

W00438

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

DESCRIPTIVE REPORT

Type of Survey: External Source Data

Registry Number: W00438

LOCALITY

State(s): New York

General Locality: North Atlantic Ocean

Sub-locality: New York Bight

2017

NOAA Ship Nancy Foster

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

W00438

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: **North Atlantic Ocean**

Sub-Locality: **New York Bight**

Scale: **1:40000**

Dates of Survey: **10/01/2017 to 10/09/2017**

Project Number: **ESD-AHB-18**

Data Source: **NOAA Ship Nancy Foster**

Chief of Party: **Timothy Battista**

Soundings by: **multibeam sonar**

Imagery by: **multibeam 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 Centers for Environmental Information (NCEI) and can be retrieved via <http://www.ncei.noaa.gov/>.

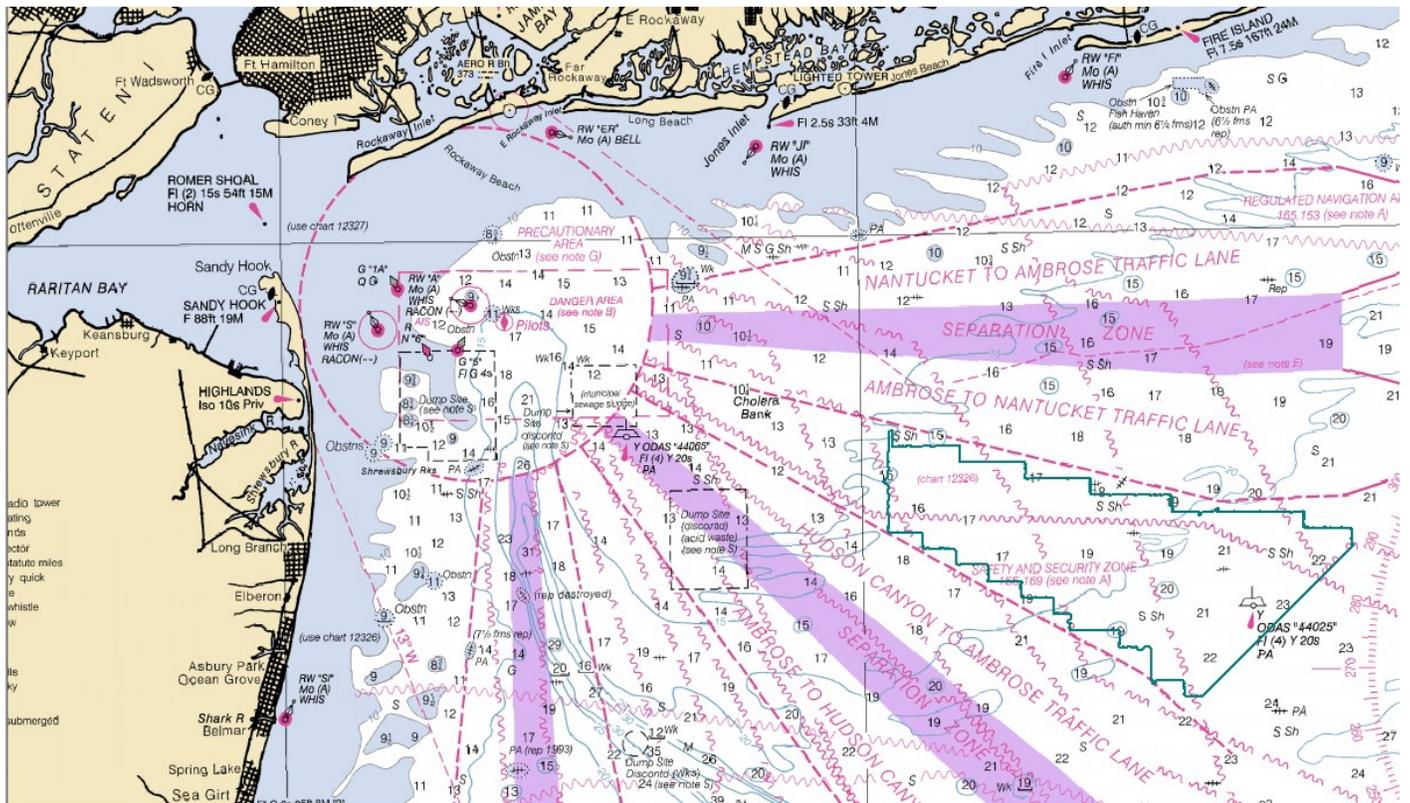
Descriptive Report Summary W00438	
Project	ESD-AHB-18
Survey	W00438
State	New York
Locality	North Atlantic Ocean
Sub Locality	New York Bight
Scale of Survey	1:40000
Sonars Used	
Horizontal Datum	North American Datum 1983
Vertical Datum	Mean Lower Low Water
Vertical Datum Correction	TCARI
Projection	Projected UTM 18
Field Unit	NOAA Ship <i>Nancy Foster</i>
Survey Dates	10/01/2017 - 10/09/2017
Chief of Party	Timothy Battista

A. Area Surveyed

This hydrographic survey was conducted without formal project instructions. The registry number for this survey was provided after data acquisition had been completed. The survey was referred to as NF1709-NY-Bight during field acquisition and post-processing.

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
40° 22' 21" N 73° 28' 56" W	40° 11' 29" N 73° 4' 36" W



Survey Area (green)

B. Survey Purpose

The project provided bathymetric data in support of offshore wind farm planning off the coast of New York. Bathymetric data from the project was collected with multibeam echosounders (MBES) and will also be utilized by the Office of Coast Survey (OCS) to update the nautical charts in the surveyed area.

C. Intended Use of Survey

The entire survey is adequate to supersede previous data.

The survey is recommended for charting.

This survey was funded by the Bureau of Ocean Energy Management (BOEM) for offshore wind farm development. Data were acquired and processed to meet IHO Order 1 specifications however, weather impacted the survey quality as detailed in Uncertainty section of this report.

MBES backscatter was logged in the Kongsberg SIS format and Reson Hypack formats. Data were processed and evaluated by NCCOS with a combination of Fledermaus FMGT and the Hypack implementation of Geocoder. The backscatter data was used in combination with the bathymetry to create Principal Component Analysis surfaces in

ArcGIS and ENVI to segment areas of difference. This information will be used to characterize benthic habitats in the surveyed regions.

D. Data Acquisition and Processing

No Data Acquisition and Processing Report is provided with this survey.

The NOAA ship Nancy Foster (R352) was the platform for this survey. Major components are provided in the Table: Major Survey Components.

Software Updates

There are no processing software updates to report. The POS MV firmware (SW08.63-Jul12/16) used for this project is before the latest leap second adjustment (which occurred on December 31, 2016) and should be updated onboard the Nancy Foster if it has not already been.

Calibrations

No additional calibration tests were conducted.

Corrections to Echo Soundings

Data processing followed the typical CARIS HIPS CUBE processing pipeline except for tidal reduction, which was done using TCARI (see CUBE Processing Workflow). Please note, since TCARI correction was completed outside of CARIS HIPS it is not reflected in the HIPS Log Viewer.

GPS Waterlevels

An observable vertical step of 0.3 m was observed on DN279 and DN280. To reduce this offset, GPS waterlevels were computed using a height correction to MLLW. The correction was determined using NOAA's Vdatum transformation tool (v3.7). A single point correction was determined from the average differences between the ellipsoid and tidal datum (please see VDatum tab of NF-17-09-NY-Bight_ProcessingLog and NF-17-09-NY-Bight_POSPAC_Processing for details). The correction was applied during "Compute GPS Waterlevels" in CARIS Hips. Approval for the use of GPS waterlevels is included in the folder Correspondence, submitted with this dataset.

HVF

The Processor was unable to verify the offsets in Transducer 1 of the HVF for both the Reson 7125 and Kongsberg EM710. The small differences between the processor calculated offsets (based on offset survey: Nancy Foster Mar 2015-2R_v5) and HVF be might related to the custom sonar mounts. The offsets for the EM710 were entered during acquisition and were reviewed by dumping an .ALL survey line.

The NF7125-SV2_400khz_512_2016 vessel file was modified slightly. The pitch and roll alignment offsets were moved to SVP1 as advised by CARIS for proper sound speed correction. This is best practice for large lever arms. Although the pitch and roll alignment offsets on the Nancy Foster are relatively small, the processor was attempting to help mitigate an observable motion artifact in the dataset prior to post processing. This artifact is described in detail later in this report.

Sound Speed

An OceanScience uCTD was the primary sound velocity acquisition device. The uCTD were deployed in approximately 4 hour increments during survey and actions were taken to distribute the casts evenly throughout the survey area. Sound speed was applied in CARIS using the “nearest in distance within time (4 hours)” option. One survey line was processed using a 5 hour profile method see: *Spatial Distribution of Sound Speed Casts*.

Post Processed Attitude and Uncertainties

The data converted onboard the Nancy Foster has a one second offset between the real-time and the post processed attitude. Navigation and attitude data were time synced in CARIS by applying -1.0 second time offset during load for Delayed Heave and SBET. Further testing indicates this offset might be the result of CARIS HIPS version used in the field versus in the office. Survey lines converted in CARIS version 9.1.11 did not require the -1 second time offset.

Custom SBETs were exported and applied to all the data to shift the acquisition reference frame of ITRF2014 to NAD83, as detailed in Vertical and Horizontal Control section of this report.

Surfaces

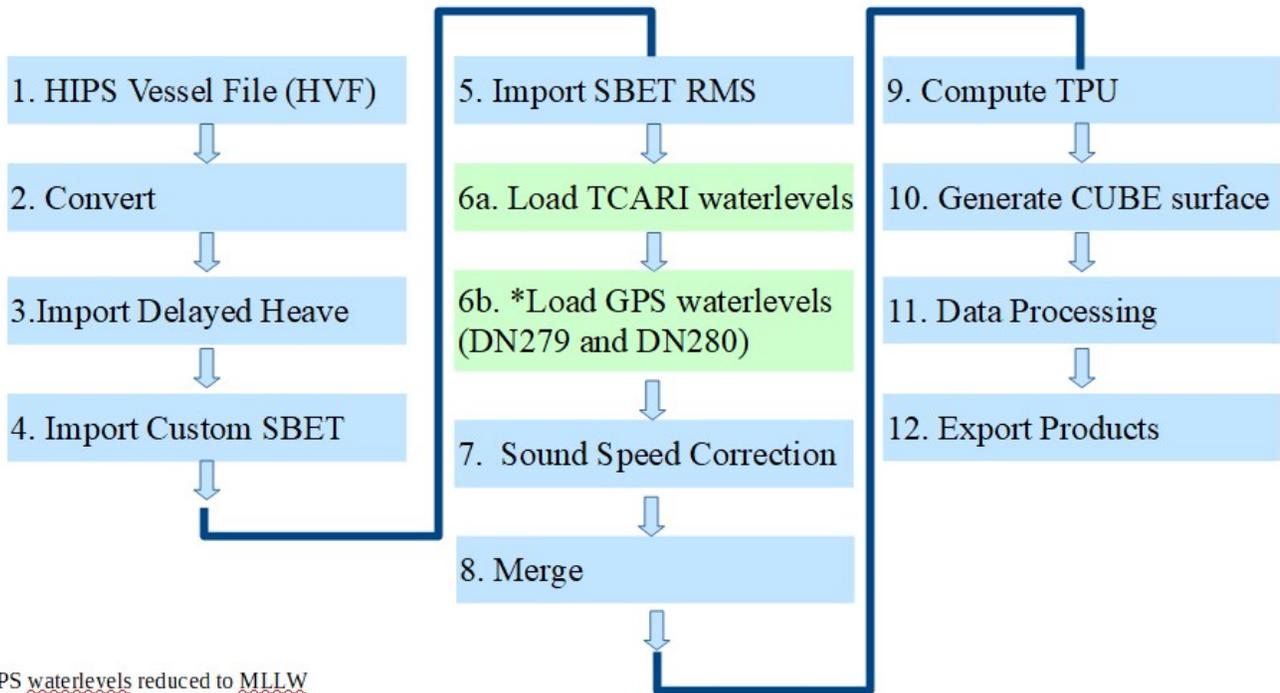
Bathymetric grids were created relative to Mean Lower Low Water (MLLW) in CUBE format using complete coverage resolution requirements as described in the HSSD and using the CUBEParams_NOAA.xml file. As result of marginal survey conditions, small holidays were created throughout the project area.

<i>Type</i>	<i>Manufacturer</i>	<i>Model</i>
Multibeam Echosounder	Kongsberg	EM710
Multibeam Echosounder	Reson	7125
Surface Sound Speed	Reson	SVP-71 (2)
Primary Sound Speed Profiler	OceanScience	uCTD
Secondary Sound Speed Profiler	Sea-Bird	SBE-19
Positioning & Attitude	Applanix	POS/MV 320 v4
Positioning & Attitude	Trimble	DSM132

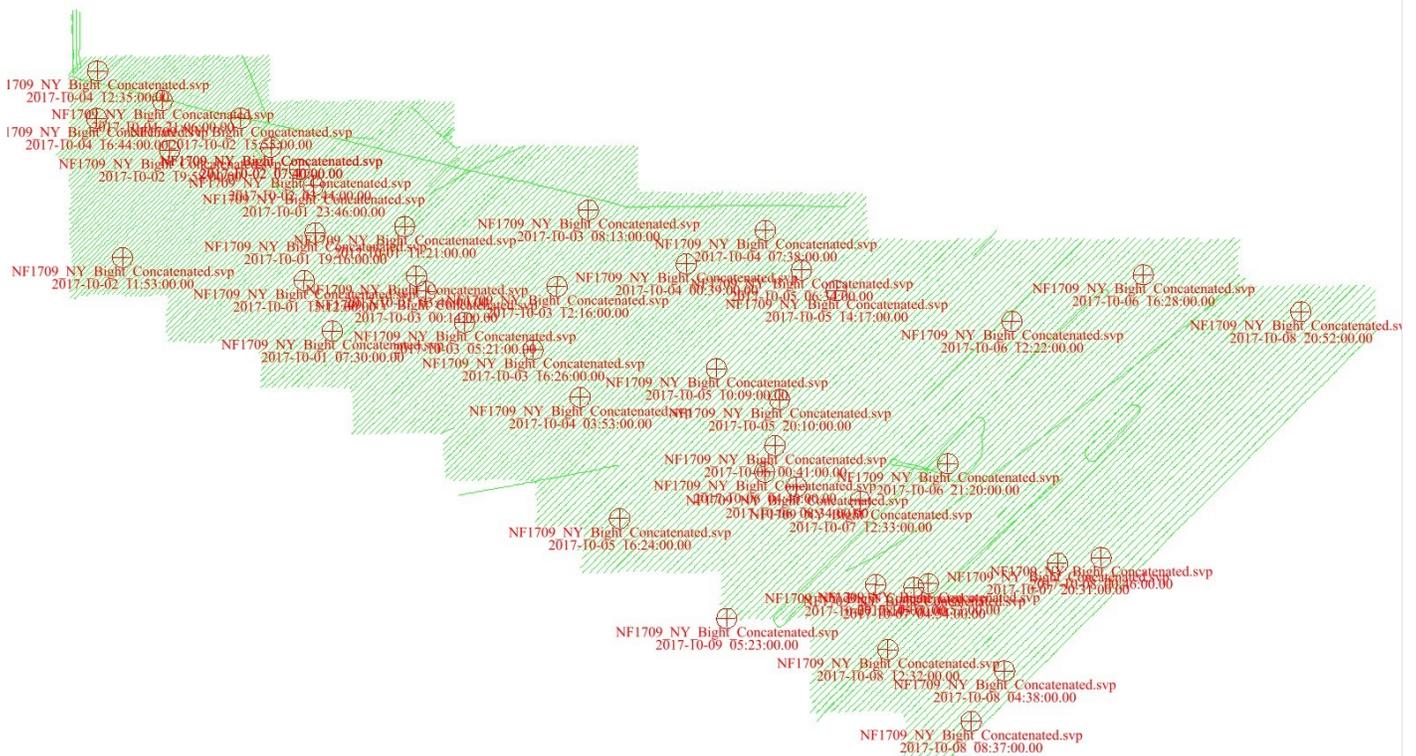
Major Survey Components



NOAA Ship Nancy Foster



CUBE Processing Workflow



Spatial Distribution of Sound Speed Casts

E. Uncertainty

Results from the crossline analysis, final CUBE surface uncertainties, the Total Vertical Uncertainties (TVU QC), and standard deviation statistics computed for each 100% multibeam surface indicate internal consistency of the MBES data within IHO Order 1 specifications.

TPU

The TPU section of the NF7125-SV2_400khz_512_2016.hvf had not been updated for the March 2015 survey (see 7125 TPU field offsets). The MRU to Trans values for X, Y, and Z were updated in the CARIS vessel file for this project (see 7125 Updated TPU offsets). The TPU offsets entered in NF_EM710_2016.hvf did not match the vessel survey. These values have been updated based on the offsets in the vessel survey (see 710 TPU offsets).

Survey specific uncertainty parameters for tide and sound speed are included in the Table: TPU Values for Tide and Sound Speed. The TCARI methodology for tidal correction creates an uncertainty model by propagating water level uncertainties, datum uncertainties, and TCARI grid vertical uncertainties. This error budget overwrites previously-defined error sources in CARIS and is applied as part of the TPU processing.

During surface finalization in HIPS, the "greater of the two" option was selected, where the calculated uncertainty from Total Propagated Uncertainty (TPU) is compared to the standard deviation (StdDev) of the soundings influencing the node, and where the greater value is assigned as the final uncertainty of the node. The uncertainty of the finalized surface increased for nodes where the StdDev of the node was greater than the TPU.

The resulting "greater of the two" calculated uncertainty values of all nodes in the 2m finalized surface range from 0.23 m to 1.02 m. The maximum uncertainty values are associated with a high standard deviation in the depth surface caused by steep and irregular features on the sea floor.

Sonar QC Checks

As an additional internal quality check the 2m CUBE surface for the EM710 data was differenced from the 2m CUBE surface created for the 7125. Differences between these two surveys averaged 0.1m with a standard deviation value of 0.06m. The maximum differences are on steep features.

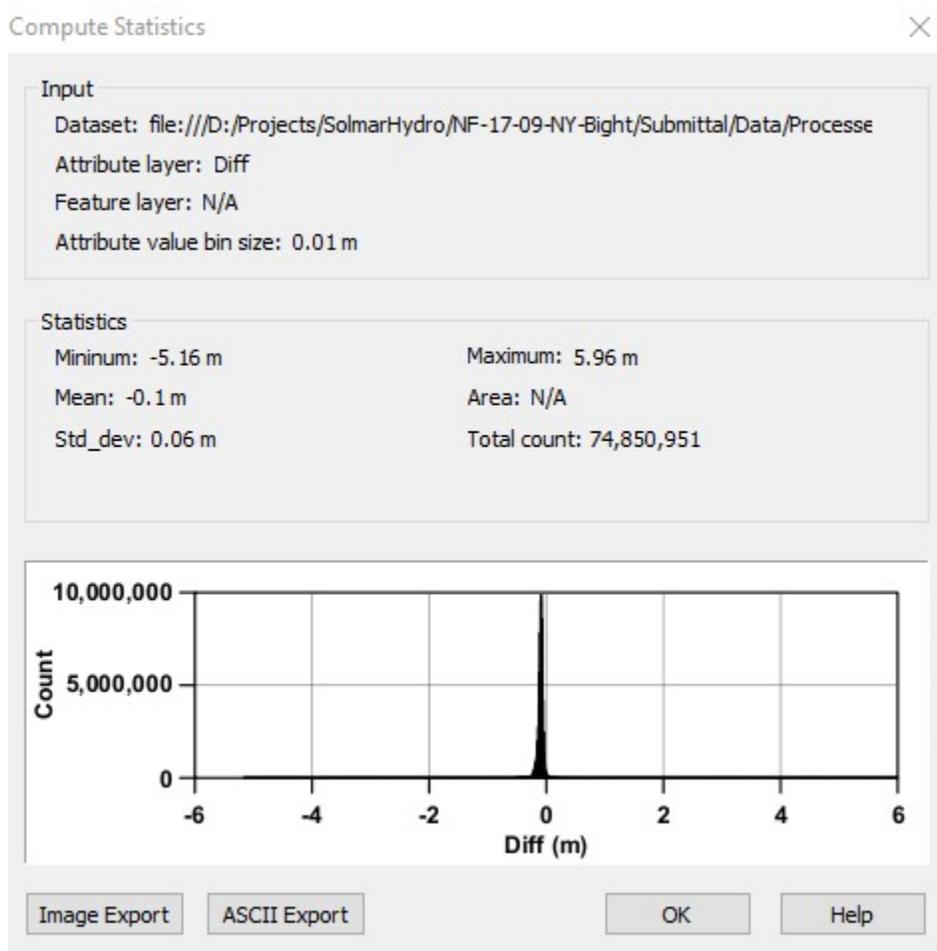
Equipment Effectiveness

Both the Kongsberg EM710 and the Reson 7125 have observable motion artifacts. The node standard deviation child layer in CARIS was employed to review and edit all nodes with a standard deviation of 0.5m or greater in subset mode. The highest standard deviations tended to be the difference between the peaks and troughs of the motion artifact. Rejecting data related to the motion artifact created numerous small holidays in the final 2m CUBE surface. These areas were manually inspected for features prior to editing. An interpolated surface from the finalized 2m CUBE was created to aid in the characterize benthic habitats.

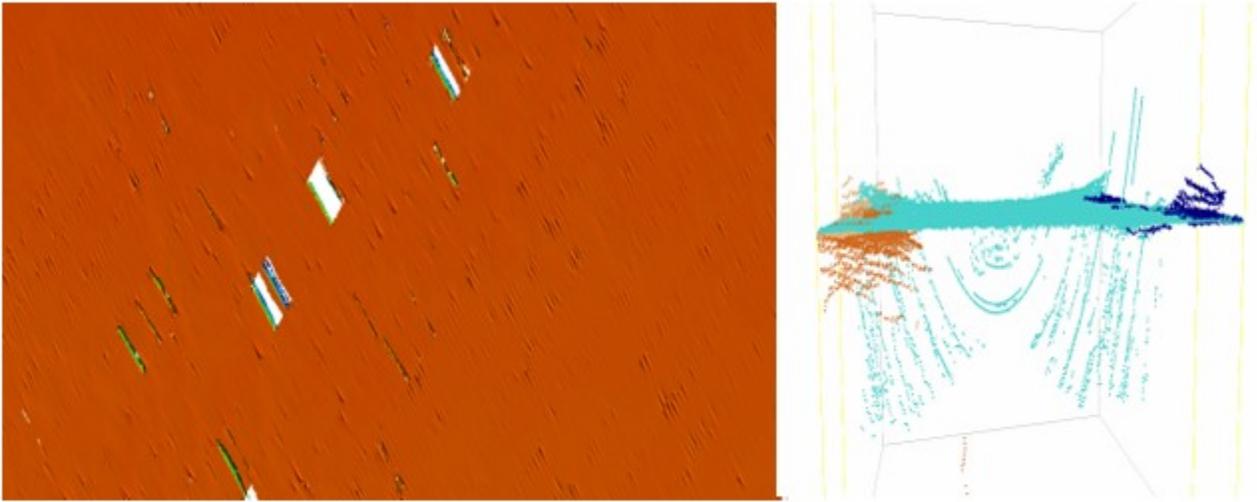
Although high sea state did impact the survey it was not detrimental to the determination of feature detection within the coverage area (see Example Post Processing Quality) .

<i>Total Propagated Uncertainty Computation in CARIS HIPS*</i>		
<i>Tide Values</i>	<i>Uncertainty* (m) Source</i>	<i>Day Number Range</i>
Tide Value Measured	TCARI	274- 278, 281-282
Tide Value Measured	POSPac	279-280
Tide Value Zoning	TCARI	274- 278, 281-282
Tide Value Zoning	POSPac	279-280
<i>Sound Speed Values</i>	<i>Uncertainty* (m/s)</i>	<i>Day Number Range</i>
Sound Speed Measured	0.7	all
Surface Sound Speed	0.5	all

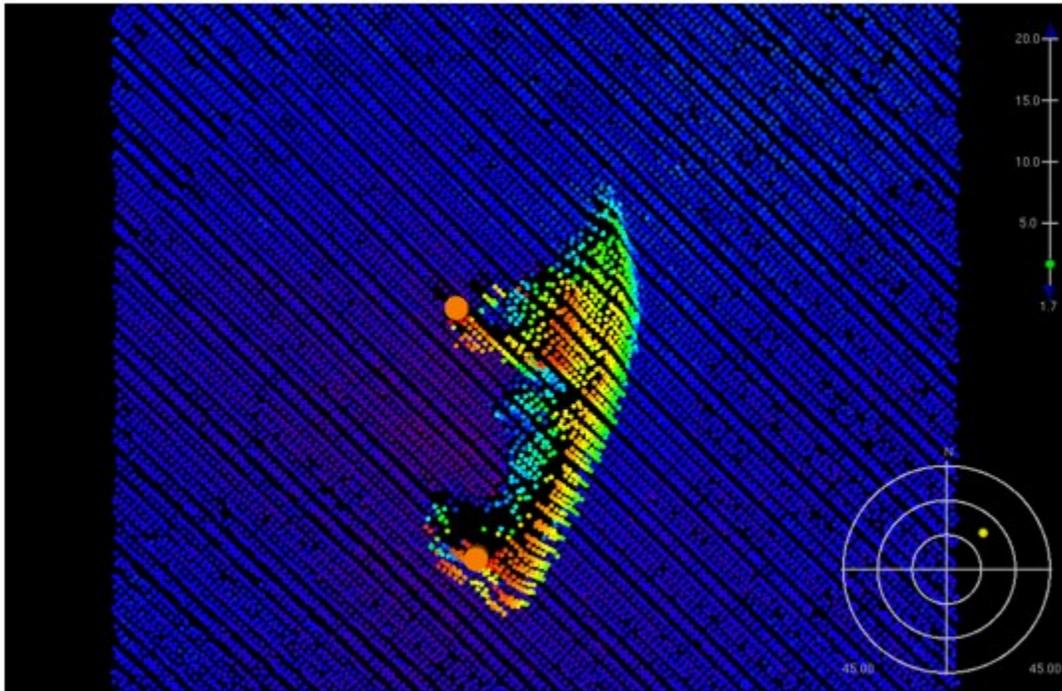
TPU Values for Tide and Sound Speed



EM710 and Reson 7125 2m Surface Difference



Typical Motion Artifact Prior to Data Processing in EM710 (3x vertical exaggeration, 2m CUBE surface)



Example Post Processing Quality

	MRU to Trans ...	MRU to Trans ...	MRU to Trans ...	Nav to Trans X...	Nav to Trans Y...	Nav to Trans Z...	Trans Roll (deg)
	-0.537	-2.178	1.084	5.280	-8.755	17.377	0.000

Previous 7125 TPU Offsets

	MRU to Trans ...	MRU to Trans ...	MRU to Trans ...	Nav to Trans X...	Nav to Trans Y...	Nav to Trans Z...	Trans Roll (deg)
▶	-1.3851	-3.7914	1.1455	5.280	-8.755	17.377	0.000

7125 Updated TPU Offsets

	MRU to Trans ...	MRU to Trans2...	MRU to Trans ...	MRU to Trans2...	MRU to Trans ...	MRU to Trans2...	Nav to Trans X...	Nav to Trans2 ...	Nav to Trans Y...	Nav to Trans2 ...	Nav to Trans Z...	Nav to Trans2 ...	Trans Roll (deg)	Trans Roll 2 (d...
1	1.856	0.000	0.074	0.000	1.800	0.000	6.596	0.000	5.760	0.000	17.984	0.000	-0.014	0.000
2	0.163	0.000	-1.457	0.000	1.424	0.000	6.657	0.000	6.423	0.000	17.665	0.000	-0.014	0.000
3														

710 TPU Offsets (Row 1 Previous, Row 2 updated)

F. Results and Recommendations

The following are the largest scale RNC and ENC, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4NY1BM	1:80000	6	10/04/2017	02/06/2018	NO
US3NY01M	1:400000	39	12/22/2017	01/09/2018	NO

The chart comparison was performed by comparing a depth CUBE layer to the largest scale charts.

US4NY1BM

Surveyed soundings generally compare well with ENC US4NY1BM (RNC 12326), with the average difference of a foot or less. This survey found some minor shoaling within the charted 120- foot contour.

US3NY01M

Similar results were found for the ENC US3NY01M (RNC 12300).

An ENC to RNC comparison revealed that the same sounding information was used to derive both types of charts.

Additional affected RNCs:

13003

13006

5161

Dangers to Navigation

No Dangers to Navigation (DtNs) were reported for this survey.

Shoal and Hazardous Features

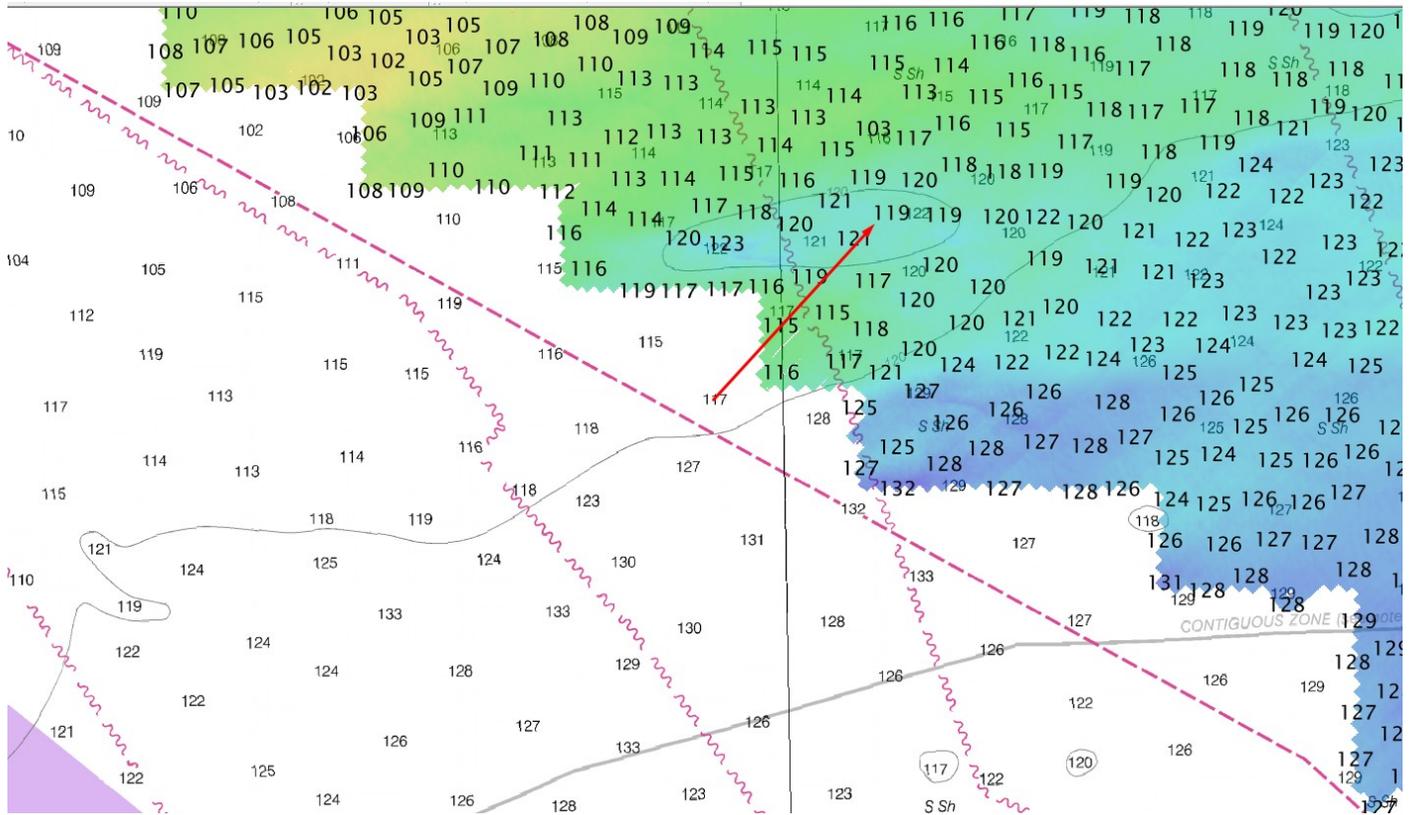
No shoals or potentially hazardous features were located within the survey area.

Channels

The survey area does not contain any anchorage areas, maintained navigation channels or channel lines.

Bottom Samples

There was no bottom sample requirement for this survey.



12326 Chart Comparison (soundings in feet)

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
W00438_710_7125_2m_MLLW_1of1_Final	CUBE	2 m	26.10 m - 42.99 m	Final	Coverage
W00438_710_7125_2m_MLLW_1of1_Final_Interp	CUBE	2 m	26.10 m - 42.99 m	Interpolated	Coverage

G. Vertical and Horizontal Control

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

The vertical control method used for this survey was TCARI.

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

Station Name	Station ID
Lewes, DE	8557380
Cape May, NJ	8536110
Atlantic City, NJ	8534720
Sandy Hook, NJ	8531680
Montauk, NY	8510560

The NWLON stations provided residuals for this project.

The vertical datum for this project is MLLW 83-01 NTDE. Tidal data was applied with a finalized TCARI grid (NF1712.tc) supplied by CO-OPS with verified tides values obtained from the assigned NWLON tide gauges.

The horizontal datum for this project is North American Datum 1983. The projection used for this survey is Projected UTM 18.

The following DGPS Stations were used for horizontal control:

DGPS Stations

The coordinate system for this survey is UTM NAD83, Zone 18N. Data were acquired with Marinestar corrections on ITRF2014. The difference between ITRF2014 and NAD83(2011) in this area is approximately a meter horizontally. Navigation and attitude data were adjusted in POSpac to NAD83 by exporting a custom SBET using NAD83 (2011) 2017.756 mapping frame.

H. Additional Results

Shoreline

Shoreline investigation was not assigned for this project.

Prior Surveys

Aside from previously discussed charted comparisons, no comparisons with prior surveys were conducted.

Aids to Navigation

A charted lighted buoy was not verified.

Overhead Features

There were no overhead bridges, cables, or other structures which would impact overhead clearance in the survey area.

Submarine Features

The survey area contains charted cable features, no cables were observed on the seafloor.

Ferry Routes and Terminals

There were no ferry routes or terminals within the survey area.

Platforms

There were no platforms within the survey area.

Significant Features

No additional information of scientific or practical value was observed during the survey other than the benthic habitat characterization maps created by the NCCOS scientific party.

Construction and Dredging

There was no construction or dredging activities observed during survey operations.

NEW SURVEY RECOMMENDATIONS

No new survey or further investigations are recommended for this area.

Inset Recommendations

No inset recommendations are requested at this time for the surveyed area.

I. Approval

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 Survey Summary 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, 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 Survey Summary Report.

Approver Name	Title	Date	Signature
Michael Stecher	Lead Hydrographer	03/07/2018	Mike Stecher <small>Digitally signed by Mike Stecher DN: cn=Mike Stecher, o=Solmar Hydro Inc, ou=SHI, email=solmarhydro@gmail.com, c=US Date: 2018.03.12 09:01:44 -07'00'</small>

mike@solmarhydro.com

November 03, 2017

MEMORANDUM FOR: Gerald Hovis, Chief, Products and Services Branch, N/OPS3

FROM: Mike Stecher-CCMA, Nancy Foster

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

1. Tide Note
2. Final TCARI grid
3. Six Minute Water Level data (Co-ops web site)

Transmit data to the following:

mike@solmarhydro.com

These data are required for the processing of the following hydrographic survey:

Project No.: NF-17-09-NY

Registry No.:

State: NY

Locality: NY Bight

Sublocality:

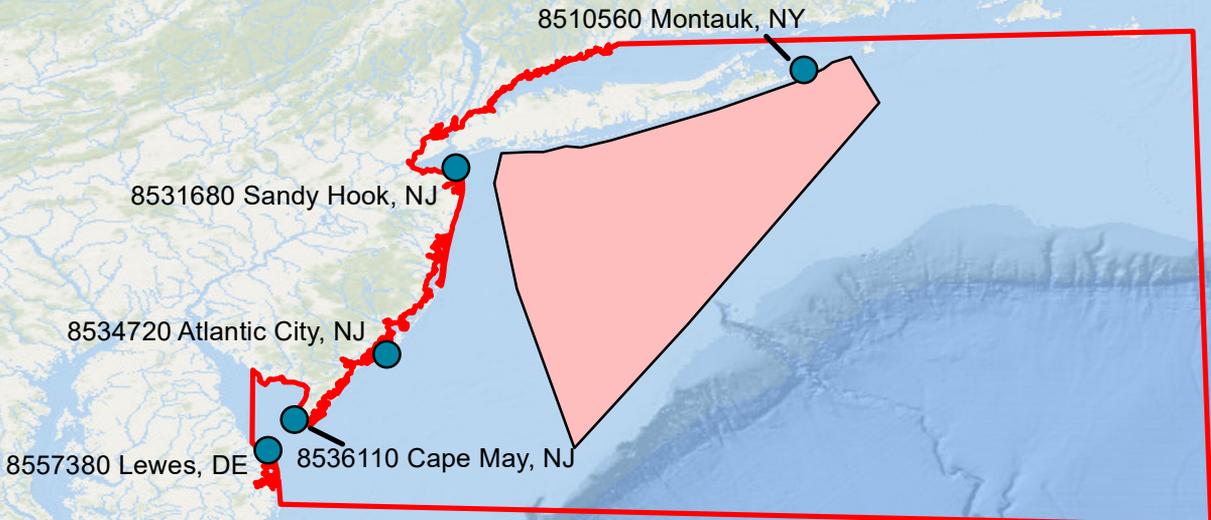
Attachments containing:

- 1) an Abstract of Times of Hydrography,
- 2) digital MID & MIF files of the track lines from Pydro

cc: tim.battista@noaa.gov

Year_DOY	Min Time	Max Time
2017_272	22:02:15	22:31:45
2017_273	16:52:33	23:43:10
2017_274	00:01:37	23:54:54
2017_275	00:08:52	23:54:38
2017_276	00:05:36	23:54:37
2017_277	00:17:59	23:40:54
2017_278	00:03:26	23:55:13
2017_279	00:06:03	23:54:29
2017_280	00:05:18	23:55:26
2017_281	00:06:46	23:55:41
2017_282	00:12:12	09:32:40

Preliminary TCARI Boundary for NF-17-12 NY Bight





Shyla Allen <shyla.allen@gmail.com>

Fwd: Project Instructions for NF-17-12 NY Bight

mike stecher <solmarhydro@gmail.com>
To: Shyla Allen <shyla.allen@gmail.com>

Fri, Jan 19, 2018 at 11:04 AM

----- Forwarded message -----

From: **Tim Battista - NOAA Federal** <tim.battista@noaa.gov>
Date: Wed, Jun 28, 2017 at 8:35 AM
Subject: Fwd: Project Instructions for NF-17-12 NY Bight
To: Mike Stecher <solmarhydro@gmail.com>, Will Sautter <will.sautter@noaa.gov>, Rachel Husted <rachel.husted@noaa.gov>, Ayman Mabrouk - NOAA Affiliate <ayman.mabrouk@noaa.gov>

----- Forwarded message -----

From: **Louis Licate - NOAA Federal** <louis.licate@noaa.gov>
Date: Wed, Jun 28, 2017 at 11:33 AM
Subject: Project Instructions for NF-17-12 NY Bight
To: Tim Battista - NOAA Federal <tim.battista@noaa.gov>, Gerald Hovis - NOAA Federal <gerald.hovis@noaa.gov>, HPT list <nos.coops.hpt@noaa.gov>



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

DATE: 06/28/2017

MEMORANDUM FOR: Tim Battista

Oceanographer, Biogeography Branch, N/CS31

FROM: Gerald Hovis

Chief, Products and Services Branch, N/OPS3

SUBJECT: Delivery of Tide Requirements for Hydrographic Surveys

Tide requirements for hydrographic survey project NF-17-12 NY Bight are are being provided in Microsoft Word format. A .ZIP file containing all pertinent files, as well as a graphic in PDF, is attached to this email and posted to the Sharepoint website under the project name "NF-17-12". Six minute preliminary data for Montauk, NY (8510560), Sandy Hook, NJ (8531680), Atlantic City, NJ (8534720), Cape May, NJ (8536110), and Lewes, DE (8557380) may be retrieved in one month increments over the internet from the CO-OPS SOAP web services at <https://opendap.co-ops.nos.noaa.gov/axis/text.html> by clicking on "Six Minute Data".

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Louis Licate

NOAA/NOS/CO-OPS

1305 East-West Highway, 11337
Silver Spring, MD 20910
Office: [301-734-1139](tel:301-734-1139)
Cell: [301-806-0908](tel:301-806-0908)

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Tim Battista
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(p) [240-533-0379](tel:240-533-0379)
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(email) Tim.Battista@noaa.gov
<https://coastalscience.noaa.gov>

"Essentially, all models are wrong, but some are useful."
-George E.P. Box

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Mike Stecher C.H.
Solmar Hydro Inc.
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Cell: (206) 200 8269
Email: solmarhydro@gmail.com



NF1712.zip
6694K

NF1709 NY Bight

Multibeam Processing Report

This report is meant to give a brief over-view of the data processing procedures. For details on the processing pipeline please refer to the CARIS and POSPAC processing logs, submitted with the dataset.

Data Acquisition and On-board Processing

Vessel POS/MV

Data converted on the Nancy Foster has a one second offset between the real-time and the post processed attitude. The navigation and attitude data were time synced in CARIS by applying -1.0 second time offset when loading Delayed Heave and SBET. Survey lines converted in field are reported in CARIS HIPS Log Viewer (version 9.1.11) as “unknown process.” It is unknown to the processor if this related to newer version of HIPS used by the field. It should be noted survey lines converted by the processor did not require the -1 second time offset.

The firmware of the POS/MV, SW08.63-Jul12/16, on the Nancy Foster is before the latest leap second adjustment (December 31, 2016). It is possible this may have resulted in the timing offset.

Geodetic Parameters

The coordinate system for this survey is UTM NAD83, Zone 18N. Data were acquired with Marinestar corrections on ITRF2014. The difference between ITRF2014 and NAD83(2011) in this area is approximately a meter horizontally. Navigation and attitude data were adjusted in post processing to NAD83 by exporting a custom Smoothed BET using NAD83 (2011) 2017.756 mapping frame. The export was verified using NOAA’s online vertical datum transformation tool.

The difference between ITRF2014 and NAD83(2011) in this area is approximately 1.2 meters vertically. Data were reduced using the NOAA supplied TCARI (version 16.6) corrections (NF1712.tc) to MLLW. GPS Heights was selected during SBET load to over-write the real time ITRF2014 corrections but, where only applied to DN279 and DN280. See the VDatum section of this report for additional details.

Data Processing

HIPS Vessel File

Pitch and Roll

The NF7125-SV2_400khz_512_2016 vessel file was modified slightly. The pitch and roll alignment offsets were moved to SVP1 for proper sound speed correction. CARIS advises this as best practice, particularly for large lever arms. Although the pitch and roll alignment offset on the Nancy Foster are relatively small, the processor was attempting to help mitigate an observable motion artifact in the dataset prior to post processing. This artifact is described in detail later in this report.

Offsets

The Processor was unable to verify the offsets in Transducer 1 of the HVF for both the Reson 7125 and Kongsberg EM710. The differences between the processor calculated offsets (based on offset survey: Nancy Foster Mar 2015-2R_v5) and HVF might related to the sonar mounts. It is advisable to review these offsets. The offset for the EM710 were entered during acquisition and were reviewed by dumping a .ALL survey line.

TPU

The TPU section of the NF7125-SV2_400khz_512_2016.hvf was not updated for the March 2015 survey. I have updated the MRU to Trans values for X, Y, and Z. The Nav to Trans offsets are close to what I have calculated. As such, the Nav to Trans offsets were not updated. The processor highly advises that all the offsets in the HVF be reviewed and the Nancy Foster Mar 2015-2R_v5 report be updated to include the sonar ACs and mount offsets. My offset calculations are shown on TPU_Comps.xlsx.

The TPU offsets entered in NF_EM710_2016.hvf did not match the result of the dump or the vessel survey. These values have been updated based on the vessel survey.

Pipeline

Data processing followed the typical CARIS HIPS CUBE processing pipeline except for tidal reduction which, as mentioned previously, was done using TCARI. Please note, since TCARI correction is done outside of CARIS HIPS and is not reflected in the HIPS Log Viewer.

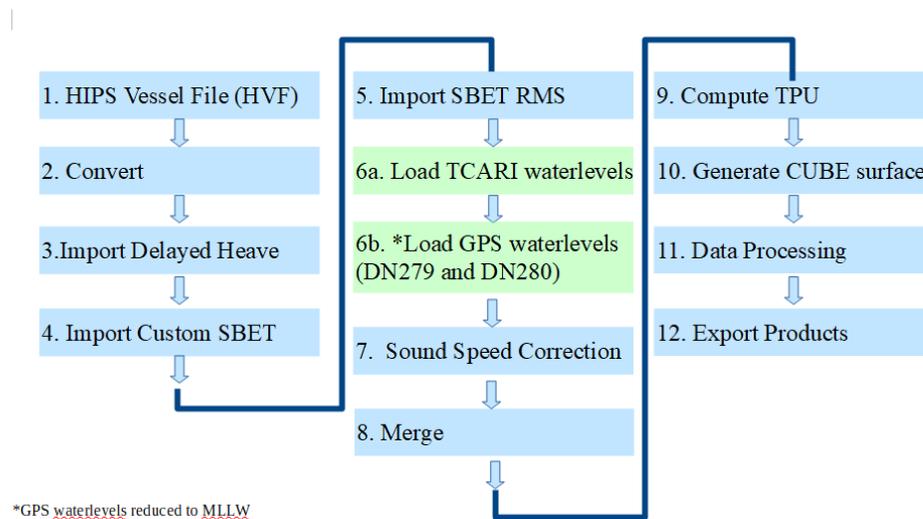


Figure 1 CUBE Processing Workflow

Post Processed Attitude and Uncertainties

As previously described, custom SBET were applied. For the SBET application for most of the Reson7125 a -1 second time offset was entered for the timing option component.

TCARI

TCARI tidal corrections were applied outside of CARIS therefore the CARIS log will not reflect the final tidal corrections (i.e. may list observed or zero tides).

GPS Water levels

An observable vertical step of 0.3 m was observed on DN279 and DN280. To reduce this offset GPS water levels were computed using a height correction to MLLW. The correction was determined using NOAA's VDatum transformation tool v3.7. A single point correction was determined from the average differences and applied during Compute GPS water levels in CARIS Hips. Approval for the use of GPS water levels is included in the folder *Correspondence*, submitted with this dataset.

Sound Speed

Sound speed was applied “nearest in distance within time (4 hours).” One survey line was processed using a 5 hour profile method.

Filters

Most of the survey lines were filtered using a beam angle filter of 60°/60° port and starboard. This was done to reduce the contribution of noise from outer beams. The eastern edge of the survey was filter more conservatively to retain coverage.

The survey area contained piles and other man-made features. Most of these features were removed with the outer beam filters.

Data Assessment

Motion Artifact

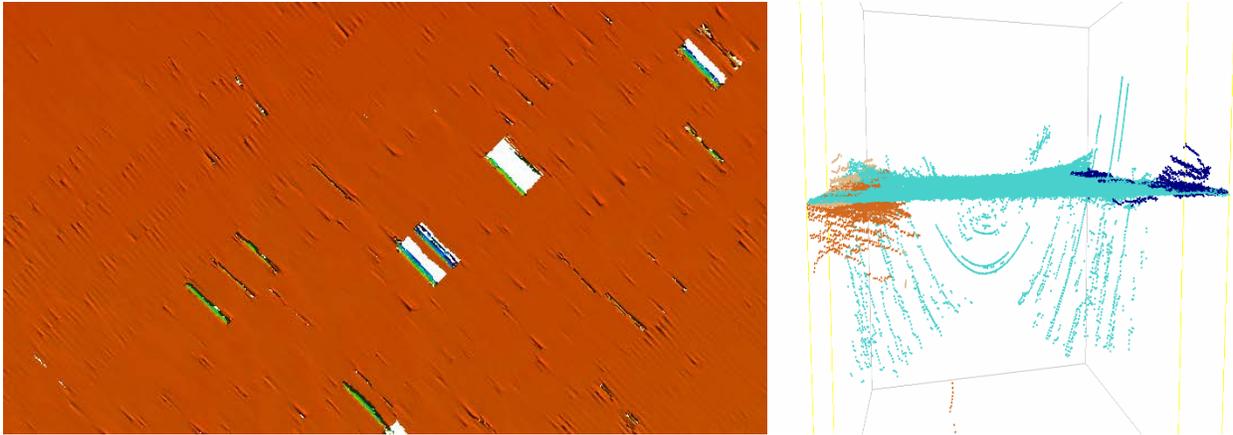


Figure 2 Typical Motion Artifact Prior to Data Processing in EM710 (3x vertical exaggeration, 2m CUBE surface)

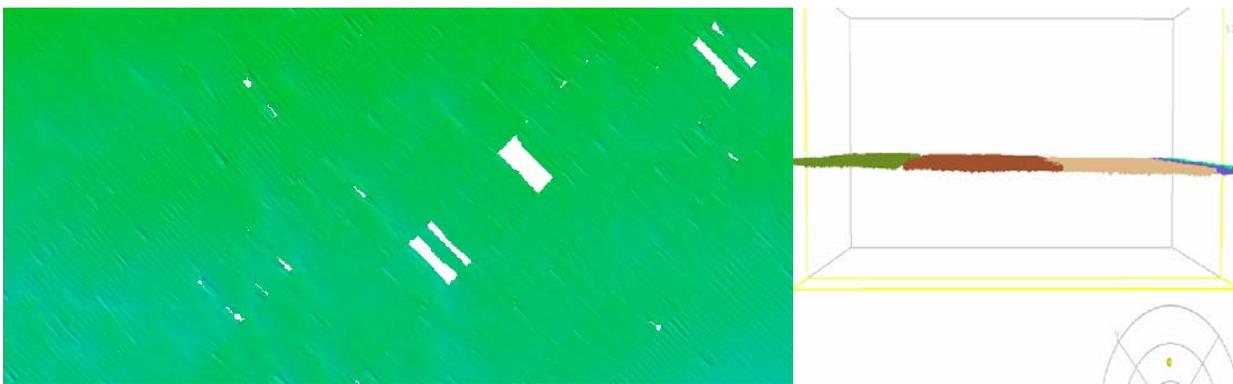


Figure 3 Motion Artifact Reduction in EM710 (3x vertical exaggeration, interpolated final CUBE surface)

Both Kongsberg EM710 and the Reson 7125 have observable motion artifacts. This required a great deal of processing to reduce. To aid in reviewing and editing the node standard deviation child layer was employed. All nodes with a standard deviation of 0.5m or greater were reviewed manually in subset mode. The majority of the high standard deviation were related to the difference in heights of the peaks and troughs caused by the motion artifact. Reducing the noise related to the motion artifacts created numerous small holidays in the final 2m CUBE surface. The processor created an interpolated surface from the finalized 2m CUBE surface and believes this is a better representation of the sea floor.

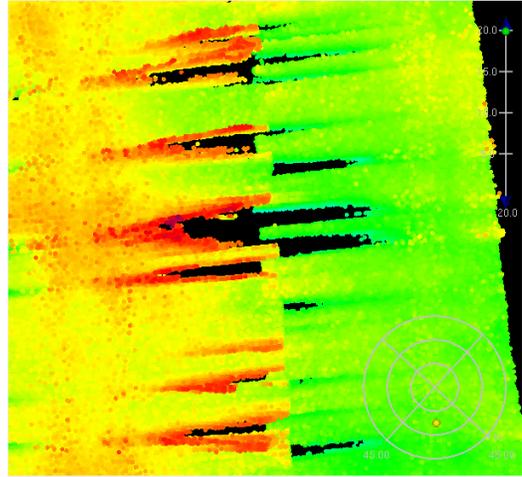


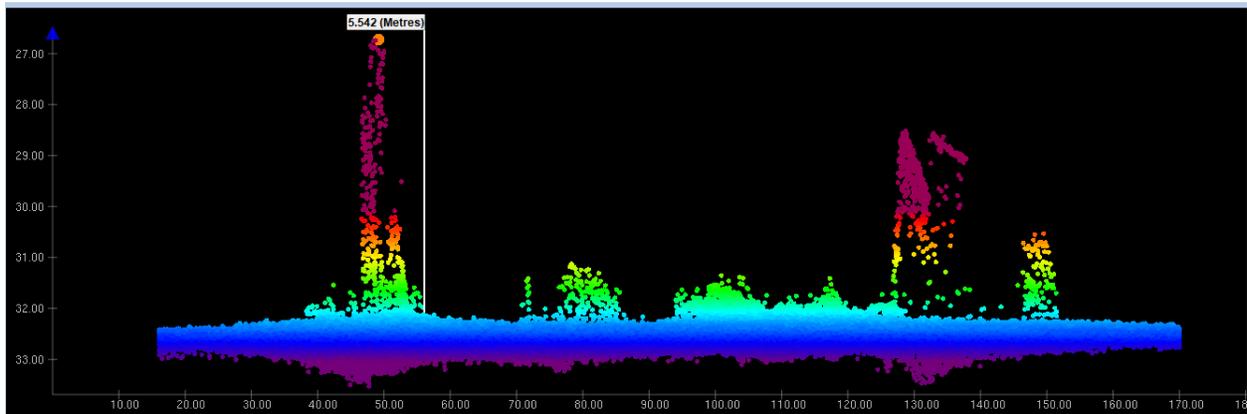
Figure 4 Small holidays created during processing

Crosslines

All crosslines meet IHO Order 1 accuracy standard.

Wrecks

A possible historic wreck was located in the survey area at 40-17.434N, 073-22.243W. The wreck is approximately 100m long and stands 5.5m proud from the surrounding sea floor.



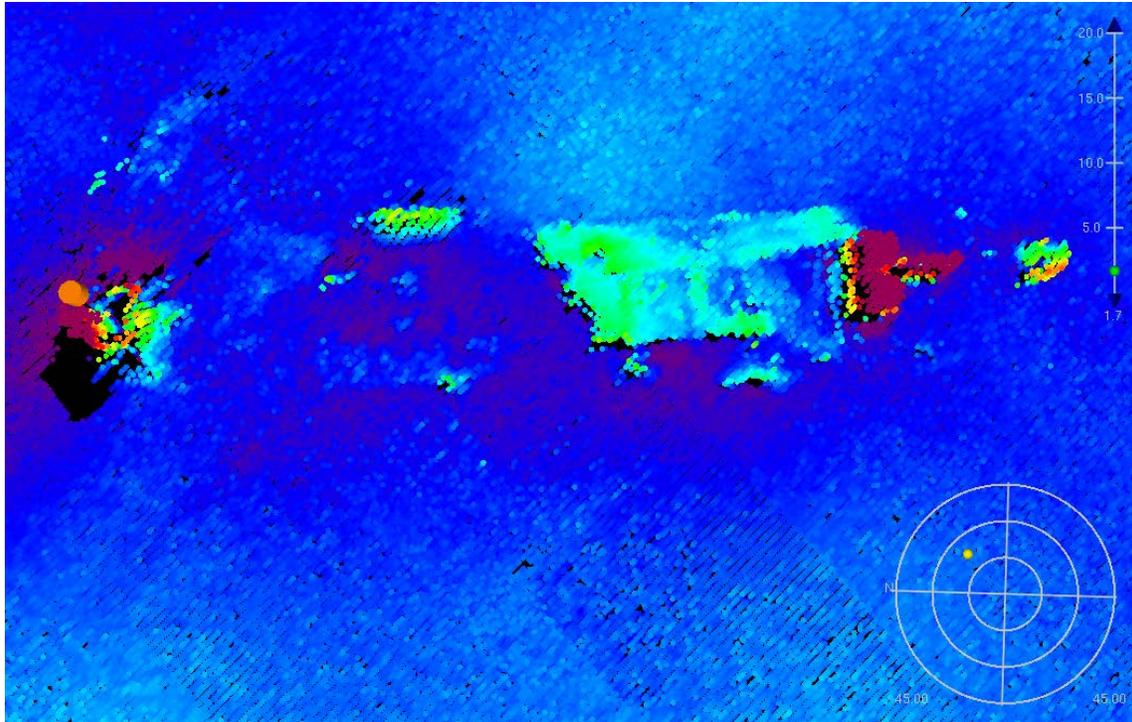


Figure 5 Possible AWOIS Wreck 7721

Although, not on the largest scale chart, the wreck corresponds to the general area for AWOIS Record 7721 for the wreck of the SS “Durley Chine.” The vessel sank April 30, 1917 after it was collided with the Steamer “Harlem.” Unable to locate any photographs of the Durley Chine however, the image of the Harlem has remarkably similar features (two stacks and aft cabin) to the wreck above¹.



Figure 6. Photograph of SS “Harlem”

¹ http://njscuba.net/sites/chart_deep_sea.php#DurleyChine

A smaller, more modern, wreck was located at 40-16.593N, 073-19.196W.

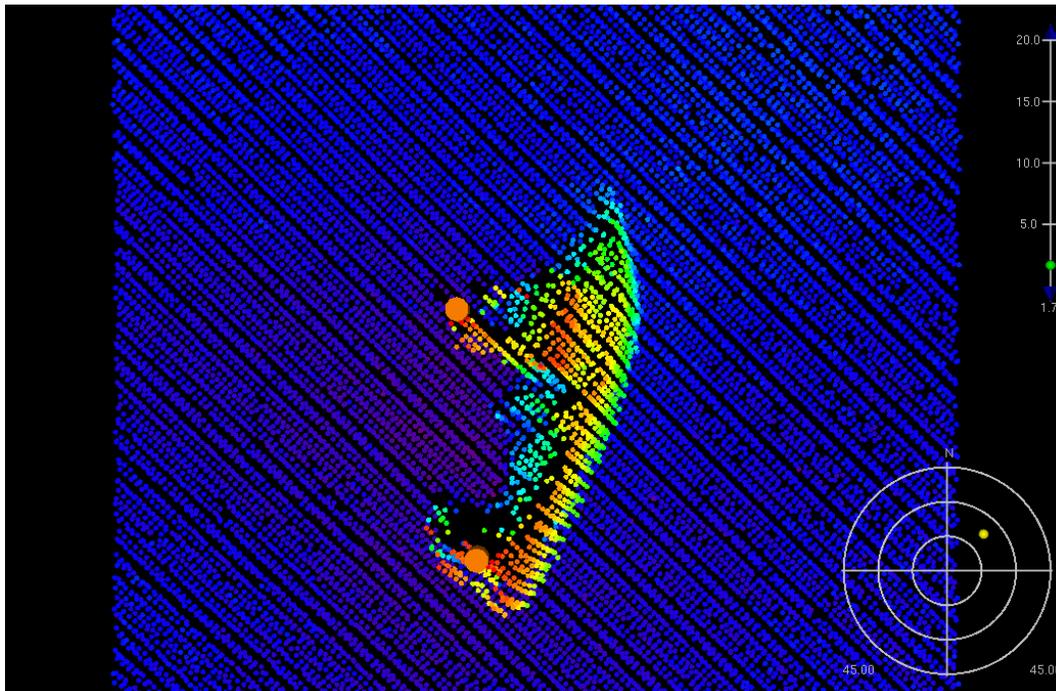


Figure 7 Uncharted Wreck in Survey Area

Data Package

The data delivery includes processed CARIS data, MBES processing log, POSPac processing log, and processed SBET projects and associated files.

The “POSPac” folder on the data drive was renamed “POS MV” and a new POSPac folder that contains the post processed navigation and attitude. Please note all the custom exported SBET and RMS files are in the export folder for each POSPac project and in a separate folder under POSPac (e.g. D:\Projects\SolmarHydro\NF-17-09-NY-Bight\POSPAC\SBET).

This data is not to be used for navigation, volume computations or product creation until reviewed and approved for such use by a certified hydrographer, surveyor or party chief.

Please feel free to contact me with any questions or concerns. Thank you for the opportunity to work on this project!

Shyla Hocker
206-612-0727
Shyla.allen@gmail.com



Shyla Allen <shyla.allen@gmail.com>

NF-17-09-NY-Bight

3 messages

Shyla Allen <shyla.allen@gmail.com>
To: mike stecher <solmarhydro@gmail.com>

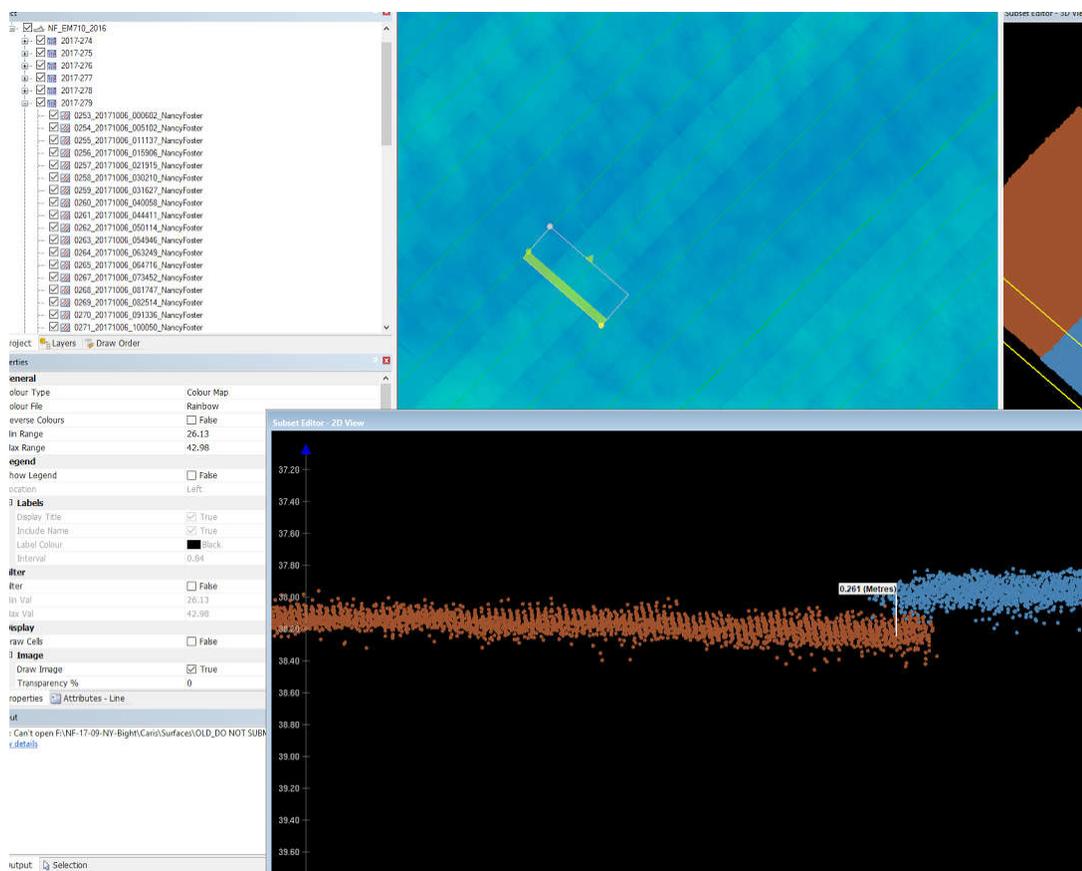
Wed, Dec 6, 2017 at 8:10 AM

Mike,

TCARI waterlevels have been applied to the entire dataset however, there is a day (DN279) that is offset from the rest of the survey by nearly 0.3m. This day was particularly rough. I've reviewed the obvious causes (no draft level change in the HVF, no sound speed spikes). I would like to apply GPS waterlevels to this day and see I can reduce this offset. GPS heights have already been applied, but GPS tides have been created or loaded.

For testing, I will need the Vdatum model for the New York Bight area and NOAA's approval to apply it. If GPS waterlevels fail to help then TCARI tidal constituents will be reloaded.

Thanks,
Shyla



mike stecher <solmarhydro@gmail.com>
To: Shyla Allen <shyla.allen@gmail.com>

Wed, Dec 6, 2017 at 10:27 AM

----- Forwarded message -----

From: **Colleen Fanelli - NOAA Federal** <colleen.fanelli@noaa.gov>

Date: Wed, Dec 6, 2017 at 10:17 AM

Subject: Re: NF-17-09-NY-Bight

To: Mike Stecher <solmarhydro@gmail.com>, Tim Battista - NOAA Federal <tim.battista@noaa.gov>

Cc: "_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>

Mike,

The VDatum tool is available online here: <https://vdatum.noaa.gov/welcome.html>. Any questions you may have regarding VDatum should be sent to vdatum.info@noaa.gov. Our office works with the NOAA VDatum program but we do not maintain it, nor have access to the model. For approval to use VDatum over TCARI, Tim would need to respond to this request. Thank you.

~Colleen

--

Colleen Fanelli

Oceanographer, Hydrographic Planning Team Lead

NOAA/National Ocean Service

Center for Operational Oceanographic Products and Services

Station 7127

[1305 East-West Highway](#) N/OPS3

Silver Spring, MD 20910

Colleen.Fanelli@noaa.gov

Phone (NEW): (240) 533 - 0615

Compare the meteorologist with his or her oceanographer colleague: the oceanographer may spend many years planning a campaign of observations of currents, temperature and salinity in a tiny area of the ocean, many weeks of discomfort on a ship taking the observations and several years analysing them back at the laboratory. All of this work is done for the research meteorologist, several times a day on a global basis, who merely has to read the numbers from an archive and construct whatever diagnostic quantity is required.

--Ian N. James, Introduction to Circulating Atmospheres

On Wed, Dec 6, 2017 at 12:16 PM, Hua Yang - NOAA Affiliate <hua.yang@noaa.gov> wrote:

----- Forwarded message -----

From: **mike stecher** <solmarhydro@gmail.com>

Date: Wed, Dec 6, 2017 at 11:19 AM

Subject: Fwd: NF-17-09-NY-Bight

To: Tim Battista <Tim.Battista@noaa.gov>, Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>

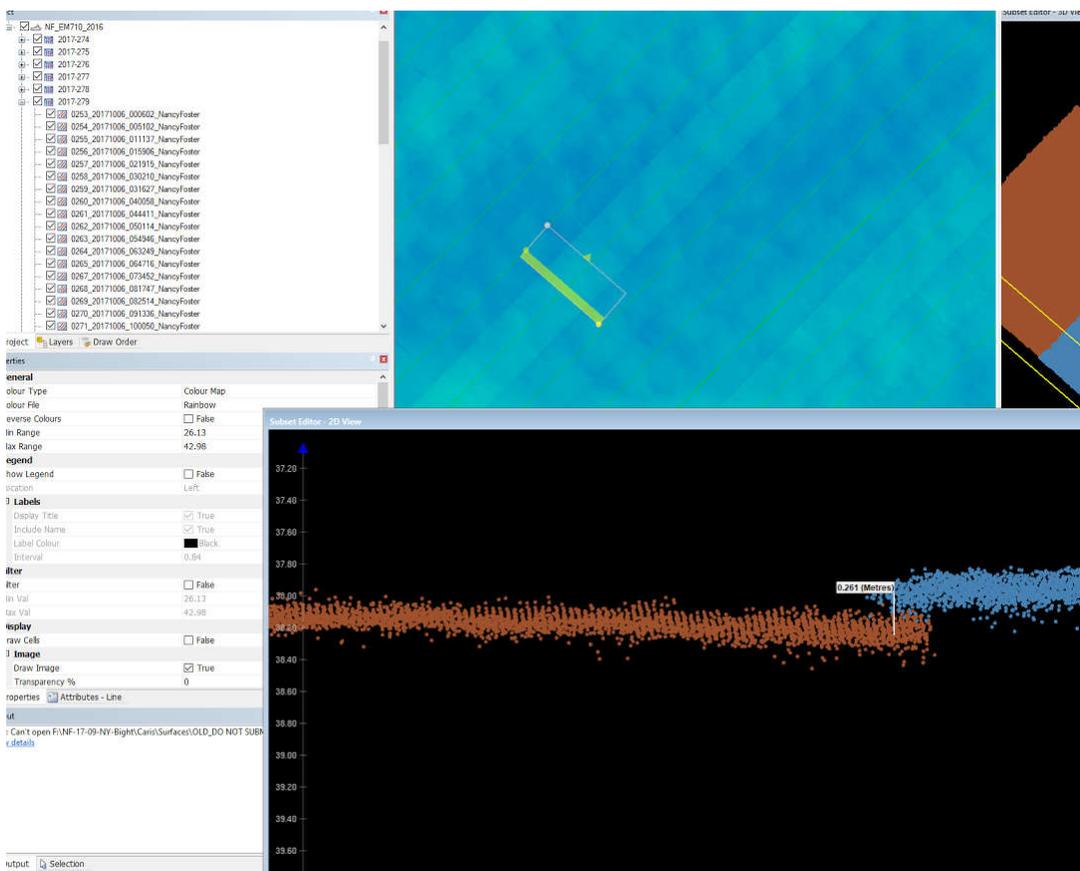
Fellows,

TCARI waterlevels have been applied to the entire dataset however, there is a day (DN279) that is offset from the rest of the survey by nearly 0.3m. This day was particularly rough. I've reviewed the obvious causes (no draft level change in the HVF, no sound speed spikes). I would like to apply GPS waterlevels to this day and see I can reduce this offset.

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If GPS waterlevels fail to help then TCARI tidal constituents will be reloaded.

Thanks,
Mike



--
Mike Stecher C.H.
Solmar Hydro Inc.
www.solmarhydro.com
Cell: (206) 200 8269
Email: solmarhydro@gmail.com

--
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Solmar Hydro Inc.
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mike stecher <solmarhydro@gmail.com>
To: Shyla Allen <shyla.allen@gmail.com>

Wed, Dec 6, 2017 at 10:59 AM

----- Forwarded message -----

From: **Tim Battista - NOAA Federal** <tim.battista@noaa.gov>

Date: Wed, Dec 6, 2017 at 10:28 AM

Subject: Re: NF-17-09-NY-Bight

To: Colleen Fanelli - NOAA Federal <colleen.fanelli@noaa.gov>

Cc: Mike Stecher <solmarhydro@gmail.com>, "_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>

Mike, I think it is worth investigating VDatum for a solution to this issue. Please report back to us what you find

Tim

On Wed, Dec 6, 2017 at 1:17 PM, Colleen Fanelli - NOAA Federal <colleen.fanelli@noaa.gov> wrote:

Mike,

The VDatum tool is available online here: <https://vdatum.noaa.gov/welcome.html>. Any questions you may have regarding VDatum should be sent to vdatum.info@noaa.gov. Our office works with the NOAA VDatum program but we do not maintain it, nor have access to the model. For approval to use VDatum over TCARI, Tim would need to respond to this request. Thank you.

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Colleen Fanelli

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NOAA/National Ocean Service

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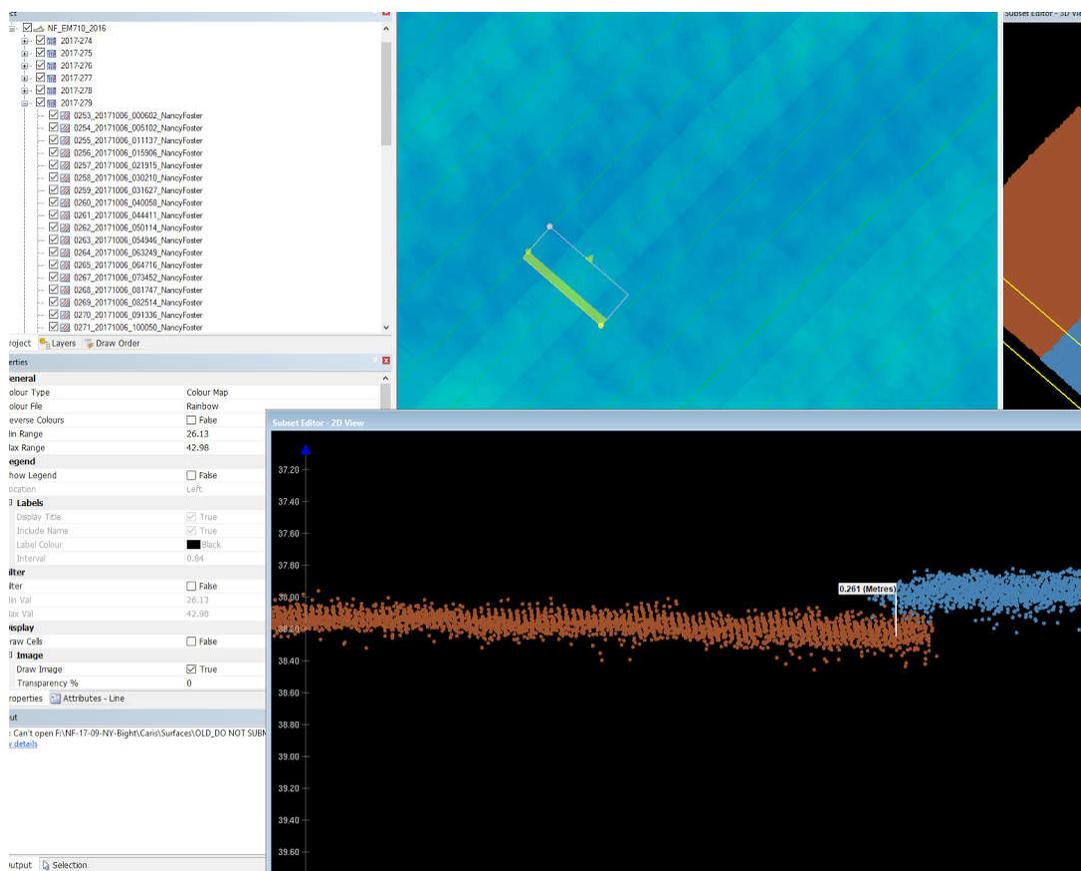
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Mike



--
Mike Stecher C.H.
Solmar Hydro Inc.
www.solmarhydro.com
Cell: (206) 200 8269
Email: solmarhydro@gmail.com

--
Tim Battista
Oceanographer
Biogeography Branch, Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
NOAA National Ocean Service

(p) [240-533-0379](tel:240-533-0379)
(f) [301-713-4384](tel:301-713-4384)
(email) Tim.Battista@noaa.gov
<https://coastalscience.noaa.gov>

"Essentially, all models are wrong, but some are useful."
-George E.P. Box

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Mike Stecher C.H.
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Cell: (206) 200 8269
Email: solmarhydro@gmail.com

APPROVAL PAGE

W00438

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 NCEI for archive

- Descriptive Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Processed survey data and records
- GeoPDF of survey products
- Collection of Backscatter mosaics

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

Approved: _____

Lieutenant Commander Ryan Wartick, NOAA
Chief, Atlantic Hydrographic Branch