

F00658

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: F00658

LOCALITY

State(s): New York

General Locality: Hudson River

Sub-locality: Castleton-on-Hudson to North Germantown

2015

CHIEF OF PARTY
LTjg Andrew R. Clos

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

F00658

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: **Hudson River**

Sub-Locality: **Castleton-on-Hudson to North Germantown**

Scale: **5000**

Dates of Survey: **08/14/2015 to 09/10/2015**

Instructions Dated: **09/15/2015**

Project Number: **S-B929-NRT5-15**

Field Unit: **Navigation Response Team 5**

Chief of Party: **LTjg Andrew R. Clos**

Soundings by: **Multibeam Echo Sounder**

Imagery by:

Verification by: **Pacific Hydrographic Branch**

Soundings Acquired in: **meters at Hudson River Datum**

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. Notes in red were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Centers for Environmental Information (NCEI): <https://www.ncei.noaa.gov/>

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Descriptive Report to Accompany Survey F00658

Project: S-B929-NRT5-15

Locality: Hudson River

Sublocality: Castleton-on-Hudson to North Germantown

Scale: 1:5000

August 2015 - September 2015

Navigation Response Team 5

Chief of Party: LTjg Andrew R. Clos

A. Area Surveyed

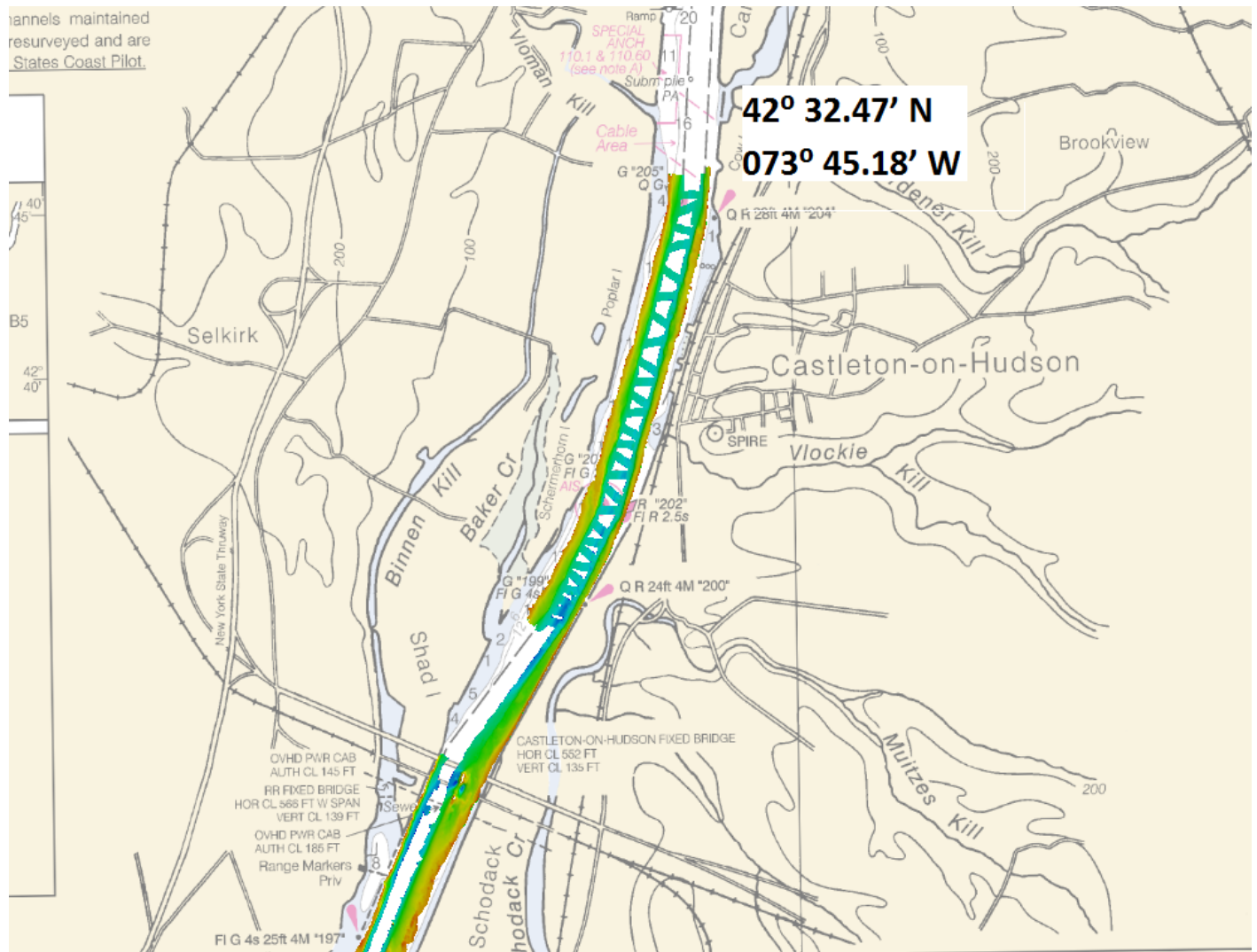
The survey was conducted at specific locations within the Hudson River, spanning a length of approximately 40 nautical miles. The northernmost area begins 6.5 nautical miles south of Albany, NY and the southern extent is 0.25 nautical miles north of Kingston, NY.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
42° 32' 28.2" N 73° 45' 10.8" W	41° 56' 32.4" N 73° 57' 40.8" W

Table 1: Survey Limits



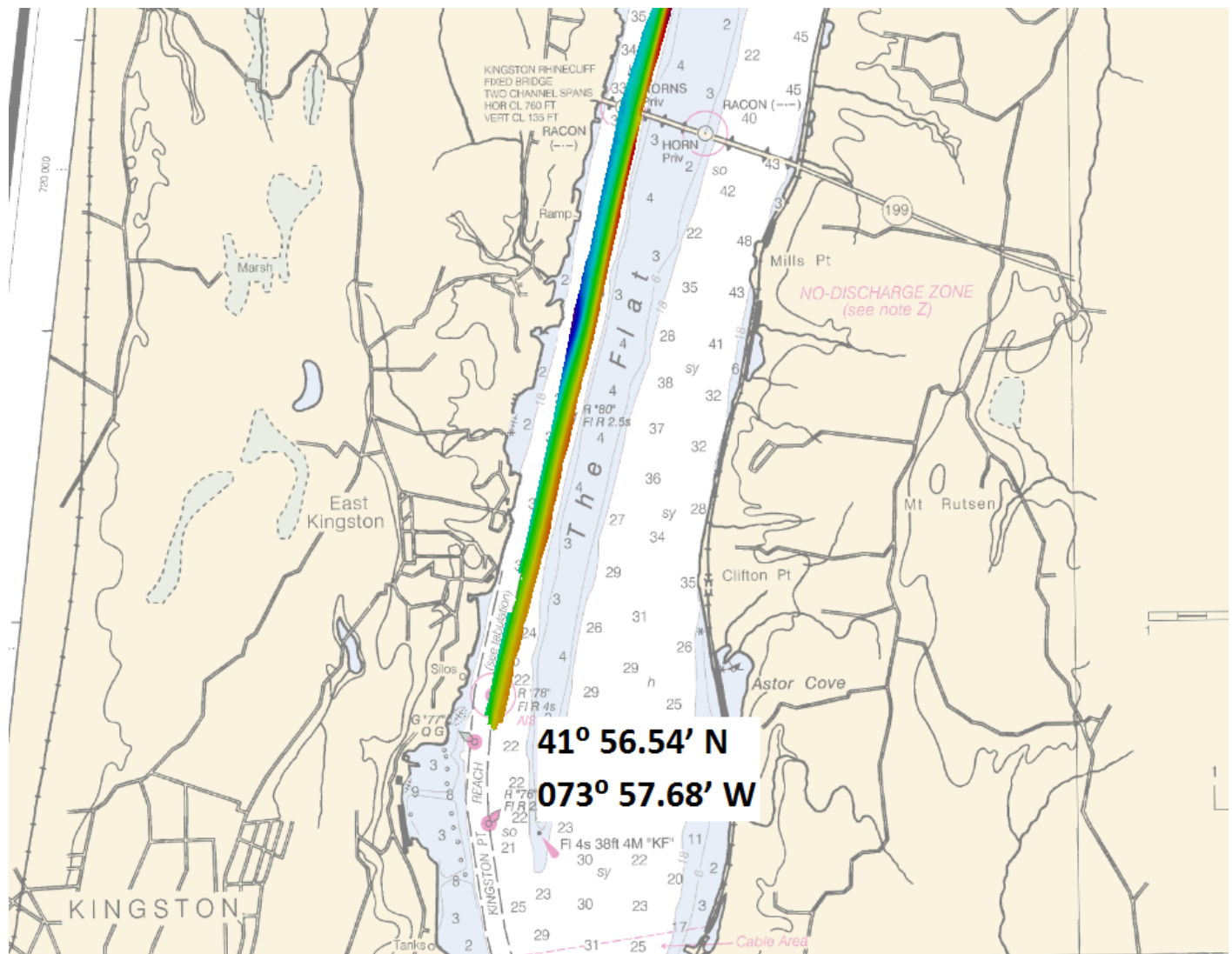


Figure 2: Southern extent of surveyed area.

Certain areas were surveyed past the sheet limits in preparation for future re-charting of the area at 1:12000 scale. The current sheet limits, set back from the shoreline by 2mm at 1:40000 scale, were exceeded to prevent the need to return to the extreme near shore area when the region is re-charted at a larger scale.

A.2 Survey Purpose

The Hudson River Pilots Association is requesting updated survey data for six selected areas outside the federal channel in the Hudson River from Kingston, NY up to Albany, NY. Ship traffic to the facilities in Albany and along this section of the Hudson River is steadily increasing and the maximum draft of the vessels calling on the port is getting deeper. Existing chart data outside the federal channels in this area dates from prior to 1939 and in many cases pre-1900 surveys. The federal channel in this area is only 400-ft wide and the size of ships is exceeding 600-ft in length, which necessitates maneuvering outside of the federal channel. The pilots feel more recent survey data is warranted in this area, especially given the heavy

storm activity that has occurred in the past two years, and the increased shipping traffic carrying hazardous cargoes, such as crude oil. Areas south of Kingston, NY are also based on old survey data, but the channel in this region is wider and thus these areas are considered a lower priority for the pilots. The field unit is assigned to survey from the outer channel limit shoreward to define the 12 foot contour in the area at North Germantown and the area from Castleton-on-Hudson fixed bridge to Roah Hook. The pilots consider both of these areas critical, and they should be given high priority. In the other four survey areas, the field unit is required to survey from the outer channel limit shoreward to define the 18 foot contour, giving the first 100 feet outside the channel highest priority. The regions greater than 100 feet outside the channel to the 18 foot contour in these four areas are considered second priority for this project. The field unit is not assigned to survey inside the channel.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

The following table lists the coverage requirements for this survey as assigned in the project instructions:

Water Depth	Coverage Required
All waters in survey area	Either 200% SSS with (a) concurrent set line spacing SBES or MBES or (b) object detection MBES

The Hudson River Pilots and Northeast Navigation Manager identified several areas of importance that fall outside of the six areas defined by the project instructions. These additional areas were given secondary importance to the main survey, but were acquired as time allowed.

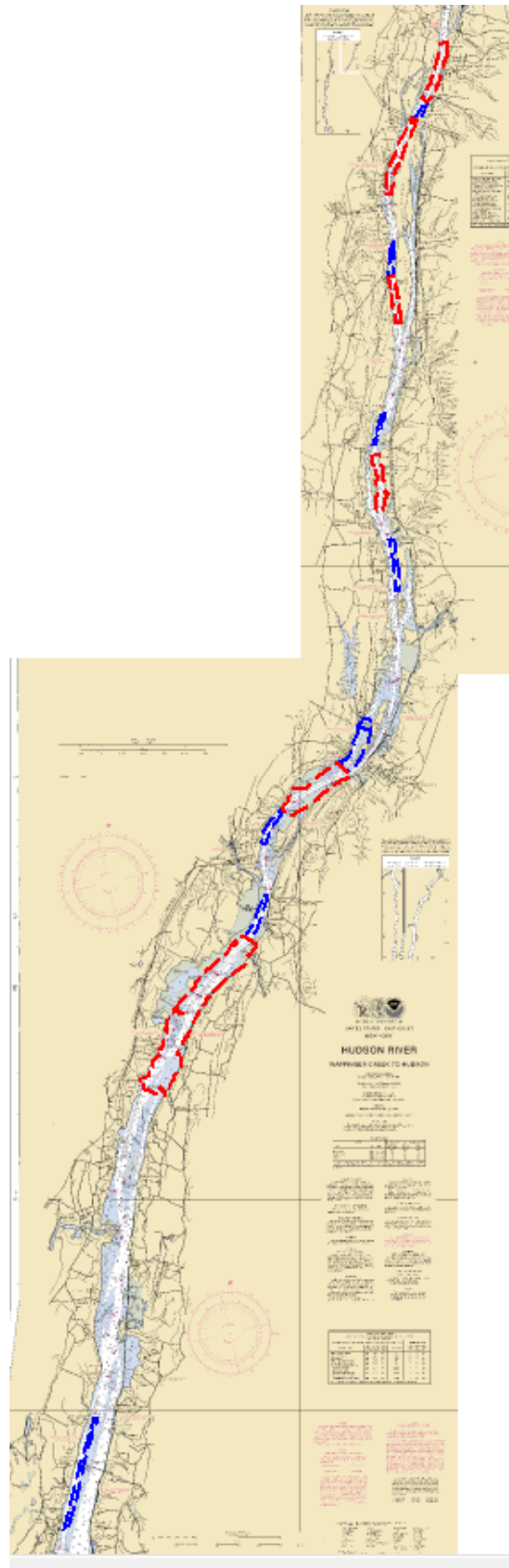


Figure 3: Required areas shown in red. Areas of acquisition in addition to the project instructions shown in blue.

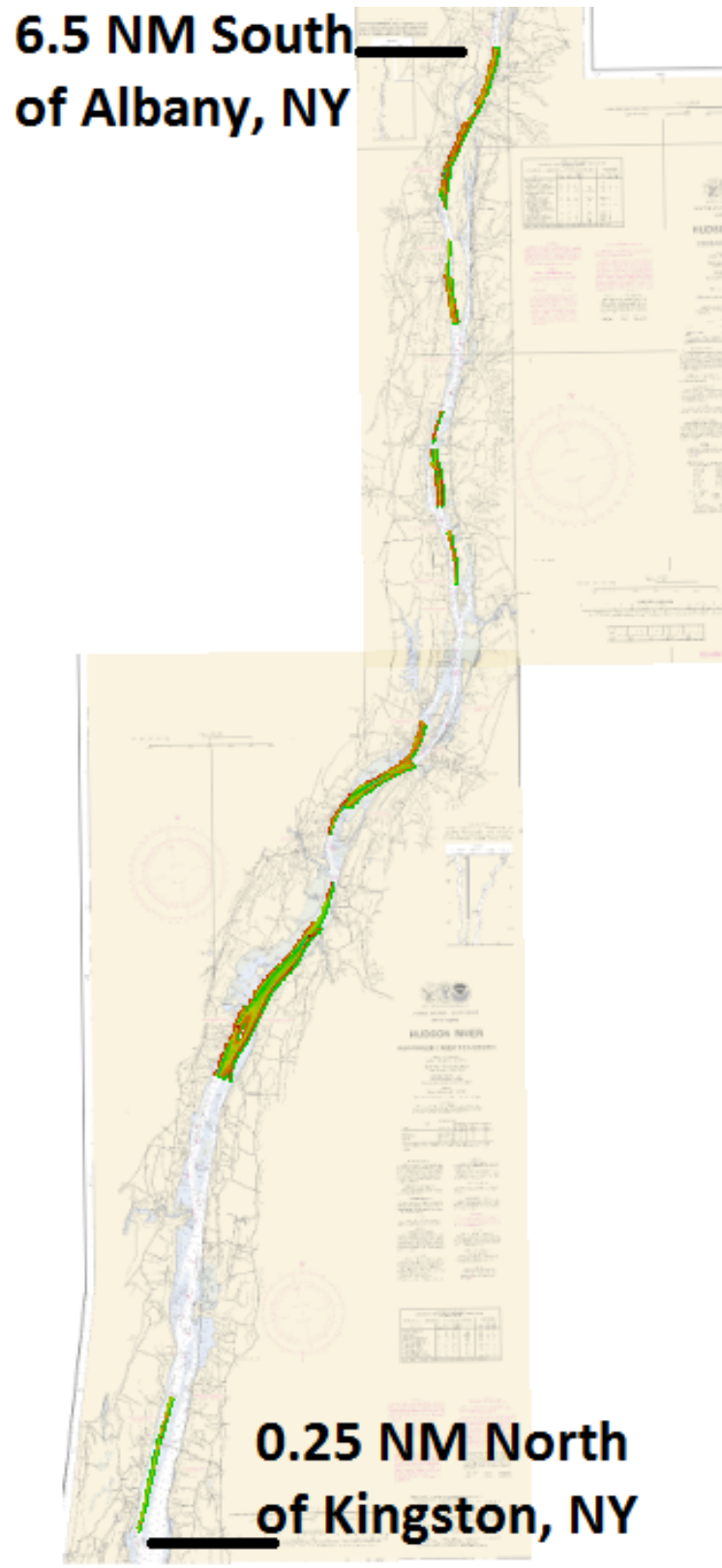


Figure 4: MBES coverage shown with raster charts 12347 and 12348 in the background.

A.5 Survey Statistics

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

	HULL ID	<i>S3002</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	290.52	290.52
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	0	0
	SBES/MBES Crosslines	26.1	26.1
	Lidar Crosslines	0	0
Number of Bottom Samples			0
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			4.43

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
08/14/2015	226
08/17/2015	229
08/18/2015	230
08/19/2015	231
08/20/2015	232
08/21/2015	233
08/24/2015	236
08/25/2015	237
08/26/2015	238
08/27/2015	239
08/28/2015	240
08/31/2015	243
09/01/2015	244
09/08/2015	251
09/09/2015	252
09/10/2015	253

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>S3002</i>
LOA	33 feet
Draft	0.75 meters

Table 4: Vessels Used



Figure 5: S3002

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg	EM3002	MBES
Applanix	POS M/V V5	Positioning and Attitude System
Trimble	SPS361	Positioning System
Seabird	SBE 19+	Conductivity, Temperature, and Depth Sensor
AML	Micro X	Sound Speed System

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 8.98% of mainscheme acquisition.

S3002 acquired 290.54 linear nautical miles of mainscheme bathymetry and 26.1 linear nautical miles of MBES cross lines, which equates to 8.9% of mainscheme MBES data. Crosslines were compared to mainscheme using a difference surface, created in CARIS BathyDataBase. By comparing with the difference surface method, every instance of overlap was evaluated. The mean was 0.06 meters and the standard deviation was 0.06 meters.

Additional comparison was made using CARIS Subset Editor and a 50 centimeter BASE surface to visually identify areas of mainscheme/crossline disagreement. The highest areas of disagreement occurred near sand waves and the steep edges of the channel.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0 meters	5.385 centimeters	V DATUM

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S3002	2.0 meters/second	0 meters/second	0.5 meters/second

Table 7: Survey Specific Sound Speed TPU Values

An accuracy layer named "Order 1a" was created for the finalized surface, and surface statistics were computed. For F00658_MB_50cm_MLLW_Final, 99.93% of all nodes meet or exceed NOS Order 1a TVU requirements. The majority of the nodes failing TVU requirements were in extremely steep areas near the channel edges or in areas with sand waves.

Density statistics were calculated for the BASE surface F00658_MB_50cm_MLLW_Final. 98.73% of nodes were found to have 5 or more soundings. The areas of lowest density were found where a single line's coverage overlapped with the channel edge and in the typical areas near the extreme edges of the sheet.

The hydrographer has under-reported their density compliance, 99.3% of all nodes contained 5 or more soundings.

B.2.3 Junctions

No junction surveys were assigned by the Project Instructions. Soundings and features were compared by chart comparison to the raster and ENC.

There are no contemporary surveys that junction with this survey.

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: Sound Speed Cast Frequency: SVP casts were typically taken every two to three hours in the deepest area being surveyed at the time. The SVP casts were applied to the MBES lines in Caris using the "nearest in time," method.

Although the survey area covered a 35 nautical mile span of the Hudson River, surface sound velocity and water column sound velocity profiles showed very little variation, even across different days and work areas that were 10-20 miles apart. Sound velocities ranged from 1497 meters per second (m/s) to 1504 m/s and it was rare to see more than a 2 m/s variation over the course of the day. Upon inspecting MBES data in CARIS Subset editor, no sound velocity artifacts were found.

B.2.8 Coverage Equipment and Methods

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

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

During the second week of survey, the vessel's AML Micro X surface sound velocity probe was lost overboard. A new probe of the same type was installed, and a CTD comparison as well as MBES data monitoring were performed. No anomalies or sound velocity errors were noticed.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Raw Backscatter was logged in the .all file. Backscatter was not processed by the field unit.

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following software program was the primary program used for bathymetric data processing:

Manufacturer	Name	Version
CARIS	HIPS	9.0.17

Table 8: Primary bathymetric data processing software

The following Feature Object Catalog was used: NOAA Extended Attribute Files V_5_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
F00658_MB_50cm_MLLW	CUBE	50 centimeters	0 meters - 18.70 meters	NOAA_0.5m	Object Detection
F00658_MB_50cm_MLLW_Final	CUBE	50 centimeters	0 meters - 18.70 meters	NOAA_0.5m	Object Detection

Table 9: Submitted Surfaces

The survey was carried out to meet the Object Detection Coverage requirements as defined by section 5.2.2.1 of the Hydrographic Surveys Specifications and Deliverables (2014 ed). With a maximum surveyed water depth of 18.7 meters, the 50 centimeter grid is sufficient to cover this entire survey area.

The hydrographer has not reported the vertical datum in the surface names correctly in Table 8. The survey was completed using the Hudson River Datum (HRD) and not Mean Lower Low Water (MLLW). Both surface names were changed in review to reflect the vertical datum used to reduce soundings and to grid depths.

C. Vertical and Horizontal Control

Additional information discussing the Real Time Kinematic GPS correction method and assessment of the Hudson River Datum separation model used for this survey can be found in the accompanying RTK Procedures document in the Project Reports folder.

C.1 Vertical Control

The vertical datum for this project is Hudson River Datum.

Non-Standard Vertical Control Methods Used:

VDatum

Ellipsoid to Chart Datum Separation File:

S-B929-NRT5-15_SEP.csar0

S-B929-NRT5-15_SEP.csar

A separation model was provided by NOAA's Navigation Response Branch. This model was modified near the end of the project to include the southern-most area of sheet near East Kingston, NY. This final version of the separation was re-applied to all data and is included with the survey submission.

C.2 Horizontal Control

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

The projection used for this project is Universal Transverse Mercator(UTM) - Zone 18.

Use of Real Time Kinematic GPS correctors provided three significant advantages:

1. Reduced Total Vertical Uncertainty (TVU) as compared to the TVU associated with traditional tidal zoning in the survey area. TVU for tidal zoning is high due to the distance between the controlling gauge and the survey area, compounded by the affects of varying river discharge rates.
2. Reduced time in the field for data acquisition. RTK allowed surveying at any rate of river discharge, where as traditional tide zoning would have required restricting acquisition to times when river discharge was approximately 7500 cfs or less.
3. Reduced processing time compared to Post Processed Kinematic methods.

Further discussion of the methods employed by the field unit can be found in the Horizontal and Vertical Control section's "RTK Procedures Report."

Additional background information regarding the effects of river flow rates and associated uncertainty in water level modeling can be found as addendums to the Project Instructions.

C.3 Additional Horizontal or Vertical Control Issues

3.3.1 Vertical offsets when surveying under overhead obstructions.

In the northern portion of area 1.2, underneath the Castleton-on-Hudson Fixed Bridge, satellite reception would be lost and vertical accuracy would drift quickly. Since no traditional tides were available for this survey these areas were considered holidays and reacquired. To collect data underneath and near the bridge, the vessel would move sufficiently far away to reacquire its GAMS heading and then move quickly towards the unsurveyed location and survey until losing GAMS heading and vertical accuracy. In some places, small vertical offsets of up to 20cm are still present.

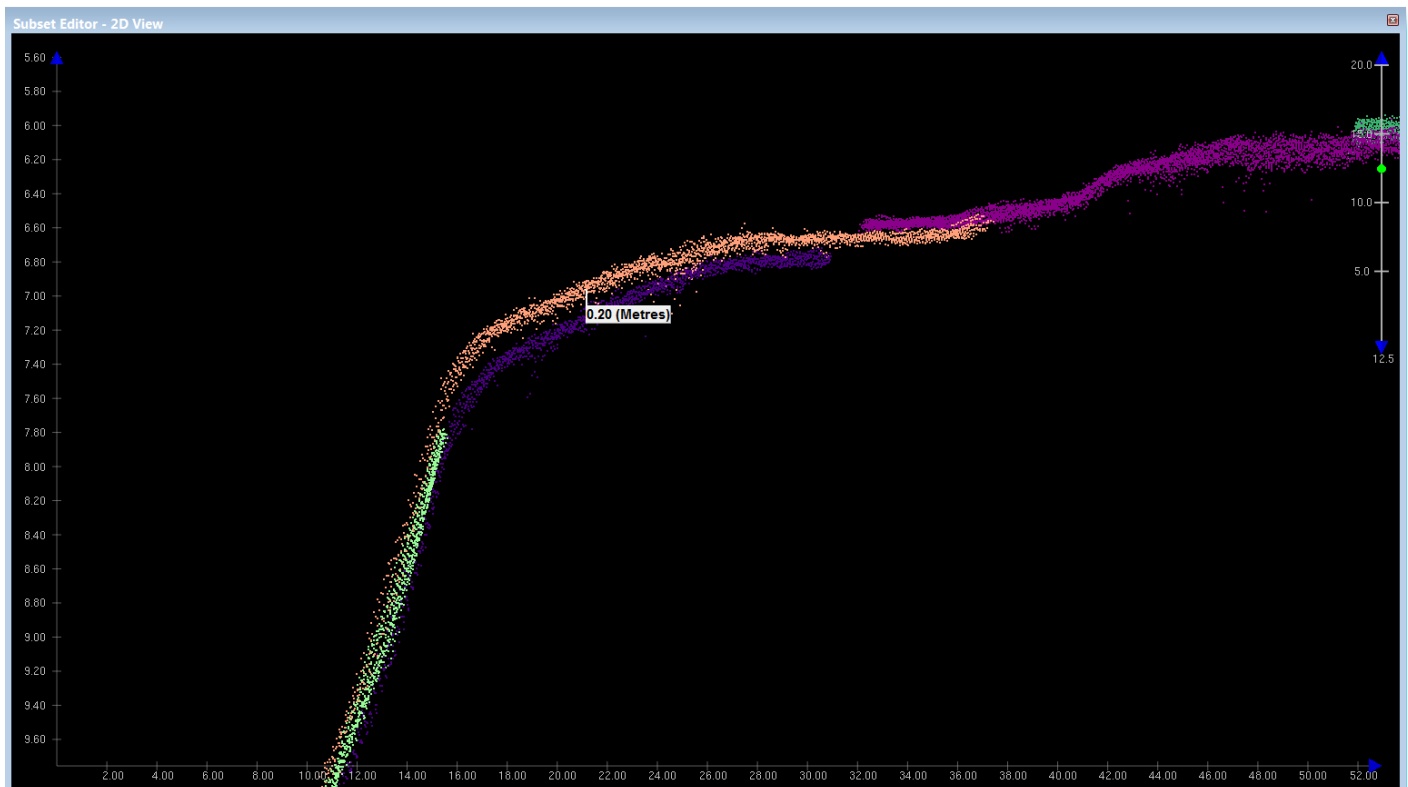


Figure 6: Vertical offsets due to satellite loss from overhead objects.

D. Results and Recommendations

D.1 Chart Comparison

F00658 was compared to affected RNC and ENC products by creating a high density sounding layer in CARIS BathyDataBase and comparing charted water depths with surveyed soundings.

In several places, charted depths differ significantly from soundings collected by this survey. Most of the southern portion of the sheet was last surveyed between 1900 and 1939, while the northern section was surveyed before 1900. Over the years, significant dredging and shoreline construction activities have taken place which has altered the current patterns and caused the river bottom to change shape. Additionally, significant sand waves are present and are known to shift rapidly.

The charts in this area are 1:40,000 scale and due to the narrow shape of the river, relatively few soundings are charted. In some places these sparsely charted depths cannot convey enough information about the sea floor. In the image below, notice that the charted 7 foot sounding appears to be "generalized," offshore and that the charted 14 foot depth encompasses surveyed soundings that range from 13 to 36 feet.

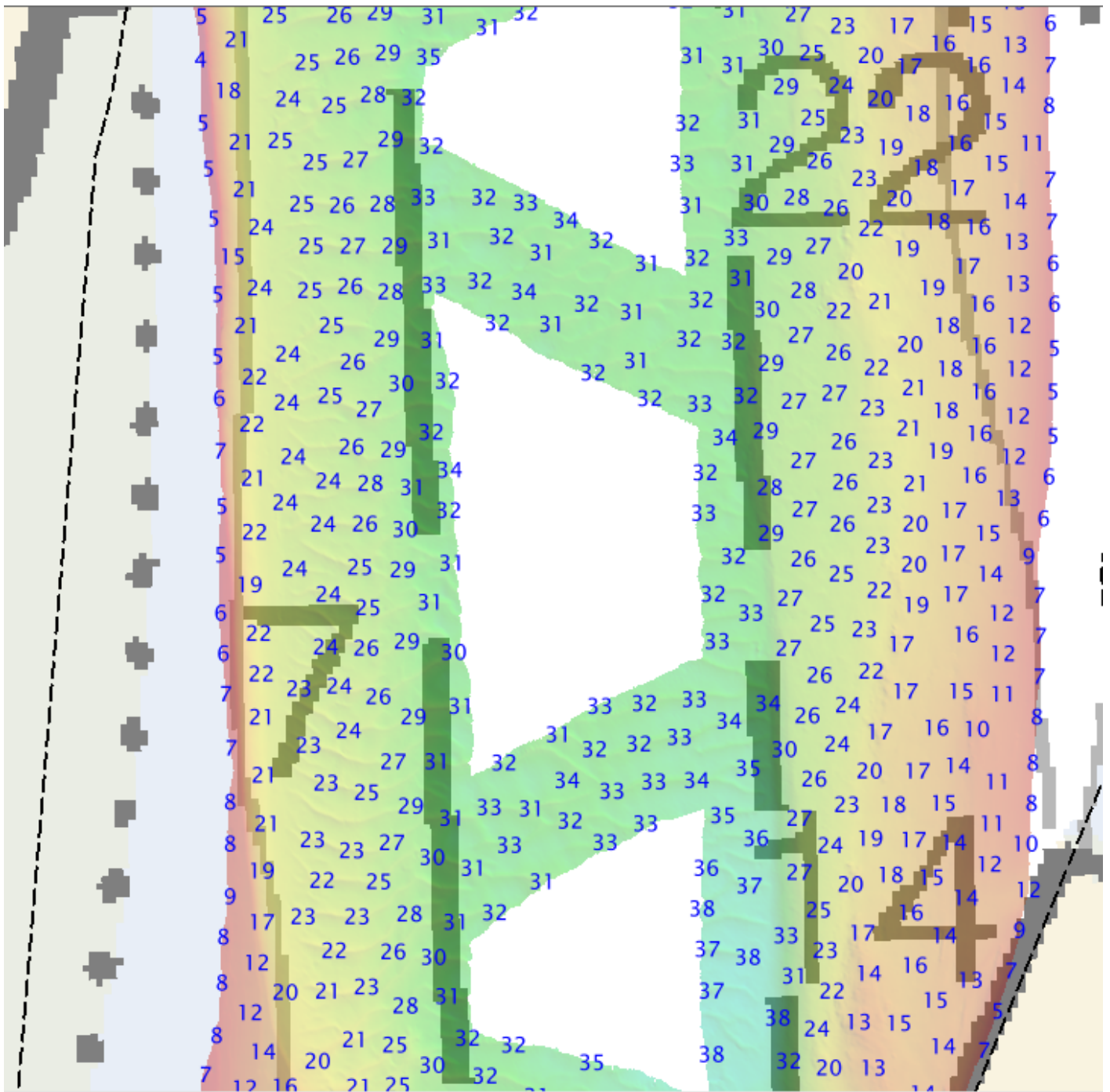


Figure 7: 1:40,000 scale raster chart with survey scale soundings overlaid.

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNМ Date	NM Date
12347	1:40000	31	07/2010	05/09/2015	05/09/2015
12348	1:40000	34	06/2010	04/18/2015	04/18/2015

Table 10: Largest Scale Raster Charts

12347

In most locations, surveyed soundings agreed within 2-3 feet of charted depths. In locations where the channel edge is close to shore, charted depths appear to be much more shallow than surveyed soundings. See the first figure below for reference.

At the request of the NE Navigation Manager, additional bathymetry was collected north of the sheet limits of area 5, towards Athens, NY. Significant discrepancies were found between the surveyed soundings and charted depths. Over time, it appears that the deepest part of the southern approach to Athens, NY has filled in. Sand waves are prevalent throughout the area. See the DtoN section for more information.

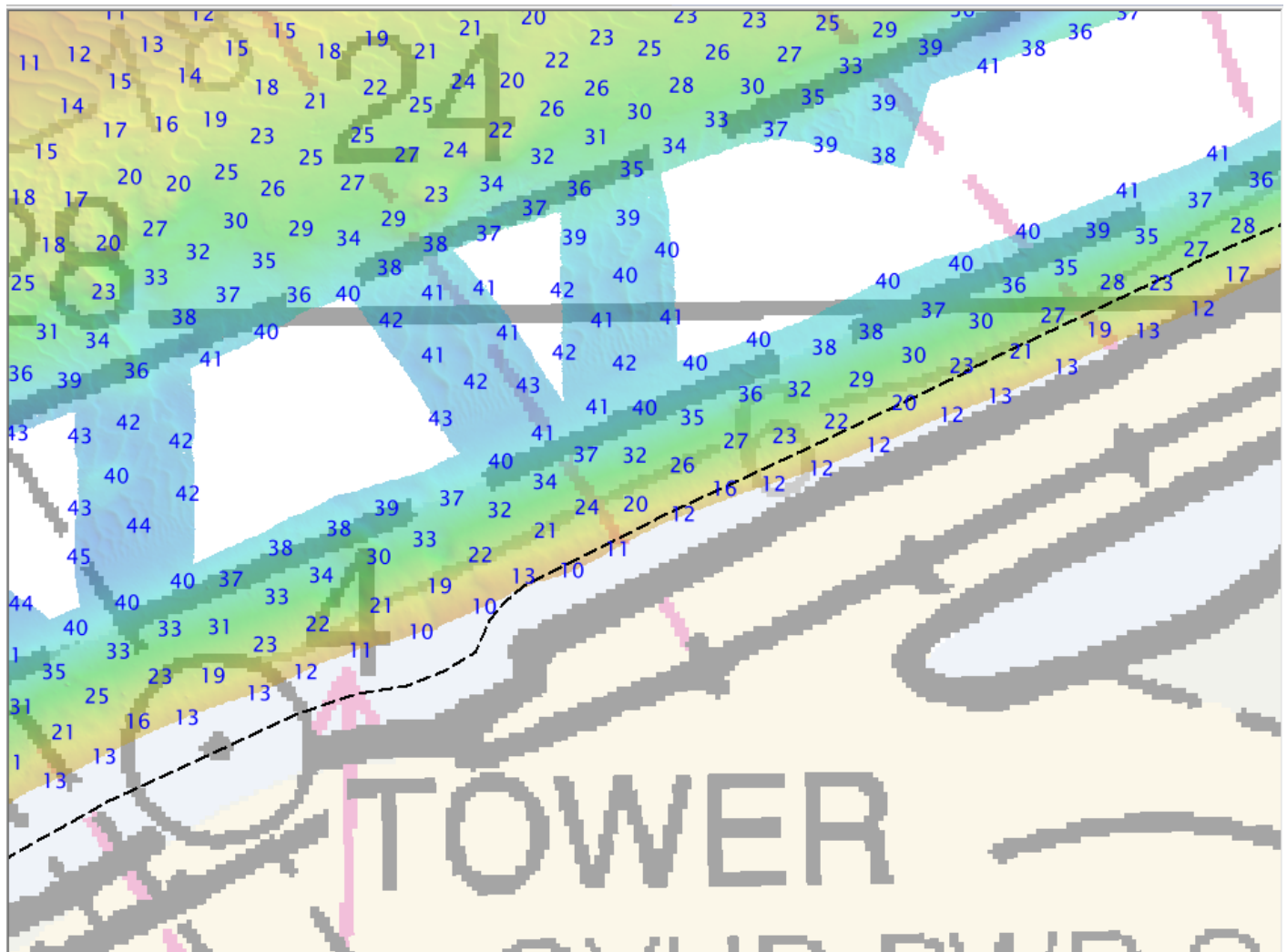


Figure 8: Charted 4 and 6 foot soundings appear to be drawn offshore.

12348

In most locations, surveyed soundings agreed within 2-3 feet of charted depths.

As with raster 12347, some charted soundings between the channel edge and shoreline appear to be drawn offshore and surveyed soundings are significantly deeper. However, just north of Rattlesnake Island, on the western side of the channel a shoal area was discovered by this survey. Charted soundings between 20 and 32 feet appear inshore of surveyed depths between 5 and 9 feet. This area was submitted as a DtoN, refer to the attached DtoN report for more details.

Additionally, an area to the west of the channel, 0.8 nautical miles SSW of Castleton-on-Hudson shows a significant chart discrepancy with surveyed soundings of 10-12 feet falling outside of the 12 foot contour. This area was discussed as a potential DtoN, but was not submitted as one due to the type of traffic that uses the area. See the correspondence section and the image below for more details.

The hydrographer recommends additional survey throughout this entire area to update pre-1900 survey data and to create larger scale charts in this region.

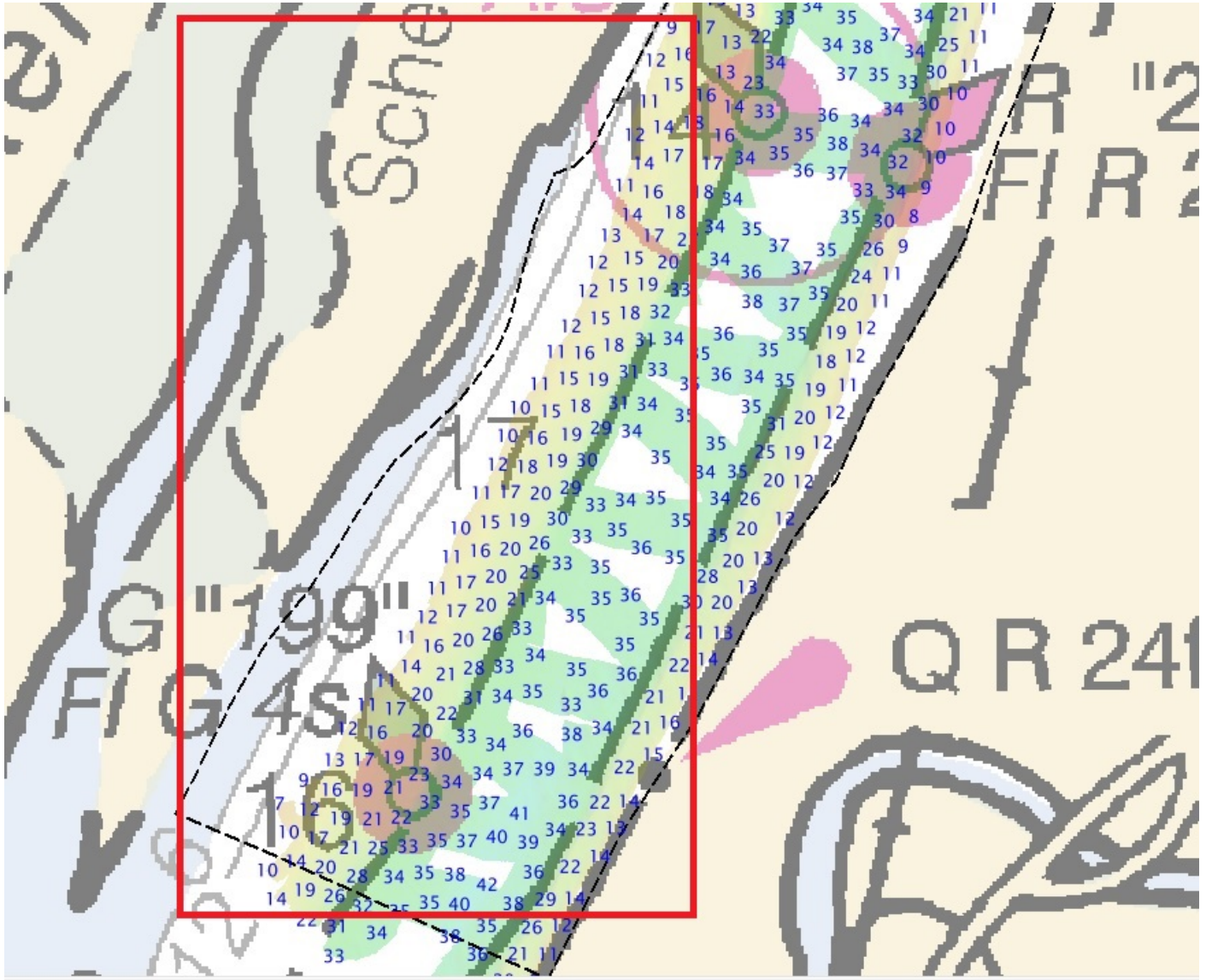


Figure 9: Raster 12347 in disagreement with surveyed soundings near western river bank.

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?
US5NY43M	1:40000	12	11/09/2015	11/09/2015	NO
US5NY44M	1:40000	15	07/20/2015	07/20/2015	NO

Table 11: Largest Scale ENC's

US5NY43M

ENC US5NY43M is a digitized version of raster chart 12347 and contains no GC features. US5NY43M was compared to F00658 and contains the same issues as raster 12347.

US5NY44M

ENC US5NY44M is a digitized version of raster chart 12348 and contains no GC features. US5NY44M was compared to F00658 and contains the same issues as raster 12348.

D.1.3 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.4 Charted Features

A dangerous wreck is charted at position 42 08' 37.04" N, 073 54' 23.097"W and was disproved by this survey. A small obstruction measuring 1.5 meters in height was discovered 27 meters to the northwest of the charted wreck and is included in the Final Feature File. After analysis in CARIS Subset Editor 2d and 3d modes, the object does not resemble a wreck.

D.1.5 Uncharted Features

Although no features were assigned for this survey, 19 navigationally significant features were discovered and documented in the Final Feature File, F00658_FFF.hob.

One uncharted rock was discovered and included in the Final Feature File due to its location. Although it is well outside of the maintained channel, it is located in an area which could be used for smaller commercial traffic per conversations with the Hudson River Pilots.

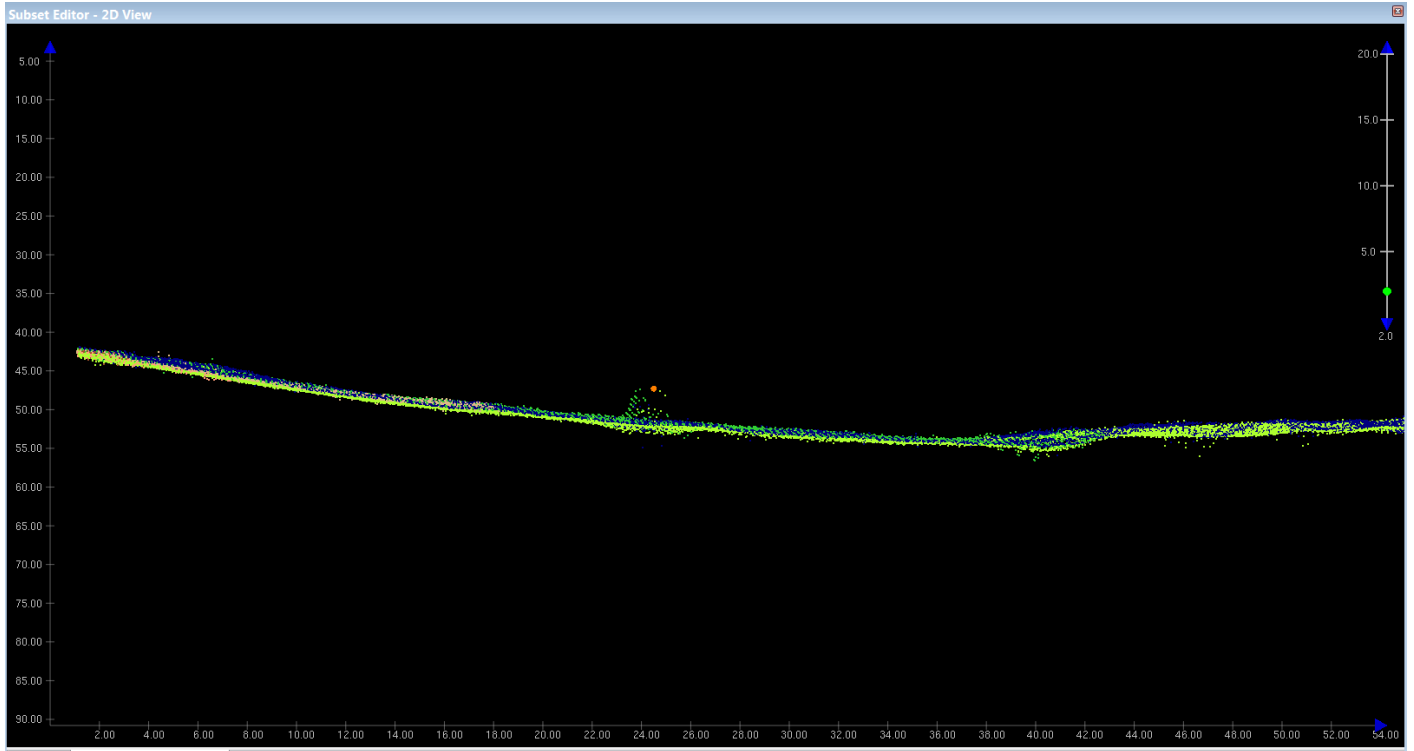


Figure 10: 2d Subset Editor view of 47 foot obstruction.

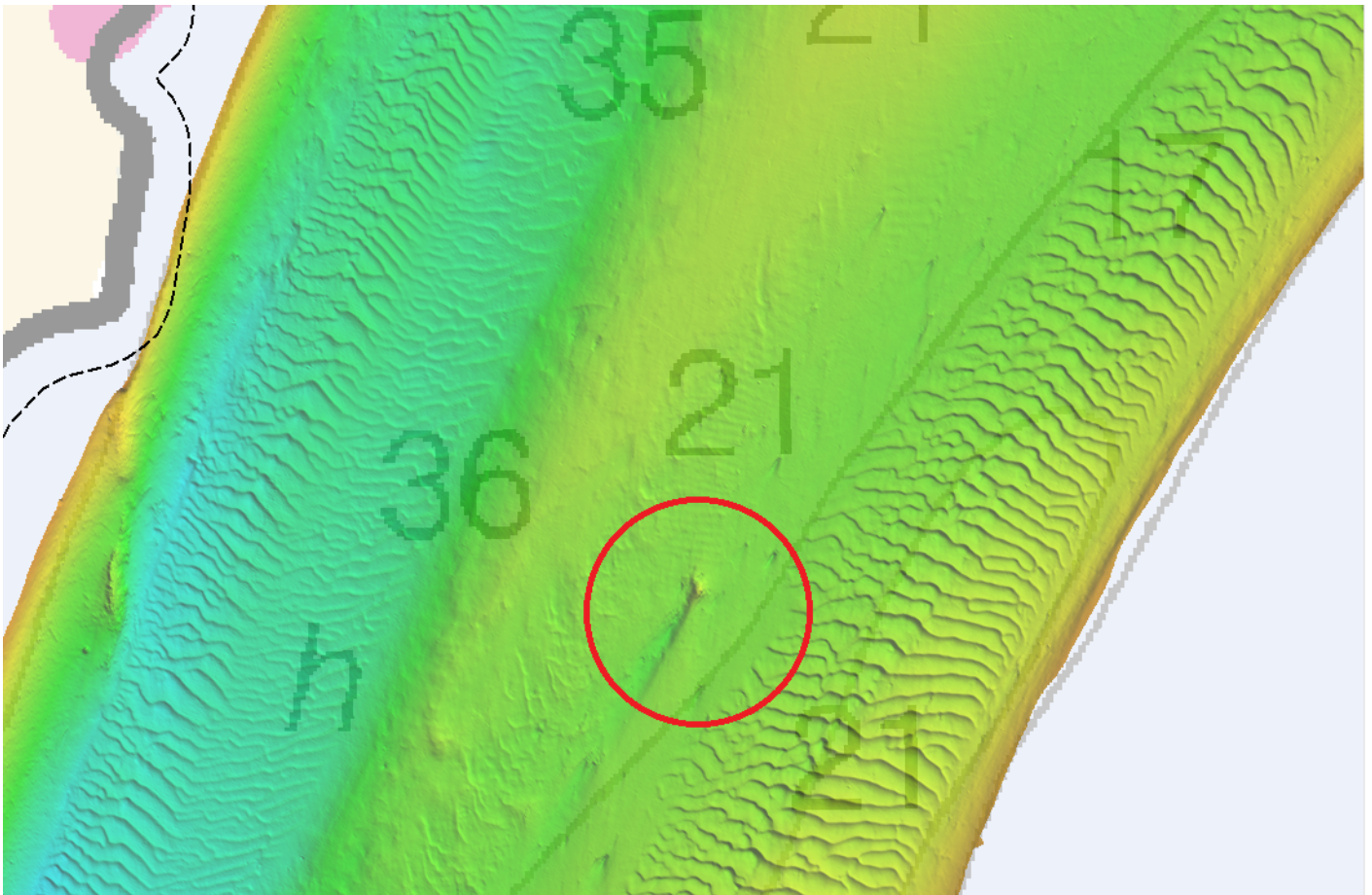


Figure 11: Uncharted 18ft rock near a potential secondary channel for smaller traffic.

D.1.6 Dangers to Navigation

The following DTON reports were submitted:

DTON Report Name	Date Submitted
F00658 Area DtoN	2015-11-30
F00658 Area DtoN 2	2015-12-03
F00658 Area DtoN 3	2015-12-09

Table 12: DTON Reports

Danger to Navigation Reports are included in Appendix III of this report.

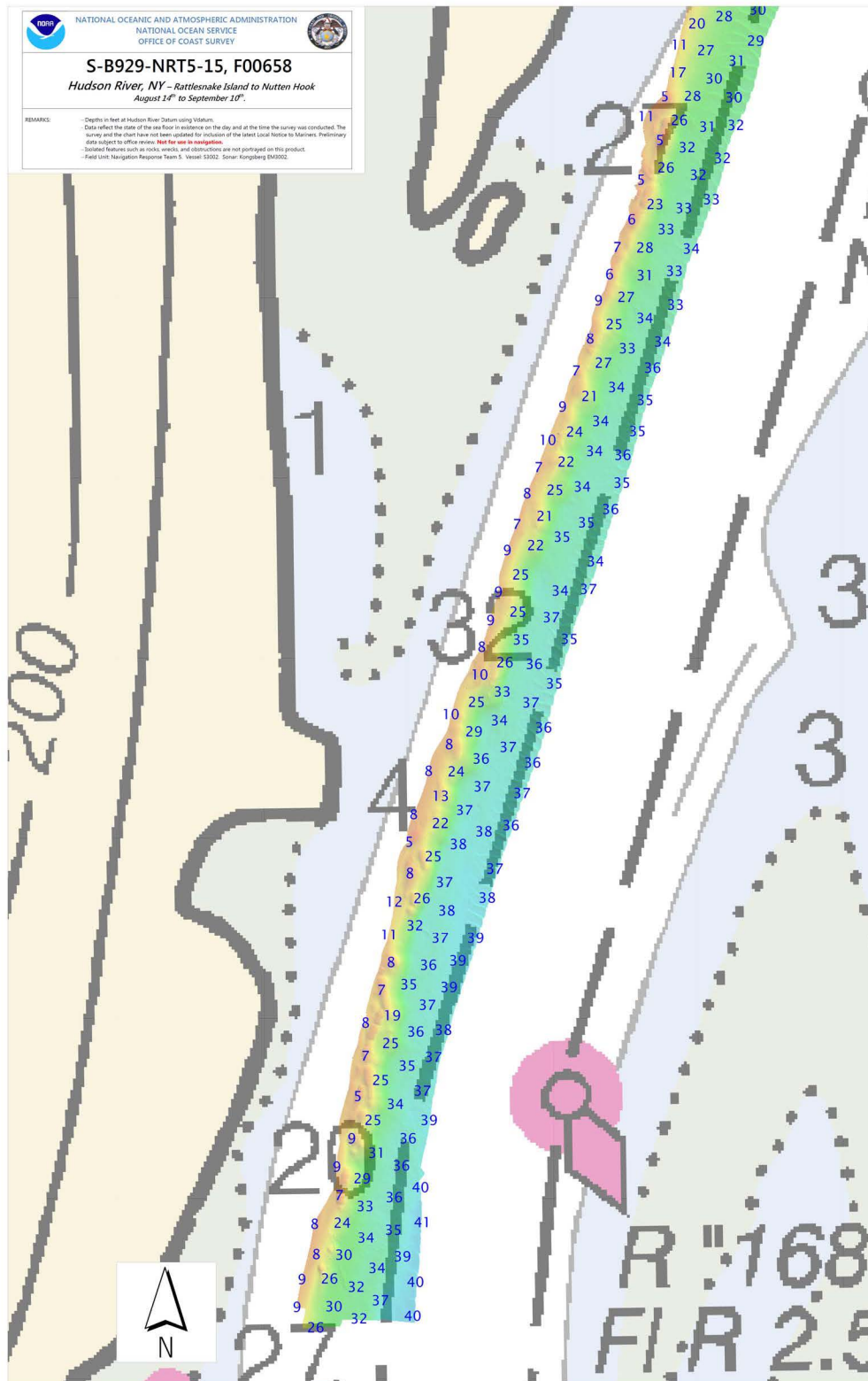


Figure 12: Area DtoN #1 discovered between the shoreline and channel edge, north of Rattlesnake Island.

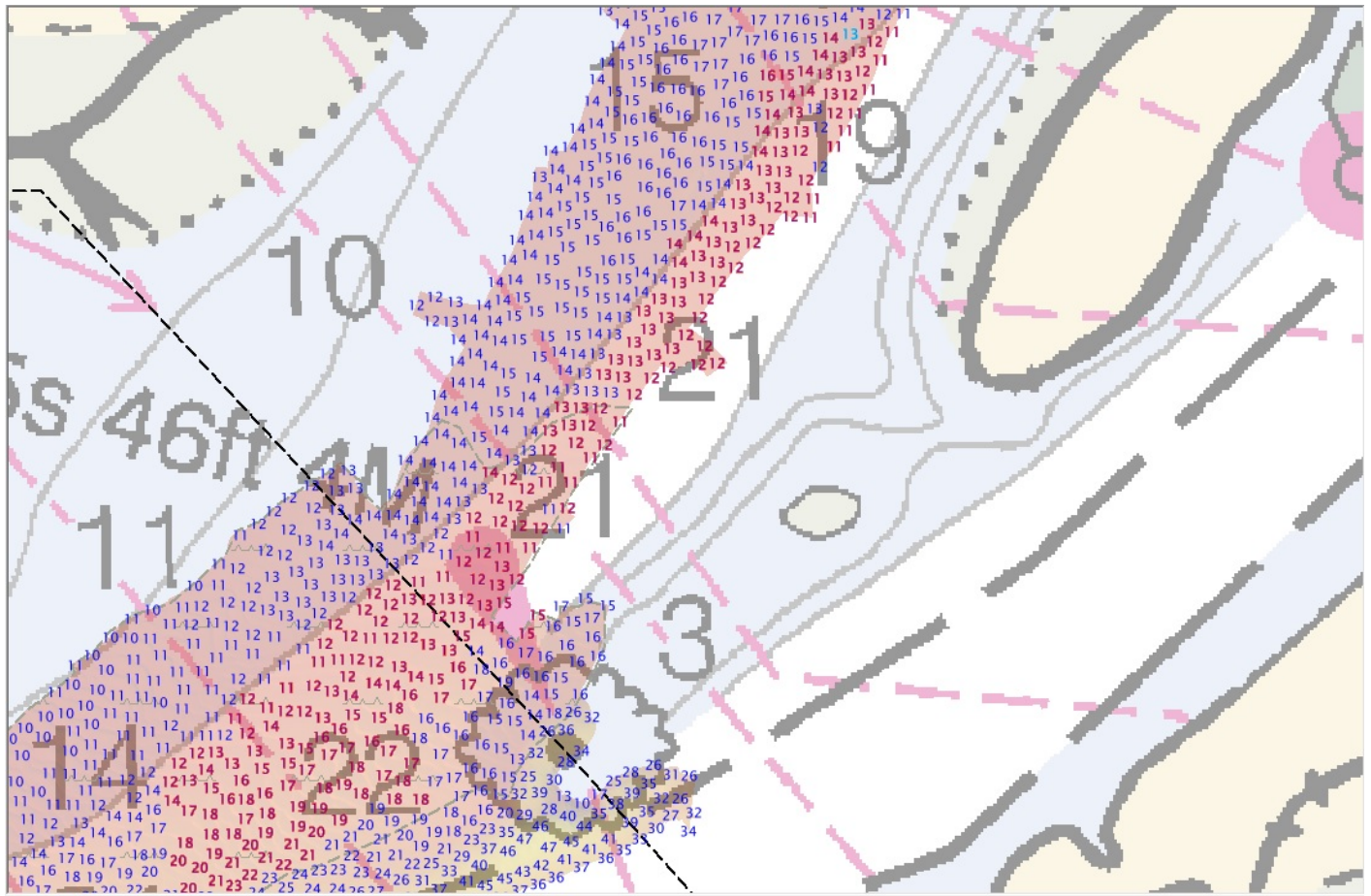


Figure 13: Area DtoN #2 discovered between Middle Ground Flats and Athens, NY

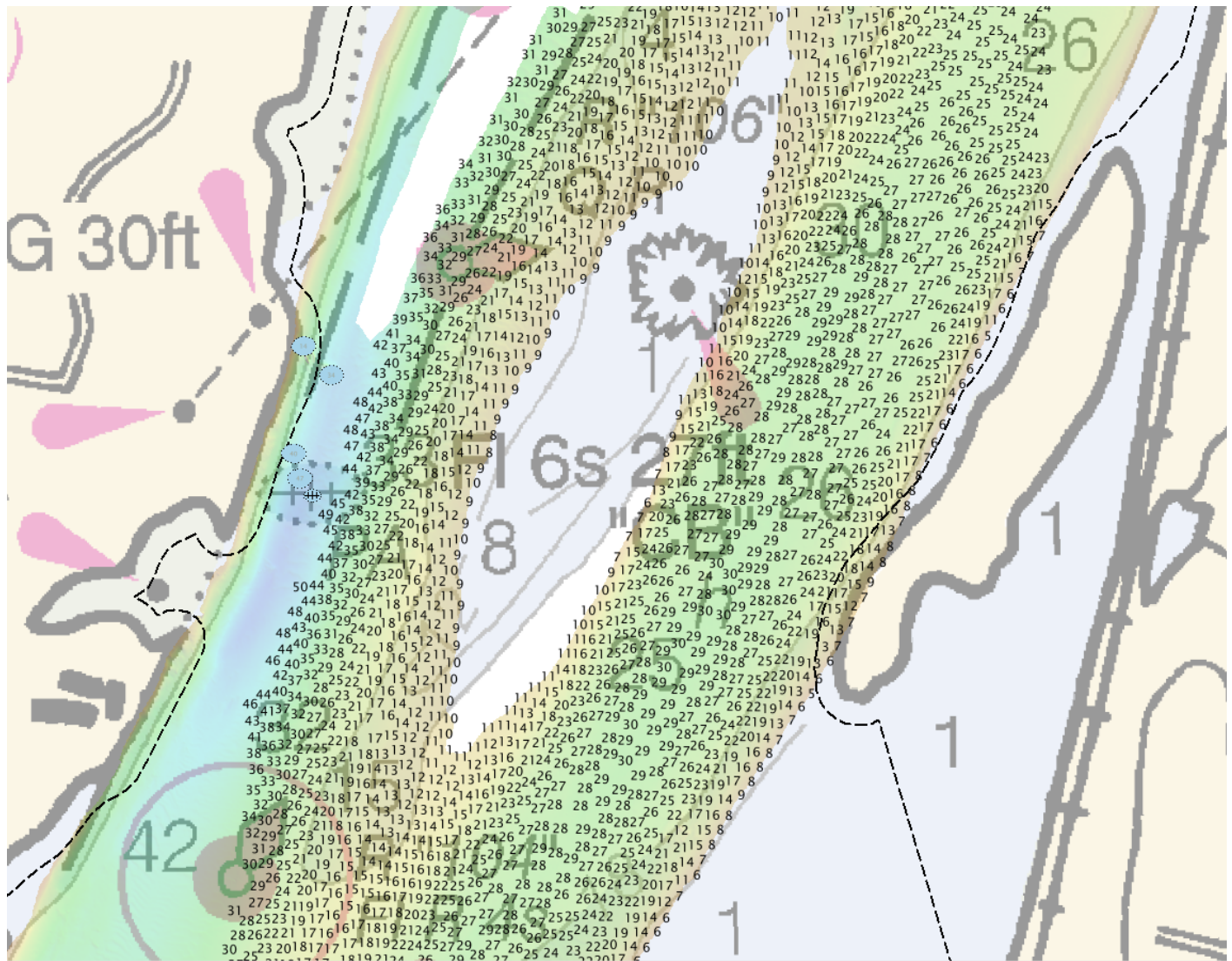


Figure 14: Area DtoN #3 discovered near the mid-river shoal in the vicinity of North Germantown, NY. *The DTON Report is attached.*

D.1.7 Shoal and Hazardous Features

Shoals and potentially hazardous features have been discussed in D.1.7 Dangers to Navigation. No additional shoal or potential hazardous features to report.

D.1.8 Channels

Although the maintained channel was not part of the survey area, crosslines and overlap at the sheet edges caused portions of the channel to be surveyed. Soundings acquired in these areas were compared to the chart's tabulated depths and were generally found to be equal to or deeper than the control depth.

D.1.9 Bottom Samples

No bottom samples were required for this survey.

D.2 Additional Results

D.2.1 Shoreline

Shoreline features were not specifically assigned for this survey, but limited shoreline verification was conducted near pier faces and wharfs.

At location 42° 09' 25.51" N, 073° 53' 48.00" W, a pier face is not accurately positioned on the raster chart. As surveyed by MBES, the actual face of the pier is seaward of its charted position and flat across its front, as opposed to rounded as it appears in the Composite Source File (CSF). The SLCONS feature was transferred from the CSF to the Final Feature File and re-digitized to match the surveyed position. The hydrographer recommends using orthoimagery and MBES data from this survey to re-digitize the seaward extent of this pier face.

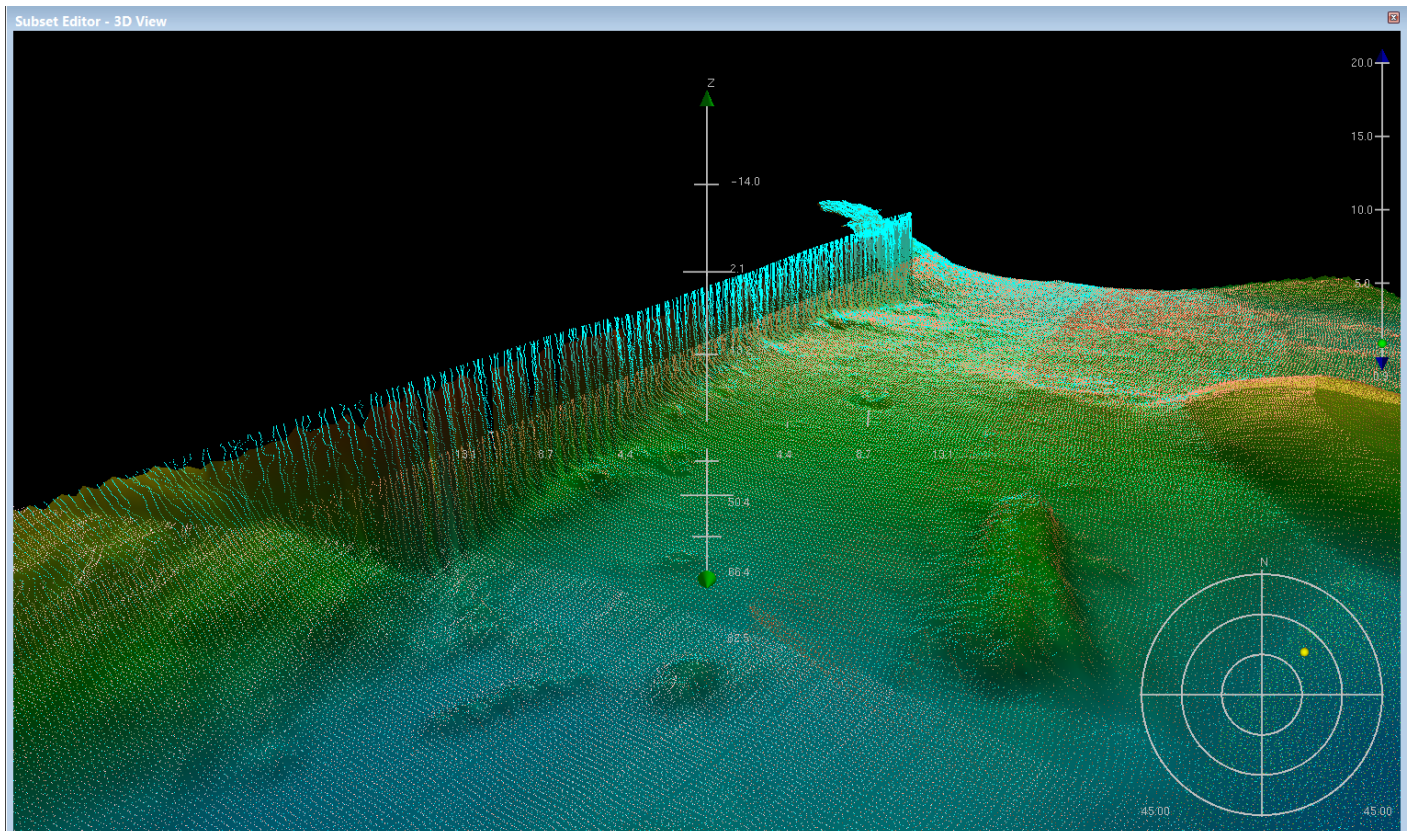


Figure 15: Vertical returns from MBES depicting location of pier face.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

No aids to navigation (ATONs) were assigned for positioning. Aids to navigation were observed to be on station and serving their intended purpose.

D.2.4 Overhead Features

All overhead features exist as charted. Clearances were not confirmed by this survey.

D.2.5 Submarine Features

No submarine features 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

Significant features are documented in the Final Features File submitted with this survey.

D.2.9 Construction and Dredging

No present or planned construction or dredging exist within the survey limits. Although dredging of the maintained channel is an ongoing process, the limits of this survey did not include these controlled areas.

D.2.10 New Survey Recommendation

Based on extensive conversations between the field unit, Northeast Navigation Manager and the Hudson River Pilots, it is recommended that this entire portion of river be resurveyed in order to generate 1:12000

scale charts. The current raster charts at a 1:40,000 scale do not show enough detail when navigating outside of the maintained channel.

The survey was compiled at a scale of 1:12,000 in anticipation of future larger scale charts on the Hudson River.

D.2.11 Inset Recommendation

No new insets are recommended for this area.

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, 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
Andrew R. Clos	Chief of Party	01/06/2016	

F. Table of Acronyms

Acronym	Definition
AHB	Atlantic Hydrographic Branch
AST	Assistant Survey Technician
ATON	Aid to Navigation
AWOIS	Automated Wreck and Obstruction Information System
BAG	Bathymetric Attributed Grid
BASE	Bathymetry Associated with Statistical Error
CO	Commanding Officer
CO-OPS	Center for Operational Products and Services
CORS	Continually Operating Reference Station
CTD	Conductivity Temperature Depth
CEF	Chart Evaluation File
CSF	Composite Source File
CST	Chief Survey Technician
CUBE	Combined Uncertainty and Bathymetry Estimator
DAPR	Data Acquisition and Processing Report
DGPS	Differential Global Positioning System
DP	Detached Position
DR	Descriptive Report
DTON	Danger to Navigation
ENC	Electronic Navigational Chart
ERS	Ellipsoidal Referenced Survey
ERZT	Ellipsoidally Referenced Zoned Tides
FFF	Final Feature File
FOO	Field Operations Officer
FPM	Field Procedures Manual
GAMS	GPS Azimuth Measurement Subsystem
GC	Geographic Cell
GPS	Global Positioning System
HIPS	Hydrographic Information Processing System
HSD	Hydrographic Surveys Division
HSSD	Hydrographic Survey Specifications and Deliverables

Acronym	Definition
HSTP	Hydrographic Systems Technology Programs
HSX	Hypack Hysweep File Format
HTD	Hydrographic Surveys Technical Directive
HVCR	Horizontal and Vertical Control Report
HVF	HIPS Vessel File
IHO	International Hydrographic Organization
IMU	Inertial Motion Unit
ITRF	International Terrestrial Reference Frame
LNM	Local Notice to Mariners
LNM	Linear Nautical Miles
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NAIP	National Agriculture and Imagery Program
NALL	Navigable Area Limit Line
NM	Notice to Mariners
NMEA	National Marine Electronics Association
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NRT	Navigation Response Team
NSD	Navigation Services Division
OCS	Office of Coast Survey
OMAO	Office of Marine and Aviation Operations (NOAA)
OPS	Operations Branch
MBES	Multibeam Echosounder
NWLON	National Water Level Observation Network
PDBS	Phase Differencing Bathymetric Sonar
PHB	Pacific Hydrographic Branch
POS/MV	Position and Orientation System for Marine Vessels
PPK	Post Processed Kinematic
PPP	Precise Point Positioning
PPS	Pulse per second

Acronym	Definition
PRF	Project Reference File
PS	Physical Scientist
PST	Physical Science Technician
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPE	Total Propagated Error
TPU	Topside Processing Unit
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positioning System timing message
ZDF	Zone Definition File

F00658 Area DtoN

Registry Number: F00658
State: New York
Locality: Hudson River
Sub-locality: North of Rattlesnake Island to Cocksackie Creek
Project Number: S-B929-NRT5-15
Survey Dates: 08/14/2015 - 09/10/2015
Raster Chart (ENC): 12348 (US5NY44M)

Remarks:

During data acquisition for hydrographic survey F00658, significant discrepancies were observed between the survey data and the charted depths between 0.25 nautical miles north of Rattlesnake Island and Cocksackie Creek. The river bottom rises steeply toward shore in this area. Surveyed soundings closest to shore are in the 5 to 9 foot range, but three charted soundings between 20 and 32 feet appear slightly inshore of the surveyed area. For this reason, the area is submitted as a DtoN.

The shoaling is too widespread to be depicted with a point feature; therefore a survey scale sounding plot was generated, and is included with this report. Additionally, a contour .hob and .000 file have been included. The shape file F00658_Dton_Soundings_Sheet4.shp is in UTM – NAD83 zone 18N coordinates.

This survey was acquired to the Ellipsoid. Soundings have been translated to MLLW, Hudson River Datum using a VDatum model.

Hydrographer Recommendations:

Update contours and soundings to reflect the current survey data.

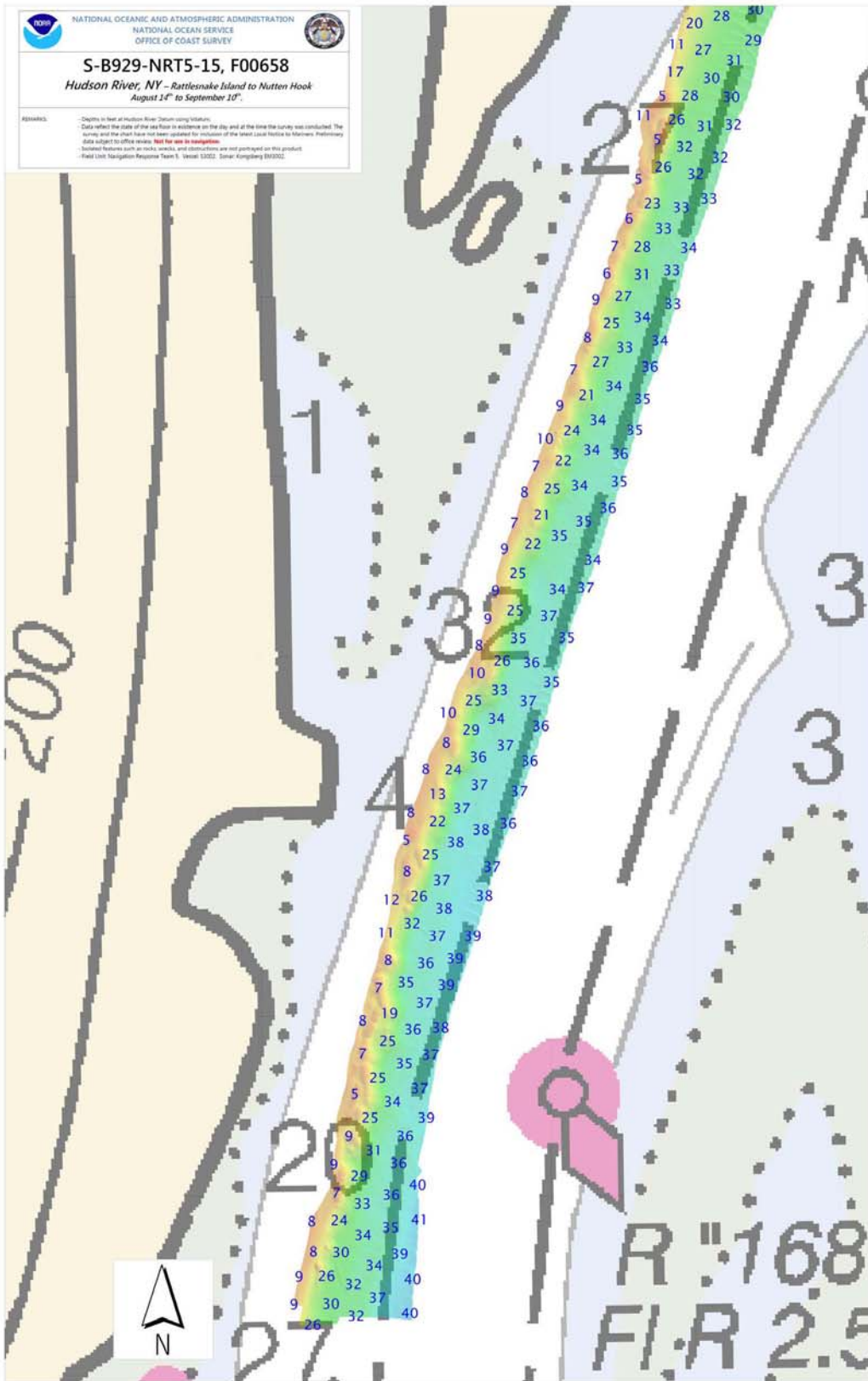


Figure 1: Overview of Area DtoN.

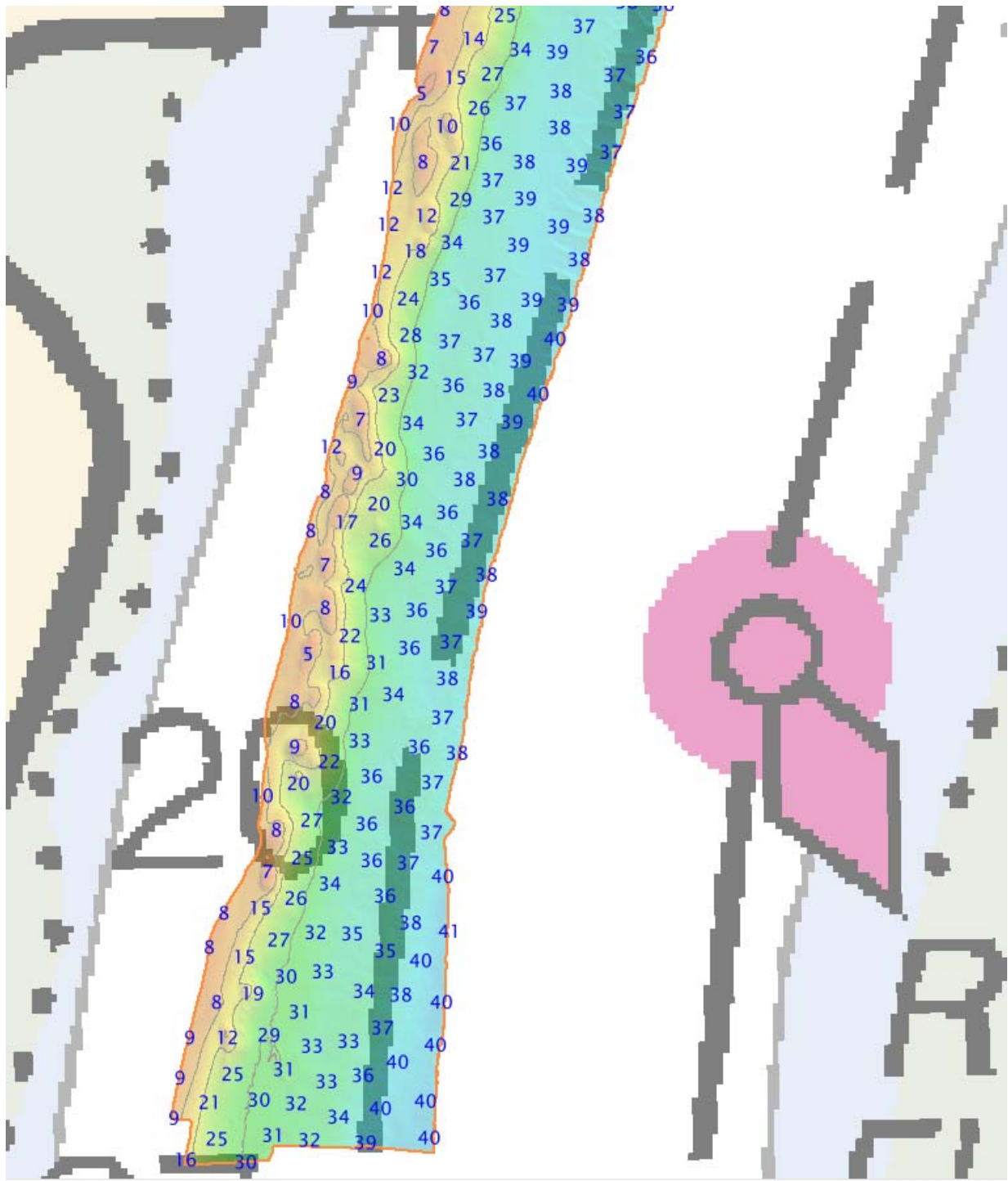


Figure 2: Southern portion of area DtoN.

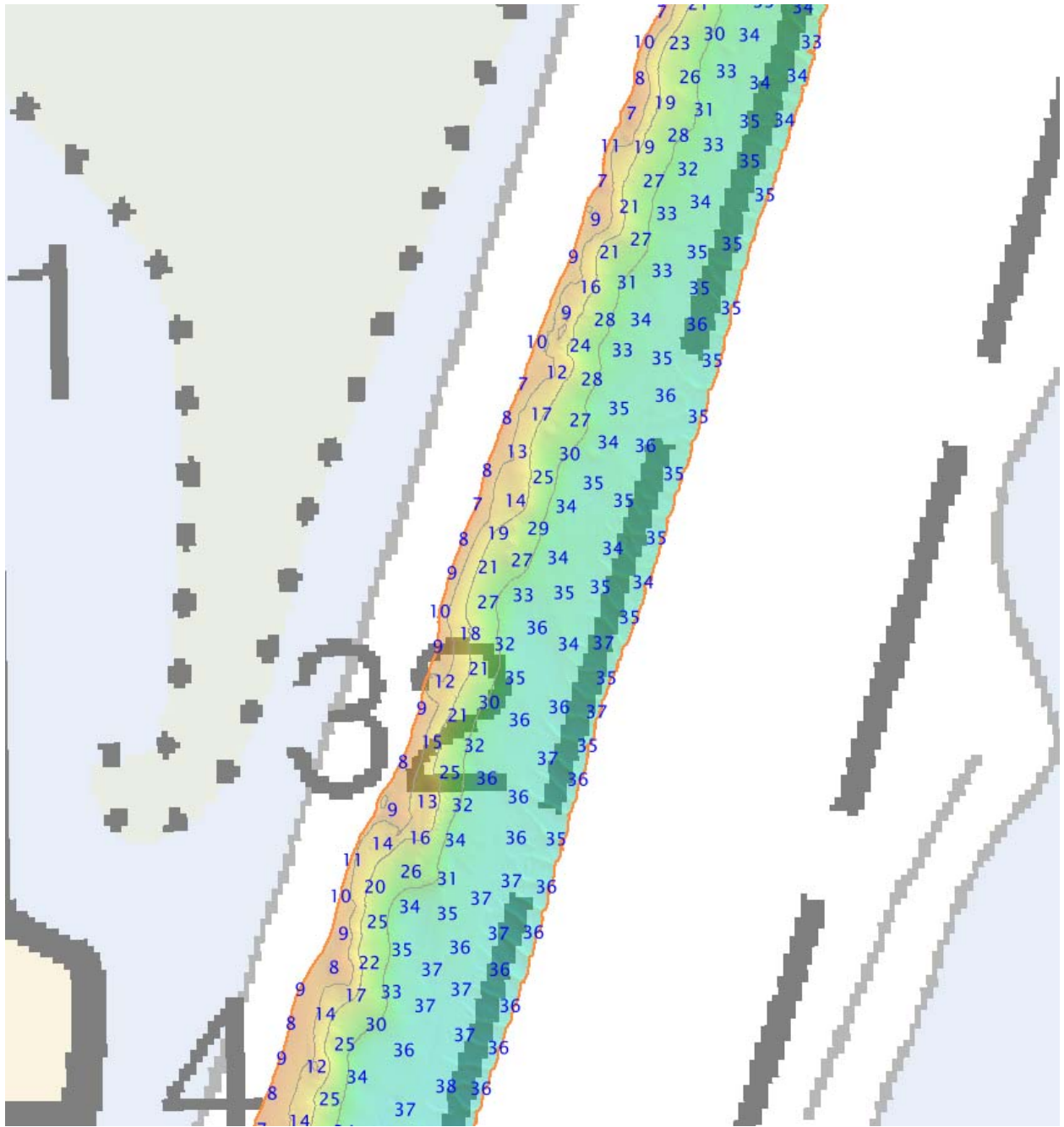


Figure 3: Center portion of area DtoN.

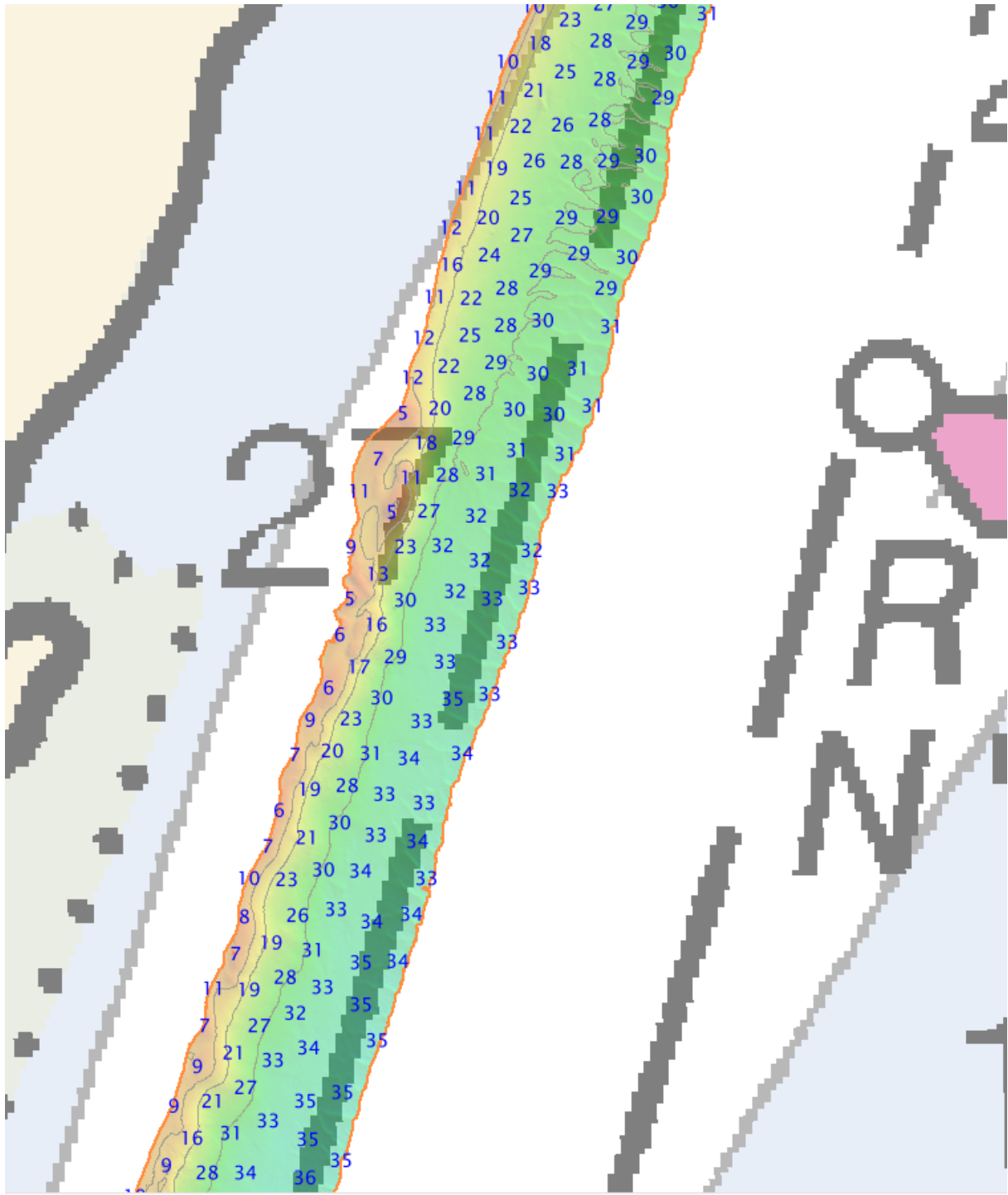


Figure 4: Northern portion of area DtoN.

Office Notes: Concur

F00658 Area DtoN 2

Registry Number: F00658
State: New York
Locality: Hudson River
Sub-locality: Southern Approach to Athens, NY
Project Number: S-B929-NRT5-15
Survey Dates: 08/14/2015 - 09/10/2015
Raster Chart (ENC): 12347 (US5NY43M)

Remarks:

During data acquisition for hydrographic survey F00658, significant discrepancies were observed between the survey data and the charted depths on the southern approach to Athens, NY, just southwest of Middle Ground Flats.

Although the main channel and most vessel traffic follows the eastern side of Middle Ground Flats, vessels transiting to the town of Athens, NY travel up the west side of the island. When approaching the waterway from the south, the chart leads the mariner to believe that there is 19 to 21 feet of water if slightly favoring the eastern side of the waterway. Surveyed soundings indicate that there is only 11-12 feet of water in this area, and that slightly deeper water is actually found 100-200 meters to the west.

The shoaling is too widespread to be depicted with a point feature; therefore a survey scale sounding plot was generated, and is included with this report. The shape file F00658_Dton_Soundings_Area5.shp is in Geographic Lat/Long – NAD83 coordinates.

This survey was acquired to the Ellipsoid. Soundings have been translated to Hudson River Datum.

Hydrographer Recommendations:

Update contours and soundings to reflect the current survey data.

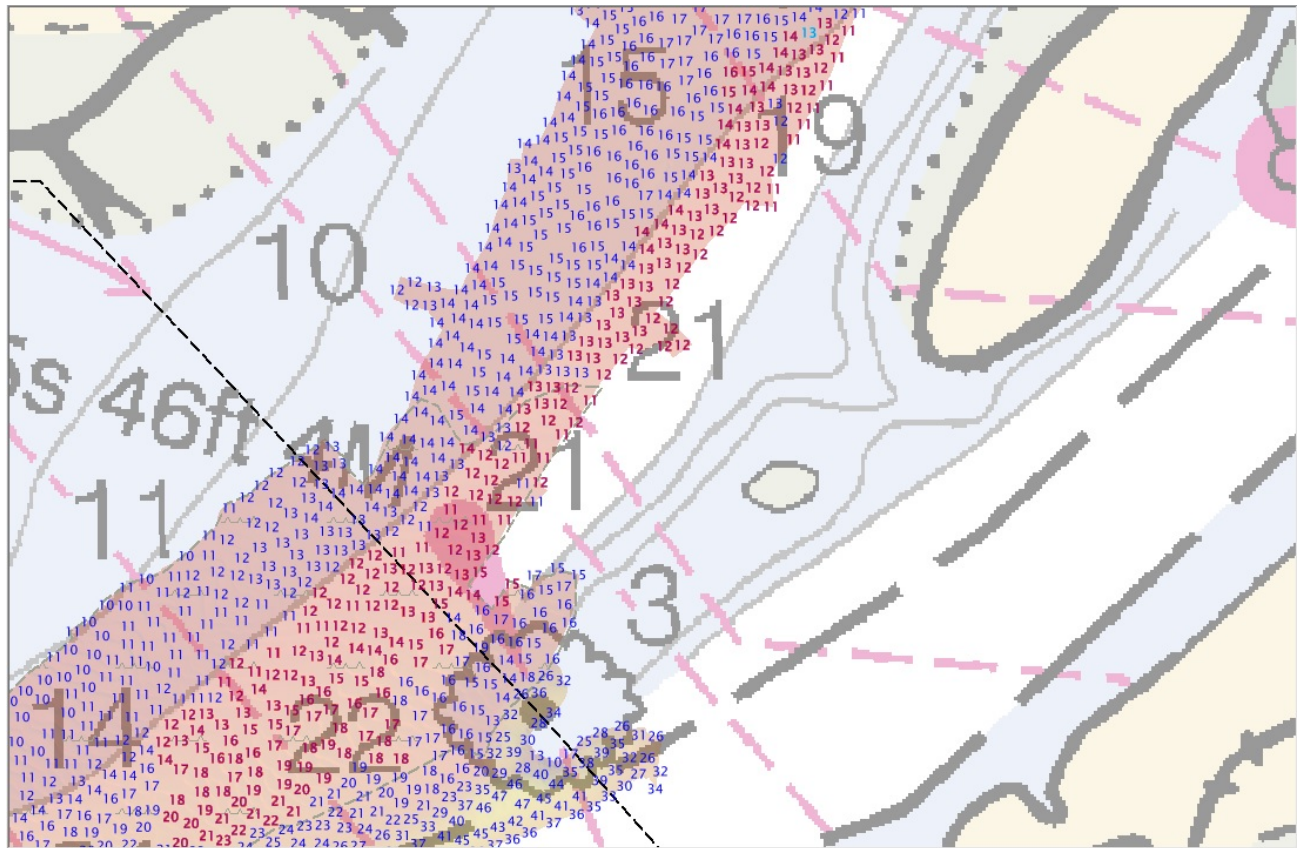


Figure 1: Overview of Area DtoN, specific soundings highlighted in red.

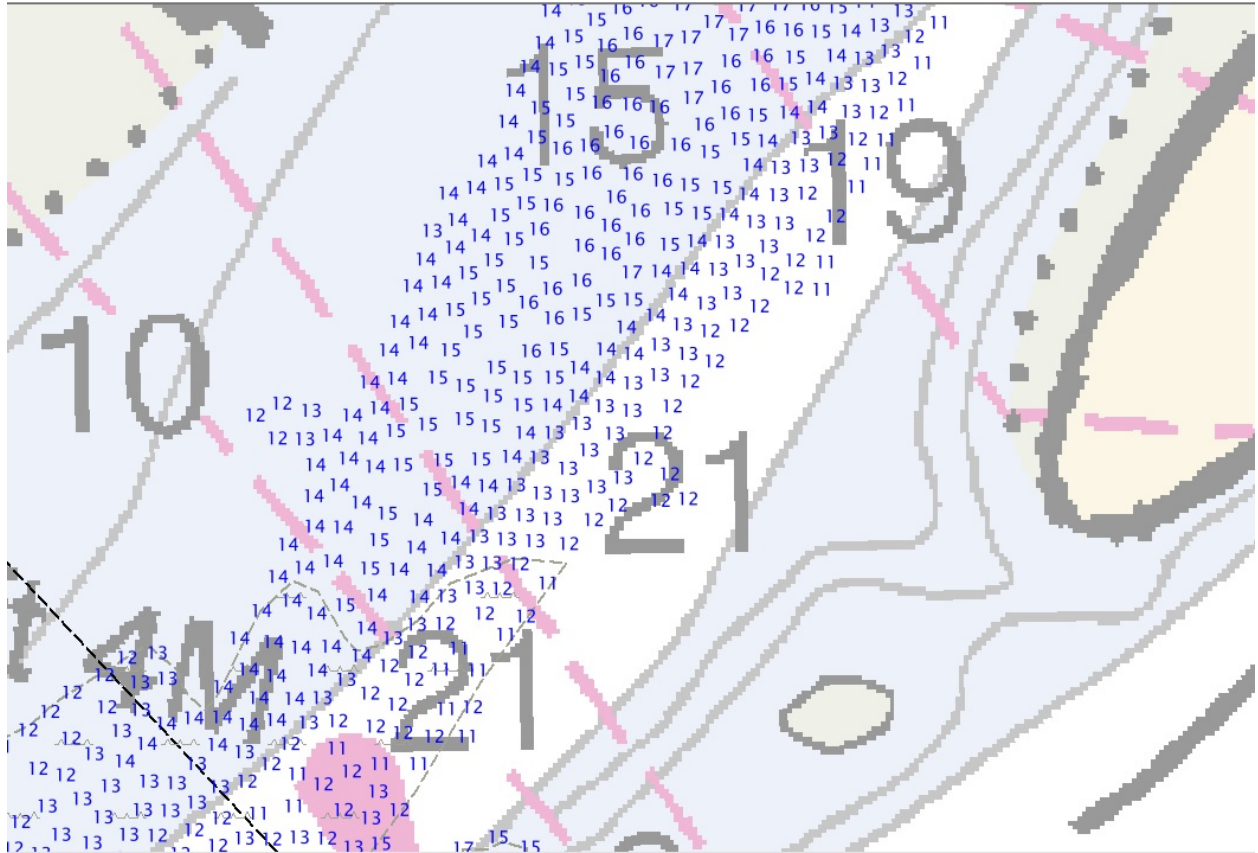


Figure 2: Close view of chart discrepancy.

Office Notes: Concur

F00658 Area DtoN 3

Registry Number: F00658
State: New York
Locality: Hudson River
Sub-locality: North Germantown, NY
Project Number: S-B929-NRT5-15
Survey Dates: 08/14/2015 - 09/10/2015
Raster Chart (ENC): 12347 (US5NY43M)

Remarks:

During data acquisition for hydrographic survey F00658, significant discrepancies were observed between the survey data and the charted depths approximately 0.8 NM northeast of Cementon, NY and 0.25 NM south of the "CB" (Fl 6s 27ft) aid to navigation.

In this location a charted shoal exists in the middle of the river. The extents of this shoal appear to extend further to the southeast than they are presently charted. Soundings of 6 to 11 feet are present outside of the 18 foot contour.

The shoaling is too widespread to be depicted with a point feature; therefore a survey scale sounding plot was generated, and is included with this report. The shape file F00658_Dton_Soundings_Area6.shp is in Geographic Lat/Long – NAD83 coordinates.

This survey was acquired to the Ellipsoid. Soundings have been translated to Hudson River Datum.

Hydrographer Recommendations:

Update contours and soundings to reflect the current survey data.

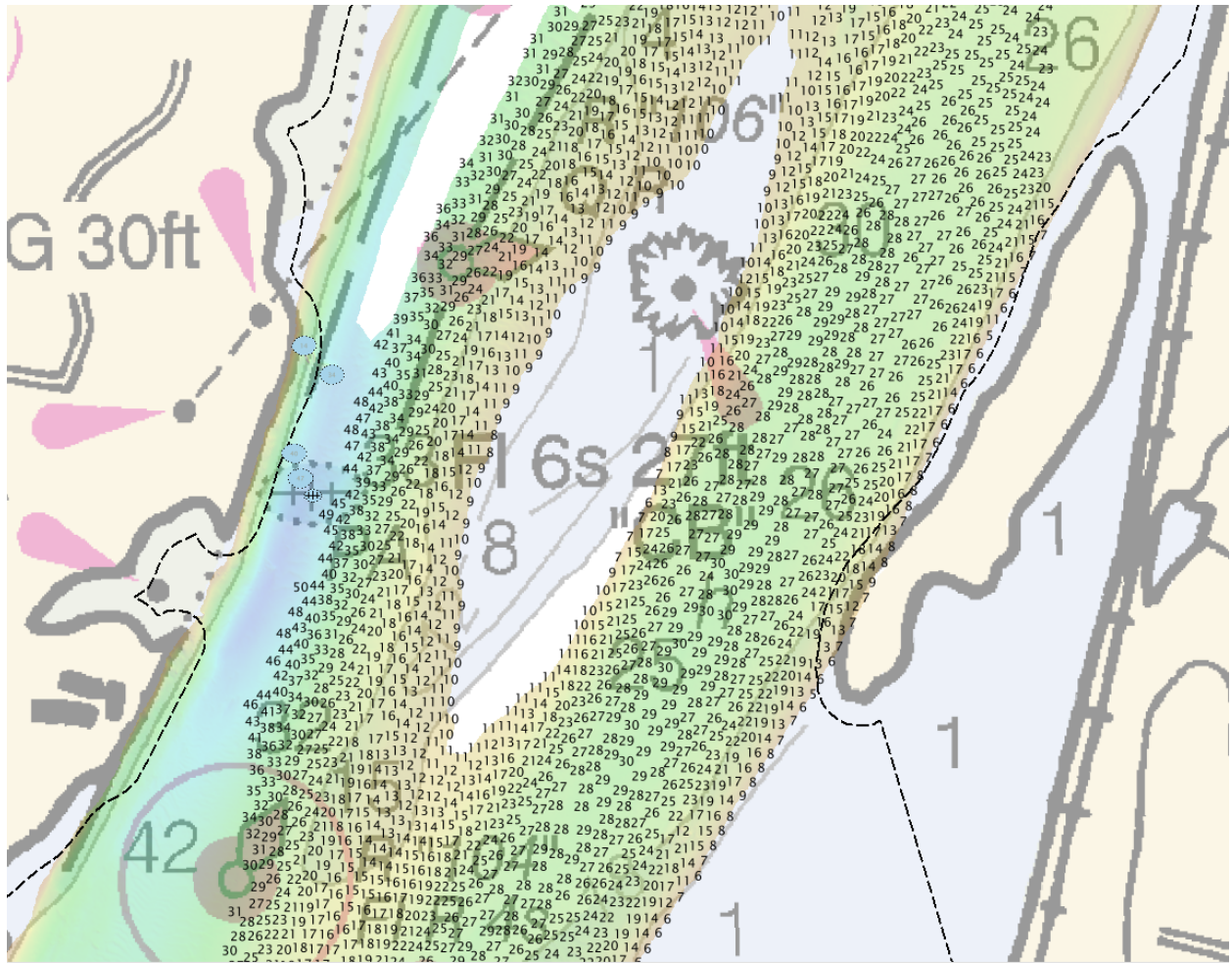


Figure 1: Overview of Area Dton.

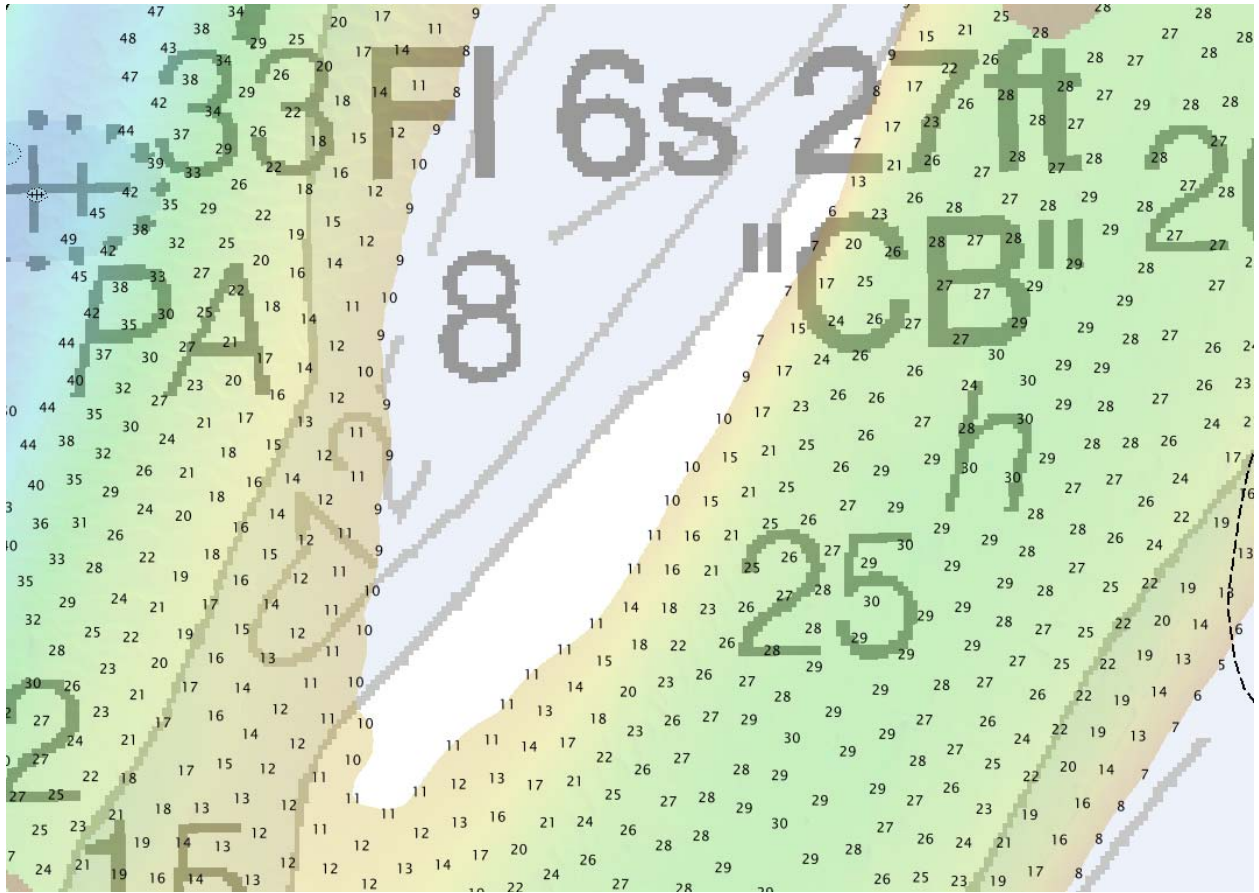


Figure 2: Close view of chart discrepancy.

Office Notes: Concur

Wreck Report

Survey: F00658
Project: S-B929-NRT5-15
Locality: Hudson River, New York
Charts: Charts 12347, 12348, US5NY43M and US5NY44M

Description: Three uncharted wrecks were found as a result of the survey.

(1) Chart new wreck:

Geographic Position: 42°14'15.548"N Lat., 073°50'37.141"W Long.
Value of Sounding (VALSOU): 23.225 ft.
Water Level Effect (WATLEV): always underwater
Source Date (SORDAT): 20150910
Source Indication (SORIND): US,US,graph,F00658

(2) Chart new wreck:

Geographic Position: 42°11'32.834"N Lat., 073°51'24.819"W Long.
Value of Sounding (VALSOU): 25.302 ft.
Water Level Effect (WATLEV): always underwater
Source Date (SORDAT): 20150910
Source Indication (SORIND): US,US,graph,F00658

(3) Chart new wreck:

Geographic Position: 42°14'50.911"N Lat., 073°49'25.776"W Long.
Value of Sounding (VALSOU): 23.225 ft.
Water Level Effect (WATLEV): always underwater
Source Date (SORDAT): 20150910
Source Indication (SORIND): US,US,graph,F00658

APPROVAL PAGE

F00658

Data partially meet 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 specific areas as delineated during office processing.

The following products will be sent to NGDC for archive:

- F00658_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records

The survey evaluation and verification has been conducted according current OCS Specifications.

Approved: _____

Annie Raymond

Acting Cartographic Team Lead, Pacific Hydrographic Branch

The survey has been approved for dissemination and limited usage of updating NOAA's suite of nautical charts.

Approved: _____

CDR Benjamin K. Evans, NOAA

Chief, Pacific Hydrographic Branch