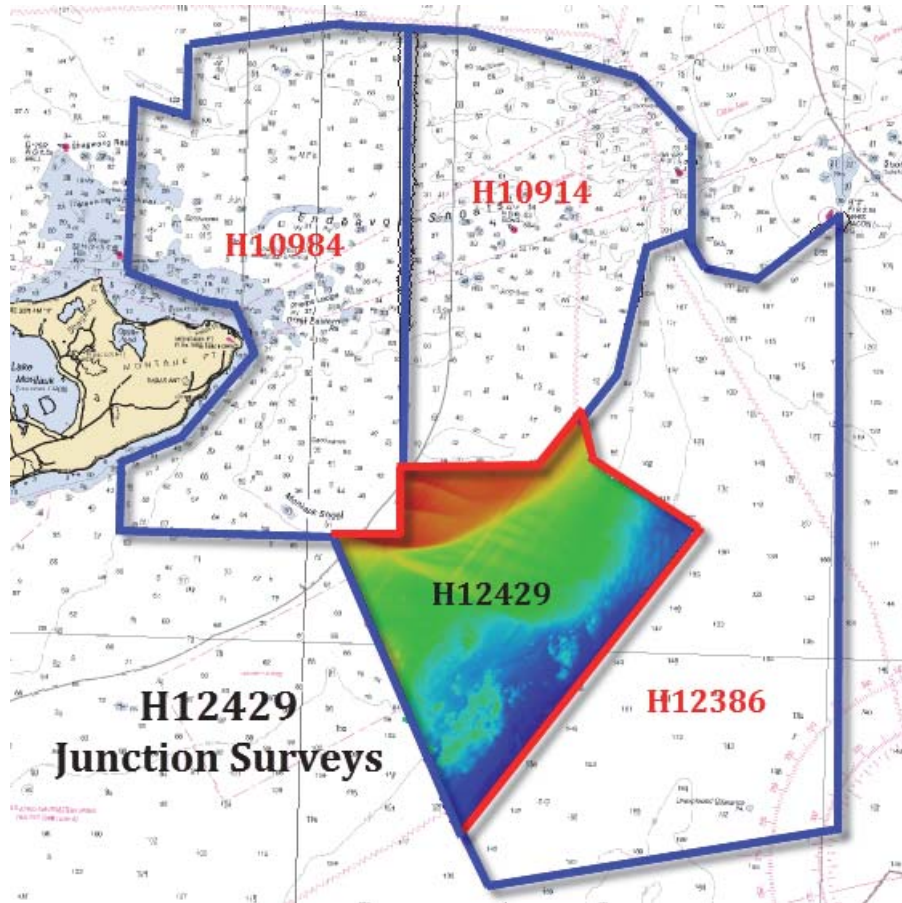


Figure 4: Survey H12429 junctions

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H10914	1:10000	1999	NOAA Ship Rude	N
H10984	1:10000	2000	NOAA Ship Rude	N
H12386	1:20000	2011	NOAA Ship THOMAS JEFFERSON	E

Table 8: Junctioning Surveys

H10914

The difference between survey H12429 and H10914 ranged from -0.50 m to 1.30 m. The mean was 0.40 m, and the standard deviation was 0.2 m. Out of 10,268 nodes 10,204, or 99.37%, were within 1 meter.

H10984

The difference between survey H12429 and H10984 ranged from -1.8 m to 1.4 m. The mean was 0.2 m, and the standard deviation was 0.6 m. Out of 3,435 nodes 3,325, or 96.79%, were within 1 meter.

H12386

The difference between survey H12429 and H12386 ranged from -1.2 m to 0.8 m. The mean was 0.2 m, and the standard deviation was 0.8 m. Out of 400,520 nodes 400,515, or 99.9%, were within 1 meter.

B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

B.2.5 Equipment Effectiveness

There were no conditions or deficiencies that affected equipment operational effectiveness.

B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Casts were acquired and processed approximately every 30 minutes during multibeam acquisition from the NOAA Ship Thomas Jefferson using a Brooke Ocean MVP100.

Frequent acquisition of sound speed profiles allowed for maximum data correction.

B.2.8 Coverage Equipment and Methods

All equipment and survey methods were used as detailed in the DAPR.

B.2.9 Density Requirements for survey H12429

Density requirements for H12429 were analyzed using NOAA's Standards Compliance Review script. For the 50cm surface, it was found 98.9% of finalized surface nodes contain five or more soundings. For the 2m surface, it was found 99.9% of finalized surface nodes contain five or more soundings. For the 4m surface, it was found 99.9% of finalized surface nodes contain five or more soundings

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter was logged as a 7k file and submitted to the Atlantic Hydrographic Branch for processing. One line per vessel, per day was processed aboard the Thomas Jefferson in order to assess and ensure quality.

B.5 Data Processing

B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: V5.3.2

B.5.2 Surfaces

The following surfaces and/or BAGs were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12429_MB_50cm_MLLW_Final	CUBE	0.50 meters	12.09 meters - 20.0 meters	NOAA_0.5m	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12429_MB_2m_MLLW_Final	CUBE	2.0 meters	18.0 meters - 40.0 meters	NOAA_2m	Complete MBES
H12429_MB_4m_MLLW_Final	CUBE	4.0 meters	36.0 meters - 42.7 meters	NOAA_4m	Complete MBES
H12429_Combined_4m_MLLW	CUBE	4.0 meters	12.09 meters - 42.72 meters	NOAA_4m	Complete MBES

Table 9: Submitted Surfaces

Per section 5.2.2.1 of the NOAA HSSD Manual (2012 ed), all MBES data was gridded according to depth: 0.5m resolution for depths ranging from 0 - 20m, 2m resolution for depths 18- 40m, and 4m resolution for depths 36 - 80m.

B.5.3 H12429 ERS Complications

ERS processing for H12429 presented several challenges. Several issues arose within SBET processing including data outside of smart station geometry and positioning errors. Though the majority of the survey was processed using GPS tides, some data showed vertical offsets that exceeded acceptable values and were thusly processed using TCARI tide. For a list of lines processed with TCARI, refer to supplementary Excel documentation "H12429_Detailed_Line_Query" located in Separates II.

Vertical offsets between congruent mainscheme lines were noted in the southeast portion of the survey. A majority of the vertical offsets were corrected by reverting to TCARI based tides, but reversion in the southeast section induced other vertical errors. For that reason, GPS tides were retained. The offsets remain within IHO Order 1 uncertainty specifications, with some exceptions along the outerbeam overlap. The error can be visually observed on both the Node_Std_Dev and Std_Dev child layers of H12429_MB_2m_MLLW_Final and H12429_MB_4m_MLLW_Final.

B.5.4 Line 124_405_2159

During acquisition, the True Heave file associated with line 124_405_2129 was permanently misplaced. This file does not have any correctors usually associated with GPS tide applied. Refer to "H12429_Detailed_Line_Query" in Separates II for further information.

C. Vertical and Horizontal Control

No HVCR was generated for H12429 per section 5.1.2.3 of the FPM (ed 2012).

C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

Standard Vertical Control Methods Used:

TCARI

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey:

Station Name	Station ID
Newport, RI	845-2660
New London, CT	846-1490
Montauk, NY	851-0560

Table 10: NWLON Tide Stations

File Name	Status
8461490_verified.tid	Verified Observed
8510560_verified.tid	Verified Observed
8542660_verified.tid	Verified Observed

Table 11: Water Level Files (.tid)

File Name	Status
B363TJ2013.tc	Final

Table 12: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 05/08/2013. The final tide note was received on 05/24/2013.

No changes were made to the preliminary zoning scheme.

Non-Standard Vertical Control Methods Used:

VDatum

Ellipsoid to Chart Datum Separation File:

2013_B363_VDatum_Ellip_MLLW_SEP.xyz

Occasional anomalies occurred with ERS data, in which case TCARI was used. A total of 20 files were processed with TCARI, all others with ERS. For a list of lines processed with TCARI, refer to "H12429_Detailed_Line_Query" in Separates II.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD83).

The projection used for this project is 19 N.

The following PPK methods were used for horizontal control:

Smart Base

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
NCCI	NCCI
NYRH	NYRH
CTGU	CTGU
CTMA	CTMA
CTGR	CTGR
ACU5	ACU5
COVX	COVX
CTPU	CTPU
MOR5	MOR5
URIL	URIL

Table 13: CORS Base Stations

The following DGPS Stations were used for horizontal control:

DGPS Stations
Moriches, NY (293 kHz)

Table 14: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

Sounding to chart comparisons were produced using sounding selection at 1:40000 and TIN smoothed contouring in CARIS Bathydatabase.

D.1.1 Raster Charts

The following are the largest scale raster charts, which cover the survey area:

Chart	Scale	Edition	Edition Date	LNLM Date	NM Date
13209	1:40000	26	08/2011	05/21/2013	06/01/2013
13215	1:40000	20	02/2011	05/21/2013	06/01/2013
13205	1:80000	39	12/2010	05/21/2013	06/01/2013

Table 15: Largest Scale Raster Charts

13209

Chart 13209 covers a portion of survey H12429. A large amount of area in question for comparison is covered by an informational insert listing dates of most recent surveys in the area. Of the 47 soundings available for comparison, 9 were charted shoal of surveyed soundings while two were charted as being deeper than survey soundings show. The accuracy of charted soundings were compared to survey soundings to 1 ft. The 60 ft contour has shifted and smoothed from what is displayed on chart 13209.

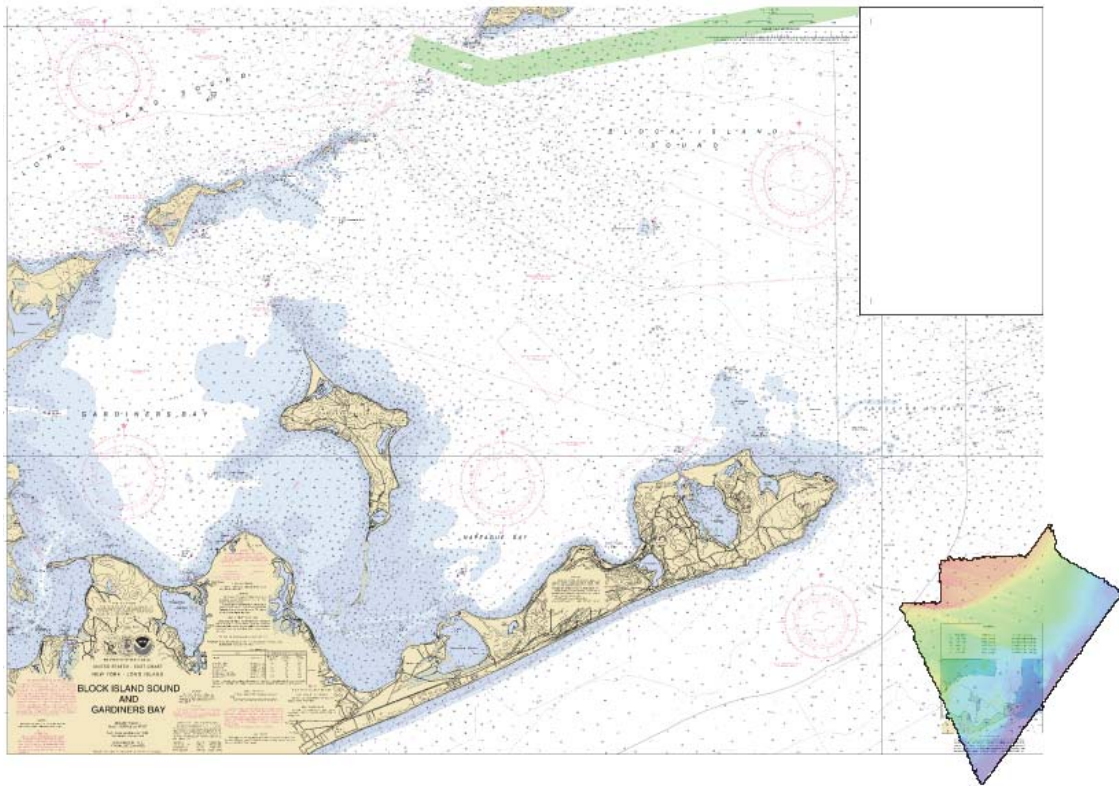


Figure 5: Overview of survey H12429 relative to chart 13209.

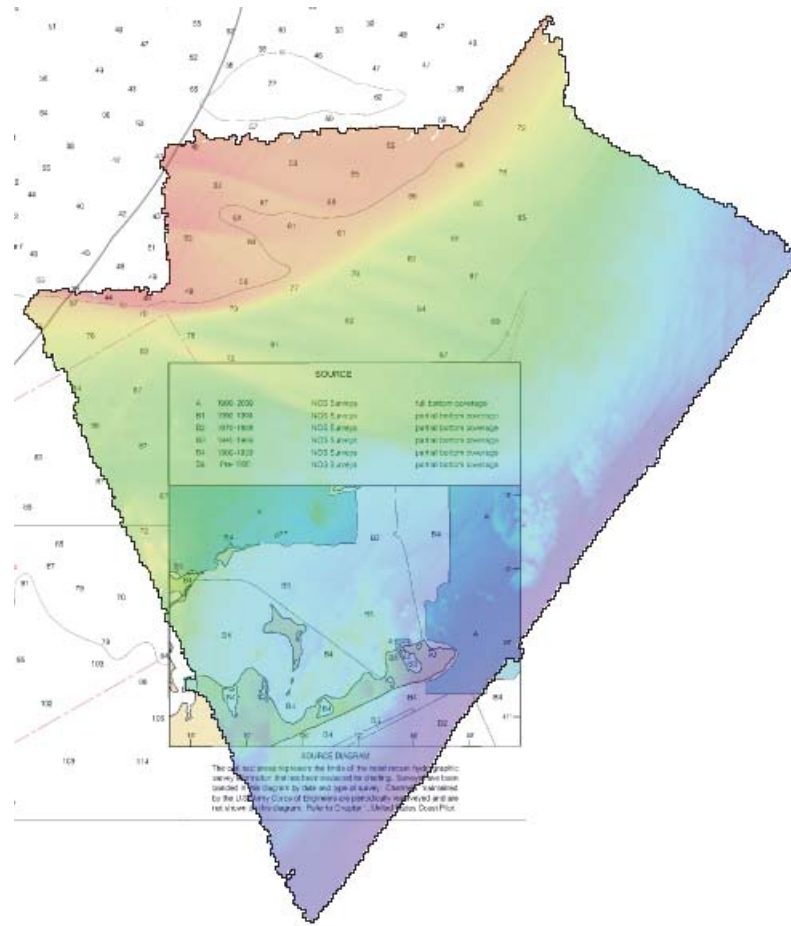


Figure 6: Survey H12429 on chart 13209.

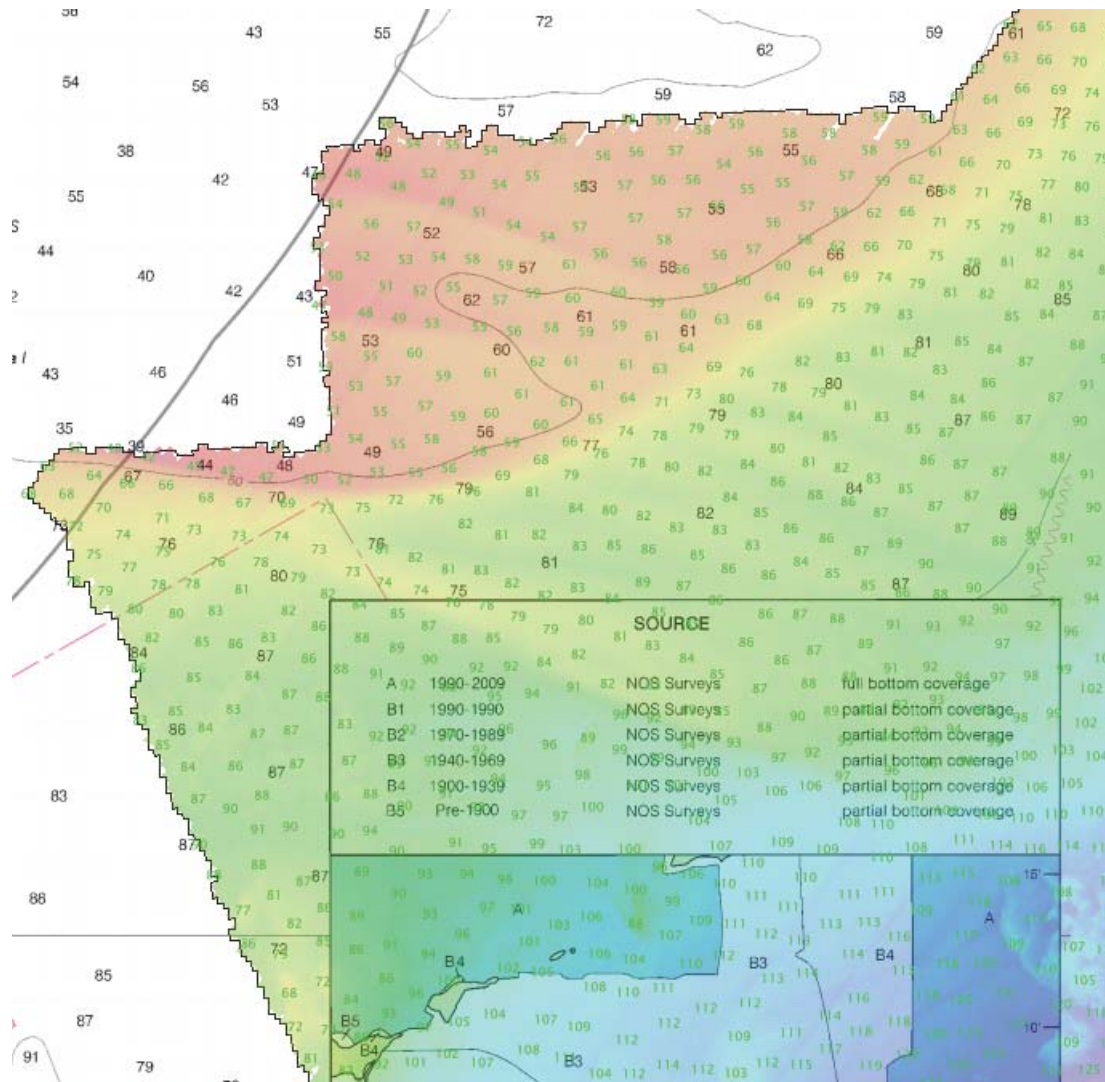


Figure 7: Sounding set for survey H12429 on chart 13209.

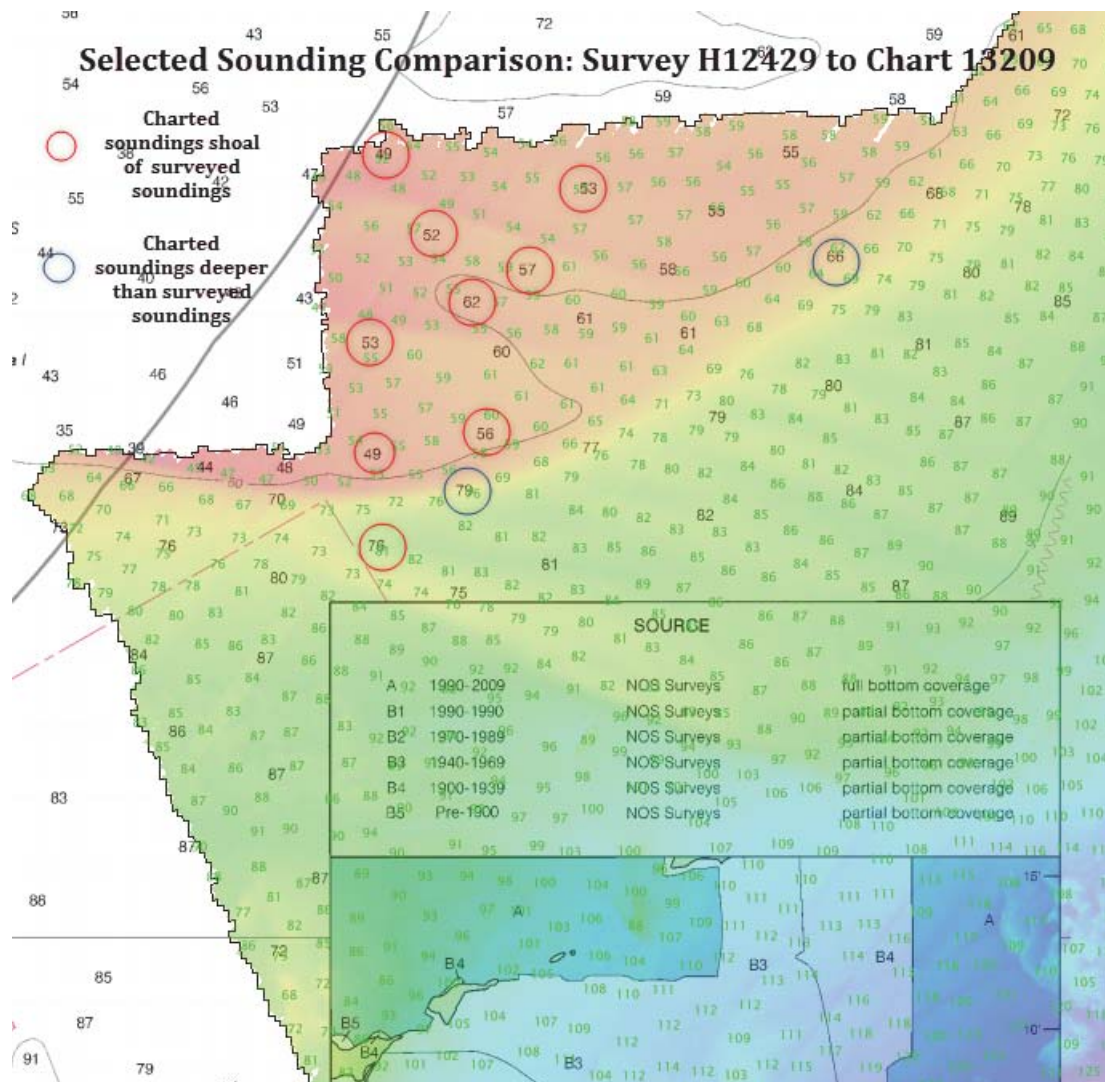


Figure 8: Soundings with a survey to charted value of greater than 1 foot.

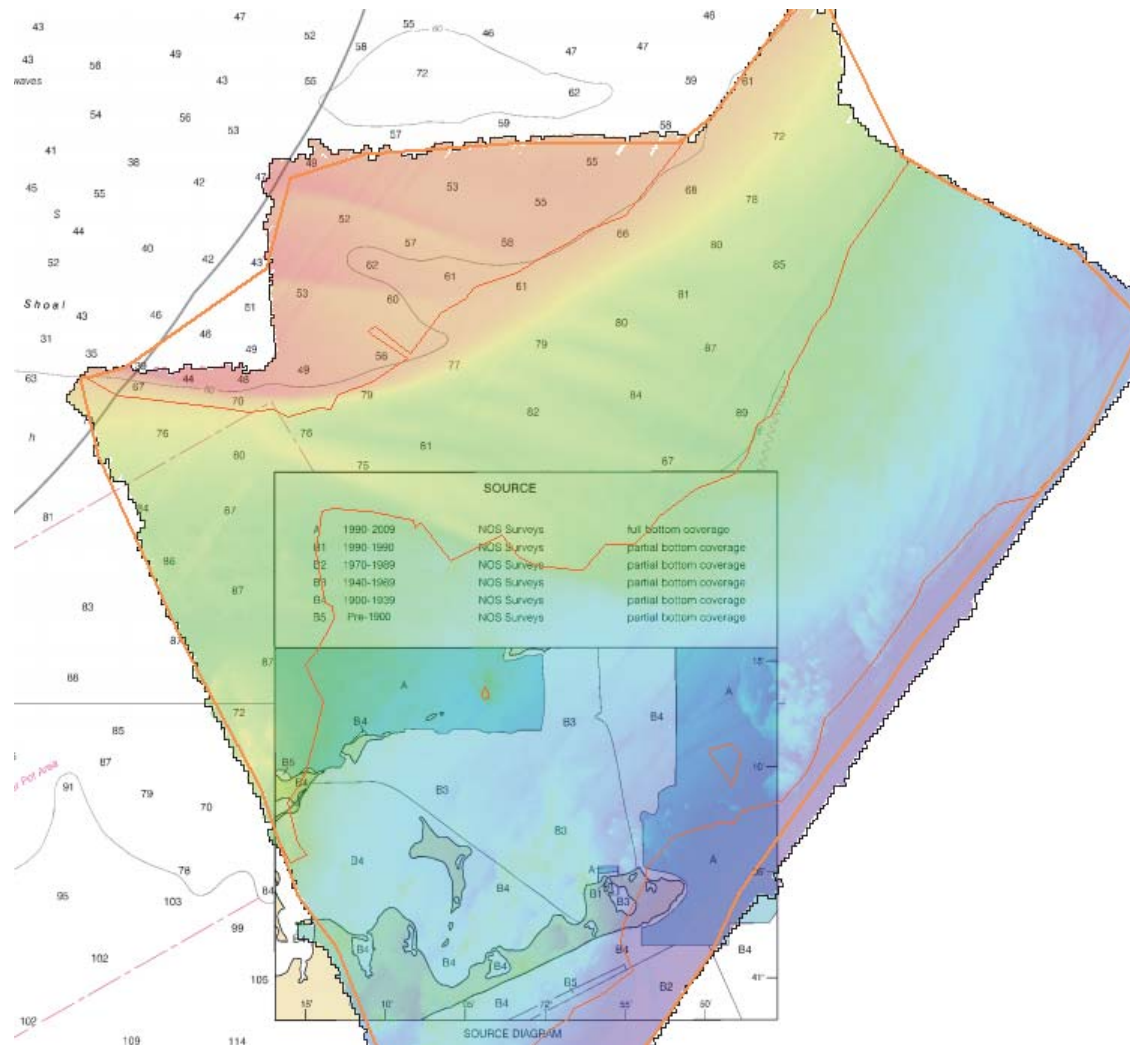


Figure 9: H12429 60 ft and 90 ft contours.

13215

Chart 13215 encompasses the area of Block Island, RI from the southwestern point of Montauk, NY through Block Island Sound. In general, surveyed soundings agree with charted soundings to within 1 ft difference. The greatest deviations between surveyed and charted soundings occur along the western portion of survey H12429, where surveyed soundings are generally shoal of charted soundings by 2-3 ft. Another region of high deviation is found in the northwestern section of H12429, where surveyed soundings are both shoal of and deeper than charted soundings. Upon examination of contours produced, potential hazards are two 88 ft surveyed soundings outside the 90 ft contour, and one 118 ft contour outside of the 120 ft contour.

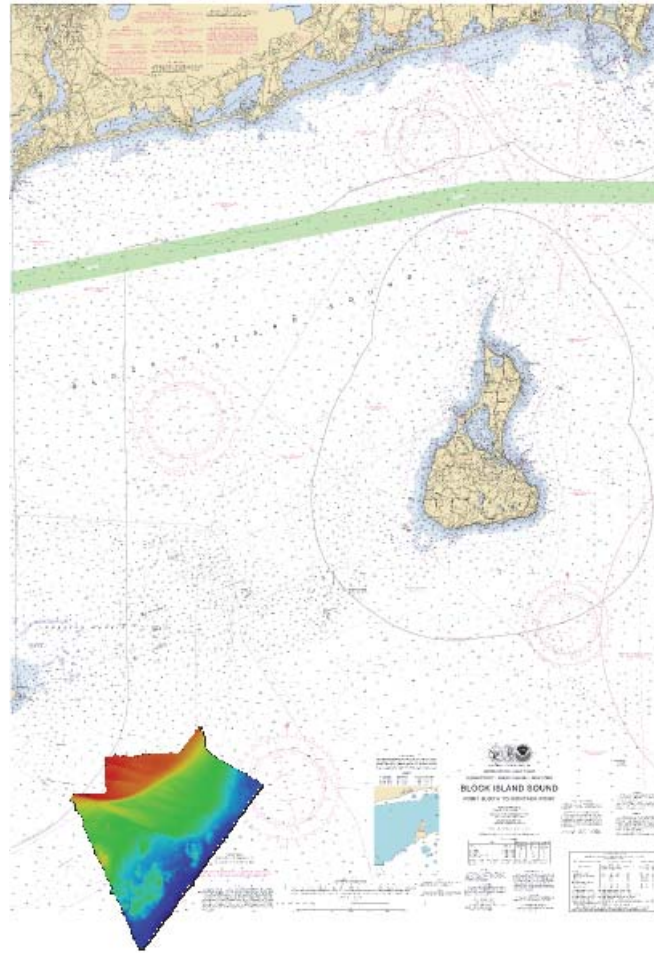


Figure 10: Overview of chart 13215 coverage relative to survey H12429.

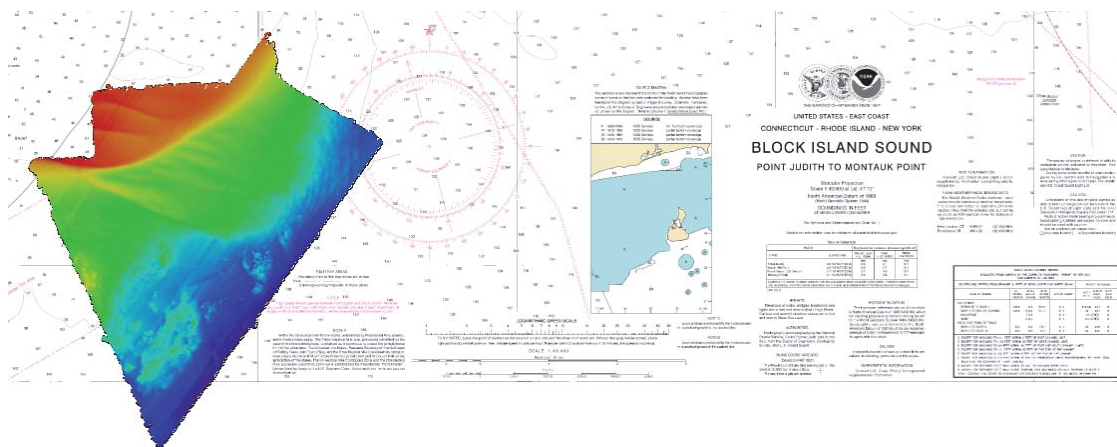


Figure 11: Overview of chart 13215 coverage relative to survey H12429.

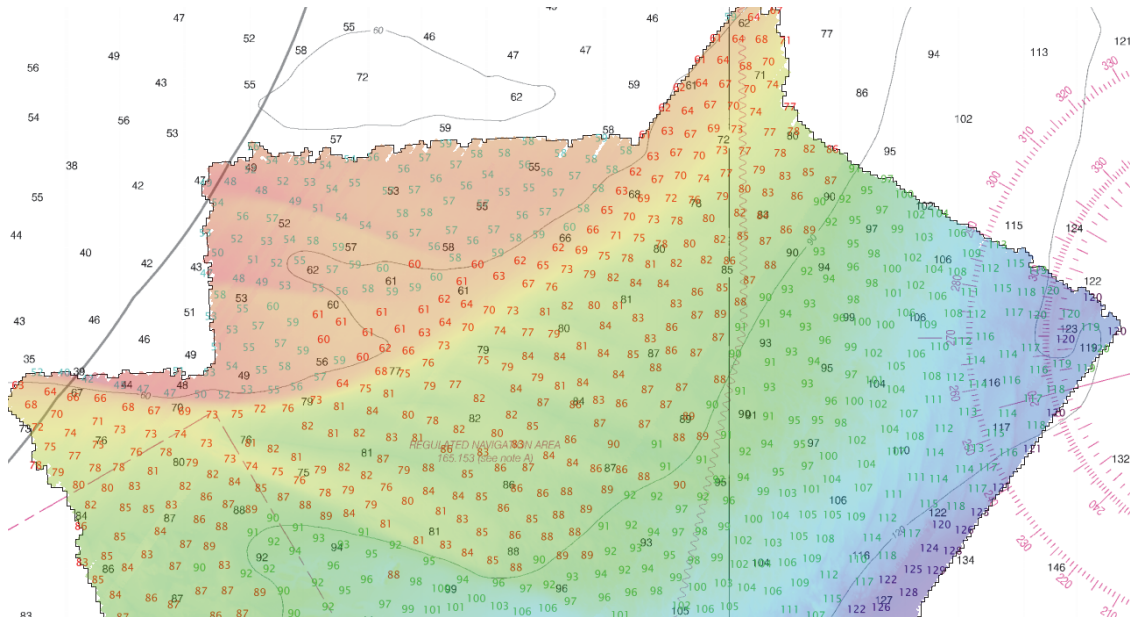


Figure 12: Sounding set of survey H12429 over chart 13215.

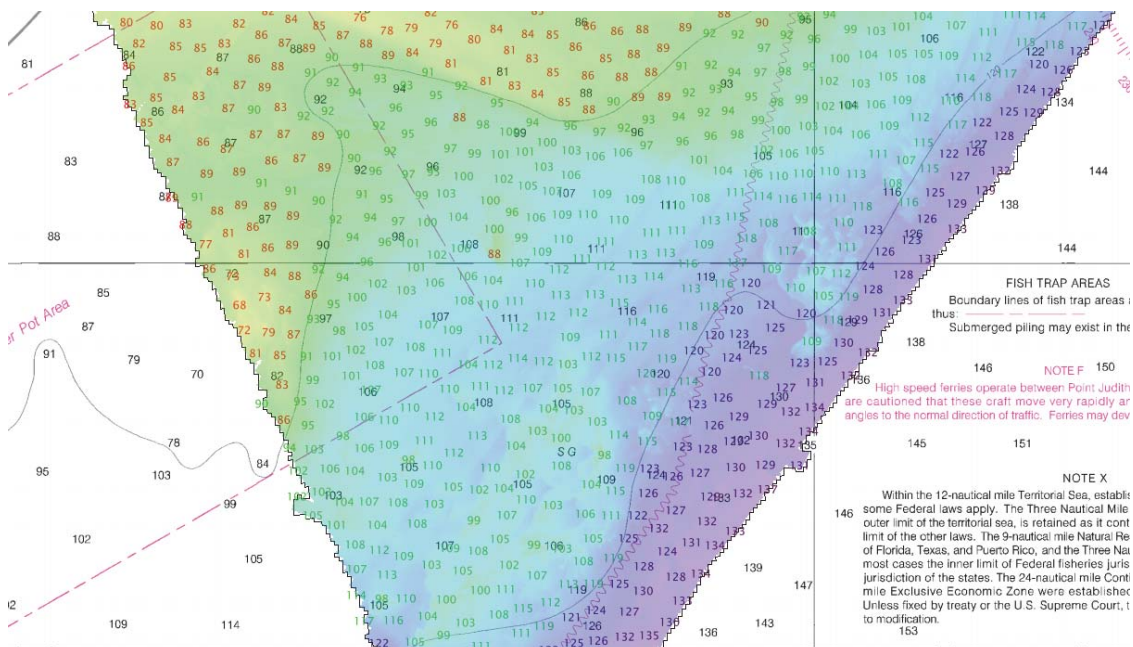


Figure 13: Sounding set of survey H12429 over chart 13215.

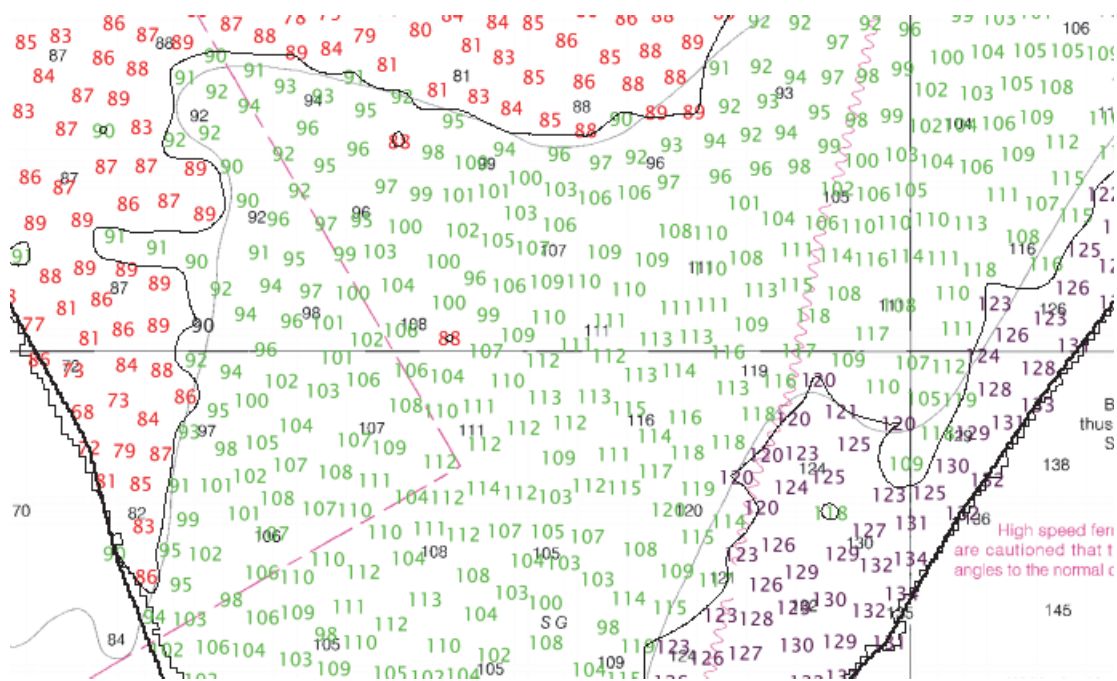


Figure 14: Shoal soundings outside of appropriate contours.

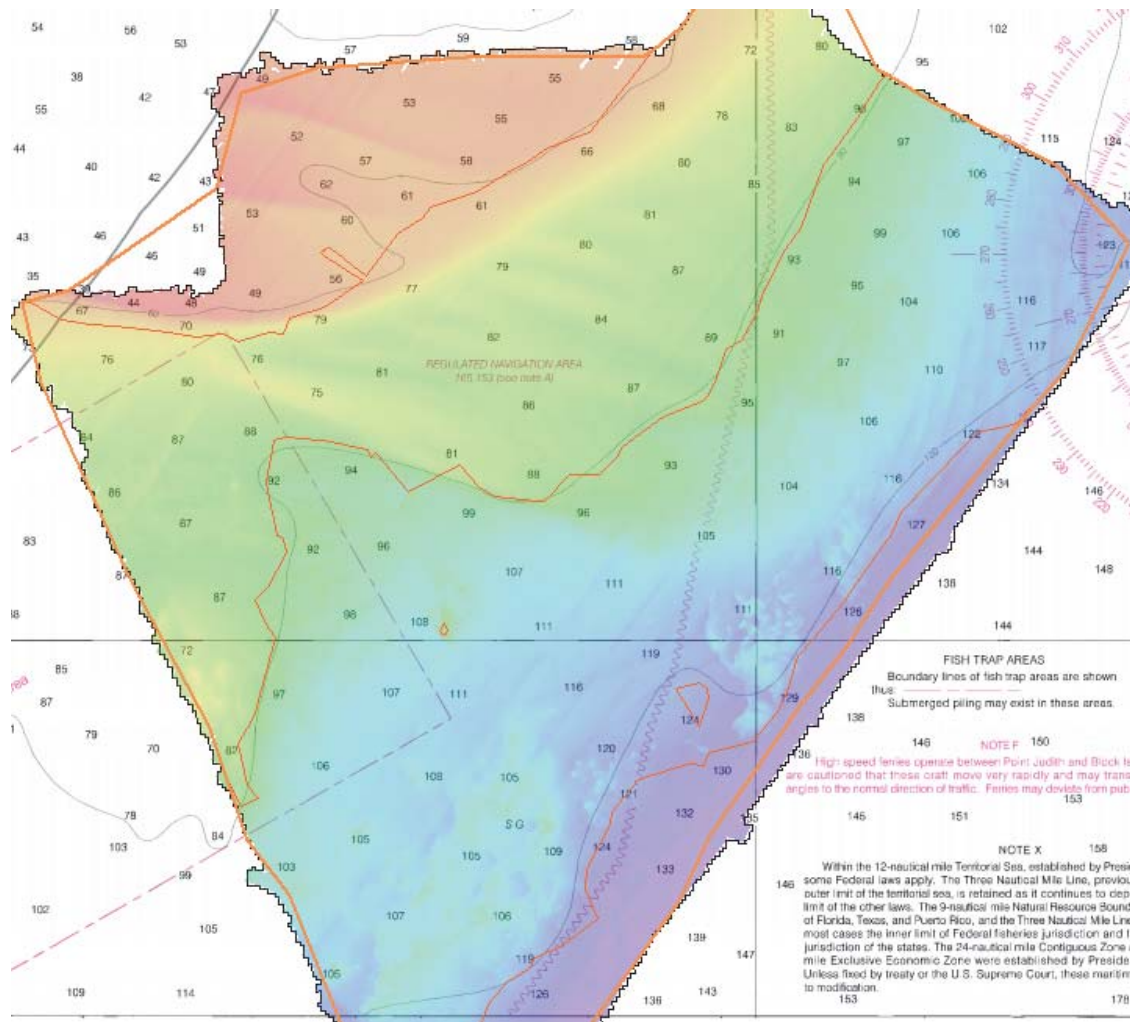


Figure 15: H12429 contours

13205

Survey H12429 results compare favorably to chart 13205. Sounding selection and contouring generally agree. The 60 ft contour in the northwestern section of H12429 could be smoothed. Survey results indicate the 90 ft contour is acceptable as is, but the 120 ft contour along the eastern edge of the sheet is not properly placed on chart 13205.

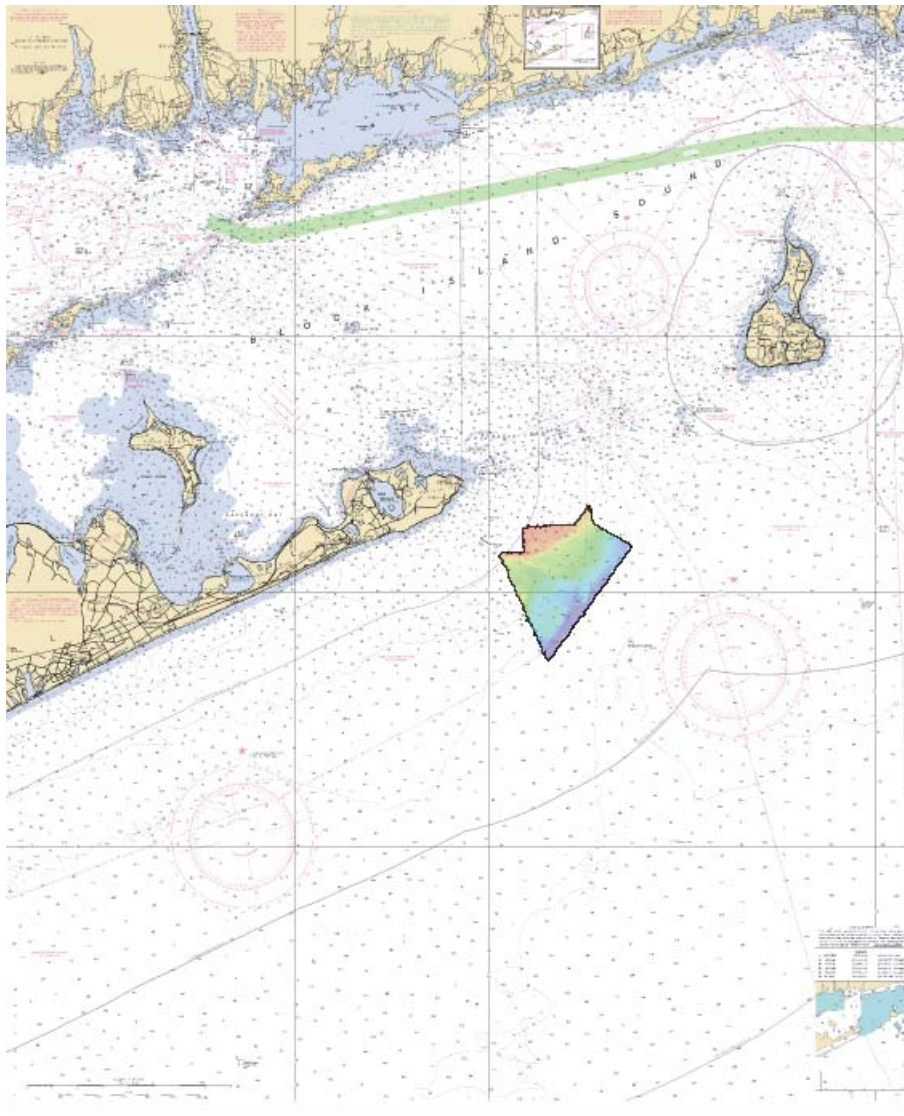


Figure 16: Overview of survey H12429 on chart 13205.

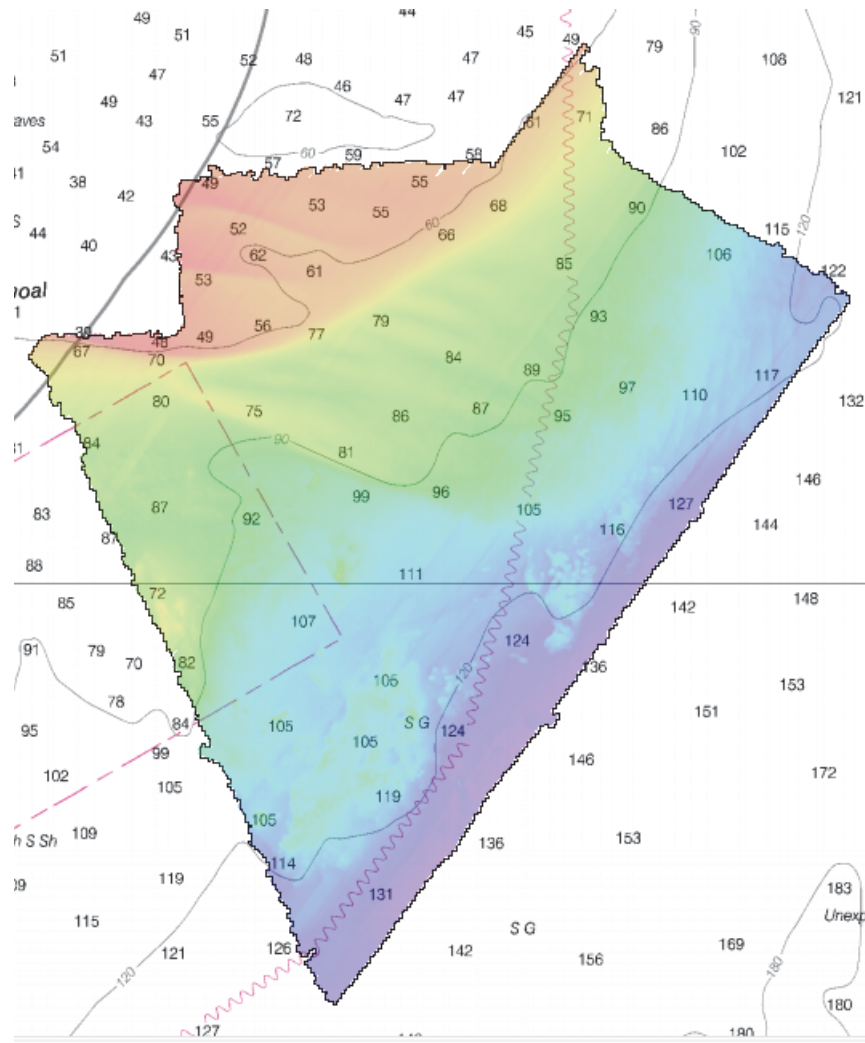


Figure 17: Overview of survey H12429 on chart 13205.

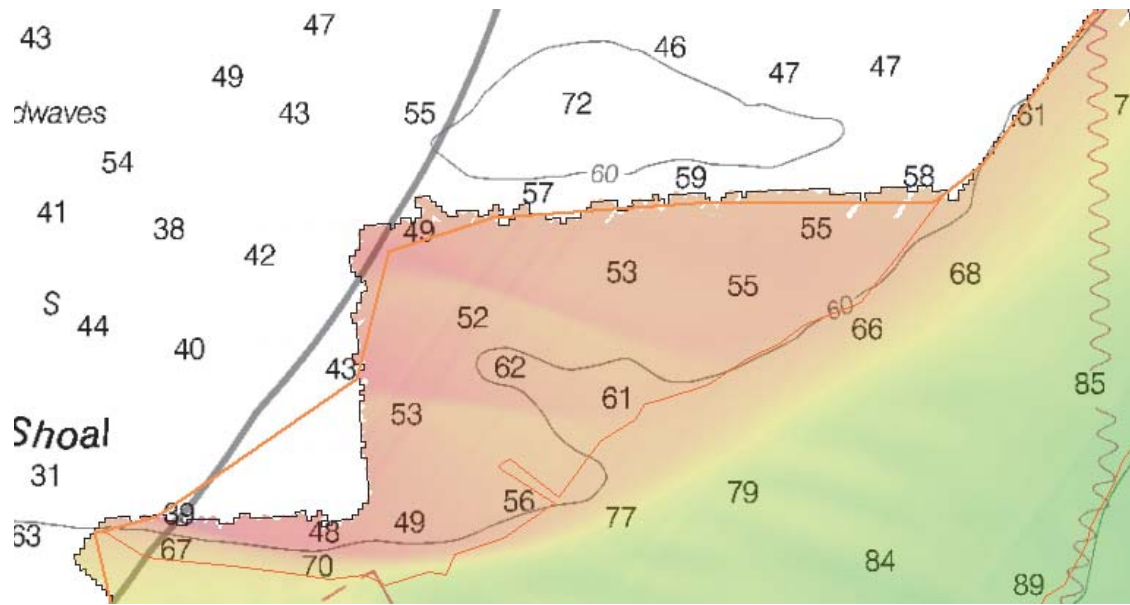


Figure 18: 60 ft contour line has shifted.

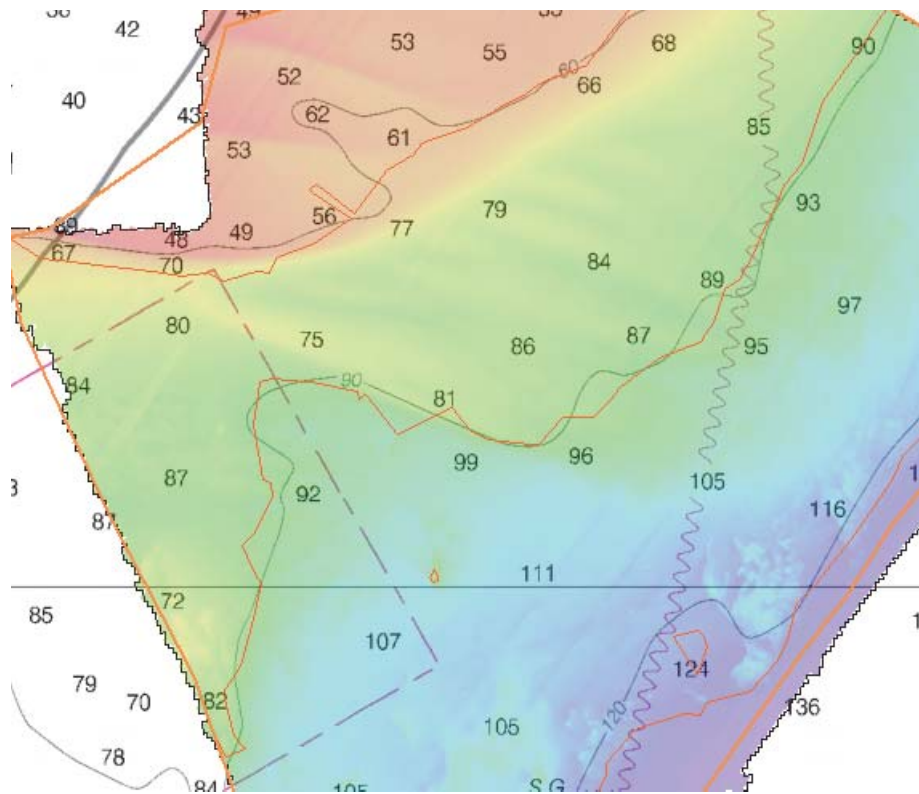


Figure 19: 90 ft contour is charted accurately.

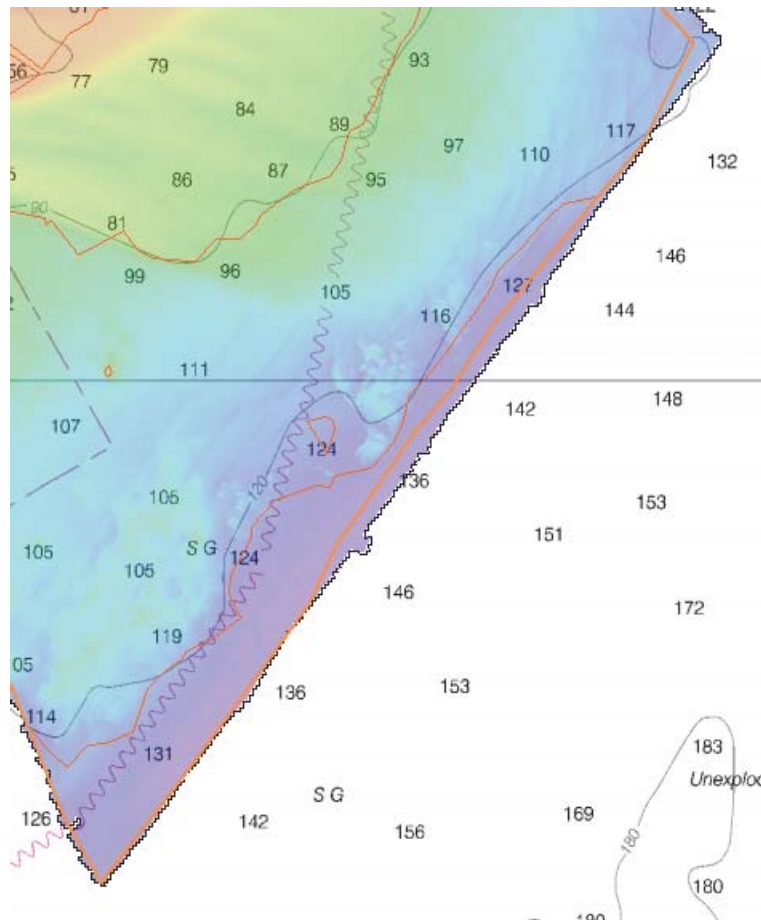


Figure 20: 120 ft contour has shifted.

D.1.2 Electronic Navigational Charts

The following are the largest scale ENC's, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US5MA22M	1:40000	2	06/26/2013	09/10/2005	NO
US5RI10M	1:40000	7	01/16/2013	03/21/2013	NO
US4CN22M	1:80000	7	08/16/2012	06/10/2013	NO

Table 16: Largest Scale ENC's

US5MA22M

ENC US5MA22M is in general agreement with the results of survey H12429. The 60 ft contour should be smoothed as area of deeper soundings is inaccurate.

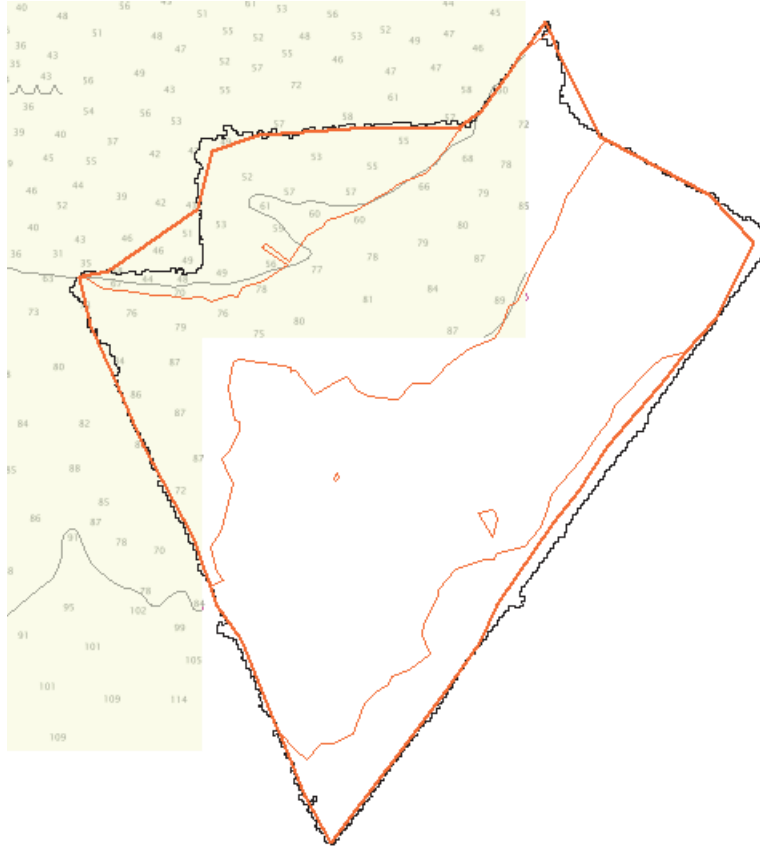


Figure 21: Survey H12429 comparison to ENC US5MA22M.

US5RI10M

ENC US5RI10M is in general agreement with the results of survey H12429. The 120 ft contour may be shifted East.

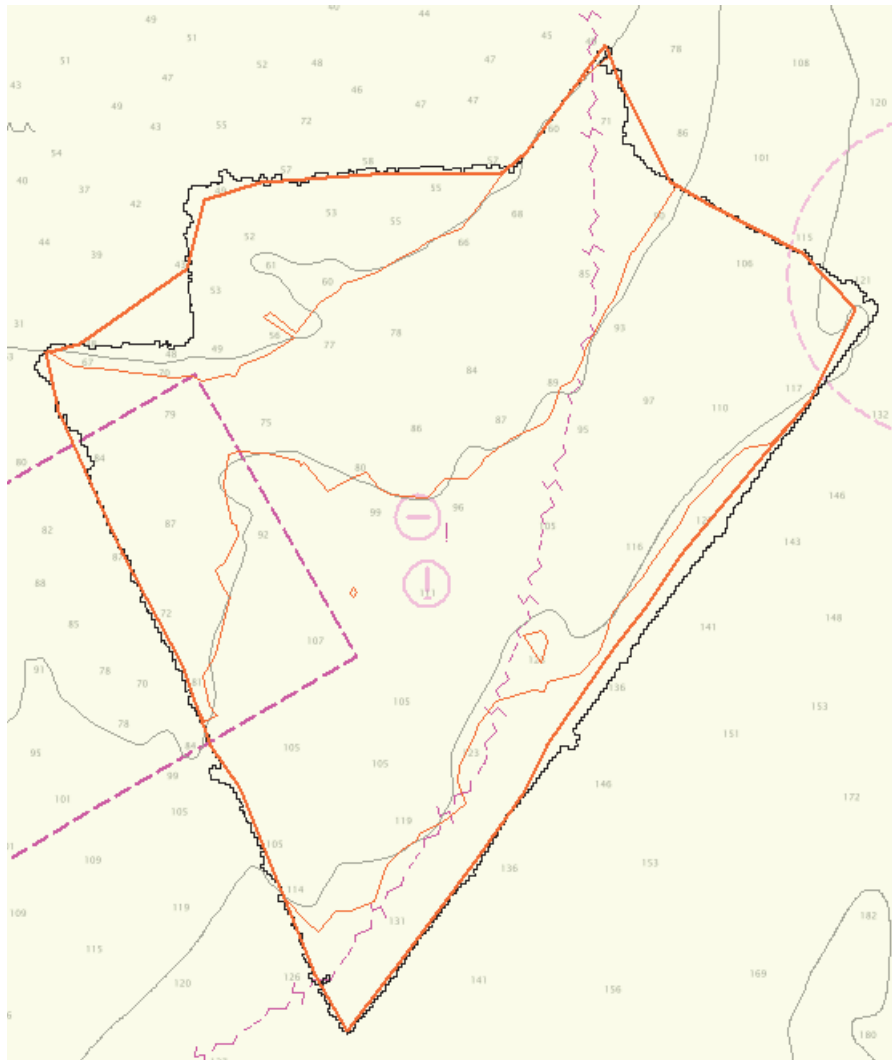


Figure 22: Survey H12429 comparison to ENC US5RI10M.

US4CN22M

ENC US4CN22M is in general agreement with the results of survey H12429. The 60 ft contour should be smoothed as area of deeper soundings is inaccurate. The 120 ft contour may be shifted East.

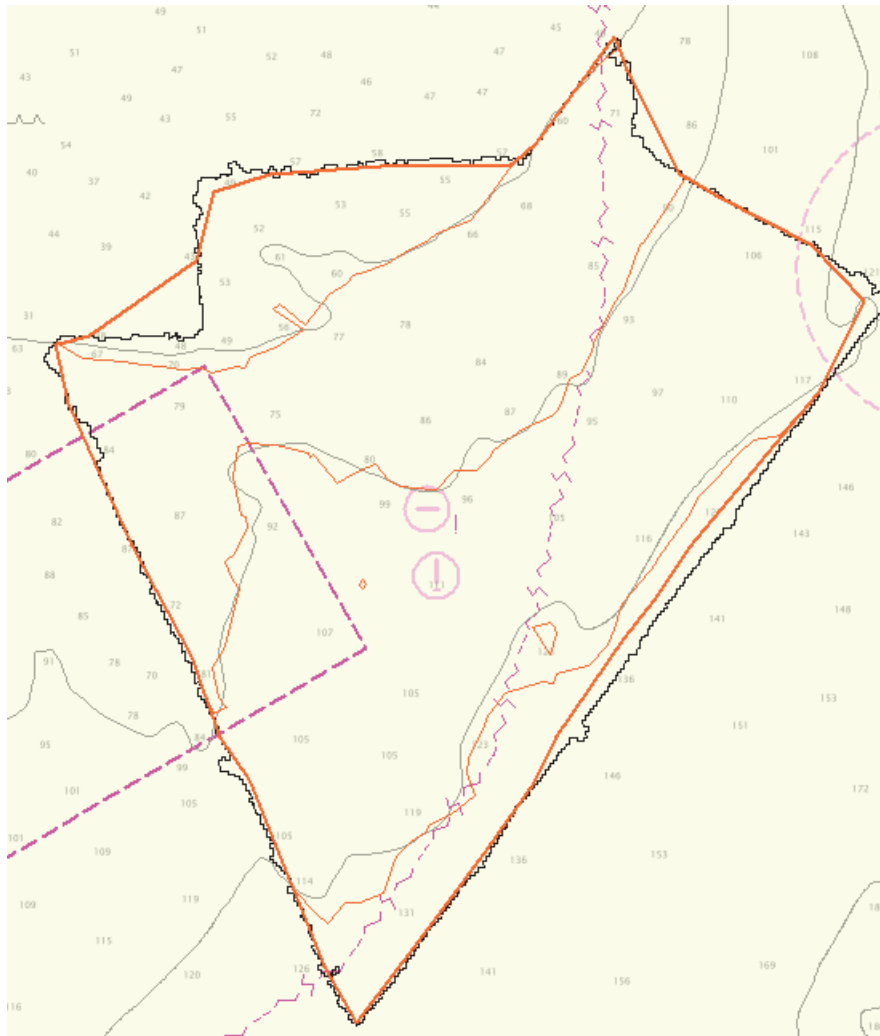


Figure 23: Survey H12429 comparison to ENC US4CN22M.

D.1.3 AWOIS Items

No AWOIS items exist for this survey.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

No charted features exist for this survey.

D.1.6 Uncharted Features

No uncharted features exist for this survey.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.9 Channels

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

D.1.10 Bottom Samples

A total of 7 bottom samples were acquired for survey H12429. For further discussion, see the final feature file.

D.2 Additional Results**D.2.1 Shoreline**

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

Aids to navigation (ATONs) do not exist for this survey.

D.2.4 Overhead Features

Overhead features do not exist for this survey.

D.2.5 Submarine Features

Submarine features do not exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

There is no present or planned construction or dredging within the survey limits.

D.2.10 Montauk Point Lighted Whistle Buoy

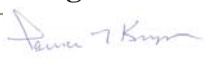
At the time of most recent survey of H12429, the Montauk Lighted Whistle Buoy was not present in the area. Investigation of latest notice to mariners indicates that the removal of the buoy has been noted.

E. Approval Sheet

As Chief of Party, Field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Standing and Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

Approver Name	Approver Title	Approval Date	Signature
Lawrence T. Krepp	Commanding Officer	08/07/2013	
Megan Guberski	Field Operations Officer	08/07/2013	
Allison Stone	Sheet Manager	08/07/2013	

APPENDIX I

TIDE NOTE AND GRAPHICS

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



APPENDIX II

SUPPLEMENTAL SURVEY RECORDS
AND CORRESPONDENCE

(No supplemental Correspondence)

APPENDIX III
FEATURES REPORT
(NO AWOIS ITEMS, DTONS, WRECKS, OR
MARITIME BOUNDARIES)

APPROVAL PAGE

H12429

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NGDC for archive

- H12429_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12429_GeoImage.pdf

The survey evaluation and verification has been conducted according to current OCS Specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: _____

LCDR Abigail Higgins
Chief, Atlantic Hydrographic Branch